

POPULAR COMMUNICATIONS

SEPTEMBER 1985 \$1.95
\$2.50 CANADA

Goodyear Blimp Communications

- **KTNT: Wacko 1920's Broadcaster**
- **We Visit A 1-Room Radio Station**
- **Build A Direction Finding Antenna**
- **POP'COMM Tests The New Yaesu FRG-8800 Receiver**
- **Broadcasting In The Philippines**
- **Scanning A Skyjacking**



KENWOOD

...pacesetter in amateur radio

Scan the World. R-2000

Kenwood's R-2000 receiver has opened the doors to a new world in the 150-kHz to 30-MHz HF bands, with microprocessor controlled operating features and an UP conversion PLL circuit for maximum flexibility and to enhance the excitement of listening to stations from east to west, and from pole to pole. An optional VC-10 VHF converter, for 118 to 174-MHz, allows access to police, aviation, marine, commercial, and two meter Amateur frequencies. With dual digital VFO's, ten memories that store frequency, band and mode information, memory scan, programmable band scan, fluorescent tube digital display, and dual 24-hour clock with timer, this outstanding radio has the versatility needed to reach out and catch those distant and elusive stations in the most remote areas of the world.

The R-2000 receives in the USB, LSB, CW, AM, and FM modes, and its ten memories allow moving from band to band without concern for mode of operation. The programmable band scan feature permits scanning over operator selected

CIRCLE 71 ON READER SERVICE CARD

limits, reducing scan cycle time. Memory scan allows the operator to scan all, or only specific memories. Lithium battery memory backup (Estimated 5 year life) is built-in.

With the sensitive R-2000, only the best in selectivity will do. It has three built-in IF filters, with NARROW/WIDE selector switch, and an optional 500-Hz narrow CW filter is available. A noise blanker, and an all-mode squelch circuit further enhance the operators control of his listening environment. An AGC switch, and an RF attenuator switch allow selection of the best signal-to-noise ratio. It has a large, front mounted speaker, a tone control, an "S" meter, high and low impedance antenna terminals, and operates on 100/120/220/240 VAC, or on 13.8 VDC, with an optional DCK-1 DC cable kit. Other features include a record output jack, an audible "beeper," a carrying handle, a headphone jack, and an external speaker jack.

The R-2000 places the world at your finger tips.

R-2000 optional accessories:
VC-10 VHF converter • HS-4, HS-5, and HS-6 headphones • DCK-1 DC cable kit • YG-455C 500-Hz CW filter.



R-1000 High performance receiver
• 200 kHz—30 MHz • digital display/clock/timer • 3 IF filters • PLL UP conversion • noise blanker • RF step attenuator • 120-240 VAC (Optional 13.8 VDC).



R-600 General coverage receiver
• 150 kHz—30 MHz • digital display
• 2 IF filters • PLL UP conversion • noise blanker • RF attenuator • front speaker
• 100-240 VAC (Optional 13.8 VDC).

More information on these products is available from authorized dealers of Trio-Kenwood Communications, 1111 West Walnut Street, Compton, California 90220.

Specifications and prices are subject to change without notice or obligation.



ICF-2010 **Intro Special**

\$279.95
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LIST \$349.00 1985 catalog price \$299.00

**NEW! SONY
RECEIVER**



TECHNOLOGY FEATURES

- **Dual PLL quartz frequency synthesis** — the world's most accurate tuning system; uses a quartz crystal's accuracy to abolish drift and maximize tuning stability
- **New synchronous detection circuitry** for the first time in a consumer radio; dramatically reduces fading and annoying "beat" frequency interference from adjacent stations
- **Switchable IF bandwidth**, "narrow" to select one station out of a crowded band, or "wide" for the lowest distortion when your station isn't fighting to break through the clutter
- **Built-in ferrite bar antenna** for LW and MW reception
- **Telescopic antenna** for FM and SW reception

SPECIFICATIONS

Frequency Range: AM: 150-29,999.9 kHz; FM: 76-108 MHz; Air: 116-136 MHz

Antenna System: LW, MW: Built-in Ferrite Bar Antenna; FM, Air, SW: Telescopic Antenna

Inputs: DC-In 4.5V, External antenna input (minijack x 2)

Outputs: Earphone (minijack); Record output (minijack)

Speaker: 4-inch dynamic

Power Requirements: Batteries "D" x 3 (4.5V) (optional); "AA" x 2 (3V) (optional) for programmable clock/timer; AC 120 Volts, 60 Hz with AC Adaptor (supplied); DC-12 Volts with DCC-127A Car Battery Cord (optional)

Dimensions: 6 1/4" H x 1 13/16" W x 2 1/8" D

Weight: 3 lbs, 12 oz (with batteries inserted)

Color: Black

Supplied Accessories: AC Adaptor, Earphone, Shoulder Strap, Long Wire External Antenna, External Antenna Connector (x 2), Short Wave Handbook

Optional Accessories: DCC-127A Car Battery Cord, AN-1 Active Antenna

CONVENIENCE FEATURES

- **Full AM band coverage (LW, MW, SW, USB, LSB) plus FM and Air Band reception**
- **Band select** function for quick access to SW broadcast bands
- **Direct Access™** tuning enables you to "key-in" station numbers directly
- **Rotary tuning knob** for smooth, convenient manual tuning up and down the band
- **32 station memory presets** for immediate recall at the touch of a button
- **Memory Scan tuning** gives a brief sampling of each preset

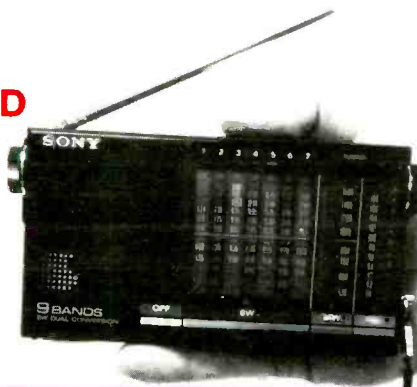
- **Automatic Scan tuning** gives a brief sampling of each station on the band
- **Built-in quartz clock** with standby and alarm capability
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- **Switchable 12-hour/24-hour clock** indication; 24 hour indication facilitates reference to Greenwich Mean Time (GMT)
- **Multi-function liquid crystal display (LCD)** indicates tuned frequency, preset station number, AM (LW, MW, SW) or FM, shortwave meter band, and more

NEW! 9 BANDS IN THE PALM OF YOUR HAND

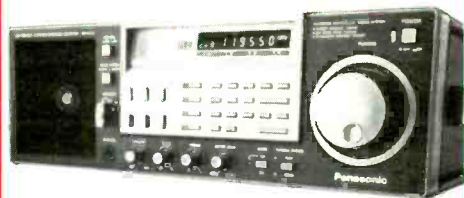
SONY ICF-4910

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150 kHz-30 MHz AM, 76-108 MHz FM • 1 uV sensitivity @ 6 dB S/N @ 10 MHz • 72 dB @ 10 MHz image ratio • 3 kHz @ -6 dB

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Communications Electronics,™ the world's largest distributor of radio scanners, introduces new scanners and scanner accessories from J.I.L., Regency and also Uniden/Bearcat. Chances are the police, fire and weather emergencies you'll read about in tomorrow's paper are coming through on a scanner today.

NEW! Regency® MX7000-J

List price \$699.95/CE price \$424.00/SPECIAL **10-Band, 20 Channel • Crystalless • AC/DC** Frequency range: 25-550 MHz, continuous coverage and 800 MHz. to 1.3 GHz, continuous coverage In addition to normal scanner listening, the MX7000 offers CB, VHF, and UHF TV audio, FM Broadcast, all aircraft bands (civil and military), 800 MHz communications, cellular telephone, and when connected to a printer or CRT, satellite weather pictures. If you just need continuous frequency coverage of 25-550 MHz, order the Regency MX5000-J for only \$329.00 each.

NEW! Regency® MX4000-J

List price \$629.95/CE price \$299.00/SPECIAL **Multi-Band, 20 Channel • No-crystal scanner Search • Lockout • Priority • AC/DC Selectable AM-FM modes • LCD display** Bands: 30-50, 118-136, 144-174, 440-512, 800-950 MHz. The Regency MX4000 is gives coverage in the standard VHF and UHF ranges with the important addition of the 800 MHz. and aircraft bands. It features keyboard entry, multifunction liquid crystal display and variable search increments.

NEW! Regency® Z60-J

List price \$379.95/CE price \$216.00/SPECIAL **8-Band, 60 Channel • No-crystal scanner** Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz. Cover your choice of over 15,000 frequencies on 60 channels at the touch of your finger.

Regency® HX-650P-J

List price \$189.95/CE price \$99.00/SPECIAL **5-Band, 6 Channel • Handheld crystal scanner** Bands: 30-50, 146-174, 450-512 MHz

Now, Communications Electronics Inc. offers a special package price on the Regency HX-650 scanner and the following items for only \$94.00. You get the Regency HX-650 scanner, a set of 4 AAA ni-cad batteries, the MA-506 carrying case, six crystal certificates, AC adapter/charger and flexible rubber antenna for only \$99.00 per package plus \$10.00 shipping/handling.

NEW! JIL SX-400-J

List price \$799.95/CE price \$469.00/SPECIAL **Multi-Band, 20 Channel • No-crystal Scanner Search • Lockout • Priority • AC/DC** Frequency range: 26-520 MHz, continuous coverage. With optionally equipped RF converters 150KHz-3.7 GHz. The JIL SX-400 synthesized scanner is designed for commercial and professional monitor users that demand features not found in ordinary scanners. The SX-400 will cover from 150 KHz to 3.7 GHz, with RF converters. Order the following RF converters for your SX-400 scanner. **RF-1030-J** at \$259.00 each for frequency range 150 KHz-30 MHz, USB, LSB, CW and AM. (CW filter required for CW signal reception); **RF-5080-J** at \$199.00 each for 500-800 MHz.; **RF-8014-J** at \$199.00 each for 800 MHz-1.4 GHz. Be sure to also order **ACB-300-J** at \$99.00 each which is an antenna control box for connection of the RF converters. Add \$3.00 shipping for each RF converter or antenna control box. If you need further information on the JIL scanners, contact JIL directly at 213-926-6727 or write JIL at 17120 Edwards Road, Cerritos, California 90701.

SPECIAL! JIL SX-200-J

List price \$499.95/CE special price \$159.00 **Multi-Band - 16 Channel • No-Crystal Scanner** Frequency range 26-88, 108-180, 380-514 MHz

The JIL SX-200 scanner tunes military, F.B.I., Space Satellites, Police and Fire, Drug Enforcement Agencies, Defense Department, Aeronautical AM band, Aero Navigation Band, Fish & Game, Immigration, Paramedics, Amateur Radio, Justice Department, State Department, plus other thousands of radio frequencies most other scanners can't pick up. The SX-200 has selectable AM/FM receiver circuits, tri-switch squelch settings - signal, audio and signal & audio, outboard AC power supply - DC at 12 volts built-in, quartz clock - bright vacuum fluorescent blue readouts and dimmer, dual level search speeds, tri-level scan delay switches, 16 memory channels in two channels banks, receive fine tune (RIT) ± 2KHz., dual level RF gain settings - 20 db pad, AGC test points for optional signal strength meters. All in all, the JIL SX-200 gives you more features for the money than any other scanner currently on sale. Order your JIL SX-200 scanner at this special price today.

Regency® HX1000-J

List price \$329.95/CE price \$209.00 **6-Band, 30 Channel • No Crystal scanner Search • Lockout • Priority • Scan delay Sidelit liquid crystal display • Digital Clock** Frequency range: 30-50, 144-174, 440-512 MHz.

The new handheld Regency HX1000 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 30 channels at the same time. When you activate the priority control, you automatically override all other calls to listen to your favorite frequency. The LCD display is even sidelit for night use. Order **MA-256-J** rapid charge drop-in battery charger for \$79.00 plus \$3.00 shipping/handling. Includes wall charger, carrying case, belt clip, flexible antenna and nicad battery. Order now.

NEW! Bearcat® 100XL-J

List price \$349.95/CE price \$229.00 **9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC** Frequency range: 30-50, 118-174, 406-512 MHz

The world's first no-crystal handheld scanner now has a LCD channel display with backlight for low light use and aircraft band coverage at the same low price. Size is 1 3/4" x 7 1/2" x 2 1/4". The Bearcat 100XL has wide frequency coverage that includes all public service bands (Low, High, UHF and "T" bands), the AM aircraft band, the 2-meter and 70 cm. amateur bands, plus military and federal government frequencies. Wow... what a scanner!

Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

NEW! Regency® HX2000-J

The World's First 800 MHz. Handheld Scanner List price \$569.95/CE price \$299.00/SPECIAL **7-Band, 20 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC Sidelit liquid crystal display • Memory backup** Bands: 118-136, 144-174, 440-512, 800-950 MHz

The HX2000 scanner operates on 120V AC or 6 VDC. Scans 15 channels per second. Size 3" x 7" x 1 1/2". Includes wall charger, carrying case, belt clip, flexible antenna and nicad batteries. Selectable AM/FM modes.

NEW! Bearcat® 800XLT-J

List price \$499.95/CE price \$329.00 **12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC** Bands: 29-54, 118-174, 406-512, 806-912 MHz. The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9 1/4" x 4 1/2" x 1 1/2".

OTHER RADIOS AND ACCESSORIES

Panasonic RF-2600-J Shortwave receiver	\$179.00
Panasonic RF-B300-J Shortwave receiver	\$195.00
RD95-J Uniden Remote mount Radar Detector	\$139.00
BC 300-J Bearcat 50 channel scanner	\$344.00
BC 20/20-J Bearcat 40 channel scanner	\$274.00
BC 210XW-J Bearcat 20 channel scanner	\$219.00
BC 280-J Bearcat 16 channel mobile scanner	\$274.00
BC 201-J Bearcat 16 channel scanner	\$189.00
BC 180-J Bearcat 16 channel scanner	\$164.00
BC-WA-J Bearcat Weather Alert™	\$39.00
DX1000-J Bearcat shortwave receiver	\$459.00
PC22-J Uniden remote mount CB transceiver	\$99.00
PC55-J Uniden mobile mount CB transceiver	\$59.00
Z10-J Regency 10 channel scanner	\$139.00
Z30-J Regency 30 channel scanner	\$154.00
Z45-J Regency 45 channel scanner	\$179.00
MX3000-J Regency 30 channel scanner	\$189.00
C403-J Regency 4 channel scanner	\$69.00
R106-J Regency 10 channel scanner	\$99.00
RH250B-J Regency 10 channel VHF transceiver	\$329.00
RU150B-J Regency 10 channel UHF transceiver	\$449.00
RP410-J 10 ch. handheld no-crystal transceiver	\$399.00
BC10-J Battery charger for Regency RP410	\$79.00
MA256-J Drop-in charger for HX1000 scanner	\$79.95
MA257-J Cigarette lighter cord for HX1000	\$19.95
MA258-J Ni-Cad battery pack for HX1000	\$24.95
EC10-J Programming tool for Regency RP410	\$20.00
SMRH250-J Service man. for Regency RH250	\$20.00
SMRU150-J Service man. for Regency RU150	\$20.00
SMRPH410-J Service man. for Regency RP410	\$20.00
B-4-J 2 V AAA Ni-Cad batteries (set of four)	\$9.00
A-135C-J Crystal certificate	\$3.00
FB-E-J Frequency Directory for Eastern U.S.A.	\$12.00
FB-W-J Frequency Directory for Western U.S.A.	\$12.00
TSG-J "Top Secret" Registry of U.S. Govt. Freq.	\$15.00
TIC-J Techniques for Intercepting Comm.	\$15.00
RRF-J Railroad frequency directory	\$10.00
CIE-J Covert Intelligent, Elect. Eavesdropping	\$15.00
A60-J Magnet mount mobile scanner antenna	\$35.00
A70-J Base station scanner antenna	\$35.00
USAMM-J Mag mount VHF/UHF ant. w/ 12' cable	\$39.95
USAK-J 3/4' hole mount VHF/UHF ant. w/ 17' cable	\$35.95
USATLM-J Trunk lip mount VHF/UHF antenna	\$35.95
Add \$3.00 shipping for all accessories ordered at the same time.	
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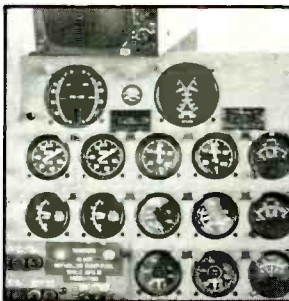
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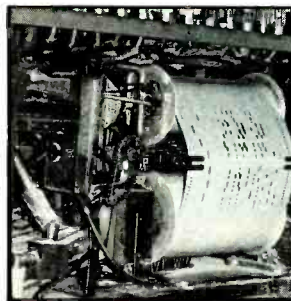
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SEPTEMBER 1985

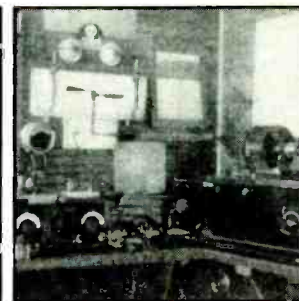
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This month's cover: One of the blimps in the Goodyear fleet shown in Pompano Beach, Florida. The inset shows Jim Maloney at the controls. Photo: by Larry Mulvehill, WP2ZPI.

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BEAMING IN

AN EDITORIAL

BY TOM KNEITEL, K2AES

The Curse Of An Old Radio

When I think back about the old neighborhood, I vividly remember the next door neighbor known to me only as "Aunt Rose." She wasn't really related to me, but somehow had been awarded the title of *aunt* as an acknowledgement of some *auntly* deed performed at some point in the past. Mostly, what I remember about Aunt Rose was that she maintained a knapsack that she called a *reticule*. This was always kept on the top shelf of the front hall closet.

If I didn't become too big a nuisance about it, I was able to get her to permit me to climb up on a chair and drag this reticule thing down and spread its wonderful contents out across her dining room floor. It was the repository of what must have been most of the collected memorabilia of her entire life. There was a menu from the Glen Island Casino autographed to her from Glenn Miller. A green and red wrapper from Lucky Strikes contained a scribbled smudge she insisted was the signature of Eleanor Roosevelt.

There were pressed flowers, hand written poems that made little sense to me, a packet of letters wrapped in a blue ribbon that I wasn't allowed to untie, and there were photographs of Aunt Rose posing with people she described to me as "Uncle Harry," "Un-

cle Willie," "Uncle Benny," "Uncle Charlie," and several others. There were snapshots of Aunt Rose at the beach, at amusement parks, and even one she claimed was taken atop the Eiffel Tower. There were assorted keys, ticket stubs, matchbooks, train schedules—and each and every one of these objects had with it a wonderful story.

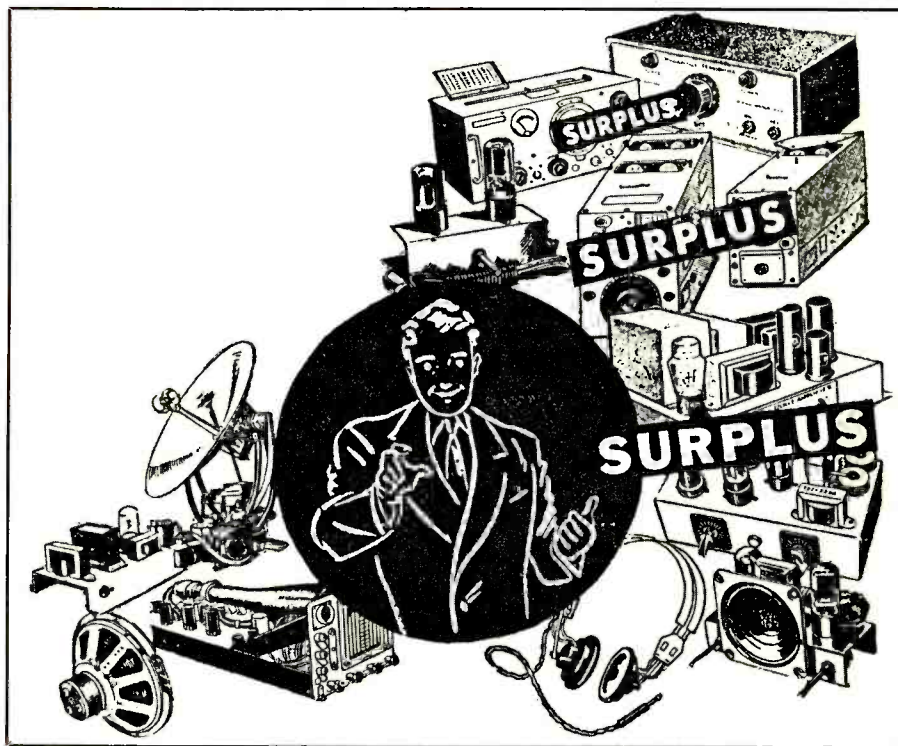
I've often thought how great it was to be able to put the souvenirs of one's life into one little container where they could be reviewed at will. More specifically, I once had the notion that I might do the same.

The problem comes down to the fact that lots of the things a communications nut holds dear can't easily be put into a small knapsack and tossed into a closet for later perusal.

True, a radio is only a hunk of metal with some dials and wires, but somehow one gets emotionally attached to one of these things after countless nights of exploring the frequencies. Each of these hunks of hardware has its own special memories, such as the time *this* receiver pulled in that rare DX station I'd been trying to snag for two years, or *that* set which offered me the chance to get on the air for the very first time.

(Continued on page 74)

"Just the sight of an ad for the stuff takes its toll."





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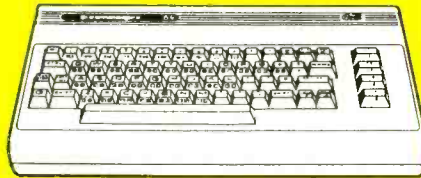
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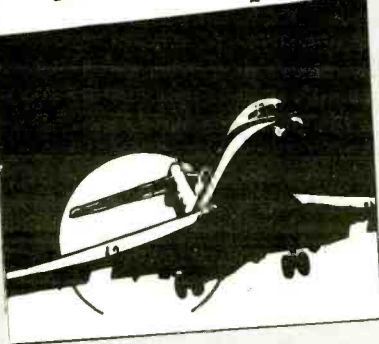
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LETTERS TO THE EDITOR

The most interesting questions we receive will be answered here in each issue. Address your questions to: Tom Kneitel, Editor, Popular Communications magazine, 76 North Broadway, Hicksville, NY 11801.

Holly Would

From time to time I've noticed that scanners and shortwave equipment are used in movies. These are brand name units and I was wondering who is responsible for the placement of these and who gets paid.

George Politakis, Jr.
Astoria, NY

An industry known as "product placement" attends to this and guarantees that their client's product will appear in several films per year. One major company in the field charges a minimum annual fee of \$25,000 for at least five placements per year. The placement company receives advance copies of scripts and decides where a client's products may be used—if necessary they even suggest scene changes in order to include such products. Products aren't usually shown being used by a villain or during the commission of a crime or in any other way that would discredit their use (the cops might be shown using a Brand X scanner, but not the crooks).

The advantage to the film companies (which aren't paid any fee to be a party to the commercial tie-in) is that the product placement company can furnish thousands of dollars worth of props for a film at no cost to the producers—that can include radios, cameras, candy bars, cars, aircraft, guns, beer, and more. The film's production staff can also benefit by receiving a generous handout of some of these products, ranging from cases of beer, candy bars, free trips on aircraft, radios, cameras, and other similar perks. The star of one of TV's most popular macho weekly series became an avid scanner fan after receiving one as a gift while he was working on a TV movie in which scanners were used. From that humble start three years ago, his interest in scanners and radios evolved to the point where he now has a rather lavish radio room in which he spends several hours each week. He's a POP'COMM reader and his specialty is federal frequency monitoring. —Editor

W2NSD's 1940's QSL Card

In reference to the W2NSD QSL in the July issue—yep, I got on the air the day we were permitted on 2 1/2 meters right after the war. I used a little walkie-talkie I'd built pre-war and worked hams all over the New London area. I got licensed in 1940 and managed to win the ARRL Sweepstakes in 1941 for my section—not bad for 160 meter operation. Then, after the war, I again won the

SS contest (1946) for my section, both times operating from my fraternity at college.

After serving for five war patrols on the USS *Drum*, I was sent to New London to teach electronics to new submariners. This is where I was when the FCC opened our first post-war ham band.

By the way, my old submarine crew gets together for a reunion every year. Recently I went to Mobile where the *Drum* is open to visitors, next to the battleship *Alabama*. Twenty five of my old shipmates attended.

I hope PC is doing well!

Wayne Green, W2NSD/1
Wayne Green Enterprises
Peterborough, NH

Interestingly, when we ran Wayne's 1946 QSL card we jokingly asked whatever became of him. No less than three very precise readers took the time and trouble to set the record straight by writing us lengthy letters pointing out some of the high points of Wayne's very colorful career in the publishing industry. —Editor

Regarding "72JKL"

I see that a number of POP'COMM readers have reported the station using the identification 72JKL. During my travels (I'm a signalman in the Royal Dutch Navy), I've had the chance to speak to signalmen in the Spanish Navy about 72JKL. I asked them to explain the difference between 72JKL and stations AME3/6/8, inasmuch as they all use the same frequencies.

They explained that 72JKL is used mainly for Spanish Naval communications while AME3/6/8 is for the Spanish merchant fleet. Spain also uses the call sign AOK, which is at the U.S. Navy HQ at Rota Naval Base. Most 72JKL transmissions are in RTTY mode and CW usage is for personal messages for crew members on naval vessels. POP'COMM is very informative.

Teun Feldman
Utrecht, Netherlands

Are You Talking About Me, Fella?

In the May issue Mailbag column you ran a letter from John M. Boyle of Bath, Ontario. Surprisingly, only a very small percentage of people even realize that shortwaves exist, or at least that there is something to hear on a radio receiver other than local broadcasters. I've been an avid SW and BCB DX'er for 30 years, and I resent Mr. Boyle's insinuation that I am part of a "sick busybody element." Doesn't Mr. Boyle realize that seeking out clandestine operations is the essence of the hobby? It's no feat of wonder to broadtune a 50 kW broadcaster in your own city, but tune in a cordless telephone from 7 miles away and

you're talking about DX! POP'COMM is fine, don't change a thing. Tell Mr. Boyle to loosen up and start enjoying the many pleasures of this great hobby.

Tracy Sands
Anaheim, CA

Let's Put A Cover On It!

Regarding your May editorial, obviously the readers who complained about POP'COMM's front covers have no idea how to sell a product. To me, the covers are of secondary importance to the information inside POP'COMM, but there's no denying that they are attention-getters. When I go to hamfests or the local newsstand and look over the "tons" of magazines displayed, POP'COMM is invariably the first to catch my eye, even though I might already have gotten that particular issue in the mail and have already seen the cover. It really stands out from the crowd, and this is obviously what you're after. I might add that nowhere have I found a publication with such a diversity of topics on communications like POP'COMM. Keep up the good work—you've got me hooked, line, and sinker for as long as POP'COMM is around. I expect that will be many, many years.

By the way, if any reader can spare a copy of the operator's manual for the Heath HW-8, I'd be interested in borrowing or purchasing same.

David Taillard, KC8GP
8396 Hillcrest
Westland, MI 48185

For the most part, reader response to the May issue discussion said the covers were fine just the way we've been running them. Several readers wrote to say that the negative comments we had received were perhaps unworthy of serious consideration on our part. And, of course, our editorial inspired a few newly discovered persons who are now writing to implore us to discontinue running "macho" covers. — Editor

'Low There!

My station runs QRP (very low power) and I'd like POP'COMM's readers to know that I sincerely appreciate SWL reports and will QSL all that validly report my station's signals. The best times to catch my signals are on the first Sunday of every month on frequencies (± 5 kHz): 3560, 7040, 10120, 14060, 21060, and 28060 kHz.

Brian Greer, WD6DMY
4422 Ben Avenue
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Forget about those killer-watts, here's a chance to QSL someone running a flea-powered station. What with the trend to run higher and higher power, WD6DMY's QSL could become a valuable part of your collection. — Editor

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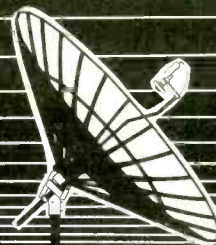
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CIRCLE 87 ON READER SERVICE CARD

September 1985 / POPULAR COMMUNICATIONS / 9



(Photo courtesy of The Goodyear Tire & Rubber Company)

Goodyear Airship Operations

Scanning Lighter-Than-Air Craft

BY ROBERT ZAMALIN, WA6VIP

A Goodyear blimp can operate eight hours a day for nearly a week on the amount of fuel that a big jet takes to taxi from ramp to runway for takeoff. Economy is only one fascinating part of the Goodyear blimp story, and we will be focusing on the history, operation, and, of course, the communication capability of the Goodyear airship fleet.

History

The Goodyear Tire & Rubber Company of Akron, Ohio built its first airship envelope in 1911, a big 400,000 cubic foot bag or-

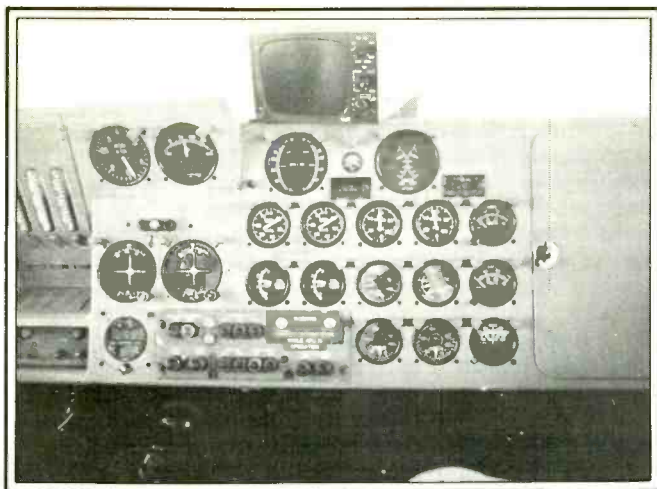
dered by a lighter-than-air enthusiast named Melvin Vaniman. He planned to fly across the Atlantic Ocean. His attempt proved disastrous. A spark from an engine set fire to the hydrogen-filled bag, plunging the airship into the ocean just off the New Jersey coast. Vaniman and several crewmen were lost.

But not to be deterred, Goodyear established its reputation as a leader in lighter-than-air craft during World War I, producing more than 1,000 balloons and approximately 100 non-rigid airships for the Allies. Since 1917 Goodyear has built over 300 airships, more than any company in the world.

Of that number, 60 have been commercial airships, with the remaining airships constructed for the Army and Navy.

Goodyear pioneered the use of helium in 1925 when the first of its commercial airships, the *Pilgrim*, was inflated with the non-flammable gas. Until that time, hydrogen was the most frequently used lifting agent, but it is highly flammable. A cubic foot of hydrogen can lift about 10% more weight than a cubic foot of helium, but the latter has greater safety advantages.

During World War II Navy airships, mostly constructed by Goodyear, compiled an



The Columbia's instrument panel. (Photo by G. E. Glidewell)



The "local copy unit" that puts the moving letters on the side of the blimp. (Photo by G. E. Glidewell)



This is the Columbia's gondola. (Photo by G. E. Glidewell)

astounding record, especially in the role of aerial escort for convoys. During the war in the Atlantic and Gulf Coast waters of the United States, and in the coastal waters of the Caribbean, Eastern Central America and Brazil, 532 vessels were sunk. But not one vessel was sunk by enemy submarines under escort by airships. Altogether, Navy airships escorted 89,000 ships during the war without loss of a single vessel.

Goodyear resumed its commercial airship operations after World War II. With the advent of the Korean conflict, the Navy once again stepped up its airship operations.

The last airships built for the Navy were four huge ZPG-3W type, non-rigid airships for use in the nation's early-warning defense network. These airships were retired from service by the Navy in 1962 after more sophisticated early-warning equipment was developed. Each of the ZPG-3W's was 10 times as large as the present day blimps.

Operations

Goodyear presently has four airships: the *Columbia*, *America*, *Enterprise*, and the *Europa* (which travels to Western Europe and England). In the early days of Goodyear's activity in lighter-than-air, the late P.

W. Litchfield, Chief Executive of the company, envisioned the blimp as an aerial yacht. As a result, all of Goodyear's domestic commercial airships have been named after yachts that won the famed America's Cup race. The *Columbia* spends six months of the year at its winter base in Los Angeles, California. The other six months she barnstorms throughout the nation. The *America*, based in Houston, Texas; the *Enterprise*, based in Pompano Beach, Florida; and the *Europa*, based in Rome, Italy, have similar schedules.

The Goodyear blimps are 192 feet long, 50 feet wide, and 59 feet tall. The envelope, which is 2,400 square yards of two-ply rubber coated polyester fabric, holds 202,700 cubic feet of helium for lift. The maximum gross weight is 12,320 pounds and the maximum lift is 2,820 pounds, and they are designed to carry six passengers and the pilot. Each ship can be set up for passenger flights, night sign operations, or sporting events. The blimps are powered by twin six-cylinder pusher-type fuel injected Continental IO360 (360cc) engines. These engines are normally rated at 180 hp, but with fuel injection they are brought up to 210 hp. The engines use 10 gallons per hour of 100 octane aviation fuel. The blimps have a cruising speed of 35 miles per hour and a maximum speed of 50 m.p.h., and normally fly between 1,000 feet and 3,000 feet with a maximum ceiling of 10,000 feet.

Each ship is staffed by five pilots, 16 ground crewmen, and a public relations representative. Ground crewmen play dual roles. In addition to handling the airship during takeoffs, landings, and moorings, they also serve as licensed radio technicians, mechanics, riggers, electricians, night sign specialists, and clerks.

With four specially equipped ground support vehicles, the blimp crew is almost self-sustaining in the field as far as operations and maintenance of the blimps is concerned. Moving from city to city, this caravan travels by highway with the blimp overhead. A bus specially designed for the operation serves as a flight center and communi-

cations headquarters on tour. It is equipped with radio equipment, all administrative aids necessary for the operation, and a special mast for landing the blimp if an emergency should arise during a cross-country mission. A large tractor-trailer serves as a mobile maintenance facility. The unit includes a machine shop, night sign, and television equipment lab. It also carries the main mast, spare parts, and supplementary equipment. A passenger van and sedan round out the rolling stock and are used for ground liaison work and crew transportation. All vehicles are equipped with two-way radio for contact with each other and the airship.

Goodyear's use of the blimp is primarily for public relations. More than likely, when the blimp is seen over the skyline, it is on a mission to promote conservation or other activities in the public interest, made at the request of a government agency, environmental group, or civic group. This includes air and noise pollution studies, traffic surveys, marine life, aerial studies, improvement of patrol methods by law enforcement agencies, or the production of educational television programs. The blimp is also used in covering sporting events, which will be covered later.

Also, it should be noted that rides on the blimp are not available to the public. The primary passengers are press, then Goodyear customers. Years ago they sold rides to the public, but because of their other obligations, they had to turn too many people away, so they stopped altogether.

Light Show

A feature of the Goodyear blimps is the "Super Skytacular" night signs on the sides of the envelopes, which uses a programmed assembly of more than 7,000 lights. The light show makes a procession of colorful messages, cartoons, and designs across the night sky. The "Super-Skytacular" sign on each side of the blimp is 105 feet long, and 24.5 feet high. Each includes 3,780 lamps or a total of 7,560 on both sides. These specially designed lamps, inside red, blue, green, and yellow reflectors, are connected

by 80 miles of wiring. With the blimp flying 1,000 feet above the ground, the Super-Skytacular night sign can be read by people on the ground from one mile on either side of the airship.

The skytacular night system is a marvel of electronic engineering. A technician "draws" the animation and copy on a cathode ray tube with a special "light beam" pencil and it is put on magnetic tape. A typical six minute tape consists of 40 million bits, which when run through special electronic readers aboard the airship, control the lamp and color selection and the speed at which the

messages are run. A technician on board can also type messages on a keyboard (known as the local copy unit), but cannot do animation.

Power supplied by the airship generators are not sufficient for the night signs electrical requirements, so an auxiliary power unit, a jet turbine engine, is employed. The auxiliary power unit is mounted on the underside of the gondola only during the night sign operations and is detached when not in use. Although the unit is, in effect, a small jet engine enclosed in a pod, it is designed to operate without any appreciable forward

thrust for the airship. Its purpose is to power a 500 ampere, 28 volt direct current generator which supplies electricity for the sign.

Communications

When communicating between the crew and airship, Goodyear Airship Operations uses a Motorola HF radio with 10 watts output and a PL circuit on 161.64 MHz. If there is interference or other problems, they can switch to 132.0 MHz. Narco radios are used for aviation band coverage. Both bands, of course, are being monitored at the same time. Other radio equipment in the blimp includes two Collins Nav-Com systems with other avionix gear, mostly Bendix. The ground crew is also supplied with handie-talkies.

Several antennas are used. A whip is attached to the bottom of the gondola for the HF radio. There are also two standard aviation antennas used to handle the Nav-Coms. Each blimp also has a glide-slope antenna mounted forward of the gondola, up high. Because of antenna placement, it is difficult to tune the communications gear. The receiver, indicator, and amplifier are taken to the shop, which tunes it the best they can, and it is then fine-tuned in the airship itself. However, this can't be done when the airship is flying because it involves taking up the floorboards of the gondola to gain access to the antennas. There is a certain amount of error, but it is not critical, not at least to the extent of other aircraft.

The Goodyear Airship Operations communications system really shines during coverage of sporting events, which includes everything from the Rose Bowl to the Indy 500. The blimps are known for providing spectacular aerial platforms for television operations. During these events Goodyear supplies the radio equipment, but the network's frequencies are used. A specially modified Goodyear supplied light-weight color camera is used for the telecast. A microwave transmitter sends the camera signals to the ground where a dish antenna picks them up. A network cameraman and video technician are on board the blimp. A third network crewman keeps the dish antenna positioned skyward to receive the signals from the blimp. The pilot listens for cues from the director, who is on the ground, in positioning the blimp.

Frequencies

Communications between the crew and airship takes place on 151.625 MHz when using the HF band. If necessary to use the aviation band, they use 132.0 MHz. When communicating with the networks during a media event, communications will also take place on 161.64, 161.70, and 161.76 MHz. All frequencies used by Goodyear Airship Operations are the same throughout the United States, but the unit numbers for each individual blimp are different. The *Columbia* uses 30, the *America* uses 40, and the *Enterprise* uses 50.

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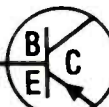
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KTNT – “Know The Naked Truth”

Controversy, Calliopes, And Cancer Cures Were The Stuff Of Which KTNT Was Made – It Was A 1920’s Broadcaster To Remember!

BY TOM KNEITEL, K2AES, EDITOR

Last May we ran a photograph of 1920’s broadcaster KTNT, Muscatine, Iowa. Our faded photo revealed a strange scene—the station building emblazoned with uplifting words such as “courage” and “honor,” and, just over the main entrance, the station’s owner had etched into the walls a dedication to his mother.

Even more curious was what was in the yard—the antenna tower used by KTNT, complete with an ice cream stand in its base.

There was, it turned out, only one thing more odd than this station. That was its owner, Norman G. Baker.

Born in Muscatine on 27 November 1882, Baker made it through the 10th grade in school, then dropped out to work in a machine shop. He went on to work in the local Muscatine industry of button making. Baker had a quick mind and found that not all of his helpful suggestions on how to run a business were always well received by his employers. This, along with a number of bouts with various illnesses, made his early employment record a series of briefly-held and generally menial jobs.

After working as a machinist and a circus barker, Baker tried his luck at being a vaudeville mentalist, thus reviving an interest he had toyed with a few years earlier. Eventually he devised a successful vaudeville act that toured throughout the midwest. This act had Baker working with an associate he dubbed “Madame Pearl Tangley.”

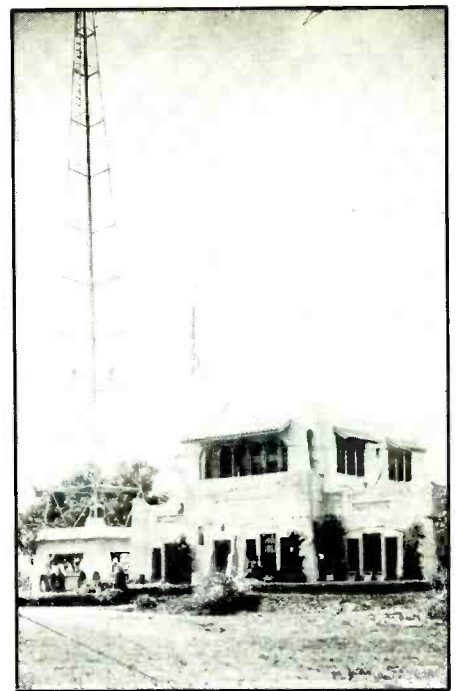
Several different ladies had worked in the act as Madame Tangley, but the final one was Teresa Pinder (or Pender), whom he married in 1912 (and divorced in 1915). Baker’s mentalist act was well received but basically was not at all substantially different than other similar acts wherein the mentalist (Madame Tangley), blindfolded, was on the stage writing on a blackboard as her assistant (Baker) wandered through the audience asking her to identify objects submitted by members of the audience.

In early 1914, Baker got into a discussion with his father-in-law (a church organist) that inspired him to design and build a fantastic automatic musical instrument, which was to be marketed as the Tangley Calliophone. Within a few months, Baker had put together prototypes of his air-operated instrument which, unlike the popular steam-operated calliopes, were also endowed with various refinements upon which Baker eventually took out patents.

Baker’s company produced a large variety of these instruments, including some installed in vehicles. They were put to use by circuses, carnivals, theatres, and for outdoor advertising purposes. These instruments, priced from \$675 to \$2,250, were well-made and quite popular. Some 900 still exist.

Getting On The Air

By the 1920’s, Baker had built his Tangley Calliophone business into a substantial and profitable enterprise. With broadcasting beginning to come into its own, Baker decided it was time to expand his operations in



KTNT as it appeared beginning in 1927, with the second story added to the studio/residence building.

this area, thus providing a nationwide showcase for his Calliophones and also some of his personal opinions.

In 1924, Baker, as President of the Tangley Manufacturing Company, applied for a license to construct a broadcasting station to be operated on 900 kHz from his residence at 1018 East Second Street, Muscatine, Iowa. The 500-watt station would be on “KTNT Hill,” 165 feet above the Mississippi River. Baker requested the callsign KTNT, which he said stood for “Know The Naked Truth.”

In the Autumn of 1924 Baker commenced construction of his station, which consisted of a one story building “of Egyptian-Moorish design” accompanied by two large steel lattice towers. A used 500-watt transmitter and various studio equipment was purchased (in August of 1925) from station KFKB in Milford, Kan-

Norman Baker tied his Tangley Calliophone business in with his broadcasting station. The name “Tangley” was originally concocted by Baker for use in his vaudeville “mentalist” act. The word was selected because Baker claimed he liked the way it sounded. (Illustration courtesy Player Piano Treasury, by Harvey Roehl, Vestal Press)





Baker's ads for his Tangley Calliophone advised potential customers how they could hear the instrument over KTNT. This ad calls KTNT "Prettiest station in America" and also "The Station That's Different." Baker described the use of the Calliophone on KTNT as "a big advertising stunt." (Illustration courtesy Player Piano Treasury, by Harvey Roehl, Vestal Press)



Norman Baker's Calliophone. (Photo courtesy of Morris Moses)

sas. KFKB, of course, was the station owned by the controversial Dr. John Brinkley, he of the goat-gland operation (see *POP'COMM*, February '84 for the story of Doc Brinkley and KFKB, "The Amazing Goat Gland Radio Station").

Doc Brinkley sold this transmitter in the midst of a hassle he was having with the American Telephone and Telegraph Company when they were charging a yearly license fee of \$4-per-watt for the use of commercially built transmitters running 500 watts or more.

The KTNT license was issued on 14 October 1925. Even though Baker had requested a license for 900 kHz, the license stipulated that the station was to operate on 1170 kHz. On 27 October 1925 KTNT began test-

ing and presenting some basic programming, although the official opening of KTNT took place on Thanksgiving Day of 1925.

Baker's business arrangements were ideal. He had put Muscatine on the radio map and the city fathers extended him the courtesy of not charging him any taxes, water, light, or power fees. Moreover, Baker used the station's facilities to heavily promote his Calliophone business. The sounds of the instrument were a regular feature of KTNT's programming.

Signs of Unrest

After only two months of KTNT's operation, Baker decided it was time to begin sharing some of his personal opinions with the waiting world. By January of 1926, Baker had embarked on a series of tirades against larger radio stations and also against network broadcasting. By November of 1926, after a year on the air, Baker was really feeling his oats and decided it was time for him to shift KTNT over to 900 kHz, the frequency he had originally requested.

True, his license still read 1170 kHz, but during this period of no regulation, many stations jumped frequencies and even increased power without authorization in an effort to gain a foothold once pending legislation was enacted. Thus entrenched on a more desirable operating frequency, Baker was in a position to expand his commercial empire and promote it over his own broadcasting station. At this time a second story was added to the KTNT Building, giving it a total of 9 rooms. Baker moved upstairs.

In 1927, Baker announced the operation of the Baker Mail Order Company, The K-TNT Store, an art school, the K-TNT Oil Company, the K-TNT Cafe, the Tangley Institution, and the Western Drug Company. However, none of Baker's enterprises equalled the ambition or sheer audacity of Baker's other announcement, that he could cure horse-leg "knots" and cancer. Much to the dismay of the American Medical Association, he opened up two facilities in Muscatine (both dedicated to his mother) called The Baker Hospital. He also opened up hospitals in San Luis Potosi (Mexico) and Brisbane (Australia).

One famous Baker promotion for his hospitals was the public exhibition (in a Muscatine park) of a person supposedly cured of brain cancer by Baker's techniques. Baker claimed that his exhibition of "the man with the opened head" attracted an audience of more than 25,000 persons!

Baker cut a handsome figure in his purple car, wearing his white suit with the purple shirt. He also wore a bullet-proof vest.

Attempted Restraints

In the Spring of 1927 the Federal Radio Commission was established and the agency promptly ordered KTNT to shift back to 1170 kHz where it belonged. Baker's methods of selling merchandise to farmers over the air were also criticized by the FRC. As described by the FRC, "those talks incited

the more ignorant class" and his programs were "not accepted by thinking people of the state."

Baker did move to 1170 kHz, but had somehow convinced the FRC to let him raise power to 5 kW (nighttime power 3.5 kW). By November of 1927 the new higher powered equipment was in operation. The station was widely heard throughout the midwest, and listeners to "The Home of the Calliophone" (also known on the air as "Voice of The Iowa Farm Union") were treated to a constant stream of vitriol directed at the FRC, the AMA, and AT&T. One of his favorite anti-AMA observations was that "MD" stood for "More Dough."

In early 1928, KTNT's power was cut to 2 kW (day/night), but by November 11 it had been again upped to 5 kW during the day. At this time KTNT was operating co-channel with WCAU in Philadelphia and Baker observed that he "gave WCAU the right to

KGEX/KPNP: KTNT's "Little Brother"

Not content with KTNT as his only broadcasting enterprise, Norman Baker had another interesting encounter with radio. KGEX was the callsign assigned to a new broadcast station licensed 2 January 1927 to the Central Radio Company, Muscatine, Iowa. This license was for a 100-watt station on 1380 kHz. Norman Baker owned the Central Radio Company from his home address at 1018 East Second Street, although the license was issued for 213 Chestnut Street.

On 14 February, Baker applied for a change in the callsign to become KPNP. The change was granted 19 February 1927 and the station was supposed to go on the air that month, but when the government attempted to monitor KPNP in April of 1927, the frequency was strangely quiet. The government began to suspect that KPNP was "erected for speculative purposes."

Nevertheless, in June the FRC advised KPNP to forget using 1380 kHz and switch its operations to 1420 kHz. Baker didn't argue the change but advised the FRC that KPNP "was not constructed yet." Whatever the reasons for Baker taking out the KPNP license, in June, when KTNT upped its power to 5 kW, he lost interest in the KPNP project.

In 1928 the FRC held a hearing in Washington to determine the status of KPNP. Baker didn't bother to show up. On the basis of Baker's non-appearance, the license was not renewed and on 1 August 1928, phantom station KPNP was deleted from government records. The 1420 kHz frequency assignment was later given to KICK in Red Oak, Iowa.

KPNP had never gone on the air, not even once!

broadcast" on his 1170 kHz. When WCAU was silent during the nighttime hours, KTNT ran 1 kW.

In late 1929, Baker began publishing a newspaper called the *Midwest Free Press*, intended to compete with the *Muscatine Free Journal*. He also had a magazine called *TNT*. Both of these publications gave extended coverage of his views against his standard enemies—the AMA, FRC, and AT&T.

By October of 1930, KTNT's broadcasting license came up for renewal. This was the moment of truth when Baker's operations would be examined during hearings established to determine if his station would continue to be a licensee.

Problems Galore

The AMA had little good to say about KTNT and Baker at the hearings, and the FRC itself was also less than enthusiastic about KTNT's programming. The hearings stalled and Baker took the opportunity, in late 1930, to lease The Baker Institute (but not KTNT) to a licensed physician in order to escape charges that he was practicing medicine without a license. Baker's other business enterprises continued in operation and his slogan of "Cancer Is Curable" was still much in evidence over KTNT.

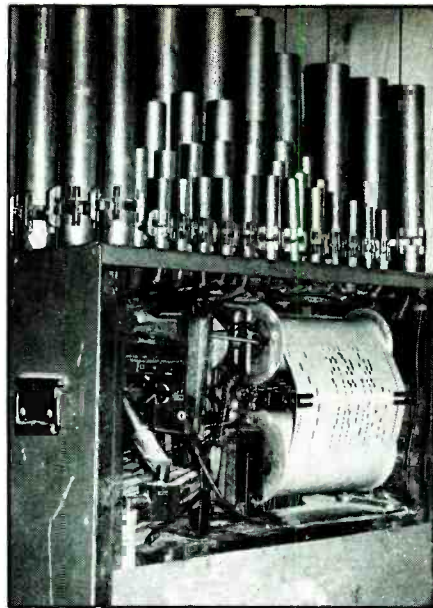
The day of reckoning came on 5 March 1931. The FRC told Baker to wind up his affairs in 90 days. On 5 June 1931 the District of Columbia Court of Appeals supported this decision and KTNT was ordered off the air on 12 June 1931. As reported in the March (1932) issue of the DX'ing magazine *RADEX*: "KTNT . . . was taken off the air . . . because it was being used as a personal mouthpiece. It failed to secure even temporary relief upon appeal and remains silent as its owner, Norman Baker, appears unable financially to press the appeal further in the courts."

And silent it was. On 12 June 1931, Baker broadcast his final KTNT speech at 2:05 p.m. At 3:30 p.m. Baker ended his farewell remarks and pulled the master power switch at KTNT for the last time. The station was deleted from FRC records on 2 July 1931.

Not The End

In 1931 Baker ran unsuccessfully for Governor of Iowa. A new chapter took place in October of 1932 at Nuevo Laredo (Mexico) when Baker opened up station XENT in order to campaign for a bid for the Senate in Iowa (1936 elections).

XENT started out on 1110 kHz but soon jumped to 910 kHz, and its power increased in several stages to a whopping 150 kW. Baker was still hawking his medical cures as well as selling automobile tires (5% discount for cash). His election bid was lost, and even if he had won, he would have had a difficult time visiting Iowa inasmuch as he was a fugitive from justice, having been convicted of contempt charges before the Iowa Supreme Court.



The interior view of Norman Baker's complex invention. (Photo courtesy of Morris Moses)



Norman Baker. (Photo courtesy of Morris Moses)

In the major frequency shuffle of 1941, XENT (along with several other high-powered Mexican/American border stations such as XEAW and XERF) was forced off the air (although XEAW did eventually return on a new frequency).

XENT was billed by Baker as "The Voice Of The Continent," and was claimed by its owner to be the largest station with its own hydroelectric power source. At this time he also published a book called *Doctors, Dynamiters and Gunmen*, to reveal details of the AMA's attempts to get him.

By this time the U.S. Post Office had brought suit against Baker for mail fraud. It ended up with a \$10,000 fine and three years in Leavenworth for Baker. More than

1,000 of his patients showed up at his trial but weren't allowed to testify—and even into the late 1930's there was a Baker clinic at Eureka Springs, Arkansas.

When Baker got out of prison, he made a number of attempts to get back into the hospital business. But the public had become too skeptical of miracle cures. Also, medical licensing laws had become far more stringent than they had been in Baker's heyday.

In July of 1944, Baker bought a yacht and quietly retired to Miami, Florida. Fourteen years later, in September 1958, at age 76, Baker died. Ironically, he died of the disease he claimed to have cured in so many others—cancer.

Laid to rest at Greenwood Cemetery in Muscatine, less than a dozen persons showed up for his funeral, and the pallbearers had to be hired. It was a strangely quiet end to a man whose life had been anything but quiet.

Thanks!

The author would like to especially thank the following for valuable information used in the preparation of the KTNT and Norman Baker saga: Broadcast Pro-Files, Hollywood, CA; Stanley Harper, Lisle, NY; Morris G. Moses (ex-W8UVC), Albany, NY; Harry Lookabill, Kansas City, Mo. Without their generous cooperation, this story would not have been possible. **PC**

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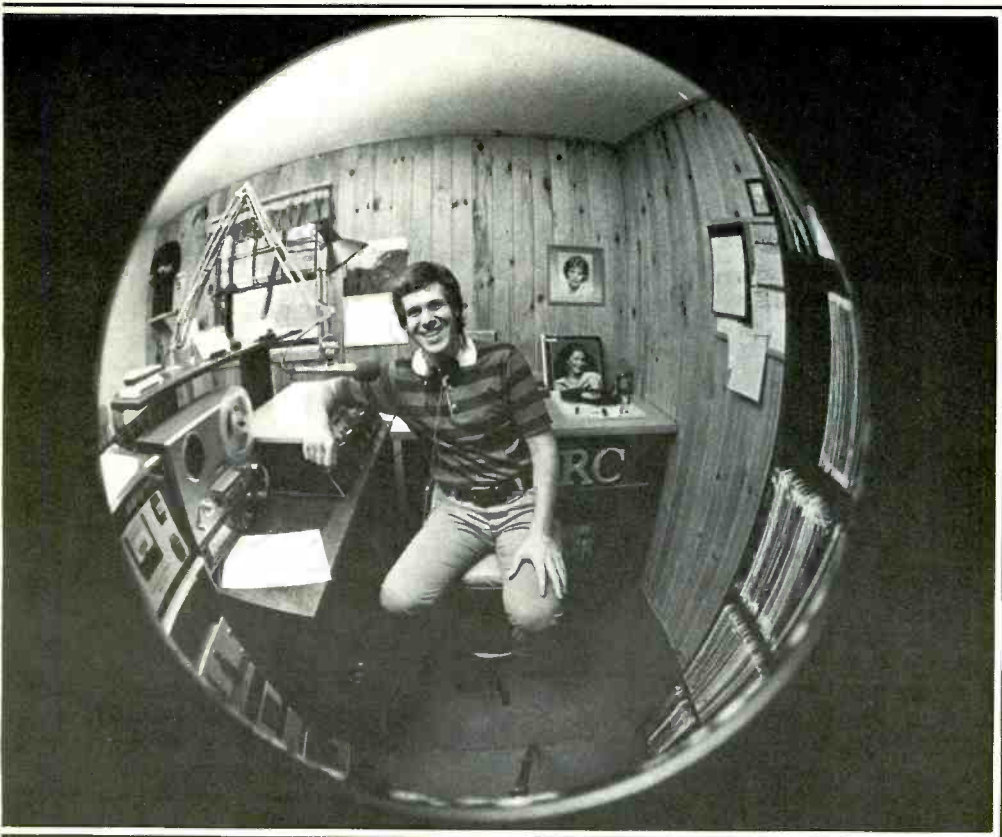
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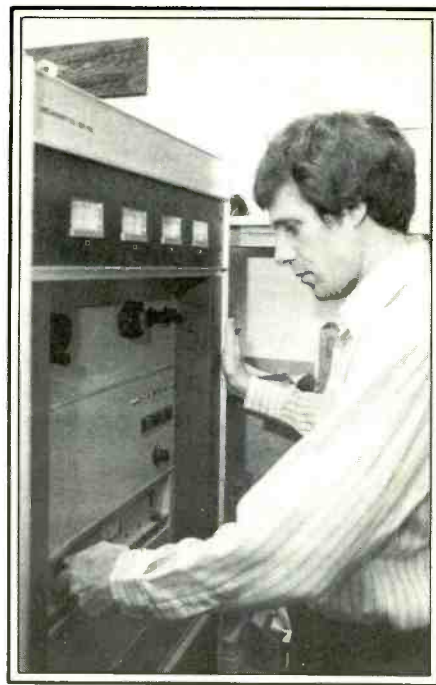
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Because of the small studio size, a fish-eye lens was used to catch Peter Hunn at the on-air control board. (Photo by Warren Studio)



Peter Hunn tuning up the McMartin BF-1K 1500 watt FM transmitter. To achieve their licensed power, the transmitter is throttled back to 960 watts. Taking into consideration "line loss power" from the transmission line, and the .955 dB gain of the Jampro antennas, the ERP comes to some 820 watts. (Photo by Warren Studio)

POP'COMM Visits

A One-Room Broadcaster

Mom-And-Pop FM Station Fills The Airwaves

BY EDWARD A. GARGAN

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Peter Hunn is a captive of his dream.

Up the swath of torn asphalt that is Joiner Hill Road (located in the village of Port Henry in the Town of Moriah, New York), about a mile from the main road, what looks very much like a two-car garage stands alone on a scrubby acre of patchy grass. Inside live Mr. Hunn and his wife, Carolyn, and in a tiny living room, paneled in rec-room knotty pine, is what he calls "the smallest radio station in America."

"I thought I'd like to do like a lot of artisans in the Adirondacks did by bringing their own crafts and businesses here," Mr. Hunn said. "So I did the same thing."

For three years, 365 days a year, Mr. Hunn has spun records, chatted about the weather and announced local ham-and-bean dinners from a stool in his living room, the home of WHRC-FM.

"This is supposed to be the living room,"

said the 31-year old Mr. Hunn, waving one hand toward a plaid couch against the wall while flipping a lever to start turntable No. 2 and James Taylor's "Golden Moments" with the other. "This wasn't supposed to look like this. It was supposed to be a two-story Cape Cod."

The two-story Cape Cod, however, succumbed to a lumber-yard circular advertising do-it-yourself garages.

"It's 20 feet by 24 feet," Mr. Hunn said of the house here in the foothills of the Adirondacks, toward the southern end of Lake Champlain. "We put in doors and windows instead of the overhead door. There's supposed to be two cars in here."

He also put in a kitchen, bedroom, bathroom and a study of sorts that is mostly occupied by the station's transmitter.

Just so there is no unpleasantness from other broadcasters, Mr. Hunn is quick to ad-

mit that his station may not really be the smallest in the country, although he cannot imagine one smaller.

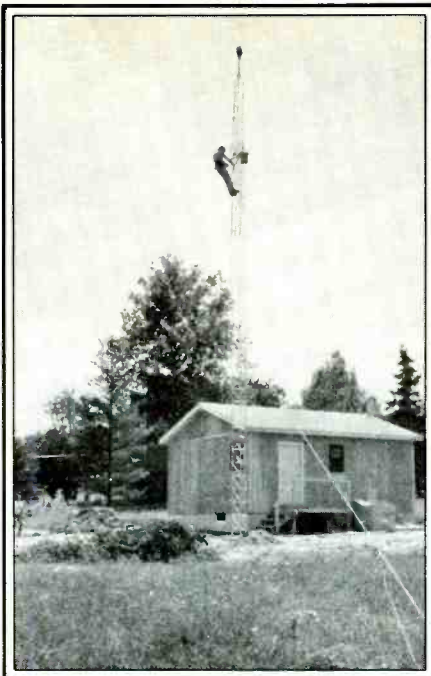
"We often say we're the smallest commercial FM station in the country because of the size of the building," he said, laying out his case. "With taxes and insurance and electricity, we run everything on \$800 a month."

Getting On The Air

Everything includes fighting off the Adirondack cold, because the station's 800-watt transmitter, a metal box the size of a side-by-side refrigerator-freezer, not only spills radio waves into the Champlain Valley and over to Vermont, but also generates enough heat to keep the house warm.

Radio waves have run in Mr. Hunn's blood a good while.

"As long as I can remember, I've wanted



The tower installers are erecting our 100-foot Rohn 45-G tower. They put up the tower in one day, installed the two bay antenna during the next. (Photo by Warren Studio)

housewife, although that's not a very good term, the young woman, the receptionist for a doctor, a lawyer, a dentist, the person who controls the radio dial." How many are in the audience, he does not know, but his signal reaches as far as Burlington, Vt.

At 6 A.M., when the station goes on the air, Mrs. Hunn retreats to the "newsroom"—the kitchen table and an ancient Royal typewriter—to prepare the morning's newscast from local newspapers and press releases.

Living Room "Weather Window"

While the nuances of the Soviet leader Mikhail S. Gorbachev's latest pronouncement on arms talks may not be explored in depth, Mr. Hunn will talk at length about the new dietitian at the local hospital. And even though he has a National Weather Service receiver on the counter, he uses the "weather window" in the living room as often, from which he can inspect "the automatic wind-indicating pine tree."

Mr. Hunn financed his radio station and the 100-foot antenna tower out back with a \$40,000 loan, half from his parents, half from the Federal Small Business Administration.

Like any station, Mr. Hunn's sells ads, although unlike many stations, WHRC is a real bargain. For \$2, advertisers can get Mr. Hunn to talk for 15 seconds about their products. Five dollars will buy a whole minute of Mr. Hunn's time. Ben Franklin's in Vergennes, Vt., across Lake Champlain, which has been having a sale on yarn and fabric recently, is Mr. Hunn's biggest advertiser. He will not say exactly how much he is earning, but even with his low rates he was able recently to replace some secondhand equipment with new.

All of this means Mr. Hunn is virtually chained to his station. "I pretty much do all the shifts," he said. "Vacation? I guess I haven't had time off in more than three years."

The only times the station has not kept to its 6 A.M.-to-10 P.M. schedule were when

FM BROADCAST
STATION
92 WHRC

Joiner Hill Road, Port Henry, N. Y.

WHRC-FM's signal originates on a hill some 575 feet above Port Henry, New York and is beamed, naturally, by the Adirondack Mountains, to the communities in Vermont's Champlain Valley

During the day, WHRC-FM broadcasts an easy blend of pop music from the past and present. Christian Programming is featured in the early evening hours as well as on Sundays. WHRC-FM begins its' day at 6 A.M. and turns in shortly past 10 P.M. Monday through Saturday. On Sunday WHRC-FM is on the air from 8 A.M. to 6 P.M.

Local information is aired at 7 A.M., 8 A.M., Noon and 6 P.M.

Please feel free to dial our way (92.1 FM) We'd love to have you keep us company as we broadcast.

A PETER HUNN STATION

to have my own radio station," he explained. "When I was a kid, I set up a station in my bedroom and broadcast to my family. That was 100 milliwatts, not very much."

Mr. Hunn leaned over and slipped a white card from a file of record titles, glanced at it, whirled around on the stool, pulled an album from a shelf and dexterously flipped a black vinyl disk onto a turntable. "Golden Moments" ended and the quiet Beatles melody "Michelle" floated from a speaker.

"We went on the air in September 1982," said Mr. Hunn, his voice resonating with an accentless diction found along radio dials from Miami to Minneapolis. "But we lived here a year waiting for last-minute snafus to sort out. I did this all myself, and getting a license without a lawyer is a lot like trying to break into show biz without an agent."

Getting a license, he explained, involved more than will. It also involved the proper coordinates. "You have to be a certain distance from other stations near your frequency," he said.

In the language of radio, Mr. Hunn describes his station's music as "soft contemporary," to which he adds four hours a day of "inspirational," or religious, broadcasting—"Dad's a Presbyterian minister, but I don't think that's the only reason." Saturday on WHRC is polka night and, it is said, if you drive down Witherbee Street here with your car window open, you can hear polkas the whole way.

Mr. Hunn, who has worked behind microphones at a dozen radio stations from Warrensburg, Mo., to Pawtucket, R.I., believes, but really does not know, that his average listener is "a 30-year-old woman with a child or two. I think I'm getting the

lightning once struck the tower and when there was a local power failure.

But, Mr. Hunn added with a sure earnestness: "It's not like I was selling stoves last week and decided to get into radio this week. I have a commitment to this.

"Many people don't know what the station looks like. But it doesn't make any difference that it's in a small building run by two people. To a lot of people, this is their station."

Then he turned away and slid a silver lever to begin John Denver's "Rocky Mountain High." PC

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Radio Long-Ago

Leafing Through The Pages Of History

BY ALICE BRANNIGAN

A touch of class—that's what it was for the briefest moment in the hectic world of commercial broadcasting. Station WJY in New York City was its name.

The Radio Corporation of America, in May of 1923, received broadcasting licenses for two stations—WJY (740 kHz) and WJZ (660 kHz). Studio and transmitters were to be established in the heart of New York City atop the building that housed the RCA offices, 29 West 42nd Street.

It's not only that this building was centrally located, being situated between prestigious Fifth Avenue and glittery Times Square (better known as The Great White Way). It wasn't even that the building was across the street from the main New York Public Library and (then) beautiful Bryant Park. The main feature of 29 West 42nd Street was that it was Aeolian Hall, a structure dedicated to fine music and primarily occupied by the Aeolian Company.

The Aeolian Company was the world's largest manufacturer of musical instruments and was best known as the producer of the Duo-Art reproducing piano mechanism, as well as Pianola brand player pianos. The Aeolian Hall was a mecca of fine arts and housed many elegant concert chambers and recital halls given frequency usage by famous musical artists.

The concept was that while WJZ would be on the air every day from 10 a.m. to noon, 1 to 2 p.m., 4 to 6 p.m., and 7 to 11:30 p.m. with programs appealing to a mass audience, WJY was to operate on a limited schedule and carry "high class" programming, consisting mostly of fine music. Broadcast schedules for 1925, for instance, showed WJY operating only five days a week from 7:30 p.m. to 11 p.m., although its schedule did vary from time to time.

WJY was to tie-in with the Aeolian image of fine arts. All of the concert halls were specially wired so that WJY could broadcast a wealth of entertainment. Some concerts were simulcast over WJY and WJZ.

WJY and WJZ transmitters were located atop the building, but it was the towers that were the engineering triumph. They were completed on March 1, 1923. These were two, 12-ton steel monsters. Besides the monumental job of constructing these masts high above one of the busiest streets in New York City, there was a problem with the structural strength of Aeolian Hall. As one journal of the day noted, "Because of the great weight of the towers and transmitter house, a special street foundation for them



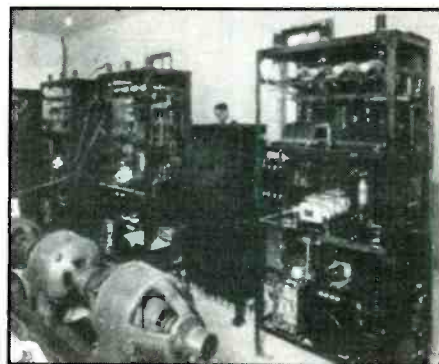
The original Aeolian Hall with the massive antennas of WJY/WJZ on the roof overlooking New York's busy West 42nd Street. The large building at the left was Stern Brothers Department Store.

was constructed and attached directly to the steel framework on the sides of the building so that the burden does not fall on the roof." The engineering, expense, and time involved in erecting the masts was truly heroic!

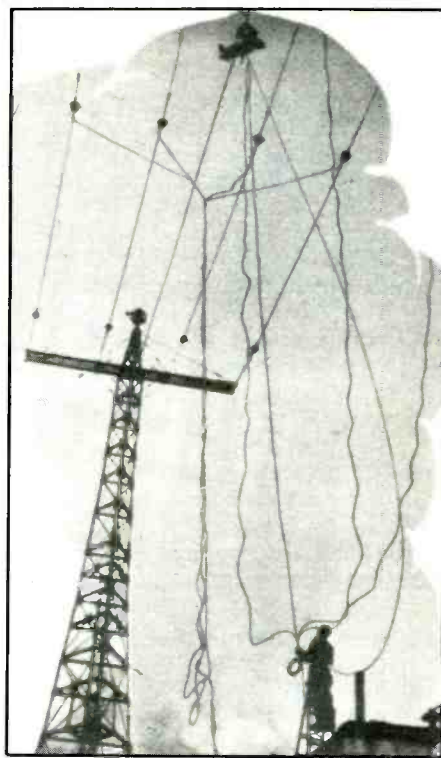
The masts supported a 4-wire antenna system used by WJZ, and also WJY's 2-wire antenna system.

WJY went on the air May 15, 1923. The following month, it was sharing time on 740 kHz with two other broadcasters, WOR and WDT, although WDT went out of business in December of 1923. In late 1924 WJY upped its power from 500 to 750 watts, and in the spring of 1925 the power went to 1,000 watts.

Then something took place that must have been viewed as a catastrophe to WJY's owners. Aeolian was an image-conscious operation and sought to offer their more expensive pianos to the carriage trade. They came to feel that 42nd Street no longer projected the proper image. A new Aeolian Hall was needed, one to be located at a more impressive location. The result was a replacement Aeolian Hall at Fifth Avenue and 34th Street. The magnificent structure was opened in 1926 and awarded the Gold Medal by the Fifth Avenue Association for the best building erected during 1926. This left WJY up in the air in more ways than



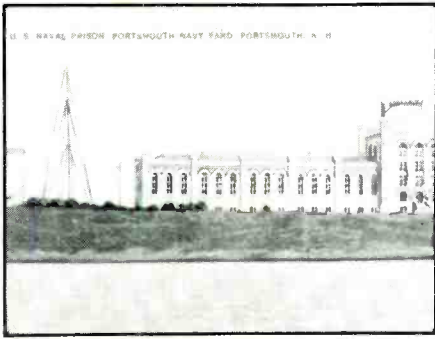
Inside the WJY/WJZ transmitter shed atop Aeolian Hall.



This tangled mess is a look at WJY/WJZ technicians stringing the antenna leads. It offers a nice close-up view of one of the 12-ton steel towers.

one. In late summer of 1926, WJY left the air and on 2 February 1927, the station's license was deleted. It had become a station without a reason to exist.

WJZ, the sister station of WJY, moved its offices to 233 Broadway and erected a 25 kW transmitting facility in nearby Bound Brook, New Jersey. The current incarnation of WJZ is station WABC on 770 kHz.



An undated picture postcard view of the antenna and slammer at the Portsmouth, New Hampshire Navy Yard.

In 1927 the two gigantic WJY/WJZ towers looming over 42nd Street were demolished. Today, 29 West 42nd Street is the New York City University Graduate Center. Aeolian's headquarters are now in Memphis, Tennessee. And WJY's expensive three year experiment as the world's first fine arts prestige broadcasting station is scarcely a memory. It was a class act all the way.

We've Got This One Locked In

Ron Buckler of New Hampshire passed along an old (undated) picture postcard showing a guyed radio mast situated between a water tower and a grim looking building. The card is captioned "U.S. Naval Prison, Portsmouth Navy Yard, Portsmouth, NH."

There isn't any indication that the antenna shown is specifically related to the prison and my guess is that it isn't. Most likely the antenna is that of the communications system used at the Navy Yard. In the mid-1920's, which looks to be the era from which this postcard emerged, the callsign at the Portsmouth Navy Yard was NAC. The station operated on 226 kHz, 315 kHz, and (naturally) 500 kHz.

Another Ham/Broadcast Station

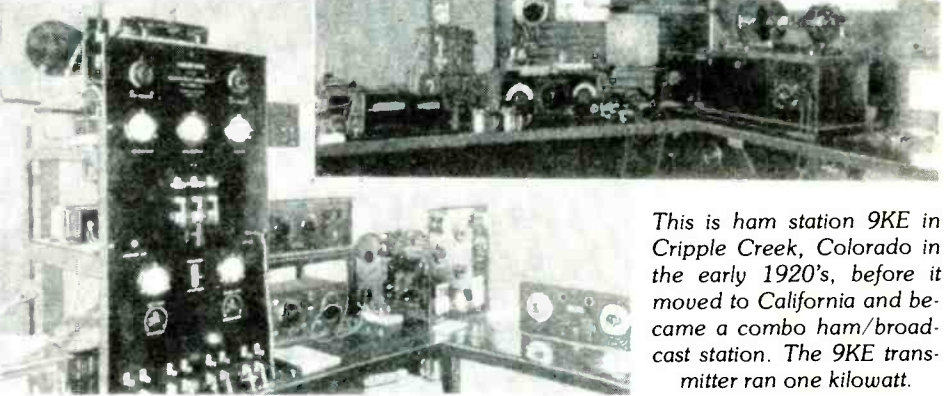
In the June issue we had a photo of a strange little combination ham and commercial broadcast station known as KFJR.

This month we came up with another similar arrangement.

H.C. Colburn was originally licensed as a ham in Cripple Creek, Colorado under the callsign 9KE. In 1924 he moved to San Leandro, California where he established the Colburn Radio Laboratories at 448 Dowling Blvd. His ham call became 6UR, however, he soon took out an experimental license and was assigned the call letters 6XBY. Simultaneously he opened up a broadcasting station running 50 watts on 1340 kHz. This station was known as KFUU, "The Voice of The Cherry City," and it operated Mondays, Wednesdays, and Fridays from 8 to 9:30 p.m.

Within only a few months KFUU had undergone a major metamorphosis. Colburn had hooked up with E.L. Mathewson of the

A 3-in-1 station, broadcaster KFUU, ham 6UR, and experimental 6XBY as it appeared during its short 1925 stay in San Leandro, California.



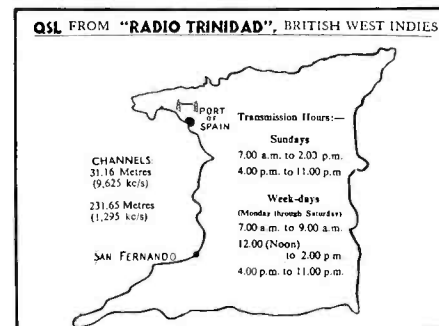
This is ham station 9KE in Cripple Creek, Colorado in the early 1920's, before it moved to California and became a combo ham/broadcast station. The 9KE transmitter ran one kilowatt.

Mathewson Motor Company, Oakland, California. KFUU was then moved to the Flint Motor Car Building in Oakland, where it operated with 100 watts on 1360 kHz, being known henceforth as "The Voice of Automobile Row." Operating six days per week, usually between 6 and 10 p.m. (with a curious 30 minute break between 7:30 and 8 p.m.), KFUU was active for a while, but not for too long. Station listings of 1928 revealed KFUU had gone out of business.

Hey Dad, Remember Trinidad?

At one point, Radio Trinidad, VP4RD, was a well-known fixture on the shortwave broadcasting bands. These days Trinidad is to be heard broadcasting only on the AM and FM bands. Unless you can nail down Trinidad on the AM, ham, or "ute" bands, you can't count Trinidad and Tobago amongst your verified countries. Console yourself with a peek at a genuine QSL card from VP4RD, as shown here.

VP4RD officially went on the air 31 August 1947 from studios in Port of Spain. Running 2 kW, VP4RD's operations commenced on 1295 kHz, 6085 kHz, and 9625 kHz. A 500-watt emergency stand-by transmitter was also available and was often used as the "regular" 9625 kHz rig.

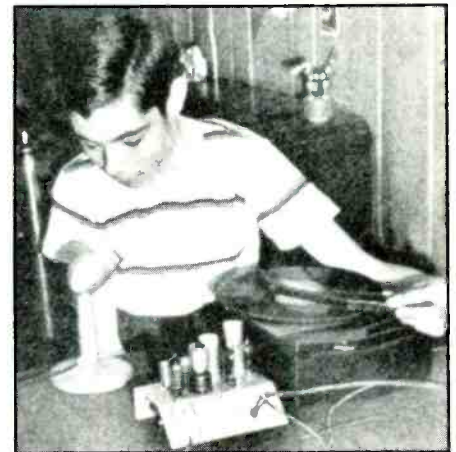


Radio Trinidad, VP4RD, sent out this QSL card when it first went on the air in 1947.

Broadcasts from VP4RD were in both English and Hindustani. This station was active on shortwave into the 1960's.

Bootie-Legger Radio

A letter from a fan of POP'COMM's Pirates Den column comments that we have never given any coverage to olde-time pirate broadcasters. In fact, the comment was put into the form of a challenge, suggesting that we might not be able to carry it off.

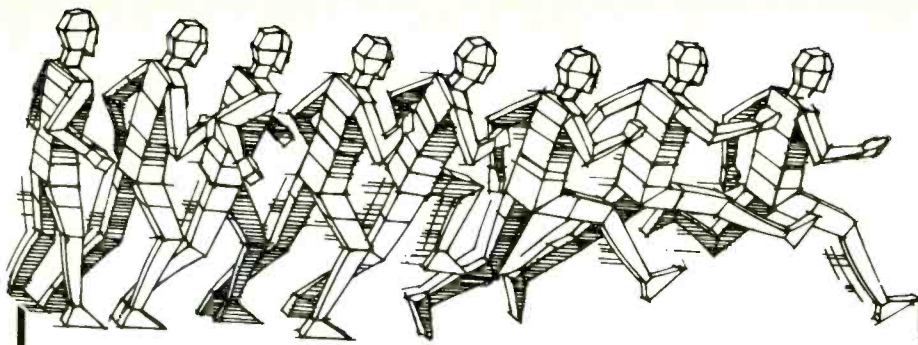


In 1949, pirate FM station WCBC had a brief but widely-monitored career in MA.

That stirred our Yankee spirit and the challenge has been met as you get a look at a photo of unlicensed broadcaster WCBC in full operation.

WCBC was a bold venture into broadcasting that took place in May of 1949 and consisted of two very successful evenings on the air. WCBC, The Childrens Broadcasting Company of Pittsfield, Massachusetts, operated from studios in the bedroom of its owner, Philip Krause, then aged 14.

The equipment at WCBC was a \$7.95 phono oscillator that Philip hooked up to the family's 150-ft. FM receiving antenna. Although the phono oscillator had a rated



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A very rare QSL card from a station that led DX'ers on a merry chase 50 years ago—CR7AA in Mozambique.

range of only 75-feet, when illegally hooked to the 150-ft. high FM antenna, it sent out a signal for three miles.

When Philip's dad found out that the FCC had the authority to issue fines to unlicensed broadcasters, he regretfully ordered WCBC off the air. During WCBC's brief existence broadcasting records by request and giving a few spot announcements, nearly 200 phone calls and a big handful of letters were received—but none from the FCC!

Rare Stuff

This month I'll leave you with a QSL from a station that DX'ers of 50 years ago were going bananas trying to copy and then QSL. It was the 1930's equivalent to the Falkland Islands Broadcasting Service!

I'm referring to little CR7AA, and only a few 1930's DX hounds were lucky enough to verify the station. CR7AA was operated on a limited commercial basis by "Gremio dos Radiofilas da Colonia de Mocambique" (your basic "Radio Club of Mozambique") in Lourenco Marques, Portuguese East Africa. Operating on approximately 6137 kHz, CR7AA operated with low power daily (except Sundays). Some North American listeners were able to log the station between 0945 and 1115 GMT. Of course, hearing it was one thing but getting a QSL was something else altogether.

After WWII the operations of the club were expanded. CR7AA shifted to 11764 kHz and six more stations were added in order to carry a heavy daily broadcast schedule. The station's interval signal was "Sarie Marais," and English language listeners of the 1950's found it relatively easy to hear the station's four chimes followed by the slogan, "Lourenco Marques for happy listening in the ____ meter bands from 6 o'clock in the morning until 11 o'clock at night." Things were much improved, compared to the 1930's.

Our CR7AA QSL card, however, is from the painful pre-war era. Cut carefully along the edges and pin it to the wall of your radio shack, then tell your friends how you fought for months to drag in this station before it sank back into the static.

Comments and suggestions, as well as photos and photocopies of old QSL's, are most welcome here (but please don't send the original copies of the QSL's—photocopies will do just fine). Your support of the information presented in these pages has been just great. Thanks!



Test Report:

Yaesu FRG-8800 Receiver

BY RAINER LICHTER

Yaesu continues its immensely successful FRG-series with this modern development. The FRG-8800 is the most expensive FRG model so far and competes with sets like the ICOM IC-R70 and the Kenwood R-2000.

Pushbuttons Everywhere

The FRG-8800 takes the proven concept of the FRG-7700 a step further. Quite a few features were added; the large number of pushbuttons clearly indicates that a micro-processor has control over tuning and mode selection. Fortunately, a wise decision was made early in the design stage: All standard controls were retained in the form of old-fashioned rotary potentiometers.

The μ P controlled functions are accessible through 37 pushbuttons, cleverly divided into several distinct blocks. Two AM bandwidths are available, and in SSB mode a selection can be made between USB or LSB. A narrow band FM detector is integrated, useful in the 10m and 11m ham bands. Two timing constants are available for the automatic gain control (AGC). RF gain may be controlled manually or set to automatic. The noise blander can be set for two blanking time-constants; the switch is on the rear.

A novel type of S-meter is used, an integral part of the multi-purpose LCD. This signal indicator works with 30 vertical segments of varying size. Standard S-units are indicated along with the corresponding value of the S in SIO or SINPO codes.

The high contrast LCD shows the frequency with a resolution of 100 Hz. The smallest tuning step (not indicated) is 25 Hz. An optoelectronic device is used between the large tuning knob and the frequency control section of the circuit. Two speeds are available for manual tuning: 125 kHz per revolution (step size 500 Hz), and 6.25 kHz per revolution (step size 25 Hz). The tuning knob may be disabled by pushing D.LOCK. Direct access tuning is also possible and appears to be somewhat awkward, but there is some method in this madness. MHz and kHz values are entered separately and a leading zero must be input when tuning to frequencies below 10 MHz. Now push the orange button, telling the μ P to change the MHz. If a change in the kHz setting is also desired, enter three digits and hit the blue button marked kHz. This method has certain advantages, allowing setting MHz and



The Yaesu FRG-8800.

kHz independently, but also the disadvantage of differing from all the keyboard entry methods used by other manufacturers.

Frequency scanning is also possible in three modes:

- MSCAN—searches all memories
- SSCAN—searches certain memories
- PSCAN—searches between the limits set in M1 and M2

The criterion for stop-of-scan is the level set by the squelch control. If a signal exceeds this threshold, and indicator reports BUSY.

Three more buttons are needed (or provided) to correct certain peculiarities of the tuning logic:

-VFO—transfers control back to main tuning (VFO) when a station was called from memory. This is necessary because all controls for frequency and mode are inactive when a frequency is called from memory.
VFO-M—goes back to the last setting called from memory.

VFO—goes back to the last frequency used with manual tuning, i.e. VFO control. And MSELECT calls the corresponding frequency and mode setting, while MR writes into the selected memory channel.

The RF gain control is labelled ATT and it will increase signal attenuation when turned clockwise. The digital clock can display two different time zones in 24 hour format. A programmable timer may be set to switch the radio on and off at desired times once a day. A relay output on the back controls a recording device, if so desired. If that's not enough, the set also has a sleep timer. Our sugges-

tion: 15 minutes of Radio Tirana's news may do the trick.

A Look Into The Future: CAT

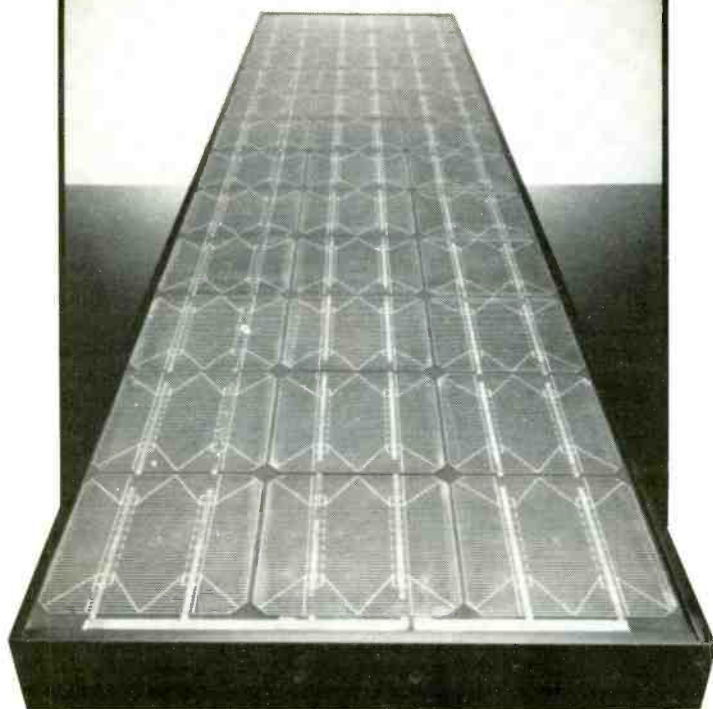
Fully automated operation of this mid-priced shortwave receiver is possible via an inconspicuous looking DIN-jack on the rear. CAT is the magic word that stands for Computer Aided Tuning. The computer in this case can be almost any type of home computer. Suitably programmed, the electronic brain is able to control: receiver power, frequency, filter, and mode. Unfortunately, the company is rather tight-lipped about this novel feature. The manual contains a scant two pages with information relating to the format of commands, timing, and type of interface needed. For those not wanting to do their own programming, software for the Apple IIe is available through Gilfer.

Accessories

The backside of this receiver holds another surprise. There is a removable cover that opens to accept a VHF converter, with frequency range 118 to 174 MHz. This option is powered by the receiver, has its own antenna connector (UHF), and modifies the frequency display to read true MHz values.

Another DIN-jack supplies power to the well-known FRA-7700 active antenna, also from Yaesu. And of course, there is a set of spring loaded wire clamps to accept the open end coax used by this unit. Virtually all other receiver accessories from Yaesu will fit

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Yaesu FRG-8800: Specifications

Manufacturer: Yaesu Musen Co. Ltd.

Type of receiver: stationary

Type of circuit: Dual superhet, PLL-type

Frequency coverage: 150 kHz-30 MHz

Reading accuracy: ± 100 Hz

Absolute accuracy: ± 180 Hz

Frequency stability: ± 80 Hz

Remarks: Successor to FRG-7700. Incorporates latest trends in receiver design. S-meter, multiple memories, three filters, direct access tuning, clock and timer.

RF-section

	at frequency	wide	Bandwidth narrow	SSB
Sensitivity in μV	0.15 MHz	12	10	—
for 10 dB S + N/N	0.50 MHz	12	11	—
AM-modulation	1.00 MHz	12	10	—
400 Hz, 30%	2.00 MHz	2.1	1.2	.15
	5.00 MHz	1.3	.9	.15
	7.00 MHz	1.0	.7	.15
	10.00 MHz	1.2	.8	.2
	20.00 MHz	1.2	.8	.2
	30.00 MHz	1.6	1.1	.25
Bandwidth 6/60dB, in kHz	SSB	3.2/7.0		
	wide	6.8/18		
	normal	2.9/7.2		
	narrow	-1-		
Image rejection	60 dB			
AGC range	96 dB			
ICP 3rd order	+ 3 dBm			
Tuning indicator	S1	1 μV		
	midscale	18 μV		
	end of scale	4.5 mV		
	Antennas	none		

External antenna connections—UHF type coax SO-238; clamps for high impedance and low impedance antennas.

Remarks—jack on rear carrier power for active antenna FRA-7700. VHF-converter optional.

AF section

Audio power output—1.6 watts

Audio frequency range—62-8200 Hz

Tone controls—± 6 dB/1 kHz

Noise limiter—yes, switchable, wide/narrow

Speaker—8 ohms, 2 watts, 10 mO

Connections—headphones 1/4" jack, record out

Connections—external speaker, mute

General

Power supply—110 VAC plus 3 batteries for memory and CPU

Power consumption—26 μV

Dimensions—33.5 × 12 × 23 WHD in cm

Weight—6.2 kg (13.7 lbs.)

Accessories—Operator's manual, fuse, extra-long rubber feet, line cord

perfectly, e.g. speaker, headphones, antenna tuner FRT-7700, etc. This compatibility, with a complete line of accessories, is noteworthy, since rarely found.

Thoroughness

Some details deserve special credit. For one, there is the UHF-type antenna connector that is mounted just where it should be—in the upper right-hand part of the back. There are jacks for all conceivable connections: external speaker, muting, tape recording, and RTTY processing. A battery compartment holds three AA cells, which back up the memory when the line cord is disconnected. Be careful, though, on the lifespan of these keep-alive batteries! If the main power is removed for more than about 14 days, you'll have a dead receiver when you power up again. The drain on the batteries is high, and without this auxiliary power pack, nothing operates. So, if the LCD remains blank, check those batteries.

Workmanship is excellent inside and out, with the exception of some buttons sitting loose in their openings in the front.

Surprise Performance

The receiver as tested in the lab gave results that substantially exceeded the manufacturer's specifications. So we performed a lengthy recalibration procedure on our equipment. Alas, the values didn't change a bit. So this is indeed a hot little receiver. The high sensitivity is not degraded by an inferior dynamic range. ICP 3rd. measurements came up with a remarkable +3 dBm. Circuit noise is somewhat higher than expected; we believe that still more performance would be available if a competent technician realigns the IF section.

There are several birdies and whistles throughout the entire frequency range; the digital logic circuits make themselves known with signals reading up to S2 on the meter.

The final product coming out of the speaker is otherwise very satisfying. The FRG-8800 is one of the best sounding radios in a long time. Harmonic distortion was measured at an unbelievable low 1.5%, unheard of in shortwave receivers.

Two ceramic filter units are used. Normal is very wide, but narrow is quite sufficient to separate stations only 5 kHz apart. The filter does this without producing a harsh or metallic sound. One or both filters may be replaced to give even better selectivity (Gilfer Shortwave does this). We have tried this substitution with excellent results.

The usefulness of this receiver and the joys of shortwave listening are diminished only by certain shortcomings of the overall concept. To name a few: non-standard S-meter, S9 = 18 μ V; no indication for timer activation; no indication for noise blanker in operation; unusual pushbutton logic; RIT not indicated, knob very small.

The last complaint needs attention, because RIT (fine tune) has a range of ± 550 Hz. If a frequency is corrected with this control, it never shows on the LCD. Subse-

quently, when this setting is stored in memory, you store the offset without knowledge of having done so.

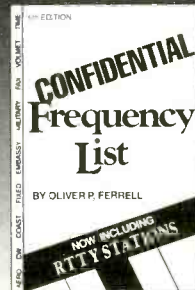
Except for these purely subjective remarks on operation, we have very few complaints. The FRG-8800 is a capable performer; the only circuit detail we missed was PBT. Never fear, there certainly will be an FRG-9900 sooner or later.

The FRG-8800 is the logical continuation of a design concept inaugurated with the be-

loved FRG-7. The addition of the latest technologies make things like CAT, memories, keypad tuning, and scanning possible. But the set is not as straightforward to operate as were its predecessors. The actual performance of this radio is very satisfying, and the FRG-8800 sets a new standard for middle priced receivers. **PC**

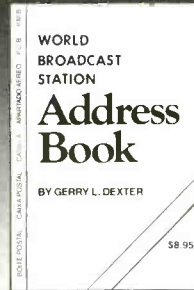
This review by Mr. Lichte, is reprinted through courtesy of Gilfer Shortwave, Park Ridge, N.J. whose book Radio Receiver—Chance or Choice includes reviews on fifty or more receivers.

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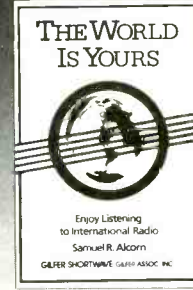
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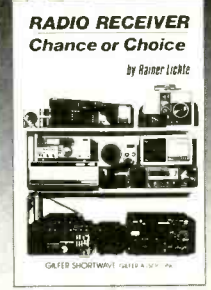
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“HUFF-DUFF”

Your Own High Frequency Direction Finding Antenna

BY WILLIAM ORR, W6SAI

HUFF-DUFF (High Frequency Direction Finding) was widely used by Allied and Axis powers to locate submarine and aircraft high frequency transmissions, obtain a bearing on the signals and thus “pin-point” the location of the enemy vehicle. It was a good idea, but the design and installation of practical direction finding stations throughout the world proved to be a formidable task. After the war, when much air and marine traffic was transferred to the VHF bands, high frequency radio direction finding lapsed into obscurity except for location of clandestine transmissions. Modern direction finding equipment is beyond the ability and cost of today’s active listener, but some of the simpler techniques developed for aircraft location during the “thirties” can be applied today with good results. The Adcock direction finding system is one device that can be built, at little cost, to provide the user with interesting direction finding techniques. This article covers the construction and use of such an instrument.

Early Direction Finding Attempts

The use of a radio wave for direction finding was well-known to Marconi, and this early radio pioneer developed equipment that was used by the Italian Navy to locate the approximate line of direction to a radio signal source. The U.S. and British Navies built and used RDF (radio direction finding) sets based upon Marconi’s design for many years, but it was not until 1938 that compact RDF equipment came into use for aircraft spotting. Many RDF installations were in use in Europe and Australia to aid civil aviation, but, aside from transoceanic flights, the U.S. employed other means that made the use of direction finders unnecessary.

With the coming of World War II, the need for high frequency direction finding accelerated development of new equipment in the U.S. and many simple ADF stations were installed along the airways operated by the U.S. Air Forces and served for aircraft rescue purposes. The ultimate transfer of most aircraft traffic to the VHF/UHF region during the late “forties” made obsolete most RDF stations, and gradually they were dismantled. Today, most RDF stations in the U.S. are operated by the military and the Federal Communications Commission for the purpose of spotting unauthorized radio transmissions. The FCC monitoring stations are located at Allegan, MI; Anchorage, AK;

Belfast, ME; Douglas, AZ; Ferndale, WA; Fort Lauderdale, FL; Grand Island, NE; Kingsville, TX; Laurel, MD; Livermore, CA; Powder Springs, GA; Sabana Seca, PR; and Waipahu, HI.

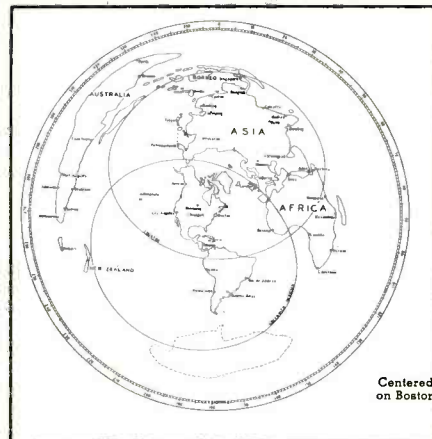
How RDF Is Used

Radio transmission between two points usually follows the shortest path consistent with its reflections back and forth between the earth and the ionosphere. This path is known as the *Great Circle route*, which is the shortest distance between two points on the surface of a globe. This route commonly appears as a curve on a regular map. The Great Circle route became widely publicized in 1927 when Col. Charles A. Lindbergh

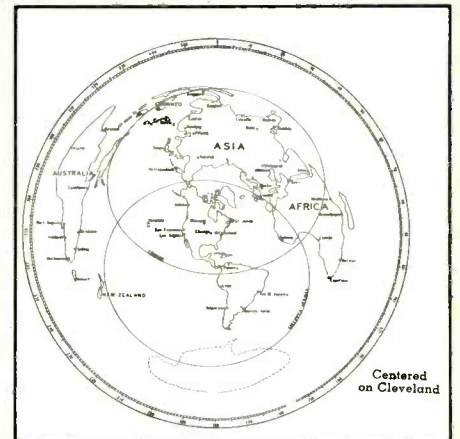
made his historic transatlantic flight from New York to Paris. The maps published in newspapers showed “Lucky Lindy” flying far north, grazing the tip of Greenland en-route to Europe. Why didn’t he fly a direct line from New York to Paris? Actually, he did, but on a regular map his route was distorted into an arc that took him close to the Arctic regions.

Four Great Circle maps are shown (Figures 1-4) that quickly reveal Great Circle routes from four locations in the U.S. to other world points. Notice the apparent distortion of the continents on the maps. But a ruler laid between the point of origin (the center of the map) and any point in the world will instantly give the line of direction to that point. Note that a Great Circle map

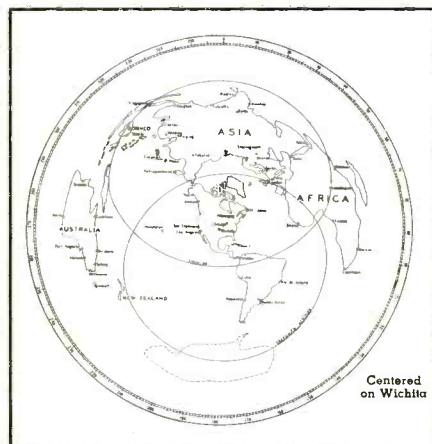
Figures 1-4: Great Circle Charts for the United States. (Charts courtesy of Radio Publications, Inc.)



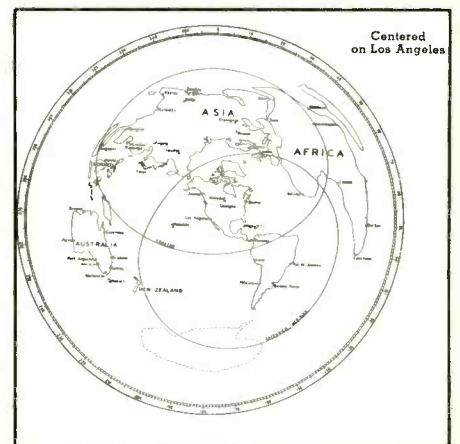
Centered on Boston



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Centered on Wichita



Centered on Los Angeles

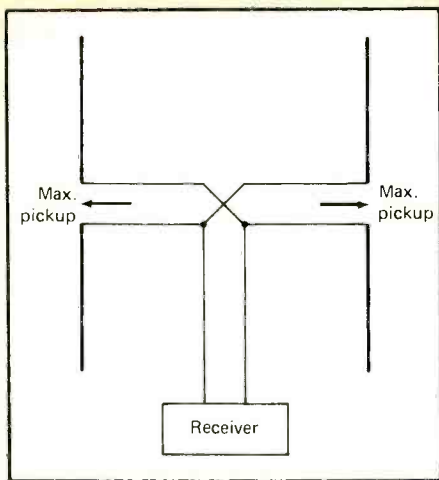


Figure 5: The Adcock direction finding antenna. If spacing between elements is small compared to wavelength of received signal, the antenna provides a figure-8 pattern having deep nulls. Bearing errors caused by down-coming horizontally polarized waves can be substantially eliminated with this simple array.

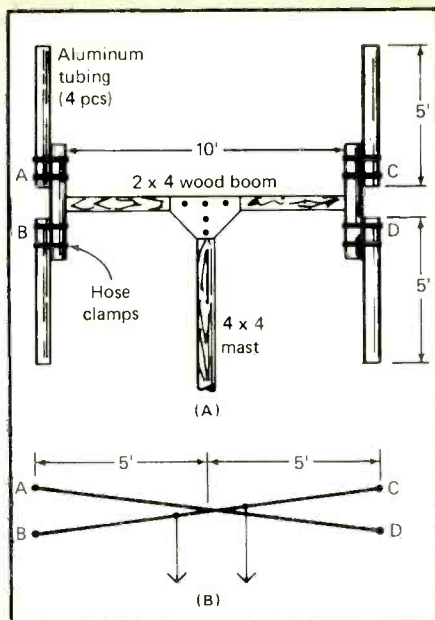


Figure 6: Top—layout of Adcock array
Bottom—connecting harness made out of 300-ohm line.

for one location will not work for another location.

A Great Circle map, in addition to being useful for navigation, is used to determine the line of direction of a radio signal. With a map and RDF equipment, the listener can locate a line of direction between his receiver and a distant radio station. Or can he?

Pitfalls In RDF

It is tempting to think the high frequency radio wave travels a Great Circle route as it passes from continent to continent. But high frequency waves reflected from the ionosphere are often altered during their path from transmitter to receiver. The alterations greatly increase the difficulty of locating the direction of origin as deviations of 10 to 20 degrees from the direct path are common, and deviations larger than this have been observed on occasion. The cause of these deviations have been linked with the ever-changing structure of the ionosphere, as well as by auroral activity.

Luckily, most deviations are of short duration and are, in general, much less than 20 degrees, and it has been determined that a number of observations made over a period of time can result in good determination of a line of direction between transmitter and receiver.

The Adcock ADF Antenna

Simple loop antennas have been used for many years for low frequency (below 500 kHz) direction finding. The deviations of HF signals due to action of the ionosphere, however, make the loop useless for HF observations. This was realized very early in the game, and in 1919 an English patent to Adcock was granted for an improved HF di-

rection finding antenna system which would eliminate the errors inherent in the loop system. The Adcock elements responded only to vertically polarized waves and were insensitive to horizontal polarization. This was the result of a discovery that, regardless of the original wave polarization, the reflected wave had a great degree of vertical polarization, which exhibited less of the directional fluctuations that did the horizontally polarized portion of the wave. The Adcock ADF system has been in use for many years and only in the past few decades has it been surpassed by more exotic and expensive ADF antennas. The Adcock array is cheap and easy to build and provides a good introduction to the listener to the art of radio direction finding.

Building An Adcock Antenna

The simplest Adcock antenna consists of two vertical antennas, connected together and to the receiver tuner via a two-wire transmission line (Figure 5). The spacing between the antennas must be small compared to the wavelength of reception and antenna length need only be long enough to provide adequate signal pickup. The Adcock antenna described in this article was designed to operate over the 10 MHz to 18 MHz range in order to keep size and spacing to a reasonable size. Spacing is about 0.1 wavelength at 10 MHz, or approximately 10 feet. For convenience, each vertical element is made 10 feet long. This is a good compromise between element length and signal pickup.

The interconnecting, two-wire transmission line can be made out of TV-ribbon line and runs from the antenna to a tuner located near the antenna. Coaxial line is run from the tuner to the station receiver.

As with any directional antenna, it is important to make sure that signal pickup is only by the antenna and that the feedline is immune to pickup. More on this important feature later.

The tuner transforms the balanced Adcock two-wire feedline to the unbalanced line which runs to the station receiver. The reason that the two-wire ribbon line is not run directly to the receiver is that a balance to ground must be maintained in the line. It must be short, and it must drop down directly below the antenna. The tuner, in fact, is placed directly below the antenna to allow a good balance to be maintained in the transmission line. Placement of the coaxial line from tuner to receiver is not critical, nor is the length of the line.

The antenna elements can be made up of 10-foot sections of light aluminum tubing, cut in half. They are mounted to a support board with hose clamps or U-bolts. The board, in turn, is mounted to the end of the support boom L-shaped angle plates. The boom is 2" x 4" on edge, ten feet long. The assembly is shown in Figure 6. When the wood framework is completed, it should be given a coat or two of paint or shellac to protect it from the weather.

For ease of assembly, the boom can be temporarily mounted to a short section of TV mast, so that it is held about six feet in the air. This makes it convenient to work on the antenna.

A length of 300 ohm ribbon line is used to connect the antenna elements. Make sure that you have a half-twist in the line so that the upper section of one antenna is connected to the lower section of the other, as in the drawing. Make the line as short as possible, consistent with good workmanship.

Finally, find the center point of the line and clean the insulation from the wires for about an inch. You will solder the feedline on at this point. Wrap the joint with vinyl electrical tape when you finish it to make it waterproof.

Installing The Adcock Array

The antenna is now complete and ready to mount on a supporting structure. The bottom tips of the elements should be at least 10 to 15 feet above ground level. This places the boom of the antenna about 15 to 20 feet in the air. A guyed slip-up TV mast will do the job, with a light-duty TV rotator at the top of the mast. The control cable from the rotator should be taped closely to the mast so that it will not interact with the ribbon feedline, which drops down from the center of the antenna.

The feedline should be kept well clear of the mast in order not to upset the direction finding ability of the antenna. The antenna tuner is placed at the foot of the mast, as discussed in the next section.

The Antenna Tuner

A schematic of the antenna tuner is shown in Figure 7. The tuner resonates the antenna to the frequency range of reception

and also provides balancing controls to obtain a proper null. The easiest way to check out tuner and antenna is to temporarily bring the station receiver out to the antenna site and connect it to the tuner with a short length of coax line. The coil taps and tuning capacitor are adjusted for maximum signal strength on a strong signal in the frequency range under investigation. The taps and capacitor setting are logged across the operating range and a table made up so that you can preadjust the tuner after the receiver is returned to the operating position.

The last step is to adjust the two balancing capacitors in the tuner. A strong, nearby station whose location is known should be used for this adjustment. The Adcock array is rotated until a sharp signal null is found. There should be two nulls, 180 degrees apart in antenna direction. Between the nulls is a broad area of maximum signal. Either null will work for the adjustment. The best null (weakest signal) spot is found and the balancing capacitors adjusted until the signal is nulled out. A very strong signal (40 dB over S9) should be nulled down to S2 or S1 on

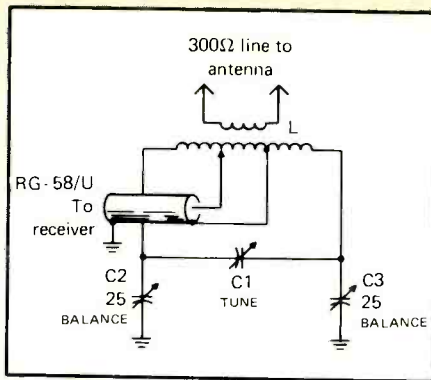


Figure 7: Adcock Tuner for 6-15 MHz
*C₁, C₂, C₃—midget variable capacitors
 L—10 turns #12e, 1/2" diameter, 1 1/4" long. Link is 3 turns of insulated wire wrapped around center of coil. Coax shield tapped to center of coil. Center conductor tapped 2 turns off-center. Adjust tap for best signal.*

the receiver meter. Adjust the main tuning capacitor as you null the signal; the adjustments are slightly interlocking.

Once you have a good null on your test signal, find other strong signals and attempt to get a good signal null on them. You may have to readjust the balancing capacitors a bit. You should be able to get good nulls on most signals over the range of the tuning capacitor.

To lower the frequency range of the tuner, add more turns to the coil. Both halves of the coil (measuring from the ground, or shield, of the coax tap point) should have an equal number of active turns, or you will lose your null adjustment.

Now, tune in signals at random and practice nulling them out by swinging the antenna back and forth. Once you have the hang of it, you should adjust your rotator so that the two vertical antennas lie in a plane that is true north-south (not magnetic north). If your control box on the rotator is calibrated up to 180 degrees, you can make readings directly from the indicator. (Some of the Ham-type rotators have this feature). Armed with a Great Circle Map and knowing the direction of true north, and a little expertise in making null readings, you should be able to draw a line of direction from your site to the distant station on the map. You will have to make a number of readings over the space of a day or two in order to get an average reading that will make sense.

A Final Word

Listener direction finding is a new art and is still in the early stages of development. If you can find a colleague a few thousand miles away, you can practice on known stations to see if you can achieve triangulation on the signal. The process is not hard, but time and patience are required to obtain meaningful results. The key to good results are a ship-shape installation and good null balancing. It is unfortunate that the tuner must be located at the foot of the antenna installation, but those investigators who develop expertise can then extend the ribbon line and bring the tuner into the dwelling and place it at the receiver location. This makes rapid frequency change much more flexible. But this step should not be taken until the system is in a good, working condition with the tuner directly under the antenna. One problem at a time, please!

Final Words On The Subject Of DF'ing

I am still experimenting with the Adcock array and don't know all the answers. I do know it is a lot of fun to play with. Sometimes it is possible to get startlingly accurate readings; other times the results are mush. But the problem of high frequency direction finding is so interesting and challenging, this simple antenna is a good introduction to the science of determining a line of direction to a distant station. If you build the array, let me know your results. Write me care of POP'COMM. Good Hunting!

PC

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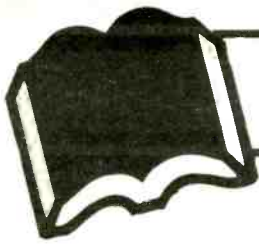
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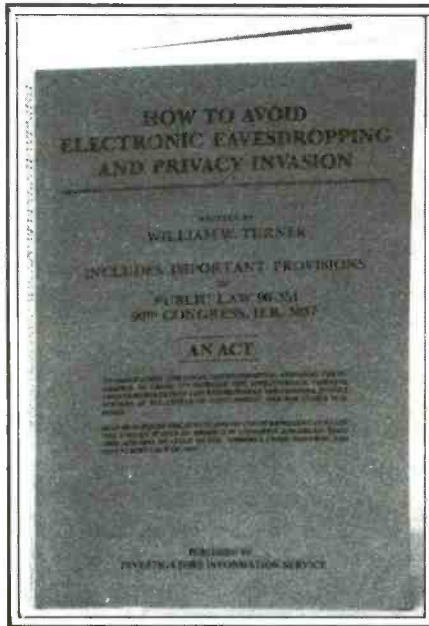
Bill Orr, W6SAI, whose writings have long graced the pages of the electronics press (including *POP'COMM*), teamed up with Stu Cowan, W2LX, to author a useful book entitled *Better Shortwave Reception*. Actually, this is the 5th Edition of this book.



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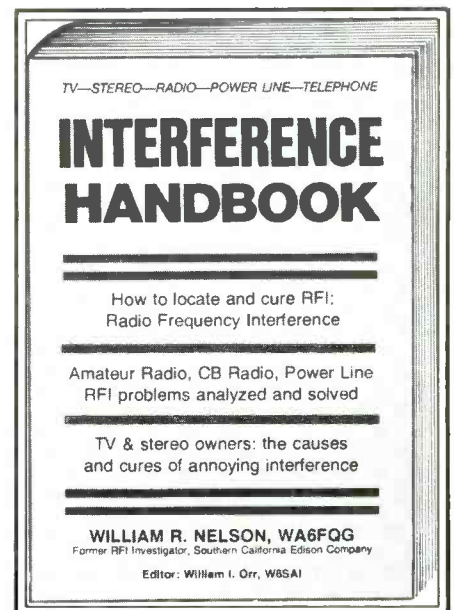
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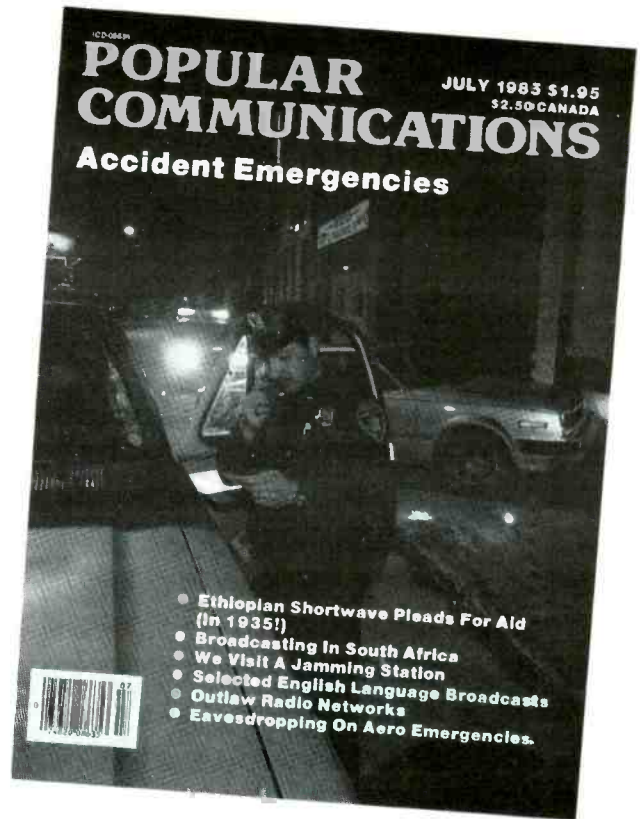
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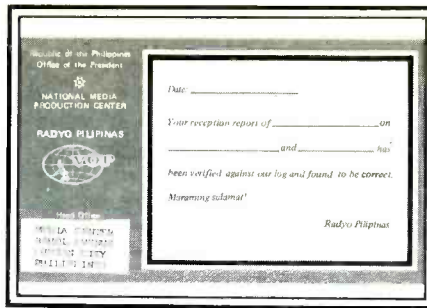
Early efforts on the part of the Voice of the Philippines (VOP) suffered from many growing pains, not the least of which was caused by typhoon Yo Ling on November 17, 1970. Damage to transmitting antennas was so extensive that the VOP was silent until mid-January of the next year.

The studios for the VOP were moved several times during the ensuing years, but finally found a home at the centrally located National Media Production Center (NMPC) on Bohol Avenue in Quezon City (just outside Manila). In addition to the VOP, the NMPC is home for the Maharlika Broadcasting Network, Channel 4 TV, the Philippine News Agency, and medium wave stations DZRM and DZCA.

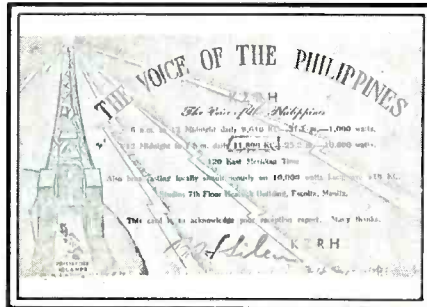
In a recent interview with the supervisor of overseas broadcasting, Jun Ruiz, he said the purpose of the VOP was to provide a source of accurate information about the Philippines, spiced with music and entertainment. He said that the western press has often portrayed the Philippines in an inaccurate and sensational manner. According to Ruiz, the VOP seeks to present honest and pleasant view of the Philippines and its people.

Ruiz and his staff of 9, who double as announcers and office crew, receive about 30-50 letters each week, mostly from California and Japan. They endeavor to answer each letter and provide a QSL card when an accurate reception report is received. Whenever possible, they also send a personal reply to each listener. Ruiz said that comments on the VOP's programs as well as information on signal strength and quality are of the greatest importance to him and his staff. As with many broadcasters these days, however, the VOP operates on a limited budget so IRCs or return postage are almost a necessity for those DXers seeking a reply.

At the VOP the announcer's days begin in mid-morning, and when the first program goes on the air at 0700 GMT, it is three in the afternoon in Manila. The first transmission



Sample QSL card used by the VOP to verify reception reports.

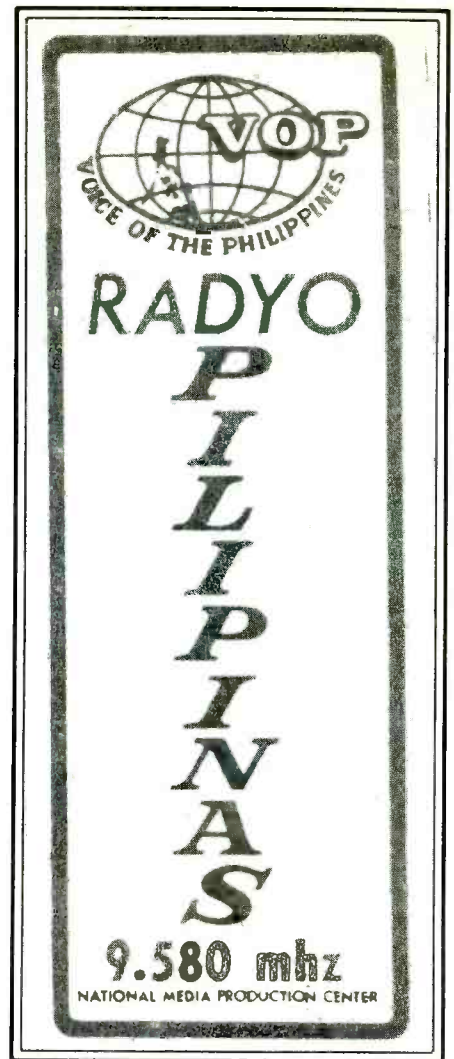


Out of the past, a 1939 QSL card from the original "Voice of the Philippines-KZRH." (Courtesy of the late August Balbi)

runs from 0700 to 0955 GMT and is targeted for Japan, Korea, and Taiwan. Next comes the beam to Burma, Cambodia, Thailand, and Vietnam from 1200 to 1355 GMT. At 1400 GMT, programs for North America are on the air until 1655 GMT.

Broadcasts from the VOP are interesting and give an intriguing view of the Philippines. Programs include "Halina sa Pilipinas" (Come to the Philippines), "Himig Pilipino" (Sounds of the Philippines—a talent showcase), and "Let's Speak Pilipino." All programs are in English and are transmitted on 9,580 kHz.

Although a 50,000 watt transmitter is



Attractive pennant sometimes sent to DXers by the Voice of the Philippines.

rather modest in the cutthroat world of international broadcasting these days, big plans are afoot at the VOP. According to Ruiz, negotiations are underway at this time for the VOP to take possession of a 270,000 watt transmitter from the Voice of America. If the deal goes through, it will certainly put the VOP in a better position to compete with the big guns on the airways today.

Additionally, Ruiz hopes to hire announcers and staffers of other nationalities in order to include foreign language broadcasts in the VOP schedule. He also hopes to add more frequencies and an expanded and more versatile program format.

A major modernization and face-lifting effort begun in 1983 was recently completed and the VOP just returned to the air in January of this year. So now is the time to add this interesting and somewhat rare station to your log book, and their attractive QSL card to your collection. Their address is: Radyo Pilipinas, The Voice of the Philippines, Media Center, Bohol Avenue, Quezon City, Philippines.

Why not try tuning them in, and sample the world famous Philippine hospitality from your own DX shack.

PC

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Please send all reader inquiries directly.

NEW AND EXCITING TELEPHONE TECHNOLOGY

Just Say "Over"

A few issues ago, we talked about the problems associated with telephone calls that are routed through our geostationary satellites. I received several phone calls from engineers representing Ma Bell, and they all seemed to say the same thing—*don't talk about it*—you can't change Mother Nature.

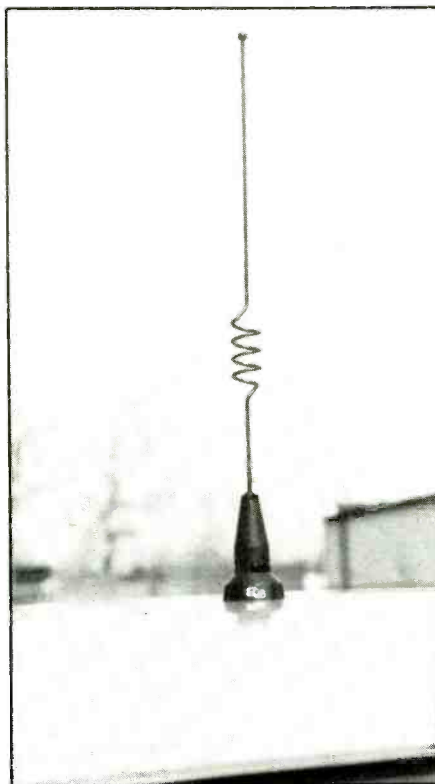
While I may agree that we can't change the velocity of radio waves in free space, I think we still need to talk about it.

The problem lies in the delay that takes place in a telephone conversation when calls are routed through the orbiting satellite. Our marvelous satellite telephone relay system hovers above us at 22,500 miles above the Equator. As our earth spins, so do the satellites—so they appear motionless so that ground stations may beam telephone calls through these extraterrestrial repeaters. I think we all agree that the fidelity of the phone calls is just about as clear as a call next door. However, satellite-routed phone calls always have that agonizing delay between when you stop talking and the other party begins talking. This delay is many times compounded when a quick-paced conversation ends up with both parties interrupting each other because of the delay.

Many businessmen who rely on a quick exchange phone call session may hang up in frustration with the connection they get because the delay adds tremendous confusion when interrupting a party who's already talking.

Since radio waves travel at the velocity of light, near 186,000 miles per second, the delay occurs when you stop talking and your signal must travel 22,000 miles up to the satellite and then 22,000 miles back down to the different ground station. Now add in the reaction time of the called party to your last words, "You are fired," and then it's another delay for their voice to travel up the 22,000-mile circuit to the satellite, and then back down again to your telephone receiver when he responds, "That suits me fine." The delay is manageable if only one person talks at a time, and they conclude each interval conversation with, "Over."

Representatives of several phone companies are quick to point out that they have made exemplary efforts to silence the annoying echo that sometimes accompanies the delay—and I think they have done a swell job in this. Thank goodness. Have you ever tried to carry on a conversation and heard your own voice delayed a quarter or a half second? It's virtually impossible. Try it



Antenna Specialists make this cellular roof antenna.

tonight with a professional separate-head tape recorder—I bet you can't do it!

So what it boils down to is that the echo suppression is something they can deal with, but the time delay is something that is here to stay. Not all phone calls that go across the country are relayed by satellite—only about 15 percent, say phone experts. However, in my own experience, and I am sure yours, we find that certain cities always seem to get hooked up on the satellite, and it's always impossible for a quick-paced conversation to take place.

The conversations that are relayed via microwaves here on earth have no noticeable delay at all. I have tried unsuccessfully to specifically request a microwave link to a distant party that always seems to come up on the satellite, but to no avail. Some exchanges must always go through the satellite, I surmise, when calling long distances.

Cellular Business

The cellular phone service is coming along remarkably well. Fidelity seems excellent, and the pass-over between cell sites



Yaesu's new FRG-9600 scanner.

seems smooth as silk. Occasionally one can detect a small change in phone levels, but cellular users and those parties called by a cellular telephone setup hardly notice anything at all. Congratulations to the hard working cellular telephone industry that gives us such a marvelous product. As predicted, cellular telephone prices are plummeting, and it's now possible to purchase your own "MUNZ" cellular telephone for under \$1,000! Many cellular telephone networks are just about giving away the equipment to entice more users to go on the air. This is great!

A cellular telephone in your car—just think of those very private conversations you can have without the scanner listener eavesdropping. Ha-ha.

Several new scanners have been developed specifically to cover the cellular telephone channels.

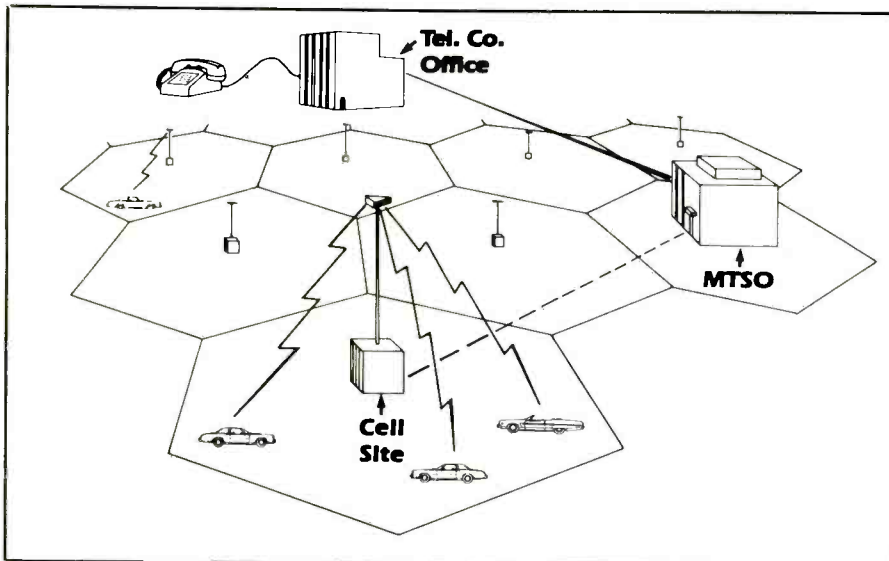
However, before you buy a scanner, be sure and check those specifications. Remember, not all scanners will step evenly throughout the 30 kHz cellular channels. If the scanner only offers 25 kHz channel stepping, it won't fare well in 30 kHz spots.

I have tested some of the products that tune in the cellular channels. The Regency M7000 scanner steps in 5 kHz increments. We also tested the JIL Corporation's SX-400 with the matching RF-8014 down-converter, which lets this 26 through 520 MHz scanner also cover 800 MHz through 1,400 MHz with steps small enough to pick out any type of channel spacing and bring in the signals loud and clear. External down-converters are an excellent way to add additional channels to your present scanner set. We will be seeing more of these down-converters as higher frequencies are explored.

Yaesu (PO Box 49, Paramount, CA 90723; ATT: Chip) has finally introduced to the scanning enthusiast a communications receiver that is one of the finest scanners I

Frequency range:	60-905 MHz (up to 460 MHz for SSB)	Tuning steps:	FM-N* 5/10/12.5/25 kHz FM-W 100 kHz AM-N 100 Hz/1 kHz AM-W* 5/10/12.5/25 kHz SSB 100 Hz/1 kHz *Selected steps shown on display
Modes, 3dB Bandwidth:	FM Narrow (15 kHz BW) FM Wide (180 kHz BW) AM Narrow (2.4 kHz BW) AM Wide (6 kHz BW) SSB (2.4 kHz BW)	Memory channels:	100
Conversion Schemes:	Triple (FM-N, AM, SSB) Double (FM-W) Single (Optional Video Unit)	Audio output:	1W (into 8 ohms, with less than 10% THD)
IF Frequencies:	45.754, 10.7 MHz and 455 kHz	Power supply voltage:	DC 12-15V AC 100/117/220-230V
Image Rejection:	60-460 MHz - 50dB typical 460-905 MHz - 40dB typical	Power supply current:	Operating 550 mA (maximum) Power switch off 100 mA DC supply off 3 μ A max. (lithium memory backup)
Typical Sensitivity:	FM-N 0.5 μ V (for 12dB SINAD) FM-W 1.0 μ V (for 12dB SINAD) AM-N 1.0 μ V (for 10dB S+N/N) AM-W 1.5 μ V (for 10dB S+N/N) SSB 1.0 μ V (for 15dB S+N/N)	Case size (WHD):	180 x 80 x 220 (mm)
		Weight:	2.2 kg (4.9 lb) without options

Specifications for the Yaesu FRG-9600.



This is the way a cellular system is set up.



Which calls will go through the satellites?

have ever tested. It's their Model FRG-9600, and this communications receiver/scanner covers 60 to 905 MHz without interruption in the following modes:

- Wideband FM (for TV broadcasts)
- Narrow band FM (regular two-way radio FM)
- AM wideband (AM broadcast station and aero beacons)
- AM narrow band (air-to-ground communications)
- Single sideband (ham radio weak signal work as well as the new business amplitude compandered sideband emission)
- CW (for copying code broadcasts)

I'm not sure why the frequency begins at 60 MHz, rather than 30 MHz, but this is a small price to pay for such a tremendous scanner. (Maybe Japan doesn't have much activity below 60 MHz, whereas we do here in the United States.)

The scanner has seven tuning rates between 100 Hertz and 100 kiloHertz, which will insure it picks up each and every channel. Cellular telephone channels would be a snap with this receiver.

The scanning system will allow either full or keypad programmed band scanning as well as memory channel scanning, all with auto-resume. How many memory channels? I hope you're sitting down—100!

In addition to carrier sensing scan stop, audio scan stop sensing is also selectable on the front panel, which allows the scanner to only lock onto frequencies that contain voice. It would skip those "carrier only" channels.

At last the Yaesu FRG-9600 presents, to the scanner enthusiast, an S-meter. The S-meter gives a faithful rendition of incoming signal strength. Our tests indicate the following sensitivity to the Yaesu FRG-9600 S-meter circuit:

S1	1.56 milliwatts
S3	25.00 milliwatts
S7	6.25 watts
S9	100.00 watts
S9/30dB	102.40 kilowatts

Each S-unit change in received signal strength gave us a 6 dB difference, or a 4 times change in power. We found the S-meter quite accurate and dependable.

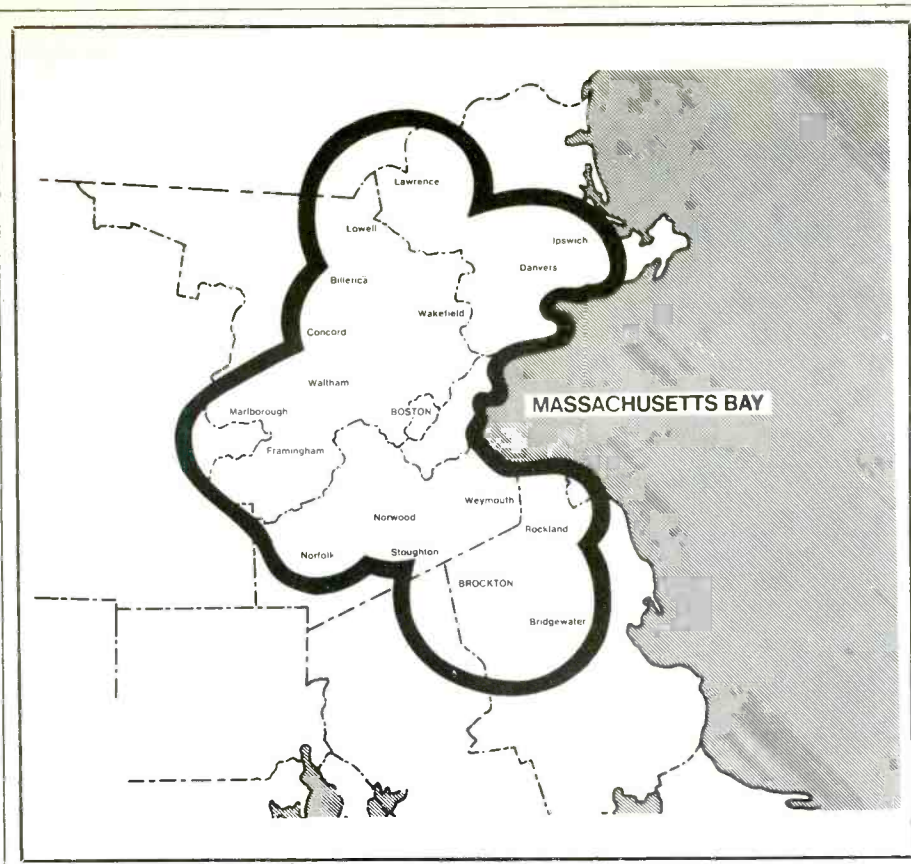
When you approach signal strengths over S9, the blue vacuum fluorescent display turns to red.

We also found the 24-hour clock, as well as a timer, to turn your scanner on and off. There is a jack for a recorder, as well as automatic power on and off switching and recording. There were also jacks provided for CPU band selection output, multiplex FM wideband output, audio frequency and radio frequency use, and some additional jacks for accessories that they are developing down the line. The scanner requires 12 volts DC, and they even give you a wall power adapter when you want to run it from the house.

You've really got to see this scanner to believe it—it's really a work of art, and it is intended primarily for the very serious scanner listener.

What's on those frequencies above 800 MHz? Benn Kobb of *Personal Communications* magazine offers this partial list of activities above 800:

800-806 MHz	UHF television
805-821 MHz	Land mobile two-way radio service, repeaters, and simplex
821-825 MHz	Uplink segment for the proposed land mobile satellite service
825-845 MHz	Cellular mobile telephone mobile unit transmit channels



The cellular system surrounding Boston.

- 845-851 MHz Reserved frequencies for additional cellular telephone traffic
- 851-866 MHz Base station side of the 809-821 MHz land mobile service
- 866-870 MHz Satellite downlink side of the land mobile satellite band
- 870-896 MHz Base station side of cellular telephone channels
- 896-902 MHz Reserved band for land mobile use
- 902-928 MHz Catch-all band that may include amateur radio
- 928-Up MHz Paging, government, broadcast industry frequencies

By the way, if you'd like a sample copy of the cellular telephone magazine, *Personal Communications*, write Benn Kobb, FutureComm Publications, 4005 Williamsburg Court, Fairfax, VA 22032. It's an excellent magazine intended for the cellular telephone industry and the cellular telephone user. If you're interested in telephone channels, this magazine is a must.

That's it for this month—happy scanning on the cellular channels, and don't forget to say "Over" next time you place a long distance phone call through the satellites. **PC**

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BETTER SIGNALS

BY ED NOLL, W3FQJ

ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

SWL Slopers

A sloper is a single mast, easy-to-erect antenna (Figure 1), with a sloping antenna wire that is either a quarter-wave or a half-wave in length. The half-wavelength version is really a slanted dipole with transmission line connected at the center. The quarter-wavelength version is attractive as an antenna for the low-frequency SWB bands or for a limited space erection site. Transmission line is attached at the mast top. The inner conductor of the coaxial line attaches to the sloping wire. Braid connects to the metal mast or to a wire that drops down the mast to a ground stake.

Dimensions of a quarter-wavelength segment in feet are given for the various short-wave bands in Figure 1. These lengths also apply to the half-wavelength because it comprises two quarter-wave segments.

A sloper has some directivity in the direction of its slope and a reduced pick-up from the opposite direction. In the forward direction the sloper responds well to long-distance DX signals because of the low angles at which they arrive on the antenna.

Simple 19-Meter Sloper Construction

Any convenient mast or high point can be used as a point of attachment for the high end of a sloper antenna. Our discussion shows how two telescoping sections of PVC piping can be used as a convenient and versatile mast. Such a mast is light in weight and can be slipped by one person over a short but smaller diameter pipe positioned two or so feet into the ground or over a metal fence post that has been purchased from the hardware store. The mast bottom rests on the ground and is supported upright by the post. If the post has been driven straight into the ground, it will be absolutely vertical. A three-section mast can be erected if desired, although some help may be advisable and several guys are helpful in lining up the mast exactly vertical.

The 19M band has been a favorite of mine. There are usually daytime and dawn/dusk DX signals to be found, reception often extending into the night hours. In general, conditions are poorest on 19M during the winter months of the very lowest sunspot years. Otherwise it is a very active band with signals arriving from most parts of the world in any 24-hour period. The 19M band is tops for the antenna designer and experimenter. Antenna dimensions are reasonably short and various configurations can be built and tested in a small area before they are expanded to lower-frequency use.

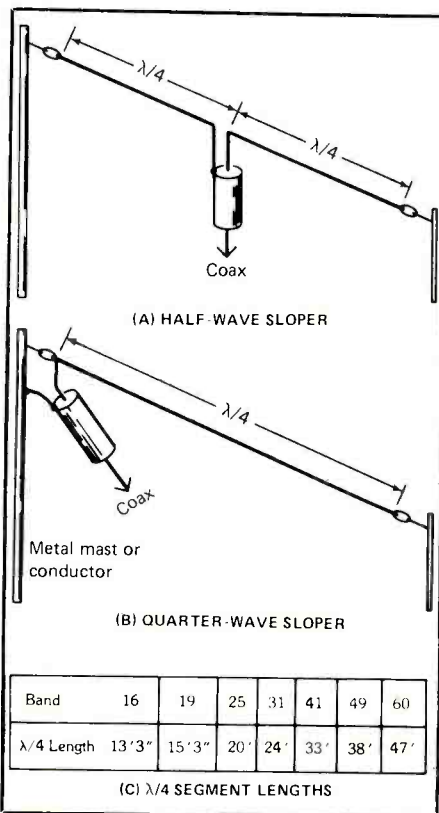


Figure 1: Two basic sloper antennas.

An effective 19M sloper, Figure 2, can be constructed using two telescoping 10-foot sections of PVC piping (2" and 1½" ID). Drop the top section 1½ foot into the lower section and fasten with two through bolts, Figure 3. Two eye rings are fastened to the top of the mast, Figure 4. The high end of the sloper antenna wire is looped into the top bolt. No insulator is used. The antenna

Figure 2: 19 meter half-wave sloper.

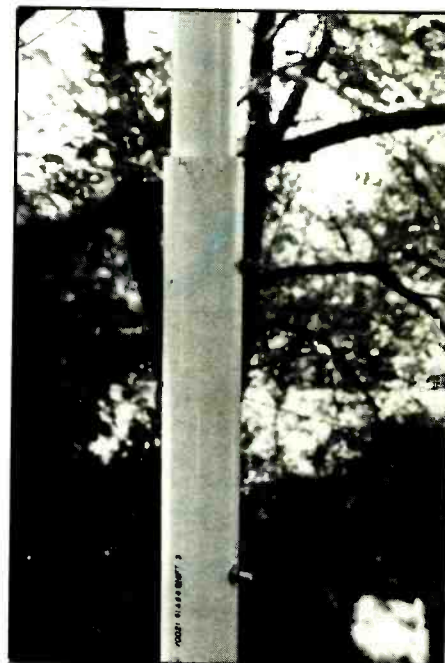
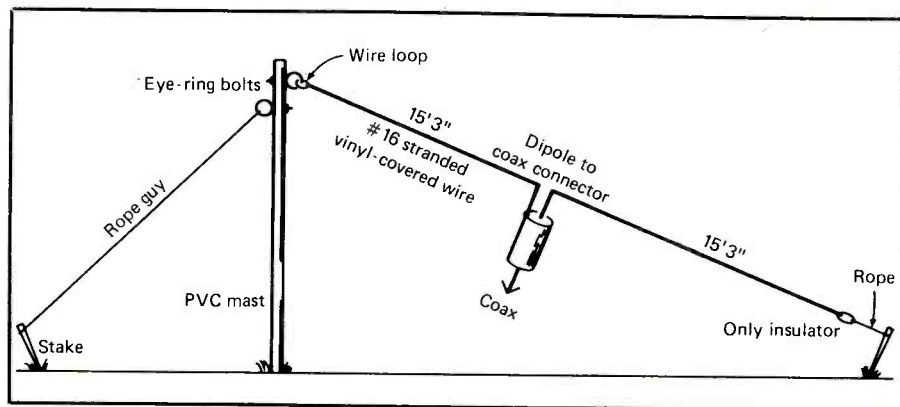


Figure 3: Top section telescoped 1½' into bottom section. Fastened with two through bolts.

itself is constructed of number 16 vinyl-covered wire. Fasten the loop so it will slide readily around the ring. As a result you will be able to change the direction your sloper is angled if you wish to obtain a bit of added sensitivity in some preferred direction. From time to time you may wish to change this directive angle.

Insulated antenna wire has always been my preference because it can be handled easily, and scratchy noises and shorting do not occur when it rubs against metallic or wet surfaces. Performance is the same as that of bare wire, plus it is a bit stronger per wire size

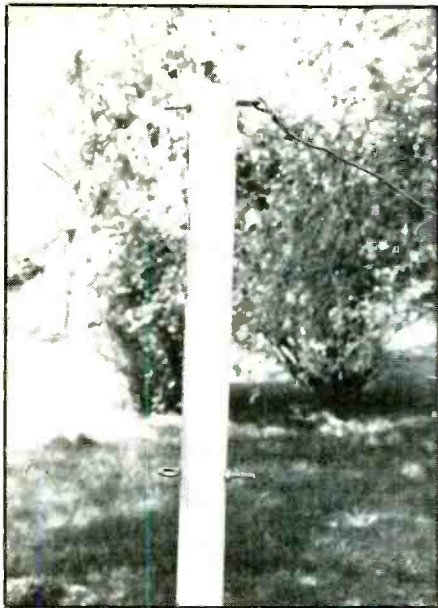


Figure 4: Insulated-wire antenna looped through top eye-ring. Lower eye-ring bolt for rope guy attachment.



Figure 5: Swing coax line back to mast in a loop away from center feed-point of sloper.

and a mite safer. Guy ropes can be attached to the lower eye ring. Usually for a sloper, a single guy wire will do when it is stretched out on the opposite side of the mast as shown in Figure 2.

The opposite end of the sloper is connected to an insulator after some of the insulation has been cut away. The reason for doing this will be presented later. Connect a piece of rope to the opposite eye of the insulator and fasten it to a metal ground stake. Position the ground stake far enough back to obtain a height of approximately 5-7 feet between the end of the antenna wire and ground level.

At the center of the antenna, position a dipole-to-coaxial-line connector. When the coaxial line is connected, let it drop away from the connector and swing back to a con-

venient point for taping to the mast (Figure 5). In my installation, a 50-foot section of line is attached here and runs back to the radio room.

Sloper performance is fine. It is essentially omnidirectional except for directly off the back $\pm 45^\circ$. This reduced back-up can often be used to advantage. For example, you can position the sloper at your mounting site so its back direction cuts down the level of some interfering signal. As you know, a number of high-powered stations may come on the air in the continental United States. Thus a sloper would be of advantage if it was angled at approximately 45° for Europe (angle for the eastern States). Its minimum pick-up rear would then cut down the level of signal for signals then being transmitted from the southwest and west. An example is the daytime Swedish signal on 15420, which is also occupied by WRNO during the same time period. The angle of Sweden from my location is 41° ; WRNO 234° . They are almost directly opposite and the sloper does cut back on the WRNO level, and I can receive a usable signal from Sweden with a little bit of cooperation from propagation conditions. If you wish to pick up signals from the west and southwest such as Australia on 15320, you can easily swing the sloper around and attach to an appropriate fence post located on that side of the mast. Slopers for other bands can be built using the dimensions given in Figure 1.

25 And 31 Meter Improvements

The 19-meter sloper operates reasonably well on the adjacent bands of 16 and 25 meters. Frequency-wise, the 16 meter band is only about 2 MegaHertz higher in frequency. Results are good. The antenna can be made to perform better on the 25 and 31 meter band by using an additional jumper that can be clipped into operation when desired (Figure 6). Attach an 8'9" segment of antenna wire to a clip. Tape the wire several places along the guy rope that is connected between the antenna insulator and metal fence post. Leave the clip to hang loose whenever you're interested in peak performance on the 16 and 19 meter bands. The clip-on will add better performance on the 25 and 31 meter bands, with some sacrifice in 16 and 19 meter performance. It provides your 19-meter installation with some additional versatility.

Low-Band Quarter-Wave Sloper

The half-wave sloper functions very well on the lower frequency SWB bands. However, it occupies a good chunk of real estate. A good performing compromise is the quarter-wave sloper of Figure 7. This particular one was designed for operation on the 49 meter band. It was sloped toward Europe to provide good nighttime listening during the winter months. When conditions were good, I was able to copy ORF sideband signal on 6155 in the very early afternoon.

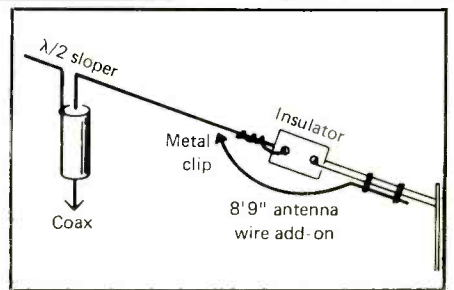


Figure 6: Add-on for 24 and 31 meter bands.

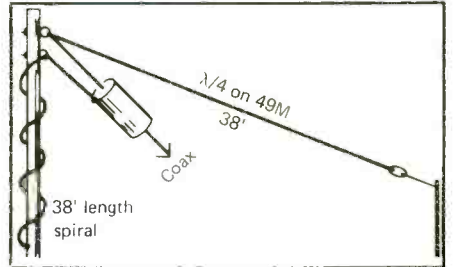


Figure 7: Space-saving quarter-wave sloper.



Antenna erected showing sloper wire and support guy in position.

At the top of the mast, the inner conductor of the coaxial line is connected to the sloping wire. Braid is connected to an antenna wire of the same length that was wound in a spiral around the PVC mast down to its base. Use the full 38 feet of length and tie its end to a bolt that is inserted in a hole drilled through the mast at the very bottom. The top of the mast was about 23 feet above ground.

Readers with general questions about signal improvement matters can contact me by writing: Ed Noll, Better Signals Dept., Popular Communications, 76 North Broadway, Hicksville, NY 11801. Although I can't design special antennas for individual readers, I'll be happy to offer you my opinions (please include an SASE if you wish a direct reply).

PC



Scanning A Skyjacking

Plans and Preparations

BY BOB PARKER

“Flight 608, Seattle Center. Confirm your squawk seven-five-zero-zero.”

“Seattle Center, 608. Confirming the seven-five-hundred. We have a man on Board who claims to have a bomb and wants to go to Portland.””

And so, with words and phrases similar to the above, first word of yet another skyjacking could have been yours, even before law enforcement officials got word of trouble.

Skyjackings have become, thankfully, rare since their popularity peaked in the 1970's. But they still happen, and you can have an ear on the action if you know where to listen. Because an airplane is a relatively isolated chamber jam-packed with radio gear, radio just naturally plays more of a role in skyjacking than in other hostage-type situations. You'll not only hear planning and logistics preparation by responding agencies, but very interesting conversations between the pilot and the FBI. In extremely rare situations, you might even hear the skyjacker personally!

Best of all, due to the massive logistical

problems by dealing with a skyjacker, you'll likely know what's going to happen in advance by virtue of the coordination which must be handled via radio.

But just like law enforcement agencies, you must plan ahead for such situations. You'll need to have a list of frequencies in the drawer and ready to go, some idea of what equipment is needed to tune the frequencies involved, and a good listening location since many of the transmissions will be simplex in nature. Making your plans on a club-wide basis might be an interesting project and provide better listening for all.

The purpose of this article is not to provide you a list of frequencies. Actual frequencies used vary greatly from area to area, and there's simply not room here to cover the entire country. I merely hope to fill you in on how radio is used during a skyjacking, and let you make whatever preparations are appropriate for your area.

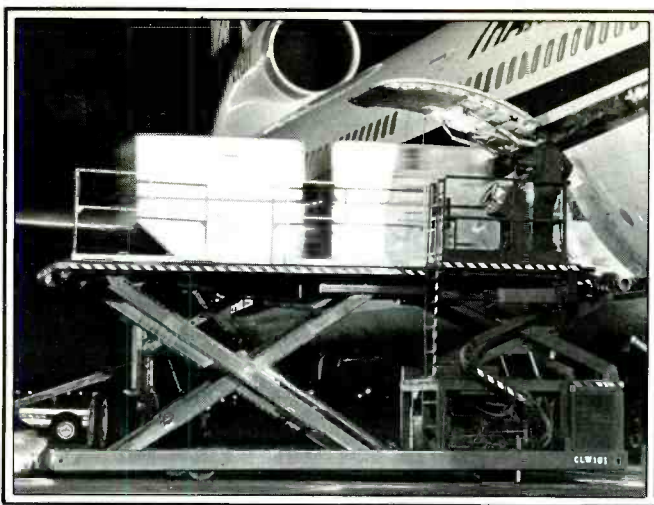
Right off the top though, a couple of words of warning. The well-known Section 605 was written for just such situations. You might get away with blabbing about a burglary down the block, but if you shoot off

your mouth about a major crime, you will get a visit from the Feds. Listen and enjoy, but do it discreetly.

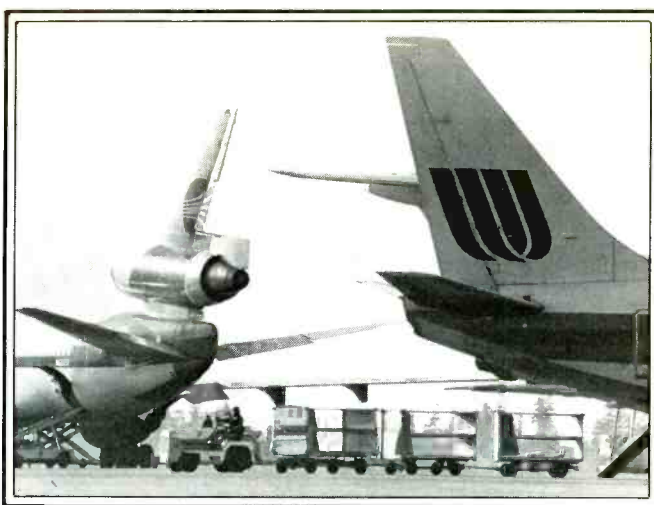
Secondly, stay away from the actual scene. “Call-chasers” give legitimate scanner enthusiasts a bad name and could bring burdensome regulations upon our hobby. It's just not necessary to “drive-by” when a friend's house near the airport has both 110 volts for your scanner and a refrigerator full of cool beverage. Additionally, if the skyjacker sees he has an audience along the airport perimeter, his sense of power might become inflated, making the situation more difficult for those trying to keep any hostages alive.

The best place to monitor routinely for first word of a skyjacking is your local FBI Field Office. Be sure to monitor both the day and night status frequencies. FAA Tower and Enroute frequencies might also prove worthwhile, so as long as you don't let the continual chatter cause you to mentally “tune out.”

Once you know a skyjacking is in progress, FBI frequencies are the best to get an overall handle on the situation. They will obviously be sending a large number of agents



The loading of air cargo at a busy airport is complicated and interesting listening in and of itself. But ramp frequencies really come alive during a skyjacking! You may actually hear the skyjacker himself on the frequencies normally used by cargo handlers.



"Where to next?" he might ask, looking for another load of luggage to lose. But the next voice you hear on that radio net could be a pilot telling the FBI about the man who just hijacked his airplane!

to the airport, and may be briefing them via radio while enroute. FBI freqs will continue to provide a wealth of information during the incident, but as you learn more about what's happening, dig your list out of the drawer and start punching some other numbers into that scanner!

Airline "Ramp Frequencies" may well provide the sexiest transmissions of the day and can be found in the upper regions of the VHF Aircraft Band. These channels are normally used for communications by ground crews, or between ground crews and pilots during the loading of baggage and meals. During a skyjacking, though, the FBI will come up on the ramp frequency for the airline involved and begin getting information directly from the pilot. Such information will include the number of hijackers, weapons, demands, number and condition of hostages, and anything else the pilot can learn from the flight attendants. Should the skyjacker make it into the cockpit, this is where you'll hear him talking to the FBI!

Ramp frequencies are generally simplex though, and some planning may be required to hear them. This is where a good antenna system, or a club member living near the airport, will come in very handy.

If the plane is not yet on the ground, FAA Tower and Enroute frequencies may prove helpful. If you know the plane's tail or flight number you can listen in to landing and taxiing instructions. But once on the ground, the pilot will be switching to his airline's ramp frequency to contact the FBI.

You should also determine, in advance, which radio station in the area does the best job on "breaking" news stories. This isn't necessarily the station with the best announcers, so listen with an ear toward "Field Reports," primarily those aired via two-way Remote Pickup Units. Monitoring a station's R.P.U. will provide not only official word of what's happening, but those unconfirmed tidbits reporters will be trying to verify before broadcast. Don't, however, put media frequencies in the same scanner with FBI or Ramp frequencies. Broadcast reports may

run a minute or more, and could lock up your scanner while better stuff is on other frequencies.

TV and newspaper frequencies can't be ignored, but won't be as helpful as radio. Both have fewer deadlines, and will be primarily concerned with logistics such as camera angles and personnel deployment. Radio stations that will cover the story as it happens will provide the hottest two-way traffic. Newspaper reporters, for instance, generally file their reports by phone. While their coverage is usually the most comprehensive, their two-ways are the duller.

Airport and municipal police departments will also be involved in skyjacking incidents, but in a much more peripheral way than you might expect. They generally provide perimeter control only, and may be responsible for seeing that an "audience" doesn't develop to inflate the skyjacker's ego. Local S.W.A.T. or sniper teams may be called in to back-up the FBI, but will generally keep a low profile. Listen for transmissions about "Bomb Dogs" though, a tip that the skyjacker might be claiming to have such a device.

Sudden curtailment of transmissions from the scene might also be a tip that officials really believe the skyjacker has a bomb. Radio transmissions are generally restricted around such devices, since they've been known to detonate electric blasting caps.

Airport and municipal fire departments will be a good place to tune. They're responsible for fire suppression and first aid, so a listen there might provide some tips about what officials expect to happen. You might hear word of an expected surrender or a planned raid on the aircraft!

And don't forget those boring old Port Authority frequencies. The people who normally cut the grass and paint the white lines will be providing coffee and buses on "Hijacking Day." You can use what you hear from them in concert with facts from other radio services to get a pretty good picture of what's going on. And should the feds try to pose as airport maintenance personnel,

they may, out of necessity, have to use these frequencies to communicate.

Because airport workers also have access to pickup trucks, forklifts, and various other equipment, they may be heavily involved in the logistics of meeting a skyjacker's demands. They could provide a bus to take released hostages to another location, a vehicle the skyjacker thinks he can escape in, or fuel should the plane be forced to take off.

But the first step in all of this is planning. Develop your frequency list, perhaps as a club project, and listen-test those frequencies critical to good monitoring. Most will be busy enough with routine traffic that such preparations shouldn't be a big problem.

You can upgrade your antenna if that'll do the job, but the best solution is a friend or club member living near the airport who will throw open his front room and refrigerator during an incident. If three or four friends drop by with scanners and other gadgets, you'll have enough resources to easily stay on top of the situation. Don't forget to stop at a store on the way over, though, and pick up that six-stage monitoring kit. Buy two if you're big drinkers, and maybe some pretzels for solid food.

To really organize yourselves, you might even consider a "member call-out" list so that everyone gets the word to fire up their scanners. Don't forget to include tape recorders, BCB receivers, and a TV set or two on your equipment list.

But most importantly, don't get so caught up in last-minute logistics that you miss the excitement. Have everything thoroughly planned so that when a skyjacking occurs, you can punch in a few numbers, and sit back and listen. That's what it's all about.

About the Author: Bob Parker is a "Breaking Story" reporter for a Seattle all-news radio station. His job depends heavily on the proper use of scanners, and he has developed monitoring systems in both Seattle and Portland, Oregon. He previously worked as both a police officer and dispatcher for the City of Portland Police Bureau. He has taught various aspects of communications to dispatcher-recruits, and was involved in Portland's switch from manual to computer-assisted dispatching. His coverage of the hijacking of Northwest Airlines Flight 608 in February of 1983, during which a hijacker was killed in an FBI raid on the plane, won him awards from both the Associated Press and the Society of Professional Journalists.

PC

PIRATES DEN

BY DARREN LENO, WD0EWJ

FOCUS ON FREE RADIO BROADCASTING

During the late 1960's and early 70's, when ships with transmitters were floating off the coast of Britain and challenging that government's broadcasting monopoly (much as they are doing again today), the eyes of the American news media, however briefly, looked with interest upon these "pirates" and the threat they posed to Great Britain's ability to regulate broadcasting.

It was undoubtedly the pirates in Europe at this time that prompted the American news media to further explore the phenomenon of unlicensed broadcasting. In addition to articles on the European pirates, research of this topic turns up information on illegal CBers, anti-Vietnam War pirates, Abby Nathan's floating peace station in Israel, and a minister who wanted to broadcast religious programs from a ship off the coast of New York. In the midst of all this coverage are a few rare news accounts of radio "hooligans," or pirates, in the Soviet Union.

It is unfortunate that most of these news accounts of Soviet hooligans are 10 to 15 years old. But examining this information can give us insight into the world of unlicensed Soviet broadcasters, and help us understand the risks they take.

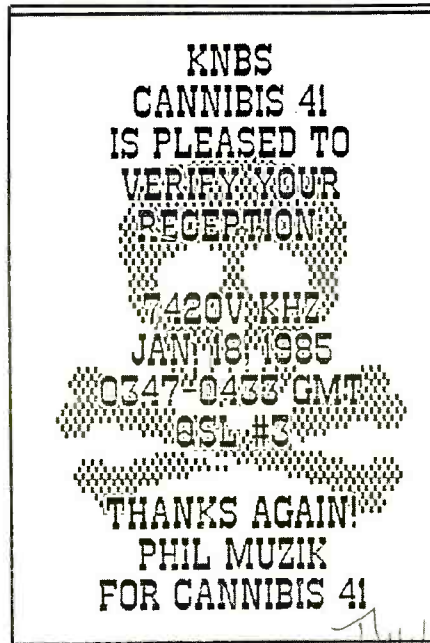
Like many American pirates, Soviet hooligans like to adopt colorful names to identify themselves. Some of these names include: "Bullet Hole," "Diamond," "Green Ghost," "Graveyard Goon," "The Parasite," "Flying Skeleton," and "The Invisible Man."

Like the American government, the Soviets are constantly searching for these stations, and closing them down upon discovery. In 1974, *Time* magazine reported that in the Ukrainian city of Donetsk—a hotbed of hooligan activity—1,000 broadcasters were arrested and fined 50 rubles (then equal to \$69) for "violating rules governing the use of radio frequencies."

It seems that the Soviets were willing to go easy on most hooligans who enjoyed playing western rock and jazz music, telling jokes, and reading messages to girlfriends. After all, they posed no direct or serious threat to the establishment. But when one hooligan in Lithuania taped Western newscasts from a shortwave receiver and retransmitted them, he was actively sought out and sentenced to three years in prison for "anti-Soviet agitation."

In 1973, *Los Angeles Times* reporter Murray Seeger reported that the "thousands of 'radio hooligans' are a growing problem" for the Soviet police. He listed Moscow, the southern Caucasian republics, and Central Volga as the most significant problem areas for police, even though hooligan activity occurs throughout this vast country.

Typical hooligans are teenagers or people in their early twenties. They have technical



Elizabeth and Paul Priddle are a husband and wife DX team. KNBS recently mailed QSL numbers 2 and 3 for their effort.

knowledge (usually enough to build their own shortwave transmitters since they are hard to come by in the Soviet Union) and have a desire to learn about radio; they often wish to make it a career. Most are not Amateur Radio Operators, and have limited knowledge of proper radio procedure and little understanding of frequency allocation.

As a result, the Soviet press has reported several incidents of harmful interference to legitimate radio services. One incident accused a hooligan of preventing an airport control tower from talking down a crippled airliner. Another reported that a hooligan broadcast prevented a doctor from talking to a first-aid crew on an offshore oil rig during a life-threatening situation.

From these news accounts, we can draw definite parallels between Soviet "hooligans" and American "pirates." Both share many of the same characteristics, including the most important one—the desire to speak and be heard. Until there is a mechanism for them to do so legally, the broadcasts will undoubtedly continue in both countries.

Across The Dial

Green Acre Radio Paul Walkendorf in Michigan heard this new pirate on 7430 kHz at 0100 GMT. A phone number was announced over the air, and Paul dialed it up. He talked to the operator who said he was using an ART-13 transmitter at 35 watts. He added that this transmission would probably be his last since he would soon be moving out of his house.

KOLD Also calling themselves KOLA, Paul Walkendorf heard this pirate on 7415 kHz at 2130 GMT. Listeners were asked to send reception reports to club bulletins and magazines since this station has no regular mailing address.

KROK Ken Evans in South Carolina heard this pirate on 7435 at 0040 GMT. Music selections included oldies and humorous songs. Their address is PO Box 245, Moorhead, MN 56560. Be sure to include 3 First Class stamps for a reply.

Phantom Broadcasting System Steve Reinstein in Florida heard this new station and remarked that it sounded like a Halloween broadcast. There were interviews with your favorite monsters (including a vampire), and music included such classic horror hits as "Monster Mash," "Godzilla," and "Season of the Witch."

Pig Boy Radio-WPBR The Messenger and the Soldier are the main personalities on this station. John Norfolk in Oklahoma heard at 0040 GMT on 7435 kHz using single sideband modulation. Their address for reception reports is PO Box 982, Battle Creek, MI 49016.

Radio Ohm This is another new pirate. According to Ken Suess in Wisconsin, Radio Ohm plays music by groups such as Wall of Voodoo, The Clash, and Kraftwerk. Monty Python humour and poetry was also noted on 7430 kHz at 2250 GMT.

Radio Woodland Int'l This is the only pirate I know of that entitles their broadcasts.

This interesting QSL was earned by Elmer Cronkright in Michigan.

Zeppelin Radio Worldwide

Antenna: half-wave dipole

Power: 120 watts

Date: 2-2-85 Time: 1201-1216 EST

Frequency: 7425 KHZ

VIA WESTERN UNION 12-118 "Ze Cond" #10
NICE REPORT!

Count Wolfgang von Manteuffel

ZRM QSL ZRM

Steve Reinstein heard the "Woods are Alive" program on 7430 kHz at 2330 GMT. Music by Jethro Tull and Ian Andersen was heard.

Secret Mountain Laboratory Frank Decker in New York says this pirate sounds quite professional. Spoof ads and announcements were heard during a broadcast on 7427 kHz at 2300 GMT.

Voice Of Bob Michael Wegner of Texas tuned into a "very fast paced and very funny program about Bob and the Church of the Sub-Genius" on 7432 kHz at 0600 GMT.

Voice of Laryngitis This professional sounding pirate is still one of the favorites among pirate DXers. There seems to be no end to their creativity. Ken Cobb in Maine heard them on 15050 kHz at 1930 until 2004 GMT. *The National Enquirer* newspaper fell victim to the VOL that evening when they spoofed it with the "National Ignorer." Reception reports go to PO Box 982, Battle Creek, MI 49016.

WQTU Ken Evans found this pirate, also known as "Q-2 Radio," testing their transmitter on 7430 kHz at 0110 GMT. John Norfolk tuned them in on 7436 kHz at 0100 GMT. Their address is c/o PO Box 5074, Hilo, HI 96720.

WKUE Ken Suess heard this pirate playing "The greatest hits of all time" on 7404 kHz at 2100 GMT.

WMTV Don Mussell in Kentucky discovered this pirate on 7425 kHz at 0300 GMT as they played rock music and took phone calls from listeners. He remarks that the audio was a bit distorted and became worse as the broadcast continued until sign off at 0407 GMT.

WYMN This is one of the more interesting new pirates we have this month. WYMN programs mostly country and bluegrass music by female singers. George Zeller of Ohio heard them on 7427 kHz at 0000 GMT. There were occasional ID's and announcements by a female DJ. A phone number of 949-HUBY was given, but probably didn't work.

In Conclusion

The *AM Press/Exchange* is the only publication dealing exclusively with the AM mode of communication. Hams and SWLs who are interested in the latest FCC and Congressional action affecting AM will enjoy getting this newsletter. For more information, send a large stamped and self-addressed envelope to AM Press/Exchange, Rt. 1, Box 281, Woodwin, TN 37191.

People who are wondering what is happening with 11-meter communications should seek out the *Eleven-Meter Times & Journal*, published ten times yearly. Send \$1 for a sample issue to PO Box 10723, Edgemont Stn., Golden, CO 80401.

A*C*E publishes a monthly newsletter on pirate, clandestine, and spy-numbers broadcasters. For information and a membership application, send a long stamped, self-addressed envelope to A*C*E, PO Box 452, Moorhead, MN 56560.

If you own a computer and a telephone

THE NEWS BY THE VOICE OF VENUS

A QSL from...

po box 245
MOORHEAD, MN 56560

modem, you may wish to explore the A*C*E remote computer bulletin board system. Pirate DXers from all over the country leave messages and loggings on the system. The number is 913-677-1288. The systems operator, Kirk Baxter, says the A*C*E RBBS operates at either 300 or 1200 baud.

The *DDXLK Hobby Pirate List* is a quarterly publication listing addresses and frequencies for dozens of European pirate stations. Send 2 IRCs for a single copy, or 7 IRCs for the next four issues to Pirate-Info-News, Box 22 03 42, D-5600 Wuppertal 22, Federal Republic of Germany.

Most pirates operate during weekend evenings. Activity can begin as early as 2100 and last until 0600 GMT. Notice the times and frequencies mentioned in this article, and search them regularly. Pirates are on the air virtually every weekend, and you can hear them with a little patience and persistence.

When you finally do tune one in, be sure to report the details of your discovery to The Pirates Den. My address is: The Pirates Den, c/o Popular Communications, 76 N. Broadway, Hicksville, NY 11801. I'll see you next month!

PC

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BROADCAST TOPIX

BY MARK MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Back in April the National Association of Broadcasters (NAB) had a meeting with some 350 AM Radio Engineers to discuss ways to improve AM radio. AM radio is what most of us are interested in, and although it used to be "big daddy" in terms of listeners, it has become number two to FM, and the value of FM stations is greater than AM in most markets. The AM station can be much more expensive to operate as well, with more complicated multi-tower antenna systems. The thought at this seminar was AM engineers must do something to counteract the AM decline before it gets to the point that it will be impossible to make recovery economically feasible.

The NAB is going to spend \$23,000 to help educate the public about AM Stereo, although with that paltry sum they probably can't do very much. As I mentioned a few months ago, the NAB has set up a clearing house to pass ideas through so that all may share in the effort to improve AM.

Richard Biby, a consulting engineer, has developed a model for an antenna that attenuates the skywave. Although as DXers we do not like this idea, as lovers of the AM band it could mean the difference between survival and death. By attenuating the skywave, the local coverage becomes intensified, without causing interference to distant stations. The point I am leading to is AM BCB DX oriented! The NAB hopes to put a model of Biby's antenna on the air! They hope to use 1700 kHz in the Washington, D.C. area. So it might not hurt to check this frequency occasionally to see if they have gotten anything together. Let me know if you hear anything and I'll pass the word back to the NAB.



The other discussion at the seminar was about our other bugaboo, namely interference from electrical devices! Are you aware of the new type of fluorescent lighting called RF lights? These devices are noisier than the light dimmers that are atrocious noise generators. They use an RF signal to excite the fluorescent lamp. They are more efficient and cost less. Watch out if you are buying the \$10, two tube "shop light." I got one for my wood shop but luckily I can't be in two places at once. Also, it operates poorly if the ambient temperature is below about 60°. The lamps take a long time to warm up and they flicker like crazy until they do. If it's really cold, it may take 15 or 20 minutes for the flickering to stop.

TV Stereo

TV stereo is here, but like AM Stereo, it is moving slowly. The reason TV stereo is moving slowly is not the same as AM Stereo. TV is so expensive—not only for the con-

sumer but also for the station and the network. There may be some for less, but most of the stereo TV's I've seen advertised are well above the \$500 mark!

NBC is the only network offering stereo at this time, and it is limited to *The Tonight Show*, *Friday Night Videos*, and a few select sports events. Even if some shows are available in stereo, the networks may not want to spend the extra bucks to broadcast them. It's kind of like the situation when FM stereo was getting started; there were those who were willing to push stereo to the limit, but found there was no programming to push with.

Table 1 is a list of TV stereo stations and the approximate number of stereo broadcast hours per week.

There are also some stations broadcasting with separate audio channels. I'll try to update you on these in the next month or so.

More Stations

The FCC has authorized full time operation on 14 Canadian, Mexican, and Baha-

Table 1

Call	City	Channel	Hours	Call	City	Channel	Hours
WDBB	Tuscaloosa, AL	17	5+	WVJV	Boston, MA	66	168
KNBC	Los Angeles, CA	4	8	KPLR-TV	St. Louis, MO	11	7
KTLA	Los Angeles, CA	5	6+	KTNV-TV	Las Vegas, NV	13	8+
KRBK-TV	Sacramento, CA	31	15	WNBC-TV	New York, NY	4	8
KTZO	San Francisco, CA	20	8+	WBTW	Charlotte, NC	3	-
KOVR	Stockton, CA	13	40	WCET	Cincinnati, OH	48	4+
KCNC-TV	Denver, CO	4	8	WVIZ-TV	Cleveland, OH	25	8
WFSB	Hartford, CT	3	-	KATU	Portland, OR	2	24+
WTIC-TV	Hartford, CT	61	7	WAXA	Anderson, SC	40	1+
WTXX	Waterbury, CT	20	-	WATE-TV	Knoxville, TN	6	9+
WDCA-TV	Washington, DC	20	3+	KERA-TV	Dallas, TX	13	8+
WRC-TV	Washington, DC	4	8	KSAT-TV	San Antonio, TX	12	-
WTLV	Jacksonville, FL	12	8+	KXXV	Waco, TX	25	-
WPBT	Miami, FL	2	3+	KSL-TV	Salt Lake City, UT	5	1+
WTTW	Chicago, IL	11	5+	KUED	Salt Lake City, UT	7	3
KDIN-TV	Des Moines, IA	11	3	KIRO-TV	Seattle, WA	7	-
				KOMO-TV	Seattle, WA	4	-

mian clear channels. This will allow 519 stations to begin operating at night up to 500 watts of power. The operations will not all be 500 watts, but up to 500 watts and some power levels may not make the authorization worthwhile in some situations. The stations should be notified by the time you read this. This agreement, with the foreign countries involved, also means about 40 new stations on the frequencies. The Canadian, Mexican, and Bahamian frequencies are (540 is excluded): 690, 730, 740, 800, 860, 900, 940, 990, 1000, 1010, 1050, 1060, 1070, 1090, 1130, 1140, 1190, 1220, 1540, 1550, 1570, and 1580.

According to reports in *Broadcasting* magazine, many daytimers who have authorization for pre-sunrise and post-sunset operation are not taking advantage of it. They feel the power is so small that it is not worth the trouble. However, there are others who have found 35 watts or 2 watts to be sufficient power to cover the most important part of their licensed area.

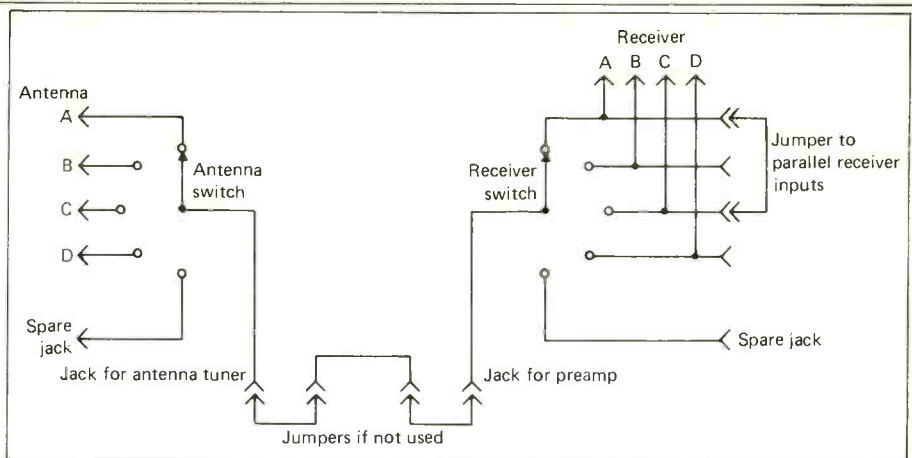
Radio Junkies

Are we "Radio Junkies"? If we are, we constitute some 22 percent of the total radio audience. According to a report issued by Reymer and Gersin of Detroit, the BCB DXer would best fit into the category of Radio Junkie. We listen more than the average listener and are not necessarily loyal to one station. I don't know about you, but that title doesn't bother me! I've been called a lot worse.

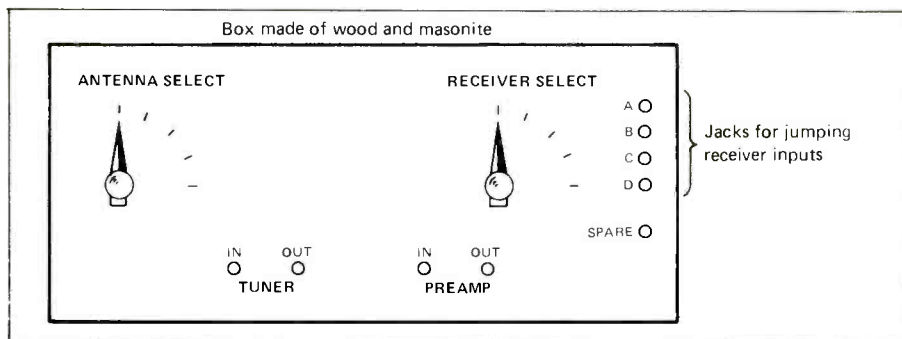
Bob Walker tells me that WHAS lost their tower during a storm in April. They ran for a couple of days with 700 watts into a long-wire antenna and then on a 300-foot temporary tower with 50 kW. Hopefully they will be back to full power shortly. If you tried to listen the past few months (as I have), you can appreciate what a good antenna will do when compared to a regular antenna.

I received several letters this month asking for recommendations of specific equipment such as receivers, antennas, etc. I would like to help out, but I cannot recommend equipment that I know nothing about and have not used. Therefore, it is unfair for me to say anything. It is unfair to the manufacturer of a fine piece of equipment that I have not seen for me to recommend some other gear. It is bias on my part to only recommend what I buy, except via an equipment report in the magazine. It is not fair to you, the reader, since you may not get both sides of the story (since I may not be aware of special features on a product). However, I can give generic reports on what to look for when purchasing items of interest to the BCB DXer, which is what I try to do in the column. That is why I spoke about receivers the last few months and why I gave a description of how loop antennas operate and what the different types are. If you have specific questions about the generics, don't hesitate to ask, but don't expect me to say which receiver or antenna is the better one to buy.

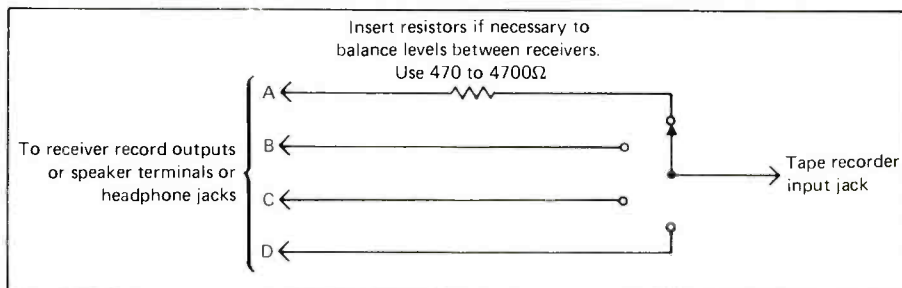
You know, even the equipment lineup in my shack is not an indication of what to buy.



Jacks may be RCA phono jacks, phone jacks, SO-239 (UHF), BNC, etc. Connections between switches and jacks should be coax, RG58, RG174 or other 50 ohm type. Jumpers should be coax also, although 3 or 6 inch audio jumpers might be used with RCA type jacks. The wiring should be such that the antenna tuner comes first between the antenna and the receiver preamp. The antenna switch is B&W type 5 position coax switch which grounds the unused antennas. The receiver switch cannot ground unused receivers if more than one receiver is to be used simultaneously. For a first-time builder one might try using audio switches which might be found with the RCA jacks mounted right on the switch.



NOTE: Tuner and preamp might be mounted so their front panels are part of the front panel shown here. If this is done the tuner and preamp jacks would not be needed.



For some of my equipment, I have made special swaps or gotten a good buy, just as you might. My requirements are not going to be the same as most people since I use some of my equipment in earning a living doing freelance work for radio stations.

How you set up your shack is important, regardless of the amount of equipment you have. Everyone starts with one receiver and one antenna. Over the years the collection grows or the items are "traded up" for a better item. My collection represents about 30 years of collecting and swapping. I just re-

cently reacquired an old SX-62 receiver to go with an old SX-28, a Skyrider 32, an S-36A, an NC-125, and I'm saving my pennies for an SX-42. In the modern department, I have my R-70, a portable Panasonic RF-1170, and my Sony SRF-A100. Not all of the older gear is in top shape yet; some don't even operate at this time, but as I have time they will be repaired and aligned.

Some readers would not be interested in older gear at all if they have money to buy newer. Others would have to pay to have the gear repaired, so that would not interest

Call Letter Changes

Location AM Stations	Old	New	Location FM Stations	Old	New
Fields Landing, CA	new	KKDV	Newnan, GA	WRNG	WBUS
Anaheim, CA	KEZY	KPZE	Swainsboro, GA	WJAT-FM	WGKS
Bakersfield, CA	KLYD	KUNN	Jacksonville, IL	new	KXLK
West Palm Bch, FL	WCGY	WEAT	Jacksonville, IL	WEAI	WYMG
Thonotosassa, FL	new	WFLZ	Columbia City, IN	new	WJHS
Gordon, GA	WQXM	WMKS	Mason City, IA	new	KNIQ
Gooding, ID	new	KIDI	Columbus, KS	KCCU	KSSC
Sandwich, IL	new	WBYG	Campbellsville, KY	new	WKJV
Ft. Wayne, IN	WAFX	WEZR	Burnside, KY	new	WJDJ
Lake Charles, LA	KLOU	KXZZ	Waterville, ME	WTVL-FM	WDBX
Charlevoix, MI	WVOY	WKHQ	Camden, ME	new	WABH
Houghton Lake, MI	WHGR	WJGS	Charlevoix, MI	WKHQ	WKHQ-FM
N. Las Vegas, NV	new	KBKK	Detroit, MI	WDRQ	WLTJ
Mount Holly, NJ	new	WMHN	Houghton Lake, MI	WJGS	WJGS-FM
Springville, NY	WSPF	WSPQ	E. Grand Forks, MN	KRRK-FM	KZLT-FM
Raleigh, NC	new	WLLE	Marshall, MN	new	KBJJ
Washington, NC	WITN	WRRF	Neosho, MO	new	KNEO
Eugene, OR	KASH	KEED	Springfield, MO	new	KWFC
Eugene, OR	KEED	KRXX	Centralia, MO	KZOU	KMFC
Cave Junction, OR	KIVR	KBGG	Great Falls, MT	KOOZ	KQDI-FM
Homer City, PA	WRID	WCCS	Butte, MT	new	KMTT
Allentown, PA	WSAN	WXKW	Aurora, NE	KIAE	KKBB
Santee, SC	WSOL	WMNY	Albuquerque, NM	KWXL	KRKE-FM
Greenville, SC	WQOK	WMRB	Niagara, NY	WRXT	WKSE
Hollywood, SC	new	WWRJ	Rotterdam, NY	new	WMRL
Sioux Falls, SD	KRSS	KJIA	Bridgeton, NC	WSFL	WSFL-FM
Watertown, SD	KLSC	KSDR	Toledo, OH	new	WFTD
Brentwood, TN	WTBN	WWCR	Cave Junction, OR	KBGG	KBGG-FM
Oak Ridge, TN	WORI	WKNF	Allentown, PA	WXKW	WAEB-FM
Memphis, TN	WKDJ	WRVR	Greenville, PA	WGRP-FM	WEXC
Bolivar, TN	WJDS	WQKZ	Blairsville, PA	WCQQ	WNQQ
Edna, TX	KQTI	KVOJ	Mifflintown, PA	new	WJBS
El Paso, TX	new	KEPB	Batesburg, SC	WKWQ-FM	WBLR-FM
Terrell Wells, TX	KLLS	KRNN	Orangeburg, SC	WIGL-FM	WTCB-FM
Cedar Bluff, VA	new	WYRV	Sisseton, SD	new	KREH
Opportunity, WA	KGGR	KKPL	Oak Ridge, TN	WETQ	WKNF-FM
Spokane, WA	KLHT	KZZU	Memphis, TN	WRVR	WRVR-FM
Pewaukee, WI	WGNW	WKSH	Bolivar, TN	WQKZ	WQKZ-FM
			Stephenville, TX	KWWM	KSTV-FM
			Orem, UT	KUUT	KMGR
			St. Johnsbury, VT	new	WNKV
			Winchester, VA	new	WTRM
			Galax, VA	WBOB-FM	WBRF
			Opportunity, WA	KKPL	KPPL-FM
			Quincy, WA	KLLH	KWWW-FM
			Seattle, WA	KKMI-FM	KQKT
			Spokane, WA	KZZU	KZZU-FM
			Eagle River, WI	WERL-FM	WRJO
			Milwaukee, WI	WBTT	WLTQ

FM Stations

Langdale, AL	new	WEBT
Flagstaff, AZ	new	KENR
Kingman, AZ	new	KAWA
Ashdown, AR	new	KARQ
Anaheim, CA	KEZY-FM	KEZY
Bakersfield, CA	new	KPRX
Jupiter, FL	WKTQ	WIXI-FM
Jessup, GA	WSOJ	WAJS
Nashville, GA	new	WTKZ

them either. So your shack becomes very individualized. The thought comes to mind as to how all this gear can be used in one area.

Shack Setups

So if you have more than one antenna or receiver, how do you make them work together? My shack is probably pretty complicated since I also have transmitters and transceivers mixed in with the above-mentioned gear. I will simply, but I want to give you some ideas to work over in your head also. The addition of more than one antenna brings more complications into the shack setup. In my basement shack, I currently

have switches and a "patch panel" to route the antennas to the equipment. My antenna farm consists of a 4' loop, a 56' vertical, a 136' end fed Hertz, a shortwave vertical, a 40 meter loop, and several other odds and ends. The most important thing to remember about antennas is being able to disconnect them from the equipment when they are not being used. This is for lightning protection. Remember, it only takes one "hit" to ruin a beautiful setup and even set a home on fire. I know a lot of readers have long antennas, so I want to emphasize the importance of a good ground, well used. When I was a young fellow, I had several types of

long antennas. The longest one was over 300 feet and I had it about 30 feet over the yacht basin (no yachts) where I lived in Florida. In the summer I would ground this wire after wrapping a few turns around a 4 foot fluorescent lamp. The lamp would flicker frequently, even light up to full brilliance at times. How much voltage does it take to ignite a fluorescent tube? I don't know, but can you imagine what this would do to a solid state receiver of today? A word to the wise.

With indoor loops the problem should not be forgotten if an outside wire comes near the loop. The induction of the lightning

Station Updates

Call	Location	Freq	Pwr	Ant
AM				
KAFY	Bakersfield, CA	550	1/1	DA-2
WOI	Ames, IA	640	5/1	DA-N
KJEL	Lebanon, MO	750	.25/0	O
KJJR	Whitefish, MT	880	10/1	DA-N
WMUF	Paris, TN	1000	5/2.5	DA-2
KTEK	Alvin, TX	1110	2.5	O
WQMR	Skowhegan, ME	1160	5/1	DA-N
WCCS	Homer City, PA	1160	1/1	DA-2
WJJN	Newburgh, IN	1180	1/0	O
WKOX	Framingham, MA	1200	50/50	DA-N
WAGE	Leesburg, VA	1200	5/1	DA-N
KOJO	Laramie, WY	1210	10/0	O
WHYO	Salinas, PR	1210	5/5	DA-2
WJTN	Jamestown, NY	1240	1/1	O
WMTL	Leitchfield, KY	1580	.5/0	DA-D
WLIM	Patchogue, NY	1580	5/1	£
FM				
KADO	Laredo, TX	89.9	N/C	575'
KLSX-FM	Rochester, MN	90.7	3.75	464'
KCFS	Sioux Falls, SD	90.9	2.35	190'
WMMQ	Charlotte, MI	92.7	1.48	142'
KZLA-FM	Los Angeles, CA	93.9	49	720'
WKXS	Marion, SC	94.3	1.21	500'
WZOU	Boston, MA	94.5	11.6	N/C
WSIF	Wilkesboro, NC	94.7	N/C	- 151'
WSNY	Columbus, OH	94.7	22.3	N/C
KTHK	Bozeman, MT	95.1	N/C	220'
WPLJ	New York, NY	95.5	6.9	1335'
KOKE-FM	Austin, TX	95.5	100	1000'
KWWW-FM	Quincy, WA	96.7	.26	1079'
WRNG	Newnan, GA	96.7	1	543'
WKXQ	Rushville, IL	96.7	N/C	328'
KDOG	N. Mankato, MN	96.7	.7	639'
WRSA	Decatur, AL	96.9	N/C	1027'
KCCY	Pueblo, CO	97.9	N/C	1235'
WEVE-FM	Eveleth, MN	97.9	71	528'
WREI	Quebradillas, PR	98.3	N/C	1099'
KQSS	Miami, AZ	98.3	N/C	- 302'
KRSN-FM	Los Alamos, NM	98.5	94	1781'
WBAZ	Southold, NY	101.7	2.88	N/C
KDSQ	Denison, TX	101.7	N/C	275'
KEEY-FM	St. Paul, MN	102.1	N/C	1066'
WEQX	Manchester, VT	102.7	1.27	N/C
WSHE	Ft. Lauderdale, FL	103.5	N/C	1006'
KRRS	Hamlin, TX	103.7	N/C	995'
KBUS	Paris, TX	103.9	1.1	525'
KDFM	Silverton, CO	103.9	N/C	N/C
WJMK	Chicago, IL	104.3	4.1	1575'
WHPA	Hollidaysburg, PA	104.9	.14	N/C
WKAU-FM	Kaukauna, WI	104.9	1.35	N/C
KNDD	Lake Havasu City, AZ	105.1	21	1400'
KDBL	Rifle, CO	105.3	47.9	2446'
KITE-FM	Portland, TX	105.5	1.9	353'
KRBD	Ketchikan, AK	105.9	15	- 106'
KFRZ-FM	Brigham City, UT	106.9	67.5	2369'
WZFM	Briarcliff Manor, NY	107.1	3	N/C
KMLE	Chandler, AZ	107.9	N/C	1001

KEY: D = Daytime N = Nighttime DA = Directional Antenna DA1 = Same Pattern Day & Night DA2 = Different Pattern/Power Day/Night O = Omni Antenna Day and/or Night £ = Special Operation or Critical Hours

grounding and run in the \$20 range. CB type switches may also be used for receiving setups at a considerable savings in dollars.

A panel may be built and all the switching can be done by changing the plugs from one jack to another. RCA type phono plugs may be used for a receiving setup, or the more expensive UHF or BNC connectors may be employed.

An antenna tuner may be brought out to such a panel so that it may be used with several receivers and/or antennas. Try to use all the same type of coax, all 50 ohm or all 75 ohm. Do not use audio wire. The best setup will use all 50 ohm since most antennas and receivers are of this impedance. That means the use of RG-8, RG-58, RG-174, or other 50 ohm cable. Do not just use hookup wire to wire up a panel. The results will be disappointing. Oh, it will work, but let's get in the habit of doing the job right! One other thing not to do is tie the antenna terminals of two or more receivers together. They must be separated and switched individually. It is okay to be able to switch the antennas to more than one receiver at a time, but be able to separate them as well.

How about the output to facilitate recording all this great DX? This can be treated in the same way. The outputs of the receivers may be switched to a single recorder or paralleled to several recorders simultaneously. If you can afford a small mixer panel, this is a great way to accommodate several receivers at one time. It would also make dubbing from one recorder to another easier. In a future article, I'll show you how to tap into a receiver to get the high quality audio you would like to record rather than tapping the speaker or using the headphone jack. These connections work well but depend on the setting of the volume and tone controls of the receiver. The R-70 and other receivers have a recorder output jack that is separate from the headphone output. Please don't use a mike in front of the speaker! If you would like to use a mixer, look around flea markets, at hamfests, and the electronics section of the want ads in newspapers. Check the used equipment sections of audio and music stores.

I'll describe a mixer setup next month. An excellent mixer to use would be the Shure M-67 or its equivalent. Numark has a variety of mixers out for the audiophile, and Radio Shack also has some.

Loops

Over the summer I have put some additional loop antennas together. I have two using ferrite rods and a shielded loop using a metal (box) frame and regular wire about 2 feet in size. The ferrite loops use a preamp. One is designed to tune into the LF range below the BC band as well as the BC band. The second is for the BC band. I am offering them as a group as it did not work well last time to have separate orders. All of the plans will appear in future issues of POP'COMM. The preamp will be in the November column. But for the early birds, the three loops and the preamp may be ordered from me for

coming down an outside wire into a nearby loop could damage the antenna circuit in a receiver if it is still connected.

Make provisions to ground the antennas to a good ground, not just an AC ground.

The switches mentioned in the drawing may be of the self-grounding type to simplify the switching. Antenna switches of many different prices may be used; the most expensive are the B&W type, which are self-

WFL

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\$7.50 postage-paid. In the spring, I offered two box loops for \$5.50 and they are still available. The amount of your check will tell me what you want. I have a variety of computer programs for the C-64; send an SASE for details on those. The address is P. O. Box 5624, Baltimore, MD 21210.

AM Stereo

Now with Harris offering the C-Quam system, we are starting to see conversion from Harris to C-Quam. I am also seeing, for the first time, conversions from Kahn to C-Quam. There have been several and the main reason appears to be the lack of Kahn receiving equipment. To this date there is not a single auto radio available that will receive the Kahn system. There are some adapters available, but that's another \$35 or so. I'll have a report next month on the Kahn adapter. For those who have a good mono radio, there is a problem in converting it to stereo and I'll have more to say about that next month, also. It has been four or five months since I have seen a new Kahn station added to the airwaves, whereas in the same period, C-Quam has added dozens.

That's about it for this month. Send me shack pictures and DX reports for the column. The reason you don't see more about European and other foreign DX is you're not telling me about it. Get your FM and TV antennas repaired as fall is approaching—that means DX! See you next month. **PC**

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INSIDE THE WORLD OF TVRO EARTH STATIONS

The Site Check And Terrestrial Interference

As satellite television continues to experience explosive growth, so do the problems associated with terrestrial interference (unaffectionately known as TI) stemming from microwave sources occupying the same or adjacent frequency bands. The site check is a critical component of any successful installation. Those dealers who have installed a TVRO without a site check occasionally take a big lump on the profit belt when unexpected problems with interference make a TV picture unwatchable. The remedies are often quite expensive or, in rare cases, not possible.

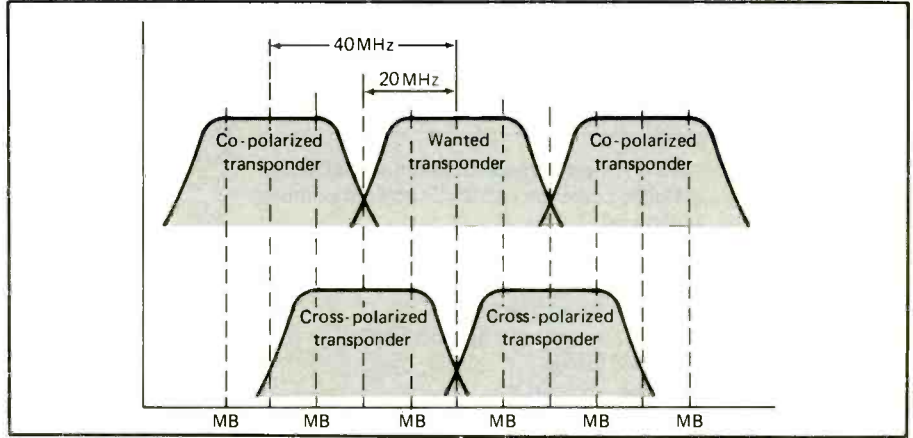
The purpose of the site check is to choose a location for the dish where it has a clear view of every satellite in the geosynchronous arc, to check for and to take the necessary steps to eliminate any TI, and to plan the entire installation, including cable runs and equipment location.

Siting the dish where it has a clear view of the arc is a rather simple procedure. A compass is used to find true north knowing that magnetic deviation must be taken into account. Then a declinometer and the compass are used to site satellites at both ends and at the middle of the belt. A listing of the appropriate azimuth and elevation angles to these satellites is easily calculated or obtained. This will ensure that all satellites can be viewed without obstructions.

Note that water is a very strong absorber of microwaves. If an installation is completed in the winter behind deciduous trees without foliage, when spring and summer come the signal and thus the TV picture may suddenly disappear.

There are a number of ways to check for TI. Simply powering up a feedhorn, LNA, and receiver and scanning the LNA/feedhorn assembly across the field of view will show any strong interference on a signal strength meter. This method will detect strong and intermediate levels of interference. Doing the same with a spectrum analyzer will be more effective.

This simplest method with the most clear results is to hook up a dish and all the associated electronics and see if the picture is good across all satellites and channels. TI, like all microwave radiation, is quite directional and effectively bounces off buildings and other objects. A signal may be perfect in one location and poor in another only feet away depending upon the direction of the TI source and the natural or man-made screening environment. Note that a small, portable 5- or 6-foot dish with an inexpensive



Satellite transponder frequency layout showing permissible microwave telephone carriers ("Ma Bell" = MB).

sive receiver and TV located feet away is more than adequate for this test.

Commercial jobs may require use of companies such as Compuserve or Microwave Filter Company to do something called a fre-

quency coordination. For a small cost, such organizations will chart all nearby microwave communicators and estimate the potential problems. This procedure is also part of obtaining an FCC license. Although this is

Channel Frequency Table Showing Possible "Ma Bell" Interference Frequencies *

Transponder Number	Center Frequency (MHz)	Possible MB (MHz)	Transponder Number	Center Frequency (MHz)	Possible MB (MHz)
		3710	13	3960	3950
1	3720	3730	14	3980	3970
2	3740	3750	15	4000	3990
3	3760	3770	16	4020	4010
4	3780	3790	17	4040	4030
5	3800	3810	18	4060	4050
6	3820	3830	19	4080	4070
7	3840	3850	20	4100	4090
8	3860	3870	21	4120	4110
9	3880	3890	22	4140	4130
10	3900	3910	23	4160	4150
11	3920	3930	24	4180	4170
12	3940				4190

(*for Satcom/Comstar 24-transponder satellites)

Frequency (GHz)	Type Of Possible TI	Frequency (GHz)	Type Of Possible TI
0.960-1.350	Land-based air navigation systems	2.900-3.700	Maritime radio location
1.350-1.400	Armed forces	3.300-3.500	Amateur radio (Seldom used but very close to TVRO band)
1.400-1.427	Radio astronomy		
1.427-1.435	Land-mobile: police, fire, forestry, railway		
1.429-1.435	Armed forces	3.700-4.200	Common carrier (telephone)
1.435-1.535	Telemetry	C-band	Earth Stations
1.535-1.543	SAT—maritime mobile		
1.605-1.800	Radio location	4.200-4.400	Altimeters
1.660-1.670	Radio astronomy	4.400-4.990	Armed forces (Seldom used but very close to TVRO band)
1.660-1.700	Meteorological—Radiosound	4.990-5.000	Meteorological—radio astronomy
1.700-1.710	Space—research	5.250-5.650	Radio location (coastal radar)
1.710-1.850	Armed forces	5.460-5.470	Radio navigation—General
		5.470-5.650	Maritime radio navigation
1.990-2.110	TV Pick-up (Prevalent common carriers)	5.600-5.650	Meteorological—Ground based radar
2.110-2.180	Public common carrier (Prevalent common carriers)	5.650-5.925	Amateur
		5.800	Industrial and scientific equipment
2.130-2.150	Fixed point-to-point (non-public)		
2.150-2.180	Fixed—omnidirectional	5.925-6.425	Common carrier and fixed SAT (Prevalent common carriers)
2.180-2.200	Fixed, point-to-point (non-public)		
2.200-2.290	Armed forces	6.425-6.525	Common carrier (Prevalent common carriers)
2.290-2.300	Space—research		
2.450-2.500	Radio location	6.525-6.575	Operational land and mobile
2.500-2.535	Fixed, SAT	6.575-6.875	Non-public point-to-point carrier
2.500-2.690	Fixed point-to-point (non-public) Instructional TV	6.625-6.875	Fixed SAT
2.655-2.690	Fixed, SAT	6.875-7.125	TV pick-up
2.690-2.700	Radio astronomy	7.125-8.400	Armed forces
2.700-2.900	Armed forces	8.800	Airborne Doppler Radar
2.900-3.100	Maritime radio navigation		

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not mandated for receive-only stations, it is good protection against plans of other microwave communicators who plan future conflicting installations. Any licensed installation must be informed of the activities of other businesses who generate microwaves.

Microwave interference comes from both out-of-band and in-band sources. The prime in-band conflict is with the Bell Telephone relay system also using the 3.7 to 4.2 GigaHertz range. The FCC has intelligently allocated different center frequencies for satellite broadcasters and telephone systems. The center RF frequency chosen for satellite is 70 MHz and for the latter group is 60 and 80 MHz. These line-of-sight stations transmit up to six frequencies of one polarity at powers on the order of watts not billionths or billionths of watts typical of those received by TVROs!

Signs of TI range from sparkle pictures to complete whiteout or blackout. Since earth-based relays use fewer channels that does satellite TV patterns of some good, and some bad channels are a sure sign of TI. Generally, the higher a dish is mounted, the greater the likelihood of this dish "seeing" interference.

A TVRO using a conventional LNA and downconverter selects individual channels from the satellite broadcast band and centers their 36 MHz bandwidth on 70 MHz. There are two ways of combating moderate levels of interference to be used only after either re-siting an antenna or using some screening method has been tried. A 60 or 80 MHz

Selected Frequency Allocations

Selected from Western Hemisphere allocations most likely to penetrate poorly shielded TVRO receivers. Bands are approximate, in MHz

U.S. Government Communications

- Armed Forces and Other Departments
25.33-157.20
173.40-174.00
225.00-420.00 (3)

Mobile Radio

- Public Safety Land Mobile Radio (Police, Fire, Highway, Forestry, Emergency)
30.56- 47.69
150.98-173.20
451.00-512.00 (4)
- Industrial Land Mobile Radio (Power, Petroleum, Pipeline, Forestry, Factory, Builders, Ranchers, Motion Picture, Press Relay)
25.01- 49.60
151.49-173.40
216.00-220.00
451.00-512.00
- Land Transportation Mobile Radio (Taxi, Truck, Bus, Railroad)
30.56- 44.61
150.80-161.57
451.00-512.00
- Broadcast Remote Pick-Up Mobile Radio
26.10- 26.48
161.62-170.15
450.00-456.00 (4)
- Domestic (Public & Commercial) Mobile Radio
35.19- 43.69
152.00-158.71
454.00-512.00 (4)
- Maritime Mobile Radio
12.42- 22.62 Ship & Coastal Stations
156.80 Emergency Telephone
243.00 Survival Craft & Equipment (3)

- Aeronautical Mobile Radio (Ground-to-Ground or Air-to-Air)
10.00- 23.35 General (1)
123.59-136.00 General
26.62 Civil Air Patrol
143.90 Civil Air Patrol
148.15 Civil Air Patrol

Aeronautical Functions

- Navigation
74.60- 75.40 Marker Beacons (2)
108.00-117.97 VOR Locator
328.60-335.40 Glide Path (4)
- Distress & Emergency
123.10 Search & Rescue
156.80 Distress Telephone
243.00 Survival Craft & Equipment
- Miscellaneous
118.00-121.40 Aerodrome Control
121.60-121.93 Aero Utility (General)
121.97-123.07 Private Aircraft Communications
123.12-123.50 Flight Testing
123.30-123.50 Aviation Instruction

Astronomy and Space Operations

- Radio Astronomy
10.68- 31.50
89.00- 92.00
130.00-140.00
230.00-240.00 (3)
- Space Operations
137.00-138.00
401.00-402.00 (4)
- Research
136.00-138.00
400.00-401.00 (4)

Notes:

- (1) Potential interference to basebands.
- (2) Potential interference to final (70 MHz) IF.
- (3) Potential interference to 230 MHz IF.
- (4) Potential interference to applicable block downconverters.

notch filter can be used with small loss of signal quality. Or an adjustable bandpass filter can reduce the bandwidth to less than 20 MHz to avoid the "Ma Bell" carriers. Tests have shown that there is no noticeable difference in picture quality when reducing bandwidth from 36 to 28 MHz. Larger bandwidth reductions can have noticeable effects on picture clarity and color definition.

The most common out-of-band interfering carriers are common carrier transmissions in the 2 and 6 GHz bands. Symptoms are a set of horizontal lines across a TV picture. An inexpensive bandpass filter placed between the LNA and downconverter will usually cure such ills. A stronger signal may even overload the LNA and cause intermodulation. The cure is a most costly bandpass filter placed between the LNA and feedhorn.

Other types of interference are caused by "ingress" signals, which enter the system via

routes other than by the antenna. Poorly shielded electronics may be susceptible to such annoying picture degradation.

Unfortunately, the incidence of in-band interference will continue to increase in the foreseeable future as existing land-based microwave relay systems are expanded. The satellite TV dealer and knowledgeable customer must be aware of the symptoms because a once healthy installation may, in the future, be the unfortunate target of TI. A newly published book by Frank Baylin and Brent Gale outlines the technology underlying satellite TV operation and details steps to be taken in cases where problems arise. This book, *The Complete Home Satellite TV Installation Manual*, as well as *Satellites Today—The Complete Guide to Satellite TV*, are available for \$29.95 from Baylin/Gale Productions and for \$9.95 from ConSol Network, respectively, 1905 Mariposa, Suite C, Boulder, CO 80302. **PC**

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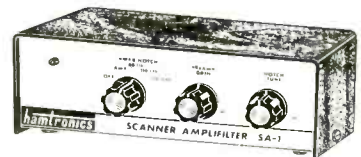
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LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Welcome back to Radio Nacional de Venezuela, now putting in strong signals up to 0300 sign off on 5.020. English is promised sometime down the calendar.

South Florida DX'ers have discovered a new clandestine station announcing as Radio Maquisaria, La Voz de la Libertad and also as La Voz de las Fuerzas Armadas Revolucionarias de Colombia (Voice of the Colombian Revolutionary Armed Forces). It has been heard in Florida by Steve Reinsteiner, Bob Wilkner, David Potter, Terry Krueger, W. J. Parks, and others on 10.543 slightly variable. Broadcasts lasting about 50 minutes run at 1200 and 2100. Sadly, we have not been able to pick it up at Listening Post Headquarters.

Here's a survey of currently active Argentine stations provided by Buenos Aires DX'er Gabriel Ivan Barrera in *DX Ontario*, the bulletin of the Ontario DX Association.

- Radio Belgrano, Buenos Aires, 6.090 from 2200 to 0300 and 11.780 from 1600 to 2200.

- Radio Nacional, Mendoza on 6.180, 24 hours per day.

- Radio Malargue, Malargue, 6.160 broadcasts "weekly" and, we might add, "weakly." Check for this 5 kilowatt transmitter around 1000.

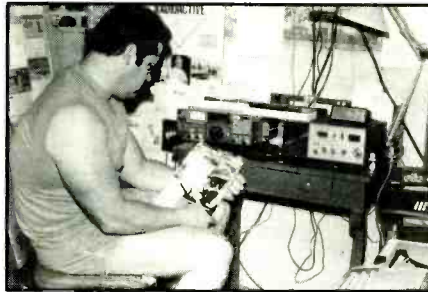
- Radio Nacional Arcangel San Gabriel, (Argentine Antarctica, Editor) on 15.474 from 2200 to 0030 with English IDs.

- Radio Nacional, Buenos Aires, 6.060 and 6.120 Tuesdays through Fridays 0100 to 1100, Saturdays and Sundays 0100 to 1500. On 11.710 at 0500 to 1200 daily. The Radiodifusora Argentina al Exterior service in English runs daily at 1200-1300 and 1800-1900 on 15.345.

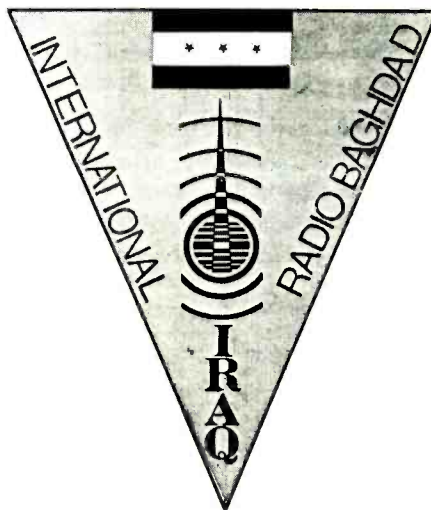
- Radio Rivadavia, Buenos Aires, a single sideband relay of medium wave on 4.588 "at night" and 9.115 "evenings." Daily at 2100-0200 variable sign off and Saturdays at 2100-0400, Sundays 1700-0000.

Another item in *DX Ontario* notes that KYOI in Saipan is for sale. It can be yours for a cool two million dollars. The story notes that, while the station is making money, it is hampered because it is unable to advertise in Japan or even to distribute a program schedule there due to Japanese trade restrictions. In the meantime, on Guam, Adventist World Radio (AWR) is preparing to construct another shortwave outlet which will serve South, Southeast, and Central Asia with a 100 kilowatt transmitter. No target date yet but target dates are usually meaningless anyway.

Activity continues in the local clubs department. The Austin Area Radio Listeners are holding regular meetings and you can get more info on that group by sending an SASE to Richard Quintanilla, P.O. Box 5053, Austin, TX 78763. Central Florida



Thomas Ross of Lyons, Illinois gets in the mood with a look at POP'COMM before turning on his receiver.



Chicago's Jerry Brumm is proud of this Radio Baghdad pennant.

DX'ers who live within 100 miles of Tampa are invited to get in on the beginnings of a local club. SASE to David Sharp, 17602 Meadowbridge, Lutz, FL 33549. Listeners in the Denver area should contact Wayne Heinen, 4131 South Andes Way, Aurora, CO with an SASE. Andrew Crowell reminds us of the now-forming Tennessee DX Club and details on that one can be had from P.O. Box 479, Jamestown, TN 38556. Thomas V. Ross asks that we mention the Chicago Area DX Club again. If you live within 150 miles of Chicago you're invited to join this active group, which holds several meetings each year and produces a nice monthly bulletin. For a sample copy send \$1 to CADX, 7811 West Oklahoma Ave., #5, Milwaukee, WI 53219.

In the Mailbag

It's time for Listener's Letterbox as they say on some stations.

Ronald T. Seymour of St. Louis is the proud owner of the new Sony 2010 receiver and has been experimenting to determine the time period when most English programs are on the air. He feels it's from 2200

to 0100. Late afternoons and evenings sometime would certainly be right Ron. That's prime time for listeners in North America and therefore the time when most North American services are on the air.

Ted Moran of Chicago wants to know our deadline for reports. Officially it's the 15th, Ted, but sometimes we get a day or two's headstart, depending on how heavy the schedule is during a particular month. Ted is using a Kenwood R-1000 and an Allied SX-190 with several antennas.

His wife thinks he's crazy but Gary Watts in Baltimore decided he'd send in his shack photo anyway, and it's one we're featuring this month, so there! Equipment includes the Kenwood R-1000 and R-2000 receivers, Eico DX 718, Realistic models DX-160 and DX-300 plus a number of scanners, CB rigs, and associated gear.

SWBC is the "special love" of Jon VanAllen in West Jordan, Utah. Although he listens to much of the spectrum and does some hamming as well, SWBC was what got him started. He uses a Uniden CR-2021 and a Sony ICF-6500W.

There's a place in East Hartford, Connecticut that's a hotbed of electrical interference and it seems to be right in the building where Ted Fried lives. It is so strong he is unable to listen to shortwave. Ted believes it's coming from a faulty utility company installation. Most utility companies are pretty good about trying to correct this sort of problem, particularly if it is troubling TV reception. So, give them a call and explain your problem and what you've done to try and track it down. Chances are they'll make an effort to correct the problem. Let us know how you make out.

Bruce Rossi has moved from Nevada to California, and his opinion of California air as compared to Nevada air is graphically illustrated in one of this month's photos. Bruce notes he's hearing Radio Beijing very well in its Southeast Asia service at 1400 on 9.730, an unannounced frequency.

Pat McDonough of Pittsburgh wonders about reporting to stations in a foreign language. Except for Latin America and, to a lesser degree, French Africa, most stations can handle English language reports. Multilingual report forms are available from Gilfer Associates, P.O. Box 239, Park Ridge, NJ 07656. SPEEDX has a reporting guide which covers reporting in a foreign language. Available from SPEEDX, 7738 East Hampton Street, Tucson, AZ 85715. Price is around \$2.

Michele Shute, a stalwart Listening Post reporter from Pensacola, Florida says a recent report on Morocco credited to her wasn't hers. Sorry Michele. Those gremlins slip in now and then when you handle hundreds of reports each month. It helps im-

measurably to add your last name and state abbreviation after each item.

Evelyn Hampton of Chicago checks in for the first time and we hope she'll be a regular now. We've had the pleasure of meeting Evelyn a couple of times at Chicago Area DX Club meetings. She's been listening for a decade and currently uses a Sony 2002 and Panasonic RF-2800.

Vince James Porto, also of Chicago, would like us to print the full addresses of logging reporters. Some reporters don't want their full addresses used, Vince. We print them only when an individual wants to be contacted.

Sheryl Paszkiewicz in Manitowoc, Wisconsin got an overseas call from Sudwestfunk after sending them a reception report. The station taped a few of Sheryl's comments about herself and her listening, job, and such, translated it into German and used it on the air. A star is born!

"What does one have to do to get a QSL card from the Voice of Nicaragua?" complains Will Dermeyer, Jr. of Jackson, Michigan. They responded quite well a year or so back but now it seems that no one is getting replies, Will. Heard somewhere it was a lack of funds. It's a safe wager that, eventually, replies will start coming through again.

Kal Hunsaker in Tempe, Arizona needs a source for mint stamps to send with reception reports. Send an SASE to the DX Stamp Service, 7661 Roder Parkway, Ontario, NY 14519 for their latest price list. As to a source for current postal rates from foreign countries, we don't know of any for that information. Usually three IRCs are enough to provide an airmail reply.

Why is Radio Moscow so mum about their 4.765 outlet? Thomas V. Ross in Lyons, Illinois says he's reported this transmission to them several times and they reply that this is not one of their frequencies. Well, technically it isn't. The frequency 4.765 has been used by various Russian home service broadcasts, currently Mayak. Radio Moscow can thus claim no knowledge of the frequency. Anybody hear actual Radio Moscow programs on this frequency?

Let's hear from you next month. Your comments, questions, shack photos, schedules, QSL cards, clippings and of course, your reports are always welcome. Please type or print reports, add your name and state abbreviation after each logging, and allow some space between each.

Listening Reports

Here's what's on. All times are GMT.

Albania Radio Tirana in French with "Ici Tirana" ID at 0500 on 9.500. (Shute, FL)

Algeria Radio Algiers, at 2000 on 17.745, news in English, QRM from 17.740. (McDonough, PA)

Angola Emissora Provincial de Huila, Lubanga on 3.970 at 0642 with man announcer in Portuguese. Fair with ham QRM. (Crowell, TN)

Argentina Radio Nacional 9.690 with English from 0400. (Lyon, ME) 0407 with Argentine news. (McDonough, PA) News review 0415. (Salmi, MA) At 0130 in English. (Hunt, NC)

Ascension Island BBC Relay on 6.005 a 1026. Report on heroin derivatives, big band music. (Hampton, IL)



Another Chicagoan, Evelyn Hampton, has had the shortwave bug for a decade now.

Australia Radio Australia, 11.910 at 0700 in English with news. (Salmi, MI) News in English at 0500 found on 15.160, 15.240, 15.320, 15.395, 17.715, 17.795, and 17.865. Announced but not receivable were 15.165, 17.750, 21.525, and 21.720. (Griffith, CO) 0300 world news and discussion on 15.395. (Hunt, NC) 15.320 at 2320 pop music, ID, news. (Cobb, ME)

VNG Time Station 7.500 at 0720, 12.000 at 0640. (Salmi, MA) 12.000 at 0500. (McDonough, PA)

Austria Austrian Radio at 0150 on 6.000 in English. (Hunt, NC) 5.945 and 6.000 in English at 0145, German at 0200. (Lyon, ME)

Belgium BRT with Brussels Calling at 0105 on 5.910 with item on Belgian economy. (Hunt, NC) 0030 with Radio World program and Music Box. (Dermeyer, MI) 9.905 at 2205, program on the Christian Party movement in Belgium. (Hunt, NC)

Brazil Radiobras, 11.745 with Brazilian vocals at 0230. (Hunt, NC) Excellent level, rivaling local AM's at 0245. (Griffith, CO)

Radio Nacional Amazonia, 11.780 at 2200 in Portuguese, news and ID. (Hunt, NC)

Radio Relogio Federal, Rio de Janeiro, 4.905 at 0332 with lite pops, man in Portuguese. (Crowell, TN)

Bulgaria Radio Sofia, 9.700 at 2337 with variety of local music and English. (Lyon, ME) News, mailbag, etc. on 2135. (Wermuth, MA)

Burma Burma Broadcasting Service, in Burmese on 4.725 at 1430. (Duke, Thailand)

Cambodia Voice of the People of Kampuchea, 11.938 heard briefly in English at 0023. (VanAllen, UT)

Cameroon Radiodiffusion National, Yaounde, 4.850 at 2100 in English with news, ID, political commentary, into French at 2115. (Cobb, ME)

Radio Douala, 4.795 at 0530 with African pops. (Lyon, ME)

Canada Radio Canada International, 11.945 at 1945 with English to Europe. (Witsman, IL) 2155 in African service with SWL Digest. Heavy QRM from 11.940. (McDonough, PA)

CFRX Toronto, 6.070 at 2145 with local event announcements. (Hunt, NC) 0900 with ID for CFRB, into news. (Durocher, TX)

CFCX, Montreal, 6.005 from 1500 with talk program. Number for collect calls given as (514) 790-0741. (Lyon, ME)

Chad RNT on 4.904 with balafon music sign on around 0500, popular and traditional African music, French announcements. May be some jamming lately. (Lyon, ME)

Chile Radio Nacional 15.140 at 0335 with old rock, all Spanish announcements. (Chinakas, WA) 0130 with American pops. (Hunt, NC)

Radio Diego Portales on 9.572 at 1117 weak in Spanish with music. Lost at 1130. (Fravel, WV)

China Radio Beijing, on 15.103 varying and parallel 15.180 in Spanish at 0039, flutter. (Crowell, TN) 9.820 at 1242 Chinese songs by woman, orchestral music. (Hampton, IL) 9.680 at 1200 news, folktales, music, clear but slightly over-modulated. (Wermuth, MA) 11.860 and 15.105 with English at 0000. Spanish at 0055 respectively. (VanAllen, UT)

Clandestine Radio Truth, anti-Zimbabwe, 5.015 at 0430 in English with bird IS, news by woman. Het, RTTY and QRN. (Pasziewicz, WI)

Radio Monimbo, anti-Nicaragua, 6.230 at 0015-0039 with music and talk about Sandinistas and Nicaragua, all Spanish. (Fravel, WV) 0200 poor with utility QRM. (Ligenfield, VA)

Radio Quince de Septiembre, 5.565 at 0318 with excited talk in Spanish by man and woman, siren sound ef-

fects, music separators, several clear IDs. Off 0339. (Goetsch, OH)

Radio Venceremos, 6.553 at 0210, fair. (Ligenfield, VA)

La Voz del CID at 0458 on 7.400, strong but distorted audio. (Shute, FL) 6.300 at (time? Editor) comedy show and "Hora de Musica." (Wermuth, MA)

Colombia Radio Sutatenza, Bogota 5.095 in Spanish at 0320. (Hunt, NC) 0602 in Spanish. (Ligenfield, VA) 0250 news in Spanish, CW QRM. (Hunt, NC) 0340 music and ID in Spanish. (Goetsch, OH)

Radio Super de Cali, 6.118 (varying from 6.120) at 0720 with Latin pops, high energy announcer, very good strength. (Crowell, TN)

Costa Rica Radio Colombia, 4.849 at 0448 to sudden sign off at 0503 in Spanish. Music, many ads. (Witsman, IL) 4.850 at 0335 in Spanish with music, ID. (Hunt, NC)

Radio Reloj, 4.832 at 0516 music and news. (Witsman, IL) 0440. (Hunt, NC) 6.006 at 0800 music and IDs. (Wermuth, MA)

Radio Impacto, 6.150 Spanish music, American pops, very strong. (Hunt, NC)

Cuba Radio Havana 17.885 at 2114 with "Musical QSL" Cuban music, reading reports. (McDonough, PA)

Mayak relay, 4.765, 0140 with mostly Russian classical music. (Goetsch, OH) 0515 in Russian. (Salmi, MA)

Radio Rebelde, 5.025 at 1155 with remote broadcast from Managua, Nicaragua. (Crowell, TN) 0342 music and announcements in Spanish. (Goetsch, OH)

Czechoslovakia Radio Prague heard on 11.990 in English at 0530, 5.930 in English at 2000, 1500 and 0100 and 2300 in Spanish. (Lyon, ME) 5.930, 0100 with news, views, music. RTTY interference. (Dermeyer, MI) "Sunday Concert" at 0336. (McDonough, PA)

Denmark Radio Denmark, 15.165 in Danish at 1528. (Marengo, NY)

East Germany Radio Berlin International on 15.445 in English to Southeast Asia at 1515. Also in English from 1600 on 15.100. (Lyon, ME)

Ecuador Radio Luz y Vida, Loja at 0241 in Spanish. (Goetsch, OH)

Radio Pastaza, 3.315, El Puyo at 0343, weak, in Spanish. (Fravel, WV)

Radio Quito, 4.920 at 0410 with Latin music, ID in Spanish. (Hunt, NC)

Emisoras Gran Colombia, Quito, 4.910 at 0230, Spanish. (Ligenfield, VA)

Radio Zaracay, Santo Domingo de los Colorados, 3.395 with pop music, Spanish at 0330. (Moran, IL) 0200 Spanish IDs, time checks, Latin pops. (Cobb, ME)

HD2IOA time station, 7.600 at 0143 with time announcements in Spanish. (Goetsch, OH) 0720. (Salmi, MA)

Radio Iris, Esmeraldas 3.380 at 0123 Spanish announcements and music. (Crowell, TN)

Egypt Radio Cairo, 9.475 at 0022 news in English. Weak. (Hampton, IL) 0200 in English. (Lyon, ME) 12.050 at 2245 in Arabic with Egyptian music. (McDonough, PA) 11.665 at 2155 in Arabic. (Hunt, NC)

England BBC World Service on 3.975 at 0654. Bad ham QRM. (Crowell, TN) 9.915 at 2200 with news. (McDonough, PA) 3.955 at 0520 in English. (Salmi, MA) At 2300 on 5.975, 6.120, 6.175, and 9.410 in English, also 9.765 in Spanish at 0220. (Lyon, ME)

Falkland Islands FIBS 3.958 at 1012 with pop music, personal messages, and news. Weak and lost to hams at 1058. (Fravel, WV)

Finland Radio Finland International on 15.400 at 1515 in English. (Hunt, NC) 1403 with interval signal, ID and news in English at 1405. (Crowell, TN) 1500 with news in English. (Lyon, ME)

France Radio France International 11.930 at 2152 in French with music but abruptly stopped transmission at 2154. (McDonough, PA) 0425 with news in English on 9.800. (McDonough, PA) 9.790 at 2115 with pop music, news in French. On 6.055 at 0530. Also 9.800 from 0315 giving schedule for English on 17.620 at 1615 and 9.790 in French at 0100. (Lyons, ME)

Gabon Africa No. One on 11.940 and 4.810 with variety of African and other pop music from 2200 to 2302 sign off in French. (Lyon, ME)

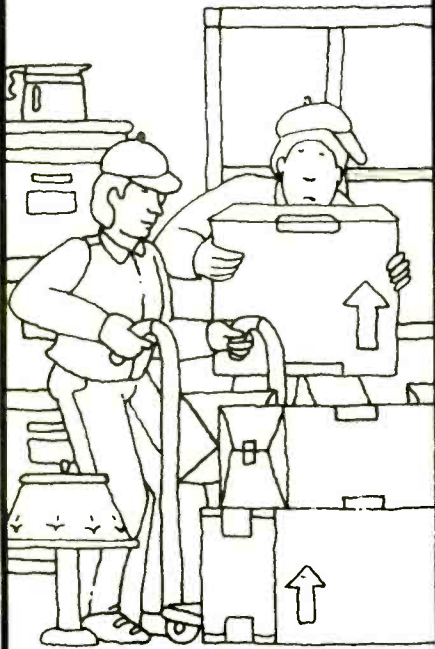
Greece Voice of Greece, 9.420 at 0130 to 0143 with news. (Dermeyer, MI)

Guatemala La Voz de Nahuala, 3.360 at 0215 with Spanish talk and music, ID 0303. (Brumm, IL) 0137 with folk music. (Crowell, TN)

Radio Chortis, Jocotan, Chiquimala on 3.370 at 2348 with folk music, man in Indian language. (Crowell, TN)

Radio Cultural, TGNA, 3.300 at 0310 with "Back to the Bible." (Hunt, NC)

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Haiti 4VEH 4.930 at 0038 in French. (Durocher, TX) 2305 with women in English, translated into French by man, echo ID. (Hunt, NC)

Hawaii WWVH on 15.000 at 2306, woman with time announcements, stronger than WWV. (Moran, IL)

Honduras La Voz Evangelica, 4.820 at 0224 with music. (Goetsch, OH)

Radio Juticalpa, Juticalpa, 4.780 at 0345, music program in Spanish. Sign off 0400. (Fravel, WV)

Hungary Radio Budapest on 9.835 at 0214 in English. (Hampton, IL)

Iceland Icelandic State Broadcasting Service on 13.797 with man and woman in Icelandic at 2015. Weak and bad QRM. (Crowell, TN)

India All India Radio on 11.620 at 2200 in English with news, commentary. Heard fairly well. (Shute, FL) 9.525 Madras at 0245 Indian language, man announcer. (Hunt, NC)

Iran Voice of the Islamic Republic of Iran on 9.022 at 2015 in English, news of the Islamic nations. (Hunt, NC) 2017 to 2030 English, weak and fading. (Fravel, WV)

Iraq Radio Baghdad 9.610 with English at 2140. (Hunt, NC) 2211-2224 English with woman announcer, Arabic-style vocals, Radio Baghdad ID. (Brumm, IL) 13.700 with Mideast music at various times between 1500 and 1900, often jammed. (Lyon, ME)

Israel Kol Israel 9.815 and 9.440 in Spanish at 2323, English at 0000. Also at 1745 on 15.485. (Lyon, ME) 12.025 at 2230 with world and Jewish news. (McDonough, PA)

Italy Adventist World Radio, 7.125 at 0610 with religious program in English. (Lingerfield, VA)

Japan NSB on 3.925 at 0655 with man and woman announcers in Japanese. Weak, with ham QRM. (Crowell, TN)

Kuwait Radio Kuwait, 11.675 at 2010 in English. (Hunt, NC) 9.880 with Arabic music and woman announcer at 0525. (Crowell, TN) Arabic music at 1545 on 15.495, 11.990, and 9.890. Also 9.840 at 2145. (Lyon, ME)

Liberia VOA Relay on 17.870 at 2135 in English. Also on 15.600, 15.580, and 15.445. (Moran, IL)

ELWA on 3.230 at 0638 man and woman announcers in vernacular. Good, but short, sharp fades. (Crowell, TN)

Libya Radio Jamahiriya, 15.450 at 1900 with African Service. (Lyon, ME)

SPLAJBC 9.890 at 0230 in Arabic. (Hunt, NC)

Lithuanian SSR Radio Vilnius 9.685 at 2200 in English with program on Lithuanian culture. (Hunt, NC) 2200-2230 with news, commentary, listener's letters. Gave schedule as 2130 on 6.1, 2200 on 9.750, 15.1, 15.24, 17.87. 9.685 not announced. (Dermyer, MI)

Luxembourg Radio Luxembourg on 6.090 at 0731 with lite German pops and man, woman announcers in German. (Crowell, TN) 0030 with rock. (Lyon, ME) 0025 with U.S. pops. (Hunt, NC)

Malaysia Radio Malaysia 7.295 in English at 0200 0530, 0930. 9.665 at 0200, 9.750 at 0600 and 1000. (Duke, Thailand)

Malta Radio Mediterranean, 6.110 at 2315 with sports, music, U.S. relations with Nicaragua. (Hunt, NC)

Mexico La Voz de la America Latina, XEWW, Mexico City 6.165 in Spanish at 0746. (Shute, FL) 15.175 at 2250, tentative. (Moran, IL) 0043 commercials and pop music. (Crowell, TN)

XEBR Hermosillo on 11.820 at 1425 with Latin disco, man announcer. Surprisingly good but het QRM. (Crowell, TN)

6.115 Radio Universidad de Sonora at 2230 with opera, always good in Arizona. (Hunsaker, AZ)

Mongolia Radio Ulan Bator, 12.015 at 1200 in English, interval signal, ID, news by woman. (Paszkievicz, WI)

Morocco RTVM on 15.105 at 2106 in Arabic. (Ligenfield, VA)

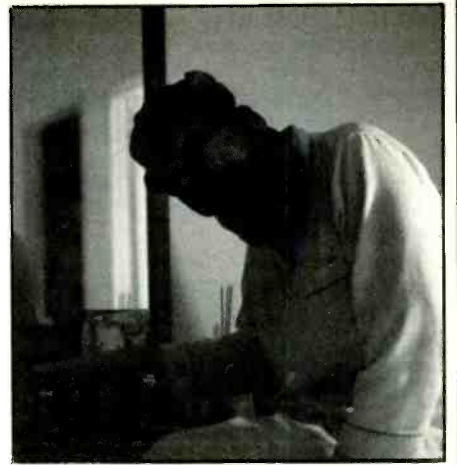
Netherlands Antilles Radio Netherlands 9.590 via Bonaire, English at 0235. (Hunt, NC) 6.165 in Dutch with ID at 0440. (Shute, FL)

Nicaragua Voice of Nicaragua 6.015 at 0018 in Spanish to 0026 when overridden by Vatican. (Fravel, WV) 0442 with news in English. Think the man announcer needs speech lessons. (Shute, FL)

Nigeria Voice of Nigeria, 7.255 at 0540 with report on American investments in Nigerian agriculture, medical program, ID, stock reports. (Hampton, IL)

FRNC Ibadan, 6.050 at 0640 man in English, African music. Fair. (Crowell, TN)

Radio Nigeria, Kaduna 4.770 at 2245 to 2300 sign off, in English. (Lyon, ME)



Bruce Rossi, transplanted Arizonian, is either making a statement about the California air or operating Radio Monimbo.

North Korea Radio Pyongyang, 9.977 at 1100. (Marengo, NY) 9.745 at 1115 with news, Korean Opera, "Radio Magazine." (Wermuth, MA) 9.977 at 1210 in English, talks, Korean vocals. (Paszkievicz, WI) 15.230 in English at 2340. (VanAllen, UT)

Northern Marianas KYOI Saipan, 11.900 with pop music, IDs in English and Japanese at 1545. Also on 9.665 after 1600. (Griffith, CO) 9.670 at 2120 with rock, schedule, and ID at 2130. (Crowell, TN)

Norway Radio Norway 15.305 at 1400 talks in English. (Hunt, NC) English from 1300 (Sunday only, Editor), also 1600 and 1700. Also on 15.170 at 1855. (Lyon, ME)

Papua New Guinea Radio East New Britain, 3.385 at 1140 in unknown language with island music, country/western, ID. (Paszkievicz, WI)

Paraguay Radio Nacional 9.735 Spanish, IDs, lots of music at 0901. (Crowell, TN) 0245 Latin ballads. (Hunt, NC) 0000 accordion music and Gaucho music. (Wermuth, MA)

Peru Radio Huancayo, Huancayo, 5.955 at 0712 with non-Peruvian music. (Shute, FL)

Radio Minería, La Oroya, 6.145 at 0629 Latin pops, RFI splatter. (Crowell, TN) ID? Editor

Radio El Sol, Lima, 5.970 at 0104. YL with talk on the contras. (Hampton, IL)

Radio Union, Lima, 6.115 at 0730 with ID "Union, La Radio" and mention of "Pregunta Usted" program coming on later. (Shute, FL) 0627 in Spanish. (Salmi, MI)

Radio Atlantida, Iquitos, 4.790 pop music and Spanish talk at 0400. (Moran, IL) 0335, music, ID. (Hunt, NC)

Philippines FEBC at 0800 on 11.890, 0030 on 15.450 in English. (Duke, Thailand)

Saudi Arabia BSKSA news in Arabic read by man at 2150 on 17.740. (Moran, IL)

Singapore Radio Singapore, 5.010 at 1430 in English. (Duke, Thailand)

South Africa Radio RSA on 4.990 at 0328 with news in English. QRM Radio Barquisimeto, Venezuela co-channel. (Crowell, TN) 9.610, 9.615, and 6.010 in English from 0200, DX program ending 0255. (Lyon, ME)

SABC 3.965 at 0651 with Afrikaans service. Severe ham QRM. (Crowell, TN) 4.880 in Afrikaans at 0445, ID "Dit is Radio Suid Afrika." (Shute, FL)

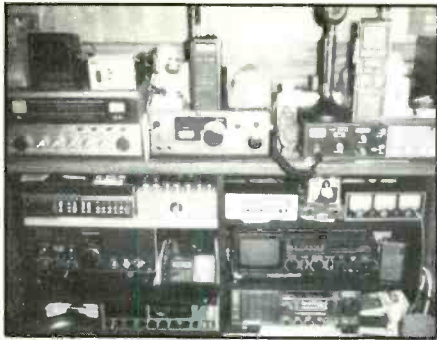
Capital Radio, Transkei, 3.930 at 0400 in English with news, IDs, cigarette ads, pops, local time checks, contests, sports news, ad for upcoming performance of *The King and I*. (Paszkievicz, WI)

South Korea Radio Korea, 15.575 at 1335 world news in English. (Hunt, NC)

Spain Radio Exterior España, 5.900 in English at 2302 with news, sports. (Cobb, ME) 6.125 at 0115 in English. (Hunt, NC) 0045-0100 Spanish lesson. (Dermyer, MI) 0550 with DX program. (Witsman, IL)

Sri Lanka Radio Sri Lanka external service at 1100 on 17.850 with Radio Monitor's International. (Duke, Thailand)

Swaziland Trans World Radio, 9.725 at 0453 with hymns. (Durocher, TX)



Mrs. Watts, here's Gary's shack. He's not so crazy after all. The Watts live in Baltimore.

Switzerland Swiss Radio International, 3.985 at 0455 with interval signal. (Shute, FL)
Syria Damascus on 12.085 at 1908 in French. Weak in English at 2030. (Lingerfield, VA)
Tahiti Radio Tahiti, off frequency on 11.826 at 0453 with Polynesian music. (Shute, FL) 11.825 at 0505, island songs. (Salmi, MA)
Tanzania Radio Tanzania 4.785 at 0630, local music. (Fravel, WV)
Thailand Radio Thailand on 6.070 in Thai at 0500, 1300, 2300. (Duke, Thailand)
Turkey Voice of Turkey, 9.560 at 2310 in English with news. (Hunt, NC) 0449 in English with schedule and frequency announcements. (Shute, FL) 0340 Turkish folk music, ID, schedule, into unknown language. (Hampton, IL)
Ukraine SSR Radio Kiev at 0030 on 7.205. (Marenco, NY)
United Arab Emirates UAE Radio, Dubai 15.300 at 1640 in English with regional news, discussion. (Hunt, NC) 7.310 at 0345 in English, requesting reception reports. (Hunt, NC) 15.320 and 17.775 at 1315, into

English at 1330. Announced 21.605 but not heard. Also at 1530 in Arabic on 15.320 and 11.955, into English at 1600. (Lyon, ME)
United States United Nations Radio, 11.780 at 0225 in English. (Hunt, NC)
AFRTS on 17.765 at 2040 with baseball game and occasional news briefs. (McDonough, PA)
KGFI in Spanish with news on 15.280 at 2240. (Moran, IL)
WYFR on 17.845 and 15.565 at 1555 with IS, into English at 1600, religious programs, into German at 1700. Also at 0700 on 7.355. (Lyon, ME)
USSR Radio Moscow World Service at 2030 on 9.710 with news and "Front Seat, Backstage" program. (McDonough, PA) 15.455 various times between 1200 and 1600. 9.600 and 15.135 1000-1100, 9.765, 9.710 and 11.860 between 2000 and 2200, 11.860 at 1500-1900, also 15.500 at 1900. African service in English from 1700 on 15.510, North American Service 7.150, 7.165, 7.195 at 0200, also 9.720, 9.765 at 2300. (Lyon, ME)
Radio Peace and Progress, English from 1630 on 12.010, into French at 1700. Also on 15.510 at 1350. (Lyon, ME)
Radio Atlantika on 11.950 from 1700 in French. (Lyon, ME)
Radiostansiya Rodina, 15.175 at 1400 light music and news. Mayak on frequency earlier. (Lyon, ME)
Mayak service, continuous on 4.765 between 2300-1130 with wide variety of music, news, and chimes every half hour all Russian. Also on 12.020 at 1010 and 15.175 at 1120. (Lyon, ME)
Vatican Vatican Radio 6.251.9 variable with Liturgy in East European language at 0711. Noisy and weak with occasional ± 2 kHz shifts. (Crowell, TN) 17.840 at 1450 in English with replies to listener letters. (Hunt, NC) 6.015 at 0050 strong with interference from Nicaragua. (Wermuth, MA) 7.250 at 0438 with interval signal which sounded a little sick, think the tape was messed up. (Shute, FL)
Venezuela Radio Rumbos, 4.970 at 0242, music. (Goetsch, OH) 0230. (Hunt, NC) 9.660 at 0123 Latin pops. (Wermuth, MA)
Radio Barquisimeto, 4.990 at 0245, Latin music. (Hunt, NC)

Ecoss del Torbes, 4.980 at 0245 music, possible ads. (Goetsch, OH) 0055 with music til 0100 news. (McDonough, PA) 0240. (Hunt, NC)
Radio Valera, 4.840 heard at 0340, Latin music, IDs. (Hunt, NC)
La Voz de Carabobo, 4.780 at 0210, Latin music, several IDs. (Hunt, NC)
Radio Juventud, 4.900 at 0328, U.S. rock. (Hunt, NC)
Radio Tachira, 4.830, Latin music, ID caught at 0220. (Hunt, NC)
Vietnam Voice of Vietnam, 2345 in French on 12.035, 0105 in Vietnamese on 15.010. (VanAllen, UT)
West Germany RIAS on 6.005 at 0740, classical music, announcements in German. (Crowell, TN)
Yugoslavia Radio Belgrade, 9.620 at 2000 in English with news. (Hunt, NC)

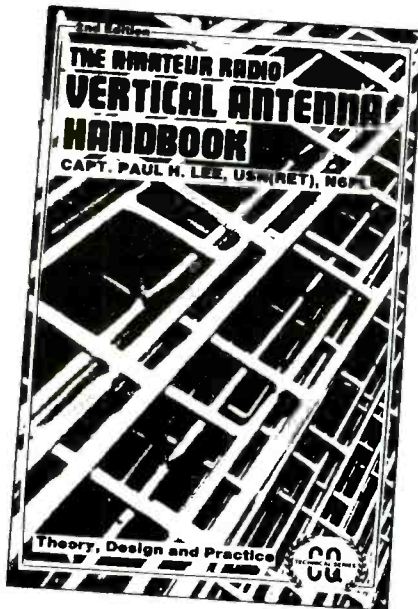
Our thanks to: Jon S. VanAllen, West Jordan, UT; Billy Hunt, Durham, NC; Michael Goetsch, Berea, OH; Darrell E. Lingenfield III, Woodbridge, VA; David E. Salmi, Maynard, MA; Kal Hunsaker, Tempe, AZ; Edward Lynn, Orono, ME; Willard D. Dermeyer Jr., Jackson, MI; Sheryl Paszkiewicz, Manitowoc, WI; Jerry Brumm, Chicago, IL; Larry Fravel, Clarksburg, WV; Evelyn Hampton, Chicago, IL; Conrad R. Durocher, Dickinson, TX; Karl R. Witsman, Oakwood, IL; Michele Shute, Pensacola, FL; Mike Chinakos, Camus, WA; Andrew Wermuth, S. Deerfield, MA; Patrick M. Griffith, Denver, CO; Pat McDonough, Pittsburgh, PA; Thomas Marengo, Lindenhurst, NY; Ted Moran, Chicago, IL; Ken Cobb, Portland, ME; Sandra L. Duke, Bangkok, Thailand; and Andrew Crowell, Murphysboro, TN. **PC**

It's Back! THE AMATEUR RADIO VERTICAL ANTENNA HANDBOOK

CAPT. PAUL H. LEE, USN(RET), N6PL

Capt. Paul H. Lee's *Vertical Antenna Handbook* became a classic in its first printing. Out of print for several years, this Second Edition has been brought out in response to your demand and the needs of the service. Among the topics covered are vertical antenna theory, design, installation, and construction. Specific information is given on vertical arrays, feeding and matching, short verticals, ground effects, and multiband and single-band verticals, plus there is a section that answers many of the most commonly asked questions about vertical antennas for the amateur. The Second Edition features an addendum on antenna design for 160 meters, the band that finally is coming into its own.

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THE EXCITING WORLD OF RADIOTELETYPE MONITORING

April, 1982. The British fleet is steaming down the North Atlantic Ocean to the defense of the Falkland Islands from its Argentine invaders. Constant communication has to be kept via radioteletype with Portishead Radio, England as the war effort intensifies. Coded messages keep the troop carriers apprised of the war situation.

But the fleet soon enters the warm waters of the South Atlantic and is out of range of Portishead's transmitters. It will be difficult to maintain RTTY communications unless something is done to improve reception.

To the rescue, during the first week of that war, comes WLO, Mobile Marine Radio, Alabama. It becomes the relay of RTTY messages between Portishead and the fleet that is now thousands of miles from its home port at Plymouth, England.

"The teletype tapes were 25 feet long," recalled John Klemm, assistant to WLO President James L. DeZauche, as he explained WLO's role in that war.

"But it was all coded traffic, so we could never tell what we were sending," Klemm continued.

When that first week ended, the British were able to establish a communications link with their troops, thereby ending WLO's short-lived period of excitement.

This story is one of many in the long history of WLO, which is celebrating its 38th anniversary this month. It began as a one-man operation in 1947 at the Alabama State Docks. WLO has since grown to be this country's largest privately owned public coast radio station. It has 55 employees.

Its headquarters is in western Mobile County, with its receiving site on 16 acres of land, 12 miles from the Port of Mobile.

Eighty "Henry" transmitters are to be found on 24 acres of land at Coden, Alabama, on the Gulf of Mexico, keeping WLO in constant communication with vessels from all countries on the shortwave and VHF bands. Their output is 5 kilowatts each.

To the RTTY buff who owns demodulating equipment capable of receiving both the Baudot and TOR modes, WLO can offer many hours of enjoyment. All types of merchant marine vessels will be noted sending telexes to the station, which is the largest marine telex facility in the country.

They are in contact with passenger liners, cruise liners, and passenger cargo liners, as well as general cargo carriers, roll-on/roll-off ships, pallet ships, cargo handlers, barge carriers, and refrigerated ships. Oil tankers, liquefied gas tankers, chemical carriers, general purpose carriers, ore and oil carriers, special purpose carriers, container ships, cable-laying ships, cable ships, and ocean-going tugs are also among the menagerie. And

don't forget fishing trawlers and supply ships.

And, of course, there was the British fleet.

To handle all of these vessels via teletype, WLO uses Phillips PACT200 terminals and Phillips STB750 modems.

WLO was the first maritime coastal station in the U.S. to use the Phillips System ARQ radio telex service, installing it in 1974. This occurred five years before any other U.S. coastal facility installed similar ARQ systems.

During the peak hours of 1500 GMT to 2000 GMT, WLO uses five RTTY operators. This compares with only one operator working during hours with very light traffic.

Weather broadcasts are sent to ships four times daily via RTTY and are free of charge. Times (all GMT) are 0530, 1130, 1730, and 2330. The frequencies used are 4352 kHz, 8712 kHz, 13096.9 kHz, 17199.5 kHz, and 22587.9 kHz.

The weather broadcasts cover the Gulf of Mexico, Caribbean Sea, Western North Atlantic Ocean, and Eastern North Pacific Ocean.

The weather broadcast is sent usually in the ARQ mode, but can be found at times being sent at 850/100N if a vessel does not have TOR equipment. Vessels within 75 to 100 miles of WLO are able to receive RTTY transmissions, Klemm said.

QSL cards and letters are accepted from RTTY enthusiasts.

"We encourage them," Klemm said, "because they're all dedicated people."

Address QSL material to WLO, Mobile Marine Radio, Inc., 7700 Rinla Ave., Mobile, AL 36619-1199.

Remember, though, do not divulge the contents of any telexes you may have read when sending in your QSL material. Disclosure is prohibited by Sec. 605 of the Communications Act of 1934.

Mention what type of equipment you use and the strength of the received signal. Klemm calls this "good information for us."

All of this month's RTTY loggings feature intercepts from many type of sailing vessels, and maritime and naval stations. Thanks to Association of DX Reporters for some of these loggings. They come from utility monitors Jim Hartung and Robert French.

RTTY Logs

4172.5: ELBK9, Northern Lynx, sending a telex via SITOR to WLO, Mobile Radio, AL at 0244. ONBU, Ellen Hudig, with a telex to WLO via SITOR at 0300. (Robert Margolis, Skokie, IL)

4196: 73HSX, an unidentified unit of the Spanish Navy at Madrid, with a test tape of RY's and SG's, 850/100R, from 0414 to

0425. The station then went to CW, calling 78QLD. (Margolis, IL)

4209: 77HHW, an unidentified unit of the Spanish Navy, Madrid, sending a test tape of foxes and RY's to 78CFJ, 850/100N at 0430. There followed traffic in Spanish from AIG 9734 to RETM: AIG 9407. (Margolis, IL)

4279: 72JKL, a unit of the Spanish Navy, Madrid, observed at 0346 sending an RY/SG test tape, 850/100R, followed by traffic in Spanish. (Margolis, IL)

6261: Kimovsk, a Soviet cargo ship built in Finland, with telegrams to Leningrad Radio, USSR, 170/66N, at 0602. (Margolis, IL)

6263: UEZB, Kanev, a Finnish-built Soviet cargo ship, with telegrams to UJY, Leningrad Radio, USSR, 170/66N, at 0537. (Margolis, IL)

6263.5: PHBS, Rio Frio, sending a telex to PCH, Scheveningen Radio, Holland, while sailing from Long Beach, CA to Ecuador. Was via ARQ at 0351. (Margolis, IL)

6264: UITQ, Kapitan Gudin, a Soviet bulk carrier, with telegrams to UNM2, Klaipeda Radio, USSR, 170/66N, at 0358. (Margolis, IL)

6264.5: UJOB, Krymskie Gory, a Swedish-built Soviet fish carrier, sending a "kryptogramma" containing five-letter groups to UJY, Kaliningrad Radio, USSR, 170/66N, at 0519. Transmission of a coded message suggests that this vessel has other uses to the Soviet Union besides hauling fish. (Margolis, IL)

6267: Mexican Reefer No. 7, sailing from Corinto, Nicaragua to Port Hueneme, CA, sending a telex via SITOR at 0323. (Margolis, IL)

6334: CTH21/3, Portuguese Navy, Horta, Azores, with RY's test tape, 850/100R, at 0239. (Robert French, District Heights, MD)

8299.6: Soviet-sailing vessel Vostok with encrypted and Russian traffic, 170/66N, noted at 0334. (French, MD) The Vostok is a fish factory mother ship that was built at the Admiralteiski Shipyard, Leningrad. (Editor)

8346: OWIP, Sine Maersk, working WLO, Mobile Radio, AL, via SITOR at 0040. (Jim Hartung, Aberdeen, MD)

8350: GUNZ, London Glory, with SITOR traffic to KPH, San Francisco Radio, CA, at 0424. (Hartung, MD)

8357: 3ELR3, Daphne, working WLO, Mobile Radio, AL, via SITOR at 2320. (Hartung, MD)

8439: PBC98, Goeree Naval Radio, Netherlands, running RY's, 850/100R, at 0440. (Hartung, MD)

8714: HEC18, Berne Radio, Switzerland, working C6CN, Osco Castor, via SITOR at 1918. (Hartung, MD)

11140: RPFN, Monsanto Naval Radio, Portugal, at 1508, sending RY's, foxes and "teste de RPFN" tape, 850/66R. The station then sent a five-letter-grouped "PAPA LIMA SIERRA" message via RETJ, Madrid Naval Radio, Spain, to the Portuguese Naval Attache at Madrid. (Margolis, IL)

11142: YWM, Maracaibo Naval Radio, Venezuela, with data and traffic in Spanish at 0005, 850/66N. (Margolis, IL)

11250: 5KM, Bogota Naval Radio, Colombia, with test tape of RY's, SG's and QRK's, 425/100R, at 1344. (Margolis, IL)

12061: RFLIG, the French Navy at Cayenne, French Guiana, with traffic, 850/66R, at 2241. (French, MD)

12492: L2VN, BP Energy (a British Petroleum vessel), with a telex to BP Shipping, Harlow, England, via Portishead Radio, England. Was in SITOR mode at 2011. (Margolis, IL)

12493.5: NKR V, USS Sealift Caribbean, a US Navy oil tanker, with weather data via SITOR at 1954. (Margolis, IL)

12496: Boris Butoma, a Russian-built bulk oil carrier, formerly called the Oktyabrsk, noted at 1735 sending telegrams via SITOR to Novorossisk Radio, USSR. (Margolis, IL)

12501.5: UUSH, SS Burgas, a Russian-built, Sofia-type oil tanker enroute to Havana, Cuba, working WCC, Chatham Radio, MA at 1355 via SITOR. Other vessels noted working WCC in the same RTTY mode were M/N Ciudad de Pasto and GBCF, M/V Pacific Princess. (Margolis, IL)

12503: USS Range Sentinel, a missile range instrumentation ship of the US Navy, with SITOR traffic to NMF, US Coast Guard, Boston, MA, at 1621. (Margolis, IL)

12505: 9VKP, Faith; ELDF2, El Amaan; GBSA, Author; and LIAH, Celsius, observed at various times sending SITOR traffic to Portishead Radio, England. (Margolis, IL)

12510.5: SQLC, M/V Vlad A. Sikorsky, working VCS, Canadian Coast Guard, Halifax, Canada, via SITOR at 1638. (Margolis, IL)

12518: C6DJ, Brazil Pride, with telexes to WLO, Mobile Radio, AL, via SITOR at 1808. 3ERW3, Danisa, traffic to FFT6, St. Lys Radio, France, same mode, at 2228. (Margolis, IL)

12521: Alapayevsk, a Finnish-built Soviet general cargo ship, sending telegrams to Leningrad Radio, USSR, 170/66N, at 2224. (Margolis, IL)

12524.5: Dvinskiy Zaliv, a French-built, Soviet fish carrier, with telegrams to Sevastopol Radio, USSR, 170/66N, at 2217. (Margolis, IL)

12526: Soviet trawler "General Pliev" with telegrams to Riga Radio, USSR, 170/66N, at 2222. (Margolis, IL)

13083: NMF, US Coast Guard, Boston, MA, with SITOR messages to NEKF, USS Lynch at 1832. The Lynch is a US Navy oceanographic research ship of the "Conrad" class. At 2145, Petropavlovsk-Kamchatskiy, a Soviet cargo ship built in Gdansk, Poland, sending a weather report

to Vladivostok Radio, USSR, at 170/66N. (Margolis, IL)

13083.5: WLO, Mobile Radio, AL, working 3EIC2, Caribe, via SITOR at 2040. (Hartung, MD)

13091: URD, Leningrad Radio, USSR, sending news in Russian to ships at sea via SITOR at 1431. (Margolis, IL)

13093.5: OXZ, Lyngby Radio, Denmark, working sailing vessel Lotte Scheel via SITOR at 2000. (Hartung, MD)

13975.5: NNNOICE, the US Navy MARS station at McMurdo Station, Antarctica, with telegrams, 170/100R, at 0112. (Margolis, IL)

16663: Vostok 5, a Soviet cargo ship built in Leningrad in 1965, with telegrams to Arkhangelsk Radio, USSR, 170/66N, at 1446. (Margolis, IL)

16668: YUFS, M/B Tuhobic, a Yugoslav vessel, with a message in Serbo Croat being sent to HEC, Berne Radio, Switzerland via SITOR at 1451. (Margolis, IL)

16695: XVI Syezd Profsoyuzov, a Soviet-built trawler-factory ship, with telegrams to Novorossisk Radio, USSR, 170/66N, at 2105. (Margolis, IL)

17227: DCF, Norddeich Radio, West Germany, working EWBK, Odessa, at 2016 in the SITOR mode. (Margolis, IL)

22120: CCS, Santiago Naval Radio, Chile, with "BOLETIN DE PRENSA NAVAL" news in Spanish sent to ships at sea from 1600 to 1613, 850/66N. (Margolis, IL)

Reports should be sent to Bob Margolis, Popular Communications, 76 North Broadway, Hicksville, NY 11801. **PC**

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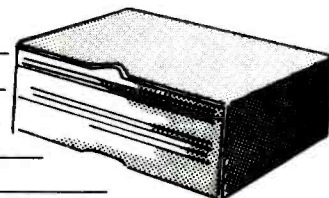
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PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

Programmable Eight Band Scanner

Regency Electronics, Inc., announces the introduction of a 60-channel automatic/programmable scanner with built in alarm clock, the Regency Z60.

In addition to the standard six public service bands, the Z60 will receive aircraft and FM broadcast frequencies. Ten of the 60 channels are set aside for FM broadcast only. A special feature of the Z60 is its digital clock with programmable alarm.



Additional features include contemporary woodgrain styling, pre-programmed frequencies, search/priority channel, permanent memory system, dual level display with prompting messages, and scan delay.

Suggested retail price for the Regency Z60 has been set at \$379.95. For more information, contact Regency Electronics, 7707 Records Street, Indianapolis, IN 46226, or circle number 104 on the reader service card.

Full-Function Microprocessor-Controlled Satellite Receiver

Kenwood's new advanced design satellite receiver system represents a unique approach to satellite television reception. Unlike current products on the marketplace that require manual operation for most or all of their functions, the Kenwood Satellite Receiver uses advanced computer technology to perform virtually all receiver functions. The KSR-1000 4 GHz Stereo Satellite Receiver, KSP-1000 Satellite Antenna Positioner, LNB-1000 Low Noise Block Down Converter/Amplifier (LNB), and KSA-1000 Antenna Actuator is an interactive system, designed to function as a single unit.

The KSR-1000 serves as the control unit, while the KSP-1000 optimizes antenna position, the KSA-1000 drives the antenna and the LNB delivers the antenna output to the receiver. Once the system is installed, satellite broadcasts can be selected with a single switch, and transponder frequencies tuned in with a single tuning knob.



"Kenwood's new satellite system is as simple to use as a conventional television set," says Sam Rosenzweig, Vice President of Marketing, Home Entertainment Division. "Microprocessor technology has helped us create the first truly convenient satellite receiver. You just select the satellite and tune it to the desired transponder."

The KSR-1000 Stereo Satellite Receiver is the heart of the system. Up to 18 satellite signals may be stored in the receiver memory. The KSP-1000 can be fine-positioned to any of 360 points, providing access to satellites anywhere in the sky. All transponder frequencies currently broadcasting have been preset at the factory, eliminating the need for any post-installation modification. A unique parental lock feature allows parents to "lock out" any two transponder frequencies on a locked-in satellite so that children will not be able to access adult channels. The dish antenna can also be completely locked by a pre-programmed numerical code, which will prevent children from playing with the antenna.

The KSR-1000 is a true state-of-the-art product offering stereo reception and built-in Dolby B noise reduction for current Dolby broadcasts, such as those found on the Disney Channel, MTV, and several movie channels. Once a broadcasting satellite is located, the antenna position is locked in and the transponder selector can be used to tune in the transmission. The KSR-1000 is capable of receiving Mono/Multiple Stereo, Discrete Stereo and Matrix Stereo signal and will automatically reproduce the audio mode of the signal received. A single infrared remote control unit can activate all system operations, making the Kenwood Satellite Receiver system the most convenient on the market today.

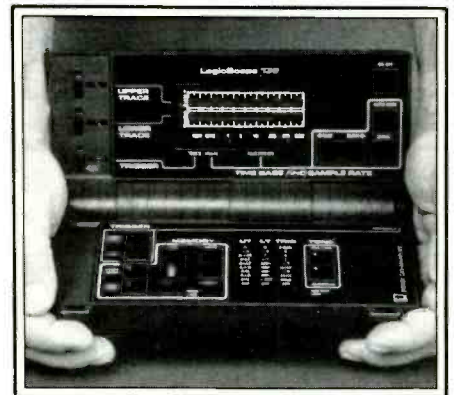
The KSR-1000 is perfectly complemented by the KSP-1000 Satellite Positioner. Like the KSR-1000, it is microprocessor-controlled with positional data on up to 18 satellites stored in its memory. The microprocessor technology facilitates precise fine tuning, enabling the actuator to be adjusted to any one of 360 points for flawless reception. The KSP-1000 can also be activated by the KSR-1000's remote control, further enhancing the incredible convenience of this sophisticated system. A bright fluorescent

digital readout displays all relevant information, including satellite number, antenna position, and over-travel limits, while soft-touch controls are easy to operate.

Kenwood quality permeates each of the four components of the new satellite receiver system. From the clean styling and functional design of the components to the advanced technology engineering, the Kenwood Satellite Receiver system is truly high-end. Kenwood is backing the system with a complete 1-year warranty. Kenwood satellite dealers will emphasize installation and service, reinforcing Kenwood's commitment to the quality of this unique product. The Kenwood Satellite Receiver system (without antenna and feed horn) will be offered at a suggested retail price of \$1900.

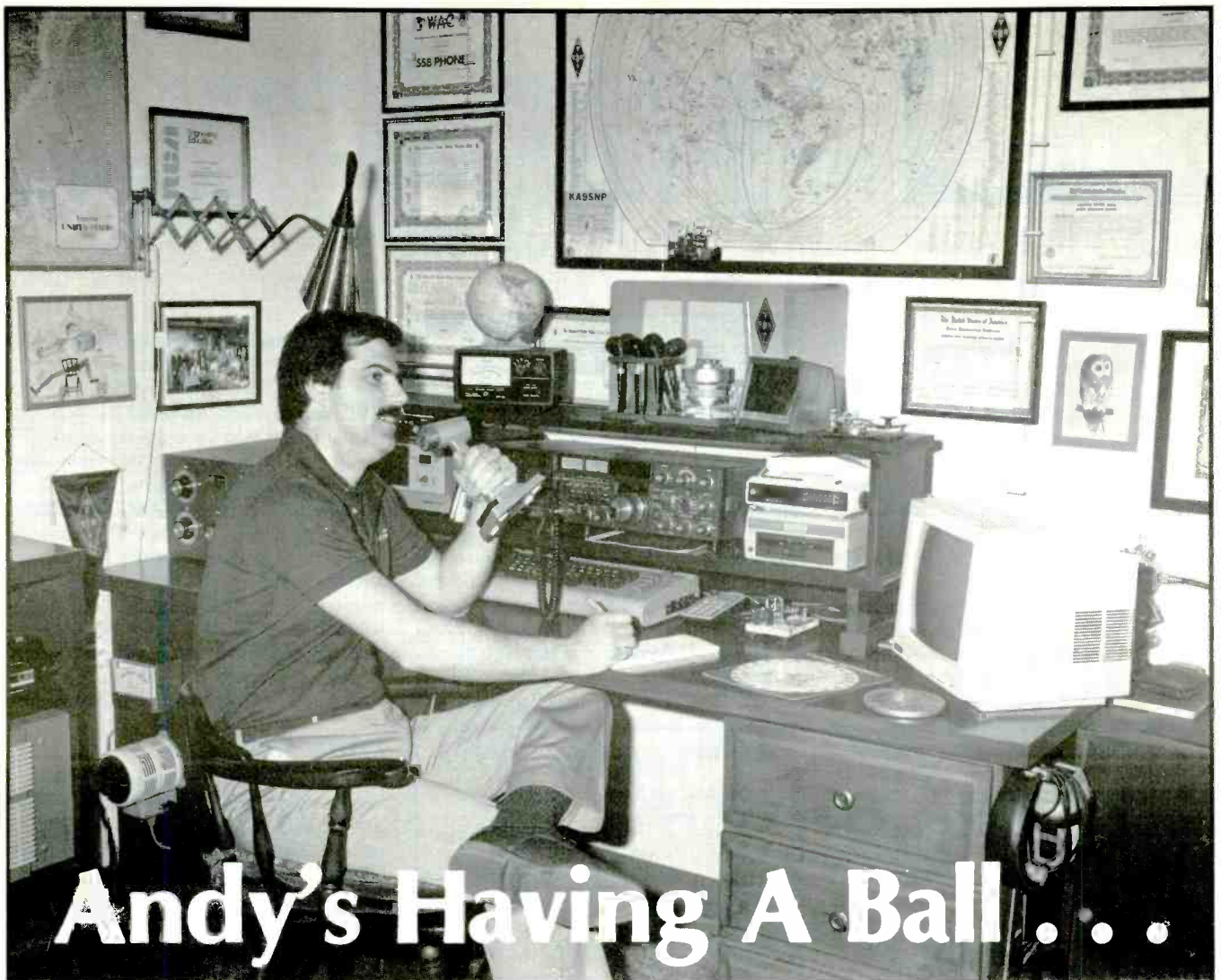
10 MHz, Portable LogicScope For Digital Field Service

Now available from Jensen Tools Inc, the LogicScope™ 136 combines many of the features and capabilities of sophisticated logic analyzers and oscilloscopes. Lightweight (1.25 lbs.), compact (8.25" x 4.5" x 1.75"), and powerful (10 MHz), the instrument was designed for servicing digital electronic circuits and equipment, and is especially well suited for field work.



LogicScope replaces the conventional CRT with a unique array of 400 LED's, which permit simultaneous display of two waveforms. It can be operated in Real-Time or memory modes. Memory mode permits acquisition and storage of up to twenty-four

(continued on page 73)



Andy's Having A Ball . . .

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Andy is a Ham Radio operator and he's having the time of his life talking to new and old friends in this country and around the world.

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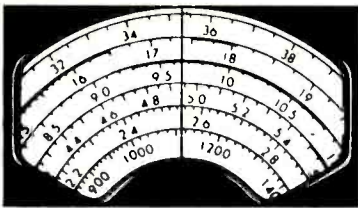
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COMMUNICATIONS CONFIDENTIAL

BY MIKE CHABAK

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

September is a month of transition. Throughout the summer, we've had to contend with heavy QRN from thunderstorm activity, and unpredictable ionization disturbances of the upper level radio signal refractive layer. For many areas of North America, September is the time to bid farewell to those ear splitting thunderstorm concerts of nature. To be sure, there will be more, but the worst is now behind us, save for the southern tier of states.

Ahead lies winter, and as all of us radio buffs know, so comes the best season for receiving stations that were, up to now, somewhat or completely hidden from our ever persistent monitoring efforts.

As such, it is time for CommCo to explore some of what is in store for the utility buff.

Hurricane Hunters

Last month I mentioned the USAF/AFRES units that have the exciting and dangerous task of playing tag with hurricanes. Right now the hurricane season is in full swing, and it would do well to more closely examine the monitoring aspects.

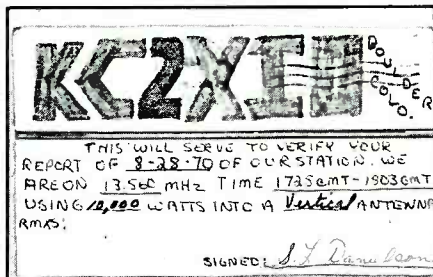
First off, for those of you QSL buffs, here are the mailing addresses for the hurricane hunter units: Aircraft GULL ##, c/o 53rd WRS, Keesler AFB, Biloxi, MS 39534; Aircraft SWAN ##, c/o 54th WRS, APO San Francisco, CA 96630; Aircraft TEAL ##, c/o 920th WRG/815 WRS AFRES, Keesler AFB, Biloxi, MS 39534; Aircraft LARK ##, c/o 41st RWRW, McClellan AFB, Sacramento, CA 95652.

The GULL and TEAL callsigns will be most frequently encountered, as they reconnoiter severe weather disturbances in the Gulf of Mexico, Caribbean, and Atlantic. They also do go where needed and on occasion, both the GULL/TEAL aircraft will be heard operating on the eastern Pacific side of the USA.

The SWAN's are typhoon chasers out of Andersen AFB Guam, with their primary operating area being the western Pacific. On occasion, they too will venture into the eastern Pacific.

By the way, hurricane, typhoon, and cyclone refer to the same type of major weather storm. It is called a hurricane when it occurs in the Atlantic, Caribbean, Gulf, and eastern Pacific. It's a typhoon when it occurs in the western Pacific, and called a cyclone in the Indian Ocean area.

June through November marks the hurricane season along the Atlantic and Gulf coasts. Most storm activity takes place from



Terry O'Laughlin, WB9GVB, received this prepared return QSL from National Bureau of Standards experimental station KC2XIE in Boulder, Colorado. The station was noted on 13560 kHz with time signals and voice ID. QSL says they run 10 gallons.

WEH	WAQ	WLF
COASTAL HARBOR RADIO		
RADIO <input checked="" type="checkbox"/>	TXN <input type="checkbox"/>	QSL <input type="checkbox"/>
DATE March 23, 1970		
XMTR POWER 400W INPUT		DIAMOND STATE TELEPHONE 901 TATNALL STREET WILMINGTON DELAWARE
ANT 1/4 λ VERTICAL		

Coastal telephone station WAQ in Delaware sent this nifty QSL to Terry O'Laughlin, WB9GVB, for reception of their signals. This station is on 2558 kHz.

August through October. In the west Pacific, typhoons can occur all year round, but the major occurrences are from May through December.

GULL, TEAL, and SWAN units use a modified version of the Lockheed Hercules transport. These are either WC-130 E or H models.

Logging these weather recon aircraft are easy, as they are heard on commercial aero freqs with position reports, and via the USAF Global Command & Control System stations, passing weather observations.

During the hurricane season, both GULL and TEAL will normally phone patch via MacDill or Albrook (see last month's column for frequencies).

Weather observations are phone patched in to one of two stations: Miami or Mather Monitor. Miami Monitor is the national hurricane center, and all data to it is of a civilian nature and application. Mather Monitor is the USAF global weather data collection center at Mather AFB near Sacramento, California. Hence WX obs to Mather Monitor are military oriented.

In the USAF inventory there are only 13 WC-130E/H aircraft. These are distributed among the 53rd, 54th WRS, and 920th WRG, and as such, each unit has but a small handful operated by each squadron. This has a definite bearing on monitoring these aircraft, for during the course of a year, it is possible to log dozens of different GULL, TEAL, or SWAN callsigns. The numerical portion of their IDs are not IDs of a specific aircraft. Instead they are mission or aircrew references. Hence if you QSL, say, five different GULL callsigns, it is possible that you will have monitored the same exact aircraft. A way to ascertain this is to request the aircraft tail number data on your PFC.

LARK Callsigns

The LARK unit is engaged in military weather recon activity and is the only unit to use the WC-135s (a version of the KC-135 tanker). No LARK has been heard passing WX obs to Mather Monitor. If they do transmit this data while airborne, it is via secure means. The only way to log a LARK will be from position reports to a commercial aero ATC station, or via non-WX obs phone patches via a USAF GCCS station. LARKs will be more difficult to QSL because of possible security restrictions applied to their missions. I might add that the LARKs normally fly back and forth between Elmendorf AFB Alaska and Yokota AFB Japan. This takes them parallel to a portion of the Soviet Pacific coast. I mention this because at Eielson AFB Alaska, there is a SAC RC-135 unit that operates in the same area for strategic electronic recon purposes. Both types of C-135s have a very similar radar return configuration, and since both units are engaged in military recon activities, their movements are of particular interest to the Soviet military. Not too long ago, this cloak-and-dagger game had a tragic outcome when Korean Airlines flight 007, which normally flies a similar route, strayed over Soviet territory and was shot down with the loss of all passengers and crew.

QSLing Policies

The military services of the USA have been slowly evolving a policy in regard to reception reports to aircraft. In the past your report ended up in the hands of the aircraft commander or the radio officer. Nowadays this is not always the case. Your report often ends up being read and verified by one entitled, "Base Frequency Manager." It is the duty of this individual and the staff not only

to determine the validity of your report, but to insure that if verifiable, this would not violate any military security restrictions. This serves not only to enforce comms policy, but to relieve overworked aircrews from any additional burden. So don't be surprised if the signature on your QSL bears a base frequency manager/officer designation.

NOAA Hurricane Hunters

The U.S. Department of Commerce conducts severe weather research with a small fleet of aircraft. These include versions of the C-130 Hercules and the Lockheed P-3 Orion. These aircraft use an "NOAA" call-sign prefix followed by two numbers. They can be heard in comms with commercial ATC stations, USAF GCCS stations, and DIRECTLY with Miami Monitor. In DIRECT comms, Miami Monitor uses the call letters KJY74. The most active direct air/ground freqs are: 3407, 4668, 5562, 6673, 8876, 10015, 11396, 13354, and 17901 kHz USB voice.

At this time I cannot add any information. A request for current data/addresses/QSL-ing policies did not show up in time to be added to this column. Hopefully it will, and can be included in the next CommCo.

U.S. Antarctic Operations

The months of October through February encompass the annual scientific research season down on the ice. During this time, while we in North America contend with old man winter, it is summer in Antarctica.

U.S. scientific research is managed by the National Science Foundation on behalf of the U.S. Antarctic Research Program (USARP). The U.S. Navy provides the logistical support.

The U.S. has four permanent stations—McMurdo, Siple, South Pole, and Palmer. McMurdo is the metropolis of Antarctica and is not only the largest facility, it is also the central logistical supply hub for all U.S. Antarctic activities.

Air support is the key element, for without it, men and material could only reach Antarctica by sea, and then would have to be transported over land to the other stations and temporary summer camps. This air logistical support is the duty of the U.S. Navy unit, "ANTARCTIC DEVRON SIX" (Antarctic Development Squadron Six). Its naval squadron designation is VXE-6, and their official name/insignia is the "Puckered Penguins." Tongue in cheek, they refer to themselves as Antarctic Airlines.

VXE-6 utilizes a half-dozen specially modified Lockheed C-130 Hercules transports. These are configured for cold weather operations and are equipped with a combination standard wheel and ski landing gear assembly.

The U.S. Navy mans and maintains this fleet of LC-130 F/Rs, but the aircraft themselves are owned by the National Science Foundation. VXE-6 also operates six UH-1N helicopters (twin engine Bell Hueys).

Although the season doesn't officially be-

gin until October, in August McMurdo is visited by elements of VXE-6. One or two LC-130s depart their home base at NAS Point Mugu, California, and make a 26 hour, 6,000 mile flight to Christchurch, New Zealand. Over a period of a few weeks, the LC-130s then make several round trips to McMurdo, bringing in supplies that will be utilized for the initial seasonal start up. By the way, the Christchurch to McMurdo leg is an 8 hour, 2,200 mile flight. Afterward, these aircraft return to NAS Point Mugu.

In late September, the entire VXE-6 fleet deploys to Christchurch. Now begins a massive airlift of men and material from the Christchurch Antarctic support facility to McMurdo. During a six week period from October into November, when the ice runway outside of McMurdo is still thick enough, USAF C-141 Starlifters will fly in payloads of up to 50 tons per flight. All of this influx of men and material arrive at Williams Field, which is roughly seven miles from McMurdo. Snowcat vehicles provide a shuttle service from Williams Field to the sprawling McMurdo complex.

Whereas McMurdo is situated on Ross Island, Williams Field is located on the Ross ice shelf. It is nothing more than a stretch of ice bulldozed down to a level surface. Its control tower is a mobile unit; all fuel is kept in giant rubber bladders and simply laid on the ice. There are no hangers and all routine maintenance must be accomplished out in the open. If any major problem develops, the aircraft must be flown back to Christ-

church. A few years ago, a USAF C-141, upon taking off from Williams, couldn't get one of its main landing gear to retract. There was no option but to fly the 2,200 miles to Christchurch with the gear hanging down. The C-141 eventually made a successful emergency landing at Christchurch.

Even more primitive conditions exist at the Siple and South Pole stations. The South Pole station is at an elevation of just over 9,000 feet, so conditions there are always on the chilly side. The normal procedure is for the LC-130 aircraft to keep all of its engines running while on the ground at South Pole. Any prolonged shutdown could require up to 18 hours to bring the aircraft back to flight-ready conditions.

A tour of duty with ANTARCTIC DEVRON SIX is a demanding one, both on the aircraft and its personnel. It is a credit to the unit that, despite primitive conditions and a hostile environment, they successfully carry out their missions.

Reasons for "roughing it" at Williams is that the ice shelf moves, so with every successive season, a new runway must be plowed. Otherwise, Williams will move farther and farther away from McMurdo, eventually breaking up.

By late November the Ross Sea has eaten away the underside of Williams Field to the point of the ice being only some seven feet thick. Once this occurs, the ice runway is abandoned, and the LC-130s then operate from a prepared snow skiway.

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diminishing ice shelf and plow a channel into Winter Quarters Bay at McMurdo Sound. Once this is accomplished, cargo laden ships bring in additional supplies.

The LC-130s of VXE-6 usually fly four missions per day between McMurdo, Siple, and the South Pole, and sometimes shutting back and forth between McMurdo and Christchurch. The Palmer station is located on the Antarctic peninsula and is not serviced by VXE-6. Instead it is supplied by sea via Argentine ports.

When the season is in full swing, VXE-6 also supplies several summer camps that have been set up on a seasonal basis. Byrd Surface Camp and Dome Charlie are two that have been used for the past several seasons. Local area support is carried out by the VXE-6 fleet of UH-1N helos.

By February, the Antarctic summer is rapidly coming to an end. Three of the UH-1N helos will be left behind at McMurdo to provide logistical support for any winter time research. The other three are transported back to NAS Point Mugu for overhaul. The LC-130 fleet now reverses itself, flying out men, equipment, and accumulated scientific material back to Christchurch. Left behind at the four U.S. stations are a skeleton staff of naval support personnel and scientists. For extended periods of time, they will be totally isolated from the outside world, except for radio comms.

U.S. Antarctic Comms

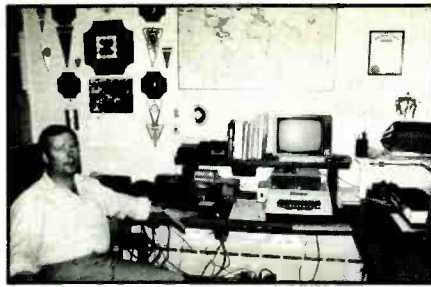
Air/ground comms are carried out on the primary frequency of 8997 kHz USB voice. The alternate freqs are: 5726, 11255, and 13251 kHz. Williams Field has no HF, so ATC duties are handled by McMurdo. In air/ground comms, McMurdo often IDs as "MAC CENTER." The LC-130 aircraft use an "XRAY DELTA" callsign prefix followed by two numbers. These numbers should range from 00 to 07. The UH-1N helos have no HF capability.

On 8997 kHz you will hear McMurdo, Siple, South Pole, the XRAY DELTA LC-130 callsigns, and if propagation conditions are good, possibly one or more of the summer camps. The best heard station will be Christchurch, for there seems to be just as much airborne activity between Christchurch and McMurdo as there is Antarctic overland flights.

Remember that during October and November, USAF "MAC" aircraft will also be heard. In addition you may hear "KIWI ###." These are C-130 aircraft from Number 40 Squadron of the Royal New Zealand Air Force, showing support for their Antarctic stations.

A point of interest: South Pole will ID as such, but its official name is the "Amundsen-Scott South Pole Station."

The best time period to monitor these air/ground ops are between 0400 through 1000 GMT, with 8997 kHz almost always being the primary frequency. For reasons stated, Palmer station will not be heard on this net. By the way, 8997 kHz is an active U.S. Navy frequency. During the above



Darryl Symington, N8EBR, of Holland, Ohio is not only a POP'COMM reader, he also publishes an excellent Ohio frequency guide for scanner owners.

time periods, and at other times, you can hear tactical naval callsigns and encrypted RTTY that are not associated with the Antarctic network.

Other U.S. Antarctic Comm Nets

U.S. Antarctic stations have their own station-to-station comm net. On occasion, Antarctic stations operated by other nations can be heard communicating with the U.S. facilities. The primary USB voice frequency is 11552 kHz. Alternate freqs are 13678.5 and 14766 kHz. The best time to monitor is between 2300 through 0300 GMT.

U.S. Navy MARS is quite active down in Antarctica. During the winter over period, these MARS stations provide the only direct link between the personnel in Antarctica and their families back home. The primary frequency is 13974.0 kHz USB voice. The best time to monitor is between 2200 and 0200 GMT.

For you RTTY buffs, U.S. Antarctic stations have been monitored running 75/850n or 75/170n on the following freqs: 9075, 9127, 10130, 10862.5, 11027, 13683 and 13975.5 kHz. The best time to monitor is local early evening to sunrise.

SWBC Outlet

Although not a utility station, there is a shortwave broadcast facility down at McMurdo. It is the American Forces Antarctic Network (AFAN) operating 24 hours a day on 6012 kHz AM mode. The best time to hear it appears to be the 0700 through 1100 GMT period.

U.S. Antarctic Callsigns

Below is a list showing station name, U.S. Navy call letters, and U.S. Navy MARS calls:

McMurdo	NGD	NNNOICE
Siple	NQU	NNNOICF
South Pole	NPX	NNNONWB
Palmer	NPG	NNNOKMR
Williams Field	NZCM	NNNONGQ
Byrd	NBY	NNNONGX

Mailing Addresses

For McMurdo, Siple, South Pole, and any temporary facility, all have the same basic address: c/o USNAVSUPPFOR—

ANTARCTICA, FPO San Francisco, CA 96692.

How you "head" the address depends on the station. If heard on air/ground or station to station freqs, use station name and call letters. An example is:

"McMurdo Communications Station—NGD . . ."

If heard via MARS, use MARS callsign and station name. An example is:

"US Navy MARS station—NNNOICE McMurdo . . ."

For aircraft of the VXE-6 squadron, use: Aircraft Xray Delta ##, c/o USNAVSUPPFOR—Antarctica, ANTARCTIC DEVRON SIX—Williams Field McMurdo, FPO San Francisco, CA 96692.

*Note: If you log a VXE-6 aircraft during August or near the end of the season in February, your best bet is to send the report via their home base. This would be: Aircraft Xray Delta ##, ANTARCTIC DEVRON SIX, Det. NAS Point Mugu, Point Mugu, CA 93042.

Christchurch comms are handled by New Zealand personnel working for U.S. Antarctic operation: USNAVSUPPFOR—Antarctica, Detachment Delta, Christchurch ATC Radio, FPO San Francisco, CA 96601.

For the SWBC AFAN station, the address is: AFAN McMurdo, USNAVSUPPFOR—Antarctica, FPO San Francisco, CA 96601.

(In case you haven't already figured it out, USNAVSUPPFOR stands for: U.S. Naval Support Forces.)

Report Enclosures

All stations reachable via FPO require only the standard First Class postage rate to mail to. Return postage is therefore just the appropriate postcard or First Class letter stamp. Include a prepared card or letter to all stations. Only the MARS outlets have their own QSL cards.

Antarctic Reception

Radio reception will be the big question mark for this 1985/86 season. We are but a few years from the next minimal solar sunspot cycle, yet last year Antarctic comms were poor. They were fair but readable throughout October; beyond early November the bottom fell out. After that, only during infrequent evenings/mornings were QSA levels up to a point where the comms were readable. Hopefully this year there will be a marked improvement in reception.

By contrast, during the last minimal period (1976/77), U.S. Antarctic comms were easily heard in North America. To illustrate just how good they were, your Editor has a QSL from a USCG helicopter (from the USCG icebreaker *Polar Star*) in comms with McMurdo, while sitting on the ice. So there is both anticipation and worry over how this season will pan out, monitoring-wise.

In any event, on 8997 kHz, Christchurch will be the station with the best signal strength. The LC-130 aircraft will normally be heard at better levels than the Antarctic stations. This is due to their elevated trans-

mitting platform, allowing for more slant angle refractions off of the F2 layer. By the way, don't be surprised to hear a YL radio operator at either one or more of the stations, or aboard the LC-130 aircraft. U.S. Navy Antarctic duty is a non-combat assignment, so if women qualify, they're assigned.

Next month we will explore Antarctic stations operated by nations other than the United States.

Kermadec Islands

This island group is located approximately 500 miles NNE of New Zealand, and 900 miles SSE of Fiji. The New Zealand Meteorological Service has established a weather station on Sunday Island, which is more commonly called Raoul Island. They are heard on HF using a ZME callsign prefix, and although audible throughout the year, it is less traumatic on the ears and nerves to do so during the quieter winter months.

Raoul does offer the opportunity to log and QSL a South Pacific island group that cannot be done by any other means.

All comms are DUPLEX USB voice. For you utility neophytes, that means that Raoul transmits on one frequency but receives on another.

The normal procedure is for Raoul to call up Wellington (New Zealand). This is done with a distinctive New Zealand accent, and in a very rapid machine gun like delivery. In the call up, Raoul will usually announce the specific Wellington callsign/frequency it is hailing. Once duplex comms are established, weather observations are passed. Most often one or more of the personnel at Raoul will then place a radiotelephone call. If not, the comms could last but a few minutes total. When R/T patches are made, Raoul may be up for 60 minutes or more.

Raoul operates on the following frequencies: ZME 3-9950, ZME 6-12152.5, ZME 20-7890, and ZME 22-4601 kHz.

To monitor Raoul, try 12152.5 kHz around 0200-0300 GMT; 12152.5 or 9950 kHz around 0500-0600 GMT; and 7890 or 4601 kHz around 1100-1200 GMT. Time lines are approximate as Raoul has shown up (over the past several years) in almost all of the hourly time periods between 0200 and the DXers local dawn. The above time slots reflect the periods when Raoul was most often encountered.

Raoul prefers to work ZLX59 Wellington on 11550 kHz. Other Wellington possibilities are ZLZ38 on 8080 kHz and ZLX95 on 13580 kHz (ZLX95 is listed as NZ Navy). During 1100-1200 GMT, Wellington most often uses ZLZ51 on 5225 kHz.

While we're at it, there is another NZ weather station that can be heard on the Raoul freqs and others. It is Campbell Island, located about 500 miles south of New Zealand. Even under the best of conditions, Campbell will be difficult to hear in North America. It has the same duplex comms setup. Its freqs are: ZLBC 3-7890, ZLBC 4-9950 kHz, ZLBC 5-4601, ZLBC 6-12152.5, and ZLBC ??-11552 kHz. It normally works the same Wellington sta-

tions as Raoul. In the few instances when Campbell was heard in North America, it was during the 0430-0530 GMT period.

Raoul should be readable (during winter) on the east coast and easily heard on the west coast. Campbell, as I said, will be a problem even on the west coast. Raoul has its own QSL card, so only 2 IRCs are required. The QSLing policy of Campbell is unknown, so assume you provide a PFC plus 2 IRCs.

The mailing address for ZME Raoul is: Raoul Island station ZME, c/o Overseas Mail Branch, C.P.O., Auckland, New Zealand.

For Campbell, try substituting Campbell Island in the above address.

One point I should mention—comms are duplex but there have been instances while monitoring Raoul or Wellington that one also heard the other side on the same frequency. It is assumed that they are using separate transmit and receive units, and while receiving, the transmitter is not muted. This allows the receiver audio to go out via the transmitter, producing an inadvertent loop back. Then again, this could be purposely done to allow the other station to monitor and ascertain its own transmission values as received by the other station.

Western Australian Police

During the winter months, the Western Australian Police radio net is surprisingly easy to monitor in the western portions of North America. East coast monitors may find it more of a challenge. Predominately, the traffic concerns itself with administrative matters.

Comms are catch as catch can, but the best time period to monitor is from 0800 GMT through your local dawn. Frequencies are 4560 and 7760 kHz USB voice.

It should be noted that both freqs get their share of QRM. The frequency 4560 is a USAF MARS. Occasionally military tactical callsign traffic has also been noted. The frequency 7760 kHz gets splash over QRM via the CW marker from the U.S. Embassy station, KWL90 on 7762 kHz.

Stations to be heard are:

VKI-Perth (net control station)
 VL6JA-Albany
 VL6JB-Bunbury
 VL6JC-Kalgoorlie
 VL6JD-Narrogin
 VL6JE-Geraldton
 VL6JF-Northam
 VL6JG-Norseman

VKI Perth should be relatively easy to hear, but the other stations, not so.

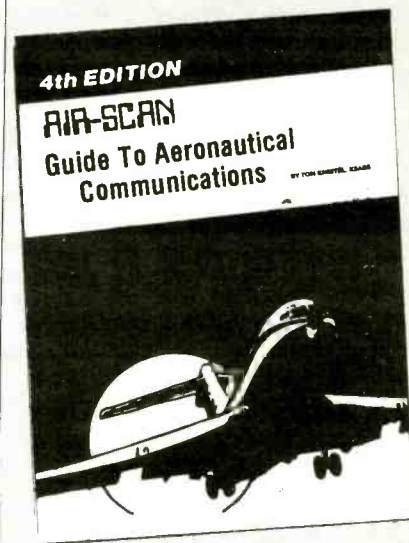
Voice idents are variable. Examples you may encounter include: "JA this is VKI," "JA Albany this is VKI Perth," and "Albany this is Perth."

Only the mailing address for VKI Perth is known: Perth Police Radio - VKI, Technical, Communication & Scientific Branch, 2 Adelaide Terrace, East Perth, WA 6000, Australia.

Include 2 IRCs and a PFC (they have no QSL card).

The winter season in North America can

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be a bone-chilling experience for many of us. From the radio monitoring aspect, it is the best time to seek lower HF stations, others that are low powered, and some that have been tough to hear due to summertime thunderstorms and an overactive ionospheric layer.

Next month we will take another look at Antarctica and a few other interesting and challenging radio activities that are best heard during our cold, snow filled season.

Local SWL Clubs

All of us are familiar with the major SWL clubs that boast large memberships, including participants from other nations. At the same time, there are also dozens of regional and local clubs with small but dedicated memberships. Local clubs cannot compete with their big brothers, but offer the unique advantage of having a large percentage of its members in close proximity, enabling them to meet, sit down, and rag chew about the hobby.

One requirement on obtaining accreditation by ANARC is that a local club must have a minimal yearly membership total. Many never can attain this, while others strive to expand their club to meet this goal. A major reason why local clubs have low memberships is because they cannot financially afford to advertise. Hence, they must rely on word of mouth. So by word of mouth, I pass the following on to you.

In the Big Apple (the New York City area), there is a club called the "New York City DX Association," NYDXA for short. Its SWL coverage is general in nature, with a leaning toward the utilities. NYDXA publishes a bulletin and its membership fee is quite modest. Considering the size of the New York metro area, there should be a potential for many SWLers who like to rub shoulders with fellow buffs to be able to do so via a local area club, even though they may already belong to one of the big boys. For you NYC area buffs, if this is something that

piques your curiosity, why not check it out. You can write or call for information: New York City DX Association, c/o Gregg Baker, 4103 Fort Hamilton Parkway, Brooklyn, NY 11219, tel: (718) 981-4866.

By plugging NYDXA, this is not to be inferred an endorsement by POP'COMM nor this column's editor. It is more of a public service announcement. As an active SWLer, you read POP'COMM and join a major radio club with the purpose of expanding your knowledge and expertise. Belonging to a local or regional club can likewise become an additional means to this end.

Local clubs struggle for existence, and if any need some media exposure, space permitting, I'll be happy to oblige. That, after all, is one of the purposes of CommCo—to explore and inform about the world of utility monitoring and communications from all avenues of this varied subject.

Let's cross our fingers that this winter season, old man Sol will minimize sunspot blemishes and not tear loose with any major or prolonged flares. The quieter he is, the better for us to roam the world from the comfort of our own home.

Intercepts

Here are this month's intercepts:

- 524:** "HEH" beacon, Newark OH at 0812 GMT. (Terry O'Laughlin, WB9GVB, Madison, WI)
530: "NB" beacon, North Bay, Ontario, at 0813. (O'Laughlin, WI)
1610: TIS station, repeating air terminal info tape (parking, etc.) for Ft. Lauderdale Int'l. Airport FL at 0800. (Greg Dones, Alexandria, VA)
2775: DAO, German Hydrographic Institute, time pulses from 2355 to 0006 GMT, announcement in USB. (George Osier, Norfolk, NY)
3500: A reporter to this column claims that the FCC has financed propagation test transmitters located at the transmitter site of broadcast station WLW in Cincinnati OH. Transmitters supposedly send out a steady unmodulated carrier on 3500, 7000, 14000, and 21000 kHz. How about it, readers—any more information on this? ("Bubba," Orlando, FL)
4079: RMP in CW at 2317 GMT sending encrypted (5 letter groups) to RMIJ. Possible Soviet naval? (Robert G. D'Imperio, Villas, NJ)
4145: Hotel Eight Oscar and other tactical station heard (USB) nightly from about 0200 GMT. (Matt Blaze, WB2SRI, New York, NY)

4550: Petroleum helicopter net offshore LA/TX coast. Flight plans and other relevant info when choppers are out of VHF range. Also noted on 8070 kHz most nites. Base station located 100 miles south of Lafayette LA. (Tom Marcotte, Duson, LA)

4704: USN Tactical Data System's LINK-11. Also noted on 4718, 4800, and other frequencies. Have a strange "doink, doink, doink, hiss" sound which some listeners have reported as "unusual CW." LINK-11 is a simplex data net with crypto security. It is used to pass radar tracks between ships, aero, shore stations. These sigs also noted in the UHF aero band. (Jim Christopher, Dana Point, CA)

4723: MVU, West Drayton RAF, UK, aviation weather by OM in USB at 0011 GMT. (Osier, NY)

4833.5: "Shipyard Control" to "USS Farragut" in USB at 2125 GMT. This was a lengthy radio check. (Phil Haub, River Vale, NJ)

5158: "Green Giant," "Delta Hotel" and other stations using SSB here are the Naval Reserve units in the Naval Reserve Readiness Command Region 1 (New England). Also noted using 7595, 13975, and 17540 kHz (7595 kHz is primary). Power levels range from 25 watts to 250 watts and some RTTY has been noted too. This is an administrative net. (A. Nonymous)

6673: Hurricane net with "NOAA-43" as net control for aircraft comms during last year's hurricane "Diana," may be worth watching this frequency this year, too. Also noted on 5562 and 3407 kHz. RTTY advisories from Miami are on 5925 kHz. (David R. Alpert, New York, NY)

6693: Halifax Military Radio working "3BTM" with coded traffic. USB at 0315 GMT. (Jerry Reamer, San Diego, CA)

6740.6: Illegal "outbander" net running LSB at 0352 GMT. Lots of swearing and shouting and one net member was obviously quite drunk. These were commercial fishermen 75 miles NW of San Francisco. Listen after about 0300 GMT nightly. (Reamer, CA)

7357: CAK, Los Cerrillos Air Base, Chile, with RTTY (850/67) "RY" marker at 0309 GMT. (Dallas Williams, WA0MRG/0, Sedgwick, CO)

7450: "61C" and "61G" in USB at 0302 GMT. Sounded like an outbander net. (Reamer, CA)

8207.6: Mississippi River traffic in USB at 0635 GMT. (Ted Moran, Chicago, IL)

8289: Whiskey Alpha Mike, Eastern European language stating that the USCG was on board at 0320 GMT. (Dones, VA)

8518: 4XZ, Haifa Naval Radio, Israel, CW marker followed by crypto traffic at 0220 GMT. (D'Imperio, NJ)

9980: FAX transmission (parallel with 18996 kHz) daily at 1300 GMT sent out by Norwegian press; starts off with a weather map followed by world/local news and ending with a cartoon. (A. Nonymous, Canada)

12823: CTP96, Oerias Naval Radio (NATO), Portugal at 1611 with CW marker. (W. Mayer, Allentown, PA)

13873: FTN87, Paris Observatory, France. CW ID at 1252 followed by time pips at 1255 to 1300 GMT then CW again. S/off at 1302. (Osier, NY)

13977: Phone patch via AGAOH0, Howard Air Base, Panama, at 2055 GMT. (D. Saunders, E. Brunswick, NJ)

14905: Head Cap 22 calling net in USB at 1530 GMT. Stations checking in included Blue Flight 100, Profile 12, Rocky Mountain 4, and Wigwam 4. This is a CAP net. (Williams, CO)

16480: "MINREX" and "EMBACUBA" (Cuban Ministry of External Affairs) with RTTY (425/67) crypto and poorly sent CW at 1650 GMT. (Williams, CO)

16706: UOOU in CW at 2005 GMT in contact with USTA, UBQM, UHJQ, UYUX, UWSB, USKX, and other Soviet vessels. (Ralph Cameron, VE3BBM, Nepean, Ontario)

18665: At 1510 GMT an unknown USB station calling Easter Island. (Marcotte, LA)

22050: SX calling SW in USB at 1215 GMT. Watz? (Ted Moran, Chicago, IL)

22412: HPN60, Puerto Armuellas, Panama, calling CQ in CW at 2015 GMT. (Mayer, PA)

Send all "ute" intercepts of SSB/AM/CW stations to Don Schimmel, our new Intercepts Editor, Popular Communications, 76 North Broadway, Hicksville, NY 11801. Utility station intercepts should be listed by frequency (in ascending order) and contain information on callsign or ID, location (if known), mode, time (in GMT), and type of communications monitored. **PC**

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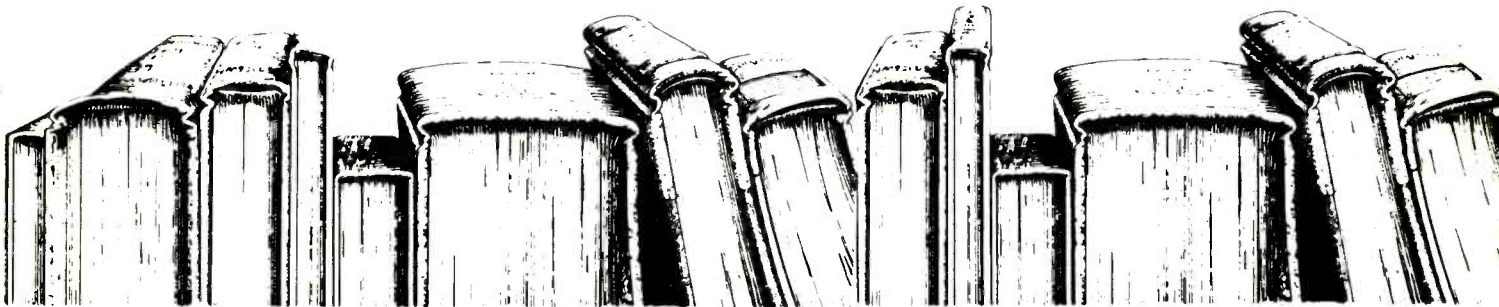
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SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

It has become a multimillion-dollar business; real and perceived threats in all varieties have forced businesses and institutions—both large and small—to develop all types of security systems.

Whether systems as simple as closed-circuit cameras or intercoms are used, or systems as elaborate as perimeter detection or infrared viewers are employed, radio communications often plays a key role in the protection of lives and property.

Almost all large employers use some type of security force: It might range from a force as small as a receptionist in direct radio contact with a patrolling guard to a squad as large as a full complement of uniformed guards and vehicles. If the firm's spread is large enough, helicopters and airplanes might even be employed.

Although there are no frequencies specifically allocated by the Federal Communications Commission for security use, business band and manufacturers radio service channels are most often used for corporate guard services. The systems available can range from a simple simplex arrangement allowing hand-helds to communicate with each other, a system allowing a base station dispatcher to be in contact with hand-helds and mobiles, to a system employing repeaters for extended coverage within or outside a building, complex, or region.

Some companies might even use a primary channel for security operations and dispatching with a second portable-only channel held in reserve for in-plant surveillance assignments. Security operations also might be carried out on company maintenance or paging channels. If a repeater is used, don't forget to see if they are using "talkaround," the repeater's output frequency for short-range simplex operations.

Some security operations might also pop up on itinerant business channels. The itinerant business channels are: 27.49, 35.04, 151.625, 464.500, 464.550, 469.500, and 469.550 MHz.

In addition to private security guards hired by companies and institutions for their own forces, there also are guard services that provide guards for hire for smaller firms and warehouses. Many guard services use UHF or 800 MHz area-wide repeaters to enable security supervisors to communicate anywhere there are assignments in a metropolitan area. The guard services also might use the itinerant business channels for special investigations at a particular site.

For short-range communications, for either surveillance or on-premises operations, don't forget to check low-power business band channels that might be sufficient for some security operations. These channels



Here's the scanner installation in your columnist's car. The Regency HX1000 sits on the dashboard ledge and an angle adapter adjusts the rubber duck so it is vertical. Excellent reception is obtained without an outside antenna. (Photo by Chuck Gysi, N2DUP)

include: 27.51, 27.53, 30.84, 33.14, 33.40, 35.02, 42.98, 154.570, 154.600, 457.525, 457.550, 457.575, 457.600, 467.750, 467.775, 467.800, 467.825, 467.850, 467.875, 467.900, and 467.925 MHz. There are also dozens of UHF 12.5 kHz spacing "splinter" channels that can be used for up to 2 watts of power. The business band splinter channels are those located 12.5 kHz between regular UHF business band channels in the 460-470 MHz band. The manufacturers radio service also has 12.5 kHz split channels between regular 25 kHz spacing channels in the 451 and 456 MHz bands.

The manufacturers radio service has frequencies available in the 153 MHz (153.035-153.395 at 15 kHz spacing); 158 MHz (158.280, 158.295, 158.310, 158.415, and 158.430); 451 MHz (451.175, 451.225, 451.275, 451.375, 451.425, 451.475, 451.525, 451.575, 451.625 and 451.675); 456 MHz (the corresponding 5-MHz higher mobile channels for the 451 MHz frequencies); 462 MHz (462.200-462.525 at 25 kHz spacing); and 467 MHz (the corresponding 5-MHz higher mobile channels for the 462 MHz frequencies) bands.

Many security forces use what are sometimes known as "local control" UHF channels for their operations. These eleven 464-MHz business band channels can be used by businesses as long as their base antenna does not exceed 100 feet in height above the ground, the transmitter does not exceed 100 watts, and the area of operation of the mobiles or hand-helds does not exceed a 75-mile radius from the base or repeater transmitter.

The frequencies for local control are:

464.325, 464.375, 464.425, 464.475, 464.525, 464.575, 464.675, 464.775, 464.875, 464.925, and 464.975 MHz. Mobiles and portables may operate on the associated 5-MHz higher channels in the 469 MHz band for repeater or duplex operations. The 469 MHz channels also might be used for hand-held to hand-held operations on a simplex system sometimes.

These local control channels often are in use for security at high-rise office buildings, corporate offices, shopping malls and department stores, stadiums, schools and universities, hospitals, hotels, airports, museums, libraries, casinos, apartment complexes, zoos, amusement parks, golf courses, nursing homes, cemeteries, etc.

Other frequencies that may be used by security forces include those in the petroleum radio service at oil refineries, power radio service at nuclear reactors and generating stations, railroad radio service at rail yards, and motion picture radio service at film production studios. In addition, special emergency channels in the 155 MHz band often are used by hospital security forces.

The general mobile radio service channels—462.550, 462.575, 462.600, 462.625, 462.650, 462.675, 462.700, and 462.725 MHz, and the corresponding 5-MHz higher mobile channels—also can be used by security guards. For instance, American Telephone and Telegraph Co. uses some of these channels for security at most of its New Jersey installations.

Knowing where to listen is half the battle in trying to track down a user's radio frequency. Security operations can pop up in so many places, one must be patient in trying to track down the exact frequency. If possible, first try to establish what band is be-

ing used by looking at base, mobile, or hand-held antennas. If the antennas are long, perhaps low band is being used. Medium-sized antennas might indicate VHF high band, stubby antennas might indicate the UHF band, and those little, tiny antennas that you sometimes can hardly see might indicate the 800 MHz band. The basic rule for quarter-wave mobile antennas are: 60-100 inches for VHF low band, 18 inches for VHF high band, 6 inches for UHF, and 3 inches for 800 MHz.

Casing The Radio

Robert James Crane of St. Catherines, Ontario, writes to say he recently purchased a Realistic Pro 30 hand-held scanner, but is having trouble finding a suitable carrying case for the radio. I don't know what Robert means by "suitable," but there is a manufacturer of leather cases for portable two-way radios, pagers, and instruments. The company claims to have carrying cases in stock for most makes of portable two-way radios on the market today, and one of them might fit your hand-held. I called BEE Electronics and they said they don't make any cases specifically for hand-held scanners, but because they had some inquiries, they are considering making them. You can write to BEE Electronics Inc. at 10001 Derby Lane, Suite 204, Westchester, Illinois 60153, or call them at (800) 336-3115.

As we usually say about this time, we welcome and invite your letters, questions, frequency lists, and photographs here at Scanner Scene. We really need some photos of those listening posts out there. How about it folks? Get out the camera and take a photo of your gear at home or in the car. Let's hear from you. Write: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801-2909. **PC**

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WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

FCC Authorizes Additional Emissions For Amateurs In 1800-2000 kHz Band

The FCC authorized Amateur radio operators to use additional emissions in the 1800-2000 kHz band (160 meters).

Formerly, emission modes in the 160-meter band were restricted to telegraphy and telephony to protect LORAN-A radio-navigation systems. The Commission based its action on the discontinuance of those systems, as well as on the fact that additional emission modes are needed by Amateurs for experimentation with radioteleprinter techniques.

The Commission did not specify particular sub-bands in the 160-meter band where the emissions could be used, but urged Amateurs to follow the voluntary band plan to be developed by the American Radio Relay League, Inc.

It noted that the 1900-2000 kHz portion of the 160-meter band is the subject of another FCC proceeding (PR Docket 84-874), and cautioned Amateurs that no equities would accrue for investment in equipment that operates on frequencies between 1900-2000 kHz.

FCC Affirms Recovery Of Unloaded Channels From Houston SMRS

The Commission has affirmed an action by the Private Radio Bureau to take back nine unloaded channels from Specialized Mobile Radio Systems (SMRS) WZC-793 in Houston, Texas.

The Bureau had reclaimed the channels on January 3, 1985, because the licensee, Communications Unlimited, Inc. (CUI), did not have the 20-channel SMRS loaded to 70 mobile units per channel, as required by Section 90.366(e) of the rules.

CUI sought review of the action, alleging the Bureau had miscounted the number of mobile units in operation by twice subtracting 86 mobile units whose operation was in doubt. But the Bureau had subtracted the number only once, after CUI admitted it could not confirm the operating status of 86 of the 1,166 units it had claimed were in operation when the initial license term ended June 1, 1984.

The Bureau had initially reclaimed 11 channels from WZC-793, but CUI asked for reconsideration. It said it was entitled to keep 12 channels based on loading of "1,166 units either during the five-year license term or shortly thereafter." When asked to certify how many of the 1,166 units were actually in operation, CUI replied that there were 86 units "whose operation on the

system as of June 13, 1984, cannot be confirmed." The Bureau then credited CUI's SMRS with 1,080 units, enough to meet the loading requirements for 11 of the 20 channels. The nine unloaded channels will be assigned to other applications on waiting lists for SMRS frequencies.

The Commission found no error in the Bureau's calculation of loading levels and, therefore, denied CUI review.

FCC Adopts Two-Way Radiotelephone And EPIRB Rules For Survival Craft

The Commission has amended Part 83 of its rules to provide for the use of emergency position indicating radiobeacons (EPIRB) and two-way radiotelephones in survival craft.

This implements amendments to the Safety of Life at Sea (SOLAS) Convention. The new rules include technical standards, testing provisions, equipment approval procedures, and licensing provisions.

The new "Class S" EPIRB will be designed specifically for stowage in lifeboats to be used should it become necessary to abandon ship. The EPIRB will transmit a signal that rescue teams can follow to the lifeboat.

The two-way radiotelephone rules will enable the lifeboat's occupants to establish voice communications with persons still aboard the launch vessel, other survival craft, or rescue vessels. The rules will permit the use of UHF hand-held transmitters presently used for on-board communications or VHF marine band equipment for this.

The United States Coast Guard, in its own separate proceedings, will determine the specific requirements for carrying this equipment by various classes of ships.

Portable Aircraft License And Two Additional Uses For 122.9 MHz

The Commission proposed providing for portable aircraft station licenses in Part 87 of its rules.

Currently, requests by operators for authority to operate portable aircraft radios are reviewed on a case-by-case basis. The Commission stated that specifically providing for these licenses will better serve the aviation community.

In addition, the FCC proposed making 122.9 MHz routinely available to utility status operating at airports not having a control tower, flight service station, or aeronautical advisory station. Currently, the frequencies assigned to these utility stations at uncontrolled airports correspond to the FCC's common traffic advisory frequency

(CTAF), with the exclusion of 122.9 MHz. This addition is intended to enhance safety and improve communications capabilities.

The Commission also proposed making 122.9 MHz available for activation of runway lights at airports not having an aeronautical station utilizing one of the frequencies currently assignable. This frequency is being used increasingly as the CTAF at uncontrolled airports. The FCC said this would allow the pilot to remain on the recommended CTAF when approaching the airport at night and would, therefore, be safer and more convenient to the flying public.

FCC Declines To Mandate Narrowband In Land Mobile Bands

The FCC declined a request by the Personal Radio Steering Group (PRSG) for a rulemaking to implement a "Master Plan" requiring all land mobile users to use narrowband technology (5 kHz channels) by the year 2000.

While denying the request, the Commission noted its support for spectrum efficient technologies and utilization of the radio frequency spectrum to the fullest extent current technology will allow. However, it stated that the "Master Plan" was too broad in scope and did not provide appropriate locations involved, or the different levels of technology that exist or will be developed.

The Commission further stated that marketplace forces were still the best means of implementing new technologies. Nevertheless, it noted that if marketplace forces did not implement spectrum-efficient technology, then it may revisit this issue and consider other regulatory action.

Eligibility For Portable Ship Station Licenses And Frequency Assignments On The Great Lakes

The Commission amended its rules to eliminate granting portable ship station licenses to entities which solely install or service marine radio equipment, and designated certain marine VHF channels as primarily available for ship movement service communications in the Great Lakes.

Continuing, the FCC believes it was necessary for a service company to test newly installed radio equipment under its own portable ship station license since it can be done under the "instant" special temporary authority that is granted to boat owners by concurrently completing the combined application form, FCC Form 506 and 506-A. This will prevent unlicensed station operations by uninformed boat owners who as-

sume that after a service company installs and tests a radio, it is appropriately licensed and available for use.

Further, the Commission, in response to complaints of interference on ship movement channels in some areas of the Great Lakes, designated marine VHF Channels 11, 12, 13, and 14 as primarily available for the ship movement service in the Great Lakes. This will enhance the ship movement service, which is part of a safety system established by the Canadian and U.S. Coast Guards.

Nationwide Paging

The Commission denied National Message Network's (NMN) petition for reconsideration of its May 24, 1984, action implementing lottery procedures for network organizers in the nationwide paging service.

NMN argued that each of 16 network organizer applicants should receive its own frequency so that market forces, rather than random selection, would choose the favored licensees. In the alternative, it argued that the FCC should have a comparative hearing to determine the best applicants.

In denying reconsideration, the Commission stated that a rulemaking would be required to allocate additional reserve frequencies, and there are competing common carrier and private radio interests involved. Additionally, no evidence was forthcoming that sufficient demand exists to justify 16 network organizer frequencies. Allowing market forces to choose the best licensee has much appeal, but the amount of spectrum is too limited to permit the free competitive development of any service.

The FCC said a lottery is preferable to a comparative hearing because, although technologically more elaborate, nationwide paging is basically similar to wide-area paging, which it had earlier decided to be best handled by random selection. Second, applicants for the network organizer frequencies are no more different from one another than are any other mutually exclusive Public Land Mobile Service applicants.

Automatic Control For Amateur Stations Except For Frequencies Below 29.5 MHz

The FCC proposed expanding automatic control for all Amateur operations, except when transmitting on frequencies below 29.5 MHz.

Automatic control currently is authorized for Amateur repeaters, auxiliary links, and beacon operations. The Commission said this may be the appropriate time to expand automatic control operations in order to utilize new technology, such as Computer Based Message Systems.

Automatic control would still be prohibited where the Amateur station is transmitting third-party traffic, since a control operator must always be present when a third party is participating in Amateur radio communications.

FCC Affirms Action Denying System 800 Permission To Change Location Of SMRS Station KNEC 738 At Dover, Delaware

The Commission has affirmed a staff action denying System 800 permission to change the location of Specialized Mobile Radio System (SMRS) station KNEC 738 from Dover, Delaware, to Boothwyn, Pennsylvania.

The Private Radio Bureau also had denied System 800's alternative request for an extension of time in which to build the station at Dover.

In seeking review, System 800 asked that the action be reversed and that it be granted Special Temporary Authority to move the station or the extension of time. It also requested that construction of one channel at its proposed alternate site be considered "substantial compliance" with FCC rules and that it be permitted to retain its authorization, or, in the alternative, retain the constructed channel.

System 800 made its requests to the Bureau on the afternoon of May 17, 1984, the date its license expired. The Bureau informed System 800 that unless its system were constructed and placed in operation by that date, as required by Section 90.366D, its license cancelled automatically. Since System 800 had constructed only one channel at an unauthorized site, it could not demonstrate compliance with the rule and its license was cancelled.

In affirming the Bureau's action, the Commission noted that no circumstances beyond System 800's control prevented it from completing construction of the station within one year. Therefore, System 800's predicament stemmed from its own business decisions and it was not entitled to any relief.

The Commission said there was no basis upon which to permit System 800 to retain the one constructed channel, first because it is not at its authorized site, and second, it is less than 70 miles from KNFG 260 at Allentown, Pennsylvania, which operates on the same frequencies.

Action by the Commission February 12, 1985, by Memorandum Opinion and Order (FCC 85-68). Commissioners Fowler (Chairman), Quello, Dawson, Rivera and Patrick.

New Experimental Stations

The Commission, by its Office of Science and Technology, Frequency Liaison Branch, took the following action:

KE2XPL, CBS, Inc., New York, NY. Experimental research station to operate on 149.195, 149.220, 149.245 MHz to determine the feasibility of mobile satellite use.

KQ2XAS, Magnum Microwave Corp., Monte Bello Ridge, California. Experimental developmental station to operate on 18765 MHz for testing of equipment for use in Parts 21 and 94 prior to production of said equipment.

KQ2XAT, Magnum Microwave Corp., Mountain View, California. Experimental developmental station to operate on 19105 MHz for testing of equipment prior to production. Eventual use will be under Parts 21 and 94 of FCC Rules.

KQ2XAU, Western Geophysical Company of America, Offshore areas of Continental United States and Alaska. Experimental developmental station to operate on 72-73 and 75.4-76 MHz bands to develop and test seismic telemetry equipment for use in offshore and oil exploration.

Granted Stations to Sports Car Club of America, Inc., to develop equipment suitable for communications between security, race car driver, maintenance and emergency personnel during Grand Prix style race events. See below for locations and frequencies. All stations include a mobile operation of 1 mile radius of their fixed locations. Frequencies in () are mobile only.

KQ2XAV, Dallas, Texas: 452.900, 452.925, 452.950, 451.300, (457.900, 457.925, 457.950, 456.300) MHz.

KQ2XAW, Detroit, Michigan: 452.875, 452.900, 452.925, 452.950, 452.650, 451.300, 451.425, (457.875, 457.900, 457.925, 457.950, 457.650, 456.300, 456.425) MHz.

KQ2XAX, San Diego, California: 452.325, 452.425, 452.775, 452.825, 452.900, 452.925, 452.950, 452.725, 452.800, (457.325, 457.425, 457.775, 457.825, 457.900, 457.925, 457.950, 457.725, 457.800) MHz.

KQ2XAY, Atlanta, Georgia: 451.025, 451.325, 451.500, 452.800, 452.900, 452.925, (456.025, 456.300, 456.325, 457.800, 457.900, 457.925)

KQ2XAZ, Watkins Glen, NY: Every .025 beginning 452.775 ending 452.950 MHz and every .025 beginning 457.775 ending 457.950 MHz.

KQ2XBB, Motorola, Inc., Schaumburg, Illinois. Experimental research station is scheduled to operate on 1359.6 and 1360.06 MHz for feasibility testing of communication system only.

KQ2XBC, Motorola, Inc., Canton, Massachusetts. Experimental research station to operate on 1359.6 and 1360.06 MHz for advance feasibility only testing of communication system.

KQ2XBD, Motorola, Inc., Cupertino, California. Experimental research station to operate on 1359.6 and 1360.06 MHz for advance feasibility only testing of communication system.

KQ2XBE, Litton International Development Corporation, White Sands Missile Range, New Mexico. To operate on 2-30 MHz and 30-80 MHz to test antenna coverage on HF and UHF of communications units being developed for shipment to Saudi Arabia.

KQ2XBF, Westinghouse Communication Services, Inc., Anne Arundel, Maryland. Experimental research station to operate on 1030 MHz to test and evaluate equipment as required by U.S. Government contract.

KQ2XBT, Radio Shack, Fort Worth and Dallas, Texas. Experimental developmental station to operate on 825-845 MHz band and 870-890 MHz band for research and development of cellular equipment.

KQ2XBU, Geostar Corporation, Six (6) mile radius Princeton, New Jersey. Experimental research station to operate on 461.0625 and 461.1125 MHz to provide communication and navigational guidance essential to research project.

KQ2XBV, Millimeter Wave Technology, Inc., Atlanta, Georgia. Experimental research station to operate in 10.0-10.5 GHz band to design, build, test, and deliver equipment as required by U.S. Government contract.

FCC Proposes Prohibiting Disqualified Persons From Participating In Third-Party Communications

The Commission has proposed prohibiting disqualified persons from participating in third-party Amateur communications.

The Commission rules require an Amateur station to be under the control of a licensed operator at all times. However, the rules permit a third party, who can be any person, to participate in Amateur communications, provided the control operator monitors and supervises the transmissions.

Persons whose Amateur privileges have been terminated have wanted to take advantage of the third-party rule by participating in communications from stations licensed to Amateurs in good standing.

The Commission believes that any Amateur whose license has been revoked, suspended, or cancelled, either voluntarily or involuntarily, because of rule violations, should not be able to participate in any Amateur communication as a third party until such participation has been approved. Comments are requested as to whether this

approval should be by relicensing, by requiring the disqualified person to request and be granted written permission from the Commission to be a third party, or by some other means.

Furthermore, the Commission said that any Amateur licensee who knowingly allows a disqualified person to participate in third-party communications will be subject to sanctions for violating the proposed rule.

Private Radio License Applicant Should Use Old Emission Designators

Applicants for licenses in any of the private radio services are reminded not to use the new emission designators approved by the Commission last year. The new designators were published in the *Federal Register* December 14, 1984, but the automated license processing system for PRB applications are not yet ready for them.

Applicants should continue to use the old designators until further notice. The old designators for applicants in Parts 81, 83, 87, 90, 94, 95, and 97 are listed in section 2.201 of the Commission's rules, as published in the October 1984 edition of Title 47, Code of Federal Regulations (47 CFR).

Policies Governing Interconnection of PLMRS Stations Below 800 MHz With Public Switched Telephone Network Adopted

The Commission has adopted policies and regulations governing the interconnection of Private Land Mobile Radio Service (PLMRS) stations below 800 MHz with the public switched telephone network.

In a notice released June 12, 1984, the Commission had proposed allowing interconnection in those cities and radio services

where it now is prohibited, permitting licensees and users to share telephone service and interconnection equipment rather than to continue obtaining it separately, modifying requirements for special channel monitoring equipment for interconnected operations, and eliminating the rules which placed time limitations on the length of interconnected communications.

In amending Part 90 of the rules, the Commission noted that interconnection in the Automobile Emergency, Business, Special Emergency, Special Industrial, and Taxicab Radio Services has been prohibited within 75 miles of the 25 largest urban areas. However, modification of the rule will allow licensees in these five services to interconnect if they obtain the consent of all co-channel licensees located within the intersection of two circles: one with a radius of 75 miles around the city center and the other with a radius of 75 miles around the interconnected base station transmitter. Interconnection will continue to be secondary to dispatch operations.

Common point interconnection below 800 MHz would be allowed, with third parties authorized to act as ordering agents as long as telephone service is obtained from an authorized provider and shared on a non-profit basis, the Commission said.

Generally, licensees are required to install equipment at the base station transmitter which automatically monitors the frequencies and closes down the transmitter at the end of the allotted time for communications. However, the Commission concluded that in situations where there are no other licensees on a frequency within a given area, or when all co-channel licensees consent, there would be no need to require installation of monitoring equipment. Also, co-channel licenses would be allowed to decide whether to use FCC time limitations, to set their own, or to use none at all.

Restriction Removed On Use Of 13.2 GHz Low Power Transmitters By PLMRS

The Commission has amended Section 94.75 of the rules to exempt low-power portable temporary-fixed transmitters of Private Land Mobile Radio Service (PLMRS) operating in the 13.2-13.25 GHz band from antenna standards.

The Commission noted that broadcasters and common carriers use PLMRS equipment for portable operations in electronic news gathering, and that the transmitters' antennas are exempt from the beamwidth standards of Parts 21, 74, and 78 of the rules. Private users have a similar need for low-power portable transmitters for short range communications. However, since the antenna exemption did not apply to the private radio users eligible under Part 74, they could not use such equipment without a rule waiver. Therefore, amendment of Section 94.75 allows private radio users to use the same transmitters available in other services.



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Products (from page 60)

128-bit waveforms. Waveforms can be recalled and logically compared (And, Or, Exclusive Or) to other stored or input waveforms. RS-232 input/output port provides for a modem link capability for signal transfers as well as future expansion features.

It features 10 sources for triggering, including free-run, Ch. A, Ch. B, and trigger channel. A special trigger mode causes the LogicScope to trigger when a difference occurs between the lower and upper trace. Other features are 50-100ns glitch catcher, BNC adapter for simultaneous use of three standard BNC style test probes, AC charger/transformer, neck strap, carrying case, and detailed operations manual. Optional Triple Probe Set has three 1X-10X probe assemblies mated to an adapter head.

For more information or free catalog, write or call Jensen Tools Inc., 7815 S. 46th Street, Phoenix, AZ 85040, or circle number 102 on the reader service card.

Microprocessor-Powered Bell Type 212 Modems

Universal Data Systems introduces two smaller, microprocessor-powered 212-type modems: The UDS 212A—A 300/1200 bps modem with automatic answer, and the UDS 212A/D—A 300/1200 bps modem with auto-dial and auto log-on. Both models



feature full duplex, asynchronous operation at 0 to 300 bps, or 1200 bps data transmission of asynchronous or synchronous data. Both models operate over the 2-wire Public Switched Telephone Network. The 212A lists for \$495 and the 212 A/D lists for \$545.

The models 212A and 212 A/D feature automatic or manual answer. Both modems feature the new UDS mini-box housings which are approximately 7" x 9 1/2" x 2 1/4" and fit underneath the telephone base. Both models take up considerably less space than previous UDS 212A models.

Each model also features built-in diagnostic circuitry to test both the modem performance and the telephone line performance. The test functions allow quick and easy verification of transmitted or received data. The built-in test features include: Digital Loop-

back, Analog Loopback, Remote Digital Loopback, Self Test.

The 212A/D also features automatic dialing and automatic log-on and stores up to ten numbers with log-on sequences. Each stored number may contain up to 126 characters including log-on sequences. Telephone numbers may also be entered through the keyboard of the terminal. The built-in memory is also battery backed to allow ten year retention of numbers after power-down. The dial commands are easy to execute and can be displayed on the screen for easy reference. Portions of the log-on sequence may be hidden for security purposes.

Universal Data Systems is a part of the Motorola Information Systems Group. They are located at 5000 Bradford Drive, Huntsville, AL 35805-1953.

Beaming In (from page 4)

My problems have been made especially complicated by the fact that I've always been attracted by lonely looking old radios I spot at tag sales and flea markets. Somehow I feel an inner need to rescue them from possible capture by Philistines who won't appreciate them.

Military surplus electronics equipment has always been a special problem for me. Even the sight of the stuff takes its toll. Let's put it this way; the three things on top of my "favorites" list are Shorty's Barbecue in South Miami, Ann's Chili Dogs in Venice Beach, and military surplus radio gear. If you can recall the yogurt ads on TV and the expression the actors get on their faces as soon as they sample the sponsor's product, then you can get an idea of my reaction to surplus.

At an earlier stage of my career I wrote training films for the U.S. Army. Many were on electronics and some were classified. I remember the day I was at a certain military installation to take notes on some new communications device that needed a training film. Before they let me see this gizmo demonstrated, they spent a couple of hours impressing upon me how sophisticated and secret it was; it was a solemn occasion to say the very least.

When they finally unveiled the contraption I quickly recognized a few of the components. I was like a kid who had been led into the Big Rock Candy Mountain. Immediately I began to rattle off familiar nomenclatures

and specs, frequency ranges, operational modes. It wasn't too difficult for me to do this inasmuch as a few of the components had already gone on the surplus market and, frankly, anybody who had scanned the ads in CQ magazine would have known what an R-390 receiver was. Not these Army dudes, however. They turned out to be under the crazy impression that every nut and bolt on the table was super-secret. They stood there stony-faced and grim until I had finished my little outburst, and then they rapidly ended the meeting without so much as flipping one single toggle switch.

I spent the remainder of the day trying to explain to a skeptical Intelligence Officer how I knew "so much" about equipment that was spoken of only in hushed tones. I was given the advice "please don't know so much, you're making a lot of people around here nervous."

It's been just this kind of enthusiasm for the stuff that has caused me to accumulate a considerable amount of military surplus electronics over the years—in fact, not only military surplus equipment, but lots of other radio gear that no longer serves me any practical purpose. Much of it I've put into actual use, but I must confess that I've come into permanent custody of many things that have eluded repair, conversion, or discovery of any useful purpose. For instance, I can't imagine why I felt the need to buy two surplus Thyratron FG-105 mercury rectifier tubes. And whom did I once think I was going to ring up on a pair of Army EE-8 field telephones? What demon possessed me and caused me at one time to buy a BC-733D receiver designed for lateral blind landing aircraft guidance in the 108 to 110 MHz band?

And I have never been able to understand what in the world was wrong with good old 117 volt 60 Hz AC power. Why isn't it good enough for our Army and Navy? I've accumulated surplus gear that craves for 117 volts at 400 Hz, sets that want 24 volts, 135 volts, 450 volts, and other voltages too horrible to mention in these pages. I've found military equipment that could be worked on if only it hadn't been assembled by Munchkins with tiny tweezers after which all screws were tightened with power screwdrivers and then sealed for eternity with epoxy. I've located equipment that might be convinced to operate if only I could get a couple of those specially made IF transformers from that company that was located in Zamboanga until it went out of business in 1940.

And yet, I fear parting with any of these sets. I mean, what do you do with an old friend? You can't take it to a veterinarian to have it put to sleep. You can't put a price on an old friend and then sell it to strangers. You hesitate offering it for adoption. Can you imagine: "For adoption, one 9-year-old Irish Setter and a 40-year-old Hammarlund SP-600 Super Pro receiver. Both need a good home. Not good with children."

What's especially annoying is that over the years I seem to have lost a couple of my old friends. My mind tends to block out the

actual fate that befell individual pieces of equipment. My first real receiver was a wonderful hunk of junk—a Hallicrafters S-38. I think I callously sold it to strangers in a moment of weakness. The Hallicrafters S-40B possibly suffered the ignominious fate of being traded toward an SX-42 receiver—after I saw Claude Rains using one in the 1947 movie *The Unsuspected*, I just knew that one day I'd have to own one. And I suspect that the SX-42 may have later been the victim of a fast deal when I decided that nothing else in the world mattered unless I had a Hammarlund HQ-140X.

But no more moments of such folly! As I stand here in the attic surrounded by the odd and exotic debris of a misspent life, I wonder if I'll ever be able to bring myself to part with any more of it with a clear conscience. What about the Army GRC-9 backpack transceiver I ran out to buy after I saw one in the movie *Pork Chop Hill*? And that BC-1206 beacon receiver over there peaked my interest in longwave monitoring but it hasn't tasted a good jolt of DC in more than 25 years. The BC-221 frequency meter is no longer as accurate as the digital display on a modern communications receiver; I used to write nasty letters to WWV saying they were off frequency when the BC-221 gave them a bad reading.

And here's a Police-Alarm tunable low-band VHF receiver. I could hear coast-to-coast skip stations on this in the early 1950's.

Sitting on a shelf is an early Zenith Trans-Oceanic portable all-band receiver, big and heavy as a briefcase full of tire irons. In 1970 I found this set at a yard sale. Some maniac had extracted half of its innards before I could rescue it and give it sanctuary. I figure that someday I'll restore this set to its original glory, so there's no way I'll send it back out into a world so cruel as to mistreat this once-proud champ.

Radio nuts, at least those of us who are foolish enough to become attached to our worn-out radios, have an altogether overwhelming problem. Aunt Rose had it easy, she could toss it all into a knapsack with a draw-string top!

Anniversary Issue

This issue marks the commencement of POP'COMM's fourth year! It's as good a time as any to thank our readers for their enthusiastic support—we couldn't have done it without you.

I'd also like to take this moment to make mention of our staff here at POP'COMM—the columnists, typesetters, artists, production, and other creative folks whose talent and experience comes into play with each and every issue.

I'd like to especially mention the work and contributions to POP'COMM of Anita Hipius, our Associate Editor. Anita, who has been with us since the first issue, has been the "make it happen" person here and the magazine's most organized staffer.

We look forward to many years of continuing to bring our readers the type of features and columns you like best!

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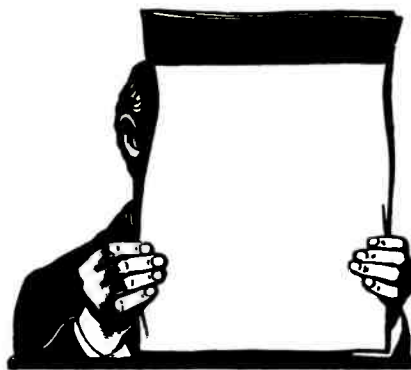
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related operating mode into any of the 99 memories. Scan the memories. Or in between them. Or simply "dial up" any frequency with the frequency entry pad.

Plus there's more, including a 24-hour clock, multiplexed output, fluorescent readout, signal strength graph, and an AC power adapter.

The FRG-8800 HF communications receiver. A better way to listen to the world. If you want a complete communications package, the FRG-8800 is just right for you.

You get continuous worldwide coverage from 150 KHz to 30 MHz. And local coverage from 118 to 174 MHz with an optional VHF converter.

Listen in on any mode: upper and lower sideband, CW, AM wide or narrow, and FM.

Store frequencies and operating modes into any of the twelve channels for instant recall.

Scan the airwaves with a number of programmable scanning functions.

Plus you get keyboard frequency entry. An LCD display for easy readout. A SINPO signal graph. Computer interface capability for advanced listening functions. Two 24 hour clocks. Recording functions. And much more to make your listening station complete.

Listen in. When you want more from your VHF/UHF or HF receivers, just look to Yaesu. We take your listening seriously.

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Dealer inquiries invited.

Prices and specifications subject to change without notice.
FRG-9600 SSB coverage: 60 to 460 MHz.

ICOM HF Receiver

IC-R71A



The World Class World Receiver

ICOM introduces the IC-R71A 100KHz to 30MHz superior-grade general coverage HF receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to worldwide communications. With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (opt.), dual VFO's, scanning, selectable AGC and noise blanker, the IC-R71A's versatility is unmatched by any other commercial grade unit in its price range.



Keyboard Entry. ICOM introduces a unique feature to shortwave receivers...direct keyboard entry for simplified operation. Precise frequencies can be easily selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control.

Superior Receiver Performance. Passband tuning, wide dynamic range (100dB), a deep IF notch filter, adjustable AGC (Automatic Gain Control) and a noise blanker provide easy-to-adjust clear reception even in the presence of strong interference or high noise levels. A preamplifier allows improved reception of weak signals.

32 Tunable Memories. Thirty-two tunable memories, more than any other general coverage receiver on the market, offer instant recall of your favorite frequencies. Each memory stores frequency, VFO and operating mode, and is

backed by an internal lithium memory battery.

Options. FM, RC-11 wireless remote controller, synthesized voice frequency readout, IC-CK70 DC adapter for 12 volt operation, MB-12 mobile mounting bracket, two CW filters, FL32-500Hz and FL63-250Hz, and high-grade 455KHz crystal filter, FL44A.



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First in Communications

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All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. R71A1084