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POPULAR COMMUNICATIONS

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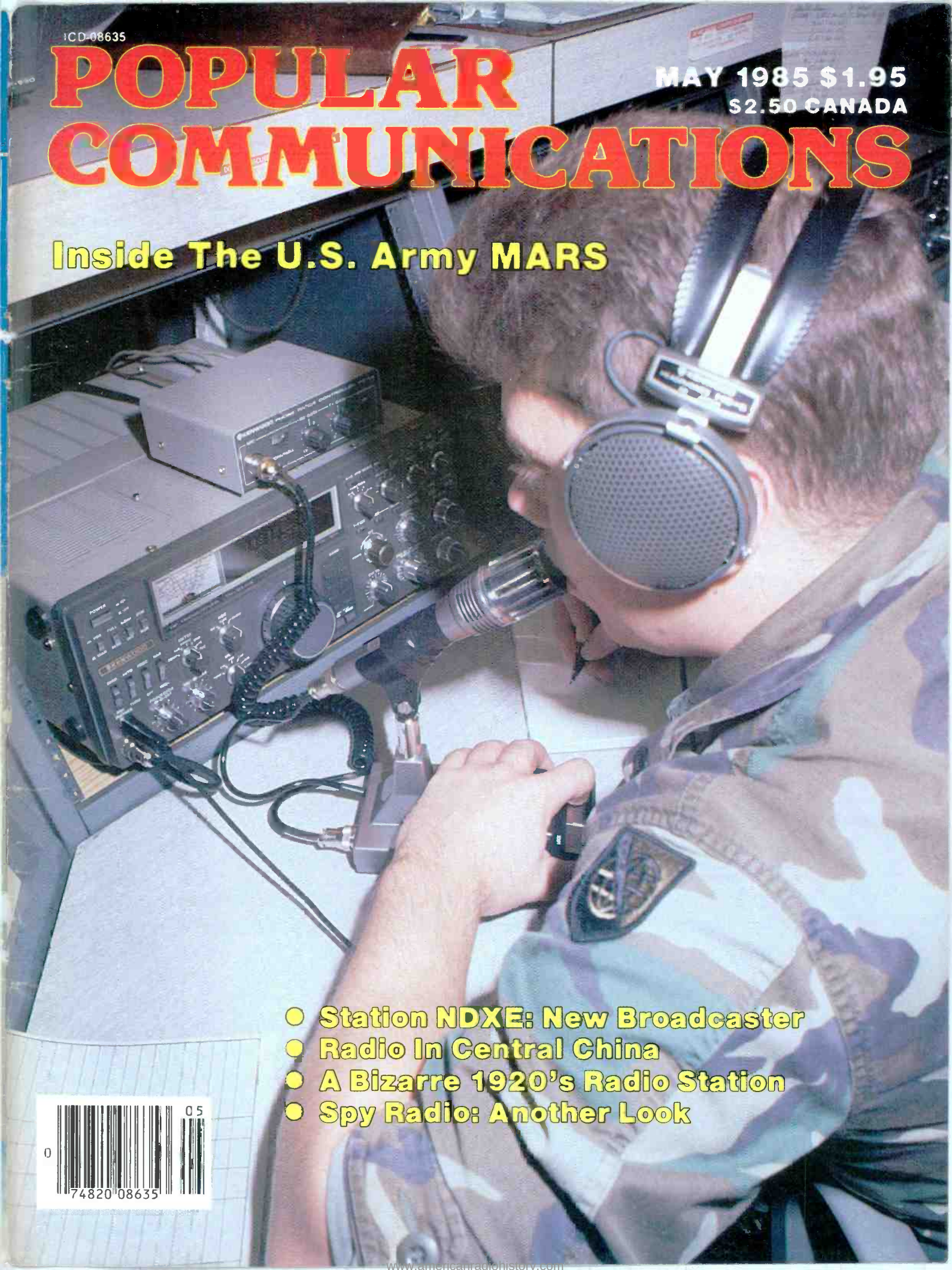
Inside The U.S. Army MARS



- Station NDXE: New Broadcaster
- Radio In Central China
- A Bizarre 1920's Radio Station
- Spy Radio: Another Look

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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 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.

CIRCLE 71 ON READER SERVICE CARD

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.

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- Automatically determines RTTY speed and indicates if ASCII or Baudot
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- Copies Russian RTTY and Japanese RTTY & CW

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ICOM IC-R71A

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ICOM introduces the **IC-R71A** 100KHz-30MHz superior-grade general coverage 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 world-wide communications. Demanding no previous shortwave receiver experience, the **IC-R71A** will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (optional), 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.

Utilizing ICOM's DFM (Direct Feed Mixer), the **IC-R71A** is virtually immune to interference from strong adjacent signals, and has a 100dB dynamic range.

ICOM introduces a unique feature to shortwave receivers . . . direct keyboard entry for simplified operation. Precise frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control. Memory channels may be called up by pressing the VFO/M (memory) switch, then keying in the memory channel number from 1 to 32.

Thirty-two tunable memories offer instant recall of your favorite frequency. Each memory stores frequency, operating mode, and a backup battery maintains the memories for up to five years.

Specifications.

• **Frequency Coverage:** 0.1 MHz-30.0 MHz • **Frequency Control:** CPU based 10 Hz step Digital PLL synthesizer with dual VFO system. Direct frequency entry through keyboard or RC-11 remote unit. • **Memories:** 32 tunable memories store frequency and mode. • **Scanning:** Memory and band scan with auto-stop. • **Frequency Readout:** 6 digit 100 Hz fluorescent readout. • **Frequency Stability:** Less than 250 Hz after switch on 1 min to 60 mins, and less than 50 Hz after 1 hour. With option CR-64 high stability crystal: Less than + 50 Hz after switch on 1 m in to 60 mins, and less than ± 10 Hz after 1 hour at normal room temperature. Less than ± 100 Hz in the range of −10°C to +60°C. • **Receiving Mode:** A^1, A^3J (USB, LSB), F^1 (Output FSK audio signal), A^3, F^3*. • **IF Frequencies:** 1st: 70.4515 MHz, 2nd: 9.0115 MHz, 3rd: 455KHz, 4th: 9.0115MHz (except F^3*); with continuous Passband Tuning (except F^3*). • **2nd IF Center Frequency:** SSB (A^3J) FM*(F^3)—9.0115 MHz, CW (A^1) RTTY (F^1)—9.0106 MHz, AM (A^3)—9.0100 MHz. • **Sensitivity (when preamplifier is ON):** SSB, CW, RTTY: Less than 0.15 microvolts (0.1—1.6 MHz: 1 microvolt) for 10 dBS + N/N; AM: Less than 0.5 microvolts (0.1—1.6 MHz: 3 microvolts); FM*: Less than 0.3 microvolts for 12dB SINAD (1.6—30MHz). • **Selectivity:** SSB, CW, RTTY: 2.3 KHz at -6dB (Adjustable to 500 Hz min), 4.2KHz at -60dB; CW-N, RTTY-N: 500 Hz at -6dB, 1.5KHz at -60dB; AM: 6KHz at -6dB (Adjustable to 2.7KHz min), 15KHz at -50dB; FM*: 15KHz at -6dB, 25KHz at -60dB. • **Antenna Impedance:** 50 ohms Unbalanced (Single wire can be used on 0.1—1.6MHz). • **Weight:** 7.5kg (16.5 lbs.) • **Dimensions:** 111mm(H)x286mm(W)x276mm(D)(4⅜ in. x 11¼ in x 10⅞ in.) • **Power Supply Requirements:** 117V or 235V ± 10% 50-60Hz 30V A, (100V/200V/220V use requires internal modification).

ICOM R71A OPTIONS

CK-70	12 Volt DC Kit	$9.95
CR-64	High Stability Osc.	$56.00
EX-310	Voice Synthesizer	$39.95
EX-257	FM unit (10M Ham)	$38.00
FL-32	CW filter, 500Hz 9MHz	$59.50
FL-44	2.4KHz 455KHz SSB Crystal Filter	$159.00
FL63	CW filter 250Hz 9MHz	$48.50
RC-11	Remote Control	$59.95

INSTALLATION . . . options can be installed by a skilled user/owner. ***EEB*** will do it for you!
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ICOM ICR71A with full factory warranty but without ***EEB's*** extra service/no installed options
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EEB—EXCLUSIVE OPTIONS

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CIRCLE 81 ON READER SERVICE CARD

NEW!

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Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new models with special savings on all radio scanners. 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-G

List price $699.95/**CE price $449.00**

10-Band, 20 Channel • Crystalless • AC/DC

Frequency range: 25-550 MHz. continuous coverage and 800 MHz. to 1.2 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.

NEW! Regency® MX5000-G

List price $599.95/**CE price $354.00**

Multi-Band, 20 Channel • No-crystal scanner Search • Lockout • Priority • AC/DC Selectable AM-FM modes • LCD display World's first continuous coverage scanner

Frequency range: 25-550 MHz. continuous coverage.

Never before have so many features come in such a small package. The *Regency* MX5000 mobile or home scanner has continuous coverage from 25 to 550 MHz. That means you can hear CB, Television audio, FM broadcast stations, all aircraft bands including military and the normal scanner bands, all on your choice of 20 programmable channels.

NEW! Regency® MX4000-G

List price $629.95/**CE price $394.00**

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.

Regency® MX3000-G

List price $319.95/**CE price $182.00**

6-Band, 30 Channel • No-crystal scanner Search • Lockout • Priority • AC/DC

Bands: 30-50, 144-174, 440-512 MHz.

The *Regency* Touch MX3000 provides the ease of computer controlled, touch-entry programming in a compact-sized scanner for use at home or on the road. Enter your favorite public service frequencies by simply touching the numbered pressure pads. You'll even hear a "beep" tone that lets you know you've made contact.

Regency® Z30-G

List price $279.95/**CE price $166.00**

6-Band, 30 Channel • No-crystal scanner

Bands: 30-50, 144-174, 440-512 MHz.

Cover your choice of over 15,000 frequencies on 30 channels at the touch of your finger.

Regency® C403-G

List price $99.95/**CE price $62.00**

5-Band, 4 Channel • Crystal scanner Channel indicator LED • AC only • Low cost

Bands: 30-50, 148-174, 450-470 MHz.

Regency's basic scanner, the C403 gives you the excitement of police, fire and emergency calls at a budget price. It can tune in to any of five public service bands and brings the signal in loud and clear...on any of four possible channels. It comes with detachable telescope antenna and AC power cord. Order one crystal certificate for each channel you want to receive.

Regency® HX1000-G

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. A die-cast aluminum chasis makes this the most rugged and durable hand-held scanner available. There is even a backup lithium battery to maintain memory for two years. Includes wall charger, carrying case, belt clip, flexible antenna and nicad battery. Order your *Regency* HX1000 now.

Regency® R106-G

List price $159.95/**CE price $92.00**

5-Band, 10 Channel • Crystal scanner • AC/DC

Frequency range: 30-50, 146-174, 450-512 MHz.

A versatile scanner, The *Regency* R-106 is built to provide maximum reception at home or on the road. Rugged cabinet protects the advanced design circuitry allowing you years of dependable listening.

NEW! Regency® R1050-G

List price $179.95/**CE price $109.00**

6-Band, 10 Channel • Crystalless • AC only

Frequency range: 30-50, 144-174, 440-512 MHz.

Now you can enjoy computerized scanner versatility at a price that's less than some crystal units. The *Regency* R1050 lets you in on all the action of police, fire, weather, and emergency calls. You'll even hear mobile telephones.

Programming the R1050 is easy. Merely touch the keyboard and enter any of over 15,000 frequencies on your choice of 10 channels.

Regency® HX650-G

List price $129.95/**CE price $79.00**

5-Band, 6 Channel • Handheld crystal scanner

Bands: 30-50, 146-174, 450-512 MHz.

Now you can tune in any emergency around town, from wherever you are, the second it happens. Advanced circuitry gives you the world's smallest scanner. Our low CE price includes battery charger/A.C. adapter.

NEW! Regency® HX-650P-G

List Price $189.95/**CE price $104.00**

Now, Communications Electronics offers a special packaged price on the *Regency* HX-650 scanner and the following items for only $104.00. 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 $104.00 per package plus $10.00 shipping/handling. To order this special package, use CE special order number HX-650P-E.

QUANTITY DISCOUNTS AVAILABLE

Order two scanners at the same time and deduct 1%, for three scanners deduct 2%, four scanners deduct 3%, five scanners deduct 4% and six or more scanners purchased at the same time earns you a 5% discount off our super low single unit price.

NEW! Regency® HX2000-G

The World's First 800 MHz. Handheld Scanner

List price $569.95/**CE price $359.00**

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 new *Regency* HX2000, handheld scanner covers thousands of frequencies including the new 800 MHz. band. Selectable AM/FM reception modes on all channels. With the included AC/DC transformer, the HX2000 can be operated on either 120V AC or 6 VDC. Scans 15 channels per second. Size 3" x 7" x 1½." Includes wall charger, carrying case, belt clip, flexible antenna and nicad batteries.

NEW! Regency® RH250B-G

List price $699.95/**CE price $379.00**

10 Channel VHF synthesized transceiver Built-in scanner with programmable priority Fully programmable CTCSS on every channel

Frequency range: 150-162 MHz. transmit & receive.

If you're a fireman, policeman or a person on the go and it's essential that you stay in touch with headquarters, you need the *Regency* RH250 transceiver. You can program simplex or semi-duplex frequencies including CTCSS tones on all channels. 25 Watts output on VHF. If you need a **UHF version** of this radio with 15 Watts output and frequency coverage of 450-482 MHz., order model number **RU150B-G** for $449.00 each.

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Z45-G Scanner	$199.00
RPH410-G 10 ch. handheld no-crystal transceiver	$399.00
EC10-G Programming tool for *Regency* RPH410	$20.00
SMRH250-G Service man. for *Regency* RH250	$20.00
SMRU150-G Service man. for *Regency* RU150	$20.00
SMRPH410-G Service man. for *Regency* RPH410	$20.00
B-4-G 1.2 V AAA Ni-Cad batteries (set of four)	$9.00
A-135C-G Crystal certificate	$3.00
A60-G Magnet mount mobile antenna	$35.00
A70-G Base station antenna	$35.00

Add $3.00 shipping for all *accessories* ordered at the same time. Add $3.00 shipping per scanner antenna.

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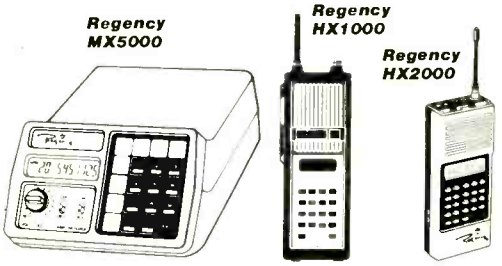

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POPULAR COMMUNICATIONS

MAY 1985 **VOL. 3, NO.9**

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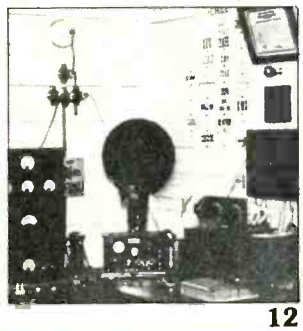
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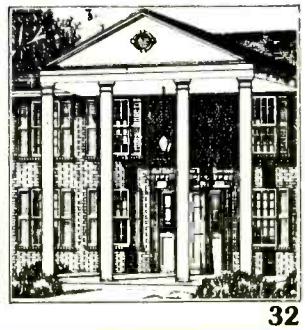
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FEATURES

This month's cover: *A U.S. Army MARS operator handles messages. Photo courtesy of the U.S. Army.*

DEPARTMENTS

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Roses & Brickbats

One of the greatest things about producing a monthly magazine is that there is such a wide diversity of readers to serve. Not only that, *POP'COMM*'s readers are the most prolific Letters-to-the-Editor writers I've ever encountered. The letters that come in have, by far, been the most enthusiastic and upbeat imaginable. Nevertheless, it does seem that scarcely a single issue comes out that we don't manage to slightly offend or totally outrage at least a few readers.

As I've mentioned several times previously, there are a couple of prime contenders for top honors in the Brickbat Department. For instance, it is virtually impossible for any mention of DX clubs or Nikola Tesla to show up in our pages without at least a few correspondents complaining that we have said either too much or to little. Some months ago there was a passing and casual reader mention of a particular DX club in our Mailbag column. It created such a violent reaction in one of *POP'COMM's former* Contributing Editors that he promptly informed me that had he still been on our staff he would have resigned! Folks, we're talking violent heavy, *heavy*, emotions.

Our Pirates Den column seems to perpetually irritate a small and persistent group of readers who continually demand that we cease any and all coverage of illegal and unlicensed broadcasters. Their point is that by our even mentioning that they exist, we are somehow either endorsing, encouraging, or instructing in pirate broadcasting.

It's a fuzzy logic. There's nothing tainted about listening to these stations. Moreover, the pirates don't determine whether or not they will continue broadcasting by checking the Neilsen ratings to find out the size of their audience; the operators are usually fulfilling some internal need of their own that has little to do with whether or not anybody is listening. Pirates have been on the scene for more than 60 years and it's just as "valid" to log them as any other station. Those who squawk about our coverage never mention that while we tell you about which stations are on the air, we also bring you the grisly tales of which stations have been removed from the air by the FCC!

Interestingly, while complaints have come in about our coverage of the myriad of North American shortwave and FM pirates, not one person has ever griped about our presenting information on clandestine underground political broadcasters operated throughout the world. In fact, our coverage of those stations seems very popular. I have not been able to see a very sharp delineation between one type of unlicensed station and another. To me, they are all candidates for monitoring.

I have never been able to rationalize how ignoring the existence of North American pirates (who are operating whether or not one likes the idea) will cause them to go away, quietly or otherwise. It's like saying that the national media (AM/FM/TV broadcasters, newspapers and weekly newsmagazines) are endorsing/encouraging crime, poverty, war, and famine by reporting about them, and if they would only stop talking about it then everything would (somehow) be fine. Can you imagine the state of affairs if that should ever happen? The very same people who write me letters whining about North American pirate broadcasters would immediately take up the cudgel about "laundering the news," "censorship," and a "free press."

Another occasional but ongoing cause for brickbats is, in ways, related to the same type of logic that brings in mail decrying our coverage of pirate broadcasters. This is as good a time as any to give it an airing.

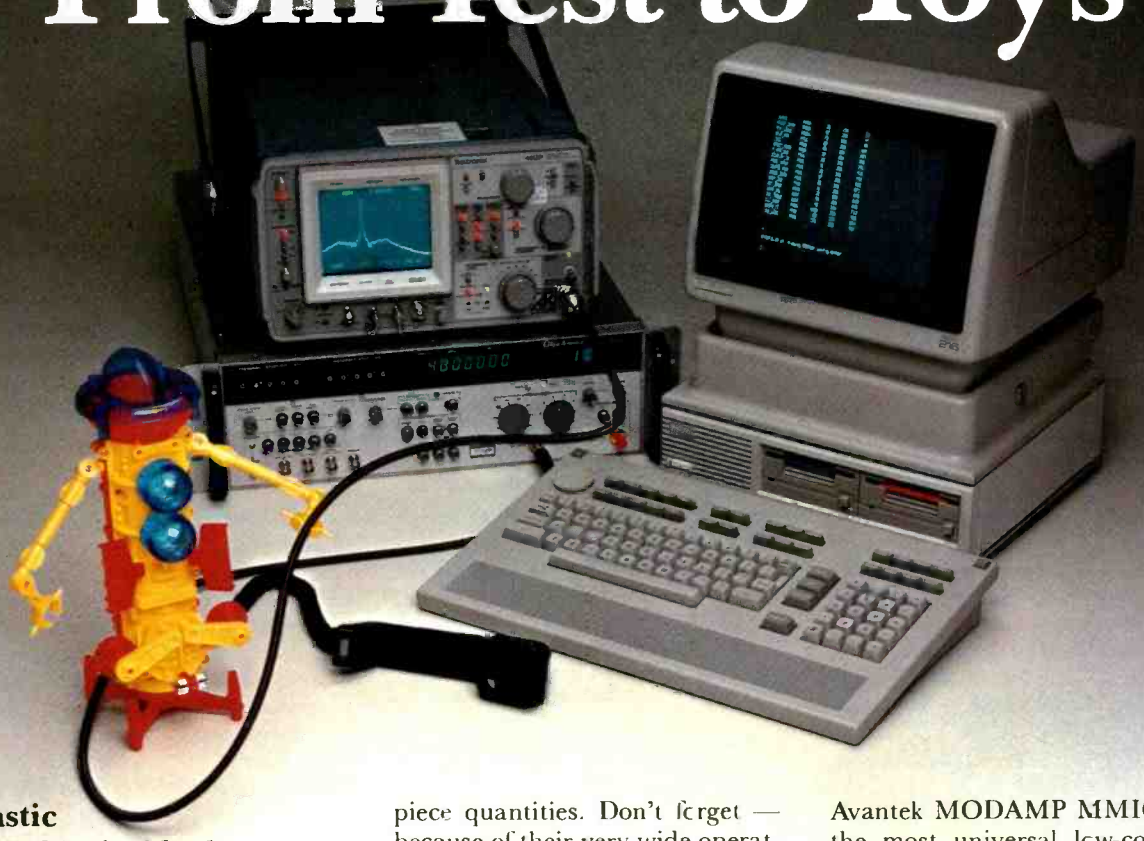
There are some readers who have written to complain about certain front covers that have appeared on *POP'COMM*. Even though they are the best selling (on the newsstand) covers we use, there are readers who write to express annoyance (or even considerable anger) at covers that show anything relating to military, guerrilla, paramilitary, or law enforcement activities.

The logic expressed is, in many ways, similar to some of the complaints that have come in about pirate radio coverage in *POP'COMM*; the old story about our encouraging or endorsing certain things that the writers feel are most unpleasant or distressing. I must say that those who write to squawk about certain of our covers are far more emotional and dramatic than those who are all het up about pirate broadcasters. Like the one reader who demanded that, "in the name of humanity, you immediately cease running those macho covers!" Can you imagine that the fate of humanity itself hangs in the balance based upon our Staff Photographer and his camera? I dare say that neither *TIME* nor *Newsweek*, which frequently use similar photos, have ever received such a plea!

A less dramatic and more well-put complaint letter about some of these covers arrived the other day from reader Brent S. D. Taylor (VE1APG) of New Brunswick, Can-

(Continued on page 74)

From Test to Toys



Plastic MMIC gain blocks. Avantek 4-Pac amplifiers. $1.80 each*.

Avantek's series of MODAMP™ silicon monolithic microwave integrated circuit amplifiers are ready to drop into your 50-ohm circuit, with no design problems — virtually no concern for what comes before or after. These MMICs are unconditionally stable and provide cascadable gain blocks at any frequency up to 2 GHz.

4-Pacs are small (140 mil) plastic packages suitable for PC board or stripline applications in products ranging from instrumentation to toys, from fiber optic systems to mobile communications. They're simple to use and readily available.

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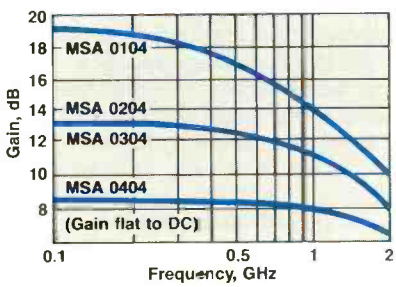
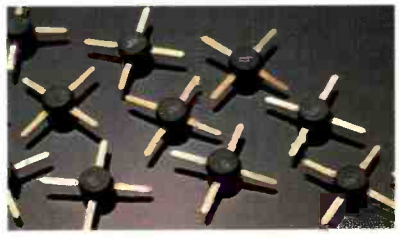
Avantek 4-Pac MODAMP MMICs are available today from your nearest distributor. Prices start at $2.75 and go to $1.80 in 10,000 piece quantities. Don't forget — because of their very wide operating range, the same amplifier can work from DC through video all the way up to 2 GHz. And you can stack them like building blocks to add whatever gain you need. Avantek innovation — designed to make your design job easier.

Gain vs. Frequency





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MAILBAG 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.

Help Wanted Dept.

I will tapespond with anyone interested in DXing or shortwave listening. Am now just getting into tapesponding. Please contact me by tape (only).

Bruce DeShazo
1710 Whitman Rd.
Memphis, TN 38116

I publish a pirate-phreak-hacking magazine formatted for the Apple Computer (on Apple diskette) called *The Bootlegger*. Willing to swap misc. info including DCO (Digital Central Office) manuals. Am interested in information on uplinks with Telco satellites, also microwave Telco repeaters. I have a 12-ft. dish with 100° LNA for downloading. Also interested in Telco fibre optics cable communications. Any readers that share my interests and want to exchange information should contact me.

"Boot Leg"
The Bootlegger Magazine
3310 Holland Loop Rd
Cave Jct., OR 97523

Looking for any information readers might be able to offer me on a military aircraft receiver I have marked "Type CW-46048-D Navy Bureau of Ships Western Electric, Serial #365."

James Hoffman
5 Kellog St.
Ft. Plain, NY 13339

CB Or Not CB

I notice that broadcasters in Canada are assigned callsigns which commence with the letters, CB, CF, CH, CI, CJ, and CK. All well and good, but I also note that stations in Chile are also using the "CB" prefixes. I was under the impression that each nation is allocated certain specific callsign blocs from which they may assign callsigns, and that violating these allocations "just isn't done." Please explain.

Steve Levitt
Grand Rapids, MI

You're perfectly correct in all of your observations. It is seldom that one nation utilizes the callsigns of another—but it does happen. In 1959, when the U.S. began licensing Citizens Band stations, the FCC was giving out licenses bearing callsigns such as 2A2204, etc. Actually, the FCC didn't really visualize these as callsigns as much as they were considered serial numbers. The British, however, who had been allocated the use of the callsign bloc 2AA or 2ZZ, saw this as an infringement and filed a complaint with the International Telecommunications Union. By 1962 or so, the FCC backed away and began issuing Citizens Band licenses bearing the authorized American "K" prefix.

Chile has long been allocated the bloc CAA to CEZ (at least going back before 1920), and yet broadcasters owned by the Canadian Broadcasting Company have used the "CB" prefixed callsigns for decades. Chile seems unperturbed by it and assigns its own callsigns from this bloc without the slightest hesitation, probably feeling that there is little chance of anybody getting mixed-up. So, for example, there is a broadcast station CBT on 540 kHz in Grand Falls, Newfoundland. There is also a coastal telegraph station CBT on 461, 500, and 518 kHz in Talcahuano, Chile. There are numerous similar examples of this duplication. Obviously, Canada uses the prefix letters "CB" to signify the initials of the CBC, although the ITU apparently does not recognize any of the Canadian callsigns and doesn't list them in their records. To add to the merriment, there are about 30 radiobeacons in at least 16 countries (including the U.S. and Canada) that are identified by the letters or prefix "CB." Radiobeacon ID's, however, aren't considered to be callsigns in the pure sense of the term and they seldom conform to international callsign bloc agreements; although, come to think of it, that's what the FCC once said about the original Citizens Band serial numbers!—Editor

Not Everybody Makes The Grade

Your magazine seems to give very strong support to pirate broadcasters, even giving QSL addresses. Is this in the best interest of broadcasting? You also seem to be appealing to the sick busybody element of society with . . . giving the Metroliner telephone frequencies. The October '84 piece on eavesdropping on cordless telephones was in the same vein and did little to enhance your reputation. The contents of the magazine exhibit very poor editorial judgment.

John M. Boyle
Bath, Ontario

Just picked up my first two copies of *POP'COMM*. I'm impressed. So impressed, I read both cover-to-cover last night. My radio mags seem to pile up each month, but you can be assured that yours will be one of the first looked for and read each month.

Ken Mummery, KE6XI
San Diego, CA

When you try to be everything to everybody, you end up being nothing to anybody. By our having the unmitigated gall to offer a lot of non-traditional and unconventional information that nobody else ever thought of presenting, or didn't have the unmitigated gall to present, we strive to blow some of the cobwebs out of a hobby which looked to be bogging down in the tiresome and humdrum. See this month's "Beaming In" editorial for some thoughts on some of the comments we have received.—Editor

Hidden Frequency?

Here's the problem. I monitor the Sacramento County Sheriff's Department on Channel 1 (453.90 MHz), Channel 2 (453.25), and Channel 3 (453.575). But when the action gets really good, they talk about going to a Channel 5 and that's where I run into a stone wall. I can't find that channel on my scanner and none of the scanner stores I've asked seem to know where it is. Can you help me?

H. N. E.
Rancho Cordova, CA

Channel 5 is the Tactical Operations frequency at 453.475 MHz. If you've put your scanner into the "search scan" mode and haven't been able to find it on your own, then the chances are that the communications are low powered and intended for short-range use. Punch that frequency into your scanner, open up the "squelch" and see what happens.—Editor

Tried & Proven By Now

The *POP'COMM* report on low power and carrier current neighborhood broadcasting stations (April issue) was intriguing. I would like to bring to your attention that, as far as anybody has ever determined, the pioneer broadcaster within this category was station "MREL." This station operated on 1120 kHz in Minden, Nebraska in 1931, being operated by The Minden Radio and Electric Labs. Signals were fed into the community power lines and a broadcast schedule of an hour per day and two hours each Sunday were maintained. This was written up in several radio magazines of the time.

Barry Winthrop
Lincoln, NE

Thanks for mentioning this, Barry. I hadn't realized that the technique had any practical applications that far back in time.—Editor.

Info Wanted

As a subscriber I find your magazine very informative. Currently I am pursuing a Master's Degree with an emphasis on terrorism and guerrilla conflicts on a national and transnational level. I would like any information that you or the readers may have on the above subject matter. Also if anybody is aware of the types of communication used by terrorists or guerrillas and the frequencies used by them.

David Williams
Coronado, CA

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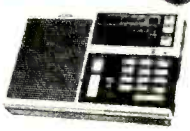

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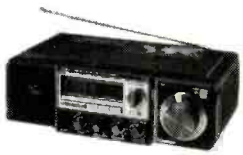

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1984年11月26——12月2日节目介绍

Radio In Central China!

An American SWL/Ham Reports

BY DAVE COIA, KA8RUL

About the author: *Dave Coia, KA8RUL, is a graduate student in Chinese Linguistics at Ohio State University. Presently he is in Wuhan, People's Republic of China, on a fellowship at the Huazong University of Science and Technology. An expert in Chinese culture and a dedicated radio enthusiast, Dave Coia is in a unique position to observe and comment upon a topic about which little is known outside of the PRC.*

During the 1950's, sixties, and early seventies, China was a nation like a hive of bees in a tree; you could learn something about the country from the workers who went out to forage, but once back in the hive, it was almost impossible to find out how they lived without getting stung in the process. This was especially true amidst the background of the first half of what is known here as the *Great Proletarian Cultural Revolution* (1966 to 1976). At that time, the zealous quest for ideological purity assumed monstrous proportions, resulting in persecution of intellectuals and the rise of many incompetent persons to responsible positions within the industry and government.

Communications monitoring during those years was quite difficult. Even though the receiving equipment (even sophisticated models) was available, very little was being done in the area of local broadcasting. This had not gone totally unobserved by the Chinese government, and even as late as 1977, Chinese leader Deng Xiaoping observed, "Now it appears that China is fully 20 years behind developed countries in science, technology, and education."

The fact was that it made very little difference to have a good receiver if almost all of the "broadcasting" consisted of people standing around in a public square listening to sounds coming from a loudspeaker that was receiving its programming from wirelines. This was the case in China.

This isn't to say that radio played no part in the life of China. Since it is one of the world's most mountainous nations, and very large in size, obviously wireline communication could never meet all of China's needs. It just wasn't practical, and the primary way of communicating with people in more remote areas (at least with any immediacy) was via radio—the same way it's done in Australia, where Radio Australia, in addition to serving its overseas audience, serves those people living in the nation's remote areas.

In China, broadcasting has resulted in a mixture of standard broadcast band stations and also regional stations utilizing shortwave. One of the difficulties encountered in establishing some of these stations was noted in especially remote areas. Qualified skilled and technical personnel were not easily enticed into these rugged areas.

These stations offer programs in mass education, especially valuable in areas where more formalized personal schooling is not available. Instructions are given in art, economics, history, literature, logic, and modern politics. Among the languages taught are English, Japanese, and French.

The broadcasts are reinforced by periodicals such as *Zixue* (Self Study) and the newspaper *Zixue Bao* (Self-study newspaper). Both carry articles covering a wide range of courses and different levels of sophistication. In terms of the amount of information broadcast (and supplemented by the periodicals), our own PBS pales by comparison, although some American municipal or county operated broadcast educational broadcasting systems are somewhat comparable, such as WCVE in Columbus, Ohio, for example. It wasn't always like this.

After the death of Chinese Communist Party Chairman Mao Tse-tung in 1976, and the subsequent arrest and prosecution of the so-called "Gang of Four" (the leaders of the "Cultural Revolution,") PRC embarked upon a program intended to overcome the chaos of the 1960's and early 1970's. The emphasis was on action as opposed to ideology. Since 1978 contruction of all variations has been going on everywhere.

Here in Wuhan, Hubei Province, a large TV and radio tower overlooking the confluence of the Hanshui and Yangtze (Changjiang) Rivers is nearing completion.

The present level of radio broadcasting, both domestic and international, is a far cry from the situation in the early 1950's when Radio Peking (now Radio Beijing) was barely heard on only one frequency in North America. Radio Beijing's English Language service to North America goes out on 9820, 9860, 9880, 11860, and 11970 kHz. Last January, the English Language Capital Service began operation, complete with commercials.

Since broadcasting has been on the upswing on PRC, a host of weekly newspapers has commenced operation in order to publicize mass-media programming. These are four-page sheets containing stories about various programs (including introductions and summaries), as well as articles about personalities involved in the media. There are a few items of technological interest also included. Sometimes foreign language texts are offered.

Because PRC is still in the process of opening up to outsiders, many of these publications remain on official lists as not being available for sale to foreigners. I have personally seen just such a discouraging list of publications; it is a thick, hard-bound volume. There are a few things more frustrating than standing at a news vendor's window, seeing the publication you want, and then being told that they won't sell it. One time the vendor told me that they didn't have it, even though it was displayed in plain sight. The one time I reached in and grabbed one of these papers it caused quite a stir!

There is really nothing approaching a secret in any of these papers, and many end up in the hands of foreigners anyway. For that matter, many of them are displayed on billboards along the sidewalks for public perusal. Fortunately, the policy of withholding sale of such publications is not evenly adhered to by all vendors.

For comparison, imagine if *TV Guide* couldn't be sold to persons who weren't

American citizens, with those who sell the magazine responsible for checking the identification papers of all prospective customers.

The earliest of the papers published here in the Wuhan area was the *Hubei Radio and Television Newspaper*. It is a provincial publication started in 1979 and covers programming from the Hubei People's Shortwave Radio Station (774, 1404, 3940 kHz, 96.2 and 99.8 MHz for one series of programs; and 1179 kHz, 93.4 and 95.0 MHz for another series of programs).

This publication also covers programming information related to the Wuhan People's Shortwave Radio Station, 873, 1053 kHz and 90.2 MHz.

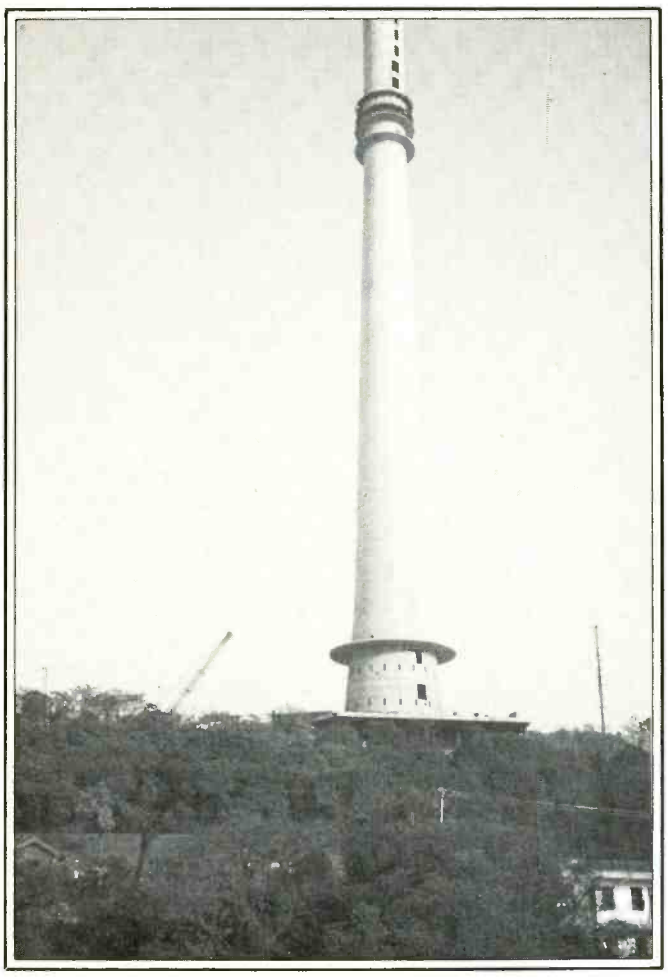
The Wuhan Radio and Television Weekly Newspaper has been published since last year. While it duplicates some of the program data of the above noted paper, it adds coverage of the Central China People's Shortwave Radio Station in Beijing. This station operates on 540, 639, 756, 981, 1053, 7504, and 9064 kHz.

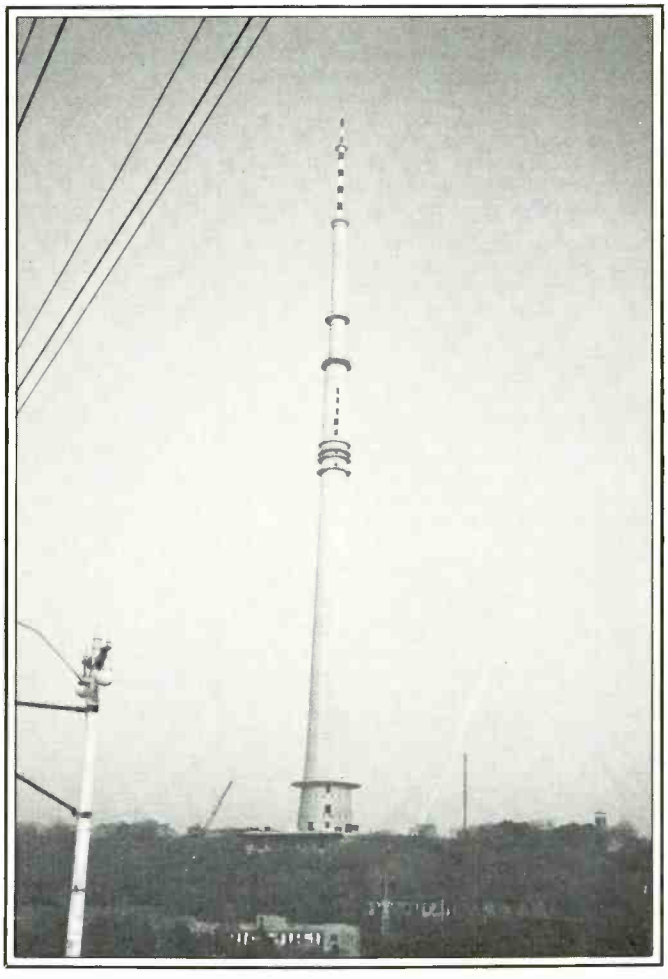
Both papers also publish a variety of TV schedules.

The Wuhan area also has the Radio Program Newspaper. Begun in 1981, the paper is actually distributed nationally and covers only the programming of the Central People's Shortwave station, uniquely offering programs of this station taking place on 630, 720, 855, 7770, and 10260 kHz, which are not mentioned in other publications.

These publications reflect programming originating in the PRC and directed to the local audience. Although much of the programming is educational in nature, much of it is presented in the form of entertainment.

The giant television and radio tower under construction in Wuhan.





CIRCLE 29 ON READER SERVICE CARD

CIRCLE 136 ON READER SERVICE CARD

This incorporates a wide variety of Chinese and foreign music, readings of short stories, radio drama, the opera, and even comedy routines.

Listening here in Central China, one can receive transmissions from North and South Korea, Japan, Taiwan, Kenya, Bulgaria, Australia, Armed Forces Radio, the USA, and the USSR.

Radio Australia, which puts in a strong signal here, is regularly monitored on 9770, 15395, 17830, 17715, 17750, and 21720 kHz. This station has the most detailed and comprehensive English language coverage of Asian news and events. For instance, RA had the earliest and most current coverage of the assassination of Indian Prime Minister Indira Gandhi.

Voice of America (VOA) broadcasts, because of the distance from PRC, are heard over fewer frequencies and the signals lack the punch of Radio Australia. Although at times embarassing to some U.S. citizens, VOA is certainly the best source of "news from home" and also for position reports on official U.S. foreign policy.

Criticism leveled againt the VOA arises from the very ethnocentric views of some of the programs about "America," combined with the ignorance the programs often reveal of the peoples and cultures to which they are beamed. For instance, there is some amount of confusion about the use of the term "American," since technically it should include Canadians, Mexicans, Brazilians and many others, yet it usually doesn't mean those people.

Radio Moscow, and its companion propaganda arm, Radio Peace and Progress, by their proximity to China and the inconsiderate and unsophisticated nature of the Soviet government, may be found easily (and nearly anywhere) on the shortwave bands. This abundance of transmissions often interferes with the programming of other stations. The English and Chinese programming is interesting, although it is nonetheless irritating to the sensibilities of educated people, especially in the audacity of many of the accusations made. Best RM frequencies here are 7185, 15170, 17835, 21785 kHz, with RPP noted with strong signals on 7220, 11775, and 15405 kHz.

SWLing in the PRC can become an occupation in itself, given the intense level of competition for listeners here in Asia. For those who can come to grips with several languages, the rewards for listening are beyond measure. Listening with a knowledge of the Chinese language permits one to witness the shortwave dueling between Taiwan and the Mainland; a contest no true sports fan could resist.

Still, mass communications here is undergoing vast and rapid changes. This not only includes broadcasting, but reaches right down to upgrading the terribly outdated and antiquated landline telephone system being replaced by new switching systems and microwave links. All things being equal, by 1990, China should be far more advanced in communications than it is today.

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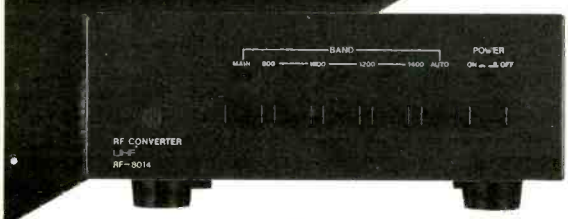

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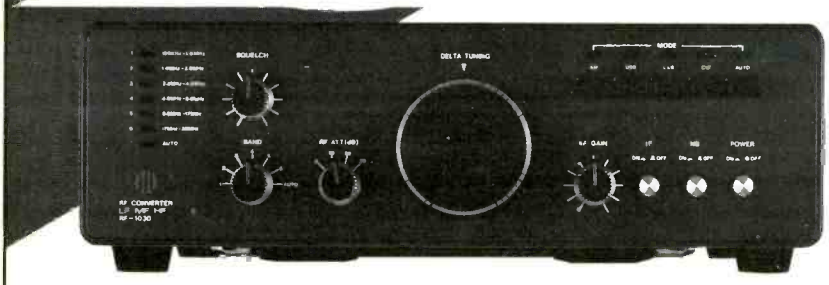

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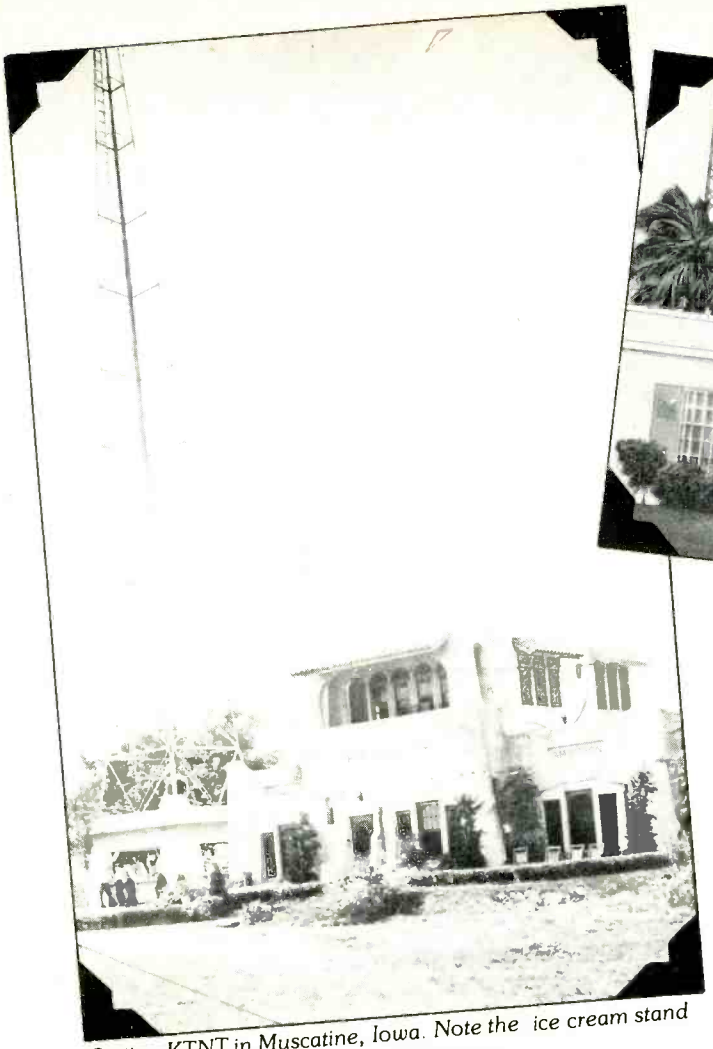
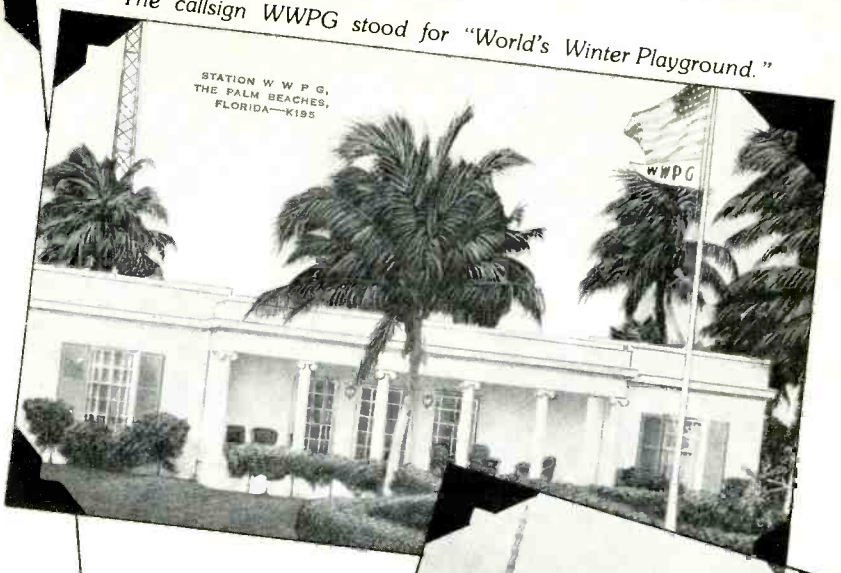
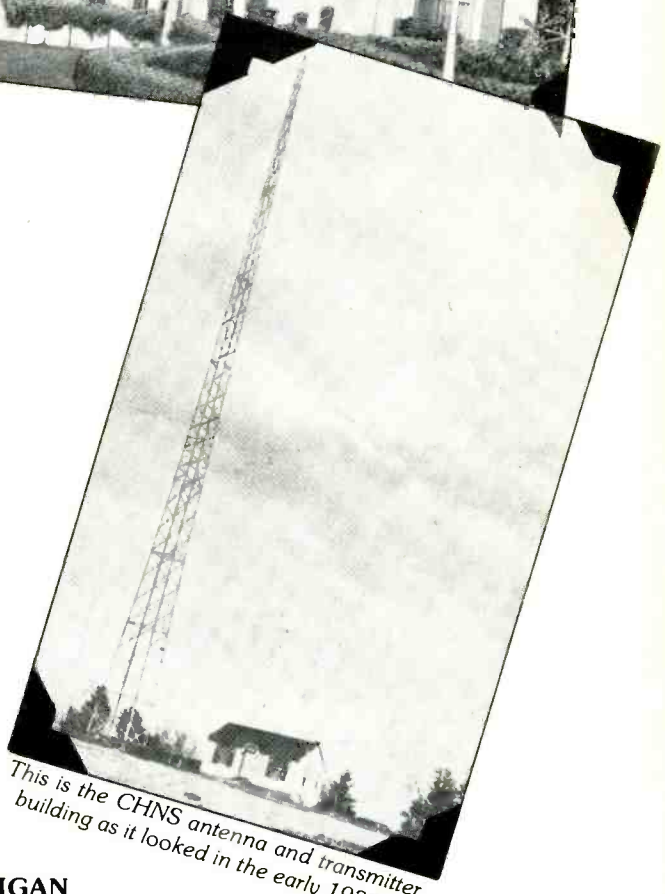
CIRCLE 43 ON READER SERVICE CARD



Station KTNT in Muscatine, Iowa. Note the ice cream stand in the base of the tower.

The callsign WWPG stood for "World's Winter Playground."





This is the CHNS antenna and transmitter building as it looked in the early 1930's.

A Picture Is Worth . . .

Views Of Early Radio

BY ALICE BRANNIGAN

No doubt about it, May means fair weather is on the way. It also means Mother's Day, and while this normally doesn't portend any special events taking place in regard to radio, it certainly does bring to mind one of the most unusual (looking) broadcasting stations seen in these parts—a broadcaster that appeared to be dedicated to the owner's mom!

That would be good old KTNT, late of Muscatine, Iowa. Unfortunately, the only view I could find of KTNT is on a somewhat faded black/white photographic process postcard which survived from the dim past. It's still sufficient to show this curious station.

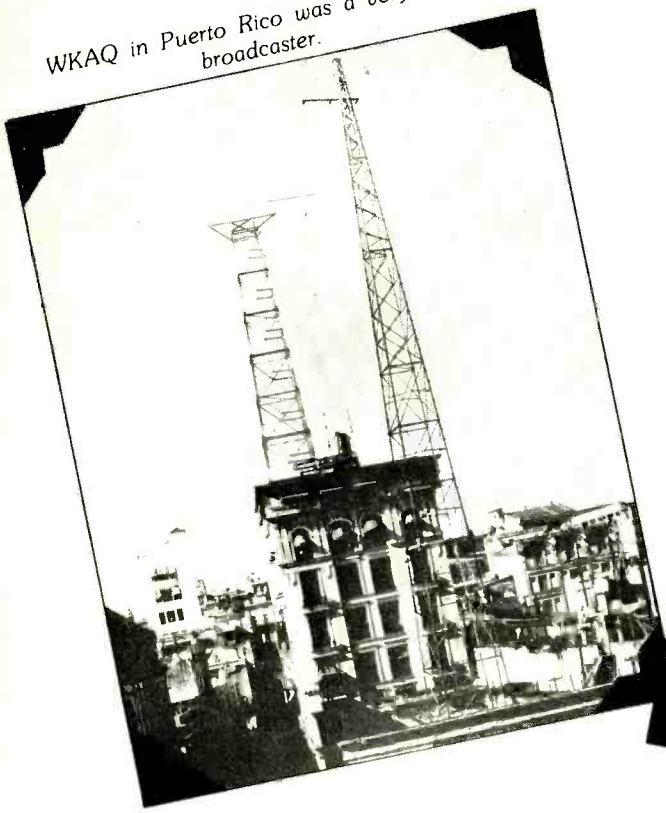
KTNT went on the air in 1926, which puts it in the realm of being one of our early broadcasters—although it certainly didn't have an exceptionally long career. It vanished from station rosters by the summer of 1931, which meant that it existed for only five short years.

Muscatine, it should be noted for the record, is located in the southeastern part of the state and (in those days) had a population of about 17,000 people. It is known as the "Pearl Button Capital of the World" (thanks to Mississippi River mussel shells); Mark Twain lived there in 1853 and '54. The city overlooks the river from a bluff, and that earns the city its second title—"The Port City of the Corn Belt." It's a city that spreads out from the riverbank with old brick buildings lining narrow, brick-paved streets that slope away to dip between hills. It was in this setting that KTNT commenced its broadcasting career on 900 kHz with 500 watts.

It wasn't long before the station went to 1,000 watts, switched frequencies to 1170 kHz, and eventually went to 5,000 watts during the day (and 1,000 watts at night).

This, in itself, isn't particularly unusual—at least it wasn't as unusual as the station's base of operations on 2nd and Lombard Streets. Our faded photo shows a stucco residence with a single tower to the left. It is nicely landscaped with shrubs and a low hedge. An American flag flies from a pole on the roof of the two-story building. A neat row of several wooden folding chairs is arranged near the front door. So far, still nothing unusual, but from here on in it's strictly from *Ripley's Believe It Or Not.*

For instance, we can see writing on the outside walls. Large concrete slabs are set into the building's stucco facade. On the side of the building showing at the right of the photo is the word "AMBITION." On the single story portion of the building near the tower is the word "COURAGE." But above the main entrance, in the most prominent spot of all, are the station's dedication words, "TO MY MOTHER" chiseled into the stone!



WKAQ in Puerto Rico was a very early broadcaster.

The radio shack of amateur 4JE in Puerto Rico way back in 1922.

That's not quite all for KTNT. If you direct your attention to the tower itself, it will be noted that it seems to rest on a base with four concrete feet. This is more than merely the base of the tower—it is a refreshment stand! A sign on this structure reads: "DRINKS, ICE CREAM, SUNDAES, COME ON OVER." In fact, the photo shows three customers standing there chatting with the lady behind the counter (Mom?). On the third level of the tower above the ice cream stand can be seen two large spotlights aimed upwards to illuminate the tower as (being Muscatine's only broadcasting station) it was undoubtedly quite a tourist attraction and brought many visitors, even at night, to the ice cream stand.

The station's slogan was "Calliphone Studio KTNT, First New Tone in 40 Years," which was certainly catchy, but doesn't make too much sense from a vantage point 55 years later, although one might speculate that it somehow related to the callsign, KTNT. The KTNT operating schedule was also a bit strange. It operated weekdays from noon to 12:30, only one half-hour, and then it was off the air until 6:45 p.m. when it came on again for one hour. Then it came back on at 9 p.m. for 1½ hours before signing off for a half-hour. At 11 p.m. it came back on for an hour until a midnight sign-off. KTNT did not operate at all on Saturdays; on Sundays it operated only between 9 and 10:30 p.m. Program highlights included "The Home Folks Program," aired from noon to 12:30 weekdays, and "Common Sense Talks" every Monday evening on the 9 to 10:30 broadcast. Most likely, the station's owner, Norman Baker, was the primary air personality; maybe Mom was able to say a few words herself from time to time.

See, I told you this was a really special blast from the past, and a unique tribute to Mom for Mother's Day! It would be fascinating to find out if any remnants of this station exist, such as the building itself. Any readers in the Muscatine area might wish to check it out and send along a photo. And, Happy Mother's Day, Mrs. Baker.

Next, we have a look at station WWPG, West Palm Beach, Florida. This station went on the air in 1941, running 250 watts on 1340 kHz with studio and transmitter on South Ocean Blvd. It was put on the air by the Palm Beach Broadcasting Corp., Charles E. Davis, President.

Our (undated) postcard shows a neatly manicured lawn in front of a single-story building decorated with six stately columns having Ionian capitals. The back of the postcard notes that the station's callsign stands for "World's Winter Playground." A single tower is shown at the left of the photo, to the rear of the building. Note the WWPG banner on the flagpole.

WWPG is no longer in existence, however Palm Beach station WPBR operates (with 1,000 watts) on the old WWPG frequency and seems to have an address on South Ocean Blvd. This would appear to be the current incarnation of WWPG, still serving one of the most beautiful and exclusive resort areas of Florida.

POP'COMM reader and well-known historian Will Jensby (W0EOM/6) very thoughtfully sent us a postcard depicting the transmitter building and tower of Halifax (Nova Scotia) station CHNS. This 1934 postcard shows these facilities at Bedford, Nova Scotia.

CHNS first became operational in 1926 from its studios at the Lord Nelson Hotel in Halifax. Originally, the station operated on 930 kHz, but in 1934 it shifted over to 1050 kHz. A few years later it moved again to its present spot on the dial at 960 kHz. Its original 1,000 watt transmitter was increased to 5,000 watts, then to its present 10,000 watts.

CHNS was also, from the early days, a station that had a shortwave transmitter to relay its programming to distant points. The original CHNS shortwave relay transmitter was VE9HX on 6110 and 11853 kHz. At present this station is known as CHNX and operates on 6130 kHz.

By the 1940's the station's location was given as Broadcasting House at 10 Tobin Street in Halifax (transmitter in Rockingham, Nova Scotia). The licensee was listed as the Maritime Broadcasting Company. Presently, it gives its location as P.O. Box 400, Halifax, NS, Canada B3J 2R2.

In the 1934 postcard view, the CHNS transmitting facilities at Bedford, Nova Scotia consisted of a humble transmitter "shack" standing next to a tower which seems to be about 130 feet tall.

As CHNS/CHNX approaches its 60th anniversary, we salute them and wish them many more years of success and service.

Radio historian (and *POP'COMM* read-

er) Jose Arturo Fernandez, of Electronica Fernandez, Hato Rey, Puerto Rico, passed along a fantastic photo of radio station WKAQ, which went on the air in 1922. Early records show this station, located in San Juan, Puerto Rico, operating on 833 kHz with 100 watts, 890 and 1240 kHz with 500 watts, 620 kHz with 5,000 watts. Presently WKAQ is on 580 kHz with 5,000 watts running an all-news format.

For many years, the station was operated by the Radio Corporation of Puerto Rico, with studios at 30 Tetuan Street, San Juan. The present licensee is El Mundo Broadcasting, G.P.O. Box 4668, San Juan, PR 00936.

Our photo shows WKAQ's transmitter located in a downtown area with two transmitting towers supporting a series of dipoles. The taller tower (to the right of the photo) sits atop a building bearing a sign reading "French Telegraph Co."

Mr. Fernandez also shared with us a 1922 photo of amateur station 4JE, operated by Joaquin Agusty (3 San Joseph St.) in San Juan, Puerto Rico. Mr. Augusty was a true radio pioneer and was the founder of the first Puerto Rican Radio Club (in 1918). Rare QSLs adorn the walls—but where, oh where, is equipment by ICOM, Trio-Kenwood, Yaesu? In the days of 4JE, if you couldn't build it yourself, you simply didn't operate!

The interest in, and support for, the material we have been displaying here over the past few months has been truly outstanding. Keep it coming! PC

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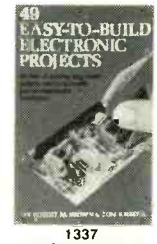

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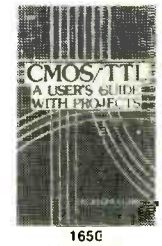

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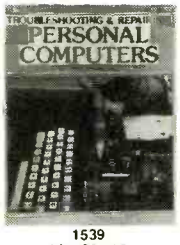

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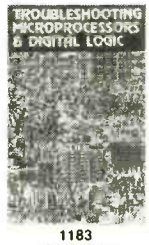

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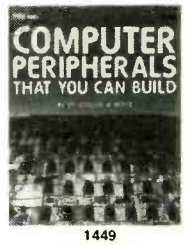

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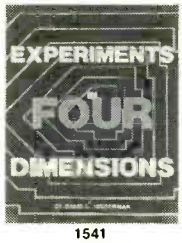

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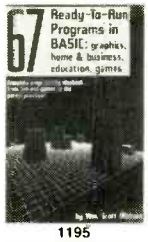

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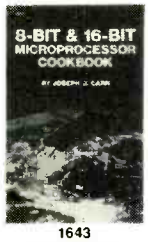

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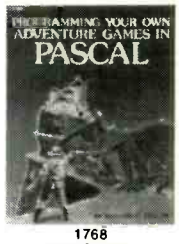

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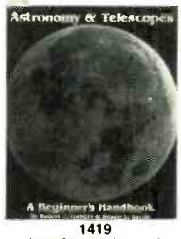

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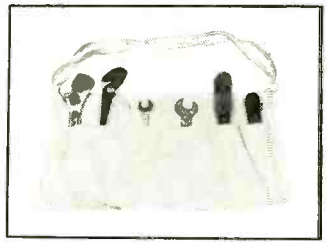

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Remington Sub Types

Number Transmision Survey Report

BY ROBERT M. DYQUETTA

Anyone who intensively monitors the number transmissions soon comes to realize that there are several main types, and each can be recognized by their distinctive transmission format. Regardless, all of the regular number transmissions adhere to a predictable transmission pattern; this being a s/on preamble, followed by an encrypted text arranged in block groups, then a s/off signature, all of which is carried out in either a voice or Morse code delivery.

Of these transmissions, number buffs are well aware of the SS/YL 4-digit, and those of you of a Morse code persuasion are familiar with the CW 5-element type, which utilizes the A U V 4 E 6 B D N T cut sequence. Both of these main types originate from a location known as the Remington Virginia site.

What some number buffs are now aware of is that these two main types each have a counterpart coming from the same location. It is these counterpart number transmissions (that I will, refer to as "sub types") that are the subject of this article.

The SS/YL sub type uses the same 4-digit setup, but employs a "voice" different from that of the regular main type. I emphasize the word "voice" for, in all probability, both do not use a human female for this purpose. The voice most certainly is a by-product of computer voice synthesization.

The CW sub type uses the same AUV4E6BDNT cut sequence, but presents the groups in blocks of four, rather than the five block used by the CW 5-element type. By the way, the AUV4E6BDNT sequence is "cut" Morse. When numbers make up the entire text, there is a standard international Morse code abbreviated table for use in those instances. When it is utilized, some of the group elements appear to be letters as well as numbers. Actually, *all* are numbers, and the Morse code shorthand breaks down as follows:

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

The only modification to the standard cut system is #5. This is normally 5-dots, instead of the 1-dot now employed by the CW number type.

It is to be noted that other CW number transmissions use slightly different "cut" sequences. It is presumed that these are not part of the Remington transmissions.

The sub types immediately stand out from their regular counterparts because of their different transmission procedures:

A) start is on the half-hour
B) no s/on preamble nor s/off signature is used
C) transmissions consist of a short series of 4-digit groups, repeated over and over for a ten minute period.
D) heard 7 days a week in (at least) three hourly time slots. Their transmissions schedule (valid as of this survey) was:

CW

0330 GMT on 6840/11605 kHz
1130 GMT on 11605/18737 kHz
1730 GMT on 18737/9958 kHz

VOICE

0230 GMT on 6840/9958 kHz
1030 GMT on 7725/10324 kHz
1630 GMT—never heard, but the time frame is presumed, due to the alignment of the voice with the CW, one hour earlier

During these daily transmission periods, the *same* message is repeated in all time slots, in voice and CW transmissions.

These sub types and their frequencies have been identified as originating from the Remington Virginia site.

In previous years, both sub types had a s/on marker, which was the "walking man" cadence for the voice, and a one-second interval tone pulse for the CW. Both s/on markers began at plus 25 minutes (5 minutes before transmission start). In late 1983, these markers were eliminated, and during the survey, the transmissions simply came up on the line, predominantly at +30 minutes.

Both of these sub types followed the same procedure—two to five 4-digit groups, repeated over and over until +40 minutes. The exact time ending of a given transmission depended on the number of groups. As they always fully completed the entire set of groups, a given transmission could end slightly before or after plus 40 minutes.

In the monitoring aspect of number investigation, you have two basic methods you can follow up on. One is to ascertain the day, time, and frequency usage for a given number transmission type, or to copy the s/on idents and/or the full message text for a given number transmission type. Afterwards, you would catalog, arrange, breakdown and analyze the data you accumulated. As the DTF alignments were all but established, and there were no s/on idents, this survey chose to devote itself to the message text.

The most promising frequency was 6840 kHz, due to the fact that both sub types utilized it, one hour apart, during the 0230/0330 GMT time frame. The survey ran from 07 July through 07 November 1984.

Table A lists, side by side, the texts of the SS/YL and CW sub types. Although these transmissions repeated their text, only one complete run through is depicted. You will note several oddities, and these will be examined in more detail.

The basic breakdown was as follows:

SS/YL Voice

a) total of 123 transmissions monitored
b) 35 transmissions were repeated once (**)
c) actual different texts were 88
d) roughly 28% of all transmissions were repeated
e) a total of two hundred forty-three 4-digit groups were recorded (excluding the repeat transmissions)
f) group usage (excluding repeat transmissions)
1 group—0%
2 groups—39.75%
3 groups—47.75%
4 groups—09%
5 groups—03%
6 or more groups—0%

(**) this included 5 which had additional 4-digit groups, as opposed to its corresponding repeat transmission

CW breakdown

a) a total of 121 transmissions monitored
b) 29 transmissions were repeated once(***)
c) actual different texts were 90
d) roughly 24% of all transmissions were repeated
e) a total of two hundred forty-six 4-digit groups were recorded (excluding the repeat transmission)
f) group usage (excluding repeat transmissions)
1 group—0%
2 groups—44.5%
3 groups—35.5%
4 groups—10%
5 groups—09%

SS/YL	CW	SS/YL	CW
July			
07 - 5462 6272 2944	0305 9742	14 - 4116 4613	1335 2667
08 - 5462 6272 2944	0305 9742	15 - 4116 4613	8701 9735
09 - 5994 9780	3776 4215 0511 7201 4994	16 - 3373 7940 1253	8701 9735
10 - 3042 0366 9527	4939 2256 1278 5817	17 - 1253 7390	7832 9633
11 - 5286 5690 9696	6307 2913 4994	18 - 7763 9429	7545 6057
12 - 2125 8798	6307 4994 2913	19 - 7763 9429	8510 3058
13 - 2574 2284 9017	8682 0848	20 - 1602 2454	8510 3058
14 - 9454 5170 1470	6540 8350 6870 8731 8791	21 - 8805 4534	4160 4293
15 - 9454 5170 1470	8350 8791 4532	22 - 8018 4096 7614	7820 6429
16 - 4282 0023 9696	NOT MONITORED	23 - 8018 4096 7614	3702 2487
17 - 1098 4661 4054 3850	8731 8791 5863 0375	24 - 6796 0577 0095	3702 2487
18 - 3040 4661 4054 3850	6031 9542 0621	25 - 1546 3093 9116	0870 0652
19 - 7042 6845 4764	7714 1266	26 - 0672 6147 1795	5546 8755
20 - 7042 6845 4764	7714 1266	27 - 0672 6147 1795	2081 0674
21 - 6835 6864	9568 4042 8752 5959 4532	28 - 8368 6327 8915	2081 0674
22 - 9977 3179 2998 5250	2802 1045 2853	29 - 8368 6327 8915	4122 3589 9641
23 - 9529 4926 3335	3118 1185 4771	30 - 2137 2934 4519	4151 9641
24 - NOT MONITORED	NOT MONITORED	31 - 4980 2271	4499 5590 7266
25 - 5897 7183 1860	9492 8659 7248 7163	**September**	
26 - 3698 2352 5713	1380 2099	01 - 8550 7954	4499 5590 7266
27 - 8784 1182 1378 0250	9078 8967 2274 3785 5470	02 - 8550 7954	6228 9721 5490 5592
28 - 8784 1182 1378 0250	9078 8967 2274 3785 5470	03 - 0997 6412	2757 4653
29 - 9301 0907 7467 5534	2712 1449 0148 0462 7439	04 - 1949 7398 6482	1839 7749 2912
30 - 0451 7174 2464 4877	1449 0148 0462 7639 2712	05 -1949 7398 6482 1248 8825	1839 7749 2912 2392 1423
31 - 2805 1898 4283	0222 8371	06 - 4977 6323 7496	1839 7749 2912 2392 1423
August		07 - 4977 6323 7496	1560 2804
01 - 2805 1898 4283	0222 8371	08 - 8913 3567	2749 6837 8529
02 - 1837 1064 9737	6908 9103	09 - 0819 8842	3211 7204 9634
03 - 1837 1064 9737	5390 3300 0906	10 - 9234 8742	3211 7204 9634
04 - 7107 9359 2240	5390 3300 0906	11 - 9234 8742	7454 8868 9892
05 - 5382 6709	2108 9637 2621	12 - 6349 7445 8403	4394 5884
06 - 1867 6330	0938 2922 5573	13 - 0705 5082	0639 2178
07 - 1867 6330	6217 1330	14 - 8431 4453	0639 2178 3501 5963
08 - 9123 1217	6217 1330	15 - 8431 4453 6402	0639 2178 3501 5963
09 - 9282 0735 7579	9135 7311	16 - 6943 6456 8041	2055 5498
10 - 2586 0663	1113 4631	17 - 6943 6456 8041	9280 8006 7157 9371
11 - 2586 0663	4542 0864	18 - 6776 7810 5048 8921	1548 7935
12 - 6276 6709	4542 0864	19 - 8156 4469 3240	1548 7935
13 - 7690 6729	8501 6630	20 - 1680 0467	4925 1952 2554 1652 1528

SS/YL	CW	SS/YL	CW
21 - 1680 0467 4245	7371 2580	15 - 6906 2272 4095	2436 4300
22 - 8570 8181	8909 0135 9516	16 - 6906 2272 4095	3261 2541 7674
23 - 8570 8181	8909 0135 9516	17 - 6555 2688 3224	3261 2541 7674
24 - 1874 7500	9126 2383 4271	18 - 4083 8584 9749	3045 0592 6011
25 - 2491 0421 6978	7375 8567 3583 7412	19 - 6600 0407 3949	4622 3615 3914
26 - 3611 7649 2075	9770 9516 8961	20 - 6600 0407 3949 3656	4622 3615 3914
27 - 3611 7649 2075	9770 9516 8961	21 - 4955 5937	4309 9181
28 - 5591 9755 5622	2090 5035 8630	22 - 4955 5937	7837 9349
29 - 5102 5711 9061	6113 7039 3396	23 - 4854 3320 4073 2407	4438 7601 0676
30 - 0198 1418	6578 8246	24 - 3635 9185 7819	4438 7601 0676
October		25 - 0750 7510	7252 7751 9356
01 - 0198 1418	6578 8246	26 - 0750 7510 6826	6538 1806
02 - 2336 8869 1288	5464 0746	27 - 5537 7118	3124 4944 5958
03 - 6033 2327 0748	4872 5619 9068	28 - 5537 7118	5958 3124 4944
04 - 6033 2327 0748	5619 9068 4872	29 -9957 8271 7288 2636 9975	1645 0500 5658
05 - 3106 1946	2134 5249	30 - 5473 3683	9137 7028
06 - 4842 6574	5506 1095 2537	31 - 5473 3683	3475 0184 1290
07 - 1463 2294 8237	4314 7419 2782	**November**	
08 - 8237 1463 2294	4314 7419 2782	01 - 9945 7907 2640 9163	3475 0184 1290
09 - 7212 0267	4127 5616	02 -7089 2268 2132 3985 1016	2304 5467 3439 1974 6679
10 - 4175 1208 7715	0993 0371 2939	03 -7089 2268 2132 3985 1016	3774 1210 9029 1883
11 - 6050 0120	0418 8005	04 - 8394 7089 4155	8896 4350
12 - 6872 6181 2270 1100 2437	NOT MONITORED	05 - 8394 7089 4155	8896 4350
13 - 6872 6181 2270 1100 2437	2577 5468 9401	06 - 0626 2896 2268	8512 8881 0685
14 - 7535 2591	6504 0887	07 - 8106 8827 2132	0362 6922 8883 9314

Table A: *Texts of the SS/YL and CW sub types*

6 or more groups—0%

(***) including 2 which lacked full text repeats or had additional groups

This basic summary shows little in common, until we check Table A and compare certain aspects, one of which is denoted in Table B: the days when the SS/YL and CW sub types repeated their transmissions.

As you can observe, the SS/YL and CW had: 13 repeat transmissions on the *same* two corresponding days; 11 repeats one day out of alignment, and only 5 of the CW repeated transmissions had no correlation with the SS/YL sub type.

This correlation of repeated transmissions is very apparent. Of these correlations, we must note these very odd ones that contained additional groups in their next day repeat.

SS/YL—04 Sept—1949 7398 6482
05 Sept—(transmission was sent in this order)
1949 7398 6482
1949 7398 6482 1248 8825
1949 7398 6482 1248 8825

This entire sequence was repeated over and over again.

During the same corresponding time frame, the CW sub type had:
04 Sept—1839 7749 2912
05/06 Sept—1839 7749 2912 2392 1423

Another repeat set was:
SS/YL 14 Sept—8431 4453
15 Sept—8431 4453 6402
The CW had:
13 Sept—0639 2178
14/15 Sept—0639 2178 3501
5963

The SS/YL had three more repeated transmissions that utilized an additional group (20/21 Sept, 19/20 Oct, 25/26 Oct) but with no correlation with the CW.

A preliminary analysis of these add-on repeat correlations strongly suggest that the SS/YL and CW sub types were carrying out the *same* type of operation, only from a voice versus CW mode aspect.

Table C lists numerically all of the 4-digit groups used by the sub types. As the side by side comparison shows, neither used *any* common numerical group. It can be inferred from this that the SS/YL and CW sub types were utilizing *two different* cipher keys. But as we will show, this has another meaning.

Before advancing further, let us mention some other oddities and characteristics of these sub type transmissions.

In examining Table A, you will note that each sub type used a specific 4-digit group twice, and in one instance three times. (This is excluding the next day repeat transmission.) Below are shown the 4-digit group and the days utilized.

SS/YL
Group
1253—16/17 Aug
2132—02/07 Nov
6709—05/12 Aug
7089—02/04 Nov
9696—11/16 July

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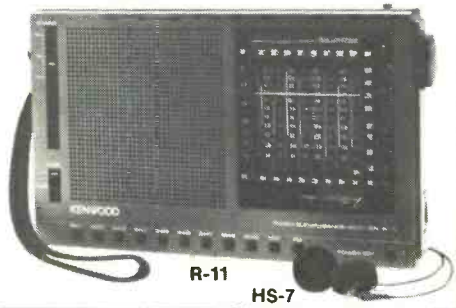

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SS/YL	CW	SS/YL	CW
July			
07-08	07-08	04-05	04-05-06
-----	11-12	06-07	-----
14-15	-----	-----	09-10
17-18	-----	10-11	-----
19-20	19-20	14-15	13-14-15
27-28	27-28	16-17	-----
29-30	-----	-----	18-19
31	31	20-21	-----
August		22-23	22-23
01	01	26-27	26-27
02-03	-----	30	30
-----	03-04	**October**	
06-07	-----	01	01
-----	07-08	03-04	03-04
10-11	-----	07-08	07-08
-----	11-12	12-13	-----
14-15	-----	15-16	-----
-----	15-16	-----	16-17
18-19	-----	19-20	19-20
-----	19-20	21-22	-----
22-23	------	-----	23-24
-----	23-24	25-26	-----
26-27	-----	27-28	27-28
-----	27-28	30-31	31
28-29	-----	**November**	
-----	31	-----	01
September		02-03	-----
01-02	01	04-05	04-05

Table B: *Days when SS/YL and CW repeated transmissions*

CW
Group
4532—15/21 July
4994—09/11 July
8350—14/15 July
8731—14/17 July
8791—14/15/17 July
9516—22/26 Sept
9641—29/30 Aug

. . . SS/YL on 17/18 July started the respective texts with a different 4-digit group. Following both, the other three groups were identical.

. . . The CW on 14 and 17 July, transmitted two different texts which both contained the groups, 8731 8791, sent in the same order. More on this later.

. . . The CW always had a repeated pair which occurred on the last day of the month, and the first day of the next month.

. . . In both the SS/YL and CW sub types, there were several instances when one of the transmissions started with one particular group, but its repeat started with a different group within the overall text.

. . . In over 50% of all SS/YL transmissions, the first group being transmitted contained a "pause" within the first group. An example of this was: "83 (pause) 94." The remaining groups had a normal cadence delivery. Once the full text was completed and the whole text began repeats, the pause was not there. What made this unusual was that some of the day to day repeated transmissions had an observed pause one day, but not the next. There were no observed pauses in the CW sub type transmissions.

Analysis Of The Encipherment System

1. Only two to five 4-digit groups constituted any given text. This makes for a very short message. With the 2 for 1 RNK (random numerical key) encipherment system, these sub types had only a 4 to 10 character possibility. In other words, the chances that the sub types are using a conventionally worded sentence structure is nil.
2. Over the four month survey period, 243 SS/YL sub type groups were recorded. This total can be achieved and surpassed in just a six to eight hour period by its regular SS/YL 4-digit counterpart.
3. From an RNK encoder standpoint, the odds for the same exact 4-digit group appearing again in the sub type texts (assuming it had a different decoded meaning) is remote, although not impossible considering the very small overall total of groups encountered in this survey.

Yet both sub types did repeat the same 4-digit group twice (discounting the repeat transmissions) in different texts. There were five instances by the SS/YL and 7 by the CW sub type. The most interesting point is that a given group was only repeated within the same month. This leads to the assumption that the "system" being utilized was changed every month.

4. The different text CW transmissions on 14 & 17 July contained the same two 4-digit groups, in a consecutive order. In an RNK system, the odds of eight RNK numbers combining with a plain text, to equal the same eight consecutive numbers in two different texts, is virtually impossible.

The only logical way this can occur would be if the same encoder key was used, and that the same thing was being "said" in both instances. From this, it is felt that the sub types were not utilizing an RNK encoder system.

Previously, we mentioned the "pause" phenomenon that occurred in over 50% of all SS/YL sub type transmissions. It is tempting to speculate that the pause was intended to denote a first group marker in the multi-group text. If this pause had occurred in all transmissions, then the assumption has merit. But it did not.

Many of the repeated transmissions had no observed pause, which was present in its companion transmission. To complicate matters, some repeated transmissions started with a different group within the text. The 07/08 Oct. is an example. Additionally, in many of the single text transmissions (having no next day repeat), there was no observed pause.

If the pause was being utilized as a group sequence alignment marker, its absence means that you would have no idea of the intended group wise sequence.

Unfortunately, the exact number of group wise transpositions is unknown. Some of the transmissions were QRMed, or so very weak that the precise initial sequence could not be ascertained. In those instances, both texts were aligned alike in Table A.

You can now see the point I am making. In order to decipher a conventionally worded message, the plan text is mixed with the encoder key, and the resulting enciphered text is presented in a consecutive manner.

Let me illustrate this whole process with an example . . . The plain text message is "LOCATE THE SITE OF THE XMTR" This is converted into its numerical equivalents (A = 01, B = 02, and so on). This is then aligned with the RNK encoder, and for our example, added together, to form the enciphered text.

RNK Encoder—
042615161701241410182306220225150108191101 16
Plain Text—
121503012005200805190920051506200805241320 18
Enciphered—
164118173706442215373226271731350913432421 34

To transmit, the enciphered sequence is broken down into 4-digit groups: 1641 1817 3706 4422 1537 3226 2717 3135 0913 4324 2134.

To decipher the message, you take the same RNK encoder sequence and subtract it from the enciphered text, to come up with the numerical equivalents of the plain text letters.

As the RNK encoder has a precise sequence, if the "message" was transmitted, starting somewhere other than its first actual group, the results are pure gibberish. To illustrate, below is the same enciphered text, now started at mid-point, but aligned with the *same* RNK encoder sequence. Decoded it appears:

Enciphered—
153732262717313509134324213416411817370 6
RNK Encoder—
042615161701241410182306220225150108191 1
Decode—
091117101016072 1????2018??32??26170918??

Converted into their number to letter equivalents, we come up with a message that reads: I K Q J J P G U ? ? T R ? ? ? Z Q I R ? ? F. The ? indicates subtractions of a minus numerical value, or numerical values beyond 26.

This sort of confusion will occur if those

SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW
0023	-	1016	-	2075	-	-	2802	-	4042	4980	-	-	6113	-	7163
0095	-	-	1045	-	2081	-	2804	4054	-	-	4994	6147	-	7174	-
0120	-	1064	-	-	2090	2805	-	4073	-	-	5035	6181	-	7183	-
-	0135	-	1095	-	2099	-	2853	4083	-	5048	-	-	6217	-	7201
-	0148	1098	-	-	2108	2896	-	4095	-	5082	-	-	6228	-	7204
-	0184	1100	-	2125	-	-	2912	4096	-	5102	-	6272	-	7212	-
0198	-	-	1113	2132	-	-	2913	4116	-	5170	-	6276	-	-	7248
-	0222	1182	-	-	2134	-	2922	-	4122	-	5249	-	6307	-	7252
0250	-	-	1185	2137	-	2934	-	-	4127	5250	-	6323	-	-	7266
0267	-	1208	-	-	2178	-	2939	-	4151	5286	-	6327	-	7288	-
-	0305	-	1210	2240	-	2944	-	4155	-	5382	-	6330	-	-	7311
-	0362	1217	-	-	2256	2998	-	-	4160	-	5390	6349	-	-	7371
0366	-	1248	-	2268	-	3042	-	4175	-	5462	-	6402	-	-	7375
-	0371	1253	-	2270	-	-	3045	-	4215	-	5464	6412	-	7390	-
-	0375	-	1266	2271	-	-	3058	4245	-	-	5467	-	6429	7398	-
0407	-	-	1278	2272	-	3093	-	-	4271	-	5468	6456	-	-	7412
-	0418	1288	-	-	2274	3106	-	4282	-	-	5470	6482	-	-	7419
0421	-	-	1290	2284	-	-	3118	4283	-	5473	-	-	6504	-	7439
0451	-	-	1330	2294	-	-	3124	-	4293	-	5490	-	6538	7445	-
-	0462	-	1335	-	2304	3179	-	-	4300	-	5498	-	6540	-	7454
0467	-	1378	-	2327	-	-	3211	-	4309	-	5506	6555	-	7467	-
-	0500	-	1380	2336	-	3224	-	-	4314	5534	-	6574	-	7496	-
-	0511	1418	-	2352	-	3240	-	-	4350	5537	-	-	6578	7500	-
0577	-	-	1423	-	2383	-	3261	-	4394	-	5546	6600	-	7510	-
-	0592	-	1449	-	2392	-	3300	-	4438	-	5573	-	6630	7535	-
-	0621	1463	-	2407	-	3320	-	4453	-	-	5590	-	6679	-	7545
0626	-	1470	-	-	2436	3335	-	4469	-	5591	-	6709	-	7579	-
-	0639	-	1528	2437	-	3373	-	-	4499	-	5592	6729	-	-	7601
-	0652	1546	-	2454	-	-	3396	4519	-	-	5616	6776	-	7614	-
0663	-	-	1548	2464	-	-	3439	-	4532	-	5619	6796	-	7649	-
0672	-	-	1560	-	2487	-	3475	4534	-	5622	-	6826	-	-	7674
-	0674	1602	-	2491	-	-	3501	-	4542	-	5658	6835	-	7690	-
-	0676	-	1645	-	2537	3567	-	4613	-	5690	-	-	6837	-	7714
-	0685	-	1652	-	2541	-	3583	-	4622	5711	-	6845	-	7715	-
0705	-	1680	-	-	2554	-	3589	-	4631	5713	-	6864	-	-	7749
0735	-	1795	-	2574	-	3611	-	-	4653	-	5817	-	6870	-	7751
-	0746	-	1806	-	2577	-	3615	4661	-	-	5863	6872	-	7763	-
0748	-	1837	-	-	2580	3635	-	4764	-	-	5884	6906	-	7810	-
0750	-	-	1839	2586	-	3656	-	-	4771	5897	-	-	6908	7819	-
0819	-	1860	-	2591	-	3683	-	4842	-	5937	-	-	6922	-	7820
-	0848	1867	-	-	2621	3698	-	4854	-	-	5958	6943	-	-	7832
-	0864	1874	-	2636	-	-	3702	--	4872	-	5959	6978	-	-	7837
-	0870	-	1883	2640	-	-	3774	4877	-	-	5963	-	7028	7907	-
-	0887	1898	-	-	2667	-	3776	-	4925	5994	-	-	7039	-	7935
-	0906	1946	-	2688	-	-	3785	4926	-	-	6011	7042	-	7940	-
0907	-	1949	-	-	2712	3850	-	-	4939	-	6031	7089	-	7954	-
-	0938	-	1952	-	2749	-	3914	-	4944	6033	-	7107	-	-	8005
-	0993	-	1974	-	2757	3949	-	4955	-	6055	-	7118	-	-	8006
0997	-	-	2055	-	2782	3985	-	4977	-	-	6057	-	7157	8018	-

SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW	SS/YL	CW
8041	-	8431	-	-	8701	-	8868	-	9029	9185	-	9454	-	-	9721
8106	-	-	8501	-	8731	8869	-	9061	-	9234	-	-	9492	-	9735
8156	-	-	8510	8742	-	-	8881	-	9068	-	9280	-	9516	9737	-
8181	-	-	8512	-	8752	-	8883	-	9078	9282	-	9527	-	-	9742
8237	-	-	8529	-	8755	-	8896	-	9103	9301	-	9529	-	9749	-
-	8246	8550	-	8784	-	-	8909	9116	-	-	9314	-	9542	9755	-
8271	-	-	8567	-	8791	8913	-	9123	-	-	9349	-	9568	-	9770
-	8350	8570	-	8798	-	8915	-	-	9126	-	9356	-	9633	9780	-
8368	-	8584	-	8805	-	8921	-	-	9135	9359	-	-	9634	-	9892
-	8371	-	8630	8825	-	-	8961	-	9137	-	9371	-	9637	9945	-
8394	-	-	8659	8827	-	-	8967	9163	-	-	9401	-	9641	9957	-
8403	-	-	8682	8842	-	9017	-	-	9181	9429	-	9696	-	9975	-
														9977	-

Table C: *List of all 4-digit groups used by the sub types*

who must decode it have a fixed RNK sequence (such as the one-time code pad), and the message was not sent in the exact sequence relevant to the RNK encoding. In fact, any enciphered message that utilizes a sequence aligned system, such as the one-time code pad, could not be correctly deciphered if the coded message was transmitted in anything but its exact enciphered sequence.

The group wise alignment could be established if, say, the first two numbers of the intended start group were pre-determined identifiers. If so, you see a problem with the transmissions having only two 4-digit groups. The message, if based on a 2 for 1 system, then contains only three deciphered characters.

Likewise, because of the small total number of groups per text, one could play musical chairs with the groups versus the RNK sequence, and eventually come up with the correct message. This, though, would only be practical if the text was composed of recognizable words.

This leads to the conclusion that the sub types are not utilizing a predetermined RNK encoder, or any other technique that requires a correct sequential enciphered text presentation.

The only logical conclusions are:

1. The sub types are bogus transmissions
2. The groupwise alignment is not necessary, because each group in itself has a specific meaning/reference, independent of the other groups. If true, the sub type transmissions are encoded references and not an enciphered text. An encoded reference would be a substitution, composed of a numerical, alphabetical, phonetic, or code word. As an example, "shortwave receiver" could have an encoded reference of: 2964, JEKAP, Delta Victor, or Pineapple.

The exact purpose of the pause is unknown. It could be nothing more than an electronic glitch, or done deliberately, in a random fashion, to draw attention to something that has no real function.

Table C showed that *none* of the 4-digit groups used by the SS/YL sub type had any duplicate in the CW sub type series. This in itself indicates that both sub types utilized a different "cipher" system. Table A depicts that day for day, the group usage by the SS/YL versus the CW often did not total out the same. This indicates that each sub type was transmitting something different.

But Table A, along with the repeat transmission breakdowns, shows a very curious fact. The majority of the repeat/additional group transmissions occurred in the same relative day/time frame period. These correlations are too similar to be purely coincidental. A specific example was the SS/YL and CW 04 Sept transmissions. Both contained three 4-digit groups. In the next day repeat, both added one additional group. These add-ons to a repeated transmission are, by themselves, odd enough, but the fact that both sub types did it for the same time frame repeat indicates that *both* sub types were motivated by a common denominator. From this, there is a strong possibility that both were referring to the same exact thing.

This is somewhat supported by the fact that the CW sub type does not follow its regular CW counterpart by transmitting 5-element groups. Instead, the CW sub type conformed to the 4-digit group usage of its SS/YL sub type.

Granted day for day, SS/YL versus CW sub type transmissions often showed one using more groups than the other. This may not indicate a different message, but the fact that one type may require something that the other type did not need to convey . . . . But in context, both transmitted the same message.

The fact that *none* of the SS/YL groups had an exact duplicate in the CW sub type (Table C) is somewhat unusual. In the RNK system, randomly generated numbers, or those derived from a mathematical exercise, combine with equally random plain text equivalent numbers (random from a numerical standpoint). The resulting enciphered text, when segmented into convenient groups, likewise produces a seemingly random series of X-digit groups. But it is because of this random factor that the same X-digit group can occur, in the same message text, as well as different message texts. This occurs only when one is examining a large assemblage of groups, such as found in the regular number transmissions.

If the sub types were each utilizing a separate RNK, then the random probability factor could have produced at least one or more 4-digit groups, common to both. This did not occur, but is not too surprising due to the overall small total of groups monitored in this survey.

Another reason why no common group association occurred can be found by ex-

SERIES	SS/YL	CW	DIFFERENCE
1000	19	14	05-SS/YL
2000	19	24	05-CW
3000	12	14	02-CW
4000	18	19	01-CW
5000	10	18	08-CW
6000	26	12	14-SS/YL
7000	21	21	EVEN
80000	20	15	05-SS/YL
9000	13	22	09-CW
0000	17	18	01-CW

	SS/YL	CW
SERIES RANGE -	10 to 26	12 to 24
RANGE DIFFERENTIAL -	16	12
TOTAL SERIES USE -	175	177
DIFFERENTIAL TOTALS -	24	26

Table D: *Block series usage for the months of August, September, and October*

amining Table C. There is a most definite alternating/staggered usage of groups by the SS/YL and CW. We can further delve into this by breaking down Table C into their block series alignments (first group number denoting the block series).

Table D shows the results of this. *Only* the full months of August, September, and October were tabulated. July and November were not included, since they each did not reflect a full month of transmissions.

Of this breakdown, only the 7000 series group had equal totals. All of the others differed by 01 to 14 . . . . But when these differentials were totalled, the overall SS/YL versus CW difference was only 02. The same holds true for the total series use by each sub type—it, too, being 02.

The series range differential (SS/YL versus CW) was 04.

When we take each sub type series total, align them and compute the differences, we show this:

SS/YL	CW	Difference
10	12	02
12	14	02
13	14	01
17	15	02
18	18	00
19	18	01
19	19	00
20	21	01
21	22	01
26	24	02

As you can see, the differences had a maximum variation of only 02. Table D therefore indicates that even though a specific block series of groups were utilized twice as much (the 6000 series), the overall differences were remarkably similar. As such, even though the SS/YL utilized more series group totals in some instances, the CW all but compensated for this in other series groups.

Earlier we discussed the possibility that the "encoder" was changed monthly. To check this out, Table E was set up to visualize block series usage, per month, by each of the sub types. Of the five months, July, August, and October had a variance of 02, November 03, and September 06. If we examine only the full months (August, September, October) we find that they total out to 170 SS/YL versus 172 CW. This variation of 02 corresponds with the differential results of Table D.

By examining the group usage alignments (Table C), the overall block series usage (Table D), and the month by month block series (Table E), we find these clues:

a) the alternating/staggered group usage by both sub types suggests that a single encoder system was being *shared* by both.

b) overall total block series breakdowns show a predominate trend toward even usage of specific blocks. If the sub types were each using a separate encoder, this even usage would not be probable.

c) the month to month block comparisons (Table E) do show variances up to 9, but the comparative monthly totals are very similar.

SERIES	July	August	September	October	November	SERIES	July	August	September	October	November
1000	06	03	07	04	03	1000	06	08	05	05	01
2000	07	06	11	07	01	2000	08	06	02	10	04
3000	03	04	04	06	02	3000	05	02	03	07	01
4000	06	07	04	08	01	4000	07	06	04	07	01
5000	04	04	06	08	01	5000	09	01	06	03	00
6000	04	05	04	03	02	6000	04	07	09	09	00
7000	05	05	09	07	00	7000	04	07	07	07	02
8000	08	04	08	01	04	8000	02	04	12	04	03
9000	05	06	08	06	02	9000	08	06	03	04	02
0000	08	06	02	09	02	0000	05	05	06	05	01
TOTALS	56	50	63	59	18	TOTALS	58	52	57	61	15

Table E: *Month by month block series use*

Taking everything into consideration, it appears that the sub types are:

1) transmitting the same basic message
2) utilizing a common encoder system, but not of the RNK sequence type
3) or, that they are the component parts of a single message.

If there is no RNK, then a simple coded reference system can be used. This works especially well to convey entire words, sentences, paragraphs, and so on. In other words, 8463 could denote "Instruction Bravo," and if Bravo is often referred to, this fact could be hidden by assigning X-number of groups to indicate it.

Table C denoted the obvious alternating/staggered use of groups by the sub types. This is to say that out of a possible 10,000 combinations (0000 to 9999), one half are assigned to the SS/YL and the other to the CW sub type. In this scenario, both can denote the same thing, yet would not use the same 4-digit groups to do so.

Checking into other possibilities, could these groups be frequency references? If you check out Table C, you'll note that the groups from a 3000 to 9999 level all could denote a specific HF frequency. For groups having a 0-1-2 start number, we could preface them with the number 1. Therefore, these would indicate 10-11-12 MHz area frequencies. As such, some of the groups are either the exact or close proximity references to number transmission frequencies.

But do they indicate frequencies over which some type of message will be transmitted? It seems unlikely, due to the fact they are being transmitted in the clear. Presenting a frequency roster over the air seems an irrational thing to do, considering the cloak-and-dagger nature of these transmissions.

It seems probable that the groups themselves refer to something specific, not frequencies or individual letters. This could well be an item for item reference.

Are the sub types directly linked to their regular counterparts? This does not seem probable, since the first new set of sub type transmissions are at the 0230/0330 GMT period. If we assume the regular number types have a 0000 GMT new day time start, then this rules out any any correlation. But then again, who says 0000 GMT is the new day time start? This begins after a full 24 hour period. In this context, the regular Remington types could have a new day time start, beginning at the 0300/0400 GMT time period. If this is true, then these sub types are very possibly directly intertwined with their regular counterparts.

The use of only a two to five numerical group block is unique. No matter what these sub types are saying, it can always be accomplished with two to five 4-digit groups . . . no more, no less. The absence of any transmission sending just one-group is most interesting. Whatever is going on, it requires a minimum of *two* 4-digit groups to convey. It is possible that one group is the item reference, while the other serves as an authenticator, specific routing code, and such. If true, these would be changed daily to preclude any static use betrayal.

If the sub types are linked to their regular counterparts, it is difficult to ascertain how. Each sub type transmits the same message throughout the 24 hour period. At the same time, upwards of 24 different transmissions

could be generated by each of the Remington regulars. Therefore, this question cannot be validated at this time.

If the sub types are transmitting the same basic message, plus they are in some manner directly tied into the regular counterparts, it is intriguing to speculate that the regular SS/YL 4-digit and the CW 5-element are themselves saying the same thing in their transmissions. This brings up the question, why do you need two different modes to convey the same thing?

Anyone can learn to recognize numbers, no matter what the language. Phonetically, "new-way-vay" is 9, "sink-ko" is 4, and so on. Even if you cannot understand spoken Spanish, you could still recognize and transcribe Spanish language single digit numerics.

Not everyone can "read" Morse code, but this inability does not really apply to the CW sub type. It transmits the dot/dash elements so slowly that anyone could jot them down, and then later look up their character equivalent. In effect, you do not need to know Spanish or Morse code in order to correctly copy either the regular or sub type transmissions. Ergo, it is illogical to send the same thing in two different transmission modes when you are repeating the transmission during other time slots. If this is illogical, what plausible answer is there? We briefly touched on this before.

Table C denotes a strict segregation of 4-digit groups. From this, it could be deduced that each sub type is using only one-half of the same encoder system. The four month survey shows this trend toward evenly divided group usage. But as this was used to illustrate one possibility, we now find that we are also describing the parameters of another possibility.

Ask yourself, what is the logic to divide a single encoder system between voice and Morse code mode transmissions, and then proceed to say the same thing in each? There is no rationale to this method, when copying the messages are so easy and they are repeated.

But we can still take the same basic deductions and apply them to the alternate possibility. The SS/YL and CW sub types share one-half of the same encoder system because each is only transmitting *one-half* of the full message. In other words, the SS/YL starts the message, and the CW sub type finishes it.

Even as such, the combined daily group totals, in most instances, are still too short to be a conventionally worded statement. Hence, a group equalling a specific item reference remains a most probable answer.

The Remington sub types are but one aspect of those mysterious HF radio activities that have been labeled *number transmissions*. Some of you have gone even farther and consider the whole class to be of the cloak-and-dagger gender.

Because no definitive answers are known, there remains a lively debate as to exactly what the number transmissions are doing, and to whom they are being directed to. In a way, the sub types are more intriguing than their regular counterparts, due principally to their very limited group texts. By no stretch of the imagination are they sending what amounts to a conventionally worded statement. The regulars have the group counts for this, but the sub types do not . . . . The question is, why?

It may well be that a key to unlocking the mystery of the number transmissions can be found by concentrating one's efforts on these sub types, the reason being they are part of the number transmission enigma, so their activity must, in some way, be interrelated.

Investigating the numbers is complicated by the fact that each prober has his or her own ideas as to what they are all about. Objectivity often gets lost in the shuffle, especially when the data you're working on seemingly points in a certain direction. As such, any conclusions drawn in this article suffer from a measure of subjectivity creeping into a hopefully objective analysis.

Fortunately, this article has included a full presentation of the message texts; so, you don't have to make your own tedious four month survey. The raw data (Table A) is yours, and if you are intrigued by these sub types, you can sit down and conduct your own analysis. By following your own line of reasoning, you could come up with similar results, or conclusions that vastly differ.

If any of you do uncover clues, I'd appreciate it if you would inform me, via *POP'COMM*.

Analyzing aspects of the number transmissions, be it via the DTF factor, s/on indents, or the texts themselves, will not directly lead you to the answers behind these mysterious transmissions. At best, your efforts can uncover specifics of the operational procedures. Other than that, it will not indicate who these messages are for, what their actual purpose is, or what specifically is being said. But this line of investigation has merit, for it adds pieces to the overall jigsaw puzzle.

The box our puzzle comes in has no picture of the finished product, so you must try to fit together each piece and see what develops. This is both tedious and frustrating, but if the puzzle maker deliberately hides the picture from you, it doesn't mean that you can't go on, fitting piece by piece, and eventually come up with the picture yourself. PC

POP'COMM *Checks Out*

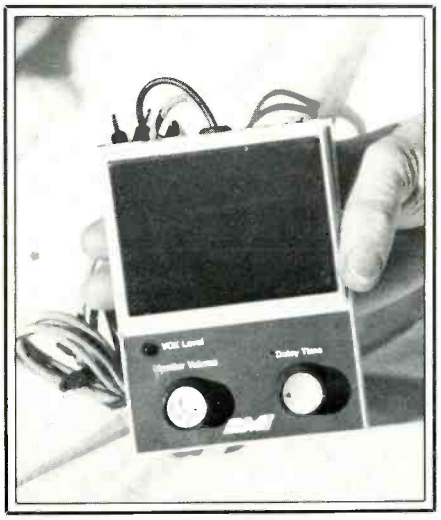
The Nitelogger: Automatic Tape Recorder Activator

News headlines make many scanner owners wince with no little amount of genuine annoyance, for no matter how many hours per day or week you spend monitoring a police, fire, or other *action* frequency, something major always seems to take place there just after you've gone to work, or to bed, or to the store, or inside to watch TV. That's luck, and you've probably figured it's also fate.

Benjamin Michael Industries, Inc. (BMI), of 65 East Palatine, Prospect Heights, Illinois 60667, has now made it possible for you to not only hear everything that goes out over your favorite VHF communications channel, but you'll have a cassette taped audio record of the event to place in your station archives for future reference. You'll have this even if you're at work, or shopping, or sleeping, or doing anything else that may take you away from your scanner. BMI's NiteLogger is the device that will accomplish this for you.

This device connects between your scanner and a cassette recorder. The heart of the NiteLogger is a VOX (voice controlled relay) that automatically directs the cassette recorder when to turn on and off, based upon the activity taking place on your scanner. When the scanner is silent, there is no reason for the cassette machine to be doing anything but just sitting there and waiting. When the scanner begins picking up communications activity, the NiteLogger instantly commands the cassette recorder to commence recording the traffic. Essentially, this is very similar to the type of device used to operate tape recorders used in connection with phone taps and room bugs, except the NiteLogger was designed specifically for operation with a scanner receiver.

You can pop a C-90 cassette into your machine, hook the thing into your scanner by means of the NiteLogger, and then go away for a vacation. When you get back, you can review what went on while you were gone. Depending upon the amount of activity on the channel, you might well get an entire week's worth of communications recorded on a single cassette.



The NiteLogger is small, self-contained, and performs a needed service at a very reasonable price.

Operation is quite simple and straightforward, taking only four steps to get it connected, then four more steps to set it for operation. Connecting the device doesn't require any internal digging or modifications, any tools, any technical savvy. All you have to do is insert a couple of plugs into existing jacks and you're ready to operate.

There are only two controls on the NiteLogger to be concerned with; one adjusts the volume of the NiteLogger's internal monitoring speaker, and the other sets the VOX's delay time to minimize blank tape time. A VOX level light on the unit is adjusted by the scanner's volume control and everything is set to go.

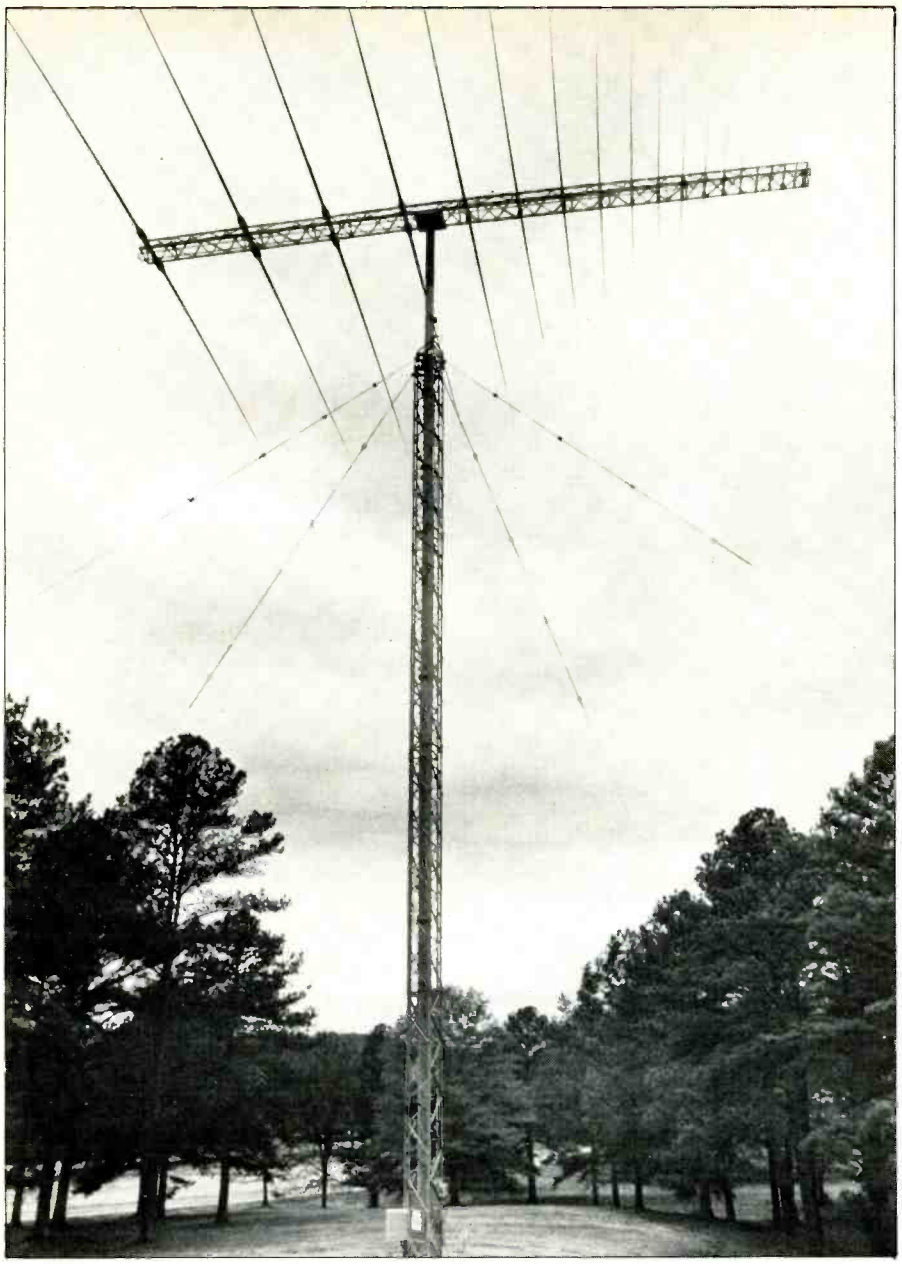
Then watch what happens. The scanner activates and, instantaneously, the cassette recorder switches on. Since the audio output of the scanner is being fed out through the external speaker jack, the scanner's internal speaker is disconnected; no problem, you can listen in (if you want) on the NiteLogger's built-in speaker, or you can use NiteLogger's monitor volume control if you want the system to operate in stony silence.

The NiteLogger itself is small, attractive, and well constructed—a good idea whose time has definitely arrived. You can use it with any scanner and any standard cassette unit. We liked its ease of installation and overall operation. In one test, we set it to a surveillance channel used by a certain enforcement agency and let the scanner do its thing for three days without interruption. When I checked the cassette machine I noted that only half of the tape had been used, which indicated that after almost 75 hours of monitoring, there had been only about 20 minutes of actual communications! I was then able to spend only 20 minutes of time monitoring everything that went out on that frequency for several days, day and night.

It should be noted that while it's less confusing to monitor only one single channel by this method, if you have a couple of favorite frequencies you want to absentee monitor, you can put your receiver into its usual scan mode to inspect as many frequencies as you like. Of course, your cassette recorder will take down a steady stream of communications and leave it to you to sort out who's who on the recording. For the sake of avoiding confusion, it would probably be best to limit the number of frequencies to two or three at the most.

The NiteLogger sells for less than $70. It's a great little timesaver. PC

Reviewed by Tony Earll, KNY2AE



An 80-foot antenna links the Fort McClellan, Alabama MARS station with amateur radio operators throughout the country. (U.S. Army photo by Lt. Col. Douglas L. Verdier)

This Is MARS . . .

The Military Affiliate Radio System

BY ROBERT L. WARREN AND AL HINTON

The Military Amateur Radio System (MARS) was reborn November 20, 1948 as a joint project of the Air Force and the Army. MARS was, in effect, the reactivation of the pre-war Army Amateur Radio System (AARS). AARS, so familiar to old-timers, went out of business December 7, 1941.

There have been many organizational changes since Major General Spencer B. Akin, Chief Signal Officer, announced the reactivation of Army MARS, but the basic purpose has stayed the same.

The main mission of MARS is to provide Department of Defense sponsored emergency communications on a local, national, and international basis as an adjunct to normal communications. Army MARS is managed by the Army Information Systems Command, headquartered at Fort Huachuca, Arizona.

When called on to provide auxiliary communications, a civilian MARS member operates in military nets passing military traffic. Some civilian members have quite sophisticated communications centers and are able to pass RTTY and data traffic.

Civilian MARS members have access to a limited amount of surplus or unusable communications equipment in proportion to the amount of time they spend in MARS networks. The average MARS member will testify that this is not necessarily the boon it may appear to be. By and large, the equipment available tends to be well worn or so old that parts are no longer available.

MARS also provides auxiliary communications for military, civil, and disaster relief officials during periods of emergency. To do this, MARS is dedicated to coordinating amateur radio communications procedures with military radio procedures to provide a potential reserve of trained radio communicators, with equipment available, to be called to assist when needed.

Many MARS members have, either singly or banded together in small groups, put together mobile rigs that carry both communications and power generation equipment in a truck. By doing this they can either go to a site where communications is needed or operate independently where commercial power is out.

While the MARS program is military in concept, it is being executed by both soldier and civilian amateur radio operators.

Although emergency communications is its basic reason for existence, MARS is best known for its morale and welfare communications, the MARSGRAMS and phone patches from Korea, Vietnam, Grenada, and Europe.

MARSGRAMS are similar to telegrams in that the person sending the message provides a written message that is usually mailed to the recipient's home from the receiving MARS station in the United States.

It is the pride of accomplishment and the pleasure of joining families together across the continents that keeps the 6,000 affiliate members by their radio sets for long hours over the holidays.

A typical example, Pat Lane (AAR4LL), of Memphis, Tennessee, was working with three MARS stations in Grenada over the 1983 Thanksgiving holidays. He was completing phone patches over Sprint circuits that had been donated to MARS free of charge.

One MARS station in Grenada was using a military tactical radio unit that was Jeep mounted. The operator drove the vehicle to various outposts on the north end of the island and let the troops call home from the radio in the Jeep.

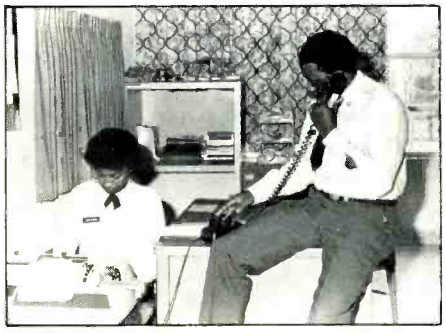
Lane said, "Judging from the conversations, this was the only way these people had of communicating other than by mail."

He said, "Words could not express the joy

Spec 4 Kelly Stitzel, a radio operator with the Army's 11th Signal Brigade at Fort Huachuca, Arizona, works in the teletype room of the Army MARS station at Fort Huachuca. (U.S. Army photo by Jack Bruno)

Sp4 Rory Arenz, a radio operator assigned to the Fort McClellan, Alabama MARS (Military Affiliate Radio System) station, sends a message from a soldier's family to the soldier through another MARS station in North Carolina. (U.S. Army photo by Lt. Col. Douglas L. Verdier, Fort McClellan, Alabama, Public Affairs Office)

Spec 4 Leonardo Arce, assigned to the Army Information Systems Command Agency-Fort Huachuca, Arizona, is a radio operator in the post's Army MARS station. (U.S. Army photo by Jack Bruno)



PFC Inez DeDaviess, a radio and Morse code operator from Savannah, Georgia (left), and Sp4 Bennie Harris, a radio operator from Maywood, Illinois, use the telephone to relay a message from a serviceman stationed in Germany to his family in Anniston, Alabama. DeDaviess and Harris are both assigned to the Fort McClellan, Alabama, Military Affiliate Radio System (MARS) station. (U.S. Army photo by Lt. Col. Douglas L. Verdier)

these men of the 82nd Airborne Division and their families received as a result of the MARS phone patch service and the free Sprint telephone lines."

Lane donated many hours of his time and was kept from his family for a large part of the Thanksgiving holiday, but he considered the results worth every minute of the effort. He completed 221 telephone patches from soldiers on Grenada to family members in the United States.

In these phone patches, MARS provides a radio link from the source to a radio operator in the United States. The radio operator in the states usually calls the final number collect and establishes the connection by radio and telephone.

MARS plays a very critical part in maintaining the morale of people stationed in Korea. The 1st Signal Brigade (AISC) Area MARS Director and the Seoul Gateway Station have developed a dynamic program to advise eligible people in Korea of the capability of MARS.

The program includes sport announcements on Armed Forces Korea radio and television, as well as orientation of new arrivals at the reception center.

During Exercise Team Spirit each year, when the 25th Infantry Division deploys from Hawaii to Korea, a special MARS network is established to keep the troops in touch with their families. A similar system is being tested this year to keep the troops participating in Exercise Reforger in Germany in touch with their families in the United States.

The accomplishments of Army MARS in support of military, state, and local governments are many. In Hawaii, MARS provides communications support for the Honolulu Marathon, the Round The Island Run, and the TRANSPAC Yacht Race between Los Angeles and Honolulu.

During flooding in Tucson, Arizona, in 1983, MARS members donated more than 800 hours to the Arizona National Guard, assisting as radio operators and net control stations.

In May, 1983, a strong earthquake struck Coalinga, California. Army MARS was first to react. Douglas Johnson, an Army MARS affiliate member in Fresno, California, activated his MARS equipment. He established an Army MARS emergency network, relaying preliminary earthquake data to the MARS Gateway Station at the Presidio of San Francisco.

Other California members located in the Simi Valley, Norwalk, and Fair Oaks checked into the net. Following the quake, MARS members relayed messages into and out of the disaster area, using MARS HF and VHF.

In September 1984, Hurricane Diana struck the North Carolina coast. Don Biltcliffe, the North Carolina State MARS Director, activated an Army MARS emergency net. A total of 85 Army MARS stations from Florida to New York were either operational or on standby throughout the crisis. Constant contact was maintained with the National Guard and state Civil Defense organizations.

Membership in Army MARS is not restricted to military installation stations operated and maintained by military personnel under the auspices of a military command.

Any individual who desires to operate in the Army MARS program may submit an application to the MARS director of the geographical area in which the applicant is located. Applicants must meet the following requirements: Be a minimum of 14 years of age; be a citizen of the United States; be a

holder of a valid FCC amateur radio license; be a member of only one service MARS program; and possess a radio station capable of operating on Army MARS frequencies. Army MARS frequencies are specifically assigned military frequencies just outside the authorized amateur frequencies. They must also agree to operate in accordance with the regulations prescribed for participation in the Army MARS program.

On approval, the appropriate MARS director will issue the new MARS member an Army MARS radio station license, a MARS station callsign, procedural manual, and other instructional and informational material. Following a period of training, the new member will be free to participate in net and traffic handling MARS operations.

To retain membership, a minimum of twelve hours of participation in three consecutive months consisting of at least six hours on HF networks is required. Monthly participation reports are submitted to the state director. Operation on amateur radio bands doesn't count towards participation in MARS activities.

Further information is available from Headquarters, U.S. Army Information Systems Command, ATTN: AS-OPS-OA, Fort Huachuca, AZ 85613-5000.

About the authors: *Robert L. "Larry" Warren is the Chief of Army MARS, and Al Hinton is from the Office of the Chief of Public Affairs, U.S. Army Information Systems Command.*

Monitor Army MARS!

Although Army MARS operates on a large number of frequencies, here are some of the more popular channels noted in use:

4020 kHz	LSB.
4025	LSB.
4030	LSB/USB.
4035	LSB/USB.
6997.5	All mode. Note that MARS station WAR in Washington, DC is heard with a CW broadcast to MARS stations at 0100 and 0400 GMT.
13996.5	USB in the Pacific and Alaska.
13997.5	USB phone patches.
14402	USB phone patches.
14403.5	Station WAR noted here with RTTY on Wednesdays at 0300 and 0430 GMT.
16041.5	All modes.
19532.5	RTTY (170/45N) in the Pacific, Europe, and Alaska.

MARS stations operated by amateur radio operators have callsigns consisting of 3 letters (commencing with "A," followed by a single digit, followed by 2 letters). Typical examples would include AAA9CG, AAA3BW, or ABL6RS, etc. Military operated MARS stations have callsigns consisting of 3 letters (commencing with "A," a single digit, and 3 letters). Typical examples:

AAA3USA	Ft. Meade, MD
AAA6USA	Ft. Sam Houston, TX
AAA9USA	Presidio of San Francisco, CA
ABM4USA	Korea
ABM6USA	Hawaii
AEM1USA	Germany

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY FRANK BAYLIN

Scrambling And Home Satellite Television

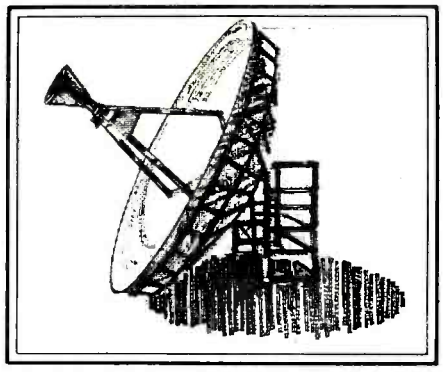
The explosive growth of the satellite television industry during the past five years—the entire lifetime of the home market—caught most program producers and program distributors, such as cable TV companies, by surprise. Their initial response to ignore this once minor irritant was followed by threats and, in some cases, by lawsuits.

Today the tide has turned. Most programmers are investigating methods of collecting revenues from the estimated one million TVRO owners. Some cable TV companies, especially in rural areas, are even selling satellite TV systems. For example, Indiana-based Omega Communications, which operates 20 small cable systems in Illinois, Michigan, Minnesota, Pennsylvania, and Indiana, sells and rents over 1,000 home satellite systems—and others are following.

Congress recently gave support to this changing tide. In November of 1984 it passed a bill, originally sponsored by Senator Goldwater (R-AZ), which legalizes once and for all reception of satellite broadcasts by home based systems. So now program producers, such as HBO, are stepping up their efforts to scramble their broadcasts. A scrambled television program would be completely unrecognizable without the use of a decoder to reassemble the original message. But all is not lost; in fact, the future appears to be quite promising.

Almost everyone agrees that the program producers should be paid in full for their creative efforts. The alternative would be the death of advertising-free television. Taylor Howard, one of the pioneers of satellite TV and co-founder of Chaparrel Communications, explained that the quantity of video entertainment available today is rather limited. "There's something like 8,000 movie titles total, existing . . . I've relived my childhood six times now." He goes on to argue that to produce new video takes money—someone must pay the bill. Scrambling seems to be the only choice, not as a means of depriving the home satellite TV market, but simply as a means of establishing a mechanism to collect well-earned revenues.

But is the home TVRO market large enough for the likes of HBO, Cinemax, MTV, or Showtime to service? Experts estimate that the U.S. has over 85 million televisions in use, expected to grow to 95 million by 1990. Of the 53 million households passed by cable, approximately 32 million view cable. Of this group, 26 million receive pay services. But 25 million sets get only two or three poorly received channels—so an



estimated 10 million TV owners of this group alone will purchase earth stations. Today, about one million home receiving stations are in operation. Ken Kinderman, Director of Network Distribution for HBO, figures that 13.5 million subscribers view HBO. He added that "Basic cable networks with over 25 million subscribers each are struggling to make ends meet . . . the issue of whether it's worth doing business (with TVRO) at all has to be scrutinized very carefully." Apparently, the home TVRO business has already decided this question.

What if the likes of HBO scramble their broadcasts in an attempt to exclude this fledgling industry. Many thousands of small, "mom and pop," independent cable TV companies may balk at such attempts. They might simply shift their allegance to another one of the tens of pay TV programmers. After all, who would pay for and maintain the equipment for decoding the scrambled broadcasts?

Technical questions, as well as engineer solutions, have also not been completely resolved. An ideal answer for the home market would be a satellite video receiver with built-in electronics to decode perhaps up to ten or twenty scrambled pay TV signals. Will the first programmer to build and sell a decoder for the home market be saddled with a non-standard technology once industry standards develop?

These and related questions have obviously been weighing on the minds of the decision makers. HBO has announced the imminent arrival of its scrambling system for over two years. Also, most programmers do not have the financial resources to effect the switch to scrambling in the near future. Probably only MTV and HBO have the economic wherewithall to quickly implement scrambling—most likely by the end of 1985, if all goes well. And many TVRO owners will not even notice their departure because so many other quality shows are being aired—or perhaps more appropriately "spaced."

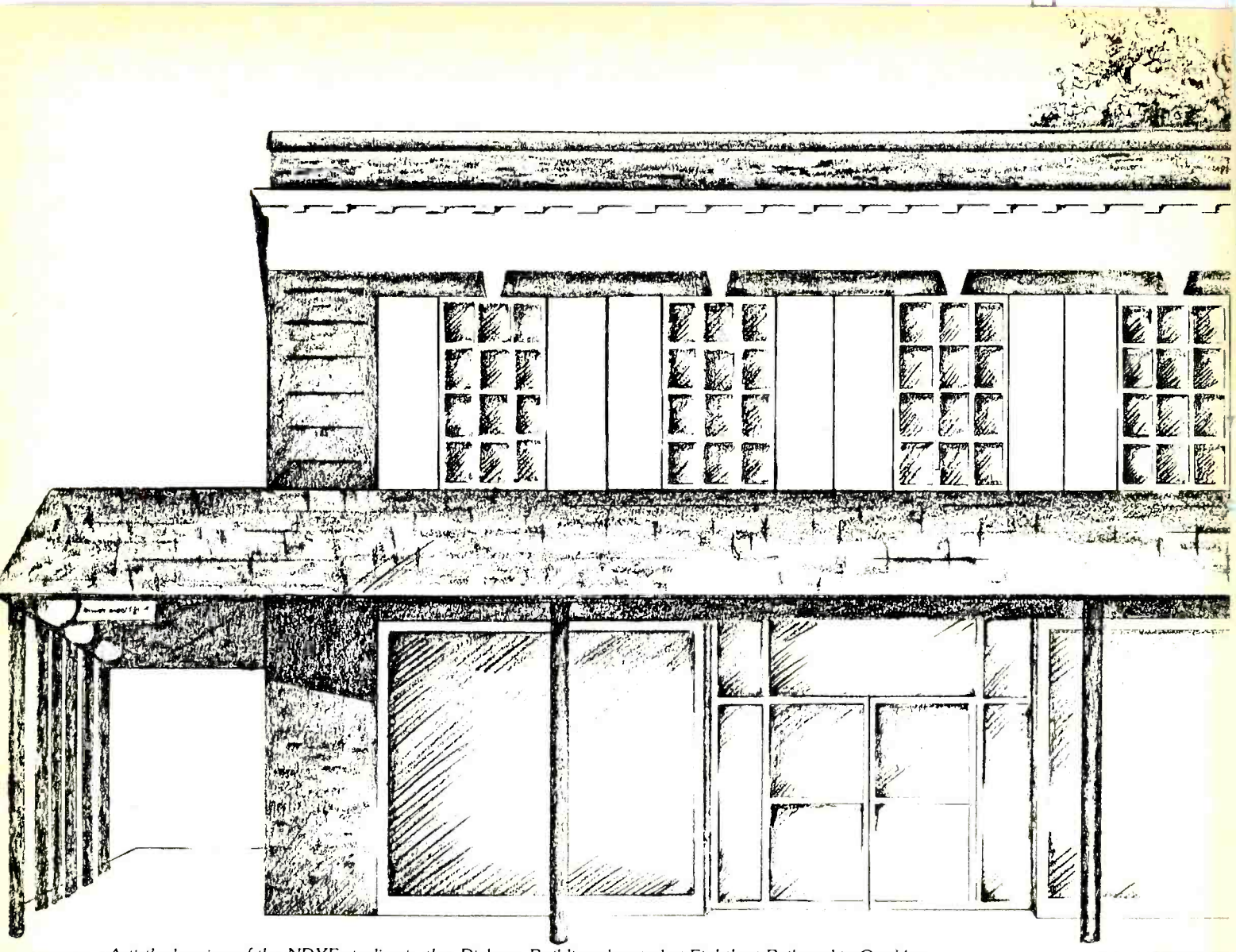
Once the technical and economic problems are solved, some basic managerial issues will need to be addressed. For example, how would revenues be collected from millions of individuals—home and business subscribers—to pay broadcasters? Such an answer has to include the information that some satellite TV viewers will wish to watch only non-pay broadcasts such as religious programs (offered free of charge) or commerically sponsored programs. Local cable companies or co-op organizations may be recruited to aid in the collection. Also, for example, will all video receiver manufacturers be allowed to incorporate the scrambling equipment?

The TVRO lobbying organization SPACE has not stood idly by during this rapid evolutionary period. Rick Brown, legal council for this group, recently outlined a program to speed the cooperative development of a method to maintain a competitive climate if scrambling is introduced. First, it is seeking to strengthen a bill introduced by Representative Gore (D-TN) to make scrambling equipment available to the home market immediately if and when scrambling occurs. Second, it is fighting to maintain reasonable rates for pay TV satellite programs. Third, it stands by the principle that there be no monopoly for descrambling equipment.

Scrambling of satellite television broadcasts will come to pass and pay TV programmers will eventually be paid for their efforts. This is especially so as the number of installed systems continues to rapidly grow. However, in the near future, the home earth station owner has little to be concerned about. The technical and institutional problems will by necessity cause rather slow and deliberate actions to be taken. And when these actions are taken, the home TVRO enthusiast will most likely be protected by legislative action.

Mike Gustavson, another pioneer of home satellite TV viewing, sums up the probable outcome well in a recent issue of *STV Magazine*. "We have had a good ride so far. We are going to have to start paying for the ride soon."

Frank Baylin is a communications consultant based in Boulder, Colorado. He has authored *Satellites Today – The Complete Guide to Satellite Television*, which is available for $9.95 from ConSol Network, Suite B, 1905 Mariposa, Boulder, CO 80302. PC



Artist's drawing of the NDXE studios in the Dickson Building, located at Eighth at Railroad in Opelika.

Here's Station NDXE

A New Station With New Sounds From Dixie

BY GERRY L. DEXTER

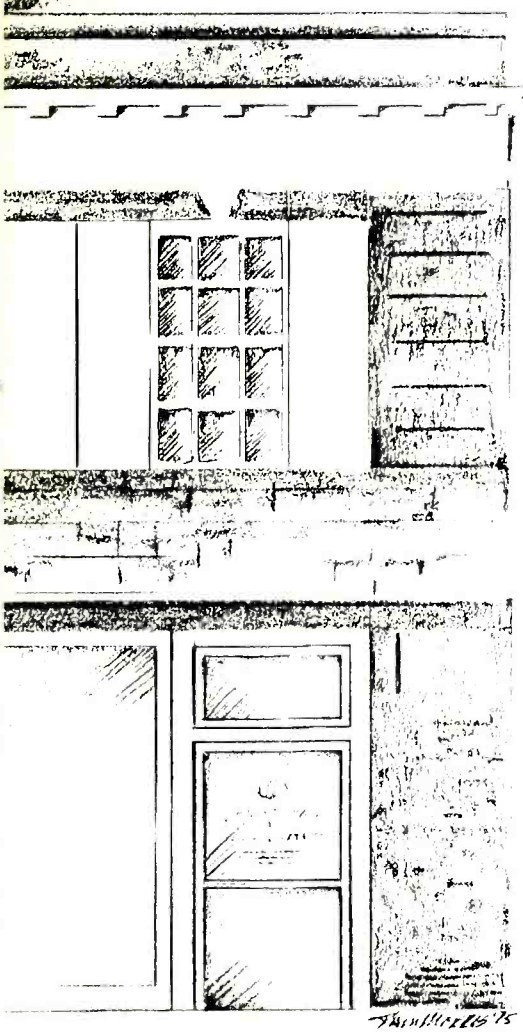
Harry Dickson Norman, Jr., may very well be one of those rare people whom others describe with the adjective "visionary."

Norman is hardly the first person to ever think about putting a shortwave station on the air. He certainly isn't the first to win Federal Communications Commission approval to do so. But he may very well bring to the task more determination, enthusiasm, single-minded devotion, creative ideas, and big thinking than anyone else ever did.

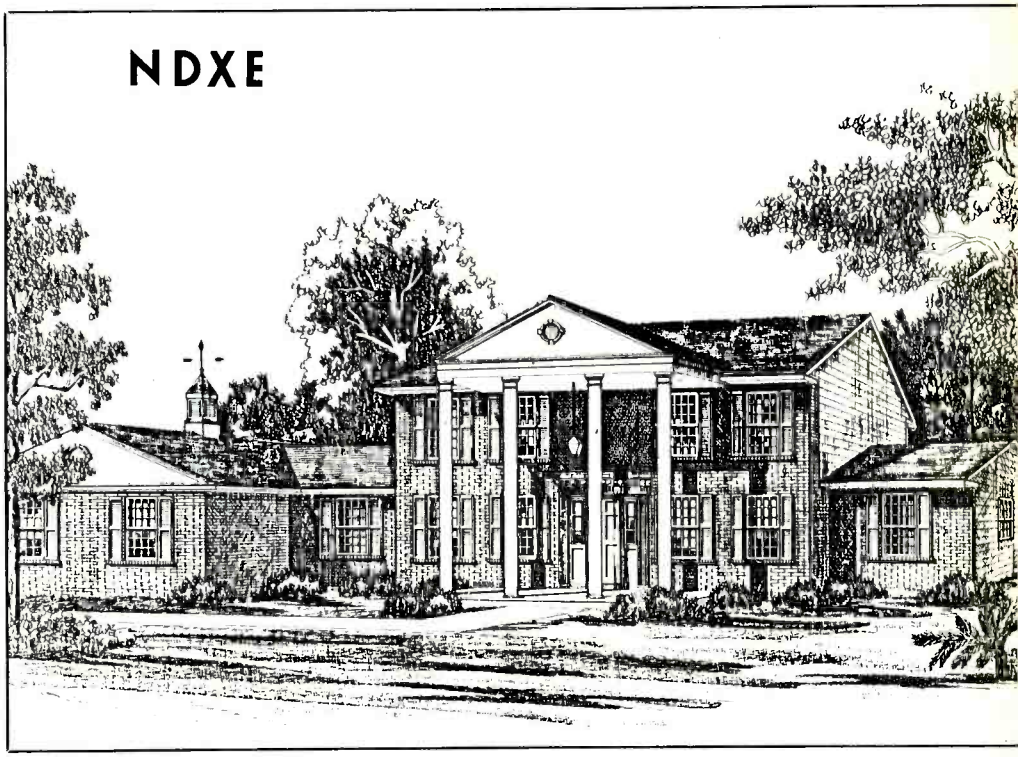
Norman is the man behind World Service Broadcasting, which plans to put shortwave station NDXE on the air later this year as the second commercial shortwave station in the United States (WRNO in New Orleans was the first in the 1980's crop of shortwave broadcast authorization).

The 33-year-old Norman won approval from the FCC on June 29, 1984 after a year and a half of lobbying by Alabama senators and congressmen and four years of prior planning. Norman says "he could have gone to Marine boot camps and not been beaten up as I was in dealing with the bureaucracy." He was investigated by both the Army and the FBI before the grant was awarded. "I guess they figured a country boy couldn't do much damage," he says. "Alabama is 49th and 50th in a lot of things and this is a chance to be a voice to the world," Norman believes.

NDXE (pronounced "In Dixie") are the chosen call letters of the new outlet, the first modern case in which something other than a "W" or "K" would be used as a call letter prefix for a shortwave station in the U.S. It'll take about one million dollars to get NDXE on the air and Norman hopes that President Reagan will be on hand to throw the switch and turn the transmitter on for the first broadcast.



NDXE



Artist's concept of the Colonial style NDXE facility on I-85, which will house transmitters and other company operations.

"These cotton fields can grown radio stations just as well as they can grow cotton" says Norman, and he intends to provide a high level of broadcast service to every area of dominant influence in the world.

Norman has been a radio freak since he was eight years old. That's when he and a friend visited WJHO, the local AM station in Opelika, Alabama. From that day on, Norman was hooked on the medium. He began to show up at the station regularly and was soon sweeping the studios and filing records away just for the fun of it. By the time he was 13, he held a job at WJHO, and for the next ten years was active in every phase of the station's operation, from spinning records to selling commercial time. At age 12, before he began working at the station, he already had an FCC Commercial radiotelephone operator's license.

Norman graduated from Auburn University with a degree in Mass Communications. Later he operated his own successful advertising agency and still later his own video production firm which produced video software for government and industry. He was also a consultant to Joseph S. Tushinsky, Chairman of the Marantz Corporation, who introduced the Sony transistor radio to America.

Norman's mentor for many years was the late John Herbert Orr, who produced the first U.S.-manufactured magnetic recording tape. Orr, who was also from Opelika and owned a magnetic tape manufacturing company there, encouraged Norman in his goal of owning his own shortwave station. The two men eventually formed a research and development company which, in addition to development of the NDXE idea, developed the Digital 88 Piano Player and built the J. Herbert Orr Museum of Sound.

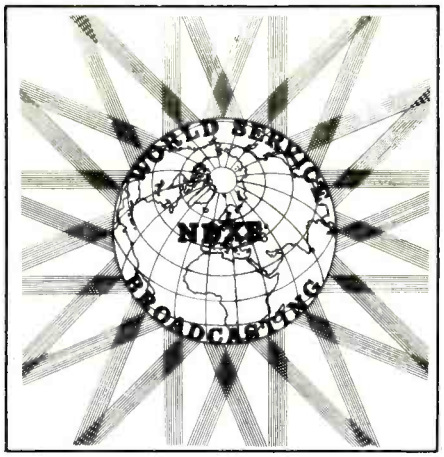
Orr died last June and Dickson is determined to carry the NDXE idea on to full completion and fruition, "committed to quality" in every area of the project. Norman, additionally, has been the director of the Atlanta Falcons Football Network and was once nominated for a seat on the Federal Communications Commission. He turned it down. On a non-radio front, he is active in the local heart fund, Jaycees, and United Way Campaign. If some of the things that follow seem far-fetched or impossible, H. Dickson Norman's history of success should give the reader some pause.

Initially, NDXE will employ a 100 kilowatt shortwave transmitter (a Continental Type 418D-2 with a Kahn stereo exciter) and a 100-foot TCI-521 rotatable log antenna to achieve an effective radiated power of 4.5 million watts. In the beginning, primary coverage targets will be Europe, Canada, South America, and the Pacific. English and several foreign languages will be used, with the number of languages expanding later. Transmitters will be located on a family farm owned by Norman on a site west of Opelika on U.S. Interstate 85. The main building there will feature architecture in the Southern Colonial style. Studios and offices will be in downtown Opelika in a building being remodeled to house those facilities.

During the first year of operation, the staff is expected to number 40 to 45, including people from area colleges and universities who will provide programming and technical help through an internship program. Higher echelon personnel (some already signed on) will be drawn from the management ranks of some of the top stations in the United States. Later, as additional elements in World Service Broadcasting's scheme of things come into being, the staff size is expected to grow into the hundreds.

NDXE's commercial side involves several aspects as a means of bringing operating funds and profit into the station. Norman's goal is to make NDXE the foremost commercial station in the world. Norman, the man with the new ideas, reached back half a century to come up with one of the basics around which NDXE's income will be built.

In those days, Sears Roebuck owned radio station WLS (World's Largest Store) in Chicago and used the station to promote Sears' goods. In the 1980's version, Norman will advertise a catalog of American products over NDXE. Listeners can write



H. Norman Dickson conducting an interview back in his days with WJHO.

the station or call direct to order the goods they wish—from record albums to blue jeans to refrigerators. NDXE's trading company will then ship the items out through the Port of Mobile. It was this aspect of the operation that captured the imagination of the Alabama congressional delegation.

Major U.S. manufacturers who distribute their products worldwide are being sought as regular commercial advertisers at initial rates varying from $2,000 to $5,000 per half minute of air time. NDXE is aiming at a minimum of one percent of the available audience in each country it will serve. If achieved, that translates into a very low "cost per thousand" for national advertisers. Sales offices are already operating in New York, Atlanta, and Daytona, Florida.

The firm will also be involved in selling and advertising Alabama-made products to individuals, governments, and other foreign concerns. Additionally, investors based in Alabama and in other parts of the country have already put money into the company, although Norman holds the majority of the stock. Norman says there's a possibility that the stock may one day "go public." If that happens, then Joe SWL could own a piece of a shortwave station!

Norman wants NDXE to "contribute to world peace and understanding" and "expand shortwave listenership" through its programming which, he notes, will be "world class" in quality.

"Shortwave has been inadequately programmed and promoted in the past" according to Norman. So, he has a lot planned for his audience—enough to fill the schedules of several stations. Although the format isn't yet typed up, it's planned to include worldwide weather, stock market and economic information, agricultural news, health, humor, old time radio, possibly an SWL program, and a children's show which may be built around a call-in format.

Syndicated programming from U.S. producers will also be used, as will an affiliation with at least one U.S. radio network, probably the Cable News Network, some religious shows, talk shows, and music. Music will run the gamut from country to contemporary, worldwide pop to classical concerts. The station plans to purchase a local theater and equip it so that shows with live audiences can be aired.

Sports will play a large role in NDXE's air plans. Through a division of the company called "World Span Sports," a long and varied selection of sports events are being looked at for the schedule, including college football, Sebring, Daytona 500, Miami Grand Prix, and LeMans racing, the Masters Golf Tournament, Wimbledon tennis, Atlanta Braves baseball, hockey, soccer, skiing, gymnastics, and track and field. Events which run over a period of days will be covered through periodic updates broadcast from the scene of the action.

Special promotions and contests will involve cash prizes for listeners and "prize packages." The NDXE program schedule will be published regularly in the major newspapers around the world. The station will have a firm policy of not interjecting politics into its broadcast, other than legitimate news items and events.

Norman sees NDXE and its potential as a "tremendous thing," a "tremendous challenge" and once the station gets on the air, that'll be just the beginning. About six months after the station first goes on the air, a second 100 kilowatt transmitter will be added, and a few months beyond that at least one 500 kilowatt unit will join the lineup. Eventually, that will produce "four levels" of broadcast service around the clock. There are plans for still more transmitters in other Alabama locations.

And that's still not the end. According to Norman, a lot of research and development is in progress which may lead to still more innovations. The station may offer access through subscription to various data transmitted on its sidebands. Programming may one day be aimed specifically at a domestic shortwave audience as well as listeners worldwide. Norman also has plans for the development of a "universal" low-cost AM-FM-Shortwave receiver in conjunction with a commercial sponsor. This, he feels, would not only help his audience grow further but that of radio in general. Such a receiver could also be placed in libraries and high schools and be made available to people on loan, like a book, so they could try out shortwave on a trial basis.

Negative thinkers may toss all of this off as impossible. H. Dickson Norman does not. But H. Dickson Norman is not a negative thinker. He is a fountainhead of ideas, plans, possibilities. And he's already turned more than one of them into reality. But he does not claim to have a corner on the idea market. He seeks ideas and opinions from his future listeners too. You can let him have yours by writing to him at NDXE-World Service Broadcasting, P.O. Box 569, Opelika, Alabama 36801.

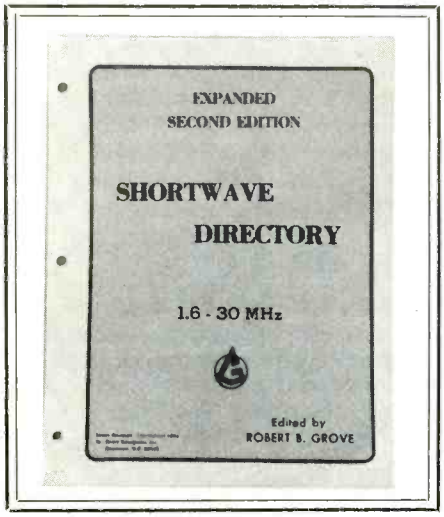
NDXE is targeted for a mid-year opening. When it does, and if H. Dickson Norman's plans bear fruit, shortwave listeners the world over can expect to hear a revolutionary approach to shortwave broadcasting.

BOOKS YOU'LL LIKE!

Shortwave Directory

The well-known *Shortwave Frequency Directory* by Bob Grove is now available in its updated, expanded, and revised second edition covering U.S. and foreign communications stations operating between 1.6 and 30 MHz.

Approximately 6,000 listings include U.S. and foreign Air Force, Navy, Coast Guard, Army, energy, emergency, State Dept., embassies, smugglers, ships, space, spy stations, and plenty more. If it's a "utility" station of interest using voice/CW/RTTY/FAX, then it's probably in this book, which is arranged according to agency or operating company. A new frequency cross-index has been included in this edition for your convenience.



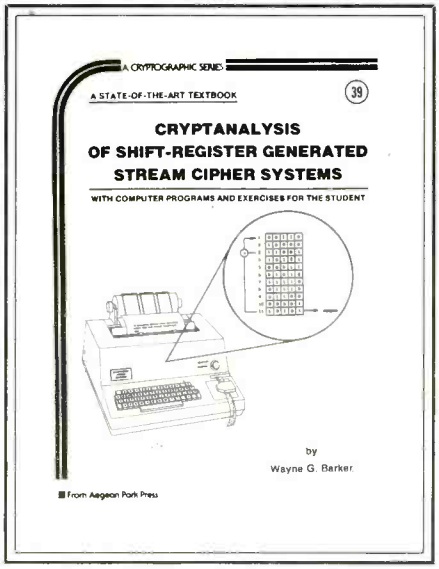
This is 174 pages of hard data that will zero you in on a wide spectrum of interesting communications stations. Looseleaf pages have been punched for your 3-ring binder.

Copies are available at $12.95 each (plus $1.25 for postage/handling to USA/Canada/APO/FPO addresses) from CRB Research, P.O. Box 56, Commack, NY 11725.

Advance Crypto Information

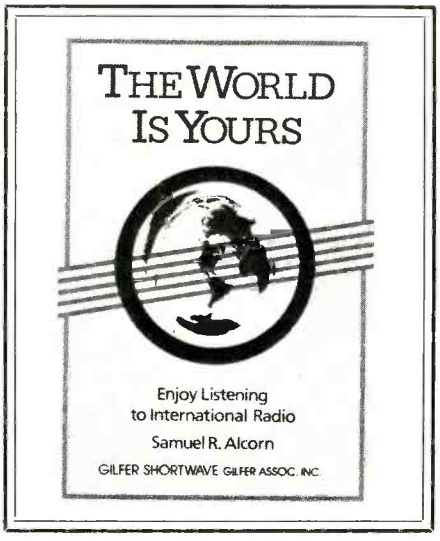
Cryptanalysis of Shift-Register Generated Stream Cipher Systems is a 243-page state-of-the art textbook which concerns a large class of modern cipher machines. The book is intended to make it easy for the student to understand the many new cryptanalytic principles that concern the solution of shift-register generated stream cipher systems. Every chapter contains at least one computer program (often two) written in BASIC for use with a TRS-80 Model 4 computer.

The text assumes the student has basic knowledge concerning cryptography and cryptanalysis. For those who are interested



in the current techniques used in cryptanalysis, this is an excellent textbook.

This book may be ordered from the Aegean Press, P.O. Box 2837, Laguna Hills, CA 92654. The price is $48.80 (includes postage to addresses in the USA; add $1 for shipments outside the USA).



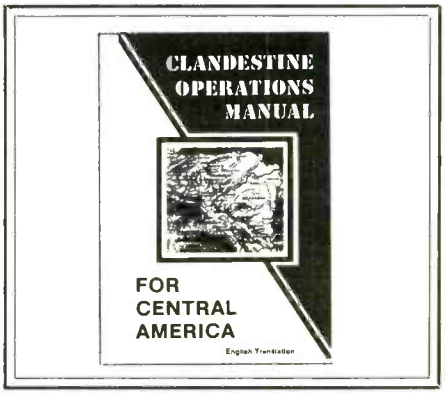
The World Is Yours

The World Is Yours—Enjoy Listening to International Radio by Samuel R. Alcorn, leads the complete novice listener by the hand into a new hobby; the world of international radio. Printed in very readable type and amply illustrated with charts/diagrams/photos, it can bring the world much closer to anyone with a shortwave receiver.

The book was written in non-technical language and is just the type of information to present to a friend, relative, or neighbor who would probably enjoy shortwave listening if only they knew what it had to offer.

Chapters include: What you can hear; how to get started; how to hear the countries of your choice; how to collect souvenirs; where to obtain more information; and a glossary of terms. It is a very good, unpretentious book to get someone hooked on shortwave without scaring them off.

This book is just $2.95 plus $1 shipping from Gilfer Shortwave, P.O. Box 239, Park Ridge, NJ 07656.



Clandestine Operations Manual

Undoubtedly nothing within the past year created as much official smoke as the guerrilla operations manual produced by the CIA for use by the Freedom Commandos in Nicaragua. When the news media found out about it there were BIG fireworks! And BIG denials! And BIG investigations! Heads rolled down through the halls of government. The book's explanations of "neutralizing" one's enemies really rang the gong! While the book never exactly said what "neutralizing" meant, it didn't take a lot of smarts to guess that it was something different from the way you used to have it neutralize a pair of 6L6 vacuum tubes.

This illustrated book was originally published in Spanish, but it has just been translated into English. It's there in all of its glory from the first word to the last, along with the illustrations. It's a real eye-opener; no wonder they had so much trouble getting someone to own up to writing it. The English language translation reveals a spectacular super-secret handbook of psychological warfare as carefully taught by Big Brother himself, the old Grand Master.

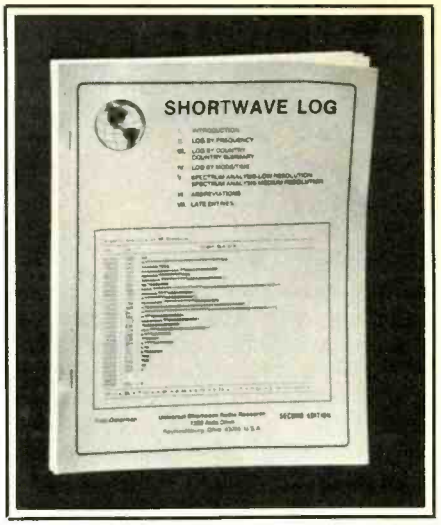
Among the many tips and techniques it offers are the methods of getting propaganda messages across to the masses—the same methods used by guerrilla broadcasters and even several major international broacasters. Word-magic is indeed a highly polished art-form with rigid rules and "do's" and "do not's," as this manual shows.

The new English language translation is called the *Clandestine Operations Manual For Central America*, and it lets it *all* hang out. It can be ordered from CRB Research, P.O. Box 56, Commack, NY 11725. The manual is $8.95 plus $1 postage/handling to USA/Canada/APO/FPO addresses.

Shortwave Log

Fred Osterman is a long-time DXer who has spent years chasing down the interesting and unusual on the shortwave bands. This includes shortwave broadcasters, clandestines, and a gigantic array of communications stations using voice, CW, TOR, FAX, and RTTY. Fred's monitoring log of stations he has heard took on a new dimension when he became Manager at Universal Electronics in Ohio, a large dealer in communications gear.

When Fred let customers look through his loggings, many of them wanted to obtain photocopies for reference at their own stations. He started out making individual photocopies of the approximately 2400 loggings, but soon realized that this was a rather cumbersome way of handling the situation. Not only that, Fred figured that maybe the information he had compiled would be useful to many DX enthusiasts. That's when he put all of his data into a computer and produced printouts of his loggings arranged according to frequency, according to country, and according to operating mode and operating time. He included dual resolution spectrum analysis information showing the



type of activity found on the most interesting frequencies throughout the shortwave spectrum. When put together with lots of worthwhile explanatory text on monitoring, Fred ended up with a full-blown 170-page book in a large 8½" × 11" format. The 2nd edition of this useful reference source, appropriately called the *Shortwave Log*, is now available for $9.95, plus $1.55 postage/handling. Get it from Universal Shortwave Radio, 1280 Aida Drive, Reynoldsburg, OH 43068. And while you're at it, ask ol' Fred to send you a copy of the full Universal Shortwave 68-page catalog.

Fred will send you the catalog even if you don't buy a book.

ON THE LINE

BY GORDON WEST, WB6NOA

NEW AND EXCITING TELEPHONE TECHNOLOGY

Telephones—More Models Than Ever

If you are into gadgets, computers, and like ultra-modern telephones and answering machines, this year is for you. Manufacturers of telephones and telephone accessories have more products to offer you than ever before. This month we will take an inside look at some of these futuristic products, and I am sure you will agree with me that "phone fever" is here to stay.

On the left is the AT&T Genesis™ unit. On the right is the Super Call™ Model 660 by Sam Hill.

Facts And Figures

The new 46 MHz/49 MHz cordless telephones will remain a consistent strong selling item for 1985, accounting for 6,200,000 units. Although this is about the same quantity as was sold last year, the newer units will receive less interference and will talk further than the older 1.7 MHz/49 MHz sets. Cordless telephones will also be less expensive—with importers buying them from overseas at about $75 each, selling them to retailers for about $125 each, and you will be able to buy them for approximately $175 each.

Plug-in "corded" telephones should account for approximately 28,000,000 sales this year, up from 24,000,000 last year and up dramatically when, in 1982, only 3,000,000 were sold! Your regular telephone set will cost a little over $50, but the more elaborate imported microprocessor controlled telephone set may run as much as $200. The domestic super exotic telephone sets could cost as much as $500, but more about this technology in a moment.

If you are interested in a telephone answering device, 4,000,000 will be sold this year at approximately $175 each. Importers bring these units in huge quantities at $80 each and sell them to dealers at about $125 each. You see, most importers who bring in thousands of units require at least a double markup to stay in business. Dealers normally sell telephone equipment at a 40% margin. There's no way to get around this markup procedure unless you are willing to go directly to an overseas supplier and bring in 10,000 units yourself. Or, you might want to set yourself up as a dealer and save 40%, but this would probably require an opening order of 100 units. The best way to receive the most value on your future telephone purchase is to simply shop around for the best price for a unit that has the most features. Trying to skirt the distribution network usually won't work.

Looking at these figures, you will see that most telephone equipment, corded, cordless, and accessories, are imported from overseas suppliers. Back in 1982, we only brought in one half million units, but last year, we imported over 34,000,000 units, and import units dominate the market place. Except for those very cheap one-piece, under $10 telephone sets, the majority of the imported pieces of gear tend to be fairly good quality. If nothing else, that $10 imported phone and the first full year of deregulation allowed you to tell Ma Bell that you didn't want to rent their equipment anymore, and to come in and pick up their older equipment sets. I can remember when it was a big deal just to be able to get a colored telephone rather than the standard black. Now you can buy any type of phone and plug it in to meet any whim, fancy, or business application you may wish to use it in.

Domestic manufacturers of telephones have been hard-pressed to meet the overseas competition. Most domestic phone equipment suppliers tout better workmanship, higher quality, and a longer mean time to failures of up to eight years. The less expensive and sometimes more featured imported phones are really giving them a run for their money—and it looks like the qual-

The Command Dialer II by Audec lets you dial with your voice.

POP COMM BOOK SHOP

Guide To RTTY Frequencies 2nd ed.
Details on 5500 RTTY stations/frequencies in two lists. "Real" press schedules, inside information on new RTTY techniques, etc. 192 pages, paperback, $9.95. Order #G205.

Radio Handbook, 22nd ed.
by Bill Orr, W6SAI
A state-of-the-art, single-source reference on radio communications and theory for hams, professional ops, techs, and engineers. New coverage includes solid-state devices, Yagis and quads, and H.F. amplifier designs. A hands-on instruction manual, as well. 1168 pages, hardcover, $39.95. Order #S197.

The Radio Publications Group—The "Bill Orr Series"
These easy reading classics belong in the library of any active ham. Loaded with practical how-to information, with tables, charts, and formulas arranged for handy reference.
Beam Antenna Handbook, 200 pages, paperback, $7.95. Order #R143.
Wire Antennas, 192 pages, paperback, $7.95. Order #R144.
Antenna Handbook, 192 pages, paperback, $7.95. Order #R145.
Cubical Quad Antennas, 112 pages, paperback, $6.95. Order #R146.
VHF Handbook, 336 pages, paperback, $11.95. Order #R147.
Interference Handbook, by W.R. Nelson, 247 pages, paperback, $9.95. Order #R172.

World Radio TV Handbook 1985
The world's only complete directory of international broadcasting and TV stations—the established, authoritative guide endorsed by the world's leading broadcasting organizations. A comprehensive country-by-country listing of short-, medium-, and long-wave stations, revised and updated to reflect actual conditions. Also includes special features on The Future Regulation of High-Frequency Broadcasting, Solar Activity in 1985, Technical Innovations at Radio Nederland's New Transmitting Station, and more. 600 pages, paperback, $19.50. Order #B097.

World Press Services Frequencies
by Thomas Harrington
A comprehensive manual covering the field of radioteletype news monitoring—antennas, receivers, terminal units, monitors, and more. Contains 3 master lists of times of transmission, frequencies, plus ITU list of over 50 news services worldwide. 84 pages, paperback, $8.95. Order #U173.

Satellites Today: The Complete Guide To Satellite Television
by Frank Baylin
Learn how to buy, install, operate, or even build a home satellite TV system. An overview of satellite TV written for both the non-technically educated beginner and the professional who wants to know more. It clearly explains: the history of satellite TV and electronic communication; how TV and radio messages are transmitted to and from satellites; in-depth look at how home receiving stations work; types of satellite TV and radio programs; the future of satellite TV; and much more. 160 pages, 43 illustrations, 34 photos, paperback, $9.95. Order #CS218.

POPULAR COMMUNICATIONS BOOK SHOP

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Signature required on all charge orders.

ity, workmanship, and mean time to failures may rival domestic sets.

Now let's consider the 20,000,000 households (that's 25% of all U.S. homes) that are categorized as home businesses. Instead of a regular phone, these operations require more sophisticated phones that offer 2-line capabilities, hold, call forwarding, 60 memory positions, and other features that will appeal to those who work at home.

Clearly, the imported telephone, answering machine, and telephone accessories from overseas will play an important part in this giant industry.

Latest Innovations

By now, there are a few older cordless telephones being sold; all the new ones use frequencies at 46 MHz/49 MHz. As we mentioned in an earlier article, you would be advised to avoid purchasing the new 46/49 MHz phones that share some of the older 49 MHz frequencies. Shared frequencies include the following channels: Channel 2, Channel 3, Channel 5, Channel 6, and Channel 7.

The new 46/49 MHz channels that are not shared with the older 1.7 MHz/49 MHz sets would be: Channel 1, Channel 4, Channel 8, Channel 9, and Channel 10. These five channels should be relatively free of interference from the older sets. If you discover your new set is still on a portion of the older frequencies, you can always try to get the frequencies changed. Most newer sets can be frequency shifted by changing crystals or having the factory reprogram the microprocessor frequency section. Your better 46/49 MHz cordless phone will give you user adjusted channel selection.

A big breakthrough in electronic technology on new corded telephone sets may allow you to simply *say* a name you want dialed, and the telephone will immediately respond by recognizing the name and dialing out the preprogrammed number. While voice recognition systems are still in their infancy, some manufacturers are attempting to give you telephones that will respond to your voice. Say "mom," and it will faithfully ring her number. Voice recognition phones are expensive—around $350, and I'm still not convinced they have licked the problem of responding to your voice when you may have laryngitis or a cold. Don't confuse these phones with speech synthesized phones that simply leave an electronic message to the calling party that you are not at home. Speech synthesized phones as answering machines and voice recognition dialing phones are two separate animals. For the handicapped or physically disabled the voice recognition telephone may have quite a future.

As for the popular decorator phones that may resemble hot lips, wood ducks, lamp shades, Olympic figures, and gosh knows how many other unique designs, they still remain a favorite. The only things new with them are slightly lower prices, slightly better quality control, and hundreds of more de-

New Cordless Channels

Channel	Base Frequency	Handset Frequency
Channel 1	46.61 MHz	49.67 MHz
Channel 2	46.63 MHz	49.845 MHz
Channel 3	46.67 MHz	49.86 MHz
Channel 4	46.71 MHz	49.77 MHz
Channel 5	46.73 MHz	49.875 MHz
Channel 6	46.77 MHz	49.83 MHz
Channel 7	46.83 MHz	49.89 MHz
Channel 8	46.87 MHz	49.93 MHz
Channel 9	46.93 MHz	49.99 MHz
Channel 10	46.97 MHz	49.97 MHz

Cordless Telephone Frequencies (MHz)

Ch.	New Plan Base Tx.	Portable Tx.	Old Plan* Base Tx.	Ch.
1	46.610	49.670		
2	46.630	49.845	1.710	7A
3	46.670	49.860	1.730	13A
4	46.710	49.770		
5	46.730	49.875	1.750	19A
6	46.770	49.830	1.690	1A
7	46.830	49.890	1.770	25A
8	46.870	49.930		
9	46.930	49.990		
10	46.970	49.970		

*No new manufacturing after Oct. 1, 1984

This chart courtesy of a reader at P.O. Box 109, Huntingdon, TN 38344.

signs. I would classify these sets as more of a conversation piece rather than a traditionally useful phone set up.

The big battle may be in the very sophisticated computerized multi-line home phone race. AT&T with their Genesis™ telephone will surely make you drool over its capabilities, sleek business look, and brillant blue fluorescent readouts. The Genesis™ system you expand at will—adding a powerful memory dialer cartridge that memorizes names rather than numbers, call forwarding, electronic date reminder and calendar, and a host of other features. This super quality phone system must be looked at to be appreciated; it's really a miniature switchboard that you can install at your house or expand to a complete key system at your office. It's also expensive, and there's little or no discounting of the products in the local phone stores.

However, another well-known phone company has taken this particular product on with a similar looking imported set called the Super Call™ Model 660, manufactured by Sam Hill Corporation, 137 Fifth Avenue, New York, New York 10010. When you see it in the many catalogs that sell mail order telephone equipment (such as the Sharper Image™), you will think you are looking at the AT&T Genesis™ system—but you're not. The Super Call™ is a powerful microprocessor based home or office telephone system with capabilities of two incoming lines, a 60 memory dialer, speaker phone, automatic redialer, calculator, alarm clock, and has multiple hidden switches to adapt it to any type of dialing system. And yes, it gives you that classic membrane-touch keypad that beeps at you, as well as a not-quite-as-large-as-Genesis™ blue vacuum fluorescent readout. Sure, it may be an imitation of a domestic product, but at a fraction of the price, it seems to work just as well in my tests of both the AT&T set-up and the Super Call™ apparatus. They also offer several other multi-key phone set-ups as cordless telephones that have powerful microprocessor computers built inside for any type of home or office use. It's also $300 less than the AT&T setup.

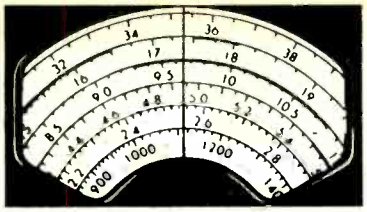
I think you may be catching my drift. Manufacturers of domestic home sets may need to find a different market for their very high quality and usually higher priced equipment than the conventional home and small business systems. Overseas suppliers with very smart phones are taking a large chunk out of their sales potential.

Answering machines haven't changed too much for this year, but we do see more with remote control capabilities. The trend seems to be getting away from remote controlling your machine with that separate controller that you always seem to forget when you go on that long trip. Many new answering machines now take commands from the keyboard of the phone you are dialing in from. Now you have nothing to lose when you want to play your messages back at a remote location thousands of miles away. Just enter your secret code.

Since margins on telephone equipment at the dealer and distributor level are extremely thin, I wouldn't expect to see any further reduction in telephone prices. However, I do expect to see more features for the dollar, and this is what has precisely happened with telephones introduced for 1985.

My best advice to my readers when considering the purchase of a telephone is to place tremendous importance on *where* you buy your phone. Deal with a company that will take care of you in case you get a phone that didn't meet your expectations, or prematurely fails. The catalog houses are doing very well in backing up their products. Local phone stores also offer good sales and service back-up after the equipment is sold. However, purchasing your telephone from a store not really in the phone business could lead to some disappointing results if you need some back-up service on your telephone. Buy it from the professionals.

There has never been a greater selection of telephone equipment, telephone accessories, and answering machines than for 1985. Take advantage of this technology and try-out a new phone at your office or on your desk at home. While the person at the other end of the circuit won't know that you've changed equipment, you'll find the newer sets much more fun to talk over, and tremendously smarter in their operation for private, home business, or commercial use.



COMMUNICATIONS CONFIDENTIAL

BY MIKE CHABAK

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

For those of you who are faithful readers of this Communications Confidential column (which I will now refer to as CommCo), you may have been somewhat confused. Seems you are owed an explanation, so here it is.

POP'COMM and I worked up the idea to start a second utility column, separate from CommCo. CommCo was to remain primarily as it was, a reader logging printout format, while I was to edit a column that explored specific aspects of utility monitoring and communications. It was under that premise that I submitted my initial column draft, for the April 85 *POP'COMM* issue.

At the same time, and for whatever reasons, the March column was to be the last for Ron Ricketts. As this event occurred very close to the April issue deadline, Tom Kneitel was placed in a difficult position. Unable to find a replacement editor on such short notice, Tom either had to disappoint you with no April CommCo column at all, or else find something to put in its place. So what we have is a shotgun wedding.

I will continue with the type of format presented in the April issue, now officially under the CommCo banner. Your loggings will still be printed out, but not by yours truly. In essence, CommCo will be a dual column, with separate editors, under a common column banner. I will discuss specific aspects of the utilities, and Jim Taggart will handle *all* the logging reports that you, the reader, will send in.

I trust that the confusion has been laid to rest, and that this modified format will be acceptable to one and all.

Nifty monitoring shack of John Snel, NL-9369, of Utrecht, Holland. John is a member of the excellent BDXC club in Europe, and he's a fan of POP'COMM.

About D/Fing

I will now continue with last month's subject, that of D/Fing. In that discussion I may have given the erroneous impression that *all* D/Fing antenna arrays produce a bi-directional bearing. This is true of loops and dipoles, but the "professional" type systems do come up with uni-directional bearings. How this is accomplished will be the major topic of this issue's column.

Whereas the Wullenweber wide aperture array was developed during World War II, the earlier World War I vintage Adcock system is very widely used.

The Adcock arrays come in several variations, such as the elevated H, buried/shielded U, and the balanced/coupled U. Usually the Adcock consists of 4 or 8 vertical dipole elements linked in opposite pairs. Again a goniometer is used to sample the element pairs. Adcocks work well when the physical spacing of the antenna elements are far less than one-half wavelength of the radio wave signal they are intercepting. Adcocks are therefore classed as small aperture arrays. SAA's can only measure the instantaneous direction of arrival of the radio wave, not the true direction, which because of propagation variables could be substantially different.

The Wullenweber overcomes this by being more than one full wavelength in size, measuring the signal via narrow segment scans of its array. All of the arrays discussed are only capable of measuring the azimuth (360° horizontal) bearing of the incoming signal. There is a D/Fing array that in addition to obtaining an azimuth bearing can also determine the range/distance of the transmitter by a process called vertical triangulation. This is the Phase Interferometric array (P.I. array for short).

A 1950's forerunner to the modern P.I. array was the rotating interferometer. This consisted of two identical antennas—one was fixed; the other, mounted on an electrically driven cart and tethered to the fixed antenna mount, drove a circular course around it. In the 1960's, this was modified into the elevated beam rotating interferometer. This system again had two identical antennas. Each were mounted on the opposite ends of a boom, with the boom being rotated on its central pivot point.

The modern P.I. array is made up of two square loop antennas, mounted together, but at right angles to each other. In an overhead view, this would look like an X. Figure 1 depicts an overhead view of a modern P.I. setup, which is laid out in two radial arms. These arms can be on the order of 180 feet in length, and the individual square box loops on the order of 6 feet square.

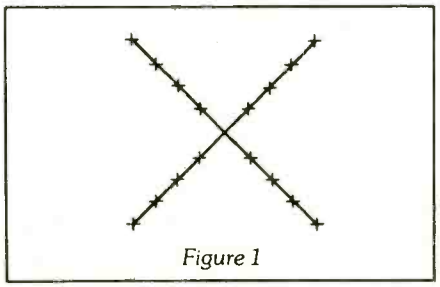


Figure 1

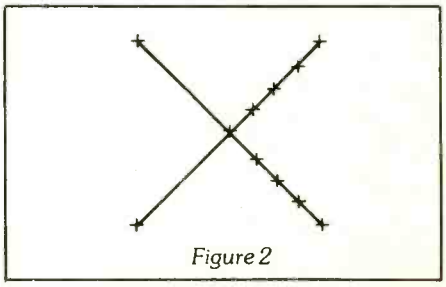
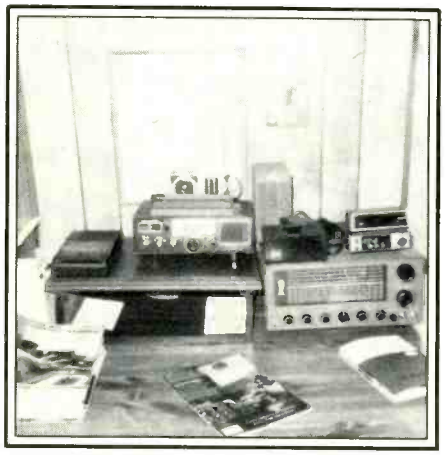


Figure 2

"Thumbs up, POP'COMM!" comments one of our European readers, Teun Feldman, of Utrecht, Holland. Teun listens to the "utes" on a Kenwood R-1000.



Richard D. Sprau, Lake City, Florida says that he has enjoyed POP'COMM for two years. He listens on a DX-100 and a Lafayette HE-30.

This array can also be setup as a portable unit, with the elimination of several of the individual arrays. Each arm of the array is actually two redundant systems, separated at the point where the radial arms cross. As one leg of each arm produces identical data, one of the arms intermediate arrays can be eliminated. Figure 2 shows an overhead layout of this portable setup.

All of the professional type arrays D/F by a similar process called phase differential. In order to explain how D/Fing is accomplished, it will be necessary for you to understand the basic fundamentals of electromagnetic radiation. This concept is difficult to visualize, so every effort will be made to simplify the explanation.

Everything in nature can be reduced to its smallest part, which still retains the characteristics of its original. This smallest part is called an atom. An atom consists of two primary parts—a nucleus (made up of protons having a positive charge) and orbiting electrons (having a negative charge). All atoms are electrically neutral, having the same total number of protons as electrons. As such, their values cancel each other out.

Some substances have a very tight proton/electron association, while others have an outer electron only loosely held in orbit. Rubber and glass are examples of a tight atomic association, while copper and other metals have a loose outer electron.

In a piece of copper wire, its atomic structure can be temporarily altered by forcing one of its electrons away from its parent atom.

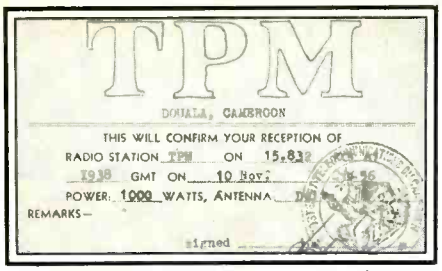
Visualize a bunch of copper atoms set up in a line, as in a piece of wire. When a force (voltage current) is appliced to the left most atom, that force, like a sort of shock wave, is transmitted down the line, left to right. This knocks one electron off of the copper atoms, and these free electrons migrate towards the next copper atom, in a direction opposite from the force. When the copper atom loses an electron, it becomes a positive ion, and as such, under the principle of opposites attract, attracts the negative electron. As long as the force is applied, this one direction leapfrogging of electrons continues. This uni-directional electron flow through a wire is more commonly known as electrical current.

The process described is direct current, in which whose flow and current values remain constant.

A dry cell battery is an example of this. Here we have carbon and a metal, immersed in a chemical compound, which causes an electron flow from the metal to the carbon core. When you set up a loop circuit and place a light bulb between this flow, the bulb glows. This chemical reaction process has one side effect. The metal progressively undergoes a molecular transformation. Once a sufficient amount of the metal is altered, its electron flow decreases to a point too low to power whatever was hooked into its loop circuit. That is why batteries run down and become useless. Obviously, a direct current apparatus of the battery type has a finite amount of energy which, once tapped, cannot be renewed. Even in the case of rechargeable batteries, there will only be a finite number of times the battery can be recharged. So quite obviously, a better method of generating electrical current is required, especially when voltage levels must be quite high.

During the past 200 years, many individuals were involved with experiments concerning electricity and magnetism. One researcher, Hans Oersted, found that when he ran an electrical current through a piece of wire and held a compass near it, the needle of the compass moved. Oersted deduced that since the needle of the compass was only affected by a magnetic force, the electron flow itself must have been producing a magnetic field.

Michael Faraday took up where Oersted left off. Faraday reasoned that if an electrical current produced a magnetic field, why couldn't a magnetic field produce an electrical field. Faraday experimented by insert-



Tom Kneitel received this prepared return card from CW station TPM in Douala, Cameroon back in 1956. The station was running 1 kW on 15832 kHz when monitored.

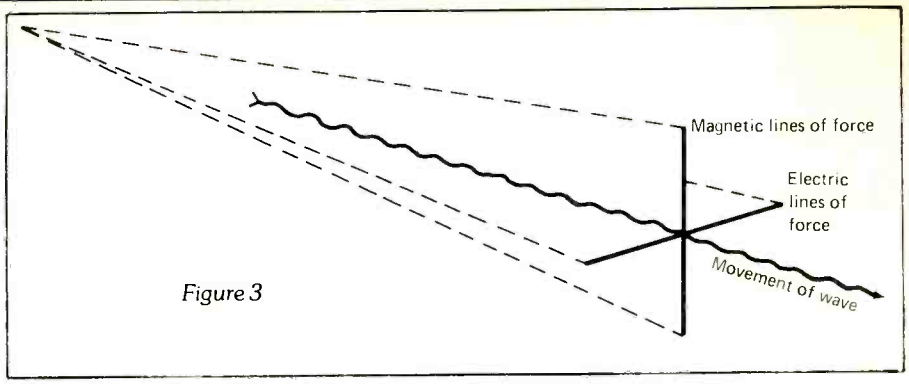


Figure 3

ing a magnet into a coil of wire, which was attached to a galvanometer (a device that indicates the amount and direction of current flow). He discovered that an electron flow was induced in the coil, and also that its direction through the wire coil changed depending on which pole of the magnet was inserted. The experiments of Oersted and Faraday proved that without a physical connection, there was a current/voltage exchange between an electrical field and a magnetic field. This exchange is commonly called induction.

Picture a bar magnet. Now put iron filings on a piece of stiff paper and place both on top of the magnet. Tap the paper and the iron filings form two loops. That visualizes the magnetic lines of force. Opposites attract, so in the bar magnet, the magnetic field runs from the north pole to the south pole, then south back to north. In the case of a bar magnet, the south to north movement is through the magnet itself.

You now have an idea of what is an electrical field and a magnetic field, and a vague idea of their interreaction. Let's examine a dynamo to see how the fields work together.

A dynamo is an electric motor that generates electricity. It may be motor driven or hand cranked. The basic makeup of a dynamo/electric motor is as follows: A coil of wire is wrapped around a horseshoe-shaped piece of iron. When current is applied to the wire, we have an electromagnet. The electromagnet generates lines of force, and the total number of lines is referred to as magnetic flux. Between the poles of the electromagnet is inserted a conductor, in the form of a wire loop. This wire is wound around a cylinder, end over end, which is attached to a shaft, allowing the whole assembly to rotate around its axis. Since the conductor wiring is in the form of a loop, it has two faces. At any given instant, one will be broadside (parallel), the other, edge on (perpendicular) to the poles of the electromagnet. When current is applied to the coil of the electromagnet, it induces a voltage flow into the conductor via its flux field. This causes the conductor to rotate.

As it turns, it cuts across the magnetic flux lines of the electromagnet poles. If the conductor is rotating counterclockwise, then one edge of the loop (side A) will move downwards through the south pole flux field. At the same time, the B side of the loop is moving up through the north pole flux field. The results are that the induced voltage through the B side loop will be positive, and the A side loop, negative.

As the conductor spins away from this edge on position, arriving at a point broadside to the electromagnet poles, the induced voltage drops to zero. The conductor continues to spin, once again cutting through the flux lines, but this time from an opposite direction. Loop side A is now moving upwards through the north pole flux, while side B is moving through the south pole flux. This produces a reverse of polarity. B loop is now producing a negative voltage, while A loop, a positive voltage value.

What does this all mean? We have just found out the principle of alternating current—polarity phasing. This is the key to understanding electromagnetic radio wave radiation, and how it is used in D/Fing a signal. This alternating polarity phasing is exactly what a radio wave "particle" is doing. The induced voltage flow is oscillating in a bi-polar magnetic field.

The electromagnetic field takes on a definite alignment. If we can visualize the electrical field lines as horizontal, the magnetic field lines would be at a right angle to it, or vertical. When an electromagnetic field is generated, it is compelled to move, and in a direction at a right angle to these fields. Figure 3 illustrates this alignment.

Electromagnetic radiation is pure energy, and as such has zero mass. Mass can be thought of as the amount of matter in a particle or object. We can also view mass from the standpoint that it resists acceleration when a force is applied to it.

To illustrate, pick up a baseball and throw it. Now do the same thing with a 10 pound barbell. As you can see, the more mass the object has, the more force is required to accelerate or move it from a stationary position. If this force were the same (your arm and shoulder muscles), the baseball will not only leave your hand at a greater initial velocity than the barbell, but it will also travel farther than the barbell. Any mass that does not have a continual force to move it will eventually come to a stop. On our planet, gravity and friction with air molecules are the external forces that eventually bring the object to a stop, unless it hits or is hit by something in the process.

As I said, the electromagnetic particle has no mass, therefore a very small force can accelerate it to a fantastic speed.

Even when electromagnetic radiation is moving through the electronic circuit wires, coax cable, or the antenna elements themselves, it is roughly moving along at 100,000 miles per second. Immediately upon exiting the antenna, it is instantly accelerated to 186,000 miles per second, all due to the fact that it has zero mass.

The electron has mass, but its flow produces a voltage current, and it is this voltage that is oscillated in electromagnetic radiation, not the electron.

And while we are at it, I've used the word "particle" as a descriptive reference. In the true sense, a particle denotes something with a physical mass. So excuse my taking liberties with this word.

Other than the oft times unpredictable propagation varies, the radio wave signal has another factor that acts upon it. This is expressed by the term "attenuation."

The electromagnetic "particle" is energized by virtue of the power output of the electrical generator. As such, it has a finite energy potential when it leaves the transmitter antenna.

Visualize a 12-gauge shotgun. When fired, the propellant charge (the energy potential) accelerates the pellets out of the barrel. At the point of exiting the barrel, the energy potential is concentrated in a 3/4 inch diameter circle.

As the pellets move away from the barrel, they begin to separate from one another. They expand into an ever larger circular pattern, and likewise the energy potential is defused over a correspondingly larger area.

This is roughly the same thing that happens to the electromagnetic particle—only instead of it expanding, its energy potential (the signal strength) expands, or to be more precise, is dissipated, in a ratio of output power and frequency versus distance.

At point blank ranges, your earphones would be blown off by the signal. X-thousands of miles away, the radio signal's energy potential has now been dissipated over an immense area. Hence, what reaches your antenna/receiver is a signal almost too weak to even detect. That is why your receiver must greatly amplify the radio signal in order to properly demodulate it.

Our wandering journey through EM wonderland is at last taking a course back to the

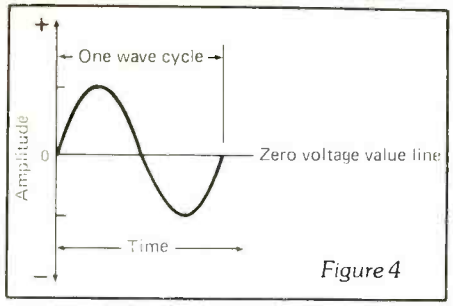


Figure 4

subject of D/Fing. The place to start is at the source, the transmitter. The operators have dialed in a frequency of 6775 kHz, and the transmitter's R-F oscillator obeys this electronic command, and begins to oscillate the incoming current to vibrate/phase at a rate of 6,775,000 times per second (kHz = frequency × 1,000, or for you math buffs, kHz = F × 10^3). This generated frequency is the carrier wave, in that it carries no message; hence it has a steady sine wave or wave form (each cycle has an identical amplitude value). See Figure 4 for illustration.

At the same time, a person begins to speak into a microphone. His or her varying vocal tones are converted into equivalent audio electrical values. In essence, the audio signal directly corresponds in frequency to the sound waves that it represents.

Both the carrier wave and the audio signal are separately amplified, soon coming together in the R-F power amplifier circuit. At this point, the audio signal is superimposed onto the carrier, forcing its steady wave form to vary or modulate in accordance with the audio signal variations. This is called amplitude modulation. By the way, only the amplitude of the frequency carrier wave is changed, not its oscillation rate.

Amplitude can be viewed as the strength of the audio signal. If the voice tones are electrically converted into a 1,000 Hz envelope, the maximum amplitude of the sine wave would correspond to the 1,000 Hz value. Hence one wave cycle could have a 1,000 Hz amplitude peak, the next, 700 Hz, then 850 Hz, 325, 690, 550 Hz, and so on.

Properly modulated, an unending stream of EM "particles" blissfully exit the transmitter, and via a coax cable, speed their way to the transmitter antenna.

It is here that the lead element of the EM pack finds a problem developing. Up until now, he and his buddies have been traveling the path of least resistance (through the conductive wiring), but as he leads them into the antenna array, he discovers that it is a dead end. So, like a pack of trapped animals, they race back and forth through the antenna element seeking an escape route. This movement serves to induce an electromagnetic field around the transmitter antenna. EM and his buddies have found a way out, via an electromagnetic bridge they themselves induced.

Once free of the antenna, they make a fast 186,000 mile per second getaway. Since it is night at the transmitter site, EM and friends form a sort of freight train conga line, winging their way towards the distant F2 layer.

Making a glancing encounter with the ion layer, they ricochet off and begin a straight line dive back toward earth.

Upon arriving at the D/Fing array, EM and friends once again find a conductive medium (the metal antenna). As they race down it, their arrival is sensed by the receiver as a slight A.C. voltage change.

The receiver is tuned to 6775 kHz, and in doing so, takes on the counterpart of a mirror image twin. Its detector circuitry is producing an internal 6,775,000 cps signal. So even though there be thousands of different frequencies impacting the antenna at the

Here's another view of Bob Leary's radio room, capturing the full scope of his very impressive looking station. But tell us, Bob, with all of those scanners and communications receivers, when do you find time to listen to the stereo?

same instant, the receiver disregards all but its mirror image twin.

Let's back up a bit, and go back to the antenna. The D/Fing array is made up of identical antennas, all physically spaced apart. We could label them "A, B, C, D, E" and so on. As the radio wave passes by the antennas, if we could freeze that instant in time, we would find that each antenna has intercepted the electromagnetic wave at a specific but slightly different position in its alternating cycle phase. (For a position reference, the start of the phase is at zero voltage. Then the phase ascends through its positive phase, back to zero voltage, then through the negative phase, back to zero voltage. This is one full wave cycle.)

So not only does each antenna convey to the D/Fing analyzing circuitry a signal detection, but also at what specific position it was in its phase. When all antennas are scanned, the computer takes that data and can deduce which specific antenna was closest to the incoming wave. This is useful, but cannot in itself produce an accurate azimuth bearing. For this, antennas are also linked in pairs. They are opposite to one another, linked by an invisible straight line, with each antenna anchored at the ends of this line. As such, we have antenna A1 and A2, B1 and B2, and so on.

If pair E1/E2 were edged onto the incoming signal, each would receive the phase at a totally different position. The computer takes their phase data, compares it, and comes up with a differential value. Each antenna pair are scanned for this data, and then their differentials are all compared. What is sought is the antenna pair with the least differential. If pair A1/A2 happen to be exactly broadside to the incoming signal, their phase differential will be zero. As such, the azimuth bearing is at a right angle to their alignment.

You now know the principle of D/Fing, via the phase differential technique.

As I said, the P.I. array is also capable of coming up with the down range distance of the transmitter via vertical triangulation. This is possible due to the radial arm configuration of the P.I. array.

To determine the range, the incoming angle of the signal must first be deduced. This is accomplished by sequentially sampling each antenna in the radial arm.

As each antenna is identical, we can divide them up into equal segments (say 10). If antenna A received the incoming radio wave at the very top of its antenna, it would convey signal data equal to 10 full segments. As the antennas are also physically separated, each in turn would (in our example), receive the wave, progressively lowering down their antenna length. So antenna A conveys a 10 segment value, B a 9, C-8, D-7, E-6.

If we set up a graph, plotted the antenna heights, their segmentation and physical separation distances, it is simply a matter of connecting their highest segment values, via a straight line. Of course, a computer is programmed to do this analyzation electronically. So now we have the incoming angle (for our example, it is a 30° elevation).

Do you know this man? It's none other than Bob Leary, KA8UWR (Registered Monitor KOH8GX), of Akron, Ohio. Bob is a regular contributor to POP'COMM's columns. He's also top man at Galaxy Electronics.

Before proceeding, we require one additional and critical piece of information. We need to know the height of the F2 layer. (We're assuming the D/Fing site is likewise in a nighttime condition.)

There are many sites throughout the USA whose task it is to take measurements of the F2 layer. These sites are called ionospheric sounding stations. What they do is transmit a signal straight up, and from the time it takes the signal to return, the height is computed. (For our example, the F2 is at 150 miles altitude.) We now have all the pieces to conduct a down range estimation, based on the method called vertical triangulation.

Here again, a computer is programmed to carry out this task, but for visualization purposes, we've drawn up a graph. As shown in Figure 5, a line is drawn from the D/Fing site, at a 30° elevated angle, up to the point where it intersects the F2 layer. The F2 layer ideally refracts/bends back the radio wave at the same angle, but in the opposite direction from whence it came up. So we draw an opposite 30° angle line, down from the point of F2 intersection, and come up with a down range distance of 525 miles.

This is not going to put an X marks the spot directly over the transmitter site, but what it does is come up with a very small target area location, at a specific distance, along the azimuth radial bearing line of the signal.

Propagation variables being what they are, the entire D/Fing procedure can be run several times, and then averaged out to obtain azimuth bearing and radiation angle data. Quite obviously, if several widely placed P.I. array stations work in consort, a very precise location can be determined.

Now before you go out and try to purchase a P.I. array, or worse, write to me for construction plans, let's face cold reality.

D/Fing involves first having these requirements: a large and unobstructed backyard, a background in antenna fundamentals and electronics, fabrication and construction techniques, a computer and the knowledge to load it, plus the most critical factor—a large bank roll. So as I stated in the April discussion, the average SWL doesn't have the necessary equipment, expertise, and finances to conduct reliable and accurate D/Fing.

There is a method that any SWL can follow, regardless of the type of antenna/rig setup they have. It is based on monitoring during time periods either side of sunrise and sunset. Unfortuntely, it has several limiting factors. It works best with frequencies between 2 to somewhere around 6 MHz, and the station being targeted must be active on those lower HF frequencies during your local sunrise, and likewise, before, during, and after your local sunset.

What results from this is an initial geographical area location that most often encompasses a longitude/latitude spread of 15 × 15 degrees.

I'm still refining data on this, so when and if a fully reliable procedure is worked up, it will be presented in this column.

Other Interesting Areas

Last month I described the publishing lag that exists between the time I draft a column and when you finally read it (this column was typed up in late December 84 for the May 85 issue). So, I will draft another two columns even before you read the initial April 85 discussion.

I want to base the exploration of utility monitoring and communications, to a large degree, on what questions, suggestions, and hard data you send in.

This won't be possible for the next two columns, so I will be playing it by ear, presenting general type subjects that I hope will have broad appeal.

As I stated last month, I want to know who you are, where you live, the antenna(s) and

type of receivers you use, and your primary areas of utility interest. Knowing this, I won't present topics that there is no interest in. So take a minute to jot down this data and send it to the CommCo column via *POP'COMM*.

The month of May heralds springtime in the northern tier of states and Canada, while at the same time, the southern states are already experiencing daytime temperatures in the 80 to 100 degree range. For all of us, gone are the quiet winter nights, when we could reliably monitor the lower HF frequencies, or stations, who under the best of propagation conditions, were only marginally readable. Ahead lies a DXers headache in the form of thunderstorms and an increase in upper atmosphere ionization.

On the bright side, we are one year closer to the minimum solar sunspot cycle (1987/88). Any of you SWLers who were active during the last minimum cycle of 1976/77 know full well what a DXing boon awaits all of us. Nevertheless, we still have to get through the summer of 85. That means thunderstorm activity and what it portends.

The modern shortwave receiver is a technological marvel. Transistors, diodes, integrated circuits and microprocessor chips put a big potential into a relatively small package. There is one trade off . . . these miniaturized components are very sensitive to voltage overloads.

Your receiver has a built in fuse, and your house AC wiring likewise has a fuse or circuit breaker assembly. Their express purpose is to short out/or pop when the current level goes above a specified limit. Just because you have these, don't be lulled into a sense of false security. Likewise, don't think that by properly grounding your receiver you are safe. Grounding only serves to bleed off a static electrical buildup in the rig.

If you believe that these overload devices can protect your rig during a thunderstorm, you've got only one oar in the water.

A lightning bolt is the visible portion of static electrical discharge, that has an average energy potential in the area of 100/200,000 watts, and a 10/20,000 ampere range—all occurring in less than a 50 millisecond duration.

If the AC transmission line going to your house or your rig's antenna is struck by a lightning bolt, this electrical potential is instantly transferred. Fuses and circuit breakers are primarily slow reaction (fraction of a second) devices. They will blow if you take a strike, but not before a considerable amount of energy has already crossed over—in other words, now on its way through the rig's AC plug or antenna terminal. Admittedly, the grounding wire will bleed off the discharge, but only *after* the overload has gone through your receiver . . . .

The results of a direct strike are catastrophic to modern electrical circuits. You can end up with a rig whose only remaining function will be to become a book end, door stop, or boat anchor . . . and this can happen even if you did not take a direct hit. A close encounter can produce the same results—fried components!

Quite obviously, you should NEVER monitor during a local area thunderstorm. Notwithstanding possible receiver damage and a chance of you being electrocuted, your eardrums are going to take a beating every time there is a discharge.

The best and simplest way to protect your receiving equipment is not to go out and purchase lightning arrestors for your antenna, or millisecond reaction AC line breakers. The best method is to *disconnect* the antenna and grounding wire from your rig, and by all means pull the plug from the wall socket. So even if you are away from home or asleep during a thunderstorm, your rig will be safe from any incoming overload.

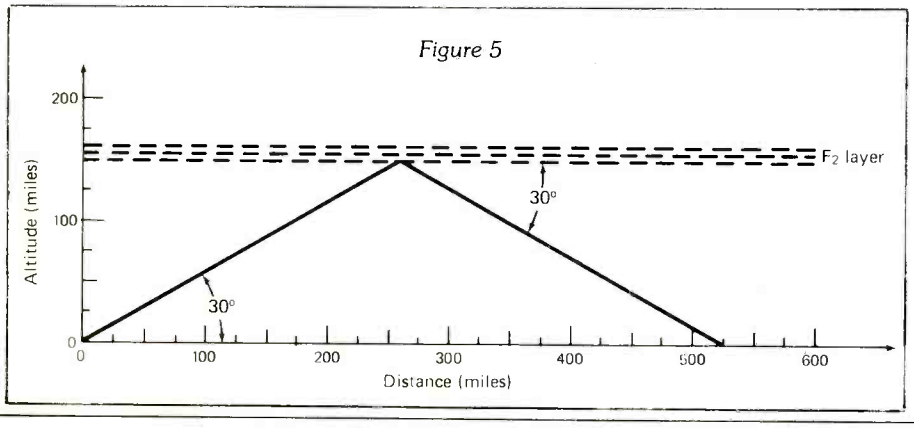
Admittedly this is a very inconvenient thing to do, considering the long odds of a close or direct lightning strike. On the other hand, it only has to happen once to transform hundreds or several thousand dollars worth of equipment into useless junk. So use your common sense during the thunderstorm season. Until next time, best of DXing and 73s.

Intercepts Section

Send your reports to: Jim Taggart, Utility Loggings Editor, Communications Confidential, Popular Communications, 76 North Broadway, Hicksville, NY 11801. Here we go for this month:

226: EZE, beacon at Hopkins Int'l Airport, Cleveland OH heard at 1800 GMT. (Mike Gardner, Mansfield, OH)
236: GNI, beacon at Grand Isle LA, heard with weak signal at 0429. (Joey Garcia, Key West, FL)
256: RV, beacon in Romeoville IL at 0415. Part of the approach system at Chicago O'Hare Airport. (Shirley Lieb, Oak Park, IL)
260: MTH, beacon in Marathon FL heard at 0202. (Garcia, FL)
273: UVR, beacon in Veradero, Cuba heard at 0423. (Garcia, FL)
286: OE, beacon at Dry Tortugas FF, heard 0204. This is the site of Ft. Jefferson National Monument and is about as far south as you can go in the continental USA. (Garcia, FL)
290: CCG, beacon at Cayo Caiman, Bahamas Islands. (Robert Kramer, Chicago, IL)
1846.5: CW "dits" sounding like time "pips" at 0113. (Lloyd Curry, NA4D, Greensburg, KY)
2372: CAP stations MIDDLE EAST 42, PLANT 181, and PLANT 189, in USB at 2358. Correct frequency here is 2374 kHz, Al. (Al Quaglieri, Albany, NY)
3044: "NR10439" sending "V's" in CW at 0250. Chirpy note and changed speed. (Curry, KY)
3151: Halifax Military, Canada, in USB at 0554 with coded numbers and letters. (Curry, KY)
3326: Q8J exchanging CW radio training drills with 7ER at 0354. Undoubtedly military. (Quaglieri, NY)
3500: Randomly sent CW "dits" which seem to be there every time the 80 meter ham band opens. (Curry, KY)
3515: OAZBO being called by "47" in CW at 0600. One of those mystery stations! (Curry, KY)
3645: Male voice repeating "ocho" (the number 8 in Spanish) over and over again, like a "numbers" station, but very fast. AM modulated at 0309. (Curry, KY)
4232: HWN, Paris Naval Radio, France. CW at 2217. (Hank Lukas, Plainview, NY)
4268: XUK, Kompongsongville Radio, Cambodia, weak CW marker at 0313. (Quaglieri, NY) A really nice catch! (Editor)
4274: GKB2, Portishead Radio, England in CW at 2159. (Lukas, NY)
4283: ZSJ3, NAVCOMCEN, Cape Radio, Silvermine RSA, in CW at 2006. (Lukas, NY)
4307: SS/YL counting 1 through 0 then "871" three times. At 0310 there were 10 beeps and then into 4-digit numbers. Similar to the station on 9465 kHz in the January '85 issue. (Leo J. Boberschmidt, Kensington, MD)
4308: DAN, Norddeich Radio, W. Germany, in CW at 2137. This seems to be an old favorite on the maritime bands. (Lukas, NY)
4346.2: YUR, Rijeka Radio, Yugoslavia. Coastal station heard with CW "V" marker at 2318. (Gary L. Bledsoe, NV4S, W. Palm Beach, FL)
4349: EAD, Aranjuez, Spain, CW marker at 0351. (Lukas, NY)
4416: P4O, YL with coded traffice in USB at 0505. (Curry, KY)
4543: German YL with 5-digit number groups, each group said twice. Noted in USB at 0542. (Curry, KY)
4637.5: Station WRB669 in USB at 0547 rag-chewing with another station. (Curry, KY)
4645: Extremely rapid number spoken by a man in Spanish. An RTTY-like sound in the background. Heard in AM at 0033. (George Osier, Norfolk, NY)
4670: SS/YL 4-digit groups in AM at 0223. Running parallel to 5812 kHz. (Curry, KY)
4890: Unidentified Spanish-speaking USB net. Mentioned Mexico several times. This was noted at 0445. (Quaglieri, NY)
4990: German 3/2 numbers station in USB at 2007. Started with 3-digit ID then counted 1 to 0, then into number groups in Spanish! (Osier, NY)
5200: Unidentified Portuguese ship/shore communications in USB at 2239. (Quaglieri, NY)
5235: Two Soviet CW stations exchanging numbers, with occasional Russian characters and Q-signals. Noted ending at 0139. (Quaglieri, NY)
5239: SS/YL 4-digit groups with usual format in AM at 1113. Parallel with on 5810 kHz. (Osier, NY)
5570: Anti-drug smuggler traffic in Caribbean and Florida area noted here now. Same network as formerly noted on 7527 kHz. ("A. Nonymous," FL)
5597.9: Aircraft in voice with Gander (Nfld.) at 0245. He announced his speed at "mach 84." Maybe it was a UFO! (Lieb, IL)
5696: Coast Guard Long Beach (CA) to rescue craft looking for vessel lost at sea. Rescue craft also worked San Francisco, Miami, and New Orleans. Noted in USB at 0127. (Curry, KY)
6151: WGY965 calling WGY905 in USB (no time given), then switched to RTTY. (Curry, KY)
6218.6: KGW347 in USB working vessel "Challenger" (WRX6550), tug "Independence" (WZG8465) and "Corsair" (WYZ6499) around 2113. (Quaglieri, NY)
6326: WNU32, Slidell Radio, LA, in CW at 0025. (Lukas, NY)

Figure 5



6348: KFS, San Francisco Radio, in CW at 0033. (Lukas, NY)
6369: D3E, Luanda Radio, Angola, in CW at 0258. (Lukas, NY)
6387: FUF, Fort de France Naval Radio, Martinique, in CW at 0047. (Lukas, NY)
6410.1: UHK/UFA, Batumi, Georgian SFR, sending CW traffic in Russian (?) at 0032. Good one, Gary! (Bledsoe, FL)
6493: VAI, Vancouver (BC), Coast Guard Radio in CW at 0140. (Lukas, NY)
6494.7: UBN, Jdanov, Ukraine, with CW marker at 0123. (Bledsoe, FL)
6496.6: UFB, Odessa, USSR, with CW marker at 0237. (Bledsoe, FL)
6515: SS/OM 5-digit numbers station running in AM. Each group repeated twice. Signed off at 0345 ending with "044 044 5 5 5 5 0 0 0 0." (Lieb, IL)
6643: Male ops in Spanish exchanging 4-digit number groups, USB at 0345. (Lieb, IL)
6801: SS/YL 4-digit numbers on AM at 0228. (Lieb, IL)
6843: SS/YL 4-digit numbers in AM s/off abruptly at 0243. (Lieb, IL)
7335: Time station CHU in Canada and Radio Moscow were battling one another for the frequency at 2018. (Osier, NY)
7445: Kilo Papa Alpha 2 running in AM at 0304. Repeated recording of YL's voice saying ID. Believed to be Mossad (Israeli Intelligence). (Roberschmidt, MD)
7627.7: KWS78, Nicosia, Cyprus, in CW with QRA marker at 0131. Most people believe it to be the U.S. Embassy, but some doubts linger as to the full extent and scope of this and other similar stations—Ed. (Bledsoe, FL)
8000: USS Farragut in USB at 0210 calling "Shipyard Control." (Curry, KY)
8010: CW transmission of groups such as T6N6T, A46E6, DUUN4, OBAEA, etc. at 0333. (Curry, KY)
8050: SS/OM speaking slowly and reading off a long list of names. "Julio, Armando, Alfredo, Alberto, Maria, Hombre, Santiago, Carlos," etc. Noted at 0425. (Lieb, IL)
8257: HNRM calling Rio Radio in USB at 0251. (Curry, KY) HNRM is the callsign of a ship called the Rumaila. (Editor)
8440: 33AME sending "23RG" and "37UMA" in CW, CW at 0342. (Curry, KY)
8459.9: "Balance" net control station for a military training net. Stations in the net all had ID's consisting of the word "Balance" followed by two digits. Noted in USB around 1900. (Quaglieri, NY)
8501.4: XSG/3/7/8, Shanghai, PRC, with CQ marker in CW at 1212. (Bledsoe, FL) Not often reported lately. (Editor)
8558: CCV6, Valparaiso Naval Radio, Chile, with time signals at 0055. (Osier, NY)
8649: ICB, Genoa Radio, Italy, heard in CW at 2200. (Lukas, NY)
8660.1: UJQ7, Kiev, Ukraine, calling 4LA in CW at 0132. (Bledsoe, FL)
9010.5: "A" beacon in CW at 0805. (Curry, KY)
9940: Cyprus with LSB telephone call in English at 1700. (Quaglieri, NY)
11092.5: St. Helena telephone calls, USB at 2008. (Quaglieri, NY)
11228: SAM-502 talking with Andrews AFB asking for weather at Norton AFB and Palm Springs. Heard at 18650. ("Bismarck," Macon, GA)
12243: "Bigbone" to base about arrangements for a flight to Billings (MT) for military brass. (Curry, KY)
11267: "Oscar 6 Echo passing traffic in the blind." USB at 1416. Probably military in nature. (Curry, KY)
11460: Time "pips" or a reasonable facsimile at 1420. (Curry, KY)
11535: SS/YL 4-digit numbers commencing with the ID "917" and a count from 1 to 0. Heard at 1708 using AM. (Curry, KY)
13366.5: 5YD, Nairobi, Kenya, RTTY (425/67N) with "RY" tape at 2037. (Alice Brannigan, Boston, MA)
14014: "CQ DE CLS QSX 8366/12549" in CW at 2321. The 20-meter ham band is indeed a strange place—Ed. (Curry, KY)
14469: Station using a USN MATS (NNØ) callsign breaking in on traffic between two Spanish speaking stations. MARS op said he was in Honduras. After several calls, one Spanish station answered and was quite irritated at being interrupted. Said he was in "Baja." One station used the ID "Maria," the other "Echo Tango." (Curry, KY)
14886.5: WGY908, FEMA station in very slow CW with coded traffic at 1414. (Curry, KY)
14888.4: Very slow CW 5-letter groups at 2051. (Brannigan, MA)
14938: Mauretania Posts and Telegraph USB "voice mirror" in French at 2056. (Brannigan, MA)
15036: Halifax Military, Canada, in USB at 1940 with weather info. (C. K. Redding, Middletown, RI)
15975.8: Random letters in CW, hand keyed, at 2115. (Brannigan, MA)
16164: D2J31, Luanda, Angola, ANGOP Spanish news in RTTY (425/67N) at 2020. (Brannigan, MA)
16450: Ship "Ashley" talking to an MD about a sick passenger. USB at 1800. (Curry, KY)
17139.9: UMV, Murmansk, USSR with CW marker at 1903. (Bledsoe, FL)
18360: CME329, Czech Embassy, Havana, Cuba, running Czech language traffic in RTTY (425/100N) at 1508. (Brannigan, MA)
19360: Very lively INTERPOL network with a number of CW stations at 1520. (Brannigan, MA)
27650: J3Z4 CW beacon (no time given). (Dennis Murphy, Orland, CA)
27475: DB2 CW beacon (no time given). (Murphy, CA)

Alice Brannigan mentions having monitored mystery station "73JKL" a number of times, sometimes running CW but mostly in RTTY (850/75R) on 2788.5, 6358, 8466, and 12933 kHz. This station has been noted previously in this column. While the station seems to spend most of its time running an RY marker, one time it was intercepted with actual traffic. This consisted of a message which was partially encrypted, including the plaintext information "TO AIG" followed by an encrypted name, then "FROM AIG" followed by an encrypted name, with copies intended for several others whose names were preceeded by "AIG."

Next month we will be using a better record-keeping system at the loggings desk. This will enable us to present a more well-rounded and wider cross-section of the choicest loggings from virtually all of our many reporters. Prior to my taking over the loggings section of the column there were a number of reporters whose loggings somehow got left out in the cold. Sorry about that, but we are taking steps to correct the situation. In the meantime, please keep those intercepts heading our way.

It would be best if reporters could arrange their loggings according to frequency (ascending order—that is, lowest frequency first), and include as much data as possible, such as callsigns or ID, location (if known), time (in GMT), mode (CW, RTTY, AM, USB, SSB, or whatever). If an RTTY station is being reported, please give baud rate, shift, and whether normal or reverse. In all cases, mention the language if other than English; also mention any information about the station or its transmission (such as station it was contacting or calling, etc.), especially anything odd or unusual. Send in loggings of any "utility" stations; that is, any stations *other than* AM/FM/TV broadcasts, international SW broadcasters, and hams. Thanks—Jim Taggart.

SURVIVAL

BY R.L. SLATTERY

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Site Selection

A communications command post is best located where it is secure and also where it will assure communication with all other stations with whom it is to communicate. Easier said than done.

For those who are anchored in urban areas, sites are limited, but for those who aren't confined by a city location, the ability to select a decent site becomes a matter of choice. The site chosen can be one purchased by you as an individual or by a group to which you may belong. Short of outright purchase, you may be able to secure its use by rental or long-term lease. Catalogs from national real estate companies, such as United Farm and Strout Realty, list hundreds upon hundreds of large/small parcels of land in all areas at (often) surprisingly low prices—many with structures located on the land. Here are some thoughts on what to consider when looking for a site for a remote communications station.

Hills and mountains between stations normally limit the range of communications gear. In mountainous or hilly terrain, positions relatively high on the slopes should be selected. Locations at the base of a cliff or in a deep ravine or valley should be avoided. For operation at frequencies above 30 MHz, a locations that offers line-of-sight communication is preferred.

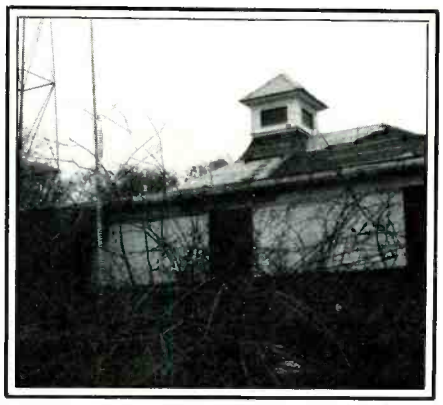
Dry ground has high resistance and limits the range of your communications equipment. If possible, the site should be near moist ground since it has much less resistance. Water, and in particular salt water, will greatly increase the distances that will be covered.

Trees with heavy foliage absorb radio waves, and leafy trees have more of an adverse affect than evergreens. The antenna should be kept clear of all foliage and brush.

All types of pole wire lines, such as telephone, telegraph, and high-tension power lines, should be avoided when picking a site for a communications station. Such lines absorb power from radiating antennas located in their vicinity. They also introduce hum and noise interference in receiving antennas. Secondarily, they also pose a safety hazard in the event your antenna system should come into contact with these lines.

Positions adjacent to heavily traveled roads and highways should be avoided. In addition to noise and confusion caused by the activity of the vehicles themselves, the ignition systems in the vehicles may cause electrical interference.

Sites located in remote areas would, of course, need to be accessible by vehicle. Potable water in the immediate vicinity is a definite plus.



This abandoned one-room schoolhouse could be bought for a song. It was an ideal communications station site and even had its own radio tower in fairly good condition. (Photo courtesy Tom Kneitel)

It's almost impossible to select a site that will satisfy all technical and tactical requirements. Therefore, a compromise is usually necessary and the best site available and within your means is selected.

A word of caution: If you're out scouting for sites for long or short-term use, be careful not to trespass on private property.

Some other observations: Private children's summer camps aren't as much in vogue as they were for many years. There are probably a dozen reasons for this. In any event, about 10 to 15 years ago a lot of these camps started going out of business and were either converted to adult summer bungalow colonies or were simply abandoned. Several people have written to note that in the backwoods in many areas of the nation (notably in the northeastern states), there seems to be a load of abandoned summer camps. The structures on such sites may still be in usable condition, or easily put back into shape. Moreover, these places can often be purchased at very reasonable prices or leased from owners who are more than happy to get out from under them.

Last summer, one of our readers wrote to say that he came across the remains of just such an abandoned summer camp in Hubbardton, Vermont and that he was attempting to make contact with the owners in order to secure its use for a survivalist group with which he was associated.

POP'COMM's Editor, Tom Kneitel, cites another example of coming across a good potential communications site. He tells me that he noticed in a land-for-sale catalog a parcel of property described as having "an abandoned school house and broadcasting station." That was, he reports, too good to ignore. Within jiffy time he had made arrangements to see the property and, sure enough, it was just as described—an ancient and boarded-up one-room schoolhouse complete with a reasonably-good condition radio tower adjacent to the building! Nobody seemed to be able to recall anything about the circumstances surrounding the existence of a radio station at the school, however it was one instance where a communications site was available on an almost ready-to-go basis. This is just one more example of what can be located with only a little bit of effort.

Mailbag

Ian Smith, 6529 171st Ave., N.E., Snohomish, WA 98290, writes to say that he has a BC-348-J military surplus receiver made by Wells Gardner, a National NC-Sixty receiver, and a mil surplus BC-645-A transceiver. He's looking for manuals, conversion information, or any data on these sets.

Ian's BC-348 receiver is a wonderful WWII unit that is quite similar to the famous BC-312 and BC-314 family. The BC-348 is a superhet covering 950 kHz to 18,000 kHz. The set requires a 12 VDC power source and pulls 4.5 amps, unless it is a version with thermostatic heaters for oscillator stability, in which case it requires 7.5 amps. The 110 VAC version of this set draws 75 watts, or 100 watts with thermostatic heaters. The IF of this set is 915 kHz and it has broader tuning than the other sets in this series. Actually, many of these sets were dumped onto the surplus market and saw SWL and ham service. However, at this point, their technology is so outdated that they would require more conversion than anybody would want to devote in order to make them competitive with even the most inexpensive modern receivers.

The BC-645-A is (or was in WWII) an airborne IFF (Identification Friend or Foe) transceiver operating in the 470 to 495 MHz band. It transmits either a pulse or 30 kHz modulated CW signal. The big feature of this set was the WE-316A tube. Back in the 1950's, when these sets were being sold for $20 on the surplus market and touted as "easily converted" to the 420 MHz ham band or the 465 MHz Citizens Band, they were useless. It's an interesting souvenir but that's about all. Leave it on the shelf.

If any readers have manuals or additional data on these sets, contact Ian directly. The National NC-Sixty might be worthy of updating; it was a pretty good piece of gear in its day. PC

PIRATES DEN

FOCUS ON FREE RADIO BROADCASTING

BY DARREN LENO, WDØEWJ

Last month, we learned about a noncommerical radio broadcaster from Yonkers, New York on 1622 kHz. The station was licensed by the FCC as KPF-941 under FCC rules and regulations Part 74 D, which allows for auxiliary broadcasting. An example of an auxiliary station would be a remote unit transmitting back to a broadcast station. KPF-941 was supposed to have broadcast back to WOZI-FM in Presque Isle, Maine, and WOZW-AM in Monticello, Maine. This class of stations is not supposed to broadcast directly to the public.

Two men decided to bend the rules a bit and see if they would break. But the FCC, true to form, steadfastly refused to budge and changed its mind about the license it had issued after it became clear what owners Allan Weiner, 31, and J. P. Ferraro, 36, really had in mind. They wanted to give Yonkers (a city of nearly 200,000 people) its first radio station.

Ferraro says that Yonkers is one of few U.S. cities its size without a radio or television station. "We just feel that Yonkers deserves to have its own radio station. I don't think there's anything outrageous about that," he said.

As Yonkers first but short-lived radio station, KPF-941 broadcasted with 100 watts and a 40-foot homemade tower in the backyard of the house where Ferraro's mother lives. The entire operation cost less than $1,000 to set up.

It appears Yonkers will have to got a bit longer without a radio station, at least until the FCC expands the AM broadcast band past 1600 kHz. All AM and FM frequencies in the area are occupied by stations in surrounding cities. "There is literally no room on the dial for Yonkers," Ferraro stated.

Conflict with the FCC is not new to J. P. Ferraro or Alan Weiner. The pair met in 1970, while each was running a pirate radio station. They joined forces in 1971 and formed the Falling Star Network, which espoused counterculture views and music. FSN was closed that same year, and the two pirates received a year of probation. Today, Alan Weiner owns two radio stations (WOZI and WOZW) and J. P. Ferraro is a freelance studio and radio technician.

According to Ulises Fleming, reporting for *The ACE*, Ferraro and Weiner would like listeners and supporters to write the FCC and New York senators in favor of issuing a waiver of the rules to allow this station to return to the air. Letters can be addressed to KPF-941, PO Box 327, Hastings-on-Hudson, NY 10706.

Return Of Jolly Roger

Another former pirate is trying to get a broadcasting license from the FCC. Bruce Quinn, 29, of Delphi, Indiana, will ask the government to issue him the call letters WXJR. The significance behind the call letters is understood by anyone that remembers the 13 years that this "ex-Jolly Roger" operator ran his station on AM, FM, and SW frequencies. The FCC "bust" of Jolly Roger Radio in 1980 by FCC official George Sklom made national news. After the bust, Quinn applied to the FCC for a license for JRR, and when it was flatly refused, he claimed he would "pirate 'til the day I die." We began to take his remarks seriously after JRR was resurrected in 1983. This prompted the FCC's Sklom to publicly remark that if he had to come after JRR again, someone would go to jail. The station left the air shortly afterward. Quinn then took a trip to England to see if setting up a pirate station there was feasible, but concluded it wasn't. Now, in light of the recent FCC attitude toward deregulation of radio and television. Quinn feels his chances of being issued a license are as good as they ever were.

Here's the busy studio/control room at station KAMB in Cambridge, Nebraska, 106.7 MHz. (Photo courtesy Tom Kneitel)

The Wizzard and the rest of the gang at KAMB, 106.7 MHz, in Cambridge, Nebraska. This station was formerly KXYZ on 750 kHz (AM), and before that it was on CB Channel 13. Plans are for a shortwave channel to open up this year. (Photo courtesy Tom Kneitel)

Quinn's resentment toward the FCC may have stemmed from his issuance of a "blind endorsement" license in the 1970's before they were ruled discriminatory. The license limited the duties a blind person could perform if working at a broadcast station. To Quinn, an imaginative person who loves radio, the limits imposed by the FCC on his creativity were not acceptable. Perhaps this was one of the factors that lead to the establishment of his Jolly Roger Radio, a station free of all rules and regulations.

Quinn told an *Indianapolis Star* reporter recently, "They (the FCC) felt my blindness would hamper my ability to work. I was bitter about that."

As a person who has followed the escapades of Bruce Quinn for at least half the years he has been pirating, I've seen the spirit and enthusiasm this man brings to every project he undertakes, never letting his handicap slow him down. If ever a person deserved a license to broadcast, Bruce Quinn is that person. The wonderful programs he and the JRR staff produced during the station's 13 years of existence, the quality of his transmissions, and the enjoyment thousands of listeners derived from JRR qualify him to be heard legally. I envy the residents of Delphi, Indiana. If Bruce gets his license, they're in for a treat.

Across The Dial

KABF: Although not a pirate itself, someone was pirating the signal from this FM broadcaster on 88.3 MHz in Little Rock, Arkansas, and was relaying it on shortwave. Gary Hickerson heard it on 7425 kHz after 0400 GMT.

KGUN: This station appears to be coming from the studio of the Secret Mountain Laboratory. Gary Carter of North Carolina heard KGUN broadcasting from "downtown Unice, Louisiana" with an interesting blend of music and comedy on 7435 kHz after 0300 GMT. Reports can be sent to PO Box 5074, Hilo, HI 96720.

Frank Orcutt of New York QSL'ed this popular offshore broadcaster in the 1970's. Today, offshore pirates are again broadcasting to excited listeners in Europe.

KRZY: DJ's Joe Cool and Capt. Crazy were playing rock music on 7440 kHz after 2145 GMT when Dave Molinelli of Illinois tuned in. Charles Hampton of Tennessee heard them on 7440 kHz until 0530 GMT.

Radio Angeline: In Florida, Steve Siggins heard this pirate on 6212 kHz at 0700 GMT. He tuned in an interval signal consisting of the song "Send in the Clowns" played on a music box. Steve wonders if this station is new. Well Steve, the earliest logging I could locate for Radio Angeline is July 2, 1983. Broadcasts by this station have been few and far between since then. In the January 1984 issue of *The ACE*, the man who forwards mail for them tagged the station as being "inactive," so they're not a regular find on the SW bands. Try for a QSL card through PO Box 982, Battle Creek, MI 49016.

WMTV: Bill Thim of Connecticut heard WMTV on 7435 kHz at 2309 GMT as they played rock music. He also heard an ID as "96MTV, FM and SW." He wonders if the "FM" claim is true. It sure is, Bill. WMTV operates a 20 watt transmitter on 96.3 MHz in south Florida. They also have been logged on 1610 kHz AM with their 35 watt transmitter, and they claim to have a 10 watt transmitter for Channel 3 television! On shortwave, they use a 50 watt Hallicrafters HT 37. These folks live dangerously! Their address is WMTV c/o John, PO Box 1945, Del Rey Beach, FL 33444.

WYMN: This all female-DJ, country music pirate was heard by Gary Hickerson on 7432 kHz after 0430. This station broadcasts for and about women.

Secret Mountain Laboratory: Bob Pegritz in Delaware tuned in SML one evening on 7431 kHz at 0349 GMT with banjo music.

Voice of Laryngitis: This station was heard after 2330 GMT on 7430 kHz by Walt

May We Recommend . . . .

The American SWL Club, 16182 Ballad Lane, Huntington Beach CA 92649. This club has been operating since 1959. It publishes an excellent 60 page monthly DX publication covering shortwave and broadcast band DX, utility stations, QSL reports, and more. The club co-sponsors three annual DX meetings per year held in southern California. Dues in North America are $18 per year (includes First Class Mailing of monthly publication). Students (located in North America and 16 years old or younger) can join for $13 per year. A sample bulletin is available from the club for $1 (in North America).

Sepaniac in Texas. The ever-popular "Atilla Huxley Hour" program with the Rev. Billy Bob Huxley was heard.

Zepplin Radio Worldwide: Gary Carter heard ZRW on 7435 kHz after 0220 GMT. Reception reports go to PO Box 245, Moorhead, MN 56560.

The "Fat One" Lives

Frank Orcutt of New York sends an interesting letter about the original 94.5 KFAT.

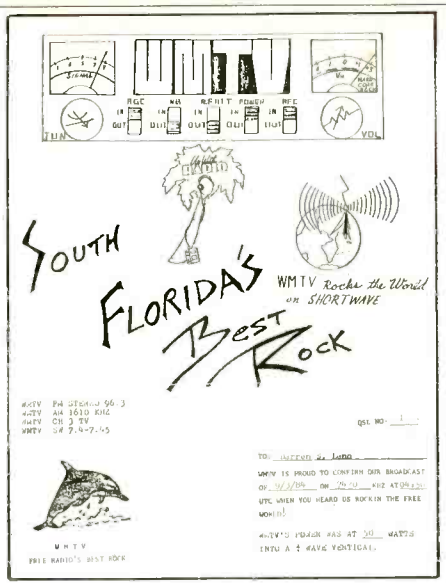
Dear Darren,

I've noticed that in *POP'COMM*, a pirate called KFAT has been referred to several times. I came to New York from the San Francisco Bay area, and my favorite station there was KFAT on 94.5 MHz FM. Part of what is being broadcast now on the SW pirate are bits and pieces of old KFAT studio tapes. I'm fortunate to own some 36 hours of KFAT tapes, having received them for a birthday gift a few years back.

KFAT was on the air from August 1975 to January, 1983. It was more than *just* a radio station, it was a way of life. If you're interested, there are still a couple of bastions of FATness left. One is KFAT —T-SHIRTS, PO Box 390, Santa Cruz, CA 95061, and Down Home Music, 10341 San Pablo, El Cerrito, CA 94530. You can get KFAT T-shirts, belt buckles, hats, baseball shirts, stickers, patches, and more at both places. Down Home also sells the off-the-wall records and tapes that made KFAT the legend it is on the west coast.

Best of DX, Frank Orcutt

San Francisco's KFAT seems to have had quite a following. I've received other letters like Frank's since the shortwave KFAT began appearing in these pages. The pirate operation is no doubt being run by a very loyal fan of this unique radio station.



European Report

Raymond Fraff in Kastellaun, West Germany sends us some loggings of stations that are being heard in Europe: Radio Gemini, 6220 kHz, 1000-1100, #10 London Road, Ashley, Hartfortshire, England; Radio Krypton, 6265 kHz, 1030-1130, 134 Eastworth Road, Chertsey, Surry, England KC 16807; Future World Radio; 7310 kHz, 1000-1130, 725 Arnhem, Holland; KBC Radio, 7338 kHz, 1030-1100, 725 Arnhem, Holland.

In Conclusion

Most pirates take to the air weekend evenings. Note the frequencies and times listed above, and periodically monitor them. One range of frequencies to pay particular attention to is from 7350-7450 kHz, especially the "pirate channel" of 7425 kHz. With a little patience, you'll be able to hear these stations. The first one is always the hardest.

Another tool you may find useful for pirate hunting is *The ACE*, a bulletin published monthly by the Assoc. of Clandestine radio Enthusiasts. Send a large SASE for info, or $1 for a sample bulletin to A*C*E, PO Box 452, Moorhead, MN 56560.

Media Monitor is an interesting weekly publication produced by Roger Tidy, 3 Kingsdown Rd., London N19, England. Although it covers international broadcasting in general, there are frequent references to European pirates. Send 3 IRC's for subscription information.

Thanks to David Morris of Indiana for his submission of an *Indianapolis Star* article.

Readers are encouraged to be on the look-out for news articles relating to pirate radio in magazines and newspapers. Loggings and copies of QSL cards are always welcome here, as is your feedback in general. Send your contributions to this column to The Pirates Den, c/o Popular Communications, 76 North Broadway, Hicksville, NY 11801.

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

New VHF Radiotelephones With Multi-Readout Information Centers

Apelco Marine Electronics has introduced two new high-tech VHF scanning radiotelephones with multi-readout "Information/Control Centers" unlike any seen in the industry. The VXL 9000 and VXL 7000 VHF Radiotelephones offer LCD readouts, color-coded keyboard controls, dual-monitoring, and a number of precision control performance features.

Apelco's VXL 9000 VHF Radiotelephone has all-scan and select-scan capability of all U.S.A. or International VHF channels. A large LCD indicates selected channel and mode of operation. A mini bar-graph, also on the LCD, shows the squelch level set-point in "receive" and the RF power in "transmit" mode. A five-LED indicator displays received signal levels and monitors modulation to verify that messages are being transmitted "loud and clear." Channel entry is by numeric keypad and function selection is by color-coded keypad. An ambient light sensor adjusts backlighting for optimum viewability.

Apelco's lower cost VXL 7000 VHF Radiotelephone has many similar features, including LCD display of selected channel, designated function, and squelch level. Mode selection is by color-coded keypad, and channel selection is by up-down touch control.

A number of advanced features are built into both of the new Apelco radiotelephones. Each will monitor Channel 16 and any other selected channel. The priority function can be assigned to any selected channel, memory recall confirms the menu of operator-selected channels, and both have PA outputs.

The VXL 9000 and VXL 7000 are 25-watt radiotelephones; one-watt selectable. Compact in size, the units measure 3″ (H) × 9.75″ (W) × 8.87″ (D), (76 H × 246 W × 225 D mm). Both can be mounted tabletop, bulkhead, or overhead. Manufacturer's suggested list price for the Apelco VXL 9000 VHF Radiotelephone is $519; and $419 for the VXL 7000.

Apelco, a Raytheon Company, offers a two-year Limited Warranty and a Lifetime Flat Rate Repair Program.

For more information contact: Apelco Marine Electronics, 1107 N. Ward Street, Tampa, FL 33607 or circle number 104 on the reader service card.

Model SRB2

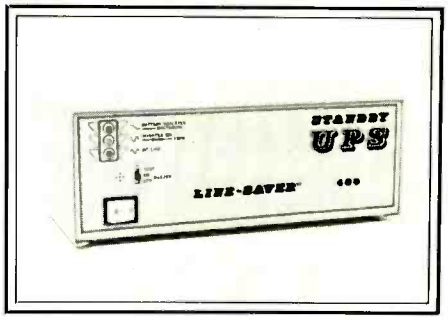
DATONG SRB 2 Automatic Woodpecker Blanker

AllComm/Spectrum West is pleased to announce that once again the fine line of Ham/SWL accessories from this British manufacturer are available, including the SRB 2 Automatic Woodpecker Blanker.

DATONG's leadership in the market again is highlighted in this unique product, the only one of its type. Not only does the blanker eliminate the woodpecker, it does it automatically for complete hands-off operation once turned on. The unique circuitry allows the SRB 2 to first track and then automatically blank the woodpecker signal. Unlike other blankers, this unit does not require you to adjust to the exact synchronization or pulse width and thus, once activated, you will not need to readjust it as the woodpecker comes and goes all over the bands.

The unit is connected in line with the coax and audio lines to allow for the detection and blanking. It can work with any receiver or transceiver allowing passage of up to 150 watts RF. The RF shielded case eliminates all other problems inherent in other blanker designs. The SRB 2 uses 12 volt DC and all plugs and connectors are supplied.

Believing in the old adage that hearing is believing, AllComm is offering a TEST LISTEN program so that interested customers can hear what the SRB 2 can do before purchasing. Those interested are asked to send $1 to cover postage and handling, with their name and address, and in return will receive a C-60 cassette with a brief demonstration of the DATONG products, including the SRB 2. The cassette is theirs to keep as well as a certificate good for $5.00 off the price of the SRB 2. The address is: DATONG TEST LISTEN, 5717 NE 56th St., Seattle, Washington 98105 ($1.50 or 7 IRC's outside North America), or circle number 106 on the reader service card.



Uninterruptible Power System

Kalglo Electronics has announced a new model to its LINE-SAVER (TM) standby uninterruptible power systems.

Designated the LINE-SAVER, Model LS-480, it represents a breakthrough in standby uninterruptible power systems for use with the more powerful configurated XT, AT, and advanced types of business microcomputers.

It is engineered to provide trouble-free standby back-up power in 4 milliseconds or less and is available in models for 120/240 volt, 60/50 Hz, with 480 watts-VA capacity. The unit utilizes the latest "Pulse Width Modulation" (PWM) to regulate the RMS AC output voltage for greater efficiency to various load conditions. The PWM AC output also increases battery efficiency to increase back-up time; 11 min. @full load, 30 min. @one-half load, 45 min. @one-third load. In addition, the unit is furnished with a maintenance free sealed rechargeable battery, replaceable fuses, and two multiple staged voltage surge and noise protected AC outlets. The unit features an exclusive audible and visual power failure warning system, test mode indicator switch, and front mounted illuminated master control switch. The unit's compact design, 13¼″L × 7″W × 5″H, allows for portability and its external battery connectors allows an additional battery pack to be added to extend back-up time.

The suggested retail price is $795.00.

For more details, contact: Kalglo Electronics Co., Inc., 6584 Ruch Rd., E. Allen Twp., Bethlehem, PA 18017, or circle number 103 on the reader service card.

BROADCAST TOPIX

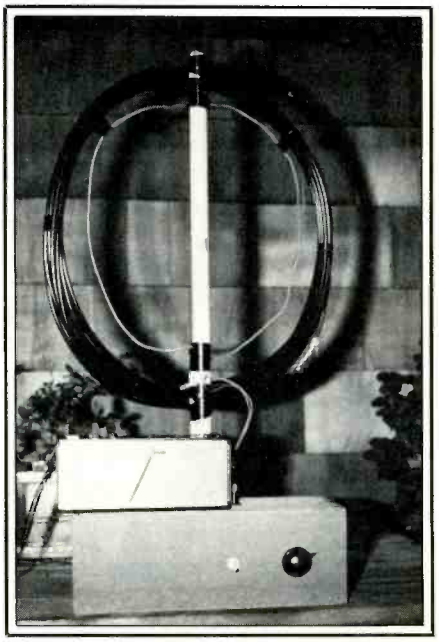
BY MARK J. MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

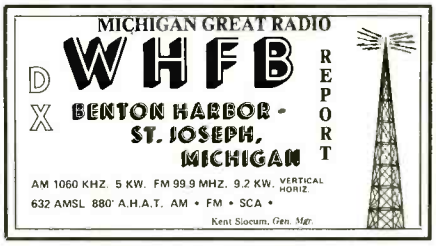
Driving back from the middle of Virginia to Baltimore one cold night in January, I couldn't help but notice how radio has changed. It was after midnight, the signals on AM were strong, the FM band had good distance for the higher power stations, but something was missing. My car radio is one of these electronic, digital marvels that tunes from channel to channel searching for a good signal. It has a seven band graphic equalizer, loudness switch, bass, treble, and a front to rear fader. This is not to mention the normal tuning, search buttons, local-DX switch, and volume. One would think with all this at my fingertips I could make a radio station sound the way I choose. Guess what? I can't do it. My seven bands of EQ won't match the EQ of the station. The EQ of the station? It seems we are not only in a loudness war that has raged for nigh onto 20 or so years on AM and about half that long on FM, but we now have an EQ war! With all the modern audio processors available today, a radio station can be made to sound many different ways.

Back in the late '50's and early '60's, as a broadcast engineer, I used to boost the low range slightly and the highs a touch. However, this was done with a few components placed across the program line or in an amplifier. Today, the processors split the audio band into anywhere from three to seven or more ranges and process each range separately through a bevy of limiters, equalizers, and other devices unknown to man. Then these audio "ranges" are recombined and sent to a "master limiter" and/or a clipper, which further controls the original audio signal. Next the signal may be sent to a "transmitter equalizer," which compensates the transmitter's ability to handle square waves. Square waves? I didn't think audio was made of square waves? Well, by the manner some of these processors are adjusted by stations, the sine waves are so changed one would never know that's what they were. It's no wonder my super IC, digital electronic, seven band whoop-boomer car radio doesn't sound good! It doesn't know how to convert unknown waves back to sine waves! Back to the drawing boards.

Thank goodness this is not true of all stations. The very reason many of these audio processor companies provide locking doors on the front of the units they sell is they are delicate to adjust. To make the right adjustment for every ear is almost impossible. Add the varied experience of the engineer, programmer, and management of each station to this whizzbang processor and we get the brassy, boomy, distorted radio of today!



Dimensions are not critical on the 2 foot loop. One is shown here with Sony SRF-A100 AM Stereo Radio.



QSL card of WHFB.

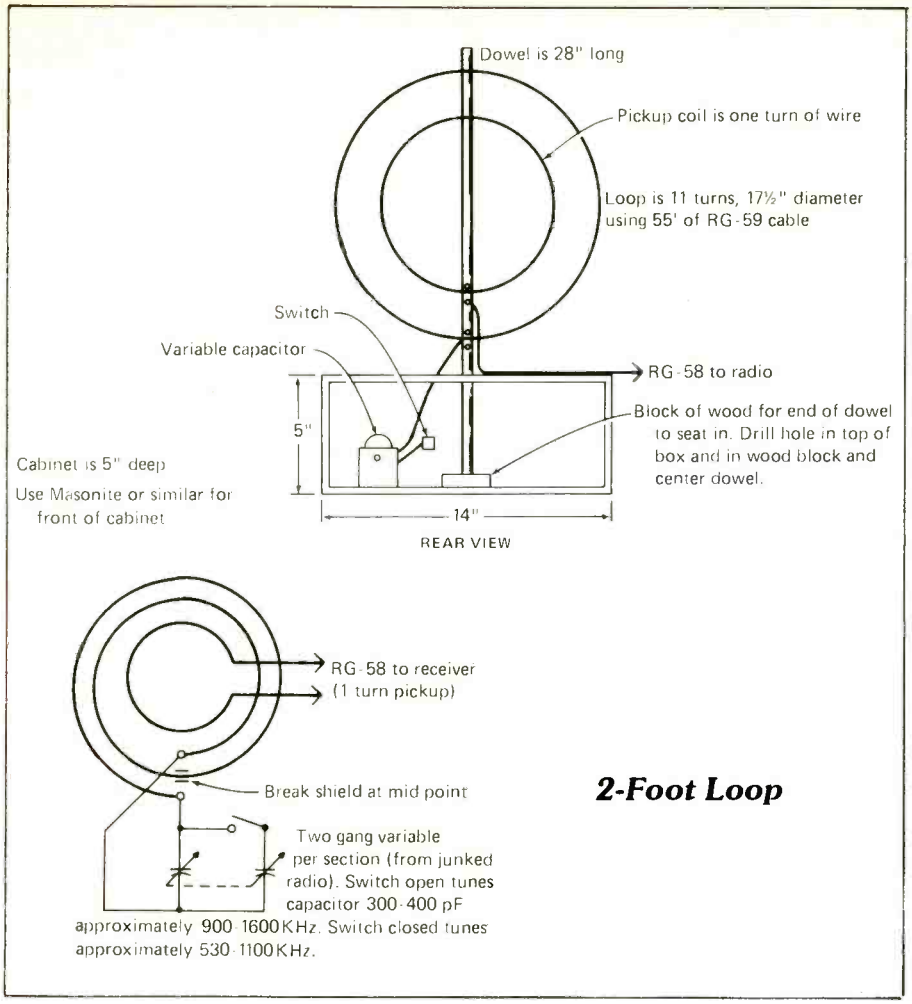
Well, no doubt by this time next year someone will have another gizmo to attach to every transmitter that will revolutionize the audio processing game plan. I did hear many stations properly using processors; that was a joy to my ears. By the way, the stations which sound the way you're used to hearing the radio sound are not using processors to an extreme! They are not dull, boring, weak stations. They are the ones transmitting flat audio response. They're the ones the seven band EQ on my amplifier will adjust to create the sound my ears like.

How does an engineer do a proof of performance with such a processor in the audio chain? Actually, the FCC has now removed the necessity of doing a proof each year as part of the deregulation of the broadcast industry. But all processors, including the "old fashioned" limiters, have "proof switches" which disable anything extra the processor does to the audio signal so that everything is as it once was; clean, flat audio! Don't misunderstand what I am trying to say. The new generation of processors is excellent. They will operate with any type of format better than those of only a few years ago. Perhaps some individual stations need more education on the proper use of an excellent tool for the industry.

Well, down off my soap box and on to loop antennas, again. This time last month I left you with a four-foot loop too large to get out of the workshop! Shown separately is the matching network for 50 ohms if you need to use it to eliminate intermod problems. If you have no intermod when using the loop, I don't think you will be able to tell the difference in performance by adding the extra switch and capacitors.

The 2-foot loop is built to be portable. It comes apart and lays flat. The only parts are RG-59, hookup wire, a variable capacitor, a fixed capacitor, and a switch; a short length of RG-58 with a connector if you need to connect to antenna terminals on your receiver. This loop also works well by induction (no connection to the radio).

The 2-foot loop uses 55 feet of RG-59 cable close wound with a 17-1/2 inch diameter. Before you wind the loop, the shield must be cut at the center (22-1/2 feet). Cut only the outer covering and the shield. Do not cut the center poly insulation or the center conductor. Remove about 1-inch of the shield. This keeps the loop shield from being a complete short into which no signal may travel. The loop is wound the same way you would wind up a garden hose. I used electrical tape to hold the coil together and to fasten it to a dowel the size of a mop handle. You may use the end of a mop handle if it's easier. The other end of the dowel fits through a hole the same size (plus a fraction) as the dowel. It seats in a small block of wood fastened to the inside of the box. This keeps the loop straight and vertical while allowing it to be rotated. The pickup coil is a single turn of wire. The ends of the loop and the pickup coil are soldered to four small nails driven into the dowel at the base of the loop. The pickup turn is connected to a length of coax (RG-58 or RG-59) to go to the antenna terminals or connector on your receiver. Solder the coax to the nails (or small screws) where the pickup turn terminates. The loop termination is connected to a short jumper (zip cord) to a connector on the box. The connector may be anything convenient, such as a phone plug and jack or a TV cheater plug (which is what I used). This allows the loop



2-Foot Loop

to be separated from the base box for portability. Inside the box there is nothing except a tuning capacitor and a switch. If you only have a single gang capacitor, it will be necessary to have a fixed capacitor of about 200 to 350 pf.

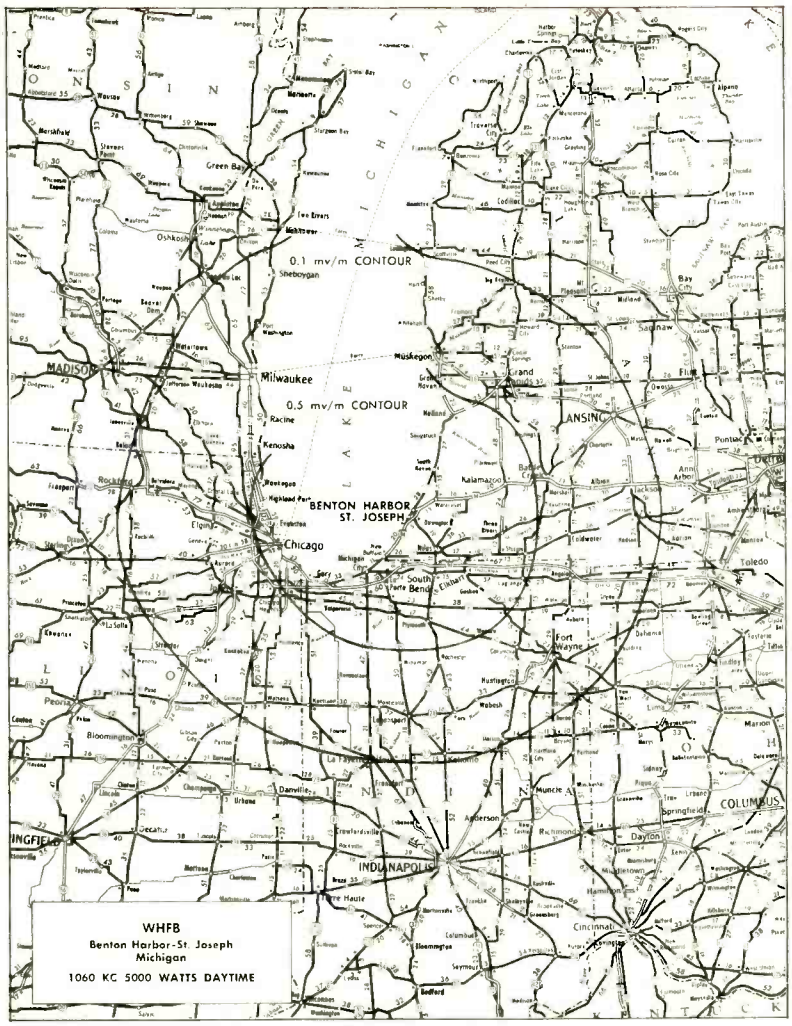
Now I am going to teach you the art of "cut and try" in case you are not familiar with it. With all homemade loops there will be a degree of difference. No two will be exactly alike. The brand of coax I have may not be the same as what you come up with. This will make a difference in the tuning range of the loop, not in its performance. So here's how to compensate. First we put together the basic loop and hook it up to the receiver or set it next to the radio with a built-in loop. Tune in a distant station close to 1600 kHz and tune the loop to a peak. If all goes well, it should peak with the loop tuning capacitor near minimum capacity, that is with the plates turned out all the way. Next we have to find the lower end resonance of the loop. Tune a weak station around 1000 kHz. Peak the station with the loop and notice where the loop tuning capacitor is this time. If it is not fully meshed (plates closed), then keep tuning toward 540 kHz until the capacitor is meshed fully. Make a note of this frequency. Next jumper the two gangs together (if you have a two gang capacitor on the loop capacitor), otherwise add the small fixed capacitor. Pick up where you left off with the single capacitor and repeak the loop to the same station. Then continue down in frequency and see if you can tune the loop all the way to 540 or 530 kHz. If you can't, add another fixed capacitor of 200-300 pf and that should reach 540 kHz. Now you'll need a three position switch, unless you can use a larger value capacitor to replace the two. The object is to be able to tune the entire BC band with as few components as possible.

If you were not able to tune the loop all the way up to 1600 kHz, it will be necessary to make some adjustments. First, be sure the cable from the loop to the plug on top of the box is as short as possible to allow you to turn the loop 180 degrees. The next step is to remove turns from the loop. It is necessary to remove two turns each time since we must keep the break in the cable at the center. After removing the turns (one from each end), the loop should tune to 1600 kHz. Then proceed as described above.

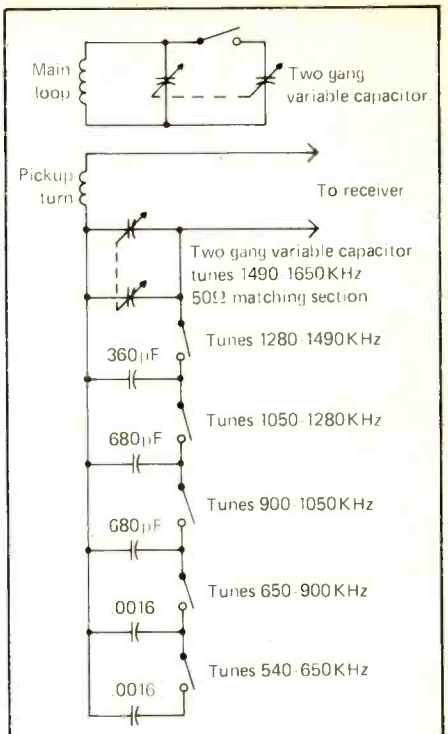
The switch is added in place of the jumper or to add the small capacitor in parallel with the single capacitor. It is possible to extend the range of the loop below the broadcast band by adding additional capacitors with a multipole switch. A point will be reached where the tuning range becomes limited regardless of how much capacity is added. Also, by using more RG cable and a larger diameter for the loop, the range may be extended below the BC band. Conversely, by shortening the length of RG cable, the range may be extended into the utility frequencies. The frequencies above the BC band do not depend on the ground wave propagation as much, so the directional characteristics of the loop are diminished. The null of the loop is broadside to the plane of the coil.

Mail Call

Steve Kramer from Cincinnati likes to eavesdrop on the SCA channels of FM stations. He asks about decoding the digital sounds on some channels. If you have a computer with an RTTY interface, try feed-



Attention all BCB DXers: WHFB conducts tests as follows: AM, 1060 kHz; 1st Monday, 5000 watts; 2nd Monday, 1000 watts; 3rd Monday FM on 99.9 MHz. Tests are from midnight Sunday to 3 a.m. Monday. QSL sent for reception report. Please include postage.



4-Foot Loop

The 4-foot loop tunes about 1000-1600 kHz with one section of capacitor and 540-1100 kHz with the two sections paralleled. If you need the 50 ohm matching section then use a multipole switch that will short each section as the switch is advanced. If the matching section is not needed, then delete all capacitors and couple the one turn loop via the RG-58 to the receiver. If your receiver has no antenna terminals, then the one turn pickup loop is not necessary. Set the radio near the loop and the pickup range of the radio will be boosted. Use a lazy susan under the loop to rotate it.

ing the speaker audio into the interface and see what comes out on the screen. Anyone else have any suggestions or experience with digital SCA decoding?

From Oswego, New York, Huson Wilken asks about specifications on receivers and antennas. Good thought, Huson. Tell you what I'll do. Let's spend some time next month discussing the different specs and see what we can learn. Thanks for the idea.

Got a nice letter from Mike Hardester of Littleton, Colorado, who has been collecting info on TIS stations for quite some time. We'll share some of his information in the months ahead.

Scott Ketcher of Miami, Florida, says for those of you traveling South Florida, you might want to try for 1610 kHz near the Everglades National Park. Scott, my whizz-bang radio will tune 530 but not 1610!

Bud Stacey is a long-time radio buff living in Sennes, Alabama. He's been DXing since grade school!

Another Alabamian, Keith Pugh, writes from New Hope, reporting an FM opening on December 2, 1984. Although not being able to ID Spanish, Keith heard stations on 88.3, 88.5, 93.1, 93.3, and 94.1. All had full scale "S" meter readings. It has been so warm this past winter that the "skip" stayed with us for a while. The best time to look for FM skip during the spring and fall is early morning, just after sunrise and an hour or so after sunset. Days when the temperature change is rapid are usually the best.

Ken Pilon of Gimli, Manitoba, puts a vote in for Mould Bay, Canada, being one of the best DX locations. The sun is down five months out of the year. The closest AM station is 2,000 kilos, south, in North Pole, Alaska! Ken says it is very quiet there (except for the howling wind, Ken?). Anyway, they are able to DX into Europe and the States on the BC band. Any other readers wish to comment on their favorite DX location?

Kevin Klein of Appleton, Wisconsin, sent a whole package of material on the stations where he works in Oshkosh. Those of you around Lake Winnebago might listen for him on WOSH (1490) or WMGV (103.9).

Also got a nice long letter from Arnold Feldman of Jesup, Maryland, who told of his interest in broadcasting. He also helps out with the Baltimore Radio Reading Service. This is an SCA channel on WBJC in Baltimore, a service to the blind.

AM Stereo

The news from Harris is AM Stereo may be down to two systems! It seems there has not been too much activity by PMX in promoting the Magnavox stereo system and Harris has reached agreement with Motoro-

la to market the C-Quam system as well as their own. I think what this means is Harris realizes there is a much better chance to sell Motorola type exciters than Harris. They will retrofit all of the Harris exciters with modifications to make them compatible with C-Quam. This leaves Kahn and Motorola in the forefront of AM Stereo. With Harris switching to C-Quam, this boosts the Motorola system to outnumber Kahn on the air by about four to one. Although Motorola has made an advance in the battlefield, Kahn has also announced that Sony is marketing an IC or a combination of IC's that will decode all four stereo signals automatically, switching the proper one into service and lighting a stereo lamp. From what I understand, it would be possible to have four indicator lamps (if one wanted) to tell which system was in use. That would be great fun for people like us!

For the first time in a national (non electronic) magazine, I saw an ad for an AM Stereo car radio. In a January issue of *TIME*, there was a Chrysler ad mentioning optional AM Stereo/FM Stereo auto radios. So AM Stereo is slowly but continually advancing, one station at a time.

SCA List

Here are some SCA listings near Cincinnati using 67 kHz: 90.9, Radio Reading service; 98.5, Digital (Stocks); 105.1 and 105.9, Music; 107.7, Digital. These are from Steve Kramer. Anyone else have others? Send them along.

If the explanations on the loop antennas are not sufficient for you to follow, I will be glad to help answer you questions. Just enclose return postage. More detailed plans are $2.00 for each loop plus 50 cents for postage. That covers my photocopy costs. I also have some Commodore 64 computer programs used for the updates in the column and for logging. Send an SASE for more information.

Are you interested in swapping air checks? See last month's column and respond with an SASE. I'm still anxious to receive shack photos and photos of radio stations as well as coverage maps and QSLs. Respond to me at P.O. Box 5624, Baltimore, Maryland 21210. The mail has been good and I want to thank those who have written for the kind words about the column.

Station Updates

Call	Location	Freq	Pwr	Ant
AM				
new	Paintsville, KY	600	.5/0	0
new	Spencer, TN	760	1/0	0
WAIT	Chicago, IL	820	5/1	N
KHAM	Horseshoe Bend, AR	1000	1/0	0
new	Marion, TX	1000	1/0	D
new	Indian Head, MD	1030	50/0	D
new	Wake Forest, NC	1030	50/2.5	D£
new	Floyd, VA	1030	1/0	0
new	Washington, MO	1350	.5/0	D
WCHQ	Camuy, PR	1360	1/1	D
WTOB	Winston-Salem, NC	1380	5/2.5	N
FM				
KRSD	Sioux Falls, SD	88.1	1.26	183′
new	Rapid City, SD	88.5	.65	358′
new	Anchorage, AK	89.3	.1	644′
new	Ukiah, CA	89.5	.713	1142′
WJGF	Romney, WV	89.7	.109	N/C
new	Ft. Walton Bch, FL	91.1	.38	80′
new	Terre Haute, IN	91.3	.525	324′
new	Fairbanks, AK	91.5	.374	48′
new	Erwinville, LA	91.5	.38	122′
new	Angola, LA	91.7	.103	51′
new	Lorman, MS	91.7	3	300′
WCCV	Cartersville, GA	91.7	.91	537′
new	Gillette, WY	91.9	.51	413′
new	Albion, NE	92.7	3	65′
KZBQ-FM	Pocatello, ID	93.7	N/C	976′
KKLS-FM	Rapid City, SD	93.9	100	756′
new	Reliance, SD	94.5	35.4	900′
new	Benton, PA	95.9	3	300′
new	Soldotna, AK	96.5	100	258′
WNIZ-FM	Zion, IL	96.9	50	N/C
new	Sisseton, SD	99.3	1.2	496′
KQPD	Payette, ID	100.1	100	475′
WZPR	Meadville, PA	100.3	33.4	588′
KFPW-FM	Ft. Smith, AR	100.9	3	201′
WAVV	Marco, FL	101.1	N/C	1019′
KDSR	Williston, ND	101.1	N/C	800′
KDEX-FM	Dexter, MO	102.3	3	N/C
KXJX	Pella, IA	103.3	N/C	745′
WZYQ-FM	Braddock Hgts, MD	103.9	.42	N/C
KJJO	St. Louis Park, MN	104.1	97.6	1000′
new	Ouray, CO	104.9	3	−2563′
KYKX	Longview, TX	105.7	N/C	1005′
KCMA	Owasso, OK	106.1	N/C	1315′
WHOH	Cadiz, OH	106.3	2.57	328′
KRAB-FM	Seattle, WA	107.7	100	1288′
KWIC	Beaumont, TX	107.9	N/C	N/C

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. PC

Call Letter Changes

Old	New	Location
AM		
WCOV	WACV	Montgomery, AL
KZLA	KSKQ	Los Angeles, CA
WUSW	WDFL	Cross City, FL
WKTZ	WRXJ	Jacksonville, FL
KLEU	KQQI	Waterloo, IA
new	WYHV	Canton, NY
new	WEMR	Tunkhannock, PA
WNSY	WGH	Newport News, VA
KHQ	KLSN	Spokane, WA
KJZZ	KLSY	Bellevue, WA
FM		
new	KFKB	Mountain Home, AR
new	KNPY	Eureka Spgs, AR
WMFM	WYGC	Gainesville, FL
WKTZ-FM	WKTZ	Jacksonville, FL
new	WURC	Pittsford, MI
KMFL-FM	KMMO-FM	Marshall, MO
new	KVAD	Libby, MT
new	KTRD	Gardnerville, NV
KKBC	KWNZ	Carson City, NV
WDRE	WELV-FM	Ellenville, NY
WNSY-FM	WNSY	Newport News, VA
WJMA-FM	WVJZ	Orange, VA
KLSY	KLSY-FM	Bellevue, WA
new	WUQU	S. Charleston, WV

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

Selected English Language Press Transmissions

This month, per reader requests, we are presenting a selection of English language press transmissions. Times shown do not necessarily indicate continuous transmissions; they indicate the general time span during which English has been scheduled or monitored. Within this time frame there may be silent periods and/or transmissions in languages other than English. Frequencies above 14,000 kHz (14 MHz) are received best during daylight hours.

U.S. INFORMATION AGENCY
Shift/Speed: 425/75N

14638	kHz	WFK54	1515-2215 GMT
18542.5	kHz	WFK48	1515-2215 GMT
22782.2	kHz	WFN62	1515-2215 GMT
23770	kHz	WFG93	1700-2215 GMT

VOICE OF AMERICA (N. CAROLINA)
Shift/Speed: 425/100N

15752	kHz	KLW61	2300-0300 GMT
19915	kHz	KLW61	0800-1130 GMT
20060	kHz	KLW61	2300-0300 GMT
25705	kHz	KLW61	0800-1130 GMT

TASS (USSR)
Shift/speed: 425/67R

8140	kHz	RNN51	1715-2200 GMT
10270	kHz	RKA25	1615-2230 GMT
10465	kHz	RKA74	1715-2200 GMT
10790	kHz	RKA71	1715-2200 GMT
12085	kHz	RCB55	0600-2200 GMT
12250	kHz	RHA71	1645-1900 GMT
13410	kHz	RIF38	1615-2230 GMT
14470	kHz	REM54	1645-1900 GMT
14510	kHz	RIC75	1615-2230 GMT
14700	kHz	REB74	0500-2230 GMT
16150	kHz	RCE59	0600-1700 GMT
17510	kHz	RFD53	0500-1600 GMT
18125	kHz	RND70	1645-1900 GMT
18160	kHz	RTU47	0600-1700 GMT
18385	kHz	RRQ70	0500-1600 GMT
18835	kHz	RWN74	0600-1700 GMT
21840	kHz	RCT58	0600-1630 GMT
22782	kHz	RDD73	0500-1600 GMT
22791	kHz	RKB70	0600-1600 GMT
22890	kHz	RKB56	0600-1630 GMT

CENTRAL NEWS AGENCY (TAIWAN)
Shift/speed: 425/67R

7695	kHz	3MA26	0230-1430 GMT
13563	kHz	3MA22	0230-1430 GMT
16223	kHz	3MA35	0230-1430 GMT

XINHUA NEWS AGENCY (PRC)
Shift/Speed: 425/67R

7520	kHz	BZP57	0100-0300 GMT
9491	kHz	BZR69	0100-0300 GMT
11680	kHz	BZP51	1830-1930 GMT
12265	kHz	BZR62	1830-1930 GMT
14368	kHz	BZP54	1200-1645 GMT
14923	kHz	BAP54	0700-0845 GMT
16136	kHz	BZR66	1200-1645 GMT
16412	kHz	BAK46	2145-2300 GMT
17214.5	kHz	BZP58	0700-0845 GMT
18872	kHz	BZR68	0700-0845 GMT
19150	kHz	BAJ29	0300-0515 GMT
19850	kHz	BZC70	0530-0715 GMT

LONDON PRESS SERVICE
Shift/Speed: 425/67N

7446	kHz	GAY27B	2300-2330 GMT
14645	kHz	GIW34A	1900-2000 GMT

REUTERS (LONDON)
Shift/Speed: 350/67R

13625.5	kHz	GPP33	2000-0700 GMT
18335	kHz	GPE38	0700-2000 GMT
20386.6	kHz	GPN40	0700-2000 GMT

ISLAMIC REPUBLIC NEWS AGENCY (IRAN)
Speed/Shift: 425/67R

7800	kHz		1500-2030 GMT
7850	kHz		1900-2030 GMT
7960	kHz		1500-2030 GMT
19200	kHz		1000-1100 GMT
19980	kHz	EPJ2	0900-1100 GMT

PRENSA LATINA (CUBA)
Shift/Speed: 425/67R

9312	kHz		0400- GMT
9362	kHz	CLN261	0300-0500 GMT
12280	kHz	CLN369	0800-0930 GMT
16280	kHz		0900-1000 GMT

IRAQUI NEWS AGENCY
Shift/Speed: 250/67R

13524	kHz	YIO71	1400-1700 GMT
14699	kHz	YIX70	1500-1800 GMT

REUTERS (LEBANON)
Shift/Speed: 425/67

17375	kHz	ODP37	1745-1900 GMT

ANSA (ITALY)
Shift/Speed: 425/67N

12108	kHz	IRJ21	0800-1000 GMT
12293	kHz	IRJ22	1730-1830 GMT
14630	kHz	ISX46	1900-2000 GMT

JAMAHIRIYAH NEWS AGENCY (LIBYA)
Shift/Speed: 425/67R

12186	kHz		1400-2200 GMT
20560	kHz		1615-1715 GMT

AGENCE FRANCE PRESSE (FRANCE)
Shift/Speed: 425/67N

10184	kHz	FPK8	0300-0430 GMT
10616	kHz	FTK61	0330-0430 GMT
10942	kHz	FTK94A	0100-0530 GMT
17544	kHz	FTR54	1445-1645 GMT
18670	kHz	FTS67	1130-1900 GMT

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

No "Immediate Danger" To Public From RF Radiation

In May of 1984, the U.S. Environmental Protection Agency and the Federal Communications Commission conducted an environmental measurement survey of radio frequency (RF) radiation levels near broadcast transmitters in Honolulu. This survery was carried out in response to concerns expressed to the FCC over the possibility that RF radiation in some publicly accessible locations in Honolulu might be exceeding safe levels for human exposure.

The Commission said it was pleased to announce that the results of the study have shown that radio and TV signals in Honolulu do not pose an immediate danger to the public. However, it recognized that, in a small number of cases, measured signal levels do exceed exposure guidelines. The FCC pointed out that it will be working with broadcasters and local authorities either to reduce the electromagnetic radiation levels in areas of concern, or restrict public access to those areas.

Honolulu is unique in that local conditions have led to a higher concentration of broadcast transmitters in densely populated areas than is seen in other cities. The Commission noted that antenna placement is becoming more and more difficult due to new buildings crowding existing sites, and the scarcity of vacant sites. Consequently, any plans or proposals developed by the FCC likely will be highly individualized and will require a great deal of cooperation by all parties concerned.

Selection Process For 2.5 GHz OFS Licenses

In response to the *Memorandum Opinion and Order* released June 23, 1983 in Docket No. 19671, 48 Fed. Reg. 32,578 (July 18, 1983), the Commission has received approximately 2,100 applications proposing to operate private distribution systems on the three Operational-Fixed Service (OFS) H-group channels in the 2.5-2.69 GHz band. Most of the applications submitted are mutually exclusive with one or more other applications.

Based upon our initial analysis of the applications and the proposed uses, we conclude that there are no substantial material differences in the applications which necessitate comparative hearings. Licensees therefore will be selected by lottery. See Second Report and Order in Gen. Docket No. 81-768, 93 FCC 2d 952, 988-89 (1983). The use of lotteries to resolve these mutually exclusive applications, all of which propose the commercial distribution of data at 2.5 GHz, will significantly benefit the public interest by assuring expedited delivery of the proposed services to potential users. The lotteries will be conducted pursuant to the authority contained in Section 1.972 of the Commission's Rules and Regulations.

To facilitate the conduct of the lotteries, the Private Radio Bureau will apply the following procedures:

1. Applicants will be considered only for the specific H-group channel identified on each application. Only one H-group channel will be authorized to a single applicant in any particular geographic area.

2. After each application in a mutually exclusive area has been rank-ordered using the random selection process, the Commission will examine each application in detail to determine which applications may be granted. This examination will include an analysis of whether the application was timely filed against all other competing co-channel applications, the proximity of the proposed station to previously authorized stations, any other issues which may have been raised in petitions to deny, and a consideration of the technical merits and completeness of the application. For purposes of determining mutual exclusivity and applying the filing periods specified in Section 1.227(b)(4) of the Rules, any application proposing a transmitter site which is less than 50 miles from a co-channel transmitter site specified by another applicant will be considered to be mutually exclusive with that other application. Similarly, any application proposing a transmitter site which is less than 50 miles from a previously authorized transmitter on the same channel will not be granted. Applicants may submit a detailed engineering analysis to demonstrate that an exception to the 50-mile standard would be warranted in situations with unique terrain conditions or peculiar propagation characteristics. Applicants who request an exception to the 50-mile standard must indicate their willingness to accept interference from all licensees whose grants are based on a separation of 50 miles between transmitters. Licenses issued to applicants for operation at less than 50 miles from other licensees will be conducted to indicate that they are on a secondary basis to previously authorized OFS stations.

3. Using the criteria specified above, the Commission will issue licenses for the H-group channels beginning with the first grantable application assigned the highest priority in the lottery and proceeding sequentially according to the rankings determined by the lottery and the analysis of the data before us.

A subsequent public notice will announce the date on which the lotteries will be conducted and additional procedural matters.

The Commission will be receptive to settlement agreements among competing applicants. All applicants are encouraged to consider any settlement proposals which may be proffered. Only settlement agreements which eliminate mutual exclusivity for an entire area will be considered. Partial settlements will not be considered by the Commission. All settlement agreements are subject to final approval by the Commission.

Taxi Drivers Fined For Having Citizen Band Radios With Illegal Amplifiers

The Federal Aviation Administration (FAA) complained to the Commission that taxi drivers serving Washington National Airport were causing interference to aircraft communications. The interference occurred when taxis near the airport illegally used linear amplifiers with their CB radios. The FCC recently inspected the radio equipment of all taxis coming through Washington National Airport. Several taxis were found to have amplifiers illegally attached to their CB radios. Each of the following were issued a forfeiture of $300 for their illegal installations: Capital Cab Company, American Cab Company, Autorama Cab Company.

The FCC considers this interference problem, which has raised safety-of-life concerns, a high priority matter. The Commission will continue to conduct taxi inspections at Washington National Airport.

Working Paper On International Telecommunications Released By OPP

The Office of Plans and Policy of the Federal Communications Commission today released Working Paper #13, "Promoting Competition Piecemeal in International Telecommunications," by Evan Kwerel. The paper discusses the need to consider the impact of growth in competition in international telecommunications on the U.S. relationship with foreign telecommunications authorities. Increased competition among U.S. suppliers of international telecommunications services could result in a reduction in the U.S. share of the benefits from such services unless the U.S. government takes appropriate action. The paper recommends promoting competition among U.S. firms while simultaneously strengthening the FCC's power to counter the resulting increase in market power accruing to foreign telecommunications authorities.

Foreign governments generally delegate the responsibility for the provision of all telecommunications and postal services to a single government agency or public corpora-

tion. These public sector agencies are referred to as administrations of posts, telegraph, and telephones (PTTs). All countries exercise control over international access by requiring an operating agreement of any carrier wishing to establish a communications link from abroad. Operating agreements specify the type of service to be provided and the terms for sharing revenues with the PTT.

The paper develops a theoretical model of piecemeal competition under the assumption that the FCC permits free entry into the U.S. segment of international telecommunications but plays no role in establishing the terms of the operating agreements U.S. firms negotiate with foreign PTTs. In this theoretical model, promoting competition among U.S. suppliers of international telecommunications may do nothing more than shift profits abroad. Competition for a component of an international telecommunications service will tend to drive the price of *that component* down to cost. But the price of the *total* service may remain the same if some other essential component of the service is controlled by a monopolist. The PTTs have a monopoly on access and may be willing to exercise their market power in order to provide revenues to subsidize telephone and postal rates.

Five qualifications to this theoretical conclusion are considered. The essence of the first three qualifications is that competition may increase economic efficiency. With a "bigger pie," the U.S. may gain even if its share of the pie shrinks. But it is also quite possible that competition may so reduce the U.S. share of the pie that the U.S. ends up with a smaller piece. The fourth qualifications concerns the behavior of PTTs. The fifth qualification takes into account the FCC "uniform settlement rates policy," which was designed to prevent a PTT from playing competing U.S. carriers against one another. The paper argues that this policy, as it exists, may reduce but cannot eliminate the PTTs' ability to exercise their market power.

Several policy options are examined. The most promising would be to promote competition among U.S. firms but strenghten the FCC's oversight of the terms of international operating agreements. This option would allow the U.S. consumer to benefit from lower markups over cost and greater product diversity while preventing foreign PTTs from "whipsawing" U.S. firms into accepting unfavorable terms of trade.

The Working Paper does not necessarily represent the views of the Federal Communications Commission. The Working Paper is available for purchase from International Transcription Service, FCC, 1919 M Street, N.W., Washington, D.C.

800 MHz Frequencies Along The U.S./Mexico Border

The United States Government and the Government of the United Mexican States have modified the provisions of the June 18, 1982 Agreement dealing with land mobile service in the bands 470-512 MHz and

Table 1

Bands from 806 to 821 and 851 to 866 MHz

A. Specific sub-bands reserved for each country:

For Mexico

Mobile	**Paired With**	**Base**
806.000 MHz to 811.000 MHz		851.000 MHz to 856.000 MHz

For the United States

Mobile	**Paired With**	**Base**
811.000 MHz to 816.000 MHz		856.000 MHz to 861.000 MHz

B. In the bands from 816.000 to 821.000 MHz and from 861.000 to 866.000 MHz the specific frequency allotments are the following:

For Mexico

Block 1

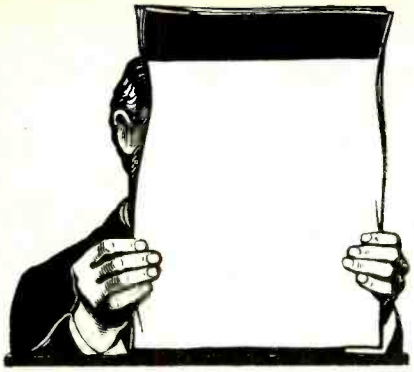
Channel	1	41	81	121	161
Mobile	820.975	819.975	818.975	817.975	816.975
Base	865.975	864.975	863.975	862.975	861.975
Channel	21	61	101	141	181
Mobile	820.475	819.475	818.475	817.475	816.475
Base	865.475	864.475	863.475	862.475	861.475
Channel	11	51	91	131	171
Mobile	820.725	819.725	818.725	817.725	816.725
Base	865.725	864.725	863.725	862.725	861.725
Channel	31	71	111	151	191
Mobile	820.225	819.225	818.225	817.225	816.225
Base	865.225	864.225	863.225	862.225	861.225

Block 3

Channel	3	43	83	123	163
Mobile	820.925	819.925	818.925	817.925	816.925
Base	865.925	864.925	863.925	862.925	861.925
Channel	23	63	103	143	183
Mobile	820.425	819.425	818.425	817.425	816.425
Base	865.425	864.425	863.425	862.425	861.425
Channel	13	53	93	133	173
Mobile	820.675	819.675	818.675	817.675	816.675
Base	865.675	864.675	863.675	862.675	861.675
Channel	33	73	113	153	193
Mobile	820.175	819.175	818.175	817.175	816.175
Base	865.175	864.175	863.175	862.175	861.175

Block 5

Channel	5	45	85	125	165
Mobile	820.875	819.875	818.875	817.875	816.875
Base	865.875	864.875	863.875	862.875	861.875
Channel	25	65	105	145	185
Mobile	820.375	819.375	818.375	817.375	816.375
Base	865.375	864.375	863.375	862.375	861.375
Channel	15	55	95	135	175
Mobile	820.625	819.625	818.625	817.625	816.625
Base	865.625	864.625	863.625	862.625	861.625
Channel	35	75	115	155	195
Mobile	820.125	819.125	818.125	817.125	816.125
Base	865.125	864.125	863.125	862.125	861.125



The Clandestine Confidential Newsletter

A new publication devoted to clandestine stations and programs, *The Clandestine Confidential Newsletter* is designed to keep you up to date on this intriguing aspect of shortwave listening and DXing.

C-C-N will be published six times a year, beginning with the February, 1984 issue. It will contain the latest frequency and schedule information, monitoring data, background information, addresses, and features on new and old stations.

C-C-N will serve as a continuing updater to the new book *Clandestine Confidential,* being published by Universal Electronics.

Subscriptions to *C-C-N* are $10.00 per year in North America, $13.00 overseas, payable in cash, check or money order.

Also available: *List of Clandestines By Time* and *List of Clandestines By Frequency* for $3.95 each.

To subscribe, send your remittance to:

C-C-N,
Gerry L. Dexter,
RR4 Box 110,
Lake Geneva, WI 53147, U.S.A.

Block 7

Channel	7	47	87	127	167
Mobile	820.825	819.825	818.825	817.825	816.825
Base	865.825	864.825	863.825	862.825	861.825
Channel	27	67	107	147	187
Mobile	820.325	819.325	818.325	817.325	816.325
Base	865.325	864.325	863.325	862.325	861.325
Channel	17	57	97	137	177
Mobile	820.575	819.575	818.575	817.575	816.575
Base	865.575	864.575	863.575	862.575	861.575
Channel	37	77	117	157	197
Mobile	820.075	819.075	818.075	817.075	816.075
Base	865.075	864.075	863.075	862.075	861.075

Block 9

Channel	9	49	89	129	169
Mobile	820.775	819.775	818.775	817.775	816.775
Base	865.775	864.775	863.775	862.775	861.775
Channel	29	69	109	149	189
Mobile	820.275	819.275	818.275	817.275	816.275
Base	865.275	864.275	863.275	862.275	861.275
Channel	19	59	99	139	179
Mobile	820.525	819.525	818.525	817.525	816.525
Base	865.525	864.525	863.525	862.525	861.525
Channel	39	79	119	159	199
Mobile	820.025	819.025	818.025	817.025	816.025
Base	865.025	864.025	863.025	862.025	861.025

For the United States
Block 2

Channel	2	42	82	122	162
Mobile	820.950	819.950	818.950	817.950	816.950
Base	865.950	864.950	863.950	862.950	861.950
Channel	22	62	102	142	182
Mobile	820.450	819.450	818.450	817.450	816.450
Base	865.450	864.450	863.450	862.450	861.450
Channel	12	52	92	132	172
Mobile	820.700	819.700	818.700	817.700	816.700
Base	865.700	864.700	863.700	862.700	861.700
Channel	32	72	112	152	192
Mobile	820.200	819.200	818.200	817.200	816.200
Base	865.200	864.200	863.200	862.200	861.200

Block 4

Channel	4	44	84	124	164
Mobile	820.900	819.900	818.900	817.900	816.900
Base	865.900	864.900	863.900	862.900	861.900
Channel	24	64	104	144	184
Mobile	820.400	819.400	818.400	817.400	816.400
Base	865.400	864.400	863.400	862.400	861.400
Channel	14	54	94	134	174
Mobile	820.650	819.650	818.650	817.650	816.650
Base	865.650	864.650	863.650	862.650	861.650
Channel	34	74	114	154	194
Mobile	820.150	819.150	818.150	817.150	816.150
Base	865.150	864.150	863.150	862.150	861.150

Block 6

Channel	6	46	86	126	166
Mobile	820.850	819.850	818.850	817.850	816.850
Base	865.850	864.850	863.850	862.850	861.850
Channel	26	66	106	146	186
Mobile	820.350	819.350	818.350	817.350	816.350
Base	865.350	864.350	863.350	862.350	861.350

Channel	16	56	96	136	176
Mobile	820.600	819.600	818.600	817.600	816.600
Base	865.600	864.600	863.600	862.600	861.600
Channel	36	76	116	156	196
Mobile	820.100	819.100	818.100	817.100	816.100
Base	865.100	864.100	863.100	862.100	861.100

Block 8

Channel	8	48	88	128	168
Mobile	820.800	819.800	818.800	817.800	816.800
Base	865.800	864.800	863.800	862.800	861.800
Channel	28	68	108	148	188
Mobile	820.300	819.300	818.300	817.300	816.300
Base	865.300	864.300	863.300	862.300	861.300
Channel	18	58	98	138	178
Mobile	820.550	819.550	818.550	817.550	816.550
Base	865.550	864.550	863.550	862.550	861.550
Channel	38	78	118	158	198
Mobile	820.050	819.050	818.050	817.050	816.050
Base	865.050	864.050	863.050	862.050	861.050

Block 10

Channel	10	50	90	130	170
Mobile	820.750	819.750	818.750	817.750	816.750
Base	865.750	864.750	863.750	862.750	861.750
Channel	30	70	110	150	190
Mobile	820.250	819.250	818.250	817.250	816.250
Base	865.250	864.250	863.250	862.250	861.250
Channel	20	60	100	140	180
Mobile	820.500	819.500	818.500	817.500	816.500
Base	865.500	864.500	863.500	862.500	861.500
Channel	40	80	120	160	200
Mobile	820.000	819.000	818.000	817.000	816.000
Base	865.000	864.000	863.000	862.000	861.000

806-890 MHz along their common border. Final details are subject to an exchange of notes between the two governments.

More specifically, with regard to the bands 816-821/861-866 MHz, which are shared equally by both countries, pursuant to the provisions of Section B (2) (b) of the Agreement, it has been agreed to shift down by 12.5 kHz the frequencies available to each country.

The specific changes are set out in Table 1. The effect of this change is to make 100 more channels available for private land mobile use in the common border regions. The Commission will issue licenses for a portion of these additional channels to the pending applicants that will be considered in the California lottery to be held as a result of the numerous applications filed during the open-window of November-December 1982.

FCC Establishes Office Of Congressional And Public Affairs

The FCC approved the consolidation of the Office of Public Affairs, the legislative affairs functions of the Office of General Counsel and the congressional correspondence functions of the Office of the Chairman into the Office of Congressional and Public Affairs, effective December 10, 1984. With the reorganization, William A. Russell, Jr., Director, Office of Public Affairs, becomes the Director, Office of Congressional and Public Affairs. Additionally, Jackson F. Lee, Director of Legislative Affairs in the Office of General Counsel moves over to the Office of Congressional and Public Affairs to become Chief of the Legislative Affairs Division.

The reorganization creates an integrated organizational structure for communicating the Commission's policies regarding telecommunications to the Congress, the news media, and the public, by combining these similar activities into a single bureau level entity. The FCC said this reorganization recognizes, by elevating the Congressional affairs function to the bureau level, the importance of policy coordination between the Commission and Congress.

The Office of Congressional and Public Affairs will be responsible for the Commission's news media, consumer assistance and small business, minority enterprise, and legislative affairs programs. The purpose of these programs is to inform the public of the Commission's regulatory requirements, to facilitate public participation in the FCC's decision making processes, to apprise the public of FCC policies promoting minority participation in telecommunications, and to implement the Commission's legislative programs in the telecommunications industry

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

This month we thought we'd wrap up a few loose ends and discuss some recent regulatory matters affecting what you may be listening to.

One of the biggest matters handled by the Federal Communications Commission was the allocation of the remaining 41 MegaHertz of spectrum in the 800 and 900 MHz bands. If everything is implemented as planned, land mobile will receive 12 MHz of space from 896 to 902 MHz and 935 to 941 MHz, of which public safety users will get 30 percent of the available frequencies, specialized mobile radio (trunked) users will get 30 percent, business band users will get 20 percent and industrial and land transportation users will get 20 percent. Channel spacing of 12.5 kHz is being proposed for this new band; current spacing on 800 MHz frequencies is 25 kHz.

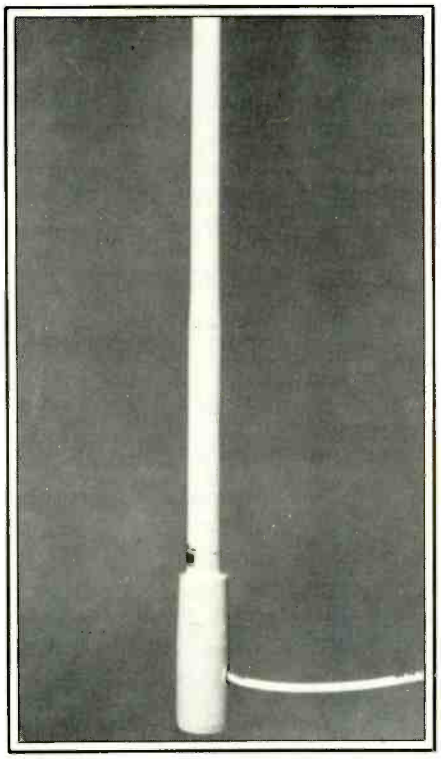
In addition, cellular mobile telephone service will get 12 more MegaHertz, a land mobile satellite service will get 8 MHz, government and non-government agencies will get 6 MHz for fixed services, and broadcast stations will get 3 MHz for studio-to-transmitter links and relays.

The biggest splash to come out of the FCC when it carved up the reserve spectrum was that there was nothing left for Airfone, a service that started in October, offering telephone service from commercial airliners in flight. The service, which operates on single sideband (rather than FM) in the 900 MHz band, allowed passengers on board airplanes to make credit-card calls anywhere in the U.S. for $7.50 for the first three minutes and $1.25 for each additional minute.

In its decision, the FCC said it would not allocate separate frequencies for air-to-ground telephone service because it is "a luxury or convenience rather than a necessity." At the same time, the FCC also rejected allocating spectrum for Railfone, which would provide mobile telephone service from trains on Airfone's frequencies. In the interim, the FCC Office of Science and Technology granted Airfone a one-year extension of its developmental license to operate on the 900 MHz band until December 1. The office also suggested to Airfone that it might obtain permanent operating authority sharing frequencies with private services, cellular services, or unused two-way aeronautical channels assigned to the Federal Aviation Administration.

Because Airfone has spent more than $20 million just to get its service started up, it plans to file petitions for its own spectrum.

In any event, readers such as Alan Wawrzyniak of Elmhurst, Illinois, have written in requesting information on the frequencies



Although marine mobile telephone service is available on the VHF marine band, more and more cellular telephone users are installing the 800 MHz phones on their boats. Thus, Antenna Specialists has produced this 8-foot tall cellular telephone fiberglass antenna for marine use.

currently being used by Airfone. The following is a list of transmitter sites. A total of 32 channels are assigned to each transmitter site. Each channel is 6 kHz higher than the preceding channel, except for the last channel assigned to each site, which is 10 kHz higher than its preceding channel. This list shows the transmitter sites and only the initial channel of the 32 at each site:

Abajo Peak, Utah, 945.204; Albuquerque, New Mexico, 945.804; Atlanta, Georgia, 945.404; Austin, Texas, 944.204; Boston, Massachusetts, 945.204; Bridgeton, Missouri, 944.604; Burlingame, California, 945.204; Charleston, South Carolina, 944.604; Charleston, West Virginia, 944.204; Chicago, Illinois, 945.804; Delta, Utah, 944.204; Denver, Colorado, 944.604; Des Moines, Iowa, 944.204; Fort Wayne, Indiana, 945.204; Grand Island, Nebraska, 944.404; Hawthorne, Nevada, 945.604; Houston, Texas, 945.404; Irving, Texas, 944.804; Jamaica, New York 945.204; Klamath Falls, Oregon, 945.884.

Also, Las Vegas, Nevada, 945.404; Los Angeles, California, 944.604; Meridian, Mississippi, 945.604; Miami, Florida, 944.404; Monahans, Texas, 945.004; Nashville, Tennessee, 944.404; New Orleans, Louisiana, 945.004; Orlando, Florida, 945.004; Phoenix, Arizona, 944.804; Pittsburgh, Pennsylvania, 944.804; Seattle, Washington, 944.604; Shreveport, Louisiana, 945.804; Springfield, Missouri, 945.404; Tallahassee, Florida, 944.804; Washington, D.C., 944.604; Wilmington, North Carolina, 945.204; Woodward, Oklahoma, 945.604; U.S. nationwide channel, 899.000.

Because calls cannot be handed off from one side to another as in cellular mobile phones, calls can last no longer than 45 minutes on an average basis.

In other matters, the FCC has reallocated TV Channels 15 and 16 (476-482 and 482-488 MHz) for use by stations in the off-shore radio service along the coasts of Texas and Louisiana. The FCC said it took the action because of the growing need for radio communications by petrochemical companies operating off the coast. Common carriers will receive 4 MHz of each 6 MHz channel, while private land mobile services will be allocated 2 MHz in each channel.

One petition for rulemaking before the FCC that bears watching is that by the Land Mobile Communications Council to expand frequency sharing policies between broadcasters and land mobile users. Currently, UHF TV Channels 14 through 20 are used on a shared basis in the nation's 13 largest cities. The council wants the FCC to expand the privilege to 21 urban areas identified in a special FCC report on land mobile frequency demands to the year 2000. In addition, the communications council wants to open all frequencies from TV Channel 14 through Channel 69 (470-806 MHz) to land mobile service. In its petition, the council claims the band is underutilized by broadcasters and the fact that the frequencies are adjacent to others used by land mobile users at present.

Miscellany

Robert W. Kozlarek, WA2SQQ, of Elmwood Park, New Jersey, writes in to say how he cured his Regency MX5000 of microprocessor noise he had encountered. Apparently, the problem lies in the grounding of the scanner. He said he removed each board from the radio and soldered a ground strap to each board and tied them to ground. In addition, he installed star washers under each mounting screw. He also sprayed the inside surfaces of the radio's plastic case with EMI shielding spray, which is made by Miller Stephenson of Connecticut. He said this

trick eliminated the noise generated by the MX5000's on-board clock.

If you live in the area of Chattanooga, Tennessee, a list of more than 200 active frequencies is available. The list, which covers the area between Knoxville and Marietta, is sorted by frequency and by station and is available for $3 plus an SASE to: Jim Whitehead, 4437 Comet Trail, Hixson, Tennessee 37343.

One of the better scanner clubs to come along, and one which is getting even better, is the All Ohio Scanner Club. Its president, Dave Marshall, tells me the club's coverage area for its monthly newsletter is expanding to include the states of Indiana, Kentucky, Michigan, Pennsylvania, Tennessee, West Virginia, and the province of Ontario in Canada. The club welcomes members from anywhere; however, they now will have something to offer to those in states surrounding Ohio. Their monthly newsletter discusses frequencies and radio systems throughout their coverage area and includes columns on technical matters, scanning out-of-band frequencies, new products and books, beginners' questions and listening to utility communications below 30 MHz. The club was founded by Jerry Callam in December 1979 and has probably close to 200 members by now. If you live in Ohio or one of its surrounding states, we certainly advise you to join AOSC. Dues are $15 a year with renewals at $12. A sample of the club's newsletter, which runs about 32 pages, can be obtained for $1 plus a 22-cent stamp ($1.25 in Canada, no stamp) by writing to: All Ohio Scanner Club, 1043 Princewood Avenue, Dayton, Ohio 45429. An information flier can also be obtained for a loose 22-cent stamp (25 cents in coin for Canada).

We like to hear from our readers here at *POP'COMM*. Send along any questions, comments, frequencies, lists, or photographs you have to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, New York 11801-2909. PC

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

The Cubans are at it again, with another 60-meter channel now taken over by broadcasts from Havana. This time it's a Cuban medium wave outlet, Radio Rebelde, now occupying 5.025, 24 hours per day. Nolan Olson in Idaho Falls, Idaho reports them at fair strength. Here in the Listening Post the station is being received at very good levels during evenings and early mornings. Radio Rebelde was on shortwave before Castro's revolution, but didn't last long on the higher frequencies after the take-over.

Shortwave from Grenada, which went off the air before the U.S. intervention, may eventually return, according to an article in the North American Shortwave Association's bulletin *Frendx*. According to Sam Alcorn, who visited the island and spoke with station officials there, Radio Grenada still has access to a shortwave transmitter and plans to put it to use "eventually." We'll leave it to you to interpret just what "eventually" may mean in terms of months or years. Meantime, Radio Grenada's 535 kHz medium wave outlet is reported after 2100 by Harold Eisley in St. Mary's City, Maryland.

Another Caribbean island that has been off shortwave, this one absent for decades, is Trinidad. Don't hold your breath but we understand that shortwave broadcasting is at least being discussed in Port of Spain, but there's nothing yet even on paper. Maybe someday.

Kol VOA? The Voice of America has been discussing the possibility of setting up a relay station in Israel with the view of putting stronger signals into the Soviet Union and Afghanistan. According to press reports Israeli officials are not wild about the idea, but American officials are pressing the matter. Any such facility would probably be shared with Radio Liberty, the U.S.-funded station which broadcasts to Russia exclusively. Meantime, the VOA has signed agreements with five other countries covering relay facilities. Those existing sites in Morocco and Sri Lanka will be modernized, a new shortwave relay will go up in Thailand, and medium wave outlets will go on from Costa Rica and Belize. Several additional sites are still in the negotiating stages.

Budget balancers in Canada took a long hard look at Radio Canada International recently and for a time it looked ominous. There were even calls for the total demise of RCI. We're really happy to say that the cuts ended up being fairly small and most of the savings will come out of the transcription service. *Whew!*

The answer is at the end of the rainbow. A couple of months ago we had a question about "Radio Rainbow" and were unable to answer it, even though it did tickle something back there in the memory circuits. Ace DXer Steve Reinstein in Florida as well as readers Edouard Provencher in Maine and Charlene Vickers in Alberta point out that Radio Rainbow is the title of the BBC's English language lesson program in Spanish. The 6.937 frequency in question (actually 6.938) is a 30 kilowatt feeder station in Daventry. Thanks to the three readers who supplied the answer.

Larry Beaty II of Tennessee operates this listening post.

Dave Carlson in San Diego, California has a computer-equipped shack.

Bangladesh has always been a little tricky to tune, but things may have improved now that the station has its new 250 kilowatt transmitter on the air. Check for their English half hour at 1230-1300 on 17.665.

The SPEEDX Club has announced plans for an expansion of their bulletin, increasing its size during the prime DXing months, and adding some new features and columns as well. You can contact the club at 7738 E. Hampton Street, Tucson, Arizona 85715. Enclose a dollar or two to help defray costs of sending you a sample bulletin.

Frank Orcutt of Buffalo, New York owns this nice QSL from the West German regional, Sudwestfunk.

In The Mailbag

Time for "Letterbox" as they say on some stations. Here's this month's reader mail.

Paul Nelson of Lubbock, Texas needs the address of Radio France International. Okay. It's B.P. 9516, 75762 Paris, Cedex 16, France.

A couple of Tennessee listeners are interested in getting a statewide club going. If you live in Tennessee and are interested, write to Larry Beaty II, P.O. Box 479, Jamestown, Tennessee 38556.

Here comes Alan J. Nacht's New York City longwire again. Alan defines the term as "as much wire antenna which can fit in a confined area." In Alan's case it goes out of his window to the roof of the apartment building 9 stories higher up and then travels around the perimeter of the roof. Alan uses 16 gauge insulated zipcord speaker wire and has an antenna tuner to add oomph to the signal.

Charlotte Brooks of Auburn, California sends in a copy of an old article called "DX With the Boinger" by old friend Ralph W. Perry. He solved his apartment antenna problem by anchoring one end of a "Slinky" toy inside a tin can, attaching a weighted fishing line to one end, then using a fishing reel to raise and lower the antenna as needed. When raised, the antenna fit neatly inside the can where it was never spotted by the apartment house manager. Actual construction is a bit more complicated than outlined here, so if you want full details, try and look up the original article. Check the 1979 issue of the old *Communications World*.

Bruce I. DeShazo, who sends us a photo of his new-look shack this month, would like

Bruce DeShazo and his Memphis, Tennessee shack.

Here's Ron Wildauer of Elyria, Ohio with copy of POP'COMM at the ready.

to tapespond or correspond with other DXers and SWLs in the U.S. Write him at 1710 Whitman Road, Memphis, Tennessee.

Ray Thombs, Jr. of Bath, Maine wants information about the hobby and, in particular, about local clubs. Tall order! For clubs, check the *DXers Directory*, published by Universal Shortwave Radio, for a list of national and local clubs.

Stereo shortwave? Marc Giard of Roberval, Quebec wonders about that in connection with our mention of NDXE and its plans back in December. Like the process on the AM band, you should be able to hear stereo on shortwave with no additional tuning techniques required. A stereo shortwave receiver isn't required. Marc also wonders about those NDXE call letters. At this writing, the call letters haven't officially been assigned, but they've been requested. "N" is a prefix assigned to the United States but it hasn't been used in conjunction with broadcasting stations—yet!

Ron Wildauer of Elyria, Ohio sends a shack photo and says he hopes to fill one wall with QSLs by the end of 1985! Ron got started briefly in 1963 and is now back at the dials in earnest.

Bob Ziajka of Philadelphia gets us back to antenna talk with a note saying that anyone who needs an antenna switching device can use any "video selector" switch. They cost around $6 for a 3-position switch and Bob notes there's no loss of signal.

Got an instruction manual for a Knight R-55A receiver? If so, Nick Kanka would like to hear from you at 36695 Ridge Avenue, Ingleside, Illinois.

Anthony Pitale of Thorofare, New Jersey wants to know if he can receive utility stations on his Sony ICF 6500W. Sure. But full coverage receivers with better facilities for tuning single sideband will bring in more stations. As for clubs, send 25 cents and a business size SASE to ANARC Club List, 1500 Bunbury Drive, Whittier, CA 90601.

Larry Fravel of Clarksburg, West Virginia says he sent a letter to Radiodiffusion Television Tchadienne, putting the country name on the envelope as "Tchad." The USPS then returned the letter to him with the notation that the country name had to be shown in English. Yup, that's the rule. You can use the foreign spelling if you wish but the English version has to be included as well.

Michael Goetsch of Berea, Ohio wants a tip on how to log Angola. If you'll settle for Portuguese, Mike, the easiest is late afternoon and evenings for Radio Nacional in Luanda on 5.334, slightly variable. It's been a regular there for several months now.

Remember that we're looking to hear from you, too. Your loggings, questions, comments, copies of QSLs, shack photos, station schedules, news clippings about shortwave are always welcome!

Listening Reports

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

Albania Gjirokaster home service on 5.057 at 0630 with Albanian folk music. Also on parallel 5.020. Beats Radio Tirana in programming. (Goetsch, OH)

Radio Tirana, 7.300 with IS at 0328, ID in English, news on Socialist Party of Albania, etc. (Goetsch, OH)

Algeria Radio Algiers, 17.745 at 2018 in English with ID, U.S. pop, address. (Gray, MI) 9.640 at 2019 with music program, man announcer, ID in English with frequencies, times, address. Into Spanish at 2030. (Goetsch, OH)

Antigua BBC Caribbean Relay on 9.510 at 0436 with opera, ID for London at 0444. (Goetsch, OH)

Argentina Radio Rividavia (SSB feeder, Editor) heard on 9.115 at 2255 with soccer game in Spanish. (Fleming, MD)

RAE on 15.345 in English to North America and Europe at 0202. (Nacht, NY) 0200 in English with news, music. (Provencher, ME)

Ascension Island BBC on 9.580 in Hausa at 1915. (Gray, MI)

Australia Radio Australia, 15.250 at 1500 to Oceana and Papua New Guinea. (Brooks, CA) 6.035 at 2049 music and news. (Lukas, NY) 11.910 at 0602 talk on arms control. (Gray, MI) 9.580 at 1545 with "Jazz Australia." (Nelson, TX) 1500 with news and music. (Provencher, ME) 1437 with interview. (Hamilton, NC) 15.160 at 0507 with news. (Shute, FL)

Austria Austrian Radio on 6.000 in English at 0330. (Lukas, NY) 9.540 at 2100, poor, in English. Beamed to where? (Provencher, ME) English would be to Europe and N. Africa but this frequency listed for Spanish to South America. (Editor) 5.945 at 0336 with news, "Austria and the U.N." (Hamilton, NC) 0329 with IS, ID, program preview, news. (Goetsch, OH)

Bangladesh Radio Bangladesh, 7.105 at 1315 sign on to 1345 sign off in Nepali. Interval signal, exotic music, ID. (Hickerson, AR)

Belgium BRT on 5.910 at 0033 with how Brussels Calling and the BRT have progressed, how to join listener's club. Not good for a North American service. (Goetsch, OH) 0300 with DX program on a GMT Monday. (Lukas, NY) 0040-0115 sign off, requested two reports per month in order to join their International Listener's Club. QSL cards to club members only. (Dementiuk, SC) 17.610 at 1430 with mailbag program in English. (Provencher, ME)

Botswana Radio Botswana, 4.820 and 7.255 with barnyard interval signal at 0350. 4.820 under HRVC. (Shute, FL) 7.255, 0359 with ID, anthem, frequencies given in English, Afro chanting. Ham QRM. (Gray, MI)

Brazil Radio Globo, 11.805 at 2317 in Portuguese with news and music. (Fleming, MD) 0900 in Portuguese. (Knisely, NY) 0030. (Westphal, NY)

Radio Nacional Amazonia, 11.780 with Latin music at 1800. (Nacht, NY) 2115. (Provencher, ME)

RSA – English Service *(Left to right) Front row: Sandra Pretorius, Virginia Haas, June Palmer, Kathy Fitch. Back row: David Hall-Green, Koos Redebe, Colin Houston, Kelly Ngwira, Archie Bhengu, Colin Jackson, Henry Hlophe, Peter Finn, Clive Ravenscroft, Wallace Baird, Henry Vaughan, and Bernhard Leemann.*

Radio Nacional/Radiobras 17.755 in English at 1949. (Lukas, NY)

Radio Guaiba, Porto Alegre, in Portuguese at 2258 on 5.956. (Lukas, NY)

Radio Inconfidencia, Belo Horizonte, 3225 on 6.000 in Portuguese. (Lukas, NY)

Radio Universo, Curitiba, good on 9.545 at 0837 in Portuguese. Fair on 11.905 at 1030. (Knisely, NY) 11.905 at 0048 in Portuguese. (Paszkiewicz, WI)

Radio Nacional Sao Gabriel, 3.375 in Portuguese at 1012. (Knisely, NY)

Bulgaria Radio Sofia, 7.115 with IS, ID at 0400 into English but QRM'd about five minutes later. (Goetsch, OH) On approximately 11.665 at 1947 in English. Into non-English at 2000. (Nelson, TX) Heard on 7.115 at 2130 with sign on, program schedule, news in English. (Fravel, WV)

Burma Burma Broadcasting Service, Rangoon, caught on 4.725.5 with orchestral music at 0040, ID 0100. (Nacht, NY)

Cameroon Radio Douala, 4.795 at 2240 in French with man announcer and music. (Nacht, NY)

Canada CHU time station, 3.330 at 2339-0400 with French and English IDs and periodic time announcements. (Meece, OH)

CFRX Toronto, 6.070 at 1250, weak and fading, various commericals, sports report. (Stark, NM) 1400 with ID at 23 past the hour. (Meece, OH)

CKZN St. John's, 6.160 at 1330 in English with local programs. Poor. (Provencher, ME) 1131 with news, ID 1138, more news.(Goetsch, OH)

Radio Canada International, 15.150 at 2157 in English with news. (Shute, FL)

Chad Radiodiffusion Nationale Tchadienne, 4.904 at 0525 in French with local popular music. (Fleming, MD) 0535 with music and French announcements. (Fravel, WV) Interval signal at 0455, anthem 0500, weak but stronger by 0600. (Knisely, NY)

Chile Radio Nacional on 15.140 at 1820, all Spanish with music and news. (Provencher, ME) 0055 in Spanish with music. (Brooks, CA) 9.550 at 2350 with Latin music. (Nacht, NY)

China Radio Beijing around 9.000 at 0000 in Spanish. (Brooks, CA) 6.180 at 1142-1200 discussing Mexican-Chinese relations, ID, request for letters. (Stark, NM) North American service on 9.820 at 0132, news and commentary. (Nelson, TX)

Fujian Front (People's Liberation Army) 4.045 at 1128 in Chinese. (Hickerson, AR)

Clandestines Radio Venceremos, 6.550 to 6.555 at 1220 to 1247 sign off. March music, exhortations, address as Apartado Postal 7-907, Mexico, DF. (Stark, NM) 6.569 at 0010 with folk music, commentary in Spanish. (Fleming, MD)

Radio 15 de Septiembre, 6.215 and 5.555 at 0519, anti-Sandinista slogans, siren sounds. (Fleming, MD)

Radio Camilo Cienfuegos, 7.352 and 6.229 to 0045 sign off. La Voz del CID ID's. (Westphal, NY)

Voice of the Revolutionary Party for Reunification, via North Korea at 1012 on 4.118 in Korean. Sent report via Radio Pyongyang. What's the chance of a reply? (Goetsch, OH) Slim and none. (Editor) 4.557 at 1514 martial music. (Kusalik, Alberta)

Voice of the Libyan People, 15.039 at 1917 in Arabic. Jammed. (Lukas, NY)

Colombia Ecos del Combeima, Ibague, 4.785 at 0620 in Spanish. Latin music, IDs. QRM from 4.780. (Paszkiewicz, WI)

Radio Super de Cali, 6.120 at 0650 in Spanish. (Lukas, NY)

La Voz del Llano, Villavicencio 6.118 at 0620 with cumbias and salsas, Spanish announcements and ID. (Fleming, MD)

Radio Sutatenza, Bogota, 5.095 good in Spanish at 0005. (Shute, FL)

Radio Macarena on 5.975 at 1158, weak, in Spanish. (Stark, NM)

Costa Rica Radio Reloj, 4.832 and 6.006 at 0500 in Spanish with news and music. (Fleming, MD)

TIFC, Faro del Caribe, in Spanish on 6.175 at 1243. (Shute, FL) 5.055 at 0250 with English religious program. (Nacht, NY)

Radio Impacto, San Jose, 6.150 at 1246, strong, two men with "Impacto Noticieros." (Shute, FL)

Congo Brazzaville, 3.232 at 0640 with music, man in local language. (Fravel, WV)

Cuba Radio Havana, 11.855 at 1835 in English. (Nelson, TX) 11.760 at 0525 with contest announcement and music. (Goetsch, OH) 11.850 at 2000 in English with news, letters. (Westphal, NY) 2011-2115 news, sports, music. (Fleming, MD)

Czechoslovakia Radio Prague, 5.930 at 0257 with IS, ID, English times schedule, news, commentary. (Goetsch, OH)

Dominican Republic Radio Clarin, 11.700 in Spanish at 1856. Meringue and salsas. QRM from Vatican at 1930. (Fleming, MD)

Radio Earth, via Clarin, Sundays 1600-2300 with programming formerly carried weeknights. (Provencher, ME)

East Germany Radio Berlin International heard on 6.125 with English news and commentary at 2130. (Lukas, NY)

Ecuador HI2IOA time station from Guayaquil, 7.600 at 0435. (Dementiuk, SC)

HCJB 11.925 at 1100 in Russian. (Runch, PA)

Sistema Radiodifusora Atalaya, 4.790 at 0504 sign off. (Knisely, NY) 4.792 at 2329 in Spanish. (Shute, FL) 0217-0220 in Spanish. (Fravel, WV)

Radio Popular de Cuenca, 4.801 at 0242 with untypical Ecuadorian music, sounded more Venezuelan. (Shute, FL)

La Voz del Napo, Tena, 3.280 at 0145. (Shute, FL)

Radio Iris, 3.380 at Esmeraldes, 0202 with strong signal. (Shute, FL)

Egypt Radio Cairo, 12.050 at 1730 in Arabic, music and mentions of Islam. (Gray, MI)

England BBC with "The World Today" on 17.885 at 1645. (Shute, FL) 6.190 at 1925, fading in. (Lukas, NY)

Equatorial Guinea Radio Malabo, 6.250 at 2120 in Spanish: African music, talk, drums, chorus. CW, woodpecker and ute QRM. Presumed. There was no ID. (Paszkiewicz, WI)

Radio Nacional, Bata 4.926 at 0534 in Spanish. (Shute, FL)

Servicio Internacional, 15.105 in Spanish with religious programs, several IDs and then off at 2355. (Hickerson, AR)

Ethiopia Tentative VORE on 7.110 in Amharic or Arabic. (Shute, FL) No time given. Presume around 0330. (Editor)

Falkland Islands FIBS on 3.958 at 0250 with music. Stronger around 0400. (Hickerson, AR)

Finland Radio Finland International, 17.800 at 1300 sign on with "Northern Report," "Perspective" and off 1326. (Fravel, WV)

Gabon Africa Number One on 15.200 at 1530 in French with African music. (Provencher, ME) 11.940 at 1815 in French. (Nacht, NY)

Ghana GBC in vernaculars on 4.915 at 0614 after English ID by man. (Gray, MI)

Greece Voice of Greece, 6.205 in Greek at 0120. QRM from co-channel HCJB. (Hickerson, AR)

Guam KTWR on 9.510 at 1352 with religious talk in English. (Shute, FL)

Guatemala TGNA, Radio Cultural, 3.300 at 0300-0430 with English religious programs. Weak. (Ziajka, PA) English at 0400. Very strong. (Knisely, NY) 0345-0400 sign off with religious programs in English, ID as TGN and TGNA, 730, 3,300 and 5,955 kiloHertz. (Shute, FL)

Radio Mam, Cabrican, 4.825 at 2241 with Guatemalan music, man and woman in Spanish. (Shute, FL)

Radio Tezulutlan, Coban, 4.835 in Spanish with 40's Big Band music 0135-0153. (Fravel, WV)

Guinea Radiodiffusion Nationale, tentative on 15.310 at 1730 with news and comment in French. (Nacht, NY) 4.910 at 2305 hi-life music, lively talk, ID 2315. (Gray, MI)

Honduras Radio Noti-Cinco? 1225 on 6.075. Boisterous announcer, QRM and fading in and out. (Stark, NM) Possibly a program name. If Honduran is probably La Voz del Junco, or could also be R. Rumbo, Costa Rica. (Editor)

Hungary Radio Budapest, 6.025 at 2100 in English. (Lukas, NY)

Indonesia RKIP Surabaya 4.699 at 1600 with news in Indonesian. (Kusalik, Alberta)

Radio Republik Indonesia, Serui, 4.607 with pop music, ID at 1500, news to 1517, choral anthem, U.S. country/western. Past 1600. (Kusalik, Alberta)

RRI Surakarta, 4.899 military music, clear ID at 1528 "warta Radio Republik Indonesia, stasiun Surakarta." The only other Indonesian noted was on frequency 4.719. (Kusalik, Alberta)

Iraq Baghdad on 9.610 at 2117 with Arabic music, woman in German with ID and sign off. (Fravel, WV)

Israel Kol Israel, 7.412 at 0500 with talk, then "Calling All Listeners." (Gray, MI) 0116 with current events

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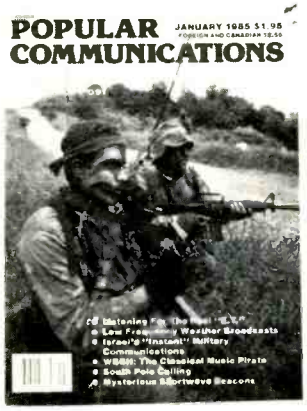

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program in English. (Fravel, WV) 9.535 at 0000 with news in English. (Shute, FL)

Japan Radio Japan on 9.570 at 0358 with interval signal, into Russian. (Shute, FL)

Lebanon KING of Hope, 6.215 at 2206 in English, giving address in Israel, ID, talk by man and off. QRM'd. (Paszkiewicz, WI)

Liberia ELBC on 3.255 with music, movie commercials, ID at 0700 and news about Liberia. (Goetsch, OH)

ELWA on 4.760 at 0726 with English religious program, ID. (Goetsch, OH)

VOA Monrovia, 0435 on 6.035 with "Sports This Morning" and "Science For Today." (Goetsch, OH) 15.600 news in English at 1716. 17.870 with commentary, "Nightline Africa" at 1625. (Gray, MI)

Lithuanian SSR Radio Vilnius, 15.100 approximate at 2300-2329 in English with listener's letters. (Shute, FL)

Madagascar Radio Madagascar, caught on 5.010 at 0259 in language with sign on, IS, choral national anthem, ID, TC, announcements, religious program. (Paszkiewicz, WI)

Radio Netherlands Relay 15.570 at 1728 in unknown language from sign on in African service. (Gray, MI)

Malaysia Radio Malaysia, Sarawak, 4.835 with Koran at tune in, nice ID for RTM Kuching at 1556 with mentions of frequencies, meter bands, times of broadcasts. Off at 1601. (Kusalik, Alberta)

Mali Radiodiffusion Nationale du Mali, 4.783 at 0616 in French, heavy CW QRM from around 0622. (Knisely, NY) Beautiful music at 0722. (Shute, FL)

Mauritania Radiodiffusion Nationale Mauritaine, 4.845 at 0608 with Arabic programming. (Fravel, WV)

Mexico XEW La Voz de la America Latina, 15.175 at 2331, commerical for Banco Nacional, all Spanish. (Shute, FL) 15.175 and 6.165, strong lately. Talk, interviews, lots of commercials. (Stark, NM) XEW is medium wave call which is relayed on SW. XEWW, the shortwave call, is seldom, if ever, announced. (Editor)

XEUJ Linares, with "club de madrugadores" (early riser's club) on 5.982. Blocked by sign off of a loud religious station. (Stark, NM) Probably WYFR. (Editor) 1236 man in Spanish with address, time checks, music. (Shute, FL)

Radio Huayacocotla, 2.390 at 1240 but difficult reception. All Spanish. Operates from Universidad Iberoamericana in Mexico City which I attended in the summer of '73. (Stark, NM)

Radio Mexico International on 17.765 at 2127 in Spanish. ID's as "Radio Mexico International" and "XERMX." (Dementiuk, SC)

Montserrat Deutsche Welle relay at 0550 on 11.705. (Shute, FL)

Morocco Radio TV Morocaine, 17.595 at 1432 with Arabic music, ID at 1515. (Shute, FL) 1520 with Arabic music, chanting, ID. (Hickerson, AR)

Mozambique Radio Mozambique, 9.618 at 0356 man and woman in Portuguese. QRM from KGEI—9.615. (Shute, FL)

Netherlands Radio Netherlands 9.590 (via Bonaire, Editor) at 0230 in English. (Nelson, TX) 17.605 with international service at 1350 to 1419 sign off. Weak. (Shute, FL) New Flevoland transmitter on 6.020 in English, Spanish, French, and Arabic caught at 0030 and at 2000 on 11.865 in English, Spanish, French. (Provencher, ME)

Netherlands Antilles Trans World Radio, Bonaire at 0430 with "Our Daily Bread" on 9.535. (Griffith, CO) 15.285 at 1430 in English. (Nelson, TX)

Nicaragua Voice of Nicaragua, 6.015 at 0402 with "Nicaragua Today." (Griffith, CO) 0145 with English til 0200 when into Spanish. (Fleming, MD) Heard at 0130 in English, anti-American talks, Latin music. (Provencher, ME)

Radio Sandino 6.200 at 0553 in Spanish with Latin music, ID, TC. QRM from HCJB—6.205, otherwise good. (Paszkiewicz, WI)

Nigeria FRCN Kaduna, 4.770 at 0441 with ID at 0444, talks. (Goetsch, OH)

Voice of Nigeria on 7.255 at 0512 with music, "Africa This Week" ID 0530. (Fravel, WV)

Norway Radio Norway International, Norwegian edition of Listener's Choice at 1605 on 11.850. (Nacht, NY)

Paraguay Radio Nacional, 9.735 at 0020 with Spanish talks, Latin music. (Nacht, NY) Variety program, all Spanish. (Provencher, ME)

Peru Radio San Martin, 4.810 at 0123 in Spanish with music, time check, announcement, ID. Poor modulation. (Paszkiewicz, WI)

Portugal Radio Portugal, 9.560 at 0310 in English with news. (Shute, FL)

Saipan KYOI on 9.670 at 2125 with pop/rock, ID as "Super Rock KYOI." (Shute, FL)

Saudi Arabia BSKSA 7.245 at 2130 in Arabic. Ham QRM. (Lukas, NY) 0256 in Arabic, man announcer 0300. (Fravel, WV)

Seychelles "Radio Seychelles" 11.810 and 15.200 at 0501 possibly in Swahili. (Shute, FL) You mean FEBA? Radio Seychelles is medium wave only. (Editor) 11.745 in Arabic or local language at 1820. (Provencher, ME)

Solomon Islands SIBC Happy Radio at 1158 on 5.020 in English with music, news. (Lukas, NY)

South Africa Radio RSA on 3.230 with music program, man and woman announcers, ID 0400. (Goetsch, OH) 9.730 at 0100 with call-in show. (Lukas, NY) 11.770 at 2245 with call-in. (Nacht, NY) 5.980 at 0200 in English. (Brooks, CA)

SABC/Radio Orion 4.835 at 2140 in English with "Mike Til Midnight" show and ID for "all night service of Radio Orion." (Paszkiewicz, WI)

Capital Radio, Transkei, 0310 on 3.930 with rock show. ID 0315, more music. Lots of ham QRM. (Goetsch, OH)

Spain Radio Exterior de Espana on 9.630 in English at 0200. (Dementiuk, SC)

Sweden Radio Sweden International, 6.045 with English mailbag at 2315. (Nacht, NY)

Switzerland Swiss Radio International on 17.765 at 1559 in Portuguese. (Shute, FL)

Surinam Radio Suriname International, 17.775 at 1730-1830 in Dutch. Via Radiobras transmitters in Brazil. (Provencher, ME)

Swaziland Trans World Radio, English religious program at 0314 on 3.240. (Westphal, NY)

Taiwan Voice of Free China, 5.985 at 0505 in English. (Nelson, TX) 0338 with non program "Adventures in Sound" and at 0230 in Chinese. (Provencher, ME) 9.555 at 2303 in Spanish. (Fleming, MD) 11.885 in Spanish at 2304. (Brumm, IL) Relays by WYFR. (Editor)

Tanzania Radio Tanzania, 5.050 at 0310 high-life music, woman in Swahili, ID. (Hickerson, AR) 9.749 at 1905 with English to 1915. (Knisely, NY)

Ukraine SSR Radio Kiev, English at 0300-0330 on 7.195. (Westphal, NY)

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United Arab Emirates UAE Radio Dubai, 17.775 at 1329 with interval signal, ID, news, weather, news, and music. (Fravel, WV)

United States WINB Red Lion, 17.730 at 1830 in English with evangelical program. (Provencher, ME) At 1758 ending religious song, ID, more religious programs. (Goetsch, OH)

KGEI on 15.280 at 2130 sign on with trumpets, ID in English, "Hour of Decision." (Goetsch, OH)

VOA Greenville 5.995 at 0601 with news. Bethany-site on 9.550 at 0756 to 0801 sign off. (Goetsch, OH)

AFRTS via Greenville on 6.030 at 1159 with ID, news. Via Bethany on 6.030 at 2300. (Goetsch, OH)

WRNO 15.420 at 1833 with religious program, ID. (Goetsch, OH) At 1900. Also on 6.185 at 0428 and 0450. (Griffith, CO)

WYFR religious programs, ID at 2100, more religion on 15.215. (Goetsch, OH) 21.100 (? Editor) at 1600 with news, religious music. (Meece, OH)

United Nations Radio via VOA on 9.565 at 0630 in English with frequency announcements, into French. (Shute, FL)

USSR Radio Moscow on 15.460 at 1430-1510 in English. (Nelson, TX) 9.575 in English at 1352, QRM'ing Radio Australia on 9.580. (Lukas, NY)

Petropavlovsk, Kamchtka, Radio Moscow home service relay very strong on 4.485. (Kusalik, Alberta) Believed to be a new Cuban-based relay. (Editor)

Radio Dushanbe, Tadzhik in Russian with ID, opera at 0220 on 4.635. (Hickerson, AR)

Uruguay Radio El Espectador, Montevideo, 11.835 poor at 2305 with interference. (Shute, FL)

Uzbekistan SSR Radio Tashkent, 1203 on 9.650 with news, commentary, and program on labor. Strong. (Hamilton, NC)

Vanuatu Radio Vanuatu on 3.945 at 0952, music, talks by man, country songs, conch shell horn-like interval signal, possible news. Parallel to 7.260 though much weaker there. Faded at 1016. (Goetsch, OH)

Vatican Vatican Radio, 6.250 (nominal 6.252, Editor) 0010 with midnight mass. (Brumm, IL) 1,611 kHz in parallel to 6.252 at 0548. (Fleming, MD) 6.015 strong at 0115 in Spanish. (Shute, FL)

Venezuela YVTO time station 6.100 through RM at 0445. (Knisely, NY) Pips and announcements in Spanish 0050-0110. (Kusalik, Alberta)

Ecos del Torbes, San Cristobal, caught on 4.980 at 0115 in Spanish with news, comments, music. (Provencher, ME)

Radio Rumbos, 9.660 with news, soap opera at 1400. (Stark, NM)

West Germany Deutsche Welle 9.545 at 0100 with usual news, comments. Little music. (Provencher, ME) 6.130 in German at 2115. (Lukas, NY) 9.545 in English at 0459 (via Antigua). (Shute, FL) Julich site, 3.995 at 0145 in German. (Fravel, WV)

Radio Free Europe, 9.595 at 2128 "Radio Svbodna Europa" ID. (Nacht, NY)

Zaire La Voix du Zaire, Lubumbashi, 4.750.7 at 0400 with sign on, interval signal, into Swahili and hi-life music. They are back after several years absence. (Hickerson, AR) Tentative 7.205 at 0400 with music and French. (Shute, FL)

Zambia SBC, Lusaka, 4.910 at 0349 with fish eagle interval signal. (Shute, FL)

And our thanks to the following: Michael Goetsch, Berea, OH; Bob Ziajka, Philadelphia, PA; Deborah Stark, Albuquerque, NM; Charlotte Brooks, Auburn, CA; Alan J. Nacht, New York, NY; Paul Nelson, Lubbock, TX; Jerry Brumm, Chicago, IL; Phil Hamilton, Newton, NC; Hank Lukas, Plainview, NY; Johnny M. Knisely II, Fairmount, NY; Edouard Provencher, Biddeford, ME; Ed Kusalik, Coaldale, Alberta, Canada; Michelle Shute, Pensacola, FL; Michael Westphal, Alden, NY; J. Speed Gray III, Grand Rapids, MI; Ulises R. Fleming, Odenton, MD; Mark Meece, West Chester, OH; Larry Fravel, Clarksburg, WV; Roman Dementiuk, Charleston, SC; Robert K. Runch, Philadelphia, PA; Patrick M. Griffith, Denver, CO; Gary Hickerson, Ft. Smith, AR; Sheryl Paszkiewicz, Manitowoc, WI. 'Til next month, good listening!

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

Orwick Wins Victory In Radar Crusade

Former Auburn, Washington, resident John Orwick, the scourge of radar-wielding police statewide, won a major victory in the Washington Supreme Court recently.

The court ruled that Orwick and two other defendants have the right to sue the city of Seattle for malicious prosecution. The decision allows the trio's once-dismissed lawsuit to go to trial, and if they win the suit they can receive an unspecified amount of money for damages and legal fees. But Orwick said his goal isn't money—it's to force police departments to use accurate radar.

"If I can accomplish my objectives, just as many officers will be using radar, except the radar won't be producing erroneous readings," said Orwick. "The equipment will be better, and it will be in the hands of officers who know what they are doing."

Orwick was cited in 1981 by Seattle police for driving 43 miles per hour in a 30-mph zone. Orwick contended that he was actually going 28 mph, and that the officers' radar equipment was faulty. He began to research the subject—he owns the Washington Research Associates, so he knows how to do legal research—and he concluded that at least one-quarter to one-third of the city of Seattle's radar citations "have no basis in reality."

The city of Seattle dismissed his $57 ticket after he formed a corporation (Driver's Defense Fund) to finance the fight, and after he lined up a stable of experts to testify about the fallibility of Seattle's radar equipment. But Orwick wasn't about to drop the issue.

"At that point, we hadn't accomplished a thing," said Orwick. "All we'd proved is that we could spend between $8,000 and $10,000 to kick a traffic ticket."

So Orwick and two other defendants, Arthur M. Peterson and John A. French, filed a class-action lawsuit. They contended that their constitutional rights were violated, and that the Seattle Municipal Court's handling of their cases was incorrect.

The lawsuit was dismissed in King County Superior Court in December 1981. But Orwick said he felt all along that the decision would be reversed by the Washington Supreme Court.

"The only thing that would have surprised me would have been if I had lost," Orwick further commented.

The Washington Supreme Court said the issue of the Seattle Municipal Court's handling of the case was moot since the tickets were dismissed anyway.

But the Supreme Court said that the Superior Court went too far in dismissing the damage claims based on malicious prosecution. The charges that the police and court system knowingly violate motorists' constitutional rights create an inference of malice, which can be used as a basis for damages.

The lawsuit will automatically be re-filed because of the Supreme Court's decision. Orwick and the other defendants will still have to prove their charges during trial in order to win the lawsuit.

Orwick said that Seattle isn't the only police department that uses inaccurate or faulty equipment. He contends that many other police departments in the state have the same problem.

Meanwhile the Driver's Defense Fund is working on a separate case that could have a more direct impact on police radar procedures. The suit, which is now before the Court of Appeals, calls for tougher new rules.

Speed-trap Flap Heats Up In Massachusetts

The Civil Liberties Union of Massachusetts is investigating a complaint by a Burlington engineer who says he was wrongfully cited by state police for flashing his headlights to warn motorists about a speed trap.

John Reinstein, staff attorney for the local civil liberties office, said he is reviewing a complaint received from Reinhard Bartelmann, who was cited and fined $25 when he flashed his headlights after passing a speed trap on Route 2 in Acton, MA.

Bartelmann has challenged the police, calling the charge a violation of his right to "free speech," and that State Police Commissioner Frank Trabucco admitted there is no law against flashing a warning.

Paul Revere Of The Roadway Fined For Blinking Headlights

A Connecticut resident driving east on I-86 was giving the standard warning to oncoming motorists (blinking her headlights) that they were heading into a radar trap.

The guy driving the car behind her also started blinking his lights. He, too, was giving a universally recognized signal—pull over and stop. He was a state police officer.

"Is there something wrong with your headlights?" he asked the driver.

"No," she replied. "Why do you ask?"

"They were flashing on and off," the officer said.

"Is there something wrong with that?" she asked.

The police officer obviously thought there was. He gave her a ticket for illegal use of headlights, which carries a $50 penalty that may be paid by mail.

The charge is rarely used in Connecticut anymore, ever since Supreme Court Judge John F. Mulcahy Jr. ruled in 1980 that a driver was exercising his right of free speech when he alerted other motorists to a police radar trap.

The judge dismissed the charge. As a result prosecutors have been reluctant to go after such cases.

Lawyers still talk fondly of the 13-page brief that persuaded Mulcahy to decide in favor of the driver who blinked the warning.

Two attorneys, Joseph Keefe of Torrington and Thomas J. Barbarie, of Hartford, wrote it in defense of Barbarie, who was given a ticket for flashing his lights to warn other drivers of a state police radar trap on I-91.

What is the difference, the attorneys argued in effect, between Paul Revere riding through every Middlesex village and farm to warn the colonists that armed British troops were in the area, and Barbarie driving along I-91 and signaling the presence of state troopers?

Barbarie, the attorneys contended, "was merely carrying on one of this country's traditions and exercising his right to freedom of speech, chronicling the presence of armed authority."

They also compared Barbarie to the good Samaritan who helped his neighbors, and they enclosed the appropriate passage from the Bible at the end of their brief.

The prosecutor offered to drop the charges, but the attorneys refused. They wanted a dismissal in court and they got it.

And while Mulcahy's decision is only one judge's opinion and not binding on the rest of the judiciary, most court rulings are based on precedent.

As a result, Hartford State's Attorney John M. Bailey recommended the state stop prosecuting people for alerting other drivers to radar traps.

A state police official said the department does not encourage such arrests anymore, but has not gone so far as to advise the troopers to stop giving out tickets to drivers who use the flashing headlights signal.

Police make a good argument against signaling other drivers that they are heading into a radar trap. The habitual, reckless speeder will pay attention to the flashing lights warning, slow down only long enough to get out of range, then start speeding again.

Of course, one of the main reasons for setting up radar traps is to slow down traffic, so what difference does it make if the result is accomplished by the sight of state troopers, or by drivers flashing their headlights?

The state police could augment their radar units by having auxiliaries drive around in unmarked cars flashing their headlights on and off at intervals.

Janice Lee is the Editor of Monday A.M., *the newsletter of Electrolert, Inc.*

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Beaming In *(from page 4)*

ada. He said, in part, "In venturing into the bookstore searching for *POP'COMM*, what do I see? Police officers with a thug spread-eagled on the wall of a building and, on the January issue, two gun wielding survivalists in camo! Why can't we get back to the old boring antenna arrays, receivers, and transmitters?" Other than "those" covers, Brent said that he's "very pleased" with the magazine in general.

In response to Brent, and the several others who have written to complain about some of our covers, I'd like to point out that long before we put together the first issue of *POP'COMM,* Dick Ross, the Publisher, and I spent a lot of time deciding what the magazine would be and what it would look like inside and out. We did this in order to avoid producing a magazine that looked in any way similar to *Communications World, Communications Handbook, Popular Electronics, Electronics World* or any others. A conscious effort was made to bring out a publication that wasn't a clone of any other magazine, especially one which eventually withered on the vine.

We simply didn't want to be a reincarnation of tired old concepts that were insufficient to keep those magazines in line with contemporary reader tastes and that contributed to their ultimate demise. We were aware that, even though those publications failed, they still had a hardcore of readers who were well satisfied with the formats and "look" they offered. Still, we felt that we wanted a different approach for *POP'COMM.* When our first issue appeared in 1982, we made our opening statement. My editorial was entitled, "And Now For Something Completely Different." Our front cover had the unmitigated gall to display an armed guerrilla at an underground communications station.

Yes, a few letters came in from those who said that they liked *POP'COMM* but wished that we would make the magazine look more like this or that magazine which they missed seeing because it had gone to that big publisher in the sky. But many more letters came in expressing genuine enthusiasm about what we were doing. Furthermore, the first issue was such an overwhelming success on the newsstands and on the counters in electronics stores that its performance far exceeded our highest hopes. It was a *spectacular* success!

Since that time we have utilized many different types of covers and, as most magazines eventually learn, some are more appealing than others to newsstand buyers. There's no doubt about the fact that covers that don't offend anybody just haven't got the same appeal as those covers which cause some readers to write complaint letters. Selling the most number of copies of a magazine is the name of the game, and is what keeps a publication in business and permits it to grow. As it turns out, the types of covers that Brent (and some others) suggests for *POP'COMM* ("the old boring antenna arrays, receivers and transmitters") don't have anywhere near the great appeal that they probably had a number of years ago. I suppose that this was a very hard lesson for some late and lamented magazines to learn.

Whether a person is offering cars, boats, shoes, furniture, or whatever, to the public, it would seem to me to be imperative to take whatever steps were necessary to be as successful as possible. Moreover, it would be sheer folly to be anxious, or even slightly willing, to copy the mistakes of others who have failed. When I receive a complaint letter about a specific cover, I wonder if the writer of the letter—if given the chance to be the Editor of a national magazine—would select covers that would appeal to as many potential readers as possible or (instead) would pick one that had lesser appeal.

The fact is that a great many scanner owners like to monitor police and other law enforcement channels. Also, our mail indicates that many readers interested in shortwave follow military/paramilitary/ guerrilla broadcasts and communications, and these topics are given considerable coverage in *POP'COMM.* Therefore, our covers always attempt to reflect the coverage of the publication and offer a depiction of those topics our readers like. Offering readers a pictorial image of those things in which they are interested may, after all, not be as radically new as it seems to some. If one looks through the media from the pre-TV "Golden Era" of AM broadcasting, There are countless photos showing "Gang Busters" engaged in a high-speed car chase, or "Mr. District Attorney" closing in on the bad guys, or "Don Winslow of the Navy" aboard a ship. Obviously, people find it pleasing to see those things that they like to hear. If this weren't true, there would be no such thing as TV and we'd all still be spending our evenings *listening* to the world news on radio rather than watching it on TV!

I devoted this space to discussing these matters because I felt that those who have taken the time and trouble to write have done so with what they feel are the best interests of the magazine (if not all of humanity) in mind. Our covers are most carefully planned for maximum impact and eye-catching appeal. If they cause a few readers to become startled—to us that's a better response than covers that just sit on a newsstand rack or store counter and say nothing, do nothing, and which portend the eventual demise of those publications that they so sadly adorn. We wouldn't have it any other way. Would you?

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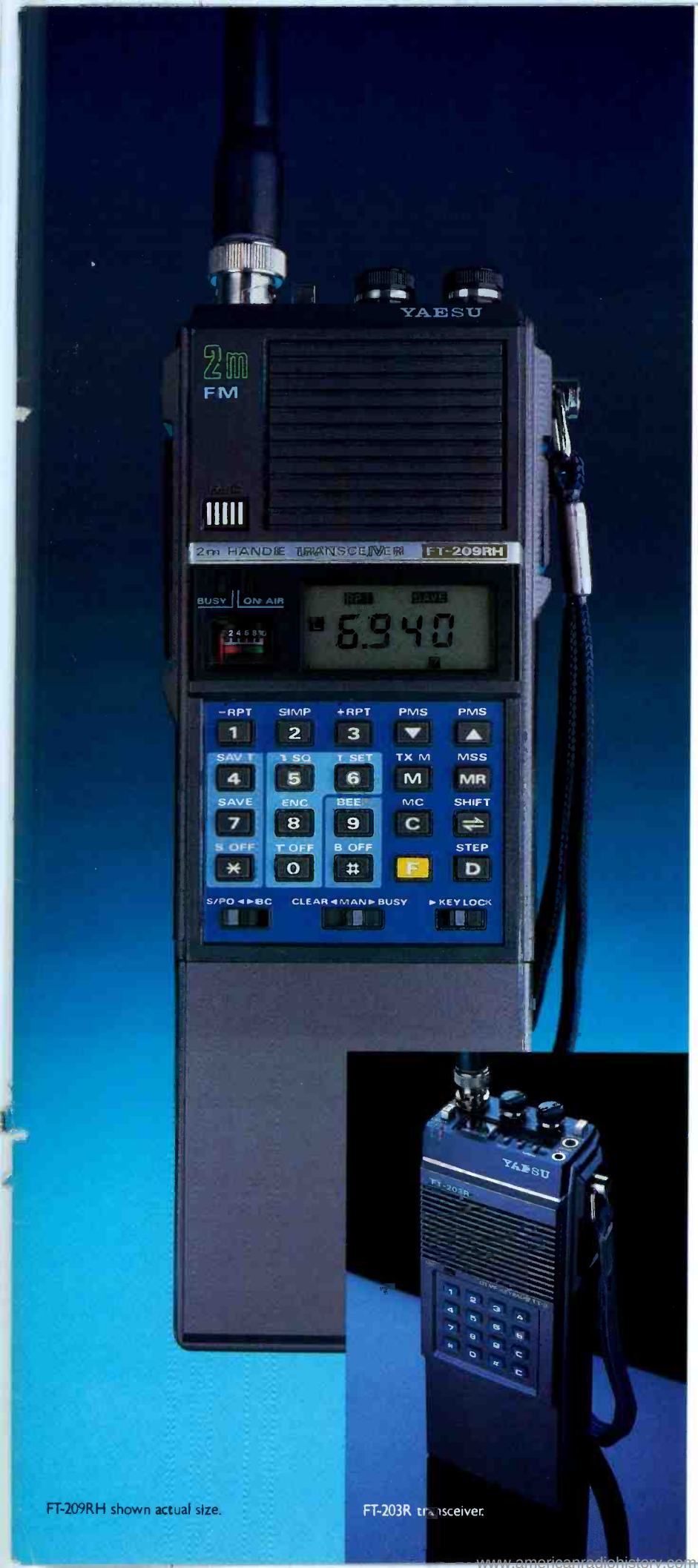

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