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Radio-TV EXPERIMENTER

WHITE'S RADIO LOG
AM-FM STATIONS/WORLD-WIDE SHORTWAVE LISTINGS

JUNE-JULY 75c

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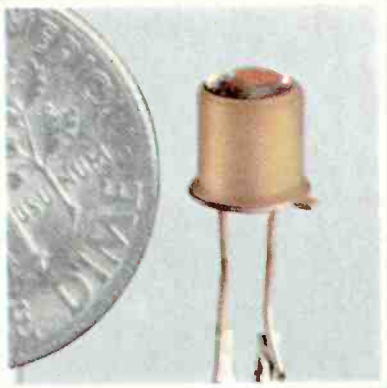

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- $9 CB SIGNAL CENTER
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LAB CHECKS

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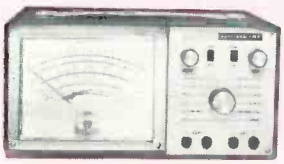

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Radio-TV EXPERIMENTER

June-July 1967

SPECIAL SCIENCE FEATURE

CONSTRUCTION PROJECTS

COMMUNICATIONS: Ham • CB • SWL

ELECTRONICS FEATURES

LAB CHECKS

REGULAR DEPARTMENTS

WHITE'S RADIO LOG, Vol. 47, No. 3—Page 94

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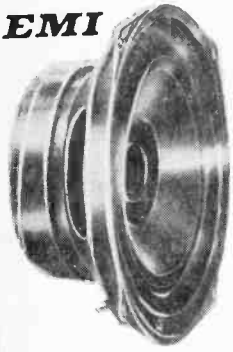

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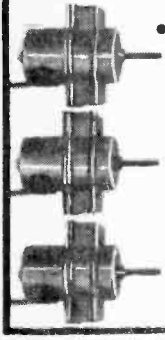

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JUNE/JULY, 1967

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RADIO-TV EXPERIMENTER

Dedicated to America's Electronics Experimenters

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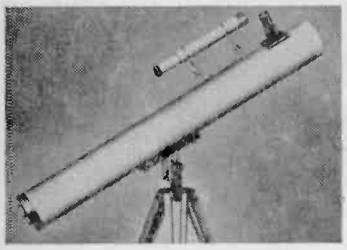

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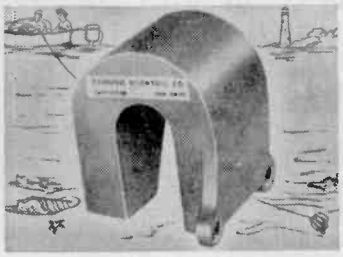

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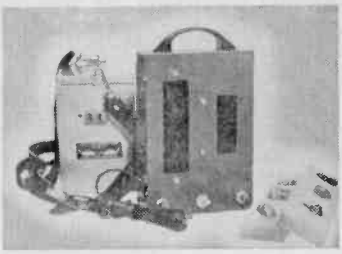

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70,007HP	12½"	2⅛"	65.85 f.o.b.

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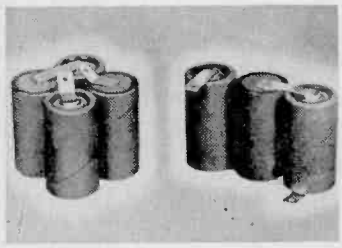

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Order #	Cells	DC Volt.	Price Ppd.
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40,987HP	2	2.50	2.75
60,633HP	3	3.75	3.60
60,634HP	4	5.00	4.80
70,812HP	Trickle Charger (1-10 cells)		10.95

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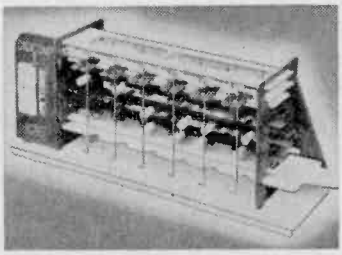

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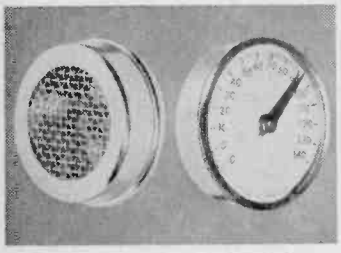

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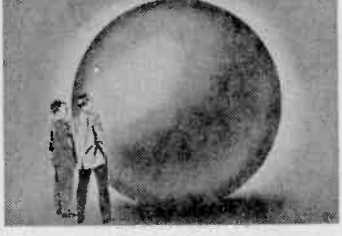

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POSITIVE FEEDBACK

JULIAN M. SIENKIEWICZ, EDITOR

CB Rules Change Again!? The FCC has released a proposal to amend the CB rules again, this time to require that Class D transceivers be *type accepted*. This means that no equipment can be licensed unless its manufacturer has submitted data on technical operating characteristics and the FCC finds that the equipment conforms with the technical requirements of the rules.

If the rule changes are adopted, CBers will be allowed to continue use of their existing equipment for five years provided it meets present technical standards. That's five watts input, etc. Six months after adoption of the rules only *type accepted* equipment can be licensed. And after five years, *non-type accepted* equipment cannot be used. That'll be no big loss to CBers. After all, who is operating a 1962 rig today? *(If you are using an ancient rig, please let the Editor know the Manufacturer and Model No.)*

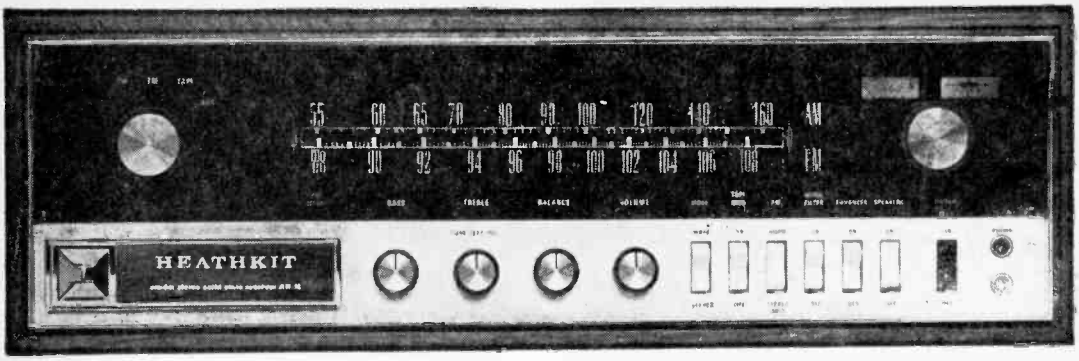
The new rules prohibit the use of external accessories except those furnished by the transceiver manufacturer and as covered by the type acceptance. So you better dump those 30-watt linear amps and the like. CB users will not be permitted to modify their transceivers, nor will they be allowed to change tubes, transistors or crystals, which might affect the ability of the equipment to meet FCC technical standards, except under the supervision of the holder of a first or second class radio operator license. Components can be replaced only with new components approved by the equipment manufacturer. So, if you installed 811's in the final, you're in trouble.

Transmitter power will be rated in terms of mean "output" power, not "input" power as at present. Class D AM transmitter power will be limited to 4 watts and SSB transmitters to 8 watts peak envelope power. This makes sense to the CB buyer. Who cares what goes in, it's what comes out that is important. Some current *five-watt input* units can barely put out 3 watts while others find 3½ watts easy pickings.

Part 15 Unbanned! What was published in the newspapers early in February about banning the use of Part 15 (less than 100-milliwatt) walkie-

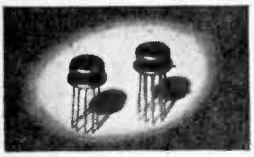
(Continued on page 14)

New Heathkit® AR-15 Solid-State Stereo Receiver

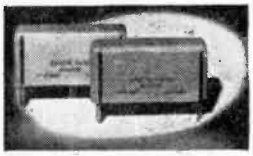


150 Watts . . . AM-FM Stereo . . . $329.95†

"Black Magic" Panel Lighting A touch of the power switch and presto! . . . The black magic panel lights up with a slide-rule dial for easy tuning, and instant identification of all controls.



Integrated Circuits . . . two are used in the IF amplifier for hard limiting excellent temperature stability, increased reliability. Capture ratio is 1.8 db. Each IC is the size of a tiny transistor, yet each contains 10 transistors, 7 diodes, and 11 resistors.



Crystal Filters . . . two are used in the IF amplifier to replace the usual transformers . . . Heath hi-fi exclusive. Provide near-perfect bandpass characteristics, (70 db selectivity) yet no adjustment is ever needed!

Now From The World's Most Experienced Solid-State Audio Engineers Comes The World's Most Advanced Stereo Receiver . . . The New Heathkit AR-15. There's nothing like it anywhere in the transistor stereo market place. Besides the use of space-age integrated circuits and exclusive crystal filters in the IF section, it boasts other "state-of-the-art" features like these:

150 Watts Dynamic Music Power . . . the highest power output of any transistor stereo receiver . . . delivers the coolest, most natural sound you've ever heard.

All-Silicon Transistor Circuitry . . . a total of 69 transistors, 43 diodes and 2 IC's for maximum reliability.

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Field Effect Transistor FM Tuner . . . cascode 2-stage FET RF amplifiers and an FET mixer provide high overload capability, excellent cross modulation and image rejection. Sensitivity 1.8 uv. Features 4-gang variable capacitor and 6 tuned circuits for extreme selectivity under the most adverse conditions. Completely shielded . . . completely assembled.

Two Calibrated Tuning Meters . . . for signal levels, for center tuning — doubles as a VOM for check-out during or after kit assembly. Plus automatic switching to stereo, transformerless design, filtered outputs and a host of other deluxe features. Full details in FREE catalog.

† Kit AR-15, (less cabinet) 28 lbs. **$329.95**
AE-16, assembled wrap-around walnut cab., 7 lbs. **$19.95**

AR-15 SPECIFICATIONS — AMPLIFIER SECTION: Dynamic Power Output Per Channel (Music Power Rating): 8 ohm load; 75 watts. **Continuous Power Output, Per Channel*:** 8 ohm load; 50 watts. **Power Bandwidth For Constant 0.5% Total Harmonic Distortion*:** 6 Hz to 25 kHz. **Frequency Response (1 watt level):** ±1 db, 6 to 50,000 Hz. ±3 db, 4 to 70,000 Hz. **Harmonic Distortion:** Less than 0.5% from 20 to 20,000 Hz at 50 watts output. Less than 0.2% at 1,000 Hz with 50 watts output. Less than 0.2% at 1,000 Hz with 1 watt output. **Intermodulation Distortion (60 Hz: 6,000 Hz=4:1)** Less than 0.5% with 50 watts output. Less than 0.2% with 1 watt output. **Damping Factor:** 45. **Hum & Noise:** Volume control at minimum position; —80 db. PHONO; **Channel Separation:** PHONO; 45 db. TAPE & AUX.; 55 db. **Output Impedance (each channel):** 4, 8 & 16 ohms. **FM SECTION (Mono): Sensitivity:** 1.8 uv*. **Frequency Response:** ±1 db, 20 to 15,000 Hz. **Antenna:** Balanced input for external 300 ohm antenna, unbalanced, 75 ohm. **Volume Sensitivity:** Below measurable level. **Selectivity:** 70 db*. **Image Rejection:** 90 db. **IF Rejection:** 90 db minimum*. **Capture Ratio** 1.5 db*. **AM Suppression:** 50 db*. **Harmonic Distortion:** 0.5% or less*. **Intermodulation Distortion:** 0.5% or less*. **Hum & Noise:** 65 db*. **Spurious Rejection:** 100 db*. **FM SECTION (Stereophonic): Channel Separation:** 40 db or greater. **Frequency Response:** ±1 db, 20 to 15,000 Hz. **Harmonic Distortion:** Less than 1% at 1,000 Hz with 100% modulation. **19 & 38 kHz Suppression:** 55 db or greater. **SCA Suppression:** 50 db. **AM SECTION: Sensitivity:** 12 microvolts at 1,000 kHz. **Image Rejection:** 60 db at 600 kHz. 40 db at 1400 kHz. **IF Rejection:** 70 db at 1,000 kHz. **Harmonic Distortion:** Less than 1.5% at 400 Hz, 90% modulation. **Hum & Noise:** 45 db. **Power Requirements:** 105-125 or 210-250 volt 50/60 Hz AC. **Dimensions:** Overall, 16⅞" wide x 4¾" high x 14½" deep.

*Rated IHF (Institute of High Fidelity) Standards.

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Heathkit Rectangular Color TV's With Exclusive Self-Servicing

Kit GR-295
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(180 sq. inch viewing area)

Exclusive Features That Can't Be Bought In Ready-Made Sets At Any Price!

All color TV sets require periodic convergence and color purity adjustments. Both Heathkit Color TV's have exclusive built-in servicing aids, so *you* can perform these adjustments anytime . . . *without* calling in a TV serviceman . . . *without* any special skills or knowledge. Just flip a switch on the built-in dot generator and a dot pattern appears on the screen. Simple-to-follow instructions and detailed color photos in the manual show you exactly what to look for, what to do and how to do it. Results? Beautifully clean and sharp color pictures day in and day out . . . and up to $200 savings in servicing calls throughout the life of your set.

Exclusive Heath Magna-Shield . . . surrounds the entire tube to keep out stray magnetic fields and improve color purity. In addition, **Automatic Degaussing** demagnetizes and "cleans" the picture everytime you turn the set on from a "cold" start.

Choice Of Installation . . . Another Exclusive! Both color TV's are designed for mounting in a wall or your own custom cabinet. Or you can install either set in a choice of factory assembled and finished Heath contemporary walnut or Early American cabinets.

From Parts To Programs In Just 25 Hours. All critical circuits are preassembled, aligned and tested at the factory. The assembly manual guides you the rest of the way with simple, non-technical instructions and giant pictures.

Plus A Host Of Advanced Features . . . a hi-fi rectangular picture tube with "rare earth" phosphors for brighter, livelier colors and sharper definition . . . **Automatic Color Control** and **Gated Automatic Gain Control** to reduce color fading and insure jitter-free pictures at all times . . . deluxe **VHF Turret Tuner** with "memory" fine tuning . . . **2-Speed Transistor UHF Tuner . . . Two Hi-Fi Sound Outputs** for play through your hi-fi system or connection to the special limited-field speaker . . . **Two VHF Antenna Inputs** — 300 ohm balanced and 75 ohm coax . . . **1-Year Warranty** on the picture tube, 90 days on all other parts . . . plus many more deluxe features. For full details, mail coupon for FREE Heathkit catalog.

***Kit GR-295,** everything except cabinet, 131 lbs. . . . **$479.95**

GRA-295-1, walnut cabinet (shown above) 56 lbs. . . . 19" D. x 31" H. x 34½" W. **$62.95**
Deluxe contemporary walnut & Early American cabinets also available at $94.50 & $99.95

****Kit GR-180,** everything except cabinet, 102 lbs. . . . **$379.95**

GRA-180-1, walnut cabinet (shown above) 41 lbs. . . . 18¼" D. x 28¼" W. x 29" H. **$49.95**

Early American cabinet available at $75.00

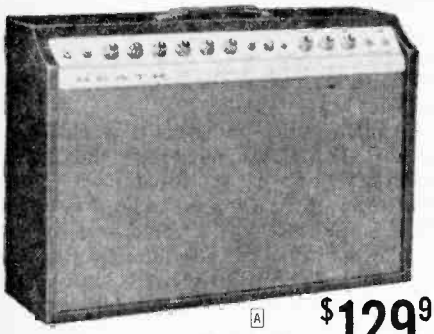
NEW! Heathkit Transistor Code Practice Oscillator

Kit HD-16
$8.95

Learn Radio-Telegraph Code . . . ideal for beginning hams, or boy scouts working toward merit badge. Uses unijunction transistor with separate controls to vary tone frequency and volume. Hear tone through built-in speaker or a headphone set . . . features separate phone jacks for key and headphone outlet. For visual monitoring, just flip a switch and watch the top-panel blinker light. Includes key with plug and cord. 2 lbs.

Your Own Heathkit® Electronics!

NOW ... New Lower Prices On Harmony®-By-Heathkit® Guitars!



Kit TA-16 **$129.95**

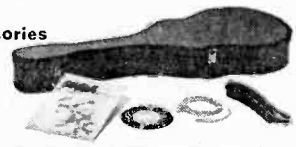
[A] NEW Heathkit Transistor Guitar Amplifier

60 watts peak power; two channels — one for accompaniment, accordian, organ, or mike, — the other for special effects . . . with both variable reverb and tremolo; 2 inputs each channel; two foot switches for reverb & tremolo; two 12″ heavy-duty speakers; line bypass reversing switch for hum reduction; one easy-to-build circuit board with 13 transistors, 6 diodes; 28″ W. x 9″ D. x 19″ H. leather-textured black vinyl cabinet of ¾″ stock; 120 v. or 240 v. AC operation; extruded aluminum front panel. 52 lbs.

American Made Harmony-By-Heathkit Guitars

All wood parts factory assembled, finished and polished . . . you just mount the trim, pickups and controls in predrilled holes and install the strings . . . finish in one evening.

These Valuable Accessories Included With Every Guitar Kit



Each guitar includes vinylized chipboard carrying case, cushioned red leather neck strap, connecting cord, Vu-Tuner® visual tuning aid, tuning record, instruction book and pick . . . worth $19.50 to $31.50 depending on model.

[B] Deluxe Guitar . . . 3 Pickups . . . Hollow Body

Double-cutaway for easy fingering of 16 frets; ultra-slim fingerboard — 24¼″ scale; ultra-slim "uniform feel" neck with adjustable Torque-Lok reinforcing rod; 3 pickups with individually adjustable pole-pieces under each string for emphasis and balance; 3 silent switches select 7 pickup combinations; 6 controls for pickup tone and volume; professional Bigsby vibrato tail-piece; curly maple arched body — 2″ rim — shaded cherry red. 17 lbs.

[B] Kit TG-46 WAS $219.95 NOW **$189.95** (mftrs. list $331.50)

[C] Kit TG-26 WAS $99.95 NOW **$88.50** (mftrs. list $146.95)

[D] Kit TG-36 WAS $119.95 NOW **$94.50** (mftrs. list $160.50)

[C] Silhouette Solid-Body Guitar . . . 2 Pickups

Modified double cutaway leaves 15 frets clear of body; ultra-slim fingerboard — 24¼″ scale; ultra-slim neck for "uniform feel"; Torque-Lok adjustable reinforcing rod; 2 pickups with individually adjustable pole-pieces under each string; 4 controls for tone and volume; Harmony type 'W' vibrato tail-piece; hardwood solid body, 1½″ rim, shaded cherry red. 13 lbs.

[D] "Rocket" Guitar . . . 2 Pickups . . . Hollow Body

Single cutaway style; ultra-slim fingerboard; ultra-slim neck, steel rod reinforced; 2 pickups with individually adjustable pole-pieces for each string; silent switch selects 3 combinations of pickups; 4 controls for tone and volume; Harmony type 'W' vibrato tailpiece; laminated maple arched body, 2″ rim; shaded cherry red. 17 lbs.

FREE

World's Largest Electronic Kit Catalog!

Describes these and over 250 kits for stereo/hi-fi, color TV, amateur radio, shortwave, test, CB, marine, educational, home and hobby. Save up to 50% by doing the easy assembly yourself. Mail coupon or write Heath Company, Benton Harbor, Michigan 49022

HEATHKIT

HEATH COMPANY, Dept. 19-6
Benton Harbor, Michigan 49022

☐ Enclosed is $_____, plus shipping.

Please send model (s)_____

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Prices & specifications subject to change without notice. CL-285

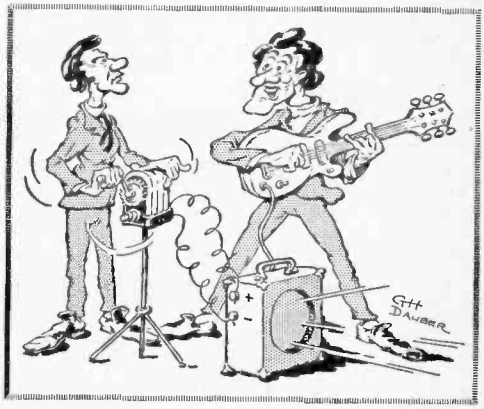
Continued from page 10

talkies in the citizens band is *not true*. According to the news report, the FCC was supposed to be considering the move of Part 15 walkie-talkies from the Citizens Band to 49.9 MHz (mc.) at the edge of the six-meter ham band. The story got into the papers because someone had seen a copy of a staff level, in-house FCC document with no official status and leaked the information to the press. (Who bugged the FCC?)

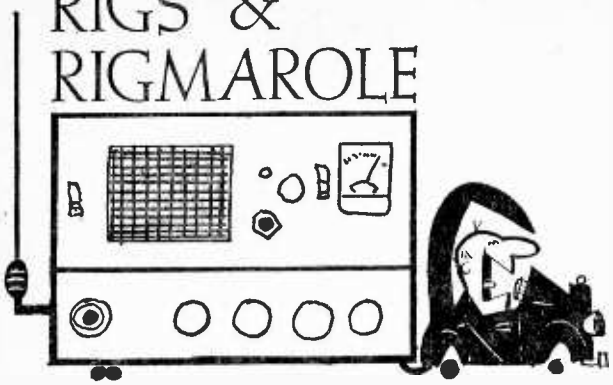
If this phony story were true it would have meant that the 12-million or so unlicensed walkie-talkies now in use would have to be either licensed in the Citizens Radio Service or junked. Also, manufacturers would have had to design new walkie-talkies for the new Part 15 band and rules. Ship loads of walkie-talkies on the way from Japan may have ended up making the Pacific Ocean a wee bit shallower.

If you have a Part 15 walkie-talkie, don't worry. James Barr, chief of the Safety and Special Radio Services division of the FCC, said "There is no such proposal." Thanks a lot, James. With all those Dick Tracy gadgets bugging and buzzing the CB channels, someone should do some worrying. Too bad it's not the FCC.

Wait for a Better Price. IC's (integrated circuits) have been coming on strong for the past two years and more and more will find their way into consumer products toward the end of 1967. One IC design made by the National Semiconductor Corporation is a voltage regulator. The device is about the size of a quarter-watt transistor case with eight leads. Some of the outstanding characteristics of this voltage regulator are: output voltage adjustable from 2 VDC to 30 VDC; one per cent regulation; adjustable short circuit limiting; and wide-range temperature tolerance. This is just what every experimenter would like to have on his test bench, but hold up fellah's, the price tag for one unit is $60.00. So be patient, the chips will fall in price as the state of the art and competition increases. If you belong to that breed of disbelievers and would like to see some manufacturer's specifications, write to National Semiconductor Corporation, Dept. RTV, Danbury, Connecticut 06810 and ask for Technical Bulletin SC-100. ■



CB RIGS & RIGMAROLE



a what's new product column that's fun to read

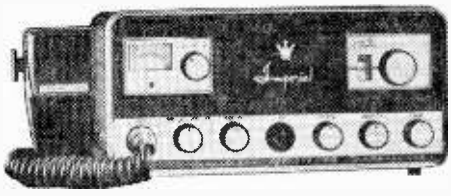
■ **One Side of the Story.** Would you believe that *Regency Electronics* has come out with an all-channel CB rig which does the all-channel act in the grand style—like 69 channels!! So far as we know, this rig is the *first-ust* with the *most-ust*.

Hey—don't go 'way, Regency's new Imperial rig is *absolutely legal*. No, the FCC hasn't flipped its beanie and opened up another 46 CB channels; credit for the extra elbow room goes to the manufacturer of the rig.

Using an extremely versatile method of voice transmission known as "single sideband," the Imperial makes triple use of each of the 23 CB channels, the upper sideband, the lower sideband, and the full channel (using regular AM modulation for the full channel use). It would actually be possible for one single sideband (SSB) net to be in full swing on, say, Channel 9/LSB (that's lower sideband) and a second local net to be operating on 9/USB (U is for upper) and neither net would even be aware of the other one.

Without going into a whole involved complicated technical dissertation which is a major article in itself, suffice it to say, in explanation of the miracle of SSB, that only a small portion of your voice need be transmitted over a radio circuit to achieve communication. In SSB, the transmitter sends out only a portion (not quite half) of the usual signal; it takes up less radio-spectrum space, it's more concentrated, it carries farther than a standard AM signal. Of course, there is less-than-hi-fi quality here, but you don't often have occasion to broadcast the Boston Pops over a communications circuit.

At the receiving end, electronics magic locks onto the incoming SSB signal and reprocesses the sliced up signal and out comes something which bears a striking resemblance to the human voice. When heard on a regular AM receiver, an SSB signal cannot be understood; it's "scrambled." In fact it sounds like a Russian monkey talking French. The Regency system permits the two SSB circuits to co-exist on the same channel. While the use of SSB offers a certain amount of privacy it has the disadvantage of leaving you with a "scrambled" transmission. In the event you must seek road assistance—while traveling out of range of your base station—standard AM CB rigs just can't copy you.



Regency Electronics SSB Rig

The *Regency Imperial* has solved this problem by giving you the option to switch over instantly to standard AM for communications with all other CB rigs. A front panel switch selects USB, LSB, and AM.

Double conversion is used in the kilo-Hertz inhaler for extra selectivity and the set can pull in all of the weak ones (it's got half-a-microvolt sensitivity).

Smartly designed with gold and black front panel, it's got the full assortment of deluxe features including squelch, 2-scale (4-function) meter, illuminated channel selector, universal power supply.

The Imperial goes for $299 and it's made by *Regency Electronics, Inc.*, 7900 Pendleton Pike, Indianapolis, Ind. 46226. (Always use Zip numbers.)

Packed With Power. For those of you who have always wondered about why there isn't a way to pull the CB rig out from under the

dashboard and carry it with you to the beach, while hunting, or while doing emergency work, we've got big news for you—big news if you happen to have an *e.c.i.* solid-state CB rig.

Besieged by requests for a truly portable CB rig. *e.c.i.'s* lab engineers whomped up a fully self-contained battery pack which lets you have CB anyplace, any time.

e.c.i. Solid-State Port-a-Pak

Dubbed the Model PAP-1 *PORT-A-PAK*, it has a collapsible antenna, nifty Texion case, rechargeable battery, battery meter, shoulder strap. It provides up to 8 hours of continuous receiving on a single charge of the batteries.

All you do is pull the rig out of the car, pop it into the *PORT-A-PAK*, and prance merrily on your way. Pull, pop, prance—as simple as that! All for $59.95.

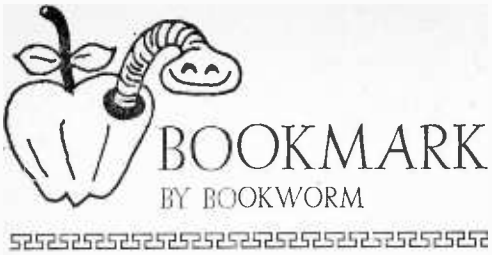
If you're interested in this clever unit, contact *e.c.i. Electronics Communications, Inc.*, 56 Hamilton, White Plains, N. Y. 10601.

What's Watt. Three watts, that's what — and it all comes from a 2-channel CB station which is carried in the palm of your hand (even if you've got a pint-sized mitt).

The rig is the new Duo-Com 123, a latter-day version of the famous Duo-Com 120 which was an integral part of the 1963 expedition to Mount Everest.

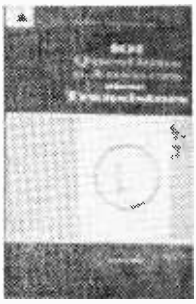
The 123 has a lot packed into its tiny case—things such as a dual-conversion receiver, all transistor circuitry, rechargeable nickel-cadmium battery, sealed speaker and mike (both of which can't be affected by humidity).

The little devil can be yours for $129.50. It's from *Polytronics Laboratories, Inc.*, 900 Burlington Ave., Silver Spring, Md. 20902. ■



Q Q & A. Since the transistor was invented in 1947, its widespread use has revolutionized electronics. However, there are many persons interested in electronics who want a better working knowledge of transistors and what these chunks of germanium and silicon can do. *101 Questions and Answers About Transistors,* by Leo G. Sands, fills a gap in existing technical literature for many experimenters. This book answers the most frequently asked questions about transistors and their applications in a simple, straightforward manner.

The first part of the text covers questions about basic transistor types, functions, characteristics, and testing. The remaining four parts of the book cover applications. These include the



Soft cover
112 pages
$2.25

use of the transistor as an amplifier at audio and radio frequencies, as an oscillator, and as a switch for control purposes. Questions and answers about bias stabilization, preamplifiers, superregenerative detectors, phase-shift oscillators, AND and OR circuits, and flip-flops are covered in these parts. No attempt has been made by the author to include mathematics or discussions about atoms, electrons, and holes. Schematic diagrams, graphs, and photographs are frequently used to illustrate the answers.

Anyone desiring to know more about transistors will find this book an easy path to gain a greater familiarity with them. Copies are available from electronics parts distributors and bookstores throughout the country, or from the publisher, Howard W. Sams & Co., Inc., Dept. Q, 4300 West 62nd Street, Indianapolis, Indiana 46206.

Color TV. Now, in one handbook, the amateur TV serviceman has all the service information he needs to tackle any of twelve popular color TV set brands. The *RCA Color TV Service Handbook* has been compiled in a con-

Bookmark

venient form for specific service information on many makes of 1960-1966 color TV sets. Admittedly, the handbook was written for the professional serviceman; however, RCA has done a fine job in the text's preparation so that any amateur can meet with success. We will qualify the amateur serviceman's required experience by stating that he should know something about

Soft cover
140 pages

color TV. The ol' Bookworm believes this knowledge can be had by any individual who has puttered around the old style black-and-white TV sets and had read a text or two on color TV.

The handbook is divided into ten sections and if you count on your fingers, you will have no problems following the simple directions specified for your make set. The contents cover the following in detail: chassis layouts; purity and convergence adjustments; static and dynamic convergences; black-and-white setup; phase and matrix; color field and miscellaneous adjustments; fuse and circuit breaker data; test equipment information; and receiving tubes used in color TV sets. Just look up the chassis number of your set in the chassis index, and you will be guided to the proper sections in the 140-page handbook. All the information is based on the manufacturer's own service notes. With a little experience the amateur serviceman may become the most wanted man in his immediate color-TV community. See your local parts distributor for price information.

One Always Bites Back. One of the worst things that can happen to a TV serviceman is to run into a series of tough-dog TV sets. They can pile up while you work on easier-to-repair sets; or they can make the easy ones pile up while you spend several hours on a tough-dog

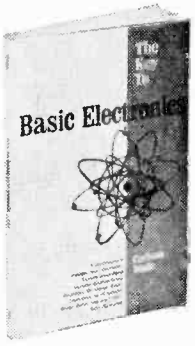
Postpaid
Soft cover
160 pages
$3.25

set. If a number of the sets you troubleshoot turn into tough-dogs, the newly-revised book, *Solving TV Tough-Dogs*, by servicing "pro" Bob Middleton, can help you greatly.

This text will help you select the right approaches and cut down the time required for pinpointing trouble sources. Not only are the best techniques discussed, but pitfalls which can cause so much trouble are pointed out so you can avoid them. All the information included is based upon actual tried-and-proven techniques. This new, enlarged edition contains additional material on servicing color TV receivers including all-transistor TV portables.

Copies are available from electronics parts distributors and bookstores throughout the country, or from the publisher, Howard W. Sams & Co., Inc., 4300 West 62nd Street, Indianapolis, Indiana 46206.

Get Started. Every so often an author comes up with a text on basic theory that is worth singling out for special mention. Carlson Wade's text *The Key to Basic Electronics* is a short, easy-to-understand course in modern, basic electronics. Although prepared for the beginner, it also can be of use to experimenters wishing to bring themselves up-to-date in this rapidly changing field with its shifting emphasis caused by new components and circuits. Thorough explanations on such basics as electron tubes, amplifiers, oscillators and radio are complemented by chapters dealing with transistors, servo systems, radar and sonar. A special salute should be given to the draftsman who assembled (or should we say composed) the drawings for this text. Tube characterists curves, CRT scope pattern generation, servo gear trains, sideband pictorials, and many other diagrams supplement the text's crystal clear presentation style. Interested? Write to the publisher, Key Publishing Co., Dept. RTV, 817 Broadway, New York, New York.

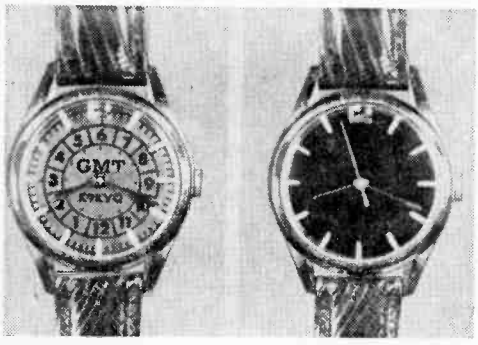


Soft cover
182 pages
$4.00

☆☆☆

Two-Faced Watch

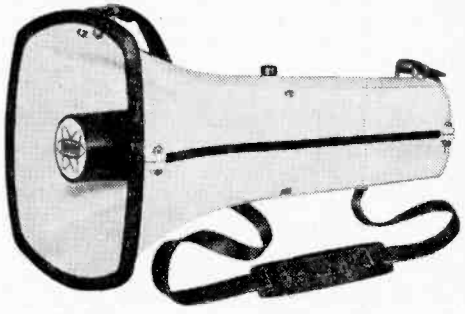
To aid amateur and commercial radio operators, shortwave listeners, pilots, amateur astronomers, etc., in fast, accurate Greenwich Mean Time logging, this unusual dual-function wristwatch shows user's local 12-hour time on a gold and black dial for 20 seconds—then the GMT dial emerges into view and remains in view for 15 seconds, after which it disappears completely, and appearance of the dial changes back to the original black dial for 20 seconds, etc. This dial cycling repeats continually, as the face-changing mechanism is powered by the watch movement. Watch hands remain in full view at all times. User of the GMT watch may read both local time and GMT conversion for his zone (watch illustrated is made for use in the Central U.S. time zone). There is also a Daylight-Saving Time scale. With gold-finish case and crown, black lizard band, and 1-year guaranteed Swiss movement, the unit is available with custom-made GMT dial for $17.95, postpaid in U.S.A.—3 to 5 weeks delivery. The watch may also be personalized with the user's radio call sign or name for $4.50. Sold by Nordlund Radio Products, 7635 W. Irving Park Rd., Chicago, Ill. 60634.



Nordlund Face-Changing Local/GMT Watch

Hand-y PA System

The Fedtro MEG-3300 Deluxe is a portable public address system that fits into your hand. The unit features two dynamic microphones, one built in the unit itself, and the other a detachable microphone with coiled extension cable which allows the unit to be carried over the shoulder or mounted on a tripod. The MEG-3300 is powered by four D-size flashlight batteries, is fully transistorized, and features volume control and instant battery loading. It weighs 2¼ lb.; power range is up to 3300 ft. Retail price is $59.95 at Fedtro dealers and electronics parts suppliers. Want more information? Write to Fedtro Inc., Dept. ET, Federal Electronics Building, Rockville Center, New York 11517.



Fedtro Meg-3300 Transistorized Megaphone

Wide-Band Scope

This 5-in. oscilloscope is ideal for audio and industrial testing as well as black-and-white and color-TV servicing. Model 315A's panel-control layout incorporates the new Green Line arrangement, featuring easy-on-the-eyes coloring, specially-shaped control knobs and legible, fast-reading pencil markings. Performance: vertical response to 5MHz with 10 mv rms/cm sensitivity; 3-step frequency-compensated vertical attenuator with separate stepless control; 2-stage push-pull vertical amplifier plus cathode-follower input; panel-mounted astigmatism control for extra-sharp trace adjustment; drift-free positioning control for full observation of expended traces; negligible rise-time, over-shoot and square-wave tilt for true

display of complex waveforms; fully automatic sync. The 315A is $134.95 net from Precise Electronics, Dept. RT, 76 E. 2nd St., Mineola, N. Y. 11501.

FM Lip Service

Operating within the FM Broadcast band with output power meeting FCC regulations, Channel Master's Model 6433 wireless FM microphone

Channel Master 6433 Wireless FM Mike

fills business, home entertainment and recording applications in conjunction with any FM radio or tuner. With an anti-capacitance alignment tool supplied, the 9-volt, solid-state, battery-powered unit is adjustable over a 90-106 MHz range in the FM band. Its field strength will overpower a commercial station to permit break-in communications in businesses utilizing regular FM radio for background music. When used with a tuner and PA amplifier, and tuned out of range of local stations, the 6433 makes an ideal public address for a roving speaker. Recording fans can team the unit with an FM radio whose output is then fed to a tape recorder for remote "candid" recordings. Response of the under-4-oz. unit is 100 to 10,000 Hz. An input is provided for an external low-impedance dynamic microphone. Channel Master's 120-day instant, free replacement guarantee applies to this new unit. Suggested list price is $34.95 at dealers everywhere. Can't find a dealer? Don't tell us, tell Channel Master, Ellenville, N. Y. 12428.

Rechargeable Portable Power Source

A new, portable 12-volt rechargeable power source with built-in charger, the CRL-1200 Power Pack, powers most battery-operated devices. In transforms easily from one 12-volt appliance to another, including portable TVs, tape recorders, phonographs, camping lights, ski-trail lights, portable radios, electric shavers, PA systems, portable power tools, movie cameras, portable lamps, electric typewriters and CB and FM radio communication units. The CRL-1200 can operate continuously up to 40 hours or more, depending on the current requirements of the equipment. The average portable TV set will

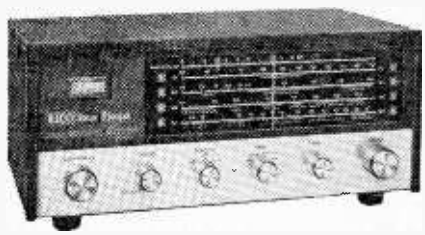
Centralab CRL-1200 Power Pack

operate for 5 to 8 hours. Charging time is seven hours for 90% charge and 12 hours for a complete charge. It operates efficiently from −30°F to +122°F, and can't be damaged even if the temperature drops to −60°F or rises to +158°F. Charge loss during storage is only 3% per month. After 2½ years of shelf life, the Power Pack can be recharged to original full capacity.

All 12-volt devices already equipped with a cigarette lighter plug fit the socket of the Power Pack, which includes two RP-680 6-volt, 8 ampere-hour, lead-silica-gel batteries and one CRL-1000 (1.2 ampere rate) automatic charger in a genuine black leather carrying case 8½ x 2¼ x 9 in. Available through major electronic outlets, the CRL-1200 Power Pack retails for $49.95, or write to Centralab, P.O. Box 591, Milwaukee, Wis. 53201.

Fits All the News That's Broadcasted

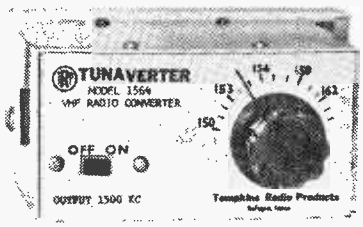
For listening to the news broadcasts that emanate from the capital cities all around the globe, don't overlook EICO's new Space Ranger Model 711. Easy-to-build kit is $49.95; factory-assembled it's $69.95. A flip of the switch brings broadcasts by amateur radio enthusiasts, ship-to-shore, weather reporters, CBers, Coast Guard, or leisure listening on the standard AM broadcast band. The 711 is a superheterodyne receiver tuning 550 kHz through 30 MHz—including the popular amateur radio bands of 160, 75, 40, 20, 15 and 10 meters. The unit has a built-in ferrite rod antenna and provision for external antenna. The built-in S meter tells you when you are exactly on a station. Pin-point accuracy of tuning is achieved by electrical band-spread tuning. Continuous Wave (CW) code and Single Sideband (SSB) transmissions are received with the help of the integral variable BFO (beat frequency oscillator). For additional selectivity, the 711 has an output for connecting a Q-multiplier. There's a 4-in. PM speaker, headphone jack, and transformer-operated power supply. Size is 6 x 13½ x 9 in., construction is printed-circuit board, weight is 17 lb. At all EICO Electronic Instrument Co., Inc., dealers and electronics mail order houses.



EICO "Space-Ranger" Communications Receiver

Converting All Calls!

You can listen to Police, Fire, mobile radio telephone, VHF marine, many other exciting calls on your car or home radio with the Tunaverter and 6-1 reduction tuning—in other words, you can "tune the band." Model 375 tunes 37 to 50 MHz; VHF model 1564 tunes 150-164 MHz and VHF marine calls. Fully transistorized, the Tunaverter measures 2¼ x 3½ x 4¼ in. and uses a self-contained 9-volt battery, and

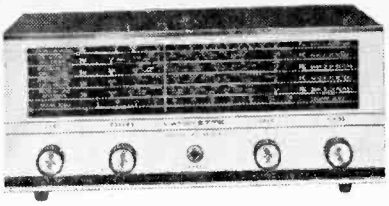


Salch "Tunaverter" VHF Converter

comes with a 24-in. connecting coax cable and mobile mount for your auto radio. The on/off switch automatically switches from broadcast to VHF reception. Price is $29.95, postpaid in the U.S. or Canada. Optional output kit for using Tunaverter with home and transistor radios is $1.25. Get more information from Herbert Salch & Co., Marketing Div. of Tompkins Radio Products, Woodsboro PR4, Texas 78393.

DX Buster

The Explor-Air Mark V is a precision-built AM broadcast and shortwave receiver in a compact (14 x 8 x 6 in.) walnut-grained metal cabinet. Full coverage on 5 bands: medium wave (0.55-1.6 MHz); international 49 meter (5.9-6.25 MHz); shortwave 31 meter (9.45-9.8 MHz); broadcast 25 meter (11.45-12 MHz); 19 meter (15.05 to 15.5 MHz). It's AC transformer-powered, has superheterodyne circuitry with individual tuned circuits for each band and a big slide-rule dial calibrated for easy reading. There are controls for tuning, volume off/on,

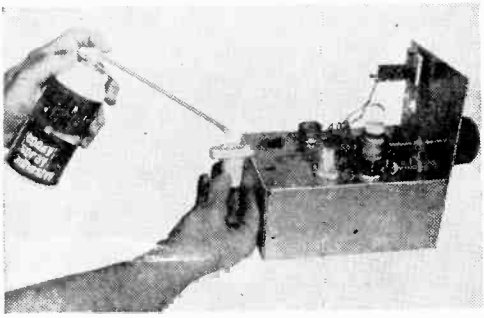


Lafayette Explor-Air Mark V Receiver

tone, band selector. Tube complement: 6BE6 converter, 6BA6 IF amplifier, 6AV6 detector and 1st audio, 6AQ5 audio output, and full-wave silicon rectifiers. There's a built-in 4-in. PM speaker, rear-panel connection for shortwave antenna, and front-panel headphone jack. For 105-125 V, 50-60 Hz AC. Priced at $49.95, the Explor-Air weighs 11 lbs. Imported by Lafayette Radio Electronics, 111 Jericho Tpke., Syosset, N. Y. 11791.

Latest Epoxy Epoch Episode

For such applications as fastening of brackets, handles, hardware, small parts and components to cabinets, chassis or enclosures, try Leal-Lok, a new non-mix epoxy spray adhesive. This one-part material in aerosol containers is also recommended for bonding nameplates. Leal-Lok is activated by contact with the air, eliminating the need for clamps and fixtures for most applications. Curing takes 8-16 hours to develop full joint strength; and baking in an oven for 1 hour at 150°F speeds curing. Price: $2.00. For literature write to Leal Co., 1716 S. 6th St., Camden, N. J. 08104.



Leal-Lok Epoxy Adhesive

"Waddayamean ya didn't know the light was red?"

Service Library

I need books and schematics of Sears, Admiral and other TV sets, also a field-strength meter. I have put up 100 antennas for my customers and TV signals are weak here. I want to be a subscriber to your magazine. It's great.

—J. A. W., East Stroudsburg, Penna.

Schematics of most TV sets are available from the manufacturers and in the form of Photo Facts kits from Howard W. Sams & Co., Inc., Indianapolis 6, Indiana, and in schematic books from Hayden/Rider/Ahrens, 116 West 14th Street, New York 11, New York. TV field-strength meters are made by several companies including Jerrold Corporation, 401 Walnut Street, Philadelphia, Pennsylvania. To subscribe, just send us your check. Glad you like our magazine.

Convert Aero Bander?

In your December-January 1965-1966 issue, you published an article about the Aero-Band converter which covers the 108-135 MHz band. Is there any way to modify the unit to cover the police band in the 145-160 MHz range and still use it to cover the aeronautical band?

—J. J., Florissant, Mo.

Switching coils at such high frequencies is difficult. It is done with intricate mechanisms in TV tuners, but I would not recommend it for this purpose. Why don't you just build another converter of the same type, but using coils of fewer turns for receiving in the police band? Of course you could try using a little less capacitance across the tuned circuits to raise the frequency to the 145-160 MHz (mc) band. If the transmitters you want to hear are using FM, you're out of luck—aircraft use AM.

Try a Mouse Trap!

A light fingered chap at work relieves his fellow employees of a five or ten spot when we leave our billfolds in our jackets in the cloakroom. I just got touched myself. I would like to put a transmitter in my jacket which would actuate a buzzer 20 feet away. Two aluminum plates could be put into the wallet to act as a switch which would close when the wallet is removed from the pocket. Any suggestions?

—M. B., New Hyde Park, N. Y.

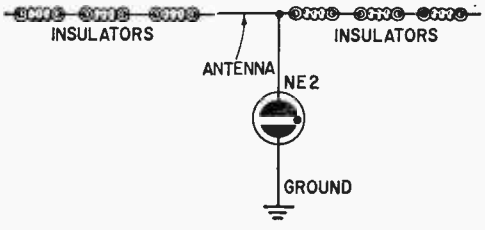
Get one of those money clips and keep your long green in your trouser pockets. Your problem could be solved your way if those tiny clip-on transmitters used on "The Man From U.N.C.L.E." TV show were real and available. You could get a pocket-size garage-door control transmitter and wire its switch terminals to aluminum plates as you suggested. But, it would cost you about two ten spots and a five.

Lightning Light

Since I am interested in meteorology I would like to build a lightning-discharge indicator which indicates lightning flashes with a neon bulb or another device. Can you give me a circuit?

—C. H., Bushnell, Illinois

For specific information you should talk with a U.S. Weather Bureau meteorologist in Chicago or St. Louis. A neon lamp connected to a radio antenna and ground, as shown in the diagram, should flash when static charges are high—in excess of 60 volts for an NE-2 lamp.



Color-TV Problem

On our color TV set, the colors all run into the white. One side of a face is sometimes purple and the other side green. The convergence has been checked. We are about 100 miles from a station. Could our 11-year-old antenna cause this? Would a new antenna help?

—F. R. M., Ponce City, Oklahoma

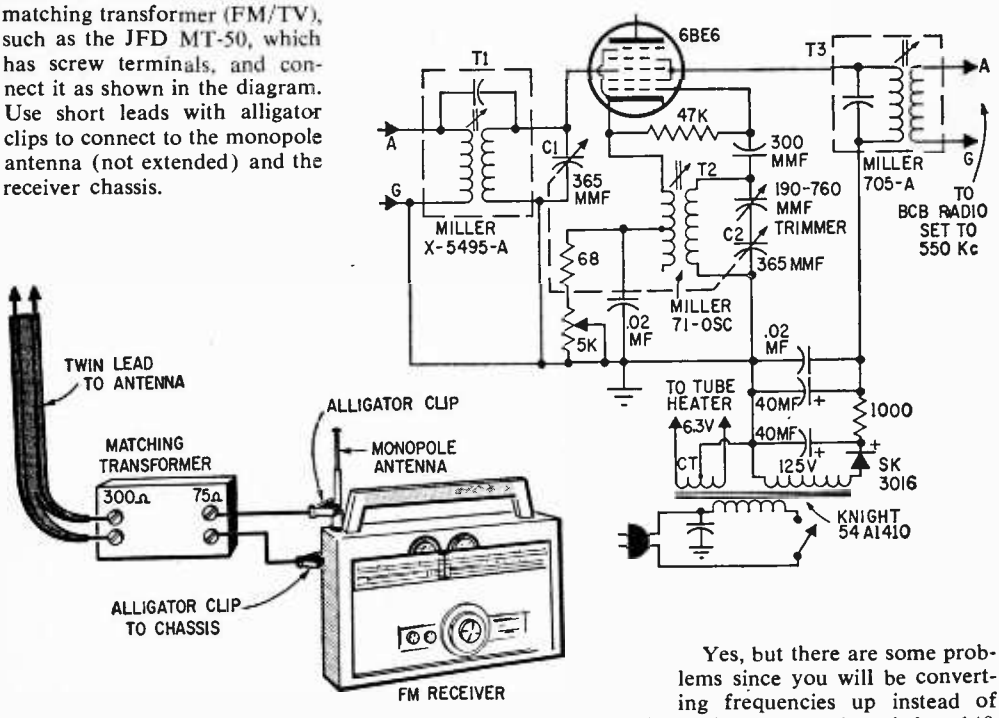
Sounds familiar. Happens in New York, too —within sight of the TV-station antennas on top of the Empire State Building. For good color TV, get the best antenna you can (most directive and highest gain) and use low-loss coaxial cable instead of twin-lead as the transmission line. After the new antenna system has been installed, get a competent service technician to adjust and degauss your set.

Fixed Antenna for Portable FM

How can I connect an external antenna to my portable FM-broadcast receiver which has a monopole telescoping antenna?

—F. M. B., Latham, New York

Get a 75 to 300-ohm antenna matching transformer (FM/TV), such as the JFD MT-50, which has screw terminals, and connect it as shown in the diagram. Use short leads with alligator clips to connect to the monopole antenna (not extended) and the receiver chassis.



Seek and Ye Shall Find!

I have a number of transistors and diodes of various types in some quantity. Is it possible to make an intercom using them?

—S. B., Key West, Florida

Get a copy of "Datadex" (DT-2) on transistors from a radio parts store or from IRC, 401 North Broad Street, Philadelphia, Penna. It lists the equivalents of the transistors you identified by type number in your letter. There are jillions of transistor types, many of them interchangeable. Look through back issues for intercom diagrams and match the transistors you have with those specified.

BFO Problem

I built the BFO described in one of your recent issues. It doesn't seem to have sufficient output to demodulate SSB. Only a direct connection to the antenna will produce any signal. Any help?

—A. E. P., Newberry, Mich.

Feed the output of the BFO through a very small capacitor to the plate of your receiver's IF amplifier or to the detector. Connect the ground to the receiver chassis.

Low Down On Converter

Are converters practical for receiving low frequencies below 100 kHz (kc), say as low as 15 kHz? Are there any receivers that tune these frequencies?

—W. R., Waukegan, Illinois.

Yes, but there are some problems since you will be converting frequencies up instead of down. There's nothing much to hear below 140 kHz except standard-frequency signals of value to laboratories. The diagram shows a circuit of a converter for 140-425 kHz. Your parts store should be able to order the coils for you. You may not be able to gang tuning capacitors C1 and C2. Set your BCB radio to about 550 kHz, tune in stations with C2 and adjust C1 for best reception. If your receiver doesn't have antenna connections, place the converter so that T3 (a ferrite loop antenna) is close to the radio's loop antenna.

Thinks It's a Hangar

My radio-controlled garage door opens by itself when plane traffic over my roof is heavy. What causes this and how can I stop it?

—E. M., Flushing, N. Y.

Your garage door control probably operates at around 200 MHz as permitted under Part 15 of the FCC rules for unlicensed operation of radio-control transmitters. It is probably actuated by signals from radio equipment on aircraft nearby. You should have both the transmitter in your car and the receiver in your garage retuned to another frequency. Check with the manufacturer for possible conversions to tone-coded operation. (*turn page*)

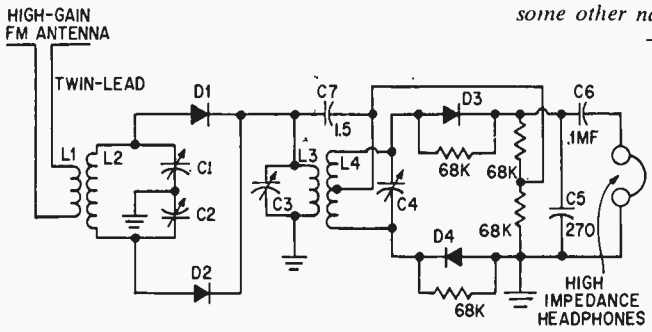
Ask Me Another

FM Crystal Set

How can I convert my AM crystal set to FM?

—M. T. J., Audubon, Iowa

You wouldn't be happy with the results. You need a superhet receiver in order to get sufficient frequency deviation at the detector.



You might try the circuit shown in the diagram. It uses four diodes capable of VHF operation. The first stage is a frequency doubler. It doubles the FM signal frequency and the FM deviation so that the detector will recover more audio. L2 is tuned by C1-C2 to the FM band. L3-C3 and L4-C4 are tuned to twice the FM-band frequency. It *might* work if the signals are really strong.

Atwater-Kent Model 20

In your October-November 1966 issue, D.E.H. of Mt. Orab, Ohio, asked for a schematic diagram of an Atwater Kent Model 20 receiver. I have one of the sets and the circuit, and will he glad to help D.E.H. By the way, when did Atwater Kent go out of business?

—R. J. M., St. Lambert, Que., Canada

We don't keep records of the addresses of inquirers. However, D.E.H. and others interested can contact R.J.M. (R. J. Manning) at 310 Edison Avenue, St. Lambert, Quebec, Canada. Atwater Kent closed up his plant in about 1933. He went to California to retire. His huge Philadelphia plant is now one of the many plants of Philco-Ford Corporation.

Stop BCI at Source

There are many electric motors at the grocery store where I work and they cause interference to my six-transistor radio. Can I add a noise limiter?

—T. L. McQ., Girard, Ill.

A noise limiter might help, but not enough. Stop the noise at the sources by adding radio interference filters. They are available at most radio parts stores and mail order houses.

No-License FM Broadcast

We operate a low-power FM station without a license under Part 15 of the FCC rules. We broadcast regular programs and would like to have a telephone, listed in the phone book, so our listeners can call us. Should we contact the FCC and get them to reserve our call letters, WKAF-FM, for us or should we get our station listed in the phone book as "Radio Freedom" or some other name?

—W. F. and V. W., Kankakee, Ill.

The FCC assigns call letters to licensed stations only. If your transmitter operates in the 88 to 108-MHz FM broadcast band, make sure it is one that has been *type approved* by the FCC. Otherwise, you can't operate it lawfully without a station license. At other frequencies above 70 MHz transmission is limited to one second and cannot be resumed until after a 29-second waiting period.

What Luck!

In my 14-transistor radio, two of the transistors are connected as diodes. Two other PNP transistors have their collectors and emitters connected together. An example is Q2 in the enclosed diagram. I don't understand how Q2 works. Do you know?

—H. P. W., Wichita Falls, Texas

You're lucky your set actually has all 14 of its transistors connected. Some gyp manufacturers install transistors that aren't even connected into the circuit so they can claim to have an umpteen transistor radio. There must be an error in the diagram you sent us. The collector and emitter of Q2 should not be connected together. Otherwise, Q2 would not function as the local oscillator which it apparently is.

It's a Problem!

How can I convert a UHF television converter to receive the 216-470 MHz band between the VHF and UHF television bands?

—W. B. T., Atlantic City, N. J.

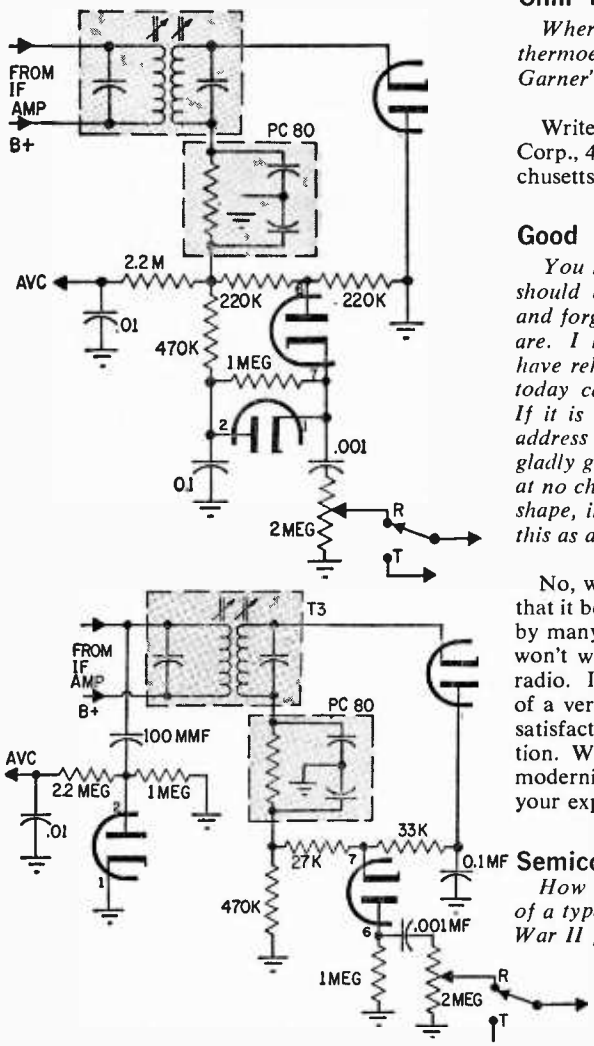
It might be tricky. If it uses coils, increase their inductance. If it uses tuned lines, lengthen them. You should have a VHF-UHF signal generator, which is expensive, for making the adjustments. There's not much to listen to in that range except in the 450-470 MHz (mc) land mobile band where you might hear a taxi dispatcher. It won't work with a conventional (intercarrier sound) TV set unless you add an oscillator to simulate the video RF carrier. (To produce the sound, both the audio RF carrier and video RF carrier must be present.)

Makino Limiter for CB

I have two CB sets that are very noisy. A schematic is enclosed. Please tell me how to modify the circuit to employ a Makino limiter circuit.

—P. L. McG., Knoxville, Tennessee.

The first diagram shows the present detector, noise limiter and AVC circuits in your set. All three share the three diodes of a 6BJ7 tube. The second diagram shows the modified circuit. Note that one of the diodes is now used as an AVC rectifier. The tube-socket terminal numbers are noted on the diagram.



Try, Try Again

I repair radio and TV sets as a hobby and have come across a trouble that has stumped me. Recently, I replaced its 50C5 tube and the radio played well for a few days. Then, the two local stations started to sound distorted and a noise like static is heard. All other stations sound normal. I cleaned the tuning capacitor and tested all the tubes and then replaced all of them except the 50C5. There was no improvement. Got any ideas?

—T. I., Dalton, Mass.

Sounds like front-end overloading. It could be caused by inadequate AVC voltage. Check the capacitors in the AVC circuit (could be leaky or shorted), also the resistors. Also, it could be the incorrect bias on the 50C5.

Chill It!

Where can I get complete specifications on the thermoelectric modules described briefly in Lou Garner's article back in 1965?

—J. S., Panorama City, California

Write directly to: Cambridge Thermionic Corp., 445 Concord Avenue, Cambridge, Massachusetts.

Good Listening? Listen Good!

You told D. E. H. of Mt. Orab, Ohio, that he should discard his old Atwater Kent 20 radio and forget about it completely. How wrong you are. I have several old radio receivers that I have rehabilitated, and most of the new ones of today can't even begin to compare with them. If it is possible, please send me the name and address of the writer of this letter and I will gladly give him the information that he requires, at no charge. Unless an old radio is in very bad shape, it can always be repaired. I do much of this as a hobby.

—J. P., Kansas City, Kansas

No, we didn't say to discard it. We suggested that it be given to a museum where it can be seen by many. Of course it can be modernized but it won't work as well as a cheap pocket transistor radio. If it were a later model superhet instead of a very early TRF, the owner might get some satisfaction out of his investment in modernization. Why don't you write an article for us about modernizing old radios so many can benefit from your experience and ideas?

Semiconductors for Type 80

How can I use semiconductor diodes instead of a type 80 rectifier tube used in the pre-World War II power transformer radios?

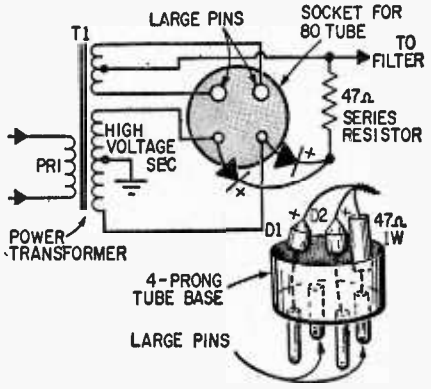
—W. W. (Address not given)

Whether you want to replace an 80, a 5Z3, or a more modern 5Y3, the best way to do it is make a plug-in adapter from the base of a defective tube. Use diodes with a 150-ma, 600-volt piv (prv) rating. (To replace other rectifier tubes you may need 750 ma diodes—with two or more connected in series to handle the piv

Ask Me Another ★★★★★★★★★★★★★★★★★★★★★★★★

rating of the tube.) Generally the silicon diodes will give a higher B-plus voltage than the tube did so the voltage drop across the resistor (that you *must* connect in series with the diodes) won't be noticed. Without the resistor, very-high current surges into the input filter capacitor can "pop" those diodes the first time you turn the power *on*. You don't have this with a tube-type rectifier. The filament warm-up time lets current increase slowly with no surge.

If you wire the diodes directly to the rectifier-tube socket, run the pigtail leads down through the tube-pin holes in the wafer sockets to prevent someone from plugging a tube into the socket and upsetting things.



Surplus Is a Problem

I recently purchased a shortwave radio from a friend for $20. It is black, very heavy and looks like a war surplus product. It was designed for battery operation but has been converted to AC, using an external power transformer. I can tune in many foreign stations. What make and model is it? On the front panel it says "before operating read TM 11-850." Where can I get the manual? Are tubes and parts available?

—B. C. H., Cherryfield, Me.

Judging from the picture you sent, the receiver is probably a BC-312 or BC-348, made for the Signal Corps (circa 1942). Tubes are available but mechanical parts would be difficult to find. If a reader knows where a manual is available, contacting B.C.H. at P.O. Box 144 in Cherryfield, Me., would be a nice gesture.

Sorry About That!

I sent a question to Ask Me Another. Will the answer be sent to me by mail or published?

—R. W., Brooklyn, N. Y.

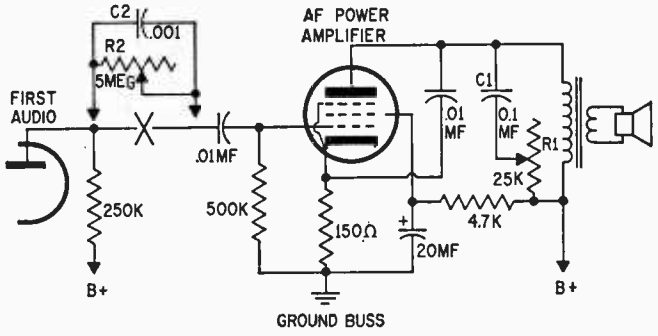
No questions can be answered by mail even if return postage is sent. Questions will be answered in the magazine as soon as possible and as space permits. Short questions get speedier answers.

Tone It Down

How can I add bass and treble controls to my amplifier?

—C. R. C., Woodstock, Illinois

According to the diagram you sent (partially reproduced here), you already have a treble control (R1). To add a bass control, break the circuit at "X" and add R2 and C2. Try a 5-megohm potentiometer for R2 and a 1000-picofarad capacitor for C2. Try various values for C2 until you get the desired effect.



Fruitless Labor

How can I convert the pocket mike described in the Feb.-Mar. issue of Radio-TV Experimenter from the 88-108 MHz FM band to the 540-1600 kHz AM band?

—F. B., Arlington, Va.

We're talking about apples and oranges now. One is an FM device for the VHF band, the other an AM device for the MF (medium frequency) band. For the AM band you need an effective antenna. This is easily achieved in the VHF band because of the much shorter wavelengths. In the AM broadcast band (MF), you should wire the transmitter directly to the receiver input, or drag around a wire antenna about 20 feet long. While a basic circuit could be included here, you might be very disappointed with the results. Perhaps some reader will design and build an AM/FM pocket mike and write it up for us.

42-MHz (mc) RF Preamp

Can one of the popular 6-meter preamps be used for receiving at around 42 MHz? Will it pass a narrow-band FM signal?

—A. E. P., Newberry, Mich.

Simply modify the coils to increase their inductance, or add capacitance across them, so the preamp will have high gain at the lower frequency. It should pass a narrow-band FM signal since some 6- meter band Hams use FM. A narrow-band FM signal occupies about 10 kHz (kc) of space. An AM (voice modulated) signal takes up about 6 kHz.

My Boo-Boo

In the Dec.-Jan. issue of Radio-TV Experimenter, in response to the question of J. A. C. which was entitled "Too Much Soup" you said that the images of stations on 1450 kHz and 1490 kHz, picked up at 540 kHz and 580 kHz respectively, were not images. I don't think you're right.

—J. D., Pittsburgh, Pa.

I was wrong. If the receiver has a 455-kHz (kc) IF and is tuned to 540 kHz, its oscillator will be at 995 kHz (if oscillator operates at higher frequency than intended signal). Thus, when tuned to 540 kHz, the receiver could pick up a signal from a station on 1450 kHz since that signal beating with the 995-kHz oscillator signal will produce a 455-kHz IF signal (1450−955=455). The same would be true at 580 kHz where the oscillator operates at 1035 kHz (1490−1035=455). What reader J. A. C. needs is a tuned preselector ahead of his receiver or a radio with an RF stage. Thanks to Jim Kyle, John Berry and David Lawry who wrote to call my attention to the error. My boo-boo reminds me of the day I tried to find out who swiped my hat—it was on my head.

TVI from Receiver

When I tune my shortwave receiver past certain frequencies, interference is caused to my TV set. I wrote the manufacturer of the TV set who charged me $5 for a device which didn't work. How can I stop the interference?

—R. K., Morton Grove, Ill.

The local oscillator of your shortwave set is probably radiating and is being picked up by the TV antenna or IF amplifier. Your shortwave receiver may be inadequately shielded. Move it and its antenna as far away as possible from the TV set and its antenna. Try grounding your shortwave receiver chassis (but not if it is an AC-DC type). You might also try a line filter just in case the interfering signal is being fed through the power line.

Solid-State Shortwave

For several years I have been trying to find an all-transistor portable shortwave receiver that will cover from about 1.5 MHz to about 9 MHz, which has band spread tuning, BFO, telescoping antenna, and is operable from a 9-volt battery and AC through an adaptor. Do you know of any such receiver?

—J. F. R., Malden, Mass.

There are many portable shortwave receivers on the market, none of which meet your speci-

Ask Me Another

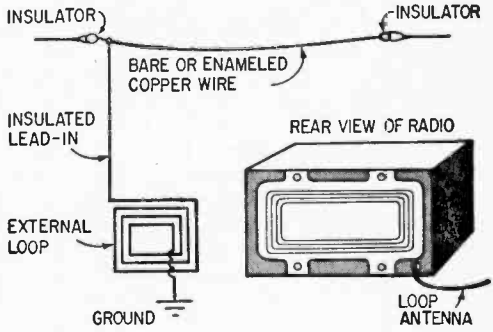
fications exactly, but from among which you should be able to pick one that will fill the bill. Lafayette and Allied have a 15-transistor, 4-band model which covers the BCB, shortwave from 1.7-4.7 Mhz and 5-12 Mhz, and the FM broadcast band. Both are priced at $49.95. Neither have bandspread and BFO. You can easily add BFO. The Globetrotter at $159.95 covers 15 bands, giving you the effect of bandspread, but no BFO. It's a dandy.

BCB DX Booster

I get a kick out of monitoring distant AM BCB stations on my table radio. How can I boost receiving range? What kind of antenna can I use?

—D. L. H., Memphis, Tennessee

Your radio probably has a built-in loop antenna if it was manufactured after 1940. To avoid having to open up the set, you can fasten an external flat loop antenna (salvaged from a discarded radio) to the back of the set, connected to an external antenna and ground as shown in the diagram. The signals picked up by the antenna will be inductively coupled from the external loop to the internal loop. Adjust the distance between the loops for best reception.



Shame, Shame

I would like to know where I can buy or order Amperite delay relays and at what prices.

—L. E. M., Chicago, Ill.

At Allied Radio, 100 N. Western Ave., on your town's west side or directly from Amperite Co., 600 Palisade Ave., Union City, N. J. 07087.

BCI from Thermostat

The aquarium heater in our house causes annoying noise in my radio receiver as the thermostat cuts in and out. I have tried many different commercial static eliminators, but none have worked. What should I do?

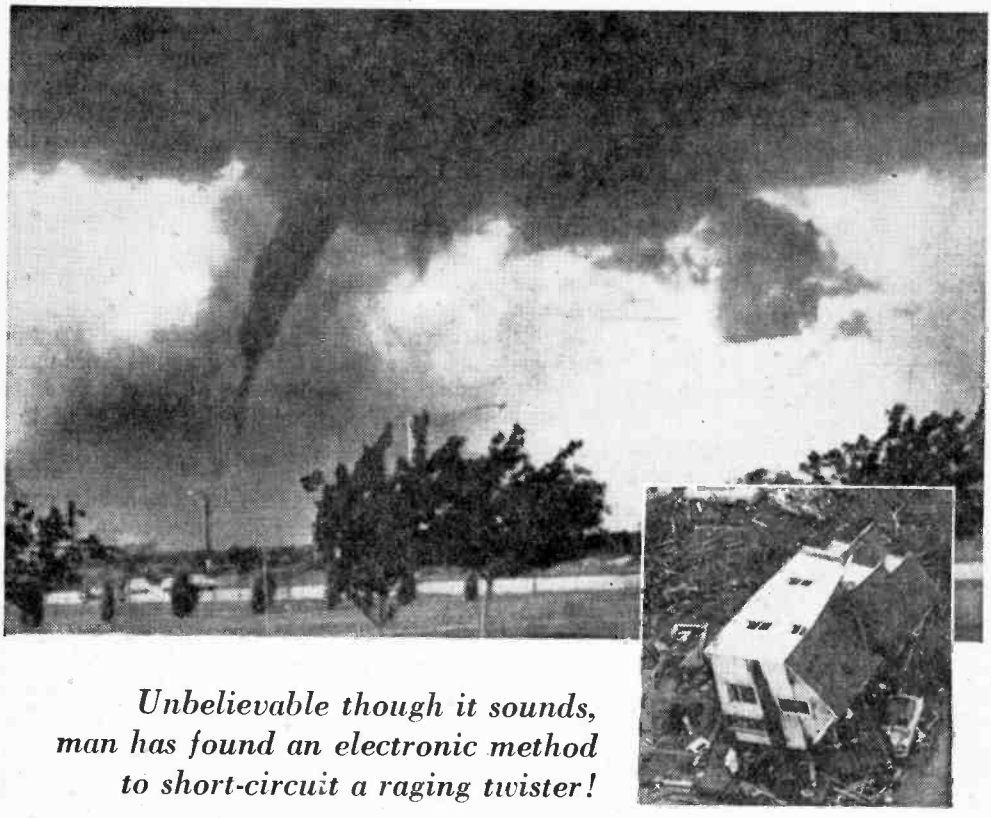
—M. E. B., Jacksonville, Ill.

Capacitors should be connected directly to the thermostat but there is no room and there is danger of lousing up the heater and cooking the fish. Get a new heater with built-in radio interference filters. ■

TORNADO BUSTING

Radio-TV EXPERIMENTER

by Jorma Hyypia



Unbelievable though it sounds, man has found an electronic method to short-circuit a raging twister!

If you hanker to watch a real tornado in action, find a rock to sit on in the middle of Kansas, between four and six in the afternoon, on Friday the Thirteenth, in May. If tornado statistics mean anything, you should be in the ideal space-time orientation to satisfy your penchant for uncontrolled violence.

But if you have ever been pushed around by a tornado, or if you have seen the calamitous aftermath of its fantastic power, you probably go right along with those who would like to see these wind-spooks blasted out of existence. And it might just happen that while you are sitting on that rock in Kansas, someone may come along and try to do precisely that—with a 40 millimeter cannon! Should this happen, don't pass the artilleryman off as some sort of a nut—a latter-day Don Quixote tilting with space age windmills—because he will be conducting a wholly rational and sophisticated scientific experiment. His aim will be to short-circuit the biggest electrostatic motor in existence—the tornado.

The notion of shooting down tornados is still only a scientific theory which has yet to be proved out with a full-blown tornado. But miniature tornados are being created under controlled laboratory conditions. They behave like electrostatic motors, and can be turned on and off at will. If these man-made tornados accurately reflect actual electrical conditions in real tornados, a new war against the elements may one day erupt in Kansas or some other convenient location in the midwestern tornado belt.

TORNADO BUSTING

If the idea works, there will be immeasurable benefits in lives saved and property protected from total devastation. During the half-century since 1916, there have been over 14,000 *recorded* tornados within the borders of the United States; the total death toll has been about 10,000; the estimated property damage now approaches the $800 million mark.

How numerous and how widespread is this natural enemy? Fig. 1 shows tornados occur in most areas east of the Rocky Mountains, although they are mostly concentrated in the midwest. The average number of tornados per year works out to 276 on basis of a near half-century of records. But this figure is grossly misleading because tornado-counting has become fully organized only in relatively recent times. If the recorded tornados of the past ten years are averaged, the annual U. S. tornado expectation works out to about 660 a year!

The whirling winds of a tornado can climb to speeds of 500 miles an hour. As if this were not enough, updrafts moving up to 200 miles an hour, and barometer-shattering vacuums inside the tornado funnels literally cause houses to explode and add to their destructive power.

Small wonder that year after year death and property-damage statistics continue to increase. Individual storms often create appalling losses of life and property. For example, 317 people were killed by one tornado in Mississippi in 1840; another storm travelled 219 miles in 1925 leaving in its wake 689 dead, 1,980 injured and $17 million worth of destroyed property; a 1953 tornado in Massachusetts set an all time record of $52 million in property damage; and only two years ago a storm in the midwest killed 240 and injured 5,000 people.

The Genesis of Terror. How are tornados formed? What accounts for their tremendous power? The scientific community still has no definite answers, mainly because intensive study of the mechanics of tornado formation has been going on only during the past decade or so.

Clues were sought in the various observable characteristics of the storms. There are always powerful electrical disturbances; sounds described variously as roaring freight trains or the buzzing of millions of bees are characteristic; heavy rains or hailstorms usually accompany tornados; and at times those curious lights known as *St. Elmo's Fire* are seen on the ground in the vicinity of tornados.

There is increasing evidence supporting the idea that tornados are spawned by enormous positive and negative electrical charges that are built up in clouds by rising columns of air. But the puzzle still to be unravelled concerns the triggering mechanism that suddenly taps these reservoirs of electrical power.

Early Researches. A number of scientists have contributed to tornado studies. Notable among these probings were the speculations and experiments conducted by researcher Paul Silberg of *Raytheon Company*. A few years ago Silberg theorized that tor-

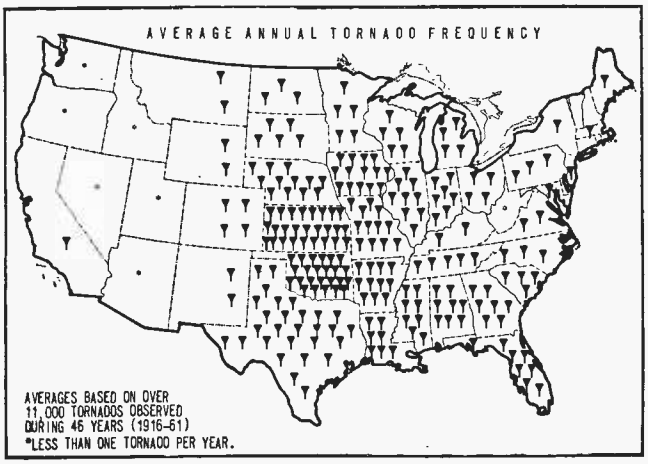


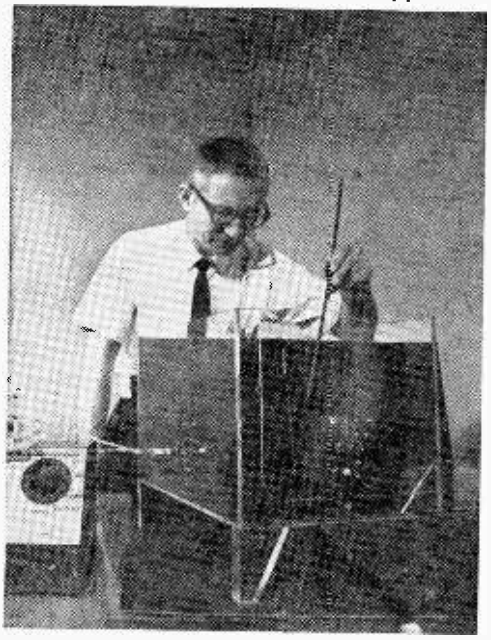
Fig. 1. Occurrence of nature's malevolent force is seldom in the mountainous regions. Most likely areas are the flat open sections of the great plains of the central United States.

nados could perhaps be generated by electrical energy stored in clouds; but as recently as 1962 Silberg had to admit that there was no real proof that the electrical energy (known to be accumulated in clouds) actually *does* create the storms. There was the possibility that the storms might be created by some other unknown mechanisms, and that the electrical phenomena associated with tornados were the results, not causes, of the storms.

Silberg conducted several laboratory experiments in an effort to separate cause and effect. In one experiment he placed sixteen spherical electrodes into a ring configuration, then energized the system by connecting a small Van de Graaff electrostatic generator to only two of the spheres. He placed polyethylene and brass rotors in the center of the ring of spheres to serve as sensitive detectors of electrical charges. When the Van de Graaff generator was turned on, these rotors revolved at rates varying from 20 to 150 revolutions per minute. Waveform analyses indicated that the spinning action generated pulsed oscillations against the background electrostatic field configuration. This was taken as clear indication that rotary and vertical motion could be induced electrostatically.

In a second experiment, Silberg placed a similar electrode configuration inside a large transparent tube. A 90-kv electrostatic power supply was used to charge the system. When smoke was introduced into the tube, it acquired a rotary fluid motion whenever the power was on, and stopped moving when the power was cut off.

Dr. Vernon J. Rossow, a scientist at NASA's Ames Research Center (near Mountain View, Cal.) with some of the laboratory apparatus.



NASA Stirs Up a Storm. Using the discoveries of Silberg and other scientists as a springboard, *NASA* researcher Vernon Rossow (*Ames Research Center,* Moffet Field, Calif.) has gone ahead to develop more sophisticated theories about tornado formation. Rossow is now making miniature tornados in his laboratory by imposing high electrostatic charges onto jets of cooled steam. Rossow believes he is getting close to answering the vital questions about tornado formation. He also has ideas about how to knock out tornados before they can go on their rampages.

Super Motor. Rossow visualizes a tornado as a super-size electrostatic motor somewhat like that in the simplified diagram in Fig. 2. This motor has large, fixed electrodes charged to a high voltage differential. Between the electrodes is a rotor which transfers charges from one electrode to the other, thereby tending to neutralize the electric field. As the electrostatic forces of repulsion and attraction on the charge-carrying elements of the rotor make the rotor spin, the reservoir of electrical energy in the system is converted to mechanical energy in the rotor.

A typical cycle starts with the rotor ends in grazing contact with the electrodes so that they are charged to the same potentials as the adjacent electrodes. Since bodies with identical charges repel one another, and opposite bodies attract, the rotor ends are driven away from the starting positions. At the end of a half-revolution, the initial charge is deposited on the opposite electrode while a new charge of opposite sign is picked up and the process is repeated again and again.

The rotor may have any number of charge carriers and any number of electrode pairs. The speed of rotation depends on the charges on the rotor ends and electrodes, and on the friction drag of the surrounding medium. The rotor can move in either direction with equal effectiveness.

The analogous condition in a storm cloud would consist of charged positive and negative regions in the cloud replacing the fixed electrodes, a gaseous rotor composed of

TORNADO BUSTING

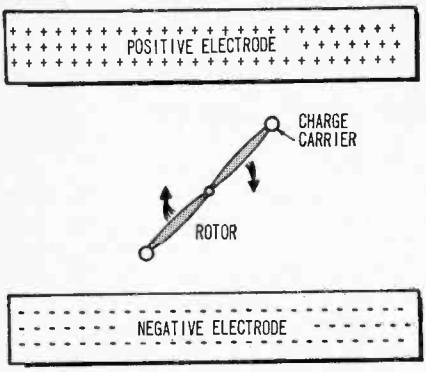


Fig. 2. Diagram of electrostatic motor shows how rotary motion is developed in vortex by effect of accumulated high-voltage charge.

charged water droplets, and air as the rotor spindle.

It is theorized that two elongated regions in a cloud become filled with charged water droplets (Fig. 3). It is further theorized that the intensity of the electric field between the charged regions is too low for discharge by lightning, but strong enough to drive fluid motion. It is estimated that this potential is in the order of 3,000 to 10,000 V/m.

When the potential (E) is large enough, a sizable eddy of cyclonic or anti-cyclonic rotation (clockwise or counterclockwise—depending on whether it is in the northern or southern hemisphere) from winds in the storm clouds disturbs the charged fluid system enough so that the unstable system is put into motion as shown in Fig. 4. There is a build-up of circulatory motion resulting from transfer of charge from one region to the other in a manner analogous to the electrostatic motor discussed earlier.

Since a well-charged region must be available to drive the induced vortex, the circulatory flow fluid (the central uncharged core and adjacent mixing areas) must move to new charged regions; this movement determines the path of the tornado. The "wake" is made up of nearly neutral fluid consisting of positively and negatively charged droplets that are coalescing to produce rain (which sometimes falls in the form of hail). Light emitted during this coalescence may account for the steady glow often seen to accompany tornados.

The initial rotary movement soon extends to the ground in the characteristic shape of a tornado funnel because of convection of vorticity, downdrafts, or viscous shear. This is a predictable and characteristic aspect of almost any vortex, as witness the behavior of water draining rapidly out of a sink or bath tub.

An admittedly over-simplified version of the theorized flow field is shown in Fig. 5. In the laboratory, the charge transfer positions are approximated by grids 1 and 2 which remove arriving charges and recharge the carrying water particles with charges of the opposite sign. In an actual tornado the arriving gases are thought to be expelled into adjacent cloud regions and the departing gases are drawn into the charge carrying channel at the same rate. The two contact points (grids 1 and 2) would behave like solid barriers in an actual tornado.

Laboratory Simulation. Rossow found that he could make small, four-inch high tornados in his laboratory from steam mixed

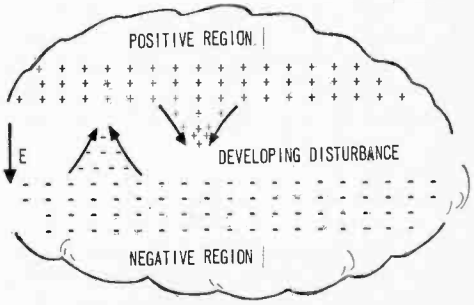


Fig. 3. In the initial stage of tornado formation, electrically charged clouds are thought to develop a localized instability as the opposing charges try to neutralize themselves.

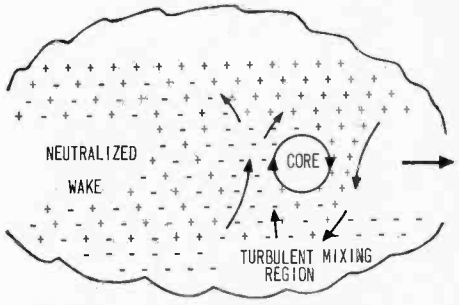


Fig. 4. As charge builds up a core or vortex is created. Core advances along charged area leaving a neutralized wake which often contains both rain and hail as well as light.

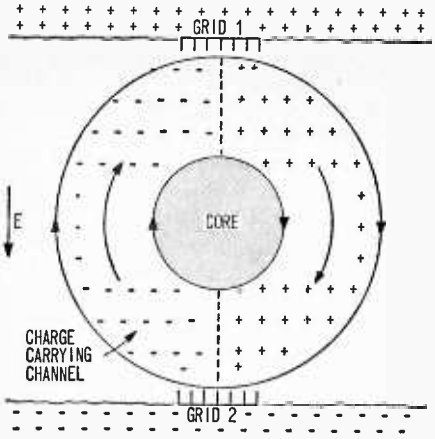


Fig. 5. A charge-carrying channel in the vortex moves positive and negative charges in opposite directions between charged cloud areas. Grids supply charge in laboratory.

with enough cool air to bring the system to the point of condensation. Sharp-pointed electrodes are used as charge injectors.

A lot of preliminary experimentation was needed before Rossow could set up a reliable tornado generator. First various shapes and arrangements of electrode grids were used to determine the flow streamlines that would result. The first tests were made with a linear electrostatic generator diagramed in Fig. 6. From these tests it was learned that sufficient charge (using 20,000 volts) to set the steam-air mixture into motion could be obtained with several wire points, 0.2 millimeters in diameter, which projected a short distance downstream of the wire grid.

The grids were then arranged in circular configurations inside a cylindrical boundary (Fig. 7) and suspended over a ground plane (Fig. 8). The drawings show the types of vortexes that were obtained in each case.

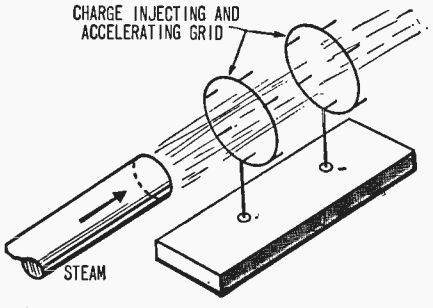


Fig. 6. A linear accelerator was used to study grid shapes. Wire points, directed downstream of steam jet, were found necessary in order to achieve maximum vapor acceleration.

The final grid system (Fig. 9) was made to resemble an electrostatic vortex over ground. Note the asymmetric positioning of the grids; these off-set positions were found to be necessary in order to achieve the maximum degree of circulation.

Bigger Tornados. You might think that Rossow would be satisfied now that he can turn his four-inch tornados on and off at will. Not so. The scientist is hard at work seeking ways to make bigger tornados in his lab. These, he believes, will lead to better measurements of the velocity of the field, more accurate descriptions of the way in which vorticity is transferred to the ground, and in general more accurate knowledge about all the variables that are critical for vortex formation.

How to Stop Tornados. A laboratory tornado can be stopped by the simple act of turning off the electrical power; the whole system coasts to a stop as soon as the residual charges on the electrodes are neutralized.

But how might it be possible turn off full-sized natural tornados? In theory, in exactly the same way—by removing the power that drives the tornado, *if* the driving mechanism behind a real tornado is in fact

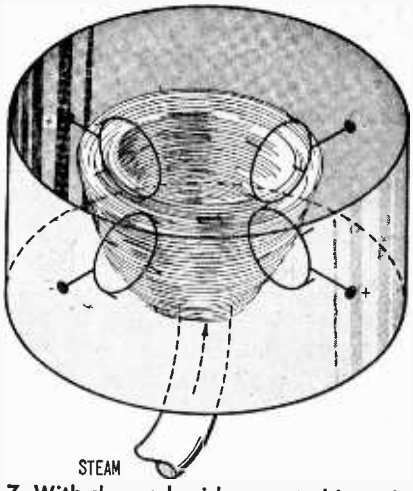


Fig. 7. With charged grids mounted in a circle, steam (injected at bottom) formed a rapidly turning tornado-like vortex in test chamber.

similar to that used in the laboratory. One approach would be to find some way of preventing the electrical charging of clouds to those conditions which would be conducive to tornado formation. However, this approach at present would seem to be applicable only in science fiction.

A more realistic method, it seems, would

TORNADO BUSTING

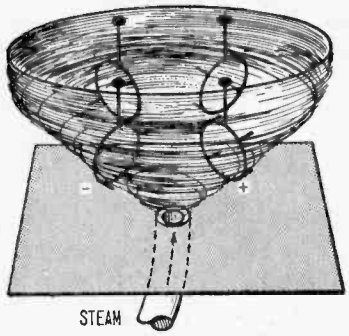


Fig. 8. The circular grid arrangement produces an electrostatic vortex over a ground plane when cylindrical boundary is absent.

be to short-circuit the cloud charges before they have a chance to build up to tornado-forming potentials. Rossow believes there is a good chance that this could be done by shooting long, fine copper wires into the clouds with a 40 millimeter cannon. The special projectiles would be pre-wound with AWG-40 wire (which is 0.003 inches in diameter). One pound of such wire would stretch out for over 5 miles when fully unwound. The rear plate of the projectile—necessary for launch purposes—could also serve as a drag parachute to aid in the unravelling of the wire. The unwinding would have to be timed to begin only after the projectile had travelled from ½ to 1 mile from the launch site to ensure the safety of the launch crew.

A number of such wires, spread out in front of and on top of the tornado (Figs. 10, 11), would trigger lightning discharges which would quickly short out the charges and tend to neutralize the electric field in the cloud. Such neutralization would remove the driving power behind the tornado and the storm would presumably coast to a stop.

Do Rossow's experiments *prove* that tornados can be shot down in this manner? "No," says the scientifically cautious researcher, "quite the opposite. If actual field tests with cannon are successful, *those* results would prove that the electrostatic motor theory is in fact correct."

War Without End. Assuming that theory will prove to be fact, one can begin to imagine the type of war that would be waged against these natural enemies. One of the major problems would be to find the tornados and put them out of action in extremely short periods of time. The "lives" of tornados are known to extend anywhere from a few seconds to as long as four hours; the average duration is only about *4 minutes!* Some tornados only travel a few feet while others are known to have travelled far greater distances—as much as 400 miles; the average path length is about 2 miles.

Obviously, the "average" tornado would be a most elusive adversary; it would materialize almost instantly, travel 2 miles in four minutes, and disappear. Is it even possible to make contact, much less prepare to fight such a foe?

The problem appears somewhat less formidable when it is remembered that statistical averages represent the composite picture of very short-lived tornados which would have relatively little time to wreak widespread havoc, and the longer-lived tornados which present greater dangers. A great many tornados occur in areas where they are likely to do little or no serious damage—as

(Continued on page 116)

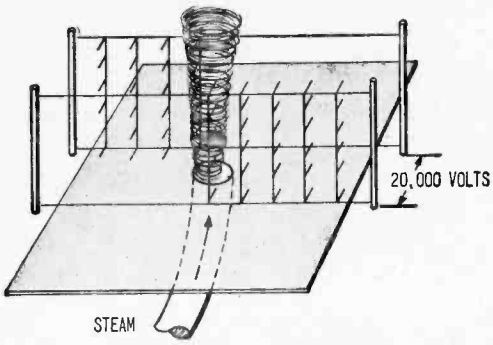


Fig. 9. This asymmetric grid arrangement simulates charged cloud regions over the earth.

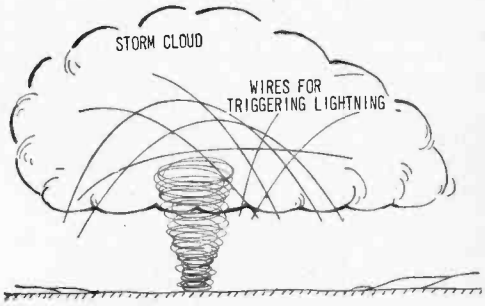


Fig. 10. In theory, a tornado conceivably could be short-circuited by launched conductors.

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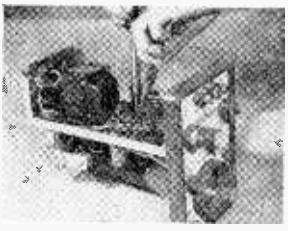
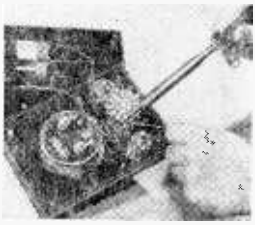
Construction of Oscilloscope.



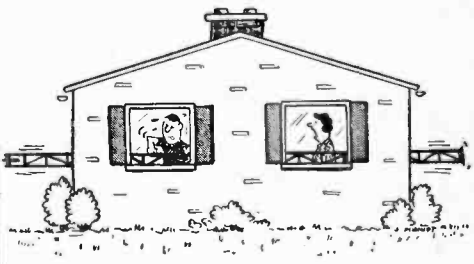
Construction of Multimeter.



KIT KAPERS

By Jack Schmidt

"Serves you right!
You and your imported bargains!"



"Are you certain that the antenna has to be assembled in the house?"

"Doris, have you seen my instruction book?"

"No, they won't make nice earrings!
They're going to make a nice receiver!"

COVER STORY

Talk on a light beam with our . . .

INFRARED COMMUNICATOR

In the infrared region you don't have to worry about licenses, TVI or the complaints from neighbors, or eavesdroppers.

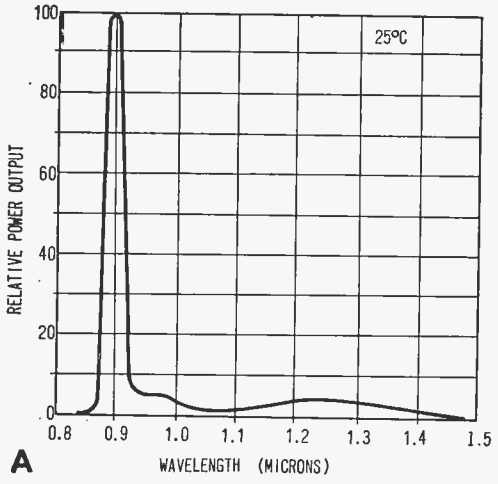
by Charles Caringella, W6NJV

■ A fantastic new semiconductor device has recently left the laboratory stage and is now available "off-the-shelf" from many electronic parts dealers handling industrial components. The device is the *gallium-arsenide* diode, which emits invisible infrared rays when current is made to pass through it. Modulate it, and you can transmit intelligence between two distant points!

If you have been searching for a real Science Fair show stopper—look no further. Build this *gallium-arsenide* (GaAs is the scientific abbreviation) *Infrared Communicator* system and transmit music or sound over an invisible beam to distances of 100-feet and more.

As the radio-frequency spectrum becomes more cluttered and jammed, light-beam communication links employing similar semiconductor devices will take over. Experimental systems are now in operation (like the *Infrared Communicator,* only on a much larger and more expensive scale) and have successfully transmitted audio and video information over distances of 30 miles and more.

The Gallium-Arsenide Diode. The *General Electric* LED-9 emitting diode was chosen for this system since it proved to be the most readily available and the least expensive ($12.00 from *Allied Radio*) of the currently available diodes. The actual GaAs semiconductor chip measures only 0.010-in. in diameter. A transistor-type enclosure, with a glass lens mounted on the top of the case, houses the tiny chip. The entire pack-



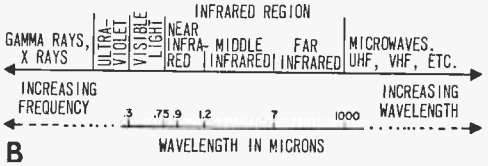


Fig. 1. Emission of the GaAs diode (left) is shown on an enlarged segment of electromagnetic spectrum. This is the portion indicated as near infrared in the chart below.

INFRARED COMMUNICATOR

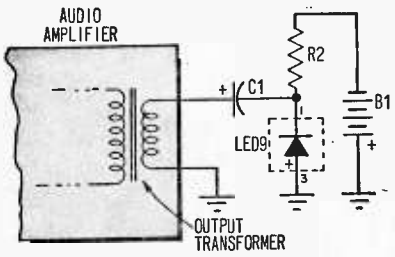
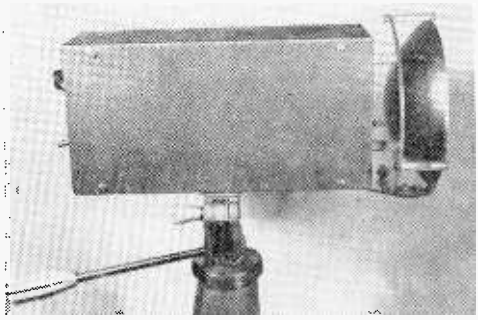


Fig. 2. Simplified schematic of output circuit used to modulate gallium-arsenide diode.

Fig. 3. Complete schematic diagram of amplifier modification to infrared transmitter.

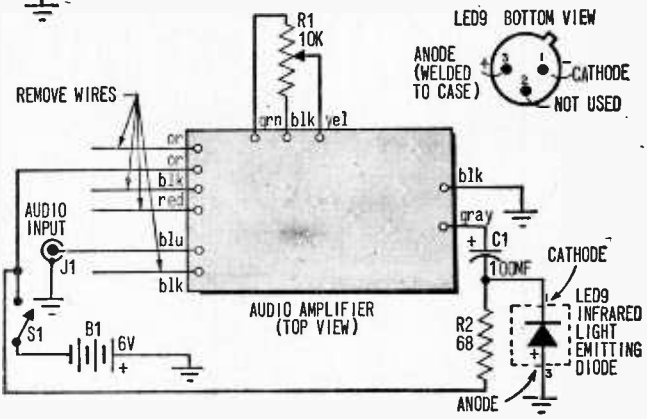
Fig. 4. Completed infrared transmitter is mounted on tripod to make aiming easier.



age is not much bigger than the head of a wooden match! Infrared light is emitted from the diode junction when DC current is passed through it in the forward direction (forward bias.) This phenomenon is known as electroluminescence. The emitted light output is directly proportional to the amount of current passing through the diode.

As shown in Fig. 1, the diode emits a very narrow "band" of frequencies at 0.9 micron (9,000 Angstroms). This lies in the near-infrared region of the electromagnetic spectrum. The emitted light is non-coherent even though the bandwidth is very narrow. Specially designed, more costly diodes, can be made to emit coherent (single frequency) light. They must be pulsed with extremely high-current, short-duration pulses. This special class of emitting diodes are sometimes referred to as *laser* diodes. The emitted light output of the GaAs diode can be amplitude modulated, and the operation is similar to an AM transmitter. GaAs diodes have inherently fast response and can therefore be modulated up to about 100 MHz. Audio *and* video information can be easily transmitted by these diodes.

Under normal operating conditions, the power output of the GE LED-9 is low—about 50 microwatts! This probably doesn't sound like much power. However, by employing proper optics, the emitted light can be beamed over a considerable distance.



How The Transmitter Works. The simplified electrical diagram of the transmitter is shown in Fig. 2. Battery supply, B1, furnishes the DC forward bias for the diode. Resistor R2 serves as the DC current limiter, and also as the AC load resistor. Capacitor C1 couples the AC modulating current from the audio amplifier to the diode. The output impedance of the audio amplifier closely matches the AC impedance of the diode circuit.

The complete schematic diagram of the transmitter is shown in Fig. 3. Battery supply, B1, consists of four D-size flashlight cells connected in series to provide 6 volts. B1 powers the audio amplifier and also provides the DC bias for the GaAs emitting diode.

Using a *Lafayette* preassembled audio amplifier greatly simplifies the circuit. Since this amplifier provides lots of gain, it is possible to use any type of microphone, such as a crystal or ceramic type. So of course you can even feed the output of a phonograph cartridge into the amplifier. Since the

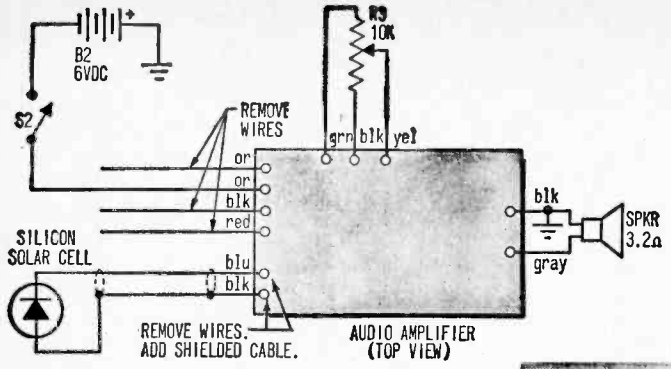
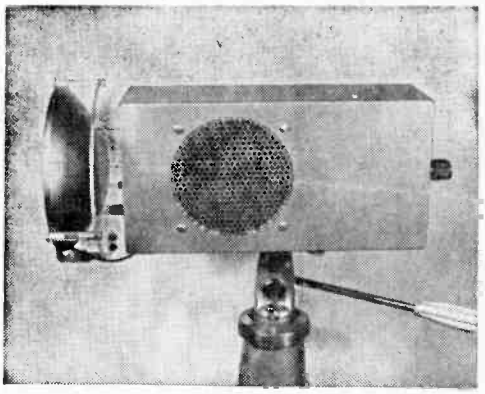


Fig. 5. Schematic diagram shows added components you must connect to use ready-wired transistor amplifier as receiver for infrared transmitter on facing page.

Fig. 6. Major external difference between transmitter and receiver is the speaker grille on one side of receiver.



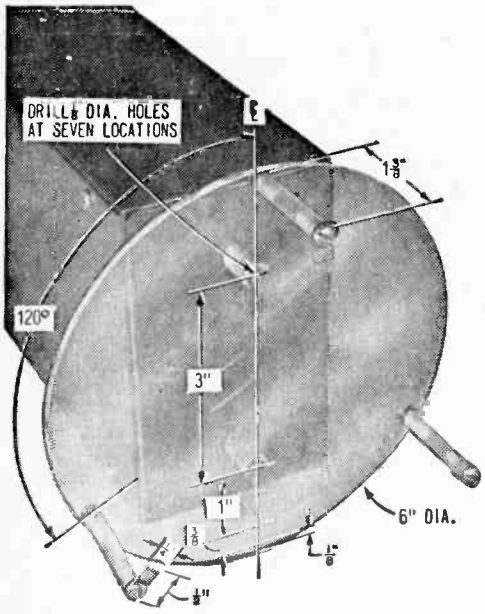
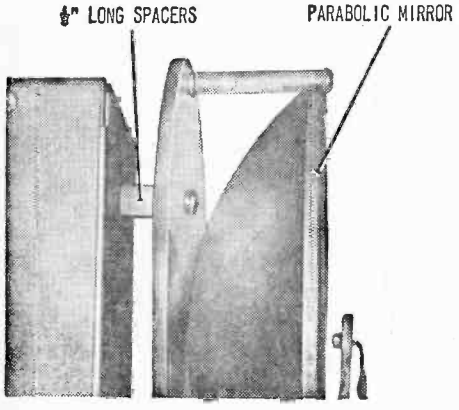


Fig. 7. Dimensions of mirror mount are given above. Disc can be cut from wood, plastic or fiber as long as material is rigid enough to hold mirror in place and will not be affected by variations in temperature or humidity.



output of a crystal cartridge is usually much higher than that of a microphone you may have to reduce the signal level through a separate gain control.

Referring to the schematic diagram, you will notice that not all of the amplifier leads are used. The diagram shows which wires to remove.

Bias current through the diode is limited by R2 to approximately 80 milliamps. R1 serves as the gain control, and is used to set the modulation level. Over-modulation will cause the audio signal to be clipped by the diode resulting in a distorted signal. Therefore, R1 is adjusted to prevent this.

The completed transmitter package is shown in Fig. 4. It consists of a mirror assembly mounted on a standard 5 x 10 x 3-inch chassis. The diode is held in the focal point of the mirror with a special bracket. A 5½-inch diameter "mangin" mirror (available from *Edmund Scientific* for $5.00) is used. The infrared rays emitted from the diode are focused into a very narrow beam, very much like that from an automobile spotlight. This beam is aimed at the receiver unit which employs a similar set of optics.

The Receiver. The complete schematic diagram of the receiver is shown in Fig. 5. Basically, it is a silicon solar cell feeding

INFRARED COMMUNICATOR

another preassembled Lafayette audio amplifier. The solar cell detects the infrared rays emitted by the GaAs diode. Its spectral response very closely matches the spectral emission of the GaAs diode. The silicon solar cell *spectral sensitivity* curve looks very much like the *spectral emission* curve of the GaAs diode shown in Fig. 1. The silicon solar cell is also a very "fast" detector and therefore easily responds to the audio modulation content of the infrared beam.

Battery supply, B2, consists of four D-size flashlight batteries in series to provide 6 VDC. R3 serves as the volume control for a 4-inch 3.2-ohm PM speaker connected to the output of the audio amplifier.

The completed receiver package is shown in Fig. 6. Like the transmitter, it consists of a mirror assembly mounted on a standard 5 x 10 x 3-inch chassis. Here the *solar cell* is held in the focal point of the 5½-inch "mangin" mirror with a special bracket. The infrared beam from the transmitter is focused on the silicon solar cell by the mirror. A shielded lead must be used to connect the solar cell to the input of the amplifier within the chassis enclosure.

Size of the solar cell is not important. The cell used here measures 0.4 x 0.4-in. (equivalent to a *Hoffman* type 110C). Any of the smaller sizes (as specified in the Parts List)

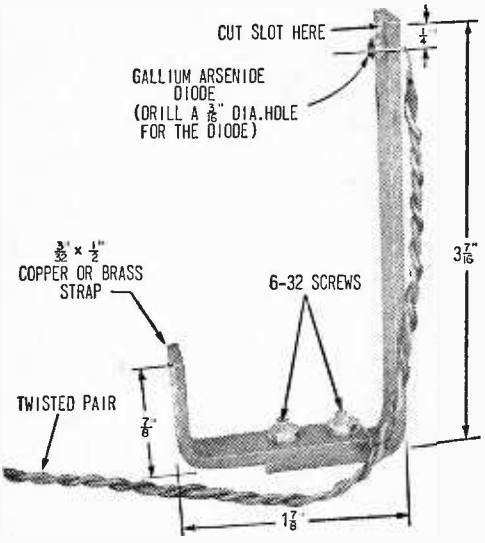


Fig. 8. Diode mounting bracket (left) holds diode in focal point of mirror.

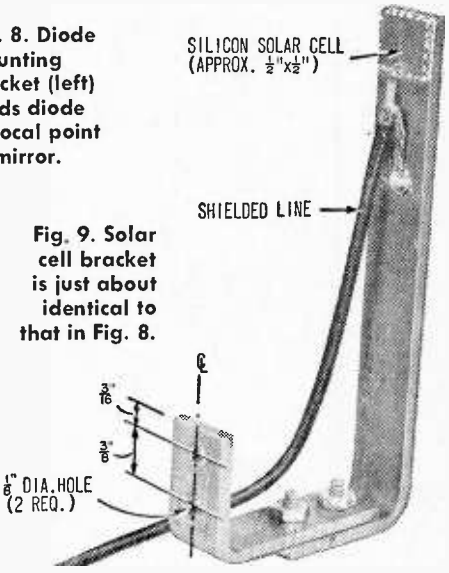


Fig. 9. Solar cell bracket is just about identical to that in Fig. 8.

PARTS LIST FOR INFRARED COMMUNICATOR

B1, B2—6-volts DC (four D-size flashlight cells in series or equiv.)
C1—100-mf, 12 WVDC, miniature electrolytic capacitor (Lafayette 99C6086 or equiv.)
J1—Phono jack (Switchcraft 3501FP or equiv.)
R1, R3—10,000-ohm potentiometer
R2—68-ohm ½-watt carbon resistor
S1, S2—S.p.s.t. toggle switch
2—Five-transistor push-pull audio amplifier, 360-milliwatt output (Lafayette model PK-544, 99C9037 or equiv.)
1—Gallium Arsenide emitting diode (General Electric LED-9, available from Allied. Price: $12.00)
1—Silicon solar cell, see text (Hoffman 51C, 55C or equiv.—Newark)
2—5x10x3-in. aluminum chassis (Bud AC-404 or equiv.)
2—5x10-in. aluminum bottom plates (Bud BPA-1591 or equiv.)
2—5½-in. diameter mirrors (Edmund Scientific No. 70080)
1—4-in. PM speaker (Lafayette 99C6268 or equiv.)
4—Dual D-size battery holders (Keystone 176 or equiv.)
4—½-in. spacers, ¼-in. O.D., tapped 6-32 (H. H. Smith ceramic stand-off insulator type 2641 or equiv.)
2—Knobs
2—¼-in. rubber grommets
1—Terminal strip
3—Solder lugs
Misc.—Shielded wire, microphone, speaker grill, sheet plastic or plywood, plastic rod or wood dowel, brass or copper strap, 6-32 hardware, hookup wire, solder, etc.

Estimated cost: $45.00
Construction time: 7 hours

will work equally well if connected properly.

Construction. Construction details of the mirror holders are given in Fig. 7. You can use any material, such as plastic, wood, pressed hardboard, etc., to construct the holders. The main objective is to hold the glass mirrors securely without chipping, cracking or otherwise damaging them. Ceramic spacers (they're actually stand-off insulators) are used to secure the mirror holders to the chassis enclosures.

Two identical J-shaped brackets are fabricated for the GaAs diode and the solar cell. Details are shown in Fig. 8 and Fig. 9. Heavy aluminum, copper or brass strap material should be used to fabricate the brackets since it is important that the GaAs diode and the solar cell are rigidly supported in the focal points of the mirrors. Each bracket is built in two halves. The holes for the 6-32 screws used to fasten the two halves together should be long slots to permit "focusing" the GaAs diode and the solar cell. The heavy strap material can usually be found at any sheetmetal shop or in the do-it-yourself materials section of hardware and building supply dealers.

The GaAs diode is mounted in a 3/16-in. hole. Slot the end of the bracket as shown in Fig. 9, then press fit the diode into the hole.

The rear of the solar cell is pretinned with a low-melting-point solder. Solder the solar cell directly to the bracket (if you use copper or brass) as shown in Fig. 8. The inner conductor of the shielded lead is soldered to the conducting strip on the front side of the solar cell. The outer shield is soldered directly to the bracket.

Inside views of the transmitter and receiver are shown in Fig. 10 and Fig. 11. The location of parts is not critical nor is the wiring. Make sure the black leads on the audio amplifiers are grounded to the chassis. The leads from the GaAs diode and the solar cell pass into the chassis through ¼-inch rubber grommets.

Operation. Successful operation of the *Infrared Communicator,* particularly over any distance, hinges on how well you align the optics. It is suggested that both units be mounted on tripods for added versatility.

You can focus the GaAs diode and the silicon solar cell in the following manner. Set the units about 25-feet apart and aimed at each other. Both units should be turned *on*. Turn the volume control on the receiver all the way up. You will hear the internal noise (rushing sound) generated by the audio amplifier. Now turn the gain up on the transmitter. You will hear an added noise level in the receiver. This is due to

(Continued on page 116)

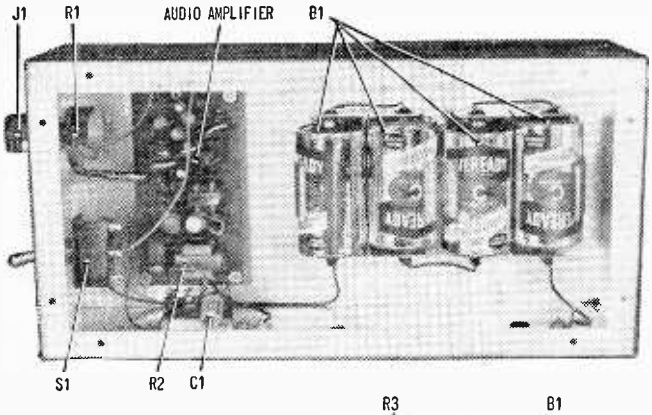


Fig. 10. Completely wired transmitter (above) only needs to have mirror and GaAs diode mounted at one end.

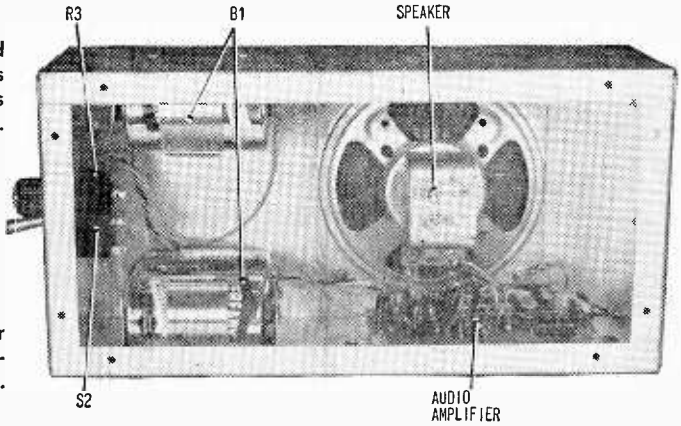


Fig. 11. Insides of the receiver shows speaker, amplifier, battery B1 and panel controls.

BANANA BELT DX

by C. M. Stanbury II

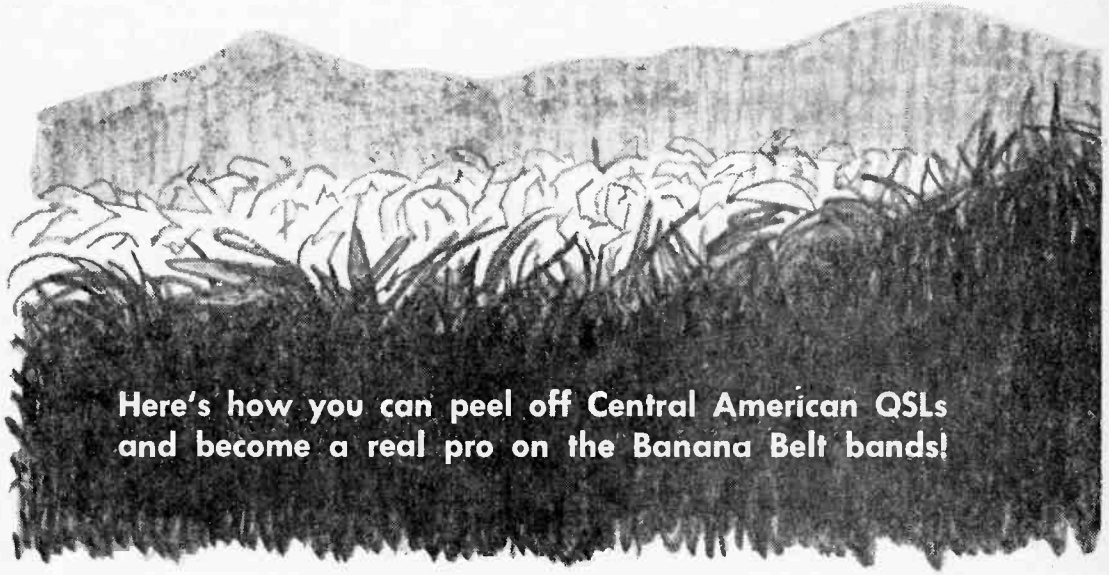
■ Of all the areas on earth a DXer can tackle, one of the most challenging is right in his own backyard. Central America, stretching southeastwardly from Guatemala to Panama (and the Panama Canal Zone), can be logged either on shortwave or the broadcast band, though few of its stations have high power and most are tricky to QSL. In other words, the eight tiny countries of Central America will give every DXer a chance to try *all* his DX skills.

Guatemala. Moving from west to east, we start with Guatemala which has the longest history of any Central American nation. Here civilization reaches all the way back to the Mayan empire. More recently, Guatemala was the scene of the first Communist takeover in Latin America which took place in the early '50s. Said red regime was subsequently overthrown by the CIA, and presently, the government is slightly right of center.

Possibly the most interesting DX catch is TGBA "Radio Maya" at Barillas on 2360 kHz. Although above the MW BCB, that is still technically MW territory. In addition to Spanish, this religious station also transmits in such exotic languages as Cluj, Mam and K'jobal. Everything about TGBA seemed so unusual that one well known club editor even went so far as to compare it with a *hoax station.* (You can't believe everything you read!) But, there really is a R.Maya and on good evenings it can be heard prior to their 2200 EST S/Off.

Of course Guatemala's most powerful station is government owned R.Nacional at Guatemala City. During the communist era it was, needless to say, very active on the international bands. Currently, R.Nacional uses only one SW frequency, 6180 kHz (TGWB) where it is very heavily QRMed. The BCB frequency, 640 kHz (TGW) also suffers severe interference from CMQ in Habana (Havana, if you prefer the English spelling) as well as our own KFI in Los Angeles.

Ironically, a low powered regional government station is much better heard in the U.S. and Canada than the main Guatemala City transmitters. This station is TGFP, R.Nacional Tikal on 6205 kHz at Flores Peten, often heard evenings until they S/Off at 2330 EST. Incidentally, TGFP is located in the heart of Guatemala's wild northern jungle. Finally, novices hunting Guatemala



The author has bagged a few QSLs. Top left is Panama's HOHM on the BCB; bottom left lighthouse station TIFC on 1075 kHz in Costa Rica, and at right is Guatemala's BCB station TGW, "La Voz de Guatemala."

Banana Belt DX

should start with TGNB R. Cultural at Guatemala City which has English religious programming on 9670 kHz at 2200-2300 EST.

British Honduras. Roughly 90 miles east of Flores Peten we find Belize, capitol city of British Honduras. In a year or two, this country expects to graduate from colony to independent nation status. Then the whole country will be known as Belize. (A new hot country for DXers and stamp collectors.) Unfortunately, Guatemala is holding up proceedings by claiming British Honduras as its own. These claims were pressed most vigorously during Guatemala's red period, via potent R.Nacional, and these claims are still being pressed although somewhat more quietly.

ABBREVIATIONS

BCB	broadcast band
CIA	Central Intelligence Agency
DX	long distance, distant (contact or country)
DXer	hobbyist who seeks DX contacts
EST	Eastern Standard Time
kHz	kilohertz (kilocycles)
kw	kilowatts
M	meters
MW	medium wave
QRM	noise and signals interfering with desired signal
QSL	decorated postal card or letter from station acknowledging reception report
R.	Radio (as in Radio Maya)
S/Off	sign off
SW	shortwave
SWBC	shortwave broadcast
SWL	shortwave listener

R.Belize is widely logged by North American DXers, both on the MW broadcast band (where they have a 20 kw transmitter on 834 kHz) and on 3300 kHz. The latter is 90-M territory. R.Belize is apparently the only broadcast station in Central America without call letters.

Honduras. Moving south along Guatemala's eastern border, and crossing the Gulf of Honduras we come to the Republic of Honduras. This country has a long history of dictatorships and poverty. Currently, however, there is a form of democracy and it shows a few signs of prosperity as demonstrated by the appearance of broadcast stations in the smaller cities (really large towns). For example, HRRZ, R.Juticalpa on 4950 kHz, can occasionally be heard up here evenings until 2200 S/Off. Incidentally, when the CIA overthrew Guatemala's red regime, its army marched from Nueva Ocotepeque which today boasts HROE "La Voz de las Fronteras" on 5035 kHz, usually blocked for DXers by QRM.

There is no Honduran station easily heard by SWLs and many are eradic verifiers. One that will QSL correct reports consistently is missionary station HRVC R.Evangelica on 4820 kHz at the capitol, Tegucigalpa. Further, HRVC has English programs on Sundays prior to their 2230 S/Off. Moving up a little in frequency, HRQ R.Suyapa at San Pedro Sula is heard from time to time during evening hours on 6125 kHz, 49-M territory. With an ever increasing sunspot count, more and more high powered European QRM will be vacating this band thus making stations like HRQ easier to hear. R.Suyapa often identifies itself and S/Off is 2300 EST.

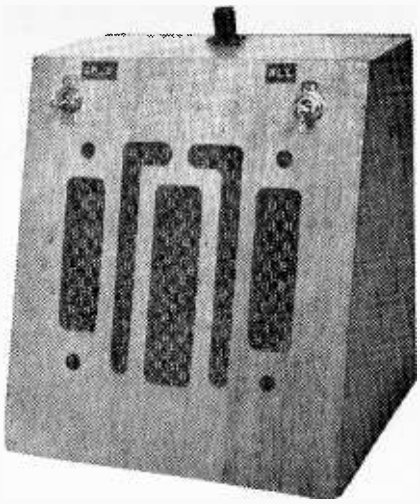
El Salvador. South of Honduras, cutting off most of its Pacific coast, is tiny El Salvador. This country shouldn't give SWLs much trouble as government owned YSS R.Nacional at the capitol San Salvador operates up on 31 meters, 9555 kHz where they are often heard at 0700-1200 EST, late afternoons and evenings. YSS also has a potent BCB signal on 655 kHz. If your broadcast band receiver has any kind of selectivity at all, you should be able to log them evenings. Unless, of course, you live in Nashville (WSM 650) or New York City (WNBC 660).

Console of YNOL ("Ondas del Luz") is prime Central American target for many DXers.

Nicaragua. East of Honduras is Nica-

(Continued on page 118)

CB Signal Center



Let this dual voice coil speaker reduce much of the clutter from your desk and free your operating position for important work.

by Herb Friedman, W2ZLF / KBI9457

■ If your CB operations consist of something more than sitting back and chewing the fat on 11 meters, your operating position is probably jammed to the edges of the desk with gear. Perhaps a radio to fill the silent voids between calls, maybe a second transceiver to cover the H.E.L.P. channel if you're involved in a REACT operation, possibly a public-service receiver for police and fire calls if you're part of an *emergency net.*

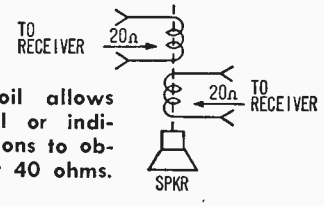
Yet, as important as all the auxiliary equipment might be, rare is the professional communications center that buries the operator under a mountain of equipment. Generally, the signal from secondary equipment is fed from a remote location, such as a closet, to a speaker at the operating position; and even the primary equipment might be remote controlled. In fact, in some of the really complex communications centers there is but a single speaker at the operating position, with a special electronic switch rapidly "cutting" the speaker into several circuits, so that a single speaker carries two or more signal circuits.

While electronic switching is somewhat expensive, there is still an inexpensive way for the CB'er to get more than one signal out of a single speaker; thereby freeing the operating position from the clutter of some of the receiving equipment.

One pathway to a clutter-free communications center is through the *CB Signal Center.* The Signal Center has but a *single* 6-inch speaker, yet the speaker can be connected to *two* separate receivers (or transceivers) at the same time. The levels can be preset so that one signal source is reproduced at a background level—such as music from a radio—while the second signal, say from a CB transceiver, comes in much louder and overrides the background signal.

Either signal circuit can be totally disabled, or if desired, the level from each receiver can be controlled directly at the Signal Center. The total flexibility of the Signal Center depends on how much you want to build in. In fact, total signal control can be built into the Signal Center so that all equipment can be placed in a closet. All you'll need is a remote (long cord) cable for the push-to-talk microphone.

How It Works. The heart of the signal center is a dual-voice-coil speaker, Utah's model SP6D-M1. As shown in the diagram below, each voice coil is completely independent of the other, and each voice coil can be connected to an individual receiver.



Dual voice coil allows series, parallel or individual connections to obtain 10, 20 or 40 ohms.

If the speaker is connected to two radios, the two separate radio programs will be reproduced. If one voice coil is connected to

CB Signal Center

a radio and the other connected to a CB transceiver, both the radio program and the CB signals will be heard.

Add the appropriate switching and volume control facilities shown in the *Signal Center* schematic and the *Signal Center* can control all the volume and program switching adjustments.

The schematic of the *Signal Center* shows two possible connections you can utilize. The connections for REC 1 has provisions for controlling the volume at the speaker. With the volume control of REC 1 set ¾ to full open, the volume is adjusted at the speaker by the L-pad (R1)—a speaker-level volume control that provides proper impedance match to the receiver's output transformer.

If you don't need volume control at the speaker, you can use the circuit shown for REC 2; a switch to cut the speaker in and out (S2) and a load resistor (R2).

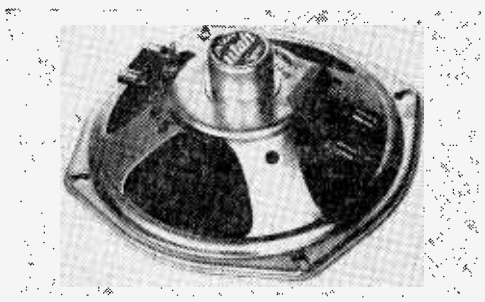
If you have no need to completely disable either signal source the switches can be eliminated. Of course, an L-pad can be used in both circuits to provide individual remote volume control.

Why The Load Resistor. If an L-pad is not used, the load resistor, R2, *must* be used to provide the correct terminating impedance for the receiver. This is because the impedance of each of the speaker's voice coils are 20 ohms. For 5-watt CB transceivers and table radios (which normally use a 3.2-ohm speaker) R2 is 3.9 ohms at two watts. (The 3.9-ohm resistor in parallel with the 20-ohm speaker provides a total impedance of approximately 3.2 ohms.) For 6 to 8-ohm speaker circuits R2 should be 10-ohms at 2 watts.

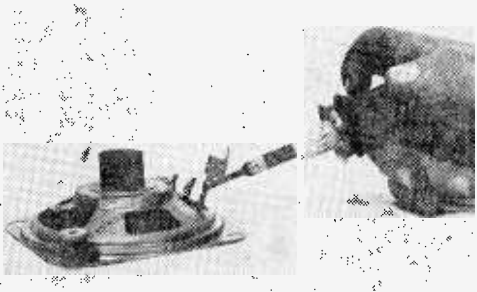
Resistor R2 isn't needed when an L-pad is used as the pad will "compensate" for the 20-ohm speaker voice coil mismatch as long as the L-pad isn't set "wide open." Just keep the L-pad backed-off slightly from full-open and you'll have no mismatch problems at all.

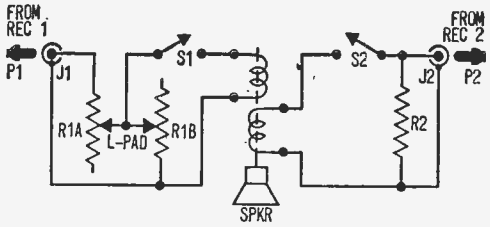
Keep in mind that the matching resistor does "eat up" some output level, and the receiver's volume control will have to be advanced slightly from the usual setting to obtain the "normal" speaker level.

Building the Signal Center. The unit shown in the illustrations incorporates the circuits shown in the large schematic; an L-pad control on REC 1 and a matching resistor for REC 2. It is housed in a 6-inch wooden speaker baffle.



Utah multi-impedance speaker has plug-in terminals (above) while speaker in AC/DC set (see below) uses typical solder connection.



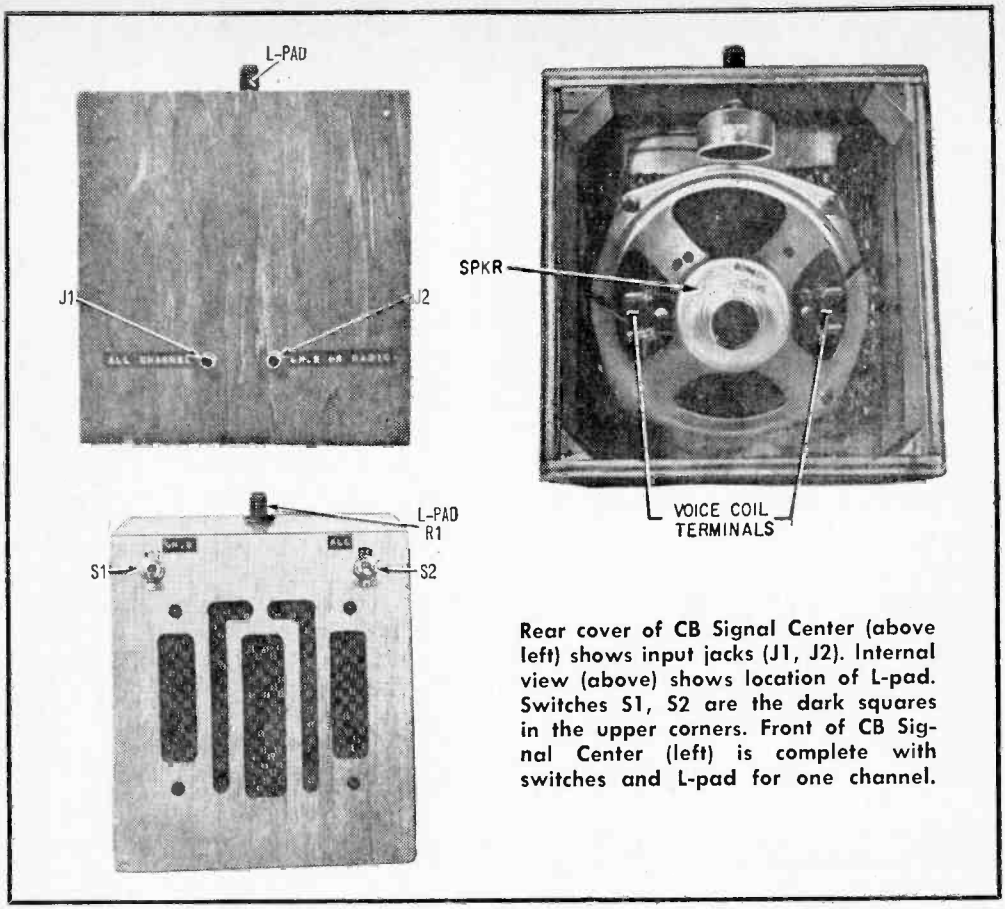


Signal Center schematic diagram shows two methods of connecting to the receivers. A load resistor (R2) can be used in place of the pad (R1) or two pads can be wired in the circuit.

PARTS LIST

J1, J2—Phono jack
P1, P2—Phono plug to match J1, J2
R1—L-pad; 4-ohm for 3.2- or 4-ohm circuits; (Lafayette 33C1376 or equiv.) 8-ohm for 6- or 8-ohm circuits (Lafayette 33C1378 or equiv.)
R2—Load resistor (see text)
S1, S2—S.p.s.t. switch
SPKR—6-in. dual-voice-coil speaker (Utah SP6D-M1, Lafayette 32C2205 or equiv.)
1—Speaker enclosure
Misc.—Terminal strips, lugs, solder, hookup wire, speaker wire, etc.

Estimated cost: $9.50
Construction time: 1 hour



Rear cover of CB Signal Center (above left) shows input jacks (J1, J2). Internal view (above) shows location of L-pad. Switches S1, S2 are the dark squares in the upper corners. Front of CB Signal Center (left) is complete with switches and L-pad for one channel.

While a metal enclosure might look more *pro,* keep in mind that a wood baffle produces a superior sound, with none of the metallic "ring" common to metal enclosures (you'll be surprised how good your transceiver sounds when you get the speaker out of the metal coffin).

If your speaker baffle doesn't come complete with a back panel cut one from a piece of plywood. If the speaker sounds *boxy* or hollow with the back on, simply drill two or three ½-in. holes in the back panel.

Install input jacks J1 and J2 on the back panel. If you don't use an L-pad solder the load resistors (R2) directly across the jacks. The load resistor (not shown in the photographs) is wired directly across the solder terminals of J2. Connect about 12 inches of two-wire zip-type (thin parallel) speaker wire to each of the jacks and then set the panel aside.

Temporarily mount the speaker—so you can judge the clearance for the switches. Mark the locations for the switches in the upper corners, then remove the speaker and drill the holes for the switches. If you use L-pads they can be installed on the top of the baffle as shown in the photographs.

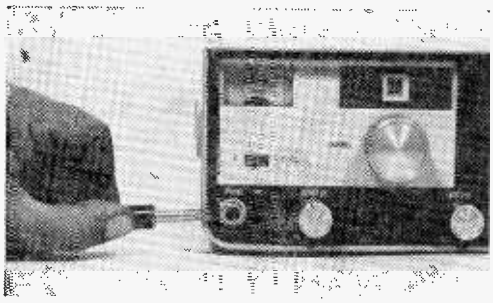
Mount the switches, the L-pad, do as much wiring as possible, and then install the speaker. Complete the speaker wiring and connect the leads from the back panel. Finally, use four wood screws to hold the back in place.

Connecting the Receivers. If both speaker circuits are to be connected to CB or communications receivers make up a patch cord with a phono plug at one end (for J1 and J2) and a plug at the other end that matches the headphone or remote speaker jack on the receiver. Simply plug the one end of the cord into the Signal Center and the other into the receiver.

If the receiver doesn't have a headphone or remote speaker jack, or if you're connecting to a radio, you'll have to make a slight modification to that speaker circuit,

Disconnect the leads at the radio's (or

CB Signal Center



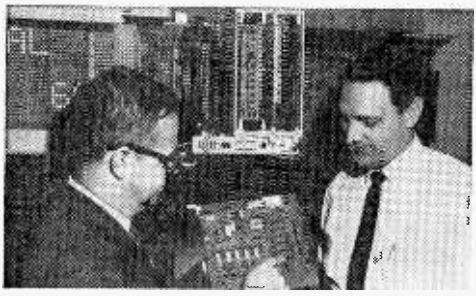
Often it is just a matter of inserting a plug into a jack to connect the BcB receiver or CB rig to the CB Signal Center speaker circuit.

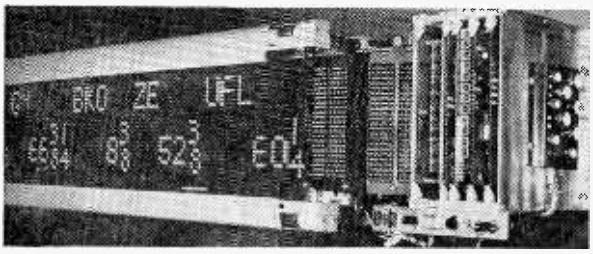
receiver's) speaker, and as shown in the photographs, solder a terminal strip to one speaker terminal. Re-install the speaker but connect one of the leads to the speaker to the insulated terminal (disabling the internal speaker). Then solder a length of zip or speaker wire to the speaker terminal having the output transformer lead, and to the insulated terminal.

If the receiver or radio doesn't have a power transformer, and is the so-called AC-DC type, you must make certain you don't bring out a "grounded" speaker lead as this might create a shock hazard by making the shell of P1 or P2 one side of the AC power line. As shown in the photograph, check that one speaker terminal is not connected to the speaker frame—with the frame, in turn, connected to the radio's chassis (this is common in many radios). If you do find a ground strap, or a direct connection between the speaker terminal and the frame, make certain it is this connection that is opened and connected to the insulated terminal strip.

Finally, label the switches and jacks so you'll know what is what and get rid of the junk at the operating position. Unlike 30 years ago, the sure sign of a professional operation is a completely clear desk, not a wall of dials, meters and cabinets. ■

SOLID-STATE BULL/BEAR TICKER NEEDS NO TAPE



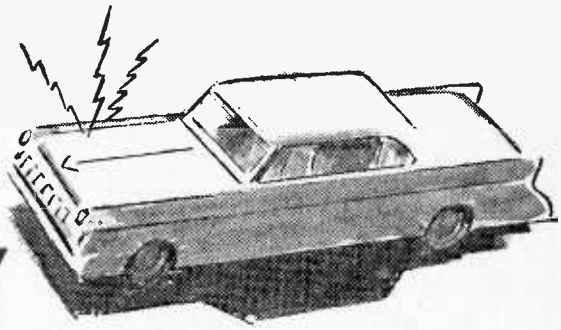


■ A new display system with a semiconductor "brain" that functions at nearly the speed of light will soon give brokers and investors a better picture of the stock market. Legible in any lighting environment, the new system is the first one able to keep pace with even the busiest market, according to Trans-Lux Corp., designer and manufacturer of the new tapeless ticker apparatus.

Called Trans-Jet, the system links directly to the nation-wide communications networks of stock exchanges to instantaneously display market quotations. It needs neither ticker nor tape because its "brain" converts network signals into quotations via pneumatically-driven, high-contrast luminescent discs fixed to a conveyor belt.

Our photos depict three views of the new system; in center photo, Trans-Lux chief engineer Charles J. Holloman shows technician James Lusk the printed circuit board containing the system's logic "brain." ■

AUTO SIREN SENTRY

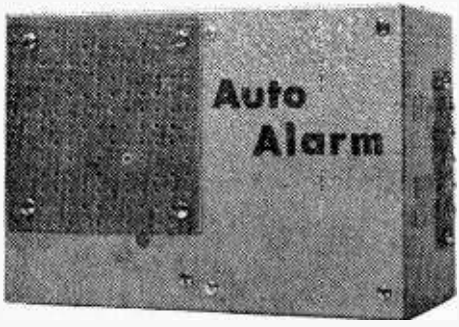


by Herb Friedman W2ZLF / KBI9457

Let electronics stand guard when you leave your wheels unattended!

■ You almost could give odds that in the next few months someone you know will have his car stolen or broken into. Fact is, auto break-in and theft is fast becoming the *All American Sport,* for you've not only got professional thieves to contend with, you've got the local hoods who believe any shiny new car *belongs* to them.

Insurance? Next to worthless! You can never get back the true value of your car since most insurance policies are limited to actual cash value (*ACV*), meaning you get about what it's worth on a legitimate trade-in. Whether it's spotless and smooth-running, or it has a one-lung engine and mashed fenders, it's still worth the same *ACV*. Contents stolen or damaged? Not covered by car insurance! That CB rig, camera, or luggage (filled with vacation clothes) is completely lost if you don't have separate theft insurance—the *expensive* kind.



This version of the Auto Siren Sentry is completely protected by the aluminum box. Perforated phenolic protects speaker cone.

But invest about $17 and an hour's work installing the *Auto Siren Sentry* and you've got just about the best theft "insurance" you can buy. The Auto Alarm fights theft and break-in two ways. Firstly, it sticks out like Jayne Mansfield at a Boy Scout meeting. Right there on the fender is a *key switch* which in any man's language means *"Watch Out,"* this car is wired for sound.

Secondly, the instant anyone tries to open a door, the hood or the trunk, a *screaming* siren fills the neighborhood; and it can only be turned off with a key. Unlike other theft alarms which shut off when a door is closed or if the trip switch is taped down, the Auto Alarm cannot be silenced other than with the alarm's key or ripping loose the connections. Keep the wires hidden and friend thief will take off on foot before he can find the wires. No thief is going to try driving around with a siren roaring under the hood. Police take a dim view of a "civilian" car with a siren.

How It Works. The schematic diagram shows how the siren and locking circuits work. M1, an electronic siren module, in conjunction with speaker SPKR, comprise the *siren.* The positive voltage input is fed through S1, a key-lock switch, to the module. R1 is simply a dropping resistor for the module which works best with a 6- to 10-volt input.

The negative battery connection to the siren module is made through normally closed pushbutton switches, like those used to turn on courtesy lights when a door is opened (these switches are indicated by the dotted lines in the schematic).

Trace the circuit through. Note that when a door is opened, the associated switch connects terminal 2 of terminal strip TS1 to ground—completing the power connection to the module and the siren "sounds off." Also note that when terminal 2 is grounded

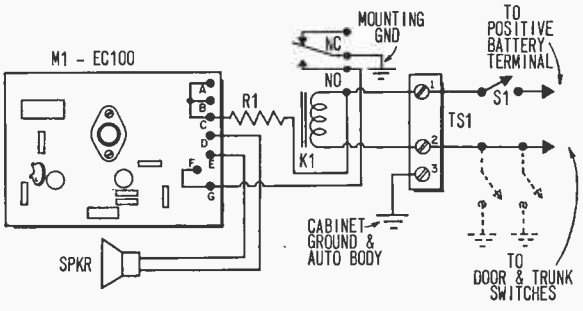
AUTO SIREN SENTRY

relay K1 is energized, pulling down K1's armature or wiper contact. When the moving contact touches this normally open terminal (#2) it parallels the door and trunk switches and "permanently" grounds the relay and the module's ground connection—the siren keeps sounding even if the door is closed (opening the switch). The only way K1 can be released—to turn off the *Auto Siren Sentry*—is to interrupt the positive battery connection by opening key switch S1.

Protecting The User. Since key-switch S1 is mounted on the fender—and you want it there for all to see—it protects the user against the embarrassment which might be caused by the siren going off as he attempts to leave the car (which will happen if the alarm switch is mounted inside the car). After the user leaves the car, the alarm is set by turning S1 to *on*. Before getting into the car, the driver then turns S1 to *off*. Naturally, if S1 is mounted inside the car the alarm will sound whenever the driver enters the car. Mount the key switch out on the fender for your own peace of mind.

Construction. Actually, there isn't much involved in building the *Auto Siren Sentry*. The siren module is an *EICOCRAFT* Siren Module Kit —type EC-100, which can be assembled in a matter of minutes. There is but a handful of components which are mounted on a pre-punched and "component position marked" printed circuit board. However, assemble only the board itself, do not make the external connections given in the instructions as the *Auto Siren Sentry* uses a simpler external wiring than that given with the module.

After the module is completed, connect a 10-inch length of black wire to terminal *G*, loop the wire under the board and solder the end to *F*. Connect a 1-inch length of bare wire to *C*. Connect a bare-wire jumper from point *A* to point B. Then connect two wires of the same color to *D* and *E*, the speaker terminals. Note that the board shows the battery connection to *A* and *B;* ignore these instructions. In the *Auto Siren Sentry* the positive battery connection is the



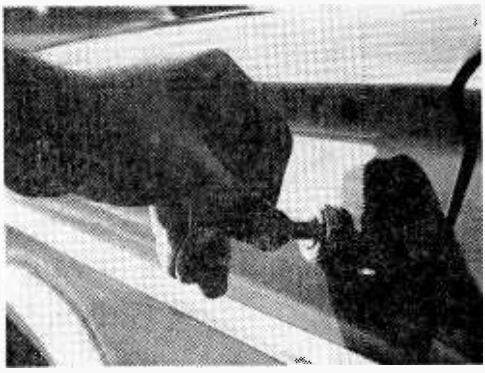
Noisemaker of the Auto Siren Sentry is the Eico EC100 (M1) module that drives the speaker. Relay K1 keeps siren sounding.

PARTS LIST

K1—S.p.d.t. relay (Potter and Brumfield RS5D-12VDC, Allied 41D5504—P & B RS5D-6VDC Allied 41D5896 or equiv.)
M1—Siren Module (EICOCRAFT EC-100 or equiv.)
R1—10-ohm, 5-watt resistor (see text)
S1—Key-lock switch (Lafayette 33C6401 or equiv.)
SPKR—Weatherproof speaker (Lafayette 44C-5201 or equiv.)
TS1—Terminal strip (see text)
1—3 x 5 x 7-in. aluminum chassis box
Misc.—Wire, solder, mounting hardware, solder lugs, etc.

Note: The EC-100 Siren kit is available from Custom Electronics, P.O. Box 124, Springfield Gardens, N. Y. 11413. Price is $4.95 plus 35¢ postage and handling.

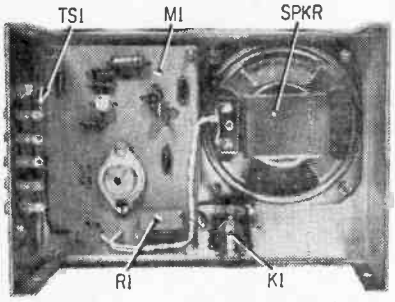
Estimated cost: $17.00
Construction time: 2 hours



Inexpensive key-lock switch set in fender advertises burglar alarm. Presence of lock alone will give some theft protection.

short bare wire at *C* while the negative battery connection is the black wire going to *F* and *G*.

After all cabinet holes are cut in the main section of a 3 x 5 x 7-inch aluminum cabinet,



Internal view of Auto Siren Sentry shows location of major components. Much smaller box can be used if speaker is outside.

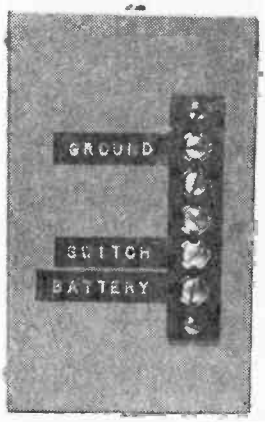
mount the siren module as shown in the photographs, on the bottom as close as possible to one side; use stand-offs between the board and the cabinet to avoid shorting the printed-circuit wiring. The stand-offs as well as the necessary mounting hardware are supplied with the module.

The speaker is a three-inch waterproof type. The speaker specified in the Parts List is supplied in a metal cabinet having an integral gimbal bracket. If the speaker is installed as shown, in an aluminum cabinet, place a piece of perforated phenolic board in front of the speaker, to prevent possible damage to the cone. (If desired, the speaker can be used in the cabinet supplied.) Mount the speaker cabinet near the radiator, facing outwards, and connect the speaker leads from the module to the terminals on the speaker cabinet.

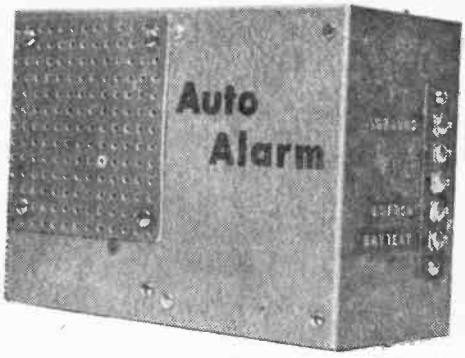
The wiper contact on K1 is *automatically grounded* when the relay is mounted in the cabinet—the wiper contact is connected directly to the frame of K1.

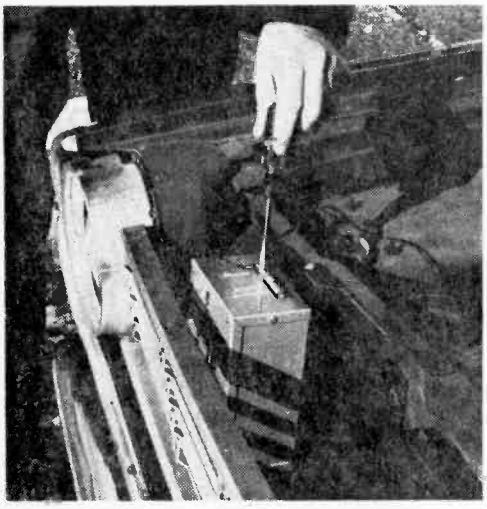
While only a three-lug terminal strip is required if the speaker is mounted in the aluminum cabinet, we show a five terminal type in the photographs to illustrate the arrangement when an external speaker is used. The speaker would connect to the two terminals shown unused. To reduce the possibility of wiring errors, place the battery connections on opposite ends of TS1, as shown, with at least the switch terminal in between.

Install the *Auto Siren Sentry* on any convenient surface under the hood. Just make certain the alarm doesn't project above the hood line or you won't be able to close the hood.



The two unused connections of the terminal strip (TS1) are used for external speaker leads. A grommet can be used instead of a strip—just make wires long enough to reach switches.

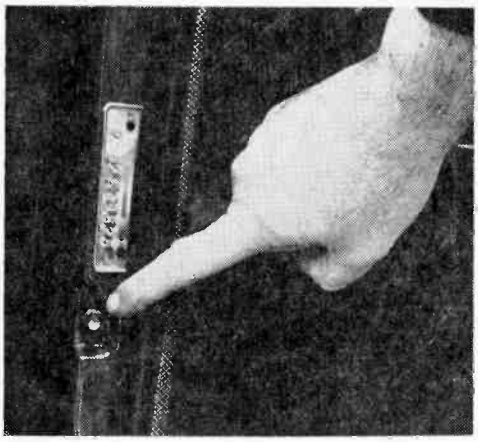


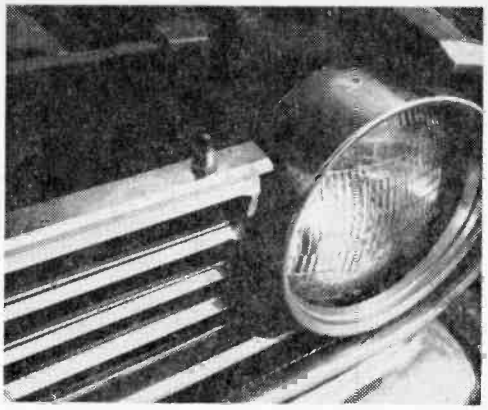


Once Auto Siren Sentry is attached to the body, leads to switches can be connected. Protect leads from accidental breakage and possible tampering through grill openings.

Installing The Switches. Any existing door switch automatically becomes part of the *Auto Siren Sentry* when the wire from terminal 2 of TS1 is connected to the cour-

AUTO SIREN SENTRY





Hood switch prevents tampering with Auto Siren Sentry although someone familiar with your system could conceivably disable it fast.

Courtesy-light door switches become part of the Auto Siren Sentry burglar alarm system.

tesy light circuit. These switches are the self grounding type, always switching the ground lead of the courtesy lights: therefore, when you look at these switches you will see only *one* connecting wire. All other switches which may be added should be of the same type, self grounding, with their leads connected to the wiring of any of the original door switches. Additional switches for the hood, trunk or rear doors can be purchased from your car dealer at nominal cost.

The key switch should be installed so some smart "cooky" can't jump the terminals. If the switch is installed in the part of the fender that faces the tire anyone can reach under the car and jump the terminals, making the alarm inoperative. Install the switch on part of the *double fender*. Part of each fender, near the door, is shielded by the sides of the firewall, and access to the space between the fender and firewall is only through a small area which is exposed when the door is open. Place the switch so that its terminals are in the concealed space.

Positive Grounds. The circuit shown is for cars with the more common *negative* ground battery. If your car uses a positive ground battery simply reverse the connections to siren module terminals C and G.

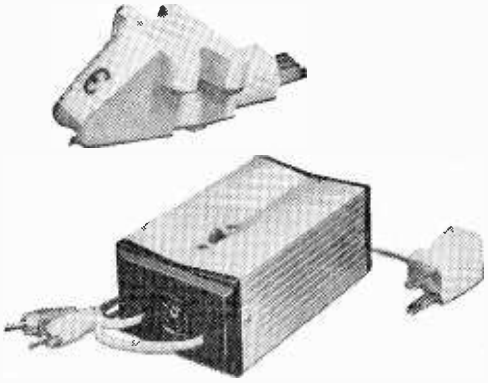
6-Volt Systems. If your car uses 6-volts eliminate R1—use a direct connection from terminal 1 of TS1 and use the alternate 6-volt relay specified in the parts list. ■

WIRELESS LINGO LAB

☐ Latest thing in language labs may be the Class-Master 1 system by Dictaphone, which works as a closed-circuit radio setup. With the Class-Master 1, foreign language lessons on tape or disc can be broadcast from a transmitter to the classroom and received by the students through their headsets. They learn by listening to a foreign language phrase and then repeating the words into a lightweight earphone-type mike.

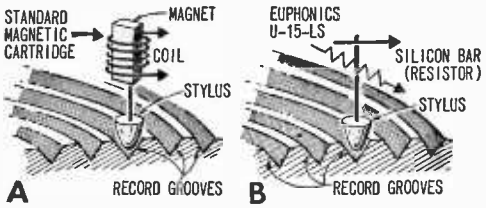
The teacher, who hears the lesson through her own headset, is able to provide individualized instruction by roving through the classroom and monitoring the response of particular students at will. Signals come from a single loop antenna hidden in the classroom. ■

EUPHONICS MINICONIC U-15-LS Stereo Cartridge and PS-15 Power Source



■ *Totally new concepts* in the hi-fi field often turn out to be nothing more than improvements on a previous "totally new concept" which in itself was an improvement on a "totally new concept," etc., etc., *ad nauseam.*

It was therefore surprising to find that *Euphonics' Miniconic* line of phono cartridge really was *totally new*. Whereas the modern hi-fi cartridge is a precision refinement of a magnetic voltage generator, the *Euphonics' Miniconic* is essentially a *resistor* which develops an output voltage by functioning as a variable part of a series voltage divider. We have diagrammed these differences in the illustration below.



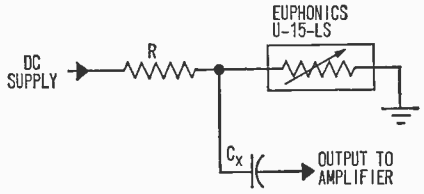
Standard magnetic cartridge and newer solid-state type do same thing, but in entirely different manners. Stylus in standard cartridge moves magnet or coil to generate voltage output; stylus in Euphonics unit simply varies resistance of silicon bar to produce signal.

This and That. In a typical hi-fi cartridge the movement of the stylus varies the magnetic field around a coil of wire. Either the stylus moves the coil or it moves the magnet. Or it can simply vary the intensity of the magnetic field. Regardless of the mechanical operation, the end purpose is to generate a voltage by changing the strength of the magnetic field in relation to the coil. On the other hand, the *Miniconic's* element is simply a resistor—a bar of silicon—which, by itself, cannot generate an output voltage. The movement of the attached stylus only varies the resistance of a silicon bar.

To obtain an output voltage it is necessary to make the silicon resistive element part of a voltage divider, as shown in the basic circuit diagram. As the stylus motion rapidly changes the resistance of the silicon bar, the voltage at the junction of the bar and the fixed resistor changes, too, varying above and below the no-movement voltage at the junction. Since capacitor *Cx* passes AC while blocking the DC at the junction, the voltage appearing between the output terminal of *Cx* and ground is the audio-signal voltage resulting from the motion of the stylus in the record groove.

Since the *Miniconic* cartridge is a stereo unit, it has two silicon bars—one for the left channel and one for the right.

Unless you're a skilled electronics technician there isn't much you can do with *just* the cartridge. By itself, the cartridge has no output signal.

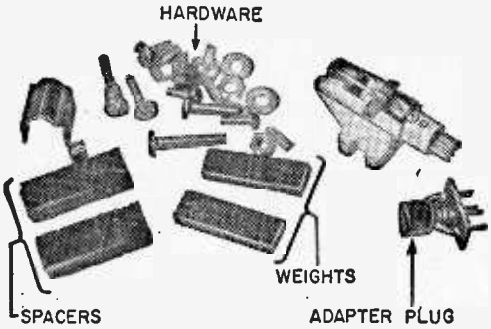


Simplified circuit of Euphonics system shows need for DC power source and amplifier. Cartridge effectively serves as a voltage divider.

To make the *Euphonics Miniconic* cartridge as easy to install and to operate as a magnetic cartridge, *Euphonics* supplies

the *Miniconic* cartridge as a complete kit—the cartridge with a power supply and phase-inverter equalizing amplifier—called the Power Source. The kit we tested consisted of the *Euphonics Miniconic* U-15-LS cartridge and the PS-15 Power Source.

PS-15 Power Source. Each channel has a one-transistor amplifier, but the left channel has, in addition, a phase inverter amplifier that inverts the phase of the left-channel signal for correct phasing. The output of each amplifier is fed to an equalizer network. When the switch on the PS-15 is set to the *HI* position the signal is fully equalized to the RIAA curve at an output level of 0.4-volt *rms*. This allows the *Miniconic* system to be connected directly to the high-level input of your amplifier with full equalization. When the switch is set to the *LO* position, the output level is reduced to 8-millivolts *rms*, and the *Miniconic* can be fed into any standard *mag* phono input.



Necessary spacers, weights, adapter plug, and miscellaneous hardware tend to complicate installation of the Euphonics cartridge.

Euphonics U-15-LS Cartridge. The cartridge itself is extremely small and very lightweight—so light that the counterbalance on many arms will not compensate for the weight of the cartridge. To handle this problem, the U-15-LS is supplied with a set of weights and spacers which allows the cartridge to be balanced, and positioned so that the stylus is below the cartridge holder. While the *Miniconic* simply plugs into its matching arm with no weight or positioning problem, we chose to test it with a quality turntable-and-arm combination that is more or less a favorite with serious hi-fi enthusiasts. We found that positioning the weights and spacers was a bit troublesome, and it must be done very carefully and very slowly. Once the weights and spacers are correctly installed there's no further difficulty.

While the *Euphonics* U-15-LS cartridge is designed to plug directly into its own arm, a special plug adaptor, which is supplied, must be used with arms other than the *Euphonics*. The adaptor just plugs onto the back of the cartridge while the arm connection plugs onto the adaptor pin. The combined length of the cartridge and adaptor is just slightly longer than the available head space on many arms. If you're short of space, carefully bend the connecting lugs from the arm at right angles to the adaptor and rotate them so none short together.

Is It Worth The Cost And Effort? Since the *Euphonics Miniconic* system commands a premium price, and might involve some extra effort, the question is: "Is it worth it all?" Well, the answer depends on your own musical tastes. If they are as severe and critical as the editor's, the answer is, "yes!"

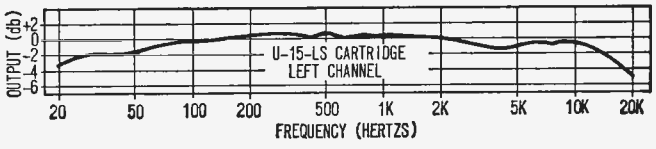
We found the U-15-LS cartridge to have exceptionally smooth sound—*soft* and *silky* would be the best description. There was virtually no discernible distortion, nor could we hear, even with the amplifier set to an ear-splitting volume, any hum or noise contributed by the added power supply and amplifier.

Unlike some other cartridges, acclaimed for their hi-fi quality, which have a *hard* sound (slightly peaked at the high end), the *Miniconic* is *soft*. And at first it seemed that it lacked highs, even though a frequency run proved otherwise. After we became accustomed to the sound we started to notice a most excellent *definition*—a quality whereby the listener is able to easily distinguish one instrument when all are playing together.

For clarity, the frequency response shown in the graph is for the left channel only. The maximum deviation between the left and right channel was 3 db, at 12, 16, and 18 kHz (kc.). Separation was excellent, measured as 23 db at 1 kHz and 16 db at 20 kHz.

Both the frequency response and separa-

(Continued on page 116)



Left-channel response of Euphonics system was ±1.5 db from 20-15,000 Hz. Right channel (not shown) was within 3 db of left channel.

TVI WITH A TWIST

by Jim Kyle, K5JKX

■ "That's right, Joe, send the ambulance to . . . *WHEEE* . . . *SCRAWWWWK* . . . Will *BATMAN* meet his doom? Will *ROBIN* fly away? Tune in tomorrow! Same bat-time. Same bat-channel . . ." And the 10-33 message disappears into an indecipherable mass of mixed-up audio from all the low-frequency channels.

Has this ever happened to you? Perhaps not during an emergency—but the chances are great that you have been a victim of *ITV* at least once or twice.

ITV—interference *from* television—is the reverse of that ancient plague TVI. While in TVI, the Ham or CBer produces interference to the television picture, in ITV the reverse is true. The television set produces interference to the radio operator. Frequently the interference is so severe as to make continued operation impossible.

However, like all other forms of interference, ITV *can* be brought under control. The first step is to determine just what is happening, and most important, just which TV receiver is causing the interference.

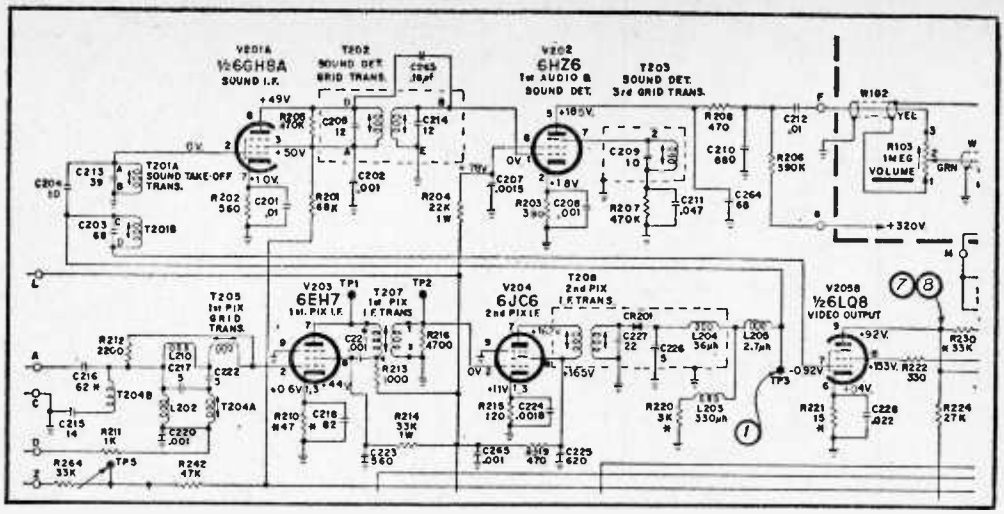
Spotting ITV. ITV announces its presence in a variety of ways. One of the most prevalent is that used in our opening example —a mass of mixed-up TV audio, which effectively blanks out the band from one end to the other. Frequently this type seems to be strongest right at 27.000 MHz (mc), fading down somewhat as you tune away from the 27 MHz spot.

Another form of ITV shows up as a loud buzz. This kind usually isn't so all-blanketing as the audio type. Sometimes the buzz is accompanied by a single-channel audio signal a few kHz (kc) away and sometimes not. Frequently the buzz appears to be wandering over the band, either up or down. Normally in this case the direction will remain constant and the buzz will move at about the same speed for the duration of its existence.

Occasionally ITV appears simply as a single interfering CW signal having the appearance of an unmodulated carrier. This type is particularly hard to recognize, since it can just as easily actually *be* an unmodulated carrier. Fortunately, it's rare.

The really nerve-wracking kind of ITV makes its appearance as a mixture of all the other kinds. Usually one type will be strongest, but all the rest will be there too. This kind is most often a secondary effect of whichever kind is showing up strongest, and frequently disappears when the primary cause is cured one way or another.

What Causes ITV? While all these kinds



Schematic diagram above is typical of the circuit used in many television receivers. Top half of diagram is the sound IF and audio detector; bottom is video IF, output.

of interference can be traced back to television receivers, each kind usually traces back to a different portion of the receiver.

The all-blanketing mass of *mixed-up audio* is usually caused by an oscillating sound-IF stage in the receiver. This effect is particularly prevalent with the newer designs of receivers, which use high-gain tubes in their IF stages—these suffer from oscillation.

Surprisingly, the oscillation usually can't be detected by listening to the receiver itself; it has no effect on the TV sound. It does, however, spray out a potent signal at the sound-IF frequency of 4.5 MHz—and at all the harmonics of this frequency. That includes 9, 13.5, 18, 22.5, and 27.0 MHz. The mushy sound characteristic of this type of ITV is caused by two things—the frequency spread of the TV sound signal (which is FM in the first place), and the 6-time multiplication of the original signal.

The *loud* buzz is the TV video signal itself. This type of ITV usually is due to re-radiation from the tuner of the TV set, and normally can be heard only for a short distance from the offending set. The band-wandering is actually just that—frequency drift of the TV receiver. On the picture tube you don't notice it because TV receivers are wide-band devices. When you hear the signal as re-radiated interference, the drift is obvious.

The *unmodulated carrier* signal is also tuner radiation, but it's the tuner's local oscillator rather than the re-radiated video.

Sometimes mistaken for video buzz is a *buzz-saw whine* caused by sweep-circuit radiation. The sweep-circuit interference can be distinguished because it peaks in intensity every 15.75 kHz, while true video buzz has only one peak. Occasionally video buzz has peaks at varying spacings—depending upon the video content at any particular instant.

When all kinds of symptoms show up together, the problem is most likely a case of cross-modulation, due to the strongest of the interference sources. When the strongest source is removed, all the rest may disappear as if by magic. In any case, each source must be traced individually.

One type of cross-modulation, though, must be mentioned, since it's particularly difficult to do anything about. This is cross-modulation between two local TV-broadcast signals which produce a difference-frequency interference signal.

This type of ITV is most prevalent in Ham bands. Two-meter operators in particular are plagued by it wherever local assignments place Channel 4 and Channel 13 in the same geographical area. These two channels are exactly 144.0 MHz apart in the spectrum, and the video of one mixes with the video of the other to produce one mass of signals at 144 MHz, while the two audio signals intermix in the same way to produce another component of the mass.

The only thing the operator can do about this is to pack up and move—any other measures are ineffective.

But most cases of ITV aren't so undefeatable. Almost all of them can be cured

with patience and cooperating neighbors.

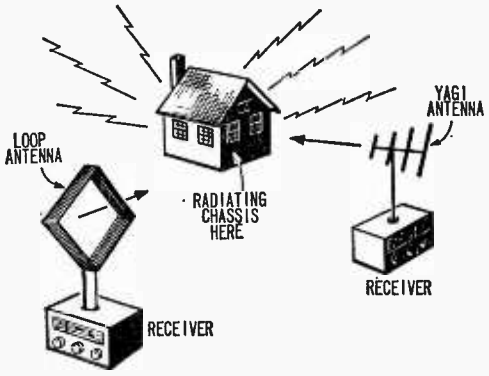
Spotting the Offending Set. Even after you have identified the type of interference you're suffering, your detective job has just gotten started. You still have to find the set which is producing it, and determine how to cure that set.

Start by checking all sets to which you have ready access. Begin your checking with the interference present. While listening to the interference, have the sets switched *off* one by one. When the offender is switched *off*, the interference will disappear.

Usually the interference-generating set will be located close to the affected receiver. Frequently, however, it won't be the closest set. In particular, some makes of TV's seem to give more trouble than others (probably due to design differences).

If the *on-off* test of all TV sets in your home doesn't locate the culprit, the next step is to go door-knocking. This can be either an interesting foray into good-neighborism, or a frightening venture into no-man's land. Much will depend upon past relations with neighbors and the situation regarding TVI (the non-reversed variety). Some astute ITV-hunters have impersonated TV rating services and called their neighbors. This will at least establish whether any individual's set is on at the same time as the interference—but the channel information is of no use.

If all else fails, you can use a directional antenna and direction-finding techniques (like searching for a hidden transmitter) to zero in on the location of the offending set. However, if you have to resort to this, you probably won't be in any position to effect a cure even after you find the culprit.

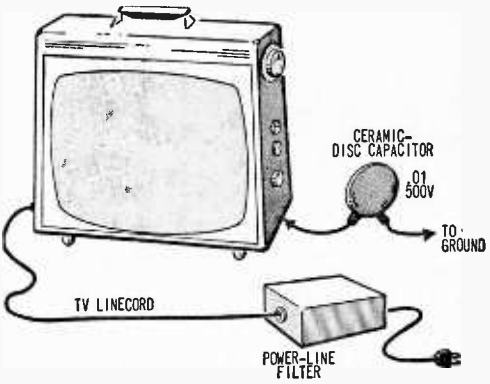


Some sources of ITV must be tracked with direction-finding techniques. Loop and Yagi antennas are easily made and should be tuned to the interference frequency.

Curing the Condition. Let's assume that you have located the offending set, and what's more let's assume that it's your own set so you can do as you please to cure the trouble. (If the real culprit belongs to a neighbor, you can improvise.)

The oscillating sound-IF stage can usually be quieted down by a very slight (not over ¼ turn) adjustment of the associated IF transformer. Often, replacement of the tube in the oscillating stage is enough to effect a complete cure.

Tuner re-radiation can be cured by installation of a high-pass filter at the antenna connections *of the tuner* inside the receiver, together with proper grounding of the TV chassis. Be cautious when attempting to ground the chassis, however, since many sets use so-called *hot-chassis* circuits and



Metal-cabinet TV sets are easy to ground but plastic and wooden cabinets do not act as shielding unless lined with metal foil.

an improper ground connection can either blow fuses or cause a fire. The *proper* way to ground a TV chassis, when chasing interference, is through a .01-mf, 500-volt ceramic-disc capacitor. This lets all RF interference flow straight to ground, but holds back the house current from a chassis.

Sweep-circuit radiation is hardest to cure. One method which has worked in many cases calls for complete shielding of the inside of the TV cabinet, using aluminum foil tacked or cemented to the cabinet interior. This foil should be grounded directly, and the chassis grounded to the foil through a capacitor as described above. In more stubborn cases, a power-line filter may also be required. However, sweep-circuit radiation usually is troublesome only to Hams working on the 160-M band, and to VLF devotees. ■

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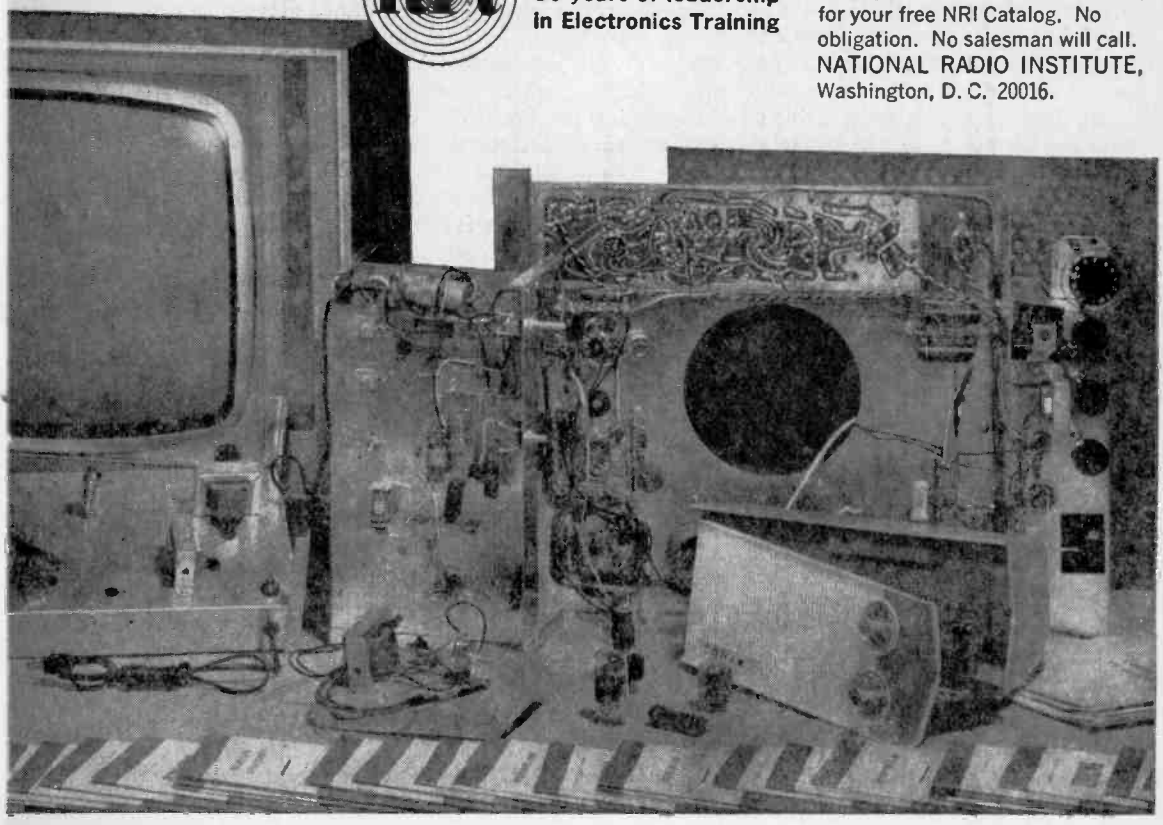


Radio-TV EXPERIMENTER LAB CHECK

HARMONY-by-HEATHKIT

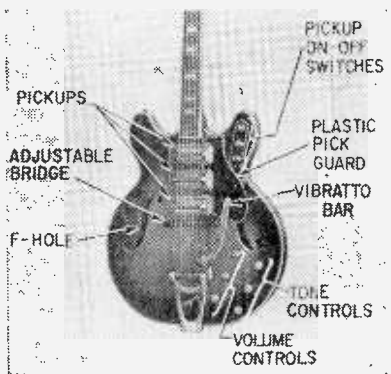
Model TG-46

Electric Guitar

Here's your chance to stop sitting on the sidelines while the rest of the *go-go* crowd passes you by. Latch onto a swinging electric guitar, learn a few low-down *rock* tunes, and you've got your passport to *fun-fun-fun!* You don't own a guitar, let alone know how to play one? No sweat! The new Harmony-by-Heathkit TG-46 electric guitar solves both problems in one stroke (or is it *strum?*).

The TG-46 is specifically designed for both the beginner who wants to learn, and the experienced strummer who'd like a professional-quality instrument that doesn't shatter his budget. Heath accomplishes both purposes by providing a quality Harmony guitar in kit form. Besides saving quite a bit of change with the kit purchase, the buyer also gets a tuning record, pick, connecting cord, cushioned red-leather neck strap, carrying case with deep-pile red lining, and a "VU tuner." (This last item is a special gadget that permits even a tin ear to tune up the guitar as we'll see shortly.)

From the top of the headpiece to the bottom of the tailpiece the TG-46 is all "pro." There are three pickups: one for *melody* (full range), one for *rhythm* (bass), and one for *treble*. Each pickup has its own on-off switch as well as individual tone and volume controls. Also each pickup has six adjustable pole pieces, one for each string, which permit the player to adjust the strings for relative loudness comparable to a standard guitar (or, for that matter, any loudness arrangement desired).



Each of the three pickups has its own set of tone and volume pots. Vibratto bar decreases spring tension for unusual musical effects.

The tailpiece, which the ends of the strings are anchored on, is a professional Bigsby vibrato type. By pushing a handle (which varies string tensions) variable frequency effects such as *slurs, slides,* and *vibrato* are obtained.

To overcome the effects of moisture and aging, which often ruin a guitar by deforming the neck, the TG-46 has a steel shank running through the neck. The player can easily adjust a nut on the steel shank to make the neck perfectly straight without any bows.

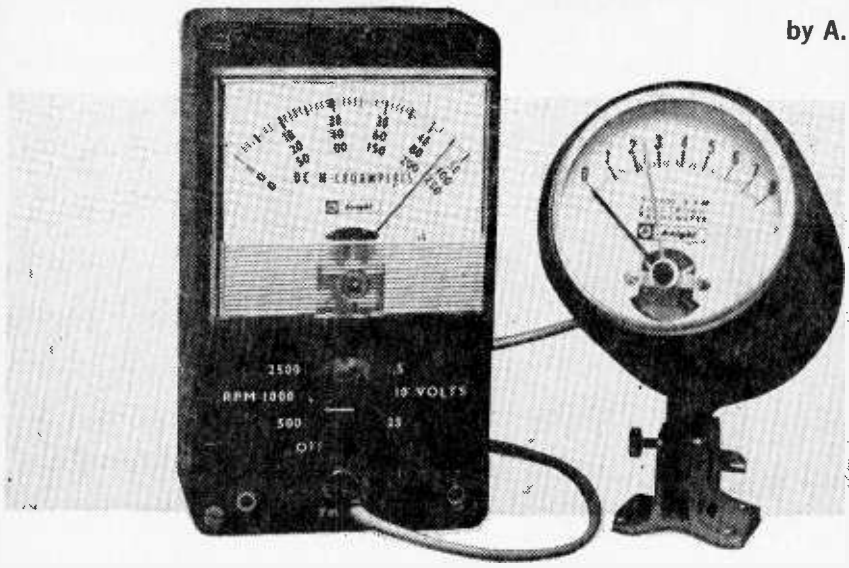
The bridge is fully adjustable, allowing the player to determine the exact desired *action*. (In guitar lingo, action is the distance strings must be pressed by fingers on the left hand before they are fretted.) This is of advantage to the beginner who would prefer a greater spacing between the strings and frets to eliminate fuzzy sounds caused by strings vibrating against unused frets. An experienced player might prefer the minimum spacing to get a good "fast" action.

Is Assembly Difficult? Unlike some other guitar kits that give you a block of wood you're supposed to trim on a bandsaw, the Harmony-by-Heathkit TG-46 is supplied with a completely assembled body, made of quality, good-sounding rosewood and handsomely finished in gleaming, warm, lightly-

(Continued on page 118)

Plug-in adaptor gives accurate readings at low RPM using your single-range tachometer.

by A. A. Mangieri



TACH STRETCHER

■ Single-range transistorized tachometers having an 8000- to 10,000-rpm range are not suitable for engine idle-speed adjustments, air-fuel ratio tests and adjustments. Why? Because the engine rpm readings that are useful for these tests and adjustments are crowded into the lower five- or ten-percent of the meter scale.

The *Tach Stretcher* adaptor provides accurate, easily read full-scales of 500, 1000, and 2500 rpm. The *Tach Stretcher* plugs into and is operated by the tachometer now in your car. A long connecting cable allows convenient placement of the meter when in use. Removal of the cable restores normal operation of the tach.

In addition, for added utility, the *Tach Stretcher* adaptor optionally includes DC-voltage ranges of .5, 10, and 25 volts for checking circuit voltages. The .5-volt range is used to locate high-resistance ground connections.

The adaptor is used with pulse-driven transistorized electronic tachometers having a meter with a basic current sensitivity of 500 microamperes or more, typical of single wide range tachs. It operates with either positive or negative ground systems.

Two calibration procedures are detailed. Included is a precise oscilloscope method which additionally permits a more accurate up-scale calibration of the tach and a scale-accuracy test over the entire scale.

Circuit. The schematic diagram (next page) shows the Knight negative-ground tach circuit modifications. This circuit, with variations, is typical of all pulse-driven tachs. Short voltage pulses from the ignition points drive transistor Q1 into conduction. A voltage-regulated pulse of longer duration with a very steep rise appears across Zener diode D2. This pulse, when applied to a relatively-large capacitance (C2), rectifiers D3 and D4, and meter M*t*, results in very-short current pulses through the meter. The meter responds to the repetition frequency of the input pulses and is properly calibrated by potentiometer R*t*.

Phone jack J1 is added to the tach circuit and transfers the output of the tach circuit from meter M*t* and pot R*t* to the more sensitive meter in the adaptor just by plugging in the interconnecting cable. When the cable is removed from J1 the closed-circuit contacts restore normal operation of the tach.

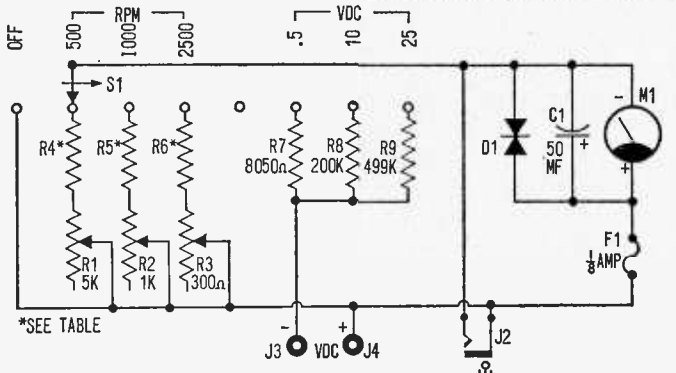
Range switch S1 selects the rpm range—each provided with a calibrating pot (R1, R2, and R3). Resistors R7, R8, and R9 are voltage multipliers for the DC ranges. Fuse

TACH STRETCHER

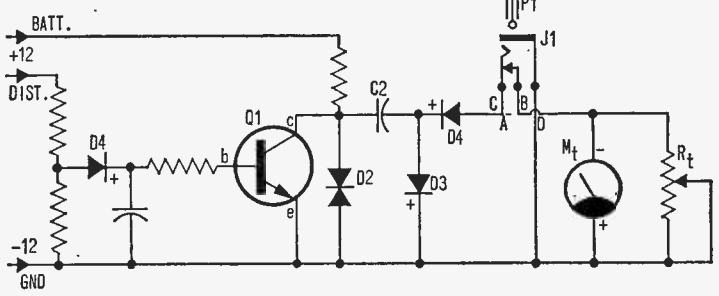
F1 and diode D1 provide meter protection. Capacitor C1 prevents meter-needle vibration at very-low rpm.

Adaptor Construction. First, add 0-100 and 0-250 scale markings on meter M1. Scales were added to the meter face using *Letraset* dry transfers. Or, place the scales on the plastic meter front. The meter front can be removed by slightly wedging open four retaining snaps using caution.

A 6¼ x3¾ x 2-in. plastic case houses all parts. Mount a 3 x 4¾ piece of perforated phenolic board on the meter terminals. Install fuse clips and push-in terminals. Drill holes to accept the pc type trimmer pots.



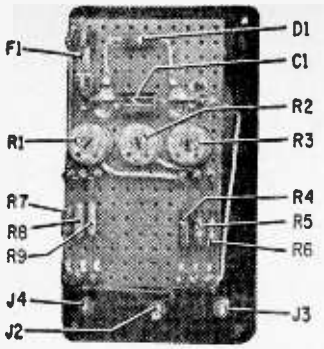
Tach Stretcher schematic diagram (above) is all you have to wire up to convert your present tachometer to read those very-low RPMs. Schematic diagram of tachometer (below) is for a Knight unit but method of adding the plug-in jack (J1) is typical of all the single-range tachometer accessories for high-performance autos.



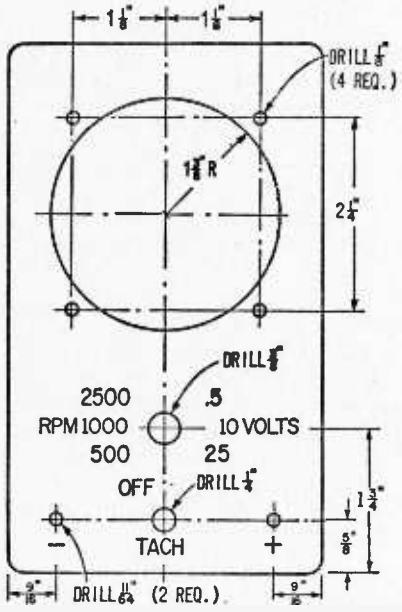
PARTS LIST

C1—50 mf., 15-WVDC electrolytic capacitor
D1—Meter protector diode (Ohmite OMC7111 or equiv.)
F1—⅛-amp fast-action 8AG fuse (Littlefuse 361000 or equiv.)
J1, J2—Midget phone jack (Switchcraft 42A, Allied 47A4985 or equiv.)
J3, J4—5-way binding post (one red, one black)
M1—DC meter, 0-50 microampere (Knight 3½ in., Allied 52A7201; Lafayette 1½ in., 99C5049 or equiv.)
P1, P2—Midget phone plug (Switchcraft 750, Allied 47A1520 or equiv.)
R1—5000-ohm potentiometer (Clarostat U39, Allied 46A7970C or equiv.)
R2—1000-ohm potentiometer (Clarostat U39, Allied 46A7970C or equiv.)
R3—300-ohm potentiometer (Clarostat U39, Allied 46A7970C or equiv.)
R4, R5, R6—carbon resistor, ½ watt (see Table 1 for values)
R7—8060-ohm, ½ watt resistor, 1% (IRC CEC T-O or equiv.)
R8—200,000-ohm, ½ watt resistor, 1% (IRC CEC T-O or equiv.)
R9—499,000-ohm, ½ watt resistor, 1% (IRC CEC T-O or equiv.)
S1—1-pole, 12-position switch (Mallory 31112J or equiv., Allied 56A4301)
Misc.—Perforated phenolic board; 6¼ x 3¾ x 2 inch plastic case and panel; AWG-22 mike cable; fuse clips; push-in terminals; tie strips; wire, solder, etc.

Estimated Cost: $15
Construction Time: 4 hours



Internal view of the Tach Stretcher shows mounting of components on the circuit board. R1, R2 and R3 are calibration controls.



Layout of front panel of Tach Stretcher accommodates the Knight 0-50 microammeter.

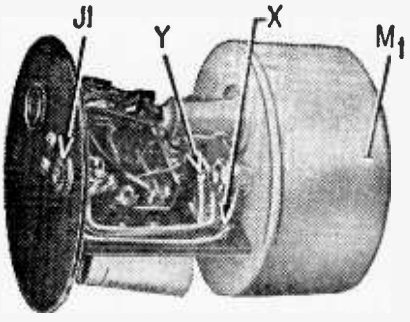
Depending on your engine, refer to Table 1 for R4, R5, and R6 values. Omit R1 and R4 for four-cycle, four-cylinder engines. If the DC ranges are not desired, omit R7, R8, R9, D1, F1, J3 and J4. Observe polarity of C1. *Use only a ⅛-amp fast-action fuse for F1.*

When wiring S1, skip three switch positions between the 2500-rpm range switch setting and the .5-volt position for easier panel labeling as shown. Connect a miniature phone plug, P1 and P2, to each end of an eight- to 10-foot length of AWG-22 microphone cable. Connect the outer shield to the sleeves of the plugs.

Tach Modification. The *Knight* electronic tachometer modification is shown here to illustrate the procedure—most other tachometers are similar. First, the high or ungrounded side of meter M*t* (and its calibrating potentiometer R*t*) is disconnected from the output of the tachometer circuit at point A in the schematic diagram. The closed-circuit contacts of jack J1 are wired to close the broken circuit at A to allow normal operation of the tach when plug P1 is removed.

For the tach shown, unsolder D4 from the soldering lug on the meter terminal bracket at Y (see below). Install a flea clip on the board at point X. Connect the disconnected end of D4 to the flea clip. Mount jack J1 on the back-plate as shown using fiber shoulder washers for insulation.

Run wire C from D4 to the long spring leaf of J1. Run wire B from the high side of meter M*t* (and pot R*t*) to the shorter contact leaf of J1. Finally, connect wire D from the remaining meter terminal to the frame of J1. If you wish to avoid drilling the tach



Internal view of Knight tachometer shows location of J1 and added solder terminal.

case, run the three wires out of the grommet and locate J1 as desired.

For other tachometers, simply locate the high, or ungrounded side of the meter and its shunt calibrating pot. Disconnect them from the tach output circuit and reconnect to J1 as shown.

Calibration. First, with the plug removed from J1, run a bench test on the tachometer against the 60 Hz (cps) line frequency.

TABLE 1. RANGE RESISTORS

Cylinders	Resistance in Ohms		
	R4	R5	R6
4	—	2200	390
6	5600	680	220
8	270	270	100

TACH STRETCHER

Check instructions for your particular model tach. For the usual bench test, connect tach ground to earth ground, connect a 180K carbon resistor to the distributor lead wire, and connect the free end of the resistor to the hot side of the AC power line. Use a transistor radio battery in place of the car battery. With 60 Hz input, the tach should read 1800, 1200, or 900 rpm, respectively, for 4-, 6-, and 8-cylinder engines. If not, recheck wiring of J1.

Next, set S1 to 2500 and plug in the connecting cable. The tach meter should read zero. If M1 reads backwards, reverse the connections to J2. With a 60 Hz test signal, adjust R3 until M1 reads 1800 rpm for four-cycle, four-cylinder engines, 1200 rpm for sixes, or 900 rpm for eights. Set S1 to 1000 rpm and adjust R2 until M1 indicates 900 rpm for eights. Further direct calibration is not possible at 60 Hz but two other methods are available.

For the first alternate method, reconnect the tach to the engine. Calibrate a lower range against any suitable operating engine speed as indicated on a higher previously calibrated range. For example, to calibrate the 500-rpm range for eight-cylinder engines, set S1 to 1000 and adjust engine speed to a steady 500 rpm. Then, set S1 to 500 and adjust R1 until M1 indicates 500. Two such steps calibrate the 500- and 1000-rpm ranges for sixes and one step calibrates the 1000-rpm range for four-cylinder engines.

The second alternate method uses an oscilloscope with a sawtooth-output terminal for calibration. Table 2 lists a number of frequencies and the corresponding calibration rpm for four-cycle engines. The table was calculated using the formula.

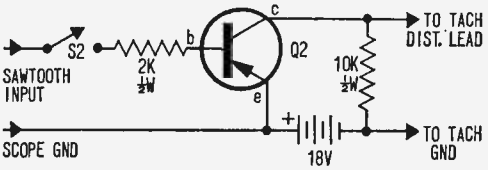
$$CAL.\ RPM = \frac{120 \times Frequency}{Number\ of\ cylinders}$$

Use this formula if your line frequency differs from 60 Hz. For two-cycle engines, change the factor (in the above equation) 120 to 60.

First, feed a small AC voltage (at power line frequency) to the vertical input terminals of the scope for use in counting cycles on the scope screen. Voltage from a 6- or 12-volt filament transformer or the AC test-signal jack on the scope is adequate.

As an example, to calibrate the 500-rpm range for four-cycle, eight-cylinder engines (referring to Table 2,) we find that 30 Hz provides a calibration signal of 450 rpm for eight-cylinder engines. This frequency is available from the scope sawtooth output but may be of insufficient amplitude.

Tach Driver. If the signal amplitude is too low, wire up the tach drive circuit (below) to boost the drive signal. Open S2 and set the horizontal sweep frequency control to show two cycles of AC on the scope screen. Connect the tachometer to the drive circuit



Simple amplifier increases sawtooth amplitude to Tach Stretcher for calibration.

as shown. (For positive-ground tachs, reverse the connections to the 10K resistor and keep tach and scope grounds isolated.)

To check for sufficient drive signal, remove the plug from J1 and advance the horizontal gain control to increase the output. The tach should read 450 rpm for eights and remain fixed at 450 with additional advance of the H-gain control. Set the control to give more than enough drive signal.

Next, insert the plug into J1, set S1 to 500 rpm and adjust R1 until M1 reads 450. Using the same procedure, calibrate the other ranges using the frequencies and rpm-calibration checkpoints listed in Table 2. Use the scope patterns to set the sweep frequency control as required.

TABLE 2. FREQUENCY vs RPM

Sweep Freq. (Hz)	Number of Cylinders		
	4	6	8
	RPM	RPM	RPM
15	450	300	225
30	900	600	450
60	1800	1200	900
120	3600	2400	1800
240	7200	4800	3600
480	—	9600	7200

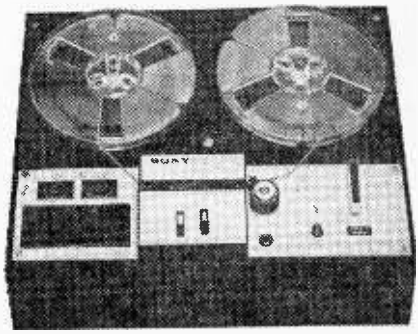
At 15-Hz sweep frequency, the scope shows four stationary cycles on the screen. At 60 Hz, one cycle appears on the screen. At 120 Hz, two curved lines appear on the

(Continued on page 117)

SONY MODEL TC-350

Solid-State

Stereo Tape Recorder



■ To many audiophiles, no *true* hi-fi installation is complete without a tape deck. For without the tape medium, how can anyone enjoy the advantages of prerecorded tapes, or preserve the like-new sound of quality disc performances?

Unfortunately, a semiprofessional or professional tape deck (a complete recorder except for power amplifier and speakers) often represents nearly the total cost of *all* the other equipment—tuner, amplifier, turntable and, sometimes, speakers.

From all appearances, the Sony TC-350 *Tapecorder* was intended as a moderate priced answer to the need for a tape deck which would meet the performance requirements of the serious audiophile—hi-fi quality at slightly more than budget prices.

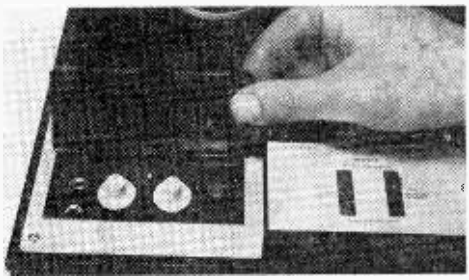
The Sony TC-350 electronics are all solid-state (transistorized), providing either stereo or 4-track mono recording. As with all semi-pro machines, three heads are used, allowing simultaneous recording and *playback monitoring*.

Features. Among the standard features are line-level input and output jacks, a single control for selection of either 7.5 or 3.75-*ips* speeds and their matching frequency equalization, separate recording-level meters for each channel, single lever to select the *FF, FR, Forward* and *Pause* modes, a resetable tape-travel counter, and an automatic shut-off switch that stops the capstan motor after the end of the tape has passed through the heads.

Line input and output jacks are provided in addition to a combined-signal *DIN* (European type) jack. If you have one of the imported amplifiers or receivers which provide for both tape-in and tape-out signals at a single DIN jack, you can connect the Sony to this jack through a single multi-conductor cable. Otherwise, you use the standard phono-type line-in and line-out jacks. The microphone jacks, which are mounted along with the L- and R-record volume controls and the record interlock under a hinged cover on top of the deck, are the *mini* type. The TC-350 does not accommodate the standard phone-type microphone plug.

Unique Switching. A useful feature is the individual L and R source-tape switching of the line output jacks. When the L or R *mode* switch is set to the *Source* position both the VU meter and the line output signal are switched to the source (incoming) signal; this allows the operator to establish the correct recording level while simultaneously monitoring the *input signal*. When the mode switch is set to the *tape* position, the VU meter indicates the *playback* level at the output of the playback amplifier, and the playback signal from the third head is fed to the line-out jack(s).

A rather unusual feature is the *SOS*, or



Snap-open door on top left conceals the 350's mike jacks and record level controls. Two mode switches are directly below heel of hand.

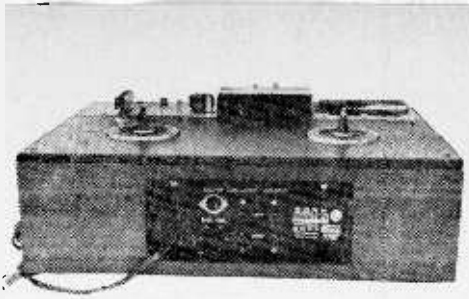
Sound-On-Sound control that is located on the rear apron. When the *SOS* control is rotated to the *off* position the TC-350 operates like any other stereo recorder. As the control is advanced whatever signal is recorded on the left channel is automatically fed to the right channel; the volume level being determined by the setting of the *SOS* control. This arrangement permits you to obtain *multiple effects*. For example, you might sing melody and record it on the left track, and then automatically re-record the melody (while singing harmony) on the right track. The final result (melody with harmony) would appear on the right track.

A stereo-headphone monitor jack, which accommodates high-impedance headsets, is mounted on the front panel.

The Greatest. A rarity in this age, the Sony TC-350's instruction manual is also a service manual intended for other than 9-year olds. The manual shows how to dismantle the recorder for custom installation, has a recommended lubrication procedure, and a real honest-to-goodness schematic diagram.

Test Results. In terms of noise and distortion the Sony TC-350 we checked was notably *good*. At *maximum* recording level (as indicated by the VU meter at maximum scale) the combined noise and total harmonic distortion was slightly less than 1.5%. The noise level, below normal recording volume (not peak volume which is referenced at 3% THD), checked out at −42 db. This would be equivalent to slightly better than −50 db if the higher 3% THD reference level was used. Surprisingly, the high-pitched hiss generally prevalent on solid-state recorders was absent from the TC-350's output.

Microphone input sensitivity was very high, less than 0.1 mv. for normal recording level. The microphone input circuit is designed to acommodate microphone impedances from 250 to 1000 ohms.



Rear panel of the 350 contains line-level input and output jacks, a DIN signal jack, and the SOS (sound-on-sound) volume control.

The line-level (auxiliary) input impedance is 100,000 ohms with a sensitivity of 68 mv.

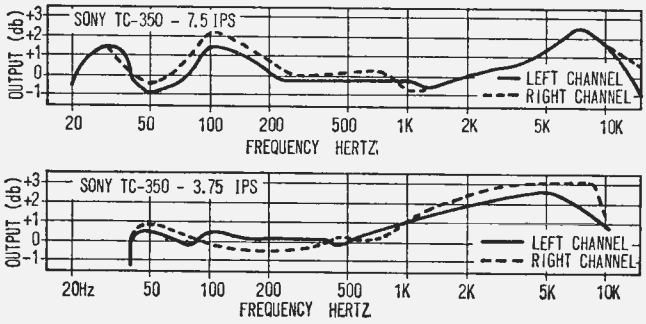
The output level for a maximum recording level as indicated on the VU meter was 0.8 v.

The frequency response (for both channels, at both speeds) is shown in the test curves. The recording medium was Sony type PR-150 Professional Recording Tape. As shown, while the frequency response measured less than the limits claimed by Sony (±3 db 50-15,000 Hz at 7.5 ips and 30-14,000 Hz at 3.75 ips) they are well within the accepted hi-fi range. We assume there would be some variation in the frequency response depending on the brand and type of tape used.

While there is an unusual "double peak" at the extreme low end of the 7.5 ips response surve, the lower peak falls outside the referenced lower limit of 50 Hz. Even allowing for a response down to 20 Hz, the lower peak is still within the ±3 db specification.

Want One? The Sony TC-350 tape-recorder lists at $174.50. The deck is supplied mounted on a walnut base. A rigid "soft" dust cover is provided, along with a complete set of cables and a take-up reel.

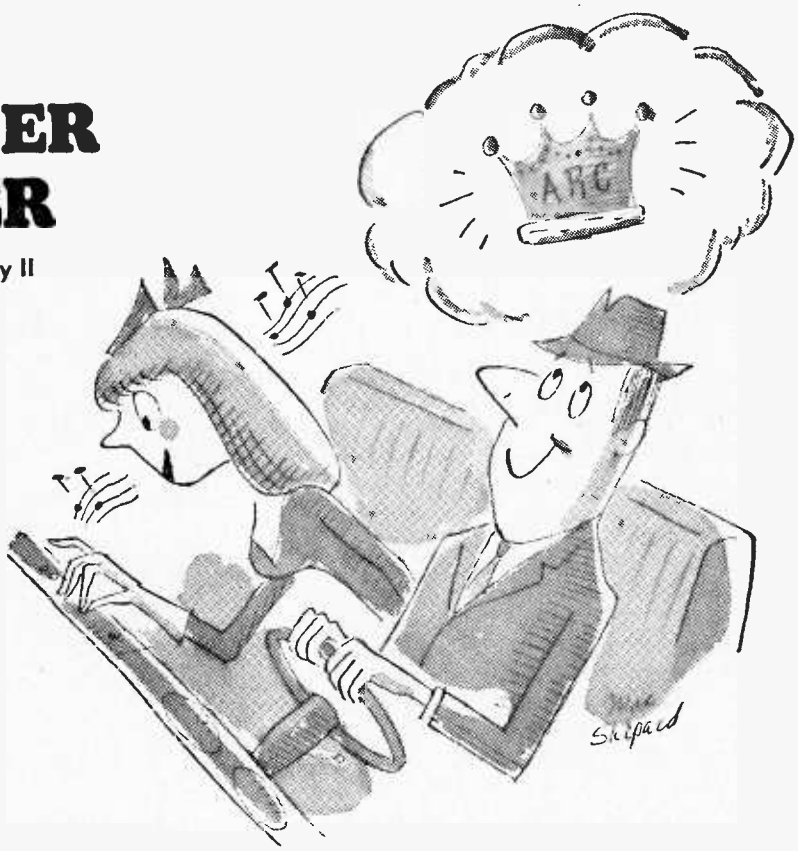
For additional information, write to Consumer Products Div. Sony Corporation of America, Dept. MG, 580 Fifth Avenue, New York, N. Y. 10036. ■



Curves show overall record/play response at both 3¾- and 7½-ips speeds for Sony 350 tape recorder (the identical tape deck, mounted in a carrying case for portable use, is also available as the Model 350C). Note that response actually extends to a low 20 Hz at the faster 7½-ips speed.

CALL LETTER CAPER

By C. M. Stanbury II



Opportunity knocked; I answered. The moon, meanwhile, beamed brightly on.

□ We left Anne's cousin's place in Rochester around 1:00 a.m. By 1:30 we were on the thruway and headed for home. A cold clear night with full moon. Anne fiddled with the car radio.

"What are you looking for?" I held the speedometer at a nice steady 70.

"Some jazz or blues—something like that." Anne lighted briefly on a Miami station with an open-line type program. Some refined lady was phoning from her yacht to complain about too much raucous music on the air. Anne made a face and moved on.

"Try WCFL on 1000. Their lady DJ plays jazz and blues all night." (I harbored secret hopes the 1000-spot might see me snag my latest pet DX target, ZET, the one that could make me a really big man in the radio world.)

Anne eyed me suspiciously. "Where's that from, Honolulu or Hong Kong?"

"Chicago. And it usually comes in real good this time of night."

She found WCFL on the first try. Not only S9 but playing her favorite record, too.

Big league town,
Minor-league man.
Minor-league man,
Gotta make it when you can.

Anne snuggled a little closer to me. "You really aren't going to DX tonight, are you?" She smoothed her silky red hair which hung loose to the shoulders.

"I promise we won't move off that frequency all the way home." Deep down in the background I thought I could make out a Mantovani record. I figured my chances of bagging ZET were pretty good.

Anne adjusted the tuning knob a little to make sure we were right on station. WCFL brought forth "Night Train."

I had already verified that call, ZET, up on 2966 kHz when it was assigned to the Kingston, Jamaica Aeradio. But when Jamaica became independent, Kingston Aeradio had been issued a new call, 6YK. Then someone reported in a radio club bulletin that ZET had been reassigned to a broadcast station on 1000 kHz—a certain Radio Rum in Rum Cay, Bahamas. Those two different

ZET-QSLs would make a real prize package for my collection. And nobody else in the club had the original ZET, so I was the only member who could bring off this DX coup.

Mantovani gave way to Percy Faith. A little stronger now, and Anne noticed the interference during the last few bars of Night Train. "Isn't there anything you can do about that?"

Shook my head. According to the club this new ZET catered to the Florida yacht trade. Slowed down slightly and listened a little harder.

Anne, suddenly wary, straightened up. "Are you listening for some DX?"

"Only if it comes in on WCFL's frequency."

"And what weird station are you after this time?" Set her mouth.

"ZET." I watched traffic as we passed a tractor-trailer.

Anne put her hand on her hips. "You've already got something from ZET!"

"That was from Jamaica. Now they're in the Bahamas." My DX treasure lost ground and was temporarily buried under Count Basie. "If I can QSL that same call from both locations, it would be a real wild combination." I daydreamed. "Make me a real wheel in the Atlantic Radio Club."

She gave me the you-don't-exist sign.

I decided to try psychology. "It's like that song goes, honey, you got to make it when you can."

"Make what?" Sarcastically.

"Maybe president of ARC." During a WCFL beer commercial my target reappeared. "All it takes is a few really spectacular QSLs to make yourself a reputation." Under a jazz piano played softly, I could hear "Golden Violins" being dedicated to a gal in Sarasota. Knew I had it made. Ahead there was a rest area and I pulled off into it, confident I had made a kill.

"Now what are you doing?"

"Got to make some program notes." I reached across her to the glove compartment, came up with a pencil and scratch pad. Checked my dashboard clock, scribbled down the time of that Sarasota request.

Anne said, deadpan, "And this is going to make you president of the Atlantic Radio Club?"

WCFL's lady DJ put on a jazz version of "Slaughter on Tenth Avenue," but "Golden Violins" was really holding its own.

"Could be." I tensed a little waiting for that crucial ID. Outside the moon had completely disappeared and rain had begun to fall. The noise level was almost nil.

"What do you want to be president of a radio club for?" Anne drummed one finger on the seat.

"Don't do that. It makes it harder to hear."

She sat still. "What do you want to be president for?"

Suddenly my prize was on top with an outboard motor commercial. I laughed. "Everyone wants to be president of something."

"Even if it's just a radio club?"

I sang a few bars of her favorite song. *"Minor league man, gotta make it when you can."*

By this time WCFL was completely buried. "This is the great voice of Florihama, Radio Rum, coming to you with 50,000 watts from Rum Cay, Bahamas."

I held my breath. Anne looked disgusted.

Still almost S9. "We are now using our new call letters, ZRUM . . ."

I felt sick.

". . . which suit us much better than those call letters they first stuck us with last month."

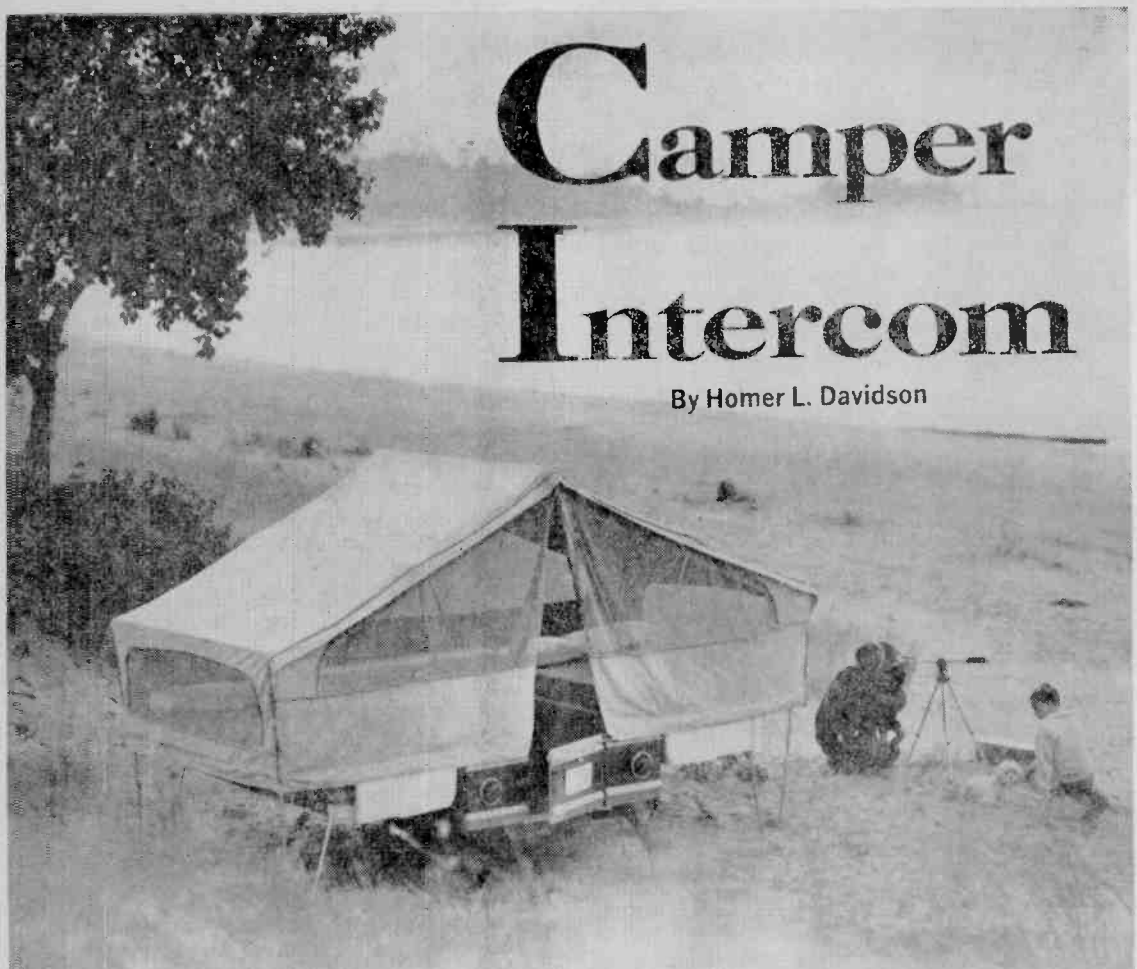
Shell shock. In a moment, WCFL and ZRUM were about even.

Anne switched off the radio. "Well, minor league man, you just struck out." She reached over and started my motor. "Drive."

It was going to be a long drive home. ■

Camper Intercom

By Homer L. Davidson



Whether you use this intercom to eavesdrop on the children tucked away in the pickup camper or use it between the kitchen and garage, playroom or nursery, you can talk back-and-forth or use it as an extension speaker to hear your favorite AM or FM radio programs!

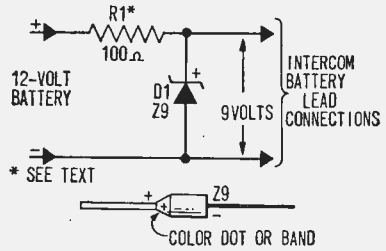
■ There are several camper-to-cab intercom-units on the market but you can save a few dollars converting one to our Camper Intercom. Just add a few features to a small low-priced commercial intercom and the results are the same. To modify a $9.95 transistor intercom unit all you add are a Zener-diode network and a toggle switch.

Modified, the Camper Intercom is no longer powered by a small, internal battery. Power is taken from the pickup truck's own 12-volt battery. Your favorite radio programs can be piped to the camper with a flip of a switch. Simply run a pair of wires from the radio speaker to the master unit of the Camper Intercom. Two wires to the small remote speaker are paralleled across the radio speaker terminals. With this hookup the remote unit works just like a rear-seat speaker in a sedan.

9 Volts from 12. Since the small intercom is designed to operate from a nine-

Camper Intercom

volt battery, a voltage drop of three volts must be provided to operate it from the pick-up-truck battery. A voltage dropping resistor and Zener diode keep the operating voltage around 9 volts. R1 drops the DC voltage to 9 volts with D1, the Zener diode, regulating the dropped voltage. The value of R1 will be determined by the current drawn from



Simple two-component circuit drops output of 12-volt automotive battery to 9 volts. Be sure to watch polarity when connecting the Zener diode and leads between intercom and battery.

the master unit. In most cases R1 can be 100 ohms for Zener diodes rated at 100 ma.

Radio, Too! To provide music to the remote unit, both wires going to the radio speaker must be wired to the intercom circuit. Check to see if one of the speaker wires or one side of the radio's output transformer is grounded. If this is the case, simply cut the lead from the ground terminal and wire directly to the radio speaker. In many auto and truck radios one speaker wire is grounded. By removing this ground both radio and intercom will operate without blowing a car fuse. Take a look at the *speaker-hookup* schematic diagram (below).

Modification. Before attempting to rewire the intercom drill all necessary holes in the plastic case of the master unit. Two ¼-in. holes are put in the right-hand bottom-end of the plastic case. One hole provides an entrance for the 12-volt leads. The other ¼-in. hole is for the radio speaker wires. At the top center of the master unit drill a ⅜-in. hole to mount the s.p.d.t. toggle switch.

Mount toggle switch S1 before wiring the unit. Remove the snap-on battery terminals from the red and black wires. The red wire is the positive terminal and the black wire is negative.

Most etched circuit boards have one to two small holes that the dropping resistor and zener diode can be tied to. If not, drill two 1/16-in. holes, side by side, at the top right hand side of the etched board. Use these insulated holes as tie points. Solder one lead of the resistor and Zener diode together (after they have been looped through the holes in the etched board) to hold them in place.

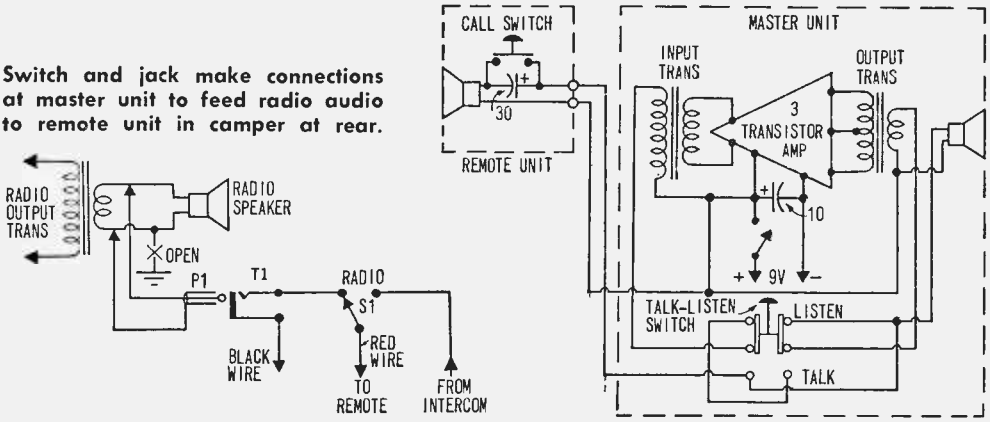
PARTS LIST

D1—9-volt Zener diode, 100-250 ma (Cardover Z9, Motorola HEP-104 or equiv.)
R1—100-ohm, 1-watt resistor (see text)
S1—S.p.d.t. miniature toggle switch
1—Intercom (Fannon Electronics EG-2—Allied 24A9957; Burstein-Appleby 36A196; Lafayette 99C4578 or equiv.)
6 ft—Speaker wire.
Misc.—Machine screws and nuts, wire, solder, lugs, etc.

Estimated cost: $12
Construction time: 1 hour

Only modification required to work intercom in camper is simple circuit shown above left. Radio listening is a bonus, but could be handled by separate wires and speaker.

Switch and jack make connections at master unit to feed radio audio to remote unit in camper at rear.



You can easily eavesdrop on the children in the camper while driving, via intercom, as well as control their choice of radio fare.

Mark the positive wire terminal (with a tied knot of thread or a dab of red paint), at both ends. This mark indicates the hot or lead coming from the 12-volt battery. Most new American-built trucks and autos have a negative ground electrical system. It is very important that the positive battery terminal go to the red-marked wire of the small intercom master unit. Damage to the small transistors will result if the polarity is reversed.

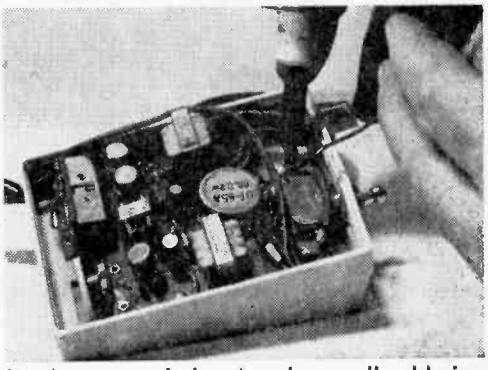
Solder R1 in series with the +12 volt lead wire and the red wire that went to the built-in battery terminals. Run the black lead directly to ground. Shunt the Zener diode across the red and black built-in battery leads. After these leads are soldered into the circuit, either tape them up or slip a large piece of spaghetti over the exposed connections. Be sure the positive terminal of D1 or the metal body of the diode goes to R1. Recheck your wiring.

Wiring to the Radio. Remove the red lead from one side of the small remote speaker jack (J1) at the top of the master unit. Leave the black lead soldered to one side of the remote jack. Solder one lead coming from the radio speaker to this black terminal. The other radio lead is soldered to one side of the toggle switch. Take a piece of hook-up wire from the center switching terminal of the toggle switch and solder to the open terminal on the speaker jack. Solder the red lead from the etched board to the remaining lug of S1. Recheck radio-speaker wiring.

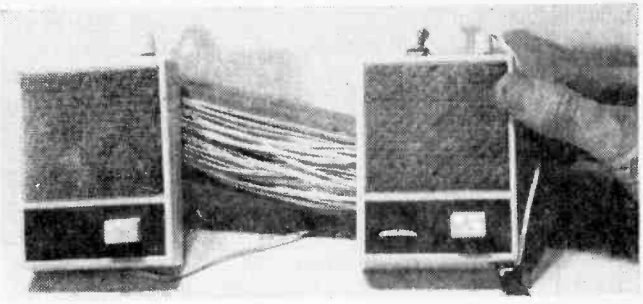
A three-foot length of flat speaker wire should be used to connect the intercom to the radio speaker. Both the power and speaker leads should be long enough to go under the dash and then can be cut to exact length.

Most small intercom units are provided with 50 feet of interconnecting cable. Cut off the excess wire when plugging into the remote station. Since the cable is very small and lightweight, tape or place a large piece of spaghetti over the connecting cable upon entering the camper and truck body. Do not staple the small cable at any point unless protected with tape. Vibration may cut the insulation of the wires, shorting out the remote unit.

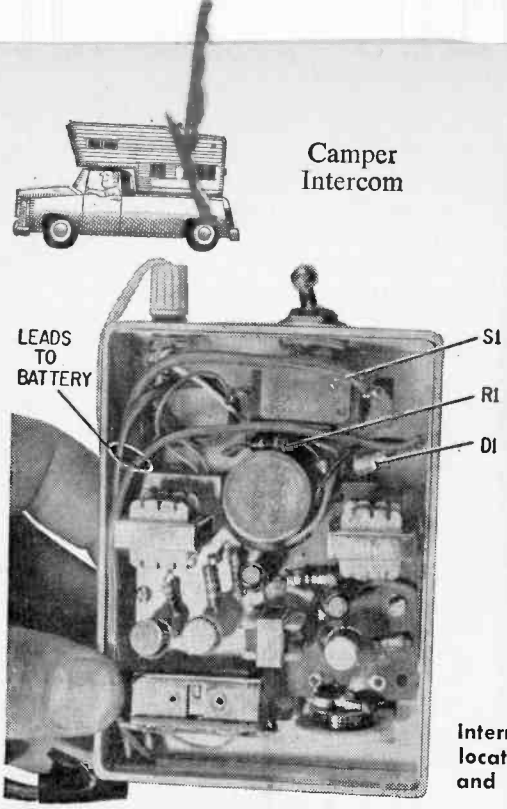
Master Unit Mounting. The master intercom unit must be secured to the dash of the panel truck with metal screws. Several mounting holes are in the back plastic cover just for this purpose. To prevent the master unit from vibrating out of the plastic back when traveling, run a long machine screw clear through both units and through the front of the metal dashboard.



It takes a steady hand and a small soldering iron tip to make necessary speaker connections.



Intercom, as supplied by the manufacturer, has large hank of wire for connecting between master and remote units. Wire not needed to make connection should be clipped off so that run between units is as direct as possible.



Master intercom unit is mounted on dash of pickup truck. Make sure wiring isn't dangling —tape it securely to bracket behind dash.

Internal view of modified intercom shows locations of battery-eliminator components and radio connections; jack, plug, switch.

Connect the speaker wires from the master unit to the radio speaker terminals. Solder and tape them where necessary. Be sure one of the speaker leads is not grounded to the speaker or radio chassis as stated before. Run the hot lead of the intercom to accessories terminal on the ignition switch or to a fuse-block terminal. It is best to have the intercom unit powered through the ignition switch so that the intercom will turn off with the ignition key. Run the negative lead to a grounding screw or a body bolt under the dash panel.

Using the Intercom. Plug the interconnecting cable into the master and remote unit. Rotate the volume knob about halfway —you are now ready to call the remote station. Press down the talk-listen switch and speak into the master unit. You do not need to bend over to talk directly into the unit as there is plenty of pickup volume. Remember, you must press the switch down while you talk into the master unit. Adjust the volume for desired loudness.

The remote is non-private and replies, to a call from the master unit, can be made without touching any switch. As conversation proceeds the person at the master unit manipulates the switch—always pressing to talk and releasing to listen.

Someone in the camper can call the master unit by pressing the call switch when the master is turned *off*. When the call switch is pressed a tone is heard at the master station—indicating that the remote is originating a call. The master unit then answers the remote by turning the volume knob to *on* and pressing down to talk.

Note that the remote station uses the call switch only when originating a call to the master unit and the master unit is *off*. Once the master station has replied, the operator at the remote need not use the call switch when the master is on.

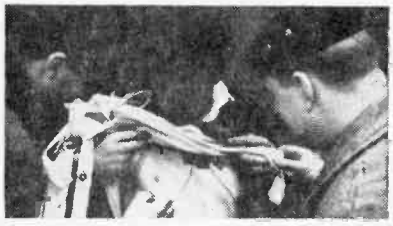
The master station power switch must be in the *off* position when the radio music is piped to the remote unit in the camper. Just flip the toggle switch to radio with the radio operating in the front cab or pickup truck.

Eliminating Hash. Excessive auto motor noise can be eliminated with distributor suppressor and capacitor. Check to see if the center distributor cable has a noise suppressor in series with it. Also tie a .5 mf capacitor from the ignition switch to ground. Under extreme cases noise can be eliminated by running a shielded cable from the master unit to remote in the camper.

Now you can enjoy music in the camper from the pickup-truck radio, communicate with persons while riding, or monitor the children in the camper itself. Many miles of conversation and music can be had for very few dollars. ■

CHECKING OUT THE CHAMP

Though Jan has undergone tests aplenty, meds still lack an explanation for his ills.



EKG leads taped to Jan's chest recorded cardiac activity throughout a 220-minute-long match.

■ Jan Kodes, Czechoslovakia's crack tennis champ, may look a trifle weird wearing face mask and back pack, but the pair have been Jan's mascots for many a match. To pinpoint the cause of a cramp in his left thigh, doctors fitted Jan with a breathing mask to check respiratory frequency and EKG apparatus to monitor heart action. Both feed the back-pack transmitter. —*Robert Levine.* ■

Outputs from breathing mask and EKG device were fed to miniature back-pack transmitter and ultimately recorded in normal fashion.

WB2UFZ CALLING

■ The label on the shortwave receiver kit suggested "Do It Yourself"—so the nuns did! Following instructions inside the dusty cardboard box they discovered in the basement of their Motherhouse, the Maryknollers spent hours of their spare time assembling the receiver. That it worked and could actually receive signals from around the world astonished the Sisters—so much so they decided to become Hams in order to be able to send as well as receive.

When some Maryknoll seminarians heard of their interest and sent over additional gear, the Maryknoll Sisters at Maryknoll, N.Y., continued to "do it themselves" until they had constructed an entire station. And that's how WB2UFZ had its beginning.

A small tower on the highest part of the

Instant communications with other missionaries around the world is the chief reason for station WB2UFZ's existence. Here, Sisters manage to contact Maryknoll novitiate in Topsfield, Mass.

Tuning the transmitter takes knowledge and patience, two qualities the Sisters possess in extremely good measure.

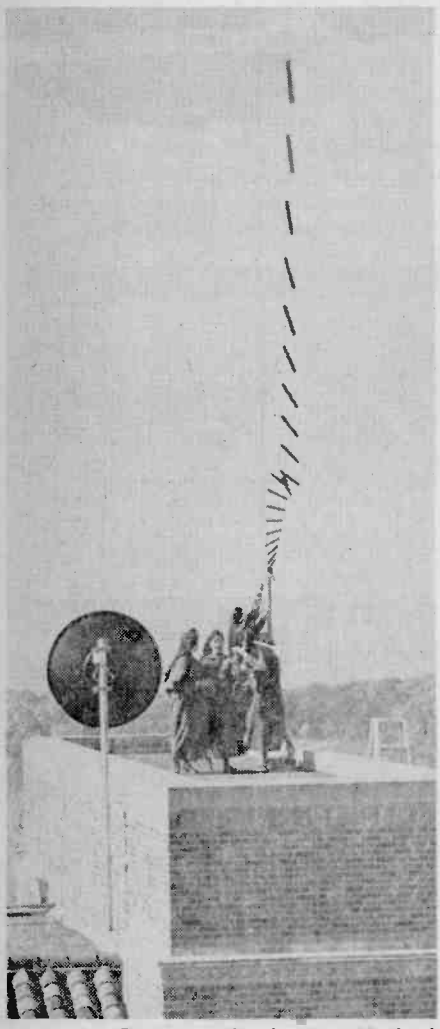
Other Hams often chat with the Sisters for some time before realizing that WB2UFZ's ops are nuns. Sister Mary Ellen locates a Ham on call map.

Motherhouse seemed an ideal place to install the equipment, so the Hams-to-be moved in. Once inside their shack, high above the Hudson River, the Sisters began part two of their project: learning Morse Code and radio theory. For months the staccato sounds of the code echoed through the fourth-floor corridors late every afternoon and evening until the Sisters had mastered their Morse.

Help in understanding radio theory came from Al LaPlaca, K2DDK, of nearby Long Island, and from Sister Anne Marie, science teacher at Maryknoll's Mary Rogers College. With Al's classes and Sister's tutoring, they were soon ready to tackle the FCC exams.

Sister Karen was the first to pass and to receive the coveted General license; Sisters Patricia, Mary Ellen, Carolyn, and Judith each earned a Novice license. Their celebration was simple: they officially went "on the air." Ultimately, they hope to talk to their missionary Sisters stationed around the world.

"Mail takes the slow boat to China—and to every other Maryknoll mission," explains Sister Karen with a smile. "Instant communication is our aim," and instant communication the Sisters will have whenever WB2UFZ goes calling. ■



Messages received in code are immediately typed in English, thanks to Sister Carolyn's excellent knowledge of Morse.

Putting a dipole atop Motherhouse proved an all-day job for the Sisters, but put it up they did (circular object at left is part of Maryknoll's ETV equipment). At right, Sister Anne Marie, science teacher at Maryknoll's Mary Rogers College, helps nuns cram up on theory for the FCC exam.

Propagation Forecast

By C. M. Stanbury II

June/July, 1967

■ Up until now the rising sunspot count has been nothing but bad news for died-in-the-wool DXers, especially when it comes to logging prized European and African DX. In Europe such stations operate on 49 meters (where conditions are never any worse than fair on a year-round basis). But equally rare African stations operate primarily on 60 and 90 meters where conditions promise to be pretty rough the next few years. And during the summer low-band shortwave reception is even rougher because of a higher noise level.

Ironically, a development (produced by the increasing sunspot count itself) will now partially offset some of these barriers to rare DX. This will open 41 and 31 meters for Europe and Africa during most of the hours of darkness—to around 0500. These bands are high enough to escape most static.

Almost any condition can be used to DXing advantage (if you know how). During ionospheric disturbances (which will become more numerous with the increasing sunspot count) reception from Africa and Latin America will actually improve. Strength of the signals from these areas will remain relatively unchanged while QRM from stations in Europe, Asia and even North America will be almost wiped out. ■

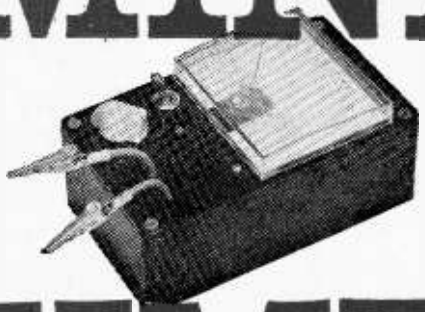
RADIO-TV EXPERIMENTER PROPAGATION FORECAST

LISTENER'S STANDARD TIME	ASIA (except Near East)	EUROPE, NEAR EAST & AFRICA (N. of the Sahara)	AFRICA (S. of the Sahara)	SOUTH PACIFIC	LATIN AMERICA
0000-0300	31, 25	31 (41)	31 (41)	31 , 41 (49)	49
0300-0600	31, 25	31 (41)	31 (poor)	49 (60,41)	49
0600-0900	19, 16	19	19 (poor)	31, 25	31 (49)
0900-1200	19 (poor)	19, 16	19, 16	25	25
1200-1500	19 (poor)	19, 16	19, 16	25 (poor)	19
1500-1800	19, 16	25, 19 (31)	31 (41)	19 (poor)	31
1800-2100	19, 16	31, 25	31, 25	19	49 , 60 (90)
2100-2400	19, 16	31, 25	31 (41)	19 , 25	49, 60 (90)

To use the table put your finger on the region you want to hear and log, move your finger down until it is along side the local standard time at which you will be listening and lift your finger. Underneath your pointing digit will be the shortwave band or bands that will give the best DX results. The time in the above propagation prediction table is given in *standard time* at the listener's location which effectively compensates for differences in propagation characteristics between the east and west coasts of North America. However, Asia and the South Pacific stations will generally be received stronger in the West while Europe and Africa will be easier to tune on the east coast. The shortwave bands in brackets are given as second choices. Refer to White's Radio Log for World-Wide Shortwave Broadcast Stations list.

MINI-OHMER

Having trouble measuring the resistance of switches, transformers?



Solve those mini-ohm measuring problems—build this little tester.

by Marshall Lincoln, W7DQS

■ "A little bit goes a long way" is literally true with this handy home workshop project. It's a *Mini-Ohmer,* designed specifically for measuring "little bits" of resistance—say in the neighborhood of a couple ohms or less!

The low-resistance measurements of this useful gadget take over where most ohmmeters leave off. Most ohmmeters don't measure much below 10 ohms with very great accuracy—and that's where *Mini-Ohmer* shines.

Readings of less than 10 ohms are relegated to a rather small portion of the meter face with almost all ohmmeters and, even then, their accuracy is questionable. Accuracy is often poor because of the normal characteristics of the ohmmeter circuit, the difficulty of setting the *zero adjust* control properly, or the chance that it may be misadjusted accidentally.

The *Mini-Ohmer* is designed to make low-resistance measurements with much greater accuracy. Its scale has been *spread out* electrically so that low resistances are easy to read. The space on the meter face devoted to just one ohm is equivalent to the space for several ohms on most ohmmeter scales.

You'll find the *Mini-Ohmer* to be a very handy for measuring the resistance of IF and power transformer windings, chokes, switch contacts, and many other low-resistance electronics parts. It may even help you locate some faulty solder joints that otherwise have escaped detection!

What Is It? Essentially, the *Mini-Ohmer* is a "shunt-type" or slide-back ohmmeter—with a slightly modified circuit, and a special calibration technique.

There are two basic types of ohmmeters —*series*-type (Fig. 1) and *shunt*-type (Fig. 2).

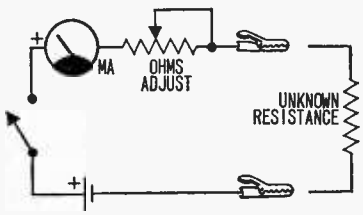


Fig. 1. Basic ohmmeter circuit is the same as that in most VOMs. Short clips and set ohms adjust for zero indication.

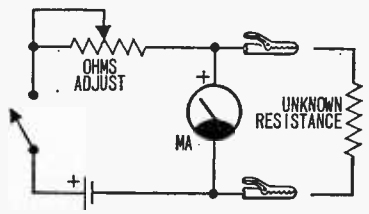


Fig. 2. Slide-back ohmmeter circuit isn't suitable for high-resistance measurements and isn't added to most VOMs for low-ohms.

Generally speaking, the series type is better for measuring high resistance while the shunt type is better for measuring low resistances. However, even a good shunt-type

ohmmeter may not give you as high accuracy as you'd like in low-resistance values —down around a half dozen ohms.

So, the *Mini-Ohmer* takes things a step further by adding a simple component to the standard shunt circuit—a 15¢-resistor! This resistor, of very-low resistance itself, is added in parallel with the meter (and in parallel with the resistance being measured), as shown in Fig. 3.

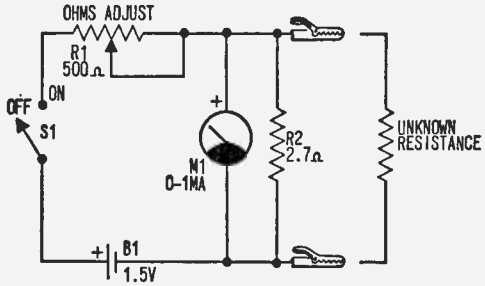


Fig. 3. Schematic diagram of Mini-Ohmer has only one difference from circuit in Fig. 2—R2 in shunt with meter. Meter indicates IR drop across R2 and unknown.

PARTS LIST

B1—1.5-volt C-cell
M1—0-1 ma panel meter (Allied 52A7209; Lafayette 99C5040 or equiv.)
R1—500-ohm, linear taper potentiometer
R2—2.7-ohm, ½-watt resistor
S1—S.p.s.t. toggle switch
1—6¼ x 3¾ x 2-in. plastic case (Allied 42A-7885 or equiv.)
1—6 x 3½-in. cover for plastic case (Allied 42A7887 or equiv.)
1—110-inch length #40 magnet wire (See Wire Calibration Table)
Misc.—Knob, alligator clips, hook-up wire, test-lead wire, battery holder, solder lugs, solder, etc.

Estimated cost: $6.00
Construction time: 3 hours

How It Works. You may think of this resistor as *loading* the meter so that it is always *looking* at a very-low resistance. When you measure low resistance with this meter, you add a second low resistance in parallel with the shunt resistor in the meter circuit. The resultant resistance, formed by paralleling these two resistances, produces a very noticeable deflection of the meter needle. Medium to high resistances, when connected to the meter, produce no noticeable deflection, so they must be measured with a conventional meter. The *Mini-Ohmer* is a specialist—it handles very-low resistances *only*.

A 2.7-ohm resistor was selected as a reasonable compromise. A higher resistance would make the meter less useful when measuring resistances of only an ohm or so, while a lower resistance would limit the upper range of the low resistances measurable with this meter. However, if you're especially interested in measuring just one or two ohms, use a resistance lower in value than shown here for the permanent shunt in your meter.

Build It. Construction is easy and straightforward. A black phenolic box was used for the unit to give it a dressy appearance similar to commercially-made multitesters. A metal utility box, or even a chassis with a bottom plate attached, may be used. If you do use a metal box or chassis, be sure to use rubber grommets where the test leads pass through the panel.

The 0-1 ma. meter used has a removable plastic cover, to make easier the job of installing a new meter scale. You must calibrate this custom scale yourself but that is surprisingly easy.

There's absolutely nothing critical about the parts layout (Fig. 4). Just drill the holes in locations to suit your own taste and install the few components shown in conventional manner. Pin jacks or banana

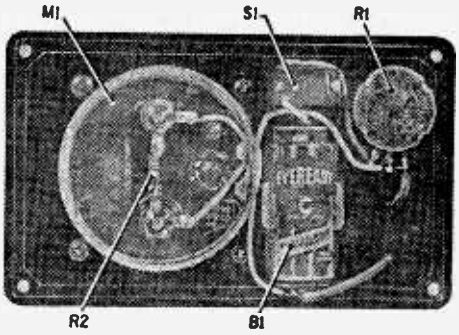


Fig. 4. Internal view of Mini-Ohmer is uncluttered since few parts are actually needed to assemble this low-resistance-measuring instrument. All are on cover.

jacks, for use with ordinary test leads, could be used with this meter, but greater accuracy in low-resistance measurements will result if you use short pieces of test-lead wire with *clean, sharp-toothed* alligator clips. These precautions will keep lead and contact resistance to a minimum as well as the chance of stray resistances within the meter circuit itself.

Testing. Once construction and wiring

have been completed, test the meter this way:

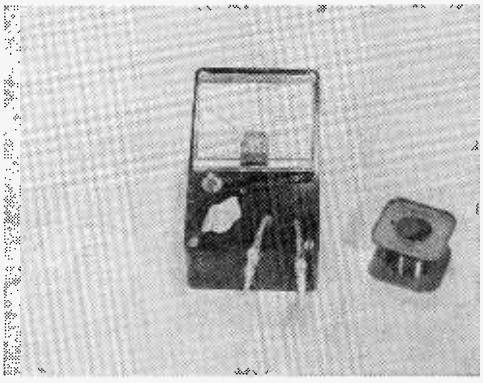
Be sure the test clips are not touching each other, flip the battery switch (S1) to *on*, and adjust the calibration control to produce exactly full-scale deflection of the meter needle. Then, connect a low-value resistor, say about 10 ohms, to the test clips. You will see the needle deflect downward a little ways. Then connect another resistor, of 3 or 4 ohms, and notice how much further downscale the needle moves.

Calibration. To calibrate your instrument, all you need is a length of AWG-40 wire. This very fine wire has a resistance of 1 ohm for each 11 inches at normal room temperature. So, by cutting appropriate lengths of it, you can calibrate your meter by connecting these lengths to the test leads. Handle the wire carefully. If you stretch the thin wire, its resistance will increase. If you are a fussy old dud that likes to fuss about exact calibrations, we must be honest with you. There are exactly 112 inches of #40 wire for ten ohms of resistance. Hence, 11.2 inches per ohm. If you do not have #40 wire in the junk box, then gander at the *Wire Calibration Table*. Wire lengths for standard wire sizes are given. If you don't want to mess with tenths of an inch, round off to the nearest inch. Error introduced is less than 2% with #40 wire and decreases with lower numbered wire sizes.

First, though, turn off the battery switch, remove the plastic cover from over the meter face, and very carefully remove the regular meter face by removing the two tiny screws that hold it in place. Prepare a substitute face of heavy white paper (or typing paper glued to light pasteboard) cut to exactly the same size and shape as the regular meter face. Measure the *zero* and *full scale* positions on the old face and mark these positions on the new, blank face.

Install this blank face on the meter, leave the plastic meter cover off for the time being, and proceed to calibrate your *Mini-Ohmer* this way:

Set the meter to full-scale by flipping the battery switch *on* and adjusting the calibration control for exactly full-scale with the test clips empty and separated.



Use old meter scale (left) as template to make new scale or cement white paper on reverse of old scale and calibrate it.

Now measure off 110 inches of AWG-40 wire, carefully scrape the insulation from each end, and attach the wire to the test clips. The meter needle will drop to the meter's 10-ohm position. With a sharp pointed, hard lead pencil, mark this point carefully on the meter face. Cut off 11 inches from the 110-inch length of wire and repeat the process. This time, the meter needle will indicate 9 ohms.

Continue in this manner right down till you have only 11 inches of wire left. This will be one ohm.

Turn the meter's battery switch (S1) to *off*. Carefully remove the hand-made meter face, and ink in the calibration points with India ink. Add the appropriate numerals, either lettering by hand or by using decals or transfer labels. Replace the meter face and then snap on the plastic meter cover.

Operation. Your *Mini-Ohmer* is completed, calibrated, and ready for use. In operation, flip the battery switch *on* and carefully adjust the calibration control to produce exactly a full-scale reading. Then connect the resistance to be measured to the test clips and read its resistance directly on the meter scale. Snap the battery switch *off* when the meter is not in use to conserve the flashlight cell. ■

WIRE CALIBRATION TABLE

Wire Size	Wire Length for 10 Ohms (inches)	Wire Length for 1 Ohm (inches)
40	112	11.2
38	179	17.9
36	236	23.6
34	376	37.6
32	598	59.8
30	951	95.1
28	1510	151.0

For room temperatures of 25°C or 77°F.

Datemaker Deluxe

Computer plays matchmaker for Gotham's single folk!

■ Big cities—New York, say—are places where people all too often have to be introduced to even their next-door neighbor. They're also filled with single folk who would love to find a mate if only the cityscape didn't prevent compatible people from coming into companionable orbit. Now, a Datemaker Deluxe promises to break those barriers.

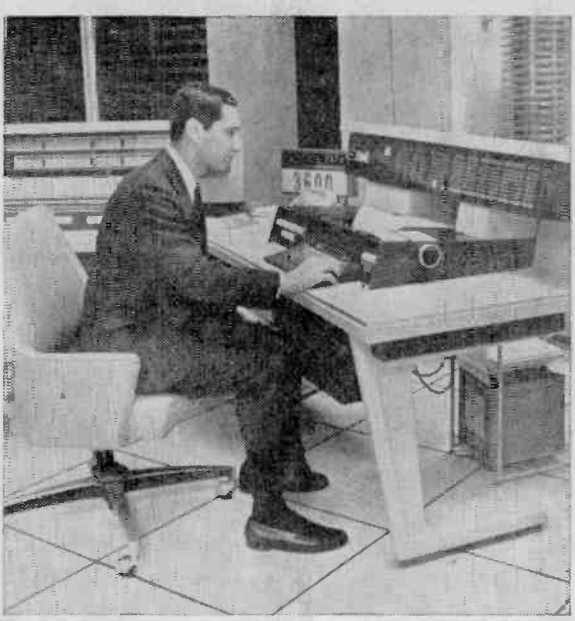
Mr. D.D., it happens, is none other than a computer programmed to help people meet the ideal mate. Called TACT (for *T*echnical *A*utomated *C*ompatibility *T*esting), the service is rooted in logic, nothing else, and that logic is provided by the applicants themselves. Only single, professional, college graduates can apply, and they must be willing to tell the computer a great deal about their interests, tastes, personality, and temperament.

From a questionnaire loaded with multiple-choice questions, Mr. D.D. assembles his info on a punched IBM card. This is fed into the computer, which singles out all compatible cards, then provides the names, addresses, and telephone numbers of the people they represent.

What happens when people who logically were made for each other do get together can be another story, of course, though our photographer followed one Gotham couple from start to finish (well, almost). If you'd like to give Mr. D.D. a whirl, check your telephone directory—there may be a TACT office in your town. ■

Electronic matchmaking begins with applicant completing multiple-choice questionnaire.

Information divulged by questionnaire is then transferred to punched IBM cards.

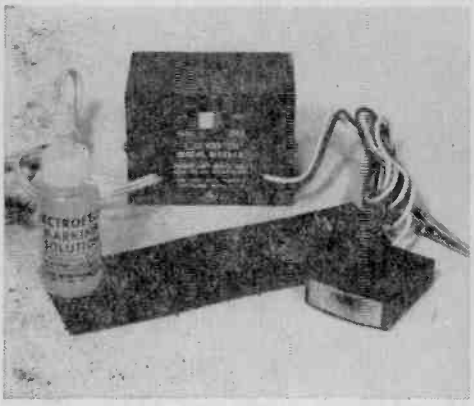


At TACT headquarters, card is fed into computer which selects six cards from applicants of opposite sex who seem best mate prospects. Names, addresses, and telephone numbers for six are then sent to original applicant.

A phone call, and *voila*—the prospective couple meet for the first time while each cautiously reflects on the computer's ability to play matchmaker.

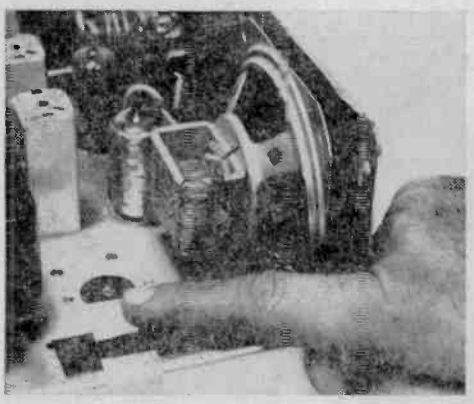
Happiness is a friendship ring, say the smiles on the faces of this happy duo. Engagement ring may follow if couple decides they are really serious.

s Panels.....Shortcut to High-Class Panels.....

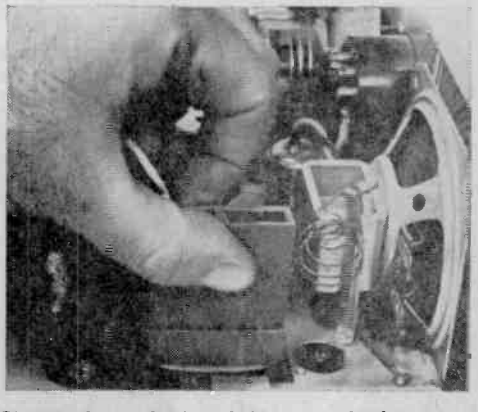


Basic metal marking kit contains transformer and cord, a clip and hand pad, oxidation chemical, and strips of the stencil material.

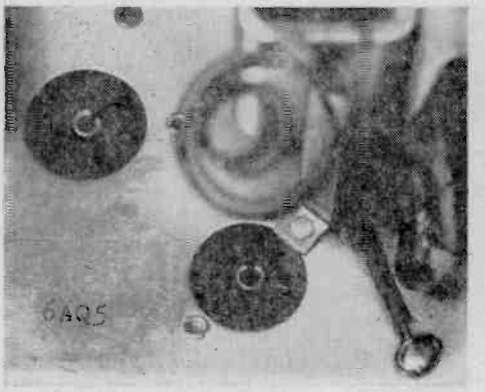
Stencil is ideally cut on a typewriter, but a ball pen or a metal stylus can also be used. Clean, clear stencil works best. Type carefully!



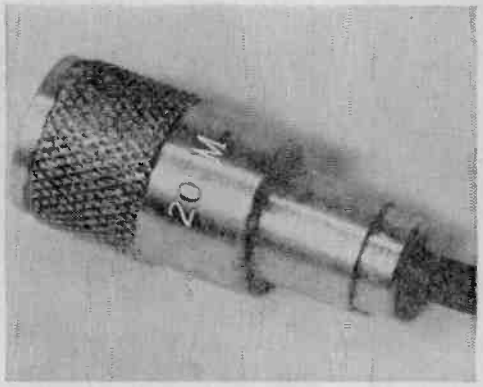
Tape the stencil to the item to be marked with masking or other adhesive tape. Leave ½ in. of space around the symbol or mark.



Chemical supplied with kit is applied to hand pad, then the pad is pressed firmly against the stencil for a few seconds for engraving.



Finished result shows 6AQ5 tube designation "engraved" on the chassis. Kit is not suitable for use with anodized, coated metals.



Even coax connectors can be "engraved" with Lectroetch. 20 M on connector above indicates it feeds a 20-meter Ham antenna on other end.

.....Shortcut to High-Class Panels..... Short

by Bert Mann

■ The sure sign of an experimenter's project is home-brew labels. You know the type, a strip of paper held on with sticky-tape that's turned yellow and crinkly, grease pencil marks that rub off each time you handle the gadget, paper tags that pull off their strings. The list is endless, for even the experimenter who uses transfer labels finds that just the sweat of the brow is enough to float them off a panel.

Even if you're willing to have your own personal gear looking like the Mongolian Creeping Crud, there are times you could use a good, professional-looking marking job. Examples? Suppose you build custom electronic equipment or custom hi-fi installations for friends, customers, or school or community groups. What could look more pro, or get you more business, than to have the tube or transistor numbers "engraved" directly on the chassis?

Similarly, think of having *input* and *output* or other connection notations "engraved" directly on the connectors. Best of all, why not have your name or your company name "engraved" right on the rear apron!

But if you steal a trick from the science/mechanics-type magazines, you can have professional looking engravings that are a lot more permanent—and a lot better looking—than paper nameplates or other cheap imitations.

There's a gadget in the hardware stores—called the *Lectroetch Metal Marking Kit* (about $8) that every experimenter should own. It is used to *engrave* the user's name on tools, knives, guns, etc. Total time to make the marking is about three minutes—maybe less. And just as one can easily mark his name, it's just as easy to mark electronic symbols and names on connectors, chassis, panels, etc.

And even if a paper or grease-pencil label will do the job most of the time, there are times you could use a good professional marking job. Examples? Suppose you build *custom electronic equipment* for, perhaps, friends, or your school. What would look more *pro* than the tube- or transistor-type numbers engraved on the chassis? Or *input* and *output* engraved on the connectors? Or how about that rat's nest of wires for the antenna farm out back? Which connector is what antenna after the grease-pencil marks wear off? Somewhere among your projects there's a need for professional quality markings.

How It Marks. The *Lectroetch Metal Marking Kit* marks through the process of oxidation. First, a stencil is cut on a typewriter (or written with a ballpoint pen or standard stencil stylus) using the supplied stencil material. In our photographs we have cut the mark *6AQ5*, which will be engraved on a chassis next to the matching tube socket. Then the stencil is cut away from the stencil material (the rest can be used later) and taped to the chassis with masking or sticky-tape.

The "ground" lead from the Marker is clipped to the chassis, the pad (attached to the positive lead) is saturated with the supplied chemical, and then the pad is held against the stencil.

The holes in the stencil (the symbols or letters) allow the chemical to flow from the pad to the chassis only where the symbols were cut. The electric current flowing from the pad, through the chemical and through the chassis causes an oxidation layer to be built up on the chassis; total time to build up the oxide is about 5 seconds. When the pad and stencil is removed, the marking appears as an "engraving" on the chassis; black if the metal you are working on is steel, clear or white on aluminum or chrome.

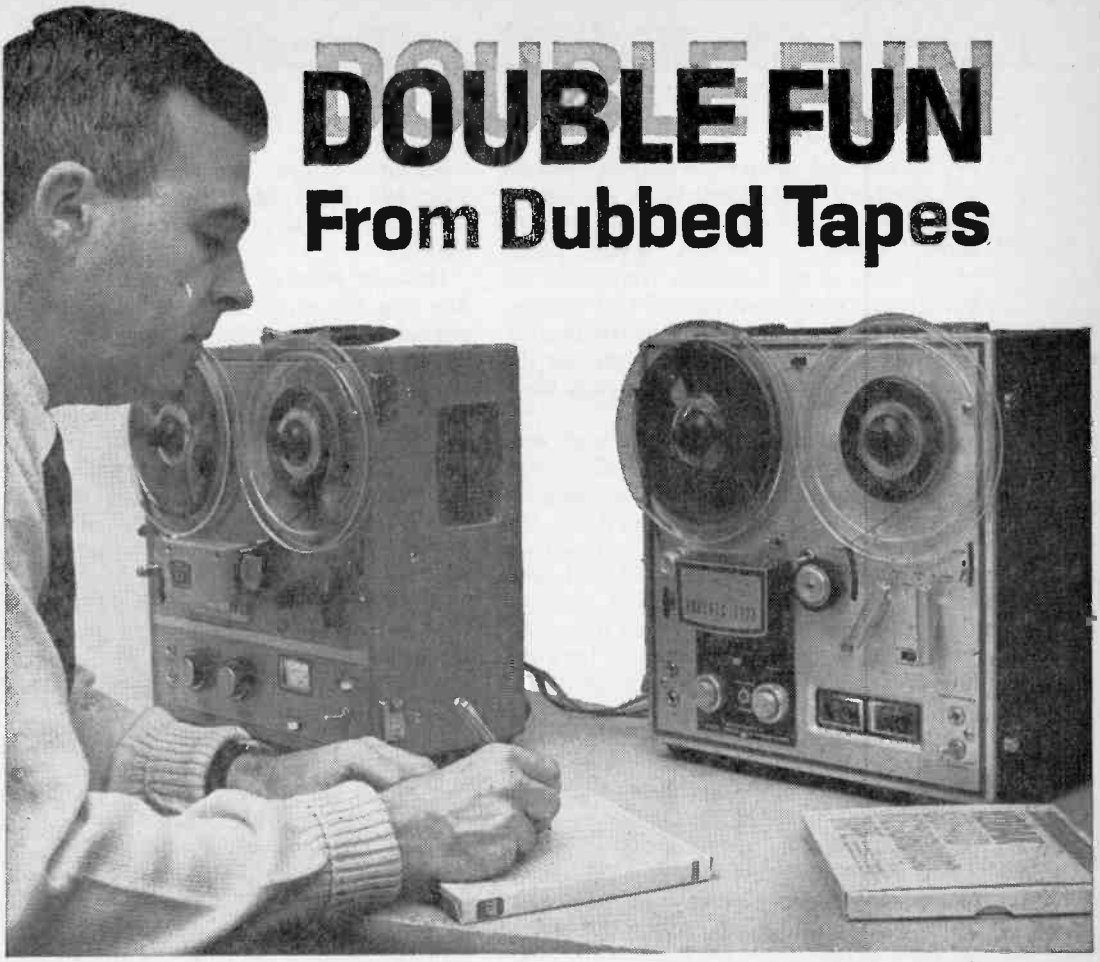
There is no way to change the color of the oxides. Steel comes out as black (with a slight brownish cast), and the white is white. You have no choice.

Markings can only be made on "raw" metal; you cannot mark painted or lacquered surfaces or an anodized aluminum surface (chassis are generally not anodized).

The only difficulty you're likely to run across is a poor mark due to a poorly cut stencil. If you use a typewriter set the ribbon to the *stencil* position and use a relatively heavy stroke—as heavy as possible without cutting out the center of the symbols. If you use a ballpoint pen or stencil stylus make certain you *really* cut through. A little practice will make you a pro.

Don't worry about running out of stencil material or the chemical—a replacement kit is available. ■

DOUBLE FUN
From Dubbed Tapes



Facts courtesy Eastman Kodak

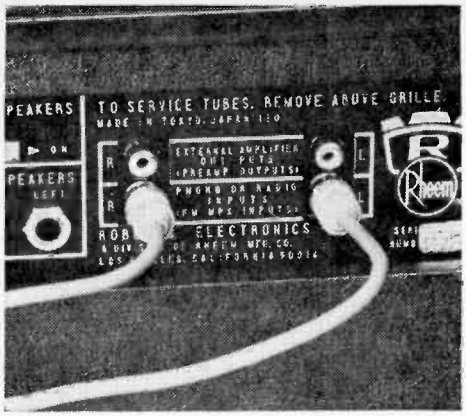
■ The sound of children laughing, the voice of a friend, the beauty and majesty of a great symphony, the noises of traffic, of wind whispering through trees—all of these play on our emotions. The ability to record these experiences and to share them with others, by duplicating sound, sets tape recording (and tape duplication) off as a creative and satisfying hobby.

There are many reasons for making tape duplicates, and these reasons make up a substantial part of the fun in having a good-quality, home tape-recording system.

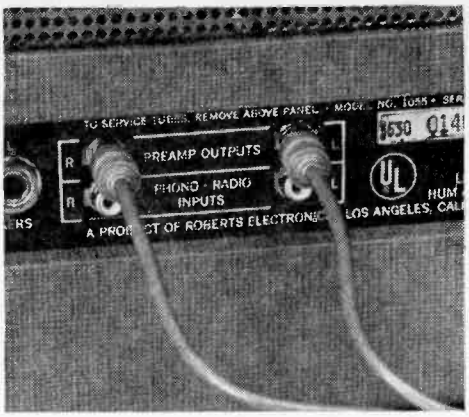
Dubbing a good tape of the kids, for example, and sending it to their grandparents as a tape-recorded letter is one of the simplest and best reasons. And you know that if the tape is good enough to send through the mails, you'll want the original for your own tape library. Perhaps you might want to edit a tape to go along with a movie or slide show without chopping up the original tape . . . or perhaps you want to exchange tapes with a fellow audiophile . . . or because you want to experiment with a variety of sounds from a number of recordings in making a "montage" tape . . . or simply to preserve your early tape recordings on modern, more efficient sound recording tape.

Let's Begin. All you need to get started in duplicating your tapes is an additional tape recorder. If you don't already have a second tape recorder, borrow one from a good friend —you might even get together to help duplicate each other's tapes. However, you had better be careful about the quality of the second tape recorder you use. If it emits sounds similar to an old tin drum, so will your dubbed tapes. The quality of a dubbed tape depends on the quality of the dubbing equipment. Also, be very particular about the tape you use.

Because, at best, a dubbed recording is still a second generation tape, make sure both



Tape recorders vary in way their inputs are labeled, but it's best to select high-level, low-impedance inputs in the slave.



Outputs from master unit should ideally come from preamps. This way, any distortion in unit's power amps can be bypassed.

tape systems are in the best possible condition. This may seem obvious to you, but remember the dubbed tape will combine all the deficiencies present in your original tape recording, in the playback recorder, and in the dubbing or re-recording equipment. Therefore, read instruction books for both machines carefully, and then clean the heads with one of the commercial preparations available. Another good hint, if you can lay your hands on a degausser, is to demagnetize the heads.

What Connections? Now you're ready to connect your two tape machines—the "master" and the "slave." To avoid adding the distortion of the master's power amplifier to your dubbing, take your output from the master machine at the pre-amp stage. For the input to the slave, you usually have a choice—one marked *mike* or *high impedance* (usually in the 50,000- to 500,000-ohm range), the other marked either *radio, phono, tuner, tape* or *low impedance*. You want the latter.

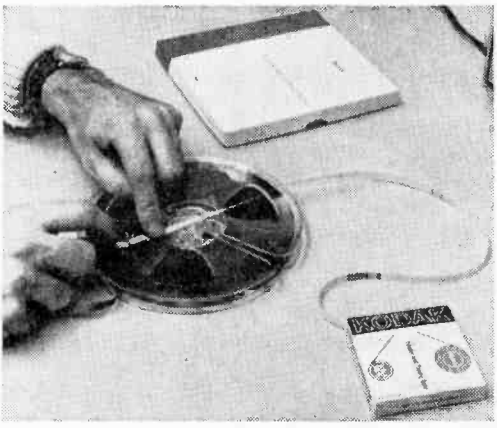
The touchiest area in dubbing is signal-to-noise. What you want is a tape that will give you the lowest noise level on the duplicate tape without lowered output—a tape such as *Kodak* type 34A High Output Professional Tape. This tape, for example, packs five or more decibels of undistorted output than the usual *low-noise* tapes, and it does this with no increase in print-through over general-purpose tapes. Because of its dynamic range, tape noise can be greatly reduced simply by lowering the record level.

Tape Differences. To show the effectiveness of this type of tape, let's compare it with a more conventional tape—*Kodak* 31A Standard Play Tape. The values in the table (see page 117) are in decibels at optimum bias settings using Type 31A as reference.

Why not use an ordinary low-noise tape for your dubbing? Well, designing a low-noise tape is somewhat like a woman trying to stuff a size-9 foot into a size-4 shoe. Cutting open the end of the shoe is a solution, but it lacks elegance. Tapewise, if all you do is use a low-noise tape, you end up with lowered output, i.e., a mighty short foot. And if you push up the gain, where's the low noise you were hoping for?

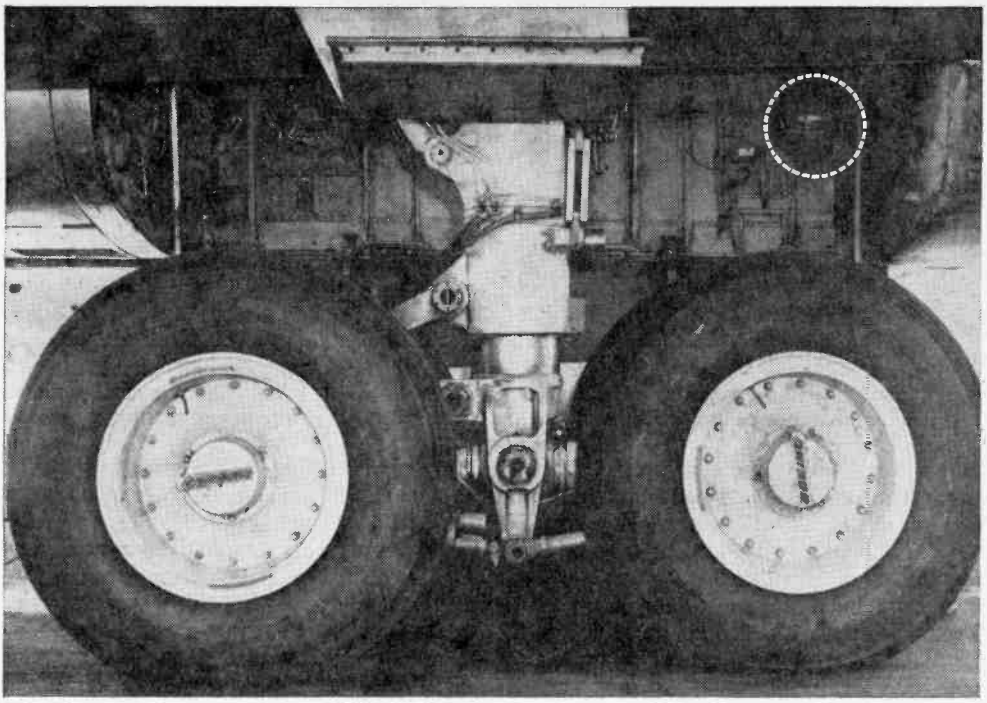
The art of low noisemanship requires a bit more finesse. Try this test: Listen to a "no signal" tape at high gain. Now turn down the gain until the hiss disappears. Now, silence lovers, wouldn't it be nice if you

(Continued on page 117)



Adding leader-timing tape protects tape during threading operation. "No-trim" tabs let you make splices right on the reel.

Flight Recorders Tattletales on In-Flight Mishaps!



Facts courtesy Esso AIR WORLD. Photos by AIR INDIA.

Made to BUG an Airplane

by K. S. Mhatre

■ Over the years, aeronautical engineers have looked forward to having an electronic gadget on aircraft that would keep a continuous record of a flight, from the time of takeoff until the time the aircraft lands. If and when something went wrong, this gadget would tell the tale and pinpoint the cause of the trouble.

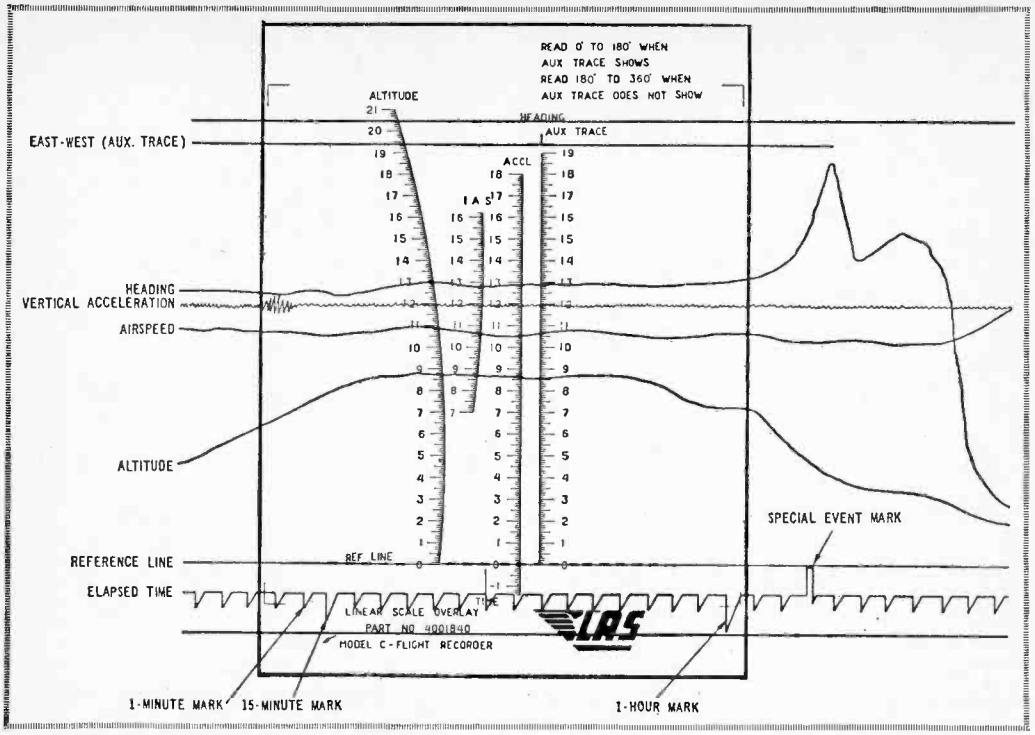
As each leap forward in aeronautical progress touched new frontiers of knowledge and airplanes grew bigger, faster and more complex, new problems of safety arose which made the need for such equipment more urgent than ever.

With rapid advances in electronics and metallurgy in the last few years it became possible to develop flight recorders which were fireproof and which would remain undamaged in the event of a crash.

Snoopy Gadget. A flight recorder is an aeronautical engineer's delight, a gadget that provides him with the minutest detail of how the airplane behaved in flight, how it climbed and descended, how fast, high or low it flew, how many times it changed its course and the stresses and strains ("g" forces measured in terms of earth's gravitation) it suffered. All this against a time scale.

A modern airplane is tested with impressive thoroughness during thousands of hours of test flying under the toughest possible operating and weather conditions; pilots go through a period of intense training on the new airplane to achieve the highest possible standards of efficiency. Even so, mishaps do occur. Engineers and operations personnel go to great lengths to determine the exact cause of the accident so that it can be eliminated from future operations. It would surprise many people to know the man-hours and the money spent in accident investigation by the airlines and governments in order to improve air safety.

It is seldom that all evidence on a particular accident is readily available at a given time. Therefore, the investigators must painfully piece together all the known facts. And it is here that a flight recorder can be of immense help, for it provides an accurate



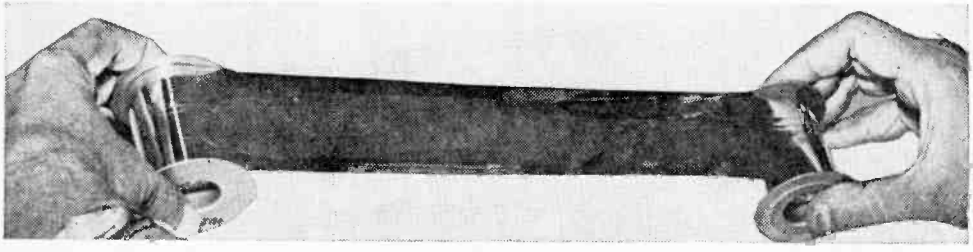
Each Air-India Boeing 707 has a Lockheed Aircraft Service 109-C flight recorder mounted inside left-hand wheel well (left), close to center of gravity. The crash-proof spherical container has been tested to withstand temperatures up to 2,000°F and impact of 500g. Traces on tape (above) can be read easily with transparent scale placed over recorded tape.

record of the progress of a flight with every normal and abnormal airplane movement recorded faithfully. Before flight records became available a few years ago, it frequently happened that investigators could only guess at the cause of an accident, especially if the pilot's testimony was not available.

A Must. In November 1960, the Federal Aviation Agency of the United States made it mandatory that all US registered turbine aircraft above 12,000 lb. must carry flight recorders. A typical unit, Lockheed's Model 109-C, consists of five independently functioning systems which maintain a continuous record of course, altitude, airspeed, vertical acceleration and elapsed time. The information is recorded on a paper-thin foil nearly two inches wide which runs for 200 hours. A clockwork mechanism controls the speed at which the foil moves, so that a constant time scale is maintained. The trace on the aluminum foil appears in the form of a graph which can later be measured.

Exit Black Box. A layman thinks of a flight recorder as a "black box." In fact the LAS 109-C is neither black nor a box. It is spherical, approximately 13 in. in horizontal diameter, 15 in. along the vertical axis and weighs approximately 32 lb. Although the

(Continued on page 113)



Two-inch wide aluminum tape is more resistant to fire than plastic tape used to record data for industrial operations and computers. Aluminum foil is low cost and easy to handle.

VOLUME 47, NO. 3

WHITE'S RADIO LOG

An up-to-date Broadcasting Directory of North American AM, FM and TV Stations. Including a Special Section on World-Wide Shortwave Stations

This is the third and last part of *White's Radio Log*, published in three parts twice each year. This format presentation enables the Editors of RADIO-TV EXPERIMENTER to offer its readers two complete volumes of *White's Radio Log* each year, while increasing the scope of the *Log* and its accuracy.

In this issue of *White's Radio Log* we have included the following listings: U. S. AM Stations by Call Letters, U. S. FM Stations by Call Letters, Canadian AM Stations by Call Letters, Canadian FM Stations by Call Letters and the World-Wide Shortwave stations section. Also, we have added to White's in this issue a new listing—Major Broadcast Stations in Mexico and the Caribbean.

In the August/September, 1967 issue of RADIO-TV EXPERIMENTER the *Log* will contain the following listings: U. S. AM Stations by Frequency, Canadian AM Stations by Frequency, U. S. Television Stations by States, Canadian Television Stations by Cities and the World-Wide Shortwave Stations section. In the event you missed a part of the *Log* published during 1967, you will have a complete volume of *White's Radio Log* by collecting any three consecutive issues of RADIO-TV EXPERIMENTER published during the year. The three consecutive issues are an entire volume of *White's Radio Log* that offers complete listings with up-to-the minute station change data that are not offered in any other magazine or book.

If you are a broadcast band DX'er, FM station logger, like to photograph distant TV test patterns, or tune the shortwave bands, you will find the new *White's* format an *unbeatable* and *up-to-date* handy reference.

QUICK REFERENCE INDEX TO WHITE'S RADIO LOG

U. S. AM Stations by Call Letters

Call	Location	kHz
KAAA	Kingman, Ariz.	1230
KAAY	Little Rock, Ark.	1090
KABC	Los Angeles, Calif.	790
KABH	Midland, Tex.	1510
KABI	Abilene, Kans.	1560
KABL	Oakland, Calif.	960
KABQ	Albuquerque, N.M.	1350
KABR	Aberdeen, S.Dak.	1420
KACE	Riverside, Calif.	1570
KACI	The Dalles, Oreg.	1300
KACL	Santa Barbara, Cal.	1290
KACT	Andrews, Tex.	1360
KACY	Port Hueneme, Calif.	1520
KADA	Ada, Okla.	1230
KADL	Pine Bluff, Ark.	1270
KADO	Marshall, Tex.	1410
KADY	St. Charles, Mo.	1460
KAFE	Sante Fe, N.M.	810
KAFF	Flagstaff, Ariz.	930
KAFY	Bakersfield, Calif.	550
KAGE	Winona, Minn.	1380
KAGH	Crossett, Ark.	800
KAGI	Grants Pass, Oreg.	930
KAGO	Klamath Falls, Oreg.	1150
KAGT	Anacortes, Wash.	1340
KAHI	Auburn, Calif.	950
KAHR	Redding, Calif.	1330
KAHU	Waipahu, Hawaii	940
KAIM	Honolulu, Hawaii	870
KAIN	Nampa, Ida.	1340
KAIR	Tucson, Ariz.	1490
KAJO	Grants Pass, Oreg.	1270
KAKA	Wickenburg, Ariz.	1250
KAKC	Tulsa, Okla.	970
KAKE	Wichita, Kan.	1240
KALB	Alexandria, La.	580
KALE	Richland, Wash.	960
KALF	Mesa, Ariz.	1510
KALG	Alamogordo, N.Mex.	1230
KALI	San Gabriel, Cal.	1430
KALL	Salt Lake City, Utah	910
KALM	Thayer, Mo.	1290
KALN	Iola, Kan.	1370
KALO	Little Rock, Ark.	1250
KALT	Atlanta, Tex.	900
KALV	Alva, Okla.	1430
KAMD	Camden, Ark.	910
KAMI	Cozad, Neb.	1580
KAML	Kenedy-Karnes City, Tex.	990
KAMO	Rogers, Ark.	1390
KAMP	El Centro, Calif.	1430
KAMY	McCamey, Tex.	1450
KANA	Anaconda, Mont.	580
KANB	Shreveport, La.	1300
KAND	Corsicana, Tex.	1340
KANE	New Iberia, La.	1240
KANI	Wharton, Tex.	1500
KANN	Ogden, Utah	1090
KANO	Anoka, Minn.	1470
KANS	Larned, Kan.	1510
KAOH	Duluth, Minn.	1390
KAOK	Lake Charles, La.	1400
KAOL	Carrollton, Mo.	1430
KAOR	Oroville, Calif.	1340
KAPA	Raymond, Wash.	1340
KAPB	Marksville, La.	1370
KAPE	San Antonio, Tex.	1480
KAPI	Pueblo, Colo.	690
KAPR	Douglas, Ariz.	930
KAPS	Mt. Vernon, Wash.	1470
KAPT	Salem, Ore.	1220
KAPY	Port Angeles, Wash.	1290
KARA	Albuquerque, N.M.	1310
KARE	Atchison, Kan.	1470
KARI	Blaine, Wash.	550
KARK	Little Rock, Ark.	920
KARM	Fresno, Calif.	1430
KARR	Great Falls, Mont.	1400
KARS	Belen, N.M.	860
KART	Jerome, Idaho	1400
KARY	Prosser, Wash.	1310
KASH	Eugene, Ore.	1590
KASI	Ames, Iowa	1430
KASK	Ontario, Calif.	1510
KASL	Newcastle, Wyo.	1240
KASM	Albany, Minn.	1150
KASO	Minden, La.	1240
KAST	Astoria, Ore.	1370
KASY	Auburn, Wash.	1220
KATA	Arcata, Calif.	1340
KATE	Albert Lea, Minn.	1450
KATI	Casper, Wyo.	1400
KATL	Miles City, Mont.	1340
KATN	Boise, Idaho	1010
KATO	Safford, Ariz.	1230
KATQ	Texarkana, Tex.	940
KATR	Eugene, Ore.	1320
KATY	San Luis Obispo, Cal.	1340
KATZ	St. Louis, Mo.	1600
KAUS	Austin, Minn.	1480
KAVE	Carlsbad, N.Mex.	1240
KAVI	Rocky Ford, Colo.	1320
KAVL	Lancaster, Calif.	610
KAVR	Apple Valley, Calif.	960
KAWA	Waco-Marlin, Tex.	1010
KAWL	York, Neb.	1370
KAWT	Douglas, Ariz.	1450
KAWW	Hebor Springs, Ark.	1370
KAYC	Beaumont, Tex.	1450
KAYE	Puyallup, Wash.	1450
KAYG	Lakewood, Wash.	1480
KAYL	Storm Lake, Iowa	990
KAYO	Seattle, Wash.	1150
KAYS	Hays, Kans.	1400
KAYT	Rupert, Idaho	970
KBAB	Indianola, Iowa	1490
KBAL	San Saba, Tex.	1410
KBAM	Longview, Wash.	1270
KBAN	Bowie, Tex.	1410
KBAR	Burley, Idaho	1230
KBAT	San Antonio, Tex.	680
KBBA	Benton, Ark.	690
KBBB	Borger, Tex.	1600
KBBC	Centerville, Utah	1600
KBBO	Yakima, Wash.	1390
KBBR	North Bend, Oreg.	1340
KBBS	Buffalo, Wyo.	1450
KBCH	Oceanlake, Oreg.	1380
KBCL	Shreveport, La.	1220
KBEA	Mission, Kans.	1480
KBEC	Waxahachie, Tex.	1390
KBEE	Modesto, Calif.	970
KBEK	Elk City, Okla.	1240
KBEL	Idabel, Okla.	1240
KBEN	Carrizo Sprgs., Tex.	1450
KBER	San Antonio, Tex.	1150
KBET	Reno, Nev.	1340
KBEV	Portland, Oreg.	1010
KBEW	Blue Earth, Minn.	1560
KBFS	Belle Fourche, S.Dak.	1450
KBGH	Memphis, Tex.	1130
KBGN	Caldwell, Idaho	910
KBGO	Waco, Tex.	1580
KBHB	Sturgis, S. D.	1280
KBHC	Nashville, Ark.	1260
KBHM	Branson, Mo.	1220
KBHS	Hot Springs, Ark.	590
KBIA	Burlington, Ia.	1150
KBIB	Monette, Ark.	1560
KBIF	Fresno, Calif.	900
KBIG	Avalon, Cal.	740
KBIL	Liberty, Mo.	1140
KBIM	Roswell, N.Mex.	910
KBIS	Bakersfield, Calif.	970
KBIX	Muskogee, Okla.	1490
KBJM	Lemmon, S.D.	1400
KBIZ	Ottuwa, Iowa	1240
KBJT	Fordyce, Ark.	1570
KBKR	Baker, Oreg.	1490
KBKW	Aberdeen, Wash.	1450
KBLA	Burbank, Calif.	1500
KBLC	Lakeport, Cal.	1270
KBLE	Seattle, Wash.	1050
KBLF	Red Bluff, Calif.	1490
KBLI	Blackfoot, Idaho	690
KBLL	Helena, Mont.	1240
KBLR	Bolivar, Mo.	1550
KBLT	Big Lake, Tex.	1290
KBLU	Yuma, Ariz.	1320
KBLY	Gold Beach, Oreg.	1220
KBMI	Henderson, Nev.	1400
KBMN	Bozeman, Mont.	1230
KBMO	Benson, Minn.	1290
KBMR	Bismarck, N. D.	1350
KBMW	Wahpeton, N.D.-Breckenridge, Minn.	1450
KBMY	Billings, Mont.	1240
KBND	Bend, Oreg.	1110
KBOA	Kennett, Mo.	830
KBOE	Oskaloosa, Iowa	740
KBOI	Boise, Idaho	670
KBOK	Malvern, Ark.	1310
KBOL	Boulder, Colo.	1490
KBOM	Bismark-Mandan, N.Dak.	1270
KBON	Omaha, Nebr.	1490
KBOP	Pleasanton, Tex.	1380
KBOR	Brownsville, Tex.	1600
KBOW	Butte, Mont.	550
KBOX	Dallas, Tex.	1480
KBOY	Medford, Oreg.	730
KBPS	Portland, Oreg.	1450
KBRC	Mt. Vernon, Wash.	1430
KBRI	Brinkley, Ark.	1570
KBRK	Brookings, S.Dak.	1430
KBRL	McCook, Nebr.	1300
KBRN	Brighton, Colo.	800
KBRO	Bremerton, Wash.	1490
KBRR	Leadville, Colo.	1230
KBRS	Springdale, Ark.	1340
KBRV	Soda Sprgs., Ida.	540
KBRX	O'Neill, Nebr.	1350
KBRZ	Freeport, Texas	1460
KBSF	Springhill, La.	1460
KBSN	Crane, Tex.	970
KBST	Big Spring, Tex.	1490
KBTA	Batesville, Ark.	1340
KBTC	Houston, Mo.	1250
KBTM	Jonesboro, Ark.	1230
KBTN	Neosho, Mo.	1420
KBTO	El Dorado, Kans.	1360
KBTR	Denver, Colo.	710
KBUC	San Antonio, Tex.	1310
KBUD	Athens, Tex.	1410
KBUH	Brigham City, Utah	800
KBUN	Bemidji, Minn.	1450
KBUR	Burlington, Iowa	1490
KBUS	Mexia, Tex.	1590
KBUY	Ft. Worth, Tex.	1540
KBUZ	Mesa, Ariz.	1310
KBVM	Lancaster, Calif.	1380
KBVU	Bellevue, Wash.	1540
KBWD	Brownwood, Tex.	1380
KBXM	Kennett, Mo.	1540
KBYE	Okla. City, Okla.	890
KBYG	Big Spring, Tex.	1400
KBYP	Shamrock, Tex.	1580
KBYR	Anchorage, Alaska	1270
KBZY	Salem, Oreg.	1490
KBZZ	LaJunta, Colo.	1400
KCAB	Dardanelle, Ark.	980
KCAC	Phoenix, Ariz.	1010
KCAD	Abilene, Tex.	1560
KCAL	Redlands, Calif.	1410
KCAM	Glennallen, Alaska	790
KCAN	Canyon, Tex.	1550
KCAP	Helena, Mont.	1340
KCAR	Clarksville, Tex.	1350
KCAS	Slaton, Tex.	1050
KCAT	Pine Bluff, Ark.	1530
KCBC	Des Moines, Iowa	1390
KCBD	Lubbock, Tex.	1590
KCBN	Reno, Nev.	1230
KCBQ	San Diego, Calif.	1170
KCBS	San Fran., Calif.	740
KCCB	Corning, Ark.	1260
KCCC	Carlsbad, N.M.	930
KCCL	Paris, Ark.	1460
KCCN	Honolulu, Hawaii	1420
KCCO	Lawton, Okla.	1050
KCCR	Pierre, S. D.	1240
KCCT	Corpus Christi, Tex.	1150
KCCV	Independence, Mo.	1510
KCEE	Tucson, Ariz.	790
KCEY	Tunlock, Calif.	1390
KCFA	Spokane, Wash.	1330
KCFH	Cuero, Tex.	1600
KCFI	Cedar Falls, Iowa	1250
KCHA	Charles City, Iowa	1580
KCHE	Cherokee, Iowa	1440
KCHI	Chillicothe, Mo.	1010
KCHJ	Delano, Calif.	1010
KCHR	Charleston, Mo.	1350
KCHS	Truth or Consequences, New Mexico	1400
KCHV	Coachella, Calif.	970
KCHY	Cheyenne, Wyo.	1530
KCID	Caldwell, Idaho	1490
KCII	Washington, Iowa	1380
KCIJ	Shreveport, La.	1050
KCIL	Houma, La.	1490
KCIM	Carroll, Iowa	1380
KCIN	Victorville, Calif.	1590
KCJB	Minot, N.Dak.	910
KCKC	San Bernardino, Cal.	1350
KCKG	Sonora, Tex	1240
KCKN	Kansas City, Kans.	1340
KCKW	Jena, La.	1480
KCKY	Coolidge, Ariz.	1150
KCLA	Pine Bluff, Ark.	1400
KCLE	Cleburne, Tex.	1120
KCLN	Clinton, Iowa	1390
KCLO	Leavenworth, Kans.	1410
KCLR	Ralls, Tex.	1530
KCLS	Flagstaff, Ariz.	600
KCLU	Rolla, Mo.	1590
KCLV	Clovis, N.Mex.	1240
KCLW	Hamilton, Tex.	900
KCLX	Colfax, Wash.	1450
KCMC	Texarkana, Tex.	1230
KCMJ	Palm Sprgs., Calif.	1010
KCMO	Kansas City, Mo.	810
KCMS	Manitou Sprgs., Colo.	1490
KCNI	Broken Bow, Nebr.	1280
KCNO	Alturas, Calif.	570
KCNY	San Marcos, Tex.	1470
KCOB	Newton, Iowa	1280
KCOG	Centerville, Iowa	1400
KCOH	Houston, Tex.	1430
KCOK	Tulare, Calif.	1270
KCOL	Ft. Collins, Colo.	1410
KCOM	Comanche, Tex.	1550
KCON	Conway, Ark.	1230
KCOR	San Antonio, Tex.	1350
KCOW	Alliance, Nebr.	1400
KCOY	Santa Maria, Calif.	1400
KCPX	Salt Lake City, Utah	1320
KCRA	Sacramento, Calif.	1320
KCRB	Chanute, Kans.	1460
KCRC	Enid, Okla.	1390
KCRG	Cedar Rapids, Iowa	1600
KCRM	Crane, Tex.	1380
KCRS	Midland, Tex.	550
KCRT	Trinidad, Colo.	1240
KCRV	Caruthersville, Mo.	1370
KCSJ	Pueblo, Colo.	590
KCSR	Chadron, Nebr.	610
KCTA	Corpus Christi, Tex.	1030
KCTI	Gonzales, Tex.	1450
KCTY	Salinas, Calif.	980
KCTX	Childress, Tex.	1510
KCUB	Tucson, Ariz.	1290
KCUE	Red Wing, Minn.	1250
KCVL	Colville, Wash.	1270
KCVR	Lodi, Calif.	1570
KCYL	Lampasas, Tex.	1450
KDAC	Ft. Bragg, Calif.	1230
KDAD	Weed, Calif.	800
KDAK	Carrington, N.D.	1600
KDAL	Duluth, Minn.	610
KDAN	Eureka, Calif.	790
KDAV	Lubbock, Tex.	580
KDAY	Santa Monica, Calif.	1580
KDB	Santa Barbara, Calif.	1490
KDBM	Dillon, Mont.	800
KDBS	Alexandria, La.	1410
KDCE	Espanola, N.M.	970
KDDA	Dumas, Ark.	1560
KDDD	Dumas, Tex.	800
KDEC	Decorah, Iowa	1240
KDEF	Albuquerque, N.Mex.	1150
KDEN	Denver, Colo.	1340
KDEO	El Cajon, Calif.	910
KDES	Palm Sprgs., Calif.	920
KDET	Center, Tex.	930
KDEX	Dexter, Mo.	1590
KDEY	Boulder, Colo.	1360
KDFL	Sumner, Wash.	1560
KDFN	Doniphan, Mo.	1500
KDGO	Durango, Colo.	1240
KDHI	Twenty-nine Palms, California	1250
KDHL	Faribault, Minn.	920
KDHN	Dimmitt, Tex.	1470
KDIA	Oakland, Calif.	1310
KDIO	Ortonville, Minn.	1350
KDIX	Dickinson, N.Dak.	1280
KDJI	Holbrook, Ariz.	1270
KDKA	Pittsburgh, Pa.	1020
KDKD	Clinton, Mo.	1280
KDKO	Littleton, Colo.	1510
KDLA	DeRidder, La.	1010
KDLK	Del Rio, Tex.	1230
KDLM	Detroit Lakes, Minn.	1340
KDLR	Devils Lake, N.Dak.	1240
KDLS	Perry, Iowa	1510
KDMA	Montevideo, Minn.	1450
KDMO	Carthage, Mo.	1490
KDMS	El Dorado, Ark.	1290
KDNC	Spokane, Wash.	1440
KDNT	Denton, Tex.	1440
KDOK	Tyler, Tex.	1490
KDOL	Mojave, Calif.	1340
KDOM	Windom, Minn.	1580
KDON	Salinas, Calif.	1460
KDOT	Scottsdale, Ariz.	1440
KDOV	Medford, Oreg.	1300
KDOX	Marshall, Tex.	1410
KDQN	DeQueen, Ark.	1390
KDRG	Deer Lodge, Mont.	1400
KDRO	Sedalia, Mo.	1340
KDRS	Paragould, Ark.	1490
KDRY	Alamo Hts., Tex.	1110
KDSJ	Deadwood, S.Dak.	980
KDSN	Denison, Iowa	1580
KDSX	Denison-Sherman, Tex.	950
KDTA	Delta, Colo.	1400
KDTH	Dubuque, Iowa	1370
KDUZ	Hutchinson, Minn.	1260
KDWA	Hastings, Minn.	1460
KDWB	St. Paul, Minn.	630
KDWT	Stamford, Tex.	1400
KDXE	No. Little Rock, Ark.	1380
KDXI	Mansfield, La.	1360
KDXU	St. George, Utah	1450
KDYL	Tooele, Utah	990
KDZA	Pueblo, Colo.	1230
KEAN	Brownwood, Tex.	1240
KEAP	Fresno, Calif.	980
KEBE	Jacksonville, Tex.	1400
KECH	Ketchikan, Alaska	620
KECK	Odessa, Tex.	920
KEDA	San Antonio, Tex.	1540
KEDD	Dodge City, Kans.	1550
KEDO	Longview, Wash.	1400

Every effort has been made to ensure accuracy of the information listed in this issue of White's Radio Log, but absolute accuracy is not guaranteed and of course, only information available up to press-time could be included.

WHITE'S RADIO LOG

Call	Location	kHz
KEED	Eugene, Ore.	1450
KEEE	Nacogdoches, Tex.	1230
KEEL	Shreveport, La.	710
KEEN	San Jose, Calif.	1370
KEEP	Twin Falls, Idaho	1450
KEES	Gladewater, Tex.	1430
KEGG	Daingerfield, Tex.	1560
KEHG	Fosston, Minn.	1480
KELA	Centralia-Chekalis, Wash.	1470
KELD	El Dorado, Ark.	1400
KELI	Tulsa, Okla.	1430
KELK	Elko, Nev.	1240
KELO	Sioux Falls, S.Dak.	1320
KELP	El Paso, Tex.	920
KELR	El Reno, Okla.	1460
KELY	Ely, Nev.	1230
KENA	Mena, Ark.	1450
KEND	Cheyenne, Wyo.	980
KENE	Toppenish, Wash.	1490
KENI	Anchorage, Alaska	550
KENM	Portales, N.Mex.	1450
KENN	Farmington, N.M.	1390
KENO	Las Vegas, Nev.	1460
KENR	Houston, Tex.	1070
KENT	Prescott, Ariz.	1340
KENY	Bellingham-Ferndale, Wash.	930
KEOR	Atoka, Okla.	1110
KEOS	Flagstaff, Ariz.	690
KEPR	Kennewick-Richland-Pasco, Wash.	610
KEPS	Eagle Pass, Tex.	1270
KERB	Kermit, Tex.	600
KERC	Eastland, Tex.	1590
KERG	Eugene, Oreg.	1280
KERN	Bakersfield, Calif.	1410
KERV	Kerrville, Tex.	1230
KESM	Eldorado Springs, Mo.	1580
KEST	Boise, Idaho	790
KETO	Seattle, Wash.	1590
KETX	Livingston, Tex.	1440
KEUN	Eunice, La.	1490
KEVA	Evanston, Wyo.	1240
KEVL	White Castle, La.	1590
KEVT	Tucson, Ariz.	690
KEWB	Oakland, Calif.	910
KEWI	Topeka, Kans.	1440
KEX	Portland, Oreg.	1190
KEXO	Grand Junc., Colo.	1230
KEYD	Oakes, N.Dak.	1220
KEYE	Perryton, Tex.	1400
KEYJ	Jamestown, N.Dak.	1400
KEYL	Long Prairie, Minn.	1400
KEYR	Terrytown, Nebr.	690
KEYS	Corpus Christi, Tex.	1440
KEYY	Provo, Utah	1450
KEYZ	Williston, N.Dak.	1360
KEZU	Rapid City, S.Dak.	920
KEZY	Anaheim, Calif.	1190
KFAB	Omaha, Nebr.	1110
KFAC	Los Angeles, Calif.	1330
KFAH	Lakewood Center, Wash.	1480
KFAL	Fulton, Mo.	900
KFAM	St. Cloud, Minn.	1450
KFAR	Fairbanks, Alaska	660
KFAX	San Francisco, Calif.	1100
KFAY	Fayetteville, Ark.	1250
KFBB	Great Falls, Mont.	1310
KFBC	Cheyenne, Wyo.	1240
KFBK	Sacramento, Calif.	1530
KFCB	Redfield, S. Dak.	1380
KFDF	Van Buren, Ark.	1580
KFDI	Wichita, Kansas	1070
KFDR	Grand Coulee, Wash.	1360
KFEL	Pueblo, Colo.	970
KFEQ	St. Joseph, Mo.	680
KFFA	Helena, Ark.	1360
KFGO	Fargo, N.D.	790
KFGQ	Boone, Iowa	1260
KFGT	Flagstaff, Ariz.	930
KFH	Wichita, Kans.	1330
KFI	Los Angeles, Calif.	640
KFIF	Tucson, Ariz.	1550
KFIL	Preston, Minn.	1060
KFIV	Modesto, Calif.	1360
KFIZ	Fond du Lac, Wis.	1450
KFJB	Marshalltown, Iowa	1230
KFJM	Grand Forks, N.Dak	1370
KFJZ	Ft. Worth, Tex.	1270
KFKA	Greeley, Colo.	1310
KFKF	Bellevue, Wash.	1330
KFKU	Lawrence, Kans.	1250
KFLA	Scott City, Kans.	1310
KFLD	Floydada, Tex.	900
KFLI	Mountain Home, Ida.	1240
KFLJ	Walsenburg, Colo.	1380
KFLN	Baker, Mont.	960
KFLW	Klamath Falls, Oreg.	1450
KFLY	Corvallis, Oreg.	1240
KFMB	San Diego, Cal.	760
KFMJ	Tulsa, Okla.	1050
KFML	Denver, Colo.	1390
KFMO	Flat River, Mo.	1250
KFNF	Shenandoah, Iowa	920
KFNV	Ferriday, La.	1600
KFNW	Fargo, N.Dak.	900
KFOR	Lincoln, Nebr.	1240
KFOX	Long Beach, Calif.	1280
KFPW	Ft. Smith, Ark.	1230
KFQD	Anchorage, Alaska	750
KFRA	Franklin, La.	1390
KFRB	Fairbanks, Alaska	900
KFRC	San Francisco, Calif.	610
KFRD	Rosenberg-Richmond, Tex.	980
KFRE	Fresno, Calif.	940
KFRM	Kansas City, Mo.	550
KFRO	Longview, Tex.	1370
KFRU	Columbia, Mo.	1400
KFSA	Ft. Smith, Ark.	950
KFSB	Joplin, Mo.	1310
KFSC	Denver, Colo.	1220
KFST	Ft. Stockton, Tex.	860
KFTM	Ft. Morgan, Colo.	1400
KFTV	Paris, Tex.	1250
KFTW	Fredericktown, Mo.	1450
KFUN	Las Vegas, N.Mex.	1230
KFUO	Clayton, Mo.	850
KFVS	Cape Girardeau, Mo.	960
KFWB	Los Angeles, Calif.	980
KFXD	Nampa, Idaho	580
KFXM	San Bernardino, Calif.	590
KFYN	Bonham, Tex.	1420
KFYO	Lubbock, Tex.	790
KFYR	Bismarck, N.Dak.	550
KGA	Spokane, Wash.	1510
KGAF	Gainesville, Tex.	1580
KGAK	Gallup, N.Mex.	1330
KGAL	Lebanon, Oreg.	920
KGAR	Vancouver, Wash.	1550
KGAS	Carthage, Tex.	1590
KGAY	Salem, Oreg.	1430
KGB	San Diego, Calif.	1360
KGBC	Galveston, Tex.	1540
KGBS	Los Angeles, Calif.	1020
KGBT	Harlingen, Tex.	1530
KGBX	Springfield, Mo.	1260
KGCA	Rugby, N.D.	1450
KGCL	East Prairie, Mo.	1080
KGCX	Sidney, Mont.	1480
KGDN	Edmonds, Wash.	630
KGEE	Bakersfield, Calif.	1230
KGEK	Sterling, Colo.	1230
KGEM	Boise, Idaho	1140
KGEN	Tulare, Calif.	1370
KGER	Long Beach, Calif.	1390
KGEZ	Kalispell, Mont.	600
KGFF	Shawnee, Okla.	1450
KGFJ	Los Angeles, Calif.	1230
KGFL	Roswell, N.Mex.	1400
KGFW	Kearney, Nebr.	1340
KGFX	Pierre, S.D.	1080
KGGF	Coffeyville, Kans.	690
KGGM	Albuquerque, N.Mex.	610
KGHL	Billings, Mont.	790
KGHM	Brookfield, Mo.	1470
KGHO	Hoquiam, Wash.	1560
KGHS	International Falls, Minn.	1230
KGIL	San Fernando, Calif.	1260
KGIW	Alamosa, Colo.	1450
KGKL	San Angelo, Tex.	960
KGKO	Benton, Ark.	850
KGLC	Miami, Okla.	910
KGLE	Glendive, Mont.	590
KGLM	Avalon, Calif.	740
KGLN	Glenwood Sprgs., Colo.	980
KGLO	Mason City, Iowa	1300
KGLU	Safford, Ariz.	1480
KGMB	Honolulu, Hawaii	590
KGMC	Englewood, Colo.	1150
KGMI	Bellingham, Wash.	790
KGMO	Cape Girardeau, Mo.	1220
KGMR	Jacksonville, Ark.	1500
KGMS	Sacramento, Calif.	1380
KGMT	Fairbury, Nebr.	1310
KGNB	New Braunfels, Tex.	1420
KGNC	Amarillo, Tex.	710
KGNO	Dodge City, Kans.	1370
KGNU	Santa Clara, Cal.	1430
KGNS	Laredo, Tex.	1390
KGO	San Francisco, Calif.	810
KGOL	Palm Desert, Cal.	1270
KGOS	Torrington, Wyo.	1490
KGPC	Grafton, N.Dak.	1340
KGRB	West Loma, Cal.	900
KGRI	Henderson, Tex.	1000
KGRL	Bend, Oreg.	940
KGRN	Grinnell, Iowa	1410
KGRO	Pampa, Tex.	1230
KGRS	Pasco, Wash.	1340
KGRT	Las Cruces, N.Mex.	570
KGST	Fresno, Calif.	1600
KGTN	Georgetown, Tex.	1530
KGU	Honolulu, Hawaii	760
KGUC	Gunnison, Colo.	1490
KGUD	Santa Barbara, Calif.	990
KGUL	Port Lavaca, Tex.	1560
KGVL	Greenville, Tex.	1400
KGVO	Missoula, Mont.	1290
KGVW	Belgrade, Mont.	630
KGW	Portland, Oreg.	620
KGWA	Enid, Okla.	960
KGY	Olympia, Wash.	1240
KGYN	Guymon, Okla.	1220
KHAC	Window Rock, Ariz.	1300
KHAI	Honolulu, Hawaii	1090
KHAK	Cedar Rapids, Iowa	1360
KHAL	Homer, La.	1300
KHAP	Aztec, N.M.	1340
KHAR	Anchorage, Alaska	590
KHAS	Hastings, Nebr.	1230
KHAT	Phoenix, Ariz.	1480
KHBM	Monticello, Ark.	1430
KHBR	Hillsboro, Tex.	1560
KHDN	Hardin, Mont.	1230
KHEM	Big Springs, Tex.	1270
KHEN	Henryetta, Okla.	1590
KHEP	Phoenix, Ariz.	1280
KHEY	El Paso, Tex.	690
KHFH	Sierra Vista, Ariz.	1420
KHFI	Austin, Tex.	970
KHHH	Pampa, Tex.	1230
KHIP	Albuquerque, N.M.	1520
KHIT	Walla Walla, Wash.	1320
KHJ	Los Angeles, Calif.	930
KHMO	Hannibal, Mo.	1070
KHOB	Hobbs, N.Mex.	1390
KHOE	Truckee, Calif.	1400
KHOG	Fayetteville, Ark.	1440
KHOS	Tucson, Ariz.	940
KHOT	Madera, Calif.	1250
KHOW	Denver, Colo.	630
KHOZ	Harrison, Ark.	900
KHQ	Spokane, Wash.	590
KHRB	Lockhart, Tex.	1060
KHRT	Minot, N. D.	1320
KHSJ	Hemet, Calif.	1420
KHSL	Chico, Calif.	1290
KHUB	Fremont, Nebr.	1340
KHUM	Santa Rosa, Calif.	1580
KHUZ	Borger, Tex.	1490
KHVH	Honolulu, Hawaii	1040
KIBE	Palo Alto, Calif.	1220
KIBH	Seward, Alaska	950
KIBL	Beeville, Tex.	1490
KIBS	Bishop, Calif.	1230
KICA	Clovis, N.M.	980
KICD	Spencer, Iowa	1240
KICK	Springfield, Mo.	1340
KICM	Golden, Colo.	1250
KICO	Calexico, Calif.	1490
KICS	Hastings, Neb.	1550
KICX	McCook, Neb.	1360
KICY	Nome, Alaska	850
KID	Idaho Falls, Idaho	590
KIDD	Monterey, Calif.	630
KIDO	Boise, Idaho	630
KIEV	Glendale, Calif.	870
KIFG	Iowa Falls, Ia.	1510
KIFN	Phoenix, Ariz.	860
KIFW	Sitka, Alaska	1230
KIGO	St. Anthony, Ida.	1400
KIHN	Hugo, Okla.	1340
KIHR	Hood River, Oreg.	1340
KIJV	Huron, S.Dak.	1340
KIKI	Honolulu, Hawaii	830
KIKK	Pasadena, Tex.	650
KIKO	Miami, Ariz.	1340
KIKS	Sulphur, La.	1310
KILE	Galveston, Tex.	1400
KILO	Grand Forks, S.Dak.	1440
KILT	Houston, Tex.	610
KIMA	Yakima, Wash.	1460
KIMB	Kimball, Nebr.	1260
KIML	Gillette, Wyo.	1270
KIMM	Rapid City, S.D.	1150
KIMN	Denver, Colo.	950
KIMO	Hilo, Hawaii	850
KIMP	Mt. Pleasant, Tex.	960
KIND	Independence, Kans.	1010
KINE	Kingsville, Tex.	1330
KING	Seattle, Wash.	1090
KINN	Alamagordo, N. M.	1270
KINO	Winslow, Ariz.	1230
KINS	Eureka, Calif.	980
KINT	El Paso, Tex.	1590
KINY	Juneau, Alaska	800
KIOA	Des Moines, Iowa	940
KIOT	Barstow, Calif.	1310
KIOX	Bay City, Tex.	1270
KIPA	Hilo, Hawaii	1110
KIQS	Willows, Calif.	1560
KIRO	Seattle, Wash.	710
KIRT	Missio, Tex.	1580
KIRV	Fresno, Cal.	1510
KIRX	Kirksville, Mo.	1450
KISD	Sioux Falls, S.Dak.	1230
KISI	Salina, Kan.	910
KISN	Vancouver, Wash.	910
KIST	Santa Barbara, Calif.	1340
KIT	Yakima, Wash.	1280
KITE	San Antonio, Tex.	930
KITI	Chahalis-Centralia, Wash.	1420
KITN	Olympia, Wash.	920
KIUL	Garden City, Kans.	1240
KIUN	Pecos, Tex.	1400
KIUP	Durango, Colo.	930
KIVY	Crockett, Tex.	1290
KIWA	Sheldon, Iowa	1550
KIXF	Fortuna, Cal.	1280
KIXI	Seattle, Wash.	910
KIXL	Dallas, Tex.	1040
KIXX	Provo, Utah	1400
KIXZ	Amarillo, Tex.	940
KIZZ	El Paso, Tex.	1150
KJAM	Madison, S.Dak.	1390
KJAN	Atlantic, Iowa	1220
KJAX	Santa Rosa, Calif.	1150
KJAY	Sacramento, Calif.	1430
KJBC	Midland, Tex.	1150
KJCF	Festus, Mo.	1400
KJCK	Junction City, Kans.	1420
KJDY	John Day, Ore.	1400
KJEF	Jennings, La.	1290
KJEM	Oklahoma City, Okla.	800
KJET	Beaumont, Tex.	1380
KJFJ	Webster City, Iowa	1570
KJIM	Ft. Worth, Tex.	870
KJKJ	Flagstaff, Ariz.	1400
KJLT	North Platte, Nebr.	970
KJNO	Juneau, Alaska	630
KJOE	Shreveport, La.	1480
KJOY	Stockton, Calif.	1280
KJPW	Waynesville, Mo.	1390
KJR	Seattle, Wash.	950
KJRB	Spokane, Wash.	790
KJRG	Newton, Kans.	950
KJSK	Columbus, Nebr.	900
KJST	Joshua Tree, Cal.	1420
KJWH	Camden, Ark.	1450
KKAL	Denver City, Tex.	1580
KKAM	Pueblo, Colo.	1350
KKAN	Phillipsburg, Kans.	1490
KKAR	Pomona, Calif.	1220
KKAS	Silsbee, Tex.	1300
KKEY	Vancouver, Wash.	1150
KKHI	San Francisco, Calif.	1550
KKIN	Aitkin, Minn.	930
KKIS	Pittsburg, Calif.	990
KKIT	Taos, N.Mex.	1340
KKJO	St. Joseph, Mo.	1550
KKOK	Lompoc, Calif.	1410
KKUB	Brownfield, Tex.	1300
KLAC	Los Angeles, Calif.	570
KLAD	Klamath Falls, Oreg.	960
KLAK	Lakewood, Colo.	1600
KLAM	Cordova, Alaska	1450
KLAN	Lemoore, Calif.	1320
KLAV	Las Vegas, Nev.	1230
KLBK	Lubbock, Tex.	1340
KLBM	La Grande, Oreg.	1450
KLBS	Los Banos, Calif.	1330
KLCB	Libby, Mont.	1230
KLCN	Blytheville, Ark.	910
KLCO	Poteau, Okla.	1280
KLEA	Lovington, N.Mex.	630
KLEB	Golden Meadow, La.	1600
KLEE	Ottumwa, Iowa	1480
KLEI	Kailua, Hawaii	1130
KLEM	LeMars, Iowa	1410
KLEN	Killeen, Tex.	1050
KLEO	Wichita, Kans.	1480
KLER	Orofino, Idaho	950
KLEX	Lexington, Mo.	1570
KLEY	Wellington, Kan.	1130
KLFD	Litchfield, Minn.	1410
KLGA	Algona, Iowa	1600
KLGN	Logan, Utah	1390
KLGR	Redwood Falls, Minn.	1490
KLIB	Liberal, Kans.	1470
KLIC	Monroe, La.	1230
KLID	Poplar Bluff, Mo,	1340
KLIF	Dallas, Tex.	1190
KLIK	Jefferson City, Mo.	950
KLIN	Lincoln, Nebr.	1400
KLIP	Fowler, Calif.	1220
KLIQ	Portland, Oreg.	1290
KLIR	Denver, Colo.	990
KLIV	San Jose, Cal.	1590
KLIX	Twin Falls, Idaho	1310
KLIZ	Brainerd, Minn.	1380
KLKC	Parsons, Kans.	1540
KLLA	Leesville, La.	1570
KLLL	Lubbock, Tex.	1460
KLME	Laramie, Wyo.	1490
KLMO	Longmont, Colo.	1060
KLMR	Lamar, Colo.	920
KLMS	Lincoln, Nebr.	1480
KLMX	Clayton, N.Mex.	1450
KLO	Ogden, Utah	1430
KLOA	Ridgecrest, Calif	1240
KLOC	Ceres, Calif.	920
KLOE	Goodland, Kans.	730
KLOG	Kelso, Wash.	1490
KLOH	Pipestone, Minn.	1050
KLOK	San Jose, Calif.	1170
KLOL	Lincoln, Neb.	1530
KLOM	Lompoc, Calif.	1330
KLOO	Corvallis, Ore.	1340
KLOS	Albuquerque, N. M.	1580
KLOU	Lake Charles, La.	1580
KLOV	Loveland, Colo.	1570
KLPL	Lake Providence, La.	1050
KLPM	Minot, N.Dak.	1390
KLPR	Okla. City, Okla.	1140
KLRA	Little Rock, Ark.	1010
KLRS	Mountain Grove, Mo.	1360
KLTF	Little Falls, Minn.	960
KLTI	Macon, Mo.	1560
KLTR	Blackwell, Okla.	1580
KLTZ	Glasgow, Mont.	1240
KLUB	Salt Lake City, Utah	570
KLUC	Las Vegas, Nev.	1050
KLUE	Longview, Tex.	1280
KLUV	Haynesville, La.	1580
KLVI	Beaumont, Tex.	560

Call	Location	kHz
KLVL	Pasadena, Tex.	1480
KLVT	Levelland, Tex.	1230
KLWN	Lawrence, Kans.	1320
KLWT	Lebanon, Mo.	1230
KLWW	Cedar Rapids, Iowa	1450
KLYD	Bakersfield, Calif.	1350
KLYQ	Hamilton, Mont.	980
KLYR	Clarksville, Ark.	1360
KLZ	Denver, Colo.	560
KMA	Shenandoah, Iowa	960
KMAC	San Antonio, Tex.	630
KMAD	Madill, Okla.	1550
KMAK	Fresno, Calif.	1340
KMAM	Butler, Mo.	1530
KMAN	Manhattan, Kans.	1350
KMAQ	Maquoketa, Iowa	1320
KMAR	Winnsboro, La.	1570
KMAS	Shelton, Wash.	1280
KMAV	Mayville, N.D.	1520
KMBC	Kansas City, Mo.	980
KMBL	Junction, Tex.	1450
KMBY	Monterey, Calif.	1240
KMCD	Fairfield, Iowa	1570
KMCL	McCall, Ida.	1240
KMCM	McMinnville, Oreg.	1260
KMCO	Conroe, Tex.	900
KMDO	Ft. Scott, Kans.	1600
KMED	Medford, Oreg.	1440
KMEL	Wenatchee, Wash.	1340
KMEN	San Bernardino, Cal.	1290
KMER	Kemmerer, Wyo.	950
KMFB	Mendocino, Cal.	1520
KMHL	Marshall, Minn.	1400
KMHT	Marshall, Tex.	1450
KMIL	Cameron, Tex.	1330
KMIN	Grants, N.M.	980
KMIS	Portageville, Mo.	1050
KMJ	Fresno, Calif.	580
KMLB	Monroe, La.	1440
KMMJ	Grand Island, Nebr.	750
KMMO	Marshall, Mo.	1300
KMNS	Sioux City, Iowa	620
KMO	Tacoma, Wash.	1360
KMON	Great Falls, Mont.	560
KMOP	Tucson, Ariz.	1330
KMOR	Murray, Utah	1230
KMOX	St. Louis, Mo.	1120
KMPC	Los Angeles, Calif.	710
KMPG	Hollister, Cal.	1520
KMPL	Sikeston, Mo.	1520
KMRC	Morgan City, La.	1430
KMRE	Anderson, Cal.	1580
KMRS	Morris, Minn.	1230
KMSL	Ukiah, Calif.	1250
KMUL	Muleshoe, Tex.	1380
KMUS	Muskogee, Okla.	1380
KMVI	Wailuku, Hawaii	550
KMYC	Marysville, Calif.	1410
KNAF	Fredericksburg, Tex.	910
KNAK	Salt Lake City, Utah	1280
KNAL	Victoria, Tex.	1410
KNBA	Vallejo, Calif.	1190
KNBI	Norton, Kan.	1530
KNBR	San Francisco, Cal.	680
KNBY	Newport, Ark.	1280
KNCB	Vivian, La.	1600
KNCK	Concordia, Kans.	1390
KNCM	Moberly, Mo.	1230
KNCY	Nebraska City, Nebr.	1600
KNDC	Hettinger, N.Dak.	1490
KNDI	Honolulu, Hawaii	1270
KNDY	Marysville, Kans.	1570
KNEA	Jonesboro, Ark.	970
KNEB	Scottsbluff, Nebr.	960
KNED	McAlester, Okla.	1150
KNEL	Brady, Tex.	1490
KNEM	Nevada, Mo.	1240
KNET	Palestine, Tex.	1450
KNEW	Oakland, Cal.	910
KNEX	McPherson, Kans.	1540
KNEZ	Lompoc, Calif.	960
KNGL	Paradise, Calif.	930
KNGS	Hanford, Calif.	620
KNIA	Knoxville, Iowa	1320
KNIC	Winfield, Kan.	1550
KNIM	Maryville, Mo.	1580
KNIN	Wichita Falls, Tex.	990
KNIR	New Iberia, La.	1360
KNIT	Abilene, Tex.	1280
KNLV	Ord, Neb.	1060
KNND	Cottage Grove, Oreg.	1400
KNNN	Friona, Tex.	1070
KNOC	Natchitoches, La.	1450
KNOE	Monroe, La.	540
KNOG	Nogales, Ariz.	1340
KNOK	Ft. Worth, Tex.	970
KNOP	N. Platte, Nebr.	1410
KNOR	Norman, Okla.	1400
KNOT	Prescott, Arlz.	1450
KNOW	Austin, Tex.	1490
KNOX	Grand Forks, N.Dak.	1310
KNPT	Newport, Ore.	1310
KNUI	Makawao, Hawaii	1310
KNUJ	New Ulm, Minn.	860
KNUZ	Houston, Tex.	1230
KNWC	Sioux Falls, S.D.	1270
KNWS	Waterloo, Iowa	1090
KNX	Los Angeles, Calif.	1070
KOA	Denver, Colo.	850
KOAC	Corvallis, Oreg.	550
KOAD	Lemoore, Calif.	1240
KOAG	Arroyo Grande, Cal.	1280
KOAL	Price, Utah	1230
KOAM	Pittsburg, Kans.	860
KOB	Albuquerque, N.Mex.	770
KOBE	Las Cruces, N.Mex.	1450
KOBH	Hot Springs, S.Dak.	580
KOCA	Kilgore, Tex.	1240
KOCY	Oklahoma City, Okla.	1340
KODA	Houston, Tex.	1010
KODE	Joplin, Mo.	1230
KODI	Cody, Wyo.	1400
KODL	The Dalles, Oreg.	1440
KODY	North Platte, Nebr.	1240
KOEL	Oelwein, Iowa	950
KOFI	Kalispell, Mont.	930
KOFO	Ottawa, Kans.	1220
KOFY	San Mateo, Calif.	1050
KOGA	Ogallala, Nebr.	930
KOGO	San Diego, Calif.	600
KOGT	Orange, Tex.	1600
KOH	Reno, Nev.	630
KOHI	St. Helens, Ore.	1600
KOHO	Honolulu, Hawaii	1170
KOHU	Hermiston, Oreg.	1570
KOIL	Omaha, Nebr.	1290
KOIN	Portland, Oreg.	970
KOJM	Havre, Mont.	610
KOKA	Shreveport, La.	1550
KOKE	Austin, Tex.	1370
KOKL	Okmulgee, Okla.	1240
KOKO	Warrensburg, Mo.	1450
KOKX	Keokuk, Iowa	1310
KOKY	Little Rock, Ark.	1440
KOL	Seattle, Wash.	1300
KOLD	Tucson, Ariz.	1450
KOLE	Port Arthur, Tex.	1340
KOLI	Coalinga, Cal.	1050
KOLJ	Quanah, Tex.	1150
KOLM	Rochester, Minn.	1520
KOLO	Reno, Nev.	920
KOLR	Sterling, Colo.	1490
KOLS	Pryor, Okla.	1570
KOLT	Scottsbluff, Nebr.	1320
KOLY	Mobridge, S.Dak.	1300
KOMA	Okla. City, Okla.	1520
KOME	Tulsa, Okla.	1300
KOMO	Seattle, Wash.	1000
KOMW	Omak, Wash.	680
KOMY	Watsonville, Calif.	1340
KONA	Kealakekua, Hawaii	790
KONE	Reno, Nev.	1450
KONG	Visalia, Calif.	1400
KONI	Spanish Fork, Utah	1480
KONO	San Antonio, Tex.	860
KONP	Port Angeles, Wash.	1450
KOOK	Billings, Mont.	970
KOOL	Phoenix, Ariz.	960
KOOO	Omaha, Nebr.	1420
KOOS	Coos Bay, Oreg.	1230
KOPR	Butte, Mont.	550
KOPY	Alice, Tex.	1070
KOQT	Bellingham, Wash.	1550
KORA	Bryan, Tex.	1240
KORC	Mineral Wells, Tex.	1140
KORD	Pasco, Wash.	910
KORE	Springfield-Eugene, Ore.	1050
KORK	Las Vegas, Nev.	1340
KORL	Honolulu, Hawaii	650
KORN	Mitchell, S.Dak.	1490
KORT	Grangeville, Idaho	1230
KOSA	Odessa, Tex.	1230
KOSE	Osceola, Ark.	860
KOSG	Panshuska, Okla.	1500
KOSI	Aurora, Colo.	1430
KOSY	Texarkana, Ark.	790
KOTA	Rapid City, S.Dak.	1380
KOTE	Fergus Falls, Minn.	1250
KOTN	Pine Bluff, Ark.	1490
KOTS	Deming, N.M.	1230
KOUR	Independence, Iowa	1220
KOVC	Valley City, N.Dak.	1490
KOVE	Lander, Wyo.	1330
KOVO	Provo, Utah	960
KOWB	Laramie, Wyo.	1290
KOWH	Omaha, Neb.	660
KOWL	Bijou, Calif.	1490
KOWN	Escondido, Calif.	1450
KOXR	Oxnard, Calif.	910
KOY	Phoenix, Ariz.	550
KOYL	Odessa, Tex.	1310
KOYN	Billings, Mont.	910
KOZE	Lewiston, Idaho	1300
KOZI	Chelan, Wash.	1220
KOZY	Grand Rapids, Minn.	1490
KPAC	Port Arthur, Tex.	1250
KPAL	Palm Springs, Calif.	1450
KPAM	Portland, Oreg.	1410
KPAN	Hereford, Tex.	860
KPAS	Banning, Calif.	1490
KPAT	Berkeley, Calif.	1400
KPAY	Chico, Calif.	1060
KPBA	Pine Bluff, Ark.	1590
KPBC	Port Sulphur, La.	1510
KPBM	Carlsbad, N.Mex.	740
KPCA	Marked Tree, Ark.	1580
KPCN	Grand Prairie, Tex.	730
KPCR	Bowling Green, Mo.	1530
KPON	Pampa, Tex.	1340
KPDQ	Portland, Oreg.	800
KPEG	Spokane, Wash.	1380
KPEL	Lafayette, La.	1420
KPEP	San Angelo, Tex.	1420
KPER	Gilroy, Calif.	1290
KPET	Lamesa, Tex.	690
KPHO	Phoenix, Ariz.	910
KPIK	Colorado Sprgs., Colo.	1580
KPIN	Casa Grande, Ariz.	1260
KPIR	Eugene, Ore.	1120
KPLC	Lake Charles, La.	1470
KPLT	Paris, Tex.	1490
KPLY	Crescent City, Calif.	1240
KPMC	Bakersfield, Calif.	1560
KPNG	Port Neches, Tex.	1150
KPOC	Pocahontas, Ark.	1420
KPOD	Crescent City, Calif.	1310
KPOF	Denver, Colo.	910
KPOI	Honolulu, Hawaii	1380
KPOJ	Portland, Oreg.	1330
KPOL	Los Angeles, Calif.	1540
KPOR	Quincy, Wash.	1370
KPOS	Post, Tex.	1370
KPOW	Powell, Wyo.	1260
KPPC	Pasadena, Calif.	1240
KPQ	Wenatchee, Wash.	560
KPRB	Redmond, Oreg.	1240
KPRC	Houston, Tex.	950
KPRK	Livingston, Mont.	1340
KPRL	Paso Robles, Calif.	1230
KPRM	Park Rapids, Minn.	1240
KPRO	Riverside, Calif.	1440
KPRS	Kansas City, Mo.	1590
KPSO	Falfurrias, Tex.	1260
KPST	Preston, Idaho	1340
KPTL	Carson City, Nev.	1300
KPUA	Hilo, Hawaii	970
KPUB	Pueblo, Colo.	1480
KPUG	Bellingham, Wash.	1170
KPUL	Pullman, Wash.	1150
KPUR	Amarillo, Tex.	1440
KPWB	Piedmont, Mo.	1140
KQAQ	Austin, Minn.	970
KQCY	Quincy, Calif.	1370
KQEN	Roseburg, Ore.	1240
KQED	Albuquerque, N.Mex.	920
KQIK	Lakeview, Oreg.	1230
KQMS	Redding, Calif.	1400
KQOT	Yakima, Wash.	930
KQRS	Golden Valley, Minn.	1440
KQTE	Missoula, Mont.	1340
KQV	Pittsburgh, Pa.	1410
KQWB	Fargo, N.D.	1550
KQXI	Arvada, Colo.	1550
KQYX	Joplin, Mo.	1560
KRAD	E. Grand Forks, Minn.	1590
KRAF	Reedsport, Ore.	1470
KRAI	Craig, Colo.	550
KRAK	Sacramento, Cal.	1140
KRAL	Rawlins, Wyo.	1240
KRAM	Las Vegas, Nev.	920
KRAN	Morton, Tex.	1280
KRAY	Amarillo, Tex.	1360
KRBA	Lufkin, Tex.	1340
KRBC	Abilene, Tex.	1470
KRBI	St. Peter, Minn.	1310
KRBN	Red Lodge, Mont.	1450
KRCB	Council Bluffs, Ia.	1360
KRCK	Ridgecrest, Calif.	1360
KRCO	Prineville, Oreg.	690
KRDD	Roswell, N. M.	1320
KRDG	Redding, Calif.	1230
KRDO	Colo. Springs, Colo.	1240
KRDR	Gresham, Ore.	1230
KRDS	Tolleson, Ariz.	1190
KRDU	Dinuba, Calif.	1240
KREB	Shreveport, La.	980
KREH	Oakdale, La.	900
KREI	Farmington, Mo.	800
KREK	Sapulpa, Okla.	1550
KREL	Corona, Cal.	1370
KREM	Spokane, Wash.	970
KREN	Renton, Wash.	1420
KREO	Indio, Calif.	1400
KREW	Sunnyside, Wash.	1230
KREX	Grand Junc., Colo.	920
KRFO	Owatonna, Minn.	1390
KRFS	Superior, Nebr.	1600
KRGI	Grand Island, Neb.	1430
KRGV	Weslaco, Tex.	1290
KRHD	Duncan, Okla.	1350
KRIB	Mason City, Iowa	1490
KRIG	Odessa, Tex.	1410
KRIH	Rayville, La.	990
KRIK	Roswell, N. Mex.	960
KRIO	McAllen, Tex.	910
KRIZ	Phoenix, Ariz.	1230
KRKC	King City, Calif.	1490
KRKD	Los Angeles, Calif.	1150
KRKO	Everett, Wash.	1380
KRKT	Albany, Ore.	990
KRLA	Pasadena, Calif.	1110
KRLC	Lewiston, Ida. Clarkston, Wash.	1350
KRLD	Dallas, Tex.	1080
KRLN	Canon City, Colo.	1400
KRLW	Walnut Ridge, Ark.	1320
KRMD	Shreveport, La.	1340
KRMG	Tulsa, Okla.	740
KRML	Carmel, Calif.	1410
KRMO	Monett, Mo.	990
KRMS	Osage Beach, Mo.	1150
KRNO	San Bernardino, Calif.	1240
KRNR	Roseburg, Oreg.	1490
KRNS	Burns, Oreg.	1230
KRNT	Des Moines, Iowa	1350
KRNY	Kearney, Nebr.	1460
KROB	Robstown, Tex.	1510
KROC	Rochester, Minn.	1340
KROD	El Paso, Tex.	600
KROE	Sheridan, Wyo.	930
KROF	Abbeville, La.	960
KROP	Brawley, Calif.	1300
KROS	Clinton, Iowa	1340
KROW	Dallas, Ore.	1460
KROX	Crookston, Minn.	1260
KROY	Sacramento, Calif.	1240
KRPL	Moscow, Idaho	1400
KRRR	Ruidoso, N.Mex.	1340
KRRV	Sherman, Tex.	910
KRSA	Alisal, Calif.	1570
KRSC	Othello, Wash.	1400
KRSD	Rapid City, S.Dak.	1340
KRSI	St. Louis Park, Minn.	950
KRSL	Russell, Kans.	990
KRSN	Los Alamos, N.Mex.	1490
KRSP	Salt Lake City, Utah	1060
KRSY	Roswell, N.Mex.	1230
KRTN	Raton, N.Mex.	1490
KRTR	Thermopolis, Wyo.	1490
KRUN	Ballinger, Tex.	1400
KRUS	Ruston, La.	1490
KRUX	Glendale, Ariz.	1360
KRVC	Ashland, Oreg.	1350
KRVN	Lexington, Nebr.	1010
KRWB	Roseau, Minn.	1410
KRXK	Rexburg, Idaho	1230
KRYS	Corpus Christi, Tex.	1360
KRYT	Colo. Springs, Colo.	1530
KRZE	Farmington, N.M.	1280
KRZY	Albuquerque, N.M.	1580
KSAC	Manhattan, Kans.	580
KSAL	Salina, Kans.	1150
KSAM	Huntsville, Tex.	1490
KSAY	San Francisco, Calif.	1010
KSBW	Salinas, Calif.	1380
KSCB	Liberal, Kans.	600
KSCJ	Sioux City, Iowa	1360
KSCO	Santa Cruz, Calif.	1080
KSD	St. Louis, Mo.	550
KSDN	Aberdeen, S.Dak.	930
KSDO	San Diego, Calif.	1130
KSDR	Waterton, S.Dak.	1480
KSEE	Santa Maria, Calif.	1480
KSEI	Pocatello, Idaho	930
KSEK	Pittsburg, Kans.	1340
KSEL	Lubbock, Tex.	950
KSEM	Moses Lake, Wash.	1470
KSEN	Shelby, Mont.	1150
KSEO	Durant, Okla.	750
KSET	El Paso, Tex.	1340
KSEW	Sitka, Alaska	1400
KSEY	Seymour, Tex.	1230
KSFA	Nacogdoches, Tex.	860
KSFE	Needles, Calif.	1340
KSFO	San Francisco, Calif.	560
KSGM	Ste. Genevieve, Mo.	1340
KSGT	Jackson, Wyo.	1340
KSHA	Medford, Ore.	860
KSIB	Creston, Iowa	1520
KSID	Sidney, Nebr.	1340
KSIG	Crowley, La.	1450
KSIL	Silver City, N.Mex.	1340
KSIM	Sikeston, Mo.	1400
KSIR	Wichita, Kans.	900
KSIS	Sedalia, Mo.	1050
KSIW	Woodward, Okla.	1450
KSIX	Corpus Christi, Tex.	1230
KSJB	Jamestown, N.Dak.	600
KSKI	Sun Valley, Idaho	1340
KSKY	Dallas, Tex.	660
KSL	Salt Lake City, Utah	1160
KSLM	Salem, Oreg.	1390
KSLO	Opelousas, La.	1230
KSLV	Monte Vista, Colo.	1240
KSLY	San Luis Obispo, Cal.	1400
KSMA	Santa Maria, Calif.	1240
KSMK	Kennewick, Wash.	1340
KSMM	Shakopee, Minn.	1530
KSMN	Mason City, Iowa	1010
KSMO	Salem, Mo.	1340
KSNN	Pocatello, Ida.	1290
KSNO	Aspen, Colo.	1260
KSNY	Snyder, Tex.	1450
KSO	Des Moines, Iowa	1460
KSOK	Arkansas City, Kans.	1280
KSOL	San Francisco, Cal.	1450
KSON	San Diego, Calif.	1240
KSOO	Sioux Falls, S.Dak.	1140
KSOP	Salt Lake City, Utah	1370
KSOX	Raymondville, Tex.	1240
KSPA	Santa Paula, Calif.	1400
KSPI	Stillwater, Okla.	780
KSPL	Diboll, Tex.	1260
KSPO	Spokane, Wash.	1230
KSPR	Springdale, Ark.	1590
KSPT	Sandpoint, Idaho	1400
KSRA	Salmon, Idaho	960
KSRC	Socorro, N.Mex.	1290
KSRO	Santa Rosa, Calif.	1350
KSRV	Ontario, Oreg.	1380
KSSS	Colorado Springs, Colo.	740
KSST	Sulphur Springs, Tex.	1230
KSTA	Coleman, Tex.	1000
KSTB	Breckenridge, Tex.	1430
KSTL	St. Louis, Mo.	690
KSTN	Stockton, Calif.	1420
KSTP	St. Paul, Minn.	1500
KSTR	Grand Junction, Colo.	620
KSTT	Davenport, Iowa	1170
KSTV	Stephenville, Tex.	1510
KSUB	Cedar City, Utah	590
KSUD	W. Memphis, Ark.	730
KSUE	Susanville, Calif.	1240
KSUM	Fairmont, Minn.	1370

WHITE'S RADIO LOG

Call	Location	kHz
KSUN	Bisbee, Ariz.	1230
KSVC	Richfield, Utah	980
KSVN	Ogden, Utah	730
KSVP	Artesia, N.Mex.	990
KSWA	Graham, Tex.	1330
KSWM	Aurora, Mo.	940
KSWO	Lawton, Okla.	1380
KSWS	Roswell, N. M.	1020
KSXX	Salt Lake City, Utah	630
KSYC	Yreka, Calif.	1490
KSYL	Alexandria, La.	970
KSYX	Santa Rosa, N.Mex.	1420
KTAC	Tacoma, Wash.	850
KTAE	Taylor, Tex.	1260
KTAN	Tucson, Ariz.	580
KTAR	Phoenix, Ariz.	620
KTAT	Frederick, Okla.	1570
KTBB	Tyler, Tex.	600
KTBC	Austin, Tex.	590
KTCB	Malden, Mo.	1470
KTCR	Minneapolis, Minn.	690
KTCS	Fort Smith, Ark.	1410
KTDL	Farmersville, La.	1470
KTDO	Toledo, Oreg.	1230
KTEE	Idaho Falls, Idaho	1260
KTEL	Walla Walla, Wash.	1490
KTEM	Temple, Tex.	1400
KTEO	San Angelo, Tex.	1340
KTER	Terrell, Tex.	1570
KTFI	Twin Falls, Idaho	1270
KTFO	Seminole, Tenn.	1250
KTFS	Texarkana, Tex.	1400
KTGO	Tioga, N. D.	1090
KTGR	Columbia, Mo.	1580
KTHE	Thermopolis, Wyo.	1240
KTHO	Tahoe Valley, Calif.	590
KTHS	Berryville, Ark.	1480
KTHT	Houston, Tex.	790
KTIB	Thibodaux, La.	630
KTIL	Tillamook, Oreg.	1590
KTIM	San Rafael, Calif.	1510
KTIP	Porterville, Calif.	1450
KTIS	Minneapolis, Minn.	900
KTIX	Pendleton, Ore.	1240
KTKN	Ketchikan, Alaska	930
KTKR	Taft, Calif.	1310
KTKT	Tucson, Ariz.	990
KTLD	Tallulah, La.	1360
KTLN	Denver, Colo.	1280
KTLO	Mountain Home, Ark.	1240
KTLQ	Tahlequah, Okla.	1350
KTLU	Rusk, Tex.	1580
KTLW	Texas City, Tex.	920
KTMC	McAlester, Okla.	1400
KTMN	Trumann, Ark.	1530
KTMS	Santa Barbara, Calif.	1250
KTNC	Falls City, Nebr.	1230
KTNM	Tucumcari, N.Mex.	1400
KTNT	Tacoma, Wash.	1400
KTOB	Petaluma, Cal.	1490
KTOC	Jonesboro, La.	920
KTOD	Sinton, Tex.	1590
KTOE	Mankato, Minn.	1420
KTOH	Lihue, Hawaii	1490
KTOK	Oklahoma City, Okla.	1000
KTON	Belton, Tex.	940
KTOO	Henderson, Nev.	1280
KTOP	Topeka, Kans.	1490
KTOT	Big Bear Lake, Cal.	1050
KTOW	Sand Spring, Okla.	1340
KTPA	Prescott, Ark.	1370
KTRB	Modesto, Calif.	860
KTRC	Santa Fe, N.Mex.	1400
KTRE	Lufkin, Tex.	1420
KTRF	Thief River Falls, Minn.	1230
KTRG	Honolulu, Hawaii	990
KTRH	Houston, Tex.	740
KTRI	Sioux City, Iowa	1470
KTRM	Beaumont, Tex.	990
KTRN	Wichita Falls, Tex.	1290
KTRY	Bastrop, La.	730
KTSA	San Antonio, Tex.	550
KTSL	Burnett, Tex.	1340
KTSM	El Paso, Tex.	1380
KTTN	Trenton, Mo.	1600
KTTR	Rolla, Mo.	1490
KTTS	Springfield, Mo.	1400
KTTT	Columbus, Nebr.	1510
KTUC	Tucson, Ariz.	1400
KTUE	Tulia, Tex.	1260
KTUI	Sullivan, Mo.	1560
KTW	Seattle, Wash.	1250
KTWO	Casper, Wyo.	1030
KTXJ	Jasper, Tex.	1350
KTXO	Sherman, Tex.	1500
KTYM	Inglewood, Calif.	1460
KUAI	Eleele, Kanai, Hawaii	720
KUAM	Agana, Guam	610
KUBA	Yuba City, Calif.	1600
KUBC	Montrose, Colo.	580
KUDE	Oceanside, Calif.	1320
KUDI	Great Falls, Mont.	1450
KUDL	Fairway, Kan.	1380
KUDU	Ventura, Calif.	1590
KUDY	Spokane, Wash.	1280
KUEN	Wenatchee, Wash.	900
KUEQ	Phoenix, Ariz.	740
KUGN	Eugene, Oreg.	590
KUIK	Hillsboro, Oreg.	1360
KUJ	Walla Walla, Wash.	1420
KUKA	San Antonio, Tex.	1250
KUKI	Ukiah, Calif.	1400
KUKU	Willow Springs, Mo.	1330
KULA	Honolulu, Hawaii	690
KULE	Ephrata, Wash.	730
KULP	El Campo, Tex.	1390
KULY	Ulysses, Kan.	1420
KUMA	Pendleton, Oreg.	1290
KUNO	Corpus Christi, Tex.	1400
KUOA	Siloam Springs, Ark.	1290
KUOM	Minneapolis, Minn.	770
KUPD	Tempe, Ariz.	1060
KUPI	Idaho Falls, Idaho	980
KUPK	Garden City, Kan.	1050
KURA	Moab, Utah	1450
KURL	Billings, Mont.	730
KURV	Edinburg, Tex.	710
KURY	Brookings, Oreg.	910
KUSD	Vermillion, S.Dak.	690
KUSH	Cushing, Okla.	1600
KUSN	St. Joseph, Mo.	1270
KUTA	Blanding, Utah	790
KUTI	Yakima, Wash.	980
KUTY	Palmdale, Calif.	1470
KUVR	Holdredge, Nebr.	1380
KUXL	Golden Valley, Minn.	1570
KUZN	W. Monroe, La.	1310
KUZZ	Bakersfield, Calif.	800
KVAL	Sauk Rapids, Minn.	800
KVAN	Camas, Wash.	1480
KVAS	Astoria, Ore.	1230
KVBR	Brainerd, Minn.	1340
KVCK	Wolf Point, Nebr.	1450
KVCL	Winnfield, La.	1270
KVCV	Redding, Calif.	600
KVEC	San Luis Obispo, Calif.	920
KVEE	Conway, Ark.	1330
KVEG	Las Vegas, Nev.	970
KVEL	Vernal, Utah	1250
KVEN	Ventura, Calif.	1450
KVET	Austin, Tex.	1300
KVFC	Cortez, Colo.	740
KVFD	Ft. Dodge, Iowa	1400
KVGB	Great Bend, Kans.	1590
KVI	Seattle, Wash.	570
KVIC	Victoria, Tex.	1340
KVII	Amarillo, Tex.	1010
KVIL	Highland Park, Tex.	1150
KVIN	Vinita, Okla.	1470
KVIO	Cottonwood, Ariz.	1600
KVIP	Redding, Calif.	540
KVKM	Monahans, Tex.	1330
KVLB	Cleveland, Tex.	1410
KVLC	Little Rock, Ark.	1050
KVLF	Alpine, Tex.	1240
KVLG	LaGrange, Tex.	1570
KVLH	Pauls Valley, Okla.	1470
KVLL	Livingston, Tex.	1220
KVLV	Fallon, Nev.	980
KVMA	Magnolia, Ark	630
KVMC	Colorado City, Tex.	1320
KVML	Sonora, Calif.	1450
KVNC	Winslow, Ariz.	1010
KVNI	Coeur d'Alene, Idaho	1240
KVNU	Logan, Utah	610
KVOB	Bastrop, La.	1340
KVOC	Casper, Wyo.	1230
KVOD	Albuquerque, N. Mex.	730
KVOE	Emporia, Kans.	1400
KVOG	Ogden, Utah	1490
KVOL	Lafayette, La.	1330
KVOM	Morrilton, Ark.	800
KVON	Napa, Calif.	1440
KVOO	Tulsa, Okla.	1170
KVOP	Plainview, Tex.	1400
KVOR	Colo. Springs, Colo.	1300
KVOU	Uvalde, Tex.	1400
KVOW	Riverton, Wyo.	1450
KVOX	Moorhead, Minn.	1280
KVOY	Yuma, Ariz.	1400
KVOZ	Laredo, Tex.	1490
KVPI	Ville Platte, La.	1050
KVRC	Arkadelphia, Ark.	1240
KVRD	Cottonwood, Ariz.	1240
KVRE	Santa Rosa, Calif.	1460
KVRH	Salida, Colo.	1340
KVRS	Rock Springs, Wyo.	1360
KVSA	McGehee, Ark.	1220
KVSF	Santa Fe, N.Mex.	1260
KVSH	Valentine, Nebr.	940
KVSI	Montpelier, Ida.	1450
KVSO	Ardmore, Okla.	1240
KVWC	Vernon, Tex.	1490
KVWG	Pearsall, Tex.	1280
KVWM	Show Low, Ariz.	970
KVWO	Cheyenne, Wyo.	1370
KVYL	Holdenville, Okla.	1370
KWAC	Bakersfield, Calif.	1490
KWAD	Wadena, Minn.	920
KWAK	Stuttgart, Ark.	1240
KWAL	Wallace, Idaho	620
KWAM	Memphis, Tenn.	990
KWAT	Watertown, S.Dak.	950
KWAY	Forest Grove, Oreg.	1570
KWBA	Baytown, Tex.	1360
KWBB	Wichita, Kans.	1410
KWBC	Navasota, Tex.	1550
KWBE	Beatrice, Nebr.	1450
KWBG	Boone, Iowa	1590
KWBW	Hutchinson, Kans.	1450
KWCB	Searcy, Ark.	1300
KWCL	Oak Grove, La.	1280
KWCO	Chickasha, Okla.	1560
KWEB	Rochester, Minn.	1270
KWED	Seguin, Tex.	1580
KWEI	Weiser, Idaho	1260
KWEL	Midland, Tex.	1440
KWEW	Hobbs, N.Mex.	1480
KWFA	Merkle, Tex.	1500
KWFR	San Angelo, Tex.	1260
KWFS	Eugene, Oreg.	1540
KWFT	Wichita Falls, Tex.	620
KWG	Stockton, Calif.	1230
KWHI	Brenham, Tex.	1280
KWHK	Hutchinson, Kans.	1260
KWHN	Fort Smith, Ark.	1320
KWHO	Salt Lake City, Utah	860
KWHW	Altus, Okla.	1450
KWIC	Salt Lake City, Utah	1550
KWIK	Pocatello, Idaho	1240
KWIL	Albany, Oreg.	790
KWIN	Ashland, Oreg.	580
KWIP	Merced, Calif.	1580
KWIQ	Moses Lake, Wash.	1260
KWiV	Douglas, Wyo.	1050
KWIZ	Santa Ana, Calif.	1480
KWJJ	Portland, Oreg.	1080
KWK	St. Louis, Mo.	1380
KWKC	Abilene, Tex.	1340
KWKH	Shreveport, La.	1130
KWKW	Pasadena, Calif.	1300
KWKY	Des Moines, Iowa	1150
KWLA	Many, La.	1530
KWLC	Decorah, Iowa	1240
KWLG	Wagoner, Okla.	1530
KWLM	Willmar, Minn.	1340
KWMT	Ft. Dodge, Iowa	540
KWNA	Winnemucca, Nev.	1400
KWNO	Winona, Minn.	1230
KWNS	Pratt, Kans.	1290
KWNT	Davenport, Iowa	1580
KWOA	Worthington, Minn.	730
KWOC	Poplar Bluff, Mo.	930
KWOE	Clinton, Okla.	1320
KWON	Bartlesville, Okla.	1400
KWOR	Worland, Wyo.	1340
KWOS	Jefferson City, Mo.	1240
KWOW	Pomona, Calif.	1600
KWPC	Muscatine, Iowa	860
KWPM	West Plains, Mo.	1450
KWPR	Claremore, Okla.	1270
KWRC	Woodburn, Ore.	940
KWRD	Henderson, Tex.	1470
KWRE	Warrenton, Mo.	730
KWRF	Warren, Ark.	860
KWRG	New Roods, La.	1500
KWRO	Coquille, Oreg.	630
KWRT	Boonville, Mo.	1370
KWRW	Guthrie, Okla.	1490
KWSC	Pullman, Wash.	1250
KWSD	Mt. Shasta, Calif.	620
KWSH	Wewoka-Seminole, Oklahoma	1260
KWSL	Grand Junction, Colo.	1340
KWSO	Wasco, Calif.	1050
KWTC	Barstow, Calif.	1230
KWTO	Springfield, Mo.	560
KWTX	Waco, Tex.	1230
KWUN	Concord, Cal.	1480
KWVR	Enterprise, Oreg.	1340
KWVY	Waverly, Iowa	1470
KWWL	Waterloo, Iowa	1330
KWXY	Cathedral City, Cal.	1340
KWYK	Farmington, N.Mex.	960
KWYN	Wynne, Ark.	1400
KWYO	Sheridan, Wyo.	1410
KWYR	Winner, S.Dak.	1260
KWYZ	Everett, Wash.	1230
KXA	Seattle, Wash.	770
KXAR	Hope, Ark.	1490
KXEL	Waterloo, Iowa	1540
KXEN	Festus-St. Louis, Mo.	1010
KXEO	Mexico, Mo.	1340
KXEW	Tucson, Ariz.	1600
KXEX	Fresno, Calif.	1550
KXGI	Ft. Madison, Iowa	1360
KXGN	Glendive, Mont.	1400
KXIC	Iowa City, Iowa	800
KXIT	Dalhart, Tex.	1410
KXIV	Phoenix, Ariz.	1400
KXJK	Forrest City, Ark.	950
KXKW	Lafayette, La.	1520
KXL	Portland, Oreg.	750
KXLE	Ellensburg, Wash.	1240
KXLF	Butte, Mont.	1370
KXLJ	Helena, Mont.	1240
KXLL	Missoula, Mont.	1450
KXLO	Lewiston, Mont.	1230
KXLR	Little Rock, Ark.	1150
KXLW	Clayton, Mo.	1320
KXLY	Spokane, Wash.	920
KXO	El Centro, Calif.	1230
KXOA	Sacramento, Calif.	1470
KXOK	St. Louis, Mo.	630
KXOL	Ft. Worth, Tex.	1360
KXOW	Hot Springs, Ark.	1420
KXOX	Sweetwater, Tex.	1240
KXRA	Alexandria, Minn.	1490
KXRJ	Russellville, Ark.	1490
KXRO	Aberdeen, Wash.	1320
KXRX	San Jose, Calif.	1500
KXXL	Bozeman, Mont.	1450
KXXX	Colby, Kans.	790
KXYZ	Houston, Tex.	1320
KYA	San Francisco, Calif.	1260
KYAC	Kirkland, Wash.	1460
KYAL	McKinney, Tex.	1600
KYCA	Prescott, Ariz.	1490
KYCN	Wheatland, Wyo.	1340
KYED	Burlington, La.	1150
KYES	Roseburg, Oreg.	950
KTET	Payette, Idaho	1450
KYJC	Medford, Oreg.	1230
KYME	Boise, Idaho	740
KYMN	Oregon City, Ore.	1520
KYND	Tempe, Ariz.	1580
KYNG	Coos Bay, Oreg.	1420
KYNO	Fresno, Calif.	1300
KYNT	Yankton, S.Dak.	1450
KYOK	Houston, Tex.	1590
KYOR	Blythe, Calif.	1450
KYOS	Merced, Calif.	1480
KYOU	Greeley, Colo.	1450
KYRO	Potosi, Mo.	1280
KYSM	Mankato, Minn.	1230
KYSN	Colorado Spgs., Colo.	1460
KYSS	Missoula, Mont.	910
KYUM	Yuma, Ariz.	560
KYVA	Gallup, N.Mex.	1230
KYW	Philadelphia, Pa.	1060
KZAK	Tyler, Tex.	1330
KZEE	Weatherford, Tex.	1220
KZEY	Tyler, Tex.	690
KZIN	Yuba City, Cal.	1450
KZIP	Amarillo, Tex.	1310
KZIX	Fort Collins, Colo.	600
KZNG	Hot Springs, Ark.	1340
KZOE	Princeton, Ill.	1490
KZOL	Farwell, Tex.	1570
KZON	Santa Maria, Cal.	1600
KZOO	Honolulu, Hawaii	1210
KZOT	Marianna, Ark.	1460
KZOW	Globe, Ariz.	1240
KZUN	Opportunity, Wash.	630
KZYM	Cape Girardeau, Mo.	1220
KZZN	Littlefield, Tex.	1490
VOUS	Argentia, Nfld.	1480
WAAA	Winston-Salem, N.C.	980
WAAB	Worcester, Mass.	1440
WAAC	Terre Haute, Ind.	1300
WAAF	Chicago, Ill.	950
WAAG	Adel, Ga.	1470
WAAK	Dallas, N.C.	960
WAAM	Ann Arbor, Mich.	1600
WAAO	Andalusia, Ala.	1530
WAAT	Trenton, N.J.	1300
WAAX	Gadsden, Ala.	570
WAAY	Huntsville, Ala.	1550
WABA	Aguadilla, P.Rico	850
WABB	Mobile, Ala.	1480
WABC	New York, N.Y.	770
WABD	Ft. Campbell, Ky.	1370
WABF	Fairhope, Ala.	1220
WABG	Greenwood, Miss.	960
WABH	Deerfield, Va.	1150
WABI	Bangor, Maine	910
WABJ	Adrian, Mich.	1490
WABL	Amite, La.	1570
WABO	Waynesboro, Miss.	990
WABQ	Cleveland, Ohio	1540
WABR	Winter Park, Fla.	1440
WABT	Tuskegee, Ala.	580
WABV	Abbeville, S.C.	1590
WABY	Albany, N.Y.	1400
WABZ	Albemarle, N.C.	1010
WACA	Camden, S.C.	1590
WACB	Kittanning, Pa.	1380
WACE	Chicopee, Mass.	730
WACI	The Dalles, Ore.	1300
WACK	Newark, N.Y.	1420
WACL	Waycross, Ga.	570
WACO	Waco, Tex.	1460
WACR	Columbus, Miss.	1050
WACT	Tuscaloosa, Ala.	1420
WACY	Moss Point, Miss.	1460
WADA	Shelby, N.C.	1390
WADE	Wadesboro, N.C.	1210
WADK	Newport, R.I.	1540
WADM	Decatur, Ind.	1540
WADO	New York, N.Y.	1280
WADR	Remsen, N. Y.	1480
WADS	Ansonia, Conn.	690
WAEB	Allentown, Pa.	790
WAEL	Mayaguez, P.Rico	600
WAEW	Crossville, Tenn.	1330
WAFC	Staunton, Va.	900
WAFS	Amsterdam, N.Y.	1570
WAGC	Centre, Ala.	1550
WAGE	Leesburg, Va.	1290
WAGF	Dothan, Ala.	1320
WAGG	Franklin, Tenn.	950
WAGL	Lancaster, S. C.	1560
WAGM	Presque Isle, Maine	950
WAGN	Menominee, Mich.	1340
WAGR	Lumberton, N.C.	580
WAGS	Bishopville, S.C.	1380
WAGY	Forest City, N.C.	1320
WAHT	Annville-Cleona, Pa.	1510
WAIK	Galesburg, Ill.	1590

Call	Location	kHz
WAIL	Baton Rouge, La.	1260
WAIM	Anderson, S.C.	1230
WAIN	Columbia, Ky.	1270
WAIR	Winston-Salem, N.C.	1340
WAIT	Chicago, Ill.	820
WAJF	Decatur, Ala.	1490
WAJR	Morgantown, W.Va.	1440
WAKE	Valparaiso, Ind.	1500
WAKI	McMinnville, Tenn.	1230
WAKN	Aiken, S.C.	990
WAKO	Lawrenceville, Ill.	910
WAKR	Akron, Ohio	1590
WAKY	Louisville, Ky.	790
WALD	Walterboro, S.C.	1060
WALE	Fall River, Mass.	1400
WALG	Albany, Ga.	1590
WALK	Patchogue, N.Y.	1370
WALL	Middletown, N.Y.	1340
WALM	Albion, Mich.	1260
WALO	Humacao, P.R.	1240
WALT	Tampa, Fla.	1110
WALY	Herkimer, N.Y.	1420
WAMD	Aberdeen, Md.	970
WAME	Miami, Fla.	1260
WAMG	Galatin, Tenn.	1130
WAMI	Opp, Ala.	860
WAML	Laurel, Miss.	1340
WAMM	Flint, Mich.	1420
WAMO	Homestead, Pa.	860
WAMR	Venice, Fla.	1320
WAMS	Wilmington, Del.	1380
WAMW	Washington, Ind.	1580
WAMY	Amory, Miss.	1580
WANA	Anniston, Ala.	1490
WANB	Waynesburg, Pa.	1580
WANN	Annapolis, Md.	1190
WANO	Pineville, Ky.	1230
WANS	Anderson, S.C.	1280
WANT	Richmond, Va.	990
WANV	Waynesboro, Va.	970
WANY	Albany, Ky.	1390
WAOK	Atlanta, Ga.	1380
WAOP	Ostego, Mich.	980
WAOV	Vincennes, Ind.	1450
WAPA	San Juan, P.R.	680
WAPC	Riverhead, N.Y.	1570
WAPE	Jacksonville, Fla.	690
WAPF	McComb, Miss.	980
WAPG	Arcadia, Fla.	1480
WAPI	Birmingham, Ala.	1070
WAPL	Appleton, Wis.	1570
WAPO	Chattanooga, Tenn.	1150
WAPX	Montgomery, Ala.	1600
WAQE	Towson, Md.	1570
WAQI	Ashtabula, Ohio	1600
WAQY	Birmingham, Ala.	1220
WARA	Attleboro, Mass.	1320
WARB	Covington, La.	730
WARD	Johnstown, Pa.	1490
WARE	Ware, Mass.	1250
WARF	Jasper, Ala.	1240
WARI	Abbeville, Ala.	1480
WARK	Hagerstown, Md.	1490
WARM	Scranton, Pa.	590
WARN	Ft. Pierce, Fla.	1330
WARO	Canonsburg, Pa.	540
WART	Moulton, Ala.	1530
WARU	Peru, Ind.	1600
WASA	Havre de Grace, Md.	1330
WASC	Spartanburg, S.C.	1530
WASK	Lafayette, Ind.	1450
WATA	Boone, N.C.	1450
WATC	Gaylord, Mich.	900
WATE	Knoxville, Tenn.	620
WATH	Athens, Ohio	970
WATI	Indianapolis, Ind.	810
WATK	Antigo, Wis.	900
WATM	Atmore, Ala.	1590
WATN	Watertown, N.Y.	1240
WATO	Oak Ridge, Tenn.	1290
WATP	Marion, S.C.	1430
WATR	Waterbury, Conn.	1320
WATS	Sayre, Pa.	960
WATT	Cadillac, Mich.	1240
WATV	Birmingham, Ala.	900
WATW	Ashland, Wis.	1400
WATY	N. Atlanta, Ga.	680
WATZ	Alpena, Mich.	1450
WAUB	Auburn, N.Y.	1590
WAUC	Wauchula, Fla.	1310
WAUD	Auburn, Ala.	1230
WAUG	Augusta, Ga.	1050
WAUK	Waukesha, Wis.	1510
WAVA	Arlington, Va.	780
WAVC	Warner Robins, Ga.	1350
WAVE	Louisville, Ky.	970
WAVI	Dayton, Ohio	1210
WAVL	Apollo, Pa.	910
WAVN	Stillwater, Minn.	1220
WAVO	Avondale Estates, Ga.	1420
WAVP	Avon Park, Fla.	1390
WAVU	Albertville, Ala.	630
WAVY	Portsmouth, Va.	1350
WAVZ	New Haven, Conn.	1300
WAWA	West Allis, Wis.	1590
WAWK	Kendallville, Ind.	1140
WAWZ	Zarephath, N.J.	1380
WAXE	Vero Beach, Fla.	1370
WAXK	Superior, Wis.	1320
WAXU	Georgetown, Ky.	1580
WAXX	Chippewa Falls, Wis.	1150
WAYB	Waynesboro, Va.	1490
WAYE	Baltimore, Md.	860
WAYN	Rockingham, N.C.	900
WAYR	Orange Park, Fla.	550
WAYS	Charlotte, N.C.	610
WAYX	Waycross, Ga.	1230
WAYZ	Waynesboro, Pa.	1380
WAZA	Bainbridge, Ga.	1360
WAZE	Clearwater, Fla.	860
WAZF	Yazoo City, Miss.	1230
WAZL	Hazelton, Pa.	1490
WAZS	Summerville, S.C.	780
WAZY	Lafayette, Ind.	1410
WBAA	West Lafayette, Ind.	920
WBAB	Babylon, N.Y.	1440
WBAC	Cleveland, Tenn.	1340
WBAD	College Park, Ga.	1570
WBAF	Barnesville, Ga.	1090
WBAG	Burlington, N.C.	1150
WBAL	Baltimore, Md.	1090
WBAM	Montgomery, Ala.	740
WBAP	Fort Worth, Tex.	570 & 820
WBAR	Bartow, Fla.	1460
WBAT	Marion, Ind.	1400
WBAW	Barnwell, S.C.	740
WBAX	Wilkes-Barre, Pa.	1240
WBAY	Green Bay, Wis.	1360
WBAZ	Kingston, N.Y.	1550
WBBA	Pittsfield, Ill.	1580
WBBB	Burlington, N.C.	920
WBBF	Rochester, N.Y.	950
WBBI	Abingdon, Va.	1230
WBBK	Blakely, Ga.	1260
WBBL	Richmond, Va.	1480
WBBM	Chicago, Ill.	780
WBBO	Forest City, N.C.	780
WBBQ	Augusta, Ga.	1340
WBBR	Travelers Rest, S.C.	1580
WBBT	Lyons, Ga.	1340
WBBW	Youngstown, Ohio	1240
WBBX	Portsmouth, N.H.	1380
WBBZ	Ponca City, Okla.	1230
WBCA	Bay Minette, Ala.	1110
WBCB	Levittown, Pa.	1490
WBCH	Hastings, Mich.	1220
WBCI	Williamsburg, Va.	740
WBCK	Battle Creek, Mich.	930
WBCM	Bay City, Mich.	1440
WBCO	Bucyrus, Ohio	1540
WBCU	Union, S.C.	1460
WBEC	Pittsfield, Mass.	1420
WBEE	Harvey, Ill.	1570
WBEJ	Elizabethton, Tenn.	1240
WBEL	Beloit, Wis.	1380
WBEN	Buffalo, N.Y.	930
WBER	Moncks Corner, S. C.	950
WBET	Brockton, Mass.	1460
WBEU	Beaufort, S.C.	960
WBEV	Beaver Dam, Wis.	1430
WBEX	Chillicothe, Ohio	1490
WBFD	Bedford, Pa.	1310
WBFJ	Woodbury, Tenn.	1540
WBGC	Chipley, Fla.	1240
WBGN	Bowling Green, Ky.	1340
WBGS	Slidell, La.	1560
WBHB	Fitzgerald, Ga.	1240
WBHC	Hampton, S.C.	1270
WBHF	Cartersville, Ga.	1450
WBHM	Birmingham, Ala.	1550
WBHP	Huntsville, Ala.	1230
WBHT	Brownsville, Tenn.	1520
WBIA	Augusta, Ga.	1230
WBIB	Centreville, Ala.	1110
WBIC	Islip, N.Y.	540
WBIE	Marietta, Ga.	1080
WBIG	Greensboro, N.C.	1470
WBIP	Booneville, Miss.	1400
WBIR	Knoxville, Tenn.	1240
WBIS	Bristol, Conn.	1440
WBIW	Bedford, Ind.	1340
WBIX	Jacksonville Beach, Fla.	1010
WBIZ	Eau Claire, Wis.	1400
WBJM	Lemmon, S. D.	1400
WBKC	Selinsgrove, Pa.	1240
WBKH	Hattlesburg, Miss.	950
WBKN	Newton, Miss.	1410
WBKV	West Bend, Wis.	1470
WBLA	Elizabethtown, N.C.	1440
WBLC	Lenoir City, Tenn.	1360
WBLE	Batesville, Miss.	1290
WBLF	Bellefonte, Pa.	1330
WBLG	Lexington, Ky.	1300
WBLJ	Dalton, Ga.	1230
WBLO	Evergreen, Ala.	1470
WBLR	Batesburg, S.C.	1430
WBLT	Bedford, Va.	1350
WBLU	Salem, Va.	1480
WBLY	Springfield, Ohio	1600
WBMA	Beaufort, N.C.	1400
WBMC	McMinnville, Tenn.	960
WBMD	Baltimore, Md.	750
WBME	Belfast, Me.	1230
WBMJ	San Juan, P. R.	1190
WBMK	West Point, Ga.	1310
WBML	Macon, Ga.	1240
WBMS	Black Mountain, N.C.	1350
WBNB	Charlotte Amalie, Virgin Islands	1000
WBNC	Conway, N.H.	1050
WBNL	Boonville, Ind.	1540
WBNO	Bryan, Ohio	1520
WBNR	Beacon, N.Y.	1260
WBNS	Columbus, Ohio	1460
WBNT	Oneida, Tenn.	1310
WBNX	New York, N.Y.	1380
WBOB	Galax, Va.	1360
WBOC	Salisbury, Md.	960
WBOK	New Orleans, La.	800
WBOL	Bolivar, Tenn.	1560
WBOM	Jacksonville, Fla.	970
WBOP	Pensacola, Fla.	980
WBOS	Brookline, Mass.	1600
WBOW	Terre Haute, Ind.	1230
WBOX	Bogalusa, La.	920
WBOY	Clarksburg, W.Va.	1400
WBPZ	Lock Haven, Pa.	1230
WBRB	Mt. Clemens, Mich.	1430
WBRC	Birmingham, Ala.	960
WBRD	Bradenton, Fla.	1420
WBRE	Wilkes-Barre, Pa.	1340
WBRG	Lynchburg, Va.	1050
WBRI	Indianapolis, Ind.	1500
WBRJ	Marietta, O.	910
WBRK	Pittsfield, Mass.	1340
WBRL	Berlin, N.H.	1400
WBRM	Marion, N.C.	1250
WBRN	Big Rapids, Mich.	1460
WBRT	Bardstown, Ky.	1320
WBRO	Waynesboro, Ga.	1310
WBRV	Boonville, N.Y.	900
WBRW	Brewster, N.Y.	1510
WBRX	Berwick, Pa.	1280
WBRY	Waterbury, Conn.	1590
WBSA	Boaz, Ala.	1300
WBSC	Bennetsville, S.C.	1550
WBSG	Blackshear, Ga.	1350
WBSM	New Bedford, Mass.	1420
WBSR	Pensacola, Fla.	1540
WBT	Charlotte, N.C.	1110
WBTA	Batavia, N.Y.	1490
WBTC	Uhrichsville, O.	1540
WBTH	Williamson, W.Va.	1400
WBTM	Danville, Va.	1330
WBTN	Bennington, Vt.	1370
WBTO	Linton, Ind.	1600
WBTS	Bridgeport, Ala.	1480
WBUC	Buckhannon, W.Va.	1460
WBUD	Trenton, N.J.	1260
WBUG	Ridgeland, S.C.	1430
WBUT	Butler, Pa.	1050
WBUX	Doylestown, Pa.	1570
WBUY	Lexington, N.C.	1440
WBUZ	Fredonia, N.Y.	1570
WBVM	Utica, N.Y.	1550
WBVP	Beaver Falls, Pa.	1230
WBYB	St. Pauls, N.C.	1060
WBYE	Calera, Ala.	1370
WBYG	Savannah, Ga.	1450
WBYS	Canton, Ill.	1560
WBZ	Boston, Mass.	1030
WBZA	Glens Falls, N.Y.	1410
WBZB	Selma, N.C.	1090
WBZE	Wheeling, W. Va.	1470
WRZY	Torrington, Conn.	990
WCAB	Rutherfordton, N. C.	1520
WCAI	Fort Myers, Fla.	1350
WCAL	Northfield, Minn.	770
WCAM	Camden, N.J.	1310
WCAO	Baltimore, Md.	600
WCAP	Lowell, Mass.	980
WCAR	Detroit, Mich.	1130
WCAT	Orange, Mass.	1390
WCAU	Philadelphia, Pa.	1210
WCAW	Charleston, W.Va.	680
WCAY	Cayce, S.C.	620
WCAZ	Carthage, Ill.	990
WCBA	Corning, N.Y.	1350
WCBG	Chambersburg, Pa.	1590
WCBI	Columbus, Miss.	550
WCBK	Martinsville, Ind.	1540
WCBL	Benton, Ky.	1290
WCBM	Baltimore, Md.	680
WCBS	New York, N.Y.	880
WCBT	Roanoke Rapids, N.C.	1230
WCBY	Cheboygan, Mich.	1240
WCCC	Hartford, Conn.	1290
WCCF	Punta Gorda, Fla.	1580
WCCM	Lawrence, Mass.	800
WCCN	Neillsville, Wis.	1370
WCCO	Minneapolis-St. Paul, Minn.	830
WCCW	Traverse City, Mich.	1310
WCDJ	Edenton, N.C.	1260
WCDL	Carbondale, Pa.	1440
WCDS	Glasgow, Ky.	1340
WCDT	Winchester, Tenn.	810
WCEC	Rocky Mount, N.C.	1420
WCED	DuBois, Pa.	1050
WCEF	Parksburg, W.Va.	610
WCEH	Hawkinsville, Ga.	1240
WCEM	Cambridge, Md.	1150
WCEN	Mt. Pleasant, Mich.	1390
WCER	Charlotte, Mich.	1000
WCFL	Chicago, Ill.	1480
WCFR	Springfield, Vt.	1230
WCFV	Clifton Forge, Va.	900
WCGA	Calhoun, Ga.	1270
WCGC	Belmont, N.C.	1600
WCGO	Chicago Hghts., Ill.	1550
WCGR	Canandaigua, N.Y.	800
WCHA	Chambersburg, Pa.	1440
WCHB	Inkster, Mich.	1520
WCHE	Westchester, Pa.	1350
WCHI	Chillicothe, Ohio	1470
WCHJ	Brookhaven, Miss.	1290
WCHK	Canton, Ga.	1360
WCHL	Chapel Hill, N.C.	1360
WCHN	Norwich, N.Y.	970
WCHO	Washington Court House, Ohio	1250
WCHS	Charleston, W.Va.	580
WCHV	Charlottesville, Va.	1260
WCIK	Gordon, Ga.	1560
WCIL	Carbondale, Ill.	1020
WCIN	Cincinnati, Ohio	1480
WCIR	Beckley, W. Va.	1060
WCIT	Lima, Ohio	940
WCJU	Columbia, Miss.	1450
WCKB	Dunn, N.C.	780
WCKD	Ishpenning, Mich.	970
WCKI	Greer, S.C.	1300
WCKM	Winnsboro, S.C.	1250
WCKY	Cincinnati, Ohio	1530
WCLA	Claxton, Ga.	1470
WCLB	Camilla, Ga.	1220
WCLC	Jamestown, Tenn.	1260
WCLD	Cleveland, Miss.	1490
WCLE	Cleveland, Tenn.	1570
WCLG	Morgantown, W.Va.	1300
WCLI	Corning, N.Y.	1450
WCLO	Janesville, Wis.	1230
WCLR	Crystal Lake, Ill.	850
WCLS	Columbus, Ga.	1580
WCLT	Newark, Ohio	1430
WCLU	Covington, Ky.	1320
WCLW	Mansfield, O.	1140
WCMA	Corinth, Miss.	1230
WCMB	Harrisburg, Pa.	1460
WCMC	Wildwood, N.J.	1230
WCME	Brunswick, Maine	900
WCMI	Ashland, Ky.	1340
WCMN	Arecibo, P.R.	1280
WCMP	Pine City, Minn.	1350
WCMR	Elkhart, Ind.	1270
WCMS	Norfolk, Va.	1050
WCMT	Martin, Tenn.	1410
WCMY	Ottawa, Ill.	1430
WCNB	Connersville, Ind.	1580
WCNC	Elizabeth City, N.C.	1240
WCND	Shelbyville, Ky.	940
WCNF	Weldon, N.C.	1400
WCNH	Quincy, Fla.	1230
WCNL	Newport, N. H.	1010
WCNR	Bloomsburg, Pa.	930
WCNS	Canton, O.	900
WCNT	Centralia, Ill.	1210
WCNU	Crestview, Fla.	1010
WCNW	Fairfield, O.	1560
WCNX	Middletown, Conn.	1150
WCOA	Pensacola, Fla.	1370
WCOC	Meridian, Miss.	910
WCOF	Immokalee, Fla.	1490
WCOG	Greensboro, N.C.	1320
WCOH	Newnan, Ga.	1400
WCOJ	Coatesville, Pa.	1420
WCOK	Sparta, N. C.	1060
WCOL	Columbus, Ohio	1230
WCON	Cornelia, Ga.	1450
WCOP	Boston, Mass.	1150
WCOR	Lebanon, Tenn.	900
WCOS	Columbia, S.C.	1400
WCOU	Lewiston, Maine	1240
WCOV	Montgomery, Ala.	1170
WCOW	Sparta, Wis.	1290
WCOY	Columbia, Pa.	1580
WCPA	Clearfield, Pa.	900
WCPC	Houston, Miss.	940
WCPH	Etowah, Tenn.	1220
WCPM	Cumberland, Ky.	1280
WCPO	Cincinnati, Ohio	1230
WCPR	Coamo, P. R.	1450
WCPS	Tarboro, N.C.	760
WCQS	Alma, Ga.	1400
WCRA	Effingham, Ill.	1090
WCRB	Waltham, Mass.	1330
WCRE	Cheraw, S.C.	1420
WCRI	Scottsboro, Ala.	1050
WCRK	Morristown, Tenn.	1150
WCRL	Oneonta, Ala.	1570
WCRM	Clare, Mich.	990
WCRO	Johnstown, Pa.	1230
WCRS	Greenwood, S.C.	1450
WCRT	Birmingham, Ala.	1260
WCRV	Washington, N.J.	1580
WCRW	Chicago, Ill.	1240
WCRY	Macon, Ga.	900
WCSA	Ripley, Mass.	1260
WCSC	Charleston, S.C.	1390
WCSH	Portland, Maine	970
WCSI	Columbus, Ind.	1010
WCSJ	Morris, Ill.	1550
WCSL	Cherryville, N. C.	1590
WCSM	Celina, Ohio	1350
WCSR	Hillsdale, Mich.	1340
WCSS	Amsterdam, N.Y.	1490
WCST	Berkeley Springs, W.Va.	1010
WCTA	Andalusia, Ala.	920
WCTC	New Brunswick, N.J.	1450
WCTR	Chestertown, Md.	1530
WCTT	Corbin, Ky.	680
WCTW	New Castle, Ind.	1550
WCUB	Manitowoc, Wis.	980
WCUE	Cuyahoga Falls, Ohio	1150
WCUM	Cumberland, Md.	1230
WCVA	Culpeper, Va.	1490
WCVI	Connellsville, Pa.	1340
WCVL	Crawfordsville, Ind.	1550
WCVP	Murphy, N.C.	600

WHITE'S RADIO LOG

Call	Location	kHz
WCVS	Springfield, Ill.	1450
WCWA	Toledo, O.	1230
WCWC	Ripon, Wis.	1600
WCWR	Tarpon Springs, Fla.	1470
WCYB	Bristol, Va.	690
WCYN	Cynthiana, Ky.	1400
WDAD	Indiana, Pa.	1450
WDAE	Tampa, Fla.	1250
WDAF	Kansas City, Mo.	610
WDAK	Columbus, Ga.	540
WDAL	Meridian, Miss.	1330
WDAN	Danville, Ill.	1490
WDAR	Darlington, S.C.	1350
WDAS	Philadelphia, Pa.	1480
WDAX	McRae, Ga.	1410
WDAY	Fargo, N. Dak.	970
WDBC	Escanaba, Mich.	680
WDBF	Delray Beach, Fla.	1420
WDBJ	Roanoke, Va.	960
WDBL	Springfield, Tenn.	1590
WDBM	Statesville, N.C.	550
WDBO	Orlando, Fla.	580
WDBQ	Dubuque, Iowa	1490
WDCF	Dade City, Fla.	1350
WDCJ	Arlington, Fla.	1220
WDCR	Hanover, N.H.	1340
WDDT	Greenville, Miss.	900
WDDY	Gloucester, Va.	1420
WDEA	Ellsworth, Me.	1370
WDEC	Americus, Ga.	1290
WDEE	Hamden, Conn.	1220
WDEF	Chattanooga, Tenn.	1370
WDEH	Sweetwater, Tenn.	800
WDEL	Wilmington, Del.	1150
WDEV	Waterbury, Vt.	550
WDEW	Westfield, Mass.	1570
WDGL	Douglasville, Ga.	1520
WDGY	Minneapolis, Minn.	1130
WDIA	Memphis, Tenn.	1070
WDIC	Clinchco, Va.	1430
WDIG	Dothan, Ala.	1450
WDIX	Orangeburg, S.C.	1150
WDJS	Mt. Ollve, N.C.	1480
WDKD	Kingstree, S. C.	1310
WDKN	Dickson, Tenn.	1260
WDLA	Walton, N.Y.	1270
WDLB	Marshfield, Wis.	1450
WDLC	Port Jervis, N.Y.	1490
WDLR	Delaware, Ohio	1550
WDLM	E. Moline, Ill.	960
WDLP	Panama City, Fla.	590
WDLT	Indianola, Miss.	1380
WDMG	Douglas, Ga.	860
WDMJ	Marquette, Mich.	1320
WDMS	Lynchburg, Va.	1320
WDMV	Pocomoke City, Md.	540
WDNC	Durham, N.C.	620
WDNE	Elkins, W.Va.	1240
WDNG	Anniston, Ala.	1450
WDNT	Dayton,Tenn.	1280
WDOB	Canton, Miss.	1370
WDOC	Prestonsburg, Ky.	1310
WDOD	Chattanooga, Tenn.	1310
WDOE	Dunkirk, N.Y.	1410
WDOG	Allendale, S.C.	1460
WDOK	Cleveland, Ohio	1260
WDOL	Athens, Ga.	1470
WDON	Wheaton, Md.	1540
WDOR	Sturgeon Bay, Wis.	910
WDOS	Oneonta, N.Y.	730
WDOT	Burlington, Va.	1400
WDOV	Dover, Del.	1410
WDOW	Dowaglac, Mich.	1440
WDQN	DuQuoin, Ill.	1580
WDRC	Hartford, Conn.	1360
WDSC	Dillon, S.C.	800
WDSG	Dversburg, Tenn.	1450
WDSK	Cleveland, Miss.	1410
WDSL	Mocksville, N. C.	1520
WDSM	Superior, Wis.	710
WDSP	DeFuniak Springs, Fla.	1280
WDSR	Lake City, Fla.	1340
WDUN	Gainesville, Ga.	1240
WDUX	Waupaca, Wis.	800
WDUZ	Green Bay, Wis.	1400
WDVA	Danville, Va.	1250
WDVH	Gainesville, Fla.	980
WDVL	Vineland, N.J.	1270
WDWD	Dawson, Ga.	990
WDWS	Champaign, Ill.	1400
WDXB	Chattanooga, Tenn.	1490
WDXE	Lawrenceburg, Tenn.	1370
WDXI	Jackson, Tenn.	1310
WDXL	Lexington, Tenn.	1490
WDXN	Clarksville, Tenn.	540
WDXR	Paducah, Ky.	1560
WDXY	Sumter, S.C.	1240
WDYX	Buford, Ga.	1460
WDZ	Decatur, Ill.	1050
WEAB	Greer, S.C.	800
WEAC	Gaffney, S. C.	1500
WEAD	College Park, Ga.	1570
WEAG	Alcoa, Tenn.	1470
WEAL	Greensboro, N. C.	1510
WEAM	Arlington, Va.	1390
WEAN	Providence, R.I.	790
WEAQ	Eau Claire, Wis.	790
WEAS	Savannah, Ga.	900
WEAT	W. Palm Beach, Fla.	850
WEAV	Plattsburg, N.Y.	960
WEAW	Evanston, Ill.	1330
WEBB	Baltimore, Md.	1360
WEBC	Duluth, Minn.	560
WEBJ	Brewton, Ala.	1240
WEBO	Owego, N.Y.	1330
WEBQ	Harrisburg, Ill.	1240
WEBR	Buffalo, N.Y.	970
WEBS	Calhoun, Ga.	1110
WEBY	Milton, Fla.	1330
WECL	Eau Claire, Wis.	1050
WECP	Carthage, Miss.	1480
WEDC	Chicago, Ill.	1240
WEDO	McKeesport, Pa.	810
WEEB	Southern Pines, N.C.	990
WEED	Rocky Mount, N.C.	1390
WEEE	Rensselaer, N.Y.	1300
WEEF	Highland Park, Ill.	1430
WEEI	Boston, Mass.	590
WEEL	Fairfax, Va.	1310
WEEN	Lafayette, Tenn.	1460
WEEP	Pittsburgh, Pa.	1080
WEER	Warrenton, Va.	1570
WEET	Richmond, Va.	1320
WEEU	Reading, Pa.	850
WEEW	Washington, N.C.	1320
WEEX	Easton, Pa.	1230
WEEZ	Chester, Pa.	1590
WEGO	Concord, N.C.	1410
WEGP	Presque Isle, Maine	1390
WEHH	Elmira Heights-Horseheads, N.Y.	1590
WEIC	Charleston, Ill.	1270
WEIF	Moundsville, W. Va.	1370
WEIM	Fitchburg, Mass.	1280
WEIR	Weirton, W.Va.	1430
WEIS	Center, Ala.	990
WEJL	Scranton, Pa.	630
WEKR	Fayetteville, Tenn.	1240
WEKY	Richmond, Ky.	1340
WEKZ	Monroe, Wis.	1260
WELB	Elba, Ala.	1350
WELC	Welch, W.Va.	1150
WELD	Fisher, W.Va.	690
WELE	S. Daytona, Fla.	1590
WELI	New Haven, Conn.	960
WELK	Charlottesville, Va.	1010
WELM	Elmira, N.Y.	1410
WELO	Tupelo, Miss.	580
WELP	Easley, S.C.	1360
WELR	Roanoke, Ala.	1360
WELS	Kinston, N.C.	1010
WELV	Ellenville, N.Y.	1370
WELW	Willoughby, O.	1330
WELY	Ely, Minn.	1450
WELZ	Belzoni, Miss.	1460
WEMB	Erwin, Tenn.	1420
WEMD	Easton, Md.	1460
WEMJ	Laconia, N.H.	1490
WEMP	Milwaukee, Wis.	1250
WENC	Whiteville, N.C.	1220
WEND	Edensburg, Pa.	1580
WENE	Endicott, N.Y.	1490
WENG	Englewood, Fla.	1530
WENK	Union City, Tenn.	1240
WENN	Birmingham, Ala.	1320
WENO	Madison, Tenn.	1480
WENR	Englewood, Tenn.	1090
WENT	Gloversville, N.Y.	1340
WENY	Elmira, N.Y.	1230
WENZ	Highland Springs, Va.	1450
WEOK	Poughkeepsle, N.Y.	1390
WEOL	Elyria, Ohio	930
WEPG	S. Pittsburgh, Tenn.	910
WEPM	Martinsburg, W.Va.	1340
WERA	Plainfield, N.J.	1590
WERD	Atlanta, Ga.	860
WERE	Cleveland, Ohio	1300
WERH	Hamilton, Ala.	970
WERI	Westerly, R.I.	1230
WERK	Muncie, Ind.	990
WERL	Eagle River, Wis.	950
WERT	Van Wert, Ohio	1220
WERX	Wyoming, Mich.	1530
WESA	Charleroi, Pa.	940
WESB	Bradford, Pa.	1490
WESC	Greenville, S.C.	660
WESO	Southbridge, Mass.	970
WESR	Tasley, Va.	1330
WEST	Easton, Pa.	1400
WESX	Salem, Mass.	1230
WESY	Leland, Miss.	1580
WETB	Johnson City, Tenn.	700
WETC	Wendell-Zebulon, N.C.	540
WETH	St. Augustine, Fla.	1420
WETO	Gadsden, Ala.	930
WETT	Ocean City, Md.	1590
WETU	Wetumpka, Ala.	1250
WETZ	New Martinsville, West Virginia	1330
WEUC	Ponce, P.R.	1420
WEUP	Huntsville, Ala.	1600
WEVA	Emporia, Va.	860
WEVD	New York, N.Y.	1330
WEVE	Eveleth, Minn.	1340
WEW	St. Louis, Mo.	770
WEWO	Laurinburg, N.C.	1080
WEXL	Royal Oak, Mich.	1340
WEXT	W. Hartford, Conn.	1550
WEYE	Sanford, N.C.	1290
WEYY	Talladega, Ala.	1580
WEZE	Boston, Mass.	1260
WEZJ	Williamsburg, Ky.	1440
WEZQ	Winfield, Ala.	1300
WEZY	Cocoa, Fla.	1350
WFAA	Dallas, Tex.	570 & 820
WFAB	Miami, Fla.	990
WFAD	Middlebury, Vt.	1490
WFAG	Farmville, N.C.	1250
WFAH	Alliance, Ohio	1310
WFAI	Fayetteville, N.C.	1230
WFAR	Farrell, Pa.	1470
WFAS	White Plains, N.Y.	1230
WFAU	Augusta, Me.	1340
WFAW	Ft. Atkinson, Wis.	940
WFAX	Falls Church, Va.	1220
WFBA	San Sebastion, P.R.	1460
WFBC	Greenville, S.C.	1330
WFBF	Fernandino Beach, Fla.	1570
WFBG	Altoona, Pa.	1290
WFBL	Syracuse, N.Y.	1390
WFBM	Indianapolis, Ind.	1260
WFBR	Baltimore, Md.	1300
WFBS	Spring Lake, N. C.	1450
WFCG	Franklinton, La.	1110
WFCM	Winston-Salem, N. C.	1550
WFDF	Flint, Mich.	910
WFDR	Manchester, Ga.	1370
WFEA	Manchester, N.H.	1370
WFEB	Sylacauga, Ala.	1340
WFEC	Harrisburg, Pa.	1400
WFFF	Columbia, Miss.	1360
WFFG	Marathon, Fla.	1300
WFGM	Fitchburg, Mass.	960
WFGN	Gaffney, S.C.	1570
WFGW	Black Mountains, N.C.	1010
WFHG	Bristol, Va.	980
WFHK	Pell City, Ala.	1430
WFHR	Wis. Rapids, Wis.	1320
WFIA	Louisville, Ky.	900
WFIF	Milford, Conn.	1500
WFIG	Sumter, S.C.	1290
WFIL	Philadelphia, Pa.	560
WFIN	Findlay, Ohio	1330
WFIS	Fountain Inn, S.C.	1600
WFIV	Kissimmee, Fla.	1080
WFIW	Fairfield, Ill.	1390
WFIX	Huntsville, Ala.	1450
WFKN	Franklin, Ky.	1220
WFKY	Frankfort, Ky.	1490
WFLA	Tampa, Fla.	970
WFLB	Fayetteville, N.C.	1490
WFLI	Lookout Mtn., Tenn.	1070
WFLN	Philadelphia, Pa.	900
WFLO	Farmville, Va.	870
WFLR	Dundee, N.Y.	1570
WFLS	Fredericksburg, Va.	1350
WFLW	Monticello, Ky.	1360
WFMC	Goldsboro, N.C.	730
WFMD	Frederick, Md.	930
WFMH	Cullman, Ala.	1460
WFMI	Montgomery, Ala.	1500
WFMJ	Youngstown, Ohio	1390
WFMO	Fairmont, N.C.	860
WFMW	Madisonville, Ky.	730
WFNC	Fayetteville, N.C.	1390
WFNL	No. Augusta, S.C.	1600
WFOB	Fostoria, Ohio	1480
WFOM	Marietta, Ga.	1230
WFOR	Hattiesburg, Miss.	1400
WFOX	Milwaukee, Wis.	860
WFOY	St. Augustine, Fla.	1240
WFPA	Fort Payne, Ala.	1400
WFPG	Atlantic City, N.J.	1450
WFPM	Fort Valley, Ga.	1150
WFPR	Hammond, La.	1400
WFRA	Franklin, Pa.	1450
WFRB	Frostburg, Md.	560
WFRC	Reidsville, N.C.	1600
WFRL	Freenort, Ill.	1570
WFRM	Coudersport, Pa.	600
WFRO	Fremont, Ohio	900
WFRX	West Frankfort, Ill.	1300
WFSC	Franklin, N.C.	1050
WFSG	Boca Raton, Fla.	740
WFSO	Pinellas, Fla.	570
WFSR	Bath, N.Y.	1380
WFST	Caribou, Maine	600
WFTC	Kinston, N.C.	960
WFTG	London, Ky.	1400
WFTL	Ft. Lauderdale, Fla.	1400
WFTM	Maysville, Ky.	1240
WFTN	Franklin, N.H.	1240
WFTR	Front Royal, Va.	1450
WFTW	Ft. Walton Beach, Fla.	1260
WFUL	Fulton, Ky.	1270
WFUR	Grand Rapids, Mich.	1570
WFVA	Fredericksburg, Va.	1230
WFVG	Fuquay Sprgs., N.C.	1460
WFWL	Camden, Tenn.	1220
WFWR	Ft. Wayne, Ind.	1090
WFYC	Alma, Mich.	1280
WGAA	Cedartown, Ga.	1340
WGAC	Augusta, Ga.	580
WGAD	Gadsden, Ala.	1350
WGAF	Valdosta, Ga.	910
WGAI	Elizabeth City, N.C.	560
WGAL	Lancaster, Pa.	1490
WGAN	Portland, Maine	560
WGAP	Maryville, Tenn.	1400
WGAR	Cleveland, Ohio	1220
WGAS	S. Gastonia, N.C.	1420
WGAT	Gate City, Va.	1050
WGAU	Athens, Ga.	1340
WGAW	Gardner, Mass.	1340
WGBB	Freeport, N.Y.	1240
WGBC	Chipley, Fla.	1240
WGBF	Evansville, Ind.	1280
WGBG	Greensboro, N.C.	1400
WGBI	Scranton, Pa.	910
WGBR	Goldsboro, N. C.	1150
WGBS	Miami, Fla.	710
WGCB	Red Lion, Pa.	1440
WGCD	Chester, S.C.	1490
WGCH	Greenwich, Conn.	1490
WGCM	Gulfport, Miss.	1240
WGEA	Geneva, Ala.	1150
WGEE	Indianapolis, Ind.	1590
WGEM	Quincy, Ill.	1440
WGET	Gettysburg, Pa.	1320
WGEZ	Beloit, Wis.	1490
WGFA	Watseka, Ill.	1360
WGFS	Covington, Ga.	1430
WGGA	Gainesville, Ga.	550
WGGG	Gainesville, Fla.	1230
WGGH	Marion, Ill.	1150
WGGO	Salamanca, N.Y.	1590
WGH	Newport News, Va.	1310
WGHC	Clayton, Ga.	1570
WGHM	Skowegan, Maine	1150
WGHN	Grd. Haven, Mich.	1370
WGHQ	Kingston, N.Y.	920
WGIG	Brunswick, Ga.	1440
WGIL	Galesburg, Ill.	1400
WGIR	Manchester, N.H.	610
WGIV	Charlotte, N.C.	1600
WGKA	Atlanta, Ga.	1190
WGKR	Perry, Fla.	1310
WGKV	Charleston, W. Va.	1490
WGL	Fort Wayne, Ind.	1250
WGLB	Port Wash., Wis.	1560
WGLC	Mendota, Ill.	1090
WGLI	Babylon, N.Y.	1290
WGMA	Hollywood, Fla.	1320
WGML	Hinesville, Ga.	990
WGMM	Millington, Tenn.	1380
WGMS	Washington, D.C.	570
WGN	Chicago, Ill.	720
WGNC	Gastonia, N.C.	1450
WGNE	Panama City Beach, Fla.	1480
WGNI	Wilmington, N.C.	1450
WGNP	Indian Rocks Beach, Fla.	1520
WGNS	Murfreesboro, Tenn.	1450
WGNU	Granite City, Ill.	920
WGNY	Newburgh, N.Y.	1220
WGOE	Richmond, Va.	1590
WGOG	Walhalla, S. C.	1000
WGOH	Grayson, Ky.	1370
WGOK	Mobile, Ala.	900
WGOL	Goldsboro, N.C.	1300
WGON	Munising, Mich.	1400
WGOO	Georgetown, S. C.	1470
WGOV	Valdosta, Ga.	950
WGPA	Bethlehem, Pa.	1100
WGPC	Albany, Ga.	1450
WGR	Buffalo, N.Y.	550
WGRA	Cairo, Ga.	790
WGRD	Grand Rapids, Mich.	1410
WGRI	Griffin, Ga.	1410
WGRM	Greenwood, Miss.	1240
WGRO	Lake City, Fla.	960
WGRP	Greenville, Pa.	940
WGRV	Greeneville, Tenn.	1340
WGSA	Ephrata, Pa.	1310
WGSB	Geneva, Ill.	1480
WGSM	Huntington, N.Y.	740
WGSR	Millen, Ga.	1570
WGST	Atlanta, Ga.	920
WGSV	Guntersville, Ala.	1270
WGSW	Greenwood, S.C.	1350
WGTA	Summerville, Ga.	950
WGTC	Greenville, N.C.	1590
WGTL	Kannapolis, N.C.	870
WGTM	Wilson, N.C.	590
WGTN	Georgetown, S.C.	1400
WGTO	Cypress Gardens, Fla.	540
WGUL	New Port Richey, Fla.	1500
WGUN	Atlanta-Decatur, Ga.	1010
WGUS	North Augusta, S.C.	1380
WGUY	Bangor, Maine	1250
WGVA	Geneva, N.Y.	1240
WGVM	Greenville, Miss.	1260
WGWC	Selma, Ala.	1340
WGWR	Asheboro, N.C.	1260
WGY	Schenectady, N.Y.	810
WGYV	Greenville, Ala.	1380
WGYW	Fountain City, Tenn.	1430
WHA	Madison, Wis.	750
WHAB	Baxley, Ga.	1260
WHAG	Halfway, Md.	1410
WHAI	Greenfield, Mass.	1240
WHAK	Rogers City, Mich.	960
WHAL	Shelbyville, Tenn.	1400
WHAM	Rochester, N.Y.	1180
WHAN	Haines City, Fla.	930
WHAP	Hopewell, Va.	1340

Call	Location	kHz
WHAR	Clarksburg, W.Va.	1340
WHAS	Louisville, Ky.	840
WHAT	Philadelphia, Pa.	1340
WHAV	Haverhill, Mass.	1490
WHAW	Weston, W.Va.	980
WHAZ	Troy, N.Y.	1330
WHB	Kansas City, Mo.	710
WHBB	Selma, Ala.	1490
WHBC	Canton, Ohio	1480
WHBF	Rock Island, Ill.	1270
WHBG	Harrisonburg, Va.	1360
WHBL	Sheboygan, Wis.	1330
WHBN	Harrodsburg, Ky.	1420
WHBO	Tampa, Fla.	1050
WHBQ	Memphis, Tenn.	560
WHBT	Harriman, Tenn.	1600
WHBU	Anderson, Ind.	1240
WHBY	Appleton, Wis.	1230
WHCC	Waynesville, N.C.	1400
WHCO	Sparta, Ill.	1230
WHCQ	Spartanburg, S.C.	1400
WHCU	Ithaca, N.Y.	870
WHDF	Houghton, Mich.	1400
WHDH	Boston, Mass.	850
WHDL	Olean, N.Y.	1450
WHDM	McKenzie, Tenn.	1440
WHEB	Portsmouth, N.H.	750
WHEC	Rochester, N.Y.	1460
WHEE	Martinsville, Va.	1370
WHEL	New Albany, Ind.	1570
WHEN	Syracuse, N.Y.	620
WHEO	Stuart, Va.	1270
WHEP	Foley, Ala.	1310
WHER	Memphis, Tenn.	1430
WHEW	Riveria Beach, Fla.	1600
WHFB	Benton Harbor-St. Joseph, Mich.	1060
WHGR	Houghton L., Mich.	1290
WHHH	Warren, Ohio	1440
WHHL	Holly Hill, S.C.	1440
WHHT	Lucedale, Miss.	1440
WHHV	Hillsville, Va.	1400
WHHY	Montgomery, Ala.	1440
WHIE	Griffin, Ga.	1320
WHIH	Portsmouth, Va.	1400
WHIL	Medford, Mass.	1430
WHIM	Providence, R.I.	1110
WHIN	Gallatin, Tenn.	1010
WHIO	Dayton, Ohio	1290
WHIP	Mooresville, N.C.	1350
WHIR	Danville, Ky.	1230
WHIS	Bluefield, W.Va.	1440
WHIT	New Bern, N.C.	1450
WHIY	Orlando, Fla.	1270
WHIZ	Zanesville, Ohio	1240
WHJB	Greensburg, Pa.	620
WHJC	Matawan, W.Va.	1360
WHK	Cleveland, Ohio	1420
WHKP	Hendersonville, N.C.	1450
WHKY	Hickory, N.C.	1290
WHLB	Virginia, Minn.	1400
WHLD	Niagara Falls, N.Y.	1270
WHLF	South Boston, Va.	1400
WHLI	Hempstead, N.Y.	1100
WHLL	Wheeling, W.Va.	1600
WHLM	Bloomsburg, Pa.	550
WHLN	Harlan, Ky.	1410
WHLO	Akron, Ohio	640
WHLP	Centerville, Tenn.	1570
WHLS	Port Huron, Mich.	1450
WHLT	Huntington, Ind.	1300
WHMA	Anniston, Ala.	1390
WHMC	Gaithersburg, Md.	1150
WHMI	Howell, Mich.	1350
WHMP	Northampton, Mass.	1400
WHN	New York, N.Y.	1050
WHNC	Henderson, N.C.	890
WHNY	McComb, Miss.	1250
WHO	Des Moines, Iowa	1040
WHOA	San Juan, P.R.	870
WHOC	Philadelphia, Miss.	1490
WHOD	Jackson, Ala.	1290
WHOK	Lancaster, Ohio	1320
WHOL	Allentown, Pa.	600
WHOM	New York, N.Y.	1480
WHON	Centerville, Ind.	930
WHOO	Orlando, Fla.	990
WHOP	Hopkinsville, Ky.	1230
WHOS	Decatur, Ala.	800
WHOT	Campbell, Ohio	1330
WHOU	Houlton, Maine	1340
WHOW	Clinton, Ill.	1520
WHP	Harrisburg, Pa.	580
WHPB	Belton, S.C.	1390
WHPE	High Point, N.C.	1070
WHPL	Winchester, Va.	610
WHRN	Herendon, Va.	1440
WHRT	Hartselle, Ala.	960
WHRV	Ann Arbor, Mich.	1600
WHRY	Elizabethtown, Pa.	1600
WHSC	Hartsville, S.C.	1450
WHSL	Wilmington, N.C.	1490
WHSM	Hayward, Wis.	910
WHSY	Hattiesburg, Miss.	1230
WHTC	Holland, Mich.	1450
WHTG	Asbury Park-Eatontown, N.J.	1410
WHUB	Cookeville, Tenn.	1400
WHUC	Hudson, N.Y.	1230
WHUM	Reading, Pa.	1240
WHUN	Huntington, Pa.	1150
WHUT	Anderson, Ind.	1470
WHVL	Hendersonville, N.C.	1600
WHVR	Hanover, Pa.	1280
WHVW	Hyde Park, N.Y.	950
WHWB	Rutland, Vt.	1000
WHWH	Princeton, N.J.	1350
WHYD	Columbus, Ga.	1270
WHYL	Carlisle, Pa.	960
WHYN	Springfield, Mass.	560
WHYP	North East, Pa.	1530
WHYZ	Greenville, S. C.	1070
WIAC	San Juan, P.R.	740
WIAM	Williamston, N.C.	900
WIBA	Madison, Wis.	1310
WIBB	Macon, Ga.	1280
WIBC	Indianapolis, Ind.	1070
WIBG	Philadelphia, Pa.	990
WIBM	Jackson, Mich.	1450
WIBR	Baton Rouge, La.	1300
WIBU	Poynette, Wis.	1240
WIBV	Belleville, Ill.	1260
WIBW	Topeka, Kans.	580
WIBX	Utica, N.Y.	950
WICC	Bridgeport, Conn.	600
WICE	Providence, R.I.	1290
WICH	Norwich, Conn.	1310
WICK	Scranton, Pa.	1400
WICO	Salisbury, Md.	1320
WICU	Erie, Pa.	1330
WICY	Malone, N.Y.	1490
WIDE	Biddeford, Maine	1400
WIDD	Elizabethton. Tenn.	1520
WIDG	St. Ignace. Mich.	940
WIDU	Fayetteville, N.C.	1600
WIEL	Elizabethtown. Ky.	1400
WIFE	Indianapolis, Ind.	1310
WIFM	Elkin, N.C.	1540
WIGL	Superior, Wis.	970
WIGM	Medford, Wis.	1490
WIGO	Atlanta, Ga.	1340
WIGS	Gouverneur, N.Y.	1230
WIII	Homestead, Fla.	1480
WIIN	Atlanta, Ga.	970
WIKC	Bogalusa, La.	1490
WIKE	Newport, Vt.	1490
WIKI	Chester, Va.	1410
WIKY	Evansville. Ind.	820
WIL	St. Louis, Mo.	1430
WILA	Danville, Va.	1580
WILD	Boston, Mass.	1090
WILE	Cambridge, Ohio	1270
WILI	Willimantic, Conn.	1400
WILK	Wilkes-Barre, Pa.	980
WILL	Urbana, Ill.	580
WILM	Wilmington, Del.	1450
WILO	Frankfort. Ind.	1570
WILS	Lansing, Mich.	1320
WILZ	St. Petersburg Beach, Fla.	1590
WIMA	Lima, Ohio	1150
WIMO	Winder, Ga.	1300
WIMS	Michigan City, Ind.	1420
WINA	Charlottesville, Va.	1070
WINC	Winchester, Va.	1400
WIND	Chicago, Ill.	560
WINE	Brookfield, Conn.	940
WINF	Manchester, Conn.	1230
WING	Dayton, Ohio	1410
WINI	Murphysboro. Ill.	1420
WINK	Fort Myers, Fla.	1240
WINN	Louisville, Ky.	1240
WINQ	Tampa, Fla.	1010
WINR	Binghamton, N.Y.	680
WINS	New York, N.Y.	1010
WINT	Winter Haven, Fla.	1360
WINU	Highland Park, Ill.	1510
WINW	Canton, O.	1520
WINX	Rockville, Md.	1600
WINY	Putnam, Conn.	1350
WINZ	Miami, Fla.	940
WINU	Highland, Ill.	1510
WINW	Canton, Ohio	1520
WIOD	Miami, Fla.	610
WIOI	New Boston, Ohio	1010
WIOK	Normal, Ill.	1440
WION	Ionia, Mich.	1430
WIOO	Carlisle, Pa.	1000
WIOS	Tawas City, Mich.	1480
WIOU	Kokomo, Ind.	1350
WIP	Philadelphia, Pa.	610
WIPC	Lake Wales, Fla.	1280
WIPR	San Juan, P.R.	940
WIPS	Ticonderoga, N.Y.	1250
WIRA	Ft. Pierce, Fla.	1400
WIRB	Enterprise, Ala.	600
WIRC	Hickory, N.C.	630
WIRD	Lake Placid, N.Y.	920
WIRE	Indianapolis, Ind.	1430
WIRJ	Humboldt, Tenn.	740
WIRK	W. Palm Beach, Fla.	1290
WIRL	Peoria, Ill.	1290
WIRO	Ironton, Ohio	1230
WIRV	Irvine, Ky.	1550
WIRY	Plattsburg, N.Y.	1340
WIS	Columbia, S.C.	560
WISA	Isabella, P.R.	1390
WISE	Asheville, N.C.	1310
WISK	Americus, Ga.	1390
WISL	Shamokin, Pa.	1480
WISM	Madison, Wis.	1480
WISN	Milwaukee, Wis.	1130
WISO	Ponce, P.R.	1260
WISP	Kinston, N.C.	1230
WISR	Butler, Pa.	680
WIST	Charlotte, N.C.	1240
WISV	Virouqua, Wis.	1360
WISZ	Glen Burnie, Md.	1590
WITA	San Juan, P.R.	1140
WITH	Baltimore, Md.	1230
WITL	Lansing, Mich.	1010
WITN	Washington, N.C.	930
WITY	Danville, Ill.	980
WITZ	Jasper, Ind.	990
WIVE	Ashland, Va.	1430
WIVI	Christiansted, V.I.	970
WIVK	Knoxville, Tenn.	850
WIVV	Vieques, P.R.	1370
WIVY	Jacksonville, Fla.	1050
WIXI	Lancaster, Ky.	1280
WIXK	New Richmond, Wis.	1590
WIXN	Dixon, Ill.	1460
WIXX	Oakland Park, Fla.	1520
WIYN	Rome, Ga.	1360
WIZE	Springfield, Ohio	1340
WIZR	Johnstown, N. Y.	930
WIZS	Henderson, N.C.	1450
WIZZ	Streator, Ill.	1250
WJAB	Westbrook, Me.	1440
WJAC	Johnstown, Pa.	850
WJAG	Norfolk, Nebr.	780
WJAK	Jackson, Tenn.	1460
WJAM	Marion, Ala.	1310
WJAR	Providence, R.I.	920
WJAS	Pittsburgh, Pa.	1320
WJAT	Swainsboro, Ga.	800
WJAX	Jacksonville, Fla.	930
WJAY	Mullins, S.C.	1280
WJAZ	Albany, Ga.	960
WJBB	Haleyville, Ala.	1230
WJBC	Bloomington, Ill.	1230
WJBD	Salem, Ill.	1350
WJBK	Detroit, Mich.	1500
WJBL	Holland, Mich.	1260
WJBM	Jerseyville, Ill.	1480
WJBO	Baton Rouge, La.	1150
WJBS	DeLand, Fla.	1490
WJCD	Seymour, Ind.	1390
WJCM	Sebring, Fla.	960
WJCO	Jackson, Mich	1510
WJCW	Johnson City, Tenn.	910
WJDA	Quincy, Mass.	1300
WJDB	Thomasville, Ala.	630
WJDX	Jackson, Miss.	620
WJDY	Salisbury, Md.	1470
WJEF	Grand Rapids, Mich.	1230
WJEH	Gallipolis, Ohio	990
WJEJ	Hagerstown, Md.	1240
WJEM	Valdosta, Ga.	1150
WJER	Dover, Ohio	1450
WJES	Johnston, S.C.	1570
WJET	Erie, Pa.	1400
WJFC	Jefferson City, Tenn.	1480
WJGA	Jackson, Ga.	1540
WJHO	Onelika, Ala.	1400
WJIC	Salem, N. J.	1510
WJIG	Tullahoma, Tenn.	740
WJIL	Jacksonville, Ill.	1550
WJIM	Lansing, Mich.	1240
WJJC	Commerce, Ga.	1270
WJJD	Chicago, Ill.	1160
WJJJ	Christiansburg, Va.	1260
WJJL	Niagara Falls, N.Y.	1440
WJJM	Lewisburg, Tenn.	1490
WJKM	Hartsville, Tenn.	1090
WJLB	Detroit, Mich.	1400
WJLD	Homewood, Ala.	1400
WJLE	Smithville, Tenn.	1480
WJLK	Asbury Park, N. J.	1440
WJLS	Beckley, W.Va.	560
WJMA	Orange, Va.	1340
WJMB	Brookhaven, Miss.	1340
WJMC	Rice Lake, Wis.	1240
WJML	Petoskey, Mich.	1110
WJMO	Cleveland Hgts., Ohio	1490
WJMS	Ironwood, Mich.	630
WJMW	Athens, Ala.	730
WJMX	Florence, S.C.	970
WJNC	Jacksonville, N.C.	1240
WJNO	W. Palm Beach, Fla.	1230
WJOB	Hammond, Ind.	1230
WJOE	Port Joe, Fla.	1080
WJOI	Florence, Ala.	1340
WJOL	Joliet, Ill.	1340
WJON	St. Cloud, Minn.	1240
WJOH	South Haven, Mich.	940
WJOT	Lake City, S.C.	1260
WJOY	Burlington, Vt.	1230
WJPA	Washington, Pa.	1450
WJPB	Kissimmee, Fla.	1220
WJPD	Ishpeming, Mich.	1240
WJPF	Herrin, Ill.	1340
WJPG	Green Bay, Wis.	1440
WJPR	Greenville, Miss.	1330
WJPS	Evansville, Ind.	1330
WJPW	Rockford, Mich.	810
WJQS	Jackson, Miss.	1400
WJR	Detroit, Mich.	760
WJRC	Joliet, Ill.	1510
WJRD	Tuscaloosa, Ala.	1150
WJRI	Lenoir, N.C.	1340
WJRM	Troy, N.C.	1390
WJRZ	Newark, N.J.	970
WJSB	Crestview, Fla.	1050
WJSO	Jonesboro, Tenn.	1590
WJTN	Jamestown, N.Y.	1240
WJTO	Bath, Me.	730
WJUN	Mexico, Pa.	1220
WJVA	South Bend, Ind.	1580
WJW	Cleveland, Ohio	850
WJWL	Georgetown, Del.	900
WJWS	South Hill, Va.	1370
WJXN	Jackson, Miss.	1450
WJZM	Clarksville, Tenn.	1400
WKAC	Athens, Ala.	1080
WKAI	Macomb, Ill.	1510
WKAJ	Saratoga Springs, N.Y.	900
WKAL	Rome, N.Y.	1450
WKAM	Goshen, Ind.	1460
WKAN	Kankakee, Ill.	1320
WKAP	Allentown, Pa.	1320
WKAQ	San Juan, P.R.	580
WKAR	East Lansing, Mich.	870
WKAT	Miami Beach, Fla.	1360
WKAU	Kaukanna, Wis.	1050
WKAY	Glasgow, Ky.	1490
WKAZ	Charleston, W.Va.	950
WKBA	Vinton, Va.	1550
WKBC	N. Wilkesboro, N.C.	810
WKBH	La Crosse, Wis.	1410
WKBJ	Milan, Tenn.	1600
WKBK	Keene, N.H.	1220
WKBL	Covington, Tenn.	1250
WKBN	Youngstown, Ohio	570
WKBO	Harrisburg, Pa.	1230
WKBR	Manchester, N.H.	1250
WKBV	Richmond, Ind.	1490
WKBW	Buffalo, N. Y.	1520
WKBX	Winston-Salem, N.C.	1500
WKBY	Chatham, Va.	1080
WKBZ	Muskegon, Mich.	850
WKCT	Bowling Green, Ky.	930
WKCU	Corinth. Miss.	1350
WKCW	Warrenton, Va.	1420
WKDA	Nashville, Tenn.	1240
WKDE	Altavista, Va.	1000
WKDK	Newberry, S.C.	1240
WKDL	Clarksdale, Miss.	1600
WKDN	Camden, N.J.	800
WKDX	Hamlet, N. C.	1250
WKDZ	Cadiz, Ky.	1110
WKEE	Huntington. W. Va.	800
WKEI	Kewanee, Ill.	1450
WKEN	Dover, Del.	1600
WKER	Pompton Lakes, N.J.	1500
WKEU	Griffin, Ga.	1450
WKEY	Covington, Va.	1340
WKFD	Wickford, R.I.	1370
WKFE	Yauco, P.R.	1550
WKFR	Battle Creek, Mich.	1400
WKGN	Knoxville, Tenn.	1340
WKHM	Jackson, Mich.	970
WKIC	Hazard, Ky.	1390
WKID	Urbana, Ill.	1580
WKIG	Glenville, Ga.	1580
WKIK	Leonardtown, Md.	1370
WKIN	Kingsport, Tenn.	1320
WKIP	Poughkeepsie, N.Y.	1450
WKIS	Orlando, Fla.	740
WKIX	Raleigh, N.C.	850
WKIZ	Key West, Fla.	1500
WKJB	Mayaguez, P.R.	710
WKJG	Fort Wayne, Ind.	1380
WKJK	Granite Falls, N. C.	1580
WKJR	Muskegon. Mich.	1520
WKKD	Aurora, Ill.	1580
WKKO	Cocoa. Fla.	860
WKKR	Pickens, S. C.	1540
WKKS	Vanceburg, Ky.	1570
WKLA	Ludington. Mich.	1450
WKLC	St. Albans, W.Va.	1300
WKLF	Clanton, Ala.	980
WKLK	Cloquet, Minn.	1230
WKLM	Wilmington. N.C.	980
WKLO	Louisville, Ky.	1080
WKLP	Keyser. W. Va.	1390
WKLV	Blackstone, Va.	1440
WKLY	Hartwell, Ga.	980
WKLZ	Kalamazoo. Mich.	1470
WKMC	Roaring Sprgs., Pa.	1370
WKMF	Flint, Mich.	1470
WKMI	Kalamazoo, Mich.	1360
WKMK	Blountstown, Fla.	1370
WKMT	Kings Mtn., N.C.	1220
WKNE	Keene, N.H.	1290
WKNR	Dearborn. Mich.	1310
WKNT	Kent, Ohio	1520
WKNX	Saginaw. Mich.	1210
WKNY	Kingston. N.Y.	1490
WKOA	Hopkinsville. Ky.	1480
WKOK	Sunbury, Pa.	1070
WKOP	Binghamton. N.Y.	1360
WKOV	Wellston, Ohio	1330
WKOW	Madison. Wis.	1070
WKOX	Framingham. Mass.	1190
WKOY	Bluefield. W.Va.	1240
WKOZ	Kosciusko, Miss.	1350
WKPA	New Kensington, Pa.	1150
WKPM	Princeton. Minn.	1300
WKPO	Prentiss. Miss.	1510
WKPR	Kalamazoo. Mich.	1420
WKPT	Kingsport. Tenn.	1400
WKQV	Sullivan. Ind.	1550
WKRA	Holly Springs. Miss.	1110
WKRC	Cincinnati. Ohio	550
WKRG	Mobile, Ala.	710
WKRK	Murphy. N.C.	1320
WKRM	Columbia. Tenn.	1340
WKRO	Cairo. Ill.	1490
WKRS	Waukegan. Ill.	1220
WKRT	Cortland, N.Y.	920

WHITE'S RADIO LOG

Call	Location	kHz
WKRW	Cartersville, Ga.	
WKRZ	Oil City, Pa.	1340
WKSB	Milford, Del.	930
WKSC	Kershaw, S.C.	1300
WKSK	W. Jefferson, N.C.	1600
WKSN	Jamestown, N.Y.	1340
WKSR	Pulaski, Tenn.	1420
WKST	New Castle, Pa.	1280
WKTC	Charlotte, N.C.	1310
WKTE	King, N.C.	1090
WKTG	Thomasville, Ga.	730
WKTJ	Farmington, Maine	1380
WKTQ	South Paris, Maine	1450
WKTS	Sheboygan, Wis.	950
WKTX	Atlantic Beach, Fla.	1600
WKTY	LaCrosse, Wis.	580
WKUL	Cullman, Ala.	1340
WKVA	Lewistown, Pa.	920
WKVM	San Juan, P.R.	810
WKVT	Brattleboro, Vt.	1490
WKWF	Key West, Fla.	1600
WKWK	Wheeling, W.Va.	1400
WKWS	Rocky Mount, Va.	1290
WKXL	Concord, N.H.	1450
WKXR	Exeter, N.H.	1540
WKXV	Knoxville, Tenn.	900
WKXY	Sarasota, Fla.	930
WKYC	Cleveland, Ohio	1100
WKYE	Bristol, Tenn.	1550
WKYF	Greenville, Ky.	1600
WKYK	Burnsville, N. C.	1540
WKYN	San Juan, P. R.	630
WKYO	Caro, Mich.	1360
WKYR	Cumberland, Md.	1270
WKYX	Paducah, Ky.	570
WKZA	Kane, Pa.	960
WKZI	Casey, Ill.	800
WKZO	Kalamazoo, Mich.	590
WLAC	Nashville, Tenn.	1510
WLAD	Danbury, Conn.	800
WLAF	LaFollette, Tenn.	1450
WLAG	La Grange, Ga.	1240
WLAK	Lakeland, Fla.	1430
WLAM	Lewiston, Maine	1470
WLAN	Lancaster, Pa.	1390
WLAP	Lexington, Ky.	630
WLAQ	Rome, Ga.	1410
WLAR	Athens, Tenn.	1450
WLAS	Jacksonville, N.C.	910
WLAT	Conway, S.C.	1330
WLAU	Laurel, Miss.	1600
WLAV	Grand Rapids, Mich.	1340
WLAW	Lawrenceville, Ga.	1360
WLAY	Muscle Shoals, Ala.	1450
WLBA	Gainesville, Ga.	1580
WLBB	Carrollton, Ga.	1100
WLBC	Muncie, Ind.	1340
WLBE	Leesburg, Fla.	790
WLBG	Laurens, S.C.	860
WLBH	Mattoon, Ill.	1170
WLBI	Denham Springs, La.	1220
WLBJ	Bowling Green, Ky.	1410
WLBK	DeKalb, Ill.	1360
WLBL	Auburndale, Wis.	930
WLBN	Lebanon, Ky.	1590
WLBR	Lebanon, Pa.	1280
WLBZ	Bangor, Maine	620
WLCB	Moulton, Ala.	1530
WLCK	Scottsville, Ky.	1250
WLCM	Lancaster, S.C.	1360
WLCN	Laurensburg, N.C.	1300
WLCO	Eustis, Fla.	1240
WLCS	Baton Rouge, La.	910
WLCX	LaCrosse, Wis.	1490
WLCY	St. Petersburg, Fla.	1380
WLDB	Atlantic City, N.J.	1490
WLDS	Jacksonville, Ill.	1180
WLDY	Ladysmith, Wis.	1340
WLEA	Hornell, N.Y.	1480
WLEC	Sandusky, Ohio	1450
WLEE	Richmond, Va.	1480
WLEF	Greenwood, Miss.	1540
WLEM	Emporium, Pa.	1240
WLES	Lawrenceville, Va.	580
WLET	Toccoa, Ga.	1420
WLEW	Bad Axe, Mich.	1340
WLEY	Cayey, P.R.	1080
WLFA	Lafayette, Ga.	1590
WLFH	Little Falls, N.Y.	1230
WLIB	New York, N.Y.	1190
WLIJ	Shelbyville, Tenn.	1580
WLIK	Newport, Tenn.	1270
WLIL	Lenoir City, Tenn.	730
WLIP	Kenosha, Wis.	1050
WLIQ	Mobile, Ala.	1360
WLIS	Old Saybrook, Conn.	1420
WLIV	Livingston, Tenn.	920
WLIZ	Lake Worth, Fla.	1380
WLKE	Waupun, Wis.	1170
WLKM	Three Rivers, Mich.	1510
WLKN	Lincoln, Me.	1450
WLKR	Norwalk, O.	1510
WLKS	W. Liberty, Ky.	1450
WLKW	Providence, R.I.	990
WLLE	Raleigh, N.C.	570
WLLH	Lowell, Mass.	1400
WLLL	Lynchburg, Va.	930
WLLY	Wilson, N.C.	1350
WLMD	Laurel, Md.	900
WLNC	Laurinburg, N.C.	1300
WLMJ	Jackson, Ohio	1280
WLNA	Peekskill, N.Y.	1420
WLNG	Sag Harbor, N.Y.	1600
WLNH	Laconia, N.H.	1350
WLOA	Braddock, Pa.	1550
WLOB	Portland, Maine	1310
WLOC	Munfordville, Ky.	1150
WLOD	Pompano Beach, Fla.	980
WLOE	Leaksville, N.C.	1490
WLOF	Orlando, Fla.	950
WLOG	Logan, W.Va.	1230
WLOH	Princeton, W.Va.	1490
WLOI	LaPorte, Ind.	1540
WLOK	Memphis, Tenn.	1340
WLOL	Minneapolis, Minn.	1330
WLON	Lincolnton, N.C.	1050
WLOP	Jesup, Ga.	1370
WLOR	Thomasville, Ga.	730
WLOS	Asheville, N.C.	1380
WLOU	Louisville, Ky.	1350
WLOV	Washington, Ga.	1370
WLOW	Aiken, S.C.	1300
WLOX	Biloxi, Miss.	1490
WLPH	Irondale, Ala.	1480
WLPM	Suffolk, Va.	1460
WLPO	LaSalle, Ill.	1220
WLPS	Lehighton, Pa.	1150
WLRC	Whitehall, Mich.	1490
WLS	Chicago, Ill.	890
WLSB	Copper Hill, Tenn.	1400
WLSC	Loris, S.C.	1570
WLSD	Big Stone Gap, Va.	1220
WLSE	Wallace, N.C.	1400
WLSH	Lansford, Pa.	1410
WLSI	Pikeville, Ky.	900
WLSM	Louisville, Miss.	1270
WLST	Escanaba, Mich.	600
WLSV	Wellsville, N.Y.	790
WLTC	Gastonia, N.C.	1370
WLTH	Gary, Ind.	1370
WLTN	Littleton, N. H.	1400
WLUV	Loves Park, Ill.	1520
WLUX	Baton Rouge, La.	1550
WLUZ	Bayamon, P. R.	1600
WLVA	Lynchburg, Va.	590
WLW	Cincinnati, Ohio	700
WLWO	(V.O.A.) Marathon, Fla.	1040
WLWO	(V.O.A.) Marathon. Fla.	1180
WLYB	Albany, Ga.	1250
WLYC	Williamsport, Pa.	1050
WLYN	Lynn, Mass.	1360
WLYO	New Orleans, La.	940
WLYV	Ft. Wayne, Ind.	1450
WMAB	Munising, Mich.	1400
WMAC	Netter, Ga.	1360
WMAD	Madison, Wis.	1550
WMAF	Madison, Fla.	1230
WMAG	Forest, Miss.	860
WMAJ	State College, Pa.	1450
WMAK	Nashville, Tenn.	1300
WMAL	Washington, D.C.	630
WMAM	Marinette, Wis.	570
WMAN	Mansfield, Ohio	1400
WMAP	Monroe, N.C.	1060
WMAQ	Chicago, Ill.	670
WMAS	Springfield. Mass.	1450
WMAT	Lansing, Mich.	1010
WMAX	Grand Rapids, Mich.	1480
WMAY	Springfield. Ill.	970
WMAZ	Macon. Ga.	940
WMBA	Ambridge. Pa.	1460
WMBC	Macon, Miss.	1400
WMBD	Peoria, Ill.	1470
WMBH	Joplin, Mo.	1450
WMBI	Chicago, Ill.	1110
WMBL	Morehead City, N.C.	740
WMBM	Miami Beach, Fla.	1490
WMBN	Petoskey, Mich.	1340
WMBO	Auburn, N.Y.	1340
WMBR	Jacksonville, Fla.	1460
WMBS	Uniontown, Pa.	590
WMBT	Shenandoah, Pa.	1530
WMC	Memphis, Tenn.	790
WMCA	New York, N.Y.	570
WMCH	Church Hill, Tenn.	1260
WMCK	McKeesport, Pa.	1360
WMCP	Columbia, Tenn,	1280
WMCR	Oneida, N.Y.	1600
WMCW	Harvard, Ill.	1600
WMDC	Hazlehurst, Miss.	1220
WMDD	Fajardo, P.R.	1480
WMDN	Midland, Mich.	1490
WMEG	Eau Gallie, Fla.	920
WMEK	Chase City, Va.	980
WMEL	Pensacola, Fla.	610
WMEN	Tallahassee, Fla.	1330
WMEV	Marion, Va.	1010
WMEX	Boston, Mass.	1510
WMFC	Monroeville, Ala.	1360
WMFD	Wilmington, N.C.	630
WMFG	Hibbing, Minn.	1240
WMFJ	Daytona Beach, Fla.	1450
WMFR	High Point, N.C.	1230
WMGA	Moultrie, Ga.	1400
WMGR	Bainbridge, Ga.	930
WMGS	Bowling Green, Ohio	730
WMGW	Meadville, Pa.	1490
WMGY	Montgomery, Ala.	800
WMIA	Arecibo, P. R.	1070
WMIC	Sandusky, Mich.	1560
WMID	Atlantic City, N.J.	1340
WMIE	Miami, Fla.	1140
WMIK	Middlesboro, Ky.	560
WMIL	Milwaukee, Wis.	1290
WMIN	Mpls.-St. Paul, Minn.	1400
WMIQ	Iron Mountain, Mich.	1450
WMIR	Lake Geneva, Wis.	1550
WMIS	Natchez, Miss.	1240
WMIX	Mt. Vernon, Ill.	940
WMJM	Cordele, Ga.	1490
WMKR	Millinocket, Me.	1240
WMKT	S. St. Paul, Minn.	1370
WMLO	Beverly, Mass.	1570
WMLP	Milton, Pa.	1380
WMLS	Sylacauga, Ala.	1290
WMLT	Dublin, Ga.	1330
WMMB	Melbourne, Fla.	1240
WMMH	Marshall, N.C.	1460
WMMJ	Lancaster, N.Y.	1300
WMMM	Westport, Conn.	1260
WMMN	Fairmont, W.Va.	920
WMMW	Meriden, Conn.	1470
WMNA	Gretna, Va.	730
WMNB	No. Adams, Mass,	1230
WMNC	Morganton, N.C.	1430
WMNE	Menomonie, Wis.	1360
WMNI	Columbus, Ohio	920
WMNS	Olean, N.Y.	1360
WMNT	Manati, P.R.	1500
WMNZ	Montezuma, Ga.	1050
WMOA	Marietta, Ohio	1490
WMOC	Chattanooga, Tenn.	1450
WMOG	Brunswick, Ga.	1490
WMOH	Hamilton, Ohio	1450
WMOK	Metropolis, Ill.	920
WMON	Montgomery, W.Va.	1340
WMOO	Mobile, Ala.	1550
WMOP	Ocala, Fla.	900
WMOR	Morehead, Ky.	1330
WMOU	Berlin, N.H.	1280
WMOV	Ravenswood, W.Va.	1360
WMOX	Meridian, Miss.	1240
WMOZ	Mobile, Ala.	960
WMPA	Aberdeen, Miss.	1240
WMPC	Lapeer. Mich.	1230
WMPL	Hancock. Mich.	920
WMPM	Smithfield, N.C.	1270
WMPO	Middleport-Pomeroy. Ohio	1390
WMPP	Chicago Heights, Ill.	1470
WMPS	Memphis, Tenn.	680
WMPT	So. Williamsport, Pa.	1450
WMQM	Memphis, Tenn.	1480
WMRB	Greenville, S.C.	1490
WMRC	Milford. Mass.	1490
WMRE	Monroe, Ga.	1490
WMRF	Lewistown, Pa.	1490
WMRI	Marion, Ind.	860
WMRN	Marion, Ohio	1490
WMRO	Aurora, Ill.	1280
WMRP	Flint. Mich.	1570
WMRR	Marshall, Mich.	1540
WMSA	Massena, N.Y.	1340
WMSG	Oakland, Md.	1050
WMSJ	Sylva, N.C.	1480
WMSK	Morganfield, Ky.	1550
WMSL	Decatur, Ala.	1400
WMSR	Manchester, Tenn.	1320
WMST	Mt. Sterling, Ky.	1150
WMT	Cedar Rapids, Iowa	600
WMTA	Central City, Ky.	1380
WMTC	Vancleve. Ky.	730
WMTD	Hinton. W. Va.	1380
WMTE	Manistee, Mich.	1340
WMTL	Leitchfield, Ky.	1580
WMTM	Moultrie. Ga.	1300
WMTN	Morristown, Tenn.	1300
WMTR	Morristown, N.J.	1250
WMTS	Murfreesboro, Tenn.	810
WMUS	Muskegon, Mich.	1090
WMUU	Greenville, S.C.	1260
WMVA	Martinsville, Va.	1450
WMVB	Miltville, N.J.	1440
WMVG	Milledgeville, Ga.	1450
WMVO	Mt. Vernon, Ohio	1300
WMVR	Sidney. Ohio	1080
WMWM	Wilmington, O.	1090
WMYB	Myrtle Beach. S.C.	1450
WMYN	Mayodan, N.C.	1420
WMYR	Ft. Myers, Fla.	1410
WNAB	Bridgeport. Conn.	1450
WNAC	Boston, Mass,	680
WNAD	Norman, Okla.	640
WNAE	Warren, Pa.	1310
WNAG	Grenada, Miss.	1400
WNAH	Nashville, Tenn.	1360
WNAK	Nanticoke, Pa.	730
WNAM	Neenah. Wis.	1280
WNAR	Norristown, Pa.	1110
WNAT	Natchez. Miss.	1450
WNAU	New Albany. Miss.	1470
WNAV	Annapolis. Md.	1430
WNAX	Yankton. S.Dak.	570
WNBC	New York, N.Y.	660
WNBF	Binghamton, N.Y.	1290
WNBH	New Bedford, Mass.	1340
WNBP	Newburyport, Mass.	1470
WNBS	Murray, Ky.	1340
WNBT	Wellsboro, Pa.	1490
WNBY	Newberry, Mich.	1450
WNBZ	Saranac Lake, N.Y.	1240
WNCA	Siler City, N.C.	1570
WNCC	Barnesboro, Pa.	950
WNCG	N. Charleston, S.C.	910
WNCO	Ashland, Ohio	1340
WNCT	Greenville, N. C.	1590
WNDB	Daytona Beach, Fla.	1150
WNDR	Syracuse, N.Y.	1260
WNDU	South Bend, Ind.	1490
WNEB	Worcester, Mass.	1230
WNEG	Taccoa, Ga.	630
WNEL	Caguas, P. R.	1430
WNER	Live Oak. Fla.	1250
WNES	Central City, Ky.	1050
WNEW	New York, N.Y.	1130
WNEX	Macon, Ga.	1400
WNGA	Nashville, Ga.	1600
WNGO	Mayfield, Ky.	1320
WNHC	New Haven, Conn.	1340
WNHV	White River Jct., Vt.	910
WNIA	Cheektowaga, N.Y.	1230
WNIK	Arecibo, P.R.	1230
WNIL	Niles, Mich.	1290
WNIO	Niles, Ohio	1540
WNJH	Hammonton. N.J.	1580
WNJR	Newark, N.J.	1430
WNKY	Neon, Ky.	1480
WNLC	New London, Conn.	1510
WNLK	Norwalk, Conn.	1350
WNMP	Evanston, Ill.	1590
WNNC	Newton, N.C.	1230
WNNJ	Newton, N.J.	1360
WNNR	New Orleans, La.	990
WNNT	Warsaw, Va.	690
WNOE	New Orleans, La.	1060
WNOG	Naples, Fla.	1270
WNOK	Columbia, S.C.	1230
WNOO	Chattanooga, Tenn.	1260
WNOP	No. Platte, Neb.	1410
WNOR	Norfolk, Va.	1230
WNOS	High Point, N.C.	1590
WNOW	York, Pa.	1250
WNOX	Knoxville. Tenn.	990
WNPS	New Orleans, La.	1450
WNPT	Tuscaloosa. Ala.	1280
WNPV	Lansdale, Pa.	1440
WNRG	Grundy, Va.	940
WNRI	Woonsocket, R.I.	1380
WNRK	Newark, Del.	1260
WNRV	Narrows, Va.	990
WNSL	Laurel, Miss.	1260
WNSM	Valparaiso-Niceville, Fla.	1340
WNTN	Newton. Mass.	1550
WNTT	Tazewell, Tenn.	1250
WNUE	Ft. Walton Bch., Fla.	1400
WNUS	Chicago, Ill.	1390
WNUZ	Talladega. Ala.	1230
WNVA	Norton. Va.	1350
WNVL	Nicholasville, Ky.	1250
WNVY	Pensacola, Fla.	1230
WNWI	Valparaiso, Ind.	1080
WNXT	Portsmouth. Ohio	1260
WNYC	New York, N.Y.	830
WNYR	Rochester. N.Y.	680
WOAH	Miami, Fla.	1220
WOAI	San Antonio, Tex.	1200
WOAP	Owosso. Mich.	1080
WOAY	Oak Hill. W.Va.	860
WOBS	Jacksonville, Fla.	1360
WOBT	Rhinelander, Wis.	1240
WOC	Davenport, Iowa	1420
WOCB	W. Yarmouth. Mass.	1240
WOCH	North Vernon. Ind.	1460
WOCK	Okeechobee, Fla.	1570
WOCN	Miami, Fla.	1450
WOCO	Oconto, Wis.	1260
WODI	Brookneal, Va.	1230
WODY	Bassett, Va.	900
WOGA	Sylvester, Ga.	1540
WOGO	New Smyrna Beach, Fla.	1550
WOHI	E. Liverpool, Ohio	1490
WOHO	Toledo, Ohio	1470
WOHP	Bellefontaine, Ohio	1390
WOHS	Shelby, N.C.	730
WOI	Ames, Iowa	640
WOIB	Saline, Mich.	1290
WOIC	Columbia, S.C.	1320
WOIO	Canton, O.	1060
WOKA	Douglas, Ga.	1310
WOKB	Winter Garden, Fla	1600
WOKE	Charleston, S.C.	1340
WOKK	Meridian, Miss.	1450
WOKO	Albany, N.Y.	1460
WOKS	Columbus, Ga.	1340
WOKW	Brockton, Mass.	1410
WOKY	Milwaukee, Wis.	920
WOKZ	Alton. Ill.	1570
WOL	Washington. D.C.	1450
WOLD	Marion. Va.	1330
WOLF	Syracuse, N.Y.	1490
WOLS	Florence, S. C.	1230
WOMI	Owensboro. Ky.	1490
WOMN	Decatur, Ga.	1310
WOMP	Bellaire, Ohio	1290
WOMT	Manitowoc, Wis.	1240
WONA	Winona, Miss.	1570

Call	Location	kHz
WOND	Pleasantville, N.J.	1400
WONE	Dayton, Ohio	980
WONN	Lakeland, Fla.	1230
WONS	Tallahassee, Fla.	1410
WONW	Defiance, Ohio	1280
WOOD	Grand Rapids, Mich.	1300
WOOF	Dothan, Ala.	560
WOOK	Washington, D.C.	1340
WOOO	Deland, Fla.	1310
WOOW	Greenville, N.C.	1340
WOPA	Oak Park, Ill.	1490
WOPI	Bristol, Tenn.	1490
WOR	New York, N.Y.	710
WORA	Mayaguez, P.R.	760
WORC	Worcester, Mass.	1310
WORD	Spartanburg, S.C.	910
WORG	Orangeburg, S.C.	1580
WORK	York, Pa.	1350
WORM	Savannah, Tenn.	1010
WORX	Madison, Ind.	1270
WOSC	Fulton, N.Y.	1300
WOSH	Oshkosh, Wis.	1490
WOSU	Columbus, Ohio	820
WOTR	Corry, Pa.	1370
WOTT	Watertown, N.Y.	1410
WOTW	Nashua, N.H.	900
WOUB	Athens, Ohio	1340
WOVE	Welch, W.Va.	1340
WOW	Omaha, Nebr.	590
WOWL	Florence, Ala.	1240
WOWO	Ft. Wayne, Ind.	1190
WOWW	Naugatuck, Conn.	1380
WOWY	Clewiston, Fla.	500d
WOXF	Oxford, N.C.	1340
WOZK	Ozark, Ala.	900
WPAB	Ponce, P.R.	550
WPAC	Patchogue, N.Y.	1580
WPAD	Paducah, Ky.	1450
WPAG	Ann Arbor, Mich.	1050
WPAL	Charleston, S.C.	730
WPAM	Pottsville, Pa.	1450
WPAQ	Mount Airy, N.C.	740
WPAR	Parkersburg, W.Va.	1450
WPAT	Paterson, N.J.	930
WPAW	E. Syracuse, N.Y.	1540
WPAX	Thomasville, Ga.	1240
WPAY	Portsmouth, Ohio	1400
WPAZ	Pottstown, Pa.	1370
WPBC	Richfield, Minn.	980
WPCC	Clinton, S.C.	1400
WPCF	Panama City, Fla.	1430
WPCO	Mt. Vernon, Ind.	1590
WPDE	Paris, Ky.	1440
WPDF	Corydon, Ind.	1550
WPDM	Potsdam, N.Y.	1470
WPDQ	Jacksonville, Fla.	600
WPDR	Portage, Wis.	1350
WPDX	Clarksburg, W.Va.	750
WPEH	Louisville, Ga.	1420
WPEL	Montrose, Pa.	1250
WPEN	Philadelphia, Pa.	950
WPEO	Peoria, Ill.	1020
WPEP	Taunton, Mass.	1570
WPET	Greensboro, N.C.	950
WPFB	Middletown, Ohio	910
WPFP	Park Falls, Wis.	1450
WPGA	Perry, Ga.	980
WPGC	Bradbury Hghts., Md.	1580
WPGF	Burgaw, N. C.	1470
WPGM	Danville, Pa.	1570
WPGW	Portland, Ind.	1440
WPHB	Philipsburg, Pa.	1260
WPHC	Waverly, Tenn.	1060
WPHN	Liberty, Ky.	1560
WPIC	Sharon, Pa.	790
WPID	Piedmont, Ala.	1280
WPIK	Alexandria, Va.	730
WPIN	St. Petersburg, Fla.	680
WPIP	Collierville, Tenn.	1590
WPIT	Pittsburgh, Pa.	730
WPKE	Pikeville, Ky.	1240
WPKO	Waverly, Ohio	1380
WPKY	Princeton, Ky.	1580
WPLA	Plant City, Fla.	910
WPLB	Greenville, Mich.	1380
WPLK	Rockmart, Ga.	1220
WPLM	Plymouth, Mass.	1390
WPLO	Atlanta, Ga.	590
WPLY	Plymouth, Wis.	1420
WPMB	Vandalia, Ill.	1500
WPME	Punxsutawney, Pa.	1540
WPMH	Portsmouth, Va.	1010
WPMP	Pascagoula, Miss.	1580
WPNC	Plymouth, N.C.	1470
WPNF	Brevard, N.C.	1240
WPNH	Plymouth, N. H.	1300
WPNX	Phoenix City, Ala.	1460
WPOK	Pontiac, Ill.	1080
WPON	Pontiac, Mich.	1460
WPOP	Hartford, Conn.	1410
WPOR	Portland, Maine	1490
WPOW	New York, N.Y.	1330
WPPA	Pottsville, Pa.	1360
WPRA	Mayaguez, P.R.	990
WPRC	Lincoln, Ill.	1370
WPRE	Prairie Du Chien, Wis.	980
WPRN	Butler, Ala.	1220
WPRO	Providence, R.I.	630
WPRP	Ponce, P.R.	910
WPRS	Paris, Ill.	1440
WPRT	Prestonsburg, Ky.	960
WPRV	Wauchula, Fla.	1600
WPRW	Manassas, Va.	1460
WPRY	Perry, Fla.	1400
WPSL	Monroeville, Pa.	1510
WPTF	Raleigh, N.C.	680
WPTL	Canton, N.C.	920
WPTN	Cookeville, Tenn.	1500
WPTR	Albany, N.Y.	1540
WPTS	Pittston, Pa.	1540
WPTW	Piqua, Ohio	1570
WPTX	Lexington Pk., Md.	920
WPUV	Pulaski, Va.	1580
WPVA	Colonial Hghts., Va.	1290
WPVL	Painesville, Ohio	1460
WPXE	Starke, Fla.	1490
WPXI	Roanoke, Va.	910
WPXY	Greenville, N. C.	1550
WPYB	Benson, N.C.	1580
WQAM	Miami, Fla.	560
WQBC	Vicksburg, Miss.	1420
WQDY	Calais, Maine	1230
WQIC	Meridian, Miss.	1390
WQIK	Jacksonville, Fla.	1090
WQIZ	St. George, S. C.	1300
WQMR	Silver Spring, Md.	1050
WQOK	Greenville, S.C.	1440
WQSN	Charleston, S.C.	1450
WQTE	Monroe, Mich.	560
WQTW	Latrobe, Pa.	1570
WQUA	Moline, Ill.	1230
WQVA	Quantico, Va.	1530
WQXI	Atlanta, Ga.	790
WQXL	Columbia, S.C.	1320
WQXQ	Ormond Bch., Fla.	1380
WQXR	New York, N.Y.	1560
WQXT	Palm Beach, Fla.	1340
WRAA	Luray, Va.	1330
WRAB	Arab, Ala.	1380
WRAC	Racine, Wis.	1460
WRAD	Radford, Va.	1460
WRAG	Carrollton, Ala.	590
WRAI	Rio Piedras, P.R.	1190
WRAJ	Anna, Ill.	1440
WRAK	Williamsport, Pa.	1400
WRAM	Monmouth, Ill.	1330
WRAN	Dover, N.J.	1510
WRAP	Norfolk, Va.	850
WRAW	Reading, Pa.	1340
WRAY	Princeton, Ind.	1250
WRBC	Jackson, Miss.	1300
WRBD	Pampano Beach, Fla.	1470
WRBJ	St. Johns, Mich.	1580
WRBL	Columbus, Ga.	1420
WRBN	Warner Robins, Ga.	1600
WRC	Washington, D.C.	980
WRCD	Dalton, Ga.	1430
WRCH	New Britain, Conn.	910
WRCK	Tuscumbia, Ala.	1410
WRCO	Richland, Wis.	1450
WRCP	Philadelphia, Pa.	1540
WRCR	Maplewood, Minn.	1010
WRCS	Ahoskie, N.C.	970
WRDB	Reedsburg, Wis.	1400
WRDO	Augusta, Maine	1400
WRDS	S. Charleston, W.Va.	1410
WRDW	Augusta, Ga.	1480
WREB	Holyoke, Mass.	930
WREC	Memphis, Tenn.	600
WREL	Lexington, Va.	1450
WREN	Topeka, Kans.	1250
WREO	Ashtabula, Ohio	970
WREV	Reidsville, N.C.	1220
WREX	Grand Junction, Colo.	920
WREY	New Albany, Ind.	1290
WRFC	Athens, Ga.	960
WRFD	Worthington, Ohio	880
WRFS	Alexander City, Ala.	1050
WRGA	Rome, Ga.	1470
WRGS	Rogersville, Tenn.	1370
WRHC	Jacksonville, Fla.	1400
WRHI	Rock Hill, S.C.	1340
WRHL	Rochelle, Ill.	1060
WRIB	Providence, R.I.	1220
WRIC	Richlands, Va.	540
WRIG	Wausau, Wis.	1400
WRIM	Pahokee, Fla.	1250
WRIN	Rensselaer, Ind.	1560
WRIP	Rossville, Ga.	980
WRIS	Roanoke, Va.	1410
WRIT	Milwaukee, Wis.	1340
WRIV	Riverhead, N.Y.	1390
WRIZ	Coral Gables, Fla.	1550
WRJC	Mauston, Wis.	1270
WRJN	Racine, Wis.	1400
WRJS	San German, P. R.	1060
WRJW	Picayune, Miss.	1320
WRKB	Kannapolis, N.C.	1460
WRKD	Rockland, Maine	1450
WRKH	Rockwood, Tenn.	580
WRKL	New City, N. Y.	910
WRKM	Carthage, Tenn.	1350
WRKN	Brandon, Miss.	970
WRKT	Cocoa Beach, Fla.	1300
WRKV	Rockville, Conn.	800
WRLD	Lanett, Ala.-W. Point, Ga.	1490
WRMA	Montgomery, Ala.	950
WRMF	Titusville, Fla.	1050
WRMN	Elgin, Ill.	1410
WRMS	Beardstown, Ill.	790
WRMT	Rocky Mount, N.C.	1490
WRNB	New Bern, N.C.	1490
WRNC	Raleigh, N.C.	1240
WRNE	Wis. Rapids, Wis.	1220
WRNL	Richmond, Va.	910
WRNY	Rome, N.Y.	1350
WROA	Gulfport, Miss.	1390
WROB	West Point, Miss.	1450
WROC	Rochester, N.Y.	1280
WROD	Daytona Beach, Fla.	1340
WROK	Rockford, Ill.	1440
WROL	Fountain City, Tenn.	1490
WROM	Rome, Ga.	710
WRON	Ronceverte, W.Va.	1400
WROS	Scottshoro, Ala.	1330
WROV	Roanoke, Va.	1240
WROW	Albany, N.Y.	590
WROX	Clarksdale, Miss.	1450
WROY	Carmi, Ill.	1460
WROZ	Evansville, Ind.	1400
WRPL	Charlotte, N.C.	1540
WRPM	Poplarville, Miss.	1530
WRR	Dallas, Tex.	1310
WRRC	Spring Valley, N. Y.	1300
WRRR	Rockford, Ill.	1330
WRRZ	Clinton, N.C.	880
WRSA	Saratoga Sprgs., N.Y.	1280
WRSC	State College, Pa.	1390
WRSJ	Bayamon, P. R.	1560
WRSL	Stanford, Ky.	1520
WRSW	Warsaw, Ind.	1480
WRTA	Altoona, Pa.	1240
WRTH	Wood River, Ill.	1030
WRTL	Rantoul, Ill.	1530
WRUF	Gainesville, Fla.	850
WRUM	Rumford, Maine	790
WRUN	Utica, N.Y.	1150
WRUS	Russellville, Ky.	610
WRVA	Richmond, Va.	1140
WRVK	Mt. Vernon, Ky.	1460
WRWD	Augusta, Ga.	1480
WRWH	Cleveland, Ga.	1380
WRXO	Roxboro, N.C.	1430
WRYM	New Britain, Conn.	840
WRYT	Boston, Mass.	950
WSAC	Fort Knox, Ky.	1470
WSAF	Sarasota, Fla.	1220
WSAI	Cincinnati, Ohio	1360
WSAJ	Grove City, Pa.	1340
WSAL	Logansport, Ind.	1230
WSAM	Saginaw, Mich.	1400
WSAN	Allentown, Pa.	1470
WSAO	Senatobia, Miss.	1550
WSAR	Fall River, Mass.	1480
WSAT	nr. Salisbury, N.C.	1280
WSAU	Wausau, Wis.	550
WSAV	Savannah, Ga.	630
WSAY	Rochester, N.Y.	1370
WSAZ	Huntington, W.Va.	930
WSB	Atlanta, Ga.	750
WSBA	Savannah, Ga.	1400
WSBB	New Smyrna Beach, Fla.	1230
WSBC	Chicago, Ill.	1240
WSBR	Boca Raton, Fla.	740
WSBS	Gt. Barrington, Mass.	860
WSBT	South Bend, Ind.	960
WSCM	Panama City Beach, Fla.	1290
WSBP	Chattahoochee, Fla.	1580
WSCR	Scranton, Pa.	1320
WSDR	Sterling, Ill.	1240
WSEB	Sebring, Fla.	1340
WSEL	Pontotoc, Miss.	1440
WSEM	Donaldsonville, Ga.	1500
WSEN	Baldwinsville, N.Y.	1050
WSER	Elkton, Md.	1550
WSET	Glen Falls, N.Y.	1410
WSEV	Sevierville, Tenn.	930
WSFB	Quitman, Ga.	1490
WSFC	Somerset, Ky.	1240
WSFR	Sanford, Fla.	1360
WSFT	Thomaston, Ga.	1220
WSGA	Savannah, Ga.	1400
WSGB	Sutton, W.Va.	1490
WSGC	Elberton, Ga.	1400
WSGN	Birmingham, Ala.	610
WSGO	Oswego, N.Y.	1440
WSGW	Saginaw, Mich.	790
WSHB	Raeford, N.C.	1400
WSHF	Sheffield, Ala.	1290
WSHN	Fremont, Mich.	1550
WSHO	New Orleans, La.	1230
WSHP	Shippenburg, Pa.	1480
WSIB	Beaufort, S.C.	1490
WSIC	Statesville, N.C.	1400
WSID	Baltimore, Md.	1010
WSIG	Mount Jackson, Va.	790
WSIP	Paintsville, Ky.	1490
WSIR	Winter Haven, Fla.	1490
WSIV	Pekin, Ill.	1140
WSIX	Nashville, Tenn.	980
WSJC	Magee, Miss.	810
WSJM	St. Joseph, Mich.	1400
WSJR	Modawaska, Me.	1230
WSJS	Winston-Salem, N.C.	600
WSJT	Chesapeake, Va.	1600
WSKI	Montpelier-Barre, Vt.	1240
WSKT	S. Knoxville, Tenn.	1580
WSKY	Asheville, N.C.	1230
WSLB	Ogdensburg, N.Y.	1400
WSLC	Clermont, Fla.	1340
WSLG	Clermont, Fla.	1340
WSLI	Jackson, Miss.	930
WSMA	Marine City, Mich.	1590
WSLM	Salem, Ind.	1220
WSLR	Akron, Ohio	1350
WSLS	Roanoke, Va.	610
WSLT	Ocean City-Somers Pt., N.J.	1520
WSM	Nashville, Tenn.	650
WSMB	New Orleans, La.	1350
WSMD	La Plata, Md.	1560
WSME	Sanford, Maine	1220
WSMG	Greenville, Tenn.	1450
WSMI	Litchfield, Ill.	1540
WSMN	Nashua, N.H.	1590
WSMT	Sparta, Tenn.	1050
WSNE	Cummings, Ga.	1410
WSNJ	nr. Bridgeton, N.J.	1240
WSNO	Barre, Vt.	1450
WSNT	Sandersville, Ga.	1490
WSNW	Seneca, S. C.	1150
WSNY	Schenectady, N.Y.	1240
WSOC	Charlotte, N.C.	930
WSOK	Savannah, Ga.	1230
WSOL	Tampa, Fla.	1300
WSUM	Salem, Ohio	600
WSON	Henderson, Ky.	860
WSOO	Ste. Marie, Mich.	1230
WSOQ	No. Syracuse, N.Y.	1220
WSOR	Windsor, Conn.	1480
WSOY	Decatur, Ill.	1340
WSPA	Spartanburg, S.C.	950
WSPB	Sarasota, Fla.	1450
WSPD	Toledo, Ohio	1370
WSPF	Hickory, N.C.	1000
WSPR	Springfield, Mass.	1270
WSPT	Stevens Pt., Wis.	1010
WSRA	Milton, Fla.	1490
WSRC	Durham, N.C.	1410
WSRF	Ft. Lauderdale, Fla.	1580
WSRD	Marlborough, Mass.	1470
WSRW	Hillsboro, Ohio	1590
WSSB	Durham, N.C.	1490
WSSC	Sumter, S.C.	1340
WSSD	Starkville, Miss.	1230
WSSV	Petersburg, Va.	1240
WSTC	Stamford, Conn.	1400
WSTH	Taylorsville, N.C.	860
WSTK	Woodstock, Va.	1230
WSTL	Eminence, Ky.	1600
WSTP	Salisbury, N.C.	1490
WSTR	Sturgis, Mich.	1230
WSTU	Stuart, Fla.	1450
WSTV	Steubenville, Ohio	1340
WSUB	Groton, Conn.	980
WSUH	Oxford, Miss.	1420
WSUI	Iowa City, Iowa	910
WSUN	St. Petersburg, Fla.	620
WSUX	Seaford, Del.	1280
WSUZ	Palatka, Fla.	800
WSVA	Harrisonburg, Va.	550
WSVL	Shelbyville, Ind.	1520
WSVN	Valdese, N.C.	1490
WSVM	Valdese, N.C.	1490
WSVS	Crewe, Va.	800
WSWN	Belle Glade, Fla.	900
WSWV	Pennington Gap, Va.	1570
WSWW	Platteville, Wis.	1590
WSYB	Rutland, Vt.	1380
WSYD	Mt. Airy, N.C.	1300
WSYL	Sylvania, Ga.	1490
WSYR	Syracuse, N.Y.	570
WTAB	Tabor City, N.C.	1370
WTAC	Flint, Mich.	600
WTAD	Quincy, Ill.	930
WTAE	Pittsburgh, Pa.	1250
WTAG	Worcester, Mass.	580
WTAI	Eau Gallie, Fla.	1560
WTAK	Garden City, Mich.	1090
WTAL	Tallahassee, Fla.	1450
WTAN	Clearwater, Fla.	1340
WTAP	Parkersburg, W.Va.	1230
WTAQ	LaGrange, Ill.	1300
WTAR	Norfolk, Va.	790
WTAW	Bryan, Tex.	1150
WTAX	Springfield, Ill.	1240
WTAY	Robinson, Ill.	1570
WTBC	Tuscaloosa, Ala.	1230
WTBF	Troy, Ala.	970
WTBO	Cumberland, Md.	1450
WTCA	Plymouth, Ind.	1050
WTCB	Flomaton, Ala.	990
WTCH	Shawano, Wis.	960
WTCJ	Tell City, Ind.	1230
WTCM	Traverse City, Mich.	1400
WTCO	Campbellsville, Ky.	1450
WTCR	Ashland, Ky.	1420
WTCS	Fairmont, W.Va.	1490
WTCW	Whitesburg, Ky.	920
WTEL	Philadelphia, Pa.	860
WTGA	Thomaston, Ga.	1590
WTGR	Myrtle Beach, S. C.	1520
WTHB	Augusta, Ga.	1550
WTHE	Mineola, N.Y.	1520
WTHI	Terre Haute, Ind.	1480
WTHM	Lapeer, Mich.	1530
WTHN	Thomaston, Ga.	1500
WTHT	Hazleton, Pa.	1300
WTIC	Hartford, Conn.	1080
WTID	Newport News, Va.	1270
WTIF	Tifton, Ga.	1340
WTIG	Massillon, Ohio	990
WTIK	Durham, N.C.	1310
WTIL	Mayaguez, P.R.	1300
WTIM	Taylorville, Ill.	1410
WTIP	Charleston, W.Va.	1240
WTIQ	Manistique, Mich.	1490
WTIX	New Orleans, La.	690
WTJH	East Point, Ga.	1260

WHITE'S RADIO LOG

Call	Location	kHz
WTJS	Jackson, Tenn.	1390
WTKM	Hartford, Wis.	1540
WTKO	Ithaca, N.Y.	1470
WTKY	Tompkinsville, Ky.	1370
WTLB	Utica, N.Y.	1310
WTLK	Taylorsville, N.C.	1570
WTLN	Apopka, Fla.	1520
WTLO	Somerset, Ky.	1480
WTLS	Tallasee, Ala.	1300
WTMA	Charleston, S.C.	1250
WTMB	Tomah, Wis.	1390
WTMC	Ocala, Fla.	1290
WTNE	Trenton, Tenn.	1500
WTMJ	Milwaukee, Wis.	620
WTMP	Tampa Fla.	1150
WTMT	Louisville, Ky.	820
WTNC	Thomasville, N.C.	790
WTND	Orangeburg, S.C.	920
WTNS	Coshocton, Ohio	1560
WTNT	Tallahassee, Fla.	1270
WTOB	Winston-Salem, N.C.	1380
WTOC	Savannah, Ga.	1290
WTOD	Toledo, Ohio	1560
WTOE	Spruce Pine, N.C.	1470
WTOJ	Tomah, Wis.	1460
WTON	Staunton, Va.	1240
WTOP	Washington, D.C.	1500
WTOR	Torrington, Conn.	610
WTOT	Marianna, Fla.	980
WTPR	Paris, Tenn.	710
WTPS	Portage, Mich.	1560
WTOX	Selma, Ala.	1570
WTRA	Latrobe, Pa.	1480
WTRB	Ripley, Tenn.	1570
WTRC	Elkhart, Ind.	1340
WTRE	Greensburg, Ind.	1330
WTRI	Brunswick, Md.	1520
WTRL	Bradenton, Fla.	1490
WTRN	Tyrone, Pa.	1340
WTRO	Dyersburg, Tenn.	1330
WTRP	LaGrange, Ga.	620
WTRR	Sanford, Fla.	1400
WTRU	Muskegon, Mich.	1600
WTRW	Two Rivers, Wis.	1590
WTRX	Flint, Mich.	1330
WTRY	Troy, N.Y.	980
WTSA	Brattleboro, Vt.	1450
WTSB	Lumberton, N.C.	1340
WTSL	Hanover-Lebanon, New Hampshire	1400
WTSN	Dover, N.H.	1270
WTSV	Claremont, N.H.	1230
WTTB	Vero Beach, Fla.	1490
WTTC	Towanda, Pa.	1550
WTTF	Tiffin, Ohio	1600
WTTH	Port Huron, Mich.	1380
WTTI	Dalton, Ga.	1530
WTTL	Madisonville, Ky.	1310
WTTM	Trenton, N.J.	920
WTTN	Watertown, Wis.	1580
WTTO	Toledo, Ohio	1520
WTTR	Westminster, Md.	1470
WTTS	Bloomington, Ind.	1370
WTTT	Amherst, Mass.	1430
WTUF	Mobile, Ala.	840
WTUG	Tuscaloosa, Ala.	790
WTUP	Tupelo, Miss.	1490
WTUX	Wilmington, Del.	1290
WTVB	Coldwater, Mich.	1590
WTVL	Waterville, Maine	1490
WTVN	Columbus, Ohio	610
WTVR	Richmond, Va.	1380
WTWA	Thomson, Ga.	1240
WTWB	Auburndale, Fla.	1570
WTWN	St. Johnsbury, Vt.	1340
WTXL	W. Spgfd., Mass.	1490
WTYC	Rock Hill, S.C.	1150
WTYM	East Longmeadow, Mass.	1600
WTYN	Tryon, N.C.	1550
WTYS	Marianna, Fla.	1340
WTZE	Tazewell, Va.	1470
WUFD	Amherst, N.Y.	1080
WUFF	Eastman, Ga.	710
WUFO	Amherst, N. Y.	1080
WULA	Eufaula, Ala.	1240
WUMU	Gainesville, Fla.	1390
WUNA	Aquadilla, P. R.	1340
WUND	Uhrichsville, Ohio	1540
WUNE	Baton Rouge, La.	1550
WUNI	Mobile, Ala.	1410
WUNN	Mason, Mich.	1110
WUNO	Rio Piedras, P.R.	1320
WUNS	Lewisburg, Pa.	1010
WUPR	Utado, P.R.	1530
WUSI	Lockport, N.Y.	1340
WUSM	Havelock, N.C.	1330
WUST	Bethesda, Md.	1120
WUWU	Gainsville, Fla.	1390
WVAB	Virginia Bch., Va.	1550
WVAK	Paoli, Ind.	1560
WVAL	Sauk Rapids, Minn.	800
WVAM	Altoona, Pa.	1430
WVAR	Richwood, W. Va.	600
WVCB	Shallotte, N. C.	1410
WVCF	Apopka, Fla.	1520
WVCG	Coral Gables, Fla.	1080
WVCH	Chester, Pa.	740
WVEC	Hampton, Va.	1490
WVGT	Mt. Dora, Fla.	1580
WVIC	E. Lansing, Mich.	730
WVIM	Vicksburg, Miss.	1490
WVIP	Mt. Kisco, N.Y.	1310
WVJP	Caguas, P.R.	1110
WVJS	Owensboro, Ky.	1420
WVKO	Columbus, Ohio	1580
WVLD	Valdosta, Ga.	1450
WVLK	Lexington, Ky.	590
WVLN	Olney, Ill.	740
WVMC	Mt. Carmel, Ill.	1360
WVMG	Cochran, Ga.	1440
WVMI	Biloxi, Miss.	570
WVMT	Burlington, Vt.	620
WVNA	Tuscumbia, Ala.	1590
WVNJ	Newark, N.J.	620
WVOB	Bel Air, Md.	1520
WVOC	Battle Creek, Mich.	1500
WVOE	Chadburn, N.C.	1590
WVOH	Hazelhurst, Ga.	920
WVOK	Birmingham, Ala.	690
WVOL	Berry Hill, Tenn.	1470
WVOM	Iuka, Miss.	1270
WVON	Cicero, Ill.	1450
WVOP	Vidalia, Ga.	970
WVOS	Liberty, N.Y.	1240
WVOT	Wilson, N.C.	1420
WVOW	Logan, W.Va.	1290
WVOX	New Rochelle, N.Y.	1460
WVOZ	Carolina, P.R.	1400
WVPO	Stroudsburg, Pa.	840
WVRC	Spencer, W. Va.	1400
WVSA	Vernon, Ala.	1380
WVSC	Somerset, Pa.	990
WVVW	Grafton, W.Va.	1260
WWAB	Lakeland, Fla.	1330
WWBC	Cocoa, Fla.	1510
WWBD	Bamberg-Denmark, S.C.	790
WWBR	Windber, Pa.	1350
WWBZ	Vineland, N.J.	1360
WWCA	Gary, Ind.	1270
WWCC	Bremen, Ga.	1440
WWCH	Clarion, Pa.	1300
WWCM	Brazil, Ind.	1380
WWCO	Waterbury, Conn.	1240
WWDC	Washington, D.C.	1260
WWDR	Murfreesboro, N. C.	1080
WWDS	Everett, Pa.	1050
WWGM	Nashville, Tenn.	1560
WWGO	Erie, Pa.	1450
WWGP	Sanford, N.C.	1050
WWGS	Tifton, Ga.	1430
WWHG	Hornell, N.Y.	1320
WWHY	Huntington, W.Va.	1470
WWIL	Ft. Lauderdale, Fla.	1580
WWIN	Baltimore, Md.	1400
WWIS	Black River Falls, Wis.	1260
WWIT	Canton, N.C.	970
WWIZ	Lorain, Ohio	1380
WWJ	Detroit, Mich.	950
WWJB	Brooksville Fla.	1450
WWJC	Superior, Wis.	1270
WWKE	Ocala, Fla.	1370
WWKY	Winchester, Ky.	1380
WWL	New Orleans, La.	870
WWML	Portage, Wis.	1470
WWNC	Asheville, N.C.	570
WWNH	Rochester, N.H.	930
WWNR	Beckley, W.Va.	620
WWNS	Statesboro, Ga.	1240
WWNY	Watertown, N.Y.	790
WWOD	Lynchburg, Va.	1390
WWOK	Charlotte, N.C.	1480
WWOL	Buffalo, N.Y.	1120
WWOM	New Orleans, La.	600
WWON	Woonsocket, R.I.	1240
WWOW	Conneaut, Ohio	1360
WWPA	Williamsport, Pa.	1340
WWPF	Palatka, Fla.	1260
WWRI	W. Warwick, R.I.	1450
WWRL	New York, N.Y.	1600
WWSC	Glens Falls, N.Y.	1450
WWSD	Monticello, Fla.	1090
WWSF	Loretto, Pa.	1400
WWSR	St. Albans, Vt.	1420
WWST	Wooster, Ohio	960
WWSW	Pittsburgh, Pa.	970
WWTC	Minneapolis, Minn.	1280
WWUN	Jackson, Miss.	1590
WWVA	Wheeling, W.Va.	1170
WWWB	Jasper, Ala.	1360
WWWF	Fayette, Ala.	990
WWWR	Russellville, Ala.	920
WWXL	Manchester, Ky.	1450
WWYN	Erie, Pa.	1260
WWYO	Pineville, W.Va.	970
WXAL	Demopolis, Ala.	1400
WXCL	Peoria, Ill.	1350
WXCO	Wausau, Wis.	1230
WXGI	Richmond, Va.	950
WXHR	Cambridge, Mass.	740
WXIG	Windermere, Fla.	1480
WXKW	Troy, N. Y.	1600
WXLI	Dublin, Ga.	1230
WXLL	Big Delta, Alaska	980
WXLN	Potomac-Cabin John, Md.	950
WXLW	Indianapolis, Ind.	950
WXOK	Baton Rouge, La.	1460
WXOX	Bay City, Mich.	1250
WXPQ	Eatonton, Ga.	1520
WXMT	Merrill, Wis.	730
WXRF	Guayama, P.R.	1590
WXTN	Lexington, Miss.	1000
WXTR	Pawtucket, R.I.	550
WXUR	Media, Pa.	690
WXVA	Charles Town, W.Va.	1550
WXVW	Jeffersonville, Ind.	1450
WXXX	Hattiesburg, Miss.	1310
WXYC	Ft. Myers, Fla.	1350
WXYZ	Detroit, Mich.	1270
WYAL	Scotland Neck, N.C.	1280
WYAM	Bessemer, Ala.	1450
WYBG	Massena, N. Y.	1050
WYCL	York, S.C.	980
WYDE	Birmingham, Ala.	850
WYFE	Rockford, Ill.	1150
WYGO	Corbin, Ky.	1330
WYHE	Bristol, Tenn.	1550
WYLD	New Orleans, La.	940
WYLO	Jackson, Wis.	540
WYMB	Manning, S.C.	1410
WYNA	Raleigh, N. C.	1550
WYND	Sarasota, Fla.	1280
WYNG	Warwick-East Greenwich, R.I.	1590
WYNK	Baton Rouge, La.	1380
WYNN	Florence, S.C.	540
WYNR	Brunswick, Ga.	790
WYNS	Leighton, Pa.	1150
WYNX	Smyrna, Ga.	1550
WYNZ	Ypsilanti, Mich.	1520
WYOQ	Wyoming, Mich.	1530
WYOU	Tampa, Fla.	1550
WYPR	Danville, Va.	970
WYRE	Annapolis, Md.	810
WYRN	Louisburg, N.C.	1480
WYSE	Inverness, Fla.	1560
WYSH	Clinton, Tenn.	1380
WYSI	Ypsilanti, Mich.	1480
WYSL	Buffalo, N.Y.	1400
WYSR	Franklin, Va.	1250
WYTH	Madison, Ga.	1250
WYTI	Rocky Mount, Va.	1570
WYVE	Wytheville, Va.	1280
WYWY	Barbourville, Ky.	950
WYXI	Athens, Tenn.	1390
WYZE	Atlanta, Ga.	1480
WZAM	Prichard, Ala.	1270
WZBN	Zion, Ill.	1500
WZEP	DeFuniak Sprgs., Fla.	1460
WZIP	Cincinnati, Ohio	1050
WZKY	Albemarle, N.C.	1580
WZOB	Ft. Payne, Ala.	1250
WZOE	Princeton, Ill.	1490
WZOK	Jacksonville, Fla.	1320
WZRH	Zephyr Hills, Fla.	1400
WZST	Leesburg, Fla.	1410
WZUM	Carnegie, Pa.	1590
WZYX	Cowan, Tenn.	1440
WZZZ	Boynton Beach, Fla.	1510

U. S. FM Stations by Call Letters

Call	Location
KABC-FM	Los Angeles, Calif.
KABL-FM	San Francisco, Cal.
KACA	Prosser, Wash.
KACE-FM	Riverside, Calif.
KACO	St. Louis, Mo.
KADI	St. Louis, Mo.
KADS	Los Angeles, Cal.
KAFE-FM	Santa Fe, N. M.
KAFF-FM	Flagstaff, Ariz.
KAFI	Auburn, Calif.
KAFM	Salina, Kans.
KAIM-FM	Honolulu, Hawaii
KAJS	Newport Beach, Calif.
KAKC	Tulsa, Okla.
KAKI	San Antonio, Tex.
KALB-FM	Alexandria, La.
KALH	Denver, Colo.
KALW	San Francisco, Calif.
KALX	Berkeley, Cal.
KAMB	Merced, Cal.
KAMS	Mammoth Spring, Ark.
KANG	Angwin, Cal.
KANS-FM	Larned, Kan.
KANT-FM	Lancaster, Calif.
KANU	Lawrence, Kans.
KANW	Albuquerque, N.Mex.
KAOL-FM	Carrollton, Mo.
KARK	Little Rock, Ark.
KARL-FM	Carlsbad, Cal.
KARM-FM	Fresno, Calif.
KASC	Conway, Ark.
KASU	Jonesboro, Ark.
KATI-FM	Casper, Wyo.
KATT	Woodland, Calif.
KATY-FM	San Luis Obispo, Calif.
KAVI-FM	Rocky Ford, Colo.
KAVR-FM	Applevalley, Cal.
KAYD	Beaumont, Tex.
KAZZ	Austin, Tex.
KBBI	Los Angeles, Calif.
KBBL	Riverside, Cal.
KBBW	San Diego, Cal.
KBBX	Seattle, Wash.
KBCA	Los Angeles, Calif.
KBCL-FM	Shreveport, La.
KBEE-FM	Modesto, Calif.
KBER-FM	San Antonio, Tex.
KBEW-FM	Blue Earth, Minn.
KBEY	Kansas City, Mo.
KBFI	Boise, Idaho
KBFL	Buffalo, Mo.
KBFM	Lubbock, Tex.
KBGL	Pocatello, Ida.
KBHF	Bozeman, Mont.
KBHS-FM	Hot Springs, Ark.
KBIG-FM	Los Angeles-Avalon, Cal.
KBIM-FM	Roswell, N.Mex.
KBLE-FM	Seattle, Wash.
KBMC	Eugene, Ore.
KBMF-FM	Spearman, Tex.
KBMS	Los Angeles, Calif.
KBNM	Albuquerque, N.M.
KBNO	Houston, Tex.
KBOA-FM	Kennett, Mo.
KBOB	West Covina, Cal.
KBOC	Ogden, Utah
KBOE-FM	Oskaloosa, Iowa
KBOI-FM	Boise, Ida.
KBOX-FM	Dallas, Tex.
KBOY-FM	Medford, Oreg.
KBPI	Denver, Colo.
KBRG	San Francisco, Cal.
KBRO-FM	Bremerton, Wash.
KBTC-FM	Houston, Mo.
KBTM-FM	Jonesboro, Ark.
KBUY-FM	Ft. Worth, Tex.
KBUZ-FM	Mesa, Ariz.
KBVR	Corvallis, Ore.
KBYR-FM	Anchorage, Alaska
KBYU-FM	Provo, Utah
KCAB-FM	Dardanelle, Ark.
KCAL-FM	Redlands, Calif.
KCBH	Beverly Hills, Calif.(s)
KCBL-FM	Greeley, Colo.
KCBS-FM	San Francisco, Calif.
KCDR-FM	Cedar City, Utah
KCEE-FM	Tucson, Ariz.
KCER	Redding, Cal.
KCES	Eufaula, Okla.
KCFC	Kansas City, Kan.
KCFM	St. Louis, Mo.
KCHQ-FM	Conchella, Cal.
KCHV-FM	Conchella, Cal.
KCIB-FM	Fresno, Calif.(s)
KCIL-FM	Houma, La.
KCIM-FM	Carroll, Ia.
KCJB-FM	Minot, N. D.
KCKN-FM	Kansas City, Kan.
KCLE-FM	Cleburne, Tex.
KCLO-FM	Leavenworth, Kans.
KCLU-FM	Rolla, Mo.
KCMA	San Francisco, Cal.
KCMB-FM	Wichita, Kans.
KCMJ	Los Angeles, Calif.
KCMK	Kansas City, Mo.
KCMO-FM	Kansas City, Mo.(s)
KCMS-FM	Manitou Springs, Colo.
KCNM	Carlsbad, N. M.
KCOM	Omaha, Nebr.
KCOR-FM	San Antonio, Tex.
KCPS	Tacoma, Wash.
KCPX-FM	Salt Lake City, Utah
KCRA-FM	Sacramento, Calif.
KCRC-FM	Enid, Okla.
KCRH	Nampa, Ida.
KCRW	Santa Monica, Calif.
KCSB-FM	Santa Barbara, Cal.
KCSC	Edmond, Okla.
KCSM	San Mateo, Calif.

Call	Location
KCSU-FM	Ft. Collins, Colo.
WCTS FM	Minneapolis, Minn.
KCUE-FM	Red Wing, Minn.
KCUI	Pella, Ia.
KCUR-FM	Kansas City, Mo.
KCVR-FM	Lodi, Calif.
KCWS-FM	Ellensburg, Wash.
KCYS	Richland, Wash.
WDAF-FM	Kansas, Mo.
KDB-FM	Santa Barbara, Calif.
KDDD-FM	Dumas, Tex.
KDEF-FM	Albuquerque, N.Mex.
KDEN-FM	Oenver, Colo.
KDES-FM	Palm Spgs., Calif.
KDFC	San Francisco, Calif.
KDEF-FM	Albuquerque, N. M.
KDEX-FM	Dexter, Mo.
KDFM	Walnut Creek, Cal.
KOFR	Tulare, Cal.
KDHI-FM	Twenty-Nine Palms, Cal.
KDIG	San Diego, Cal.
KDKA-FM	Pittsburgh, Pa.
KDLA-FM	De Ridder, La.
KDLK-FM	Del Rio, Tex.
KDLR-FM	Devils Lake, N.D.
KDMC	Corpus Christi, Tex.
KDM1	Des Moines, Iowa(s)
KDNC-FM	Spokane, Wash.
KDNT-FM	Denton, Tex.
KDOK-FM	Tyler, Tex.
KDPS	Des Moines, Iowa
KDSU	Fargo, N.D.
KDUO	Riverside, Calif.(s)
KDUX-FM	Aberdeen, Wash.
KDVR	Sioux City, Ia.(s)
KEAR	San Francisco, Calif.
KEAX	National City, Calif.
KEBJ	Phoenix, Ariz.
KEBR	Sacramento, Calif.
KEBS	San Diego, Calif.
KECR	El Cajon, Calif.
KEDC-FM	Northridge, Cal.
KEDP	Las Vegas, N. M.
KEEN-FM	San Jose, Calif.
KEEZ	San Antonio, Tex.(s)
KEFC	Waco, Tex.(s)
KEFM	Santa Rosa, Cal.
KEFW	Honolulu, Hawaii
KEIR	Dallas, Tex.
KELD-FM	El Dorado, Ark.(s)
KELE	Phoenix, Ariz.
KELO-FM	Sioux Falls, S. D.
KELT	Harlingen, Tex.
KEMO	St. Louis, Mo.
KERI	Bellingham, Wash.
KERN-FM	Bakersfield, Calif.
KERR	Salinas, Cal.
KERS	Sacramento, Cal.
KESM-FM	El Dorado Springs, Mo.
KETO-FM	Seattle, Wash.(s)
KEWC-FM	Cheney, Wash.
KEZE	Anaheim, Calif.
KFAB-FM	Omaha, Nebr.
KFAC-FM	Los Angeles, Calif.
KFAM-FM	St. Cloud, Minn.
KFAV	Fayettevile, Ark.
KFBD	Waynesville, Mo.
KFBI-FM	Omaha, Neb.
KFBK-FM	Sacramento, Calif.
KFCA	Phoenix, Ariz.
KFGQ-FM	Boone, Iowa
KFH-FM	Wichita, Kans.
KFJC	Los Altos, Cal.
KFJZ	Fort Worth, Tex.
KFKF-FM	Bellevue, Wash.
KFLA-FM	Scott City, Kan.
KFLY-FM	Corvallis, Ore.
KFMB-FM	San Diego, Calif.
KFMC	Provo, Utah
KFMD	Dubuque, Ia.
KFMF	Ft. Collins, Colo.
KFMG	Des Moines, Ia.
KFMK	Houston,Tex.(s)
KFML-FM	Denver, Colo.(s)
KFMM	Tucson, Ariz.
KFMN	Abilene, Tex.
KFMP	Port Arthur, Tex.(s)
KFMQ	Lincoln, Nebr.
KFMR	Fremont, Cal.
KFMV	Minneapolis, Minn
KFMW	San Bernardino, Calif.
KFMX	San Diego, Calif.(s)
KFMY	Eugene, Oreg.(s)
KFNB	Oklahoma City, Okla.
KFNE	Big Springs, Tex.
KFNW-FM	Fargo, N.D.
KFOA	Honolulu, Hawaii
KFOG	San Francisco, Calif.
KFOX-FM	Los Angeles, Cal.
KFRC-FM	San Francisco, Calif.
KFRE-FM	Fresno, Calif.
KFRN-FM	Brownwood, Tex.
KFRW	Quincy, Cal.
KFTM-FM	Ft. Morgan, Colo.
KFUO-FM	Clayton, Mo.
KFWT-FM	Ft. Worth, Tex.
KFYR-FM	Bismarck, N.O.
KGAF-FM	Gainesville, Tex.
KGB-FM	San Diego, Calif.
KGBI-FM	Omaha, Neb.
KGBN-FM	Caldwell, Idaho
KGBS-FM	Los Angeles, Cal.
KGEC	Palm Springs, Cal.
KGEE-FM	Bakersfield, Cal. (s)
KGEN-FM	Tulare, Cal.
KGFM	Edmonds, Wash.
KGHO-FM	Hoquiam, Wash.
KGLA	Los Angeles, Calif.
KGME-FM	Centralia, Wash.
KGMI-FM	Bellingham, Wash.
KGMR-FM	Jacksonville, Ark.
KGNC-FM	Amarillo, Tex.
KGNO-FM	Dodge City, Kan.
KGO-FM	San Francisco, Calif.
KGPO	Grants Pass, Oreg.
KGRD-FM	Las Cruces, N.M.
KGRI-FM	Henderson, Tex.
KGUD-FM	Santa Barbara, Calif.
KGUS	Hot Springs, Ark.
KGVM-FM	Idaho Falls, Ida.
KGVW-FM	Belgrade, Mont.
KHAK-FM	Cedar Rapids, Iowa(s)
KHAR-FM	Anchorage, Alaska
KHBL	Plainview, Tex.
KHBR-FM	Hillsboro, Tex.
KHCB-FM	Houston, Tex.
KHEP-FM	Phoenix, Ariz.
KHFI-FM	Austin, Tex.
KHFM	Albuquerque, N.Mex.(s)
KHIQ.	Sacramento, Calif.(s)
KHJ-FM	Los Angeles, Calif.
KHMS	El Paso, Tex.
KHOB-FM	Hobbs, N. M.
KHOF	Los Angeles, Calif.
KHOZ-FM	Harrison, Ark.
KHPC	Brownwood, Tex.
KHQ-FM	Spokane, Wash.
KHSC	Arcata, Calif.
KHSJ-FM	Hemet, Cal.
KHVH-FM	Honolulu, Hawaii
KHVR	Bijou, Calif.
KHYI	Fremont, Calif.
KIBS-FM	Bishop, Cal.
KICD-FM	Spencer, Ia.
KICS-FM	Hastings, Neb.
KICN	Omaha, Nebr.
KID-FM	Idaho Falls, Ida.
KIEM	Eureka, Calif.
KIFG-FM	Iowa Falls, Ia.
KIFM	Bakersfield, Cal.
KIHI	Tulsa, Okla.
KIKK-FM	Houston, Tex.
KIKS-FM	Lake Charles, La.
KIMP-FM	Mt. Pleasant, Tex.
KING-FM	Seattle, Wash.
KIOO	Oklahoma, Okla.
KIRO-FM	Seattle, Wash.
KISA	Kansas City, Mo.
KISS	San Antonio, Tex.
KISW	Seattle, Wash.(s)
KITE-FM	San Antonio, Tex.
KITH	Phoenix, Ariz.
KITT	San Diego, Calif.
KITY	San Antonio, Tex. (s)
KIXI-FM	Seattle, Wash.
KIXL-FM	Dallas, Tex.(s)
KJAN-FM	Atlantic, Ia.
KJAZ	Alameda, Calif.
KJCK-FM	Junction City, Kan.
KJEF-FM	Jennings, La.
KJEM-FM	Okla. City, Okla.
KJET-FM	Beaumont, Tex.
KJLH	Long Beach, Cal.
KJLM	San Diego, Calif.
KJML	Sacramento, Calif.
KJOY-FM	Burlington, Vt.
KJPO	Fresno, Calif.
KJRG-FM	Newton, Kans. (s)
KJSB	Houston, Tex.
KJSK-FM	Columbus, Neb.
KKFM	Colorado Springs, Colo.
KKHI-FM	San Francisco, Cal.
KKIT-FM	Taos, N. M.
KKOP	Redondo Beach, Cal.
KLAK-FM	Lakewood, Colo.
KLAW	Lawton, Okla.
KLAY-FM	Tacoma, Wash.
KLBK-FM	Lubbock, Tex.
KLBS-FM	Los Banos, Cal.
KLCN-FM	Blytheville, Ark.
KLEA-FM	Lovington, N. M.
KLEB-FM	Golden Meadow, La.
KLEF	Houston, Tex. (s)
KLEN-FM	Killeen, Tex.
KLGS	Los Gatos, Cal.
KLFM	Beverly Hills, Calif.
KLIL	Akiah, Cal.
KLIR-FM	Denver, Colo.
KLIZ-FM	Brainerd, Minn.
KLJT	Lake Jackson, Tex.
KLMO-FM	Longmont, Colo.
KLOA-FM	Ridgecrest, Calif.
KLOM-FM	Lompoc, Cal.
KLON	Long Beach, Calif.
KLOR-FM	Ponca City, Okla.
KLOV-FM	Loveland, Colo.
KLPW-FM	Union, Mo.
KLRO	San Diego, Calif.(s)
KLSN	Seattle, Wash.(s)
KLUB-FM	Salt Lake City, Utah
KLUE-FM	Longview, Tex.
KLUR	Wichita Falls, Tex.
KLVI-FM	Beaumont, Tex.
KLVL	Pasadena, Tex.
KLWN-FM	Lawrence, Kan.
KLYD-FM	Bakersfield, Calif.
KLYN-FM	Lynden, Wash.
KLYX	Memphis, Tenn.
KLZ-FM	Denver, Colo.
KMAG-FM	Ft. Smith, Ark.
KMAK-FM	Fresno, Calif.
KMAP	Dallas, Tex.
KMAQ-FM	Maquoketa, Ia.
KMAX	Sierra Madre, Calif.
KMBR	Kansas City, Mo.
KMBY-FM	Monterey, Cal.
KMCP	Portland, Oreg.
KMEO	Phoenix, Ariz. (s)
KMER	Fresno, Calif.
KMET	Los Angeles, Cal.
KMFA	Austin, Tex.
KMFM	San Antonio, Tex. (s)
KMHT	Marshall, Tex.
KMJ-FM	Fresno, Calif.
KMLB-FM	Monroe, La.(s)
KMMK	Little Rock, Ark.
KMMM-FM	Muskogee, Okla.
KMND-FM	Mesa, Ariz.
KMOD-FM	Midland, Tex.
KMOR-FM	Morehead, Ky.
KMOX-FM	St. Louis, Mo.
KMPX	San Francisco, Calif.(s)
KMSC	Clear Lake City, Tex.
KMSM	Rolla, Mo.
KMSU	Mankato, Minn.
KMUL-FM	Muleshoe, Tex.
KMUW	Wichita, Kans.
KMYC-FM	Marysville, Calif.
KMYO-FM	Little Rock, Ark.
KMYR	Denver, Colo.
KMUZ	Santa Barbara, Calif.(s)
KNBQ	Bethany, Okla.
KNBR-FM	San Francisco, Calif.
KNBU	Baldwin, Kan.
KNBY-FM	Newport, Ark.
KNDR	Chickasha, Okla.
KNDX	Yakima, Wash.
KNEB-FM	Scottsbluff, Nebr.
KNED-FM	McAlester, Okla.
KNER	Dallas, Tex.
KNEV	Reno, Nev. (s)
KNEW-FM	Scottsbluff, Nebr.
KNFB	Nowata, Okla.
KNFM	Midland, Tex.
KNHS	Torrance, Cal.
KNIK-FM	Anchorage, Alaska
KNIX-FM	Phoenix, Ariz. (s)
KNJO	Thousand Oaks, Calif.
KNOB	Long Beach, Calif. (s)
KNOC-FM	Natchitoches, La.
KNOE-FM	Monroe, La.
KNOF	St. Paul, Minn.
KNOK-FM	Ft. Worth, Tex.
KNRO-FM	Conroe, Tex.
KNTO	Wichita Falls, Tex.(s)
KNUS	Dallas, Tex.
KNWA	Fayetteville, Ark.
KNWS-FM	Waterloo, Iowa
KNX-FM	Los Angeles, Calif.
KNXR	Rochester, Minn.
KOA-FM	Denver, Colo.
KOAP-FM	Portland, Ore.
KOAT-FM	Albuquerque, N.M.
KOB-FM	Albuquerque, N.M.
KOBH-FM	Hot Springs, S.D.
KOCM	Newport Beach, Cal.
KOCV	Odessa, Tex.
KOCW	Tulsa, Okla.(s)
KOCY-FM	Oklahoma City, Okla.
KODA-FM	Houston, Tex.
KOFM	Oklahoma City, Okla.
KOFO-FM	Ottawa, Kan.
KOGM-FM	Tulsa, Okla.
KOGO	San Diego, Calif.
KOIN-FM	Portland, Oreg.
KOKH	Oklahoma City, Okla.
KOL-FM	Seattle, Wash.
KONG-FM	Visalia, Calif.
KOOL-FM	Phoenix, Ariz.
KOPR-FM	Great Falls, Mont.
KORA-FM	Bryan, Tex.
KORE-FM	Springfield-Eugene, Ore.
KORK	Las Vegas, Nev.
KORU	Tulsa, Okla.
KOSE-FM	Osceola, Ark.
KOSI-FM	Denver, Colo.
KOSO	Turlock, Cal.
KOST	Dallas, Tex.
KOSU-FM	Stillwater, Okla.(s)
KOSY-FM	Texarkana, Tex.
KOTN-FM	Pine Bluff, Ark.
KOTO	Alamagordo, N. M.
KOWH-FM	Omaha, Neb.
KOWN-FM	Escondido, Cal.
KOYA	Ontario, Cal.
KOYL-FM	Odessa, Tex,
KOZE-FM	Lewiston, Idaho
KPAC-FM	Port Arthur, Tex.
KPAK	El Paso, Tex.
KPAN-FM	Hereford, Tex.
KPAT-FM	Berkeley, Calif.
KPCS	Pasadena, Calif.
KPDQ-FM	Portland, Ore.
KPEL-FM	Lafayette, La.
KPEN	San Francisco, Cal.(s)
KPET-FM	Lamesa, Tex.
KPFA	Berkeley, Calif.
KPFB	Berkeley, Calif.
KPFK	Los Angeles, Calif.
KPIK-FM	Colorado Springs, Colo.
KPLC-FM	Lake Charles, La.
KPLT-FM	Paris, Tex.
KPLU	Tacoma, Wash.
KPLX	San Jose, Cal.
KPFM	Portland, Oreg.(s)
KPGM	Los Altos, Calif.
KPLR-FM	St. Louis, Mo.
KPMT	Oxnard, Cal.
KPOI-FM	Honolulu, Hawaii (s)
KPOJ-FM	Portland, Oreg.
KPOL-FM	Los Angeles, Calif.
KPPC-FM	Pasadena, Calif.
KPPS-FM	Parsons, Kans.
KPRI	San Diego, Calif.
KPRN	Seattle, Wash.
KPRS-FM	Kansas City, Mo.
KPSD	Dallas, Tex.
KQAL-FM	Omaha, Nebr.(s)
KQFM	Portland, Oreg.
KQIP	Odessa, Tex.
KQRS-FM	Golden Valley, Minn.
KQTY	Wichita, Kan.
KQUE	Houston, Tex. (s)
KQV-FM	Pittsburgh, Pa.
KQXX	McAllen, Tex.
KRAB	Seattle, Wash.
KRAK-FM	Stockton, Calif.
KRAM-FM	Las Vegas, Nev.
KRAV	Tulsa, Okla.(s)
KRBE	Houston, Tex.(s)
KRBI-FM	St. Peter, Minn.
KRCC	Colorado Springs, Colo.
KRCS	San Bernardino, Cal.
KRCW	Santa Barbara, Calif.
KRDO-FM	Colorado Springs, Colo.
KREB	Monroe, La.
KREM-FM	Spokane, Wash.
KREP	Santa Clara, Cal.
KRES	Moberly, Mo.
KREX-FM	Grand Junction, Colo.
KRFM	Phoenix, Ariz.
KRHM	Los Angeles, Calif.
KRIL	El Dorado, Ark.(s)
KRIT	Clarion, Iowa
KRKD-FM	Los Angeles, Calif.
KRKH-FM	Lubbock, Tex.
KRKY	Denver, Colo.
KRLD-FM	Dallas, Tex.
KRMD-FM	Shreveport, La.
KRMG-FM	Tulsa, Okla.
KRML-FM	Carmel, Cal.
KRMS-FM	Osage Beach, Mo.
KRNL-FM	Mt. Vernon, Ia.
KRNW	Boulder, Colo.
KRNY-FM	Kearney-Holdrege, Nebraska
KROB-FM	Robstown, Tex.
KROC-FM	Rochester, Minn.
KRON-FM	San Francisco, Calif.
KROS-FM	Clinton, Iowa
KROW	Santa Barbara, Calif.
KROY-FM	Sacramento, Calif.
KRPM	San Jose, Calif.
KRRC	San Jose, Calif.
KRSA-FM	Salinas, Cal.
KRSI	Minneapolis, Minn.(s)
KRSI-FM	St. Louis Park, Minn.
KRSL-FM	Russell, Kan.
KRSN-FM	Los Alamos, N.Mex.
KRSP-FM	Salt Lake City, Utah
KRST	Albuquerque, N. M.
KRUS-FM	Ruston, La.
KRVM	Eugene, Oreg.
KRVN-FM	Lexington, Nebr.
KRWG	University Park, N. M.
KRVS-FM	Lafayette, La.
KRXL	Kirksville, Mo.
KRYT-FM	Colorado Springs, Colo.
KSAM-FM	Huntsville, Tex.
KSBY-FM	San Luis Obispo, Cal.
KSCO	Santa Cruz, Calif.
KSBW-FM	Salinas, Calif.
KSDA	La Sierra, Calif.
KSDB-FM	Manhattan, Kans.
KSDO-FM	San Diego, Cal.
KSDS	San Diego, Calif.
KSEA	San Diego, Calif.
KSEL-FM	Lubbock, Tex.
KSEO-FM	Durant, Okla.
KSFA-FM	Nacogdoches, Tex.
KSFM	Dallas, Tex.(s)
KSFR	San Francisco, Calif.(s)
KSFV	San Fernando, Calif.
KSFX	San Francisco, Calif.
KSHE	Crestwood, Mo.
KSHS	Colorado Springs, Colo.
KSIB-FM	Creston, Ia.
KSIS-FM	Sedalia, Mo. (s)
KSJO-FM	San Jose, Calif.(s)
KSJR-FM	Collegeville, Minn.
KSJS	San Jose, Calif.
KSJT	San Angelo, Tex.
KSL-FM	Salt Lake City, Utah(s)
KSLA	Seattle, Wash.(s)
KSLH	St. Louis, Mo.
KSLO-FM	Opelousas, La.
KSMA-FM	Santa Maria, Calif.
KSMB	Lafayette, La.

WHITE'S RADIO LOG

Call	Location
KSNM	Santa Fe, N. M.
KSOM	Tucson, Ariz.
KSOP-FM	Salt Lake City, Utah
KSOZ	Point Lookout, Mo.
KSPC	Claremont, Calif.
KSPI-FM	Stillwater, Okla.
KSPL-FM	Diboll, Tex.
KSRF	Santa Monica, Calif.
KSRN	Reno, Nev.
KSRT	Tracy, Cal.
KSTE	Emporia, Kans.
KSTL-FM	St. Louis, Mo.
KSTN-FM	Stockton, Calif.
KSTP-FM	St. Paul, Minn.
KSUI	Iowa City, Iowa
KSUN-FM	Bisbee, Ariz.
KSYM	San Antonio, Tex.
KSYN	Joplin, Mo.(s)
KTAC-FM	Tacoma, Wash.
KTAL	Texarkana, Tex.
KTAP	Tucson, Ariz.
KTAR-FM	Phoenix, Ariz.
KTBC-FM	Austin, Tex.(s)
KTBT	Garden Grove, Cal.
KTCF	Cedar Falls, Iowa
KTCS-FM	Ft. Smith, Ark.
KTCU-FM	Ft. Worth, Tex.
KTEA-FM	Midwest City, Okla.
KTEC	Oretech, Oreg.
KTFC	Sioux City, Ia.
KTGM	Denver, Colo.
KTHO-FM	Tahoe Valley, Cal.
KTIB-FM	Thibodaux, La.
KTIM	San Rafael, Calif.
KTIS-FM	Minneapolis, Minn.
KTJO-FM	Ottawa, Kans.
KTLQ-FM	Tahlequah, Okla.
KTMS-FM	Santa Barbara, Cal.
KTNM-FM	Tucumcari, N.M.
KTNT-FM	Tacoma, Wash.
KTOD-FM	Sinton, Tex.(s)
KTOP	Topeka, Kan.
KTOY	Tacoma, Wash.
KTQM-FM	Clovis, N. M.
KTRB-FM	Modesto, Calif.
KTRH-FM	Houston, Tex.
KTRM-FM	Beaumont, Tex.
KTSM-FM	El Paso, Tex.
KTSR	Kansas City, Mo.
KTTS-FM	Springfield, Mo.
KTUX	Hayward, Cal.
KTW-FM	Seattle, Wash.
KTWD	Spokane, Wash.
KTWN	Anoka, Minn.
KTXJ-FM	Jasper, Tex.
KTXN-FM	Victoria, Tex.
KTWR	Tacoma, Wash.
KTXR-FM	Springfield, Mo.(s)
KTXT-FM	Lubbock, Tex.
KTYM-FM	Inglewood, Calif.
KUAC	College, Alaska
KUAM-FM	Agana, Guam
KUCR	Riverside, Cal.
KUID	Moscew, Ida.
KUDE-FM	Oceansido, Calif.
KUDU-FM	Ventura-Oxnard, Calif.
KUER	Salt Lake City, Utah
KUFM	Missoula, Mont.
KUFY	Redwood City, Calif.
KUGN-FM	Eugene, Oreg.
KUHF	Houston, Tex.
KUKI-FM	Ukiah, Cal.
KUMD-FM	Duluth, Minn.
KUNF	La Canada, Cal.
KUNM	Albuquerque, N. M.
KUOA-FM	Siloam Springs, Ark.
KUOH	Honolulu, Hawaii
KUOP	Stockton, Cal.(s)
KUOR-FM	Redlands, Cal.
KUOW	Seattle, Wash.
KUPD-FM	Tempe, Ariz.
KUPK-FM	Garden City, Kan.
KURL-FM	Billings, Mont.
KUSC	Los Angeles, Calif.
KUSN-FM	St. Joseph, Mo.
KUSU-FM	Logan, Utah
KUT-FM	Austin, Tex.
KUTE	Glendale, Calif.
KUWR	Laramie, Wyo.
KUWS-FM	Newton, Ia.
KUZN-FM	W. Monroe, La.
KVBC	Grand Forks, N. D.
KVCL-FM	Winnfield, La.
KVCR	San Bernardino, Calif.
KVEE-FM	Conway, Ark.
KVEG-FM	Las Vegas, Nev.
KVEN-FM	Ventura, Calif.
KVET-FM	Austin, Tex.
KVFM	San Fernando, Calif.
KVII-FM	Amarillo, Tex.
KVIL-FM	Highland Park-Dallas, Tex.
KVMN	Pueblo, Colo.
KVOA-FM	Tucson, Ariz.
KVOE-FM	Emporia, Kan.
KVOF-FM	El Paso, Tex.
KVOK	Honolulu, Hawaii
KVOP-FM	Plainview, Tex.
KVOR-FM	Colorado Springs, Colo.
KVOX-FM	Moorhead, Minn.
KVPI-FM	Ville Platte, La.
KVRO	Stillwater, Okla.
KVSC	Logan, Utah
KVTT	Dallas, Tex.
KVWM	Show Low, Ariz.
KWAR	Waverly, Iowa
KWAX	Eugene, Oreg.
KWBE-FM	Beatrice, Neb.
KWBU	Waco, Tex.
KWCR-FM	Ogden, Utah
KWDM	Des Moines, Ia. (s)
KWFM	Minneapolis, Minn.(s)
KWFR-FM	San Angelo, Tex.
KWG-FM	Stockton, Calif.
KWGN-FM	Abernathy, Tex.
KWGO-FM	Abernathy, Tex.
KWGS	Tulsa, Okla.
KWHG	Lincoln, Neb.
KWHI-FM	Brenham, Tex.
KWHO-FM	Salt Lake City, Utah
KWHP	Edmond, Okla.
KWIX	St. Louis, Mo.
KWIZ-FM	Santa Ana, Calif.
KWJB-FM	Globe, Ariz.
KWKC-FM	Abilene, Tex.
KWKH-FM	Shreveport, La.
KWLM-FM	Willmar, Minn.
KWLW	San Angelo, Tex.
KWMF-FM	Walnut Creek, Cal.
KWMO	Odessa, Tex.
KWMT-FM	Ft. Dodge, Ia.
KWNS-FM	Pratt, Kan.
KWNT-FM	Davenport, Ia.
KWOA-FM	Worthington, Minn.
KWOC-FM	Poplar Bluff, Mo.
KWPC-FM	Muscatine, Iowa
KWPM-FM	West Plains, Mo.
KWWC-FM	Columbia, Mo.
KWWR-FM	Mexico, Mo.
KXEL-FM	Waterloo, Iowa(s)
KXFM	Santa Maria, Cal.
KXIC-FM	Iowa City, Ia.
KXIT-FM	Dalhart, Tex.
KXJK-FM	Forrest City, Ark.
KXKX	San Francisco, Calif.
KXL-FM	Portland, Ore.
KXLU	Los Angeles, Calif.
KXLY-FM	Spokane, Wash.
KXOA	Sacramento, Calif.
KXOL-FM	Ft. Worth, Tex. (s)
KXQR	Fresno, Calif.(s)
KXRQ	Sacramento, Calif.
KXTR	Kansas City, Mo.(s)
KXXI	Alamogordo, N. M.
KXYZ-FM	Houston, Tex. (s)
KYA-FM	San Francisco, Calif.
KYEW	Phoenix, Ariz.
KYFM	Oklahoma City, Okla.
KYLE-FM	Temple, Tex.
KYMS	Santa Ana, Cal.
KYSM-FM	Mankato, Minn.
KYW-FM	Cleveland, Ohio
KZAK-FM	Tyler, Tex.
KZAM	Seattle, Wash.(s)
KZFM	Corpus Christi, Tex.
KZOM	Oklahoma City, Okla.
KZSU	Stanford, Cal.
KZUN-FM	Opportunity, Wash.
KZYM-FM	Cape Girardeau, Mo.
WAAA-FM	Winston-Salem, N.C.
WAAB-FM	Worcester, Mass.
WAAM-FM	Parkersburg, W.Va.
WAAW	Murray, Ky.
WAAZ-FM	Crestview, Fla.
WABA-FM	Aguadilla, P.R.
WABC-FM	New York, N.Y.
WABE	Atlanta, Ga.
WABF-FM	Fairhope, Ala.
WABI-FM	Bangor, Maine
WABQ	Cleveland, Ohio
WABX-FM	Detroit, Mich. (s)
WABZ-FM	Albemarle, N.C.
WACO	Waco, Tex.
WACT-FM	Tuscaloosa, Ala.
WACY-FM	Moss Point, Miss.
WAEB-FM	Cincinnati, Ohio
WAEF-FM	Cincinnati, O.
WAER	Syracuse, N.Y.
WAEW-FM	Crossville, Tenn.
WAEZ	Miami Beach, Fla.(s)
WAFB-FM	Baton Rouge, La.
WAGR-FM	Lumberton, N.C.
WAGY-FM	Forest City, N. C.
WAHR	Huntsville, Ala. (s)
WAIC	Springfield, Mass.
WAIR-FM	Winston-Salem, N.C.
WAIV	Indianapolis, Ind.
WAJC	Indianapolis, Ind.
WAJM	Montgomery, Ala.(s)
WAJP	Joliet, Ill.
WAJR-FM	Morgantown, W.Va.
WAKE-FM	Valparaiso, Ind.
WAKM	Bedford, Pa.
WAKN-FM	Aiken, S.C.
WAKO-FM	Lawrenceville, Ill.
WAKR-FM	Akron, Ohio
WAKW-FM	Cincinnati, Ohio
WALK-FM	Patchogue, N.Y.
WALL-FM	Middletown, N. Y.
WAMC	Albany, N.Y.
WAMF	Amherst, Mass.
WAMO-FM	Pittsburgh, Pa.
WAMU-FM	Washington, D.C.
WANG	Goldwater, Mich.
WANY-FM	Albany, Ky.
WAOV-FM	Vincennes, Ind.
WAPC-FM	Riverhead, N.Y.(s)
WAPI-FM	Birmingham, Ala.
WAPL-FM	Appleton, Wis.
WAPS	Akron, Ohio
WAQB-FM	Atlantic Beach, Fla.
WAQE-FM	Towson, Md.(s)
WARC	Meadville, Pa.
WARD-FM	Johnstown, Pa.
WARK	Little Rock, Ark. (s)
WARN-FM	Fort Pierce, Fla.
WARU-FM	Peru, Ind.
WASA-FM	Havre De Grace, Md.
WASH	Washington, D.C.(s)
WASK-FM	Lafayette, Ind.
WATH-FM	Athens, O.
WATL-FM	Tampa, Fla.
WATM-FM	Atmore, Ala.
WATO-FM	Oak Ridge, Tenn.
WATR-FM	Waterbury, Conn.
WATZ-FM	Alpena, Mich.
WAUG-FM	Augusta, Ga.
WAUK-FM	Waukesha, Wis.
WAUP	Akron, Ohio
WAVA-FM	Arlington, Va.
WAVO-FM	Decatur, Ga.
WAVY-FM	Portsmouth, Va.
WAWA-FM	Milwaukee, Wis.
WAWK-FM	Kendallville, Ind.
WAWR-FM	Bowling Green, O.
WAWZ-FM	Zarephath, N.J.
WAXO	Kenosha, Wis.
WAYL	Minneapolis-St. Paul, Minn.
WAYZ-FM	Waynesboro, Pa.
WAZL-FM	Hazelton, Pa.
WAZY-FM	Lafayette, Ind.
WBAA-FM	W. Lafayette, Ind.
WBAB-FM	Babylon, N.Y.
WBAI	New York, N.Y.
WBAL-FM	Baltimore, Md.
WBAP-FM	Ft. Worth, Tex.(s)
WBAW-FM	Barnwell, S.C.
WBAY	Green Bay, Wis.(s)
WBBA-FM	Pittsfield, Ill.
WBBB-FM	Burlington, N.C.(s)
WBBF-FM	Rochester, N.Y.
WBBM-FM	Chicago, Ill.
WBBO-FM	Forest City, N.C.
WBBQ-FM	Augusta, Ga.
WBBR-FM	E. St. Louis, Ill.
WBBW-FM	Youngstown, Ohio (s)
WBCA-FM	Bay Minette, Ala.
WBCB-FM	Levittown-Fairless Hills, Pa.
WBCI-FM	Williamsburg, Va.
WBCL-FM	South Beloit, Ill.
WBCM-FM	Bay City, Mich.
WBCN	Boston, Mass.(s)
WBCO-FM	Bucyrus, O.
WBCR-FM	Beloit, Wis.
WBDG	Indianapolis, Ind.
WBEL-FM	S. Beloit, Ill.
WBEN-FM	Buffalo, N.Y.
WBET-FM	Brockton, Mass.
WBEU-FM	Beaufort, S.C.(s)
WBEX-FM	Chillicothe, Ohio
WBEZ	Chicago, Ill.
WBFG	Detroit, Mich.
WBFM	Seneca, S. C.
WBFO	Buffalo, N.Y.
WBGM-FM	Tallahassee, Fla.
WBGO	Newark, N.J.
WBGU	Bowling Green, Ohio
WBHS	Warwick, R.I.
WBHT-FM	Brownsville, Tenn.
WBIE-FM	Marietta, Ga.
WBIR	Knoxville, Tenn.
WBIV	Wethersfield, N.Y.
WBJC	Baltimore, Md.
WBKV-FM	West Bend, Wis.(s)
WBKW	Beckley, W.Va.
WBKY	Lexington, Ky.
WBLK-FM	Buffalo, N.Y.
WBLR-FM	Batesburg, S.C.
WBLY-FM	Springfield, Ohio
WBMI	Meridan, Conn.(s)
WBNE-FM	Fitchburg, Mass.
WBNT-FM	Oneida, Tenn.
WBMP	Elwood, Ind.
WBMR	Telford, Pa.
WBNC-FM	Conway, N. H.
WBNO-FM	Bryan, Ohio
WBNS-FM	Columbus, Ohio
WBNY-FM	Buffalo, N.Y.
WBOC-FM	Salisbury, Md.
WBOE	Cleveland, Ohio
WBON	Milwaukee, Wis.
WBOR	Brunswick, Maine
WBOS-FM	Brookline, Mass.
WBOW-FM	Terre Haute, Ind.
WBPZ-FM	Lock Haven, Pa.
WBRB-FM	Mt. Clemens, Mich.
WBRC	Birmingham, Ala.
WBRD-FM	Bradenton, Fla. (s)
WBRE-FM	Wilkes-Barre, Pa.
WBRK-FM	Pittsfield, Mass.
WBRN-FM	Big Rapids, Mich.
WBRU	Providence, R.I.
WBSM-FM	New Bedford, Mass.
WBST	Muncie, Ind.
WBT-FM	Charlotte, N.C.(s)
WBTC-FM	Houston, Mo.
WBUD-FM	Trenton, N.J.(s)
WBUF	Buffalo, N.Y.
WBUR	Boston, Mass.
WBUT-FM	Butler, Pa.
WBUY-FM	Lexington, N.C.
WBVA	Woodbridge, Va.
WBVB	Union City, Pa.
WBVP-FM	Beaver Falls, Pa.
WBWC	Berea, Ohio
WBYM	Bayamon, P.R.
WBYO	Boyertown, Pa.(s)
WBZ-FM	Boston, Mass.
WBZI	Xenia, O.
WCAC	Anderson, S.C.
WCAO-FM	Baltimore, Md.
WCAR-FM	Detroit, Mich.
WCAS	Knoxville, Tenn.
WCAU-FM	Philadelphia, Pa.
WCBC	Catonsville, Md.
WCBD	Memphis, Tenn.
WCBE	Columbus, Ohio
WCBL-FM	Benton, Ky.
WCBM-FM	Baltimore, Md.
WCBS-FM	New York, N.Y.
WCBW	Columbia, Ill.
WCBY-FM	Cheboygan, Mich.
WCCC-FM	Hartford, Conn.
WCCM-FM	Lawrence, Mass.
WCCN-FM	Neillsville, Wis.
WCCV-FM	Charlottesville, Va.
WCED-FM	Dubois, Pa.
WCEF-FM	Parkersburg, W. Va.
WCEN-FM	Mt. Pleasant, Mich.(s)
WCER-FM	Charlotte, Mich.
WCFM	Williamstown, Mass.
WCHA-FM	Chambersburg, Pa.(s)
WCHD	Detroit, Mich.
WCHK-FM	Canton, Ga.
WCHN-FM	Norwich, N.Y.
WCHS-FM	Charlestown, W.Va.
WCHO-FM	Washington Court House, O.
WCJM	W. Point, Ga.
WCKW	La Place, La.
WCLE-FM	Cleveland, Tenn.
WCLI-FM	Corning, N.Y.
WCLM	Chicago, Ill.
WCLO-FM	Janesville, Wis.
WCLT-FM	Newark, Ohio
WCLV	Cleveland, O.(s)
WCLW-FM	Mansfield, Ohio
WCMC-FM	Wildwood, N.J.
WCMB-FM	Harrisburg, Pa.
WCME-FM	Brunswick, Maine
WCMF-FM	Rochester, N.Y.(s)
WCMI-FM	Ashland, Ky.
WCMN-FM	Arecibo, P.R.
WCMQ	Marietta, Ohio
WCMS-FM	Norfolk, Va.
WCMU-FM	Mt. Pleasant, Mich.
WCNA-FM	Scottsboro, Ala.
WCNB-FM	Connersville, Ind.
WCNH-FM	Quincy, Fla.
WCNO	Canton, Ohio(s)
WCNT-FM	Centralia, Ill.
WCNW-FM	Fairfield, O.
WCOA-FM	Pensacola, Fla.
WCOF-FM	Immokalee, Fla.
WCOH-FM	Newnan, Ga.
WCOL-FM	Columbus, Ohio
WCOM-FM	Urbana, O.
WCON-FM	Cornelia, Ga.
WCOP-FM	Boston, Mass.
WCOS-FM	Columbia, S.C.
WCOU-FM	Lewiston, Maine
WCOW-FM	Sparta, Wis.
WCPC-FM	Houston, Miss.
WCPO-FM	Cincinnati, Ohio
WCPS-FM	Tarbor, N.C.
WCRA-FM	Effingham, Ill.
WCRB-FM	Waltham, Mass.(s)
WCRD	Bluffton, Ind.
WCRF	Cleveland, O.
WCRQ	Providence, R. I.
WCRS-FM	Greenwood, S. C.
WCRT-FM	Birmingham, Ala.
WCSC-FM	Charleston, S.C.
WCSI-FM	Columbus, Ind.(s)
WCSM-FM	Celina, O.
WCSQ	Central Square, N.Y.
WCST-FM	Berkeley Springs, W. Va.
WCSU-FM	Wilberforce, O.
WCTC-FM	New Brunswick, N.J.
WCTM	Eaton, Ohio
WCTS-FM	Minneapolis, Minn.
WCTW-FM	New Castle, Ind.
WCUE-FM	Akron, O.
WCUF	Akron, Ohio
WCUM-FM	Cumberland, Md.

Call	Location
WCUY-FM	Cleveland Hts., Ohio
WCWC-FM	Ripon, Wis.
WCWM	Williamsburg, Va.
WCWP	Brookville, N. Y.
WDAC	Lancaster, Pa.
WDAF-FM	Kansas City, Mo.
WDAN-FM	Danville, Ill.
WDAO	Dayton, Ohio
WDAR-FM	Darlington, S.C.
WDAS-FM	Philadelphia, Pa.
WDAY-FM	Fargo, N. D.
WDBJ-FM	Roanoke, Va.
WDBL-FM	Springfield, Tenn.
WDBN	Barberton, O.
WDBO-FM	Orlando, Fla.
WDBQ-FM	Dubuque, Iowa
WDCX	Buffalo, N.Y.(s)
WDDE	Hamden, Conn.
WDDS-FM	Syracuse, N.Y.
WDEA-FM	Ellsworth, Me.
WDEB	Jamestown, Tenn.
WDEC-FM	Americus, Ga. (s)
WDEE	Hamden, Conn.
WDEF-FM	Chattanooga, Tenn.
WDEL-FM	Wilmington, Del.
WDET-FM	Detroit, Mich.
WDFM	State College, Pa.
WDHA-FM	Dover, N.J.
WDHF	Chicago, Ill.
WDIX-FM	Orangeburg, S. C.
WDJK	Atlanta, Ga.
WDJR	Oil City, Pa.
WDKD-FM	Kingstree, S.C.
WDKN-FM	Dickson, Tenn.
WDLB-FM	Marshfield, Wis.
WDLP-FM	Panama City, Fla.
WDMB-FM	Statesville, N.C.
WDMJ-FM	Marquette, Mich.
WDMS-FM	Lynchburg, Va.
WDMW	Menomonie, Wis.
WDNC-FM	Durham, N.C.
WDOC-FM	Prestonsburg, KY.
WDOD-FM	Chattanooga, Tenn.
WDOK-FM	Cleveland, Ohio
WDOL-FM	Athens, Ga.
WDOM	Providence, R.I.
WDOR-FM	Sturgeon Bay, Wis.
WDOV-FM	Dover, Del.
WDRC-FM	Hartford, Conn.
WDRK-FM	Greenville, Ohio
WDRM	Decatur, Ala.
WDRN	Norwalk, Conn.
WDSC-FM	Dillon, S.C.
WDSU-FM	New Orleans, La.
WDTM	Detroit, Mich.(s)
WDTR	Detroit, Mich.
WDUB	Granville, Ohio
WDUN-FM	Gainesville, Ga.(s)
WDUQ	Pittsburgh, Pa.
WDUX-FM	Aberdeen, Wash.
WDUZ-FM	Green Bay, Wis.
WDVR	Philadelphia, Pa.
WDWS-FM	Champaign, Ill.
WDXE-FM	Lawrenceburg, Tenn.
WDXL-FM	Lexington, Tenn.
WEAF-FM	Philadelphia, Pa.
WEAS-FM	Savannah, Ga.
WEAU-FM	Eau Claire, Wis.
WEAV-FM	Plattsburgh, N.Y.
WEAW-FM	Evanston, Ill.
WEBH	Chicago, Ill.
WEBQ-FM	Harrisburg, Ill.
WEBR-FM	Buffalo, N.Y.
WECI	Richmond, Ind.
WECW	Elmira, N.Y.
WEDA-FM	Grove City, Pa.
WEDR-FM	Miami, Fla.
WEEC	Springfield, Ohio
WEED-FM	Rocky Mount, N.C.
WEEF-FM	Highland Park, Ill.
WEEI-FM	Boston, Mass.
WEEP-FM	Pittsburgh, Pa.
WEER-FM	Warrenton, Va.
WEEX-FM	Easton, Pa.
WEFA	Waukegan, Ill.
WEFG	Winchester, Va.
WEFM	Chicago, Ill.
WEGO-FM	Concord, N.C.
WEHH-FM	Elmira, N. Y.
WEIC-FM	Charleston, Ill.
WEIV	Ithaca, N.Y.
WEKZ-FM	Monroe, Wis.
WELD-FM	Tupelo, Miss.
WELF	Glen Ellyn, Ill.
WELG	Elgin, Ill.
WELL-FM	Freeport, Ill.
WELP-FM	Easley, S. C.
WEMC	Harrisonburg, Va.
WEMI	Tampa, Fla.
WEMP-FM	Milwaukee, Wis.
WEMU	Ypsilanti, Mich.
WEND-FM	Ebensburg, Pa.
WENY-FM	Elmira, N. Y.
WEOK-FM	Poughkeepsie, N.Y.
WEOL-FM	Elyria, Ohio
WEPM-FM	Martinsburg, W.Va.
WEPS	Elgin, Ill.
WEQR	Goldsboro, N.C.
WERE-FM	Cleveland, Ohio
WERH-FM	Hamilton, Ala.
WERI-FM	Westerly, R.I.
WERM	Wapakoneta, Ohio
WERS	Boston, Mass.
WERT-FM	Van Wert, Ohio
WESC-FM	Greenville, S.C.
WEST-FM	Easton, Pa.
WETL	South Bend, Ind.
WETN	Wheaton, Ill.
WEVC	Evansville, Ind
WEVD-FM	New York, N.Y.
WEWO-FM	Laurinburg, N.C.
WEZY-FM	Cocoa, Fla.
WFAA-FM	Dallas, Tex.
WFAH-FM	Alliance, Ohio
WFAN	Washington, D.C.
WFAS-FM	White Plains, N.Y.
WFAU-FM	Augusta, Maine
WFAW	Fort Atkinson, Wis.
WFBC-FM	Greenville, S.C.
WFBE	Flint, Mich.
WFBG-FM	Altoona, Pa.
WFBM-FM	Indianapolis, Ind.
WFBS-FM	Winston-Salem, N.C.
WFCI	Franklin, Ind.
WFCJ	Miamisburg, Ohio
WFCR	Amherst, Mass.
WFDR-FM	Manchester, Ga.
WFDS-FM	Baltimore, Md.
WFFF-FM	Columbia, Miss.
WFFM	Muskegon, Mich.
WFHA-FM	Red Bank, N.J.
WFHR-FM	Wisconsin Rapids, Wis.
WFID	Rio Piedras, P.R.(s)
WFIG	Sumter, S.C.
WFIL-FM	Philadelphia, Pa.
WFIN-FM	Findlay, Ohio(s)
WFIU	Bloomington, Ind.
WFIW-FM	Fairfield, Ill.
WFIZ	Conneault, O.
WFKO	Kokomo, Ind.
WFLA-FM	Tampa, Fla.
WFLM	Ft. Lauderdale, Fla.
WFLN-FM	Philadelphia, Pa.
WFLO	Farmville, Va.
WFLT-FM	Franklin, Tenn.
WFLW-FM	Monticello, Ky.
WFLY	Troy, N.Y.
WFMA	Rocky Mount, N.C.
WFMB	Springfield, Ill.
WFMD-FM	Frederick, Md.
WFME	Newark, N.J.
WFMF	Chicago, Ill.
WFMG	Gallatin, Tenn.
WFMH-FM	Cullman, Ala.
WFMI	Montgomery, Ala.
WFMK	Mt. Horeb, Wis.
WFML	Washington, Ind.
WFMM-FM	Baltimore, Md.
WFMN	Newburgh, N. Y.
WFMQ	Lebanon, Tenn.
WFMS	Indianapolis, Ind.
WFMT	Chicago, Ill.(s)
WFMU	East Orange, N.J.
WFMW-FM	Madisonville, KY.
WFMX	Statesville, N.C.
WFMZ	Allentown, Pa.
WFNC-FM	Fayetteville, N.C.
WFNS-FM	Burlington, N.C.
WFNY	Racine, Wis.
WFOB-FM	Fostoria, Ohio
WFOL	Hamilton, Ohio(s)
WFOR-FM	Hattiesburg, Miss.
WFOS	Chesapeake, Va.
WFOY-FM	St. Augustine, Fla.
WFPG	Atlantic City, N.J.
WFPK	Louisville, Ky.
WFPL	Louisville, Ky.
WFQM	San Juan, P.R.
WFRB-FM	Frostburg, Md.
WFRE-FM	Fresno, Cal.
WFRL-FM	Freeport, Ill.
WFRO-FM	Fremont, Ohio
WFSC-FM	Franklin, N. C.
WFST-FM	Caribou, Maine
WFSU-FM	Tallahassee, Fla.
WFTL-FM	Ft. Lauderdale, Fla.
WFTM-FM	Maysville, Ky.
WFTW-FM	Ft. Walton Beach, Fla.
WFUL-FM	Fulton, Ky.
WFUR-FM	Grand Rapids, Mich.
WFUV	New York, N.Y.
WFVA-FM	Fredericksburg, Va.
WFYC-FM	Alma, Mich.
WFYN-FM	Key West, Fla.
WGAL-FM	Lancaster, Pa.
WGAN-FM	Portland, Me.
WGAR-FM	Cleveland, Ohio
WGAU-FM	Athens, Ga.(s)
WGAY	Washington, D.C.
WGBA-FM	Columbus, Ga.
WGBE-FM	Columbus, Ga.
WGBH-FM	Cambridge, Mass.(s)
WGBI-FM	Scranton, Pa.
WGBS-FM	Miami, Fla.
WGCB-FM	Red Lion, Pa. (s)
WGCS	Goshen, Ind.
WGEE-FM	Indianapolis, Ind.
WGEM-FM	Quincy, Ill.(s)
WGET-FM	Gettysburg, Pa.
WGEV	Beaver Falls, Pa.
WGFM	Schenectady, N.Y. (s)
WGGC	Glasgow, Ky.
WGGM	Taylorville, Ill.
WGH-FM	Newport News, Va.
WGHF	Brookfield, Conn.(s)
WGHQ-FM	Kingston, N.Y.
WGIG-FM	Brunswick, Ga.
WGIR-FM	Manchester, N. H.
WGKA-FM	Atlanta, Ga.
WGLB-FM	Port Washington, Wis.
WGLC-FM	Mendota, Ill.
WGLM	Richmond, Ind.
WGLS-FM	Glassboro, N. J.
WGNT	Normal, Ill.
WGMR-FM	Tyrone, Pa.
WGMS-FM	Washington, D.C.
WGMZ	Flint, Mich.(s)
WGNB	St. Petersburg, Fla.
WGNC-FM	Gastonia, N.C.
WGNU-FM	Madison, Ill.
WGOH-FM	Grayson, Ky.
WGOS	Miami Beach, Fla.
WGOV-FM	Valdosta, Ga.
WGPA-FM	Bethlehem, Pa. (from Ga.)
WGPC-FM	Albany, Ga. (s)
WGPM	Detroit, Mich.
WGPR	Detroit, Mich.(s)
WGPS	Greensboro, N.C.
WGR-FM	Buffalo, N.Y.
WGRE	Greencastle, Ind.
WGRN	Greenville, Ill.
WGRP-FM	Greenville, Pa.
WGSM-FM	Babylon, N.Y.
WGSU	Geneseo, N.Y.
WGTB-FM	Washington, D.C.
WGTS-FM	Takoma Park, Md.
WGUC	Cincinnati, Ohio
WGVE	Gary, Ind.
WGWR-FM	Asheboro, N.C.
WGYA	Interlochen, Mich.
WHA-FM	Madison, Wis.
WHAD	Delafield, Wis.
WHAG-FM	Halfway, Md. (s)
WHAI-FM	Greenfield, Mass.
WHAS-FM	Louisville, Ky.
WHAT-FM	Philadelphia, Pa. (s)
WHAV-FM	Haverhill, Mass.
WHBB-FM	Selma, Ala.
WHBC-FM	Canton, Ohio
WHBF-FM	Rock Island, Ill.(s)
WHBI	Newark, N.J.
WHBM-FM	Xenia, Ohio
WHCI	Hartford City, Ind.
WHCL-FM	Clinton, N.Y.
WHCN	Hartford, Conn.
WHCU-FM	Ithaca, N.Y.
WHDH-FM	Boston, Mass.
WHDL-FM	Allegheny, N.Y.
WHEB-FM	Portsmouth, N.H.
WHEN-FM	Syracuse, N.Y.
WHFB-FM	Benton Harbor, Mich.
WHFH	Flossmoor, Ill.
WHFI	Birmingham, Mich.
WHFM	Rochester, N.Y.
WHFS	Bethesda, Md.(s)
WHGM	Bellwood, Pa.
WHHI	Highland, Wis.
WHHS	Havertown, Pa.
WHHY-FM	Montgomery, Ala.
WHIL-FM	Medford, Mass.
WHIM-FM	Providence, R.I.
WHIO-FM	Dayton, Ohio
WHIY-FM	Mt. Dora, Fla.
WHIZ-FM	Zanesville, Ohio
WHK-FM	Cleveland, Ohio
WHKP-FM	Hendersonville, N.C.
WHKW	Chilton, Wis.
WHKY-FM	Hickory, N. C. (s)
WHLA	Holmen, Wis.
WHLD-FM	Niagara Falls, N. Y.
WHLF-FM	South Boston, Va.
WHLI-FM	Hempstead, N.Y.
WHLM-FM	Bloomsburg, Pa.
WHLS-FM	Port Huron, Mich.
WHLT-FM	Huntington, Ind.
WHMA-FM	Anniston, Ala.
WHMD	Marinette, Wis.
WHME	South Bend, Ind.
WHMP-FM	Northampton, Mass.
WHMS	Hialeah, Fla.
WHNC-FM	Henderson, N.C.
WHNR	McMinnville, Tenn.
WHO-FM	Des Moines, Iowa
WHOD-FM	Jackson, Ala.
WHOH	Hamilton, Ohio
WHOK-FM	Lancaster, Ohio
WHOM-FM	New York, N.Y.
WHOO-FM	Orlando, Fla.(s)
WHOP-FM	Hopkinsville, Ky.
WHOV	Hampton, Va.
WHP-FM	Harrisburg, Pa.
WHPE-FM	High Point, N.C.
WHPH	Hanover, N.J.
WHPR	Highland Park, Mich.
WHRB-FM	Cambridge, Mass.
WHRL	Albany, N.Y.
WHRM	Wausau, Wis.
WHRW	Binghamton, N.Y.
WHSA	Highland Twp., Wis.
WHSB	Alpena, Mich.
WHSL-FM	Wilmington, N.C.
WHSR-FM	Winchester, Mass.
WHSY-FM	Hattiesburg, Miss.
WHTC-FM	Holland, Mich.
WHTG-FM	Eatontown, N.J.
WHUB-FM	Cookeville, Tenn.
WHUS	Storrs, Conn.
WHWC	Colfax, Wis.
WHYL-FM	Carlisle, Pa.
WHYN-FM	Springfield, Mass.
WIAC-FM	San Juan, P. R. (s)
WIAL	Eau Claire, Wis.
WIAM-FM	Williamston, N.C.
WIAN	Indianapolis, Ind.
WIBA-FM	Madison, Wis.
WIBC-FM	Indianapolis, Ind.
WIBF-FM	Jenkintown, Pa.
WIBG-FM	Philadelphia, Pa.
WIBM-FM	Jackson, Mich.
WIBQ-FM	Utica, N. Y.
WIBW-FM	Topeka, Kan.
WICB	Ithaca, N.Y.
WICH-FM	Norwich, Conn.
WICR	Indianapolis, Ind.
WIFF	Auburn, Ind.
WIFI	Philadelphia, Pa. (s)
WIFN	Franklin, Ind.
WIKY-FM	Evansville, Ind.
WIL-FM	St. Louis, Mo.
WILE-FM	Cambridge, O.
WILL-FM	Urbana, Ill.
WILO-FM	Frankfort, Ind.
WILS-FM	Lansing, Mich.
WIMA-FM	Lima, Ohio
WINA-FM	Charlottesville, Va.
WINE-FM	Kenmore, N.Y.
WINK-FM	Ft. Myers, Fla.
WINZ-FM	Miami, Fla.
WIOD-FM	Miami, Fla.
WIPR-FM	San Juan, P.R.
WIRA-FM	Ft. Pierce, Fla.
WIRJ-FM	Humboldt, Tenn.
WISA-FM	Isabela, P.R.
WIRQ	Rochester, N.Y.
WISH-FM	Indianapolis, Ind.(s)
WISM-FM	Madison, Wis.(s)
WISN-FM	Milwaukee, Wis.
WIST-FM	Charlotte, N.C.
WISU	Terre Haute, Ind.
WISZ-FM	Glen Burnie, Md.
WITA-FM	San Juan, P.R.
WITH-FM	Baltimore, Md.
WITL-FM	Lansing, Mich.
WITN-FM	Washington, N. C.
WITZ-FM	Jasper, Ind.
WIUS	Christiansted, V.I.
WIVI-FM	Cristiansted, St. Croix, V.I.
WIVK-FM	Knoxville, Tenn.
WIVY-FM	Jacksonville, Fla.
WIXN-FM	Dixon, Ill.
WIZR-FM	Johnstown, N.Y.
WIZZ-FM	Streator, Ill.
WJAC-FM	Johnstown, Pa.
WJAS-FM	Pittsburgh, Pa.
WJAT-FM	Swainsboro, Ga.
WJAX-FM	Jacksonville, Fla.
WJAZ	Albany, Ga.
WJBC-FM	Bloomington, Ill.
WJBI	Cincinnati, Ohio
WJBK-FM	Detroit, Mich.
WJBL-FM	Holland, Mich.
WJBO-FM	Baton Rouge, La.
WJBR	Wilmington, Del.
WJCD-FM	Seymour, Ind.
WJCW-FM	Johnson City, Tenn.
WJDX-FM	Jackson, Miss.
WJEF-FM	Grand Rpds., Mich.(s)
WJEH-FM	Gallipolis, Ohio
WJEJ-FM	Hagerstown, Md.
WJGA-FM	Jackson, Ga.
WJGS	Houghton, Mich.
WJHL-FM	Johnson City, Tenn.
WJIG-FM	Tullahoma, Tenn.(s)
WJIM-FM	Lansing, Mich.
WJIV	Cherry Valley, N.Y.
WJIZ	Albany, Ga.
WJJD-FM	Chicago, Ill.
WJLK-FM	Asbury Park, N.J.
WJLN	Birmingham, Ala.
WJMC-FM	Rice Lake, Wis.
WJMD	Bethesda, Md.(s)
WJMI	Jackson, Miss.
WJMK	Plainfield, Ind.
WJML	Petoskey, Mich.
WJMX-FM	Florence, S.C.
WJNC-FM	Jacksonville, N. C.
WJOF	Athens, Ala.
WJOI-FM	Florence, Ala.
WJOL-FM	Joliet, Ill.
WJOY-FM	Burlington, Vt.
WJPA-FM	Washington, Pa.
WJR-FM	Detroit, Mich.
WJRH	Easton, Pa.
WJRS-FM	Jamestown, Ky.
WJSI	Peoria, Ill.
WJSM	Martinsburg, Pa.
WJTN-FM	Jamestown, N.Y.
WJVA-FM	South Bend, Ind.
WJVM	Sterling, Ill.
WJW-FM	Cleveland, Ohio
WJZZ	Bridgeport, Conn.
WKAI-FM	MaComb, Ill.
WKAK	Kankakee, Ill.
WKAQ-FM	San Juan, P.R.
WKAR-FM	E. Lansing, Mich.
WKAT-FM	Jacksonville-Atlantic Beach, Fla.
WKAY-FM	Glasgow, Ky.
WKAZ-FM	Charleston, W.Va.
WKBC-FM	N. Wilkesboro, N.C.
WKBI-FM	San Antonio, Tex.

WHITE'S

RADIO LOG

Call	Location
WKBJ-FM	Milan, Tenn.
WKBL-FM	Covington, Tenn.
WKBN-FM	Youngstown, Ohio
WKBR-FM	Manchester, N.H.
WKBV-FM	Richmond, Ind.
WKCQ	Berlin, N.H.
WKCR-FM	New York, N.Y.
WKCS	Knoxville, Tenn.
WKCU-FM	Corinth, Miss.
WKDA-FM	Nashville, Tenn.
WKDN-FM	Camden, N.J.
WKEE-FM	Huntington, W.Va.
WKEI-FM	Kewanee, Ill.
WKET-FM	Kettering, Ohio(s)
WKEU-FM	Griffin, Ga.
WKEY-FM	Covington, Va.
WKFM	Chicago, Ill.(s)
WKFR-FM	Battle Creek, Mich.
WKHM-FM	Jackson, Mich.
WKIC-FM	Hazard, Ky.
WKIP-FM	Poughkeepsie, N.Y.
WKIS-FM	Orlando, Fla.
WKIX-FM	Raleigh, N.C.
WKJB-FM	Mayaguez, P. R.
WKJF	Pittsburgh, Pa.(s)
WKJG-FM	Ft. Wayne, Ind.
WKKD-FM	Aurora, Ill.
WKKY-FM	Erlanger, Ky.
WKLC-FM	St. Albans, W.Va.
WKLF-FM	Clanton, Ala.
WKLS	Marietta, Ga.
WKLW-FM	Grand Rapids, Mich.
WKMH-FM	Dearborn, Mich.
WKMO	Kokomo, Ind.
WKNA	Charleston, W.Va.(s)
WKNC-FM	Raleigh, N.C.
WKNE-FM	Keene, N.H.
WKNT-FM	Kent, O.
WKOC	Kankakee, Ill.
WKOD-FM	Hyannis, Mass.
WKOF	Hopkinsville, Ky.
WKOK-FM	Sunbury, Pa.
WKOP-FM	Binghamton, N.Y.
WKOX-FM	Framingham, Mass.
WKOZ-FM	Kosciusko, Miss.
WKPT-FM	Kingsport, Tenn.(s)
WKRC-FM	Cincinnati, Ohio (s)
WKRG-FM	Mobile, Ala.
WKRT-FM	Cortland, N.Y.
WKSL	Greencastle, Pa.
WKSN-FM	Jamestown, N. Y.
WKSU-FM	Kent, Ohio
WKTA	McKenzie, Tenn.
WKTL	Struthers, O.
WKTM	N. Charleston, S.C.
WKTM-FM	Mayfield, Ky.(s)
WKTN-FM	Kenton, O.
WKTZ-FM	Jacksonville, Fla.(s)
WKUB	Manitowoc, Wis.
WKUZ	Wabash, Ind.
WKWK-FM	Wheeling, W.Va.
WKXI	Smyrna, Ga.
WKYW	Frankfort, Ky.
WKYX-FM	Paducah, Ky.
WLAC-FM	Nashville, Tenn.
WLAD-FM	Danbury, Conn.
WLAE	Hartford, Conn.
WLAG-FM	LaGrange, Ga.
WLAN-FM	Lancaster, Pa.
WLAP-FM	Lexington, Ky.
WLAT-FM	Conway, S.C.
WLAV-FM	Grand Rapids, Mich.
WLAY-FM	Muscle Shoals, Ala.
WLBB-FM	Carrollton, Ga.
WLBG-FM	Laurens-Clinton, S.C.
WLBH-FM	Mattoon, Ill.
WLBJ-FM	Bowling Green, Ky.
WLBK-FM	DeKalb, Ill.
WLBR-FM	Lebanon, Pa.
WLCK-FM	Scottsville, Ky.
WLCM-FM	Lancaster, S.C.
WLDM	Oak Park, Mich.(s)
WLDR-FM	Traverse City, Mich.
WLDS-FM	Jacksonville, Ill.
WLEC-FM	Sandusky, Ohio
WLEN	Adrian, Mich.
WLEO-FM	Ponce, P. R.
WLET-FM	Toccoa, Ga.
WLEW-FM	Bad Axe, Mich.
WLEX-FM	Lexington, Ky.
WLFM	Appleton, Wis.
WLGN-FM	Logan, O.
WLIB-FM	New York, N.Y.
WLIH-FM	New London, Wis.
WLIN	Detroit, Mich.
WLIP-FM	Kenosha, Wis.
WLIR	Hicksville, N.Y.(s)
WLIV-FM	Livingston, Tenn.
WLJC	Beattyville, Ky.
WLJM	Gadsden, Ala.
WLKR-FM	Norwalk, Ohio
WLLH-FM	Lowell, Mass.
WLMC	Okeechobee, Fla.
WLNA-FM	Peekskill, N.Y.
WLNH-FM	Laconia, N.H.
WLNO	London, Ohio
WLNR-FM	Lansing, Ill.
WLOA-FM	Braddock, Pa.(s)
WLOB-FM	Portland, Maine
WLOC-FM	Munfordville, Ky.
WLOE-FM	Leaksville, N.C.
WLOI-FM	La Porte, Ind.
WLOL-FM	Minneapolis, Minn.
WLOM	Chattanooga, Tenn.
WLOQ	Winter Park, Fla.
WLOS-FM	Asheville, N.C.
WLOV	Cranston, R.I.
WLOW-FM	Aiken, S.C.
WLPO-FM	La Salle, Ill.
WLPR	Mobile, Ala. (s)
WLRS	Louisville, Ky.
WLRJ	Roanoke, Va.
WLRW	Champaign, Ill.
WLS-FM	Chicago, Ill.
WLSM-FM	Louisville, Miss.
WLTA-FM	Atlanta, Ga.(s)
WLUR	Lexington, Va.
WLUV-FM	Loves Park, Ill.(s)
WLVL	Louisville, Ky.
WLVP	Franklin, N. J.
WLWM	Nashville, Tenn.
WLYC-FM	Williamsport, Pa.
WLYM-FM	Lynn, Mass.
WMAI-FM	Panama City, Fla.
WMAJ-FM	State College, Pa.
WMAL-FM	Washington, D.C.
WMAQ-FM	Chicago, Ill.(s)
WMAS-FM	Springfield, Mass.
WMAZ-FM	Macon, Ga.
WMBD-FM	Peoria, Ill.
WMBI-FM	Chicago, Ill.
WMBN-FM	Petoskey, Mich.
WMBO-FM	Auburn, N.Y.
WMC-FM	Memphis, Tenn.
WMCB-FM	Michigan City, Ind.
WMCD	Statesboro, Ga.
WMCF	Stuart, Fla. (s)
WMCO	New Concord, Ohio
WMDD-FM	Fajardo, P. R.
WMDE	Greensboro, N.C.(s)
WMEB-FM	Orono, Maine
WMEN-FM	Tallahassee, Fla.
WMER	Celina, Ohio
WMEV-FM	Marion, Va.
WMFC-FM	Monroeville, Ala.
WMFJ-FM	Daytona Beach, Fla.
WMFM	Madison, Wis.
WMFP	Ft. Lauderdale, Fla.
WMFR-FM	High Point, N.C.
WMGM	Atlantic City, N.J.
WMGW-FM	Meadville, Pa.
WMHC	South Hadley, Mass.
WMHE	Toledo, Ohio
WMHS	Morrison, Ill.
WMIL-FM	Milwaukee, Wis.
WMIN-FM	St. Paul, Minn.
WMIT	Black Mountain, N.C.
WMIV	S. Bristol, N.Y.
WMIX-FM	Mt. Vernon, Ill.
WMJR	Ft. Lauderdale, Fla.
WMKC	Oshkosh, Wis.
WMKY-FM	Morehead, Ky.
WMLS-FM	Sylacauga, Ala.
WMLW	Milwaukee, Wis.
WMMB-FM	Melbourne, Fla.
WMMM	Westport, Conn.
WMMR	Philadelphia, Pa.
WMNA-FM	Gretna, Va.
WMNB-FM	North Adams, Mass.
WMNI-FM	Columbus, Ohio
WMOA-FM	Marietta, O.
WMOP-FM	Ocala, Fla.
WMOR-FM	Morehead, Ky.
WMOU-FM	Berlin, N.H.
WMPI	Scottsburg, Ind.
WMPL-FM	Hancock, Mich.
WMPS-FM	Memphis, Tenn.
WMRF-FM	Lewistown, Pa.
WMRI-FM	Marion, Ind.
WMRN-FM	Marion, Ohio
WMRO-FM	Aurora, Ill.
WMRY	E. St. Louis, Ill.
WMRP-FM	Flint, Mich.
WMSC-FM	Oakland, Md.
WMSH-FM	Elizabethtown, Pa.
WMSK-FM	Morganfield, Ky.
WMSP	Harrisburg, Pa.
WMSR-FM	Manchester, Tenn.
WMT-FM	Cedar Rapids, Iowa (s)
WMTH	Park Ridge, Ill.
WMTI	Norfolk, Va.
WMTM-FM	Moultrie, Ga.
WMTN-FM	Morristown, Tex.(s)
WMTS-FM	Murfreesboro, Tenn.
WMTW-FM	Mt. Washington, N.H.
WMUA	Amherst, Mass.
WMUB	Oxford, Ohio
WMUH	Allentown, Pa.
WMUK	Kalamazoo, Mich.
WMUL	Huntington, W.Va.
WMUN	Muncie, Ind.
WMUU-FM	Greenville, S.C.(s)
WMUZ	Detroit, Mich.
WMVA-FM	Martinsville, Va.(s)
WMVB-FM	Millville, N.J.
WMVG-FM	Milledgeville, Ga.
WMVO-FM	Mount Vernon, Ohio
WMVR-FM	Sidney, Ohio
WMYB-FM	Myrtle Beach, Fla.
WMYR-FM	Ft. Myers, Fla.
WNAD-FM	Norman, Okla.
WNAM-FM	Neenah-Menasha, Wis.
WNAS	New Albany, Ind.
WNAT-FM	Natchez, Miss.
WNAU-FM	New Albany, Miss.
WNAV-FM	Annapolis, Md
WNBC-FM	New York, N.Y.
WNBD-FM	Daytona Beach, Fla.
WNBF-FM	Binghamton, N.Y.
WNBH-FM	New Bedford, Mass.
WNBX	Andalusia, Ala.
WNCN	New York, N.Y.
WNCO-FM	Ashland, Ohio
WNCT-FM	Greenville, N.C.
WNDA	Huntsville, Ala.(s)
WNDU-FM	South Bend, Ind.
WNDY	Crawfordsville, Ind.
WNEM-FM	Bay City, Mich.(s)
WNES-FM	Central City, Ky.
WNEW-FM	New York, N.Y.
WNEX-FM	Macon, Ga.
WNFM	Naples, Fla.
WNFO	Nashville, Tenn.
WNGO-FM	Mayfield, Ky.
WNHC-FM	New Haven, Conn.
WNIB	Chicago, Ill.
WNIC	DeKalb, Ill.
WNIK-FM	Arecibo, P. R.
WNNJ-FM	Newton, N.J.
WNNR-FM	New Orleans, La.
WNOB	Cleveland, Ohio (s)
WNOF	St. Paul, Minn.
WNOK-FM	High Point, N.C.
WNON	Lebanon, Ind.
WNOR-FM	Norfolk, Va.
WNOS-FM	High Point, N.C.
WNOW-FM	York, Pa.
WNRE	Circleville, Ohio
WNRG-FM	Grundy, Va.
WNSL-FM	Laurel, Miss.
WMTH	Winnetka, Ill.
WNTI	Hackettstown, N.J.
WNTL	Memphis, Tenn.
WNUJ-FM	New Ulm, Minn.
WNUR	Evanston, Ill.
WNUS-FM	Chicago, Ill. (s)
WNWC-FM	Arlington Hts., Ill.
WNXT-FM	Portsmouth, O.
WNYC-FM	New York, N.Y.
WNYE	New York, N.Y.
WNYR-FM	Rochester, N.Y.
WOAK	Royal Oak, Mich.
WOAP-FM	Owosso, Mich.
WOAY-FM	Oak Hill, W.Va.
WOBN	Westerville, Ohio
WOBT-FM	Rhinelander, Wis.
WOC-FM	Davenport, Iowa
WOCB-FM	W. Yarmouth, Mass.
WOCH-FM	North Vernon, Ind.
WODL-FM	Carbondale, Pa.
WOFM	Greeneville, Tenn.
WOHS-FM	Shelby, N.C.
WOI-FM	Ames, Iowa
WOIV	De Ruyter, N.Y.
WOKU-FM	Greensburg, Pa.
WOKZ-FM	Alton, Ill.
WOL-FM	Washington, D.C.
WOLA	San Juan, P.R.
WOLI	Ottawa, Ill.
WOMC	Royal Oak, Mich.(s)
WOMI-FM	Owensboro, Ky.
WOMP-FM	Bellaire, Ohio
WONE-FM	Dayton, O.
WONO-FM	Syracuse, N. Y. (s)
WOOD-FM	Grand Rapids, Mich.
WOOF-FM	Dothan, Ala. (s)
WOPA-FM	Oak Park, Ill.
WOPI-FM	Bristol, Tenn.
WOR-FM	New York, N.Y.
WORA-FM	Mayaguez, P.R.
WORM-FM	Savannah, Tenn.
WORO	Corozal, P.R.
WORX-FM	Madison, Ind.
WOSC-FM	Fulton, N.Y.
WOSE	Oswego, N. Y.
WOSH-FM	Oshkosh, Wis.
WOSU-FM	Columbus, Ohio
WOTW-FM	Nashua, N.H.
WOUB-FM	Athens, Ohio
WOUR	Utica, N. Y.
WOVE	Welch, W. Va.
WOW-FM	Omaha, Nebr.
WOXR	Oxford, Ohio
WOYE-FM	Mayaquez, P. R.
WPAA	Andover, Mass.
WPAB-FM	Ponce, P. R.
WPAC-FM	Patchogue, N.Y.(s)
WPAD-FM	Paducah, Ky.
WPAT-FM	Paterson, N. J. (s)
WPAY-FM	Portsmouth, Ohio(s)
WPBA-FM	Palm Beach, Fla.
WPBC-FM	Richfield, Minn. (s)
WPBF	W. Palm Beach, Fla.
WPBS	Philadelphia, Pa.
WPBS	Philadelphia, Pa. (s)
WPEL-FM	Montrose, Pa.
WPEN-FM	Philadelphia, Pa.
WPEX-FM	Pensacola, Fla.(s)
WPFB-FM	Middletown, Ohio (s)
WPFK	Los Angeles, Cal.
WPFR	Terre Haute, Ind.
WPGA-FM	Perry, Ga.
WPGC	Bradbury Hts., Md.
WPGF-FM	Burgaw, N.C.
WPGI	Pittsburgh, Pa.
WPGU	Urbana, Ill.
WPHD	Norfolk, Va.
WPHS	Warren, Mich.
WPIC-FM	Sharon, Pa.
WPIN-FM	St. Petersburg, Fla.
WPIT-FM	Pittsburgh, Pa.
WPIX-FM	New York, N. Y.
WPJB-FM	Providence, R.I.
WPKE-FM	Pikeville, Ky.
WPKM	Tampa, Fla.
WPLB	Greenville, Mich.
WPLM-FM	Plymouth, Mass.
WPLN	Nashville, Tenn.
WPLO-FM	Atlanta, Ga.
WPMP-FM	Pascagoula, Miss.
WPOR-FM	Portland, Me.
WPOS-FM	Holland, O.
WPPA-FM	Pottsville, Pa.
WPRB	Princeton, N.J.
WPRK	Winter Park, Fla.
WPRM-FM	Park Rapids, Minn.
WPRO-FM	Providence, R.I.
WPRS-FM	Paris, Ill.
WPRW-FM	Manassas, Va.
WPSR	Evansville, Ind.
WPTF-FM	Raleigh, N.C.
WPTH	Fort Wayne, Ind. (s)
WPTN-FM	Cookeville, Tenn.
WPTW-FM	Piqua, Ohio
WPWT	Philadelphia, Pa.
WQAL	Philadelphia, Pa.(s)
WQDC-FM	Midland, Mich.(s)
WQFM	Milwaukee, Wis.
WQIK-FM	Jacksonville, Fla.
WQMF	Babylon, N.Y.(s)
WQMG	Greensboro, N.C.
WQMS	Hamilton, Ohio
WQMV	Vicksburg, Miss.
WQRB-FM	Pittsfield, Mass.
WQRS-FM	Detroit, Mich.
WQSB	Albertville, Ala.
WQST	Forest, Miss.
WQXI-FM	Atlanta, Ga.
WQXR-FM	New York, N.Y.
WQXY-FM	Baton Rouge, La.
WRAD-FM	Radford, Va.
WRAG-FM	Carrollton, Ala.
WRAJ-FM	Anna, Ill.
WRAK-FM	Williamsport, Pa.
WRAL-FM	Raleigh, N.C.
WRAR-FM	Tappahannock, Va.
WRAY-FM	Princeton, Ind.
WRBJ-FM	St. Johns, Mich.
WRBL-FM	Columbus, Ga.
WRBS	Baltimore, Md.
WRC-FM	Washington, D.C.
WRCO-FM	Richland Center, Wis.
WRCP-FM	Philadelphia, Pa.
WREC-FM	Memphis, Tenn.
WRED	Youngstown, Ohio
WREK	Woodstock, Ill.
WREO-FM	Ashtabula, Ohio
WRFD-FM	Worthington-Columbus, Ohio
WRFK	Richmond, Va.
WRFL	Winchester, Va.
WRFM	New York, N.Y.
WRFS-FM	Alexander City, Ala.
WRFY-FM	Reading, Pa.
WRGA-FM	Rome, Ga.
WRHS	Park Forest, Ill.
WRIG-FM	Wausau, Wis.
WRIP-FM	Rossville, Ga.
WRIT-FM	Milwaukee, Wis.
WRIU	Kingston, R. I.
WRIW	Mackinaw City, Mich.
WRJN-FM	Racine, Wis.
WRJR	Lewiston, Maine
WRKB-FM	Kannapolis, N.C.
WRKO-FM	Boston, Mass.
WRKT-FM	Cocoa Beach, Fla.(s)
WRLB	Long Branch, N.J.(s)
WRLC	Palmyra, Pa.
WRLD-FM	Lanett, Ala.
WRLJ	Jacksonville, Fla.
WRLM	Taunton, Mass.
WRMF-FM	Titusville, Fla.
WRMI-FM	Morris, Ill.
WRMN-FM	Elgin, Ill.
WRNJ	Atlantic City, N.J.
WRNL-FM	Richmond, Va.
WRNW	Mount Kisco, N.Y.
WROA-FM	Gulfport, Miss.
WROC-FM	Rochester, N.Y.
WROK-FM	Rockford, Ill.
WROM-FM	Rome, Ga.
WROW-FM	Albany, N.Y.
WROY-FM	Carmi, Ill.
WRPI	Troy, N.Y.
WRPM-FM	Poplarville, Miss.
WRPN-FM	Ripon, Wis.

Call	Location
WRR-FM	Dallas, Tex. (s)
WRRH	Franklin Lakes, N.J.
WRRN	Warren, Pa.
WRRZ-FM	Clinton, N.C.
WRSA	Decatur, Ala.
WRSC-FM	State College, Pa.
WRSJ-FM	Bayamon, P.R.
WRSV	Skokie, Ill.
WRSE-FM	Elmhurst, Ill.
WRSJ-FM	Bayamon, P. R.
WRST-FM	Oshkosh, Wis.
WRSW-FM	Warsaw, Ind.
WRTC-FM	Hartford, Conn.
WRTI-FM	Philadelphia, Pa.
WRUF-FM	Gainesville, Fla.
WRUN-FM	Utica, N.Y.
WRUR-FM	Rochester, N.Y.
WRUS-FM	Russellville, Ky.
WRUV	Burlington, Vt.
WRVA-FM	Richmond, Va.
WRVB-FM	Madison, Wis.
WRVC	Norfolk, Va.
WRVG	Georgetown, Ky.
WRVI	Winnebago, Ill.
WRVP	New York, N.Y.
WRWR	Port Clinton, Ohio(s)
WRXO-FM	Roxboro, N.C.
WSAB	Mt. Carmel, Ill.
WSAC-FM	Ft. Knox, Ky.
WSAE	Spring Arbor, Mich.
WSAL-FM	Logansport, Ind.
WSAM-FM	Saginaw, Mich.
WSAU-FM	Wausau, Wis.
WSB-FM	Atlanta, Ga.(s)
WSBA-FM	York, Pa.
WSBC-FM	Chicago, Ill.(s)
WSBF-FM	Clemson, S.C.
WSBT-FM	South Bend, Ind.
WSCB	Springfield, Mass.
WSCI-FM	Platteville, Wis.
WSCT-FM	Berkeley Springs, W.V.
WSDM	Chicago, Ill.
WSEB	Sebring, Fla.
WSEI	Olney, Ill.
WSEK	Somerset, Ky.
WSEL-FM	Pontotoc, Miss.
WSEN-FM	Baldwinsville, N. Y.
WSEO-FM	Kalamazoo, Mich.
WSEV-FM	Sieverville, Tenn. (s)
WSFM	Birmingham, Ala.(s)
WSHJ	Southfield, Mich.
WSHS	Floral Park, N.Y.
WSHU	Fairfield, Conn.
WSID-FM	Baltimore, Md.
WSIM-FM	Salem, Ind.
WSIP-FM	Paintsville, Ky.
WSIU	Carbondale, Ill.
WSIV-FM	Pekin, Ill.
WSIX-FM	Nashville, Tenn.(s)
WSJG	Hallandale, Fla.
WSJM-FM	St. Joseph, Mich.
WSJS-FM	Winston-Salem, N.C.
WSKS	Wabash, Ind.
WSLI-FM	Jackson, Miss.
WSLN	Delaware, Ohio
WSLS-FM	Roanoke, Va.
WSLU	Canton, N.Y.
WSMC-FM	Collegedale, Tenn.
WSMD-FM	Waldorf, Md.
WSMI-FM	Litchfield, Ill.
WSMJ	Greenfield, Ind.
WSMT-FM	Sparta, Tenn.
WSNJ-FM	Bridgeton, N.J.
WSOC-FM	Charlotte, N.C.
WSOM-FM	Salem, Ohio
WSON-FM	Henderson, Ky.
WSOU	S. Orange, N.J.
WSOY-FM	Decatur, Ill.
WSPA-FM	Spartanburg, S.C.(s)
WSPB-FM	Sarasota, Fla.
WSPD-FM	Toledo, Ohio
WSPE	Springville, N.Y.
WSPT-FM	Stevens Point, Wis.
WSRC-FM	Durham, N. C.
WSRF-FM	Ft. Lauderdale, Fla.
WSRS	Worchester, Mass.
WSRV	Syracuse, N. Y.
WSRW-FM	Hillsboro, Ohio
WSSU	Superior, Wis.
WSSV-FM	Petersburg, Va.
WSTC-FM	Stamford, Conn.
WSTM	St. Mathews, Ky.
WSTO	Owensboro, Ky. (s)
WSTP-FM	Salisbury, N.C.
WSTR-FM	Sturgis, Mich.
WSTU-FM	Stuart, Fla.
WSTV-FM	Steubenville, Ohio
WSUP	Platteville, Wis.
WSUW	Whitewater, Wis.
WSVA-FM	Harrisonburg, Va.
WSVB	Tamaqua, Pa.
WSVL-FM	Shelbyville, Ind.
WSVS-FM	Crewe, Va.
WSWG	Greenwood, Miss.
WSWM	East Lansing, Mich.(s)
WSWN-FM	Belle Glade, Fla.
WSWW-FM	Platteville, Wis.
WSYR-FM	Syracuse, N.Y.(s)
WTAB-FM	Tabor City, N. C.
WTCA-FM	Plymouth, Ind.
WTAD-FM	Quincy, Ill.
WTAE-FM	Pittsburgh, Pa.
WTAP-FM	Parkersburg, W. Va.
WTAR	Norfolk, Va.(s)
WTAS	Crete, Ill.
WTAW-FM	College Station, Tex.
WTAX-FM	Springfield, Ill. (s)
WTAY-FM	Robinson, Ill.
WTBC-FM	Tuscaloosa, Ala.
WTBO-FM	Cumberland, Md.
WTBS	Cambridge, Mass.
WTCA-FM	Plymouth, Ind.
WTCH-FM	Shawano, Wis.
WTCM-FM	Traverse City, Mich.
WTCO-FM	Campellsville, Ky.
WTCW-FM	Whitesburg, Ky.
WTCX	St. Petersburg, Fla.(s)
WTDS	Toledo, Ohio
WTFM	Lake Success, N.Y.(s)
WTGI	Hammond, La.
WTGN	Lima, O.
WTHI-FM	Terre Haute, Ind.
WTHS	Miami, Fla.
WTIC-FM	Hartford, Conn.(s)
WTIO	Charleston, W. Va.
WTJS-FM	Jackson, Tenn.
WTJU	Charlottesville, Va.
WTLN-FM	Maitland, Fla.
WTMA-FM	Charleston, S.C.
WTMB-FM	Tomah, Wis.
WTMJ-FM	Milwaukee, Wis.(s)
WTNC-FM	Thomasville, N.C.
WTOA	Trenton, N.J.
WTOC-FM	Savannah, Ga.
WTOD-FM	Toledo, Ohio
WTOF	Canton, Ohio
WTOL-FM	Toledo, Ohio
WTOP-FM	Washington, D.C.
WTOS	Wauwatosa, Wis.
WTOT-FM	Marianna, Fla.
WTPA-FM	Harrisburg, Pa.
WTRC-FM	Elkhart, Ind.
WTRE-FM	Greensburg, Ind.
WTRF-FM	Wheeling, W.Va.
WTRW-FM	Two Rivers, Wis.
WTSB-FM	Lumberton, N.C.
WTES-FM	Buffalo, N.Y.
WTSR	Trenton, N.J.
WTSV-FM	Claremont, N.H.
WTTC-FM	Towanda, Pa.
WTTF-FM	Tiffin, Ohio
WTTM-FM	Trenton, N.J.
WTTN-FM	Watertown, Wis.
WTTR-FM	Westminster, Md.
WTTV-FM	Bloomington, Ind.
WTVN-FM	Columbus, Ohio
WTVR-FM	Richmond, Va.
WTVY-FM	Dotham, Ala.
WUAG	Greensboro, N. C.
WUCB-FM	Chicago, Ill.
WUFM	Utica, N.Y.(s)
WUHY-FM	Philadelphia, Pa.
WULX-FM	Richmond, Ind.
WUNC	Chapel Hill, N.C.
WUNH	Durham, N.H.
WUOA	Tuscaloosa, Ala.
WUOM	Ann Arbor, Mich.
WUOT	Knoxville, Tenn.
WUPY	Lynn, Mass.(s)
WUSC-FM	Columbia, S.C.
WUSF	Tampa, Fla.
WUSQ	Springfield, O.
WUST-FM	Bethesda, Md.
WUSV	Scranton, Pa.
WUWM	Milwaukee, Wis.
WVAC	Adrian, Mich.
WVAF-FM	Charleston, W.Va.
WVAM-FM	Altoona, Pa.
WVBC	Bethany, W.Va.
WVBR-FM	Ithaca, N.Y.
WVBU-FM	Lewisbury, Pa.
WVCA-FM	Gloucester, Mass.
WVCG-FM	Coral Gables, Fla.(s)
WVEC-FM	Hampton, Va.
WVEM	Springfield, Ill.
WVFM	Lakeland, Fla.
WVFV	Dundee, Ill.
WVGR-FM	Grand Rapids, Mich.
WVHC	Hempstead, N.Y.
WVHI	Evansville, Ind.
WVIC-FM	E. Lansing, Mich.
WVIP-FM	Mount Kisco, N.Y.
WVIS	Terre Haute, Ind.
WVJP-FM	Caguas, P. R.
WVJS-FM	Owensboro, Ky.
WVKC-FM	Galesburg, Ill.
WVKO-FM	Columbus, Ohio
WVLK-FM	Lexington, Ky.(s)
WVLR	Sauk City, Wis.
WVMC-FM	Mt. Carmel, Ill.
WVMI-FM	Biloxi, Miss.
WVNA-FM	Tuscumbia, Ala.
WVNJ-FM	Newark, N.J.
WVNO-FM	Mansfield, Ohio(s)
WVOR	Rochester, N.Y.
WVOS-FM	Liberty, N.Y.
WVOT-FM	Wilson, N.C.
WVOX-FM	New Rochelle, N.Y.
WVOZ-FM	Carolina, P. R.
WVPO-FM	Stroudsburg, Pa.
WVQM	Huntington, W.Va.
WVSC-FM	Somerset, Pa.
WVSH	Huntington, Ind.
WVST	St. Petersburg, Fla.
WVSU-FM	Birmingham, Ala.
WVTL	Monticello, Ind.
WVTS	Terre Haute, Ind.(s)
WVUD-FM	Kettering, Ohio
WVUR-FM	Valparalso, Ind.
WVVV	Blacksburg, Va.
WVWB-FM	Bridgeton, N.C.
WVWO-FM	Cheyenne, Wyo.
WWBD-FM	Bamberg, S.C.
WWCF	Greenfield, Wis.
WWCO-FM	Waterbury, Conn.
WWDC-FM	Washington, D.C.
WWDL-FM	Scranton, Pa. (s)
WWDL	Scranton, Pa. (s)
WWGP-FM	Sanford, N.C.
WWHC	Hartford City, Ind.
WWHG-FM	Hornell, N.Y.
WWHI	Muncie, Ind.
WWHO	Jackson, Miss.
WWJ-FM	Detroit, Mich.
WWJC-FM	Superior, Wis.
WWKS	Macomb, Ill.
WWLA	La Crosse, Wis.
WWMO	Reidsville, N.C.
WWMT	New Orleans, La.(s)
WWOD-FM	Lynchburg, Va.
WWOG	Boca Raton, Fla.
WWOL-FM	Buffalo, N.Y.
WWOM-FM	New Orleans, La.
WWON-FM	Woonsocket, R.I.
WWOS	Palm Beach, Fla.
WWPB	Miami, Fla.(s)
WWQS	Orlando, Fla.
WWQT	Gainsville, Ga.
WWST-FM	Wooster, Ohio
WWSW-FM	Pittsburgh, Pa.
WWTV-FM	Cadillac, Mich.
WWVA-FM	Wheeling, W.Va.
WWVR	W. Terre Haute, Ind.
WWXL-FM	Manchester, Ky.
WWYN-FM	Erie, Pa. (s)
WXAC	Reading, Pa.
WXAX	Elkhart, Ind.
WXBM-FM	Milton, Fla.
WXBR	Cocoa Beach, Fla.
WXEL	Louisville, Ky.
WXEN-FM	Cleveland, Ohio
WXFM	Elmwood Park, Ill.
WXHR-FM	Boston, Mass.
WXKL	Winter Haven, Fla.
WXLI-FM	Dublin, Ga.
WXPN	Philadelphia, Pa.
WXQL	Glens Falls, N. Y.
WXQR-FM	Jacksonville, N. C.
WXRA	Woodbridge, Va.
WXRC	Hickory, N. C.
WXRF-FM	Guayama, P. R.
WXRI	Norfolk, Va.
WXTA	Greencastle, Ind.
WXTC	Annapolis, Md.
WXTO-FM	Grand Rapids, Mich.
WXUR-FM	Media, Pa.
WXYW	Suffolk, Va.
WXYZ-FM	Detroit, Mich.
WYAK	Sarasota, Fla.(s)
WYBC-FM	New Haven, Conn.
WYBG-FM	New Haven, Conn.
WYCS	Yorktown, Va.
WYDD	New Kensington, Pa.
WYCA	Hammond, Ind.
WYCE	Warwick, R.I.
WYCR	York-Hanover, Pa.
WYCS	Yorktown, Va.
WYFI	Norfolk, Va.(s)
WYFM	Charlotte, N.C.
WYFY-FM	Columbia, Tenn.
WYNR-FM	Brunswick, Ga.
WYON	Grand Rapids, Mich.
WYSH-FM	Clinton, Tenn.
WYSL-FM	Buffalo, N.Y.
WYSO	Yellow Springs, Ohio
WYZZ	Wilkes-Barre, Pa.
WZAK	Cleveland, O.
WZEP-FM	DeFuniak Springs, Fla.
WZFM	Charlestown, W.Va.
WZIP-FM	Cincinnati, Ohio
WZMF	Menomonee Falls, Wis.

Canadian AM Stations By Call Letters

Call	Location	kHz
CBA	Sackville, N.B.	1070
CBAF	Moncton, N.B.	1300
CBD	Saint John, N.B.	1110
CBDR	Schefferville, P.Q.	1230
CBE	Windsor, Ont.	1550
CBF	Montréal, Que.	690
CBG	Gander, Nfld.	1450
CBH	Halifax, N.S.	860
CBI	Sydney, N.S.	1140
CBJ	Chicoutimi, Que.	1580
CBK	Regina, Sask.	540
CBL	Toronto, Ont.	740
CBM	Montreal, Que.	940
CBN	St. John's, Nfld.	640
CBO	Ottawa, Ont.	910
CBOF	Ottawa, Ont.	1250
CBR	Calgary, Alta.	1010
CBT	Grand Falls, Nfld.	540
CBU	Vancouver, B.C.	690
CBV	Québec, Que.	980
CBW	Winnipeg, Man.	990
CBX	Edmonton, Alta.	740
CBY	Corner Brook, Nfld.	990
CBZ	Fredericton, N.B.	970
CFAB	Windsor, N.S.	1450
CFAC	Calgary, Alta.	960
CFAM	Altona, Man.	1290
CFAR	Flin Flon, Man.	590
CFAX	Victoria, B.C.	1070
CFBC	Saint John, N.B.	930
CFBR	Sudbury, Ont.	550
CFBV	Smithers, B.C.	1230
CFCB	Corner Brook, Nfld.	570
CFCF	Montreal 15, Que.	600
CFCH	Callander, Ont.	600
CFCL	Timmins, Ont.	620
CFCN	Calgary, Alta.	1060
CFCO	Chatham, Ont.	630
CFCP	Courtenay, B.C.	1440
CFCW	Camrose, Alta.	790
CFCY	Charlottetown, P.E.I.	630
CFDA	Victoriaville, Que.	1380
CFDR	Dartmouth, N.S.	790
CFGB	Goose Bay, Nfld.	1340
CFGM	Richmond Hill, Ont.	1310
CFGP	Grande Prairie, Alta.	1050
CFGR	Gravelbourg, Sask.	1230
CFGT	Saint-Joseph-d'Alma, Que.	1270
CFJC	Kamloops, B.C.	910
CFJR	Brockville, Ont.	1450
CFLD	Smithers, B.C. Studio at Station CFBV	1400
CFLM	La Tuque, Que.	1240
CFLV	Valleyfield, Que.	1370
CFMB	Montreal, Que.	1410
CFML	Cornwall, Ont.	1110
CFMR	Fort Simpson, N.W.T.	1490
CFNB	Fredericton, N.B.	550
CFNS	Saskatoon, Sask.	1170
CFOB	Fort Frances, Ont.	800
CFOM	Quebec, Que.	1340
CFOR	Orillia, Ont.	1570
CFOS	Owen Sound, Ont.	560
CFOX	Pointe Claire, Que.	1470
CFPA	Port Arthur, Ont.	1230
CFPL	London, Ont.	980
CFPR	Prince Rupert, B.C.	860
CFQC	Saskatoon, Sask.	600
CFRA	Ottawa, Ont.	580
CFRB	Toronto, Ont.	1010
CFRC	Kingston, Ont.	1490
CFRG	Gravelbourg, Sask.	710
CFRN	Edmonton, Alta.	1260
CFRS	Simcoe, Ont.	1560
CFRW	Winnipeg, Man.	1470
CFRY	Portage la Prairie, Man.	920
CFSL	Weyburn, Sask.	1340
CFSX	Stephenville, Nfld.	910
CFTJ	Galt, Ont.	1110
CFTK	Terrace, B.C.	590
CFUN	Vancouver, B.C.	1410
CFVR	Abbotsford, B.C.	1240
CFWB	Campbell River, B.C.	1490
CFWH	Whitehorse, Y.T.	570
CFYK	Yellowknife, N.W.T.	1340
CHAB	Moose Jaw, Sask.	800
CHAD	Amos, Que.	1340
CHAK	Inuvik, N.W.T.	860
CHAT	Medicine Hat, Alta.	1270
CHCM	Marystown, Nfld. with another studio at St. John's, Nfld.	560
CHEC	Lethbridge, Alta.	1090
CHED	Edmonton, Alta.	630
CHEF	Granby, Que.	1450
CHER	Sydney, N.S.	950
CHEX	Peterborough, Ont.	980
CHFA	Edmonton, Alta.	680
CHFC	Churchill, Man.	1230

Call	Location	kHz
CHFI	Toronto, Ont.	680
CHGB	La Pocatière, Que.	1310
CHIC	Brampton, Ont.	790
CHIN	Toronto, Ont.	1540
CHIQ	Hamilton, Ont.	1280
CHLC	Saguenay Co., Que.	580
CHLN	Trois-Rivières, Que.	550
CHLO	St. Thomas, Ont.	680
CHLT	Sherbrooke, Que.	630
CHML	Hamilton, Ont.	900
CHNC	New Carlisle, Que.	610
CHNO	Sudbury, Ont.	900
CHNS	Halifax, N.S.	960
CHOK	Sarnia, Ont.	1070
CHOV	Pembroke, Ont.	1350
CHOW	Welland, Ont.	1470
CHQM	Vancouver, B.C.	1320
CHQR	Calgary, Alta.	810
CHQT	Edmonton, Alta.	1110
CHRC	Québec, Que.	800
CHRD	Drummondville, Que.	1340
CHRL	Roberval, Que.	910
CHRS	Jacques-Cartier, Que.	1090
CHSJ	Saint John, N.B.	1150
CHSM	Steinbach, Man. Studio at Station CFAM, Altona, Man.	1250
CHTK	Prince Rupert, B.C.	560
CHTM	Thompson, Man.	610
CHUB	Nanaimo, B.C.	1570
CHUC	Cobourg, Ont.	1450
CHUM	Toronto, Ont.	1050
CHWK	Chilliwack, B.C.	1270
CHWO	Oakville, Ont.	1250
CHYM	Kitchener, Ont.	1490
CJAD	Montreal, Que.	800
CJAF	Cabano, Que.	1240
CJAT	Trail, B.C.	610
CJAV	Port Alberni, B.C.	1240
CJBC	Toronto, Ont.	860
CJBM	Causapscal, Que., with Studio at Rimouski, Que.	1450
CJBQ	Belleville, Ont.	800
CJBR	Rimouski, Que.	900
CJCA	Edmonton, Alta.	930
CJCB	Sydney, N.S.	1270
CJCH	Halifax, N.S.	920
CJCJ	Woodstock, N.B.	920
CJCN	Grand Falls, Nfld.	680
CJCS	Stratford, Ont.	1240
CJDC	Dawson Creek, B.C.	1350
CJDV	Drumheller, Alta.	910
CJEM	Edmundston, N.B.	570
CJET	Smiths Falls, Ont.	630
CJFP	Rivière-du-Loup, Que.	1400
CJFX	Antigonish, N.S.	580
CJGX	Yorkton, Sask.	940
CJIB	Vernon, B.C.	940
CJIC	Sault Ste. Marie, Ont.	1050
CJJC	Langley, B.C.	850
CJKL	Kirkland Lake, Ont.	560
CJLM	Joliette, Que.	1350
CJLR	Quebec, Que.	1060
CJLS	Yarmouth, N.S.	1340
CJLX	Fort William, Ont.	800
CJME	Regina, Sask.	1300
CJMS	Montreal, Que.	1280
CJMT	Chicoutimi, Que.	1420
CJNB	North Battleford, Sask.	1050
CJNR	Blind River, Ont.	730
CJOB	Winnipeg, Man.	680
CJOC	Lethbridge, Alta.	1220
CJON	St. John's, Nfld.	930
CJOR	Vancouver, B.C.	600
CJOX	Grand Bank, Nfld.	710
CJOY	Guelph, Ont.	1460
CJRL	Kenora, Ont.	1220
CJRN	Niagara Falls, Ont.	1600
CJRW	Summerside, P.E.I.	1240
CJSL	Estevan, Sask.	1280
CJSO	Sorel, Que.	1320
CJSP	Leamington, Ont.	710
CJSS	Cornwall, Ont.	1220
CJVI	Victoria, B.C.	900
CJVR	Melfort, Sask.	1420
CJWA	Sault Ste. Marie, Ont.	1240
CKAC	Montréal, Que.	730
CKAD	Middleton, N.S.	1490
CKAP	Kapuskasing, Ont.	580
CKAR	Huntsville, Ont.	630
CKAR-1	Parry Sound, Ontario, Studio at Station CKAR, Huntsville, Ontario	1340
CKAY	Duncan, B.C.	1300
CKBB	Barrie, Ont.	950
CKBC	Bathurst, N.B.	1360
CKBI	Prince Albert, Sask.	900
CKBL	Matane, Que.	1250
CKBM	Montmagny, Que.	1490
CKBS	St. Hyacinthe, Que.	1240
CKBW	Bridgewater, N.S.	1000
CKCB	Collingwood, Ont. with another Studio at Barrie, Ont.	1400
CKCH	Hull, Que.	970
CKCK	Regina, Sask.	620
CKCL	Truro, N.S.	600
CKCM	Grand Falls, Nfld. with another studio at St. John's, Nfld.	620
CKCN	Sept-Iles, Que.	560
CKCQ	Quesnel, B.C.	570
CKCR	Revelstoke, B.C. Studio at Station CKXR, Salmon Arm, B.C.	1340
CKCV	Québec, Que.	1280
CKCW	Moncton, N.B.	1220
CKCY	Sault Ste. Marie, Ont.	920
CKDA	Victoria, B.C.	1220
CKDH	Amherst, N.S.	900
CKDM	Dauphin, Man.	730
CKDR	Dryden, Ont. Studio at Station CJRL, Kenora, Ont.	900
CKEC	New Glasgow, N.S.	1320
CKEK	Cranbrook, B.C.	570
CKEN	Kentville, N.S.	1350
CKEY	Toronto, Ont.	590
CKFH	Toronto, Ont.	1430
CKGB	Timmins, Ont.	680
CKGM	Montreal, Que.	980
CKJL	Saint-Jérôme, Que.	900
CKKR	Rosetown, Sask.	1330
CKKW	Kitchener, Ont.	1320
CKLB	Oshawa, Ont.	1350
CKLC	Kingston, Ont.	1380
CKLD	Thetford Mines, Que.	1230
CKLG	Vancouver, B.C.	730
CKLM	Montreal, Que.	1570
CKLN	Nelson, B.C.	1390
CKLS	La Sarre, Que.	1240
CKLW	Windsor, Ont.	800
CKLY	Lindsay, Ont.	910
CKML	Mont Laurier, Que.	610
CKMP	Midland, Ontario	1230
CKMR	Newcastle, N.B.	790
CKNB	Campbellton, N.B.	950
CKNL	Fort St. John, B.C.	560
CKNW	New Westminster, B.C.	980
CKNX	Wingham, Ont.	920
CKOC	Hamilton, Ont.	1150
CKOK	Penticton, B.C.	800
CKOM	Saskatoon, Sask.	1250
CKOT	Tillsonburg, Ont.	1510
CKOV	Kelowna, B.C.	630
CKOX	Woodstock, Ont.	1340
CKOY	Ottawa, Ont.	1310
CKPC	Brantford, Ont.	1380
CKPG	Prince George, B.C.	550
CKPM	Ottawa, Ont.	1440
CKPR	Port Arthur, Ont.	580
CKPT	Peterborough, Ont.	1420
CKRB	Cté de Beauce, Que.	1460
CKRC	Winnipeg, Man.	630
CKRD	Red Deer, Alta.	850
CKRM	Regina, Sask.	980
CKRN	Rouyn, Que.	1400
CKRS	Jonquière, Que.	590
CKSA	Lloydminster, Alta.	1080
CKSB	Saint-Boniface, Man.	1050
CKSL	London, Ont.	1410
CKSM	Shawinigan, Que.	1220
CKSO	Sudbury, Ont.	790
CKSW	Swift Current, Sask.	1400
CKTB	St. Catharines, Ont.	610
CKTK	Kitimat, B.C.	1230
CKTR	Trois-Rivières, Que.	1150
CKTS	Sherbrooke, Que.	900
CKUA	Edmonton, Alta.	580
CKVD	Val-d'Or, P.Q.	900
CKVL	Verdun, Que.	850
CKVM	Ville-Marie, Que.	710
CKWL	Williams Lake, B.C.	1240
CKWS	Kingston, Ont.	960
CKWW	Windsor, Ont.	580
CKWX	Vancouver, B.C.	1130
CKX	Brandon, Man.	1150
CKXL	Calgary, Alta.	1140
CKXR	Salmon Arm, B.C.	580
CKY	Winnipeg, Man.	580
CKYL	Peace River, Alta.	610
VOAR	St. John's, Nfld.	1230
VOCM	St. John's, Nfld.	590
VOWR	St. John's, Nfld.	800

Canadian FM Stations by Call Letters

Abbreviations: (s) broadcasts stereo

Call	Location	MHz
CBC-FM	Toronto, Ont.	99.1
CBF-FM	Montreal, Que.	95.1
CBM-FM	Montreal, Que.	100.7
CBO-FM	Ottawa, Ont.	103.3
CBU-FM	Vancouver, B.C.	105.7
CBW-FM	Winnipeg, Man.	98.3
CFBC-FM	Saint John, N.B.	98.9
CFFM-FM	Kamloops, B.C.	98.3
CFFM-FM-1	Savona, B.C.—Re-broadcasting of CFFM-FM	101.9
CFFM-FM-2	Clearwater, B.C.—Rebroadcasting of CFFM-FM	92.7
CFFM-FM-3	Merritt, B.C.—Re-broadcasting of CFFM-FM	103.9
CFFM-FM-4	Clinton, B.C.—Rebroadcasting of CFFM-FM	106.5
CFFM-FM-5	Mount Timothy, B.C.—Rebroadcasting of CFFM-FM-4	99.7
CFMC-FM	Saskatoon, Sask.	103.9
CFMO-FM	Ottawa, Ont.	93.9
CFMQ-FM	Regina, Sask.	92.1
CFMS-FM	Victoria, B.C.	98.5
CFPL-FM	London, Ont.	95.9
CFQR-FM	Montreal, Que.	92.5
CFRC-FM	Kingston, Ont.	91.9
CFRN-FM	Edmonton, Alta.	100.3
CFRW-FM	Winnipeg, Man.	94.3
CHEC-FM	Lethbridge, Alta.	100.9
CHFI-FM	Toronto, Ont.	98.1
CHFM-FM	Calgary, Alta.	95.9
CHGB-FM	La Pocatiere, Que.	102.9
CHIC-FM	Brampton, Ont.	102.1
CHLT-FM	Sherbrooke, Que.	102.7
CHML-FM	Hamilton, Ont.	95.3
CHNS-FM	Halifax, N.S.	96.1
CHQM-FM	Vancouver, B.C.	103.5
CHRC-FM	Quebec, Que.	98.1
CHUM-FM	Toronto, Ont.	104.5
CHYM-FM	Kitchener, Ont.	96.7
CJBQ-FM	Belleville, Ont.	97.1
CJBR-FM	Rimouski, Que.	101.5
CJCA-FM	Edmonton, Alta.	99.5
CJCB-FM	Sydney, N.S.	94.9
CJFM-FM	Montreal, Que.	95.9
CJIC-FM	Sault Ste. Marie, Ont.	100.5
CJMS-FM	Montreal, Que.	94.3
CJOB-FM	Winnipeg, Man.	97.5
CJOV-FM	Kelowna, B.C.	104.7
CJRT-FM	Toronto, Ont.	91.1
CJSS-FM	Cornwall, Ont.	104.5
CJUS-FM	Saskatoon, Sask.	89.7
CKCL-FM	Truro, N.S.	100.9
CKCY-FM	Sault Ste. Marie, Ont.	104.3
CKFM-FM	Toronto, Ont.	99.9
CKGB-FM	Timmins, Ont.	94.5
CKGM-FM	Montreal, Que.	97.7
CKLC-FM	Kingston, Ont.	98.3
CKLG-FM	Vancouver, B.C.	99.3
CKLW-FM	Windsor, Ont.	93.9
CKOK-FM	Penticton, B.C.	97.1
CKOT-FM	Tillsonburg, Ont.	100.5
CKPC-FM	Brantford, Ont.	92.1
CKPR-FM	Port Arthur, Ont.	94.3
CKQS-FM	Oshawa, Ont.	93.5
CKRD-FM	Red Deer, Alta.	98.9
CKSO-FM	Sudbury, Ont.	92.7
CKTB-FM	St. Catharines, Ont.	97.7
CKUA-FM	Edmonton, Alta.	98.1
CKVL-FM	Verdun, Que.	96.9
CKWM-FM	Kentville, N.S.	97.7
CKWS-FM	Kingston, Ont.	96.3
CKX-FM	Brandon, Man.	96.1
CKY-FM	Winnipeg, Man.	92.1

Major Broadcast Stations in Mexico and the Caribbean

kHz	Call	Location
BAHAMAS		
1540	ZNSI	Nassau
CUBA		
570	CMHI	Santa Clara
590	CMW	Havana
630	CMHQ	Santa Clara
640	CMQ	Havana
690	CMBC	Havana
720	——	Colon
760	CMCD	Havana
790	CMCH	Havana
830	CMCA	Havana
860	CMBL	Havana
870	CMDN	Guantanamo
910	CMGX	Mantanzas
930	CMBF	Isle de Pinos
CURACAO (Netherlands, W. I.)		
855	PJC2	Willemstad (Curacao)

kHz	Call	Location
DOMINICAN REPUBLIC		
620	HISD	Santo Domingo
690	HIAW	Santo Domingo
790	HIL	Santo Domingo
958	HIF	Puerto Plata
1020	HIJP	Santo Domingo
1330	HIDB	Santiago de los Caballeros
1460	HIAN	Hato Mayor del Rey
HAITI		
1035	4VEC	Cap Hatien
JAMAICA		
550	——	Montego Bay
560	——	Kingston
580	——	Port Maria
620	——	Mandeville
700	——	Montego Bay
720	——	Kingston
750	——	Port Maria
770	——	Mandeville
MEXICO		
620	XENK	Mexico City
630	XEFB	Monterrey
660	XERPM	Mexico City
680	XELG	Leon
690	XEN	Mexico City
690	XETRA	Tijuana
730	XEX	Mexico City
730	XEX	Leon (relay)
800	XELO	Ciudad Juarez
850	XETQ	Orizaba
900	XEW	Mexico City
940	XEQ	Mexico City
970	XEJ	Ciudad Juarez
970	XEDF	Mexico City
980	XETU	Tampico
990	XETG	Tuxtla Gutierrez
1000	XEOY	Mexico City
1010	XEHL	Guadalajara
1030	XEQR	Mexico City
1060	XEPD	Mexico City
1110	XERCN	Mexico City
1150	XEJP	Mexico City
1260	XEL	Mexico City
1290	XEDA	Mexico City
1310	XEBP	Torreon
1320	XEAI	Mexico City
1460	HELX	Zitacuara
1500	XERH	Mexico City
1570	XERF	Ciudad Acuna
1580	XEDM	Hermosillo
1590	XEVOZ	Mexico City
SWAN ISLAND (United States)		
1160	——	Radio America

■ **The Great DX Challenge.** Okay you hot shot DX operators, here's your chance to dig 'neath the static and really hear some rough ones—or some that aren't so rough but are a bit on the rare or unusual side.

We'll list 'em, you try to hear 'em, then you score yourself. Scoring instructions are at the end of the challenge.

1. People's Liberation Army station, somewhere in Fukien Province, Communist China. Heard on 5900 kHz at 1130 GMT with Chinese dialog, singing, music.

2. Radio Tarawa, 4912.5 kHz, located in the Gilbert and Ellice Islands. Callsign is VTW2, runs only 2 kw into a poor antenna. Sked is 1845 to 2000 GMT Monday through Friday, and 0430 to 0600 GMT Monday, Wednesday, and Friday. On Sundays the station is on 0430 to 0630 GMT.

3. "The Voice of Rightousness," Taiwan, on 7198 kHz at 1200 GMT. Hard to pull through 40 meter Ham interference.

4. International Red Cross Radio, Geneva, Switzerland, on 7210 kHz. Station is on at 0600, 1130, 1500, and 2300 GMT from time to time during May, July, and September (about 3 days per month). Station runs 150,000 watts.

5. BBC station using sideband transmission with point-to-point (non-broadcast) transmission directed to Asia. Heard on 15912 kHz at 1330 GMT.

6. How many "spy" stations can you hear in one evening? These stations are usually found reading groups of numbers in Spanish or German on frequencies between 4 and 7 MHz. There's one station we've heard many evenings at around 0515 GMT on 5623 kHz with a real powerhouse signal. The bands bulge with these stations, believed to be in East Germany, Cuba, and possibly even the U. S.

7. How many countries can you log on 8837 or 6537 kHz? These are really swinging aeronautical channels used throughout the Caribbean area. Some of the countries to be heard include Haiti, Curacao, Puerto Rico, Jamaica, Trinidad, Cuba, Bahamas, Surinam, Colombia, Canal Zone, and Argentina.

8. Radio Gambia, on 4820 kHz at 2015 GMT. Gambia is the smallest nation in Africa (it's completely surrounded by another country and the ocean) and is not often reported by monitors.

9. Istanbul Police Radio, heard in Turkish each day on 6325 kHz from 0900 to 1000 GMT.

10. Radio Santa Cruz, in Santa Cruz de Quiche, Guatemala. A new station heard on 4872 kHz at 0000 GMT. Some say that this station operates only during religious holidays and festivals.

Scoring. Score *10 points* each for Challenges **1** through **5**, **8** through **10**. On Challenges **6** and **7**, you get *2 points* for each station logged.

Results: 80 and above, you're a champ. If you got 70, you're a pretty sharp operator. A score of 60 indicates that you show great promise. For 40 to 59 we say, keep trying—all is not lost. For 20 to 39—either try harder or get a better receiver. Less than 20 means that maybe you might do better at stamp collecting.

We invite our readers to send in their loggings for inclusion in these listings. Be sure to include the following information for each station reported: approximate frequency, callsign and/or station name, and time monitored in Greenwich Mean Time (24 hour clock). Address your reports to DX Central, White's Radio Log, RADIO-TV EXPERIMENTER, 505 Park Avenue, New York, N. Y. 10022, U.S.A.

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kHz	Call	Name	Location	GMT
2410	4VU	R. Lumiere	Port au Prince, Haiti	1005
2450	4VSO	R. V. Evangelique	Cap Haitien, Haiti	1030
3230	VRH8	Fiji BC	Suva, Fiji	0800
3304	VL8BD	R. Daru	Daru, New Guinea	1050
3395	VL98R	R. Rabaul	Rabaul, New Guinea	0800
3905	—	R. Port Vila	Port Vila, New Hebrides	0615
3925	VLK3	Austral. BC	Port Moresby, New Guinea	1255
3990	—	V. America Relay	Monrovia, Liberia	2240
4008	—	Govorit Frunze	Frunze, USSR	1200
4485	—	R. Petropavlovsk	Petropavlovsk, USSR	1200

60-Meter Band—4750-5060 kHz

4775	—	R. Kabul	Kabul, Afghanistan	1230
4780	—	R. Djibouti	Djibouti, Fr. Somaliland	1937
4795	—	R. Comercial	Lourenco Marques, Angola	2010
4807	—	R. Clube Sao Tome	Sao Tome	2135
4810	YVMG	R. Popular	Caracas, Venezuela	2345
4815	—	R. Ouagadougou	Ouagadougou, Upper Volta	0730
4839	—	R. Bukavu	Bukavu, Congo	0416
4840	YVOI	R. Valera	Caracas, Venezuela	0355
4855	—	Nigerian BC	Lagos, Nigeria	2055
4865	CSA97	Emis. Regional	Ponta Delgada, Azores	2225
4870	YVKP	R. Tropical	Caracas, Venezuela	0000
4885	ZGW85	V. Kenya	Nairobi, Kenya	2025
	ZYG26	R. Pioneira	Teresina, Brazil	0810
4890	VLT4	Austr. BC	Port Moresby, New Guinea	
4900	YVNK	R. Juventud	Caracas, Venezuela	1010
4904	—	R. Chad	Fort Lamy, Chad	0700
4910	—	V. of Revolucion	Conakry, Guinea	0640
4915	—	R. Ghana	Accra, Ghana	2245
4940	—	R. Abidjan	Abidjan, Ivory Coast	0600
4965	HJAF	R. Santa Fe	Bogota, Colombia	0445
5010	—	R. Garoua	Garoua, Cameroon	2150
	YVRW	R. Bocono	Caracas, Venezuela	0230
5015	—	Govorit Vladivostok	Vladivostok, USSR	1200
5020	HJFW	Tras. Caldas	Manizales, Colombia	0000
5026	—	R. Uganda	Kampala, Uganda	2030
5035	—	R. Bangui	Bangui, Centr. Afr. Rep.	2130
5040	—	R. Moscow	Tbilisi, USSR	0600
	—	Burmese BC	Rangoon, Burma	1155
5052	—	R. Singapura	Singapura, Singapore	1230
5804	—	R. Sanaa	Sanaa, Yemen	2040
5875	HRN	V. de Honduras	Tegucigalpa, Honduras	2340
5930	—	R. Prague	Prague, Czech.	1900
	—	R. Arkhangelsk	Arkhangelsk, USSR	0445

49-Meter Band—5950-6200 kHz

5955	—	R. Berlin Int'l.	Berlin, E. Germany	0110
5965	—	Swiss BC	Berne, Switz.	0115
5970	—	Canadian BC	Montreal, Que.	0100
5975	ZYT44	R. Guaruja	Florianapolis, Brazil	2230
5980	—	R. Moscow	Tbilisi, USSR	2100
5985	LRS2	R. Splendid	Buenos Aires, Argentina	0130
5990	—	RAI	Rome, Italy	0100
	—	R. Bucharest	Bucharest, Rumania	1930
	—	Canadian BC	Montreal, Que.	2330
6000	PRK5	R. Inconfidencia	Rio de Janeiro, Brazil	2245
6003	—	RIAS	Berlin, W. Germany	0435
6015	—	R. Habana	Havana, Cuba	2010
6045	YDF	RRI	Djakarta, Indonesia	1140
6050	—	R. Moscow	Irkutsk, USSR	2100
6055	—	R. Prague	Prague, Czech.	0700
6070	—	R. Habana	Havana, Cuba	0005
	—	R. Sofia	Sofia, Bulgaria	2135
	CFRX	CFRX	Toronto, Ont.	0030
6085	PCJ	R. Nederland	Hilversum, Neth.	2100
6095	—	R. Prague	Prague, Czech.	0330
6100	DMQ5	Deutsche Welle	Cologne, W. Germany	0015
6115	XEUDS	R. University	Sonora, Mex.	1800
6120	—	Swiss BC	Berne, Switz.	0030
6130	CHNX	CHNX	Halifax, N.S.	0730
6135	—	R. Habana	Havana, Cuba	0330
6150	—	R. Bucharest	Bucharest, Rumania	0130
6155	OEI2I	Viennese R.	Vienna, Austria	0750
6165	—	Swiss BC	Berne, Switz.	0700
6170	—	R. Habana	Havana, Cuba	0100
6175	—	R. Algiers	Algiers, Algeria	2230
6180	TGWB	V. de Guatemala	Guatemala City, Guat.	0000
6185	DMQ6	Deutsche Welle	Cologne, W. Germany	0145
6190	—	R. Bucharest	Bucharest, Rumania	2230
6195	—	BBC	London, England	2000
6234	—	R. Budapest	Budapest, Hungary	0330

41-Meter Band—7100-7300 kHz

7115	—	R. Prague	Prague, Czech.	0100
	—	Moroccan R-TV	Rabat, Morocco	0645
7120	—	BBC	London, England	2000
7125	—	R. Warsaw	Warsaw, Poland	0600
7130	CSA55	R. Nacional	Lisbon, Portugal	0630
	BED7	V. Free China	Taipei, Formosa	1000
7135	—	R. Monte Carlo	Monte Carlo, Monaco	0500
7185	—	R. Bucharest	Bucharest, Rumania	2230
7210	VUD	All India R.	New Delhi, India	1745
7225	—	R. Bucharest	Bucharest, Rumania	1930
7260	—	R. Moscow	Moscow, USSR	2100
7265	—	R. Tirana	Tirana, Albania	0015
7270	—	R. RSA	Capetown, S. Africa	0500
7275	—	RAI	Rome, Italy	0330
7280	—	R. Moscow	Moscow, USSR	2100
7295	—	V. America	Monrovia, Liberia	0300
	—	R. Ghana	Accra, Ghana	0615
	—	R. Novosibirsk	Novosibirsk, USSR	1140
7320	—	R. Moscow	Minsk, USSR	1900
7620	—	R. Peking	Peking, China	2340
9009	—	Kol Zion	Tel Aviv, Israel	0430
9250	—	R. Moscow	Alma Ata, USSR	0210
9370	—	R. Nacional	Madrid, Spain	2315
9410	—	BBC	London, England	0340
9475	—	UAR BC	Cairo, Egypt	0145
9480	—	R. Moscow	Komsomolsk, USSR	2330

31-Meter Band—9500-9775 kHz

9505	—	R. Japan	Tokyo, Japan	0600
9510	—	R. Bucharest	Bucharest, Rumania	1930
9525	—	Ici Paris	Paris, France	2100
9530	—	R. Japan	Tokyo, Japan	1800
9540	ZL2	R. N.Z.	Wellington, N.Z.	0615
9545	—	R. Ghana	Accra, Ghana	2100
9550	—	Windward Is. BC	St. Georges, Grenada	1635
9555	OIX2	Finnish BC	Helsinki, Finland	0635
	YSS	R. Nacional	San Salvador, El Salvador	2330
	CP6	R. del Estado	La Paz, Bolivia	1030
9560	—	R. Sofia	Sofia, Bulgaria	2200
	—	R. Prague	Prague, Czech.	1200
9570	—	R. Bucharest	Bucharest, Rumania	0215
9590	PCJ	R. Nederland	Hilversum, Neth.	2100
	—	R. Bucharest	Bucharest, Rumania	0130
9595	—	R. Free Europe	Lisbon, Port.	2145
9600	—	R. Tashkent	Tashkent, USSR	1215
	CE960	R. Pres. Balmaceda	Santiago, Chile	0125
9605	DMQ9	Deutsche Welle	Cologne, W. Germany	0200
9610	VLX9	Australian BC	Waneroo, Australia	2200
	ZYC8	R. Tupi	Rio de Janeiro, Brazil	0000
9620	—	VTVN	Saigon, S. Vietnam	1220
9625	—	R. Canada	Montreal, Que.	2300
9630	—	RAI	Rome, Italy	0105
9635	—	R. Nacional	Madrid, Spain	2130
9640	YVPG	Ecos del Torbes	Caracas, Venez.	1945
9645	HVJ	Vatican Radio	Vatican City	0050
9650	—	V. de Revolucion	Conakry, Guinea	2100
9655	—	R. Habana	Havana, Cuba	0630
9667	—	R. Ceylon	Colombo, Ceylon	1310
9675	DMQ9	Deutsche Welle	Cologne, W. Germany	1515
	—	R. RSA	Capetown, S. Africa	2330

kHz	Call	Name	Location	GMT
9685	—	R. Moscow	Moscow, USSR	0300
	—	V. Free Korea	Seoul, S. Korea	1035
9690	—	V. Nigeria	Lagos, Nigeria	2020
	—	R. Kiev	Kiev, USSR	0030
9730	—	R. Berlin Int'l.	Berlin, E. Germany	1800
9740	WNYW	R. N.Y. Worldwide	New York, N.Y.	2150
9750	—	R. RSA	Capetown, S. Africa	2350
9752	—	VTVN	Saigon, S. Vietnam	1230
9760	—	R. Nacional	Madrid, Spain	0130
9770	OEI47	Viennese R.	Vienna, Austria	0030
9795	—	R. Prague	Prague, Czech.	1730
9800	—	R. Kazan	Kazan, USSR	1540
9833	—	R. Budapest	Budapest, Hungary	0000
9840	—	R. Baku	Baku, USSR	1610
9865	YDF6	RRI	Djakarta, Indonesia	1145
9912	VUD	All India R.	New Delhi, India	1945
10353	—	R. Alma Ata	Alma Ata, USSR	0000
10885	—	R. Ulan Bator	Ulan Bator, Mongolia	0230
11570	—	R. Moscow	Moscow, USSR	1330
11672	—	R. Pakistan	Karachi, Pakistan	1900

25-Meter Band—11750-11975 kHz

kHz	Call	Name	Location	GMT
11700	HVJ	Vatican Radio	Vatican City	1840
11705	—	R. Sweden	Stockholm, Sweden	2015
11710	—	R. Australia	Melbourne, Australia	0500
11750	—	BBC Relay	Tebrau, Singapore	1145
11760	—	V. Vietnam	Hanoi, N. Vietnam	1000
	—	R. Habana	Havana, Cuba	0100
11780	—	R. Clube de Mozamb.	Lourenco Marques, Moz.	0335
11785	OEI52	Viennese Radio	Vienna, Austria	2200
11800	—	R. Nacional	Canary Is.	0015
11815	—	R. Free Europe	Lisbon, Portugal	2130
11820	ZL2	R. N.Z.	Wellington, N.Z.	0615
11825	—	R-TV Francaise	Papeete, Tahiti	0430
11835	4VEJ	V. Evangelique	Cap Haitien, Haiti	1330
11860	—	BBC	London, England	2015

19-Meter Band—15100-15450 kHz

kHz	Call	Name	Location	GMT
15105	—	BBC Relay	Ascension I.	1745
15115	HCJB	V. Andes	Quito, Ecuador	1620
15140	—	BBC Relay	Ascension I.	2000
15180	—	BBC Relay	Ascension I.	2000
15220	—	Trans World R.	Bonaire, Neth. Ant.	1705
15280	ZL4	R. N.Z.	Wellington, N.Z.	0355
15345	—	Hellenic BC	Athens, Greece	1730
15425	PCJ	R. Nederland	Hilversum, Neth.	1900

16-Meter Band—17700-17900 kHz

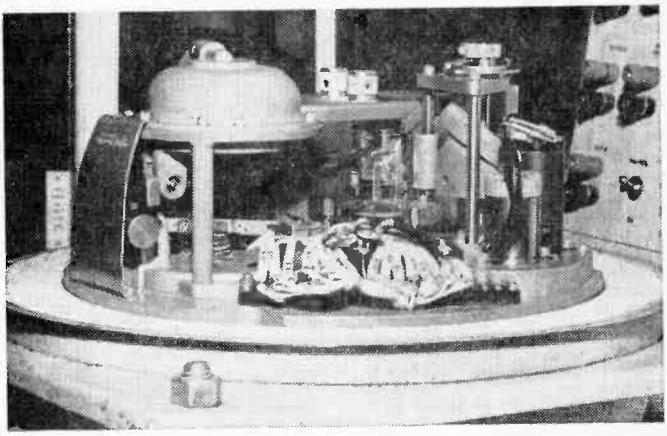
kHz	Call	Name	Location	GMT
17765	—	Deutsche Welle Relay	Kigali, Rwanda	1745
17805	—	V. West	Lisbon, Portugal	1455
17825	LLN	R. Norway	Oslo, Norway	1605

13-Meter Band—21450-21750 kHz

kHz	Call	Name	Location	GMT
21450	—	R. Prague	Prague, Czech.	0700
21495	—	V. West	Lisbon, Portugal	1825
21510	ORU	V. Friendship	Brussels, Belg.	1328
21720	—	R. Ghana	Accra, Ghana	1515

Made to Bug an Airplane

Continued from page 93



The interior of the LAS flight recorder in which the two-inch-wide aluminum foil tape keeps continuous record of plane's course, speed, altitude and stresses and strains.

earlier models were black, the present ones are painted with a special orange-yellow paint to make them easier to locate after an accident.

Protected. The flight recorders on Air-India's 707's are mounted in the left-hand wheel well, near the aircraft's center of gravity, a location which is considered ideal for measuring aircraft acceleration. The FAA has recently recommended that flight recorders should be installed nearer the tail to ensure minimum impact and fire damage.

The container of the flight recorder is fireproof and can withstand temperatures of up to 2,000° F. The spherical cover has been designed to provide ultimate crush resistance and has been successfully tested against a simulated impact force of 500g.

Lots of Data. Although flight recorders were initially introduced as an aid to accident investigation, subsequent technological advances have resulted in development of recorders with hundreds of channels to monitor various parameters of engine, aircraft and other systems' performance to assist trouble-shooting. It also serves as a valuable maintenance aid. During maintenance checks, engineers check the foil trace to see whether the aircraft has been subjected to undue strain such as a heavy landing which has gone unreported. If they find anything unusual they at once carry out a thorough inspection based on the clue supplied by the flight recorder. ■

LITERATURE

★ Starred items indicate advertisers in this issue. Consult their ads for additional information and specifications.

LIBRARY

CB—AMATEUR RADIO SHORTWAVE RADIO

121. Going CB? Then go *CB Center of America*. Get their catalog and discover the *big bonus* offered with each major product—serves all 50 states.

107. Get with the mobile set with *Tram's* XL'100. The new Titan CB base station, another *Tram* great, is worth knowing about.

116. Pep-up your CB rig's performance with *Turner's* M+2 mobile microphone. Get complete spec sheets and data on other *Turner* mikes.

★**93.** *Heath Co.* has a new 23-channel all-transistor 5-watt CB rig at the lowest cost on the market, plus a full line of CB gear. See their new 10-band AM/FM/Shortwave portable and line of shortwave radios.

101. If it's a CB product, chances are *International Crystal* has it listed in their colorful catalog. Whether kit or wired, accessory or test gear, this CB-oriented company can be relied on to fill the bill.

48. *Hy-Gain's* new CB antenna catalog is packed full of useful information and product data that every CB'er should know. Get a copy.

111. Get the scoop on *Versa-Tronics'* Versa-Tenna with instant magnetic mounting. Antenna models available for CB'ers, hams and mobile units from 27 MHz to 1000 MHz.

45. Catering to 2-way radio buffs for 30 years, *World Radio Laboratories* has a new free catalog which includes the latest CB transceivers, etc. Quarterly fliers chock-full of bargains are also available.

115. Get the full story on *Polytronics Laboratories'* latest CB entry —Carry-Comm. Full 5-watts, great for mobile, base or portable use. Works on 12 VDC or 115 VAC.

50. Make your connection with *Amphenol*—tune in to the latest on CB product news with specs and pics on new gear. Keep informed on Amphenol's new products.

100. You can get increased CB range and clarity using the "Cobra" transceiver with speech compressor—receiver sensitivity is excellent. Catalog sheet will be mailed by *B&K Division* of *Dynascan Corporation*.

★**54.** A catalog for CB'ers, hams and experimenters, with outstanding values. Terrific buys on *Grove Electronics'* antennas, mikes and accessories.

96. If a rugged low-cost business/industrial two-way radio is what you've been looking for, be sure to send for the brochure on *E. F. Johnson Co.'s* brand new Messenger "202."

103. *Squires-Sanders* would like you to know about their CB transceivers, the "23'er" and the new "S5S." Also, CB accessories that add versatility to their 5-watters.

46. A long-time builder of ham equipment, *Hallicrafters* will send you lots of info on the ham, CB and commercial radio-equipment.

KITS

★**42.** Here's a colorful 108-page catalog containing a wide assortment of electronic kits. You'll find something for any interest, any budget. And *Heath Co.* will happily send you a copy.

★**44.** *EICO's* new 48-page 2-color pocket-size short form catalog is just off the press. Over 250 products: Ham radio, CB, hi-fi—in kit and wired form—are illustrated. Also, discover *EICO's* new experimenter kit line.

ELECTRONIC PRODUCTS

66. Try instant lettering to mark control panels and component parts. *Datak's* booklets and sample show this easy dry transfer method.

108. Get the facts on *Mercury's* line of test equipment kits—designed to make troubleshooting easier, faster and more profitable.

67. "Get the most measurement value per dollar," says *Electronics Measurements Corp.* Send for their catalog and find out how!

92. How about installing a transistorized electronic ignition system in your current car? *AEC Laboratories* will mail their brochure giving you specifications, schematics.

109. *Seco* offers a line of specialized and standard test equipment that's ideal for the home experimenter and pro. Get specs and prices today.

ELECTRONIC PARTS

120. *Tab's* new electronics parts catalog is now off the press and you're welcome to have a copy. Some of *Tab's* bargains and odd-ball items are unbelievable.

117. Don't build that next project until you get your mits on *Bigelow's* 13th anniversary catalog. You've got to read this one to believe the buys.

1. Allied's catalog is so widely used as a reference book, that it's regarded as a standard by people in the electronics industry. Don't *you* have the latest *Allied Radio* catalog? The surprising thing is that it's free!

★**2.** The new 1967 Edition of *Lafayette's* catalog features sections on stereo hi-fi, CB, ham gear, test equipment, cameras, optics, tools and much more. Get your copy today.

★**3.** Bargains galore! Parts, tools, test equipment, radios and many more specials at ultra-low prices. *Progressive Edu-Kits* will send latest catalog.

★**4.** *Olson's* catalog is a multi-colored newspaper that's packed with more bargains than a phone book has names. Don't believe us? Get a copy.

23. No electronics bargain hunter should be caught without the 1967 copy of *Radio Shack's* catalog. Some equipment and kit offers are so low, they look like misprints. Buying is believing.

5. *Edmund Scientific's* new catalog contains over 4000 products that embrace many interests and fields. It's a 148-page buyers' guide for Science Fair fans.

★**106.** With 70 million TV's and 240 million radios somebody somewhere will need a vacuum tube replacement at the rate of one a second! Get *Universal Tube Co.'s* Troubleshooting Chart and facts on their $1 flat rate per tube.

★**7.** Whether you buy surplus or new, you will be interested in *Fair Radio Sales Co.'s* latest catalog—chuck full of surplus buys for every experimenter.

★**8.** Want a colorful catalog of goodies? *John Meshna, Jr.* has one that covers everything from assemblies to zener diodes. Listed are government surplus radio, radar, parts, etc. All at unbelievable prices.

★**6.** Bargains galore, that's what's in store! *Poly-Paks Co.* will send you their latest eight-page flyer listing the latest in available merchandise, including a giant $1 special sale.

10. *Burstein-Applebee* offers a new giant catalog containing 100's of big pages crammed with savings including hundreds of bargains on hi-fi kits, power tools, tubes, and parts.

★**11.** Now available from *EDI (Electronic Distributors, Inc.)* a catalog containing hundreds of electronic items. *EDI* will be happy to place you on their mailing list.

12. VHF listeners will want the latest catalog from *Kuhn Electronics*. All types and forms of complete receivers and converters.

HI-FI/AUDIO

26. Always a leader, *H. H. Scott* introduces a new concept in stereo console catalogs. "At Home With Stereo," offers decorating ideas, a complete explanation of the more technical aspects of stereo consoles.

85. Need a tuner? Preamp? Amp? Tape deck? Then inspect *Dynaco* for kits or wired units. It's worthwhile looking at test reports *Dynaco* sends your way.

119. *Kenwood* puts it right on the line. The all-new *Kenwood* stereo-FM receivers are described in a colorful 16 page booklet complete with easy-to-read-and-compare spec data. Get your copy today!

15. Besides sending specs on their famous speaker systems and turntable, *Acoustic Research* would like to give you a copy of their new "Stylus Force" booklet—must reading for hi-fi bugs.

16. Discover how Cueing Control, anti-skating and other *Garrard* features in the Lab 80 offer tops in audio listening. 32-page *Garrard* Comparator Guide will make you a wiser buyer—get it.

17. *Electro-Voice* has two new, pocket-size, four-color product guides for you. One covers speakers and components; the other, microphones and accessories.

19. *Empire* has made exceptional advances in speaker cabinet design you should read about. Also, *Empire's* successes in the turntable and cartridge fields are worth discovering.

24. Need a hi-fi or PA mike? *University Sound* has an interesting microphone booklet audio fans should read before making a purchase.

27. 12 pages of *Sherwood* receivers, tuners, amplifiers, speaker systems, and cabinetry make up a colorful booklet every hi-fi bug should see.

95. Confused about stereo? Want to beat the high cost of hi-fi without compromising on the results? Then you need the new 24-page catalog by *Jensen Manufacturing.*

99. Get the inside info on why *Acoustech's* solid-state amplifiers are the rage of the experts. Colorful brochure answers all your questions.

TAPE RECORDERS AND TAPE

113. *Scotch* is the product and it's made by *Minnesota Mining and Mfg. Co. (3M).* Get a packet full of facts and tape data from *3M* and learn all about your tape recorder and the tape it needs.

31. All the facts about *Concord Electronics Corp.* tape recorders are yours for the asking in a free booklet. Portable, battery operated to four-track, fully transistorized stereos cover every recording need.

32. "Everybody's Tape Recording Handbook" is the title of a booklet that *Sarkes-Tarzian* will send you. It's 24-pages jam-packed with info for the home recording enthusiast. Includes a valuable table of recording times for various tapes.

33. Become the first to learn about *Norelco's* complete Carry-Corder 150 portable tape recorder outfit. Four-color booklet describes this new cartridge-tape unit.

34. "All the Best from *Sony*" is an 8-page booklet describing *Sony-Superscope* products—Tape recorders, microphones, tape and accessories. Get a copy before you buy!

35. If you are a serious tape audiophile, you will be interested in the new *Viking of Minneapolis* line—they carry both reel and cartridge recorders you should know about.

91. Sound begins and ends with a *Uher* tape recorder. Write for this new 20 page catalog showing the entire line of *Uher* recorders and accessories. How to synchronize your slide projector, execute sound on sound, and many other exclusive features.

HI-FI ACCESSORIES

112. *Telex* would like you to know about their improved Serenata Headset—and their entire line of quality stereo headsets.

98. Swinging to hi-fi stereo headsets? Then get your copy of *Superex Electronics'* 16-page catalog featuring a large selection of quality headsets.

104. You can't hear FM stereo unless your FM antenna can pull 'em in. Learn more and discover what's available from *Finco's* 6-pager "Third Dimensional Sound."

SCHOOLS AND EDUCATIONAL

114. Prepare for tomorrow by studying at home with *Technical Training International.* Get the facts today on how you can step up in your present job.

★59. For a complete rundown on curriculum, lesson outlines, and full details from a leading electronic school, ask for this brochure from the *Indiana Home Study Institute.*

★61. *ICS (International Correspondence Schools)* offers 236 courses including many in the fields of radio, TV, and electronics. Send for free booklet "It's Your Future."

★74. Join the *troubleshooters!* Let *CIE (Cieveland Institute of Electronics)* train you to keep our electronics world running.

105. Get the low-down on the latest in educational electronic kits from *Trans-Tek.* Build light dimmers, amplifiers, metronomes, and many more. *Trans-Tek* helps you to learn while building.

TOOLS

118. Secure coax cables, speaker wires, phone wires, etc., with *Arrow* staple gun tackers. 3 models for wires and cables from 3/16" to ½" dia. Get fact-full Arrow literature.

★78. Need a compact screwdriver kit? *Xcelite's* 99PV-4 and 99PV-6 consists of handle, 3 and 5 blades, respectively, in "see-thru" zipper case. Get *Xcelite's* catalog 166.

TELEVISION

★70. *The Heath Co.* now has a 19" color TV to complement their 21" and 25" models. A new B&W portable model will be a hot seller for the mobile set. Get the facts today!

97. Interesting, helpful brochures describing the TV antenna discovery of the decade—the log periodic antenna for UHF and UHF-TV, and FM stereo. From *JFD Electronics Corporation.*

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Euphonics Miniconic

Continued from page 58

tion curves differed slightly from the individual curves supplied with the cartridge. This we attribute to the difference in measurement techniques. Instead of a "laboratory" test, we checked the *Miniconic* as it would be used by the audiophile—on a quality turntable in a matching arm with the shielded lead length exactly as supplied by the turntable manufacturer. However, the manufacturer's curves are valid and *honest*.

While the U-15-LS cartridge is rated for a stylus pressure of 0.75 to 1.5 grams, best results were obtained at 1.5 grams. With less than 1 gram of stylus pressure a slightly warped record could not be tracked at all. Perhaps the *Miniconic* in its own matching arm could be used at the very light stylus pressures.

Price Facts. The CK-15-LS phono conversion kit, consisting of the *Miniconic* U-15-LS cartridge and PS-15 Power Source, is available for $55.00. Several other kits are available, some with tone arms, that range in price from $87.50 to $39.00. Euphonics has prepared a beautiful four-color booklet that explains all the possible options in a very clear style. For your copy write to Euphonics Marketing, Dept. LE, 173 W. Madison St., Chicago, Ill. 60602. ■

Infrared Communicator

Continued from page 45

the fact that the noise generated by the audio amplifier in the transmitter modulates the GaAs diode and is received by the solar cell in the receiver. Now you can focus the GaAs diode and the solar cell in their respective mirrors by simply listening for maximum sound (noise in this case) in the receiver.

After you have aligned the system, you can connect a mike or phono cartridge to J1 on the panel of the transmitter and you're ready to transmit sound over an invisible light beam!

For demonstration purposes, you may want to buy an infrared filter. A 5⅜-in. diameter filter is available from *Edmund Scientific* for $2.00 (the part number is 60,033). This filter blocks out all visible light but lets through the infrared. When you insert the filter in the infrared beam between the transmitter and receiver, it will have little effect on the transmission of the beam. But insert your hand or a piece of cardboard in the path of the beam, and the transmission will be blocked. ■

Tornado Busting

Continued from page 36

in wastelands such as deserts, in open range lands, and like places.

Presumably the initial and major effort in combating tornados would be concentrated near highly populated areas in the midwest tornado belt. Highly mobile gun units would be deployed strategically so that they could reach all vulnerable areas quickly *before* the tornados are born rather than after the fact; this would only be possible if meterological techniques are refined to the point wherein it will be possible to predict with reasonable accuracy just where atmospheric conditions are building up potentially dangerous electrical charges in the clouds. And it would not seem to be beyond the possible that eventually we may see permanent anti-tornado gun emplacements ringed around major metropolitan areas where they would be ready to go into action the instant a tornado appears. ■

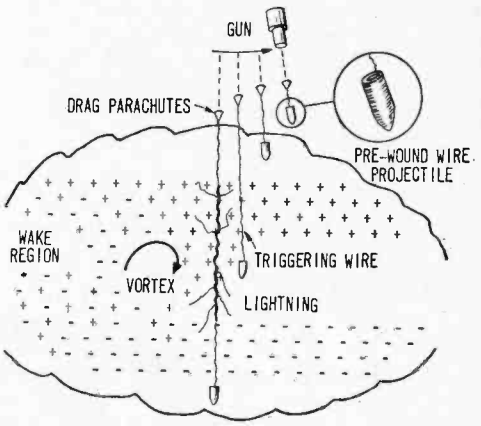

Fig. 11. Wires might be launched through charged area using coiled-wire projectile.

Tach Stretcher

Continued from page 70

screen each of which is one-half cycle. At 240 Hz, four lines appear. At 480 Hz, eight lines appear, each of which is one-eighth of one cycle. These patterns tend to shift slowly or rotate but are unmistakable. Use a minimum of sync amplitude to lock in the scope patterns.

Use the high rpm check points in Table 2 to check the accuracy of the tachometer over its entire scale. If desired, you can re-calibrate the tachometer precisely in the 2400 to 3600 rpm portion of the scale.

If you run out of pot adjustment during calibration, simply increase or decrease the value of R4, R5, or R6 as required. If the lowest rpm range cannot be brought into calibration, due to insufficient tachometer output at low rpm, delete that range. For this reason, the 500-rpm range is omitted for four-cycle, four-cylinder engines.

Application. Install the tachometer in the car. To use the *Tach Stretcher* adaptor, set S1 to the desired range and plug the connecting cable into J1. Remove the cable to restore normal operation of the tachometer.

For air-fuel ratio tests and adjustments, idle-speed adjustments and others, refer to the specifications for your particular engine. On the 500-, 1000-, and 2500-rpm ranges, each division mark on the meter respectively equals 10, 20, and 50 rpm affording excellent scale readability as required for these tests and adjustments.

When using the voltage ranges, always disconnect the cable. Use the .5-volt range to check for high-resistance grounds by measuring the voltage drop across a ground connection while it is carrying current. A good ground should indicate zero volts.

When the *Tach Stretcher* adaptor is not in use, set S1 to the *off* or *transit* position. ■

Double Fun

Continued from page 91

could listen to the tape that way? Okay, what does all this mean? It means, obviously, that the solution is to select a tape you can put a lot on—while still being able to play it back at low gain . . . and low noise, naturally!

When dubbing on *Kodak* type 34A High Output Professional Tape, our example, set the recording level on your slave unit at 4 decibels over your normal level—if you set your level by a VU meter, that's just slightly higher than normal. Because you can put a lot of signal on this tape, you can play it back at lower gain—and, there's the secret of how you manage to get your low noise.

It is not necessary, however, when you're getting started in dubbing your tapes to hold off because all you have at home is standard sound recording tape. Go right ahead and use your regular tape. Get the "feel" of making tape duplicates first. As a matter of fact, you may even find such dubbed tapes perfectly satisfactory. And remember, Aunt Harriet—or whoever you're sending your duplicate tapes to—may not be quite as critical as you are. The important thing is to get right into it so that you can see not only how easy it is to dub a tape, but also how much audio fun you can get out of it.

What Else. One of the beautiful parts of dubbing tapes is that aside from borrowing a second tape recorder, you really need no special accessories other than those that almost every tape enthusiast already has. *Kodak* Presstapes, for example, are handy little gismos to have around. These are ¼-inch pre-cut splices which can be easily applied to recording tape with none of the customary trimming—they are identical in width to the recording tape itself. *Kodak* also makes a leader and timing tape that's really useful to anyone who goes in for tape dubbing.

Duplicating your tapes, and thereby sharing your sound experiences with others, can be extremely rewarding. And, after all, isn't this what life is really all about—the sharing of experiences with others? ■

TABLE OF TAPE CHARACTERISTICS

Tape Characteristic	Kodak 31A Tape	Kodak 34A Tape
Bias	0.0 db	+ 0.8 db
Sensitivity at 37.5 mil wavelength	0.0	+ 2.1
Input at 2% harmonic distortion	+10.0	+13.0
Output at 2% harmonic distortion	+11.5	+16.3
Saturation output	+20.0	+23.6
Maximum dynamic range	75.0	79.0
Modulation S/N ratio		
20 to 1000 Hz (cps)	62.0	62.0
1000 to 15,000 Hz	64.0	67.0

Heathkit Guitar

Continued from page 66

shaded cherry red. The player only assembles the hardware and electrical components: he does *none* of the woodwork. All wires and cables are pre-cut and pre-stripped. And since all holes in the body are pre-drilled, assembly consists of nothing more than *fishing* the wired components into the correct holes, tightening the strings, and then tuning up. It's a one evening project.

Tune Up. The VU tuner is about the handiest gadget we've seen, intended for beginners who can't tell an A-sharp from an E-flat. You place the tuner on the guitar's bridge, then adjust one string until the gadget (actually a miniature tuning reed) vibrates. *Voila,* the string is almost perfectly tuned and you can then easily tune up the remaining strings.

Unlike solid-body electric guitars which must be used with amplifiers, the TG-46 has an acoustic body which, by itself, produces a full-rich sound. (And since the guitar can be used in practice sessions without an amplifier, you're more likely to stay on good terms with your family and neighbors.)

The Harmony-by-Heathkit TG-46 guitar, complete with lessons and VU tuner is priced at $189.95. Less expensive electric guitars (also Harmony-by-Heathkit) are available at $94.50 and $88.50. And if you're planning on purchasing a guitar amplifier, Heathkit has a dandy. It's a 60-watt amplifier kit (model TA-16) with all the fixings, that sells for $129.95. For additional information on any of these items, write to the Heath Co., Dept. EB, Benton Harbor, Mich. 49022.

You strummers ready? A-*one,* and-a-*two,* and-a-*three,* and-a . . . ■

Banana Belt DX

Continued from page 48

ragua which closely resembles Honduras, both politically and economically. When the CIA bombed Guatemala City, its planes flew from Managua International Airport. When the CIA's Bay of Pigs invasion fleet sailed, it sailed from Puerto Cabezas at the northern end of Nicaragua's Atlantic coast (the troops were actually trained in Guatemala). At that time Puerto Cabezas did have a broadcast station, R.Puerto, but it has since gone out of business. Another (YNVC La Voz del Puerto on 6075 kHz) has supposedly taken its place. To the best of our knowledge no DXer has ever reported hearing YNVC.

Probably the most widely logged Nicaraguan SWBC station is YNRG R.Zalaya, approximately 5950 kHz at Bluefields some 150 miles due south of Puerto Cabezas. Watch for this one around 0600-0700 EST and in the evenings. But, Nicaragua is almost as *easy* to log and QSL on the BCB where two potent Managua transmitters are often heard; government owned YNM Radiodifusora Nacional on 615 kHz, and YNOL Ondas del Luz ("Waves of Light") 828 kHz, a religious station. Watch for them both during the evening.

Costa Rica. Next we come to Costa Rica. Along with Panama, it ranks as Central America's most prosperous, democratic and literate country. It is also the most easily logged thanks to world famed missionary station TIFC at San Jose. This one can be heard almost nightly on 9645 kHz. TIFC "Faro del Caribe" (Lighthouse of the Caribbean) also has a potent BCB signal on 1075 kHz. English is scheduled at 2200-2300 EST. In the event you are looking for a little stiffer DX challenge, try TIQQ R.Casino on 5955 kHz at Puerto Limon and TIHBG R.Reloj on 6210 at San Jose.

Panama and Canal Zone. Panama currently has only one SWBC station which is heard with any regularity, but happily for SWLs, it's up on 31 meters. This is HOF31 on 9685 kHz at Panama City and owned by Panama's largest network, Radio Programas Continental.

However, from time to time, there is considerable anti-American feeling in Panama over the Canal Zone on which the U.S. has a long term lease. Whenever there is a "Yankee go home" surge, it becomes difficult to QSL Panamanian stations.

Also, because of that long-term lease, the Panama Canal Zone counts as a separate country for DX purposes. However, it has no SWBC transmitters and its BCB stations are seldom heard at a distance. Best bet is Panama Aeradio (WHZ operated by the Federal Aviation Agency at Balboa, C.Z.) which is widely heard on all Latin American aeronautical channels—2966, 5619, 8820—to mention just a few. The station simply identifies as "Panama". ■

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ELECTRONIC PARTS

28 CIRCUITS build: liquid-level control, burglar alarm, weather detector, trick circuits, fire alarm, etc. Booklet and special relay $3.95 prepaid. Alco, Dept. H, Lawrence, Mass.

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FOR INVENTORS

PATENT Searches—48 hour airmail service, $6.00, including nearest patent copies. More than 200 registered patent attorneys have used my service. Free invention protection Forms. Write Miss Ann Hastings, Patent Searcher, P. O. Box 176, Washington, D. C. 20004.

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PERSONAL

BILL Problems? Poor credit no trouble. Not a loan company. Send for free application. Automobile Acceptance, 318DC Broadway Blvd., Reno, Nev. 89502. or 307-DC Pocasset Ave., Providence, R. I. 02909.

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McGEE Radio Company. Big 1966-1967 Catalog Sent Free. America's Best Values. Hi-Fi, Amplifiers, Speakers, Electronic Parts. Send Name, Address and Zip Code Number to McGee Radio Company, 1901 McGee Street, Dept. RTV, Kansas City, Missouri 64108.

FREE Catalog. Electronics parts, tubes, Wholesale. Thousands of items. Unbeatable prices. Arcturus Electronics-RT, 502 22nd St., Union City, N. J. 07087.

CANADIANS—Giant Electronic Catalogs. Hi-Fi, Shortwave, Ham, CB. Rush $1.00. ETCO, Dept. EX, Box 741, Montreal, Canada.

ELECTRONICS Parts for Construction. Free Catalog. Bigelow Electronics, Bluffton, Ohio 45817.

UNASSEMBLED fruitwood Blaupunkt speaker kits for stereo or monaural $9.95. Worth more than double. Free Bulletin. Cherry Radio, 1430 Belfield, Philadelphia, Pennsylvania 19140.

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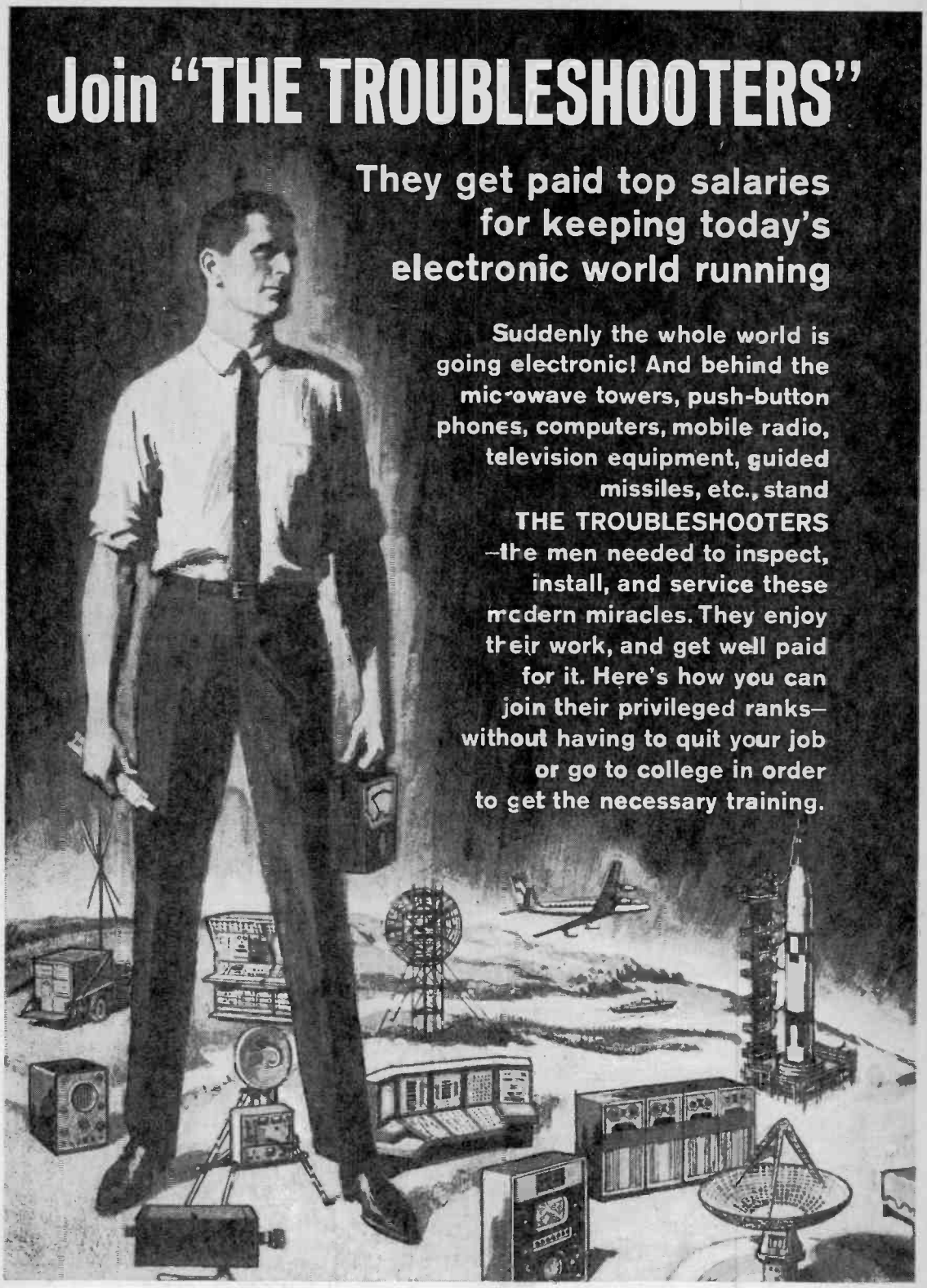

JUST THINK HOW MUCH in demand you would be if you could prevent a TV station from going off the air by repairing a transmitter...keep a whole assembly line moving by fixing automated production controls...prevent a bank, an airline or your government from making serious mistakes by repairing a computer.

Today, whole industries depend on electronics. When breakdowns or emergencies occur, someone has got to move in, take over, and keep things running. That calls for one of a new breed of technicians—The Troubleshooters.

Because they prevent expensive mistakes or delays, they get top pay—and a title to match. At Xerox and Philco, they're called Technical Representatives. At IBM they're Customer Engineers. In radio or TV, they're the Broadcast Engineers.

What do you need to break into the ranks of The Troubleshooters? You might think you need a college diploma, but you don't. What you need is know-how—the kind a good TV service technician has—only lots more.

Think With Your Head, Not Your Hands

The service technician, you see, "thinks with his hands." He learns his trade by taking apart and putting together, and often can only fix things he's already familiar with.

But as one of The Troubleshooters, you may be called upon to service complicated equipment that you've never seen before or *can't* take apart. This means you have to be able to take things apart "in your head." You have to know enough electronics to understand the engineering specs, read the wiring diagrams, and calculate how a circuit should test at any given point.

Now learning all this can be much simpler than you think. In fact, you can master it without setting foot in a classroom and without giving up your job!

AUTO-PROGRAMMED™ Lessons Show You How

For over 30 years, the Cleveland Institute of Electronics has specialized in teaching electronics at home. We've developed special techniques that make learning easy, even if you've had trouble studying before.

For one thing, our AUTO-PROGRAMMED™ lessons build your knowledge as you'd build a brick wall—one brick at a time. Each piece rests securely on the one that came before it.

In addition, our instruction is personal. When your teacher goes over your assignment, no one else competes for his attention. You are the only person in his class. He not only grades your work, he analyzes it to make sure you are thinking correctly. And he returns it the day it's received so that you can read his comments and corrections while everything is fresh in your mind.

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To keep up with the latest developments, our courses are constantly being revised. This year CIE students are getting new lessons in Laser Theory and Application, Microminiaturization, Single Sideband Techniques, Pulse Theory and Application, and Boolean Algebra.

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Two-way mobile work and many other types of troubleshooting call for a Government FCC License, and our training is designed to get it for you. But even if your work doesn't require a license, it's a good idea to get one. Your FCC License will be accepted anywhere as proof of good electronics training.

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The "Edu-Kit" offers you an outstanding PRACTICAL HOME RADIO COURSE at a rock-bottom price. Our Kit is designed to train Radio & Electronics Technicians, making use of the most modern methods of home training. You will learn radio theory, construction practice and servicing. THIS IS A COMPLETE RADIO COURSE IN EVERY DETAIL.

You will learn how to build radios, using regular schematics; how to wire and solder in a professional manner; how to service radios. You will work with the standard type of punched metal chassis as well as the latest development of Printed Circuit chassis.

You will learn the basic principles of radio. You will construct, study and work with RF and AF amplifiers and oscillators, detectors, rectifiers, test equipment. You will learn and practice code, using the Progressive Code Oscillator. You will learn and practice trouble-shooting, using the Progressive Signal Tracer, Progressive Signal Injector, Progressive Dynamic Radio & Electronics Tester, Square Wave Generator and the accompanying instructional material.

You will receive training for the Novice, Technician and General Classes of F.C.C. Radio Amateur Licenses. You will build Receiver, Transmitter, Square Wave Generator, Code Oscillator, Signal Tracer and Signal Injector Circuits, and learn how to operate them. You will receive an excellent background for television, Hi-Fi and Electronics.

Absolutely no previous knowledge of radio or science is required. The "Edu-Kit" is the product of many years of teaching and engineering experience. The "Edu-Kit" will provide you with a basic education in Electronics and Radio, worth many times the low price you pay. The Signal Tracer alone is worth more than the price of the kit.

THE KIT FOR EVERYONE

You do not need the slightest background in radio or science. Whether you are interested in Radio & Electronics because you want an interesting hobby, a well paying business or a job with a future, you will find the "Edu-Kit" a worth-while investment.

Many thousands of individuals of all ages and backgrounds have successfully used the "Edu-Kit" in more than 79 countries of the world. The "Edu-Kit" has been carefully designed, step by step, so that you cannot make a mistake. The "Edu-Kit" allows you to teach yourself at your own rate. No instructor is necessary.

PROGRESSIVE TEACHING METHOD

The Progressive Radio "Edu-Kit" is the foremost educational radio kit in the world, and is universally accepted as the standard in the field of electronics training. The "Edu-Kit" uses the modern educational principle of "Learn by Doing." Therefore you construct, learn schematics, study theory, practice trouble shooting—all in a closely integrated program designed to provide an easily-learned, thorough and interesting background in radio.

You begin by examining the various radio parts of the "Edu-Kit." You then learn the function, theory and wiring of these parts. Then you build a simple radio. With this first set you will enjoy listening to regular broadcast stations, learn theory, practice testing and trouble-shooting. Then you build a more advanced radio, learn more advanced theory and techniques. Gradually, in a progressive manner, and at your own rate, you will find yourself constructing more advanced multi-tube radio circuits, and doing work like a professional Radio Technician.

Included in the "Edu-Kit" course are Receiver, Transmitter, Code Oscillator, Signal Tracer, Square Wave Generator and Signal Injector Circuits. These are not unprofessional "breadboard" experiments, but genuine radio circuits, constructed by means of professional wiring and soldering on metal chassis, plus the new method of radio construction known as "Printed Circuitry." These circuits operate on your regular AC or DC house current.

THE "EDU-KIT" IS COMPLETE

You will receive all parts and instructions necessary to build twenty different radio and electronics circuits, each guaranteed to operate. Our Kits contain tubes, tube sockets, variable, electrolytic, mica, ceramic and paper dielectric condensers, resistors, tie strips, hardware, tubing, punched metal chassis, Instruction Manuals, hook-up wire, solder, selenium rectifiers, coils, volume controls and switches, etc.

In addition, you receive Printed Circuit materials, including Printed Circuit chassis, special tube sockets, hardware and instructions. You also receive a useful set of tools, a professional electric soldering iron, and a self-powered Dynamic Radio and Electronics Tester. The "Edu-Kit" also includes Code Instructions and the Progressive Code Oscillator, in addition to F.C.C. Radio Amateur License training. You will also receive lessons for servicing with the Progressive Signal Tracer and the Progressive Signal Injector, a High Fidelity Guide and a Quiz Book. You receive Membership in Radio-TV Club, Free Consultation Service, Certificate of Merit and Discount Privileges. You receive all parts, tools, instructions, etc. Everything is yours to keep.

Progressive "Edu-Kits" Inc., 1186 Broadway, Dept. 542NN, Hewlett, N. Y. 11557

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- HIGH FIDELITY GUIDE • QUIZZES
- TELEVISION BOOK • RADIO TROUBLE-SHOOTING BOOK
- MEMBERSHIP IN RADIO-TV CLUB: CONSULTATION SERVICE • FCC AMATEUR LICENSE TRAINING
- PRINTED CIRCUITRY

SERVICING LESSONS

You will learn trouble-shooting and servicing in a progressive manner. You will practice repairs on the sets that you construct. You will learn symptoms and causes of trouble in home, portable and car radios. You will learn how to use the professional Signal Tracer, the unique Signal Injector and the dynamic Radio & Electronics Tester. While you are learning in this practical way, you will be able to do many a repair job for your friends and neighbors, and charge fees which will far exceed the price of the "Edu-Kit." Our Consultation Service will help you with any technical problems you may have.

FROM OUR MAIL BAG

J. Stataitis, of 25 Poplar Pl., Waterbury, Conn., writes: "I have repaired several sets for my friends, and made money. The "Edu-Kit" paid for itself. I was ready to spend $240 for a Course, but I found your ad and sent for your Kit."

Ben Valerio, P. O. Box 21, Magna, Utah: "The Edu-Kits are wonderful. Here I am sending you the questions and also the answers I received them. I have been in Radio for the last seven years, but like to work with Radio Kits, and like to build Radio Testing Equipment. I enjoyed every minute I worked with the different kits; the Signal Tracer works fine. Also like to let you know that I feel proud of becoming a member of your Radio-TV Club."

Robert L. Shuff, 1534 Monroe Ave., Huntington, W. Va.: "Thought I would drop you a few lines to say that I received my Edu-Kit, and was really amazed that such a bargain can be had at such a low price. I have already started repairing radios and phonographs. My friends were really surprised to see me get into the swing of it so quickly. The Trouble-shooting Tester that comes with the Kit is really swell, and finds the trouble, if there is any to be found."

PRINTED CIRCUITRY

At no increase in price, the "Edu-Kit" now includes Printed Circuitry. You build a Printed Circuit Signal Injector, a unique servicing instrument that can detect many Radio and TV troubles. This revolutionary new technique of radio construction is now becoming popular in commercial radio and TV sets.

A Printed Circuit is a special insulated chassis on which has been deposited a conducting material which takes the place of wiring. The various parts are merely plugged in and soldered to terminals.

Printed Circuitry is the basis of modern Automation Electronics. A knowledge of this subject is a necessity today for anyone interested in Electronics.

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