Build – 1,000,000 -Volt Spark Generator!

Radio-TV EXPERIMENTER

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

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Tunable CB Converter for Your AM Radio

Seven Shortwave Hoaxes and How They Grew

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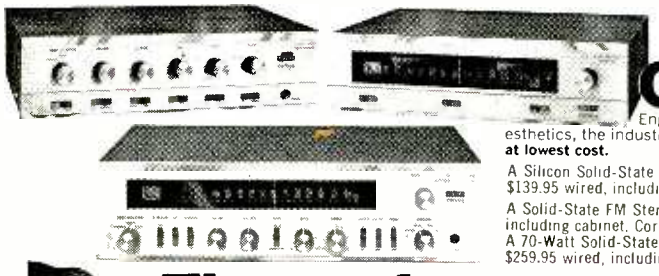

Cortina Stereo

Engineering excellence, 100% capability, striking esthetics, the industry's only **TOTAL PERFORMANCE STEREO at lowest cost.**

A Silicon Solid-State 70-Watt Stereo Amplifier for $99.95 kit, $139.95 wired, including cabinet. Cortina 3070.

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For all 6V/12V systems; 4, 6, 8-cyl. engines.

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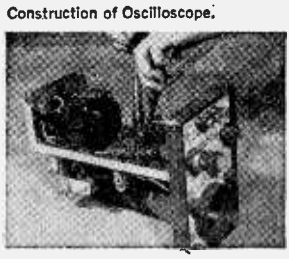
RCA

Transistor experiments on programmed breadboard – using oscilloscope.



Construction of Oscilloscope.

Construction of Multimeter.

Radio-TV EXPERIMENTER

June/ July 1968

SPECIAL CONSTRUCTION FEATURE

ELECTRONICS FEATURES

SPECIAL CONSTRUCTION PROJECTS

COMMUNICATIONS: CB • HAM • SWL

FEATURETTES

REGULAR DEPARTMENTS

WHITE'S RADIO LOG, Vol. 49, No. 4—page 106

Cover photo by Leonard Heicklen

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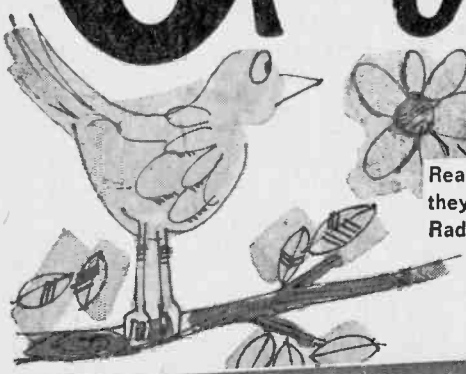
RADIO SHACK

Spring Clearance!



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Buy anything (in person or by mail) from the following Radio Shack pages using the order blank on page 20 and we'll automatically include one of our handy "MATHMILE" COMPUTERS. It's 7½" long and made of tough stock to give years of use. It multiplies and divides as fast as you can twirl the dial. It computes interest, figures percentages, does all kinds of auto computations. For example: you used 12 gallons of gas to drive 180 miles. How many miles did you get per gallon? Set the inner circle 12 against the outer circle 18.0 and read the answer at the black 10. It is 15 — as shown in the illustration. Complete detailed instruction for all computer functions are clearly printed on the back.

Store Addresses, Order Form, See Page 20

GIANT VALUES FOR "SOUND" HOBBYISTS

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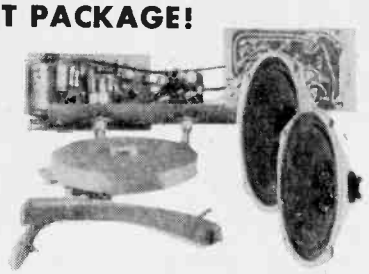

- *8-Watt Stereo Amplifier Semi-Kit Complete with Accessory Kit!*
- *Turntable, Tone Arm and Stereo Cartridge!*
- *Two 8-Inch Round Speakers!* • *No Extras to Buy!*

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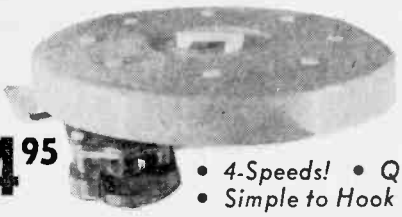

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- *4-Speeds!* • *Quiet!*
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Use with stereo amplifiers! Vibration-free AC operation assured by rubber shock-mounted friction drive motor. Speed changes controlled by idler driving the 8" metal turntable. 4½ x 3⅜" mounting centers; 2⅛" below base plate. #42-129; #278-1255, AC Line Cord, .39 net.

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- *Studio Quality!*
- *20-20,000 CPS!*

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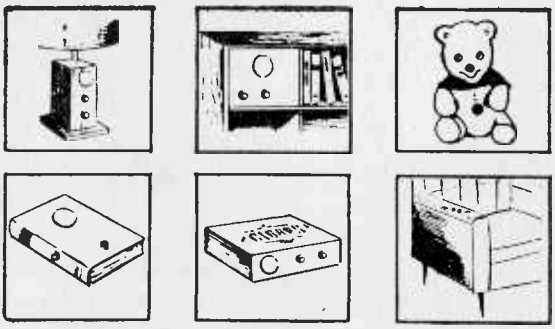

What's your project for our "Build In" radio?

Here's a wired transistor radio in 3 pieces. Dextrous do-it-yourselfers should have a field-day with this one.

You carpenters, metal-workers and gift designers will really appreciate Radio Shack's novel "Build In" — a 6-transistor superhet that's really *a kit that isn't a kit.* Confused? Part *one* is the radio, 100% wired, installed in a crystalline 2¼ x 1 x 3⅛" case with the tuning knob sticking out of one end, and 8 wires out of the other. Part *two* is a separate volume control with built-in switch, knob, and soldered leads. Part *three* is a 2¼" PM speaker installed in a plastic case, with soldered leads.

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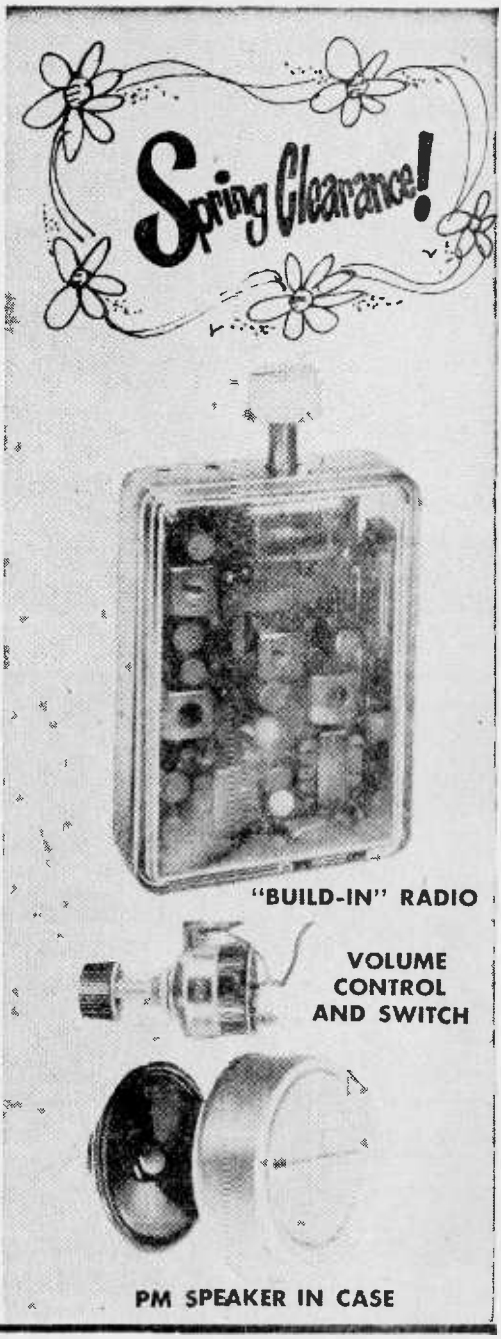
The basic radio itself looks like a little jewel, a real work of art — our photo doesn't do it justice. And the "kit that isn't a kit" is another of Radio Shacks's exciting exclusive products that can't be bought elsewhere. Get a "Build In" at your nearest Radio Shack store.

For Store Addresses, Order Form, See Page 20



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Spring Clearance!

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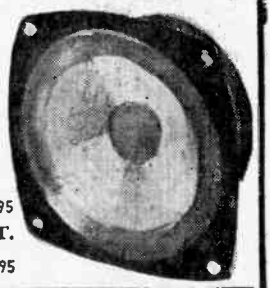
4" Acoustic Suspension FE-103 Speaker System!



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7.95

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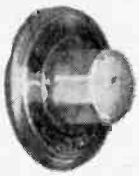
MINIATURE PM SPEAKERS FOR TRANSISTOR PROJECTS, RADIOS

8 Ohm Impedance



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ONLY 98¢ EACH!

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For Transistor Radios

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Neck/Hand/Desk Use!

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U.S. made with superactive rosin core. Fits fed. specs. QQ-S-571d
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Over 600 pieces! Something here for everyone! All brand new — no sweepings! One full pound. Comparable value: $4.50!
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Build Yourself — or Win Cash by Sending Us Your Own Ideas!

D.C.M.
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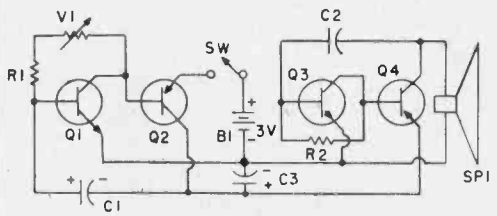
BEEP BEEPER

Produces Clocked One Second Pulses — Ideal for Audible Timing Devices



PROJECT PARTS LIST

Stock No.	Item	Net
272-954	30 MFD 15V Capacitor (C1)	.29
71-049	.1 MFD Capacitor (C2)	.22
272-953	10 MFD 15V Capacitor (C3)	.29
271-1716	50K Pot. (V1)	.59
70-0195	12K Resistor (R1)	.12
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270-385	Battery Holder	.49
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276-1701	Transistor 2N107 (Q2, Q4)	.49
40-246	2¼" PM Speaker (SP1)	.98
275-602	SPST Switch (SW)	.30

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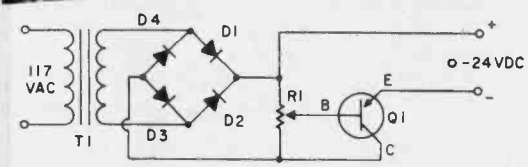
S.P.
Canoga Park, California

VARIABLE POWER SUPPLY

Transistorized with a Bridge Rectifier. Delivers up to 24 Volts DC. Great for Experimenters!



PROJECT PARTS LIST

Stock No.	Item	Net
276-1135	Diodes (D1, D2, D3, D4) (Pak of 2)	.29
271-1443	10K Pot. with Switch (R1)	.79
276-833	Power Transistor (Q1)	.98
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278-1255	Line Cord	.39

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730 Commonwealth Avenue, Boston, Mass. 02215

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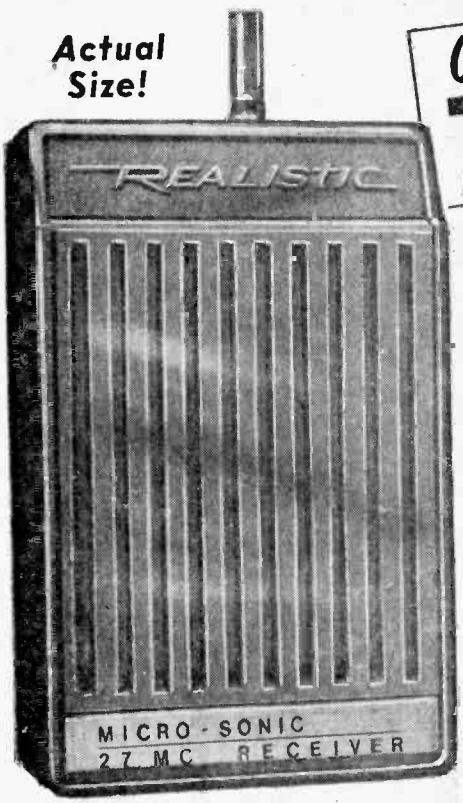
RADIO SHACK EXCLUSIVE! ADD A SLAVE "WALKIE" TO YOUR BASE, MOBILE, OR WALKIE TALKIES!

Actual Size!



ONLY 7.95

Crystal-controlled superhet receiver ONLY! Add as many ears to your network as you want. Fits in a shirt pocket — an excellent paging or guided tour device!

This unusual Radio Shack product, called the Realistic Microsonic 27MC Receiver, comes complete with a Ch. 11 CB crystal — and because it's a plug-in, it can be changed to any of the 23 channels. It's a teeny 3½ x 2½ x 1⅜". It includes an earphone with clip, and the phone's lead acts as the antenna. So if you want to hide it away as a pager, there's nothing showing. For DX we've included a 16" telescopic whip to be used only if necessary. Let your imagination run wild with this novel device!

21-109 Microsonic 27MC Receiver ..... Only 7.95

NEW IDEA #2 — as a companion to the above, or a wireless CB microphone (!), there's also the Realistic Microsonic CB transmitter. Same size, color, everything. But transmit only, 100mw of course, with plug-in crystal for Ch. 11. Uses? For example: one of these plus x-number of receivers and you have a guided tour technique that'll never quit!

21-110 Microsonic CB Transmitter ..... Only 7.95

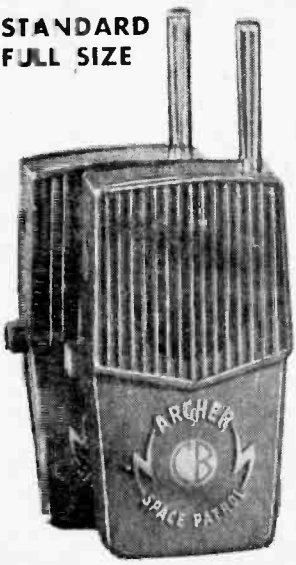
FREE ACCESSORIES:

- **Receiver — earphone and whip antenna**
- **Transmitter — 35" telescopic antenna**

Note: both units include crystals but require a 9V transistor battery to operate. 23-464, 29¢ each.

RADIO SHACK'S FABULOUS SPACE PATROL® TWOSOME

STANDARD FULL SIZE



ARCHER

SPACE PATROL®

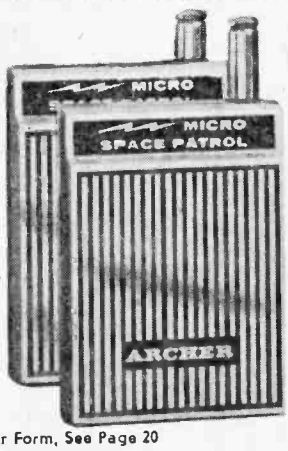
Talk up to ¼ mile with our perennial favorite in the 100MW no-license class. Over 100,000 of these transceivers now in use! "Lock-on" talk switch for continuous transmission when needed. Extra-long 43" telescopic antenna! Channel 14 crystal & battery included.

60-3030, 3 lbs. Pair 11.95

11.95 PER PAIR

ARCHER MICRO

SPACE PATROL®



Double transformer talk-power in the world's smallest (3-5/6 x 2-7/16 x 1¼") case. Fits easily in your shirt pocket (and your budget). Handsomely styled hi-impact, custom-chromed case. Easy to operate with a hideaway "push-to-talk" button. 9-section telescoping antenna. With channel 14 crystal and battery.

60-3032, 2 lbs. .... Pair 14.95

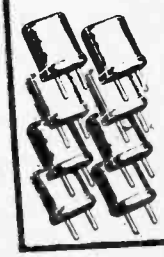
14.95 PER PAIR

For Store Addresses, Order Form, See Page 20

CB'ers MOBILE REALISTIC® TRANSCEIVERS!

REALISTIC® 12-CHANNEL SOLID STATE CB TRANSCEIVER

FREE
CRYSTAL BONUS!
With Purchase of TRC-15



4 SETS OF CRYSTALS

Channel 11 Installed in Set; YOUR CHOICE OF 3 ADDITIONAL CHANNELS — FREE!

A Regular $19.92 Value When Crystals Purchased Separately

Made in U.S.A.

Model TRC-15 89.95 NO MONEY DOWN

The $100-quality 2-way radio for any 12V (neg. ground) car, truck or boat! 5 full watts of input power; 1 μv sensitivity; solid 100% modulation! Includes built-in ANL; provision for connecting PA speaker. Complete with set of Ch. 11 crystals, push-to-talk mike with coiled cable, adjustable mounting bracket, DC cable, instructions.
21-033, Sh. wt. 5 lbs., 8¼x5⅝x2⅜" ..... Net 89.95

★ *13 Silicon Transistors; 4 Diodes!* ★ *12 Crystal-Controlled Channels!* ★ *Illuminated Channel Selector!* ★ *Adjustable Squelch!* ★ *Electronic Antenna Switching!* ★ *No Warm-Up Delay!* ★ *Die-Cast Panel; Extruded Trim!* ★ *Provision for PA!*

REALISTIC® 12 CHANNEL CB TRANSCEIVER
Single Crystal Operation for Receive and Transmit

99.95

- *Solid State Circuitry!*
- *Dual Conversion 6.2 MHZ and 455 KHZ for Greater Sensitivity & Selectivity!*
- *Mechanical 455 KHZ Filter!*
- *Push-to-talk Dynamic Mike!*

A truly versatile communications package. Incorporates advanced frequency synthesis technique used on higher priced models, the TRC-18 transmits and receives with only one crystal per channel. Up to 3-watts output with a full 5 watts of RF input. Low battery drain in any 12 VDC neg. ground vehicle. Adjustable squelch control; automatic noise limiter; illuminated channel selector and meter. Sensitivity: 0.5 μv for 10 db S+S/N. With cords, brackets, crystal for channel 11. 7½" x 6⅜" x 2⅛".
21-120, Ship. Wt. 8 lbs. ..... Net 99.95

TRC-24 23-CHANNEL CRYSTAL-CONTROLLED TRANSCEIVER

- *18 Transistors, 4 Diodes!*
- *Low Battery Drain!*
- *Antenna Changeover Relay!*
- *Synthesizer Circuitry!*
- *Illuminated S Meter and Channel Selector!*
- *Chrome and Wood Grain Front Panel!*

139.95 No Money Down

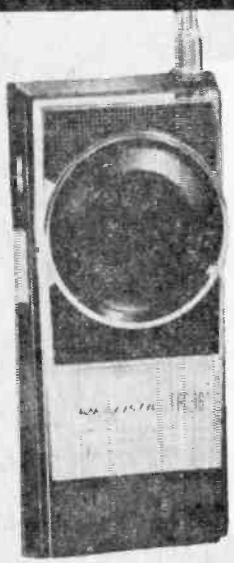
Obsoletes all 23-channel crystal-controlled CB transceivers! 0.25 μv sensitivity at 10db S/N! Includes adjustable squelch, automatic series gate noise limiter . . . all wanted features! 12 VDC neg. ground. Plug-in ceramic mike, fusable DC cable, bracket, instructions.
21-124, Sh. wt. 6 lbs. ..... Net 139.95

ALL CRYSTALS SUPPLIED!

ONLY 6"x7"x1¾"

For Store Addresses, Order Form, See Page 20

CB WALKIE TALKIE VALUES!



TRC-1B 7-Transistor Superhet

13.95 Each

- *Low in Cost — High in Quality!*
- *Compact and Lightweight!*
- *With Push-Pull Audio Output!*
- *100MW — No License Needed!*
- *Rugged Die-Cast Front Panel!*

More RF output power, more audio and greater sensitivity than most others in its price class! Push-pull audio output modulator, 1 diode, on/off volume control switch, and 45" 10-section telescopic antenna. Includes set of crystals for Channel 11, battery, and carry strap. 6 x 2½ x 1½".
21-102, Ship. wt. 2 lbs. ..... Net 13.95

NOW — SAVE UP TO 15% OFF OUR ALREADY LOW, LOW PRICES!

1-WATT 3-CHANNEL TRC-44B

- *Adjustable Squelch!*
- *Automatic Noise Limiter!*
- *Push-Pull Audio Output!*

SAVE $5.00
REG. $44.50
SALE 39.50 Each

Plenty of sock! Exclusive "lock-switch" for continuous transmit; Beep Signal feature; separate microphone and speaker! Has 12 transistors, 3 diodes and a thermistor. With set of Ch. 11 crystals, batteries, telescoping antenna, carry strap. 9x2¾x2"
21-106, Sh. wt. 5 lbs. ..... Sale 39.50

1½-WATT 2-CHANNEL TRC-66

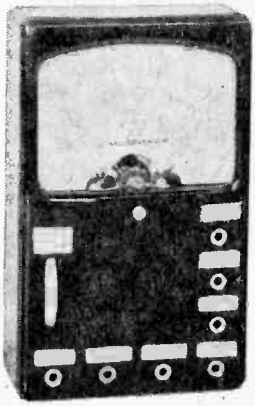
- *Center-Loaded Telescopic Antenna Increases Effective Radiated Power!*
- *Battery Meter Indicator!*
- *Beep Signal!*

SAVE $10
REG. $59.95
SALE 49.95 Each

15 times the power of 100 MW units! This husky feature-packed unit has 14 transistors, 4 diodes and 1 thermistor, plus ANL and "DX-boost" for better modulation. With crystals, batteries, earphone.
21-105, Sh. wt. 5 lbs. ..... Sale 49.95

EASY-TO-USE =MICRANTA TEST EQUIPMENT!

1,000 OHMS/VOLT MULTITESTER



SPECIAL!

3.95 Factory Wired

Our Regular $5.95

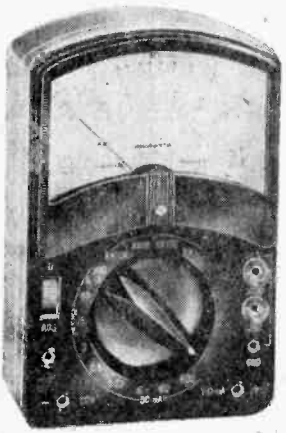
- *Convenient Thumb-Set Zero Adjustment!*
- *Reads AC/DC Volts in 3 Ranges: 0-5,-150, 1000!*

Only 3½ x 2⅛ x 1"!

Great for home or workshop! Pin jacks for all 5 ranges; 2-color 1¾" meter scale. DC Current 0-150 ma. Resistance: 0-100,000 ohms. Accuracy is ±3% of full scale value on DC ranges, ±4% of full scale on AC ranges. A rugged black bakelite case. Comes with pair of color-coded test leads, instructions, battery.

22-4027, Ship. Wt. 1 lb. ..... Net 3.95

30,000 Ω/V 26-RANGE MULTITESTER



16.95 Factory Wired

- *30,000 Ohms/VDC!*
- *15,000 Ohms/VAC!*
- *Single Knob Selector!*
- *Easy-to-Read Meter!*

Makes easy work of the big jobs with precision 1% resistors and recessed zero ohm adjustment! DC volts: 0-0.6/3/15/60/300/600/1200/3000; AC volts: 0-6/30/120/600/1200. Resistance: R x 1/100/1000/10,000. Current (ma): 0-0.03/6/60/600. −2 to +63db in 5 ranges. With leads, instructions, battery.

22-049, Wt. 2 lbs. ..... Net 16.95

50,000 OHMS/VOLT MULTITESTER

27.95 Factory Wired

- *4" Full View Meter with Mirrored Scale!*
- *Meter Protection Circuit!*
- *1% Precision Resistors!*
- *26-Ranges!*

Only 7 x 5½ x 5⅝"!

Great for technicians, mechanics and hobbyists. Specs: DC volts: 0-0.5-2.5-10-50-250-500-1000V @ 50,000 Ω/volts. AC volts: 0-2.5-10-50-250-1000V @ 12,500 Ω/volts. DC current: 0-25ma-2.5ma-250ma-1 amp-10 amps. DC Resistance: 0-10,000/100,000/1 meg./10 meg-ohms. Center scale: 90/900/9000/900,000 ohms. Decibels: −20 to +62 (5 Ranges).

22-150, Ship. Wt. 5½ lbs. ..... Net 27.95

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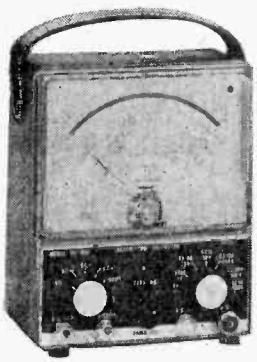
=MICRANTA 6½" VTVM METER



39.95 Factory Wired

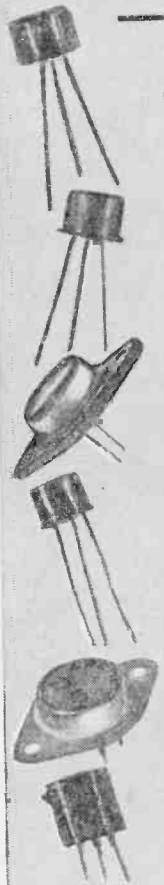
- *Precision Resistors!*
- *Measures Peak-to-Peak and RMS (7 Ranges on Each Function)!*
- *Frequency Response: 30 cps to 10 mc!*
- *Easy-to-Read 2-Color Full View Mirrored Scale!*

Features a zero-center scale for alignment of FM-TV detector circuits. Specs: AC volts: RMS 0.1 to 1500 V. (7 ranges); DC volts: 0.1 to 1500 V. (7 ranges). Peak-to-peak 4-4000 V. (7 ranges). Output −20 db to +65 db (7 ranges). Resistance: 0.2Ω to 1000 meg-ohms (7 ranges). Tubes: 12AU7, 6AC5 and SR1A. Power: 117 VAC, 50/60 cycles.

22-025, Ship. Wt. 7 lbs. ..... Net 39.95

SEMI-CONDUCTORS FOR THE HOBBYIST

ARCHER Replacement Transistors



PNP TYPES

For high frequency, RF IF, and converter circuits. Replaces: 2N247, 2N248, 2N252, 2N267, 2N274, 2N308, 2N309, 2N310.
276-412, Wt. 3 oz. 1.29

For mixer/oscillator converter circuits. Replaces: 2N112, 2N113, 2N114, 2N135, 2N136, 2N137, 2N140, 2N175, etc.
276-401, Wt. 3 oz. ..... .99

For universal IF circuits. Replaces: 2N111, 2N112, 2N139, 2N218, 2N219, 2N315, 2N366, 2N406, etc.
276-402, Wt. 3 oz. ..... .99

For 6 volt audio circuits. Replaces: 2N77, 2N104, 2N105, 2N107, 2N109, 2N130, 2N131.
276-403, Wt. 3 oz. ..... .99

For 12 volt audio circuits. Replaces: 2N36, 2N37, 2N38, 2N41, 2N43, 2N44, 2N45, 2N46, etc.
276-404, Wt. 3 oz. ..... .99

For 9 volt audio circuits. Replaces: 2N188, 2N189, 2N190, 2N191, 2N192, 2N195, 2N196, 2N197, etc.
276-405, Wt. 3 oz. ..... .99

For auto radio AF amplifier circuits. Replaces: 2N176, 2N178, 2N179, 2N234, 2N235, 2N35B, 2N236, 2N242, etc.
276-406, Wt. 3 oz. 1.19

For high power AF circuits in auto radios. Replaces: 2N173, 2N174, 2N277, 2N278, 2N441, 2N442, 2N443, 2N1515, etc.
276-407, Wt. 3 oz. 2.29

Silicon Epoxy high gain. Replaces: 2N940-2N946, 2N2333-2N2337, 2N3548-2N3550.
276-420, Wt. 3 oz. .... Net 1.09

Silicon Epoxy medium gain. Replaces: 2N1132, 2N923-2N928, 2N2372, 2N859, 2N865.
276-421, Wt. 3 oz. ..... Net .99

NPN TYPES

For mixer/oscillator converter circuits. Replaces: 2N193, 2N194/A, 2N211, 2N2-12, 2N233, 2N234, 2N357, 2N358.
276-408, Wt. 3 oz. 1.09

For universal IF amplifier circuits. Replaces: 2N98, 2N99, 2N100, 2N145, 2N146, 2N147, 2N148, 2N149, etc.
276-409, Wt. 3 oz. 1.15

For 9 volt AF amplifier circuits. Replaces: 2N35, 2N169A, 2N213, 2N214, 2N228, 2N306, 2N312, 2N313, etc.
276-410, Wt. 3 oz. ..... .99

For 12 volt AF amplifier circuits. Replaces: 2N306A, 2N445A, 2N446A, 2N447A, 2N556, 2N557, 2N587, 2N649, etc.
276-411, Wt. 3 oz. ..... .99

Silicon Epoxy high gain. Replaces: 2N3704-2N3709, 2N3415-2N3417, 2N3877.
276-422, Wt. 3 oz. .... Net 1.09

Silicon Epoxy Medium gain. Replaces: 2N706TPP, 2N3663, 2N3843A, 2N3900, 2N3901, etc.
276-423, Wt. 3 oz. ..... Net .99

Integrated Circuit Specials!

1.98 Up

- *Ideal for the Hobbyist, Builder, Experimenter!*
- *Fantastic Savings!*

New from Radio Shack! Resistor-Transistor Logic type ICs are ideal for builders, hobbyists, labs, industry etc. Guaranteed to be 100% perfect electronically and mechanically. Each comes complete with diagram and lead locations. Power requirements: 3 volts. Flat Pak type. Size 3/4 x 5/16 x 1/16".

DUAL 3 INPUT GATE. Can be used as a 6 input microphone mixer. Contains up to 6 transistors & 8 resistors in pak. Elements can be used parallel to increase current capabilities.
276-430, Wt. 3 oz. ..... Net 1.98

DUAL JK FLIP-FLOP. Construct your own binary computers, digital adding machines, etc. Contains up to 25 transistors and 32 resistors per pak.
276-431, Wt. 3 oz. ..... Net 2.49

Silicon Field-Effect Transistors

1.98

- *High Impedance Input!*
- *Low Noise! High Gain!*
- *Characteristics Similar to Pentode Vacuum Tube!*

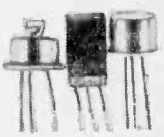
1000's of applications where pentode tubes are used in low level circuits; field strength meters, "gate dippers," receivers, flea power transmitters, etc. TO-5 case. Includes specifications.
276-664, Sh. wt. 2 oz. ..... Net 1.98

Hard-to-Find IBM Component Boards

8 For 1.00

All quality American made parts. Each board contains at least two transistors, plus loads of other components: resistors, capacitors, coils, diodes, modules, chokes, and heat sinks. Size: 2 5/8 x 3 1/8".
276-617 ..... 8 for 1.00

NEW! Twin-Pak Transistor Kit

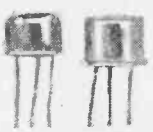


1.98 Pak of 50

- *25 NPN*
- *25 PNP*
- *Silicon & Planars Included*

A sensational value! Full-length leads; ideal for RF applications, switching and general-purpose audio use. Silicon and planar types included to provide replacements for many popular numbers without circuit change. Think of it — less than 4¢ per transistor!
276-1516, Wt. 2 lbs. ..... Net 1.98

100-Pc. Jumbo Pak Assorted Transistors



3.98

Includes Germanium & Silicon

PNP and NPN's in assorted cases, TO-1, TO-5, TO-3, TO-22, etc. Ideal for RF, IF, OSC., audio and power.
276-544, Sh. wt. 1 lb. ..... Net 3.98

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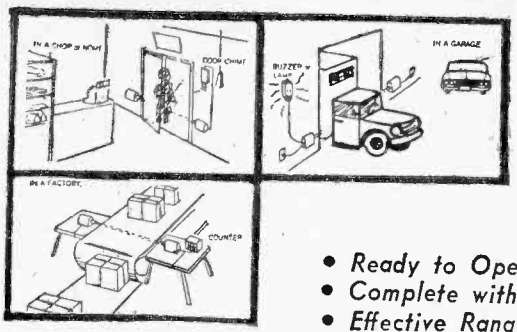


ARCHER
PHOTO-ELECTRIC RELAY SYSTEM

- *Ready to Operate — Not a Kit!*
- *Complete with Exciter Lamp and Photo-Cell Receiver!*
- *Effective Range: up to 50 Feet!*
- *Each Unit Is Separately Powered!*

ONLY 19.95

The ideal multi-purpose photo-relay for business, retail store, home or warehouse use! System consists of an exciter lamp and photo-cell receiver, each housed in a rugged metal case. Both plug into standard 117 VAC house current. The system can be used (with bell or buzzer) to signal when someone enters a room and "breaks" the beam; to count people or objects; or to trigger an alarm to deter intruders. A variable sensitivity control adjusts for ambient light-level, or can be used to inactivate the system temporarily. Each unit 5½x4x2⅞".
275-489, Sh. wt. 6 lbs. ..... Net 19.95

Ⓐ D Cell 23¢ Each in Box of 24
Ⓑ C Cell 18¼¢ Each in Box of 24
Penlite 13¾¢ Ⓒ Each in Box of 72
Ⓓ 9V (Rectangular) 40¢ Each in Box of 50

RADIO SHACK "EXTRA-LIFE" BATTERIES

- *50% Longer Life!*
- *Higher Lumen Output!*
- *Higher MNO Content!*
- *Steel Encased with Anti-Corrosive Caps!*

Radio Shack's new 50% Extra Life cells yield fresher, longer life without sacrificing "shelf life" or adding weight. Ideal for radios, recorders, flashlights, etc. Designed to exceed U.S. Government standards! Buy 'em by the box — save more!

Fig.	Cat. No.	RADIO SHACK	Interchangeable with Eveready	Burgess	RCA	Pack	Per Box
A	23-1538	1.5V "D" Cell	950	2	VS036	4/.98	24/5.59
B	23-478	1.5V "AA" Cell	915	Z	VS034A	4/.69	72/9.95
C	23-153	1.5V "C" Cell	935	1	VS035A	4/.88	24/4.49
D	23-152	9V Rect.	216	2U6	VS323	2/.98	50/19.95

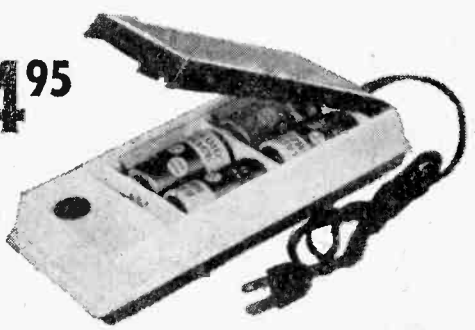
AMAZING HOME BATTERY CHARGER

Don't Discard Your "Dead" Batteries!

Accepts All These Types:

- *1½V "AA" Cells*
- *"D" and "C" Cells*
- *9V Transistor Radio Batteries*

4.95



Count the number of batteries you use around the house right now — then count how much you'd save by recharging them over and over again. End replacement costs! Get the handy battery charger that plugs into any 117 VAC house outlet and recharges batteries overnight! Accepts up to 4 batteries at a time. Cannot overcharge or burn out. Start saving money today!
270-1526, Sh. wt. 1½ lbs. ..... Net 4.95

For Store Addresses, Order Form, See Page 20

ANY ARCHER-PAK ON THIS PAGE $1 PER PAK

Spring Clearance!

20 Power Resistors

Package consists of high-quality vitreous, cand-ohm and wire-wound types. Includes 5 to 25-watt power resistors; individual catalog net — $10!
271-1202, 2 lbs. ..... Net 1.00

35 Precision 1% Resistors

Large assortment of popular ½, 1 and 2-watt values; includes encapsulated, bobbin, carbon film, etc. Made by Aerovox, Shellcross, IRC, and other famous names.
271-1196, 1 lb. ..... Net 1.00

50 Tubular Capacitors

An assortment of quality tubular capacitors, 100 mmf to .1 mf to 600 WVDC. Includes molded, paper and porcelain types. $10 if purchased individually from catalog!
272-1568, 1 lb. ..... Net 1.00

4 Subminiature 455KC IF Transformers

Slug tuned, made for printed circuitry mtg., shielded. Size: ⅜ x ⅜ x ½".
273-515, ¼ lb. .... Net 1.00

8 Sets - RCA Plugs & Jacks

Quality items, ideal for use in phono amplifiers, tuners, recorders, etc. Take advantage of this Radio Shack Special low price!
274-1575, ½ lb. ..... Net 1.00

40 Micro Resistors

World's smallest ¼-watt carbon type resistors! All have axial leads; built for transistor and subminiature circuitry: Assorted values, with resistor color code chart.
271-1566, ½ lb. ..... Net 1.00

40 Coils and Chokes

Shop assortment consisting of RF, OSC, IF, parasitic, peaking and many more types. Individually purchased, this would cost you $15!
273-1569, 1 lb. ..... Net 1.00

55 Mica Capacitors

Famous name micas — Aerovox, Sangamo, C.D., etc. This assortment includes popular values 100 mmf to .01 mf, as well as silver type condensers. A $10 catalog net value!
272-1573, 1 lb. ..... Net 1.00

8 Volume Controls

Most Popular Values

Contains 8 assorted values including long and short shaft types. A tremendous bargain for servicemen!
271-127, 1 lb. ..... Net 1.00

Special! 50 Capacitors

Assortment of many types including disc, ceramic, mylar, temperature coefficient, molded, paper, oil, Vit-Q. You save $9 over industrial net catalog prices!
272-1199, 1 lb. ..... Net 1.00

60 Half-Watt Resistors

Made by Allen Bradley and IRC. Many 5% and 10% tolerance. Color chart. All most popular values. An absolute "must" for hobbyists and kit-builders.
271-1612, 1 lb. ..... Net 1.00

50 Ceramic Capacitors

Wide variety of popular values by Centralab and other famous-name makers. 10 mmf to .04 mf to KV. Assortment includes tubulars, discs, NPO's, temp. coefficient, etc.
272-1566, 1 lb. ..... Net 1.00

48 Terminal Strips

You get a wide variety of screw and solder lug type terminal strips with 1 to 6 lugs. Outstanding value at this low price! 101 uses for the builder and experimenter.
274-1555, 1 lb. ..... Net 1.00

40 Disc Type Capacitors

A varied assortment of types, including NPO's, Hi-Q, N-750's, mylar and ceramic. 10 mmf to .01 mf to 6 KV. A $10 catalog net value!
272-1567, ¼ lb. ..... Net 1.00

150' of Hook-Up Wire

Assortment consists of 6 V rolls of 25' each — solid and stranded wire. #18 through #22. Necessary for multitude of jobs and always useful!
278-025, ½ lb. ..... Net 1.00

40 One-Watt Resistors

Here are resistors for hundreds of uses! Assortment has Allen Bradley and IRC carbons, with 5% values included. This pack is a regular $8.00 catalog net!
271-1576, 1 lb. ..... Net 1.00

4 Transistor Transformers

Made by UTC and Remington Rand. Famous miniatures. Includes subouncer, mike, input types. Color coded leads.
273-1581, 1 lb. ..... Net 1.00

$25 SURPRISE PACKAGE!

Loaded with Parts! $1

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CREATED BY RADIO SHACK ENGINEERS to let you build the way the pros build — by "breadboarding"

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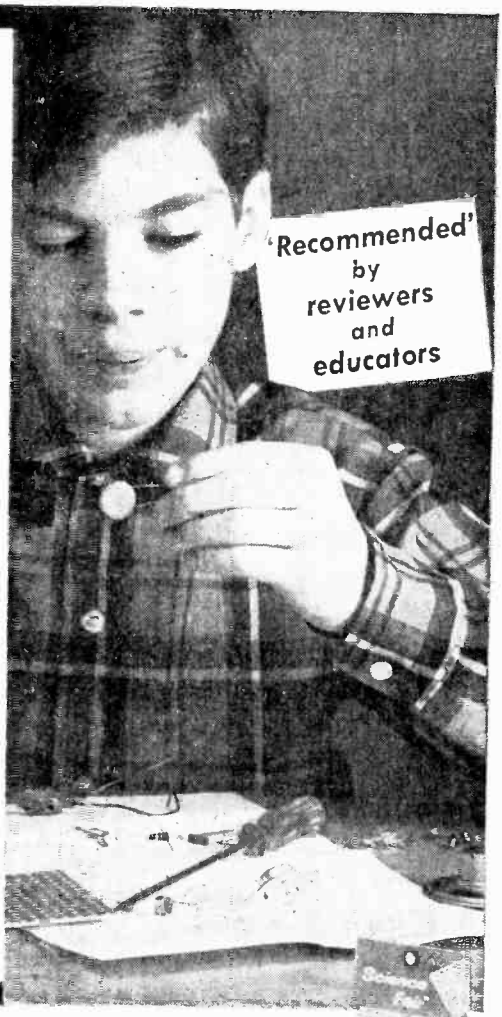

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Ready to Install 8.95

Enjoy the extra convenience of an extra phone! Our most popular style; it's modern, low-cost, and easy to install. Each phone is factory reconditioned to give trouble-free service. Bakelite body and handset; metal base. Dial, bell and coil included. (Note: use of telephone equipment not installed by a telephone company may be subject to local tariff.)

279-371, Sh. wt. 10 lbs. ..... Net 8.95

- Save Time!
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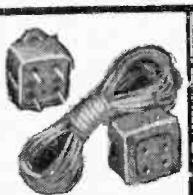
- Save Money!

For Private Phone and Intercom Systems.

30 Ft. Telephone Extension Cord



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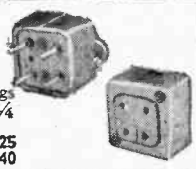

Ideal for making extensions, these plugs and jacks each weigh approximately ¼ pound.

279-366, plug ..... Net 1.25
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278-361 ..... Net 1.19

Four conductor extends up to fifteen feet. Shipping weight: ½ pound.

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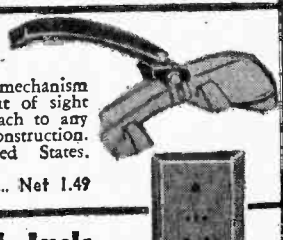

Frees both hands! Spring mechanism enables arm to be folded out of sight when not in use. Easy to attach to any phone. Long lasting metal construction. Manufactured in the United States. Weight: 1 pound.

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For 2, 3, 4-wire systems. Fits standard wall conduit boxes. 1 lb.

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For Mobile and Replacement Use!

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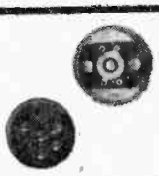

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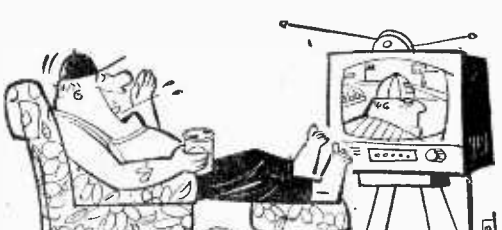
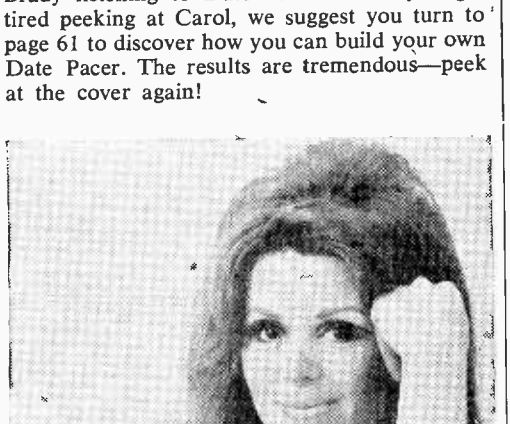


POSITIVE FEEDBACK

JULIAN M. SIENKIEWICZ, EDITOR

This Issue's Cover. You've got to admit we had some fun this issue. On the cover is Miss Carol Brady listening to Date Pacer. After you get tired peeking at Carol, we suggest you turn to page 61 to discover how you can build your own Date Pacer. The results are tremendous—peek at the cover again!



Miss Carol Brady—this issue's cover girl!

Bye-Bye, Hal! My friend Hal is a nice guy, but there are times when you don't like nice people. Hal has been getting into my hair of late, and I just had to get rid of him. But how to do it without hurting his feelings and still keep our friendship? The method struck me one morning when I opened my front door to take in the milk bottles. There was Hal beside a half-finished bash of cow juice, angrily demanding the rest of *his* breakfast!

I steered the boy to the breakfast nook and set him up with three sunny-side eggs and a half pound of sizzling bacon strips. As his fork poised for the first dive I said, "Hold it, Hal! I

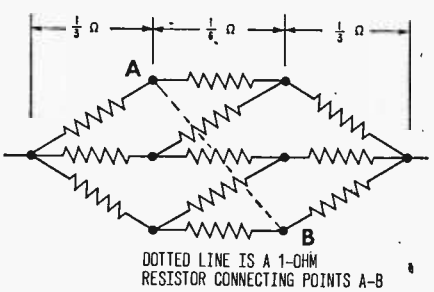
have a small problem I would like you to answer before you take a bite. It's a simple problem that even I can answer: *How far can a dog run into a forest?"*

That did it! Beyond my wildest expectations, my dreams, my hidden thoughts, Hal, the mooch, put down his fork and sat with a puzzled look. *He did not know the answer!* I had to assure him it was not a trick question, but rather a geometrical problem with a logical answer.

With an air of human tragedy, Hal pushed his plate away, quietly put down his fork, got up from the table, and gave a last, longing lingering look at the golden yokes and left.

I did it! I did it! I fooled the master mooch. He didn't know the answer. Do you? Well, it's simple, you see—on second thought, see the next issue of Radio-TV Experimenter. It'll all be in my column. But if you can't wait, send a self-addressed, postcard and I'll jot down the answer for you.

Last Issue's Puzzler. This is one solution you must visualize or solve it the hard way by using several loop equations. Imagine the resistive cube illustrated in the last issue to be formed by ½-watt resistors arranged in the shape of a cube. There is no solid matter in the cube itself. Therefore, by pulling at the corners of the cube where the ohmmeter was connected, the cube would collapse into the orderly resistive array shown below.



DOTTED LINE IS A 1-OHM RESISTOR CONNECTING POINTS A-B

Now, all resistors fall into one of three parallel groups that are in series with other groups. The first group on the left consists of three one-ohm resistors, which effectively add up (or is it down, in this case?) to ⅓ ohm. The same summation is true for the group on the right. The center group consists of six resistors and sums to ⅙ ohm. Hence, when you add up ⅓ + ⅙ + ⅓, the answer comes to ⅚ ohm.

Don't believe me? Then make your own resistive cube using 100,000-ohm resistors —they're easy to come by. Then measure the resistance at diagonal corners and the result will be approximately 83,000 ohms —or ⅚ of 100,000 ohms.

Phrustrated Fotographer. Electronics editors are a versatile breed of men. Aside from being experts in their subject matter, they must be gifted with a talent for writing and editing. But that's not enough! Most hobby electronics editors are camera bugs, too, and the reason is simple. Many of the photographs you see on these pages of this magazine are taken by your Editor; not because he is the world's best photographer but because he knows best which angle to shoot for the best snap! Also, your Editor, in many cases, has to disassemble, rebuild, alter, modify, and re-assemble projects before he snaps the shutter. Hence, with time your Editor has become the hobby electronics magazine industry's foremost photographic specialist on black-and-white, still-life equipment photos. (To be perfectly honest, I shoot lousy baby pictures.)

I'd like to take my lens cover off the fine people at Kodak who through the years have been quite patient in explaining to me how I can get better photos. Frankly, without their help and products this magazine would be filled with foggy, dull photos.

Now, Kodak has done the impossible. They've made it possible for even me to take excellent baby color pictures (the babe on the cover is not my photo). It's all due to Kodak's High Speed Ektachrome film using their new Kodak Special Processing Envelope. Film speeds with daylight lighting of ASA 400 are possible with excellent results. Your local film dealer can give you the facts better than I can. In the meantime, your Editor is shooting color photos of everything with a wire in it, hoping some day to make the front cover. Wish me luck—I'll need it.

A Head for Numbers. The European Center for Nuclear Research (CERN) vies with the United States in fundamental physics, hoping to discover new atomic secrets that might redress the balance of technologic power for the proud European fathers of it all. While the weird banks of electronic equipment on opposite sides of the Atlantic resemble one another, CERN enjoys one instrument the United States can hardly duplicate; its human computer, William Klein.

No machine has yet been programmed that can display the sort of intellectual skill that William Klein brings to computation. He restores man's ego in the face of electronic marvels. Multiplication, for instance, of any five figure number takes him but a few seconds. Even 1,388,978,361 × 5,645,418,496 = 7,841,364,129,733,165,056 is done all in his head in 64 seconds. For Klein, this involves 25 multiplications, each of two-digit numbers—49 operations in all.

Division, addition, subtraction, power, roots, logarithms and factors are all handled with equal facility. Behind this unique ability lies a phenomenal memory for number and sheer intellectual virtuosity. *(Continued on page 129)*

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Stock No. 70,904HP.....$27.95 Ppd.
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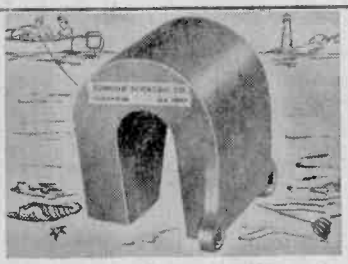
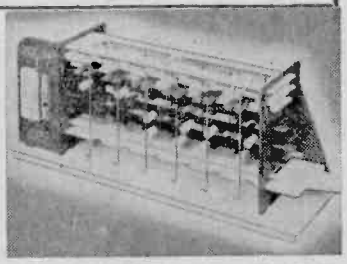


"FISH" WITH A MAGNET

Go treasure hunting on the bottom. Fascinating fun & sometimes profitable! Tie a line to our 5-lb. Magnet—drop it overboard in bay, river, lake or ocean. Troll it along bottom—your "treasure" haul can be outboard motors, anchors, other metal valuables. 5-lb. Magnet is war surplus—Alnico V Type—Gov't cost $50. Lifts over 150 lbs. on land—much greater weights under water.

Stock No. 70,571HP.....$12.50 Ppd.



WORKING MODEL DIGITAL COMPUTER

Solve problems, teach logic, play games, with miniature version of giant electronic brains! Adds, subtracts, multiplies, shifts, complements, carries, memorizes. Colored plastic parts easily assembled. 12"x3½"x4¾". Incl. step-by-step assembly diagrams, 32-p. instruction book covering operation, computer language (binary system) programming, problems and 15 experiments.

Stock No. 70,683HP.....$5.98 Ppd.

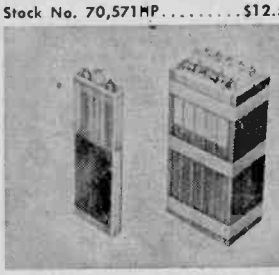
IT'S HERE—BIG, NEW DIGICOMP III

Stock No. 70,946HP.....$16.00 Ppd.

ASTRONOMICAL TELESCOPE KITS

Grind your own mirror for powerful telescope. Kit contains fine annealed pyrex mirror blank, tool, abrasives, diagonal mirror and eyepiece lenses. You build instrument valued from $75.00 up.

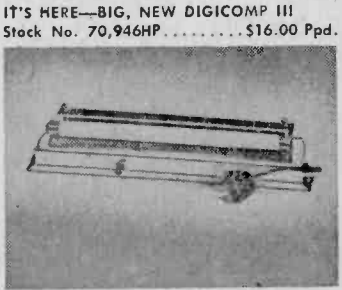
Stock No.	Diam.	Thickness	Price
70,003HP	4¼"	¾"	$8.00 Ppd.
70,004HP	6"	1"	12.95 Ppd.
70,005HP	8"	1⅜"	21.00 Ppd.
70,006HP	10"	1¾"	34.25 f.o.b.
70,007HP	12½"	2⅛"	65.85 f.o.b.



NICKEL-CADMIUM BATTERY BARGAIN!

Terrific value—slightly used gov't. surplus. Lightweight 5 cell, 6 volt, 4 Amp-hour battery with almost unlimited life. Extremely high current output. Recharges in 1 hour with Edmund kit. Won't deteriorate when left discharged. Minimum maintenance—few drops of water per year. Rugged, shock-and-vibration resistant nylon case. Delivered partially charged, filled with electrolyte. 3⅛" x 2" x 6". 2 lbs.

Stock No. 70,942HP..(battery)..$15.00 Ppd.
Stock No. 70,807HP (charger kit) $ 8.00 Ppd.



LONG-WAVE BLACK LIGHT FIXTURE

Extremely versatile, compactly designed, long wave (3200-4000 angstroms) black light (ultraviolet) fixture. Has 6-watt, 110-V lamp with built-in filter—eliminates harmful shorter wave ultraviolet rays. Use to identify minerals, fungi, bacteria—check for surface flaws, oil and gas leakage—perfect for displays with fluorescent paper, paints, chalk, crayons, trace powder. Incl. adjustable aluminum reflector, push-pull switch, connecting plug. Mount vert., horr., or on corner. 10" L., 1½" W., 1¼" H.

Stock No. 70,364HP.....$9.95 Ppd.
No. 60,124HP (Replacement Bulb) $3.25 Ppd.

3" ASTRONOMICAL TELESCOPE

See stars, moon, phases of Venus, planets close up. 60 to 180 power—famous Mt. Palomar reflecting type. Aluminized & over coated 3" diameter f/10 primary mirror ventilated cell. Equipped with 60X eyepiece and mounted 3X finder scope, hardwood tripod. FREE: "STAR CHART"; 272-page "HANDBOOK OF HEAVENS"; "HOW TO USE YOUR TELESCOPE."

Stock No. 85,050HP.....$29.95 Ppd.
Stock No. 85,105HP—(4¼").$84.50 F.O.B.
Stock No. 85,086HP—(6").$199.50 F.O.B.

FLY 9-FT. HOT AIR BALLOON

9 Ft. tall. Rises to amazing heights on just hot air. Supplied with tether attached, so can be used over and over. Easy to make, launch, fly. Loads of fun. Great for celebrations, science fairs, plain fun. Will lift model gliders, parachutes, instruments, etc.—anything up to ½ lb. Approx. 5 ft. diam. when fully inflated. Kit contains 10 pre-cut red & white gores (No. 1 model paper), 6 ft. 14-gage wire for bottom ring, top, "tie-off" cord, complete instructions.

Stock No. 60,691HP.....$2.00 Ppd.

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Completely new. Packed with huge selection of lenses, prisms, optical instruments, parts and accessories, 100's of charts, illustrations. Many hard-to-get surplus bargains. Enormous variety of telescopes, microscopes, binoculars, magnets, magnifiers, photo components, etc. For hobbyists, experimenters, workshops, factories. Shop by mail. No salesman will call. Simply check coupon or write for Catalog "HP" to Edmund Scientific Co., Barrington, N. J. 08007.

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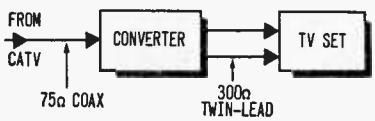
20 Channels from 12

A CATV company advertises that it can furnish 20 channels of TV. Since CATV systems convert only VHF signals and since TV sets can select only 12 channels, how is it done?

—R. B., Holland, Pa.



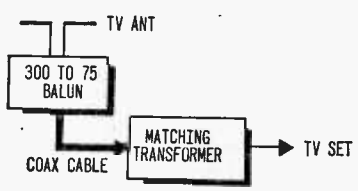
All of the picked-up VHF and UHF television channels are translated in frequency to one VHF channel. Each TV set is equipped with a converter, connected as shown in the diagram. The TV receiver is set to the specified TV channel and a dial on the converter is used for selecting channels.

Powerful Ghosts

I live very close to a TV station and reception of that station is poor, particularly in color. When I disconnect the antenna line, the picture is better but there are still plenty of ghosts. What can I do about it?

—W. H. F., Philadelphia, Pa.

You've got two problems: The signal is too strong when the antenna is connected. Also, your set picks up the signal through both antenna line as well as directly by tuner wiring. These multiple signals are not phase and you get severe ghosting.



The cure may require substantial investment. Replace the twin-lead transmission line with RG-59/U coaxial cable and install a balun (300 to 75 ohms) near the antenna as shown in the diagram. At the TV set, use a 75- to 300-ohm matching transformer. You might also require a signal attenuator to reduce overload in the set.

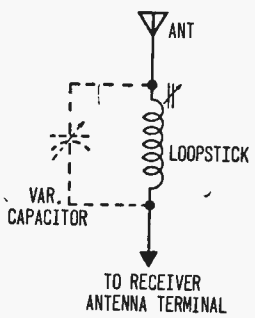
Another solution, but a costly one, is using a VHF-to-VHF converter. By converting channel frequency you will avoid ghosts caused by pick-up of signals directly by the receiver. You can get the necessary hardware from Jerrold Electronics, Dept. JS, 401 Walnut St., Philadelphia, Pa. 19105, or from Holt Electronic Research, Dept. JMS, 105 E. Spruce St., Mahanoy City, Pa. 17948. Holt makes a VHF-to-VHF converter for $169.95.

Crystal Selectivity

I have had excellent results from the push-pull receiver described in an old issue of ELEMENTARY ELECTRONICS. *It pulls in many stations as far as Baltimore. However, selectivity is poor, and I have been wondering if this can be improved. I have a straight antenna 50 feet long. Would a directional antenna improve this condition?*

—H. L. H., Warren, N. H.

You can't expect high selectivity from a crystal set. You could try a coil in series with the antenna, such as a loopstick, as shown in the diagram. Vary its inductance with its tuning slug. Also, try placing a BC tuning capacitor in series or parallel with the loopstick to obtain best selectivity.



Try Ohms Law

Could you tell me how much current this circuit draws?

—B. K., Ellwood, Pa.

Redrawn, the circuit becomes recognizable as that used for inexpensive educational-kit analog computers. For certain mathematical problems the known values are set on potentiometers R1 and R2. R3 is adjusted, while alternately pressing and releasing pushbutton S1, until zero-

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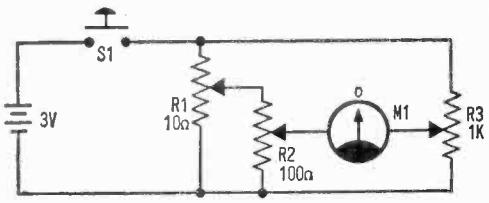


center meter M1 shows no indication. The answer to the problem is read from the scale of R3.

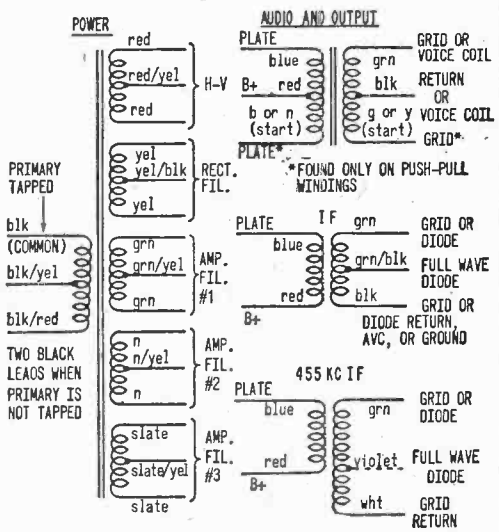
With S1 depressed R1 draws 300 milliamperes; R2 draws 30 ma and R3 draw 3 ma. Normally the meter draws little or no current but if all the pots are set to certain end-of-limit positions, three volts will be directly across the meter and it will probably burn out if S1 is held down. The current, while the meter lasts, will be whatever the source can deliver.

Transformer Color Code

I found an old power transformer in my junk box. What is color code for the leads?

—F. B., Yonkers, N. Y.

The recommended standard color code for both power and audio transformers is shown in the diagram. But, all transformer manufacturers do not necessarily use this code.



Two Bands, One Lead-in

How can I use one lead-in for a TV set and a 30-50 MHz band police receiver? I want to mount antennas for both sets on the same tower. What can I use for a 30-50 MHz band antenna?

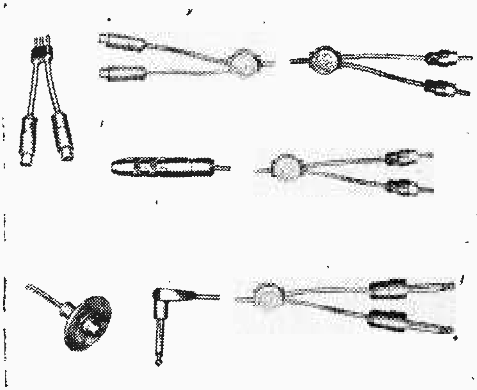
—R. L. F., Snohomish, Wash.

Make a vertical dipole from two 6-foot long sections of metal tubing and use a piece of RG-59/U coaxial cable to connect it to a Jerrold

(Continued on page 32)

Audiophiles,. Accessorize!

If you have component interconnection problems, Switchcraft has seven new molded adapters and cable assemblies. They are: A special stereo adapter (330BP1, $2.50) that connects 2 single conductor phono jack outputs to one 3-pin in-line plug. A flanged, molded speaker enclosure phono jack (379P1, $1.50) with a 24-in. parallel cable terminated with stripped and tinned leads, with 3 mounting screws. An adapter cable (381P1, $7.00) with a 3-conductor right angle phone plug on an 11-ft. 2-conductor shielded cable to a Y junction, making 2 single conductor 1-ft. cables terminated with 2 conductor straight phone plugs. A 4-ft. stereo adapter cable (25FH81, $3.90) with 2 standard molded phono plugs wired to a 3-conductor molded extension phone jack. A

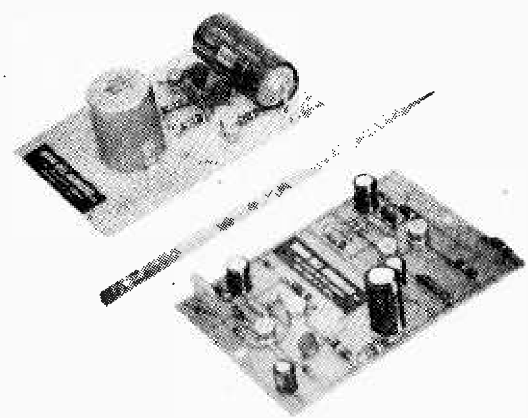


Switchcraft Audio Cable Adaptors

3-ft. stereo extension cable (25FF82, $3.25) with 2 straight molded phono plugs wired to 2 molded phono jacks, providing 2 separate shielded isolated channels. Parts 25FK82 ($3.75) and 25 FN82 ($4.50) are 6- and 10-ft. versions of 25FF82, respectively. Pick 'm up at your local hi-fi dealer, or write to Switchcraft, Inc., 5555 N. Elston Ave., Chicago, Ill. 60630.

The State Is Solid and the Module Is Mod

Here are two new solid-state modules from Round Hill Associates. Reading from bottom to top, the type AA-500 is a preamplifier with a minimum voltage gain of 70 dB, and an input impedance of 47,000 ohms and an output impedance of 5,000 ohms. When used with any low-level high-impedance input device, it will deliver an undistorted output of as much as 5 volts rms, which can be used directly to drive any high-input-impedance power amplifier. With



Round Hill Associates Solid State Modules
Top: Type OS-100 Power Oscillator
Bottom: Type AA-500 Preamplifier

this circuit board you don't need anything but signal and power connections. Size is 4½ x 3 x 1¼ in., weight 2 oz., price $23.95. The module at the top in the photo is type OS-100 power oscillator, which utilizes two transistors in a push-pull arrangement to produce a sine-wave output having less than 1% harmonic distortion. Frequencies from about 20 kHz to over 150 kHz can be generated, and a tapped output transformer provides a variety of possible output voltages. The OS-100 is recommended for supersonic signalling, biasing of tape recorder heads, and supplying power for tape erasing. Input terminals on the unit provide a means for amplitude modulating the oscillator signal, so you can use it as a modulated signal generator or as a low-power/low-frequency transmitter. The OS-100 operates from any well-filtered DC supply of 18 to 22 volts, and draws approxi-

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mately 100 mA. Unit is 5 x 3 x 2 in., weighs 4 oz., and costs $21.95. Write for further specs to Round Hill Associates, Inc., 434 Ave. of the Americas, New York, N.Y. 10011.

Probing the Vast Wasteland

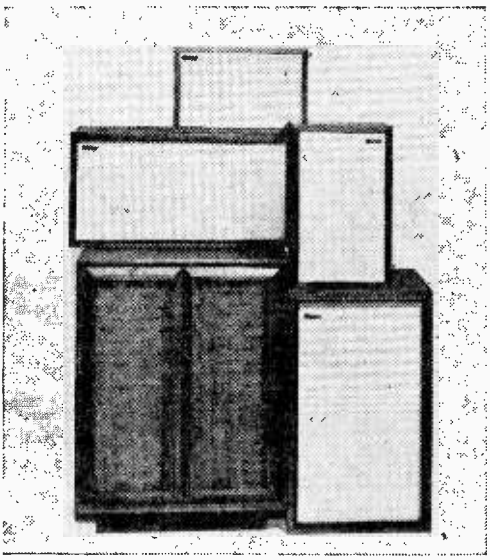
This new test probe from Triplett, Model 72-265, is designed to operate with their 11-megohm VOM (Model 600). The 40,000 VDC

Triplett Model 72-265 40,000-Volt DC Probe

portable probe lets you make accurate and safe high voltage checks on all color as well as black-and-white television sets, prior to making color alignment adjustments. It can also be used for checking power supplies of radio and television transmitters. The 72-265 checks three ranges: 40, 16 and 4 kV DC. For proper readout, set the VOM at these ranges and multiply by factors of 1000 correspondingly. The new probe is equipped with a miniature spring tensioned hook at the end of its tip which frees your hands and provides positive contact with the mechanical connection of the circuit being tested. An instruction label on the probe tells you the DC power ranges you can test. The probe, which comes with a 44-in. cable, measures 12½ in. long by ⅞-in. dia., and weighs 7½ oz. List price is $25.20. If you wish to probe the matter further, write to Triplett Electrical Instrument Co., Bluffton, Ohio 45817.

Controlled Impedance Speakers

Scott's new line of speakers are designed for use with solid-state components, which perform best over a narrow range of load impedance. The S-9 system, 14 x 8¾ x 5 in., includes woofer, tweeter, and Scott crossover system in a walnut finished air-suspension enclosure, and is priced at $39.95. The luxurious S-10 system combines a large low-frequency speaker with

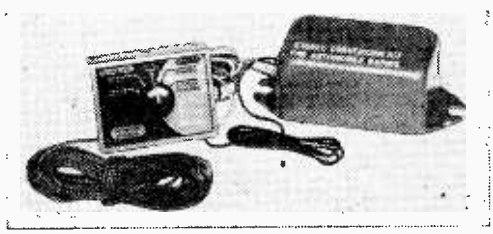


H. H. Scott Hi-Fi Speaker Line

an adjustable high-frequency/midrange speaker to provide extended range capabilities, measures 23½ x 11¾ x 9 in., and costs $79.95. The S-11 comes in a contemporary hand-rubbed oiled walnut cabinet, 24 x 14 x 11¼ in., and is priced at $149.95. The super-luxe S-12 utilizes a massive woofer, midrange and high frequency speakers for full response, measures 27 x 21 x 16 in., has removable grille frames, and is priced at $274.95. The S-14, which is included with Scott's 2501, 2502 and 2504 stereo compacts, features high compliance woofer and tweeter level controls, measures 16 x 10 x 6½ in., and costs $49.95. For additional information on these Controlled Impedance systems, write H. H. Scott, Inc., Dept. P., 111 Powder Mill Rd., Maynard, Mass. 01754.

Get That Stereomobile Sound!

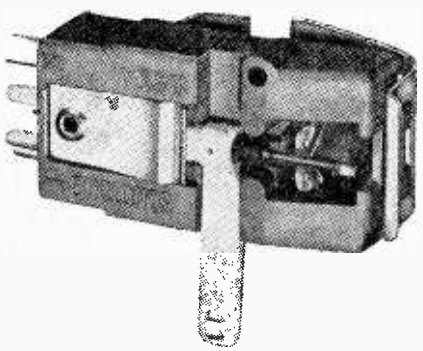
Here is a Stereo Conversion Kit that converts any car radio using front and rear speakers to stereo. The kit actually splits the sound from your radio—high notes are produced by one speaker, low notes from the other speaker. This easy-to-install kit contains everything required for conversion—pre-wired switch and chassis and easy-to-follow instructions. Fits all cars and trucks. Only $6.50, postpaid, from J. C. Whitney & Co., 1917 Archer Ave., Dept. 345, Chicago, Ill. 60616.



J. C. Whitney Stereo Conversion Kit

We Could Make Such . . .

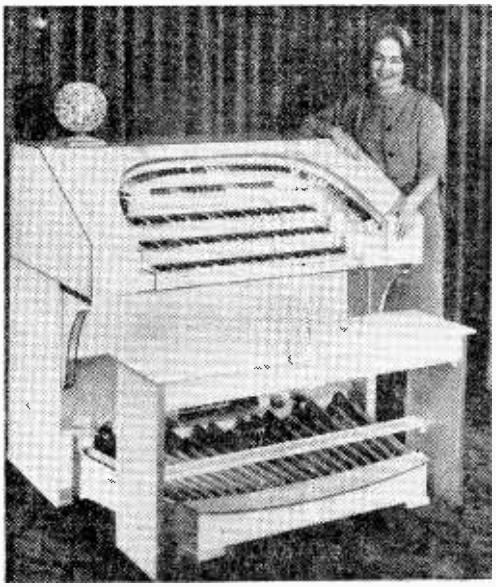
Beautiful Music is Sonotone's appellation for their new Model 24TA cartridge, designed to pick up the new hissless, humless recordings. An innovation in its design is a snubber rubber (rhymes!) pad, set between the cartridge body and the mounting bracket, ensuring no mechanical vibrations at the point of mounting bracket/cartridge body. As a result, the mid-frequency response, the real work area of all cartridges, is clean and separation is optimized. Overall frequency response of the 24TA is said to be smooth from 20 to 15,000 Hz; channel separation averages 25 dB at 1000 Hz. For the audiophile, the 24TA requires only two resistors and a capacitor (per channel) to work directly into low-impedance magnetic pickup inputs. Its needle can be flexed 180° and come back to playing position. All styli are available in combinations of 0.7-mil and 3.0-mil sapphire; dual 0.7-mil sapphire; 0.7-mil diamond and 3.0-mil sapphire; and 1.0-mil diamond and 3.0-mil sapphire. The 24TA with a sapphire-diamond needle combination lists at $14.65. Care to know more? Write Sonotone Corp., Elmsford, N.Y. 10523.



Sonotone Model 24TA Stereo Cartridge

Did You Always Want to Play the Mighty Console?

The Artisan Organ people have 12 models of transistorized organs, in kit or custom form, which, by employing many sets of transistor oscillators plus special voicing filters, reproduce the actual tone of theatre pipes. Some examples: the Imperial, with four sets of oscillators (262) and 65 stops—kit price $3995.00; custom-built, $7500.00. The Cinema, a miniature version of the Imperial, has a single row of 47 stops, three ranks of oscillators (190), and is $3195.00 kit

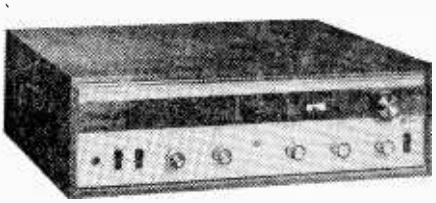


Artisan Transistorized Kit or Custom Organ

priced; $5500.00 custom built. For complete specifications, brochure, price list; write Artisan Organs, 1372 E. Walnut St., Pasadena, Calif. 91106.

For What We Are About to Receive . . .

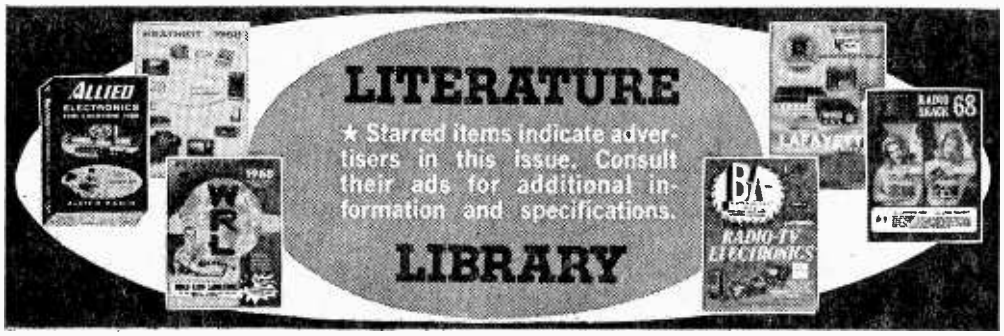
Knight-kit's new KG-980 has some pretty fancy features at a nice price for a 50-watt solid-state stereo-FM receiver. With transformerless driver and output circuits, they claim virtually no hum or distortion. Frequency response is within 1 dB from 18 to 30,000 Hz. The FM tuner has a four-stage front end, including two RF stages for sensitive reception even in fringe areas. There is an automatic stereo switch and indicator light. The critical



Knight-kit Model KG-980 Stereo Receiver

FM front end and IF sections are factory-assembled and aligned. The cool-running unit also has precision tuning meter, speaker muting switch, tape monitor, front-panel stereo headphone jack, and positive-action rocker switches. Inputs include magnetic phono, tape monitor, and auxiliary. There are outputs for tape recorder and speakers in addition to the head-

(Continued on page 128)



CB—AMATEUR RADIO—SHORTWAVE RADIO

102. No never mind what brand your CB set is, *Sentry* has the crystal you need. Same goes for ham rigs. Seeing is believing, so get *Sentry's* catalog today. Circle 102.

130. Bone up on the CB with the latest *Sams* books. Titles range from "ABC's of CB Radio" to "99 Ways to Improve your CB Radio." So Circle 130 and get the facts from *Sams*.

107. Want a deluxe CB base station? Then get the specs on *Tram's* all new Titan II—it's the SSB/AM rig you've been waiting for!

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.

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 ham, CB and commercial radio equipment.

★**129.** Boy, oh boy—if you want to read about a flock of CB winners, get your hands on *Lafayette's* new 1968 catalog. *Lafayette* has CB sets for all pocketbooks.

122. Discover the most inexpensive CB mobile, Citi-Fone II by *Multi-Elmac Company*. Get the facts plus other CB product data before you buy.

50. Get your copy of *Amphenol's* "User's Guide to CB Radio"—18 pages packed with CB know-how and chit-chat. Also, *Amphenol* will let you know what's new on their product line.

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.

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

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

45. Hams, CBers, experimenters! *World Radio Labs* 1968 catalog is a bargain hunter's delight. Get your copy—it's free.

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 117 VAC.

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 CBers, hams and experimenters, with outstanding values. Terrific buys on *Grove Electronics'* antennas, mikes and accessories.

ELECTRONIC PARTS

★**135.** Get with ICs! *RCA's* new integrated Circuit Experimenter's Kit KD2112 is the first of its kind and should be a part of your next project. Get all the facts direct from *RCA*. Circle 135.

132. Discover 18 new and different professional-quality amplifiers, tuners, and preamps completely assembled on PC-boards now offered by *Amperex*. Prices will amaze you!

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 1968 *Allied Radio* catalog? The surprising thing is that it's free!

★**2.** The new 1968 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.

★**8.** Get it now! *John Meshna, Jr.'s* new 46-page catalog is jam packed with surplus buys—surplus radios, new parts, computer parts, etc.

★**23.** No electronics bargain hunter should be caught without the 1968 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 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.

★**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.

★**7.** Before you build from scratch check the *Fair Radio Sales* latest catalog for electronic gear that can be modified to your needs. *Fair* way to save cash.

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 100s 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.

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 offers.

117. Harried by the high cost of parts for projects? Examine *Bigelow's* 13th Anniversary catalog packed with "Lucky 13" specials.

ELECTRONIC PRODUCTS

★**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.** Kit Builder? Like wired products? *EICO's* 1968 catalog takes care of both breeds of buyers. 32 pages full of hi-fi, test, CB, ham, SWL, automotive and hobby kits and products—do you have a copy?

128. If you can hammer a nail and miss your thumb, you can assemble a *Schober* organ. To prove the point, *Schober* will send you their catalog and a 7-in. disc recording.

126. *Delta Products* new capacitive discharge ignition system in kit form will pep up your car. Designed to cut gas costs and reduce point and plug wear. Get *Delta's* details in full-color literature.

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

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.

TOOLS

★**78.** You can drive nuts and screws, ream, scribe, pierce holes with *Xcelite* Series 99 handles and economical, interchangeable blades. Many kits available. Get your copy of Catalog 166 today.

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.

SCHOOLS AND EDUCATIONAL

★74. Whiz through math and electronics problems without pencil and paper. Get the facts on the amazing Electronics Slide Rule and 4-lesson instruction course offered by *Cleveland Institute of Electronics.* No charge!

★61. *ICS (International Correspondence Schools)* wants to send you a 64-page booklet on the most often asked questions on preparing for an electronics career. You also get "How to Succeed" and a sample *ICS* lesson.

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.*

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.

★3. Get all the facts on Progressive Edu-Kits Home Radio Course. Build 20 radios and electronic circuits; parts, tools and instructions come with course.

HI-FI/AUDIO

134. Discover *PlayTape*—America's newest tape cartridge and tape players. Units priced at under $17 with cartridges at 45-disc prices. *PlayTape* has one of America's largest recording libraries.

19. *Empire's* new 16-page, full-color catalog features speaker systems in odd shapes for beautiful room decor. Also, rediscover *Empire's* quality turntable line and cartridges.

124. Now, *Sonotone* offers you young ideas in microphone use in their new catalog. Mikes for talk sessions, swinging combos, home recording, PA systems and many more uses.

26. Always a leader, *H. H. Scott* introduces a new concept in stereo console catalogs. The information-packed 1968 Stereo Guide and catalog are required reading for audio fans.

85. Write the specs for an ideal preamp and amp, and you've spelled out *Dynaco's* stereo 120 amp and PAS-3X preamp. So why not get all the facts from *Dynaco!*

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!

131. Let *Elpa* send you "The Record Omibook." It's a great buy and *Elpa* wants you to have it free. Your records will thank you when the mailman delivers it.

16. *Garrard's* Comparator Guide clues you in on the new Synchro-Lab turntable/changer series. Discover how *Garrard* locks on to the correct disc speed.

17. Mikes, speakers, amps, receivers—you name it, *Electro-Voice* makes it and makes it good. Get the straight poop from *E-V* today.

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 *Telex/Acoustech's* solid-state amplifiers are the rage of the experts. Colorful brochure answers all your questions.

TAPE RECORDERS AND TAPE

123. Yours for the asking—*Elpa's* new "The Tape Recording Omnibook." 16 jam-packed pages on facts and tips you should know about before you buy a tape recorder.

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.

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 all new *Viking/Telex* line of quality tape recorders.

HI-FI ACCESSORIES

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

TELEVISION

★70. Need a new TV set? Then assemble a *Heath* TV kit. *Heath* has all sizes. B&W and color, portable and fixed. Why not build the next TV you watch?

127. *National Schools* will help you learn all about color TV as you assemble their 25-in. color TV kit. Just one of *National's* many exciting and rewarding courses.

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

RADIO-TV EXPERIMENTER
Dept. 668
505 Park Avenue
New York, N. Y. 10022

Please arrange to have the literature whose numbers I have circled sent to me as soon as possible. I am enclosing 25¢ for 1 to 10 items; 50¢ for 11 to 20 items to cover handling. No stamps, please.

maximum number of items = 20

☐ Indicate total number of booklets requested

1	2	3	4	5	6	7	8	10	11
16	17	19	23	26	27	31	32	34	35
42	44	45	46	48	50	54	59	61	66
70	74	78	85	95	96	97	99	100	101
102	103	104	105	106	107	109	111	112	114
115	116	117	118	119	120	122	123	124	126
127	128	129	130	131	132	134	135		

NAME (Print clearly)_____

ADDRESS_____

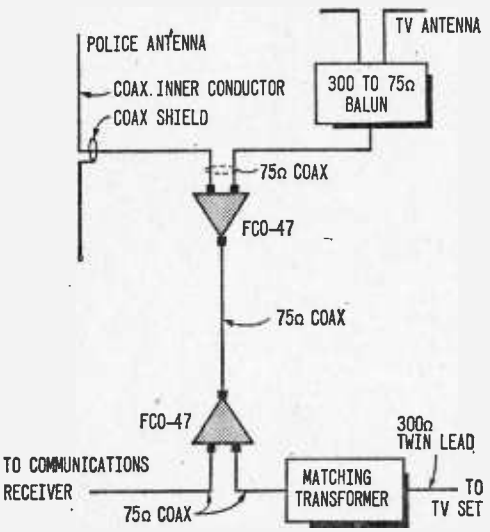
CITY_____

STATE_____ ZIP_____

ASK ME ANOTHER ★★★★★★★★★★

Continued from page 25

FCO-47 splitter/mixer as shown in the diagram. Connect the TV antenna to the FCO-47 through RG-59/U coax and a balun. For the common lead-in, use RG-59/U or RG-11/U coax and connect it to another FCO-47 near the TV set. Connect the antenna terminals of the communications receiver to the FCO-47 through RG-59/U coax. Connect the TV set to the FCO-



47 through the same kind of coax and a 75-ohm to 300-ohm matching transformer. All connections to the FCO-47's must be made with suitable coax connectors. The FCO-47 (available from Jerrold Electronics, 401 Walnut Street, Philadelphia) passes signals from 5 to 47 MHz

(Continued on page 133)

Learn I.C.'s...Build this new RCA Audio Amplifier Kit

RCA's new Integrated Circuit Experimenter's Kit, KD2112, is the first of its kind. You get a "short course" in integrated circuits, and you can build a 500-milliwatt audio amplifier or a variable-tone audio oscillator.

The heart of this new "all-parts-included kit" is an RCA linear integrated circuit—a multipurpose wide-band audio amplifier—containing the equivalent of 7 transistors, 11 resistors, and 3 diodes.

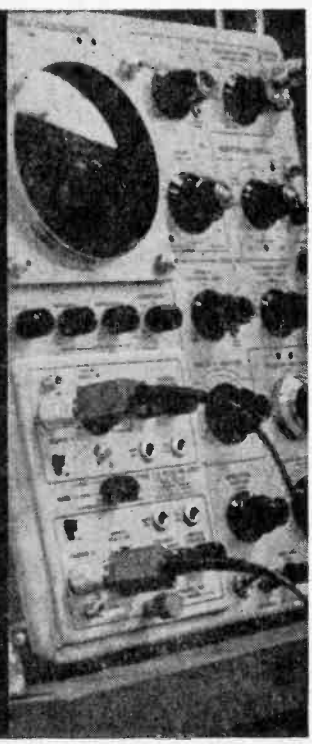
Each kit comes with a 20-page manual which gives complete step-by-step kit construction details. An extra I.C. "chip," with case removed, is also supplied so that its circuitry can be examined.

RCA's new Integrated Circuit Experimenter's Kit KD2112 is available from your RCA Distributor. Ask him for it, and learn more about I.C.'s.

RCA Electronic Components, Harrison, N. J. 07029

In today's electronics boom, the demand for men with technical education is far greater than the supply of graduate engineers. Thousands of real engineering jobs are being filled by men without engineering degrees—provided they are thoroughly trained in basic electronic theory and modern application. The pay is good, the future is bright...and the training can now be acquired at home—on your own time.

How to become a "Non-Degree Engineer"



The electronics boom has created a new breed of professional man—the non-degree engineer. Depending on the branch of electronics he's in, he may "ride herd" over a flock of computers, run a powerful TV transmitter, supervise a service or maintenance department, or work side by side with distinguished scientists on a new discovery.

But you do need to know more than soldering connections, testing circuits and replacing components. You need to really know the fundamentals of electronics.

How can you pick up this necessary knowledge? Many of today's non-degree engineers learned their electronics at home. In fact, some authorities feel that a home study course is the *best* way. *Popular Electronics* said:

"By its very nature, home study develops your ability to analyze and extract information as well as to strengthen your sense of responsibility and initiative."

Cleveland Method Makes It Easy

If you decide to advance your career through home study, it's best to pick a school that *specializes* in the home study method. Electronics is complicated enough without trying to learn it from texts and lessons that were designed for the classroom instead of the home.

The Cleveland Institute concentrates on home study exclusively. Over the last 30 years it has developed techniques that make learning at home easy, even if you once had trouble studying. Your instructor gives the lessons and questions you send in his undivided personal attention—it's like being the only student in his "class." He not only grades your work, he analyzes it. And he mails back his corrections and comments the same day he gets your lessons, so you read his notations while everything is still fresh in your mind.

Students who have taken other courses often comment on how much more they learn from CIE. Says Mark E. Newland of Santa Maria, Calif.:

"Of 11 different correspondence courses I've taken, CIE's was the best prepared, most interesting, and easiest to understand. I passed my 1st Class FCC exam after completing my course, and have increased my earnings by $120 a month."

Always Up-to-Date

Because of rapid developments in electronics, CIE courses are constantly being revised. This year's courses include up-to-the-minute lessons in Microminiaturization, Laser Theory and Application, Suppressed Carrier Modulation, Single Sideband Techniques, Logical Troubleshooting, Boolean Algebra, Pulse Theory, Timebase Generators...and many more.

CIE Assures You an FCC License

The Cleveland method of training is so successful that better than *9 out of 10 CIE men who take the FCC exam pass it—and on their first try.* This is despite the fact that, among non-CIE men, 2 out of every 3 who take the exam fail! That's why CIE can promise in writing to refund your tuition in full if you complete one of its FCC courses and fail to pass the licensing exam.

This Book Can Help You

Thousands who are advancing their electronics careers started by reading our famous book, "How To Succeed in Electronics." It tells of many non-degree engineering jobs and other electronics careers open to men with the proper training. And it tells which courses of study best prepare you for the work you want.

If you would like to cash in on the electronics boom, let us send you this 40-page book free.

Just fill out and mail the attached card. Or, if the card is missing, write to:

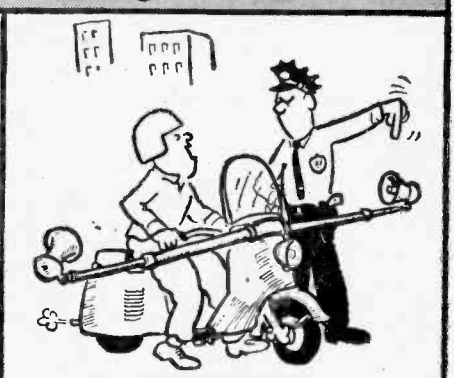
CIE
Cleveland Institute of Electronics
1776 E. 17th St., Dept. EX-26
Cleveland, Ohio 44114
Accredited Member National Home Study Council

ENROLL UNDER NEW G.I. BILL
All CIE courses are available under the new G.I. Bill. If you served on active duty since January 31, 1955, or are in service now, check box on reply card for G.I. Bill information.

THAT STEREO SPREAD

By Jack Schmidt

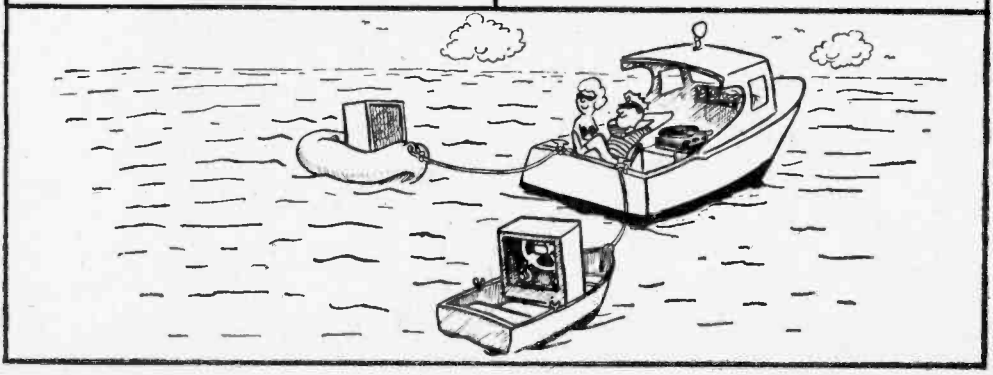
"Hey, Wilson!"



"Stereo, what else?"

"It's not stereo, Alfred, there are two apartments in this building!"

"It might help if you checked the balance or moved one of the speakers!"



BOOKMARK
BY BOOKWORM

How Old is Old? Whenever this old Bookworm feels the pain in his bones, some kind publisher sends a bit of nostalgia that predates me and youth flows through my veins again. Floyd Clymer Publications were kind in sending *A Pictorial Album of Wireless and Radio, 1905-1928.*

One of the most fabulous eras in science was that period in which man took the giant step

Soft cover
224 pages
$3.00

forward in communication by means independent of direct contact and the transmission of the human voice. *Wireless and Radio* relives this era by offering photos and verbal pictorial snaps. Some of the photos show a Murdock 1-killowatt

spark transmitter (1912), Radiotron UV201 vacuum tube that listed for $6.50 (1920), Victor crystal set (circa 1920), Atwater Kent Model 10—$80 (1922), RCA's Radiola IV made by General Electric (1922), Paragon RA-6 receiver first to use Armstrong regenerative circuit—$35 (1916), Daven Scanning-Disc television (1928), just to name a few. This pictorial album has over 1000 exciting photographs—a historical text worthy of any book collection. Published by Floyd Clymer Publications, 222 N. Virgil Ave., Los Angeles, Calif. 90004.

Feh, a FET! There's not much on FETs (field effect transistors) published to date for the beginner, so the old Bookworm has turned to a text written especially for the practicing engineer. *FET Applications Handbook* edited by Jerome Eimbinder is a comprehensive compila-

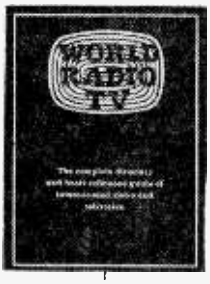
Hard cover
288 pages
$12.95

tion on FET design data where goodly portions are understandable by the electronics hobbyist and experimenter.

This text contains practical material comprising a wealth of data on the FET and its various applications in practical circuit designs. The first four chapters are devoted to basic FET types, parameters and characteristics, and operational modes. Additional chapters, providing the real "meat" of the content, deal with linear applications, chopper and switching circuits, integrated circuits, and photo-FETs.

The in-depth information provided in this book will be of immediate value to anyone looking for new ideas and unique circuit applications, including many basic circuit descriptions. Get your copy of *FET Applications Handbook* from Tab Books, Blue Ridge Summit, Pa. 17214.

Here We Go Again. Gilfer Associates is now offering the 1968-22nd annual edition of *World Radio TV Handbook.* This is the only book that will tell you everything you need to know about foreign broadcast stations. It gives comprehensive details on frequencies, schedules, languages, programs, call letters, power, addresses (these are important and not in every callbook), station personnel, plus numerous special features on DXing, SWL clubs, etc Also includes in-



Soft cover
340 pages
$5.95

formation on TV, foreign AM broadcasters, time signals, weather stations, and a much expanded list of U. S. stations. This is the book that every SWL needs.

Order your copy of the *1968 World Radio TV Handbook* direct from Gilfer Associates, Box 239, Park Ridge, N. J. 07656.

School Days. Utilizing a revolutionary method of self instruction, *Fundamentals of Transistors* provides the reader with the tools he needs for the mastery of the foundation of transistor technology and circuit design. In this manual of programmed instruction, the reader serves the dual role of pupil and instructor. Throughout the development of the subject, there is a constant sense of exchange between the "expert" and the novice. Key questions are posed, prompts and cues are offered, and answers are surmised, then confirmed by a unique system of checks.

The big plus going for this text is that it was prepared by the Technical Training Staff, RCA Service Company, a division of RCA. You, too, can get off the ground with transistors by picking up a copy of *Fundamentals of Transistors: A Programmed Text.* It was published by Prentiss-Hall, Inc., Englewood Cliffs, N. J. 07332.

Hard cover
223 pages
$13.25

Ah, so! Did you ever troubleshoot a Jap transistor radio only to discover a blown 2SB221 transistor? Now, who wants to wait eight weeks for a Hong Kong replacement? Besides, LBJ says keep the cash at home. So, all you do is flip open a nifty transistor substitution pocketbook *Transistoren* and discover the Jap *whatsit* is a 2N109. This interchangeability guide between

American, European and Japanese transistors lists compatible transistors such as the counterparts: Jap 2SB220, European AC106, and popular American 2N404. And, the text does this for thousands of transistors ranging in American EIA numbers from 2N24A to 2N3588; Japanese 2S12 to 2T3043; or European AC105 to 2G-1026.

Transistoren is the "must" pocketbook for repair shops, home work benches and store

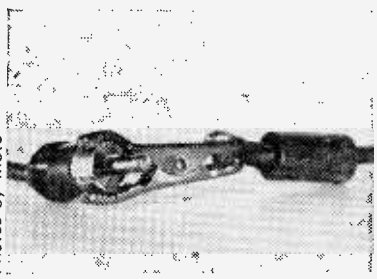
Soft plastic cover
192 pages
3¾ x 5¾-in.
$1.95

counters—wherever American transistors are available for direct replacement in foreign equipment. *Transistoren* is distributed by Gilfer Associates, Inc., Box 239, Park Ridge, N. J. 07656.

Don't Be Bashfull Let us know about the books you would like the ol' Bookworm to review. Just jot down the title and publisher on a post card and send it to the Editor.

"Oh, didn't you know that Harry is studying electronics in depth?"

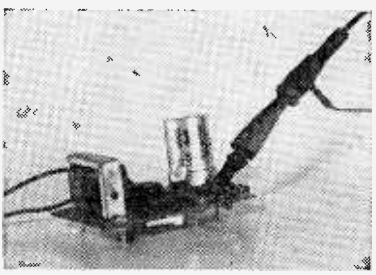
IMAGINEERING DESIGN TIPS



Photos by Moto

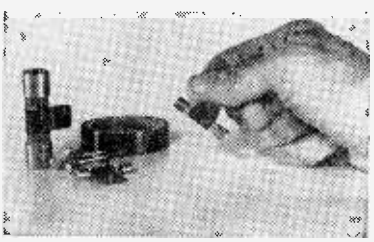
ROUND HOLE FOR A ROUND PEG

● The trouble with alligator clips is that they were designed for grabbing wire and small flat terminals. Try using them on larger objects and zip—they slip right off. Here's an idea you can try. Bend both jaws of a clip round with long-nose pliers. Then watch how they grip tight on phono plugs, dial lamps, transistor cases, and other "slipables." —Bart Stramme



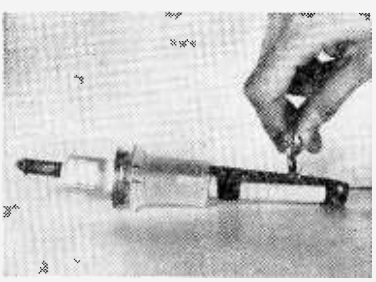
5-WAY CLIP-ON TERMINAL

● How many times have you tried to connect several test leads to the same test point? The chances are that the smaller the test point's physical area, the more leads you must connect. To avoid crowding a test point and shorting a circuit, add a typical 5-way terminal to an alligator clip. A dab of solder makes it one with many possible connections. —AL Wise



TAPE IT! BLOW IT! PULL IT!

● Did you ever notice how big your fingers get when you pull a cartridge fuse, 3AG size to 30-amp job, from its clips? Even with the power off we worry about a shock. Shake your fears! Wrap some 3/8-in. plastic tape around the fuse body with the ends forming a tab about 3/4-in. long. Now yank tab for instant out! —J. Lamb

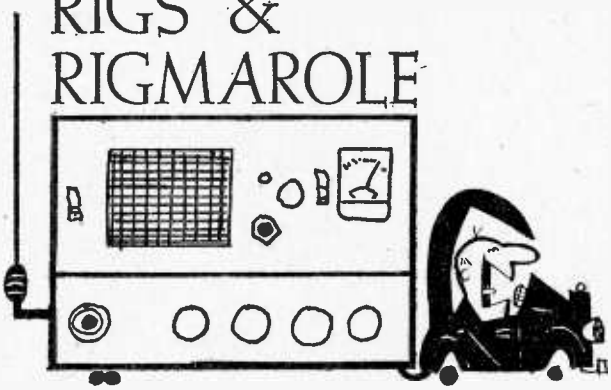


NO HANG NAIL FOR SOLDERING GUN

● Rust, grime, dirt, and films on component leads and terminals may be too tough for the rosin and heat of soldering. A phone plug ground lead may resist solder unless the contact area is filed. Make this soldering job easy by taping a small nail file to your iron's handle. The next time you'll need a file to clean a terminal—the tool will be in your hand. —I. Grafft

● Send your Imagineering Design Tips with full details and a photo or drawing to Radio-TV Experimenter, 505 Park Ave., New York, N. Y. 10022. The top ideas selected by the editors will win $10.00 each. Entries become the property of Radio-TV Experimenter and can't be returned.

CB RIGS & RIGMAROLE



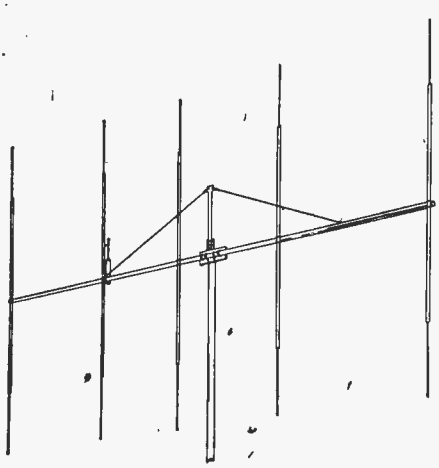
a what's new product column that's fun to read

■ Here we go again, hitting the CB product trail.

But before we do, our thanks go to the many readers who write us expressing their thanks for picking out selected products from the mounds and mounds of gear that hit the CB stores throughout the year. In particular we would like to thank Annabelle Griswald for sending us a lemon meringue pie all the way from downtown Burbank, Calif. Annabelle mentioned that she is a grandmother and an avid surfer. The Editor would like to mention he prefers fruit cake. After all, how can anyone enjoy lemon meringue pie after it's scraped off the inside of a mailbag?

Aunt Enna. Well we'll be a monkey's uncle, if it doesn't look like there's a passel of new CB antennas worthy of note.

Mosley Electronics, for instance, is now offering a monster base station antenna which they call the Delta 5, Model SA-511-S. This is a new and souped-up version of how to wither every other station on the band with a 5-element beam.



Mosley Electronics Delta 5 5-Element Beam

Seems Mosley has licked one of the bigger problems which have plagued big beam antennas; namely midriff sag or droop. This is accomplished with a special boom support system which will not adversely affect the radiation pattern of the antenna.

Speaking of its radiation pattern, it has a forward gain of 9.5 dB (compared to a reference dipole) and a front-to-back ratio of 20 dB. What this means is that not only does it pump most of your signal into the one desired direction, it will also block out signals bombarding you from other directions.

That's all well and good, but are you ready for this: you can stack *two* of these antennas back to back and lay on a signal which increases the effective power of your CB rig by 20 times! Try that on your transistor!

Details on this nifty trick (and others, equally delicious) are available for the asking if you write to Mosley Electronics and ask for their new catalog. Their address is Dept. JMS, 4610 N. Lindbergh Blvd., Bridgeton, Mo. 63044.

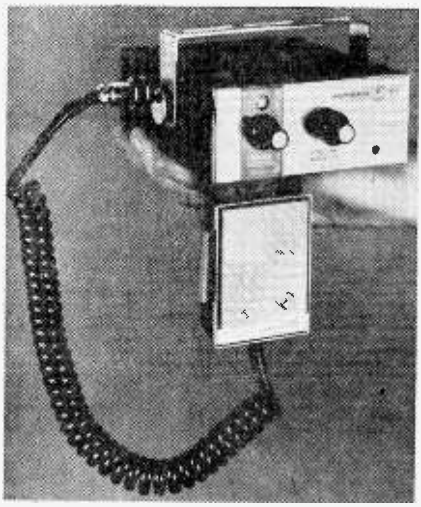
Mini-Mite. A lot for your money doesn't always mean a big and sprawling piece of metal and glass communications gear. Today it often means many good features rolled into a transistorized rig. If all of this space-age magic can be had for a minute investment, all the better!

So it is with Amphenol's all-new *Model 750,* which gives you a full 5-watts input packed into a cabinet 4¾ inches wide, 2 inches high, 5¼ inches deep, and all for $79.95.

The *750* gives you a squelch, .5 *u*V sensitivity, automatic noise limiter, combined dynamic mike/speaker, transmit light, illuminated channel selector, 6-channel operation (crystals supplied for Channel 9).

One of the other nice features of this rig is,

CB RIGS & RIGMAROLE



Amphenol Model 750 6-Channel Rig

if you use it for emergency communications in your car, it will operate with much less power than it takes to light a typical 12-volt tail light. This may not sound like such a big deal but think what it will mean if you ever get stuck with what the British call a "flat" battery.

Why not find out more about this new miniature communications station by contacting Amphenol Distributor Division, Dept. JMS, 2875 S. 25th Avenue, Broadview, Ill. 60153.

Matchless Mobiles. On the mobile front; that is, we mean not for the *front* of the mobile unit, but for roof—oh well, forget it. Let's just say that New-Tronics has a new mobile CB antenna which goes delightfully on your car's roof or any other flat surface. It's their Model RTB-27-L, a sexy, slick, sophisticated, streamlined sky-hook which features an adjustable impedance matching device for forming a perfect marriage (electronically speaking, of course) with your CB rig. Even has its own built-in spring for those of you who take those low branches without mercy.

More data sent to you gladly from New-Tronics Corp., Dept. JMS, 3455 Vega Ave., Cleveland, Ohio 44113.

Nine's Fine. Possibly you're one of the few CBers who haven't yet been given the clue about CB Channel 9. It's been set aside, on an unofficial basis, but with FCC blessings, as the National CB Calling and Emergency Channel. It is monitored for emergency calls by thousands of CB base and mobile stations in addition to organized CB groups such as REACT, HELP, and others. The idea is for you to avoid using Channel 9 for regular messages to try and clear it for important calls.

You can also help by publicizing the use of

New-Tronics Model RTB-27-L Hertz Grabber

C.E.S.R. Channel 9 Decal

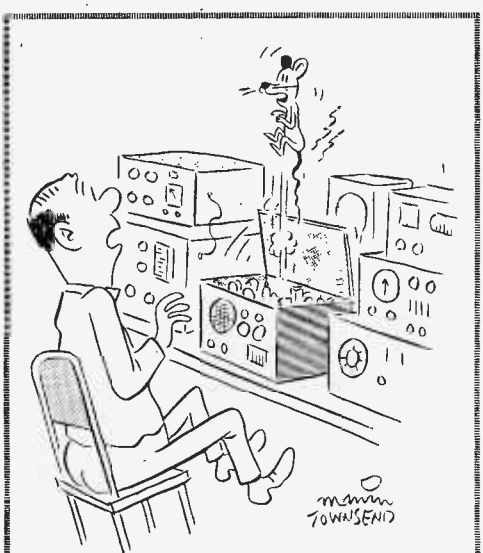
Channel 9 by telling your friends and also displaying a Channel 9 decal in the window of your mobile unit.

While these decals are available from a number of sources, one of the nicest looking and best quality decals sells for 50¢ each from C.E.S.R., 5 Parish Court, Stony Brook, N.Y. 11790.

Johnson Supports CB! Right! E. F. Johnson (you thought maybe L.B.?) has been supporting for years and if you've been around for years, you'll recall that CBers have always picked E.F. Johnson's CB gear as one of their all-time favorites.

Well Mr. Johnson has a nice way of saying thanks, he does it by bringing out some sharp

(Continued on page 134)



"Yipes! You've got a short, Mac!"

Radio-TV JUNE-JULY 1968 EXPERIMENTER

By Jorma Hyypia

Great Balls of Fire

Is ball lightning a myth? Should it be relegated to the dusty pseudo-science shelf occupied by such other odd notions as ectoplasm, black sun miracles, and flying saucers? Until very recently, most scientists regarded reports of ball lightning sightings with considerable scepticism. But it is getting harder all the time to pooh-pooh the tales about floating balls of fire, especially since man-made ball lightning has at long last been created in the laboratory.

Many Forms. If the accounts of harrowing experiences with ball lightning reported by hundreds of (Continued Overleaf)

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people are taken at face value, this type of lightning can take many forms and behave in strangely contradictory ways.

Natural ball lightning generally takes the shape of an elastic sphere, although it need not always have a smooth outer surface. The ball may vary from one inch to 40 feet in diameter, but is most likely to be from 4 to 10 inches in diameter.

The luminous, glowing sphere can be any special color—white, blue, yellow, orange or red. It may be quite cool, or searingly hot with temperatures up to 5000 degrees or more. Some last only a few seconds, others several minutes. Some die out quietly, with hardly a whimper; others disappear to the accompaniment of bubble-gum "pops" or deafening explosions!

Impish Antics. Perhaps the most fascinating characteristic of ball lightning is its impish, unpredictable behavior. It slips into houses through open doors or windows—even through small cracks. It swooshes down chimneys and pops out of fireplaces. It may "explore" a room, then leave quietly the way it came—or just vanish into thin air.

Most often, the ball "floats" along a more or less horizontal path. But it may, on a whim, dart erratically, run along fence tops or electric wires, perhaps climb a church steeple.

Encounters with humans have ranged from the comic to near tragic. For example, two centuries ago, according to an Italian Abbé, a rather precocious ball ducked under a girl's skirt and tore it to shreds without seriously harming the distraught victim. And thirty years ago a British meteorologist told how a more malicious ball streaked into a BOAC flying boat to singe the pilot's eyebrows before exploding with a loud bang. Ball lightning literature is full of accounts of similarly bizarre antics of this strange form of lightning.

Optical Illusions? Most scientists have for long regarded ball lightning as a probable myth, largely because of the anecdotal nature of the reported sightings and because the balls, as described, had such highly variable physical characteristics.

It has been suggested that the observers had only seen retinal after-images after their eyes had been dazzled by ordinary lightning flashes. However, this scientifically sound explanation has one serious weakness, as the following simple experiment demonstrates.

You can create a retinal after-image closely resembling ball lightning by looking briefly at a bright electric light bulb and then transferring your gaze to the wall of a room. Rapid blinking of the eyes will enhance the illusion. The demonstration is far more vivid if you look across a darkened room at a photo flash bulb or electronic flash when it goes off. The brilliant, luminous ball you see will change color, move about with a "floating" action, and persist as long as a full minute.

An ordinary lightning bolt, normally observed, probably will not create a ball illusion. However, the ball illusion *might* be observed if the lightning flash is close by, or if its light is reflected to the eye by some small, bright object.

It has also been suggested that St. Elmo's Fire has been mistaken for ball lightning. This is a luminous discharge of electricity from pointed objects such as the masts and

If the tale related by an Italian Abbé is true, ball lightning can be a real time-saver around the house!

yardarms of ships, lightning rods, steeples, mountain tops, even people. Such misinterpretations may well have happened. But this is not a ready explanation of all ball lightning sightings. St. Elmo's Fire does not move about from place to place, and it does not explode with audible sounds.

People's Phenomenon. Perhaps the most disturbing aspect about ball lightning, from the scientists' point of view, is that it has always seemed to be a sort of "people's phenomenon." Ball lightning seems to make itself known mainly to non-scientific "common people," in somewhat the same way that religious miracles favor uneducated peasants rather than members of the clergy. To meteorologists this seems unreasonable—or at least unfair.

The meteorologists argue, in effect: "We observe and photograph thousands of electrical storms, hence we are the ones who should see ball lightning most often. And yet we do not. Hence there is no such thing as ball lightning."

Actually, a few scientists have seen phenomena that might have been ball lightning. Perhaps the most interesting observation was by the late Professor J. C. Jensen of the physics department of Nebraska Wesleyan University. In August, 1930, Professor Jensen made a photograph that shows several normal lightning bolts and several bright spots that look like exploding balls. One of these balls fell to the ground and exploded. However, neither the photograph nor the professor's testimony did much to convince the sceptical scientific community that ball lightning really does exist.

Computer Evidence. In 1966 Drs. Martin A. Uman and Carl W. Helstrom of the Westinghouse Research Laboratory did some fancy theorizing and then "proved," with the aid of a computer, that ball lightning probably does exist.

The scientists theorized that ball lightning results from changes in electrical conductivity in the air and associated temperature and radiation changes. They imagined a ball of air having a higher temperature than the surrounding atmosphere, and assumed a current of electricity being drawn into this ball. The ball of air would heat up even more because of the electric current. These basic ideas were developed into a series of mathematical equations which the scientists fed into a computer.

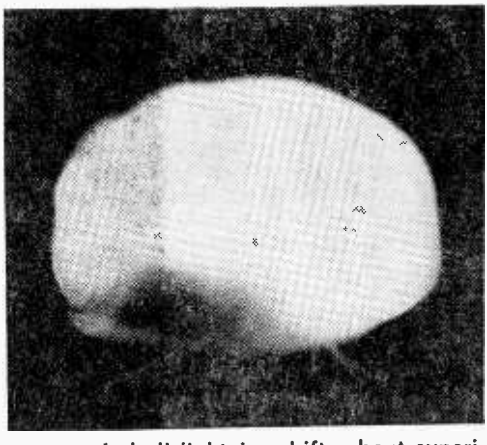
On solving the equations, the computer indicated that these conditions would yield a ball several inches in diameter which would glow about as brightly as a 1000-watt light bulb. The characteristics of this theoretical ball jibed very well with those described by people who thought they had seen natural ball lightning.

Admittedly, this "evidence" was still highly circumstantial. It did not really prove the existence of ball lightning; it only showed that ball lightning is theoretically possible.

Synthetic Lightning. The ultimate proof of the existence of natural ball lightning will come if, some day, the phenomenon is detected and measured with scientific instruments other than the camera. But it has for long been conceded that even lacking such final, definitive proof, the existence of ball lightning could be accepted if it could be created in the laboratory.

Now that has been done, at long last. Drs. J. Powell and M. Zucker of the Brookhaven National Laboratory, working with other scientists, have synthesized something that is so like ball lightning that they have been able to state with assurance that "it appears that ball lightning is simply air with a high proportion of its molecules excited to metastable electronic states." In short, ball lightning may be for real!

Plasma Ball. These Brookhaven physicists had been experimenting with metastable nitrogen plasmas (highly ionized gases) when they observed that the plasmas had characteristics very similar to those in reported sightings of ball lightning. They devised new experiments and came up with some surprising—and highly convincing—results. *(Continued overleaf.)*



Man-made ball lightning drifts about experimental chamber at Brookhaven National Lab.

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It was first discovered that afterglows could be produced in air, nitrogen, and oxygen at normal atmospheric pressures. Longer lasting afterglows were obtained with nitrous oxide gas which exists in the atmosphere in small amounts (this is the familiar "laughing gas" used as a medical and dental anesthetic).

The plasma balls created in the laboratory ranged from to 6 to 8 inches in diameter and had colors extending from white to orange. Thus far the correlation with natural ball lightning was excellent.

However, the synthetic balls had lifetimes ranging from only 0.7 to 1.5 seconds—roughly five times shorter than the average lifetime of natural ball lightning. But this discrepancy could be explained. First, the plasmas created in the laboratory are contaminated with atoms introduced from the energizing electrodes; this impurity shortens the life of the plasma. Secondly, a natural lightning bolt, which creates natural ball lightning, provides far more energy; hence natural ball lightning contains a higher concentration of the metastable gases. Since the decay is exponential, the light would last longer before the emission became too small to be distinguished from the background.

Prolonged Excitation. The experimenters recognized still another important factor. If the ball could be invested with a *continuing* energy input, its lifetime could be greatly increased. To test the idea, a plasmoid inside an 8 foot cubical cavity resonator was continually excited by a 75-MHz oscillator.

The result: *The ball floated through the cavity for as long as 20 seconds before attaching to the wall or occasionally exploding.*

But does this prolonged excitation have its counterpart in nature? The calculated RF field strength in the cavity was about 1500 V/cm. DC fields of this magnitude are known to exist after a lightning stroke. However, a current of more than 10 mA is needed to maintain the glow. Hence, some continuing current source is needed, most likely from the clouds. No problem, say the Brookhaven scientists. Continuing currents of about 100 A have been observed (which keeps the entire lightning stroke channel luminous for several hundred msec.)

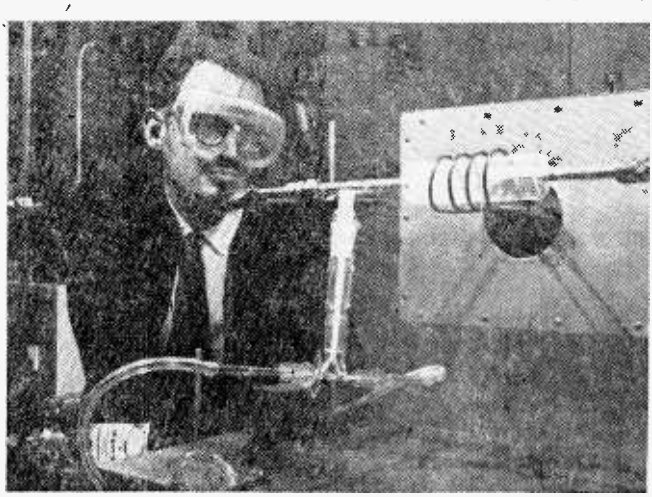
On the basis of such experiments the physicists conclude: "Thus it appears that ball lightning is simply air with a high proportion of its molecules excited to metasable electronic states. Once the ball is formed by the lightning stroke, it may receive additional energy from persistent currents in the DC field, which could significantly extend its lifetime from the 1 to 2 seconds it normally would have."

When the man-made plasmoids are produced in a large chamber, far from the walls of the chamber, they exhibit a "swirling" action. This too is consistent with the behavior of natural ball lightning.

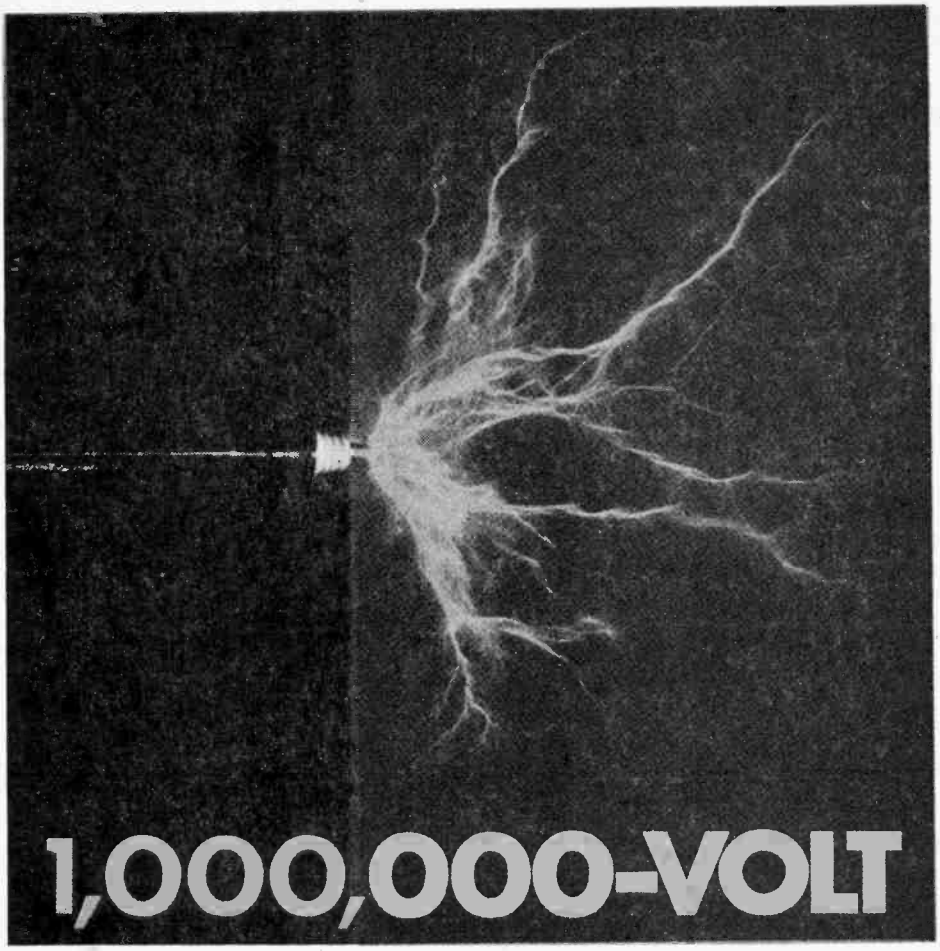
Unanswered Questions. The Brookhaven experiments have thrown considerable new light on the hitherto baffling nature of ball lightning. But much remains to be learned.

For example: Why does natural ball lightning move about in such strange ways? Why

(Continued on page 134)



Plasma research, directed toward design of magnetohydrodynamic nuclear reactor power systems, led to other experiments relating to natural ball lightning. Here, a researcher at Brookhaven National Laboratory in Upton, N.Y. measures electrical conductivity of a given plasma—uranium iodide-neon gas.



1,000,000-VOLT Lightning Generator

By Lloyd F. Ritchey, Jr.

☐ Experimenters of every ilk will be tickled pink (though not too literally, we trust) with the performance of this small-but-potent Lightning Generator. Capable of generating not-so-miniature lightning bolts up to 24-in. long, the device is unusually potent considering its overall simplicity and minimal power requirements.

While in operation, the Lightning Generator spouts a continuous, crackling discharge of gyrating lightning bolts into the air. These waving fingers of electricity will converge and strike any conducting object that comes within range.

A wad of paper placed atop the discharge terminal will burst into flames after a few seconds' operation, and a balloon tossed near the terminal will pop as though shot down by lightning. Though the Generator can inflict a paintful shock if a hand gets too close, the current is no more dangerous than that in an automobile ignition system.

Construction. Building the Lightning Generator is relatively simple. The cost, depending on your scrounge-ability, will be from $35 to $50.

Start with L2, the secondary coil, which consists of a 36½-in. length of 1⅞-in. OD cardboard tubing, wound with a single layer of AWG 30 enameled, copper wire. Choose as perfect a tube as possible and make sure that it is not contaminated with paint or

Lightning Generator

other substances. Heat the tube in an oven to drive out moisture and paint it lightly with varnish or plastic spray.

The coil can be wound by hand or chucked in a slow-turning lathe. Starting ¼-in. from the end, begin winding clockwise, making all turns as tight and close together as possible. Avoid kinks and overlapping and, if necessary, splice all wire breaks with Western Union splices.

Total number of turns will be about 3350, but there is no need to keep count since the turns are closely spaced. Leave about two

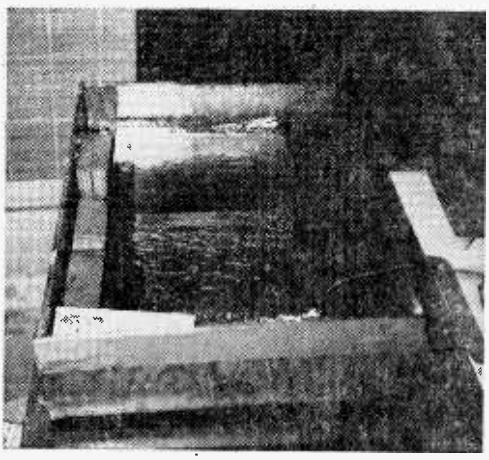
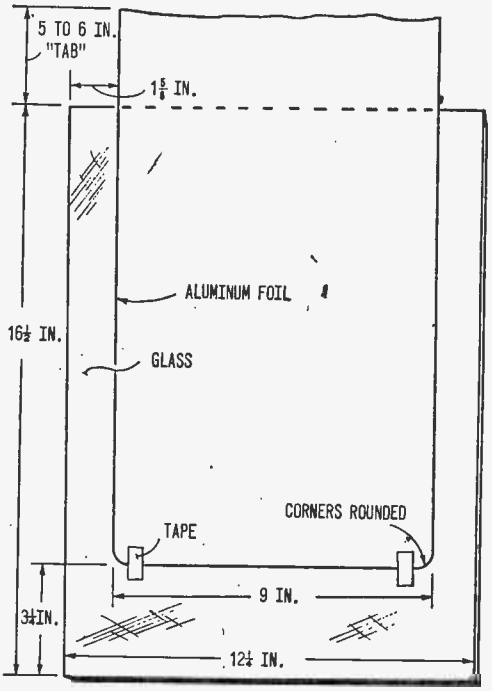


Photo shows how author mounted capacitor C1 in home-made, fiberglass-reinforced box.

feet of wire free at the end. Stop winding ¼ in. from the opposite end of the tube and run a 3-in. length of the wire through a small hole punched in the exposed cardboard.

This end will be the top of the secondary. Apply several coats of varnish or epoxy resin to the windings for protection and insulation.

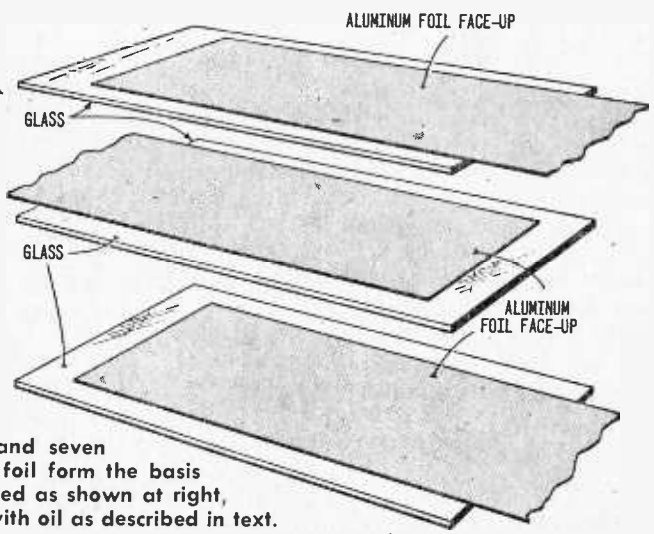
To make the discharge electrode, fit the top of the secondary with a porcelain, center-fed insulator of any



Aluminum foil is taped to the glass foil-side up, with tabs protruding from opposite ends.

type (length should not exceed 3 in.). Insert a bolt through the center of the insulator and attach the 3-in. coil wire to the bottom end of the bolt. No more than ¾ in. of the bolt should protrude from the insulator top. Fasten the insulator to the end of the secondary coil with electrical tape.

Make a platform for L2 by cutting a 9-in. square from ½-in. plywood and fastening a 6-in. long wooden dowel to the center. Use a

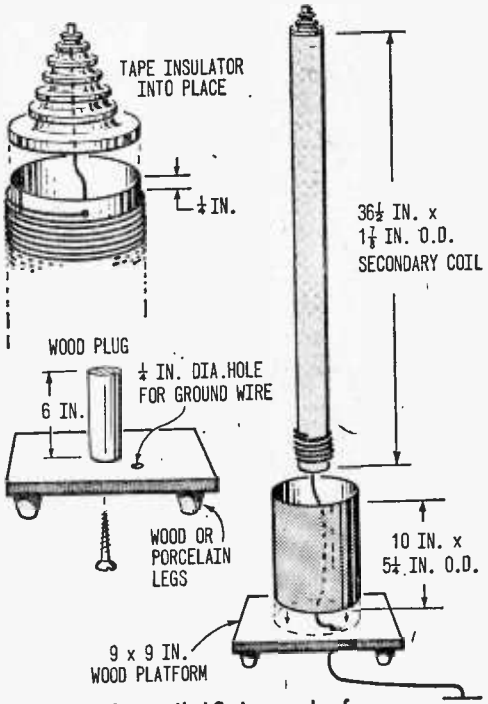


Eight sheets of window glass and seven sheets of heavy-duty aluminum foil form the basis of capacitor C1. Plates are stacked as shown at right, with each layer of foil covered with oil as described in text.

3-in. wood screw to attach the dowel, or glue it in place. The secondary should fit snugly over the dowel.

The 2-ft. length of coil wire from L2 can be brought through a ¼-in. hole drilled in the platform 1 in. from the dowel. For appearance's sake, add insulator or wooden legs to the platform.

Primary coil L1, which fits at the base of the secondary, consists of 28 closely-spaced turns of AWG 8 insulated copper wire on a 10 x 5¼-in. CD Quaker Oats box. In a pinch, ordinary two-conductor line cord can be used, with the ends twisted together to form one conductor. The box should be

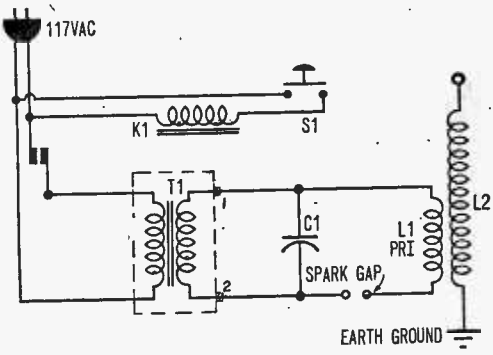


Platform for coil L2 is made from 9 x 9 in. square of ½-in. plywood.

varnished and it can be reinforced with a few layers of fiberglass cloth and epoxy resin.

To wind L1, secure the first turn at the bottom of the box with a piece of string, then wind clockwise until 28 turns have been made. Do not wind the entire length of the box, but keep the turns as closely spaced as possible. Secure the last winding with electrical tape.

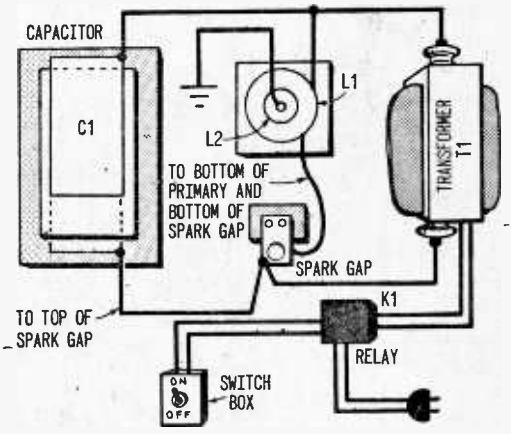
Cut a hole in the bottom of the box and slip the completed L1 over L2, keeping the secondary centered. The exposed cardboard of the primary can be painted with non-conducting enamel or wound with tape.



Schematic of Lightning Generator. Biggest single expenditure (roughly $20) is for T1.

PARTS LIST FOR LIGHTNING GENERATOR

K1—5-amp. contact, 120-volt coil relay (Potter & Brumfield type MR3A or equiv.)
L1—38-feet AWG-8 solid insulated wire wound on 5¼-in. form.
L2—1650 feet AWG-30 enameled solid copper magnet wire (approximately a ½-lb. spool) wound on 1⅞-in. form.
S1—S.p.s.t. pushbutton switch
T1—15,000-volt, 30-mA. neon-sign transformer
1—Spark gap (see text)
1—16 x 20 x 5-in. deep box (plastic or wood —see text)
1—porcelain insulator for discharge terminal
1—36½ x 1⅞-in. OD tube (cardboard, phenolic, or other non-conductor)
1—10 x 5¼-in. OD tube (cardboard, phenolic, or other non-conductor—see text)
3—SAE-30 motor oil, quart cans
8—12¼ x 16½ x ¼-in. sheets of glass (to fit box above—see text)
Misc.—9 x 9 x ½-in. plywood board, switch box, wood screws, hookup wire, solder, insulating varnish or epoxy, tape, etc.



Pictorial diagram of Lightning Generator. Leads are attached directly to tabs on C1.

Lightning Generator

Low-Leakage Capacitor. A box about 16 x 20 x 5 in. will be needed for capacitor C1. A box can be made of ¼- or ½-in. plywood and reinforced with fiberglass, or a store-bought variety can be had in the form of a plastic refrigerator storage box. Box size is not critical, though the box must be large enough to hold the capacitor about to be described.

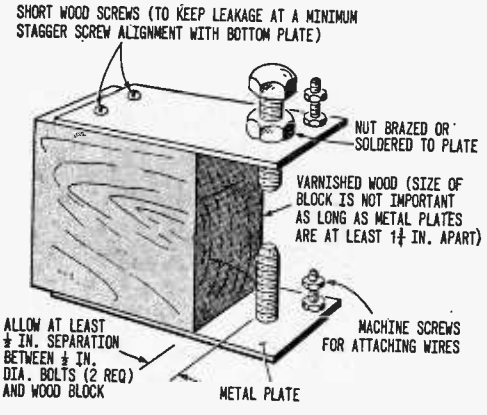
Glass dielectric for the capacitor consists of eight sheets of 16½ x 12¼ x ¼-in. window glass. Cost should run $11 to $12. Use extreme care in handling, as the edges are razor sharp.

Cut out seven sheets of 20- x 9-in. heavy-duty aluminum foil and assemble C1 as follows: lay a sheet of glass in the box and place a sheet of 20- x 9-in. aluminum foil on the glass as shown in the drawings. Pour in just enough ASA 30 motor oil to cover the foil. On top of this lay another sheet of glass and aluminum foil, but be sure to reverse the tab or free end of foil so that it protrudes from the opposite side of the glass.

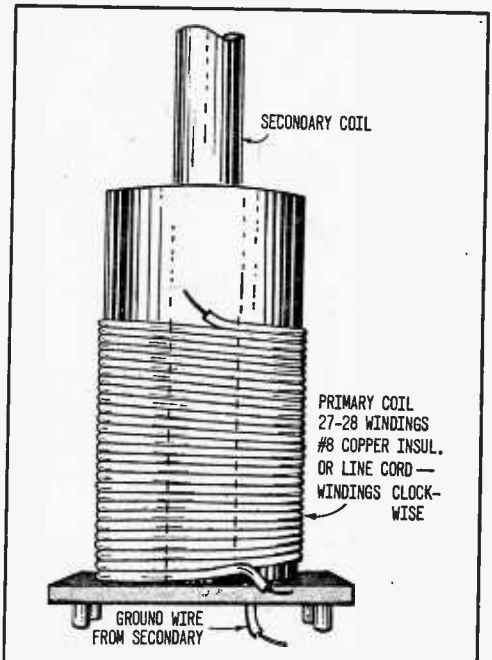
Press all air bubbles from between the glass. This done, pour in more oil and continue the process, always alternating each sheet of foil. Bend the foil tabs together on each side of the capacitor in order that wires from the rest of the circuit can be connected to them. About three quarts of oil will be needed for a 16- x 20-in. box. Wooden blocks can be wedged around the plates as a means of keeping them from shifting.

There are a number of ways to make the spark gap, but the best arrangement consists of two ½-in. diameter conductors adjustable from ¼- to 1-in. separation.

A simple gap can be made by mounting two ½-in. diameter bolts through nuts brazed on 1- x 2-in. metal plates. The plates are mounted on a varnished wood block at least 1¾-in. thick to prevent arcing around the gap (see our illustrations).



Spark gap can take any number of forms, but this spacing arrangement worked best in author's case. Gap is adjustable from ¼ to 1-in.



Coil L1 is close-wound with AWG-8 insulated wire. One end of coil connects to spark gap, the other to C1 and to T1.

Power for the circuit is supplied by a 15,000-volt, 30 mA neon-sign transformer. New transformers cost about $20—used ones are considerably less.

Wire the circuit with AWG 12 or 14 single-conductor copper wire, as it is stiff enough to be self-supporting. Route all wires separate from each other and other objects, keeping in mind that high voltages will be present throughout most of the circuit. Capacitor C1 is wired into the circuit by attaching wires directly to the aluminum foil tabs. Place components according to drawings.

Operating the Generator. When the circuit is ready for testing, connect the ground wire from the bottom of the secondary to a water pipe or telephone ground system. Adjust the spark-gap to about ½-in.

separation, plug the transformer in, and turn the switch *on* for a second or two.

A heavy, blue spark should bridge the gap and a visible discharge should show from the tip of L2. Throw the switch on again and watch the capacitor to be sure that it is not arcing around the plates. If no arcing occurs in C1 and the coil seems to be functioning properly, open the gap to ¾ of an inch and turn the power on again. This time, an 18- to 20-in. discharge should dart from the top of L2. At 1-in. separation the discharge should reach a full 24 inches; beyond 1 in. the gap may not fire. Grinding the tips of the bolts (forming the spark gap) into conical points will make it easier for the arc to form. Always keep an eye on the capacitor for arcing—if allowed to occur, the plates may break in time.

If no spark occurs, double-check the wiring and make sure the plates in the capacitor have been properly assembled. If the transformer is good, a 1½- to 2-in. arc can be drawn between the output terminals 1 and 2 with the L1 and L2 out of the circuit.

Tuning. If the spark-gap is operating, but either a weak discharge or none at all appears at the top of L2, the coil will have to be tuned. This is accomplished by varying the number or size of the aluminum foil sheets in C1 and by varying the effective turns on L1.

It's easier to begin tuning by varying the exposed area of the top sheet of aluminum foil and by "tapping in" a few turns down from the top of the primary. Maximum discharge generally will be reached with a total variation of no more than two or three turns on coil L1 and one full sheet of aluminum foil in C1.

If reducing the number of turns in L1 and changing the number of plates in C1 doesn't help, try adding several turns to L1 by splicing in additional wire. An additional sheet of foil can be added to the capacitor, but another sheet of glass will be needed, too.

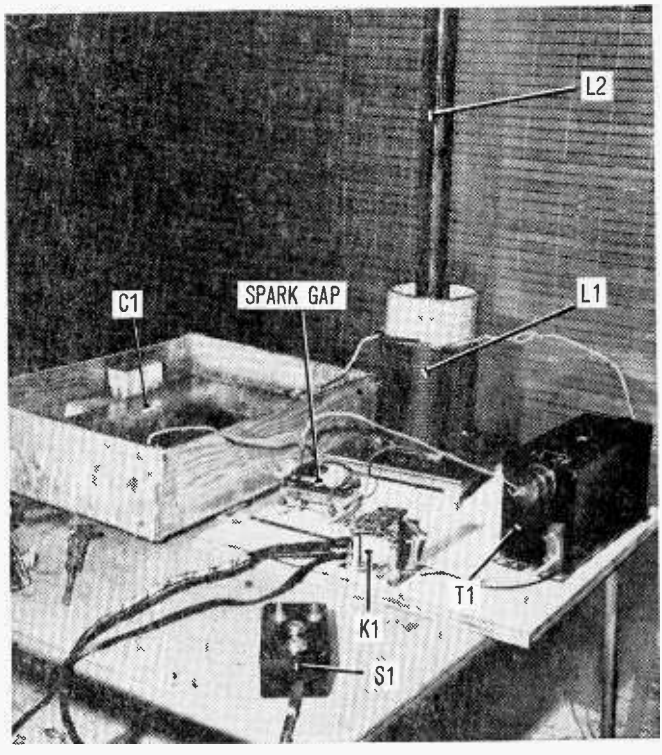
It is best not to operate the Generator for more than 15 to 20 seconds continuously without an equal time off, as the oil in the capacitor will start to break down, allowing arcing to occur.

Experiments. Hold a fluorescent light a few feet from the Generator and throw the switch. The light will glow even though not connected to any electrical source. Large, clear light bulbs held near the coil will glow with weird, flowing colors.

Bring a grounded, metal rod within range of the discharge point atop L2 and notice the "bunching" effect as the sparks leave their random pattern and arc to the rod. The discharge will not travel as far to reach a grounded conductor as it will in open air, since the atmosphere itself acts as the opposite electrical pole.

A pinwheel rotor about 6 to 8 in. in diameter can be made from AWG 18 or 20 solid wire and fitted atop the discharge terminal so that it can rotate freely. When the Generator is operating, the rotor will turn from the force of the discharge leaving the ends of the wire.

Place a piece of paper on the terminal and



Completed Lightning Generator stands ready to go with all of a million volts! Wiring between components is AWG-12 or 14.

Lightning Generator

close the switch. In a few seconds, the paper will burst into flames.

Despite the extremely high voltages, the Lightning Generator develops very little current, making a shock from the coil relatively harmless. However, the currents in the rest of the circuit are very dangerous, so they must be treated with respect.

The discharge is virtually impossible to contain. Try inverting a glass tumbler over the discharge electrode; the discharge will pass right through, leaving the glass full of ozone. A heavy, waving arc will easily crackle across a distance of a foot or more to reach a metal rod. To capture the lightning on film, use a camera capable of at least 1/250th sec. shutter speed and try a variety of f-stops.

Balloons can be shot down simply by tossing them at the terminal, and sometimes the effective range of the lightning "anti-aircraft" is surprising.

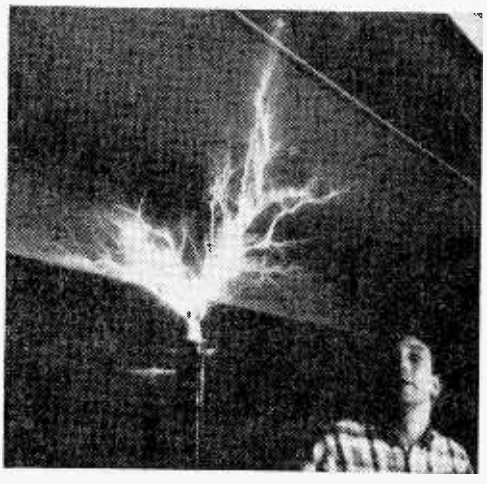
With reasonable maintenance, the Generator will last indefinitely. And with a little ingenuity you will discover new experiments and gain insight into the fundamentals of tuned circuits with this great-granddaddy of modern radio.

How It Works. The primary coil L1 and capacitor C1 together form a tuned circuit designed to oscillate at a frequency four times the natural resonant frequency of the secondary coil L2. By inducing current at the base of the secondary L2 equal to a quarter of its natural wavelength, the induced voltage will reach a peak, every half-cycle, at the discharge terminal at the top of L2. The voltage generated is determined by the inductance of L1 and how accurately L1 is tuned.

The spark gap, being an open circuit, allows the capacitor to charge to maximum. The spark gap ionizes and the charge stored in the capacitor discharges across the spark gap and most of the charge stored in the electrostatic field of the capacitor becomes energy in the magnetic field that builds up around L1 as the discharge current flows through L1. When C1 has discharged to a point where the voltage across C1 will no longer sustain an arc across the spark gap, current stops flowing through L1 and the magnetic field therefore starts to collapse.

When the magnetic field around L1 collapses, it generates a counter EMF (electromotive force) or voltage that is almost as great as the voltage from T1 that originally charged C1. This voltage breaks down the already partially ionized spark gap and C1 begins to charge all over again.

Because of the high inductance and low natural resonant frequency of the secondary winding of T1, this portion of the circuit is effectively nonexistent. Most of the energy pumped into the circuit formed by L1, C1, and the spark gap remains in that portion of the circuit. The secondary of T1 just adds energy every 1/120th of a second. For best results, the oscillation frequency should be some high harmonic (multiple) of this 120—like 120 kHz.



Lightning-like discharge reaches 24-in. to strike low-hanging ceiling beam, while operator watches from a respectable distance.

As C1 recharges from the magnetic field around L1, a point is again reached where the spark gap cannot be sustained because all the energy is gone from the winding of L1. This means that the magnetic field has collapsed completely.

Once more C1 discharges, and current flow again reverses through the spark gap and a magnetic field builds up around the coil L1. With each cycle of charge and discharge the energy transferred is reduced and would soon die out if energy weren't added by the secondary of T1.

Each buildup and breakdown of the magnetic field induces a voltage in coil L2 which discharges from the tip of L2 in the form of lightning-like flashes and streaks. ■

THE MAN WITH THE TELEPSYCHIC MIND

By Charles Getts

■ 'Either this man is a lunatic, or I've discovered the most astonishing thing in the history of mental phenomena,' thought J. C. Bradford, Vice-President of Nationwide Broadcasting System. He flicked the intercom switch and spoke to his receptionist. ¶ "Send Mr. Pambly in, Vicki." ¶ The mahogany door of his office opened, and a middle-aged man with bald head, cherubic face, and blue eyes entered. ¶ "Come in, come in, Mr. Pambly," said J. C. in a genial tone, as he waved a well-manicured hand at the chair beside his huge desk. He picked up a letter as Henry Pambly sat down nervously on the edge of the chair and then folded his hands. ¶ "Ordinarily, a letter such as this one would be thrown into a wastepaper basket," said J. C. "But for some strange reason, Mr. Perkins, our General Manager, sent it up here to me. And for some still stranger reason, I invited you for an interview. You realize that most people would regard the writer of this letter as being some kind of a lunatic?" ¶ "Yes, sir. I realize that, sir," said Henry in hesitant voice. "Hardly anyone I talk to about this believes me. But I thought that it might be of some use in television so I wrote your company. I need a job quite badly, sir." ¶ "Let me just be certain that I understand your statements in this letter, Mr. Pambly," said J. C. "You say that for some time now, you have had the ability to look into the lens of a camera and register on the film whatever is on your mind. Is that correct?" ¶ "Yes sir," said Henry. "It all began six months ago when I fell off a scaffold. I am a painter by trade. I suffered a mild con-

(Continued Overleaf)

cussion from this accident. Then, a week later, I was fooling around with my camera and holding it with the lens pointing at me when I tripped the release accidentally. When I developed the roll, I found that the first picture was of my wife. It made me feel frightened in a way, sir."

"Why? Maybe somebody took a picture of her with the camera when you weren't home," said J. C., calmly.

"My wife has been dead for five years," said Henry.

"Oh, I see," replied J. C. slowly. "Well, since you began doing this thing—looking into the camera lens, I mean—you write in your letter that most of the time you get pictures of what you are thinking about. What do you mean, most of the time?"

"Well, there have been a couple of times when I wasn't thinking of anything. My mind was a blank and I took a picture just for fun—to see what would happen."

"And what did happen?" asked J. C. patiently.

"One picture showed Moses holding up the Ten Commandments and the other was a close-up of the planet Saturn."

J. C. loosened his necktie and opened his collar as he pressed the intercom switch.

"Vicki, get Jim Blake and tell him to report to Studio B. I want to run a closed circuit test with Mr. Pambly. Tell him that it's urgent, please."

As he leaned back in his padded-leather chair and looked at the face of his visitor, his mind filled with wild ideas. This meek-looking painter could shake the very foundations of the entire television industry if his strange psychic ability registered on a TV camera. Why, he could just hand Henry a history book on ancient Egypt and let him study it for a few minutes. He could then sit him in a chair with a camera focused on his eyes and broadcast a spectacle on the building of the pyramids, with Cleopatra and a hundred or so dancing girls tossed in for good measure. There would be no location crews to send to Egypt, no research needed, no big-name stars with astronomical fees, no costumes . . . nothing but $4.50 for a history book!

He lit a fresh cigar as his blood pressure increased.

"Let's walk down to studio B on the floor below and make a little camera test, Mr. Pambly," he said as he rose from his desk and escorted his guest carefully out of the office.

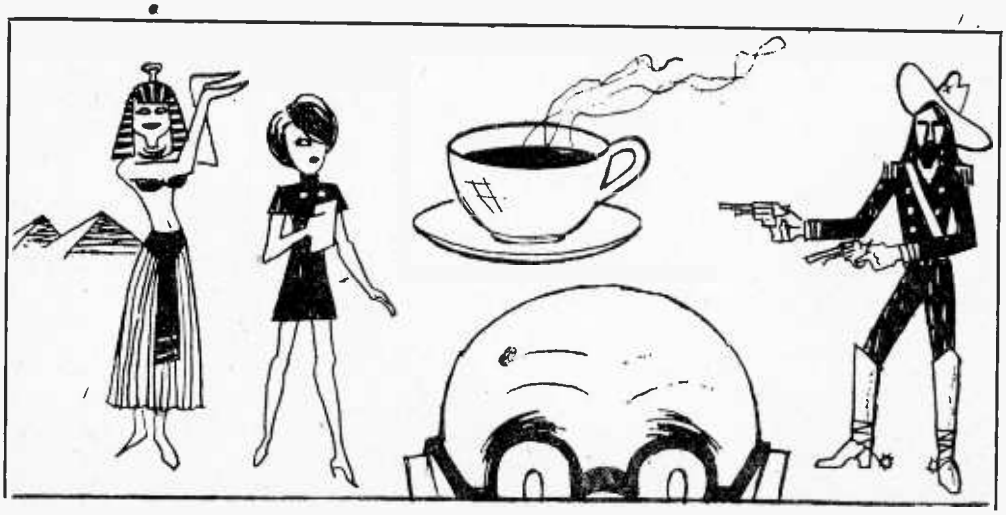
The cameraman was waiting when they entered the studio.

J. C. suddenly had a chilling thought. The cameraman would find out about Pambly's gift and it would be all over the industry within the next hour. Somebody might kidnap his discovery that same afternoon.

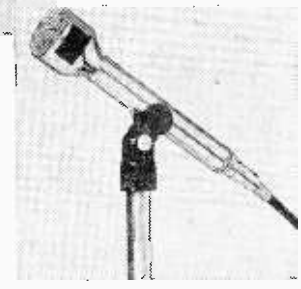
"Jim," he said in casual tone, "this gentleman is very shy. I'm going to take a short test of him for a pilot film. Just turn on the camera and focus it on this chair, then you can leave us alone. Report back to studio D."

When the man had left, J. C. led Henry to the chair.

"Now just sit down here and look into the lens, the same way you do with your own camera. Let's see, what do you want to think about. Have you read any books lately?" *(Continued on page 131)*



E-V Model 631



E-V Model 627

ELECTRO-VOICE
Models 631 and 627
Recording Microphones

☐ The tale is sad, but true: few tape fans ever realize their tape recorders' full potential when it comes to home recordings. Why? Because the response characteristics of even budget-priced recorders generally far exceed the performance of the microphones supplied with them. In fact, even many semi-pro recorders are furnished with some of the cheapest mikes imaginable.

The reason for this stems from the fact that even a reasonable set of microphones can tack $60 onto a recorder's price tag. Also, at the beginning the average tape fan is happy just to get some sound on a piece of tape; it's only after the initial thrill wears off that he starts to hear lack of lows, a basic distortion level, pops, and mike breakup. No, supplied mikes can rarely deliver *really* good sound quality, for quality recordings require quality microphones.

Luckily, due to improved design and manufacturing techniques, the price of a reasonable quality—perhaps semi-pro—mike is now in what can be called the budget range of $30 to $40. This means that there's no longer any need for the serious recordist to wait until he can afford studio microphones.

Omni and Cardioid. A typical example of quality at budget prices is Electro-Voice's new models 631 and 627, both priced at $36 (user net). The 631 is an omnidirectional dynamic microphone which features a notably smooth frequency response between 80 and 13,000 Hz; an internal shock absorber to minimize cable and mechanical noise generated by external contact; a built-in pop filter; and an unusual, magnetically-operated, sealed on/off switch. And wonder of wonders, the mike is supplied with tangle-free, rubber-covered cable, rather than the easily-knotted plastic type.

The microphone is available in either high (25,000 ohms) or low (150 ohms) impedance.

The model 627 microphone is similar to the 631 except that it has a cardioid pattern rather than omnidirectional, and the on/off switch is a standard slide switch rather than the magnetic type. The difference in pickup patterns is shown in Fig. 1. Fig. 1A is the pattern of the model 631; note that it is sensitive to sounds from any direction. On the other hand, the model 627's cardioid pattern (shown in Fig. 1B) indicates that the mike is primarily sensitive to sounds arriving from the front.

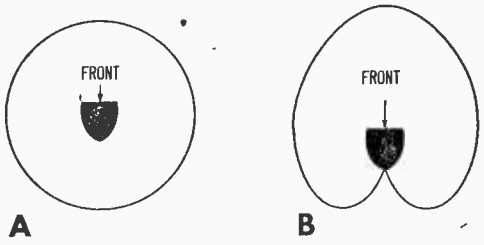


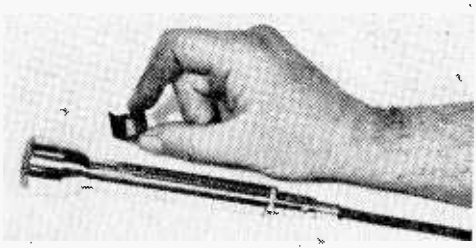
Fig. 1. Though mikes are similar in design, 631 has an omnidirectional pickup pattern (drawing A), 627 a cardioid pattern (drawing B).

Magnetic Switch. The 631's magnetic on/off switch is somewhat unique. The switch itself is sealed inside the case, which means there is no opening for the switch in

LAB CHECK

the case. A small plastic block with a built-in magnet locks in a track on the outside of the case directly over the switch.

When the magnet is moved up, the switch is *open*, thereby lifting the short across the



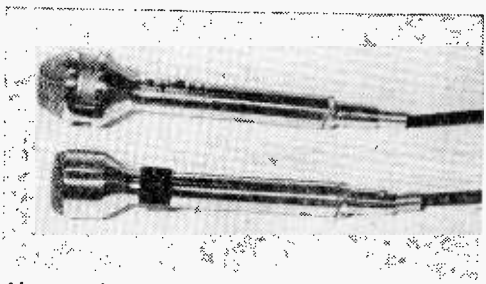
Model 631's unique on/off switch can easily be removed, leaving mike in the "on" mode.

microphone and turning the mike on. When the magnet is moved down, the magnetic field *closes* the switch, shorting the mike and thereby turning it off. To avoid the possibility of a dead mike, the switch (magnet) can be lifted off the case, leaving the mike connected in the *on* mode. What you end up with is a switchless mike, but you're perfectly free to reinstate the switch any time you like (it's almost like waving a magic wand).

Fig. 2 shows the specified frequency response. Actually, the frequency response cannot reflect overall sound quality as it does not show distortion, and even a poor quality mike can turn out a decent frequency response. The acid test is always "How does a mike sound when used," and it is here that you will note improved quality in your recordings.

Performance. We compared the 631 directly against some microphones normally supplied with recorders. It was immediately apparent that the 631 had a decidedly smooth, balanced quality. In fact, its sound was the same as that afforded by some pro mikes of higher cost available just a few years back.

The 631's resistance to popping was outstanding. The average home recordist has a tendency to mike too closely (family rock-and-rollers have been known to get the mike back almost to their tonsils). The result generally is explosive consonants, such as popped *Ps* and *Ts*. But popping with the 631 was sharply muted, even when the mike was placed almost against the lips.



Above, the 627 cardioid; below, the 631 omnidirectional. Price for either mike: $36.

Summing Up. Both the Electro-Voice 631 and 627 proved capable of producing recordings approaching the quality common to recording studios. And both sharply improved the sound quality obtained from a recorder when used with the mikes normally supplied. Pickup patterns proved to be accurately omnidirectional and cardioid, as stated (in the case of the 627, an acoustic chamber effectively phases out sounds arriving from the sides and rear).

Both the 631 and the 627 come with a 15-ft. rubber-covered cable, microphone connecting plug, and a quick-release stand-bracket. And both microphone elements have heat-, moisture-, and salt-spray-resistant nonmetallic diaphragms.

For additional information, write Electro-Voice, Inc., Dept. DF, Buchanan, Mich. 49107. ■

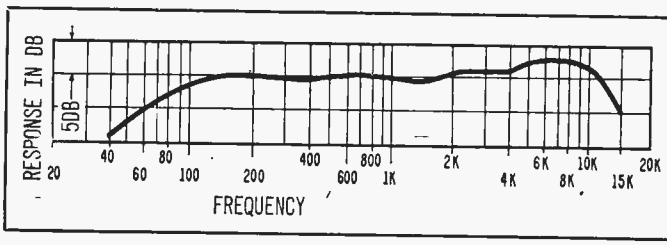


Fig. 2. Smooth as it is, frequency response of the 631 fails to reveal unit's relatively low distortion and freedom from breakup—two very potent factors affecting performance.

COVER STORY

make music with...
DATE PACER

By Bill Britton

mmmmmmm! Love that sound, Daddy! But tell me: did you really make it yourself?

■ You say you're lazy—and you're just 'bout broke, but you want hi-fi to make a good impression on *you-know-who?* Tell you what we're gonna do! We're gonna let you in on a little secret—good audio reproduction doesn't have to be sky-high in price. Most of the cost in those high-priced units is for skilled labor, rent on large factories, sales promotions, and don't forget *markup.* The Editors in cooperation with the author have come up with a you-build-it project called the *Date Pacer* hi-fi system, using preassembled components. We think it's the *greatest* even at twice the price.

For The Price! If you've been looking around for a low-cost *good quality* stereo music center—just a record changer with an integrated (built-in) amplifier and real speaker enclosures—you know such a thing can't be bought over the counter.

Do you really think you can get first class high fidelity for under $100? For this price or a bit more you can buy "hi-fi"—a one-piece stereo player with attached speakers, not over three feet apart. You might as

DATE PACER

well have mono! What's that? You can get one in a real pretty wooden cabinet—with open-back speaker enclosures for "wide sound dispersal" (and no bass at all) and it's only $160. Do you think it will be any better than the one your friend picked up for a C-note? Well, it sounds pretty good—except that the amplifier has a tendency to shatter on the sound peaks. Give up?

Don't! You can get a really good quality *low-cost* stereo music center by building your own. But you'll have to use the components the Editors of RADIO-TV EXPERIMETER specify. Then you'll not only have a good-sounding system—you'll have top-quality, real-walnut styling—not a plastic box or a laminated plastic or painted finish.

Patter on Date Pacer. The Date Pacer you-build-it project is essentially a semi-kit—just like those from a kit manufacturer. The only difference is *you* buy the items separately and save some more money. All the components are ready to connect together. You don't have to do a thing to the speaker systems, record changer or amplifier. You simply put a few holes into the walnut base, mount the amplifier, solder a few connections and you're finished.

Remember, the overall sound quality is determined by *all* the components. These units were specifically selected for good sound balance and competitive price. If you make any substitutions and it doesn't sound as well as you hoped you only have yourself to blame—you've been warned.

The speakers are Lafayette Radio's Minuette II (99HO-171W). They come completely assembled—even to the brilliance level control. All you do is connect speaker wires.

To make your shopping easier the record changer is Lafayette's Model 400 (21HO-155W). All you do is take it out of the box and set it in the cutout in the walnut base (21-0203W) that matches the changer. The only thing left for you to do is solder the leads from the stereo/mono ceramic cartridge.

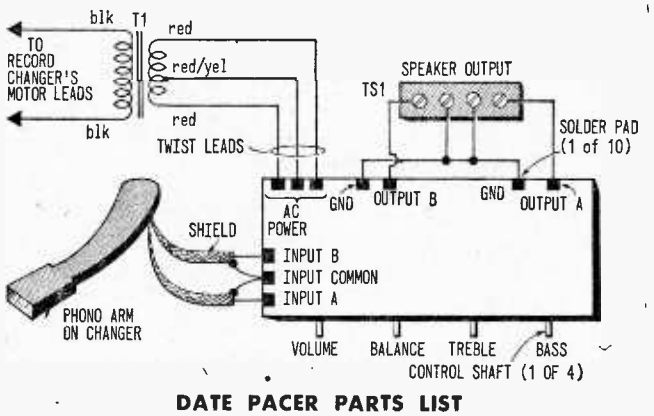
It's an Amperex. The heart of the system is the amplifier, an Amperex PCA-3B-18-1—a completely assembled printed-circuit board. Just solder on a few leads—from the ceramic cartridge, to the speaker terminals and from the power transformer.

To avoid size and voltage problems, and make shopping easier, use the Lafayette (19-0918) power transformer. It's only $2.95. You won't find this transformer listed in the catalog—but order it anyhow. Lafayette is stocking this item just for readers of RADIO-TV EXPERIMENTER.

The PCA-3B-18-1 amplifier is rated at 4-watts per channel. We know that won't break any windows but you won't play it at full volume for long. Because even if the neighbors or the family doesn't complain you'll turn it down because it's uncomfortably loud. But the power output is equal to, or greater than, most budget-priced stereo record players—and the Date Pacer sounds a lot better, too!

The amplifier's input sensitivity is rated as 1.6 volts—good for ceramic pickups. You won't be able to use a magnetic pickup with this amplifier.

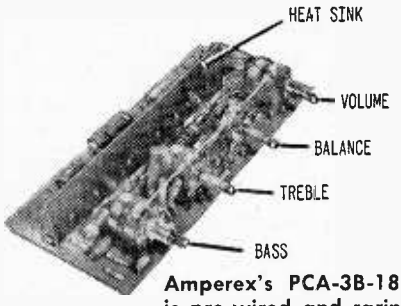
All the controls you need are mounted right on the printed-circuit board. So you'll have to make provisions for *Bass, Treble, Balance* and *Volume* control shafts in the side of the walnut base. Connections to the amplifier are made at easy-to-find *solder*



DATE PACER PARTS LIST

1—4-watt/channel amplifier (Amperex PCA-3B-18-1 or Lafayette 19-0914)
2—Speaker system with brilliance control (Lafayette Minuette II 99-0171W)
1—Record changer with ceramic cartridge (Lafayette 400 21-0155W)
1—Record changer base (Lafayette 21-0203W)
T1—Power transformer (Lafayette 19-0918)
TS1—Terminal strip with screw posts—4-lug

pads, pre-tinned spots on the printed-circuit board approximately ¼-in. square.



Amperex's PCA-3B-18-1 amp is pre-wired and rarin' to go.

Assembly. First step is to mount the amplifier in the walnut base for the record changer. Position the amplifier so the bottom of the printed circuit board is exactly flush with the bottom edge of the walnut changer base. Mark a horizontal line, across the front of the walnut base, to indicate where the controls will line up. Next, make a center line exactly midway between the sides of the base. This is the center of the front panel. Now go ahead and lay out the positions of the controls as shown in the photo. Make all marks lightly. You don't want them to show or otherwise ruin the beauty of the walnut finish.

Before you do any drilling, check the position of the marks by holding the amplifier close to the walnut base. Each control shaft should line up with one of the marks. If they don't, check your layout again.

Use the marks on the horizontal line as your drill guide. Once you've double checked you can make the marks easier to see. Mark them darkly with a pencil or even use a scribe or ice pick. Don't slip and scratch the walnut finish.

Now drill the holes. If you're using power wood bits be careful—the wood is thin, and you'll have to be content with the ⅜-in. bit. The next standard power wood bit size is too large.

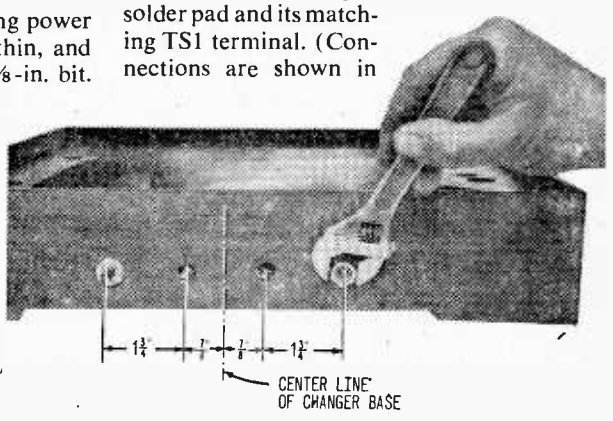
If you're using a brace and auger bit pick the next larger size. The same goes for regular twist bits—but to be safe (to prevent the drill from wandering) drill an ⅛- or 3/16-in. pilot hole before using the large drill. Use the same size drill for all holes.

Once the holes are drilled check to see that the controls fit through the holes. If they don't fit exactly right don't try to force the control shafts through the holes. There's a good chance that all you'll do is crack the printed-circuit board. It's best to use a rattail file and file away some of the wood on the side of the hole.

Set the amplifier aside temporarily, and mount the power transformer with 8-32 machine screws *through the side of the base.* Do not try to mount the power transformer with wood screws from the inside as the wood isn't thick enough to hold the screw. Stand the base upright on its back and mount the power transformer in the lower left corner so that the red and yellow leads face out; the two black leads will be between the transformer and the base's mounting board. Install speaker terminals TS1 on the rear apron of the base and then mount the amplifier using flat washers under the control-shaft-bushing nuts.

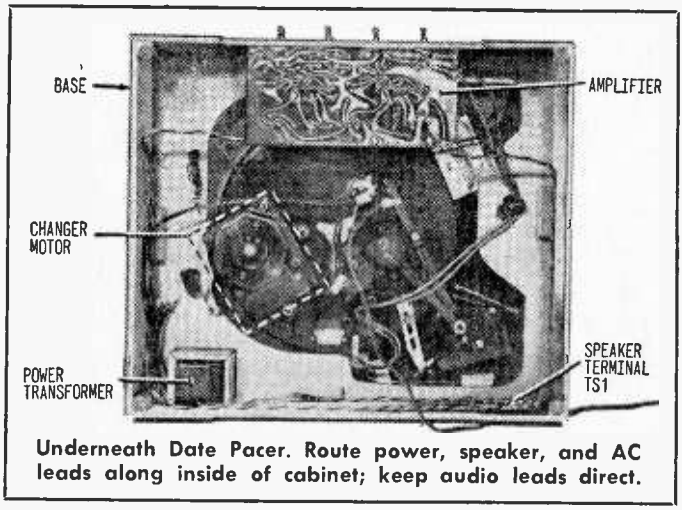
Now Comes the Wiring. Twist together three 24-in. lengths of wire, two red and one black. Connect one end of each of the red wires to the power transformer's red leads. Solder and insulate the connections with tape or shrinkable tubing. Connect the black wire to the power transformer's red/yellow lead—solder and insulate. Run the twisted wires along the inside edges of the base to the amplifier and connect to the amplifier's AC power. Solder pads as shown in the pictorial diagram. Staple, tape or cement the wires to the base so they don't flop around.

Twist together three 15-in. leads of *three* different colors, one being black. Connect the black lead to the two GND solder pads for each speaker. Connect the other end of the black wire to the *two* inside TS1 terminals. Connect the remaining two wires to each speaker-output solder pad and its matching TS1 terminal. (Connections are shown in



Nuts on control shafts secure amplifier to base. Take care not to mar base when drilling holes.

DATE PACER



Underneath Date Pacer. Route power, speaker, and AC leads along inside of cabinet; keep audio leads direct.

the schematic diagram.) Staple, tape or cement the wires to the inside of the base.

The leads from the stereo cartridge are pre-wired. Run them to the corresponding amplifier input terminals; leave some slack, but cut off the excess. Unwrap the shield from each cable and attach both shields to the input common solder pad. Connect the left and right center conductors to the matching Input A and Input B solder pads, respectively.

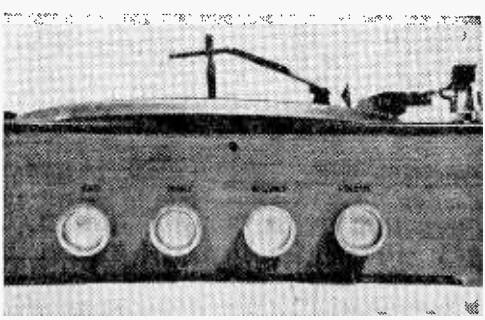
Finally, connect the power-transformer primary winding. Note that the changer has an automatic power shut-off. When the last record is played, the power is automatically removed from the motor. The power transformer must be connected so that it also receives its power when the changer is turned *on*, and so it automatically has the power removed when the changer shuts itself *off*.

Connect the black leads from power transformer T1 directly across the motor. Scrape the insulation off each motor lead and connect the leads using a T-splice. Solder and insulate the joint. Now, whenever the motor is powered to operate the record changer, the amplifier will be powered to deliver sound from the Date Pacer.

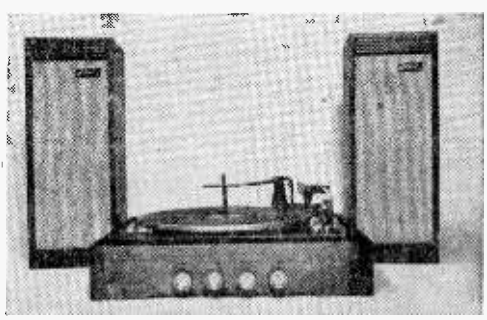
Did It, Dad! The Date Pacer is now completed. Simply connect the speakers to the matching TS1 terminals and you're ready to play your records—either mono or stereo. As a starter, we suggest you run the speakers' brilliance control wide-open to get a good picture of the overall sound quality. You can later adjust them to your sound quality preference and the conditions within your room.

Unlike some budget stereo centers which can drive to excessively-distorted high-volume levels, the Date Pacer has only enough gain to maintain reasonably undistorted sound; you cannot shatter your ears with distortion. This feature is a function of the cartridge output voltage, and is one reason we suggest no substitutions be made for the specified components.

Where to Obtain the Components. The changer, walnut base, power transformer and speakers are available from Lafayette Radio. The Amperex amplifier is available from Amperex dealers. If you cannot obtain an amplifier locally it can be obtained direct from Lafayette Radio—simply specify catalog no. 19HO914. ■



Front-panel labels are ordinary Technicals; gold-plated knobs complement walnut finish.

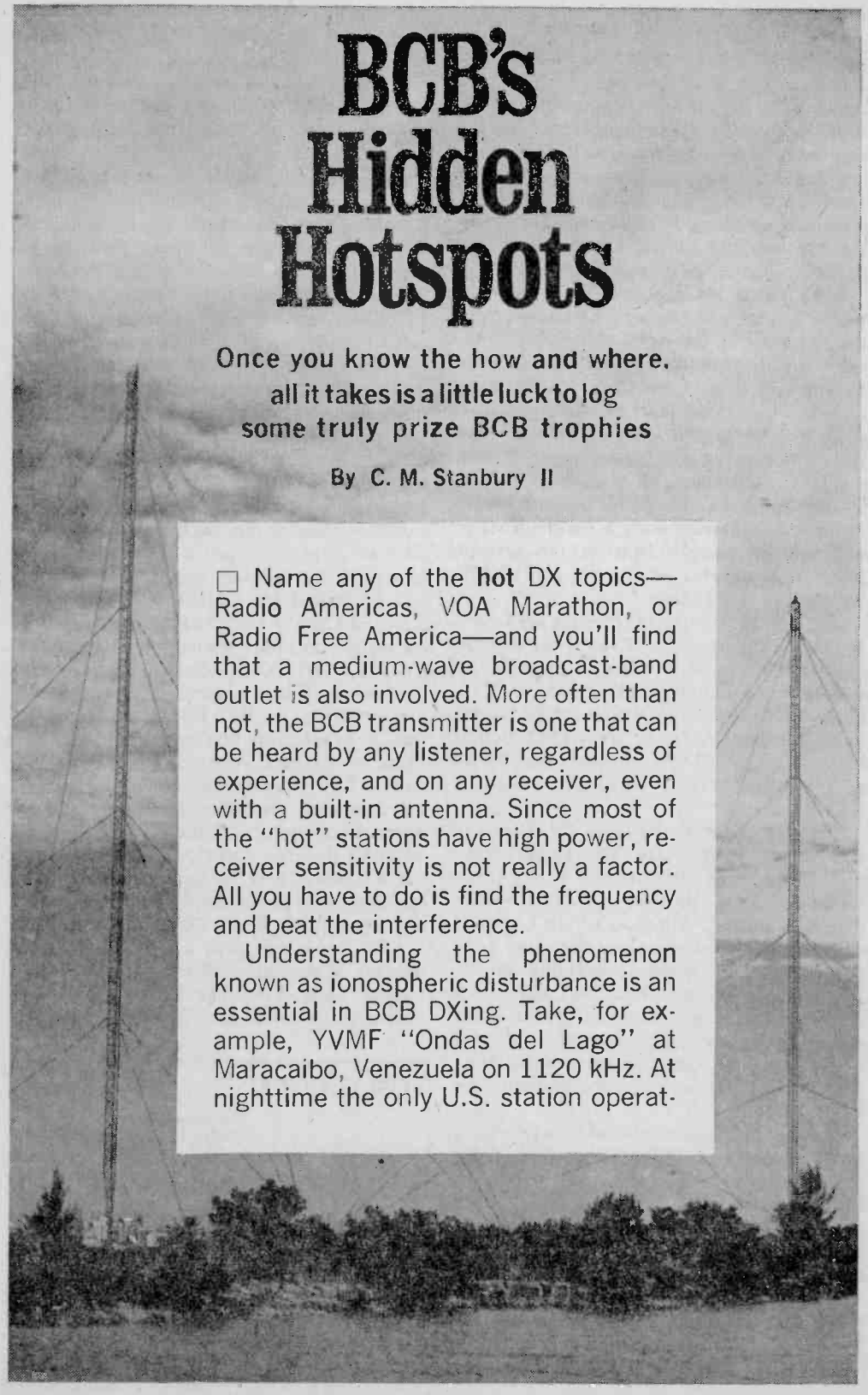


Completed Date Pacer is a project you'll take real pride in. And the sound? It's fantastic!

BCB's Hidden Hotspots

Once you know the how and where, all it takes is a little luck to log some truly prize BCB trophies

By C. M. Stanbury II



□ Name any of the **hot** DX topics—Radio Americas, VOA Marathon, or Radio Free America—and you'll find that a medium-wave broadcast-band outlet is also involved. More often than not, the BCB transmitter is one that can be heard by any listener, regardless of experience, and on any receiver, even with a built-in antenna. Since most of the "hot" stations have high power, receiver sensitivity is not really a factor. All you have to do is find the frequency and beat the interference.

Understanding the phenomenon known as ionospheric disturbance is an essential in BCB DXing. Take, for example, YVMF "Ondas del Lago" at Maracaibo, Venezuela on 1120 kHz. At nighttime the only U.S. station operat-

Hidden Hotspots

ing on 1120 kHz is KMOX, St. Louis. Since KMOX is ordinarily audible throughout the continent, you should have no trouble locating this frequency on your particular dial (calibration on many inexpensive AM receivers is anything but accurate), so don't assume that KMOX will necessarily roll in at the 1120 spot on your dial.

Now when an ionospheric disturbance (caused by a burst of charged particles from the sun entering the earth's ionosphere) occurs, signals from upper- and mid-latitude stations are greatly weakened, while those from tropical transmitters remain unaffected. Therefore, to tune in on and log a tropical station occupying the same frequency as a domestic transmitter, all you have to do is adjust your dial and hope for an ionospheric disturbance. During such a period KMOX will often be completely wiped out (except in the St. Louis area, of course), and YVMF will be left in the clear.

The best time to try for "Ondas del Lago" is early in the evening. (Even if the listener doesn't understand a word of Spanish, he will have no trouble picking out its ID.) Other South Americans which can be logged under similar conditions are HJED at 820 kHz (WFAA/WBAP's channel) and HJBI at 840 kHz (WHAS' frequency), both in Colombia.

The Big Names. Famous R. Americas is even more easily heard. Though not everyone agrees, this transmitter is definitely on Swan Island. Be that as it may, nightly reception from R. Americas can be expected east of the Mississippi, since there are only two other U.S. stations operating on its 1160-kHz frequency—KSL Salt Lake City and WJJD Chicago. Inasmuch as the latter signs off at sunset, Mountain time, all you need to hear R. Americas west of the Mississippi is a little ionospheric disturbance to weaken KSL.

To be sure, Castro does have various jammers around this channel, but they don't present much of a problem for stateside DXers. In fact, R. Americas' Spanish-language signal normally packs wallop enough that there's no real difficulty locating it on the dial.

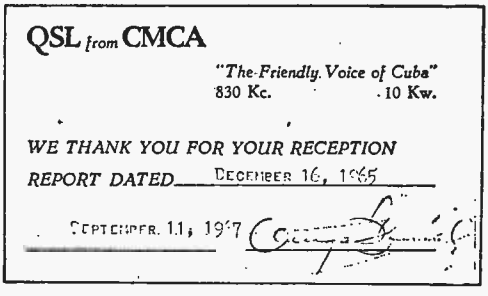
The Voice of America, located at Marathon, Fla., also broadcasts in Spanish (on 1180 kHz) and can be just as easily logged. Marathon's chief competitor on 1180 kHz is WHAM at Rochester, N.Y.; there is also some Cuban jamming.

Originally, the VOA used a portable BCB station (two movable towers of normal BCB height accompanied by a quick-phasing unit, portable power supply, and 50-kW transmitter). A more or less permanent facility now operates at Marathon, while the valuable transportable unit has been moved elsewhere. However, a certain "DXpert" (who asks that his name be withheld) has suggested that it is only the transportable antenna complex which has been removed. Though it is difficult to imagine a pair of BCB towers wandering around the world without a transmitter attached, the theory does offer some intriguing possibilities!

Clean Channel Game. The second element essential for interesting BCB DXing on a simple receiver is a "clear" channel—where there is no more than one non-DX station to beat. Broadcasters such as Fidel Castro, who are eager to reach a distant audience, have also learned this lesson. A few years ago he moved his CMCA ("The Friendly Voice of Cuba") to 830 kHz, where his only competitor in either the continental U.S. or Canada is WCCO at Minneapolis.

However, Castro is apparently not the only one interested in 830 kHz. It is rumored that an avant-garde literary group under the name of R. Free America and headed by author Lawrence Lipton also plans to use this frequency for broadcasts from a ship in international waters off the California coast. Whether R. Free America actually gets on the air remains to be seen (the cards are certainly stacked against it), but it is already creating a storm in the DX world.

RFA's critics include a writer who commented, "Personally, we hope that Mr. Lipton and his R. Free Americas plan are sunk before that station goes into being," and a


QSL from CMCA

"The Friendly Voice of Cuba"
830 Kc. 10 Kw.

WE THANK YOU FOR YOUR RECEPTION REPORT DATED DECEMBER 16, 1965

SEPTEMBER 11, 1967

QSL from "The Friendly Voice of Cuba" is unimaginative, though nice for the shack wall.

long-established radio club publication which commented, "Who needs it?"

In any event, DXers in the PST and MST zones should check nightly for RFA's appearance. Even though RFA plans low-power (120 watts) operation, it should be audible, at least poorly, on the simplest of receivers in these areas. Another target which DXers can also shoot for is KIKI out in Honolulu, Hawaii, at 830 kHz. And all listeners, both east and west, can expect to log R. Belize down in tiny British Honduras, also on 830 kHz.

Summer and Static. During the late spring and summer months, atmospheric noise becomes a real problem for medium-wave DXers. However, barring thunderstorms in your immediate vicinity, static should not prevent you from logging any of the stations listed here. When other conditions are favorable, all (except for KIKI) can be heard within an hour after your local sunset—before the noise level has a chance to build up.

Speaking of noise, many urban DXers are bothered by noise from power lines, neon signs, heavy machinery, and so on. But summer does have at least one point in its favor for city-dwelling DXers. Around sunset in the summer, if the listener owns either a battery-powered portable or a car radio, he can drive out and park at some rural spot, preferably a hilltop, and try for the stations listed in this article. And he can do so without worrying much about man-made noise of any description. ■

HOT DX PROSPECTS FOR THE TAKING ON THE BROADCAST BAND

Channel (kHz)	Station	Location	Interference
640	Circuito CMQ	Havana, Cuba	KFI, WHLO
820	HJED, La Voz de Rio Cauca	Cali, Colombia	WFAA/WBAP
830	CMCA, The Friendly Voice of Cuba	Havana, Cuba	WCCO
	R. Belize	Belize, British Honduras	WCCO
	KIKI	Honolulu, Hawaii	WCCO
	R. Free America	Off California Coast	WCCO
	(not yet on air at press time)		
840	HJBI	Santa Maria, Colombia	WHAS
1050	XEG	Monterrey, Mexico	WHN & Canadians
1120	YVMF, Ondas del Lago	Maracaibo, Venezuela	KMOX
1160	R. Americas*	Unknown	KSL, WJJD
1180	Voice of America	Marathon, Florida	WHAM
1570	XERF	Ciudad Acuna, Mexico	WHAM & Canadians

* R. Americas actually transmits on 1157 kHz

Great Gunns! An Amoeba-sized Radar Set!

■ Chips of a metallic element called gallium arsenide—about the size of the period at the end of this sentence—are expected to bring about a revolution in radar and other microwave systems every bit as earth-shaking as that caused by the transistor (now used in everything from computers to pocket radios).

The process promises low-cost radar sets for cars, boats, and small aircraft. There's even the very real possibility that it might end up in a small hand-carried maneuvering device for use by the blind.

The chips can be made to emit radar waves by the application of electricity: the result is called the Gunn effect. The Patent Office recently granted a patent covering this phenomenon to John B. Gunn of Yorktown Heights, N.Y., who assigned rights to IBM.

The tiny chips can be used to generate microwaves having frequencies as high as 50,000 MHz. By speeding up the reaction so that a new cycle starts before the first has completely traversed the crystal, frequencies as high as 100,000 MHz can be attained.

But whether this latter mode of operation is covered in the current patent, which contains 61 claims, is likely to be decided in court. The reason: virtually every major electronics company in the world is working on the Gunn effect. ■

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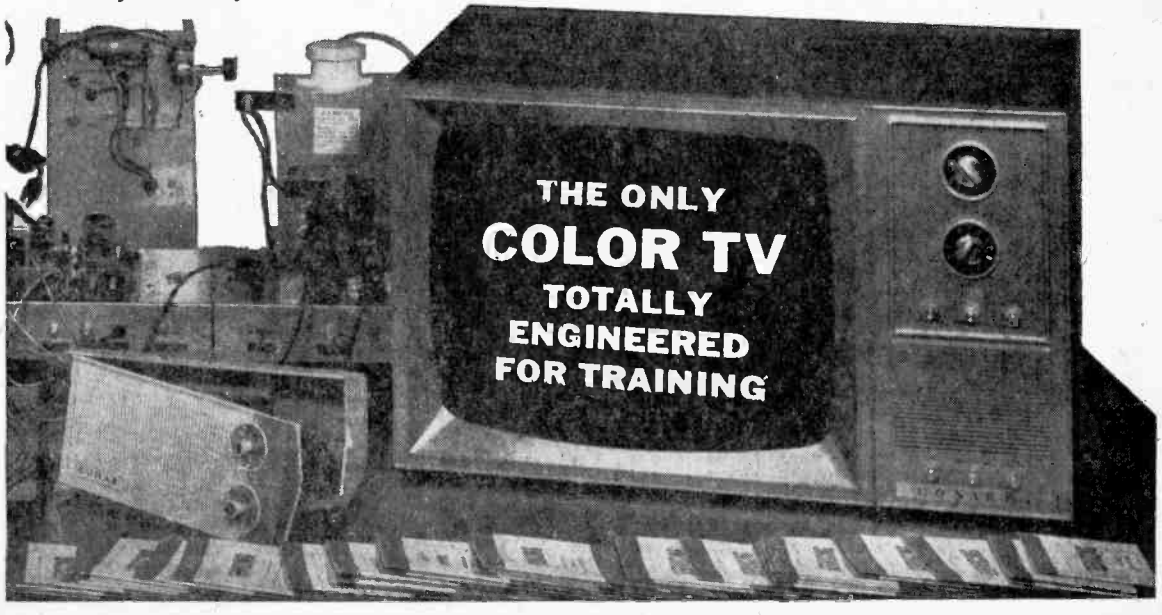


Propagation Forecast

By C. M. Stanbury II

☐ Tune in Africa south of the Sahara during June and July especially at 1200-1500 listener's standard time to pull in some rare DX. While not necessarily at peak strength, stations south of the Sahara will dominate the 25-meter band during this period. Since the lower half of Africa is enjoying winter, thus reducing signal absorption; and Europe, Africa's chief daytime competitor, is having summer with its attending maximum absorption, the weak African stations will make it states-side to your receiver.

The 25-meter opening is very important now that reception on the lower, *tropical* bands has fallen off with the current sunspot count (and summer static rise). Those nice mid-summer evening DX openings to such rare spots as Rhodesia, Mozambique and Zambia on 60 and 90 meters will be few and far between for the next couple of years. In fact, African reception on those lower frequencies will show only minor improvement even when static drops off this fall.

The African situation points up another fact of DX life. During lower portions of the sunspot cycle, nighttime reception is at its best; during the upper part of this cycle (like now), daytime listening reaches a peak. Unfortunately, many of the rarer and more interesting stations have a habit of remaining on the lower bands which are always out of reach during daylight hours. ■

RADIO-TV EXPERIMENTER PROPAGATION FORECAST

June/July 1968 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	25, 31	25, 31	41, 49	41	49, (60)
0300-0600	25, 31	31	31 (poor)	41, 49	49, (60)
0600-0900	19, 25	(16), 19	19	31	31
0900-1200	19, 25	13, 16, 19	19	19 (poor)	25
1200-1500	19	13, 16, 19	25	19 (poor)	19 & 25 (poor)
1500-1800	16, 19	19, 25, (31)	25, (31)	19	25 & 31 (poor)
1800-2100	16, 19	25, 31	31 (poor)	16, 19	49, (60)
2100-2400	16, 19	25, 31	41	(16), 19, (25)	49, (60)

To use the table put your finger on the region you want to hear and log, move your finger down until it is alongside 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.

HEATH MODEL SB-310
Linear Tuning
Shortwave Receiver

■ Almost from the instant Heath introduced its SB-300 amateur receiver, SWLs have wished for a shortwave model. Now it's finally here in the form of the Heath SB-310—an SWL version of the famed SB-300.

For those unfamiliar with the SB-300 series, we'd best digress for a moment and tell why the SB-300 (the mother of them all) was so highly respected. The SB-300 was the very first of the inexpensive receivers which could be accurately described as "a frequency meter with a loudspeaker."

As far as sensitivity and selectivity are concerned, the SB-300's performance was typical of any other high-performance receiver. The big difference was its phenomenal frequency stability and a linear tuning (master) oscillator called an LMO that was typically accurate to 200 Hz, 400 Hz at worst.

If the user were waiting for a station to come on at, say, 3577 kHz, he could set the dial to that frequency and be absolutely certain of reception. Unfortunately, the SB-300 tuned only the 80- through 10-meter ham bands, so an SWL had to shell out close to $1000 for a *used* SW receiver with the same reliable dial calibration.

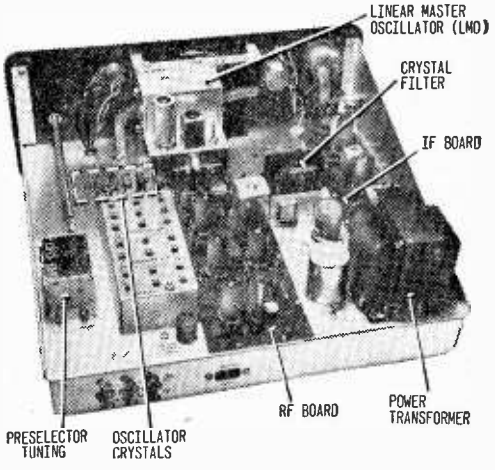
But now, for a mere $249.00 (less speaker), an SWL can have the exact same performance on the important SW frequencies as the ham obtained from the SB-300. In fact, the SB-310 shortwave model is nothing more than the SB-300 with different coils and crystals and a noise limiter.

Nine Bands. Available in kit form, the SB-310 tunes nine 500-kHz-wide SW bands: 3.5-4.0 MHz, 5.7-6.2 MHz, 7.0-7.5 MHz, 9.5-10 MHz, 11.5-12.0 MHz, 14.0-14.5 MHz, 15.0-15.5 MHz, 17.5-18.0 MHz, and 26.9-27.4 MHz. Note that this coverage includes the most popular SW frequencies—the 80-, 40-, and 20-meter ham bands and the Citizens Band.

Feature-wise, the SB-310 is loaded. The rear apron provides jacks for an 8-ohm speaker, 500-ohm line, hi-fi (amplifier) output, remote receiver muting, and antenna. Both a product detector for sideband reception and a diode detector for AM reception are provided. The AGC (automatic gain control) provides for *off*, *fast* release for SSB and CW, and *slow* release for AM. An S-meter tuning aid is provided as well as a noise limiter with an on/off switch.

The basic package also includes a built-in 100-kHz crystal calibrator which is put into operation from the front panel, and a means whereby the dial can be adjusted to the calibrator (also from the front panel).

Four Filters. To avoid running on about features we'll end with the crystal filters. The basic package includes an AM crystal filter which is used for the AM, CW, and SSB modes. The basic AM crystal filter provides



Though the SB-310 is jam-packed with features, chassis layout is neat and wide-open.

LAB CHECK

selectivity only 15 kHz wide at 60 dB down. This in itself is excellent, but for super-selective CW and SSB reception three optional crystal filters are available.

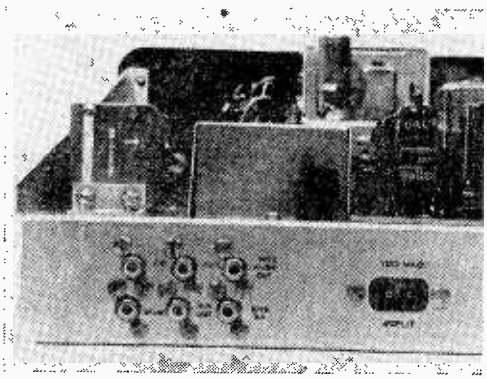
The CW filter is only 400 Hz wide at 6 dB down, and only 2 kHz wide at 60 dB down (that's like cutting through the QRM with a razor). The standard SSB filter is only 7 kHz wide at 60 dB down, while a deluxe SSB filter is but 5 kHz wide at 60 dB down. (60 dB down is used as the reference since a signal attenuated 60 dB or more is assumed to cause no objectionable interference.)

The receiver's mode switch is so wired that when only the AM crystal filter is used it functions for all modes, while the proper filter is switched in when optional filters have been installed. Further, when SSB filters are used an extra crystal is also added so that the user can select between the upper and lower sideband without retuning.

The remarkable frequency stability of the SB-310 is obtained through use of crystal-controlled oscillators for high-frequency heterodyning and a low-frequency tunable linear master oscillator (LMO). The input signal passes through a *preselector*—an amplifier whose tuning is independent of the tuning dial—and then to a first mixer where a crystal-controlled oscillator beats the signal to approximately 8.5 MHz.

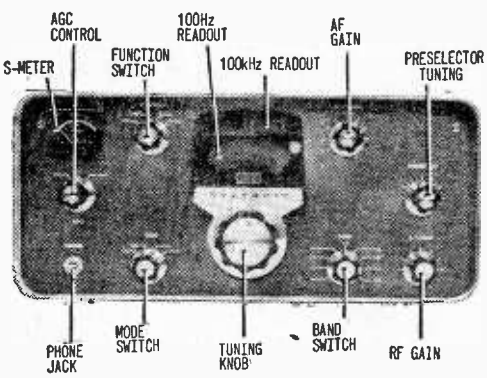
The 8.5-MHz signal is then passed through a bandpass filter to strip off any spurious frequencies and passed to a second mixer where a linear master oscillator of approximately 5 MHz beats the signal down to the second IF frequency of 3.395 MHz. The signal then passes through a crystal filter, two stages of IF amplification and the appropriate detector, and on to the noise limiter and AF amplifier.

Since the first conversion is crystal-controlled, and because the second (tunable) oscillator is working at a relatively low frequency, drift is almost negligible. In our test unit the receiver was almost rock stable after a 5-minute warm-up.



Jacks at rear provide for connecting speakers or line, amp, muting switch, antenna.

In a sense it is the combination of crystal control and LMO which makes the SB-310 different from other high-performance receivers, since these features enable it to provide not only superb stability but direct frequency reading to, at worst, a 400-Hz accuracy.



Controls on the Heath SB-310 were found to be attractively grouped, convenient to use.

Heathkit SB-310 AM Sensitivity

Freq. (MHz)	Sens. (uV)	Freq. (MHz)	Sens. (uV)
3.5	0.8	14.0	0.5
5.7	0.3	15.0	0.6
7.0	0.3	17.5	0.7
9.5	1.6	26.9	0.8
11.5	1.3		

Building the Kit. While the SB-310 kit appears complex, it is in fact no more difficult to build than a hi-fi receiver, and it's a lot easier to align. You may consider that the kit consists of four independent sections: the LMO (which is supplied wired, aligned, and sealed), an RF printed circuit board, an IF printed circuit board, and power sup-

(Continued on page 127)

Sound Sipper

By Elmer C. Carlson, KOD1752

This audio project was not conjured up in a malt shop but you may need to visit a sundae supermart to pick up plastic straws!

They're free! That's right! All the basic materials needed for making a lightweight directional baffle for your recorder's microphone are free. All you need is a handful of plastic drinking straws, a plastic sleeve and a few small rubber bands, and *voila—Sound Sipper*.

Get Started. To assemble Sound Sipper you'll need about a dozen plastic drinking straws, more or less depending on the microphone's housing diameter. Use plastic straws—paper straws crush and don't return to their original shape.

You'll have to cut all of the straws except one which will be used full length. Put the uncut straw aside. With a sharp single-edge razor blade cut ¼-in. off the first plastic straw. Cut ½-in. off the second; ¾-in. off the third, and so on. Don't throw away the cut-off ends. Some of those longer pieces may be used as the "short" ends—those near the base of the microphone housing. Altogether, this version of Sound Sipper used 20 sections. But, you can use almost any mike with slight modification.

To make it easy on yourself, lay out the cut straws on a strip of masking tape as shown in the photo (see next page). The strip of masking tape keeps the straws from rolling all over and keeps them in their size-places position to make the job of assembling Sound Sipper easier.

For a temporarily-mounted Sound Sipper all you need is a few rubber bands looped around the upper parts of the baffle. About three rubber bands are all you need to keep the straws in their places. A couple of wraps of masking tape around the base completes the assembly. See what we mean? It's *Free!*

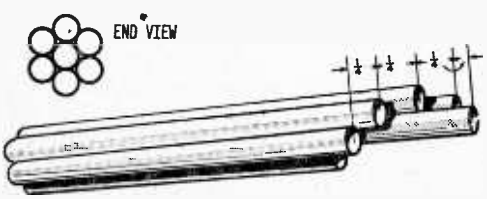
A Better Way. To make your Sound Sipper permanent you had better cement the polyethylene straws together. But, polyethylene is not the easiest plastic to cement. The Editors recommend you use Pliobond. Probably there are other cements, even some special-purpose cements, that will do a good job with polyethylene. But none of the other commonly available cements worked well when tested. *(Continued Overleaf)*

Start Sound Sipper's baffle with a core of seven straws as shown in the drawing. The longest straw, the uncut one, goes in the middle. The other six go around the long straw in the center. It won't matter which way the spiral of straws runs.

Cementing the straws together takes the longest part of the construction time. That's because you have to work in layers—longest straws first. Let one layer dry and then cement on another layer. Rubber bands do a good job of holding the drinking straws together while the cement sets.

Now comes the task of fitting the baffle onto the microphone. The straw assembly fits flush against the microphone grille with the end of the spiral pointing along the axis of the microphone. A white polyethylene sleeve salvaged from an empty deodorant bottle fits about the microphone housing and the straws. This plastic serves as a hood to mount the straws on the microphone. Stiff, durable cardboard can be used, or acetate, or other stiff plastic material. Use Pliobond to cement the straws to the white plastic hood. Rubber bands secure Sound Sipper to the mike unless you wish to make it a permanent attachment, then cement it, too!

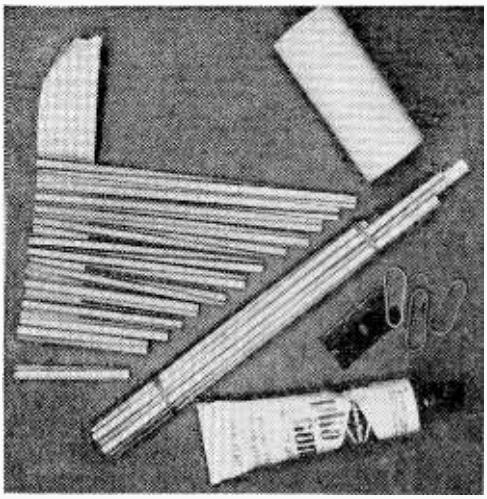
Some Tests. Without connecting a sensitive meter into the tape recorder circuitry you won't notice much difference in sound pickup over a 45° segment of space in front of the microphone. For best appraisal of Sound Sipper just tape record a quarter-minute with and without Sound Sipper in place in a slightly noisy room.



Like all projects, it's important to get a good start. The first seven straws are the most critical in forming the spiral.

The first test of Sound Sipper was made in an office using a portable radio as a sound source. Just tune in a news broadcast. Without Sound Sipper the microphone picked up much of the noise of the typewriters and adding machines. The office noise made it difficult to hear the audio from the radio set at low volume.

With Sound Sipper in place the voice from the radio came out much clearer on the second part of the recording. The constant clatter of the office machines wasn't annoying any longer.



Here's what your workbench will look like part way through the construction. Straws are kept in place by sticking them to some masking tape. Other construction items are Pliobond cement, razor, rubberbands and white plastic hood. See photo below.

Outdoor tests proved much better than those conducted indoors. The reason was there were no walls to bounce the noise around the room. However, if used in a crowd such as a screaming football mob it is wiser to head for open spaces on the sidelines, if possible.

To make more accurate tests of the effectiveness of your Sound Sipper use a constant tone audio signal. Try 400 Hz from a modulated signal generator picked up by a radio. With a constant tone it will be easy to make relative measurements just using the recording level meter on the tape recorder. In time, you could plot a pickup pattern for Sound Sipper's microphone baffle that you assembled.

Sound Sipper doesn't make a pencil-sharp pickup like the pro jobs do. It can't compete with those parabolic dishes or yard-long baffles. But, it will reduce background noise considerably. What's more, you can stuff Sound Sipper in your pocket—it'll bend but won't break. And if you lose it, you won't cry over the cost. Just head back to the maltshop and pick up some more straws. ■

Here's the Sound Sipper all finished and ready to snoop out the sounds you want in.

By MARSHALL LINCOLN

HAM TRAFFIC
DE W7DQS

DOUBLE YOUR FUN WITH A DOUBLET

☐ Getting up an antenna is a job that gets many a ham down. But both you and your sky-hook can be riding high in short order if you latch on to the dual-purpose dipole illustrated here.

Though usually the least expensive part of a ham station, antennas often present more problems than any other single item. In a city, especially, hams frequently have considerable trouble finding room to put up the kind of antenna they really want because of space restrictions.

The sky wire described here is an ideal antenna for the beginner because it lets him operate the popular 80-meter band plus the very versatile 40-meter band. And it does so while taking up only slightly more room than a regular 40-meter antenna. Though it looks like a trap antenna, it is not. And tuning it up for peak operation requires no special tools not found in the typical ham shack.

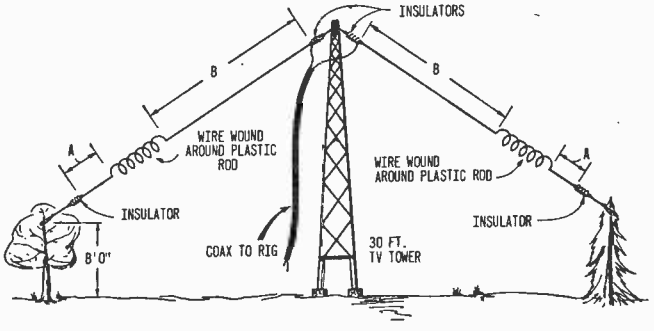
The basic design has been kicking around for a long time, yet it is known to surprisingly few hams. It functions like a dipole, but has a "loading coil" near the end of each leg to make the antenna resonate on both 40 and 80 meters.

The exact lengths of each dimension shown in the diagram may vary a little according to your preferred operating frequencies and the effect of nearby objects such as buildings and trees, as well as the height of the antenna above ground.

Thirty and Eight. When I put up this antenna, I used a 30-ft. TV mast to support the center insulator, where the 52-ohm coax feed line attaches to the two legs of the dipole. The ends were tied into tree limbs about eight feet off the ground. Ceramic insulators were placed on each end to isolate the antenna wire from the rope used to attach to the tree limbs.

Each coil was made of #18 enameled copper wire, with 270 turns close-spaced on a ⅞-in. diameter plastic rod which was 14 in. long. I like to pound brass, so I tuned the antenna to about the middle of the 40- and 80-meter SW bands. In my installation, lengths *A* were 4 ft. 6 in., and lengths *B* were 35 ft. 10 in.

I'd suggest you start with these dimensions, check the SWR they produce, then make any changes in lengths *A* and *B* to ensure proper operation on your favorite frequencies or band segments. To do this, connect the antennas to the output of your rig and tune up on your favorite frequency at a moderately low power level with an SWR



W7DQS made use of a 30-ft. TV mast and a couple of trees to support his 80/40 doublet, but your installation needn't be the same. Lengths A and B were 4 ft. 6 in. and 35 ft. 10 in. in his case — exact dimensions must be determined through use of an SWR bridge as described in text.

HAM TRAFFIC

bridge in the feed line between the transmitter and the antenna.

(Don't forget to listen first with your receiver to avoid tuning up on top of somebody else's QSO. And keep your test transmissions short so you don't foul up the bands.)

Measure the SWR on your preferred frequency, or at the middle of the frequency range you want to operate. Then tune up above and below this frequency and measure the SWR at these points.

C & T in Practice. If the SWR is higher above your preferred frequency than below it, you should cut a little wire from the legs of the antenna and try again. If the SWR is higher below your desired frequency than above it, you should add a little wire to the legs. (Now you know what "cut and try" means!)

Start with 40 meters and make all your changes to the sections labeled *B* in the diagram. When you find the proper *B* length that produces the lowest SWR on your desired 40-meter frequency, switch to 80 meters and do the same thing. This time, however, make any changes to the *A* sections.

An important thing to remember is that on 80, changing the length of sections *A* only a small amount will move the resonant frequency appreciably. Therefore, it's best to change *A* only an inch or two each time. (Changing it 6 or 8 inches at one whack might put you clear out of the band before you know it.)

Because the finished antenna is not a full half wavelength long on 80, you will be restricted to a fairly narrow portion of this band. Whenever you get out of this narrow portion, the SWR on the feed line will be extremely high. However, this narrow bandwidth is a small price to pay if the only alternative is no operation on 80 at all because you don't have room for a full-size 80-meter antenna.

That, in a nutshell, is how to make a double-purpose doublet. The cost is little more than a single-band job, yet in effect you have two antennas in the space of one.

Those New IDS. Ham radio must be growing up. The clue: its voice is changing.

Those old familiar procedures which ham stations have used to identify themselves—and the stations to which they were transmitting—have been scrapped by the Federal Communications Commission. New requirements are now in effect which are much simpler and more lenient than the ones used for many years.

There wasn't much ballyhoo given to the change, so lots of hams haven't heard about the new rules, or don't understand them. This may account for some of the confusion and disagreements you may have stumbled across on the bands.

The basic rule, which requires a station to identify at the beginning and end of a QSO and every ten minutes in between, is still in effect. However, a fellow now needs only to identify *his own station;* he does not have to identify the station or stations to which he is transmitting *until* he finishes his QSO or conversation. Then he need only identify *one* of the stations he has been talking to.

Of course, it's still permissible to use the other chap's call letters when calling him—most operators will probably go on doing this for years because of habit—but you are not *required* to state the other op's call *except* at the end of your final transmission.

Hey, Joe! For example, if you hear your old pal, Joe, on the air, you may just mash down on the go button and say "Hey, Joe, this it W2XYZ." That's all that's legally required to start a two-way conversation. Every ten minutes, you will have to give your own call letters, then you are free to go right on yakking.

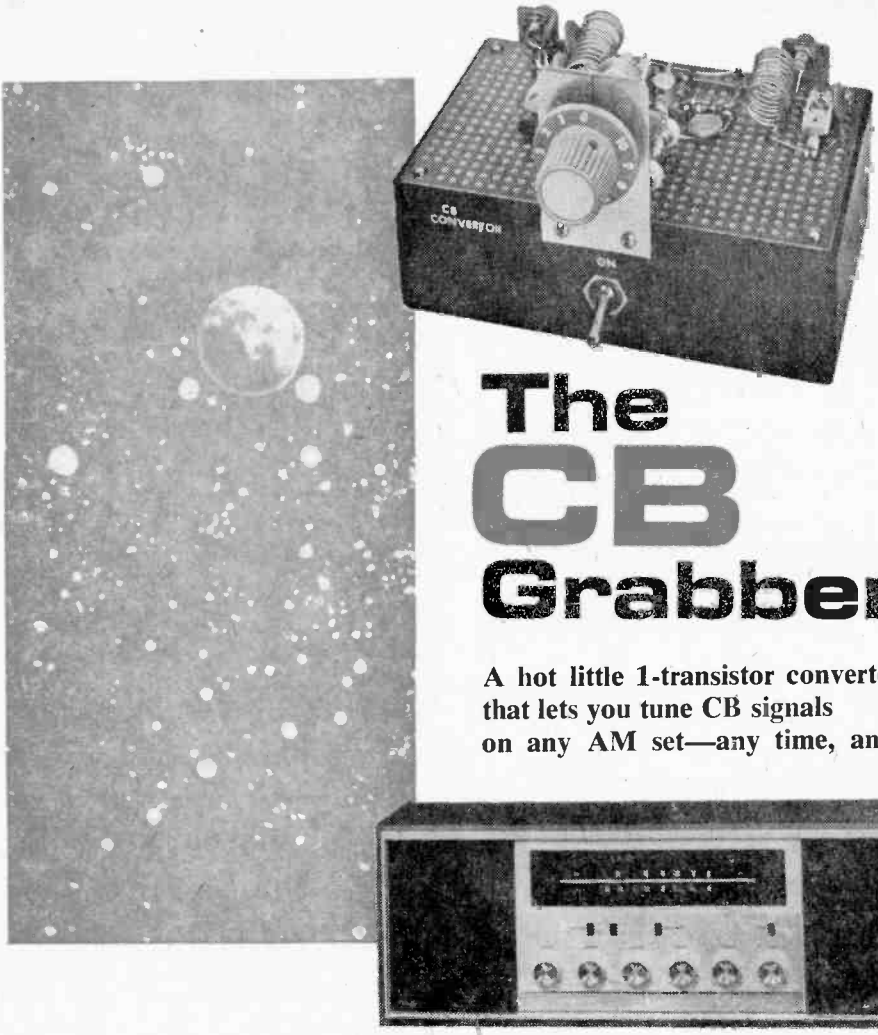
When you get through chewing the fat and decide to shut down the rig for a while, you should say something like "W3XXX, this is W2XYZ."

Actually, you don't even have to say *this is* or *from* between his call and yours anymore, but the FCC says "usage of these terms and smiliar phrases is permitted and encouraged." (That's official federal government talk for "pretty please.")

Of course, you realize that *this is* and *from* are expressions used when operating phone. On CW, you would use *de*, which, in case you didn't realize it, is French for *from*. (This is about the only chance you will ever have to say something in French that comes out shorter than it does in English!)

Pick A Call. It used to be that when a station was in a round table with several stations, each station was required to identify itself as being in contact with every one of the others. In reality, hardly anybody ever

(Continued on page 136)



The CB Grabber

A hot little 1-transistor converter that lets you tune CB signals on any AM set—any time, anywhere!

By Charles Green, W6FFQ

■ Here is a double-fun project, the fun of building a simple solid-state converter and the fun of listening to the activity on the Citizens Band. Tabbed the CB Grabber, the one-transistor converter will work with any BC-band receiver tuned to 1550 kHz, or any quiet spot near this frequency. The converter tuning dial is tunable to cover all 23 channels for easy operation.

The BC receiver together with the CB Grabber forms a dual-conversion receiving system to separate the CB stations for better listening. No changes are required in the BC receiver, and the CB Grabber is powered with a self-contained battery.

It is easy to build the converter. Most of the resistors, capacitors and coils are mounted on the top of a perf-board box using breadboard construction.

Operation. The CB Grabber can be operated with almost any BC-band receiver that can be tuned to the converter output frequency (1550 kHz). The converter can even be connected to a battery-operated receiver for portable use.

If the BC band receiver does not have terminals for an external antenna and ground, wind 5 turns of hook-up wire around the receiver loopstick and connect the turns to J2 on the CB Grabber with either coax or twisted pair wire.

Do not make any direct connections to the "hot chassis" type of AC/DC receiver—use .005-μF ceramic disc capacitors in series

CB Grabber

with each lead to the converter to prevent electrical shock.

For best results, use a rooftop CB whip fed with coax to J1 and a good external ground. Strong signals may be received with an inside antenna. Even a TV antenna can be used with some results.

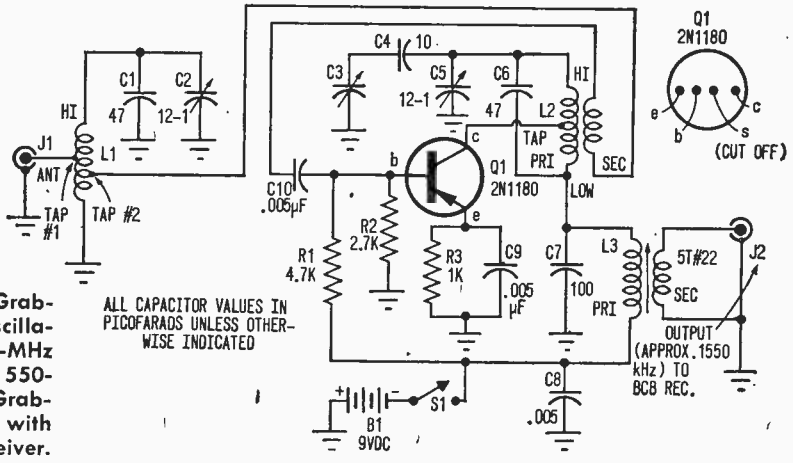
For long or continuous use, a larger external 9-volt battery can be connected to the converter in place of the internal 9-volt battery.

How It Works. CB signals are coupled from the antenna (via coax connector J1) to tap 1 on L1. Refer to the schematic diagram. Coil L1 and C1-C2 are a broadly tuned circuit centered at 27 MHz. The signals are coupled from tap 2 on L1 to the low-impedance base circuit of Q1. Transistor Q1 is also a tuned oscillator—look at its collector circuit in the schematic diagram. The oscillator circuit (L2, C3, C4, C5 and C6) is varied in frequency by tuning capacitor C3 and trimmer C5. Ceramic tubular capacitor C4, in series with C3, limits the capacitance variation possible with C3. Output frequency is set by C5 and L3.

The tuning capacitor adjusts the oscillator frequency to about 1550 kHz above the frequency of the incoming CB signals. This frequency difference is actually the first IF of this dual-conversion setup. (The second IF is that inside the broadcast receiver.) The first IF generated, in the collector circuit of Q1, is coupled (via L3 through J2) to the BC-band receiver input.

Battery B1 supplies power to the circuit—switch S1 controls it.

Construction. The converter, as shown in the illustrations, is built on a 6x3¾x2-in.



Schematic of the CB Grabber reveals simple oscillator that converts 27-MHz signals at J1 into 1550-kHz signals at J2. Grabber must be used with a broadcast-band receiver.

PARTS LIST FOR THE CB GRABBER

B1—9-volt battery (see text)
C1, C6—47-pF, ceramic disc capacitor, NPO
C2, C5—1-12 pF, mica trimmer capacitor (ARCO 420 or equiv.)
C3—1-15 pF variable capacitor, modified—one rotor blade removed (E. F. Johnson 149-1)
C4—10-pF ceramic tubular capacitor, NPO
C7—100-pF ceramic disc capacitor, NPO
C8, C9, C10—.005-uF ceramic disc capacitor
J1, J2—Phono jacks, one-hole mounting (Radio Shack 274-346 or equiv.)
L1—10 turns AWG 18 solid wire, ½-in. dia., spaced to 1-in., tapped at 1 turn and 3 turns from ground end (see drawing and text)
L2—Primary, 9 turns AWG 18 solid wire, ½-in. dia., spaced to 1 in., tapped 3¼ turns from low end (see drawing and text); secondary, 2 turns AWG 18 solid wire, ½-in. dia., spaced to 3/10-in. and covered with plastic sleeving (positioned ⅛-in. from L2 primary cold end (see text and drawing).
L3—Adjustable antenna coil (J. W. Miller 6300), modified, 5 turns AWG 22 hook-up wire wound as secondary winding (see text and drawing)
Q1—2N1180 transistor (RCA)
R1—4700-ohm, ½-watt resistor
R2—2700-ohm, ½-watt resistor
R3—1000-ohm, ½-watt resistor
S1—S.p.s.t. toggle switch (Radio Shack 275-602 or equiv.)
1—6 x 3¾ x 2-in. phenolic box and perf-board (Radio Shack 270-097 or equiv.)
Misc.—Push-in terminals for perf-board, aluminum for brackets, wire, solder, battery connector, machine screws and nuts, etc.

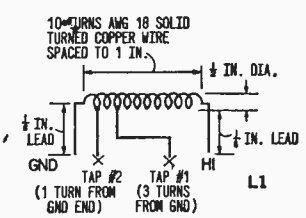
phenolic box with a perforated phenolic board top. Most of the resistors, capacitors and coils are mounted on the perf-board using push-in terminals. The tuning capacitor is mounted at the front of the box and input and output connectors J1 and J2 are mounted at the rear. A few easy-to-make aluminum brackets are used. The 9-volt battery, B1, is mounted inside the box.

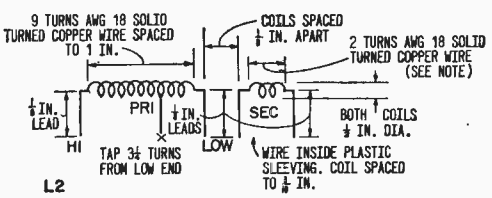
To start construction, remove the perf-board panel from the box and set it aside. Drill a ½-in. hole through the center of one side of the phenolic box. This hole is for S1. When mounting S1 use an internal-tooth lock washer between the switch body and the phenolic case. Using the internal-tooth lock washer this way prevents the switch from turning easily after the nut has been tightened (not too tight) on the shaft.

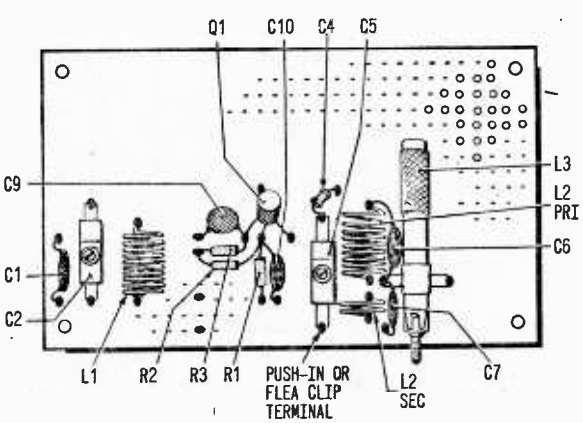
Any 9-volt battery that will fit into the box can be used. Here a NEDA 1604 was mounted to the rear of the box with the leads connected to S1 and brought out through a hole in the rear of the box. The larger the battery, the longer it will last (the 8.4-volt mercury batteries will last longer than carbon-zinc types). Make sure the battery is mounted securely and that there is at least ½-in. clearance to the bottom of the perf-board panel.

Watch Where You Put It! The sizes of the mounting brackets for the tuning capacitor and jacks are not critical, but their placement is critical. The tuning capacitor C3 should be mounted so that its bottom is approximately ¼-in. above the perf-board. The jacks J1 and J2 should be mounted approximately ¼-in. above the perf-board also. Position the tuning capacitor and jack brackets exactly as shown in the photo. The brackets are mounted with two screws and nuts for each bracket in holes drilled in the box front and rear sides. For easier tuning, remove one plate from the rotor of tuning capacitor C3.

Drawings at left and below give full details for winding coils L1 and L2; see photo on next page for placement of secondary winding on L3. Location of components on perf-board can also be seen on this photo as well as on the pictorial below.







Lay out and mount parts, soldering them to push-in (flea-clip) terminals, as shown in the illustration. Parts placement is critical because of the high operating frequency of the converter.

Before mounting Q1, locate and cut off the shield lead, as shown in the base diagram for the transistor on the schematic diagram. Wire the components as shown in the schematic diagram and photos. Do not connect the leads from the battery and S1 to the circuit wiring until all of the other wiring is completed and checked. Keep the wiring straight and as short as possible. Connect the taps on the coils as shown in the diagrams. Use stranded wire with a little slack bent in for the connections to C3 and the push-in terminal. This minimizes any microphonics while tuning C3. Make sure that the L2 secondary turns are wound in the same direction as the L2 primary turns.

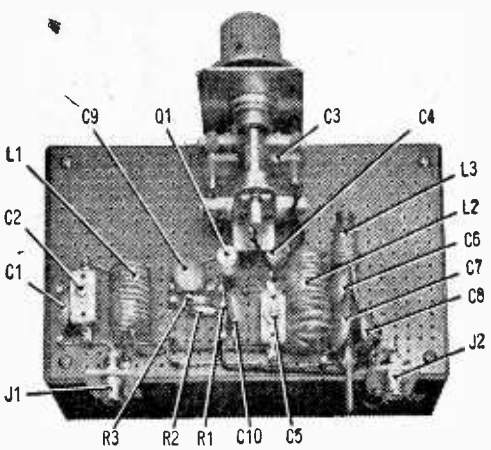
Alignment. Tune your BC-band receiver to a quiet spot on the dial as near to 1550 kHz as possible. Don't tune too close to any strong signal, as this will interfere with the operation of the CB Grabber—especially if

the BC-band receiver does not have a shielded input with antenna and ground connections.

Connect a signal generator to J1 and connect the output from J2 to the BC-band receiver (see earlier text covering *Operation*). Adjust the signal generator output frequency (about 1550 kHz) for maximum output from the BC-band receiver. Now set S1 to ON and adjust the tuning slug in L3 for maximum tone output from the BC-band receiver.

Rotate the tuning capacitor almost to its full capacitance position. Set the signal generator output frequency to 27 MHz. Now alternately adjust trimmer capacitors C2 and C5 until you hear the 27-MHz tone-modulated signal from the BC-band receiver. Adjust the trimmers for maximum tone output. If necessary push together or stretch apart the turns of coil L1 and the primary of L2.

Make sure the oscillator is operating at a frequency *above* the incoming CB frequency. Tune the signal generator for the IF image signal—it should be near to the 30-MHz calibration on the signal generator. If an image frequency cannot be found tune the signal generator to about 25.5 MHz. Should the signal be heard at this point you must retune trimmer C5. Readjust C5, turning the adjusting screw to increase the oscillator frequency—readjust the signal generator to check the frequency of the oscillator in the CB converter.



Here's the completed CB Grabber, all hooked up and rarin' to go. Needed: an antenna into jack J1, a lead to a BCB set from jack J2.

CB CHANNELS AND FREQUENCIES

Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	26.965	13	27.115
2	26.975	14	27.125
3	26.985	15	27.135
4	27.005	16	27.155
5	27.015	17	27.165
6	27.025	18	27.175
7	27.035	19	27.185
8	27.055	20	27.205
9	27.065	21	27.215
10	27.075	22	27.225
11	27.085	23	27.255
12	27.105		

For those willing to beg, borrow, or buy an accurate RF signal generator, here are exact frequencies in MHz for all 23 channels.

After adjustment with the signal generator, connect an antenna to J1 and loosely couple the signal generator to the converter by connecting a lead from the generator output alongside the coil L1. Set the tuning capacitor C3 to its full capacitance position and adjust the signal generator to 26.965 MHz. Tune C3 slightly for the signal, if necessary, then adjust the signal generator to 27.255 MHz and tune C3 to near minimum capacitance until you hear the signal. If you cannot spread the CB band out like this, increase the value of C4.

An uncalibrated dial was used for the CB Grabber, but a cardboard calibrated dial can be used with the channels indicated. You can style the dial or the entire CB Grabber to suit your needs.

No Sig Gen? If you do not have a signal generator, connect an antenna to J1 and vary C2 and C6 for loudest signals in the CB frequencies. As a starter you can use a CB handie-talkie. Have someone hold down the *Transmit* switch while you make adjustments. Move the transceiver further and further away as you make the adjustments. Have your helper hold the *Transmit* switch down for 10 or 15 seconds then wait several minutes before repeating adjustments. This gives others a chance to make use of the frequencies. After your helper has moved 20 or 30 feet away from the converter and you can still hear the transmissions loud and clear you'll have to rely on CBers' broadcasts for a signal. This may be a tedious process since these signals are on and off. But a signal generator is best. ■

DXING'S 7 GREATEST HOAXES

By Don Jensen

■ As the setting sun sinks slowly into the blue Pacific, from a tiny tropic island, ringed with white sandy beaches, crackles the first broadcast of a new DX station. An exotic interval signal (would you believe the sound of falling coconuts?) precedes the 0400 EST sign-on of the 20-minute program in the island's native tongue, Aku-Aku.

When it was first reported in mid-1958, the station, Radio Nibi Nibi, thrilled the DX world. From Kokomo to Cologne, listeners tuned to the station's frequency, hoping to hear it. Only trouble was that Nibi Nibi—the station *and* the island—existed only in the fertile brain of a teen-age DXer.

Nibi Nibi was a DX hoax!

It was not the first such hoax perpetrated in the listening hobby; certainly it will not be the last. But in the minds of many it stands today—a decade later—as a bench mark in radio chicanery. Even now, among listeners who were more interested in tricycles than kilocycles when the Nibi Nibi bubble burst, it is cited as the classic DX hoax. Reports of a suspicious new station supposedly on the air are greeted with derisive hoots of "another Nibi Nibi."

Radio Phonies. DX hoaxing has taken many forms over the years. In the never-never world of clandestine propaganda broadcasting, radio phonies have cropped up regularly since the mid-1930s. Some have been foisted on hobbyists by would-be pirate broadcasters. Still others, like Nibi Nibi, have been dreamed up by listeners themselves.

Seven of these DX hoaxes stand out, however, as the most notable in the history of shortwave listening.

Perhaps the SWL fraternity was more innocent then; perhaps it was just that so many listeners hoped against hope to snare a brand-new station from a remote and romantic corner of the globe. Regardless of the reason, there were a good many DXers who bit hook, line, and sinker for Nibi Nibi. And because they'd been fooled so badly, reaction to the "con" job was extreme.

Nibi Nibi was the brainchild of a young Californian who presumably intended the tale as nothing more than a youthful prank. He'd come upon the DXing scene a couple of years earlier and had gained a reputation in several SWL clubs for reporting a number of questionable loggings. Other listeners who had visited his radio den claimed that some of his rarer QSL cards bore evidence of having been merely samples on which the DXer had filled in the necessary details himself.

Nibi Nibi Island. With such a reputation, this DXer's tale of the fabled island in the Pacific might never have been believed, but for a simple strategem. He apparently reported the station to various DX programs and clubs under an assumed name. Respected clubs and programs spread word of a new station on Nibi Nibi. Strangely enough, SWLs believed the story and our young friend's prank got out of hand. Before long, though, saner heads began doubting that there was such a station, supposedly located some "12,650 miles southwest of Sheboygan, Wisconsin." The doubters consulted the National Geographic Society, only to be advised that there was no such place as Nibi Nibi.

(Continued overleaf.)

7 GREATEST HOAXES

But the credibility gap narrowed suddenly when a well-known listener, living in a small Ohio town, told a major radio club that he knew where Nibi Nibi was. Even more surprising was his claim that there was a station on the island which had run a test broadcast on that October 12th. This report from an experienced listener sent the doubters scurrying back to their ever-loving atlases.

Confusion reigned again until the Ohio DXer, pressed for details, replied, "As an island, Nibi Nibi, or Niki Niki, never did exist except in a fabled story of many years ago. . . . I would guess that whoever started this Nibi Nibi hoax has read this old book somewhere."

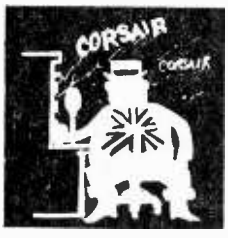
This vague explanation didn't do much for the reputation of the Ohioan, but it did at least establish that there was no such station as Nibi Nibi. The hoax exposed, hobbyists were up in arms and set about with a vengeance to discover its perpetrater. The DX editor of a German station, Deutsche Welle, enlisted the aid of his country's criminal police.

Before long, lab technicians had pinpointed the culprit. They established that the typewriter and paper used by the unknown person who'd submitted the Nibi Nibi tip were identical to that used by a certain young DXer. The police reported that even personal typing characteristics corresponded.

The secret was out and the young man's remaining reputation was shattered. He was expelled from those radio clubs to which he had belonged. His name was anathema to all shortwave listeners. Because of his Nibi Nibi hoax, he probably never again will be permitted to participate in any form of organized DXing, which is a stiff price to pay for a little fun.

Radio Corsair. Luckier than our young Californian was a group of English shortwave listeners who devised another hoax station in the spring of 1966. Though their pseudo-station, R. Corsair, was exposed as a fraud in time, they never suffered the slings and arrows of outraged listeners. It all began with an item published in the respected Danish publication, World Radio Bulletin. A British SWL, Douglas Hopper, wrote that a new station, calling itself Radio Corsair, was testing a 50-watt transmitter from a ship, nine miles off the north-Kentish coast in international waters.

With pop-music pirate stations all the rage in England at the time, Hopper noted the shipboard outlet announced, "This is Corsair calling, on 41 for fun." He said the irregular, low-powered tests would be expanded later to a full international service on the 41-meter frequency of 7340 kHz. Despite the fact that a Dutch listener claimed to have heard the station, and verified it via the supposed address (Corsair House, 86 Toronto Rd., Gillingham, Kent, England), English DXers were skeptical. They couldn't even find a trace of the station on the air.



An investigation turned up the fact that R. Corsair had no telephone listening, nor was it listed at the address given. Curiously, one A. D. Gordon, himself a sometime SWL. lived there. As the attempted hoax became more apparent, a European radio club received an anonymous postcard from Ottingham, Kent, reporting that R. Corsair had left the air. The informant said he heard the station hoped to reopen in another part of the world.

Xeron Magazine. But there was an odd postscript to the tale, a touch of science fiction. An inquiry to the station brought a belated reply from a John Quattremini. Though ignoring direct questions about R. Corsair, he enclosed a copy of a mimeographed science-fiction magazine called *Xeron*.

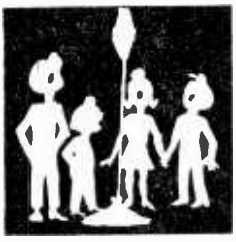
Xeron, it seemed, was published quarterly by an organization identified only as PADS, affiliated with the British Science-Fiction Association. Its pages were filled with short science-fiction articles, studies on "monsterism," and letters from its subscribers. Words like "linonophobic," "laumer," and "retief," were sprinkled liberally throughout.

Apparently, the minds that created such a "way-out" publication also planned R. Corsair, a station more fiction than science.

Courtland School of Music. Closer to home, on May 14, 1966, a Binghamton, N.Y. SWL, Bill Graham, heard an unusual program while tuning the 60-meter band.

The station was presenting a spoken commentary to a recording of *Midsummer Night's Dream*. Following this, Graham heard an announcement that brought him upright in his chair: "WBBH, 5 megacycles shortwave, for the discriminating shortwave listener."

The announcer continued with comments about television programs seen and scheduled in New York City. Asking for listener's reports, the station promised verifications and gave an address in New Brunswick, N. J. WBBH was never heard again, but Graham's letter requesting a verification was answered ten days later with a printed QSL.



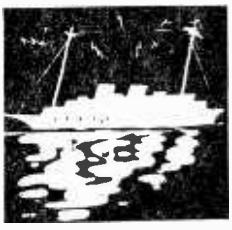
The QSL read, "Your reception report was much appreciated. WBBH uses a Gates BFE50C xmtr which puts out 50 watts. The station is owned by the Courtland School of Music and is operated by the students. We are on the air weeknights at 7 p.m., as well as weekends at 3 p.m." It was signed only "Fisk."

Later letters sent to the WBBH address were returned as "undeliverable." Telephone operators were unable to come up with a New Brunswick number for WBBH or the Courtland School of Music. The music department of Rutgers University in New Brunswick had never heard of the Courtland school. A partial answer to the mystery was eventually provided by the FCC field engineer in New York. It seems WBBH was a cleverly contrived hoax, operated by a group of young broadcasters until their small, unlicensed transmitter was shut down by the federal agency.

Radio Phoenix. Like WBBH, another illegal broadcaster that had the earmarks of an elaborately planned hoax was R. Phoenix, variously known as the "Call of the Wild" and the "Call of the High Seas." And, like WBBH, its life was short, but fascinating. Apparently, it too was closed down by the FCC, though federal authorities are reluctant to discuss such illegal ventures, even after they have been silenced.

During its short existence, however, R. Phoenix moved into the magic circle of notorious hoaxes by virtue of the imagination displayed by its clandestine operators. Its range was not great, but it was heard from Pennsylvania to New Jersey in December 1966 and January 1967, operating on a frequency that varied from 6000 to 6085 kHz.

A Fairview, N.J. listener first heard R. Phoenix one December afternoon, supposedly its first day of operation "from international waters, three miles off the coast of Atlantic City." Despite the announcement, the station almost surely was land-based. R. Phoenix was oriented to a teen-age audience, probably a clue to the age of its operators. Its rock 'n' roll announcer, Don Scott, played music which was said to be "dedicated to listeners' enjoyment of radio."



A Pennsylvania DXer heard the station using the slogan "Call of the High Seas," and featuring a pop record program called "Music and Roger Birdwell." The listener said the station promised to return to the air the following month with "500 watts and a new antenna." It didn't.

Navassa Island. How about the great Navassa Island hoax? Oh, yes, there is a Navassa Island, alright. It's a tiny, barren isle in the Caribbean, between Jamaica and Haiti, a hundred miles due south of Cuba. The two-square-mile dot in the ocean is owned by the U.S. and is administered by the Coast Guard. Tri-lingual signs posted on Navassa declare it off-limits to visitors. In the early '60s it was reportedly used by U.S.-supported Cuban exile raiders for staging forays against the Castro regime, which could account for the no-trespassing rule.

Back in 1961, after a real propaganda voice—R. Swan—popped up on another tiny Caribbean island, a now defunct magazine, *CB/DXing Horizons*, reported "What may be another Radio Swan could be brewing in the Caribbean." The article went on, "We have learned that an American organization has been making inquiries to transmitter and tower manufacturers regarding anticipated delivery dates of this equipment to U.S.-owned Navassa Island." The story alleged a 50-kW medium wave and a 20-kW shortwave transmitter and two 250-ft. towers would enable the station to transmit programs similar to R. Swan's.

The magazine's staff then sent out phony letters of inquiry to broadcast-equipment manufacturers to bolster its story. Manufacturers reacted as expected, with a flurry

7 GREATEST HOAXES

of letters to *CB/DXing Horizons,* trying to peddle their gear. DXers' ears also pricked up with the prospect of a new radio territory in the offing. But there were no plans for a station on Navassa. It was all a gimmick, devised by the magazine's editor, Tom Kneitel, to determine reader reaction and to try to "smoke out" the government about suspected ties with the real Radio Swan.

The magazine never pushed the matter further, but DXers just wouldn't let it die. Some waited patiently for the new station to come on the air; others, with mental gymnastics, managed to transfer the real R. Swan, and its successor, R. Americas, to Navassa. Periodically the old hoax keeps cropping up. As recently as last fall, published reports from a Florida listener claimed that very soon there would be a 50-kW medium wave and a 20-kW shortwave operation on Navassa Island. The seven-year-old hoax has come full cycle!

Secret Agent Delmer. For at least 30 years, radio listeners have been plagued with yet another sort of hoax, the clandestine broadcaster. Because the effectiveness of these propaganda voices often depends on their ability to pretend to be something they are not, they go to great lengths to disguise their true identities.

The most famous and successful of the World War II radio phonies was the British-operated Gustav Siegfried Eins. Though not revealed until long after the war, Gustav Siegfried Eins was the brainchild of a British journalist, Sefton Delmer, head of the organization responsible for British secret broadcasting operations.

Gustav Siegfried Eins brought a new twist to radio hoaxing. Delmer called it "psychological judo," exploiting the impetus of the enemy's own ideological preaching to turn it against him. One technique was to create a station which did not seem to be directed to the general public. Delmer recalled listening to the uninhibited conversations of ships' captains talking over the radiotelephone at sea. In the same way, he intended to make his German listeners believe they were eavesdropping on radio talk not intended for their ears.

The listener, supposedly, would find himself tuned to what sounded like the traffic of a clandestine military organization sending ciphered instructions to secret cells all over occupied Europe. Between the coded messages, a caustic old soldier of the Prussian school would use the transmitter to give members of the supposed organization his outspoken views of what was going on inside Germany. Spiced with plenty of "inside" information, his remarks would show him contemptuous of the group that had seized control of the Fatherland. The hidden propaganda message was supposed to demonstrate a growing split in German ranks.

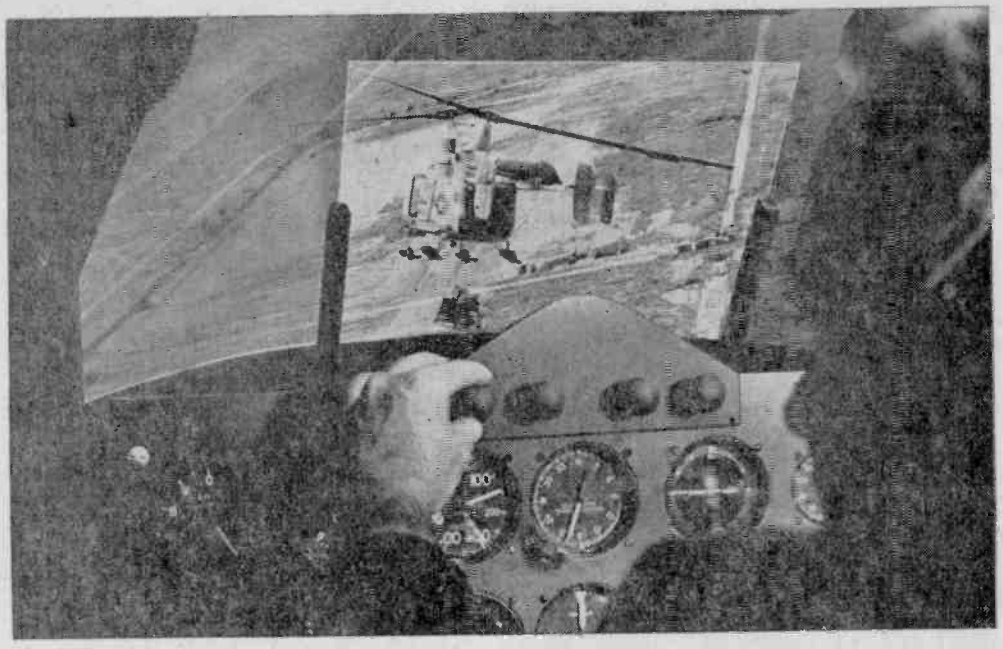
German GS-1. The programs were all in German, of course, and the salty old character was referred to only as "the chief." The station's name, Gustav Siegfried Eins, German phonetic code for GS-1, had no meaning. Or did it mean *Geheimsender* (secret transmitter)? *Generalstab* (general staff)? Or even *Gurkensalat* (cucumber salad)? It was left to the listeners to decide what the cabalistic initials meant; and there were plenty of theories.

Gustav Siegfried Eins first went on the air May 23, 1941, from studios in a brick house in the Bedfordshire village of Aspley Guise. The leading character, the chief, was played by an ex-mystery writer, Cpl. Paul Sanders. And Delmer's scheme worked. The station soon had a vast audience in Germany. Even Allied journalists were fooled. Speculation as to who was behind the station was widespread, with some even suspecting the Nazi Air Force chief, Hermann Goering. Few suspected the British, however.

So successful was the hoax that the British government worried lest their American allies actually believe that such widespread internal frictions existed within Nazi Germany. U.S. authorities were therefore let in on the plot. Unfortunately, someone in Washington let the word slip and soon it was common gossip in the nation's capital. With the station's value in jeopardy, it was decided that the operation would be ended with the "death" of the chief.

Toward the close of October, 1943, Gus-

(Continued on page 127)

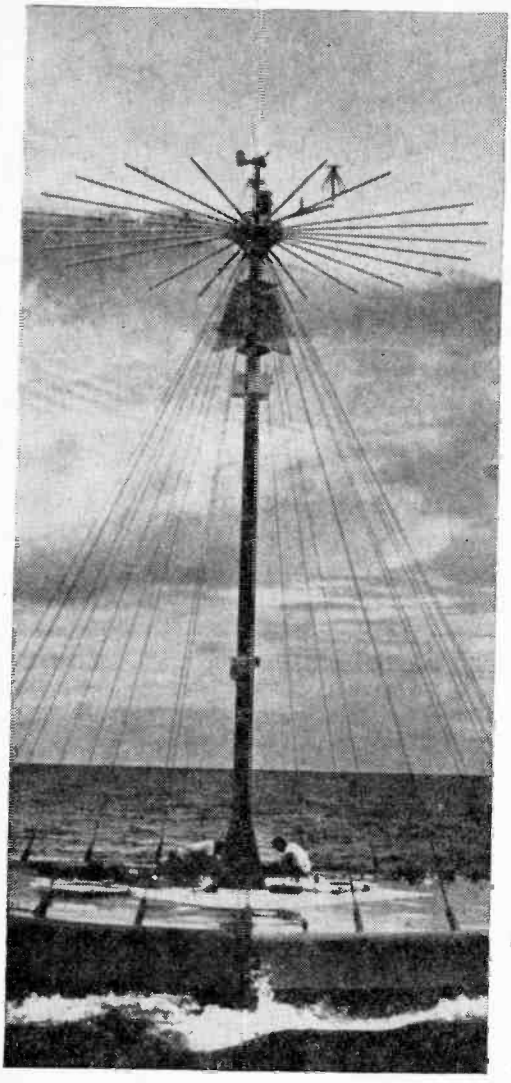


The Eyes Have It

■ A one-foot-square screen that mounts behind aircraft windshields may soon give pilots their first clear, realistic view of night-darkened terrain. Called "Night Window" by its developers at Kollsman Instrument Corp., it uses a system of highly light-sensitive television and advanced optics to give pilots a life-size, three-dimensional view of landscapes lit only by overcast starlight.

In our photo below, a technician is shown examining a model of Night Window. And in the photo above, the pilot of an observer aircraft gets a clear, daylight-like view of a helicopter landing on a twilight-shrouded field through Night Window's 3-D screen.

Clearly, Night Window means the eyes have it. And if the Kollsman people are successful in their next venture, they'll have it even more so. In the works: a version of Night Window which will permit seeing through fog and rainstorms for all-weather flying and landing. —*Robert Levine.* ■

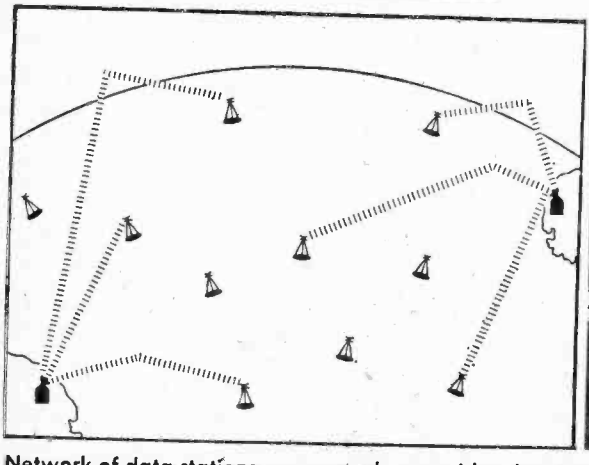


OH, BUOY!

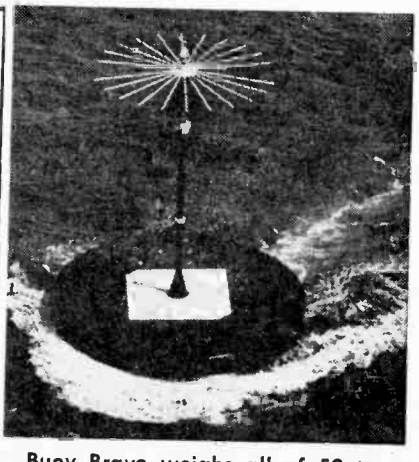
Weather we'll have, whether or not. And since taming the elements isn't exactly feasible, predicting their action accurately is the meteorologist's task in hand. Weather is essentially a result of the interaction of sun and air with the oceans. Therefore, what's needed is an oceanographic weather bureau.

Significantly, that's precisely what General Dynamics has come up with for the Navy's Office of Naval Research. Buoy Bravo (see our photos), the first prototype, is 40 ft. in diameter, 7½ ft. deep, and loaded with instruments which collect weather data and transmit it to stations on shore. This tough yet sensitive buoy can be moored to an ocean floor as deep as 30,000 ft. And its omnidirectional antenna always remains beamed to its station.

With a network of these non-bouncing buoys relaying weather-in-the-making, long-range weather predictions may some day be sure as shootin'. And when that day comes . . . Oh, buoy!—*C. Hansen* ■

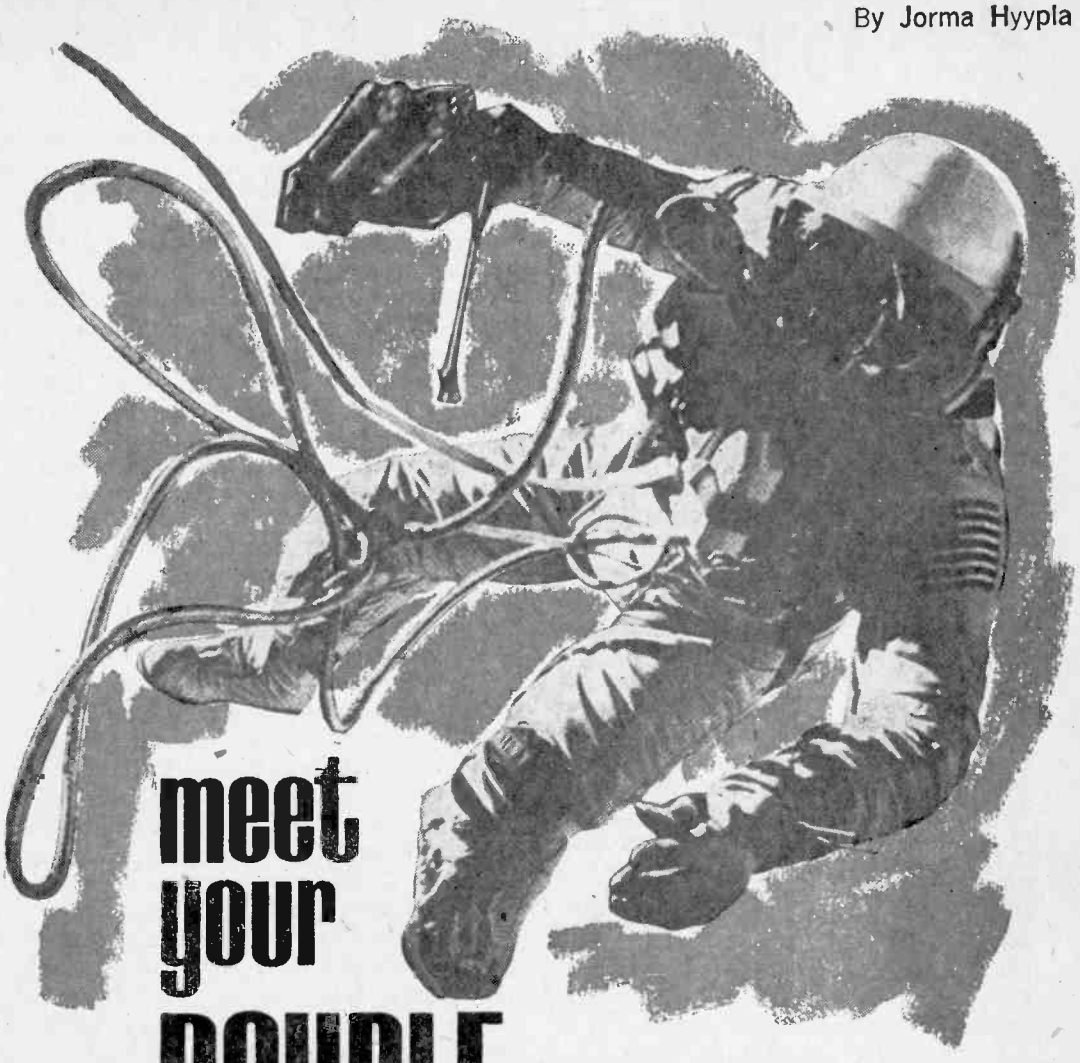


Network of data stations may someday provide minute-by-minute picture of happenings in Davy Jones-ville.



Buoy Bravo weighs all of 50 tons, can operate unattended for a year.

By Jorma Hyypia



meet your DOUBLE in space....

. . . and if you do, don't shake hands! You'll both be zapped!

■ Professor Noel Namredel shuffles his papers on the lectern, glances at the distinguished assemblage of scientists before him, and prepares to make some startling predictions.

Professor Namredel speaks: "As you all know, a quarter century ago Dr. Luap Carid reported that his mathematical calculations indicate that such curious atomic particles as negatively charged electrons and positively charged protons may actually exist. At that time, few of us could completely accept the idea of reversed-charge atomic particles except as an ingenious bit of science fiction.

"And yet, a few years ago the first man-made negative electron was created with the aid of our Nevahkoorb synchrotron particle accelerator. Since then, we have succeeded in creating the reversed-charge counterparts of all known atomic particles.

"Gentlemen, we can no longer escape the obvious conclusion. It is quite possible that somewhere in the universe there may be a world—perhaps a planet much like ours—

Meet Your Double

where all matter is made up of particles having reversed electrical charges; in that world, electric lights, motors, electronic equipment of all kinds must operate because of the flow of *negatively* charged electrons!"

We know that the professor guessed correctly. There is such a planet. It is called *earth*.

Flip Flop. The discerning reader will have spotted our ruse. Professor Noel Namredel and Dr. Luap Carid are fictional scientists presumed to live in some far off antiworld where everything is backwards in relation to our familiar world. Their names are fittingly the reverse of Professor Leon Lederman and Dr. Paul Dirac whose very real ideas we shall deal with in a moment. The Nevahkoorb synchrotron is, of course, the Brookhaven synchrotron of the imagined antiworld.

In the fancied antiworld all atomic particles have electrical charges just the reverse of the charges on the corresponding particles in our atoms. Their protons, for example, are negatively rather than positively charged. Their electrical systems depend on the flow of positively charged electrons (positrons).

It is very easy for us to see the logic in Professor Namredel's speculations. We actually live in the world he can only suppose as a theoretical possibility. Now let us put the shoe on the other foot. Can we see the same logic in the far-out speculations of *our* physicists who categorically state that antiparticles actually do exist, and that therefore some very strange antiworlds may also exist somewhere in outer space? Can we concede that in theory Professor Namredel and Dr. Carid may in fact actually exist at this very moment?

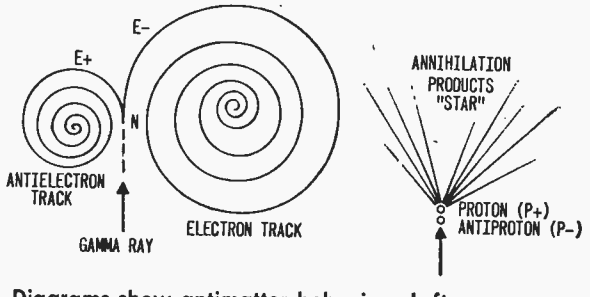
To start the antimatter ball rolling, let us first recall why our scientists developed a compelling desire to find such things as antiparticles.

Search for Symmetry. The intuitive faith that most scientists had in the fundamental balance and symmetry of nature was badly shaken when it was first learned that the proton of an atom is about 1840 times heavier than an electron orbiting around it. These constituent parts of an atom have electrical charges of equal magnitude. Why not equal masses as well? The disproportionate division of mass seemed to imply that nature is, after all, unbalanced and unsymmetrical. The implication was highly disturbing to many scientists.

Then along came Paul Dirac. This physicist suggested an audacious "solution" to the dissymmetry paradox. Nature as a whole would be put back into balance if it were assumed that there are in existence a lot of inside-out atoms—sort of mirror images of normal atoms. These atoms would have negatively rather than positively charged protons, and electrons having positive rather than negative charges. In these atoms the protons would still be 1840 times heavier than the electrons, *but the heavier element would now be associated with the negative charge* rather than the positive charge. Thus, throughout the universe there would be equal amounts of mass associated with both positive and negative charges. Nature as a whole would be in balance.

The only trouble was that there was not the slightest evidence that such inside-out atoms actually existed. Though Dirac showed mathematically that such atoms would violate no natural laws of physics, his ingenious idea smacked of science fiction. It was hard to accept it seriously.

Cosmic Clue. Dirac's whacky atom remained a scientific fiction for the next couple of years. Then, in 1932, physicist Carl Anderson found something very unusual on a photographic plate used to record cosmic ray tracks. There was a streak that could not have been made by any known particle. Whatever had made it had been positively charged and had a mass about that of an electron. It could only be one thing: the first discovered antielectron—or "positron" as it would later be called.



Diagrams show antimatter behavior. Left, gamma ray strikes neutron, generating electron and antielectron. Right, antiproton hits proton and gamma rays!

The big hunt was on! During the next 35 years huge accelerators ("atom-smashers") were kept busy hunting for more anti-particles. And they were found, one after another: antielectrons (positrons), antiprotons, antimesons, antineutrinos—even the antineutron (neutrons and antineutrons have no electrical charges but differ in magnetic and spin-momentum properties).

Antideuteron was discovered in 1965 by a team of physicists working with the AGS synchrotron accelerator at the Brookhaven National Laboratory. Deuteron is the nucleus of an atom of "heavy" hydrogen; the antideuteron created by the accelerator consists of an antiproton and an antineutron. This was the first complex atomic nucleus of antimatter to be found. It demonstrated beyond doubt that all of the properties of the nuclear force are closely mirrored in an "anti-world."

Anti-world! After discovery of the antideuteron, Columbia physicist Leon Lederman, leader of the research group, made the following startling statement:

"It is no longer possible to question the basic physics part of the cosmological conception of a literal antiworld populated by stars and planets made up of atoms of antimatter—negative nuclei surrounded by positive electrons. It is not now possible to disprove the grand speculation that these antiworlds could be populated by thinking creatures!

"A new and deeper *world-antiworld symmetry* is now believed to hold in which the antiworld (which is supposed to be precisely identical to our world) not only has anti-particles instead of particles but also is a mirror image of our world in which the flow of time is also reversed.

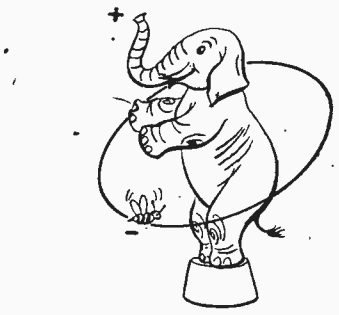
"If the whole thing started with an explosion (the *Big Bang* theory of creation), there is every reason to believe that the same number of particles and anti-particles were created."

Where is this anti-world? No one knows. Why haven't we seen it? Maybe we have, only there is no way of recognizing it as an anti-world because it would in every way appear to be identical to a normal world.

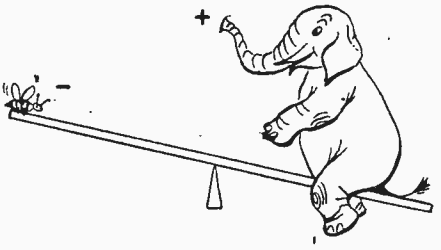
The Last Handshake. One thing is certain. We would never want to make actual physical contact with any part of an anti-world! Let's say you are Joe Doakes, galactic traveller of the distant future. Somewhere out in the reaches of space you meet

AESOP'S ATOMS

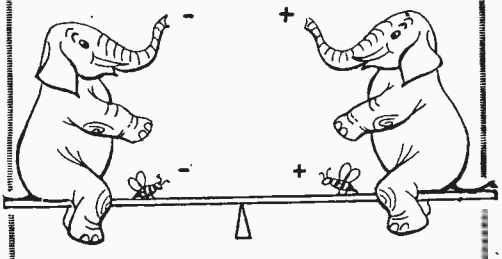
Once upon a time . . .



. . . the atom was a small, negatively-charged bee (electron) whizzing around a large, positively-charged elephant (proton). Their electrical charges were opposite in sign and equal. They balanced nicely.



Then someone noticed that the elephant is 1840 times heavier than the bee. They were out of balance after all, which meant that the whole universe must be unsymmetrical. But no one liked living in a lop-sided universe.



So a clever scientist fixed everything. He added an anti-elephant (−) for every ordinary elephant (+) and an anti-bee (+) for every ordinary bee (−). Now everything balances nicely again; and we don't have to live in a lop-sided universe.

MORAL: If things are out of balance, invent some anti-things. Then build an atom smasher to find the anti-things you invented.

Meet Your Double

another traveller—an anti-Joe who looks just like you. You reach out to shake hands. What happens? You are both annihilated instantly, leaving only a blaze of photons streaking off into space as mute testimony of your last handshake!

Not that you have to make direct personal contact with anti-people in order to get a quick trip into oblivion. The astronaut who touches down on a planet, or even enters the atmosphere of a planet made of antimatter would explode with the energy output of an atom bomb! And perhaps the only way an astronaut could play it safe would be to first send in an un-manned space vehicle; if it explodes, keep away. We know, for example, that our own moon is definitely *not* made of antimatter because our Surveyor craft have landed on it safely.

Annihilation Shields. If the inevitable result of matter meeting antimatter is total annihilation—as every physicist agrees it must be—we must ask some pretty perplexing questions.

First, why do not the worlds and antiworlds annihilate each other? Perhaps because they are too far apart to make calamitous contact. Perhaps because there is a natural annihilation shield.

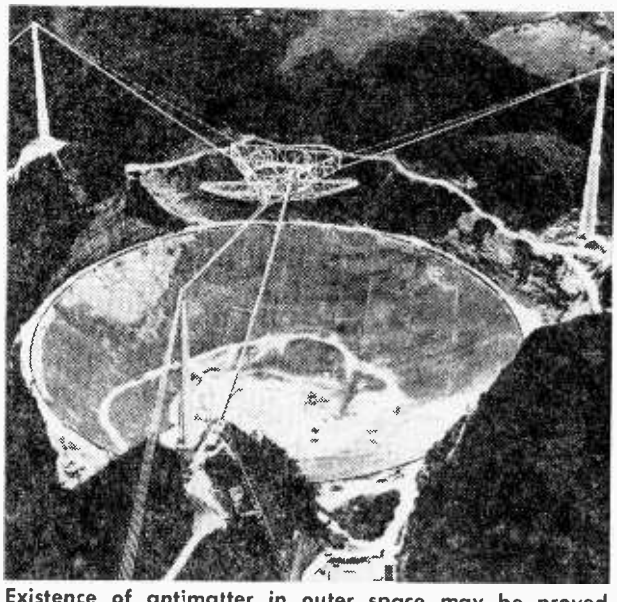
Secondly, if both matter and antimatter particles were formed simultaneously when the universe was created, why did they not immediately annihilate each other to leave a universe filled with nothing more than a mess of photons?

This second question would really be tough to answer had not a Swedish physicist, Oskar Klein, come up with a brand new theory about the creation of the universe. If he is right, the Big Bang theory will have burst like a soap bubble.

Klein thinks that the universe originally consisted of an extremely thin gas made up of both ordinary particles and antiparticles—but so far dispersed from one another that annihilation collisions occurred rarely if at all. (Every cosmological theory has to start with something tangible because the human mind can't conceive of material substance being created out of nothing. Admittedly, it is just as hard to believe that the original "something" existed forever, and never had to be created.)

Very slowly, the cloud of protons and antiprotons contracted because of gravitational forces. Eventually they came close enough so that protons and antiprotons began to annihilate each other, creating increasing amounts of radiation as annihilation products. When this radiation pressure became strong enough to overcome the gravitational forces, the cloud began to expand. However, the expansion occurred in such a way that the matter and antimatter components of the cloud separated into isolated regions.

Wherever these incompatible island worlds rubbed elbows, a hot insulating skin called a Leidenfrost Layer was formed by the collision of protons and antiprotons. The exact theoretical explanation is too involved to detail here, but a simple analogy will suggest the general principles involved. If a drop of water is placed on a *very* hot metal surface, the water immediately assumes the shape of a lopsided or flattened ball that skithers about the hot surface for a considerable length of time. (On a cooler surface the water would simply evaporate quickly.) The intense heat evaporates a little of the water to form a thin layer of vapor be-



Existence of antimatter in outer space may be proved with the aid of Arecibo's $8.3 million mammoth antenna.

tween the hot metal and the drop of water; this layer insulates the water from the heat that would otherwise evaporate it. In a like manner, annihilation shields consisting of radiation form between the worlds and anti-worlds, greatly slowing down the process of annihilation.

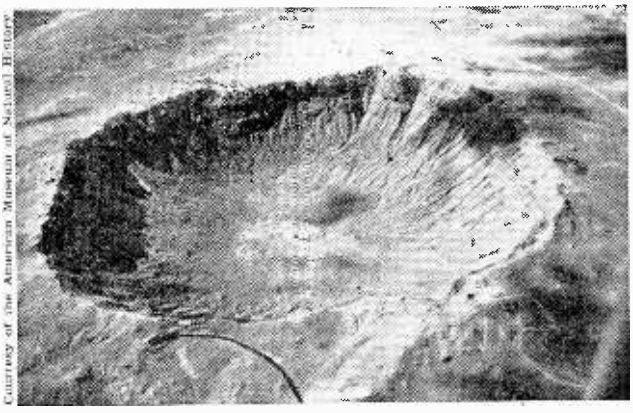
Enemies Within? It can be rather disconcerting to think that perhaps some of our neighboring galaxies are made up of antimatter. It is more disquieting to think that huge masses of antimatter may be roaming about in our own galaxy. This is a distinct possibility! Some of the stars you see in the sky with the naked eye could conceivably be anti-stars. At present there simply is no way to prove it—or to disprove it.

Yet, someday we may have proof that antimatter exists in our own galaxy, or at least in other galaxies. How? By detecting the theorized Leidenfrost Layers. This might be done by detecting one or more of several products thought to be produced in this layer: neutrinos, gamma rays, or synchrotron radiation (radio waves). For various reasons, radio waves may be the easiest to detect. It is thought quite possible that at least some of the already detected radio stars—including quasars—may exist because of matter-antimatter annihilations. The radio telescope may therefore be the instrument that will eventually tell us whether the theorized anti-worlds actually exist.

If antigalaxies exist, they undoubtedly produce enormous numbers of antineutrinos, the counterparts of neutrinos which are the massless ghost particles produced by our sun and other stars made of matter. The science of neutrino "astronomy" is still in infancy, but neutrino (and antineutrino) detection techniques may some day be refined to the point wherein it will be possible to pinpoint sources of antineutrinos far out in space. If such natural antineutrino generators are found, they would provide the most conclusive proof that antimatter exists in nature.

Mysterious Meteor. Perhaps the most dramatic evidence of antimatter would be

WHAT HAPPENS WHEN MATTER AND ANTIMATTER BOMBARD EARTH



Courtesy of the American Museum of Natural History

Many centuries ago earth was slammed very hard near the town of Winslow, Arizona. The crater formed by the impact is 4,150 feet from rim to rim and 570 feet deep. Test drillings indicate that parts of the meteorite are imbedded deep in the ground. This crater was formed by matter which was similar to that found on earth.

A meteoric explosion of atom bomb proportions destroyed plant and animal life over a vast area in Siberia in 1908. Yet, this meteor failed to dig a crater like the one shown above. The absence of a crater suggests that the visitor from space was not an ordinary meteor, but an "anti-rock" that suffered total annihilation while it was still high in the earth's atmosphere.

Meet Your Double

provided by collision of a meteor made of antimatter with the earth's atmosphere. In fact, such an event may actually have occurred!

On June 30, 1908, a meteor streaked over Russian Siberia and exploded with fantastic violence over the Tunguska River basin. Trees were blown down over a radius of 25 miles, clothes were burned off people almost 40 miles away from the blast center. The sound of the blast was heard hundreds of miles from the point of origin, shock waves were recorded on seismographs around the world, and the earth's magnetic field was significantly distorted.

Large meteors have struck the earth many times. Why should this one be suspected of being anything more than an unusually large, but ordinary meteor? For one thing, no typical meteor crater was ever found, nor have any meteor fragments been discovered. The object, whatever it was, appears to have been destroyed completely.

A thorough scientific study of the event was forestalled because of global preoccupation with World War I. But in 1965 Professor Clyde Cowan of Catholic University of America, and C. R. Atluri and Nobel Prize winner W. F. Libby of the University of California revealed the results of their unique study of the Tunguska incident.

These scientists reasoned that if the explosion over Siberia had been caused either by a nuclear blast or by a matter-antimatter annihilation reaction, the amount of radioactive carbon-14 in the atmosphere should have increased significantly. This radioactive element is absorbed by plants, and can be detected years later.

There was no need to go to Siberia for tree samples because the carbon-14 in the atmosphere would have spread around the globe. Hence the scientists studied the annual growth rings in trees that had grown in California and Arizona at the time of the Tunguska blast. Significantly, they discovered that the concentration of carbon-14 was unusually high in those rings formed during 1909, the year following the blast.

The indicated high carbon-14 concentration in the atmosphere that year could be explained by assuming that either a nuclear explosion or a matter-antimatter annihilation event had taken place. But which was it?

According to people who witnessed the Tunguska event, there was no mushroom cloud characteristically associated with nuclear explosions. A matter-antimatter reaction would not produce a mushroom cloud because all of the physical material involved in the reaction would be converted to energy, leaving nothing to form a cloud. The absence of the cloud argues against the nuclear explosion theory, and supports the idea of matter-antimatter annihilation.

Scientists Cowan, Atluri and Libby do *not* say that the Tunguska meteor *definitely* was an anti-rock from outer space; they simply argue that the possibility bears further consideration. The issue remains highly controversial in scientific circles.

Remember that the Tunguska explosion occurred over half a century ago—long before anyone had the slightest knowledge about either antimatter or nuclear reactions. Scientists of that day were not equipped to evaluate these possibilities.

Exciting as the prospect of another anti-rock visitation might seem, from a scientific point of view, the event is not one to be avidly wished for. Luckily, the Tunguska meteor struck a remote, thinly-populated area of the world. If a similar object were to land on Moscow or New York, the result would be catastrophic. Moreover, the event might trigger the feared nuclear war because the explosion might easily be mistaken for a nuclear attack by another nation!

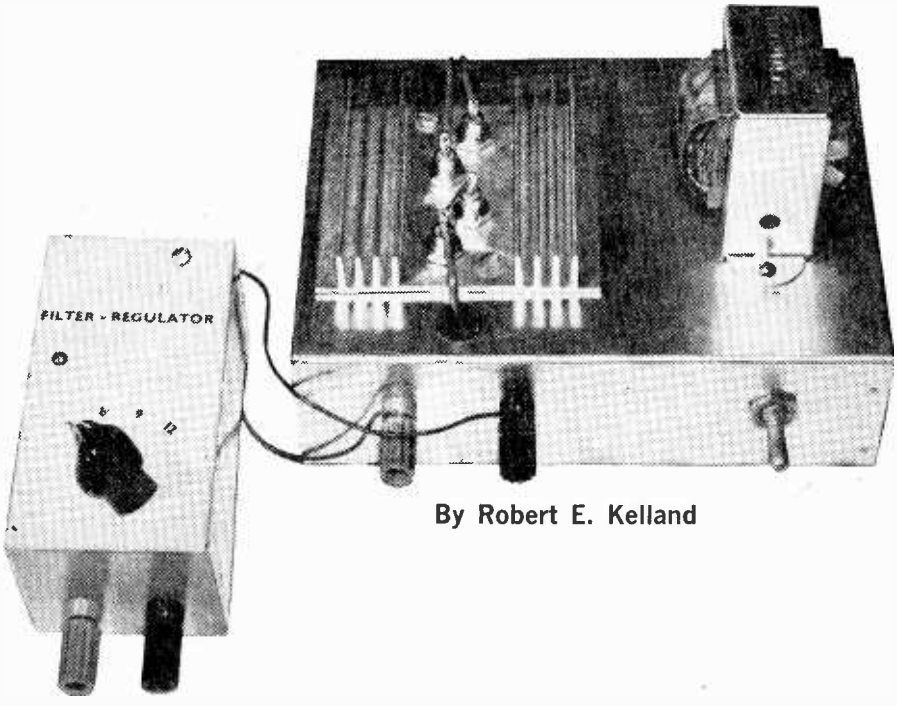
Unlimited Power. Nuclear fusion reactions unquestionably represent the most potent sources of power yet discovered by man. And yet the energy produced by nuclear reactions seems almost insignificant when compared with the power inherent in matter-antimatter reactions!

In the most energetic nuclear fusions known, only about one percent of the total mass of materials involved is converted to energy. In any matter-antimatter annihilation the conversion from matter to energy is total. In other words, matter-antimatter reactions would produce 100 times as much energy as do nuclear fusions using equivalent amounts of mass as fuel.

The theoretical and practical problems that had to be solved before Einstein's $e=mc^2$ scribble could be translated into nuclear bombs and atomic reactors were formidable to say the least. The ultilization of antimatter as a practical power source poses

(Continued on page 130)

You start with Charger (for a good, solid source of 12 VDC), then add Spender (for well-filtered and regulated 3, 6, 9, or 12 VDC). You end with a pair that's the cat's meow for car, home, and workbench!



By Robert E. Kelland

Charger & Spender

■ Here are two projects that can be put to very good use in the car or on the workbench. *Charger,* a car battery trickle-booster, is built around an inexpensive silicon diode rectifier kit that comes complete with all mounting hardware and heat sink. Charger can supply up to about 1.2 amps to a 12-volt car battery. That's just enough to keep a lead-acid battery up to full charge during the cold winter months. *Spender,* a filter-regulator unit, gives 3, 6, 9, or 12 volts of low-ripple DC—a must for transistor experimenting and servicing. Spender draws its raw DC voltage from the output of Charger, filters it, and then breaks up the DC into the four Zener regulated voltages.

Charger. Charger is constructed separately on a standard 5 x 7 x 2-in. aluminum chassis so that it may be moved conveniently to its working location. The circuit is a conventional full-wave bridge rectifier supplied by the stepped-down 12.6-VAC from a filament transformer. Complete mounting instructions are supplied with the rectifiers. Note that no part of Charger's circuit is grounded. This prevents shorting Charger's output should it come in contact with the automobile body if the car has a positive-ground battery circuit. *(Continued overleaf)*

Charger & Spender

The rectifier diodes are stagger-mounted on the heat sink to evenly distribute the unwanted heat and to provide optimum mounting room. Before following the kit-supplied instructions to assemble the diodes and heat sink, use the diode mounting holes in the heat sink to locate the proper punch points on the aluminum chassis. Punch out ⅝-in. holes (there are four diodes) so that both the studs and soldering lugs of the diodes clear the chassis. The heat sink is attached to the chassis with two small machine screws.

Any filament transformer that can deliver 1.2 amps AC at approximately 12.6 volts may be used. If the transformer has a secondary winding center tap, cut it short and insulate the end with tape. Jacks J1 and J2 are the insulated type and should be color-coded to help avoid incorrect battery connections.

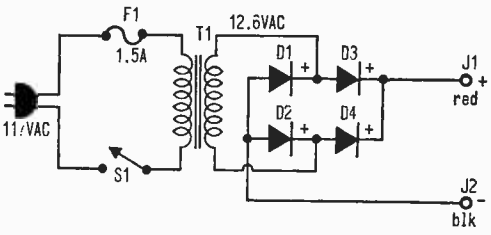
The wiring of Charger is straightforward. The underside of the chassis is wide open for working and should not present any obstacles. Be sure to use at least AWG-18 insulated hookup wire for all connections. Before testing Charger, double check to see that no part of the circuit makes contact with the chassis. An ohmmeter check between each diode and the chassis is an easy way to check the effectiveness of the mica washers and the plastic spacers.

Spender. The full-wave rectified output from Charger is used by Spender to provide four common low DC voltages used to power transistor circuits.

All parts for Spender are arranged in a 4 x 2¼ x 2¼-in. aluminum chassis box. The dual-section filter capacitor (C1A-C1B) takes up the most of the room in the box. The capacitor is mounted lugs up in a capacitor mounting ring. Be sure the capacitor you buy will fit the chassis box.

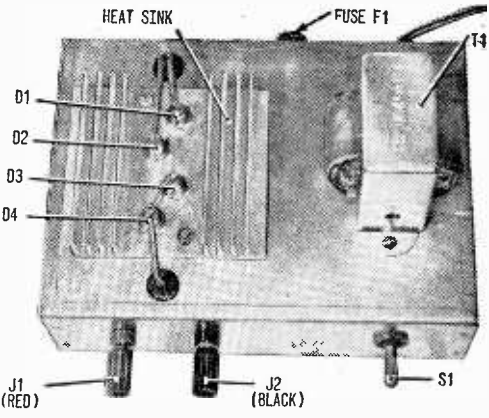
If you can't get a dual, can-type electrolytic small enough to fit the chassis box, two tubular capacitors 1000 μF, 25 volts each may be used. An additional 2-lug terminal strip will be needed for solder connections.

Even though Spender supplies four output voltages, only two zener diodes are used in this voltage-divider output circuit. With this arrangement, plenty of current (at least 20 mA on all voltages) is available with only a few tenths-of-a-volt variation in voltage from no load to full load. Wiring is fairly tight in the chassis box, so be sure to use

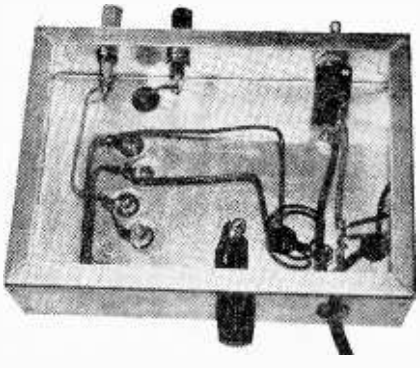


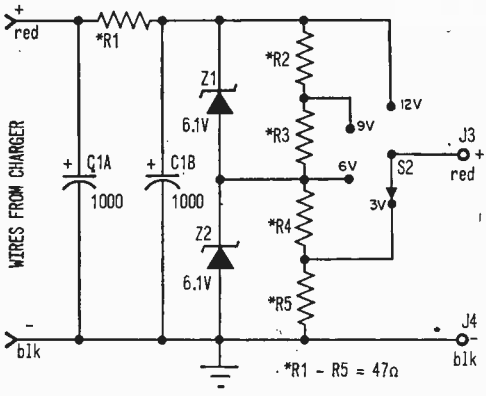
PARTS LIST FOR CHARGER

D1-D4—Rectifier diode—part of Battery Charger kit, includes heat sink and mounting hardware (Radio Shack 276-1266)
F1—1.5-amp, 3AG fuse (Radio Shack 77-2764 or equiv.)
J1, J2—5-way binding post, 1 black, 1 red (Radio Shack 274-736 or equiv.)
S1—S.p.s.t. toggle switch (Radio Shack 275-602 or equiv.)
T1—1.2-amp, 12.6-volt filament transformer (Radio Shack 273-1505 or equiv.)
1—Fuse holder, 3AG-size (Radio Shack 270-364 or equiv.)
1—Chassis, 5 x 7 x 2-in. (Lafayette 12H8195 or equiv.)
Misc.—AC line cord, rubber grommets, machine screws and hex nuts, wire, solder, etc.



Top and bottom views of Charger, showing parts placement. Diodes run cool as cucumbers due to high conductivity of heat sink.





PARTS LIST FOR SPENDER

C1A, C1B—1000/1000-uF, 25/25-volt dual electrolytic capacitor, can type or use two 1000-uF, 25-volt tubular type with wire leads (Radio Shack 272-1718 or equiv.—see text.)

J3, J4—5-way binding post, 1 black, 1 red (Radio Shack 274-736 or equiv.)

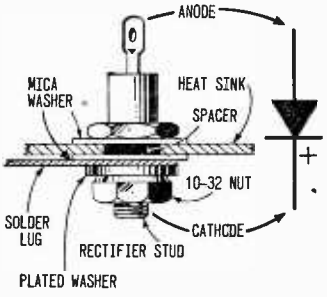
R1-R5—47-ohm, 1-watt resistor

S2—S.p. 4-t. rotary switch, non-shorting type (Mallory 3215J or equiv.)

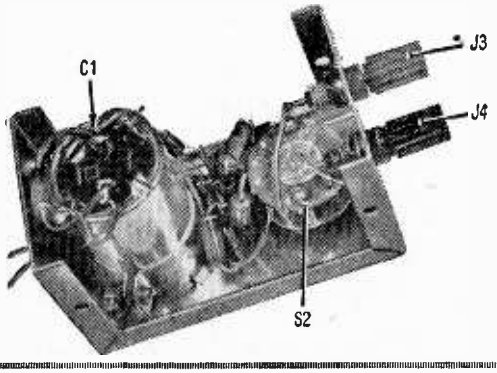
Z1, Z2—6.2-volt, 1-watt Zener diode (GE Z4XL6.2, Radio Shack 276-561 or equiv.)

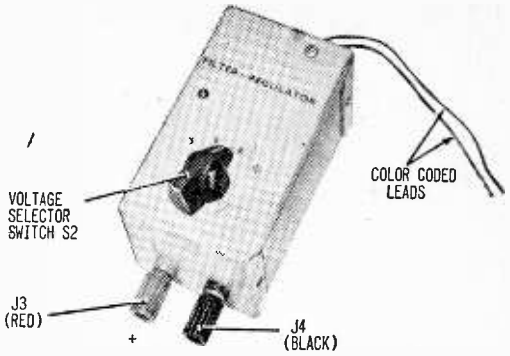
1—Chassis box, 4 x 2¼ x 2¼-in. (Radio Shack 77-0680 or equiv.)

Misc.—Knob, 3-lug terminal strip, machine screws, wire solder, decals, etc.



Above, mounting details for diodes D1-D4. Below, Spender with its cover removed.





Spender makes neat package in its Minibox.

spaghetti and dress leads neatly to avoid shorts. Use a heat sink when soldering the zener diodes in the circuit.

Using Charger. Only 12-volt car batteries can be connected across Charger. To be real safe, remove the cables from the car battery before the Charger is placed across it. Connect the positive lead from Charger to the positive battery terminal and the negative lead to the negative battery terminal. If not marked otherwise, the positive battery terminal will have a slightly larger diameter than the negative terminal. Still not sure? Then use a DC voltmeter to pick out the positive terminal.

To bring the battery up to full charge, the above setup should be left powered overnight, and longer if necessary. If a hydrometer is available, check the specific gravity of the battery electrolyte. A reading between 1.260 and 1.280 indicates a fully-charged cell. Lacking a hydrometer, the battery may be considered fully charged when bubbling (gassing) of the electrolyte is noticeable. If the charging is done indoors provide ventilation to rid the area of expelled battery gases.

A trickle charger is intended primarily to "top up" batteries in a relatively good state of charge. However, an almost fully discharged battery can be brought back to full charge if Charger is left connected to it long enough. For a 60 ampere-hour battery, charge time can be 50 hours or more. And that's a small battery for a small compact car.

You can also use Charger to pep up 9-volt transistor radio batteries with complete success. The current drain varies from about 200 mA to somewhat below 100 mA while charging, so do not keep the battery on charge for long periods. Single cells and

(Continued on page 136)

HATCHINGS & HAPPENINGS

Education in a Kit

A new portable electricity and electronics training aid for use in vocational and technical schools, technical institutes and community and junior colleges, designated the Philco Model 1040, can be used for teaching basic electricity up to advanced electronics skills. The Model 1040 is a self-contained unit. It includes all of the materials and equipment necessary to carry out all of the experiments detailed in the EIA's new manuals on Basic Electricity and Basic Electronics.

The Model 1040 is a versatile unit which meets all basic requirements at an economic cost, but which contains extra features making it possible to tailor use of the unit to meet the needs of advanced students. The unit is ideal for teaching characteristics of devices and circuits, transistors, semiconductor diodes, microelectronic integrated circuits and silicon-controlled rectifiers. To provide complete course coverage, special material on vacuum tube circuit analysis has been provided.

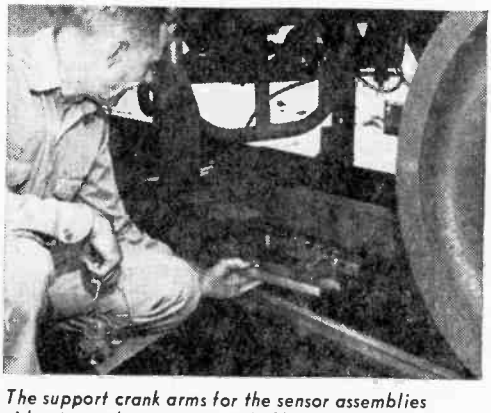
An AC power supply is included and stored in the reinforced cabinet, which is protected with a newly developed scuff-resistant vinyl coating. A separate DC power supply provides the necessary voltage and current for all experiments. A quick-trip overload device guards against accidental damage.

Components, which can be arranged vertically, horizontally or stacked, are quickly snapped into place. New terminal clips, designed by Philco-Ford, use bimetal construction for maximum current-carrying capacity, tight contact grip and long life. All in all, Model 1040 should offer the opportunity for simple laboratory tests and survive the rough handling of students.

A member of the Philco-Ford staff checks out experiments which can be performed with the new Model 1040 Electricity/Electronics Portable Laboratory. The Model 1040 provides experiments across the full range from basic electricity to advanced electronics.

Rod Rider

A small metal assembly that can take the shakes without getting the jitters is proving to be a hero on the 150 mile-an-hour test runs now being made by a Department of Transportation laboratory train over a 21-mile stretch of Pennsylvania Railroad welded track between Trenton and New Brunswick, N. J.



The support crank arms for the sensor assemblies ride at speeds up to 157 mph, ¾ of an inch above the track on a test train. By measuring the capacitance across the air gap between sensor and rail, the sensor assemblies act as proximity detectors, measuring horizontal and vertical rail alignment, track gauge and superelevation.

Made from a new alloy called "Almar 362," the assemblies act as crank arms and shafts which support electronic sensors ¾ of an inch above the rails, carefully sniffing out the facts of track geometry down to measurements of .001 of an inch.

By measuring the capacitance across an air

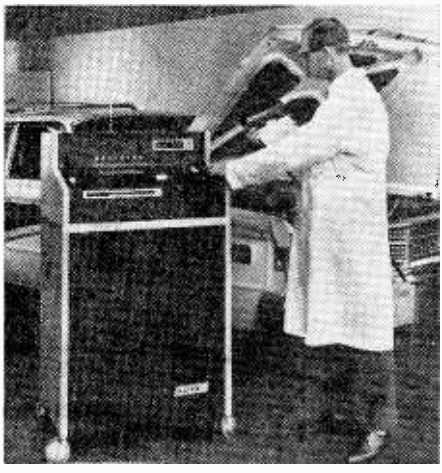
gap between the sensor and the rail, the small proximity detectors are able to measure horizontal and vertical alignment of each rail, track gauge and superelevation of the track, (the height of one rail in relation to the other).

Conventional equipment in which there is direct contact between rail and sensor is not possible on this train because of its high speeds. Results provided by the new system would not have been possible with previous methods.

Test engineers at Melpar, Inc., Falls Church, Va., who designed the test equipment used on the train, had difficulty finding a sensor bracket material which could take the heavy vibrations caused by passing over small track irregularities as the train accelerates at speeds up to 157 miles an hour. The heaviest vibrations of the sensor assemblies seem to occur in the speed range between 80 and 90 miles per hour, tapering off above and below it.

The Coming Auto Fad

Seat belts, directional signals, windshield washers, back-up lights, padded dashes and tinted windshields all have done their part over the years to contribute to increased safety in automobiles, but the latest and maybe the most significant safety device isn't even part of the vehicle.



Each component in the automobile is checked separately through the computer. A card is inserted which tells what to do for each test. When the test is completed, the card advances automatically to the next item.

For years, motorists brought their cars in to mechanics—some skilled and some not so skilled—for maintenance, repair and safety checks. The diagnosis was primarily a function of the experience, skill-level and judgment of the operator; thus, human error and failure of proper interpretation was an ever-present problem. The increasing number and complexity of vehicles accentuates this problem.

Now the human element has been eliminated by the substitution of a computer. The Allen system (Allen Electric and Equipment Co.) is capable of performing up to 150 different tests on automobile parts and components. About 37 of these tests are conducted completely through computer analysis, while others combine visual inspection with the computer.

While the tests are being run through the computer at the rate of one every four seconds, the customer can be seated in another room watching the results of the test being printed on a special two-part carbonless form listing each check-point. As the test is completed, it is recorded on the form in one of the three columns indicating the component is good, marginal or failing.

One copy of this form is given to the customer to take with him when he leaves the garage and the other is retained in garage's files. This can be used for follow-up purposes at some later time.

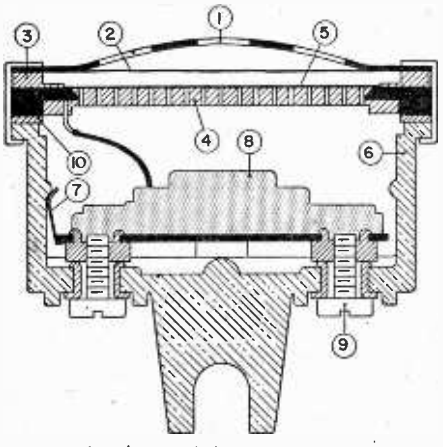
The Allen system not only increases the accuracy, thoroughness and speed of automobile inspection, but also provides the customer with the wherewithal to view the entire testing operation and be sure everything is being thoroughly checked. Next stop is the repair shop where, thank goodness, people take over.

Has the Carbon Mike Had It?

When Alexander Graham Bell invented the telephone, over 90 years ago, he produced a device which would transmit and receive the human voice. The transmitting function was improved by Thomas A. Edison in 1877 and by Henry Hunnings in 1878, but apart from these changes, the principles of the telephone set have

remained virtually unaltered to this day. Meanwhile, the whole concept of a telephone system, of complex switching centers and vast transmission networks, has developed beyond all of Bell's wildest dreams. Only now, however, does it appear likely that the basic principles of the transmitter (and perhaps the receiver) may be replaced and we may soon be using telephones with "electret" transducers in place of the carbon granule units which have served the industry so well and so long.

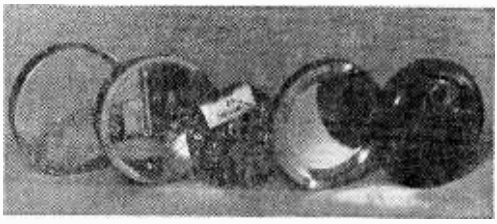
The electret unit depends for its action on the ability of certain dielectric materials to store an electric charge, in somewhat the same way in which a permanent magnet maintains a magnetic field. The carbon transmitter is at present the only known practical unit which does not require amplification of the output signal, a feature which was instrumental in making telephony practical in the days before electronics. Now, however, with the introduction of linear



A cross-sectional view of the electret transmitter showing (1) screen, (2) dust and humidity cover, (3) contact spacer, (4) perforated back plate, (5) electret diaphragm, (6) cup, (7) contact spring, (8) amplifier assembly, (9) screw terminals and (10) contact ring. This new electret microphone fits directly into the present telephone handset with no modifications.

integrated circuits, this advantage is of less importance, and the electret transducer, in association with a small amplifier, becomes a practical possibility.

The electret was first discovered in 1919 by a Japanese scientist Eguchi, who melted a sample of carnauba wax in the presence of an electrostatic field. When the sample solidified with the field still applied, he found a charge remaining on the surface of the sample. With the surfaces of the wax covered by metal plates which were kept short-circuited, no measurable decay of the charge could be detected for several years. Since then, numerous other materials



An exploded view of the electret microphone assembly showing, left to right: the clamping ferrule, the cup, the pre-amplifier assembly, the back plate and electret film and finally the protective membrane and screen.

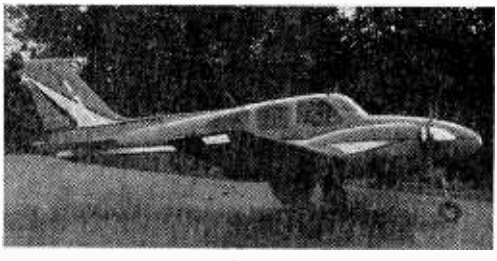
including ferro-electric ceramics and polymers have been found to display this electret capability.

The electret, used to generate an electrostatic field in the airgap, between the vibrating diaphragm and the rigid backplate of a condenser microphone, allows the elimination of the conventional external voltage source. Because electrets can be made from very thin (.0003 in.) dielectric films, a higher capacitance per unit area than with conventional condenser microphones is possible. The electret microphone has a very simple and rugged structure. The lightweight film is placed in direct contact with the roughened surface of the rigid backplate, and it is the only moving part of the microphone. These features, together with the availability of stable electrets, qualify the new microphone as a possible candidate for not only replacing the present carbon transmitter, but for use in many other acoustic applications.

EL, It's a Shooting Star

Helicopters and other aircraft are now being outfitted with a new advance in *exterior* lighting which will permit pilots to see another plane's shape up to three miles away in dusk and darkness. In formation flying, this lighting advance could eliminate a present cause of spatial disorientation in which a pilot loses proper refer-

(Continued on page 132)



Newly developed Capsul light on aircraft permits pilots to see a plane's shape up to three miles away in dusk and darkness. Picture of above aircraft was taken in early evening. Strips of Capsul are on tail, mid-fuselage, wing tip and engine cowling make in-the-air sightings easy.

Now There Are 3 Heathkit® Color TV's

The NEW Deluxe Heathkit "227" Color TV

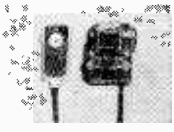
Exclusive Heathkit Self-Servicing Features. Like the famous Heathkit "295" and "180" color TV's, the new Heathkit "227" features a built-in dot generator plus full color photos and simple instructions so *you* can set-up, converge and maintain the best color pictures at all times. Add to this the detailed trouble-shooting charts in the manual, and you put an end to costly TV service calls for periodic picture convergence and minor repairs. No other brand of color TV has this money-saving self-servicing feature.

Advanced Features. Top quality American brand color tube . . . 227 sq. in. rectangular viewing area . . . 24,000 v. regulated picture power . . . improved phosphors for brilliant, livelier colors . . . new improved low voltage power supply with boosted B+ for best operation . . . automatic degaussing . . . exclusive Heath Magna-Shield to protect against stray magnetic fields and maintain color purity . . . ACC and AGC to reduce color fade and insure steady, flutter-free pictures under all conditions . . . preassembled & aligned IF with 3 stages instead of the usual 2 . . . preassembled & aligned 2-speed transistor UHF tuner . . . deluxe VHF turret tuner with "memory" fine tuning . . . 300 & 75 ohm VHF antenna inputs . . . two hi-fi sound outputs . . . 4" x 6" 8 ohm speaker . . . choice of installation — wall, custom or optional Heath factory assembled cabinets. Build in 25 hours.

Kit GR-227
$419.95
(less cabinet)
$25 mo.

Kit GR-227, (everything except cabinet) . . . $42 dn., as low as $25 mo. **$419.95**
GRA-227-1, Walnut cabinet . . . no money dn., $6 mo. **$59.95**
GRA-227-2, Mediterranean Oak cabinet (shown above), . . . no money dn., $10 mo. **$94.50**

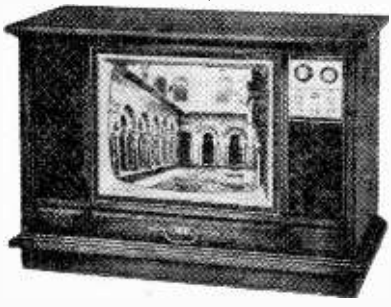
Kit GRA-27
$19.95



New Remote Control For Heathkit Color TV

Now change channels and turn your Heathkit color TV off and on from the comfort of your armchair with this new remote control kit. Use with Heathkit GR-227, GR-295 and GR-180 color TV's. Includes 20' cable.

Kit GR-295
$479.95
(less cabinet)
$42 mo.



Deluxe Heathkit "295" Color TV

Has same high performance features and built-in servicing facilities as new GR-227, except for 295 sq. in. viewing area (industry's largest picture) . . . 24,000 volt picture power . . . universal main control panel for versatile in-wall installation . . . and 6" x 9" speaker.

Kit GR-295, (everything except cabinet), 131 lbs. . . . $48 dn., $42 mo. **$479.95**
GRA-295-4, Mediterranean cabinet (shown above), 90 lbs. . . . no money dn., $11 mo. **$112.50**
Other cabinets from $62.95.

Kit GR-180
$349.95
(less cabinet & cart)
$30 mo.

Deluxe Heathkit "180" Color TV

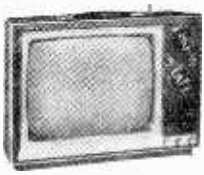
Same high performance features and exclusive self-servicing facilities as new GR-227 (above) except for 180 sq. in. viewing area.

Kit GR-180, (everything except cabinet), 102 lbs. . . . $35 dn., $30 mo. **$349.95**
GRA-180-5, table model cabinet & mobile cart (shown above), 57 lbs. . . . no money dn., $5 mo. **$39.95**
Other cabinets from $24.95

Deluxe 12" Transistor Portable B&W TV – First Kit With Integrated Circuit

Unusually sensitive performance. Plays anywhere . . . runs on household 117 v. AC, any 12 v. battery, or optional rechargeable battery pack ($39.95); receives all channels; new integrated sound circuit replaces 39 components; preassembled, prealigned tuners; high gain IF strip; Gated AGC for steady, jitter-free pictures; front-panel mounted speaker; assembles in only 10 hours. Rugged high impact plastic cabinet measures a compact 11½" H x 15¾" W x 9⅜" D. 27 lbs.

Kit GR-104
$119.95
$11 mo.



Kit GR-104, 27 lbs. . . . no money dn., $11 mo. **$119.95**

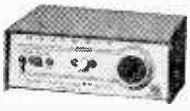
No Money Down On $25 to $300 Orders — Write For Credit Form

11 New Kits From Heath . . .

New! Heathkit Wireless Home Protection System for Your Family's Safety

GD-97
Utility Transmitter
for Universal Protection

GD-87
Wireless Smoke/Heat
Detector-Transmitter

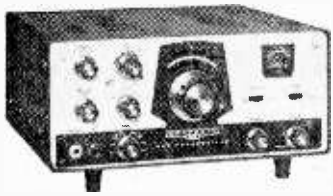


GD-77 Wireless Receiver/Alarm
fail-safe, always alert

Applications Unlimited . . . Customize Your Own System. Here's reliable, low cost, 24-hour protection for your family and property. System warns of smoke, fire, intruders, freezing, thawing, cooling, rising or receding water, pressures . . . any change you want to be warned about. Uses unique new signaling method developed by Berkeley Scientific Labs.; exclusively licensed to Heath. Your house is already wired for this system, just plug the units into any AC outlet. "Load transmission" design (not a carrier type as in wireless intercoms) generates unusual signal that is practically unduplicable in other devices or random noise sources. Solid-state circuitry has built-in fail-safe capability to sound alarm if power fails, if power supply components in any unit fail, or if 50,000 hour bulb in smoke detector fails. Receiver/Alarm has 2800 Hz transistor alarm and receptacle for extra 117 VAC bell or buzzer to extend range, plus rechargeable battery (always kept charged) to sound alarm if power fails. Smoke-Heat Detector-Transmitter capability may be extended to other areas by adding extra heat sensors to its built-in sensor. Utility Transmitter accepts any type of switch or sensor for any purpose; examples: magnetic reed switches for doors and windows to warn of entry; step-on switches for door or driveway; micro switches with trip wire around yard; heat sensors; water pressure switches warn of pump failure; thermal switches warn of freezing in gardens, or thawing in freezers; two wires act as switch to warn of changing water levels in sump-pump wells, pools, etc. Units are small and unobtrusive in beige and brown non-reflecting velvet finish. Any number of units may be used in the system. All units feature circuit board construction; each unit takes only 3 hours to build. Operating cost similar to electric clocks. Invest in safety for your family now with this unique Heath system.

Kit GD-77, receiver/alarm, 4 lbs. **$39.95**
Kit GD-87, smoke/heat det.-trans., 5 lbs. **$49.95**
Kit GD-97, Utility trans., 4 lbs. **$34.95**
(numerous accessory switches available from Heath)

New! Low Cost Heathkit 5-Band SSB-CW Transceiver



Kit HW-100
$240.00

You asked for it . . . a 5-band version of the Heathkit "single-banders" . . . a low cost SSB transceiver for 10 or 15 meters . . . an SSB transceiver equal or superior to many wired rigs but at much lower cost. It's the new HW-100, the most SSB equipment you can get for the money. Features build-it-yourself solid-state (FET) VFO; 80-10 meter coverage; switch-selected upper or lower sideband or CW; crystal filter; full coverage on all bands with 500 kHz per band segment; smooth vernier control; built-in 100 kHz calibrator; separate offset CW carrier crystal; TALC; quiet, enclosed relays; fixed or mobile operation with accessory power supplies; 180 watts PEP, 170 watts CW input; PTT or VOX on SSB; CW transceive by VOX from keyed tone using grid-block keying; less than 100 Hz drift per hour after warmup; less than 100 Hz variation under 10% line voltage variation; receiver sensitivity less than 0.5 uv for 10 dB S+N/N ratio for SSB operation; selectivity 2.1 kHz at 6 dB down, 7 kHz at 60 dB down; image & IF rejection better than 50 dB; easy circuit board construction with one large wiring harness; handsome 2-piece green wrinkle finish cabinet. It's a winner!

Kit HW-100, 19 lbs., no money dn., $22 mo. **$240.00**

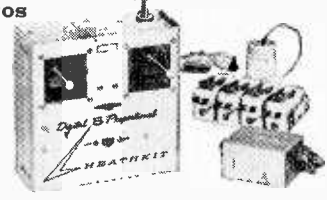
New! Heathkit High-Power Inverter for Boats, Cars, Campers

Kit
MP-14
$99.95

Powers Color & B&W TV's, power tools, radios, phonos, lights, tape recorders, hi-fi systems, shavers, PA systems, ham & CB rigs, any small appliance except compressor-type refrigerators and units having heating elements drawing over 400 watts. Also makes good source of limited emergency power at home. Delivers 500 watts intermittant; 400 watts continuous; freq. and output adjustable for best operation; remote control-output and cables included. 29 lbs.

New! Heathkit/Kraft 5-Channel Digital Proportional System with Variable Capacitor Servos

System Kit GD-47
$219.95
$21 mo.

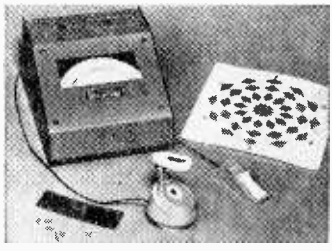


This Heathkit version of the internationally famous Kraft system saves you over $200. The system includes solid-state transmitter with built-in charger and rechargeable battery, solid-state receiver, receiver rechargeable battery, four variable capacitor servos, and all cables. Servos feature sealed variable capacitor feedback to eliminate failure due to dirty contacts, vibration, etc.; three outputs: two linear shafts travel ⅝" in simultaneous opposite directions plus rotary wheel. Specify freq.: 26.995, 27.045, 27.145, 27.195 MHz.

System Kit GD-47, all of above, 5 lbs. **$219.95**
Kit GDA-47-1, transmitter, battery, cable, 3 lbs. **$86.50**
Kit GDA-47-2, receiver, 3 lbs. **$49.95**
GDA-47-3, receiver rechargeable battery, 1 lb. **$9.95**
Kit GDA-47-4, one servo only, 1 lb. **$21.50**

New! Heath/Mitchell COLORVAL Darkroom Computor . . . Kit or Assembled

Kit PM-17
$89.95
$9 mo.

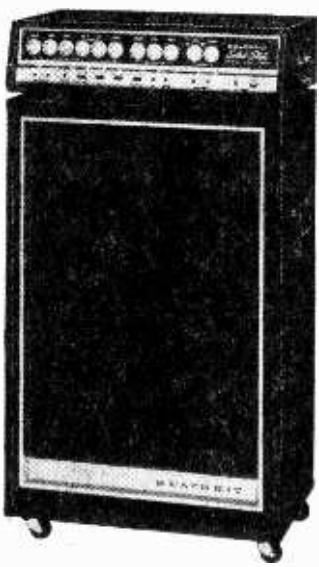


Colorval takes the work out of color printing, leaves the creativity to you. Colorval is easy to set up . . . you "program" the scan filter pack for the type of film, paper, and equipment you use . . . we show you how. Unique Color Probe allows visual determination of ideal enlarger filter combination. Color Wheel and table shows what filter changes are needed. Exposure Probe scans shadows and highlights; exposure scale on Computer indicates proper contrast for color and b/w printing. Get started in color the right way, quickly, easily.

Kit PM-17, 6 lbs., no money dn., $9 mo. **$89.95**
Assembled PMW-17, 6 lbs. . . no money dn., $13 mo. . . **$125.00**

See 300 More in FREE Catalog

What would you expect to pay for a Vox "Jaguar" Combo organ with a 180-watt 3-channel amp? $1000? $1250? $1500? More?



You can get both for only $598 during this Special Heathkit Offer!

Now you can get this famous professional combo organ with a versatile high-power piggy-back amp. and matching speaker system for just a little more than you'd expect to pay for the "Jaguar" alone! The Heathkit/Vox "Jaguar" is solid-state; two outputs for mixed or separated bass and treble; reversible bass keys for full 49 key range or separate bass notes; bass volume control; vibrato tab; bass chord tab; four voice tabs (flute, bright, brass, mellow); keyboard range C_2 to C_6 in four octaves; factory assembled keyboard, organ case with cover, and stand with case. Also available separately; you'll still save $150 (order Kit TO-68, $349.95).

The Heathkit TA-17 Deluxe Super-Power Amplifier & Speaker has 180 watts peak power into one speaker (240 watts peak into a pair); 3-channels with 2 inputs each; "fuzz", brightness switch; bass boost; tremolo, reverb; complete controls for each channel; foot switch; 2 heavy duty 12" speakers plus horn driver. Also available separately kit or factory assembled (Kit Amplifier TA-17, $175; Assembled $275; Kit Speaker TA-17-1 $120; Assembled $150; Kit TAS-17-2, amp. & two speakers $395; Assembled TAW-17-2, amp. & two speakers $545).

Kit TOS-1
Organ, Amplifier & Speaker Kits (240 lbs.)
$598.00

Kit TOS-2
Organ Kit, Assembled Amplifier & Speaker (240 lbs.)
$698.00

New! Solid-State Portable Volt-Ohm-Meter

So Handy, So Low Cost we call it "every man's" meter. Just right for homeowners, hobbyists, boatowners, CBer's, hams ... it's even sophisticated enough for radio & TV servicing! Features 12 ranges ... 4 AC & 4 DC volt ranges, 4 ohm ranges; 11 megohm input on DC, 1 megohm input on AC; 4½" 200 uA meter; battery power; rugged polypropylene case and more. Easy 3 or 4 hour kit assembly.

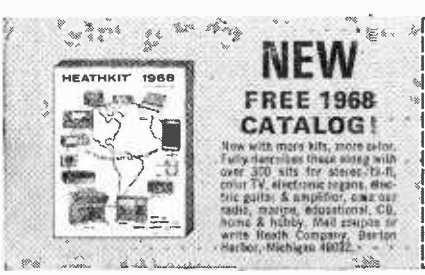
Kit IM-17
$19.95

New! Heathkit Guitar Headphone Amplifier

Kit TA-58
$9.95

Now you can play and practice your electronic guitar in private! Just plug this miniature amplifier into the jack of your guitar and use a pair of headphones. Solid-state circuit has tailored response; automatic off-on switching; self-contained battery (not supplied); and capability of operating one or two pairs of mono or stereo headphones of 4 to 2 meghohms. Ideal for practice or instruction. Easy to build.

Kit TA-58, 2 lbs. **$9.95**



NEW FREE 1968 CATALOG!

Now with more kits, more color. Fully describes these along with over 300 kits for stereo, hi-fi, color TV, electronic organs, electric guitar & amplifier, ham & ssb radio, marine, educational, CB, home & hobby. Mail coupon or write Heath Company, Benton Harbor, Michigan 49022.

HEATHKIT

HEATH COMPANY, Dept. 19-6
Benton Harbor, Michigan 49022
In Canada, Daystrom Ltd.

☐ Enclosed is $_____, including shipping.

Please send model (s)_____

☐ Please send FREE Heathkit Catalog.

☐ Please send Credit Application.

Name_____

Address_____

City_____ State_____ Zip_____

Prices & specifications subject to change without notice. CL-323

VOLUME 49, PART 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, Major Broadcast Stations in Mexico and the Caribbean and the World-Wide Shortwave stations section.

In the August-September, 1968 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 1968, 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
KAFE	Santa 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.	1480
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.	1480
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
KASA	Phoenix, Ariz.	1540
KASH	Eugene, Ore.	1590
KASI	Ames, Iowa	1430
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, Ida.	950
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
KAVA	Burney, Cal.	1450
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	Heber 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
KAZA	Gilroy, Cal.	1290
KBAB	Indianola, Iowa	1490
KBAL	San Saba, Tex.	1410
KBAM	Longview, Wash.	1270
KBAN	Bowie, Tex.	1410
KBAR	Burley, Idaho	1280
KBAT	San Antonio, Tex.	680
KBBA	Benton, Ark.	690
KBBB	Borger, Tex.	1600
KBBC	Centerville, Utah	1600
KBBO	Yakima, Wash.	1390
KBBQ	Burbank, Cal.	1500
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
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.	810
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
KBLC	Lakeport, Cal.	1270
KBLE	Seattle, Wash.	1050
KBLF	Red Bluff, Calif.	1490
KBLI	Blackfoot, Idaho	690
KBLL	Helena, Mont.	1240
KBLR	Bolivar, Mo.	1130
KBLT	Big Lake, Tex.	1290
KBLU	Yuma, Ariz.	1320
KBLW	Logan, Utah	1390
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
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
KBRB	Ainsworth, Neb.	1400
KBRC	Mt. Vernon, Wash.	1430
KBRF	Fergus Falls, Minn.	1250
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 Springs, Ida.	790
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
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
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
KCTO	Columbia, La.	1540
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
KCYN	Williams, Ariz.	1240
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
KDEW	DeWitt, Ark.	1470
KDEX	Dexter, Mo.	1590
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.	1250
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	1310
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
KOSJ	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
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-Paseo, 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.	1560
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
KEWI	Topeka, Kans.	1440
KEWQ	Paradise, Cal.	930
KEX	Portland, Oreg.	1190
KEXO	Grand Junc., Colo.	1230
KEXS	Excelsior Springs, Mo.	1090
KEYD	Oakes, N.Dak.	1220
KEYE	Perryton, Tex.	1400
KEYJ	Jamestown, N.Dak.	1400
KEYL	Long Prairie, Minn.	1400
KEYN	Wichita, Kan.	900
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
KFBR	Nogales, Ariz.	1340
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
KFH	Wichita, Kans.	1330
KFI	Los Angeles, Calif.	640
KFIL	Fergus Falls, 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.	1540
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.	1240
KFNF	Council Bluffs, Ia.	920
KFNV	Ferriday, La.	1600
KFNW	Fargo, N.Dak.	900
KFOR	Lincoln, Nebr.	1240
KFOX	Long Beach, Calif.	1280
KFPW	Ft. Smith, Ark.	1230
KFQO	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.	1060
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
KGMY	Missoula, Mont.	1450
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.	1210
KHAC	Window Rock, Ariz.	1300
KHAI	Honolulu, Hawaii	1090
KHAK	Cedar Rapids, Iowa	1360
KHAL	Homer, La.	1320
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
KHIL	Willcox, Ariz.	1250
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.	960
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.	1320
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, Nebr.	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
KIKX	Tucson, Ariz.	580
KILE	Galveston, Tex.	1400
KILO	Grand Forks, S.Dak.	1440
KILR	Estherville, Ia.	1070
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
KIML	Gillette, Wyo.	1270
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	Mission, 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
KJIN	Houma, La.	1490
KJLT	North Platte, Nebr.	970
KJNO	Juneau, Alaska	630
KJNP	North Pole, Alaska	1170
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
KKEP	Estes Park, Colo.	1470
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
KKUA	Honolulu, Hawaii	690
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

Are your home-town AM stations listed correctly in *White's Radio Log?* If you believe there is a correction called for in *White's* listings, please check first with your local station. For each callsign obtain the correct city location, frequency, and power. (Remember, even though your local paper may list a station as a "home-town" station, it may be officially licensed by the FCC for operation in the next city.) Get all the facts on a piece of paper (be very brief), include your name and address, and mail to *White's Radio Log,* RADIO-TV EXPERIMENTER, 505 Park Ave., New York, N. Y. 10022. Your help in contributing to the accuracy and completeness of *White's Radio Log* will be sincerely appreciated. See page 124. *—Editor*

Call	Location	kHz
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
KLFB	Lubbock, Tex.	1420
KLFD	Litchfield, Minn.	1410
KLGA	Algona, Iowa	1600
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
KLOU	Lake Charles, La.	1580
KLOW	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
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
KMBL	Junction, Tex.	1450
KMBY	Monterey, Calif.	1240
KMBZ	Kansas City, Mo.	980
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
KMEO	Phoenix, Ariz.	740
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
KMLO	Vista, Cal.	1000
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
KNAB	Burlington, Colo.	1140
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
KNDK	Langdon, N. D.	1080
KNDY	Marysville, Kans.	1570
KNEA	Jonesboro, Ark.	970
KNEB	Scottsbluff, Nebr.	960
KNED	McAlester, Okla.	1150
KNEI	Waukon, Ia.	1140
KNEL	Brady, Tex.	1490
KNEM	Nevada, Mo.	1240
KNET	Palestine, Tex.	1450
KNEW	Oakland, Cal.	910
KNEX	McPherson, Kans.	1540
KNEZ	Lompoc, Calif.	960
KNFT	Bayard, N.M.	950
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
KNOK	Ft. Worth, Tex.	970
KNOP	N. Platte, Nebr.	1410
KNOR	Norman, Okla.	1400
KNOT	Prescott, Ariz.	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
KOAK	Red Oak, Ia.	1080
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.	1180
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
KOOD	Lakewood Center, Wash	1480
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
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	South Lake Tahoe, Cal.	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
KPAR	Albuquerque, N.M.	1190
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
KPDN	Pampa, Tex.	1340
KPDQ	Portland, Oreg.	800
KPEG	Spokane, Wash.	1380
KPEL	Lafayette, La.	1420
KPEP	San Angelo, Tex.	1420
KPET	Lamesa, Tex.	690
KPHO	Phoenix, Ariz.	910
KPIK	Colorado Sprgs., Colo.	1580
KPIN	Casa Grande, Ariz.	1260
KPLC	Lake Charles, La.	1470
KPLT	Paris, Tex.	1490
KPLY	Crescent City, Calif.	1240
KPMC	Bakersfield, Calif.	1560
KPNG	Port Neches, Tex.	1150
KPNW	Eugene, Ore.	1500
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
KPOP	Roseville, Cal.	1110
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
KPTN	Central Point, Ore.	1400
KPUA	Hilo, Hawaii	970
KPUB	Pueblo, Colo.	1480
KPUG	Bellingham, Wash.	1170
KPUL	Pullman, Wash.	1150
KPUR	Amarillo, Tex.	1440
KPWB	Piedmont, Mo.	1140
KPXE	Liberty, Tex.	1050
KQAQ	Austin, Minn.	970
KQCY	Quincy, Calif.	1370
KQEN	Roseburg, Ore.	1240
KQEO	Albuquerque, N.Mex.	920
KQIK	Lakeview, Oreg.	1230
KQIQ	Santa Paula, Cal.	1400
KQMS	Redding, Calif.	1400
KQOT	Yakima, Wash.	930
KQRS	Golden Valley, Minn	1440
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 June., Colo.	920
KRFO	Owatonna, Minn.	1390
KRFS	Superior, Nebr.	1600
KRGI	Grand Island, Neb.	1430
KRGV	Weslasco, 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
KRME	Hondo, Tex.	1460
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.	1350
KRVC	Ashland, Oreg.	1350
KRVN	Lexington, Neb	880
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

WHITE'S RADIO LOG

Call	Location	kHz
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
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
KSOM	Ontario, Cal.	1510
KSON	San Diego, Calif.	1240
KSOO	Sioux Falls, S.Dak.	1140
KSOP	Salt Lake City, Utah	1370
KSOX	Raymondville, Tex.	1240
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
KSRM	Soldatna, Alaska	920
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.	1450
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
KSUN	Bisbee, Ariz.	1230
KSVC	Richfield, Utah	980
KSVN	Ogden, Utah	730
KSVP	Artesia, N.Mex.	990
KSWA	Graham, Tex.	1330
KSWB	Seaside, Ore.	930
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
KTAR	Phoenix, Ariz.	620
KTAT	Frederick, Okla.	1570
KTBB	Tyler, Tex.	600
KTBC	Austin, Tex.	590
KTCB	Malden, Mo.	1470
KTCH	Wayne, Neb.	1590
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	South Lake Tahoe, Cal.	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	Tullulah, 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	1350
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
KTUF	Tempe, Ariz.	1580
KTUI	Sullivan, Mo.	1560
KTW	Seattle, Wash.	1250
KTWO	Casper, Wyo.	1030
KTXJ	Jasper, Tex.	1350
KTXO	Sherman, Tex.	1500
KTYM	Inglewood, Calif.	1480
KUAI	Eleele, Kanai, Hawaii	720
KUAM	Agana, Guam	610
KUAT	Tucson, Ariz.	1550
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
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
KUMU	Honolulu, Hawaii	1500
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
KURB	Mountlake Terrace, Wash.	1510
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
KVAC	Forks, Wash.	1490
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	Woodville, 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
KVRA	Vermillion, S. D.	1570
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
KVSL	Show Low, Ariz.	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
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
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.	1580
KWLC	Decorah, Iowa	1240
KWLG	Wagoner, Okla.	1530
KWLM	Willmar, Minn.	1340
KWMC	Del Rio, Tex.	1490
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 Roads, La.	1500
KWRO	Coquille, Oreg.	630
KWRT	Boonville, Mo.	1370
KWRW	Guthrie, Okla.	1490
KWSC	Pullman, Wash.	1250
KWSO	Mt. Shasta, Calif.	620
KWSH	Wewoka-Seminole, Oklahoma	1260
KWSL	Grand Junction, Colo.	1340
KWSO	Wasco, Calif.	1050
KWSR	Rifle, Colo.	810
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
KWYS	W. Yellowstone, Mont.	920
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
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
KYAK	Anchorage, Alaska	630
KYAL	McKinney, Tex.	1600
KYCA	Prescott, Ariz.	1490
KYCN	Wheatland, Wyo.	1340
KYES	Roseburg, Oreg.	950
KTET	Payette, Idaho	1450
KYJC	Medford, Oreg.	1230
KYLT	Missoula, Mont.	1340
KYME	Boise, Idaho	740
KYND	Burlington, Ia.	1150
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 Sprgs., Colo.	1460
KYSS	Missoula, Mont.	910

Call	Location	kHz
KYUM	Yuma, Ariz.	560
KYVA	Gallup, N.Mex.	1230
KYW	Philadelphia, Pa.	1060
KYXI	Oregon City, Ore.	1520
KZAK	Tyler, Tex.	1330
KZEE	Weatherford, Tex.	1220
KZEL	Eugene, Ore.	1540
KZEY	Tyler, Tex.	690
KZIA	Albuquerque, N.M.	1580
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
WAGO	Oshkosh, Wis.	690
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
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
WAKS	Fuquay Springs, N.C.	1460
WAKY	Superior, Wis.	970
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
WANL	Lineville, Ala.	1540
WANN	Annapolis, Md.	1190
WANO	Pineville, Ky.	1230
WANS	Anderson, S.C.	1260
WANT	Richmond, Va.	990
WANV	Waynesboro, Va.	970
WANY	Albany, Ky.	1390
WAOA	Opelika, Ala.	1520
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.	1580
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
WARV	Warwick-E. Greenwich, R.I.	1590
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.	1480
WATR	Waterbury, Conn.	1320
WATS	Sayre, Pa.	960
WATT	Cadillac, Mich.	1240
WATV	Birmingham, Ala.	900
WATW	Ashland, Wis.	1400
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
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.	980
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
WBFN	Quitman, Miss.	1500
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
WBHN	Bryson City, N. C.	1590
WBHP	Huntsville, Ala.	1230
WBHT	Brownsville, Tenn.	1520
WBIA	Augusta, Ga.	1230
WBIB	Centreville, Ala.	1110
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
WBKH	Hattiesburg, 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.	1230
WBOL	Bolivar, Tenn.	1560
WBOM	Jacksonville, Fla.	970
WBOO	Baraboo, Wis.	740
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
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	Odessa, Tex.	920
WBZE	Wheeling, W. Va.	1470
WBZY	Torrington, Conn.	990
WCAB	Rutherfordton, N.C.	590
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
WCAS	Cambridge, Mass.	740
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
WCDQ	Hamden, Conn.	1220
WCDS	Glasgow, Ky.	1440
WCDT	Winchester, Tenn.	1340
WCEC	Rocky Mount, N.C.	810
WCED	DuBois, Pa.	1420
WCEF	Parkersburg, W.Va.	1050
WCEH	Hawkinsville, Ga.	610
WCEM	Cambridge, Md.	1240
WCEN	Mt. Pleasant, Mich.	1150
WCER	Charlotte, Mich.	1390
WCFL	Chicago, Ill.	1000
WCFR	Springfield, Vt.	1480
WCFV	Clifton Forge, Va.	1230
WCGA	Calhoun, Ga.	900
WCGB	Pastillo, P. R.	1050
WCGC	Belmont, N.C.	1270
WCGO	Chicago Hghts., Ill.	1600
WCGR	Canandaigua, N.Y.	1550
WCHA	Chambersburg, Pa.	800
WCHB	Inkster, Mich.	1440
WCHE	Westchester, Pa.	1520
WCHI	Chillicothe, Ohio	1350
WCHJ	Brookhaven, Miss.	1470
WCHK	Canton, Ga.	1290
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

WHITE'S RADIO LOG

Call	Location	kHz
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.	1570
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
WCNH	Quincy, Fla.	1230
WCNL	Newport, N. H.	1010
WCNR	Bloomsburg, Pa.	930
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
WCPK	Chesapeake, Va.	1600
WCPM	Cumberland, Ky.	1280
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.	1590
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
WCSW	Shell Lake, Wis.	940
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
WCVR	Randolph, Vt.	1230
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
WDEF	Chattanooga, Tenn.	1370
WDEH	Sweetwater, Tenn.	800
WDEL	Wilmington, Del.	1150
WDEN	Macon, Ga.	1500
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. Olive, N.C.	1430
WDJZ	Bridgeport, Conn.	1530
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
WDLV	Donaldsonville, La.	1090
WDME	Dover-Foxcraft, Me.	1340
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.	1300
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
WDSC	Dyersburg, 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
WDSU	New Orleans, La.	1280
WDTM	Selmer, Tenn.	1130
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
WDYZ	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
WEHW	Windsor, Conn.	1480
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.	1400
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
WELX	Xenia, O.	1110
WELY	Ely, Minn.	1450
WELZ	Belzoni, Miss.	1460
WEMR	Erwin, Tenn.	1420
WEMD	Easton, Md.	1460
WEMJ	Laconia, N.H.	1490
WEMP	Milwaukee, Wis.	1250
WENC	Whiteville, N.C.	1220
WEND	Ebensburg, Pa.	1580
WENE	Endicott, N.Y.	1430
WENG	Englewood, Fla.	1530
WENK	Union City, Tenn.	1240
WENN	Birmingham, Ala.	1320
WENO	Madison, Tenn.	1430
WENR	Englewood, Tenn.	1090
WENT	Gloversville, N.Y.	1340
WENY	Elmira, N.Y.	1230
WENZ	Highland Springs, Va.	1450
WEOK	Poughkeepsie, 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.	790
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
WFZQ	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
WFGL	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.	1000
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	1430
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	Freeport, 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
WFSH	Valparaiso, Fla.	1340
WFSO	Pinellas, Fla.	570
WFSP	Kingwood, W. Va.	1560
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
WFTO	Fulton, Miss.	1330
WFTR	Front Royal, Va.	1450
WFTW	Ft. Walton Beach, Fla.	1260
WFUL	Fulton, Ky.	1270
WFUR	Grand Rapids, Mich.	1570
WFVA	Fredericksburg, Va.	1230
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

Call	Location	kHz
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
WGEN	Geneseo, Ill.	1500
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
WGIC	Xenia, O.	1500
WGIG	Brunswick, Ga.	1440
WGIL	Galesburg, Ill.	1400
WGIR	Manchester, N.H.	610
WGIV	Charlotte, N.C.	1600
WGKA	Atlanta, Ga.	1110
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	Bethesda, Md.	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
WGOC	Kingsport, Tenn.	1090
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
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.	980
WGRP	Greenville, Pa.	940
WGRT	Chicago, Ill.	950
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
WGTR	Natick, Mass.	1060
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
WHA	Madison, Wis.	970
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
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
WHOF	Houghton, Mich.	1400
WHOH	Boston, Mass.	850
WHDL	Olean. N.Y.	1450
WHOM	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
WHHM	Henderson, Tenn.	1580
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.	1600
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
WHOY	Salinas, P. R.	1210
WHP	Harrisburg, Pa.	580
WHPB	Belton, S.C.	1390
WHPE	High Point, N.C.	1070
WHPL	Winchester, Va.	610
WHRF	Riverhead, N.Y.	1570
WHRN	Herendon, Va.	1440
WHRT	Hartselle, Ala.	860
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
WICY	Malone, N.Y.	1490
WIDE	Biddeford, Maine	1400
WIDD	Elizabethton, Tenn.	1520
WIDG	St. Ignace, Mich.	940
WIOU	Fayetteville, N.C.	1600
WIEL	Elizabethtown, Ky.	1400
WIFE	Indianapolis, Ind.	1310
WIFM	Elkin, N.C.	1540
WIGG	Wiggins, Miss.	1420
WIGM	Medford, Wis.	1490
WIGO	Atlanta, Ga.	1340
WIGS	Gouverneur, N.Y.	1230
WIII	Homestead, Fla.	1430
WIIN	Atlanta, Ga.	970
WIKB	Iron River, Mich.	1230
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
WILT	Tomahawk, Wis.	810
WILY	Centralia, Ill.	1210
WILZ	St. Petersburg Beach, Fla.	1590
WIMA	Lima, Ohio	1150
WIMO	Winder, Ga.	1300
WIMS	Michigan City, Ind.	1420
WINA	Charlottesville, Va.	1050
WINC	Winchester, Va.	1400
WIND	Chicago, Ill.	560
WINE	Brookfield, Conn.	940
WINF	Manchester, Conn.	1230
WING	Dayton, Ohio	1410
WINH	Georgetown, S. C.	1470
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
WIQT	Horseheads, N. Y.	1000
WIRA	Ft. Pierce, Fla.	1400
WIRB	Enterprise, Ala.	800
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
WIXY	Cleveland, O.	1260
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
WJBE	Knoxville, Tenn.	1430
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
WJOA	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	Opelika, 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
WJJZ	Mt. Holly, N. J.	1460
WJKM	Hartsville, Tenn.	1090
WJKY	Jamestown, Ky.	1060
WJLB	Detroit, Mich.	1400
WJLD	Homewood, Ala.	1400
WJLE	Smithville, Tenn.	1480
WJLK	Asbury Park, N. J.	1310
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 St. Joe, Fla.	1080
WJOI	Florence, Ala.	1340
WJOL	Joliet, Ill.	1340
WJON	St. Cloud, Minn.	1240
WJOR	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
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	Hackensack, N.J.	970
WJSB	Crestview, Fla.	1050
WJSM	Martinsburg, Pa.	1110

WHITE'S RADIO LOG

Call	Location	kHz
WJSO	Jonesboro, Tenn.	1590
WJSW	Maplewood, Minn.	1010
WJTN	Jamestown, N.Y.	1240
WJTO	Bath, Me.	730
WJTS	Jupiter, Fla.	1000
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
WKCY	Harrisonburg, Va.	1300
WKDA	Nashville, Tenn.	1240
WKDE	Altavista, Va.	1000
WKDK	Newberry, S.C.	1240
WKDL	Clarksdale, Miss.	1600
WKDN	Camden, N.J.	800
WKDR	Plattsburgh, N.Y.	1070
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.	900
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.	1000
WKMT	Kings Min., N.C.	1220
WKNE	Keene, N.H.	1290
WKMG	Newberry, S.C.	1520
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
WKDZ	Kosciusko, Miss.	1350
WKPA	New Kensington, Pa.	1150
WKPM	Princeton, Minn.	1300
WKPO	Prentiss, Miss.	1510
WKPR	Kalamazoo, Mich.	1420
WKPT	Kingsport, Tenn.	1400
WKQH	Chiefland, Fla.	940
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
WKRW	Cartersville, Ga.	1340
WKRZ	Oil City, Pa.	1300
WKSC	Kershaw, S.C.	1600
WKSK	W. Jefferson, N.C.	1340
WKSN	Jamestown, N.Y.	1090
WKSP	Kingstree, S. C.	1420
WKSR	Pulaski, Tenn.	1280
WKST	New Castle, Pa.	1310
WKTC	Charlotte, N.C.	1090
WKTE	King, N.C.	730
WKTG	Thomasville, Ga.	1380
WKTJ	Farmington, Maine	1450
WKTQ	South Paris, Maine	950
WKTS	Sheboygan, Wis.	1600
WKTX	Atlantic Beach, Fla.	580
WKTY	LaCrosse, Wis.	1340
WKUL	Cullman, Ala.	920
WKVA	Lewistown, Pa.	1280
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
WKYB	Hemingway, S. C.	1000
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
WKYZ	Madisonville, Tenn.	1250
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
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.	1800
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
WLEH	Lehigh Acres, Fla.	1440
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
WLGN	Logan, Utah	1510
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
WLIX	Islip, N. Y.	540
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
WLMS	Leominster, Mass.	1000
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
WLDN	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.	1450
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.	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
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
WMCL	McLeansboro, Ill.	1060
WMCP	Columbia, Tenn.	1280
WMCR	Oneida, N.Y.	1600
WMCS	Machias, Me.	1400
WMCT	Mountain City, Tenn.	1390
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.	1230
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	Vanceive, 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	Millville, 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

Call	Location	kHz
WMYR	Ft. Myers, Fla.	1410
WNAB	Bridgeport, Conn.	1450
WNAD	Norman, Okla.	640
WNAE	Warren, Pa.	1310
WNAG	Grenada, Miss.	1400
WNAH	Nashville, Tenn.	1360
WNAK	Nanticoke, Pa.	730
WNAL	Nelsonville, O.	940
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.	1070
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
WNFL	Green Bay, Wis.	1440
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	Newport, Ky.	740
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
WNRJ	Gainsville, Ga.	1580
WNRK	Newark, Del.	1260
WNRV	Narrows-Pearlsburg, Va.	990
WNSL	Laurel, Miss.	1260
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
WNYN	Canton, O.	900
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
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
WOKC	Okeechobee, Fla.	1570
WOKE	Charleston, S.C.	1340
WOKJ	Jackson, Miss.	1550
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
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
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.	1480
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.	980
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
WPHM	Port Huron, Mich.	1380
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.	1240
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
WPUT	Brewster, N.Y.	1510
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.	810
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	San Juan, P.R.	1520
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
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
WRGM	Richmond, Va.	1540
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
WRIE	Erie, Pa.	1330
WRIG	Wausau, Wis.	1400
WRIM	Pahokee, Fla.	1250
WRIN	Rensselaer, Ind.	1560
WRIP	Rossville, Ga.	1190
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
WRKO	Boston, Mass.	680
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
WRNG	N. Atlanta, Ga.	680
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	Scottsboro, 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.	590
WRTL	Rantoul, Ill.	250d
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
WSEW	Selingsgrove, Pa.	1240
WSFB	Quitman, Ga.	1490
WSFC	Somerset, Ky.	1240
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

WHITE'S RADIO LOG

Call	Location	kHz
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
WSJW	Woodruff, S.C.	1510
WSKE	Everett, Pa.	1060
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.	1840
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
WSLV	Ardmore, Tenn.	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
WSML	Graham, N.C.	1190
WSMN	Nashua, N.H.	1590
WSMT	Sparta, Tenn.	1050
WSMY	Weldon, N. C.	1400
WSNE	Cumming, 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
WSOM	Salem, Ohio	600
WSON	Henderson, Ky.	860
WSOO	Slt. Ste. Marie, Mich.	1230
WSOQ	No. Syracuse, N.Y.	1220
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
WSRO	Marlborough, Mass.	1470
WSRW	Hillsboro, Ohio	1590
WSSB	Durham, N.C.	1490
WSSC	Sumter, S.C.	1340
WSSO	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
WTHD	Milford, Del.	930
WTHE	Mineola, N.Y.	1520
WTHI	Terre Haute, Ind.	1480
WTHM	Lapeer, Mich.	1530
WTHN	Thomaston, Ga.	1500
WTHT	Hazleton, Pa.	1300
WTHU	Thurmont, Md.	1450
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
WTIV	Titusville, Pa.	1230
WTIX	New Orleans, La.	690
WTJH	East Point, Ga.	1260
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.	620
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
WTWW	Towson, Md.	1570
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
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
WUBE	Cincinnati, O.	1230
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
WUSJ	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	Windermere, Fla.	1480
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
WVLY	Water Valley, Miss.	1320
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.	1490
WVSA	Vernon, Ala.	1380
WVSC	Somerset, Pa.	990
WVSM	Rainsville, Ala.	1500
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
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
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
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
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	Albemarie, 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

U. S. FM Stations by Call Letters

Call	Location
KAAY-FM	Little Rock, Ark.
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.
KAFE-FM	Santa Fe, N. M.
KAFF-FM	Flagstaff, Ariz.
KAFI	Auburn, Calif.
KAFM	Salina, Kans.
KAGH-FM	Crossett, Ark.
KAIM-FM	Honolulu, Hawaii
KAJS	Newport Beach, Calif.
KAKC	Tulsa, Okla.
KAKI	San Antonio, Tex.
KALA	Davenport, Ia.
KALB-FM	Alexandria, La.
KALH	Denver, Colo.
KALL-FM	Salt Lake City, Utah
KALW	San Francisco, Calif.
KALX	Berkeley, Cal.
KAMB	Merced, Cal.
KAMS	Mammoth Spring, Ark.
KAMU	Anchorage, Alaska
KANG	Angwin, Cal.
KANS-FM	Larned, Kan.
KANT-FM	Lancaster, Calif.
KANU	Lawrence, Kans.
KANW	Albuquerque, N.Mex.
KAOL-FM	Carrollton, Mo.
KARD	Wichita, Kan.
KARK	Little Rock, Ark.
KARL-FM	Carlsbad, Cal.
KARM-FM	Fresno, Calif.
KASC	Conway, Ark.
KASU	Jonesboro, Ark.
KATT	Woodland, Calif.
KATY-FM	San Luis Obispo, Calif.
KAUS-FM	Austin, Minn.
KAVI-FM	Rocky Ford, Colo.
KAVR-FM	Applevalley, Cal.
KAWL-FM	York, Neb.
KAWY	Casper, Wyo.
KAYD	Beaumont, Tex.
KAZZ	Austin, Tex.
KBAY	San Jose, Cal.
KBBB-FM	Borger, 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.
KBGH-FM	Memphis, Tex.
KBGL	Pocatello, Ida.
KBHF	Bozeman, Mont.
KBHS-FM	Hot Springs, Ark.
KBIA-FM	Columbia, Mo.
KBIG-FM	Los Angeles-Avalon, Cal.
KBIM-FM	Roswell, N.Mex.
KBIQ	Edmonds, Wash.
KBLE-FM	Seattle, Wash.
KBMC	Eugene, Ore.
KBMF-FM	Spearman, Tex.
KBMS	Los Angeles, Calif.
KBMW-FM	Breckenridge, Minn.
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.
KBOO	Portland, Ore.
KBOS	Tulare, Cal.
KBOX-FM	Dallas, Tex.
KBDY-FM	Medford, Oreg.
KBPI	Denver, Colo.
KBPO	Beaumont, Tex.
KBRG	San Francisco, Cal.
KBRK-FM	Brookings, S. D.
KBRO-FM	Bremerton, Wash.
KBTC-FM	Houston, Mo.
KBTM-FM	Jonesboro, Ark.
KBUS-FM	Terrell Hills, Tex.
KBUR-FM	Burlington, Ia.
KBUY-FM	Ft. Worth, Tex.
KBUZ-FM	Mesa, Ariz.
KBVR	Corvallis, Ore.
KBYU-FM	Provo, Utah
KCAB-FM	Dardanelle, Ark.
KCAL-FM	Redlands, Calif.
KCBH	Beverly Hills, Calif.
KCBL-FM	Greeley, Colo.
KCBS-FM	San Francisco, Calif.
KCCE	Weatherford, Okla.
KCDR-FM	Cedar City, Utah
KCEE-FM	Tucson, Ariz.
KCES	Eufaula, Okla.
KCFA-FM	Spokane, Wash.
KCFM	St. Louis, Mo.
KCHV-FM	Conchella, Cal.
KCIB-FM	Fresno, Calif.(s)
KCIL	Houma, La.
KCIM-FM	Carroll, Ia.
KCJB-FM	Minot, N. D.
KCJC	Kansas City, Kan.
KCKN-FM	Kansas City, Kan.
KCLC	St. Charles, Mo.
KCLE-FM	Cleburne, Tex.
KCLO-FM	Leavenworth, Kans.
KCLU-FM	Rolla, Mo.
KCMA	San Francisco, Cal.
KCMI	Los Angeles, Calif.
KCMO-FM	Kansas City, Mo.
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.
KCSU-FM	Ft. Collins, Colo.
KCTA-FM	Sinton, Tex.
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.
KDCR	Sioux Center, Ia.
KDDD-FM	Dumas, Tex.
KDEF-FM	Albuquerque, N.Mex.
KDEN-FM	Denver, Colo.
KDES-FM	Palm Spgs., Calif.
KDFC	San Francisco, Calif.
KDEF-FM	Albuquerque, N. M.
KDFM	Walnut Creek, Cal.
KDFR	Tulare, Cal.
KDHI-FM	Twenty-Nine Palms, Cal.
KDHL-FM	Faribault, Minn.
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.
KDMI	Des Moines, Iowa
KDNC-FM	Spokane, Wash.
KDNT-FM	Denton, Tex.
KDOK-FM	Tyler, Tex.
KDOL-FM	Mojave, Cal.
KDOT-FM	Scottsdale, Ariz.
KDPS	Des Moines, Iowa
KDSN-FM	Denison, Ia.
KDSU	Fargo, N.D.
KDSX-FM	Denison-Sherman, Tex.
KDUO	Riverside, Calif.
KDUX-FM	Aberdeen, Wash.
KDVR	Sioux City, Iowa
KDVS	Davis, Calif.
KEAR	San Francisco, Calif.
KEAX	National City, Calif.
KEBC	Oklahoma City, Okla.
KEBE-FM	Jacksonville, Tex.
KEBJ	Phoenix, Ariz.
KEBR	Sacramento, Calif.
KEBS-FM	San Diego, Cal.
KECR	El Cajon, Calif.
KEDC-FM	Northridge, Cal.
KEDP	Las Vegas, N. M.
KEEE-FM	Nacogdoches, Tex.
KEEZ	San Antonio, Tex.
KEFC	Waco, Tex.(s)
KEFW	Honolulu, Hawaii
KEIR	Dallas, Tex.
KELD-FM	El Dorado, Ark.
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.
KESD	Brookings, S.D.
KESM-FM	El Dorado Springs, Mo.
KETO-FM	Seattle, Wash.
KEWB	Redding, Cal.
KEWC-FM	Cheney, Wash.
KEZE	Anaheim, Calif.
KFAB-FM	Omaha, Nebr.
KFAC-FM	Los Angeles, Calif.
KFAM-FM	St. Cloud, Minn.
KFAV	Fayetteville, Ark.
KFBC-FM	Cheyenne, Wyo.
KFBD	Waynesville, Mo.
KFBI-FM	Omaha, Neb.
KFBK-FM	Sacramento, Calif.
KFCA	Phoenix, Ariz.
KFGQ-FM	Boone, Iowa
KFH-FM	Wichita, Kans.
KFJB-FM	Marshalltown, Ia.
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.
KFMM	Tucson, Ariz.
KFMN	Abilene, Tex.
KFMP	Port Arthur, Tex.
KFMQ	Lincoln, Nebr.
KFMR	Fremont, Cal.
KFMV	Minneapolis, Minn
KFMW	San Bernardino, Calif.
KFMX	San Diego, Calif.
KFMY	Eugene, Oreg.
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	Quiney, Cal.
KFTM-FM	Ft. Morgan, Colo.
KFUO-FM	Clayton, Mo.
KFWT-FM	Ft. Worth, Tex.
KFXM	Jackson, Miss.
KFYR-FM	Bismarck, N.D.
KGAF-FM	Gainesville, Tex.
KGB-FM	San Diego, Calif.
KGBC-FM	Galveston, Tex.
KGBI-FM	Omaha, Neb.
KGBN-FM	Caldwell, Idaho
KGBS-FM	Los Angeles, Cal.
KGEC	Palm Springs, Cal.
KGEE-FM	Bakersfield, Calif.
KGHO-FM	Hoquiam, Wash.
KGLA	Los Angeles, Calif.
KGLT	Bozeman, Mont.
KGMB-FM	Honolulu, Hawaii
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.
KGRE	Greeley, Colo.
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
KHAR-FM	Anchorage, Alaska
KHBL	Plainview, Tex.
KHBR-FM	Hillsboro, Tex.
KHCB-FM	Houston, Tex.
KHEN-FM	Henryetta, Okla.
KHEP-FM	Phoenix, Ariz.
KHFI-FM	Austin, Tex.
KHFM	Albuquerque, N. Mex.
KHIQ	Sacramento, Calif.
KHJ-FM	Los Angeles, Calif.
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	Biloxi, Calif.
KHYI	Fremont, Calif.
KIBS-FM	Bishop, Cal.
KICD-FM	Spencer, Ia.
KICS-FM	Hastings, Neb.
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.
KIOU	Corpus Christi, Tex.
KIRO-FM	Seattle, Wash.
KISA	Kansas City, Mo.
KISS	San Antonio, Tex.
KISW	Seattle, Wash.
KITE-FM	San Antonio, Tex.
KITH	Phoenix, Ariz.
KITT	San Diego, Calif.
KITY	San Antonio, Tex.
KIXI-FM	Seattle, Wash.
KIXL-FM	Dallas, Tex.(s)
KJAM-FM	Madison, S.D.
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.
KKND	Jamestown, N.D.
KJOY-FM	Stockton, Cal.
KJPO	Fresno, Calif.
KJRG-FM	Newton, Kans.
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.
KLCC	Eugene, Ore.
KLCN-FM	Blytheville, Ark.
KLEA-FM	Lovington, N. M.
KLEB-FM	Golden Meadow, La.
KLEF	Houston, Tex.
KLEM-FM	LeMars, Ia.
KLEN-FM	Killeen, Tex.
KLFM	Ames, Ia.
KLGS	Los Gatos, Cal.
KLFM	Beverly Hills, Calif.
KLIL	Ukiah, Cal.
KLIN-FM	Lincoln, Neb.
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.
KLSN	Seattle, Wash.
KLSS	Mason City, Ia.
KLTB	Bolivar, Mo.
KLUB-FM	Salt Lake City, Utah
KLUE-FM	Longview, Tex.
KLUR	Wichita Falls, Tex.
KLVL	Pasadena, Tex.
KLWN-FM	Lawrence, Kan.
KLYD-FM	Bakersfield, Calif.
KLYK	Longview, Wash.
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-FM	Kansas City, Mo.
KMBY-FM	Monterey, Cal.
KMCP	Portland, Oreg.
KMEO-FM	Phoenix, Ariz.
KMER	Fresno, Calif.
KMET	Los Angeles, Cal.
KMFA	Austin, Tex.
KMFB-FM	Mendocino, Cal.
KMFL-FM	Marshall, Mo.
KMFM	San Antonio, Tex. (s)
KMFS	Memphis, Tex.
KMHL-FM	Marshall, Minn.
KMHT	Marshall, Tex.
KMJ-FM	Fresno, Calif.
KMLB-FM	Monroe, La.
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.
KMRC-FM	Morgan City, La.
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.
KNBQ	Bethany, Okla.
KNBR-FM	San Francisco, Calif.
KNBU	Baldwin, Kan.
KNBY-FM	Newport, Ark.
KNDA	St. Louis, Mo.
KNDR	Chickasha, Okla.
KNDX	Yakima, Wash.
KNEB-FM	Scottsbluff, Nebr.
KNED-FM	McAlester, Okla.
KNER	Dallas, Tex.

WHITE'S RADIO LOG

Call	Location
KNEV	Reno, Nev.
KNEW-FM	Scottsbluff, Nebr.
KNFB	Nowata, Okla.
KNFM	Midland, Tex.
KNHS	Torrance, Cal.
KNIK-FM	Anchorage, Alaska
KNIR-FM	New Iberia, La.
KNIX-FM	Phoenix, Ariz.
KNJO	Thousand Oaks, Calif.
KNOB	Long Beach, Calif.
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.
KNUJ-FM	New Ulm, Minn.
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.
KOIL-FM	Omaha, Neb.
KOIN-FM	Portland, Oreg.
KOKH	Oklahoma City, Okla.
KOL-FM	Seattle, Wash.
KOLM-FM	Rochester, Minn.
KONG-FM	Visalia, Calif.
KONI-FM	Spanish Fork, Utah
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	Los Angeles, Cal.
KOSU-FM	Stillwater, Okla.
KOSY-FM	Texarkana, Tex.
KOTN-FM	Pine Bluff, Ark.
KOTO	Alamagordo, N. M.
KOVF-FM	Kearney, Neb.
KOWH-FM	Omaha, Neb.
KOWN-FM	Escondido, 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, Calif.
KPER-FM	Gilroy, Cal.
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.
KPGM	Los Altos, Calif.
KPLR-FM	St. Louis, Mo.
KPMT	Oxnard, Cal.
KPOI-FM	Honolulu, Hawaii
KPOJ-FM	Portland, Oreg.
KPOL-FM	Los Angeles, Calif.
KPPC-FM	Pasadena, Calif.
KPPS-FM	Parsons, Kans.
KPQ-FM	Wenatchee, Wash.
KPRI	San Diego, Calif.
KPRN	Seattle, Wash.
KPRS-FM	Kansas City, Mo.
KPSD	Dallas, Tex.
KPUL-FM	Pullman, Wash.
KPWD	Plentywood, Mont.
KQFM	Portland, Oreg.
KQIP	Odessa, Tex.
KQRS-FM	Golden Valley, Minn.
KQTY	Wichita, Kan.
KQUE	Houston, Tex.
KQV-FM	Pittsburgh, Pa.
KQWB-FM	Moorhead, Minn.
KQXX	McAllen, Tex.
KRAB	Seattle, Wash.
KRAK-FM	Stockton, Calif.
KRAM-FM	Las Vegas, Nev.
KRAV	Tulsa, Okla.
KRBE	Houston, Tex.
KRBI-FM	St. Peter, Minn.
KRCB-FM	Council Bluffs, Ia.
KRCC	Colorado Springs, Colo.
KRCH	St. Louis, Mo.
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.
KRFO-FM	Owatonna, Minn.
KRHM	Los Angeles, Calif.
KRIL	El Dorado, Ark.
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.
KRNT-FM	Des Moines, Ia.
KRNW	Boulder, Colo.
KRNY-FM	Kearney-Holdrege, Nebraska
KROA	Aurora, Neb.
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.
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.
KRWL	Carson City, Nev.
KRYS-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.
KSFR	San Francisco, Calif.
KSFV	San Fernando, Calif.
KSFX	San Francisco, Calif.
KSGM-FM	Ste. Genevieve, Mo.
KSHE	Crestwood, Mo.
KSHN	Sherman, Tex.
KSHS	Colorado Springs, Colo.
KSIB-FM	Creston, Ia.
KSIS-FM	Sedalia, Mo.
KSIX-FM	Corpus Christi, Tex.
KSJM	Jamestown, N.D.
KSJN-FM	New Brighton, Minn.
KSJO-FM	San Jose, Calif.
KSJR-FM	Collegeville, Minn.
KSJS	San Jose, Calif.
KSJT	San Angelo, Tex.
KSL-FM	Salt Lake City, Utah
KSLA	Seattle, Wash.(s)
KSLH	St. Louis, Mo.
KSLO-FM	Opelousas, La.
KSMA-FM	Santa Maria, Calif.
KSMB	Lafayette, La.
KSNM	Santa Fe, N. M.
KSQM-FM	Ontario, Cal.
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.
KSTN-FM	Stockton, Calif.
KSTP-FM	St. Paul, Minn.
KSUI	Iowa City, Iowa
KSUN-FM	Bisbee, Ariz.
KSVP-FM	Artesia, N. M.
KSWC	Winfield, Kan.
KSYM	San Antonio, Tex.
KSYN	Joplin, Mo.
KTAC-FM	Tacoma, Wash.
KTAL	Texarkana, Tex.
KTAP	Tucson, Ariz.
KTAR-FM	Phoenix, Ariz.
KTBC-FM	Austin, Tex.
KTBT	Garden Grove, Cal.
KTCF	Cedar Falls, Iowa
KTCS-FM	Ft. Smith, Ark.
KTCU-FM	Ft. Worth, Tex.
KTEA-FM	Midwest City, Okla.
KTEC	Oreteeh, Oreg.
KTFC	Sioux City, Ia.
KTGM	Denver, Colo.
KTGR-FM	Columbia, Mo.
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.
KTOC-FM	Jonesboro, La.
KTOD-FM	Sinton, Tex.
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.
KTXT-FM	Lubbock, Tex.
KTYM-FM	Inglewood, Calif.
KUAC	College, Alaska
KUAM-FM	Agana, Guam
KUCR	Riverside, Cal.
KUCV	Lincoln, Neb.
KUID	Moscow, Ida.
KUDE-FM	Oceanside, Calif.
KUDU-FM	Ventura-Oxnard, Calif.
KUDY-FM	Spokane, Wash.
KUER	Salt Lake City, Utah
KUFM	Missoula, Mont.
KUGN-FM	Eugene, Oreg.
KUHF	Houston, Tex.
KUKI-FM	Ukiah, Cal.
KULP-FM	El Campo, Tex.
KUMD-FM	Duluth, Minn.
KUMN	Albuquerque, N. M.
KUNF	La Canada, Cal.
KUOA-FM	Siloam Springs, Ark.
KUOH	Honolulu, Hawaii
KUOP	Stockton, Calif.
KUOR-FM	Redlands, Cal.
KUOW	Seattle, Wash.
KUPD-FM	Tempe, Ariz.
KUPK-FM	Garden City, Kan.
KURL-FM	Billings, Mont.
KUSC	Los Angeles, Calif.
KUSD-FM	Vermillion, S. Dak.
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.
KUZZ-FM	Bakersfield, Cal.
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.
KVEZ	San Mateo, Cal.
KVFM	San Fernando, Calif.
KVII-FM	Amarillo, Tex.
KVIL-FM	Highland Park-Dallas, Tex.
KVLV-FM	Fallon, Nev.
KVMG-FM	Cochran, Ga.
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.
KVRF	Vermillion, S.D.
KVRO	Stillwater, Okla.
KVSC	St. Cloud, Minn.
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)
KWEB-FM	Rochester, Minn.
KWEH	Camden, Ark.
KWFM	Minneapolis, Minn.
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.
KWIQ-FM	Moses Lake, Wash.
KWIX	St. Louis, Mo.
KWIZ-FM	Santa Ana, Calif.
KWJB-FM	Globe, Ariz.
KWKC-FM	Abilene, Tex.
KWKH-FM	Shreveport, La.
KWKI	Kansas City, Mo.
KWLM-FM	Willmar, Minn.
KWLW	San Angelo, Tex.
KWMF-FM	Walnut Creek, Cal.
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.
KWTO-FM	Springfield, Mo.
KWWC-FM	Columbia, Mo.
KWWR-FM	Mexico, Mo.
KXEL-FM	Waterloo, Iowa
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.
KXQR	Fresno, Calif.(s)
KXRA-FM	Alexandria, Minn.
KXRQ	Sacramento, Calif.
KXTR	Kansas City, Mo.
KXXI	Alamogordo, N. M.
KXYZ-FM	Houston, Tex.
KYA-FM	San Francisco, Calif.

Are your home-town FM stations listed correctly in *White's Radio Log?* If you believe there is a correction called for in *White's* listings, please check first with your local station. For each callsign obtain the correct city location and frequency. (Remember, even though your local paper may list a station as a "home-town" station, it may be officially licensed by the FCC for operation in the next city). Get all the facts on a piece of paper (be very brief), include your name and address, and mail to *White's Radio Log*, RADIO-TV EXPERIMENTER, 505 Park Ave., New York, N. Y. 10022. Your help in contributing to the accuracy and completeness of *White's Radio Log* will be sincerely appreciated. See page 124.

—Editor

Call	Location
KYEW	Phoenix, Ariz.
KYFM	Oklahoma City, Okla.
KYLE-FM	Temple, Tex.
KYMS	Santa Ana, Cal.
KYSM-FM	Mankato, Minn.
KZAK-FM	Tyler, Tex.
KZAM	Seattle, Wash.
KZAP	Houston, Tex.
KZEL-FM	Eugene, Ore.
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.
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
WABX-FM	Detroit, Mich.
WABZ-FM	Albemarle, N.C.
WACO	Waco, Tex.
WACT-FM	Tuscaloosa, Ala.
WACY-FM	Moss Point, Miss.
WADM-FM	Decatur, Ind.
WAEB-FM	Cincinnati, Ohio
WAEF	Cincinnati, O.
WAER	Syracuse, N.Y.
WAEW-FM	Crossville, Tenn.
WAEZ	Miami Beach, Fla.
WAFB-FM	Baton Rouge, La.
WAGR-FM	Lumberton, N.C.
WAGY-FM	Forest City, N. C.
WAHR	Huntsville, Ala.
WAIC	Springfield, Mass.
WAIV	Indianapolis, Ind.
WAJC	Indianapolis, Ind.
WAJM	Montgomery, Ala.
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.
WALM-FM	Marshall, Mich.
WAMC	Albany, N.Y.
WAMF	Amherst, Mass.
WAMO-FM	Pittsburgh, Pa.
WAMU-FM	Washington, D.C.
WANG	Goldwater, Mich.
WANS-FM	Anderson, S. C.
WANY-FM	Albany, Ky.
WAOV-FM	Vincennes, Ind.
WAPC-FM	Riverhead, N. Y.
WAPI-FM	Birmingham, Ala.
WAPL-FM	Appleton, Wis.
WAPS	Akron, Ohio
WAQB-FM	Atlantic Beach, Fla.
WARC	Meadville, Pa.
WARD-FM	Johnstown, Pa.
WARK	Little Rock, Ark.
WARN-FM	Fort Pierce, Fla.
WARU-FM	Peru, Ind.
WASA-FM	Havre De Grace, Md.
WASH	Washington, D. C.
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.
WAWW	Murray, Ky.
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.
WBAW-FM	Barnwell, S.C.
WBAY	Green Bay, Wis.(s)
WBBA-FM	Pittsfield, Ill.
WBBB-FM	Burlington, N. C.
WBBC	Jackson, Mich.
WBBF-FM	Rochester, N.Y.
WBBI-FM	Abingdon, Va.
WBBM-FM	Chicago, Ill.
WBBO-FM	Forest City, N.C.
WBBQ-FM	Augusta, Ga.
WBBR-FM	E. St. Louis, Ill.
WBBW-FM	Youngstown, Ohio
WBCB-FM	Levittown-Fairless Hills, Pa.
WBCH-FM	Hastings, Mich.
WBCI-FM	Williamsburg, Va.
WBCL-FM	South Beloit, Ill.
WBCM-FM	Bay City, Mich.
WBCN	Boston, Mass.
WBCO-FM	Bucyrus, O.
WBCR-FM	Beloit, Wis.
WBDG	Indianapolis, Ind.
WBEA	Elyria, O.
WBEN-FM	Buffalo, N.Y.
WBET-FM	Brockton, Mass.
WBEU-FM	Beaufort, S. C.
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.
WBJH	Trenton, N. J.
WBKV-FM	West Bend, Wis.
WBKW	Beckley, W.Va.
WBKY	Lexington, Ky.
WBLK-FM	Buffalo, N.Y.
WBLR-FM	Batesburg, S.C.
WBLY-FM	Springfield, Ohio
WBMI	Meridan, Conn.
WBNT-FM	Oneida, Tenn.
WBMP	Elwood, Ind.
WBMR	Telford, Pa.
WBNC-FM	Conway, N. H.
WBNE	Fitchburg, Mass.
WBNL-FM	Boonville, Ind.
WBNO-FM	Bryan, Ohio
WBNQ	Bloomington, Ill.
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.
WBRE-FM	Wilkes-Barre, Pa.
WBRK-FM	Pittsfield, Mass.
WBRN-FM	Big Rapids, Mich.
WBRS	Waltham, Mass.
WBRU	Providence, R.I.
WBSM-FM	New Bedford, Mass.
WBST	Muncie, Ind.
WBT-FM	Charlotte, N. C.
WBTC-FM	Houston, Mo.
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.
WBZ-FM	Boston, Mass.
WBZI	Xenia, O.
WCAC	Anderson, S.C.
WCAL-FM	Northfield, Minn.
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.
WCCA	McComb, Miss.
WCCC-FM	Hartford, Conn.
WCCM-FM	Lawrence, Mass.
WCCN-FM	Neillsville, Wis.
WCCV-FM	Charlottesville, Va.
WCCW-FM	Traverse City, Mich.
WCDR-FM	Cedarville, O.
WCED-FM	Dubois, Pa.
WCEF-FM	Parkersburg, W. Va.
WCEM-FM	Cambridge, Md.
WCEN-FM	Mt. Pleasant, Mich.
WCER-FM	Charlotte, Mich.
WCFM	Williamstown, Mass.
WCHA-FM	Chambersburg, Pa.
WCHD	Detroit, Mich.
WCHK-FM	Canton, Ga.
WCHN-FM	Norwich, N.Y.
WCHS-FM	Charlestown, W.Va.
WCHO-FM	Washington Court House, O.
WCHQ	Camuy, P.R.
WCJM	W. Point, Ga.
WCKS	Cocoa Beach, Fla.
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.
WCLW-FM	Mansfield, Ohio
WCMC-FM	Wildwood, N.J.
WCMB-FM	Harrisburg, Pa.
WCME-FM	Brunswick, Maine
WCMF-FM	Rochester, N. Y.
WCMI-FM	Ashland, Ky.
WCMN-FM	Arecibo, P.R.
WCMO	Marietta, Ohio
WCMS-FM	Norfolk, Va.
WCMT-FM	Martin, Tenn.
WCMU-FM	Mt. Pleasant, Mich.
WCNA-FM	Scottsboro, Ala.
WCNB-FM	Connersville, Ind.
WCNH-FM	Quincy, Fla.
WCNT-FM	Centralia, Ill.
WCNW-FM	Fairfield, O.
WCOA-FM	Pensacola, Fla.
WCOD-DM	Hyannis, Mass.
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.
WCPA-FM	Clearfield, Pa.
WCPC-FM	Houston, Miss.
WCPO-FM	Cincinnati, Ohio
WCPS-FM	Tarbor, N.C.
WCRA-FM	Effingham, Ill.
WCRB-FM	Waltham, Mass.
WCRD	Bluffton, Ind.
WCRF	Cleveland, O.
WCRM-FM	Clare, Mich.
WCRQ	Providence, R. I.
WCRS-FM	Greenwood, S. C.
WCRT-FM	Birmingham, Ala.
WCRX	Springfield, Mass.
WCSC-FM	Charleston, S.C.
WCSI-FM	Columbus, Ind.
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.
WCTT-FM	Corbin, Ky.
WCTW-FM	New Castle, Ind.
WCUE-FM	Akron, O.
WCUF	Akron, Ohio
WCUM-FM	Cumberland, Md.
WCUY-FM	Cleveland Hts., Ohio
WCWA-FM	Toledo, O.
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.
WDBM	Medina, O.
WDBO-FM	Orlando, Fla.
WDBQ-FM	Dubuque, Iowa
WDCX	Buffalo, N. Y.
WDDE	Hamden, Conn.
WDDS-FM	Syracuse, N.Y.
WDEA-FM	Ellsworth, Me.
WDEB-FM	Jamestown, Tenn.
WDEC-FM	Americus, Ga.
WDEE	Hamden, Conn.
WDEF-FM	Chattanooga, Tenn.
WDEH-FM	Sweetwater, Tenn.
WDEL-FM	Wilmington, Del.
WDEN-FM	Macon, Ga.
WDEQ-FM	DeGraff, O.
WDET-FM	Detroit, Mich.
WDFM	State College, Pa.
WDHA-FM	Dover, N.J.
WDHF	Chicago, Ill.
WDIA-FM	Memphis, Tenn.
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	Cleveland, O.
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.
WDSC-FM	Dillon, S.C.
WDSU-FM	New Orleans, La.
WDTM	Detroit, Mich.
WDTR	Detroit, Mich.
WDUB	Granville, Ohio
WDUN-FM	Gainesville, Ga.
WDUQ	Pittsburgh, Pa.
WDUX-FM	Waupaca, Wis.
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.
WEBN-FM	Cincinnati, O.
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.
KEKU-FM	Richmond, Ky.
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.
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
WESA-FM	Charleroi, Pa.
WESC-FM	Greenville, S.C.
WEST-FM	Easton, Pa.
WETA-FM	Washington, D.C.
WETL	South Bend, Ind.
WETN	Wheaton, Ill.
WEVC	Evansville, Ind
WEVD-FM	New York, N.Y.
WEWO-FM	Laurinburg, N.C.
WEZK	Knoxville, Tenn.
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.
WFDT	Columbia City, Ind.
WFEM	Georgetown, Del.
WFFF-FM	Columbia, Miss.
WFFM	Muskegon, Mich.
WFHA-FM	Red Bank, N.J.
WFHC-FM	Henderson, Tenn.
WFID	Rio Piedras, P. R.
WFIG	Sumter, S.C.
WFIL-FM	Philadelphia, Pa.
WFIN-FM	Findlay, Ohio
WFIU	Bloomington, Ind.
WFIW-FM	Fairfield, Ill.
WFIZ	Conneaut, O.
WFKO	Kokomo, Ind.
WFLA-FM	Tampa, Fla.
WFLM	Ft. Lauderdale, Fla.

WHITE'S RADIO LOG

Call	Location
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.
WFMU	East Orange, N.J.
WFMW-FM	Madisonville, Ky.
WFMX	Statesville, N.C.
WFNY	Racine, Wis.
WFMZ	Allentown, Pa.
WFNC-FM	Fayetteville, N.C.
WFNS-FM	Burlington, N.C.
WFNY	Racine, Wis.
WFOB-FM	Fostoria, Ohio
WFOL	Hamilton, Ohio(s)
WFON	Fond du Lac, Wis.
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.
WFRI	Auburn, Ga.
WFRL-FM	Freeport, Ill.
WFRO-FM	Fremont, Ohio
WFSC-FM	Franklin, N. C.
WFST-FM	Caribou, Maine
WFSU-FM	Tallahassee, Fla.
WFTC-FM	Kinston, N. C.
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.
WGAY	Washington, D.C.
WGBA-FM	Columbus, Ga.
WGBE-FM	Columbus, Ga.
WGBH-FM	Cambridge, Mass.
WGBI-FM	Scranton, Pa.
WGBM	Viroqua, Wis.
WGBS-FM	Miami, Fla.
WGCB-FM	Red Lion, Pa.
WGCS	Goshen, Ind.
WGEE-FM	Indianapolis, Ind.
WGEM-FM	Quincy, Ill.(s)
WGET-FM	Gettysburg, Pa.
WGEV	Beaver Falls, Pa.
WGFM	Schenectady, N. Y.
WGGC	Glasgow, Ky.
WGGM	Taylorville, Ill.
WGH-FM	Newport News, Va.
WGHF	Brookfield, Conn.
WGHQ-FM	Kingston, N.Y.
WGIG-FM	Brunswick, Ga.
WGIL-FM	Galesburg, Ill.
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.
WGLT	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-FM	Miami, Fla.
WGOV-FM	Valdosta, Ga.
WGPA-FM	Bethlehem, Pa. (from Ga.)
WGPC-FM	Albany, Ga.
WGPL	Winston-Salem, N.C.
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	Smithtown, N.Y.
WGSU	Genesco, N.Y.
WGTB-FM	Washington, D.C.
WGTS-FM	Takoma Park, Md.
WGUC	Cincinnati, Ohio
WGUS-FM	Augusta, Ga.
WGVE	Gary, Ind.
WGWR-FM	Asheboro, N.C.
WGYA	Interlochen, Mich.
WHA-FM	Madison, Wis.
WHAD	Delafield, Wis.
WHAG-FM	Halfway, Md.
WHAI-FM	Greenfield, Mass.
WHAS-FM	Louisville, Ky.
WHAT-FM	Philadelphia, Pa.
WHAV-FM	Haverhill, Mass.
WHBB-FM	Selma, Ala.
WHBC-FM	Canton, Ohio
WHBF-FM	Rock Island, Ill.
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.
WHEN-FM	Syracuse, N.Y.
WHFB-FM	Benton Harbor, Mich.
WHFH	Flossmoor, Ill.
WHFI	Birmingham, Mich.
WHFM	Rochester, N.Y.
WHFS	Bethesda, Md.
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.
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.
WHOP-FM	Hopkinsville, Ky.
WHOV	Hampton, Va.
WHP-FM	Harrisburg, Pa.
WHPE-FM	High Point, N.C.
WHPH	Hanover, N.J.
WHPK-FM	Chicago, Ill.
WHPR	Highland Park, Mich.
WHRB-FM	Cambridge, Mass.
WHRF-FM	Riverhead, N.Y.
WHRL	Albany, N.Y.
WHRM	Marshfield, 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.
WHUC-FM	Hudson, N.Y.
WHUN-FM	Huntingdon, Pa.
WHUS	Storrs, Conn.
WHWC	Colfax, Wis.
WHYL-FM	Carlisle, Pa.
WHYN-FM	Springfield, Mass.
WIAA	Interlochen, Mich.
WIAC-FM	San Juan, P. R.
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.
WIFN	Franklin, Ind.
WIGS-FM	Gouverneur, N.Y.
WIHS	Middletown, Conn.
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.
WIOD-FM	Miami, Fla.
WIPR-FM	San Juan, P.R.
WIRA-FM	Ft. Pierce, Fla.
WIRB-FM	Enterprise, Ala.
WIRJ-FM	Humboldt, Tenn.
WISA-FM	Isabela, P.R.
WIRQ	Rochester, N.Y.
WISH-FM	Indianapolis, Ind.
WISM-FM	Madison, Wis.
WISN-FM	Milwaukee, Wis.
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	Winchester, Ind.
WIUS	Christiansted, V.I.
WIVC	Peoria, Ill.
WIVE-FM	Ashland, Va.
WIVI-FM	Cristiansted, St. Croix, V.I.
WIVK-FM	Knoxville, Tenn.
WIVY-FM	Jacksonville, Fla.
WIXK-FM	New Richmond, Wis.
WIXL-FM	Newton, N. J.
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.
WJBK-FM	Detroit, Mich.
WJBL-FM	Holland, Mich.
WJBM-FM	Jerseyville, Ill.
WJBO-FM	Baton Rouge, La.
WJBR	Wilmington, Del.
WJCD-FM	Seymour, Ind.
WJCW-FM	Johnson City, Tenn.
WJDX-FM	Jackson, Miss.
WJEH-FM	Gallipolis, Ohio
WJEJ-FM	Hagerstown, Md.
WJFM	Grand Rapids, Mich.
WJGA-FM	Jackson, Ga.
WJGS	Houghton, Mich.
WJHL-FM	Johnson City, Tenn.
WJIB	Cambridge, Mass.
WJIG-FM	Tullahoma, Tenn.
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.
WJMI	Jackson, Miss.
WJMK	Plainfield, Ind.
WJML	Petoskey, Mich.
WJMX-FM	Florence, S.C.
WJNC-FM	Jacksonville, N. C.
WJNS-FM	Yazoo City, Miss.
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.
WJSM-FM	Martinsburg, Pa.
WJTN-FM	Jamestown, N.Y.
WJVA-FM	South Bend, Ind.
WJVM	Sterling, Ill.
WJW-FM	Cleveland, Ohio
WJWS-FM	Ridgeway, Pa.
WJZZ	Bridgeport, Conn.
WKAI-FM	MaComb, Ill.
WKAJ-FM	Saratoga Springs, N.Y.
WKAK	Kankakee, Ill.
WKAQ-FM	San Juan, P.R.
WKAR-FM	E. Lansing, Mich.
WKAT	Miami, Fla.
WKAY-FM	Glasgow, Ky.
WKAZ-FM	Charleston, W.Va.
WKBC-FM	N. Wilkesboro, N.C.
WKBI-FM	Ridgeway, Pa.
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
WKEU-FM	Griffin, Ga.
WKEY-FM	Covington, Va.
WKFM	Chicago, Ill.
WKFR-FM	Battle Creek, Mich.
WKHM-FM	Jackson, Mich.
WKIC-FM	Hazard, Ky.
WKIP-FM	Poughkeepsie, N.Y.
WKIS-FM	Orlando, Fla.
WKIT	Wilmington, O.
WKIX-FM	Raleigh, N.C.
WKJB-FM	Mayaguez, P. R.
WKJF	Pittsburgh, Pa.
WKJG-FM	Ft. Wayne, Ind.
WKKD-FM	Aurora, Ill.
WKKY-FM	Erlanger, Ky.
WKLC-FM	St. Albans, W.Va.
WKLF-FM	Clanton, Ala.
WKLN	Cullman, Ala.
WKLS	Marietta, Ga.
WKMH-FM	Dearborn, Mich.
WKMO	Kokomo, Ind.
WKNA	Charleston, W. Va.
WKNC-FM	Raleigh, N.C.
WKNE-FM	Keene, N.H.
WKNT-FM	Kent, O.
WKOC	Kankakee, Ill.
WKOF	Hopkinsville, Ky.
WKOK-FM	Sunbury, Pa.
WKOP-FM	Binghamton, N.Y.
WKOX-FM	Framingham, Mass.
WKOZ-FM	Kosciusko, Miss.
WKPT-FM	Kingsport, Tenn.
WKRC-FM	Cincinnati, Ohio
WKRG-FM	Mobile, Ala.
WKRT-FM	Cortland, N.Y.
WKRX	Louisville, Ky.
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.
WKTN-FM	Kenton, O.
WKTZ-FM	Jacksonville, Fla.
WKUB	Manitowoc, Wis.
WKUZ	Wabash, Ind.
WKWK-FM	Wheeling, W.Va.
WKXI	Smyrna, Ga.
WKYC-FM	Cleveland O.
WKYF-FM	Greenville, Ky.
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.
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.
WLIL-FM	Lenoir City, Tenn.
WLIN	Detroit, Mich.
WLIP-FM	Kenosha, Wis.
WLIR	Hicksville, N. Y.
WLIV-FM	Livingston, Tenn.
WLJC	Beattyville, Ky.
WLJM	Gadsden, Ala.
WLKR-FM	Norwalk, Ohio
WLKW	Norwalk, Conn.
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.

Call	Location
WLOM	Chattanooga, Tenn.
WLOQ	Winter Park, Fla.
WLOS-FM	Asheville, N.C.
WLOW-FM	Aiken, S.C.
WLPO-FM	La Salle, Ill.
WLPR	Mobile, Ala.
WLRS	Louisville, Ky.
WLRJ	Roanoke, Va.
WLRW	Champaign, Ill.
WLS-FM	Chicago, Ill.
WLSM-FM	Louisville, Miss.
WLTA-FM	Atlanta, Ga.
WLTI	Lowell, Mass.
WLTL	La Grange, Ill.
WLUR	Lexington, Va.
WLUV-FM	Loves Park, Ill.
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.
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.
WMCO	New Concord, Ohio
WMDD-FM	Fajardo, P. R.
WMDE	Greensboro, N. C.
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.
WMIC-FM	Sandusky, Mich.
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.
WMLP-FM	Milton, Pa.
WMLS-FM	Sylacauga, Ala.
WMLW	Milwaukee, Wis.
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.
WMRR-FM	Marshall, Mich.
WMRY	E. St. Louis, Ill.
WMRP-FM	Flint, Mich.
WMSG-FM	Oakland, Md.
WMSH-FM	Elizabethtown, Pa.
WMSK-FM	Morganfield, Ky.
WMSP	Harrisburg, Pa.
WMSR-FM	Manchester, Tenn.
WMT-FM	Cedar Rapids, Iowa
WMTH	Park Ridge, Ill.
WMTI	Norfolk, Va.
WMTL-FM	Leitchfield, Ky.
WMTM-FM	Moultrie, Ga.
WMTN-FM	Morristown, Tex.
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.
WMUZ	Detroit, Mich.
WMVA-FM	Martinsville, Va.
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
WNAZ-FM	Nashville, Tenn.
WNBC-FM	New York, N.Y.
WNBD-FM	Daytona Beach, Fla.
WNBF-FM	Binghamton, N.Y.
WNBH-FM	New Bedford, Mass.
WNBX	Andalusia, Ala.
WNCI	Columbus, O.
WNCN	New York, N.Y.
WNCO-FM	Ashland, Ohio
WNCT-FM	Greenville, N.C.
WNDA	Huntsville, Ala.
WNDN	Kingston, N. Y.
WNDU-FM	South Bend, Ind.
WNDY	Crawfordsville, Ind.
WNEM-FM	Bay City, Mich.
WNES-FM	Central City, Ky.
WNEW-FM	New York, N.Y.
WNEX-FM	Macon, Ga.
WNFM	Naples, Fla.
WNGO-FM	Mayfield, Ky.
WNHC-FM	New Haven, Conn.
WNIB	Chicago, Ill.
WNIC	DeKalb, Ill.
WNIK-FM	Arecibo, P. R.
WNNR-FM	New Orleans, La.
WNNT-FM	Warsaw, Va.
WNOB	Cleveland, Ohio
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.
WNUB-FM	Northfield, Vt.
WNUR	'Evanston, Ill.
WNUS-FM	Chicago, Ill.
WNWC-FM	Arlington Hts., Ill.
WNXT-FM	Portsmouth, O.
WNYC-FM	New York, N.Y.
WNYE	New York, N.Y.
WNYN-FM	Canton, O.
WNYR-FM	Rochester, N.Y.
WOAB	Ozark, Ala.
WOAK	Royal Oak, Mich.
WOAP-FM	Owosso, Mich.
WOAY-FM	Oak Hill, W.Va.
WOBC	Oberlin, O.
WOBM	Toms River, N. J.
WOBN	Westerville, Ohio
WOBT-FM	Rhinelander, Wis.
WOC-FM	Davenport, Iowa
WOCB-FM	W. Yarmouth, Mass.
WOCH-FM	North Vernon, Ind.
WOCO-FM	Oconto, Wis.
WODL-FM	Carbondale, Pa.
WOFM	Greeneville, Tenn.
WOHS-FM	Shelby, N.C.
WOI-FM	Ames, Iowa
WOIV	De Ruyter, N.Y.
WOKK-FM	Meridian, Miss.
WOKU-FM	Greensburg, Pa.
WOKZ-FM	Alton, Ill.
WOL-FM	Washington, D.C.
WOLA	San Juan, P.R.
WOLI	Ottawa, Ill.
WOMA	Tallahassee, Fla.
WOMC	Royal Park, Mich.
WOMI-FM	Owensboro, Ky.
WOMP-FM	Bellaire, Ohio
WONC	Naperville, Ill.
WONE-FM	Dayton, O.
WONF	Pensacola, Fla.
WONO-FM	Syracuse, N. Y.
WOOD-FM	Grand Rapids, Mich.
WOOF-FM	Dothan, Ala.
WOOO-FM	DeLand, Fla.
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.
WPAD-FM	Paducah, Ky.
WPAG-FM	Ann Arbor, Mich.
WPAT-FM	Paterson, N. J.
WPAY-FM	Portsmouth, Ohio
WPBA-FM	Palm Beach, Fla.
WPBC-FM	Richfield, Minn.
WPBF	W. Palm Beach, Fla.
WPBS	Philadelphia, Pa.
WPBS	Philadelphia, Pa.
WPDE-FM	Paris, Ky.
WPDR-FM	Portage, Wis.
WPEA	Exeter, N. H.
WPEL-FM	Montrose, Pa.
WPEN-FM	Philadelphia, Pa.
WPEX-FM	Pensacola, Fla.
WPFB-FM	Middletown, Ohio
WPFK	Los Angeles, Cal.
WPFM	Portsmouth, N. H.
WPFR	Terre Haute, Ind.
WPGA-FM	Perry, Ga.
WPGC	Bradbury Hts., Md.
WPGF-FM	Burgaw, N.C.
WPGI	Pittsburgh, Pa.
WPGU	Urbana, Ill.
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.
WPKN	Bridgeport, Conn.
WPLB	Greenville, Mich.
WPLC	Plantation Key, Fla.
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.
WPRT-FM	Prestonburg, Ky.
WPRW-FM	Manassas, Va.
WPSR	Evansville, Ind.
WPTF-FM	Raleigh, N.C.
WPTH	Fort Wayne, Ind.
WPTN-FM	Cookeville, Tenn.
WPTW-FM	Piqua, Ohio
WPWT	Philadelphia, Pa.
WQAL	Philadelphia, Pa.
WQDC-FM	Midland, Mich.
WQFM	Milwaukee, Wis.
WQIK-FM	Jacksonville, Fla.
WQLT	Florence, Ala.
WQMF	Babylon, N. Y.
WQMG	Greensboro, N.C.
WQMS	Hamilton, Ohio
WQMV	Vicksburg, Miss.
WQRB	Pittsfield, Mass.
WQRS-FM	Detroit, Mich.
WQSB	Albertville, Ala.
WQST	Forest, Miss.
WQSU	Selingsgrove, Pa.
WQXM	Clearwater, Fla.
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.
WRDB-FM	Rudsburg, Wis.
WRDL	Ashland, O.
WREC-FM	Memphis, Tenn.
WRED	Youngstown, Ohio
WREK	Woodstock, Ill.
WREO-FM	Ashtabula, 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.
WRIO-FM	Cape May, N. J.
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.
WRKD-FM	Rockland, Me.
WRKO-FM	Boston, Mass.
WRKT-FM	Cocoa Beach, Fla.
WRLB	Long Branch, N. J.
WRLC	Palmyre, Pa.
WRLD-FM	Lanett, Ala.
WRLJ	Jacksonville, Fla.
WRLM	Tounton, Mass.
WRMF-FM	Titusville, Fla.
WRMI-FM	Morris, Ill.
WRMN-FM	Elgin, Ill.
WRNA	Charlotte, N.C.
WRNJ	Atlantic City, N.J.
WRNL-FM	Richmond, Va.
WRNO	New Orleans, La.
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.
WRPC	San German, P.R.
WRPI	Troy, N.Y.
WRPM-FM	Poplarville, Miss.
WRPN-FM	Ripon, Wis.
WRR-FM	Dallas, Tex.
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.
WRSL-FM	Stanford, Ky.
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.
WRTS	E. Liverpool, O.
WRUF-FM	Gainesville, Fla.
WRUN-FM	Utica, N.Y.
WRUR-FM	Rochester, N.Y.
WRUS-FM	Russellville, Ky.
WRUV	Burlington, Vt.
WRUW-FM	Cleveland, O.
WRVA-FM	Richmond, Va.
WRVB-FM	Madison, Wis.
WRVC	Norfolk, Va.
WRVF	River Falls, Wis.
WRVG	Georgetown, Ky.
WRVI	Winnebago, Ill.
WRVM	Suring, Wis.
WRVP	New York, N.Y.
WRWC	S. Beloit, Ill.
WRWR	Port Clinton, Ohio
WRXO-FM	Roxboro, N.C.
WSAB	Mt. Carmel, Ill.
WSAC-FM	Ft. Knox, Ky.
WSAE	Spring Arbor, Mich.
WSAF-FM	Sarasota, Fla.
WSAL-FM	Logansport, Ind.
WSAM-FM	Saginaw, Mich.
WSAU-FM	Wausau, Wis.
WSB-FM	Atlanta, Ga.
WSBA-FM	York, Pa.
WSBC-FM	Chicago, Ill.
WSBF-FM	Clemson, S.C.
WSBT-FM	South Bend, Ind.
WSCB	Springfield, Mass.
WSCC	Somerset, Ky.
WSCI-FM	Platteville, Wis.
WSCT-FM	Berkeley Springs, W.V.
WSDM	Chicago, Ill.
WSEB-FM	Sebring, Fla.
WSEI	Olney, Ill.
WSEK	Somerset, Ky.
WSEL-FM	Pontotoc, Miss.
WSEN-FM	Baldwinsville, N. Y.
WSEO-FM	Kalamazoo, Mich.
WSET	Nashville, Tenn.
WSEV-FM	Sevierville, Tenn.
WSFM	Birmingham, Ala.
WSHJ	Southfield, Mich.
WSHR	Lake Ronkonkoma, N.Y.
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.
WSJC-FM	Magee, Miss.
WSJG	Hallandale, Fla.
WSJM-FM	St. Joseph, Mich.
WSJS-FM	Winston-Salem, N.C.
WSKS	Wabash, Ind.
WSLI-FM	Jackson, Miss.
WSLM-FM	Salem, Ind.
WSLN	Delaware, Ohio
WSLS-FM	Roanoke, Va.
WSLU	Canton, N.Y.
WSMC	Collegedale, Tenn.
WSMD-FM	Waldorf, Md.
WSMI-FM	Litchfield, Ill.
WSMJ	Greenfield, Ind.
WSML	Petersburg, Va.
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.
WSPB-FM	Sarasota, Fla.

WHITE'S

RADIO LOG

Call	Location
WSPD-FM	Toledo, Ohio
WSPE	Springville, N.Y.
WSPT-FM	Stevens Point, Wis.
WSRC-FM	Durham, N. C.
WSRF-FM	Ft. Lauderdale, Fla.
WSRS	Worcester, 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.
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.
WSWN-FM	Belle Glade, Fla.
WSWW-FM	Platteville, Wis.
WSYR-FM	Syracuse, N. Y.
WTAB-FM	Tabor City, N. C.
WTCA-FM	Plymouth, Ind.
WTAD-FM	Quincy, Ill.
WTAE-FM	Pittsburgh, Pa.
WTAN-FM	Clearwater, Fla.
WTAP-FM	Parkersburg, W. Va.
WTAR	Norfolk, Va.
WTAS	Crete, Ill.
WTAW-FM	College Station, Tex.
WTAX-FM	Springfield, Ill.
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.
WTDS	Toledo, Ohio
WTFM	Lake Success, N. Y.
WTGI	Hammond, La.
WTGN	Lima, O.
WTHB-FM	Augusta, Ga.
WTHI-FM	Terre Haute, Ind.
WTHS	Miami, Fla.
WTIC-FM	Hartford, Conn.
WTID-FM	Norfolk, Va.
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.
WTNC-FM	Thomasville, N.C.
WTNT-FM	Tallahassee, Fla.
WTOA	Trenton, N.J.
WTOC-FM	Savannah, Ga.
WTOD-FM	Toledo, Ohio
WTOF	Canton, Ohio
WTOP-FM	Washington, D.C.
WTOS	Wauwatosa, Wis.
WTOT-FM	Marianna, Fla.
WTOW-FM	Baltimore, Md.
WTPA-FM	Harrisburg, Pa.
WTPR-FM	Paris, Tenn.
WTQX-FM	Selma, Ala.
WTRC-FM	Elkhart, Ind.
WTRE-FM	Greensburg, Ind.
WTRF-FM	Wheeling, W.Va.
WTRO-FM	Dyersburg, Tenn.
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.
WTVL-FM	Waterville, Me.
WTVN-FM	Columbus, Ohio
WTVR-FM	Richmond, Va.
WTVY-FM	Dothan, Ala.
WUAG	Greensboro, N. C.
WUCB-FM	Chicago, Ill.
WUFM	Utica, N. Y.
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.
WUSC-FM	Columbia, S.C.
WUSF	Tampa, Fla.
WUSO	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.
WVCL-FM	Winnfield, La.
WVCM	Carrollton, Ky.
WVCR	Loudenville, N.Y.
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.
WVLR	Sauk City, Wis.
WVMC-FM	Mt. Carmel, Ill.
WVMI-FM	Biloxi, Miss.
WVMO	Monroe, Mich.
WVNA-FM	Tuscumbia, Ala.
WVNJ-FM	Newark, N.J.
WVNO-FM	Mansfield, Ohio
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.
WVPC-FM	Monmouth, Ill.
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.
WVUD-FM	Kettering, Ohio
WVUR	Valparaiso, Ind.
WVVV	Blacksburg, Va.
WVWB-FM	Bridgeton, N.C.
WVWC	Buckhannon, W. Va.
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.
WWDL	Scranton, Pa.
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.
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.
WWQS	Orlando, Fla.
WWQT	Gainsville, Ga.
WWRH	Columbus, Ga.
WWRW	Wisconsin Rapids, Wis.
WWSC-FM	Glens Falls, N. Y.
WWSM	Bay Minette, Ala.
WWST-FM	Wooster, Ohio
WWSW-FM	Pittsburgh, Pa.
WWTV-FM	Cadillac, Mich.
WWVA-FM	Wheeling, W.Va.
WWVR	W. Terre Haute, Ind.
WWWW	Detroit, Mich.
WWXL-FM	Manchester, Ky.
WWYN-FM	Erie, Pa.
WXAC	Reading, Pa.
WXAX	Elkhart, Ind.
WXBM-FM	Milton, Fla.
WXEN-FM	Cleveland, Ohio
WXFM	Elmwood Park, Ill.
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.
WYBC-FM	New Haven, Conn.
WYCR	York-Hanover, Pa.
WYCS	Yorktown, Va.
WYDD	Pittsburgh, Pa.
WYCA	Hammond, Ind.
WYCE	Warwick, R.I.
WYCS	Yorktown, Va.
WYFI	Norfolk, Va.
WYFM	Charlotte, N.C.
WYFY-FM	Columbia, Tenn.
WYGO-FM	Corbin, Ky.
WYNR-FM	Brunswick, Ga.
WYON	Grand Rapids, Mich.
WYOR	Coral Gables, Fla.
WYRL	Melbourne, Fla.
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.
WZZM-FM	Grand Rapids, Mich.

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	Alma, Que.	1270
CFJC	Kamloops, B.C.	910
CFJR	Brockville, Ont.	1450
CFLD	Smithers, B.C. Studio at Station CFBV	1400
CFLH	Hearst, Ont. Studio at Station CFCL, Timmons, Ont.	1340
CFLK	Kapuskasing, Ont. Studio at Station CFCL, Timmons, Ont.	1230
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	Ville Vanier, 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
CHAM	Hamilton, Ont.	1280
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
CHFI	Toronto, Ont.	680
CHGB	La Pocatière, Que.	1310
CHIC	Brampton, Ont.	790
CHIN	Toronto, Ont.	1540
CHIR	Leamington, Ont.	730
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
CHQB	Powell River, B. C.	1280
CHQM	Vancouver, B.C.	1320
CHQR	Calgary, Alta.	810
CHQT	Edmonton, Alta.	1110
CHRC	Québec, Que.	800
CHRD	Drummondville, Que.	1480
CHRL	Roberval, Que.	910
CHRS	Jacques-Cartier, Que.	1090
CHRT	Riviere du Loup, P.Q.	1450
CHSC	St. Catherines, Ont.	1220
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
CHVD	Dolbeau, Que.	1230
CHWK	Chilliwack, B.C.	1270
CHWO	Oakville, Ont.	1250
CHYM	Kitchener, Ont.	1490
CHYR	Leamington, Ont.	710
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

Call	Location	kHz
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
CJOE	London, Ont.	1290
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
CJRS	Sherbrooke, P.Q.	1510
CJRW	Summerside, P.E.I.	1240
CJSA	Ste. Agathe des Monts, P.Q.	1230
CJSL	Estevan, Sask.	1280
CJSN	Shaunavon, Sask.	1490
CJSO	Sorel, Que.	1320
CJSS	Cornwall, Ont.	1220
CJTT	Kirkland Lake, Ont.	1230
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.	1500
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
CKNR	Elliott Lake, Ont.	1340
CKNW	New Westminster, B.C.	980
CKNX	Wingham, Ont.	920
CKOC	Hamilton, Ont.	1150
CKOK	Penticton, B.C.	800
CKOM	Saskatoon, Sask.	1250
CKOD	Osoyoos, B. C.	1240
CKOT	Tillsonburg, Ont.	1510
CKOV	Kelowna, B.C.	630
CKOX	Woodstock, Ont.	1340
CKOY	Ottawa, Ont.	1310
CKPC	Brantford, Ont.	1280
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

Call	Location	MHz
CBC-FM	Toronto, Ont.	94.1
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
CFCA-FM	Kitchener, Ont.	105.3
CFFM-FM	Kamloops, B.C.	98.3
CFFM-FM-1	Savona, B.C.—Rebroadcasting of CFFM-FM	101.9
CFFM-FM-2	Clearwater, B.C.—Rebroadcasting of CFFM-FM	92.7
CFFM-FM-3	Merritt, B.C.—Rebroadcasting 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
CHIN-FM	Toronto, Ont.	100.7
CHLT-FM	Sherbrooke, Que.	102.7
CHNS-FM	Halifax, N.S.	96.1
CHQM-FM	Vancouver, B.C.	103.5
CHRC-FM	Quebec, Que.	98.1
CHSC-FM	St. Catherines, Ont.	105.7
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
CJRM-FM	Montreal, Que.	93.5
CJRT-FM	Toronto, Ont.	91.1
CJSS-FM	Cornwall, Ont.	104.5
CJUS-FM	Saskatoon, Sask.	89.7
CKAT-FM	North Bay, Ont.	93.7
CKCL-FM	Truro, N.S.	100.9
CKCY-FM	Sault Ste. Marie, Ont.	104.3
CKDS-FM	Hamilton, Ont.	95.3
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.	94.9
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
CKWW-FM	Windsor, Ont.	88.7
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	ZNS1	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)
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 (?)

A THANK YOU NOTE FROM THE EDITORS

Thank you! The Editors of RADIO-TV EXPERIMENTER would like to thank all readers who offered information on station changes, additions and deletions during the past few months. Though many of the letters overlapped, each aided us considerably in making the task of keeping White's Radio Log as current as possible at press time. If we left your name out, please forgive us!

CKDS, Hamilton, Ont.
KENR, Houston, Tex.
KEZU, Rapid City, So. Dak.
KGFX, Pierre, So. Dak.
KIXI, Seattle, Wash.
WGEN, Geneseo, Ill.
Worldwide TV-FM-DA Assoc., Milwaukee, Wis.
Joseph P. Adrosko, Egg Harbor City, N. J.
Paul F. Bahr, Albuquerque, N. M.
John S. Barone, Ridge, N. Y.
George Batis, San Altos Hills, Calif.
John Batts, Wayne, N. Y.
Thomas Bell, Minneapolis, Minn.
John Berszoner, Lemont, Ill.
Lee Boggus, Atlanta, Ga.
Harry Brann, Erie, Pa.
Wm. F. Brookenbrough, Richmond, Va.
David L. Buda, Ft. Walton Beach, Fla.
David LeRoy Cross, Barrie, Ont.
Dave Dawson, Leamington, Ont.
Dennis Daylor, Downington, Pa.
Patrick Donahue, Cape Coral, Fla.
Michael Dorner, Jr., Metairie, La.
Ned E. Edgington, Minneapolis, Minn.
Jason Farlam, Capetown, Ont.
Ken Farnik, E. Nassau, N. Y.
Henry Gac, Detroit, Mich.
W. R. Garrett, Augusta, Ga.
James Harvey, Centralia, Mo.
Bruce B. Hayden, Des Moines, Iowa
R. Hehn, Bozeman, Mont.
John Irwin, Green Bay, Wis.
Wayne K. Irwin, Rockville, Conn.
Rodger L. Jones, Cambridge, Mass.
Steve Kaplan, Providence, R. I.
Richard Knipler, Foustell, Mo.
Al Kuntzler III, Atlanta, Ga.
Charles L. Langseth, E. Hartford, Conn.
G. Harley De Leurere, Elk Garden, W. Va.
Ken McCrimmon, Pomona, Calif.
Sgt. Robert R. McPheeters, Seattle, Wash.
Dave de Manigold, Detroit, Mich.
Michael B. Northam, Beaverton, Ore.
H. Richard Obermanns, New Haven, Conn.
Richard C. Oliver, Lafayette, Ind.
Jerry Padgett, Kansas City, Kans.
Tom Palermo, Toledo, Ohio
Roy D. Paquette, Topeka, Kans.
Helen Parker, New York, N. Y.
Ilse Pese, Victoria, B. C.
John F. Preston, Sarasota, Fla.
Bob Raymond, Haverhill, Me.
W. Ritayik, Queens Village, N. Y.
Mark S. Robbins, New Milford, N. J.
Jay Rudko, Miami, Fla.
Jim Ruecker, Hillsboro, Ore.
R. Runell, N. Vancouver, B. C.
Bob St. Peter, Gainesville, Fla.
Gladys Sienkiewicz, Brooklyn, N. Y.
Phil Skinner, Lynwood, Calif.
Cpl. John E. Snyder, U.S.M.C., San Diego, Calif.
David C. Sommers, Menasha, Wis.
Kendall Stevens, Xenia, Ohio
Tom Taggart, Lakewood, Ohio
Gregory Vaal, Newport, Ky.
J. R. Vanderplough, Bloomington, Ind.
David Walcutt, Syracuse, N. Y.

World-Wide Shortwave Stations

■ Here it is again, time to dust the rust off that ol' antenna and see how you stack up in our big DX contest. Yes, be the first one on your block to be called the nut who spent hours to qualify in a contest where there are no prizes and where you don't even have to enter! Well, that's the bit. All you do is follow the instructions and then rate yourself, to see how good you are. Ready? Let's go!

1. Did you ever *lithen* (pardon our *lisp*) to *Lithuania*? Probably not because it's a pretty rare bird. Here's your chance. Look for Radio Vilnius, located at Vilnius, Lithuanian SSR; it's on 7260, 9560, 9590, and 11970 kHz at 2100 and 2230 GMT, Friday and Sunday (only), and in *English*.

2. Like locals? Several hard-to-hear small local broadcasters in Greece are being reported and you might want to take a whack at them. Look for the station in Mytilene which runs 100 watts until 2300 GMT on 6420; the station in Carpenission running 300 watts on 6525 kHz until 2400 GMT; and the station at Chios on 6590 kHz with 100 watts until 2230 GMT.

3. If you're a Navy fan you'll get a kick out of hearing the U.S. Navy aeronautical network which goes nightly on 6723 kHz. Both land stations and aircraft stations can be heard.

4. Here's a change to log one of those newly formed countries. It's the *Voice of*

This Issue's Contributors

Dale Willson, McKeesport, Pa.
Harvey Morrison, Olympia, Wash.
Mel Berkowitz, Skokie, Ill.
R. L. Schnarr, Montreal, P. Q.
Frederik Plesser, Dallas, Tex.
Newton Wolf, Lincoln, Nebr.
Gladys Sienkiewicz, Brooklyn, N. Y.
Noel Wallace, Orlando, Fla.
Thomas Johnson, San Diego, Calif.
George Jelineck, Sao Paulo, Brazil
Helen Parker, New York, N. Y.
Mike Vavoudis, New York, N. Y.
Richard Curtis, APO, San Francisco, Calif.
Steven Kobley, Frankfort, Ky.
Roscoe Moore, Evanston, Ill.
Paul Loomis, Tuscola, Ill.
Ralph Sipe, Vancouver, B. C.
Tom Kneitel, New York, N. Y.
Billy O'Brien, Twin Falls, Idaho
Alfred Leding, Woodsboro, Tex.
P. Mendelson, Cleveland, Ohio
Sid Krentz, Uniontown, Pa.
Ray Yaeger, Mercury, Nevada

Biafra in the new nation of . . . (you guessed it) *Biafra.* The signal isn't great, but it's there if you seek it out on 6145 kHz around 0500 GMT.

5. We'd like t'bet that you've never logged Tibet; a mini-nation which has been swallowed up by China lo these many years. It's being reported 5935 kHz at 1415 GMT.

6. Here's a switcheroo. We're asking you to try your hand at a distant station on the standard broadcasting band. The station is Radio Peking which pumps a cool *2-million watts* onto 1525 kHz. With a nice long antenna you might be able to hear something here if you have no local broadcasters on 1520 or 1530 kHz.

7. Guess what's back in town; no, it's not Lulu, it's *Radio Americas!* That's right, it's holding down the fort on its old 6000 kHz channel too, after an absence of about a year. Is it still on Swan Island? It sure is; however, the station is trying to make it appear that they are in Venezuela. The broadcast band channel (1157 kHz) is still coming from Swan Island; there's no doubt about that any longer since the press was allowed to visit the island.

8. The Canadian Coast Guard and other governmental stations are being heard on 1630 kHz most evenings. This is a good channel and should provide an interesting earful.

How Do You Rate? Here's how to score yourself. You get 10 points each for numbers 1, 4, 5, 6, and 7. Score yourself 5 points each for the stations in number 2. You earned yourself 2 points each for each station heard within a half hour's listening stint on numbers 3 and 8.

Below 40 points; keep trying. From 42 to 60 points; you show promise. From 62 to 80 points; you're a winner. From 82 to 90 points; great! From 91 points upward; nobody likes a show-off!

kHz	Call	Name	Location	GMT
2450	4VSO			0130

90-Meter Band—3200-3400 kHz

kHz	Call	Name	Location	GMT
3255	HIRM	R. Sol	Higuey, D.R.	2300
3395	YVOJ	R. Universidad	Merida, Venez.	2322
4795	—	R. TV Francaise	Brazzaville, Congo	0500
4813	—		Ouagadougou, Upper Volta	2240
4845	HJGF	R. Bucaramanga	Bucaramanga, Colombia	0045
4870	YVKP		Caracas, Venez.	0235
4885	—	V. Kenya	Nairobi, Kenya	2020
4890	—	Austral. BC	Port Moresby, Papua	0830
4900	YVNK	R. Juventud	Barquisimeto, Venez.	0220
4910	HIN		Santo Domingo, D.R.	2310
4915	HRSY	V. del Pacifico	San Lorenzo, Honduras	0200
	—	Ghana BC	Accra, Ghana	2215
4920	—	Austral. BC	Brisbane, Australia	0845
4925	HCRQ	R. Quito	Quito, Ecuador	0045
4940	HCXZI	R. Nacional	Quito, Ecuador	0800
	YVPA	R. Yaracuy	San Felipe, Venez.	0040
4945	—	R. RSA	Capetown, S. Africa	2230
4965	HJCQ	R. Nacional	Bogota, Colombia	2350
4965	—	R. Santa Fe	Bogota, Colombia	0730
4970	YVLK	R. Rumbos	Caracas, Venez.	0940
4980	—	Ghana BC	Accra, Ghana	0645
4990	YVMQ	R. Barquisimeto	Barquisimeto, Venez.	0400
4993	—	R. Omdurman	Omdurman, Sudan	2215
5015	—	R. Vladivostok	Vladivostok, USSR	0800
	—	West Indies BC	St. Georges, Grenada	2215
5030	YVKM	R. Continente	Caracas, Venez.	0230
5040	—	R. Tblisi	Tblisi, USSR	2000
5180	—	R. Atlantida	Atlantida, Peru	0315

60-Meter Band—5950-6200 kHz

kHz	Call	Name	Location	GMT
5955	TIQ	R. Casino	Puerto Limon, C.R.	0500
5960	HRRH	V. de Occidente	Santa Rosa, Hond.	2350
5965	—	Swiss BC	Berne, Switz.	0450
5975	CE597		Santiago, Chile	0000
5982	—	V. de la Revolution	Port au Prince, Haiti	2355
5985	—	V. of West	Lisbon, Portugal	0215
5990	—	R. Sweden	Stockholm, Sweden	0035
6005	CFCX	CFCX	Montreal, P.Q.	1500
6010	—	V. America	Okinawa	1015
6025	—	V. West	Lisbon, Portugal	0230
6030	CFVP	V. Praries	Calgary, Alta.	0510
6055	—	R. Prague	Prague, Czech.	0210
6060	LRA	R. Splendid	Buenos Aires, Arg.	0108
6070	—	R. Habana	Havana, Cuba	0100
	CFRX	CFRX	Toronto, Ont.	0505
6075	HJHV		Bogota, Colombia	0105
6090	HISD	R-TV Dominicana	Santo Domingo, Dom. Rep.	0130
	VLI6	Austral. BC	Sydney, Austral.	0845
6095	—	R. RSA	Capetown, S. Afr.	0430
	—	R. Baghdad	Baghdad, Iraq	1945
	ZYB7	R. de Sao Paulo	Sao Paulo, Brazil	0845
6100	—	R. Belgrade	Belgrade, Yugoslavia	2000
6105	—	R. Mogadiscio	Mogadiscio, Somali	0350
6115	—	R. TV Francaise	Brazzaville, Congo	0515
6150	—	R. RSA	Johannesburg, S. Afr.	0250
6155	—	Far East Net.	Tokyo, Japan	0710
6165	XEWW	V. de America Latina	Mexico City, Mex.	0115
6180	TGWB	V. de Guatemala	Guatemala City, Guat.	0400
6200	—	R. Tirana	Tirana, Albania	2200
6215	—	R. Reloj	San Jose, C.R.	0130
6235	—	R. Budapest	Budapest, Hungary	0310

41-Meter Band—7100-7300 kHz

kHz	Call	Name	Location	GMT
7115	—	R. Free Europe	Munich, W. Germany	2200
7150	—	R. Comercial	Angola	2220
7190	—	BBC	London, England	0145
	—	R. Australia	Melbourne, Australia	0430
7195	—	R. Bucharest	Bucharest, Rumania	2230
7200	—	V. America	Wooferton, England	0225
7210	—	R. Senegal	Dakar, Senegal	2330
7245	—	Viennese R.	Vienna, Austria	0600
7265	—	R. Tirana	Tirana, Albania	0035
7295	—	R. Libertad	(clandestine)	0515
	—	V. Malaysia	Penang, Malaysia	1115
7300	—	R. Tirana	Tirana, Albania	0300
7345	—	R. Prague	Prague, Czech.	0100
9358	—	R. Nac. Espana	Madrid, Spain	0000
9410	—	BBC	London, England	0315
9470	—	R. Moscow	Moscow, USSR	0245

31-Meter Band—9500-9775 kHz

kHz	Call	Name	Location	GMT
9505	—	R. Habana	Havana, Cuba	0040
9510	YVXJ	R. Barquisimeto	Barquisimeto, Venez.	0110
9525	—	R. Habana	Havana, Cuba	0100
9545	PJB		Bonaire, N.W.I.	0340
	DMQ9	Deutsche Welle	Cologne, W. Germany	2245
9600	—	BBC	London, England	0745
	CE960	R. Presidente Balmaceda	Santiago, Chile	0300
9625	—	Kol Yisrael	Jerusalem, Israel	2030
9630	—	RAI	Rome, Italy	0110
9640	DMQ9	Deutsche Welle	Cologne, W. Germany	0230
9650	—	R. Berlin Int'l.	Berlin, E. Germany	0415
9660	VLQ9	Austral. BC	Brisbane, Australia	0845
9680	—	R. Moscow	Moscow, USSR	0200
	—	R. Australia	Melbourne, Australia	0825
	—	V. West	Lisbon, Portugal	0215
9690	—	Vatican R.	Vatican City	0050
9695	PJB		Bonaire, N.W.I.	0230
9700	—	R. Sofia	Sofia, Bulgaria	2330
9705	—	R. RSA	Capetown, S. Afr.	2345
9720	—	R. Senegal Int'l.	Dakar, Senegal	0800
9725	—	Kol Yisrael	Jerusalem, Israel	2035
9730	—	R. Berlin Int'l.	Berlin, E. Germany	2030
9760	—	R. Ghana	Accra, Ghana	2000
9770	4VEH	V. Evangelique	Cap Haitien, Haiti	2245
	—	Viennese R.	Vienna, Austria	2235
9833	—	R. Budapest	Budapest, Hungary	0100
11600	—	R. Peking	Peking, China	2345
11705	—	Vatican R.	Vatican City	2230

25-Meter Band—11750-11975 kHz

kHz	Call	Name	Location	GMT
11760	—	R. Habana	Havana, Cuba	0100
	—	R. Vatican	Vatican City	0035
11765	ZYB8	R. de Sao Paulo	Sao Paulo, Brazil	2300
11800	—	R. Nac. De Espana	Madrid, Spain	2330
11810	—	RAI	Rome, Italy	0100
11835	4VEH	V. Evangelique	Cap Haitien, Haiti	0310
11840	—	R. Australia	Melbourne, Australia	0815
11845	—	R. TV Francaise	Paris, France	2330
11850	—	R. Ghana	Accra, Ghana	2015
	—	R. Norway	Oslo, Norway	2300
11865	—	BBC	Ascension I.	0415
11880	XEHH		Mexico City, Mex.	0115
11900	—	R. RSA	Johannesburg, S. Afr.	0400
11905	—	Deutsche Welle	Kigali, Rwanda	0600
	—	RAI	Rome, Italy	0325
11910	HCJB	V. Andes	Quito, Ecuador	0530
11925	—	V. West	Lisbon, Portugal	0200
11930	—	BBC	London, England	0445
	—	R. Habana	Havana, Cuba	1825
	—	V. America	Monrovia, Liberia	0600
11935	—	V. West	Lisbon, Portugal	0000
11945	DMQ11	Deutsche Welle	Cologne, W. Germany	0145
	—	R. Peking	Peking, China	0110
11960	—	R. Moscow	Moscow, USSR	0430
12030	—	R. Moscow	Moscow, USSR	0115
15060	—	R. Peking	Peking, China	2345
15080	—	R. Euzkadi	(clandestine)	2130

19-Meter Band—15100-15450 kHz

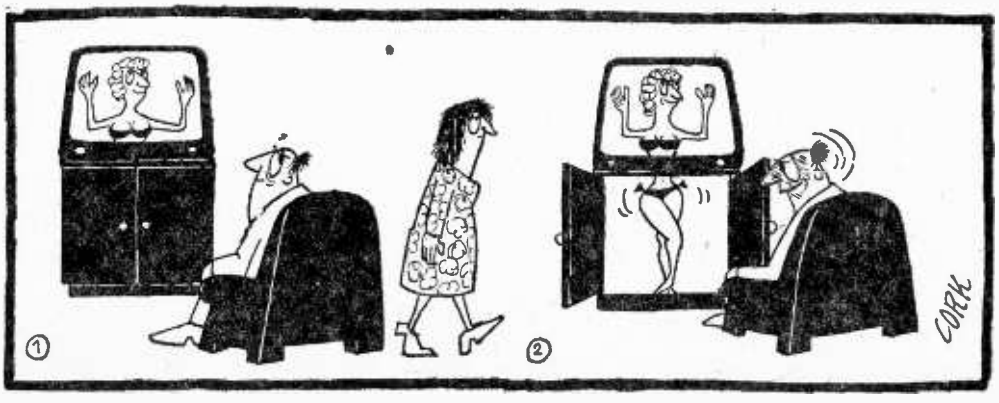
kHz	Call	Name	Location	GMT
15110	XERR		Mexico City, Mex.	0010
	—	R. New Zealand	Wellington, N.Z.	0530
15120	—	Vatican R.	Vatican City	1500
	—	Nigerian BC	Lagos, Nigeria	1830
15125	BED60	V. Free China	Taipei, Formosa	0230
15135	—	R. Japan	Tokyo, Japan	0010
15140	—	BBC	Ascension I.	2200
15150	—	Arabian BC	Djeddah, Saudi Arabia	1800
15155	ELWA	R. Village	Monrovia, Liberia	2010
15190	—	R. TV Francaise	Brazzaville, Congo	1915
15220	—	R. Nederland	Hilversum, Neth.	2145
15225	ZYN30		Salvador, Brazil	0200
15230	—	R. Ceylon	Colombo, Ceylon	1530
15235	—	R. Japan	Tokyo, Japan	0230
15255	—	Nigerian BC	Lagos, Nigeria	1830
15320	—	R. Australia	Melbourne, Australia	0115
15332	—	R. Pakistan	Karachi, Pakistan	0130
15370	ZYC9	R. Tupi	Rio de Janeiro, Braz.	2040
15380	—	R. Peking	Peking, China	0130
15420	—	R. Nac. Espana	Madrid, Spain	2030
15425	VLX15	Austral. BC	Perth, Australia	0140
	—	R. Nederland	Hilversum, Neth.	2100
15440	WNYW	R. NY Worldwide	New York, N.Y.	1445
15445	ZYN32		Brasilia, Brazil	0130

16-Meter Band—17700-17900 kHz

kHz	Call	Name	Location	GMT
17720	WINB	WINB	Red Lion, Pa.	1930
17725	—	NHK	Tokyo, Japan	0115
17785	—	R. Japan	Tokyo, Japan	2300
17790	—	BBC	London, England	2145
17810	—	R. Nederland	Hilversum, Netherlands	2145
17810	—	R. RSA	Johannesburg, S. Afr.	1945
	—	Far East BC	Manila, Phil.	0310
17825	—	R. Japan	Tokyo, Japan	0000
17840	WNYW	R. NY Worldwide	New York, N.Y.	2230
17895	—	V. America	Bethany, Ohio	2045
17898	—	R. Peking	Peking, China	0245

13-Meter Band—21450-21750 kHz

kHz	Call	Name	Location	GMT
21495	—	V. West	Lisbon, Portugal	1825
21500	—	R. RSA	Johannesburg, S. Afr.	1915
21520	—	Swiss BC	Berne, Switz.	1330
21540	—	Swiss BC	Berne, Switz.	1600
21580	—	R-TV Francaise	Brazzaville, Congo	1900
21585	—	R. Sweden	Stockholm, Sweden	1430
21730	—	R. Norway	Oslo, Norway	1715
25780	—	R. RSA	Johannesburg, S. Afr.	1445
25950	—	V. America	Greenville, N. C.	1630



Greatest Hoaxes

Continued from page 86

tav Siegfried Eins left the air, with the dramatic discovery of the chief by the Gestapo. But this final broadcast was marred by the only serious flaw in the station's history.

A British engineer, not knowing German, nor the final nature of the program, followed his usual routine of repeating the reported broadcast an hour after it had first been put on the air. As a result, the chief's death scene, complete with tommy gun salvo, received a second performance. But by then it didn't matter very much.

Secret Vietnamese Station. The last of our seven greatest DX hoaxes is still on the air, the currently active Voice of the Patriotic Militiamen's Front. This station, apparently beamed to North Vietnamese audiences, attacks not only North Vietnamese and Chinese leaders, but also the South Vietnamese and American governments. It stresses a nationalistic theme designed to turn the North Vietnamese against their government.

The station denounces the U.S. position in the Far East, probably as a means of boosting its credibility among its intended listeners, but its true mission is to plant the seeds of discontent. It is believed to be operating secretly from somewhere in South Vietnam by "our" side. It claims, however, to be located in Hanoi. (All of which is to imply that there's something on the fishy side somewhere.)

The Voice of the Patriotic Militiamen's Front has been heard in the U.S., transmitting on frequencies of approximately 9433 and 7216 kHz, normally signing on with a drum-and-cymbal interval signal at 0900 EST. Its Vietnamese identification in "Day la Tieng Noi cua Mat Tran Dan Quan Ai Quec." Its hour-long program concludes with dictation-speed announcements and coded orders for agents and sabotage teams, supposedly operating within South Vietnam.

Could this be the last of the great DX hoaxes? Hardly. And if you've never heard any of these seven greatest DX hoaxes, don't feel *too* bad. A new one may crop up any day. ■

Heath SB-310

Continued from page 74

ply and control wiring which is on the chassis.

Since the kit is obviously intended for beginners, our kit was built by someone with a minimum of construction experience to uncover possible problems for the beginner. The only problem which came up was IF amplifier instability caused by poor solder connections on the printed circuit board. Take our advice: the SB-310 represents more than $200 in cost—therefore, *spend* another couple of bucks and get a high-temperature, medium-wattage (approximately 40 watts) soldering iron to ensure good PC connections. (The Ungar 4033 soldering tip is an excellent choice.)

To reduce the possibility of wiring errors Heath has group-packaged the components; the parts utilized for a particular pictorial are in the same envelope.

Alignment couldn't be easier. You simply turn on the built-in 100-kHz calibrator and adjust the coils for maximum S-meter reading. You do not need instruments other than a VTVM to adjust the crystal oscillators (you have only to adjust the oscillator tuning for a test point voltage of 2.7 volts). An instrument alignment failed to make any performance improvement over the calibrator alignment.

Performance. Unfortunately, there are few standard test procedures which can accurately indicate the SB-310's performance. While sensitivity, selectivity, and image rejection *can* be measured, how do you graphically show the SB-310's excellent noise rejection, which has no valid relationship to typical S+N/N (signal plus noise to noise) measurements? (For example, two receivers may both have a 3.5-MHz sensitivity of 1.0 *uv* for 10 dB S+N/N. Even so, one may bring in crystal clear reception while the other is virtually jammed with "buzz.")

And how to indicate stable SSB reception where the signal does not have to be returned for upwards of 15 minutes? Or a dial so accurate it can be preset to a station before it comes on the air and then be tuned-in exactly on-frequency? Or CW reception so sharp

(Continued on next page)

you can drop an interfering station "off the cliff?" Clearly, the SB-310's outstanding performance falls in areas that are rarely measured.

As for sensitivity, it is consistently better than 1.0 *u*V except on the 9.5- and 11.5-MHz bands (see our chart). We could find no rational reason for this, but since both bands use the same preselector coil we assume either the coil was defective or the builder got a little sloppy on the coil installation and/or connections. Image rejection was better than 90 dB, while spurious signal and IF rejection ranged between 45 and 85 dB.

All in all, the SB-310 is so far the finest SWL-type receiver we've run across.

A Reservation. Our one complaint with the SB-310 is the holes in the frequency coverage, due in part to the LMO having a maximum tuning range of 500 kHz. (Another first-conversion crystal is required for each 500-kHz additional coverage.) To the SWL whose favorite monitoring is done at, say, 10.5 MHz, the SB-310 is tentatively useless, since the receiver doesn't cover 10.5 MHz. (We say tentatively because the preselector's tuning has much greater potential than is used, and by simply changing a crystal the user can select virtually any 500-kHz band segment he desires. Unfortunately, Heath gives no details on this technique, which is in fact a rather simple procedure.)

But if your listening is done within the frequency coverage of the SB-310 you'll have to look hard to find anywhere near as good a performance.

For additional information write to the Heath Co., Dept. EB, Benton Harbor, Mich. 49022. ■

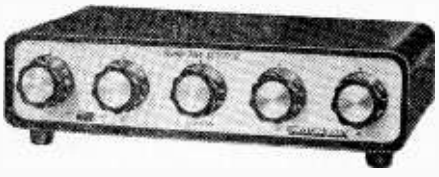
New Products

Continued from page 29

phone jack; two AC outlets and a built-in FM dipole antenna. The KG-980 measures only 16x13½x4-in. The receiver is priced at $149.95, with a walnut wood case available for $19.95. For more specs, ask for the 1968 catalog from Allied Radio Corp., Dept. 20, 100 N. Western Ave., Chicago, Ill. 60680.

Not for Cake Batter!

The battery-operated Studio MixMASTER, Model 307TR, is a solid-state, stereo-monaural audio frequency mixer/amplifier. With it you can record sound on sound, fade music and



Switchcraft Studio MixMASTER

voices, record voice over music, or mix voice and program sources from several locations. Powered by D batteries, its 18-volt converter provides a minimum of 2 volts output into a high-impedance load. Distortion is 1% maximum (0.5% typical) at 1.5 V output. Frequency response is 20 to 20,000 Hz with a minimum signal-to-noise ratio of 60 dB. The Studio MixMaster accepts 1 to 4 monaural input signals or up to two stereo input signals from any combination or type of program source—microphones, tape recorders, stereo or monaural phono pickups, tuners, preamplifiers and musical instruments, and it's also equalized for magnetic phono cartridges. Through its solid-state circuitry, signals are mixed and amplified up to 2 volts in each channel, then fed to a single high-impedance output for distribution to recorders, PA, and/or musical instrument amplifiers. Satin-black enameled finished, it measures 3½x12x7¼-in. Price is $145.00; further dope from Switchcraft, Inc., 5555 N. Elston Ave., Chicago, Ill. 60630.

Nuts, Look Out!

A hollow-shaft nutdriver set, No. HS6-18, now comes in a molded yellow plastic case which keeps them in good order on the workbench. The tight-fitting cover with integral snap lock keeps the nutdrivers clean and dust-free when not in use. Set No. HS6-18 consists of ten hollow-shaft nutdrivers with hex openings from 3/16 through 9/16 in. The nutdrivers have precision fit, case-hardened sockets; polished plated steel shafts; and shockproof, breakproof, color-coded plastic (UL) handles. List price is $18.50. For further info, write to Xcelite Inc., Orchard Park, N.Y. 14127, and ask for Bulletin N567.

Turn-On From Afar

Olson announces a wireless remote control switch, Model SW-394, that'll turn any electric appliance (up to 500 watts) off and on from anywhere in your home. Just plug the appliance into the remote receiver and the receiver into the electric wall outlet; there is no complicated wiring. The remote control plugs into any other outlet in the house. Size: 5⅛ x 2 x 1¾ in. Operates on 110 to 120 VAC, 50-60 Hz. The complete unit includes transmitter and receiver and is available from Olson at $14.95. For the whole story, write Olson Electronics, Inc., 260 S. Forge St., Akron, Ohio 44308. ■

Positive Feedback

Continued from page 22

Klein rarely follows the standard sequence of calculation that a computer would follow. His basic material, acquired by long hard effort, includes knowing by heart the multiplication tables up to 100 × 100, all squares up to 1000 × 1000, logarithms of all integers under 150, to five decimal places, and all prime numbers below 10,000—plus an enormous number of odd facts and principles, some his own, some adopted from earlier theoreticians.

One day several years ago, for example, Klein was at a British business exhibition. He visited the Friden stand and asked for a demonstration of the company's new "root" machine.

"All right, sir, let's try all the fives," offered a salesman, feeding 555555555555. Before he could press the button for the result, Klein said quietly, "745356 should be about right." The operator was justifiably amazed when 745355.9924 appeared.

Klein had obviously not gone through the laborious process of conventional square rooting. Instead he remembered that 0.5555 is the decimal equivalent of 5/9, the square root of which is 1/3 times the square root of 5. Knowing the square root of 5 and dividing by 3 gives the answer.

He was born in Amsterdam on Dec. 4, 1912. ("That was a Wednesday of course.") He was the son of a strict medical practitioner. The father insisted that one of his two sons become a doctor and William, the elder, dutifully went to medical school for five years from 1932 to 1937; he quit before the last two clinical years.

Destitute after the war, Klein turned to the stage. From the age of 9 or 10—"I was not one of those 3- to 4-year-old prodigies," he says—he had independently worked at his mental arithmetic. His first interest was factoring and prime numbers. In his spare time he worked up to almost 20,000, distinguishing the indivisible prime numbers from those that were products of two or more other numbers. He grew more enthusiastic as the computation became easier.

In 1945, William went on stage in Pascal's variety show, where he worked until 1951, thoroughly enjoying show business and performing in three countries.

In 1951, he obtained a job as a special calculator at the Mathematics Center affiliated with Amsterdam University. He served on many projects for government, industry and universities, such as helping scientists to diminish the vibrations of airplane wings and helping technicians to take the bugs out of popular products. "This was all numerical," Klein says, musing, "It was the precomputer age, ahh, a jolly good time."

But again the siren call of the midway drew him from other duties. This time it was Pigalle, and later Marseilles and Toulon.

Next he met some Monroe Calculator people in Paris, demonstrated his talent and was assigned to London. He still likes to say "blimey." The BBC had him perform, and again it was vaudeville. Says a yellowing program, "The Dutch Miracle, William Klein." It calls him the man with the brain worth 10,000 pounds (British currency).

Again with the Amsterdam math center, he worked on projects for Geneva agencies, contacted CERN and was hired in 1958 as numerical theoretician supreme and problem-solver.

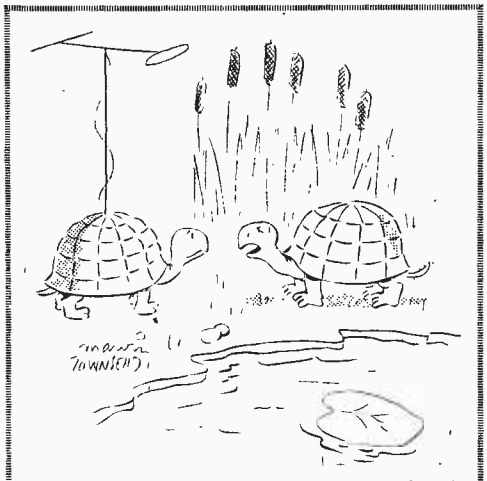
Can many youngsters acquire Klein's prowess? "I'm sorry, but it is difficult. You need long self-training and exercise . . . and a bit more. I don't like to say 'gift.' "

"More and more, mental arithmetic is losing its influence, instead of gaining," he says sadly, "because of the computer." Still, he is gratified, for he is deep in theoretical physics, working with Europe's best scientists, exploring the mysteries of matter.

"I don't trust computers," he mutters. "Of course it turns out great quantities of results, 5,000 or 6,000; I can't bother to check them all." But he checks them when he can.

Super Cold. The Navy hopes to get, from experiments in a trench at Stanford University, a super-cold ship with super eyes, super ears, and a super memory.

While super-cold techniques have been slowly edging out of the laboratory into daily use—in communication with immensely distant planet probes, for example—no one until now has tried to set up such a system on the scale now conceived. The breakthrough comes with an immense refrigerator being built at the Palo Alto, Calif. campus to increase the efficiency of an atomic accelerator. *(Continued on next page.)*



"I'm waiting until I can afford color."

The life-blood of the ship-sized system would be liquid helium, cooled to some 458 degrees below zero Fahrenheit. Helium at these temperatures has the little-understood, gravity-defying propensity to climb up the walls of containers and ooze through minuscle aperatures. The energy of a flashlight beam will cause it to erupt in a tall fountain.

Scientists at Stanford are demonstrating the usefulness of this characteristic in developing a cooling system without pumps. And Navy researchers anticipate a pumpless ability to raise the coolant as much as 50 to 60 feet, to cool the components of electronics-laden ships. By piping this coolant to communications ships and spy ships similar to the USS Pueblo, the Navy could significantly sharpen their senses.

Navigation, detection of submarines or satellites, sonar and radar could be greatly improved. There may be other systems that would benefit: much of the information is classified. But among them might be submarines, able to direct a signal precisely to a land base of another ship or submarine without fear of broadcasting its position to the enemy.

Computers in this cryogenic temperature range have improved memories and can be read out repeatedly without weakening them.

Radio oscillators for broadcast and reception can be tuned with fantastic precision. Combined with cryogenic wave guides, also under development at Stanford, the oscillators could provide narrowly directed radio beams that could squeeze many more communications channels into a given narrow waveband than room-temperature electronics could ever separate and use.

A radar tuned so finely could supply superbly accurate readings of position and approach or departure velocity of any object it picked up.

The refrigerator at Stanford was originally designed to enlist in the accelerator program a phenomenon called superconductivity. Within a few degrees of absolute zero electrical resistance in certain metals vanishes, meaning that currents will pass through the metals without heating them, offering the physicists powerful electric magnets without heat problems. Also, a current once started in such a super-cold ring will run around indefinitely, without any added power. The system will cut power loss to about a millionth of the usual operation.

Since the usual atomic accelerator uses enough power to light a small city, superconductivity will cut the electric bill by important amounts.

The Navy is not worried greatly about electric bills—even though it happens to be paying this one. The Navy supports the project, and will continue to do so under present budget plans, in spite of Defense Department plans to shuck off other basic research. Navy wants that refrigerator.

August 10, 1968. Mark the date, readers in Dixieland, because the Citizens Radio Club, Inc. of Pensacola and the Blue Angels Radio Assistance Club of Pensacola will hold a National CB Jamboree. This sounds like a great undertaking for two fine radio clubs and we urge our readers to attend if possible. For more details write to Pat Barsden, Citizens Radio Club, Inc., Box 374, Pensacola, Fla. 32501.

Meet Your Double

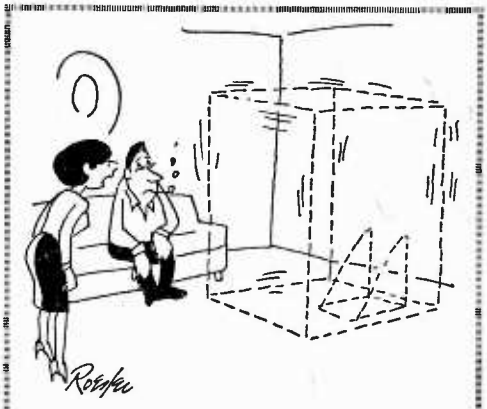
Continued from page 94

problems that make the nuclear job look like a third grade arithmetic problem.

Where would we find a source of antimatter "fuel?" It cannot exist in our material universe. The most powerful particle accelerators can only make individual specimens that stay in existence only a millionth of a second or so. If we could obtain a larger supply of antimatter, how would we store and handle it? It explodes instantly on contact with any known substance.

It seems that we will have to muddle along, as best we can, with our puny nuclear reactors. But to theoretical physicists and cosmologists the discovery of antimatter couldn't be more important. Here may be one of the vital keys that will eventually unlock mother nature's most jealously guarded secrets: the nature of the basic structure of the universe, and the how and even the when of the earth's creation!

The Diracs and Ledermans of our world will continue to speculate and probe these mysteries. And maybe—just maybe—the Carids and Namredels in some distant anti-world are trying to do the same thing. ■



"No! You're not thinking of enlarging your basement workshop again!"

Man With The Mind

Continued from page 58

"I read an interesting book about the Old West last week. I can still remember most of it," said Henry.

"Splendid. I'm going up to the control room, behind that glass panel, so I can watch the monitor. Go right ahead."

When J. C. walked into the control room, the wall monitor showed a company of soldiers at the base of encircling low hills. Several hundred Indians were riding around and firing at them from their racing ponies.

"Holy moly! Custer's Last Stand!" he cried in an awed voice, as he sank into a chair with white face and lit a cigar with shaking hands while staring at the screen on the wall.

A few minutes later he returned to the studio floor.

"Was it all right, sir? Did you see anything?" asked Henry in a nervous voice, as J. C. walked up to his chair.

"Well yes, I saw a few Indians," said J. C. as his mind began working swiftly. "Not very clear, of course. But it wasn't bad considering it was your first test on TV."

"Then . . . you mean you might be able to give me some kind of a job here?" asked Henry. "I'm sure I could do better when I'm more relaxed. I'm a little nervous right now, sir."

"Let's go back to my office and talk things over," said J. C. "I think I can find something for you, Mr. Pambly."

A half-hour later, Henry signed a contract giving his services as 'mental broadcaster' to the Nationwide System for a period of five years at a weekly salary of $250.00.

"I certainly appreciate this, Mr. Bradford," he said as he shook hands with his new employer. "That's more than I ever made painting. When do you want me to start work, sir?"

"Well, let's see. It will take me a little while to get certain matters taken care of," replied J. C. "I'll get in touch with you in a couple of days. And by the way, don't say anything about this little agreement of ours to anyone. Or about this trick of yours. People would just think you're a little off in the head—get what I mean?"

"Yes sir. I'll keep my mouth shut, sir," said Henry as he rose and left the office with a happy smile.

That afternoon the executive board of the company met behind the locked doors of the conference room. When J. C. finished talking there was a stunned silence as the members realized the vast importance of Mr. Henry Pambly.

"As soon as news about him spreads around, the other companies will offer him millions," said W. P. Winthrop.

"When the unions hear about him, he'll have another concussion," remarked another man in grim tone of voice.

"It's up to us to protect him and also to keep him from realizing what he's doing," said J. C. "It's for his own good. Now, what are your suggestions for the first program. I want to get publicity out immediately. Remember, gentlemen, we can present anything in the history of civilization from the Flood with Noah's Ark to the destruction of Hiroshima."

"What about that picture he took of his dead wife?" asked Winthrop. "Why don't we put on a spectacular dealing with that one? It wouldn't cost us any more."

"It would be too much of a shock for the public," said J. C. after a moment's thought. "I think we should start off with something not too unusual. Why not let him do Custer's Last Stand. The parts I saw were simply terrific."

The vote was in favor of this proposal and the meeting adjourned as the machinery went into motion to announce the big Special due to be presented the following Saturday.

At the appointed time, Henry sat in the same chair with an unmanned TV camera focused and pointed at his eyes. This time the control room was filled with nervous executives.

Custer's Last Stand went on the air right on schedule and with such realism for the scenes of slaughter as to be hair-raising.

The executives were jubilant and began to relax when someone phoned out for some coffee to be brought up. As the boy with the tray passed through the studio, Henry smelled the freshly brewed coffee and disaster struck the network.

The action-filled scene of dying soldiers and savage Indians suddenly changed to a picture of a hamburger sandwich, a cup of coffee, and a side order of french fries.

"Oh!" cried J. C. as he stared up at the monitor then dashed down to the studio floor. "Get your mind back on the Indians, Henry!" he shouted wildly. "Forget the hamburger!"

(Continued on next page)

Henry nodded his head and when J. C. re-entered the control room the Indians were back. However, in place of Custer's Last Stand, these Indians were peaceful and squatting in a clearing before several log cabins. Several Pilgrims were there.

"Now he's thinking about Thanksgiving!" groaned Winthrop.

Just then a pretty messenger girl bearing a note for J. C. passed through the studio. She was wearing a brief mini-skirt. Henry glanced over his horn rims at her shapely, silken legs.

The Thanksgiving feast on the TV monitor abruptly changed into a shot of a very attractive girl . . . in the nude!

Henry, who, from his chair in the soundproofed camera room could comfortably observe all that was going on in the studio's auditorium, stared in fascination at the frenzied antics of an elderly woman. This lady, outraged at the nude picture on the screen, stood up, screamed, gesticulated, and fell down in a faint.

As she collapsed, Henry suddenly sensed what had happened, and the fear and guilt he felt for his own lusty thoughts resulted in utter bewilderment. As each confused mental image of his flashed across the screen he became ever more panic-stricken. Positive mental feedback between the camera and his brain overcame poor Mr. Pambly, and he passed out.

By this time J. C.'s frantic cries had resulted in the station's running the late show in place of the dreadful Pambly fiasco. Mr. Winthrop called two ambulances—one for the dowager who had fainted and one for poor Henry.

The next morning, after a board meeting, J. C. took several checks over to the hospital where Mr. Pambly was being treated. At Mr. Winthrop's request it had already been established that Henry's fabulous powers were lost in the mental maelstrom resulting from man-machine interaction. So, Henry accepted J. C.'s termination-of-services payment with resignation tempered with relief.

The man with the telepsychic mind was no more. ■

Hatchings & Happenings

Continued from page 100

ence between his own plane and other aircraft.

Called *Capsul* light, the advance in lighting technology is a recent breakthrough by Atkins & Merrill, Inc. of Sudbury, Mass. Its all-weather capability makes it practical for the first time to take advantage of electroluminescent lighting (EL) for outdoor use. Tested on the newest military helicopters, supersonic jet fighters and business planes during the past year, *Capsul* light's steady, uniform low-level glow, Air Force pilots report, still is easy to see and follow in flight. During this test period, the material has been flown more than 300 hours on F4C jet fighters, on hundreds of runs up to mach 2 speed, and subjected to violent rainstorms and desert sun.

The EL base itself is made by depositing a thin coating of phosphor between two layers of electrical conducting material. The phosphor—like the material on the face of a TV picture tube—glows over the entire area when excited electrically.

EL light can glow in any of five colors; green, the brightest; blue, yellow, white or red. EL brightness can be regulated by varying the voltage and frequency of the electricity. In formation flying, the glow could be brightest for rendezvous, then dimmed to individual pilot preferences. Wafer thin and lightweight, the solid-state EL light is available in strips up to 10 feet long. For specialized uses, it offers many advantages over incandescent lighting. It is flexible and can be bent around curves or molded to complex shapes. Unlike incandescent light, EL has no filament to warm up or burn out. It is practically indestructible. A bullet could pierce it, yet destroy only the hole area. The rest would continue to glow.

Power needs are negligible. A piece of *Capsul* light 1 foot long and 1 inch wide consumes only 3/10s of 1 watt. The material can be powered with normal AC current or by flashlight or other batteries coupled with a small inverter. ■

"Now listen carefully, Ed . . ."

Ask Me Another

Continued from page 32

through one port and from 54 to 216 MHz through the other when used as a splitter. As a coupler, it combines the signals.

The Super Goofed

My building has an MATV system. My apartment has a single MATV outlet which has two screw connections. We wanted to operate two TV sets from the outlet. The building superintendent ran a piece of coaxial cable to each set from the MATV outlet to the TV set antenna terminals. Now, color TV reception is terrible. What's wrong?

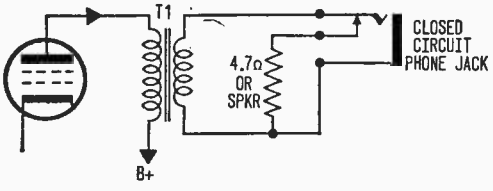
—J. W., New York, N. Y.

The MATV outlet has 300-ohm impedance and coax impedance is 75 ohms. He should have used a 2-set coupler, as shown in the diagram. Show him this and tell him to re-work the system using 300-ohm twinlead.

Speaker or Earphones

I was planning to build the multiband-VHF receiver described in the December-January 1967 issue of RADIO-TV EXPERIMENTER. *Could the speaker and T1 be left out and just the headphones used? Also, could another coil with more and larger turns be used with L1 to L5 to tune in frequencies in the longer wave bands, between 26 MHz and the broadcast band?*

—R. B., Guelph, Ont.



Yes, you can omit the speaker as shown in the diagram. And you can use a coil with more inductance in order to tune to lower frequencies.

Interfering Broadcast

How can I attenuate a station on 850 kHz that causes strong interference as much as 60 kHz away on the dial. Also, when did WEEI in Boston change its call letters to WEEP?

—B. J., Boston, Mass.

If your receiver employs an internal loop antenna, use the set-up shown in diagram A. If it uses an external antenna, connect a wave trap in series with the antenna, as shown in

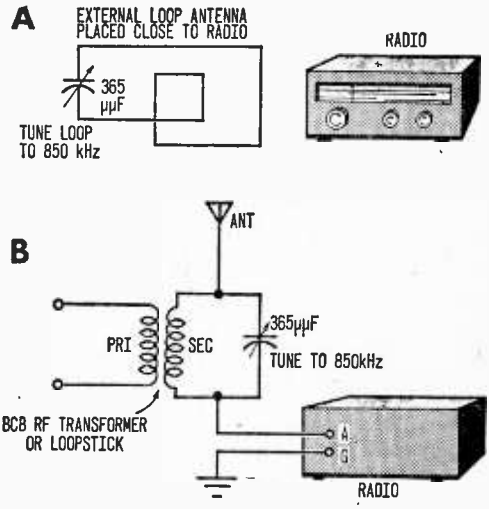
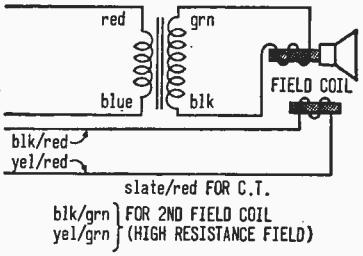


diagram B. The last we heard was that WEEP was in Pittsburgh.

Speaker Connections

The speaker of an old radio has four colored leads running to it. Which lead goes where?

—P. R., Jackson Heights, N. Y.

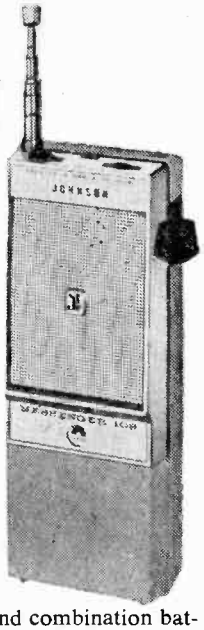


The diagram shows the standard color coding. If the output transformer is mounted on the speaker, the leads running to the transformer primary are probably blue and red ■

"Don't worry, Mother will make dinner. I've electrified the back fence!"

CB Rigs & Rigmarole

Continued from page 45



E. F. Johnson Messenger 109 hand-held rig

CB gear periodically. This time it's a 3-watt 2-channel hand-held unit called the *Messenger 109*.

The *109* is light and rugged, runs 14 transistors and 9 diodes (even a thermistor for an extra added attraction). It weighs less than 2 lbs., has been FCC and DOT approved.

The rig runs from rechargeable nickel-cadmium batteries and gives up to 8 hours of service on one charge. Other features include a squelch, and combination battery pack and extension battery charger jack to provide a unit that needs never to be taken off the air for recharging.

Detailed information is available from E.F. Johnson Company, Dept. JMS, Waseca, Minn. 56093.

"This is the most unusual request we've ever had for this suite!"

Great Balls of Fire

Continued from page 50

does it go down chimneys and drift down long hallways in houses?

A number of explanations have been offered. It is suggested that they are moved about by air currents. On the other hand, they have been seen travelling against the wind! It has also been suggested that uneven electron densities within the balls might polarize the masses in which case they might be moved along by the earth's magnetism—in somewhat the same way that the rotor of an electric motor moves by virtue of a magnetic field.

More than a decade ago, a Russian physicist, Peter L. Kapitza, conceived the idea that ball lightning is a plasma sphere as the recent experiments at Brookhaven now seem to confirm. Kapitza suggested that electromagnetic radiation produced by a thunderstorm might cause a cascade of ionization through which additional energy, probably in the form of radio waves, might effectively be channeled.

He further theorized that the radio waves would reach their maximum intensities at points of resonance for the waves—parallel to the surface of the earth. If such is actually the case, then it is entirely reasonable to assume that chimneys and hallways might very well act as wave guides through which the plasmoids would move.

It is already well known that plasma particles tend to travel along lines of magnetic force. In fact, so-called "magnetic bottles" consisting of magnetic fields of controlled shapes are used to contain plasmas which would quickly disintegrate in contact with bottles made of material substance. In these respects, too, the plasma theory seems to fit the observed behavior of ball lightning. If the ball lightning doesn't simply die out quietly through gradual loss of its energy, it may contact some solid object and decompose cataclysmically with an audible explosion.

Verification of the existence of ball lightning, and knowledge about the way it is formed and how it behaves is apparently close at hand. In the very near future we may no longer have reason to call it either bunkum or baffling. But no matter how well it is understood, it will always seem bizarre and bumptious. ■

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Ham Traffic

Continued from page 78

did it that way. Apparently Uncle Whiskers didn't really care, for now he's made it official that you don't have to identify all the stations in your group. You only need to identify one of them. *Any* one of them.

Most hams used to say something like "W2XXX and the group, this is W2XYZ." That wasn't legal before, but now it is. Another formerly illegal procedure, which was used by most operators anyhow, has been made legal. This is the habit of identifying mobile or portable stations on phone as W7XYZ "portable five" or "mobile six," etc.

Formerly, you were supposed to give your approximate geographic location when operating portable or mobile on phone. Now, all you are required to do on phone is identify your station and then give the call-letter area. This applies whether you are in your home area, or in a different area. However, you need do this only at the end of your QSO.

On CW, no change is made, so you still use just a slant bar and numeral whenever you are operating away from your home location.

Tails Are In. One effect of the new rules is to make tail ending legal. This practice, generally thought of in connection with chasing DX, consists of jumping in on the coattails of a rare foreign station and giving your own call just as he finishes signing his call. This is supposed to help get ahead of other stations just panting to work that rare one, and it has been frowned on by the DX big shots as being undignified. Some of them did it anyway when they thought no one was looking. Now it doesn't matter—tail ending is legal, whether for DX, for contests, or for anything else. Confusionville, here we come.

The net effect of looking over the new rules is to get the feeling the FCC has decided to let hams legally engage in all the illegal things that have been going on for years. Not so, says Uncle Frank Charlie Charlie. He says the former ID rules were more strict than was required for his monitoring and enforcement purposes, so he relaxed the rules to give us more time to talk about more important things. No need for us to engage in unnecessary station identification that the monitors weren't interested in anyway.

But who knows? The day may come when the Feds will abolish call letters and tell us to use our social security numbers!

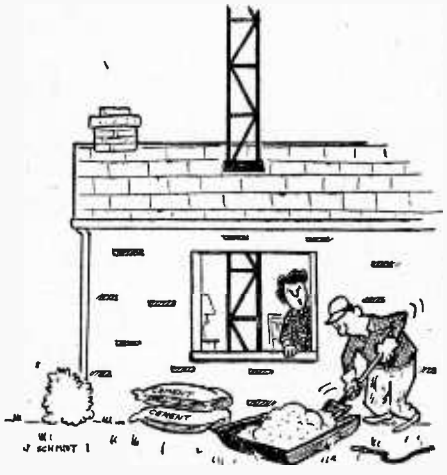
Ham Shorthand? In last issue's HAM TRAFFIC, I promised I would have more tips on how to speed your operating through symbols and codes. However, the need to explain the new FCC identification rules crowded out that information this month. I will get it in the next issue . . . unless something else of greater import crops up in the meantime. ■

Charger & Spender

Continued from page 97

lower-voltage batteries may be "charged" in a similar manner if suitable voltage dropping resistors are used.

Using Spender. Operation is simple, but the following points should be noted: observe polarity when connecting Spender to Charger. When uncertain about correct voltage needed for an experimental circuit, always start at the 3-volt position and switch up, if necessary. Under no circumstances should current exceed 60 mA. Do not attempt to charge a battery through the Spender. If you power two transistor units with Spender at the same time, it would be wise to place an electrolytic capacitor (1000 μF, 15-VDC) across J3-J4 to eliminate any unwanted cross coupling between units. ■



"I know it needs a good base, Harry —but in the living room?"

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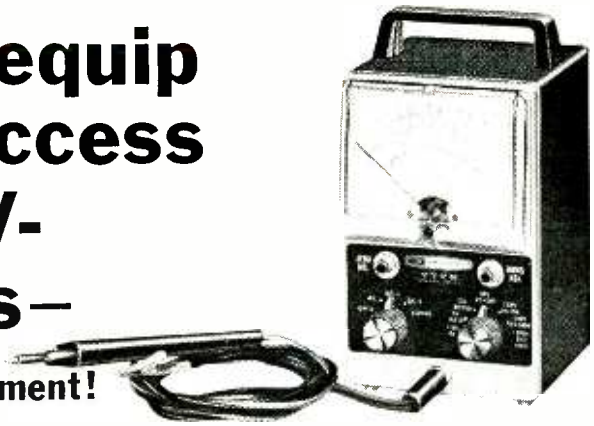

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The Progressive Radio "Edu-Kit" is the foremost educational radio kit in the world, and is universally accepted as the standard in the field of electronics training. The "Edu-Kit" uses the modern educational principle of "Learn by Doing." Therefore 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.

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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.

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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.

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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 for 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."

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Please rush my Progressive Radio "Edu-Kit" to me, as indicated below:

Check one box to indicate choice of model
- ☐ Regular model $26.95.
- ☐ Deluxe model $31.95 (same as regular model, except with superior parts and tools plus Radio & TV Parts Jackpot worth $15.)

Check one box to indicate manner of payment
- ☐ I enclose full payment. Ship "Edu-Kit" post paid.
- ☐ Ship "Edu-Kit" C.O.D. I will pay postage.
- Send me FREE additional information describing "Edu-Kit."

Name .....

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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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An Early Career Book

careers with a RADIO STATION

Mark Lerner

photographs by
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Lerner Publications Company
Minneapolis, Minnesota

With thanks to my friend Jim duBois

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Would you like to work for a radio station?

The radio is a very important part of our daily lives. Radio entertains us with our favorite music and keeps us informed of the day's news. When we want to know what the weather will be like, we turn on the radio.

Everything we hear on the radio comes to us from a radio station. Some radio stations play rock music. Others play country songs. Still other stations report the news, weather, and sports throughout the day.

No matter what their radio station plays, the people who work there want as many people as possible to listen. In this book, you will read about some of the people who work for a radio station and what they do. Maybe you'll find a career that you'd someday like to try.

ANNOUNCER

Announcers play the music you hear on the radio. They choose which songs to play and when to play them. And when you hear weather reports, announcers are the people you're listening to. They give the important information that listeners need.

When announcers are not on the air, they often talk to listeners who have telephoned the station. Announcers like to play *requests*, or songs that these callers especially want to hear. Announcers also do *commercials*. Commercials are advertisements. Businesses pay to advertise on the radio to tell listeners about what they sell. It is very important for announcers to make commercials sound just like the businesses want them to sound.

Announcers must have very clear voices. They must also like to entertain people.


WDCY
TOP 11
WDCY
WDCY
HIT ME!
WDCY
PROMOS
1. CAR

NEWS DIRECTOR

News directors write the station's news reports. Their reports cover national, state, and local news. At some stations, news directors then read the news over the air. At other stations, that job is done by announcers.

News directors often attend important speeches and meetings where they hear government officials speaking about issues that affect the community. News directors put the most important information they've heard into their news reports. During severe weather, news directors give listeners up-to-the-minute reports.

The news director in the picture is standing in front of a *teletype* machine, or "wire." News comes over the wire from reporters all over the world. This news director will use some of these news stories when he writes his own reports.


EBS
CHECK
LIST
UNITED PRESS INTERNATION

SPORTS DIRECTOR

Have you ever seen somebody at a ball game holding a microphone and tape recorder while talking with a player on the field? If you have, you might have been watching a radio station's sports director at work. Sports directors go to many sports events. There they talk to fans, players, and coaches. Sports directors *interview,* or question, players about past games, upcoming opponents, or about how they are recovering from an injury.

Sports directors tape record such interviews and then *edit* them, or decide which parts of interviews to include in the station's sports report. Sometimes sports directors do "live" interviews. A live interview is not taped. Instead, it goes on the air as it happens, so listeners can hear the interview as if they were right there.

Sports directors are big sports fans and know a lot about the games they cover. Many were once athletes themselves.


WDGY
RADIO 1130
North Country Cruiser

RESEARCHER

Radio stations want to play songs that their listeners like. So stations have researchers who telephone listeners and ask them which songs are their favorites. Researchers also play recordings of new songs for the people they call to see which ones people like. If they find that people like a new song, the station will play it often.

Many radio stations have contests and give away records, concert tickets, and other prizes. When researchers telephone listeners, they also ask them how they like the station's contests or how the contests might be improved. Stations often get the telephone numbers of contest winners. That's how they know who many of their listeners are.