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Radio-TV EXPERIMENTER

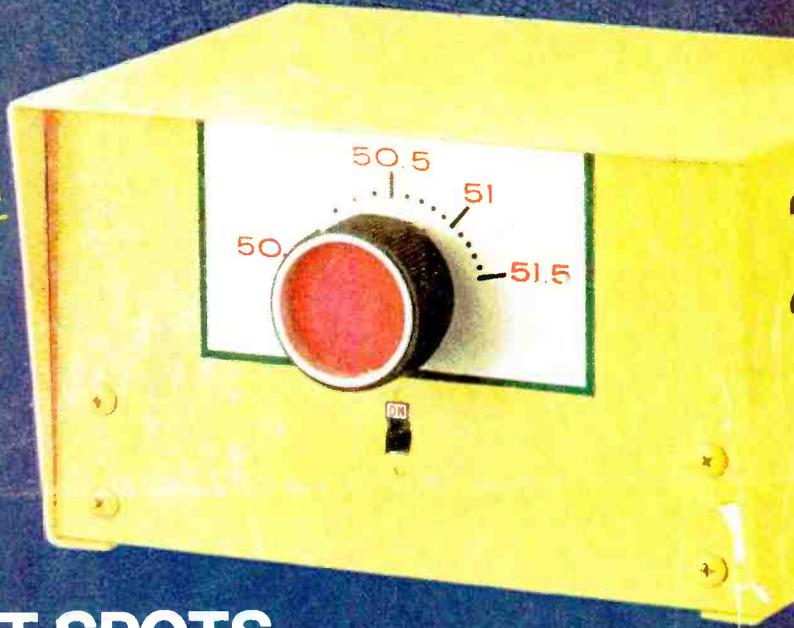
WHITE'S RADIO LOG
AM-FM STATIONS / WORLD-WIDE SHORTWAVE LISTINGS 

DECEMBER - JANUARY 75c

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■ A full capability 70-watt All Silicon Solid State Stereo Amplifier for \$89.95 kit, \$129.95 wired, including cabinet. Cortina 3070.

■ An Automatic FM Stereo Tuner for \$89.95 kit, \$129.95 wired, including cabinet. Cortina 3200.

■ A 70-Watt Solid State FM Stereo Receiver for \$159.95 kit, \$239.95 wired, including cabinet. Cortina 3570.

The most electronics value for your money has been the EICO design philosophy for 22 years. Its successful expression in stereo is the new Cortina Series. In performance, specifications, circuitry, controls, decor — in everything you expect of professional quality stereo, you'll see that

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SIMPLIFIED KIT ASSEMBLY — New EICO exclusive circuitry techniques make kit building easier, faster and more enjoyable. RF, IF and Multiplex circuitry of the tuner and receiver are all supplied completely pre-assembled and pre-aligned. Each channel of the amplifier and receiver uses 3 etched printed-circuit module boards.

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"The compact dimensions and attractive styling appealed

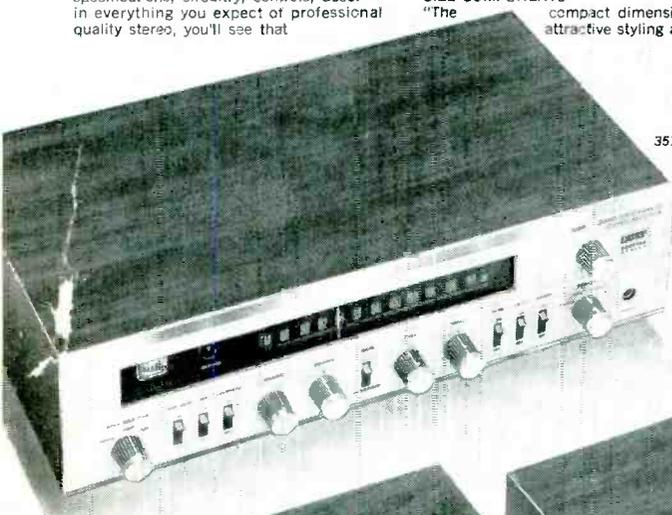
to us. The Cortina 3070 represents a wholesome trend away from "overblown" amplifiers which are much larger than need be. In fact, it is one of the very few we have seen which are actually suitable for bookshelf mounting." Hirsch-Houch Labs.

CORTINA TECHNICAL HIGHLIGHTS:

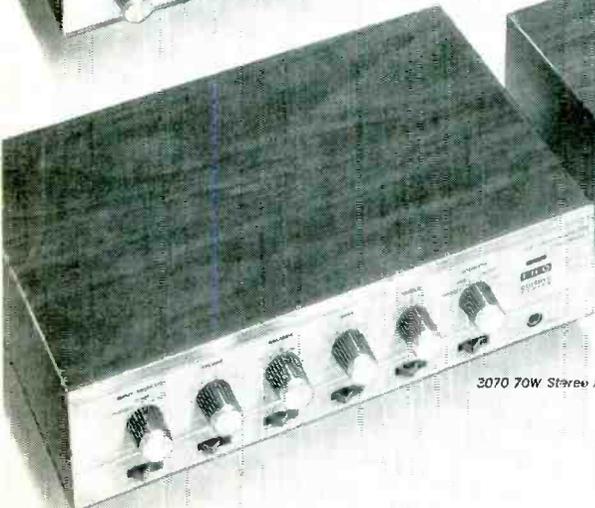
AMPLIFIER — Total Music Power: 70W into 4 ohms; 50W into 8 ohms. Harmonic Distortion: less than 0.8%. IM Distortion: less than 2% at full power. Hum & Noise: 72db below rated output. Frequency Response: ± 1.5 db 5Hz to 10kHz; ± 0.5 db 8Hz to 60kHz. Channel Separation: 40db. Size (HWD) 3 1/4" x 12" x 7 1/4".

TUNER — Usable Sensitivity 1HF: 2.4 microvolts for 30db quieting. Channel Separation: 40db at 1kHz. Signal-to-Noise Ratio: 60 db. Capture Ratio: 4.5db. Image Rejection: 45db. Selectivity: 45 db. Audio Frequency Response: ± 1 db 20Hz to 15kHz. Size (HWD) 3 1/4" x 12" x 7 1/4".

RECEIVER — Same as above Cortina Tuner and Amplifier. Size (HWD) 4 1/4" x 16" x 9".



3570 FM Stereo Receiver



3070 70W Stereo Amplifier



3200 FM Stereo Tuner

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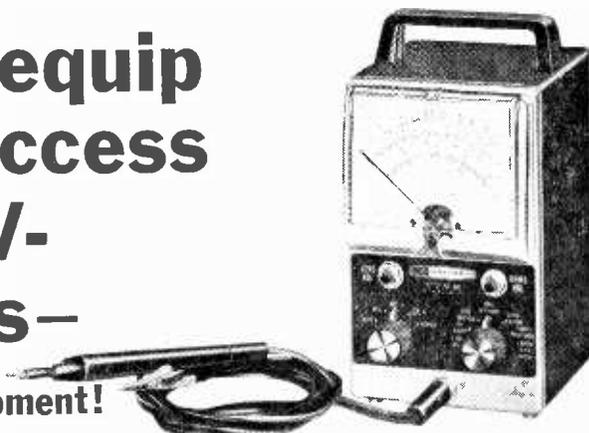
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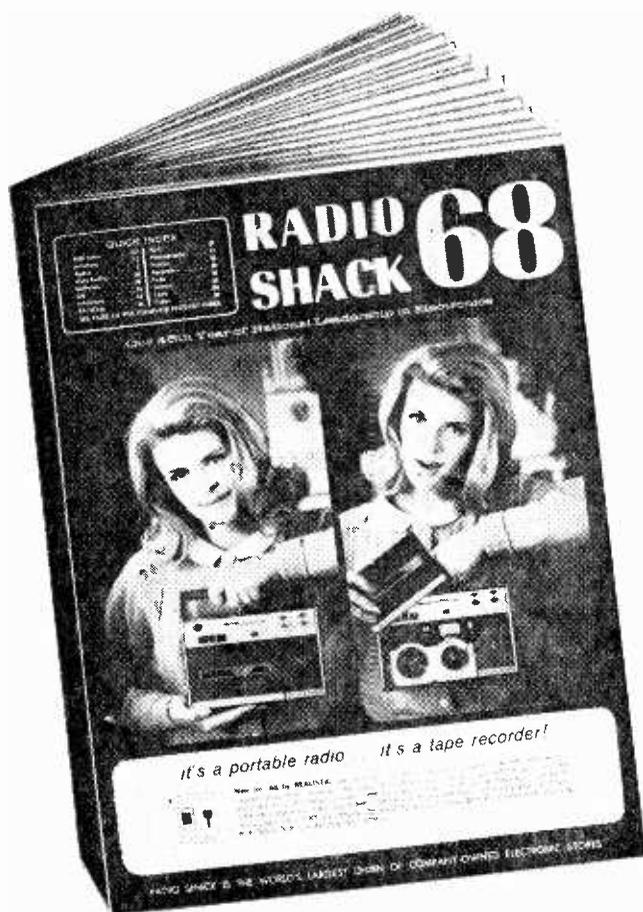
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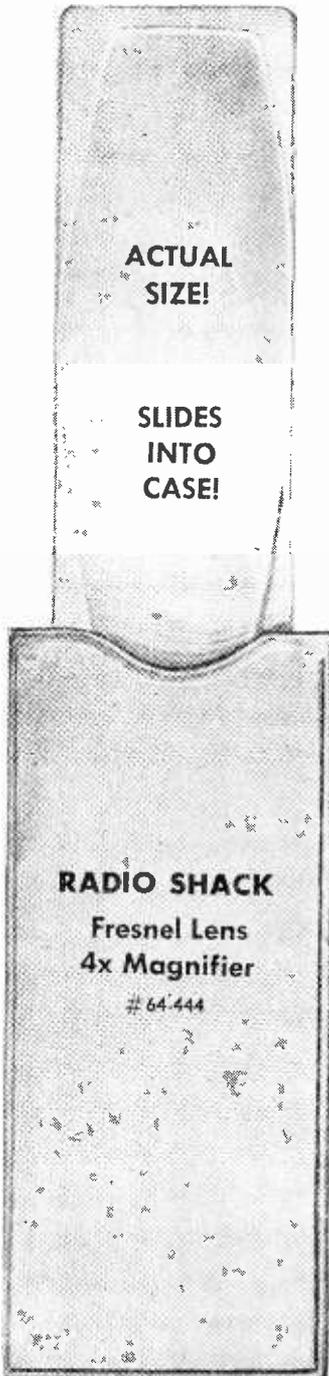
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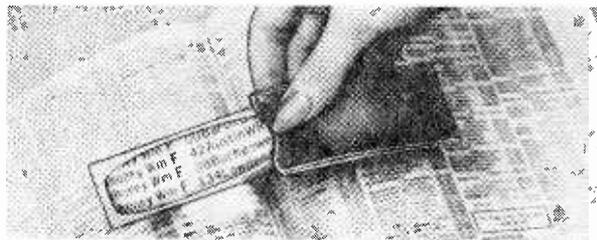
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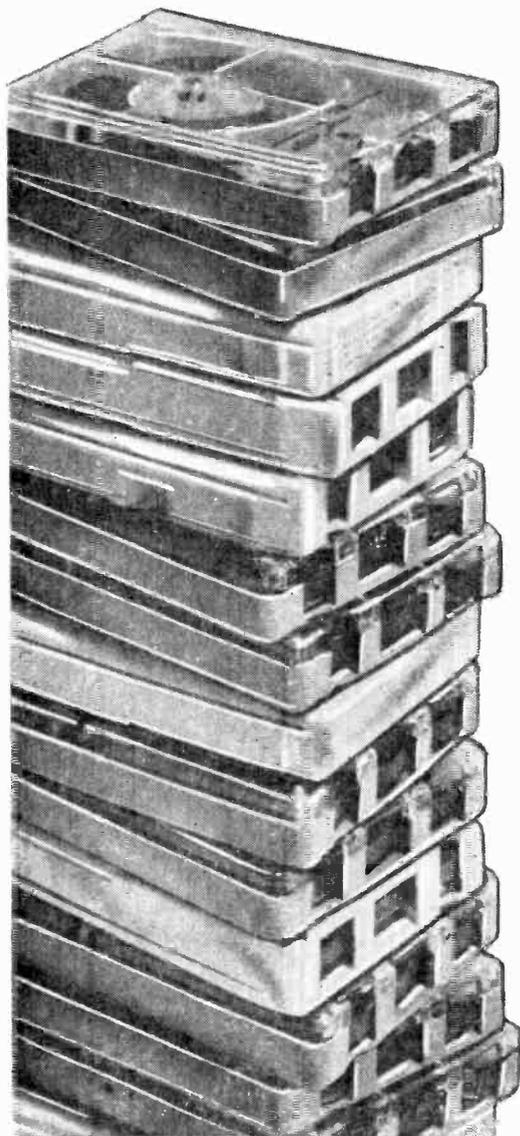
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Store Addresses, Order Form, See Page 20

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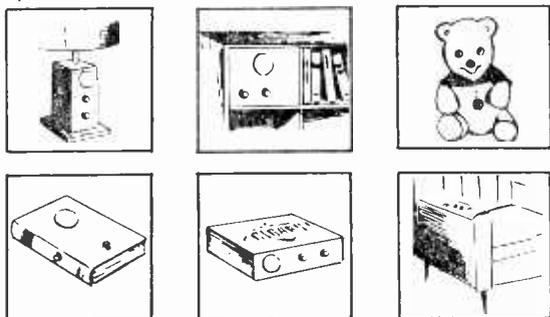
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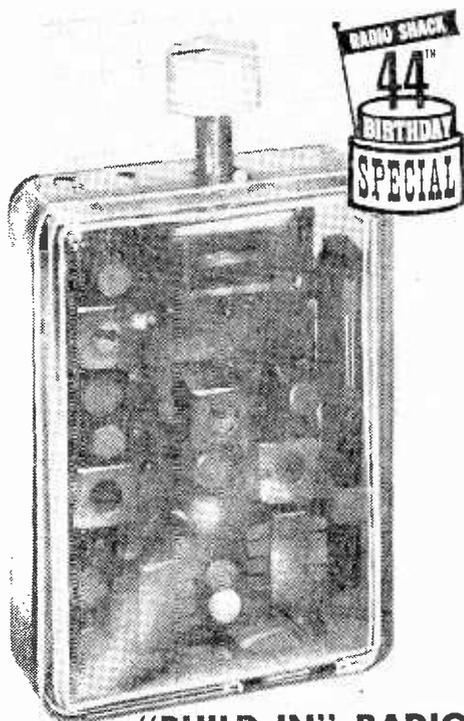
What's your project for our "Build In" radio?

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

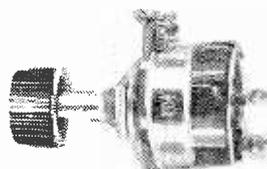
You carpenters, metal-workers and gift designers will really appreciate Radio Shack's novel "Build In" — a 6-transistor superhet that's really *a kit that isn't a kit*. Confused? Part *one* is the radio, 100% wired, installed in a crystalline $2\frac{1}{4} \times 1 \times 3\frac{1}{8}$ " case with the 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 $2\frac{1}{4}$ " PM speaker installed in a plastic case, with soldered leads.

The three parts (plus a flat 9V battery, not included) can be installed in, on, or under anything, in just about any desired angle or position. And you don't have to be an engineer — Radio Shack's geniuses have provided a simple, idiot-proof lshup pictorial. Now all you need is the price (*just* \$6.98, Cat No. 12-1150) and some Yankee ingenuity! Whether you hide "Build In" in a jug of corn likker, junior's wagon or Tillie's sewing box, the result is sure to please.

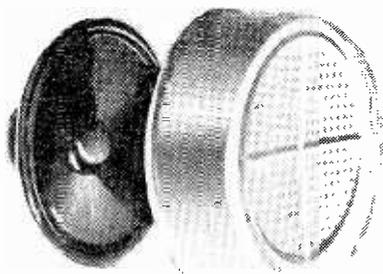
The basic radio itself looks like a little jewel, a real work of art — our photo doesn't do it justice. And the "kit that isn't a kit" is another of Radio Shack's exciting exclusive products that can't be bought elsewhere. Get a "Build In" at your nearest Radio Shack store . . . and start your Christmas *project* early! For Store Addresses, Order Form, See Page 20



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VOLUME CONTROL AND SWITCH



PM SPEAKER IN CASE

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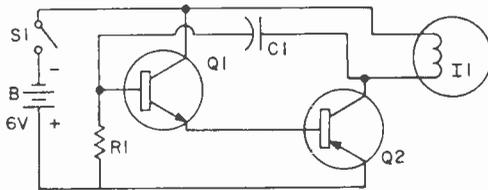
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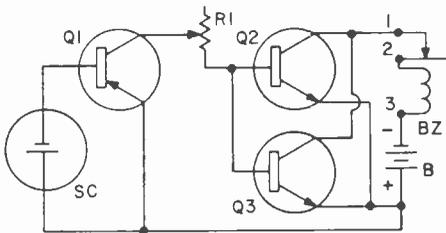
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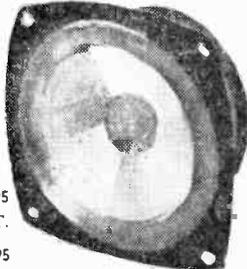
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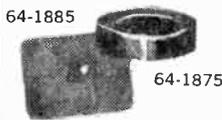
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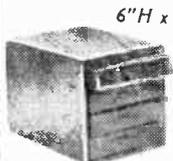
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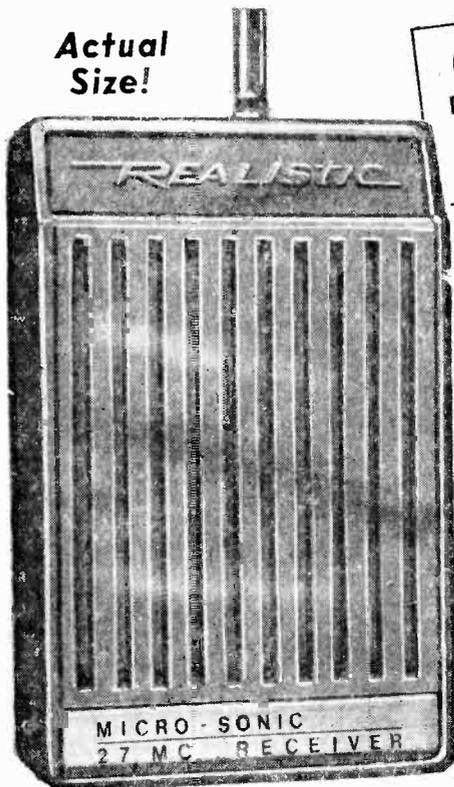
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ONLY
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21-109 Microsonic 27MC Receiver Only 7.95

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!

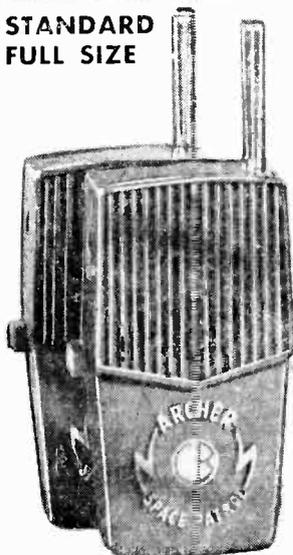
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 - Transmitter — 35" telescopic antenna
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STANDARD
FULL SIZE

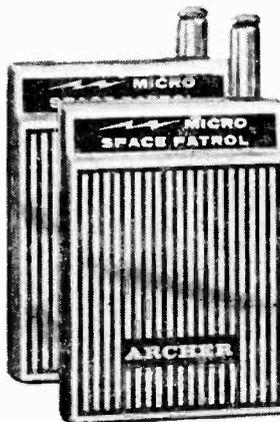


→ ARCHER → SPACE PATROL®

Talk up to $\frac{1}{4}$ 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.

1195
PER PAIR

→ ARCHER → MICRO SPACE PATROL®

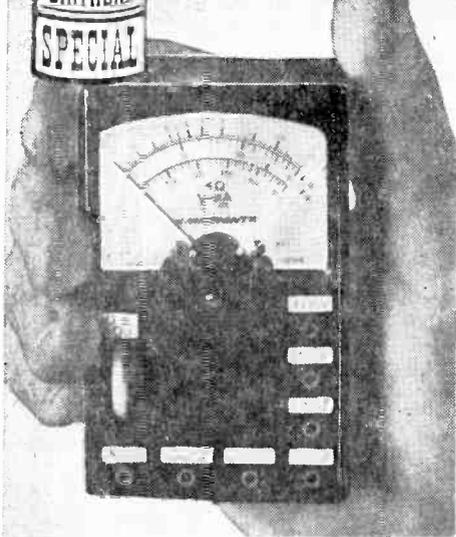


Double transformer talk-power in the world's smallest ($3\frac{5}{16} \times 2\frac{7}{16} \times 1\frac{1}{4}$ ") case. Fits easily in your shirt pocket (and your budget). Handsomely styled hi-impact, custom-chromed case. Easy to operate with a hideaway "push-to-talk" button. 9-section telescoping antenna. With channel 14 crystal and battery.

1495
PER PAIR

For Store Addresses, Order Form, See Page 20

RADIO SHACK
44th BIRTHDAY SPECIAL
MICRONA TEST EQUIPMENT
AVAILABLE ONLY AT RADIO SHACK



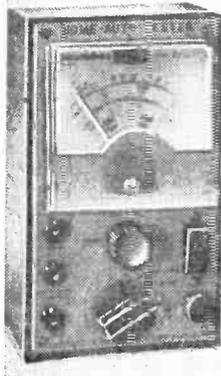
**1000 OHMS/VOLT
 POCKET AC/DC VOM**
 Regular: ~~\$5.95~~ **SALE! 3.95**

- Ultra Compact Size; Only 3 1/2" x 2 1/8" x 1"
- Convenient Thumb-Set Zero Adjustment

Pin jacks for 5 ranges. 2-color 1 3/4" meter scale. Reads AC or DC volts in 3 ranges: 0-5, 150, 1000V. DC Current: 0-150ma. Resistance: 0-100K ohms. Accuracy ±3% DC, ±4% AC. Bakelite case with test leads, instructions, batteries.

22-4027, Sh. wt. 1 lb. Net 3.95

HOME/AUTO TESTER



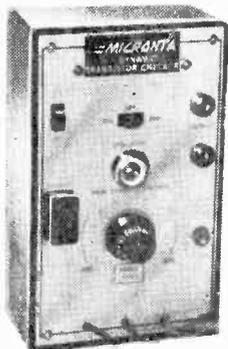
11.95 Factory Wired

- Checks Electrical Circuits in the Home or Garage!

Volt, ohm, ammeter, wattage and leakage checker; checks 6-12V batteries. 0-7.5/15/150/300V, 15 amps. Resistance 0-1000Ω. With leads, power cord. 6 1/4" x 3 3/4" x 2 1/8".

22-011, Wt. 3 lbs. 11.95

DYNAMIC TRANSISTOR CHECKER



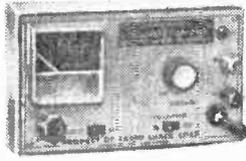
9.95

- Test Transistors "In" or "Out" of Circuit. Tests Low, Medium, High Power

Visual indication of electrode open & short circuits, current gain, GO/NO-GO test 5ma-50ma, clip leads for in circuit tests. 6 1/4 x 3 3/4 x 2 1/2".

22-024, Wt. 2 lbs. 9.95

TRANSISTORIZED REGULATED VARIABLE DC POWER SUPPLY

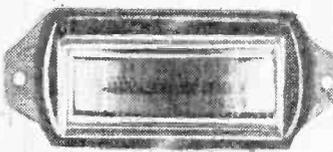


Reg. ~~\$16.95~~ **SALE! 13.44**

- 25% Ripple, 0-20 Volts, Current 0-200 ma

Continuously variable output of 0-20 VDC. 2 operating ranges deliver 0-20ma to 0-200ma. Meter reads output voltage and milliamps. 115 VAC @ 50/60 cy. Test leads. 4 7/8 x 2 3/4" x 2 3/4". 22-023, Sh. Wt. 4 lbs. Net 13.44

EDGEWISE PANEL METERS



1.99 up

- Moving Coil Type! 2% Accuracy!
- Compact! Easy-To-Read Scales!

Moving coil of 1 MA with zero adjust set screw. 2% accuracy, soldier lug terminals. 1 7/8" mounting hole centers. Size: 2 1/8" W x 1-7/16" D x 7/8" H.

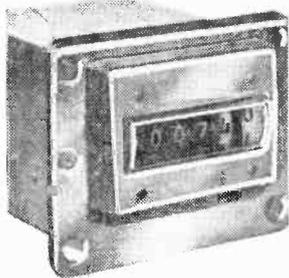
22-004, Signal Strength Net 1.99
 22-006, VU, -20 to +3 (0-100%) Net 2.50
 22-003, Balance & Tuning Meter Net 2.50

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SAVE BIG! ELECTRONIC PARTS NOW WAY OFF REGULAR PRICES

RUNNING TIME METER



Reg. ~~\$6.95~~ Sale Price **5.44**

• Records 0 to 9999.99 Hours!

Measures elapsed operating time of electronic equipment, transmitters, receivers, industrial machines, etc. Records running time in hours, tenths and hundredths. Operates either from 40 or 110/125 VAC, 60 cy., with external resistor (supplied). Synchronous motor drive. Size: 2 1/4 x 2 1/4 x 3 1/8".

273-1628, Sh. wt. 3 lbs. Net 5.44

500' OF HOOK-UP WIRE



Solid & Stranded **2.98**

Five 100-ft. coils, sizes #18 through #22. Cotton, vinyl insulation; different colors. 278-1484, Wt. 2 lbs. Net 2.93

75' MINI-SPEAKER WIRE



1.19

Place speaker away from amplifier. 2-conductor #24 wire. Plastic insulation.

278-1509, Sh. wt. 1/4 lbs. Net 1.19

6-FOOT LINE CORDS



39c

Feature #18 wire complete with molded plug. Ideal for home or shop! 278-1255, Sh. wt. 1/4 lb. Net .39

NUMERAL LAMPS



Orig. ~~1.44~~ **1.44**

Bayonet type socket with 11 interchangeable lenses. For 3/4" hole.

272-343, Sh. wt. 4 oz. Net 1.44

5-LB. ELECTRONIC MYSTERY BOX



1.98 Worth at Least \$25!

Hobbyist's delight! Assorted switches, resistors, capacitors, transformers.

270-496, Sh. wt. 5 1/2 lbs. Net 1.98

DPDT SWITCH Neutral Center

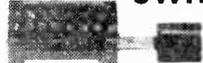


99c Pak of 2

Kit of two DPDT toggle switches with long bar handles. Heavy duty excellent for power circuits, PA systems, etc. Rated at 10 amps, 125 VAC. With on/off plate, screw terminals, and mounting nut.

275-1533, Sh. wt. 1/4 lb. Net .99

6-PDT PUSH BUTTON SWITCH



49c

Replacement switches for most walkie talkies. May also be used in circuits where momentary action is required. Size: 1x1 1/16x7/16". Shaft length, with knob: 3/4".

275-051, Sh. wt. 1/4 lb. Net .49

COAX CABLE CONNECTORS



278-200, PL-259 Net .59
278-201, SO-239 Net .50
278-1370, UG175/U, Adapter for RG58/U cable Net .16

FUSE HOLDERS



99c Kit of 6

Chassis mounting fuse holders for popular 1 1/4 x 1/4" fuses. 3 holders accept 2 fuses, and 3 take single fuse. Each equipped with snap-on dust cover.

270-337, Sh. wt. 1/4 lb. Net .99

COMPOSITION RESISTORS



1.99 Pak of 100

1/10, 1/2, 1, 2 watts. Many 5% and "Magnetic Film" types. Comes complete with free Color Code Chart.

271-810, 2 lbs. Kit of 100 Net 1.99

6.3 VOLT FILAMENT TRANSFORMER



1.19

Hundreds of applications! Input: 117 volts at 60 cy. Output: 6.3 volts at 1.2 amps. Tinned color-coded leads. Size: 1-15 16x1 1/4 x 9 1/16".

273-050, Sh. wt. 1 lb. Net 1.19

ARCHER

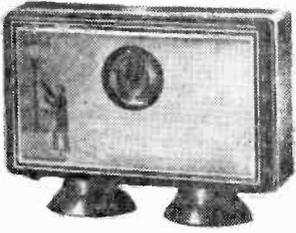
- Automatically Turns Light On at Dusk, Off at Dawn!
- Silent Guardian of Your Home or Office!

Reg. ~~\$5.95~~ Sale **4.44**

An electronic "eye" that automatically controls selected lights, turning them on at sunset, off at dawn, daily — without resetting. Ideal for controlling driveway lights, interior lights, displays. Size: 3 7/8 x 1 3/8 x 2 3/8".

275-1399, Sh. wt. 1 lb. Net 4.44

TWILIGHTER



Store Addresses, Order Form, See Page 20

24 VOLT POWER TRANSFORMER



1.98

Use for transistor, semi-conductor circuitry conversions, etc. Operates from primary 117V 60 cy. Secondary: 24 VAC 1.2 amps. Open frame. Size: 2x1-15/16x3-3/16".

273-1480, Sh. wt. 2 lbs. Net 1.98



SEMI CONDUCTORS FOR THE HOBBYIST



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: 2N177, 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

NPN TYPES

For mixer/oscillator converter circuits. Replaces: 2N193, 2N194/A, 2N211, 2N212, 2N235, 2N234, 2N357, 2N358.
276-408, Wt. 3 oz. 1.09

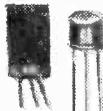
For universal IF amplifier circuits. Replaces: 2N98, 2N99, 2N100, 2N145, 2N146, 2N147, 2N148, 2N149, etc.
276-409, Wt. 3 oz. 1.15

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

Twin PAK "POP" SERIES

Popular PNP Types



- 5-2N107 Types
- 5-CK722 Types

Radio Shack Exclusive! Great for experimenters, hams, hobbyists . . . all audio applications. Complete with transistor base diagrams.

1.98

276-031, Wt. 3 oz. 1.98

Popular NPN Types



- 5-2N35 Types
- 5-2N170 Types

Big savings on NPN type transistors! Especially suited for audio applications. Great for hams, hobbyists! Includes transistor base diagram.

1.98

276-032, Wt. 3 oz. 1.98

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

IBM Component Boards



29¢

SAVE!

4 for 1.00

All quality American made parts; ideal for builder and hobbyist alike. 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 7/8".
276-616, Sh. wt. 1/4 lb. Net .29

Photo-Multiplier Power Transistor



1.98

Photo-sensitive cell, power transistor amplifier, electronic relay. Includes specs. and diagrams.

276-847, Wt. 1/4 lb. Net 1.98

750 MA Top Hat Rectifiers

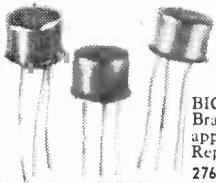


25¢ PAK of 2

From 50-1000 PIV

276-1107	50 PIV	Pak of 2	.25
276-1108	100 PIV	Pak of 2	.39
276-1109	200 PIV	Pak of 2	.59
276-1110	400 PIV	Pak of 2	.89
276-1111	600 PIV	Pak of 2	1.39
276-1112	800 PIV	Pak of 2	1.79
276-1113	1000 PIV	Pak of 2	1.98

ARCHER Twin-Pak Transistor Kit



1.98

Kit of 25 • 10 NPN • 15 PNP

BIGGEST BUY yet for the hobbyist or experimenter. Brand new . . . with full length leads. Ideal for RF applications, switching and general purpose audio types. Replace many popular numbers without circuit change.
276-1516, Ship. wt. 2 lbs. Net 1.98

3 Amp Silicon-Controlled Rectifiers



1.95

TO-66 Case! 200V

Designed to deliver loads up to 3 amps. Ideal for use in speed control operation, power converters.
276-1065 Net 1.95
276-1066, TO-66 mtg. hdwr.30

10 GERMANIUM DIODES

Similar to 1N34, 1N34A, 1N60

99¢



Equivalent in use to silicon diodes with lower forward voltage drop.
276-821, Ship. wt. 1/4 lb. Net .99

Transistor Sockets



99¢

Kit of 10

Takes PNP or NPN transistors with 3 contacts in line or triangle; complete with mounting plates. For every experimenter!
274-1510, Wt. 2 oz. Net .99

For Store Addresses, Order Form, See Page 20

ANY ARCHER-PAK ON THIS PAGE

\$1 PER PAK

Celebrating Our 44TH Anniversary



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 1/2, 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 nif 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: 3/8 x 3/8 x 1/2". 273-515, 1/4 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, 1/2 lb. Net 1.00

35 Miniature Resistors



World's smallest 1/4-watt carbon type resistors! All have axial leads; built for transistor and subminiature circuitry! Assorted values, with resistor color code chart. 271-1566, 1/2 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

45 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

35 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, 1/4 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, 1/2 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 sub-ouncer, mike, input types. Color coded leads. 273-1581, 1 lb. Net 1.00

\$25 SURPRISE PACKAGE!

Loaded with \$ **1** Parts!

The biggest surprise package yet! Enough electronics components to make your eyes pop! Resistors, capacitors, condensers, diodes... your guess is as good as ours. The famous-make parts are worth at least \$25.00! 270-1251, 1 lb. Net 1.00

50 Plugs and Sockets



Ideal bench assortment for servicemen, hams, etc. Subminiature and printed circuit types included! This assortment saves you \$10 over individual catalog prices! 274-1562, 1 lb. Net 1.00

30 2-Watt Resistors



These quality 2-watt resistors are non-inductive, magnetic film, carbon types. Many with 5% values. Made by famous-name manufacturers. 271-1211, 1/2 lb. Net 1.00

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Celebrating Our 44TH Anniversary

ANY
ARCHER-PAK
ON
THIS
PAGE

\$1
PER
PAK



4 Type 2N107 PNP Transistors

One of the most widely used transistors today for general audio use. Complete with base wiring diagram.
276-501, 1/2 lb. Net 1.00



6 Zener Rectifiers

Includes zener references! Ratings from 250MW-10 Watt. Stud, axial lead, upright types, assorted voltages; 1N429, 1N821, etc.
276-538, 1/2 lb. Net 1.00



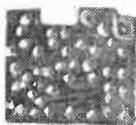
10 MAT High Frequency Transistors

Similar to 2N501 type PNP Freq. 30-180 MCS. Used in RF and switching circuits. Ideal for CB, Hams, and experimenters.
276-522, 1/2 lb. Net 1.00



4 100 Mc. NPN Planar Transistors

Similar to 2N1613, 2N-1893 and 2N2049. Made by Fairchild and Rheem. Rated at 700 MW. Vce 75; Hfe 40-120; 150 Ma; TO-18, TO-46 cases.
276-536, 1/2 lb. Net 1.00



8 Pre-Etched Boards

Assorted types of pre-punched boards ideal for transistor experiments, hobby work. Any path may be used.
276-1572 Net 1.00



5-10W PNP Power Transistor Pak

Ideal for the experimenter wanting higher wattage rating transistors. Types similar to 2N155.
276-527, 1 lb. Net 1.00



2 Silicon NPN 400 Mc. Planar Transistors

Excellent for VHF, switching and oscillator applications. Made by Sylvania. Similar to 2N-707-8, 360 MW; Vcb 15; Hfe 12-75; 10 Ma.
276-541, 1/2 lb. Net 1.00



5-6 Volt Zener Diodes

Rated at 1 watt. Gold plated. Long axial leads. Ideal for voltage regulated power supplies, transistor bias, etc.
276-518, 1/2 lb. Net 1.00



3 Coax Silicon Transistors

Similar to Hughes 2N1241-2N1243 type PNP. Used in audio and switching circuits Vcb 35 Hfe 30 Ic 10. Rated 1 watt.
276-550, 1/2 lb. Net 1.00



Pak of 8 PNP Switching Transistors

PNP includes TO-5, TO-22, cases. Similar to 2N1305, 2N394, 2N404. Frequency: 4 MC, 150MV, Vcb 10; Hfe 70, 10 Ma.
276-539, Sh. Wt. 1/2 lb. Net 1.00



25-Pc. Surprise Pak

Includes both PNP and NPN's Silicon and Germanium types. Assorted cases TO-5, TO-18, and TO-46. Ideal assortment for the experimenter.
276-524, 1 lb. Net 1.00



3 Silicon 100MC 2W Transistors

PNP type TO-5 case. Similar to 2N1132, 2N2104 and 2N2303 types. Ideal for high frequency work. Vcb 60 Hfe 40-120.
276-523, 1/2 lb. Net 1.00



Pak of 8 NPN Switching Transistors

NPN Type; Similar to 2N333, 2N336-337, Specifications as above. With diagram.
276-540, Ship. Wt. 1/2 lb. Net 1.00



25 Germanium Diode Surprise Pak

Used in computer switching and general experimental use. Long axial leads. Ideal for experimenter and builder.
276-519, 1/4 lb. Net 1.00



3 RF Silicon Transistors

NPN type — similar to 2N790-2N792, 2N1150 and 2N170 types. Rated at 150 MW, Freq. 13 MC. Vcb 45. MA 22; TO-22 case.
276-528, 1/2 lb. Net 1.00



10 Popular PNP and NPN Transistors

Includes most popular types: CK-722, 2N35, 2N107, 2N440, and 2N335. Invaluable to experimenters and hobbyists.
276-510, 1/2 lb. Net 1.00



20 Top Hat Rectifier Pak

Some up to 1 AMP. Flangless types too! Assorted voltages and current. Long leads. Each Pak a real surprise!
276-520, 1 lb. Net 1.00



3 PNP High Power Transistors

Rating: 10-40 W. Similar to 2N155, 255, 2N1320, 2N1504. Top quality manufacturer. Includes cases TO-3, TO-10, TO-13.
276-529, 1/2 lb. Net 1.00



25 250MW Silicon Zener Diodes

Glass miniature diodes in assorted voltages. Long axial leads. Excellent for transistor power supply regulation.
276-521, 1/2 lb. Net 1.00



New! 4-Micro Silicon Epoxy Rectifier

Rated at 1 amp a 400 PIV. Mfg. by GE Long axial leads. Ideal for micro miniature circuitry where space is a factor.
276-549, 1/2 lb. Net 1.00

New! 6 NPN and PNP Micro-Transistors

Both silicon and planars with T and T-46 cases. Similar to T-706, 2N995, 2N834, 2N2357. Frequency: to 200 MC. Wiring diagram.
276-542, 1/2 lb. Net 1.00

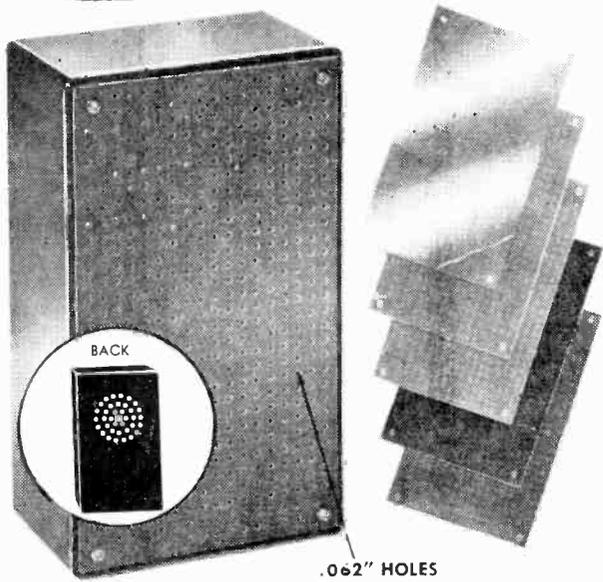
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RADIO-TV EXPERIMENTER



Ingenious New Radio Shack PERFBOX™ "Professionalizes" Project Building!

The bloody-knuckle brigade will appreciate
Radio Shack's effort to eliminate chassis
cutting and drilling, and make things prettier!

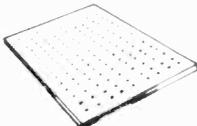


.062" HOLES

Somebody at "The Shack"—thank heaven!—must hate metal chassis and the generally sloppy look of breadboard projects. Now they've come up with a bakelite chassis box into which they've installed (4 screws) a 3½" x 6" perfboard top. But that's not all—the back of the box is pre-drilled for a 2¼" or other PM speaker, and there's a pre-drilled ¼" outlet hole on one side! This much-needed item is called the Radio Shack Experimenter's PERFBOX™. (Cat. No. 270-097, price \$1.69) and should sell like film at Expo 67. As an added fillip, there's a companion deal they call Radio Shack Experimenter's 5-Piece Panel Set, consisting of 3 perfboards and 1 aluminum and 1 bakelite panel board, all 3¼"x6" predrilled to fit the PERFBOX™. The latter two boards are un-perfed (to coin a word), and the 5-piece set (Cat. No. 270-100, price \$1.69) should answer just about any need for extending the usefulness of the PERFBOX short of filling it with champagne!

RECOMMENDED PARTS FOR USE IN PERFBOX PROJECTS

DESIGN, CONSTRUCT YOUR OWN CIRCUITS . . . using these time-saving phenolic boards, breadboard or permanent type. 3/32" holes punched on 0.265" centers. Can be sawed. Shipping weight 1 lb.

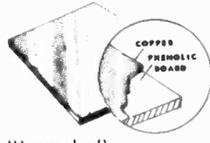


Punched

UNCLAD PERF-BOARD

- Accepts Miniature Components!
- Easy-In, Easy-Out Mounting!
- Ideal for Modular Construction!

276-1582, 3.65x6.87x1/16" Net .59
276-1583, 6.87x9.8x1/16" Net 1.15

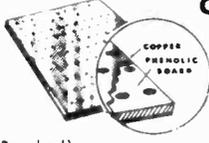


(Unpunched)

COPPER-CLAD SOLID BOARD

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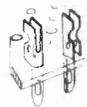
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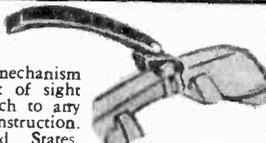
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POSITIVE FEEDBACK

JULIAN M. SIENKIEWICZ, EDITOR

■ 1967 has been a year for disastrous earthquakes. Almost every newspaper headlined the disasters afflicting regions in Turkey and Venezuela. Many lives were lost and millions of dollars worth of damage sapped the economy of these countries. So great were the quakes that one which struck the western Pyrenees went practically unnoticed by the North American press despite the destruction of the French village of Arette and two hamlets, leaving over 1,000 people homeless.

These disasters raise again the question of how we can learn more about the mechanism causing these violent geological upheavals and so, perhaps, warn people of impending danger.

It is a difficult task for a number of reasons. But over the past few years, the science of seismology has undergone something of a revolution following the development of extremely sensitive and powerful methods of monitoring the continuous major and minor rumblings of the earth's crust.

Already a great deal is known about earthquakes. For example, nearly all of them occur within two well-defined zones of the globe. These are the most recent belts of mountain-building activity which form irregular rings enclosing more stable regions of the earth's surface.

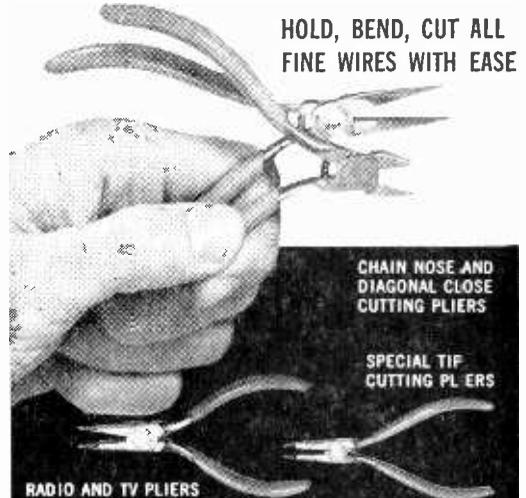
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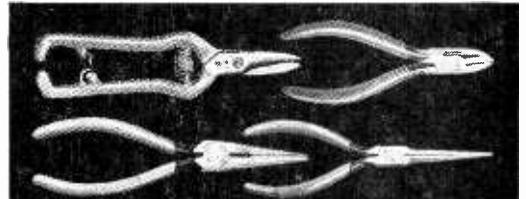
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The Venezuelan tremors of July 29 and 31, which left behind a sad toll of more than 300 dead, 1,600 injured in Caracas and the port of La Guaiava, happened somewhere near the mid-point of the Great Cordilleran Mountain Belt which itself forms part of the much larger circum-Pacific belt of mountains and earthquakes. Caracas lies at the point where part of the belt, the Caribbean Loop, curves back into the South American Continent.

Recent oceanographic research has now provided strong evidence that the floor of the Pacific—and those of other oceans—is slowly spreading (see "Continents on the Move," RADIO-TV EXPERIMENTER, April/May 1967). This very stiff flow, continued beneath the edges of the bordering continents, sets up drag forces which crumple up mountains and produce intense stresses in the overlying crustal rocks. It is when these finally become too great for the rocks to sustain that breaks occur in the rock formations accompanied by the vibrations we recognize as earthquakes. Similar mechanisms are at work beneath the second of the world's great mountain belts, the Mediterranean-Trans-Asiatic Zone, running from the Pyrenees through the Alps, Causasus and Himalayas and down to the East Indies.

The tremor that destroyed Arette occurred within this zone. Turkey, too, is unfortunate to lie in this zone and the earthquakes of July 22, 23, and 30, centered on the city of Adapazari, 90 miles east of Istanbul, caused over 200 deaths.

Unfortunately these crustal catastrophes reveal very little of their intentions beforehand. Some, it is true, are preceded by so-called foreshocks, but not at any substantial interval of time before the main earthquake arrives. What does occur beforehand is a long and slow build-up of stress in the crustal rocks. But this state of tension is an exceedingly difficult thing to measure directly. Because most rocks are extremely rigid, the stress causes a minimal amount of deformation. Unlike a piece of wood which bends before it snaps, the strata give very little indication that they are about to rupture.

Any attempt to place measuring instruments within the rocks is thwarted because placing them there, by drilling for instance, relieves the tension at that point. Some attempts are being made—for example along the Great San Andreas Fault in California—to measure the minute surface distortion directly with sensitive optical techniques. But such methods can only work at sites where successive crustal movements are known to recur. Failing stress measurements as a means of predicting earthquakes, the only alternative left is to try to make some sense out of the overall patterns of crustal disturbance.

In fact the earth's crust is in a continuous state of grumbling activity, though most of the

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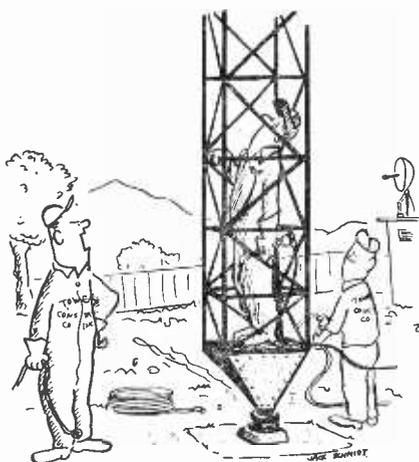
POSITIVE FEEDBACK

vibrations—microseisms as they are termed—are very tiny. In addition to having their origin in geological processes occurring at depth, similar signals are produced by sea waves pounding the coast, by man-made explosions, by the wind in the trees and by railways and traffic. All these form a confusing jumble of "noise." Is it possible to distinguish them one from another and, perhaps, pick out some diagnostic rumbling which foretells an earthquake on the way?

Not enough is known about these more feeble signals to tell whether such seismic signs even exist. But thanks to the need to develop instruments capable of distinguishing clandestine underground nuclear tests from natural earthquakes, we now have at least the tools that can enable us to study the microseismic world and gain new insight into it.

Since the Geneva committee of 1958 on the banning of nuclear tests, seismologists and instrument experts in southern England have been working to perfect equipment which will detect and identify the smallest underground nuclear explosions. The detection system chosen—one that had been used before only in a limited fashion by oil exploration companies—was that of the seismometer array. Instead of using single seismometers—instruments in which ground tremors transmitted to a sprung weight are measured electrically—arrays were built several tens of miles in extent in which 20 or 30 seismometers were spaced at equal intervals along two arms at right angles.

The underlying idea of such a system is that while distant signals will arrive at each instrument in turn with an appropriate time lag, there will be no such regularity about local disturb-



"How can a guy with seven years experience weld himself inside a six hundred foot tower?"

ances. By taking all the records from all the instruments and adding them together with suitable time adjustments, the record of the distant event is enhanced at the expense of the local ones. Computers can do the job rapidly and accurately.

In other words, an array acts as a filter. Moreover, by using suitable electronics to alter the time lag of recordings between each instrument, the array can be "tuned" to respond to seismic waves of a given kind. Experimental arrays of this type now exists at Eskdalemuir, Scotland; at Yellowknife, Canada; at Tennant Creek, Australia; and at Jauribidanur, India. They are capable of detecting some of the smallest earthquakes occurring at any point on the globe. However, the total effort is only the first step in a soon-to-be worldwide research program. In a decade we will look upon this *crude* beginning and wonder why we desisted so long.

Who's for Dinner? All my readers should know Hal by now. He's the joker that'll twist any situation into a backdrop for one of his math teasers. For example, as the light comes up on our little drama, we see four happily married couples enjoying a delightful Chinese dinner. However, the table is a bit cramped because a single has joined the group. Yep, you're right! The single is Hal, and the four couples include my wife and myself plus some friends. Hal met us in the movie theater and tagged along for what he hoped would be a free meal. No one complained about the free loader until he decided to entertain us with a small problem he conjured up while cleaning some *egg foo yong* off his lapels.

Hal began, "Nine men found themselves captives of Chinese pirates who had picked up some strange customs from East Indian natives. The captives were first seated in a straight line in front of the chief pirate. They were then asked to join a feast of feasts.

"A huge pirate who made Mr. Clean look like

an infant with a full set of teeth stood behind the first diner on the extreme left and counted heads until he reached the seventh diner. This captive was invited to sample some exotic dish in the kitchen—not realizing the dish would be *him*, served in wine sauce to the boys in the back hut. The yellow giant would resume the head count with the next diner, again selecting the seventh head. He would return to the extreme left of the table when he came to the last diner at the table's extreme right in order to continue the count.

"This every-seventh-head elimination procedure continued until there was only one person left. The last diner was offered to join the pineapple tidbits dessert being prepared in the kitchen or romance the night away with a beautiful Oriental wench and gain his freedom." (I was surprised with Hal's vivid description of the girl until I realized he was actually giving a rundown on the pretty young thing tending the cash register.)

"Now," Hal continued, "if you were one of the captives and knew the strange habits of these Chinese bandits, where would you sit? Would it be on seat 1 on the extreme left? Or would it be seat 2, or 3, or . . . up to seat 9 on the extreme right?"

Conceivably, it could be quite easy to determine the best seat at the table if pencil and paper were used. However, Hal would have none of that, nor would he tolerate any finger pointing or counting. The penalty for taking a short cut to the answer would certainly be a dash of soy sauce as Hal promised, and everyone knows Hal has no normal human restraint. So, dear reader, why should you be better off than me? See if you can do the problem in your head the first time—you get only one guess because Chinese pirates do not repeat.

I'll let you know next issue which seat you should sit in and what seat I sat in. So set up your pup tent along side your favorite newsstand and start munching candy bars till the next issue comes your way.

Last Issue's Puzzler

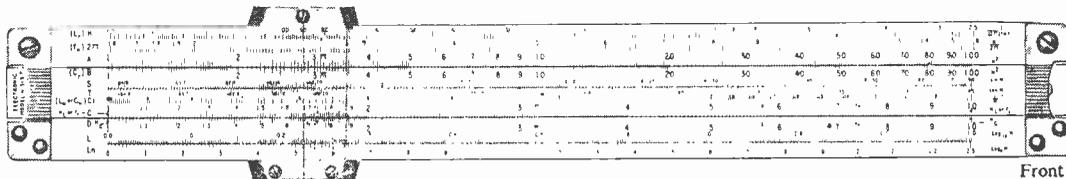
It's easy to guess the birthday. The calculations you ask an unsuspecting person to perform are actually loaded. In a roundabout way the person doing the calculations multiplies the month number by 100 and adds the actual date. Hence, since I was born on June 27th, the calculated number should be 627. Now, anyone clever enough to do the computations asked of him will recognize *that* number, so the calculations are geared to add in the number 165. Hence, after performing the calculations given in the last issue, I came to the number 792. Hal subtracted 165 in his head and came up with my birthday. It's easy as one-six-five!

Kick in the Head. From time to time, interesting letters cross the Editor's desk, some praising our mag and others—well, you might call them a *kick in the head*. Tommy Kneitel, a well-known author and a very good friend of this editor (and, I might point out, an Editor in his own right), took exception to an article by C. M. Stanbury II in our last issue. But, why should I explain; let Tommy's letter do it!

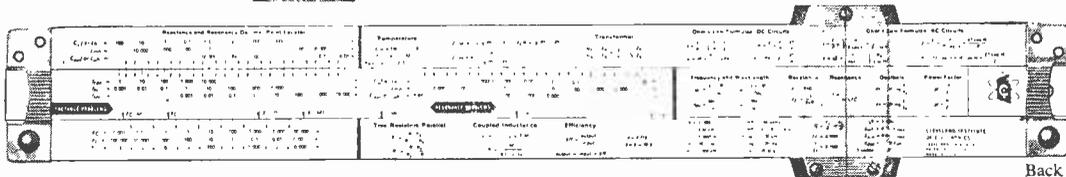
Dear Mr. Sienkiewicz,
I seldom write letters to Editors; you people are a bad lot in general (what about you, T.K.?) and hardly worth venting any of my valuable anger on. As you can imagine, this time you must have really rung the gong, for a letter is most certainly in order. You recently ran a story about clandestine radio broadcasters (DX Crooks And Clandestines, Oct.-

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Front



Back

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Positive Feedback

Nov. '67 RADIO-TV EXPERIMENTER) and your author (C. M. Stanbury II) went off into orbit about how, after their transmitter fire on April 9, 1967, WNYW, Radio New York Worldwide, broadcast temporarily from a "secret location." Much ado was made in your article about why the FCC could permit such a thing, how the station has possible CIA ties, and other such childish bilge. Unfortunately, Mr. Stanbury has a severe case of *CIA Syndrome*. I'm sure that he sees a sinister CIA plot on any given subject ranging from the American Revolution to aardvark breeding.

In actual fact, there was no "secret location" involved. The plain and simple story is that when WNYW burned down they were offered the loan of equipment from station KGEI. They decided against this and were even considering renting or buying outright the transmitter of shortwave station WINB in Red Lion, Pa. They finally decided to purchase time on commercial point-to-point transmitters for their programs. An arrangement was made with RCA for the use of 10-, 20-, and 50-kw transmitters in Riverhead, N. Y., and with IT&T for similar transmitters in Brentwood, N. Y. Special authorization was obtained from the FCC for these point-to-point transmitters to temporarily operate within SWBC bands.

Within two months, Radio New York Worldwide had obtained three Gates transmitters (10, 20, 50 kw) of their own and a 50-kw Continental transmitter. They use these while awaiting 100-kw transmitters; the plan is to return the 10-kw unit to Gates for credit, use the 20-kw transmitter to drive one of the 100-kw transmitters, and keep the two 50-kw units on the air. The station is considering the use of 250-kw transmitters from their new New Jersey site.

Most DXers feel that Stanbury holds the unchallenged Olympic record for jumping to conclusions, but this time he really flipped his gourd. Does he actually believe all of his speculations, does he do it because he feels that a bit of fiction peppers-up what might otherwise be a dull story, is he just putting us on, or is it that he doesn't know how to research an article?

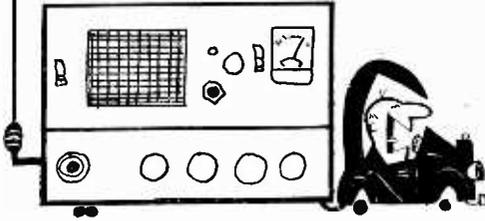
Oh well, maybe CIA (Cunningly Imaginative Author) was involved after all.

Your for better facts.
Tom Kneitel, K2AES

Now, this editor does not want to take sides. Goofs and errors pop up in the best of magazines, and everyone knows the old saying, "Best intentions pave the road to QRM" or something like that. Kneitel and Stanbury (order does not indicate rank) are two of the finest shortwave authors in mag biz today. So, when one pops off at another, I just stand back and watch the fun.

Beer Can Report. In previous issues of RADIO-TV EXPERIMENTER and ELEMENTARY ELECTRONICS I have asked readers to mail beer cans to the FCC in protest to a recent Part 15 action. Well, readers sent beer cans to me—indicating they agree with the FCC. Frankly, it has been an education. For example, did you know there are beers named Burgermeister, Colt 45, Coors, Hamm's, Lucky Lager, and Olympia? Oh well, more next issue. ■

CB RIGS & RIGMAROLE

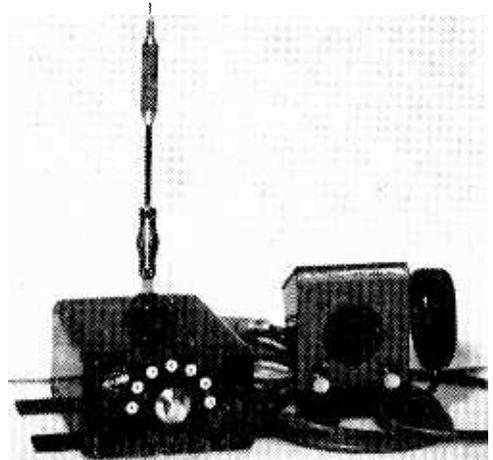


Motorcycle Megacycles. Scooting down the highway on two wheels can be fine and dandy if that kind of goings on is your cup of tea—it isn't ours. And, you can add a spot of lemon to the tea by adding a CB rig to your bike. Sure, we've all seen CB rigs mounted on motorcycles, but this is the first time a rig has been specially designed for motorcycle installation.

The rig is the Poly Otter and it's from Polytronics Communications, Box 536, Baltimore, Md. 21203. This is a seven-channel CB unit

with all crystals supplied, contained in a weather-proof black enamel aluminum case. Bottom mounting brackets let you bolt the set to your luggage rack (just like the fuzz radios) and a remote control head mounts on the handlebars.

Antenna for the Otter is where it *otter* be



Polytronics Poly Otter Motorcycle Rig

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CB RIGS & RIGMAROLE

(sorry about that), right atop the transceiver; this makes for a more efficient transfer of signal from the rig to the antenna and also eliminates part of the installation chore since it's already in place. An inverter is available which will permit the Otter to utter on 6-volt cycles. The tab is only \$199.50 for the Otter.

Gee, It's a G. E.! Yes, General Electric, which may be a trifle unimaginative in the art of giving fancy model names to their CB gear, has come up with a unit known as the Model Y7050 transceiver. Actually, this is a "high powered" walkie-



General Electric Y7050 Walkie-Talkie

talkie which is credited with having a range of "up to 10 miles." G. E. doesn't say the actual RF wattage input or output other than to report that it is "greater than 1/10 watt" and requires a CB license.

Tipping the scales at about a pound and a half, the Y7050 can come alive with either penlight batteries, or with accessories which permit operation with rechargeable batteries, a 12-volt storage battery, an auto cigarette lighter, or even house current. Operation is on Channels 11 and 16. Signals are flung into the great beyond by means of a 51-inch telescoping whip.

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(Continued on page 136)

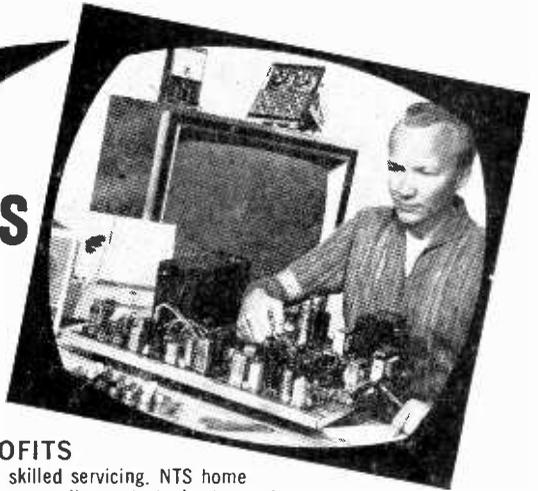
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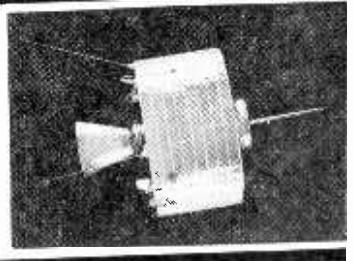
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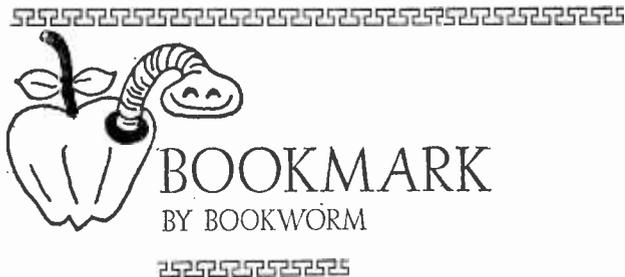
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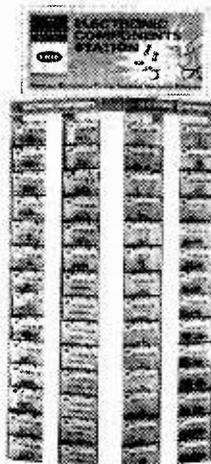
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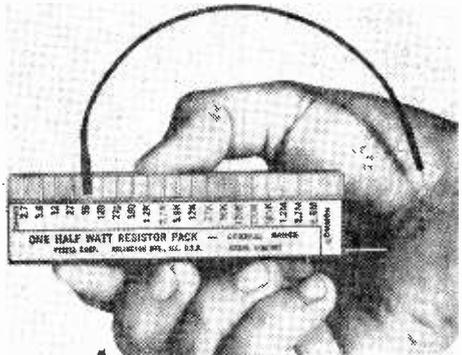
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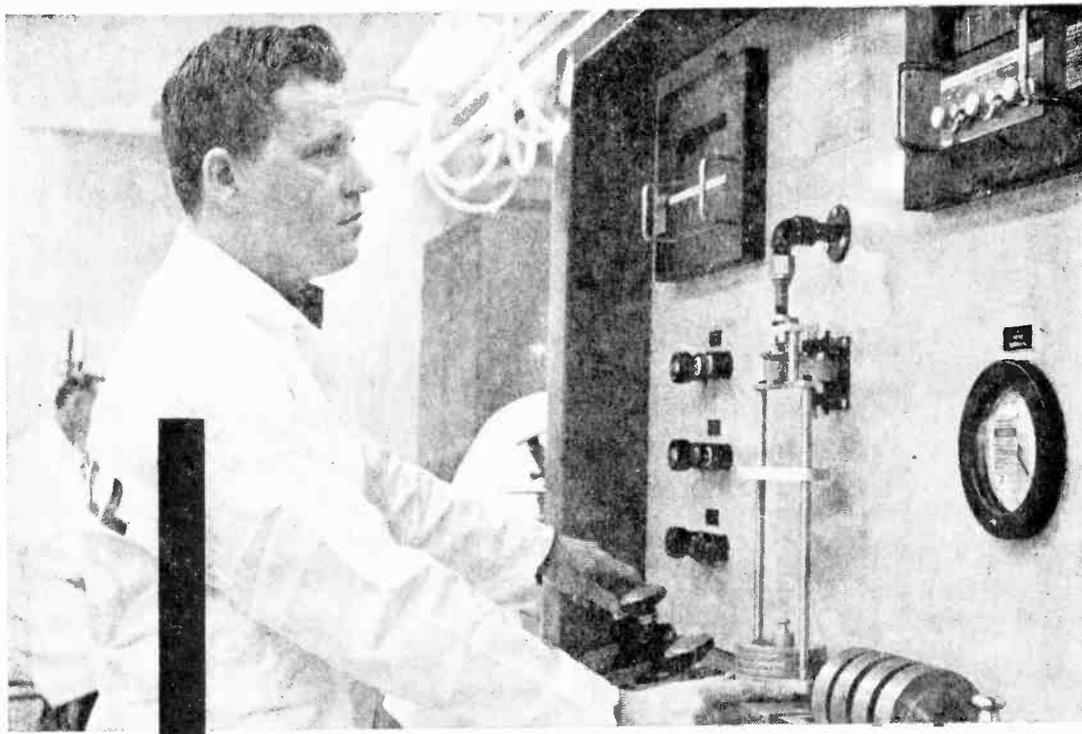
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networks. The Resistor Pack includes twenty 1/2-watt, 10% resistors, each with one lead connected to a common bus. The other lead is available for use with the push-on connector assembly furnished with the Pack, or with standard miniature clip leads. Construction allows visual inspection of resistor condition without disassembly through the clear thermoplastic housing. The Resistor Pack comes in three re-

(Continued on page 131)



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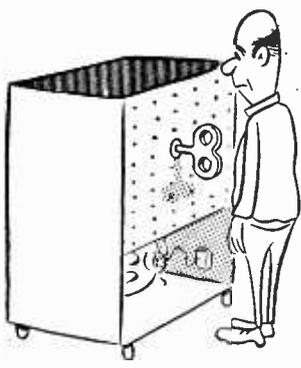
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Radio Heaven Maybe

I'm an SWL and tune in mostly on 25 meters. There, I occasionally hear a sound that might be produced by trumpets and a French horn. It is of about three bars duration and repeats itself indefinitely. What is it?

—M. G. Z., McKeesport, Pa.

We don't know, but why don't you write lyrics for it—it just might make the top-ten. Can our readers help us out?

FM Is Not AM

Please tell me how to modify my FM receiver front end to extend its range from 108 MHz to about 122 MHz.

—L. J. H., Chattanooga, Tenn.

While it could be done, you wouldn't benefit since there are no FM stations up there, only AM aviation stations—which your set would not demodulate.

Wasted Watts

I have an old TV set that was given to me which I use only as a phono amplifier. I would like to make it more compact by eliminating the picture tube. However, I learned that it is in series with the rest of the set and the amplifier section won't function without it. Can I replace the tube with something smaller and still use the set as a phono amplifier.

R. T., Harrisburg, Pa.

You're burning up a lot of kilowatt-hours of power running a whole TV set and making use of only two or three of its tubes as a phono amplifier. If the set draws 160 watts and you get one watt of audio out, you've got a mighty inefficient lash up. Since you can buy a comparable amplifier in kit form

for as little as \$10.95, why don't you have the trashman take away that old TV set?

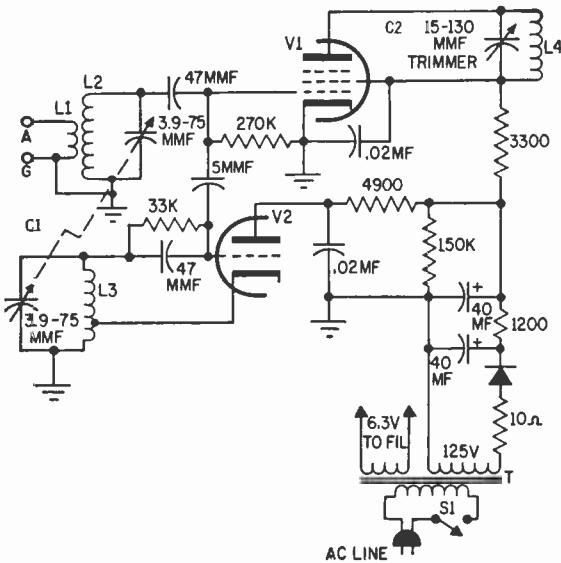
Shortwave Converter

I have a Zenith AM radio. Can you give me a circuit for a shortwave converter to use with it?

—R. A. R., Hayward, Calif.

You can use a separate pentode (V1) and a triode (V2) or a combination pentode-triode tube such as the 6GH8 connected as shown in the diagram. Coils L1 and L2 are wound on the same plug-in coil form. Coil L3 is also a plug-in coil. You'll have to wind your own or select non-plug-in coils for the shortwave bands you want to cover from a J. W. Miller catalog. Radio parts stores in Oakland and San Francisco should have the catalog and many of the coils.

Coil L4 is a BCB loop antenna which should be placed close to your AM radio, assuming it too uses a loop. Set the radio to a clear spot on the dial around 1500 kHz. Tune in shortwave stations with C2 and adjust C1 for best reception.



CCTV with Sound

Is it legal to have sound with my closed-circuit TV camera? If so, could my camera be converted? Or, could I use one of the new FM wireless microphones converted to operate on TV Channel 6?

—M. F., Prescott, Ariz.

Write to the TV camera manufacturer and ask if they have a sound modulator for use with your camera. Sylvania and others make them. It is simply an FM transmitter which is fed directly to a TV set. The new FM wireless microphones operate in the 88-108 MHz FM broadcast band and may not be lawfully used if modified for one of the TV channels. You could use one if you use an FM receiver to

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can't pick up 2-3 MHz band marine signals with present antennas.

—A. A., Rochester, Minn.

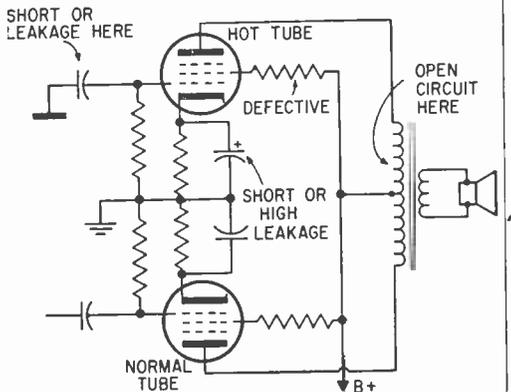
You're about 150 miles from the Great Lakes but not too far from the Mississippi. You should be able to receive marine signals at night, but not necessarily in the daytime when range is limited to about 50 miles over water, and there is land to cross. For all but CB, use a long wire antenna and a ground. For CB, use a 9-foot vertical wire or regular CB antenna.

Not So Hot

My stereo receiver uses four EL95 tubes. After 15 minutes of operation the plate of one of the tubes glows orange and gets very hot. Any tube in the same socket does the same. The set sounds O.K. Is this normal?

—T. W., Calumet City, Illinois

There probably is distortion in one of the stereo channels and you're not noticing it if there is a defect in your receiver. It could be a leaky coupling capacitor which allows positive DC to reach the grid of one of the tubes (see diagram), causing it to draw excessive plate current. It is possible that the screen of the affected tube is glowing instead of the plate. This would happen if one side of the output transformer is open, as shown in the diagram.



So You're the One!

I own a Sibley AF-950 receiver. It covers the AM, FM and SW (4-12 MHz) band. When I tune in the FM band on certain frequencies (104-105 MHz) my favorite television and the family's TV picture and sound just go off on Channel 9. Is there anything wrong with the radio receiver?

—A. S., Chicago, Ill.

Sounds like the trouble is caused by radiation from your receiver's local oscillator. Move it further away from the TV sets. Also, think of using a coax TV antenna lead-in. Frankly, there may be something wrong with your TV antenna and lead-in wire. Check it today! ■

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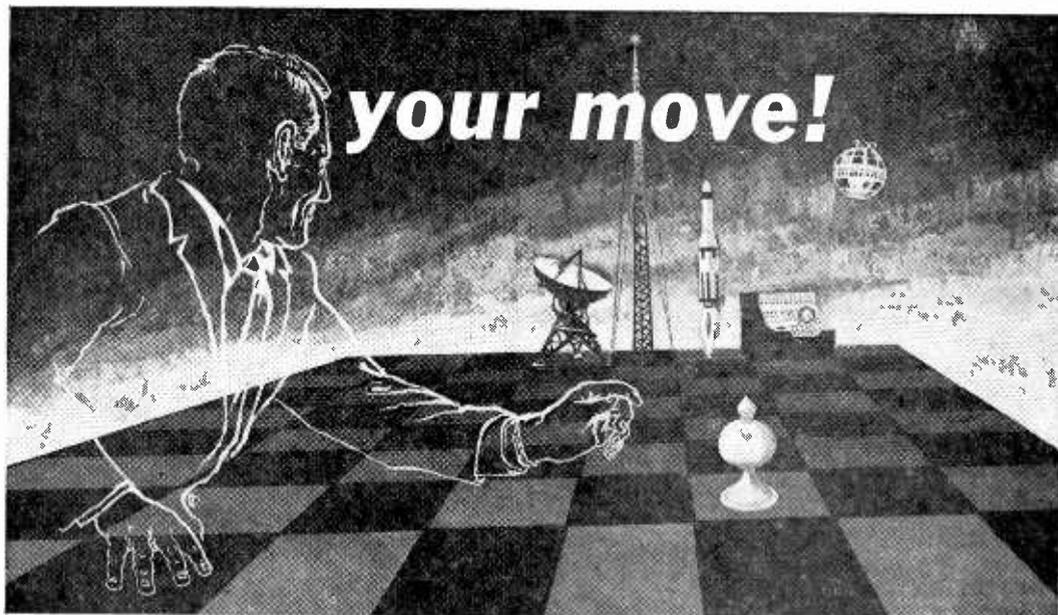
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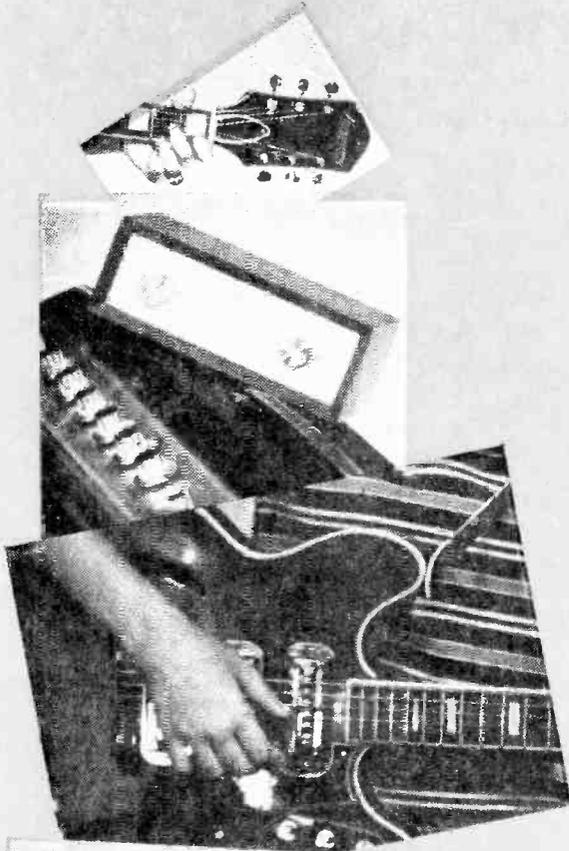
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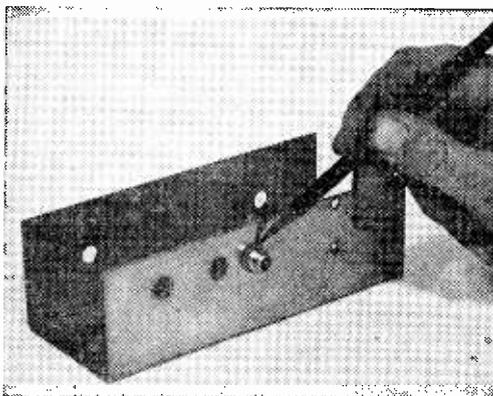


Hottest item going these days for the in-crowd guitar pickers is Olson Electronics' RA-844, a twenty buck add-on reverberation device that can make a twenty-dollar amplifier (or even your hi-fi amp) sound like a \$200 guitar amplifier. You simply plug the electric guitar to the RA-844's input jack, connect the reverb amp to the guitar amp (or the hi-fi), and you can make the guitar sound like it's at the bottom of a five-story cavern.

Or, if you don't go for overpowering echo, you can add just a smidgen of reverb to make the overall sound very bright (like they do down at the local radio station.)

(Continued overleaf)

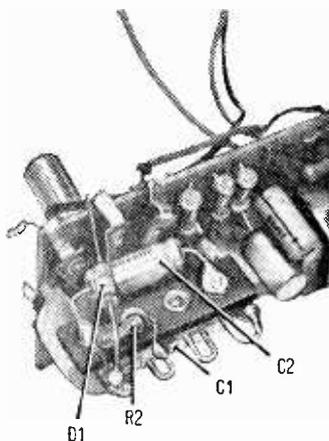
REVERB



After the reverb unit has been disassembled, the keying jack hole is drilled and the jack installed. Note that the jack is insulated from chassis with fiber washers.

You can even use the RA-844 reverb amp with a dynamic mike to put a little pizzazz on a vocalist.

Few Bucks, Big Buy. Sound like a great buy for twenty bucks? You're right, it is; that's why it's so big with the in-crowd. Only problem is that the reverb amp cannot be keyed in and out while playing. If you want to change back and forth from reverb to "dead strings," you have to stop playing and shut down the depth (reverb) control. But if you're willing to go for a few extra dollars and about an hour's work, you can



All components of the keying circuit mount on a 4-lug terminal strip which is soldered to the back of the depth control.

add a switch (keying) jack to the reverb amp so it can be keyed in and out with a foot switch as you play.

The foot switch modification for the reverb amp is shown in the schematic. The components to be added are shown in the dotted line. The reverb amp components show only the parts value. To understand what the modification does, let's take a quick run through the circuit of the basic reverb amplifier itself.

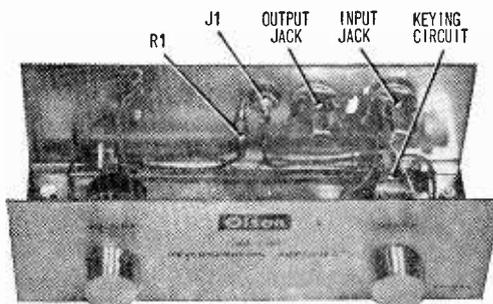
The guitar pickup feeds into the input jack—its level controlled by the 10K volume control—and is amplified by transistor Q1. The unmodified (no reverb) signal is tapped off Q1's collector through a capacitor and the 470K resistor, and is again amplified by Q4. (The loss through the 470K resistor compensates for Q4's gain.) The guitar's signal is then fed to the output jack—which is connected to the guitar amplifier's input jack.

Springy Sound. Now go back to Q1's collector. Note that the guitar's signal is also fed through the transformer and is amplified by the push-pull amplifier (Q2 and Q3) and is then fed to the reverb unit. The heart of the reverb unit is a spring that literally *bounces* the signal back and forth, just like the echoes in a canyon (when you holler hello-o-o-o).

The output from the reverb unit—which now consists of "echoes," or reverberation—is fed through the *Depth Control* into Q4, where it mixes with the direct guitar signal.

When the *Depth Control* is closed, only the direct guitar signal passes through Q4 and there is no reverberation. As the depth control is advanced and more reverb signal is mixed with the direct sound, the total effect at the output jack varies from no reverb, to slight "liveness," to cavernous reverberation.

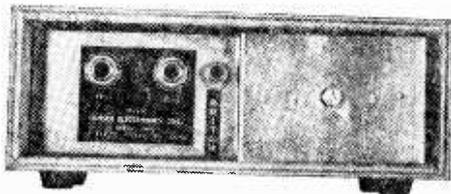
The Keying Circuit. If one attempted to



Completed modification of the Olson reverberation amplifier. R1 is soldered directly to the keying control jack.

REVERB

line along the edge of the input and output jack's trim plate and the edge of the battery holder. Drill a 9/16-in. hole exactly midway between the two lines (there is virtually no extra clearance so make certain the hole is centered before you drill). Install a single-mounting-nut type phono jack in the hole.

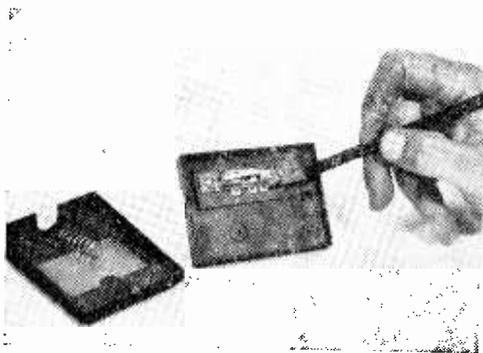


Rear view of completed modification showing keying control jack where foot switch is plugged in.

Be sure it is insulated from the chassis with shoulder washers.

Thoroughly clean the back of the depth control with some kind of contact cleaner, or radio-cement solvent, and solder a small terminal strip to the back of the depth control as shown in the photographs. The control cover will not take solder if it is not thoroughly clean. If possible, use a miniature terminal strip as supplied in the Allied Radio Terminal Strip Kit.

Install C1, C2, R2 and D1 on the strip as shown in the photographs. We used very small 300- μ F capacitors to keep things neat; these capacitors as specified in the parts list are somewhat expensive. You can, if you want to cut costs, substitute any cheap capaci-



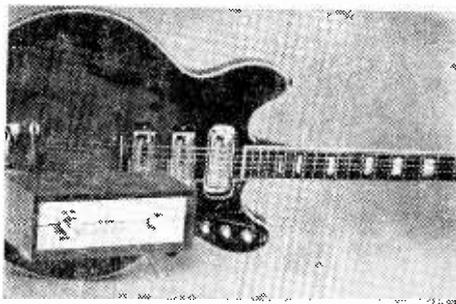
Foot switch is disassembled so cable and plug can be attached. Be sure to connect cable to the right two contacts.

tor as long as the voltage rating is three volts or more. In addition, C1 and C2 can be reduced to 100 μ F, though the keying thump will be somewhat louder than with the bigger capacitors.

Finally, connect a 10-in. wire to the circuit-side power terminal on the volume control and re-assemble the reverb amp.

Cut the 10-in. lead just long enough to reach jack J1 and connect R1 between the jack (either terminal) and the lead; insulate the R1/wire joint with tape or spaghetti. Connect the remaining J1 terminal to the C1-R2 junction. Make certain the leads to J1 do not interfere with the reverb unit's spring.

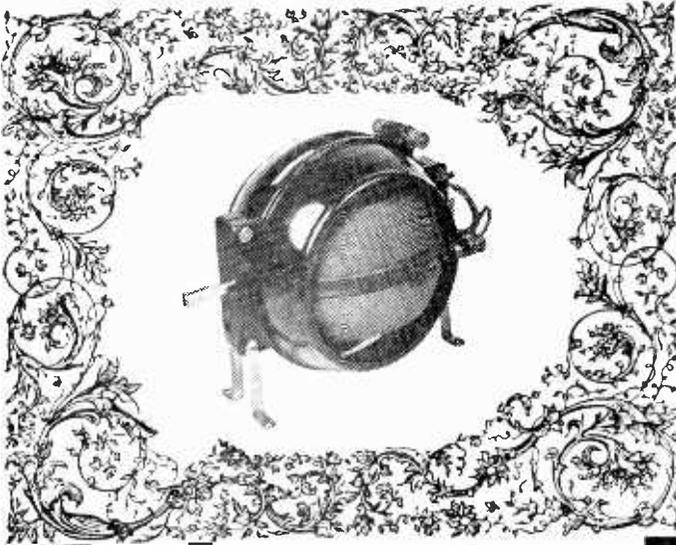
Switching Feet. We suggest the foot switch listed as it's inexpensive, though just about any switch will work. Disassemble the foot switch and connect a length of ordinary lamp cord (or any two conductor cord) to the two switching terminals. The switch has s.p.d.t. terminals, so make certain you select



With the modification finished and the reverb amp plugged into guitar and amplifier, you're ready to make with the great wild sounds of the seventies.

the right two—check for the right ones by having a close look or with an ohmmeter. Now, to finish up the job, connect a phono plug to the free end of the lamp cord being careful not to melt the cord insulation when soldering and causing a short circuit.

Connect the switch to J1, the guitar to the input jack, and the guitar amp to the output jack. Key the switch so the reverb effect is off and adjust the guitar, reverb volume, and amplifier volume controls for desired sound level; then key the echo effect in and adjust the depth control for the desired reverb effect. As you play, you can key the reverb effect in-and-out as desired. Try St. Louis Blues or Kansas City with reverb. Man, it's the greatest! ■



The variometer may be gone, but it's not forgotten; here's how to make your own version of this novel device.

By
Art
Trauffer

Variometer Radio

■ Meet the variometer, an efficient variable-inductance commonly used in crystal and tube radios in the early '20s. The variometer opens up a new field of experimentation for modern hobbyists, although it is no stranger to old-timers in radio.

The photo shows one of the many factory-made variometers which were popular in the early '20s. It is simply a movable coil which rotates inside a stationary coil—the rotary coil and stationary coil are both wound in the same direction and are connected in series.

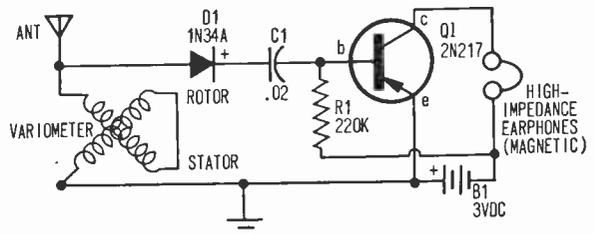
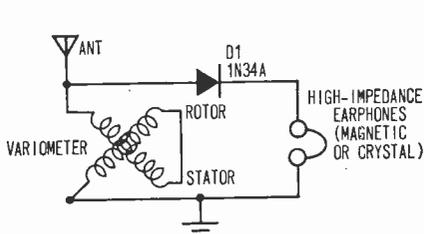
Some of the original variometers were round and molded from hard rubber or bakelite, and others were square and made of wood. Some had the stationary coil cemented to the inside surface of the outer form, and some had the stationary coil wound on the outside of the outer form as

is the case with the variometer described in this article.

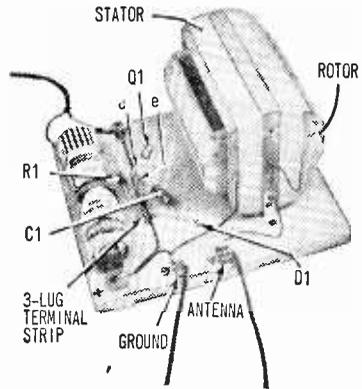
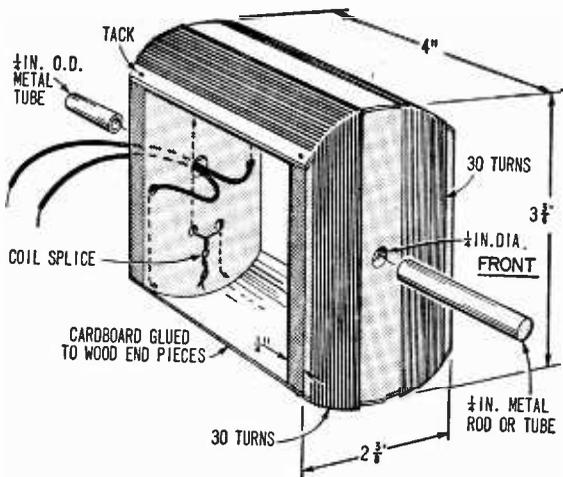
• **How It Does It.** When the rotor coil and the stator coil of the variometer both carry current in the same direction, the magnetic field will be greatest and the inductance will be maximum. When the rotor coil is rotated through a half revolution so that its magnetic field opposes that of the stator coil, the resulting field will be small and the inductance minimum. Thus the inductance is continuously variable over a considerable range.

The drawings show the constructional details for the author's experimental variometer. With a little patience, it is easy to build and performs as well as the factory-made variometer.

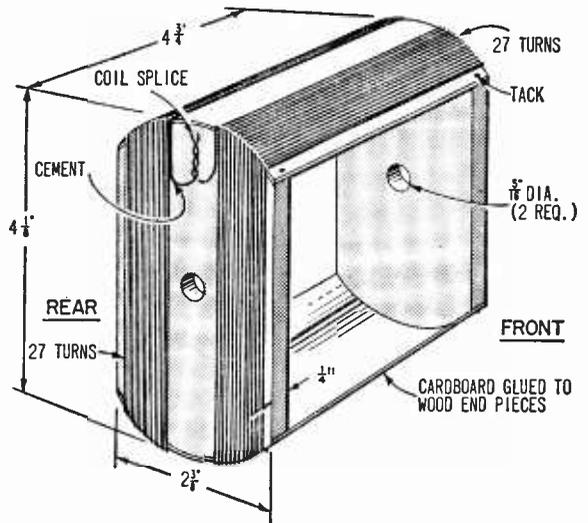
Be sure to wind the rotor and stator coils in the same direction, and connect them in series. *(Continued overleaf)*



Two radio circuits in which the experimenter can use the variometer as a tuning device.



The homemade variometer rotor is shown above. The cardboard used in the curved sections should be of the poster-board variety. The stator at right is almost identical in construction but is somewhat larger. The author's transistorized experimental variometer radio is at upper right.



Rolling Your Own. The stator form consist of two wooden end pieces of the dimensions given. Cardboard is used for the curved body sections and is fastened with glue and tacks. The holes in the end pieces are made big enough to freely pass a 1/4-in. rod. The stator coil is wound on the form as shown and consists of two sections of 27 turns each of #24 wire. The windings are held in place by glue, applied sparingly.

The rotor is virtually identical to the stator but is slightly smaller so that it will fit inside the stator. Construct the form to the dimensions given. Then drill the holes in the end pieces so that the 1/4-in. rod or tube makes a snug fit. Wind the two sections of the rotor coil also using #24 wire, 30 turns per section. Attach flexible leads to the coil ends to allow the rotor to rotate.

Assemble the variometer by placing the rotor inside the stator and pressing the tube rotor shaft (through which the rotor leads will pass) in the one end and the tube or rod in the other. Placing fiber washers between rotor and stator will prevent the rotor winding rubbing on the stator. Pass the rotor leads through the tube and connect one rotor wire to one stator wire so the windings are in series. (Continued on page 136)

PARTS LIST

- B1—2 size-D flashlight cells
- C1—.02-uF capacitor
- D1—1N34A germanium diode (or equiv.)
- Q1—2N217 transistor
- R1—220,000-ohm, 1/2-watt resistor
- 1—3-lug terminal strip
- 4—Fahnestock clips

BILL OF MATERIALS

- 1—1/4-lb. spool #24 single-cotton-covered enameled magnet wire
- 1—20x2 3/8 x 1/4-in. hardwood strip (for wood end pieces)
- 1—1/4 dia. (O.D.)x4-in. brass tube
- 1—3/8-in. wide metal strip for mounting angle brackets
- 1—3/4-in. wide metal strip for making battery holder
- 12—Short round-head wood screws
- 1—8x7x3/4-in. wood baseboard
- Misc.—Tacks, thin cardboard, glue, hook-up wire, solder, etc.

1884



1967

SALUTE TO HUGO GERNSBACK

Fifty years ago, if you were here, old enough to read, and interested in radio or electricity, you would probably have been an avid reader of *Electrical Experimenter*, then the most famous experimenter's magazine and one that is still talked about. That exciting pioneer magazine was edited and published by Hugo Gernsback. And it was only one of dozens he was to found. *Radio-Electronics*, for one, is still being published and is known throughout the world for its unique Gernsback flavor. Another, originally called *Radio News*, is known now as *Electronics World*.

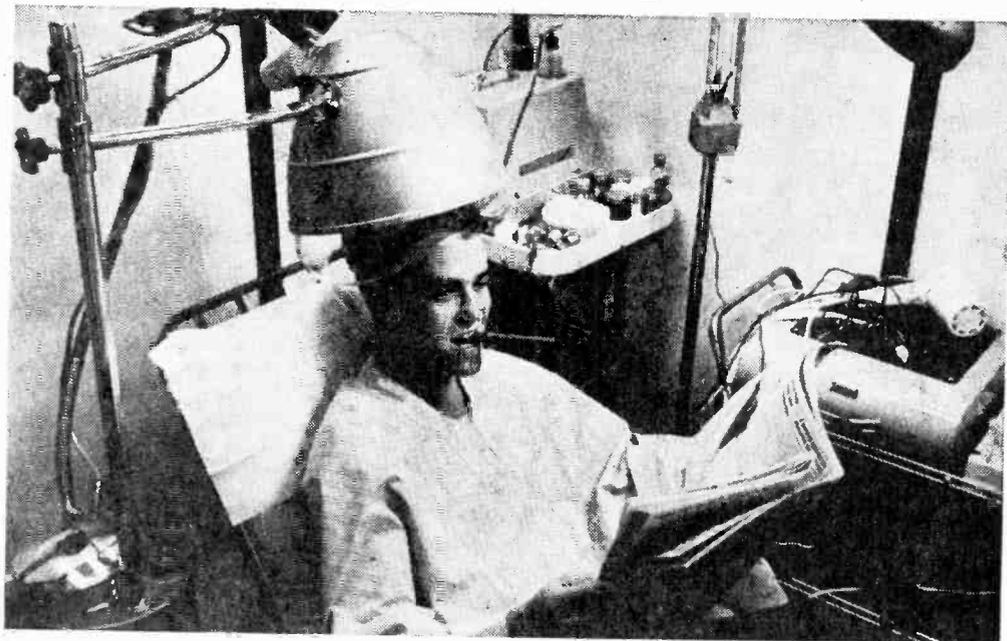
The father of science fiction and one of our greatest prophets, Hugo Gernsback predicted there would one day be television, radar, fluorescent lighting, plastics, space travel, microfilm, synthetic fabrics, tape recorders.

Gernsback, in fact, outdid Jules Verne as a prophet. In 1911 he wrote about atomic energy as well as the problems of weightlessness and orbital rendezvous in space. Long before the word "television" was known to the public (1928) Hugo Gernsback opened up the first TV station, WRNY. Some of his predictions have not yet come true—"teleportation," dissolving here and reappearing there—is still in the future.

Hugo Gernsback was born in Luxembourg on August 16, 1884. From age nine, when his imagination was fired by Percival Lowell's "Mars," he spent the rest of his fruitful life creating and publicizing technical changes. All of us will mourn the passing of this remarkable man.

BEAUTY

is only skin deep, fellahs!



No gang, it's not a cigar-smoking short-cropped dame, it's a young gent concerned with his manly loveliness getting a scalp treatment with hormones and high-voltage generated ozone steam that's supposed to prevent baldness.



This male is getting the lines at the corner of his mouth removed with a treatment consisting of an electrified needle inserted into the skin at the wrinkle. The current charges the coagulated albumins which causes the wrinkle, resulting in a degree of de-coagulation and lessening of the depth of the wrinkle.

Beautification of men came into vogue with the advent of men's cologne, face creams, hair dyes, sprays, and styling, but now . . . a bit of electronics gets into the act.

■ It was only a matter of time, and now it's here. The beauty salon for men. And we owe it all to one Christine Valmy, whose extensive background in both medicine, electronics and cosmetology allows her the title: aesthetician.

Miss Valmy practices her arcane art on hapless males at New York's Todaro Barber Shop. Her facial overhaul for men includes a variety of treatments such as "sandblasting" a client's skin with a powerful jet of water containing various cleaning agents. This opens the pores, cleans them and restores a measure of the bloom of youth.

Other treatments help restore a guy's loveliness by scraping off the dead cells of the face with a high-speed electric brush.

Chemical treatments of assorted types and hues are also employed in the re-making of a man. For instance, greasy goo for bedtime application (just like the little lady's) composed of vitamins, amino acids, enzymes, essential oils and phytostimulines.

Miss Valmy obviously feels that beauty treatments for men is the coming thing and to make sure you, I, and the guy down the

A special variety of mud-pack, vegetal gel (that's what they call it) is applied and then removed in a special way to cleanse and beautify. Cigar-smoking during this operation is optional, but it helps separate the boys from the girls.



Miss Valmy is treating this young man for unhealthy looking skin by using an ozone steam that opens pores, cleans them and removes dead outer cells.



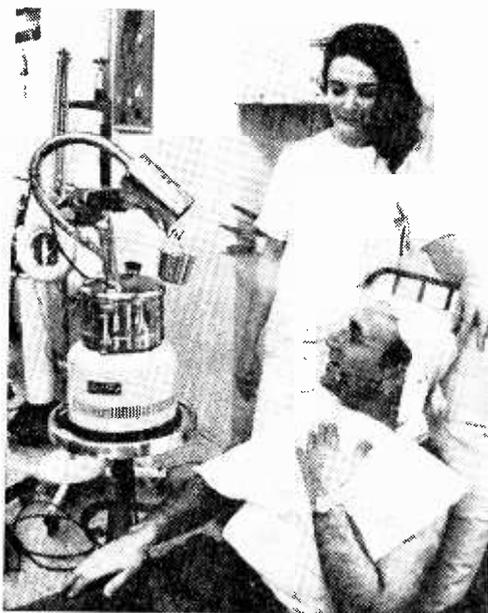
BEAUTY—YUK!

street will be able to have our regular beauty appointments, she's set up a one-of-a-kind school to train aspiring aestheticians in the arts of skin anatomy, skin physiology, cosmetic chemistry, morpho-psychology and skin rejuvenation.

Claims for results of Miss Valmy's expertise are that treatments can completely remove or at least very much improve a man's skin problems depending on skin condition.

Not content that man should be beautiful of face only, Miss Valmy also has a range of hair and scalp treatments that'll help prevent baldness and falling hair. This deed is accomplished with the aid of chemicals ranging from vitamins to hormones accompanied by tender loving massage.

Where it'll all end this writer fears to say, but since the advent of cosmetics for men such as hair sprays and face creams, the care and feeding of manly loveliness has definitely been on the increase. Does it mean an end to the rugged, wrinkled all-American Western hero type? Meanwhile, fellahs, see you at Miss Valmy's salon. —Joe Craig ■



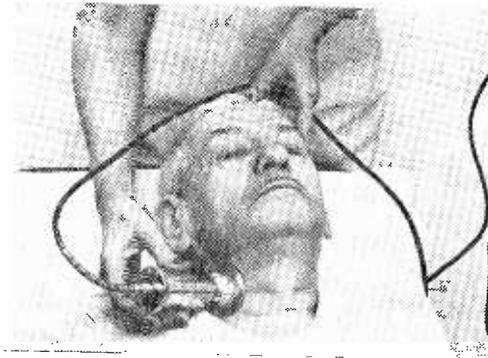
This fellah is admiring the space-age gadget responsible for making him a new man. It's the device used to generate ozone steam employed in many of the scalp and facial treatments.



The best way to get a new skin that glows with the vigor of youth is to take off the old one. That's just what this electrically powered brush is doing to the gentleman's face.



Flabby neck muscles are firmed up with these menectron pads; they exercise the muscles by zapping them with small jolts of electricity. Some 30 sessions are required to complete the job.



Deep neck creases are attacked with a kind of vacuum cleaner that massages, deep-cleans and disinfects the skin. This treatment combined with others can do much to make you lovelier.

Gadgets and Gizmos for Way- Out- Sounds



■ There was a time when an electric (or amplified) guitar was just that—a guitar feeding an amplifier. Then someone added a *tremolo* to their amplifier. Someone else followed with *reverberation*. And in no time flat the electric guitar became the number-one sound on the local radio station.

But as a famed performer of yesteryear was fond of saying: “You ain’t heard nothin’ yet.” As deluxe-featured as they were, guitar amplifiers of only a few months back don’t begin to approach what’s now available in *pro* amplifiers at the local music shops. Name any effect you can think of, and it’s likely yours for the buying, in a complete amplifier or as an add-on unit.

You think *reverb* is real gone? You literally ain’t heard nothing till you hear *echo* from *drum-repeater*—with the notes repeated over and over till they die away. Same thing goes for a *fuzzbox* that not only distorts the guitar’s sound but uses high-frequency feedback for an extra kick in the treble range. In fact, there are so many

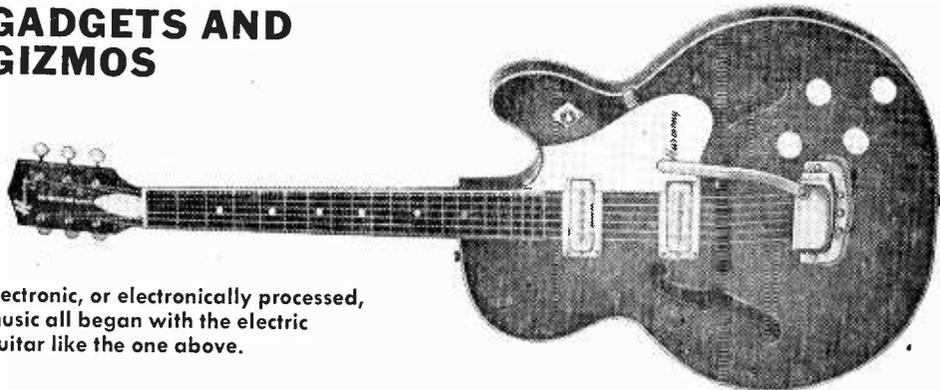
special guitar effects that we couldn’t uncover all of them in the 2½ hours we spent at one of the largest guitar amplifier dealers in the East—Sam Goodys, located in Valley Stream, N. Y.

But before we go off on a tangent, let’s go back to the basic guitar amplifier and work our way up. This way, you’ll know what’s available and what you want to look for in a guitar amplifier.

First off, there’s the basic amplifier, which offers nothing in the way of features other than a tone control. Basic amplifiers start at about 1½ watts output—just enough to entertain the family in the living room. The tone control will generally be a simple treble-cut affair, and the price of the entire unit will fall in the area of \$20 or so.

As you move up the price ladder the power output similarly goes up, perhaps to 50 or 100 watts (though powers of this order are rarely found in a no-other-feature amplifier). Higher price also brings more flexible tone control—both bass and treble boost

GADGETS AND GIZMOS



Electronic, or electronically processed, music all began with the electric guitar like the one above.

and cut. Also, a line-polarity reversing switch is ordinarily included to reduce hum and the possibility of shock stemming from simultaneous use of several AC-powered instruments or amplifiers.

Before we go any further, a note about a guitar amplifier's power-output rating. Unlike hi-fi amplifiers, which are rated in continuous sine-wave power output or music power output, a guitar amplifier is usually rated for peak power output. As you may know, peak power makes anything appear extra powerful, but what you may not be aware of is that peak power involves 4x factor. Therefore, to get continuous power output from peak power you divide by four: 100 watt peak power is 25 watts continuous (and vice versa).

Naturally, since a guitar's sound can predominate in volume peaks, a special speaker capable of handling high peak power output must be used. These special speakers are labelled and referred to as *music speakers*—or some similar term. The thing to remember is that the name music speaker doesn't necessarily infer hi-fi quality. Instead, it generally indicates high efficiency and high power-handling capacity needed in this kind of service.

Two Inputs Or Channels. Nearly all amplifiers are available with two inputs, but it is up to you to determine *what* inputs you're getting. Two inputs generally means two input jacks to a single amplifier channel with a single volume and tone controls affecting both inputs. On the other hand, two channels means two inputs each with its own independent volume and tone controls. In addition, one channel is generally a normal channel, equipped with standard tone and volume controls. The second channel, in contrast, might have identical tone and volume controls, plus user-selected

tremolo, reverb, or other desired effects.

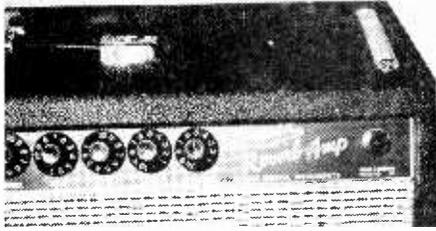
Tremolo. First effect generally added to a basic amplifier is tremolo, which slowly "pulses" the overall gain, usually at a rate of somewhere between 4 to 20 Hz. Two controls are provided. One, called a *speed* or *rate* control, determines the tremolo's frequency (a low rate gives a slow, sensuous pulsation while a high rate imparts a wobbling quality to the sound). A *depth* or *intensity* control determines the degree of tremolo effect (a little depth is just barely noticeable, while nearly full depth can almost move a water glass right off a table). As a rule of thumb, tremolo can be disabled by an on/off switch on the amplifier panel. However, more expensive amplifiers generally have a foot switch allowing the musician to key the tremolo in and out while playing.

Significantly, tremolo is nearly always provided as part of an amplifier. Rarely is it



Sam Goody's, Valley Stream, N. Y.

End of the burgeoning electric guitar and accessory industry isn't in sight, as the variety of available equipment will attest to.



One of the big names in electric guitar amps, this high-powered Fender has built-in reverb and tremolo.

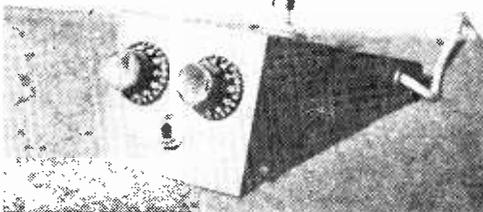
an addition to an existing amplifier, though your local dealer just might be able to get you an add-on unit if you want one. However, you might have to wield the old soldering iron a bit to wire it in.

Reverberation. Reverberation (often erroneously called echo) is available either built-into an amplifier or as an add-on extra. Normally, it results from use of one or more springs. The signal, bouncing back and forth from one end of the spring to the other, generates an almost infinite number of rapidly decaying echoes that blend together so that no one particular echo stands out by itself.

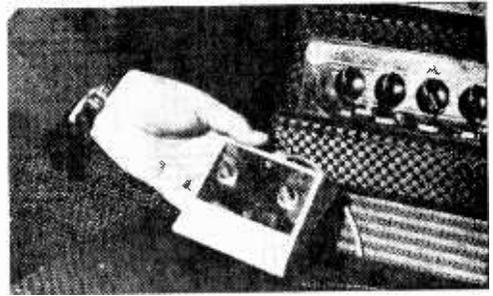
Reverb effects generally have just one control, a reverb knob that sets the amount of reverb added to the primary guitar signal. Toss in just a touch of reverb and the sound gets bright, or live. Add a lot of reverb and the guitar sounds like it's being played in a deep cavern.

While the reverb effect can be disabled with the reverb control, most amplifiers have provisions for a foot switch that allows the effect to be keyed in and out without interrupting the jam session.

Echo. Echo is a most unusual effect, gen-



Insert this Gibson fuzz-box between guitar and amplifier and you get a variety of weird special sound effects.

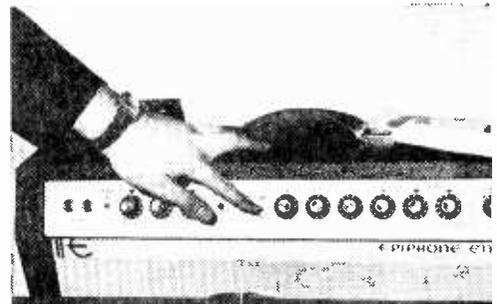


Dual foot-switch on this Ampeg amplifier lets you switch-in vibrato and echo with your foot while playing.

erated by a tape loop, or a magnetic drum or cylinder. One or more playback heads pick off the sound at some time interval—within a user-adjusted range—after it is recorded on the magnetic medium. The playback from the head or heads is then generally re-combined with the input signal so that the sound repeats and repeats itself, gradually or sharply decaying. In effect, you get at least one full repeat of a note or sound while you continue merrily playing other notes or sounds.

Echo units also provide for reverb, whereby the echoes are blended as in a straight reverb system. An echo add-on may also provide a vibrato effect which actually varies the frequency of the tone itself. Generally, when vibrato is provided in an echo add-on, it is very light and continuous, not controlled by the player as is vibrato generated at the guitar.

Bright And Super-Treble. Many amplifiers incorporate a brightness or super-treble switch. Basically, both circuits deliver extra treble boost, the exact frequencies being determined by the particular design. The bright or super-treble effect is generally in addi-



A feature of this Epiphone amplifier is a "presence" circuit; this boosts the high frequency audio for added liveness.

GADGETS AND GIZMOS

tion to the treble boost provided by the treble tone control.

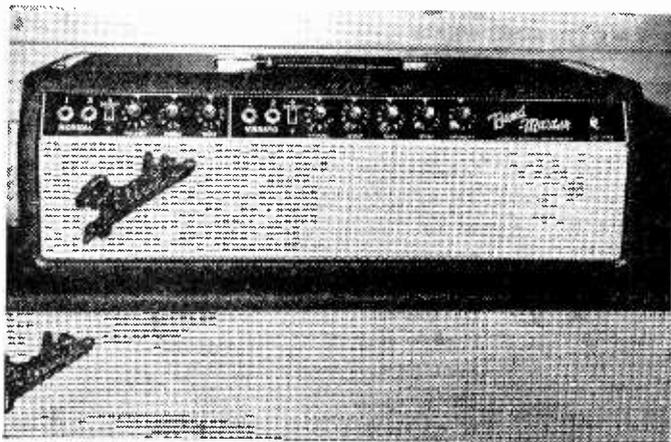
Super Bass. No standard amplifier incorporates a super-bass circuit that gives more boost than can be obtained from the bass tone control. However, some custom-made super-bass add-on units are available if you have a secret hankering for thump with a vengeance.

Fuzzbox. A fuzzbox is an add-on device connected between the guitar pickup and the amplifier input that generates pure distortion

boost. As a general rule, an oversize speaker(s) or specially designed low-frequency speakers are provided to handle the large amount of power needed.

A bass amplifier may be provided with an equalizer switch to allow its use with a "standard" guitar (high-frequency attenuation is removed). Or it may have a second or "normal" channel, so that the same amplifier can simultaneously handle a bass and "standard" guitar.

Piggybacks. When extreme high power is employed the possibility of microphonics is reduced by separating the amplifier from the speakers. Or you might have occasion to place the speaker at some distance from



This Fender Band Master piggyback amplifier is used when extremely high output power is needed. It contains no speakers (they're separate) thereby reducing the possibility of speaker-to-amplifier microphonics.

—the solid rock sound. Essentially, a fuzzbox simply distorts the sound by sharply chopping the peaks of the waveform. The fuzzbox generally incorporates a control that determines the amount of distortion generated. Some fuzzboxes also have a feedback arrangement for the higher frequencies which cause the internal amplifier to break slightly into oscillation. The effect is to generate a hangover sound after the note or chord is struck.

A fuzzbox is supplied as a footswitch and contains an integral battery power source. The fuzz effect is keyed in and out by simply stepping down on the switch.

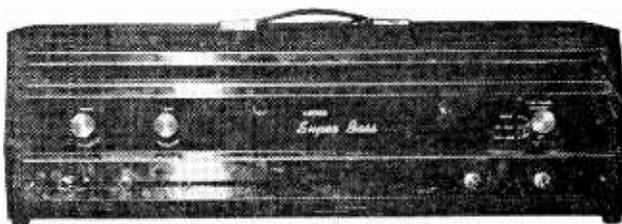
The Bass Amplifier. A bass guitar tuned one octave below a "standard" guitar naturally generates predominantly bass tones. Therefore, it requires an amplifier capable of exceptionally good response and power output at the lower frequencies. A bass amplifier is specifically designed for top performance at the way-down-low frequencies, usually providing an extra degree of bass

the playing position, yet still require the amplifier controls to be within reach. An amplifier intended for use with only an external speaker is called a "piggyback." This means that it has no integral speakers and must be placed on top of (piggyback) or connected to a separate external speaker or speaker system.

Sing Alongs. As a general rule all amplifiers will accommodate a microphone on the normal or effects channel. (You would use the effects channel to put echo or reverb on a vocalist.) If you have need for a microphone channel, make certain the amplifier you select has a separate volume control for *each* channel. You will almost never obtain the desired sound balance if one volume control determines the level of both the instruments and voice.

Tube Or Transistor? Unlike the hi-fi field which is now virtually ruled by the transistor, the guitar-amp field sports both tube and transistor models. Since the predominant weight is the speaker and cabinet,

Bass amplifiers, like this one by Gretsch, are designed to provide very-high low-frequency power for earth-shaking bass.



solid-state amplifiers offer virtually nothing in the way of overall weight or size reduction. Suffice it to say that the tube and transistor realms both lay claim to some really great amplifiers and some extremely rotten ones. (You pay your money and take your choice.) On the other hand, if you need a really portable guitar amplifier, you'll find it only in solid state. But, be careful—some cheap units will come apart in the rain.

Portable amplifiers are generally of relatively low power, intended for beach parties, picnics, and the like. They operate off either 117 VAC or an internal power pack. Some models are basic amplifiers while others contain tremolo; and we may assume that reverb will soon be added to portable amplifiers.

The Choice Is Yours. Exactly what features you require is of course strictly up to you, and features (along with power output) usually determine price. The fuzzbox has proven so popular with rock-and-rollers

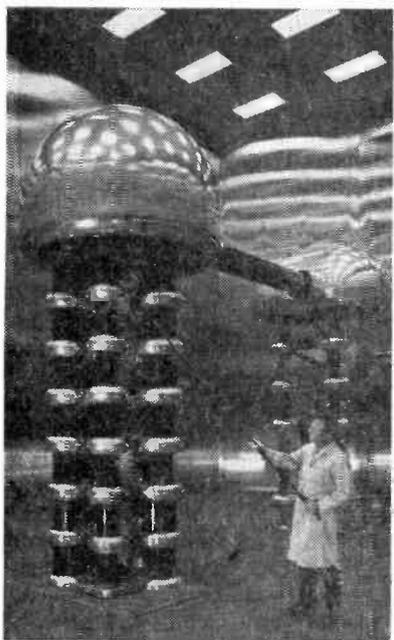
as an add-on that it may soon be made an integral feature of most amps. (Check the Jan.-Feb., 1968 issue of *ELEMENTARY ELECTRONICS*.) We may also see a miniaturization of the echo add-on, allowing it to be offered as an integral feature as well.

As a general rule, of course, it's best to purchase an amplifier that meets your future needs the first time round. While there is a trade-in market for amplifiers, there is really no sense in trading one amplifier for a virtual duplicate just to secure built-in reverb or some other effect that can be had inexpensively with an outboard device.

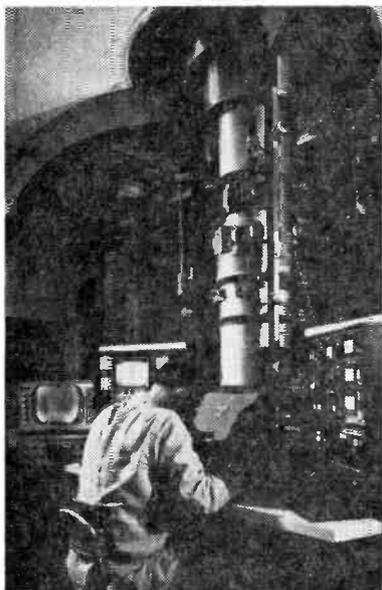
If too many desired features will severely strain your budget, you might consider building your own amplifier. Several amplifier kits are available from the Heath Co., Benton Harbor, Mich. 49022. In fact, they have some good guitar kits, too! Kit assembly isn't difficult or troublesome for anyone with some electronic construction experience and a little spare time. ■

Having a good listen to a setup you're interested in buying is one way to decide, but don't forget to determine the features you want now and in the future. When making a listening check, pick a quiet corner and keep the volume down; a lot of volume can mask bad performance though make sure the unit's got the guts you need too.

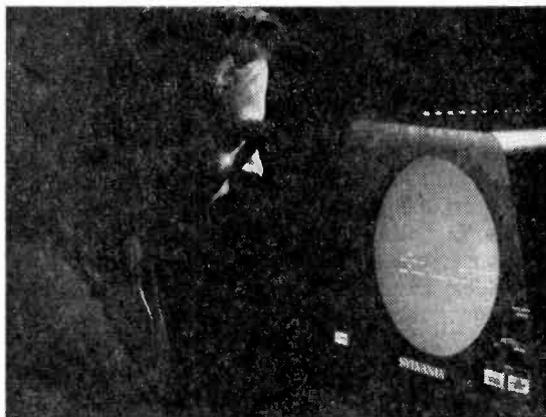




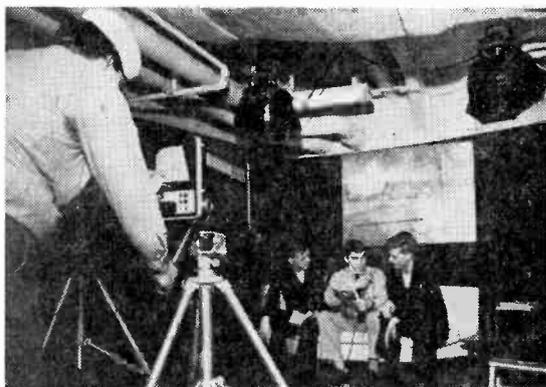
The nation's most powerful electron microscope has recently been installed at U.S. Steel's Fundamental Research Laboratory in Monroeville, Pa. Resolving power of the unit is in the area of atomic dimensions. The million-volt, 17-foot high electron accelerator used to power the instrument is shown above. The microscope, below, is being used for a close look at the atomic structure of steels and other metals. ■



WHO'S WATCHING WHAT?

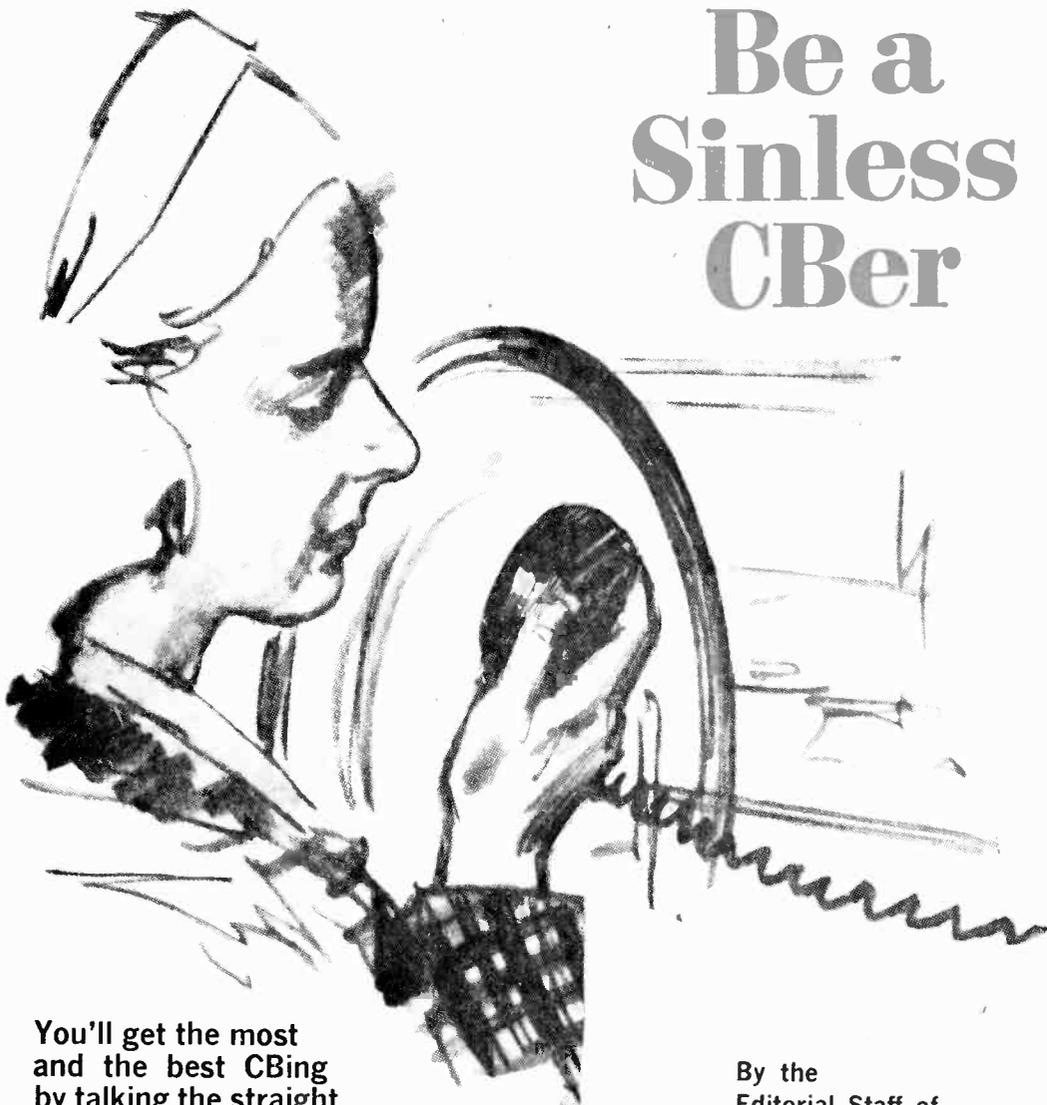


Sylvania's Electronic Tube Division has come out with a 10-inch, two-color, single gun cathode ray tube. The tube contains two layers of phosphor (red and green) alternately activated by a single electron beam. While not applicable to home color TV use, the tube has numerous other applications. Two suggested uses are in an air traffic control radar monitor showing high-flying aircraft in red and low-altitude traffic in green and "Identification, Friend or Foe" military radar. ■



The 3500 men aboard the aircraft carrier U.S.S. Oriskany don't suffer from lack of entertainment. They have their own closed circuit TV system (known as KRIS-TV) featuring news programs, films, and live interviews of ship-side notables. The system (by Sylvania) transmits to 65 television receivers located throughout the ship. ■

Be a Sinless CBer



You'll get the most
and the best CBing
by talking the straight
and narrow, here's how . . .

By the
Editorial Staff of
Radio-TV Experimenter

■ There you sit with your CB license, equipment, and permission from wife and/or landlord to make the installation; all you've got to worry about now is the message and how to get it transmitted, legally, quickly, efficiently. Make no mistakes about this, it can't be done by intuition and luck has little to do with it either. It's a definite science, and we might as well set you straight right now.

Here's the idea in a nutshell, before we go into details:

1. The FCC has a set of operating rules

which you must know and use. They enforce these rules.

2. CB operators (at least, most of them) are dedicated to trying to keep the CB channels as useful as possible. Towards this end they have set up several rules of the road for operators.

3. Efficient operating can frequently mean the difference between communications and confusion.

Those are the basics.

The FCC's Rules. The FCC (known to CBers as *Uncle Charlie* or *Fox Charlie*

SINLESS CBer

Charlie and sometimes the *Friendly Candy Company*) sort of cherishes the idea that you have in your possession a copy of Part 95 of their rules. This is a rather high-falootin' document which many CBers find

with transmissions to stations of others limited only to those messages which are absolutely necessary.

A few examples of messages which *cannot* be legally transmitted are:

"I'm just calling to see who can hear me. How's my signal over there?"

"The rig here is a Frammis Mark Two, what's the set up on your end?"

"Calling the station in Venezuela, you're



CBers in *all* walks of life get the maximum from CBing by abiding by the letter and spirit of the rules and reg's laid down by Uncle Charlie. Above is a happy foursome of typical CBers ranging from a pretty miss to—holy hasenpfeffer isn't that. . . .

hard to decipher; it spells out the things which can and can't be done with a CB transceiver on 27 megs.

The main theme is that the transmissions from your station must contain *substantive* messages relating to your own personal or business affairs. In other words, hobby type (like ham radio) chit-chat is strictly *verboten*. The idea is for you to communicate mostly with units under your own license,

coming in loud and clear here in Wisconsin."

"Name here is Billy, thought I'd give you a shout to get acquainted. What's the handle there?"

"Got a new mike on the rig, how's it sound?"

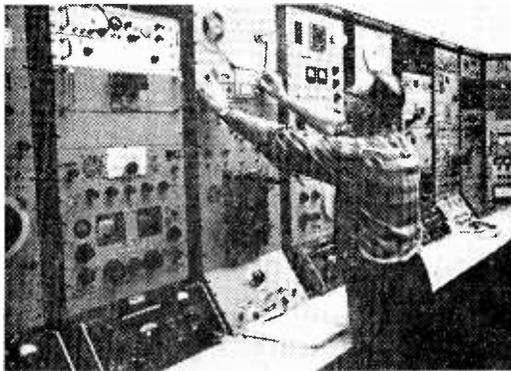
"Calling any station on the channel for a radio check."

"Can anybody out there tell me when the club meeting is?"

Get the idea? Substantive messages only.

Other Don'ts. Other things which cannot be transmitted are: transmissions for any purpose which is contrary to federal, state, or local laws; transmission of indecent, obscene, or profane words, language, or meaning; to communicate with unlicensed stations, or with stations licensed in other radio services or licensed by governments other than the U. S.; communications not addressed to a specific station (except in an emergency): to transmit music or entertainment; transmissions intended to cause interference to another station; false distress signals; for advertising services or products; coded messages (except when standard message codes are used and a copy of the full code is on hand at the station); communications covering more than 150 miles.

All transmissions should be as brief as possible and should not exceed 5 minutes.



Big brother is listening and the results of his sleuthing gets many a lawless CBer his very own FCC pink ticket.

After 5 minutes you must clear the channel and stand by (not transmitting on any other channel) for at least 5 minutes to let others use the channels.

Your callsign must be transmitted in full (letter for letter and number for number) at the beginning and end of each transmission or series of transmissions, in addition, you must also transmit the entire callsign of each station involved in the communication with you. If the callsign of the other station isn't immediately available, you can use a distinctive name ("React Control, Station in Hammondsville," etc.) until you ascertain the other station's call.

You may use any channel for your communications with your own units, however (except in emergencies), communications

The CBers Creed

As a Citizens Band Radio Operator, I recognize my obligations:

To the Federal Communications Commission and The United States of America, who believe that I am sufficiently mature to be entrusted with the ownership, control, and operation of a radio transmitter.

To my neighbors, who trust their lives and safety to my skill and judgment during times of emergency.

To my fellow Citizens Band operators, who depend upon me to follow established good practices, procedures and courtesies.

—and—

To discharge these responsibilities, I will at all times observe the highest standards as a Citizens Band operator.

—and—

I will never knowingly cause interruption to Citizens Band stations engaged in communications.

I will be careful to avoid generating interference to radio and TV receiving equipment, and will endeavor to locate and eliminate interference to any such equipment which may emanate from my station.

I will transmit only to pass necessary and substantive messages.

I will make all efforts to make full and proper use of Channel 9, the National Calling and Emergency Channel.

I will aggressively maintain my proficiency as a Citizens Band operator and keep abreast of electronics and communication developments so that my operation, which largely depends on such knowledge, may be of the highest order.

I will conduct myself on the air to reflect credit upon myself, the Citizens Radio Service and my country.

I will constantly strive to keep my standards high.

I pledge adherence to these principles so that I may contribute my part to more efficient radio communications, and advance the dignity of the Citizens Radio Service.

OPERATOR'S NAME

Our thanks to Cowan Publishing Co.

SINLESS CBer

with stations not in your own network must be conducted on channels 9, 10, 11, 12, 13, 14, and 23.

On The Plus Side. You're probably saying to yourself, "That makes it impossible to use the equipment." Not true! You'd be surprised how little the foregoing taboos make a scratch in the communications you *can* transmit.

Here's how to call your mobile unit from your base:

Calling—"KXX1234 Base, calling Unit 2."

Response—"KXX1234 Unit 2, to base, over."

Clearing—"KXX1234 base, clear with unit 2," and "KXX1234 Unit 2, clear with base."

Between mobile units of the same licensee:

Calling—"KXX1234 Unit 1 calling Unit 3."

Response—"KXX1234 Unit 3 to Unit 1, over."

Clearing—"KXX1234 Unit 1 clear with Unit 3," and "KXX1234 Unit 3 clear with Unit 1."

Between units of different licensees:

Calling: "KXX1234 to KXX6789," or "KXX1234 to KXX6789 Unit 3."

Response: "KXX6789 to KXX1234, over."

Clearing: "KXX1234 clear with KXX6789," and "KXX6789 clear with KXX1234."

Rules of the road. Backing up the FCC's



Members of the Dixie Communications Club in their monitoring station atop Stone Mountain. This club promotes good CBing.

rules and regulations, most CB operators try to exercise as much courtesy as possible with others of their brotherhood. For instance, they will seldom hog a channel when they know that others wish to use it; they get their message sent and done with as quickly as possible.

CBers have unofficially established Channel 9 as their *Calling and Emergency Channel*. The idea is to keep the receiver going on Channel 9 when not otherwise engaged in communications; in this manner, stations can always find each other on this one particular channel. When the initial contact is made, stations can then switch over to another channel so as to keep 9 clear. Emergency communications with REACT and other emergency monitoring stations are also conducted initially on Channel 9. The message here is *Keep 9 Clear!*

CBers have also established their own specialized version of the popular 10 Code. While, at one time, there were a number of different versions of 10-Codes (a different one in each locality), a standardized one was introduced several years ago and has now won universal acceptance.

FCC Enforcement. There has to be a traffic cop on duty to protect the pedestrians from those who might violate the traffic laws. So it is with CB, and the cop on the corner is the FCC's extensive monitoring network.

Elaborate and highly sophisticated monitoring stations are located across the nation from Puerto Rico to Alaska and Hawaii. These stations listen to CB channels (and everything else too) and make tape recordings of those transmissions which are in violation of Part 95.

FCC monitors then transcribe these tapes

CHANGE OF ADDRESS NOTICE

A licensee of a Citizens Class B, C, or D radio station may advise the Commission of a change of mailing address by letter. No application or fee is required. Supply the following information:

Station Call Sign _____

Licensee's name as shown on license _____

Licensee's address as shown on license _____

Licensee's new mailing address _____

Zip _____

Licensee's signature _____

You may use this notice to furnish the information if you desire. Mail it to: Federal Communications Commission, 334 York St., Gettysburg, Pa. 17325.

into written documents which are then incorporated into official FCC "Violation Notices." Cbers who receive such a notice are required to immediately respond to the notice in writing, explaining the reason for the rule infraction.

Appropriate action is taken after the FCC has considered the Cber's explanation—the FCC may then decide to forget the incident, to give the operator another chance, to impose a fine (possibly as much as \$200), or to revoke the Cber's license.

Failure to answer the FCC's notice will almost surely mean license revocation.

In addition to the FCC's regular monitoring stations, the FCC's 24 District Offices frequently are pressed into monitoring services. These offices are especially effective when it comes to sending out mobile units to clean up a particularly nasty area of irresponsible CB activity. Last year a fleet of FCC mobile monitors descended on a town near Washington, D. C., and the end result was 8 sadder but wiser *former* Cbers. The job was accomplished in only a few trips.

You will never know when an FCC monitor is listening in on your conversation; the

FCC people don't cut in and make their presence known. Our advice is to talk the straight and narrow.

Emergencies. Emergencies are a special case since the FCC recognizes that by their very nature they must take precedence over all other communications.

When a station sends out an emergency call you should get the channel cleared of all other users as soon as possible. Make every effort to assist the other station.

Stations involved in emergency communications are given a pretty free hand at temporarily violating the FCC's rules—any channel may be used, time limitations are thrown to the wind, getting the message through is the most important consideration.

The FCC requires, however, that if you are forced to violate any of the normally imposed CB operating restrictions while involved in emergency communications, you must notify the FCC's Washington, D. C. office and also your local (or nearest) FCC office of the incident as soon as possible. Tell them the nature of the emergency and the use to which your station was put during that time. (Continued on page 130)

NATIONAL CB 10-CODE

- | | | | |
|-------|---------------------------------------|--------|--|
| 10-1 | Receiving poorly. | 10-37 | Wrecker needed at _____. |
| 10-2 | Receiving well. | 10-38 | Ambulance needed at _____. |
| 10-3 | Stop transmitting. | 10-39 | Your message delivered. |
| 10-4 | OK, message received. | 10-41 | Please tune to channel _____. |
| 10-5 | Relay message. | 10-42 | Traffic accident at _____. |
| 10-6 | Busy, stand by. | 10-43 | Traffic tieup at _____. |
| 10-7 | Out of service, leaving air. | 10-44 | I have a message for you (or _____). |
| 10-8 | In service, subject to call. | 10-45 | All units within range please report. |
| 10-9 | Repeat message. | 10-50 | Break channel _____. |
| 10-10 | Transmission completed, standing by. | 10-60 | What is next message number? |
| 10-11 | Talking too rapidly. | 10-62 | Unable to copy, use phone. |
| 10-12 | Visitors present. | 10-63 | Net directed to _____. |
| 10-13 | Advise weather/road conditions. | 10-64 | Net clear. |
| 10-16 | Make pickup at _____. | 10-65 | Awaiting your next message/assignment. |
| 10-17 | Urgent business. | 10-67 | All units comply. |
| 10-18 | Anything for us? | 10-70 | Fire at _____. |
| 10-19 | Nothing for you, return to base. | 10-71 | Proceed with transmission in sequence. |
| 10-20 | My location is _____. | 10-73 | Speed trap at _____. |
| 10-21 | Call by telephone. | 10-75 | You are causing interference. |
| 10-22 | Report in person to _____. | 10-77 | Negative contact. |
| 10-23 | Stand by. | 10-81 | Reserve hotel room for _____. |
| 10-24 | Completed last assignment. | 10-82 | Reserve room for _____. |
| 10-25 | Can you contact _____? | 10-84 | My telephone number is _____. |
| 10-26 | Disregard last information. | 10-85 | My address is _____. |
| 10-27 | I am moving to Channel _____. | 10-89 | Radio repairman needed at _____. |
| 10-28 | Identify your station. | 10-90 | I have TVI. |
| 10-29 | Time is up for contact. | 10-91 | Talk closer to mike. |
| 10-30 | Does not conform to FCC Rules. | 10-92 | Your transmitter is out of adjustment. |
| 10-32 | I will give you a radio check. | 10-93 | Check my frequency on this channel. |
| 10-33 | Emergency traffic at this station. | 10-94 | Please give me a long count. |
| 10-34 | Trouble at this station, help needed. | 10-95 | Transmit dead carrier for 5 seconds. |
| 10-35 | Confidential information. | 10-99 | Mission completed, all units secure. |
| 10-36 | Correct time is _____. | 10-200 | Police needed at _____. |

Note: Any 10-code signal may be reversed by stating it as a question. For example, 10-20? would mean "What is your location?" or 10-36? "What is the correct time?"

By Jorma Hyypia

Star performers on this quiz program are likely to win only a free trip to the pen

The Big PAYOFF



Ampex video tape system is used in experimental setup by Miami Police Department. Detective here is watching pre-recorded interview.

■ Want to get on TV? Perhaps the easiest way is to heave a brick through a store window in Miami, Fla. In no time at all you will be a star performer in a new TV spectacular recently set up by the Miami Police Department.

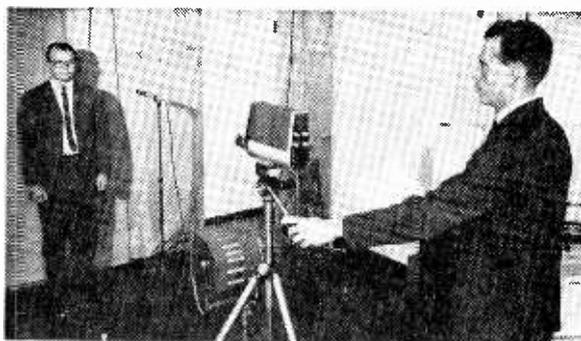
You are low in a quiet recording studio. The lights go on. As you answer question after question, every twitch, lip-wetting and shoulder-jerking movement you have will be recorded for posterity on videotape. And you can be assured of having an interested audience.

Several times a day, all the precinct officers will line up at attention in the roll call room and give your taped performance undivided attention. They couldn't be more interested. They want to be sure to ask for your autograph the next time they spot you wandering through downtown Miami with a brick in your hand.

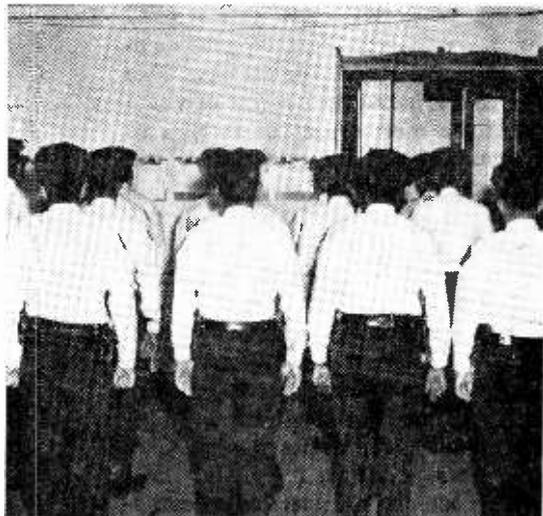
Admittedly, the Miami quiz show is still small-time TV. But the day may come when your performance will be shown on a nationwide police TV network—provided that you rate VIP treatment. This is pretty much assured in light of the big-time sponsor giving financial backing to the Miami experiment. The sponsor: The Office of Law Enforcement Assistance of the U. S. Department of Justice.

Tools Of The Trade. Using Federal funds, the Miami police acquired an Ampex VTR-7000 series video tape system including six monitors (two for the squad room, two for the detective bureau, and two for use as portable equipment). Two tape units are used for recording and playback—a console for regular station-house work, and a portable unit for field work.

The Miami video equipment uses 300-line resolution. Cost of the tape is about \$60 per



Suspect being interviewed is video-taped, sight and sound. Mannerisms and speech recorded this way makes far better identification possible than old system of mug shots. With an average of 75 interviews per spool, relatively little tape is required.



Officers watch tapings of local crooks to aid future recognition.



3,000-ft. reel; which is substantially cheaper than the cost of commercial video tape. A 3,000-ft. reel provides an hour of recording time. In theory, this is equivalent to about 120 separate "interviews" averaging about a half-minute each. However, in practice each tape holds about 75 interviews; even so, the tape cost is well under a dollar per interview—an obvious bargain considering the wealth of information recorded as compared with ordinary still photo mug shots.

The tape provides a permanent record not only of the appearance of the suspect, but also of his personal mannerisms and voice characteristics.

So far the equipment has checked out A-OK except that the operators would like to replace the 3-lens camera turret with a more flexible zoom lens.

The day may come when police video-taping will be done in color as well as in

black and white. Color would offer obvious advantages. Skin colorings, identifying blemishes, scars and the like would be recorded much more naturally. The cost of color equipment, says Ampex, would not be prohibitive; a color video system would cost only about \$500 more than the presently used VTR-7000 black and white system.

Other Applications. Primary emphasis now is on video-mugging of suspects. But there are many other ways in which video tape systems could be used in police work.

For example, various police training programs would be far more effective if supplemented with video tapes that demonstrate such techniques as first aid, self defense, surveillance, and suspect questioning.

Portable equipment taken to the scene of a crime could provide far more revealing photographic records than is possible

(Continued on page 134)



Remember the year you wanted a 20-amp-200-BV... silicon transistor and got a barbeque apron and a chef's cap? Or the Christmas you asked for a 4-band communications receiver and got bedroom slippers?

Don't blame the little woman: she operates on another wavelength. Seldom are her audio receptors tuned to your sound waves. The mismatch turns out neckties.

To discourage such distortion, why not give up attempts at audio communication and try this simple visual layout?

Print this year's Wish List in large red letters on poster board. Next, tape the communication to the top of her dressing table mirror so that it intercepts her line of vision every time she tries to see her face. This will guarantee that a full-color image will be imprinted on her visual receptors with a high repetition rate.

To assure yourself of high volume and quality reception at Christmas, always jot down gift wishes as they occur to you. This will prevent that awkward failure of recall just when the missus pops the question, "And what would you like for Christmas, dear?"

In case your memory now refuses a playback of the many little wishes you have had during the year, following is a list of small items which almost any electronics enthusiast would be happy to find in his Christmas sock.

1. A burp gun for troubleshooting
2. A little red wagon for pulling a chassis
3. Toggle switches for chastening recalcitrant toggles
4. A purity ring to wear around your tongue when the children are within earshot
5. A sack of horse manure to keep your tuner stable
6. Pink plastic curlers to ensure correct waveform
7. A wideband detector to sort the single girls from the married ones
8. A woofer to offer friendly welcomes to lonely burglars
9. A bottle of Scotch for maintaining loading characteristics
10. Jack—any kind—telephone, telegraph, check, or money order

With these items, and others that may occur to you, you should be well on your way to the merriest of Christmases. ☺

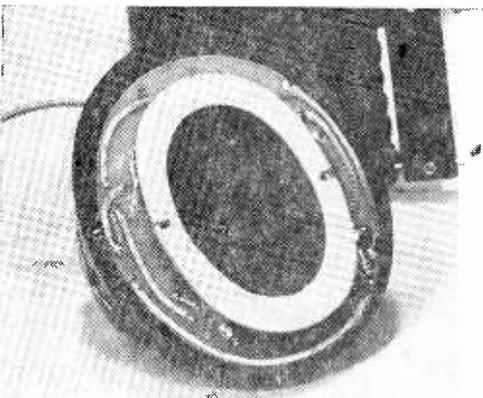
TELEX AMPLITONE I Solid-State, High Fidelity Amplified Headphones

■ As far as modern music is concerned, nothing equals the big, pulsating sound of an amplified guitar. But as far as your neighbor is concerned, nothing is more annoying—particularly at midnight.

To answer the need of musicians who like to practice at unusual hours, and to provide an easily portable “practice amplifier,” Telex has introduced the *Amplitone I* headset.

The *Amplitone I* is a standard mono hi-fi headset with one important difference. Built into the right earphone is a complete six-stage amplifier, and a battery compartment for a 9-volt battery. When the power switch, which is also built into the earphone, is in the *Off* position, the amplifier is disabled and disconnected, and the *Amplitone I* functions as a 22-ohm hi-fi headset. When the power switch is turned *On*, the amplifier is connected between the attached phone plug (with cord) and the earphones.

Speaker Earphone. Each earphone consists, as shown, of a specially fabricated wide-range miniature 44-ohm speaker—the two speakers are connected in parallel for 22 ohms total impedance. The right hand



Each headphone contains a miniature wide-range speaker of 44-ohms impedance, the two hooked in parallel for 22 ohms.



speaker is backed up by the printed circuit amplifier.

The power switch mounts on the earpiece housing, which is moulded so that space is available for the battery. The left earpiece does not contain an amplifier, but is used to house a spare battery.

We tested overall operation of the *Amplitone I* just as it would be used by an amateur or professional guitarist; and we also checked it for usable frequency response with an AF signal generator.

Usable Frequency Response. The frequency response of the system—amplifier and speaker—appeared to a panel of users to be essentially flat, as far as the ear was concerned, from 80 to 15,000 Hz. The low end response, that is, the minimum frequency producing a discernible and usable sound level was 50 Hz.

We checked the *Amplitone I* with a moderately priced three-pickup solid-body guitar. The headset provided more than adequate amplification with the guitar's level controls well below maximum.

Sound level in the headset approached the threshold of pain without undue distortion. In fact, at very loud listening levels the distortion was very low, equivalent to a good hi-fi amplifier.

Soundwise, the only negative aspect was an annoying “hiss” at very low sound levels; the amount of hiss being to some degree determined by the setting of the guitar's volume control (the *Amplitone I* does not have a volume control). As with the distortion, the hiss was discernible only at an extremely low sound levels. Within a *normal* to *very loud* sound level, neither hiss nor distortion is evident.

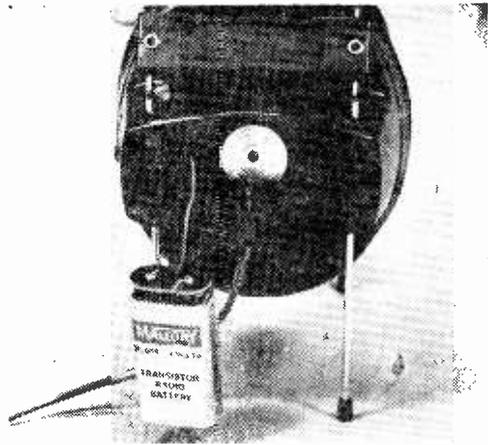
LAB CHECK

Comfort. The *Amplitone I* appears massive and has a good solid heft, but surprisingly, it is one of the most comfortable headsets we've used. The band, being large, sets across the entire top of the head with no tendency to fall off—even if the user bobs, rocks, jumps, or rolls in time to the music.

The earphone pads are relatively narrow and very soft with little noticeable pressure against the head, yet they effectively insulate the wearer from outside noise. Soft slider springs allow the headset to adjust to the size of the user's head, and provides an inch or so of up-and-down adjustment.

Other Uses. If your guitar amplifier is equipped with a headphone or external speaker jack, the *Amplitone I* can be used as ordinary hi-fi phones by simply setting the power switch to *Off*.

Another model, the *Amplitone II*, has an amplifier built into each earphone providing a stereo headset. While we can't see any value in stereo for guitars, the stereo connection would allow two instruments to be monitored by one player—say two guitars, or one guitar and an electronic sideman. Actually, the *Amplitone II* is designed for



A 9-Volt battery in right phone case provides power for the amplifier; the left phone case contains a spare battery.

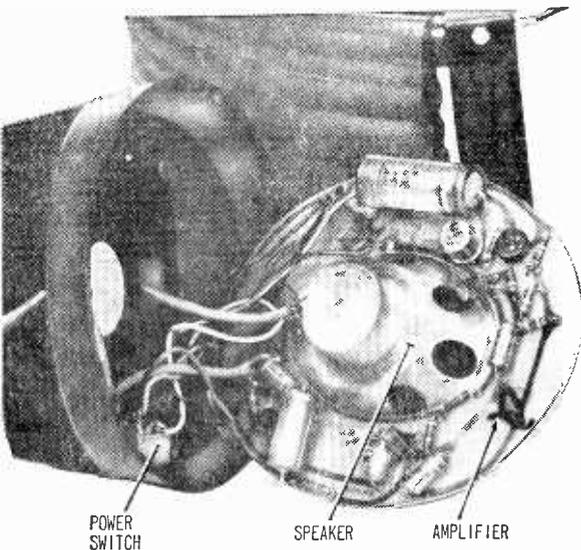


When the built-in amplifier is turned off, the headset can be used as standard hi-fi phones for just about any purpose.

hi-fi use. It can be connected directly to a record player, tape deck, or tuner, and produce full stereo sound for enjoyable and private listening.

Summing Up. When used within normal and natural sound levels limits, the *Amplitone I* does exactly what it's supposed to do and does it well. It most certainly provides a means of individual enjoyment of an electric guitar not hitherto available—such as at the beach or in a moving vehicle.

The *Amplitone I* is priced at \$79.95. The *Amplitone II* sells for \$99.95. Additional information is available from Telex, Dept. S, 3054 Excelsior Blvd., Minneapolis, Minn. 55416. ■



The right-hand speaker is backed up by a four-stage transistor amplifier that drives both left and right phones.

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Propagation Forecast

By C. M. Stanbury II

December, 1967/January, 1968

■ As noted several times in the past, these forecasts are not based entirely on propagation conditions, but upon the best shortwave broadcast DX available during any given period. A striking example of the differences produced by this method is our listing for Africa (south of the Sahara) at 1800-2100 listener's time. Here, we are forecasting *poor* reception. It's not that the propagation conditions themselves are so bad at these hours—in fact, they'll be comparatively good. It's that most African stations, especially the DX variety, are off the air during most of this period.

Except for stations somewhat below the equator (where it is summer), reception con-

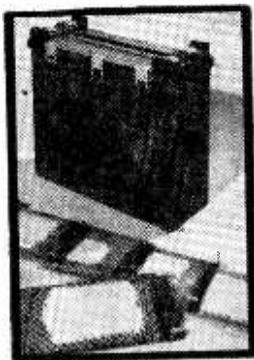
ditions will generally be at their annual peak. At night, static on the lower bands will be virtually nil, while during daylight hours the upper bands (including 11 meters) will be open for lengthy periods. Of course, at this relatively high point in the sunspot cycle we can definitely expect some severe ionospheric disturbances during which only nighttime reception of tropic stations will be anywhere near par. Speaking of tropical stations, a reminder! On Christmas and New Year eves most Latin American stations remain on the air past normal sign-off. Hard working DXers should bag some interesting catches on 60 and 90 meters, and if you listen late enough, the medium wave broadcast band. ■

RADIO-TV EXPERIMENTER PROPAGATION FORECAST

Dec./Jan. 1967 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, (41), 49	41, 60	25, 31	49, 60, 90
0300-0600	25, (41), (60)	31	31 (poor)	41	49, 60, 90
0600-0900	19	(16), 19, (25)	19	25	49
0900-1200	19	(13), 16, 19	19	25 (poor)	31
1200-1500	19 (poor)	(13), 16, 19	19, 25	25 (poor)	(19), 25
1500-1800	16, 19	25, 31, (49)	31, (49), 60	(16), 19	31
1800-2100	25	25, 31	31 (poor)	(16), 19, (25)	49, 60, 90
2100-2400	25	31, 41	41, 60	(16), 19, (25)	49, 60, 90

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

AIR + SALT + WATER = E aplenty



By Jorma Hyypia

Amazing new battery promises to revolutionize portable power sources

■ Air, water and salt. That's all you need to make this revolutionary portable battery operative. To recharge, just slip in some fresh electrodes! Too good to be true? Read on. You'll flip when you get all the dope on this battery's performance!

But first, who will use the so-called Magair battery? The U.S. Marine Corps for one, inasmuch as USMC gave General Electric Company researchers a \$167,000 contract to develop a new power source. Non-military users will probably include just about anyone who operates mobile communications equipment, tape recorders or other electronic devices in the field. Campers, hunters and fishermen will find the Magair a convenient source of power around camp. And it's a natural for boat enthusiasts who can juice it up as easily with salt water as with fresh.

Exit Lead-Acid? The Magair battery promises a number of important advantages over conventional dry cells and lead-acid storage batteries. Unlike dry cells, the Magair can be reactivated repeatedly. Simply pour out the water and magnesium hydroxide sludge that forms during use, insert new magnesium anodes, add salt and water. That's all! There's no need for external power sources or orthodox recharging equipment. The entire reactivation can be accomplished in minutes, anywhere, far out in the wilderness or aboard a boat.

Handling safety is an important plus. A lead-acid storage battery must be protected carefully from physical damage because of

the highly corrosive and toxic acid it contains. Not so the Magair. The only thing you can slop out is salt water.

In light of all these advantages, you might expect at least some sacrifice of performance. Here's the big surprise. The Magair actually packs five times more energy than a typical lead-acid storage battery! The Magair provides an energy density of about 50 watt-hours per pound of battery weight; the average lead-acid battery provides only about 10 watt-hours per pound of weight.

Too Good To Be True. Still looking for a catch? You probably won't find it in the price, although GE hasn't yet said what the Magair will cost. However, manufacturing costs are substantially lower than in the case of conventional batteries. The obvious conclusion: highly competitive pricing is in the offing.

The cost of electricity obtained from the magnesium-air cell is composed of the replenishment cost plus the amortized cost of the air electrode and cell structure. The replenishment cost is conservatively estimated at \$0.003 per watt-hour.

At moderate rates of production, the cost of magnesium-air cells using a high-performance platinum-catalyzed electrode is estimated to be less than \$10 per watt. At this cost, and with 1000 hour service life, the cost of electricity would be 1.3 cents per watt-hour. This is well below the cost of electric power from inexpensive dry cells. Used at room temperature, the expected cell life is over 2000 hours, hence the cost may

E aplenty

actually be substantially lower than this.

Buck Per Watt. Magnesium-air cells using cheaper air electrodes with no platinum catalyst would have an estimated cost of less than \$4 per watt, and might be as low as \$1 per watt.

The Magair battery currently being developed under the Marine Corps contract consists of 23 cells, each with a magnesium anode and a porous air cathode. This battery measures 4 x 8 x 12 inches in size. One set of magnesium anodes in this unit will supply 24 volts for a field radio for up to 12 hours before anode replacement is necessary.

The fact that almost any available water can be added to the battery means that use in remote areas is easier than in the case of other types of batteries. For example, the carry-in weight of a 5-cell battery is 11.9 pounds—10.8 pounds for magnesium anodes and salt and 1.1 pound dry battery weight. This battery will supply 500 watt-hours or more if the cell is refilled 60 times using locally available water.

How It Works. Like a conventional battery, the Magair system's anode undergoes a chemical change and is consumed in the reaction. Unlike a conventional battery, however, the Magair system combines fuel with oxygen drawn from the air through a porous cathode. The porous cathode promotes the reaction of oxygen in the air with water in the electrode and the magnesium electrode to produce an electric current.

Magnesium hydroxide (milk of magnesia) is formed as a by-product. By chance, the magnesium hydroxide sludge acts to purify water of contaminants that might otherwise be deleterious to cell action.

Mystery Cathode. The porous air cath-

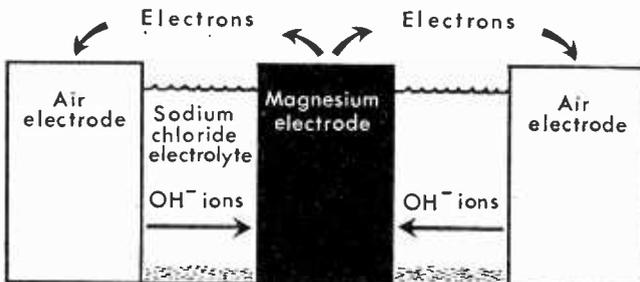


Single Magair battery packs as much power as stacked lantern batteries at right.

odes are not consumed in the chemical reaction, but do eventually deteriorate for other reasons. These may be replaced one-at-a-time, as necessary. Design of the cathode is still considered proprietary by GE, and details concerning its construction or composition are not yet revealed. However, it is known that the design includes a porous polymer material and a metal current collector. Platinum is the most effective catalyst although other metals such as palladium, silver and mixed oxides can also be used.

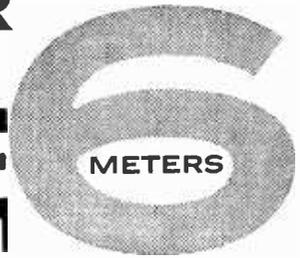
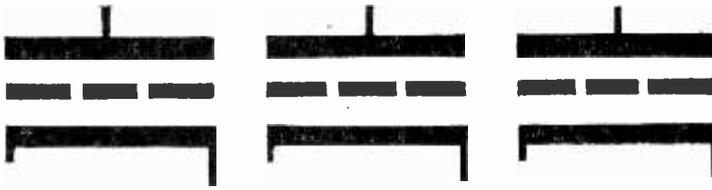
To most of us, these design secrets are of marginal interest. What we would really like to know right now is just when—and at what price—GE will put the revolutionary Magair on dealer shelves.

One thing is certain. If GE's advance claims for the battery are proved out in consumer practice, the company's battery sales should zoom higher than Ben Franklin's kite in a Kansas windstorm. ■



Oxygen in air combines with electrolyte and electrons from circuit to form OH ions. These ions combine with magnesium to form magnesium hydroxide and free electrons.

TRICKY TRIO FOR



By Charles Green, W6FFQ

■ The 6-meter Ham band is one of the busy portions of the VHF spectrum. Local rag-chews, traffic nets and experimental transmissions fill the band. At times the band opens up, and over the horizon transmissions from several hundred to thousands of miles become possible. At these times, the 6-meter band sounds like a swarm of bees, with stations trying to complete QSO's before the band becomes normal again. Sound like these 6-meter happenings are for you?

If so, you can listen in on 6-meter goings-on with our one-tube compactron convertor. The convertor tunes the most active portion of 6 meters, being bandspread over 50 to 51.5 MHz, and uses the triple-triode compactron as grounded-grid RF amplifier, mixer and tunable oscillator stages.

The convertor is built into a compact aluminum cabinet with a built-in AC power supply, and it converts 6-meter signals to the upper end of the broadcast band (1500 to 1600 kHz) so you can receive them with a standard BCB receiver.

Here's How. 6-meter signals are coupled from the antenna, via J1, to the broadly

tuned antenna coil L1. The signals are amplified by the grounded grid amplifier V1A, and coupled by L2 and C3 to the mixer V1B. The oscillator V1C is tuned by L3 and C6 above the frequency of the 6-meter signals. C7 and C8 bandspread the oscillator to cover the most active portion of the 6-meter band. L5 and the interelectrode capacities of V1C provide the RF feedback path for the oscillator.

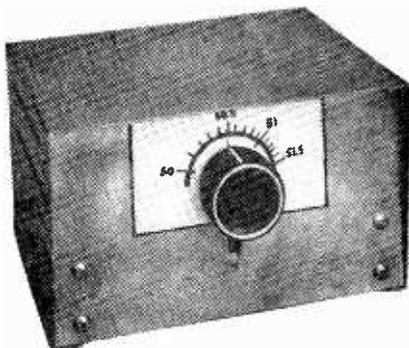
The oscillator output is coupled to the mixer grid by internal capacity of the compactron, and the frequency difference between the oscillator and the 6-meter signals is converted to an output IF frequency of 1600 kHz. This output frequency is coupled to the BCB receiver via L4 and J2.

The DC power for the convertor circuits is supplied by T1—D1, and filtered by C11—R8. The compactron heater power is also supplied by T1.

Construction. Our convertor is built in a 7½ x 4½ x 5-in. aluminum cabinet with a built-in chassis (LMB W-2F). This cabinet has removable front, rear, and bottom panels, as well as a removable top panel. Best way to start construction is to remove all of the panels and lay out the positions of the components on top of the chassis as shown in the photos. Place the parts as close as possible to the positions shown as placement is critical.

Install the tuning capacitor C6 on the front panel approximately ⅛-in. above the chassis, and cut a feed-through hole ⅜-in. dia. just below the terminal nearest V1. Mount the remaining parts as shown in the photos, using serrated washers to prevent movement.

Coil Winding. Wind 13 turns of #28 enameled wire on a J. W. Miller adjustable coil form 20A000-4 for L1 and L2 coils. Space the coil terminals approximately ¼-in.



Hot triple-triode six-meter convertor makes great addition to any ham shack.

apart and the top terminal should be about 1/16-in. from the top of the coil form.

After L1 is installed, wind two turns of #22 hookup wire around its center and connect the ends to the ground lug installed with the coil, and a length of coax. Connect the other end of the coax to J1. Then wire the remainder of the convertor chassis. Wind 10 turns of #22 hookup wire around L4, twist the wire ends together and connect them to J2. Remove 1 rotor blade from C6.

Remove unused terminals on the terminal board holding the power supply components R8, C12, D1, C14 and C15. Use insulated sleeving on the pigtail fuse F1 to prevent shorts. Keep the AC line cord and power supply wiring away from the other wiring and components around the V1 socket. Cement a 2¼ x 4-in. cardboard section on the panel for a dial and cement a length of bus wire to the knob for a dial pointer.

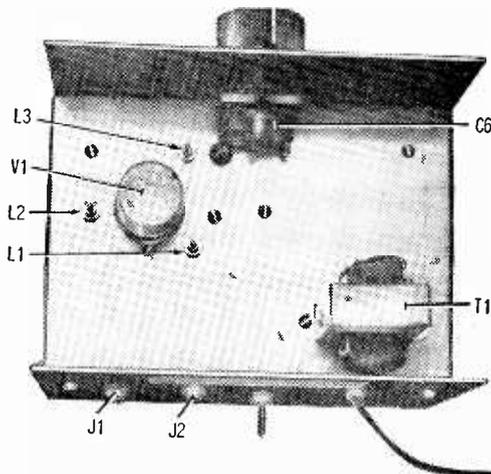
Alignment And Operation. Install V1 in its socket and connect the convertor to the AC line. Set the power switch S1 to *on* and allow the convertor to warm up for approximately 10 minutes. While the convertor is warming up, check for any signs of trouble, such as overheating components.

Connect the convertor to a BCB receiver with coax from J2. If the receiver does not have terminals for an external antenna and ground, wind four turns of wire around the receiver loop antenna and connect them to J2. If the receiver is of the transformerless variety, take care to prevent direct connection between the receiver chassis and the convertor.

Using A Generator. Set the receiver to a clear spot between 1500 and 1600 kHz. Connect a signal generator to J1 and set the generator for a modulated 50-MHz output. Set the tuning capacitor to a point slightly less than full capacity (the rotor blades not quite fully meshed with the stator).

Set the adjustment screw of L3 all the way out from the chassis and adjust it towards the chassis until you hear the signal. Note; the signal can be heard at two positions of the tuning screw. Set the screw at the position highest from the chassis (higher frequency). This enables the oscillator to operate at a higher frequency than the signal.

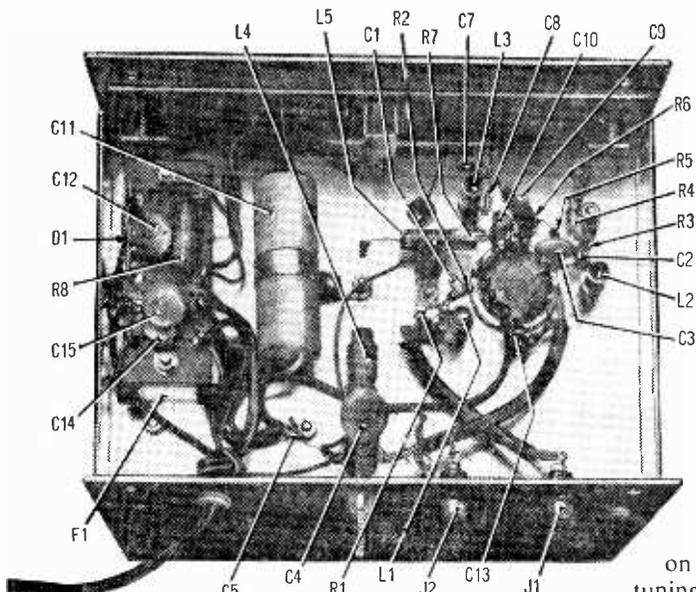
Set the signal generator frequency to 50.5 MHz and tune C6 until you hear the signal. Adjust L1, L2 and L4 for maximum output signal, reducing the signal generator output as necessary to prevent overloading. Now calibrate the dial with the signal generator.



High frequency circuitry is critical so follow above layout for best results.

PARTS LIST

- C1, C2, C5, C10, C13—.001- μ F disc capacitor
- C3, C9—47-pF disc capacitor
- C4—100-pF disc capacitor
- C6—Variable capacitor, modified (Hammarlund HFA-15B), one rotor blade removed (original capacity is 2.8 to 16 pF)
- C7—4.7-pF, disc capacitor
- C8—10-pF, disc capacitor
- C12, C14, C15—.005- μ F disc capacitor
- C11A, B—Dual 50- μ F, 150-VDC electrolytic capacitor
- D1—1N2071 silicon diode, 400-PIV, 500-mA
- F1—½-A fuse, pigtail type
- J1, J2—Phono jacks, single-hole mounting
- L1, L2—13 turns #28 enameled wire on J. W. Miller coil form 20A000-4 or equiv. (see text)
- L3—Adjustable RF coil, 0.68- μ H (J. W. Miller 20A687RBI or equiv.)
- L4—Antenna coil, loopstick (J. W. Miller RFC-50 or equiv.)
- L5—8.2- μ H RF choke (J. W. Miller RFD-50 or equiv.)
- R1, R3—6800-ohm, ½-watt resistor
- R2—220-ohm, ½-watt resistor
- R4—1600-ohm, ½-watt resistor
- R5—1-megohm, ½-watt resistor
- R6—33,000-ohm, ½-watt resistor
- R7—4700-ohm, ½-watt resistor
- R8—3300-ohm, 2-watt resistor
- S1—S.p.s.t. slide switch
- T1—Power transformer, 125-VAC 15-mA, 6.3-VAC 0.6-A secondary (Allied 54A1410 or equiv.)
- V1—6D10 compactron tube
- 1—Compactron tube socket
- 1—Terminal board, 8-lug (Erie 3976-205-2 or equiv.)
- 1—Cabinet with built-in chassis 7½ x 4½ x 5 in. (Newark 91F1096 or equiv.)
- Misc.—AC line cord, RG-58 coax cable, solder lugs, wire, solder, etc.



Under-chassis placement of parts is uncluttered. Leads are kept short and all critical components are close to compactron. Note use of coax for input and output leads.

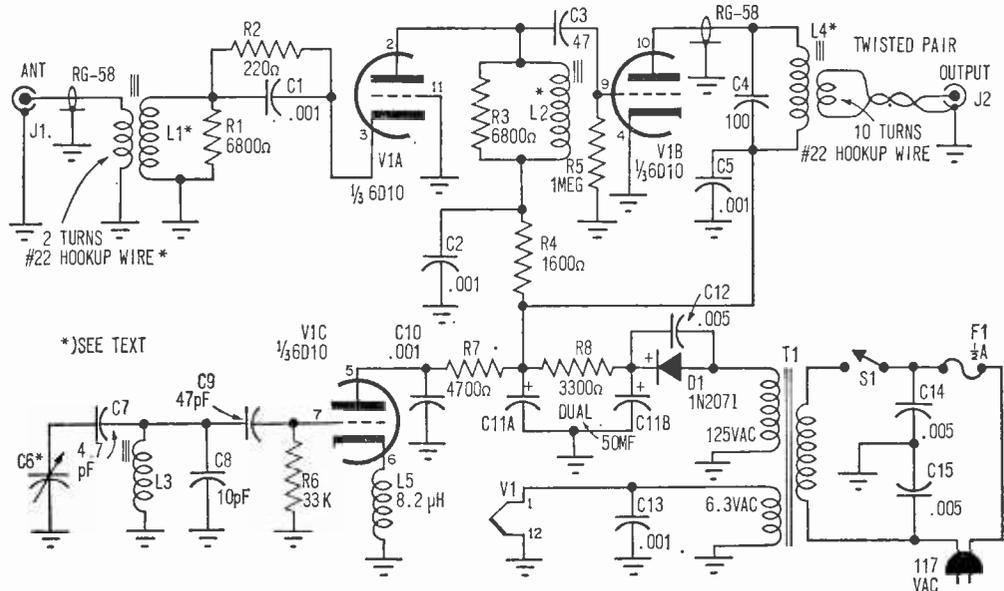
Without A Generator. If you don't have a signal generator, set the coil tuning screws out from the chassis as follows: L1—7/16-in., L2—9/16-in., L3—9/16-in. Connect the unit to an antenna and try to peak up the coils on received signals.

Before using the converter, allow a 10-minute warmup to stabilize the oscillator section and minimize signal drift. For strong signals, a whip antenna will be fine; for weaker signals, use a beam antenna.

If you live in an area with FM broadcast

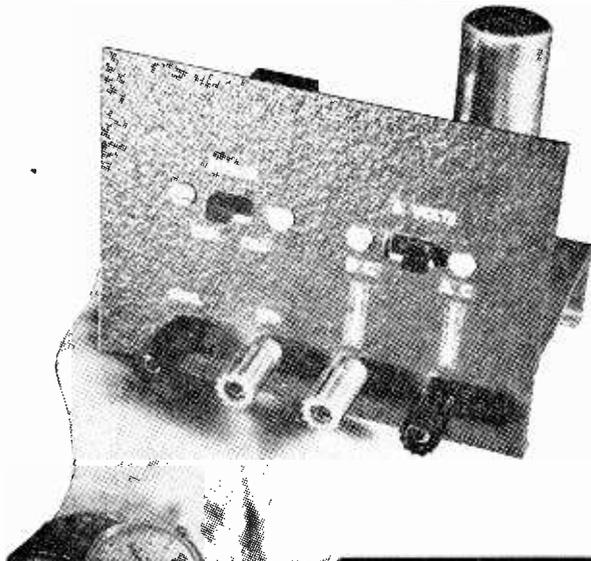
stations, you may receive them on the higher end of the converter tuning range. This is caused by the second harmonic of the converter oscillator hetrodyning with the FM signals. This is most noticeable when the 6-meter band is quiet, and is minimized when the band is active.

The converter tuning range is bandspread from 50 to 51.5 MHz. This is the most active part of the band as most hams stay near the band bottom to avoid TVI in channel 2 areas. If desired, the tuning range of the converter can be expanded by increasing the value of C8.



Schematic of Tricky Trio shows well engineered design resulting in fine performance.

EXPERIMENTER'S



Neat package that will fire-up either tube or transistor experimental circuits like nobody's business

■ All electronic gear requires some level of voltage and current to function properly. The power supply presented here will meet most of the power requirements for projects described in this publication and elsewhere.

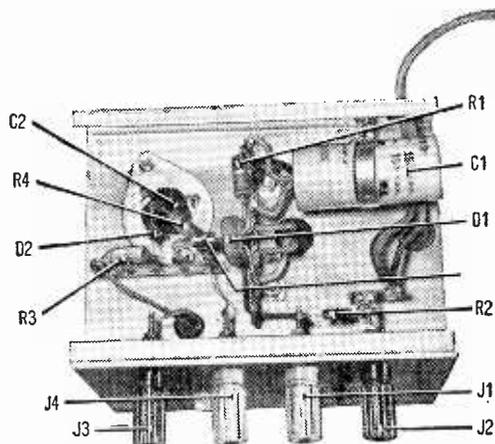
Authors of electronic projects for the hobbyist generally keep in mind the economic aspects of building the project and therefore design circuits around an economic power source.

In many cases, where a one or two tube gadget is described, the B+ voltage requirements range between 125 and 175 VDC at up to about 40 mA, and the filament supply is

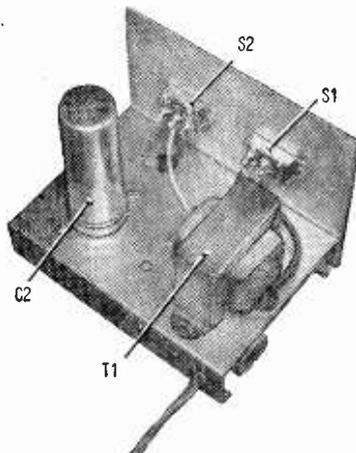
usually 6.3 VAC at approximately 1 A.

For transistor projects, the voltage range is usually from 3 to 9 VDC at up to a maximum of about 30 mA. This compact unit will supply the B+ and filament voltages and currents, and provide a regulated 6 VDC at up to 40 mA.

Circuit Description. The high voltage supply features a full-wave bridge-rectifier module selected to give minimum ripple using reasonable size filter capacitors. A bridge may be made up using four standard silicon diodes, but you can't beat the module for small size and easy hookup.



Under-chassis layout is roomy with lots of working space. J2 is common ground point.



Component location isn't critical but following layout shown insures good results.

QV POWER SUPPLY

By Robert E. Kelland

Resistor R2 acts as a bleeder to drain the charged capacitors after the power supply is shut down. Many electronic projects that have three or more stages require two separate power supply taps to minimize inter-stage coupling.

If you plan on building such circuits, we recommend you install an additional B-plus output jack as indicated on the schematic. In use, the optional output should be connected to the plates of the output tubes where hum level is not overly critical. The regular B-plus output (J1) connects to the low level or input stage.

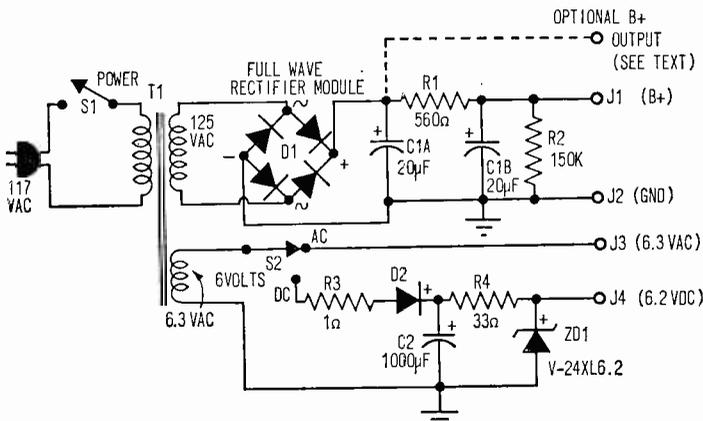
Low Voltage DC. The s.p.s.t. slide switch S2 selects either a 6.3 VAC output (J3 and GND) or 6.2 VDC (J4 and GND). The DC circuit utilizes a conventional half wave rectifier with a single capacitor providing the necessary filtering.

The 1-ohm resistor R3 prevents damage to silicon diode D2 when the initial surge of current flows to charge the large filter capacitor C2. Zener diode ZD1 is a 6.2-volt 1-watt unit and does an excellent job of regulating the output voltage under varying loads.

Up to 40 mA of current can be drawn from this supply with only a .03 volt change in output voltage from no load level.

Construction. The chassis is formed from 18 gauge aluminum to measure 1 x 3 x 5 in. The nearest size chassis commercially available measures 1¼ x 3 x 6½ in. and may be substituted for a home-made job. The front panel is cut from a piece of aluminum and measures 3 in. high by 5 in. wide. However, the panel must be made to match the chassis you use.

Five-way binding posts were chosen for all jacks because of their versatility in accepting connecting leads. The



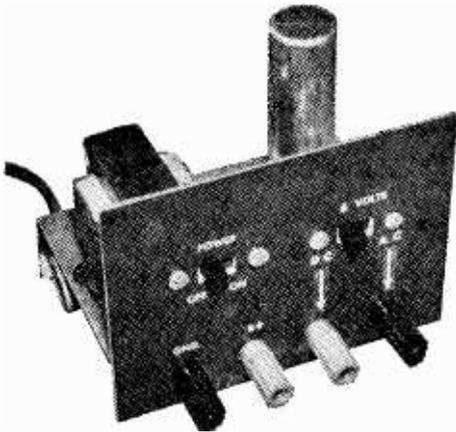
Wire power supply as shown in schematic. Be sure to observe correct polarities.

QV POWER SUPPLY

jacks are equally spaced along the lower front panel and serve to secure the panel to the chassis.

The low voltage filter capacitor C2 is available in a smaller package than the one used by the author. The capacitance may range from 800 μF to 1500 μF at no less than 10 VDC. If you use a "can" type capacitor, a 1-in. mounting hole is needed.

Terminal Strip Wiring. The mounting and wiring of the small components is centered around two terminal strips; one for the low voltage DC and the other for the high voltage DC. Don't forget to use a heat sink when soldering D1, D2 and ZD1 and make sure the polarities are correct. Proper polarity is, of course, to be observed for both



Nifty little package ready to fire-up just about any project that's in the works.

PARTS LIST

- C1A, C1B—20-20- μF , 150-VDC, dual-section electrolytic capacitor (Radio Shack 71-2-49 or equiv.)
- C2—1000- μF , 10-VDC electrolytic capacitor (see text)
- D1—Full-wave bridge rectifier module (Erie FWB 3004A or equiv.)
- D2—Silicon rectifier diode, min. 50-PIV, 750-mA (Radio Shack 276-1107 or equiv.)
- J1, J4—5-way binding posts, insulated, red (Radio Shack 274-333 or equiv.)
- J2, J3—5-way binding posts, insulated, black (Radio Shack 274-333 or equiv.)
- R1—560-ohm, 1-watt resistor
- R2—150,000-ohm, $\frac{1}{2}$ -watt resistor
- R3—1-ohm, $\frac{1}{2}$ -watt resistor
- R4—33-ohm, 1-watt resistor
- S1—S.p.s.t. slide switch (Radio Shack 275-315 or equiv.)
- S2—S.p.d.t. slide switch (Radio Shack 275-125 or equiv.)
- T1—Power transformer, 117-VAC pri.; 125-VAC, 50-mA and 6.3-VAC, 1.5-A sec. (see text)
- ZD1—Zener diode, 6.2-V, 1-watt (General Electric V-24XL6.2 or equiv.)
- 1—Chassis, aluminum, 1x3x5 in.
- 1—Panel, aluminum, 3x5 in.
- 2—Terminal strips, 6 lug
- Misc.—Screws, nuts, decals, wire, solder, etc.

of the filter capacitors as well.

Putting It To Work. Before connecting the power supply to a project, be certain to check the circuits' voltage and current requirements. If it is your own experimental circuit, use a tube manual to ascertain the approximate plate currents and filament currents required. Remember that some of the popular 12 volt filament tubes may be operated with a 6-volt supply by connecting the two halves of the filament in parallel across the 6 volts. Under no circumstances should the 6-VDC supply be used for the filament supply. ■

Yipes! Stripes!

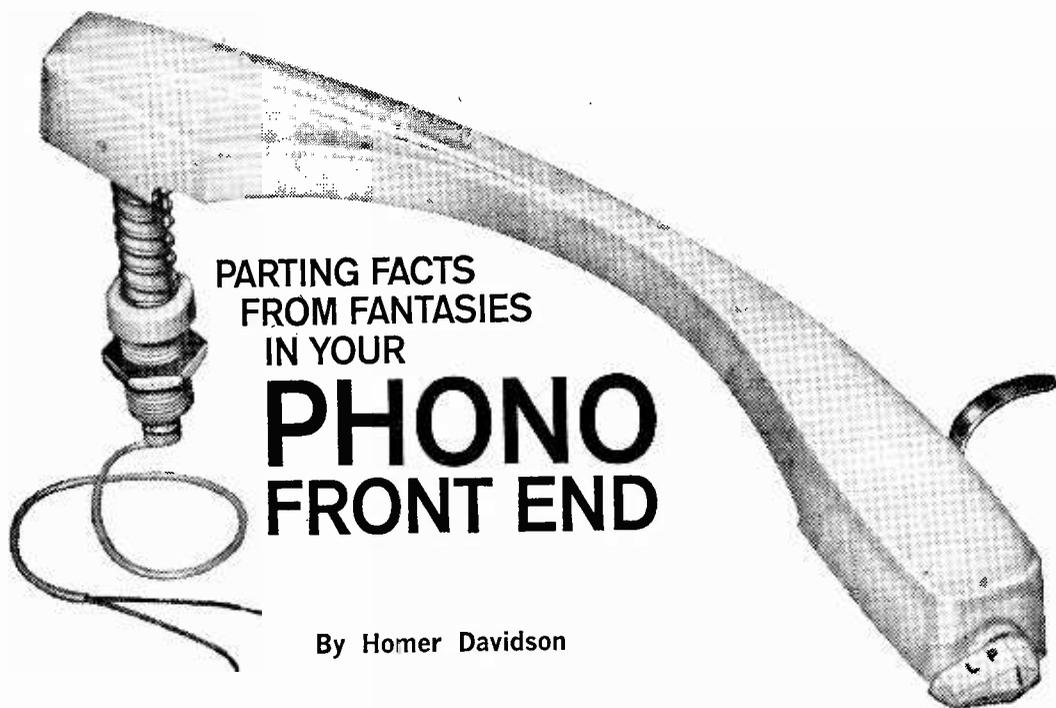
Here's one for the curious who wonder where tigers and zebras get their stripes. At General Electric's Communication Products Department, Lynchburg, Va., they're painting multi-colored stripes on miles of circuit wire used in two-way mobile radios.

Though wire painting is not new, it is unusual activity for an electronics plant. Three different colors are applied simultaneously while the wire travels 150 feet per minute. The wire is thus color coded to help get it wired to the right terminal.

The wire machine's carousel-shaped dauber

has three paint pots and striping wheels. The colorful merry-go-round whirls 1,800 times per minute while applying three different paints at the same time. Although 40 color combinations are used by GE, the machine can paint 729 combinations of stripes with nine colors—black, brown, red, green, orange, yellow, blue, violet and gray.

Now one more for the curious. What about stripes on peppermint sticks? Candy-makers say they're not painted. Just two strips of different colored candy are wound together. ■



PARTING FACTS FROM FANTASIES IN YOUR **PHONO FRONT END**

By Homer Davidson

■ There's lots more to needle, cartridge and record care than meets the eye and these are the items subjected to the most abuse of all the components in a phonograph. The basics of servicing and maintenance of "what's up front" in a phono are simple—once you know them. So come with us as we present the hows and whys essential to keeping your disc show on the road. And if you're an old timer that knows all about it, this may be just the refresher needed to keep you heading right.

First Of All. How do you know that your phono needle (stylus) is defective? To find out, there are several simple tests you can make. If the tone arm of the phonograph slides across the record after setting down, change the stylus. This check should be made on a new (unwanted or unloved) record.

Now take a look at the stylus to see if dirt or dust is lodged between it and cartridge. If there is, brush it out, using a small camel's hair brush.

Play the record once again. Often, dust or dirt will cause mushy music. If there is still no improvement, let's try another check.

Take a new record or one that is clean. Set the changer to manual position, and play

about one inch of the record. See Fig. 1 on the next page. Is the one inch played-space duller looking? If so, replace the stylus.

Other Ways. Another method is to take a clean white cloth and wipe the record after it has been played. If the stylus is defective and cutting the groove, you'll pick up small black record chips (black or dark dust) on the cloth. Replace the defective stylus.

Another way is to take a magnifying glass, like Grandpa used to read with, or a low-power microscope, and take a good look at the tip of the stylus. A sharply-pointed one will chisel out the groove of the record. Maybe there is a flat spot on the point. Replace the stylus in the above cases.

A good stylus will go towards a sharp point, but will be rounded off at the pointed end as shown in Fig. 2.

Check to see if you have excessive noise or scratchy *needle-talk*. This test should also be made on a fairly new record. (Be sure the volume is down when making this check.) Bend down close to the record and you should hear a little *needle-talk* even under good conditions. With a very bad needle or defective record, you can hear the noise from quite a distance.

(Continued overleaf)

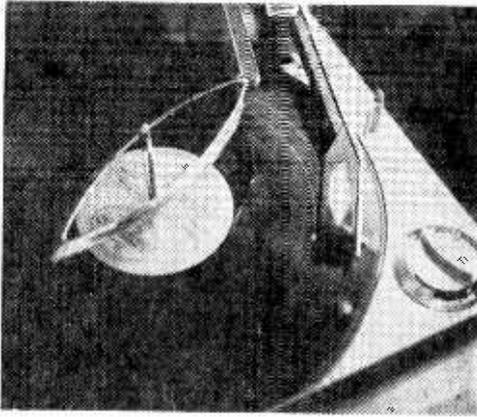


Fig. 1. A chipped or worn stylus will cut the grooves of a record making them dull-looking; if so, better get a new stylus.

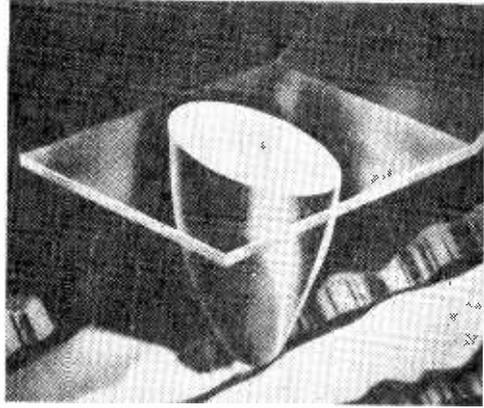


Fig. 2. The tip of a good stylus is actually a rounded "ball" that won't chisel into the soft vinyl record groove.

PHONO FRONT END

Record Wear. Most phonograph records will last for years if proper care is used. Before any record is played, wipe it off with a *record cloth*. Handle all records by the edge. Don't grasp them in the middle or with one hand. Little hands should not handle expensive records. Sticky fingers will smear the record with grease which will lodge dust and dirt into the record groove.

Don't leave a stack of records on the spindle center post or turntable after shut-

ting off the record player. They will start to warp and on a very warm day may begin to droop. Phonograph records left on the turntable will also collect dust. Return all records to their jackets or record cabinet.

Watch Your Speed. Watch for correct speed settings and correct stylus position for the record being played. For instance, if a 78 stylus is played on a 45 or 33 $\frac{1}{3}$ record, damage can be done. Also the pickup arm will tend to skate on the record.

Can a new record be defective? It certainly can be. Check for a poor cut in the record grooves. Also, if the starting cut is too shallow or narrow, the pickup arm may drop off the record or start ahead of the music (Fig. 3). Check to see if the finish

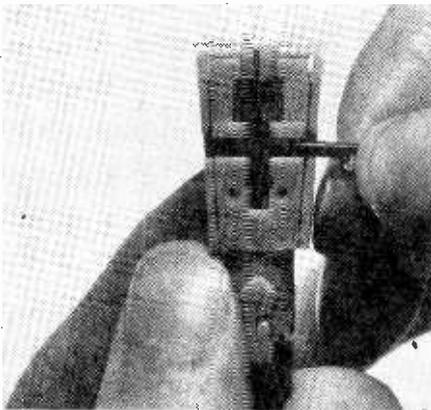


Fig. 6. On this popular cartridge, the stylus shank simply snaps into the plastic cartridge body.

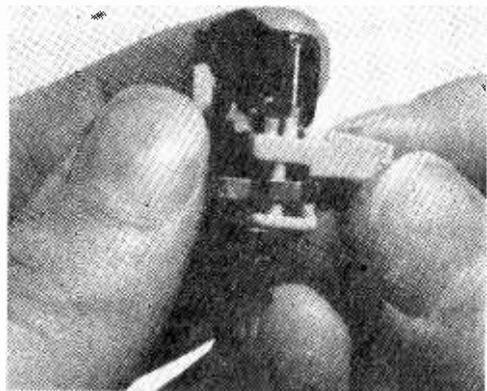


Fig. 7. To remove the stylus assembly from this type cartridge, position the turnover lever as shown.



Fig. 3. Poor sound can also be the fault of the record even if it's a new one. Compare sound against other records.

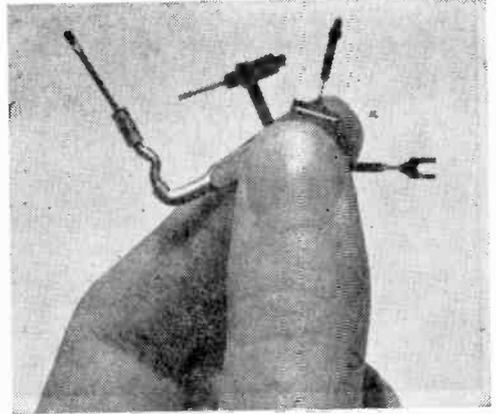


Fig. 4. Dozens of different types of styli can make for confusion on your part. Four typical styli are shown here.

track of the record is triggering the changer. If other records play at these settings, you have purchased a defective record.

In case a new record doesn't drop down from the center post, it's possible the center hole is not perfectly round. Generally a defective record will stand alone while all other records play perfectly.

To avoid getting a defective one, select a new record in its original sealed jacket. One that has been opened may have been played several times before. Also, buy only good known brand records to make sure you don't get stung.

Diamond Or Sapphire. What type of replacement stylus should you buy? There are pros and cons on whether to buy a dia-

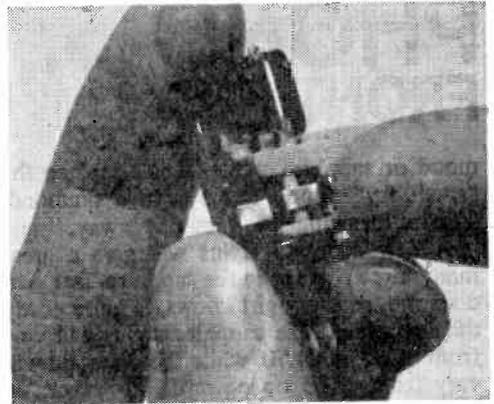


Fig. 5. When removing the stylus for replacement, first check to see how it is attached to the cartridge.

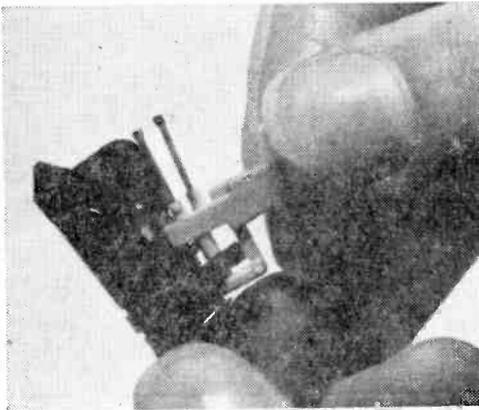


Fig. 8. Gently pull up and away on the stylus assembly; the metal clip gives way with very little pressure.

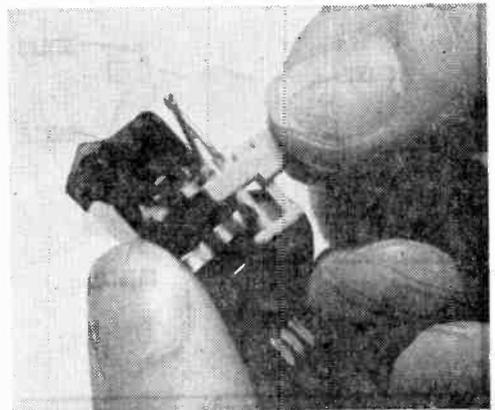


Fig. 9. Pull the stylus assembly clear being very careful not to put strain on the stylus shank or "saddle."

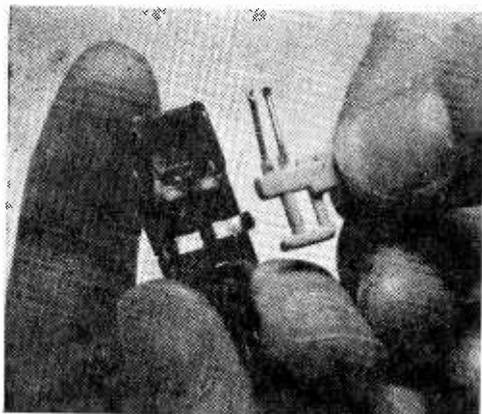


Fig. 10. Replacement of this type of stylus is exactly the reverse process of the removal procedure.

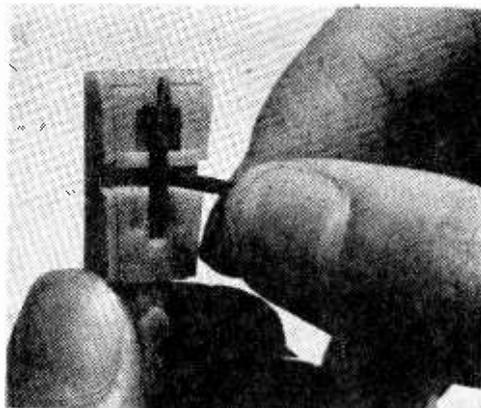


Fig. 11. To remove the stylus assembly in this type of phono cartridge, first turn the stylus-flip lever straight out.

PHONO FRONT END

mond or sapphire stylus. Don't replace the "small fry" phono stylus with a diamond. You're throwing good money away.

A new diamond stylus will give a great many more plays than the sapphire. But then diamond, as every girl knows, is more costly than sapphire. The sapphire stylus will cost from \$1.50 to \$4.50, while the diamond will vary from \$4.95 on upwards. However, on an hours-of-play-per-dollar basis, the diamond stylus outshines them all. A handful of

typical and vastly different replacement styli are shown in Fig. 4.

Some people get more hours per stylus than others. But this is the choice of the operator. One person may hear a worn stylus before another.

Some hi-fi bugs will replace the stylus when it has less than 500 plays. Other music enthusiasts replace the stylus four or five times a year—with the seasons.

On really good records, a diamond stylus should be used. Extra record care can save you money.

Stylus Replacement. Can you replace your own stylus? Certainly, by knowing how and using a little care. Pull the arm up and take a glance at the stylus and cartridge.

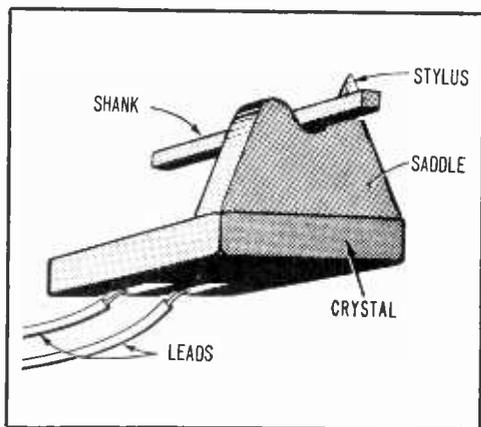


Fig. 15. Stylus shank rides in saddle which is connected to the cartridge element that turns groove wiggle into sound.

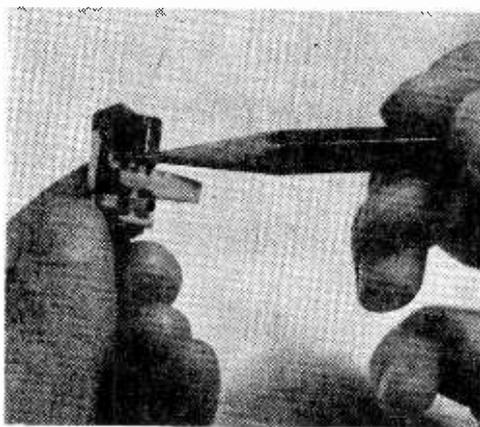


Fig. 16. The pencil points to the U-shaped saddle in a typical cartridge. Be sure stylus shank is properly seated in saddle.

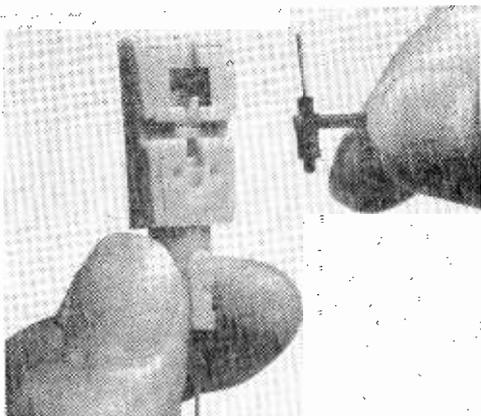


Fig. 12. Then pull it straight away from the cartridge body. To replace the stylus, use the reverse procedure.

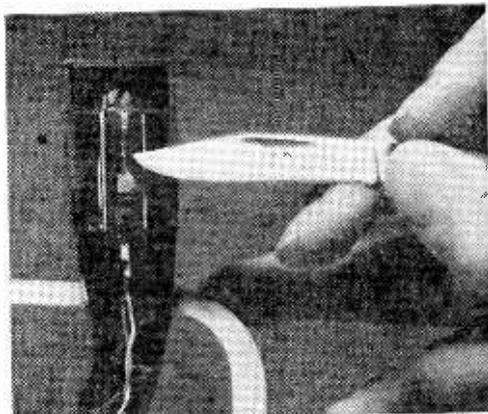


Fig. 13. Another type of stylus mounts on a rubber grommet and can be removed by carefully popping it off with a knife.

Some styli are held down with a metal clip as in Fig. 5; some snap into position as in Fig. 6. Others plug into a slot or are bolted in place with a small nut. With a steady hand, anyone can replace a stylus. If nervous, let someone else do it.

Figs. 7-10 show you how to change a stylus in a clip type of cartridge. There are many types of styli on the market but they all replace fairly easily. Figs. 11-13 shows another typical stylus replacement procedure. In some cases it may be necessary to drop the cartridge out of the holder before the stylus can be replaced, as seen in Fig. 14.

Instruction booklets that come with the phonograph will illustrate how to replace the stylus. Look at the instructions on the

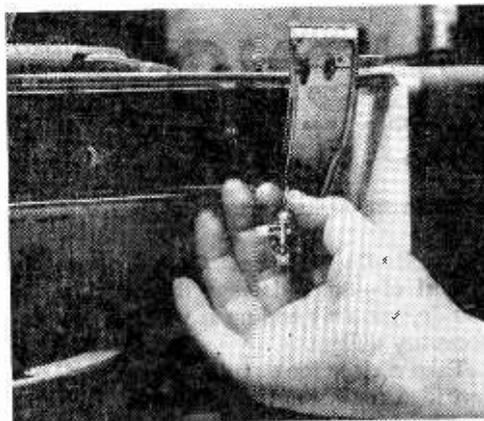


Fig. 14. If the tone-arm has limited vertical movement, cartridge can be removed for easier stylus replacement.

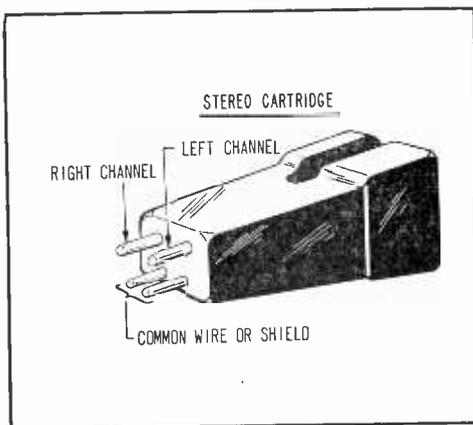


Fig. 17. Typical stereo cartridge has four terminals but only three connecting wires since ground connection is shared.

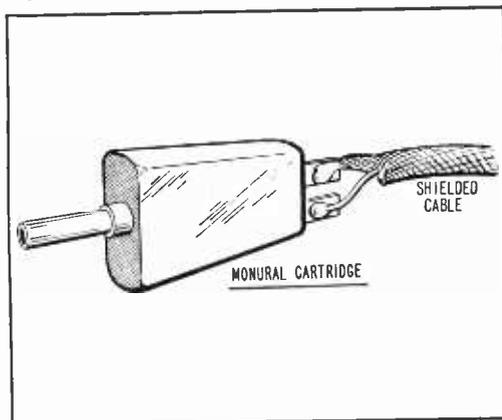


Fig. 18. Mono cartridge is usually hooked up with a shielded cable though in cheapies, it may just be a twisted pair.

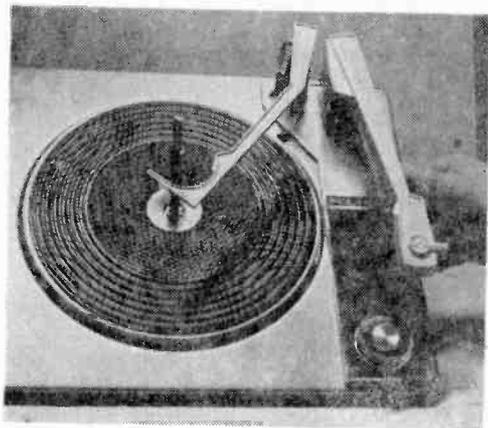


Fig. 19. Using a changer in "manual," be careful not to drop arm as record, stylus, and cartridge may be damaged.

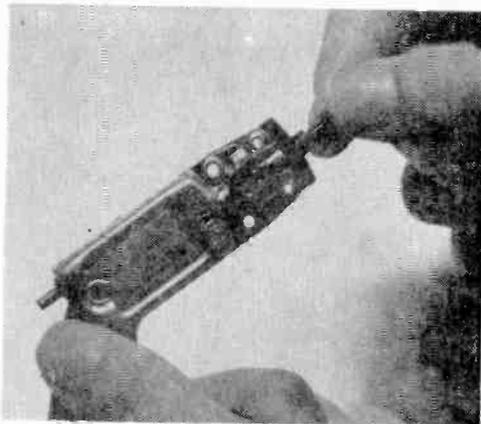


Fig. 20. Old turnover type crystal cartridge mounts and pivots on front shaft; it's removed by taking turnover knob off.

PHONO FRONT END

replacement stylus carton for further directions.

Fragile-Don't Drop. One thing to be careful of—don't damage the cartridge. If you do, you may end up spending a few unnecessary dollars.

Take a close look at the front end of the cartridge for a "U" shaped saddle (shown in Fig. 15). This saddle, or plastic piece, goes down into the cartridge and fastens to

(Continued on page 132)

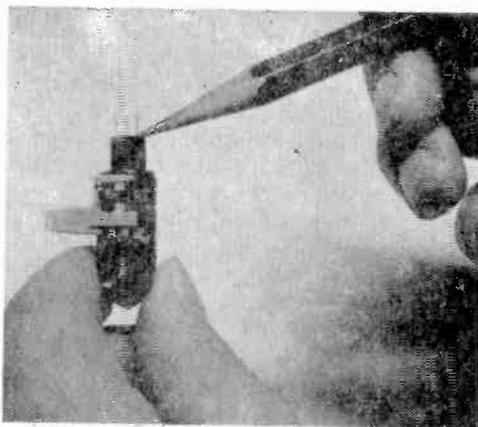


Fig. 21. Some stereo cartridges have only three terminals with center one being common ground for both sides of cartridge.

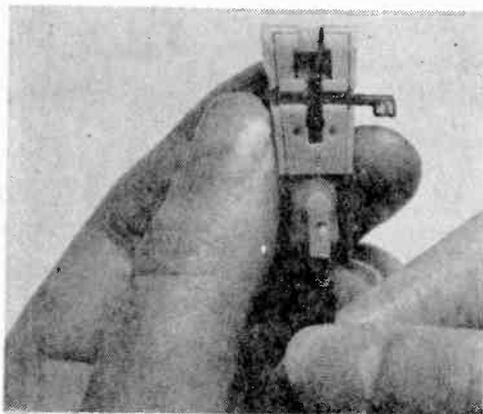


Fig. 22. On this type cartridge, the connecting wires are soldered to a small adapter which then plugs on to the cartridge.



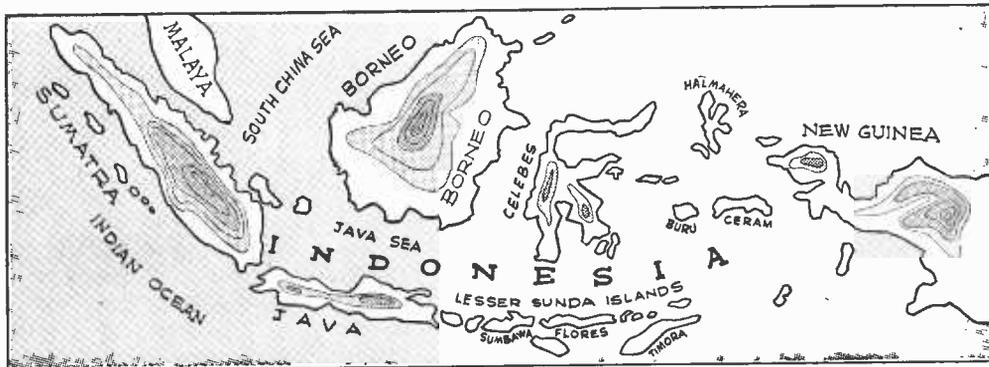
Fig. 23. Replacement cartridges often come with a choice of different mounting brackets to suit different tone-arms.

DXing

By C. M. Stanbury II

Hotspot for decades, Southeast Asia offers challenge aplenty for SWLs of every ilk

INDONESIA AND ITS NEIGHBORS



■ Like much of Southeast Asia, Indonesia boasts an intriguing political past and offers equally intriguing DX prospects. Made up entirely of islands, it counts DX-wise as anywhere from one to six countries, primarily because those islands are farther apart than a good many countries we can think of. Its varied collection of neighbors—Malaysia, the city-state of Singapore, the sultanate of Brunei, and Timor, a Portuguese colony—promise equally fascinating shortwave hunts.

The islands of Indonesia were originally administered as separate colonies under the Dutch. Later, dictator Sukarno, now deposed, welded the islands together politically as one nation. Its capitol is at Djakarta on the south-central island of Java, which, along with Sumatra and Bali, makes up the heart of this politically stormy nation.

Radio Republik Indonesia's (RRI) key station at Djakarta is readily heard throughout North America. Best bet is its international service, "The Voice of Indonesia," which has English beamed to our West Coast at 0930-1030 EST (0630-0730 PST) on 9865 kHz.

Though this is the only transmission aimed at us from Indonesia, the English transmission at 0600-0700 EST on the same fre-

quency is, strange as it seems, even more widely heard in North America. And for those who want to make logging the main part of Indonesia more of a DX challenge, RRI's regional transmitter at Jogjakarta (YDJ on 5047 kHz) is a natural. Its frequency falls in 60-meter territory, which means that reception will usually peak around sunrise, listener's time.

On The Outside. One outlying Indonesian state which nearly always counts as a separate DX country is West Irian, the former Dutch New Guinea. Explanation is that this is technically a trust territory (though in fact, it is administered as permanent part of the Republic). RRI has transmitters at Sorong on 7290 kHz (best time is again around 0600 EST) and 4872 kHz. For the record, reports for RRI regional stations should go to the appropriate local office. But be sure to make reports "interesting," since all Indonesian stations seem to be erratic verifiers.

Two more outlying Indonesian states sometimes also considered separate DX countries are Maluku (which is the Molucca Islands with capitol at Ambon) and Sulawesi (which is the Celebes Islands with administrative center at Manado). RRI at Ambon

DXing Indonesia

is heard from time to time on 7140; RRI Menado, also operating in 40-meter Ham territory, is on 7295 kHz (be careful not to mistake the latter for West Irian on 7290). Both Ambon and Menado will probably get through the Ham QRM best shortly after sunrise, but you might start looking a little earlier in the day if you live east of the Mississippi.

With the island of Timor, we come to one of the toughest places in the world for North American listeners to bag. Portuguese Timor, of course, always counts as a separate country and, in some DX circles, so does the Indonesian portion of this island. RRI (with an ID that can be readily spotted by almost any SWL) operates here from Kupang (YDV) on 3259 kHz—down in 90-meter land. The Portuguese, meanwhile, operate their station at Dili on 3268 kHz, just 9 kHz up from Kupang's frequency. Reception patterns on 90M are similar to those on 60M but stations are somewhat tougher to bag.

One For Three. The final RRI target also operates on 90M. This is YDW2 at Pontianak, Kalimantan on 3340 kHz (frequency may vary slightly). RRI Kalimantan is heard more often than either Kupang or Dili. Therefore, it's best to look for YDW2 first, then, if you hear it, shoot for the other two. For the record, Kalimantan is Indonesia's portion of the island of Borneo. Also, located on the island of Borneo is the Eastern part of Malaysia (the former British colonies of Sabah and Sarawak) as well as the sultanate of Brunei.

Significantly, the inclusion of Sabah and Sarawak into Malaysia led to conflict with Indonesia, which claims the territory for itself. While Sukarno was in power, this dispute had reached the guerilla warfare stage, but tensions have eased considerably since his overthrow. However, for DX purposes, East Malaysia always counts as a separate country. The R. Malaysia regional station at Kuching (Sarawak) transmits on 4895 and 4950 kHz, while 7160 is also used around 0430 EST; the station at Jesselton (Sabah) operates on 4970 kHz. Both of these stations are often heard in North America, as is R. Brunei on 4865.

Mainland Malaysia. Fortunately, stations on the mainland are even more easily

received. R. Malaysia's international service, "The Voice of Malaysia," operating from transmitters at Kuala Lumpur, has English language broadcasts for Australia and New Zealand at 0615 EST on 11900 and 6175 kHz. It can also be logged on 9710 kHz with various oriental languages after the 0800 S/On. Meanwhile, the BBC operates a Far East Relay at Tebrau (for some reason many SW clubs erroneously list this one as Singapore). The BBC Far East Station uses a number of different frequencies, including 11750 kHz around 0700, 9580 kHz around 0800, and 11725 kHz—sometimes heard around 1900 EST.

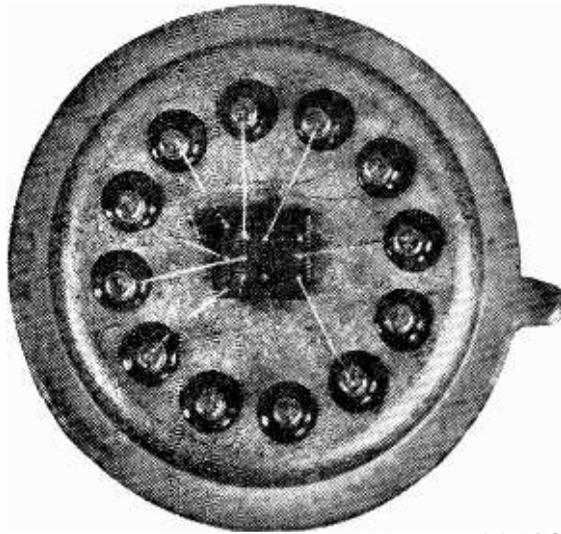
The city-state of Singapore (actually an island off the tip of the Malay Peninsula) originally did join Malaysia but withdrew shortly, more or less by mutual consent of all parties concerned. R. Singapore transmits extensively on 11940 kHz during the a.m. hours, with English aired at 0430 EST (0130 PST). Another channel used, starting at 0400, is 7250.

Finally, for those SWLers who would rather do things the hard way, the British Forces Broadcasting Station can sometimes be heard on or about 5010 kHz with a little luck and a lot of patience.

Incidentally, all *non-Indonesian* stations listed in this article are good verifiers. ■

THE ACTION AT A GLANCE

kHz	Station
3259	R.R.I., Kapang, Indonesian Timor
3268	Dili, Portuguese Timor
3340	R.R.I., Pontianak, Kalimantan
4865	R. Brunei
4872	R.R.I., Sorong, West Irian
4895	R. Malaysia, Kuching, East Malaysia
4950	R. Malaysia, Kuching, East Malaysia
4970	R. Malaysia, Jesselton, East Malaysia
5010	Forces Broadcasting Station, Singapore
5047	R.R.I., Jogjakarta, Indonesia
6175	R. Malaysia, Kuala Lumpur, West Malaysia
7140	R.R.I., Ambon, Maluku
7160	R. Malaysia, Kuching, East Malaysia
7250	R. Singapore
7290	R.R.I., Sorong, West Irian
7295	R.R.I., Menado, Sulawesi
9580	B.B.C. Far East Station, Tebrau, West Malaysia
9710	R. Malaysia, Kuala Lumpur, West Malaysia
9865	R.R.I., Djakarta, Indonesia
11725	B.B.C. Far East Station, Tebrau, West Malaysia
11750	B.B.C. Far East Station, Tebrau, West Malaysia
11900	R. Malaysia, Kuala Lumpur, West Malaysia
11940	R. Singapore



By James Fred

Mini Mix

Little mixer with big performance using the first low-cost experimenter's IC

■ Integrated circuits, or IC's as they are now called, are the epitome of electronic technology today. A typical integrated circuit consists of a 25-mil square of semiconductor material with a number of transistors, diodes, resistors, and, in some cases, capacitors deposited thereon. These components are interconnected and packaged in a small transistor can or other container with external leads for circuit connection.

One of the first integrated circuits available to the experimenter was the Westinghouse WC183. It's available as the WC183G in a ten lead plastic package or as the WC183T in a TO5-style transistor can.

The WC183 is a general-purpose low-level audio amplifier consisting of an 8 transistor

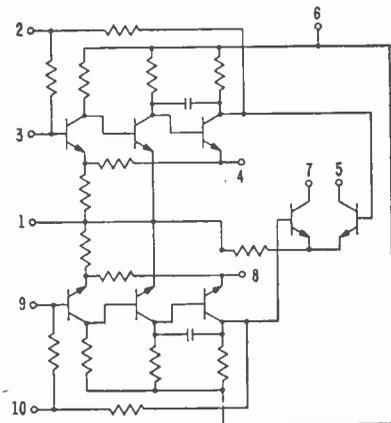
balanced circuit with internal DC feedback. It is fabricated on a silicon chip about 20 mils square.

The photograph shows the silicon chip and interconnections to the hermetic glass sealed leads. (The photograph is highly magnified to show it more clearly.) The circuit is shown in the diagram and consists of a 3-stage class "A" amplifier followed by a class "B" output stage. Note that the amplifier must be used in a push-pull output arrangement and not as two separate amplifiers.

Gobs Of Gain. Under ideal laboratory conditions, the overall circuit gain of the IC is given as 90 dB with a 4.5 volt power source. (90 dB represents a voltage gain of



Mini Mix is compact professional looking unit that's easy to build using IC whose tiny "chip" contains circuit at right.



PIN NUMBERS REFER TO G PACKAGE

something in the area of 39,000 times.)

In the circuit shown, with 50,000 ohms input impedance, undistorted voltage gain of 20 times (26 dB) was obtained. This is adequate gain for most applications.

Mini-Mix has an output transformer that will provide a 75- or 150-ohm output impedance. This will enable you to use microphone cables up to 100 ft. long between the mixer and the power amplifier. Of course, the power amplifier must have a low impedance input.

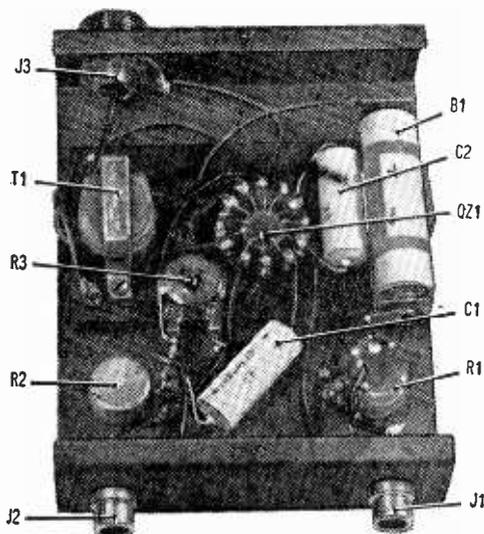
Mini-Mix has two inputs with individual gain controls. Two microphones can be connected, their gains controlled individually and their outputs mixed in the output stage of the IC amplifier. The 50,000-ohm impedance of most crystal microphones is a good match to the 40,000-ohm input impedance of the IC amplifier. The gain controls are also 50,000 ohms and won't degrade the input impedance.



Completed Mini Mix all hooked up and ready to go. Unit's small size and good performance makes it welcome anywhere.

Making Mini-Mix. The entire mixer is self-contained in an aluminum box $3\frac{1}{4} \times 4 \times 1$ in. It can easily be held in one hand or slipped into a jacket pocket. The box is made from a miniature aluminum chassis with a homemade aluminum cover. The input and output connectors, gain controls, and amplifier assembly are mounted on the chassis.

The cover has four rubber feet attached and is actually the bottom of the box. The two box halves are carefully cleaned with steel wool and sprayed with two coats of



Internal layout of unit is simple and uncluttered thanks to IC. Most components including IC mount on phenolic board.

zinc chromate. They are then wet sanded and spray-painted with flat black lacquer. The decals are applied and a clear flat spray is given it to protect the lettering.

Sans Socket. The IC has 12 leads on .200-in. diameter centers. IC sockets are difficult to find and expensive to buy so the alternate method of mounting shown in the photo was used. A center clearance hole $11/32$ in. in diameter is made in a phenolic board and a circle of twelve holes .093-in. diameter is drilled around it. The phenolic board is laid out and drilled approximately as shown and the turret terminals and two short stand-offs are staked into place. The TO5 IC can be inserted in the hole upside down and the leads are attached to turret terminals staked into the .093 holes.

The standoffs on the bottom of the board are for mounting board to chassis. The battery holder is riveted in place and the output transformer is held in place by two 2-56 screws and nuts. Two 2-56 screws hold the box halves together. The two additional turret terminals near the transformer are for the secondary leads that provide the two different output impedances.

The connectors and the IC board assembly are mounted into the box half and then the wiring is installed. It is not necessary to use shielded wire since all the leads are short and the unit is completely shielded.

Buss wire, number 22, was used with plastic insulating sleeving where necessary

Top of Mini Mix is miniature aluminum chassis and bottom is made from sheet aluminum to fit.

for circuit wiring. The IC can be pushed into the mounting hole in the phenolic board and the leads crimped to the terminals as shown.

The locating tab on the IC can be positioned as shown. Additional leads are fastened to the terminals before being soldered. Use extreme care when soldering so as not to overheat the IC junctions.

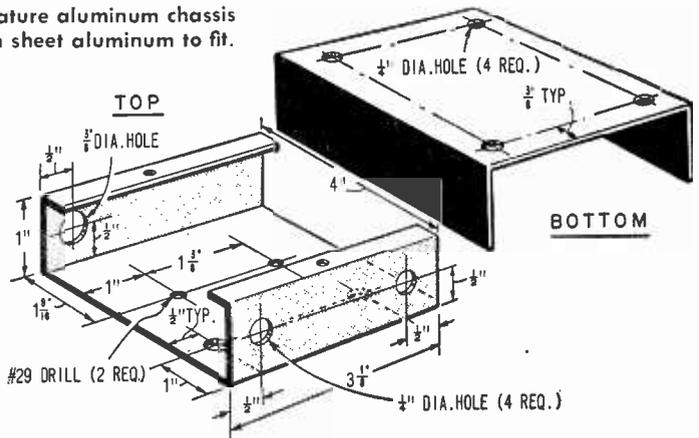
Sink The Heat. Each turret terminal should be held with needle nose pliers to draw off the excess heat from soldering.

The output transformer has a tapped secondary. One wire is connected to ground and the other two to turret terminals. A wire from the output connector can then be soldered to either terminal to get either 75 or 150 ohms output impedance.

The miniature trimmer resistor is used to control the gain of the circuit. It can be set to its maximum value unless distortion oc-

curr. The battery should be installed after all the wiring is completed and checked for errors.

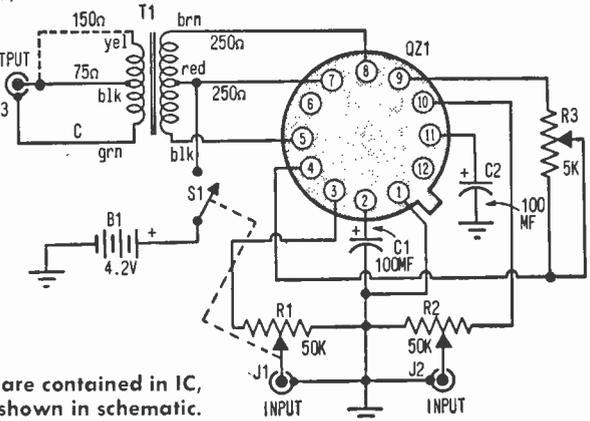
Try-Outs. After the unit is completed, it can be tested by connecting one or two crystal microphones to Mini-Mix and connecting its output to the low impedance input of an audio amplifier. If an audio signal generator and oscilloscope is available, a check can be made for distortion. Our unit was free of distortion at normal input levels. Mini Mix will work nicely when connected to just about any public address amplifier. ■



PARTS LIST FOR MINI MIX

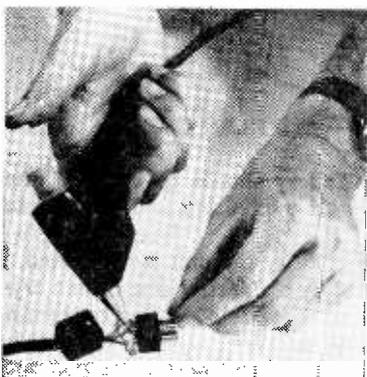
- B1—Mercury battery, 4.2 volts (Mallory TR153, Allied Radio 18B5938, or equiv.)
- C1, C2—100- μ F, 15-VDC electrolytic capacitor (Mallory MTA110E15 or equiv.)
- J1, J2—phono jacks (Radio Shack 274-346 or equiv.)
- J3—Microphone connector (Keystone 505 or equiv.)
- QZ—Integrated circuit (Westinghouse WC-183T, available from Tridac Electronics Corp., Box 313, Alden Manor Br., Elmont, N. Y. 11003 for \$8.95 postpaid, N. Y. State residents add appropriate tax.)
- R1—50,000-ohm variable resistor with switch (Lafayette 32C7367 or equiv.)
- R2—50,000-ohm variable resistor (Lafayette 32C7359 or equiv.)
- R3—5000-ohm miniature trimmer resistor (Mallory MTC-53L1 or equiv.)
- S1—Switch on R1
- T1—Transistor output transformer (Argonne AR163, Lafayette 33C8554 or equiv.)
- 2—Knobs (Mallory 1910K or equiv.)

- 1—Battery holder for mercury battery, B1 (Keystone Electronics 137 or 106, Allied Radio 18B5909, or equiv.)
- 1—Miniature chassis (Bud CB1617, Allied 4ZA7816 or equiv.)
- 2—Standoffs, 1/4-in. high, threaded 6-32 (Keystone 1591-2 or equiv.)
- 14—Turret terminals (Keystone 1502-2 or equiv.)
- Misc.—Phenolic board, 6-32 screws, 2-56 screws and nuts, buss wire, insulating tubing, sheet aluminum, etc.



Most components in Mini Mix are contained in IC, remaining parts are wired as shown in schematic.

IMAGINEERING SHORT CUTS



PLUG CONNECTIONS THAT WON'T QUIT

● A great new goody to fix up those cable plugs so they just won't quit is this thermogrip glue-gun that uses a hot-melt polyethylene-based adhesive. Operation of the gun is simplicity itself, just plug it in, let it warm up, then apply the nozzle to the area to be sealed or the wires to be immobilized. Then, press down on the solid-stick sealant and it'll flow out the nozzle. In only sixty seconds, the glue has set to about 90 percent full strength. When set, it's non-flammable, has good insulating properties, and is resilient so it won't break.

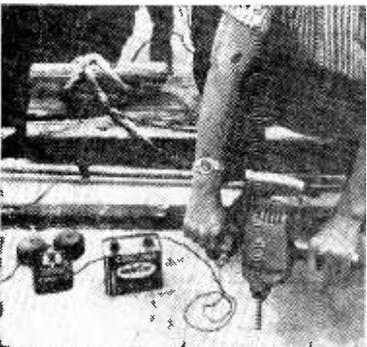
—Judith Rubin



START YOUR CAR WITH ONE JUMPER CABLE

● There may come a time when you're stuck with a car with a dead battery and only one jumper cable. As shown in the photo, all is not lost, just drive an A-OK auto up nose-to-nose so the bumpers touch. That gives you a current path through the chassis. Then take the jumper cable and hook it to the hot side of the battery; that's the side that's not grounded. The other end of the cable goes to the ungrounded side of the other vehicle. Start up as you would normally and you're all set to go. Bet you never thought of that.

—John L. Russel



NEAT TRICK AVOIDS BURIED CONDUCTORS

● When drilling holes in floors or walls, you may accidentally slice through a buried cable conduit or water pipe. This simple setup lets you drill to your heart's content without danger of a nasty shock, blown fuse, or a face full of water. The hookup consists of a battery and doorbell hooked in series. The other side of the battery goes to the metal case of the drill, and the remaining connection of the doorbell is hooked to any cold water pipe. Then if the drill bit hits conduit or a pipe, the circuit is completed, and the bell rings.

—John L. Russel

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

Be Your Own NEWS CENTRAL

By C. M. Stanbury II



Separating fact from slick fiction is easy
when you know how to hear between the lines

■ The shortwave broadcast bands literally crawl with news programs of all shapes, sizes and political hues. SW news coverage far exceeds that of AM (BCB), FM or television. But the trick is to know the sources that are "good" and, even trickier, how to use the bad ones. In the next few pages, we'll show you how to start your own personal news service and then how to systematically improve it.

An example of a good news source is the British Broadcasting Corporation (BBC). Of any single broadcasting organization anywhere in the world, it offers the broadest and most reliable coverage. A close second to the BBC is our own Voice of America (VOA).

These two operate on so many different frequencies there is no point in listing specific channels. You will be able to find their English language broadcasts at almost any hour on whichever bands are active. And you should monitor at least one newscast from each of them every day. They will provide you with needed background information to cope with the many "points of view" presented by less reliable sources.

Inside Info. For added regional (continental) coverage, there are other more or less accurate stations which at times can prove helpful. For additional African news,

the best source is probably R. Ghana's transmission to the Caribbean at 1500 EST on 11850 and 9760 kHz; for Asia, have a listen to R. Japan at 1845 EST on 15135 and 17825 kHz, then again at 2100 on 15135, 15235, 17825 and (beamed to Hawaii) 17720 kHz.

Finally, for additional European info, the Swiss Broadcasting Corp. is a pretty fair prospect. It beams English our way at 2030 EST on 9535 and 11715 kHz. This is repeated at 0015 EST (2115 PST) on 9695 and 11715 kHz. About the only trouble with these stations' newscasts, especially the latter pair, is that they are so neutral that sometimes the heart of the news comes out pretty sugar-coated.

Between The Lines. Now, armed with these reliable sources, you're ready to make sense out of the wild propaganda which other SWBC voices habitually spew forth. For example, if on June 8, 1967 you had listened to the BBC recount Israeli victories throughout the day, and then tuned in to R. Cairo's North American broadcast (at 2030 EST on 9475 kHz) and heard them use the Israeli attack on an American ship (the U.S.S. Liberty, which turned out to be spying on both sides) as proof that we were helping Israel, you would have known just how desperate the Arab world really was.

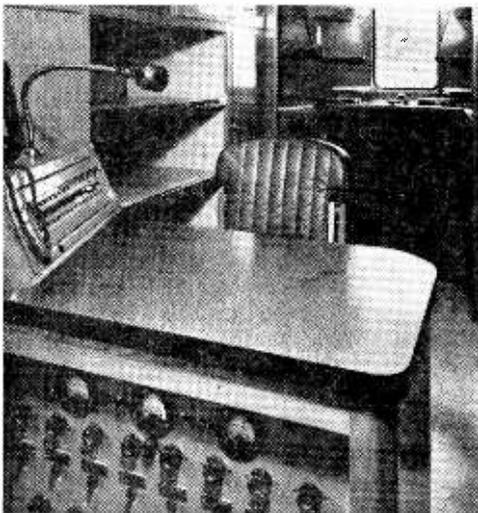
NEWS CENTRAL

Then, had you tuned in to Cairo's home service June 9 on 15475, you could have heard, following Nasser's "resignation" speech, some of the best-staged "live" wails in the history of broadcasting.

So there, illustrated by the above examples, you have it. From unreliable news stations (those engaging in pure propaganda) a shortwave listener can discover for himself that government's official line and, particularly in time of crisis, how weak or how strong their position is.

While English language broadcasts will, needless to say, be the most useful and informative, foreign language home services can also provide interesting clues. With the latter, you should watch for long periods of martial or nationalistic (national anthems, etc.) music (which indicates fighting is either taking place or imminent), short excited speeches or official proclamations (the long winded variety don't mean much and are usually just the standard barrage of propaganda).

Tuning A Clue. A good list of home service transmitters can be found in WHITE'S RADIO LOG in this issue. Most of those listed below 8MHz fall into that category. During emergency periods, they will operate continuously (unless damaged or destroyed) and



One of BBC's mobile studios with which they provide live on-the-spot coverage.

you can tune for them at any appropriate time of night (check Propagation Forecast in this issue for exact hours).

Tuning for international broadcasts in the English language is more complicated. Both times and frequencies are constantly subject to change and in order to truly make SW "your own news central," you should have the very latest schedule data.

The best solution to the problem of *what's happening where* is to join a good radio club specializing in shortwave broadcast information. By a "good club," we mean one that gets the latest frequency and time changes to its members within 30 days. At present, the two top SWBC oriented clubs are the American SWL Club, 16182 Ballad Lane, Huntington Beach, Calif. 92647 (annual dues \$4.00) and the North American Shortwave association, P. O. Box 989, Altoona, Pa. 16603 (annual dues \$5.00). A sample copy of their monthly bulletins can be had for 25¢ each.

Spotting Trends. Now, once you have your news service set up, you will want to keep complete records to refer back to. Even if you already maintain a DX log, it's best to keep a separate news record. As this volume grows, the SWL will find that it has traced his own "ear witness" record of our fast changing world.

For example, if you had started a few years back, your news log would record the decline of O.R.T.F. Brazzaville (the French government's international relay in the Congo Republic) from Africa's top news source to the out-an-out propaganda mouth-piece of Charles DeGaulle that it has become today.

Your SW news log can best be arranged by date though you may want to cross-index by country. Each item recorded should include station name, transmitter location (when known), country, time, frequency, and all pertinent transmission content. Nothing should be put in the log unless you're sure of the identification and that you have correctly heard what the station was broadcasting.

You should also have some general reference sources at your fingertips. A world almanac (such as "Information Please"), an up-to-date atlas, one or two large scale wall maps, and a reliable daily newspaper are all important. From the paper you can clip significant items and staple them to the appropriate page of your log book.

(Continued on page 136)



HAM TRAFFIC DE W7DQS

HOW THEY TORE UP PART 97

■ The newcomer to ham radio, about a year from now, will be one of the most confused fellows there ever was. He will feel like the guy who walks into a movie theater showing a complicated mystery film and discovers the projectionist has the reels mixed up.

This befuddled newcomer will be faced with a new set of Federal regulations, the first major revision of ham rules in 15 years.

After sitting on a series of proposals for nearly four years, while frequently promising final action "soon," the Federal Communications Commission finally hatched its overdue egg recently.

The new rules are intended to benefit ham radio, and they probably will do just that, although maybe not as much as some experienced hams had hoped. Because of their unnecessary complexity, though, there may be some bad effects, too.

Here's the Scoop. Basically, the new regs, some of which go into effect in November, 1968, and the rest in November, 1969, create a new class of ham license and slice up the 80, 40, 20, 15 and 6 meter bands among this class and the other two principal license classes already existing.

The new class will be called "Advanced Class," and the written exam for it will be somewhere between the present General and Extra Class exams in difficulty. The new Advanced Class code test will be 13 words a minute—same as for the General—and hams with a General Class license will not be required to take the code test when they apply for an Advanced Class license. The Extra Class written exam will remain the most difficult of all and the code test with it will remain at 20 words a minute.

Hams having the old Advanced Class ticket, issued years ago under an earlier and more sensible licensing plan, will retain this designation and will be allowed all operating

privileges of the new Advanced Class license.

Under the new plan, holders of the Extra Class license will be allowed to work all ham frequencies, just as they may now. General Class license holders will be allowed to work only certain frequencies roughly half of the 80 through 15 meter bands, while Advanced Class license holders will fit in between—allowed on some frequencies where Generals are forbidden, but restricted from some frequencies which are open to Extras. The details are shown in a table on page 108.

Why? Objective of all this business is to give hams the incentive to improve their ability by studying for a higher class license. The carrot held out to encourage us is the privilege of using frequencies that we will be restricted from otherwise.

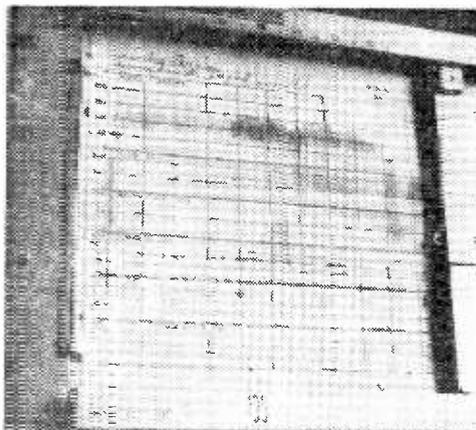
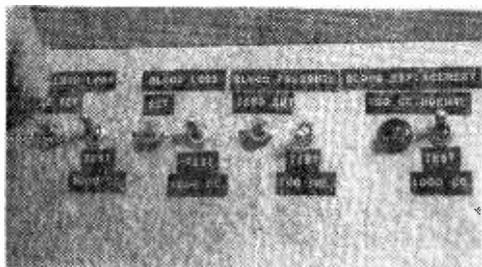
Since General, Conditional and Extra Class license holders may use all frequencies under the present rules, the only way to set up an incentive plan was to take away some frequencies from General and Conditional Class license holders. This unfortunate situation, which was impossible to avoid, was what kicked up all the fuss when this plan was originally proposed. Most of the guys kicking up the fuss didn't trouble themselves to find out what they were talking about.

The reason for having an incentive licensing set-up at all is simply this: it seems many of us have been criticized in recent years for growing into a bunch of ignorant slob who spend a lot of time on the air running off at the mouth, but do very little to really learn what radio is all about. Sadly, much of this criticism is justified.

By giving us the incentive to crack open a few text books and peek behind the front panel of our chrome-plated rigs to see what goes on back there, it is hoped that we become smarter about electronics.

(Continued on page 108)

Below are some of the controls that activate Susie's monitoring functions which include blood pressure, pulse and respiration rate, temperature, fluid loss, blood loss and replacement rate; all of which are recorded on graph at right.



Sexy Susie

Sweet little lady
that she is,
her only curves
are sinusoidal

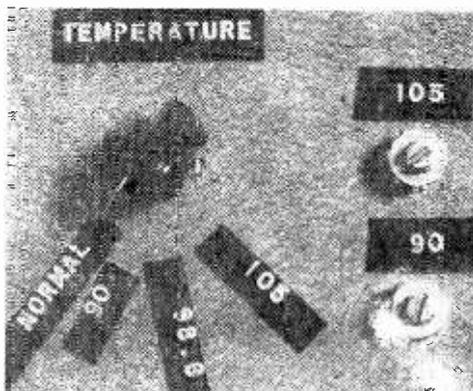
By Bob Williams

■ Sexy Susie, the nurse's aide, is a recent development in the vital area of keeping tabs on the critically ill. Originally, her electronic brain was designed only to keep vigilant watch on open-heart surgery patients during the post-operative period. But now she's plugged in to any hospital patient needing continuous observation.

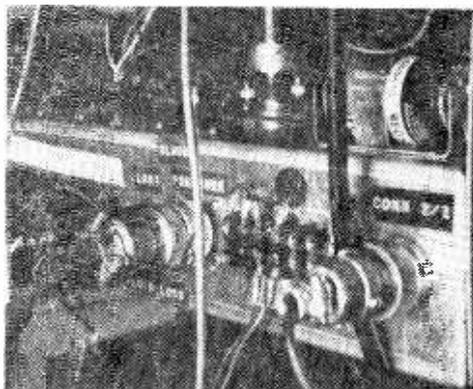
One of Susie's big assets is the freeing of scarce nurses and internes for other duties. And as skilled hospital labor becomes even shorter in supply, we're likely to see a lot more of Susie and her planned-for improved sisters.

Susie's talents allow every important physical parameter of the patient to be monitored, including pulse rate, respiration rate, temperature, fluid loss, blood loss, blood replacement rate, and blood pressure, both diastolic and systolic. This host of readings is processed in Susie's circuits and the results are recorded on a moving graph.

The graph allows a physician to tell at a glance just what's happening to his patient and whether the condition is improving or



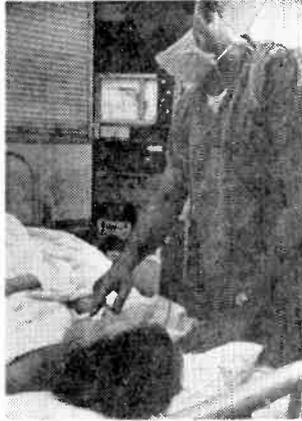
Temperature monitoring is done with a thermocouple attached to patient. Controls on Susie sets limits for alarm.



Monitoring devices attached to patient feed into Susie's interior through cables where the signals are analyzed.



Total cost of Susie is estimated at over \$10,000 and she took some five months to design and build.



Above, technician attaches various sensing devices to patient so that Susie can do her job with minimal outside help.



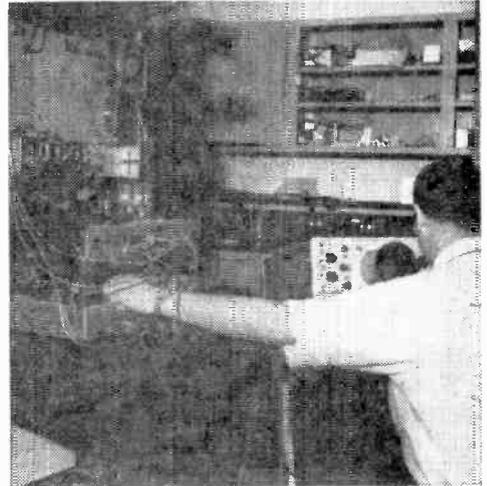
getting worse. Also, the continuous record can provide important clues as to the nature of the illness that periodic checks can't.

Susie is the brainchild of Dr. Adrian Kantrowitz who, working with technician Phillip Herschberg, designed and built her over a five month period at the Maimonides Hospital in Brooklyn, New York. A grant from the National Institute of Health paid the bill.

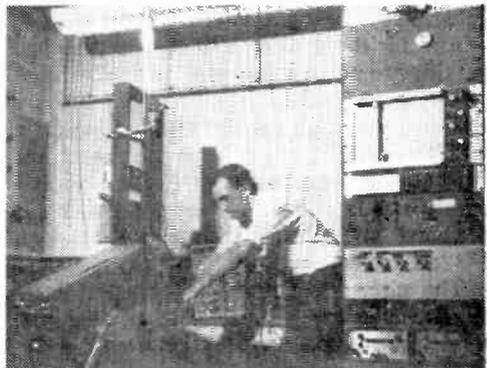
Susie is being evaluated, improved and the overall results of her talents are being studied to see if on a large scale basis this type of system is feasible in hospitals.

In the planning stages are a setup whereby a number of monitoring devices could be operated and controlled through a centrally located console. Each device would be programmed to keep watch on one or more specific conditions depending on the nature of the patient's illness.

Meanwhile, Susie is working with her special patients day and night and while she's not much to look at, she certainly rates an *A* for effort. ■



Susie goes through a routine physical to insure that her inhuman vigilance never wavers in time of need.



Susie, though she's got a heart of gold, isn't perfect, so advanced models are in the works and she may soon have a sister or two.

Laps By The



By Ken Greenberg

NUMBERS

No homegrown Grand Prix is complete without this electronic scorekeeper

■ When the winds of winter are putting the dampers on outdoor activities, one very popular indoor sport sees a seasonal revival. That is the pastime of slot-car racing.

This sometime king of indoor sports is further enhanced by the endless experimentation and modification possible. And, too, by the accessory gadgetry that makes for added tinkering joy.

And for the dedicated racer, we have just the thing to put the final professional touches on any race. The little goody presented here will give you a green light to start the race, then the green turns red for whichever car finishes first, after a preset (from 1 to 10) number of laps. This unique lap counter is designed to be used with either 1/24 or 1/32nd scale cars.

The circuit is simple, using small inexpensive stepping relays to count the laps. There are actually two identical counting circuits. The schematic is kept simple by showing only one circuit. A 12-VDC stepping relay (K1) is tripped each time a model car passes a track mounted microswitch (S4).

A two-deck, 11-position rotary switch (S6) selects the desired number of laps and connects a red winning light (I1) to the proper relay contact. A reset pushbutton (S2) lets you conveniently set the relay to its zero or starting position for proper sequencing, as indicated by a green light (I2). Note that the relays operate from a half-wave DC power supply while the pilot lights use 12.6 VAC.

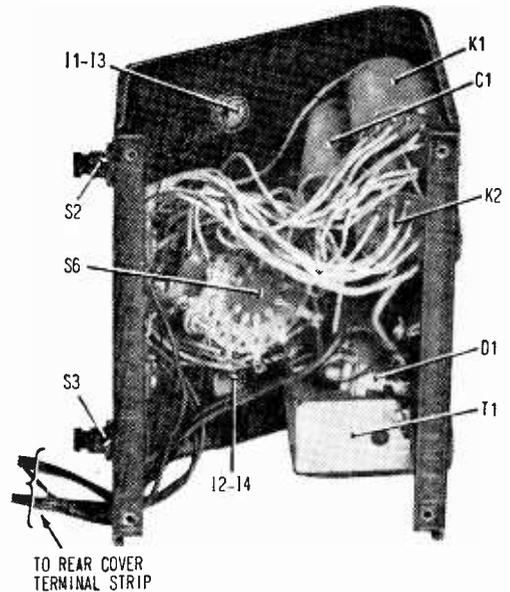
Construction. All parts fit easily into a 6 x 4 in. sloping panel cabinet. Be sure you mount the relays and switches so that all terminals are readily exposed for easy soldering. The two white translucent lens caps are press fitted/screwed into slightly larger than 1/2-in. holes. Tape (by their leads) a red and a green 16-volt grain-of-wheat bulb into each lens cap. Effectively, you will have two white indicators, each of which can be made to light either red or green.

The track-mounted microswitches (S4 and S5) are fastened to the track on 4-40 x 1 1/2-in. screws inserted through 7/64-in. holes drilled in 1/4-in. from the edges of the track.

If you use the recommended Olson SW-338 switches, remove the metal mounting plate that comes on them and run a 7/64-in. drill through the mounting hole nearest the actuating arm. Using this drilled out hole, mount the switch on the 4-40 screw sticking up from the track. Be sure the switch arm action is in the direction the cars will travel.

Three nuts and two lockwashers are used on each 4-40 screw. One nut tightens the screw to the track. One nut and lockwasher on top and one nut and lockwasher on the bottom of the switch holds it firmly in place. By loosening the nuts, the switch can be moved up and down or rotated in or out for proper car contact.

Wiring. The wiring is straightforward and can be readily done from the schematic. Connections for the relay coil are soldered directly on the two male prongs; a connector isn't necessary. The use of a terminal strip or two mounted under the transformer screws will be helpful. Notice that one of the 11 lugs on S6 is not used. This is the zero or off position of the switch. Notice also that one of the 12 contacts on the relay is not used. (Continued overleaf)



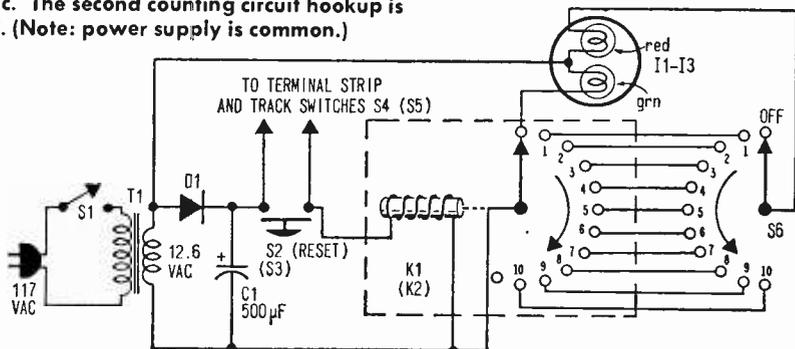
Though relays require a number of interconnections, construction and wiring of unit isn't difficult. Layout isn't critical and can be arranged to suit.

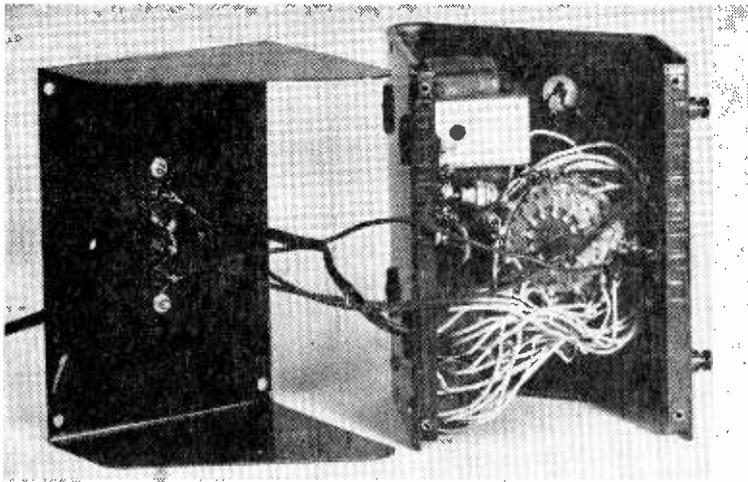
PARTS LIST

- C1—500- μ F, 25-VDC electrolytic capacitor
- D1—2-A, 50-PIV silicon rectifier (Radio Shack 276-1052 or equiv.)
- 11, 13—16-volt grain-of-wheat bulb, red (available at hobby-craft stores)
- 12, 14—16-volt grain-of-wheat bulb, green (available at hobby-craft stores)
- K1, K2—12-VDC stepping relay, (Guardian Rotomite IR705 12P 12D, Allied Radio 41D7706 or equiv.)
- S1—S.p.s.t. toggle switch (Radio Shack 275-602 or equiv.)
- S2, S3—S.p.s.t. pushbutton switch, normally open (Radio Shack 275-1547 or equiv.)

- S4, S5—Lever actuated microswitch (Allied 56A5030 or equiv.)
- S6—Two-deck, 11-position rotary switch (Mallory 1321L, Allied 56A4256 or equiv.)
- T1—Filament transformer, 117-VAC pri.; 12.6-VAC, 1.2-A sec. (Radio Shack 273-1505 or equiv.)
- 1—Sloping panel chassis box (Bud C-1612, Allied 42A8648 or equiv.)
- 1—Terminal strip, four screw
- 2—Terminal strips, four lug
- 2—Lens caps, white (Dialco 15-0935, Allied 60D8033 or equiv.)
- Misc.—Line cord, grommets, wire, solder, dial plates, nuts and bolts, etc.

For simplicity, only one counting circuit is shown in schematic. The second counting circuit hookup is identical. (Note: power supply is common.)





Completed lap-counter ready to button up. Terminal strip on rear cover provides connections for track-mounted microswitches. Finished unit adds professional touch to any race.

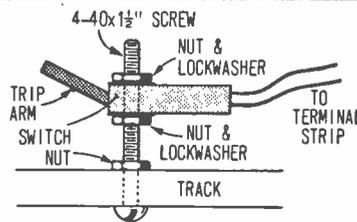
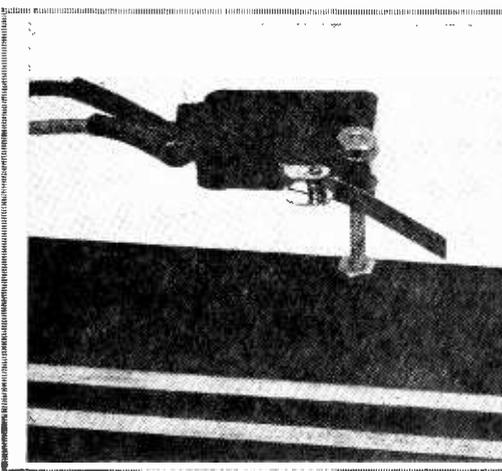
Looking at the terminal side of the relay, the stepping action is counter-clockwise. Be sure you remember this as you wire the switches to the relays so the number indicated by the switch will correspond to the number of steps needed to get the relay to that point. The zero or starting position on each relay is the terminal to which one lead of the green bulbs (PL2 and PL4) is connected. One deck of S6 is wired to K1 and the other deck to K2. Screw terminals provide connections for the remote switches.

Operation. Switch S1 on. Rotate S6 to the desired number of laps (from 1 to 10). Push both reset buttons until both indicators light green. This indicates that both relays are in the same starting position for proper sequencing. Start the model cars ahead of the track mounted switches so that one lap must be made before the green lights go off. The green lights stay off for the re-

mainder of the race. The first car completing the selected number of laps will cause its indicator to light red, thus winning the race. If you want the winner to be indicated audibly, a buzzer can be connected into the circuit.

You may find that adjustment of the track switches is required at this point. The easiest way is to place the car in the position it would be when passing the switch. Raise or lower the switch on the screw until its height is such that the contact arm hits the car mid-body. Then rotate the switch on the screw so as the car passes, the lap counter registers a click. Tighten the nuts securely and you're ready for the Grand Prix.

An electric counter of this type is much more reliable and accurate than the mechanical variety used with most sets. It will add more excitement and professionalism to your model car racing. ■



Microswitches can be mounted anywhere on track. Check width of car before installing to make sure switch mount won't interfere with passing car.

Now There Are 3 Heathkit Color TV's To Choose From

Introducing 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.

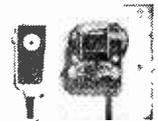
Advanced Performance Features. Boasts new RCA Perma-Chrome picture tube with 227 sq. in. rectangular viewing area for 40% brighter pictures . . . 24,000 v. regulated picture power and improved "rare earth" phosphors for more brilliant, livelier colors . . . new improved low voltage power supply with boosted B+ for best operation . . . automatic degaussing combined with exclusive Heath Magna-Shield that "cleans" the picture every-time you turn the set on from a "cold" start, and keeps colors pure and clean regardless of set movement or placement . . . automatic color control and gated automatic gain control to reduce color fade and insure steady, flutter-free pictures even under adverse conditions . . . preassembled & aligned 3-stage IF . . . preassembled & aligned 2-speed transistor UHF tuner and 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 . . . one-piece mask & control panel for simple installation in a wall, your custom cabinet or either optional Heath factory-assembled cabinets. Build in 25 hours.

GRA-227-1, Walnut cabinet \$59.95
GRA-227-2, Mediterranean Oak cabinet (shown above) . . . \$94.50



Kit GR-227
\$399⁹⁵
 (less cabinet)

Kit GRA-27
\$19⁹⁵



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
\$479⁹⁵
 (less cabinet)

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) . . . 25,000 volt picture power . . . universal main control panel for versatile in-wall installation . . . and 6" x 9" speaker.

GRA-295-1, Walnut cabinet (illust. above) \$62.95
GRA-295-3, Early American cabinet \$99.95
GRA-295-2, Deluxe walnut cabinet \$94.50



Kit GR-180
\$349⁹⁵
 (less cabinet)

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.

GRA-180-1, Contemporary walnut cabinet \$49.95
GRA-180-2, Early American cabinet \$75.00
GRA-180-3, Table model cabinet \$24.95
GRA-180-5, Table model cabinet & mobile cart (illust. above) \$39.95



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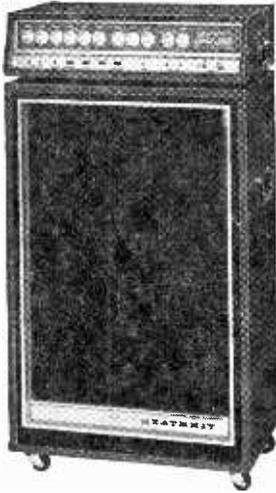
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Amplifier
\$175⁰⁰
40 lbs.

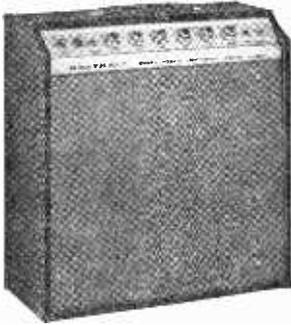
Kit TA-17-1
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Kit TAS-17-2 Amplifier &
2 Speaker Systems
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NEW! Low Cost Single-Channel Solid-State Guitar Amplifier



Kit TA-27
\$89⁹⁵
Assembled
TAW-27
\$134⁹⁵

Boasts 20 watts EIA music power, 40 watts peak power; variable tremolo & reverb; two inputs that handle lead guitars; singer's mike; special heavy-duty 12" speaker; line bypass reversing switch that reduces hum; transformer-operated power supply; and handsome leather-textured, black vinyl covered wood cabinet with extruded aluminum front panel and chrome knobs. 35 lbs.

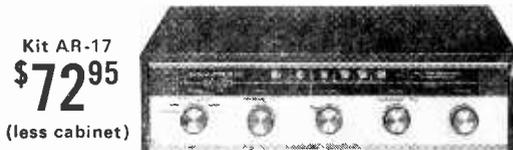
NOW Available Fully Assembled . . . Heathkit "Starmaker" Dual-Channel Guitar Amplifier



Assembled
TAW-16
\$199⁹⁵
(Kit TA-16
\$134.95)

Features all solid-state circuit; 25 watts EIA, 60 watts peak power; two channels, one for accompaniment, accordion or mike, the other for variable tremolo & reverb; two inputs each channel; two 12" heavy-duty speakers; line bypass reversing switch for hum reduction; leather-textured black vinyl covered wood cabinet with extruded aluminum front panel & chrome knobs. For extra savings, build the kit version in just 15 hours. 52 lbs.

NEW! Low Cost Solid-State FM Stereo Receiver



Kit AR-17
\$72⁹⁵
(less cabinet)

Features complete FM, FM stereo listening; wide 18-60,000 Hz ± 1 db at full 5 watt continuous power per channel; 14 watts music power; inputs for phono & auxiliary; outputs for 4 thru 16 ohm speakers; stereo indicator; adjustable phase for best stereo; and flywheel tuning. 12 lbs. Optional walnut (\$9.95) or beige metal (\$3.95) cabinets.

NEW! Low Cost Solid-State FM Mono Receiver



Kit AR-27
\$49⁹⁵
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Features all-transistor circuit for cool, instant operation; FM mono listening; 7 watts music power; 5 watts RMS; response 18 to 60,000 Hz ± 1 db; inputs for phono and auxiliary; outputs for 4 thru 16 ohm speaker; flywheel tuning; all front panel controls for easy operation. 9 lbs. Optional walnut (\$9.95) or beige metal (\$3.95) cabinets.

'68 HEATHKIT® Catalog!

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World's Most Advanced Stereo Receiver

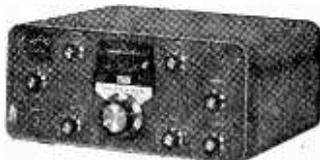


Assembled
ARW-15
\$499⁵⁰
(less cab.)
Kit AR-15,
\$329.95

Boasts advanced features like integrated circuits and crystal filters in the IF amplifier; ultra-sensitive FET FM tuner; 150 watts dynamic music power; AM, FM and FM stereo; positive circuit protection; all-silicon transistors; "black magic" panel lighting; stereo only switch; adjustable phase control and many more. 34 lbs. Optional wrap-around walnut cabinet \$19.95

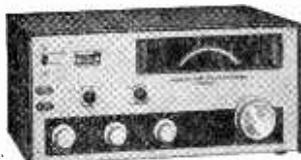
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6" x 9" speaker
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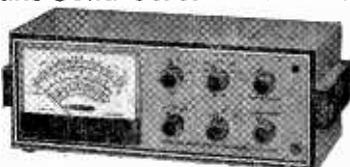


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ELECTRONIC PRODUCTS

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

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

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★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 1967 copy of *Radio Shack's* catalog. Some equipment and kit offers are so low, they look like misprints. Buying is believing.

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

106. With 70 million TV 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.

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★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.

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★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.

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

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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.

HI-FI/AUDIO

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. "At Home With Stereo" offers decorating ideas, a complete explanation of the more technical aspects of stereo consoles.

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

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

15. *Acoustic Research* would like to send you a copy of their fact-packed "Stylus Force" booklet—must reading for hi-fi bugs.

16. Discover why Lab 80 by *Garrard* offers top dollar value. 32-page *Garrard* Comparator Guide will make you a wiser buyer.

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

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

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

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

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

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

TAPE RECORDERS AND TAPE

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.

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

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

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

HI-FI ACCESSORIES

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

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

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

TOOLS

★78. Need pliers to hold, bend or cut fine wires? Check *Xcelite's* new line of miniatures shown in Catalog 166 along with a complete selection of regular pliers and snips.

118. Secure coax cables, speaker wires, phone wires, etc., with *Arrow* staple gun tackers. 3 models for wires and cables from 3/16" to 1/2" dia. Get fact-full *Arrow* literature.

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?

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

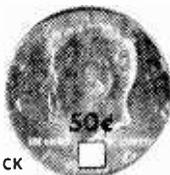
RADIO-TV EXPERIMENTER

Dept. 1267
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).

11-20 items

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59	61	66	70	74	78	85	93	95	96
97	98	99	100	101	102	103	104	105	106
107	108	109	111	112	114	115	116	117	118
119	120	121	122	123	124	125	126		

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Ham Traffic

Continued from page 95

Hopefully, this new plan will get at least some of us headed in that direction. It doesn't take much listening on the bands today to learn that most guys haven't the foggiest notion how their rigs work, and what's more, they don't care.

This is pretty bad, because ham radio isn't supposed to be a playtime hobby, it's supposed to be a serious training ground. Having fun along with it should be like having a piece of dessert, but not the main course of the meal.

The new FCC plan should wipe out some of the complacency most of us feel at one time or another, and show us we are expected to be accomplishing something.

However, it seems to me the plan is needlessly complicated and contains some dangers that were not present before.

Why Not the One-Horse Buggy? For one thing, why not basically follow the original proposal, made nearly four years ago by the American Radio Relay League, and restrict certain entire phone bands to the higher class license holders? It used to be that way, many years ago, before the General Class license was invented, and the old timers tell me it worked out pretty well. A guy who wanted to work phone had to show he was worthy of the privilege. Much of the nonsense we hear today on phone was unheard of under the pre-General Class rules.

But, by chopping up each phone band and each CW band into slivers for each license class and giving each a slice of the pie, the FCC is effectively drawing up the battle lines for war. There're already hard feelings between classes up in the VHF region—now these bitter feelings are bound to spread down to the HF bands.

You won't have to wait long before you will hear a General Class operator say "That blankety-blank Advanced Class clod is slopping over into MY part of the band."

And, a little farther along the band, an Advanced Class operator will be saying "That no good Extra Class operator is splat-tering over into MY part of the band."

Several times in past years, the FCC has been asked to divide the phone bands into sections, with one for AM operation and another for SSB. They also have been asked to set aside certain frequencies for CW only,

and others for RTTY only. The Feds always refused to divide the subbands into separate modes—they said the sidewinders and the ancient modulators would just have to learn to live with each other, just as the brass pouhders and the Teletypers would have to do likewise.

But now, Uncle Whiskers divides the bands into smaller slices than was ever asked, and does it in such a way that it is bound to cause unnecessary strife when we can little afford it.

Let's Get Technical. What really is needed, now more than ever before, are some new FCC definitions of technical standards for hams to meet. The present rules on this subject are so vague that the technically-

NEW FCC AMATEUR FREQUENCY ASSIGNMENTS

CLASS	Frequencies (kHz) Effective November 22, 1968	Frequencies (kHz) Effective November 22, 1969	
General	3525-3800 (CW)* 3850-4000 (phone) 7025-7200 (CW) 7225-7300 (phone) 14025-14200 (CW) 14235-14350 (phone)	3550-3800 (CW) 3900-4000 (phone) 7050-7200 (CW) 7250-7300 (phone) 14050-14200 (CW) 14275-14350 (phone)	
	21025-21250 (CW) 21300-21450 (phone)	21050-21250 (CW) 21350-21450 (phone)	
	50.1-54 mHz (phone, CW)	50.25-54 mHz (phone, CW)	
	Advanced	Same CW frequen- cies as for General Class	No Change
		Phone frequencies: 3825-4000 7200-7300 (entire phone band)	No Change No Change
14200-14350 (entire phone band) 21275-21450 Entire 6-Meter Band		No Change No Change No Change	
Extra		All U.S. Amateur Frequencies	No Change

Notes: *CW may be operated also on phone frequencies, just as now, if desired.

Ten-meter band is not involved in new frequency plan. Only change on two-meter band is elimination of Novice operation after November 22, 1968. Novice license term will be extended to two years.

Only change affecting Technician Class license holders is that after November 22, 1968, Extra and Advanced Class only will be allowed on 50.0-50.1 MHz. On November 22, 1969, this restriction will be extended to 50.0-50.25 MHz.

There will be no change in the present system of call sign prefixes.

After November 22, 1968, applicants for Extra Class, unless they already hold an Advanced Class license, must first take the exam for Advanced Class.

FCC says the schedule for use of frequencies which are to be restricted to Advanced and Extra Class operators may be delayed if insufficient occupancy of these frequencies is found.

oriented ham has a very difficult time learning what technical standards he is expected to meet.

For example, arguments have raged among hams for years over broad signals that caused interference to operators on adjacent frequencies, yet there are no hard and fast rules on how broad a signal may be. Nor are there any rules defining frequency tolerance or frequency drift standards. This is bound to become a sore point with the new rules that chop up the bands like mincemeat.

It seems pretty ridiculous when you consider that some hams are far enough advanced to build satellite relay stations and to bounce signals off the moon, yet the FCC rules governing hams barely recognize the existence of SSB, which hams pioneered more than 20 years ago!

Another question—how well will the complicated new rules be enforced? Already undermanned, Frank Charlie Charlie has demonstrated and admitted he can enforce the present rules only in a very spotty manner. How in the world can the new jig-saw puzzle be adequately enforced?

Not long before announcing its decision on the incentive plan, which tightens up requirements, the FCC proposed another rule change which would relax requirements for amateur station identification.

Essentially, this new proposal, if adopted, will give official approval to a whole group of sloppy operating practices now engaged in by a large number of hams.

Basically, this proposed change would require that instead of identifying his own station and the station or stations to which he is talking every 10 minutes, an operator need give only his own call. Only at the end of his communications would he have to say to whom he was talking, and even then he would need to give only the call of one station in case he was working several fellows at the same time.

Also, when working portable or mobile, he would not be required to give his location, as he is supposed to do now, but instead he would give the call sign area in which he is operating.

So, the hackneyed "W9XYZ portable five," and "WØXXX mobile seven" and "W1XAM and the group" would become the approved procedure.

The FCC says the present rules on station identification are "excessive to normal monitoring and investigative needs."

Fine for them, maybe, but how about us?

That is, how about those of us who try to operate our stations and conduct our communications with some sort of businesslike order? It's hard enough now to keep track of who's talking to whom, with so many operators not following the ID rules. If these same guys take the same light-hearted attitude toward the proposed new system, if it is adopted, just think of the unidentified babble we'll hear on the bands!

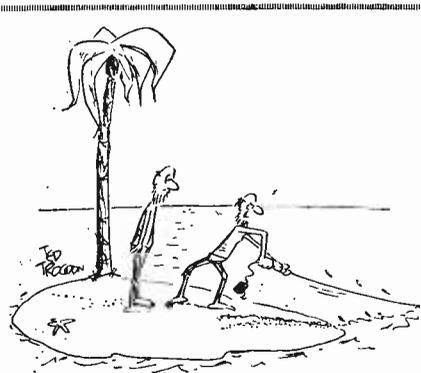
One of the purposes of the Amateur Radio Service is to serve as a training ground in radio communications. If the Feds really want to encourage us to become better qualified radio operators, which is the whole idea of the incentive rules, then their new proposal for fantastically loose identification procedures is a giant step in the reverse direction.

Maybe the FCC doesn't really take us very seriously any more. I'm sure a lot of folks in the technical industries don't take us seriously. We're to blame, though, because too many of us don't take ham radio very seriously ourselves.

So, I believe it's up to us, every one of us, to show the FCC and everyone else in the field of electronics that we are worthy of more respect.

Although the new FCC rules are needlessly complicated, they do lead the way to improvement of our "hobby," and they can be made to work *if we want them to work*.

So, what's say, gang—let's cut out the nonsense and get down to serious business. Let's become competent operators and practical technicians. Let's pick up ham radio and put it back up on the pedestal where it used to be—and then let's keep it up there! Ready? Let's go! ■



"I told you we were off the shores of Russia, it's a microphone."

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 February-March, 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 1967, you will have a complete volume of *White's Radio Log* by collecting any three consecutive issues of RADIO-TV EXPERIMENTER published during the year. The three consecutive issues are an entire volume of *White's Radio Log* that offers complete listings with up-to-the minute station change data that are not offered in any other magazine or book.

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

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U. S. AM Stations by Call Letters

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
KAAA	Kingman, Ariz.	1230	KATO	Safford, Ariz.	1230	KBOX	Dallas, Tex.	1480	KCOH	Houston, Tex.	1430
KAAV	Little Rock, Ark.	1090	KATQ	Texarkana, Tex.	940	KBOY	Medford, Oreg.	730	KCOL	Tulare, Calif.	1270
KABK	Los Angeles, Calif.	790	KATR	Eugene, Ore.	1320	KBPS	Portland, Oreg.	1450	KCOK	Fort Collins, Colo.	1410
KABH	Midland, Tex.	1390	KAVR	Ann Louis, Obispo, Cal.	1340	KBRG	Mt. Vernon, Wash.	1430	KCOM	Comanche, Tex.	1550
KABI	Bilence, Kans.	1560	KATZ	St. Louis, Mo.	1600	KBRK	Brimley, Ark.	1370	KCON	Conway, Ark.	1500
KABL	Oakland, Calif.	960	KAUS	Austin, Minn.	1480	KBRK	Brookings, S.Dak.	1430	KCOR	San Antonio, Tex.	1350
KABQ	Albuquerque, N.M.	1350	KAVA	Burney, Cal.	1450	KBRF	McCook, Nebr.	1300	KCOV	Alliance, Nebr.	1400
KABR	Aberdeen, S.Dak.	1420	KAVE	Carlsbad, N.Mex.	1240	KBRN	Brighton, Colo.	800	KCOY	Santa Maria, Calif.	1400
KACE	Riverside, Calif.	1570	KAVI	Rocky Ford, Colo.	1320	KBRQ	Bremerton, Wash.	1490	KCPX	Salt Lake City, Utah	1320
KACI	The Dalles, Oreg.	1300	KAVL	Lancaster, Calif.	610	KBRR	Ledwell, Colo.	1230	KCRS	Sacramento, Calif.	1320
KACL	Santa Barbara, Calif.	1290	KAVP	Apple Valley, Calif.	1010	KBRB	Springdale, Ark.	1340	KCRB	Chanute, Kans.	1460
KACT	Andrews, Tex.	1360	KAWA	Waco Marlin, Tex.	960	KBRX	Soda Springs, Ida.	1350	KCRC	Enid, Okla.	1390
KACY	Port Hueneke, Calif.	1520	KAWL	York, Neb.	1370	KBRX	O'Neill, Nebr.	1350	KCRG	Cedar Rapids, Iowa	1350
KADA	Ada, Okla.	1230	KAWT	Douglas, Ariz.	1450	KBRZ	Freeport, Texas	1460	KCRM	Crane, Tex.	1380
KADL	Pine Bluff, Ark.	1270	KAWB	Heber Springs, Ark.	1370	KBSF	Springhill, La.	1460	KCRS	Midland, Tex.	550
KADO	Marshall, Tex.	1410	KAYC	Beaumont, Tex.	1450	KBSN	Crane, Tex.	970	KCRT	Trinidad, Colo.	1240
KADY	St. Charles, Mo.	1460	KAYE	Puyallup, Wash.	1450	KBTB	Big Spring, Tex.	1490	KCRV	Caruthersville, Mo.	1370
KAFE	Sante Fe, N.M.	810	KAYL	Lakewood, Wash.	1480	KBTA	Batesville, Ark.	1340	KCSJ	Pueblo, Colo.	590
KAFF	Flagstaff, Ariz.	930	KAYL	Storm Lake, Iowa	1150	KBTM	Houston, Mo.	1250	KCSR	Chadron, Nebr.	610
KAFY	Bakersfield, Calif.	550	KAYO	Seattle, Wash.	1400	KBTM	Jonesboro, Ark.	1230	KCTA	Corpus Christi, Tex.	1030
KAGE	Winona, Minn.	1380	KAYS	Hays, Kans.	1400	KBTO	Neosho, Mo.	1420	KCTI	Gonzales, Tex.	1450
KAGH	Crossett, Ark.	800	KAYT	Rupert, Idaho	970	KBTO	El Dorado, Kans.	1360	KCTJ	Salinas, Calif.	980
KAGI	Grants Pass, Oreg.	930	KBAB	Indianola, Iowa	1490	KBTR	Denver, Colo.	710	KCTX	Chidress, Tex.	1510
KAGO	Klamath Falls, Oreg.	1150	KBAL	San Saba, Tex.	1410	KBUC	San Antonio, Tex.	1310	KCUB	Tucson, Ariz.	1290
KAGT	Anacortes, Wash.	1340	KBAM	Longview, Wash.	1270	KBUD	Athens, Tex.	400	KGUE	Red Wing, Minn.	1250
KAHI	Abing, Calif.	950	KBAN	Bowie, Tex.	1410	KBUB	Brigham City, Utah	810	KCVL	Colville, Wash.	1270
KAHR	Redding, Calif.	1380	KBAW	Burley, Idaho	1280	KBUN	Bemidji, Minn.	1450	KCVR	Lodi, Calif.	1570
KAHU	Waipahu, Hawaii	940	KBAT	San Antonio, Tex.	690	KBUR	Burlington, Iowa	1530	KCYL	Lampasas, Tex.	1450
KAIM	Honolulu, Hawaii	870	KBBB	Benton, Ark.	690	KBUS	Mexia, Tex.	1510	KDAP	Ft. Bragg, Calif.	1230
KAIN	Nampa, Ida.	1340	KBBB	Borger, Tex.	1600	KBUY	Ft. Worth, Tex.	1310	KDAD	Weed, Calif.	800
KAIR	Tucson, Ariz.	1490	KBBC	Centerville, Utah	1600	KBUZ	Mesa, Ariz.	1540	KDAK	Carrrington, N.D.	1600
KAJO	Grants Pass, Oreg.	1270	KBBQ	Yakima, Wash.	1390	KBVM	Lancaster, Calif.	1380	KDAL	Duluth, Minn.	610
KAKA	Wickenburg, Ariz.	1250	KBBQ	Burbank, Cal.	1500	KBWB	Bellevue, Wash.	1540	KDAN	Eureka, Calif.	790
KAKC	Wichita, Okla.	970	KBBR	North Bend, Oreg.	1340	KBWD	Brownwood, Tex.	1330	KDAY	Lubbock, Tex.	580
KAKE	Wichita, Calif.	1240	KBBR	North Bend, Oreg.	1340	KBXM	Kennett, Mo.	1540	KDAS	Santa Monica, Calif.	1580
KALB	Alexandria, La.	580	KBBN	Oceanlake, Oreg.	1450	KBXM	Okla. City, Okla.	880	KDB	Santa Barbara, Calif.	1490
KALE	Richland, Wash.	960	KBCB	Shreveport, La.	1220	KBYG	Big Spring, Tex.	1580	KDBM	Dillon, Mont.	800
KALF	Mesa, Ariz.	1510	KBCA	Mission, Kans.	1480	KBYP	Shamrock, Tex.	1410	KDEA	Helenria, La.	1410
KALG	Alamogordo, N.Mex.	1230	KBCE	Waxahachie, Tex.	1390	KBYR	Anchorage, Alaska	1270	KDEE	Espanola, N.M.	970
KALI	San Gabriel, Cal.	1430	KBCE	Modesto, Calif.	970	KBSL	Salem, Oreg.	1490	KDFA	Dumas, Ark.	1560
KALM	Salt Lake City, Utah	910	KBCK	Etik City, Okla.	1240	KBZZ	Lajunta, Colo.	1400	KDDD	Dumas, Tex.	800
KALN	Thayer, Mo.	1280	KBEN	Idabel, Okla.	1240	KCB	Dardanelle, Ark.	980	KDEF	Decorah, Iowa	1240
KALN	Iola, Kan.	1370	KBEN	Idabel, Okla.	1240	KCAC	Phoenix, Ariz.	1510	KDEF	Albuquerque, N.Mex.	1150
KALO	Little Rock, Ark.	1250	KBER	San Antonio, Tex.	1150	KCAD	Redland, Calif.	1060	KDEG	Denver, Colo.	1340
KALT	Atlanta, Tex.	900	KBER	San Antonio, Tex.	1150	KCAL	Redland, Calif.	1060	KDEI	El Centro, Calif.	910
KALV	Alva, Okla.	1430	KBEV	Portland, Oreg.	1010	KCAM	Glennallen, Alaska	790	KDES	Palm Sprng, Calif.	930
KAMD	Camden, Ark.	910	KBEW	Blue Earth, Minn.	1560	KCAN	Canyon, Tex.	1530	KDET	Center, Tex.	930
KAMI	Cozad, Neb.	1580	KBFS	Belle Fourche, S.Dak.	1450	KCAP	Helena, Mont.	1340	KDEX	Dexter, Mo.	1590
KAML	Kenedy-Karnes City, Tex.	990	KBFM	Memphis, Tex.	1130	KCAR	Clarksville, Tex.	1350	KDEY	Boulder, Colo.	1360
KAMO	Rogers, Ark.	1390	KBGO	Waco, Tex.	1580	KCAT	Slaton, Tex.	1050	KDFL	Sumner, Wash.	1560
KAMP	El Centro, Calif.	1430	KBBH	Sturgis, S. D.	810	KCAT	Pine Bluff, Ark.	1530	KDFN	Doniphan, Mo.	1500
KAMY	McCamey, Tex.	1450	KBHC	Nashville, Ark.	1260	KCB	Des Moines, Iowa	1390	KDGO	Durango, Colo.	1240
KANA	Anacanda, Mont.	580	KBHM	Branson, Mo.	1220	KCBN	Lubbock, Tex.	1580	KDHI	Twenty-nine Palms, California	1250
KANB	Shreveport, La.	1300	KBHS	Hort Springs, Ark.	580	KCBQ	San Diego, Calif.	1170	KDHL	Faribault, Minn.	1420
KANC	Corsicana, Tex.	1340	KBIA	Burlington, Ia.	1150	KCBS	San Fran., Calif.	740	KDHN	Dimitit, Tex.	970
KANE	New Iberia, La.	1240	KBIB	Montic, Ark.	1560	KCCB	Corning, Ark.	1260	KDIA	Oakland, Calif.	1310
KANI	Wharton, Tex.	1500	KBIF	Fresno, Calif.	930	KCCG	Chickasaw, N.M.	950	KDIO	Ontonville, Minn.	1350
KANN	Ogden, Utah	1090	KBIG	Avalon, Cal.	740	KCCJ	Paris, Mo.	1450	KDIX	Pickinson, N.Dak.	1230
KANO	Anoka, Minn.	1470	KBIL	Liberty, Mo.	1140	KCCN	Honolulu, Hawaii	1050	KDJA	Horsok, Ariz.	1270
KANS	Larned, Kan.	1510	KBIM	Roswell, N.Mex.	910	KCCO	Lawton, Okla.	1420	KDKA	Pittsburg, Pa.	1020
KAOH	Duluth, Minn.	1390	KBIS	Bakersfield, Calif.	970	KCCR	Pierre, S. D.	1240	KDKD	Clinton, Mo.	1280
KAOK	Lake Park, La.	1400	KBIX	Muskogee, Okla.	1490	KCCP	Corpus Christi, Tex.	1150	KDKD	Littleton, Colo.	1510
KADL	Carrollton, Mo.	1430	KBJM	Montic, S.D.	1240	KCCV	Independence, Mo.	790	KDLA	DeRidder, La.	1010
KAOB	Oroville, Calif.	1340	KBJT	Ottawa, Iowa	1570	KCEE	Tucson, Ariz.	1510	KDLK	Del Rio, Tex.	1230
KAPA	Raymond, Wash.	1340	KBJZ	Fordyce, Ark.	1570	KCF	Ames, Iowa	1300	KDLM	Detroit Lakes, Minn.	1340
KAPB	Marksville, La.	1370	KBKR	Baker, Oreg.	1490	KCFK	Spokane, Wash.	1330	KDLS	Perru, Iowa	1310
KAPE	San Antonio, Tex.	1480	KBKW	Aberdeen, Wash.	1450	KCFH	Cuero, Tex.	1600	KDMA	Montevideo, Minn.	1450
KAPD	Pueblo, Colo.	690	KBLC	Lakeport, Cal.	1270	KCFI	Cedar Falls, Iowa	1250	KDMD	Carthage, Mo.	1490
KAPR	Douglas, Ark.	1470	KBLE	Seattle, Wash.	1050	KCHA	Charles City, Iowa	1580	KDMS	El Dorado, Ark.	1290
KAPS	Mt. Vernon, Wash.	1470	KBLG	Blackfoot, Calif.	690	KCHE	Cherokee, Iowa	1440	KDNC	Spokane, Wash.	1440
KAPT	Salem, Ore.	1220	KBLH	Blackfoot, Idaho	1240	KCHI	Chicothee, Mo.	1010	KDNT	Denton, Tex.	1440
KAPY	Port Angeles, Wash.	1290	KBLH	Helena, Mont.	1130	KCHJ	Delano, Calif.	1010	KDDK	Tyler, Tex.	1490
KARA	Albuquerque, N.M.	1310	KBLR	Bolivar, Mo.	1130	KCHR	Charleston, Mo.	1350	KDOL	Mojave, Calif.	1340
KARE	Atchison, Kan.	1470	KBLT	Big Lake, Tex.	1290	KCHS	Truth or Consequences, New Mexico	1400	KDDM	Windom, Minn.	1580
KARI	Blaine, Wash.	920	KBLU	Yuma, Ariz.	1920	KCHV	Coachella, Calif.	970	KDDN	Salinas, Calif.	1460
KARK	Little Rock, Ark.	1300	KBLV	Logan, Utah	1390	KCHY	Cheyenne, Wyo.	1530	KDST	Scottsdale, Ariz.	1440
KARM	Fresno, Calif.	1430	KBLW	Gold Beach, Oreg.	1220	KCID	Caldwell, Idaho	1490	KDDV	Medford, Oreg.	1300
KARR	Great Falls, Mont.	1400	KBMH	Henderson, Nev.	1400	KCII	Washwell, Iowa	1390	KDWB	Marshall, Tex.	1410
KARS	Belem, N.M.	860	KBMM	Bozeman, Mont.	1230	KCJ	Shreveport, La.	1050	KDWN	Sanford, Tex.	1390
KART	Jerome, Idaho	1410	KBMD	Benson, Minn.	1290	KCM	Carroll, Iowa	1390	KDRG	Deer Lodge, Mont.	1400
KARY	Prosser, Wash.	1300	KBMR	Bismarck, N. D.	1350	KCM	Victorville, Calif.	1510	KDRD	Sedalia, Mo.	1340
KASA	Phoenix, Ariz.	1540	KBMW	Wahpeton, N. D.	1450	KCMN	Minot, N.Dak.	990	KDRS	Paragould, Ark.	1400
KASH	Eugene, Ore.	1580	KBWX	Breckenridge, Minn.	1240	KCKC	San Bernardino, Cal.	1350	KDRY	Alamo Hts., Tex.	1110
KASI	Ames, Iowa	1430	KBND	Bend, Oreg.	1110	KCKG	Sonora, Tex.	1240	KDSJ	Deadwood, S.Dak.	980
KASK	Ontario, Calif.	1510	KBDA	Kennett, Mo.	890	KCKN	Palm Springs, Calif.	1340	KDSS	Denison, Iowa	1580
KASL	Newcastle, Wyo.	1240	KBOE	Oskaloosa, Iowa	740	KCKY	Jena, La.	1480	KDST	Denison-Sherman, Tex.	950
KASM	Albany, Minn.	1150	KBOK	Malvern, Ark.	1310	KCKY	Coolidge, Ariz.	150	KDTA	Delta, Colo.	1400
KASO	Minden, La.	1240	KBDL	Boulder, Colo.	1490	KCLA	Pine Bluff, Ark.	1420	KDTH	Dubuque, Iowa	1370
KAST	Astoria, Ore.	1370	KBOM	Bismarck-Mandan, N.D.	1270	KCLE	Cleburne, Tex.	1180	KDUZ	Hutchinson, Minn.	1260
KAT	Abing, Wash.	1220	KBON	Omaha, Nebr.	1490	KCLN	Clinton, Iowa	1390	KDWA	Hastings, Minn.	1480
KATA	Arcata, Calif.	1370	KBOP	Pleasanton, Tex.	1380	KCLW	Leavenworth, Kans.	1410	KDWB	St. Paul, Minn.	650
KATE	Albert Lea, Minn.	1450	KBOR	Brownsville, Tex.	1600	KCLX	Flagstaff, Ariz.	600	KDWT	Sanford, Tex.	1390
KATI	Casper, Wyo.	1400	KBOW	Butte, Mont.	550	KCLL	Rolla, Mo.	1590	KDXE	N. Little Rock, Ark.	1380
KATL	Miles City, Mont.	1340				KCLV	Clovis, N.Mex.	1240	KDXI	Mansfield, La.	1360
KATN	Boise, Ida.	950				KCLW	Hamilton, Tex.	900	KDXU	St. George, Utah	1450

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WHITE'S RADIO LOG

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
KEED	Eugene, Ore.	1450	KGMT	Fairbury, Nebr.	1310	KILR	Estherville, Ia.	1070
KEEE	Nacogdoches, Tex.	1230	KGMY	Missoula, Mont.	1450	KILT	Houston, Tex.	610
KEEL	Shreveport, La.	710	KGNB	New Braunfels, Tex.	1420	KIMA	Yakima, Wash.	1460
KEEN	San Jose, Calif.	1370	KGNC	Amarillo, Tex.	710	KIMB	(Kimbali, Nebr.)	1260
KEEP	Twin Falls, Idaho	1450	KGNO	odgeville, Kans.	1370	KIML	Gillette, Wyo.	1270
KEES	Gladewater, Tex.	1430	KGNS	San Jacinto, Cal.	1430	KIMN	Rapid City, S.D.	1510
KEGG	Dainergfield, Tex.	1560	KGNS	Laredo, Tex.	1390	KIMN	Denver, Colo.	950
KEHG	Fosston, Minn.	1480	KGOS	San Francisco, Calif.	810	KIMN	Hilo, Hawaii	850
KELA	Centralia-Chekalis, Wash.	1470	KGOL	Palm Desert, Cal.	1270	KIMP	Mt. Pleasant, Tex.	960
KELO	El Dorado, Ark.	1400	KGOS	Torrington, Wyo.	1490	KIND	Independence, Kans.	1010
KELI	Tulsa, Okla.	1430	KGPC	Grafton, N.Dak.	1340	KINE	Kingsville, Tex.	1330
KELK	Elko, Nev.	1240	KGRB	West Loma, Cal.	900	KING	Seattle, Wash.	1090
KELP	El Paso, Tex.	920	KGRI	Honolulu, Hawaii	1000	KINL	Gillette, Wyo.	1270
KLBR	El Reno, Okla.	1460	KGRB	Bend, Ore.	940	KINM	Altagordo, N. M.	1270
KLBY	Ely, Nev.	1230	KGRN	Grinnell, Iowa	1410	KINO	Winslow, Ariz.	1230
KLNA	Mena, Ark.	1450	KGRS	Pampa, Tex.	1230	KINS	Eureka, Calif.	980
KEND	Cheyenne, Wyo.	1280	KGRS	Pasco, Wash.	1340	KINT	El Paso, Tex.	1590
KENE	Toppenish, Wash.	1490	KGST	Las Cruces, N.Mex.	570	KINY	Juneau, Alaska	800
KENI	Anchorage, Alaska	550	KGST	Fresno, Calif.	1600	KIOD	Des Moines, Iowa	940
KENN	Portales, N.Mex.	1450	KGTN	Georgetown, Tex.	1530	KIOT	Barstow, Calif.	1310
KENN	Farrington, N.M.	1390	KGTN	Honolulu, Hawaii	910	KIPL	Bay Mills, Mich.	1110
KENW	Las Vegas, Nev.	1460	KGUC	Gunnison, Colo.	1490	KIQA	Hilo, Hawaii	1110
KENT	Houston, Tex.	1070	KGUD	Santa Barbara, Calif.	990	KIQS	Willows, Calif.	1560
KENT	Prescott, Ariz.	1340	KGUL	Port Lavaca, Tex.	1560	KIRO	Seattle, Wash.	710
KENY	Bellingham-Ferndale, Wash.	930	KGVL	Greenville, Tex.	1400	KIRT	Mission, Tex.	1580
KEOR	Atoka, Okla.	1110	KGVO	Missoula, Mont.	1290	KIRV	Fresno, Cal.	1510
KEOS	Flagstaff, Ariz.	690	KGWV	Belgrade, Mont.	630	KIRX	Kirksville, Mo.	1450
KEPR	Kennebec-Richland, Wash.	610	KGWV	Portland, Ore.	620	KISD	Sioux Falls, S.Dak.	1230
KEPS	Eagle Pass, Tex.	610	KFRD	Rosenberg-Richmond, Tex.	960	KISN	Vancouver, Wash.	910
KERB	Kermit, Tex.	600	KFRE	Fresno, Calif.	940	KIST	Santa Barbara, Calif.	1340
KERC	Eastland, Tex.	1590	KFRM	Kansas City, Mo.	550	KITX	Yakima, Wash.	920
KERG	Eugene, Ore.	1280	KFRV	Longview, Tex.	1370	KITE	San Antonio, Tex.	280
KERN	Bakersfield, Calif.	1410	KFRU	Columbia, Mo.	1400	KITI	Chialasis-Centralia, Wash.	1420
KERV	Kerrville, Tex.	1230	KFSA	Ft. Smith, Ark.	950	KITN	Olympia, Wash.	920
KESD	Eldorado Springs, Mo.	580	KFSG	Clayton, Mo.	1240	KIUL	Garden City, Kans.	1240
KEST	Boise, Idaho	790	KFSC	Denver, Colo.	1220	KIUN	Peecos, Tex.	1400
KETO	Seattle, Wash.	1590	KFST	Ft. Steokton, Tex.	860	KIUP	Durango, Colo.	930
KETX	Livingston, Tex.	1440	KFTM	Ft. Morgan, Colo.	1400	KIUV	Crockett, Tex.	1290
KEUN	Eunice, La.	1440	KFTV	Paris, Tex.	1250	KIWA	Sheldon, Iowa	1550
KEVA	Evanson, Wyo.	1240	KFTW	Frederickstown, Mo.	1450	KIXF	Fortuna, Cal.	1280
KEVL	White Castle, La.	1490	KFUN	Las Vegas, N.Mex.	1230	KIXL	Seattle, Wash.	910
KEWJ	Tucson, Ariz.	890	KFYB	Clayton, Mo.	850	KIXX	Dallas, Tex.	1040
KEWB	Oakland, Calif.	910	KFVJ	Cape Girardeau, Mo.	960	KIXX	Provo, Utah	1400
KEWI	Topeka, Kans.	1440	KFWB	Los Angeles, Calif.	980	KIYZ	Amarillo, Tex.	940
KEWQ	Paradise, Cal.	930	KFXD	Nampa, Idaho	580	KIZZ	El Paso, Tex.	1150
KEX	Portland, Ore.	1190	KFXM	San Bernardino, Calif.	590	KJAM	Madison, S.Dak.	1390
KEXO	Grand June, Colo.	1230	KFYN	Bonham, Tex.	790	KJAN	Atlantic, Iowa	1220
KEYD	Oakes, N.Dak.	1220	KFYU	Lubbock, Tex.	1420	KJBY	Fort Collins, Calif.	910
KEYE	Perryton, Tex.	1400	KFVH	Victoria, B.C., Dak.	1510	KJCA	Albany, N.Y.	1110
KEYJ	Jamestown, N.Dak.	1400	KGAF	Spokane, Wash.	1510	KJCB	Sacramento, Calif.	1440
KEYL	Long Prairie, Minn.	1400	KGAI	Gainesville, Tex.	1580	KJCF	Midland, Tex.	1150
KEYN	Wichita, Kan.	900	KGAK	Gallup, N.Mex.	1330	KJCF	Festus, Mo.	1400
KEYR	Terrytown, Nebr.	690	KGAL	Lebanon, Ore.	920	KJCK	Junction City, Kans.	1420
KEYS	Corpus Christi, Tex.	1440	KGAR	Vancouver, Wash.	1550	KJCY	John Day, Ore.	1400
KEYT	Provo, Utah	1450	KGAS	Carthage, Tex.	1530	KJDF	Jennings, La.	1290
KEYW	Williston, N. Dak.	1340	KGAT	Harlingen, Tex.	1020	KJEG	Oklahoma City, Okla.	810
KEZU	Rapid City, S.Dak.	920	KGB	Springfield, Mo.	1260	KJEF	Beaumont, Tex.	1380
KEYZ	Anaheim, Calif.	1190	KGBC	Galveston, Tex.	1540	KJFJ	Webster City, Iowa	1570
KFAB	Omaha, Nebr.	1110	KGBT	Los Angeles, Calif.	1020	KJFM	Ft. Worth, Tex.	870
KFAC	Los Angeles, Calif.	1330	KGBT	Harlingen, Tex.	1030	KJHN	Houma, La.	1490
KFAH	Lakewood Center, Wash.	1480	KGBX	Springfield, Mo.	1260	KJHJ	Flagstaff, Ariz.	1400
KFAM	Fulton, Mo.	900	KGCC	Rugby, N.D.	1450	KJKL	Kenton Platte, Nebr.	970
KFAM	St. Cloud, Minn.	1450	KGCA	Clayton, Mo.	850	KJLN	Clinton, N.Y.	1170
KFAR	Fairbanks, Alaska	660	KGCB	Clayton, Mo.	850	KJNP	Rant, Pole, Alaska	1170
KFAX	San Francisco, Calif.	1100	KGCD	Sidney, Mont.	1480	KJOE	Shreveport, La.	1400
KFAY	Fayetteville, Ark.	1250	KGDN	Edmonds, Wash.	630	KJOY	Stockton, Calif.	1280
KFBB	Great Falls, Mont.	1310	KGEE	Bakersfield, Calif.	1230	KJPW	Waynesville, Mo.	1390
KFBC	Cheyenne, Wyo.	1240	KGEG	Stirling, Colo.	1030	KJRW	Seattle, Wash.	950
KFBK	Sacramento, Calif.	1230	KGEM	Keosauqua, Mo.	1140	KJRB	Spokane, Wash.	790
KFCB	Nogales, Ariz.	1340	KGEN	Tulare, Calif.	1470	KJRC	Newton, Kans.	950
KFCB	Redfield, S. Dak.	1380	KGER	Long Beach, Calif.	1490	KJRD	Clinton, Nebr.	1100
KFDF	Van Buren, Ark.	1580	KGEZ	Kalispell, Mont.	600	KJST	Joshua Tree, Cal.	1420
KFDI	Wichita, Kansas	1070	KGFF	Shawnee, Okla.	1450	KJWH	Camden, Ark.	1450
KFDR	Grand Coulee, Wash.	1360	KGFL	Los Angeles, Calif.	1230	KKAD	Denver City, Tex.	1580
KFEL	Pueblo, Colo.	970	KGFM	Kearney, Nebr.	1400	KKAM	Pueblo, Colo.	1340
KFEQ	St. Joseph, Mo.	660	KGFL	Pierre, S.D.	1080	KKAN	Phillipsburg, Kans.	1490
KFGL	Helena, Mont.	1360	KGGF	Coffeyville, Kans.	690	KKAR	Pomona, Calif.	1220
KFGO	Fargo, N.D.	790	KGGM	Albuquerque, N.Mex.	610	KKAS	Silbesee, Tex.	1300
KFGQ	Boone, Iowa	1260	KGHL	Billings, Mont.	790	KKES	Estes Park, Colo.	1400
KFH	Wichita, Kans.	1330	KGHM	Brookfield, Mo.	1470	KKEY	Vancouver, Wash.	1150
KFI	Los Angeles, Calif.	640	KGHO	Hoquiam, Wash.	1560	KKHI	San Francisco, Calif.	1550
KFIV	Preston, Minn.	1060	KGHS	International Falls, Minn.	1230	KKIN	Aitkin, Minn.	930
KFVL	Modesto, Calif.	1360	KGIL	San Fernando, Calif.	1260	KKIS	Pittsburg, Calif.	990
			KGIM	Los Angeles, Calif.	1490	KKIT	Taos, N.Mex.	1340
			KGIL	San Angelo, Tex.	960	KKIV	St. Joseph, Mo.	1350
			KGIO	Benton, Ark.	950	KKJG	Albany, N.Y.	1110
			KGIO	Miami, Okla.	810	KKKK	Lompoc, Calif.	1410
			KGIO	Glendive, Mont.	590	KKUA	Honolulu, Hawaii	690
			KGIM	Avalon, Calif.	740	KKUB	Brownfield, Tex.	1300
			KGIN	Glendive Sprngs., Colo.	980	KKLC	Los Angeles, Calif.	570
			KGIO	Lawrence, Iowa	1300	KKLAD	Klamath Falls, Ore.	960
			KGIO	Safford, Ariz.	1480	KKLAK	Lakewood, Colo.	1600
			KGIO	Honolulu, Hawaii	1480	KKAL	Lakewood, Alaska	1450
			KGIO	Honolulu, Hawaii	830	KKAL	Lakewood, Calif.	1320
			KGIO	Pasadena, Tex.	650	KKLV	Las Vegas, Nev.	1230
			KGIO	Miami, Ariz.	1340	KKLB	Lubbock, Tex.	1340
			KGIO	Sulphur, La.	1310	KKLM	La Grande, Ore.	1450
			KGIO	Tucson, Ariz.	580	KKLS	Los Banos, Calif.	1380
			KGIO	Galveston, Tex.	1400	KKLB	Libby, Mont.	930
			KGIO	Grand Forks, S.Dak.	1440	KKLC	Blytheville, Ark.	1210

Are your home-town AM stations listed correctly in *White's Radio Log*? If you believe there is a correction *White's* listings, please check first with your local station. For each call sign 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.

—Editor

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
KLCO	Poteau, Okla.	1280	KMPL	Sikeston, Mo.	1520	KONA	Kealahoukua, Hawaii	790	KQWB	Fargo, N. D.	1550
KLEA	Livingston, N. Mex.	1280	KMRC	Morgan City, La.	1430	KONB	Geno, Nev.	1450	KQJ	Arvada, Colo.	1530
KLEB	Golden, Meadow, La.	1600	KMRE	Anderson, Cal.	1580	KONG	Union, Calif.	1400	KQYX	Joplin, Mo.	1560
KLEE	Ottumwa, Iowa	1480	KMRS	Morris, Minn.	1230	KONI	Spanish Fork, Utah	1480	KRAF	E. Grand Forks, Minn.	1590
KLEI	Kailua, Hawaii	1130	KMUK	Ukiah, Calif.	1250	KONO	San Antonio, Tex.	860	KRAD	Reedsport, Ore.	1470
KLEM	LeMars, Iowa	1410	KMUL	Muleshoe, Tex.	1380	KONP	Port Angeles, Wash.	1450	KRAI	Craig, Colo.	550
KLEN	Killeen, Tex.	1050	KMUS	Muskogee, Okla.	1380	KOOK	Billings, Mont.	970	KRAK	Sacramento, Cal.	1140
KLEO	Wichita, Kans.	1480	KMVI	Wailuku, Hawaii	550	KUOL	Phoenix, Ariz.	960	KRAL	Rawlins, Wyo.	1240
KLER	Orofino, Idaho	950	KMVC	Marysville, Calif.	1410	KUOH	Omaha, Neb.	1420	KRAM	Las Vegas, Nev.	920
KLEX	Lexington, Mo.	1570	KMNB	Burlington, Colo.	1140	KOOS	Coos Bay, Ore.	1230	KRAM	Arvada, Colo.	1530
KLFA	Wellington, Kan.	1310	KNAE	Abernath, Tex.	1130	KOPY	Albany, Mont.	530	KRAM	Amarillo, Tex.	1360
KLFD	Litchfield, Minn.	1410	KNAK	Salt Lake City, Utah	1280	KOPY	Alaska, Tex.	1070	KRBA	Lutkin, Tex.	1340
KLGA	Algona, Iowa	1600	KNAL	Victoria, Tex.	1410	KOQT	Bellingham, Wash.	1550	KRBC	Abilene, Tex.	1470
KLGN	Logan, Utah	1390	KNBA	Vallejo, Calif.	1190	KORA	Bryan, Tex.	1240	KRBI	St. Peter, Minn.	1310
KLGR	Redwood Falls, Minn.	1490	KNBI	Norton, Kan.	1530	KORC	Mineral Wells, Tex.	1140	KRBN	Red Lodge, Mont.	1450
KLIB	Liberal, Kans.	1470	KNBR	San Francisco, Cal.	680	KORD	Pasco, Wash.	910	KRCB	Council Bluffs, Ia.	1360
KLIC	Monroe, La.	1230	KNBY	Newport, Ark.	1280	KORE	Springfield-Eugene, Ore.	1050	KRCK	Ridgecrest, Calif.	1300
KLID	Poplar Bluff, Mo.	1340	KNCB	Vivian, La.	1990	KORK	Las Vegas, Nev.	1340	KRCO	Prineville, Oreg.	890
KLIF	Dallas, Tex.	1190	KNCK	Concordia, Kans.	1390	KORL	Las Vegas, Nev.	650	KRCK	Roswell, N. M.	1320
KLIK	Jefferson City, Mo.	950	KNCM	Moberly, Mo.	230	KORN	Honolulu, Hawaii	1490	KRDK	Redding, Calif.	1230
KLIN	Lincoln, Nebr.	1400	KNCO	Nebraska City, Nebr.	1600	KORNT	Mitchell, S. Dak.	1490	KRDO	Colo. Springs, Colo.	1240
KLIP	Fowler, Calif.	1220	KNCD	Hettinger, N. Dak.	1490	KORT	Grangeville, Idaho	1230	KROB	Gresham, Ore.	1230
KLIQ	Portland, Oreg.	1290	KNDI	Honolulu, Hawaii	1270	KOSA	Odesa, Tex.	1230	KRDS	Tolleson, Ariz.	1190
KLIR	Denver, Colo.	990	KNDK	Langdon, N. D.	1080	KOSE	Oseola, Okla.	860	KRDU	Dinuba, Calif.	1240
KLIV	San Jose, Cal.	1590	KNDL	Marysville, Kans.	1570	KOSG	Pasadena, Cal.	1500	KREB	Shreveport, La.	960
KLJW	Twins Falls, Idaho	1310	KNEA	Artes, Ariz.	970	KOSI	Artes, Ariz.	970	KREH	Artes, Ariz.	970
KLKZ	Brainerd, Minn.	1380	KNEB	Scottsbluff, Nebr.	960	KOST	Texas, Ariz.	790	KREI	Farmington, Mo.	800
KLKC	Parsons, Kans.	1540	KNEC	McAlester, Okla.	1150	KOTA	Rapid City, S. Dak.	1380	KREJ	Sapulpa, Okla.	550
KLLE	Leesville, La.	1570	KNEL	Waukon, Ia.	1140	KOTE	Fergus Falls, Minn.	1250	KREL	Corona, Cal.	1370
KLLL	Lubbock, Tex.	1460	KNEI	Brady, Tex.	1490	KOTN	Pine Bluff, Ark.	1490	KREM	Spokane, Wash.	970
KLME	Laramie, Wyo.	1490	KNEM	Nevada, Mo.	1240	KOTS	Deming, N. M.	1220	KREN	Renton, Wash.	1420
KLMO	Longmont, Colo.	1060	KNET	Palestine, Tex.	1450	KOUR	Independence, Iowa	1230	KREO	Indio, Calif.	1490
KLMR	Lamar, Colo.	920	KNEU	Union, Cal.	1490	KOVE	Valley City, N. Dak.	1490	KREX	Grand Junction, Colo.	920
KLMS	Lincoln, Nebr.	1450	KNEZ	McPherson, Kans.	1540	KOVS	Lander, Wyo.	1330	KRFK	Owatonna, Minn.	1390
KLMX	Clayton, N. Mex.	1450	KNGS	Hanford, Calif.	620	KOWB	Laramie, Wyo.	1290	KRFS	Superior, Nebr.	1600
KLOD	Ogden, Utah	1430	KNIA	Knoxville, Iowa	1320	KOWH	Omaha, Neb.	660	KRGI	Grand Island, Nebr.	1300
KLOA	Ridgecrest, Calif.	1240	KNIF	Winfield, Kan.	1550	KOWL	Bjork, Calif.	1490	KRGV	Weslaco, Tex.	1290
KLOC	Ceres, Calif.	930	KNIM	Maryville, Mo.	1580	KOWN	Esccondido, Calif.	1450	KRHD	Duncan, Okla.	1350
KLOE	Goodland, Kans.	730	KNIN	Wichita Falls, Tex.	990	KPAL	Phoenix, Ariz.	1410	KRIB	Bay City, Iowa	1440
KLOG	Kelso, Wash.	1490	KNIR	San Jose, Calif.	1380	KOY	Phoenix, Ariz.	550	KRIC	Odesa, La.	1140
KLOH	Pipestone, Minn.	1090	KNIT	Abilene, Tex.	1060	KOYL	Odesa, Tex.	1140	KRIH	Rayville, La.	990
KLOK	San Jose, Calif.	1170	KNLY	Ord, Neb.	1060	KOYN	Billings, Mont.	910	KRIK	Roswell, N. Mex.	960
KLOL	Lincoln, Neb.	1530	KNND	Cottage Grove, Oreg.	1400	KOZE	Lewiston, Idaho	1000	KRIO	McAllen, Tex.	910
KLOM	Lompoc, Calif.	1330	KNNN	Frisco, Tex.	1070	KOZI	Chelan, Wash.	1220	KRIZ	Phoenix, Ariz.	1230
KLOO	Corvallis, Ore.	1340	KNOE	Natchitoches, La.	1450	KOZY	Grand Rapids, Minn.	1490	KRKC	King City, Calif.	1490
KLOS	Albuquerque, N. M.	1580	KNOE	Monroe, La.	540	KPAC	Port Arthur, Tex.	1230	KRKL	Los Angeles, Calif.	1150
KLOU	Lake Charles, La.	1580	KNOF	Wichita, Tex.	970	KPAM	Portland, Oreg.	1410	KRKM	Albany, Wash.	990
KLOW	Loveland, Colo.	1570	KNOP	N. Platte, Nebr.	1410	KPAN	Portland, Oreg.	1410	KRKA	Pasadena, Calif.	1110
KLPL	Lake Providence, La.	1390	KNOR	Norman, Okla.	1400	KPAT	Berkeley, Calif.	1400	KRLD	Dallas, Tex.	1350
KLPM	Minot, N. Dak.	1390	KNOT	Prescott, Ariz.	1450	KPAC	Chico, Calif.	1060	KRLN	Canon City, Colo.	1400
KLPR	Oklahoma City, Okla.	1140	KNOW	Austin, Tex.	1490	KPAC	Pine Bluff, Ark.	1510	KRLW	Wainut Ridge, Ark.	1320
KLRA	Little Rock, Ark.	1310	KNOX	Grand Forks, N. Dak.	1310	KPBC	Port Sulphur, La.	1590	KRMD	Shreveport, La.	1340
KLRS	Mountain Grove, Mo.	1060	KNPT	Newport, Ore.	1310	KPCB	Marked Tree, Ark.	1580	KRMG	Tulsa, Okla.	740
KLTF	Little Falls, Minn.	960	KNUI	Makawao, Hawaii	1310	KPCN	Grand Prairie, Tex.	730	KRML	Carmel, Calif.	1000
KLTI	Macon, Mo.	1560	KNUZ	Houston, Tex.	1230	KPCR	Bowling Green, Mo.	1530	KRMO	Monett, Mo.	990
KLTR	Blackwell, Okla.	1580	KNWC	Sioux Falls, S.D.	1270	KPDN	Pampa, Tex.	1340	KRMS	Osage Beach, Mo.	1150
KLTV	Glasgow, Mont.	1240	KNWS	Waterloo, Iowa	1090	KPDQ	Portland, Oreg.	800	KRND	San Bernardino, Calif.	1240
KLUB	Salt Lake City, Utah	570	KNX	Los Angeles, Calif.	1070	KPEB	Portland, Wash.	1370	KRNL	Los Angeles, Calif.	1230
KLUC	Las Vegas, Nev.	1050	KOAA	Denver, Colo.	850	KPEF	Lafayette, Calif.	1420	KRNT	Des Moines, Iowa	1350
KLUE	Longview, Tex.	1280	KOAB	Lemoor, Calif.	1240	KPEL	Gilroy, Calif.	1290	KRNY	Kearney, Nebr.	1000
KLUV	Haynesville, La.	1580	KOAG	Arroyo Grande, Cal.	1280	KPET	Lamesa, Tex.	910	KROB	Robstown, Tex.	1510
KLVI	Beaumont, Tex.	560	KOAK	Reed Oak, Ia.	1080	KPHO	Phoenix, Ariz.	690	KROC	Rochester, Minn.	1340
KLVL	Pasadena, Tex.	1480	KOAL	Price, Utah	1230	KPKI	Colorado Spgs., Colo.	1580	KROF	El Paso, Tex.	600
KLVT	Levelland, La.	1230	KOAM	Pittsburg, Kans.	860	KPKR	N. Grand, Ariz.	1260	KROG	Golden, Wyo.	960
KLWN	Lawrence, Kans.	1320	KOAN	Abilene, Tex.	770	KPKS	Eugene, Ore.	1260	KROP	Brawley, Calif.	1300
KLWT	Lebanon, Mo.	1230	KOAP	Spring Springs, S. Dak.	580	KPLC	Lake Charles, La.	1470	KROS	Clinton, Iowa	1340
KLWW	Cedar Rapids, Iowa	1450	KOAR	Price, Utah	1230	KPLT	Paris, Tex.	1490	KROW	Dallas, Ore.	1460
KLYD	Bakersfield, Calif.	1350	KOAS	Pittsburg, Kans.	860	KPLY	Bakersfield, Calif.	1260	KRXO	Crookston, Minn.	1260
KLYQ	Hamilton, Mont.	980	KOAT	Denver, Colo.	850	KPNG	Port Neches, Tex.	1150	KROY	Sacramento, Calif.	1240
KLYR	Clarksburg, Ark.	300	KOAU	Portland, Oreg.	1440	KPOC	Port Neches, Tex.	1150	KRSD	Shreveport, La.	1340
KLZ	Denver, Colo.	560	KOAV	Wichita, Kan.	1240	KPOD	Prescott City, Calif.	1310	KRRR	Ruidoso, N. Mex.	1340
KMA	Shenandoah, Iowa	960	KOAW	Wichita, Kan.	930	KPOE	Denver, Colo.	910	KRRV	Sherman, Tex.	910
KMAC	San Antonio, Tex.	1340	KOAX	Ottawa, Kans.	1220	KPOI	Honolulu, Hawaii	1380	KRSA	Alisal, Calif.	1570
KMAD	Madill, Okla.	1550	KOAY	San Mateo, Calif.	1050	KPOJ	Portland, Oreg.	1330	KRSC	Othello, Wash.	1400
KMAK	Fresno, Calif.	1340	KOAZ	Ogallah, Nebr.	930	KPOL	Los Angeles, Calif.	1540	KRSD	Rapid City, S. Dak.	1340
KMAM	Butler, Mo.	1530	KOBB	Hot Springs, S. Dak.	580	KPOP	Roseville, Cal.	1110	KRSI	St. Louis Park, Minn.	950
KMAN	Manitou, Kans.	1340	KOBC	Hot Springs, S. Dak.	580	KPOQ	Quincy, Wash.	1370	KRSR	Los Alamos, N. Mex.	490
KMAQ	Maquoketa, Iowa	1320	KOBD	Hot Springs, S. Dak.	580	KPOS	Post, Tex.	1070	KRSP	Salt Lake City, Utah	1060
KMAR	Winnabow, Ia.	1570	KOBE	Kilgore, Tex.	1240	KPOW	Powell, Wyo.	1260	KRSY	Roswell, N. Mex.	1230
KMAS	Shelton, Wash.	1280	KOBF	Oklahoma City, Okla.	1340	KPPC	Pasadena, Calif.	1240	KRTN	Raton, N. Mex.	1490
KMAV	Maryville, N. D.	1520	KOD	Houston, Tex.	1010	KPRB	Redmond, Oreg.	560	KRTR	Thermopolis, Wyo.	1490
KMBL	Junction, Tex.	1450	KODE	Joplin, Mo.	1280	KPRC	Houston, Tex.	950	KRUN	Balfinger, Tex.	1400
KMBY	Monterey, Calif.	1240	KODI	Cody, Wyo.	1400	KPRD	Livingston, Mont.	1340	KRUX	Ruton, La.	1490
KMBZ	Kansas City, Mo.	980	KODJ	Thatcher, Oreg.	1440	KPRF	Pasadena, Calif.	1230	KRVC	Golden, Ariz.	1360
KMCD	Fairfield, Iowa	1570	KODK	North Platte, Nebr.	1240	KPRG	Park Rapids, Minn.	1240	KRVN	Lexington, Nebr.	1010
KMCE	McCall, Ida.	1240	KODL	Delwin, Iowa	950	KPRH	Riverside, Calif.	1440	KRWK	Roseau, Minn.	1410
KMCM	McMinville, Oreg.	1260	KODM	Omaha, Neb.	1290	KPRI	Kansas City, Mo.	1260	KRXB	Rexburg, Idaho	1230
KMCO	Conroe, Tex.	900	KODN	Thatcher, Oreg.	1440	KPSA	Presston, Idaho	1300	KRYS	Corpus Christi, Tex.	1360
KMDO	Ft. Scott, Kans.	1600	KODP	Port Arthur, Tex.	1340	KPSB	Carson City, Nev.	1340	KRSB	Golden, Colo.	1530
KMED	Medford, Oreg.	1440	KODQ	Coalinga, Cal.	1050	KPSD	Austin, Minn.	910	KRZY	Albuquerque, N. M.	1580
KMEF	Wenatchee, Wash.	1340	KODR	Quanaah, Tex.	1150	KPUB	Pueblo, Colo.	1480	KSAC	Manhattan, Kans.	580
KMEN	San Bernardino, Cal.	1290	KODS	Coalinga, Cal.	1050	KPUL	Pullman, Wash.	1140	KSAL	Salina, Kans.	1150
KMED	Phoenix, Ariz.	740	KODT	Quanaah, Tex.	1150	KPUR	Amarillo, Tex.	1490	KSAM	Huntsville, Tex.	1490
KMER	Kemmerer, Wyo.	950	KODU	Recherster, Minn.	920	KPWB	Piedmont, Mo.	1050	KSAY	San Francisco, Calif.	1010
KMFB	Mendocino, Cal.	1520	KODV	Geno, Nev.	820	KPXE	Lidbury, Tex.	1040	KSBB	Salinas, Calif.	1380
KMHL	Marshall, Minn.	1480	KODW	Warrensburg, Mo.	1450	KPYL	Lyons, Mo.	1040	KSCJ	Sioux City, Iowa	1360
KMHT	Marshall, Tex.	1430	KOKX	Keokuk, Iowa	1310	KQNY	Quincy, Calif.	1370	KSCO	Santa Cruz, Calif.	1080
KMI	Cameron, Tex.	1330	KOKY	Little Rock, Ark.	1300	KQEN	Enterprise, Oreg.	1200	KSD	St. Louis, Mo.	550
KMIN	Grants, N. M.	980	KOL	Seattle, Wash.	1300	KQEV	Albuquerque, N. Mex.	920	KSDN	Aberdeen, S. Dak.	930
KMIS	Portageville, Mo.	1050	KOLA	Scottsbluff, Nebr.	1320	KQIB	Lakeview, Oreg.	1230	KSDR	San Diego, Calif.	1130
KMJ	Fresno, Calif.	580	KOLB	Mbridge, S. Dak.	1300	KQIK	Lakeview, Oreg.	1230	KSDS	Watertown, S. Dak.	1480
KMLB	Monroe, La.	1440	KOLC	Omaha, Neb.	1520	KQMS	Redding, Calif.	1400	KRS	Golden, Ariz.	1360
KMMJ	Grand Island, Nebr.	750	KOLA	Omaha, Neb.	1520	KQOT	Yakima, Wash.	950	KSEI	Pocatello, Idaho	930
KMMO	Marshall, Mo.	1300	KOME	Tulsa, Okla.	1300	KQVA	Valley, Wyo.	680			
KMNS	Sioux City, Iowa	620	KOMD	Seattle, Wash.	1000	KQV	Pittsburgh, Pa.	1410			
KMO	Tacoma, Wash.	1360	KOMF	Seattle, Wash.	680						
KMON	Great Falls, Mont.	560	KOMY	Watsonville, Calif.	1520						
KMOP	Tucson, Ariz.	1330									
KMOR	Murray, Utah	1230									
KMOX	St. Louis, Mo.	1120									
KMPC	Los Angeles, Calif.	710									
KMPG	Hollister, Cal.	1520									

WHITE'S RADIO LOG

Call	Location	kHz
KSEK	Pittsburg, Kans.	1340
KSEL	Lubbock, Tex.	950
KSEM	Moses Lake, Wash.	1470
KSEW	Shelby, Mont.	1150
KSEW	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
KSHJ	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
KSIN	Sikeston, Mo.	1400
KSIV	Sedalia, Mo.	1050
KSJW	Woodward, Okla.	1140
KSIX	Corpus Christi, Tex.	1230
KSJB	Jamestown, N.Dak.	600
KSJI	Sun Valley, Idaho	1340
KSJY	Dallas, Tex.	660
KSL	Salt Lake City, Utah	1160
KSLM	Salem, Ore.	1390
KSOJ	Opeletoe, La.	1340
KSLV	Monte Vista, Colo.	1240
KSLY	San Luis Obispo, Cal.	1400
KSMA	Santa Maria, Calif.	1240
KSMK	Kennewick, Wash.	1340
KSMH	Shakopee, Minn.	1530
KSMN	Manok City, Iowa	1010
KSMO	Salem, Mo.	1340
KSNM	Pocatello, Ida.	1290
KSNO	Aspen, Colo.	1260
KSNY	Snyder, Tex.	1450
KSO	Dos Moines, Iowa	1460
KSOA	Arkansas City, Kans.	1280
KSOB	San Francisco, Cal.	1450
KSOE	San Diego, Calif.	1240
KSOO	Sioux Falls, S.Dak.	1340
KSOP	Salt Lake City, Utah	1370
KSOX	Raymondville, Tex.	1240
KSPA	Santa Paula, Calif.	1400
KSPI	Stillwater, Okla.	780
KSPJ	Diboll, Tex.	1260
KSPK	Spokane, Wash.	1230
KSPR	Springfield, Mo.	1400
KSPS	Sioux Falls, S.Dak.	1400
KSRA	Salmon, Idaho	960
KSRC	Secorro, N.Mex.	1290
KSRM	Soldatna, Alaska	950
KSRD	Santa Rosa, Calif.	1350
KSRV	Ontario, Ore.	1380
KSSS	Colorado Springs, Colo.	1230
KSSU	Sulphur Springs, Tex.	1000
KSTA	Coleman, Tex.	1000
KSTB	Breckenridge, Tex.	1430
KSTL	St. Louis, Mo.	890
KSTN	Stockton, Calif.	1420
KSTP	St. Paul, Minn.	520
KSTQ	Colorado Springs, Colo.	1500
KSTT	Davenport, Iowa	1170
KSTV	Stephenville, Tex.	1510
KSUB	Cedar City, Utah	590
KSDW	W. Memphis, Ark.	730
KSUE	Susanville, Calif.	1240
KSUM	Fairmont, Minn.	1370
KSUN	Bisbee, Ariz.	1230
KSVC	Richfield, Utah	980
KSVN	Ogden, Utah	730
KSPV	Artesia, N.Mex.	990
KSWA	Graham, Tex.	1330
KSWM	Aurora, Mo.	940
KSWO	Lawton, Okla.	1380
KSWP	Roswell, N.M.	1350
KSSX	Salt Lake City, Utah	1340
KSYC	Yreka, Calif.	1490
KSYL	Alexandria, La.	970
KSYX	Santa Rosa, N.Mex.	1420
KTAC	Tacoma, Wash.	850
KTAE	Taylor, Tex.	1260
KTAF	Phoenix, Ariz.	820
KTBF	Frederick, Okla.	1230
KTBB	Tyler, Tex.	600
KTBC	Austin, Tex.	590
KTBE	Malden, Mo.	1470
KTBR	Minneapolis, Minn.	690
KTCS	Fort Smith, Ark.	1410
KTDF	Farmersville, La.	1470
KTDO	Toledo, Ohio	1230
KTEE	Idaho Falls, Idaho	1260
KTEL	Wallia Walla, Wash.	1490
KTEM	Tempe, Tex.	1400
KTEO	San Angelo, Tex.	1340
KTER	Terrell, Tex.	1570
KTEI	Twin Falls, Idaho	1270
KTFB	Seminole, Okla.	1250
KTFB	Texarkana, Tex.	1400

Call	Location	kHz
KTGO	Tioga, N. D.	1090
KTGR	Columbia, Mo.	1580
KTHE	Thermopolis, Wyo.	1240
KTHO	Tahoe Valley, Calif.	590
KTHS	Berryville, Ark.	1480
KTHT	Houston, Tex.	790
KTHI	Thibodaux, La.	630
KTIJ	Tillamook, Ore.	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
KTLJ	Tullulah, La.	1360
KTLD	Tulsa, Okla.	1280
KTLO	Tahlequah Home, Ark.	1240
KTLL	Mountain Home, Ark.	1240
KTLM	Rusk, Tex.	1580
KTLL	Texas City, Tex.	920
KTMC	McAlester, Okla.	1400
KTMM	Truman, Ark.	1530
KTMS	Santa Barbara, Calif.	1250
KTNC	Falls City, Neb.	1280
KTNN	Tucumcari, N.Mex.	1400
KTNT	Tamaca, Wash.	1400
KTOJ	Petaluma, Cal.	1490
KTOC	Johnsonboro, La.	920
KTOD	Sinton, Tex.	1590
KTOE	Mankato, Minn.	1400
KTOH	Denver, Colo.	1360
KTOK	Oklahoma City, Okla.	1000
KTON	Belton, Tex.	940
KTOO	Henderson, Nev.	1280
KTOP	Topeka, Kans.	1400
KTOQ	Big Bear Lake, Cal.	1050
KTDW	Sand Spring, Okla.	1370
KTRB	Modesto, Calif.	860
KTRC	Santa Fe, N.Mex.	1400
KTRF	Lufkin, Tex.	1420
KTRF	Trif River Falls, Minn.	1230
KTRH	Honolulu, Hawaii	990
KTRH	Houston, Tex.	740
KTRI	Sioux City, Iowa	1470
KTRM	Beaumont, Tex.	990
KTRN	Wichita Falls, Tex.	1290
KTRY	Bastrop, La.	750
KTSA	San Antonio, Tex.	530
KTSL	Burnett, Tex.	1450
KTSN	El Paso, Tex.	1380
KTIN	Trenton, Mo.	1600
KTTR	Rolla, Mo.	1490
KTTS	Springfield, Mo.	1000
KTTC	Columbus, Nebr.	1510
KTUU	Tucson, Ariz.	1400
KTUE	Tulia, Tex.	1260
KTUF	Tempe, Ariz.	1540
KTUL	Sault Ste. Marie, Mich.	1360
KTW	Seattle, Wash.	1250
KTW	Casper, Wyo.	1030
KTXJ	Kasper, Tex.	1350
KTXJ	Sherman, Tex.	1500
KTYM	Inglewood, Calif.	1460
KUAI	Elele, Kanai, Hawaii	720
KUAK	Aramoana, N.Z.	810
KUAT	Tucson, Ariz.	1550
KUBA	Yuba City, Calif.	1600
KUBC	Montrose, Colo.	580
KUCS	Oceanside, Calif.	1320
KUDI	Great Falls, Mont.	1350
KUDJ	Fairway, Kan.	1480
KUDU	Wichita, Kan.	1480
KUDY	Spokane, Wash.	1280
KUEN	Wenatchee, Wash.	900
KUGN	Eugene, Ore.	590
KUIK	Hillsboro, Ore.	1360
KUJ	Wallia Walla, Wash.	1420
KUKA	San Antonio, Tex.	1250
KUKI	Utiah, 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, Ore.	1290
KUNO	Corpus Christi, Tex.	1400
KUNO	Holdrege, Nebr.	1400
KUON	Minneapolis, Minn.	770
KUPD	Tempe, Ariz.	1060
KUPI	Idaho Falls, Idaho	980
KUPK	Garden City, Kan.	1050
KURA	Moab, Utah	1450
KURL	Billings, Mont.	710
KURV	Holdrege, Nebr.	930
KURY	Brookings, Nebr.	910
KUSD	Vermillion, S.Dak.	690
KUSH	Cushing, Okla.	1600
KUSN	St. Joseph, Mo.	1290
KUTA	Blanding, Utah	790
KUTI	Yakima, Wash.	980
KUTJ	Palmdale, Calif.	1470
KUVB	Holdrege, Nebr.	1390
KUXL	Golden Valley, Minn.	1570
KUZN	W. Monroe, La.	1310
KUZZ	Bakersfield, Calif.	800
KVAL	Sauk Rapids, Minn.	800
KVAN	Camas, Wash.	1480
KVAS	Astoria, Ore.	1230
KVBR	Brainerd, Minn.	1340
KVCK	Wolf Point, Nebr.	1450

Call	Location	kHz
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
KVEJ	Austin, Tex.	1300
KVFC	Vernal, Colo.	1470
KVFD	Fort 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
KVIV	Cottonwood, Ariz.	1800
KVIP	Redding, Calif.	540
KVKM	Monahans, Tex.	1330
KVLB	Cleveland, Ark.	1410
KVLC	Little Rock, Ark.	1050
KVLF	Alpine, Tex.	1240
KVLG	LaGrange, Tex.	1570
KVLH	Louis Valley, Okla.	1470
KVLW	Waukegan, Ill.	1270
KVLV	Fallon, Nev.	960
KVMA	Magnolia, Ark.	630
KVMC	Colorado City, Tex.	1320
KVML	Sonora, Calif.	1450
KVNC	Winslow, Ariz.	1010
KVNI	Coeur d'Alene, Idaho	1240
KVNS	Navajo, Utah	1340
KVOB	Bastrop, La.	1340
KVOC	Casper, Wyo.	1230
KVOD	Albuquerque, N. Mex.	730
KVOE	Emporia, Kans.	1400
KVOG	Ogden, Utah	1490
KVON	Lafayette, La.	1330
KVOM	Morrilton, Ark.	1240
KVON	Napa, Calif.	1440
KVOT	Tulsa, Okla.	1170
KVOP	Plainview, Tex.	1400
KVOR	Colorado Springs, Colo.	1300
KVOU	Uvalde, Tex.	1400
KVOW	Riverton, Wyo.	1450
KVOX	Moorehead, Minn.	1280
KVY	Yuba City, Iowa	1400
KVQZ	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
KVRS	Saida, Colo.	1340
KVRS	Rock Springs, Wyo.	1360
KVSA	McGehee, Ark.	1200
KVSF	Santa Fe, N.Mex.	1260
KVSH	Valentine, Nebr.	940
KVSI	Montpelier, Ida.	1460
KVSD	Ardmore, Okla.	1240
KVSM	Fort Worth, Tex.	1240
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
KWAE	Waukegan, Ill.	1240
KWAL	Wallace, Idaho	620
KWAM	Memphis, Tenn.	990
KWAT	Watertown, S.Oak.	950
KWAY	Forest Grove, Ore.	1570
KWBA	Baytown, Tex.	1360
KWBB	Wichita, Kans.	1410
KWBC	Wichita, Kan.	1550
KWBE	Beatrice, Nebr.	1450
KWBG	Boone, Iowa	1590
KWBB	Hutchinson, Kans.	1450
KWCB	Searcy, Ark.	1300
KWCL	Oak Grove, La.	1280
KWCO	Chickasha, Okla.	1560
KWEC	Rochester, Minn.	1270
KWED	Sequin, 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
KWGL	Gallego, Idaho	710
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
KWID	Idaho Falls, Idaho	710
KWIL	Albany, Ore.	790
KWIN	Ashland, Ore.	580
KWIP	Merced, Calif.	1580
KWIQ	Moses Lake, Wash.	1260
KWIV	Douglas, Wyo.	1050
KWIZ	Santa Ana, Calif.	1480
KWJ	Waukegan, Ill.	1390
KWK	St. Louis, Mo.	1380
KWKX	Abilene, Tex.	1340
KWKH	Shreveport, La.	1130
KWKW	Pasadena, Calif.	1300
KWKY	Des Moines, Iowa	1150
KWLA	Many, La.	1530
KWLC	Decorah, Iowa	1240
KWLG	Wagoner, Okla.	1160
KWLM	Willmar, Minn.	1340

Call	Location	kHz
KWMC	Del Rio, Tex.	1490
KWMT	Fort Dodge, Iowa	540
KWNA	Winnemucca, Nev.	1460
KWNO	Winona, Minn.	1230
KWNS	Pratt, Kans.	1290
KWNT	Davenport, Iowa	1589
KWOW	Worthington, Minn.	730
KWOC	Opal Bluff, Mo.	930
KWOC	Canton, Okla.	1300
KWON	Bartlett, Ill.	1400
KWOR	World, 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.	1940
KWRD	Henderson, Tex.	1470
KWRE	Warrenton, Mo.	730
KWRP	Warren, Ark.	860
KWRG	New Roods, La.	1050
KWRO	Coquille, Ore.	630
KWRV	Boonville, Mo.	1370
KWRW	Buthrie, Okla.	1400
KWRS	Wadsworth, Mo.	1250
KWST	Paducah, Ky.	620
KWSH	Wewoka-Seminole, Okla.	1260
KWSL	Grand Junction, Colo.	1340
KWSO	Wasco, Calif.	1050
KWSR	Rifle, Colo.	910
KWSW	Wagoner, Okla.	1340
KWTO	Springfield, Mo.	560
KWTX	Waco, Tex.	1230
KWUN	Concord, Cal.	1400
KWVR	Enterprise, Ore.	1340
KWVY	Waverly, Iowa	1470
KWVW	Waterloo, Iowa	1330
KWVX	Glendale, Cal.	1340
KWYK	Farmington, N.Mex.	960
KWYN	Wynne, Ark.	1400
KWYO	Sheridan, Wyo.	1410
KWYR	Winner, S.Oak.	1260
KWYV	Everett, Wash.	1230
KXA	Seattle, Wash.	770
KXAR	Hope, Ark.	1240
KXBE	Wagoner, Iowa	1540
KXEN	Festus-St. Louis, Mo.	1010
KXES	Mexico, Mo.	1340
KXEW	Tucson, Ariz.	1600
KXEX	Fresco, Calif.	1550
KXGI	Fort Madison, Iowa	1360
KXGJ	Glendale, Mont.	1460
KXGK	Lowell, Iowa	800
KXIH	Dalhart, Tex.	1410
KXIV	Phoenix, Ariz.	1260
KXJK	Forest City, Ark.	950
KXKW	Lafayette, La.	1520
KXL	Portland, Ore.	750
KXLE	Elensburg, Wash.	1240
KXLM	Glendale, Calif.	1340
KXLI	Helena, Mont.	1240
KXLW	Lewiston, Mont.	1230
KXLR	Little Rock, Ark.	1150
KXLL	Lytton, Mo.	1320
KXLY	Spokane, Wash.	920
KXMA	El Centro, Calif.	1230
KXMB	Glendale, Calif.	1340
KXOK	St. Louis, Mo.	630
KXOL	Fort Worth, Tex.	1360
KXOW	West Springs, Ark.	1420
KXOX	Sweetwater, Tex.	1240
KXRA	Alexandria, Minn.	1490
KXRR	Russellville, Ark.	1490

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz			
KZNG	Hot Springs, Ark.	1340	WANY	Albany, Ky.	1390	WBBZ	Ponca City, Okla.	1230	WBTV	Bennington, Vt.	1370
KZOE	Princeton, Ill.	1490	WAOK	Atlanta, Ga.	1380	WBCA	Bay Minette, Ala.	1110	WBTO	Linton, Ind.	1600
KZOL	Farwell, Tex.	1570	WAOP	Ostego, Mich.	980	WBBC	Levittown, Pa.	1400	WBTS	Bridgeport, Ala.	1480
KZON	Santa Maria, Cal.	1600	WAOV	Vincennes, Ind.	1450	WBCH	Hastings, Mich.	1220	WBUC	Buckhannon, W. Va.	1460
KZOO	Honolulu, Hawaii	1210	WAOW	San Juan, P.R.	680	WBCL	Williamsburg, Va.	740	WBUD	Trenton, N.J.	1280
KZOT	Marianna, Ark.	1460	WAPF	Riverhead, N.Y.	1570	WBCK	Battle Creek, Mich.	930	WBUG	Ridgeland, S.C.	1430
KZOW	Globe, Ariz.	1460	WAPG	Lockesville, Fla.	690	WBCH	Bay City, Mich.	1530	WBUC	Chattanooga, Tenn.	1060
KZUN	Opono, P.R. Wash.	630	WAPF	Waco, Tex.	980	WBCK	Bucyrus, Ohio	1540	WBUX	Doylstown, Pa.	1050
KZYM	Cape Girardeau, Mo.	1220	WAPG	Arcadia, Fla.	1480	WBCK	Union, S.C.	1420	WBUX	Lexington, N.C.	1440
KZZN	Littlefield, Tex.	1490	WAPI	Birmingham, Ala.	1070	WBEC	Pittsfield, Mass.	1460	WBUX	Frederonia, N.Y.	1570
VOUS	Argentina, Nfld.	1480	WAPL	Appleton, Wis.	1570	WBEE	Harvey, Ill.	1450	WBVM	Utica, N.Y.	1550
WAAA	Winston-Salem, N.C.	980	WAPQ	Chattanooga, Tenn.	1150	WBEJ	Elizabethton, Tenn.	1240	WBVP	Beaver Falls, Pa.	1230
WABW	Worcester, Mass.	1340	WAPX	Montgomery, Ala.	1600	WBEL	Beloit, Wis.	1380	WBVE	St. Pauls, N.C.	1370
WAC	Terre Haute, Ind.	1400	WAQE	Towson, Md.	1580	WBEL	Buffalo, N.Y.	1300	WBVC	Calverton, Md.	1450
WACB	Chicago, Ill.	950	WAQI	Ashtabula, Ohio	600	WBEL	Monroe, Corner, S. C.	950	WBVG	Savannah, Ga.	1450
WAAG	Adel, Ga.	1470	WAQY	Birmingham, Ala.	1220	WBET	Brockton, Mass.	1400	WBVS	Canton, Ill.	1560
WAAK	Dallas, N.C.	960	WARA	Attleboro, Mass.	1320	WBEU	Beaufort, S.C.	960	WBVZ	Boston, Mass.	1030
WAAM	Ann Arbor, Mich.	1600	WARB	Covington, La.	730	WBEE	Beaver Dam, Wis.	1430	WBZA	Glens Falls, N.Y.	1410
WAAD	Andalusia, Ala.	1530	WARD	Johnstown, Pa.	1490	WBEX	Chillicothe, Ohio	1490	WBZB	Odesa, Tex.	920
WAAT	Trenton, N.J.	1300	WARE	Ware, Mass.	1250	WBFD	Bedford, Pa.	1310	WBZE	Wheeling, W. Va.	1470
WAAX	Gadsden, Ala.	1570	WARF	Jasper, Ala.	1240	WBFI	Woodbury, Tenn.	1540	WBZC	Toronto, Ont., Can.	980
WAAY	Huntsville, Ala.	1460	WARL	Abutaba, Ala.	1570	WBGC	Chicago, Ill.	1240	WBZB	Rutherfordton, N.C.	1520
WABY	Albany, N.Y.	850	WARK	Hagerstown, Md.	1490	WBGJ	Bowling Green, Ky.	1340	WBZC	Fort Myers, Fla.	1350
WABB	Mobile, Ala.	1480	WARM	Scranton, Pa.	590	WBGJ	Slidell, La.	1560	WBZC	Northfield, Minn.	770
WABC	New York, N.Y.	770	WARN	Ft. Pierce, Fla.	1330	WBHB	Fitzgerald, Ga.	1240	WBZC	Camden, N.J.	1310
WABD	Ft. Campbell, Ky.	1370	WARO	Canonsburg, Pa.	540	WBHC	Hampton, S.C.	1270	WBZC	Baltimore, Md.	600
WABF	Fairhope, Ala.	1220	WART	Moulton, Ala.	1530	WBHF	Cartersville, Ga.	1450	WBZC	Lowell, Mass.	980
WABG	Greenwood, Miss.	960	WARU	Peru, Ind.	1600	WBHM	Birmingham, Ala.	1550	WBZC	Detroit, Mich.	1300
WABH	Deerfield, Va.	1150	WARV	Warwick, Conn.	1590	WBHM	Bryce City, N.C.	1230	WBZC	Northfield, Mass.	740
WABI	Newport, N.Y.	910	WASA	Great Neck, Grace, Md.	1330	WBHT	Huntsville, Tenn.	1250	WBZC	Orange, Mass.	1390
WABL	Amite, La.	1570	WASC	Spartanburg, S.C.	1530	WBIA	Augusta, Ga.	1130	WBZC	Philadelphia, Pa.	1210
WABO	Waynesboro, Miss.	990	WASK	Lafayette, Ind.	1450	WBIB	Centerville, Ala.	1210	WBZC	Charleston, W. Va.	680
WABR	Cleveland, Ohio	990	WATA	Boone, N.C.	1450	WBIE	Marietta, Ga.	1080	WBZC	Cayce, S.C.	620
WABR	Winter Park, Fla.	1440	WATC	Gaylord, Mich.	900	WBIG	Greensboro, N.C.	1470	WBZC	Carthage, Ill.	990
WABT	Tuskegee, Ala.	580	WATE	Knoxville, Tenn.	620	WBIG	Greensboro, N.C.	1470	WBZC	Corning, N.Y.	1350
WABV	Abbeville, S.C.	1590	WATH	Athens, Ohio	620	WBIG	Booneville, Miss.	1400	WBZC	Chambersburg, Pa.	1590
WABY	Albany, N.Y.	1400	WATI	Indianapolis, Ind.	810	WBIS	Bristol, Conn.	1440	WBZC	Chattanooga, Tenn.	1520
WABZ	Albemarle, N.C.	1010	WATK	Antigo, Wis.	900	WBIV	Bedford, Ind.	1340	WBZC	Martinsville, Ind.	1540
WACA	Camden, S.C.	1590	WATM	Atmore, Ala.	1590	WBIX	Jacksonville Beach, Fla.	1010	WBZC	Benton, Ky.	1290
WACB	Kittanning, Pa.	1380	WATN	Watertown, N.Y.	1240	WBIZ	Eau Claire, Wis.	1400	WBZC	Baltimore, Md.	680
WACE	Chicopee, Mass.	730	WATO	Oak Ridge, Tenn.	1290	WBIZ	Eau Claire, Wis.	1400	WBZC	New York, N.Y.	880
WACI	The Dalles, Ore.	1300	WATP	Marion, S.C.	1480	WBIZ	Eau Claire, Wis.	1400	WBZC	Roanoke Rapids, N.C.	1230
WACK	Newark, N.Y.	1570	WATQ	Waterbury, Conn.	1320	WBIZ	Eau Claire, Wis.	1400	WBZC	Cheyanne, Mich.	1240
WACL	Waynesville, N.C.	570	WATR	Waterbury, Conn.	960	WBIZ	Eau Claire, Wis.	1400	WBZC	Kalamazoo, Mich.	1290
WACO	Waco, Tex.	1460	WATT	Cadillac, Mich.	1240	WBIZ	Eau Claire, Wis.	1400	WBZC	Punta Gorda, Fla.	1580
WACR	Columbus, Miss.	1050	WATV	Birmingham, Ala.	900	WBIZ	Eau Claire, Wis.	1400	WBZC	Lawrence, Mass.	800
WACT	Tuscaloosa, Ala.	1420	WATW	Ashland, Wis.	1400	WBIZ	Eau Claire, Wis.	1400	WBZC	Newellville, Wis.	1370
WACY	Moss Point, Miss.	1460	WATZ	Alpena, Mich.	1450	WBIZ	Eau Claire, Wis.	1400	WBZC	Minneapolis-St. Paul, Minn.	830
WADA	Shelby, N.C.	1390	WAUB	Auburn, N.Y.	1590	WBIZ	Eau Claire, Wis.	1400	WBZC	Worcester City, Mich.	1310
WADE	Wadesboro, N.C.	1210	WAUC	Wauchoa, Fla.	1310	WBIZ	Eau Claire, Wis.	1400	WBZC	Edwards, N.C.	1240
WADE	Newport, R.I.	1490	WAUD	Andover, Pa.	910	WBIZ	Eau Claire, Wis.	1400	WBZC	Cardonville, Pa.	1440
WADM	Decatur, Ind.	1540	WAUG	Augusta, Ga.	1050	WBIZ	Eau Claire, Wis.	1400	WBZC	Glasgow, Ky.	1440
WADO	New York, N.Y.	1280	WAUK	Waukesha, Wis.	1510	WBIZ	Eau Claire, Wis.	1400	WBZC	Winchester, Tenn.	1340
WADR	Rensselaer, N.Y.	1480	WAV	Arlington, Va.	780	WBIZ	Eau Claire, Wis.	1400	WBZC	Rocky Mount, N.C.	810
WADS	Ansonia, Conn.	690	WAV	Warner Robins, Ga.	1350	WBIZ	Eau Claire, Wis.	1400	WBZC	DuBois, Pa.	1420
WAEB	Allentown, Pa.	790	WAVE	Louisville, Ky.	970	WBIZ	Eau Claire, Wis.	1400	WBZC	Parkburg, W. Va.	1050
WAEL	Mayaguez, P.Rico	690	WAVE	Dayton, Ohio	1210	WBIZ	Eau Claire, Wis.	1400	WBZC	Chattanooga, Tenn.	1520
WAEM	Crossport, Tenn.	1330	WAVF	Indianapolis, Ind.	910	WBIZ	Eau Claire, Wis.	1400	WBZC	Cambridge, Md.	1240
WAF	Staunton, Va.	900	WAVG	St. Louis, Mo.	1220	WBIZ	Eau Claire, Wis.	1400	WBZC	Charlotte, Mich.	1150
WAFS	Amsterdam, N.Y.	1570	WAVO	Avondale Estates, Ga.	1420	WBIZ	Eau Claire, Wis.	1400	WBZC	Marquette, Mich.	1390
WAGC	Centre, Ala.	1550	WAVY	Alberville, Ala.	630	WBIZ	Eau Claire, Wis.	1400	WBZC	Chicago, Ill.	1000
WAGE	Leesburg, Va.	1290	WAVZ	Portsmouth, Va.	1350	WBIZ	Eau Claire, Wis.	1400	WBZC	Springfield, Vt.	1480
WAGF	Dothan, Ala.	1320	WAW	New Haven, Conn.	1300	WBIZ	Eau Claire, Wis.	1400	WBZC	Clifton Forge, Va.	1230
WAGG	Franklin, Tenn.	950	WAW	West Falls, Wis.	1590	WBIZ	Eau Claire, Wis.	1400	WBZC	Chattanooga, Tenn.	1520
WAGL	Lancaster, Pa.	1560	WAW	Indianapolis, Ind.	1140	WBIZ	Eau Claire, Wis.	1400	WBZC	Pastille, Pa.	1050
WAGM	Presque Isle, Maine	950	WAWZ	Zarephath, N.J.	1380	WBIZ	Eau Claire, Wis.	1400	WBZC	Belmont, N.C.	1270
WAGN	Menominee, Mich.	1340	WAX	Vero Beach, Fla.	1370	WBIZ	Eau Claire, Wis.	1400	WBZC	Chicago Heights, Ill.	1600
WAGR	Lumberton, N.C.	580	WAXK	Superior, Wis.	1320	WBIZ	Eau Claire, Wis.	1400	WBZC	Canandaigua, N.Y.	1550
WAGS	Bishopville, S.C.	1380	WAXL	Georgetown, Ky.	1580	WBIZ	Eau Claire, Wis.	1400	WBZC	Chambersburg, Pa.	900
WAGY	Forest City, N.C.	1320	WAXX	Chippewa Falls, Wis.	1150	WBIZ	Eau Claire, Wis.	1400	WBZC	Inkster, Mich.	1440
WAHT	Anneville-Cleona, Pa.	1510	WAXY	Waynesboro, Va.	480	WBIZ	Eau Claire, Wis.	1400	WBZC	Chattanooga, Tenn.	1520
WAIC	Galesburg, Mo.	1590	WAZ	Clearwater, Fla.	800	WBIZ	Eau Claire, Wis.	1400	WBZC	Chillicothe, Ohio	1350
WAIL	Baton Rouge, La.	1260	WAZ	Rockingham, N.C.	900	WBIZ	Eau Claire, Wis.	1400	WBZC	Chillicothe, Ohio	1350
WAIM	Anderson, S.C.	1230	WAYR	Orange Park, Fla.	550	WBIZ	Eau Claire, Wis.	1400	WBZC	Crookhaven, Miss.	1470
WAIN	Columbia, Ky.	1270	WAYS	Charlotte, N.C.	610	WBIZ	Eau Claire, Wis.	1400	WBZC	Cranton, Ga.	1290
WAIR	Winston-Salem, N.C.	1340	WAYX	Waycross, Ga.	1230	WBIZ	Eau Claire, Wis.	1400	WBZC	Chapel Hill, N.C.	1330
WAIT	Chicago, Ill.	820	WAYZ	Waynesboro, Pa.	1380	WBIZ	Eau Claire, Wis.	1400	WBZC	Norwich, N.Y.	970
WAJF	Decatur, Ala.	1490	WAZA	Bainbridge, Ga.	1360	WBIZ	Eau Claire, Wis.	1400	WBZC	Washington Court House, Ohio	1250
WAJR	Morgantown, W.Va.	1440	WAZB	Clearwater, Fla.	800	WBIZ	Eau Claire, Wis.	1400	WBZC	Charleston, W. Va.	580
WAKE	Valparaiso, Ind.	1500	WAZF	Yazoo City, Miss.	1230	WBIZ	Eau Claire, Wis.	1400	WBZC	Charlottesville, Va.	1260
WAKI	McMinville, Tenn.	1230	WAZL	Hazleton, Pa.	1490	WBIZ	Eau Claire, Wis.	1400	WBZC	Gordon, Ga.	1560
WAKN	Aiken, S.C.	990	WAZS	Summerville, S. C.	980	WBIZ	Eau Claire, Wis.	1400	WBZC	Cardonville, Ill.	1020
WAKO	Lawrenceville, Ill.	910	WAZT	Lafayette, Ind.	1410	WBIZ	Eau Claire, Wis.	1400	WBZC	Cincinnati, Ohio	1480
WAKR	Akron, Ohio	1590	WBA	West Lafayette, Ind.	920	WBIZ	Eau Claire, Wis.	1400	WBZC	Beckley, W. Va.	1060
WAKY	Louisville, Ky.	790	WBA	Babylon, N.Y.	1440	WBIZ	Eau Claire, Wis.	1400	WBZC	Lima, Ohio	1450
WALD	Waynesburg, S.C.	1060	WBA	Chattanooga, Tenn.	1340	WBIZ	Eau Claire, Wis.	1400	WBZC	Columbia, Miss.	1450
WALE	Fall River, Mass.	1400	WBA	College Park, Ga.	1570	WBIZ	Eau Claire, Wis.	1400	WBZC	Dunbar, N.C.	780
WALG	Albany, Ga.	1590	WBA	Barnesville, Ga.	1090	WBIZ	Eau Claire, Wis.	1400	WBZC	Ishpeming, Mich.	970
WALK	Patchogue, N.Y.	1370	WBA	Burlington, N.C.	1150	WBIZ	Eau Claire, Wis.	1400	WBZC	Greer, S.C.	1300
WALL	Middletown, N.Y.	1340	WBA	Baltimore, Md.	1090	WBIZ	Eau Claire, Wis.	1400	WBZC	Winnabow, S.C.	1250
WALM	Albion, Mich.	1260	WBA	Montgomery, Ala.	740	WBIZ	Eau Claire, Wis.	1400	WBZC	Cincinnati, Ohio	1530
WALO	Humacao, P.R.	1240	WBAP	Fort Worth, Tex.	820	WBIZ	Eau Claire, Wis.	1400	WBZC	Claxton, Ga.	1430
WALT	Tampa, Fla.	1110	WBAR	Bartow, Fla.	1460	WBIZ	Eau Claire, Wis.	1400	WBZC	Wilmington, N.C.	1220
WALY	Herkimer, N.Y.	1420	WBAT	Marion, Ind.	970	WBIZ	Eau Claire, Wis.	1400	WBZC	Cleveland, Miss.	1490
WAMD	Aberdeen, Md.	970	WBAW	Barnwell, S.C.	740	WBIZ	Eau Claire, Wis.	1400	WBZC	Cleveland, Tenn.	1570
WAME	Miami, Fla.	1260	WBAX	Wilkes-Barre, Pa.	1240	WBIZ	Eau Claire, Wis.	1400	WBZC	Morgantown, W. Va.	1300
WAMG	Galatin, Tenn.	1130	WBAZ	Green Bay, Wis.	1360	WBIZ	Eau Claire, Wis.	1400	WBZC	Corning, N.Y.	1450
WAMI	Opp, Ala.	860	WBA	Kingston, N.Y.	1550	WBIZ	Eau Claire, Wis.	1400	WBZC	Jamestown, Pa.	1430
WAML	Laurel, Miss.	1340	WBA	Pittsfield, Ill.	1380	WBIZ	Eau Claire, Wis.	1400	WBZC	Wilmington, N.C.	1550
WAMN	Waynesburg, Pa.	1060	WBB	Burlington, N.C.	920	WBIZ	Eau Claire, Wis.	1400	WBZC	Columbus, Ga.	1580
WAMO	Homestead, Pa.	86C	WBB	Rochester, N.Y.	950	WBIZ	Eau Claire, Wis.	1400	WBZC	Newark, Ohio	1490
WAMR	Venice, Fla.	1320	WBB	Abingdon, Va.	1230	WBIZ	Eau Claire, Wis.	1400	WBZC	Covington, Ky.	1320
WAMS	Wilmington, Del.	1380	WBB	Blakely, Ga.	1260	WBIZ	Eau Claire, Wis.	1400	WBZC	Winnabow, S.C.	1570
WAMW	Washington, Ind.	1580	WBB	Richmond, Va.	1480	WBIZ	Eau Claire, Wis.	1400	WBZC	Corning, N.Y.	1450
WAMY	Amory, Miss.	1490	WBB	Chicago, Ill.	780	WBIZ	Eau Claire, Wis.	1400	WBZC	Harrisburg, Pa.	1230
WANA	Anniston, Ala.	1580	WBB	Fort Worth, Tex.	820	WBIZ	Eau Claire, Wis.	1400	WBZC	Wilmington, N.C.	1220
WANB	Waynesburg, Pa.	1060	WBB	Augusta, Ga.	1340	WBIZ	Eau Claire, Wis.	1400	WBZC	Brunswick, Maine	900
WANN	Annapolis, Md.	1190	WBB	Travelers Rest, S.C.	1580	WBIZ	Eau Claire, Wis.	1400	WBZC	Ashtand, Ky.	1340
WANO	Pineville, Ky.	1230	WBB	Lyons, Ga.	1240	WBIZ	Eau Claire, Wis.	1400	WBZC	Arcadio, P.R.	1280
WANS	Anderson, S.C.	1280	WBB	Youngstown, Ohio	1340	WBIZ	Eau Claire, Wis.	1400	WBZC	Pine City, Minn.	1350
WANT	Richmond, Va.	990	WBBX	Portsmouth, N.H.	1380	WBIZ	Eau Claire, Wis.	1400	WBZC	Elkhart, Ind.	1270
WANW	Waynesboro, Va.	970									

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
WGGO	Salamanca, N.Y.	1590	WHEN	Syracuse, N.Y.	620	WIDD	Elizabethton, Tenn.	1520	WJAK	Jackson, Tenn.	1460
WGH	Newport News, Va.	1310	WHEO	Stuart, Va.	1270	WIDG	St. Ignace, Mich.	940	WJAM	Marion, Ala.	1310
WGH	Clayton, Ga.	1570	WHEP	Foley, Ala.	1310	WIDU	Fayetteville, N.C.	1600	WJAR	Providence, R.I.	1320
WGHM	Skowegan, Maine	1150	WHFB	Memphis, Tenn.	1430	WIEL	Elizabethtown, Ky.	1400	WJAS	Pittsburgh, Pa.	1320
WGH	Cr. Haven, Mich.	1370	WHFR	Riveria Beach, Fla.	1600	WIFE	Indianapolis, Ind.	1310	WJAT	Swainsboro, Ga.	800
WGH	Kingston, N.Y.	920	WHFS	Benton Harbor-St. Joseph, Mich.	1060	WIFM	Elkin, N.C.	1540	WJAX	Jacksonville, Fla.	930
WGIS	Branswick, Ga.	1440.	WHGR	Houghton L., Mich.	1290	WIGL	Superior, Wis.	970	WJAY	Mullins, S.C.	1280
WGL	Galesburg, Ill.	1400	WHHH	Warren, Ohio	1440	WIGM	Medford, Wis.	1490	WJAZ	Albany, Ga.	960
WGR	Manchester, N.H.	610	WHHM	Henderson, Tenn.	1580	WIGS	Atlanta, Ga.	1340	WJBB	Haleyville, Ala.	1230
WGV	Charlotte, N.C.	1600	WHHT	Lucedade, Miss.	1440	WIGS	Gouverneur, N.Y.	1330	WJBC	Bloomington, Ill.	1230
WGKA	Atlanta, Ga.	1110	WHIV	Hillsville, Va.	1400	WIL	Homestead, Fla.	1430	WJBD	Salem, Ill.	1350
WGR	Perry, Fla.	1510	WHIY	Montgomery, Ala.	1440	WIKB	Iron River, Mich.	1230	WJBK	Detroit, Mich.	1500
WGW	Charlottesville, Va.	1420	WHIE	Griffin, Ga.	1320	WIKC	Bogalusa, La.	1490	WJBL	Holland, Mich.	1260
WGT	Fort Wayne, Ind.	1250	WHIP	Portsmouth, Va.	1400	WIKD	Newport, Vt.	1490	WJBM	Jerseyville, Ill.	1480
WGLB	Port Wash., Wis.	1560	WHIL	Medford, Mass.	1430	WIKI	Chester, Va.	1410	WJBO	Baton Rouge, La.	1150
WGLC	Mendota, Ill.	1090	WHIM	Providence, R.I.	1110	WIKY	Evanville, Ind.	820	WJBS	DeLand, Fla.	1490
WGLI	Babylon, N.Y.	1290	WHIN	Gallatin, Tenn.	1010	WIL	St. Louis, Mo.	1430	WJCD	Seymour, Ind.	1390
WGMA	Hollywood, Fla.	1320	WHIO	Dayton, Ohio	1290	WIL	Danville, Va.	1580	WJCM	Sebring, Fla.	960
WGML	Hinesville, Ga.	990	WHIP	Mooreville, N.C.	1350	WIL	Boston, Mass.	1090	WJCN	Jackson, Mich.	1510
WGMM	Millington, Tenn.	1370	WHIS	Bluefield, W.Va.	1440	WILE	Cambridge, Ohio	1270	WJCO	Johnson City, Tenn.	910
WGMS	Washington, D.C.	570	WHIT	New Bern, N.C.	1450	WILI	Williamette, Conn.	1400	WJDA	Quincy, Mass.	1300
WGN	Chicago	720	WHIY	Orlando, Fla.	1270	WILK	Wilkes-Barre, Pa.	980	WJDB	Thomasville, Ala.	630
WGN	Gastonia, N.C.	1450	WHIZ	Zanesville, Ohio	1240	WILM	Urbana, Ill.	580	WJDX	Jackson, Miss.	620
WGN	Panama City Beach, Fla.	1480	WHJ	Greensburg, Pa.	620	WILM	Wilmington, Del.	1450	WJFY	Salisbury, Md.	1470
WGN	Wilmington, N.C.	1450	WHJC	Matawan, W.Va.	1360	WILM	Frankfort, Ind.	1570	WJFH	Grand Rapids, Mich.	1230
WGNP	Indian Rocks Beach, Fla.	1520	WHK	Cleveland, Ohio	1420	WILS	Lansing, Mich.	1320	WJG	Galipolis, Ohio	940
WNS	Murfreesboro, Tenn.	1520	WHKP	Hendersonville, N.C.	1420	WILZ	St. Petersburg Beach, Fla.	1590	WJH	Hershey, Pa.	1200
WGNU	Granite City, Ill.	920	WHKY	Hickory, N.C.	1290	WIMA	Lima, Ohio	1150	WJH	Valdosta, Ga.	1150
WGNV	Newburgh, N.Y.	1220	WHLB	Virginia, Minn.	1400	WIMO	Winder, Ga.	1200	WIEM	Dover, Ohio	1450
WGOE	Richmond, Va.	1590	WHLD	Niagara Falls, N.Y.	1270	WIMS	Michigan City, Ind.	1420	WIJES	Johnston, S.C.	1570
WGG	Walhalla, S.C.	1000	WHLF	South Boston, Va.	1400	WINA	Charlottesville, Va.	1070	WIET	Erie, Pa.	1400
WGH	Grayson, Ky.	1370	WHLL	Hempstead, N.Y.	1100	WINC	Winchester, Va.	1400	WIJF	Jefferson City, Tenn.	1480
WGO	Mobile, Ala.	900	WHLI	Wheeling, W.Va.	1600	WIND	Chicago, Ill.	560	WIJA	Jackson, Ga.	1540
WGO	Goldsboro, N.C.	1300	WHLM	Bloomburg, Pa.	550	WINE	Brookfield, Conn.	1230	WIJO	Opelika, Ala.	1400
WGO	Valdosta, Ga.	1400	WHLN	Lancaster, Ky.	1410	WINF	Manchester, Conn.	1230	WIJC	Samuel, Mich.	1510
WGOV	Valdosta, Ga.	950	WHLO	Akron, Ohio	640	WING	Dayton, Ohio	1410	WIJK	Tullahoma, Tenn.	740
WGPA	Bethlehem, Pa.	1100	WHLP	Centerville, Tenn.	1570	WINH	Georgetown, S.C.	1470	WJIL	Jacksonville, Ill.	1550
WGPC	Albany, Ga.	1450	WHLS	Port Huron, Mich.	1450	WINI	Murphysboro, Ill.	1420	WIJM	Lansing, Mich.	1240
WGR	Buffalo, N.Y.	550	WHLT	Huntington, Ind.	1300	WINK	Fort Myers, Fla.	1240	WIJC	Commerce, Ga.	1270
WGRA	Cairo, Ga.	790	WHMA	Anniston, Ala.	1390	WINN	Louisville, Ky.	1240	WIJD	Chicago, Ill.	1160
WGRD	Grand Rapids, Mich.	1410	WHMC	Gaithersburg, Md.	1150	WINQ	Tampa, Fla.	1080	WIJE	Christiansburg, Va.	1260
WGR	Griffin, Ga.	1300	WHMI	Havel, Mich.	1370	WINR	Waco, Tex.	1350	WIJF	Niagara Falls, N.Y.	1440
WGRM	Greenville, Miss.	1240	WHMO	Washington, D.C.	400	WINS	New York, N.Y.	1010	WIJG	Wilmington, Tenn.	1490
WGR	Lake City, Fla.	960	WHN	New York, N.Y.	1050	WINT	Winter Haven, Fla.	1360	WIJM	Mt. Holly, N.J.	1460
WGRP	Greenville, Pa.	940	WHNC	Henderson, N.C.	890	WINU	Highland Park, Ill.	1510	WIJK	Memphis, Tenn.	1090
WGR	Chicago, Ill.	950	WHNY	McComb, Miss.	1250	WINW	Canton, O.	1520	WJLY	Jamestown, Ky.	1060
WGRV	Greenville, Tenn.	1340	WHO	Des Moines, Iowa	1040	WINX	Rockville, Md.	1600	WJLD	Detroit, Mich.	1400
WGSA	Ephrata, Pa.	1310	WHOA	San Juan, P.R.	870	WINY	Putnam, Conn.	1350	WJLE	Homewood, Ala.	1400
WGS	Geneva, Ill.	1480	WHOC	Philadelphia, Miss.	1280	WINZ	Yonkers, N.Y.	1080	WJLF	Smithville, Tenn.	1480
WGS	Huntington, N.Y.	740	WHOD	Jackson, Ala.	820	WIO	Brookfield, Conn.	1230	WJL	Asbury Park, N.J.	1340
WGS	Millen, Ga.	1570	WHOK	Lancaster, Ohio	1320	WIU	Highland, Ill.	1310	WJMA	Orange, Va.	560
WGST	Atlanta, Ga.	920	WHOL	Allentown, Pa.	600	WIW	Canton, Ohio	1520	WJMB	Brookhaven, Miss.	1340
WGSV	Greenterville, Ala.	1270	WHOM	New York, N.Y.	1480	WIOD	Miami, Fla.	610	WJMC	Rice Lake, Wis.	1240
WGSW	Greenville, S.C.	1350	WHON	Centerville, Ind.	930	WIOE	New Boston, Ohio	1010	WJMD	Pleasant Hgts., Ohio	1490
WGTA	Summerville, Ga.	950	WHOO	Orlando, Fla.	990	WIOK	Normal, Ill.	1440	WJME	Kentucky, Mich.	1110
WGTC	Greenville, N.C.	1590	WHOP	Hopkinsville, Ky.	1230	WION	Ionia, Mich.	1480	WJMF	Ironwood, Mich.	630
WGTL	Kannapolis, N.C.	870	WHOS	Eastport, N.Y.	800	WIOO	Carlisle, Pa.	1000	WJMG	Athens, Ga.	1340
WGTM	Wilson, N.C.	590	WHOT	Camell, Ohio	1330	WIOQ	Towson, Md.	1480	WJMX	Flora, S.C.	970
WGTV	Georgetown, S.C.	1400	WHOU	Houlton, Maine	1340	WIOU	Kokomo, Ind.	1350	WJNC	Jacksonville, N.C.	1240
WGTO	Cypress Gardens, Fla.	540	WHOV	Clinton, Ill.	1520	WIP	Lake Wales, Fla.	1280	WJND	W. Palm Beach, Fla.	1230
WGTL	New Port Richey, Fla.	1500	WHOY	Salinas, P.R.	1210	WIPR	San Juan, P.R.	940	WJNE	Port Joe, Ind.	1080
WGUN	Atlanta-Deatur, Ga.	1010	WHP	Harrisburg, Pa.	580	WIPS	Ticonderoga, N.Y.	1250	WJNF	Florence, Ala.	1340
WUS	North Augusta, S.C.	1380	WHPB	Bellton, S.C.	1390	WIQT	Heardshead, N.Y.	1000	WJNJ	St. Cloud, Minn.	1240
WGU	Bangor, Maine	1250	WHPE	High Point, N.C.	1070	WIR	Pierce, Fla.	1400	WJOT	South Haven, Mich.	940
WGA	Geneva, N.Y.	1240	WHRF	Richmond, Va.	1010	WIRB	Enterprise, Ala.	600	WJOW	Lake City, S.C.	1280
WGM	Greenville, Miss.	1260	WHRN	Henderson, Va.	1440	WIRD	Hickory, N.C.	920	WJPA	Burlington, Vt.	1230
WGC	Selma, Ala.	1340	WHRT	Hartsville, Ala.	860	WIRE	Indianapolis, Ind.	1430	WJP	Washington, Pa.	1450
WGR	Asheboro, N.C.	1260	WHRV	Ann Arbor, Mich.	1600	WIRL	Humboldt, Tenn.	740	WJPC	Kissimmee, Fla.	1220
WGY	Schenectady, N.Y.	830	WHRY	Elizabethtown, Pa.	1400	WIRK	W. Palm Beach, Fla.	1290	WJPD	Rockingham, Mich.	1340
WGV	Greenville, S.C.	1380	WHSC	Hartsville, S.C.	1450	WIRX	Irving, Ill.	1230	WJPE	Herrin, Ill.	1340
WGYW	Fountain City, Tenn.	1430	WHSL	Wilmington, N.C.	1490	WIRY	Peru, Ind.	1230	WJPG	Green Bay, Wis.	1440
WHA	Madison, Wis.	750	WHSN	Harlem, Wis.	1350	WIRZ	Irving, Ohio	1500	WJPR	Greenville, Miss.	1330
WHAB	Baxley, Ga.	1260	WHST	Hattiesburg, Miss.	1230	WIRY	Plattsburg, N.Y.	1340	WJPS	Evanville, Ind.	1330
WHAG	Halfway, Md.	1410	WHTG	Asbury Park-Eatontown, N.J.	1410	WIS	Columbia, S.C.	560	WJRW	Rockford, Mich.	810
WHAI	Greenfield, Mass.	1240	WHUB	Cookeville, Tenn.	1400	WISA	Isabella, P.R.	1390	WJSG	Jackson, Miss.	1400
WHAK	Rogers City, Mich.	960	WHUC	Hudson, N.Y.	1400	WISB	Ashville, N.C.	1310	WJTB	Detroit, Mich.	1510
WHAL	Shelbyville, Tenn.	1400	WHUD	Reading, Pa.	1230	WISK	Americus, Ga.	1390	WJTC	Joliet, Ill.	1510
WHAM	Rochester, N.Y.	1180	WHUN	Huntington, Pa.	1240	WISL	Shamokin, Pa.	1480	WJTD	Tuscaloosa, Ala.	1150
WHAN	Haines City, Fla.	930	WHU	Huntington, Pa.	1240	WISM	Madison, Wis.	1480	WJTE	Lenoir, N.C.	1340
WHAP	Hopewell, Va.	1340	WHUT	Anderson, Ind.	1470	WISN	Milwaukee, Wis.	1150	WJTR	Troy, N.C.	1390
WHAR	Clarksburg, W.Va.	1340	WHVL	Hendersonville, N.C.	1600	WISO	Ponce, P.R.	1260	WJTW	Newark, N.J.	970
WHAS	Louisville, Ky.	840	WHVR	Hanover, Pa.	1280	WISP	Kinston, N.C.	1230	WJTB	Crestview, Fla.	1050
WHAT	Philadelphia, Pa.	1340	WHVH	Hyde Park, N.Y.	950	WISR	Butler, Pa.	680	WJTC	Johnstown, Pa.	1590
WHAY	Haverhill, Mass.	1440	WHWB	Rutland, Vt.	1000	WISV	Charlotte, N.C.	1240	WJTD	Jamestown, N.Y.	1240
WHAW	Weston, W.Va.	980	WHWC	Princeton, N.J.	1270	WISW	Virginia, Ill.	1360	WJTO	Bath, Me.	730
WHAZ	Troy, N.Y.	1330	WHYD	Carlisle, Ga.	960	WISZ	Glen Burnie, Md.	1500	WJTP	Jupiter, Fla.	1000
WHB	Kansas City, Mo.	710	WHYD	Carlisle, Ga.	960	WITA	San Juan, P.R.	1140	WJUN	Mexico, Pa.	1220
WHBB	Selma, Ala.	1490	WHYN	Springfield, Mass.	950	WIT	Baltimore, Md.	1230	WJVA	South Bend, Ind.	1580
WHBC	Canton, Ohio	1480	WHYP	North East, Pa.	1570	WITL	Lansing, Mich.	1010	WJVC	Cleveland, Ohio	1360
WHBG	Rock Island, Ill.	1270	WHYZ	Greenville, S.C.	1030	WITN	Washington, N.C.	930	WJWD	Wilmington, Del.	1500
WHBG	Harrisburg, Va.	1360	WIAC	San Juan, P.R.	740	WITZ	Danville, Ill.	900	WJWS	South Hill, Va.	1370
WHBL	Shelbyga, Wis.	1330	WIAM	Williamston, N.C.	1400	WIV	Ashtabula, Ohio	960	WJXN	Jackson, Miss.	1450
WHBN	Harrisburg, Va.	1420	WIAB	Madison, Wis.	1280	WIVE	Ashland, Va.	1430	WJZN	Clarksville, Tenn.	1400
WHBO	Tampa, Fla.	1050	WIAB	Indianapolis, Ind.	1280	WIVI	Christiansv. V.I.	970	WKAC	Athens, Ala.	1450
WHBQ	Memphis, Tenn.	560	WIBG	Philadelphia, Pa.	1450	WIVK	Knoxville, Tenn.	850	WKAL	Macomb, Ill.	1080
WHBT	Harrison, Tenn.	1600	WIBH	Jackson, Mich.	1490	WIVV	Vieques, P.R.	1370	WKAS	Saratoga Springs, N.Y.	900
WHBU	Anderson, Ind.	1240	WIBR	Baton Rouge, La.	1300	WIVY	Jacksonville, Fla.	1050	WKAT	Rome, N.Y.	1450
WHBY	Arlington, Wis.	1440	WIBS	Portsmouth, Va.	1400	WIXK	New Richmond, Wis.	1590	WKAM	Goshen, Ind.	1460
WHCC	Waynesville, N.C.	1400	WIBT	San Juan, P.R.	740	WIXL	Danville, Va.	1460	WKAN	Kankakee, Ill.	1320
WHCO	Sparta, Ill.	1230	WIBV	Belleville, Ill.	1260	WIXX	Oakland Park, Fla.	1520	WKAP	Allentown, Pa.	1320
WHCQ	Spartanburg, S.C.	1400	WIBW	Topeka, Kans.	980	WIXY	Cleveland, O.	1260	WKAQ	San Juan, P.R.	580
WHCU	Ithaca, N.Y.	870	WIBX	Utica, N.Y.	550	WIXN	Rome, Ga.	1360	WKAR	East Lansing, Mich.	870
WHDF	Houghton, Mich.	1400	WICC	Bridgeport, Conn.	1290	WIZ	Springfield, Ohio	1340	WKAT	Miami Beach, Fla.	1360
WHDH	Boston, Mass.	850	WICE	Providence, R.I.	1600	WIZR	Johnstown, N.Y.	930	WKAW	Waukegan, Ill.	1490
WHDL	Olean, N.Y.	1450	WICH	Norwich, Conn.	1410	WIZS	Henderson, N.C.	1320	WKAY	Glasgow, Ky.	1450
WHDM	Memphis, Tenn.	1440	WICK	Seranton, Pa.	1300	WIAB	Westbrook, Me.	1440	WKAZ	Charleston, W.Va.	950
WHB	Portsmouth, N.H.	750	WICD	Salisbury, Md.	1330	WIAC	Johnstown, Pa.	850	WKBA	Vinton, Va.	810
WHCC	Rochester, N.Y.	1460	WICD	Malone, N.Y.	1490	WIAG	Norfolk, Nebr.	780	WKBC	N. Wilkesboro, N.C.	1550
WHCE	Marion, N.C.	1370	WIDE	Bideford, Maine	1400				WKBH	La Crosse, Wis.	1410

WHITE'S RADIO LOG

Call	Location	kHz
WKBJ	Milan, Tenn.	1600
WKBK	Keanon, N.H.	1220
WKBL	Covington, Tenn.	1250
WKBN	Youngstown, Ohio	570
WKBO	Harrisburg, Pa.	1230
WKBR	Manchester, N.H.	1250
WKBV	Richmond, Ind.	1490
WKBY	Buffalo, N. Y.	1520
WKCB	Winston-Salem, N.C.	1500
WKCY	Chatham, N.Y.	1080
WKCB	Muskegon, Mich.	850
WKCT	Bowling Green, Ky.	930
WKCU	Corinth, Miss.	1350
WKCV	Warrenton, Va.	1420
WKCY	Harrisburg, Va.	1300
WKDA	Nashville, Tenn.	1240
WKDE	Altavista, Ala.	1000
WKDK	Newberry, S.C.	1240
WKDL	Clarksdale, Miss.	1600
WKDN	Camden, N.J.	800
WKDX	Hamlet, N. C.	1250
WKDZ	Cadiz, Ky.	1110
WKEE	Huntington, W. Va.	800
WKEW	Kewanee, Ill.	1450
WKEN	Dover, N.H.	1080
WKER	Pompton Lakes, N.J.	1500
WKEU	Griffin, Ga.	1450
WKEY	Covington, Va.	1340
WKFD	Wickford, R.I.	1370
WKFE	Yauco, P.R.	1550
WKFG	Battle Creek, Mich.	1400
WKGN	Knappa, Va.	970
WKHM	Kasson, Mich.	1480
WKIC	Hazard, Ky.	1390
WKID	Urbana, Ill.	1580
WKIG	Glenview, Ga.	1580
WKIK	Leonardtown, Md.	1370
WKIL	Kingsport, Tenn.	1320
WKIP	Poughkeepsie, N.Y.	1410
WKIS	Orlando, Fla.	740
WKIX	Raleigh, N.C.	850
WKIY	Key West, Fla.	1500
WKJB	Mayaguez, P.R.	710
WKJC	Fort Wayne, Ind.	1380
WKJK	Granite Falls, N. C.	900
WKJM	Muskegon, Mich.	1580
WKKA	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
WKLE	Cianita, Ala.	980
WKLK	Clouee, Minn.	1230
WKLM	Wilmingon, N.C.	980
WKLO	Louisville, Ky.	1080
WKLP	Keyser, W. Va.	1390
WKLW	Blackstone, Va.	1440
WKLY	Hartwell, Ga.	980
WKMA	Kalamazoo, Mich.	1370
WKMC	Roanoke Sigs., Pa.	1370
WKMF	Flint, Mich.	1470
WKMI	Kalamazoo, Mich.	1360
WKMK	Blountstown, Fla.	1370
WKMT	Kings Mtn., N.C.	1220
WKNE	Keene, N.H.	1290
WKNR	Dearborn, Mich.	1310
WKNT	Kent, Ohio	1320
WKNX	Saginaw, Mich.	1210
WKNY	Kingston, N.Y.	1490
WKOA	Hopkinsville, Ky.	1480
WKOK	Sumbury, Pa.	1070
WKOP	Binghamton, N.Y.	1360
WKOW	Wellston, Ohio	1330
WKPW	Madison, Ala.	1320
WKOX	Framingham, Mass.	1190
WKOY	Bluefield, W. Va.	1240
WKOZ	Kosciusko, Miss.	1350
WKPA	New Kensington, Pa.	1150
WKPM	Princeton, Minn.	1300
WKPO	Prentiss, Miss.	1510
WKPP	Kalamazoo, Mich.	1370
WKPT	Kingsport, Tenn.	1400
WKPV	Sullivan, Ind.	1550
WKRA	Holly Springs, Miss.	1110
WKRC	Cincinnati, Ohio	550
WKRG	Mobile, Ala.	710
WKRR	Murphy, N.C.	1320
WKRM	Camden, Tenn.	1340
WKRN	Jamestown, N.Y.	1220
WKRS	Waukegan, Ill.	1220
WKRT	Cortland, N.Y.	920
WKRW	Cartersville, Ga.	920
WKRX	Oil City, Pa.	1340
WKSB	Milford, Del.	1330
WKSC	Kershaw, S.C.	1300
WKSD	W. Jefferson, N.C.	1340
WKSE	Jamestown, N.Y.	1340
WKSP	Kingstree, S. C.	1090
WKSR	Pulaski, Tenn.	1420
WKST	New Castle, Pa.	1280

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
WKTC	Charlotte, N.C.	1310	WL0E	Leaksville, N.C.	1490	WWMJ	Cardele, Ga.	1490
WKTE	King, N.C.	1090	WL0F	Oriando, Fla.	950	WWMK	Millington, Me.	1240
WKTG	Thomasville, Ga.	730	WL0G	Logan, W. Va.	1230	WWMK	S. St. Paul, Minn.	1370
WKTH	Farmington, Maine	1380	WL0H	Princeton, W. Va.	1490	WWMLO	Beverly, Mass.	1570
WKTI	South Paris, Maine	1450	WL0I	LaPorte, Ind.	1540	WMLP	Milton, Pa.	1380
WKTK	Schoeny, Wis.	950	WL0K	Memphis, Tenn.	1340	WMLS	Sylacauga, Ala.	1290
WKTX	Atlantic Beach, Fla.	1600	WL0L	Minneapolis, Minn.	1330	WMLT	Dubin, Ga.	1330
WKTY	LaCrosse, Wis.	580	WL0M	Linton, N.C.	1070	WMMB	Melbourne, Fla.	1240
WKUL	Cullman, Ala.	1340	WL0P	Jesup, Ga.	1370	WMMH	Marshall, N.C.	1460
WKVA	LeWiston, Pa.	920	WL0R	Thomasville, Ga.	1370	WMMI	Lawrence, N.Y.	1300
WKVM	San Juan, P.R.	810	WL0S	Asheville, N.C.	1380	WMMN	Westport, Conn.	1260
WKVT	Branthorpe, Vt.	1490	WL0U	Louisville, Ky.	1350	WMMN	Fairmont, W. Va.	920
WKWC	Key West, Fla.	1600	WL0V	Washington, Ga.	1370	WMMW	Meriden, Conn.	1470
WKWK	Key West, Fla.	1400	WL0W	Aiken, S.C.	1300	WMMX	Gretna, Va.	730
WKWS	Rocky Mount, Va.	290	WL0X	Biloxi, Miss.	1450	WMMN	Memorie, Wis.	1360
WKXL	Concord, N.H.	1450	WL0Y	Waltham, Mass.	1370	WMMN	Meriden, Conn.	1470
WKXR	Xeter, N.H.	1540	WL0Z	Frankie, Ala.	1490	WMMN	Fairmont, W. Va.	920
WKXX	Knoxville, Tenn.	900	WL1A	Wilmington, N.C.	1220	WMMW	Meriden, Conn.	1470
WKXY	Sarasota, Fla.	930	WL1B	Lehigh, Pa.	1120	WMMX	Gretna, Va.	730
WKYB	Hemlockway, S. C.	1000	WL1C	Whitehall, Mich.	1490	WMMY	Meriden, Conn.	1470
WKYC	Cleveland, Ohio	1100	WL1D	Chicago, Ill.	890	WMMZ	Montezuma, Ga.	1050
WKYE	Bristol, Va.	1550	WL1E	Copper Hill, Tenn.	1400	WMOA	Marietta, Ohio	1490
WKYF	Greenville, Ky.	1600	WL1F	Loris, S.C.	1570	WMOB	Chattanooga, Tenn.	1450
WKYG	Burnsville, N. C.	1540	WL1G	Big Stone Gap, Va.	1220	WMOE	Ernest, Ga.	1400
WKYN	San Juan, P. R.	630	WL1H	Wallace, N.C.	1400	WMOH	Hamilton, Ohio	1450
WKYO	Caro, Mich.	1360	WL1I	Lansford, Pa.	1410	WMOK	Metropolis, Ill.	920
WKYR	Cumberland, Md.	1270	WL1J	Pikeville, Ky.	900	WMON	Montgomery, W. Va.	1340
WKYX	Auduch, Ky.	570	WL1M	Louisville, Miss.	1270	WMOO	Mobile, Ala.	1550
WKYV	Madisonville, Tenn.	1250	WL1T	Escanaba, Mich.	600	WMOU	Ocala, Fla.	900
WKZA	Kane, Pa.	980	WL1U	Wellsville, N.Y.	790	WMOR	Morehead, Ky.	1330
WKZI	Caxey, Ill.	900	WL1V	Chandala, Ala.	1370	WMNE	Memorie, Wis.	1360
WKZO	Kalamazoo, Mich.	590	WL1W	Gary, Ind.	1370	WMOV	Ravenswood, W. Va.	1560
WLAC	Nashville, Tenn.	1510	WL1X	Littleton, N. C.	1400	WMOX	Meridian, Miss.	1240
WLAD	Danbury, Conn.	800	WL1Y	Loves Park, Ill.	1520	WMOZ	Mobile, Ala.	960
WLAF	LaFollette, Tenn.	1450	WL2A	Baton Rouge, La.	1550	WMPA	Aberdeen, Miss.	1240
WLAL	DeKalb, Ga.	1240	WL2B	Bayamon, P. R.	1600	WMPD	Lapeer, Mich.	1230
WLAK	Lakeland, Fla.	1430	WL2C	LYncburg, P. R.	590	WMPH	Laconk, N.C.	920
WLAM	Lewiston, Maine	1470	WL2D	Cincinnati, Ohio	700	WMPM	Smithfield, N.C.	1270
WLAN	Lancaster, Pa.	1390	WL2E	(V.O.A.)		WMPN	Midport-Pomeroy, Ohio	1390
WLAP	Lexington, Ky.	630	WL2F	(V.O.A.)		WMPQ	Chicago Heights, Ill.	1470
WLAQ	Rome, Ga.	1410	WL2G	(V.O.A.)		WMPR	Memphis, Tenn.	680
WLAR	Athens, Tenn.	1450	WL2H	Albany, Ga.	1250	WMPST	St. Williamsport, Pa.	1450
WLAS	Lakesville, N.C.	910	WL2I	Lynchburg, Pa.	1050	WMQM	Memphis, Tenn.	1480
WLAT	Conway, S. C.	1330	WL2J	Lynn, Mass.	1360	WMR	Greenville, S.C.	1360
WLAU	Laurel, Miss.	1600	WL2K	Lyo New Orleans, La.	940	WMRC	Hill, Pa.	1490
WLAV	Grand Rapids, Mich.	1340	WL2L	LYV Ft. Wayne, Ind.	1450	WMRE	Monroe, Ga.	1490
WLAW	Lawrenceville, Ga.	1360	WL2M	MAunising, Mich.	1400	WMRF	Lewiston, Pa.	1490
WLAY	Muscle Shoals, Ala.	1450	WL2N	MAc Netter, Ga.	1360	WMRI	Marion, Ind.	860
WLBA	Gainesville, Ga.	1100	WL2O	MAadison, Wis.	1550	WMRN	Marion, Ohio	1490
WLBB	Carrollton, Ga.	1100	WL2P	MAadison, Fla.	1520	WMRO	Aurora, Ill.	1280
WLBC	Muncie, Ind.	1340	WL2Q	MAadison, Wis.	860	WMRS	Marshall, Mich.	1370
WLBE	Leesburg, Va.	790	WL2R	MAAJ State College, Pa.	1450	WMRA	Massena, N.Y.	1540
WLBG	Laurens, S.C.	860	WL2S	MAAK Nashville, Tenn.	1300	WMSC	Oakland, Md.	1050
WLBH	Mattoon, Ill.	1170	WL2T	MAAL Washington, D.C.	630	WMSJ	Sylva, N.C.	1480
WLBI	Denham Springs, La.	1220	WL2U	MAAM Marinette, Wis.	570	WMSK	Morganfield, Ky.	1550
WLBJ	Bowling Green, Ky.	1410	WL2V	MAAN Mansfield, Ohio	1400	WMSL	Decatur, Ala.	1400
WLBK	DeKalb, Ill.	1410	WL2W	MAAP Chicago, Ill.	620	WMSM	Marion, Tenn.	1280
WLBL	Auburndale, Wis.	1330	WL2X	MAAS Springfield, Mass.	1450	WMSMT	Mt. Sterling, Ky.	1150
WLBN	Lebanon, Ky.	1590	WL2Y	MAAT Lansing, Mich.	1010	WMSU	Cedar Rapids, Iowa	600
WLBR	Lebanon, Pa.	1280	WL2Z	MAAX Grand Rapids, Mich.	1480	WMTA	Central City, Ky.	1380
WLBS	Bangor, Maine	620	WL3A	MAAY Springfield, Ill.	970	WMTB	Vanceville, Ky.	730
WLBT	Moulton, Ala.	1530	WL3B	MAAZ Macon, Ga.	940	WMTD	Hinton, W. Va.	1340
WLBU	Scottsville, Ky.	1360	WL3C	MAAB Memphis, Pa.	1480	WMTF	Manistee, Mich.	1380
WLCK	Lawrenceville, Ga.	1360	WL3D	MAAC Andover, Mass.	1470	WMTG	Hartford, Ky.	1580
WLCL	Lancaster, N.C.	1300	WL3E	MAAD Peoria, Ill.	1470	WMTM	Moulton, Ga.	1300
WLGN	Laurensburg, S.C.	1300	WL3F	WMBH Joplin, Mo.	1450	WMTN	Norristown, Tenn.	1300
WLCO	Eustis, Fla.	1240	WL3G	WMBI Chicago, Ill.	1110	WMTS	Murfreesboro, Tenn.	810
WLCS	Baton Rouge, La.	910	WL3H	WMBL Morehead City, N.C.	740	WMTU	Marion, N.J.	1250
WLCC	LaCrosse, Wis.	1490	WL3I	WMBM Miami Beach, Fla.	1490	WMTV	Murresboro, Tenn.	810
WLCT	St. Petersburg, Fla.	1380	WL3J	WMBN Petoskey, Mich.	1340	WMU	Muskegon, Mich.	1090
WLDB	Atlantic City, N.J.	1490	WL3K	WMBP Albany, N.Y.	1340	WMUU	Greenville, S.C.	1260
WLDS	Jacksonville, Ill.	1180	WL3L	WMBR Jacksonvill, Fla.	1400	WMVA	Highville, Va.	1450
WLDT	Lancaster, Pa.	1420	WL3M	WMBS Uniontown, Pa.	590	WMVB	Willsville, N.J.	1450
WLEA	Hornell, N.Y.	1450	WL3N	WMBT Shenandoah, Pa.	1530	WMVG	Milldeedville, Ga.	1450
WLEC	Sandusky, Ohio	1450	WL3O	WMC Memphis, Tenn.	790	WMVO	Mt. Vernon, Ohio	1300
WLEE	Richmond, Va.	1480	WL3P	WMCA New York, N.Y.	570	WMVR	Sidney, Ohio	1080
WLEF	Greenwood, Miss.	1540	WL3Q	WMCH Church Hill, Tenn.	1260	WMW	Wilmington, O.	1090
WLEM	Emporium, Pa.	1240	WL3R	WMCK McKeessport, Pa.	1360	WMYB	Myrtle Beach, S.C.	1450
WLEP	Lawrenceville, Va.	1420	WL3S	WMCL McLeansboro, Ill.	1060	WMYV	Ft. Myers, Fla.	1410
WLET	Locust, Ga.	580	WL3T	WMCP Columbia, Tenn.	1280	WMZ	Wagon, N.C.	1420
WLEW	Bad Axe, Mich.	1340	WL3U	WMCR Oneida, N.Y.	1600	WMAB	Bridgeport, Conn.	1450
WLEY	Cayey, P.R.	1080	WL3V	WMCC Harvard, Ill.	1600	WMAD	Norman, Okla.	640
WLFA	Lafayette, Ga.	1590	WL3W	WMDC Hazlehurst, Miss.	1220	WMAE	Warren, Pa.	1310
WLFB	Little Falls, N.Y.	1230	WL3X	WMDD Fajardo, P.R.	1480	WMAG	Gretna, Miss.	1400
WLBI	New York, N.Y.	1190	WL3Y	WMDE Midland, Mich.	1480	WMAN	Nashville, Tenn.	1360
WLBJ	Shelbyville, Tenn.	1590	WL3Z	WMDF Andover, Pa.	920	WMAP	Nanticoke, Pa.	730
WLJK	Newport, Tenn.	1400	WL4A	WMEL Chase City, Va.	960	WMAR	Beaumont, Miss.	1290
WLJL	LeNor City, Tenn.	1050	WL4B	WMEL Pensacola, Fla.	610	WMAR	Norristown, Pa.	1110
WLIP	Kenosha, Wis.	1050	WL4C	WMEN Tallahassee, Fla.	1330	WMAT	Natchez, Miss.	1450
WLIQ	Mobile, Ala.	1860	WL4D	WMEV Marion, Va.	1010	WMAU	New Albany, Miss.	1470
WLIS	Old Saybrook, Conn.	1420	WL4E	WMEX Boston, Mass.	1510	WMAV	Annapolis, Md.	1370
WLIV	Livingston, Tenn.	920	WL4F	WMFA Morehead, Fla.	1360	WMAX	Yankton, S. Dak.	570
WLIX	Islip, N. Y.	540	WL4G	WMFG Hibbing, Minn.	1240	WMBC	New York, N.Y.	860
WLJG	Lawrenceville, Fla.	1360	WL4H	WMFJ Daytona Beach, Fla.	1450	WMBS	Shenandoah, N.Y.	1290
WLKE	Waupun, Wis.	1420	WL4I	WMFR High Point, N.C.	1230	WMBS	New Bedford, Mass.	1340
WLKM	Three Rivers, Mich.	1510	WL4J	WMGA Moultrie, Ga.	1400	WMBS	Newburyport, Mass.	1470
WLKN	Lincoln, Me.	1450	WL4K	WMGR Bainbridge, Ga.	930	WMBS	Murray, Ky.	1340
WLKR	Norwalk, O.	1510	WL4L	WMGS Bowling Green, Ohio	730	WMBS	Wellsville, Pa.	1490
WLKS	W. Liberty, Ky.	1450	WL4M	WMH Washington, Pa.	1400	WMBS	Newberry, Mich.	1450
WLKW	Providence, R.I.	970	WL4N	WMG Montgome, Pa.	800	WMBS	Saranac Lake, N.Y.	1240
WLLA	Raleigh, N.C.	590	WL4O	WMIA Arechio, P. R.	1070	WMBS	Siler City, N.C.	570
WLLB	Lowell, Mass.	1470	WL4P	WMIC Sandusky, Mich.	1560	WMBS	Beaumont, Miss.	1290
WLLC	Lynchburg, Va.	930	WL4Q	WMID Atlantic City, N.J.	1340	WMBS	Charleston, S.C.	910
WLLY	Wilson, N.C.	1350	WL4R	WMIE Miami, Fla.	1140	WMBS	Ashland, Ohio	1340
WLMD	Laurel, Md.	900	WL4S	WMIF Middefboro, Ky.	560	WMBS	Greenville, N. C.	1590
WLNC	Laurinburg, N.C.	1300	WL4T	WMIL Milwaukee, Wis.	1290	WMBS	Daytona Beach, Fla.	1150
WLNJ	Jackson, Ohio	1420	WL4U	WMIS St. Paul, Minn.	1400	WMBS	Syracuse, N.Y.	1260
WLNA	Peekskill, N.Y.	1280	WL4V	WMIT Iron Mountain, Mich.	450	WMBS	New York Bend, Ind.	1490
WLNB	San Bernia, N.Y.	1350	WL4W					

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
WNES	Central City, Ky.	1050	WORX	Madison, Ind.	1270	WQIK	Jacksonville, Fla.	1090	WRRR	Spring Valley, N. Y.	1300
WNEX	New York, N.Y.	1130	WOSC	Fulton, N.Y.	1300	WQIZ	St. George, S. C.	1300	WRRR	Rockford, Ill.	1330
WNEX	Macon, Ga.	1400	WOSH	Oshkosh, Wis.	1490	WQMR	Silver Spring, Md.	1050	WRRZ	Clinton, N.C.	880
WNGA	Nashville, Ga.	1600	WOSU	Columbus, Ohio	820	WQOK	Greenville, S.C.	1400	WRSR	Saratoga Sprgs., N.Y.	1280
WNGO	Mayfield, Ky.	1320	WOTR	Corry, Pa.	1370	WQSN	Charleston, S.C.	1450	WRSR	State College, Pa.	1390
WNHC	New Haven, Conn.	1340	WOTT	Waterbury, N.Y.	1410	WQTE	Monroe, Mich.	560	WRSJ	Bayamon, P. R.	1520
WNHT	White River Jct., Vt.	910	WOTW	Nashua, N.H.	900	WQTW	Atrobo, Va.	1230	WRSW	Warsaw, Ind.	1480
WNIA	Cheektowaga, N.Y.	1230	WOWA	Waukegan, Ohio	1840	WQUA	Mt. Airy, N.C.	1300	WRTA	Altoona, Pa.	1240
WNIA	Arabic, P. R.	1230	WOWE	Waco, W.Va.	1340	WQVA	Quantico, Va.	1530	WRTW	Wood River, Ill.	590
WNIL	Niles, Mich.	1290	WOWM	Omaha, Nebr.	590	WQXI	Atlanta, Ga.	790	WRTL	Rantoul, Ill.	2500
WNIO	Niles, Ohio	1540	WOWL	Flourno, Ala.	1240	WQXL	Columbia, S.C.	1320	WRUF	Gainesville, Fla.	850
WNJH	Hampton, N.J.	1580	WOWO	Ft. Wayne, Ind.	1190	WQXQ	Ormond Bch., Fla.	1580	WRUM	Rumford, Maine	730
WNJR	Newark, N.J.	1430	WOWW	Naugatuck, Conn.	1380	WQXR	New York, N.Y.	1340	WRUS	Russellville, Ky.	610
WNKY	Neon, Ky.	1480	WOWX	Oxford, N.C.	1340	WQXT	Palm Beach, Fla.	1340	WRVA	Richmond, Va.	1140
WNLC	New London, Conn.	1510	WOWZ	Ozark, Ala.	900	WRAB	Arab, Ala.	550	WRVK	Mt. Vernon, Ky.	1480
WNLK	Newark, Conn.	1510	WPAC	Pace, P.R.	550	WRAC	Racine, Wis.	1460	WRWD	Augusta, Ga.	1480
WNMP	Newark, Conn.	1590	WPAD	Paducah, Ky.	1450	WRAD	Radford, Va.	1460	WRWX	Rowland, Ga.	1380
WNNC	Newton, N.C.	1230	WPAL	Ann Arbor, Mich.	1050	WRAG	Carrollton, Ala.	590	WRXO	Cleveland, N.C.	1430
WNNJ	Newton, N.J.	1360	WPAN	Charleston, S.C.	730	WRAI	Rio Piedras, P.R.	1190	WRXM	New Britain, Conn.	950
WNOR	New Orleans, La.	990	WPAP	Pottsville, Pa.	1450	WRAM	Anna, Ill.	1440	WRYS	York, N.Y.	1400
WNNT	Warsaw, Va.	860	WPAQ	Mount Airy, N.C.	1450	WRAN	Monmouth, Ill.	1300	WSAF	Fort Knox, Ky.	1470
WNNE	New Orleans, La.	1090	WPAK	Port Jervis, N.Y.	1450	WRAN	Dover, N.J.	1510	WSAF	Sarasota, Fla.	1220
WNOC	Naples, Fla.	1270	WPAT	Paterson, N.J.	930	WRAN	Norfolk, Va.	850	WSAJ	Cincinnati, Ohio	1360
WNOD	Chattanooga, Tenn.	1260	WPAW	E. Syracuse, N.Y.	1540	WRAP	Reading, Pa.	1340	WSAL	Grove City, Pa.	1340
WNOP	No. Platte, Neb.	1410	WPAY	Portsmouth, Ohio	1400	WRAY	Princeton, Ind.	1250	WSAM	Saginaw, Mich.	1450
WNOR	Norfolk, Va.	1230	WPAZ	Pottstown, Pa.	1370	WRBC	Jackson, Miss.	980	WSAO	Senatobia, Miss.	1570
WNOS	High Point, N.C.	1590	WPBC	Richfield, Minn.	980	WRBD	Rampant Beach, Fla.	1470	WSAR	Fall River, Mass.	1480
WNOW	York, Pa.	1250	WPCC	Clinton, N.Y.	1450	WRBY	St. Johns, Mich.	1580	WSAT	nr. Salisbury, N.C.	1280
WNOX	Newark, Tenn.	990	WPCE	Citron, Ky.	1490	WRBL	Columbus, Ga.	1420	WSAU	Wausau, Wis.	550
WNPS	New Orleans, La.	1450	WPCH	Cherry Hill, N.J.	1590	WRBN	Warner Robins, Ga.	1600	WSAV	Savannah, Ga.	630
WNPT	Tuscaloosa, Ala.	1280	WPDI	Paris, Ky.	1440	WRCD	Washington, D.C.	980	WSAY	Rochester, N.Y.	1370
WNPV	Lansdale, Pa.	1440	WPDE	Paris, Ky.	1440	WRCE	Dalton, Ga.	1430	WSAZ	Huntington, W.Va.	750
WNPW	Grundy, Va.	940	WPDF	Corydon, Ind.	1550	WRCH	New Britain, Conn.	910	WSBA	Savannah, Ga.	1400
WNRI	Woodscock, R.I.	1380	WPDM	Potsdam, N.Y.	1470	WRCK	Tusumbia, Ala.	1440	WSBB	New Smyrna Beach, Fla.	1230
WNRR	Newark, Del.	1260	WPDQ	Jacksonville, Fla.	600	WRCK	Richmond, Wis.	1350	WSBC	Chicago, Ill.	1240
WNRV	Narrows, Va.	1260	WPDR	Portage, Wis.	1350	WRCC	Richmond, Wis.	1350	WSBR	Boca Raton, Fla.	1400
WNRL	Laurin, Mich.	1250	WPDS	Port Jervis, N.Y.	1450	WRCP	Philadelphia, Pa.	1540	WSBS	Gt. Barrington, Mass.	860
WNRT	Newton, Mass.	1260	WPEH	Louisville, Ga.	1420	WRCP	Philadelphia, Pa.	1540	WSBM	Portsmouth, Ind.	960
WNST	Tazewell, Tenn.	1250	WPEL	Montrose, Pa.	1250	WRCS	Ashokis, N.C.	970	WSCM	Panama City Beach, Fla.	1290
WNUE	Ft. Walton Bch., Fla.	1400	WPEP	Philadelphia, Pa.	950	WRDB	Reedsburg, Wis.	1400	WSDB	Chattahoochee, Fla.	1580
WNUS	Chicago, Ill.	1390	WPEO	Peoria, Ill.	1020	WRDS	Augusta, Maine	1400	WSCR	Sarant, Pa.	1320
WNUZ	Tallahadega, Ala.	1230	WPEP	Taunton, Mass.	1570	WRDS	S. Charleston, W.Va.	1410	WSDR	Sterling, Ill.	1240
WNVA	Norton, Va.	1350	WPET	Greensboro, N.C.	950	WRDW	Augusta, Ga.	1200	WSEB	Sebring, Fla.	1400
WNVL	Nicholsville, Ky.	1250	WPFI	Middleton, Ohio	910	WRDY	Holy Hill, Mass.	930	WSEN	Seneca, Miss.	1440
WNVY	Pensacola, Fla.	1230	WPFJ	Ft. Falls, Wis.	1450	WREC	Memphis, Tenn.	600	WSEM	Donatonsville, Ga.	1500
WNWI	Valparaiso, Ind.	1080	WPGA	Perry, Ga.	980	WREL	Lexington, Va.	1450	WSEN	Baldwinsville, N.Y.	1050
WNXT	Portsmouth, Ohio	1280	WPGC	Bradbury Hghts., Md.	1580	WREN	Topeka, Kans.	1250	WSEK	Elkton, Md.	1550
WNYY	New York, N.Y.	930	WPGF	Burgaw, N. C.	1470	WREO	Ashtabula, Ohio	970	WSET	Glen Falls, N.Y.	1410
WNYN	Canton, O.	900	WPGM	Danville, Pa.	1570	WREV	Reidsville, N.C.	1200	WSEV	Sevierville, Tenn.	930
WNYR	Rochester, N.Y.	680	WPHB	Portland, Ind.	1440	WREX	Grand Junction, Colo.	920	WSEW	Selingsgrove, Pa.	1400
WQAH	Miami, Fla.	1220	WPHG	Phillipsburg, Pa.	1060	WREX	New Albany, Ind.	1290	WSEB	Quintman, Ga.	1240
WQAI	San Antonio, Tex.	1080	WPHI	Phillipsburg, Tenn.	1060	WRFA	Athens, Ga.	960	WSEK	Somersa, Ky.	1360
WQAP	Owosso, Mich.	860	WPHL	Liberty, Ky.	1560	WRFD	Worthington, Ohio	880	WSET	St. Joseph, Mo.	1230
WQAY	Oak Hill, W.Va.	860	WPHN	Sharon, Pa.	790	WRFE	Alexander City, Ala.	1050	WSEW	Sevierville, Tenn.	930
WQBS	Jacksonville, Fla.	1360	WPID	Piedmont, Ala.	1280	WRGA	Rome, Ga.	1470	WSEW	Selingsgrove, Pa.	1400
WQBT	Rhineland, Wis.	1240	WPIK	Alexandria, Va.	730	WRGS	Rogersville, Tenn.	1370	WSEW	Selingsgrove, Pa.	1400
WQCV	Davenport, Iowa	1420	WPIN	St. Petersburg, Fla.	680	WRHC	Jacksonville, Fla.	1090	WSEW	Selingsgrove, Pa.	1400
WQCB	Warren, Mass.	1460	WPIS	Coltlierville, Tenn.	1590	WRHC	Jacksonville, Fla.	1090	WSEW	Selingsgrove, Pa.	1400
WQCC	North Vernon, Ind.	1460	WPIT	Pittsburg, Pa.	730	WRHL	Rochelle, Ill.	1060	WSEW	Selingsgrove, Pa.	1400
WQCK	Okeechobee, Fla.	1570	WPKE	Pikeville, Ky.	1240	WRIB	Providence, R.I.	1220	WSEW	Selingsgrove, Pa.	1400
WQCN	Miami, Fla.	1450	WPKO	Waverly, Ohio	1380	WRIC	Richlands, Va.	540	WSEW	Selingsgrove, Pa.	1400
WQCO	Oconto, Wis.	1260	WPKY	Princeton, Ky.	1580	WRIG	Waukau, Wis.	1480	WSEW	Selingsgrove, Pa.	1400
WQDI	Bronckneal, Va.	1230	WPLA	Plant City, Fla.	910	WRIM	Fahoke, Fla.	1560	WSEW	Selingsgrove, Pa.	1400
WQDY	Bassett, Va.	900	WPLB	Greenville, Mich.	1380	WRIN	Rensselaer, Ind.	980	WSEW	Selingsgrove, Pa.	1400
WQGA	Sylva, N.C.	1540	WPLK	Rockmart, Ga.	1200	WRIS	Ripon, Va.	1410	WSEW	Selingsgrove, Pa.	1400
WQGO	New Smyrna Beach, Fla.	1550	WPLM	Lyons, Mass.	590	WRIS	Roanoke, Va.	1410	WSEW	Selingsgrove, Pa.	1400
WQHI	E. Liverpool, Ohio	1490	WPLN	Plymouth, Wis.	1420	WRIT	Milwaukee, Wis.	1340	WSEW	Selingsgrove, Pa.	1400
WQHO	Toledo, Ohio	1470	WPLY	Plymouth, Wis.	1420	WRIV	Riverhead, N.Y.	390	WSEW	Selingsgrove, Pa.	1400
WQHP	Bellefontaine, Ohio	1390	WPMB	Vandalia, Ill.	1500	WRIZ	Coral Gables, Fla.	1270	WSEW	Selingsgrove, Pa.	1400
WQHS	Shelby, N.C.	640	WPMX	Punxsutawney, Pa.	1540	WRIZ	Coral Gables, Fla.	1270	WSEW	Selingsgrove, Pa.	1400
WQIA	Ames, Ia.	1290	WPMH	Portsmouth, Va.	1010	WRIZ	Coral Gables, Fla.	1270	WSEW	Selingsgrove, Pa.	1400
WQIB	Saline, Mich.	1290	WPMI	Piquette, Miss.	1080	WRIZ	Coral Gables, Fla.	1270	WSEW	Selingsgrove, Pa.	1400
WQIC	Columbia, S.C.	1320	WPMC	Plymouth, N.C.	1470	WRIS	San German, P. R.	1020	WSEW	Selingsgrove, Pa.	1400
WQID	Canton, O.	1060	WPNF	Brevard, N.C.	1240	WRJW	Picayune, Miss.	1360	WSEW	Selingsgrove, Pa.	1400
WQKA	Douglas, Ga.	1310	WPNH	Plymouth, N. H.	1300	WRKB	Kannapolis, N.C.	1460	WSEW	Selingsgrove, Pa.	1400
WQKB	Winter Garden, Fla.	1600	WPNX	Phoenix City, Ala.	1460	WRKD	Rockwood, Maine	1450	WSEW	Selingsgrove, Pa.	1400
WQKE	Charleston, S.C.	1340	WPOK	Pontiac, Ill.	1080	WRKH	Rockwood, Tenn.	910	WSEW	Selingsgrove, Pa.	1400
WQKJ	Jackson, Miss.	1550	WPOP	Portland, Maine	1410	WRKL	New City, N.Y.	1350	WSEW	Selingsgrove, Pa.	1400
WQKK	Meridian, Miss.	1450	WPPK	Port Jervis, N.Y.	1490	WRKM	Carthage, Tenn.	1350	WSEW	Selingsgrove, Pa.	1400
WQKS	Albany, N.Y.	1460	WPPW	New York, N.Y.	1330	WRKN	Brandon, Miss.	970	WSEW	Selingsgrove, Pa.	1400
WQKO	Columbus, Ga.	1340	WPPA	Pottsville, Pa.	1380	WRKO	Boston, Mass.	680	WSEW	Selingsgrove, Pa.	1400
WQKW	Brookton, Mass.	1410	WPPR	Port Jervis, N.Y.	1490	WRKT	Cocoa Beach, Fla.	1300	WSEW	Selingsgrove, Pa.	1400
WQKY	Milwaukee, Wis.	920	WPPA	Mayaguez, P. R.	990	WRKV	Rockville, Conn.	800	WSEW	Selingsgrove, Pa.	1400
WQKZ	Alton, Ill.	1570	WPPR	Lincoln, Ill.	1370	WRLD	Lanet, Ala.	1490	WSEW	Selingsgrove, Pa.	1400
WQLA	Washington, D.C.	1450	WPRE	Prairie Du Chien, Wis.	980	WRMA	Montgomery, Ala.	950	WSEW	Selingsgrove, Pa.	1400
WQLD	Marion, Va.	1330	WPRN	Butter, Ala.	680	WRMF	Titusville, Fla.	1050	WSEW	Selingsgrove, Pa.	1400
WQLF	Syracuse, N.Y.	1490	WPRP	Port Jervis, N.Y.	1490	WRMN	Elgin, Ill.	1410	WSEW	Selingsgrove, Pa.	1400
WQLS	Flourno, S. C.	1230	WPRP	Ponca, P.R.	910	WRMS	Beardstony, Ill.	790	WSEW	Selingsgrove, Pa.	1400
WQMI	Owensboro, Ky.	1490	WPRS	Paris, Ill.	910	WRMT	Rocky Mount, N.C.	1440	WSEW	Selingsgrove, Pa.	1400
WQMN	Decatur, Ga.	1310	WPRT	Prestonsburg, Ky.	960	WRNB	New Bern, N.C.	1440	WSEW	Selingsgrove, Pa.	1400
WQMP	Bellaire, Ohio	1290	WPTY	Wauchula, Fla.	1600	WRNC	Raeford, N.C.	1220	WSEW	Selingsgrove, Pa.	1400
WQMT	Manitowish, Wis.	1240	WPRW	Manassas, Va.	1460	WRNE	Wis. Rapids, Wis.	1240	WSEW	Selingsgrove, Pa.	1400
WQNA	Winona, Miss.	1570	WPRY	erry, Fla.	1490	WRNG	N. Atlanta, Ga.	680	WSEW	Selingsgrove, Pa.	1400
WQND	Pleasantville, N.J.	1400	WPSY	Benning, Pa.	1510	WRNL	Richmond, Va.	910	WSEW	Selingsgrove, Pa.	1400
WONE	Dayton, Ohio	980	WPTF	Raleigh, N.C.	680	WRNY	Rome, N.Y.	1350	WSEW	Selingsgrove, Pa.	1400
WONN	Lakeland, Fla.	1230	WPTL	Canton, N.C.	920	WROA	Gulport, Miss.	1390	WSEW	Selingsgrove, Pa.	1400
WONS	Tallahassee, Fla.	1410	WPTN	Cookeville, Tenn.	1500	WROB	West Point, Miss.	1430	WSEW	Selingsgrove, Pa.	1400
WOPF	Defiance, Ohio	1280	WPTO	Albany, N.Y.	1540	WROC	Rochester, N.Y.	1280	WSEW	Selingsgrove, Pa.	1400
WOOD	Grand Rapids, Mich.	1300	WPTS	Pittsburg, Pa.	1540	WROD	Denton, Beach, Fla.	1340	WSEW	Selingsgrove, Pa.	1400
WOOF	Dothan, Ala.	560	WPTT	Piquette, Ohio	920	WROK	Rockford, Ill.	1490	WSEW	Selingsgrove, Pa.	1400
WOOQ	Washington, D.C.	1340	WPTU	Fountain City, Tenn.	1440	WROL	Fountain City, Tenn.	1440	WSEW	Selingsgrove, Pa.	1400
WOOO	Deland, Fla.	1310	WPUV	Pulaski, Va.	1580	WROM	Rome, Ga.	710	WSEW	Selingsgrove, Pa.	1400
WODW	Greenville, N.C.	1340	WPVA	Columbia Hghts., Va.	1290	WRON	Roneevette, W. Va.	1400	WSEW	Selingsgrove, Pa.	1400
WOPA	Oak Park, Ill.	1490	WPVL	Painesville, Ohio	1460	WROS	Scottsboro, Ala.	1530	WSEW	Selingsgrove, Pa.	1400
WOPF	Bristol, Tenn.	1490	WPXE	Starkes, Fla.	1490	WROW	Roanoke, Va.	910	WSEW	Selingsgrove, Pa.	1400
WOR	New York, N.Y.	710	WPXI	Roanoke, Va.	1550	WROW	Albany, N.Y.	500	WSEW	Selingsgrove, Pa.	1400
WORA	Mayaguez, P.R.	760	WPYB	Benning, N. C.	1490	WROX	Clarksdale, Miss.	1450	WSEW	Selingsgrove, Pa.	1400
WORC	Worcester, Mass.	1310	WQAM	Miami, Fla.	560	WROY	Carmi, Ill.	1460	WSEW	Selingsgrove, Pa.	1400
WORD	Spartanburg, S.C.	910	WQBS	Vicksburg, Miss.	1420	WROZ	Evansville, Ind.	1400	WSEW	Selingsgrove, Pa.	1400
WORG	Orangeburg, S.C.	1580	WQDY	Calais, Maine	1230	WRPL	Charlotte, N.C.	1540	WSEW	Selingsgrove, Pa.	1400
WQK	York, Pa.	1850	WQIC	Meridian, Miss.	1390	WRPM	Poplarville, Miss.	1530	WSEW	Selingsgrove, Pa.	1400
WORM	Savannah, Tenn.	1010				WRR	Dallas, Tex.	1310	WSEW	Selingsgrove, Pa.	1400

WHITE'S RADIO LOG

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
WSNW	Seneca, S.C.	1150	WUFF	Eastman, Ga.	710	WVNR	Beeckley, W.Va.	620
WSNY	Schenectady, N.Y.	1240	WUFO	Amherst, N.Y.	1080	WVNS	Waterboro, Ga.	1240
WSOC	Charlotte, N.C.	930	WUFL	Eufaula, Ala.	1240	WVNY	Statesboro, N.Y.	780
WSOK	Savannah, Ga.	1230	WUMU	Gainesville, Fla.	1300	WVOD	Lynchburg, Va.	1300
WSOF	Salem, Ohio	1300	WUNA	Aquadilla, P.R.	1340	WVOK	Charlotte, N.C.	1480
WSON	Henderson, Ky.	860	WUND	Urichsville, Ohio	1540	WVUF	Buffalo, N.Y.	1120
WSOO	Sit. Ste. Marie, Mich.	1230	WUNE	Baton Rouge, La.	1550	WVOM	New Orleans, La.	600
WSOQ	No. Syracuse, N.Y.	1220	WUNI	Mobile, Ala.	1410	WVON	Woonsocket, R.I.	1240
WSOR	Windsor, Conn.	1480	WUNN	Mason, Mich.	1110	WVOW	Conneaut, Ohio	1360
WSOY	Decatur, Ill.	1340	WUNO	Rio Piedras, P.R.	1320	WVPA	Williamsport, Pa.	1340
WSPB	Spartanburg, S.C.	950	WUPK	Utica, N.Y.	1480	WVPP	Falata, Fla.	1260
WSPD	Toledo, Ohio	1370	WUPR	Updora, P.R.	1330	WVRR	Wilmington, Pa.	1450
WSPF	Hickory, N.C.	1000	WUJR	Lockport, N.Y.	1430	WVRL	New York, N.Y.	1600
WSPR	Springfield, Mass.	1270	WUSM	Havelock, N.C.	1330	WVSC	Glens Falls, N.Y.	1450
WSPY	Stevens Pt., Wis.	1010	WUST	Bethesda, Md.	1120	WVSD	Monticello, Fla.	1090
WSRA	Milton, Fla.	1490	WUVU	Gainsville, Fla.	1390	WWSF	Loretto, Pa.	1400
WSRC	Durham, N.C.	1410	WVAB	Virginia Bch., Va.	1550	WWSR	St. Albans, Vt.	1420
WSRF	Ft. Lauderdale, Fla.	1450	WVAK	Paoli, Ind.	1560	WWSY	Wheaton, Ill.	960
WSRO	Marlborough, Mass.	1470	WVAM	Sauk Rapids, Minn.	1490	WWSZ	Pittsburgh, Pa.	970
WSRW	Hillsboro, Ohio	1590	WVAP	Altoona, Pa.	1440	WWTX	Minneapolis, Minn.	1280
WSSB	Durham, N.C.	1490	WVAR	Richwood, W. Va.	600	WVUN	Jackson, Miss.	1590
WSSC	Sumter, S.C.	1340	WVCB	Shallotte, N.C.	1410	WVVA	Wheeling, W. Va.	1170
WSSD	Starkville, Miss.	1230	WVCF	Windermere, Fla.	1480	WVWB	Jasper, Ala.	1360
WSSP	Starkville, Va.	1240	WVCG	Coral Gables, Fla.	1080	WVWF	Fayette, Ala.	990
WSSR	Stamford, Conn.	1450	WVCH	Chester, Pa.	740	WVWR	Russellville, Ala.	920
WSTH	Taylorsville, N.C.	860	WVCI	Hampton, Va.	490	WVXL	Manchester, Ky.	1450
WSTK	Woodstock, Va.	1230	WVCM	Met. Wynn, Va.	1450	WVYL	Waynesville, N.C.	1250
WSTL	Eminence, Ky.	1600	WVCE	E. Lansing, Mich.	730	WVYO	Pineville, W. Va.	970
WSTP	Salisbury, N.C.	1490	WVCM	Vicksburg, Miss.	1490	WVZA	Demopolis, Ala.	1400
WSTR	Sturgis, Mich.	1230	WVCP	Mt. Kisco, N.Y.	1310	WVZC	Peoria, Ill.	1350
WSTU	Stuart, Fla.	1450	WVCP	Caguas, P.R.	1110	WVZO	Wausau, Wis.	1230
WSTV	Steubenville, Ohio	1340	WVCS	Owensboro, Ky.	1420	WVZD	Richmond, Va.	950
WSUB	Groton, Conn.	980	WVCT	Columbus, Ohio	1580	WVZE	Froy, N.Y.	1600
WSUG	Oxford, Miss.	1420	WVLD	Valdosta, Ga.	1450	WVZL	Big Delta, Alaska	980
WSUI	Iowa City, Iowa	910	WVLE	Lexington, Ky.	590	WVZM	Pitman-Cabin John, Md.	950
WSUN	St. Petersburg, Fla.	620	WVLN	Olney, Ill.	740	WVZV	Indianapolis, Ind.	950
WSUX	Seaford, Del.	1280	WVMT	Mt. Carmel, Ill.	1360	WVZW	Baton Rouge, La.	1460
WSUZ	Palatka, Fla.	800	WVNG	Cochran, Ga.	1440	WVZX	Bay City, Mich.	1250
WSVA	Hamorton, Va.	550	WVNI	Bloxi, Miss.	570	WVZA	Tusculum, Ala.	1590
WSVL	Shelbyville, Ind.	1520	WVNT	Burlington, Vt.	620	WVZB	Merrill, Wis.	730
WSVN	Valdese, N.C.	1490	WVNU	Newark, N.J.	1520	WVZC	Guayama, P.R.	1590
WSVM	Valdese, N.C.	1490	WVOB	Bet Air, Md.	1520	WVZD	Lexington, Miss.	1000
WSVS	Crewe, Va.	800	WVOC	Battle Creek, Mich.	1500	WVZE	Pawtucket, R.I.	550
WSVN	Belle Glade, Fla.	900	WVOD	Hazelhurst, Ga.	920	WVZF	Media, Pa.	690
WSVW	Pennington Gap, Va.	1570	WVOH	Birmingham, Ala.	690	WVZG	Charles Town, W. Va.	1550
WSVX	Warrenton, Wis.	1590	WVOI	Berwyn, Tenn.	1470	WVZH	Waverly, Miss.	1310
WSYB	Rutland, Vt.	1380	WVOM	Iuka, Miss.	1270	WVZI	Ft. Myers, Fla.	1350
WSYD	Mt. Airy, N.C.	1300	WVON	Cicero, Ill.	970	WVZJ	Detroit, Mich.	1270
WSYL	Sylvania, Ga.	1490	WVOP	Vidalia, Ga.	1240	WVZK	Scotland Neck, N.C.	1280
WSYR	Syracuse, N.Y.	570	WVOT	Wilson, N.C.	1290	WVZL	Bessemer, Ala.	1450
WTAB	Tabor City, N.C.	1370	WVOW	Logan, W. Va.	1290	WVZM	Masena, N.Y.	1050
WTAC	Flint, Mich.	600	WVOW	New Rochelle, N.Y.	1460	WVZN	York, S.C.	850
WTAD	Quincy, Ill.	930	WVOZ	Carrollina, P.R.	1400	WVZO	Wedgefield, Ill.	1150
WTAE	Pittsburgh, Pa.	1250	WVPO	Stroudsburg, Pa.	840	WVZP	Corbin, Ky.	1380
WTAG	Worcester, Mass.	580	WVRA	Spencer, W. Va.	1400	WVZQ	York, Tenn.	1550
WTAI	Eau Gallie, Fla.	1560	WVSC	Somerser, Pa.	990	WVZR	New Orleans, La.	940
WTAK	Garden City, Mich.	1090	WVSM	Rainsville, Ala.	1500	WVZS	Jackson, Wis.	540
WTAL	Tallahassee, Fla.	1450	WVSN	Cratford, W. Va.	1340	WVZT	Manning, S.C.	1410
WTAN	Clearwater, Fla.	1340	WVWB	Lakeland, Fla.	1330	WVZA	Faleigh, N.C.	1550
WTAP	Parkersburg, W. Va.	1250	WVWC	Cocoa, Fla.	1260	WVZB	Baton Rouge, La.	1380
WTAQ	LaGrange, Ill.	1300	WVWD	Bamberg-Denmark, S.C.	790	WVZC	Florence, S.C.	540
WTAR	Norfolk, Va.	790	WVWE	Windber, Pa.	1350	WVZD	Brunswick, Ga.	790
WTAW	Bryan, Tex.	1150	WVWF	Vineland, N.J.	1360	WVZE	Leighton, Pa.	1150
WTAX	Springfield, Ill.	1240	WVWG	Gary, Ind.	1270	WVZF	Smyrna, Ga.	1550
WTAY	Robinson, Ill.	1570	WVWH	Bremen, Ga.	1440	WVZG	Spitank, Mich.	1520
WTBC	Tusealosa, Ala.	1230	WVWI	Clarton, Pa.	1300	WVZH	Wyming, Mich.	1530
WTBD	Froy, Ala.	970	WVWJ	Brazil, Ind.	1380	WVZI	Tampa, Fla.	1550
WTBE	Cumberland, Md.	1450	WVWK	Waterbury, Conn.	1240	WVZJ	Danville, Va.	970
WTCA	Plymouth, Ind.	1050	WVWL	Murfreesboro, N.C.	1260	WVZK	Annapolis, Md.	810
WTCB	Flomaton, Ala.	990	WVWM	Washington, D.C.	1080	WVZL	Louisburg, N.C.	1480
WTCH	Shawano, Wis.	960	WVWN	WDRR	1650	WVZM	Inverness, Fla.	1560
WTCL	Tell City, Ind.	1230	WVWO	Everett, Pa.	1560	WVZN	Clinton, Tenn.	1380
WTCT	Traverse City, Mich.	1400	WVWX	Erie, Pa.	1450	WVZO	Ypsilanti, Mich.	1480
WTCP	Campbellsville, Ky.	1450	WVWY	Sanford, N.C.	1050	WVZP	Buffalo, N.Y.	1400
WTCS	Fairmont, W. Va.	1490	WVWG	Tifton, Ga.	1430	WVZQ	Franklin, Va.	1250
WTCT	Whitesburg, Ky.	920	WVWH	Hornell, N.Y.	1320	WVZR	Madison, Ga.	1250
WTEL	Philadelphia, Pa.	860	WVWI	Huntington, W. Va.	1470	WVZS	Rocky Mount, Va.	1570
WTEA	Thomaston, Ga.	1590	WVWJ	Ft. Lauderdale, Fla.	1500	WVZT	Wytheville, Va.	1280
WTEB	Myrtle Beach, S.C.	1520	WVWK	Baltimore, Md.	1400	WVZU	Garberville, Ky.	950
WTEC	Augusta, Ga.	1550	WVWL	Black River Falls, Wis.	1260	WVZV	Atlanta, Ga.	1480
WTEH	Mithola, N.Y.	1520	WVWM	Canon, N.C.	970	WVZW	Prichard, Ala.	1270
WTHI	Terre Haute, Ind.	1480	WVWN	Lorain, Ohio	1380	WVZZ	Zenon, Ill.	1500
WTHM	Lapeer, Mich.	1530	WVWO	Detroit, Mich.	950	WVZA	DeFuniak Springs, Fla.	1460
WTHN	Thomaston, Ga.	1500	WVWP	Brooksville, Fla.	1450	WVZB	Cincinnati, Ohio	1050
			WVWQ	Superior, Wis.	1490	WVZC	Zy-Aubermarie, N.C.	1580
			WVWR	Oshtemo, Ia.	1370	WVZD	Waynesville, N.C.	1250
			WVWS	Waukegan, Ill.	1480	WVZE	Princeton, Ill.	1490
			WVWT	Fair Bluff, N.C.	1480	WVZF	Jacksonville, Fla.	1320
			WVWX	Winchester, Ky.	1380	WVZG	Zephyr Hills, Fla.	1400
			WVWY	New Orleans, La.	870	WVZH	Leesburg, Fla.	1410
			WVWZ	Portage, Wis.	1470	WVZI	Carnegie, Pa.	1540
			WVXA	Asheville, N.C.	570	WVZJ	Cowan, Tenn.	1440
			WVXB	Rochester, N.H.	930			

U. S. FM Stations by Call Letters

Call	Location	Call	Location	Call	Location	Call	Location
KAAY-FM	Little Rock, Ark.	KADS	Los Angeles, Cal.	KAJS	Newport Beach, Calif.	KALX	Berkeley, Cal.
KABC-FM	Los Angeles, Calif.	KAFE-FM	Santa Fe, N.M.	KAKC	Tulsa, Okla.	KAMB	Merced, Cal.
KACB-FM	San Francisco, Cal.	KAFI-FM	Flagstaff, Ariz.	KAKI	San Antonio, Tex.	KANS	Hammoth Spring, Ark.
KACA	Prosser, Wash.	KAFB	Auburn, Calif.	KALA	Davenport, Ia.	KANG	Angwin, Cal.
KACE-FM	Riverside, Calif.	KAFM	Salina, Kans.	KALB-FM	Alexandria, La.	KANS-FM	Larned, Kan.
KACO	St. Louis, Mo.	KAGH-FM	Crossett, Ark.	KALH	Denver, Colo.	KANT-FM	Lancaster, Calif.
KADI	St. Louis, Mo.	KAIM-FM	Honolulu, Hawaii	KALW	San Francisco, Calif.	KANU	Lawrence, Kans.

WHITE'S RADIO LOG

Call	Location	Call	Location	Call	Location
KOWN-FM	Esccondido, Cal.	KRPM	San Jose, Calif.	KWNS-FM	Pratt, Kan.
KOYA	Ontario, Cal.	KRRC	San Jose, Calif.	KWNT-FM	Davenport, Ia.
KOYL-FM	Odessa, Tex.	KRSA-FM	Salinas, Calif.	KWOA-FM	Worthington, Minn.
KOZE-FM	Lewiston, Idaho	KRSI	Minneapolis, Minn.	KWOC-FM	Poplar Bluff, Mo.
KPAQ-FM	Port Arthur, Tex.	KRSI-FM	Los Angeles Park, Minn.	KWPC-FM	Muscatine, Iowa
KPAN-FM	Hereford, Tex.	KRSL-FM	Russell, Kan.	KWPM-FM	West Plains, Mo.
KPAT-FM	Berkeley, Calif.	KRSN-FM	Los Alamos, N. Mex.	KWTO-FM	Springfield, Mo.
KPCS	Pasadena, Calif.	KRST	Albuquerque, N. M.	KXWV-FM	Columbia, Mo.
KPDQ-FM	Portland, Ore.	KRUS-FM	Ruston, La.	KXWR-FM	Mexico, Mo.
KPEL-FM	Lafayette, La.	KRVW	Eugene, Oreg.	KXEL-FM	Meriden, Conn.
KPEN	San Francisco, Calif.	KRWG	University, Neb. N. M.	KXFM	Santa Maria, Cal.
KPER-FM	Gilroy, Cal.	KRVS-FM	Lafayette, La.	KXIC-FM	Low City, Ia.
KPET-FM	Lamesa, Oreg.	KRXL	Kirkville, Mo.	KXIT-FM	Dalhart, Tex.
KPFA	Berkeley, Calif.	KRYT-FM	Colorado Springs, Colo.	KXJK-FM	Forrest City, Ark.
KPFB	Berkeley, Calif.	KSAM-FM	Huntsville, Tex.	KXXK	San Francisco, Calif.
KPFK	Los Angeles, Calif.	KSBY-FM	San Luis Obispo, Cal.	KXLU	Los Portland, Ore.
KPIK-FM	Colorado Springs, Colo.	KSBO-FM	Salinas, Calif.	KXLY-FM	Spokane, Wash.
KPLC-FM	Lake Charles, La.	KSDB-FM	Manhattan, Kans.	KXOA	Sacramento, Calif.
KPLT-FM	Paris, Tex.	KSDO-FM	San Diego, Calif.	KXOL-FM	Ft. Worth, Tex.
KPLT	Tacoma, Wash.	KSDS	San Diego, Calif.	KXQR	Fresno, Calif. (s)
KPLX	San Jose, Cal.	KSEA	San Diego, Calif.	KXRA-FM	Alexandria, Minn.
KPFM	Portland, Oreg.	KSEB-FM	Redwood City, Calif.	KXRG	Sacramento, Calif.
KPGM	Los Altos, Calif.	KSEB-FM	Redwood City, Calif.	KXXI	Alamogordo, N. M.
KPLR-FM	St. Louis, Mo.	KSEF-FM	St. Francis, Mo.	KXXZ-FM	Houston, Tex.
KPMT	Oxnard, Cal.	KSGM-FM	St. Genevieve, Mo.	KYA-FM	San Francisco, Calif.
KPNW	Eugene, Ore.	KSHN	Sherman, Tex.	KYEW	Phoenix, Ariz.
KPOI-FM	Honolulu, Hawaii	KSHS	Colorado Springs, Colo.	KYFM	Oklahoma City, Okla.
KPOL-FM	Los Angeles, Calif.	KSIB-FM	Creston, Ia.	KYLE-FM	Tempe, Ariz.
KPPC-FM	Pasadena, Calif.	KSIS-FM	Sedalia, Mo.	KYTB	Santa Ana, Cal.
KPPS-FM	Parsons, Kans.	KSIX-FM	Corpus Christi, Tex.	KYSM-FM	Academy, Wash. Mo.
KPQ-FM	Wenatchee, Wash.	KSJN-FM	New Brighton, Minn.	KZAK-FM	Tyler, Tex.
KPRI	San Diego, Calif.	KSJO-FM	San Jose, Calif.	KZAM	Seattle, Wash.
KPRJ	Seattle, Wash.	KSJN-FM	Collegeville, Minn.	KZEL-FM	Eugene, Ore.
KPRD-FM	Kansas City, Mo.	KSJS	San Jose, Calif.	KZFM	Corpus Christi, Tex.
KPSD	Dallas, Tex.	KSJT	San Angelo, Tex.	KZOM	Oklahoma City, Okla.
KPUL-FM	Pullman, Wash.	KSLS-FM	Salt Lake City, Utah	KZSN	Stanford, Cal.
KPWD	Plentywood, Mont.	KSLO-FM	Salt Lake City, Utah	KZUN-FM	Union, Mo.
KQFM	Portland, Oreg.	KSLS-FM	Salt Lake City, Utah	KZYM-FM	Cape Girardeau, Mo.
KQIP	Ogessa, Tex.	KSLO-FM	Opeolusas, La.	WAAA-FM	Winston-Salem, N.C.
KQPL-FM	Golden Valley, Minn.	KSMB	Lafayette, La.	WAAW-FM	Worcester, Mass.
KQTY	Wichita, Kan.	KSNM	Santa Fe, N. M.	WAAW-FM	Parkersburg, W. Va.
KQUE	Houston, Tex.	KSOM	Tucson, Ariz.	WAAW	Murray, Ky.
KQV-FM	Pittsburgh, Pa.	KSOP-FM	Salt Lake City, Utah	WAAZ-FM	Crestview, Fla.
KQWB-FM	Moorhead, Minn.	KSOP-FM	Point Lookout, Mo.	WABA-FM	Academy, N.Y.
KQXX	McAllen, Tex.	KSQC	Claremont, Calif.	WABC-FM	New York, N.Y.
KRAB	Seattle, Wash.	KSPI-FM	Stillwater, Okla.	WABE	Atlanta, Ga.
KRAK-FM	Stockton, Calif.	KSPF-FM	Diboll, Tex.	WABF-FM	Fairhope, Ala.
KRAM-FM	Las Vegas, Nev.	KSPR	San Monica, Calif.	WABI-FM	Bangor, Maine
KRAV	Tulsa, Okla.	KSRN	Reno, Nev.	WABX-FM	Dearbit, Mich.
KRBE	Houston, Tex.	KSTP-FM	Tracy, Cal.	WACO	Waco, Tex.
KRBI-FM	St. Peter, Minn.	KSTP-FM	Emporia, Kans.	WACT-FM	Tuscaloosa, Ala.
KRCC	Colorado Springs, Colo.	KSTP-FM	St. Paul, Minn.	WACY-FM	Moss Point, Miss.
KRCH	St. Louis, Mo.	KSUU	Iowa City, Iowa	WADM-FM	Deatur, Ind.
KRCS	San Bernardino, Cal.	KSUN-FM	Bisbee, Ariz.	WABE-FM	Cincinnati, Ohio
KRCS	Santa Barbara, Calif.	KSVP-FM	Artesia, N. M.	WABE	Syracuse, N.Y.
KRDD-FM	Colorado Springs, Colo.	KSYN	San Antonio, Tex.	WABE-FM	Crossville, Tenn.
KREB	Monroe, La.	KSYP	Joplin, Mo.	WAEZ	Miami Beach, Fla.
KREM-FM	Spokane, Wash.	KTAC-FM	Tacoma, Wash.	WABF-FM	Baton Rouge, La.
KREP	Santa Clara, Cal.	KTAL	Tarkenton, Tex.	WAGR-FM	Lumberton, N.C.
KRES	Moberly, Mo.	KTAP	Tucson, Ariz.	WAGY-FM	Forest City, N. C.
KREX-FM	Grand Junction, Colo.	KTAR-FM	Phoenix, Ariz.	WAHR	Huntsville, Ala.
KRFD-FM	Owatonna, Minn.	KTBC-FM	Austin, Tex.	WAIC-FM	Springfield, Mass.
KRHM	Los Angeles, Calif.	KTBT	Garden Grove, Cal.	WAIF-FM	Winston-Salem, N.C.
KRIL	El Dorado, Ark.	KTCF	Cedar Falls, Iowa	WAIV	Indianapolis, Ind.
KRIT	Clarion, Iowa	KTCU-FM	Ft. Worth, Tex.	WAJC	Indianapolis, Ind.
KRKD-FM	Los Angeles, Calif.	KTEA-FM	Midwest City, Okla.	WAJM	Montgomery, Ala.
KRKH-FM	Lubbock, Tex.	KTEC	Oreoch, Oreg.	WAJP	Joliet, Ill.
KRIY	Denver, Colo.	KTFM	Sioux City, Ia.	WAJR-FM	Morgantown, W. Va.
KRLD-FM	Dallas, Tex.	KTGM	Denver, Colo.	WAKE-FM	Valparaiso, Ind.
KRMD-FM	Shreveport, La.	KTHO-FM	Tahoe Valley, Cal.	WAKB	Bedford, Pa.
KRMG-FM	Tulsa, Okla.	KTIB-FM	Thibodaux, La.	WAKN-FM	Aiken, S.C.
KRML-FM	Carmel, Cal.	KTIM	San Rafael, Calif.	WAKO-FM	Lawrenceville, Ill.
KRMS-FM	Osage Beach, Mo.	KTIS-FM	Minneapolis, Minn.	WAKR-FM	Akron, Ohio
KRNL-FM	St. Vernon, Ia.	KTJO-FM	Ottawa, Kans.	WAKW-FM	Cincinnati, Ohio
KRNT-FM	Des Moines, Ia.	KTLQ-FM	Tahlequah, Okla.	WALK-FM	Patehogo, N.Y.
KRNW	Boulder, Colo.	KTMS-FM	San Barbara, Cal.	WALL-FM	Middletown, N.Y.
KRNY-FM	Kearney-Holdrege, Nebraska	KTNT-FM	Tucumcari, N. M.	WALM-FM	Marshall, Mich.
KROA	Aurora, Neb.	KTOC-FM	Jonesboro, La.	WAMC	Albany, N.Y.
KROB-FM	Robstown, Tex.	KTOD-FM	Sinton, Tex.	WAMF	Amherst, Mass.
KROC-FM	Recheater, Minn.	KTOP	Topeka, Kan.	WAMO-FM	Pittsburgh, Pa.
KROS-FM	San Francisco, Calif.	KTOY	Tacoma, Wash.	WAMU-FM	Washington, D.C.
KROW	Santa Barbara, Calif.	KTQM-FM	Clovis, N. M.	WANG	Goldwater, Mich.
KROY-FM	Sacramento, Calif.	KTRB-FM	Modesto, Calif.	WANI-FM	Anderson, S. C.
		KTRF-FM	Houston, Tex.	WANY-FM	Minny, Ky.
		KTRM-FM	Beaumont, Tex.	WAOV-FM	Vincennes, Ind.
				WAPC-FM	Riverhead, N.Y.
				WAPF-FM	Birmingham, Ala.
				WAPL-FM	Appleton, Wis.
				WAPS	Akron, Ohio
				WAGB-FM	Atlantic Beach, Fla.
				WARC	Meador, Pa.
				WARD-FM	Johnston, Pa.
				WARK	Little Rock, Ark.
				WARN-FM	Fort Pierce, Fla.
				WARU-FM	Peru, Ind.
				WASA-FM	Havre De Grace, Md.

Are your home-town FM stations listed correctly in called for in *White's* listings, please check first with your location and frequency. (Remember, even though your it may be officially licensed by the FCC for operation (be very brief), include your name and address, and 505 Park Ave., New York, N. Y. 10022. Your help in Radio Log will be sincerely appreciated.

White's Radio Log? If you believe there is a correction local station. For each call sign obtain the correct city local paper may list a station as a "home-town" station, in the next city). Get all the facts on a piece of paper mail to *White's Radio Log*, RADIO-TV EXPERIMENTER, contributing to the accuracy and completeness of *White's*

—Editor

WHITE'S RADIO LOG

Call	Location
WGML	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	Maize, Fla.
WGOV-FM	Valdosta, Ga.
WGPA-FM	Bethlehem, Pa. (from Ga.)
WGPC-FM	Albany, Ga.
WGPM	Detroit, Mich.
WGPR	Detroit, Mich.(s)
WGQS	Greensboro, N.C.
WGR-FM	Buffalo, N.Y.
WGRE	Greencastle, Ind.
WGRN	Greenville, Ill.
WGRP-FM	Greenville, Pa.
WGSM-FM	Babylon, N.Y.
WGSS	Geneseo, 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	Delaware, Mich.
WGIS-FM	Madison, Wis.
WHAD	Interlachen, Fla.
WHAG-FM	Halfway, Md.
WHAI-FM	Greenfield, Mass.
WHAS-FM	Louisville, Ky.
WHAT-FM	Philadelphia, Pa.
WHAV-FM	Haverhill, Mass.
WHBB-FM	Selma, Ala.
WHCB-FM	London, 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.
WHCB-FM	Des Moines, Iowa
WHDH-FM	Boston, Mass.
WHDL-FM	Allegheny, N.Y.
WHEN-FM	Syracuse, N.Y.
WHFB-FM	Benton Harbor, Mich.
WHFH	Birmingham, Ill.
WHFI	Flushing, Mich.
WHFM-FM	Rockton, Ill.
WHFS	Bethesda, Md.
WHGM	Bedford, Pa.
WHHI	Highland, Wis.
WHHS	Havertown, Pa.
WHHY-FM	Montgomery, Ala.
WHIL-FM	Medford, Mass.
WHIN-FM	Riverside, R.I.
WHIO-FM	Denton, 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	Harrison, Ohio
WHMD	Marinette, Wis.
WHME	South Bend, Ind.
WHMP-FM	Northampton, Mass.
WHMS	Hialeah, Fla.
WHNC-FM	Henderson, N.C.
WHNR	McMinnville, Tenn.
WHOF-FM	Des Moines, Iowa
WHOD-FM	Jackson, Wis.
WHOH	Hamilton, Ohio
WHOK-FM	Lancaster, Ohio
WHOM-FM	New York, N.Y.
WHOO-FM	Orlando, Fla.
WHOP-FM	Hopkinsville, Ky.
WHPT-FM	Hampton, Va.
WHPF-FM	Harrisburg, Pa.
WHPE-FM	High Point, N.C.
WHPH	Hanover, N.J.
WHPR	Highland Park, Mich.
WHRB-FM	Cambridge, Mass.
WHRL	Albany, N.Y.
WHRR	Marshfield, Wis.
WHRW	Binghamton, N.Y.
WHSA	Highland Twp., Wis.
WHSB	Alpena, Mich.

Call	Location
WHSL-FM	Wilmington, N.C.
WHSR-FM	Winchester, Mass.
WHSY-FM	Hattiesburg, Miss.
WHTC-FM	Holland, Mich.
WHTG-FM	Eatonville, N.J.
WHUB-FM	Cookeville, Tenn.
WHUS	Storrs, Conn.
WHWC	Coxsack, Wis.
WHYL-FM	Carlisle, Pa.
WHYN-FM	Springfield, Mass.
WIAA	Interlochen, Mich.
WIAC-FM	San Juan, P. R.
WIAT	Eau Claire, Wis.
WIAT-FM	Millington, 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	Topoka, Kan.
WIBC	Ithaca, N.Y.
WICH-FM	Norwich, Conn.
WICR	Indianapolis, Ind.
WIFF	Auburn, Ind.
WIFI	Philadelphia, Pa.
WIFN	Franklin, Ind.
WIFS	Middletown, Conn.
WIFX-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, Pa.
WINE-FM	Chattanooga, Va.
WINL-FM	Kenmore, N.Y.
WINK-FM	Ft. Myers, Fla.
WIOD-FM	Miami, Fla.
WIPR-FM	San Juan, P.R.
WIRA-FM	Ft. Pierce, Fla.
WIRH-FM	Humboldt, Tenn.
WISA-FM	Rocky Hill, Conn.
WIRQ	Rochester, N.Y.
WISH-FM	Indianapolis, Ind.
WISM-FM	Madison, Wis.
WISN-FM	Milwaukee, Wis.
WIST-FM	Charlotte, N.C.
WISU	Terre Haute, Ind.
WISV-FM	Glen Burnie, Md.
WITA-FM	San Juan, P.R.
WITR-FM	Baltimore, Md.
WITL-FM	Lansing, Mich.
WITN-FM	Washington, N. C.
WITZ-FM	Jasper, Ind.
WIVC	Winchester, Ind.
WIVS	Christianburg, V.I.
WIVC	Peoria, Ill.
WIVE-FM	Ashland, Va.
WIVI-FM	Christiansted, St. Croix, V.I.
WIVK-FM	Knoxville, Tenn.
WIVY-FM	Jacksonville, Fla.
WIXL-FM	Newton, N. J.
WJAN-FM	Dayton, Ill.
WJZR-FM	Johnstown, N.Y.
WJZZ-FM	Streator, Ill.
WJAC-FM	Johnstown, Pa.
WJAS-FM	Pittsburgh, Pa.
WJAT-FM	Swainsboro, Ga.
WJAX-FM	Jacksonville, Fla.
WJBA-FM	Albany, Ga.
WJBC-FM	Bloomington, Ill.
WJBK-FM	Detroit, Mich.
WJBL-FM	Holland, Mich.
WJBO-FM	Baton Rouge, La.
WJBR	Wilmington, Del.
WJCD-FM	Seymour, Ind.
WJDW-FM	Johnson City, Tenn.
WJDX-FM	Jackson, Miss.
WJEH-FM	Gallipolis, Ohio
WJEJ-FM	agerstown, 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	Ashbury Park, N.J.
WJLN-FM	Birmingham, Ala.
WJMC-FM	Rice Lake, Wis.
WJMD	Bethesda, Md.
WJMI	Jackson, Miss.
WJMK	Plainfield, Ind.
WJML	Potoskey, Mich.
WJMX-FM	Florence, S.C.
WJNC-FM	Jacksonville, N. C.
WJND-FM	Yazoo City, Miss.
WJOF	Athens, Ala.
WJOI-FM	Florence, Ala.
WJOL-FM	Joliet, Ill.
WJOF-FM	Burlington, Vt.
WJPA-FM	Washington, Pa.
WJPF-FM	Detroit, Mich.
WJRH	Easton, Pa.
WJRS-FM	Jamestown, Ky.
WJSM-FM	Martinsburg, Pa.
WJTN-FM	Jamestown, N.Y.

Call	Location
WJVA-FM	South Bend, Ind.
WJVM	Sterling, Ill.
WJW-FM	Cleveland, Ohio
WJWS-FM	Ridgeway, Pa.
WJZZ	Bridgeport, Conn.
WKAL-FM	McComb, Ill.
WKAK	Kankakee, Ill.
WKAQ-FM	San Juan, P.R.
WKAR-FM	E. Lansing, Mich.
WKAT-FM	Jacksonville-Atlantic Beach, Fla.
WKAY-FM	Glasgow, Ky.
WKAZ-FM	Charleston, W.Va.
WKBC-FM	N. Wilkesboro, N.C.
WKBI-FM	Ridgeway, Pa.
WKBJ-FM	Milan, Tenn.
WKBL-FM	Covington, Tenn.
WKBN-FM	Youngstown, Ohio
WKBR-FM	Manchester, N.H.
WKBV-FM	Richmond, Ind.
WKCC	Barlin, N.H.
WKCF-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
WKEV-FM	Covington, Va.
WKFM	Chicago, Ill.
WKFR-FM	Battle Creek, Mich.
WKHM-FM	Jackson, Mich.
WKIG-FM	Hazard, Ky.
WKIP-FM	Poughkeepsie, N.Y.
WKIS-FM	Empire, Fla.
WKIT	Wilmington, N.C.
WKIX-FM	Raleigh, N.C.
WKJB-FM	Mayaguez, P. R.
WKJP	Pittsburgh, Pa.
WKJG-FM	Ft. Wayne, Ind.
WKKD-FM	Aurora, Ill.
WKKY-FM	Elmanger, Ky.
WKLC-FM	St. Albans, W.Va.
WKLF-FM	Clanton, Ala.
WKLS	Marletta, Ga.
WKLV-FM	Grand Rapids, Mich.
WKMH-FM	Dearborn, Mich.
WKMO	Kokomo, Ind.
WKNC-FM	Charleston, W. Va.
WKNE-FM	Raleigh, N.C.
WKNE-FM	Keene, N.H.
WKNT-FM	Kent, O.
WKOC	Kankakee, Ill.
WKOD-FM	Hyanis, Mass.
WKOP	Hopkinsville, Ky.
WKPF-FM	Sunbury, Pa.
WKOP-FM	Elkhamton, N.Y.
WKOX-FM	Framingham, Mass.
WKOZ-FM	Kosciusko, Miss.
WKPT-FM	Kingsport, Tenn.
WKRC-FM	Cincinnati, Ohio
WKRG-FM	Mobile, Ala.
WKRT-FM	Corltand, N.Y.
WKRY	Dayton, Ky.
WKSL	Greencastle, Pa.
WKSJ-FM	Jamestown, N. Y.
WKSU-FM	Kent, Ohio
WKTA	McKenzie, Tenn.
WKTL	Struthers, O.
WKTM	N. Charleston, S.C.
WKTN-FM	Mayfield, Ky.
WKTF-FM	Dayton, Ohio
WKTZ-FM	Jacksonville, Fla.
WKUB	Manitowoc, Wis.
WKUZ	Wahash, 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.
WLAF-FM	LaGrange, Ga.
WLAF-FM	Lancaster, Pa.
WLAF-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.
WLBF-FM	Mattoon, Ill.
WLBF-FM	Lexington, Ky.
WLBK-FM	DeKalb, Ill.
WLBR-FM	Lebanon, Pa.
WLCK-FM	Scottsville, Ky.
WLDM-FM	Lancaster, S.C.
WLDM	Oak Park, Mich.
WLDR-FM	Traverse City, Mich.
WLDS-FM	Lebanon, Ohio
WLDC-FM	Sandusky, Ohio
WLEN	Adrian, Mich.
WLEO-FM	Ponce, P. R.
WLET-FM	Tooeva, Ga.
WLEW-FM	Bad Axe, Mich.
WLFX-FM	Lexington, Ky.
WLFG-FM	Appleton, Wis.
WLGN-FM	London, O.
WLHB-FM	New York, N.Y.
WLH-FM	New London, Wis.

Call	Location
WLIN	Detroit, Mich.
WLIP-FM	Kenosha, Wis.
WLIR	Hicksville, N. Y.
WLIV-FM	Livingston, Tenn.
WLJC	Beattyville, Ky.
WLJM	Gadsden, Ala.
WLKB-FM	Northwell, Ohio
WLKH-FM	Louisville, Ky.
WLMB	Okeechobee, Fla.
WLNA-FM	Peekskill, N.Y.
WLNG-FM	Sag Harbor, N. Y.
WLNH-FM	Laconia, N.H.
WLNO	London, Ohio
WLNR-FM	Lansing, Ill.
WLOR-FM	Graddock, Pa.(s)
WLQB-FM	Portland, Maine
WLQC-FM	Murfreesville, Ky.
WLQE-FM	Leaksville, N.C.
WLQI-FM	La Porte, Ind.
WLQD-FM	Minneapolis, Minn.
WLQM	Chattanooga, Tenn.
WLQW	Winter Park, Fla.
WLRS-FM	Champion, N.C.
WLQV	Cranston, R.I.
WLQW-FM	Aiken, S.C.
WLPO-FM	La Salle, Ill.
WLPR	Mobile, Ala.
WLRS	Louisville, Ky.
WLRJ	Roanoke, Va.
WLRT-FM	Champion, Ill.
WLS-FM	Covington, Va.
WLSM-FM	Louisville, Miss.
WLTA-FM	Atlanta, Ga.
WLUR	Lexington, Va.
WLUV-FM	Loves Park, Ill.
WLWV	Louisville, Ky.
WLW	Franklin, N.J.
WLWV	Nashville, Tenn.
WLX-FM	Williamsport, Pa.
WLYM-FM	Lynn, Mass.
WMAI-FM	Panama City, Fla.
WMAJ-FM	State College, Pa.
WMA-L	Washington, D.C.
WMA-FM	Chicago, Ill.
WMAS-FM	Springfield, Mass.
WMAZ-FM	Macon, Ga.
WMBD-FM	Peoria, Ill.
WMBI-FM	Chicago, Ill.
WMBN-FM	Potoskey, Mich.
WMBG-FM	Auburn, N.Y.
WMBN-FM	Metairie, La.
WMBG-FM	Michigan City, Ind.
WMCB	Statesboro, Ga.
WMCFC	Stuart, Fla.
WMCO	New Concord, Ohio
WMDD-FM	Fajardo, P. R.
WMDE	Greensboro, N. C.
WMDF-FM	Elkhart, Ind.
WMEN-FM	Tallahassee, Fla.
WMER	Celina, Ohio
WMFE-FM	Marion, Va.
WMFC-FM	Monroeville, Ala.
WMFJ-FM	Daytona Beach, Fla.
WMFM	Madison, Wis.
WMFX-FM	Lauderdale, Fla.
WMFR-FM	Metairie, N.C.
WMGM	Atlantic City, N.J.
WMGW-FM	Meadville, Pa.
WMHC	South Hadley, Mass.
WMHE	Toledo, Ohio
WMHS	Morrison, Ill.
WMIL-FM	Milwaukee, Wis.
WMIS-FM	Sylacauga, Ala.
WMIT	Black Mountain, N.C.
WMIV	S. Bristol, N.Y.
WMJ-FM	Mt. Vernon, Ill.
WMJR	Ft. Lauderdale, Fla.
WMKO	Oshkosh, Wis.
WMKY-FM	Morehead, Ky.
WMLC-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
WMNF-FM	Lawton, Ok.
WMOP-FM	Ocala, Fla.
WMOR-FM	Morehead, Ky.
WMQU-FM	Berlin, N.H.
WMPT	Scottsburg, Ind.
WMPL-FM	Hancock, Mich.
WMPS-FM	Memphis, Tenn.
WMRF-FM	Newtown, Pa.
WMRL-FM	Marion, Ind.
WMRN-FM	Marion, Ohio
WMRO-FM	Aurora, Ill.
WMRR-FM	Marshall, Mich.
WMRY	E. St. Louis, Ill.
WMRP-FM	Flint, Mich.
WMSC-FM	Lakeland, Fla.
WMSD-FM	Jacksonville, Fla.
WMSK-FM	Morganfield, Ky.
WMSR	Harrisburg, Pa.
WMSR-FM	Manchester, Tenn.
WMT-FM	Cedar Rapids, Iowa
WMTF	Park Ridge, Ill.
WMTI	Norfolk, Va.
WMTL-FM	Wetzel, Ky.
WMTN-FM	Moultrie, Ga.
WMLB-FM	Morristown, Tex.
WMTS-FM	Murfreesboro, Tenn.

Call	Location	Call	Location	Call	Location	Call	Location
WMTW-FM	Washington, N.H.	WOTW-FM	Nashua, N.H.	WRIU	Kingston, R. I.	WSON-FM	Henderson, Ky.
WMUA	Amherst, Mass.	WOUB-FM	Athens, Ohio	WRIW	Mackinaw City, Mich.	WSOY-FM	S. Orange, N.J.
WMUB	Oxford, Ohio	WOUB-FM	Utira, N.Y.	WRIJ	Jacksville, Wis.	WSOY-FM	Deatur, Ill.
WMUH	Allentown, Pa.	WOVE	Wetzel, W. Va.	WRIN	Lewiston, Maine	WSPA-FM	Spartanburg, S. C.
WMUK	Kalamazoo, Mich.	WOW-FM	Omaha, Nebr.	WRKB-FM	Kannapolis, N.C.	WSPB-FM	Sarasota, Fla.
WMUL	Huntington, W.Va.	WOXR	Oxford, Ohio	WRKO-FM	Boston, Mass.	WSPD-FM	Toledo, Ohio
WMUN	Muncie, Ind.	WOYE-FM	Mayaguez, P. R.	WRKT-FM	Cocoa Beach, Fla.	WSPE	Springville, N.Y.
WMUU-FM	Greenville, S. C.	WPAA	Andover, Mass.	WRLB	Long Branch, N. J.	WSPT-FM	Stevens Point, Wis.
WMUZ	Detroit, Mich.	WPAB-FM	Ponce, P. R.	WRLC	Palmire, Pa.	WSRC-FM	Durham, N.C.
WMVA-FM	Martinsville, Va.	WPAC-FM	Pathogue, N. Y.	WRLD-FM	Lanett, Ala.	WSRF-FM	Lauderdale, Fla.
WMVB-FM	Millville, N. J.	WPAD-FM	Paducah, Ky.	WRM-FM	Rocky Hill, Fla.	WSRS	Worcester, Mass.
WMVG-FM	Milledgeville, Ga.	WPAG-FM	Ann Arbor, Mich.	WRML	Toumton, Mass.	WSRY	Syracuse, N. Y.
WMVO-FM	Mount Vernon, Ohio	WPAT-FM	Paterson, N. J.	WRMF-FM	Titusville, Fla.	WSRW-FM	Hillsboro, Ohio
WMVR-FM	Sidney, Ohio	WPAY-FM	Portsmouth, Ohio	WRMI-FM	Morris, Ill.	WSSU	Superior, Wis.
WMYB-FM	Myrtle Beach, Fla.	WPBA-FM	Palm Beach, Fla.	WRMN-FM	Elgin, Ill.	WSSV-FM	Petersburg, Va.
WMYR-FM	Ft. Myers, Fla.	WPBC-FM	Richfield, Minn.	WRNJ	Atlantic City, N.J.	WSTC-FM	Stamford, Conn.
WNAD-FM	Norman, Okla.	WPBF	W. Palm Beach, Fla.	WRNL-FM	Richmond, Va.	WSTM	St. Mathews, Ky.
WNAM-FM	Neenah-Menasha, Wis.	WPBS	Philadelphia, Pa.	WRNO	New Orleans, La.	WSTP	Owensboro, Ky.
WNAS	New Albany, Ind.	WPDE-FM	Paris, Ky.	WRNW	Mount Kisco, N.Y.	WSTP-FM	Salisbury, N.C.
WNAT-FM	Natchez, Miss.	WPDR-FM	Portage, Wis.	WROA-FM	Guilford, N.Y.	WSTR-FM	Sturgis, Mich.
WNAU-FM	New Albany, Miss.	WPEA	Exeter, N. H.	WROC-FM	Rochester, N.Y.	WSTU-FM	Stuart, Fla.
WNAV-FM	Annapolis, Md.	WPEL-FM	Montrose, Pa.	WROK-FM	Rockford, Ill.	WSTV-FM	Steubenville, Ohio
WNBC-FM	New York, N.Y.	WPEM-FM	Philadelphia, Pa.	WROM-FM	Rome, Ga.	WSUP	Platteville, Wis.
WNBD-FM	Daytona Beach, Fla.	WPEN-FM	Philadelphia, Pa.	WROW-FM	Albany, N.Y.	WSUW	Whitewater, Wis.
WNBF-FM	Dayton, N.Y.	WPFX-FM	Pittsburgh, Pa.	WROY-FM	Carmi, Ill.	WSVA-FM	Harrisonburg, Va.
WNBH-FM	New Bedford, Mass.	WPFK	Los Angeles, Cal.	WRPT	Troy, N.Y.	WSWB	Tamaqua, Pa.
WNBI-FM	Andalusia, Ala.	WPFM	Portsmouth, N. H.	WRPM-FM	Poplarville, Miss.	WSVL-FM	Shelbyville, Ind.
WNCI	Columbus, O.	WPPER	Terre Haute, Ind.	WRPN-FM	Ripon, Wis.	WSVS-FM	Crews, Va.
WNCN	New York, N.Y.	WPGA-FM	Perry, Ga.	WRR-FM	Dallas, Tex.	WSWG	Greenwood, Miss.
WNCO-FM	Ashland, Ohio	WPGC	Bradbury Hts., Md.	WRRH	Franklin Lakes, N.J.	WSWM	East Lansing, Mich.
WNCT-FM	Greenville, N.C.	WPGF-FM	Burgaw, N.C.	WRRN	Warren, Pa.	WSWN-FM	Belle Glade, Fla.
WNDA	Huntsville, Ala.	WPGI	Pittsburgh, Pa.	WRRZ-FM	Clinton, N.C.	WSWV-FM	Platteville, Wis.
WNDB	Kingston, N. Y.	WPGU	Urbana, Ill.	WRSA	Deatur, Ala.	WSXR-FM	Syracuse, N. Y.
WNDF-FM	Band, Ind.	WPHS	Warren, Mich.	WRSC-FM	State College, Pa.	WSTC-FM	Winston-Salem, N.C.
WNDR	Crawfordsville, Ind.	WPI-C	St. Petersburg, Fla.	WRSL-FM	Bayamon, P.R.	WTCA-FM	Plymouth, Ind.
WNEM-FM	Bay City, Mich.	WPIE-FM	Pittsburgh, Pa.	WRSV	Skokie, Ill.	WTAD-FM	Quincy, Ill.
WNES-FM	Central City, Ky.	WPIX-FM	New York, N. Y.	WRSE-FM	Elmhurst, Ill.	WTAE-FM	Pittsburgh, Pa.
WNEW-FM	New York, N.Y.	WPJB-FM	Providence, R.I.	WRSL-FM	Bayamon, P. R.	WTAP-FM	Parkersburg, W. Va.
WNEV-FM	Macon, Ga.	WPKE-FM	Pikeville, Ky.	WRST-FM	Oshkosh, Wis.	WTAR	Norfolk, Va.
WNFM	Naples, Fla.	WPKM	Tampa, Fla.	WRSW-FM	Warsaw, Ind.	WTAS	Crete, Ill.
WNFO	Nashville, Tenn.	WPKN	Bridgeport, Conn.	WRT-C-FM	Wartburg, Conn.	WTAW-FM	College Station, Tex.
WNGB-FM	Dayton, Ky.	WPLB	Greenville, S.C.	WRTI-FM	Philadelphia, Pa.	WTAX-FM	Springfield, Ill.
WNHC-FM	New Haven, Conn.	WPLC	Plantation, Ky. Fla.	WRTS	E. Liverpool, O.	WTAY-FM	Robinson, Ill.
WNIB	Chicago, Ill.	WPLM-FM	Plymouth, Mass.	WRUF-FM	Gainesville, Fla.	WTBC-FM	Tuscaloosa, Ala.
WNIC	DeKalb, Ill.	WPLN	Nashville, Tenn.	WRUN-FM	Utica, N.Y.	WTBO-FM	Cumberland, Md.
WNIK-FM	Arecibo, P. R.	WPLO-FM	Atlanta, Ga.	WRUR-FM	Rochester, N.Y.	WTBS	Cambridge, Mass.
WNNR-FM	New Orleans, La.	WPMR-FM	Pascagoula, Miss.	WRUS-FM	Russellville, Ky.	WTCA-FM	Plymouth, Ind.
WNNT-FM	Warsaw, Va.	WPOP-FM	Portland, Me.	WRUV	Burlington, Vt.	WTCH-FM	Shawano, Wis.
WNOB	Cleveland, Ohio	WPOS-FM	Holland, O.	WRUV-FM	Cleveland, O.	WTCS-FM	Savannah, Mich.
WNOF	St. Paul, Minn.	WPPA-FM	Pottsville, Pa.	WRVA-FM	Richmond, Va.	WTCC-FM	Campellsville, Ky.
WNOK-FM	High Point, N.C.	WPRB	Princeton, N.J.	WRVB-FM	Madison, Wis.	WTCC-FM	Whitesburg, Ky.
WNON	Lebanon, Ind.	WPRK	Winter Park, Fla.	WRVC	Norfolk, Va.	WTCC-FM	Petersburg, Fla.
WNOF-FM	Norfolk, Va.	WPRM-FM	Park Rapids, Minn.	WRVF	River Falls, Wis.	WTDO	Toledo, Ohio
WNOS-FM	High Point, N.C.	WPRO-FM	Providence, R.I.	WRVG	Georgetown, Ky.	WTDM	Lake Success, N. Y.
WNOW-FM	York, Pa.	WPRS-FM	Paris, Ill.	WRVI	Winnepesaukee, Ill.	WTGI	Hammond, La.
WNRE	Cincinnati, Ohio	WPRT-FM	Prestonburg, Ky.	WRVP	New York, N.Y.	WTGN	Lima, O.
WNRG-FM	Grundy, Mo.	WPSB	W. Potomac, Va.	WRV-FM	St. Louis, Mo.	WTGR-FM	Tabor, Haute, Ind.
WNLS-FM	Laurel, Miss.	WPSB	Evansville, Ind.	WRWR	Port Clinton, Ohio	WTHS	Miami, Fla.
WMTH	Winnetka, Ill.	WPTF-FM	Raleigh, N.C.	WRXO-FM	Roxboro, N.C.	WTIC-FM	Hartford, Conn.
WNTI	Hackettstown, N.J.	WPTH	Fort Wayne, Ind.	WSAB	Mt. Carmel, Ill.	WTID-FM	Norfolk, Va.
WNUJ-FM	New Ulm, Minn.	WPTN-FM	Cookeville, Tenn.	WSAC-FM	Ft. Knox, Ky.	WTIO	Charleston, W. Va.
WNUR	Evansville, Ind.	WPTW-FM	Piqua, Ohio	WSAE	Spring Arbor, Mich.	WTIS-FM	Jackson, Tenn.
WNUS-FM	Chicago, Ill.	WPWT	Philadelphia, Pa.	WSAL-FM	Logansport, Ind.	WTIU	Charlottesville, Va.
WNXC-FM	Washington Hts., Ill.	WQAL	Philadelphia, Pa.	WSB-FM	Saga, Mich.	WTJR-FM	Wilmington, N.C.
WNXT-FM	Portsmouth, O.	WQDF-FM	Midland, Mich.	WSAU-FM	Rockford, Wis.	WTMA-FM	Charleston, S.C.
WNYC-FM	New York, N.Y.	WQFM	Milwaukee, Wis.	WSB-FM	Atlanta, Ga.	WTMB-FM	Tomah, Wis.
WNYE	New York, N.Y.	WQIK-FM	Jacksonville, Fla.	WSBA-FM	York, Pa.	WTMJ-FM	Milwaukee, Wis.
WNNY-FM	Canton, O.	WQMG	Babylon, N. Y.	WSBC-FM	Chicago, Ill.	WTNC-FM	Thomasville, N.C.
WNYR-FM	Rochester, N.Y.	WQMS	Greensboro, N.C.	WSBF-FM	Clemson, S.C.	WTNT-FM	Tallahassee, Fla.
WOAK	Royal Oak, Mich.	WQMS	Hamilton, Ohio	WSBT-FM	South Bend, Ind.	WTQA	Trenton, N.J.
WOAP-FM	Windsor, Mich.	WQMV	Vicksburg, Miss.	WSCB	Springfield, Mass.	WTQB-FM	Savannah, Ga.
WOAY-FM	Oak Hill, W.Va.	WQRB-FM	Pittsfield, Mass.	WSCC	Somers, Conn.	WTQD-FM	Toledo, Ohio
WOBM	Tom's River, N. J.	WQSB	Albertville, Ala.	WSCF-FM	Perleyville, Wis.	WTQF	Canton, Ohio
WOBV	Westerville, Ohio	WQST	Forest, Miss.	WSCF-FM	Berkeley Springs, W.V.	WTQP-FM	Washington, D.C.
WOBT-FM	Rhineland, Wis.	WQSU	Selingsgrove, Pa.	WSDM	Chicago, Ill.	WTQS	Wauwatosa, Wis.
WOC-FM	Davenport, Iowa	WQXI-FM	Atlanta, Ga.	WSEB	Sebring, Fla.	WTOT-FM	Marianna, Fla.
WOCB-FM	W. Yarmouth, Mass.	WQXM	Clearwater, Fla.	WSEI	Olney, Ill.	WTOW-FM	Baltimore, Md.
WOCF-FM	DeLaware, Ind.	WQXR-FM	New York, N.Y.	WSEK	Somerset, Ky.	WTPA-FM	Harrisburg, Pa.
WOCO-FM	Oconto, Wis.	WQXY-FM	Baton Rouge, La.	WSEL-FM	Point, Miss.	WTRC-FM	Elkhart, Ind.
WODL-FM	Carbondale, Pa.	WRAD-FM	Radford, Va.	WSEN-FM	Kalamazoo, Mich.	WTRF-FM	Greensburg, Ind.
WOFM	Greenville, Tenn.	WRAG-FM	Carrollton, Ala.	WSET	Nashville, Tenn.	WTRG-FM	Wheeling, W. Va.
WOHS-FM	Shelby, N.C.	WRAJ-FM	Anna, Ill.	WSEV-FM	Steverville, Tenn.	WTRH-FM	Dyersburg, Tenn.
WOIV	De Ruyter, N.Y.	WRAL-FM	Williamsport, Pa.	WSFM	Birmingham, Ala.	WTSB-FM	Lumberton, N.C.
WOKU-FM	Waukegan, Ill.	WRAL-FM	Raleigh, N.C.	WSH	Southfield, Mich.	WTES-FM	Buffalo, N.Y.
WOKZ-FM	Alton, Ill.	WRAR-FM	Tappanhook, Va.	WSHS	Floral Park, N.Y.	WTRF-FM	Trenton, N.J.
WOLF-FM	Washington, D.C.	WRAY-FM	Indianapolis, Ind.	WSID-FM	Baltimore, Md.	WTVS-FM	Claremont, N.H.
WOLA	San Juan, P.R.	WRBJ-FM	St. Johns, Mich.	WSID-FM	Baltimore, Md.	WTTT-FM	Towanda, Pa.
WOLI	Ottawa, Ill.	WRBL-FM	Columbus, Ga.	WSIM-FM	Salem, Ind.	WTTT-FM	Tiffin, Ohio
WOMA	Tallahassee, Fla.	WRBS	Baltimore, Md.	WSIP-FM	Paintsville, Ky.	WTTM-FM	Trenton, N.J.
WOMC	Royal Park, Mich.	WRCA-FM	Washington, D.C.	WSIU	Carbondale, Ill.	WTTN-FM	Watertown, Wis.
WOMF-FM	Delaware, Ky.	WRCO-FM	Richland Center, Wis.	WSIV-FM	Pekin, Ill.	WTR-FM	Westminster, Md.
WOMP-FM	Bellaire, Ohio	WRCP-FM	Philadelphia, Pa.	WSIX-FM	Nashville, Tenn.	WTV-FM	Philadelphia, Ind.
WONE-FM	Dayton, O.	WRD-FM	Rudersburg, Wis.	WSJC-FM	Magee, Miss.	WTVL-FM	Waverly, Mo.
WONF	Pensacola, Fla.	WRD	Ashland, O.	WSJM-FM	St. Joseph, Mich.	WTVN-FM	Columbus, Ohio
WONO-FM	Syracuse, N. Y.	WRD	Ashland, O.	WSJS-FM	Winston-Salem, N.C.	WTVR-FM	Richmond, Va.
WOOD-FM	Grand Rapids, Mich.	WREC-FM	Memphis, Tenn.	WSK	Wabash, Ind.	WTVY-FM	Dothan, Ala.
WOOD-FM	Dothan, Ala.	WRED	Youngstown, Ohio	WSLI-FM	Jackson, Miss.	WUAG	Greensboro, N. C.
WOOD-FM	DeLaware, Fla.	WREK	Woodstock, Ill.	WSLM-FM	Salem, Ind.	WUCB-FM	Chicago, Ill.
WOPA-FM	Oak Park, Ill.	WREO-FM	Ashtabula, Ohio	WSLN	Delaware, Ohio	WUFM	Utica, N. Y.
WOPF-FM	Bristol, Tenn.	WRFK	Richmond, Va.	WSLF-FM	Rockford, Fla.	WUFL-FM	Philadelphia, Pa.
WOR-FM	New York, N.Y.	WRFL	Winchester, Va.	WSLU	Canton, N.Y.	WULX-FM	Richmond, Ind.
WORA-FM	Mayaguez, P.R.	WRFM	New York, N. Y.	WSLU	Collegedale, Tenn.	WUNC	Chapel Hill, N.C.
WORM-FM	Savannah, Tenn.	WRFS-FM	Alexander City, Ala.	WSMD-FM	Walderf, Md.	WUNH	Durham, N.H.
WORO	Corozal, P.R.	WRFY-FM	Reading, Pa.	WSMI-FM	Litchfield, Ill.	WUOA	Tuscaloosa, Ala.
WORX-FM	Windsor, Ind.	WRGA-FM	Rome, Ga.	WSMJ	Greenfield, Ind.	WUON	Ann Arbor, Mich.
WOSC-FM	Fulton, N.Y.	WRHS	Park Forest, Ill.	WSML	Petersburg, Va.	WUOT	Knoxville, Tenn.
WOSE	Oswego, N. Y.	WRIG-FM	Wausau, Wis.	WSMT-FM	Sparta, Tenn.	WUPY	Lynn, Mass.
WOSH-FM	Oshkosh, Wis.	WRIO-FM	Cape May, N. J.	WSNJ-FM	Bridgeton, N.J.	WUSC-FM	Columbia, S.C.
WOSU-FM	Columbus, Ohio	WRIP-FM	Rossville, Ga.	WSOC-FM	Charlotte, N.C.	WUSF	Tampa, Fla.
		WRIT-FM	Milwaukee, Wis.	WSOM-FM	Salem, Ohio	WUSO	Springfield, O.
						WUST-FM	Bethesda, Md.

WHITE'S RADIO LOG

Call	Location
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	Lewisburg, Pa.
WVCA-FM	Gloucester, Mass.
WVCL-FM	Winnfield, La.
WVEC-FM	Hampden, Va.
WVEM	Springfield, Ill.
WVFM	Lakeland, Fla.
WVFX	Dundee, Ill.
WVGR-FM	Grand Rapids, Mich.
WVHC	Hemstead, 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.
WVIS-FM	Owensboro, Ky.
WVKB-FM	Leesburg, Ill.
WVKO-FM	Columbus, Ohio
WVLK-FM	Lexington, Ky.

Call	Location
WVLR	Sauk City, Wis.
WVMG-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.C.
WVOT-FM	Wilson, N.Y.
WVOX-FM	New Rochelle, N.Y.
WVOZ-FM	Carolina, P. R.
WVPO-FM	Stroudsburg, Pa.
WVQM	Huntington, W. Va.
WVSC-FM	Somerses, 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	Blacksville, N.Y.
WVWB-FM	Bridgeton, N.C.
WVWC	Buckhannon, W. Va.
WVWO-FM	Cheyenne, Wyo.
WVWB-FM	Bamberg, S.C.
WVWC	Greenfield, Wis.
WVWC-FM	Waterbury, Conn.
WVWD-FM	Washington, D.C.
WVWL-FM	Scranton, Pa.
WVWL	Scranton, Pa.
WVWP-FM	Sanford, N.C.
WVWH	Hartford, Conn.
WVWG-FM	Hornell, N.Y.
WVWH	Muncie, Ind.
WVHO	Jackson, Miss.

Call	Location
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.
WWPT	Orlando, Fla.
WWQT	Gainesville, Ga.
WWRH	Columbus, Ga.
WWSC-FM	Glens Falls, N. Y.
WWSM	Bay Minette, Ala.
WWST-FM	Wooster, Ohio
WWST-FM	Pittsburgh, Pa.
WWTV-FM	Cadillac, Mich.
WWVA-FM	Wheeling, W. Va.
WWVR	Terre Haute, Ind.
WWXL-FM	Manchester, Ky.
WWYN-FM	Erie, Pa.
WXAC	Reading, Pa.
WXAX	Elkhart, Ind.
WXBM-FM	Milton, Fla.
WXE	Louisville, Ky.
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.

Call	Location
WXRA	Woodbridge, Va.
WXRC	Hickory, Va.
WXRF-FM	Guayama, P. R.
WXRI	Norfolk, Va.
WXTA	Greencastle, Ind.
WXTC	Annapolis, Md.
WXTO-FM	Grand Rapids, Mich.
WXUR-FM	Media, Pa.
WXVW	Suffolk, Va.
WXYZ-FM	Detroit, Mich.
WYAK	Sarasota, Fla.
WYBC-FM	New Haven, Conn.
WYBG-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.
WYFF-FM	Columbia, Tenn.
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	Charleston, W. Va.
WZPF-FM	Cincinnati, Ohio
WZMF	Memomonee Falls, Wis.

Canadian AM Stations by Call Letters

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
CBA	Sackville, N.B.	1070	CFQB	Fort Frances, Ont.	800	CHSJ	Saint John, N.B.	1150
CBAF	Moncton, N.B.	1300	CFQM	Quebec, Que.	1340	CHSM	Steinbach, Man. Studio at Station CFAM, Altona, Man.	1250
CBD	Saint John, N.B.	1110	CFOR	Orillia, Ont.	1570	CHTK	Prince Rupert, B.C.	560
CBDR	Schefferville, P.Q.	1230	CFOS	Owen Sound, Ont.	560	CHTM	Thompson, Man.	610
CBE	Windsor, Ont.	1550	CFQX	Pointe Claire, Que.	1470	CHUB	Nanaimo, B.C.	1570
CBF	Montreal, Que.	690	CFPA	Port Arthur, Ont.	1230	CHUC	Chouinard, Ont.	1450
CBG	London, Nfld.	1450	CFPL	London, Ont.	980	CHUM	Toronto, Ont.	1030
CBH	Halifax, N.S.	860	CFPR	Prince Rupert, B.C.	600	CHVD	Dolbeau, Que.	1250
CBJ	Sydney, N.S.	1140	CFQC	Saskatoon, Sask.	580	CHWK	Chilliwack, B.C.	1270
CBJ	Chicoutimi, Que.	1580	CFRA	Ottawa, Ont.	1010	CHWO	Oakville, Ont.	1250
CBK	Regina, Sask.	540	CFRB	Toronto, Ont.	1490	CHYM	Kitchener, Ont.	1490
CBK	Toronto, Ont.	740	CFRC	Kingston, Ont.	1260	CHJN	Montreal, Que.	800
CBM	Montreal, Que.	940	CFRG	Gravelbourg, Sask.	1500	CJAF	Cabano, Que.	1240
CBN	St. John's, Nfld.	640	CFRN	Edmonton, Alta.	1470	CJAT	Trail, B.C.	920
CBP	Ottawa, Nfld.	1250	CFRS	Simons, Ont.	1340	CJAV	Port Alberni, B.C.	1240
CBQ	Ottawa, Ont.	1010	CFRY	Portage la Prairie, Man.	910	CJBM	Causapeau, Que., with Studio at Rimouski, Que.	1450
CBT	Grand Falls, Nfld.	540	CFSL	Weyburn, Sask.	1110	CJBQ	Bellefleur, Ont.	800
CBU	Vancouver, B.C.	980	CFST	St. John's, Nfld.	560	CJBR	Rimouski, Que.	900
CBV	Québec, Que.	990	CFTJ	Galt, Ont.	1410	CJCA	Edmonton, Alta.	930
CBW	Winnipeg, Man.	970	CFTK	Terrace, B.C.	1240	CJCB	Sydney, N.S.	1270
CBX	Edmonton, Alta.	990	CFUN	Vancouver, B.C.	1490	CJCF	Halifax, N.S.	920
CBY	Corner Brook, Nfld.	740	CFWB	Campbell River, B.C.	570	CJCG	Woodstock, N.B.	680
CBZ	Fredericton, N.B.	1450	CFWH	Whitehorse, Y.T.	1340	CJCN	Grand Falls, Nfld.	680
CFAB	Windsor, N.S.	960	CFYK	Yellowknife, N.W.T.	800	CJCS	Stratford, Ont.	1240
CFAC	Calgary, Alta.	1290	CHAD	Moose Jaw, Sask.	1340	CJDC	Dawson Creek, B.C.	510
CFAM	Altona, Man.	590	CHAK	Inuvik, N.W.T.	1270	CJDM	Drumheller, Alta.	910
CFAR	Flin Flon, Man.	1070	CHAM	Medicine Hat, Alta.	1270	CJEM	Edmundston, N.B.	630
CFAX	Victoria, B.C.	930	CHCM	Marystown, Nfld., with another studio at St. John's, Nfld.	560	CJET	Smiths Falls, Ont.	1400
CFBC	Saint John, N.B.	550	CHCE	Lethbridge, Alta.	1090	CJFF	Rivière-du-Loup, Que.	580
CFBR	Sudbury, Ont.	1230	CHED	Edmonton, Alta.	630	CJFX	Antigonish, N.S.	940
CFBV	Smithers, B.C.	570	CHEF	Grandy, Que.	1450	CJGJ	Yorkton, Sask.	940
CFCB	Corner Brook, Nfld.	600	CHER	Sydney, N.S.	950	CJJC	Vernon, B.C.	900
CFCF	Montreal 15, Que.	600	CHEX	Peterborough, Ont.	980	CJJJ	Sault Ste. Marie, Ont.	1050
CFCH	Callander, Ont.	600	CHFZ	Edmonton, Alta.	1230	CJKL	Kirkland Lake, Ont.	560
CFCL	Timmins, Ont.	1260	CHFV	Churchill, Man.	680	CJLM	Joliette, Que.	1350
CFCN	Calgary, Alta.	630	CHFI	Toronto, Ont.	1310	CJLN	Quebec, Que.	1060
CFCO	Chatham, Ont.	1440	CHFB	La Pocatière, Que.	680	CJLS	Yarmouth, N.S.	1340
CFCP	Courtenay, B.C.	790	CHGC	Charlottetown, P.E.I.	630	CJLX	Fort William, Ont.	800
CFCW	Camrose, Alta.	630	CHGD	Victoria, B.C.	1380	CJME	Regina, Sask.	1200
CFCY	Charlottetown, P.E.I.	790	CHIE	Brampton, Ont.	1540	CJMS	Montreal, Que.	380
CFDA	Charlottesville, Que.	1340	CHIN	Toronto, Ont.	1280	CJMT	Chicoutimi, Que.	1420
CFDB	Dartmouth, N.S.	1050	CHIQ	Hamilton, Ont.	580	CJNB	North Battleford, Sask.	1050
CFDE	Goose Bay, Nfld.	1230	CHLC	Saguenay Co., Que.	680	CJNR	Blind River, Ont.	730
CFEM	Richmond Hill, Ont.	1270	CHLD	Truro, N.S.	680	CJNS	Niagara Falls, Ont.	1240
CFEP	Grande Prairie, Alta.	1270	CHLE	St. Thomas, Ont.	680	CJOC	Lethbridge, Alta.	1240
CFGR	Gravelbourg, Sask.	910	CHLN	Toronto, Ont.	900	CJOD	London, Ont.	930
CFGT	Alma, Que.	1450	CHLO	Sherbrooke, Que.	610	CJON	St. John's, Nfld.	1290
CFGJ	Kamloops, B.C.	1400	CHML	Hamilton, Ont.	900	CJOR	Vancouver, B.C.	600
CFJR	Brookville, Ont.	1400	CHNC	New Carlisle, Que.	960	CJOX	Grand Bank, Nfld.	710
CFLD	Smithers, B.C.	1400	CHNO	Sudbury, Ont.	1070	CJOY	Guelph, Ont.	1460
CFLN	Studio at Station CFBV		CHNS	Sarnia, Ont.	1350	CJRL	Kenora, Ont.	1220
CFHL	Hearst, Ont. Studio at Station CFCL, Timmons, Ont.	1340	CHOW	Wollan, Ont.	1470	CJRN	Niagara Falls, Ont.	1600
CFLK	Kapuskasung, Ont. Studio at Station CFCL, Timmons, Ont.	1230	CHQW	Welland, Ont.	1280	CJRW	Summerside, P.E.I.	1280
CFLM	La Tuque, Que.	1240	CHQB	Powell River, B. C.	810	CJSE	Shawnauwan, Sask.	1490
CFLV	Valleyfield, Que.	1370	CHQM	Vancouver, B.C.	1320	CJSO	Sorel, Que.	1320
CFMB	Montreal, Que.	1410	CHQR	Calgary, Alta.	800	CJSP	Leamington, Ont.	710
CFMI	Corwall, Ont.	1140	CHQT	Edmonton, Alta.	1480	CJSS	Cornwall, Ont.	1220
CFMR	Fort Simpson, N.W.T.	1490	CHRC	Québec, Que.	910	CJVI	Victoria, B.C.	900
CFNB	Fredericton, N.B.	550	CHRD	Drummondville, Que.	1090	CJWF	Welfort, Sask.	1420
CFNS	Saskatoon, Sask.	1170	CHRS	Acques-Carrier, Que.	1090	CJWA	Sault Ste. Marie, Ont.	1240
			CHSC	St. Catharines, Ont.	1220			

Call	Location	kHz	Call	Location	kHz	Call	Location	kHz	Call	Location	kHz
CKOK	Penticton, B.C.	800	CKPT	Peterborough, Ont.	1420	CKSO	Sudbury, Ont.	790	CKWS	Kingston, Ont.	960
CKOM	Saskatoon, Sask.	1250	CKRB	Cité de Beauce, Que.	1460	CKSW	Swift Current, Sask.	1400	CKWW	Windsor, Ont.	580
CKOO	Osoyoos, B.C.	1240	CKRC	KRC Winnipeg, Man.	630	CKTB	St. Catharines, Ont.	610	CKWX	Vancouver, B.C.	1130
CKOT	Tillsonburg, Ont.	1510	CKRD	Red Deer, Alta.	850	CKTK	Kitimat, B.C.	1230	CKX	Brandon, Man.	1150
CKOV	Kelowna, B.C.	630	CKRM	Regina, Sask.	980	CKTR	Trois-Rivières, Que.	1150	CKXL	Calgary, Alta.	1140
CKOX	Woodstock, Ont.	1340	CKRN	Rouyn, Que.	1400	CKTS	Sherbrooke, Que.	900	CKY	Winnipeg, Man.	580
CKOY	Ottawa, Ont.	1310	CKRS	Jonquière, Que.	590	CKUA	Edmonton, Alta.	580	CKYL	Peace River, Alta.	610
CKPC	Brantford, Ont.	1380	CKSA	Lloydminster, Alta.	1080	CKV	Val-d'Or, P.Q.	980	VOAR	St. John's, Nfld.	1230
CKPG	Prince George, B.C.	550	CKSB	Saint-Boniface, Man.	1050	CKVM	Verdun, Que.	850	VOCM	St. John's, Nfld.	590
CKPM	Ottawa, Ont.	1440	CKSL	London, Ont.	1410	CKWL	Williams Lake, B.C.	1240			800
CKPR	Port Arthur, Ont.	580	CKSM	Shawinigan, Que.	1220						

Canadian FM Stations by Call Letters

Call	Location	MHz	Call	Location	MHz	Call	Location	MHz	Call	Location	MHz
CBC-FM	Toronto, Ont.	94.1	CFMO-FM	Ottawa, Ont.	93.9	CHUM-FM	Toronto, Ont.	104.5	CKGB-FM	Timmins, Ont.	94.5
CBF-FM	Montreal, Que.	95.1	CFMQ-FM	Regina, Sask.	92.1	CHYM-FM	Kitchener, Ont.	96.7	CKGM-FM	Montreal, Que.	97.7
CBM-FM	Montreal, Que.	100.7	CFMS-FM	Victoria, B.C.	98.5	CJBQ-FM	Bellefleur, Ont.	97.1	CKLC-FM	Kingston, Ont.	98.3
CBQ-FM	Ottawa, Ont.	103.3	CFPL-FM	London, Ont.	95.9	CJBR-FM	Rimouski, Que.	101.5	CKLG-FM	Vancouver, B.C.	99.3
CBU-FM	Vancouver, B.C.	105.7	CFQR-FM	Montreal, Que.	92.5	CJCA-FM	Edmonton, Alta.	99.5	CKLW-FM	Windsor, Ont.	93.9
CBW-FM	Winnipeg, Man.	98.3	CFRC-FM	Kingston, Ont.	91.9	CJCB-FM	Sydney, N.S.	94.9	CKOK-FM	Penticton, B.C.	97.1
CFBC-FM	Saint John, N.B.	98.9	CFRN-FM	Edmonton, Alta.	100.3	CJCF-FM	Montreal, Que.	95.9	CKOT-FM	Tillsonburg, Ont.	100.5
CFBM-FM	Kamloops, B.C.	98.3	CFRW-FM	Winnipeg, Man.	94.3	CJIC-FM	Sault Ste. Marie, Ont.	100.5	CKPC-FM	Brantford, Ont.	92.1
CFBF-FM-1	Savona, B.C.—Re-broadcasting of CFFM-FM	101.9	CHEC-FM	Lethbridge, Alta.	100.9				CKPR-FM	Port Arthur, Ont.	94.3
CFFM-FM-2	Clearwater, B.C.—Re-broadcasting of CFFM-FM	92.7	CHFI-FM	Toronto, Ont.	98.1				CKQS-FM	Oshawa, Ont.	94.9
CFFM-FM-3	Merritt, B.C.—Re-broadcasting of CFFM-FM	103.9	CHFL-FM	Brampton, Ont.	102.9	CJOB-FM	Winnipeg, Man.	97.5	CKRD-FM	Red Deer, Alta.	98.9
CFFM-FM-4	Clinton, B.C.—Re-broadcasting of CFFM-FM	106.5	CHLT-FM	Sherbrooke, Que.	102.1	CJOE-FM	Kelowna, B.C.	104.7	CKSO-FM	Sudbury, Ont.	92.7
CFFM-FM-5	Mount Timothy, B.C.—Re-broadcasting of CFFM-FM	99.7	CHML-FM	Hamilton, Ont.	95.3	CJRT-FM	Toronto, Ont.	91.1	CKTB-FM	St. Catharines, Ont.	97.7
CFMO-FM	Saskatoon, Sask.	103.9	CHNS-FM	Halifax, N.S.	96.1	CJSS-FM	Cornwall, Ont.	104.5	CKUA-FM	Edmonton, Alta.	98.1
			CHQM-FM	Vancouver, B.C.	103.5	CJUS-FM	Saskatoon, Sask.	89.7	CKVL-FM	Verdun, Que.	96.9
			CHRC-FM	Quebec, Que.	98.1	CKAT-FM	North Bay, Ont.	93.7	CKWM-FM	Kentville, N.S.	97.7
			CHSC-FM	St. Catharines, Ont.	105.7	CKCY-FM	Sault Ste. Marie, Ont.	104.3	CKWS-FM	Kingston, Ont.	96.3
						CKFM-FM	Toronto, Ont.	99.9	CKX-FM	Brantford, Man.	96.1
									CKY-FM	Winnipeg, Man.	92.1

Major Broadcast Stations in Mexico and the Caribbean

kHz	Call	Location	kHz	Call	Location	kHz	Call	Location	kHz	Call	Location
BAHAMAS			DOMINICAN REPUBLIC			MEXICO			SWAN ISLAND (United States)		
1540	ZNSI	Nassau	620	HISD	Santo Domingo	700	—	Montego Bay	990	XETG	Tuxtla Gutierrez
CUBA			690	HIAW	Santo Domingo	720	—	Kingston	1000	XEDY	Mexico City
570	CMHI	Santa Clara	790	HIL	Santo Domingo	750	—	Port Maria	1010	XEHL	Guadalajara
590	CMW	Havana	958	HIF	Puerto Plata	770	—	Mandeville	1030	XEQR	Mexico City
630	CMHQ	Santa Clara	1020	HJJP	Santo Domingo						
640	CMQ	Havana	1330	HIDB	Santiago de los Caballeros						
690	CMCB	Havana	1460	HIAN	Hato Mayor del Rey						
720	—	Colon	HAITI								
760	CMGD	Havana	1035	4VEC	Cap Hatien						
790	CMCH	Havana	JAMAICA								
830	CMCA	Havana	550	—	Montego Bay						
860	CMBL	Havana	560	—	Kingston						
870	CMDN	Guantanamo	580	—	Port Maria						
910	CMGX	Manzanaz	620	—	Mandeville						
930	CMBF	Isle de Pinos									
CURACAO (Netherlands, W. I.)											
855	PJC2	Willemstad (Curacao)									

World-Wide Short Wave Stations

■ Here we go again with another round of our real, *official* DX contest; the one with *no prizes*. Test your skill and equipment with the following:

1. Want to dig a not-too-often reported country? What about looking for Radio Afghanistan on 21585 kHz at 1100 to 1200 GMT.

2. How many U. S. Navy stations can you monitor on 2716 kHz in a 15 minute period? Here's a tip—listen after dark for best results.

3. How about trying your tuning ability on the rarest of the rare; Antarctica? There are no broadcasting stations there but you might hear communications station VLV

at Australia's Mawson Base. Look for VLV contacting McQuarie Island on 15845 (or sometimes 12255) kHz at 0900 GMT.

4. While we're looking for Antarctica, let's not forget that it gets pretty cold up north. Take a look at 8939 kHz and listen for an aeronautical communications net in Alaska, Canada, and on south to sunny California. How many different stations can you copy in a half hour?

5. Here's a new station—Radio Equis, in Managua, Nicaragua. Try for this one on 6025 kHz after 0100 GMT.

6. From the mysterious Himalaya Mountains we offer you the chance to log the tiny kingdom of Nepal. They have a new 100

WHITE'S RADIO LOG

kilowatt transmitter going on 4600 kHz at 1515.

7. Zambia, last nation on the country list since Zanzibar went out of business in 1964, is not too often reported. You can listen for the General Service of Radio Zambia on 7235 kHz around 0345 GMT. At around 0845 GMT they are also heard on either 7250 or 7260 kHz.

8. Hey, before you go feeling sorry for poor old out-of-business Zanzibar, they have opened up shop under the new name of Tanzania (after joining forces with Tanganyika). Their broadcasting station at Dar-es-Salaam is being reported on 4785 kHz at 1600 GMT. Also try for this station on 5985 kHz at 0300 GMT, and on 9550 kHz at 0900 GMT.

9. We wonder if any of you have ever logged the Faroe Islands; they are indeed rare on the airwaves. You might flip the receiver over to 9880 kHz around 0750 GMT to see if you can hear telephone station OKY39 which has been heard testing from Thorshavn in the Faroes.

10. Did you know that there were a number of CW (code) aeronautical beacons operating just above and below the standard broadcasting band? Some are in South America and Canada and are easily copied. Listen some night and see how many you

can hear in a half hour (15 minutes above the broadcast band and 15 minutes below).

Scoring. 10 points for numbers 1, 3, 5, 6, 7, 8, 9. You get 2 points for each of the stations in numbers 2, 4, 10. From 80 to 100 you're a champ; 50 to 79 you show promise; 30 to 49 you aren't trying hard enough; below 30 you need a better receiver and probably more patience!

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kHz	Call	Name	Location	GMT
2420	—	R. Sao Carlos	Sao Carlos, Brazil	0200

90-Meter Band—3200-3400 kHz

3204	—	Nigerian BC	Ibadan, Nigeria	0530
3222	—	Ici Lome	Lome, Togo	0530
3300	—	R. Belize	Belize, Brit. Hond.	0315
3326	—	Nigerian BC	Kaduna, Nigeria	0503
3330	—	Malawi BC	Blantyre Malawi	0500
3385	VL9BR	R. Rabaul	Rabaul, New Guinea	0800
3910	CR4AC	R. Barlavento	Cape Verde Is.	2300

60-Meter Band—4750-5060 kHz

4770	ELWA	R. Village	Monrovia, Liberia	0630
4820	HRVC	R. Evangelica	Tegucigalpa, Hond.	0330
	OAZ4G	R. La Oroya	La Oroya, Peru	0400
4860	YVPA	R. San Felipe	San Felipe Venez.	0530
4868	HJGT	R. Neiva	Neiva Colombia	0400
4890	YVKB	R. Venezuela	Caracas, Venez.	0230
4900	—	V. de la Revolucion	Conakry, Guinea	0600
4910	HCMJ1	E. Gran Colombia	Quito, Ecu.	0500
4911	—	R. Zambia	Lusaka, Zambia	0345
4918	YVKB	R. Venezuela	Caracas, Venez.	0230
4968	—	R. Kuwait	Kuwait	0500

kHz	Call	Name	Location	GMT
4970	YVLK	R. Rumbos	Caracas, Venez.	0245
4970	YVMQ	R. Barquisimeto	Barquisimeto, Venez.	0315
5035	—	R. Cristal	Sto. Domingo, Dom. Rep.	0300
5045	—	R. Bissau	Bissau, Port. Guinea	2330
5050	—	R. Tanzania	Sar es Salaam, Tanzania	0330
5180	OAX8F	R. Atlantida	Iquitos, Peru	0500
5805	—	R. Sanaa	Sanaa, Yemen	0300

49-Meter Band—5950-6200 kHz

5970	HJVN	R. Horizonte	Bogota Col.	2320
5980	—	R. Demrara	Georgetown, Guyana	0100
5995	HJGR	V. del Pueblo	Pereira, Col.	0140
6005	CFCX	Canadian Marconi	Montreal, Que.	1630
6015	—	R. Abidjan	Abidjan, Ivory Coast	2230
6070	CFRX	CFRX	Toronto, Ont.	1610
6075	—	R. Sutatenza	Colombia	0130
	HJHV	Accion Cultural	Bogota, Colombia	0100
	—	R. RSA	Johannesburg, S. Afr.	0215
6080	OAX4Z	R. Nac. de Peru	Lima, Peru	0100
6090	—	R. Prague	Prague, Czech.	0350

kHz	Call	Name	Location	GMT	kHz	Call	Name	Location	GMT
6100	TGOA	V. de las Americas	Guat. City, Guat.	2330	11900	—	R. RSA	Johannesburg, S. Afr.	0230
6105	XEQM	R. Frecuencia	Merida, Mex.	2030	11900	—	R. Kiev	Kiev, USSR	0300
6108	—	R. Alger	Algiers, Algeria	0600	11905	—	R. Tirana	Tirana, Albania	0000
6120	—	Swiss BC	Berne, Switz.	0220	11910	—	R. Bucapest	Budapest, Hungary	0030
6130	4VE	4VEH	Cap Haitien, Haiti	1010	11925	—	R. Tashkent	Tashkent, USSR	1200
6130	CHNX	CHNX	Halifax, N.S.	0345	11935	—	E. Nacional	Lisbon, Portugal	0415
6135	PRC21	R-TV Gaucha	Porto Alegre, Brazil	0940	11940	—	R. Bucharest	Bucharest, Rumania	0135
6150	—	BBC	London, England	0000	11946	ZPA5	R. Encarnacion	Asuncion, Paraguay	2245
6170	—	R. Habana	Havana, Cuba	0100	11955	—	BBC	London, England	0620
6175	ZYV74	R. Guarani	Belo Horizonte, Brazil	0700	11960	—	R. Moscow	Moscow, USSR	2220
6185	ZYR77	R. Bandeirantes	Sao Paulo, Brazil	0900	11965	—	United Arab BC	Cairo, Egypt	2155
6190	H19U	V. de la Libertad	Sto. Domingo, Dom. Rep.	2130	11970	—	Lebanese BC	Beirut, Lebanon	0325
6195	4VHW	R. Haiti	Port au Prince, Haiti	2120	11980	—	R. Kiev	Kiev, USSR	0030
6207	TIHGB	R. Reloj	San Jose, C.R.	0430	11990	—	R. Prague	Prague, Czech.	0335

41-Meter Band—7100-7300 kHz

7115	—	R. Nac. Congolaise	Kinshasa, Congo Dem. Rep.	0400
7172	—	R. Singapura	Singapore	1030
7190	—	R. Australia	Melbourne, Australia	1115
7260	—	BBC	London, England	0420
9360	—	R. Nacional	Madrid, Spain	2330
9455	OAX4W	R. America	Lima, Peru	0230
9475	—	United Arab BC	Cairo, Egypt	0215

31-Meter Band—9500-9775 kHz

9515	XEWV	V. de Amer. Latina	Mexico City, Mex.	0200
9520	OZF5	R. Denmark	Copenhagen, Denmark	0200
9545	—	R. Ghana	Accra, Ghana	2045
9570	—	R. Bucharest	Bucharest, Rumania	2230
9635	ZYR83	R. Aparecudia	Aparecudia, Brazil	0935
9640	DMQ9	Deutsche Welle	Cologne, W. Germany	0145
9665	HEU3	Swiss BC	Berne, Switz.	2010
9670	—	R. Ceylon	Colombo, Ceylon	1230
9675	—	R. Warsaw	Warsaw, Poland	0730
9675	—	R. Berlin Int'l.	Berlin, E. Germany	0115
9695	—	Vatican R.	Vatican City	0055
9690	—	Trans World R.	Bonaire, Neth. Antilles	0255
9700	—	R. Sofia	Sofia, Bulgaria	0000
9710	—	Trans World R.	Bonaire, Neth. Antilles	1045
9730	—	R. Berlin Int'l.	Berlin, E. Germany	0100
9770	—	Viennese R.	Vienna, Austria	0130
9833	—	R. Budapest	Budapest, Hungary	0030
10035	—	R. Peking	Peking, China	1310
11695	—	United Arab BC	Cairo, Egypt	0415
11703	—	R. Moscow	Moscow, USSR	1900
11705	—	NHK	Tokyo, Japan	1630
11715	—	Swiss BC	Berne, Switz.	0135
11730	—	R. Nederland	Hilversum, Neth.	1955
11735	—	R. Habana	Havana, Cuba	2030

25-Meter Band—11750-11975 kHz

11750	—	BBC	Tabrau, Malaysia	1600
11770	—	R. Kabul	Kabul, Afghanistan	1800
—	—	Far East BC	Manila, Philippines	1630
11785	—	R. Sweden	Stockholm, Sweden	0035
11800	—	R. Sofia	Sofia, Bulgaria	1930
—	—	R. Nacional	Canary Is.	0130
11805	ZYZ36	R. Globo	Rio de Janeiro, Brazil	0000
—	—	R. Sweden	Stockholm, Sweden	2015
11810	—	RAI	Rome, Italy	0110
11815	—	NHK	Tokyo, Japan	2100
—	—	Trans World R.	Bonaire, Neth. Antilles	0030
11820	XEBR	Heraldo de Sonora	Mexico City, Mex.	0950
11825	—	BBC	London, England	0540
11830	—	V. America	Greenville, N.C.	0220
11835	4VEJ	4VEH	Cap Haitien, Haiti	0300
11840	—	R. Warsaw	Warsaw, Poland	2210
11850	—	R. Ghana	Accra, Ghana	2030
—	—	R. Moscow	Moscow, USSR	0645
11865	—	RBC	Ascension I.	2300
11866	—	R. Nac. Congolaise	Lubumbashi, Congo Dem. R.	2100
11875	—	R. RSA	Johannesburg, S. Afr.	2345
11890	—	Far East BC	Manila, Philippines	1630

11900	—	R. RSA	Johannesburg, S. Afr.	0230
11900	—	R. Kiev	Kiev, USSR	0300
11905	—	R. Tirana	Tirana, Albania	0000
11910	—	R. Bucapest	Budapest, Hungary	0030
11925	—	R. Tashkent	Tashkent, USSR	1200
11935	—	E. Nacional	Lisbon, Portugal	0415
11940	—	R. Bucharest	Bucharest, Rumania	0135
11946	ZPA5	R. Encarnacion	Asuncion, Paraguay	2245
11955	—	BBC	London, England	0620
11960	—	R. Moscow	Moscow, USSR	2220
11965	—	United Arab BC	Cairo, Egypt	2155
11970	—	Lebanese BC	Beirut, Lebanon	0325
11970	—	West Indies BC	St. Georges, Grenada	2300
11980	—	R. Kiev	Kiev, USSR	0030
11990	—	R. Prague	Prague, Czech.	0335
12000	—	R. Armavir	Armavir, USSR	0410
12005	—	United Arab BC	Cairo, Egypt	2218
15060	—	R. Peking	Peking, China	1615
—	—	R. Euzkadi	(clandestine)	2300
15070	—	BBC	London, England	1515
15080	VUD	All India R.	Delhi, India	1830

19-Meter Band—15100-15450 kHz

15105	—	Windward Is. BC	St. Georges, Grenada	1600
—	—	NHK	Tokyo, Japan	1700
ZYZ32	—	R. Rural Brasilia	Rio de Janeiro, Brazil	2200
15110	ZL21	R. New Zealand	Wellington, N.Z.	0430
—	XERR	R. Comerciales	Mexico City, Mex.	2330
15115	HCBJ	V. of Andes	Quito, Ecuador	0040
15120	—	Vatican R.	Vatican City	1500
15130	—	Ici Paris	Paris, France	2100
15135	—	Windward Is. BC	St. Georges, Grenada	2200
15140	—	R. Moscow	Moscow, USSR	1830
15155	ELWA	R. Village	Monrovia, Liberia	2145
15160	—	R. Budapest	Budapest, Hungary	0045
—	—	R. Ankara	Ankara, Turkey	2200
15165	OZF7	R. Denmark	Copenhagen, Denmark	1215
15180	—	R. Moscow	Moscow, USSR	0605
15185	—	Finnish BC	Pori, Finland	2255
—	—	Vatican R.	Vatican City	0030
15190	—	R. Brazzaville	Brazzaville, Congo Rep.	1940
—	—	V. America	Rhodes, Greece	2250
15195	—	V. America	Munich, W. Germany	1350
15210	—	Viennese R.	Vienna, Austria	1855
—	—	R. Vilnius	Vilnius, USSR	2230
15220	—	R. Bucharest	Bucharest, Rumania	0130
15250	—	V. America	Manila, Philippines	1035
15265	—	R. Kabul	Kabul, Afghanistan	1800
15270	—	R. Habana	Havana, Cuba	1630
15280	ZL4	R. New Zealand	Wellington, N.Z.	0350
15285	—	Vatican R.	Vatican City	0050
15300	—	R. Habana	Havana, Cuba	1600
—	—	BBC	London, England	1600
15305	HER6	Swiss BC	Berne, Switz.	2315
15315	ETLF	R. V. Gospel	Addis Ababa, Ethiopia	1330
15320	—	R. Canada	Montreal, Que.	2015
—	—	R. Australia	Melbourne, Australia	0130
—	—	R. Nederland	Hilversum, Neth.	2310
15330	—	R. Australia	Melbourne, Australia	0100
—	HJZP	R. Nacional	Bogota, Colombia	0305
—	—	R. Pakistan	Karachi, Pakistan	0400
15350	—	R. RSA	Johannesburg, S. Afr.	2355
—	—	R. Berlin Int'l.	Berlin, E. Germany	2300
—	—	R. Luxembourg	Louvigny, Luxembourg	2330
15360	—	Viennese R.	Vienna, Austria	2315
15368	—	R. Prague	Prague, Czech.	2358
15400	ETLF	R. V. of Gospel	Addis Ababa, Ethiopia	1335
15405	—	Trans World R.	Bonaire, Neth. Ant.	2000
15410	—	Viennese R.	Vienna, Austria	0000
15425	—	R. Nederland	Hilversum, Neth.	2105
15426	—	V. Free Korea	Seoul, Korea	0300
15430	—	Viennese R.	Vienna, Austria	0000
15445	—	R. Nacional	Brasilia, Brazil	0320
15460	—	R. Kiev	Kiev, USSR	0030
17690	—	United Arab BC	Cairo, Egypt	2200

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kHz Call Name Location GMT

16-Meter Band—17700-17900 kHz

kHz	Call	Name	Location	GMT
17720	—	V. Free China	Taipei, Formosa	0230
17745	—	R. Pakistan	Karachi, Pakistan	0045
17770	—	RAI	Rome, Italy	0305
17775	—	V. America	Monrovia, Liberia	2200
17785	—	Yerevan Calling	Yerevan, USSR	0325
17790	—	NHK	Tokyo, Japan	2300
17790	—	BBC	London, England	2115
17805	—	R. RSA	Johannesburg, S. Afr.	1440
17815	ZYR58	R. Cultura	Sao Paulo, Brazil	0005
17820	—	R. Australia	Melbourne, Australia	0350
17825	LLN	R. Norway	Oslo, Norway	2000
17830	—	Swiss BC	Berne, Switz.	2330
17840	—	R. Australia	Melbourne,	

kHz Call Name Location GMT

17860	—	Vatican R.	Australia	0230
17865	—	United Arab BC	Vatican City	2330
17870	—	BBC	Cairo, Egypt	2350
—	—	R. Australia	London, England	2250
—	—	—	Melbourne, Australia	0324
17875	PRL2	R. Ministerio Educ.	Rio de Janeiro, Brazil	2300
17890	HCJB	V. of Andes	Quito, Ecuador	2300
18736	—	Posts & Telegraph	Amsterdam, Neth.	2355

13-Meter Band—21450-21750 kHz

21495	CSA67	E. Nacional	Lisbon, Portugal	1347
21500	—	Armed Forces R.	Dixon, Calif.	0115
21530	WNYW	R. New York	New York, N.Y.	2030
21540	—	R. Australia	Melbourne, Australia	0239
21570	—	R. Nederland	Hilversum, Netherlands	1730
21610	—	BBC	London, England	1640
21630	—	V. America	Dixon, Calif.	0055
21670	—	V. America	Monrovia, Liberia	1650
21690	—	V. America	Tangier, Algeria	1400
21700	CSA46	E. Nacional	Cape Verde Is.	1620
25900	LLA	R. Norway	Oslo, Norway	1825

Be A Sinless CBer

Continued from page 63

One thing to remember, the transmission of a false distress or emergency call is a very serious offense and anyone caught playing this game is usually put into orbit by the FCC. The word *MAYDAY* is the international radio-telephone distress signal—never use it except when the safety of life is directly involved.

A flat tire on a lonely road may be a rotten break for you, but it does not call for a *MAYDAY*. If your car is involved in an accident where an ambulance or other medical aid is immediately required (or even if you come upon someone else's *serious* accident) you can clear the channel with a *MAYDAY*, then proceed with the message of *who, where and when*.

When you've got a priority emergency or distress message, we suggest that you first fire up the CB rig on Channel 9. Call for any REACT station within range. That failing (and it seldom will fail), try to raise any station. Any CBer hearing the call will be only too anxious to offer you every possible cooperation and aid. Be brief and to the point, but give all pertinent details.

Operating Technique. No need to shout into your microphone when transmitting, all you'll accomplish is the distortion of your voice to the point where you can't be understood.

If you can't get through by talking in a normal tone of voice with the mike about

3 or 4 inches in front of your mouth, then there is probably something wrong with your CB rig, or with the receiver at the other end of the contact.

Speak slowly and distinctly, and avoid long transmissions. The old maxim is, "Good grief, be brief!"

Summary. Keep these things in mind before you pick up your mike and press to talk:

1. Know the FCC's CB rules, and live by them.

2. Use Channel 9 only for making the initial contact, then switch to another channel.

3. Monitor Channel 9 while you are not in communications.

4. Answer any call for aid.

5. Be courteous to all other stations; remember that no station has priority use of a channel (except in an emergency) and all must share and share alike.

6. Don't transmit without first listening long enough to be certain that the channel is not in use.

7. Don't use CB when a telephone is available.

8. Immediately reply to any FCC correspondence.

9. Be brief, but speak slowly and distinctly. Don't shout.

10. If you suspect that your equipment isn't functioning properly, don't use it until it has been checked (and repaired if necessary) by a licensed and qualified service technician.

Those are CB's 10 Commandments. Don't be a CB sinner. ■

New Products

Continued from page 34

sistance ranges for general, low and high resistance applications. Other ranges on special order. For more info write for Bulletin 501.1, Vytell Corp., Box 92, Arlington Heights, Ill. Price of Pack is \$3.49.

Kits for Experimenter Kats



So you're tired of electronic kits that lay out every move leaving nothing for the experimenter to fool with? Then you'd better investigate the new Radio Shack kit line that packs perf-board electronic projects which you bread-board. Flea clips packed with the kits let you solder or just connect—you change parts, redesign layout, or save parts easily. Six kits are currently available. They are: AC/DC power supply (No. 28-104, \$6.95); "OTL" audio amplifier (No. 28-106, \$4.95); transistor radio kit (No. 28-102, \$3.95); transistor organ (No. 28-101, \$5.95); wireless AM mike (No. 28-103, \$3.95); 1-tube DC radio (No. 28-100, \$3.95). At all Radio Shack stores; or write to Radio Shack Corp., 730 Commonwealth Ave., Boston, Mass. 02217, or 2727 W. 7th St., Fort Worth, Texas 76107, whichever is closer to you.

SWLing De Luxe!

The brand-new Heathkit SB-310 receiver will delight the finicky shortwave listener with selectivity that does away with guessing station identities—you return to the *exact* frequency every time. With its non-backlash vernier dial you get 10 switch-selected bands; 49, 41, 31, 25, 19 and 16-meter shortwave; 11-meter CB; and 80, 40 and 20-meter amateur bands. A 5-kHz crystal filter is included for AM, CW and SSB (there are optional narrower bandwidth filters for optimum CW and switch-selected upper and lower sideband coverage). The SB-310 also boasts a crystal-controlled front-end



Heathkit SB-310 Shortwave Receiver Kit

for same tuning rate on all bands, built-in switch-selected automatic noise limiter, prebuilt and aligned Linear Master Oscillator, separate RF and AF gain controls, calibrated S meter, headphone jack for DXing. "Subpack" packaging makes 20-hr. assembly possible, requiring only a VTVM for final alignment. The SB-310 kit is \$249.00 (less speaker), and the Heath Co., Benton Harbor, Mich. 49022, will be happy to supply you with further information.

Adds Multi-Miking to PA or Recorder

The Bogen MX6A-T mixer-preamplifier is an AC-powered, all-silicon, solid-state unit which can be used singly to add 4 more microphones or other signals to an existing system. The 4 inputs can handle either high- or low-impedance microphones or electric guitars, each under continuous control through individual volume controls. Also, two of the 4 channels will accept



Bogen MX6A-T Solid-State Mixer-Preamplifier

tuner or crystal cartridge signals. The output of the MX6A-T is capable of driving any packaged amplifier through its auxiliary input, and it will also drive power amplifiers with 5-volt or better sensitivity. The unit uses standard phone jacks for high-impedance microphones and guitars; screw terminals for low-impedance microphones; RCA-type phono jacks for output to auxiliary input of public address amplifier or tape recorder. Size: 9/4 x 6 x 2 5/8-in.; weight, less than 5 lb.; price, \$74.85. Ask for further specs from Bogen Communications Div., Box 500, Paramus, N. J. 07652.

Tool Kit Par Excellence

There's everything in the JTK-5 tool kit by Jensen Tools that an electronics technician or experimenter could want for breadboarding. Listen: 2 needle files, 2 regular files, scribe, precision knife, 12-piece nut-driver, 2 wire-bending pliers, 2 diagonal cutters, slip-joint pliers, scissors, 7 screwdrivers, scale, slide caliper, soldering iron and solder, soldering aid set, tweezers, wire stripper, adjustable wrench, hex and spline-key wrench sets, 3/8-in. electric drill, drill case and set of 14 high-speed drills, socket hole punches (set of 4), ball peen hammer, center punch, hacksaw, taps, reamer, and 2 electronic alignment tools. All this in a 6 x 6 x 19-in. steel toolbox with tray. Price is \$99.50. For a catalog describing the JTK-5 and other tool kits write to Jensen Tools, 3630 E. Indian School Rd., Phoenix, Ariz. 85018.

Phono Front End

Continued from page 86

the crystal element. Do not put any pressure on or disturb the saddle: accidentally dropping the pickup arm may also destroy or crack the cartridge.

The defective stylus should be removed and taken to a record shop or TV dealer for replacement. If it has broken into several pieces, take all of them with you to help identify the part.

You can also locate the stylus replacement part number by referring to the manufacturer's operation booklet. If the booklet is lost, look at the back of the console or underneath the back cover for a model number. If possible, the original stylus should be replaced with one carrying the same part number. But in case the brochure has been thrown away and the model number of the phonograph torn off, take the old stylus with you.

In A Haystack. Perhaps the stylus has dropped out and can't be found; draw the outline of it as you remember it. Since there are dozens of different styli types, you're not likely to describe it properly and hope to return with the right one.

It is wise to scotch- or mask-tape the old stylus carton number to the back of the record compartment. The next time you need a new one, the information is close at hand. Don't leave the whole carton in the record compartment; during cleaning it can easily be thrown away.

After the stylus has been replaced, be sure its shank is lying in the "U" shaped saddle shown in Fig. 16. The stylus might be bent out of place, not touching the saddle—the result will be no music. A lot of styli are destroyed or lost when the cleaning cloth snags it during routine dusting.

It may be rather difficult to replace the stylus if the pickup arm will only pull up a few inches. In this case, drop the phono cartridge down by loosening the two side mounting screws and then replace the stylus.

Cartridge Check. Before removing the stylus, always check to see if the cartridge is functioning. Take your thumb or finger and lightly draw across the stylus. You should hear a thumping or rumbling noise. If so, the cartridge and amplifier are working.

In case there is no noise at all, the cartridge, amplifier or speaker is dead. Turn the

volume on the amplifier wide open. If a hum is heard, suspect a defective cartridge.

Remove the cartridge hook-up wires and place a finger or the blade of a small screwdriver against one of the unshielded wires. You should hear a loud hum. If so, the cartridge is defective. If not, the amplifier or speaker is dead.

There may be two, three or four wires leading to the phono cartridge. The monaural cartridge has only two wires connected to it, as shown in Fig. 17. It may consist of a small shielded cable. Some low-priced phonographs have two separate, unshielded wires.

A phono cartridge with three or four wires indicates a stereo unit. Generally, the ground or shielded wire goes to each side of the cartridge with the "hot" or grid wires being inside of the braided shield, as indicated in Fig. 18.

Defective Cartridge. A defective phono cartridge may be cracked, become weak, and produce distorted, intermittent or mushy sound. The weak or dead cartridge will produce mushy or no sound in the speaker. A cracked cartridge will work intermittently. A cracked cartridge may result from dropping the pickup arm. See Fig. 19.

It is possible to have distortion or intermittent pickup in only one stereo channel. You can isolate the cartridge by switching the two channel hook-up cables. Either switch the cable at the amplifier or the cartridge hook-up wires.

For instance, if the left channel is good and the right channel is mushy, distorted, or intermittent, switch the outside cartridge hook-up wires. If the right channel is still inoperative, you know the cartridge must be replaced.

Intermittent. Now check for intermittent conditions while the switched wires are in this position. Simply place a new record on the turntable and apply a little pressure on the pickup arm. Be careful and use one finger to push up and down on the pickup arm. The intermittent cartridge will snap off and on with intermittent music. In case the amplifier is defective, a good place to start is to check all tubes.

Replacing The Cartridge. Some phono cartridges are bolted to the pickup arm while others snap into position. Hold the pickup arm up where you can see the cartridge. Usually, mounting screws will be located on each side of the cartridge assembly. A short Phillips screwdriver may be needed to get to

the screws. Snap-in type cartridges will pull down from the front end of the unit.

Other turn-over cartridges may be removed by first removing the small set-screw in the turn-over knob. A typical turn-over cartridge appears in Fig. 20. A thin screwdriver blade is needed to remove the small recessed screw. Be careful not to lose the small screw or tension spring on removing the cartridge.

After the phono cartridge has been dismounted, unhook the small connecting wires. Write the color code of each wire on a piece of scrap paper. Look for a ground wire under the cartridge mounting screws. See Fig. 21. Most connecting wires just plug into the cartridge. Others solder to a plug-on adapter as in Fig. 22.

Clip Care. Be careful when replacing or removing small wire clips. In case the wires are frayed at this point, resolder the clip connection; be sure it is removed from the cartridge when soldering, as excessive heat can destroy the cartridge.

Use rosin-core solder sparingly, as excessive solder can run into the clip and plug up the connection hole. It is best to grasp the clip with a pair of long-nose pliers close to the area to be soldered so solder can't run into the plug or connection.

Connecting wires on a turn-over cartridge can break off or become frayed and short against one another. Poor or no sound can result from this condition. Check the wire connection on all replaced cartridges for possible trouble.

Excessive hum from the phonograph may be caused by an open ground or connecting

wire. Turn the volume down to see if hum originates in the amplifier or tone arm. If the hum is still present, check for a dried-out electrolytic filter capacitor in the amplifier and replace it.

In case the hum disappears when the volume is down, look for a broken wire or shielded cable. A defective cartridge can induce hum when the amplifier volume is wide open. This is the result of the cartridge output voltage failing to override the open ground or grid line. Try reversing the two cartridge wires in a monaural phonograph. Check the common center ground wire in a stereo pickup arm for an open circuit.

Genuine Parts Only. A cartridge should be replaced with the original part if possible. If not, there are many replacement cartridges on the market. See Fig. 23. Be sure the new cartridge has approximately the same output voltages and weight as the original. Correct weight may be checked if a stylus pressure gauge is handy.

Check the cartridge for correct wiring connections after installing the new cartridge. See that the stylus is riding in the "U" shaped saddle. If the cartridge is the turn-over type, rotate the turn-over knob to see that the small wires and clips do not touch. Now turn the volume up and thumb the needle of the new cartridge. A rough sound should be heard.

Check The Changer. While replacing the stylus or cartridge, a few, quick checks should be made on the record changer.

See if the pickup arm sets down at the starting point of the record. If not, look for adjustment screw on back or underneath the arm. Adjust until satisfied that the landing point on two or three different records is correct.

Now check the inside reject point. This adjustment is under chassis and it is wise to let a known Radio-TV repair shop make this and other critical adjustments. If 45 RPM records don't change as they should, use talcum powder on the large spindle.

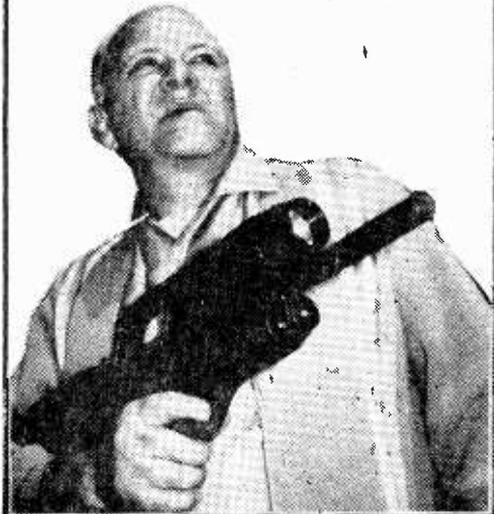
You may even want to pull the record changer or record board from the cabinet to clean up properly. See Fig. 24. Generally, several Phillips head screws hold the turntable to the cabinet. To check adjustments on the record changer, you can prop it up on two quart paint cans.

Armed with the straight dope, the future care and feeding of your record player shouldn't be a problem, and can even be downright fun. Happy playing. ■



Fig. 24. Most changers can be removed for servicing by unscrewing the two bolts on each side of the base plate.

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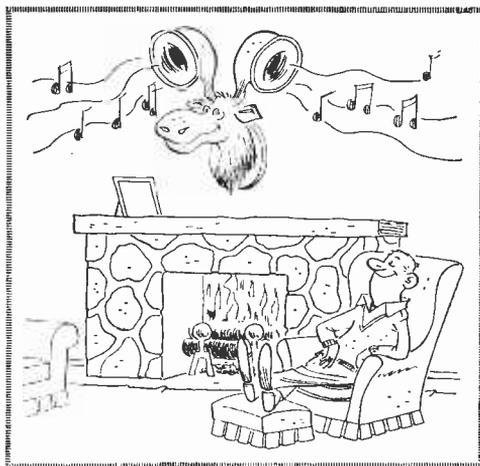
Continued from page 65

through the written word and still photos. A video camera can pan across a broad scene to show the relationship of objects one to another; an observer can simultaneously add voice descriptions to the sound track. Also, the re-enactment of crimes would be more vivid and informative if put on video tape than if described only in written reports.

Roving Record. Mobile equipment could be used by police for surveillance work in areas where trouble can be anticipated. A police officer in a patrol car (or in a van or truck not identifiable as a police vehicle) could tape a street scene, then retape it during later trips through the area. Simultaneous comparison playbacks of the tapes would instantly reveal any changes that had taken place in the period between tapings; the tapes would eliminate normal human errors deriving from limited observation or recall. This surveillance technique would be akin to aerial reconnaissance methods used in warfare.

Making a dishonest living is getting tougher all the time, and video tape is apparently going to make it even tougher. When someone taps lightfingered Louie on the shoulder and says "Smile, Crookster, you are on candid camera," it isn't likely to be the amiable and talented Allen Funt of TV fame. It will be a camera-toting police officer talking.

But a sense of humor won't help the law-breaker very much. We suspect that the real laughing will be done in the police squad room when Louie's TV performance hits the monitor screen. ■



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Variometer Radio

Continued from page 48

Variometer Radio. One diagram shows the variometer used in a crystal radio. This hook-up is beautiful in its simplicity and performs well when used with a good water pipe ground, and an outdoor antenna at least 50 feet long. A variometer is not very selective when used alone in a tuned circuit, but it is fine for the many localities where there are only a few local broadcast stations.

The other diagram shows the variometer used in a diode-transistor radio, the transistor providing one stage of audio amplification. No battery switch is used—you cut the current by pulling out one of the ear-phone cord tips.

You might want to try other experiments, such as connecting a 365-pF variable capacitor across the variometer, or in series with the antenna lead to increase selectivity and tuning range.

In any case, resurrection of this quaint variable inductor can be both an interesting and informative way to spend a few hours. And the use of a little imagination can undoubtedly find a variety of other uses for this oldie, but goody. ■

News Central

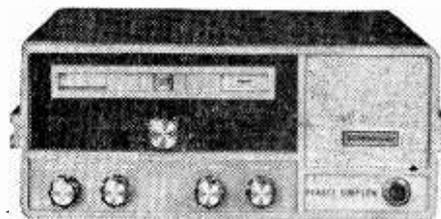
Continued from page 94

Utility Happenings. While we have dealt mostly with SWBC transmissions, utility and distant BCB stations can play a part in the SWLs search for news. Of particular importance in the utility field are 2182 kHz, the international (marine) distress and calling frequency; and 2670 kHz, the U. S. Coast Guard calling and distress channel. Whenever there is an emergency at sea, these are definitely the stops to tune the rig to. Of course, DX reception is possible only at night.

Meanwhile, during local emergencies such as flood, riot, or hurricane, AM broadcast band stations in the affected area will often remain on the air all night. Sometimes even stations with daytime-only licenses will be permitted by the FCC to remain on during the hours of darkness. And when such troubles do occur, you will be able to quickly determine frequencies from WHITE'S RADIO LOG and virtually be where the action is. ■

CB Rigs & Rigmarole

Continued from page 30



Pearce-Simpson Guardian 23B Transceiver

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The 23B comes equipped for transmitting and receiving on all 23 CB channels. All you need buy is a microphone (base station type) on a stand and you're in business. Price of the 23B is \$269.90. This unit was tested and reported on in the CB BUYER'S GUIDE, 1967 Edition by the Editors of this magazine. Some of the hot specs are: input sensitivity, 0.4 μ V; adjacent channel rejection, 65 dB; image rejection, 90 dB. Check the GUIDE for the complete report.

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J. Statistis, 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 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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