SCIENCE and MECHANICS

26 NEW PROJECTS

RADIO-TV EXPERIMENTER

No. 582 Winter '61-'62

75c

2-WAY RADIOPHONE

PLUS EXPANDED

WHITE'S RADIO LOG

500 Changes • New, Up-to-Date
AM-FM-TV STATIONS
WORLD-WIDE SHORT WAVE

5-Way $5 Radio

1-Transistor Tuner

2-Transistor Amplifier

Underwater Metal Locator

Home Hi-Fi Reverb System

CB-Controlled Model Destroyer

Neon Gas Tube Experimenting Set

AMERICAN BASIC SCIENCE CLUB

Sensational LOW COST SCIENCE LAB

NOW over 110 fascinating projects with

SOUND · ELECTRICITY · HEAT · ELECTRONICS · LIGHT · ATOMIC ENERGY

COMPLETE LABORATORY COMES IN 8 KITS, ONE A MONTH... SUPPLIES ALL THE EQUIPMENT FOR ALL THE FOLLOWING:

ELECTRICAL EXPERIMENTS
Educational fun with Electro-Magnets, Transformer, Galvanometer, Rheostat, Relay, Voltmeter, Wheatstone Bridge, and other electric equipment.

RADIO RECEIVER
Three Tube Short Wave (80 Meter) and Standard Broadcast Receiver. Sensitive Regenerative Circuit uses regular 115 volt AC. Complete with Head Set.

DC POWER SUPPLY
Power Transformer, Vacuum Tube Rectifier and 20-20 mfd. Capacitor Filter Circuit. Converts home AC to the DC required for Electronic Circuits.

PHOTOELECTRIC EYE
Photoelectric Cell, Exciter lamp — and Electronic Relay. Everything you need to control motors, bells, alarms, and do other light beam experiments.

MICROPHONE
A sensitive carbon-button microphone that greatly amplifies unsuspected noise. Also adaptable for use with your radio transmitter.

ELECTRONIC EXPERIMENTS
Explore functions of vacuum tubes and other electronic components. Build an Electronic Switch—Amplifier, and other experimental circuits.

CODE PRACTICE SET
Signal Oscillator, Key and Flasher ... the complete outfit to learn to receive and transmit the Morse Code ... the first step to a Ham License.

STROBE LIGHT
A variable pulse neon lamp "Freezes" motion of rapidly vibrating or rotating objects for close study and checking frequencies, RPM.

BROADCAST TRANSMITTER
Sends clear transmissions of both code and voice to nearby radios. Can be used with your microphone, record player, or code oscillator.

RADIO SERVICE EQUIPMENT
All the parts to build your own Radio Signal Tracer and a Probe Light Continuity Tester. Both pieces are invaluable in radio servicing.

SOUND EXPERIMENTS
Laboratory demonstration of sound waves, resonance and pitch. Includes Variable Frequency Oscillator, Sonometer and Ripple Tank

TELESCOPE
A mounted astronomical Telescope. High quality ground Lenses enable you to examine details of the moon's surface and distant objects.

PHOTOGRAPHY LAB
Complete dark room equipment: Printer — Enlarger — Electronic Timer — Safe Light — Developing Trays and supply of paper and chemicals.

SLIDE PROJECTOR
Takes 16mm and 35mm slides, sharp focusing, convection cooled. G.E. Projection Lamp included. Also adaptable as a Projection Microscope.

MICROSCOPE
High and low power, precision ground Lenses, Substage Light and Polarizer. Adaptable for photomicrography in connection with Photo Lab.

SPECTROSCOPE
Fascinating optical instrument used to identify and analyze substances by observing the spectrum of their flame. Spectrum charts are included.

ATOMIC RADIATION EXPM.
A variety of projects using Spintharicope and sensitive Electroscope. Radioactive sources included are Uranium Ore and Radium.

ATOMIC CLOUD CHAMBER
See illuminated tracks of speeding nuclear particles emanating from radioactive Alpha source and mysterious cosmic rays from outer space.

ULTRAVIOLET LAMP
Produce dazzling color effects with invisible "black light". Used extensively for crime detection, mineralogy and science. Fluorescent Ink, Crayon and Tracer Powder are included.

HEAT EXPERIMENTS
Study the Molecular Theory of heat using 2 Thermometers, Thermostat, 3 foot Gas Thermometer and special Microscope arrangement that shows the effect of Molecular Movement.

WEATHER STATION
Aneroid Barometer, Cup Anemometer that electronically measures wind speed. Sling Psychrometer, Humidity Gauge. Cloud Speed Indicator, Cloud Chart and Weather Map.

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Developed with World Famous
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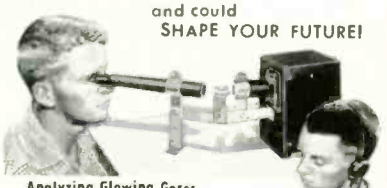
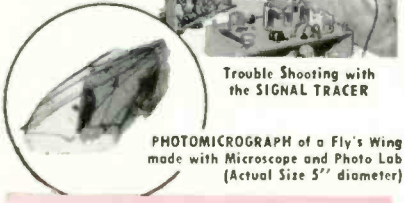
NO EXPERIENCE NECESSARY

You can complete every project and gain a VALUABLE SCIENCE BACKGROUND that will ENRICH YOUR LIFE and could SHAPE YOUR FUTURE!



Analyzing Glowing Gases with the SPECTROSCOPE



Trouble Shooting with the SIGNAL TRACER

PHOTOMICROGRAPH of a Fly's Wing made with Microscope and Photo Lab (Actual Size 5" diameter)

ALL THE EQUIPMENT FOR ALL THE ABOVE-only $29.60

SEND ONLY $2.00 WITH COUPON — PAY ONLY $3.45 FOR EACH KIT YOU RECEIVE (ONE A MONTH FOR 8 MONTHS)

FREE SOLDERING IRON with second Kit

Your Satisfaction or Your Money Back... AND you may cancel at any time without obligation. These "no risk" assurances because we know you will be...

SURPRISED! AMAZED! DELIGHTED!

A VALUABLE SCIENCE LAB
Containing Parts by RCA, MALLORY, PYRAMID, G.E., STACKPOLE, TRIM and other reliable manufacturers. Retail Value of Parts Alone is over FIFTY DOLLARS

FOR SAFETY! Circuits are low voltage supplied by isolation transformer that comes with first Kit

PHOTOGRAPHY Darkroom Handbook
WEATHER Forecasting
MICROSCOPY The World Beyond Your Lens
Steps to HAM LICENSE
Simplified RADIO-TV Servicing
ULTRAVIOLET Applications

MEMBERS ARE ENTHUSIASTIC!

I wish I could provide each of my Physics students with all of your enjoyable kits. You are doing a wonderful job.
Allen T. Ayers, Physics Dept. Jamestown High School Jamestown, New York

Your course is very enjoyable and educational for all ages. I would not sell mine for twice the price
Francis Pitcher 13 Friendship Dr Tivoli, New York

FREE! These 6 Auxiliary Textbooks

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501 E. Crockett, San Antonio 6, Texas

Start sending me A.B.S.C.'s "Science Lab" in eight kits, one each month. If not satisfied on inspection of first kit I may return it for immediate refund. (I choose the plan checked)

( ) I enclose $2.00 and will pay $3.45 plus COD postage on arrival of each kit. I may cancel unshipped kits at any time

( ) I enclose $29.60, full payment, **Postage Paid**, for all 8 kits. I may cancel any time and get full refund on unshipped kits.

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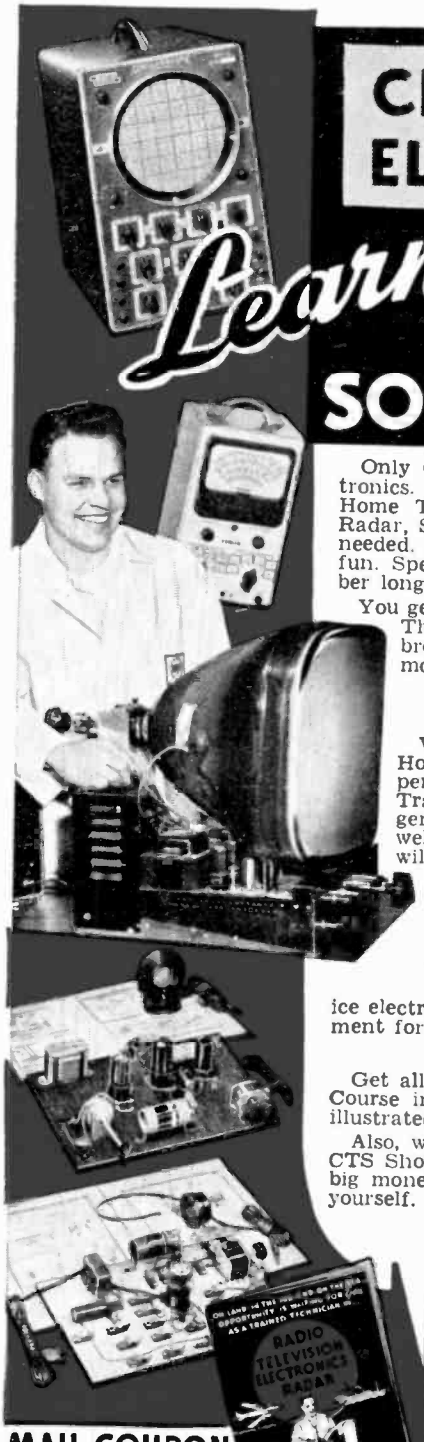
CHRISTY'S *Complete* ELECTRONIC COURSE

Learn TELEVISION, RADIO, RADAR, SONAR, ELECTRONICS



Only CTS offers you *COMPLETE* training in all phases of Electronics. Why be satisfied with less? The new Christy Shop-Method Home Training makes learning interesting and easy. You learn Radar, Sonar, Electronics, Radio, Television. No previous experience needed. You learn by working with actual equipment. Makes learning fun. Speeds your progress. Helps you understand quicker and remember longer.

You get comprehensive training starting with your first CTS lesson! The complete knowledge CTS provides you with, gives you a broader knowledge, a greater understanding which will mean more jobs and a higher income for you for the rest of your life.

HOME LABORATORY SENT! 19 TRAINING INSTRUMENTS INCLUDED

With CTS *COMPLETE* Home Training Course, you receive a Home Laboratory to assemble, use and keep for years of peak performance. You receive a Multi-Tester, Oscillator, Signal Tracer, Oscilloscope, Signal Generator, Electronic Timer, Regenerative Radio, Giant-size Television Receiver (optional) as well as many other valuable electronic devices. With these you will be able to make hundreds upon hundreds of exciting experiments.

EARN WHILE YOU LEARN! EARN $5.00—$6.00 PER HOUR

Or *MORE* while still studying! Almost from the very first you receive training that enables you to repair radios and television sets for friends and neighbors. To install and service electronic computers, communication equipment, protective equipment for police and fire departments, etc., etc.

FREE BOOK—SAMPLE LESSONS SENT

Get all there is to know about the Christy *COMPLETE* Electronic Course in Radio-Television-Radar-Sonar, etc. A complete, colorful, illustrated book on Electronics sent without obligation.

Also, we will send you Two sample lessons showing how the new CTS Shop-Method Home Training Course will train you for making big money in your spare time and for building a bright future for yourself.

CHRISTY TRADES SCHOOL, Dept. T-409, 3214-16 W. Lawrence Ave., Chicago 25

SIGN, MAIL FOR THREE BOOKS

MAIL COUPON TODAY FOR CATALOG!

Christy Trades School, Dept. T-409, 3214-16 W. Lawrence Ave., Chicago 25, Ill.

Gentlemen:
Please send me, without cost or obligation, two *FREE* lessons and the new 24-Page illustrated book telling all about the CTS Master Shop Method Home Training Course in Radar, Sonar, Television, Radio and Electronics, and the many opportunities this new field offers.

Name..... Age.....

Address .....

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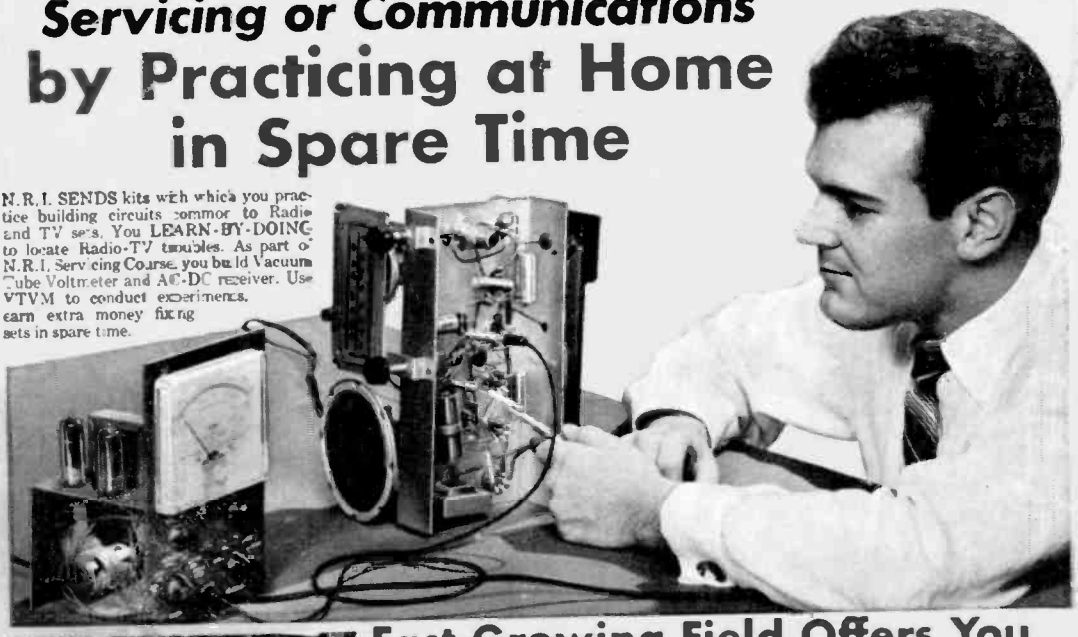
Learn Radio-Television

Servicing or Communications

by Practicing at Home in Spare Time



N.R.I. SENDS kits with which you practice building circuits common to Radio and TV sets. You LEARN-BY-DOING to locate Radio-TV troubles. As part of N.R.I. Servicing Course, you build Vacuum Tube Voltmeter and A.C.-D.C. receiver. Use VTVM to conduct experiments, earn extra money fixing sets in spare time.

RADIO-TV BROADCASTING (see above) offers important positions as Operators and Technicians. RADIO-TV SERVICING Technicians (see below) needed in every community. Their services are respected, their skill appreciated.

Fast Growing Field Offers You Good Pay, Success, Bright Future

J. E. SMITH
Founder

Bigger than ever and still growing fast. That's why Radio-TV has special appeal to ambitious men not satisfied with their job and earnings. More than 4,000 Radio and TV stations. More than 150 million home and auto Radios, 40 million TV sets. Color TV promises added opportunities. For the trained man, there are good jobs, bright futures in Radio-TV Servicing or Broadcasting.

Training PLUS opportunity is the *ideal combination* for success. So plan *now* to get into Radio-TV. The technical man is looked up to. He does important work, gets good pay for it. Radio-Television offers that kind of work. NRI can supply training quickly, without expense of going away to school. Keep your job while training. You learn at home in your spare time. NRI is the OLDEST and LARGEST home study Radio-TV school. Its methods have proved successful for more than 40 years.

Added Income Soon - $10, $15 a Week in Spare Time

Soon after enrolling, many NRI students start to earn $10, $15 a week in spare time fixing sets. Some pay for their training and enjoy extra luxuries this way. Some make enough to start their own Radio-TV shops. NRI training is *practical*—gets quick results. Easy to understand, well illustrated lessons teach you basic principles. And you LEARN-BY-DOING by practicing with kits of equipment which "bring to life" things you study.

Find Out What NRI Offers

NRI has trained thousands for successful careers in Radio-TV. Study fast or slow—as you like. Diploma when you graduate. Mail coupon now. Paste it on a postcard or mail in envelope. ACTUAL LESSON FREE. Also 64 page catalog that shows opportunities, shows equipment you get. Cost of NRI courses low. Easy terms. **NATIONAL RADIO INSTITUTE, Dept. 8HB3, Washington 16, D. C.**

N.R.I. TRAINED THESE MEN FOR SUCCESS

"I was repairing Radios by 10th Lesson. Now have good TV job." M. R. LINDEMUTH, Fort Wayne, Ind.

"Doing spare time repairs on Radio and TV. Soon servicing full time." CLYDE HIGGINS, Waltham, Mass.

"I had a successful Radio repair shop. Now I'm Engineer for WHPE." V.W.WORKMAN, High Point, N.C.

"There are a number of NRI graduates here. I can thank NRI for this job." JACK WAGNER, Lexington, N. C.

VETERANS Approved Under G.I. Bills

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Mail me Sample Lesson and 64-Page Catalog FREE. (No salesman will call. Please write plainly.)

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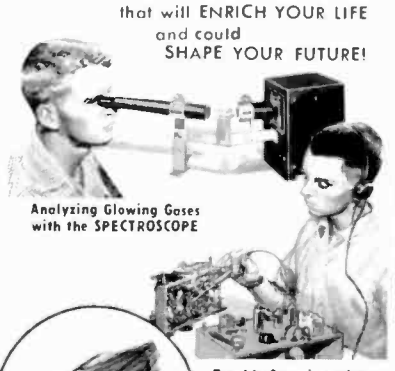

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Francis Pitcher 13 Friendship Dr Tivoli, New York

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RADIO-TV EXPERIMENTER

Winter 1961-62

Cover by Herman Bollin

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Assistant Publisher

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450 East Ohio Street **Chicago 11, Illinois**

Volume 12 of the RADIO-TV EXPERIMENTER comprises many popular electronics projects and radio-TV maintenance articles that have appeared in SCIENCE and MECHANICS magazine, plus a collection of similar projects and maintenance features being published for the first time. Also included is the authoritative White's Radio Log, completely revised and greatly expanded.

SCIENCE and MECHANICS Handbook Annual No. 11, 1961—No. 582

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or EVEN IN YOUR **POCKET** WITH
THIS EKERADIO TUNER. DEVELOPED
AND SOLD BY EKERADIO SINCE 1947

FEATURES

POWERFUL SUB-MIN H.F. TUBE. PRINTED CIRCUIT DISCRIMINATOR. HEAVY DUTY TUNING CONDENSER. Operates on small batteries, works with any car, home, portable radio or amplifier. WILL NOT WEAR OUT. Has a greater tuning range than all F M SETS 88— 108 MEG F M plus v.h.f. AIRCRAFT BAND. THIS TUNER IS WIRED, TESTED AND PERMANENTLY ADJUSTED. WILL OUT PLAY ALL F-M SETS WITHOUT ANY ANTENNA.
(proven facts since 1947)

MADE IN PASADENA, CALIF., BY AN AMERICAN WITH AMERICAN MADE PARTS FOR AMERICANS. INCLUDED WITH THE TUNER CHASSIS SHOWN YOU RECEIVE A SWITCH. A PLAN FOR A TWO TRANSISTOR AMPLIFIER. ALSO A PLAN OF THE TUNER.

THE TUNER CAN BE MOUNTED IN YOUR SMALL PLASTIC BOX.

PRICED SO EVERY-ONE CAN OWN ONE
$9.95 each
in lots of three
singly
$12.00 each
lots of 1,000
$8.00 each
EARPIECE FOR ABOVE $5.00

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NOW A BEGINNER'S TRANSISTORIZED ALL WAVE KIT FOR ONLY $5.00

Now a two stage transistorized all band radio kit for beginners. This kit will tune from 16 to 160 meters plus the broadcast band. The broadcast coil is factory wound and the short wave coils are easy to make. It is battery operated so it is safe for the youngster. It is priced lower than some crystal set kits. It is designed for use with headphones. You will be able to tune in foreign stations, police calls, aircraft, and ground stations, ship to shore and amateur phone stations from all over the world.

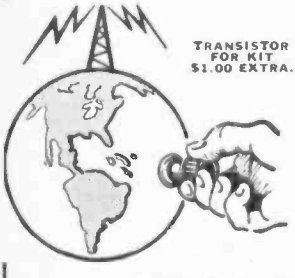
THE KIT INCLUDES THE FOLLOWING PARTS:

Broadcast tuning coil.	1 drilled plastic chassis.
Oscillator coil.	1 high frequency tube.
Wire for short wave coils.	1 audio transistor.
Hookup wire and ant. lead.	2 special printed circuit plates.
Solder.	1 tuning slug.
4 bolts.	1 tuning knob.
4 nuts.	2 phone clips.
2 battery clips.	1 resistor.
1 coil mounting bracket.	1 sheet of easy to follow instructions.

Double Headset for Beginners or Two Band Kits $2.00 P.P.

WORLD'S SMALLEST TWO BAND RADIO

TUNE IN THE WORLD OF EXCITEMENT WITH THE WORLD'S FIRST THREE STAGE TRANSISTORIZED TWO BAND RADIO KIT FOR ONLY $5.00 FULL PRICE—READ CAREFULLY



TRANSISTOR FOR KIT $1.00 EXTRA.

This set tunes the broadcast band and a click on the band switch lets you enjoy exciting police calls, ship to shore, aircraft, both commercial and military, amateur phone stations, code and foreign stations from all over the world. (It's the best electronic buy ever offered.) Tunes as many stations as sets costing up to $100.00. Kit includes the following parts: 1 Min-Tube, 1 Min-Tube Socket, 1 Two Band Coil, 1 Band Switch, 1 Battery switch, 4 Condensers, 2 Resistors, 1 Special Printed Circuit Plate, 2 Phone Clips, 1 Coil Mounting Bracket, 4 Rubber Feet, 1 Antenna Trimmer, 1 Special Ekeradio Electronic Wand, 1 Tuning Knob, Hook-up Wire and a Sheet of Easy to Follow Instructions. (Note: this set can use a 722 or 107 transistor not furnished with the kit.) Batteries available everywhere, for use with Magnetic Headphones from 1,000 to 8,000 ohms. See above for prices on headphones. This can be mounted on your small board or small plastic box. **Send only $5.00, a self-addressed gummed label to facilitate shipping of this fantastic kit, and ten cents in stamps to the address below. If the above instructions are not followed, your order may be delayed several months, so read carefully.**

WORLD'S ONLY TRANSISTORIZED POCKET F-M RADIO & TUNER

NO antenna NEEDED

An F-M tuner for your CAR, HOME, and even in your POCKET with the matched earpiece (making it a three way set)

YOUR CHOICE OF FOUR BANDS

No. 1—Channel 5 T-V sound plus 88 to 108 F-M

No. 2—88 to 108 F-M plus V.H.F. aircraft

No. 3—Channels 2, 3, 4, 5. T-V sound.

No. 4—26 to 60 meg. citizens' band, police cars and mobile phone.

Factory wound coil furnished, plus coil data.

PROVEN FOUR STAGE CIRCUIT since 1949

1.—Printed circuit plate as (diode-discriminator)

2.—H.F. sub-min. tube as (modglator)

3.—Printed circuit plate as (osc.-mixer)

4.—Transistor as (amplifier)

This set operates on small batteries available everywhere (no batteries furnished).

Only tools needed—soldering iron, pliers & screwdriver.

THE FACTORY PRICE IS $26.95 FOR THE KIT, the EARPIECE IS $3.00 extra. No C.O.D. (AMERICAN MADE, CIRCUIT TESTED, PARTS ARE USED IN EKERADIO KITS.) SEND PROPER AMOUNT, IN CALIFORNIA ADD STATE TAX ALSO, ANY DIAGRAM WILL BE SENT OUT FOR $1.00 AND A STAMPED ENVELOPE (no plans are returnable), IF THE KIT IS BOUGHT THIS AMOUNT WILL BE DEDUCTED FROM THE PRICE OF THE KIT, IN THIS CASE NO PLAN WILL BE SENT WITH THE KIT. ENCLOSE 10¢ FOR POSTAGE AND HANDLING. ALSO A GUMED LABEL WITH THE NAME OF THE PERSON YOU WANT THE ITEMS SENT TO:
EKERADIO, 650 N. FAIR OAKS, PASADENA, CALIFORNIA.

New Model 161 UTILITY TESTER®

FOR REPAIRING ALL ELECTRICAL APPLIANCES MOTORS • AUTOMOBILES • TV TUBES

As an electrical trouble shooter the Model 161:

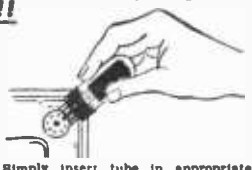
- Will test Toasters, Irons, Broilers, Heating Pads, Clocks, Fans, Vacuum Cleaners, Refrigerators, Lamps, Fluorescents, Switches, Thermostats, etc.
- *Will test all TV tubes (including picture tubes)* for open filaments, burned out tubes, etc.
- Measures A.C. and D.C. Voltages, (Both 110 Volt and 220 Volt lines).
- Will measure current consumption (amperes) *while the appliance under test is in operation.*
- Incorporates a sensitive direct-reading resistance range which will measure all resistances commonly used in electrical appliances, motors, etc.

As an Automotive Tester the Model 161 will test:

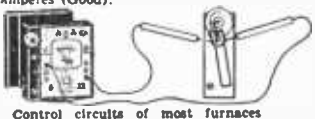
• Both 6 Volt and 12 Volt Storage Batteries • Generators • Starters • Distributors • Ignition Coils • Regulators • Relays • Circuit Breakers • Cigarette Lighters • Stop Lights • Condensers • Directional Signal Systems • All Lamps and Bulbs • Fuses • Heating Systems • Horns • Also will locate poor grounds, breaks in wiring, poor connections, etc.

IT'S SO EASY!!

With tester's cord in outlet, current consumption of appliance is read direct on meter when line cord is connected to receptacle on panel. This typical iron takes 7 amperes (Good).



Simply insert tube in appropriate socket then follow procedure as outlined in our manual.



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Small electric fan motor indicates 50 ohms (normal resistance).

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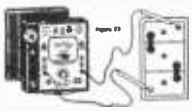

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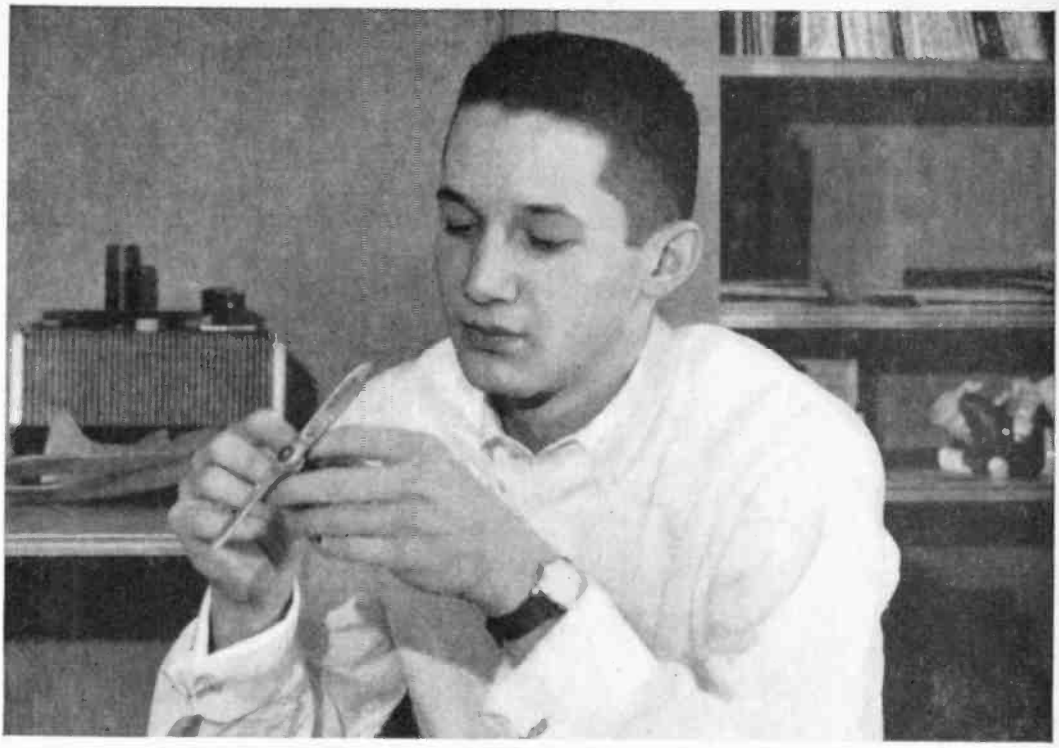

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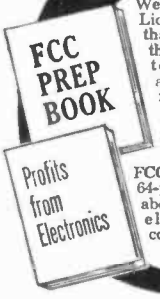

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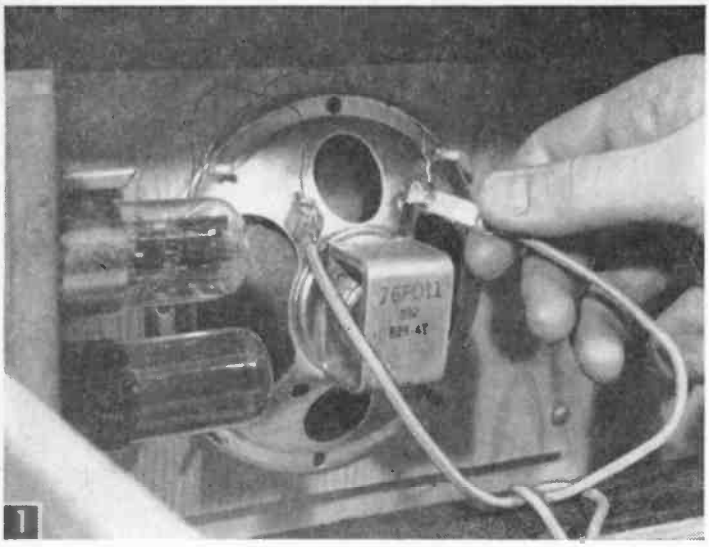
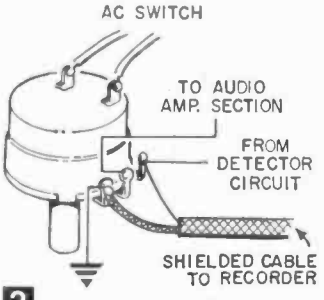


Tapping the speaker leads with clips can eliminate some mike and speaker distortion, but it's not the ideal answer for quality recordings.



Tap for Tape

Tips from an expert on making quality tape recordings from FM, AM, and phonograph records

By ART ZUCKERMAN

MANY tape recorder owners who have tried to tape music off the air have been sadly disappointed. If your tapes sound as though they came from a satellite, don't condemn the idea or your recorder until you've read these simple instructions.

The common approach of placing the recorder's mike in front of the radio or phono speaker leads only to anguish. If you want quality, it can't work since the mike is bound to pick up room noises, and because of distortion inherent in even the best speakers. Add the mike's distortion and your music sounds like a 1936 juke box.

But if you do it right, you can cut tapes that sound almost as good as the original. There are two ways to do it.

The Easiest Way is to run a wire from the speaker terminals (Fig. 1) to the radio phono input on the recorder, and set the volume controls about half way up. Most recorders come equipped with these clip wires, but if you need one, you can make it up with a length of lamp cord, a plug and clips.

Since the speaker tap carries only what comes through the radio, people in the room can shout and it won't matter. Mike and speaker are eliminated as distortion sources, and you can run the cord any length without affecting quality.

Speaker Tap Disadvantages are that the strength of the recorded signal depends on the radio volume setting. Even though you like to listen at a high volume, you'll have to set both radio and recorder at a certain point for best recording quality. And some distortion coming from the radio amplifier section rules out topnotch tapes.

For Best Quality Recording, the answer is to tap ahead of the power amplifier section itself. Here are two methods—one for radios, the other for phonographs.

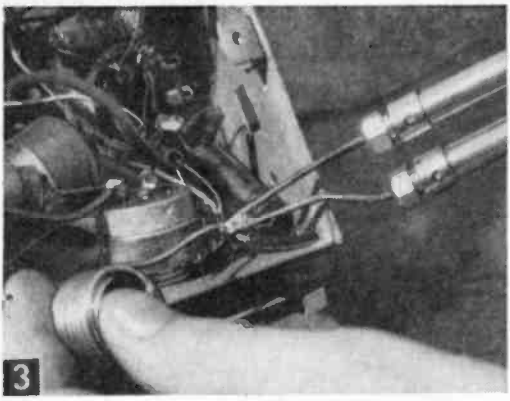
In most radio and TV sets, the tuner section feeds directly into the volume control, as in Fig. 3. So simply tap this input terminal. Because there is no oomph behind the signal at this point, use shielded cable to prevent hum pickup. The center of the cable is composed of fine wire strands, around which there is a layer of insulation topped by a wire braid (shield). Then there is an outside layer of insulation.

WARNING. Don't try this kind of tap on a transformerless radio that has a hot chassis with a-c line power feeding through the chassis itself. Before making the tap, make sure the a-c line cord does not connect with chassis either before or after the on-off switch. Use of tap on hot chassis can cause shock hazard. Consult a service technician if in doubt.

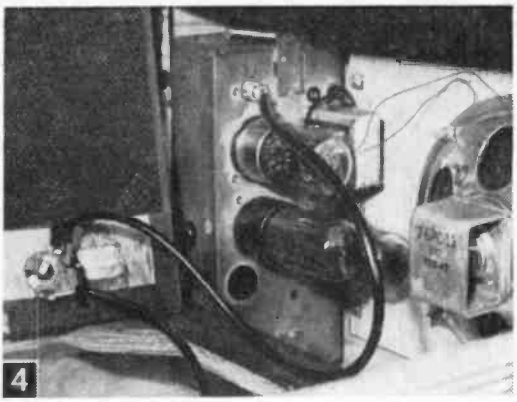
You'll see three terminals (Fig. 2) on the volume control (a second set of two terminals is the a-c on-off switch). Ignore the center terminal on the volume control. One of the other two terminals runs to a ground wire

(Continued on page 20)

(Continued from page 18)



Be sure power is off when you solder volume control connections. This a-c on-off switch is mounted on the same shaft just above the volume control.



All you need is the jack and a short length of shielded cable to convert your phonograph for convenient tape recording. The phono operates normally, or you can tape directly from the pickup cartridge leads.

that connects to chassis, while the remaining outside terminal is the input point. Solder your "hot" center wire of the shielded cable to this input terminal. Then run the cable out of the chassis through the rear to the tape recorder input plug. Keep the cable length down to minimum length, 3 feet or less for best results.

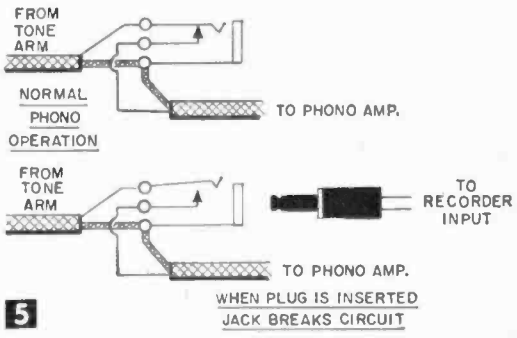
Besides eliminating distortion, the volume control tap permits recording with the radio set at any level you prefer. You can even set the radio volume control to zero, record silently, and hear the program later. The same kind of tap lets you link a TV set to a hi-fi amplifier, giving you benefit of the television's FM sound. (*Stay out of hazardous TV chassis wiring* unless you know exactly how to avoid shock.) And you can use it with inexpensive hi-fi amplifiers that don't have tape take-off jacks. Installed on such amplifiers, the tap lets you tape anything feeding through your music system.

On the Phonograph, you'll get best results if you take the signal directly from the tone arm, bypassing the phono amplifier (Fig. 4). Unscrew the panel concealing the amplifier-speaker compartment, and install a closed circuit jack in the right size hole. This kind of jack has three terminals, each anchored between a separate layer of insulation.

Now, unplug the tone-arm cable from the amplifier and cut off the phono plug. Solder the shield lead of the cable to the topmost terminal of the closed circuit jack, and solder the hot lead to the bottom-most terminal.

Next, you'll need another short length of shielded cable with phono plug attached. Insert this plug into the phonograph amplifier's input, and solder the shield lead to the same closed circuit jack terminal to which you soldered the tone arm cable shield. Then solder the amplifier cable hot lead to the remaining, or center closed circuit, jack terminal. That's all there is to it.

Your Phono Operates Normally as though nothing had been done to it, until you insert a plug into the closed circuit jack (Fig. 5). This cuts the phono amplifier out of the circuit, and the program feeds automatically directly from the tone arm to the recorder input. Now only the quality of the pickup cartridge and the tape recorder itself affects your recording. *But be sure to keep the phono volume control set at zero to avoid an irritating hum.*



You can listen to the record through your tape recorder, provided that it has a monitor switch for this purpose. If your machine lacks this feature, you can listen in through a pair of earphones running from the recorder's external speaker jack.

Remember that the law allows you to record anything you hear, provided that you don't try to profit from the copy. Broadcast and commercially-recorded material is protected by copyright. Standardize your tape recorder volume settings—use one type of tape consistently—set up a good tape indexing system, and you can look forward to hundreds of hours of musical listening pleasure.

Unscrewing the Inscrutable by OL' ROCK

Amplitude Modulation and Sidebands

FREQUENCIES in the speech-music range are transmitted as radio frequencies through the process of modulation. The modulator (modulated amplifier) has two input terminal pairs but only one pair of output terminals (Fig. 1). It may or may not contain an amplifier also. Into the first pair of input terminals we feed the audio frequency signal to be communicated. Into the second pair of input terminals we feed the carrier signal.

Let us assume that the audio frequency signal is a pure tone of 1000 cps (1 kc/s). Although usually much higher in frequency, let us make the arithmetic easy by assuming that the carrier frequency is 100 kc. Let's compare the modulator to a calculating machine. In effect, it generates two new frequencies as follows:

(Carrier frequency + audio frequency) = 100 + 1 = 101 kc.

(Carrier frequency − aduio frequency) = 100 − 1 = 99 kc.

Note that these are both relatively high frequencies of the same order as the carrier. Of course, we also have at the output the original input frequencies, 1 kc and 100 kc.

But it is common practice to tune the tuned output coupling system to the carrier frequency. Thus the modulation frequency (1 kc) is rejected at the output. But the coupling system normally is broad enough to pass not only the carrier frequency but also the two new frequencies that have been generated. Thus the output of the modulator contains the carrier plus the two new signals (sidebands).

All three of these signals are ultimately radiated by the antenna and are transmitted to the receiver. If we were to look at the output wave form upon an oscilloscope screen, it would look like Fig. 2.

From this it looks like the carrier is varying in strength in step with the low modulation frequency. In reality, the carrier signal component remains absolutely constant. What happens is that the two side band signals alternately add to and subtract from the overall signal amplitude.

Detectors take many possible forms, galena crystal and catwhisker, germanium diode or vacuum tube, but all detectors function as reverse modulators (demodulators).

The demodulator takes the carrier plus the upper and lower side bands and recalculates

them as follows:

(Upper side band − carrier) = 101 kc − 100 kc = 1 kc

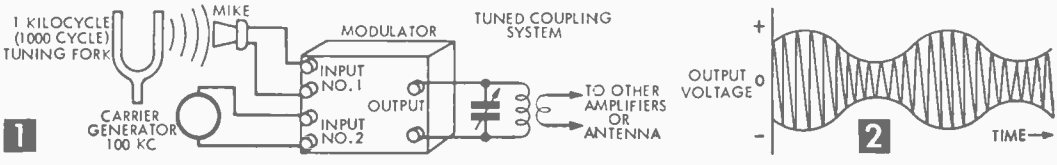
(Carrier − lower side band) = 100 kc − 99 kc = 1 kc

Thus, the 1000-cycle tone again becomes available at the receiver after having been transmitted efficiently through space by radio. Here the carrier is necessary again to recombine with the information-carrying side bands, to make the original audio signal reappear at the demodulator output.

The modulation-demodulation process has thus made possible the transmission of a low frequency signal by converting it first into a high frequency signal at the transmitter, then reconverting the high frequency back to low at the receiver. At no time does the audio frequency signal actually appear as such at the transmitting antenna, in the intervening space or at the receiver antenna. It never reappears until the output of the detector. Thus, modulation makes possible relatively short antennas and efficient transmission.

Since both sidebands carry identical information only one is really necessary. It is also possible to generate a suitable carrier signal at the receiver itself without the necessity of wasting power by transmitting it through space. From this line of thinking arose the single-sideband, suppressed-carrier mode of communication used by the armed forces and by some amateurs. Here, only one side band is transmitted—the carrier and alternate side band are filtered out at the transmitter. A carrier is generated locally at the receiver, combines with it the received signal at the demodulator, and the audio signal is recovered.

Voice and music are normally not simple signals like the 1000-cycle pure tone we have assumed. But they may be considered as a package of many such simple tones of varying frequency and amplitude. Each individual simple tone then generates its own sideband pair which travels independently through the system in the same way as does the simple tone herein discussed.



A Quality FM Receiver

By C. F. ROCKEY

HERE is a project to challenge the seasoned experimenter. This receiver will provide you and your family with many hours of fine musical entertainment.

Begin construction by laying out and punching the major holes in the 2 x 10 x 17-in. aluminum chassis (Fig. 8). Holes for the rectifier and audio amplifier tubes are punched with a 1 3/16-in. Greenlee socket punch, the others with a 3/4-in. punch.

The holes for the i.f. and discriminator transformers are first punched with the 3/4-in. punch, then filed into roughly four-leaf-clover shape with a 1/4-in. rat-tail file.

A 3/4-in. hole is also punched to pass the leads from the power transformer, while a 3/8-in. hole. with rubber grommet inserted, passes the leads from the filter choke through the chassis. Do not mount either the power transformer or filter choke upon the chassis until all of the power supply and audio section wiring has been completed. Drill mounting screw holes before beginning wiring.

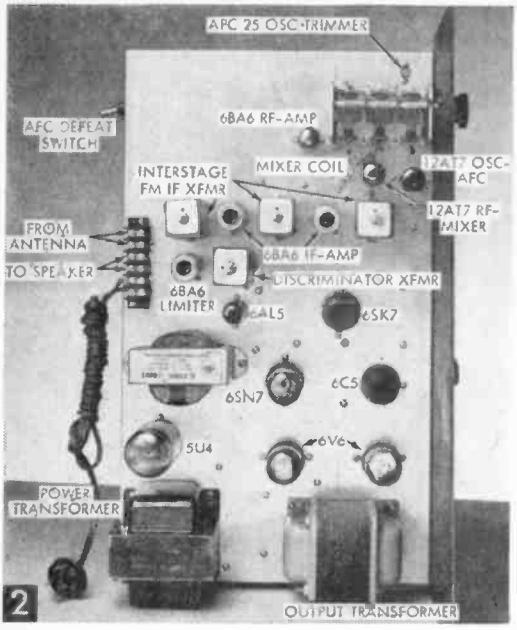
Mount the insulated tie-lug strips (see Fig. 3). Place a soldering lug under one of the mounting screws of each of the r.f. and i.f. tube sockets. Drill holes for and mount the volume control potentiometer, pilot light socket, and terminal strip.

Wire the 120 v. power circuit, following this up with the heater circuit. Although one side of the filament circuit is connected to ground, it is so grounded at only one point. All connections, including the grounded side, are actually made with wire in the audio circuit. This is to avoid circulating heater currents in the chassis which might induce hum into these sensitive circuits.

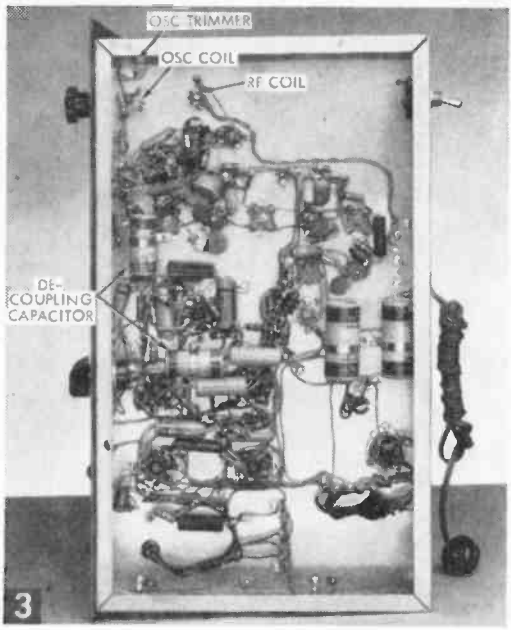
Wire the rest of the audio circuits, beginning with the 6V6 push-pull stage and working backwards. The same grounding procedure is used as in the heater circuit.

For the sake of neatness, try to keep all power supply (B+, heater leads, and grounds) together in cable form. But keep the sensitive grid and plate leads by themselves, for best results. Watch polarity on electrolytic capacitors.

When all other power supply and audio circuitry have been completed (up to but not



Top view of FM receiver with component call-out.



Bottom view of receiver chassis.

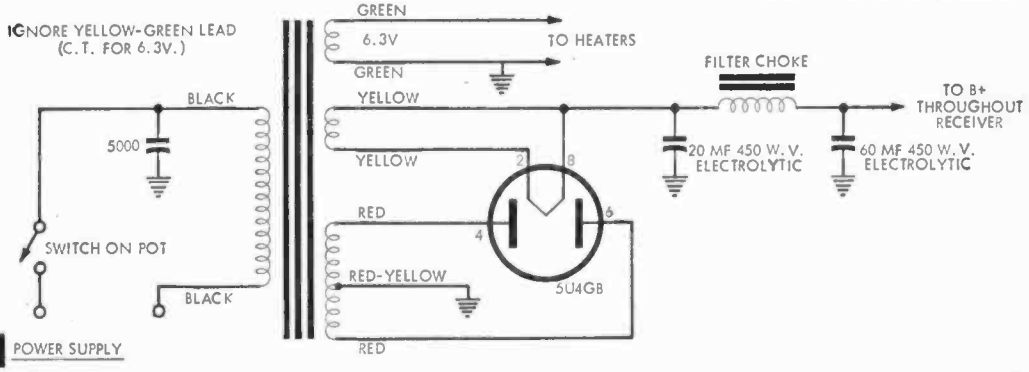
including the discriminator circuit) recheck the wiring carefully against the diagrams and install and wire the power transformer and filter choke. Next make some preliminary tests.

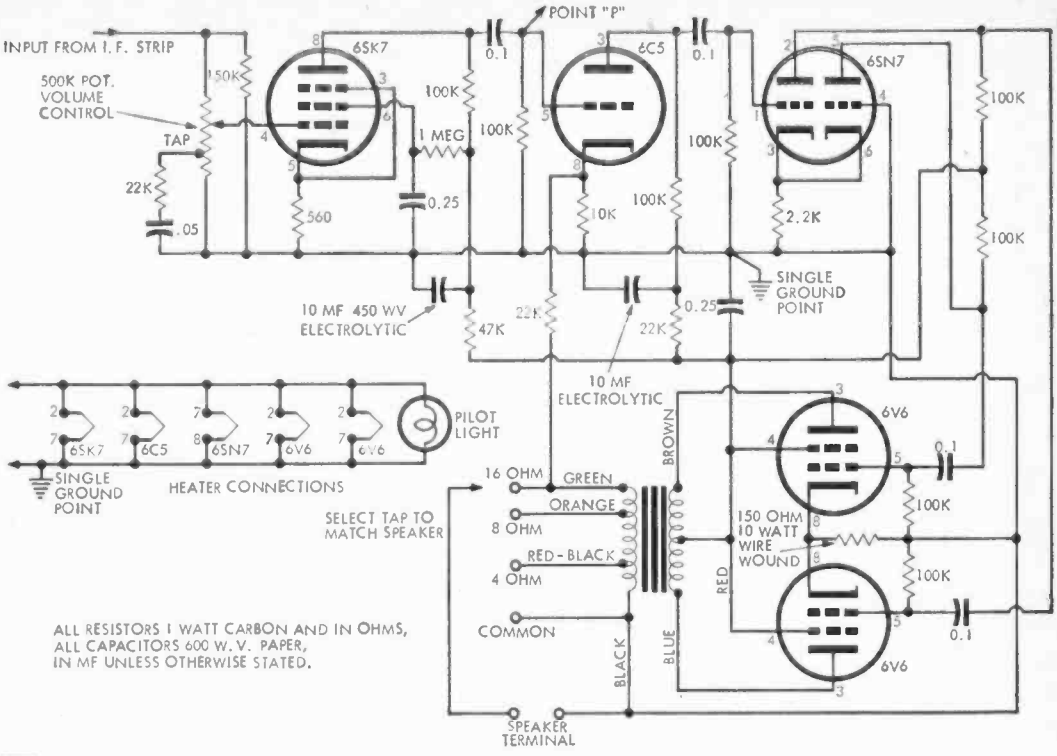
First, measure the resistance from the positive side of the last filter capacitor in the power supply to ground, using a radio serviceman's ohmmeter. The resistance here should be greater than ten thousand ohms. (If it is not, then a short from B+ to ground exists, and must be cleared. Look for solder dribbles between socket lugs or to the chassis, bare wires touching chassis, etc. The ohmmeter will be a big help in running this down.)

Connect the line cord to the line terminals on the strip. Plug in all audio amplifier tubes and turn on switch. All tubes should heat up. This checks out the heater circuit.

Connect a loudspeaker to the speaker terminals; for the present this may be any speaker capable of handling the ten watts, or so, of audio power output, but a really good speaker should be available for final listening. Turn down the volume control, but keep power on. Then plug in the 5U4GB rectifier tube. Its filament should glow, but the plates should remain dark. Be alert for any signs of sparking or overheating. If any resistors overheat, shut off power, and look for the short or wiring mistake that is causing it. With power on, and volume control turned down, there should be only a very slightly audible hum from the speaker, if anything at all.

Cautiously turn up the volume control and touch your finger to the presently unconnected hot side of the pot. A definite growly click should emerge from the speaker. If nothing such as this occurs, run down the stage that is causing trouble by touching a screwdriver, held by the metal shaft, to each control grid (grid #1 in the case of a tetrode or pentode), and keeping the other hand in the pocket. A definite, although possibly





5 A. F. SECTION

weak clicky growl should emerge from the speaker as each grid is touched by the screwdriver tip. The only exception will be the purposely grounded grid in the 6SN7 phase inverter stage, of course. The stage following the last grid that gave the growl is the culprit. If tube is good, check for wiring error, short, or a defective part, although the latter is unlikely.

To test for frequency response, connect a good loudspeaker in a proper baffle or enclosure, to the speaker terminals. Make sure you have selected the proper transformer tap to correctly match the speaker's impedance. Connect a 6-v., or smaller, ac voltmeter across the loudspeaker terminals and a radio serviceman's audio frequency oscillator from the hot side of the volume control pot to ground. Turn on the audio oscillator, adjust oscillator to produce 2 or 3 v. across speaker and run it over its frequency range.

You should find that the amplifier will give practically uniform output voltage from below 40 cycles to well above 10,000 cycles. A peaking-up of the output around 50 to 70 cycles is normal due to resonant effect of many speaker enclosures and bass-boost circuit in the amplifier.

Begin work on the i.f. strip by mounting all the tube sockets with 4-36 machine screws and nuts. Fasten a soldering lug under one screw of each socket. Install and wire the i.f. transformers.

Begin wiring with the discriminator, and continue backwards toward the mixer. Since the overall amplification of the i.f. amplifier may be 10,000 times or more, take these precautions against stray feedback which will cause uncontrolled oscillation:

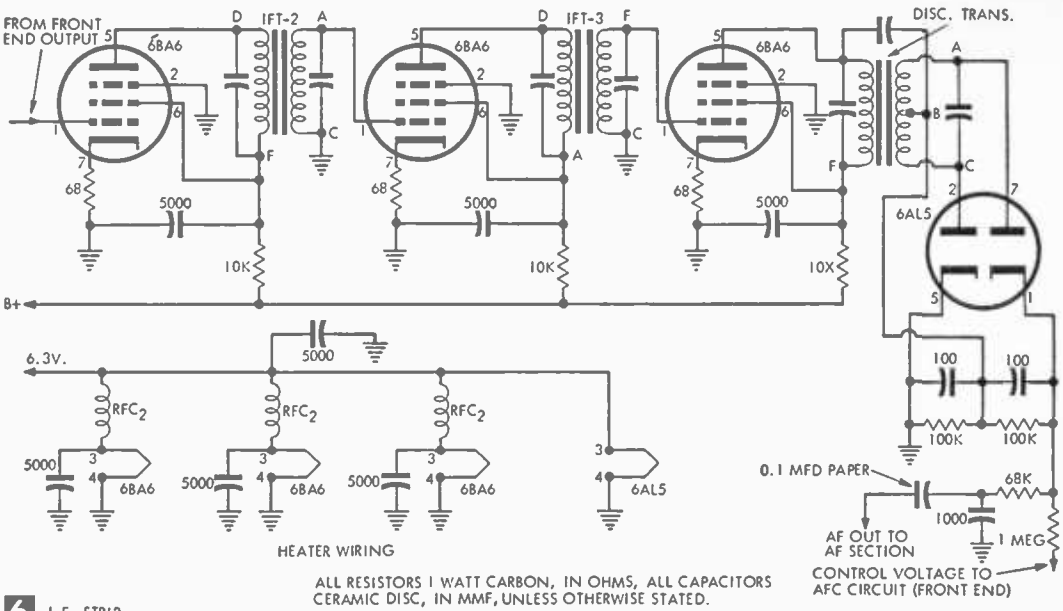
1. Use shielded sockets for the i.f. amplifier tubes.

2. Keep all grid and plate leads as short as possible, and press these down tight against the chassis to minimize interaction of their fields.

3. Return all high frequency ground connections for each stage to its own individual ground point. (Purely dc grounds, such as for grid and cathode resistors do not require such treatment, but all bypass capacitors *must* be returned to the common point.)

4. Isolate the hot side of each i.f. tube heater with an r.f. choke and bypass capacitor, made by winding 25 turns of #24 dcc wire around a 1-watt resistor. Any value of resistor greater than 10,000 ohms is usable, but one megohm is suggested. Bypass the tube side of each choke to the common ground point for that stage using a 5000-mmf capacitor, as in diagram.

5. The 10,000-ohm screen-plate dropping resistor and the 5000-mmf bypass capacitor



6 I.F. STRIP

serves as an effective decoupling filter for the plate supply circuit of each stage.

The stage immediately preceding the discriminator is the limiter stage. It flattens out strong signals, holding all signals to a constant voltage level. This aids immensely in the static eliminating property of FM.

Another noise-eliminating feature is a deemphasis filter: the 68K resistor and the 1000-mmf capacitor between the discriminator and the audio amplifier. This reduces the high frequency response at a controlled rate, removing man-made static which is modulated at a high audio frequency.

Wire the i.f. strip through the mixer plate circuit (second 12AT7 in Fig. 7) but do not bother with the tuning circuits yet. Complete the plate and cathode circuits of the mixer stage, and the 1-megohm resistor and the 50-mmf capacitor in its grid circuit. When the i.f. strip checks out, you can align the tuned transformers.

Insert all tubes wired so far, connect a loudspeaker, and apply power. Sometimes these transformers come from the factory in close-enough alignment so that some hiss can be heard in the speaker when the volume is turned all the way up. If so, carefully turn the slug in each transformer to achieve maximum hiss, then carefully turn the secondary slug of the discriminator (last) transformer until the hiss drops to a minimum. The discriminator secondary is the bottom slug of the discriminator transformer.

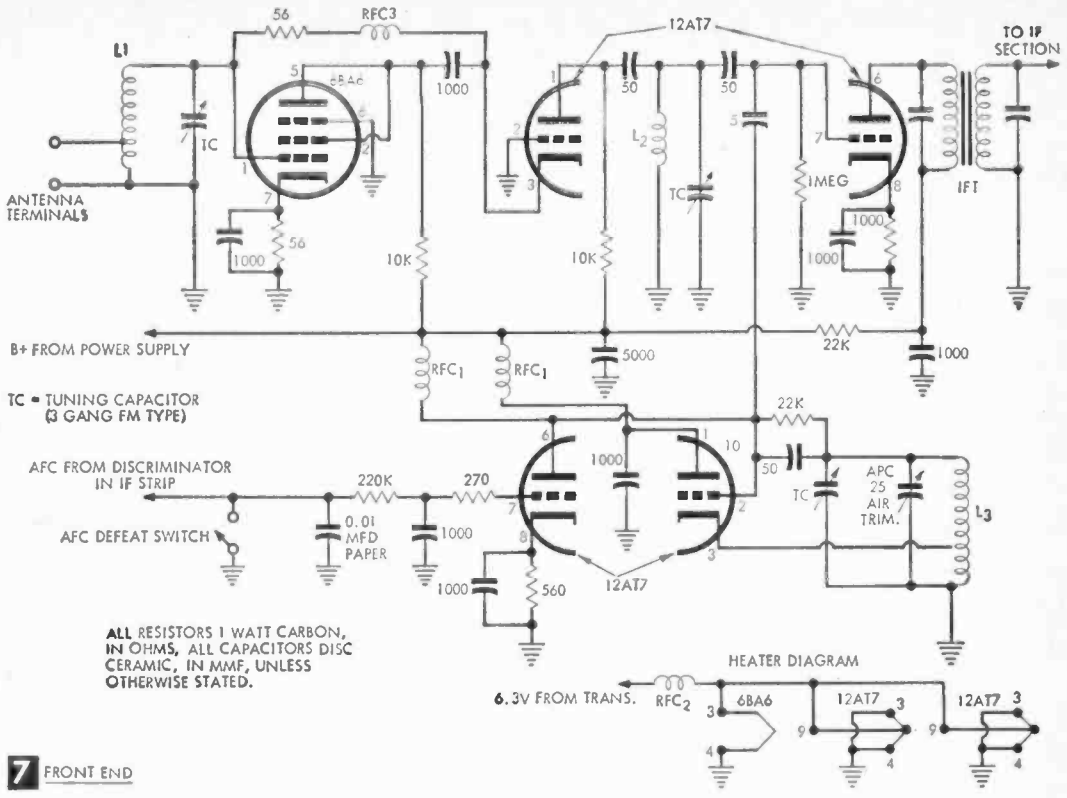
In the event that no hiss is audible, even with the volume control all the way up, do not touch the slugs. This does not necessarily mean that you have trouble, sometimes the transformers have been jarred out of factory adjustment during handling. In this latter case, shut off the power and carefully recheck the wiring of each stage. If all appears correct, re-apply power and measure the plate and screen voltage of each of the i.f. tubes, and the plate voltage of the mixer. If these are ok, should be between 80 and 150 v. to ground, you may be reasonably certain that your wiring is correct.

Now, if you do not have a good signal generator available, one that develops a good signal at 10.7 mc, take your set to a radio-TV shop. For a small fee (provided that you have not made any wiring errors which must be fixed) he will align the i.f. strip for you at 10.7 mc. Take the schematic along.

Next, begin construction of the front end. Mount the tube sockets first. The 12AT7's require a 9-pin miniature socket, the 6BA6 a 7-pin. Do not mount the tuning capacitor until necessary.

All front-end wiring must be planned and installed to keep leads as short as possible. Wire first the heater circuit, then the socket grounds. Keep these latter short and direct, establishing ground at a soldering-lug under one of the screws of each socket. Mount the APC-25 oscillator trimmer capacitor near the right front corner of the chassis, allowing the screwdriver-slotted shaft to project upward to the top of the chassis. Do all but the tuned-circuit wiring before mounting the tuning capacitor on the chassis.

Mount the tuning capacitor, using 6-32 x ¼-in. rh machine screws, threaded into the holes so provided on the underside of the capacitor's frame. Unscrew the trimmer ad-



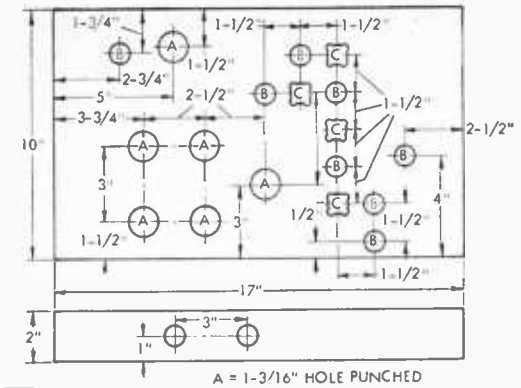
7 FRONT END

justment screw for the front section *only*, and remove the mica trimmer from this section with diagonal pliers. This section is to be the oscillator section, and the APC-25 air capacitor is to be used for the oscillator trimmer.

The coils are wound from #14 tinned copper wire, as described in the coil table. When

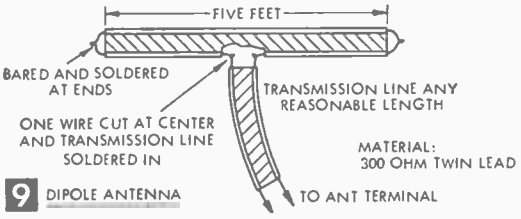
MATERIALS LIST—FM RECEIVER

No. Req.	Description
1	2 x 17 x 10" aluminum chassis
1	panel, to fit builder's purpose. We used sheet of acrylic plastic, 1/8 x 9 1/2 x 18"
1	tuning dial (National type BM or other)
1	bar knob, to fit 1/4" shaft
1	power transformer (Stancor type PC-8405)
1	filter choke (Stancor type C-1001)
1	500K tapped potentiometer with switch (IRC type Q18-133X)
6	octal tube sockets (Amphenol type MIP)
3	7-pin miniature sockets, with shields to fit 6BA6 tubes (Amphenol)
2	7-pin miniature sockets (Amphenol)
2	9-pin miniature sockets (Amphenol)
1	output transformer (Triad type S-31A)
1	power line cord and plug
1	6-terminal Cinch-Jones barrier terminal strip
1	6-v. pilot light and socket (Dialco type 510 "Jewel")
1	6-v. pilot lamp, #47
	Tubes as follows:
1	5U4GB
2	6V6
1	6SN7
1	6C5
1	6SK7
1	6AL5
4	6BA6
2	12AT7
3	Miller type 1451 interstage FM i.f. transformers
1	Miller type 1452 discriminator transformer
1	Miller type 1461 3 gang FM tuning capacitor
2	Ohmite Z-50 r.f. chokes (RFC_1) 7 microhenry
1	Ohmite Z-144 r.f. choke (RFC_3)
1	2.5 millihenry r.f. choke (RFC_4) National
1	Hammarlund type APC-25 air trimmer capacitor, 25 mmf max.
1	150 ohm, 10 watt wire wound resistor (Ohmite)
	1 watt carbon resistors as follows:
5	68 ohm
2	560 ohm
1	2.2K
1	1K
6	10K
1	270 ohm
5	22K
1	47K
1	68K
10	100K
1	150K
1	220K
4	1 megohm (including forms for filament chokes, RFC_2)
	disc type ceramic capacitors as follows:
7	5000 mmf
6	1000 mmf
3	50 mmf
1	10 mmf
2	100 mmf
1	2 mmf
	600 w.v. paper capacitors (tubular) as follows:
1	0.05 mf
5	0.10 mf
2	0.25 mf
	450 w.v. Mallory electrolytics type TC as follows:
1	60 mf
1	20 mf
2	10 mf
1	high quality loudspeaker (at least 8" dia.)
	machine screws and nuts, solder, #24 dcc magnet wire, hook-up wire, 1, 2 and 3 point insulated tie points, soldering lugs, 3/8" rubber grommet, materials for dipole antenna, #14 tinned wire.



8 CHASSIS LAYOUT

A = 1-3/16" HOLE PUNCHED
B = 3/4 " HOLE PUNCHED
C = 3/4 " HOLE PUNCHED AND FILLED



9 DIPOLE ANTENNA

wiring-in the coils, keep the leads short, and separate the r.f. and mixer coils; in the author's receiver, the mixer coil was mounted above, the r.f. coil below the chassis. If this is not done, the r.f. amplifier may oscillate. The coils should be mounted firmly, using insulated tie-points if necessary to prevent vibration. Note that the mixer and r.f. coils have an inside diameter of ¼ in., the oscillator coil is twice the diameter, or ½ in. This is because the oscillator constantly operates 10.7 mc below the frequency to which the receiver is tuned. When all wiring is done, insert the r.f. mixer, and oscillator tubes into their sockets, but leave power off.

Screw the r.f. and mixer trimmers all the way in, then back-out about 1½ turns. Set the oscillator APC trimmer to about ⅓ maximum capacity. Now, using the grid-dip meter, adjust the coils, by squeezing or separating turns, until the various circuits have the following tuning ranges as the tuning capacitor is rotated:

Oscillator: 77.3 to 97.3 mc.

Mixer and r.f. (both same): 88 to 108 mc.

A slightly greater tuning range is not disadvantageous here. Now, carefully re-check all wiring, being particularly alert for solder-glob shorts between and around those pesky little miniature socket lugs. When everything appears correct, insert all tubes, connect speaker, and apply power. Connect a good, high dipole or TV antenna to the antenna terminals. Turn up volume, and tune across the dial. The tuning range of the receiver will probably not be correct, because grid-dip meters are seldom highly accurate.

TABLE A—COIL DATA

Coil No.	Form	No. turns and winding info.	Tuning range (grid dip meter)
L_1	Air wound	3 turns #14 bare ¼" I.D. tapped 1½ turns from ground end	88 to 108 mc as tuning cap, rotated
L_2	Air wound	3 turns #14 bare ¼" I.D.	88 to 108 mc as tuning cap, rotated
L_3	Air wound	4 turns #14 bare ½" I.D. tapped one turn from ground end	77.3 to 97.3 mc as tuning cap, rotated
RFC_2	1 meg 1 watt resistor	25 turns #24 dcc close wound on resistor body, or Ohmite Z-144 r.f. choke (RFC_3)	Filament chokes: (Resonant frequency not critical).

Correct the tuning range by adjusting the APC-25 oscillator trimmer. Adjust the mixer and r.f. trimmers on tuning capacitor for strongest reception on the weakest signal you hear.

The author used as a panel a ⅛ x 9½ x 18-in. acrylic plastic sheet (Rohm and Haas Corp., with representatives in most large cities). Also, the author used a small National type BM dial, which he happened to have on hand, and which serves very well; if you prefer a fancier dial, one of these along with mounting instructions is available from Newark Electric Co., Allied Radio, or similar radio jobbing firms.

A window beneath the 0-100 precalibrated scale allows frequency calibrations to appear; these may be carefully marked with pencil or pen opposite the appropriate dial setting.

A final complete alignment upon the finished, operating set by an experienced technician will cost little, and pay dividends in improved performance.

Although not specifically included in this article, there is sufficient room up the chassis to install a phono preamplifier for record reproduction. Connect a suitable preamplifier, through a 220K resistor, to the point marked "P" in the audio schematic. (The phono preamp will have to contain the volume and phono frequency compensation controls within itself, however.)

Heathkit, and others, sell highly satisfactory speaker-enclosure systems at reasonable prices. The author uses an old Jensen Coaxial in a home-built, bass-reflex enclosure.

Use a good antenna, too. An outdoor TV antenna, or even a dipole strung along the ridgepole of your attic (Fig. 9) will provide good reception in most instances. If you live in an apartment and cannot erect an outdoor dipole, at least use a rabbit-ears as high above ground as you can. Don't fool with built-in or other line-cord antennas; they're the bunk, we've found. Give this set at least as good an antenna as you use with your TV set, and it will deliver the goods.

Exclusive of cabinetry and the loudspeaker, total cost of this project is about $75.

TV Booster Improves FM

A few adjustments and now this booster works fine with the author's Heathkit FM tuner. The booster turns on automatically with the FM, and daughter retunes only when a peak boost is needed.

A discarded TV booster is the answer for improving your FM -- a good idea for DX fans too

By JOSEPH R. NOONAN

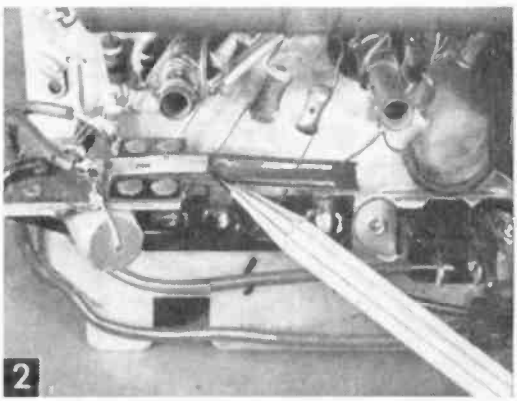
GOOD FM reception is no problem if you live close to a transmitter. This idea is intended for suburbanites, fringe area listeners 50 to 100 miles from a station, and for those who live in shadow areas, hilly country, and in other spots where FM coverage is poor.

Only a screwdriver and a few "by ear" adjustments are needed to adapt a common TV booster to FM use. Because many parts of the country are now serviced by new local TV stations, boosters are rapidly becoming obsolete, and you can often pick them up for as little as $3 in resale shops or from TV servicemen.

Using the booster shown in Fig. 1, these improvements resulted: 1. Four borderline stations were boosted to "very good". 2. Five formerly inaudible stations were boosted to an evening listening level. 3. All other stations within range improved in reception, both day and night. 4. The listenable range of the receiver extended out beyond 100 miles, and at times stations 200 miles away and more were heard working only with an ordinary antenna 21 ft. above ground level.

Of course, a booster cannot create good signals out of fading or sporadic FM transmission. But it can increase your enjoyment of regularly received weak stations since it eliminates distortion produced in many receivers when they are forced to overcome the limiting threshold of many FM receivers.

Your best bet for buying a discarded TV booster would be a TV shop that has been in business for more than a few years. During that time, most of these shops have accumulated a small stock of the boosters, and they usually are glad to sell them for a few dollars. *But be sure to avoid the single-channel types, and those that will not tune channels 2 through 6 continuously.* Since the FM band lies just above TV channel 6, you need the simple type of booster circuit that has a plug tuning feature. The booster in Fig. 1 is an *Alliance* model AB-3. However, *Bogen, Regency,* and *Jerrold* also produced similar boosters that will work the same way.



The pencil tip points to the thermal element of the booster's automatic switch. When line current passes through, the strip bends to close the contacts.

Only Two Adjustments are Needed. First, your booster probably has a thermal switch which turns power on automatically when the

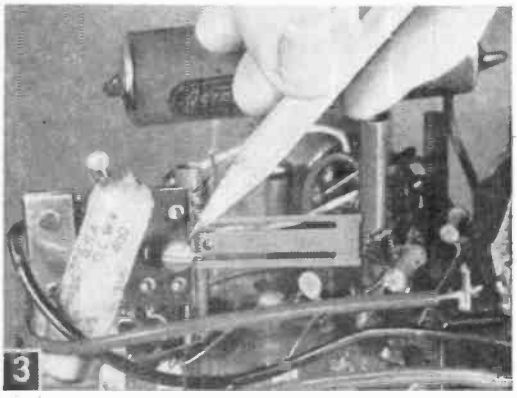
TV switch is on (Fig. 2). When line current passes through the thermal element it warms, and bends to close the contacts. These switches are designed for TV set wattages, so if your FM unit draws over 140 watts you'll be able to simply plug it in, and it will work just like the TV set. However, if your FM draws between 100 and 140 watts, you'll need to adjust the contact points with a screwdriver until your FM wattage will operate the thermal switch. Below 100 watts, these adjustments become critical, so if your FM is in the 50- to 100-watt bracket, simply close the booster contacts permanently and install a line switch on the booster.

Your Second Adjustment is Tuning. Attach your FM antenna to the booster antenna terminals with twin line. TV antennas can be used with good results on FM, but don't attach both a TV set and the booster simultaneously to one antenna without using a set coupler, or a loss in signal strength will result. You can also attach a booster to an antenna extension outlet, though there is some danger of boosting interference picked up by the extension system if it is large or passes near appliances and other sources of interference.

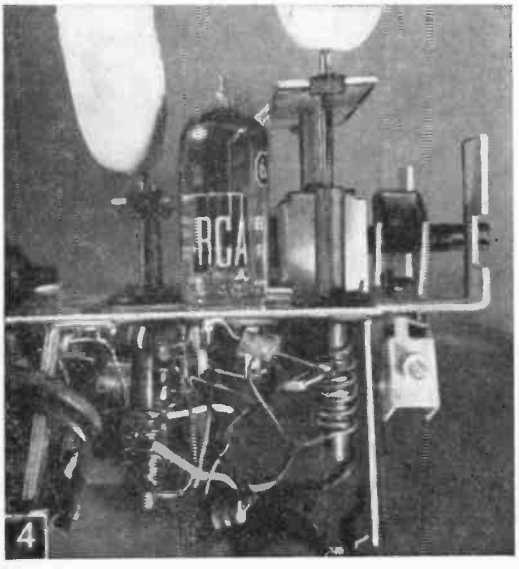
Now connect your FM set to the booster and adjust the booster tuning knob to the highest point that it will tune on channel 6. Tune the FM to a station near the 88-*mc* end of the dial. Next rock the booster tuning knob and watch the mechanical tuning linkage inside—you'll see several screw-adjustable slugs moving in and out of coils. To determine which slugs to adjust, examine the coils and select the pair with the most turns of wire. With the station tuned in, slowly unscrew (out of the coil) first one slug and then the other until you obtain the best signal.

Next turn the channel selector toward channels 4 and 5 until the signal weakens, and then repeat the slug tuning step to obtain maximum signal strength. Ear-tuning for volume is fine, but if your FM has an eye or tuning meter, it will help you. Now tune the FM to a station near 108 *mc*, and adjust the booster channel selector for maximum signal. If station is not boosted fully, even with your channel knob as high as 6, unscrew the slugs slightly until you get maximum boost. But do not unscrew the slugs more than necessary, since the booster circuit could be unstable.

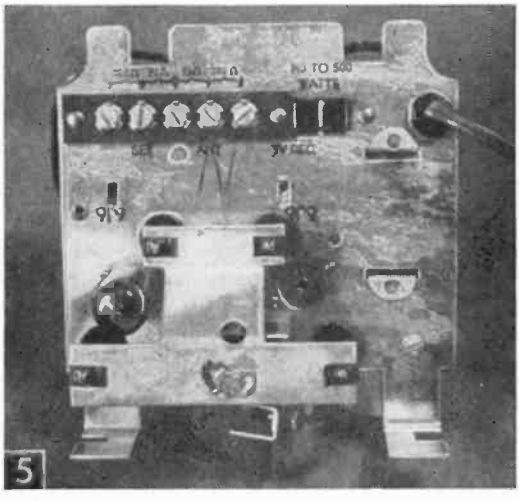
With adjustments completed, you should now notice a signal gain on any station, but for maximum boost of any one, fine-tune with the channel selector knob.



Adjust this screw to lower the thermal switch to operate with the lower wattage of your FM set.



These are the screws that adjust the tuning slugs within the coils.



Top view of booster chassis shows receptacle at the top for the TV, or FM power cord. The empty tube socket is part of the channel 7-13 section not needed for operation as an FM booster.

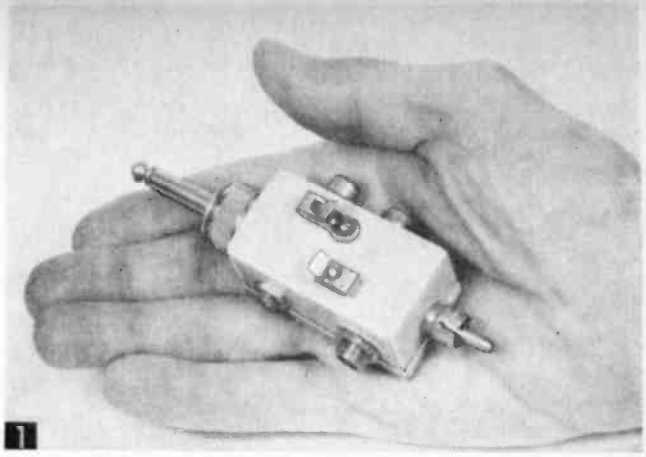
Adapter Cures Plugitis

Build this unique adapter for only $3 and you can instantly connect over 60 combinations . . . you'll never be without the right plug, jack or cable

By ART TRAUFFER

WHAT'S more annoying than being unable to cross-connect speakers, tape recorders, Hi-Fi or test equipment that just happens to come equipped with non-matching jacks and plugs?

There are dozens of simple adapters on the market, but you'd need one of each to cover every kind of connection. This adapter solves the problem. It's always handy—you won't be likely to misplace it, and it also permits instant connection of wire leads



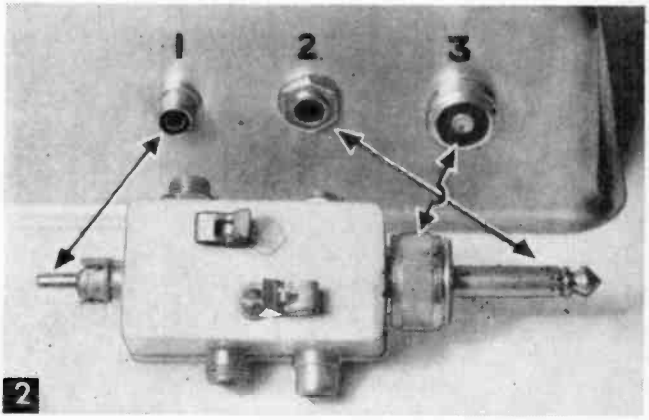
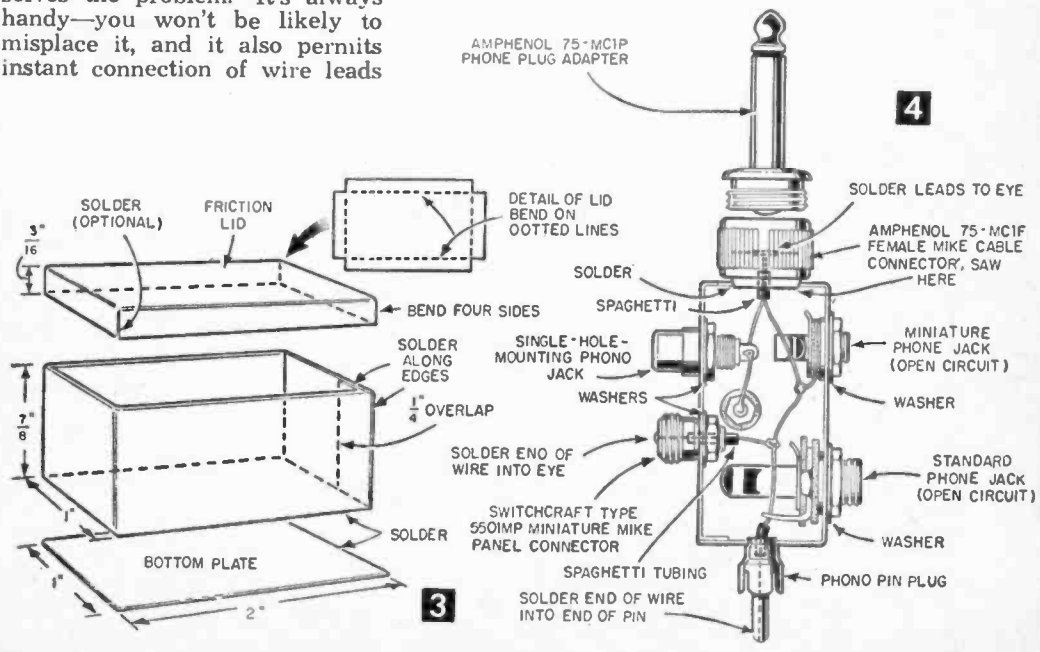
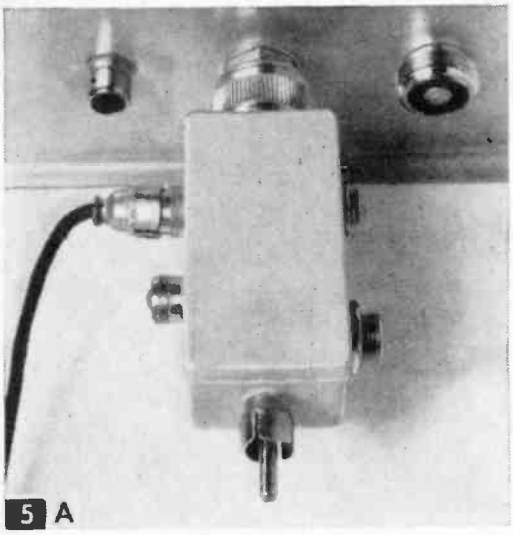
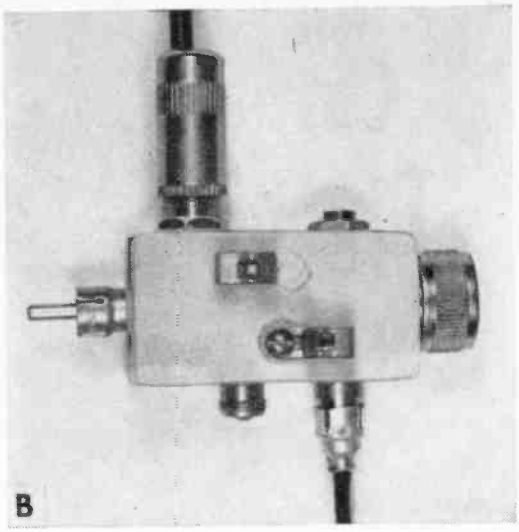
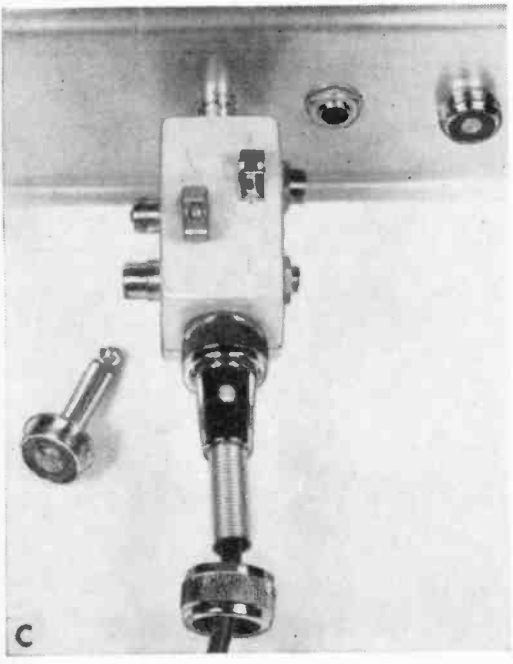


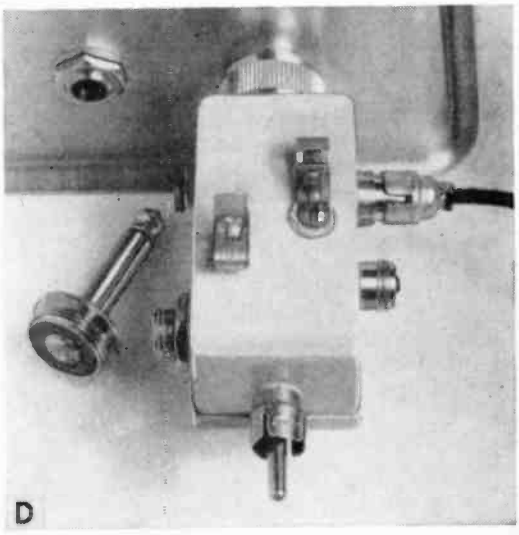
Fig. 1. This adapter fits almost every termination you'll ever see on Hi-Fi, audio and test equipment. You can make the case of sheet metal, or buy a commercial box. Fig. 2. Here's how the adapter fits three common types of chassis mounted jacks.











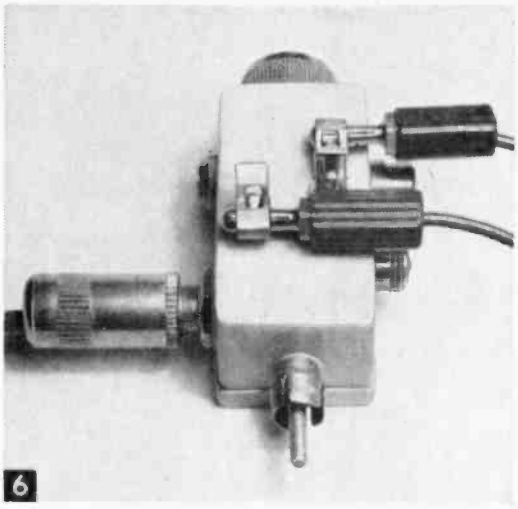
Typical connections: A. Phono pin plug to standard phone jack. B. Standard phone plug to phono pin plug. C. Mike cable connector to phono jack. Phone plug at left is removed from adapter to receive connector. D. Phono pin plug to mike chassis unit.

and probes of test instruments as in Fig. 6.

Make the Case of sheet metal. The 2 x 1 x 7/8-in. box in Fig. 3 was bent from a sheet of 16-oz. copper, an easy metal to work. Sheet steel or brass of similar thickness would serve as well, but avoid aluminum because of the difficulty in soldering the ground connections. You can't use plastic, since the case acts as a shield to prevent hum when the adapter is connected into very high gain amplifier circuits. If you're close to a surplus store you may be able to find a military connector box of the right size, or you could also order the metal box listed under materials, provided that you improvise brackets to hold the cover.

A quick way to make the box is to saw a wooden block that just fits inside. The block should be equal to the outside dimensions minus double the metal thickness. Held in a vise, the block will make it easy to get perfect corner bends.

Mount the Parts Next. Dimensions are not shown because spacing isn't critical, and the hole sizes will vary with different brands of connectors. Use locknuts on each connector except the two end plugs which are soldered directly into the holes. Mount both size 15



Fahnestock clips on the bottom make it handy to connect leads feeding to extra speakers, meters or temporary lines.

MATERIALS LIST—ADAPTER PLUG

No. Req.	Size and Description
1	phone plug adapter, Amphenol #75-MC1P (NE #39F003 $.48)*
1	female mike connector, Amphenol 75-MC1F NE #39F000 $.44)
1	single hole-mounting phono jack, Switchcraft #3501FR (NE #39F686 $.23)
1	miniature open circuit phone jack, Switchcraft #41 (NE #39F744 $.23)
1	miniature mike panel connector, Switchcraft #5501MP (NE #39F778 $.21)
1	standard open-circuit phone jack (NE #39F782 $.23)
1	phono pin plug, Cinch Jones #13A (NE #39F796 $.04)
2	#15 size Fahnestock clips (NE #28F562 10 for $.20)
1	6/32 x ¼" RH machine screw and nut
6"	bare copper hookup wire and spaghetti to cover
1	3 x 7" piece 16 ounce sheet copper for making case

Note: LMB #MO-12 miniature box chassis (NE #91F1100) 2 x 1¼ x 1" can be used in place of hand made case, but requires improvised brackets.

* NE numbers refer to catalog, Newark Electronics Corp., 223 W. Madison, Chicago 6, Ill.

Fahnestock clips on the bottom (Fig. 2). Solder one directly to the container. Insulate the other one by mounting it in fiber shoulder-washers with the 6-32 x ¼-in. screw and nut (Fig. 4). None of the parts should be mounted on the removable lid.

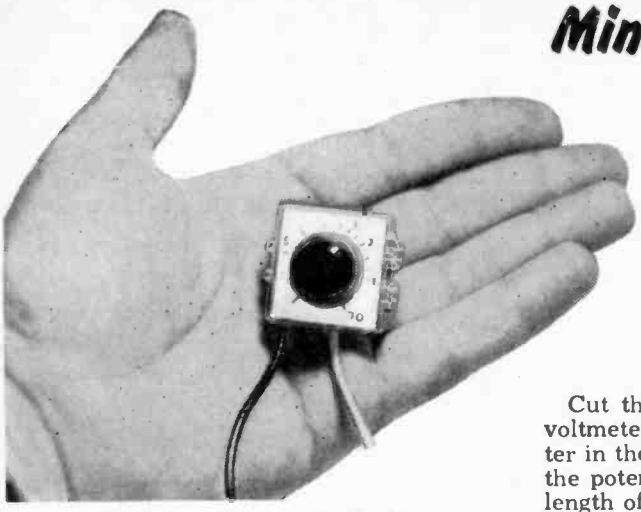
Wire the Connectors in parallel. Soldering should be perfect on each joint. The ground, or chassis side of all the connectors is automatically tied together by the metal container, which also doubles as a shield. A coat of grey spray enamel will give the unit a professional touch.

A pair of 5-way binding posts could be used in place of the Fahnestock clips. However, these clips will take not only plain wire leads, but also phone cord tips, spade lugs, alligator clips and banana plugs as in Fig. 6.

"All that work, and channel 9 is the only one that comes in."

Miniature Voltmeter Costs less than a buck

By FORREST H. FRANTZ, SR.



Front view of the completed unit.

THIS little voltmeter will fit the most limited budget, as it costs less than a dollar to build. You can build it in about fifteen minutes.

The small size tempted me to call it the world's smallest voltmeter, but such a statement always evokes a challenge. In any event, the dimensions are only $\frac{5}{8}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$ in., and I don't know of a smaller voltmeter than that.

Front and back views of the unit are shown in Figs. 1 and 2. The circuit is shown in Fig. 3. The plastic case is the type that is used to package pins and small costume jewelry.

Construction. To construct the miniature voltmeter, make a starter hole for the potentiometer (R1) with a heated ice pick on the center line with reference to one edge and $\frac{1}{16}$ in. off the center line with reference to a perpendicular edge. Enlarge the hole to $\frac{1}{4}$ in. dia. with a taper reamer. The plastic case cracks easily, so patience will pay off.

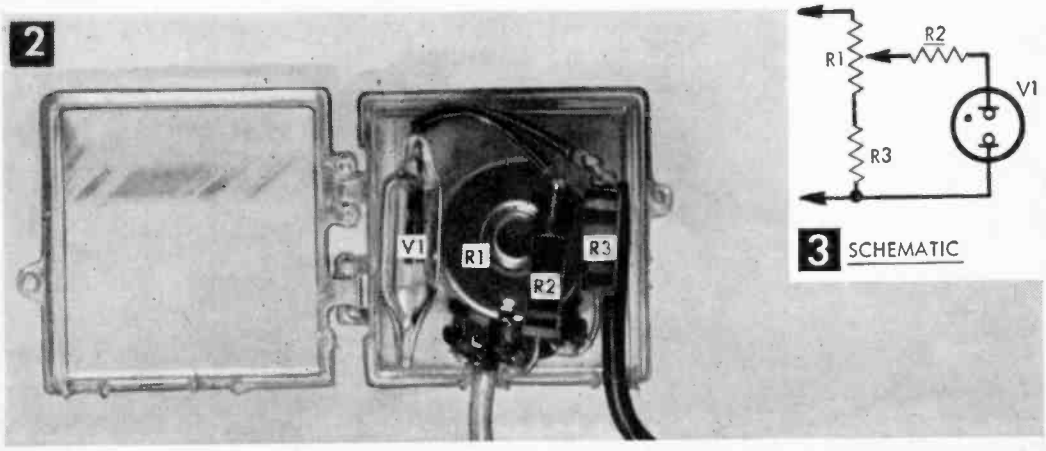
Cut the resistor leads short and wire the voltmeter before you mount the potentiometer in the case. The entire unit assembles on the potentiometer. Shaft should be cut to a length of $\frac{1}{4}$ in., either before or after wiring is completed. Place the portion of the shaft to be discarded in the vise for sawing. The leads are pieces of #20 stranded hook-up wire equipped with Mueller minigator clips.

Place a 1 x 1-in. paper face on the front of the instrument. The potentiometer hex nut holds it in place. Fasten the knob. You will use the set screw as a reference mark for calibration. Connect the voltmeter across a calibrated variable power supply, or use a variable power supply and a voltmeter for calibration. Turn the potentiometer slowly until the neon lamp goes from the *off* to the *on* state. (The lamp may be viewed from the side of

MATERIALS LIST—MINIATURE VOLTMETER

Desig.	Description
R3	100K, $\frac{1}{2}$ watt carbon resistor (10%)
R1	1000K miniature volume control potentiometer (Lafayette)
R2	4700K, $\frac{1}{2}$ watt carbon resistor (10%)
V1	NE-2 neon bulb
	miniature knob (Lafayette MS-185)
	$\frac{5}{8}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$" plastic case
	two minigator clips (Mueller 30)

Rear view of the miniature voltmeter with case open and parts called out.



3 SCHEMATIC

the case.) Stop turning and mark this point with the indicated voltage. I chose to calibrate the lowest voltage which the instrument could measure (70 v.), and increments of 50 v. from 100 to 550 v.

The case edges may be cemented together for increased ruggedness.

To measure a voltage, simply clip the instrument to the circuit and rotate the pot until the lamp turns on. The voltage is read from the scale. Range and accuracy are limited, of course, but small size, portability, ruggedness and low cost make this voltmeter ideal for many applications.

How It Works. The potentiometer R1 and the resistor R3 form a voltage divider. R3 was added in series with R1 to stretch the rotational range of the potentiometer.

The neon bulb V1 will glow when a suitably high voltage is applied to it. Since a neon bulb exhibits negative resistance when it glows, current flow can become excessive if a limiting resistor is not provided. R2 has a value of 4.7M and limits current through the bulb to a very low value.

A given combination of R2 and V1 will cause V1 to start to glow at a definite voltage when voltage is increased from a very low value. The voltage divider consisting of R1 and R3 is simply calibrated for the values of voltage at the input which correspond to R2-V1 voltage for given settings of R1.

Amateur Radio Anagram

Here is an anagram puzzle that is a challenge to your knowledge of ham lingo, abbreviations and Q-signals.

If you can slice through the "QRN" (difficult clues) and work this puzzle without aid from a fellow ham, you have met the challenge fair and square, and won. Obviously you aren't a lid! Solution is on page 48.

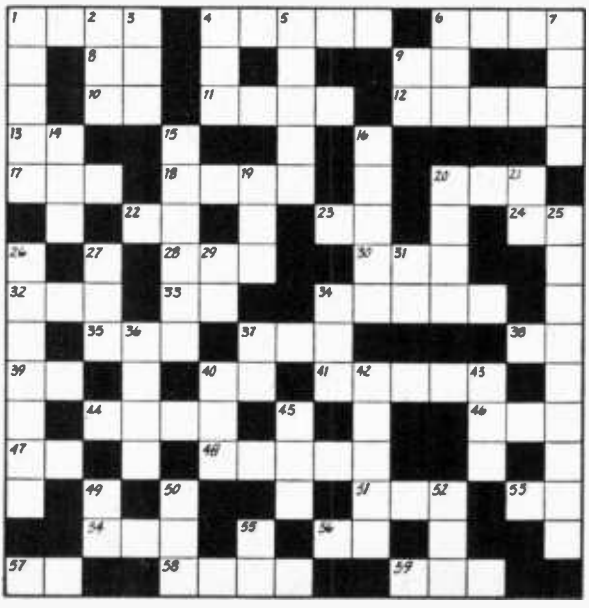
By JOHN A. COMSTOCK

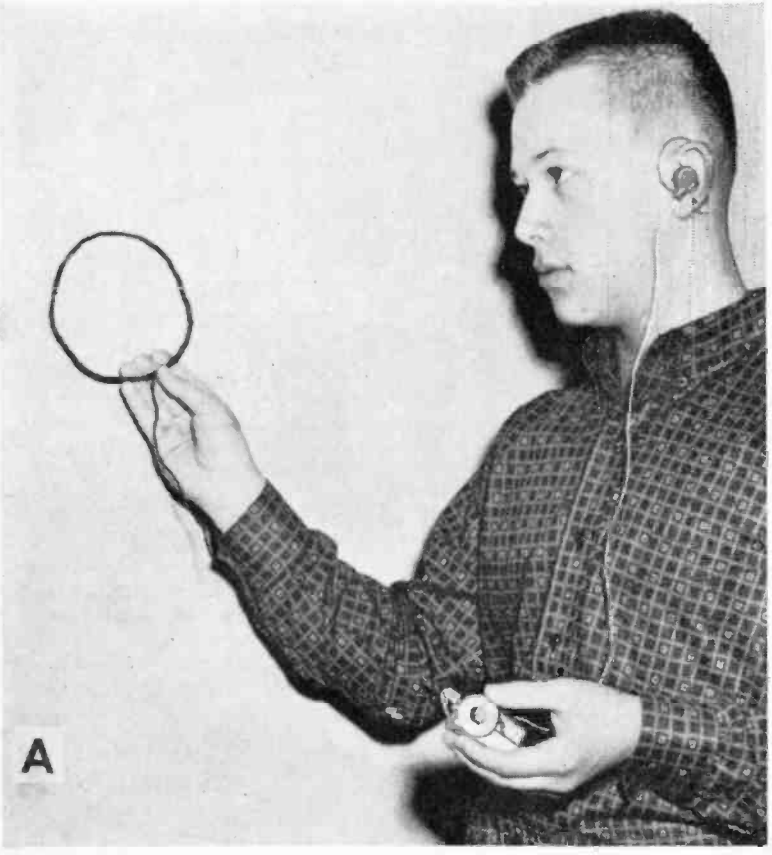
ACROSS

1) Frequency (abbr).
4) Ungrounded antenna.
6) A narrow band system of FM broadcasting.
8) #.
9) Radio inspector.
10) Distance.
11) A number of milliamperes.
12) Unnecessary radiation put out by a key.
13) End of message.
17) What ac voltage does in a capacitive circuit.
18) Telegraphy via radio.
20) Expression of gratitude.
22) Laughter.
23) Old timer.
24) Inductance-capacitance ratio.
28) Type of oscillator circuit utilizing a pentode.
30) Folks of all ages ----- become ham radio operators.
32) Unit of current flow.
33) Not later.
34) A type of coil.
35) Text.
37) Magnetic potential difference.
38) Call, closing.
39) Check.
40) All after.
41) Unit of wavelength.
44) A division of the radio spectrum.
46) Radiotelephony safety signal.
47) Nothing doing.
48) Before you ----- to transmit, you should listen in on the frequency to avoid interfering with other stations.
51) A ham's pride and joy.
53) Word after.
54) Conversation.
56) Go ahead.
57) Here.
58) A particular electron tube element.
59) What is causing the present interference?

DOWN

1) A transmitter stage of amplification.
2) VA.
3) When will you call again?
4) Amateur radio operator.
5) Hams are often called upon to ----- messages.
6) Nothing.
7) If you work phone, you talk into one.
9) Resistance-capacitance circuit.
14) Alternating current that has been rectified.
15) To point an antenna for maximum signal transmission or reception.
16) A jumper cord sometimes used by hams.
19) More than one ham.
20) A resonant circuit.
21) Reactance of an inductor.
25) Type of directional antenna.
26) A type of antenna grounded through a coil.
27) Repeat.
29) Telegraphy.
31) Unmodulated, unkeyed, cw.
34) Call for me.
36) Crystal.
37) One-thousandth of the unit of current.
40) Address.
42) A class of amateur license.
43) Number of revolutions made in a minute.
45) Are you calling me?
49) Indication of a request.
50) A ham shack's record book.
52) Ground.
55) A type of filter circuit the shape of a certain Greek letter.





This tiny metal locator is sensitive enough to detect a pipe buried 3 in. deep in a wall. You adjust the oscillator control on the box (left hand) while you guide the loop with your right. Battery and complete detector circuit are housed in the tiny box.

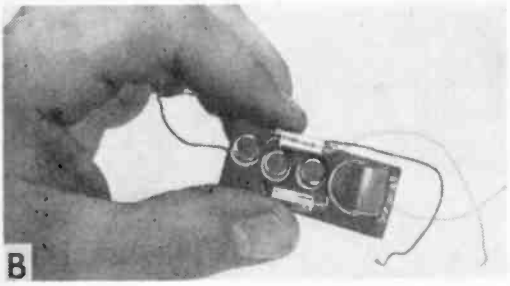
PRINTED CIRCUITS

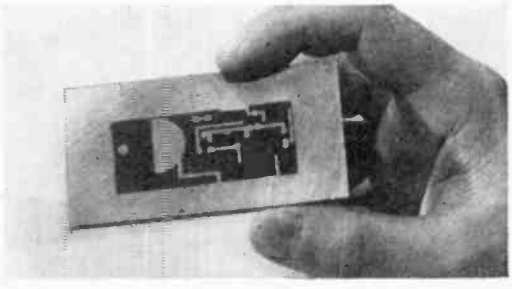
. . . the easy way

TWO miniaturized projects, a metal locator that's probably the smallest ever built and a tiny amplifier that will boost the signal of a mike or crystal radio to 100 times the volume, were selected as practical demonstrations to show you, step by step, how to make your own printed circuits.

Now you can take advantage of an up-to-the-minute technique to miniaturize radios, ham gear, portable electronic gadgetry and test instruments. To make the printed circuit, you simply clip out the template which we've furnished. You use this template as a negative over a sheet of pre-sensitized circuit board. Several minutes of light make the exposure. Develop the board and etch.

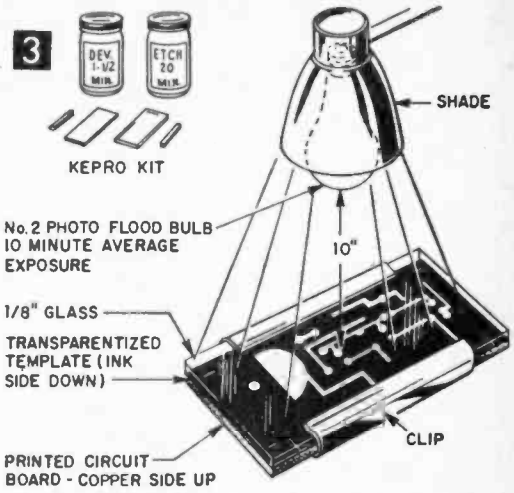
The process is fast, clean and inexpensive. You don't need a lab or photo darkroom, and you can adapt the process to making any kind of circuit, or, for that matter, to making metal nameplates, plaques, or ornamental jewelry. Besides the size reduction feature, printed circuits offer you clean layout of parts, ruggedness, fast assembly and extremely low cost.



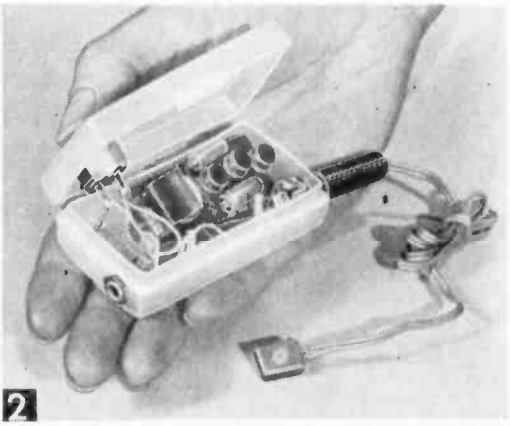


The complete 3-transistor amplifier and battery (left) is tiny enough to hide in a shirt pocket. You can use it as an emergency hearing aid, a crystal set booster or sound pickup. Connected to the metal detector, it will increase the range. After etching, the printed circuit board looks like this photo (right). Everything you need to make the board is supplied in an inexpensive kit, and it takes less than a half hour to expose, develop and etch the board.

To use the metal detector, simply adjust the control knob until you hear a tone. Then, as the sense coil approaches metal, you'll hear a change in the pitch of the sound.



An exposure guide comes along with the printed circuit kit. Time and temperature of developer and etch steps are not critical.



The complete amplifier with rechargeable battery fits into this 1½ x 2½-in. box, with plenty of room to spare. The special hearing aid microphone is only ½ in. long.

Full size paper templates are the negatives for exposing printed circuit boards that build two unusual projects; an ultra-miniature metal locator, and a tiny 3-transistor amplifier that can be used as a mike line booster, sound detector, or mechanic's stethoscope.

The simple 4-step P-C technique described in this article can be used to build many different miniature electronic projects as well as to make ornamental plaques, nameplates and dials. A special $2 kit (listed under Materials) includes 3-light sensitized printed circuit boards, contact glass, clamps and the two liquids required, developer and etchant.

Step 1. Choose one of the three printed circuit templates (Figs. 5, 6, 7) and cut along the corner guide lines. You'll notice that the templates are printed on one side only. Apply *Kit-Koa* transparentizing agent (see Materials List) to the back of the paper with a tuft of cotton. Work above an absorbent paper towel. Allow to dry for a half hour in open air. With gentle heat from a lamp,

Space in these columns reserved for templates appearing on next page.

4 While developing, gently shake the bottle occasionally. Too vigorous an action can damage the board's surface which is soft at this time.

you can cut this time down to a few minutes.

Step 2. Exposure. Now place the paper negative, ink side facing down, on the presensitized board with the glass and the clips included in the kit (Fig. 3). If you've decided to buy the materials separately, you can improvise a printing frame with glass and spring-type clothespins. The laminate board comes wrapped in light-tight aluminum foil, but it's much less light-sensitive than photopaper. A darkroom is not needed; just keep away from sunlight and bright room lights.

Expose about 10 minutes, with a #2 photoflood light (Fig. 3) 10 inches away. Overexposure will tend to harden the surface of the board through the magazine ink, and it will not develop right.

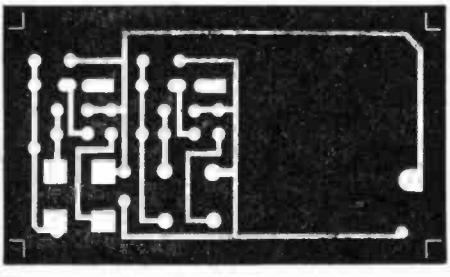
Step 3. Develop Immediately. Simply place the board in the kit's developing solution bottle for 1½ minutes, shaking gently to keep the board covered with liquid (Fig. 4). *Throughout these steps, do not touch the surface of the board, as a fingerprint can cause spots.* Developer temperature and timing is not as critical as in photography. Simply work at normal room temperatures between 70° and 80°F and you'll avoid problems. Also, keep away from sunlight and bright lamps until the 1½-minute development time is completed. Then lift the board out of the bottle with a tweezer to avoid fingerprinting the surface, and fan dry by waving gently in the air for a few moments. Held at a slant, you ought to be able to see a faint image of your circuit on the copper surface.

Step 4. Etching Is Done the same way. The liquid is corrosive, so avoid spilling and wash immediately if it gets on the fingers. Cover the bottle tightly and shake gently about once a minute for approximately 20 minutes. During the etching, you can work in full light and it won't hurt to take the board out of the bottle for a quick look. The copper circuit design should be shiny, while the rest begins to oxidize and etch away. As the etching nears completion, inspect the board by looking through the back against a strong light. You should see a solid circuit silhouette, a reverse, or negative of the template used. If the open spaces are not fully cleared, continue etching a while longer.

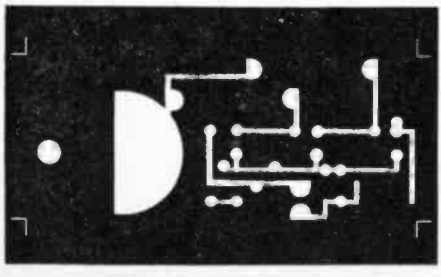
With etching completed, wash the board under a faucet and dry with paper towels. Then scrub the board gently with a fine cleanser such as Ajax to polish off the tough film of photo resist on the circuit lines that prevented them from being etched.

Cut the Board to Size with a fine toothed jig saw. Another way to trim this material is to score a cut line deeply with a sharp craft knife, and then break in a vise. If you try this technique, practice first with scrap board.

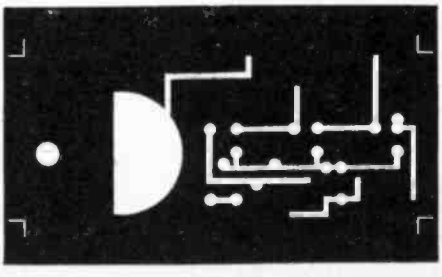
5 Metal Locator template.



6 Mini-Amp template (for ordinary resistors).



7 Mini-Amp template for painted resistors (see text).



Drill the Circuit Holes from the copper side with a hand drill and bit that just fits the diameter of your lead wires. Mark the hole centers first with a sharp center punch, and back the board with a piece of flat hard wood or plastic to keep the laminated base from punching out on back. Then take a slightly larger drill and smooth the burred edges on both sides.

Building the Metal Detector. Wind the sensing coil (Fig. 8) on any form that will give you a 5½ to 6-in. dia. loop. Label a 3-in. starting lead #1, and wind 100 turns of the #32 enameled wire ending in lead #2. Label another lead #3, wind 25 turns in the same direction and finish with lead #4. Tape the entire coil for protection with your numbered leads left out. Then make up the 3-ft., 4-conductor cable color, coding the wires to identify the leads. When you solder the connections, scrape the tiny copper wires gently and pre-tin, avoiding excessive heating.

Wind the Fixed Coil on a miniature printed circuit coil form. First turn the slug all the way in with a plastic screw driver. Cut part of the coil form away with a very sharp knife allowing a ⅜-in. winding space (Fig. 9). Now carefully scrape ½-in. of the insulation from the end of the #38 wire and solder to the #1 lug on the coil form. Jumble wind 400 turns on the coil form. Then bare a spot on the wire without breaking it, and use it to wind about 3 turns around #2 lug. Solder and clip the wire.

Next, add a secondary, wound in the same direction, but with 100 turns of wire—starting from #3 lug and finishing at #4 lug.

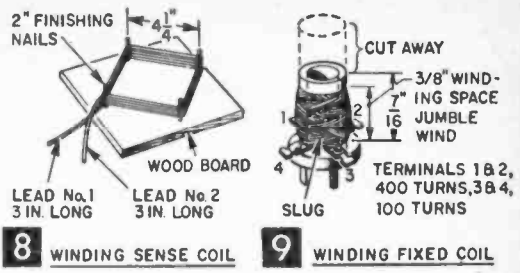
Soldering the P-C Board is easy, but you must use a small iron, the right solder, the right tip, and a heat sink to avoid damaging transistors, diode, and other small parts. Feed the four legs of the fixed coil through the holes from the plain side of the board and force it as close to the board as possible and solder.

Install the transistors allowing enough lead between part and board for the heat sink (Fig. 10). Clip should be left on for 1 minute after soldering each joint. Use the same method with clip for the capacitors. Gently bend one resistor lead (Fig. 11) and insert both leads through the board at the same time. Resistors can be pushed flush, but get that iron off the lead as soon as the solder takes. Tie in your sensing coil leads, and the board is done.

The Metal Locator Case is a clear poly box (Fig. 13). Install the phone jack, bending the lugs toward the rear of the case. The front lug supports the circuit board, while the other one is for the phone jack lead.

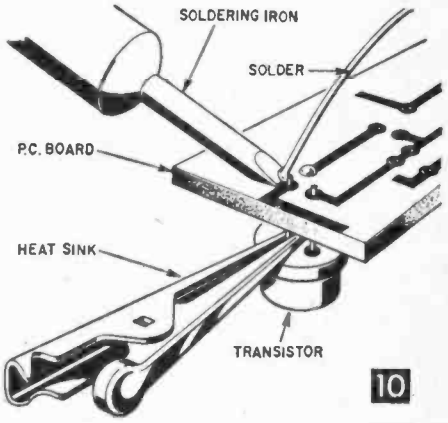
Cut the side holes with a sharp knife. Work slowly so you won't split the plastic. Cut the capacitor lugs down so only 1/16-in. extends past the front. Solder two 1½-in. leads to these short lugs. Then insert the capacitor leads through the right board holes and solder. Slide the board into place in the case, with the circuit facing away from the capacitor. Adjust the lug nearest the case to fit against the copper area marked for it on the circuit board, and solder. This connects to the phone jack, as well as supporting the board. Add the dial, and battery and you're ready to use the unit.

The Detector Operates like its bigger vacuum tube brothers, but with less sensitivity because of the tiny size. It has two oscillators, one running at a fixed frequency around 150 kc, while the other tunes via the variable



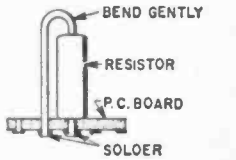
8 WINDING SENSE COIL

9 WINDING FIXED COIL

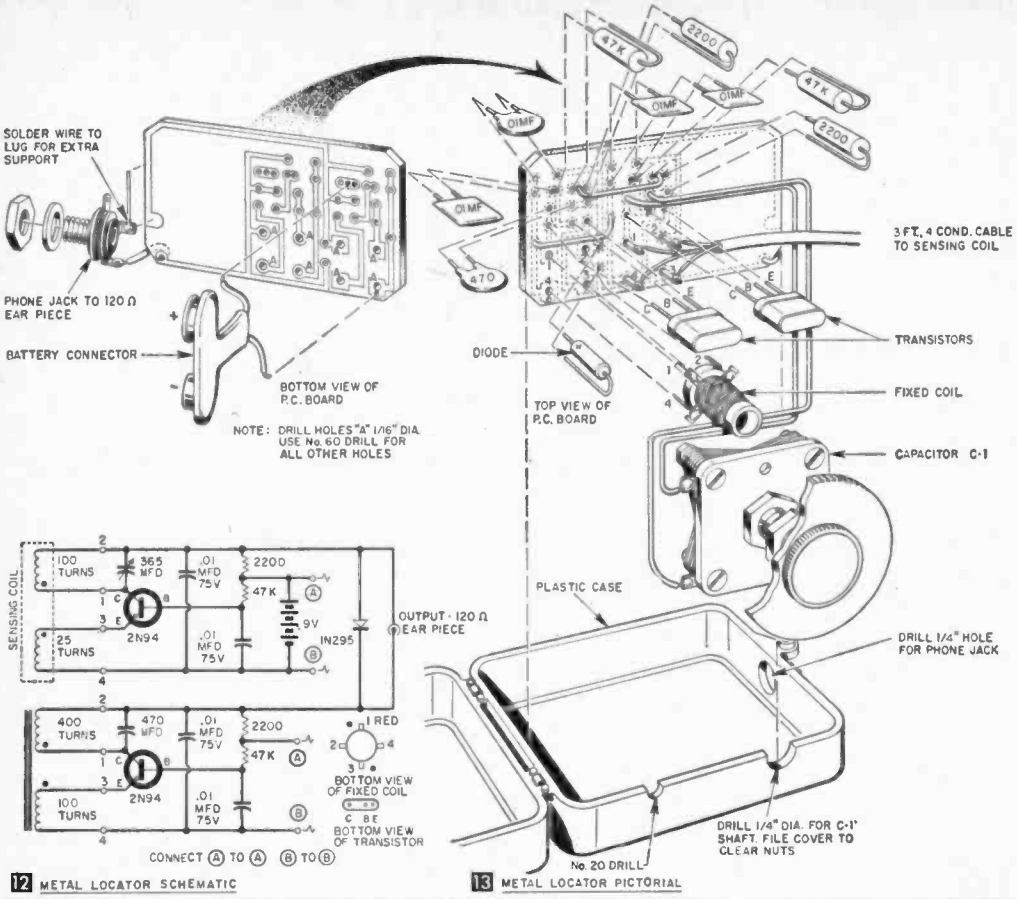


10

Try to solder without a heat sink and you'll burn up the transistor. Here's a heat sink made by filing down the teeth of a copper Minigator #33C clip. It carries away a lot of heat for its tiny size. A recommended soldering pencil is the Ungar type 776, with a #1235 heater and type 333 chisel point. The 18 ga. Ersin Multicore printed circuit solder is smaller than ordinary electronic solder, and is designed for miniature work.



11 RESISTOR MOUNTING METHOD



12 METAL LOCATOR SCHEMATIC

13 METAL LOCATOR PICTORIAL

MATERIALS LIST

PRINTED CIRCUITS

No. Req.	Size and Description
1	SM-1 Kepro P-C Introductory Kit incl. 3 pcs. 1⅜ x 3" sensitized laminate board, 4 oz. dev., 4 oz. etch, glass, clamps, instructions. Available $2 postpaid. Keil Engineering Products, 6833 Manchester St., St. Louis 10, Mo. (These items are stocked in larger sizes by Allied Radio.)
1	2-oz. bottle transparentizing agent. Available 75¢ postpaid. Kit Koa Distributors, 184 W. Washington St., Chicago 2, Ill.

METAL LOCATOR

1	120 ohm earpiece (Allied #59J124)
1	battery connector, Cinch-Jones Type 5D (Allied #54J037)
1	coil form, Cambridge Thermionic SPC-1A-4L (Lafayette #CO-302)
2	2N94 transistors
1	1N295 diode
4	.01 mfd. 75v capacitors (Lafayette #C-612)
1	C1 470 mfd. disc capacitor (Lafayette #C-601)
1	plastic case 2⅛ x 1⅝ x 1 in. (Lafayette #MS-156)
1	365 mfd. variable capacitor (Lafayette #MS-445)
2	47K ½-watt resistors
2	2200 ohm ½-watt resistors
1	subminiature plug and jack set (Lafayette MS-370)
1	9-volt battery (Burgess 2U6 or equivalent)
¼ lb.	plain enameled magnet wire #32 (Lafayette WR-86)
¼ lb.	plain enameled magnet wire #38 (Lafayette WR-92)
3 ft.	Belden type #8444, 4 conductor cable
1	S1-33, 3 x 3" Kepro light sensitized laminate (Allied #43N636)
1	E-1PT Kepro etching solution (Allied #43N648)
1	D-1PT Kepro developing solution (Allied #43N647)

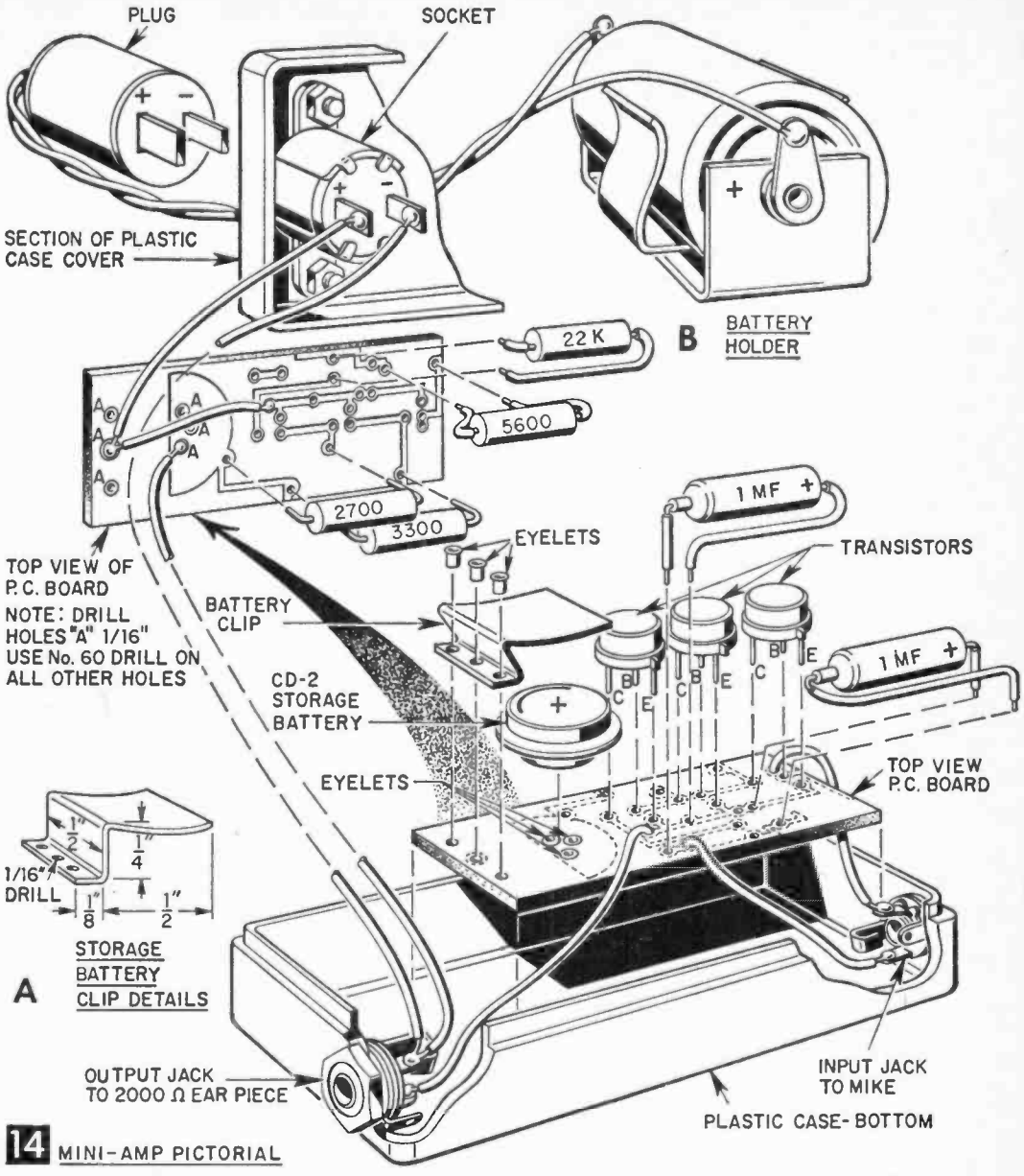
MINIATURE AMPLIFIER

No. Req.	Size and Description
1	2000 ohm earpiece (Allied #59J134)
1	CD-2 Burgess nickel-cadmium battery (Allied #79J728)
2	1 mfd. 6 V Barco capacitors or equivalent Lafayette #CG-125)
3	Lafayette SP-146 transistors
1	microphone of your choice. Knowles AY-1451 hearing aid mike, 4000 ohm (⅜ x ½ x ⅛" case), or equal. contact mike (optional) Lafayette #PA-35 crystal type.
2	subminiature plug and jack sets (Lafayette #MS-370)
1	Cinch Jones plug P-302-CCT (Allied #40H802) for charger
1	Cinch Jones socket S-302-AB (Allied #40H880) for charger
1	Keystone battery clip #175 (Allied #54J040) to fit standard flashlight battery for charger
1	2½ x 1½ x ¾" plastic hardware box, or cosmetic case
1	Kepro P-C board kit or separate items listed above
1	#SA-2 Micro-Circuits painted resistor kit, available to our readers only. Contains silver circuit paint, resistance paint, brushes, instructions, $2.24 postpaid, Micro-Circuits Company, New Buffalo, Michigan*

*If preferred, you may substitute the following resistors for the painted resistor technique.

1	5600 ohm ½-watt resistor
1	3300 ohm ½-watt resistor
1	2700 ohm ½-watt resistor
1	22K ½-watt resistor

*Special printed circuit and painted resistor kits listed are available only from mfrs. All other items available Allied Radio, 100 N. Western Ave., Chicago 80, Ill., or Lafayette Electronics, 165-08 Liberty Ave., Jamaica 33, N. Y.



14 MINI-AMP PICTORIAL

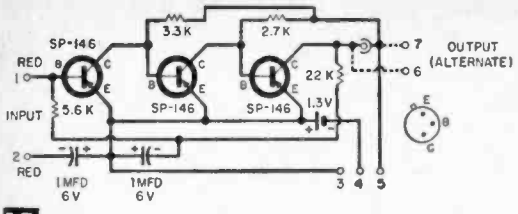
capacitor. The two frequencies are beat (mixed) by the IN295 diode, and this produces the two original frequencies, the sum of the two frequencies, and the difference of the two.

The difference frequency does the job. When there's no difference in the frequencies, no sound is heard in the earphone, but if they differ by a few cycles, a tone comes through. You get the change either by varying the capacitor, or by bringing a metal object near the sense coil. Ferrous objects increase the coil inductance, while non-ferrous materials decrease it.

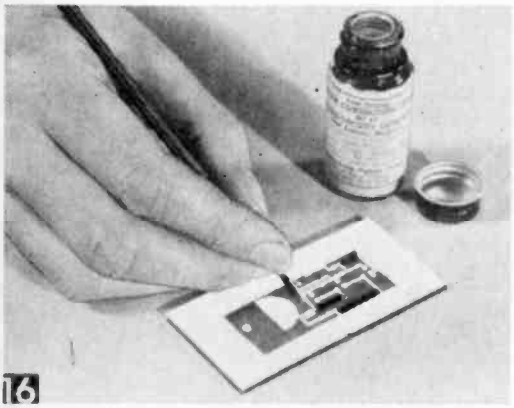
So to operate, adjust C1 until you hear a pleasant tone in the earpiece. Run the coil over the wall, floor, etc., and listen for a change in pitch. Repeat a few times to be sure you have the right spot . . . and that's it.

Mini-Amp Construction. The templates give you a choice of two ways to build the unit: for regular resistors, use Fig. 6 negative; for painted resistors use Fig. 7. If you decide to use ordinary resistors, expose, develop, and etch the board as described above, and mount the parts as in Fig. 13.

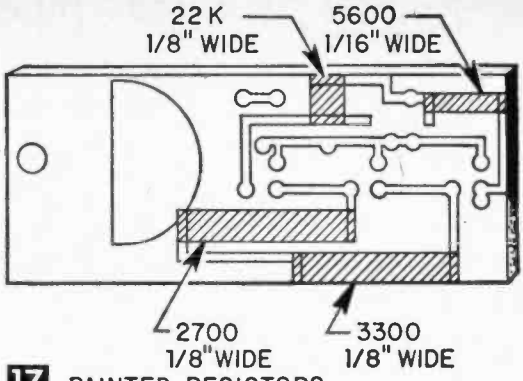
Painted Resistors are easily applied by means of a special kit offered by Microcircuits Company especially for our readers. A good ohmmeter is essential. Clean the resistor P-C leads on the board, and outline the resistor rectangles with a sharp scriber. Follow in-



15 MINI-AMP SCHEMATIC



16 The four black strips are the painted resistors. In the second step, you paint over the ends with conductive silver lacquer to adjust the ohmage down to the circuit values.



17 PAINTED RESISTORS

structions packed with the kit . . . it's very important to stir the resistance paint with the stick, and then close the bottle and shake about 50 times to properly blend the paint.

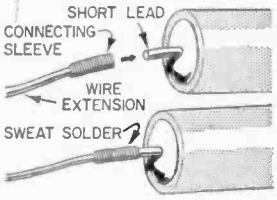
Then using the brush, paint a single heavy coating (Fig. 16). Dry 30 minutes and immediately wipe the brush and clean in lacquer thinner. Then bake the board in a kitchen oven for ½ hour, with the temperature set at about 175 degrees. The resistors should look dull black, with no blisters or bubbles.

Check with an ohmmeter; if the value is low, scrape the surface with a razor blade or fine sandpaper to reduce thickness (see Microcircuit's instruction sheet). If it's high, you simply shorten the resistor leads by painting silver from one or both ends over the resistor surface (Fig. 17). Re-heat the board 10-15 minutes in the oven before you check the resistance with your ohmmeter. A little practice and you can get any resistance value you need quickly.

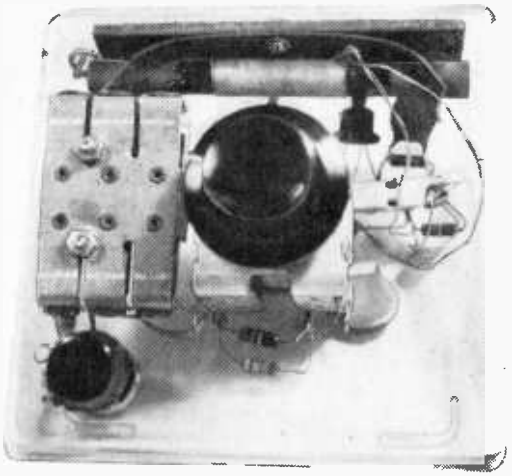
Amplifier Construction is similar to the metal detector. Bend the storage battery clip from a piece of sheet copper as in Fig. 14A. You can make the case from a plastic lipstick box. A single dry cell (Fig. 14B) charges the nickel cadmium battery. The tiny hearing aid mike can be installed in a salvaged ball-point case to make a mechanic's stethoscope for checking motors, vibration, etc. Or you can use the amp as a sensitivity booster with the metal detector. The mike also works well with small funnels and cones as a long distance sound pick-up. Holding it against a wall, you'll be able to hear water running in pipes and even sounds coming through from the next room.

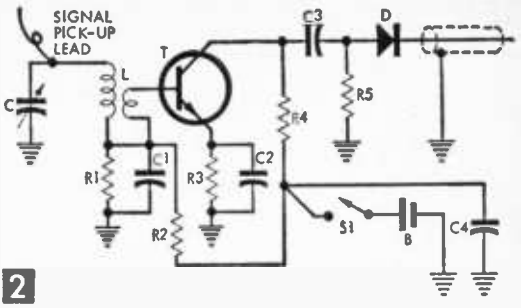
Designing Your Own Printed Circuit. Following methods described, you can make your own P-C circuits simply by making an india ink negative like Figs. 5, 6, 7 on translucent drafting paper. To solve circuit routing problems and avoid dead ends, make a perfect mockup first on a piece of cardboard actually checking the parts in position. The light-sensitive photo resist board we have shown is only one of the many ways to make a P-C. For example, Kepro supplies mechanical negative, and also tapes, and liquid etch resists that you apply directly to the board.

Extending Component Leads



• After the same components have been soldered into several different experimental circuits which then have been dismantled, the length of the leads gradually becomes shorter until the parts are no longer usable. You can extend such leads for further use by splicing on a 2-in. length of bare wire about the same diameter as the component lead. Wrap several turns of #22 or smaller bare wire tightly around the larger wire, near one end, to form a connecting sleeve. Scrape both wires clean or remove any enamel coating with solvent. Then push it up until it extends partly beyond the end of the wire. Insert the short component lead into the end of the sleeve and sweat-solder it, using resin sparingly. Grip the short lead with pliers during soldering to prevent overheating the component.—J. A. Comstock.





2

Fig. 6. Use a heated ice pick to make the battery mounting holes and a starter hole for the switch mounting hole. Be careful not to crack the case. Enlarge the switch mounting hole with a taper reamer.

Bend the battery holder terminal lugs over as in Fig. 3 to make a series battery hook-up. Fill the battery contact eyelets with solder. Fasten the battery holder in the case. Be careful not to damage the ferrite loop coil leads in this and subsequent steps.

Cut the shaft of S1 to 3/8 in. Fasten the part of the shaft to be discarded in a vise, and use a hacksaw for cutting. Mount S1 on the case. Note that a miniature 10K volume control with switch is used, but that the volume control part of the unit is not connected into the circuit.

Next, solder the terminal strip to the back of the tuning capacitor frame. Use a very hot iron (100 watts or more). Mount R1, R2, R3, R4, C1, C2, C3 and T on the terminal strip using Figs. 2 and 3 for guidance. As a heat sink, grasp the transistor leads with pliers.

Connect the lower end (few turns side) of L to the base of T on the middle lug of the terminal strip. Connect the tap on L to the junction of R1, R2 and C1 (see Fig. 3). Connect the free end of C3, the free end of D and R5 together. Connect the other end of R5 to the common ground (capacitor frame).

Connect the tuner to your amplifier and try

One Transistor Hi-Fi Tuner

By FORREST H. FRANTZ, SR.

IF THE listener is within 25 miles of a radio station, a one transistor tuner will usually suffice to drive an amplifier. This tuner uses the components and case of the crystal tuner described in the article, "Crystal Tuner," page 83.

The one transistor tuner employs a GE 2N168A r.f. transistor. Capacitor C tunes the LC combination to station frequency, amplifying 500 times. The small turns part of the loop matches the coil to the transistor low input impedance. The transistor amplifies the signal and feeds it through capacitor C3 to diode D for detection.

Resistors R1 and R2 provide base bias for the transistor. R3 stabilizes the transistor against dc operating point shifts due to temperature changes. Resistors R4 and R5 load the transistor collector circuit. C1, C2 and C4 are bypasses in their respective circuits. C3 couples the amplifier radio frequency signal to diode D but prevents the transistor collector dc bias from affecting the diode.

If you haven't constructed the instrument described in the "Crystal Tuner" article, follow the construction steps outlined there. The only connections which must be unsoldered are the connections between the tap of the loop coil L and the diode D, and the connection of the lower end of coil L to the stator of tuning capacitor C.

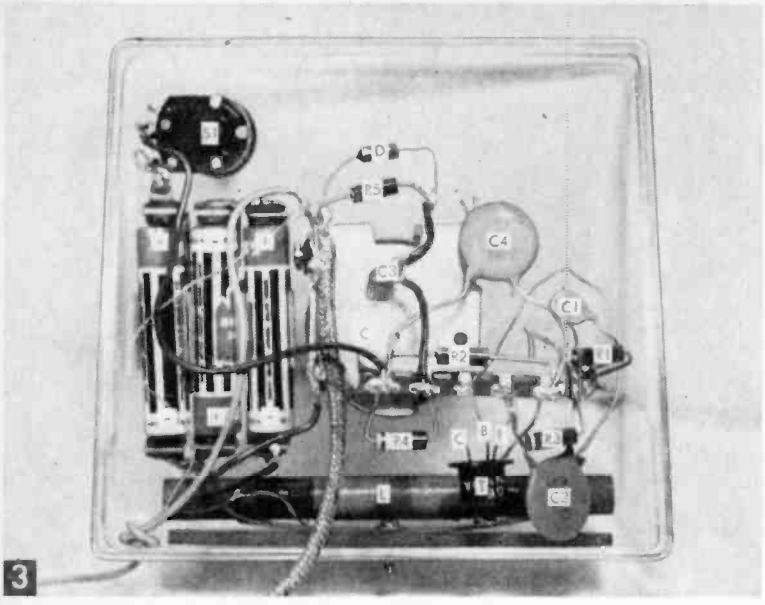
Make 3 holes in the front of the case as in

MATERIALS LIST—TRANSISTOR TUNER

In addition to parts listed for "Crystal Tuner," p. 83, the following are required to build the transistor tuner:

Desig.	Description
R3	470 ohm, 1/2 watt carbon resistor (10%)
R4	3.9 K, 1/2 watt carbon resistor (10%)
R1, R5	10K, 1/2 watt carbon resistor (10%)
R2	68K, 1/2 watt carbon resistor (10%)
C3	100 mmf., 1000 v. ceramic capacitor (Sprague 5GA-T1)
C1	.01 mf., 50 v. ceramic capacitor (Sprague TG-S10)
C2, C4	.1 mf., 50 v. ceramic capacitor (Sprague TG-P10)
S1	SPST switch (Lafayette VC-28 volume control 10K and switch was used)
B	three 1.5 v. penlite cells (Burgess #7)
T	2N1086 transistor (General Electric) battery holder (Lafayette MS-169) five terminal tie down strip (Cinch-Jones 2005)

Parts may be obtained from Lafayette Radio, 100 Sixth Avenue, New York 13, N. Y.



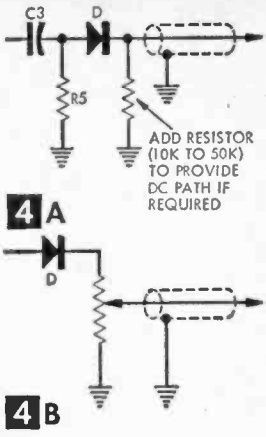
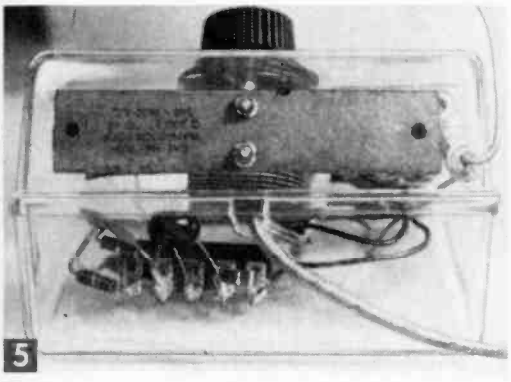
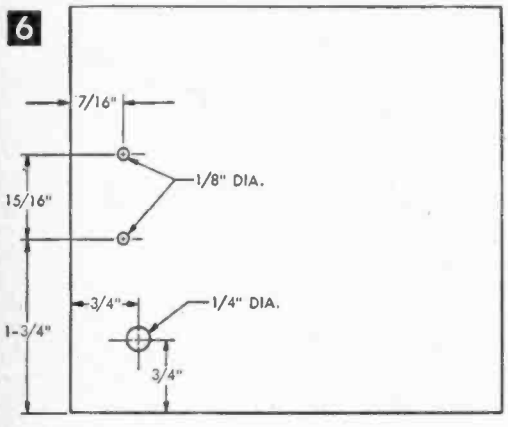


Fig. 3. Bottom view of tuner.
Fig. 5. Back view.





it out. In metropolitan areas you may have difficulty with one or more strong locals coming in under desired stations. Shortening the signal pick-up lead will help. A wave trap between the signal pick-up lead and the connection to C will be more effective. An outside antenna may be connected as described in the "Crystal Tuner" article to increase sensitivity of the tuner in areas remote from stations.

The tuner may be used as a receiver by substituting a phone jack for the phono plug. Reception is, of course, limited to what can be expected from a one transistor receiver without an amplifier. The article "Two Transistor Amplifier," page 47, describes the addition of an amplifier to convert this receiver into a high sensitivity headphone receiver with sufficient output to drive a loudspeaker if you're reasonably close to radio stations.

If the tuner is to be used with an amplifier which has a capacitor in series with the input lead, a dc path is required across the tuner output. Connect a resistor (any value between 10K and 50K) as in Fig. 4A. The volume control which carries S1 may be used to furnish this resistance. If your amplifier does not have a volume control, or if for some other reason you desire volume control on the tuner, connect the volume control which carries S1. Fig. 4B shows the arrangement.

Foil Aids Set Alignment

• To avoid interference, it is common practice to stop a superhet's oscillator before aligning the intermediate-frequency amplifiers. A simple way to do this is to wedge a piece of aluminum foil between the plates of the oscillator's tuning capacitor. When the dial is rotated, the foil between the rotor plates makes contact with the stator plates and "kills" the oscillator.

2 Transistor Amplifier

By FORREST H. FRANTZ, SR.

THIS amplifier, when installed in the tuner described on page 45, provides a receiver, or it may be used as a general purpose amplifier or as a small phono amplifier. The amplifier is built on a terminal tie-down strip.

Mount the components on the terminal strip as in Fig. 2. Note that the mounting shell forms a sixth terminal (ground common) and all of the resistors except one are soldered to the shell. Mount the transistors first. Don't shorten the transistor leads. Shorten resistor and C6 and C7 leads.

Solder all of the connections except those on the terminal to which T1 is connected. Grasp transistor leads with pliers while soldering, as a heat sink. Solder the ends of R7, R8 and R9 to the mounting shell of the tie-down strip.

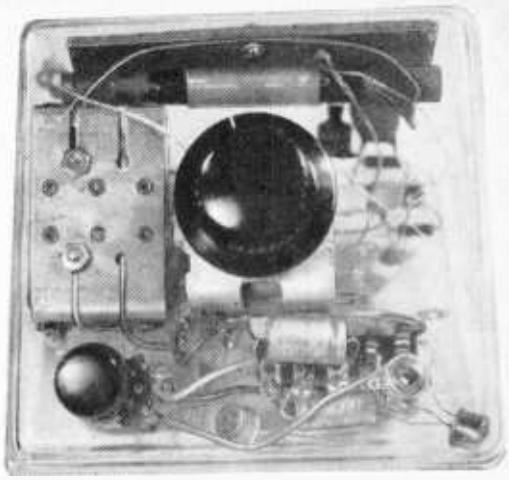
To install the amplifier in the tuner case to make a receiver, remove the back of the tuner case. Disconnect and remove the shielded output lead. Connect the free diode lead to the high side of the volume control. Make a ¼-in. dia. hole for the phone jack. See Fig. 1 for location. Mount the phone jack. Use Figs. 1, 3 and 4 for guidance in subsequent steps.

Connect a lead from the low side of the volume control to the frame of the tuning capacitor. Connect another lead from the low side of the volume control to the phone jack shell connection terminal.

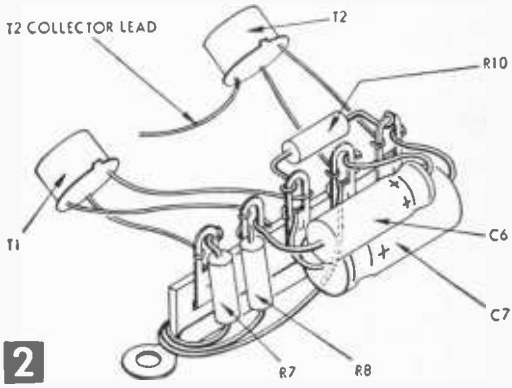
Bend the T2 end of the terminal strip mounting shell so that the amplifier will be inclined to the front of the case and then solder the amplifier assembly to the bottom of the tuning capacitor. You may have to reposition some parts when you do this. Be careful not to short against the phone jack. Connect the collector lead of T2 to the tip connection terminal on the phone jack.

Connect C8 from the on-off switch to the capacitor frame (+ to switch, — to capacitor frame). Disconnect the + power supply lead from the tuner terminal strip and connect it to the middle terminal of the amplifier strip. Connect R11 from the middle terminal of the amplifier terminal strip to the end terminal of the tuner strip where the + power lead was previously connected.

Connect the + lead of C5 to the junction of T1 base and R7 on the terminal strip and connect the negative lead of C5 to the center terminal of the volume control.



The amplifier combined with a tuner (see text) to form a receiver.



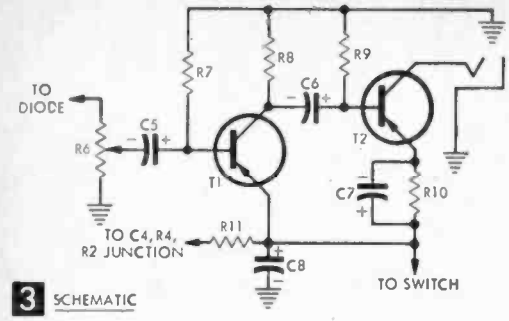
Position the transistors as in Fig. 4. Dress the transistor leads so they won't short. Place the back on the case.

Plug an earphone (500 to 1000 ohms impedance) into the phone jack. Or, a loudspeaker may be connected through a 500 ohm output transformer as in Fig. 5.

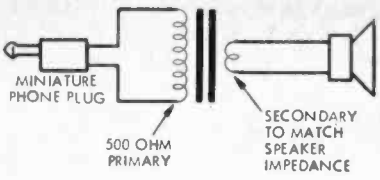
The sensitivity of the receiver can be increased by connnecting a gimmick (a small capacitor made by twisting two short pieces of insulated wire together and connecting as in Fig. 6 between base and collector T). If you insert too much capacitance, the receiver will squeal. Tight twisting of the wires has the same effect as increasing length. An inch or two of wire is probably all you can use without causing oscillation.

If the receiver output has too much high frequency to suit you, you can reduce the highs by connecting a .01 to .1 mf capacitor across the phone jack.

The gain of the receiver and the power handling ability may also be increased by ex-



3 SCHEMATIC



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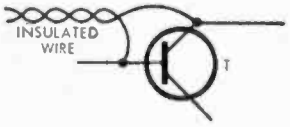

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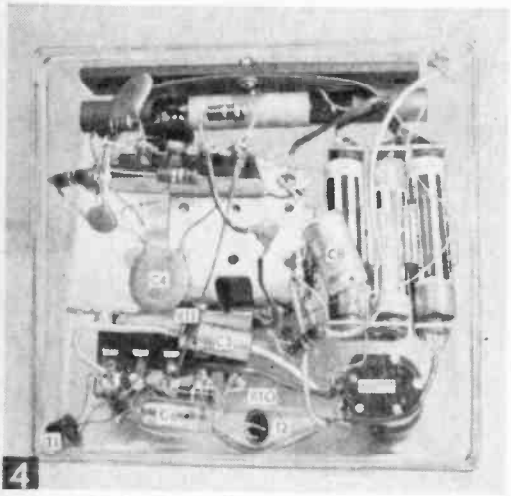


4 Detail of amplifier mounting in case.

perimenting with changes in the value of R9. The value of R9 that is optimum depends on the transistor used. Any improvement that might be secured though will probably be small. In any event, R9 should not be less than 47K.

The signal enters the amplifier through C5 and is introduced to the base of T1. R7 and R8 establish dc biases for base and collector respectively. The signal is amplified by T1 and the output is transferred to T2 via C6. C6 prevents interaction between the bias on the collector of T1 and the bias on the base of T2. R10 biases the emitter of T2 and stabilizes this transistor. C7 bypasses audio around R10. Without C7 there would be a great loss of gain in this stage. The combination of C4 and R11 form a filter and isolating network between the r.f. stage and the audio amplifier stages.

Note that the collector load and base bias resistors in the amplifier return to ground and the emitter returns eventually end up on the + side of the battery, the reverse of the situation in the r.f. amplifier. The reason for this is that the r.f. amplifier transistor is npn while the audio transistors are pnp's.

MATERIALS LIST—AMPLIFIER

Parts listed are parts required in addition to those listed in the "Crystal Tuner" and the "One-Transistor Hi-Fi Tuner" articles, if it is desired to use the amplifier as part of a receiver.

Desig.	Description
R10	270 ohm ½-w carbon resistor, 10%
R11	1K ½-w carbon resistor, 10%
R8	10K ½-w carbon resistor, 10%
R9	100K ½-w carbon resistor, 10%
R7	270K ½-w carbon resistor, 10%

(R6 is the 10K control equipped with S1 which was obtained for the transistor tuner.)

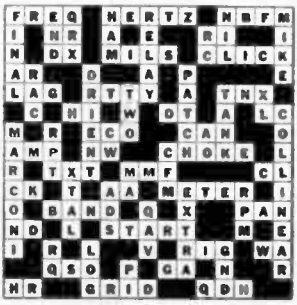
C5, C6	25 mf, 6 v Littl Lytic capacitor (Sprague TE-1091)
C7, C8	100 mfd, 6 v Littl Lytic capacitor (Sprague TE-1102)
T1	pnp transistor (Raytheon 2N362)
T2	pnp transistor (Raytheon 2N360 or 2N362)
	miniature phone jack (Lafayette MS282)
	5-terminal strip (Cinch-Jones 2005)

Parts for this project may be obtained from
Lafayette Radio
100 Sixth Avenue
New York 13, N.Y.

Extending Selenium Rectifier Life

• A selenium rectifier's life is greatly shortened when it is mounted on a chassis in a poorly ventilated location. For this reason, when building electronics gear, choose a location for the selenium rectifier that's adequately ventilated. If circuit layout makes an on-the-top chassis mounting impractical, mount the rectifier where vent holes can be punched in the chassis around the component. Since heat rises, two or more large exhaust holes punched in the chassis directly over the top of the component are usually sufficient to drain off most of the damaging heat.—JOHN A. COMSTOCK.

Solution to Amateur Radio Anagram, page 37.



WIRELESS BROADCASTER

Plays through Your Radio

It's really a tiny radio station and not illegal so long as the signal does not carry beyond your home

For real fun at parties, try playing "disk jockey." Both mike and phono pickup can be connected at once to the oscillator. For children's safety, insulate the chassis in a wood or plastic case to prevent shock.

By THOMAS A. BLANCHARD

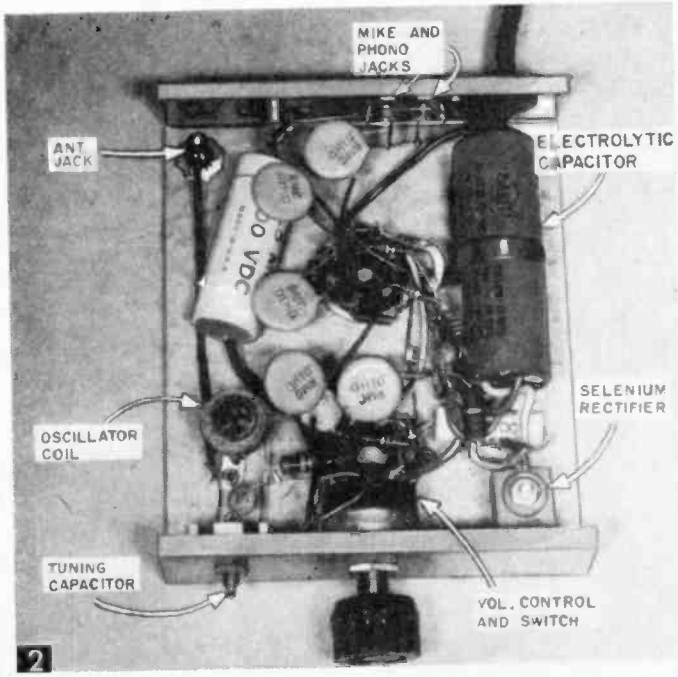
THIS little broadcast band oscillator picks up sound through the mike or a phono pickup. It's a lot of fun to play disk jockey at parties, and you can also use it to broadcast the sound portion (but not the picture signal) of interesting TV programs to any radio around the house.

Many of the parts for this project can be found in the surplus bins of electronic dealers, and some of the items can be salvaged from discarded superhet receivers. The chassis shown in Fig. 5 is a 5-in. wide x 5¾-in. long x 1½-in. deep radio utility box, but you can use any chassis of similar size. If the unit is to be used by young children, plan to eliminate shock hazard by enclosing the chassis in an insulated wood or plastic cabinet.

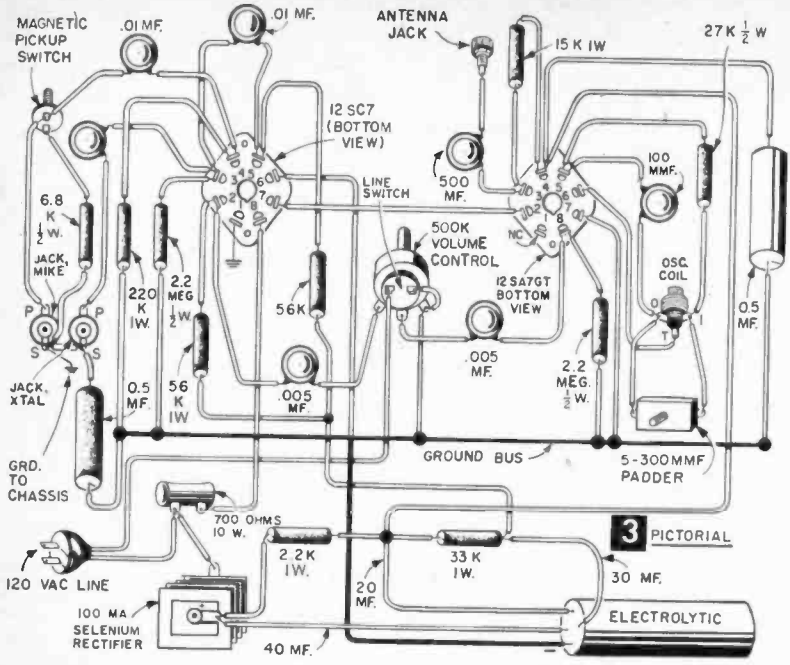
Start Construction by installing the tube sockets and controls on the chassis. Since the 12-volt tube filaments are wired in series, you'll need a suitable resistance to drop the 120-volt a-c line voltage down to 24-volts a-c. Use either a 10-watt 700 ohm wirewound resistor or a voltage drop line cord with built-in 700-ohm resistance.

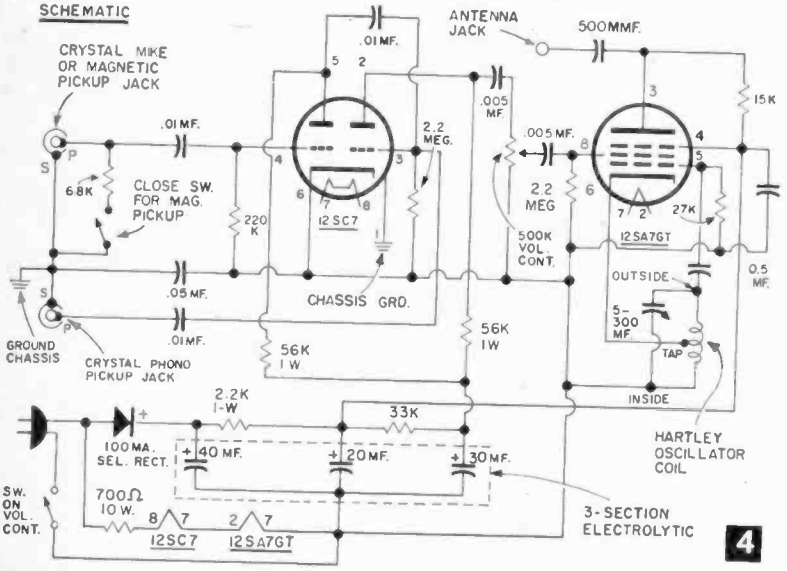
While the circuit is the ac-dc type, the design provides a "floating" or isolated ground return. For this return bus, you can use a 2-lug tie strip, with both lugs connected together. Thus any part connected to the heavy lead in the pictorial (Fig. 4) can be tied to this strip.

The oscillator coil is the 3-wire Hartley type used in superhet radios. Coils made by



Parts layout is not critical, but avoid crowding parts in smaller chassis boxes.





MATERIALS LIST—WIRELESS BROADCASTER

No. Req.	Size and Description
	RESISTORS
1	700 ohm, 10-watt wire wound (optional)
1	2.2K 1-watt
1	15K 1-watt
1	27K ½-watt
1	33K 1-watt
2	56K 1-watt
1	220K 1-watt
1	6.8K ½-watt (optional)
1	500K volume control with switch
2	2.2 meg. ½-watt
	CAPACITORS
1	100 mmf. disc ceramic
1	500 mmf. disc ceramic
2	.005 mfd. disc ceramic
3	.01 mfd. disc ceramic
1	.05 mfd. tubular capacitor
1	0.5 mfd. tubular capacitor
1	20-30-40 mfd. 3-section electrolytic 150 dcwv
1	5-300 trimmer/padder capacitor (see text)
	CHASSIS ITEMS
1	12SA7GT tube (oscillator)
1	12SC7 metal tube, GE Ken Rad or equal (amplifier)
2	octal tube sockets
2	phono jacks
1	100 ma. selenium rectifier
1	Hartley standard broadcast band oscillator coil
1	plastic phone tip jack (antenna)
1	line cord and plug (optional) see text
1	S.P.S.T. toggle switch (optional) see text
1	5¾ x 5 x 1½" chassis, or small radio utility box misc. mounting hardware, knob, hook-up-wire, mike

Miller, Stanwyck and Meissner are suitable. Some coils do not require the separate 100 mmf. capacitor shown in the circuit, since this capacity is obtained with a "floating" grid winding. This feature is indicated in manufacturers instruction sheets or in your electronic parts catalog.

How It Works. Unlike many two tube phono oscillators in which one tube is used merely as a rectifier, this circuit obtains its rectified voltage from a 100 ma selenium dry disc rectifier. Thus, in addition to the 12SA7GT oscillator, the metal 12SC7 tube is added to give you two stages of amplification before the signal reaches the oscillator grid. For playing records with a crystal pickup, only half of the 12SC7 is needed in the simple voltage amplifier circuit, but when you are using a crystal mike or low impedance mike good results demand a preamp. You've got the extra punch in the remaining half of the 12SC7.

Adjusting the Oscillator. This circuit is the Hartley type, popular because of circuit simplicity. While it was originally developed for continuous wave with triodes and pentodes, the introduction of pentagrid converter tubes for superhets allows this circuit to be grid modulated, since tubes such as the 12SA7GT (large size) and the 12BE6 (miniature) have two control grids. The wireless broadcaster covers the higher end of the broadcast band, 1000 to 1500 kc. To tune to a spot where no station interferes, a compres-

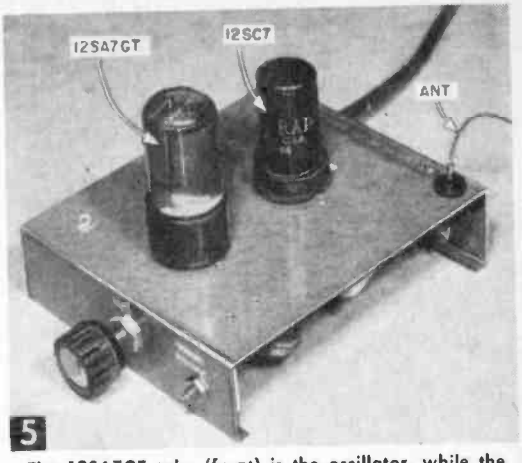
sion trimmer (padder capacitor) is shunted across the oscillator coil. You can use 5-300 mmf, 25-280 mmf, 45-380 mmf, or any other range not exceeding 400 mmf.

As you adjust the capacitor with your radio turned on, several times during the rotation of the padder screw you'll hear the carrier coming through. Listen for the loudest purring sound, as this will be the fundamental signal. Other signals heard are harmonics and will be weak in strength compared to the fundamental. Once adjusted with a screwdriver the tuning needs no further attention.

Connections and Uses. With medium to high output crystal phono pickups, you'll get good results with the 12SA7GT alone by feeding the pickup to pin #8 through the .005 mfd. capacitor with the other lead connected to ground bus through the .05 mfd. capacitor. To use more expensive high-reluctance (magnetic) pickups, connect a 6.8K shut resistor across the mike jack. Fig. 4 shows how this resistor can be switched in and out for playing records.

Even the most inexpensive crystal mikes will provide good voice reproduction. The Lafayette PA-17 mike is especially recommended. The volume control with line switch is the usual radio type and allows the volume to be regulated at point of origin, provided that your radio is set to a high level.

Determine antenna length by experiment.



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The 12SA7GT tube (front) is the oscillator, while the 12SAC7 (rear) gives you two stages of amplification; enough shock for magnetic pickups.

As little as 4 ft. of light plastic insulated wire may be enough, but you can increase it up to 20 ft., provided your signal doesn't feed over to your neighbor's house thus violating FCC regulations. For permanent installation, you can tack the antenna to a baseboard.

You'll find that you can use the broadcaster with telephone pickups, tape recorders, high-fi components, and it can double as a baby alarm and one-way intercom.

When you buy that communications receiver, be sure to get a set of headphones for it. By excluding outside noises, they make for better listening. They also make wee-hour DXing more acceptable to the other members of your family.

Photos courtesy Allied Radio Corp., Chicago

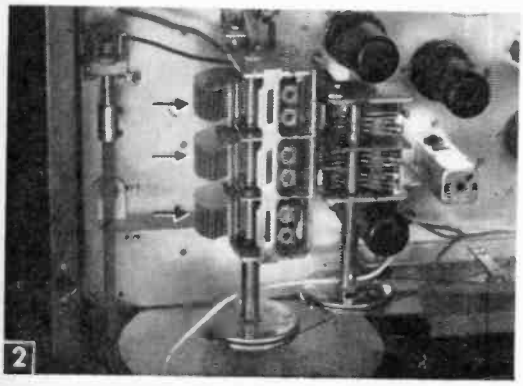
The Science of Buying a Short Wave Receiver

By JERRY SKELLY

SHORT wave listening can be one of the most enjoyable and informative of hobbies, but only if you have adequate equipment—a receiver that covers the right bands, has the sensitivity to pull in weak signals, and can separate stations that are close together on the dial.

By learning what makes a receiver a top performer, you can compare the sets on the market and select the one you want. Keep in mind that the purchase of a communications receiver is something of an investment. A good one depreciates slowly and after four or five years may still be worth half its cost. So resist any temptation to buy off-brands or marginal-performance sets merely because they are low-cost. Stick with widely known names such as those in the table on page 54.

In the table we've listed 12 already-assembled and four kit-type receivers that, together, account for most of the communications receivers sold today. All of them are superheterodynes and use a time-proved circuit that converts the signal frequency to an "intermediate frequency" where large amounts of stable amplification can be ap-

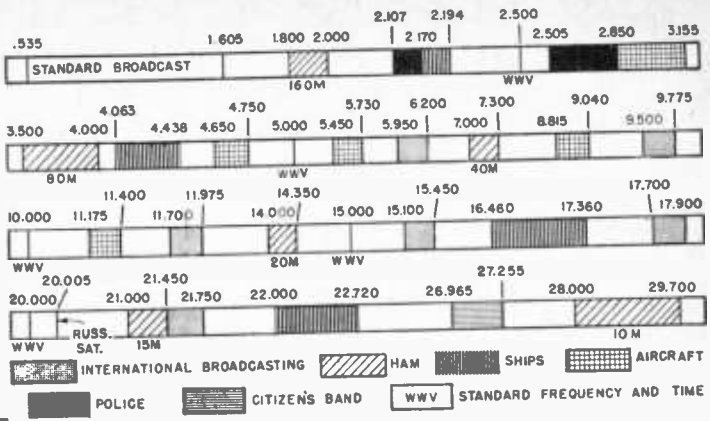


To determine how many r.f. stages a set has, look inside and count the gangs on the tuning capacitor. Set shown here has three gangs (arrows), which means there is one r.f. stage. Just two gangs means no r.f. stage, while a four-gang capacitor indicates two r.f. stages.

plied.

We'll explain each of the performance features listed in the table, so that you can see how each contributes to the set's performance. And you can use the same information to judge sets that *aren't* in the table, such as models that are no longer built but may still be found in some stores.

Many of the performance features are given in manufacturers' brochures or mail order catalogs, which means you can get a good idea as to a set's quality even before going to a store and trying it out.



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Drawing shows *all* the broadcast bands and what can be heard on them. A receiver with general coverage (such as in Fig. 4A) will bring in all of these. Receivers with non-continuous dials, as in Fig. 4C, will pick up only some.

How Many Tubes? The first thing to check is the number of tubes. In general, the more tubes, the better the receiver—and the higher the cost. The number of tubes reflects the number of amplifying stages and is a rough index of how much "guts" a set has.

Get the Right Bands. If you want to use your set for all types of listening—news broadcasts from foreign countries, music, radio amateurs or "hams", police calls, aircraft, or Russian satellites—you should steer clear of receivers that cover only the radio amateur bands. Instead you will want a set that, like the sets in the table, has general coverage and will bring in *all* the bands (Fig. 3, 4.)

An R.F. Stage? At least one radio frequency stage is desirable, because it gives the received signal some preamplification before it is subjected to the relatively noisy process of conversion to the intermediate frequency of the superhet. This contributes to the set's sensitivity by helping boost the signal *over* the noise.

An r.f stage also reduces annoying image response. (A strong signal may be received at two different points on the dial, one of them the correct frequency and the other, the "image", incorrect. Receivers with good image rejection attenuate the image below hearing level. You can easily determine how many r.f. stages a receiver has, even when it doesn't tell you in the catalog, by counting the number of gangs, or sections, on the tuning capacitors (Fig. 2).

At Least Two I.F. Stages? Intermediate frequency amplifier stages (don't confuse them with the r.f. stages) provide most of a superhet's sensitivity and much of its selectivity—or the ability to separate stations.

The i.f. amplifiers operate at a lower frequency than the signal (usually at 455 *kc*), and at that frequency tubes and transformers can be designed to give tremendous amounts of stable amplification.

The receiver you buy should have at least two i.f. stages. One stage is barely adequate, and will mean low sensitvity. You can determine how many i.f. stages a set has by checking the set's specifications in a catalog or by looking at its schematic diagram (Fig. 5).

Sensitivity. A sensitive receiver pulls in the weaker signals clearly and is a great help in DXing—trying to pick up distant signals.

Receiver manufacturers do not publish sensitivity ratings, and you would have to be an electronics engineer to figure them out yourself, but the number of i.f. and r.f. stages a set has will give you a rough idea of sensitivity. You'll note from the table that we have evaluated the sets for sensitivity and rated each as either Fair, Good or Excellent.

Selectivity is also difficult to determine unless you're a radio expert. Besides separating close-together stations, it aids the reception of weak signals close to strong ones and improves the ratio of signal to noise. As with sensitivity, look for i.f. stages; we have rated each set in the table as Fair, Good or Excellent in selectivity.

BFO for Code and Satellites. If you want to listen for Morse code (CW) or signals from satellites, your set should have a beat frequency oscillator (BFO). Normally, code signals are poorly audible. The BFO is a special circuit which—when you turn it on—"beats" with the code to give an easy-to-read musical pitch to the dots and dashes.

Receivers with BFO will have markings on the front panels such as "Code," "CW," "Pitch Control" or "BFO Pitch."

Other Valuable Features include an "S" meter, a noise limiter, an antenna trimmer, a crystal calibrator and a phono input:

Performance Guide to Communications Receivers

Manufacturer Model No.	Price	Number of Tubes (5)	Frequency Range in Mcs.	R. F. Stages	I. F. Stages	Sensitivity	Selectivity	B.F.O.	S Meter	Noise Limiter	Antenna Trimmer	Internal Crystal Calibrator	Phono Input
Hallicrafters S38E	59.95	5	.540-30	0	1	F	F	Yes	No	No	No	No	No
National NC60	59.95	5	.540-30	0	1	F	F	Yes	No	No	No	No	No
Gonset G33	89.99	6	.540-34	0	2	F	F	No	No	No	Yes	No	No
Hallicrafters S107	94.95	8	.540-1 & 2.5-31 48-54	0	2	F	F	Yes	No	Yes	No	No	Yes
Hallicrafters S108	129.95	8	.540-34	1	2	G	F	Yes	No	Yes	No	No	No
Gonset G43	159.50	8	.540-30	0	2	F	G	Yes	Yes	Yes	Yes	14.95 extra	No
Hallicrafters SX110	159.95 + 12.95 spkr	8	.540-34	1	2	G	E	Yes	Yes	Yes	Yes	No	No
National NC109	169.95 + 17.50 spkr	11	.540-40	1	2	E	E	Yes	Yes	Yes	Yes	No	No
Hammarlund HQ100C	199.00 + 14.95 spkr	10	.540-30	1	2	E	E	Yes	Yes	Yes	Yes	15.95 extra	No
Hammarlund HQ145C	279.00 + 19.95 spkr	11	.540-30	1	2	E	E	Yes	Yes	Yes	Yes	15.95 extra	No
Hallicrafters SX100	295.00 + 19.95 spkr	13	.538-1.53 1.7-34	1	2	E	E	Yes	Yes	Yes	Yes	Yes	No
Hallicrafters SX62A	375.00 + 19.95 spkr	16	.540-108	2	3	E	E	Yes	No	Yes	No	No	Yes (4)
Heath-Kit AR-3	29.95 (1)	5	.550-30	0	1	F	F	Yes	No	Yes	Yes	No	No
Knight-Kit R-55	67.50	6	.540-36	0	2	G	F	Yes	No	Yes	Yes	No	No
Knight-Kit R-100	99.95	9	.540-30	1	2	E	E	Yes	12.95 extra	Yes	Yes	No	No
Heath-Kit GC-1A	109.95 (2)	10 Tr. (3)	.550-32	1	3	E	G-E	Yes	Yes	Yes	Yes	No	No

Note (1): Cabinet $4.95 extra.
Note (2): Supplied with batteries. A-C power supply is $9.95 extra.
Note (3): Uses 10 transistors and 6 semiconductor diodes.
Note (4): The SX62A has a hi-fi audio system. Also covers the standard FM band.
Note (5): Includes rectifiers and voltage regulator tubes.

All models are current, made by standard brand manufacturers with national distribution. Price is user's net price at the time we go to press. Excise tax is included; but shipping charges and sales tax, if any, must be added.

• The "S" meter occupies a distinctive place on the front panel (if the set has such a meter) and is calibrated from 1 to 9; in some cases, the meter will be marked "Carrier Level." The calibrations indicate the strength of the received signal and are helpful for on-the-nose tuning, since signal strength is greatest when tuning is correct. Not an absolute necessity for average listening, this feature is found on only the more expensive receivers.

• Noise limiter. This circuit minimizes the effect of extraneous electrical noises. If the receiver has one, a front panel switch will be marked "Noise Limiter" or "ANL" (for Automatic Noise Limiter).

• Antenna trimmer. This is another front panel control which almost always is marked either "Antenna" or "Antenna Trimmer." Important to top performance, it tunes the antenna and the receiver input circuit together for better signal energy transfer. (You will have difficulty getting clear reception on distant stations without a good out-door antenna. Weaker signals may represent an energy of less than a few millionths of a millionth of a watt. Give your receiver a break by collecting as much as possible of this energy in a good antenna before asking the receiver to go to work on it.)

• Crystal calibrator. Inevitable variations in mass-produced parts, together with changes in temperatures, humidity and line voltage, produce inaccuracies in the tuning dial scale. A good way to overcome this is by use of a precision frequency source and its harmonics as dial calibration reference points. The receiver can then be adjusted to bring in stations at the correct spot on the dial. Receivers that provide internally for a crystal calibrator have a "Calibrate" marking on a front panel switch.

• Phono input. This is an unessential extra that permits the use of the receiver's amplifier and speaker with accessory record changers, FM tuners and such (Fig. 6).

Finding the Right Dealer. You can check out a receiver for the preceding features merely by looking at a catalog or brochure.

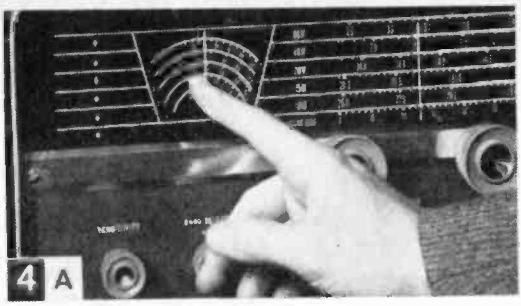
But you should also put it through its paces to see how it performs. This can be done only by going to a dealer (or by purchasing a set through a mail order house with a money-back guarantee if you're not satisfied).

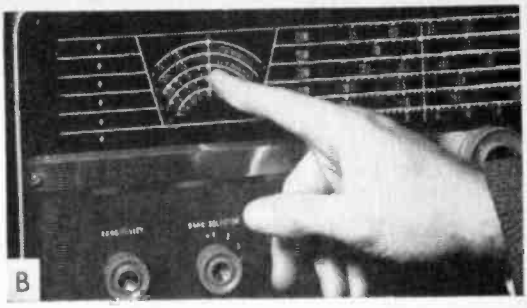
It's important to select your dealer carefully. Check your classified telephone directory for names of radio parts jobbers or ask a local radio amateur where he shops.

Be wary of department stores and jobbers who serve radio-TV servicemen exclusively, because your dealer should have a service department to back up a new set's guarantee. He should also have a wide selection of sets.

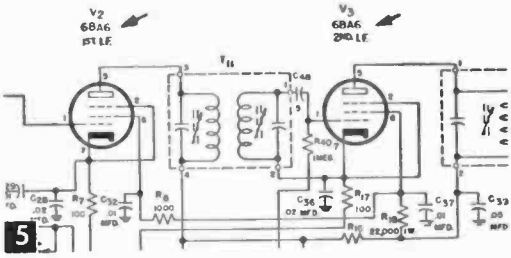
Through the Paces. Once you are ready to give a receiver its on-the-air test, turn it to short wave broadcast and amateur signals. These should be heard on one band or another at any time of the day or night. If you can't hear *any* signals, try another set.

Next, rotate the band selector switch. Some





Here's how you can easily tell if a set has general coverage, will pick up all the bands shown in Fig. 3. In 4A, finger points to 4.5 megacycles, which is at extreme left of the *second* band on the dial. In 4B, finger points to 4.6 megacycles, which is on extreme right of the *third* band; thus there is no gap between the bands. In 4C, though, note that the top band runs from 3.5 to 4.0, while the band below it picks up at 7.0. This receiver covers only the ham bands.



It's easy to tell how many i.f. stages a communications receiver has. Just take a close look at its schematic diagram. The stages (arrows) will be clearly labeled as shown in this section of a typical schematic. This set has two i.f. stages.

signals or noise should be heard on all bands. No band should be 100% dead.

Now, after tuning in a station, rotate all the controls and throw all the switches—one by one—listening carefully as you do so. Each control or switch should have some audible effect on what you hear.

Potentiometer controls should not give scratchy sounds when they are turned. If one does, it probably is worn or defective.

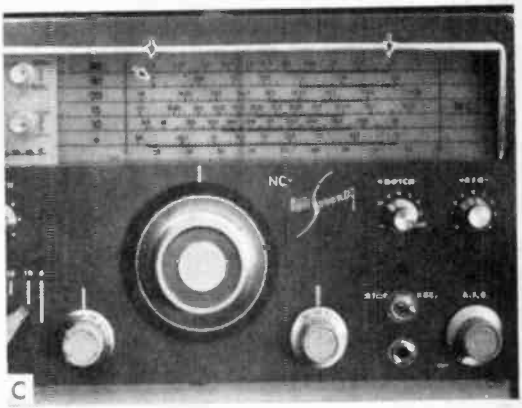
Last, turn the tuning dials over their entire range. They should move easily with no noticeable slack motion or backlash.

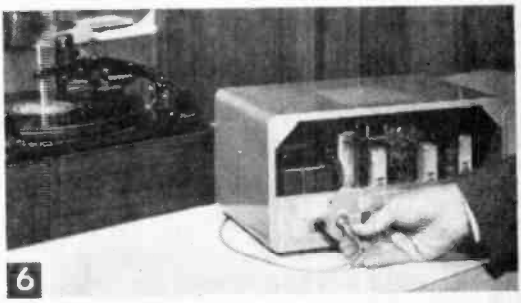
What About Portables? If you don't need the portability that comes with a transistorized receiver, you probably would do well to avoid it and buy a regular tube set. The less expensive of the transistor models—those costing up to about $90—do not have the sensitivity of a comparable tube set.

The more expensive transistor portables charge a high premium for the combination of portability and good performance—yet may lack many features desired by DXers.

Buy a Used Set? A used receiver may be a good buy, but only if it comes with the standard 90-day new set guarantee—in writing—covering parts and labor. Used sets should be purchased only from those jobbers who have service facilities and will give you an additional guarantee in writing—stating that you can get a full refund within 10 days if you are not satisfied with the set.

If you plan on buying a used receiver, you should look for the same features listed in the table, but be sure to give it a real wring-out during the on-the-air check. If possible, take an experienced radio amateur along when you go to buy the set. He'll probably be able to assess it for you pretty well.





Receivers with a phonograph input will have the word "Phono" on a front panel switch position, but the jack will be on back of the set as shown here. Don't confuse the "Phono" jack with "Phones"—which designates the headphone jack as shown in Fig. 1.

The Secret Weapon

A military surplus LW receiver can become a secret weapon for DX on any band you tune.

By C. M. STANBURY II

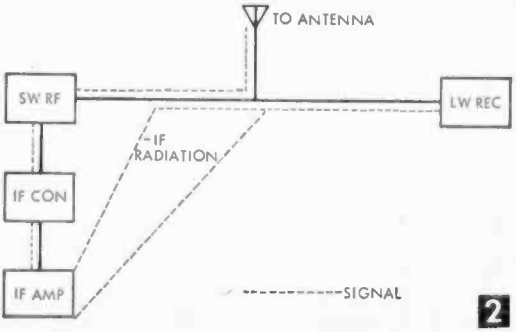
AN INEXPENSIVE short wave receiver costs approximately $60; it will lack the selectivity, sensitivity and calibration essential for top DX reception. But for another $60 or so, you can add in one unit a Q multiplier, i.f. booster and fine calibrator. What is this secret weapon? A long wave receiver.

But start at the beginning. There is no magic involved. You simply feed your SW (or BCB) radio into the long wave set and the two act as a single ultrapowerful DX system.

We are assuming that your first receiver is a superheterodyne, which picks up signals at their original frequency and converts them to a fixed intermediate frequency (i.f.—usually 455 kc. It is in the i.f. that most of a receiver's sensitivity and selectivity is achieved. The i.f. also radiates a portion of its signal; generally speaking, the cheaper your set, the greater the radiation. If a LW receiver is tuned to the i.f. and fastened to the same antenna, it will pick up most of this i.f. radiation.

Just how effective such a double-header is depends upon the amount of radiation and quality of the short wave receiver. If you use a high priced SW job with little or no radiation, forget about our "secret weapon": you don't need it—the receiver already has sen-

If there is insufficient i.f. radiation from the SW set, wrap 20 to 30 turns of antenna wire around the i.f. amplifier tube and fasten to antenna. While this method is certainly crude, it requires no internal tampering with the receiver.



2

VERIFICACION DI RECEPCION
VERIFICATION OF RECEPTION

Esaki ta pa verificá recepcion di: / This is to verify the reception of: **RADIO KELKBOOM PJA-5**

situa na: / located at: ORANJESTAD, ARUBA, ANTILLAS NEERLANDES - NETH. ANTILLES

pa: / by: C. M. Stanbury, Ontario, Canada

frecuencia: / frequency: 1435 KCS potencia / power 1 KW

fecha: / date: Dec. 17-55 hora: / time: 9.55 to 10.02 pm.

Oranjestad, Aruba February 13th 1956

The island of Aruba, in the Netherlands Antilles, can be logged at 1435 kc on most receivers with the aid of the "secret weapon." Best time to try is approximately 1 hour after sunset.

sitivity, selectivity and calibration to spare.

If you decide to add a LW set, this also should be a superheterodyne. Selectivity increases as the i.f. drops: and if your LWer picks up the SW or BCB i.f. at 455 kc and converts it to 150, you are way ahead of the game, even with no increase in amplification at all. The latter should be regarded strictly as a secondary consideration.

The kind of selectivity we have gained is "Q," ratio of resistance to frequency, and we are using the long wave receiver as a Q multiplier. Such a multiplier cuts off unwanted sideband QRM and static, though not nearly so sharply as does the crystal filter. This is usually an advantage, however: a "crystal" is often so sharp that it takes most of the modulation with it. Thus, if you own a quality radio equipped with a crystal rather than a Q multiplier, our secret weapon is also for you. Should there be insufficient i.f. radiation, your two receivers can be hitched together internally. *This is a job for a trained technician.*

The system's final function is calibration. The i.f. output is broad—extending at least 5 kc on either side of the desired frequency, and more on cheaper models. For example, in the afternoon you could pick up Radio Leopoldville on approximately 9705 and then, by tuning the long wave set one way or the other, hear Radio Sofia (9700 kc). Positions will probably be reversed and Leopoldville appear lower than Sofia, but the frequency difference will be accurate; thus, if Leopoldville comes in on the LW set at 455 and Sofia at 458, the Congo station is three kc higher. Because we know Sofia is on 9700, we also know Leopoldville is at 9703.

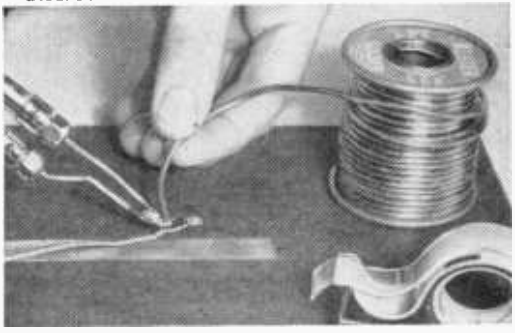
This reversal occurs when the h.f. oscillator operates above the tuned frequency (such an oscillator beats with the signal and produces the i.f.). In some receivers, it operates below on the upper short wave bands (for better image rejection), thus producing signals in normal sequence at the i.f. A little experimentation will soon tell which is which.

Success of this calibration method depends upon a nearby station of known frequency and calibration of the LWer itself. If the latter is marked every 5 kc, you should be able to measure accurately within 1 kc.

The best buy in long wave receivers is always war surplus. Surplus dealers, found in large metropolitan areas, usually have quality sets at very reasonable prices. Of course, selection and quantity vary from month to month. If you can't get to one of these centers, write Communications Equipment Co., 343 Canal St., New York 13, N. Y.—one of the largest surplus dealers. LW models are also sold via classified ads in ham publications.

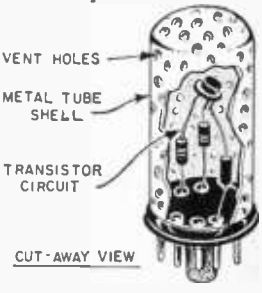
Soldering and Gluing Vise

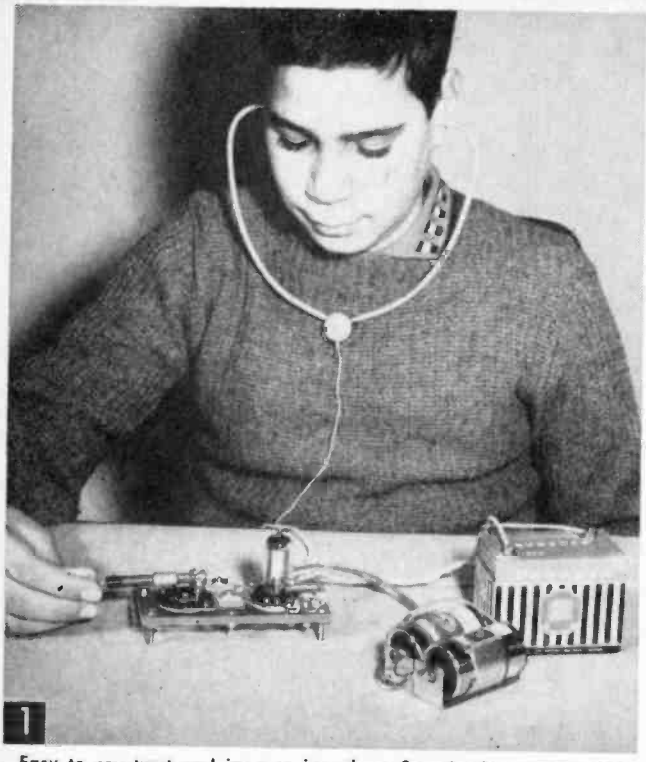
• Use double-faced cellophane tape to hold small parts while soldering or gluing. Place tape on a clean flat surface and then place the parts on the tape in the position to be joined. —J.A.C.



Tube Shells House Tiny Circuits

• Discarded metal vacuum tube shells make neat shielded housings for plug-in relays, transistors, and diode circuits. Pry the base from the tube and discard the innards. Solder in your transistor circuit making connections to the base pins, and you have a plug-in device that fits tube sockets. If components such as resistors radiate heat, then drill enough vent holes to provide an adequate air circulation.—JOHN A. COMSTOCK.





Easy to construct and inexpensive, these five circuits are planned for wiring simplicity and give you a lot of practical basic radio experience.

Five-Way $5 Radio

With only one chassis, you can experiment with

(1) Crystal Diode Set
(2) Crystal Amplifier
(3) Grid Leak Detector
(4) Super Regenerative Receiver
(5) Regenerative Short Wave Set

By GUS WESENFELD

MOUNT the main parts on this chassis, and just by re-arranging a few wires, resistors, and capacitors, you can experiment with each of five interesting basic radio circuits.

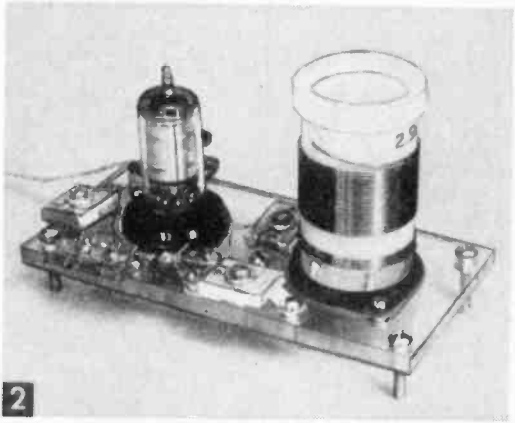
These budget-minded radios will give any electronic experimenter a flying start toward an understanding of radio principles. Easy access to wiring makes the project ideal for classroom or radio club demonstrations.

Make the Chassis of a ⅛ x 2⅜ x 5-in. piece of hardboard, and use a pencil and square to layout the holes (Fig. 3). The chassis in the photo (Fig. 1) was made of ¼-in. clear Plexiglas. Though the plastic makes a more effective demonstration unit, it costs more and requires care in drilling and sawing.

Cut the two large socket holes with an expansion bit held in a brace, or drill a series of holes inside the circles with a ⅛-in. bit and file round.

Using the parts themselves as guides, drill all the mounting holes with a 9/64-in. bit. Install the four 6-32 x 1-in. screws which act as corner legs. Now mount the tube socket, coil socket, and the capacitors as in Fig. 4. The trimmer capacitors come with two metal tabs on the underside; cut them off (Fig. 3A). These capacitors are identified by a number stamped on one edge which matches the order number listed under Materials.

Circuit Wiring Connections are all underneath the chassis, therefore the pictorial views are



Three different coils plug into the socket to cover short wave bands with the regenerative receiver.

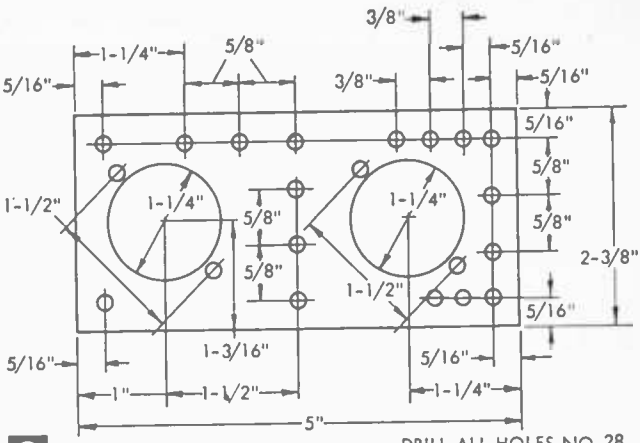
drawn as though seen from beneath. Use #22 gage solid hookup wire, the type with push back insulation to wire your circuits. Solder short lengths of bare copper wire to the outside lugs of L1, the Miller sub-miniature antenna rod (Fig. 3B). To the other end of these leads, solder two tube pins salvaged from an old large size octal type tube. To use the antenna rod later on, you will be plugging these pins across #3 and #4 on the coil socket. The trimmer capacitors are not only compact, but inexpensive. You'll need a small insulated handle screw driver to adjust them as you tune the various circuits.

The Crystal Diode Set is wired like the kind of radio grandpa had, except that you're using a modern diode instead of a "catwhisker" and crystal. Follow the pictorial diagram (Fig. 6) as you wire. The schematic drawing (Fig. 6A) is "electronic shorthand" and it is always printed to show the experienced radio hand how the circuit works.

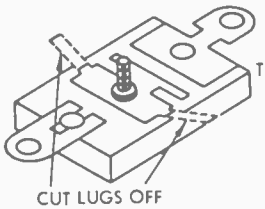
The diode, D1, rectifies the radio frequency wave coming from the station. To send a radio signal, the station modulated (varied) the amplitude of its carrier wave just like the announcer's voice varied the current flowing through the microphone. Carrier waves are broadcast at radio frequencies—varying thousands of times per second. 550 to 1750 kilocycles cover the broadcast band.

To detect a radio signal, adjust coil L1 and capacitor C4 until they are in resonance, or tuned to the frequency of the station. Now your diode set is converting the radio frequencies to audio frequencies which are within the hearing range of your ear. Capacitor C1 provides you with variable coupling to the antenna. Experiment for the best setting.

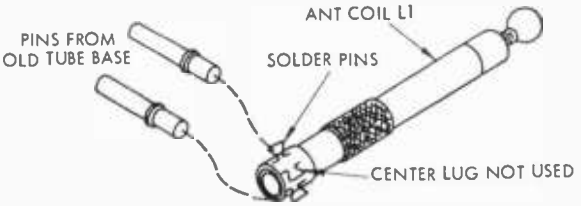
Crystal sets require long antennas such as the wire provided in the antenna kit (See Materials List), unless



3 CHASSIS LAYOUT — DRILL ALL HOLES NO. 28



A CUTTING CAPACITOR LEADS

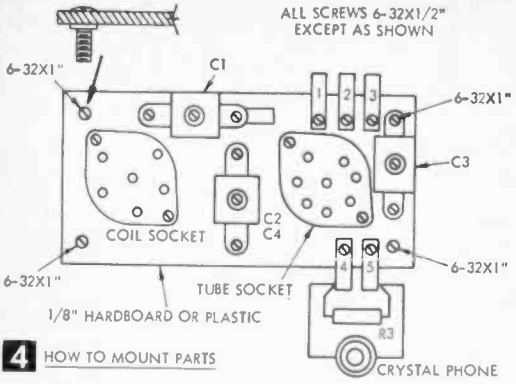


3 B SOLDERING PINS TO COIL

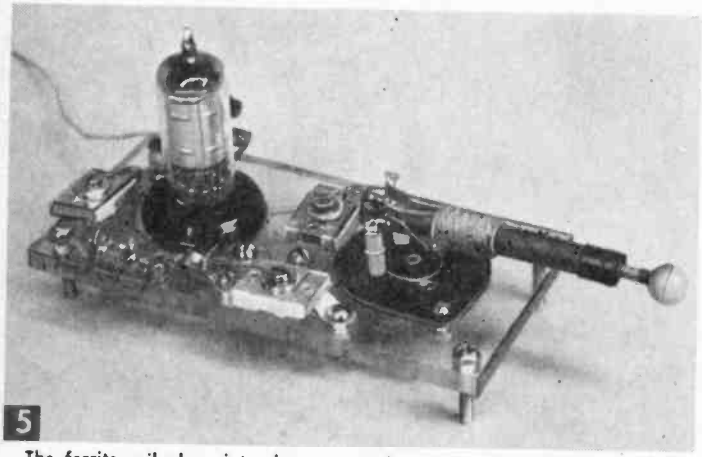
MATERIALS LIST—FIVE-WAY RADIO

No. Req.	Size and Description
	CHASSIS ITEMS
1 pc.	1/8 x 2 3/8 x 5" hardboard, or plastic
1	7 pin tube socket, Cinch-Jones type 5WY (Allied #22H617)
1	5 pin tube socket (for coils) Cinch-Jones type 7WA (Allied #22H620)
1	8 pin tube socket (optional) Cinch-Jones type 8W2 octal (Allied #22H626)
	RESISTORS
1	R1—18 megohm, 1/2 watt 10% carbon (Allied #2MM040)
1	R2—2.2 megohm 1/2 watt 10% carbon (Allied #2MM040)
1	R3—2.7K 1/2 watt 10% carbon (Allied #2MM040)
	CAPACITORS
1	C1—5–80 mmf mica trimmer (Allied #60H341)
1	C2—9–180 mmf mica trimmer (Allied #60H342)
1	C3—25–280 mmf mica trimmer (Allied #60H343)
1	C4—80–480 mmf mica trimmer (Allied #60H345)
1	C5—5 mmf disc ceramic, Sprague type Q50 (Allied #16L316)
1	.01 mfd Sprague disc ceramic (Allied #16L363)
	MISC. ITEMS
1	V1—RCA type 1L4 vacuum tube (Allied #E-1)
	NOTE: Types 1T4 and LU4 may also be used.
1	D1—Raytheon type 1N34A crystal diode
1	L1—J. W. Miller type 2002 sub miniature antenna rod (Allied #69H980)
1 ea.	L2—coil covering 1.65 to 4.1 megacycles (Allied #83Y742)
	L3—coil covering 2.9 to 7.3 megacycles (Allied #83Y743)
	L4—coil covering 7 to 17.5 megacycles (Allied #83Y745)
1	Crystal earphone, American Bell 1000 ohm single (Allied #59J112)
1 pkg.	Type AA 1/2" Fahnestock clips (Allied #41H707)
1	Antenna kit (Allied #83Y100)
16	6–32 x 1/8 RHMS and nuts
4	6–32 x 1/4 RHMS and nuts

Allied nos. refer to catalog items. Allied Radio, 100 N. Western Ave., Chicago 12, Ill.



4 HOW TO MOUNT PARTS



5

The ferrite coil plugs into the same socket used for the short-wave coils shown in Fig. 2. You tune with the knob, and by adjusting the capacitors with a small screwdriver.

you live very close to a station. If you have no space for an outdoor antenna, clip the antenna lead to the finger stop of a telephone dial, or to a bedspring. While not as sensitive as an outdoor wire, these substitute antennas should pull in most local stations.

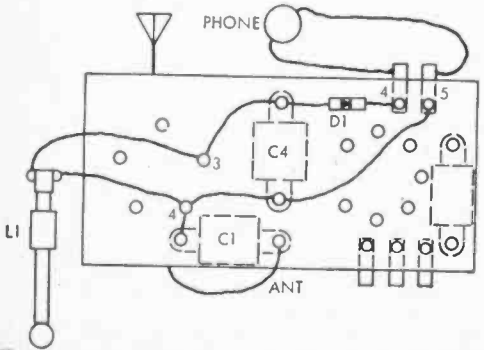
The Crystal Amplifier Set uses the same diode detector circuit. Add the one tube amplifier circuit (Figs. 7, 7A) and note how much it increases volume and sensitivity. Resistor R2 serves to bias (provide proper operating voltage) to the tube's grid and thus improve sensitivity. If you've got a collection of resistors try different values in place of R2, such as 100K, 470K, and ½ megohm. (Megohm means 1,000,000 ohms, while K stands for 1,000. Thus 100K equals 100,000 ohms).

Wire the Grid Leak Detector (Figs. 8, 8A) by replacing the diode and R2 with resistor R1 and capacitor C5. When an input signal voltage is applied to this circuit, rectified current results and develops a voltage drop across R1. Since this drop across the grid leak resistor R1 is a voltage difference between the tube's grid and cathode, you get amplification in the plate circuit.

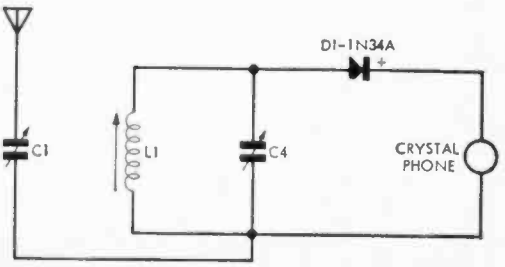
When the tube is operating with no incoming signal it is at zero bias, thus limiting the plate supply voltage that can be applied. The design results in a limited ability to handle large signal voltages without distortion. For that reason, the grid leak detector is not quite as good as the diode detector. The set is quite sensitive on broadcast band, if not quite as hot as the super-regenerative set.

The Super Regenerative Circuit is one of the most sensitive receiver types ever invented. You can easily recognize the circuit (Figs. 9, 9A) since the input is between grid and plate instead of between grid and ground. The tube acts as an oscillator. It causes the current to flow rapidly back and forth at a frequency so high the ear can not hear it as a tone. The hissing sound you'll get is the noise of electrons rushing through the tube!

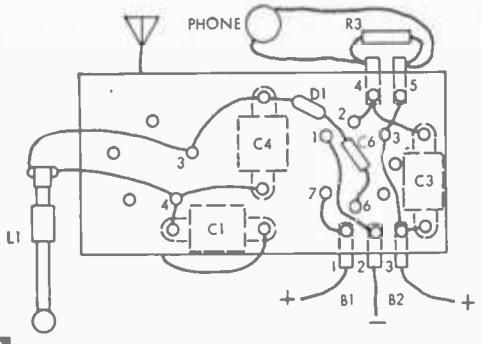
If you use a 45-v. battery for B2, the circuit will drive a small loudspeaker, at least on strong local stations. So far, we have been using the L1 miniature ferrite-cored coil. If you have a spare one in your junk box, re-



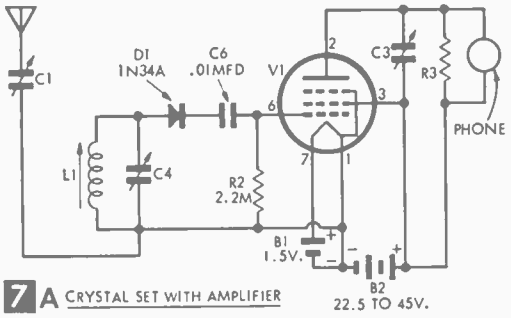
6 CRYSTAL DIODE RADIO



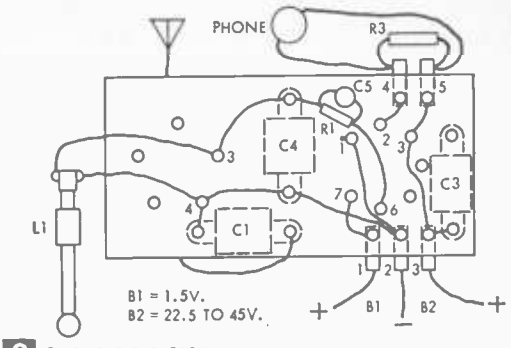
6A CRYSTAL DIODE SET



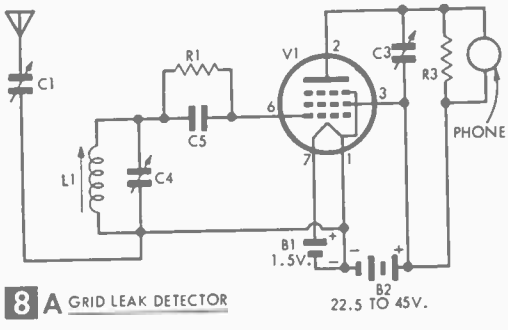
7 CRYSTAL DIODE PLUS AMPLIFIER



7 A CRYSTAL SET WITH AMPLIFIER



8 GRID LEAD DETECTOR



8 A GRID LEAK DETECTOR

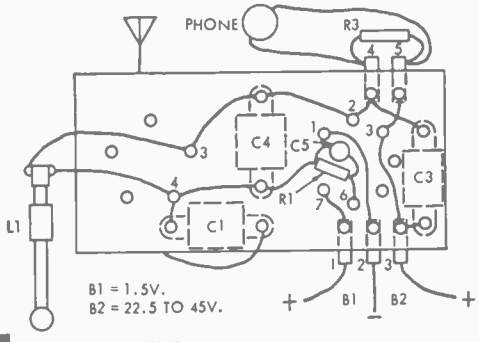
move all the windings and rewind with #28 enameled wire, or with some of the wire you removed. Wind 10 to 15 turns and try with C2 in the circuit. Add more wire turns and test again. You'll be hearing short wave ham stations, commercial code stations and messages from planes and ships.

When we use coil L1, as in Fig. 5, C4 (across it) is the tuner. This is necessary for tuning across the broadcast band. C2 is used for short wave tuning, while C1 gives you variable antenna coupling. To separate strong stations, turn the C1 screw left, and then retune C2 to bring in the station. Adjust C1, C4 (or C2) and the ferrite core of L1, and you even separate strong stations that are located in the same area. Normally operate with C3 turned up full (clockwise).

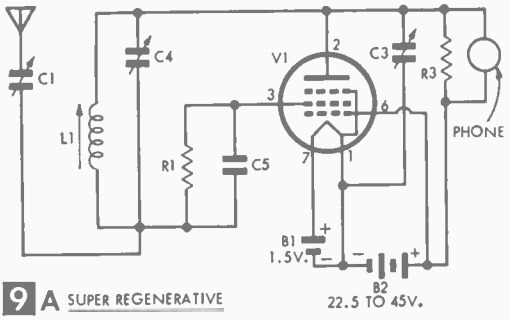
The Regenerative Receiver circuit (Figs. 10, 10A) was an old favorite before the super-heterodyne type became popular. With practice, patience and a long antenna you can get remarkable long distance results. Again, C2 is the tuner. You can take your choice of L2, L3, or L4. Normally supplied by Allied Radio for use in their short wave kit, these coils work well in many sets.

C3 is now your regeneration control. Because you're using grid 2 (pin 3) as an input grid, with grid 1 (pin 6) connected to B plus, you get greater sensitivity. The reason is that the second grid (pin 3) is closer to the tube's plate and thus exerts more control on the stream of electrons in the tube. Grid 1 (pin 6) is made positive and helps to "pull" the electrons through. This principle is used in new 12-v. car radio tube types.

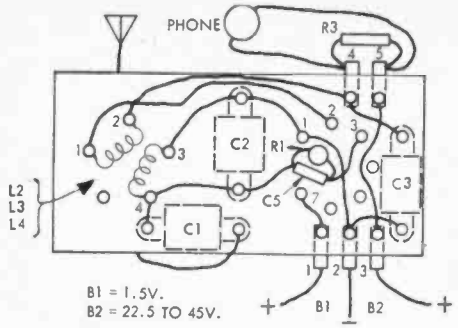
The short wave coils, L2, L3 and L4 have two windings. The smaller one is the "tickler" or feedback winding. It feeds part of



9 SUPER REGENERATIVE

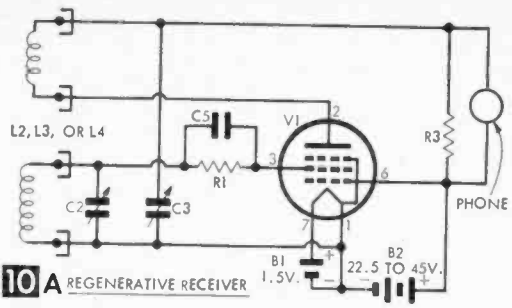


9 A SUPER REGENERATIVE



10 REGENERATIVE SHORT WAVE RADIO

the signal back to the input circuit, thus reducing input resistance and boosting the incoming signal. The circuit will whistle. Tune it by turning C3 counter clockwise until the whistling just stops; then search for stations by turning C2 back and forth. Usually, you'll have to readjust C1 for different stations.



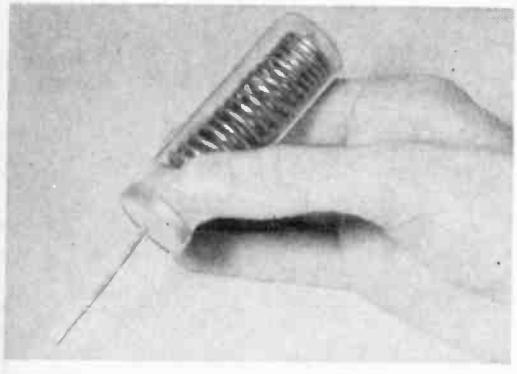
10A REGENERATIVE RECEIVER

The whistle is the result of the set going into oscillation, and when you've adjusted C3 so the whistling just stops your set is working at greatest sensitivity.

In all these circuits, except the crystal diode, use any 1½ v. battery for your filament voltage. With another tube socket (see Materials List) you can use octal tubes such as the 6C6, and following these basic circuits you can experiment with many other tubes.

Shockproof Solder Holder

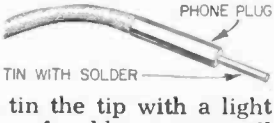
• Have you ever been shocked while soldering live wires in a "hot" circuit? This won't happen again if you wrap a length of solder



into a coil and place it in a plastic pill bottle (available at most drug stores). Punch a hole in the lid and thread one end of the coil through hole. Use this holder as you would a pen, pulling out more solder from the coil inside as needed.—JOHN A. COMSTOCK.

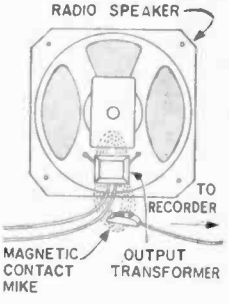
Solder Tightens Loose Connector

• If a phone tip, tube pin or other type of male electrical connector fits loosely in its socket, tin the tip with a light coating of solder. The soft-solder coating will make a snug force-fit that will have better electrical contact and less tendency to fall from the socket. If you accidentally get too much solder on the tip, file it down to size—JOHN A. COMSTOCK.



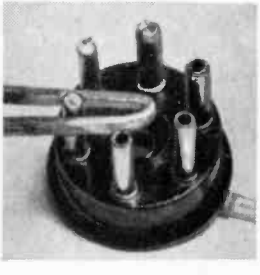
Contact Mike Bugs Radio

• Here's a way to couple your tape recorder to a radio without using a wired connection! Place a magnetic contact mike, like the kind used on string instruments, near the receiver output transformer, and you'll find that it will pick up the signal through magnetic induction. Once you find the best "hot spot" near the transformer, fasten the mike in position with tape. An advantage of this kind of connection is that it doesn't upset impedance match.—J. A. COMSTOCK.

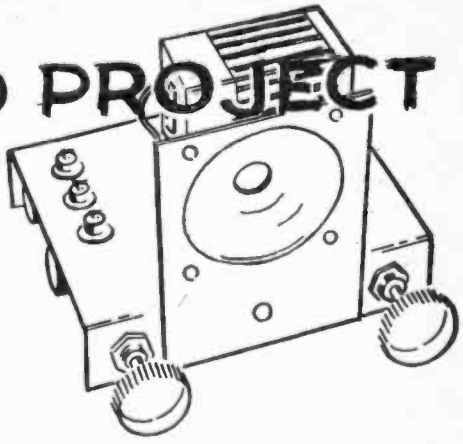


Improved Pin Soldering

• Here's how to do clean trouble - free soldering jobs on the pins of connectors and plug-in components. With the part solidly supported, or taped to the bench, slip the tip of your soldering gun over and around the pin. Two surfaces of the heating tip are in contact with the pin, and thus heat flow is more even, and the solder melts faster. Hold the trigger just long enough to melt the solder. Avoid overheating and using too much solder.—J. A. COMSTOCK.



FROM PAPER TO PROJECT



By FORREST H. FRANTZ, SR.

The project writer's desk is usually disheveled, but he must keep scores of new ideas organized.

HAVE you ever wondered how project ideas begin? How projects and project articles are created? What kind of shop and laboratory they're built and tested in?

The usually disheveled desk of an electronics gadgeteer is where a project idea is born.

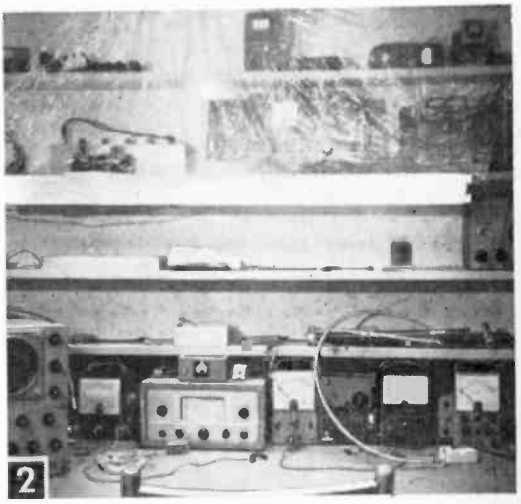
At one end of my desk, a large pad lists approximately 50 project ideas. Some of these projects have been completed and await writing, photography, or both—others are in the process of construction. Some of the projects are in the process of paper design. Most of them, though, are part of a list of projects that need much trial-and-error research and study to make them better. Some of the ideas will never be tried, and some will fail under test.

Briefly, a project article involves: (1) conception of an idea; (2) research and study; (3) design on paper; (4) experimental trial and debugging; (5) final design and layout; (6) final bench testing; (7) photography; (8) illustration; (9) writing; (10) integration and final checking. There is much further work to be done in each of these steps, such as weighing the idea to determine whether it is worth a project and writing effort, obtaining and gathering the parts, preparing parts lists and parts call-out overlays, determining parts layouts, and preparing chassis, panel or case for parts mounting.

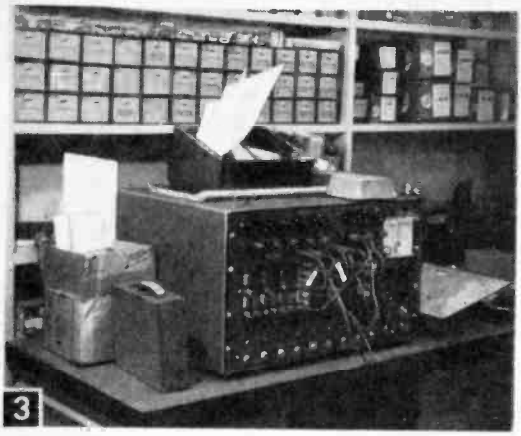
The elaborateness of an author's workshop and laboratory may vary considerably. In general though, if he does very much project-article writing he must have a large number and assortment of instruments to be able to check his projects thoroughly (Fig. 2).

It is a relatively simple matter to make a "one copy only" project work. But electronic parts tolerances vary widely and when you put any number of parts together, copy numbers 2, 3, 4, and 5 may not work at all due to parts tolerance variations. A project article writer should be sure that all copies of his projects will work if his instructions have been followed accurately. When the performance of a project hinges on the value of a part which may be different for individual copies of the project, he should try to point out the fact that the value of the past must be determined experimentally for best results.

Sometimes a paper design is followed by an experiment on the bench or on an analog



A wide variety of test instruments enables the project writer to thoroughly check his work.



Project ideas are sometimes given a trial run on this Heathkit analog computer.

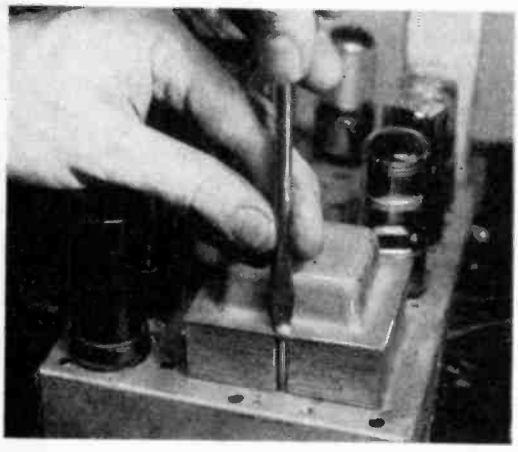
computer. I don't believe that too many authors use analog computers in their work. But I find this computer useful and willingly admit that without instruments the number of successful projects I could produce would be smaller. I'm always on the lookout for instruments and testing ideas that will help to assure the success of my projects.

Not all article ideas are sufficiently complicated to require an array of instruments. Some of them require only a voltmeter. Yet, some of the simple projects will fail and must be discarded.

All circuits are carefully tested and retested, and from that same desk—where perhaps weeks ago the idea first took form—the manuscript is sent on its way. After that the project, figuratively, is out of my hands. Its success then depends on the abilities and the initiative of eager experimenters.

Cure For Transformer Hum

• An annoying buzz or hum heard emerging from the chassis of an *ac*-operated radio, TV, or audio amplifier is often caused by loose mounting screws on the power transformer. Loose metal laminations in the core of the



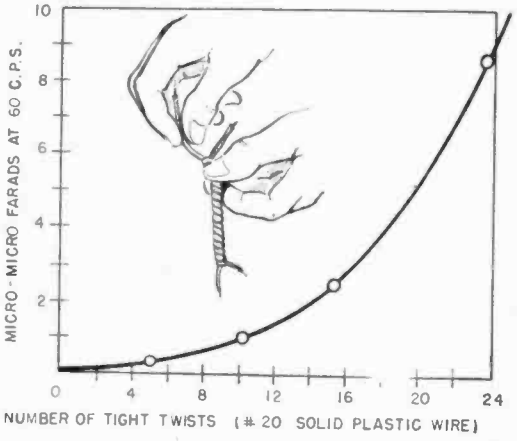
transformer vibrate together and produce the undesirable noise. Tightening the mounting screws will usually eliminate the trouble but, in severe cases, the transformer may have to be taken apart and the laminations painted with shellac.—JOHN A. COMSTOCK.

Mending an Electric Filament

• To mend the burned-out filament of an electric toaster, iron or other heating appliance, twist the loose ends of the heating element together, apply a little borax to the connection, and plug in the appliance. The borax will cause the two loose ends to weld together in an electrically perfect joint.

Twisted Wires Make Capacitor

• You can make capacitors for coupling or neutralizing simply by twisting two pieces of plastic hook-up wire tightly together. The insulation is left on, and you can easily change the capacitance to adjust your circuit.



The chart shows the result of measurements made with a bridge at 60 cycles per second. The "gimmick" capacitors were made of size 20 plastic solid hookup wire twisted as tightly as possible by hand. Leads were ½-in. long. Because dielectric constants of various brands of wire will vary, the chart will not be precise in every case.—C. F. ROCKEY.

For a Really Sharp TV Picture

• To focus a TV set for clearest picture reception, hold a large reading glass to the screen and adjust the focus control for the tiniest size scanning lines practicable.—J. A. COMSTOCK.

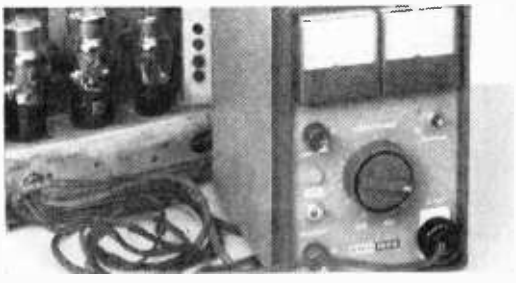
LOOKING OVER NEW PRODUCTS

Using a New AC Bench Supply

a report on a new kind of kit

By BILL McHUGH

As a performance check, use the bench supply to read amperage of motor running normally and under load. Unit also can vary speed of most portable electric tools.



This radio occasionally stopped playing. In a few minutes it would start again. Quick test with variable ac supply pinpointed a faulty resistor that was overheating.

TRY a variable ac bench supply on your test bench or around the ham shack, and in a few days you'll wonder how you ever got along without it. With any voltage from 0-140 ac available instantly, you can test radios, appliances, transformers and many kinds of electronic parts with minimum trouble.

One of several similar kits now available, the unit shown in Fig. 1 is an Eico Model 1073 (price unwired, $35.95). Within the box, a toroidal core auto-transformer controlled by the large knob on the panel delivers 0-3 amps —ample power for most radio, TV and electronic work. If you plan to work on higher wattage appliances, select a heavier kit.

The kit (Fig. 2) can be assembled in less than 3 hours. Construction has been so simplified that it can be done even if you've had no previous electronics experience. Besides common hand tools, all you need is a wire stripper and a soldering iron. This kit would be an ideal project for a beginner.

Output of the transformer is smooth. There is no waveform distortion, and little voltage dip. A range switch gives you ammeter readings of 0-1 or 0-3 amps, and separate fuses protect ammeter and tranformer.

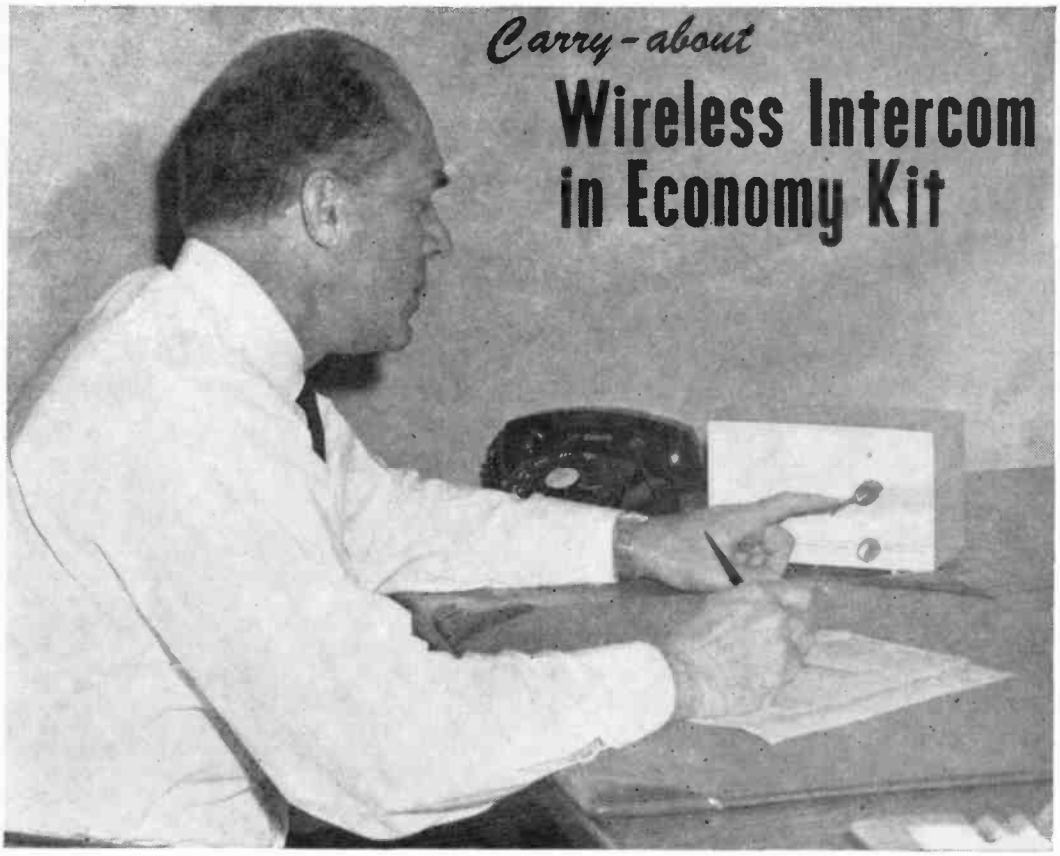
Bench Test Uses. Power consumption is the first area to check in any defective electrical device. Simply plug the radio or TV set into the front panel power outlet of the power supply, turn the voltage control up to full line voltage and read the power consumed in amps. This amp reading multiplied by the voltage should equal the rated wattage of the appliance. If the ammeter needle wavers or dips, and you know that the trouble isn't on the power line, then it's a sure sign of loose connections, poorly soldered joints, or worn-out parts.

Some radios run fine on the bench, but in the home low voltage line conditions will cause trouble. With the power supply, you can quickly simulate operating conditions. Most sets should perform well at voltages as low as 100 and up to 130 volts. If you've got an amplifier or radio that fails intermittently in normal service, use the ac supply to run it at an overvoltage. Defective parts will act up or burn out quickly, enabling you to pin down a trouble-spot that otherwise might be very hard to find. Turn the knob and you've got any odd filament or transformer voltage you might want. For dc, simply add a bridge rectifier.

Photographers Who Make Color Prints or run quantity enlargements will find the bench supply does double duty in keeping enlarger and printer light constant. You can make house lamps burn as bright as flood lamps with higher voltage. The transformer also boosts or dims spotlights for special effects.

Around the Shop, the bench supply is a real workhorse. It will control the speed of almost any universal type ac-dc motor. You can slow down a drill or saber saw so it's just right for fine work. Many hand grinders, small lathes, and drill presses run too fast for certain cutting jobs: with lowered voltage you can get the right cutting speed. And if your soldering iron is too hot for fine transistor work or sealing plastics, simply lower the voltage for any temperature desired.

Carry-about Wireless Intercom in Economy Kit



Flick of the finger converts intercom unit from listen to talk stage, and the message goes through clearly to other station in the wireless system.

LOOKING OVER NEW PRODUCTS

SITUATIONS come up almost daily in home or office where temporary use of an intercom will save much time, worry and shoe leather, but only the wireless varieties can be moved quickly and they are normally more expensive than units requiring direct connection by wire.

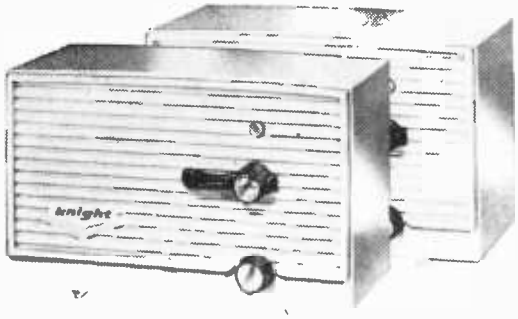
One of the latest wireless types (Fig. 2), having all the appearance and many features of deluxe custom units, has now been made available in a kit which drops the price barrier sharply to $37.90 for two complete stations.

At home with the Knight-Kit wireless intercom system, you can listen in on baby in the nursery, communicate with other members of the family on the terrace or in the garage, or keep in touch with a nearby neighbor. At work (Fig. 1), you can arrange immediate contact between desks far removed, between office and warehouse or stockroom, even between well-separated areas in adjacent buildings. It is useful for dictation, paging, making announcements and taking inventory. And you can shift from one use to another just as fast as you can carry the units to new locations and plug them into any ac or dc electrical outlet.

Since the units actually transmit and receive over interconnecting power lines, successful operation depends on their being placed in buildings served by the same power transformer at the electric utility pole.

A Special Tuning Tool supplied with the kit adjusts the oscillating coil of each intercom over a band of frequencies 10 kc wide. Thus you have a choice of operating two or more units so that any one can call all of the others, or you can set up two independent intercom systems working simultaneously over the same power lines. In the latter case, tune the units in one system to a frequency at one end of the oscillating coils, then tune the other system to a frequency at the opposite end of the 10 kc band.

In use, the units are normally in the "listen" position and power should be left on as long as intercommunication is expected. This will



As soon as they are plugged in and complete brief warmup time, twin stations link any two points on same power line. Special squelch circuit keeps them quiet between calls, while pilot lamp over lever arm acts as reminder that power is on.

not be expensive as each station draws only about 20 watts. To transmit, merely depress the arm of the talk-listen-hold switch and talk into the speaker in a normal voice. When finished, release the lever and it will spring back to the listen position. For extended transmissions such as dictation, turn the switch to "hold" by lifting up on the lever arm. It will remain there until moved by hand.

To ensure proper reception, stations must be tuned to the same frequency. The first time editors at RADIO-TV EXPERIMENTER plugged in two completed, but untuned Knight-Kit units in widely separated offices, voices were very low. However, this was quickly corrected in each unit by using the tuning tool supplied. It was inserted through a rear chassis hole into the tuning slug of the oscillating coil and rotated until volume was strongest. Since the sound was more than ample, the volume controls were backed down from full volume nearly half way.

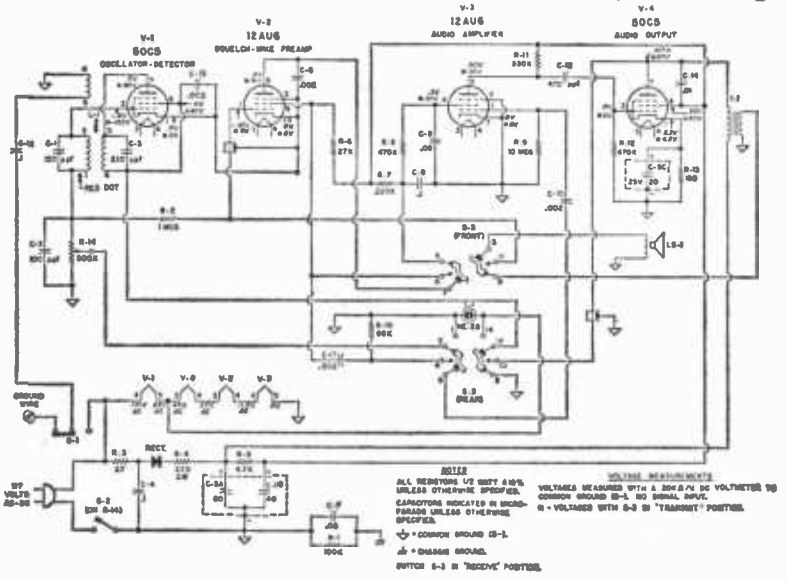
If you have no helper to speak into the other intercom while tuning, use the sound from a radio placed near the other unit while its switch is in the hold position. Tune any additional units, available individually in kit form, the same way. For best results, all should be tuned to the same transmitting station. Once everything is set, it's a good idea to tape over the tuning hole on each of the fiberboard backs.

Each intercom in a system should receive and transmit to the other stations equally well. Where noticeable hum persists, reverse the line cord plug in the wall outlet. Weak reception or transmission at any station indicates a high-current appliance such as a toaster, refrigerator or dryer may be shunting it. This can usually be cured by shifting either the appliance or the station to a different outlet. A special squelch circuit is designed to keep the units quiet during standby periods.

Ruling Out Interference. Buzzing or other noise in an intercom indicates interference from an appliance. To locate the source, disconnect suspected appliances one at a time until the noise stops. The problem can then usually be solved by connecting an inexpensive line filter to the offending appliance.

Ordinarily, the slide switch on the back of each chassis should be set at "normal." However, in cases where communication between buildings is poor or intermittent, a poor ground may be responsible. In such cases you can improve the conditions by connecting a length of insulated wire between the screw terminal on the back of the chassis and the center screw of the wall outlet. Then the switch should be set at "when grounded."

Knight-Kit wireless intercoms contain four tubes, including two 50C5's and two 12AU6's. Cream-tone molded plastic cabinets measure 5½ x 5½ x 9 in. Most novices should have little difficulty following the assembly manual which outlines and illustrates each stage of construction. The two identical talk-listen units in the basic kit can be built easily over a weekend. The only tools needed are a pencil-type soldering iron rated at 50 to 100 watts, long-nose pliers, diagonal cutters and a screw driver. Manufactured and sold by Allied Radio, 100 N. Western Ave., Chicago 80, Ill.

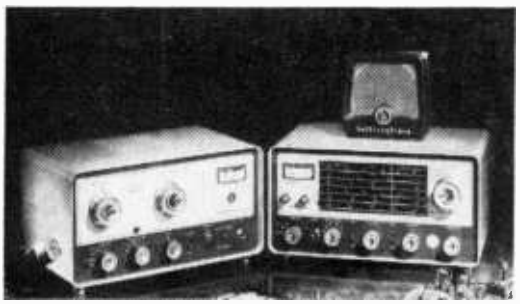


LOOKING OVER NEW PRODUCTS

Complete CW-AM Station

All amateur bands from 80 to 6 meters are covered by two new *Halli-Kits:* Model HT-40K kit transmitter (left) and Model SX-140K kit receiver, both designed for CW or AM operation. Because of its complexity, the front end of the receiver is factory-wired. Step-by-step instructions and diagrams show how to assemble the rest of the receiver and all of the transmitter.

The crystal-controlled, 75-watt transmitter has full band switching, with power output exceeding 35 watts CW or 30 watts peak AM phone (slightly less on 6-meter band). Unit is TVI-filtered, has less than 8 per cent distortion on AM, dual-range meter for accurate tuning and carrier level adjustment, 52-ohm



tunable pi network output for harmonic suppression, and provision for use of external VFO. Tubes: 6DQ5, power output; 6CX8, crystal oscillator and driver; 12AX7, speech amplifier; 6DE7, audio amplifier-modulator, and two silicon rectifiers.

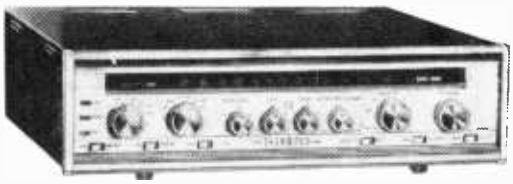
Lightweight receiver has 25-to-1 tuning ratio, sensitivity of 3 microvolts, an r.f. stage, S-meter, antenna trimmer and automatic noise limiter. Tubes: 6AZ8, tuned r.f. amplifier and crystal calibrator; 6U8, oscillator-mixer; 6BA6, 1650 kc. i.f. amplifier and BFO; 6T8A, second detector, A.V.C., ANL and first audio; 6AW8A, audio power and S-meter amplifier, and two silicon rectifiers.

Gray steel cabinets housing the units are 13⅜ in. wide, 8⅛ in. deep and 6⅝ in. high. The transmitter kit is priced at $79.95; receiver, $94.95. For fully wired, tested units, add $20 for the transmitter and $15 for the receiver.—Hallicrafters, available through regular distributors.

FM-MX Stereo Receiver

Reportedly the first FM stereo receiver made available by the industry for the new FM multiplex stereocasts is this Model S-8000. Add speakers and you complete the basic receiving system of two 32-watt amplifiers, stereo pre-amp for phono-tape-TV control, and a highly sensitive FM tuner (1.8 microvolt IHFM standard) wired for receiving the FCC-approved multiplex stereocasts.

The front panel has an *acro-beam* tuning



eye, 7-in. expanded dial scale and these controls: interchannel hush, balanced tuning, stereo bass-treble, ganged loudness, phono level, stereo balance, stereo function selector, input selector; also six slide switches for scratch and rumble filters, FM-AMC, phase reverse, and tape monitoring.

Inputs provide for tape playback, tape monitor, phono, AM tuner, and two auxiliary sources; outputs for recording and 4-, 8-, and 16-ohm speakers.

Stereo power output is 32+32 watts music power (30+30 watts continuous duty) at 1½ percent distortion. Frequency response is 20-20,000 cps±1 db at 30 watts. Receiver includes 21 tubes with four silicon rectifiers, draws 225 watts power and fits in 4½ x 14 x 16¼-in. case.

Model S-8000S, without case, is priced at $299.50; Model S-8000D, with walnut-tone leatherette case, at $307.—Sherwood Electronic Laboratories, Inc., 4300 N. California Ave., Chicago 18, Ill.

Stereo Music Center

Dual 20-watt amplifiers and preamps join with individual FM and AM tuners to make up this stereophonic music center, known as Model LA-225. Though equipped for simulcast stereo reception, the receiver also has an output for FM multiplex.

The FM section reaches sensitivity of 1.5 mv. for 20 db of quieting with AFC and AFC defeat assuring reception of very weak signals. AM superhet section features 3 stages of AVC, ferrite loop antenna and broad band width for high fidelity performance and maximum noise rejection. At normal listening levels, frequency response of 20-30,000 cps±

LOOKING OVER NEW PRODUCTS

1 db is provided; channel separation exceeds 50 db at 1,000 cps.

Front panel controls include bass, treble, balance-volume clutch, four-way selector switch (FM-MPX, FM-AM, phono, aux), four-way mode switch (left FM, right AM, stereo, rev.), blender for full stereo to full monaural. On the rear panel are a phasing switch, hum adjust, headset jack, switch for

impedance selection, fuse retainer, and ac outlet for phono.

Including contrasting brown and brass case measuring 5¼ x 15 x 17½ in., the 21-tube receiver is priced alone at $174.95, or with four-speed record changer, base, diamond needle stereo cartridge and two speakers, at $299.95. —Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

Peak-to-peak VTVM Kit

Use of a printed circuit board greatly simplifies construction of this versatile Model KT-174 vacuum tube voltmeter kit designed to meet all service and laboratory standards. It will measure 1-1500 v. dc with 2 percent accuracy, low ac RMS 0-500 mv and peak-to-peak 0-1400 mv. with 5 percent accuracy, regular ac RMS 0-1500 v. and peak-to-peak 0-4200 mv. with 5 percent accuracy; also 0-30 ohms to 3-1000 megohms.

Has pushbutton switch control of one probe for all operations, monitor terminals for direct connection to oscilloscope, quickly accessible calibration controls, and a 200 microammeter movement with 4½-in. face calibrated in red and black for easy reading. Tubes included are 6BN8, ac full-wave peak rectifier and low ac amplifier; 12AU7, twin triod, meter dc amplifier and balanced bridge; selenium rectifier.

Kit, including 8½ in. wide by 6 in. high by 5 in. deep case in light gray metal, probe, and flashlight-type D battery used for resistance measurements, is $39.95.—Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

3-Station Intercom

Any one station may be called individually from the master without disturbing the second remote in this three-station system. Three transistors in a printed circuit and 3¼-in. speakers provide volume. Units are powered by four 1.5-volt C flashlight batteries.

Lightweight plastic cabinets 1¼ x 5 x 6¾ in. are available in blue or gray and may be mounted on wall or desk. Price of 3-station system, less batteries and two-conductor wire, $36.50; 2-station system, $24.95.—Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

Car-Boat-Portable Radio

An all-transistor portable radio adapted for quick transfer from its own power supply to the 12-volt electrical system of a car or boat has been introduced as the *Sportamatic*.

It will engage instantly with the external antenna and battery of a car upon attaching to a special under-dash mounting cradle; similar mounting can be attached to a boat. Cradles have locks to prevent theft. Power supply of the radio comprises six flashlight cells affording about 1000 hours of operating time.

Fitted in black and gold leather case with carrying strap, the unit sells for $69.95.—Automatic Radio Mfg. Co., Inc., Boston, Mass.

Voltage Regulator

A fused circuit and two output receptacles make this continuously variable ac voltage power supply safely adaptable for many applications. Output of 0-140 volts is regulated at ±0.6 percent at 75 watts, and 3 percent at maximum output. Front panel 0-150 voltmeter is illuminated, has 1 percent accuracy for full scale. Model TR-114 measures 9⅜ in. long, 4⅞ in. wide and 5½ in. high, can be wall or bench mounted. Price $19.75 includes 6 ft. two-conductor line cord.—Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

Variable Transformer

Easy-to-read dial with smooth control makes this new 500-watt variable ac transformer suitable for industrial or hobby work. Model TR-115 features precision toroidal wound core, delivers full rated output 1-130 volts ac with little variation. For bench or wall mounting, 5½ x 5½ in. overall, $12.95.—Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

1

The Citizens Band control transmitter with batteries is completely contained in a portable case. The upper deck structure of the model lifts off for quick access to the radio receiver, motor, and battery components.

Radio-Controlled Model Destroyer
USS WOODWORTH

Editor's Note:

USS Woodworth was commissioned April 30, 1942, at Bethlehem Ship Yards, San Francisco. During 1942, the ship was assigned escort duty in the Southwest Pacific. In 1943, she was one of the covering ships for the Guadalcanal campaign and came through dive bomber attack unhurt. During the Rendova Island landings, June 30, 1943, twelve Japanese "Sally" torpedo planes attacked. Woodworth knocked down four, suffering light hits.

During 1944, Woodworth joined famous Destroyer Squadron 12 in conducting anti-shipping sweeps north of Rabaul, New Britain, and was credited with torpedo sinkings of an enemy destroyer and one merchantman. Four days later, February 25, she sank another Japanese merchantman and took part in a shore bombardment. During October 1944, Woodworth shot down four enemy torpedo bombers in the midst of heavy action. She earned seven Battle Stars during World War II and later was transferred to a Naval Reserve Training Unit.

Overall Length: 348 feet **Beam: 36 feet**
Displacement: 1620 tons **Speed: 38 knots**

By DICK EALY

INVISIBLE radio signals command this model of a famous World War II warship as it goes into action.

Below decks, a motor and gear box drive realistic counter-rotating props to send the ⅛-inch-per-foot scale ship churning through the water at a realistic scale speed of 38 knots.

As skipper, you issue your orders to the 42-in. long ship with a Citizens Band Transmitter similar to the kind used for gas model planes. Control range is ample to take the ship almost out of sight, and modern kits

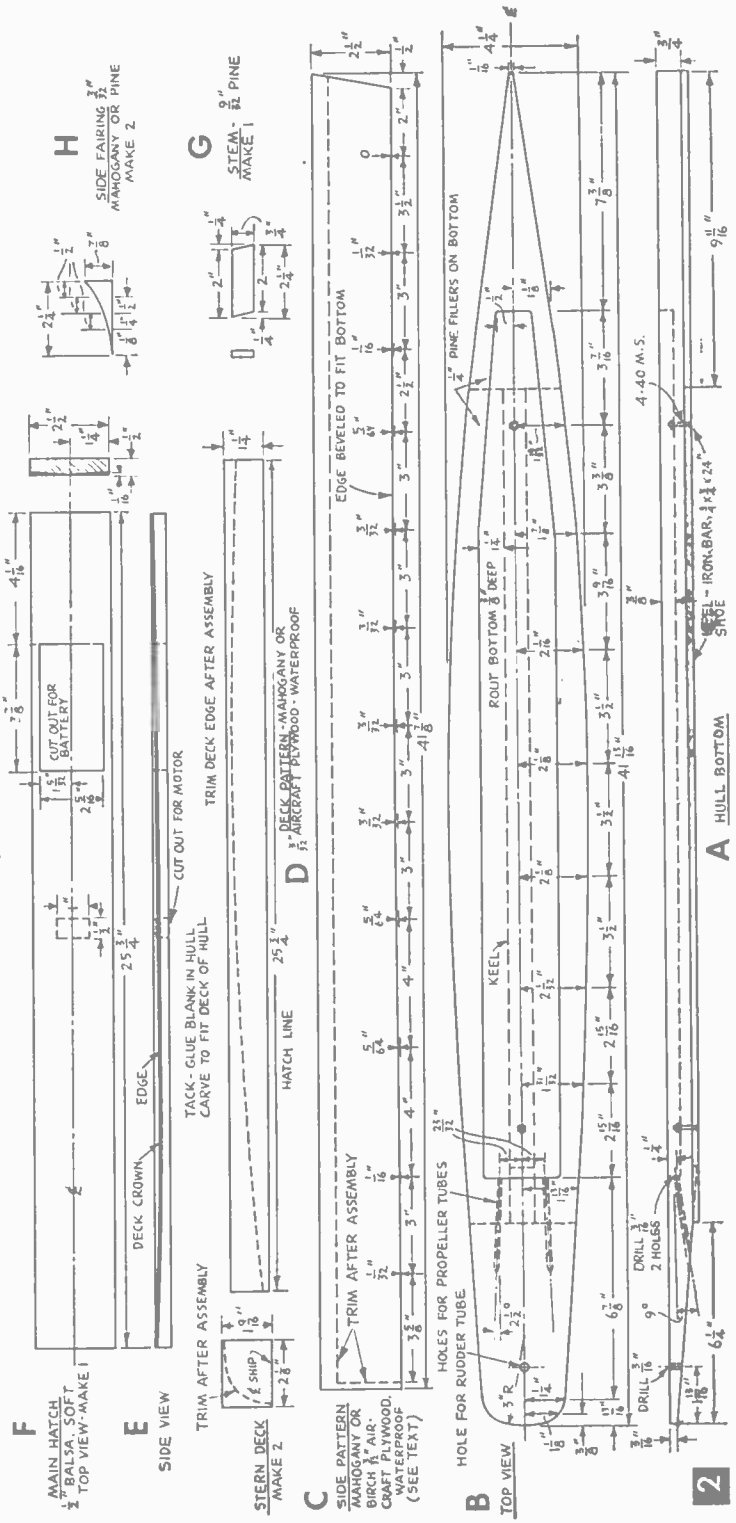
with parts wired and ready to install insure reliable radio performance. You can build the model on a small workbench with common hand tools—a power workshop is not necessary.

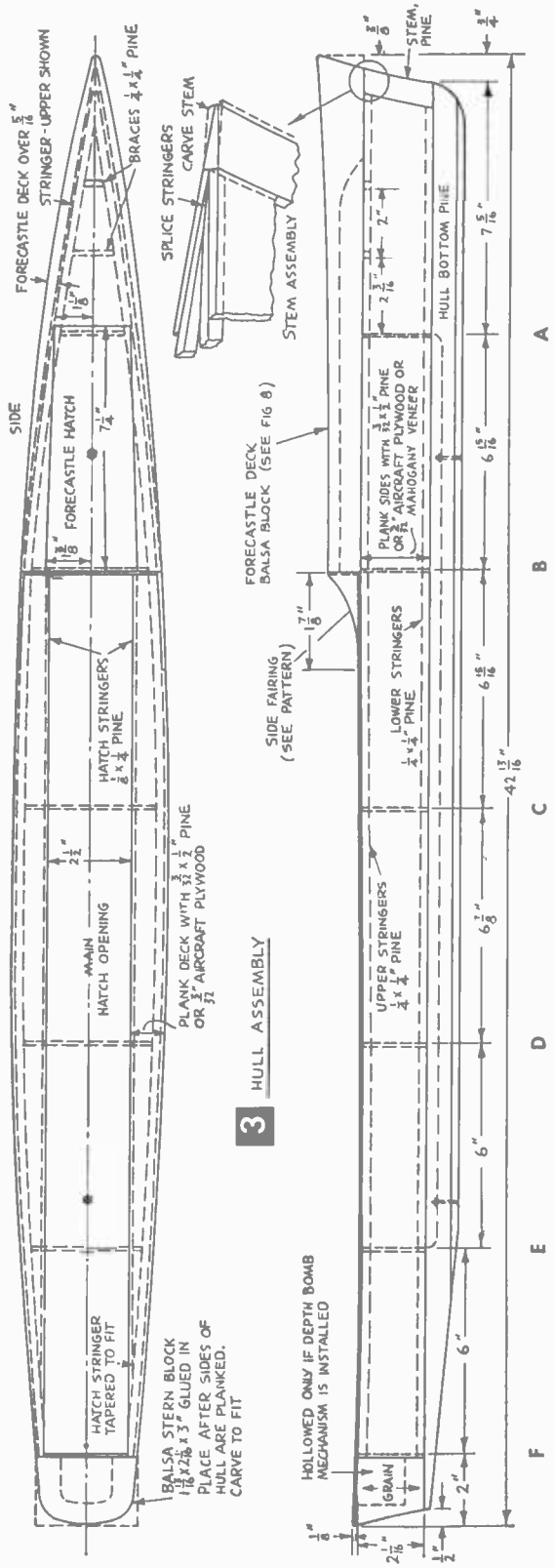
Start Hull Construction by drawing the outline of the hull bottom piece (Fig. 2A) on a piece of ¾ x 4½ x 42-in. pine, and saw with a jigsaw. Taper the stern end and drill the 3/16-in. propeller shaft holes. Since these holes are almost 3 in. long, you'll need an extension drill. Also drill the rudder tube hole, and then rout out the bottom according to outline shown on top view, Fig. 2B.

Attach the keel weight, a bar of iron or steel ¼ x ¾ x 24 in., to bottom piece with #4-40 *fh* screws, countersinking the holes. Glue three pine filler blocks ¼ in. thick around the keel weight. Use *Weldwood* glue for all hull construction, and hold the parts in place with C clamps while the glue dries. Trim the edges of the filler blocks flush with the edges of the hull bottom piece.

Cut the Six Bulkheads (Fig. 6) from 3/16-in. fir plywood, notching for the stringers, and glue as in Fig. 4A. Support the bulkheads vertically with blocks and clamps until the glue dries. Don't rush this step—care will assure smooth hull lines and easy assembly later on.

When the glue has dried, hold the lower ¼-in. square stringers in place and check the edge distance. You must have 3/32-in. clearance at each joint to



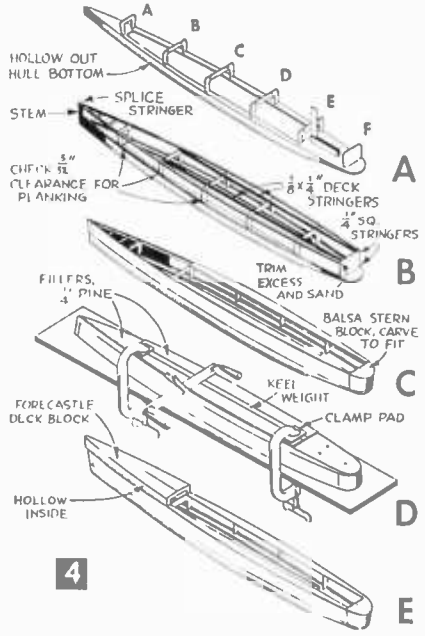


3 HULL ASSEMBLY

allow for the thickness of the side planking (Fig. 4B). Then splice the stringers at the front, and use ½-in. wire brads to secure the stringers to the bottom while you glue them in place.

Also splice the upper stringers at the bow end, and then glue, using rubber bands or masking tape to hold them in the bulkhead notches while the glue dries. Trim the stringer rear ends flush with the aft side of the rear bulkhead. Then make the pine nose stem (Fig. 2G) and glue in place. Add the two ⅛ x ¼-in. pine deck stringers and sand flush with the bulkheads.

Hull Planking Is Next. You can use 3/32 x ½-in. pine strips, or a single piece of 3/32-in. aircraft waterproof plywood (Fig. 2C). If you prefer the pine strips, start planking at the bottom and work up to the top. Otherwise cut the plywood sides to shape and fit carefully to the hull bottom. Start at the bow and attach the front half, using Weldwood glue and small clamps or clothespins to hold the panel tight against the stringers. When the front half is glued in place, pull the panel around the remainder of the frame and glue in place. Repeat the procedure on the opposite side, and then trim away excess stock flush with the upper stringers and aft of bulkhead F. Saw the balsa stern block to size, carve, and glue



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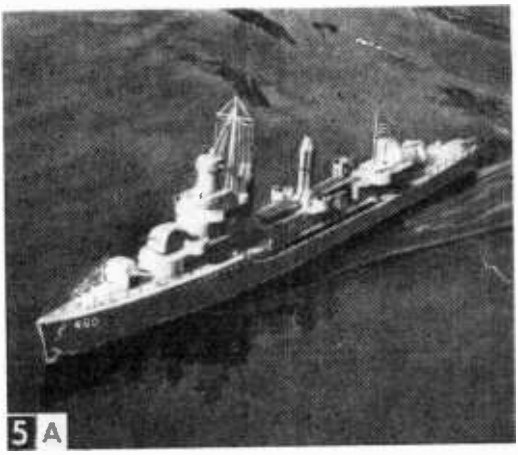

5A

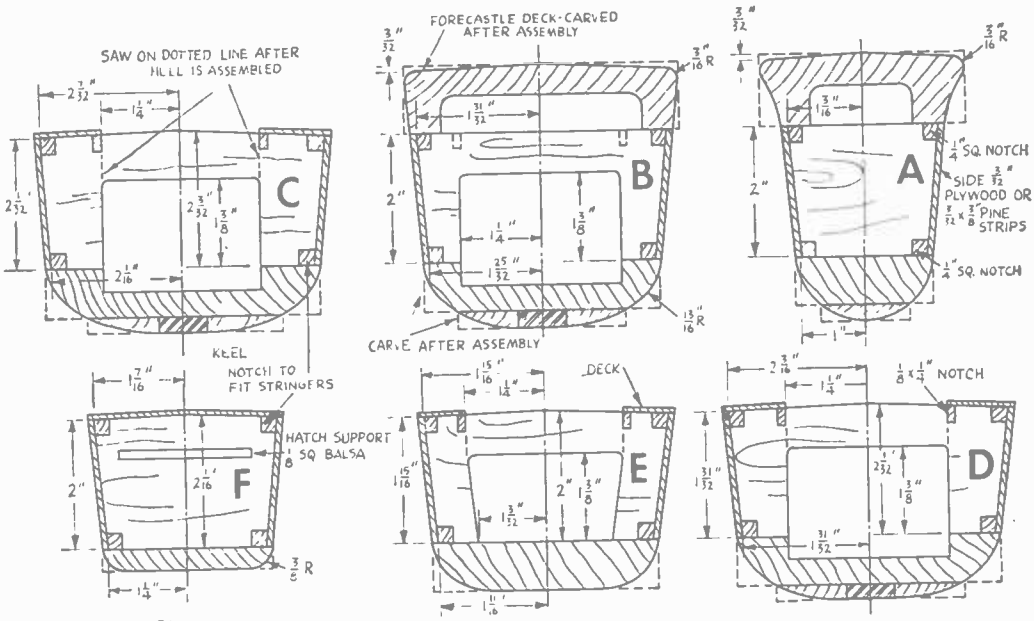
Compore this oeriol view of the USS Woodworth (Official US Navy photo) at sea, with the action shot of the model.

in place. Sand all edges with a #2/0 garnet sandpaper block.

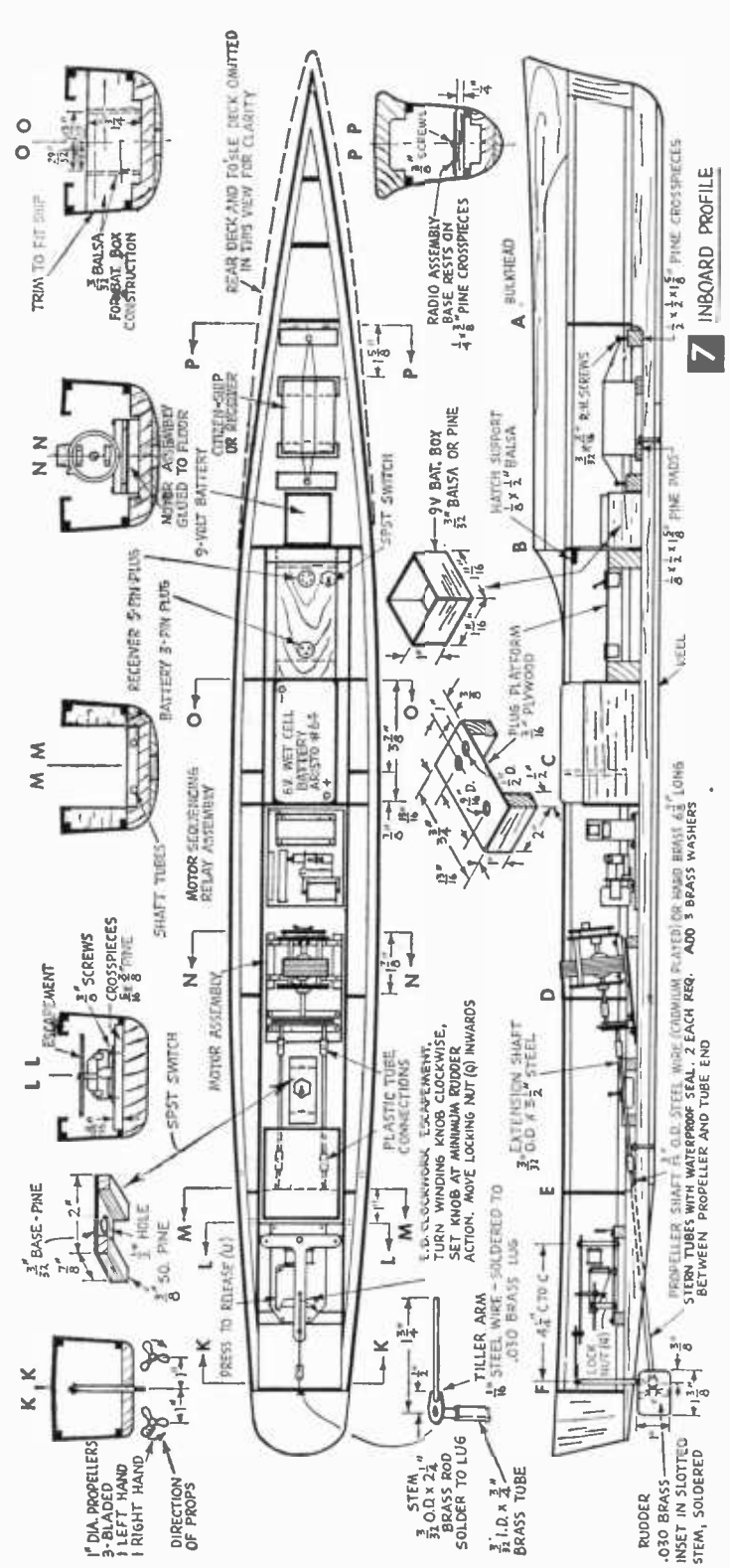
Plank the Deck Next with pine strips used for the hull. Start the planking along the ⅛ x ¼-in. deck stringer and work outward as in Fig. 4C. Trim away surplus stock flush with the sides, and sand edges. Then clamp the hull upside down and carve the rounded bottom with a two-handed drawknife (Fig. 4D) and sand.

Make the forecastle deck from a 1½ x 4⅛ x 16-in. block of medium soft balsa. First draw the outline (Fig. 8A) and cut away surplus wood with a jig saw. Sand the edges down to your pencil line. Then draw the profile (Fig. 8B) on the side of the block and clamp to your workbench. Be sure to use a pine wood pad under the clamp to avoid crushing the balsa. Use the drawknife to carve away the excess balsa at the top. The deck has a crown 3/32 in. higher at the center than at the rear end deck edge. Sand, and then turn the block over and use a gouge to hollow the inside (Fig. 6B).

Glue the forecastle to the top of the hull and then use a knife to carve the bow profile and a radius along the deck edges. Then carve in the flare for each side (Fig. 6A) and sand. Cut the front hatch out of the top of the block, and add the side fairings (Fig. 2F) where the forecastle joins the main deck. Glue a ⅛-in. thick sheet balsa bulkhead at



6 BULKHEADS



the rear of the forecastle deck.

Insert Both Propeller Shaft tubes in the hull bottom holes. Use putty and allow to harden if the fit isn't perfect. Also glue the brass rudder tube in place. Saw the inner portion of bulkheads C, D, and E away to make room for the main hatch (Fig. 4E).

Make the Main Hatch from ½-in. balsa (Fig. 2F), fit into place on the deck, and glue lightly. Be sure to allow enough stock for the higher middle portion. Use a drawknife to trim away the wood, and sand the deck. Then remove the hatch from the hull. Fill all hull cracks with white crack filler, the kind used for sealing kitchen tile. Allow it to dry and sand smooth. Finish-sand the entire hull with #2/0 sandpaper, and follow with #400 finishing paper. Wipe away all dust.

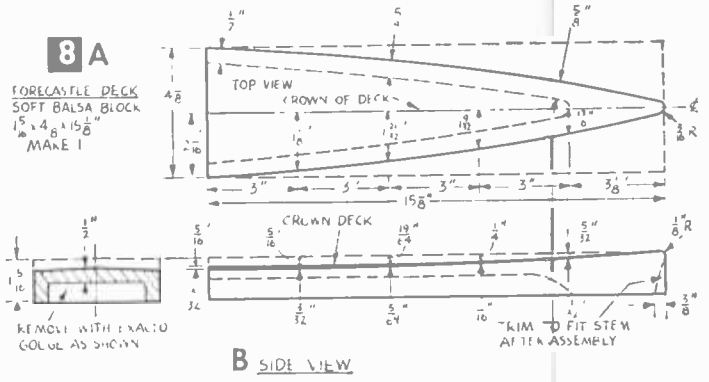
Spray Painting Is Best, but you can get a good finish by hand, too. Protect the propeller and rudder tubes and brush on a coat of white enamel undercoat, and allow to dry six hours. Sand wet with #400 paper and wipe the surface. To get a glass-like paint finish, repeat with five sanded coats or until the surface is perfectly filled. Then paint the hull with the best grade of Navy grey porch enamel that you can buy.

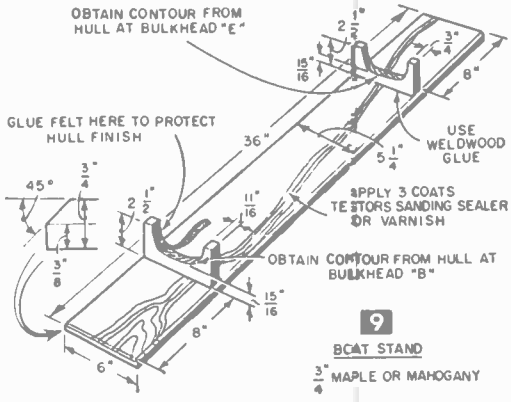
There's a trick to avoiding paint runs. Don't try to paint the entire hull at once. Instead, paint one side at a time, allowing the paint to set 15 minutes before starting the other side. Dry 24 hours and brush on a second coat. Paint the inside of the hull and the hatches grey at the same time. Also paint the entire hull beneath the waterline (1½ in. above hull bottom) with red oxide, or Chinese red enamel. Use masking tape to protect the upper hull during this step.

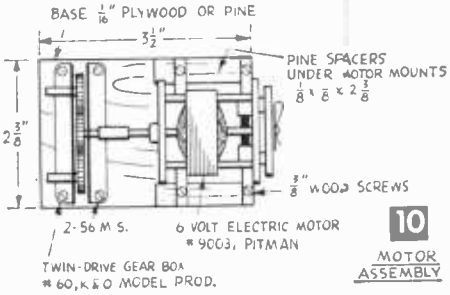
Installing Propellers. To prevent damaging the finish,

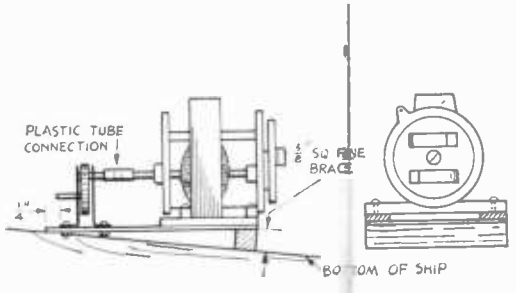
make the hull stand (Fig. 9), and brush on three coats of Testor's sanding sealer for a natural wood finish. Then clean out any paint that may have leaked into the propeller and rudder shaft tubes. Solder the 3-bladed left and right hand propellers to the $^{3}/_{32}$ x 6⅞-in. steel shafts (Fig. 7). Slip three brass washers over each shaft end, grease the shafts, and insert in the tubes. Make the two 3½-in. steel propeller shaft extension and attach to the main shafts with plastic tubing universal joints.

Mount the Pittman electric motor and the twin-drive gear box to the $^{1}/_{16}$-in. thick base (Fig. 10). Use plastic tubing to connect motor to gear box and gear box to the extension shafts. Pull the motor assembly forward until both propellers rest lightly against the rear end of the propeller shaft tubes, and then glue the assembly to the hull floor.



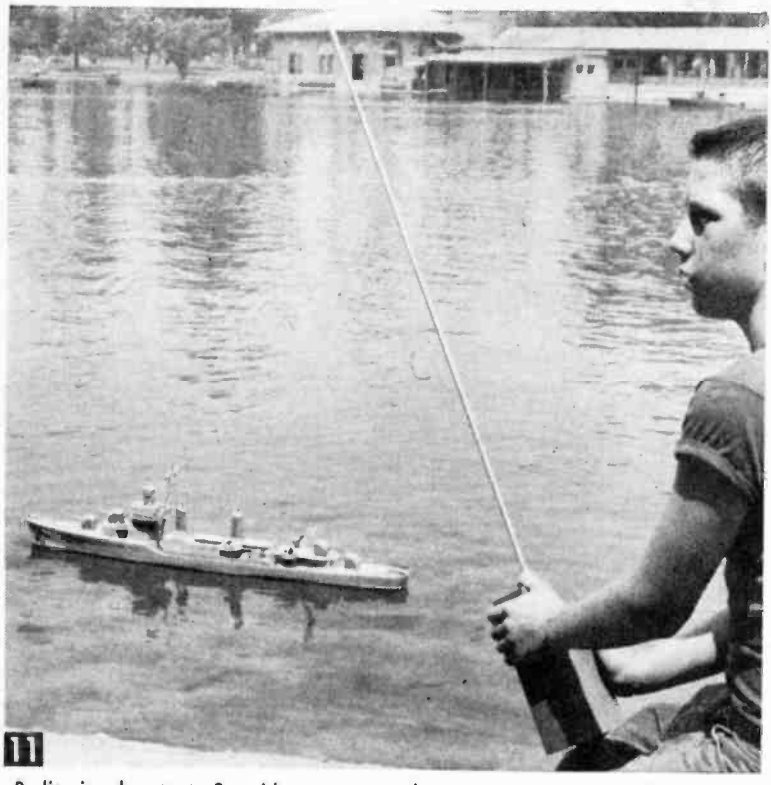






MATERIALS LIST — U.S.S. WOODWORTH PART 1

Amt. Req.	Size and Description	Use
	KEEL BOTTOM	
1	¾ x 4¼ x 42" pine	hull bottom
1	¼ x ¾ x 24" iron bar	keel weight
3	¼" pine pieces (See Fig. 2B)	keel fillers
	HULL STRUCTURE	
1 pc.	$^{3}/_{16}$ x 12 x 18" fir plywood	bulkheads
4	¼ x ¼ x 44" pine strips	stringers
2	⅛ x ¼ x 36"	deck stringers
2	$^{3}/_{32}$ x 1¼ x 25¾" aircraft waterproof plywood or:	hull planking, sides
6	$^{3}/_{32}$ x ½ x 42" pine strips	hull planking, alternate method
1	¼ x 2¼ x ¾" pine	stem
1	1 $^{3}/_{16}$ x 2 $^{1}/_{16}$ x 3" balsa	stern block
4	$^{3}/_{32}$ x ½ x 25¾" pine	deck planking
1	1½ x 4⅛ x 16" balsa	forecastle deck
1	½ x 2½ x 25¾" balsa	main hatch
	DRIVE ASSEMBLY	
2	$^{3}/_{32}$" O.D. x 6⅞" cad plated steel or hard brass	prop shafts
2	⅛" I.D. x 6¼" brass tubes. (Note: Stern tubes with waterproof packing obtainable Modelcraft Mfg. Co., 3455 W. 6th St., Los Angeles, Calif.	prop tubes
1	$^{3}/_{32}$" O.D. x 2¼" brass	rudder stem
1	$^{3}/_{32}$" I.D. x 1¾" brass tube	rudder tube
2	1" dia. left hand and right hand props	propellers
6	$^{3}/_{32}$" I.D. brass washers	prop shafts
1	$^{3}/_{32}$ x 3½" steel shaft	shaft extension
1 pc.	.030 x 1 x 2" brass	rudder
1	motor, 6 Volt, Pittman #9003	drive motor
1	gear box, K & O #60	twin drive
1	clockwork escapement, Electronic Developments	tiller control
4	2-56 x ⅜" RH machine screws and nuts	motor mount
Misc.	Weldwood glue, Testors model cement, scrap wood for mtg. parts, 1 qt. each, white enamel undercoat, navy grey porch enamel; 1 pt., red oxide paint, plastic tubing for extension shaft couplings, clamps, nails, sandpaper.	
Sources:	Most items available local hardware and model shops. Complete parts available Model Craft Mfg. Co., 3455 W. 6th St., Los Angeles, Calif., or Polk's, 314 Fifth Ave., New York 1, N. Y. Mahogany plywood etc. can be obtained from General Veneer, P.O. Box 271, Southgate, Calif.	



Radio signals actuate 8-position sequence relay to put ⅛-in. scale model through realistic operational maneuvers.

The Citizen-Ship receiver is used along with either of the Citizen-Ship transmitters (Models FL, FLX, or LC), which have proven to be reliable and require little adjustment (Fig. 15). However, other unmodulated carrier-operated receivers, such as Gyro, Ace, Kraft, or Babcock's Mark IV may be used with corresponding transmitters.

The 27.255-megacycle frequency is one of several frequencies set aside by the Federal Communications Commission as a Citizen's Band. This means that it is not necessary to take an examination when applying for your license to transmit signals in this frequency range.

You must, however, have your license before you use the transmitter. So mail the application as soon as you purchase your radio control equipment to be sure you receive your license by the time you're ready to operate your boat.

Cut the Rudder from sheet brass, and solder it to the 3/32-in. OD slotted brass stem. Insert the stem into the rudder tube and solder the brass lug on top (Fig. 7). Also solder the 1/16-in. dia. steel wire tiller to the lug.

Mount the *Electronic Developments* clockwork escapement in the hull as in Fig. 7. Loosen the winding knob adjustment nut beneath and move the knob all the way in toward center to reduce rudder action to a minimum. Tighten the nut. Glue the two pine crosspieces to the hull floor to get the right mounting height. Locate the center of the rudder stem 4¼ in. from the axis of the escapement arm, and then shim the base up until tiller and winding knob are lined up horizontally. Mount the escapement to the crosspieces with wood screws.

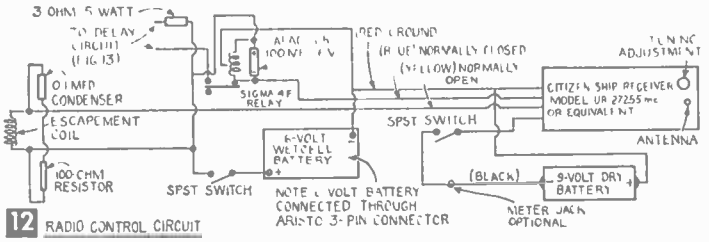
Now wind up the spring by turning the knob clockwise. Press the escapement release at "U" to actuate the 4-position starwheel. The rudder should turn to one side. Press again, and it turns back to center. The third time, it turns to the opposite side, and the fourth time, back to neutral. Adjust if necessary to assure free action of the tiller.

Now you are ready to put in the 27.255-megacycle, Model UR, *Citizen-Ship* transistorized radio receiver to control steering of the model and firing of torpedoes and depth charges.

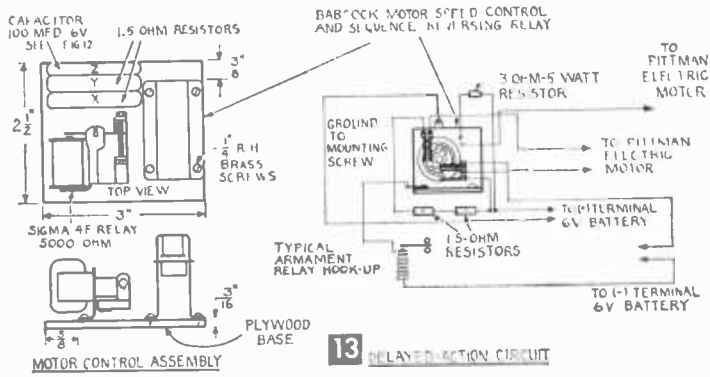
Secure the Receiver to the hull on pine crosspieces between bulkheads A and B with rubber bands running fore and aft over a pair of roundheaded woodscrews (Figs. 7 and 14). Then make up a box for the 9-volt battery from 3/32-in. balsa and glue this to the hull just aft of the receiver.

Next cut a 2 x 3¾-in. piece of 3/16-in. plywood and drill it to take the 5-pin plug for the receiver and a 3-pin for the 6-volt Aristo #64 battery (Figs. 7 and 12). Use #2 x ¼-in. *rh* woodscrews to attach the plugs to the plywood panel, and install a single-pole, single-throw toggle switch with its own lock ring. Glue pine supports to the hull bottom to provide a 1-in. clearance for the panel wiring, and mount the panel on the supports with ½-in. screws.

A radio-controlled delayed-action circuit (Fig. 13) operates the motor control and armament. When the OPERATE switch on the transmitter is pressed and released, the rudder turns. But when the same switch is held in the ON position about 1½ seconds and then released, a Babcock 8-position sequence relay is actuated in the following sequence: slow forward, stop, slow astern, stop, full forward, stop, full astern, stop.



12 RADIO CONTROL CIRCUIT



13 DELAYED-ACTION CIRCUIT

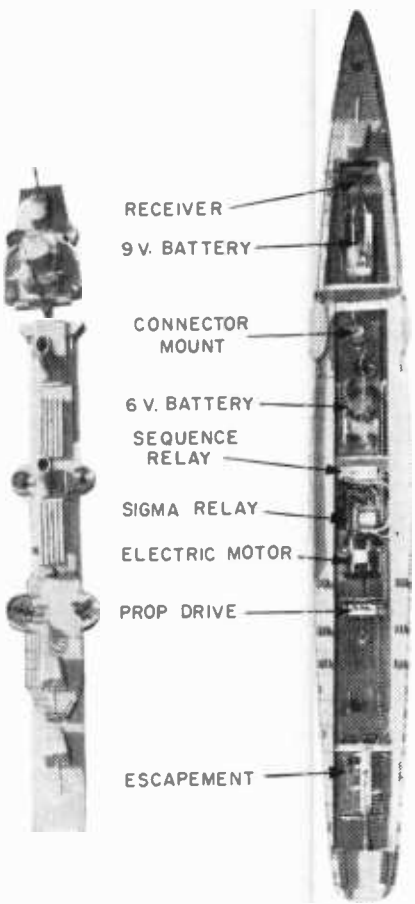
Torpedos or depth charges are fired at predetermined steps in the sequence by wiring Potter and Brumfield 6-volt relays to the sequence relay so they will be actuated individually at the desired steps. See Fig. 13 for a typical installation of one of these relays.

Mount the Sequence Relay and the Sigma 4A relay along with the capacitors and resistors (Fig. 13) on a $\frac{3}{16}$-in. plywood panel. Use only resin-core solder when wiring these components. Install this panel directly to the bottom of the hull, just forward of the electric motor, using ½-in. *rh* woodscrews.

Now you are ready to connect the delayed action circuit to the main radio control circuit. Study the schematic that comes with your receiver and compare it with Fig. 12. Sketch in the connections for the delayed-action circuit, the connectors, toggle switch, and meter jack on this schematic, and then begin the wiring. Use multi-strand, plastic-covered hook-up wire, color coding it—red for ground, blue for normally open, yellow for normally closed, brown for the antenna lead, and black for the line from the receiver to the negative (−) terminal of the 9-volt battery. Trim the four wires from the receiver to about 6-in. lengths and solder them to the 5-pin connector plug.

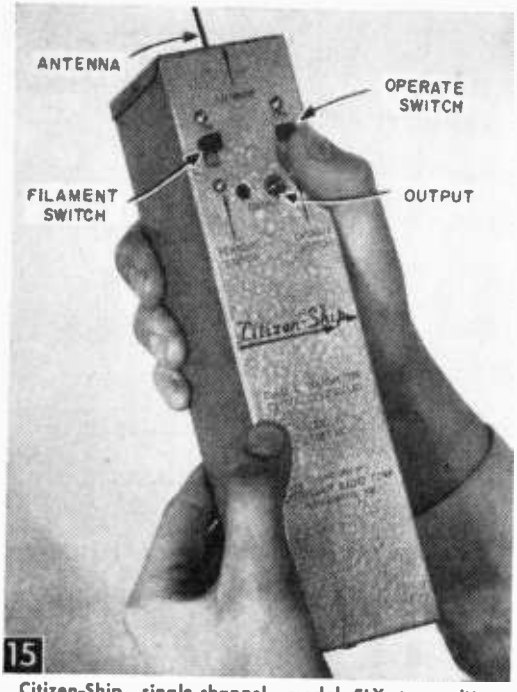
Then connect the wires for the delayed-action circuit, the escapement, the positive (+) terminal of the 9-volt battery, and one side of the toggle switch to the corresponding terminals of the 5-pin connector socket. Connect the remaining switch terminal to the negative side of the 9-volt battery. Both leads from the 6-volt main battery are connected to the 3-pin plug, and its mating is wired to feed power to the Sigma relay and the escapement mechanism.

To make it easy to keep your radio control equipment properly tuned, a meter jack (Fig. 12) can be installed in the panel near the connectors for quick plug-in checks with a 0.50 milliammeter. Insert this jack in the line between the toggle switch and the positive terminal of the 9-volt battery. The armament wiring is most easily connected after

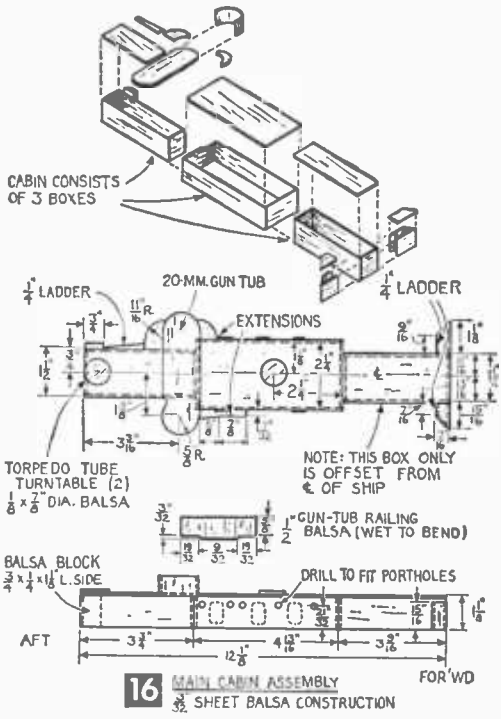


14

Radio controls are completely concealed beneath main hatch.



Citizen-Ship, single-channel, model FLX transmitter operates rudder, motor control, and armament with single control switch



MATERIALS LIST—U.S.S. WOODWORTH PART 2

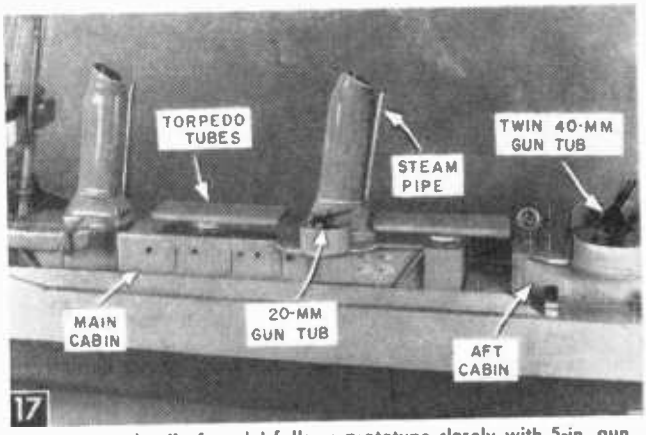
Amt.	Req.	Size and Description	Use
		CABIN AND TORPEDO TUBES	
1		⅛ x 10" balsa	torpedo and gun mounts
1		3/32 x 4 x 36" balsa	cabins and battery box
1		1/32 x 2 x 36" balsa	gun-tub railings
1		½ x 1½ x 12" balsa	cabins and funnel bases
3		½ x ½ x 1⅝" pine	receiver mount pads
2		½ x 1 x 2" pine	connector panel supports
1		3/16 x 2 x 3¾" plywood	connector panel mount
1		3/16 x 2½ x 3" plywood	control circuit mount
10		¼" dia. x 3½" brass tubing	torpedo tubes
10		⅛" dia. x 1⅛" coil spring	torpedo springs
10		¼" O.D. brass washers	torpedo tube breeches
1		.030 x 1 x 4" brass	triggers
10		3/16 x 2" hardwood dowels	torpedos
1		.010 x 3 x 8" brass shim stock	funnels
1		⅛" dia. x 2¾" metal tubing or dowel	steam pipe
Misc.		Testor's Sanding Sealer, rubber bands, ¼" and ½" woodscrews, 2-56 machine screws, 2/0 and #400 sandpaper, modeling clay or putty, ¾" brads	
		RADIO CONTROL EQUIPMENT	
1		Citizen-Ship, Model UR, 27.235 mc. receiver	control receiver
1		Citizen-Ship, FL, FLX, or LC transmitter	control transmitter
1		Babcock, 8-position sequence relay with two 1.5 ohm resistors	delayed-action relay
1		Aristo 6-volt #64 wet battery	main battery
1		Aristo 3-pin connector and plug	battery connector
1		Aristo 5-pin connector and plug	receiver connector
1		Eveready 9-volt #266 battery	receiver battery
1		⅛" dia. x 36" piano wire	antenna
1 pkg.		assorted lengths of 24-gage color-coded multi-strand plastic-covered hookup wire	
		Most parts available at local hardware and model shops. Complete parts available Model Craft Mfg. Co., 3455 W. 6th St., Los Angeles, Calif., or Polk's 314 Fifth Ave., New York 1, N. Y.	
1		Sigma 4F, 5000 ohm. adjustable point, 6-volt relay (Newark #24F354)	motor control relay
3		Potter and Blumfield, 6-volt, 335 ohm relays (Newark #24F1173)	armament relays
2		SPST toggle switches (Newark #22F961)	
1		3 ohm. 5 watt resistor (Newark #13F150)	
1		100 ohm, ½ watt resistor (Newark #13F000)	
1		100 mfd.. 6 WV capacitor (Newark #15F1150)	
1		.10 mfd., 10 WV capacitor (Newark #19F277)	
1		phono plug and jack	meter jack
		Above available from Newark Electronics, Corp., 223 W. Madison, Chicago 6, Ill.	

the cabins are complete and mounted on the main hatch.

The Main Cabin, consisting of three separate boxes assembled as in Fig. 16, is constructed next. Cut the 3/32-in. balsa panels, cement the ends between the side panels with *Testor's Model Cement*. Cement the boxes together to form a single unit with the forward section offset 1/16 in. to the starboard side. Then add the cabin roofs and wing extensions at the forward end of the cabin, and glue the ⅛-in. thick balsa torpedo-tube turntables to the cabin roof.

If the torpedo tubes are to operate, make two sets of five tubes each by soldering ¼ x 3¼-in. brass tubes together, and then grinding and filing away the lower forward ends as in Fig. 18A. Round the sharp corners with the file, and mount each set of tubes by drilling and pivoting them on a ¾-in. brad.

The torpedos are 2-in. lengths of 3/16-in. hardwood dowel rounded on one end. While these are usually gray, it will be easier to see them being fired and retrieve them if they are painted with brightly-colored enamel.



Armament detail of model follows prototype closely with 5-in. gun turrets, 20-mm and twin 40-mm anti-aircraft guns, along with torpedo tubes and depth charge projectors that can be made to operate.

and form it around the gun-tub extension on the roof edge. Hold it in place with straight pins until dry. Then remove it, and attach it and the 3/32-in. balsa cabin roof extensions permanently with model cement.

Make the Funnels by forming .010-in. brass shim stock around a 5/8-in. dowel, and solder a 1/16-in. lapped joint at the aft side (Fig. 19). Also solder an end plate of the same material to the bottom of each funnel so they will hold a mixture of dry ice and water to simulate smoke. Caution: Do not handle dry ice with bare hands or use in an unventilated room.

The Torpedo Tubes are charged by compressing a 1/8-in. coil spring between the torpedo and a washer that is soldered into the breech of each tube. File these washers to fit, and then tin them along with one end of the coil springs and the breech of the tubes. Assemble the firing mechanisms by soldering the three parts together at once.

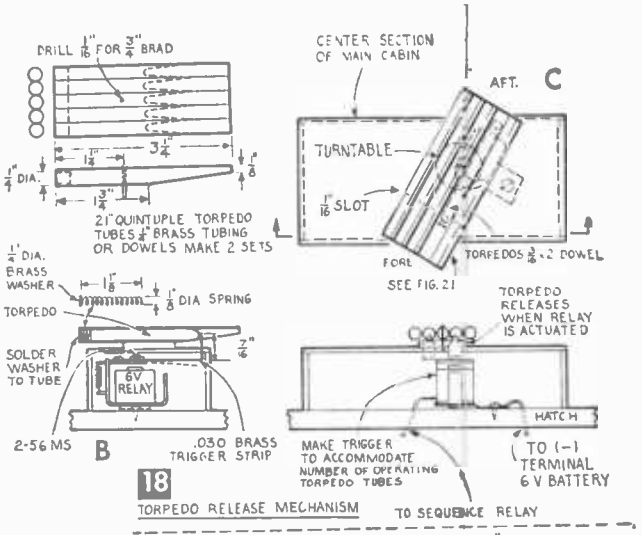
Now temporarily mount the tubes on their turntables with the pivot brads so their forward ends face outboard at no less than a 60° angle from the model's centerline. Make a mark on the cabin roof 1¾ in. from the breech on each side of tubes at aft ends of cutaway.

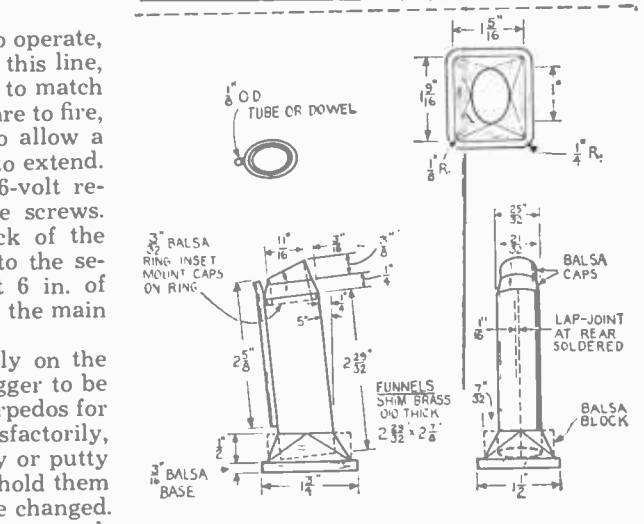
Remove the tubes from the turntables and connect these marks with a pencil line. If the two outboard tubes in each set are to operate, cut a 1/16-in. slot the entire length of this line, and make up the trigger (Fig. 18C) to match this length. If only one of the tubes are to fire, the slot can be just long enough to allow a 1/4-in. wide trigger strip (Fig. 18B) to extend.

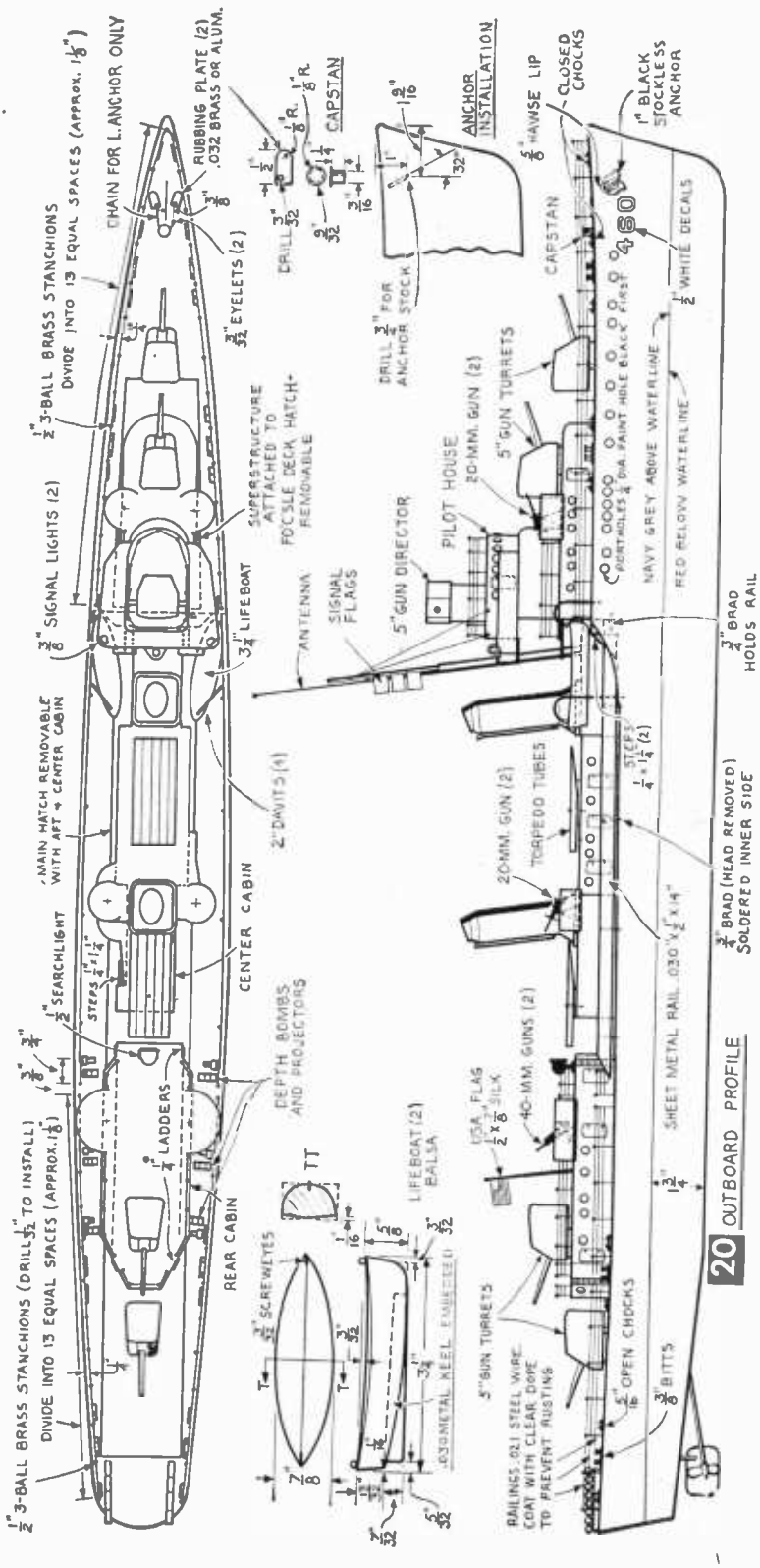
Fasten the trigger strips to the 6-volt relays (Fig. 18B) with 2-56 machine screws. Then mount the relays to the deck of the main hatch, and connect the wire to the sequence relay circuit. Leave about 6 in. of extra length on these wires to allow the main hatch to be lifted from the hull.

Set the cabin in place temporarily on the hatch, and test the action of the trigger to be sure it moves freely, clearing the torpedos for firing. When everything works satisfactorily, place a small piece of modeling clay or putty between the tubes and the table to hold them firmly yet allow their position to be changed.

Soak the 1/32-in. balsa stock for the gun-tub railing (Fig. 16) in water until it is pliable,



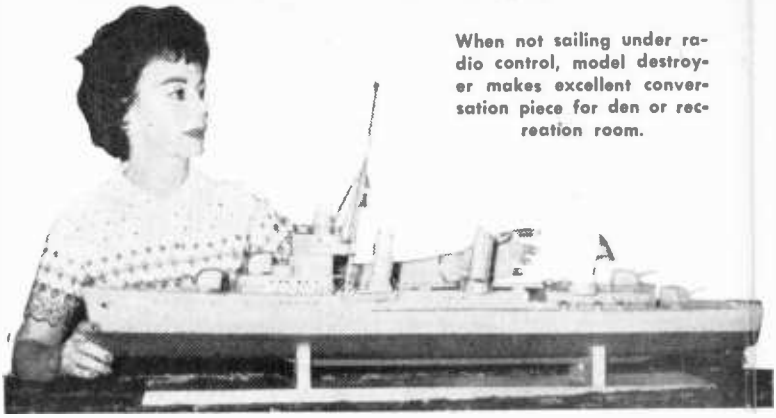




All wood parts of the model should be filled with five coats of white enamel undercoat. Apply two coats of high-grade gloss enamel for finish.

Drill four or five closely-spaced ¼-in. holes through the ½-in. balsa funnel bases (Fig. 19), and finish the holes with a file and sandpaper so the funnels will tilt 5° toward the stern when they are mounted on the cabin. Slide the funnels up through the hole from the bottom of the bases, and cement the shim stock to the balsa. Then check the tilt angle with the funnel base setting on a flat surface, cement the 3/16-in. balsa sheets in place as in Fig. 19, and finish the bases with 2/0 and #400 sandpaper.

Add the funnel caps by first cementing a 3/32-in. oval balsa ring inside of the shim stock and then a ¼- and ⅜-in. thick oval ring on top of this (Fig. 19). Carve these to shape and make the top opening in the same way as you made the holes in the bases. Fill all of the joints with *Testor's Balsa Filler* and sand them smooth. Make the stern pipes at the aft side of the funnels (Figs. 17 and 20) from ⅛-in. metal tubing or dowel. Cement these to the funnels, and then attach the funnel assemblies to the cabin top.



When not sailing under radio control, model destroyer makes excellent conversation piece for den or recreation room.

Now go on to construct the aft cabin (Fig. 22) and the superstructure (Fig. 24). Use the same general procedure that was used for the main cabin to make the basic assemblies and install the gun-tub railings.

Construct the tapered section of the aft cabin before installing the roof. On the superstructure assembly, carve the balsa blocks to shape after the cabin roofs are in place and the cement has dried. Then cement the second-level cabin to the roof of the fore cabin, and add the navigation bridge and pilot house.

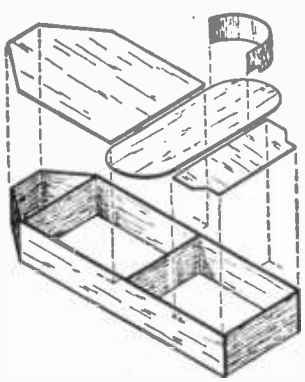
Make the Bridge Railing from 1/32-in. balsa and then cement a 1/16 x 1/8-in. strip around the outer top edge of the rail. Trim this with sandpaper as in Fig. 24. Also carve the flag bags (Fig. 25) to shape and cement them to the aft edge of the bridge railing.

Cut the mast supports from plywood or pine stock and drill them to fit the signal mast (Fig. 25). Cement these to the superstructure and then set up the mast (Fig. 28). Cement a 1/32-in. I.D. brass antenna socket to the aft side of the mast and solder the 14-in. flexible (brown) antenna lead to it. Drill a 3/32-in. hole through the aft end of the first-level cabin and the forward hatch so the lead can be threaded through at assembly. Be sure to use enough wire to allow the hatch to be lifted for access to the receiver and battery.

Next, set up the four turntables (Fig. 24) for the 5-in. guns and carve the turrets from balsa block (Fig. 28). Cement tapered 1/8-in. O.D. brass tubing or dowel barrels into the angled holes in the front of each turret. Then drill 1/2-in. deep holes in the bottoms and mount the turrets on the dowels projecting from the turntables.

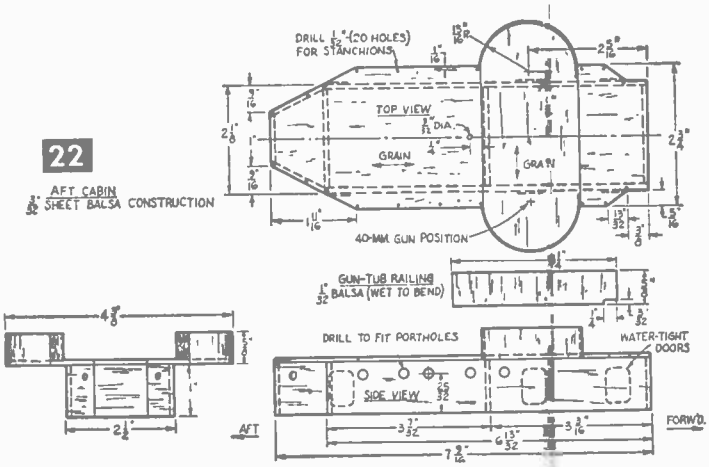
Make up the depth charge racks from balsa blocks as in Fig. 28B and C with 1/32-in. balsa railings. Mount the smaller racks and the 1/8-in. dowel projectors (Fig. 28D) as in Fig. 20.

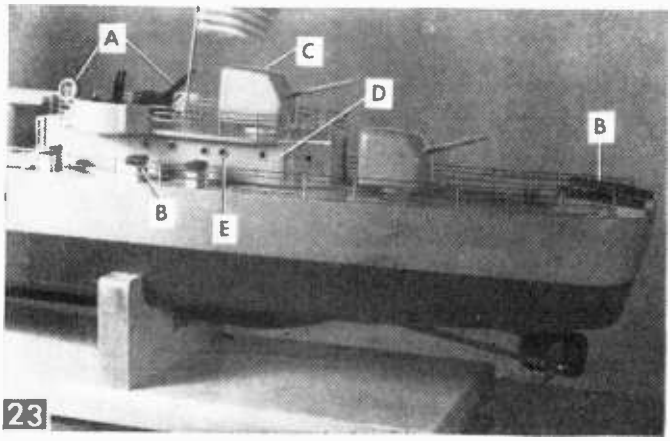
Then hollow out the stern block (Fig. 27) to take a 6-volt *Potter and Blumfield* relay with a 0.030-in. brass strip mounted to it. Cover the forward side of the stern block with 1/32-in. balsa and make the fan-tail deck from the same material. Cement the long racks to this deck and then fasten the deck to the stern block with straight pins. Bend the trigger from 1/32-in. steel wire and check its fit before soldering it to the brass strip. Wire the relay in the same way as the torpedo



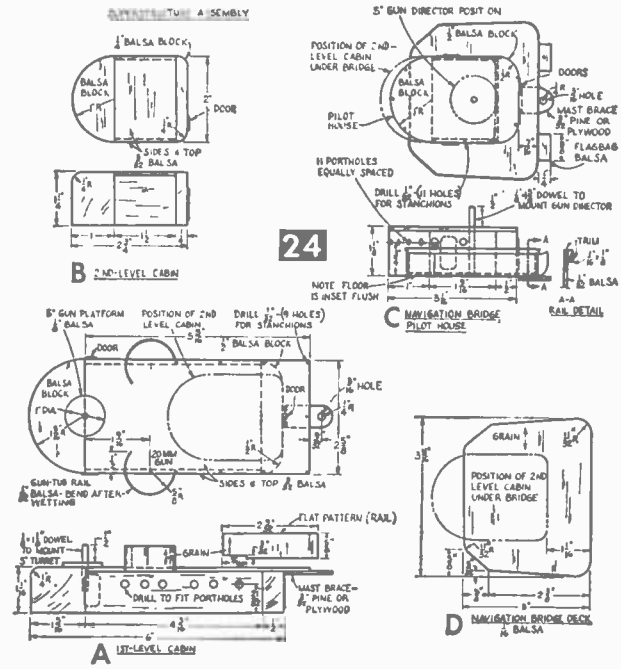
22

AFT CABIN 1/32" SHEET BALSA CONSTRUCTION





A, Twin 40-mm AA Guns; B, Depth Charge Racks; C, 5" Guns; D, Watertight Doors; E, Brass-Eyelet Ports.



tubes (Figs. 13 and 18).

Carve the fire-control tower (Fig. 28A) from balsa blocks and insert the ⅛-in. dowel range-finder scopes. Then cement a ⅛-in. dowel to the roof of the second-level cabin, letting it extend about ½ in. beyond the pilot-house roof as a mount for the tower. Paint the hatch, deck, and cabin assemblies with five coats of gray porch enamel.

Then mark the locations of the portholes as in Figs. 16, 20, 22, and 24. The ports may be either ready-made scale parts or ordinary brass eyelets. Paint the face of each port gray and, while they are drying, drill mounting holes at the locating marks. Paint the bottom of these holes black to give the illusion of depth, and then cement the parts in place. Also paint the watertight doors and ladders and attach these.

With these details in place, fasten the cabins permanently to the hatches, cutting away each hatch as necessary to clear the wires for the antenna and armament, and soldering the antenna lead to its connection at the receiver.

40-mm Guns. Next, make up two pairs of twin 40-*mm* anti-aircraft guns as in Fig. 28F. Cut the gun barrel tubes to length and then wrap them with soft tinned wire to simulate recoil springs. Insert the barrels in ⅛-in.-sq. pine breech locks and secure them with cement.

Form the base, seats, and footrests from 0.020-in. brass and then clamp the breech blocks in between the bent-up ends of the base. Drill through the clamped assembly and insert a straight pin to hold it together. Also drill through the base and insert a 1/16-in. tube, soldering the brackets for the seat and footrests to the end of the tube. The hand cranks are bent up next from 0.020-in. wire and are cemented under the breech block assembly.

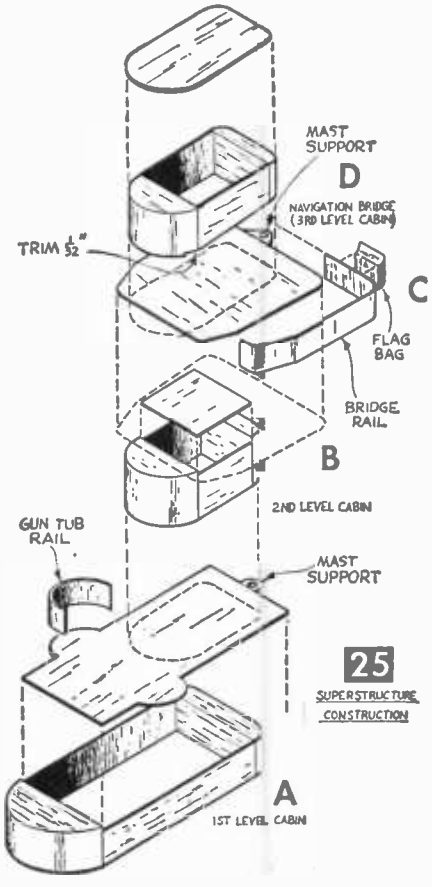
Then paint the guns with two coats of Testor's black enamel and mount them in their gun tubs (Fig. 20) with a brad or escutcheon pin through the center bottom of the base. Also paint the 20-*mm* guns and cement them in place in the gun tubs of the main and fore cabins.

Detailing. Drill slanted holes for the anchor shafts (Fig. 20) through each side of the bow and cement painted hawse lips in each hole. Paint and cement the anchors, rubbing plates, and capstan in place and then run a piece of eight-link/in. chain from the port anchor around the capstan and into an eyelet. Also paint and attach the bitts and chocks.

To attach the wire railings, first drill 1/32-in. holes in the edges of the cabin tops, bridge, and main deck for ½-in. tall, three-ball brass stancheons. The rails themselves are 0.025-in. steel piano wire. In making up each section of railing, slide the indicated number of stanchions onto the three wires, drive the stan-

chions into the holes, and then trim the wire to length. The railings on top of the pilot house are bent from a single length of assembled wire and stanchions.

Mount the sheet-metal railings at the main deck edge (Fig. 20) by soldering or cementing 3/4-in. brads to its inner side and then pressing the brads into the deck edge. Install a pair of life-boat-davit



MATERIALS LIST—U.S.S. WOODWORTH—PART 3

Amt.	Req.	Size and Description
4		20-mm AA guns #352
75		air ports #225
18		watertight doors #600
8		ladders #604
2		ladders #177
96		3-ball, rail stanchions #155
24 ft.		rail wire #155
8		3/8" bollards #106
18		1/16" chocks #40
2		1/16" hawse pipe lips #248
2		3/4" stockless navy-type anchors #16
2		2" davits #209
2		davit sockets #210
1		1/2" searchlight #156
2		1/16" searchlights #605
1		capstan #450
3 in.		8-link/in. chain
1		1/32" x 36" soft tinned wire
1		1/8 x 36" dowel

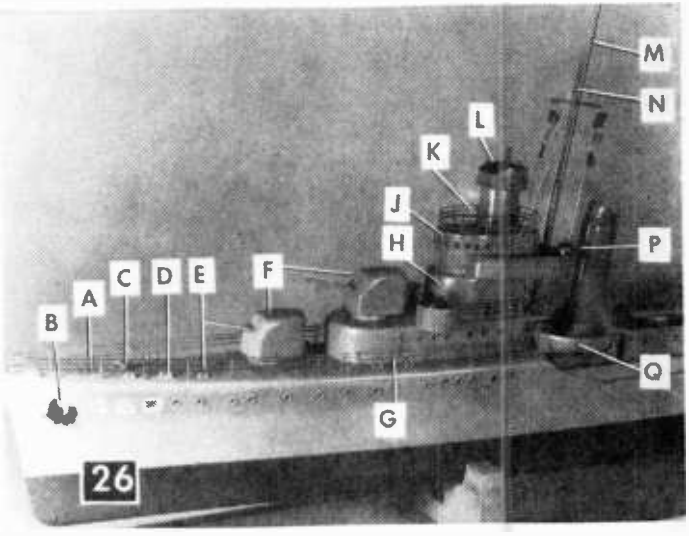
Misc.—Testor's black enamel, 2-56 mach. screws, 3/32" screweyes, 3/4" brads, silk thread, pins, flags. Above available from James Bliss Co. Inc., 342 Atlantic Ave., Boston 10, Mass.

1	1 1/2" x 1 1/2 x 8" balsa	gun mounts, superstructure, f/c tower
1	5/8 x 1 x 4" balsa	superstructure
1	1/2 x 1 1/2 x 5" balsa	superstructure
1	1/4 x 3/8 x 5" balsa	d/c racks
1	1/32 x 1/32 x 8" balsa	d/c rack rails
1	1/32 x 2 x 3" balsa	stern block bulkhead
1	1/16" O.D. x 1/32" I.D. x 5" brass tube	40-mm guns
1	1/32" O.D. x 1 1/4" brass tube	40-mm guns
1	.030 x 1/2 x 32" brass	rails, trigger
1	.020 x 1/4 x 2" brass	gun mounts, seats

sockets on each side of the main cabin at its forward edge. Then make up the life-boats and attach them to the davits with screweyes and thread.

Use #50 silk thread to rig the signal mast (Fig. 28G) and then add the colored pennants to the signal halyards. The antenna is cut to length from 1/32-in. steel wire and is tipped with a brightly-colored plastic ball or a hat pin to make it easy to see. A silk U. S. flag is cemented to the flat mast and a hat pin stuck in the top of the mast serves as a mast ornament. Mount two 3/16-in. search lights on the navigation bridge and one 1/2-in. searchlight on the fore edge of the aft cabin roof.

Tuning. To set up your Citizen-Ship, Model FLX transmitter, first insert a 36-in. length of 1/8-in. piano wire through the rubber grommet



A, Rubbing Plate; B, Hawse-Pipe Lip; C, Capstan; D, Bitt; E, Chock; F, 5" Guns; G, Fore Cabin; H, Radio Shack; J, Pilot House; K, Bridge; L, Fire-Control Tower; M, Antenna; N, Signal Mast; P, Searchlights; Q, Lifeboats.

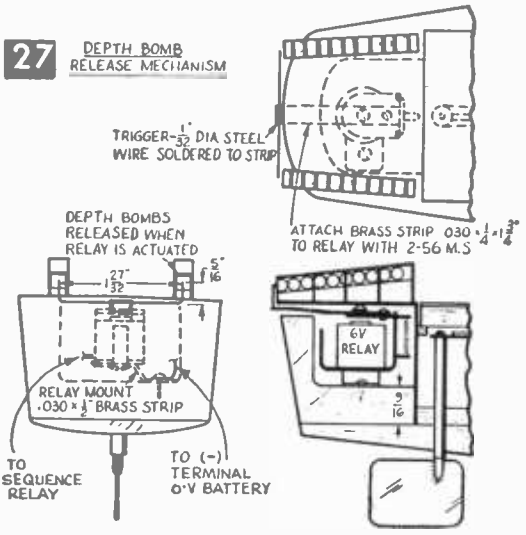
in the top of the case and then into the antenna socket below it. Put two 1½-volt batteries in the battery clip with the center terminal at the insulated contacts. Install a Burgess #P45 or an Eveready #477 "B" battery and connect it with the snap fasteners. Replace the cardboard battery filler and the transmitter case and cover. The transmitter is ready for use as soon as the filament switch is in the ON position.

With both the filament and operate switches ON, use a fiber or plastic tuning wand to turn the core in or out until the lamp is the brightest. *Never use a metal-tipped tool.*

After complete factory testing and tuning of your Citizen-Ship receiver, there is only a need to check it or slightly readjust the tuning slug. A change of over ½-turn in either direction should never be necessary. Tuning must be done with the cover of the receiver installed. For complete checking, insert a 0-50 *ma* milliammeter in the meter jack (Fig. 12) and turn on both switches. Idle current should be approximately 3-6 *ma* with the set on, although it may not be completely steady at this reading.

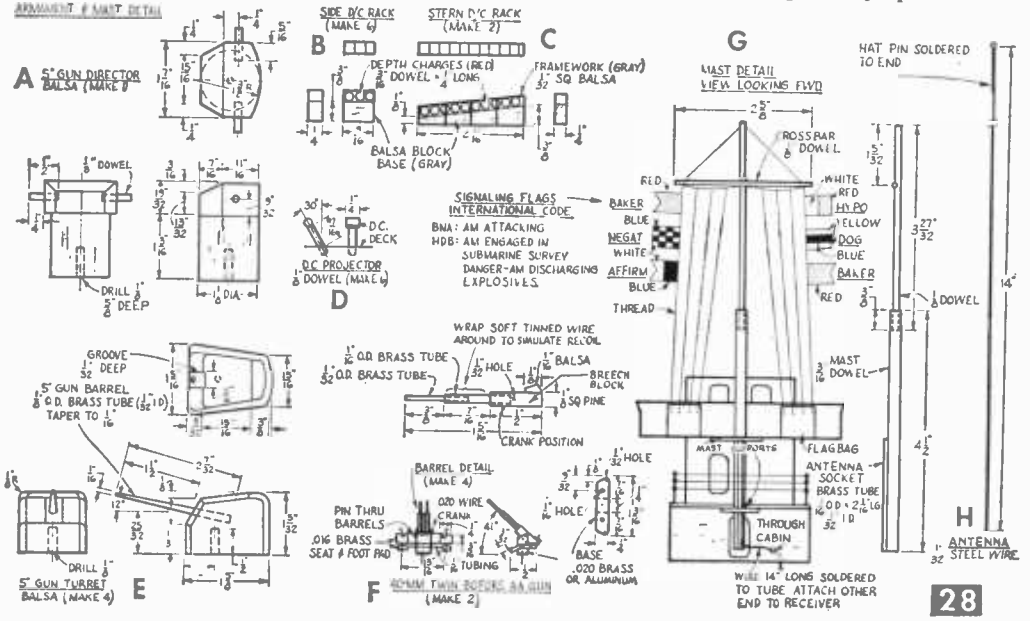
Now turn on the transmitter, push the operate switch and adjust the slug to get a rise to 10-18 *ma*. The Sigma relay should pull in and actuate the escapement. The greater the distance between transmitter and receiver while adjustments are being made, the more accurate the tuning will be.

Accurate tuning can also be accomplished by another method. Leave the transmitter switch off, but bring the antennas of the transmitter and receiver very close together. The relay should pull in. Then move the tuning slug back and forth slightly until the turned-off transmitter will operate the receiver at distances of 12-18 in. In normal use the receiver will pick up signals up to a mile away.



To operate your model, insert the antenna in the socket and be sure both the plug connectors are in place. Turn on both switches (Fig. 7) and then secure the main hatch with straight pins. Have a helper set the boat in the water and release it so it is in the clear until you can get it under control.

To control the direction of the craft, press the operate switch momentarily and release it. To set up the sequence switching that puts the Woodworth through its paces, hold the button down for 1½ seconds. The model will go through an eight-stage maneuver and then return to normal straightaway speed.



Neon Gas Tube Experiment Set

How to make a gas tube experiment set and perform intriguing experiments

By FORREST H. FRANTZ, SR.

1

NEON gas tubes are available in numerous sizes and shapes at widely varying prices. The less expensive neon tubes are very small in size and shape—somewhat like a flashlight bulb. They cost 10-25¢. These inexpensive tubes are the basis of many intriguing electronic circuits including voltage regulation, moving light beams, oscillation, switching and others. You can observe the operation of gas tubes and try a number of gas tube circuits with the apparatus described here.

The neon gas tube experiment set is inexpensive to build. Parts cost about $5. This set operates from a flashlight battery. Without additional equipment it is adequate for many experiments. This makes it a natural for parlor demonstrations. Since the equipment generates about 90 v. ac and dc it has other applications as a voltage supply. If you have a voltmeter or an oscilloscope, there are additional experiments which you can perform.

The equipment required for gas tube experiments is: 1) power supply, 2) neon tubes, 3) resistors and 4) capacitors. The experiment set is small enough to hold in one hand and contains the power supply, two neon tubes and two resistors. Other resistors and capacitors were not incorporated in the basic set because experiments may be conducted with greater ease with these other components off the board. The resistors and capacitors may take the form of decade boxes or they may be loose components.

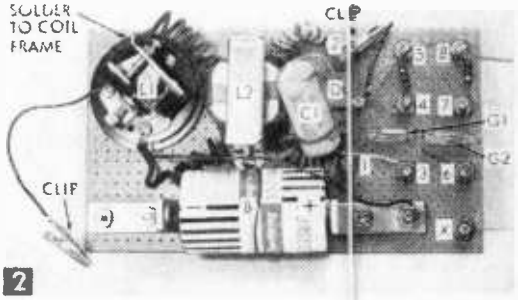
Figure 2 is a top view of the experiment set. The circuit is shown in Fig. 3. A buzzer (L1) is used as a chopper to convert the dc battery voltage to pulsating dc. This pulsating dc applied to step-up transformer L2 (a radio output transformer connected in reverse) provides a high ac voltage on the other side of the transformer. Rectifier D and filter capacitor C1 may be connected to the high voltage side of L2. The output of this combination is about 90 v. dc. Thus, either ac or dc is available from the supply. The available current is low, a desirable safety feature.

Resistors R1 and R2 and gas tubes G1 and G2 are mounted directly on the board. They are basic equipment. Connecting studs are provided with connection combinations that make experiments easy to conduct.

Use Figs. 2 and 3 for guidance in construction. All mounting holes are 5/32-in. dia. and they are centered on holes in the perforated mounting board. The mounting board is purchased cut to size. Back with a piece of wood to avoid breakage during drilling.

Mount the buzzer, transformer, rectifier, brackets and connection studs (Fig. 2). The top of the buzzer pulls off. The top may be discarded. The connection studs are 6-32 x ½-in. machine screws. A 6-32 screw with a lock washer under the head is placed through the lower hole on the bracket which serves as the negative battery terminal. The lock washer provides the necessary tension for good battery contact.

Next, wire the circuit. Note that one of the transformer leads must be soldered to the coil frame on the buzzer. A minigator clip serves as an on-off switch. Another minigator clip is provided at the rectifier input to allow quick connection to stud 2 when dc output is desired. The upper ends of R1 and R2 are left free to allow easy connection to terminals 2, 5 or 8. Use rosin core solder for soldered connections.



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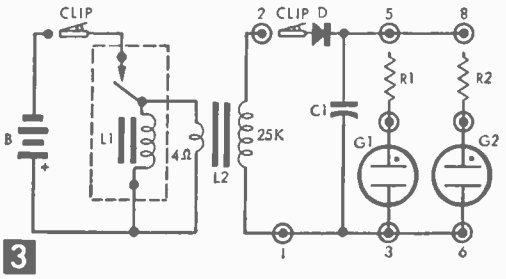


Insert the battery between the brackets. Fasten it with a loop of #18 bare copper or iron wire passing through holes in the base. Cement rubber grommets on the back of the board at the four corners to serve as feet: this will protect tables from scratches.

The buzzer contact and armature tension may have to be adjusted for optimum results. If you have a voltmeter, connect it to studs 3 (—) and 5 (+). The voltmeter range switch should be set to 150-250 v. If you don't have a voltmeter connect R2 to stud 5. In either case, connect the rectifier clip to stud 2 and the buzzer clip lead to the battery. If the voltage is about 100 v. (neon lamp glows) no adjustment is required. If not, loosen the lock nut on the buzzer contact screw and adjust the contact screw for increasing voltage (more brilliant glow); tighten the lock nut when this adjustment is completed. You may have to repeat this several times, since tightening the lock nut tends to disturb the contact adjustment. If this doesn't bring the voltage up, you may have to decrease tension on the armature slightly, and then readjust the contact screw.

The experiment set may be turned on by fastening the clip lead from the buzzer contact to the negative battery bracket stud.

Connections between elements and the power supply may be made by connecting bare wire between studs and by bridging external parts across studs. Short wire leads with minigator clips on each end may be made up for connection between studs. Frequently used components may be equipped with minigator clips.

Capacitors with values of about .001, .02, .05, .1 and .5 mfd, rated at 200 v. or more, are handy values for these experiments. A capacitor decade box is of course handier than loose capacitors.

Half-watt resistors (2 each) of 1, 2.2, 4.7 and 10 meg, and 1 each of 100K and 470K resistance are required for the experiments.

1. **Effect of type of current on electrode glow:** Connect R1 to stud 2. This applies ac to G1 (Fig. 4). Note that the glow is between the two electrodes of G1.

Now connect R2 to stud 8, the diode minigator clip to stud 2, and stud 6 to stud 3 (Fig. 5). This connects G2 to dc. Note that the glow surrounds one electrode of G2 only—the electrode connected to the negative voltage through R2.

Now disconnect R2 and the jumper from stud 3 to 6. Connect stud 6 to 8. Connect R2 to stud 3. Note that the glow surrounds the opposite electrode from that of the previous connection. You've reversed the polarity of the electrodes.

Conclusion: The glow discharge in the neon gas tube surrounds the negatively charged electrode. When ac is applied each electrode alternates from positive to negative periodically. Since the ac frequency is high, the alternation occurs so rapidly that the glow seems to surround both electrodes.

2. **Effect of current on brilliance:** Connect R1 to stud 2 (Fig. 4). Observe the light intensity of G1. Bridge a 2 meg resistor across R1. Note the intensity of G1. What happens? What is your conclusion?

3. **Flasher circuit:** Connect the rectifier clip to stud 2 and connect R1 to stud 5 (Fig. 6). Connect a .5 mfd capacitor between studs 3 and 4. A few seconds after turn-on, G1 will begin to flash approximately once per sec. Why does this take place?

4. **Start and sustaining voltage:** Connect R1 to stud 5 and rectifier clip to stud 2. Connect battery clip. Now connect a 10 meg resistor across studs 3 and 4. Although the glow of G1 diminishes, it will be sustained. Now disconnect the battery clip for about half a minute and then reconnect it. G1 will not glow, or if it does, it will glow sporadically.

Conclusion: Once the discharge is started, it will continue even if the voltage is reduced considerably. But a higher voltage is required to start the discharge than is required to sustain it.

If you didn't reach a conclusion for experiment 3, re-examine the evidence in light of this knowledge.

5. **Relaxation oscillator circuit:** Connect as for experiment 3. This is a relaxation oscillator circuit. If you connect a dc voltmeter set to the 500 v. range across R1, the oscillation will be apparent by periodic meter deflections. If you know the theory behind experiment 3, you understand how the relaxation oscillator works. If the principle is still not apparent, it will be discussed under subsequent experiments.

6. **Effect of C on relaxation frequency:** Connect as for experiment 3. Remove the .5 mfd capacitor. Replace it with a .02 mfd capacitor. Do you observe any difference in operation?

Conclusion: The capacitance C in a relaxation oscillator circuit has an effect on frequency of oscillation. If C is large, the frequency is low (long period) and as C decreases frequency increases (shorter period.)

7. **Effect of R on relaxation frequency:**

Connect the diode clip to stud 2. Connect a 10 meg resistor between studs 4 and 5. Connect a .5 mfd capacitor across studs 3 and 4. What has happened to the oscillator frequency? Now bridge a 1 meg registor across the 10 meg resistor, and observe the change in flashing rate.

Conclusion: The resistance R has an effect on relaxation oscillator frequency. Large R helps to set low frequency. As R decreases, frequency increases.

8. **Observation of relaxation oscillator waveforms:** An oscilloscope is required for this experiment. Connect rectifier clip to stud 2. Connect a 1 meg resistor to stud 4. Connect a 100K resistor in series with the 1 meg resistor. Connect the other end of the 100K resistor to stud 5. Bridge a .001 mfd capacitor across studs 3 and 4. Connect the oscillator leads across the 100K resistor (stud 5 common). The arrangement is shown in Fig. 7. The period of a single waveform with this arrangement is about 1/1000 sec. You'll observe a saw-tooth waveform on the oscilloscope.

9. **Explanation of the relaxation oscillator:** The neon tube requires a higher voltage to fire than it does to sustain a glow. When a capacitor is connected in series with a resistor, the capacitor voltage builds up as shown in the solid curve of Fig. 8. But at voltage level E1 (about 60 v. for the NE-2 neon tube), a gas tube connected across the capacitor will conduct (tube glows) till the capacitor is discharged to the lower extinction voltage of the gas tube. The cycle repeats and the dotted waveform of Fig. 8 is formed. This is the voltage waveform across the capacitor, but the circuit current waveform of experiment 8 has a similar shape.

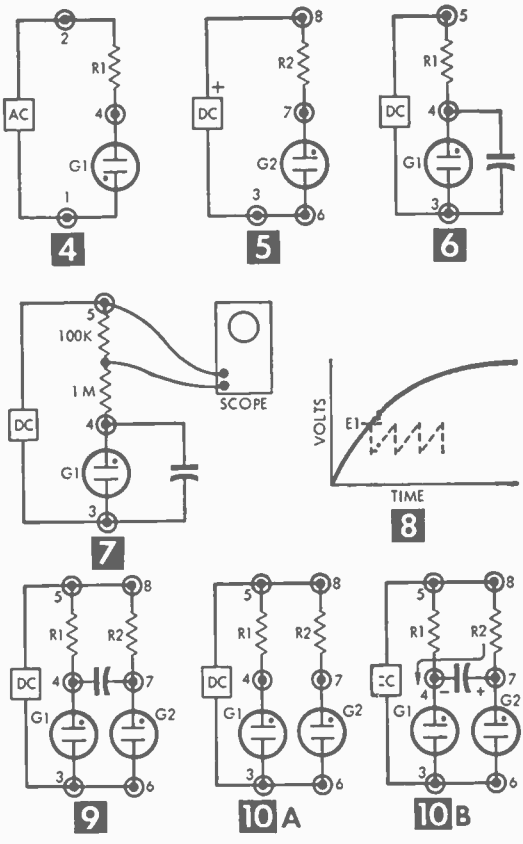
If the oscilloscope had been connected across the capacitor, the input impedance of the oscilloscope would have influenced the relaxation frequency. If you observed a small high-frequency component within the sawtooth waveform on the oscilloscope, it is due to the buzzer frequency. Filter C1 on the power supply filters out most of the hash, but it is inadequate to eliminate it completely.

10. **Dancing light:** Connect as shown in Fig. 9. The resistors are 10 meg resistors. The capacitor is .5 mfd. The gas tubes will flash alternately. How does it work?

11. **Effect of C on dancing light:** Change C to .05 mfd. The lights alternate more rapidly.

Conclusion: The rate at which the gas tube glows alternate is influenced by the capacitor. The gas tube glow alternation is faster when the capacitance is lower.

12. **Effect of simultaneous changes in R:** Use circuit and values of experiment 10. Time the glow on each tube. They're equal or nearly so. Now remove the 10 meg resistors and replace with 1 meg resistors. Time the glow for each tube again. What conclusion do you reach?

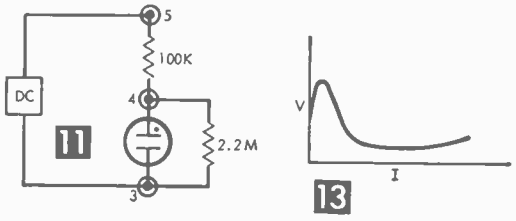


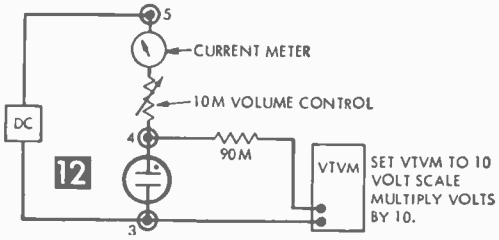
13. **Effect of different resistances:** Using the circuit of Fig. 9, let one of the resistors be 1 meg and the other 10 meg. Use a .5 mfd capacitor. You'll observe that one tube glows for a longer period than the other tube. The tube in series with the lowest resistance glows longest. How does the dancing light work?

14. **Explanation of the dancing light:** The ignition voltages for two gas tubes are not exactly the same, nor are the extinction voltages. Connect R1, R2, G1, and G2 as shown in Fig. 10a. Both lamps light. Now, connect a wire between 4 and 7: one of the lamps will be extinguished. When an uncharged capaci-

MATERIALS LIST—NEON GAS TUBE EXPERIMENT SET

Desig.	Description
R1, R2	470K ½ watt carbon resistors (10%)
C1	.5 mfd., 200 v. tubular capacitor (Sprague 2EP-P50)
L1	1.5 v. high frequency code practice buzzer (Lafayette MS-436)
L2	25K: 4 ohm output transformer (Stancor A3327)
D	65 ma. selenium rectifier (Federal 1002A)
G1, G2	NE-2 neon lamps (GE)
B	1.5 v. flashlight battery (Burgess #2)
	battery holder (Lafayette MS-175)
	3 1½ x 6¾ in. miniature perforated board (Lafayette MS-305)
	two 1½ x 1½ x ½-in. brackets (variety store hardware counter item)
	two minigator clips (Mueller 30)
Parts for this project may be obtained from:	Lafayette Radio, 100 Sixth Ave., New York 13, N. Y.

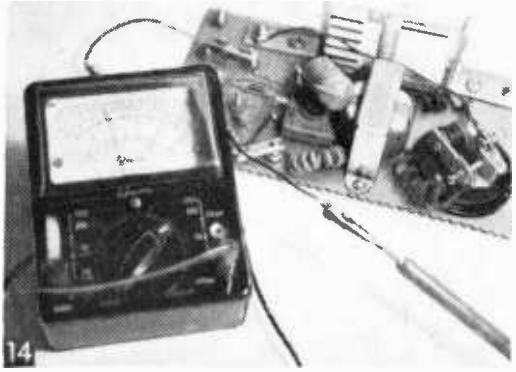




tor is connected across a circuit it looks like a piece of shorting wire at the first instant. Then as it accumulates charge, it draws less and less current for storage.

Now, assuming tube G1 stays lit when terminal 4 and 7 are connected together, it has the lowest extinction voltage. When it is conducting the capacitor in Fig. 10b charges as shown. The voltage across tube G2 increases as the capacitor charges. When the voltage across tube G2 reaches the tube's ignition voltage, tube G2 fires. This causes the capacitor to demand current through the resistor associated with tube G1, the voltage across tube G1 drops below the extinction level, and tube G1 is extinguished. The capacitor charges in the opposite direction till the ignition voltage of tube G1 is reached. Then tube G2 is extinguished. The cycle is repetitive.

15. **Voltage regulation experiment:** Connect as shown in Fig. 11. Note the brilliance of the neon bulb. Now bridge a 470K resistor across the 2200K resistor. Note that the brilliance of the neon tube diminishes. This is an indication that the resistor is carrying a portion of the current previously carried by the neon tube.



The experiment is more conclusive and more forceful if a voltmeter is connected across the gas tube. In this case, the 2200K resistor may be eliminated since the meter draws current and acts as a load. If you use a 20,000 ohms/volt meter, set it to the 50-v. range. This places a load of 1000K across the tube. If you have a 5,000 ohms/volt meter use a voltage range of 200 v. or more; if you have a 1,000 ohms/volt meter, use the 500-v. or a greater range.

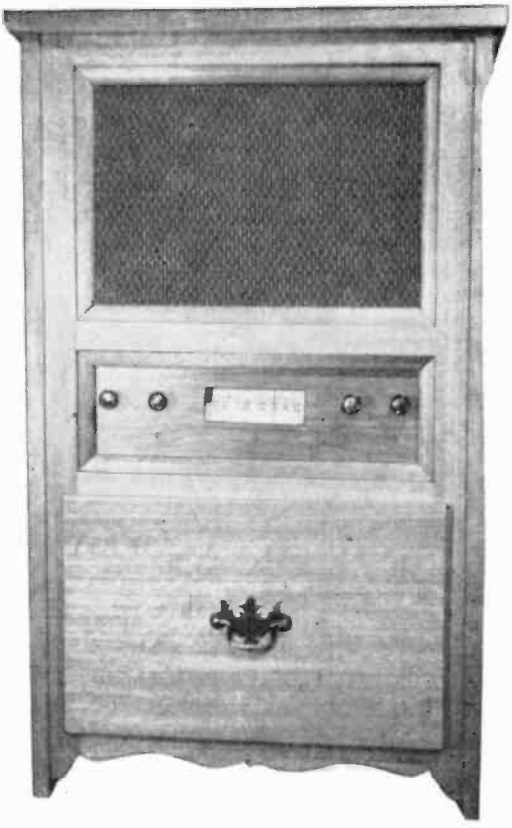
The voltage across the tube is about 50 v. When the 470K resistor is connected across it, the voltage will change by only a volt or two. Although the regulation capability of the NE-2 is limited, it nevertheless is adequate for some applications. The NE-2 is employed for voltage regulation of dc amplifiers in analog computers. Other tubes, especially designed for voltage regulation, such as OA3, OC3, OD3 tubes, have octal tube bases and are used in power supply regulation circuits.

16. **Explanation of gas tube voltage regulation:** The gas tube ignition and extinction voltages are different as noted previously. There's more to the story than this. The experimenter who has a vacuum tube voltmeter and a current meter may hook up the circuit of Fig. 12. Then, plotting current against as the voltage is varied, a curve similar to that of Fig. 13 will evolve. It is easy to see that voltage across the tube remains constant over a wide range of voltage.

You can perform many more experiments with this apparatus. The curious experimenter might care to exploit circuit arrangements employing more than two NE-2's. Applications of the timing characteristics to control problems is another interesting avenue for exploration.

Razor Shunts Iron Heat

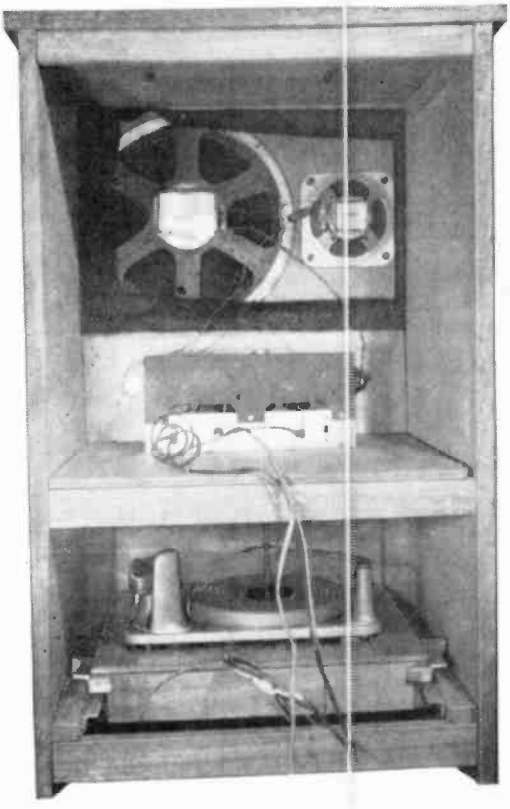
• That discarded razor can serve a useful purpose as a heat shunt when soldering radio parts leads. Clamp the razor over the lead and it will absorb the soldering heat that might otherwise damage or change the value of the radio part.



Front and rear views of the radio-phonograph combination.

Combination Radio-Phonograph

Build your own cabinet for this Heathkit receiver and record changer



By FRANK WOODS, JR.

THIS combination is made of a record changer, receiver kit and home-made cabinet. You may use the Heathkit BR-2 receiver or any other receiver. However, the use of a table model ac-dc radio will lower the quality.

Cabinet. Trim and sand the mounting board to 15¾ sq. in., and nail to base consisting of two 2¼ x 15¾-in. and two 2¼ x 14¼-in. pcs. of ¾-in. mahogany nailed together (Fig. 2). Provide 3/16-in. grooves ½ in. deep on the 15¾-in. pcs. Then nail and glue the mahogany plywood to the front of the assembled base. Finally, glue the larger piece of ¼-in. mahogany plywood on the front.

The uprights and upper cross members are mahogany. The details for the lower cross pieces are shown in Fig. 3. The width at the widest point is 1⅞ in. A ⅜ x ¼-in. recess is cut along the inner edges of the framing members to accommodate the plywood side panels. There's sufficient play to allow for joint thickness and small variations in dimensions. Use finishing nails to assemble the side frames. Set the nails and fill with mahogany plastic wood. Fasten the plywood panel to the frame with glue and small nails.

Next, construct the ¾-in. mahogany front frame (Fig. 4). Note the clipped lower inside corners of the uprights. The three straight cross members are 1¼ in. wide. The details and dimensions of the lower cross members are the same as for the side bottom cross members (Fig. 3). Nail together the front frame. Trim speaker opening and receiver panel opening with ¾-in. mahogany quarter-round.

The three cross members on the back (Fig. 5) are set ¼ in. from the rear edges of the side panels. Two ¾ x 1¼ x 18-in. strips join the lower cross member to the front frame. Glue and nail to the back cross members. The sides are joined to the front frame with coun-

ter-sunk wood screws and glue. The front frame is set 5/16 in. back from the front edges of the sides. The two fore-aft members are secured to the front frame with finishing nails driven from the front side.

Glue and fasten a 3/4 x 3/4-in. strip across the inside of the front of the cabinet. This strip provides level support for the radio receiver shelf.

Details of the receiver panel are shown in Fig. 6. Place receiver shelf in position but don't nail. Slip receiver panel into position in front of the receiver shelf. Now, place the receiver on the shelf and adjust the receiver panel till the dial window is properly aligned with the receiver dial, then tack panel in place and secure with wood screws. Remove receiver from cabinet. Push shelf against receiver panel and nail.

Next, drill four equally spaced screw holes in the 17-in. lengths of right angle stock and fasten to the wood front to back strips. These pieces of angle stock are the record changer drawer tracks.

To attach the plywood top, apply glue to the top edges of the cabinet frame, and adjust the cabinet frame for proper centering relative to the top. Then attach 1 x 1-in. right angle brackets between top and side.

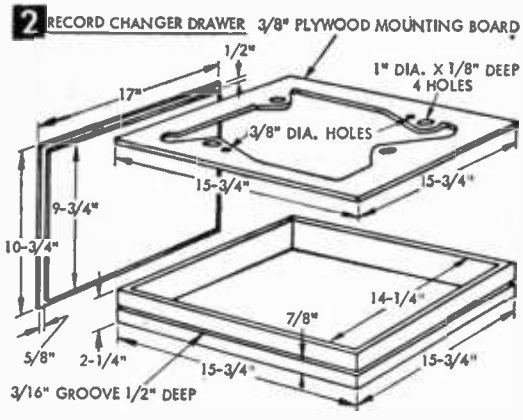
Set the cabinet back on its feet and glue and nail the top trim piece to the top of the cabinet. Finish with two coats of clear varnish. To obtain a smooth surface, rub the first coat with steel wool before applying the second coat.

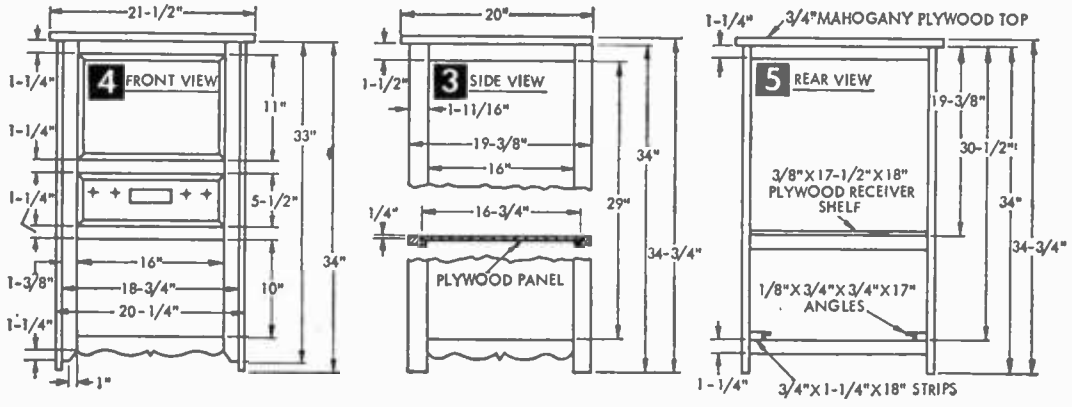
MATERIALS LIST—RADIO-PHONO COMBINATION

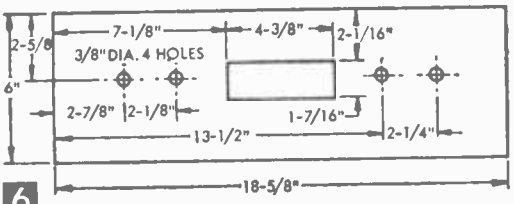
No. Reqd.	Description	Use
	Record Changer Drawer	
1	pre-cut record changer mounting board (Burstein Applebee 31C243)	
2	3/4 x 2 1/4 x 15 3/4" mahogany	base
2	3/4 x 2 1/4 x 14 1/4" mahogany	base
1	1/4 x 9 3/4 x 15 3/4" mahogany plywood	front
1	1/4 x 10 3/4 x 17" mahogany plywood	front
1	drawer pull	
	Cabinet Sides and Front	
4	3/4 x 1 11/16 x 34" mahogany	side uprights
2	3/4 x 1 3/8 x 33" mahogany	front uprights
3	3/4 x 1 1/4 x 16" mahogany	front cross members
2	3/4 x 1 1/2 x 16" mahogany	side upper cross members
3	3/4 x 1 7/8 x 16" mahogany	lower cross members
2	1/4 x 16 5/8 x 29 5/8 mahogany plywood	side panels
1	1/4 x 6 x 18 5/8 mahogany plywood	receiver panel
	Top and Interior of Cabinet	
1	3/4 x 20 x 21 1/2" mahogany plywood	top
1	3/4 x 1 1/4 x 19 3/4" mahogany	top trim piece
3	3/4 x 1 1/4 x 18 3/4" scrap	back cross members
2	3/4 x 1 1/4 x 18" scrap	fore-aft members
1	3/4 x 3/4 x 18" scrap	shelf support
1	3/8 x 17 1/2 x 18" plywood	receiver shelf
1	3/8 x 12 1/4 x 18 1/2" plywood	speaker board
2	3/4 x 3/4 x 17" aluminum or steel right angle stock	
1	15 x 21" grille cloth	
4	1 x 1" right angle brackets	
nails, Casco glue, screws, etc.		
	Electronic Components	
1	radio receiver kit (Heathkit BR-2)	
1	automatic record changer (Burstein-Applebee 32A296)	
1	12-in. PM loudspeaker (Lafayette SK-41)	
1	DPDT rotary switch (Lafayette SW-30)	
1	.05 mfd., 200 v. capacitor (Aerovox)	
1	.1 mfd., 600 v. capacitor (Sprague)	
1	2 mfd., 200 v. capacitor (Sprague)	
1	330K. 1/2 watt. 10% carbon resistor	
1	100 ohm potentiometer (Clarostat series 43)	
1	universal output transformer (Lafayette TR-12)	
4	knobs	
1	ac line cord and plug	
1	phono plug (Lafayette MS-373)	
	hook-up wire, shielded wire, solder, etc.	

Source addresses:

Burstein-Applebee Co., 1012-14 McGee St., Kansas City 6, Mo.
Heath Company, Benton Harbor 9, Mich.
Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.







6

Cut an 11-in. circle for the Heathkit speaker and a 5-in. circle for the small speaker in speaker board. Screw the speakers to the board (Fig. 9).

Next, fasten the grille cloth. Any material with a loose weave that suits your fancy will do. Stretch the cloth, turn the edges over the back of the speaker board and staple. Use carpet tacks if you don't have a stapler. Screw speaker board into the cabinet.

Changes to be made to receiver improve the audio quality and make front panel radio-phono switching possible (Fig. 7).

Remove the original output transformer and install the new universal output transformer. Connect the red primary lead to B+ (capacitor lug) and the brown lead to the plate of the 12V6. The blue lead is not used and should be cut off.

Connect the 330K resistor between output transformer secondary terminal #3 and the .05 mf, 200-v. capacitor. Connect the other end of the capacitor to the terminal strip on top of chassis behind volume control. Connect output transformer secondary terminal #5 to the chassis ground. This completes the negative feedback circuit.

Replace the .02 mf coupling capacitor connected between pin 7 of the 12AV6 and pin 5 of the 12V6 with a .1 mf, 600-v. capacitor.

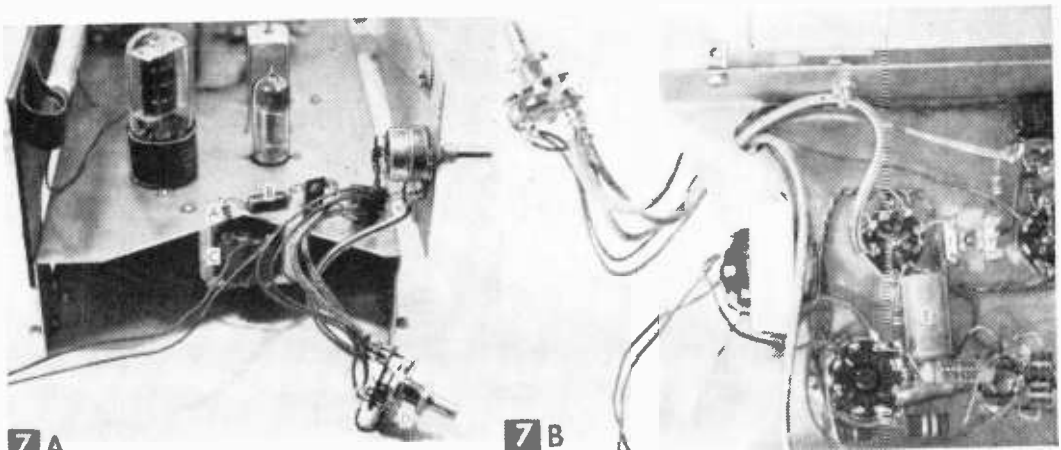
Remove the radio-phono slide switch on the rear of the chassis and replace it and the switch wires with the rotary switch and longer (10-in.) leads. Cut the shaft of the rotary switch to a length of ½ in. If you used "tuner wiring" for the receiver, change to "phono wiring." Ground the shields of the audio wires by tying them together at the switch with a piece of bare wire and then soldering. Connect the switch frame to the shields. Don't let the shields get too hot or you may melt the insulation and cause a short circuit.

Connect 15-in. lengths of insulated hook-up wire to terminals 3 and 5 of the output transformer. Cut the shaft on the 100-ohm pot to ½ in. and mount the pot (Fig. 1B). Place the chassis on the shelf and position it so that the control shafts protrude far enough for knobs. Center the tuning dial in the window. Drill mounting holes and bolt receiver to shelf.

Next, determine the loudspeaker phasing by connecting a 1.5-v. battery across the large speaker terminals with your finger resting lightly against the cone to determine the direction of motion. If the cone moves forward when the battery is connected, mark the speaker terminal connected to the + battery terminal with a + sign. If the cone moves backward when the battery is connected, mark the speaker terminal connected to the battery terminal connected to the — battery terminal with a + sign. Repeat this procedure for the small loudspeaker.

Connect the speaker terminals marked + together. Now connect the insulated leads from output transformer secondary terminals 3 and 5 to the terminals of the large speaker. Connect an insulated lead from one of the 100-ohm potentiometer terminals to the large speaker terminal which has only one lead connected to it. Connect the 2 mf, 200-v. capacitor to the unused terminal on the small speaker. Connect an insulated lead from the other end of the capacitor to the center terminal of the 100-ohm pot.

Plug the radio in and try it out. In the



7A 7B

Views of new parts and substitutions made in the Heathkit receiver. a) added 330K resistor; b) added .05 mf feedback capacitor; c) new output transformer; d) new radio-phono switch; e) new .1 mf coupling capacitor.

other radio-phono switch position you should obtain a loud hum when you insert a piece of bare wire held in your hand into the phono jack (with the volume control turned up). Also, the 100-ohm pot increases the high frequency output as you approach one of the extremes of rotation. The small speaker is brought into play for additional high frequency response.

Next, install the record changer. Connect 4 ft. of lamp cord to the power leads on the record changer. Solder and tape. The power leads are unshielded and relatively large. Connect a male plug to the other end of this cord.

Connect 4 ft. of shielded lead to the phono pick-up leads. The shield connects to the conductor that is connected to the record changer frame. The center conductor connects to the other pick-up lead. If the lead from the phono pick-up arm is shielded, the 4-ft. shielded lead would connect shield to shield and center conductor to center conductor. Connect a phono plug to the other end of the shielded 4-ft. lead.

Place the record changer in proper position on the record changer drawer and fasten the retaining screws through the two holes provided for them in the base. Don't tighten the record changer against the board. The record changer should float freely on its three "spring feet."

Slide the record changer drawer into the cabinet. Plug the ac cord into the outlet on the back of the receiver chassis and insert the phono plug into the phono jack on the rear of the chassis.

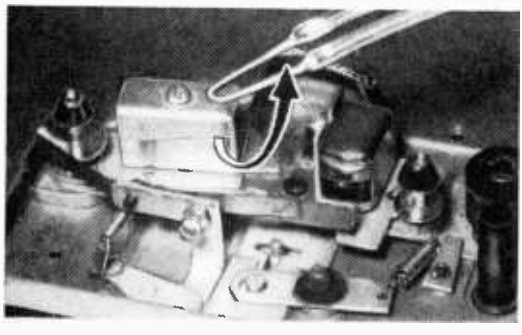
Figure 1B shows the completed installation from the back of the cabinet. Note that brackets which to prevent the drawer from being completely pulled out, a piece of thin bar stock with reverse right angle bends is attached at the back of the drawer.

Fold back and tape the leads on your record changer so they won't encounter unnecessary wear with the opening and closing of the record player drawer.

If you encounter a large amount of hum, check back to see if you might have missed grounding a shield or the radio-phono switch frame. Also see if you can't shorten the length of unshielded center conductor extending past the shields. Unshielded lead ends in high gain amplifiers are frequent causes of hum.

Soldering Gun Demagnetizes Tape Head

• Better tape recording quality will result if you demagnitize the playback head of your recorder with a few "magic" waves of your soldering gun. After a number of recordings have passed through a tape recorder, the playback head tends to take on magnetization and cause interference by erasing the very high-frequencies from recordings passing through the machine. The result is a steady

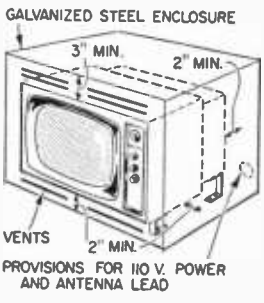


background hiss heard along with your program material.

To demagnetize your playback head, pass the tip of the soldering gun near the head with the trigger held on. Avoid fast movements, and slowly raise the tip upward and away from the head to insure complete demagnetization. Repeat the treatment whenever you clean your tape heads and before making quality recordings.—J. A. COMSTOCK.

Installing a Built-In TV

• If you plan to use a TV set in a wall installation (only sets with front controls and speaker need apply), provide adequate air circulation to guard against excessive heat and possible fire, warn General Electric engineers. Place receiver in a separate enclosure made of a galvanized steel similar to the standard terminal or junction box, or other fireproof material. Do *not* remove chassis from cabinet. Support the set with metal braces so there is a minimum of 2 in. air space between the TV cabinet and bottom and rear of enclosure, and 3 in. between enclosure and top of set. Add grille openings in front, top and bottom of enclosure. Have an electrician install the 110-v power supply within the enclosure, and provide for an antenna lead to be brought into the housing. Provide a means for removing the set for servicing.



Removing Enamel Wire Insulation

• To remove enamel insulation on magnet and hook-up wire quickly and cleanly, wrap a piece of sandpaper around the wire and give a twisting, rotary motion.—E. L. BURNER.

What to Listen for on Short Wave

Winter 1961—The Voices of Africa

By C. M. STANBURY II

ONCE the dark continent, Africa has exploded into the world's ranking hot spot. With the transformation of colony into nation have come freedom, violence, chaos—and DX. During the past two years, Africa has produced almost as many new short wave stations as governments. With the notable exceptions of Radio Brazzaville and Radio Leopoldville, none have English language service for North America. Fortunately, many do have English programs intended for listeners throughout Europe and Africa; with a little effort, the reader will be able to pick these up.

At opposite ends of the continent lie the Union of South Africa and the United Arab Republic. Their geographic separation is no greater than the gulf between them politically. While Radio Cairo is a leading spokesman for Arab nationalism, it also follows the communist line whenever possible. For example, on March 18, it praised Saudi Arabia's decision to delete the US airbase at Dhahran, listed Communist China's conditions for entering the UN and backed China's claim to Formosa.

Meanwhile, in Johannesburg, the government-owned South African Broadcasting Corporation serves as mouthpiece for Prime Minister Hendrik Frensch Verwoerd. When South Africa was forced to withdraw from the British Commonwealth because of its apartheid policy, SABC could be heard world wide with such statements as "We will stabilize our white fortress of racial purity": then it proceeded to blame the Commonwealth decision on Communist infiltration.

The English language portion of SABC's African service can be heard Tuesdays, Thursdays and Saturdays in North America at 1400 EST on 15300, 17855 and possibly 21525 kc. Radio Cairo has English for Europe from 1630 to 1730 on 11915 kc. Whenever a Communist-backed group commits some sort of atrocity (figuratively speaking or otherwise), SABC turns cart wheels. Radio Cairo uses the same propaganda method in reverse. The two really couldn't get along without each other.

Between the Devil and the Deep Blue Sea. The third major force, competing with fascism and communism, is nationalism. In the newly independent areas of Africa this always involves anti-colonialism. Measuring

QSL from Radio International. When Morrocco took over Tangier this station was put off the air.

HIERONYMUS BOSCH Circa 1500

Verification Card

Radio Tangier — Radio International

34, Goya Street
Tangier, International Zohe, Morocco

We acknowledge your listening report of Dec 2/63

RADIO INTERNATIONAL is a commercial radio station, broadcasting on medium waves (1232 kcs. 243.5 meters) and short waves (6110 kcs. 49 meters).

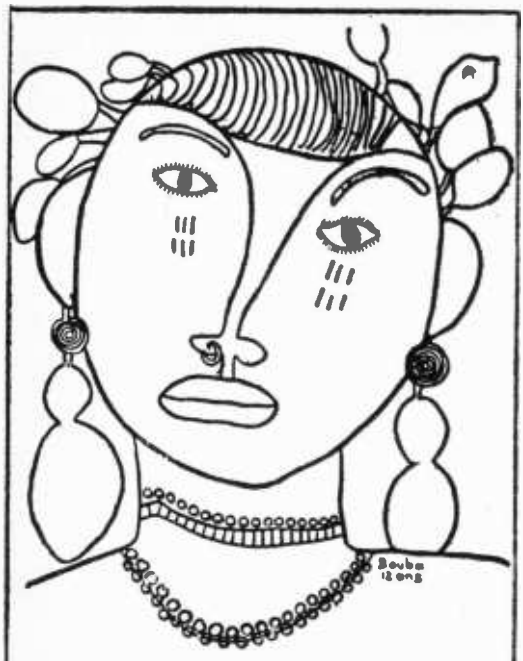
We broadcast from 7.00 hrs. to 8.15 hrs., from 12.00 hrs. to 16.00 hrs., and from 18.00 hrs. to 24.00 hrs. every day.

Programs in four languages: French, Spanish, Arabic and English.

Many thanks for your report.

RADIO TANGIER — RADIO INTERNATIONAL

Director.



Jeune fille peuhl

Dessin d'un élève de l'école de Pitoa — Cameroun septentrional — où sont appliquées les méthodes éducatives les plus modernes. Une place de choix y est réservée à la création artistique, dont voici un curieux exemple.

Artistic QSL from Radiodiffusion du Cameroun.

by coverage, Radio Ghana is number one spokesman for African independence. (The Moroccan Broadcasting System holds a similar position in the Arab world. From a station at Rabat, MBS transmits to Africa on 11735 kc, with English service between 1800 and 1845.) Over half of Radio Ghana's programs are in English, and eventually that station will probably have the most extensive international service in all of Africa. From a transmitter at Accra, the capital, it has experimented with broadcasts at 11800, and before that with 9640. When conditions are right, it isn't difficult for North American listeners to pick up Ghana's domestic frequencies 3366 and 4915 for a period starting at 0030 S/On, and then again prior to 1720 S/Off.

TABLE A—HIGH BAND DX FROM AFRICA

KC/S	STATION	TIME (EST)
17855	Paradys, South Africa	See Text
17705	Luanda, Angola	1600-1730
15300	Paradys, South Africa	See Text
15115	Dakar, Senegal	1230-1300 Tue & Fri
15120	ELWA Monrovia, Liberia	0915-1730
11970	Tunis, Tunisia	2330-0300, 1300-1800
11955	Addis Ababa, Ethiopia	1315-1345
11915	Cairo, Egypt	See Text
11895	Dakar, Senegal	0130-0300, 1315-1830
11885	Elizabethville, Katanga	See Text
11855	Omdurman, Sudan	2315-0030
11835	Algiers, Algeria	0045-0230, 1300-1715
11820	Abidjan, Ivory Coast	0130-0300, 1245-1830
11800	Accra, Ghana	See Text
11760	Lourenco Marques, Moz.	See Text
11755	Leopoldville, Rep. of Congo	See Text
11735	Rabat, Morocco	See Text
11725	Brazzaville, Congo Rep.	See Text
9668	Hargeisa, Somalia	0830-0930 (rare)
9640	Accra, Ghana	See Text
9570	Lusaka, Northern Rhodesia	0100-0230 (in English but rare)
7948	Bissau, Port. Guinea	1600-1800
7845	Bata, Spanish Guinea	1615-1700
7270	Libreville, Gabon	0000-0130
7075	Bamako, Mali	0130-0300

TABLE B—QSL HUNTER'S GUIDE

KC/S	STATION	S/On(EST)	S/Off(EST)
6240	Santa Isabela, Spanish Guinea	0130	Tue, Thur & Sat 1700
6195	Usumbura, Ruanda-Urundi	2330	
5050	Dar-Es-Salaam, Tanganyika	2215	
5047	Lome, Togo	0100	1700 (Sat 1800)
5035	Bangui, Central African R.	0030	Sat 1700
5020	Niamey, Niger	0030	Sat 1700
4990	Lagos, Nigeria	0008	1700 (Sat 1800)
4975 V	Yaounde, Cameroun	0030	1700
4934 & 4885	Nairobi, Kenya	2215	
4915	Accra, Ghana	See Text	
4910	Conakry, Guinea	0130	1700
4870	Cotonou, Dahomey	0030	Sat 1800
4855	Enugu, Nigeria	0000	1730
4815	Ougadougou, Upper Volta	0115	Sat 1700
3366	Accra, Ghana	See Text	
3316	Freetown, Sierra Leone	0145	
3305	Bengazi, Libya	0000	

V Frequency varies

Note: There are many other African stations on these bands. We have included only those transmitters known to have been heard in the US and not received regularly on the higher short wave channels.

The nightmare Republic of the Congo provides a unique short wave situation: all four of the stations previously described represent some world wide ism, but here we have two international broadcasters operated almost for the sole purpose of promoting factions within the republic itself. Radio Leopoldville, mouthpiece of the central government, transmits not only to Europe but also to North America—on 11755 kc. with English at 2130. Radio Katanga, speaking for Premier Tshombe at Elizabethville, broadcasts throughout the day on 11885 (give or take a couple kc), and features news in English at 1515. The Katanga presentation of news is slightly more polished than that of Radio Leopoldville, but the latter features fine Congo folk music and, because it broadcasts on into the evening hours (EST), puts a considerably better signal into the US.

Across the Congo River from Leopoldville is Brazzaville, location of the French Broadcasting Station in Africa. In a sense, this is a station under joint control—operated by the French government (Radio diffusion-

Television Francaise), but transmitting from the autonomous Congo Republic (not to be confused with the Republic of the Congo). The result is an almost unbiased reporting of the news, although you won't hear many kind words for Arab nationalism (especially in Algeria). Radio Brazzaville has English for North America beginning at 2015 every night, on 11725 kc.

We have now listed the best (from the viewpoint of reception) sources of news from Africa in the English language. You will note that all are government controlled. As a matter of fact, no private broadcasting stations are allowed to operate in these areas, with the possible exception of Katanga. When Tangier was an international city, it was a center for commercial and private broadcasting: since Morocco took it over, all of these stations have been put off the air. Today one must generally go to the Portuguese colonies for a commercial station operating above 7 MC. Radio Clube de Mozambique is widely heard on 11760 kc (CR7BF) after 2230 S/On; but, because CR7BF is a commercial station, it is not permitted to broadcast news. Another private station operates at Monrovia, Liberia, in the upper short wave spectrum—ELWA, best heard on 15120—but this is a religious venture and therefore does not have a news service.

DX, DX and More DX. For the QSL hunter Africa is a real strike, a great opportunity to boost your total of countries verified. In addition to those broadcasts already covered, there are a number of high band stations which, while not transmitting in English, can be logged and verified, such as Angola, Ivory Coast and Senegal. A complete list of these targets is contained in Table A.

More important, this is the time to grab those countries operating only on 60 and 90 meters. With the sunspot count dropping fast, reception around 5 MC will correspond with that on 7 MC a few years ago, except for static—QRN (atmospheric) does not vary with sunspots. However, in the winter static is seldom a problem, and we have listed the most widely heard African 60 and 90M transmitters in Table B. The best time to log them is either at S/On or just before S/Off (in the West it will always be the former).

"Just say 'Oogie Magoogie is going to analyze the news.'"

Under average conditions, audio quality of the transmitter is very readable with only slight distortion. As unit is held comfortably in the hand (left), thumb pressure converts it from receiver to transmitter by operating three momentary push button switches (above).

2-Meter Handi-Talkie For Short Distances

Single-Tube Amateur Station Fitting An Overcoat Pocket Has 2-Mile Range

By JOE A. ROLF, K5JOK

HERE'S a midget transceiver which is just the thing to have on ham outings, assist in antenna installation and adjustments, call home from your car, or carry out other short distance assignments. You can build it for less than $18.

Operating with less than a fifth of a watt output, this simple Handi-Talkie can often be heard more than two miles away, where terrain and obstructions in the path of communication are especially favorable. Under more average conditions, however, its maximum range will either approach the two-mile mark when used with a two-meter base station or be somewhat less when calling another ham with a similar Handi-Talkie.

The ultra-compact transceiver in Fig. 1 is self-contained in an aluminum box measuring but 2¼x2¼x5 in. Protruding slightly from this case (Fig. 2) are a surplus cartridge carbon mike, a 2,000-ohm earphone and a special push-to-talk switch you can make by ganging together three pushbutton units. The telescoping antenna should be extended exactly 38 in. for best range under most conditions.

You need only a technician class radio amateur's license to use this transceiver, but such operation is restricted to 145-147 mc. General amateur licensees have more leeway, but since the range of the set is about 142 to 150 mc, care must be taken not to operate it outside of the two-meter amateur band. *The unit cannot be modified or crystal controlled for novice or class C citizen band operation.*

One Sub-miniature Triode is employed for both transmitting and receiving. This lone tube in the circuit (Fig. 3) functions as a super-regenerative detector when the ganged switches are in the normal "R" position, but it operates as a grid-modulated Colpitts oscillator when these switches are depressed and thrown to position "T".

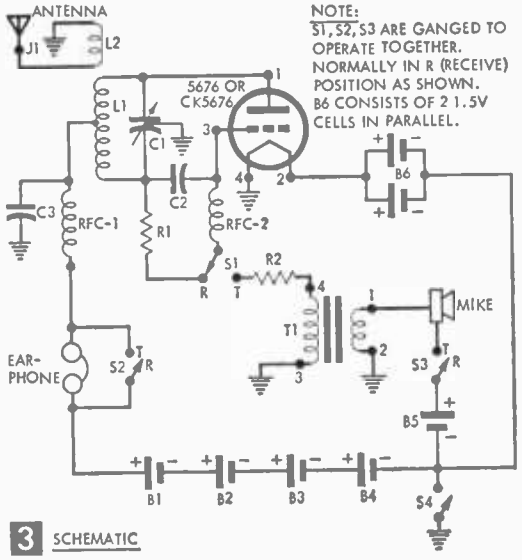
Four 30-volt hearing aid batteries in series —B1, B2, B3, and B4—supply the B-plus voltage. If you want to lower the cost somewhat and don't mind the resulting reduced range, three of these batteries will do the job at 90 volts B-plus. A 9-volt mercury battery, B5, supplies the carbon mike voltage, while two 1½-volt cells B6, connected in parallel provide filament voltage.

Begin Construction by drilling the front, side and top of the cabinet, such as a #108 LMB aluminum box, to dimensions shown in Fig. 4. Cut a 2¼-in. square out of ¼-in. plywood or hardboard, then drill and shape it (Fig. 4A) as a mounting block for a single-button carbon mike such as a surplus T-26 cartridge or equivalent. Insert mike in the center hole of the block and glue in place. When glue is dry, fasten the mike block to the cabinet front with screws.

Secure the earphone to the cabinet above the mike, using screws which either pass through or tap into the earphone case. Drill the holes carefully to avoid breaking the case or damaging its interior. Now you can mount the "on-off" slide switch in the cabinet slot between the earphone and microphone.

Make up the push-to-talk switch by installing three SPDT momentary pushbutton switches (S1, S2, and S3) on the side of the LMB box (Fig. 4). You can fashion a neat metal cap from sheet metal as in Fig. 4B and solder it to the ends of the switch arms. Directly above the cap, install the small tuning capacitor, C1.

A strip of 1/16-in. aluminum sheet serves as a chassis mounting for the antenna jack, transformer, and tube socket. Cut, drill, and

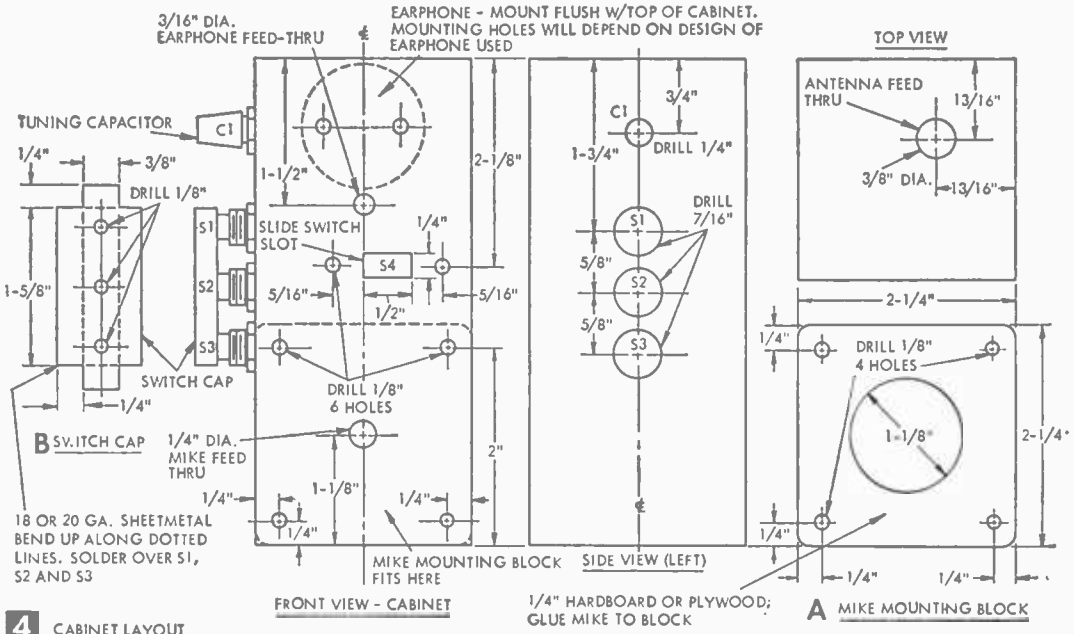


3 SCHEMATIC

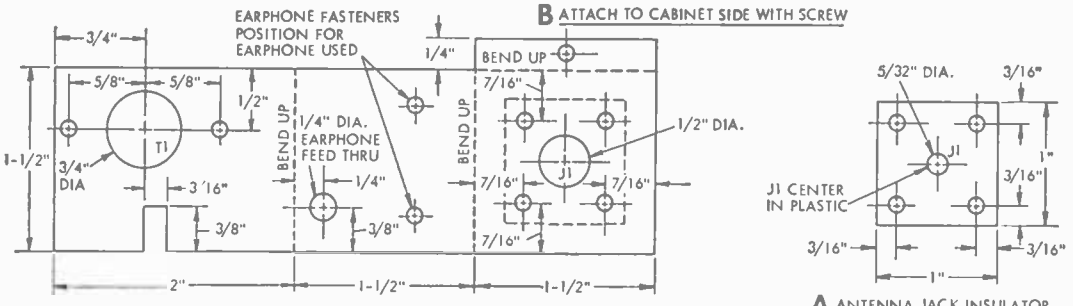
bend the strip to the shape of a U-shaped bracket as in Fig. 5. Before attaching this to the box, slip a sub-miniature, 4-pin socket into the notch cut into the side of the bracket and secure it in place with a bead of cement, such as *Duco*, on top and bottom sides. Install a midget carbon mike transformer, T1, on the bracket next to the socket.

Next, cut and shape a 1-in. square out of ⅛-in. thick plastic as in Fig. 5A to act as an insulator for the antenna jack. After mounting the jack, fasten the plastic piece to the bracket with screws (Fig. 7).

Short and Rigid Wiring is important if



4 CABINET LAYOUT



you want to be sure of maximum stability. After wiring the tube pin connections as in Figs. 3 and 6A and the transformer as in Fig. 3, you are ready to attach this bracket to the upper part of the metal cabinet with the headphone mounting screws and a single screw extending through the side of the cabinet (Fig. 5B). This leaves the lower third of the case free for battery storage, as in Fig. 7.

With the bracket in place, resume wiring according to the schematic, first to the push-to-talk switch, then the tuning capacitor and batteries, leaving the coils until last. Tape the three B5 and B6 batteries together and solder their respective leads in place. After covering the exposed terminals with tape, these batteries should make a snug fit in the bottom of the cabinet behind the microphone.

Arrange the four B-plus batteries similarly, so that when properly connected and taped together, they will fit snugly in the remaining cabinet space. If you prefer to use battery connectors instead of soldering the wires, be sure to specify connectors when purchasing the batteries.

Installing the Coils. Cut a five-turn piece of #3003 B&W *Miniductor* for the L1 coil (Fig. 3), then on either side of the mid-point, bend one turn inward. This will allow room to connect the coil's center tap without damage to the wire. Next, unwind a quarter turn from each end of the coil and solder to the stator posts of the tuning capacitor. Be sure that this coil is vibration-free and placed as close to the capacitor as possible. Connect an r.f. choke (Ohmite X144) to the center tap position (Fig. 3).

Cut a three-turn length of *Miniductor* for L2. Unwind a quarter turn from one end of this coil and three-quarters of a turn from the other. Solder securely in place with the long lead going to the antenna jack and the short lead to a ground lug mounted on the U bracket.

With coils mounted and all wiring completed as in Fig. 3, put a CK5676 or 5676 tube in the socket, making sure you have inserted it correctly, then move the slide switch to "On." (For a simple method to avoid installing the tube backwards, put a dab of nail polish on the socket to identify the end at pin 1.)

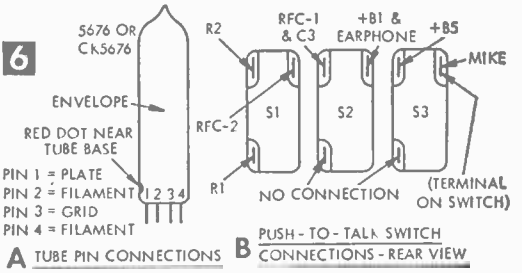
Tuning Adjustments. You'll get a rushing sound in the earphone when you turn on your Handi-Talkie at the slide switch. This indicates the detector is regenerating and functioning properly. If nothing is heard,

MATERIALS LIST—HANDI-TALKIE

No. Req.	Designation and Description
1	Telescoping antenna (Lafayette Radio #F-343 or #F-440) with jack (J1)*
4	B1, B2, B3, B4—30 v. hearing aid batteries (Burgess Y-20 or Eveready 506)
1	B5—9 v. mercury energizer (Eveready E-177 or equivalent)
2	B6—1.5 v. energizer (Eveready 1015, E91 or equivalent)
1	C1—1.7 to 3.3 mmf sub-midget butterfly capacitor (Johnson 3MB11 or equivalent)
1	C2—35 mmf capacitor, mica or ceramic
1	C3—.001 mf. capacitor, disc or midget tubular (150 WV)
1	2000-ohm impedance earphone
5	L1—turns of #3003 B&W Miniductor, tapped at 2½ turns
3	L2—turns of #3003 B&W Miniductor
1	Single button carbon mike (Surplus T-26 cartridge or equivalent)
1	R1—3.9 megohm resistor, ½ watt
1	R2—6.8 K ohms resistor, ½ watt
2	RFC1, RFC2— r.f. chokes (Ohmite Z144)
3	S1, S2, S3—SPDT momentary pushbutton switches (Herman H. Smith 556, Birnbach H & H #6234 or equivalent)
1	S4—SPST slide switch
1	T1—100-ohm primary, 125K-ohm secondary carbon mike transformer, midget type (Argonne AR-146, Stancor TA-55 or equivalent)
1	CK5676 or 5676 sub-miniature triode †
1	4-pin sub-miniature tube socket for above
1	2¼ x 2¼ x 5" #108 LMB aluminum box, natural finish
Misc.	scrap pieces of ¼" masonite or plywood, 18- or 20-gage sheet metal, 1/16 x 1¾ x 5" aluminum sheet, ⅛ x 1 x 1 plastic, hook-up wire, electrical tape, solder, ⅜-in. rubber grommet, screws and nuts, glue, cement.

* Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

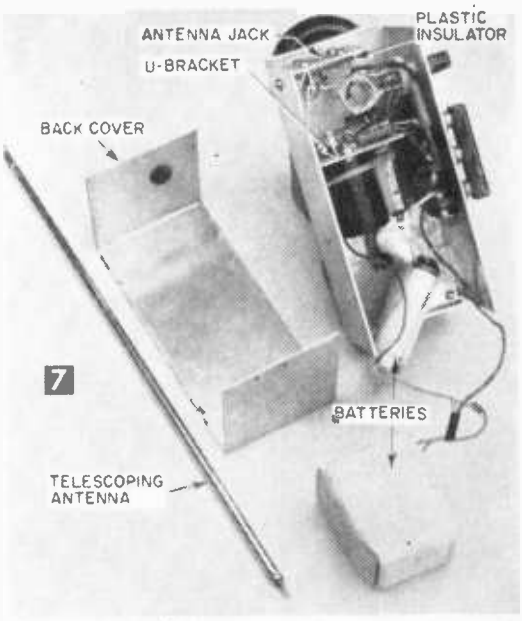
† CK5676 available through larger wholesale parts houses for about $3. The 5676 is available on surplus market for about $1.50. Surplus tubes with 90-day guarantee can be ordered from Bill Selp Co., Box 178, Ellenton, Florida.



check for wiring mistakes. With the cover of the LMB box off, insert a telescoping antenna into the jack and extend it to exactly 38 inches in length. Now move the L2 coil closer to, or farther away from, L1 until the detector will barely regenerate across the entire range of the tuning capacitor. The transceiver should tune from about 142 to 150 mc. Use a grid-dip meter to check this range.

With the detector working properly, set the tuning capacitor at mid-capacity, press the push-to-talk switch, and listen for the transceiver's signal with a two-meter receiver. When the carrier has been tuned in, talk into the mike to check modulation. The audio quality will not be as clear as that of most transmitters, particularly at close range, since there is a degree of frequency modulation present in addition to amplitude modulation. It should be perfectly readable, however, with only slight distortion.

Remove the antenna so that you can attach the back cover to the cabinet. Before reinstalling the antenna in the jack by passing it through a hole in the cover, line the hole with a rubber grommet to insulate the antenna from the cabinet and reduce stress on the jack.



Removal of back cover reveals how neatly the components fit in upper two-thirds of cabinet, leaving just enough room for batteries taped in two packs.

Operating Tips. When using the Handi-Talkie, extend the antenna to either 19 or 38 in.—a quarter or half wave length. You'll get most range at 38 in., but when you operate the transceiver in the immediate vicinity of the base station, the detector may block and be unable to catch the signal. This is usually remedied by shortening the antenna to 19 in. and, in severe cases, by moving coil L2 slightly away from L1.

If desired, you can calibrate the unit (in transmit position) with an accurate two-meter receiver. However, we have found the best insurance against accidentally operating outside the band is to zero-beat the tranceiver's signal with the base station's transmitter before any outside operation is attempted. This makes tuning adjustments in the field unnecessary.

Similarly, two Handi-Talkies working together can be zeroed well within the amateur band with the aid of a two-meter receiver. Either way, this method poses no serious disadvantages since these transceivers are intended solely for short distance communication.

Paper Clamp Cable Holder

• When you're out of regular cable clamps, a common paper spring clip will serve as a handy substitute. Just mount the paper clip with a screw and slip the cable into the jaws. The small size paper clips will accept up to 5/16-in. cable.—J. A. COMSTOCK.

Stand-Off Insulators from Screw Eyes

• Rubber grommets pressed into the eyes of screw eyes make handy screw-in stand-off insulators for wires in radio and electrical work. Make up a collection of variously sized insulators.—A. TRAUFFER.

Nail Clipper Strips Wire

• A nail clipper makes an excellent tool for radio and TV hobbyists, to use for removing insulation from small-gage wiring. First,

however, remove the pressure-handle to avoid exerting too much force and cutting right through the wire.—R. J. DECRISTOFORO.

AC Transistor Radio

There's no waiting for tube warm-up and no battery problems with this transistor radio that works on 117 v ac

By FORREST H. FRANTZ, SR.

THIS radio will fill the bill if you're looking for an ac operated set that requires very little power and turns on without warm-up time. It is constructed on a miniature perforated board which slips neatly into a commercial loudspeaker baffle case. Tuning capacitor, power transformer, volume control and loudspeaker mount on the case. The baffle case forms an attractive cabinet for use on a desk, in a bedroom, in the kitchen or at almost any other place in your home.

This set is a good performer with plenty of sensitivity and volume on locals without an external antenna. With an external antenna range is extended. The circuit is straightforward. There's no regeneration, reflexing or other circuit trickery to soup up the sensitivity. A high-Q antenna coil and relatively high beta transistors are employed to enhance sensitivity.

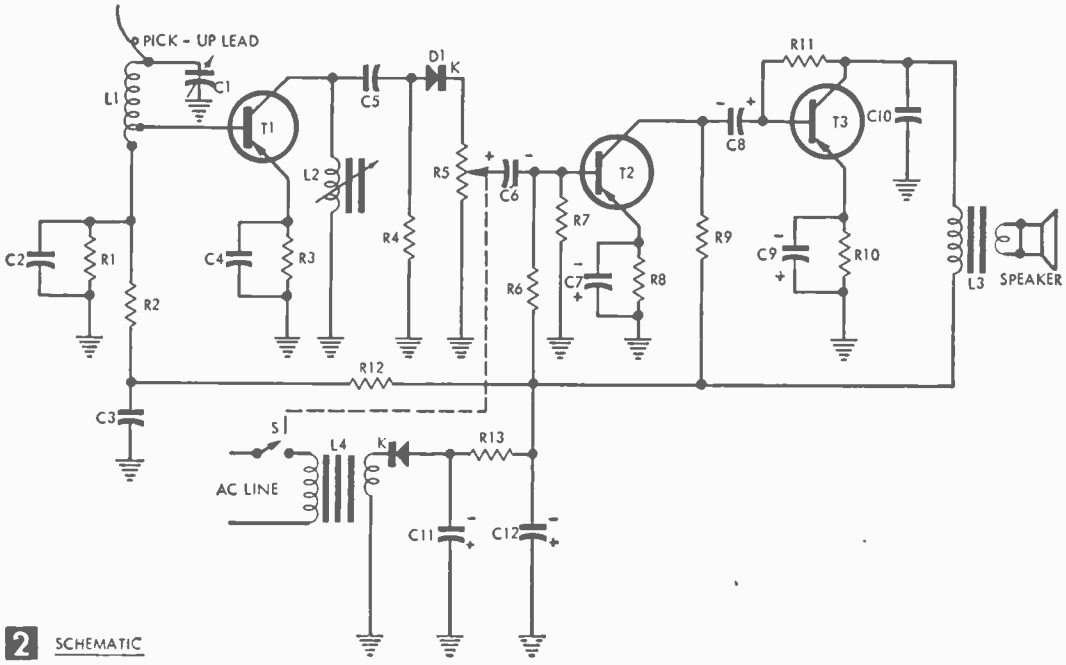
Good fidelity results from use of a good-sized output transformer and 6-in. loudspeaker.

Figures 3 and 4 may be used for guidance in carefully drilling the circuit board. Needed are two ⅛-in. dia. holes for mounting the output transformer, two 1/16-in. holes for the antenna loop coil, a ⅛-in. hole to mount the circuit board in the cabinet and a ¼-in. hole for L2. Count perforations on the circuit board to determine hole positions.

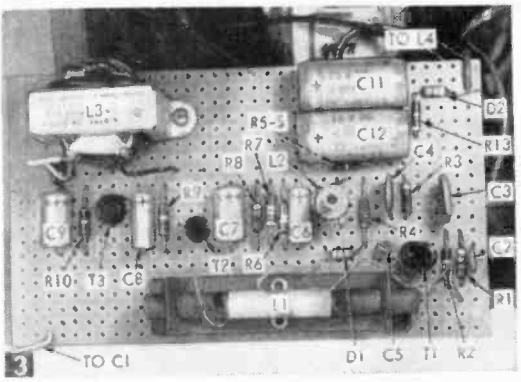
1 Built in a neat speaker enclosure, this radio makes a good second set.

Next, mount the parts on top of the circuit board, following Fig. 3. Mount in order L3, L1, capacitors, resistors, diodes, transistors and L2. Observe capacitor and diode polarities.

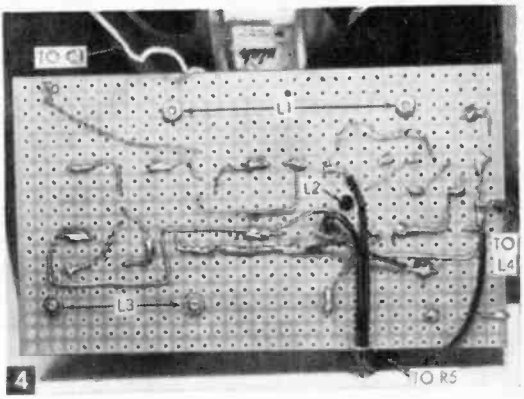
Next, wire and solder the circuit board following Figs. 2, 3 and 4. Connections are made



2 SCHEMATIC



View of the finished board shows parts layout.



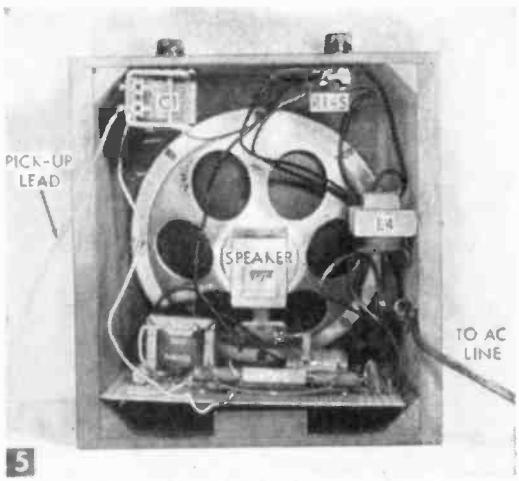
Underside of the circuit board.

by bending component pigtails over and making connections directly to other parts as required. Very little extra wire is required. Note that the common ground leads and the negative supply lead loop from bottom-to-top-to-bottom of the circuit board.

In connecting the antenna coil leads, do not allow the litz wire strands to unravel.

Next, position speaker in cabinet and locate and drill its mounting holes. Also, drill two ⅛-in. dia. holes for mounting the power transformer. Use Figs. 5 and 6 as a guide for positioning these parts. The rear transformer hole is ⅜ in. from the back of the cabinet and 3¾ in. from the top.

The volume control requires a ¼-in. hole with the center ¾ in. from the back cabinet edge and 2¼ in. from the side edge. Drill a ⅜-in. hole with center ¾ in. from the back and 2¼ in. from the side edge of the cabinet for the tuning capacitor shaft, and drill and countersink the two ⅛-in. capacitor mounting holes. Next, put volume control shaft in vise and hacksaw to ⅜ in. Also, cut the tuning capacitor shaft to ¾ in.



View of the finished job shows details of parts mounting.

Mount the cabinet parts and wire. Plug the cord into an outlet. A short pick-up lead will increase sensitivity. Use of an outside antenna connected through a 25 mmf capacitor will increase pick-up further.

If you encounter trouble, touch the center terminal of the volume control with the set turned on and the volume control full-up. If you don't get a 60-cycle hum, the trouble is in the audio portion of the set (circuits associated with T2 and T3) or in the power supply. Measure the dc power supply voltage.

MATERIALS LIST—AC TRANSISTOR RADIO

Desig.	Description
R10	270 ohm ½ w carbon resistor, 10%
R13	470 ohm ½ w carbon resistor, 10%
R3, R8	1K ½ w carbon resistor, 10%
R12	2.2K ½ w carbon resistor, 10%
R9	6.8K ½ w carbon resistor, 10%
R2, R4	10K ½ w carbon resistor, 10%
R7, R11	47K ½ w carbon resistor, 10%
R1	68K ½ w carbon resistor, 10%
R6	220K ½ w carbon resistor, 10%
R5-S	10K miniature volume control with switch (Lafayette VC-28)
C1	365 mmf. variable tuning capacitor (Lafayette MS-214
C5	100 mmf., 1000 v. ceramic capacitor (Sprague 5GA-T1)
C2, C10	.01 mfd., 50 v. ceramic capacitor (Sprague TG-S10)
C4	.05 mfd., 50 v. ceramic capacitor (Sprague TG-S50)
C3	.1 mfd., 50 v. ceramic capacitor (Sprague TG-P10)
C6, C8	10 mfd., 6 v. electrolytic capacitor (Sprague Littlylytic TE-1091)
C7, C9	100 mfd., 6 v. electrolytic capacitor (Sprague Littlylytic TE-1102)
C11, C12	160 mfd., 15 v. miniature electrolytic capacitor (Lafayette CF-127)
L1	miniature ferrite antenna loop coil (Miller 2001)
L2	320-500 microhenry miniature adjustable choke (Miller 4566)
L3	500 to 3.2 ohms output transformer (Stancor A-8101)
L4	6.3 v. filament transformer (Lafayette TR-11)
D1, D2	germanium diode (Raytheon 1N60)
T1	2N168A npn transistor (GE)
T2	2N508 pnp transistor (GE)
T3	2N241A pnp transistor (GE)
SPKR	6-in. 3.2 ohm PM loudspeaker (Lafayette SK-27)
	3 11/16 x 6¾-in. miniature perforated board (Lafayette MS305)
	miniature knob (Lafayette MS-185)
	small pointer knob (Lafayette KN-19)
	loud speaker baffle case (Lafayette SB-10)
	ac line cord and plug

Parts for this project available from
Lafayette Radio
100 Sixth Avenue
New York 13, New York

It should be somewhere over 7.5 v.

When all is well, mount the circuit board in the cabinet. Only one retaining screw is required. Tune to a station between 800 and 950 kc and adjust the L2 slug for maximum signal output with an insulated screwdriver.

Make a dial scale by fastening a piece cut from a file card to the top of the cabinet, tuning to local stations, and then making calibration marks. Remove and ink.

The received radio frequency signal is amplified by an r.f. amplifier (T1). This signal is converted into an audio frequency voltage in the diode detector stage. The audio voltage is subsequently amplified in the two audio stages (T2 and T3) and converted to acoustic energy at the loudspeaker. The power supply furnishes operating energy to all stages except the detector.

Note that T1 in npn and T2 and T3 are pnp transistors. The power supply wiring arrangement takes this difference into account.

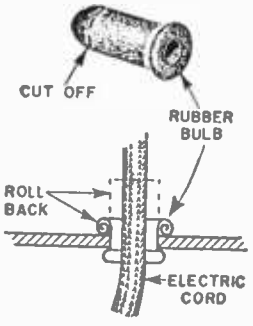
Another point of interest is the use of an inductive load (L2) in the collector circuit of T1. L2 has a large impedance at radio frequency but has a low dc resistance.

A small amount of feedback is provided from the collector to the base of T3 via resistor R11. This resistor also furnishes base bias. This feedback connection also stabilizes the dc operating point of the stage with temperature.

The output transformer (L3) is actually a line to voice coil transformer. Since the dc current in the primary winding is quite low, this kind of use is permissible. Note that the transformer is considerably larger than the miniature output transformer usually found in transistor radios. More transformer iron generally means better fidelity.

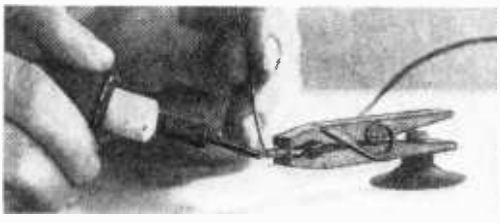
Improvised Rubber Grommets

• A rubber medicine-dropper bulb makes a handy rubber grommet for use where an electric cord passes through a metal radio chassis. Cut off the tip, insert the bulb through the hole in the chassis, and roll back the projecting end as shown in order to provide a flange for holding the grommet securely in place.—JOHN A. COMSTOCK.



The Radioman's Third Hand

• The soldering of small parts such as eyelets, terminals and lugs is simpler and speedier with this small vise. Simply attach a suction cup to



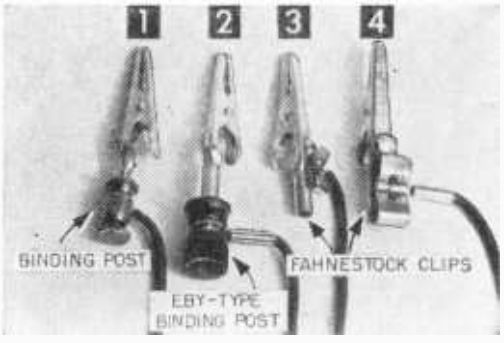
a wooden clip-type clothespin, and fasten to any smooth surface.—L. J. DOWNES.

Separate Loop Antennas

• When using a separate loop antenna with a portable receiver in a steel-frame building, place the loop near a corner of a window, not at the center. Try different loop positions with the set tuned to a weak station. The center of a steel-framed window is usually a signal dead-spot.

Improved Alligator Clips

• Here are four simple additions which can be made to alligator clips to permit quick wire or phone-tip connections to the clips (see photo below):



(1) Ream out the bottom opening in an old-fashioned nickel-plated binding post, squeeze the sleeve of the clip to a smaller diameter with a pair of pliers, and drive the sleeve into the bottom of the post. Apply a little solder around the bottom of the post to hold the two parts together securely.

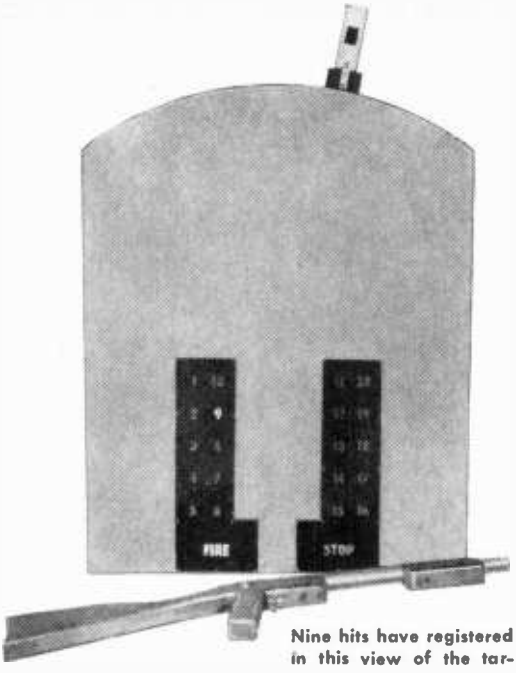
(2) To use an Eby-type binding post, squeeze the sleeve on the clip to a smaller diameter and twist the threaded stud on the bottom of the post into the sleeve of the clip. Solder.

(3) Fasten a small Fahnestock clip under the head of the screw on the alligator clip or solder the flat part of the Fahnestock clip onto the alligator clip. (4) A larger Fahnestock clip can also be used.—ARTHUR TRAUFFER.

Holder for Small Tools

• A mechanical pencil holder of the type using large leads which are clamped in place by a chuck arrangement on the pencil can become a useful tool.—HARRY F. LEEPER.

Fun With Bullets of Light



Nine hits have registered in this view of the target unit.

Safe, quiet fun for the whole family

By W. F. GEPHART

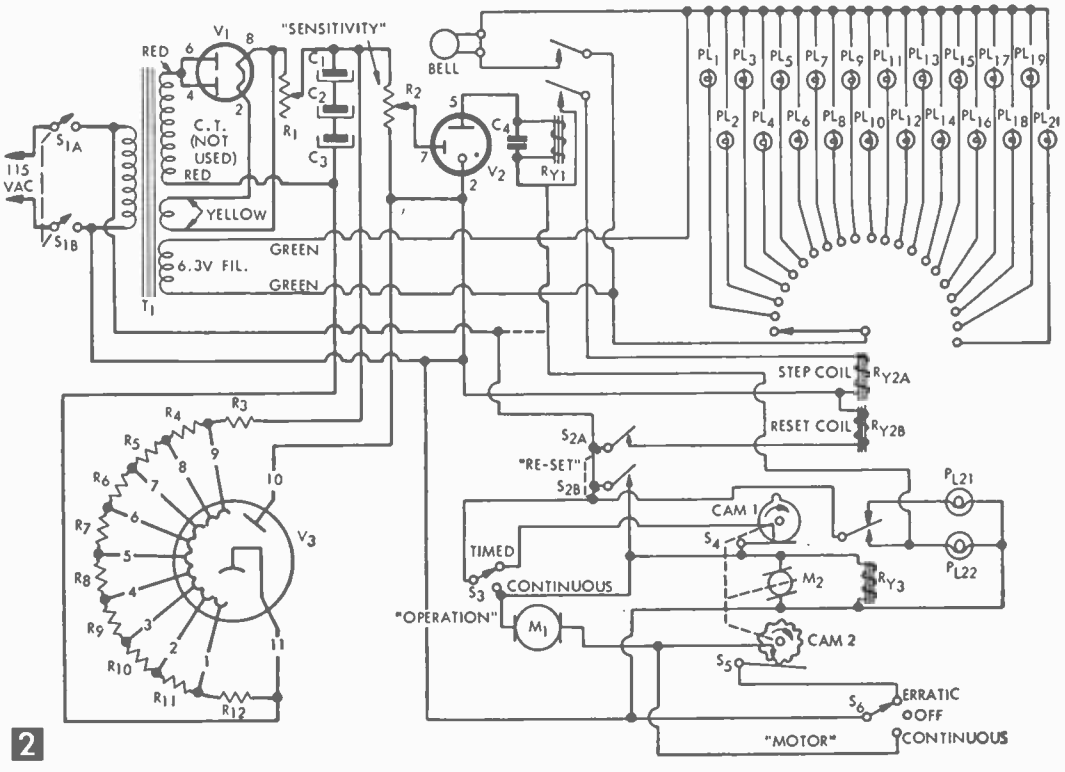
MOST everyone likes to test their marksmanship, although the noise and danger of shooting bothers some. This target shooting device is designed to be used indoors, and is safe and silent. Since the "bullets" are flashes of light, no one can be hurt.

The target assembly shown in Fig. 1 is a deluxe version, with a number of features. Some of these can be eliminated if cost and complexity are factors. These optional features include:

a. A target that swings continuously, or is motionless, or swings and stops erratically.

b. A choice of continuous operation, or a timed cycle where the unit stops registering hits after one minute.

c. A series of illuminated numbers that register hits.



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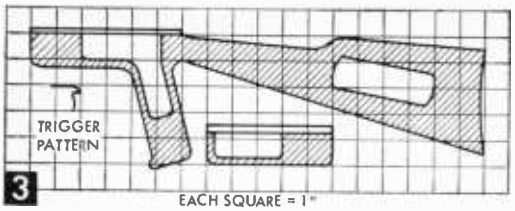

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With these features, the game can be played with increasing handicaps as the shooter's skill increases. He starts with a motionless target and continuous operation. As he improves, the timing circuit is used, limiting the time he has to make twenty hits. Then the target can be made to swing in regular cycles, and when that is mastered, the target can be made to move in an erratic start-stop pattern.

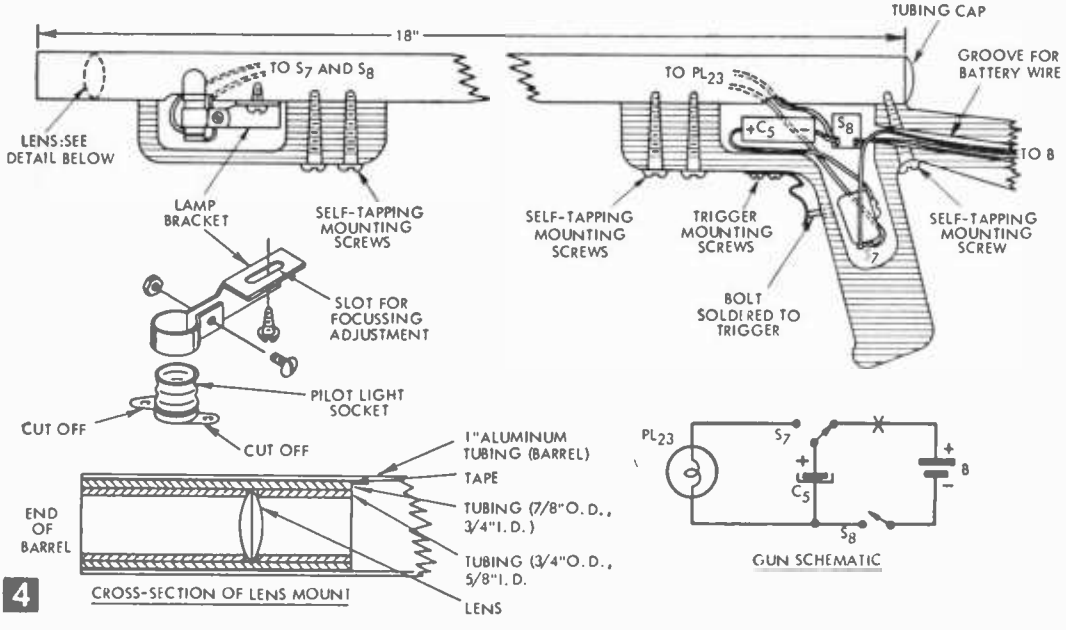
The basic target circuit consists of a photomultiplier tube (V3) that triggers a gas triode (V2) when hit by a flash of light from the gun. When the triode is triggered, a relay (Ry1) closes momentarily, which can be used to flash a light, ring a bell, etc. This basic circuit is shown in the heavy lines in Fig. 2. The unit is powered by a half-wave rectifier (V1) and a high voltage power transformer furnishing nearly 1200 volts dc. **This is a lethal voltage, and care should be used in construction and testing.**

The light lines in the schematic involve the optional features listed above. When a hit is made, Ry1 rings a bell and also closes the step coil of relay Ry2. A pilot light is connected to each step contact of Ry2, so a different light goes on for each position of the relay. These lights are behind a plastic screen with numbers, fastened to the front panel, so each hit lights a different number (from 1 to 20), showing the total number of hits.

Motor M1 powers the target arm, which swings the target (or cell) through an arc of about 45°. This motor is controlled by two switches. The "Motor" switch (S6) is a center-off, 3-position toggle switch, which provides a motionless target, a swinging target, or a combination of the two. In the latter position, the motor is connected through switch S5, which provides the start-stop cycle through an irregular cam on a second motor.

The second motor (M2) is a slow-speed timing motor, which has (in effect) two cams. When the operation of the unit is to be on a timed basis, as set by the "Operation" switch (S3), the target motor is also controlled by switch S4. This switch opens once for every revolution of cam #1 (and Motor M2), stopping both the target motor and the timing motor. If the "Motor" switch (S3) is on "Erratic," the target motor is also started and stopped during the timing cycle by cam #2 and switch S5. On the "Timed" operation, both motors are restarted to begin a new cycle by pressing the "Re-set" switch (S2) for a few seconds. This switch also resets the counter relay, Ry2.

Relay Ry3 is used to indicate the start and finish of the timing cycle. It is connected in parallel with the timing motor and is closed whenever that motor is running. When closed, it lights PL22 (that indicates "Fire"), and completes the circuit to Ry1, so hits will be registered. When the timing cycle ends and motor M2 stops, this relay opens. PL22 goes out and PL21 (which indicates "Stop") comes on, and the circuit to Ry2 is opened so hits will not register. If this relay is not to be used, the bottom connection from Ry1 should



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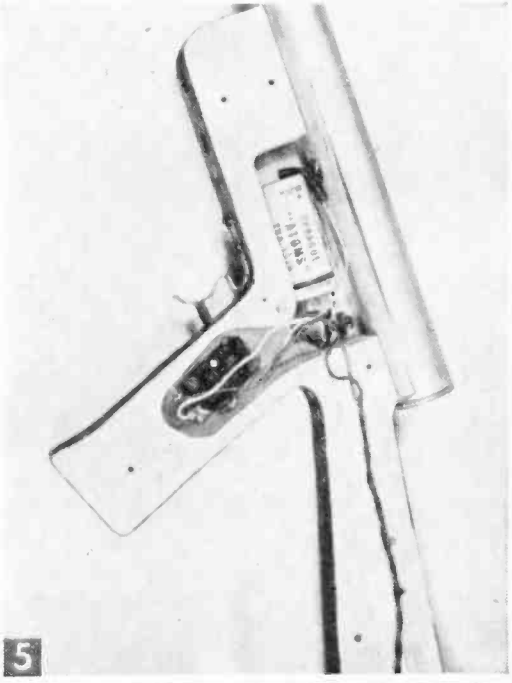
be made as shown by the dotted line in the schematic.

Regardless of the target features desired, the gun is the same. It is made from three pieces of white pine, cut as shown in Fig. 3. One piece is 1-in. stock and the gun stock and front grip are cut out as shown by the *shaded* area. The two side pieces are ¼-in. stock, cut to the entire pattern area. Notice that these two pieces do not have open areas in them, and are ¼ inch higher than the center piece. This additional height allows the side pieces to cradle the 1-in. aluminum tubing barrel, which rests on the stock and front grip.

After the three pieces have been cut out, glue one of the thin pieces to the center piece, lining up the front, back and bottom. Do this for both the stock and front grip.

The barrel is made of an 18-in. length of 1-in. dia. aluminum tubing plugged at the back with an end cap. The lens can be any double convex lens with a dia. between ¾ in. and ⅞ in., and a focal length around 1 in. to 3 in. The one shown was from a small linen tester magnifying glass.

Before mounting the lens, determine the proper distance between it and the light bulb by holding it in front of a radio pilot light and moving it back and forth until the filament is sharply focused on a wall 8 to 10 ft. away. It is mounted in the barrel by sections of plastic or phenolic tubing as shown in Fig. 4. The inside dia. of the aluminum tubing is an odd size, so it might be necessary to turn down the outside of the outer plastic tubing or enlarge its dia. by wrapping plastic electrician's tape around it. In the latter case, the



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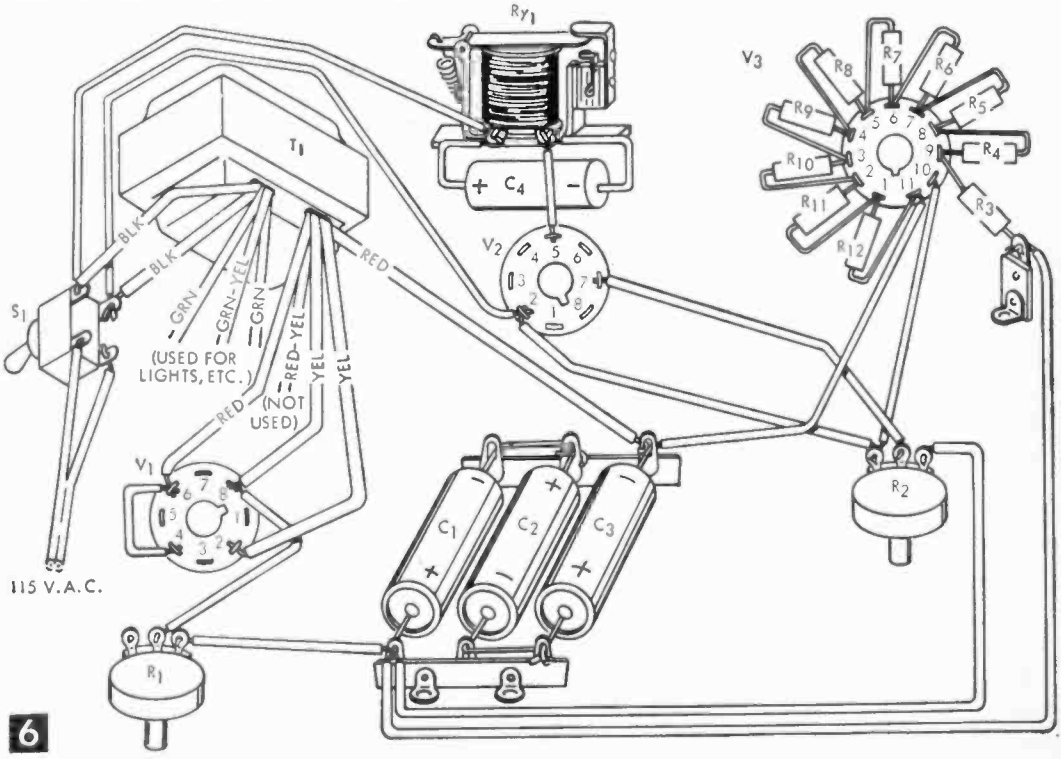
Side removed from gun shows bolt soldered to trigger and wires leading to battery.



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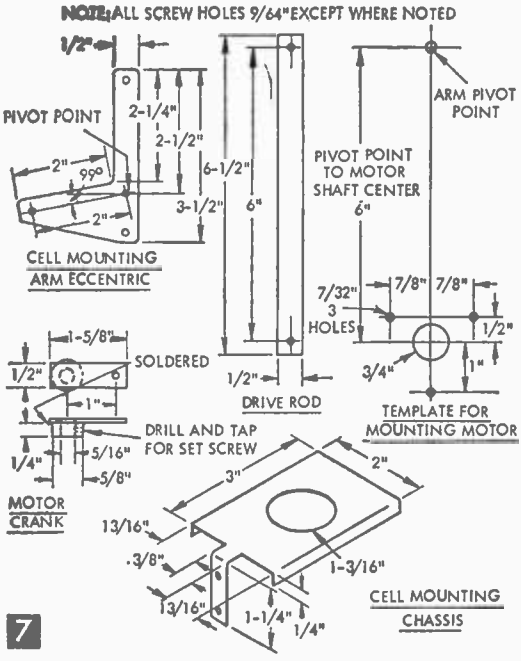

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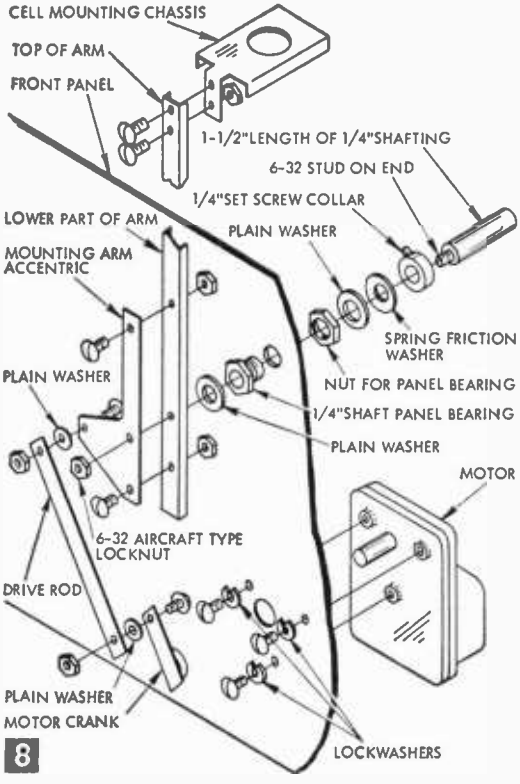

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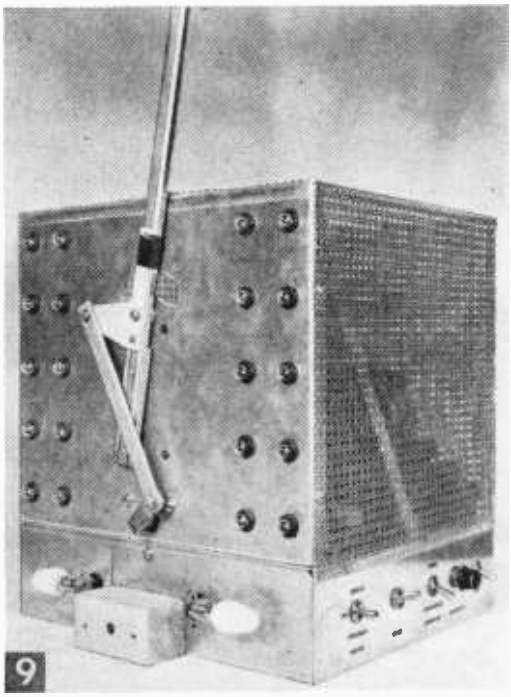
lens and mount can be fastened in the end of the barrel by force fit. The lens should be back about 1 in. from the end of the barrel.

With the lamp-to-lens distance determined above, and knowing the position of the lamp in the barrel, cut a slot in the bottom of the barrel for the lamp. This slot should be ⅝ in. wide and about 1 in. long to allow for lamp adjustment. Make the lamp mount as shown, to be fastened to the barrel with a self-tapping screw. This mount allows the lamp to be moved backward and forward, up and down, and around. With the lens in place, and the lamp bracket attached to the barrel, temporarily connect the lamp to a 6-v. source. Put the barrel in a vise, so it points toward a wall about 8 ft. away. Turn the lamp and the socket so the edge of the filament is facing the lens, evidenced by the narrowest image on the wall.

Tighten the socket screw and then move the lamp forward and backward to get the sharpest image. Before tightening the mounting screw, move the lamp laterally from side to side to center the image in the line of sight of the barrel. Tighten the mounting screw and then check to see if the height of the image is in line with the sighting line. If not, loosen the socket screw, and raise or lower the bulb, taking care not to turn it to broaden the image. When properly adjusted, the image should be a narrow vertical band of light, in alignment with the line-of-sight of the barrel.

Cut a groove in the exposed side of the thick stock section between the handle opening and the battery opening. Hold switch S7 in place, and drill a ¼-in. hole in the front of



9

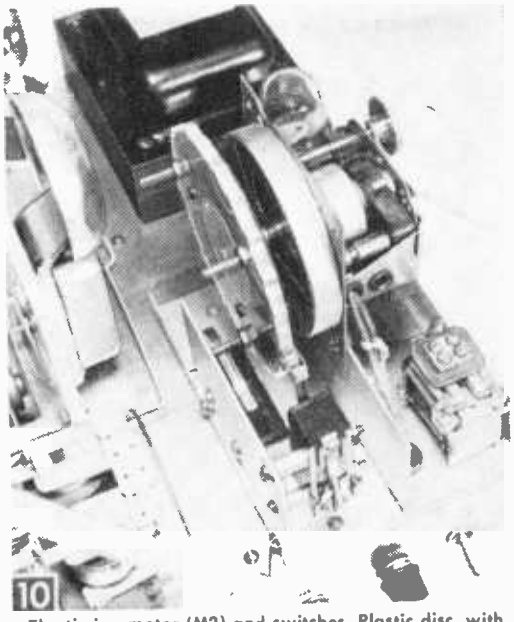
Front panel removed shows drive mechanism, indicator lights and chassis cover. Note hole in panel, above pivot point, for wires from cell.

MATERIALS LIST—BULLETS OF LIGHT

Desig.	Description
	Basic Unit
R1	50,000 ohm wire-wound potentiometer
R2	.25 meg. potentiometer ("Sensitivity")
R3 thru R12	30,000 ohm, 1 watt
C1, C2, C3	20 mfd. 450 v. electrolytic
C4	1 mfd., 200 v.
T1	750 or 800 v. power transformer
Ry1	DPDT 5000 ohm coil relay (Potter & Brumfield LM-11)
S1	DPST toggle switch
V1	5U4G, 5U4GA, 5U4GB, etc.
V2	0A4G
V3	931A photomultiplier tube
	two octal sockets, one 11-pin socket, knob, miscellaneous hardware
	Gun Parts
	1 pc 1 x 7 x 18" white pine
	2 pcs ¼ x 7 x 18" white pine
	1 pc 1" dia. aluminum tubing 18" long (Reynolds "Do-It-Yourself")
	end cap for 1" tubing (Reynolds "Do-It-Yourself")
	double convex lens, approx. ¾" dia., 1-2" focal length. (A double convex lens, 19mm dia., with a focal length of 32mm may be secured from Edmund Scientific Co., Barrington, N. J., for 90¢.)
C5	100 mfd. 50 v. electrolytic
S7	miniature SPDT snap-action switch (Micro V3-26)
S8	SPST toggle switch
PL23	6-8 v. .15 amp pilot light (DO NOT substitute—Use either No. 40 for screw base or No. 47 for bayonet base)
B	45 v. battery (Burgess U-30)
	Swinging Target Parts
M1	25 rpm 115 v. motor (Dayton 4K810: available to jobbers from W. W. Grainger, Inc., 118 S. Oakley, Chicago, Ill.)
S3	SPDT toggle switch ("Operation")
	aluminum channel (Reynolds), miscellaneous aluminum and brass
	"Hit" Indication Lights
Ry2	22-position, 115 v. stepping relay (Guardian MER-115)
PL1 thru PL20	6-8 v. .15 amp pilot lights
S2	DPST push button or spring switch ("Re-set." Note: also used with Timing Circuits below)
Bell	6-12 v. doorbell
	pilot light sockets, grommets, plastic
	Timing Circuits
M2	1 rpm 115 v. motor (Hurst SM-1; available from Allied Radio Corp., Chicago, Ill.)
S4	leaf-actuated SPDT snap action switch (Micro BZ-2RL)
S5	roller-actuated SPDT snap action switch (Micro BZ-2RL2-A2)
S6	SPDT center-off toggle switch ("Motor")
Ry3	SPDT 115 v. ac coil relay
PL21, PL22	115 v. 7 watt candelabra lamp
	pilot light holders, scrap aluminum, plastic

the pistol grip, in line with the button on S7. Drill a ½-in. hole in the bottom of the barrel, near the back, and thread two wires through to the lamp socket. Mount the switches, capacitor and battery, and wire as shown in Figs. 4 and 5. Switch S8 is an on-off switch to prevent capacitor leakage current from running the battery down. When properly wired, the battery charges the capacitor, which will create a bright flash of light as it discharges into the lamp whenever S7 is pressed.

Make a trigger of spring brass, as shown in the pattern in Fig. 3, and solder a 6-32 headless bolt to it (Figs. 4 and 5), that will press on the button of S7. Fasten the trigger to the stock with two screws, allowing movement clearance behind the upper curve of the trigger.



The timing motor (M2) and switches. Plastic disc, with irregular edges and bolts, acts as two cams, operating S4 (under bolt in lower center) and S5 (with roller on edge of disc).

Attach the barrel to the stock and front grip with self-tapping screws as shown, being careful not to disturb the lamp setting. The second thin stock and grip pieces are then fastened to the thick center section with countersunk wood screws.

In view of the variations possible with the target unit, no chassis layout is shown. Figure 6 shows the general wiring of the basic section, with relay Ry1 connected as shown by the dotted lines. All leads carrying high voltage, including resistors R3 through R12, should be well-insulated from the chassis. These resistors should be kept at least ¼ in. away from the chassis. If they are soldered to the tube pins as shown in Fig. 6, and then carefully bent upward (looking down on the bottom of the socket), they can be spaced evenly and compactly. If the cell is to be mounted on a swinging arm (as in Figs. 1 and 8), the cover around the resistors should be plastic or cardboard.

Potentiometer R1 adjusts the high voltage and should be mounted with insulated bushings. Adjust this control so that the voltage across the series of C1, C2 and C3 is 1100 v., or about 110 v. across each resistor in the R3 to R12 series. **Be very careful when making this measurement, as this voltage is dangerous!**

In operating the basic unit, first turn the "Sensitivity" control (R2) fully counterclockwise (where the wiper arm is common to the lead going to pin 2 of V2), and turn the unit on. After it warms up, turn the sensitivity control up to the point where V2 "fires,"

and then back off slightly. The unit is then at maximum sensitivity for room light conditions.

The cell (V3) must be shielded from stray light and a cover should be made, leaving an opening no larger than the window opening of the cell itself. The cover in Fig. 1 is a surplus coil shield, but a cover can be made of tin or cardboard, painted black on the inside.

In operation, room lights might have to be turned down to permit the sensitivity control to be turned up enough for the gun to "fire" V2. The room lights should be behind the target unit. Sensitivity and speed of action can be increased by loosening the spring tension on relay Ry1.

Details for making a swinging arm target are shown in Figs. 7, 8 and 9. The arm is made of a 24-in. section of aluminum channel, pivoted 4 in. from one end. The parts of the drive unit are assembled as shown in Fig. 8, and all are made of aluminum except the motor crank, which is brass. A crescent shaped hole is cut in the panel just above the pivot point (Fig. 9) permitting the cell wires, which run down the back of the channel, to pass through the panel.

In the unit shown, the "hit" pilot lights (PL1 through PL20) are mounted in grommets, so all wiring is back of the panel. Compartments, similar to egg box dividers, are made of cardboard and fastened to the plywood panel behind the plastic sections. This prevents the light from any one pilot light from lighting more than one number. The numbers were lettered backward on the back of the plastic, and the area around them painted black, permitting an illuminated number against a black background. Similar compartments and lettering arrangements were used for PL21 ("Stop") and PL22 ("Fire") lights.

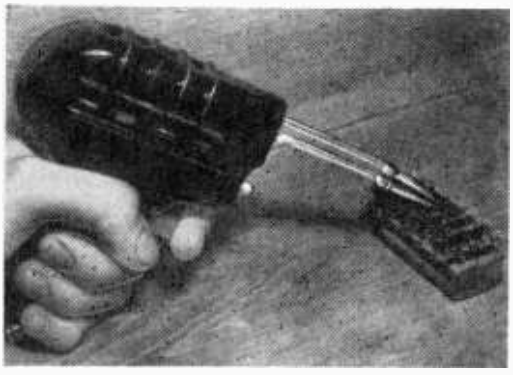
Figure 10 shows the layout for the timer motor (M2), S4, S5 and cams #1 and #2. The motor used was a surplus ⅓-rpm motor, so S4 had to be opened three times for each revolution. A plastic disc, with an irregularly-serrated edge was fastened to the shaft, and a roller-actuated micro-switch is operated by the "bumps" on the edge of the disc. This is switch S5, and provides the erratic off-on target movement. Three 6-32 bolts, mounted on the face of the disc 120° apart, operate a second micro-switch, S4. These bolts act as the "bump" on cam #1. Three were required since the motor was a ⅓ rpm, and a 1-min. interval was desired. The same principle could be used with one bolt on a 1-rpm motor as specified in the Materials List.

With the circuit shown, the gun will "fire" flashes of light as fast as the trigger is pulled. If this "machine gun" effect is undesirable, connect a resistor in the gun circuit (Fig. 4) at point "X" on the schematic. A 5000 ohm resistor will require at least ½ sec. between shots, and a 10,000 ohm will require 1 sec.

Regardless of the features included in the target unit, a cover should be made as a protection against the high voltages present. The cover shown in Fig. 9 was made of perforated sheet aluminum, bent to fit, and fastened to the chassis and front mounting panel with self-tapping screws. The plywood panel is screwed to the block at the bottom center of the chassis, and braced with two angle irons fastened at the top corners of mounting panel.

Inverted Brush Cleans Gun's Tip

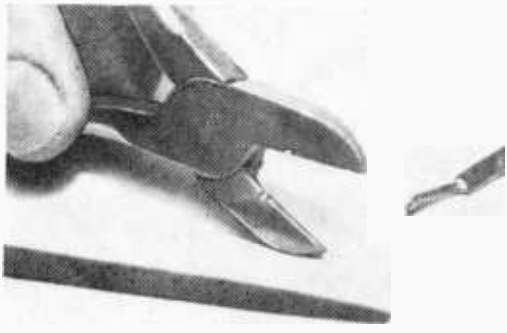
• To keep the tip of your soldering gun clean of scale, woodscrew-fasten a brass-bristle



suede shoe brush to one end of your workbench. Wipe the soldering-gun tip across the brush occasionally to keep it clean for efficient soldering.—J.A.C.

Notched Plier Strips Insulation

• With an ordinary side cutting diagonal plier, it's easy to accidentally cut strands of wire when stripping insulation. File two



small notches in the blades opposite one another. For a quick clean job, rotate the tool slightly around the wire as you strip off the insulation.—J. A. Comstock.

The reverb unit's pickup mike feeds thraugh a separate amplifier and speaker. You can use this system with both monaural and sterea tapes or records.

Echo Reverberator System for HI-FI and STEREO

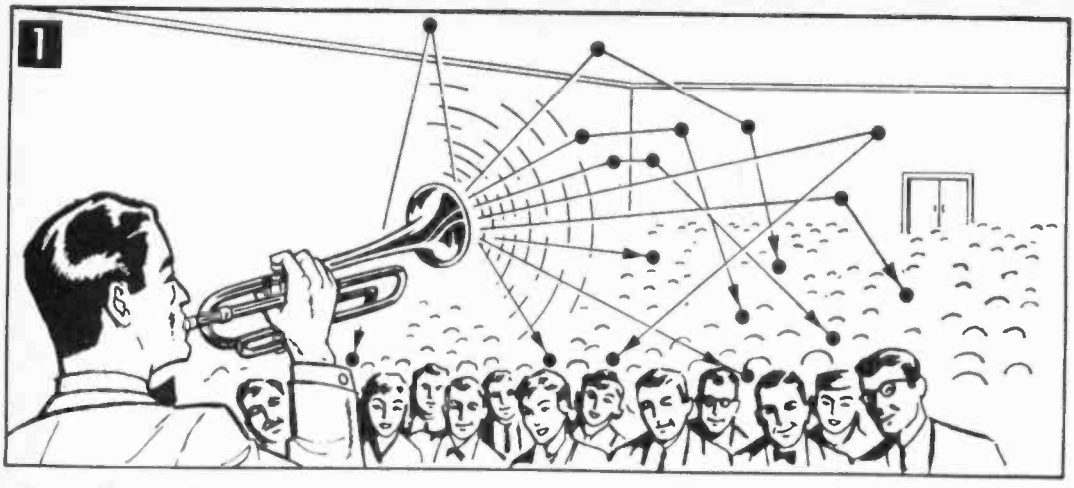
A garden hose is the acoustical delay line in this $25 system that can rival the rich colorful effects produced by expensive electronic hi-fi attachments

COMPARE the on-the-spot live sound of a dance band, or an orchestra in a concert hall, with the sound of a recording playing through your hi-fi system, and you'll notice that a certain quality of depth and vibrancy is missing. This echo system puts the color and richness back in, and will add that delayed sound, concert-hall effect to any recording. You can build it for $25 or less, depending on whether or not you have a suitable microphone on hand.

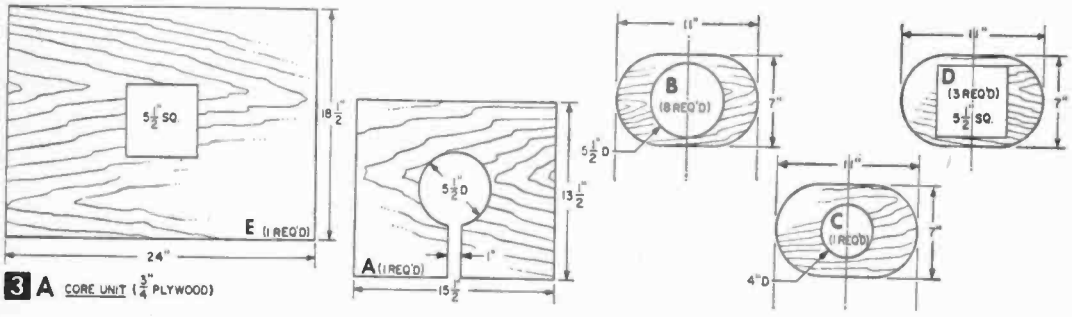
Certainly modern hi-fi systems and stereo recordings have made sound reproduction more realistic, but the facts are that the acoustics of a living room cannot equal those of a large concert hall. You can't recreate the feeling of being present in a large space simply by adding more speakers and wattage, because in the auditorium, the listener hears not only the sounds of the orchestra, but also sound waves reflected from walls and ceilings.

This system built by Bill Goodson, a WMJM program director, picks up sound from your amplifier, delays it 50 milliseconds, and then replays the sound very much like the echos you hear in the concert hall. It consists simply of a speaker, a sound collecting channel, a garden hose delay line, and a pickup mike. You can install it in a plywood box, or build the decorative cabinet shown in Fig. B. The system can be used equally well with single channel, or stereo. And if you tape your own voice recordings, you'll find it adds broadcast station quality and depth.

The reverberation unit doubles as an attractive furniture base for amplifier or tape decks.

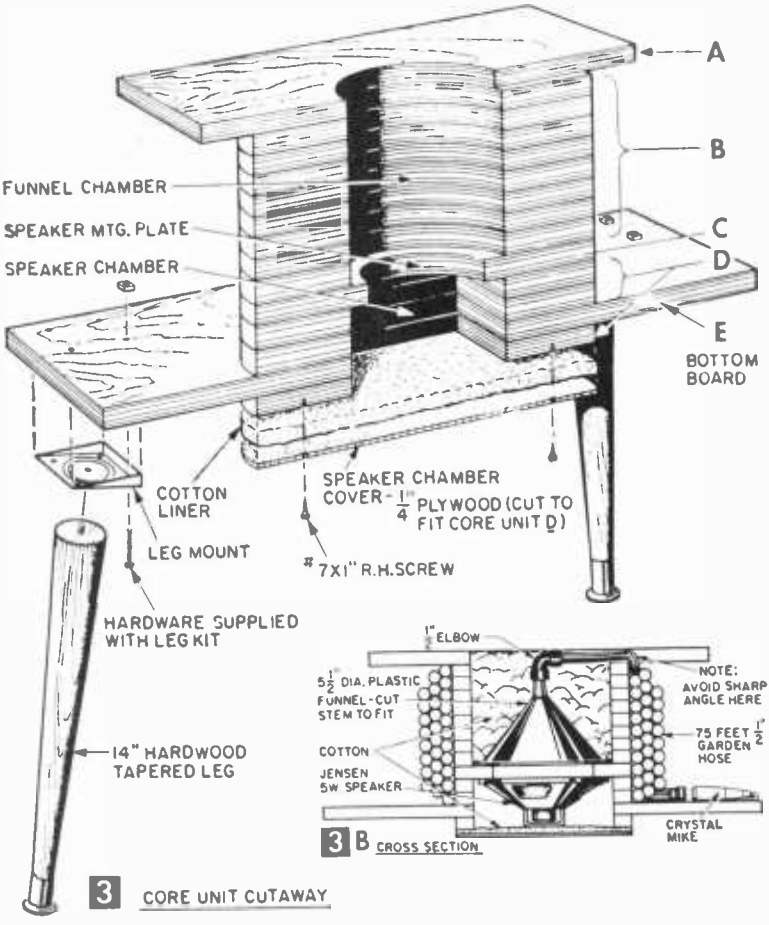


In a well-designed auditorium, the walls and ceilings are planned so that you hear just the right amount of reverberation. Too much of the echo effect can cause an overlapping of tones that makes the music indistinct. Too little reverberation, and the music lacks depth, or can't be heard clearly. The reverb unit shown on the following pages is designed to add a delayed sound echo to home hi-fi systems.



3 A CORE UNIT (¾" PLYWOOD)

You can also use the reverb unit to enhance the depth and tone of voice recordings. With some makes of tape recorders, you may need to use a separate input amplifier along with a mixer.



A delay line enclosed in the cabinet produces reverberation that will add depth and color to your records and tape recordings, and the unit doubles as an attractive furniture base for your changer, amplifier or tape deck.

Listen to a band playing outdoors on a football field, and then hear the same musicians inside an auditorium and you'll notice a big improvement in richness and depth of tone.

Outdoors, the sound is lost in space. But in a hall, as the musician plays a note, one sound wave travels directly toward you while others strike the walls and ceiling at many different angles (Fig. 1). These sound waves are reflected back toward you and reach your ear a split second later, causing reverberation, an echo-like effect that continues after the original note was played, adding greatly to listening pleasure.

Despite modern improvements in the quality of amplifiers, pickups and speaker systems, when we reproduce music within a comparatively small room in the home it lacks a true "live" quality. And though you can add reflecting surfaces, or deaden certain spots to improve your reproduction, the space just isn't available for full reverberation. Acoustics engineers estimate that the ideal reverberation time is between 50 and 65 milliseconds. The 75-foot garden hose in this echo system gives you this delay, much as though the sounds were traveling out and reflecting back from a surface 37 feet away (half the hose length).

You feed an audio signal from your radio, tape unit, or phonograph to the input speaker jack on the left of the front panel. Inside the sound insulated cabinet is a speaker which funnels into the ¾-in. garden hose. At the other end of the hose, the sound is picked up by a mike. You feed this output line through your amplifier to a separate speaker. But more about circuit connections after we finish construction.

Build the Core Unit First. A solid plywood hub forms a soundproof chamber for the speaker and funnel, while the outside of this core acts as a reel for the hose (Fig. 4). The speaker is a Jensen "Concert Series" 5-watt type with a 3.2 ohm voice coil, and has a 5-in. square mounting flange. You can use other makes of similar speakers, provided that you tailor your dimensions to fit.

Also obtain a plastic funnel with a neck about 5½ in. in diameter. If your local hardware store does not stock the plastic type, you can substitute a metal funnel of equal size provided that you line it with a sound absorbing layer of cotton to eliminate vibration and metallic noise.

Use a saber saw to cut twelve 7 x 11-in. ovals (overall size) from a sheet of ¾-in. plywood. Eight of these pieces will make the funnel chamber, so cut circular holes as in Fig. 3A for a snug fit with the funnel. Saw a 4-in. round hole in one piece for the speaker mounting plate and 5½-in. square holes in the last three ovals to make the bottom section of the stack which boxes in the rear of the speaker.

Next saw a 5½-in. round hole in the 13 x 18-in. plywood top piece (Fig. 3A). It acts as the flange of the reel to keep the coils of hose from spilling. Cut a 5½-in. square hole in

The core is one unit. The cabinet is a separate unit that fits over the top. You can adjust the legs shown for straight or angle mounting. Two jacks on the front panel connect to the monitor speaker and the pickup mike.

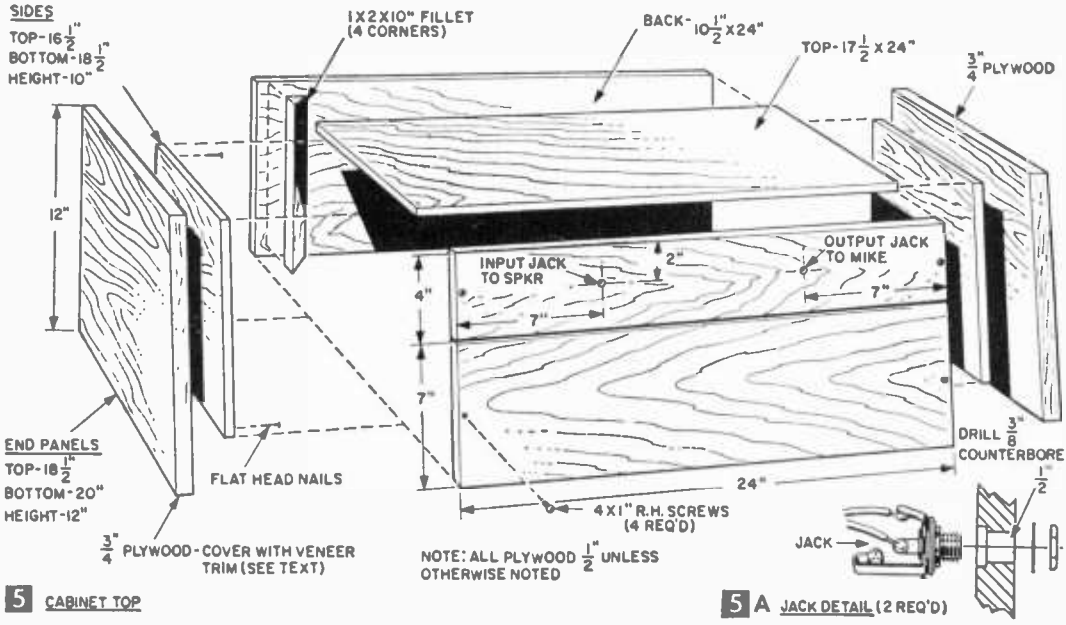
the 18½ x 24-in. bottom board, and assemble the complete core unit with short nails and glue.

At this point, you can temporarily screw on the base legs—it makes the assembly steps easier. Saw a 1-in. slot through the reel top and the first layer of plywood for the hose connection (Fig. 3A). Put the funnel in place, and if the stem extends beyond the top plate, cut it down as in Fig. 3B. Next line the inside of the funnel compartment and the speaker cone compartment with surgical cotton. This prevents sound from the speaker filling the cabinet and possibly leaking to the reverberation microphone without feeding through the hose. Fasten the funnel in place with small nails or wood screws, and then glue pads of cotton to the compartment walls. Also line the ¼-in. plywood speaker chamber cover with cotton, keeping it away from the speaker cone.

To get enough echo delay, the hose must be between 50 and 75 feet in length. A 50-foot length may give you a clearer sound, but not quite enough echo, while more than 75 feet of hose will provide too much echo and a muffled sound. The entire length must be in one piece—a test showed that couplings cause frequency drop. The garden hose (Sears, see Materials List) is a 75-ft. length of 3-layer vinyl, ½-in. I.D., and working at room temperature you'll have no trouble in winding it around the core.

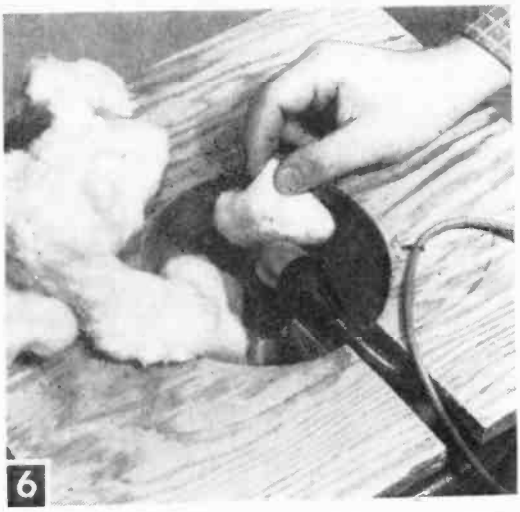
Instead of connecting the hose directly to the funnel, which might cause a sharp angle at the start preventing passage of sound, use a ½-in. waterpipe elbow (see Fig. 3B). Tape the elbow over the funnel. Use a layer of cotton and wrap thoroughly with Scotch masking tape (available in paint stores). The end of the hose, with its fitting cut off, fits inside the elbow. Also tape this joint tightly.

Now wind the hose around the core, and at the other end tape the microphone in tight contact with the hose (Fig. 8). This mike is a high impedance home recording type, available from Sears for about $8 and is just a bit larger than the diameter of the hose. Install the speaker, and you are just about ready to try the unit. You'll find that while you get reverberation, there may be some pickup

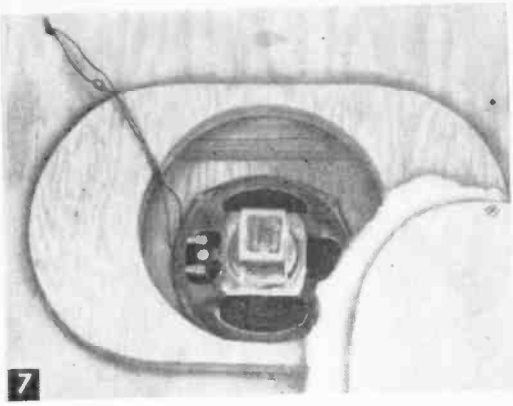


5 CABINET TOP

5 A JACK DETAIL (2 REQ'D)



After you install the funnel, stuff the space around it with cotton. Plastic funnels are better, but you can use a metal one provided that you line it with a coating of cotton to eliminate metallic rattles and vibration.



Line the bottom speaker compartment with cotton. You can fasten it with rubber cement, or wood glue. Be sure to keep loose tufts of the cotton away from the speaker cone.

It's important that no outside sound reaches the pick-up mike. Cover the hose connection with a thin wrapping of medical cotton and tape. Then cover with a heavier layer of cotton, and again tape tightly. From funnel to microphone, there can be no sharp bends in the hose line.

MATERIALS LIST—REVERB SYSTEM

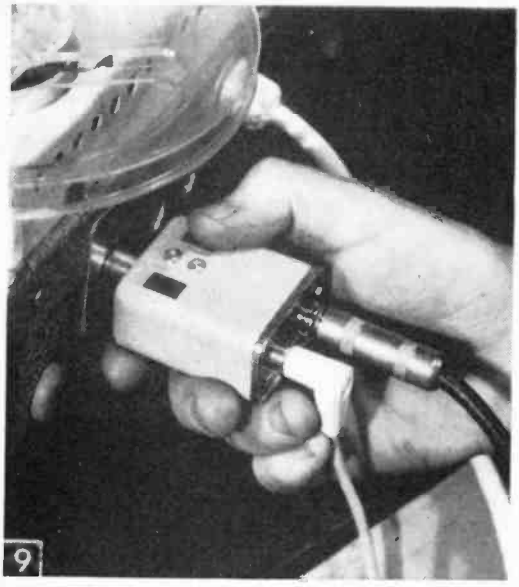
Amt. Req'd	Size and Description	Use
	CORE UNIT	
1	½ x 18½ x 24" fir plywood	bottom board
1	½ x 13½ x 15½" fir plywood	flange board
12	½ x 7 x 11" fir plywood	ovals (Fig. 4A)
1	¼ x 7 x 11" fir plywood	speaker cover
4	14" tapered hardwood legs, with mtg. plates. Sears Cat. No. 64G9712 ($2.98 plus shipping)	base legs
75'	½" I.D. 3 layer vinyl garden hose Sears Cat. No. 9G69482 ($5.67 plus shipping)	delay line
1	high impedance crystal mike, Silvertone or equal. Sears Cat. No. 57G1407 ($9.95)	mike
1	Jensen 5" square 5 watt speaker, Type P5-W, Allied Radio #82P272	
1 lb.	non-sterile cotton, available drug stores	sound insulation
1	5½" diameter plastic funnel. Available hardware stores. Metal can be used but requires insulation. See text.	sound cone
Misc.	½" pipe elbow, glue, screws, 2 phone jacks, 5 ft. hookup wire, shielded mike cord for connecting lines	
1	2-channel mixer, Switchcraft "Mini-Mix." Cost approx. $9. Write Switchcraft for full information on selection of mixers and connecting cords. See text for address.	optional
	CABINET TOP	
1	½ x 10½ x 24" fir plywood	back panel
1	½ x 17½ x 24" fir plywood	top panel
2	½ x 10 x 18½" fir plywood (see Fig. 5)	sides
2	¾ x 12 x 20" fir plywood (see Fig. 5)*	end panels
1	½ x 4 x 24" fir plywood	jack panel
1	½ x 7 x 24" fir plywood	front panel
Misc.	Wood, glue, nails, screws, corner fillets, wood stains	

NOTE: Veneer tapes for covering end grain of side panels available Albert Constantine and Son, Inc., 2050 Eastchester Road, New York 61, N. Y.
Electronics items listed are available from Allied Radio, 100 N. Western Ave., Chicago 80, Ill. The stereo amplifier shown in illustration is a Knight-Kit also available from Allied Radio.

through the walls of the hose from speakers in the room. For best results, the core unit must be enclosed either in an improvised box, or the cabinet.

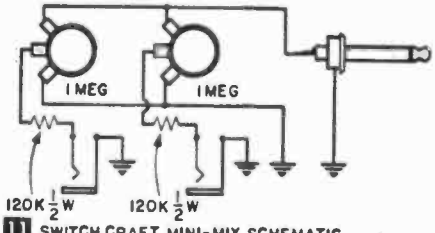
The Cabinet Top Fits over the core unit chassis, and fastens to it with screws. The end panels extend ½ in. above the level of the cabinet top. Following dimensions (Fig. 5), cut the ¾-in. plywood panels to size. For attractiveness, you can finish the unit in two colors, such as blond and mahogany. You can stain the plywood, use plastic laminate, or wood-grain vinyl over the wood. The model shown in Fig. 2 has sides made of ¼-in. blond wood-grain wall panel board, with the darker driftwood wood-grain plastic applied to the bottom front panel and top. Complete construction by wiring in the input and output jacks on the top front panel (Fig. 5A).

The Reverb Unit Hookup depends on your equipment layout. The simplest arrangement (Fig. 10) for single channel sound requires



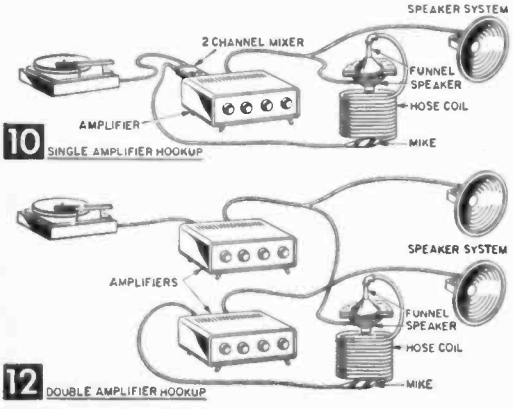
9

The Mini-Mix has two built-in volume controls that blend your input microphone lines. You can use it with the reverb system, as well as on your tape recorder.



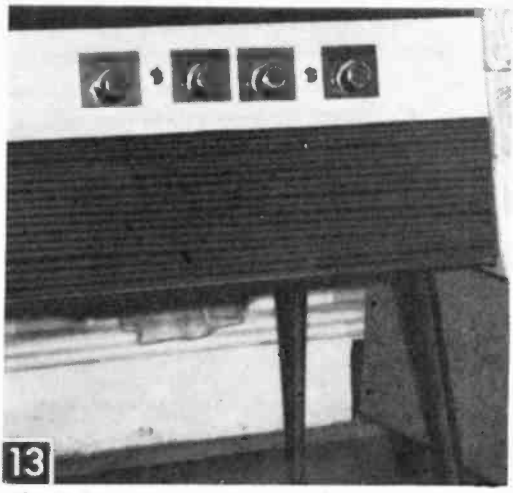
11 SWITCH CRAFT MINI-MIX SCHEMATIC

that you use a two-channel mixer to blend the delayed sound signal from the pickup microphone with the original sound signal. Of course, this hookup can be used only with hi-fi systems that have the signal source (record player or tape deck) separated from the amplifier and speaker system. The mixer shown in Fig. 9 is a new type (Switchcraft #310 Mini-Mix, $7.95) and offers an advantage of low cost and compact size. This mixer has two input jacks and volume controls arranged as in Fig. 11. You will find it has other uses in mixing voice and music, or blending the input from microphones at several locations. Complete data on various models of these mixers to fit various recorders and amplifiers can be obtained from Switchcraft, Inc., 5555 N. Elston, Chicago 30, Ill.



10 SINGLE AMPLIFIER HOOKUP

12 DOUBLE AMPLIFIER HOOKUP



13

If you have mixer volume controls, you could build them into the reverb unit's front jack panel.

You can also improvise your own mixer by wiring volume controls and jacks on the front panel. An important point to remember is that input mixers are designed to handle only the relatively small currents of microphones, and pickups—and not the heavier wattage of speaker lines. Also, with most mikes, you must use shielded cable for your connections to prevent audio howl.

If you have two amplifiers, you can operate (Fig. 12) without mixing, and this method may be your only possibility when you are using console hi-fi sets, tape recorders or radios and can't splice into the amplifier circuits. Also the separate amplifier hook-up has an advantage in that there is no possibility of audio-pickup howl.

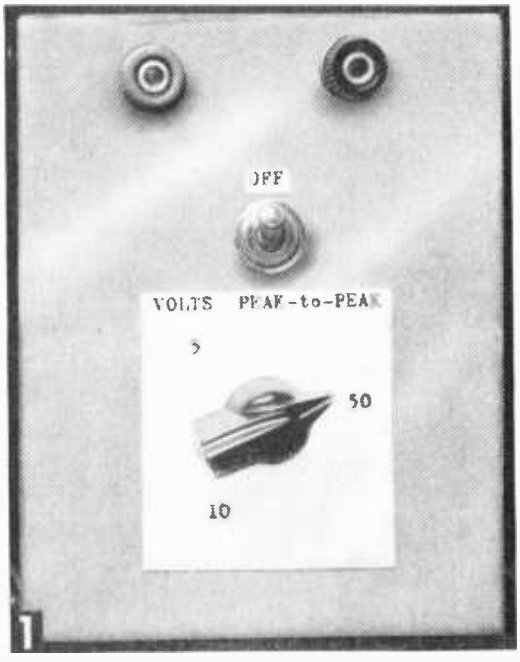
For Stereo, Connect the reverb unit either to one channel, or feed the output of both speakers of the stereo hookup to the monitor speaker. With high wattage systems, you may need to experiment with resistance added to the monitor speaker line.

The reverb unit can be tied into almost any high-gain amplifier that has inputs for high-impedance microphones. If you are working with a console hi-fi system, the leads for the monitor speaker can simply be clipped to the speaker leads in the console. The two-amplifier method (Fig. 12) must be used with most tape recorders unless you have enough technical know-how to cut into the tape recorder circuits at the proper points to bring out the necessary plugs and jacks.

Oscilloscope Calibrator

By RONALD WILENSKY

Inexpensive voltage calibrator sets up a standard voltage so that an unknown voltage may be compared with it



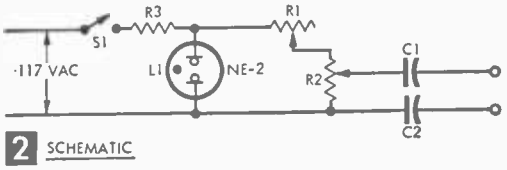
1

Front panel of the oscilloscope calibrator. Binding posts are fed through rubber grommets.

TO CALIBRATE an oscilloscope it would not be practical to merely take a medium-sized potentiometer and connect across the 117-v. line and use that as a standard for the 'scope; because of the fluctuation of the line voltage, the so-called "standard" would not be standard. To achieve an actual standard voltage we must regulate the line voltage so that the effect of voltage fluctuations will be minimized.

In this calibrator, the voltage regulator is a small neon-filled lamp, NE-2, chosen for its size, its low cost (less than 15¢), and its good regulation properties. When in operation, there are 65 v. across the lamp, regardless of voltage fluctuations. By means of several resistors, we can divide the regulated 65 v. into smaller portions, depending upon our needs. Thus, by using a small neon lamp, several resistors and a few isolating capacitors, an effective and cheap source of a standard voltage (or voltages) can be had.

The oscilloscope calibrator is built into a 3 x 4 x 5-in. Bud Minibox. Because of its simplicity there are only a few points concerning the construction that should be noted. First, the Minibox should be kept isolated from any part of the regulated 117-v. or 50-v. lines. This is done by insulating the two binding posts that provide the output voltage with small rubber grommets or fiber insulators. Second, only R2, the output control, should be mounted on the panel.



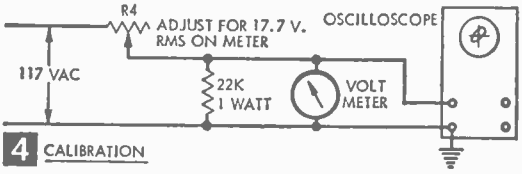
2 SCHEMATIC

The calibrating resistor R1 has a tuning screw-slot on the shaft. Mount R1 on a small right-angle bracket made of scrap aluminum or steel. Drill a mounting hole in one side of the bracket and mount the pot and the bracket so that the pot's shaft faces the back of the chassis. Opposite the shaft drill a ¼-in. hole so that a screwdriver may be passed through to turn the potentiometer.

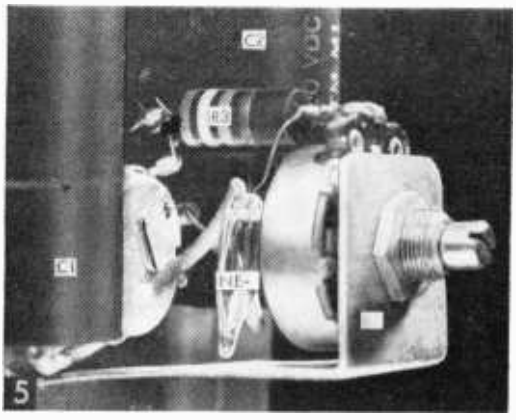
Finally, all the standard construction procedures should be followed: Use a rubber grommet where the line-cord passes through

3

Back view of calibrator shows parts placement. Note the slotted shaft on the calibration potentiometer (R2).



4 CALIBRATION



Side view of the calibrator neon light position.

MATERIALS LIST—'SCOPE CALIBRATOR

Desig.	Description
R1	1 megohm, linear taper potentiometer with screw-slot shaft adapter (Mallory U-54)
R2	3 megohm, linear taper potentiometer (Mallory U-59)
R3	33K, 1-watt, composition resistor
L1	NE-2 neon lamp
C1, C2	1 mf. paper capacitor, 450 w.v.d.c.*
S1	SPST toggle switch
	Bud Minibox CU-3005A, wire, grommets, two insulated binding posts, knob for R2.
	Parts for calibration circuit
R4	250K-500K potentiometer (any value between these will suffice)
R5	22K, 1-watt resistor

*These capacitors should be high-quality and preferably from the same package so they will be close in value.

the box, spaghetti wherever one component's lead may touch another's. Use a red colored binding post for the connection to the center of the pot (output); this connection should be used to connect the calibrator to the input of the 'scope. If the calibrator's output is reversed, that is, its ground connection is connected to the input of the oscilloscope, a serious error in voltage measurement will result.

Here are step-by-step instructions for calibrating the calibrator:

1. Connect a 250K-500K pot and a 22K resistor as shown in Fig. 4.

2. Connect this calibration circuit to the 117-v. line and to a high-resistance ac voltmeter (preferably, a VTVM, but a 5000 ohm/volt meter will suffice).

3. Adjust the pot so the meter reads 17.7 v. If you cannot read the meter that accurately, or its calibration is not that accurate, any voltage between 17.5 and 18.0 will be sufficient without seriously affecting the accuracy of the oscilloscope calibrator.

4. Turn on the oscilloscope; disconnect the sweep-circuit from the horizontal input and turn the horizontal-gain control to its lowest position.

5. Connect the calibration circuit to the vertical-input of the scope; adjust the vertical gain so that the straight-line pattern on the scope occupies a convenient size on the grid pattern covering the screen. A convenient height would be 20 boxes. (During the entire operation the pot on the calibrating circuit should be left alone.)

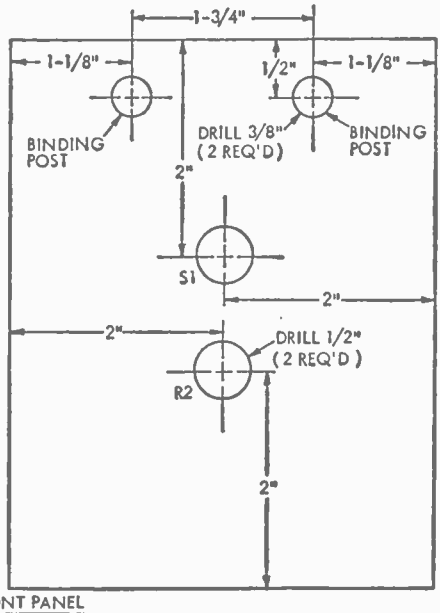
6. Leaving the vertical gain control in a position so that the calibrating voltage occupies 20 boxes, disconnect the calibrating circuit and connect the oscilloscope calibrator to the vertical input.

7. With the output control R2 in its maximum resistance position, adjust R1 so that the calibrator's voltage (50 v. p-p) also occupies 20 boxes.

8. Now, with the oscilloscope calibrator still in the circuit, adjust the vertical gain control on the scope so that the pattern now occupies 25 boxes.

9. At this point, it is necessary to decide what calibration voltages will be most useful to you. The author has found that 50 v., 10 v. and 5 v. (all peak-to-peak) are suitable for most experimentation. Adjust the output control so that the pattern occupies 5 boxes; mark this point with India ink or with a panel decal on the front of the Minibox. For a 5-v. calibration point, mark the point on the box where the pot rests when it is adjusted so that the pattern is 2½ boxes high. Thus, any voltage point desired can be easily marked.

It is important to note that all voltages



6 FRONT PANEL

emanating from the calibrator are measured as peak-to-peak v., rather than root-mean-square v. that are measured by voltmeters. To convert peak-to-peak volts to rms volts, use the following formula:

rms v. = p-p volts × 2√2 or,
rms v. = p-p volts × 2.83

To use the calibrator, merely adjust its output so you have the desired voltage; next, adjust the vertical gain so that the calibrator's voltage occupies a convenient number of squares. Disconnect the calibrator, and connect the unknown voltage; with the horizontal gain to a minimum and the sweep off, count the number of boxes the pattern occupies and apply the formula:

$$V_x = \frac{V_c}{N_c} \times N_x, \text{ where:}$$

V_x = unknown voltage
V_c = calibrator's output voltage
N_c = number of boxes calibrating voltage occupies
N_x = number of boxes occupied by the unknown voltage.

For example: the calibrator is adjusted so that its output is 50 v.; the vertical gain on the 'scope is adjusted so that the calibrating voltage occupies 25 boxes; the unknown voltage when connected to the 'scope occupies 10 boxes. What is the magnitude of the unknown voltage?

$V_c = 50$, $N_c = 25$, $N_x = 10$; therefore,

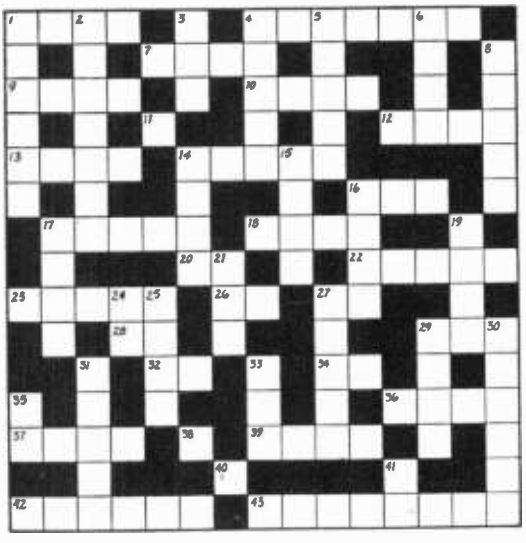
$$\frac{50}{25} \times 10 = 2 \times 10 = 20 \text{ v.}$$

Using the calibrator, your oscilloscope will serve not only as an indicating instrument but as a quantitative measuring instrument. Since most oscilloscopes have an input impedance extending into the megohm range, the oscilloscope can be used, effectively, as a VTVM.

Hi-Fi Anagram

By JOHN A. COMSTOCK

If you are an audiophile, here is an anagram puzzle for you. Take a look at the diagram and clues —think you can fill in all the empty blocks correctly?



If the puzzle looks simple, try timing yourself. See if you can correctly fill in the blocks in fifteen minutes or less. See the solution on page 141.

ACROSS
1) Low audio frequencies.
4) A number of interconnected electronic components.
7) A recorder utilizing a metallic coated ribbon.
9) Number of cycles per second of an ac wave. (abbr).
10) A ..... curve cone is a speaker diaphragm having a paraboloidal shape.
11) A class of audio amplification that gives best quality and reliability.
12) Said of an audio amplifier that amplifies a broad band of frequencies.
13) Most hi-fi audiophiles ..... stereophonic reproduction.
14) A woofer speaker is this size.
16) A type of turntable drive.
17) A .....over network in a hi-fi system is connected between an amplifier's output and two or more speakers.
18) Realism in audio reproduction (abbr).
20) A vacuum tube having four elements (abbr).
22) Sound.
23) An electron tube's electron catcher.
26) Frequencies between 20 and 15,000 cps (abbr).
27) 1/1,000th of the unit of current (abbr).
28) Radio broadcast (abbr).
29) Unit of relative power.
32) Unit of inductance (abbr).
34) Inductive reactance (letter symbol).
36) A particular type of loudspeaker used in hi-fi's.
37) Unit of loudness.
38) A class of audio amplification of two tubes or transistors connected in push-pull.
39) Opening in a bass reflex speaker enclosure.
40) Letter symbol for impedance.
42) Speaker that reproduces bass notes.
43) Faulty reproduction of bass notes from a speaker.

DOWN:
1) A reproducer enclosure.
2) A reproducer.
3) A resistance network.
4) An electro-acoustic unit of power ratio.
5) A ..... way system is one having more than two speakers.
6) ..... off is a reduction in amplification or reproduction of frequencies.
8) The property of a tone determined by its frequency.
14) Reduction in signal.
15) Opposite of #14 down.
16) Recording Industry Association of America (abbr).
17) A loudspeaker's diaphragm.
19) A transducer that picks up sound waves.
21) Opening in a magnetic circuit.
24) 1/10th of a bel.
25) A hollow sound.
27) Circuit that blends signals.
29) A resonant bass sound.
30) A type of vacuum tube amplifier.
31) A record playing device.
33) Signal amplifying circuit (abbr).
35) A recording that plays at 33⅓ rpm. (abbr).
41) The output Exl of an amplifier (abbr).

Two control knobs on the front panel adjust volume and sensitivity. The 4-ft. loop will detect large metal objects at 10-ft. maximum range.

Underwater METAL LOCATOR

This electronic detective is ideal for either salvage work or treasure hunting

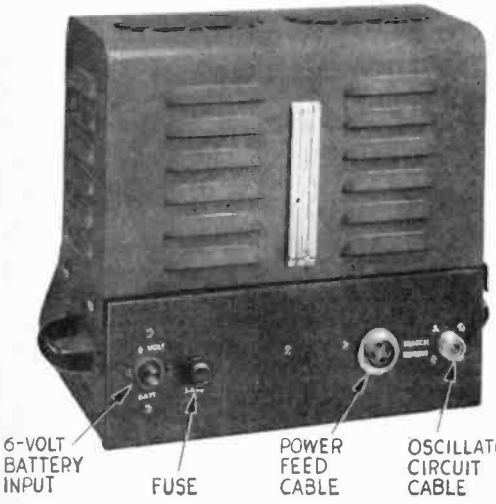
By C. L. HENRY

WHEN the muddy water closes over the expensive camera or binoculars someone dropped overboard—or the silt hides the outboard which flipped off the transom—even a skilled skindiver may not be able to find them.

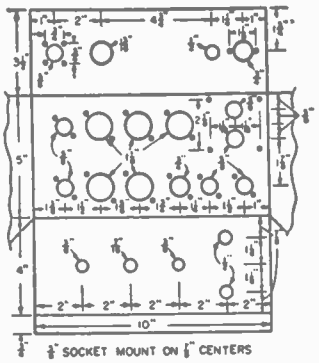
But this locator can do it with ease. Lower the sensitive detector loop in the water, and as it nears the metal object a change in the loudspeaker tone pinpoints the object's location.

You can hear the detector tone even when the outboard motor is running, because the loudspeaker delivers almost a full watt of audio power.

With the loop shown in Fig. 1, our model was tested with 100 feet of cable. The unit will, however, perform down to depths of 500 feet, if you want to add additional cable. Power is supplied by a 6-volt auto battery, which will operate the unit for about 100 hours of intermittent service. The materials for this unit total from 1/10 to 1/2 the cost of various commercial units. This detector will not only save hours of searching time, but it can also pay for itself the first time it's used. And it works equally well in salt or fresh water.



Connectors for power and the two lines which feed down to the loop oscillator are grouped on the back of the chassis.



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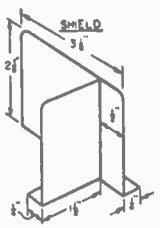

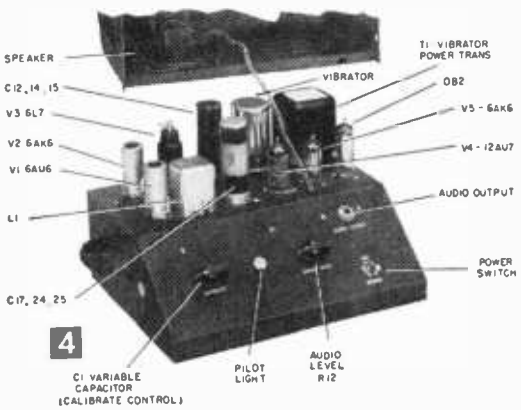

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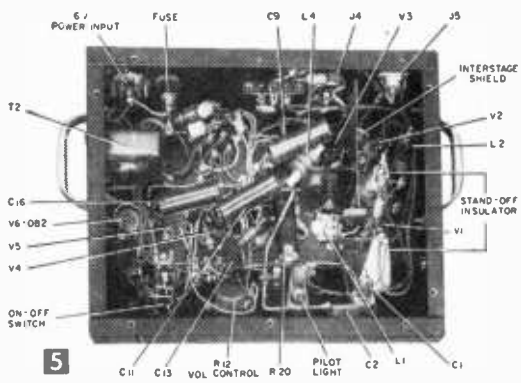


5

TABLE A—TROUBLE SHOOTING CHART

(all readings to ground)

pin	dc volts	ohms
TESTING V1-6AU6		
1	−8	47K
2	0	0
3	0	0
4	6	0.5
5	108	inf.
6	108	inf.
7	0	1
TESTING V2-6AK6		
1	0	100K
2	0	0
3	0	0
4	6	0.5
5	108	inf.
6	108	inf.
7	1.5	82
TESTING V3-6L7		
1	0	0
2	0	0
3	130	inf.
4	30	inf.
5	−6	47K
6	no connection	
7	6	0.5
8	1	470
TESTING V4-12AU7		
1	110	inf.
2	0	0 to 1 meg. (depending) on volume)
3	2.5	2.7K
4	6	0.5
5	6	0.5
6	80	inf.
7	0	470K
8	1.5	2.7K
9	0	0
TESTING V5-6AK6		
1	0	470K
2	3.8	150
3	0	0
4	6	0.5
5	160	inf.
6	160	inf.
7	3.8	150

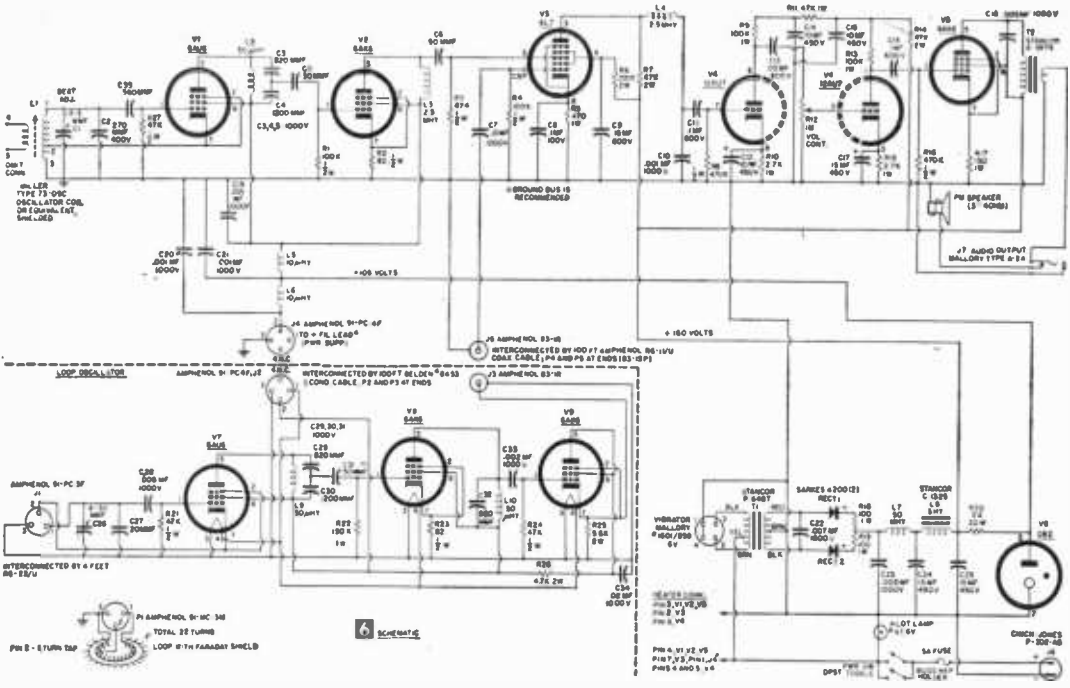
pin	dc volts	ohms
TESTING V6-0B2		
1	108	inf.
2, 3, 4	no connection	
5	108	inf.
6	no connection	
7	0	0
TESTING VIBRATOR		
1	0	0
2	5.5	0.1
3	5.5	0.1
4	0	0
TESTING V7-6AU6		
1	−7	47K
2	0	1
3	0	0
4	6	0.5
5	108	inf.
6	108	inf.
7	0	1
TESTING V8-6AK6		
1	0	150K
2	0.5	82
3	0	0
4	6	0.5
5	108	inf.
6	108	inf.
7	0.5	82
TESTING V9-6AK6		
1	0	47K
2	9	5.6K
3	0	0
4	6	0.5
5	95	inf.
6	95	inf.
7	9	5.6

All voltage and resistance checks made with a 20,000 ohm/volt-ohmmeter or VTVM. Low resistance voltmeters should not be used for these checks.

Construction of this beat oscillator-type metal detector starts with the main chassis (Fig. 4). Locate all of the chassis holes (Fig. 3) with a rule and scriber. Punch the socket holes with a chassis knockout, or use a fly cutter on a drill press. Weatherproof the speaker by spraying with five or six light coats of plastic spray, and then mount it in the right front of the chassis cover (Fig. 4). Mount the parts as shown in Fig. 5 with the controls on the sloping front. On the rear, mount the fuse holder and the connectors for the battery and search remote cables (Fig. 2).

Chassis wiring (Fig. 6) is not critical, but be sure that you keep the audio input and output separated. Also, isolate the oscillator wiring away from the rest of the wiring as much as possible. Run a bus of heavy copper wire for all ground connections. Spray completed wiring with acrylic plastic.

Mount the loop oscillator on two pieces of sheet aluminum (Fig. 7), fastened together with self-tapping screws. The assembly fits into the waterproofed plywood box (Fig. 7A). Wiring of the loop oscillator is isolated from the control unit in the boat, so the wiring of the oscillator is not critical. For extreme depths, add a valve stem for pressurizing the box.



Making the Detector Loop. The 4-ft. underwater loop is a giant sandwich made of three marine plywood rings (Fig. 8A) fastened together with Weldwood cement or an equivalent waterproof marine glue. For temporary fastening, use small wood screws that can be removed later.

When the glue is completely dry, wind 22 turns of #12 thermoplastic-insulated solid copper wire (commonly used for home wiring) into the loop. Bring out a tap at the 5th turn (Fig. 8, Sec. A-A). Make the winding as tight as possible to prevent shifting when the equipment is jarred in use. Winding loosely causes unstable loop performance.

Splice the two leads and the tap of the loop to 4 feet of RG-22 3-conductor coaxial cable, and extend this cable out through a Pyle National (or equal) cable feed-through. Later, when you coat the entire loop with fiber glass, build up the feed-through connection as in Fig. 8, Sec. A-A.

Since the loop is part of the oscillator circuit, it must be shielded against stray electromagnetic and capacitive effects. Add a Faraday shield by making a winding of #20 bare copper wire completely around the loop (Fig. 8B). Space the turns about 1 in. apart. Then pull a piece of #20 bare copper wire through these windings on the inside of the loop. Now solder this wire to each turn of the first winding (Fig. 9). Cut the outside of each turn and fold the wire back into the loop rim so that there are no closed turns or loops around the ring. This completes the Faraday shield.

Testing the Oscillators. Before you waterproof the loop, check out your wiring. Plug your main chassis into a hot shot or storage battery, and check the power supply voltages with a voltmeter 250-v. scale (see Table A). Use a broadcast radio to check the oscillator operation. It should pick up a signal at about 800 *kc.* You may have to run a wire out of the oscillator to get a signal strong enough to be heard. Then check the audio section by touching the plate of the 6L7 with a screwdriver. This should cause a loud noise in the speaker with the volume about half way up. If the oscillator fails to operate, you can find the trouble quickly by checking your voltages and resistances against the chart (Table A). A working oscillator should show a bias voltage of at least 3 volts.

Now connect the loop oscillator to the loop within the coax cable. (The length of this cable must be exactly 53 in.) Connect the oscillator to the control unit, and use your broadcast receiver as before to determine whether the oscillator is functioning. The frequencies of the two oscillators should be fairly close to one another. Adjust C1 and C28 for a beat. The beat note should be loud; probably you'll find several beats in the adjustment. The loudest is the right one to use.

If you can't find a beat, follow this procedure exactly. First remove C2 and replace with a 50-*mmfd* mica capacitor. Adjust C1, C26 and the slug in L1. If you have no luck, replace C2 with a 100-*mmfd* capacitor and try again to find a loud beat. Continue the process adding 50 *mmfd* each time until a loud

MATERIALS LIST—UNDERWATER METAL DETECTOR

No. Req'd.	Size and Description
1	C1—variable air capacitor, 1.5 to 5 mmfd, Johnson type 5M11, Allied 75H175
1	C2—mica capacitor, 270 mmfd/400 v, Allied 12L479
2	C3, C29—ceramic capacitor, 820 mmfd/Lafayette C601, 1000 v
2	C4, C30—ceramic capacitor, 1200 mmfd/Lafayette C601, 1000 v
3	C5, C 6, C31—ceramic capacitor, 50 mmfd/Lafayette C601, 1000 v
1	C7—ceramic capacitor, 0.01 mfd/Lafayette C601, 1000 v
1	C8—paper capacitor, 0.1 mfd/200 v, Lafayette Z503
1	C9—paper capacitor, 0.15 mfd/600 v, Mallory GEM, Lafayette Z581
4	C10, C19, C20, C21—ceramic capacitor, 0.001 mfd/1000 v, Lafayette C601
2	C11, C16—paper capacitor, 0.1 mfd/600 v, Mallory GEM, Lafayette Z580
1	C12, C14, C15—electrolytic capacitor, triple section, Mallory type FP, 10-10-10 mfd/450 v, Lafaytete Z1090
1	C13—paper capacitor, 0.05 mfd/600 v, Mallory GEM, Lafayette Z576
1	C17, C24, C25—electrolytic capacitor, triple section, Mallory type FP, 15-15-15 mfd/450 v, Lafayette Z1180
1	C18—ceramic capacitor, .005 mfd/1000 v, Lafayette C601
1	C22—paper capacitor, buffer type, .007 mfd/1600 v, Lafayette Z652
2	C23, C28—ceramic capacitor, .005 mfd/1000 v, Lafayette C601
1	C26—ceramic trimmer capacitor, 4 to 30 mmfd, Lafayette CA-400
1	C27—ceramic capacitor, 20 mmfd, Lafayette CA-421 (TCZ20)
2	C35, C32—mica capacitor, 560 mmfd, Allied 12L333
1	C33—ceramic capacitor, .002 mfd/1000 v, Lafayette C601
1	C34—ceramic capacitor, .02 mfd/1000 v, Lafayette C603
2	R1, R4—carbon resistors, 100 K, ½ w, Lafayette RS10
2	R2, R23—82 ohms, ½ w, Lafayette RS10
4	R3, R21, R24, R27—47K, ½ w, Lafayette RS10
1	R5—470 ohm, 1 w, Lafayette RS11
1	R6—100 K, 2 w, Lafayette RS12
2	R7, R14—47 K, 2 w, Lafayette RS12
2	R8, 16—470 K, ½ w, Lafayette RS10
2	R9, R13—100 K, 1 w, Lafayette RS11
2	R10, R15, 2.7 K, 1 w, Lafayette RS11
1	R11—47 K, 1 w, Lafayette RS11
1	R12—volume control, carbon potentiometer, 1 M, Mallory, Lafayette VC-451
1	R17—150 ohm/1 w, Lafayette RS11
2	R18, R19—100 ohm/1 w, Lafayette RS11
1	R20—wirewound resistor, 2 K/20 w, Lafayette RS118
1	R22—carbon resistor, 150 K/1 w, Lafayette RS11
1	R25—5.6 K/2 w, Lafayette RS12
1	RS26—4.7 K/2 w, Lafayette RS12
1	L1—universal shielded oscillator coil, Miller type 73-OSC, Allied 60H752
4	L2, L7, L9, L10—r.f. choke, 50 microhenries, Lafayette HP141
2	L3, L4—r.f. choke, 2.5 millihenry, Lafayette HP125
2	L5, L6—r.f. choke, 10 microhenry, Lafayette HP140
1	L8—power supply filter choke, 5 henries, Lafayette TA149
1	P1—loop connector, Amphenol 91-MC3M, Lafayette CM165
2	P2, P3—power connectors for loop oscillator, Amphenol type 91-MC4M, Lafayette CM166
2	P4, P5—loop oscillator coaxial cable connectors to control unit, Amphenol type 83-1SP, Lafayette CM-143.
1	P6—power cable connector to battery, Cinch-Jones S-302-CCT 2 contacts, Lafayette S302CCT

No. Req'd.	Size and Description
1	J1—Amphenol type 91-PC3F, Lafayette CM177
2	J2, J4—Amphenol type 91-PC4F, Lafayette CM178
2	J3, J4—Amphenol type 83-1R, Lafayette CM141
1	J6—power connector, Cinch-Jones type P-302-AB, Lafayette P302AB
1	J7—audio output jack, Mallory type A-2A, Allied 41H053
1	T1—vibrator power transformer, Stancor type P-6487, 170 volts dc at 60 MA, Lafayette P6487
1	T2—audio output transformer, Stancor type A-3879, Lafayette TA38
2	Rect 1, Rect 2—silicon rectifier, Sarkes type K200, Lafayette RE40
1	vibrator—interrupter type, Mallory type 1601/859, 6 v, Lafayette VB44
1	power switch—DPDT (DPST only function used) heavy duty switch, Lafayette SW22
1	fuse holder—Buss type HKP, with 5 amp fuse, Lafayette EL181 and Lafayette EL232 (fuse)
2	V1, V7—Vacuum tube, type 6AU6
4	V2, V5, V9—vacuum tube, 6AK6
1	V3—6L7
1	V4—12AU7
1	V6—gas regulator tube, type 0B2

Sockets

1	4 prong, Amphenol type 78-S4, Lafayette CM100
7	7 pin miniature, Amphenol type 147-905, Lafayette CM230
1	9 pin miniature, Amphenol type 59-406, Lafayette CM55
1	octal, Amphenol type 77-MIP-8, Lafayette CM73
1	pilot light, Dialco type 710-123 socket, with #47 bulb
2	stand-off insulators, porcelain, Allied 73H120
1	speaker—PM type, 4 ohm voice coil, 4 inch diameter, Lafayette SK11
1	case—sloping front amplifier case, Bud type CA-1980 Allied 88P-585

Cable (for 100 foot depth)

4′	Amphenol type RG-22A/U coaxial cable, single cond, shielded, Allied 49W894
100′	Amphenol type RG-11/U coaxial cable, one cond, shielded, Allied 47W513
100′	Belden type 8453, 3 cond, power cable to loop oscillator, Allied 47T420
10′	Belden type 8478, 2 cond, power cable to battery, Allied 47T401
4	waterproof feedthru, for ½ inch cable, Pyle-National

Note: All parts listed above can be ordered from the 1960 catalogs of Allied Radio, 100 N. Western Ave., Chicago 80, and/or Lafayette Radio, 165-08 Liberty Ave., Jamaica 33, N. Y.

Loop Assembly

1 pc.	4 x 8′ x ¼″ exterior plywood (loop)
1 pc.	1 x 2′ x ½″ exterior plywood (loop osc. case)
3	eyebolts 1¼″-20 x 1½″ with nuts and washers
1	2″ steel ring
30′	rope, manila or nylon, ⅜″
350′	#12 insulated copper wire
120′	#20 bare or insulated wire, copper
32″	¼-20 threaded rod with wing nuts and washers (for fastening loop oscillator box)
Misc.	assorted hardware for mounting. Fiber glass tape and epoxy resin for covering underwater parts.

Note: Above items available thru local marine supply, hardware and lumber stores

beat is found.

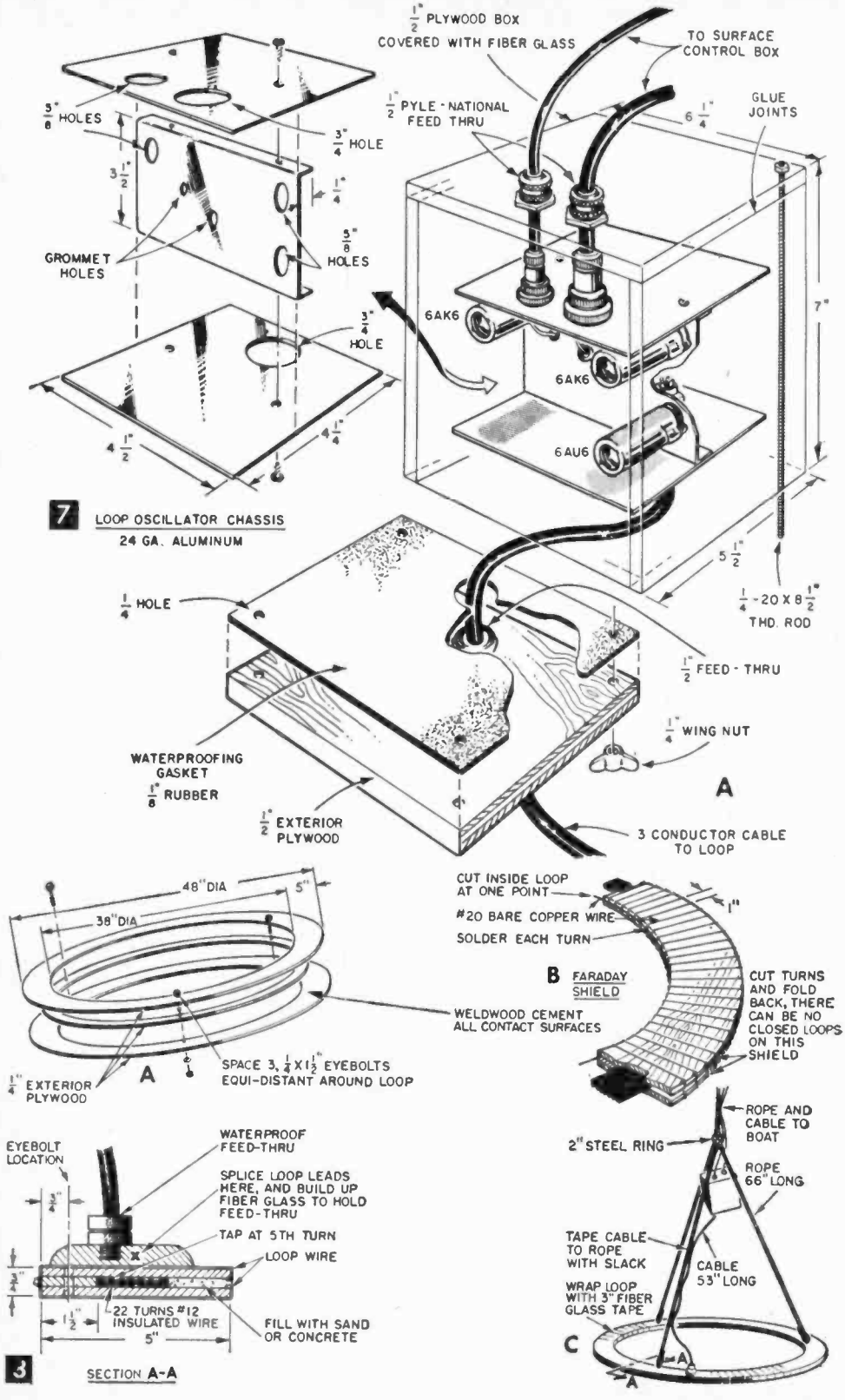
With both oscillators running, you can check your loop (out of water) for these results with metal targets:

SENSITIVITY

Object	Distance
aluminum boat	10 feet
5-gallon can	5 feet
14-in. aluminum pan	4 feet
quart can	2 feet
flashlight battery	2 inches

Waterproofing the Loop. If your unit now performs with equal sensitivity, you are ready to finish construction. Cover the loop completely with 3-in. fiber glass tape and resin. Be sure to build up many coatings of fiber glass to strengthen the area around the coax feed-through (Fig. 8).

Mount three eyebolts on the loop and attach three 66-in. pieces of ⅜-in. manila or nylon rope. Tie these lines to the cables and the line which feeds up to the boat, so that the loop is held horizontally in the water (Fig. 8C). Now permanently connect the loop to the loop oscillator. Be sure after you make the three connections to the loop oscillator



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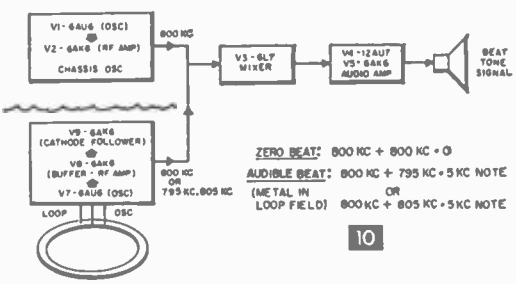

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box, that the plywood and the connectors are completely waterproofed with the fiber glass materials. The tubes will rarely require replacement.

Since your loop has an air space between the wire and the fiber glass, it will not sink. Cut two holes in the outside of the fiber glass, and with the loop leaning against a wall, pour in loose sand or a thin mixture of cement. After the air space is filled, the loop will weigh about 45 pounds and will sink easily.

How the Circuit Works. The metal detector uses two oscillators, one underwater with the loop and the other in the control unit (Fig. 10). The loop functions as the inductance of the loop oscillator V7 which normally functions at about 800 *kc*. The oscillation, amplified by V8 and V9, is fed through one of the cables up to the boat. In the control unit, a similar oscillator (V1 and V2) also supplies an 800-*kc* signal. Both 800-*kc* signals feed to the mixer V3. The beat from these signals is amplified by the audio amplifier (V4 and V5) and fed to the loudspeaker.

When the loop approaches metal, its inductance changes, thus the frequency of the oscillator shifts. For example, let's say we are approaching a submerged outboard motor. The loop oscillator will shift to perhaps 795 *kc*. After beating with the control unit oscillator (at 800 *kc*) a 5 *kc* beat will feed to the speaker giving you a change in the pitch of the tone indicating that metal is present. Tone shift will be reversed for non-magnetic metals.

Metal Hunting Procedure. Lower the loop slightly into the water and adjust C1 for zero beat; the control oscillator at the same frequency as the loop oscillator. (Keep loop 10 ft. away from metal when zeroing.)

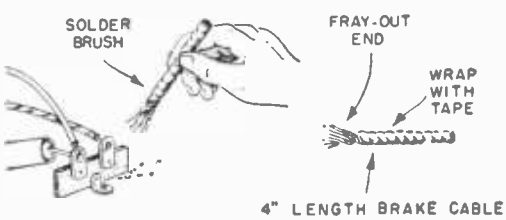
This zero beat method requires about 50 cycles of loop oscillator frequency change for detection. By setting the calibrate (C1) control so you get an audio tone of about 400 cycles (with no metal nearby) you can increase the sensitivity, since the tone will rise or fall in pitch with slight loop oscillator frequency shifts. If C1 is set to the left side of zero, tone will rise for non-magnetic items, and fall for magnetic items. If C1 is set right of zero, action will be opposite. But there is a disadvantage; the continuous tone is annoying, and with the 1-watt audio output of the amplifier can be heard by fishermen 300 feet away. Earphones up to 10,000 ohm can be plugged into the output jack.

To search, with C1 adjusted for zero beat, lower the loop until it strikes bottom. Then raise the cable two or three feet and tie it. Slowly move the boat in a search pattern until you hear a beat. Now you can close in on the object using the tone method if you need the additional sensitivity. Pinpoint the object and lower the loop to it.

The final step is to lower a grapple to retrieve the object. Or leave a marker buoy for the diver to follow. Although the maximum range of detection is 10 feet, the equipment rapidly locates objects that otherwise would be impossible to find in low visibilty waters.

Brush Removes Excess Solder

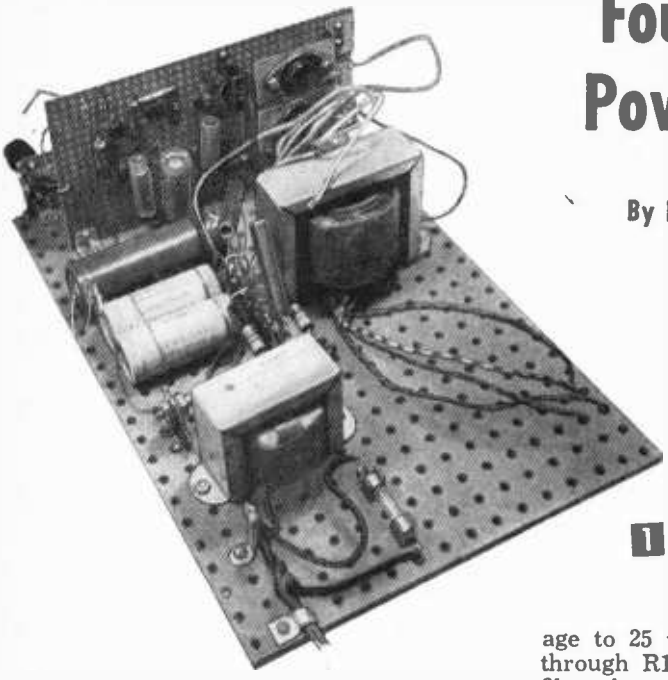
• Brush away excess solder from a terminal while unsoldering compound leads with a small wire brush made from a 4-in. length of wire rope or cable. Auto hand-brake cable



available at auto parts stores and junk yards serves the purpose ideally. Fray out one end of the cable to form "bristles," and provide an insulated grip on remainder of brush by wrapping it with plastic tape.—JOHN A. COMSTOCK.

Four Transistor Power Amplifier

By FORREST H. FRANTZ, SR.



This amplifier works with a microphone, record player or tuner.

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THE cost of this amplifier is about $15, if you have a 12-v. dc power source, or something under $25 if you don't and must build the power supply described in the article. The amplifier may be used mobile (operated from a 12-v. car battery) or it may be operated from 115 v. ac with the power supply described.

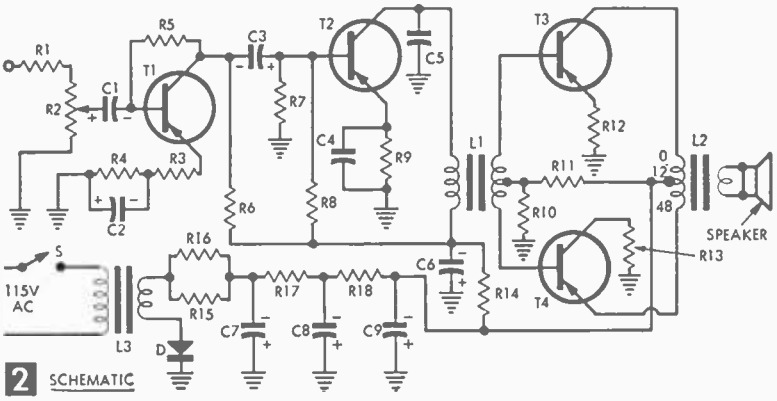
The circuit is shown in Fig. 2. No special adjustments in component values are required. The input impedance is about 55K with the series input resistor or about 5 to 10K depending on volume control setting if the series resistor is omitted. The input series resistor may be omitted if the input device is a low impedance device such as a dynamic microphone, a transistor tuner, or the output of a vacuum tube tuner which has a cathode follower output stage. But, a series input resistor is in order if a crystal phono pick-up provides the input signal.

The power supply employs a half wave silicon rectifier. The transformer L3 isolates the power supply from the ac line and reduces the line voltage to 25 v. for the supply. Resistors R15 through R18 and capacitors C7, C8 and C9 filter the power supply voltage and reduce it to the 12 v. required for amplifier operation. R14 and C6 isolate the first two stages from the output stage and filter the power supply for these stages further.

The amplifier is assembled on a $3^{11}/_{16}$ x $6^{3}/_{4}$-in. miniature perforated bakelite board. Resistors, capacitors and transistors are mounted by passing pigtail leads through the board and bending them over on the bottom side of the board. Connections are made and soldered on the bottom side of the circuit board. Use no more than a 100-watt iron and apply heat sparingly, particularly to transistor leads.

The two power transistors, T3 and T4, are mounted on heat sinks made of $^{3}/_{64}$ or $^{1}/_{32}$-in. aluminum or steel (Fig. 5).

Carefully drill holes in the circuit board



2 SCHEMATIC

TECH TALK

Power transistors have relatively large tolerances within a given type, they require plenty of drive and the coupling of power transistor input and output requires close attention. The matter of transistor bias and stabilization is important, too. Although bias may be adjusted for optimum results for a single copy of an amplifier, this procedure is usually not too desirable.

Power transistors differ considerably from the smaller transistors in the operating currents, impedances, and component values involved. Input impedances become very low. Collector currents range from several hundred milliamps to several amperes. Base currents are in the order of milliamps rather than microamps. Resistance values are on the order of a hundredth or a thousandth of the values of the smaller circuits while resistor power ratings are increased. Resistor capacitor coupling is not practical and power transistors are more difficult to drive. Furthermore, individual transistor tolerances within a given type force more critical attention to circuit values. The danger of ruining a transistor by thermal run-away or excessive back voltage becomes greater.

A number of transistor power amplifier circuits have been described in the literature. Some of these circuits incorporate worrisome adjustments of both the output stage and a power transistor driver stage. Others contain a large number of additional parts to eliminate these problems. When I began the design of this amplifier, I decided that I would be content with less power output if I could use a simple circuit. Even a class A transistor power amplifier stage exhibits considerable non-linearity unless the quiescent current is set to a relatively high value. With a class B amplifier the problem is greater and a regulated power supply becomes mandatory. I therefore decided to stick to class A and accept a low output on this first attempt with push-pull power transistors.

In the input stage (T1) the emitter resistor has been split into two separate resistors, one of them bypassed, and the other not bypassed. The unbypassed portion of the resistor increases the input impedance of this stage. The value of 470K for the base biasing resistor is unusually high, partly because of the relatively high dc voltage supplied, but also because the input signal is relatively low and the stage must not handle very much signal.

for heat sink mounting, transformer mounting and for the mounting brackets. Mount parts on the circuit board as shown in Fig. 3. Then, use Figs. 2, 3 and 4 for guidance in wiring the circuit board. Observe correct polarity in connecting electrolytic capacitors.

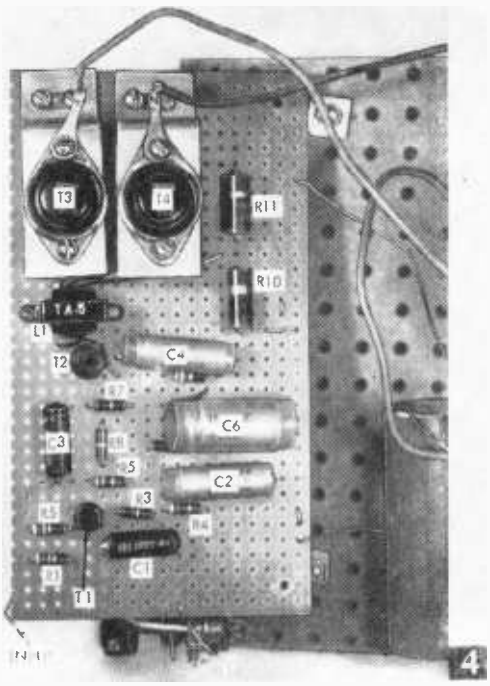
The volume control mounts on a small bracket, which in the original model was a small piece of perforated bakelite board attached to a small right angle bracket. You may make a one piece metal bracket if you wish. A ¼-in. volume control mounting hole is required.

Figure 1 shows the assembled amplifier and power supply. The fuse shown in this figure is not essential. Mount the output transformer (L2) and the power transformer (L3). Only the 0, 12, and 48 ohm primary leads of L2 will be used. Cut off the ends of the other primary leads and bend them out of the way. The secondary leads to be used will depend on the impedance of the speaker you'll be using. There are 4, 8, and 16 ohm secondary taps.

The silicon rectifier is mounted on a tie-down terminal in the original model. Cut the top edge off the terminal and fasten the rectifier in the "fork" that is formed. An alternate arrangement is to mount the rectifier on a metal bracket. Either of these arrangements provide the small heat sink required.

Next, mount the tie-down terminals and capacitors and proceed to wire the power

Left, view of parts mounting on the small circuit board; right, underside view of the small circuit board.



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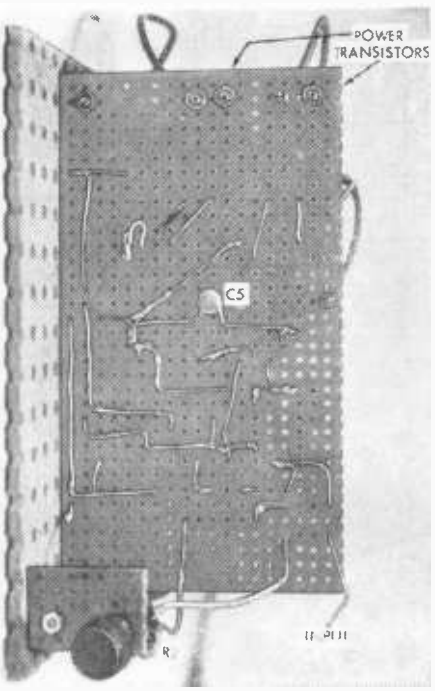

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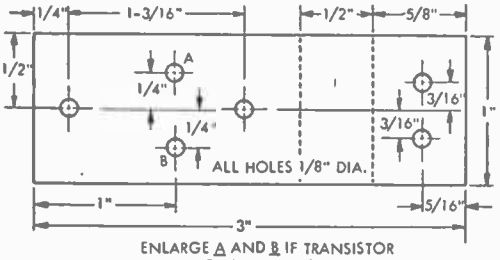
MATERIALS LIST—AMPLIFIER

Desig.	Description
	½-watt carbon resistors, 10%, as follows:
R12, R13	1 ohm
R3	100 ohm
R9	390 ohm
R4, R14	470 ohm
R7	1K
R6	3.3K
R8	5.6K
R1	47K
R5	470K
R15, R16	3.3-ohm, 1-watt carbon resistor 10%
R10	10-ohm, 2-watt carbon resistor 10%
R11	220-ohm, 2-watt carbon resistor 10%
R17, R18	12-ohm, 10-watt wire-wound resistor
R2-S	10K-miniature volume control with switch (Lafayette VC-28)
C5	.01-mfd, 50-v. ceramic capacitor (Sprague TG-S10)
C1, C3	20-mfd, 15-v. miniature electrolytic capacitor (Lafayette CF-122)
C2, C4	100-mfd, 15-v. miniature electrolytic capacitor (Lafayette CF-126)
C6	160-mfd, 15 v. miniature electrolytic capacitor (Lafayette CF-127)
C7, C8	500-mfd, 25-v. electrolytic capacitor (Sprague TVA-1209)
C9	2000-mfd, 15-v. electrolytic capacitor (C-D BR 20001)
L1	1000:200 ohm driver transformer (Stancor TA-5)
L2	universal transistor output transformer (Lafayette TR-94)
L3	115:25-v. transformer, 1A secondary current (Stancor P-6469)
T1	2N508 transistor (GE)
T2	2N188A or 2N320 transistor (GE)
T3, T4	2N307A transistor (Sylvania)
D	1N1115 silicon rectifier (GE)
	ac line cord and plug
	2 transistor heat sinks (see text)
	2 single-terminal tie-down strips
	six-terminal tie-down strip (Cinch-Jones 2006)
	miniature knob (Lafayette MS-185)
	3 1/16 x 6¾-in. miniature perforated Bakelite board (Lafayette MS-305)
	7 21/32 x 11 27/32-in. perforated Masonite board (Lafayette ML-81)

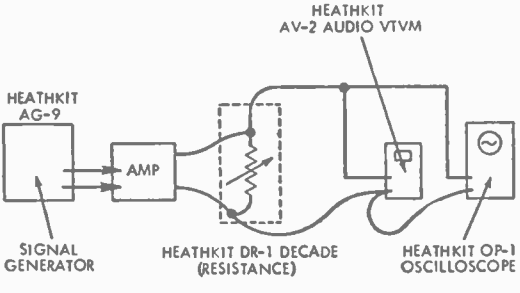
Parts may be obtained from:

Lafayette Radio
100 Sixth Avenue
New York 13, N. Y.



ENLARGE A AND B IF TRANSISTOR PINS TOUCH BRACKET

5 HEAT SINK DETAILS



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supply. When power supply wiring is completed, mount the circuit board and the volume control. Wire these into the circuit. There are two connections from circuit board to power supply, two connections from output transformer to circuit board, and three connections from circuit board to volume control. The switch on the volume control may be connected into the circuit to function as an "on-off" switch (Fig. 2). This is not shown in Fig. 1.

Place tape over exposed 115-v. connections, terminals, and if you connect it, the back of the switch.

Do not turn the amplifier on without a load such as a loudspeaker or a resistor connected to the appropriate tap on the secondary of L2.

Turn the volume control all the way up. Touch the high input lead (R1). You should hear a loud hum in the loudspeaker. If you don't, turn the amplifier off and recheck your wiring.

This amplifier may be used as a phono amplifier, a microphone amplifier, or as a tuner amplifier. It may also be used as an audio signal tracer or as a general purpose amplifier for experimental purposes.

The voltage gain is about 40 db (about 100) with R1 in the input circuit (high impedance input). The voltage gain with R1 shorted (low impedance input) is about 60 db (about 1000). These measurements were made at 1000 cycles. Gain is down 3 db at about 200 cycles at the low frequency and at about 7000 cycles at the high frequency end of the spectrum. This isn't hi-fi by a long shot, but the quality is adequate for general purpose and public address use.

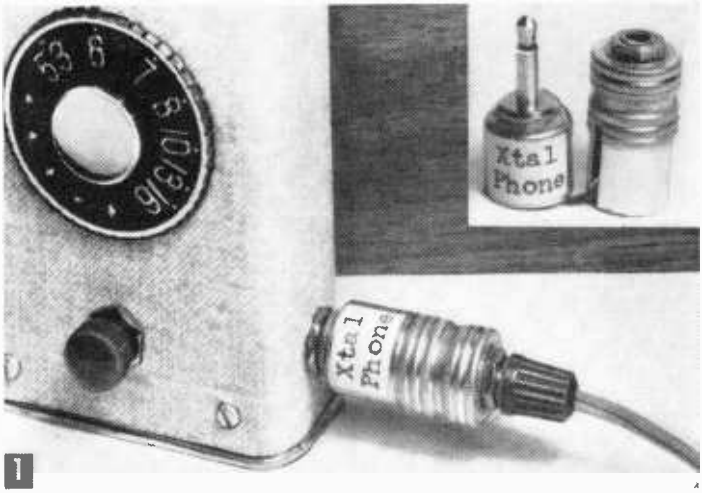
The amplifier as described has a usable power output with reasonable distortion of about 2 watts. To measure the output, hook up as shown in Fig. 6. Adjust the decade box resistance to 8 ohms and connect the decade box to the 8-ohm secondary connections on the output transformer. The scope and audio voltmeter connect across this 8-ohm load. If you have a calibrated scope such as the Heathkit model OP-1 shown in Fig. 6, the audio voltmeter is unnecessary. Increase the signal generator output till you can just detect distortion of the waveform. Read the rms voltage on the audio voltmeter (or divide peak-to-peak voltage measured on the scope by 2.82 to obtain rms). Square this voltage and divide by the load resistance (8 ohms) to obtain power output in watts. Thus, in the original model the measured output voltage was 3.74 v. Squaring 3.74 you obtain 14. Finally, 14/8 equals 1.75 watts

To determine the voltage gain, simply measure the input voltage without changing anything. Then the voltage gain is simply the output voltage divided by the input voltage.

Crystal Earphone Adapter

Most factory-built and home-made transistor radios are designed to use magnetic earphones. This adapter lets you use crystal phones too

By ART TRAUFFER



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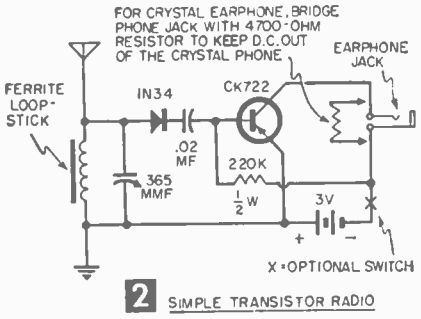
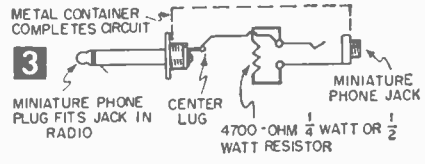
To use the crystal earphone, simply plug the adapter into the radio's phone jack. A two-piece metal lipstick container with friction top holds jack, plug, and resistor. Note the single flexible lead connecting the parts. The metal case completes the circuit.



2 SIMPLE TRANSISTOR RADIO

The battery voltage is cut off when you pull the phone plug, but for convenience add a toggle or slide switch at X.



3

CRYSTAL earphones are lightweight, sensitive, and inexpensive. Their frequency response is good, and usually a cheap crystal phone sounds a lot better than a magnetic phone in the same price bracket.

To use the crystal phone in a typical circuit (Fig. 2), it's necessary to bridge the earphone jack with a resistor to keep d-c current out of the crystal phone. A 4,700-ohm, ¼- or ½-watt resistor does the job, and incidentally, this one-transistor circuit is an excellent beginner's project.

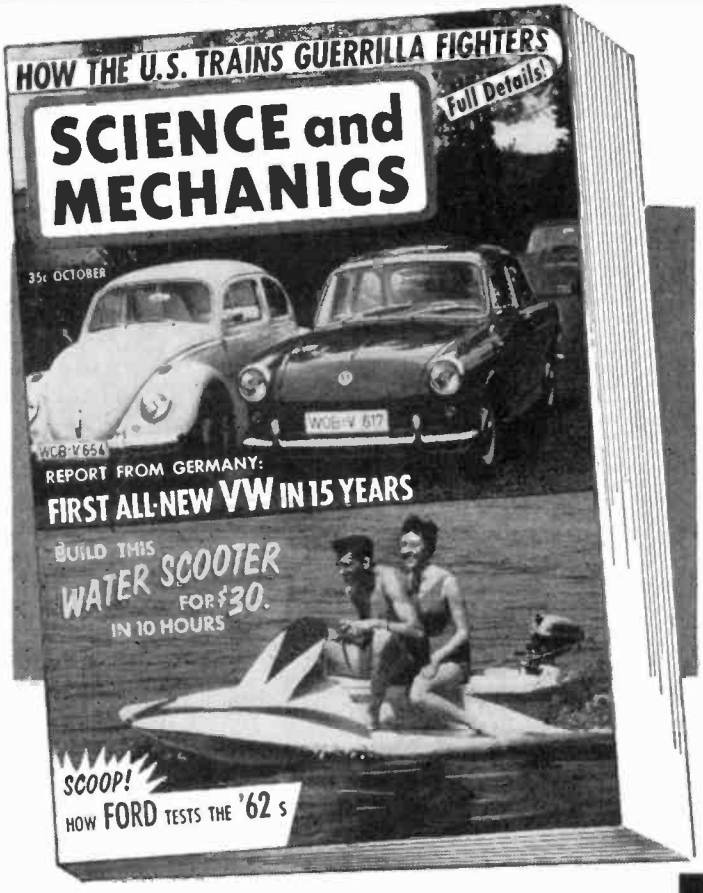
To make the adapter, your first step is to buy a miniature jack that fits the plug on your transistor radio. Unfortunately, these plugs are not all one standard size. Looking at pages of Allied Radio and Lafayette Radio catalogs, you'll find several domestic and import makes of various size jacks and plugs.

Sometimes it's possible to file down the prong of a miniature plug to fit another brand of jack. Another way to do the job is to gently chuck the jack in a lathe or electric drill and run the jack's prong up against a fine-toothed file, followed with fine sandpaper until the size is right.

Make the adapter case (Fig. 1) by cutting down a metal lipstick container. The two-piece one shown (Tangee brand) has a friction lid and is available in dime stores for about 30¢. Saw off both ends so that the overall length closed is about 1 in. Punch a hole in the center of the top with a sharp tool, and enlarge with a small file to the size of the threaded shank of the phone plug. Make another hole the same way in the bottom for the jack. Solder the plug in its hole. The case completes the circuit between the jack frame and the plug frame (Fig. 3).

Now solder a short length of insulated flexible wire from the center lug on the plug to the "high side" center lug on the jack. Solder the 4,700-ohm miniature resistor across the terminals of the jack. You can also use a small plastic pill box instead of the metal container, provided that you run two wires to complete the circuit. Remember that this adapter is intended for use with transistor radios that do not use an output transformer for the earphones. The same construction idea works well in making adapters for various plugs on tape recorders and amplifiers.

Coming in the Oct. Issue



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AT ALL NEWSSTANDS

Midget ELECTRONIC ORGAN

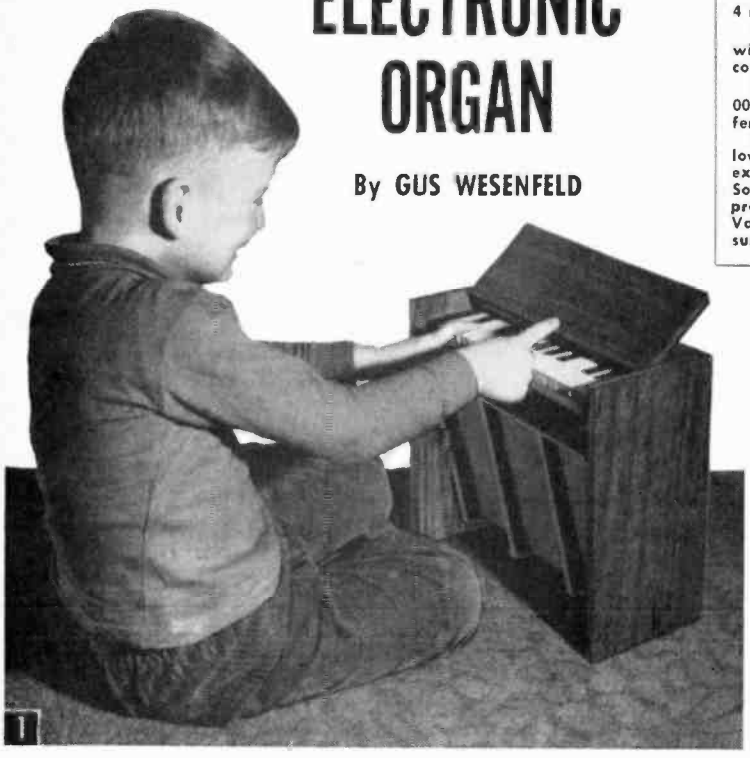
By GUS WESENFELD

RECOMMENDATIONS

Performance of the electronic organ described in this article can be greatly improved by the following changes:

1. Use 5 mfd capacitor in place of 4 mfd unit.
2. Use a larger cored transformer with greater inductance and better coupling.
3. Replace 2500-ohm pots with 25,000-ohm pots, with audio taper preferred.

The above changes improve both low and high frequency performance, extending range beyond five octaves. Sound quality may be further improved by the use of larger speakers. Variations in transistors can produce surprising tonal results.



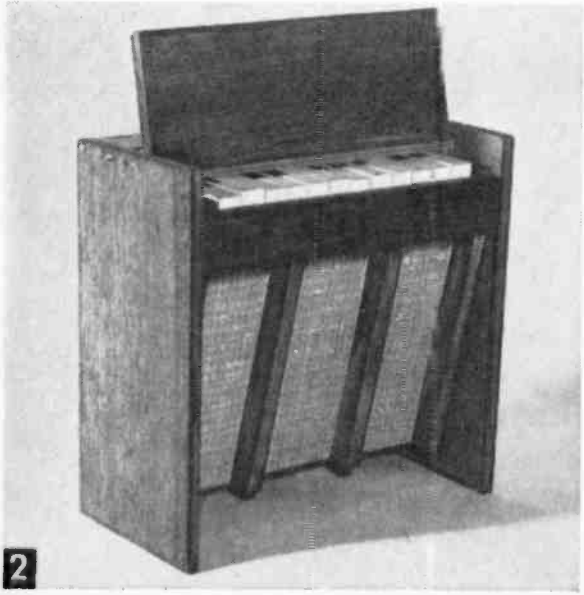
The range of the organ compares to 12 white keys on a piana, enough to play almost any simple melody. If you tune the instrument to a low range, the saund is a lot like a tenor sax. Tuned to a high range, it's like a flute or piccolo.

THE clear mellow tones of this 12-note toy organ will entertain young children for hours at a time, and will help to get them interested in learning to play more advanced musical instruments.

Though you can build the project in an evening or two with a parts cost that should total less than $9, the transistorized organ delivers lusty loudspeaker volume and boasts individual pitch tuning controls for each of the 12 keys. For tot's play, it offers an important safety feature; no danger of shock from a-c cords and plugs. The organ is powered by two self-contained harmless flashlight batteries.

First Cut the Keyboard switch plate (Fig. 3). It should be dead square on the corners, since the rest of the cabinet must line up true around this board. Now cut the keys. You can make them from the same ½-in. lumber that is used for the case. If you are working without a power saw, it would be best to have the lumber yard saw about 5 ft. of ½-in. board down into ½ x ¾-in. strips. The keys and keyboard plate are the only parts that require sawing accuracy; the rest of the cabinet you can make with ordinary hand tools.

Drill 3/32-in. holes through the keys

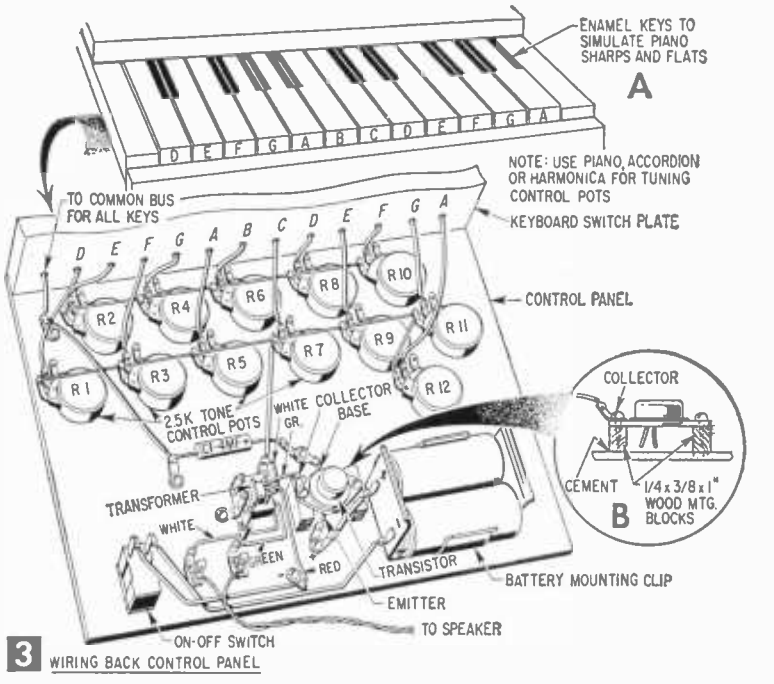


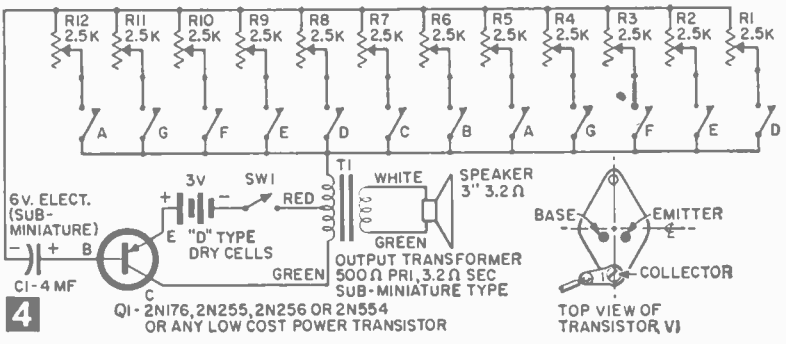
Chassis and keyboard are an assembly around which you can design your own cabinet. If you wish, you can even add keyboard sharps and flats.

(Fig. 5) for the pivot rod. You can make this rod of coat hanger wire, provided that you add a supporting screw-eye (Fig. 5A) in the center. Or substitute a length of welding rod or curtain rod for greater stiffness. Notch the keys on the sides so the rubber bands will clear. Then cut and drill the two pivot blocks. Now you're ready to make a trial assembly. Be sure to use screws to fasten the pivot blocks to the keyboard plate, since you'll be adding wire connections later.

Now, with the keyboard assembly finished, cut and drill the 1/8-in. hardboard control panel, and glue it to the keyboard plate as in Fig. 5. At this point paint the keys, using white enamel, with black strips to simulate the sharps and flats according to Fig. 3A.

Wiring. Cut twenty-four 6-in. lengths of #22 ga. bare tinned copper wire, and use resin core solder to connect to tacks as in Fig. 5A. Run these leads back to the ter-





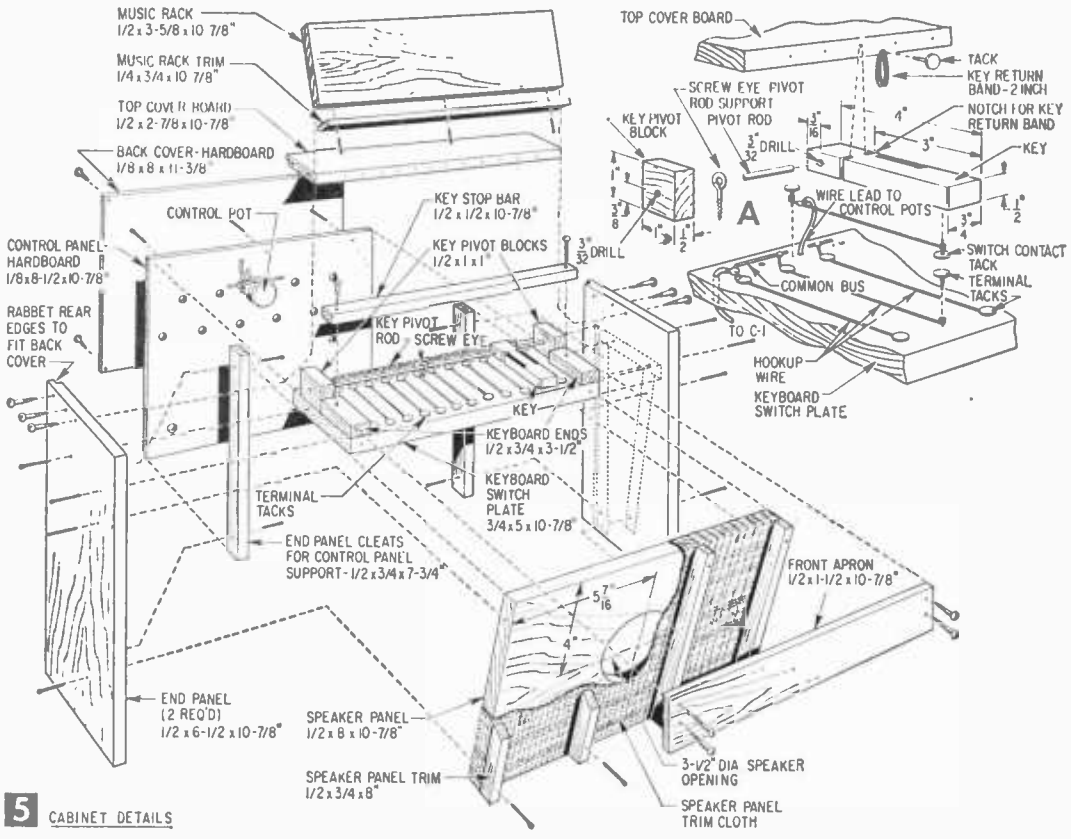
MATERIALS LIST—MIDGET ELECTRONIC ORGAN

No. Req.	Size and Description
	ELECTRONIC ITEMS
1	Q1 power type transistor, KitKoa* SC-67 ($1.50) or equivalent
1	T1 subminiature output audio transformer KitKoa* T-51 (90¢) 500 ohm CT to 3.2 ohm DC
1	C1 miniature electrolytic capacitor, 4 mfd. 6 volt, KitKoa* 6E-5 (30¢)
1	3" miniature loudspeaker, 8 ohm or 3.2 ohm KitKoa* R-27 ($1.30)
12	R1 to R12 2.5K tone control pots KitKoa* R-25 (30¢ ea.)
1	SW1, SPST toggle switch, KitKoa* S-737 (48¢)
1	battery holder for 2 size D cells, KitKoa* BH-1 (38¢)
2	B1, B2 1½ volt dry cells
5 doz.	brass or steel thumb tacks, available in stationery stores
1 doz.	2" rubber bands
1 doz.	#6 1¼" rh wood screws
Misc.	one 3-in. terminal tie strip, 1 box solder lugs, 10' #22 tinned copper wire

* Priced KitKoa items can be obtained separately or as a kit from KitKoa Distributors, 184 W. Washington St., Chicago 2, Ill., $8.40 postpaid.

No. Req.	Size and Description	Use
	KEYBOARD AND CONTROL BOARD	
1	1/8 x 8½ x 10⅞" hardboard	control panel
1	¾ x 5 x 10⅞" hardboard	keyboard switch plate
12	½ x ¾ x 4" pine or mahogany	keys
2	½ x 1 x 1" pine or mahogany	key pivot blocks
1	½ x ½ x 10⅞" pine or mahogany	key stop bar
2	½ x ¾ x 3½"	keyboard ends
	CABINET	
2	½ x 6½ x 10⅞" pine or mahogany	end panels
1	½ x 8 x 10⅞" pine or mahogany	speaker panel
1	½ x 2⅞ x 10⅞" pine or mahogany	top cover board
1	½ x 3⅝ x 10⅞" pine or mahogany	music rack
1	½ x 1 1½ x 10⅞" pine or mahogany	front apron
1	⅛ x 8 x 11⅜" pine or mahogany	back cover
Misc.	trim for front, music rack, cleats, speaker panel grill cloth, screws, nails, cement	

Mahogany lumber is available Craftsman Wood Service, 2727 S. Mary, Chicago 8, Ill.



5 CABINET DETAILS

minal tacks on the rear of the keyboard plate, and connect together. Be sure that no solder residue remains on the tacks to cause poor contact. The key contact tacks must hit cleanly, and you may need to polish the tack surface with fine sandpaper.

Assemble the tone control pots on the control panel and run the feed wires through the switch plate to the pot lugs.

Mount the battery clip, switch and Fahnestock clips for the speaker connection. The transistor's case (Fig. 3B) is part of its circuit, so be sure to mount it on the insulating support blocks. When you solder the two connecting wires to the transistor leads, be sure to use a heat sink—a clip, or long nose plier on the leads to prevent soldering iron heat from harming the transistor.

Testing and Tuning. With the remaining connections completed, you can temporarily connect the speaker, insert batteries, and test the instrument. The first note is A; two notes below middle C on a piano. Tune by rotating the corresponding tone control pot.

If you find that you cannot tune down to this note, it may be due to differences in the performance of the low cost transistors used. A .5 mfd capacitor added in parallel to C1 and C2 will lower the pitch. At the other end of the scale, you should easily be able to tune up to E. Again, test each key for operation.

Cabinet Construction. With wiring completed, cut the 3½-in. round hole in the speaker panel. Cover with grill cloth, and install the speaker. Saw and sand all of the remaining parts, and finish with wood stain and varnish. Then nail the speaker panel between the end panels, install the cleats, fasten the top cover board in place with screws, and run 2-in. rubber bands around the keys up to the tacks. Use the two screws on the ends of the key stop bar to level the keys to the best position.

Your final step is tuning each note. The rear cover panel fits into the rabbeted edges of the end panels to keep prying fingers away from the tone controls. The unit should operate for at least 20 hours on fresh batteries. Keep the switch off when not in use, and if you find that low notes sometimes sound weak, check your key contacts and battery voltage. You'll find that larger speakers—for example, salvaged car radio speakers—will make a big improvement in tone. Also, by adding separate oscillators for each note, a more complete instrument could be built.

One-Tube Loudspeaker Radio

A beginner's project, with theory explained

By FORREST H. FRANTZ, SR.

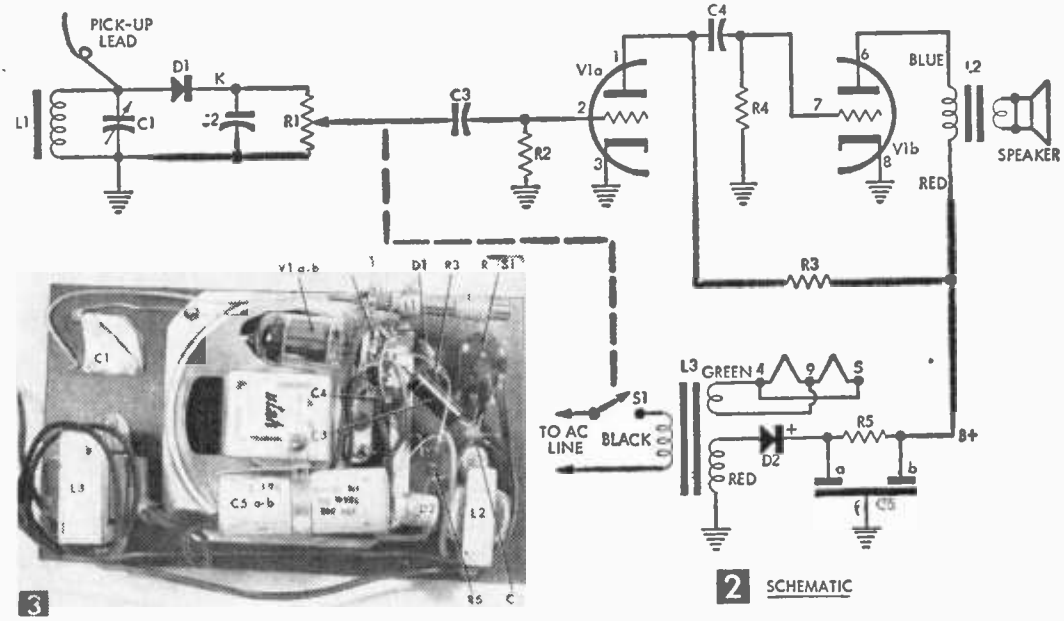
Building this simple receiver will teach you the fundamentals of radio.

THIS simple one-tube loudspeaker radio actually is a two-tuber since there are two triode tubes in the 12AU7 glass envelope. Twenty years ago it might have taken four tubes (diode detector and rectifier tubes in addition to two triodes) to obtain the same result. Now tube engineers have introduced new tubes with even more functions in one envelope—two of these "compactrons" replace the 5 tubes of a superhet.

Cut a 4½ x 8½-in. panel of ⅛-in. Masonite or plywood. Prepainted Masonite of the type used for bathroom and kitchen paneling was used in the original model. File the edges. Drill holes following Fig. 4. Saw volume control shaft to ½ in., holding shaft in vise.

Mount loudspeaker, tuning capacitor, volume control, output transformer, and power transformer following Fig. 3. Note that a bracket fastens under one of the loudspeaker mounting nuts. This bracket comes straight, with the antenna coil. Put the right angle bend ½ in. from the end with the small hole. Solder the tube socket in place on the bracket being careful not to interfere with the space required to mount L1 on the bracket. Be careful also to position the socket so that the tube may be inserted without interference from the loudspeaker. Mount C5a-b on the loudspeaker. Use one of the holes on the magnet frame.

Proceed with wiring and soldering. Wire the power supply and connect the heater wir-



2 SCHEMATIC

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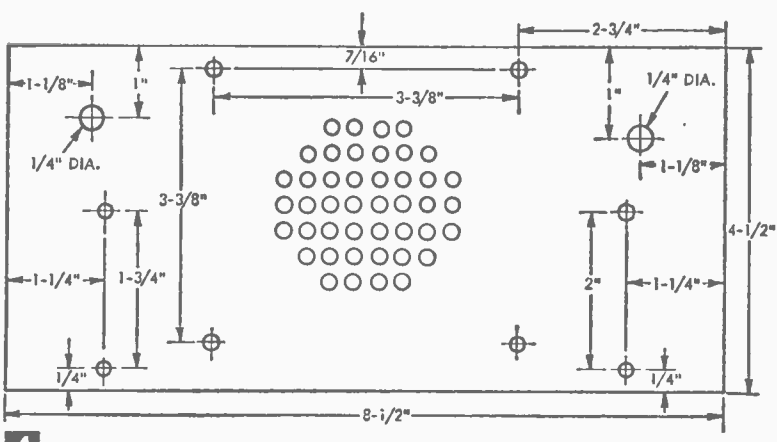

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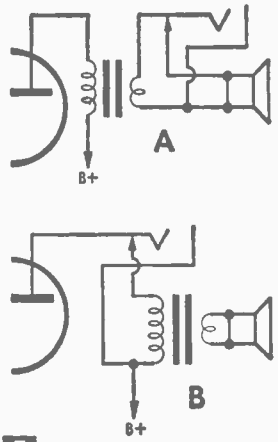
ALL HOLES 1/8" DIA. EXCEPT AS SHOWN.

Panel layout of the receiver.

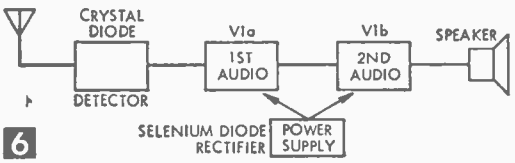


5

MATERIALS LIST—ONE-TUBE RADIO

Desig.	Description
R5	2.2K, ½ w carbon resistor (10%)
R3	270K, ½ w carbon resistor (10%)
R2, R4	10M, ½ w carbon resistor (10%)
R1-S1	50K miniature volume control with switch (Lafayette VC-31)
C2	100 mmf., 1000 v. ceramic capacitor (Sprague 5GA-71)
C3, C4	.02 mf., 200 v. capacitor (Cornell-Dubilier Cub)
C5a-b	50-50 mf., 150 v. electrolytic capacitor (Lafayette C-106)
C1	365 mmf. miniature tuning capacitor with tuning dial (Lafayette MS-445)
L1	ferrite antenna loop coil (J. W. Miller 6300)
L2	output transformer (Lafayette TR-10)
L3	115/115 and 6.3 v. power transformer (Stancor PS 8415)
D1	germanium diode (Raytheon 1N66)
D2	20 ma. selenium rectifier (Federal 1159)
V1a-b	12AU7 dual triode
SPKR	4 inch 3-4 ohm PM loudspeaker (Lafayette SK25)
	9 pin tube socket (Amphenol 77-MIP-9)
	⅛ x 4½ x 8½ inch Masonite panel
	miniature knob (Lafayette MS-185)
	ac line cord and plug

Parts for this project available from
Lafayette Radio
100 Sixth Avenue
New York 13, New York



6

ing first. Watch polarities on C5a-b and D2. The ground symbol in Fig. 2 indicates common connections. Ground connections for C5a-b may be made by soldering the negative pigtail of C-5a-b to the mounting clamp. Other grounds may be soldered to the lugs provided on the mounting shell of the tube socket. Be sure to tape the junctions of the ac power cord and transformer primary leads.

Next, connect the output transformer secondary to the speaker terminals. Wire the amplifier portion of the circuit. Then mount L1 and wire the detector circuit. C1 and D1 can be damaged by excessive soldering heat.

Unwrap the loose pick-up wire lead on L1. Insert tube, fasten volume control knob and the tuning capacitor dial.

Connect an antenna wire through a 25-mmf capacitor or twist the insulated pick-up lead and the outside antenna together so that the two leads in proximity form a capacitor.

Adjust the screw adjustable slug on L1. The sensitivity of the receiver is greatest with the slug adjusted for maximum inductance. But this may make it impossible to tune the low end of the broadcast band with the tuning capacitor. The best compromise is to set the capacitor to nearly full mesh and adjust the loop coil slug to receive a local station that has a frequency somewhere between 550 and 650 kc.

Provisions for headphone reception may be incorporated by altering the circuit as in Fig. 5a. When the headphones are plugged in the speaker is silenced. This arrangement does not provide an effective increase in sensitivity. If the arrangement of Fig. 5b is employed there is a considerable gain in effective sensitivity. However, this arrangement has the disadvantage of placing B+ voltage on the headphones. If the headphones have exposed terminals or if one of the headphone coils becomes grounded this arrangement is dangerous.

As protection against the possibility of someone touching a hot lead, some sort of cabinet should be provided.

How It Works. Refer to the circuit diagram, Fig. 2. The r.f. signal is induced in a short antenna lead or introduced through a small coupling capacitor from a longer antenna. The loop coil L1 also picks up a considerable amount of signal. Loop coil L1 and tuning capacitor C1 form a resonant circuit which permits tuning. For a given setting of C1 a given frequency signal voltage is multiplied many times while signals at other frequencies are not multiplied nearly as much. This voltage appearing across C1 is rectified by diode D1 and is filtered by capacitor C2. The output

across C2 and the volume control is an audio voltage.

R1 is the volume control. All of the audio signal appears at the top of R1 (with reference to ground). The output signal is proportional to the R1 slide setting. That is, full volume occurs when the slide is near the top of R1 and output volume decreases as the slide is moved toward ground.

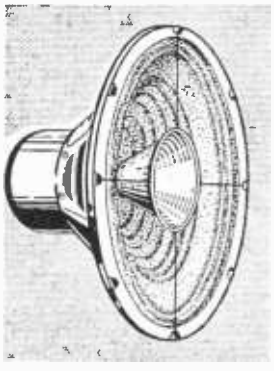
The audio signal is coupled through C3 to the grid of triode V1a. Note that this coupling capacitor is small (.02 mfd.) and inexpensive in contrast to the coupling capacitors in transistor circuits. (Transistor circuit coupling capacitors are usually 1 to 20 mfd.!)

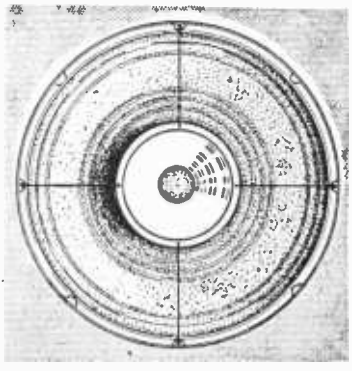
Resistor R2 is quite large (10 meg) and provides grid bias for the tube. This "zero biasing" eliminates the cathode resistor and large electrolytic capacitor required for the more frequently encountered "self-biased" audio amplifier circuit.

The amplified signal at the plate of V1a is coupled to the grid of V1b through capacitor C4. This capacitor permits the audio signal to reach the grid but prevents the dc voltage furnished to V1a through load resistor R3 from reaching the grid of V1b. R4 provides grid bias for V1b. L2 reflects the low impedance of the loudspeaker to the plate of V1b as a much higher impedance. The audio signal at the secondary of L2 is converted into acoustic energy at the loudspeaker.

S1 is the on-off switch. L3 isolates the ac line from the set and provides 115 v. and 6.3 v. for the plate and heater power respectively. The 115 v. ac is rectified by the selenium rectifier D2 to provide pulsating dc. C5a-b and R5 filter the pulsating dc to give smooth dc.

Improving Loudspeaker Performance



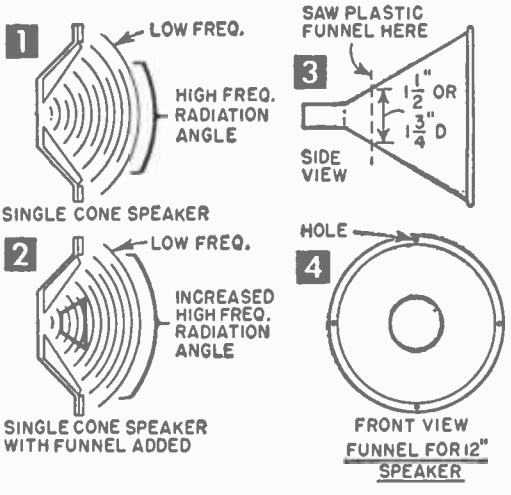


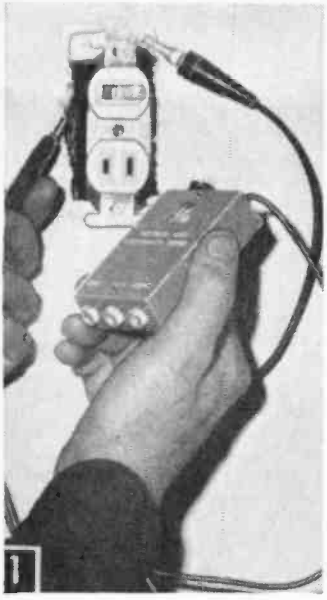
A LOUDSPEAKER cone radiates high frequency notes from the center of the cone in a narrow beam, while low frequencies are radiated from entire surface of cone at a very wide angle (Fig. 1). This is true even with better quality speakers of the single cone type, making it almost necessary to sit in front of the speaker to enjoy the highs in the best phono records or in an FM broadcast, particularly with amplifiers which have a good high frequency response.

You can improve loudspeaker performance by mounting a 10-cent plastic funnel in center of speaker cone (see drawings) to spread the highs by allowing part to pass through center of funnel, while funnel sides force remainder out at an angle so they can be heard better all over the room (Fig. 2). The better quality single cone speakers, such as the Jensen P12-SX (pre-war model number PM12-CT), and the General Electric S-1201D, will especially benefit by this simple installation since they have an extended range up to 10,000 *cps* with some contribution to the 12,000 *cps* region, and perhaps higher.

Use a funnel 4½ in. in dia. and 4½ in. deep. Saw off spout (Fig. 3) so there is an opening in bottom of funnel about 1½ or 1¾ in. in dia. Size of opening in bottom of funnel depends on size of high-frequency radiating area in center of cone, and on amount of highs you want to pass through funnel. Drill or burn with a hot needle 4 small holes through rim of funnel and suspend it in front center of speaker cone by means of strong fish line cord or small wire. Bottom of funnel should clear cone of large speaker by at least ½ to ⅝ in. to prevent damage to cone.

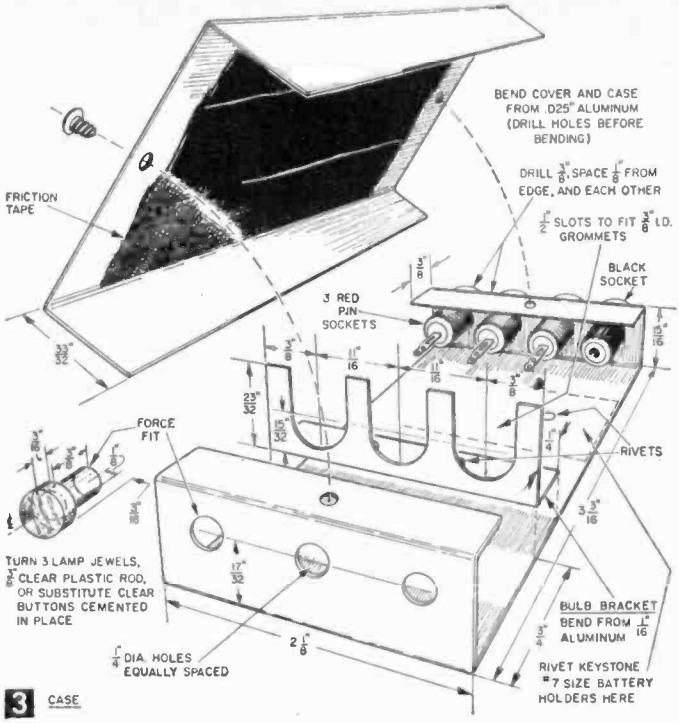
Dimensions given in this article work well with a 12 in. speaker; use a smaller funnel for an 8 in. speaker, and a larger one for a 15 in. speaker. —ARTHUR TRAUFFER.





Fasten the common clip to ground, and you can use the probe to check for shorts with the neon bulb. With the probe connected to the 24V range, you can test car wiring, as well as door bell and model train wiring.

This automatic coffee pot failed to shut off after the proper brewing time. A continuity test showed circuits properly connected, while the a-c test pointed to a defective thermostat.



Volts-Shorts Tester

Smaller than a pack of king-size cigarettes, this $3 tester checks appliances, a-c wiring, and low voltage wiring, too

By JAMES A. FRED

COMPACT size and low cost of this tester makes it a practical addition to any tool box. It's small enough to fit an electrician's shirt pocket or, kept in a car's glove box, it's handy for checking ignition shorts on the road.

Make the case of a 2⅛ x 5 13/16-in. piece of .025-in.-thick aluminum. You can get this type of metal at most lumber yards and hardware stores. A satin-finished sheet called store front aluminum is available in glass shops. Or you may have a surplus control box that you can cut down to size.

Drill the holes according to the layout (Fig. 3). Then, use a vise with a wood block to bend the case to shape. Make the bracket of a piece of .050 or 1/16-in. thick scrap aluminum. The secret of the tester's small size is the way the bulbs are mounted on grommets to save space. The 3/8-in. I. D. grommets just fit the ½-in. slots in the bracket. If you use plain aluminum, you may want to give it a satin finish before wiring by dipping it in a strong solution of household lye.

The small pin jacks (Fig. 3) usually come with spring toothed washers, but to save space simply force them into the

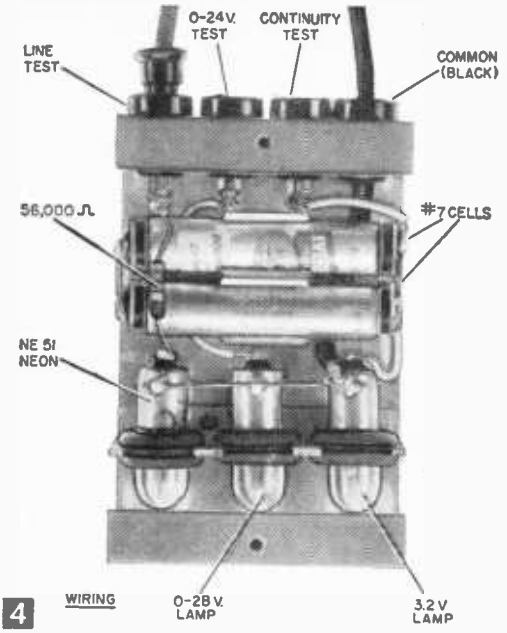
MATERIALS LIST—VOLTS-SHORTS TESTER

Amt. Req.	Size and Description
1	Bud aluminum minibox, CU=2117A (NE #91F540)
3	Amphenol 78-1L red socket (NE #39F184)
1	Amphenol 78-1L black socket (NE #39F185)
1	Amphenol 71-1L plug, red (NE #39F192)
1	H. H. Smith red test prod, type 302 (NE #36F930)
1	Mueller Crocodile clip, No. 85 (NE #28F507)
1	Mueller insulator, black, No. 87 (NE #28F547)
3 ft.	Belden red test lead wire, No. 8899 (NE #36F005A)
3 ft.	Belden black test lead wire, No. 8899 (NE #36F006A)
1	GE NE51 neon bulb (NE #25F031)
1	GE 1829 28V light bulb (NE #25F115)
1	GE 1490 3.2V light bulb (NE #25F112)
3	G-C rubber grommets, ½ inch mounting hole (NE #H036-F)
2	Burgess No. 7 pen cells, (NE #49F263)
1	Keystone battery holder (NE #28F851)
1	IRC GBT ½w, 56,000 ohm resistor (NE #13F000)
3	pilot light lens cap (NE #25F1211)
Misc.	store front aluminum sheet, see Fig. 3, for case

NOTE: The above listed stock Nos. are from catalog of Newark Electronics, 223 W. Madison, Chicago 6, Ill.

holes at the back and fasten with a drop of plastic model cement. Remove the spring clips from the common jack, and pass the black test lead right through and solder directly to the common wire lead that connects across the shells of the three lamps. These bulbs will have a long life in the tester, so solder connections directly as in Fig 4. Make the three lamp jewels (Fig. 3), or substitute clear plastic buttons, cemented in place.

Your tester has three circuits. With the test plug in the line jack (Fig. 1) the neon bulb in series with the resistor tests 115 volts a-c or d-c. With your test lead plugged into the second jack, you can check 0-24 volts a-c or d-c wiring of cars, door bell circuits, and model train wiring. The third circuit puts the lamp and battery in series for testing (with power off) low resistance cords, fuses, light bulbs and appliances. A handy accessory that you can make of a 4-in. length of copper or brass is a pointed test prod that fits the jacks.



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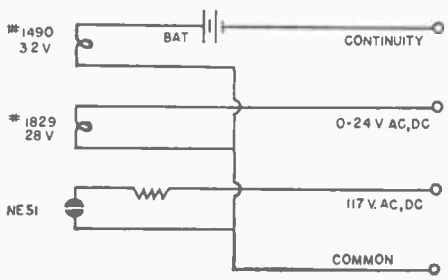

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Cover it with a length of plastic to protect the operator from shock. Complete the tester by adding decals or typewritten labels.

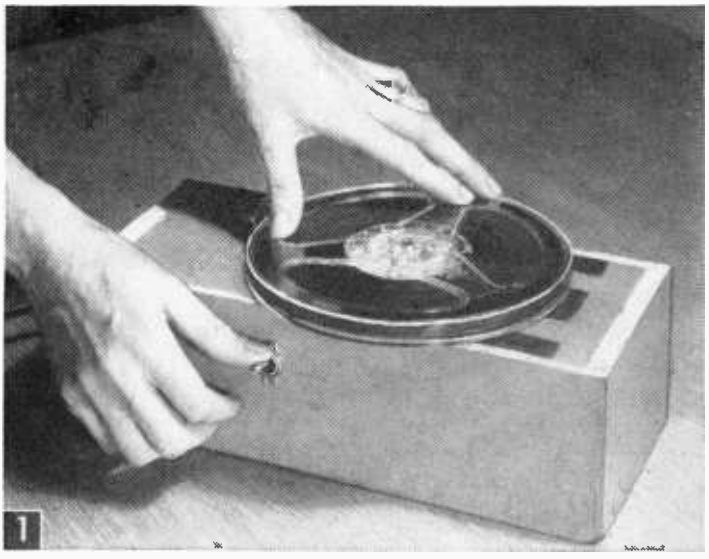
Solution to

Hi-Fi Anagram,

page 119

Improvised Pendant Switch

• When the pendant switch on your kitchen, bathroom or shop ceiling light breaks, here is a substitute that will serve until a new pendant switch is obtained. Remove the broken switch, and wire a push-button lamp socket in its place. Then turn a 15-amp. fuse into the socket to complete the circuit, and the socket will operate in the same way as a pendant switch.—Wm. Swallow.



Almost instantly, the tape recording is erased. Just put your reel on the spindle, turn power on, and rotate slowly 2 turns. Then slowly lift reel away—with power left on.

Bulk Tape Eraser

This big magnetic tape eraser can also demagnetize tools. Or plug into d-c current, and you can magnetize iron or steel

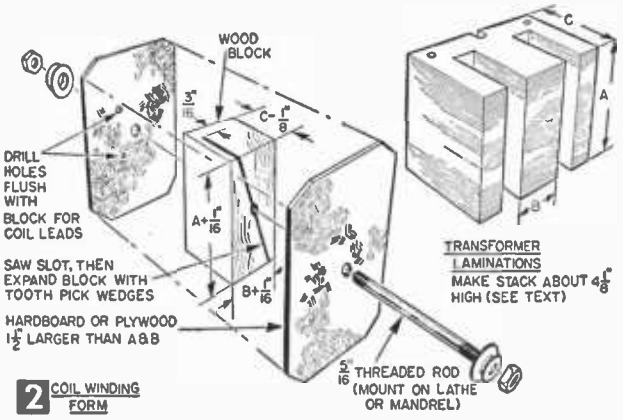
By TED LeBARON

BIGGER and huskier than most commercial tape erasers, the dense magnetic field of this 4½-in. ac electromagnet does a thorough job of erasing every trace of sound from your recorded tapes, no matter how large the reels may be.

Most tape recorders do an acceptable job of erasing, but try this test and you'll be surprised. Take a reel that has been recorded heavily with a musical number, and run it through on *erase*. Then play the tape back with your volume set up high. You'll probably hear a lot of background noise. Some of it you can eliminate by running the tape through on erase a second time. But if you're a hi-fi enthusiast interested in getting the best quality reproduction you'll want to get rid of every bit of that background noise before you record fine music.

Another reason for using a bulk tape eraser (Fig. 1) is that the erasing process is quick—you won't tie up your recorder, and there is a lot less recording head wear. Also it simplifies tape editing. If you use a recorder for dictation, you'll be able to erase your tape reels for re-use quickly.

Start construction by making an E-shaped stack of transformer laminations about 4⅛ in. high. By special arrangement with a transformer manufacturer, you can order the laminations shown in Fig. 2 for $7.15 postpaid (see Materials List). Or you could salvage the metal from an old transformer.



2 COIL WINDING FORM

Run two 3/16 x 4½-in. stove bolts through the corner holes in the laminations, and tighten up the stack with nuts and lockwashers. Then put the assembly, with the open side of the E pointing down, on a hard smooth wooden block or table top. Tap the back of the laminations lightly with a hammer and a wooden block until the front face is as smooth as possible. Straighten the sides the same way, and when the whole stack is as smooth as you can get it, snug down the bolts to hold it that way. Use a fine mill file to smooth down the ends of the laminations. The core's top face should look like a solid piece of metal. A belt sander with an emery belt will save time. Round the top corners of the "E" so there are no sharp edges to catch the reel.

Now Make a Winding Form. You'll need a block of wood and two side pieces of plywood or hardboard as shown in Fig. 2. Make this form 1/16-in. larger than the center leg of the core, so that the windings will fit over the core. Make the bobbin's width (the space between the side pieces) 1/8 in. less than the depth of the slot of the E laminations.

Drill a hole for a 5/16-in. bolt or threaded rod through the block, and then saw a slot diagonally across the face of the block almost all the way through. Use round toothpicks to wedge this slot open slightly. After the coil is wound, you pull the wedges to make it easy to remove the coil.

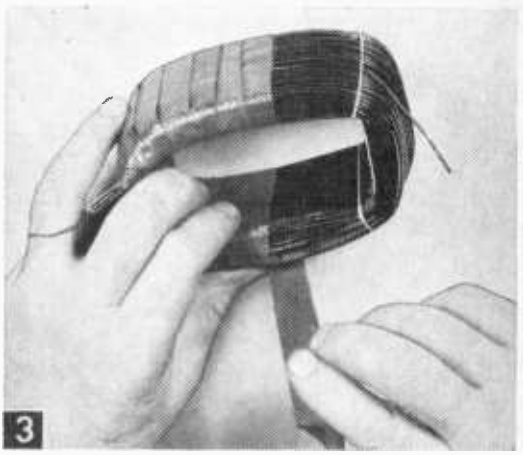
Assemble the winding form with large washers to support the sides. Drill a small hole through one end flush with the inside block for the starting end of the wire.

The coil can be wound entirely by hand, but the job will cramp your fingers. You can use a small clamp to hold the wire in place while you rest. A lathe (Fig. 5), a grinding arbor, or even a hand drill mounted in your bench vise can make the winding a lot easier, with the coil form solidly supported.

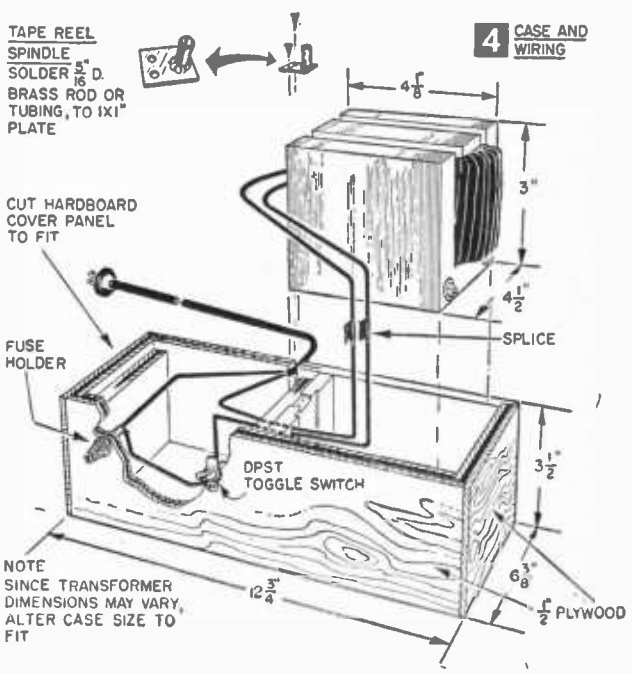
Cut some stiff paper to fit between the ends of the form. Wrap four layers around and secure with plastic tape. Tape four pieces of string across the bobbin with the ends up over the sides. You'll use these later to temporarily hold the coil together when the bobbin is removed.

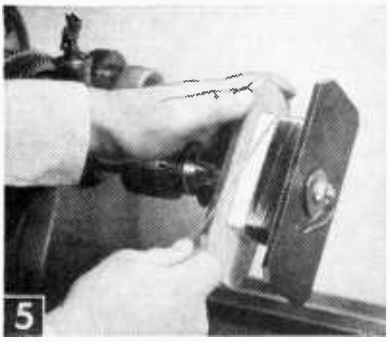
Unroll the 14 ga. wire from one of the spools and clamp one end in a vise. Stretch the wire out to remove kinks. Then pass about 4 in. through the hole in the bobbin's side for the starting lead and wrap it around the bolt to anchor in place. Start winding the wire in tight even layers—you should run about 37 turns per layer, with a total of about 280 turns in 7½ layers. As you use up the wire from one spool, hold the last turn down with a clamp and make a splice. Scrape the enamel off the wire, solder a 3/8-in. splice and cover with sleeving or thin electrical tape. Be sure you don't put a splice in a coil corner.

When the winding is complete clamp the end of the wire to hold it tight, and tie up the coil with the four strings, not too tight, or



Use electrician's friction tape but be careful not to distort the coil's shape. It must fit on the center leg of the transformer stack.





If you use a lathe or grinding mandrel with chuck to support the coil form, winding is easier. But you can do the job entirely by hand if necessary.

Melt the sealing wax in an old double boiler or coffee pot. Keep hot wax fumes away from open flame.

MATERIALS LIST—TAPE ERASER

Amt. Req.	Size and Description
9½ lbs.	Transformer laminations 24 Ga. E.I. 150, grade M27 for 4⅛" stack. Available from Forest Electric Co., 1001 N. 25th Ave., Melrose Park, Ill., $7.15 postage included.
2½ lbs.	#14 AWG enamel magnet wire
1	DPST toggle switch, H&H #8060Z or equal
1	Fuse holder, Littlefuse #342001 or equal with #3AG—10 amp. Slo-Blo fuses
2	Transformer bolts, 3/16 x 4½" w. nuts and washers
½ lb.	Sealing wax, World Wide Commercial W1-2-R or equal, available stationery stores
Misc.	Scrap wood for winding form coil wrapping tape, plywood case parts.

you'll spoil the coil shape. Now take the bobbin apart, and remove the toothpick wedges. The center will collapse inward so you can get the coil off with a gentle push.

You can wrap your coil with regular electricians' friction tape (Fig. 3) or the plastic type. The plastic-back tape takes up less space, but tears easier on the sharp lamination edges and offers less protection. A wrapping of ½-in. cotton tape is by far the best, but it does require varnishing to exclude moisture.

Trim the transformer leads off so the ends are on the long sides of the coil and solder a 10-in. piece of flexible wire to each. Run a piece of spaghetti down over each joint and lay the two leads so they exit at one end of the coil when it is slipped over the core (Fig. 4). Now, with a 2- or 3-ft. piece of tape, start wrapping the coil. Overlap each layer about half the tape width. Remember not to let the tape bunch up at the corners, or the coil will not fit on the core. Wind one tape layer under the leads coming out of the coil and another on top of them to hold in place.

Now check the continuity of the coil with an ohmmeter. Resistance should read less than 1 ohm, practically an open short. A higher reading would mean a damaged winding. Gently slip the coil over the laminations. Handle carefully to prevent the corners of the center leg cutting through the insulation of the coil. Again check continuity with the ohmmeter. Push the coil down to the bottom of the slots and then anchor in place with wooden wedges pushed into place at the ends of the pole pieces.

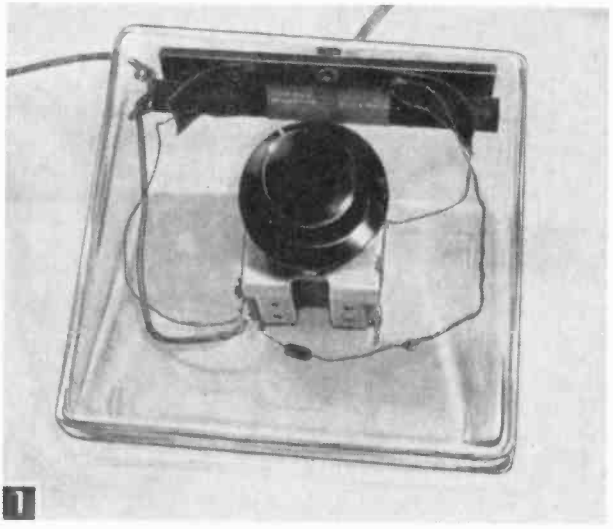
Make the case of ½-in. plywood (Fig. 4). Locate a divider of ½-in. wood about 5⅛ in. from one end. Place the magnet in the box. Lay a straightedge across the box and measure from the top edge of the box to the top of the pole face. Make a wood shim this thick to raise the magnet so the pole faces are flush with the edge of the box. Drill a hole in the partition to feed the leads into the other section. Block the magnet into position with wedge-shaped pieces of wood.

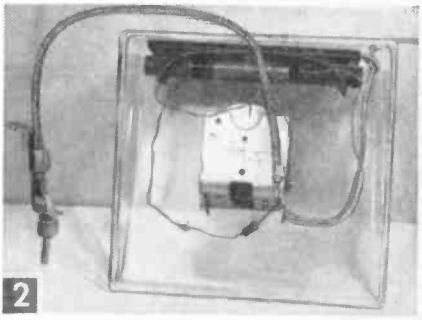
Make the tape reel spindle of a piece of 5/16-in. dia. brass tubing or rod (Fig. 4) and screw to the center partition. Now stuff paper wadding in all large openings around the coil and at the corners. Melt sealing wax in an old coffee can or a double boiler and pour in until the space around the magnet is completely filled to a point slightly higher than the top of the magnet. The wax will shrink down slightly as it cools. Finish construction by sanding the top surface smooth, adding the hardboard cover on the other side, and wiring in the switch and fuse.

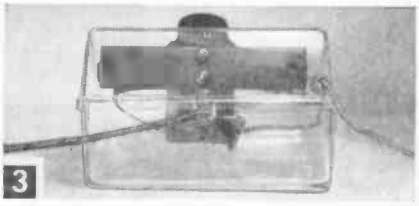
To use the tape eraser, put your reel of tape on the spindle and turn on the switch. Slowly rotate the reel about two full turns, and then (with power left on) slowly lift the reel away from the magnet. Don't turn your power off until you are at least 2 feet away from the magnet. Metal reels, or a change in this erasing technique can cause a thump at one point on the tap reel winding. Your tape should now have no recorded material, background noise clicks, or swooshing sounds, and noise level should be far below that obtained with the regular erase heads in a recorder.

You'll find that you can use your erase unit to demagnetize small hand tools using the same method as for recording tape. Connect the magnet to a 12-volt storage battery and you can magnetize iron or steel in a fraction of a second. But avoid wearing a wrist watch while you are working near the unit's magnetic field. A repair job would be costly.

Crystal Tuner







1 This tuner does its job surprisingly well.
2 Bottom view of the crystal tuner.
3 Rear view of the tuner shows shielded braid outlet.

By FORREST H. FRANTZ, SR.

SINCE broad tuning is a natural by-product of a crystal tuner, the output of the tuner has good fidelity. A crystal tuner does not require connection to the power line, so there are no hum-producing power circuits.

A crystal tuner has a limited reception range, of course. Reception of stations up to about 5 miles away without an outside antenna, and of stations further away with an outside antenna, is possible with the tuner described in this article. The feature that endows the crystal tuner with good fidelity also has a detraction in that local stations without sufficient frequency separation may interfere with each other. This tuner employs a very directional high Q antenna coil to minimize station interference. The high Q of the antenna coil also causes the sensitivity of this tuner to be high in contrast to tuners with lower Q antenna coils.

The tuner is housed in a cake slice plastic container (5 and 10¢ store). The smaller holes and a starter hole for the ½-in. dia. variable capacitor shaft hole are made with a heated ice pick. Refer to Figs. 1, 2 and 3.

1) Make the starter hole for the variable capacitor shaft. This hole center should be 1¾ in. from the upper edge. Enlarge to ½-in. dia. with taper reamer.

2) Mount the capacitor. Mark the positions for the three mounting screws, remove capacitors and make the holes with heated ice pick.

3) Position antenna coil, locate the two mounting holes, and make these holes with heated ice pick.

4) Make hole for antenna pick-up lead and cut a ¼-in. x ½-in. long slot in the lower half of the case with a hot ice pick (Fig. 3).

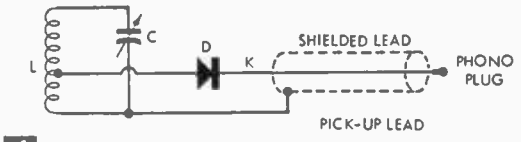
Remove plastic build-up around holes with diagonal pliers and pocket knife. Wash case, rinse and dry.

Next, open the trimmer on the tuning capacitor as far as you can. Mount with three #6-32 x ¼-in. machine screws, using washers to shorten length. Mount antenna coil.

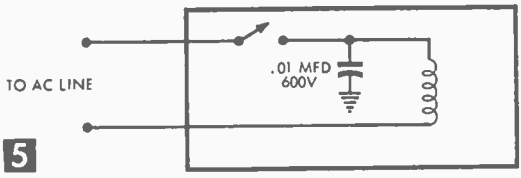
Wire the circuit. Connect the antenna lower end lead (nearest the tap) to the capacitor rotor (frame). Connect the antenna upper end lead to capacitor stator. Connect for an antenna 3 to 5 ft. of hook-up wire to the stator, first knotting for strain relief. Pass antenna through its hole.

Connect the diode to the tap lead of the coil. The other end of the diode, designated by a band, a plus sign, or the letter K connects to the center conductor of a shielded lead. The outer shield of this lead solders to the capacitor frame. But first, attach a phono plug to the other end of this lead.

I used a solderless plug. To use, push the shielding back about ¼ in. from the end of the center conductor. Don't strip the insulation. Push the center conductor against the pointed center pin connector on the jack till the point penetrates up into the conductor wires. Then turn the ear of the metal extension from the outer shell of the jack over on



4 CIRCUIT DIAGRAM



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the conductor shield and crimp it tight. You must maintain pressure against the center pin while you do this to assure a good connection. Pass the lead through the slot in the lower half of the case and connect to diode and capacitor.

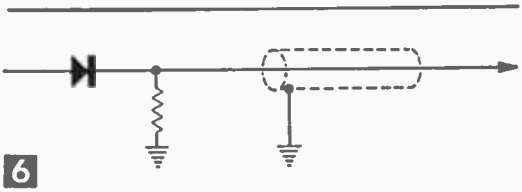
Plug the tuner into your amplifier. If you experience a large amount of hum when tuning, provide a capacitor between line and ground on the amplifier as shown in Fig. 5.

The antenna pick-up lead should be shortened if you're located very close to a station and it tends to interfere with other stations.

MATERIALS LIST—CRYSTAL TUNER

Desig.	Description
L	miniature antenna ferrite loop coil (Miller 2001)
C	365 mmf. variable tuning capacitor (Lafayette MS214)
D	germanium crystal diode (Raytheon 1N66)
	solderless phono plug (Lafayette MS373
	knob (Lafayette KN-36)
	plastic cake box
	shielded lead

Components may be obtained from
Lafayette Radio
100 Sixth Avenue
New York 13, N. Y.



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If you're in a location that is a considerable distance from the nearest radio station you can increase the sensitivity of the tuner by connecting the pick-up lead through a 100 mmf. capacitor to an outside antenna.

If the tuner is to be used with an amplifier which has a capacitor in series with the input lead, a path is required across the tuner output. Connect a resistor (any value between 10K and 50K) as shown in Fig. 6.

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MERCHANT Marine Jobs. Men and Women. Top wages. Travel. Captain, Box 501-A, Reading, Massachusetts.

HYPNOTISM

SCIENTIFIC Hypnotism new different Hypnotic Bi-Monthly Periodical. Educational, interesting research reports. Open Forum Theory Techniques Reviews. Special get acquainted rate $5.00 year $9.00 two years. Hypnotic Research Institute Inc. 437 John St., Bridgeport 3, Conn.

MISCELLANEOUS

OILTAN Chamois Extra Fine 35x38 $5.50; 28x32 $4.50; 19x25 $3.25; 17x23 $2.50. Hunsakers, Monmouth 1, Ill.

UNUSUAL Items for Men. Samples—25¢. Terry—16, Mount Wilson, Calif.

GET Rich Plans That Work. Sample 25¢. Box 342, Colorado Springs, Colo.

START planning for your security tomorrow. Send 75¢ for Income Opportunities book, No. 550, to Science and Mechanics Magazine, Dept. CDW-582, 450 E. Ohio St., Chicago 11.

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MODEL Building. Manufacturing. For Inventors, Hobbyists. Parker, 32S. Westminister, Worcester 5, Mass.

CATALOG of all Science and Mechanics Craftprints. Send 20¢ to cover postage and handling to Science and Mechanics, Dept. CDW-582, 450 E. Ohio St., Chicago 11.

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MUSICAL Instruments. Bulletin 58 Free. Piano Mart, 2461 Oakland, St. Louis 14.

LEARN your chords. Simplified details 10¢. Echo, 1863 S. W. 65th Avenue, Miami 55, Florida.

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PERSONAL

SKYSCRAPER-HEEL Shoes! Photo Catalog. $1.00. Finecraft, Box 442-Q, Hollywood 28, Calif.

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YOU'LL Have Penpals Worldover. Membership year $1.00. 25¢ brings magazine with list. World Card Club, King, N. C.

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UNUSUAL Pets—Monkeys, Ocelots, Skunks, Raccoons, Birds, Reptiles. Catalog 10¢. Ray Singleton, Box 13361, Tampa 11, Fla.

PRINTING, MIMEOGRAPHING & MULTIGRAPHING

1,000 BUSINESS Cards, "Raised Letters" $3.95. Samples. Pioneer, MH-9, Island Park, New York.

BEAUTIFULLY Embossed Business Cards: $3.99 per 1000. Samples. Edward Printing Service. 7430 Selwick Dr., Parma 29, Ohio.

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FREE Catalog, low cost, quality printing. Holland, 262-SM 17th Ave., San Francisco 21, Calif.

BUSINESS cards, raised letters $3.00 1,000 like engraved. Kavanagh, 607 Knickerbocker Ave., Brooklyn 21, N. Y.

PRINTING OUTFITS & SUPPLIES

$10.00 DOWN puts you in Profitable Rubber Stamp Business. Details Free. Helms Stamp Company, Bristol, Tenn.

RADIO & TELEVISION

TRANSISTOR Radios, connectors, resistors, capacitors at wholesale prices. Free list. Tito Capogrossi, 1011 North Cayuga, Ithaca, N. Y.

REMAILING SERVICE

SECRET Remailing 25¢, $3.00 Month. Donmar, 5644 East Pima, Tucson, Arizona.

NEW YORK City secret mailing address, $3.00 monthly. Reiss, P. O. Box 129-A, New York 18, N. Y.

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NOW! Deep Cushion 3 Lines $1.50. Fast. "Junior", Box 227, Valparaiso, Ind.

FREE Catalog! Custom, Stock Rubber Stamps. 1000 Business Cards $3.50. Altl, Box 1063-S, Concord, Calif.

YOUR 30 word advertisement, made on clear printing rubber stamp! $1.50. Loadwick's, 78 Allston Street, Cambridge 39, Mass.

SCIENCE EXPERIMENTS

SCIENCE Fair Projects List 10¢. Kits, 1452 Drake, San Pablo 10, Calif.

SCIENCE Projects—over 40 with step-by-step plans for making a light-ray tracer, solar furnace, 250,000-volt Van de Graaf generator, electronic stethoscope. Order Science Experimenter, No. 557 today, 75¢. Science and Mechanics, Dept. CDW-582. 450 E. Ohio St., Chicago 11.

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FISHERMEN-Spiralure: small, medium, large, $1.00 each. Write: M. Jan, Box 68, River Grove, Ill.

TURKEY Calls. Box type. Gives natural call. $2.95 postpaid. Schulenberg's Radio, Burton, Texas.

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500 MIXED U. S. various Issues 25¢. Monjar Fairmont, Cincinnati 14, Ohio.

TREASURE FINDERS

GOLD Detectors: Very sensitive instruments $10.00. Decter, Box 353-SM, Menard, Texas.

HITACHI WH-817 3-BAND SHORT WAVE/AM 8-TRANSISTOR PORTABLE

• 8 top quality transistors, plus 2 germanium diodes and varistor • Push-pull output stages • 200 MW undistorted output power • Wide-range automatic volume control, using a double circuit • 3-inch P.M. speaker • Tuning range: SW—3.8-10 mc; SW—10-18 mc; AM—535-1605 kc • Illuminated dial, tuning meter and battery condition indicator • Self-contained ferrite antenna, 8-stage telescopic external rod, plus long-range wire antenna • 2 earphone jacks • Dimensions 4¾" x 8⅛" x 1¾" • Batteries, 3 required —NEDA 14, Eveready 635, or equivalent.

Complete with Two Leather Carrying Cases, Personal Earphone; Gift-Boxed. **$79.95**

Higher sensitivity, lower background noise, electronic fine tuning and greater value!

HITACHI SHORT WAVE/AM TRANSISTOR RADIOS

Tuned RF amplifiers, using *the advanced mesa transistor,* make these fine Hitachi receivers many times more sensitive than conventional transistor radios. Background noise is also reduced by as much as 50% by the combination of the RF mesa transistor with 2 quality drift transistors in the IF stages. You can pick up foreign and domestic short wave stations as well as the regular broadcast band stations. Signals come in clean and undistorted, even with distant foreign stations.

ELECTRONIC FINE TUNING is another outstanding engineering achievement of both Hitachi receivers. With this special, convenient feature you can easily separate stations which are ordinarily too close to receive clearly on receivers possessing conventional tuning methods. Makes short wave listening a pleasure. Many other advantages are incorporated by Hitachi to make these receivers outstanding.

HITACHI WH-829 2-BAND SHORT WAVE/AM 8-TRANSISTOR PORTABLE

• 8 top quality transistors, plus 2 germanium diodes and varistor • Push-pull output stages • 200 MW undistorted output power • Double automatic volume control circuit • 2¼" x 3¼" P.M. speaker • Tuning range: SW—3.8-12 mc; AM—535-1605 kc • Self-contained ferrite antenna, 8-stage telescopic external rod, plus long-range wire antenna • 2 earphone jacks • Batteries, 3 required—NEDA 15, Eveready 1015, or equivalent • Pushbutton pop-out battery container • Dimensions 3¾" x 6¼" x 1¾".

Complete with Two Leather Carrying Cases, Personal Earphone; Gift-Boxed. **$59.95**

Fully Guaranteed. Shipped postpaid. If your dealer can't supply you —specify model desired, and send check or money order to:

THE SAMPSON COMPANY (Est. 1921) ELECTRONICS DIVISION 2244 S. Western Ave., Chicago 8, Ill.

WHITE'S RADIO LOG

An up-to-date broadcasting directory
AM, FM, TV and Short-Wave Stations

Vol. 38 No. 2

QUICK REFERENCE INDEX

U. S. and Canadian AM Stations by Frequency

U.S. stations listed alphabetically by states within groups, Canadian stations precede U.S.

Abbreviations: Kc., frequency in kilocycles; W.P., watt power; d—operates daytime only. Wave length is given in meters

Kc.	Wave Length	W.P.
540—555.5		
CBK	Regina, Sask.	50000
KVIP	Redding, Calif.	1000d
KFMB	San Diego, Calif.	5000
WGTO	Cypress Gardens, Florida	50000d
WDAK	Columbus, Ga.	5000
KBRV	Soda Springs, Idaho	500d
KWMT	Ft. Dodge, Iowa	1000d
WDMV	Pocomoke City, Md.	500d
WBIC	Islip, N.Y.	250d
WETC	Wendell-Zebulon, N.C.	250d
WCNG	Canonsburg, Pa.	250d
WYNN	Florence, S.C.	250d
WDXN	Clarksville, Tenn.	1000d
WRIC	Richlands, Va.	1000d
550—545.1		
CFNB	Fredericton, N.B.	50000
CFBR	Sudbury, Ont.	1000d
CHLN	Three Rivers, Que.	5000
CKPG	Prince George, B.C.	250
KENI	Anchorage, Alaska	5000
KOY	Phoenix, Ariz.	5000
KAFY	Bakersfield, Calif.	1000
KRAI	Craig, Colo.	1000
WAYR	Orange Park, Fla.	1000d
WGGA	Gainesville, Ga.	5000
KMVI	Wailuku, Hawaii	1000
KFRM	Concordia, Kansas	5000d
WCBI	Columbus, Miss.	1000
KSD	St. Louis, Mo.	5000
KOPR	Butte, Mont.	1000
WGR	Buffalo, N.Y.	5000
WDBM	Statesville, N.C.	500d
KFYR	Bismarck, N.Dak.	5000
WKRC	Cincinnati, Ohio	5000
KOAC	Corvallis, Oreg.	5000
WHLM	Bloomsburg, Pa.	1000
WPAB	Ponce, P.R.	5000
WPAW	Pawtucket, R.I.	1000
KCRS	Midland, Tex.	5000
KTSA	San Antonio, Tex.	5000
WDEV	Waterbury, Vt.	5000
WSVA	Harrisonburg, Va.	5000
KARI	Blaine, Wash.	500d
WSAU	Wausau, Wis.	5000
560—535.4		
CJKL	Kirkland Lake, Ont.	5000
CFOS	Owen Sound, Ont.	1000
WOOF	Dothan, Ala.	5000d
KYUM	Yuma, Ariz.	1000
KSFO	San Fran., Calif.	5000
KLZ	Denver, Colo.	5000
WQAM	Miami, Fla.	5000
WIND	Chicago, Ill.	5000
WMIK	Middlesboro, Ky.	500d
WGAN	Portland, Maine	5000
WHYN	Springfield, Mass.	1000
WQTE	Monroe, Mich.	500d
WEBC	Duluth, Minn.	5000
KWTO	Springfield, Mo.	5000
KMON	Great Falls, Mont.	5000
WGAI	Elizabeth City, N.C.	1000
WFIL	Philadelphia, Pa.	5000
WIS	Columbia, S.C.	5000
WHBQ	Memphis, Tenn.	5000
KFDM	Beaumont, Tex.	5000
KPQ	Wenatchee, Wash.	5000
WJLS	Beckley, W.Va.	5000
570—526.0		
CKEK	Cranbrook, B.C.	1000
CKCQ	Quesnel, B.C.	1000
CFCB	Corner Brook, N.F.	1000
CJEM	Edmundston, N.B.	1000
WAAX	Gadsden, Ala.	5000
KCNO	Alturas, Calif.	1000
KLAC	Los Angeles, Calif.	5000
WGMS	Washington, D.C.	5000
WACL	Waycross, Ga.	5000
WKYB	Paducah, Ky.	1000
WVMI	Biloxi, Miss.	1000d
KGRT	Las Cruces, N.Mex.	5000d
WMCA	New York, N.Y.	5000
WSYR	Syracuse, N.Y.	5000
WWNC	Asheville, N.C.	5000
WSHE	Raleigh, N.C.	500d
WKBN	Youngstown, Ohio	5000
WNAX	Yankton, S.Dak.	5000
WFAA	Dallas, Tex.	5000
WBAP	Ft. Worth, Tex.	5000
KLUB	Salt Lake City, Utah	5000
KVI	Seattle, Wash.	5000
WMAM	Marinette, Wis.	5000
580—516.9		
CJFX	Antigonish, N.S.	5000
CFRA	Ottawa, Ont.	50000
CKEY	Toronto, Ont.	5000
CKPR	Ft. William, Ont.	5000
CKUA	Edmonton, Alta.	10000
CKY	Winnipeg, Man.	50000
WABT	Tuskegee, Ala.	500d
KTAN	Tucson, Ariz.	5000
KMJ	Fresno, Calif.	5000
KUBC	Montrose, Colo.	5000
WDBO	Orlando, Fla.	5000
WGAC	Augusta, Ga.	5000
KFXO	Nampa, Idaho	5000
WILL	Urbana, Ill.	5000d
KSAC	Manhattan, Kans.	5000
WIBW	Topeka, Kans.	5000
KALB	Alexandria, La.	5000
WTAG	Worcester, Mass.	5000
WELO	Tupelo, Miss.	1000
WAGR	Lumberton, N.C.	500d
WHP	Harrisburg, Pa.	5000
WKAQ	San Juan, P.R.	5000
KOBH	Hot Springs, S.Dak.	500d
WRKH	Rockwood, Tenn.	1000d
KDAV	Lubbock, Tex.	500d
WLES	Lawrenceville, Va.	500d
WCHS	Charleston, W.Va.	5000
WKTY	LaCrosse, Wis.	5000
590—508.2		
CFAR	FlinFlon, Man.	1000
CKAR	Huntsville, Ont.	1000
CKRS	Jonquiere, Que.	1000
VOCM	St. Johns, N.F.	10000
WRAG	Carrollton, Ala.	1000d
KBHS	Hot Springs, Ark.	5000d
KFXM	San Bernardino, Cal.	1000
KCSJ	Pueblo, Colo.	1000
WDLP	Panama City, Fla.	1000
WPLO	Atlanta, Ga.	5000
KGMB	Honolulu, Hawaii	5000
KID	Idaho Falls, Idaho	5000
WVLK	Lexington, Ky.	5000
WEEI	Boston, Mass.	5000
WKZO	Kalamazoo, Mich.	5000
WOW	Omaha, Nebr.	5000
WROW	Albany, N.Y.	5000
WGTM	Wilson, N.C.	5000
KUGN	Eugene, Oreg.	5000
WARM	Scranton, Pa.	5000
WMBS	Uniontown, Pa.	1000
KTBC	Austin, Tex.	5000
KSUB	Cedar City, Utah	1000
WLVA	Lynchburg, Va.	1000
KHQ	Spokane, Wash.	5000
600—499.7		
CFCF	Montreal, Que.	5000
CFCH	North Bay, Ont.	10000
CFQC	Saskatoon, Sask.	5000
CJOR	Vancouver, B.C.	10000
CKCL	Truro, N.S.	1000
WIRB	Enterprise, Ala.	1000
KCLS	Flagstaff, Ariz.	5000
KVCV	Redding, Calif.	1000
KOGO	San Diego, Calif.	5000
KZIX	Ft. Collins, Colo.	1000d
WICC	Bridgeport, Conn.	1000
WPDQ	Jacksonville, Fla.	5000
WMT	Cedar Rapids, Iowa	5000
WWOM	New Orleans, La.	1000d
WFST	Caribou, Maine	5000d
WCAO	Baltimore, Md.	5000
WLST	Escanaba, Mich.	1000d
WTAC	Flint, Mich.	1000
KGEZ	Kalispell, Mont.	2000
WCVP	Murphy, N.C.	1000d
WSJS	Winston-Salem, N.C.	5000
KSJB	Jamestown, N.D.	5000
WFRM	Coudersport, Pa.	1000d
WAEL	Mayaguez, P.R.	1000
WREC	Memphis, Tenn.	5000
KROD	El Paso, Tex.	5000
KERB	Kermit, Tex.	1000d
KTBB	Tyler, Tex.	1000
610—491.5		
CHNC	New Carlisle, Que.	5000
CJAT	Trail, B.C.	1000
CKKL	Thompson, Man.	1000
CKTB	St. Catharines, Ont.	10000
WSGN	Birmingham, Ala.	5000
KAVL	Lancaster, Calif.	1000
KFRC	San Francisco, Calif.	5000
WCKR	Miami, Fla.	5000
WDEB	Pensacola, Fla.	500d
WCEH	Hawkinsville, Ga.	500d
WRUS	Russellville, Ky.	500d
KDAL	Duluth, Minn.	5000
WDAF	Kansas City, Mo.	5000
KOJM	Havre, Mont.	1000
WGIR	Manchester, N.H.	5000
KGGM	Albuquerque, N.Mex.	5000
WAYS	Charlotte, N.C.	5000
WTVN	Columbus, Ohio	5000
WIP	Philadelphia, Pa.	5000
KILT	Houston, Tex.	5000
KVNU	Logan, Utah	5000
WSLS	Roanoke, Va.	5000
WHPL	Winchester, Va.	500d
KEPR	Kennewick, Wash.	5000
620—483.6		
CFCL	Timmins, Ont.	10000
CKCK	Regina, Sask.	5000
KTAR	Phoenix, Ariz.	5000
KNGS	Hanford, Calif.	1000
KWSD	Mt. Shasta, Calif.	1000d
KSTR	Grand Junction, Colo.	5000d
WSUN	St. Petersburg, Fla.	5000

Kc.	Wave Length	W.P.
WTRP	LaGrange, Ga.	1000d
KWAL	Wallace, Idaho	1000
KMNS	Sioux City, Iowa	1000
WTMT	Louisville, Ky.	500d
WLBZ	Bangor, Maine	5000
WJOX	Jackson, Miss.	5000
WVNJ	Newark, N.J.	5000
WHEN	Syracuse, N.Y.	5000
WDNC	Durham, N.C.	5000
KGW	Portland, Oreg.	5000
WHJB	Greensburg, Pa.	1000
WCAY	Cayce, S.C.	500d
WATE	Knoxville, Tenn.	5000
KWFT	Wichita Falls, Tex.	5000
WCAX	Burlington, Vt.	5000
WWNR	Beckley, W.Va.	1000
WTMJ	Milwaukee, Wis.	5000

630—475.9

CFCO	Chatham, Ont.	1000
CHLT	Sherbrooke, Que.	5000
CFCY	Charlottetown, P.E.I.	5000
CJET	Smith Falls, Ont.	1000
CKRC	Winnipeg, Man.	5000
CKOV	Kelowna, B.C.	1000
CKYL	Peace River, Alta.	1000
WAVU	Albertville, Ala.	1000d
WJDB	Thomasville, Ala.	1000d
KJNO	Juneau, Alaska	1000
KVMA	Magnolia, Ark.	1000d
KIDD	Monterey, Calif.	1000
KHOW	Denver, Colo.	5000
WMAL	Washington, D.C.	5000
WSAV	Savannah, Ga.	5000
KIDO	Boise, Idaho	5000
WLAP	Lexington, Ky.	5000
KTIB	Thibodaux, La.	500d
WJMS	Ironwood, Mich.	1000
KDWB	So. St. Paul, Minn.	5000
KXOK	St. Louis, Mo.	5000
KGVW	Belgrade, Mont.	1000d
KOH	Reno, Nev.	5000
KLEA	Lovington, N.Mex.	500d
WIRC	Hickory, N.C.	1000d
WMFD	Wilmington, N.C.	1000
KWRO	Coquille, Oreg.	5000d
WEJL	Scranton, Pa.	500d
WKYN	San Juan, P.R.	1000d
WPRO	Providence, R.I.	5000
KGFX	Pierre, S.Dak.	250
KMAC	San Antonio Tex.	5000
KSXX	Salt Lake City, Utah	1000d
KGDN	Edmunds, Wash.	5000d
KZUN	Opportunity, Wash.	500d

640—468.5

CBN	St. John's, N.F.	10000
KFI	Los Angeles, Calif.	50000
WOI	Ames, Iowa	5000d
WHLO	Akron, Ohio	1000
WNAD	Norman, Okla.	1000d

650—461.3

KORL	Honolulu, Hawaii	10000
WSM	Nashville, Tenn.	50000
KRCT	Baytown, Texas	250d

660—454.3

KFAR	Fairbanks, Alaska	10000
KMEO	Omaha, Nebr.	500d
WNBC	New York, N.Y.	50000
WESC	Greenville, S.C.	10000d
KSKY	Dallas, Tex.	1000

670—447.5

WMAQ	Chicago, Ill.	50000

680—440.9

CHFA	Edmonton, Alta.	5000
CHLO	St. Thomas, Ont.	1000
CJOB	Winnipeg, Man.	10000
CKGB	Timmins, Ont.	10000
KNBC	San Fran., Calif.	50000
WPIN	St. Petersburg, Fla.	1000d
WCTT	Corbin, Ky.	1000
WCBM	Baltimore, Md.	10000
WNAC	Boston, Mass.	50000
WDBC	Escanaba, Mich.	1000
KFEQ	St. Joseph, Mo.	5000
WINR	Binghamton, N.Y.	1000
WRVM	Rochester, N.Y.	250d
WPTF	Raleigh, N.C.	50000
WISR	Butler, Pa.	250d
WAPA	San Juan, P.Rico	10000
WMPS	Memphis, Tenn.	10000
KENS	San Antonio, Tex.	50000
KOMW	Omak, Wash.	1000d
WCAW	Charleston, W.Va.	250

690—434.5

CBU	Vancouver, B.C.	10000
CBF	Montreal, Que.	50000
WVOK	Birmingham, Ala.	50000d
KVNA	Flagstaff, Ariz.	1000
KEVT	Tucson, Ariz.	250d
KBBA	Benton, Ark.	250d
KAPI	Pueblo, Colo.	250d
WADS	Ansonia, Conn.	500d
WAPE	Jacksonville, Fla.	25000d
KULA	Honolulu, Hawaii	10000

Kc.	Wave Length	W.P.
KBLI	Blackfoot, Idaho	1000d
KGGF	Coffeyville, Kans.	10000
WTIX	New Orleans, La.	5000
KSTL	St. Louis, Mo.	1000d
KRCO	Prineville, Oreg.	1000d
KUSD	Vermillion, S.Dak.	1000d
KHEY	El Paso, Tex.	10000
KPET	Lamesa, Tex.	250
KZEY	Tyler, Tex.	250d
WCYB	Bristol, Va.	10000d
WNNT	Warsaw, Va.	250d
WELD	Fisher, W.Va.	500d

700—428.3

WLW	Cincinnati, Ohio	50000

710—422.3

CJSP	Leamington, Ont.	250d
CFRG	Gravelbourg, Sask.	5000d
CKVM	Ville Marie, Que.	1000
WKRG	Mobile, Ala.	1000
KMPC	Los Angeles, Calif.	50000
KICN	Denver, Colo.	5000
WGBS	Miami, Fla.	50000
WROM	Rome, Ga.	1000d
KEEL	Shreveport, La.	50000
WHB	Kansas City, Mo.	10000
WOR	New York, N.Y.	50000
DZRH	Manila, P.I.	10000
WKJB	Mayaguez, P.Rico	1000
WTPR	Paris, Tenn.	250d
KGNC	Amarillo, Tex.	10000
KURV	Edinburg, Tex.	250
KIRO	Seattle, Wash.	50000
WDSM	Superior, Wis.	5000

720—416.4

WGN	Chicago, Ill.	50000

730—410.7

CJNR	Blind River, Ont.	1000
CKAC	Montreal, Que.	50000
CKDM	Dauphin, Man.	1000
CKLG	No. Vancouver, B.C.	10000
KFQD	Anchorage, Alaska	10000
WJMW	Athens, Ala.	1000d
WKTG	Thomasville, Ga.	1000d
KLOE	Goodland, Kans.	1000d
WFMW	Madisonville, Ky.	250d
WMTC	Van Cleve, Ky.	1000d
KTRY	Bastrop, La.	250d
WARB	Covington, La.	250d
WMMS	Bath, Maine	1000d
WACE	Chicopee, Mass.	1000d
KWRE	Warrenton, Mo.	500d
KWOA	Worthington, Minn.	1000d
KURL	Billings, Mont.	500d
KMGM	Albuquerque, N.Mex.	1000d
WDOS	Oneonta, N.Y.	1000d
WFMC	Goldsboro, N.C.	1000d
WOHS	Shelby, N.C.	1000d
WHRW	Bowling Green, Ohio	1000d
KBOY	Medford, Oreg.	1000d
WNAK	Nantticoke, Pa.	1000d
WPIT	Pittsburgh, Pa.	1000d
WPAL	Charleston, S.C.	1000d
WLIL	Lenoir, Tenn.	1000d
KRZY	Grand Prairie, Tex.	500d
KSVN	Ogden, Utah	1000d
WPIK	Alexandria, Va.	1000d
WMNA	Gretna, Va.	1000d
KULE	Ephrata, Wash.	1000d
WXMT	Merrill, Wis.	1000d

740—405.2

CBXA	Edmonton, Alta.	250
CBL	Toronto, Ont.	50000
WBAM	Montgomery, Ala.	50000d
KUEQ	Phoenix, Ariz.	1000d
KBIG	Avalon, Calif.	10000d
KCBS	San Francisco, Calif.	50000
KSSS	Colo. Springs, Colo.	1000
KVFC	Cortez, Colo.	1000d
WKIS	Orlando, Fla.	5000
KYME	Boise, Idaho	500d
WVLN	Olney, Ill.	250d
KBOE	Oskaloosa, Iowa	250d
WNOP	Newport, Ky.	1000d
WFRB	Frostburg, Md.	250d
WTAO	Cambridge, Mass.	250d
KPBM	Carlsbad, N.Mex.	1000d
WGSM	Huntington, N.Y.	1000d
WMBL	Morehead City, N.C.	1000d
WPAQ	Mount Airy, N.C.	10000d
KRMG	Tulsa, Okla.	50000
WVCH	Chester, Pa.	1000d
WIAC	San Juan, P.Rico	10000d
WBAW	Barnwell, S.C.	1000d
WIRJ	Humbolt, Tenn.	250d
WJIG	Tullahoma, Tenn.	250d
KTRH	Houston, Tex.	50000
KCMC	Texarkana, Tex.	1000
WBCI	Williamsburg, Va.	500d

750—399.8

WSB	Atlanta, Ga.	50000
WBMD	Baltimore, Md.	1000d
KMMJ	Grand Island, Neb.	10000
WHEB	Portsmouth, N.H.	1000
KSEO	Durant, Okla.	250d
KXL	Portland, Oreg.	50000
WPDX	Clarksburg, W.Va.	1000d

Kc.	Wave Length	W.P.
KGU	Honolulu, Hawaii	10000
WJR	Detroit, Mich.	50000
WCPS	Tarboro, N.C.	1000

770—389.4

KUOM	Minneapolis, Minn.	5000
WCAL	Northfield, Minn.	5000
WEW	St. Louis, Mo.	1000d
KOB	Albuquerque, N. Mex.	50000
WABC	New York, N.Y.	50000
KXA	Seattle, Wash.	1000

780—384.4

WBBM	Chicago, Ill.	50000
WJAG	Norfolk, Neb.	1000
WCKB	Dunn, N.C.	1000d
WBBO	Forest City, N.C.	1000d
KSPI	Stillwater, Okla.	250d
WAVA	Arlington, Va.	1000d

790—379.5

CFCW	Camrose, Alta.	10000
CKMR	Newcastle, N.B.	1000
CBY	Corner Brook, Nfld.	1000
CKSO	Sudbury, Ont.	10000
WTUG	Tuscaloosa, Ala.	500d
KCEE	Tucson, Ariz.	250d
KOSY	Texarkana, Ark.	1000
KDAN	Eureka, Calif.	5000d
KABC	Los Angeles, Calif.	5000
WLBE	Leesburg, Fla.	5000
WFUN	Miami Beach, Fla.	5000
WPFA	Pensacola, Fla.	1000d
WQXI	Atlanta, Ga.	5000
WGRA	Cairo, Ga.	1000d
KEST	Boise, Idaho	1000d
WRMS	Beardstown, Ill.	500d
KXXX	Colby, Kans.	5000d
WAKY	Louisville, Ky.	5000
WRUM	Rumford, Me.	1000d
WSGW	Saginaw, Mich.	1000
WSJC	Magee, Miss.	1000d
KGHL	Billings, Mont.	5000
WWNY	Watertown, N.Y.	1000
WLSV	Wellsville, N.Y.	1000d
WTNC	Thomasville, N.C.	1000d
KXGO	Fargo, N.Dak.	5000
KWIL	Albany, Oreg.	1000
WAEB	Allentown, Pa.	500
WPIC	Sharon, Pa.	1000d
WEAN	Providence, R.I.	5000
WWBD	Bamberg, S.C.	1000d
WETB	Johnson City, Tenn.	1000d
WMC	Memphis, Tenn.	5000
KTHT	Houston, Tex.	5000
KFYO	Lubbock, Tex.	5000
KUTA	Blanding, Utah	1000d
WSIG	Mount Jackson, Va.	1000d
WTAR	Norfolk, Va.	5000
KVOS	Bellingham, Wash.	5000
KNEW	Spokane, Wash.	5000
WEAQ	Eau Claire, Wis.	5000

800—374.8

CHAB	Moose Jaw, Sask.	10000
CKOK	Pentleton, B.C.	10000
CFOB	Ft. Frances, Ont.	1000
CJLX	Ft. William, Ont.	5000
CJBQ	Belleville, Ont.	1000
CKLW	Windsor, Ont.	50000
CHRC	Quebec, Que.	10000
CJAD	Montreal, Que.	10000
VOWR	St. Johns, N.F.	1000
WHOS	Decatur, Ala.	1000d
WMGY	Montgomery, Ala.	1000d
KINY	Juneau, Alaska	5000
KAGH	Crossett, Ark.	250d
KVOM	Morriiton, Ark.	250d
KUZZ	Bakersfield, Calif.	250d
KDAD	Weed, Calif.	1000d
KBRN	Brighton, Colo.	500d
WLAD	Danbury, Conn.	250d
WSUZ	Palatka, Fla.	1000d
WJAT	Swainsboro, Ga.	1000d
KXIC	Iowa City, Iowa	1000d
WBOK	New Orleans, La.	1000d
WCCM	Lawrence, Mass.	1000d
KREI	Farmington, Mo.	1000d
KDBM	Dillon, Mont.	1000d
WKDN	Camden, N.J.	1000d
KJEM	Okla City, Okla.	250d
KPDQ	Portland, Oreg.	1000d
WCHA	Chambersburg, Pa.	1000d
WDSC	Dillon, S.C.	1000d
WEAB	Greer, S.C.	250d
WDEH	Sweetwater, Tenn.	1000d
KDDD	Dumas, Tex.	250d
KBUH	Brigham City, Utah	250d
WSVS	Crewe, Va.	5000d
WKEE	Huntington, W.Va.	1000d
WDUX	Waupaca, Wis.	1000d

810—370.2

CFAX	Victoria, B.C.	1000d
KGO	San Francisco, Calif.	50000
WABW	Annapolis, Md.	250d
KCMO	Kansas City, Mo.	50000
WGY	Schenectady, N.Y.	50000
WKBC	N.Wilkesboro, N.C.	1000d
WCEC	Rocky Mount, N.C.	1000d
WEDO	McKeesport, Pa.	1000d
WKVM	San Juan, P.R.	25000

Kc.	Wave Length	W.P.
WAIT	Chicago, Ill.	5000d
WIKY	Evansville, Ind.	250d
WOSU	Columbus, Ohio	5000d
WFAA	Dallas, Tex.	50000
WBAP	Ft. Worth, Tex.	50000

830—361.2

KIKI	Honolulu, Hawaii	250
WCCO	Minneapolis, Minn.	50000
KBOA	Kennett, Mo.	1000d
WNYC	New York, N.Y.	1000d

840—356.9

WKAB	Mobile, Ala.	1000d
WKNB	New Britain, Conn.	1000d
WHAS	Louisville, Ky.	50000
WVPO	Stroudsburg, Pa.	250d

850—352.7

CKVL	Verdun, Que.	50000
CKRD	Red Deer, Alta.	10000
WYDE	Birmingham, Ala.	10000
KICY	Nome, Alaska	5000
KOA	Denver, Colo.	50000
WRUF	Gainesville, Fla.	5000
WEAT	W. Palm Beach, Fla.	1000
KIMO	Hilo, Hawaii	1000
WHDH	Boston, Mass.	50000
WKBZ	Muskegon, Mich.	1000
KFUO	St. Louis, Mo.	5000d
WKIX	Raleigh, N.C.	10000
WJW	Cleveland, Ohio	10000
WEEU	Reading, Pa.	1000
WABA	Aquadilla, P.R.	500
WRAP	Norfolk, Va.	5000
KTAC	Tacoma, Wash.	1000

860—348.6

CHAK	Inuvik, N.W.T.	1000
CJBC	Toronto, Ont.	50000
WHRT	Hartselle, Ala.	250d
WAMI	Opp, Ala.	1000d
KIFN	Phoenix, Ariz.	1000d
KOSE	Osceola, Ark.	1000d
KWRF	Warren, Ark.	250d
KTRB	Modesto, Calif.	10000
WOWW	Naugatuck, Conn.	250d
WAZE	Clearwater, Fla.	500d
WKKO	Cocoa, Fla.	1000d
WERD	Atlanta, Ga.	1000d
WDMG	Douglas, Ga.	5000d
WMRI	Marion, Ind.	250d
KWPC	Muscatine, Iowa	250d
KOAM	Pittsburg, Kans.	10000
WSON	Henderson, Ky.	500d
WAYE	Dundalk, Md.	500d
WSBS	Gt. Barrington, Mass.	250d
KNUJ	New Ulm, Minn.	1000d
WMAG	Forest, Miss.	500d
WFMO	Fairmont, N.C.	1000d
WAMO	Pittsburgh, Pa.	1000d
WTEL	Philadelphia, Pa.	250d
WLBG	Laurens, S.C.	1000d
WIVK	Knoxville, Tenn.	1000d
WMTS	Murfreesboro, Tenn.	250d
KFST	Ft. Stockton, Tex.	250d
KPAN	Hereford, Tex.	250d
KSFA	Nacogdoches, Tex.	1000d
KONO	San Antonio, Tex.	5000
KWHO	Salt Lake City, Utah	1000d
WEVA	Emporia, Va.	1000d
WOAY	Oak Hill, W.Va.	10000d
WFOX	Milwaukee, Wis.	250d

870—344.6

KIEV	Glendale, Calif.	250d
KAIM	Kaimuki, Hawaii	1000
WWL	New Orleans, La.	50000
WKAR	E. Lansing, Mich.	5000d
WHCU	Ithaca, N.Y.	1000d
WGTL	Kannapolis, N.C.	1000d
WHOA	San Juan, P.R.	5000
KJIM	Ft. Worth, Tex.	250d
WFLO	Farmville, Va.	1000d

880—340.7

WCBS	New York, N.Y.	50000
WRRZ	Clinton, N.C.	1000d
WRFD	Worthington, Ohio	5000d

890—336.9

WLS	Chicago, Ill.	50000
WHNC	Henderson, N.C.	1000d
KBYE	Okla. City, Okla.	1000d

900—333.1

CKTS	Sherbrooke, Que.	1000
CHML	Hamilton, Ont.	5000
CHNO	Sudbury, Ont.	10000
CJBR	Rimouski, Que.	10000
CKJL	St. Jerome, Que.	1000
CJVI	Victoria, B.C.	10000
CKBI	Prince Albert, Sask.	10000
WATV	Birmingham, Ala.	1000d
WGOK	Mobile, Ala.	1000d
WOZK	Ozark, Ala.	1000d
KPRB	Fairbanks, Alaska	10000
KHOZ	Harrison, Ark.	1000d
KBIF	Centerville, Calif.	1000d
KGRB	West Covina, Calif.	250d
WJWL	Georgetown, Del.	1000d

Kc.	Wave Length	W.P.
890—336.9		
WSWN	Belle Glade, Fla.	1000d
WMOP	Ocala, Fla.	1000d
WCGA	Calhoun, Ga.	1000d
WCRY	Macon, Ga.	250d
WEAS	Savannah, Ga.	1000d
KTEE	Idaho Falls, Ida.	1000d
KSIR	Wichita, Kan.	250d
WKYW	Louisville, Ky.	1000d
WLSI	Pikeville, Ky.	1000d
KREH	Oakdale, La.	250d
WCME	Brunswick, Maine	1000d
WATC	Gaylord, Mich.	1000d
KTIS	Minneapolis, Minn.	1000d
WDDT	Greenville, Miss.	1000d
KFAL	Fulton, Mo.	1000d
KJSK	Columbus, Nebr.	1000d
WOTW	Nashau, N.H.	1000d
WBRV	Boonville, N.Y.	1000d
WSPN	Saratoga Sprgs., N.Y.	250d
WAYN	Rockingham, N.C.	1000d
WIAM	Williamston, N.C.	1000d
KFNW	Fargo, N.Dak.	1000d
WCNS	Canton, Ohio	500d
WFRO	Fremont, Ohio	500d
WCPA	Clearfield, Pa.	1000d
WFLN	Philadelphia, Pa.	1000d
WKXV	Knoxville, Tenn.	1000d
WCOR	Lebanon, Tenn.	500d
KALT	Atlanta, Tex.	1000d
KMCO	Conroe, Tex.	500d
KFLD	Floydada, Tex.	250d
KCLW	Hamilton, Tex.	250d
WODY	Bassett, Va.	250d
WAFC	Staunton, Va.	1000d
KUEN	Wenatchee, Wash.	1000d
WATK	Antigo, Wis.	250d
910—329.5		
CJDV	Drumheller, Alta.	10000
CKLY	Lindsay, Ont.	1000
CBO	Ottawa, Ont.	5000
CFJC	Kamloops, B.C.	10000
CHRL	Roberval, Que.	1000
WDVC	Dadeville, Ala.	500d
KPHO	Phoenix, Ariz.	5000
KLCN	Blytheville, Ark.	5000d
KAMD	Camden, Ark.	1000
KDEO	El Cajon, Calif.	1000
KEWB	Oakland, Calif.	5000
KOXR	Oxnard, Calif.	1000d
KPOF	nr. Denver, Colo.	5000
WHAY	New Britain, Conn.	5000
WPLA	Plant City, Fla.	1000d
WGAF	Valdosta, Ga.	5000
KBGN	Caldwell, Ida.	1000d
WAKO	Lawrenceville, Ill.	500d
WSUI	Iowa City, Iowa	5000
WLCS	Baton Rouge, La.	1000
WABI	Bangor, Maine	5000
WFDF	Flint, Mich.	5000
WCOC	Meridian, Miss.	5000
KOYN	Billings, Mont.	1000d
KYSS	Missoula, Mont.	1000d
KBIM	Roswell, N.Mex.	5000d
WLAS	Jacksonville, N.C.	1000d
KCJB	Minot, N.Dak.	1000
WPFB	Middletown, Ohio	1000
KGLC	Miami, Okla.	1000
KURY	Brookings, Oreg.	1000d
WAVL	Apollo, Pa.	1000d
WGBI	Scranton, Pa.	1000
WSBA	York, Pa.	1000
WPRP	Ponce, P.R.	5000
WNCG	North Charleston, S.C.	500d
WORD	Spartanburg, S.C.	1000
WJCW	Johnson City, Tenn.	5000
WEPG	S. Pittsburgh, Tenn.	500d
KNAF	Fredericksburg, Tex.	1000d
KRIO	McAllen, Tex.	1000
KRRV	Sherman, Tex.	1000
KALL	Salt Lake City, Utah	5000
WWRJ	White River Junction, Vermont	1000d
WRNL	Richmond, Va.	5000
WHYE	Roanoke, Va.	1000d
KORD	Pasco, Wash.	1000d
KUDY	Renton, Wash.	1000
KISN	Vancouver, Wash.	1000
WHSM	Hayward, Wis.	1000d
WDOR	Sturgeon Bay, Wis.	500d
920—325.9		
CJCH	Halifax, N.S.	10000
CJCJ	Woodstock, N.B.	1000
CKNX	Wingham, Ont.	2500
WCTA	Adalusia, Ala.	5000
WWWR	Russellville, Ala.	1000d
KARK	Little Rock, Ark.	5000
KDES	Palm Springs, Calif.	1000d
KVEC	San Luis Obispo, Cal.	1000
KREX	Grd. Junction, Colo.	5000
KLMR	Lamar, Colo.	1000
WMEG	Eau Gallie, Fla.	1000d
WGST	Atlanta, Ga.	5000
KAHU	Waiphau, Hawaii	1000
WMOK	Metropolis, Ill.	1000d
WBAA	W. Lafayette, Ind.	5000
KFNF	Shenandoah, Iowa	1000
WTCW	Whitesburg, Ky.	1000d
WBDX	Bogalusa, La.	1000d
KTOC	Jonesboro, La.	500d
WPTX	Lexington Pk., Md.	500d
WMPL	Hancock, Mich.	1000d
KDHL	Faribault, Minn.	1000
KWAD	Wadena, Minn.	1000
KRAM	Las Vegas, Nev.	1000
KOLO	Reno, Nev.	1000d
KQEO	Albuquerque, N.Mex.	1000
WTTM	Trenton, N.J.	1000
WKRT	Cortland, N.Y.	1000
WGHQ	Saugerties, N.Y.	1000d
WBBB	Burlington, N.C.	5000d
WMNI	Columbus, Ohio	500
KGAL	Lebanon, Oreg.	1000
WKVA	Lewistown, Pa.	1000d
WJAR	Providence, R.I.	5000
WTND	Orangeburg, S.C.	1000d
KEZU	Rapid City, S.Dak.	1000d
WLIV	Livingston, Tenn.	1000d
KELP	El Paso, Tex.	1000
KECK	Odessa, Tex.	1000
KTLW	Texas City, Tex.	1000d
KITN	Olympia, Wash.	1000d
KXLY	Spokane, Wash.	5000
WMMN	Fairmont, W.Va.	5000
WOKY	Milwaukee, Wis.	1000
930—322.4		
CFBC	Saint John, N.B.	10000
CJCA	Edmonton, Alta.	10000
CJON	St. John's, N.F.	10000
WETO	Gadsden, Ala.	1000d
KTKN	Ketchikan, Alaska	1000
KAPR	Douglas, Ariz.	1000d
KHJ	Los Angeles, Calif.	5000
KMET	Paradise, Calif.	500d
KIUP	Durango, Colo.	5000
WKSB	Milford, Del.	500d
WHAN	Haines City, Fla.	500d
WJAX	Jacksonville, Fla.	5000
WKXY	Sarasota, Fla.	1000
WMGR	Bainbridge, Ga.	5000
KSEI	Pocatello, Idaho	5000
WTAD	Quincy, Ill.	5000
WKCT	Bowling Green, Ky.	1000
WFMD	Frederick, Md.	1000
WREB	Holyoke, Mass.	500d
WBCK	Battle Creek, Mich.	1000
WSLI	Jackson, Miss.	5000
KWOC	Poplar Bluff, Mo.	1000
KOFI	Kalispell, Mont.	5000d
KOGA	Ogallala, Nebr.	500d
WWNH	Rochester, N.H.	5000d
WPAT	Paterson, N.J.	5000
WBEN	Buffalo, N.Y.	5000
WSOC	Charlotte, N.C.	5000
WRRF	Washington, N.C.	5000
WEOL	Elyria, Ohio	1000
WKY	Oklahoma City, Okla.	5000
KAGI	Grants Pass, Oreg.	1000
WCNR	Bloomsburg, Pa.	1000d
KSDN	Aberdeen, S.D.	1000
WSEV	Sevierville, Tenn.	5000d
KDET	Center, Tex.	1000d
KITE	San Antonio, Tex.	5000
KENY	Bellingham-Ferndale Wash.	1000d
WSAZ	Huntington, W.Va.	5000
WLBL	Auburndale, Wis.	5000d
940—319.0		
CBM	Montreal, Que.	50000
CJGX	Yorkton, Sask.	10000
CJIB	Vernon, B.C.	1000
KOBY	Tucson, Ariz.	250
KFRE	Fresno, Calif.	50000
WINZ	Miami, Fla.	50000
WMAZ	Macon, Ga.	50000
WMIX	Mt. Vernon, Ill.	1000d
KIOA	Des Moines, Iowa	10000
WYLD	New Orleans, La.	1000
WFNC	Fayetteville, N.C.	10000
KGRL	Bend, Oreg.	1000d
WESA	Charleroi, Pa.	250d
WGRP	Greenville, Pa.	1000d
WIPR	San Juan, P.R.	10000
KIXZ	Amarillo, Tex.	5000
950—315.6		
CKNB	Campbellton, N.B.	1000
CKBB	Barrie, Ont.	10000
WRMA	Montgomery, Ala.	1000d
KXJK	Forrest City, Ark.	5000d
KFSA	Ft. Smith, Ark.	1000
KAHI	Auburn, Calif.	1000d
KIMN	Denver, Colo.	5000
WNUE	Ft. Walton Sch., Fla.	1000d
WLOF	Orlando, Fla.	5000
WGTA	Summerville, Ga.	1000d
WGOV	Valdosta, Ga.	5000
KBOI	Boise, Idaho	5000
KLER	Orofino, Idaho	500d
WAAF	Chicago, Ill.	1000d
WXLW	Indianapolis, Ind.	5000d
KOEL	Oelwein, Iowa	1000
KJRG	Newton, Kans.	500d
WBVL	Barbourville, Ky.	1000d
WAGM	Presque Isle, Maine	5000
WORL	Boston, Mass.	5000d
WWJ	Detroit, Mich.	5000
KRSI	St. Louis Park, Minn.	1000d
WBKH	Hattiesburg, Miss.	5000d
KLIK	Jefferson City, Mo.	5000d
WBBF	Rochester, N.Y.	1000
WIBX	Utica, N.Y.	5000
WPET	Greensboro, N.C.	5000d
KYES	Roseburg, Oreg.	1000d
WNCC	Barnesboro, Pa.	500d
WPEN	Philadelphia, Pa.	5000
WSPA	Spartanburg, S.C.	5000
KWAT	Watertown, S.Dak.	1000
WAGG	Franklin, Tenn.	1000d
KDSX	Denison, Tex.	500
KPRC	Houston, Tex.	50000
KSEL	Lubbock, Tex.	5000
WXGI	Richmond, Va.	1000d
KJR	Seattle, Wash.	5000
WERL	Eagle River, Wis.	1000d
WKAZ	Charleston, W.Va.	5000
WKTS	Sheboygan, Wis.	500d
960—312.3		
CFAC	Calgary, Alta.	10000
CHNS	Halifax, N.S.	10000
CKWS	Kingston, Ont.	5000
WBRC	Birmingham, Ala.	5000
WMOZ	Mobile, Ala.	1000
KOOL	Phoenix, Ariz.	5000
KAVR	Apple Valley, Calif.	5000d
KNEZ	Lompoc, Calif.	500d
KABL	Oakland, Calif.	1000
WELI	New Haven, Conn.	5000
WGRO	Lake City, Fla.	500d
WJCM	Sebring, Fla.	1000d
WJAZ	Albany, Ga.	5000d
WRFC	Athens, Ga.	5000
KSRA	Salmon, Idaho	1000d
WDLM	E. Moline, Ill.	1000d
WSBT	South Bend, Ind.	5000
KMA	Shenandoah, Iowa	5000
WPRT	Prestonsburg, Ky.	5000d
KROF	Abbeville, La.	1000d
WBOC	Salisbury, Md.	5000
WFGM	Fitchburg, Mass.	1000
WHAK	Rogers City, Mich.	5000d
KLTF	Little Falls, Minn.	500d
WABG	Greenwood, Miss.	1000
KFVS	Cape Girardeau, Mo.	1000
KNEB	Scottsbluff, Nebr.	5000
KWYK	Farmington, N.Mex.	1000d
WEAV	Plattsburg, N.Y.	5000
WCAT	Dallas, N.C.	1000d
WFTC	Kinston, N.C.	5000
WWST	Wooster, Ohio	1000d
KGWA	Enid, Okla.	1000
KLAD	Klamath Falls, Oreg.	5000d
WHYL	Carlisle, Pa.	5000d
WADP	Kane, Pa.	1000d
WATS	Sayre, Pa.	1000d
WBEU	Beaufort, S.C.	1000d
WBMC	McMinnville, Tenn.	500d
KIMP	Mt. Pleasant, Tex.	1000d
KGKL	San Angelo, Tex.	5000
KOVO	Provo, Utah	5000
WDBJ	Roanoke, Va.	5000
KALE	Richland, Wash.	1000
WTCH	Shawano, Wis.	1000
970—309.1		
CKCH	Hull, Que.	5000
WERH	Hamilton, Ala.	5000d
WTBF	Troy, Ala.	5000
KNEA	Jonesboro, Ark.	1000d
KBIS	Bakersfield, Calif.	1000
KCHV	Coachella, Calif.	1000d
KBEE	Modesto, Calif.	1000
KFEL	Pueblo, Colo.	1000d
WFLA	Tampa, Fla.	5000
WIIN	Atlanta, Ga.	5000d
WVOP	Vidalia, Ga.	5000d
KHBC	Hilo, Hawaii	1000
KAYT	Rupert, Idaho	1000d
WMAY	Springfield, Ill.	1000
WAVE	Louisville, Ky.	5000
KSYL	Alexandria, La.	1000
WCSH	Portland, Maine	5000
WAMD	Aberdeen, Md.	500d
WESO	Southbridge, Mass.	1000d
WJAN	Ishpeming, Mich.	5000d
WKHM	Jackson, Mich.	1000
KQAQ	Austin, Minn.	5000d
KOOK	Billings, Mont.	5000
KJLT	No. Platte, Nebr.	5000d
WNTA	Newark, N.J.	5000
WEBR	Buffalo, N.Y.	5000
WCHN	Norwich, N.Y.	500d
WRCS	Ahoskie, N.C.	1000d
WWIT	Canton, N.C.	1000d
WDAY	Fargo, N.Dak.	5000
WREO	Ashtabula, Ohio	5000
WATH	Athens, Ohio	1000d
KAKC	Tulsa, Okla.	1000
KOIN	Portland, Oreg.	5000
WWSW	Pittsburgh, Pa.	5000
WJMX	Florence, S.C.	5000
KASE	Austin, Tex.	1000d
KNOK	Ft. Worth, Tex.	1000d
WIVI	Christiansted, V.I.	1000
WDTI	Danville, Va.	500d
KREM	Spokane, Wash.	5000
WWYO	Pineville, W.Va.	1000d
WHA	Madison, Wis.	5000d
980—305.9		
CKNW	New Westminster, Brit. Columbia	10000
CFPL	London, Ont.	10000
CKGM	Montreal, Que.	10000
CBV	Quebec, Que.	5000
CHEX	Peterboro, Ont.	5000
CKRM	Regina, Sask.	10000
WKLF	Clanton, Ala.	1000d
KINS	Eureka, Calif.	5000
KEAP	Fresno, Calif.	500d
KFWB	Los Angeles, Calif.	5000
KGLN	GlenwoodSprgs., Colo.	1000d
WSUB	Groton, Conn.	1000
WRC	Washington, D.C.	5000
WDVH	Gainesville, Fla.	5000d
WTOT	Marianna, Fla.	1000d
WBOP	Pensacola, Fla.	1000d
WLOD	Pompano Beach, Fla.	1000d
WKLY	Hartwell, Ga.	1000d
WPGA	Perry, Ga.	500d
WRIP	Rossville, Ga.	500d
KUPI	Idaho Falls, Idaho	1000d
WITY	Danville, Ill.	1000
KOKA	Shreveport, La.	5000d
WCAP	Lowell, Mass.	1000d
WPBC	Minneapolis, Minn.	1000d
WAPF	McComb, Miss.	1000d
KMBC	Kansas City, Mo.	5000
KSGM	Ste. Genevieve, Mo.	500
KVER	Clovis, N.Mex.	1000
KMIN	Grants, N. Mex.	1000d
WTRY	Troy, N.Y.	5000
WKLM	Wilmington, N.C.	5000d
WAAA	Win.-Salem, N.C.	1000d
WONE	Dayton, Ohio	5000
WILK	Wilkes-Barre, Pa.	5000
KDSJ	Deadwood, S.Dak.	1000
WSIX	Nashville, Tenn.	5000
KFRD	Rosenberg, Tex.	1000d
KSVC	Richfield, Utah	5000
WFHG	Bristol, Va.	5000
WMEK	Chase City, Va.	500d
KUTI	Yakima, Wash.	5000d
WHAW	Weston, W.Va.	1000d
WCUB	Manitowoc, Wis.	1000d
WPRE	Prairie du Chien, Wis.	500d
990—302.8		
CBW	Winnipeg, Man.	50000
CBT	Grand Falls, N.F.	1000
WWWF	Fayette, Ala.	1000d
WTCB	Flomaton, Ala.	500d
KTKT	Tucson, Ariz.	10000
KKIS	Pittsburg, Calif.	5000
KGUO	Santa Barbara, Calif.	1000d
KLIR	Denver, Colo.	1000d
WBZY	Torrington, Conn.	1000d
WFAB	Miami, Fla.	5000
WHOO	Orlando, Fla.	10000
WDWD	Dawson, Ga.	1000d
WGML	Hinesville, Ga.	250d
KOOD	Honolulu, Hawaii	5000
WCAZ	Carthage, Ill.	1000d
WITZ	Jasper, Ind.	1000d
KAYL	Storm Lake, Iowa	250d
KRSL	Russell, Kans.	250d
WJMR	New Orleans, La.	250d
KRIH	Rayville, La.	250d
WCRM	Clare, Mich.	250d
WABO	Waynesboro, Miss.	250d
KRMO	Monett, Mo.	250d
KSVP	Artesia, N.Mex.	1000
WEEB	Southern Pines, N.C.	5000d
WJEH	Gallipolis, Ohio	1000d
WTIG	Massillon, Ohio	250d
KABY	Albany, Oreg.	250d
WIBG	Philadelphia, Pa.	50000
WVSC	Somerset, Pa.	250d
WPRA	Mayaguez, P.R.	10000
WLKW	Providence, R.I.	50000
WAKN	Aiken, S.C.	1000d
WNOX	Knoxville, Tenn.	10000
KWAM	Memphis, Tenn.	1000d
KTRM	Beaumont, Tex.	1000
KAML	Kenedy, Tex.	250d
KSYD	Wichita Falls, Tex.	10000
KDYL	Tooele, Utah	1000d
WNRV	Narrows, Va.	1000d
WANT	Richmond, Va.	1000d
WKLJ	Sparta, Wis.	250
1000—299.8		
CKBW	Bridgewater, N.S.	1000
WCFL	Chicago, Ill.	50000
KTOK	Okla. City, Okla.	5000
KSTA	Coleman, Tex.	250d
KGRI	Henderson, Tex.	250d
WHWB	Rutland, Vt.	1000d
KOMO	Seattle, Wash.	50000
1010—296.9		
CBX	Edmonton, Alta.	50000
CFRB	Toronto, Ont.	50000
KINK	Phoenix, Ariz.	500d
KVNC	Winslow, Ariz.	1000
KLRA	Little Rock, Ark.	10000
KCHJ	Delano, Calif.	5000
KCMJ	Palm Sprgs., Calif.	1000
KSAY	San Fran., Calif.	1000d
WCNU	Crestview, Fla.	1000d
WZRO	Jacksonville Beach, Florida	1000d
WINQ	Tampa, Fla.	50000d
WGUN	Decatur, Ga.	50000d
WCSI	Columbus, Ind.	500d
KSMN	Mason City, Iowa	1000d
KIND	Independence, Kans.	250d
KDLA	DeRidder, La.	1000d
WSID	Baltimore, Md.	1000d
WMOX	Meridian, Miss.	10000
KCHI	Chillicothe, Mo.	250d
KXEN	Festus, Mo.	50000d
KRVN	Lexington, Nebr.	25000d
WCNL	Newport, N.H.	250d
WINS	New York, N.Y.	50000
WABZ	Albermarle, N.C.	1000d

Kc.	Wave Length	W.P.
WELS	Kinston, N.C.	1000d
WIOI	New Boston, Ohio	1000d
KBEV	Portland, Oreg.	1000d
WITT	Lewisburg, Pa.	250d
WHIN	Gallatin, Tenn.	1000d
WORM	Savannah, Tenn.	250d
KBUY	Amarillo, Tex.	5000
KMLW	Marlin, Tex.	250d
WELK	Charlottesville, Va.	1000d
WMEV	Marion, Va.	1000d
WCST	Berkeley Sprgs., W.Va.	250d
WSPT	Stevens Pt., Wis.	1000d

1020—293.9

KGBS	Los Angeles, Calif.	50000
WCIL	Carbondale, Ill.	1000d
WPEO	Peoria, Ill.	1000d
KOKA	Pittsburgh, Pa.	50000

1030—291.1

WBZ	Boston, Mass.	50000
WBZA	Springfield, Mass.	1000
KOB	Albuquerque, N.Mex.	10000
KCTA	Corpus Christi, Tex.	50000d

1040—288.3

KHVH	Honolulu, Hawaii	5000
WHO	Des Moines, Iowa	50000
KIXL	Dallas, Tex.	1000d

1050—285.5

CFGP	Grande Prairie, Alta.	10000
CKSB	St. Boniface, Man.	10000
CJIC	Sault Ste. Marie, Ont.	10000
CHUM	Toronto, Ont.	5000
WRFS	Alexander City, Ala.	1000d
WCRI	Scottsboro, Ala.	250d
KVWM	Show Low, Ariz.	250d
KVLC	Little Rock, Ark.	1000d
KOFY	San Mateo, Calif.	1000d
KWSO	Wasco, Calif.	1000d
KLMO	Longmont, Colo.	250
WSUG	Clewiston, Fla.	250d
WJSB	Crestview, Fla.	1000d
WIVY	Jacksonville, Fla.	1000d
WHBQ	Tampa, Fla.	250d
WRMF	Titusville, Fla.	500d
WAUG	Augusta, Ga.	1000d
WBIE	Marietta, Ga.	500d
KZIN	Coeur D'Alene, Idaho	250d
WDZ	Decatur, Ill.	1000d
KNCO	Garden City, Kans.	1000d
WNES	Central City, Ky.	500d
WZIP	Cincinnati, Ohio	1050
KLPL	Lake Providence, La.	250d
KCIJ	Shreveport, La.	250d
KVPI	Villa Platte, La.	250d
WQMR	Silver Sprg., Md.	1000d
WPAG	Ann Arbor, Mich.	1000d
KLOH	Pipestone, Minn.	1000d
WACR	Columbus, Miss.	1000d
KMIS	Portageville, Mo.	250d
KSIS	Sedalia, Mo.	1000d
KRBO	Las Vegas, Nev.	500d
WBNC	Conway, N.H.	1000d
WSEN	Baldwinsville, N.Y.	250d
WSTS	Massena, N.Y.	1000d
WMGM	New York, N.Y.	50000
WBTL	Farmville, N.C.	250d
WFSC	Franklin, N.C.	1000d
WLON	Lincolnton, N.C.	1000d
WWGP	Sanford, N.C.	1000d
KCCO	Lawton, Okla.	250d
KFMJ	Tulsa, Okla.	1000d
KUBE	Pendleton, Oreg.	1000d
KEED	Springfield, Oreg.	1000d
WBUT	Butler, Pa.	250d
WLYC	Williamsport, Pa.	1000d
WSMT	Sparta, Tenn.	1000d
KLEN	Killeen, Tex.	250d
KWLD	Liberty, Tex.	250d
KPLA	Plainview, Tex.	1000d
WGAT	Gate City, Va.	250d
WBRG	Lynchburg, Va.	1000d
WCMS	Norfolk, Va.	1000d
KNBX	Kirkland, Wash.	1000d
WCEF	Parkersburg, W.Va.	1000d
WECL	Eau Claire, Wis.	1000d
WLIP	Kenosha, Wis.	250d
KWIV	Douglas, Wyo.	250d

1060—282.8

CFCN	Calgary, Alta.	10000
CJLR	Quebec, Que.	10000
KUPD	Tempe, Ariz.	500
KPAY	Chico, Calif.	10000
WNOE	New Orleans, La.	50000
WHFB	Benton Harbor, Mich.	1000d
WMAP	Monroe, N.C.	250d
WCMW	Canton, Ohio	1000d
WRCV	Philadelphia, Pa.	50000

1070—280.2

CBA	Sackville, N.B.	50000
CHOK	Sarnia, Ont.	5000
WAPI	Birmingham, Ala.	50000
KNX	Los Angeles, Calif.	50000
WVCG	Coral Gables, Fla.	1000d
WIBC	Indianapolis, Ind.	50000
KIRL	Wichita, Kans.	10000
KHMO	Hannibal, Mo.	5000
WHPE	High Point, N.C.	1000d
WMIA	Arecibo, P.R.	500
WFLI	Lookout Mtn., Tenn.	10000
WDIA	Memphis, Tenn.	50000
KOPY	Alice, Tex.	1000
WKOW	Madison, Wis.	10000

1080—277.6

CHED	Edmonton, Alta.	10000
KSCO	Santa Cruz, Calif.	1000
WTIC	Hartford, Conn.	50000
WKLO	Louisville, Ky.	5000
WOAP	Owosso, Mich.	250d
WYSL	Kenmore, N.Y.	1000d
WEWO	Laurinburg, N.C.	1000d
KWJJ	Portland, Oreg.	10000
WEEP	Pittsburgh, Pa.	1000d
KRLD	Dallas, Tex.	50000

1090—275.1

CHEC	Lethbridge, Alta.	5000
CHIC	Brampton, Ont.	250
CHRS	St. Jean, Que.	1000
KTHS	Little Rock, Ark.	50000
WCRA	Effingham, Ill.	250d
KNWS	Waterloo, Iowa	1000d
WBAL	Baltimore, Md.	50000
WILD	Boston, Mass.	1000d
WMUS	Muskegon, Mich.	1000d
WRJS	San German, P.R.	250
KING	Seattle, Wash.	50000

1100—272.6

KFAX	San Francisco, Calif.	50000
WLBB	Carrollton, Ga.	250d
WHLI	Hempstead, N.Y.	10000d
KYW	Cleveland, Ohio	50000
WGPA	Bethlehem, Pa.	250d

1110—270.1

CFML	Cornwall, Ont.	1000
CFTJ	Gait, Ont.	250
KRLA	Pasadena, Calif.	50000
WALT	Tampa, Fla.	50000d
KIPA	Hilo, Hawaii	1000
WMBI	Chicago, Ill.	50000
KFAB	Omaha, Nebr.	50000
WBT	Charlotte, N.C.	50000
KBND	Bend, Oreg.	5000
WNAR	Norristown, Pa.	500d
WVJP	Caguas, P.R.	250
WHIM	Providence, R.I.	1000d

1120—267.7

WUST	Bethesda, Md.	250d
KMOX	St. Louis, Mo.	50000
WWOL	Buffalo, N.Y.	1000d
KCLE	Cleburne, Tex.	250d

1130—265.3

CKWX	Vancouver, B.C.	50000
KROV	Dinuba, Calif.	1000
KSDO	San Diego, Calif.	5000
KWKH	Shreveport, La.	50000
WCAR	Detroit, Mich.	50000
WDGY	Minneapolis, Minn.	50000
WNEW	New York, N.Y.	50000

1140—263.0

CFTK	Terrace, B.C.	1000
CKXL	Calgary, Alta.	10000
CBI	Sydney, N.S.	5000
KRAK	Sacramento, Calif.	50000
WMIE	Miami, Fla.	10000
KGEM	Boise, Idaho	10000
WSIV	Pekin, Ill.	1000d
KLPR	Oklahoma City, Okla.	1000d
WITA	San Juan, P.R.	500
KSOO	Sioux Falls, S.Dak.	10000
KORC	Mineral Wells, Tex.	250d
WRVA	Richmond, Va.	50000

1150—260.7

CKSA	Lloydminster, Alta.	1000
CHSJ	Saint John, N.B.	10000
CKOC	Hamilton, Ont.	5000
CKX	Brandon, Man.	10000
CKTR	Three Rivers, Que.	10000
WBCA	Bay Minette, Ala.	1000d
WGEA	Geneva, Ala.	1000d
WJRD	Tuscaloosa, Ala.	5000
KCKY	Coolidge, Ariz.	1000
KXLR	No. Little Rock, Ark.	5000
KRKD	Los Angeles, Calif.	5000
KJAX	Santa Rosa, Calif.	5000
KGMC	Englewood, Colo.	1000d
WCNX	Middletown, Conn.	500d
WDEL	Wilmington, Del.	5000
WNDB	Daytona Bch., Fla.	1000
WTMP	Tampa, Fla.	5000d
WFPM	Fort Valley, Ga.	1000d
WJEM	Valdosta, Ga.	1000d
WGGH	Marion, Ill.	5000d
WJRL	Rockford, Ill.	500d
KWKY	Des Moines, Iowa	1000
KSAL	Salina, Kans.	5000
WMST	Mt. Sterling, Ky.	500d
WLOC	Mumfordville, Ky.	1000d
WJBO	Baton Rouge, La.	5000
WGHM	Skowhegan, Maine	5000d
WCOP	Boston, Mass.	5000
WCEN	Mt. Pleasant, Mich.	1000
KASM	Albany, Minn.	1000d
WXTN	Lexington, Miss.	500d
KRMS	Osage Beach, Mo.	1000d
KSEN	Shelby, Mont.	1000
KDEF	Albuquerque, N.Mex.	500d
WRUN	Utica, N.Y.	5000
WBAG	Burlington, N.C.	1000d
WGBR	Goldsboro, N.C.	5000
WCUE	Akron, Ohio	1000d
WIMA	Lima, Ohio	1000
KNED	McAlester, Okla.	1000
KAGO	Klamath Falls, Oreg.	5000
WHUN	Huntingdon, Pa.	1000d
WYNS	Lehighton, Pa.	1000d
WKPA	New Kensington, Pa.	1000d
WORA	Mayaquez, P.R.	1000
WDIX	Orangeburg, S.C.	5000
WTYC	Rock Hill, S.C.	1000d
WSNW	Seneca Township, South Carolina	1000d
WAPO	Chattanooga, Tenn.	5000
WCRK	Morristown, Tenn.	1000
WTAW	Bryan, Tex.	1000d
KCCT	Corpus Christi, Tex.	1000d
KIZZ	El Paso, Tex.	1000d
KVIL	Highland Park, Tex.	500d
KJBC	Midland, Tex.	1000d
KPNG	Port Neches, Tex.	500d
KOLJ	Quanah, Tex.	500d
KIKK	San Antonio, Tex.	1000d
KOFE	Pullman, Wash.	1000d
KAYO	Seattle, Wash.	5000
KKEY	Vancouver, Wash.	1000d
WELC	Welch, W.Va.	1000d
WAXX	Chippewa Falls, Wis.	5000d
WISN	Milwaukee, Wis.	5000

1160—258.5

WJJD	Chicago, Ill.	50000
KSL	Salt Lake City, Utah	50000

1170—256.3

CFNS	Saskatoon, Sask.	1000
WCOV	Montgomery, Ala.	10000
KCBQ	San Diego, Calif.	50000
KLOK	San Jose, Calif.	10000
KOHO	Honolulu, Hawaii	1000
WLBH	Mattoon, Ill.	250d
KSTT	Davenport, Iowa	1000
KVOO	Tulsa, Okla.	50000
WLEO	Ponce, P.R.	250
KPUG	Bellingham, Wash.	1000
WWVA	Wheeling, W.Va.	50000

1180—254.1

WLDS	Jacksonville, Ill.	1000d
WHAM	Rochester, N.Y.	50000

1190—252.0

KZON	Tolleson, Ariz.	250
KEZY	Anaheim, Calif.	1000
KNBA	Vallejo, Calif.	250d
WOWO	Ft. Wayne, Ind.	50000
WANN	Annapolis, Md.	10000d
WKOX	Fram'gham, Mass.	1000d
WLIB	New York, N.Y.	1000d
KEX	Portland, Oreg.	50000
KLIF	Dallas, Tex.	50000

1200—249.9

WOAI	San Antonio, Tex.	50000

1210—247.8

WCNT	Centralia, Ill.	1000d
WKNX	Saginaw, Mich.	10000d
WADE	Wadesboro, N.C.	1000d
WAVI	Dayton, Ohio	250d
WCAU	Philadelphia, Pa.	50000

1220—245.8

CJOC	Lethbridge, Alta.	10000
CKDA	Victoria, B.C.	10000
CJRL	Kenora, Ont.	1000
CKCW	Moncton, N.B.	10000
CJSS	Cornwall, Ont.	1000
CKSM	Shawinigan, Quebec	1000
WEZB	Birmingham, Ala.	1000d
WPRN	Butler, Ala.	1000d
KVSA	McGehee, Ark.	1000d
KIBE	Palo Alto, Calif.	1000d
KKAR	Pomona, Calif.	250d
KFSC	Denver, Colo.	1000d
WDEE	Hamden, Conn.	1000d
WQTY	Arlington, Fla.	250d
WKBX	Kissimmee, Fla.	1000
WMBM	Miami, Fla.	250d
WSAF	Sarasota, Fla.	1000d
WCLB	Camilla, Ga.	1000d
WPLK	Rockmart, Ga.	250d
WSFT	Thomaston, Ga.	250d
WLPO	LaSalle, Ill.	1000d
WKRS	Waukegan, Ill.	1000d
WSLM	Salem, Ind.	1000d
KJAN	Atlantic, Iowa	250d
KOUR	Independence, Iowa	250d
KOFO	Ottawa, Kans.	250d
WFKN	Franklin, Ky.	250d
KBCL	Shreveport, La.	250d
WLBI	Denham Springs, La.	250d
WSME	Sanford, Maine	1000d
WBCH	Hastings, Mich.	250d
WAVN	Stillwater, Minn.	1000d
WMDC	Hazlehurst, Miss.	250d
KBHM	Branson, Mo.	1000d
KLPW	Union, Mo.	1000d
WKBK	Keene, N.H.	1000d
WGNY	Newburgh, N.Y.	1000d
WSOQ	N. Syracuse, N.Y.	1000d
WKMT	Kings Mtn., N.C.	1000d
WREV	Reidsville, N.C.	250d
WENC	Whiteville, N.C.	1000d
KEYD	Oakes, N.Dak.	1000d
WGAR	Cleveland, Ohio	50000
WERT	Van Wert, Ohio	250d
KGYN	Guymon, Okla.	1000d
WJUN	Mexico, Pa.	1000d
WRIB	Providence, R.I.	1000d
WALD	Walterboro, S.C.	1000d
WFWL	Camden, Tenn.	250d
WCPH	Etowah, Tenn.	1000d
WHEY	Millington, Tenn.	250d
KVLL	Livingston, Tex.	250d
KZEE	Weatherford, Tex.	250d
WLSD	Big Stone Gap, Va.	1000d
WFAX	Falls Church, Va.	1000d
KASY	Auburn, Wash.	250d
KOZI	Chelan, Wash.	1000d

1230—243.8

CHFC	Churchill, Man.	250
CFKL	Scheffer ville, Que.	250
CFGR	Gravelbourg, Sask.	250
CFYT	Dawson City, Yukon T.	100
CFPA	Port Arthur, Ont.	1000
CKLD	Thetford Mines, Que.	250
CKMP	Midland, Ont.	250
VOAR	St. John's, Nfld.	100
CKVD	Val D'Or, Que.	250
WAUD	Auburn, Ala.	250
WJBB	Haleyville, Ala.	250
WBHP	Huntsville, Ala.	250
WNUZ	Talledega, Ala.	250
WTBC	Tuscaloosa, Ala.	250
KIFW	Sitka, Alaska	250
KSUN	Bisbee, Ariz.	250
KAAA	Kingman, Ariz.	250
KRIZ	Phoenix, Ariz.	250
KCON	Conway, Ark.	250
KFPW	Ft. Smith, Ark.	250
KBTM	Jonesboro, Ark.	250
KGEE	Bakersfield, Calif.	250
KWTC	Barstow, Calif.	250
KIBS	Bishop, Calif.	250
KXO	El Centro, Calif.	250
KDAC	Ft. Bragg, Calif.	250
KGFJ	Los Angeles, Calif.	250
KPRL	Paso Robles, Calif.	250
KROG	Redding, Calif.	250
KWG	Stockton, Calif.	250
KEXO	Grand Junc., Colo.	250
KBRR	Leadville, Colo.	250
KDZA	Pueblo, Colo.	250
KGEK	Sterling, Colo.	250
WINF	Manchester, Conn.	250
WGGG	Gainesville, Fla.	250
WONN	Lakeland, Fla.	250
WMAF	Madison, Fla.	250
WSBB	New Smyrna Bch., Fla.	250
WNVY	Pensacola, Fla.	250
WCNH	Quincy, Fla.	250
WJNO	W. Palm Beach, Fla.	250
WBIA	Augusta, Ga.	250
WBLJ	Dalton, Ga.	250
WXLI	Dublin, Ga.	250d
WFOM	Marietta, Ga.	250
WSOK	Savannah, Ga.	250
WAYX	Waycross, Ga.	250
KBAR	Burley, Idaho	250
KORT	Grangeville, Idaho	250
KRXK	Rexburg, Idaho	250
WJBC	Bloomington, Ill.	250
WQUA	Moline, Ill.	250
WHCO	Sparta, Ill.	250
WJOB	Hammond, Ind.	250
WSAL	Logansport, Ind.	250
WTCJ	Tell City, Ind.	250
WBOW	Terre Haute, Ind.	250
KFJB	Marshalltown, Iowa	250
WHIR	Danville, Ky.	250
WHOP	Hopkinsville, Ky.	250
WMLF	Pineville, Ky.	250
KLIC	Monroe, La.	250
WJBW	New Orleans, La.	250
KSLO	Opelousas, La.	250
WQDY	Calais, Maine	250
WITH	Baltimore, Md.	250
WCUM	Cumberland, Md.	250
WMNB	No. Adams, Mass.	250
WESX	Salem, Mass.	250
WNEB	Worcester, Mass.	250
WJEF	Grand Rapids, Mich.	1000d
WIKB	Iron River, Mich.	250
WMPC	Lapeer, Mich.	250
WSOO	Sit. Ste. Marie, Mich.	1000
WSTR	Sturgis, Mich.	250
WKLK	Cloquet, Minn.	250
KGHS	Internat'l Falls, Minn.	100
KYSM	Mankato, Minn.	250
KTRF	Thief Riv. Fls., Minn.	250
KWNO	Winona, Minn.	250
WCMA	Corinth, Miss.	250
WHSY	Hattiesburg, Miss.	250
WSSO	Starkville, Miss.	250
WAZF	Yazoo City, Miss.	250
KODE	Joplin, Mo.	250

Kc.	Wave Length	W.P.
KLWT	Lebanon, Mo.	250
KNCM	Moberly, Mo.	250
KANA	Anaconda, Mont.	250
KBMN	Bozeman, Mont.	250
KXLO	Lewiston, Mont.	250
KLCB	Libby, Mont.	250
KTNC	Falls City, Nebr.	100
KHAS	Hastings, Nebr.	250
KELY	Ely, Nev.	250
KLAS	Las Vegas, Nev.	250
KDOT	Reno, Nev.	250
WMOU	Berlin, N.H.	250
WTSV	Claremont, N.H.	250
WCMC	Wildwood, N.J.	100
KALG	Alamogordo, N.Mex.	250
KOTS	Deming, N.Mex.	250
KYVA	Gallup, N.Mex.	250
KFUN	Las Vegas, N.Mex.	250
KSWS	Roswell, N.Mex.	250
WNIA	Cheektowaga, N.Y.	500
WENY	Elmira, N.Y.	1000
WHUC	Hudson, N.Y.	250
WLFH	Little Falls, N.Y.	250
WFAS	White Plains, N.Y.	250
WSKY	Asheville, N.C.	250
WFAI	Fayetteville, N.C.	250
WMFR	High Point, N.C.	250
WISP	Kinston, N.C.	250
WNNC	Newton, N.C.	250
WCBT	Roanoke Rap., N.C.	250
KDIX	Dickinson, N.Dak.	250
WCPO	Cincinnati, Ohio	250
WCOL	Columbus, Ohio	250
WIRO	Ironton, Ohio	250
WTOL	Toledo, Ohio	250
KADA	N. of Ada, Okla.	250
WBBZ	Ponca City, Okla.	250
KVAS	Astoria, Oreg.	250
KRNS	Burns, Oreg.	250
KOOS	Coos Bay, Oreg.	250
KGRO	Gresham, Oreg.	250
KYJC	Medford, Oreg.	1000
KQIK	Lakeview, Oreg.	250
KTDO	Toledo, Oreg.	250
WBVP	Beaver Falls, Pa.	250
WEEX	Easton, Pa.	250
WKBO	Harrisburg, Pa.	250
WCRO	Johnstown, Pa.	250
WBPZ	Lock Haven, Pa.	250
WNIK	Arecibo, P.R.	250
WERI	Westerly, R.I.	250
WAIM	Anderson, S.C.	250
WNOK	Columbia, S.C.	250
WOLS	Florence, S.C.	250
KISD	Sioux Falls, S.Dak.	250
WMMT	McMinnville, Tenn.	250
KSIX	Corpus Christi, Tex.	250
KDLK	Del Rio, Tex.	250
KNUZ	Houston, Tex.	250
KERV	Kerrville, Tex.	250
KLVT	Levelland, Tex.	250
KEEE	Nacogdoches, Tex.	250
KOSA	Odessa, Tex.	250
KHHH	Pampa, Tex.	250
KSEY	Seymour, Tex.	250
KSST	Sulphur Sprgs., Tex.	250
KWTX	Waco, Tex.	250
KMUR	Murray, Utah	250
KOAL	Price, Utah	250
WJOY	Burlington, Vt.	250
WBBI	Abingdon, Va.	250
WCFV	Clifton Forge, Va.	250
WFVA	Fredericksburg, Va.	250
WNOR	Norfolk, Va.	250
KQTY	Everett, Wash.	1000
KLYK	Spokane, Wash.	250
KREW	Sunnyside, Wash.	250
WLOG	Logan, W.Va.	250
WTAP	Parkersburg, W.Va.	250
WHBY	Appleton, Wis.	250
WCLO	Janesville, Wis.	250
WHVF	Wausau, Wis.	250
KVOC	Casper, Wyo.	250

1240—241.8

CFLM	La Tuque, Que.	1000
CFNW	Norman Wells, Northwest Terr.	100
CFPR	Prince Rupert, B.C.	250
CFWH	Whitehorse, Y.T.	250
CJAV	Port Alberni, B.C.	250
CJCS	Stratford, Ont.	250
CJRW	Summerside, P.E.I.	250
CKBS	St. Hyacinthe, Que.	250
CKCQ-1	Williams Lake, B.C.	250
CKLS	LaSarre, Que.	250
WEBJ	Brewton, Ala.	250
WULA	Eufaula, Ala.	250
WOWL	Florence, Ala.	250
WARF	Jasper, Ala.	250
KZOW	So. of Globe, Ariz.	250
KOFA	Yuma, Ariz.	250
KVRC	Arkadelphia, Ark.	250
KWAK	Stuttgart, Ark.	250
KPLY	Crescent City, Calif.	250
KMBY	Monterey, Calif.	250
KPPC	Pasadena, Calif.	100
KRKS	Ridgecrest, Calif.	250
KROY	Sacramento, Calif.	250
KRNO	San Bernardino, Calif.	250
KSON	San Diego, Calif.	250
KSMA	Santa Maria, Calif.	250
KSUE	Susanville, Calif.	250
KRDO	Colo. Sprgs., Colo.	250
KDGO	Durango, Colo.	250
KSLV	Monte Vista, Colo.	250
KCRT	Trinidad, Colo.	250
WWCO	Waterbury, Conn.	250
WBGC	Chipley, Fla.	250
WLCO	Eustis, Fla.	250
WINK	Fort Myers, Fla.	250
WMMB	Melbourne, Fla.	250
WFOY	St. Augustine, Fla.	250
WBHB	Fitzgerald, Ga.	250
WDUN	Gainesville, Ga.	1000
WLAG	LaGrange, Ga.	250
WBML	Macon, Ga.	250
WWNS	Statesboro, Ga.	250
WPAX	Thomasville, Ga.	250
WTWA	Thomson, Ga.	250
KLEI	Kailua, Hawaii	250
KVNI	Coeur d'Alene, Idaho	250
KWIK	Pocatello, Idaho	250
WCRW	Chicago, Ill.	100
WEDC	Chicago, Ill.	250
WSBC	Chicago, Ill.	250
WEBQ	Harrisburg, Ill.	250
WTAX	Springfield, Ill.	250
WSDR	Sterling, Ill.	100
WHBU	Anderson, Ind.	250
KDEC	Decorah, Iowa	250
KWLC	Decorah, Iowa	250
KBIZ	Ottumwa, Iowa	250
KICD	Spencer, Iowa	250
KIUL	Garden City, Kans.	250
KAKE	Wichita, Kans.	250
WINN	Louisville, Ky.	250
WFTM	Maysville, Ky.	250
WPKE	Pikeville, Ky.	250
WSFC	Somerset, Ky.	250
KASO	Minden, La.	250
KANE	New Iberia, La.	250
WCOU	Lewiston, Maine	250
WCEM	Cambridge, Md.	250
WJEJ	Hagerstown, Md.	250
WHAI	Greenfield, Mass.	250
WOCB	W. Yarmouth, Mass.	250
WATT	Cadillac, Mich.	250
WCBY	Cheboygan, Mich.	250
WJPD	Ishpeming, Mich.	1000
WJIM	Lansing, Mich.	250
WMFG	Hibbing, Minn.	250
WJON	St. Cloud, Minn.	250
WMPA	Aberdeen, Miss.	250
WGRM	Greenwood, Miss.	250
WGCM	Gulfport, Miss.	250
WMIS	Natchez, Miss.	250
KFMO	Flat River, Mo.	250
KWOS	Jefferson City, Mo.	250
KNEM	Nevada, Mo.	250
KBMY	Billings, Mont.	250
KLTZ	Glasgow, Mont.	250
KBLL	Helena, Mont.	250
KFOR	Lincoln, Nebr.	250
KODY	North Platte, Nebr.	250
KELK	Elko, Nev.	1000
WSNJ	Bridgeton, N.J.	250
KAVE	Carlsbad, N.Mex.	250
KCLV	Clovis, N.Mex.	250
WGBB	Freeport, N.Y.	250
WGVA	Geneva, N.Y.	250
WJTN	Jamestown, N.Y.	250
WVOS	Liberty, N.Y.	250
WNBZ	Saranac Lake, N.Y.	250
WSNY	Schenectady, N.Y.	1000d
WATN	Watertown, N.Y.	250
WPNF	Brevard, N.C.	250
WIST	Charlotte, N.C.	250
WCNC	Elizabeth City, N.C.	250
WJNC	Jacksonville, N.C.	250
WRAL	Raleigh, N.C.	250
KDLR	Devils Lake, N.Dak.	250
WBBW	Youngstown, Ohio	250
WHIZ	Zanesville, Ohio	250
KVSO	Ardmore, Okla.	250
KBEK	Elk City, Okla.	250
KBEL	Idabel, Okla.	250
KOKL	Okmulgee, Okla.	250
KFLY	Corvallis, Oreg.	1000d
KKID	Pendleton, Oreg.	250
KPRB	Redmond, Oreg.	250
KQEN	Roseburg, Oreg.	250
WRTA	Altoona, Pa.	250
WHUM	Reading, Pa.	250
WKOK	Sunbury, Pa.	250
WBAX	Wilkes-Barre, Pa.	250
WALO	Humacao, P.R.	250
WWON	Woonsocket, R.I.	250
WKDK	Newberry, S.C.	250
WDXY	Sumter, S.C.	250
WBEJ	Elizabethton, Tenn.	250
WEKR	Fayetteville, Tenn.	250
WBIR	Knoxville, Tenn.	250
WKDA	Nashville, Tenn.	250
WENK	Union City, Tenn.	250
KVLF	Alpine, Tex.	1000
KEAN	Brownwood, Tex.	100
KORA	Bryan, Tex.	250
KOCA	Kilgore, Tex.	250
KSOX	Raymondville, Tex.	250
KXOX	Sweetwater, Tex.	250
WSKI	Montpelier, Vt.	250
WSSV	Petersburg, Va.	1000
WROV	Roanoke, Va.	250
WTON	Staunton, Va.	1000
KXLE	Ellensburgh, Wash.	250
KGY	Olympia, Wash.	1000
WKOY	Bluefield, W.Va.	250
WTIP	Charleston, W.Va.	250
WDNE	Elkins, W.Va.	1000
WOMT	Manitowoc, Wis.	250
WIBU	Poynette, Wis.	1000
WOBT	Rhinelander, Wis.	250
WJMC	Rice Lake, Wis.	250
KFBC	Cheyenne, Wyo.	250
KLUK	Evanston, Wyo.	250
KASL	Newcastle, Wyo.	250
KRAL	Rawlins, Wyo.	250
KTHE	Thermopolis, Wyo.	250

1250—239.9

CHWO	Oakville, Ont.	1000
CKBL	Matane, Que.	5000
WZOB	Ft. Payne, Ala.	1000d
WETU	Wetumpka, Ala.	5000d
KAKA	Wickenburg, Ariz.	500d
KWCX	Willcox, Ariz.	1000d
KFAY	Fayetteville, Ark.	500d
KAJI	Little Rock, Ark.	1000
KHOT	Madera, Calif.	500d
KTMS	Santa Barbara, Calif.	1000
KTWL	Golden, Colo.	1000d
WNER	Live Oak, Fla.	1000d
WRIM	Pahokee, Fla.	500d
WDAE	Tampa, Fla.	5000
WYTH	Madison, Ga.	1000d
WIZZ	Streator, Ill.	500d
WGL	Ft. Wayne, Ind.	1000
WRAY	Princeton, Ind.	1000d
KCFI	Cedar Falls, Iowa	500d
KFKU	Lawrence, Kans.	5000
WREN	Topeka, Kans.	5000
WLCK	Scottsville, Ky.	500d
WGUY	Bangor, Maine	5000d
WARE	Ware, Mass.	1000
WWBC	Bay City, Mich.	1000d
KOTE	Fergus Falls, Minn.	1000
KCUE	Red Wing, Minn.	1000d
WHNY	McComb, Miss.	5000
KVLV	Fallon, Nev.	1000d
WKBR	Manchester, N.H.	5000
WMTR	Morristown, N.J.	1000d
WIPS	Ticonderoga, N.Y.	1000d
WFAG	Farmville, N.C.	500d
WBRM	Marion, N.C.	1000d
WCHO	Washington Court House, Ohio	500d
KRXL	Roseburg, Oreg.	5000d
WLEM	Emporium, Pa.	1000d
WPEL	Montrose, Pa.	1000d
WCAE	Pittsburgh, Pa.	5000
WNOW	York, Pa.	1000d
WTMA	Charleston, S.C.	5000
WKBL	Covington, Tenn.	1000d
WNTT	Tazewell, Tenn.	500d
KFTV	Paris, Tex.	500d
KPAC	Port Arthur, Tex.	5000
KUKA	San Antonio, Tex.	500d
KSML	Seminole, Tex.	1000d
KVEL	Vernal, Utah	1000d
WDVA	Danville, Va.	5000
WYSR	Franklin, Va.	1000d
WNRQ	Grundy, Va.	1000d
KWSC	Pullman, Wash.	5000
KTW	Seattle, Wash.	1000
WEMP	Milwaukee, Wis.	5000

1260—238.0

CFRN	Edmonton, Alta.	50000
DYBU	Cebu, P.I.	1000
WCRT	Birmingham, Ala.	5000d
KPIN	Casa Grande, Ariz.	1000d
KCCB	Corning, Ark.	500d
KBHC	Nashville, Ark.	500d
KGIL	San Fernando, Calif.	5000
KYA	San Francisco, Calif.	5000
WMMM	Westport, Conn.	1000d
WWDC	Washington, D.C.	5000
WFTW	Fort Walton Beach, Florida	1000d
WMMA	Miami, Fla.	5000d
WWPF	Palatka, Fla.	1000
WHAB	Baxley, Ga.	5000d
WBBK	Blakely, Ga.	1000d
WTJH	East Point, Ga.	5000d
KIFI	Idaho Falls, Idaho	5000
KWEI	Weiser, Ida.	1000d
WIBV	Belleville, Ill.	1000d
WFBM	Indianapolis, Ind.	5000
KFGQ	Boone, Iowa	250d
KWHK	Hutchinson, Kans.	1000
WXOK	Baton Rouge, La.	1000d
WEZE	Boston, Mass.	5000
WALM	Albion, Mich.	1000
WJBL	Holland, Mich.	5000d
KROX	Crookston, Minn.	1000
KDUZ	Hutchinson, Minn.	1000d
WGVM	Greenville, Miss.	1000d
WNSL	Laurel, Miss.	1000d
KGBX	Springfield, Mo.	5000
KIMB	Kimball, Nebr.	1000d
WBUD	Trenton, N.J.	5000
KVSF	Santa Fe, N.Mex.	1000
WBNR	Beacon, N.Y.	1000d
WNDR	Syracuse, N.Y.	5000
WGWR	Asheboro, N.C.	1000d
WCDJ	Edenton, N.C.	1000d
WDOK	Cleveland, Ohio	5000
WNXT	Portsmouth, Ohio	5000
KWSH	Wewoka-Seminole, Oklahoma	1000
KMCM	McMinnville, Oreg.	1000
WERC	Erie, Pa.	5000
WPHB	Philipsburg, Pa.	1000d
WISO	Ponce, P.R.	1000
WMUU	Greenville, S.C.	1000d
WJOT	Lake City, S.C.	1000d
KWYR	Winner, S.Dak.	5000d
WNOO	Chattanooga, Tenn.	1000d
WMCH	Church Hill, Tenn.	1000d
WDKN	Dickson, Tenn.	1000d
WCLC	Jamestown, Tenn.	1000d
KSPL	Diboll, Tex.	1000d
KPSO	Falfurrias, Tex.	500d
KWFR	San Angelo, Tex.	1000d
KTUE	Tulia, Tex.	1000d
KTAE	Taylor, Tex.	1000d
WCHV	Charlottesville, Va.	5000
WBCR	Christiansburg, Va.	1000d
KWIQ	Moses Lake, Wash.	1000d
WVVW	Grafton, W.Va.	500d
WWIS	Black River Falls, Wis.	1000d
WEKZ	Monroe, Wis.	1000d
KPOW	Powell, Wyo.	5000

1270—236.1

CHAT	Medicine Hat, Alta.	1000
CHWK	Chilliwack, B.C.	10000
CJCB	Sydney, N.S.	5000
CFGT	St. Joseph d'Alma, Quebec	1000
WGSV	Guntersville, Ala.	1000d
WAIP	Prichard, Ala.	1000d
KBYR	Anchorage, Alaska	1000
KDJI	Holbrook, Ariz.	1000d
KADL	Pine Bluff, Ark.	5000d
KCOK	Tulare, Calif.	1000
WNOG	Naples, Fla.	500d
WHIY	Orlando, Fla.	5000d
WTAL	Tallahassee, Fla.	5000
WGBA	Columbus, Ga.	5000d
WJJC	Commerce, Ga.	1000d
KNDI	Honolulu, Hawaii	5000
KTFI	Twin Falls, Idaho	5000
WEIC	Charleston, Ill.	1000d
WHBF	Rock Island, Ill.	5000
WCMR	Elkhart, Ind.	5000
WWCA	Gary, Ind.	1000
WORX	Madison, Ind.	1000d
KSCB	Liberal, Kans.	500
WAIN	Columbia, Ky.	1000d
WFUL	Fulton, Ky.	1000d
KVCL	Winnfield, La.	1000d
WSPR	Springfield, Mass.	1000
WXYZ	Detroit, Mich.	5000
KWEB	Rochester, Minn.	500d
WVOM	Ioka, Miss.	1000d
WLSM	Louisville, Miss.	1000d
KUSN	St. Joseph, Mo.	1000d
KBUB	Sparks, Nev.	1000d
WTSN	Dover, N.H.	5000
WDVL	Vineland, N.J.	500d
KRAC	Alamogordo, N.Mex.	1000d
WHLD	Niagara Falls, N.Y.	5000d
WDLA	Walton, N.Y.	1000d
WCGC	Belmont, N.C.	1000
WMPM	Smithfield, N.C.	5000d
KBOM	Mandan, N.Dak.	1000
WILE	Cambridge, Ohio	1000d
KWPR	Claremore, Okla.	500d
KAJO	Grants Pass, Oreg.	5000d
WLBR	Lebanon, Pa.	1000
WBHC	Hampton, S.C.	1000d
KIHO	Sioux Falls, S.Dak.	1000
WLIK	Newport, Tenn.	5000d
KIOX	Bay City, Tex.	1000
KHEM	Big Spring, Tex.	1000d
KEPS	Eagle Pass, Tex.	1000d
KFJZ	Fort Worth, Tex.	5000
WTID	Newport News, Va.	1000d
WHEO	Stuart, Va.	1000d
KCVL	Colville, Wash.	1000d
KBAM	Longview, Wash.	5000d
WKYR	Keyser, W.Va.	5000d

1280—234.2

CHIQ	Hamilton, Ont.	5000
CJMS	Montreal, Que.	10000
CKCV	Quebec, Que.	5000
WPID	Piedmont, Ala.	1000d
WNPT	Tuscaloosa, Ala.	5000
KHEP	Phoenix, Ariz.	1000d
KNBY	Newport, Ark.	1000d
KFOX	Long Beach, Calif.	1000
KCJH	San Luis Obispo, Cal.	500d
KJOY	Stockton, Calif.	1000
KTLN	Denver, Colo.	5000
WSUX	Seaford, Del.	1000d
WDSP	DeFuniak Springs, Florida	5000d
WQIK	Jacksonville, Fla.	5000d
WIPC	Lake Wales, Fla.	1000d
WYND	Sarasota, Fla.	500d
WIBB	Macon, Ga.	1000d
WMRD	Aurora, Ill.	1000d
WGBF	Evansville, Ind.	5000
KCOB	Newton, Iowa	1000d
KSOK	Arkansas City, Kans.	1000
WCPM	Cumberland, Ky.	1000d
WDSU	New Orleans, La.	5000
KWCL	Oak Grove, La.	500d
WEIM	Fitchburg, Mass.	5000
WFYC	Alma, Mich.	1000d
WTCN	Minneapolis, Minn.	5000
KVOX	Moorhead, Minn.	1000
KDKD	Clinton, Mo.	1000d
KYRO	Potosi, Mo.	500d
KCNI	Broken Bow, Nebr.	1000d
KTOO	Henderson, Nev.	5000d
WHBI	Newark, N.J.	2500
KRZE	Farmington, N.Mex.	5000d
WADO	New York, N.Y.	5000
WVET	Rochester, N.Y.	5000d

Kc.	Wave Length	W.P.
WRSA	Saratoga Sprgs., N.Y.	1000
WSAT	Salisbury, N.C.	1000
WYAL	Scotland Neck, N.C.	5000d
WONW	Defiance, Ohio	1000
WLMJ	Jackson, Ohio	1000d
KLCO	Poteau, Okla.	1000d
KERG	Eugene, Oreg.	5000
WBRX	Berwick, Pa.	500d
WHVR	Hanover, Pa.	5000
WKST	New Castle, Pa.	1000
WCMN	Arecibo, P.R.	1000
WANS	Anderson, S.C.	1000
WJAY	Mullins, S.C.	1000d
WMCP	Columbia, Tenn.	1000d
WDNT	Dayton, Tenn.	1000d
KNIT	Abilene, Tex.	500d
KWHI	Brenham, Tex.	1000d
KLUE	Longview, Tex.	1000d
KNAK	Salt Lake City, Utah	5000
WYVE	Wytheville, Va.	1000d
KIT	Yakima, Wash.	5000
WVAR	Richwood, W.Va.	1000d
WNAM	Neenah, Wis.	1000
KOWB	Laramie, Wyo.	5000

1290—232.4

CFAM	Altona, Man.	10000
CKSL	London, Ont.	5000
WTHG	Jackson, Ala.	1000d
WMLS	Sylacauga, Ala.	1000d
KEOS	Flagstaff, Ariz.	1000
KCUB	Tucson, Ariz.	1000
KDMS	El Dorado, Ark.	5000d
KUOA	Siloam Sprgs., Ark.	5000d
KHSL	Chico, Calif.	5000
KPER	Gilroy, Calif.	1000d
KITO	San Bernardino, Calif.	5000
KACL	Santa Barbara, Calif.	500d
WCCC	Hartford, Conn.	500d
WTUX	Wilmington, Del.	1000d
WTMC	Ocala, Fla.	5000
WSCM	Panama City Beach, Florida	500d
WIRK	W. Palm Bch., Fla.	5000
WDEC	Americus, Ga.	1000d
WCHK	Canton, Ga.	1000d
WTOC	Savannah, Ga.	5000
KYTE	Pocatello, Idaho	1000d
WIRL	Peoria, Ill.	5000
WCBL	Benton, Ky.	1000d
KJEF	Jennings, La.	1000d
WHGR	Houghton Lake, Mich.	5000
WNIL	Niles, Mich.	500d
WDIA	Saline, Mich.	500d
KBMO	Benson, Minn.	500d
WBLE	Batesville, Miss.	1000d
KALM	Thayer, Mo.	1000d
KGVO	Missoula, Mont.	5000
KOIL	Omaha, Nebr.	5000
WKNE	Keene, N.H.	5000
KSRC	Socorro, N.M.	1000d
WGLI	Babylon, N.Y.	1000
WNBF	Binghamton, N.Y.	5000
WHKY	Hickory, N.C.	5000
WEYE	Sanford, N.C.	1000d
WONP	Bellaire, Ohio	1000d
WHIO	Dayton, Ohio	5000
KUMA	Pendleton, Oreg.	5000
KLIQ	Portland, Oreg.	5000d
WFBG	Altoona, Pa.	5000
WTIV	Titusville, Pa.	500d
WICE	Providence, R.I.	5000
WFIG	Sumter, S.C.	1000
WATO	Oak Ridge, Tenn.	1000
KQLT	Big Lake, Tex.	1000d
KIVY	Crockett, Tex.	500d
KRGV	Weslaco, Tex.	5000
KTRN	Wichita Falls, Tex.	5000
WPVA	Colonial Hgts., Va.	5000d
WAGE	Leesburg, Va.	1000d
WKWS	Rocky Mount, Va.	1000d
WVOW	Logan, W.Va.	5000
WMIL	Milwaukee, Wis.	1000d
WCOW	Sparta, Wis.	5000d

1300—230.6

CBAF	Moncton, N.B.	5000
CJME	Regina, Sask.	1000
WAVC	Boaz, Ala.	500d
WTLS	Tallassee, Ala.	1000d
KWCB	Searcy, Ark.	1000d
KROP	Brawley, Calif.	1000
KYNO	Fresno, Calif.	5000
KWKW	Pasadena, Calif.	1000
KVOR	Colo. Sprgs., Colo.	1000
WAVZ	New Haven, Conn.	1000
WRKT	Cocoa Beach, Fla.	500d
WFFG	Marathon, Fla.	500d
WSOL	Tampa, Fla.	5000d
WMTM	Moultrie, Ga.	5000d
WIMO	Winder, Ga.	1000d
KOZE	Lewiston, Idaho	5000
WTAQ	LaGrange, Ill.	500
WFRX	W. Frankfort, Ill.	1000d
WHLT	Huntington, Ind.	500d
WMFT	Terre Haute, Ind.	500d
KGLO	Mason City, Iowa	5000
WBLG	Lexington, Ky.	1000
WIBR	Baton Rouge, La.	1000
KANB	Shreveport, La.	1000d
WFBR	Baltimore, Md.	5000
WJDA	Quincy, Mass.	1000d
WOOD	Grand Rapids, Mich.	5000
WRBC	Jackson, Miss.	5000
KMMO	Marshall, Mo.	1000d
KBRL	McCook, Nebr.	1000d
KPTL	Carson City, Nev.	5000
WAAT	Trenton, N.J.	250d
WOSC	Fulton, N.Y.	1000d
WGOL	Goldsboro, N.C.	1000d
WSYD	Mt. Airy, N.C.	5000
WERE	Cleveland, Ohio	5000
WMVO	Mt. Vernon, Ohio	500
KOME	Tulsa, Okla.	5000
KDOV	Medford, Oreg.	5000d
KACI	The Dalles, Oreg.	1000d
WWCH	Clarion, Pa.	500d
WTIL	Mayaguez, P.R.	1000
WCKI	Greer, S.C.	1000d
KOLY	Mobridge, S.Dak.	1000d
WMTN	Morristown, Tenn.	5000d
WMAK	Nashville, Tenn.	5000
KVET	Austin, Tex.	1000
KTFY	Brownfield, Tex.	1000d
KKAS	Silsbee, Tex.	500d
KOL	Seattle, Wash.	5000
WCLG	Morgantown, W.Va.	1000d
WKLC	St. Albans, W.Va.	1000d

1310—228.9

CKOY	Ottawa, Ont.	5000
CJRH	Richmond Hill, Ont.	10000
WHEP	Foley, Ala.	1000d
WJAM	Marion, Ala.	5000d
KBUZ	Mesa, Ariz.	5000
KBOK	Malvern, Ark.	1000d
KIOT	Barstow, Calif.	500d
KPOD	Crescent City, Calif.	1000d
KDIA	Oakland, Calif.	1000
KTKR	Taft, Calif.	500d
KFKA	Greeley, Colo.	1000
WICH	Norwich, Conn.	1000
WOOD	Deland, Fla.	5000d
WAUC	Wauchula, Fla.	500d
WBRO	Waynesboro, Ga.	1000d
WBMK	West Point, Ga.	1000d
KLIX	Twin Falls, Idaho	5000
WISH	Indianapolis, Ind.	5000
KOKX	Keokuk, Iowa	1000
WTTL	Madisonville, Ky.	500d
WDOC	Prestonsburg, Ky.	5000d
KIKS	Sulphur, La.	500d
KUZN	W. Monroe, La.	1000d
WLOB	Portland, Maine	1000d
WORC	Worcester, Mass.	5000
WKMH	Dearborn, Mich.	5000
WCCW	Traverse City, Mich.	1000d
KRBI	St. Peter, Minn.	1000d
WXXX	Hattiesburg, Miss.	1000d
KFSB	Joplin, Mo.	5000
KFBB	Great Falls, Mont.	5000
WILK	Asbury Park, N.J.	250
WCAM	Camden, N.J.	250
KARA	Albuquerque, N.M.	1000d
WVIP	Mt. Kisco, N.Y.	5000d
WTLB	Utica, N.Y.	1000
WISE	Asheville, N.C.	5000
WKTC	Charlotte, N.C.	1000
WTIK	Durham, N.C.	1000
KNOX	Grand Forks, N.Dak.	5000
WFAH	Alliance, Ohio	1000d
KNPT	Newport, Oreg.	5000
WBFD	Bedford, Pa.	1000d
WGSA	Ephrata, Pa.	1000d
WNAE	Warren, Pa.	5000d
WDKD	Kingstree, S.C.	5000d
WDOD	Chattanooga, Tenn.	5000
WDXI	Jackson, Tenn.	5000
WBNT	Oneida, Tenn.	1000d
KZIP	Amarillo, Tex.	1000d
WRR	Dallas, Tex.	5000
KOYL	Odessa, Tex.	1000d
KUBO	San Antonio, Tex.	5000d
WEEL	Fairfax, Va.	1000
WGH	Newport News, Va.	5000
KARY	Prosser, Wash.	1000d
WIBA	Madison, Wis.	5000

1320—227.1

CHQM	Vancouver, B.C.	10000
CKEC	New Glasgow, N.S.	250
CJSO	Sorel, P.Q.	1000
CKKW	Kitchener, Ont.	1000
WAGF	Dothan, Ala.	1000
WENN	Birmingham, Ala.	5000d
KBLU	Yuma, Ariz.	500d
KWHN	Fort Smith, Ark.	5000
KRLW	Walnut Ridge, Ark.	1000d
KHSJ	Hemet, Calif.	500d
KLAN	Lemoore, Calif.	1000d
KUDE	Oceanside, Calif.	500
KCRA	Sacramento, Calif.	5000
KAVI	Rocky Ford, Colo.	1000d
WATR	Waterbury, Conn.	5000
WGMA	Hollywood, Fla.	1000d
WZOK	Jacksonville, Fla.	5000
WAMR	Venice, Fla.	500d
WHIE	Griffin, Ga.	5000d
WNEG	Toccoa, Ga.	1000d
KNIA	Knoxville, Iowa	500d
KMAQ	Maquoketa, Iowa	500d
KLWN	Lawrence, Kans.	500d
WBRT	Bardstown, Ky.	1000d
WNGO	Mayfield, Ky.	1000d
KVHL	Homer, La.	1000d
WICO	Salisbury, Md.	1000d
WARA	Attleboro, Mass.	1000
WILS	Lansing, Mich.	5000
WDMJ	Marquette, Mich.	1000
WCPC	Houston, Miss.	5000d
WRJW	Picayune, Miss.	5000d
KXLW	Clayton, Mo.	1000d
KOLT	Scottsbluff, Nebr.	5000
WWHG	Hornell, N.Y.	5000d
WAGY	Forest City, N.C.	500d
WCOG	Greensboro, N.C.	5000
WEEW	Washington, N.C.	500d
KQDY	Minot, N.Dak.	1000d
WHOK	Lancaster, Ohio	1000d
KWOE	Clinton, Okla.	1000d
WKAP	Allentown, Pa.	1000
WGET	Gettysburg, Pa.	1000
WJAS	Pittsburgh, Pa.	5000
WSCR	Scranton, Pa.	1000
WRIO	Rio Piedras, P.R.	5000
WMSC	Columbia, S.C.	1000
KELO	Sioux Falls, S.Dak.	5000
WKIN	Kingsport, Tenn.	5000d
WMSR	Manchester, Tenn.	1000d
KVMC	Colo. City, Tex.	1000d
KXYZ	Houston, Tex.	5000
KCPX	Salt Lake City, Utah	5000
WEET	Richmond, Va.	1000d
KXRO	Aberdeen, Wash.	1000
KHIT	Walla Walla, Wash.	1000d
WQMN	Superior, Wis.	1000d
WFHR	Wisconsin Rapids, Wis.	5000

1330—225.4

CBH	Halifax, N.S.	100
WROS	Scottsboro, Ala.	1000d
KMOP	Tucson, Ariz.	500d
KFAC	Los Angeles, Calif.	5000
KAHR	Redding, Calif.	5000d
WARN	Ft. Pierce, Fla.	1000d
WYSE	Lakeland, Fla.	1000d
WEBY	Milton, Fla.	5000d
WMEN	Tallahassee, Fla.	5000d
WMLT	Dublin, Ga.	5000d
WEAW	Evanston, Ill.	1000d
WRAM	Monmouth, Ill.	1000d
WRRR	Rockford, Ill.	1000d
WJPS	Evansville, Ind.	5000
KWWL	Waterloo, Iowa	5000
KFH	Wichita, Kans.	5000
WMOR	Morehead, Ky.	1000d
KVOL	Lafayette, La.	1000
WASA	Harve deGrace, Md.	1000d
WCRB	Waltham, Mass.	5000
WTRX	Flint, Mich.	5000
WLOL	Minneapolis, Minn.	5000
WJPR	Greenville, Miss.	1000
WDAL	Meridian, Miss.	1000d
KUKU	Willow Springs, Mo.	500d
KGAK	Gallup, N.Mex.	5000
WEVD	New York, N.Y.	5000
WPOW	New York, N.Y.	5000
WEBD	Owego, N.Y.	1000d
WHAZ	Troy, N.Y.	1000
WFIN	Findlay, Ohio	1000d
WKOV	Wellston, Ohio	500d
KPOJ	Portland, Oreg.	5000
WBLF	Bellefonte, Pa.	500
WICU	Erie, Pa.	5000
WLAT	Conway, S.C.	5000d
WFBC	Greenville, S.C.	5000
WAEW	Crossville, Tenn.	1000d
WTRO	Dyersburg, Tenn.	500d
KMIL	Cameron, Tex.	500d
KSWA	Graham, Tex.	500d
KINE	Kingsville, Tex.	1000d
KVKM	Monahans, Tex.	5000
KDOK	Tyler, Tex.	1000d
WBTM	Danville, Va.	5000
WESR	Tasley, Va.	1000d
KFKF	Bellevue, Wash.	1000d
KCFA	Spokane, Wash.	5000d
WETZ	New Martinsville, W.Va.	1000d
WHBL	Sheboygan, Wis.	1000
KOVE	Lander, Wyo.	1000

1340—223.7

CBH	Halifax, N.S.	100
CFGB	Goose Bay, Nfld.	250
CJAF	Cabano, Que.	250
CFSL	Weyburn, Sask.	1000
CFYK	Yellow Knife, N.W.T.	250
CHAD	Amos, Que.	250
CJLS	Yarmouth, N.S.	250
CHRD	Drummondville, Que.	250
CJQC	Quebec, Que.	250
CKAR-I	Parry Sound, Ont.	250
CKOX	Woodstock, Ont.	250
WKUL	Cullman, Ala.	250
WJOI	Florence, Ala.	250
WGWC	Selma, Ala.	250
WFEB	Sylacauga, Ala.	250
KIBH	Seward, Alaska	250
KIKO	Miami, Ariz.	250
KNOG	Nogales, Ariz.	250
KPGE	Page, Ariz.	250
KENT	Prescott, Ariz.	250
KBTA	Batesville, Ark.	250
KBRS	Springdale, Ark.	250
KENL	Arcata, Calif.	250
KMAK	Fresno, Calif.	250
KDOL	Mojave, Calif.	100
KSFE	Needles, Calif.	250
KATY	San Luis Obispo, Calif.	250
KIST	Santa Barbara, Calif.	250
KOMY	Watsonville, Calif.	250
KDEN	Denver, Colo.	250
KVRH	Salida, Colo.	250
WNHC	New Haven, Conn.	250
WOOK	Washington, D.C.	250
WTAN	Clearwater, Fla.	250
WROD	Daytona Bch., Fla.	250
WDSR	Lake City, Fla.	250
WTYS	Marianna, Fla.	1000
WQXT	Palm Beach, Fla.	250
WSEB	Sebring, Fla.	250
WNSM	Valparaiso-Niceville, Fla.	250
WGAU	Athens, Ga.	250
WAKE	Atlanta, Ga.	250
WBBQ	Augusta, Ga.	250
WGAA	Cedartown, Ga.	250
WOKS	Columbus, Ga.	250
WBBT	Lyons, Ga.	250
WTIF	Tifton, Ga.	250
KPST	Preston, Idaho	250
KSKI	Sun Valley, Idaho	1000
WSOY	Decatur, Ill.	250
WJPF	Herrin, Ill.	250
WJOL	Joliet, Ill.	250
WBIW	Bedford, Ind.	250
WTRC	Elkhart, Ind.	250
WLBC	Muncie, Ind.	250
KROS	Clinton, Iowa	250
KLIL	Estherville, Iowa	100
KCKN	Kansas City, Kans.	250
KSEK	Pittsburg, Kans.	250
WCMI	Ashland, Ky.	250
WBGN	Bowling Green, Ky.	250
WNBS	Murray, Ky.	250
WEKY	Richmond, Ky.	250
KVOB	Bastrop, La.	250
KRMD	Shreveport, La.	250
WFAU	Augusta, Maine	1000
WHOU	Houlton, Maine	250
WGAW	Gardner, Mass.	250
WNBH	New Bedford, Mass.	250
WBRK	Pittsfield, Mass.	250
WLEW	Bad Axe, Mich.	250
WLAV	Grand Rap., Mich.	1000d
WCSR	Hillsdale, Mich.	100
WMTE	Manistee, Mich.	250
WAGN	Menominee, Mich.	250
WMBN	Petoskey, Mich.	250
WEXL	Royal Oak, Mich.	250
KDLM	Detroit Lakes, Minn.	250
WEVE	Eveleth, Minn.	250
KROC	Rochester, Minn.	1000
KWLM	Willmar, Minn.	250
WJMB	Brookhaven, Miss.	250
WAML	Laurel, Miss.	250
KXEO	Mexico, Mo.	250
KSMO	Salem, Mo.	250
KICK	Springfield, Mo.	250
KCAP	Helena, Mont.	250
KPRK	Livingston, Mont.	250
KATL	Miles City, Mont.	1000
KQTE	Missoula, Mont.	250
KFGT	Fremont, Nebr.	100
KGFW	Kearney, Nebr.	250
KSID	Sidney, Nebr.	250
KORK	Las Vegas, Nev.	250
KBET	Reno, Nev.	250
WDCR	Hanover, N.H.	250
WMID	Atlantic City, N.J.	250
KNDE	Aztec, N.M.	250
KYAP	Ruidoso, N.M.	250
KSIL	Silver City, N.Mex.	1000
WMBO	Auburn, N.Y.	1000
WENT	Gloversville, N.Y.	250
WJOC	Jamestown, N.Y.	250
WUSJ	Lockport, N.Y.	250
WMSA	Massena, N.Y.	250
WALL	Middletown, N.Y.	250
WIRY	Plattsburgh, N.Y.	1000
WJRI	Lenoir, N.C.	250
WTSB	Lumberton, N.C.	250
WOXF	Oxford, N.C.	250
WOOW	Greenville, N.C.	250
WGNI	Wilmington, N.C.	250
WAIR	Winston-Salem, N.C.	250
KGPC	Grafton, N.D.	250
WNCO	Ashland, Ohio	250
WOUB	Athens, Ohio	250
WIZE	Springfield, Ohio	250
WSTV	Steubenville, Ohio	250
KIHN	Hugo, Okla.	250
KOCY	Okla. City, Okla.	250
KLOO	Corvallis, Oreg.	250
KWVR	Enterprise, Oreg.	250
KIHR	Hood River, Oreg.	250
KFIR	North Bend, Oreg.	250
WCVI	Connellsville, Pa.	250
WSAJ	Grove City, Pa.	100
WKRZ	Oil City, Pa.	250
WHAT	Philadelphia, Pa.	250
WRAW	Reading, Pa.	250
WTRN	Tyrone, Pa.	250
WBRE	Wilkes-Barre, Pa.	250
WWPA	Williamsport, Pa.	250
WGRF	Aguadilla, P.R.	250
WOKE	Charleston, S.C.	250
WRHI	Rock Hill, S.C.	250
WSSC	Sumter, S.C.	250
KIJV	Huron, S.D.	250
KRSD	Rapid City, S.Dak.	250
WBAC	Cleveland, Tenn.	250
WKRM	Columbia, Tenn.	250
WGRV	Greeneville, Tenn.	250
WKGN	Knoxville, Tenn.	250
WHHM	Memphis, Tenn.	250
WCDT	Winchester, Tenn.	250
KWKC	Abilene, Tex.	250
KAND	Corsicana, Tex.	250
KSET	El Paso, Tex.	250
KDUB	Lubbock, Tex.	250
KRBA	Lufkin, Tex.	250

Kc.	Wave Length	W.P.
KPDN	Pampa, Tex.	250
KOLE	Port Arthur, Tex.	250
KTXL	San Angelo, Tex.	250
KVIC	N. of Victoria, Tex.	250
WTWN	St. Johnsbury, Vt.	1000
WSTA	Charlotte Amalie, V.I.	250
WKEY	Covington, Va.	1000
WHAP	Hopewell, Va.	1000
WJMA	Orange, Va.	1000
KAGT	Anacortes, Wash.	250
KPKW	Pasco, Wash.	250
KAPA	Raymond, Wash.	250
KMEL	Wenatchee, Wash.	250
WHAR	Clarksburg, W.Va.	250
WEPM	Martinsburg, W.Va.	250
WMON	Montgomery, W.Va.	250
WOVE	Welch, W.Va.	250
WLDY	Ladysmith, Wis.	1000
WRIT	Milwaukee, Wis.	250
KYCN	Wheatland, Wyo.	250
KWOR	Worland, Wyo.	250

1350—222.1

CHOV	Pembroke, Ont.	1000
CJDC	Dawson Creek, B.C.	1000
CJLM	Joliette, Que.	1000
CHGB	St. Anne de la Pocatiere, Que.	5000
CKLB	Oshawa, Ont.	10000
CKEN	Kentville, N.S.	1000
WELB	Elba, Ala.	1000d
WGAD	Gadsden, Ala.	5000
KAAB	Hot Springs, Ark.	1000
KLYD	Bakersfield, Calif.	1000d
KCKC	San Bernardino, Calif.	500
KSRO	Santa Rosa, Calif.	1000
KGHF	Pueblo, Colo.	5000
WNLK	Norwalk, Conn.	500
WINY	Putnam, Conn.	1000d
WEZY	Cocoa, Fla.	1000
WDCF	Dade City, Fla.	1000d
WRWH	Cleveland, Ga.	1000d
WRPB	Warner Robins, Ga.	1000d
KRLC	Lewiston, Idaho	5000
WAAP	Peoria, Ill.	1000
WJBD	Salem, Ill.	500d
WIOU	Kokomo, Ind.	1000
KRNT	Des Moines, Iowa	5000
KMAN	Manhattan, Kans.	500d
WLOU	Louisville, Ky.	5000d
WSMB	New Orleans, La.	5000
WDEA	Ellsworth, Me.	1000d
WHMI	Howell, Mich.	500
KDID	Ortonville, Minn.	1000d
WCMP	Pine City, Minn.	1000d
WKOZ	Kosciusko, Miss.	5000d
KCHR	Charleston, Mo.	1000d
KBRX	O'Neill, Nebr.	1000d
WLNH	Laconia, N.H.	5000d
KABQ	Albuquerque, N.M.	5000
WCBA	Corning, N.Y.	1000d
WRNY	Rome, N.Y.	500d
WBMT	Black Mountain, N.C.	500d
WHIP	Mooresville, N.C.	1000d
WLLY	Wilson, N.C.	1000d
KQDI	Bismarck, N.D.	500d
WADC	Akron, Ohio	5000
WCHI	Chillicothe, Ohio	500d
KRHO	Duncan, Okla.	250
KTLQ	Tahlequah, Okla.	1000d
KRVC	Ashland, Oreg.	1000d
WORK	York, Pa.	5000
WDAR	Darlington, S.C.	1000d
WGSW	Greenwood, S.C.	1000d
WRKM	Carthage, Tenn.	500d
KCAR	Clarksville, Tex.	500d
KTXJ	Jasper, Tex.	1000d
KCOR	San Antonio, Tex.	5000
WBLT	Bedford, Va.	1000d
WFLS	Fredericksburg, Va.	500d
WNVA	Norton, Va.	5000d
WAVY	Portsmouth, Va.	5000
WPDR	Portage, Wis.	1000d

1360—220.4

WWWB	Jasper, Ala.	1000d
WLIQ	Mobile, Ala.	5000d
WMFC	Monroeville, Ala.	1000d
WELR	Roanoke, Ala.	1000d
KRUX	Glendale, Ariz.	5000
KLYR	Clarksville, Ark.	500d
KFFA	Helena, Ark.	1000
KFIV	Modesto, Calif.	1000
KRCK	Ridgecrest, Calif.	1000d
KGB	San Diego, Calif.	1000
WDRC	Hartford, Conn.	5000
WOBS	Jacksonville, Fla.	5000d
WKAT	Miami Beach, Fla.	5000
WSFR	Sanford, Fla.	500d
WINT	Winter Haven, Fla.	1000d
WAZA	Bainbridge, Ga.	1000d
WLAW	Lawrenceville, Ga.	1000d
WLBK	DeKalb, Ill.	500d
WVMC	Mt. Carmel, Ill.	500d
KHAK	Cedar Rapids, Iowa	1000d
KXGI	Ft. Madison, Iowa	1000d
KSCJ	Sioux City, Iowa	5000
KBTO	El Dorado, Kans.	500d
WFLW	Monticello, Ky.	1000d
KDBC	Mansfield, La.	1000d
KVIM	New Iberia, La.	1000d
KTLD	Tallulah, La.	500d
WEBB	Dundalk, Md.	5000d
WLYN	Lynn, Mass.	1000d
WKMI	Kalamazoo, Mich.	5000
KLRS	Mountain Grove, Mo.	1000d
WNNJ	Newton, N.J.	1000d
WWBZ	Vineland, N.J.	1000
WKOP	Binghamton, N.Y.	5000
WMNS	Olean, N.Y.	1000d
WCHL	Chapel Hill, N.C.	1000d
KEYZ	Williston, N.D.	5000
WSAI	Cincinnati, Ohio	5000
WWOW	Conneaut, Ohio	500d
KUIK	Hillsboro, Oreg.	1000d
WMCK	McKeesport, Pa.	5000
WPPA	Pottsville, Pa.	1000
WELP	Easley, S.C.	1000d
WLCM	Lancaster, S.C.	1000d
WNAH	Nashville, Tenn.	1000d
KRAY	Amarillo, Tex.	500d
KACT	Andrews, Tex.	1000d
KWBA	Baytown, Tex.	1000
KRYS	Corpus Christi, Tex.	1000
KXOL	Ft. Worth, Tex.	5000
WBOB	Galax, Va.	1000d
WHBG	Harrisonburg, Va.	5000d
KFDR	Grand Coulee, Wash.	1000d
KMO	Tacoma, Wash.	5000
WHJC	Matawan, W.Va.	1000d
WMOV	Ravenswood, W.Va.	1000d
WBAY	Green Bay, Wis.	5000
WISV	Virouqua, Wis.	500d
WMNE	Menomonie, Wis.	1000d
KVRS	Rock Springs, Wyo.	1000

1370—218.8

WBYE	Calera, Ala.	1000d
KTPA	Prescott, Ark.	500d
KBUC	Corona, Calif.	1000
KEEN	San Jose, Calif.	5000
KGEN	Tulare, Calif.	1000d
WHYS	Ocala, Fla.	1000d
WCOA	Pensacola, Fla.	5000
WAXE	Vero Beach, Fla.	1000d
WBGR	Jesup, Ga.	1000d
WFDR	Manchester, Ga.	1000d
WKLE	Washington, Ga.	1000d
WPRC	Lincoln, Ill.	500d
WTTS	Bloomington, Ind.	5000
WGRY	Gary, Ind.	500d
KDTH	Dubuque, Iowa	1000
KGNO	Dodge City, Kans.	5000
WGOH	Grayson, Ky.	5000d
WTKY	Tompkinsville, Ky.	1000d
KAPB	Marksville, La.	1000d
WMHI	Braddocks Hts., Md.	500d
WKIK	Leonardtown, Md.	1000d
WGHN	Grand Haven, Mich.	500d
KSUM	Fairmont, Minn.	1000
WDOB	Canton, Miss.	1000d
KWRT	Boonville, Mo.	1000d
KCRV	Caruthersville, Mo.	1000d
KXLF	Butte, Mont.	5000
KAWL	York, Nebr.	500d
WFEA	Manchester, N.H.	5000
WALK	Patchogue, N.Y.	500d
WSAY	Rochester, N.Y.	5000
WLTC	Gastonia, N.C.	10000
WTAB	Tabor City, N.C.	5000d
KFJM	Grand Forks, N.D.	1000d
WSPD	Toledo, Ohio	5000
KAST	Astoria, Oreg.	1000
WOTR	Corry, Pa.	1000d
WPAZ	Pottstown, Pa.	1000d
WKMC	Roaring Sprgs., Pa.	1000d
WIVV	Vieques, P.R.	1000
WOEF	Chattanooga, Tenn.	5000
WDXE	Lawrenceburg, Tenn.	1000d
WRGS	Rogersville, Tenn.	1000d
KOKE	Austin, Tex.	1000d
KFRO	Longview, Tex.	1000
KUKO	Post, Tex.	500d
KSOP	Salt Lake City, Utah	1000d
WBTN	Bennington, Vt.	1000d
WHEE	Martinsville, Va.	1000d
WJWS	South Hill, Va.	5000d
KPQP	Quincy, Wash.	1000d
WMOD	Moundsville, W.Va.	1000d
WCCN	Neillsville, Wis.	5000d
KVWO	Cheyenne, Wyo.	1000

1380—217.3

CFDA	Victoriaville, Que.	1000
CKPC	Brantford, Ont.	10000
CKLC	Kingston, Ont.	5000
WGYV	Greenville, Ala.	1000d
KDXE	N. Little Rock, Ark.	1000d
KBVM	Lancaster, Calif.	1000d
KGMS	Sacramento, Calif.	1000
KSBW	Salinas, Calif.	5000
KFLJ	Walsenburg, Colo.	1000d
WAMS	Wilmington, Del.	1000
WLIZ	Lake Worth, Fla.	500d
WQXQ	Ormond Bch., Fla.	1000d
WLCY	St. Petersburg, Fla.	5000
WAOK	Atlanta, Ga.	5000
WSIZ	Oeilla, Ga.	5000d
KPOI	Honolulu, Hawaii	5000
WITE	Brazil, Ind.	500d
WKJG	Ft. Wayne, Ind.	5000
KCIM	Carroll, Iowa	1000
WMTA	Central City, Ky.	500d
WWKY	Winchester, Ky.	1000d
WYNK	Baton Rouge, La.	500d
WKTJ	Farmington, Me.	1000d
WTTH	Port Huron, Mich.	1000
WPLB	Greenville, Mich.	500d
KLIZ	Brainerd, Minn.	1000d
KAGE	Winona, Minn.	1000
WDLT	Indianola, Miss.	500d
KUDL	Kansas City, Mo.	1000d
KWK	St. Louis, Mo.	5000
KUVR	Holdrodge, Nebr.	500
WBBX	Portsmouth, N.H.	1000
WAWZ	Zarephath, N.J.	5000
WBNX	New York, N.Y.	5000
WLOS	Asheville, N.C.	5000
WTOB	Winston-Salem, N.C.	5000
WWIZ	Lorain, Ohio	500d
WPKO	Waverly, Ohio	1000d
KSWO	Lawton, Okla.	1000
KMUS	Muskogee, Okla.	1000
KBCH	Ocean Lake, Oreg.	1000d
KSRV	Ontario, Oreg.	5000
WACB	Kittanning, Pa.	1000d
WARC	Milton, Pa.	1000d
WAYZ	Waynesboro, Pa.	1000d
WNRI	Woonsocket, R.I.	1000d
WAGS	Bishopville, S.C.	1000d
WGUS	N. Augusta, S.C.	1000d
KOTA	Rapid City, S.Dak.	5000
KJET	Beaumont, Tex.	1000d
KBWD	Brownwood, Tex.	1000
KCRN	Crane, Tex.	1000d
KTSM	El Paso, Tex.	1000
KMUL	Muleshoe, Tex.	500d
KBOP	Pleasanton, Tex.	1000d
WSYB	Rutland, Vt.	5000
WMBG	Richmond, Va.	5000
KRKO	Everett, Wash.	1000
KPEG	Spokane, Wash.	5000d
WBEL	Beloit, Wis.	5000

1390—215.7

CKLN	Nelson, B.C.	1000
WHMA	Anniston, Ala.	5000
KDQN	DeQueen, Ark.	500d
KAMO	Rogers, Ark.	1000d
KGER	Long Beach, Calif.	5000
KTUR	Turlock, Calif.	1000
KFML	Denver, Colo.	1000d
WAVP	Avon Park, Fla.	1000d
WGES	Chicago, Ill.	5000
WFIW	Fairfield, Ill.	500d
WJCD	Seymour, Ind.	1000d
KCLN	Clinton, Iowa	1000d
KCBC	Des Moines, Iowa	1000
KNCK	Concordia, Kans.	500d
WANY	Albany, Ky.	1000d
WKIC	Hazard, Ky.	5000d
KFRA	Franklin, La.	500d
KNOE	Monroe, La.	5000
WEGP	Presque Isle, Me.	5000d
WCAT	Orange, Mass.	1000d
WPLM	Plymouth, Mass.	5000
WCER	Charlotte, Mich.	1000d
KRFO	Owatonna, Minn.	500d
WROA	Gulfport, Miss.	1000d
WQIC	Meridian, Miss.	5000d
KENN	Farmington, N.Mex.	5000
KHOB	Hobbs, N.Mex.	5000d
WEOK	Poughkeepsie, N.Y.	5000d
WRIV	Riverhead, N.Y.	1000d
WFBL	Syracuse, N.Y.	5000
WKRK	Murphy, N.C.	1000d
WEED	Rocky Mount, N.C.	5000
WADA	Shelby, N.C.	500d
KLPM	Minot, N.Dak.	5000
WOHP	Bellefontaine, Ohio	500d
WMPO	Middleport-Pomroy, Ohio	1000d
WFMJ	Youngstown, Ohio	5000
KCRC	Enid, Okla.	1000
KSLM	Salem, Oreg.	5000
WLAN	Lancaster, Pa.	1000
WHPB	Belton, S.C.	500d
WCSC	Charleston, S.C.	5000
KJAM	Madison, S.D.	5000d
WTJS	Jackson, Tenn.	5000
KULP	El Campo, Tex.	500d
KBEC	Waxahachie, Tex.	500d
KLGN	Logan, Utah	1000
WEAM	Arlington, Va.	5000
WWOO	Lynchburg, Va.	5000
KLOQ	Yakima, Wash.	1000

1400—214.2

CKBC	Bathurst, N.B.	250
CKDH	Amherst, N.S.	250
CKCY	Sault Ste. Marie, Ont.	250
CJFP	Riviere-du-Loup, Que.	1000
CKRN	Rouyn, Que.	250
CKSW	Swift Current, Sask.	250
WMSL	Decatur, Ala.	250
WXAL	Demopolis, Ala.	250
WFPA	Ft. Payne, Ala.	250
WJLD	Homewood, Ala.	250
WJHO	Opelika, Ala.	250
KSEW	Sitka, Alaska	250
KCLF	Clifton, Ariz.	250
KXIV	Phoenix, Ariz.	250
KTUC	Tucson, Ariz.	250
KVOY	Yuma, Ariz.	250
KELD	El Dorado, Ark.	250
KCLA	Pine Bluff, Ark.	250
KWYN	Wynne, Ark.	250
KRE	Berkeley, Calif.	250
KREO	Indio, Calif.	250
KSDA	Redding, Calif.	250
KSLY	San Luis Obispo, Cal.	250
KSPA	Santa Paula, Calif.	250
KHOE	Truckee, Calif.	1400
KUKI	Ukiah, Calif.	250
KONG	Visalia, Calif.	250
KRLN	Canon City, Colo.	250
KDTA	Delta, Colo.	250
KFTM	Ft. Morgan, Colo.	250
KBZZ	La Junta, Colo.	250
WSTC	Stamford, Conn.	250
WILI	Willimantic, Conn.	250
WFTL	Ft. Lauderdale, Fla.	250
WIRA	Ft. Pierce, Fla.	250
WRHC	Jacksonville, Fla.	250
WPRY	Perry, Fla.	250
WTRR	Sanford, Fla.	250
WCQS	Alma, Ga.	250
WSGC	Elberton, Ga.	250
WNEX	Macon, Ga.	250
WMGA	Moultrie, Ga.	250
WCOH	Newnan, Ga.	250
WGSA	Savannah, Ga.	250
KCYN	Idaho Falls, Idaho	250
KART	Jerome, Idaho	250
KRPL	Moscow, Idaho	250
KSPT	Sandpoint, Idaho	250
WDWS	Champaign, Ill.	250
WGIL	Galesburg, Ill.	250
WEOA	Evansville, Ind.	250
WBAT	Marion, Ind.	250
KCOG	Centerville, Iowa	100
KVFD	Fort Dodge, Iowa	250
KVOE	Emporia, Kans.	250
KAYS	Hays, Kans.	250
WCYN	Cynthiana, Ky.	100
WIEL	Elizabethtown, Ky.	250
WFTG	London, Ky.	250
WFPR	Hammond, La.	250
KAQK	Lake Charles, La.	250
WRDO	Augusta, Maine	250
WIDE	Biddeford, Maine	250
WWIN	Baltimore, Md.	250
WALE	Fall River, Mass.	250
WLLH	Lowell, Mass.	250
WHMP	Northampton, Mass.	250
WELL	Battle Creek, Mich.	250
WJLB	Detroit, Mich.	250
WHDF	Houghton, Mich.	250
WMAB	Munising, Mich.	250
WSAM	Saginaw, Mich.	250
WSJM	St. Joseph, Mich.	250
WTCM	Traverse City, Mich.	250
KEYL	Long Prairie, Minn.	250
KMHL	Marshall, Minn.	250
WMIN	Mpls.-St. Paul, Minn.	250
WHLB	Virginia, Minn.	250
WBIP	Booneville, Miss.	250
WNAG	Grenada, Miss.	250
WFOR	Hattiesburg, Miss.	250
WJQS	Jackson, Miss.	250
WMBC	Macon, Miss.	250
KFRU	Columbia, Mo.	250
KSIM	Sikeston, Mo.	250
KTTS	Springfield, Mo.	1000
KXGN	Glendive, Mont.	250
KARR	Great Falls, Mont.	1000
KCOW	Alliance, Nebr.	250
KLIN	Lincoln, Nebr.	250
KBMI	Henderson, Nev.	250
KWNA	Winnemucca, Nev.	250
WTSL	Hanover, N.H.	250
KTRC	Santa Fe, N.Mex.	250
KCHS	Truth or Consequences, New Mexico	250
KTNM	Tucumcari, N.Mex.	250
WOND	Pleasantville, N.J.	250
WABY	Albany, N.Y.	1000
WBNY	Buffalo, N.Y.	250
WSLB	Ogdensburg, N.Y.	1000
WBMA	Beaufort, N.C.	250
WGBG	Greensboro, N.C.	250
WKDX	Hamlet, N.C.	250
WSIC	Statesville, N.C.	250
WLSE	Wallace, N.C.	250
WHCC	Waynesville, N.C.	250
WCNF	Weldon, N.C.	250
KEYJ	Jamestown, N.Dak.	1000
WMAN	Mansfield, Ohio	250
WPAY	Portsmouth, Ohio	250
KTOW	Bartlesville, Okla.	250
KTMC	McAlester, Okla.	250
KNOR	Norman, Okla.	250
KWIN	Ashland, Oreg.	250
KNNO	Cottage Grove, Oreg.	250
WEST	Easton, Pa.	250
WJET	Erie, Pa.	250
WHGB	Harrisburg, Pa.	250
WJAC	Johnstown, Pa.	250
WKBI	St. Marys, Pa.	1000
WICK	Scranton, Pa.	250
WRAK	Williamsport, Pa.	250
WCOS	Columbia, S.C.	1000
WGTN	Georgetown, S.C.	250
WTHE	Spartanburg, S.C.	250
WJZM	Clarksville, Tenn.	250
WHUB	Cookeville, Tenn.	250
WLSB	Copper Hill, Tenn.	250
WGAP	Maryville, Tenn.	250
WHAL	Shelbyville, Tenn.	250
KRUN	Ballinger, Tex.	250
KBYG	Big Spring, Tex.	100
KUNO	Corpus Christi, Tex.	250
KILE	nr. Galveston, Tex.	250
KGVL	Greenville, Tex.	250
KEBE	Jacksonville, Tex.	250
KIUN	Pecos, Tex.	250
KEYE	Perryton, Tex.	250
KVOP	Plainview, Tex.	250
KDWT	Stamford, Tex.	250
KTEM	Temple, Tex.	250
KTFS	Texarkana, Tex.	250
KVOU	Uvalde, Tex.	250
KIXX	Provo, Utah	250
WDOT	Burlington, Vt.	250

Kc.	Wave Length	W.P.
WINA	Charlottesville, Va.	1000
WLOW	Portsmouth, Va.	250
WHLF	So. Boston, Va.	1000
WINC	Winchester, Va.	250
KWLK	Longview, Wash.	250
KRSC	Othello, Wash.	250
KTNT	Tacoma, Wash.	250
WBOY	Clarkesburg, W.Va.	250
WRON	Ronceverte, W.Va.	250
WKWK	Wheeling, W.Va.	250
WBTH	Williamson, W.Va.	250
WATW	Ashland, Wis.	250
WBIZ	Eau Claire, Wis.	250
WDUZ	Green Bay, Wis.	250
WRJN	Racine, Wis.	250
WRDB	Reedsburg, Wis.	250
WRIG	Wausau, Wis.	250
KATI	Caspar, Wyo.	250
KODI	Cody, Wyo.	250

1410—212.6

CFUN	Vancouver, B.C.	10000
CHLP	Montreal, Que.	10000
WALA	Mobile, Ala.	5000
WCHP	Tuscumbia, Ala.	500d
KTCS	Fort Smith, Ark.	500d
KERN	Bakersfield, Calif.	1000
KRML	Carmel, Calif.	500d
KMYC	Marysville, Calif.	5000
KCAL	Redlands, Calif.	1000d
KCOL	Ft. Collins, Colo.	1000
WPOP	Hartford, Conn.	5000
WDOV	Dover, Del.	1000d
WMYR	Fort Myers, Fla.	5000
WBIL	Leesburg, Fla.	1000d
WRIX	Griffin, Ga.	1000d
WDAX	McRae, Ga.	10000
WLAQ	Rome, Ga.	1000
WRMN	Elgin, Ill.	500d
WTIM	Taylorville, Ill.	1000d
WAZY	Lafayette, Ind.	1000d
KGRN	Grinnell, Iowa	500d
KLEM	LeMars, Iowa	1000d
KCLO	Leavenworth, Kans.	5000d
KWBB	Wichita, Kans.	5000
WLBJ	Bowling Green, Ky.	5000
WHLN	Harlan, Ky.	5000d
KDBS	Alexandria, La.	1000d
WGRD	Grand Rap., Mich.	1000d
KLFD	Litchfield, Minn.	500d
WDSK	Cleveland, Miss.	1000d
WBKN	Newton, Miss.	500d
WHTG	Eatontown, N.J.	500d
WDDE	Dunkirk, N.Y.	500
WELM	Elmira, N.Y.	1000
WSET	Glen Falls, N.Y.	1000d
WOTT	Watertown, N.Y.	5000
WEGO	Concord, N.C.	1000d
WSRC	Durham, N.C.	1000d
WING	Dayton, Ohio	5000
KPAM	Portland, Oreg.	5000d
WLSH	Lansford, Pa.	1000d
KQV	Pittsburgh, Pa.	5000
WPCC	Clinton, S.C.	500d
WYMB	Manning, S.C.	1000d
WCMT	Martin, Tenn.	1000d
KBUD	Athens, Tex.	1000d
KBAN	Bowie, Tex.	500d
KVLB	Cleveland, Tex.	500
KXIT	Dalhart, Tex.	500d
KADO	Marshall, Tex.	500
KRIG	Odessa, Tex.	1000
KBAL	San Saba, Tex.	500d
KNAL	Victoria, Tex.	500
WRIS	Roanoke, Va.	5000d
WKBH	LaCrosse, Wis.	5000
KWYD	Sheridan, Wyo.	1000

1420—211.1

CKPT	Peterborough, Ont.	1000
CJMT	Chicoutimi, Que.	1000
CKDM	Saskatoon, Sask.	5000
WACT	Tuscaloosa, Ala.	5000d
KHFH	Sierra Vista, Ariz.	1000d
KPOC	Pocahontas, Ark.	1000d
KSTN	Stockton, Calif.	5000
WLIS	Old Saybrook, Conn.	500d
WBRD	Bradenton, Fla.	1000
WDBF	Delray Beach, Fla.	5000d
WSTN	St. Augustine, Fla.	1000d
WAVO	Avondale Estates, Ga.	1000d
WRBL	Columbus, Ga.	5000
WPEH	Louisville, Ga.	1000d
WLET	Toccoa, Ga.	5000d
WINI	Murphysboro, Ill.	500d
WIMS	Michigan City, Ind.	5000d
WOC	Davenport, Iowa	5000
KJCK	Junction City, Kans.	1000d
WTCR	Ashland, Ky.	5000d
WHBN	Harrodsburg, Ky.	1000d
WVJS	Owensboro, Ky.	1000
KPEL	Lafayette, La.	1000
WBSM	New Bedford, Mass.	5000
WBEC	Pittsfield, Mass.	1000
WAMM	Flint, Mich.	1000d
WKPR	Kalamazoo, Mich.	1000d
KTOE	Mankato, Minn.	5000
WSUH	Oxford, Miss.	1000d
WQBC	Vicksburg, Miss.	1000
KBTN	Neosho, Mo.	500d
KOOD	Omaha, Nebr.	1000d
KSYX	Santa Rosa, N.Mex.	1000d
WALY	Herkimer, N.Y.	1000d
WACK	Newark, N.Y.	500
WLNA	Peekskill, N.Y.	1000d
WMYN	Mayodan, N.C.	500
WGAS	S. Gastonia, N.C.	500d
WVOT	Wilson, N.C.	1000
WHK	Cleveland, Ohio	5000
KTJS	Hobart, Okla.	1000d
KYNG	Coos Bay, Oreg.	1000d
WCOJ	Coatesville, Pa.	5000
WCED	DuBois, Pa.	5000
WEUC	Ponce, P.R.	1000
WCRE	Cheraw, S.C.	1000d
KABR	Aberdeen, S.D.	1000d
WEMB	Erwin, Tenn.	5000d
WKSR	Pulaski, Tenn.	1000
KFYN	Bonham, Tex.	250d
KTRE	Lufkin, Tex.	1000
KGNB	New Braunfels, Tex.	1000d
KPEP	San Angelo, Tex.	1000d
WWSR	St. Albans, Vt.	1000d
WDDY	Gloucester, Va.	1000d
WKCW	Warrenton, Va.	5000d
KITI	Chehalis, Wash.	1000d
KUJ	Walla Walla, Wash.	5000
WPLY	Plymouth, Wis.	500d

1430—209.7

CKFH	Toronto, Ont.	10000
WFHK	Pell City, Ala.	1000d
KHBM	Monticello, Ark.	1000d
KAMP	El Centro, Calif.	1000d
KARM	Fresno, Calif.	5000
KALI	Pasadena, Calif.	5000
KOSI	Aurora, Colo.	5000
WSDB	Homestead, Fla.	500d
WLAK	Lakeland, Fla.	5000
WPCF	Panama City, Fla.	5000
WGFS	Covington, Ga.	1000d
WRCD	Dalton, Ga.	1000d
WWGS	Tifton, Ga.	5000
WCMY	Ottawa, Ill.	500d
WIRE	Indianapolis, Ind.	5000
KASI	Ames, Iowa	1000d
KMRC	Morgan City, La.	500d
WNAV	Annapolis, Md.	5000
WHIL	Medford, Mass.	5000d
WION	Ionia, Mich.	500d
WBRB	Mt. Clemens, Mich.	500d
WLAU	Laurel, Miss.	5000d
KADL	Carrollton, Mo.	500d
WIL	St. Louis, Mo.	5000
KRGI	Grand Island, Nebr.	1000
WNJR	Newark, N.J.	5000
KGFL	Roswell, N.M.	5000d
WENE	Endicott, N.Y.	5000
WMNC	Morganton, N.C.	5000d
WRXO	Roxboro, N.C.	1000d
WFOB	Fostoria, Ohio	1000
WCLT	Newark, Ohio	500d
KALV	Alva, Okla.	500
KTUL	Tulsa, Okla.	5000
KGAY	Salem, Oreg.	5000d
WVAM	Altoona, Pa.	1000
WFRA	Franklin, Pa.	500d
WNEL	Caguas, P.R.	500
WBLR	Batesburg, S.C.	5000d
WATP	Marion, S.C.	1000d
KBRK	Brookings, S. Dak.	1000d
WFCT	Fountain City, Tenn.	1000d
WENO	Madison, Tenn.	5000d
WHER	Memphis, Tenn.	1000
KSTB	Breckenridge, Tex.	1000d
KSIJ	Gladewater, Tex.	1000d
KCOH	Houston, Tex.	1000d
KLO	Ogden, Utah	5000
WDYL	Ashland, Va.	1000d
KBRC	Mt. Vernon, Wash.	5000
WEIR	Weirton, W.Va.	1000
WBEV	Beaver Dam, Wis.	1000d

1440—208.2

CFCP	Courtenay, B.C.	1000
WHHY	Montgomery, Ala.	5000
KWBY	Scottsdale, Ariz.	5000d
KHOG	Fayetteville, Ark.	1000d
KOKY	Little Rock, Ark.	5000d
KVON	Napa, Calif.	500
KPRO	Riverside, Calif.	1000
KCOY	Santa Maria, Calif.	1000
WBIS	Bristol, Conn.	500d
WABR	Winter Park, Fla.	5000
WWCC	Bremen, Ga.	1000d
WGIG	Brunswick, Ga.	5000
WRAJ	Anna, Ill.	500d
WPRS	Paris, Ill.	1000d
WGEM	Quincy, Ill.	1000
WROK	Rockford, Ill.	1000
WPGW	Portland, Ind.	500d
KCHE	Cherokee, Iowa	500d
KJAY	Topeka, Kans.	5000
WKLX	Paris, Ky.	1000d
WEZJ	Williamsburg, Ky.	500d
KMLB	Monroe, La.	5000
WJAB	Westbrook, Me.	5000d
WAAB	Worcester, Mass.	5000
WBCM	Bay City, Mich.	1000
WDDW	Dowagiac, Mich.	500d
WCHB	Inkster, Mich.	1000d
KEVE	Golden Valley, Minn.	5000
WHHT	Lucedale, Miss.	1000d
WMVB	Millville, N.J.	1000d
WBAB	Babylon, N.Y.	500d
WJJL	Niagara Falls, N.Y.	1000d
WBLA	Elizabethtown, N.C.	1000d
WBUY	Lexington, N.C.	5000d
KILO	Grand Forks, N.D.	1000
WHHH	Warren, Ohio	5000
KMED	Medford, Oreg.	5000
KODL	The Dalles, Oreg.	1000
WCDL	Carbondale, Pa.	5000d
WNPV	Lansdale, Pa.	500d
WGCB	Red Lion, Pa.	1000d
WQOK	Greenville, S.C.	5000
WZYX	Cowan, Tenn.	1000d
WHDM	McKenzie, Tenn.	500d
KFDA	Amarillo, Tex.	5000
KEYS	Corpus Christi, Tex.	1000
KDNT	Denton, Tex.	5000
KETX	Livingston, Tex.	1000d
WKLV	Blackstone, Va.	5000d
WHIS	Bluefield, W.Va.	5000
WAJR	Morgantown, W.Va.	5000
WJPG	Green Bay, Wis.	5000

1450—206.8

CBG	Gander, Nfld.	250
CFAB	Windsor, N.S.	250
CFJR	Brockville, Ont.	1000
CHEF	Granby, P.Q.	1000
WDNG	Anniston, Ala.	250
WYAM	Bessemer, Ala.	250
WDIG	Dothan, Ala.	250
WFIX	Huntsville, Ala.	250
WLAY	Muscle Shoals City, Ala.	250
KLAM	Cordova, Alaska	250
KAWT	Douglas, Ariz.	250
KNOT	Prescott, Ariz.	250
KOLD	Tucson, Ariz.	250
KENA	Mena, Ark.	250
KYOR	Blythe, Calif.	250
KOWN	Escondido, Calif.	250
KPAL	Palm Springs, Calif.	250
KTIP	Porterville, Calif.	250
KSAN	San Francisco, Calif.	250
KROG	Sonora, Calif.	250
KVEN	Ventura, Calif.	250
KAGR	Yuba City, Calif.	100
KGIW	Alamosa, Colo.	250
KYOU	Greeley, Colo.	250
WNAB	Bridgeport, Conn.	250
WILM	Wilmington, Del.	250
WOL	Washington, D.C.	250
WWJB	Brooksville, Fla.	250
WMFJ	Daytona Beach, Fla.	250
WSKP	Miami, Fla.	250
WBSR	Pensacola, Fla.	250
WSPB	Sarasota, Fla.	250
WSTU	Stuart, Fla.	250
WTNT	Tallahassee, Fla.	250
WGPC	Albany, Ga.	250
WBHF	Cartersville, Ga.	250
WCON	Cornelia, Ga.	250
WKEU	Griffin, Ga.	1000
WMVG	Milledgeville, Ga.	1000
WBYG	Savannah, Ga.	250
WVLD	Valdosta, Ga.	250
KEOK	Fayette, Idaho	250
KEEP	Twin Falls, Idaho	100
WHFC	Cicero, Ill.	250
WKEI	Kewanee, Ill.	100
WCVS	Springfield, Ill.	250
WANE	Ft. Wayne, Ind.	250
WASK	Lafayette, Ind.	250
WAOV	Vincennes, Ind.	250
KPIG	Cedar Rapids, Iowa	250
KWBW	Hutchinson, Kans.	250
WTCO	Campbellsville, Ky.	250
WWXL	Manchester, Ky.	250
WPAD	Paducah, Ky.	250
KSIG	Crowley, La.	250
KNOC	Natchitoches, La.	250
WNPS	New Orleans, La.	250
WRKD	Rockland, Maine	250
WKTQ	South Paris, Maine	250
WTBO	Cumberland, Md.	250
WMAS	Springfield, Mass.	250
WATZ	Alpena Township, Mich.	250
WHTC	Holland, Mich.	1000
WMIQ	Iron Mtn., Mich.	250
WIBM	Jackson, Mich.	250
WKLA	Ludington, Mich.	250
WHLS	Port Huron, Mich.	250
KATE	Albert Lea, Minn.	250
KBUN	Bemidji, Minn.	250
KBMW	Breckenridge, Minn.	250
WELY	Ely, Minn.	1000
KFAM	St. Cloud, Minn.	250
WROX	Clarksdale, Miss.	250
WCJU	Columbia, Miss.	250
WJXN	Jackson, Miss.	250
WOKK	Meridian, Miss.	1000
WNAT	Natchez, Miss.	250
WROB	West Point, Miss.	250
WMBH	Joplin, Mo.	250
KIRX	Kirksville, Mo.	250
KOKO	Warrensburg, Mo.	250
KWPM	West Plains, Mo.	250
KXXL	Bozeman, Mont.	1000
KUDI	Great Falls, Mont.	250
KXLL	Missoula, Mont.	250
KVCK	Wolf Point, Mont.	1000
KWBE	Beatrice, Nebr.	250
KCSR	Chadron, Nebr.	250
KONE	Reno, Nev.	250
WKXL	Concord, N.H.	250
WFPG	Atlantic City, N.J.	250
WCTC	New Brunswick, N.J.	250
KLOS	Albuquerque, N.Mex.	250
KLMX	Clayton, N.Mex.	250
KOBE	Las Cruces, N.Mex.	250
KENM	Portales, N.Mex.	250
WCLI	Corning, N.Y.	250
WWSC	Glen Falls, N.Y.	250
WHDL	Olean, N.Y.	1000
WKIP	Poughkeepsie, N.Y.	250
WKAL	Rome, N.Y.	250
WATA	Boone, N.C.	250
WGNC	Gastonia, N.C.	250
WHVH	Henderson, N.C.	250
WHKP	Hendersonville, N.C.	250
WHIT	New Bern, N.C.	250
KGCA	Rugby, N.Dak.	250
WJER	Dover, Ohio	250
WMOH	Hamilton, Ohio	250
WLEC	Sandusky, Ohio	250
KWHW	Altus, Okla.	250
KGFF	Shawnee, Okla.	250
KSIW	Woodward, Okla.	250
KORE	Eugene, Oreg.	250
KFLW	Klamath Falls, Oreg.	250
KLBM	La Grande, Oreg.	250
KBPS	Portland, Oreg.	250
WLEU	Erie, Pa.	250
WDAD	Indiana, Pa.	250
WPAM	Pottsville, Pa.	250
WMPT	So. Williamsport, Pa.	250
WMAJ	State College, Pa.	250
WJPA	Washington, Pa.	250
WWRI	W. Warwick, R.I.	1000
WQSN	Charleston, S.C.	250
WCRS	Greenwood, S.C.	1000
WMYB	Myrtle Beach, S.C.	250
WHSC	Hartsville, S.C.	250
KBFS	Belle Fourche, S.Dak.	250
KYNT	Yankton, S.Dak.	250
WLAR	Athens, Tenn.	250
WOGA	Chattanooga, Tenn.	250
WDSG	Dyersburg, Tenn.	250
WLAF	LaFollette, Tenn.	100
WGNS	Murfreesboro, Tenn.	250
KRIC	Beaumont, Tex.	250
KBEN	Carrizo Sprgs., Tex.	250
KCTI	Gonzales, Tex.	250
KMBL	Junction, Tex.	250
KCYL	Lampasas, Tex.	250
KMHT	Marshall, Tex.	250
KAMY	McCamey, Tex.	250
KNET	Palestine, Tex.	250
KSNY	Snyder, Tex.	250
KURA	Moab, Utah	250
KEYY	Provo, Utah	250
KDXU	St. George, Utah	250
WSNO	Barre, Vt.	250
WTSA	Brattleboro, Vt.	250
WFTR	Front Royal, Va.	250
WENZ	Highland Springs, Va.	250
WREL	Lexington, Va.	250
WMVA	Martinsville, Va.	1000
KBKW	Aberdeen, Wash.	250
KCLX	Colfax, Wash.	250
KONP	Port Angeles, Wash.	250
KAYE	Puyallup, Wash.	250
WPAR	Parkersburg, W.Va.	250
KFIZ	Fond du Lac, Wis.	250
WDLB	Marshfield, Wis.	250
WPFP	Park Falls, Wis.	250
WRCO	Richland Center, Wis.	1000
KBBS	Buffalo, Wyo.	250
KWRL	Riverton, Wyo.	250

1460—205.4

CJOY	Guelph, Ont.	10000
CKRB	Ville St. Georges, Quebec	10000
CJNB	N. Battleford, Sask.	10000
WFMH	Cullman, Ala.	5000d
WPNX	Phenix City, Ala.	5000
KCCL	Paris, Ark.	500d
KTYM	Inglewood, Calif.	1000d
KDON	Salinas, Calif.	5000
KYSN	Colo. Sprgs., Colo.	1000
WBAR	Bartow, Fla.	1000d
WZEP	DeFuniak Springs, Florida	1000d
WMBR	Jacksonville, Fla.	5000
WDMF	Buford, Ga.	1000d
WROY	Carmi, Ill.	1000d
WKAM	Goshen, Ind.	1000d
WOCH	North Vernon, Ind.	500d
KSO	Des Moines, Iowa	5000
KCRB	Chanute, Kans.	1000d
WRVK	Mt. Vernon, Ky.	500d
WAIL	Baton Rouge, La.	5000
KBSF	Springhill, La.	1000d
WEMD	Easton, Md.	500d
WBET	Brockton, Mass.	1000
WBRN	Big Rapids, Mich.	1000d
WPON	Pontiac, Mich.	500
KDMA	Montevideo, Minn.	1000
WELZ	Belzoni, Miss.	1000d
KADY	St. Charles, Mo.	5000d
KRNY	Kearney, Nebr.	5000d
KENO	Las Vegas, Nev.	1000
WOKD	Albany, N.Y.	5000
WVOX	New Rochelle, N.Y.	500d
WHEC	Rochester, N.Y.	5000
WFVG	Fuquay Sprgs., N.C.	1000d
WMMH	Marshall, N.C.	500d
WBNS	Columbus, Ohio	5000
WPVL	Painesville, Ohio	500d
KPLK	Dallas, Oreg.	1000d
WMBA	Ambridge, Pa.	500d
WCMB	Harrisburg, Pa.	5000
WBCU	Union, S.C.	1000
WGDG	Walhalla, S.C.	500d
WJAK	Jackson, Tenn.	5000d
WEEN	Lafayette, Tenn.	1000d
KBRZ	Freeport, Tex.	500d

Kc.	Wave Length	W.P.
KLLL	Lubbock, Tex.	1000d
WACO	Waco, Tex.	1000
WPRW	Manassas, Va.	500d
WRAD	Radford, Va.	5000
WLPM	Suffolk, Va.	1000
KIMA	Yakima, Wash.	5000
WBUC	Buckhannon, W.Va.	1000d
WRAC	Racine, Wis.	500d
WTMB	Tomah, Wis.	1000d

1470—204.0

CHOW	Welland, Ontario	1000
CFOX	Pointe Claire, Que.	1000
WBLO	Evergreen, Ala.	1000d
KBLO	Hot Springs, Ark.	1000d
KBMX	Coalinga, Calif.	500d
KUTY	Palmdale, Calif.	1000d
KXOA	Sacramento, Calif.	5000
WMMW	Meriden, Conn.	1000d
WPOM	Pompano Beach, Fla.	5000
WDCL	Tarpon Sprgs., Fla.	5000d
WAAG	Adel, Ga.	1000d
WDOL	Athens, Ga.	1000d
WCLA	Claxton, Ga.	1000
WRGA	Rome, Ga.	5000
WMBD	Peoria, Ill.	5000
WHUT	Anderson, Ind.	1000d
KTRI	Sioux City, Iowa	5000
KWVY	Waverly, Iowa	1000d
KARE	Atchison, Kans.	1000
KLIB	Liberal, Kans.	500d
WSAC	Fort Knox, Ky.	1000d
KPLC	Lake Charles, La.	5000
WLAM	Lewiston, Maine	5000
WJDY	Salisbury, Md.	5000d
WTTR	Westminster, Md.	1000d
WSRO	Marlborough, Mass.	1000d
WNBP	Newburyport, Mass.	500d
WKMF	Flint, Mich.	5000
WKLZ	Kalamazoo, Mich.	500d
KANO	Anoka, Minn.	1000d
WCHJ	Brookhaven, Miss.	1000d
WNAU	New Albany, Miss.	500d
KGHM	Brookfield, Mo.	500d
KTCB	Malden, Mo.	1000d
WTKO	Ithaca, N.Y.	1000d
WPDM	Potsdam, N.Y.	1000d
WBIG	Greensboro, N.C.	5000
WPNC	Plymouth, N.C.	1000d
WTOE	Spruce Pine, N.C.	1000d
WOHO	Toledo, Ohio	1000
KVLH	Pauls Valley, Okla.	250d
KVIN	Vinita, Okla.	500d
KRAF	Reedsport, Oreg.	5000d
WSAN	Allentown, Pa.	5000
WFAR	Farrell, Pa.	1000d
WNML	Portage, Pa.	500d
WOIC	Columbia, S.C.	5000d
WEAG	Alcoa, Tenn.	1000d
WVOL	Berry Hill, Tenn.	5000
KRBC	Abilene, Tex.	5000
KWRD	Henderson, Tex.	500d
KCNY	San Marcos, Tex.	250d
KELA	Centralia, Wash.	5000
KSEM	Moses Lake, Wash.	5000
WPLH	Huntington, W.Va.	5000d
WBKV	West Bend, Wis.	500d
KTWO	Casper, Wyo.	5000

1480—202.6

WIXI	Irondale, Ala.	5000d
WABB	Mobile, Ala.	5000
KHAT	Phoenix, Ariz.	500
KGLU	Safford, Ariz.	1000
KTCN	Berryville, Ark.	1000
KIEM	Eureka, Calif.	5000
KYOS	Merced, Calif.	5000
KWIZ	Santa Ana, Calif.	1000
KTUX	Pueblo, Colo.	1000d
WSOR	Windsor, Conn.	500d
WAPG	Arcadia, Fla.	1000d
WREA	E. Palatka, Fla.	500d
WTHR	Panama Beach, Fla.	500d
WYZE	Atlanta, Ga.	5000d
WRDW	Augusta, Ga.	5000
WJBM	Jerseyville, Ill.	500d
WTHI	Terre Haute, Ind.	1000
WRSW	Warsaw, Ind.	500
KLEE	Ottumwa, Iowa	500d
KBEA	Mission, Kans.	1000d
KLEO	Wichita, Kans.	5000
WKOA	Hopkinsville, Ky.	1000d
WNKY	Neon, Ky.	1000d
WTLD	Somerset, Ky.	1000d
KANV	Jonesville, La.	500d
KJOE	Shreveport, La.	1000d
WSAR	Fall River, Mass.	5000
WMAX	Grand Rapids, Michigan	1000d
WIDS	Tawas City, Mich.	1000d
KAUS	Austin, Minn.	1000
KGCX	Sidney, Mont.	5000
KLMS	Lincoln, Nebr.	1000
KWEW	Hobbs, N. Mex.	5000
WLEA	Hornell, N.Y.	1000d
WHDM	New York, N.Y.	5000
WREM	Remsen, N.Y.	1000d
WWOK	Charlotte, N.C.	1000d
WYRN	Louisburg, N.C.	500d
WMSJ	Sylva, N.C.	5000d
WHBC	Canton, Ohio	5000
WCIN	Cincinnati, Ohio	5000
WTRA	Latrobe, Pa.	500d
WDAS	Philadelphia, Pa.	5000
WISL	Shamokin, Pa.	1000
WLOK	Memphis, Tenn.	5000d
KBOX	Dallas, Tex.	5000
KLVL	Pasadena, Tex.	1000
KAPE	San Antonio, Tex.	500d
KDNI	Spanish Fork, Utah	1000d
WCFR	Springfield, Vt.	1000d
WBBL	Richmond, Va.	5000
WLEE	Richmond, Va.	5000
WBLU	Salem, Va.	5000d
KVAN	Camas, Wash.	1000d
KFHA	Lakewood, Wash.	1000d
WISM	Madison, Wis.	5000
KRAE	Cheyenne, Wyo.	1000d

1490—201.2

CFRC	Kingston, Ont.	100
CKCR	Kitchener, Ont.	250
CKBM	Montmagny, Que.	250
WANA	Anniston, Ala.	250
WAJF	Decatur, Ala.	250
WRLD	Lanett, Ala.	250
WHBB	Selma, Ala.	250
KYCA	Prescott, Ariz.	1000
KAIR	Tucson, Ariz.	250
KXAR	Hope, Ark.	250
KTLO	Mtn. Home, Ark.	250
KDRS	Paragould, Ark.	250
KOTN	Pine Bluff, Ark.	250
KXRJ	Russellville, Ark.	250
KMAP	Bakersfield, Calif.	250
KPAS	Banning, Calif.	250
KICO	Calexico, Calif.	250
KOWL	Lake Tahoe, Calif.	250
KTOB	Petaluma, Calif.	250
KBLF	Red Bluff, Calif.	250
KDB	Santa Barbara, Calif.	250
KSYC	Yreka, Calif.	250
KBOL	Boulder, Colo.	250
KRUC	Gunnison, Colo.	250
KCMS	Manitou Sprgs., Colo.	100
KOLR	Sterling, Colo.	250
WNLC	New London, Conn.	250
WTOR	Torrington, Conn.	250
WTRL	Bradenton, Fla.	250
WJBS	DeLand, Fla.	250
WMET	Miami Beach, Fla.	250
WSRA	Milton, Fla.	250
WRGR	Starke, Fla.	250
WTTB	Vero Beach, Fla.	250
WSIR	Winter Haven, Fla.	250
WMOG	Brunswick, Ga.	250
WMJM	Cordele, Ga.	250
WMRE	Monroe, Ga.	250
WSFB	Quitman, Ga.	250
WSNT	Sandersville, Ga.	250
WSYL	Sylvania, Ga.	250
KTOH	Lihue, Hawaii	250
KCID	Caldwell, Idaho	1000
WKRO	Cairo, Ill.	250
WDAN	Danville, Ill.	250
WAMV	East St. Louis, Ill.	500
WOPA	Oak Park, Ill.	250
WKBV	Richmond, Ind.	250
WNDU	South Bend, Ind.	250
KBUR	Burlington, Iowa	250
WDBQ	Dubuque, Iowa	250
KRIB	Mason City, Iowa	250
KKAN	Phillipsburg, Kans.	250
KTDP	Topeka, Kans.	250
WFKY	Frankfort, Ky.	250
WKAY	Glasgow, Ky.	250
WOMI	Owensboro, Ky.	250
WSIP	Paintsville, Ky.	1000
WIKC	Bogalusa, La.	1000
KEUN	Eunice, La.	250
KCIL	Houma, La.	250
KRUS	Ruston, La.	250
WPOR	Portland, Maine	250
WTVL	Waterville, Maine	250
WARK	Hagerstown, Md.	250
WHAV	Haverhill, Mass.	250
WMRC	Milford, Mass.	250
WTXL	W. Springfield, Mass.	1000
WABJ	Adrian, Mich.	250
WBFC	Fremont, Mich.	250
WMDN	Midland, Mich.	250
WCBQ	Whitehall, Mich.	250
KXRA	Alexandria, Minn.	250
KOZY	Grand Rapids, Minn.	250
KLGR	Redwd. Falls, Minn.	100
WLOX	Biloxi, Miss.	1000
WCLD	Cleveland, Miss.	250
WHOC	Philadelphia, Miss.	250
WTUP	Tupelo, Miss.	250
WVIM	Vicksburg, Miss.	250
KOMO	Carthage, Mo.	250
KTTR	Rolla, Mo.	1000d
KDRO	Sedalia, Mo.	250
KBOW	Butte, Mont.	1000
KBON	Omaha, Nebr.	250
WEMJ	Laconia, N.H.	250
WLDB	Atlantic City, N.J.	250
KRSN	Los Alamos, N.Mex.	250
KRTN	Raton, N.Mex.	250
WCSS	Amsterdam, N.Y.	250
WBTA	Batavia, N.Y.	250
WKNY	Kingston, N.Y.	250
WICY	Malone, N.Y.	1000
WDLC	Port Jervis, N.Y.	250
WOLF	Syracuse, N.Y.	250
WSSB	Durham, N.C.	250
WFLB	Fayetteville, N.C.	250
WLOE	Leaksville, N.C.	250
WRNB	New Bern, N.C.	250
WRMT	Rocky Mount, N.C.	250
WSTP	Salisbury, N.C.	250
KNOC	Hettinger, N.Dak.	250
KOVC	Valley City, N.Dak.	250
WBEX	Chillicothe, Ohio	250
WJMO	Cleveland Hghts., Ohio	250
WOHI	E. Liverpool, Ohio	250
WMOA	Marietta, Ohio	250
WMRN	Marion, Ohio	250
KWRW	Guthrie, Okla.	100
KBIX	Muskogee, Okla.	250
KBKR	Baker, Oreg.	250
KRNR	Roseburg, Oreg.	250
KBZY	Salem, Oreg.	1000
WESB	Bradford, Pa.	250
WAZL	Hazleton, Pa.	250
WARD	Johnstown, Pa.	250
WGAL	Lancaster, Pa.	250
WBCB	Levittown, Pa.	250
WMRF	Lewiston, Pa.	250
WMGW	Meadville, Pa.	250
WNBT	Wellsboro, Pa.	250
WMDD	Fajardo, P.R.	250
WGCD	Chester, S.C.	250
WMRB	Greenville, S.C.	1000
KORN	Mitchell, S.Dak.	250
WOPI	Bristol, Tenn.	250
WDXB	Chattanooga, Tenn.	250
WROL	Fountain City, Tenn.	250
WJJM	Lewisburg, Tenn.	250
WDXL	Lexington, Tenn.	250
KNOW	Austin, Tex.	250
KIBL	Beeville, Tex.	250
KBST	Big Spring, Tex.	250
KHUZ	Borger, Tex.	250
KNEL	Brady, Tex.	250
KSAM	Huntsville, Tex.	250
KVOZ	Laredo, Tex.	250
KZZN	Littlefield, Tex.	250
KPLT	Paris, Tex.	250
KGKB	Tyler, Tex.	250
KVWC	Vernon, Tex.	250
KVOG	Ogden, Utah	1000
WKVT	Brattleboro, Vt.	250
WIKE	Newport, Vt.	1000
WCVA	Culpeper, Va.	250
WVEC	Hampton, Va.	250
WAYB	Waynesboro, Va.	250
KBRO	Bremerton, Wash.	250
KLOG	Kelso, Wash.	250
KENE	Toppenish, Wash.	250
KTEL	Walla Walla, Wash.	250
WHMS	Charleston, W.Va.	250
WTCS	Fairmont, W.Va.	250
WLOH	Princeton, W.Va.	250
WGEZ	Beloit, Wis.	250
WLCX	LaCrosse, Wis.	250
WIGM	Medford, Wis.	250
WOSH	Oshkosh, Wis.	250
KIML	Gillette, Wyo.	250
KRTR	Thermopolis, Wyo.	250
KGOS	Torrington, Wyo.	1000

1500—199.9

CHUC	Port Hope, Ont.	1000
KBLA	Burbank, Calif.	10000
KXRX	San Jose, Calif.	1000
WTDP	Washington, D.C.	50000
WKIZ	Key West, Fla.	250
WJBK	Detroit, Mich.	10000
KSTP	St. Paul, Minn.	50000
WMNT	Manati, P.R.	250
KTXO	Sherman, Tex.	250

1510—199.1

CKOT	Tillsonburg, Ont.	1000d
KASK	Ontario, Calif.	1000
KTIM	San Rafael, Calif.	1000d
KMOR	Littleton, Colo.	1000
WKAI	Macomb, Ill.	250d
WMEX	Boston, Mass.	5000
KANS	Independence, Mo.	1000d
WRAN	Dover, N.J.	1000
WLAC	Nashville, Tenn.	50000
KCTX	Childress, Tex.	250d
KSTV	Stephenville, Tex.	250d
KGA	Spokane, Wash.	50000
WAUX	Waukesha, Wis.	250d

1520—197.4

KACY	Port Hueneme, Calif.	250
WHOW	Clinton, Ill.	1000d
WSVL	Shelbyville, Ind.	250
KSIB	Creston, Iowa	1000d
KVKW	Lafayette, La.	500
WKBW	Buffalo, N.Y.	50000
WFYI	Mineola, N.Y.	10000d
KOMA	Okla. City, Okla.	50000
KGON	Oregon City, Oreg.	10000
WWWW	Rio Piedras, P.R.	250

1530—196.1

KFBK	Sacramento, Calif.	50000
WCKY	Cincinnati, Ohio	50000
KGBT	Harlingen, Tex.	50000

1540—195.0

ZNS	Nassau, B.W.I.	5000
KPOL	Los Angeles, Calif.	10000
WSMI	Litchfield, Ill.	1000d
WBNL	Boonville, Ind.	250d
WLOI	LaPorte, Ind.	250d
KXEL	Waterloo, Iowa	50000
KNEX	McPherson, Kans.	250d
KLKC	Parsons, Kans.	250d
WDON	Wheaton, Md.	250d
WPTR	Albany, N.Y.	50000
WIFM	Elkin, N.C.	250d
WABQ	Cleveland, Ohio	1000d
WJMJ	Philadelphia, Pa.	50000d
WPTS	Pittston, Pa.	1000d
WPME	Punxsutawney, Pa.	1000d
WADK	Newport, R.I.	1000d
KCUL	Ft. Worth, Tex.	10000
KGBC	Galveston, Tex.	1000
WTKM	Hartford, Wis.	500d

1550—193.5

CBE	Windsor, Ont.	10000
WAAY	Huntsville, Ala.	5000
KFIF	Tucson, Ariz.	50000d
KQBY	San Fran., Calif.	10000
KBRB	Arvada, Colo.	10000d
WORT	New Smyrna Bch., Fla.	250
WEDA	Tampa, Fla.	10000d
WJIL	Jacksonville, Ill.	1000d
WCTW	New Castle, Ind.	250
WIRV	Irvine, Ky.	1000d
WMSK	Morganfield, Ky.	250d
KREB	Shreveport, La.	10000
KGMO	Cape Girardeau, Mo.	5000d
KRES	St. Joseph, Mo.	5000
WBAZ	Kingston, N.Y.	500d
WTYN	Tryon, N.C.	1000d
WPEG	Winston-Salem, N.C.	1000d
KUTT	Fargo, N.D.	5000d
WDLE	Delaware, Ohio	500d
WLOA	Braddock, Pa.	1000d
WTTC	Towanda, Pa.	500d
WKFE	Yauco, P.R.	250
WBSC	Bennetsville, S.C.	10000
WTHB	N. Augusta, S.C.	1000d
KWBC	Navasota, Tex.	250d
WKPT	Kingsport, Tenn.	10000d
WKBA	Vinton, Va.	1000d
WBOF	Virginia Beach, Va.	5000d
KOQT	Bellingham, Wash.	1000d

1560—192.3

CFRS	Simcoe, Ont.	250d
KPMC	Bakersfield, Calif.	10000
WBYS	Canton, Ill.	250d
KSWI	Council Bluffs, Iowa	500d
WDXR	Paducah, Ky.	1000
WQXR	New York, N.Y.	50000
WTNS	Coshocton, Ohio	1000d
WTOD	Toledo, Ohio	1000d
KWCO	Chickasha, Okla.	1000
WRSJ	Bayamon, P.R.	250
KHBR	Hillsboro, Tex.	250d
KHOQ	Hoquiam, Wash.	1000d

1570—191.1

CHUB	Nanaimo, B.C.	10000
CFRY	Portage la Prairie, Manitoba	250d
CFOR	Orillia, Ont.	10000
WCRL	Oneonta, Ala.	250d
WRWJ	Selma, Ala.	1000d
KBRI	Brinkley, Ark.	250d
KBJT	Fordyce, Ark.	250d
KRKC	King City, Calif.	250d
KCVR	Lodi, Calif.	1000d
KACE	Riverside, Calif.	1000d
KLOV	Loveland, Colo.	250d
WTWB	Auburndale, Fla.	1000d
WPAP	Fernandina Beach, Florida	1000d
WJOE	Ward Ridge, Fla.	250
WMES	Ashburn, Ga.	1000d
WGHC	Clayton, Ga.	1000d
WEAD	College Park, Ga.	1000d
WGSR	Millen, Ga.	250d
WOKZ	Alton, Ill.	1000d
WFRL	Freeport, Ill.	1000
WBEE	Harvey, Ill.	1000d
WTAY	Robinson, Ill.	250d
WILO	Frankfort, Ind.	250d
WAWK	Kendallville, Ind.	250d
WOWI	New Albany, Ind.	1000d
KMCD	Fairfield, Iowa	250d
KJFJ	Webster City, Iowa	250d
KNDY	Marysville, Kans.	250d
KWSK	Pratt, Kans.	250d
WKKS	Vanceburg, Ky.	250d
WABL	Amite, La.	500d
KLLA	Leesville, La.	250d
KMAR	Winnsboro, La.	500d
WAQE	Towson, Md.	1000d
WPEP	Taunton, Mass.	1000d
WDEW	Westfield, Mass.	1000d
WMRP	Flint, Mich.	1000d
WFUR	Grand Rapids, Michigan	1000d
KMRS	Morris, Minn.	1000d
WONA	Winona, Miss.	1000d
KLEX	Lexington, Mo.	250d
WFLR	Dundee, N.Y.	1000d
WBUZ	Fredonia, N.Y.	250d
WAPC	Riverhead, N.Y.	1000d
WNCA	Siler City, N.C.	1000d
WHOT	Campbell, Ohio	1000d
WCLW	Mansfield, Ohio	1000
WPTW	Piqua, Ohio	250d
KTAT	Frederick, Okla.	250d
KOLS	Pryor, Okla.	1000d
KWAY	Forest Grove, Oreg.	1000d
KOHU	Hermiston, Oreg.	1000d
WBUX	Doylestown, Pa.	1000d
WSHH	Latrobe, Pa.	1000d

Kc.	Wave Length	W.P.
WMLP	Milton, Pa.	1000d
WFGN	Gaffney, S.C.	250d
WLSC	Loris, S.C.	1000d
WHLP	Centerville, Tenn.	1000d
WCLE	Cleveland, Tenn.	1000d
WTRB	Ripley, Tenn.	1000d
KZOL	Farwell, Tex.	250d
KVLG	La Grange, Tex.	250d
KTER	Terrell, Tex.	250d
KWIC	Salt Lake City, Utah	5000
WSWV	Pennington Gap, Va.	1000d
WYTI	Rocky Mount, Va.	1000d
WEER	Warrenton, W.Va.	500d
WAPL	Appleton, Wis.	1000d

1580—189.2

CBJ	Chicoutimi, Que.	10000
WJHB	Talladega, Ala.	1000d
KYNO	Tempe, Ariz.	10000d
KPCA	Marked Tree, Ark.	250d
KFOF	Van Buren, Ark.	1000d
KPON	Anderson, Calif.	1000d
KWIP	Merced, Calif.	500d
KOAY	Santa Monica, Cal.	50000d
KPIK	Colorado Sprgs., Colo.	5000d
WWIL	Ft. Lauderdale, Fla.	10000
WGRC	Green Cove Springs, Florida	500d
WMDF	Mount Dora, Fla.	1000d
WCCF	Punta Gorda, Fla.	1000d
WRFB	Tallahassee, Fla.	5000d
WCLS	Columbus, Ga.	1000d
WLBA	Gainesville, Ga.	5000d
WKKO	Aurora, Ill.	250d
WOQN	OuQuoin, Ill.	250d
WBBA	Pittsfield, Ill.	250d
WKIO	Urbana, Ill.	250d
WCNB	Connersville, Ind.	250d
WJVA	South Bend, Ind.	1000d
WAMW	Washington, Ind.	250d
KCHA	Charles City, Iowa	500d
KWNT	Davenport, Iowa	500d
KDSN	Denison, Iowa	500d
WAXU	Georgetown, Ky.	10000d
WMTL	Leitchfield, Ky.	250d
WPKY	Princeton, Ky.	250d
KLUV	Haynesville, La.	250d
KLOU	Lake Charles, La.	1000
WPGC	Bradbury Hgts., Md.	15000
WOWE	Allegan, Mich.	250d
WJUO	St. Johns, Mich.	1000d
KOOM	Windom, Minn.	250d
WAMY	Amory, Miss.	5000d
WGLC	Centreville, Miss.	250d
WESY	Leland, Miss.	1000
WPMP	Pascagoula-Moss Point, Mississippi	1000d
KBIA	Columbia, Mo.	250d
KNIM	Maryville, Mo.	250d
WCRV	Washington, N.J.	500d
KHAM	Albuquerque, N.Mex.	1000d
WPAC	Patchogue, N.Y.	10000d
KZKY	Albemarle, N.C.	250d
WVKO	Columbus, Ohio	1000d
KLTR	Blackwell, Okla.	250d
WCOY	Columbia, Pa.	500d
WANB	Waynesburg, Pa.	250d
WBPO	Orangeburg, S.C.	1000d
WYCL	York, S.C.	250d
WLIJ	Shelbyville, Tenn.	1000d
WSKT	South Knoxville, Tenn.	250
KGAF	Gainesville, Tex.	250d
KIRT	Mission, Tex.	1000d
KTLU	Rusk, Tex.	500d
KWED	Seguin, Tex.	1000d
KBYP	Shamrock, Tex.	250d
WILA	Danville, Va.	1000d
WPUV	Pulaski, Va.	5000d
WTTN	Watertown, Wis.	1000d

1590—188.7

WATM	Atmore, Ala.	5000d
WVNA	Tuscumbia, Ala.	5000d
KPBA	Pine Bluff, Ark.	1000d
KLIV	San Jose, Calif.	1000
KUOU	Ventura, Calif.	1000
WBRY	Waterbury, Conn.	5000
WOWY	Clewiston, Fla.	500d
WILZ	St. Petersburg Beach, Florida	1000d
WELE	S. Daytona Beh., Fla.	1000d
WALG	Albany, Ga.	1000
WLFA	Lafayette, Ga.	5000d
WNMP	Evanston, Ill.	1000d
WAIK	Galesburg, Ill.	5000d
WGEE	Indianapolis, Ind.	5000d
WPCO	Mt. Vernon, Ind.	500d
KWBG	Boone, Iowa	1000
KVGB	Great Bend, Kans.	5000
WLBN	Lebanon, Ky.	1000d
KEVL	White Castle, La.	1000d
WETT	Ocean City, Md.	1000
WTVB	Coldwater, Mich.	5000
WOOG	Marine City, Mich.	1000d
WMIC	St. Helen, Mich.	500d
KRAD	E. Grand Forks, Minn.	1000d
WOKJ	Jackson, Miss.	5000d
KDEX	Dexter, Mo.	1000d
KPRS	Kansas City, Mo.	1000d
KCLU	Rolla, Mo.	1000d
WSMN	Nashua, N.H.	5000
WERA	Plainfield, N.J.	500d
WAUB	Auburn, N.Y.	500d
WEHH	Elmira Heights-Horseheads, N.Y.	500d
WGGO	Salamanca, N.Y.	5000d
WGTC	Greenville, N.C.	5000d
WNOS	High Point, N.C.	1000d
WAKR	Akron, Ohio	5000
WSRW	Hillsboro, Ohio	500d
KHEN	Henryetta, Okla.	500d
KTIL	Tillamook, Oreg.	250
WZUM	Carnegie, Pa.	1000d
WCBG	Chambersburg, Pa.	5000d
WEEZ	Chester, Pa.	1000
WXRF	Guayama, P.R.	1000
WYNG	Warwick, R.I.	1000d
WABV	Abbeville, S.C.	1000d
WACA	Camden, S.C.	1000d
KCCR	Pierre, S.Dak.	1000d
WJSO	Jonesboro, Tenn.	5000d
WDBL	Springfield, Tenn.	1000d
KGAS	Carthage, Tex.	1000d
KERC	Eastland, Tex.	500d
KINT	El Paso, Tex.	1000d
KYOK	Houston, Tex.	5000
KCBD	Lubbock, Tex.	1000
KBUS	Mexia, Tex.	500d
KTOD	Sinton, Tex.	1000
WEZL	Richmond, Va.	5000d
KTIX	Seattle, Wash.	5000d
WIXK	New Richmond, Wis.	5000d
WSWW	Platteville, Wis.	1000d
WTRW	Two Rivers, Wis.	1000d
KCHY	Cheyenne, Wyo.	1000d

1600—187.5

CHVC	Niagara Falls, Ont.	10000
WEUP	Huntsville, Ala.	5000d
WAPX	Montgomery, Ala.	1000
KGST	Fresno, Calif.	1000d
KWOW	Pomona, Calif.	1000
KUBA	Yuba City, Calif.	1000
KLAK	Lakewood, Colo.	5000
WKEN	Dover, Del.	500d
WKTX	Atlantic Beach, Fla.	1000d
WKWF	Key West, Fla.	500
WHEW	Riviera Beach, Fla.	1000
WOKB	Winter Garden, Fla.	1000d
WGKA	Atlanta, Ga.	1000d
WNGA	Nashville, Ga.	1000d
WCGO	Chicago Hgts., Ill.	1000d
WMCW	Harvard, Ill.	500d
WBTO	Linton, Ind.	500d
WARU	Peru, Ind.	1000d
KLGA	Algona, Iowa	5000d
KCRG	Cedar Rapids, Iowa	5000
KMDO	Ft. Scott, Kans.	500d
WSTL	Eminence, Ky.	500d
KFNV	Ferriday, La.	1000d
KLFT	Golden Meadow, La.	1000d
KLVI	Vivian, La.	500d
WINX	Rockville, Md.	1000
WBOS	Brookline, Mass.	5000
WTYM	East Longmeadow, Mass.	5000d
WHRV	Ann Arbor, Mich.	1000
WTRU	Muskegon, Mich.	5000
WKDL	Clarksdale, Miss.	1000d
KATZ	St. Louis, Mo.	5000
KTTN	Trenton, Mo.	500d
KNCY	Nebraska City, Nebr.	500d
KRFS	Superior, Nebr.	500d
WONG	Oneida, N.Y.	1000d
WWRL	Woodside, N.Y.	5000
WGIV	Charlotte, N.C.	1000
WIDU	Fayetteville, N.C.	1000d
WFRC	Reidsville, N.C.	1000
WKSK	W. Jefferson, N.C.	1000d
WBLY	Springfield, Ohio	1000d
WTTF	Tiffin, Ohio	500d
KUSH	Cushing, Okla.	1000d
KASH	Eugene, Oreg.	1000
KOHI	St. Helens, Oreg.	1000d
WHOL	Allentown, Pa.	500d
WEZN	Elizabethtown, Pa.	500d
WFIS	Fountain Inn, S.C.	1000d
WHBT	Harriman, Tenn.	5000d
WKBJ	Milan, Tenn.	1000d
KBBB	Borger, Tex.	500d
KBOR	Brownsville, Tex.	1000
KWEL	Midland, Tex.	1000
KCFH	Cuero, Tex.	500d
KMAE	McKinney, Tex.	1000d
KOGT	Orange, Tex.	1000
KBBC	Centerville, Utah	1000d
WHLL	Wheeling, W.Va.	5000d
WCWC	Ripon, Wis.	5000d

U. S. and Canadian AM Stations by Location

Abbreviations: C.L., call letters; Kc., frequency in kilacycles; N.A., network affiliation—A: American Broadcasting Co.; C: Columbia Broadcasting System, Inc.; M: Mutual Broadcasting System; N: National Broadcasting Co., Inc.

Location	C.L.	Kc.	N.A.
Abbeville, La.	KROF	960	
Abbeville, S.C.	WABV	1580	
Aberdeen, Md.	WAMO	970	
Aberdeen, Miss.	WMPA	1240	
Aberdeen, S.Dak.	KABR	1420	
	KSDN	930	A
Aberdeen, Wash.	KBKW	1450	
	KXRO	1320	
Abilene, Tex.	KRBC	1470	A
	KNIT	1280	
	KWKC	1340	M
Abingdon, Va.	WBBI	1230	
Ada, Okla.	KAOA	1230	A
Adel, Ga.	WAAG	1470	
Adrian, Mich.	WABJ	1490	A
Aguadilla, P.R.	WABA	850	
	WGRF	1340	
Aheskie, N.C.	WRCS	970	
Aiken, S.C.	WAKN	990	
Akron, Ohio	WAKR	1590	A
	WAOC	1350	C
	WCUE	1150	
	WHLO	640	M
Alamogordo, N.M.	KALG	1230	M
	KRAC	1270	
Alamosa, Colo.	KGIW	1450	M
Albany, Ga	WALG	1590	A
	WGPC	1450	C
	WJAZ	960	
Albany, Ky.	WANY	1390	
Albany, Minn.	KASM	1150	
Albany, N.Y.	WABY	1400	
	WOKO	1460	M
	WPTR	1540	A
	WROW	590	C
Albany, Oreg.	KWIL	790	M
	KABY	990	
Albemarle, N.C.	WABZ	1010	
	WZKY	1580	
Albert Lea, Minn.	KATE	1450	A
Albertville, Ala.	WAVU	630	
Albion, Mich.	WALM	1260	
Albuquerque, N.M.	KABQ	1350	
	KOEF	1150	
	KGGM	610	C
	KOB	770	N
	KQEO	920	M
	KARA	1310	
	KMGM	730	
	KLOS	1450	
	KHAM	1580	A
Alcoa, Tenn.	WEAG	1470	
Alexander City, Ala.	WRFS	1050	
Alexandria, La.	KALB	580	A
	KOBS	1410	
	KSYL	970	N
Alexandria, Minn.	KXRA	1490	A
Alexandria, Va.	WPIK	730	M
Algona, Iowa	KLGA	1600	
Alice, Tex.	KOPY	1070	
Allegan, Mich.	WOWE	1580	
Allentown, Pa.	WHOL	1600	
	WAEB	790	
	WKAP	1320	
	WSAN	1470	C
Alliance, Nebr.	KCOW	1400	
Alliance, Ohio	WFAH	1310	
Alma, Ga.	WCQS	1400	
Alma, Mich.	WFYC	1280	
Alpena Township, Mich.	WATZ	1450	
Alpine, Tex.	KVLF	1240	M
Alton, Ill.	WOKZ	1570	
Altona, Man.	CFAM	1290	
Altoona, Pa.	WFBG	1290	N
	WRTA	1240	A
	WVAM	1430	C
Alturas, Calif.	KCNO	570	
Altus, Okla.	KWHW	1450	
Alva, Okla.	KALV	1430	
Amarillo, Tex.	KBUY	1010	M
	KFOA	1440	A
	KGNC	710	N
	KIXZ	940	C
	KRAY	1360	
	KZIP	1310	
Ambridge, Pa.	WMBA	1460	
Americus, Ga.	WOEC	1290	
Ames, Iowa	KSAI	1430	
	WOI	640	
Amherst, N.S.	CKDH	1400	
Amite, La.	WABL	1570	
Amory, Miss.	WAMY	1580	
Amos, Que.	CHAO	1340	
Amsterdam, N.Y.	WCSS	1490	
Anaconda, Mont.	KANA	1230	
Anacortes, Wash.	KAGT	1340	
Anaheim, Calif.	KEZY	1190	
Anchorage, Alaska	KBYR	1270	
	KFQD	730	C-A
	KENI	550	A-M-N
Andalusia, Ala.	WCTA	920	
Anderson, Calif.	KPON	1580	
Anderson, Ind.	WHUT	1470	M
	WHBU	1240	C
Anderson, S.C.	WAIM	1230	C
	WANS	1280	M
Andrews, Tex.	KACT	1360	
Annapolis, Md.	WANN	1190	
	WABW	810	
	WNAV	1430	
Ann Arbor, Mich.	WHRV	1600	A
	WPAG	1050	
Anna, Ill.	WRAJ	1440	
Anniston, Ala.	WANA	1490	
	WONG	1450	A
	WHMA	1390	
Anoka, Minn.	KANO	1470	
Ansonia, Conn.	WADS	690	
Antigo, Wis.	WATK	900	
Antigonish, N.S.	CJFX	580	
Apollo, Pa.	WAVL	910	
Apple Valley, Cal.	KAVR	960	
Appleton, Wis.	WAPL	1570	
	WHBY	1230	M
Arcadia, Fla.	WAPG	1480	
Arcata, Calif.	KENL	1340	
Ardmore, Okla.	KVSO	1240	A
Arecibo, P.R.	WCMN	1280	
	WMIA	1070	
	WNIK	1230	
Arkadelphia, Ark.	KVRC	1240	M
Arkan. City, Kans.	KSOK	1280	
Arlington, Fla.	WQTY	1220	
Arlington, Va.	WAVA	780	
	WEAM	1390	
Artesia, N.M.	KSVP	990	M
Arvada, Colo.	KBRB	1550	
Ashburn, Ga.	WMES	1570	
Asbury Park, N.J.	WJLK	1310	
Asheboro, N.C.	WGWR	1260	
Asheville, N.C.	WISE	1310	
	WLOS	1380	N-M-A
	WSKY	1230	
	WWNC	570	C
Ashland, Ky.	WCMI	1340	C
	WTCR	1420	
Ashland, Ohio	WNCO	1340	
Ashland, Oreg.	KWIN	1400	M
	KRVC	1350	
Ashland, Va.	WOYL	1430	
Ashland, Wis.	WATW	1400	
Ashtabula, Ohio	WREO	970	
Astoria, Oreg.	KAST	1370	M
	KVAS	1230	
Atchison, Kans.	KARE	1470	
Athens, Ala.	WJMW	730	
Athens, Ga.	WGAU	1340	C
	WOOL	1470	
	WRFC	960	
Athens, Ohio	WATH	970	
	WOUB	1340	
Athens, Tenn.	WLAR	1450	M
Athens, Tex.	KBUO	1410	
Atlanta, Ga.	WPLO	590	C
	WAKE	1340	
	WAOK	1380	
	WERD	860	
	WGKA	1600	
	WGST	920	A
	WIIN	970	
	WQXI	790	
	WSB	750	N
	WYZE	1480	M
Atlanta, Tex.	KALT	900	
Atlantic, Iowa	KJAN	1220	
Atlantic Beach, Fla.	WKTX	1600	
Atlantic City, N.J.	WFPG	1450	C
	WLOB	1490	M
	WMID	1340	A
Atmore, Ala.	WATM	1590	
Attleboro, Mass.	WARA	1320	
Auburn, Ala.	WAUD	1230	A
Auburn, Calif.	KAHI	950	
Auburn, N.Y.	WMBO	1340	M
	WAUB	1590	
Auburn, Wash.	KASY	1220	
Auburndale, Fla.	WTWB	1570	
Auburndale, Wis.	WLBL	930	
Augusta, Ga.	WAUG	1050	
	WBBQ	1340	M
	WBIA	1230	N
	WGAC	580	A
	WRDW	1480	C
Augusta, Maine	WROO	1400	N
	WFAU	1340	M
Aurora, Colo.	KOSI	1430	M
Aurora, Ill.	WMRO	1280	
	WKKO	1580	
Austin, Minn.	KAUS	1480	M
	KQAQ	970	
Austin, Tex.	KNOW	1490	A
	KASE	970	
	KTBC	590	C

Location	C.L.	Kc.	N.A.
	KOKE	1370	
	KVET	1300	M
Avalon, Calif.	KBIG	740	
Avon Park, Fla.	WAVP	1390	
Avondale Estates, Ga.	WAVO	1420	
Aztec, N. Mex.	KNDE	1340	
Babylon, N.Y.	WBAB	1440	
	WGLI	1290	
Bad Axe, Mich.	WLEW	1340	
Bainbridge, Ga.	WMGR	930	
	WAZA	1360	
Baker, Oreg.	KBKR	1490	
Bakersfield, Calif.	KAFY	550	M
	KBIS	970	
	KERN	1410	C
	KGEE	1230	
	KUZZ	800	
	KLYD	1350	
	KMAP	1490	
	KPMC	1560	A
Bellingham, Wash.	KPUG	1170	M
Baldwinsville, N.Y.	WSEN	1050	
Ballinger, Tex.	KRUN	1400	
Baltimore, Md.	WBAL	1090	N
	WBMD	750	
	WCAO	600	
	WCBM	680	C
	WFBR	1300	
	WITH	1230	
	WSID	1010	
	WWIN	1400	A-M
Bamberg, S.C.	WWBO	790	
Bangor, Maine	WABI	910	A-M
	WGUY	1250	C
	WLBZ	620	N
Banning, Calif.	KPAS	1490	
Barboursville, Ky.	WBVL	950	
Bardstown, Ky.	WBRT	1320	
Barnesboro, Pa.	WNCC	950	
Barnwell, S.C.	WBAW	740	
Barre, Vt.	WSNO	1450	
Barrie, Ont.	CKBB	950	
Barstow, Calif.	KWTC	1230	A
	KIOT	1310	
Bartlesville, Okla.	KWON	1400	M
Bartow, Fla.	WBAR	1460	
Bassett, Va.	WODY	900	
Bastrop, La.	KTRY	730	
	KVOB	1340	
Batavia, N.Y.	WBTA	1490	M
Batesburg, S.C.	WBLR	1430	
Batesville, Ark.	KBTA	1340	
Batesville, Miss.	WBLE	1290	
Bath, Maine	WMMS	730	
Bathurst, N.B.	CKBC	1400	
Baton Rouge, La.	WAIL	1460	M
	WYNK	1380	
	WIBR	1300	
	WJBO	1150	N
	WLCS	910	
	WXOK	1260	
Battle Creek, Mich.	WBCK	990	
	WELL	1400	A
Baxley, Ga.	WHAB	1260	
Bay City, Mich.	WBCM	1440	A
	WWBC	1250	
Bay City, Tex.	KIOX	1270	M
Bay Minette, Ala.	WBCA	1150	
Bayamon, P.R.	WRSJ	1560	
Baytown, Tex.	KRCT	650	
	KWBA	1360	
Beacon, N.Y.	WBNR	1260	
Beardstown, Ill.	WRMS	790	
Beatrice, Nebr.	KWBE	1450	
Beaufort, N.C.	WBMA	1400	
Beaufort, S.C.	WBEU	960	
Beaumont, Tex.	KFDM	560	A
	KJET	1380	
	KRIC	1450	
	KTRM	990	
Beaver Dam, Wis.	WBEV	1430	
Beaver Falls, Pa.	WBVP	1230	
Beckley, W. Va.	WJLS	560	C
	WWNR	620	
Bedford, Ind.	WBIW	1340	
Bedford, Pa.	WBFD	1310	
Bedford, Va.	WBLT	1350	
Beeville, Tex.	KIBL	1490	
Belgrade, Mont.	KGVW	630	
Bellaire, Ohio	WOMP	1290	M
Bellefontaine, Ohio	WOHP	1390	
Bellefonte, Pa.	WBLF	1330	
Bell Fourche, S.Dak.	KBFS	1450	
Belle Glade, Fla.	WSWN	900	
Belleville, Ont.	CJBQ	800	
Belleville, Ill.	WIBV	1260	
Bellevue, Wash.	KFKF	1330	
Bellingham, Wash.	KPUG	1170	M
	KVOS	790	A
	KOQT	1550	
Bellingham-Ferndale, Wash.			
	KENY	930	
Belmont, N.C.	WCGC	1270	M-A
Beloit, Wis.	WBEL	1380	
	WGEZ	1490	M
Belton, S.C.	WHPB	1390	
Belzoni, Miss.	WELZ	1460	
Bemidji, Minn.	KBUN	1450	M
Bend, Oreg.	KBNO	1110	A
	KGRL	940	
Bennetsville, S.C.	WBSC	1550	M
Bennington, Vt.	WBTN	1370	
Benson, Minn.	KBMO	1290	
Benton, Ark.	KBBA	690	
Benton, Ky.	WCBL	1290	
Benton Harbor, Mich.	WHFB	1060	
Berkeley, Calif.	KRE	1400	
Berkeley Springs, W.Va.	WCST	1010	
Berlin, N.H.	WMOU	1230	
Berry Hill, Tenn.	WVOL	1470	
Berryville, Ark.	KTCN	1480	
Berwick, Pa.	WBRX	1280	
Bessemer, Ala.	WYAM	1450	
Bethesda, Md.	WUST	1120	
Bethlehem, Pa.	WGPA	1100	
Biddeford, Maine	WIDE	1400	M
Big Lake, Tex.	KBLT	1290	
Big Rapids, Mich.	WBRN	1460	
Big Sprg., Tex.	KBST	1490	A
	KHEM	1270	
	KBYG	1400	M
Big Stone Gap, Va.	WLSD	1220	
Biloxi, Miss.	WLOX	1490	M
	WVMI	570	
Billings, Mont.	KBMY	1240	M
	KGHL	790	N
	KOOK	970	C
	KOYN	910	
	KURL	730	
Binghamton, N.Y.	WINR	680	N
	WKOP	1360	M
	WNBF	1290	C
Birmingham, Ala.	WAPI	1070	N
	WBRC	960	A
	WCRT	1260	A
	WEZB	1220	
	WENN	1320	M
	WATV	900	
	WSGN	610	
	WYDE	850	
	WVOK	690	
Bisbee, Ariz.	KSUN	1230	A
Bishop, Calif.	KIBS	1230	A
Bishopville, S.C.	WAGS	1380	
Bismarck, N.Dak.	KFYR	550	N
	KQDI	1350	
Bismarck-Mandan, N.Dak.	KBOM	1270	
Black Mountain, N.C.	WBMT	1350	
Black River Falls, Wis.	WWIS	1260	
Blackfoot, Idaho	KBLI	690	
Blackstone, Va.	WKLV	1440	
Blackwell, Okla.	KLTR	1580	
Blaine, Wash.	KARI	550	
Blakely, Ga.	WBBK	1260	
Blanding, Utah	KUTA	790	
Blind River, Ont.	CJNR	730	
Bloomington, Ill.	WJBC	1230	A
Bloomington, Ind.	WTTS	1370	A
Bloomsburg, Pa.	WCNR	930	
	WHLM	550	
Bluefield, W.Va.	WHIS	1440	N
	WKOY	1240	M
Blythe, Calif.	KYOR	1450	A
Blytheville, Ark.	KLCN	910	
Boaz, Ala.	WAVC	1300	
Bogalusa, La.	WIKC	1490	N
	WBOX	920	
Boise, Idaho	KBOI	950	C
	KEST	790	
	KGEM	1140	M
	KIDO	630	N
	KYME	740	
Bonham, Tex.	KFYN	1420	
Boone, Iowa	KFGQ	1260	
	KWBG	1590	
Boone, N.C.	WATA	1450	
Boonville, Ind.	WBNL	1540	
Boonville, Mo.	KWRT	1370	
Booneville, Miss.	WBIP	1400	A
Boonville, N.Y.	WBRV	900	
Borger, Tex.	KHUZ	1490	M
	KBBB	1600	
Boston, Mass.	WBZ	1030	
	WCOP	1150	
	WILD	1090	
	WNAC	680	
	WEZE	1260	N
	WEEI	590	C
	WHDH	850	
	WMEX	1510	
	WORL	950	M
Boulder, Colo.	KBOL	1490	
Bowie, Tex.	KBAN	1410	
Bowling Green, Ky.	WKCT	930	A
	WBGN	1340	
	WLBJ	1410	M
Bowl. Green, Ohio	WHRW	730	
Bozeman, Mont.	KXXL	1450	N
	KBMN	1230	
Bradbury Hgts., Md.	WPGC	1580	
Braddock, Pa.	WLOA	1550	
Braddocks Heights, Md.	WMHI	1370	
Bradenton, Fla.	WTRL	1490	
	WBRD	1420	
Bradford, Pa.	WESB	1490	M
Brady, Tex.	KNEL	1490	
Brainerd, Minn.	KLIZ	1380	
Brampton, Ont.	CHIC	1090	
Brandon, Man.	CKX	1150	
Branson, Mo.	KBHM	1220	
Brantford, Ont.	CKPC	1380	
Brattleboro, Vt.	WTSA	1450	N
	WKVT	1490	
Brawley, Calif.	KROP	1300	A
Brazil, Ind.	WITE	1380	
Breckenridge, Minn.	KBMW	1450	
Breckenridge, Tex.	KSTB	1430	
Bremen, Ga.	WWCC	1440	
Bremerton, Wash.	KBRD	1490	
Brenham, Tex.	KWHI	1280	
Brevard, N.C.	WPNF	1240	M-N
Brewton, Ala.	WEBJ	1240	M
Bridgeport, Conn.	WICC	600	M
Bridgeton, N.J.	WNAB	1450	A
	WSNJ	1240	
Bridgewater, N.S.	CKBW	1000	
Brigham City, Utah	KBUH	800	
Brighton, Colo.	KBRN	800	
Brinkley, Ark.	KBRI	1570	
Bristol, Conn.	WBIS	1440	
Bristol, Tenn.	WOPI	1490	N
Bristol, Va.	WCYB	690	A
	WFHG	980	M
Brockton, Mass.	WBET	1460	
Brockville, Ont.	CFJR	1450	
Broken Bow, Nebr.	KCNI	1280	
Brookfield, Mo.	KGHM	1470	
Brookhaven, Miss.	WCHJ	1470	
	WJMB	1340	M
Brookings, Oreg.	KURY	910	
Brookings, S.Dak.	KBRK	1430	
Brookline, Mass.	WBOS	1600	
Brooksville, Fla.	WWJB	1450	
Brownfield, Tex.	KTFY	1300	
Brownsville, Tex.	KBOR	1600	A
Brownwood, Tex.	KBWD	1380	M
	KEAN	1240	
Brunswick, Ga.	WGIG	1440	A
	WMOG	1490	
Brunswick, Maine	WCME	900	
Bryan, Tex.	KORA	1240	M
	WTAW	1150	
Buckhannon, W.Va.	WBUC	1460	
Buffalo, N.Y.	WBEN	930	C
	WBNY	1400	
	WEBR	970	M
	WGR	550	
	WKBW	1520	N
	WWOL	1120	A
Buffalo, Wyo.	KBBS	1450	
Buford, Ga.	WOMF	1480	
Burbank, Calif.	KBLA	1500	
Burley, Idaho	KBAR	1230	A-M
Burlington, Iowa	KBUR	1490	A
Burlington, N.C.	WBBB	920	M
	WBAG	1150	
Burlington, Vt.	WCAX	620	N
	WDOT	1400	
	WJOY	1230	A
Burns, Oreg.	KRNS	1280	
Butler, Ala.	WPRN	1220	
Butler, Pa.	WBUT	1050	
	WISR	680	
Butte, Mont.	KBOW	1490	C
	KOPR	550	M
	KXLF	1370	N
Cabano, Que.	CJAF	1340	
Cadillac, Mich.	WATT	1240	M
Caguas, P.R.	WNEL	1430	
	WVJP	1110	
Cairo, Ga.	WGRA	790	
Cairo, Ill.	WKRO	1490	
Calais, Maine	WQDY	1230	N
Caldwell, Idaho	KCID	1490	
	KBGN	910	
Calera, Ala.	WBYE	1370	
Calexico, Calif.	KICO	1490	A
Calgary, Alta.	CFAC	960	
	CFCN	1060	
	CKXL	1140	
Calhoun, Ga.	WCGA	900	
Camas, Wash.	KVAN	1480	
Cambridge, Md.	WCEM	1240	
Cambridge, Mass.	WTAD	740	A
Cambridge, Ohio	WILE	1270	
Camden, Ark.	KAMD	910	
Camden, N.J.	WCAM	1310	
	WKDN	800	
Camden, S.C.	WACA	1590	
Camden, Tenn.	WFWL	1220	
Cameron, Tex.	KMIL	1330	
Camilla, Ga.	WCLB	1220	
Campbell, Ohio	WHOT	1570	
Campbellsville, Ky.	WTCO	1450	
Campbellton, N.B.	CKNB	950	
Camrose, Alta.	CFCW	790	
Canon City, Colo.	KRLN	1400	M
Canonsburg, Pa.	WCNG	540	
Canton, Ga.	WCHK	1290	
Canton, Ill.	WBYS	1560	
Canton, Miss.	WDOB	1370	
Canton, N.C.	WWIT	970	
Canton, Ohio	WCNS	900	
	WCMW	1080	
	WHBC	1480	A
Cape Girardeau, Mo.	KFVS	960	
	KGMO	1550	
Carbondale, Ill.	WCIL	1020	
Carbondale, Pa.	WCDL	1440	
Caribou, Maine	WFST	600	
Carlisle, Pa.	WHYL	960	
Carlsbad, N.Mex.	KAVE	1240	C
	KPBM	740	
Carmel, Calif.	KRML	1410	
Carmi, Ill.	WROY	1480	
Carnegie, Pa.	WZUM	1590	
Carrizo Springs, Tex.	KBEN	1450	
Carroll, Iowa	KCIM	1380	
Carrollton, Ala.	WRAG	580	
Carrollton, Ga.	WLBB	1100	
Carrollton, Mo.	KAOL	1430	
Carson City, Nev.	KPTL	1300	
Cartersville, Ga.	WBHF	1450	M
Carthage, Ill.	WCAZ	990	
Carthage, Mo.	KOMO	1490	
Carthage, Tenn.	WRKM	1350	
Carthage, Tex.	KGAS	1590	
Caruthersville, Mo.	KCRV	1370	
Casa Grande, Ariz.	KPIN	1260	
Casper, Wyo.	KTWO	1470	C
	KATI	1400	
	KVOC	1230	A-M
Cayce, S.C.	WCAY	620	
Cedar City, Utah	KSUB	590	C
Cedar Falls, Iowa	KCFI	1250	
Cedar Rapids, Iowa	KCRG	1600	M
	KHAK	1360	
	KPIG	1450	
	WMT	600	C
Cedartown, Ga.	WGAA	1340	
Center, Tex.	KDET	930	
Centerville, Calif.	KBIF	900	
Centerville, Iowa	KCOG	1400	
Centerville, Tenn.	WHLP	1570	
Centerville, Utah	KBBC	1600	
Central City, Ky.	WNES	1050	
	WMTA	1380	
Centralia, Ill.	WCNT	1210	
Centralia & Chehalis, Wash.	KELA	1470	
Centreville, Miss.	WGLC	1560	
Chadron, Nebr.	KCSR	1450	
Chambersburg, Pa.	WCHA	800	
	WCBG	1590	
Champaign, Ill.	WDWS	1400	C
Chanute, Kans.	KCRB	1460	
Chapel Hill, N.C.	WCHL	1360	
Charleroi, Pa.	WESA	940	
Charles City, Iowa	KCHA	1580	
Charleston, Ill.	WEIC	1270	
Charleston, Mo.	KCHR	1350	
Charleston, S.C.	WCSC	1390	C
	WOKE	1340	A-M
	WPAL	730	
	WQSN	1450	
	WTMA	1250	N
Charleston, W.Va.	WCAW	680	
	WCHS	580	C
	WHMS	1490	A
	WKAZ	950	N
	WTIP	1240	M
Charlotte, Mich.	WCER	1390	
Charlotte, N.C.	WBT	1110	C
	WAYS	610	A
	WGIV	1600	
	WKTC	1310	
	WSOC	930	M
	WIST	1240	N
	WWOK	1480	
Charlotte Amalie, V.I.	WSTA	1340	
Charlottesville, Va.	WCHV	1280	A
	WELK	1010	
	WINA	1400	M
Charlottetown, P.E.I.	CFCY	630	N
Chase City, Va.	WMEK	980	
Chatham, Ont.	CFCO	630	
Chattanooga, Tenn.	WDOD	1450	M
	WAPO	1150	A
	WDEF	1370	N
	WDOD	1310	C
	WDXB	1490	
	WNOO	1260	
Cheboygan, Mich.	WCBY	1240	
Cheektowaga, N.Y.	WNIA	1230	
Chehalis, Wash.	KITI	1420	
Chelan, Wash.	KOZI	1220	
Cheraw, S.C.	WCRE	1420	
Cherokee, Iowa	KCHE	1440	
Chester, Pa.	WEEZ	1590	
	WVCH	740	
Chester, S.C.	WGCO	1490	
Cheyenne, Wyo.	KFBC	1240	A
	KCHY	1590	
	KRAE	1480	
	KVWO	1370	M
Chicago, Ill.	WAAF	950	
	WAIT	820	
	WBBM	780	C
	WCFL	1000	
	WCRW	1240	
	WEDC	1240	
	WGES	1390	
	WGN	720	M
	WIND	560	
	WJJD	1160	
	WLS	890	A
	WMAQ	670	N
	WMBI	1110	
	WSBC	1240	
Chicago Hgts., Ill.	WCGO	1600	
Chickasha, Okla.	KWCO	1580	
Chico, Calif.	KHSL	1290	C
	KPAY	1060	
Chicopee, Mass.	WACE	730	
Chicoutimi, Que.	CBJ	1580	
	CJMT	1420	
Childress, Tex.	KCTX	1510	
Chillicothe, Mo.	KCHI	1010	
Chillicothe, Ohio	WBEX	1490	A
	WCHI	1350	
Chilliwack, B.C.	CHWK	1270	
Chipley, Fla.	WBGC	1240	
Chippewa Falls, Wis.	WAXX	1150	
Christiansburg, Va.	WBCR	1260	
Christiansted, V.I.	WIVI	970	
Church Hill, Tenn.	WMCH	1260	
Churchill, Man.	CHFC	1230	
Cicero, Ill.	WHFC	1450	
Cincinnati, Ohio	WCKY	1530	
	WCIN	1480	
	WCPO	1230	
	WKRC	550	C
	WLW	700	N-A
	WSAI	1360	
	WZIP	1050	
Clanton, Ala.	WKLF	980	
Clare, Mich.	WCRM	990	

Location	C.L.	Kc.	N.A.
Claremont, N.H.	WTSV	1230	
Claremore, Okla.	KWPR	1270	
Clarion, Pa.	WWCH	1300	
Clarksburg, W.Va.	WBOY	1400	N
	WHAR	1340	M
	WPDX	750	
Clarksdale, Miss.	WROX	1450	M
	WKDL	1600	
Clarksville, Ark.	KLYR	1360	
Clarksville, Tenn.	WJZM	1400	M
	WDXN	540	
Clarksville, Tex.	KCAR	1350	
Claxton, Ga.	WCLA	1470	
Clayton, Ga.	WGHC	1570	
Clayton, Mo.	KXLW	1320	
	KFUO	850	
Clayton, N.Mex.	KLMX	1450	
Clearfield, Pa.	WCPA	900	
Clearwater, Fla.	WTAN	1340	
	WAZE	860	
Cleburne, Tex.	KCLE	1120	
Cleveland, Ga.	WRWH	1350	
Cleveland, Miss.	WCLD	1490	
	WDSK	1410	
Cleveland, Ohio	KYW	1100	
	WDOK	1260	M
	WERE	1300	
	WGAR	1220	C
	WHK	1420	
	WABQ	1540	
	WJW	850	N
Cleveland, Tenn.	WBAC	1340	M
	WCLE	1570	
Cleveland, Tex.	KVLB	1410	
Cleve. Hgts., Ohio	WJMO	1490	A
Clewiston, Fla.	WSUG	1050	
	WOWY	1590	
Clifton, Ariz.	KCLF	1400	A
Clifton Forge, Va.	WCFV	1230	
Clinton, Ill.	WHOW	1520	
Clinton, Iowa	KCLN	1390	
	KROS	1340	M
Clinton, Mo.	KDKD	1280	
Clinton, N.C.	WRRZ	880	A
Clinton, Okla.	KWOE	1320	
Clinton, S.C.	WPCC	1410	
Cloquet, Minn.	WKLK	1230	
Clovis, N.Mex.	KCLV	1240	
	KVER	980	
Coachella, Calif.	KCHV	970	
Coalinga, Calif.	KBMX	1470	
Coatesville, Pa.	WCOJ	1420	
Cocoa, Fla.	WKKO	860	
	WEZY	1350	
Cocoa Beach, Fla.	WRKT	1300	
Cody, Wyo.	KODI	1400	A
Coeur d'Alene, Ida.	KVNI	1240	M
	KZIN	1050	
Coffeyville, Kans.	KGGF	690	A
Colby, Kans.	KXXX	790	
Coldwater, Mich.	WTVB	1590	
Coleman, Tex.	KSTA	1000	
Colfax, Wash.	KCLX	1450	
College Park, Ga.	WEAD	1570	
Colonial Heights, Va.	WPVA	1290	
Colorado City, Tex.	KVMC	1320	
Colo. Sprgs., Colo.	KRDO	1240	
	KPIK	1580	
	KVOR	1300	C
	KSSS	740	
	KYSN	1460	M
Columbia, Ky.	WAIN	1270	
Columbia, Miss.	WCJU	1450	M
Columbia, Mo.	KFRU	1400	A
	KBIA	1580	
Columbia, Pa.	WCOY	1580	
Columbia, S.C.	WCOS	1400	A
	WIS	560	N
	WMSC	1320	C
	WNOK	1230	
	WOIC	1470	
Columbia, Tenn.	WMCP	1280	
	WKRM	1340	
Columbus, Ga.	WDAK	540	N
	WRBL	1420	C
	WGBA	1270	M
	WCLS	1580	
	WOKS	1340	
Columbus, Ind.	WCSI	1010	
Columbus, Miss.	WACR	1050	
	WCBI	550	M
Columbus, Nebr.	KJSK	900	
Columbus, Ohio	WBNS	1460	C
	WCOL	1230	A
	WMNI	920	A
	WOSU	820	
	WTVN	610	
	WVKO	1580	
Colville, Wash.	KCVL	1270	
Commerce, Ga.	WJJC	1270	
Concord, N.H.	WKXL	1450	C
Concord, N.C.	WEGO	1410	
Concordia, Kans.	KNCK	1390	
	KFRM	550	A
Conneaut, Ohio	WWOW	1360	
Connellsville, Pa.	WCVI	1340	
Connersville, Ind.	WCNB	1580	
Conroe, Tex.	KMCO	900	
Conway, Ark.	KCON	1230	
Conway, N.H.	WBNC	1050	
Conway, S.C.	WLAT	1330	M
Cookeville, Tenn.	WHUB	1400	C
Coolidge, Ariz.	KCKY	1150	C
Coos Bay, Oreg.	KOOS	1280	M
	KYNG	1420	
Copper Hill, Tenn.	WLSB	1400	
Coquille, Oreg.	KWRO	630	
Coral Gables, Fla.	WVCG	1070	
Corbin, Ky.	WCTT	680	M
Cordele, Ga.	WMJM	1490	M
Cordova, Alaska	KLAM	1450	
Corinth, Miss.	WCMA	1280	
Cornelia, Ga.	WCON	1450	
Corner Brook, Nfld.	CBY	790	
	CFCB	570	
Corning, Ark.	KCCB	1260	
Corning, N.Y.	WCBA	1350	
	WCLI	1450	A
Cornwall, Ont.	CJSS	1220	
	CFML	1110	
Corona, Calif.	KBUC	1370	
Corpus Christi, Tex.	KCTA	1030	M
	KCCT	1150	
	KEYS	1440	
	KRYS	1360	N
	KSIX	1230	A-C
	KUNO	1400	
Corry, Pa.	WOTR	1370	
Corsicana, Tex.	KAND	1340	
Cortez, Colo.	KVFC	740	
Cortland, N.Y.	WKRT	920	
Corvallis, Oreg.	KOAC	550	
	KFLY	1240	
	KLOO	1340	
Coshocton, Ohio	WTNS	1580	
Cottage Grove, Ore.	KNND	1400	
Coudersport, Pa.	WFRM	600	
Council Bluffs, Iowa	KSWI	1580	M-A
Courtenay, B.C.	CFCP	1440	
Covington, Ga.	WGFS	1430	
Covington, La.	WARB	730	
Covington, Tenn.	WKBL	1250	
Covington, Va.	WKEY	1340	A
Cowan, Tenn.	WZYX	1440	
Craig, Colo.	KRAI	550	
Cranbrook, B.C.	CKEK	570	
Crane, Tex.	KCRN	1380	
Crescent City, Calif.	KPLY	1240	
	KPOD	1310	
Creston, Iowa	KSIB	1520	
Crestview, Fla.	WCNU	1010	
	WJSB	1050	
Crewe, Va.	WSVS	800	
Crockett, Tex.	KIVY	1290	
Crookston, Minn.	KROX	1260	
Crossett, Ark.	KAGH	800	
Crossville, Tenn.	WAEW	1330	
Crowley, La.	KSIG	1450	M
Cuero, Tex.	KCFH	1600	
Cullman, Ala.	WFMH	1460	
	WKUL	1340	
Culpeper, Va.	WCVA	1490	M
Cumberland, Ky.	WCPM	1280	
Cumberland, Md.	WCUM	1230	C
	WTBO	1450	
Cushing, Okla.	KUSH	1600	
Cypress Gardens, Fla.	WGTO	540	
Cynthiana, Ky.	WCYN	1400	
Dade City, Fla.	WDCF	1350	
Dadeville, Ala.	WDVC	910	
Dalhart, Tex.	KXIT	1410	
Dallas, N.C.	WCFT	960	
Dallas, Oreg.	KPLK	1460	
Dallas, Tex.	KRLD	1080	C
	KIXL	1040	
	KSKY	660	
	KLIF	1190	
	WFAA	570	A
	WFAA	820	N
	KBOX	1480	
	WRR	1310	M
The Dalles, Oreg.	KACI	1300	
	KODL	1440	A
Dalton, Ga.	WBLJ	1230	M
	WRCD	1430	
Danbury, Conn.	WLAD	800	
Danville, Ill.	WDAN	1490	C
	WITY	980	
Danville, Ky.	WHIR	1230	M
Danville, Va.	WBTM	1330	A
	WDTI	970	
	WDVA	1250	M
	WILA	1580	
Darlington, S.C.	WOAR	1350	
Dauphin, Man.	CKDM	730	
Davenport, Iowa	WOC	1420	N
	KWNT	1580	
	KSTT	1170	M
Dawson, Ga.	WDWD	990	
Dawson, Yukon T.	CFYT	1230	
Dawson Creek, B.C.	CJDC	1350	
Dayton, Ohio	WHIO	1290	C
	WING	1410	
	WONE	980	
	WAVI	1210	
Dayton, Tenn.	WDNT	1280	
Daytona Beach, Fla.	WNDB	1150	M-A
	WMFJ	1450	
	WROD	1340	
Deadwood, S.Dak.	KDSJ	980	
Dearborn, Mich.	WKMH	1310	
Decatur, Ala.	WHOS	800	
	WAJF	1490	
	WMSL	1400	M
Decatur, Ga.	WGUN	1010	
Decatur, Ill.	WDZ	1050	
	WSOY	1340	C
Decorah, Iowa	KDEC	1240	
	KWLC	1240	
Defiance, Ohio	WONW	1280	
De Funiak Springs, Fla.	WDSP	1280	
	WZEP	1460	
De Kalb, Ill.	WLBK	1360	
De Land, Fla.	WJBS	1490	
	WOOO	1310	
Delano, Calif.	KCHJ	1010	
Delaware, Ohio	WDLE	1550	
Delray, Beh., Fla.	WDBF	1420	
Del Rio, Tex.	KDLK	1230	
Delta, Colo.	KDTA	1400	
Deming, N.Mex.	KOTS	1230	
Demopolis, Ala.	WXAL	1400	M
Denham Sprgs., La.	WLBI	1220	
Denison, Iowa	KDSN	1580	
Denison, Tex.	KDSX	950	
Denton, Tex.	KDNT	1440	
Denver, Colo.	KDEN	1340	
	KFML	1390	
	KHOW	630	A
	KIMN	950	M
	KLIR	990	
	KLZ	560	C
	KICN	710	
	KOA	850	N
	KPOF	910	
	KFSC	1220	
	KTLN	1280	
De Queen, Ark.	KDQN	1390	
DeRidder, La.	KDLA	1010	
Des Moines, Iowa	KCBC	1390	A
	KIOA	940	
	KRNT	1350	C
	KSO	1460	
	KWKY	1150	M
	WHO	1040	N
Detroit, Mich.	WCAR	1130	
	WJBK	1500	
	WJLB	1400	
	WJR	760	
	WWJ	950	N
	WXYZ	1270	A
Detroit Lakes, Minn.	KDLM	1340	
Devils Lake, N.Dak.	KDLR	1240	M
Dexter, Mo.	KDEX	1590	
Diboll, Tex.	KSPL	1260	
Dickinson, N.Dak.	KDIX	1230	
Dickson, Tenn.	WDKN	1260	
Dillon, Mont.	KDBM	800	
Dillon, S.C.	WDSC	800	A
Dinuba, Calif.	KRDU	1130	
Dodge City, Kans.	KGNO	1370	M
Dothan, Ala.	WAGF	1320	
	WDIG	1450	M
	WOOF	560	
Douglas, Ariz.	KAWT	1450	M
	KAPR	930	
Douglas, Ga.	WDMG	860	
Douglas, Wyo.	KWIV	1050	
Dover, Del.	WDOV	1410	
	WKEN	1600	
Dover, N.H.	WTSN	1270	
Dover, N.J.	WRAN	1510	
Dover, Ohio	WJER	1450	
Dowagiac, Mich.	WDOW	1440	
Doylestown, Pa.	WBUX	1570	
Drumheller, Alta.	CJDV	910	
Drummondville, Que.	CHRD	1340	
Dublin, Ga.	WMLT	1330	
	WXLI	1230	
Du Bois, Pa.	WCED	1420	C
Dubuque, Iowa	KDTH	1370	A
	WDBQ	1490	M
Duluth, Minn.	KDAL	610	C
	WEBC	560	
Dumas, Tex.	KDDD	800	
Duncan, Okla.	KRHD	1350	M
Dundalk, Md.	WAYE	860	
	WEBB	1360	
Dundee, N.Y.	WFLR	1570	
Dunkirk, N.Y.	WDOE	1410	
Dunn, N.C.	WCKB	780	
Du Quoin, Ill.	WDQN	1580	
Durango, Colo.	KIUP	930	
	KDGO	1240	
Durant, Okla.	KSFO	750	
Durham, N.C.	WDNC	620	C
	WSRC	1410	
	WSSB	1490	
	WTIK	1310	A
Dyersburg, Tenn.	WDSG	1450	
	WTRO	1330	
Eagle Pass, Tex.	KEPS	1270	
Eagle River, Wis.	WERL	950	
Easley, S.C.	WELP	1360	
E. Grand Forks, Minn.	KRAD	1590	
Eastland, Tex.	KERC	1590	
E. Lansing, Mich.	WKAR	870	
E. Liverpool, Ohio	WOHI	1490	A
East Longmeadow, Mass.	WTYM	1600	
E. Moline, Ill.	WDLM	960	
E. Palatka, Fla.	WREA	1480	A
E. Point, Ga.	WTJH	1260	
E. St. Louis, Ill.	WAMV	1490	A
Easton, Md.	WEMD	1460	
Easton, Pa.	WEEX	1230	
	WEST	1400	N
Eatontown, N.J.	WHTG	1410	
Eau Claire, Wis.	WEAQ	790	N
	WBIZ	1400	M
	WECL	1050	
Eau Gallie, Fla.	WMEG	920	
Edenton, N.C.	WCDJ	1260	
Edinburg, Tex.	KURV	710	
Edmonds, Wash.	KGDN	630	
Edmonton, Alta.	CBX	1010	
	CBXA	740	
	CFRN	1260	
	CHED	1080	
	CHFA	680	
	CJCA	930	
	CKUA	580	
Edmundston, N.C.	CJEM	570	
Effingham, Ill.	WCRA	1090	
Elba, Ala.	WELB	1350	
Elberton, Ga.	WSGC	1400	
El Cajon, Calif.	KDEO	910	A
El Campo, Tex.	KULP	1390	
El Centro, Calif.	KXO	1230	M
	KAMP	1430	
El Dorado, Ark.	KDMS	1290	
	KELD	1400	A
Eldorado, Kans.	KBTO	1360	
Elgin, Ill.	WRMN	1410	
Elizabeth City, N.C.	WCNC	1240	
	WGAI	560	
Elizabethton, Tenn.	WBEJ	1240	
Elizabethtown, Ky.	WIEL	1400	
Elizabethtown, N.C.	WBLA	1440	
Elizabethtown, Pa.	WEZN	1600	
Elk City, Okla.	KBEK	1240	A
Elkhart, Ind.	WTRC	1340	N
	WCMR	1270	
Elkin, N.C.	WIFM	1340	
Elkins, W.Va.	WDNE	1240	
Elko, Nev.	KELK	1240	M
Ellensburg, Wash.	KXLE	1240	
Ellsworth, Me.	WDEA	1350	
Elmira, N.Y.	WELM	1410	A-C
	WENY	1280	N
Elmira Heights-Horseheads, N.Y.	WEHH	1590	M
El Paso, Tex.	KROD	600	C
	KELP	920	
	KHEY	690	
	KINT	1590	
	KIZZ	1150	
	KSET	1340	A
	KTSM	1380	N
Ely, Minn.	WELY	1450	M
Ely, Nev.	KELY	1280	
Elyria, Ohio	WEOL	930	
Eminence, Ky.	WSTL	1600	
Emporia, Kans.	KVOE	1400	
Emporia, Va.	WEVA	860	
Emporium, Pa.	WLEM	1250	
Endicott, N.Y.	WENE	1430	A
Englewood, Colo.	KGMC	1150	
Enid, Okla.	KCRC	1390	A
	KGWA	960	M
Enterprise, Ala.	WIRB	600	
Enterprise, Oreg.	KWVR	1340	
Ephrata, Pa.	WGSA	1310	
Ephrata, Wash.	KULF	730	
Erie, Pa.	WERC	1260	A
	WICU	1350	N
	WJET	1400	
	WLEU	1450	
Erwin, Tenn.	WEMB	1420	
Escanaba, Mich.	WDBC	680	M
	WLST	600	A
Escondido, Calif.	KOWN	1450	
Estherville, Iowa	KLIL	1340	
Etowah, Tenn.	WCPH	1220	
Eufaula, Ala.	WULA	1240	M
Eugene, Oreg.	KORE	1450	M
	KASH	1600	A
	KERG	1280	C
	KUGN	590	N
Eunice, La.	KEUN	1490	M
Eureka, Calif.	KINS	980	C
	KDAN	790	
	KIEM	1480	M
Eustis, Fla.	WLCO	1240	
Evanston, Ill.	WEAW	1330	
	WNMP	1590	
Evanston, Wyo.	KLUK	1240	
Evansville, Ind.	WEOA	1400	C
	WGBF	1280	N
	WIKY	820	
	WJPS	1330	A
Eveleth, Minn.	WEVE	1340	M
Everett, Wash.	KRKO	1380	
	KQTY	1230	
Evergreen, Ala.	WBLO	1470	
Fairbanks, Alaska	KFAR	660	A-M-N
	KFRB	900	C-A
Fairfax, Va.	WEEL	1310	
Fairfield, Ill.	WFIW	1390	
Fairfield, Iowa	KMCD	1570	
Fairmont, Minn.	KSUM	1370	M
Fairmont, N.C.	WFMO	860	
Fairmont, W.Va.	WMMN	920	C
	WTCS	1490	A
Fajardo, P.R.	WMDD	1490	
Falfurrias, Tex.	KPSO	1260	
Fallon, Nev.	KULV	1250	
Fall River, Mass.	WALE	1400	M
	WSAR	1480	A
Falls Church, Va.	WFAX	1220	
Falls City, Nebr.	KTNC	1230	
Fargo, N.Dak.	WDAY	970	N
	KFNW	900	
	KUTT	1550	
	KXGO	790	A
Faribault, Minn.	KDHL	920	
Farmington, Me.	WKTJ	1380	
Farmington, Mo.	KREI	800	
Farmington, N.M.	KENN	1390	

Location	C.L.	Kc.	N.A.
	KWYK	960	
	KRZE	1280	
Farmville, N.C.	WBTL	1050	
	WFAG	1250	
Farmville, Va.	WFLO	870	
Farrell, Pa.	WFAR	1470	
Farwell, Tex.	KZOL	1570	
Fayette, Ala.	WWWF	990	
Fayetteville, Ark.	KHOG	1440	
	KFAY	1250	M
Fayetteville, N.C.	WFAI	1280	C
	WFNC	940	M
	WFLB	1490	A
	WIDU	1600	
Fayetteville, Tenn.	WEKR	1240	M
Fergus Falls, Minn.	KOTE	1250	M
Fernandina Beach, Fla.	WFAP	1570	
Ferriday, La.	KFNV	1600	
Festus, Mo.	KXEN	1010	
Findlay, Ohio	WFIN	1330	
Fisher, W.Va.	WELD	690	A
Fitchburg, Mass.	WEIM	1280	M
	WFGM	960	
Fitzgerald, Ga.	WBHB	1240	M
Flagstaff, Ariz.	KCLS	600	N
	KVNA	690	A
	KEOS	1290	
Flat River, Mo.	KFMO	1240	M
Flin Flon, Man.	CFAR	590	
Flint, Mich.	WFDF	910	N
	WTRX	1330	A
	WAMM	1420	
	WMRP	1570	
	WKMF	1470	
	WTAC	600	A
Flomaton, Ala.	WTCB	990	
Florence, Ala.	WJOI	1340	M
	WOWL	1240	A
Florence, S.C.	WJMX	970	A
	WOLS	1230	
	WYNN	540	
Floydada, Tex.	KFLD	900	
Foley, Ala.	WHEP	1310	
Fond du Lac, Wis.	KFIZ	1450	M
Fordyce, Ark.	KBJT	1570	
Forest, Miss.	WMAG	860	
Forest City, N.C.	WBBO	780	
	WAGY	1320	
Forest Grove, Oreg.	KWAY	1570	
Forrest City, Ark.	KXJK	950	
Ft. Bragg, Calif.	KDAC	1230	
Ft. Collins, Colo.	KCOL	1410	A
	KZIX	600	
Ft. Dodge, Iowa	KVFD	1400	M
	KWMT	540	A
Ft. Frances, Ont.	CFOB	800	
Ft. Knox, Ky.	WSAC	1470	
Ft. Lauderdale, Fla.	WFTL	1400	
	WWIL	1580	
Ft. Madison, Iowa	KXGI	1360	
Ft. Morgan, Colo.	KFTM	1400	
Ft. Myers, Fla.	WINK	1240	C
	WMYR	1410	
Ft. Payne, Ala.	WFPA	1400	
	WZOB	1250	
Ft. Pierce, Fla.	WARN	1330	
	WIRA	1400	
Ft. Scott, Kans.	KMDO	1600	
Ft. Smith, Ark.	KFPW	1230	C
	KFSA	950	A
	KTCS	1410	M
	KWHN	1320	
Ft. Stockton, Tex.	KFST	860	
Ft. Valley, Ga.	WFPM	1150	
Ft. Walton Beach, Fla.	WNUE	950	
	WFTW	1260	
Ft. Wayne, Ind.	WGL	1250	A
	WOWO	1190	C
	WANE	1450	C
	WKJG	1380	N
Ft. William, Ont.	CKPR	580	
	CJLX	800	
Ft. Worth, Tex.	KJIM	870	
	KCUL	1540	
	KFJZ	1270	
	KNOK	970	
	WBAP	570	A
	WBAP	820	N
	KXOL	1360	
Fostoria, Ohio	WFOB	1430	
Fountain City, Tenn.	WFCT	1430	
	WROL	1490	
Fountain Inn, S.C.	WFIS	1600	
Framingham, Mass.	WKOX	1190	
Frankfort, Ind.	WILO	1570	
Frankfort, Ky.	WFKY	1490	M
Franklin, Ky.	WFKN	1220	
Franklin, La.	KFRA	1390	
Franklin, N.C.	WFSC	1050	
Franklin, Pa.	WFRA	1430	
Franklin, Tenn.	WAGG	950	
Franklin, Va.	WYSR	1250	
Frederick, Md.	WFMD	980	C
Frederick, Okla.	KTAT	1570	
Fredericksburg, Tex.	KNAF	910	M
Fredericksburg, Va.	WFVA	1230	A
	WFLS	1350	
Fredericton, N.B.	CFNB	550	
Fredonia, N.Y.	WBUZ	1570	
Freeport, Ill.	WFRL	1570	
Freeport, N.Y.	WGBB	1240	
Freeport, Tex.	KBRZ	1460	
Fremont, Mich.	WBFC	1490	
Fremont, Nebr.	KHUB	1340	
Fremont, Ohio	WFRD	900	
Fresno, Calif.	KARM	1430	A
	KEAP	980	
	KFRE	940	C
	KGST	1600	
	KMAK	1340	
	KMJ	580	N
	KYNO	1300	
Front Royal, Va.	WFTR	1450	M
Frostburg, Md.	WFRB	740	
Fulton, Ky.	WFUL	1270	
Fulton, Mo.	KFAL	900	
Fulton, N.Y.	WOSC	1300	
Fuquay Sprgs., N.C.	WFVG	1460	
	WGAD	1350	A
Gadsden, Ala.	WETO	980	M
	WAAX	570	
Gaffney, S.C.	WFGN	1570	
Gainesville, Fla.	WDVH	980	
	WGGG	1250	A
	WRUF	850	M
Gainesville, Ga.	WGGA	550	M
	WDUN	1240	
	WLBA	1580	
Gainesville, Tex.	KGAF	1580	
Galax, Va.	WBOB	1360	M
Galesburg, Ill.	WGIL	1400	
	WAIK	1590	
Gallatin, Tenn.	WHIN	1010	
Gallipolis, Ohio	WJEH	990	
Gallup, N. Mex.	KGAK	1330	A
	KYVA	1230	
Galt, Ont.	CKGR	1110	
Galveston, Tex.	KILE	1400	
	KGBC	1540	
Gander, Nfld.	CBG	1450	
Garden City, Kans.	KNCO	1050	
	KIUL	1240	M
Gardner, Mass.	WGAW	1340	
Gary, Ind.	WWCA	1270	
	WGRY	1370	
Gastonia, N.C.	WGNC	1450	A
	WLTC	1370	
Gate City, Va.	WGAT	1050	
Gaylord, Mich.	WATC	900	
Geneva, Ala.	WGEA	1150	
Geneva, N.Y.	WGVA	1240	A
Georgetown, Del.	WJWL	900	
Georgetown, Ky.	WAXU	1580	
Georgetown, S.C.	WGTN	1400	M
Gettysburg, Pa.	WGET	1320	
Gillette, Wyo.	KIML	1490	
Gilroy, Calif.	KPER	1290	
Gladewater, Tex.	KSIJ	1430	
Glasgow, Ky.	WKAY	1490	
Glasgow, Mont.	KLTZ	1240	
Glendale, Ariz.	KRUX	1360	
Glendale, Calif.	KIEV	870	
Glendive, Mont.	KXGN	1400	
Glen Falls, N.Y.	WSET	1410	
	WWSC	1450	A
Glenwood Sprgs., Colo.	KGLN	980	M
Globe, Ariz.	KZOW	1240	A
Gloucester, Va.	WDDY	1420	
Gloversville-Johnston, N.Y.	WENT	1340	C
Golden, Colo.	KTWL	1250	
Golden Meadow, La.	KLFT	1600	
Golden Valley, Minn.	KEVE	1440	M
Goldsboro, N.C.	WFMC	730	A
	WGBR	1150	A
	WGOL	1300	
Gonzales, Tex.	KCTI	1450	
Goodland, Kans.	KLOE	730	M
Goose Bay, Nfld.	CFGB	1340	
Goshen, Ind.	WKAM	1460	
Grafton, N.D.	KGPC	1340	
Grafton, W.Va.	WVVW	1260	
Graham, Tex.	KSWA	1330	
Granby, Que.	CHEF	1450	
Grand Coulee, Wash.	KFDR	1360	
Grande Prairie, Alta.	CFGP	1050	
Grand Falls, Nfld.	CBT	990	
Grand Forks, N.D.	KFJM	1370	
	KILO	1440	C
	KNOX	1310	M
Grand Haven, Mich.	WGHN	1370	
Grand Island, Nebr.	KMMJ	750	A
	KRGI	1430	
Grand Junction, Colo.	KREX	920	M
	KEXO	1230	A
	KSTR	620	
Grand Prairie, Tex.	KRZY	730	
Grand Rapids, Mich.	WJEF	1230	C
	WFUR	1570	
	WGRD	1410	
	WLAV	1340	A
	WMAX	1480	M
	WOOD	1300	N
Grand Rapids, Minn.	KOZY	1490	M
Grangeville, Idaho	KORT	1230	
Grants, N.Mex.	KMIN	980	
Grants Pass, Oreg.	KAGI	930	M
	KAJO	1270	
Gravelbourg, Sask.	CFGR	1230	
	CFRG	710	
Grayson, Ky.	WGOH	1370	
Gt. Barrington, Mass.	WSBS	860	
Gt. Bend, Kans.	KVGB	1590	N
Gt. Falls, Mont.	KFBB	1310	C
	KUDI	1450	
	KMON	560	M
	KARR	1400	N
Greeley, Colo.	KFKA	1310	
	KYOU	1450	
Green Bay, Wis.	WBAY	1360	C
	WJPG	1440	M
	WDUZ	1400	A
Green Cove Springs, Fla.	WGRC	1580	
Greeneville, Tenn.	WGRV	1340	
Greenfield, Mass.	WHAI	1240	M
Greensboro, N.C.	WBIG	1470	C
	WCOG	1320	
	WGBG	1400	A
	WPET	950	
Greensburg, Pa.	WHJB	620	
Greenville, Ala.	WGYV	1380	
Greenville, Mich.	WPLB	1380	
Greenville, Miss.	WJPR	1330	
	WDDT	900	
	WGVM	1260	
Greenville, Pa.	WGRP	940	
Greenville, N.C.	WGTC	1590	M
	WOOW	1340	
Greenville, S.C.	WESC	660	
	WFBC	1330	N
	WMRB	1490	A-M
	WMUU	1260	
	WQOK	1440	C
Greenville, Tex.	KGVL	1400	
Greenwood, Miss.	WABG	960	A
	WGRM	1240	N
Greenwood, S.C.	WCRS	1450	N
	WGSW	1350	
Greer, S.C.	WEAB	800	
	WCKI	1300	A
Grenada, Miss.	WNAG	1400	M
Gresham, Oreg.	KGRO	1230	
Gretna, Va.	WMNA	730	
Griffin, Ga.	WKEU	1450	M
	WHIE	1320	
	WRIX	1410	
Grinnell, Iowa	KGRN	1410	
Groton, Conn.	WSUB	980	
Grove City, Pa.	WSAJ	1340	
Grundy, Va.	WNRG	1250	
Guayama, P.R.	WXRF	1590	
Guelph, Ont.	CJOY	1460	
Gulfport, Miss.	WROA	1390	
	WGCM	1240	A
Gunnison, Colo.	KGUC	1490	
Guntersville, Ala.	WGSV	1270	
Guthrie, Okla.	KWRW	1490	
Guymon, Okla.	KGYN	1220	
Hagerstown, Md.	WARK	1490	C
	WJEJ	1240	A-M
Haines City, Fla.	WHAN	930	
Haleyville, Ala.	WJBE	1230	M
Halifax, N.S.	CBH	1330	
	CHNS	960	
	CJCH	920	
Hamden, Conn.	WDEE	1220	
Hamilton, Ala.	WERH	970	
Hamilton, Ohio	WMOH	1450	
Hamilton, Ont.	CHIQ	1280	
	CHML	900	
	CKOC	1150	
Hamilton, Tex.	KCLW	900	
Hamlet, N.C.	WKDX	1400	
Hammond, Ind.	WJOB	1230	
Hammond, La.	WFPR	1400	
Hampton, S.C.	WBHC	1270	
Hampton, Va.	WVEC	1490	
Hancock, Mich.	WMPL	920	
Hanford, Calif.	KNGS	620	
Hannibal, Mo.	KHMO	1070	
Hanover, N.H.	WTSL	1400	
	WDCR	1340	
Hanover, Pa.	WHVR	1280	
Harlan, Ky.	WHLN	1410	
Harlingen, Tex.	KGBT	1530	
Harriman, Tenn.	WHBT	1600	
Harrisburg, Ill.	WEBQ	1240	
Harrisburg, Pa.	WHGB	1400	A
	WCMB	1460	M
	WHP	580	C
	WKBO	1230	N
Harrison, Ark.	KHOZ	900	
Harrisonburg, Va.	WHBG	1360	
	WSVA	550	N
Harrodsburg, Ky.	WHBN	1420	
Hartford, Conn.	WDRC	1360	C
	WCCC	1290	
	WPOP	1410	M-A
	WTIC	1080	N
Hartford, Wis.	WTKM	1340	
Hartselle, Ala.	WHRT	860	
Hartsville, S.C.	WHSC	1450	M
Hartwell, Ga.	WKLY	980	
Harvard, Ill.	WMCW	1600	
Harvey, Ill.	WBEE	1570	
Hastings, Mich.	WBCH	1220	
Hastings, Nebr.	KHAS	1280	
Hattiesburg, Miss.	WKKH	950	
	WFOR	1400	N
	WHSY	1250	A
	WXXX	1310	
Haverhill, Mass.	WHAV	1490	
Havre, Mont.	KOJM	610	M
Havre de Grace, Md.	WASA	1330	
Hawkinsville, Ga.	WCEH	610	
Haynesville, La.	KLUV	1580	
Hays, Kans.	KAYS	1400	
Hayward, Wis.	WHSM	910	
Hazard, Ky.	WKIC	1390	M
Hazlehurst, Miss.	WMDC	1220	
Hazleton, Pa.	WAZL	1490	N-M
Helena, Ark.	KFFA	1360	M
Helena, Mont.	KCAP	1340	M
	KBLL	1240	N
Hemet, Calif.	KHSJ	1320	
Hempstead, N.Y.	WHLI	1100	
Henderson, Ky.	WSON	860	
Henderson, Nev.	KBMI	1400	
	KTOO	1280	
Henderson, N.C.	WHNC	890	M
	WHVH	1450	
Henderson, Tex.	KGRI	1000	
	KWRD	1470	
Hendersonville, N.C.	WHKP	1450	A
Henryetta, Okla.	KHEN	1590	
Hereford, Tex.	KPAN	860	
Herkimer, N.Y.	WALY	1420	
Hermiston, Oreg.	KOHU	1570	
Herrin, Ill.	WJPF	1340	M
Hettinger, N.Dak.	KNDC	1490	
Hibbing, Minn.	WMFG	1240	N
Hickory, N.C.	WHKY	1290	A
	WIRC	630	
Highland Park, Tex.	KVIL	1150	
Highland Springs, Va.	WENZ	1450	
High Point, N.C.	WMFR	1230	A
	WNOS	1590	
	WHPE	1070	
Hillsboro, Ohio	WSRW	1590	
Hillsboro, Oreg.	KUIK	1360	
Hillsboro, Tex.	KHBR	1560	
Hillsdale, Mich.	WCSR	1340	
Hilo, Hawaii	KHBC	970	C
	KIPA	1110	
	KIMO	850	M
Hinesville, Ga.	KGML	990	
Hobart, Okla.	KTJS	1420	
Hobbs, N.Mex.	KWEW	1480	M
	KHOB	1390	
Holbrook, Ariz.	KDJI	1270	
Holdredge, Nebr.	KUVR	1380	
Holland, Mich.	WHTC	1450	
	WJBL	1260	
Hollywood, Fla.	WGMA	1320	
Holyoke, Mass.	WREB	930	
Homer, La.	KVHL	1320	
Homestead, Fla.	WSDB	1430	
Homewood, Ala.	WILD	1400	
Honolulu, Hawaii	KGMB	590	C
	KPOI	1380	
	KIKI	830	
	KGU	760	N
	KHVH	1040	
	KORL	650	M
	KNDI	1270	
	KOHO	1170	
	KOOD	990	
	KULA	690	A
Hood River, Oreg.	KIHR	1340	
Hope, Ark.	KXAR	1490	
Hopewell, Va.	WHAP	1340	
Hopkinsville, Ky.	WHOP	1250	C
	WKOA	1480	
Hoquiam, Wash.	KHOQ	1560	
Hornell, N.Y.	WWHG	1320	
	WLEA	1480	M
Hot Springs, Ark.	KAAB	1350	A
	KBHS	590	
	KBLO	1470	M
Hot Springs, S. Dak.	KOBH	580	
Houghton, Mich.	WHDF	1400	
Houghton Lake, Mich.	WHGR	1290	
Houlton, Maine	WHOU	1340	
Houma, La.	KCIL	1490	N
Houston, Miss.	WCPC	1320	
Houston, Tex.	KCOH	1430	
	KILT	610	
	KNUZ	1230	
	KPRC	950	N
	KTHT	790	
	KTRH	740	C
	KXYZ	1320	A
	KYOK	1590	
Howell, Mich.	WHMI	1350	
Hudson, N.Y.	WHUC	1230	
Hugo, Okla.	KIHN	1340	
Hull, Que.	CKCH	970	
Humacao, P.R.	WALO	1240	
Humboldt, Tenn.	WIRJ	740	
Huntingdon, Pa.	WHUN	1150	
Huntington, Ind.	WHLT	1300	
Huntington, N.Y.	WGSM	740	
Huntington, W.Va.	WPLH	1470	M
	WKEE	800	M-A
	WSAZ	930	N
Huntsville, Ala.	WBHP	1230	M
	WEUP	1600	
	WFIX	1450	
	WAAY	1550	A
Huntsville, Ont.	CKAR	590	
Huntsville, Tex.	KSAM	1490	
Huron, S.Dak.	KIJV	1340	
Hutchinson, Kans.	KWBW	1450	N
	KWHK	1260	
Hutchinson, Minn.	KDUZ	1260	
Idabel, Okla.	KBEL	1240	
Idaho Falls, Idaho	KID	590	C
	KCYN	1400	
	KIFI	1260	A-M
	KTEE	900	
Independence, Ia.	KUPI	980	
	KOUR	1220	

Location	C.L.	Kc.	N.A.
Independence, Kans.	KIND	1010	M
Independence, Mo.	KANS	1510	
Indiana, Pa.	WDAD	1450	C
Indianapolis, Ind.	WFBM	1260	A
	WGEE	1590	
	WIBC	1070	
	WIRE	1430	N
	WISH	1310	C
	WXLW	950	M
Indianola, Miss.	WDLT	1380	
Indio, Calif.	KREO	1400	A
Inglewood, Calif.	KTYM	1460	
Inkster, Mich.	WCHB	1440	
International Falls, Minn.	KGHS	1230	
Invrik, N.W.T.		860	
Ionia, Mich.	WION	1430	
Iowa City, Iowa	KXIC	800	
	WSUI	910	
Iron Mtn., Mich.	WMIQ	1450	A
Iron River, Mich.	WIKB	1230	M
Irondale, Ala.	WIXI	1480	
Ironton, Ohio	WIRO	1230	M
Ironwood, Mich.	WJMS	630	M
Irvine, Ky.	WIRV	1550	
Ishpeming, Mich.	WJPD	1240	
	WJAN	970	
Islip, N.Y.	WBIC	540	
Ithaca, N.Y.	WHCU	870	C
	WTKO	1470	A
Iuka, Miss.	WYOM	1270	
Jackson, Ala.	WTHG	1290	M
Jackson, Mich.	WIBM	1450	A
	WKHM	970	M
Jackson, Miss.	WJDX	620	N
	WJQS	1400	C
	WJXN	1450	
	WOKJ	1590	
	WRBC	1300	M
	WSLI	930	
Jackson, Ohio	WLMJ	1280	
Jackson, Tenn.	WDXI	1310	
	WJAK	1400	
	WTJS	1390	A
Jacksonville, Fla.	WJAX	930	
	WAPE	690	
	WZOK	1320	A
	WIVY	1050	
	WMBR	1460	C
	WOBS	1360	
	WPDQ	600	
	WQIK	1280	
	WRHC	1400	
Jacksonville, Ill.	WJIL	1550	
	WLDS	1180	
Jacksonville, N.C.	WJNC	1240	M
	WLAS	910	
Jacksonville, Tex.	KEBE	1400	
Jacksonville Bch., Fla.	WZRO	1010	
Jamestown, N.Dak.	KEYJ	1400	M
	KSJB	600	C
Jamestown, N.Y.	WJTN	1240	A
	WJOC	1340	M
Jamestown, Tenn.	WCLC	1260	
Janesville, Wis.	WCLO	1230	M
Jasper, Ala.	WWWB	1360	
	WARF	1240	
Jasper, Ind.	WITZ	990	
Jasper, Tex.	KTXJ	1350	
Jefferson City, Mo.	KLIK	950	
	KWOS	1240	M
Jennings, La.	KJEF	1290	
Jerome, Idaho	KART	1400	
Jerseyville, Ill.	WJBM	1480	
Jesup, Ga.	WBGR	1370	
Johnson City, Tenn.	WJCW	910	C
	WETB	790	M
Johnstown, Pa.	WJAC	1400	N
	WARD	1490	C
	WCRO	1230	M
Joliet, Ill.	WJOL	1340	
Joliette, Que.	CJLM	1350	
Jonesboro, Ark.	KBTM	1230	M
	KNEA	970	
Jonesboro, La.	KTOC	920	
Jonesboro, Tenn.	WJSO	1590	
Jonesville, La.	KANV	1480	
Jonquiere, Que.	CKRS	590	
Joplin, Mo.	WMBH	1450	M
	KFSB	1310	
	KODE	1230	C
Junction, Tex.	KMBL	1450	
June. City, Kans.	KJCK	1420	
Juneau, Alaska	KINY	800	C-A
	KJNO	630	A-M-N
Kailua, Hawaii	KLEI	1240	
Kaimuki, Hawaii	KAIM	870	
Kalamazoo, Mich.	WKPR	1420	
	WKZO	590	C
	WKLZ	1470	M
	WKMI	1360	
Kalispell, Mont.	KGEZ	600	M
	KOFI	930	
Kamloops, B.C.	CFJC	910	
Kane, Pa.	WADP	960	
Kannapolis, N.C.	WGTL	870	
Kans. City, Kans.	KCKN	1340	
Kansas City, Mo.	KCMO	810	C
	KMBC	980	A
	KPRS	1590	
	KUDL	1380	
Kearney, Nebr.	WDAF	610	N
	WHB	710	
	KGFW	1340	M
	KRNY	1460	
Keene, N.H.	WKNE	1290	N
	WKBK	1220	
Kelowna, B.C.	CKOV	630	
Kelso, Wash.	KLOG	1490	
Kendallville, Ind.	WAWK	1570	
Kenedy, Tex.	KAML	990	
Kenmore, N.Y.	WYSL	1080	
Kennett, Mo.	KBOA	830	
Kennewick-Pasco-Richland, Wash.	KEPR	610	C
Kenora, Ont.	CJRL	1220	
Kenosha, Wis.	WLIP	1050	
Kentville, N.S.	CKEN	1350	
Keokuk, Iowa	KOKX	1310	
Kermit, Tex.	KERB	600	
Kerrville, Tex.	KERV	1230	
Ketchikan, Alaska	KTKN	930	C-A
Kewanee, Ill.	WKEI	1450	
Keyser, W.Va.	WKYR	1270	
Key West, Fla.	WKWF	1600	M
	WKIZ	1500	
Kilgore, Tex.	KOCA	1240	
Killeen, Tex.	KLEN	1050	M
Kimball, Nebr.	KIMB	1260	
King City, Calif.	KRKC	1570	
Kingman, Ariz.	KAAA	1230	A
Kings Mountain, N.C.	WKMT	1220	
Kingsport, Tenn.	WKIN	1320	
	WKPT	1550	N
Kingston, N.Y.	WBAZ	1550	
	WKNY	1490	M
Kingston, Ont.	CFRC	1490	
	CKLC	1380	
	CKWS	960	
Kingstree, S.C.	WDKD	1310	
Kingsville, Tex.	KINE	1330	
Kinston, N.C.	WELS	1010	
	WFTC	960	A
	WISP	1280	M
Kirkland, Wash.	KNBX	1050	
Kirkland Lake, Ont.	CJKL	560	
Kirksville, Mo.	KIRX	1450	A
Kissimmee, Fla.	WKBX	1220	
Kitchener, Ont.	CKCR	1490	
	CKKW	1320	
Kittanning, Pa.	WACB	1380	
Klamath Falls, Oreg.	KAGO	1150	M
	KFLW	1450	A-C
	KLAD	960	
Knoxville, Iowa	KNIA	1320	
Knoxville, Tenn.	WBIR	1240	A
	WIVK	860	
	WATE	620	N
	WKGN	1340	M
	WKXV	900	
	WNOX	990	C
Kokomo, Ind.	WIOU	1350	C
Kosciusko, Miss.	WKOZ	1350	A
Laconia, N.H.	WLNH	1350	
	WEMJ	1490	
LaCrosse, Wis.	WKBH	1410	N
	WLCX	1490	
	WKTY	580	A
Ladysmith, Wis.	WLDY	1340	
Lafayette, Ga.	WLFA	1590	
Lafayette, Ind.	WASK	1450	M
	WAZY	1410	
	WBAA	920	
Lafayette, La.	KPEL	1420	A
	KVOL	1330	N
	KXKW	1520	
Lafayette, Tenn.	WEEN	1460	
LaFollette, Tenn.	WLAF	1450	
LaGrande, Oreg.	KLBM	1450	
LaGrange, Ga.	WLAG	1240	M
	WTRP	620	
LaGrange, Ill.	WTAQ	1300	
LaGrange, Tex.	KVLG	1370	
LaJunta, Colo.	KBZZ	1400	M
Lake Charles, La.	KLOU	1580	
	KPLC	1470	N
	KAOK	1400	M
Lake City, Fla.	WDSR	1340	
	WGRO	960	
Lake City, S.C.	WJOT	1260	
Lakeland, Fla.	WLAK	1450	N
	WONN	1230	M
	WYSE	1380	
Lake Providence, La.	KLPL	1050	
Lake Tahoe, Calif.	KOWL	1490	
Lakeview, Oreg.	KQIK	1230	
Lake Wales, Fla.	WIPC	1280	
Lakewood, Colo.	KLAK	1600	
Lakewood, Wash.	KFHA	1480	
Lake Worth, Fla.	WLIZ	1380	
Lamar, Colo.	KLMR	920	M
Lamesa, Tex.	KPET	1490	
Lampasas, Tex.	KCYL	1450	
Lancaster, Calif.	KAVL	610	
	KBVM	1380	
Lancaster, Ohio	WHOK	1320	
Lancaster, Pa.	WGAL	1490	N
	WLAN	1390	A-M
Lancaster, S.C.	WLCM	1360	
Lander, Wyo.	KOVE	1330	M
Lanett, Ala.	WRLD	1490	A
Lansdale, Pa.	WNPV	1440	
Lansford, Pa.	WLSH	1410	
Lansing, Mich.	WILS	1320	
	WJIM	1240	A-N
Lapeer, Mich.	WMPC	1230	
LaPorte, Ind.	WLOI	1540	
Laramie, Wyo.	KOWB	1280	M
Laredo, Tex.	KVOZ	1490	M
LaSalle, Ill.	WLPO	1220	
LaSarre, Que.	CKLS	1240	
LasCruces, N.Mex.	KOBE	1450	
	KGRT	570	
Las Vegas, Nev.	KENO	1460	A
	KLAS	1230	C
	KORK	1340	M
	KRAM	920	
	KRDO	1050	
Las Vegas, N.Mex.	KFUN	1230	A
Latrobe, Pa.	WSHH	1570	M
	WTRA	1480	
LaTuque, Que.	CFLM	1240	
Laurel, Miss.	WAML	1340	N
	WLAU	1600	A
	WNSL	1260	
Laurens, S.C.	WLBG	860	
Laurinburg, N.C.	WEWO	1080	
Lawrence, Kans.	KFKU	1250	
	KLWN	1320	
Lawrence, Mass.	WCCM	800	M
Lawrenceburg, Tenn.	WDXE	1370	
Lawrenceville, Ga.	WLAW	1360	
Lawrenceville, Ill.	WAKO	910	
Lawrenceville, Va.	WLES	580	
Lawton, Okla.	KSWO	1380	A
	KCCO	1050	
Leadville, Colo.	KBRR	1230	
Leaksville, N.C.	WLOE	1490	M
Leamington, Ont.	CJSP	710	
Leavenworth, Kans.	KCLO	1410	
Lebanon, Ky.	WLBN	1590	
Lebanon, Mo.	KLWT	1230	
Lebanon, Oreg.	KGAL	920	
Lebanon, Pa.	WLBR	1270	
Lebanon, Tenn.	WCOR	900	
Leesburg, Fla.	WLBE	790	M
	WBIL	1410	
Leesburg, Va.	WAGE	1290	
Leesville, La.	KLLA	1570	
Lehighton, Pa.	WYNS	1150	
Leitchfield, Ky.	WMTL	1580	
Leland, Miss.	WESY	1580	
LeMars, Iowa	KLEM	1410	
Lemoore, Calif.	KLAN	1320	
Lenoir, N.C.	WJRI	1340	M
Lenoir, Tenn.	WLIL	730	
Leonardtown, Md.	WKIK	1370	
Lethbridge, Alta.	CJOC	1220	
	CHEC	1090	
Levelland, Tex.	KLVT	1230	
Levittown, Pa.	WBCB	1490	
Lewisburg, Pa.	WITT	1010	
Lewisburg, Tenn.	WJJM	1490	M
Lewiston, Idaho	KRLC	1350	M
	KOZE	1300	
Lewiston, Maine	WCOU	1240	M
	WLAM	1470	A
Lewistown, Mont.	KXLO	1230	M
Lewistown, Pa.	WKVA	920	A
	WMRF	1490	N
Lexington, Ky.	WLAP	630	
	WBLG	1300	A
	WVLK	590	M
Lexington, Miss.	WXTN	1150	
Lexington, Mo.	KLEX	1570	
Lexington, Nebr.	KRVN	1010	
Lexington, N.C.	WBUY	1440	
Lexington, Tenn.	WDXL	1490	
Lexington, Va.	WREL	1450	N
Lexington Pk., Md.	WPTX	920	
Libby, Mont.	KLCB	1230	M
	KLIB	1470	
Liberal, Kans.	KSCB	1270	
Liberty, N.Y.	WVOS	1240	
Liberty, Tex.	KWLD	1050	
Lihue, Hawaii	KTOH	1490	
Lima, Ohio	WIMA	1150	A
Lincoln, Ill.	WPRC	1370	
Lincoln, Nebr.	KFOR	1240	A
	KLIN	1400	
	KLMS	1480	
Lincolnton, N.C.	WLON	1050	
Lindsay, Ont.	CKLY	910	
Linton, Ind.	WBTO	1600	
Litchfield, Ill.	WSMI	1540	
Litchfield, Minn.	KLFD	1410	
Little Falls, Minn.	KLTF	960	
Little Falls, N.Y.	WLFH	1230	
Littlefield, Tex.	KZZN	1490	
Little Rock, Ark.	KARK	920	N
	KAJI	1250	M
	KLRA	1010	A
	KOKY	1440	
	KTHS	1090	C
	KVLC	1050	
Littleton, Colo.	KMOR	1510	
Live Oak, Fla.	WNER	1250	
Livingston, Mont.	KPRK	1340	M
Livingston, Tenn.	WLIV	920	
Livingston, Tex.	KETX	1440	
	KVLL	1220	
Lloydminster, Alta.	CKSA	1150	
Lock Haven, Pa.	WBPZ	1230	M
Lockport, N.Y.	WUSJ	1340	
Lodi, Calif.	KCVR	1570	
Logan, Utah	KVNU	810	M
	KLGN	1390	
Logan, W.Va.	WLOG	1230	M
	WVOW	1290	
Logansport, Ind.	WSAL	1230	M
Lompoc, Calif.	KNEZ	960	
London, Ky.	WFTG	1400	
London, Ont.	CFPL	980	
	CKSL	1290	
Long Beach, Calif.	KFOX	1280	
	KGER	1390	
Longmont, Colo.	KLMO	1050	
Long Prairie, Minn.	KEYL	1400	
Longview, Tex.	KFRO	1370	A
	KLUE	1280	
Longview, Wash.	KEDO	1400	A
	KBAM	1270	
Lookout Mtn., Tenn.	WFLI	1070	
Lorain, Ohio	WWIZ	1380	A
Loris, S.C.	WLSC	1570	
Los Alamos, N.Mex.	KRSN	1490	A
Los Angeles, Calif.	KABC	790	A
	KFI	640	N
	KHJ	930	M
	KFWB	980	
	KGFJ	1230	
	KFAC	1330	
	KLAC	570	
	KMPC	710	
	KNX	1070	C
	KPOL	1540	
	KGBS	1020	
	KRKD	1150	
Louisburg, N.C.	WYRN	1480	
Louisville, Ga.	WPEH	1420	
Louisville, Ky.	WAVE	970	N
	WAKY	790	M
	WHAS	840	C
	WKLO	1080	A
	WINN	1240	
	WKYW	900	
	WLOU	1350	
	WTMT	620	
Louisville, Miss.	WLSM	1270	
Loveland, Colo.	KLOV	1570	
Lovington, N.Mex.	KLEA	630	
Lowell, Mass.	WCAP	980	
	WLLH	1400	
Lubbock, Tex.	KCBD	1590	M-N
	KDAV	580	
	KDUB	1340	
	KFYO	790	C
	KLLL	1460	M
	KSEL	950	A
Lucedale, Miss.	WHHT	1440	
Ludington, Mich.	WKLA	1450	A
Lufkin, Tex.	KRBA	1340	A
	KTRE	1420	M
Lumberton, N.C.	WAGR	580	
	WTSB	1340	M
Lynchburg, Va.	WLVA	590	A
	WWOD	1390	M-N
	WBRG	1050	
Lynn, Mass.	WLYN	1360	
Lyons, Ga.	WBBT	1340	
Macomb, Ill.	WKAI	1510	
Macon, Ga.	WBML	1240	
	WCRY	900	
	WIBB	1280	
	WMAZ	940	C
	WNEX	1400	A-M
Macon, Miss.	WMBC	1400	
Madera, Calif.	KHOT	1250	
Madison, Fla.	WMAF	1230	
Madison, Ga.	WYTH	1250	
Madison, Ind.	WORX	1270	
Madison, S.D.	KJAM	1390	
Madison, Tenn.	WENO	1430	
Madison, Wis.	WHA	970	
	WIBA	1310	N
	WISM	1480	A-M
	WKOW	1070	C
Madisonville, Ky.	WFMW	730	
	WTTL	1310	
Magee, Miss.	WSJC	790	
Magnolia, Ark.	KVMA	630	M
Malden, Mo.	KTCB	1470	
Malone, N.Y.	WICY	1490	M
Malvern, Ark.	KBOK	1310	
Manassas, Va.	WPRW	1460	
Manati, P.R.	WMNT	1500	
Manchester, Conn.	WINF	1230	C
Manchester, Ga.	WFDR	1370	
Manchester, Ky.	WWXL	1450	
Manchester, N.H.	WFEA	1370	
	WGIR	610	C
	WKBR	1250	
Manchester, Tenn.	WMSR	1320	
Manhattan, Kans.	KSAC	580	
	KMAN	1350	
Manistee, Mich.	WMTE	1340	
Manitou Springs, Colo.	KCMS	1490	
Manitowoc, Wis.	WCUB	980	
	WOMT	1240	M
Mankato, Minn.	KYSM	1230	N
	KTOE	1420	A
Manning, S.C.	WYMB	1410	
Mansfield, La.	KDBC	1360	
Mansfield, Ohio	WMAN	1400	A
	WCLW	1570	
Maquoketa, Iowa	KMAQ	1320	
Marathon, Fla.	WEFG	1300	
Marianna, Fla.	WTYS	1340	M
	WTOT	980	
Marietta, Ga.	WFOM	1230	
	WBIE	1050	
Marietta, Ohio	WMOA	1490	M
Marine City, Mich.	WDOG	1590	
Marinette, Wis.	WMAM	570	N
Marion, Ala.	WJAM	1310	
Marion, Ill.	WGGH	1150	
Marion, Ind.	WBAT	1400	A
	WMRI	860	
Marion, N.C.	WBRM	1250	
Marion, Ohio	WMRN	1490	A

Location	C.L.	Kc.	N.A.
Marion, S.C.	WATP	1430	
Marion, Va.	WMEV	1010	A
Marked Tree, Ark.	KPCA	1580	
Marksville, La.	KAPB	1370	
Marlborough, Mass.	WSRO	1470	
Marlin, Tex.	KMLW	1010	
Marquette, Mich.	WDMJ	1320	M
Marshall, Minn.	KMHL	1400	A
Marshall, Mo.	KMMO	1300	
Marshall, N.C.	WMMH	1460	
Marshall, Tex.	KMHT	1450	
	KADD	1410	
Marshalltown, Iowa	KFJB	1230	
Marshfield, Wis.	WDLB	1450	
Martin, Tenn.	WCMT	1410	
Martinsburg, W.Va.	WEPM	1340	
Martinsville, Va.	WHEE	1370	
	WMVA	1450	N
Marysville, Calif.	KMYC	1410	M
Marysville, Kans.	KNDY	1570	
Maryville, Mo.	KNIM	1580	
Maryville, Tenn.	WGAP	1400	
Mason City, Iowa	KGLO	1300	C
	KRIB	1490	
	KSMN	1010	
Massena, N.Y.	WMSA	1340	A
	WSTS	1050	
Massillon, Ohio	WTIG	990	
Matane, Que.	CKBL	1250	
Matawan, W.Va.	WHJC	1360	
Mattoon, Ill.	WLBH	1170	
Mayaguez, P.R.	WAEL	600	
	WKJB	710	
	WORA	1150	
	WPRA	990	
	WTIL	1300	
Mayfield, Ky.	WNGO	1320	
Mayodan, N.C.	WMYN	1420	
Maysville, Ky.	WFTM	1240	M
McAlester, Okla.	KTMC	1400	
	KNED	1150	
McAllen, Tex.	KRIO	910	M
McCamey, Tex.	KAMY	1450	
McComb, Miss.	WHNY	1250	A
	WAPF	980	
McCook, Nebr.	KBRL	1300	M
McGehee, Ark.	KVSA	1220	
McKeesport, Pa.	WEDO	810	C
	WMCK	1360	
McKenzie, Tenn.	WHDM	1440	
McKinney, Tex.	KMAE	1600	
McMinnville, Oreg.	KMCM	1260	
McMinnville, Tenn.	WBMC	960	
	WMMT	1230	M
McPherson, Kans.	KNEX	1540	
McRae, Ga.	WDAX	1410	
Meadville, Pa.	WMGW	1490	
Medford, Mass.	WHIL	1430	
Medford, Oreg.	KMED	1440	A
	KDOV	1300	
	KBOY	730	
	KYJC	1230	A-C
Medford, Wis.	WIGM	1490	M
Medicine Hat, Alta.	CHAT	1270	
Melbourne, Fla.	WMMB	1240	M
Memphis, Tenn.	WHBQ	560	M
	WHER	1480	
	WMC	790	N
	WDIA	1070	
	WMPS	680	
	WHHM	1340	A
	WLOK	1480	
	WREC	600	C
	KWAM	990	
Mena, Ark.	KENA	1450	
Menominee, Mich.	WAGN	1340	A
Menomonie, Wis.	WMNE	1360	
Merced, Calif.	KYOS	1480	M
	KWIP	1580	
Meriden, Conn.	WMMW	1470	
Meridian, Miss.	WCOC	910	C
	WDAL	1330	
	WMOX	1010	
	WOKK	1450	A
	WQIC	1390	
Merrill, Wis.	WXMT	730	
Mesa, Ariz.	KBUZ	1310	
Metropolis, Ill.	WMOK	920	
Mexia, Tex.	KBUS	1590	
Mexico, Mo.	KXEO	1340	M
Mexico, Pa.	WJUN	1220	
Miami, Ariz.	KIKO	1340	
Miami, Fla.	WGBS	710	C
	WCKR	610	N
	WFAB	990	
	WMBM	1220	
	WAME	1260	A
	WMIE	1140	
	WQAM	560	
	WSKP	1450	
	WINZ	940	
Miami, Okla.	KGLC	910	
Miami Beach, Fla.	WMET	1490	
	WKAT	1360	M-A-C
	WFUN	790	
Michigan City, Ind.	WIMS	1420	
Middleport-Pomroy, Ohio	WMPO	1390	
Middlesboro, Ky.	WMIK	560	
Middletown, Conn.	WCNX	1150	
Middletown, N.Y.	WALL	1340	
Middletown, Ohio	WPFB	910	
Midland, Mich.	WMDN	1490	
Midland, Ont.	CKMP	1230	
Midland, Tex.	KCRS	550	A
	KJBC	1150	
	KWEL	1600	
Milan, Tenn.	WKBJ	1600	

Location	C.L.	Kc.	N.A.
Miles City, Mont.	KATL	1340	M
Milford, Del.	WKSB	930	
Milford, Mass.	WMRC	1490	
Milledgeville, Ga.	WMVG	1450	M
Millen, Ga.	WGSR	1570	
Millington, Tenn.	WHEY	1220	
Millville, N.J.	WMVB	1440	
Milton, Fla.	WEBY	1330	M
	WSRA	1490	
Milton, Pa.	WMLP	1570	
	WARC	1380	
Milwaukee, Wis.	WEMP	1250	
	WFOX	860	M
	WRIT	1340	
	WISN	1150	A
	WMIL	1290	
	WOKY	920	
	WTMJ	620	N
Minden, La.	KASO	1240	
Mineral Wells, Tex.	KORC	1140	
Mineola, N.Y.	WFYI	1520	
Minneapolis, Minn.	WCCO	830	C
	WLOL	1330	
	WMIN	1400	
	WDGY	1130	
	WPBC	980	
	WTCN	1280	A
	KTIS	900	
	KUOM	770	
Minot, N.Dak.	KLPM	1390	M
	KQDY	1320	
	KCJB	910	C
Mission, Kans.	KBEA	1480	
Mission, Tex.	KIRT	1580	
Missoula, Mont.	KGVO	1290	C
	KXLL	1450	N
	KQTE	1340	M
	KYSS	910	
Mitchell, S.Dak.	KORN	1490	M
Moab, Utah	KURA	1450	
Moberly, Mo.	KNCM	1230	
Mobile, Ala.	WALA	1410	N
	WABB	1480	A
	WGOK	900	
	WKAB	840	
	WKRG	710	C
	WLIQ	1360	
	WMOZ	960	
Mobridge, S.Dak.	KDLY	1300	
Modesto, Calif.	KTRB	860	
	KBEE	970	
	KFIV	1360	A
Mojave, Calif.	KDOL	1340	
Moline, Ill.	WQUA	1230	A
Monahans, Tex.	KVKM	1330	M
Moneton, N. B.	CBAF	1330	
	CKCW	1220	
Monett, Mo.	KRMO	990	
Monmouth, Ill.	WRAM	1330	
Monroe, Ga.	WMRE	1490	
Monroe, La.	KMLB	1440	A-N
	KLIC	1230	M
	KNOE	1390	
Monroe, Mich.	WQTE	560	
Monroe, N.C.	WMAP	1060	
Monroe, Wis.	WEKZ	1260	
Monroeville, Ala.	WMFC	1360	
Monterey, Calif.	KIDD	630	
	KMBY	1240	C
Montevideo, Minn.	KDMA	1460	A
Monte Vista, Colo.	KSLV	1240	
Montgomery, Ala.	WBAM	740	
	WCOV	1170	C
	WAPX	1600	A
	WHHY	1440	N
	WMGY	800	
	WRMA	950	
Montgomery, W.Va.	WMON	1340	M
Monticello, Ark.	KHBM	1430	
Monticello, Ky.	WFLW	1360	
Montmagny, Que.	CKBM	1490	
Montpelier-Barre, Vt.	WSKI	1240	A
Montreal, Que.	CBF	690	
	CBM	940	N
	CFCF	600	A
	CHLP	1410	
	CJAD	800	
	CJMS	1280	
	CKAC	730	C
	CKGM	980	
Montrose, Colo.	KUBC	580	
Montrose, Pa.	WPEL	1250	
Mooresville, N.C.	WHIP	1350	
Moorhead, Minn.	KVOX	1280	M
Moosejaw, Sask.	CHAB	800	
Morehead, Ky.	WMOR	1330	
Morehead City, N.C.	WMBL	740	
Morgan City, La.	KMRC	1430	M
Morganfield, Ky.	WMSK	1550	
Morganton, N.C.	WMNC	1430	
Morgantown, W.Va.	WAJR	1440	N
	WCLG	1300	
Morrilton, Ark.	KVOM	800	
Morris, Minn.	KMRS	1570	
Morristown, N.J.	WMTR	1250	
Morristown, Tenn.	WCRK	1150	M
	WMTN	1500	
Moscow, Idaho	KRPL	1400	
Moses Lake, Wash.	KSEM	1470	
	KWIQ	1260	
Moultrie, Ga.	WMGA	1400	A
	WMTM	1300	
Moundsville, W.Va.	WMOD	1370	
Mountain Grove, Mo.	KLRS	1360	
Mountain Home, Ark.	KTLO	1490	
Mt. Airy, N.C.	WPAQ	740	
	WSYD	1300	M

Location	C.L.	Kc.	N.A.
Mt. Carmel, Ill.	WVMC	1360	
Mt. Clemens, Mich.	WBRB	1430	
Mt. Dora, Fla.	WMDF	1580	
Mt. Jackson, Va.	WSIG	790	
Mt. Kisco, N.Y.	WVIP	1310	
Mt. Pleasant, Mich.	WCEN	1150	
Mt. Pleasant, Tex.	KIMP	960	
Mt. Shasta, Calif.	KWSD	620	
Mt. Sterling, Ky.	WMST	1150	
Mt. Vernon, Ill.	WMIX	940	
Mt. Vernon, Ind.	WPCO	1590	
Mt. Vernon, Ky.	WRVK	1460	
Mt. Vernon, Ohio	WMVO	1300	
Mt. Vernon, Wash.	KBRC	1430	
Muleshoe, Tex.	KMUL	1380	
Mullins, S.C.	WJAY	1280	
Muncie, Ind.	WLBC	1340	C
Munfordville, Ky.	WLOC	1150	
Munising, Mich.	WMAB	1400	
Murfreesboro, Tenn.	WGNS	1450	
	WMTS	860	
Murphy, N.C.	WCVP	600	
	WKRK	1390	
Murphysboro, Ill.	WINI	1420	
Murray, Ky.	WNBS	1340	
Murray, Utah	KMUR	1230	
Muscatine, Iowa	KWPC	860	
Muscle Shoals City, Alabama	WLAY	1450	
Muskegon, Mich.	WKBZ	850	A
	WTRU	1600	
	WMUS	1090	
Muskogee, Okla.	KBIX	1490	A
	KMUS	1380	
Myrtle Beach, S.C.	WMYB	1450	
Nacogdoches, Tex.	KEEE	1230	A
	KSFA	860	
Nampa, Idaho	KFXD	580	
Nanaimo, B.C.	CHUB	1570	
Nanticoke, Pa.	WNAK	730	
Napa, Calif.	KVON	1440	
Naples, Fla.	WNOG	1270	
Narrows, Va.	WNRV	990	
Nashua, N.H.	WOTW	900	
	WSMN	1590	
Nashville, Ark.	KBHC	1260	
Nashville, Ga.	WNGA	1600	
Nashville, Tenn.	WKDA	1240	
	WLAC	1510	C
	WMAK	1300	
	WNAH	1360	M
	WSIX	980	A
	WSM	650	N
Natchez, Miss.	WMIS	1240	N
	WNAT	1450	M
Natchitoches, La.	KNOC	1450	M
Naugatuck, Conn.	WOWW	860	
Navasota, Tex.	KWBC	1550	
Nebraska City, Nebr.	KNCY	1600	
Needles, Calif.	KSFE	1340	
Neenah, Wis.	WNAM	1280	
Neillsville, Wis.	WCCN	1370	
Nelson, B.C.	CKLN	1390	
Neon, Ky.	WNKY	1480	
Neosho, Mo.	KBTN	1420	
Nevada, Mo.	KNEM	1240	
New Albany, Ind.	WOWI	1570	
New Albany, Miss.	WNAU	1470	
Newark, N.J.	WNTA	970	
	WHBI	1280	
	WNJR	1430	
	WVNJ	620	
Newark, N.Y.	WACK	1420	
Newark, Ohio	WCLT	1430	
New Bedford, Mass.	WBSM	1420	
	WNBH	1340	M
New Bern, N.C.	WHIT	1450	M
	WRNB	1490	
Newberry, S.C.	WKDK	1240	
New Boston, Ohio	WIOI	1010	
New Braunfels, Tex.	KGNB	1420	
New Britain, Conn.	WHAY	910	A
	WKNB	840	
New Brunswick, N.J.	WCTC	1450	
Newburgh, N.Y.	WGNY	1220	
Newburyport, Mass.	WNBP	1470	
New Carlisle, Que.	CHNC	810	
New Castle, Ind.	WCTW	1550	
Newcastle, N.B.	CKMR	790	
New Castle, Pa.	WKST	1280	M
Newcastle, Wyo.	KASL	1240	
New Glasgow, N.S.	CKEC	1320	
New Haven, Conn.	WAVZ	1300	
	WELI	960	
	WNHC	1340	A
New Iberia, La.	KANE	1240	
	KVIM	1360	
New Kensington, Pa.	WKPA	1150	
New London, Conn.	WNLC	1490	M
New Martinsville, W.Va.	WETZ	1330	M
Newnan, Ga.	WCOH	1400	M
New Orleans, La.	WDSU	1280	N
	WJBW	1230	
	WJMR	990	
	WBOK	800	
	WNOE	1060	
	WSMB	1350	A
	WNPS	1450	
	WTIX	690	
	WWL	870	C
	WWOM	600	
	WYLD	940	M
Newport, Ark.	KNBY	1280	
Newport, Ky.	WNOP	740	
Newport, N.H.	WCNL	1010	

Location	C.L.	Kc.	N.A.
Newport, Oreg.	KNPT	1310	
Newport, R.I.	WADK	1540	
Newport, Tenn.	WLIK	1270	
Newport, Vt.	WIKE	1490	
Newport News, Va.	WGH	1310	A
	WTID	1270	
New Richmond, Wis.	WIXK	1590	
New Rochelle, N.Y.	WVOX	1460	
New Smyrna Beach, Fla.	WSBB	1230	M
	WORT	1550	
Newton, Iowa	KCOB	1280	
Newton, Kans.	KJRG	950	
Newton, Miss.	WBKN	1410	
Newton, N.J.	WNNJ	1360	
Newton, N.C.	WNNC	1230	
New Ulm, Minn.	KNUJ	860	
New Westminster, B.C.	CKNW	980	
New York, N.Y.	WABC	770	A
	WBNX	1380	
	WCBS	880	C
	WEVD	1330	
	WHOM	1480	
	WINS	1010	
	WLIB	1190	
	WMCA	570	
	WMGM	1050	
	WNEW	1130	
	WNYC	830	
	WOR	710	M
	WADO	1280	
	WPOW	1330	
	WQXR	1560	
	WNBC	660	N
Niagara Falls, N.Y.	WHLD	1270	
	WJJL	1440	
Niagara Falls, Ont.	CHVC	1600	
Niles, Mich.	WNIL	1290	
Nogales, Ariz.	KNOG	1340	A
Nome, Alaska	KICY	850	
Norfolk, Nebr.	WJAG	780	
Norfolk, Va.	WTAR	790	C
	WCMS	1050	
	WNOR	1230	
	WRAP	850	
Norman, Okla.	WNAD	640	
	KNDR	1400	
Norman Wells, Northwest Territory	CFNW	1240	
Norristown, Pa.	WNAR	1110	
N. Adams, Mass.	WMNB	1230	
N. Augusta, S.C.	WGUS	1380	
	WTHB	1550	
N. Battleford, Sask.	CJNB	1460	
North Bay, Ont.	CFCH	600	
North Bend, Oreg.	KFIR	1340	C
North Charleston, S.C.	WNCG	910	
Northfield, Minn.	WCAL	770	
Northampton, Mass.	WHMP	1400	M
N. Little Rock, Ark.	KDXE	1380	A
	KXLR	1150	
North Platte, Nebr.	KJLT	970	
	KOOY	1240	N
No. Syracuse, N.Y.	WSOQ	1220	M
No. Vancouver, B.C.	CKLG	730	
N. Vernon, Ind.	WOCH	1460	
No. Wilkesboro, N.C.	WKBC	880	
Norton, Va.	WNVA	1350	M
Norwalk, Conn.	WNLK	1350	
Norwich, Conn.	WICH	1310	
Norwich, N.Y.	WCHN	970	
Oakdale, La.	KREH	900	
Oakes, N.Dak.	KEYD	1220	
Oak Grove, La.	KWCL	1280	
Oak Hill, W.Va.	WOAY	860	
Oakland, Calif.	KEWB	910	
	KABL	960	
	KDIA	1310	
Oak Park, Ill.	WOPA	1490	
Oak Ridge, Tenn.	WATO	1290	
Oakville, Ont.	CHWO	1250	
Ocala, Fla.	WMOP	900	
	WTMC	1290	N
	WHYS	1370	
Ocean City, Md.	WETT	1590	
Oceanlake, Oreg.	KBCH	1380	
Oceanside, Calif.	KUDE	1320	
Ocilla, Ga.	WSIZ	1380	
Odessa, Tex.	KECK	920	
	KOSA	1230	C
	KOYL	1310	
	KRIG	1410	M
Oelwein, Iowa	KOEL	950	
Ogallala, Nebr.	KOGA	930	
Ogden, Utah	KLO	1430	M
	KSVN	730	
	KVOG	1490	
Ogdensburg, N.Y.	WSLB	1400	M
Oil City, Pa.	WKRZ	1340	
Okla. City, Okla.	KBYE	890	A
	KLPR	1140	
	KOCY	1340	
	KOMA	1520	
	KTOK	1000	M
	KJEM	800	
	WKY	930	
Okmulgee, Okla.	KOKL	1240	
Old Saybrook, Conn.	WLIS	1420	
Olean, N.Y.	WMNS	1360	
	WHDL	1450	A

Location	C.L.	Kc.	N.A.
Olney, Ill.	WVLN	740	
Olympia, Wash.	KGY	1240	M
	KITN	920	
Omaha, Nebr.	KBON	1490	
	KFAB	1110	N
	KOIL	1290	
	KOOO	1420	
	KMEO	660	
	WOW	590	C
Omak, Wash.	KOMW	680	
Oneida, N.Y.	WONG	1600	
Oneida, Tenn.	WBNT	1310	
O'Neill, Nebr.	KBRX	1350	
Oneonta, Ala.	WCRL	1570	
Oneonta, N.Y.	WDOS	730	
Ontario, Calif.	KASK	1510	
Ontario, Oreg.	KSRV	1380	
Opelika, Ala.	WPHO	1400	M
Opelousas, La.	KSLO	1230	A
Opp, Ala.	WAMI	860	
Opportunity, Wash.	KZUN	630	
Orange, Mass.	WCAT	1390	
Orange, Tex.	KOGT	1600	
Orange, Va.	WJMA	1340	
Orangeburg, S.C.	WDIX	1150	A
	WBPD	1580	
	WTND	920	
Orange Park, Fla.	WAYR	550	
Oregon City, Oreg.	KGON	1520	M
Orillia, Ont.	CFOR	1570	
Orlando, Fla.	WDBO	580	C
	WHOO	990	M
	WHIY	1270	
	WLOF	950	
	WKIS	740	N
Ormond Bch., Fla.	WQXQ	1380	
Orofino, Idaho	KLER	950	
Ortonville, Minn.	KDIO	1350	
Osage Bch., Mo.	KRMS	1150	
Osceola, Ark.	KOSE	860	
Oshawa, Ont.	CKLB	1350	
Oshkosh, Wis.	WOSH	1490	A
Oskaloosa, Iowa	KBOE	740	
Othello, Wash.	KRSC	1400	
Ottawa, Ill.	WCMY	1430	
Ottawa, Kans.	KOFO	1220	
Ottawa, Ont.	CBO	910	
	CFRA	580	
	CKOY	1310	
Ottumwa, Iowa	KBIZ	1240	A
	KLEE	1480	
Owatonna, Minn.	KRFO	1390	
Owego, N.Y.	WEBO	1330	
Owensboro, Ky.	WOMI	1490	M
	WVJS	1420	A
Owen Sound, Ont.	CFOS	560	
Owosso, Mich.	WOAP	1080	
Oxford, Miss.	WSUH	1420	
Oxford, N.C.	WOXF	1340	
Oxnard, Calif.	KOXR	910	
Ozark, Ala.	WOZK	900	
Paducah, Ky.	WKYB	570	N.M
	WDXR	1560	
	WPAD	1450	C
Page, Ariz.	KPGE	1340	
Pahokee, Fla.	WRIM	1250	
Painesville, Ohio	WPVL	1460	
Paintsville, Ky.	WSIP	1490	M
Palatka, Fla.	WWPF	1260	
	WSUZ	800	
Palestine, Tex.	KNET	1450	
Palm Bch., Fla.	WQXT	1340	A
Palm Sprgs., Calif.	KCMJ	1010	C
	KDES	920	
	KPAL	1450	
Palmdale, Calif.	KUTY	1470	
Palo Alto, Calif.	KIBE	1220	
Pampa, Tex.	KPON	1340	M
	KHHH	1230	
Panama City, Fla.	WOLP	590	
	WPCF	1430	M
Panama City Beach, Fla.	WTHR	1480	
	WSCM	1290	
Paradise, Calif.	KMET	930	
Paragould, Ark.	KDRS	1490	
Paris, Ark.	KCCL	1460	
Paris, Ill.	WPRS	1440	
Paris, Ky.	WKLX	1440	
Paris, Tenn.	WTPR	710	
Paris, Tex.	KPLT	1490	A
	KFTV	1250	
Parkersburg, W.Va.	WCEF	1050	
	WPAR	1450	C
	WTAP	1230	A
Park Falls, Wis.	WPFP	1450	
Parry Sound, Ont.	CKAR	1340	
Parsons, Kans.	KLKC	1540	
Pasadena, Calif.	KALI	1430	
	KPPC	1240	
	KRLA	1110	
	KWKW	1300	
Pasadena, Tex.	KLVL	1460	
Pascagoula-Moss Point, Miss.	WPMP	1580	A
Pasco, Wash.	KORD	910	
	KPKW	1340	
Paso Robles, Calif.	KPRL	1230	M
Patchogue, L.I., N.Y.	WALK	1370	
	WPAC	1580	
Paterson, N.J.	WPAT	930	
Pauls Valley, Okla.	KVLH	1470	
Pawtucket, R.I.	WPAW	550	A
Payette, Idaho	KEOK	1450	
Peace River, Alta.	CKYL	630	
Pecos, Tex.	KIUN	1400	M
Peekskill, N.Y.	WLNA	1420	
Pekin, Ill.	WSIV	1140	
Pell City, Ala.	WFHK	1430	
Pembroke, Ont.	CHOV	1350	
Pendleton, Oreg.	KKID	1240	A
	KUBE	1050	
	KUMA	1290	A
Pennington Gap, Va.	WSWV	1570	
Pensacola, Fla.	WBOP	980	
	WDEB	610	
	WBSR	1450	C
	WNVY	1230	A
	WCOA	1370	N
	WPFA	790	
Pentieton, B.C.	CKOK	800	
Peoria, Ill.	WAAP	1350	N
	WMBD	1470	C
	WIRL	1290	M
	WPEO	1020	
Perry, Fla.	WPRY	1400	
Perry, Ga.	WPGA	980	
Perryton, Tex.	KEYE	1400	M
Peru, Ind.	WARU	1600	
Petaluma, Calif.	KTOB	1490	
Peterborough, Ont.	CHEX	980	
	CKPT	1420	
Petersburg, Va.	WSSV	1240	M
Petoskey, Mich.	WMBN	1340	
Phenix City, Ala.	WPNX	1460	A
Philadelphia, Miss.	WHOC	1490	
Philadelphia, Pa.	WCAU	1210	C
	WDAS	1480	
	WFIL	560	A
	WFLN	900	
	WHAT	1340	
	WIBG	990	
	WIP	610	
	WJMJ	1540	
	WPEN	950	
	WRCV	1060	N
	WTEL	860	
Phillipsburg, Pa.	WPHB	1260	
Phillipsburg, Kans.	KKAN	1490	
Phoenix, Ariz.	KIFN	860	
	KXIV	1400	
	KHAT	1480	
	KHEP	1280	
	KINK	1010	
	KOY	550	A
	KOOL	960	C
	KPHO	910	A
	KUEQ	740	
	KRIZ	1230	
	KTAR	620	N
Pleayune, Miss.	WRJW	1320	
Piedmont, Ala.	WPID	1280	
Pierre, S.Dak.	KGFX	630	
	KCCR	1590	
Pikeville, Ky.	WLSI	900	
	WPKE	1240	M
Pine Bluff, Ark.	KCLA	1400	
	KADL	1270	
	KOTN	1490	M
	KPBA	1590	
Pine City, Minn.	WCMP	1350	
Pineville, Ky.	WMLF	1230	
Pineville, W.Va.	WWYO	970	
Pipestone, Minn.	KLOH	1050	
Piqua, Ohio	WPTW	1570	
Pittsburg, Calif.	KKIS	990	
Pittsburg, Kans.	KOAM	860	N
	KSEK	1340	
Pittsburgh, Pa.	KOKA	1020	
	KQV	1410	C
	WCAE	1250	
	WEEP	1080	
	WAMO	860	
	WJAS	1320	N
	WPIT	730	
	WWSW	970	
Pittsfield, Ill.	WBBA	1580	
Pittsfield, Mass.	WBEC	1420	A
	WBRK	1340	M
Pittston, Pa.	WPTS	1540	
Plainfield, N.J.	WERA	1590	
Plainview, Tex.	KVOP	1400	M
	KPLA	1050	
Plant City, Fla.	WPLA	910	
Platteville, Wis.	WSWW	1590	
Plattsburg, N.Y.	WEAV	960	A.N
	WIRY	1340	M
Pleasanton, Tex.	KBOP	1380	
Pleasantville, N.J.	WONO	1400	
Plymouth, Mass.	WPLM	1390	
Plymouth, N.C.	WPNC	1470	
Plymouth, Wis.	WPLY	1420	
Pocahontas, Ark.	KPOC	1420	
Pocatello, Idaho	KSEI	930	N
	KWIK	1240	M
	KYTE	1290	
Pocomoke City, Md.	WDMV	540	
Pointe Claire, Que.	CFOX	1470	
Pomona, Calif.	KWOW	1600	
	KKAR	1220	
Pompano Beach, Fla.	WLOD	980	
	WPOM	1470	A
Ponca City, Okla.	WBBZ	1230	M
Ponce, P.R.	WPRP	910	
	WEUC	1420	
	WPAB	550	
	WLEO	1170	
	WISO	1260	
Pontiac, Mich.	WPON	1460	
Poplar Bluff, Mo.	KWOC	930	
Portage, Pa.	WWML	1470	
Portage, Wis.	WPDR	1350	
Portage la Prairie, Man.	CFRY	1570	
Portageville, Mo.	KMIS	1050	
Port Alberni, B.C.	CJAV	1240	
Portales, N.Mex.	KENM	1450	
Port Angeles, Wash.	KONP	1450	
Port Arthur, Ont.	CFPA	1230	
Port Arthur, Tex.	KOLE	1340	
	KPAC	1250	M
Porterville, Calif.	KTIP	1450	A
Port Hope, Ont.	CHUC	1500	
Port Hueneme, Calif.	KACY	1520	
Port Huron, Mich.	WHLS	1450	
	WTTH	1380	A
Port Jervis, N.Y.	WDLC	1490	
Portland, Ind.	WPGW	1440	
Portland, Maine	WCSH	970	N
	WGAN	560	C
	WLOB	1310	
	WPOR	1490	A.M
Portland, Oreg.	KBPS	1450	
	KBEV	1010	
	KLIQ	1290	
	KEX	1190	
	KGW	620	N
	KOIN	970	C
	KPAM	1410	
	KPDQ	800	
	KPOJ	1330	
	KWJJ	1080	A
	KXL	750	
Port Neches, Tex.	KPNG	1150	
Portsmouth, N.H.	WBBX	1380	
	WHEB	750	
Portsmouth, Ohio	WPAY	1400	C
	WNXT	1260	A
Portsmouth, Va.	WLOW	1400	A
	WAVY	1350	N
Post, Tex.	KUKO	1370	
Poteau, Okla.	KLCO	1280	
Potosi, Mo.	KYRO	1280	
Potsdam, N.Y.	WPDM	1470	
Pottstown, Pa.	WPAZ	1370	
Pottsville, Pa.	WPAM	1450	
	WPPA	1360	M
Poughkeepsie, N.Y.	WEOK	1390	
	WKIP	1450	A
Powell, Wyo.	KPOW	1260	M
Poynette, Wis.	WIBU	1240	
Prairie du Chien, Wis.	WPRE	980	
Pratt, Kans.	KWSK	1570	
Prescott, Ariz.	KYCA	1490	N
	KENT	1340	
	KNOT	1450	A
Prescott, Ark.	KTPA	1370	
Presque Isle, Me.	WAGM	950	
	WEGP	1390	
Preston, Idaho	KPST	1340	
Prestonsburg, Ky.	WPRT	960	
	WOOC	1310	
Price, Utah	KOAL	1230	M
Prichard, Ala.	WAIP	1270	
Prince Albert, Sask.	CKBI	900	
Prince George, B.C.	CKPG	550	
Prince Rupert, B.C.	CFPR	1240	
Princeton, Ind.	WRAY	1250	
Princeton, Ky.	WPKY	1580	
Princeton, W.Va.	WLOH	1490	A
Prineville, Oreg.	KRCO	690	
Prosser, Wash.	KARY	1310	
Providence) R.I.	WEAN	790	C
	WHIM	1110	
	WICE	1290	
	WJAR	920	N
	WLKW	990	
	WPRO	630	
	WRIB	1220	M
Provo, Utah	KIXX	1400	A
	KEYY	1450	
	KOVO	960	M
Pryor, Okla.	KOLS	1570	
Pueblo, Colo.	KOZA	1230	
	KAPI	690	
	KFEL	970	
	KGHF	1350	A.M
	KCSJ	590	
	KTUX	1480	
Pulaski, Tenn.	WKSR	1420	A
Pulaski, Va.	WPUV	1580	
Pullman, Wash.	KWSC	1250	
	KOFE	1150	
Punta Gorda, Fla.	WCCF	1580	
Punxsutawney, Pa.	WPME	1540	
Putnam, Conn.	WINY	1350	
Puyallup, Wash.	KAYE	1450	
Quanah, Tex.	KOLJ	1150	
Quebec, Que.	CBV	980	
	CHRC	800	
	CJLR	1060	
	CJQC	1340	
	CKCV	1280	
Quesnel, B.C.	CKCQ	570	
Quincy, Fla.	WCNH	1230	M
Quincy, Ill.	WGEM	1440	A
	WTAD	930	C
Quincy, Mass.	WJDA	1300	
Quincy, Wash.	KPQR	1370	
Quitman, Ga.	WSQT	1490	
Racine, Wis.	WRAC	1460	
	WRJN	1400	A
Radford, Va.	WRAD	1460	
Raleigh, N.C.	WKIX	850	A
	WPTF	680	N
	WSHE	570	
	WRAL	1240	
Rapid City, S.Dak.	KOTA	1380	C
	KRSD	1340	
	KEZU	920	
Raton, N.Mex.	KRTN	1490	A
Ravenswood, W.Va.	WMOV	1360	
Rawlins, Wyo.	KRAL	1240	M
Raymond, Wash.	KAPA	1340	
Raymondville, Tex.	KSOX	1240	
Rayville, La.	KRIH	990	
Reading, Pa.	WEEU	850	A
	WHUM	1240	C
	WRAW	1340	N
Redding, Calif.	KRDG	1230	M
	KAHR	1330	
	KSDA	1400	
	KVCV	600	C
	KVIP	540	
Red Bluff, Calif.	KBLF	1490	
Red Deer, Alta.	CKRD	850	
Redlands, Calif.	KCAL	1410	
Red Lion, Pa.	WGCB	1440	
Redmond, Oreg.	KPRB	1240	
Red Wing, Minn.	KCUE	1250	
Redwood Falls, Minn.	KLGR	1490	
Reedsburg, Wis.	WRDB	1400	
Reedsport, Oreg.	KRAF	1470	
Regina, Sask.	CBK	540	
	CJME	1300	
	CKCK	620	
	CKRM	980	
Reidsville, N.C.	WFRC	1600	A
	WREV	1220	
Remsen, N.Y.	WREM	1480	
Reno, Nev.	KOH	630	N
	KBET	1340	M
	KOLO	920	C
	KONE	1450	
	KDOT	1230	
Renton, Wash.	KUDY	910	
Rexburg, Idaho	KRXK	1230	
Rhinelander, Wis.	WOBT	1240	
Rice Lake, Wis.	WJMC	1240	
Richfield, Utah	KSVC	980	
Richland, Wash.	KALE	960	
Richland, Wis.	WRCO	1450	
Richlands, Va.	WRIC	540	
Richmond, Ind.	WKBV	1490	A
Richmond, Ky.	WEKY	1340	M
Richmond, Va.	WANT	990	
	WBBL	1480	
	WEZL	1590	
	WLEE	1480	N
	WEET	1320	
	WMBG	1380	A
	WRNL	910	M
	WRVA	1140	N
	WXGI	950	
Richmond Hill, Ont.	CJRH	1310	
Richwood, W.Va.	WVAR	1280	
Ridgecrest, Calif.	KRCK	1360	
	KRKS	1240	
Rimouski, Que.	CJBR	900	
Rio Piedras, P.R.	WRIO	1320	
	WWWW	1520	
Ripley, Tenn.	WTRB	1570	
Ripon, Wis.	WCWC	1600	
Riverhead, N.Y.	WRIV	1390	
	WAPC	1570	
Riverside, Calif.	KPRO	1440	
	KACE	1570	
Riverton, Wyo.	KWRL	1450	M
Riviera Beach, Fla.	WHEW	1600	
Riviere du Loup, Que.	CJFP	1400	
Roanoke, Ala.	WELR	1360	
Roanoke, Va.	WDBJ	960	C
	WRIS	1410	M
	WHYE	910	
	WROV	1240	A
	WSLS	610	N
Roanoke Rapids, N.C.	WCBT	1290	M
Roaring Sprgs., Pa.	WKMC	1370	
Roberval, Que.	CHRL	910	
Robinson, Ill.	WTAY	1570	
Rochester, Minn.	KROC	1340	N
	KWEB	1270	
Rochester, N.H.	WWNH	930	
Rochester, N.Y.	WBBF	950	M
	WHAM	1180	N
	WHEC	1460	C
	WRVM	680	
	WSAY	1370	
	WVET	1280	A
Rockford, Ill.	WROK	1440	A
	WJRL	1150	
	WRRR	1330	
Rock Hill, S.C.	WRHI	1340	M
	WTYC	1150	
Rockingham, N.C.	WAYN	900	
Rock Island, Ill.	WHBF	1270	C
Rockland, Maine	WRKO	1450	A
Rockmart, Ga.	WPLK	1220	
Rock Springs, Wyo.	KVRS	1360	M
Rockville, Md.	WINX	1600	
Rockwood, Tenn.	WRKH	580	
Rocky Ford, Colo.	KAVI	1320	
Rocky Mount, N.C.	WCEC	810	
	WEED	1390	A
	WRMT	1490	
	WWWS	1290	
Rocky Mount, Va.	WYTI	1570	
Rogers, Ark.	KAMO	1390	
Rogers City, Mich.	WHAK	960	
Rogersville, Tenn.	WRGS	1370	
Rolla, Mo.	KCLU	1590	
	KTTR	1490	
Rome, Ga.	WLAQ	1410	A
	WRGA	1470	M
	WROM	710	
Rome, N.Y.	WKAL	1450	A

Location	C.L.	Kc.	N.A.
	WRNY	1350	
Ronceverte, W.Va.	WRON	1400	
Roseburg, Oreg.	KRNR	1490	C
	KRXL	1250	
	KQEN	1240	A
	KYES	950	
Rosenberg, Tex.	KFRD	980	
Rossville, Ga.	WRIP	980	
Roswell, N.Mex.	KSWS	1230	
	KGFL	1430	M
	KBIM	910	
Rouyn, Que.	CKRN	1400	
Roxboro, N.C.	WRXO	1430	
Royal Oak, Mich.	WEXL	1340	
Rugby, N. Dak.	KGCA	1450	
Ruidoso, N.M.	KYAP	1340	
Rumford, Me.	WRUM	790	
Rupert, Idaho	KAYT	970	
Rushton, La.	KRUS	1490	
Rusk, Texas	KTLU	1580	
Russell, Kans.	KRSL	990	
Russellville, Ala.	WWWR	920	
Russellville, Ark.	KXRJ	1490	
Russellville, Ky.	WRUS	610	
Rutland, Vt.	WHWB	1000	
	WSYB	1380	M
Sackville, N.B.	CBA	1070	
Sacramento, Calif.	KCRA	1320	N
	KFBK	1530	A
	KGMS	1380	M
	KRAK	1140	
	KROY	1240	C
	KXOA	1470	
Safford, Ariz.	KGLU	1480	A
Saginaw, Mich.	WKNX	1210	
	WSAM	1400	N
	WSGW	790	M
St. Albans, Vt.	WWSR	1420	
St. Albans, W.Va.	WKLC	1300	
St. Augustine, Fla.	WFOY	1240	C
	WSTN	1420	
St. Boniface, Man.	CKSB	1050	
St. Catherines, Ont.	CKTB	610	
St. Charles, Mo.	KADY	1460	
St. Cloud, Minn.	KFAM	1450	N
	WJDN	1240	
Ste. Anne de la Pocatiere, Que.	CHGB	1350	
St. George, Utah	KDXU	1450	
Ste. Genevieve, Mo.	KSGM	980	
St. Helen, Mich.	WMIC	1590	
St. Helens, Oreg.	KOHI	1600	
St. Hyacinthe, Que.	CKBS	1240	
St. Jean, Que.	CHRS	1090	
St. Jerome, Que.	CKJL	900	
Saint John, N.B.	CFBC	930	
	CHSJ	1150	
St. Johns, Mich.	WJUD	1580	
St. John's, Nfld.	CBN	640	
	CJON	930	
	VOAR	1230	
	VOCM	590	
	VOWR	800	
St. Johnsbury, Vt.	WTWN	1340	
St. Joseph, Mich.	WSJM	1400	
St. Joseph, Mo.	KFEQ	680	
	KRES	1550	M
	KUSN	1270	
St. Joseph d'Alma, Que.	CFGT	1270	
St. Louis, Mo.	KATZ	1600	
	KFUO	850	
	KMOX	1120	C
	KSD	550	N
	KSTL	690	
	KWK	1380	
	KXOK	630	
	WEW	770	M
	WIL	1430	A
St. Louis Park, Minn.	KRSI	950	
St. Mary's, Pa.	WKBI	1400	
St. Paul, Minn.	KSTP	1500	N
	KDWB	630	M
St. Peter, Minn.	KRBI	910	
St. Petersburg, Fla.	WPIN	690	
	WSUN	620	A
	WLCY	1380	M
St. Petersburg Beach, Fla.	WILZ	1590	
St. Thomas, Ont.	CHLD	680	
Salamanca, N.Y.	WGGO	1590	
Salem, Ill.	WJBD	1350	
Salem, Ind.	WSLM	1220	
Salem, Mass.	WESX	1230	M
Salem, Mo.	KSMO	1340	
Salem, Oreg.	KSLM	1390	A
	KBZY	1490	N
	KGAY	1430	
Salem, Va.	WBLU	1480	
Salida, Colo.	KVRH	1340	M
Salina, Kans.	KSAL	1150	M
Salinas, Calif.	KDON	1460	
	KSBW	1380	M
Saline, Mich.	WOIA	1290	
Salisbury, Md.	WBOC	980	
	WICO	1320	A
	WJDY	1470	
Salisbury, N.C.	WSTP	1490	M
	WSAT	1280	A
Salmon, Idaho	KSRA	960	
Salt Lake City, Utah	KALL	910	M
	KCPX	1320	N
	KLUB	570	A
	KNAK	1280	
	KSL	1160	C
	KSOP	1370	
	KSXX	630	
	KWHO	860	
	KWIC	1570	
San Angelo, Tex.	KTXL	1340	
	KGKL	960	A
	KPEP	1420	
	KWFR	1260	
San Antonio, Tex.	KAPE	1480	
	KCOR	1350	
	KENS	680	C
	KIKK	1150	
	KITE	930	
	KUKA	1250	
	KUBD	1310	
	KMAC	630	A
	KONO	860	
	KTSA	550	
	WOAI	1200	
San Bernardino, Calif.	KCKC	1350	
	KFXM	590	
	KRNO	1240	
	KITO	1290	M
Sandersville, Ga.	WSNT	1490	
San Diego, Calif.	KCBQ	1170	
	KFMB	540	C
	KOGO	600	N
	KGB	1360	A
	KSON	1240	
	KSDO	1130	
Sandpoint, Idaho	KSPT	1400	
Sandusky, Ohio	WLEC	1450	M
San Fernando, Calif.	KGIL	1260	
Sanford, Fla.	WTRR	1400	
	WSFR	1360	
Sanford, Me.	WSME	1220	
Sanford, N.C.	WEYE	1290	
	WWGP	1050	
San Francisco, Calif.	KFRC	610	M
	KCBS	740	C
	KFAX	1100	
	KGO	810	
	KNBC	680	N
	KQBY	1550	M
	KSAY	1010	
	KSAN	1450	
	KSFO	560	
	KYA	1260	
San German, P.R.	WRJS	1090	
San Jose, Calif.	KLOK	1170	
	KLIV	1590	
	KEEN	1370	
	KXRX	1500	
San Juan, P.R.	WAPA	680	M
	WHOA	870	
	WIAC	740	
	WIPR	940	
	WKAQ	580	C
	WKVM	1250	
	WKYN	630	
	WITA	1140	
San Luis Obispo, Calif.	KATY	1340	
	KCJH	1280	
	KSLY	1400	
	KVEC	920	M
San Marcos, Tex.	KCNY	1470	
San Mateo, Calif.	KOFY	1050	
San Rafael, Calif.	KTIM	1510	
San Saba, Tex.	KBAL	1410	
Santa Ana, Calif.	KWIZ	1480	
Santa Barbara, Cal.	KDB	1490	
	KGUD	990	
	KIST	1340	N
	KTMS	1250	A-M
	KACL	1290	
Santa Cruz, Calif.	KSCO	1080	
Santa Fe, N.Mex.	KTRC	1400	A
	KVSF	1260	C
Santa Maria, Cal.	KCOY	1400	
	KSMA	1240	
Santa Monica, Cal.	KDAY	1580	
Santa Paula, Calif.	KSPA	1400	
Santa Rosa, Calif.	KSRO	1350	
	KJAX	1150	
Santa Rosa, N.Mex.	KSYX	1420	
Saranac Lake, N.Y.	WNBZ	1240	A
Sarasota, Fla.	WKXY	930	
	WSAF	1220	
	WSPB	1450	C
	WYND	1280	
Saratoga Springs, N.Y.	WSPN	900	
	WRSA	1280	
Sarnia, Ont.	CHOK	1070	
Saskatoon, Sask.	CFQC	600	
	CFNS	1170	
	CKOM	1420	
Saugerties, N.Y.	WGHQ	920	
Sault Ste. Marie, Michigan	WSOO	1230	
Sault Ste. Marie, Ontario	CJIC	1050	
	CKCY	1400	
Savannah, Ga.	WBYG	1450	M
	WEAS	900	
	WSAV	630	N
	WSGA	1400	
	WTOC	1290	C
	WSOK	1230	A
Savannah, Tenn.	WORM	1010	
Sayre, Pa.	WATS	960	
Scheffervilie, Que.	CFKL	1230	
Schenectady, N.Y.	WGY	810	N
	WSNY	1240	
Scotland Neck, N.C.	WYAL	1280	
Scottsbluff, Nebr.	KNEB	960	M
	KOLT	1320	C
Scottsboro, Ala.	WCRI	1050	
Scottsdale, Ariz.	KWBY	1440	
Scottsville, Ky.	WLCK	1250	
Scranton, Pa.	WARM	590	A
	WEJL	630	
	WGBI	910	C
	WICK	1400	
	WSCR	1320	N
Seaford, Del.	WSUX	1280	
Searcy, Ark.	KWCB	1300	
Seaside, Oreg.	KSRG	730	
Seattle, Wash.	KAYO	1150	
	KING	1090	A
	KIRO	710	C
	KJR	950	
	KOL	1300	
	KOMO	1000	N
	KTIX	1590	
	KTW	1250	
	KVI	570	
	KXA	770	
	WJCM	960	
Sebring, Fla.	WSEB	1340	
	KDRO	1490	
Sedalia, Mo.	KSIS	1050	
Seguin, Tex.	KWED	1580	
Selma, Ala.	WGWC	1340	C
	WHBB	1490	
	WRWJ	1570	
Seminole, Tex.	KSML	1250	
Seneca Township, S.C.	WSNW	1150	
Sevierville, Tenn.	WSEV	930	
Seward, Alaska	KIBH	1340	C-A
Seymour, Ind.	WJCD	1390	
Seymour, Tex.	KSEY	1230	
Shamokin, Pa.	WISL	1480	
Shamrock, Tex.	KBYP	1580	
Sharon, Pa.	WPIC	790	
Shawano, Wis.	WTCH	960	
Shawinigan, Que.	CKSM	1220	
Shawnee, Okla.	KGFF	1450	M
Sheboygan, Wis.	WHBL	1330	A
	WKTS	950	
Shelby, Mont.	KSEN	1150	M
Shelby, N.C.	WDHS	730	M
	WADA	1390	
Shelbyville, Ind.	WSVL	1520	
Shelbyville, Tenn.	WHAL	1400	
	WLIJ	1580	
Shenandoah, Iowa	KFNF	920	
	KMA	960	A
Sherbrooke, Que.	CHLT	630	
	CKTS	900	
Sheridan, Wyo.	KWYD	1410	M
Sherman, Tex.	KRRV	910	M
	KTXO	1500	
Show Low, Ariz.	KVWM	1050	
Shreveport, La.	KANB	1300	
	KBCL	1220	
	KCIJ	1050	C
	KEEL	710	
	KREB	1550	M
	KJOE	1480	
	KOKA	980	
	KRMD	1340	A
	KWKH	1130	C
Sidney, Mont.	KGCX	1480	M
Sidney, Nebr.	KSID	1340	A
Sierra Vista, Ariz.	KHFH	1420	A
Sikeston, Mo.	KSIM	1400	
Siler City, N.C.	WNCA	1570	
Siloam Sprgs., Ark.	KUOA	1290	M
Silsbee, Tex.	KKAS	1300	
Silver City, N.Mex.	KSIL	1340	C
Silver Sprgs., Md.	WQMR	1050	
Simcoe, Ont.	CFRS	1560	
Sinton, Tex.	KTOD	1590	
Sioux City, Iowa	KSCJ	1360	A
	KMNS	620	
	KTRI	1470	
Sioux Falls, S.Dak.	KISD	1230	
	KELO	1320	
	KIHO	1270	
	KSOO	1140	A
Sitka, Alaska	KJFW	1230	C-A
	KSEW	1400	
Skowhegan, Maine	WGHM	1150	
Smithfield, N.C.	WMPM	1270	
Smiths Falls, Ont.	CJET	630	
Snyder, Tex.	KSNY	1450	M
Socorro, N.Mex.	KSRC	1290	
Soda Sprgs., Idaho	KBRV	540	
Somerset, Ky.	WSFC	1240	M
	WTLO	1480	
Somerset, Pa.	WVSC	990	
Sonora, Calif.	KROG	1450	
Sorel, P.Q.	CJSO	1320	
So. Bend, Ind.	WNDU	1490	A
	WJVA	1580	M
	WSBT	960	C
Southbridge, Mass.	WESO	970	
So. Boston, Va.	WHLF	1400	A
Southern Pines, N.C.	WEEB	990	
South Daytona Beach, Florida	WELE	1590	
So. Gastonia, N.C.	WGAS	1420	
So. Knoxville, Tenn.	WSKT	1580	
So. Paris, Me.	WKTQ	1450	
So. Pittsburg, Tenn.	WEPG	910	
So. St. Paul, Minn.	WISK	630	M
So. Williamsport, Pa.	WMPT	1450	
Spanish Fork, Utah	KONI	1480	
Sparks, Nev.	KBUB	1270	
Sparta, Ill.	WHCO	1230	
Sparta, Tenn.	WSMT	1050	
Sparta, Wis.	WKLJ	990	
	WCOW	1290	
Spartanburg, S.C.	WTHE	1400	M
	WORD	910	N
	WSPA	950	C
Spencer, Iowa	KICO	1240	
Spokane, Wash.	KGA	1510	A
	KLYK	1230	
	KPEG	1380	
	KHQ	590	N
	KNEW	790	M
	KREM	970	
	KXLY	920	C
	KCFA	1330	
Springdale, Ark.	KBRS	1340	A
Springfield, Ill.	WCVS	1450	A-M
	WMAY	970	N
	WTAX	1240	C
Springfield, Mass.	WBZA	1030	
	WHYN	560	C
	WMAS	1450	M
	WSPR	1270	
Springfield, Mo.	KGBX	1260	N
	KICK	1340	
	KTTS	1400	C
	KWTO	560	A
Springfield, Ohio	WIZE	1340	A
	WBLY	1600	
Springfield, Oreg.	KEED	1050	
Springfield, Tenn.	WDBL	1590	
Springfield, Vt.	WCFR	1480	
Springhill, La.	KBSF	1460	
Spruce Pine, N.C.	WTDE	1470	
Stamford, Conn.	WSTC	1400	A
Stamford, Tex.	KDWT	1400	
Starke, Fla.	WRGR	1490	
Starkville, Miss.	WSSO	1230	
State College, Pa.	WMAJ	1450	M
Statesboro, Ga.	WWNS	1240	
Statesville, N.C.	WSIC	1400	
	WDBM	550	
Staunton, Va.	WTDN	1240	A
	WAFC	900	
Stephenville, Tex.	KSTV	1510	
Sterling, Colo.	KGEK	1230	
	KOLR	1490	
Sterling, Ill.	WSDR	1240	
Steubenville, Ohio	WSTV	1340	M
Stevens Point, Wis.	WSPT	1010	
Stillwater, Minn.	WAVN	1220	
Stillwater, Okla.	KSPI	780	
Stockton, Calif.	KJOY	1280	
	KSTN	1420	
	KWG	1230	A-M
Storm Lake, Iowa	KAYL	990	
Stratford, Ont.	CJCS	1240	
Streator, Ill.	WIZZ	1250	
Stroudsburg, Pa.	WVPO	840	
Stuart, Fla.	WSTU	1450	M
Stuart, Va.	WHEO	1270	
Sturgeon Bay, Wis.	WDDR	910	
Sturgis, Mich.	WSTR	1230	
Stuttgart, Ark.	KWAK	1240	M
Sudbury, Ont.	CKSO	790	
	CFBR	550	
	CHNO	900	
Suffolk, Va.	WLPM	1460	A
Sulphur, La.	KIKS	1310	
Sulphur Sprgs., Tex.	KSST	1230	
Summerside, P.E.I.	CJRW	1240	
Summerville, Ga.	WGTA	950	
Sumter, S.C.	WFIG	1290	M
	WDXY	1240	
	WSSC	1340	A
Sunbury, Pa.	WKOK	1240	C
Sunnyside, Wash.	KREW	1230	
Sun Valley, Ida.	KSKI	1340	
Superior, Nebr.	KRFS	1600	
Superior, Wis.	WDSM	710	N
	WQMN	1320	
Susanville, Calif.	KSUE	1240	
Swainsboro, Ga.	WJAT	800	
Sweetwater, Tenn.	WDEH	800	
Sweetwater, Tex.	KXOX	1240	
Swift Current, Sask.	CKSW	1400	
Sydney, N.S.	CBI	1140	
	CJCB	1270	
Sylacauga, Ala.	WFEB	1340	M
	WMLS	1290	
Sylva, N.C.	WMSJ	1480	
Sylvania, Ga.	WSYL	1490	
Syracuse, N.Y.	WHEN	620	C
	WFBL	1390	
	WNDR	1260	
	WOLF	1490	A
	WSYR	570	N
Tabor City, N.C.	WTAB	1370	
Tacoma, Wash.	KMO	1360	
	KTAC	650	
	KTNT	1400	
	KVI	570	M
Taft, Calif.	KTKR	1310	
Tahlequah, Okla.	KTLQ	1350	
Talladega, Ala.	WJHB	1580	
	WNUZ	1230	M
Tallahassee, Fla.	WMEN	1330	
	WRFB	1580	
	WTAL	1270	
	WTNT	1450	A-M-C
Tallassee, Ala.	WTLS	1300	
Tallulah, La.	KTLD	1360	
Tampa, Fla.	WALT	1110	
	WDAE	1250	C
	WEDA	1550	
	WFLA	970	N
	WHBQ	1050	
	WINQ	1010	
	WTMP	1150	
	WSOL	1300	

Location	C.L.	Kc.	N.A.
Tarboro, N.C.	WCPS	760	
Tarpon Sprgs., Fla.	WDCL	1470	
Tasley, Va.	WESR	1330	
Taunton, Mass.	WPEP	1570	
Tawas City, Mich.	WIOS	1480	
Taylor, Tex.	KTAE	1260	
Taylorville, Ill.	WTIM	1410	
Tazewell, Tenn.	WNTT	1250	
Tell City, Ind.	WTCJ	1230	
Tempe, Ariz.	KUPD	1060	
	KYND	1580	
Temple, Tex.	KTEM	1400	
Terrace, B.C.	CFTK	1140	
Terre Haute, Ind.	WBOW	1230	N
	WMFT	1300	
	WTHI	1480	C
Terrell, Tex.	KTER	1570	
Texarkana, Ark.	KOSY	790	M
Texarkana, Tex.	KCMC	740	A
	KTFS	1400	
Texas City, Tex.	KTLW	920	
Thayer, Mo.	KALM	1290	
The Dalles, Oreg.	KODL	1440	
	KRMW	1300	
Thermopolis, Wyo.	KRTR	1490	M
	KTHE	1240	
Thief River Falls, Minn.	KTRF	1230	
Thetford Mines, Que.	CKLD	1230	
Thibodaux, La.	KTIB	630	
Thomaston, Ga.	WSFT	1220	
Thomasville, Ala.	WJDB	630	
Thomasville, Ga.	WPAX	1240	
	WKTG	730	
Thomasville, N.C.	WTNC	790	
Thomson, Ga.	WTWA	1240	M
Three Rivers, Que.	CHLN	550	
	CKTR	1150	
Ticonderoga, N.Y.	WIPS	1250	
Tiffin, Ohio	WTTF	1600	
Tifton, Ga.	WTIF	1340	
	WWGS	1430	
Tillamook, Oreg.	KTIL	1590	
Tillsonburg, Ont.	CKOT	1510	
Timmins, Ont.	CFCL	620	
	CKGB	680	
Titusville, Fla.	WRMF	1050	
Titusville, Pa.	WTIV	1290	
Toccoa, Ga.	WLET	1420	M
	WNEG	1320	
Toledo, Ohio	WDHO	1470	M
	WSPD	1370	N
	WTOD	1560	C
	WTOL	1230	A
Toledo, Oreg.	KTDD	1230	
Tolleson, Ariz.	KZON	1190	
Tomah, Wis.	WTMB	1460	
Tompkinsville, Ky.	WTKY	1370	
Tooele, Utah	KOYL	990	
Topeka, Kans.	WIBW	580	C
	KJAY	1440	
	WREN	1250	A
	KTOP	1490	M
Toppenish, Wash.	KENE	1490	
Toronto, Ont.	CBL	740	N
	CFRB	1010	C
	CHUM	1050	
	CJBC	860	
	CKEY	580	M
	CKFH	1430	
Torrington, Conn.	WBZY	990	
	WTOR	1490	M
Torrington, Wyo.	KGOS	1490	
Towanda, Pa.	WTTC	1550	
Towson, Md.	WAQE	1570	
Trail, B.C.	CJAT	610	
Traverse City, Mich.	WTCM	1400	
	WCOW	1310	
	WCCW	1310	
Trenton, Mo.	KTTN	1600	
Trenton, N.J.	WAAT	1300	
	WBUD	1260	
	WTTM	920	N
Trinidad, Colo.	KCRT	1240	M
Troy, Ala.	WTBF	970	M
Troy, N.Y.	WHAZ	1330	
	WTRY	980	
Truckee, Calif.	KHOE	1400	
Truro, N.S.	CKCL	600	
Truth or Consequences, New Mexico	KCHS	1400	
Tryon, N.C.	WTYN	1550	M
Tucson, Ariz.	KTUC	1400	A
	KAIR	1490	
	KCEE	790	
	KTAN	580	A
	KCUB	1290	N
	KEVT	690	
	KOBY	940	
	KMOP	1330	
	KFIF	1550	
	KTKT	990	
	KOLD	1450	C
Tucumcari, N.Mex.	KTNM	1400	M
Tulare, Calif.	KCOK	1270	M
	KGEN	1370	
Tulia, Tex.	KTUE	1260	
Tullahoma, Tenn.	WJIG	740	
Tulsa, Okla.	KAKC	970	
	KOME	1300	
	KRMG	740	
	KTUL	1430	C
	KVOO	1170	N
	KFMJ	1050	
Tupelo, Miss.	WELO	580	M
	WTUP	1490	A
Turlock, Calif.	KTUR	1390	
Tuscaloosa, Ala.	WJRD	1150	
	WACT	1420	
	WNPT	1280	A
	WTUG	790	
	WTBC	1230	M
Tuscumbia, Ala.	WVNA	1590	
	WCHP	1410	
Tuskegee, Ala.	WABT	580	
Twin Falls, Idaho	KTFI	1270	N
	KLIX	1310	M
	KEEP	1450	
Two Rivers, Wis.	WTRW	1590	
Tyler, Tex.	KDOK	1330	
	KGJB	1490	M
	KTBB	600	A
	KZEY	690	
Tyrone, Pa.	WTRN	1340	
Uklah, Calif.	KUKI	1400	
Union, Mo.	KLPW	1220	
Union, S.C.	WBCU	1460	
Union City, Tenn.	WENK	1240	
Uniontown, Pa.	WMBS	590	C
Urbana, Ill.	WILL	580	
	WKID	1580	
Utica, N.Y.	WIBX	950	C
	WRUN	1150	
	WTLB	1310	A
Uvalde, Tex.	KVOU	1400	
Val D'Or, Que.	CKVD	1230	
Valdosta, Ga.	WGOV	950	M
	WGAF	910	A
	WJEM	1150	
	WVLD	1450	
Vallejo, Calif.	KNBA	1190	
Valley City, N.Dak.	KOVC	1490	M
Valparaiso-Niceville, Fla.	WNSM	1340	
Van Buren, Ark.	KFDF	1580	
Van Cleve, Ky.	WMTC	730	
Van Wert, Ohio	WERT	1220	
Vanceburg, Ky.	WKKS	1570	
Vancouver, B.C.	CBU	690	
	CFUN	1410	
	CHQM	1320	
	CJOR	600	
	CKWX	1130	M
Vancouver, Wash.	KKEY	1150	
	KISN	910	
Venice, Fla.	WAMR	1320	
Ventura, Calif.	KVEN	1450	M
	KUDU	1590	
Verdun, Que.	CKVL	850	
Vermillion, S.Dak.	KUSD	690	
Vernal, Utah	KVEL	1250	
Vernon, B.C.	CJIB	940	
Vernon, Tex.	KVWC	1490	
Vero Beach, Fla.	WAXE	1370	
	WTTB	1490	A
Vicksburg, Miss.	WQBC	1420	M
	WVIM	1490	
Victoria, B.C.	CJVI	900	
	CFAX	810	
	CKDA	1220	
Victoria, Tex.	KNAL	1410	
	KVIC	1340	M
Victoriaville, Que.	CFDA	1380	
Vidalia, Ga.	WVOP	970	
Vieques, P.R.	WIVV	1370	
Ville Marie, Que.	CKVM	710	
Ville Platte, La.	KVPI	1050	
Ville St. Georges, Que.	CKRB	1460	
Vincennes, Ind.	WAOV	1450	M
Vineland, N.J.	WWBZ	1360	
	WOVL	1270	
Vinita, Okla.	KVIN	1470	
Vinton, Va.	WKBA	1550	
Virginia, Minn.	WHLB	1400	N
Virginia Bch., Va.	WBOF	1550	
Viroqua, Wis.	WISV	1360	
Visalia, Calif.	KONG	1400	
Vivian, La.	KLVI	1600	
Waco, Tex.	WACO	1460	A
	KWTX	1230	M
Wadena, Minn.	KWAO	920	M
Wadesboro, N.C.	WAQE	1210	
Wailuku, Hawaii	KMVI	550	N
Waipahu, Hawaii	KAHU	920	
Walhalla, S.C.	WGOG	1460	
Wallace, Idaho	KWAL	620	M
Wallace, N.C.	WLSE	1400	
Walla Walla, Wash.	KHIT	1320	
	KUJ	1420	M
	KTEL	1490	A
Walnut Ridge, Ark.	KRLW	1320	
Walsenburg, Colo.	KFLJ	1380	
Walterboro, S.C.	WALD	1220	A
Waltham, Mass.	WCRB	1330	
Walton, N.Y.	WDLA	1270	
Ward Ridge, Fla.	WJOE	1570	
Ware, Mass.	WARE	1250	M
Warner Robbins, Ga.	WRPB	1350	
Warren, Ark.	KWRF	860	
Warren, Ohio	WHHH	1440	
Warren, Pa.	WNAE	1310	
Warrensburg, Mo.	KOKO	1450	
Warrenton, Mo.	KWRE	730	
Warrenton, Va.	WEER	1570	
	WKCW	1420	
Warsaw, Ind.	WRSW	1480	
Warsaw, Va.	WNNT	690	
Warwick-E.Greenwich, R.I.	WYNG	1590	
Wasco, Calif.	KWSO	1050	
Washington, D.C.	WGMS	570	
	WMAL	630	A
	WOL	1450	M
	WOOK	1340	
	WWDC	1260	
	WRC	980	N
	WTOP	1500	C
Washington, Ga.	WKLE	1370	
Washington, Ind.	WAMW	1580	
Washington, N.J.	WCRV	1580	
	WRRF	930	A
Washington, N.C.	WEEW	1320	
Washington, Pa.	WJPA	1450	M
Washington Court House, Ohio	WCHO	1250	
Waterbury, Conn.	WATR	1320	A
	WBRY	1590	C
	WWCO	1240	M
Waterbury, Vt.	WDEV	550	M
Waterloo, Iowa	KXEL	1540	A
	KNWS	1090	
	KWWL	1330	M
Watertown, N.Y.	WATN	1240	
	WOTT	1410	
	WWNY	790	C
Watertown, S.Dak.	KWAT	950	M
Watertown, Wis.	WTTN	1580	
Waterville, Me.	WTVL	1490	A
Watsonville, Calif.	KOMY	1340	
Wauchula, Fla.	WAUC	1310	
Waukegan, Ill.	WKRS	1220	
Waukesha, Wis.	WAUX	1510	
Waupaca, Wis.	WDUX	800	A
Wausau, Wis.	WRIG	1400	N
	WSAU	550	A
	WHVF	1230	
Waverly, Iowa	KWVY	1470	
Waverly, Ohio	WPKO	1380	
Waxahachie, Tex.	KBEC	1390	
Waycross, Ga.	WACL	570	
	WAYX	1230	M
Waynesboro, Ga.	WBRO	1310	
Waynesboro, Miss.	WABO	990	
Waynesboro, Pa.	WAYZ	1360	
Waynesboro, Va.	WAYB	1490	M
Waynesburg, Pa.	WANB	1580	
Waynesville, N.C.	WHCC	1400	
Weatherford, Tex.	KZEE	1220	
Webster City, Iowa	KJFJ	1570	
Weed, Calif.	KDAD	800	
Weirton, W.Va.	WEIR	1430	
Weiser, Idaho	KWEI	1260	
Welch, W.Va.	WELC	1150	
	WDVE	1340	M
Weldon, N.C.	WCNF	1400	
Welland, Ontario	CHDW	1470	
Wellsboro, Pa.	WNBT	1490	M
Wellston, Ohio	WKOV	1330	
Wellsville, N.Y.	WLSV	790	
Wenatchee, Wash.	KPQ	560	A
	KUEN	900	
	KMEL	1340	M
Wendell-Zebulon, N.C.	WETC	540	
Weslaco, Tex.	KRGV	1290	N
W. Bend, Wis.	WBKV	1470	
Westbrook, Me.	WJAB	1440	
West Covina, Calif.	KGRB	900	
W. Frankfort, Ill.	WFRX	1300	
West Jefferson, N.C.	WKSK	1600	
W. Monroe, La.	KUZN	1310	
W. Palm Beach, Fla.	WEAT	850	N
	WJNO	1230	C
	WIRK	1290	M
West Plains, Mo.	KWPM	1450	
West Point, Ga.	WBMK	1310	
West Point, Miss.	WROB	1450	M
Westport, Conn.	WMMM	1260	
W. Springfield, Mass.	WTXL	1490	A
W. Yarmouth, Mass.	WOCB	1240	M
Westerly, R.I.	WERI	1230	M
Westfield, Mass.	WDEW	1570	
Westminster, Md.	WTTR	1470	
Weston, W.Va.	WHAW	980	M
W. Warwick, R.I.	WWRI	1450	
Wetumpka, Ala.	WETU	1250	
Wewoka-Seminole, Okla.	KWSH	1260	A
Weyburn, Sask.	CFSL	1350	
Wheatland, Wyo.	KYCN	1340	
Wheaton, Md.	WDON	1540	
Wheeling, W.Va.	WHLL	1600	
	WKWK	1400	A
	WWVA	1170	C
White Castle, La.	KEVL	1590	
White Plains, N.Y.	WFAS	1230	
White River Junc., Vt.	WWRJ	910	
Whitehall, Mich.	WCBP	1490	
Whitehorse, Y.T.	CFWH	1240	
Whitesburg, Ky.	WTCW	920	
Whiteville, N.C.	WENC	1220	
Wichita, Kans.	KAKE	1240	M
	KLEO	1480	
	KIRL	1070	N
	KFH	1330	C
	KSIR	900	
	KWBB	1410	
Wichita Falls, Tex.	KSYD	990	M
	KTRN	1290	
	KWFT	620	C
Wickenburg, Ariz.	KAKA	1250	
Wildwood, N.J.	WCMC	1230	
Wilkes-Barre, Pa.	WBAX	1240	M
	WBRE	1340	N
	WILK	980	A
Willcox, Ariz.	KWCX	1250	
Williamsburg, Ky.	WEZJ	1440	
Williamsburg, Va.	WBCI	740	
Williams Lake, B.C.	CKCQ-I	1240	
Williamson, W.Va.	WBTH	1400	M
Williamsport, Pa.	WLYC	1050	
	WRAK	1400	N
	WWPA	1340	C
Williamston, N.C.	WIAM	900	
Willimantic, Conn.	WILI	1400	
Williston, N.D.	KEYZ	1360	
Willmar, Minn.	KWLM	1340	A
Willow Springs, Mo.	KUKU	1330	
Wilmington, Del.	WAMS	1380	M
	WDEL	1150	N
	WILM	1450	A
	WTUX	1290	
Wilmington, N.C.	WMFD	630	A
	WKLM	980	
	WGNI	1340	M
Wilson, N.C.	WGTM	590	C
	WLLY	1350	
	WVOT	1420	M
Winchester, Ky.	WWKY	1380	
Winchester, Tenn.	WCDT	1340	
Winchester, Va.	WINC	1400	A
	WHPL	610	
	WIMO	1300	
Winder, Ga.	KDDM	1580	
Windom, Minn.	WSOR	1480	
Windsor, Conn.	CFAB	1450	
Windsor, N.S.	CBE	1550	
Windsor, Ont.	CKLW	800	M
Wingham, Ont.	CKNX	920	
Winnemucca, Nev.	KWNA	1400	
Winnfield, La.	KVCL	1270	
Winner, S.Dak.	KWYR	1260	
Winnipeg, Man.	CBW	990	
	CKRC	630	
	CKY	580	
	CJOB	680	
Winnsboro, La.	KMAR	1570	
Winona, Minn.	KWNO	1230	A
	KAGE	1380	
Winona, Miss.	WONA	1570	
Winslow, Ariz.	KVNC	1010	A
Winston-Salem, N.C.	WAAA	980	
	WAIR	1340	
	WPEG	1550	
	WSJS	600	N
	WTOB	1380	M-C
Winter Garden, Fla.	WOKB	1600	
Winter Haven, Fla.	WSIR	1490	M
	WINT	1360	
Winter Park, Fla.	WABR	1440	M
Wisconsin Rapids, Wis.	WFHR	1320	M
Wolf Pt., Mont.	KVCK	1450	M
Woodside, N.Y.	WWRL	1600	
Woodstock, N.B.	CJCJ	920	
Woodstock, Ont.	CKOX	1340	
Woodward, Okla.	KSIW	1450	
Woonsocket, R.I.	WNRI	1380	
	WWON	1240	
Wooster, Ohio	WWST	960	
Worcester, Mass.	WAAB	1440	M-N-A
	WNEB	1230	
	WORC	1310	
	WTAG	580	C
Worland, Wyo.	KWOR	1340	M
Worthington, Minn.	KWOA	730	
Worthington, Ohio	WRFD	880	
Wynne, Ark.	KWYN	1400	
Wytheville, Va.	WYVE	1280	
Yakima, Wash.	KIT	1280	
	KIMA	1460	C
	KUTI	980	
	KYAK	1390	M
Yankton, S.D.	KYNT	1450	
	WNAX	570	C
Yarmouth, N.S.	CJLS	1340	
Yauco, P.R.	WKFE	1550	
Yazoo City, Miss.	WAZF	1230	
Yellowknife, N.W.T.	CFYK	1340	
York, Nebr.	KAWL	1370	
York, Pa.	WNOW	1250	
	WFMJ	1390	N
	WORK	1350	N
	WSBA	910	A-M
York, S.C.	WYCL	1580	
Yorkton, Sask.	CJGX	940	
Youngstown, Ohio	WBBW	1240	A
	WFMJ	1390	N
	WKBN	570	C
Yreka, Calif.	KSYC	1490	
Yuba City, Calif.	KUBA	1600	
	KAGR	1450	
Yuma, Ariz.	KOFA	1240	
	KBLU	1320	
	KVOY	1400	A
	KYUM	560	N
Zanesville, Ohio	WHIZ	1240	N
Zarephath, N.J.	WAWZ	1380	

U. S. AM Stations by Call Letters

C.L.	Location	Kc.
KAAA	Kingman, Ariz.	1230
KAAB	Hot Springs, Ark.	1350
KABC	Los Angeles, Calif.	790
KABL	Oakland, Calif.	960
KABQ	Albuquerque, N.M.	1350
KABR	Aberdeen, S.Dak.	1420
KABY	Albany, Oreg.	990
KACE	Riverside, Calif.	1570
KACI	The Dalles, Oreg.	1300
KACT	Andrews, Tex.	1360
KACY	Port Hueneme, Calif.	1520
KADA	Ada, Okla.	1230
KADL	Pine Bluff, Ark.	1270
KADO	Marshall, Tex.	1410
KADY	St. Charles, Mo.	1460
KAFP	Petaluma, Calif.	1490
KAFY	Bakersfield, Calif.	550
KAGE	Winona, Minn.	1380
KAGH	Crossett, Ark.	800
KAGI	Grants Pass, Oreg.	930
KAGO	Klamath Falls, Oreg.	1150
KAGR	Yuba City, Calif.	1450
KAGT	Anacortes, Wash.	1340
KAHI	Auburn, Calif.	950
KAHU	Waipahu, Hawaii	920
KAIM	Kaimuki, Hawaii	870
KAIR	Tucson, Ariz.	1490
KAJI	Little Rock, Ark.	1250
KAJO	Grants Pass, Oreg.	1270
KAKA	Wickenburg, Ariz.	1250
KAKC	Tulsa, Okla.	970
KAKE	Wichita, Kan.	1240
KALB	Alexandria, La.	580
KALE	Richland, Wash.	960
KALG	Alamogordo, N.Mex.	1230
KALI	Pasadena, Calif.	1430
KALL	Salt Lake City, Utah	910
KALM	Thayer, Mo.	1290
KALT	Atlanta, Tex.	900
KALV	Alva, Okla.	1430
KAMD	Camden, Ark.	910
KAML	Kenedy, Tex.	990
KAMD	Rogers, Ark.	1390
KAMP	El Centro, Calif.	1430
KAMY	McCamey, Tex.	1450
KANA	Anaconda, Mont.	1230
KANB	Shreveport, La.	1330
KAND	Corsicana, Tex.	1340
KANE	New Iberia, La.	1240
KANO	Anoka, Minn.	1470
KANS	Independence, Mo.	1510
KAOK	Lake Charles, La.	1400
KAOL	Carrollton, Mo.	1430
KAPA	Raymond, Wash.	1340
KAPB	Marksville, La.	1370
KAPE	San Antonio, Tex.	1480
KAPI	Pueblo, Colo.	690
KAPR	Douglas, Ariz.	930
KARA	Albuquerque, N.M.	1310
KARE	Atchison, Kan.	1470
KARI	Blaine, Wash.	550
KARK	Little Rock, Ark.	920
KARM	Fresno, Calif.	1430
KARR	Great Falls, Mont.	1400
KART	Jerome, Idaho	1400
KARY	Prosser, Wash.	1310
KASE	Austin, Tex.	970
KASH	Eugene, Ore.	1600
KASI	Ames, Iowa	1430
KASK	Ontario, Calif.	1510
KASL	Newcastle, Wyo.	1240
KASM	Albany, Minn.	1150
KASO	Minden, La.	1240
KAST	Astoria, Ore.	1370
KASY	Auburn, Wash.	1220
KATE	Albert Lea, Minn.	1450
KATI	Casper, Wyo.	1400
KATL	Miles City, Mont.	1340
KATN	Boise, Idaho	1010
KATY	San Luis Obispo, Cal.	1340
KATZ	St. Louis, Mo.	1600
KAUS	Austin, Minn.	1480
KAVE	Carlsbad, N.Mex.	1240
KAVI	Rocky Ford, Colo.	1320
KAVL	Lancaster, Calif.	610
KAVR	Apple Valley, Calif.	960
KAWL	York, Neb.	1370
KAWT	Douglas, Ariz.	1450
KAYE	Puyallup, Wash.	1450
KAYG	Lakewood, Wash.	1480
KAYL	Storm Lake, Iowa	990
KAYO	Seattle, Wash.	1150
KAYS	Hays, Kans.	1400
KAYT	Rupert, Idaho	970
KBAL	San Saba, Tex.	1410
KBAM	Longview, Wash.	1270
KBAN	Bowie, Tex.	1410
KBAR	Burley, Idaho	1230
KBBA	Benton, Ark.	690
KBBB	Borger, Tex.	1600
KBBC	Centerville, Utah	1600
KBBR	North Bend, Oreg.	1340
KBBS	Buffalo, Wyo.	1450
KBCH	Oceanlake, Oreg.	1380
KBCL	Shreveport, La.	1220
KBEA	Mission, Kans.	1480
KBEC	Waxahachie, Tex.	1390
KBEE	Modesto, Calif.	970
KBEK	Elk City, Okla.	1240
KBEL	Idabel, Okla.	1240
KBEN	Carrizo Sprgs., Tex.	1450
KBET	Reno, Nev.	1340
KBEV	Portland, Oreg.	1010
KBFS	Belle Fourche, S.Dak.	1450
KBGN	Caldwell, Idaho	910
KBHC	Nashville, Ark.	1260
KBHM	Branson, Mo.	1220
KBHS	Hot Springs, Ark.	590
KBIA	Columbia, Mo.	1580
KBIF	Fresno, Calif.	900
KBIG	Avalon, Calif.	740
KBIM	Roswell, N.Mex.	910
KBIS	Bakersfield, Calif.	970
KBIX	Muskogee, Okla.	1490
KBIZ	Ottumwa, Iowa	1240
KBJT	Fordyce, Ark.	1570
KBKR	Baker, Oreg.	1490
KBKW	Aberdeen, Wash.	1450
KBLA	Burbank, Calif.	1490
KBLF	Red Bluff, Calif.	1490
KBLI	Blackfoot, Idaho	690
KBLO	Hot Springs, Ark.	1470
KBLT	Big Lake, Tex.	1290
KBLU	Yuma, Ariz.	1320
KBMI	Henderson, Nev.	1400
KBMN	Bozeman, Mont.	1230
KBMO	Benson, Minn.	1290
KBMW	Brooklnrdg., Minn.	1450
KBMX	Coalinga, Calif.	1470
KBMY	Billings, Mont.	1240
KBND	Bend, Oreg.	1110
KBOA	Kennett, Mo.	830
KBOE	Oskaloosa, Iowa	740
KBOI	Boise, Idaho	950
KBOK	Malvern, Ark.	1310
KBOL	Boulder, Colo.	1490
KBOM	Bismark-Mandan, N. Dak.	1270
KBON	Omaha, Nebr.	1490
KBOP	Pleasanton, Tex.	1380
KBOR	Brownsville, Tex.	1600
KBOW	Butte, Mont.	1490
KBOX	Dallas, Tex.	1480
KBOY	Medford, Oreg.	730
KBPS	Portland, Oreg.	1450
KBRB	Arvada, Colo.	1550
KBRC	Mt. Vernon, Wash.	1430
KBRI	Brinkley, Ark.	1570
KBRK	Brookings, S.Dak.	1430
KBRL	McCook, Nebr.	1300
KBRN	Brighton, Colo.	800
KBRO	Bremerton, Wash.	1490
KBRR	Leadville, Colo.	1230
KBRS	Springdale, Ark.	1340
KBRV	Soda Sprgs., Ida.	540
KBRX	O'Neill, Nebr.	1350
KBRZ	Freeport, Texas	1460
KBSF	Springhill, La.	1460
KBST	Big Spring, Tex.	1490
KBTA	Batesville, Ark.	1340
KBTM	Jonesboro, Ark.	1230
KBTN	Neosho, Mo.	1420
KBTO	El Dorado, Kans.	1360
KBUC	Corona, Calif.	1370
KBUD	Athens, Tex.	1410
KBUH	Brigham City, Utah	800
KBUN	Bemidji, Minn.	1450
KBUR	Burlington, Iowa	1490
KBUS	Mexia, Tex.	1590
KBUY	Amarillo, Tex.	1010
KBUZ	Mesa, Ariz.	1010
KBVM	Lancaster, Calif.	1380
KBWD	Brownwood, Tex.	1380
KBYE	Okla. City, Okla.	890
KBYG	Big Spring, Tex.	1400
KBYP	Shamrock, Tex.	1580
KBYR	Anchorage, Alaska	1270
KBZY	Salem, Oreg.	1490
KBZZ	LaJunta, Colo.	1400
KCAL	Redlands, Calif.	1410
KCAP	Helena, Mont.	1340
KCAR	Clarksville, Tex.	1350
KCBC	Des Moines, Iowa	1390
KCBD	Lubbock, Tex.	1590
KCBQ	San Diego, Calif.	1170
KCBS	San Fran., Calif.	740
KCCL	Paris, Ark.	1460
KCCO	Lawton, Okla.	1050
KCCR	Pierre, S.Dak.	1590
KCCT	Corpus Christi, Tex.	1150
KCEE	Tucson, Ariz.	790
KCFA	Spokane, Wash.	1330
KCFH	Cuero, Tex.	1600
KCFI	Cedar Falls, Iowa	1250
KCHA	Charles City, Iowa	1580
KCHE	Cherokee, Iowa	1440
KCHI	Chillicothe, Mo.	1010
KCHJ	Delano, Calif.	1010
KCHR	Charleston, Mo.	1350
KCHS	Truth or Consequences, New Mexico	1400
KCHV	Coachella, Calif.	970
KCHY	Cheyenne, Wyo.	1590
KCID	Caldwell, Idaho	1490
KCIJ	Shreveport, La.	1050
KCIL	Houma, La.	1490
KCIM	Carroll, Iowa	1380
KCJB	Minot, N.Dak.	910
KCJH	San Luis Obispo, Cal.	1280
KCKC	San Bernardino, Cal.	1350
KCKN	Kansas City, Kans.	1340
KCKY	Coolidge, Ariz.	1150
KCLA	Pine Bluff, Ark.	1400
KCLE	Cleburne, Tex.	1120
KCLF	Clifton, Ariz.	1400
KCLN	Clinton, Iowa	1390
KCLO	Leavenworth, Kans.	1410
KCLS	Flagstaff, Ariz.	600
KCLU	Rolla, Mo.	1590
KCLV	Clovis, N.Mex.	1240
KCLW	Hamilton, Tex.	900
KCLX	Colfax, Wash.	1450
KCMC	Texarkana, Tex.	1230
KCMJ	Palm Sprgs., Calif.	1010
KCMO	Kansas City, Mo.	810
KCMS	Manitou Sprgs., Colo.	1490
KCNI	Broken Bow, Nebr.	1280
KCNO	Alturas, Calif.	570
KCNY	San Marcos, Tex.	1470
KCOB	Newton, Iowa	1280
KCOG	Centerville, Iowa	1400
KCOH	Houston, Tex.	1430
KCOK	Tulare, Calif.	1270
KCOL	Ft. Collins, Colo.	1410
KCON	Conway, Ark.	1230
KCOR	San Antonio, Tex.	1350
KCOW	Alliance, Nebr.	1400
KCOY	Santa Maria, Calif.	1400
KCPX	Salt Lake City, Utah	1320
KCRA	Sacramento, Calif.	1320
KCRB	Chanute, Kans.	1460
KCRC	Enid, Okla.	1390
KCRG	Cedar Rapids, Iowa	1600
KCRN	Crane, Tex.	1380
KCRS	Midland, Tex.	550
KCRT	Trinidad, Colo.	1240
KCRV	Caruthersville, Mo.	1370
KCSJ	Pueblo, Colo.	590
KCSR	Chadron, Nebr.	1450
KCTA	Corpus Christi, Tex.	1030
KCTI	Gonzales, Tex.	1450
KCTX	Childress, Tex.	1510
KCUB	Tucson, Ariz.	1290
KCUE	Red Wing, Minn.	1250
KCUL	Fort Worth, Tex.	1540
KCVL	Colville, Wash.	1270
KCVR	Lodi, Calif.	1570
KCYL	Lampasas, Tex.	1450
KDAC	Ft. Bragg, Calif.	1230
KDAD	Weed, Calif.	800
KDAL	Duluth, Minn.	610
KDAN	Eureka, Calif.	790
KDAV	Lubbock, Tex.	580
KDAY	Santa Monica, Calif.	1580
KDB	Santa Barbara, Calif.	1490
KDBC	Mansfield, La.	1360
KDBM	Dillon, Mont.	800
KDBS	Alexandria, La.	1410
KDDD	Dumas, Tex.	800
KDEC	Decorah, Iowa	1240
KDEF	Albuquerque, N.Mex.	1150
KDEN	Denver, Colo.	1340
KDEO	El Cajon, Calif.	910
KDES	Palm Sprgs., Calif.	920
KDET	Center, Tex.	930
KDEX	Dexter, Mo.	1590
KDGO	Durango, Colo.	1240
KDHL	Faribault, Minn.	920
KDIA	Oakland, Calif.	1310
KDIO	Ortonville, Minn.	1350
KDIX	Dickinson, N.Dak.	1280
KDJI	Holbrook, Ariz.	1270
KDKA	Pittsburgh, Pa.	1020
KDKD	Clinton, Mo.	1280
KDLA	DeRidder, La.	1010
KDLK	Del Rio, Tex.	1230
KDLM	Detroit Lakes, Minn.	1380
KDLR	Devils Lake, N.Dak.	1340
KDLS	Penny, Iowa	890
KDMA	Montevideo, Minn.	1400
KDMO	Carthage, Mo.	1580
KDMS	El Dorado, Ark.	1490
KDNT	Denton, Tex.	1400
KDOK	Tyler, Tex.	1410
KDOL	Mojave, Calif.	1340
KDOM	Windom, Minn.	1350
KDON	Salinas, Calif.	1390
KDOT	Reno, Nev.	1590
KDOV	Medford, Oreg.	1170
KDQN	DeQueen, Ark.	740
KDRO	Sedalia, Mo.	1460
KDRS	Paragould, Ark.	1050
KDSJ	Deadwood, S.Dak.	1590
KDSN	Denison, Iowa	1150
KDSX	Denison, Tex.	790
KDTA	Delta, Colo.	1330
KDTH	Dubuque, Iowa	1600
KDUB	Lubbock, Tex.	1250
KDUZ	Hutchinson, Minn.	1580
KDWB	St. Paul, Minn.	1440
KDWT	Stamford, Tex.	1010
KDXE	No. Little Rock, Ark.	1010
KDXU	St. George, Utah	1350
KDYL	Tooele, Utah	1290
KDZA	Pueblo, Colo.	1490
KEAN	Brownwood, Tex.	1370
KEAP	Fresno, Calif.	1440
KEBE	Jacksonville, Tex.	1050
KECK	Odessa, Tex.	1490
KEDO	Longview, Wash.	1050
KEED	Springfield, Oreg.	1230
KEEE	Nacogdoches, Tex.	710
KEEL	Shreveport, La.	1370
KEEN	San Jose, Calif.	1450
KEEP	Twin Falls, Idaho	1130
KEKO	Kailua, Hawaii	1470
KELA	Centralia, Wash.	1400
KELD	El Dorado, Ark.	1240
KELK	Elko, Nev.	1320
KELO	Sioux Falls, S.Dak.	920
KELP	El Paso, Tex.	1230
KELY	Ely, Nev.	1450
KENA	Mena, Ark.	1490
KENE	Toppenish, Wash.	550
KENI	Anchorage, Alaska	1340
KENL	Arcata, Calif.	1450
KENM	Portales, N.Mex.	1390
KENN	Farmington, N.M.	1460
KENO	Las Vegas, Nev.	680
KENS	San Antonio, Tex.	1280
KENY	Bellingham-Ferndale, Wash.	930
KEOK	Payette, Idaho	1450
KEOS	Flagstaff, Ariz.	1290
KEPR	Kennewick, Wash.	610
KEPS	Eagle Pass, Tex.	1270
KERB	Kermit, Tex.	600
KERC	Eastland, Tex.	1590
KERG	Eugene, Oreg.	1280
KERN	Bakersfield, Calif.	1410
KERV	Kerrville, Tex.	1230
KEST	Boise, Idaho	790
KETX	Livingston, Tex.	1440
KEUN	Eunice, La.	1490
KEVE	Minneapolis, Minn.	1440
KEVL	White Castle, La.	1590
KEVT	Tucson, Ariz.	690
KEWB	Oakland, Calif.	910
KEX	Portland, Oreg.	1190
KEXO	Grand June., Colo.	1230
KEYD	Oakes, N.Dak.	1220
KEYE	Perryton, Tex.	1400
KEYJ	Jamestown, N.Dak.	1400
KEYL	Long Prarie, Minn.	1400
KEYS	Corpus Christi, Tex.	1440
KEYY	Provo, Utah	1450
KEYZ	Williston, N.Dak.	1360
KEZU	Rapid City, S.Dak.	920
KEZY	Anaheim, Calif.	1190
KFAB	Omaha, Nebr.	1110
KFAC	Los Angeles, Calif.	1330
KFAL	Fulton, Mo.	900
KFAM	St. Cloud, Minn.	1450
KFAR	Fairbanks, Alaska	660
KFAX	San Francisco, Calif.	1100
KFAY	Fayetteville, Ark.	1250
KFBB	Great Falls, Mont.	1310
KFBC	Cheyenne, Wyo.	1240
KFBK	Sacramento, Calif.	1530
KFDA	Amarillo, Tex.	1440
KFDF	Van Buren, Ark.	1580
KFDM	Beaumont, Tex.	560
KFDR	Grand Coulee, Wash.	1360
KFEL	Pueblo, Colo.	970
KFEQ	St. Joseph, Mo.	680
KFFA	Helena, Ark.	1360
KFGQ	Boone, Iowa	1260
KFH	Wichita, Kans.	1330
KFI	Los Angeles, Calif.	640
KFIF	Tucson, Ariz.	1550
KFIV	Modesto, Calif.	1360
KFIZ	Fond du Lac, Wis.	1450
KFJB	Marshalltown, Iowa	1230
KFJM	Grand Forks, N.Dak	1370
KFJZ	Ft. Worth, Tex.	1270
KFKA	Greeley, Colo.	1310
KFKF	Bellevue, Wash.	1330
KFKU	Lawrence, Kans.	1250
KFLD	Floydada, Tex.	900
KFLJ	Walsenburg, Colo.	1380
KFLW	Klamath Falls, Oreg.	1450
KFLY	Corvallis, Oreg.	1240
KFMB	San Diego, Calif.	540
KFMJ	Tulsa, Okla.	1050
KFML	Denver, Colo.	1390
KFMO	Flat River, Mo.	1240
KFNF	Shenandoah, Iowa	920
KFNV	Ferriday, La.	1600
KFNW	Fargo, N.Dak.	900
KFOR	Lincoln, Nebr.	1240
KFOX	Long Beach, Calif.	1280
KFPW	Ft. Smith, Ark.	1230
KFQD	Anchorage, Alaska	730
KFRA	Franklin, La.	1390
KFRB	Fairbanks, Alaska	900
KFRC	San Francisco, Calif.	610
KFRD	Rosenberg, Tex.	980
KFRE	Fresno, Calif.	940
KFRM	Kansas City, Mo.	550
KFRO	Longview, Tex.	1370
KFRU	Columbia, Mo.	1400
KFSA	Ft. Smith, Ark.	950
KFSB	Joplin, Mo.	1310
KFSC	Denver, Colo.	1220
KFSD	San Diego, Calif.	600
KFSG	Los Angeles, Calif.	1150
KFST	Ft. Stockton, Tex.	860
KFTM	Ft. Morgan, Colo.	1400
KFTV	Paris, Tex.	1250
KFUN	Las Vegas, N.Mex.	1230
KFUO	St. Louis, Mo.	850
KFVS	Cape Girardeau, Mo.	960
KFWB	Los Angeles, Calif.	980
KFXD	Nampa, Idaho	580
KFXM	San Bernardino, Calif.	590
KFYN	Bonham, Tex.	1420
KFYO	Lubbock, Tex.	790
KFYR	Bismarck, N.Dak.	550
KGA	Spokane, Wash.	1510
KGAF	Gainesville, Tex.	1580
KGAK	Gallup, N.Mex.	1330
KGAL	Lebanon, Oreg.	920
KGAS	Carthage, Tex.	1590

C.L.	Location	Kc.
KGAY	Salem, Oreg.	1430
KGB	San Diego, Calif.	1360
KGBC	Galveston, Tex.	1540
KGBS	Los Angeles, Calif.	1020
KGBT	Harlingen, Tex.	1530
KGBX	Springfield, Mo.	1260
KGCA	Rugby, N.D.	1450
KGCX	Sidney, Mont.	1480
KGDN	Edmonds, Wash.	630
KGEE	Bakersfield, Calif.	1230
KGEK	Sterling, Colo.	1230
KGEM	Boise, Idaho	1140
KGEN	Tulare, Calif.	1370
KGER	Long Beach, Calif.	1390
KGEZ	Kalispell, Mont.	600
KGFF	Shawnee, Okla.	1450
KGFJ	Los Angeles, Calif.	1230
KGFL	Roswell, N.Mex.	1400
KGFW	Kearney, Nebr.	1340
KGFX	Pierre, S.Dak.	630
KGGF	Coffeyville, Kans.	690
KGGG	Forest Grove, Oreg.	1570
KGGM	Albuquerque, N.Mex.	610
KGHF	Pueblo, Colo.	1350
KGHL	Billings, Mont.	790
KGHM	Brookfield, Mo.	1470
KGHS	International Falls, Minn.	1230
KGIL	San Fernando, Calif.	1260
KGIW	Alamosa, Colo.	1450
KGKB	Tyler, Tex.	1490
KGKL	San Angelo, Tex.	960
KGLC	Miami, Okla.	910
KGLN	Glenwood Spgs., Colo.	980
KGLO	Mason City, Iowa	1300
KGLU	Safford, Ariz.	1480
KGMB	Honolulu, Hawaii	590
KGMC	Englewood, Colo.	1150
KGMO	Cape Girardeau, Mo.	1220
KGMS	Sacramento, Calif.	1380
KGMT	Fairbury, Nebr.	1310
KGNB	New Braunfels, Tex.	1420
KGNC	Amarillo, Tex.	710
KGNO	Dodge City, Kans.	1370
KGO	San Francisco, Calif.	810
KGON	Oregon City, Oreg.	1520
KGOS	Torrington, Wyo.	1490
KGPC	Grafton, N.Dak.	1340
KGRI	Henderson, Tex.	1000
KGRL	Bend, Oreg.	940
KGRN	Grinnell, Iowa	1410
KGRO	Gresham, Oreg.	1230
KGRT	Las Cruces, N.Mex.	570
KGST	Fresno, Calif.	1600
KGU	Honolulu, Hawaii	760
KGUC	Gunnison, Colo.	1490
KGUD	Santa Barbara, Calif.	990
KGVL	Greenville, Tex.	1400
KGVO	Missoula, Mont.	1290
KGVW	Belgrade, Mont.	630
KGW	Portland, Oreg.	620
KGWA	Enid, Okla.	960
KGY	Olympia, Wash.	1240
KGYN	Guymon, Okla.	1220
KHAK	Cedar Rapids, Iowa	1360
KHAM	Albuquerque, N.Mex.	1580
KHAR	Anchorage, Alaska	590
KHAS	Hastings, Nebr.	1230
KHAT	Phoenix, Ariz.	1480
KHBC	Hilo, Hawaii	970
KHBM	Monticello, Ark.	1430
KHBR	Hillsboro, Tex.	1560
KHEM	Big Springs, Tex.	1270
KHEN	Henryetta, Okla.	1590
KHEP	Phoenix, Ariz.	1280
KHEY	El Paso, Tex.	690
KHFH	Fry, Ariz.	1420
KHHH	Pampa, Tex.	1230
KHIT	Walla Walla, Wash.	1320
KHJ	Los Angeles, Calif.	930
KHMO	Hannibal, Mo.	1070
KHOB	Hobbs, N.Mex.	1390
KHOE	Truckee, Calif.	1400
KHOG	Fayetteville, Ark.	1440
KHOQ	Hoquiam, Wash	1560
KHOT	Madera, Calif.	1250
KHOW	Denver, Colo.	630
KHOZ	Harrison, Ark.	900
KHQ	Spokane, Wash.	590
KHSJ	Hemet, Calif.	1320
KHSL	Chico, Calif.	1290
KHUB	Fremont, Nebr.	1340
KHUZ	Borger, Tex.	1490
KHVH	Honolulu, Hawaii	1040
KIBE	Palo Alto, Calif.	1220
KIBH	Seward, Alaska	1340
KIBL	Beeville, Tex.	1490
KIBS	Bishop, Calif.	1230
KICD	Spencer, Iowa	1240
KICK	Springfield, Mo.	1340
KICN	Denver, Colo.	710
KICO	Calexico, Calif.	1490
KICY	Nome, Alaska	850
KID	Idaho Falls, Idaho	590
KIDD	Monterey, Calif.	630
KIDO	Boise, Idaho	630
KIEM	Eureka, Calif.	1480
KIEV	Glendale, Calif.	870
KIFI	Idaho Falls, Idaho	1260
KIFN	Phoenix, Ariz.	860
KIFW	Sitka, Alaska	1230
KIHN	Hugo, Okla.	1340
KIHO	Sioux Falls, S.Dak.	1270
KIHR	Hood River, Oreg.	1340
KIJV	Huron, S.Dak.	1340
KIKI	Honolulu, Hawaii	830
KIKO	Miami, Ariz.	1340
KIKS	Sulphur, La.	1310
KILE	Galveston, Tex.	1400
KILO	Grand Forks, S.Dak.	1440
KILT	Houston, Tex.	610
KIMA	Yakima, Wash.	1460
KIMB	Kimball, Nebr.	1260
KIML	Gillette, Wyo.	1490
KIMN	Denver, Colo.	950
KIMO	Hilo, Hawaii	850
KIMP	Mt. Pleasant, Tex.	960
KIND	Independence, Kans.	1010
KINE	Kingsville, Tex.	1330
KING	Seattle, Wash.	1090
KINK	Phoenix, Ariz.	1010
KINS	Eureka, Calif.	980
KINT	El Paso, Tex.	1590
KINY	Juneau, Alaska	800
KIOA	Des Moines, Iowa	940
KIOT	Barstow, Calif.	1310
KIOX	Bay City, Tex.	1270
KIPA	Hilo, Hawaii	1110
KIRL	Wichita, Kans.	1070
KIRO	Seattle, Wash.	710
KIRT	Mission, Tex.	1580
KIRX	Kirksville, Mo.	1450
KISD	Sioux Falls, S.Dak.	1230
KISN	Vancouver, Wash.	910
KIST	Santa Barbara, Calif.	1340
KIT	Yakima, Wash.	1280
KITE	San Antonio, Tex.	930
KITI	Chehalis, Wash.	1420
KITN	Olympia, Wash.	920
KITO	San Bernardino, Calif.	1290
KIUL	Garden City, Kans.	1240
KIUN	Pecos, Tex.	1400
KIUP	Durango, Colo.	930
KIVY	Crockett, Tex.	1290
KIXL	Dallas, Tex.	1040
KIXX	Provo, Utah	1400
KIXZ	Amarillo, Tex.	940
KIZZ	El Paso, Tex.	1150
KJAM	Madison, S.Dak.	1390
KJAN	Atlantic, Iowa	1220
KJAX	Santa Rosa, Calif.	1150
KJAY	Topeka, Kans.	1440
KJBC	Midland, Tex.	1150
KJCK	Junction City, Kans.	1420
KJEF	Jennings, La.	1290
KJEM	Oklahoma City, Okla.	800
KJET	Beaumont, Tex.	1380
KJFJ	Webster City, Iowa	1570
KJIM	Ft. Worth, Tex.	870
KJLT	North Platte, Nebr.	970
KJNO	Juneau, Alaska	630
KJOE	Shreveport, La.	1480
KJOY	Stockton, Calif.	1280
KJR	Seattle, Wash.	950
KJRG	Newton, Kans.	950
KJSK	Columbus, Nebr.	900
KKAN	Phillipsburg, Kans.	1490
KKAR	Pomona, Calif.	1220
KKAS	Silsbee, Tex.	1300
KKEY	Vancouver, Wash.	1150
KKID	Pendleton, Oreg.	1240
KKIS	Pittsburg, Calif.	990
KKIT	Taos, N.Mex.	1340
KLAC	Los Angeles, Calif.	570
KLAD	Klamath Falls, Oreg.	960
KLAK	Lakewood, Colo.	1600
KLAM	Cordova, Alaska	1450
KLAN	Lemoore, Calif.	1320
KLAS	Las Vegas, Nev.	1230
KLBM	La Grande, Oreg.	1450
KLBS	Los Banos, Calif.	1330
KLCB	Libby, Mont.	1230
KLCN	Blytheville, Ark.	910
KLCO	Poteau, Okla.	1280
KLEA	Lovington, N.Mex.	630
KLEE	Ottumwa, Iowa	1480
KLEI	Kailua, Hawaii	1240
KLEM	LeMars, Iowa	1410
KLEN	Killeen, Tex.	1050
KLEO	Wichita, Kans.	1480
KLER	Orofino, Idaho	950
KLEX	Lexington, Mo.	1570
KLFD	Litchfield, Minn.	1410
KLFT	Golden Meadow, La.	1600
KLGA	Algona, Iowa	1600
KLGN	Logan, Utah	1390
KLGR	Redwood Falls, Minn.	1490
KLIB	Liberal, Kans.	1470
KLIC	Monroe, La.	1230
KLID	Poplar Bluff, Mo.	1340
KLIF	Dallas, Tex.	1190
KLIK	Jefferson City, Mo.	950
KLIL	Estherville, Iowa	1340
KLIN	Lincoln, Nebr.	1400
KLIQ	Portland, Oreg.	1290
KLIR	Denver, Colo.	990
KLIX	Twin Falls, Idaho	1310
KLIZ	Brainerd, Minn.	1380
KLKC	Parsons, Kans.	1540
KLLA	Leesville, La.	1570
KLLL	Lubbock, Tex.	1460
KLMO	Longmont, Colo.	1050
KLMR	Lamar, Colo.	920
KLMS	Lincoln, Nebr.	1480
KLMX	Clayton, N.Mex.	1450
KLO	Ogden, Utah	1430
KLOE	Goodland, Kans.	730
KLOG	Kelso, Wash.	1490
KLOH	Pipestone, Minn.	1050
KLOK	San Jose, Calif.	1170
KLOO	Corvallis, Oreg.	1340
KLOQ	Yakima, Wash.	1390
KLOS	Albuquerque, N.Mex.	1450
KLOU	Lake Charles, La.	1580
KLOW	Loveland, Colo.	1570
KLPL	Lake Providence, La.	1050
KLPM	Minot, N.Dak.	1390
KLPR	Okla. City, Okla.	1140
KLPW	Union, Mo.	1220
KLRA	Little Rock, Ark.	1010
KLRS	Mountain Grove, Mo.	1360
KLTF	Little Falls, Minn.	960
KLTR	Blackwell, Okla.	1580
KLTZ	Glasgow, Mont.	1240
KLUB	Salt Lake City, Utah	570
KLUE	Longview, Tex.	1280
KLUK	Evanston, Wyo.	1240
KLUV	Haynesville, La.	1580
KLVL	Pasadena, Tex.	1480
KLVT	Levelland, Tex.	1230
KLWN	Lawrence, Kans.	1320
KLWT	Lebanon, Mo.	1230
KLYD	Bakersfield, Calif.	1350
KLYK	Spokane, Wash.	1230
KLYR	Clarksville, Ark.	1360
KLZ	Denver, Colo.	560
KMA	Shenandoah, Iowa	960
KMAC	San Antonio, Tex.	630
KMAE	McKinney, Tex.	1600
KMAK	Fresno, Calif.	1340
KMAN	Manhattan, Kans.	1350
KMAP	Bakersfield, Calif.	1490
KMAQ	Maquoketa, Iowa	1320
KMAR	Winnsboro, La.	1570
KMBC	Kansas City, Mo.	980
KMBL	Junction, Tex.	1450
KMBO	Tucson, Ariz.	940
KMBY	Monterey, Calif.	1240
KMCD	Fairfield, Iowa	1570
KMCM	McMinnville, Oreg.	1260
KMCO	Conroe, Tex.	900
KMDO	Ft. Scott, Kans.	1600
KMED	Medford, Oreg.	1440
KMEO	Omaha, Nebr.	660
KMET	Paradise, Calif.	930
KMGM	Albuquerque, N.Mex.	730
KMHT	Marshall, Tex.	1450
KMIL	Cameron, Tex.	1330
KMIN	Grants, N.M.	980
KMIS	Portageville, Mo.	1050
KMJ	Fresno, Calif.	580
KMLB	Monroe, La.	1440
KMLW	Marlin, Tex.	1010
KMMJ	Grand Island, Nebr.	750
KMNS	Sioux City, Iowa	620
KMO	Tacoma, Wash.	1360
KMON	Great Falls, Mont.	560
KMOP	Tucson, Ariz.	1330
KMOR	Littleton, Colo.	1510
KMOX	St. Louis, Mo.	1120
KMPC	Los Angeles, Calif.	710
KMRC	Morgan City, La.	1430
KMRS	Morris, Minn.	1570
KMSL	Uklah, Calif.	1250
KMUL	Muleshoe, Tex.	1380
KMUR	Murray, Utah	1230
KMUS	Muskogee, Okla.	1380
KMVI	Wailuku, Hawaii	550
KMYC	Marysville, Calif.	1410
KMYT	Clayton, Mo.	1320
KNAF	Fredericksburg, Tex.	910
KNAK	Salt Lake City, Utah	1280
KNAL	Victoria, Tex.	1410
KNBA	Vallejo, Calif.	1190
KNBC	San Francisco, Calif.	680
KNBE	Kamab, Utah	1240
KNBX	Kirkland, Wash.	1050
KNBY	Newport, Ark.	1280
KNCK	Concordia, Kans.	1390
KNCM	Moberly, Mo.	1230
KNCO	Garden City, Kans.	1050
KNCY	Nebraska City, Nebr.	1600
KNDC	Hettinger, N.Dak.	1490
KNDE	Aztec, N.Mex.	1340
KNDI	Honolulu, Hawaii	1270
KNDY	Marysville, Kans.	1570
KNEA	Jonesboro, Ark.	970
KNEB	Scottsbluff, Nebr.	960
KNED	McAlester, Okla.	1150
KNEL	Brady, Tex.	1490
KNEM	Nevada, Mo.	1240
KNET	Palestine, Tex.	1450
KNEW	Spokane, Wash.	790
KNEX	McPherson, Kans.	1540
KNEZ	Lompoc, Calif.	960
KNGS	Hanford, Calif.	620
KNIA	Knoxville, Iowa	1320
KNIM	Maryville, Mo.	1580
KNIT	Abilene, Tex.	1280
KNND	Cottage Grove, Oreg.	1400
KNOC	Natchitoches, La.	1450
KNOE	Monroe, La.	1390
KNOG	Nogales, Ariz.	1340
KNOK	Ft. Worth, Tex.	970
KNOR	Norman, Okla.	1400
KNOT	Prescott, Ariz.	1450
KNOW	Austin, Tex.	1490
KNOX	Grand Forks, N.Dak.	1310
KNPT	Newport, Ore.	1310
KNUJ	New Ulm, Minn.	860
KNUZ	Houston, Tex.	1230
KNWS	Waterloo, Iowa	1090
KNX	Los Angeles, Calif.	1070
KOA	Denver, Colo.	850
KOAC	Corvallis, Oreg.	550
KOAL	Price, Utah	1230
KOAM	Pittsburg, Kans.	860
KOB	Albuquerque, N.Mex.	770
KOBE	Las Cruces, N.Mex.	1450
KOBH	Hot Springs, S.Dak.	580
KOCA	Kilgore, Tex.	1240
KOCY	Oklahoma City, Okla.	1340
KODE	Joplin, Mo.	1230
KODI	Cody, Wyo.	1400
KODL	The Dalles, Oreg.	1440
KODY	North Platte, Nebr.	1240
KOEL	Oelwein, Iowa	950
KOFA	Yuma, Ariz.	1240
KOFE	Pullman, Wash.	1150
KOFI	Kalispell, Mont.	930
KOFO	Ottawa, Kans.	1220
KOFY	San Mateo, Calif.	1050
KOGA	Ogallala, Nebr.	930
KOGT	Orange, Tex.	1600
KOH	Reno, Nev.	630
KOHI	St. Helens, Oreg.	1600
KOHO	Honolulu, Hawaii	1170
KOHU	Hermiston, Oreg.	1570
KOIL	Omaha, Nebr.	1290
KOIN	Portland, Oreg.	970
KOJM	Havre, Mont.	610
KOKA	ShrevePort, La.	980
KOKE	Austin, Tex.	1370
KOKL	Okmulgee, Okla.	1240
KOKO	Warrensburg, Mo.	1450
KOKX	Keokuk, Iowa	1310
KOKY	Little Rock, Ark.	1440
KOL	Seattle, Wash.	1300
KOLD	Tucson, Ariz.	1450
KOLE	Port Arthur, Tex.	1340
KOLJ	Quanah, Tex.	1150
KOLO	Reno, Nev.	920
KOLR	Sterling, Colo.	1490
KOLS	Pryor, Okla.	1570
KOLT	Scottsbluff, Nebr.	1320
KOLY	Mobridge, S.Dak.	1300
KOMA	Okla. City, Okla.	1520
KOME	Tulsa, Okla.	1300
KOMO	Seattle, Wash.	1000
KOMW	Omak, Wash.	680
KOMY	Watsonville, Calif.	1340
KONE	Reno, Nev.	1450
KONG	Visalia, Calif.	1400
KONI	Spanish Fork, Utah	1480
KONO	San Antonio, Tex.	860
KONP	Port Angeles, Wash.	1450
KOOD	Honolulu, Hawaii	990
KOOK	Billings, Mont.	970
KOOL	Phoenix, Ariz.	960
KOOO	Omaha, Nebr.	1420
KOOS	Coos Bay, Oreg.	1230
KOPR	Butte, Mont.	550
KOPY	Alice, Tex.	1070
KOQT	Bellingham, Wash.	1550
KORA	Bryan, Tex.	1240
KORC	Mineral Wells, Tex.	1140
KORD	Pasco, Wash.	910
KORE	Eugene, Oreg.	1450
KORK	Las Vegas, Nev.	1340
KORL	Honolulu, Hawaii	650
KORN	Mitchell, S.Dak.	1490
KORT	Grangeville, Idaho	1230
KOSA	Odessa, Tex.	1230
KOSE	Osceola, Ark.	860
KOSI	Aurora, Colo.	1430
KOSY	Texarkana, Ark.	790
KOTA	Rapid City, S.Dak.	1380
KOTE	Fergus Falls, Minn.	1250
KOTN	Pine Bluff, Ark.	1490
KOTS	Deming, N.M.	1230
KOUR	Independence, Iowa	1220
KOVC	Valley City, N.Dak.	1490
KOVE	Lander, Wyo.	1330
KOVO	Provo, Utah	960
KOWB	Laramie, Wyo.	1290
KOWL	Bijou, Calif.	1490
KOWN	Escondido, Calif.	1450
KOXR	Oxnard, Calif.	910
KOY	Phoenix, Ariz.	550
KOYL	Odessa, Tex.	1310
KOYN	Billings, Mont.	910
KOZE	Lewiston, Idaho	1300
KOZI	Chelan, Wash.	1220
KOZY	Grand Rapids, Minn.	1490
KPAC	Port Arthur, Tex.	1250
KPAK	Minden, La.	1240
KPAL	Palm Springs, Calif.	1450
KPAM	Portland, Oreg.	1410
KPAN	Hereford, Tex.	860
KPAP	Redding, Calif.	1270
KPAS	Banning, Calif.	1490
KPAY	Chico, Calif.	1060
KPBA	Pine Bluff, Ark.	1590
KPBM	Carlsbad, N.Mex.	740
KPCA	Marked Tree, Ark.	1580
KPDN	Pampa, Tex.	1340
KPDQ	Portland, Oreg.	800
KPEG	Spokane, Wash.	1380
KPEL	Lafayette, La.	1420
KPEP	San Angelo, Tex.	1420
KPER	Gilroy, Calif.	1290
KPET	Lamesa, Tex.	690
KPGE	Page, Ariz.	1340
KPHO	Phoenix, Ariz.	910
KPIG	Cedar Rapids, Iowa	1450
KPIK	Colorado Spgs., Colo.	1580
KPIN	Casa Grande, Ariz.	1260
KPKW	Pasco, Wash.	1340
KPLA	Plainview, Tex.	1050
KPLC	Lake Charles, La.	1470
KPLK	Dallas, Oreg.	1460
KPLT	Paris, Tex.	1490
KPLW	Union, Mo.	1220
KPLY	Crescent City, Calif.	1240
KPMC	Bakersfield, Calif.	1560

C.L.	Location	Kc.
KPNG	Port Neches, Tex.	1150
KPOC	Pocahontas, Ark.	1420
KPOD	Crescent City, Calif.	1310
KPOF	Denver, Colo.	910
KPOI	Honolulu, Hawaii	1380
KPOJ	Portland, Oreg.	1330
KPOK	Scottsdale, Ariz.	1440
KPOL	Los Angeles, Calif.	1540
KPON	Anderson, Calif.	1580
KPOR	Quincy, Wash.	1370
KPOW	Powell, Wyo.	1260
KPPC	Pasadena, Calif.	1240
KPQ	Wenatchee, Wash.	560
KPRB	Redmond, Oreg.	1240
KPRC	Houston, Tex.	950
KPRK	Livingston, Mont.	1340
KPRL	Paso Robles, Calif.	1230
KPRO	Riverside, Calif.	1440
KPRS	Kansas City, Mo.	1590
KPSO	Falfurrias, Tex.	1260
KPST	Preston, Idaho	1340
KPTL	Carson City, Nev.	1300
KPUG	Bellingham, Wash.	1170
KQAQ	Austin, Minn.	970
KQBY	San Francisco, Calif.	1550
KQDI	Bismarck, N.D.	1350
KQDY	Minot, N.Dak.	1320
KQEN	Roseburg, Oreg.	1250
KQEO	Albuquerque, N.Mex.	920
KQIK	Lakeview, Oreg.	1230
KQTE	Missoula, Mont.	1340
KQTY	Everett, Wash.	1230
KQV	Pittsburgh, Pa.	1410
KRAC	Alamogordo, N.M.	1270
KRAD	E. Grand Forks, Minn.	1590
KRAE	Cheyenne, Wyo.	1480
KRAI	Craig, Colo.	550
KRAK	Stockton, Calif.	1140
KRAL	Rawlins, Wyo.	1240
KRAM	Las Vegas, Nev.	920
KRAY	Amarillo, Tex.	1360
KRBA	Lufkin, Tex.	1340
KRBC	Abilene, Tex.	1470
KRBI	St. Peter, Minn.	1310
KRBO	Las Vegas, Nev.	1050
KRCK	Ridgecrest, Calif.	1360
KRCO	Prineville, Oreg.	690
KRCT	Baytown, Tex.	650
KRDG	Redding, Calif.	1230
KRDO	Colo. Springs, Colo.	1240
KRDP	Reedsport, Oreg.	1470
KRDU	Dinuba, Calif.	1240
KRE	Berkeley, Calif.	1400
KREB	Shreveport, La.	1550
KREH	Dakdale, La.	900
KREI	Farmington, Mo.	800
KREM	Spokane, Wash.	970
KREO	Indio, Calif.	1400
KRES	St. Joseph, Mo.	1550
KREW	Sunnyside, Wash.	1230
KREX	Grand Junc., Colo.	920
KRFD	Owatonna, Minn.	1390
KRFS	Superior, Nebr.	1600
KRGI	Grand Island, Neb.	1430
KRGV	Weslaco, Tex.	1290
KRHD	Duncan, Okla.	1350
KRIB	Mason City, Iowa	1490
KRIC	Beaumont, Tex.	1450
KRIG	Odessa, Tex.	1410
KRIH	Rayville, La.	990
KRIO	McAllen, Tex.	910
KRIZ	Phoenix, Ariz.	1230
KRKC	King City, Calif.	1570
KRKD	Los Angeles, Calif.	1150
KRKO	Everett, Wash.	1380
KRKS	Ridgecrest, Calif.	1240
KRLA	Pasadena, Calif.	1110
KRLC	Lewiston, Idaho	1350
KRLD	Dallas, Tex.	1080
KRLN	Canon City, Colo.	1400
KRLW	Walnut Ridge, Ark.	1320
KRMD	Shreveport, La.	1340
KRMG	Tulsa, Okla.	740
KRML	Carmel, Calif.	1410
KRMO	Monett, Mo.	990
KRMS	Osage Beach, Mo.	1150
KRNO	San Bernardino, Calif.	1240
KRNR	Roseburg, Oreg.	1490
KRNS	Burns, Oreg.	1230
KRNT	Des Moines, Iowa	1350
KRNY	Kearney, Nebr.	1460
KROC	Rochester, Minn.	1340
KROD	El Paso, Tex.	600
KROE	Sheridan, Wyo.	930
KROF	Abbeville, La.	960
KROG	Sonora, Calif.	1450
KROP	Brawley, Calif.	1300
KROS	Clinton, Iowa	1340
KROX	Crookston, Minn.	1260
KROY	Sacramento, Calif.	1240
KRPL	Moscow, Idaho	1400
KRRV	Sherman, Tex.	910
KRSC	Othello, Wash.	1400
KRSD	Rapid City, S.Dak.	1340
KRSI	St. Louis Park, Minn.	950
KRSL	Russell, Kans.	990
KRSN	Los Alamos, N.Mex.	1490
KRTN	Raton, N.Mex.	1490
KRTR	Thermopolis, Wyo.	1490
KRUN	Ballinger, Tex.	1400
KRUS	Ruston, La.	1490
KRUX	Glendale, Ariz.	1360
KRVC	Ashland, Oreg.	1350
KRVN	Lexington, Nebr.	1010
KRXK	Rexburg, Idaho	1230
KRXL	Roseburg, Oreg.	1250
KRYS	Corpus Christi, Tex.	1360
KRZE	Farmington, N.M.	1280
KRZY	Grand Prairie, Tex.	730
KSAC	Manhattan, Kans.	580
KSAL	Salina, Kans.	1150
KSAM	Huntsville, Tex.	1490
KSAN	San Francisco, Calif.	1450
KSAY	San Francisco, Calif.	1010
KSBW	Salinas, Calif.	1380
KSCB	Liberal, Kans.	600
KSCJ	Sioux City, Iowa	1360
KSCO	Santa Cruz, Calif.	1080
KSD	St. Louis, Mo.	550
KSDA	Redding, Calif.	1400
KSDN	Aberdeen, S.Dak.	930
KSDO	San Diego, Calif.	1130
KSEI	Pocatello, Idaho	930
KSEK	Pittsburg, Kans.	1340
KSEL	Lubbock, Tex.	950
KSEM	Moses Lake, Wash.	1470
KSEN	Shelby, Mont.	1150
KSEO	Durant, Okla.	750
KSET	El Paso, Tex.	1340
KSEW	Sitka, Alaska	1400
KSEY	Seymour, Tex.	1230
KSFA	Nacogdoches, Tex.	860
KSFE	Needles, Calif.	1340
KSFO	San Francisco, Calif.	560
KSGM	Ste. Genevieve, Mo.	980
KSIB	Creston, Iowa	1520
KSID	Sidney, Nebr.	1340
KSIG	Crowley, La.	1450
KSIJ	Gladewater, Tex.	1430
KSIL	Silver City, N.Mex.	1340
KSIM	Sikeston, Mo.	1400
KSIR	Wichita, Kans.	800
KSIS	Sedalia, Mo.	1050
KSIW	Woodward, Okla.	1450
KSIX	Corpus Christi, Tex.	1230
KSJB	Jamestown, N.Dak.	600
KSKI	Sun Valley, Idaho	1340
KSKY	Dallas, Tex.	660
KSL	Salt Lake City, Utah	1160
KSLM	Salem, Oreg.	1390
KSLO	Opelousas, La.	1230
KSLV	Monte Vista, Colo.	1240
KSMA	Santa Maria, Calif.	1240
KSML	Seminole, Tex.	1250
KSMN	Mason City, Iowa	1010
KSMO	Salem, Mo.	1340
KSNA	Santa Rosa, Calif.	1460
KSNB	Santa Barbara, Calif.	1290
KSNY	Snyder, Tex.	1450
KSO	Des Moines, Iowa	1460
KSOK	Arkansas City, Kans.	1280
KSON	San Diego, Calif.	1240
KSOO	Sioux Falls, S.Dak.	1140
KSOP	Salt Lake City, Utah	1370
KSOX	Raymondville, Tex.	1240
KSPA	Santa Paula, Calif.	1400
KSPI	Stillwater, Okla.	780
KSPL	Diboll, Tex.	1260
KSPT	Sandpoint, Idaho	1400
KSRA	Salmon, Idaho	1290
KSRC	Socorro, N.Mex.	1490
KSRO	Santa Rosa, Calif.	1350
KSRV	Ontario, Oreg.	1380
KSSS	Colorado Springs, Colo.	740
KSST	Sulphur Springs, Tex.	1230
KSTA	Coleman, Tex.	1000
KSTB	Breckenridge, Tex.	1450
KSTE	St. Louis, Mo.	690
KSTN	Stockton, Calif.	1420
KSTP	St. Paul, Minn.	1500
KSTR	Grand Junction, Colo.	620
KSTT	Davenport, Iowa	1170
KSTV	Stephenville, Tex.	1510
KSUB	Cedar City, Utah	590
KSUE	Susanville, Calif.	1240
KSUM	Fairmont, Minn.	1370
KSUN	Bisbee, Ariz.	1230
KSVC	Richfield, Utah	980
KSVN	Ogden, Utah	730
KSVP	Artesia, N.Mex.	990
KSWA	Graham, Tex.	1330
KSWC	Tucson, Ariz.	1550
KSWI	Council Bluffs, Iowa	1560
KSWO	Lawton, Okla.	1380
KSWS	Roswell, N.Mex.	1230
KSXX	Salt Lake City, Utah	630
KSYC	Yreka, Calif.	1490
KSYD	Wichita Falls, Tex.	990
KSYL	Alexandria, La.	970
KSYX	Santa Rosa, N.Mex.	1420
KTAC	Tacoma, Wash.	850
KTAE	Taylor, Tex.	1260
KTAN	Tucson, Ariz.	580
KTAR	Phoenix, Ariz.	620
KTAT	Frederick, Okla.	1570
KTBB	Tyler, Tex.	600
KTBC	Austin, Tex.	590
KTCB	Malden, Mo.	1470
KTCI	Terrytown, Nebr.	690
KTCN	Berryville, Ark.	1480
KTCS	Fort Smith, Ark.	1410
KTDO	Toledo, Oreg.	1230
KTEE	Idaho Falls, Idaho	900
KTEL	Walla Walla, Wash.	1490
KTEM	Temple, Tex.	1400
KTER	Terrell, Tex.	1570
KTFI	Twin Falls, Idaho	1270
KTFS	Texarkana, Tex.	1400
KTFY	Brownfield, Tex.	1300
KTHE	Thermopolis, Wyo.	1240
KTHS	Little Rock, Ark.	1090
KTHT	Houston, Tex.	790
KTIB	Thibodaux, La.	630
KTIL	Tillamook, Oreg.	1590
KTIM	San Rafael, Calif.	1510
KTIP	Porterville, Calif.	1450
KTIS	Minneapolis, Minn.	900
KTIX	Seattle, Wash.	1590
KTJS	Hobart, Okla.	1420
KTKN	Ketchikan, Alaska	930
KTKR	Taft, Calif.	1310
KTKT	Tucson, Ariz.	990
KTLD	Tullulah, La.	1360
KTLN	Denver, Colo.	1280
KTLO	Mtn. Home, Ark.	1490
KTLQ	Tahlequah, Okla.	1580
KTLU	Rusk, Tex.	550
KTLW	Texas City, Tex.	920
KTMC	McAlester, Okla.	1400
KTMS	Santa Barbara, Calif.	1250
KTNC	Falls City, Nebr.	1230
KTNM	Tucumcari, N.Mex.	1400
KTNT	Tacoma, Wash.	1400
KTOC	Jonesboro, La.	920
KTOD	Sinton, Tex.	1590
KTOE	Mankato, Minn.	1420
KTOH	Lihue, Hawaii	1490
KTOK	Oklahoma City, Okla.	1000
KTOO	Henderson, Nev.	1280
KTOP	Topeka, Kans.	1490
KTPA	Prescott, Ark.	1370
KTRB	Modesto, Calif.	860
KTRC	Santa Fe, N.Mex.	1400
KTRE	Lufkin, Tex.	1420
KTRF	Thief River Falls, Minn.	1230
KTRH	Houston, Tex.	740
KTRI	Sioux City, Iowa	1470
KTRM	Beaumont, Tex.	990
KTRN	Wichita Falls, Tex.	1290
KTRY	Bastrop, La.	730
KTSA	San Antonio, Tex.	550
KTSM	El Paso, Tex.	1380
KTTN	Trenton, Mo.	1600
KTTR	Rolla, Mo.	1490
KTTS	Springfield, Mo.	1400
KTUC	Tucson, Ariz.	1400
KTUE	Tulia, Tex.	1260
KTUL	Tulsa, Okla.	1430
KTUR	Turlock, Calif.	1390
KTUX	Pueblo, Colo.	1480
KTW	Seattle, Wash.	1250
KTWL	Golden, Colo	1250
KTWO	Casper, Wyo.	1470
KTXJ	Jasper, Tex.	1350
KTXL	San Angelo, Tex.	1340
KTXO	Sherman, Tex.	1500
KTYM	Inglewood, Calif.	1460
KUAM	Agana, Guam	610
KUBA	Yuba City, Calif.	1600
KUBC	Montrose, Colo.	580
KUBE	Pendleton, Oreg.	1050
KUDE	Oceanside, Calif.	1320
KUDL	Great Falls, Mont.	1450
KUDY	Kansas City, Mo.	1380
KUDU	Ventura, Calif.	1590
KUDY	Renton, Wash.	910
KUEN	Wenatchee, Wash.	900
KUEQ	Phoenix, Ariz.	740
KUGN	Eugene, Oreg.	590
KUIK	Hillsboro, Oreg.	1360
KUJ	Walla Walla, Wash.	1420
KUKA	San Antonio, Tex.	1250
KUKI	Ukiah, Calif.	1400
KUKO	Post, Tex.	1370
KUKU	Willow Springs, Mo.	1330
KULA	Honolulu, Hawaii	690
KULE	Ephrata, Wash.	730
KULP	El Campo, Tex.	1390
KUMA	Pendleton, Oreg.	1290
KUNO	Corpus Christi, Tex.	1400
KUOA	Siloam Springs, Ark.	1290
KUOM	Minneapolis, Minn.	770
KUPD	Tempe, Ariz.	1060
KUPI	Idaho Falls, Idaho	980
KURA	Moab, Utah	1450
KURL	Billings, Mont.	730
KURV	Edinburg, Tex.	710
KURY	Brookings, Oreg.	910
KUSD	Vermillion, S.Dak.	690
KUSH	Cushing, Okla.	1600
KUSN	St. Joseph, Mo.	1270
KUTA	Blanding, Utah	790
KUTI	Yakima, Wash.	980
KUTT	Fargo, N.Dak.	1550
KUTY	Palmdale, Calif.	1470
KUVR	Holdredge, Nebr.	1380
KUZN	W. Monroe, La.	1310
KUZZ	Bakersfield, Calif.	800
KVAN	Camas, Wash.	1480
KVAS	Astoria, Oreg.	1230
KVCK	Wolf Point, Nebr.	1450
KVCL	Winnfield, La.	1270
KVCV	Redding, Calif.	600
KVEC	San Luis Obispo, Calif.	920
KVEL	Vernal, Utah	1250
KVEN	Ventura, Calif.	1450
KVER	Clovis, N.Mex.	980
KVET	Austin, Tex.	1300
KVFC	Cortez, Colo.	740
KVFD	Ft. Dodge, Iowa	1400
KVGB	Great Bend, Kans.	1590
KVHL	Homer, La.	1320
KVI	Seattle, Wash.	570
KVIC	Victoria, Tex.	1340
KVIL	Highland Park, Tex.	1150
KVIM	New Iberia, La.	1360
KVIN	Vinita, Okla.	1470
KVIP	Redding, Calif.	540
KVKM	Monahans, Tex.	1330
KVLB	Cleveland, Tex.	1410
KVLC	Little Rock, Ark.	1050
KVLF	Alpine, Tex.	1240
KVLG	LaGrange, Tex.	1570
KVLH	Pauls Valley, Okla.	1470
KVLL	Livingston, Tex.	1220
KVLV	Fallon, Nev.	1250
KVMA	Magnolia, Ark.	630
KVMC	Colorado City, Tex.	1320
KVNA	Flagstaff, Ariz.	690
KVNC	Winslow, Ariz.	1010
KVNI	Coeur d'Alene, Idaho	1240
KVNU	Logan, Utah	610
KVOB	Bastrop, La.	1340
KVOC	Casper, Wyo.	1230
KVOE	Emporia, Kans.	1400
KVOG	Ogden, Utah	1490
KVOL	Lafayette, La.	1330
KVOM	Morrilton, Ark.	800
KVON	Napa, Calif.	1440
KVOO	Tulsa, Okla.	1170
KVOP	Plainview, Tex.	1400
KVOR	Colo. Springs, Colo.	1300
KVOS	Bellingham, Wash.	790
KVOU	Uvalde, Tex.	1400
KVOX	Moorhead, Minn.	1280
KVOY	Yuma, Ariz.	1400
KVOZ	Laredo, Tex.	1490
KVPI	Ville Platte, La.	1050
KVRC	Arkadelphia, Ark.	1240
KVRH	Salida, Colo.	1340
KVRS	Rock Springs, Wyo.	1360
KVSA	McGehee, Ark.	1220
KVSF	Santa Fe, N.Mex.	1260
KVSH	Valentine, Nebr.	940
KVSO	Ardmore, Okla.	1240
KVWC	Vernon, Tex.	1490
KVWM	Show Low, Ariz.	1050
KVWO	Cheyenne, Wyo.	1370
KWAD	Wadena, Minn.	920
KWAK	Stuttgart, Ark.	1240
KWAL	Wallace, Idaho	620
KWAM	Memphis, Tenn.	990
KWAT	Watertown, S.Dak.	950
KWAY	Forest Grove, Oreg.	1570
KWBA	Baytown, Tex.	1360
KWBB	Wichita, Kans.	1410
KWBC	Navasota, Tex.	1550
KWBE	Beatrice, Nebr.	1450
KWBG	Boone, Iowa	1590
KWBW	Hutchinson, Kans.	1450
KWCB	Searcy, Ark.	1300
KWCL	Oak Grove, La.	1280
KWCO	Chickasha, Okla.	1560
KWEB	Rochester, Minn.	1270
KWED	Seguin, Tex.	1580
KWEI	Weiser, Idaho	1260
KWEL	Midland, Tex.	1600
KWEW	Hobbs, N.Mex.	1480
KWFR	San Angelo, Tex.	1260
KWFT	Wichita Falls, Tex.	620
KWG	Stockton, Calif.	1230
KWHI	Brenham, Tex.	1280
KWHK	Hutchinson, Kans.	1260
KWHN	Fort Smith, Ark.	1320
KWHO	Salt Lake City, Utah	860
KWHW	Altus, Okla.	1450
KWIC	Salt Lake City, Utah	1570
KWIK	Pocatello, Idaho	1240
KWIL	Albany, Oreg.	790
KWIN	Ashland, Oreg.	1400
KWIP	Merced, Calif.	1580
KWIQ	Moses Lake, Wash.	1260
KWIV	Douglas, Wyo.	1050
KWIZ	Santa Ana, Calif.	1480
KWJJ	Portland, Oreg.	1080
KWK	St. Louis, Mo.	1380
KWKC	Abilene, Tex.	1340
KWKH	Shreveport, La.	1130
KWKW	Pasadena, Calif.	1300
KWKY	Des Moines, Iowa	1150
KWLC	Decorah, Iowa	1240
KWLD	Liberty, Tex.	1050
KWLM	Willmar, Minn.	1340
KWMT	Ft. Dodge, Iowa	540
KWNA	Winnemucca, Nev.	1400
KWNO	Winona, Minn.	1230
KWNT	Davenport, Iowa	1580
KWDA	Worthington, Minn.	730
KWOC	Poplar Bluff, Mo.	930
KWOE	Clinton, Okla.	1320
KWON	Bartlesville, Okla.	1400
KWOR	Worland, Wyo.	1340
KWOS	Jefferson City, Mo.	1240
KWDW	Pomona, Calif.	1600
KWPC	Muscatine, Iowa	860
KWPM	West Plains, Mo.	1450
KWPR	Claremore, Okla.	1270
KWRA	Idaho Falls, Idaho	1400
KWRD	Henderson, Tex.	1470
KWRE	Warrenton, Mo.	730
KWRF	Warren, Ark.	860
KWRL	Riverton, Wyo.	1450
KWRD	Coquille, Oreg.	630
KWRT	Boonville, Mo.	1370
KWRW	Guthrie, Okla.	1490
KWSC	Pullman, Wash.	1250
KWSD	Mt. Shasta, Calif.	620
KWSH	Wewoka-Seminole, Oklahoma	1260
KWSK	Pratt, Kans.	1570
KWSO	Wasco, Calif.	1050
KWTC	Barstow, Calif.	1230
KWTO	Springfield, Mo.	560
KWTX	Waco, Tex.	1230
KWVR	Enterprise, Oreg.	1340
KWVY	Waverly, Iowa	1470
KWWL	Waterloo, Iowa	1330

C.L.	Location	Kc.
KWYK	Farmington, N.Mex.	960
KWYN	Wynne, Ark.	1400
KWYO	Sheridan, Wyo.	1410
KWYR	Winner, S.Dak.	1260
KXA	Seattle, Wash.	770
KXAR	Hope, Ark.	1490
KXEL	Waterloo, Iowa	1540
KXEN	St. Louis, Mo.	1010
KXEO	Mexico, Mo.	1340
KXGI	Ft. Madison, Iowa	1360
KXGN	Glendive, Mont.	1400
KXGO	Fargo, N.D.	790
KXIC	Iowa City, Iowa	800
KXIT	Dalhart, Tex.	1410
KXIV	Phoenix, Ariz.	1400
KXJK	Forrest City, Ark.	950
KXL	Portland, Oreg.	750
KXLE	Ellensburg, Wash.	1240
KXLF	Butte, Mont.	1370
KXLJ	Helena, Mont.	1240
KXLL	Missoula, Mont.	1450
KXLO	Lewiston, Mont.	1230
KXLR	Little Rock, Ark.	1150
KXLW	Clayton, Mo.	1320
KXLY	Spokane, Wash.	920
KXO	El Centro, Calif.	1230
KXOA	Sacramento, Calif.	1470
KXOK	St. Louis, Mo.	630
KXOL	Ft. Worth, Tex.	1360
KXOX	Sweetwater, Tex.	1240
KXRA	Alexandria, Minn.	1490
KXRJ	Russellville, Ark.	1490
KXRO	Aberdeen, Wash.	1320
KXRX	San Jose, Calif.	1500
KXXL	Bozeman, Mont.	1450
KXXX	Colby, Kans.	790
KXYZ	Houston, Tex.	1320
KYA	San Francisco, Calif.	1260
KYAP	Ruidoso, N.Mex.	1340
KYCA	Prescott, Ariz.	1490
KYCN	Wheatland, Wyo.	1340
KYES	Roseburg, Oreg.	950
KYJC	Medford, Oreg.	1230
KYME	Boise, Idaho	740
KYND	Tempe, Ariz.	1580
KYNG	Coos Bay, Oreg.	1420
KYNO	Fresno, Calif.	1300
KYNT	Yankton, S.Dak.	1450
KYOK	Houston, Tex.	1590
KYOR	Blythe, Calif.	1450
KYOS	Merced, Calif.	1480
KYOU	Greeley, Colo.	1450
KYRO	Potosi, Mo.	1280
KYSM	Mankato, Minn.	1230
KYSN	Colorado Sprgs., Colo.	1460
KYSS	Missoula, Mont.	910
KYTE	Pocatello, Idaho	1290
KYUM	Yuma, Ariz.	560
KYVA	Gallup, N.Mex.	1230
KYW	Cleveland, Ohio	1100
KZEE	Weatherford, Tex.	1220
KZEY	Tyler, Tex.	690
KZIN	Coeur d'Alene, Idaho	1050
KZIP	Amarillo, Tex.	1310
KZIX	Fort Collins, Colo.	600
KZOK	Prescott, Ariz.	1340
KZOL	Farwell, Tex.	1570
KZON	Tolleson, Ariz.	1190
KZOW	Globe, Ariz.	1240
KZUN	Opportunity, Wash.	630
KZZN	Littlefield, Tex.	1490
WAAA	Winston-Salem, N.C.	980
WAAB	Worcester, Mass.	1440
WAAF	Chicago, Ill.	950
WAAG	Adel, Ga.	1470
WAAP	Peoria, Ill.	1350
WAAT	Trenton, N.J.	1300
WAAX	Gadsden, Ala.	570
WAAY	Huntsville, Ala.	1550
WABA	Aguadilla, P.Rico	850
WABB	Mobile, Ala.	1480
WABC	New York, N.Y.	770
WABG	Greenwood, Miss.	960
WABI	Bangor, Maine	910
WABJ	Adrian, Mich.	1490
WABL	Amite, La.	1570
WABO	Waynesboro, Miss.	990
WABQ	Cleveland, Ohio	1540
WABR	Winter Park, Fla.	1440
WABT	Tuskegee, Ala.	580
WABV	Abbeville, S.C.	1590
WABW	Annapolis, Md.	810
WABY	Albany, N.Y.	1400
WABZ	Albemarle, N.C.	1010
WACA	Camden, S.C.	1590
WACB	Kittanning, Pa.	1380
WACE	Chicopee, Mass.	730
WACK	Newark, N.Y.	1420
WACL	Waycross, Ga.	570
WACO	Waco, Tex.	1460
WACR	Columbus, Miss.	1050
WACT	Tuscaloosa, Ala.	1420
WADA	Shelby, N.C.	1390
WADC	Akron, Ohio	1350
WADE	Wadesboro, N.C.	1210
WADK	Newport, R.I.	1540
WADO	New York, N.Y.	1280
WADP	Kane, Pa.	960
WADS	Ansonia, Conn.	690
WAEB	Allentown, Pa.	790
WAEL	Mayaguez, P.Rico	600
WAFC	Staunton, Va.	900
WAGE	Leesburg, Va.	1290
WAGF	Dothan, Ala.	1320
WAGG	Franklin, Tenn.	950
WAGM	Presque Isle, Maine	950
WAGN	Menominee, Mich.	1340
WAGR	Lumberton, N.C.	580
WAGS	Bishopville, S.C.	1380
WAGY	Forest City, N.C.	1320
WAIK	Galesburg, Ill.	1590
WAIL	Baton Rouge, La.	1460
WAIM	Anderson, S.C.	1230
WAIN	Columbia, Ky.	1270
WAIP	Prichard, Ala.	1270
WAIR	Winston-Salem, N.C.	1340
WAIT	Chicago, Ill.	820
WAJF	Decatur, Ala.	1490
WAJR	Morgantown, W.Va.	1440
WAKE	Atlanta, Ga.	1340
WAKN	Aiken, S.C.	990
WAKO	Lawrenceville, Ill.	910
WAKR	Akron, Ohio	1590
WAKY	Louisville, Ky.	790
WALA	Mobile, Ala.	1410
WALD	Walterboro, S.C.	1220
WALE	Fall River, Mass.	1400
WALG	Albany, Ga.	1590
WALK	Patchogue, N.Y.	1370
WALL	Middletown, N.Y.	1340
WALM	Albion, Mich.	1260
WALO	Humacao, P.R.	1240
WALT	Tampa, Fla.	1110
WALY	Herkimer, N.Y.	1420
WAMO	Aberdeen, Md.	970
WAME	Miami, Fla.	1260
WAMI	Opp, Ala.	860
WAML	Laurel, Miss.	1340
WAMM	Flint, Mich.	1420
WAMO	Homestead, Pa.	860
WAMR	Venice, Fla.	1320
WAMS	Wilmington, Del.	1380
WAMV	E. St. Louis, Ill.	1490
WAMW	Washington, Ind.	1580
WAMY	Amory, Miss.	1580
WANA	Anniston, Ala.	1490
WANB	Waynesburg, Pa.	1580
WAND	Canton, Ohio	900
WANE	Ft. Wayne, Ind.	1450
WANN	Annapolis, Md.	1190
WANS	Anderson, S.C.	1280
WANT	Richmond, Va.	990
WANY	Albany, Ky.	1390
WAOK	Atlanta, Ga.	1380
WAOV	Vincennes, Ind.	1450
WAPA	San Juan, P.R.	680
WAPC	Riverhead, N.Y.	1570
WAPE	Jacksonville, Fla.	690
WAPF	McComb, Miss.	980
WAPG	Arcadia, Fla.	1480
WAPI	Birmingham, Ala.	1070
WAPL	Appleton, Wis.	1570
WAPO	Chattanooga, Tenn.	1150
WAPX	Montgomery, Ala.	1600
WAQE	Towson, Md.	1570
WARA	Attleboro, Mass.	1320
WARB	Covington, La.	730
WARC	Milton, Pa.	1380
WARD	Johnstown, Pa.	1490
WARE	Ware, Mass.	1250
WARF	Jasper, Ala.	1240
WARK	Hagerstown, Md.	1490
WARL	Arlington, Va.	780
WARM	Scranton, Pa.	590
WARN	Ft. Pierce, Fla.	1330
WARU	Peru, Ind.	1600
WASA	Havre de Grace, Md.	1330
WASK	Lafayette, Ind.	1450
WATA	Boone, N.C.	1450
WATC	Gaylord, Mich.	900
WATE	Knoxville, Tenn.	620
WATH	Athens, Ohio	970
WATK	Antigo, Wis.	900
WATM	Atmore, Ala.	1590
WATW	Watertown, N.Y.	1240
WATO	Oak Ridge, Tenn.	1290
WATP	Marion, S.C.	1430
WATR	Waterbury, Conn.	1320
WATS	Sayre, Pa.	960
WATT	Cadillac, Mich.	1240
WATV	Birmingham, Ala.	900
WATW	Ashland, Wis.	1400
WATZ	Alpena, Mich.	1450
WAUB	Auburn, N.Y.	1590
WAUC	Wauchula, Fla.	1310
WAUD	Auburn, Ala.	1230
WAUG	Augusta, Ga.	1050
WAUX	Waukesha, Wis.	1510
WAVC	Bonz, Ala.	1300
WAVE	Louisville, Ky.	970
WAVI	Dayton, Ohio	1210
WAVL	Apollo, Pa.	910
WAVN	Stillwater, Minn.	1220
WAVO	Avondale Estates, Ga.	1420
WAVP	Avon Park, Fla.	1390
WAVU	Albertville, Ala.	630
WAVY	Portsmouth, Va.	1350
WAVZ	New Haven, Conn.	1300
WAWK	Kendallville, Ind.	1570
WAWZ	Zarephath, N.J.	1380
WAXE	Vero Beach, Fla.	1370
WAXU	Georgetown, Ky.	1580
WAXX	Chippewa Falls, Wis.	1150
WAYB	Waynesboro, Va.	1490
WAYE	Dundalk, Md.	860
WAYN	Rockingham, N.C.	900
WAYR	Orange Park, Fla.	550
WAYS	Charlotte, N.C.	610
WAYX	Waycross, Ga.	1230
WAYZ	Waynesboro, Pa.	1380
WAZA	Bainbridge, Ga.	1360
WAZE	Clearwater, Fla.	860
WAZF	Yazoo City, Miss.	1230
WAZL	Hazelton, Pa.	1490
WAZY	Lafayette, Ind.	1410
WBAA	West Lafayette, Ind.	920
WBAB	Babylon, N.Y.	1440
WBAC	Cleveland, Tenn.	1340
WBAG	Burlington, N.C.	1150
WBAL	Baltimore, Md.	1090
WBAM	Montgomery, Ala.	740
WBAP	Ft. Worth, Tex.	570, 820
WBAR	Bartow, Fla.	1460
WBAT	Marion, Ind.	1400
WBAW	Barnwell, S.C.	740
WBAX	Wilkes-Barre, Pa.	1240
WBAY	Green Bay, Wis.	1360
WBAZ	Kingston, N.Y.	1550
WBBA	Pittsfield, Ill.	1580
WBBB	Burlington, N.C.	920
WBBF	Rochester, N.Y.	950
WBBI	Abingdon, Va.	1230
WBBK	Blakely, Ga.	1260
WBBL	Richmond, Va.	1480
WBBM	Chicago, Ill.	780
WBBO	Forest City, N.C.	780
WBBQ	Augusta, Ga.	1340
WBBT	Lyons, Ga.	1340
WBBW	Youngstown, Ohio	1240
WBBX	Portsmouth, N.H.	1380
WBBZ	Ponca City, Okla.	1230
WBCA	Bay Minette, Ala.	1150
WBCB	Levittown, Pa.	1490
WBCH	Hastings, Mich.	1220
WBCI	Williamsburg, Va.	740
WBCK	Battle Creek, Mich.	930
WBCM	Bay City, Mich.	1440
WBCR	Christiansburg, Va.	1260
WBCU	Union, S.C.	1460
WBEC	Pittsfield, Mass.	1420
WBEE	Harvey, Ill.	1570
WBEJ	Elizabethton, Tenn.	1240
WBEL	Beloit, Wis.	1380
WBEN	Buffalo, N.Y.	930
WBET	Brockton, Mass.	1460
WBEU	Beaufort, S.C.	960
WBEV	Beaver Dam, Wis.	1430
WBEX	Chillicothe, Ohio	1490
WBFC	Fremont, Mich.	1490
WBFD	Bedford, Pa.	1310
WBGC	Chipley, Fla.	1240
WBGN	Bowling Green, Ky.	1340
WBGR	Jesup, Ga.	1370
WBHB	Fitzgerald, Ga.	1240
WBHC	Hampton, S.C.	1270
WBHF	Cartersville, Ga.	1450
WBHM	Birmingham, Ala.	1550
WBHP	Huntsville, Ala.	1230
WBIA	Augusta, Ga.	1230
WBIC	Islip, N.Y.	540
WBIE	Marietta, Ga.	1050
WBIG	Greensboro, N.C.	1470
WBIL	Leesburg, Fla.	1410
WBIP	Booneville, Miss.	1400
WBIR	Knoxville, Tenn.	1240
WBIS	Bristol, Conn.	1440
WBIW	Bedford, Ind.	1340
WBIZ	Eau Claire, Wis.	1400
WBKH	Hattiesburg, Miss.	950
WBKN	Newton, Miss.	1410
WBKV	West Bend, Wis.	1470
WBLA	Elizabethtown, N.C.	1440
WBLE	Batesville, Miss.	1290
WBLF	Bellefonte, Pa.	1330
WBLG	Lexington, Ky.	1300
WBLJ	Dalton, Ga.	1230
WBLO	Evergreen, Ala.	1470
WBLR	Batesburg, S.C.	1430
WBLT	Bedford, Va.	1350
WBLU	Salem, Va.	1480
WBLY	Springfield, Ohio	1600
WBMA	Beaufort, N.C.	1400
WBMC	McMinnville, Tenn.	960
WBMD	Baltimore, Md.	750
WBMK	West Point, Ga.	1810
WBML	Macon, Ga.	1240
WBMT	Black Mountain, N.C.	1350
WBNC	Conway, N.H.	1050
WBNL	Boonville, Ind.	1540
WBNR	Beacon, N.Y.	1260
WBNS	Columbus, Ohio	1460
WBNT	Oneida, Tenn.	1310
WBNX	New York, N.Y.	1380
WBNY	Buffalo, N.Y.	1400
WBOB	Galax, Va.	1360
WBOC	Salisbury, Md.	960
WBOF	Virginia Beach, Va.	1550
WBOK	New Orleans, La.	800
WBOP	Pensacola, Fla.	980
WBOS	Brookline, Mass.	1600
WBOW	Terre Haute, Ind.	1230
WBOY	Clarksburg, W.Va.	1400
WBPD	Orangeburg, S.C.	1580
WBPZ	Lock Haven, Pa.	1230
WBRB	Mt. Clemens, Mich.	1430
WBRC	Birmingham, Ala.	960
WBRD	Bradenton, Fla.	1420
WBRE	Wilkes-Barre, Pa.	1340
WBRG	Lynchburg, Va.	1050
WBRK	Pittsfield, Mass.	1340
WBRM	Marion, N.C.	1250
WBRN	Big Rapids, Mich.	1460
WBRO	Waynesboro, Ga.	1310
WBRT	Bardstown, Ky.	1320
WBRV	Boonville, N.Y.	900
WBRX	Berwick, Pa.	1280
WBRY	Waterbury, Conn.	1590
WBSC	Bennetsville, S.C.	1550
WBSM	New Bedford, Mass.	1420
WBSR	Pensacola, Fla.	1450
WBT	Charlotte, N.C.	1110
WBTA	Batavia, N.Y.	1490
WBTH	Williamson, W.Va.	1400
WBTL	Farmville, N.C.	1050
WBTM	Danville, Va.	1330
WBTN	Bennington, Vt.	1370
WBTO	Linton, Ind.	1600
WBUC	Buckhannon, W.Va.	1460
WBUD	Trenton, N.J.	1260
WBUT	Butler, Pa.	1050
WBUX	Doylestown, Pa.	1570
WBUY	Lexington, N.C.	1440
WBUZ	Fredonia, N.Y.	1570
WBVL	Barboursville, Ky.	950
WBVP	Beaver Falls, Pa.	1230
WBYE	Calera, Ala.	1370
WBYG	Savannah, Ga.	1450
WBYS	Canton, Ill.	1560
WBZ	Boston, Mass.	1030
WBZA	Springfield, Mass.	1030
WBZY	Torrington, Conn.	990
WCAE	Pittsburgh, Pa.	1250
WCAL	Northfield, Minn.	770
WCAM	Camden, N.J.	1310
WCAO	Baltimore, Md.	600
WCAP	Lowell, Mass.	980
WCAR	Detroit, Mich.	1130
WCAT	Orange, Mass.	1390
WCAU	Philadelphia, Pa.	1210
WCAW	Charleston, W.Va.	680
WCAX	Burlington, Vt.	620
WCAY	Cayce, S.C.	620
WCAZ	Carthage, Ill.	990
WCBA	Corning, N.Y.	1350
WCBG	Chambersburg, Pa.	1590
WCBI	Columbus, Miss.	550
WCBL	Benton, Ky.	1290
WCBM	Baltimore, Md.	680
WCBS	New York, N.Y.	880
WCBT	Roanoke Rapids, N.C.	1230
WCBY	Cheboygan, Mich.	1240
WCCC	Hartford, Conn.	1290
WCCF	Punta Gorda, Fla.	1580
WCCM	Lawrence, Mass.	800
WCCN	Neillsville, Wis.	1370
WCCO	Minneapolis, Minn.	830
WCCW	Traverse City, Mich.	1310
WCDL	Carbondale, Pa.	1440
WCDJ	Edenton, N.C.	1260
WCDT	Winchester, Tenn.	1340
WCEC	Rocky Mount, N.C.	810
WCED	DuBois, Pa.	1420
WCEF	Parksburg, W.Va.	1050
WCEH	Hawkinsville, Ga.	610
WCEM	Cambridge, Md.	1240
WCEN	Mt. Pleasant, Mich.	1150
WCER	Charlotte, Mich.	1390
WCFL	Chicago, Ill.	1000
WCFR	Springfield, Vt.	1480
WCFT	Dallas, N.C.	960
WCFV	Clifton Forge, Va.	1230
WCGA	Calhoun, Ga.	900
WCGC	Belmont, N.C.	1270
WCGO	Chicago Hghts., Ill.	1600
WCHA	Chambersburg, Pa.	800
WCHB	Inkster, Mich.	1440
WCHI	Chillicothe, Ohio	1350
WCHJ	Brookhaven, Miss.	1470
WCHK	Canton, Ga.	1290
WCHO	Washington Court House, Ohio	1250
WCHL	Chapel Hill, N.C.	1360
WCHN	Norwich, N.Y.	970
WCHP	Tuscumbia, Ala.	1410
WCHS	Charleston, W.Va.	580
WCHV	Charlottesville, Va.	1260
WCIL	Carbondale, Ill.	1020
WCIN	Cincinnati, Ohio	1480
WCJU	Columbia, Miss.	1450
WCKB	Dunn, N.C.	780
WCKI	Greer, S.C.	1300
WCKR	Miami, Fla.	610
WCKY	Cincinnati, Ohio	1530
WCLA	Claxton, Ga.	1470
WCLB	Camilla, Ga.	1220
WCLC	Jamestown, Tenn.	1260
WCLD	Cleveland, Miss.	1490
WCLE	Cleveland, Tenn.	1570
WCLG	Morgantown, W.Va.	1300
WCLI	Corning, N.Y.	1450
WCLO	Janesville, Wis.	1230
WCLS	Columbus, Ga.	1580
WCLT	Newark, Ohio	1430
WCLW	Mansfield, Ohio	1570
WCMA	Corinth, Miss.	1230
WCMB	Harrisburg, Pa.	1460
WCMC	Wildwood, N.J.	1230
WCME	Brunswick, Maine	900
WCMI	Ashland, Ky.	1340
WCMN	Arecibo, P.R.	1280
WCMP	Pine City, Minn.	1350
WCMR	Elkhart, Ind.	1270
WCMS	Norfolk, Va.	1050
WCMT	Martin, Tenn.	1410
WCMW	Canton, Ohio	1060
WCMY	Ottawa, Ill.	1430
WCNB	Connersville, Ind.	1580
WCNC	Elizabeth City, N.C.	1240
WCNF	Weldon, N.C.	1400
WCNG	Canonsburg, Pa.	540
WCNH	Quincy, Fla.	1230
WCNL	Newport, N. H.	1010
WCNR	Bloomsburg, Pa.	930
WCNT	Centralia, Ill.	1210
WCNU	Crestview, Fla.	1010
WCNX	Middletown, Conn.	1150
WCOA	Pensacola, Fla.	1370
WCOC	Meridian, Miss.	910

C.L.	Location	Kc.
WCOG	Greensboro, N.C.	1320
WCOH	Newnan, Ga.	1400
WCOJ	Coatesville, Pa.	1420
WCOL	Columbus, Ohio	1230
WCON	Cornelia, Ga.	1450
WCOP	Boston, Mass.	1150
WCOR	Lebanon, Tenn.	900
WCOS	Columbia, S.C.	1400
WCOU	Lewiston, Maine	1240
WCOV	Montgomery, Ala.	1170
WCOW	Sparta, Wis.	1290
WCOY	Columbia, Pa.	1580
WCPA	Clearfield, Pa.	900
WCPC	Houston, Miss.	1320
WCPH	Etowah, Tenn.	1220
WCPM	Cumberland, Ky.	1280
WCPO	Cincinnati, Ohio	1230
WCPS	Tarboro, N.C.	760
WCQS	Alma, Ga.	1400
WCRA	Effingham, Ill.	1090
WCRB	Waltham, Mass.	1330
WCRE	Cheraw, S.C.	1420
WCRI	Scottsboro, Ala.	1050
WCRK	Morristown, Tenn.	1150
WCRL	Oneonta, Ala.	1570
WCRM	Clare, Mich.	990
WCRO	Johnstown, Pa.	1230
WCRR	Corinth, Miss.	1330
WCRS	Greenwood, S.C.	1450
WCRT	Birmingham, Ala.	1260
WCRV	Washington, N.J.	1580
WCRW	Chicago, Ill.	1240
WCRY	Macon, Ga.	900
WCSC	Charleston, S.C.	1390
WCSH	Portland, Maine	970
WCSI	Columbus, Ind.	1010
WCSR	Hillsdale, Mich.	1340
WCSS	Amsterdam, N.Y.	1490
WCST	Berkeley Springs, W.Va.	1010
WCTA	Andalusia, Ala.	920
WCTC	New Brunswick, N.J.	1450
WCTT	Corbin, Ky.	680
WCTW	New Castle, Ind.	1550
WCUB	Manitowoc, Wis.	980
WCUE	Akron, Ohio	1150
WCUM	Cumberland, Md.	1230
WCVA	Culpeper, Va.	1490
WCVI	Connellsville, Pa.	1340
WCVP	Murphy, N.C.	800
WCVS	Springfield, Ill.	1450
WCWC	Ripon, Wis.	1600
WCYB	Bristol, Va.	690
WCYN	Cynthiana, Ky.	1400
WDAD	Indiana, Pa.	1450
WDAE	Tampa, Fla.	1250
WDAF	Kansas City, Mo.	610
WDAK	Columbus, Ga.	540
WDAL	Meridian, Miss.	1330
WDAN	Danville, Ill.	1490
WDAR	Darlington, S.C.	1350
WDAS	Philadelphia, Pa.	1480
WDAX	McRae, Ga.	1410
WDAY	Fargo, N. Dak.	970
WDBC	Escanaba, Mich.	680
WDBF	Delray Beach, Fla.	1420
WDBJ	Roanoke, Va.	960
WDBL	Springfield, Tenn.	1590
WDBM	Statesville, N.C.	550
WDBO	Orlando, Fla.	580
WDBQ	Dubuque, Iowa	1490
WDCF	Dade City, Fla.	1350
WDCL	Tarpon Sprgs., Fla.	1470
WDCR	Hanover, N.H.	1340
WDDT	Greenville, Miss.	900
WDOY	Gloucester, Va.	1420
WDEA	Ellsworth, Me.	1350
WDEB	Pensacola, Fla.	610
WDEC	Americus, Ga.	1290
WDEE	Hamden, Conn.	1220
WDEF	Chattanooga, Tenn.	1370
WDEH	Sweetwater, Tenn.	800
WDEL	Wilmington, Del.	1150
WDEV	Waterbury, Vt.	550
WDEW	Westfield, Mass.	1570
WDGY	Minneapolis, Minn.	1130
WDIA	Memphis, Tenn.	1070
WDIG	Dothan, Ala.	1450
WDIX	Orangeburg, S.C.	1150
WDKD	Kingstree, S.C.	1310
WDKN	Dickson, Tenn.	1260
WDLA	Walton, W.Va.	1270
WDLB	Marshfield, Wis.	1450
WDLC	Port Jervis, N.Y.	1490
WDLE	Delaware, Ohio	1550
WDLM	E. Moline, Ill.	960
WDLT	Indianola, Miss.	1380
WDLP	Panama City, Fla.	590
WDMF	Buford, Ga.	1460
WDMG	Douglas, Ga.	860
WDMJ	Marquette, Mich.	1320
WDMV	Pocomoke City, Md.	540
WDNC	Durham, N.C.	620
WDNE	Elkins, W.Va.	1240
WDNG	Anniston, Ala.	1450
WDNT	Dayton, Tenn.	1280
WDOB	Canton, Miss.	1370
WDOC	Prestonsburg, Ky.	1310
WDOD	Chattanooga, Tenn.	1310
WDDE	Dunkirk, N.Y.	1410
WDOG	Marine City, Mich.	1590
WDOK	Cleveland, Ohio	1260
WDOL	Athens, Ga.	1470
WDDN	Wheaton, Md.	1540
WDOR	Sturgeon Bay, Wis.	910
WDOS	Oneonta, N.Y.	730
WOOT	Burlington, Va.	1400
WOOV	Dover, Del.	1410
WDOW	Dowagiac, Mich.	1440
WDQN	DuQuoin, Ill.	1580
WDRC	Hartford, Conn.	1360
WDSC	Dillon, S.C.	800
WDSG	Dyersburg, Tenn.	1450
WDSK	Cleveland, Miss.	1410
WDSM	Superior, Wis.	710
WDSP	DeFuniak Springs, Florida	1280
WDSR	Lake City, Fla.	1340
WDSU	New Orleans, La.	1280
WDTI	Danville, Va.	970
WDUN	Gainesville, Ga.	1240
WDUX	Waupaca, Wis.	800
WDUZ	Green Bay, Wis.	1400
WDVA	Danville, Va.	1250
WDVH	Gainesville, Fla.	980
WDVL	Vineland, N.J.	1270
WDWD	Dawson, Ga.	990
WDWS	Champaign, Ill.	1400
WDXB	Chattanooga, Tenn.	1490
WDXE	Lawrenceburg, Tenn.	1370
WDXI	Jackson, Tenn.	1310
WDXL	Lexington, Tenn.	1490
WDXN	Clarksville, Tenn.	540
WDXR	Paducah, Ky.	1560
WDXY	Sumter, S.C.	1240
WDYL	Ashland, Va.	1430
WDZ	Decatur, Ill.	1050
WEAB	Greer, S.C.	800
WEAG	Alcoa, Tenn.	1470
WEAM	Arlington, Va.	1390
WEAN	Providence, R.I.	790
WEAQ	Eau Claire, Wis.	1390
WEAS	College Park, Ga.	850
WEAT	W. Palm Beach, Fla.	960
WEAV	Plattsburg, N.Y.	1330
WEAW	Evanston, Ill.	1360
WEBB	Baltimore, Md.	560
WEBC	Duluth, Minn.	1240
WEBJ	Brewton, Ala.	1330
WEBO	Owego, N.Y.	1240
WEBQ	Harrisburg, Ill.	970
WEBR	Buffalo, N.Y.	1330
WEBY	Milton, Fla.	1050
WECL	Eau Claire, Wis.	1240
WEDC	Chicago, Ill.	810
WEDO	McKeesport, Pa.	990
WEEB	Southern Pines, N.C.	1390
WEED	Rocky Mount, N.C.	590
WEEI	Boston, Mass.	1310
WEEL	Fairfax, Va.	1460
WEEN	Lafayette, Tenn.	1080
WEEP	Pittsburgh, Pa.	1570
WEER	Warrenton, Va.	1320
WEET	Richmond, Va.	850
WEEU	Reading, Pa.	1320
WEEW	Washington, N.C.	1230
WEEX	Easton, Pa.	1590
WEEZ	Chester, Pa.	1410
WEGO	Concord, N.C.	1390
WEGP	Presque Isle, Maine	
WEHH	Elmira Heights-Horseheads, N.Y.	1590
WEIC	Charleston, Ill.	1270
WEIM	Fitchburg, Mass.	1280
WEIR	Weirton, W.Va.	1430
WEJL	Scranton, Pa.	630
WEKR	Fayetteville, Tenn.	1240
WEKY	Richmond, Ky.	1340
WEKZ	Monroe, Wis.	1260
WELB	Elba, Ala.	1350
WELC	Welch, W.Va.	1150
WELD	Fisher, W.Va.	690
WELE	S. Daytona, Fla.	1590
WELI	New Haven, Conn.	960
WELK	Charlottesville, Va.	1010
WELL	Battle Creek, Mich.	1400
WELM	Elmira, N.Y.	1410
WELO	Tupelo, Miss.	580
WELP	Easley, S.C.	1360
WELR	Roanoke, Ala.	1360
WELS	Kinston, N.C.	1010
WELY	Ely, Minn.	1450
WELZ	Belzoni, Miss.	1460
WEMB	Erwin, Tenn.	1420
WEMD	Easton, Md.	1460
WEMJ	Laconia, N.H.	1490
WEMP	Milwaukee, Wis.	1250
WENA	Bayamon, P.R.	1560
WENC	Whiteville, N.C.	1220
WENE	Endicott, N.Y.	1430
WENK	Union City, Tenn.	1240
WENN	Birmingham, Ala.	1320
WENO	Madison, Tenn.	1430
WENT	Gloversville, N.Y.	1340
WENY	Elmira, N.Y.	1230
WEOA	Evansville, Ind.	1400
WEOK	Poughkeepsie, N.Y.	1390
WEOL	Elyria, Ohio	930
WEPG	S. Pittsburgh, Tenn.	910
WEPM	Martinsburg, W.Va.	1340
WERA	Plainfield, N.J.	1590
WERC	Erie, Pa.	1260
WERD	Atlanta, Ga.	860
WERE	Cleveland, Ohio	1300
WERH	Hamilton, Ala.	970
WERI	Westerly, R.I.	1230
WERL	Eagle River, Wis.	950
WERT	Van Wert, Ohio	1220
WESA	Charleroi, Pa.	940
WESB	Bradford, Pa.	1490
WESC	Greenville, S.C.	660
WESN	N. Augusta, S.C.	1550
WESO	Southbridge, Mass.	970
WESR	Tasley, Va.	1330
WEST	Easton, Pa.	1400
WESX	Salem, Mass.	1230
WESY	Leland, Miss.	1580
WETB	Johnson City, Tenn.	790
WETC	Wendell-Zebulon, N.C.	540
WETO	Gadsden, Ala.	930
WETT	Ocean City, Md.	1590
WETU	Wetumpka, Ala.	1250
WETZ	New Martinsville, West Virginia	1330
WEUC	Ponce, P.R.	1420
WEUP	Huntsville, Ala.	1600
WEVA	Emporia, Va.	860
WEVD	New York, N.Y.	1330
WEVE	Eveleth, Minn.	1340
WEW	St. Louis, Mo.	770
WEWO	Laurinburg, N.C.	1080
WEXL	Royal Oak, Mich.	1340
WEYE	Sanford, N.C.	1290
WEZB	Birmingham, Ala.	1220
WEZE	Boston, Mass.	1260
WEZJ	Williamsburg, Ky.	1440
WEZL	Richmond, Va.	1590
WEZN	Elizabethtown, Pa.	1600
WEZY	Cocoa, Fla.	1350
WFAA	Dallas, Tex.	570, 820
WFAB	Miami, Fla.	990
WFAG	Farmville, N.C.	1250
WFAH	Alliance, Ohio	1310
WFAI	Fayetteville, N.C.	1230
WFAR	Farrell, Pa.	1470
WFAS	White Plains, N.Y.	1230
WFAU	Augusta, Me.	1340
WFAX	Falls Church, Va.	1220
WFBC	Greenville, S.C.	1330
WFBG	Altoona, Pa.	1290
WFBL	Syracuse, N.Y.	1390
WFBM	Indianapolis, Ind.	1260
WFBR	Baltimore, Md.	1300
WFCT	Fountain City, Tenn.	1430
WFDF	Flint, Mich.	910
WFDR	Manchester, Ga.	1370
WFEA	Manchester, N.H.	1370
WFEB	Sylacauga, Ala.	1340
WFEC	Miami, Fla.	1220
WFFG	Marathon, Fla.	1300
WFGM	Fitchburg, Mass.	960
WFGN	Gaffney, S.C.	1570
WFHG	Bristol, Va.	980
WFHK	Pell City, Ala.	1430
WFHR	Wis. Rapids, Wis.	1320
WFIG	Sumter, S.C.	1290
WFIL	Philadelphia, Pa.	560
WFIN	Findlay, Ohio	1330
WFIS	Fountain Inn, S.C.	1600
WFIW	Fairfield, Ill.	1390
WFKN	Franklin, Ky.	1220
WFKY	Frankfort, Ky.	1490
WFLA	Tampa, Fla.	970
WFLB	Fayetteville, N.C.	1490
WFLI	Lookout Mtn., Tenn.	1070
WFLN	Philadelphia, Pa.	900
WFLO	Farmville, Va.	870
WFLR	Dundee, N.Y.	1570
WFLS	Fredericksburg, Va.	1350
WFLW	Monticello, Ky.	1360
WFMC	Goldsboro, N.C.	730
WFMD	Frederick, Md.	930
WFMH	Cullman, Ala.	1460
WFMJ	Youngstown, Ohio	1390
WFMO	Fairmont, N.C.	860
WFMW	Madisonville, Ky.	730
WFNC	Fayetteville, N.C.	1390
WFOB	Fostoria, Ohio	1430
WFOM	Marietta, Ga.	1230
WFOR	Hattiesburg, Miss.	1400
WFOX	Milwaukee, Wis.	860
WFOY	St. Augustine, Fla.	1240
WFPA	Fort Payne, Ala.	1400
WFPG	Atlantic City, N.J.	1450
WFPM	Fort Valley, Ga.	1150
WFPR	Hammond, La.	1400
WFRA	Franklin, Pa.	1430
WFRB	Frostburg, Md.	740
WFRC	Reidsville, N.C.	1600
WFRL	Freeport, Ill.	1570
WFRM	Coudersport, Pa.	600
WFRO	Fremont, Ohio	1300
WFRX	West Frankfort, Ill.	1300
WFSC	Franklin, N.C.	1050
WFST	Caribou, Maine	600
WFTC	Kinston, N.C.	960
WFTG	London, Ky.	1400
WFTL	Ft. Lauderdale, Fla.	1400
WFTM	Maysville, Ky.	1240
WFTR	Front Royal, Va.	1450
WFTW	Ft. Walton Beach, Florida	1260
WFUL	Fulton, Ky.	1270
WFUN	Huntsville, Ala.	1450
WFUR	Grand Rapids, Mich.	1570
WFVA	Fredericksburg, Va.	1230
WFVG	Fuquay Sprgs., N.C.	1460
WFWL	Camden, Tenn.	1220
WFYC	Alma, Mich.	1280
WFYI	Mineola, N.Y.	1520
WGAA	Cedartown, Ga.	1340
WGAC	Augusta, Ga.	580
WGAD	Gadsden, Ala.	1350
WGAF	Valdosta, Ga.	910
WGAI	Elizabeth City, N.C.	560
WGAL	Lancaster, Pa.	1490
WGAN	Portland, Maine	560
WGAP	Maryville, Tenn.	1400
WGAR	Cleveland, Ohio	1220
WGAS	S. Gastonia, N.C.	1420
WGAT	Gate City, Va.	1050
WGAU	Athens, Ga.	1340
WGAW	Gardner, Mass.	1340
WGBA	Columbus, Ga.	1270
WGBB	Freeport, N.Y.	1240
WGBF	Evansville, Ind.	1280
WGBG	Greensboro, N.C.	1400
WGBI	Scranton, Pa.	910
WGBR	Goldsboro, N.C.	1150
WGBS	Miami, Fla.	710
WGCB	Red Lion, Pa.	1440
WGCD	Chester, S.C.	1490
WGCM	Gulfport, Miss.	1240
WGEA	Geneva, Ala.	1150
WGEE	Indianapolis, Ind.	1590
WGEM	Quincy, Ill.	1440
WGES	Chicago, Ill.	1390
WGET	Gettysburg, Pa.	1320
WGEZ	Beloit, Wis.	1490
WGFS	Covington, Ga.	1430
WGGA	Gainesville, Ga.	550
WGGG	Gainesville, Fla.	1230
WGGH	Marion, Ill.	1150
WGGO	Salamanca, N.Y.	1590
WGH	Newport News, Va.	1310
WGHC	Clayton, Ga.	1570
WGHM	Skowegan, Maine	1150
WGHN	Grd. Haven, Mich.	1370
WGHQ	Saugerties, N.Y.	920
WGIG	Brunswick, Ga.	1440
WGIL	Galesburg, Ill.	1400
WGIR	Manchester, N.H.	610
WGIV	Charlotte, N.C.	1600
WGKA	Atlanta, Ga.	1600
WGL	Fort Wayne, Ind.	1250
WGLC	Centreville, Miss.	1580
WGLI	Babylon, N.Y.	1290
WGMA	Hollywood, Fla.	1320
WGML	Hinesville, Ga.	990
WGMS	Washington, D.C.	570
WGN	Chicago, Ill.	720
WGNC	Gastonia, N.C.	1450
WGNI	Wilmington, N.C.	1450
WGNS	Murfreesboro, Tenn.	1450
WGNY	Newburgh, N.Y.	1220
WGOG	Walhalla, S.C.	1460
WGOH	Grayson, Ky.	1370
WGOK	Mobile, Ala.	900
WGOL	Goldsboro, N.C.	1300
WGOV	Valdosta, Ga.	950
WGPA	Bethlehem, Pa.	1100
WGPC	Albany, Ga.	1450
WGR	Buffalo, N.Y.	550
WGRA	Cairo, Ga.	790
WGRC	Green Cove Springs, Florida	1580
WGRD	Grand Rapids, Mich.	1410
WGRF	Aguadella, P.R.	1340
WGRM	Greenwood, Miss.	1240
WGRO	Lake City, Fla.	960
WGRP	Greenville, Pa.	940
WGRV	Greeneville, Tenn.	1340
WGRY	Gary, Ind.	1370
WGSA	Ephrata, Pa.	1310
WGSM	Huntington, N.Y.	740
WGSR	Millen, Ga.	1570
WGST	Atlanta, Ga.	920
WGSV	Guntersville, Ala.	1270
WGSW	Greenwood, S.C.	1350
WGTA	Summerville, Ga.	950
WGTC	Greenville, N.C.	1590
WGTL	Kannapolis, N.C.	870
WGTM	Wilson, N.C.	590
WGTN	Georgetown, S.C.	1400
WGTO	Cypress Gardens, Fla.	540
WGUN	Decatur, Ga.	1010
WGUS	North Augusta, S.C.	1380
WGUY	Bangor, Maine	1250
WGVA	Geneva, N.Y.	1240
WGVM	Greenville, Miss.	1260
WGWC	Selma, Ala.	1340
WGWR	Asheboro, N.C.	1260
WGY	Schenectady, N.Y.	810
WGYV	Greenville, Ala.	1380
WHA	Madison, Wis.	970
WHAB	Baxley, Ga.	1260
WHAI	Greenfield, Mass.	1240
WHAK	Rogers City, Mich.	960
WHAL	Shelbyville, Tenn.	1400
WHAM	Rochester, N.Y.	1180
WHAN	Haines City, Fla.	930
WHAP	Hopewell, Va.	1340
WHAR	Clarksburg, W.Va.	1340
WHAS	Louisville, Ky.	840
WHAT	Philadelphia, Pa.	1340
WHAV	Haverhill, Mass.	1490
WHAW	Weston, W.Va.	980
WHAY	New Britain, Conn.	910
WHAZ	Troy, N.Y.	1330
WHB	Kansas City, Mo.	710
WHBB	Selma, Ala.	1490
WHBC	Canton, Ohio	1480
WHBF	Rock Island, Ill.	1270
WHBG	Harrisonburg, Va.	1360
WHBI	Newark, N.J.	1280
WHBL	Sheboygan, Wis.	1330
WHBN	Harrodsburg, Ky.	1420
WHBO	Tampa, Fla.	1050
WHBQ	Memphis, Tenn.	560
WHBT	Harriman, Tenn.	1600
WHBU	Anderson, Ind.	1240
WHBY	Appleton, Wis.	1230
WHCC	Waynesville, N.C.	1400
WHCO	Sparta, Ill.	1230
WHCU	Ithaca, N.Y.	870
WHDF	Houghton, Mich.	1400
WHDH	Boston, Mass.	850
WHDL	Olean, N.Y.	1450
WHDM	McKenzie, Tenn.	1440

C.L.	Location	Kc.
WHEB	Portsmouth, N.H.	750
WHEC	Rochester, N.Y.	1460
WHEE	Martinsville, Va.	1370
WHEN	Syracuse, N.Y.	620
WHEO	Stuart, Va.	1270
WHEP	Foley, Ala.	1310
WHER	Memphis, Tenn.	1430
WHEW	Riveria Beach, Fla.	1600
WHEY	Millington, Tenn.	1220
WHFB	Benton Harbor, Mich.	1060
WHFC	Cicero, Ill.	1450
WHGB	Harrisburg, Pa.	1400
WHGR	Houghton L., Mich.	1290
WHHH	Warren, Ohio	1440
WHHT	Lucedale, Miss.	1440
WHHY	Montgomery, Ala.	1440
WHHM	Memphis, Tenn.	1340
WHIE	Griffin, Ga.	1320
WHIL	Medford, Mass.	1430
WHIM	E. Providence, R.I.	1110
WHIN	Gallatin, Tenn.	1010
WHIO	Dayton, Ohio	1290
WHIP	Mooresville, N.C.	1350
WHIR	Danville, Ky.	1230
WHIS	Bluefield, W.Va.	1440
WHIT	New Bern, N.C.	1450
WHIY	Orlando, Fla.	1270
WHIZ	Zanesville, Ohio	1240
WHJB	Greensburg, Pa.	620
WHJC	Matawan, W.Va.	1360
WHK	Cleveland, Ohio	1420
WHKP	Hendersonville, N.C.	1450
WHKY	Hickory, N.C.	1290
WHLB	Virginia, Minn.	1400
WHLO	Niagara Falls, N.Y.	1270
WHLF	South Boston, Va.	1400
WHLI	Hempstead, N.Y.	1100
WHLL	Wheeling, W.Va.	1600
WHLM	Bloomsburg, Pa.	550
WHLN	Harlan, Ky.	1410
WHLO	Akron, Ohio	640
WHLP	Centerville, Tenn.	1570
WHLS	Port Huron, Mich.	1450
WHLT	Huntington, Ind.	1300
WHMA	Anniston, Ala.	1390
WHMI	Howell, Mich.	1350
WHMP	Northampton, Mass.	1400
WHMS	Charleston, W.Va.	1490
WHNC	Henderson, N.C.	890
WHNY	McComb, Miss.	1250
WHO	Des Moines, Iowa	1040
WHOA	San Juan, P.R.	870
WHOC	Philadelphia, Miss.	1490
WHOK	Lancaster, Ohio	1320
WHOL	Allentown, Pa.	600
WHOM	New York, N.Y.	1480
WHOO	Orlando, Fla.	990
WHOP	Hopkinsville, Ky.	1230
WHOS	Decatur, Ala.	800
WHOT	Campbell, Ohio	1570
WHOU	Houlton, Maine	1340
WHOW	Clinton, Ill.	1520
WHP	Harrisburg, Pa.	580
WHPB	Belton, S.C.	1390
WHPE	High Point, N.C.	1070
WHRT	Hartselle, Ala.	860
WHRV	Ann Arbor, Mich.	1600
WHRW	Bowling Green, Ohio	730
WHSC	Hartsville, S.C.	1450
WHSM	Hayward, Wis.	910
WHSY	Hattiesburg, Miss.	1230
WHTC	Holland, Mich.	1450
WHTG	Eatontown, N.J.	1410
WHUB	Cookeville, Tenn.	1400
WHUC	Hudson, N.Y.	1230
WHUM	Reading, Pa.	1240
WHUN	Huntington, Pa.	1150
WHUT	Anderson, Ind.	1470
WHVF	Wausau, Wis.	1230
WHVH	Henderson, N.C.	1450
WHVR	Hanover, Pa.	1280
WHWB	Rutland, Vt.	1000
WHYE	Roanoke, Va.	910
WHYL	Carlisle, Pa.	960
WHYN	Springfield, Mass.	560
WHYS	Ocala, Fla.	1370
WIAC	San Juan, P.R.	740
WIAM	Williamston, N.C.	900
WIBA	Madison, Wis.	1310
WIBB	Macon, Ga.	1280
WIBC	Indianapolis, Ind.	1070
WIBG	Philadelphia, Pa.	990
WIBM	Jackson, Mich.	1450
WIBR	Baton Rouge, La.	1300
WIBU	Poynette, Wis.	1240
WIBV	Belleville, Ill.	1260
WIBW	Topeka, Kans.	580
WIBX	Utica, N.Y.	950
WICC	Bridgeport, Conn.	600
WICE	Providence, R.I.	1290
WICH	Norwich, Conn.	1310
WICK	Scranton, Pa.	1400
WICO	Salisbury, Md.	1320
WICU	Erie, Pa.	1330
WICY	Malone, N.Y.	1490
WIDE	Biddeford, Maine	1400
WIDU	Fayetteville, N.C.	1600
WIEL	Elizabethtown, Ky.	1400
WIFM	Elkin, N.C.	1540
WIGM	Medford, Wis.	1490
WIIN	Atlanta, Ga.	970
WIKB	Iron River, Mich.	1230
WIKE	Newport, Vt.	1490
WIKC	Bogalusa, La.	1490
WIKE	Newport, Vt.	1490
WIKY	Evansville, Ind.	820
WIL	St. Louis, Mo.	1430
WILA	Danville, Va.	1580
WILD	Boston, Mass.	1090
WILE	Cambridge, Ohio	1270
WILI	Willimantic, Conn.	1400
WILK	Wilkes-Barre, Pa.	980
WILL	Urbana, Ill.	580
WILM	Wilmington, Del.	1450
WILO	Frankfort, Ind.	1570
WILS	Lansing, Mich.	1320
WILZ	St. Petersburg Beach, Florida	1590
WIMA	Lima, Ohio	1150
WIMO	Winder, Ga.	1300
WIMS	Michigan City, Ind.	1420
WINA	Charlottesville, Va.	1400
WINC	Winchester, Va.	1400
WIND	Chicago, Ill.	560
WINF	Manchester, Conn.	1230
WING	Dayton, Ohio	1410
WINI	Murphysboro, Ill.	1420
WINK	Fort Myers, Fla.	1240
WINN	Louisville, Ky.	1240
WINQ	Tampa, Fla.	1010
WINR	Binghamton, N.Y.	680
WINS	New York, N.Y.	1010
WINT	Winter Haven, Fla.	1360
WINX	Rockville, Md.	1600
WINY	Putnam, Conn.	1350
WINZ	Miami, Fla.	940
WIOI	New Boston, Ohio	1010
WION	Ionia, Mich.	1430
WIOS	Tawas City, Mich.	1480
WIOU	Kokomo, Ind.	1350
WIP	Philadelphia, Pa.	610
WIPC	Lake Wales, Fla.	1280
WIPR	San Juan, P.R.	940
WIPS	Ticonderoga, N.Y.	1250
WIRA	Fort Pierce, Fla.	1400
WIRB	Enterprise, Ala.	800
WIRC	Hickory, N.C.	630
WIRE	Indianapolis, Ind.	1430
WIRJ	Humboldt, Tenn.	740
WIRK	W. Palm Beach, Fla.	1290
WIRL	Peoria, Ill.	1290
WIRO	Ironton, Ohio	1230
WIRV	Irvine, Ky.	1550
WIRY	Plattsburg, N.Y.	1340
WIS	Columbia, S.C.	560
WISE	Asheville, N.C.	1310
WISH	Indianapolis, Ind.	1310
WISL	Shamokin, Pa.	1480
WISM	Madison, Wis.	1480
WISN	Milwaukee, Wis.	1150
WISO	Ponce, P.R.	1260
WISP	Kinston, N.C.	1230
WISR	Butler, Pa.	680
WIST	Charlotte, N.C.	1240
WISV	Virouqua, Wis.	1360
WITA	San Juan, P.R.	1140
WITE	Brazil, Ind.	1380
WITH	Baltimore, Md.	1230
WITT	Lewisburg, Pa.	1010
WITY	Danville, Ill.	980
WITZ	Jasper, Ind.	990
WIVI	Christiansted, V.I.	970
WIVK	Knoxville, Tenn.	860
WIVV	Vieques, P.R.	1370
WIVY	Jacksonville, Fla.	1050
WIXK	New Richmond, Wis.	1590
WIZE	Springfield, Ohio	1340
WIZZ	Streator, Ill.	1250
WJAB	Westbrook, Me.	1440
WJAC	Johnstown, Pa.	1400
WJAG	Norfolk, Nebr.	780
WJAK	Jackson, Tenn.	1460
WJAM	Marion, Ala.	1310
WJAN	Ishpeming, Mich.	970
WJAR	Providence, R.I.	920
WJAS	Pittsburgh, Pa.	1320
WJAT	Swainsboro, Ga.	800
WJAX	Jacksonville, Fla.	930
WJAY	Mullins, S.C.	1280
WJAZ	Albany, Ga.	960
WJBB	Haleyville, Ala.	1230
WJBC	Bloomington, Ill.	1230
WJBD	Salem, Ill.	1350
WJBK	Detroit, Mich.	1500
WJBL	Holland, Mich.	1260
WJBM	Jerseyville, Ill.	1480
WJBO	Baton Rouge, La.	1150
WJBS	DeLand, Fla.	1490
WJBW	New Orleans, La.	1230
WJCO	Seymour, Ind.	1390
WJCM	Sebring, Fla.	960
WJCW	Johnson City, Tenn.	910
WJDA	Quincy, Mass.	1300
WJDB	Thomasville, Ala.	630
WJDX	Jackson, Miss.	620
WJDY	Salisbury, Md.	1470
WJEF	Grand Rapids, Mich.	1230
WJEH	Gallipolis, Ohio	990
WJEJ	Hagerstown, Md.	1240
WJEM	Valdosta, Ga.	1150
WJER	Dover, Ohio	1450
WJET	Erie, Pa.	1400
WJHB	Talladega, Ala.	1580
WJHO	Opelika, Ala.	1400
WJIG	Tullahoma, Tenn.	740
WJIL	Jacksonville, Ill.	1550
WJIM	Lansing, Mich.	1240
WJIV	Savannah, Ga.	900
WJJC	Commerce, Ga.	1270
WJJD	Chicago, Ill.	1160
WJJL	Niagara Falls, N.Y.	1440
WJJM	Lewisburg, Tenn.	1490
WJLB	Detroit, Mich.	1400
WJLD	Homewood, Ala.	1400
WJLK	Asbury Park, N.J.	1310
WJLS	Beckley, W.Va.	560
WJMA	Orange, Va.	1340
WJMB	Brookhaven, Miss.	1340
WJMC	Rice Lake, Wis.	1240
WJMJ	Philadelphia, Pa.	1540
WJMO	Cleveland Hgts., Ohio	1490
WJMR	New Orleans, La.	990
WJMS	Ironwood, Mich.	630
WJMW	Athens, Ala.	730
WJMX	Florence, S.C.	970
WJNC	Jacksonville, N.C.	1240
WJNO	W. Palm Beach, Fla.	1230
WJOB	Hammond, Ind.	1230
WJOC	Jamestown, N.Y.	1340
WJOE	Ward Ridge, Fla.	1570
WJOI	Florence, Ala.	1340
WJOL	Joliet, Ill.	1340
WJON	St. Cloud, Minn.	1240
WJOT	Lake City, S.C.	1260
WJOY	Burlington, Vt.	1230
WJPA	Washington, Pa.	1450
WJPD	Ishpeming, Mich.	1240
WJPF	Herrin, Ill.	1340
WJPG	Green Bay, Wis.	1440
WJPR	Greenville, Miss.	1330
WJPS	Evansville, Ind.	1330
WJQS	Jackson, Miss.	1400
WJR	Detroit, Mich.	760
WJRD	Tuscaloosa, Ala.	1150
WJRI	Lenoir, N.C.	1340
WJRL	Rockford, Ill.	1150
WJSB	Crestview, Fla.	1050
WJSO	Jonesboro, Tenn.	1590
WJTN	Jamestown, N.Y.	1240
WJUD	St. Johns, Mich.	1580
WJUN	Mexico, Pa.	1220
WJVA	South Bend, Ind.	1580
WJW	Cleveland, Ohio	850
WJWL	Georgetown, Del.	900
WJWS	South Hill, Va.	1370
WJXN	Jackson, Miss.	1450
WJZM	Clarksville, Tenn.	1400
WKAB	Mobile, Ala.	840
WKAI	Macomb, Ill.	1510
WKAL	Rome, N.Y.	1450
WKAM	Goshen, Ind.	1460
WKAN	Kankakee, Ill.	1320
WKAP	Allentown, Pa.	1320
WKAQ	San Juan, P.R.	580
WKAR	East Lansing, Mich.	870
WKAT	Miami Beach, Fla.	1360
WKAY	Glasgow, Ky.	1490
WKAZ	Charleston, W.Va.	950
WKBC	N. Wilkesboro, N.C.	810
WKBH	La Crosse, Wis.	1410
WKBI	St. Mary's, Pa.	1400
WKBJ	Milan, Tenn.	1600
WKBK	Keene, N.H.	1220
WKBL	Covington, Tenn.	1250
WKBN	Youngstown, Ohio	570
WKBO	Harrisburg, Pa.	1230
WKBR	Manchester, N.H.	1250
WKBV	Richmond, Ind.	1490
WKBW	Buffalo, N. Y.	1520
WKBX	Kissimmee, Fla.	1220
WKBZ	Muskegon, Mich.	850
WKCT	Bowling Green, Ky.	930
WKCW	Warrenton, Va.	1420
WKDA	Nashville, Tenn.	1240
WKDK	Newberry, S.C.	1240
WKDL	Clarksdale, Miss.	1600
WKDN	Camden, N.J.	800
WKDX	Hamlet, N.C.	1400
WKEE	Huntington, W. Va.	800
WKEI	Kewanee, Ill.	1450
WKEN	Dover, Del.	1600
WKEU	Griffin, Ga.	1450
WKEY	Covington, Va.	1340
WKGN	Knoxville, Tenn.	1340
WKHM	Jackson, Mich.	970
WKIC	Hazard, Ky.	1390
WKIO	Urbana, Ill.	1580
WKIK	Leonardtown, Md.	1970
WKIN	Kingsport, Tenn.	1320
WKIP	Poughkeepsie, N.Y.	1450
WKIS	Orlando, Fla.	740
WKIX	Raleigh, N.C.	850
WKIZ	Key West, Fla.	1500
WKJB	Mayaguez, P.R.	710
WKJG	Fort Wayne, Ind.	1380
WKKO	Aurora, Ill.	1580
WKKO	Cocoa, Fla.	860
WKKS	Vanceburg, Ky.	1570
WKLA	Ludington, Mich.	1450
WKLC	St. Albans, W.Va.	1300
WKLE	Washington, Ga.	1370
WKLF	Clanton, Ala.	980
WKLJ	Sparta, Wis.	990
WKLK	Cloquet, Minn.	1230
WKLM	Wilmington, N.C.	980
WKLO	Louisville, Ky.	1080
WKLV	Blackstone, Va.	1440
WKLX	Paris, Ky.	1440
WKLY	Hartwell, Ga.	980
WKLZ	Kalamazoo, Mich.	1470
WKMC	Roaring Sprgs., Pa.	1370
WKMF	Flint, Mich.	1470
WKMH	Dearborn, Mich.	1310
WKMI	Kalamazoo, Mich.	1360
WKMT	Kings Mtn., N.C.	1220
WKNB	New Britain, Conn.	840
WKNE	Keene, N.H.	1290
WKNX	Saginaw, Mich.	1210
WKNY	Kingston, N.Y.	1490
WKOA	Hopkinsville, Ky.	1480
WKOK	Sunbury, Pa.	1240
WKOP	Binghamton, N.Y.	1360
WKOV	Wellston, Ohio	1330
WKOW	Madison, Wis.	1070
WKOX	Framingham, Mass.	1190
WKOY	Bluefield, W.Va.	1240
WKOZ	Kosciusko, Miss.	1350
WKPA	New Kensington, Pa.	1150
WKPR	Kalamazoo, Mich.	1420
WKPT	Kingsport, Tenn.	1400
WKRC	Cincinnati, Ohio	550
WKRG	Mobile, Ala.	710
WKRK	Murphy, N.C.	1390
WKRM	Columbia, Tenn.	1340
WKRO	Cairo, Ill.	1490
WKRS	Waukegan, Ill.	1220
WKRT	Cortland, N.Y.	920
WKRZ	Oil City, Pa.	1340
WKSB	Milford, Del.	930
WKSK	W. Jefferson, N.C.	1600
WKSR	Pulaski, Tenn.	1420
WKST	New Castle, Pa.	1280
WKTC	Charlotte, N.C.	1310
WKTG	Thomasville, Ga.	730
WKTJ	Farmington, Maine	1380
WKTL	Sheboygan, Wis.	950
WKTQ	South Paris, Maine	1450
WKTX	Atlantic Beach, Fla.	1600
WKTY	LaCrosse, Wis.	580
WKUL	Cullman, Ala.	1340
WKVA	Lewistown, Pa.	920
WKVM	San Juan, P.R.	810
WKVT	Brattleboro, Vt.	1490
WKWF	Key West, Fla.	1600
WKWK	Wheeling, W.Va.	1400
WKWS	Rocky Mount, Va.	1290
WKXL	Concord, N.H.	1450
WKXV	Knoxville, Tenn.	900
WKXY	Sarasota, Fla.	930
WKY	Oklahoma City, Okla.	930
WKYB	Paducah, Ky.	570
WKYN	Rio Piedras, P.R.	630
WKYR	Keyser, W.Va.	1270
WKYW	Louisville, Ky.	900
WKZO	Kalamazoo, Mich.	590
WLAC	Nashville, Tenn.	1510
WLAD	Danbury, Conn.	800
WLAF	LaFollette, Tenn.	1450
WLAG	La Grange, Ga.	1240
WLAK	Lakeland, Fla.	1430
WLAM	Lewiston, Maine	1470
WLAN	Lancaster, Pa.	1390
WLAP	Lexington, Ky.	630
WLAQ	Rome, Ga.	1410
WLAR	Athens, Tenn.	1450
WLAS	Jacksonville, N.C.	910
WLAT	Conway, S.C.	1330
WLAU	Laurel, Miss.	1600
WLAV	Grand Rapids, Mich.	1340
WLAW	Lawrenceville, Ga.	1360
WLAY	Muscle Shoals, Ala.	1450
WLBA	Gainesville, Ga.	1580
WLBB	Carrollton, Ga.	1100
WLBC	Muncie, Ind.	1340
WLBE	Leesburg, Fla.	790
WLBG	Laurens, S.C.	860
WLBH	Mattoon, Ill.	1170
WLBI	Denham Springs, La.	1220
WLBJ	Bowling Green, Ky.	1410
WLBK	DeKalb, Ill.	1360
WLBL	Stevens Point, Wis.	930
WLBN	Lebanon, Ky.	1590
WLBR	Lebanon, Pa.	1270
WLBZ	Bangor, Maine	620
WLCK	Scottsville, Ky.	1250
WLCM	Lancaster, S.C.	1360
WLCO	Eustis, Fla.	1240
WLCS	Baton Rouge, La.	910
WLCX	LaCrosse, Wis.	1490
WLCY	St. Petersburg, Fla.	1380
WLDB	Atlantic City, N.J.	1490
WLDS	Jacksonville, Ill.	1180
WLDY	Ladysmith, Wis.	1340
WLEA	Hornell, N.Y.	1480
WLEC	Sandusky, Ohio	1450
WLEE	Richmond, Va.	1480
WLEM	Emporium, Pa.	1240
WLEO	Ponce, P.R.	1170
WLGS	Lawrenceville, Va.	580
WLET	Toccoa, Ga.	1420
WLEU	Erie, Pa.	1450
WLEW	Bad Axe, Mich.	1340
WLFA	Lafayette, Ga.	1590
WLFH	Little Falls, N.Y.	1230
WLIB	New York, N.Y.	1190
WLIJ	Shelbyville, Tenn.	1580
WLIK	Newport, Tenn.	1270
WLIL	Lenoir, Tenn.	730
WLIP	Kenosha, Wis.	1050
WLIQ	Mobile, Ala.	1360
WLIS	Old Saybrook, Conn.	1420
WLIV	Livingston, Tenn.	920
WLIZ	Lake Worth, Fla.	1380
WLKW	Providence, R.I.	990
WLLH	Lowell, Mass.	1400
WLLY	Wilson, N.C.	1350
WLMJ	Jackson, Ohio	1280
WLNA	Peekskill, N.Y.	1420
WLNH	Laconia, N.H.	1350
WLOA	Braddock, Pa.	1550
WLOB	Portland, Maine	1310
WLOC	Munfordville, Ky.	1150
WLOD	Pompano Beach, Fla.	980
WLOE	Leaksville, N.C.	1490
WLOF	Orlando, Fla.	950
WLOG	Logan, W.Va.	1230

C.L.	Location	Kc.
WLOH	Princeton, W.Va.	1490
WLOI	LaPorte, Ind.	1540
WLOK	Memphis, Tenn.	1480
WLOL	Minneapolis, Minn.	1330
WLON	Lincolnton, N.C.	1050
WLOS	Asheville, N.C.	1380
WLOU	Louisville, Ky.	1350
WLOW	Portsmouth, Va.	1400
WLOX	Biloxi, Miss.	1490
WLPM	Suffolk, Va.	1460
WLPO	LaSalle, Ill.	1220
WLPS	Lehighton, Pa.	1150
WLS	Chicago, Ill.	890
WLSB	Copper Hill, Tenn.	1400
WLSC	Loris, S.C.	1570
WLSD	Big Stone Gap, Va.	1220
WLSE	Wallace, N.C.	1400
WLSH	Lansford, Pa.	1410
WLSI	Pikeville, Ky.	900
WLSM	Louisville, Miss.	1270
WLST	Escanaba, Mich.	600
WLSV	Wellsville, N.Y.	790
WLTC	Gastonia, N.C.	1370
WLVA	Lynchburg, Va.	590
WLW	Cincinnati, Ohio	700
WLYC	Williamsport, Pa.	1050
WLYN	Lynn, Mass.	1360
WMAB	Munising, Mich.	1400
WMAF	Madison, Fla.	1230
WMAG	Forest, Miss.	860
WMAJ	State College, Pa.	1450
WMAK	Nashville, Tenn.	1300
WMAL	Washington, D.C.	630
WMAM	Marinette, Wis.	570
WMAN	Mansfield, Ohio	1400
WMAP	Monroe, N.C.	1060
WMAQ	Chicago, Ill.	670
WMAS	Springfield, Mass.	1450
WMAX	Grand Rapids, Mich.	1480
WMAY	Springfield, Ill.	970
WMAZ	Macon, Ga.	940
WMBA	Ambridge, Pa.	1460
WMBC	Macon, Miss.	1400
WMBD	Peoria, Ill.	1470
WMBG	Richmond, Va.	1380
WMBH	Joplin, Mo.	1450
WMBI	Chicago, Ill.	1110
WMBL	Morehead City, N.C.	740
WMBM	Miami Beach, Fla.	790
WMBN	Petoskey, Mich.	1340
WMBO	Auburn, N.Y.	1340
WMBR	Jacksonville, Fla.	1460
WMBS	Uniontown, Pa.	590
WMC	Memphis, Tenn.	790
WMCA	New York, N.Y.	570
WMCH	Church Hill, Tenn.	1260
WMCK	McKeesport, Pa.	1360
WMCP	Columbia, Tenn.	1280
WMCW	Harvard, Ill.	1600
WMOC	Hazlehurst, Miss.	1220
WMDD	Fajardo, P.R.	1490
WMDF	Mount Dora, Fla.	1580
WMDN	Midland, Mich.	1490
WMEG	Eau Gallie, Fla.	920
WMEK	Chase City, Va.	980
WMEN	Tallahassee, Fla.	1330
WMET	Miami Beach, Fla.	1490
WMEV	Marion, Va.	1010
WMEX	Boston, Mass.	1510
WMFC	Monroeville, Ala.	1360
WMFD	Wilmington, N.C.	630
WMFG	Hibbing, Minn.	1240
WMFJ	Daytona Beach, Fla.	1450
WMFR	High Point, N.C.	1230
WMFT	Terre Haute, Ind.	1300
WMGA	Moultrie, Ga.	1400
WMGM	New York, N.Y.	1050
WMGR	Bainbridge, Ga.	930
WMGW	Meadville, Pa.	1490
WMGY	Montgomery, Ala.	800
WMID	Atlantic City, N.J.	1340
WMIE	Miami, Fla.	1140
WMIK	Middlesboro, Ky.	560
WMIL	Milwaukee, Wis.	1290
WMIN	Mpls.-St. Paul, Minn.	1400
WMIQ	Iron Mountain, Mich.	1450
WMIS	Natchez, Miss.	1240
WMIX	Mt. Vernon, Ill.	940
WMJM	Cordele, Ga.	1490
WMLF	Pineville, Ky.	1230
WMLP	Milton, Pa.	1570
WMLS	Sylacauga, Ala.	1290
WMLT	Dublin, Ga.	1330
WMMB	Melbourne, Fla.	1240
WMMH	Marshall, N.C.	1460
WMMM	Westport, Conn.	1260
WMMN	Fairmont, W.Va.	920
WMMS	Bath, Maine	730
WMMT	McMinnville, Tenn.	1230
WMMW	Meriden, Conn.	1470
WMNA	Gretna, Va.	730
WMNB	No. Adams, Mass.	1230
WMNC	Morganton, N.C.	1430
WMNE	Menomonie, Wis.	1360
WMNI	Columbus, Ohio	920
WMNS	Olean, N.Y.	1360
WMNT	Manati, P.R.	1500
WMOA	Marietta, Ohio	1490
WMOD	Moundsville, W.Va.	1370
WMOG	Brunswick, Ga.	1490
WMOH	Hamilton, Ohio	1450
WMOK	Metropolis, Ill.	920
WMON	Montgomery, W.Va.	1340
WMOP	Ocala, Fla.	900
WMOR	Morehead, Ky.	1330
WMOU	Berlin, N.H.	1230
WMOV	Ravenswood, W.Va.	1360
WMOX	Meridian, Miss.	1240
WMOZ	Mobile, Ala.	960
WMPA	Aberdeen, Miss.	1240
WMPC	Lapeer, Mich.	1230
WMPL	Hancock, Mich.	920
WMPM	Smithfield, N.C.	1270
WMPO	Middleport-Pomroy, Ohio	1390
WMPS	Memphis, Tenn.	680
WMPT	So. Williamsport, Pa.	1450
WMRB	Greenville, S.C.	1490
WMRC	Milford, Mass.	1490
WMRE	Monroe, Ga.	1490
WMRF	Lewistown, Pa.	1490
WMRI	Marion, Ind.	860
WMRN	Marion, Ohio	1490
WMRO	Aurora, Ill.	1280
WMRP	Flint, Mich.	1570
WMSA	Massena, N.Y.	1340
WMSC	Columbia, S.C.	1320
WMSJ	Sylva, N.C.	1480
WMSK	Morganfield, Ky.	1550
WMSL	Decatur, Ala.	1400
WMSR	Manchester, Tenn.	1320
WMST	Mt. Sterling, Ky.	1150
WMT	Cedar Rapids, Iowa	600
WMTA	Central City, Ky.	1380
WMTC	Vancleve, Ky.	730
WMTE	Manistee, Mich.	1340
WMTL	Leitchfield, Ky.	1580
WMTM	Moultrie, Ga.	1300
WMTN	Morristown, Tenn.	1300
WMTR	Morristown, N.J.	1250
WMTS	Murfreesboro, Tenn.	860
WMUS	Muskegon, Mich.	1090
WMUU	Greenville, S.C.	1260
WMVA	Martinsville, Va.	1450
WMVB	Millville, N.J.	1440
WMVG	Milledgeville, Ga.	1450
WMVO	Mt. Vernon, Ohio	1300
WMYB	Myrtle Beach, S.C.	1450
WMYN	Mayodan, N.C.	1420
WMYR	Ft. Myers, Fla.	1410
WNAB	Bridgeport, Conn.	1450
WNAC	Boston, Mass.	680
WNAD	Norman, Okla.	640
WNAE	Warren, Pa.	1310
WNAG	Grenada, Miss.	1400
WNAH	Nashville, Tenn.	1360
WNAK	Nanticoke, Pa.	730
WNAM	Neenah, Wis.	1280
WNAR	Norristown, Pa.	1110
WNAT	Natchez, Miss.	1450
WNAU	New Albany, Miss.	1470
WNAV	Annapolis, Md.	1430
WNAX	Yankton, S.Dak.	570
WNBC	New York, N.Y.	660
WNBF	Binghamton, N.Y.	1290
WNBH	New Bedford, Mass.	1340
WNBP	Newburyport, Mass.	1470
WNBS	Murray, Ky.	1340
WNBT	Wellsboro, Pa.	1490
WNBZ	Saranac Lake, N.Y.	1240
WNCA	Siler City, N.C.	1570
WNCC	Barnesboro, Pa.	950
WNOG	N. Charleston, S.C.	910
WNCO	Ashland, Ohio	1340
WNDB	Daytona Beach, Fla.	1150
WNDR	Syracuse, N.Y.	1260
WNDU	South Bend, Ind.	1490
WNEB	Worcester, Mass.	1230
WNEG	Taccoa, Ga.	1320
WNER	Live Oak, Fla.	1250
WNES	Central City, Ky.	1050
WNEW	New York, N.Y.	1130
WNEX	Macon, Ga.	1400
WNGA	Nashville, Ga.	1600
WNGO	Mayfield, Ky.	1320
WNHC	New Haven, Conn.	1340
WNIA	Cheektowaga, N.Y.	1230
WNIK	Arecibo, P.R.	1230
WNIL	Niles, Mich.	1290
WNJR	Newark, N.J.	1430
WNKY	Neon, Ky.	1480
WNLC	New London, Conn.	1490
WNLK	Norwalk, Conn.	1350
WNML	Portage, Pa.	1470
WNMP	Evanston, Ill.	1590
WNNC	Newton, N.C.	1230
WNNJ	Newton, N.J.	1360
WNNT	Warsaw, Va.	690
WNOE	New Orleans, La.	1060
WNOG	Naples, Fla.	1270
WNOK	Columbia, S.C.	1230
WNOO	Chattanooga, Tenn.	1260
WNOP	Newport, Ky.	740
WNOR	Norfolk, Va.	1230
WNOS	High Point, N.C.	1590
WNOW	York, Pa.	1250
WNOX	Knoxville, Tenn.	990
WNPS	New Orleans, La.	1450
WNPT	Tuscaloosa, Ala.	1280
WNPV	Lansdale, Pa.	1440
WNRG	Grundy, Va.	1250
WNRI	Woonsocket, R.I.	1380
WNRV	Narrows, Va.	990
WNSL	Laurel, Miss.	1260
WNSM	Valparaiso-Niceville, Florida	1340
WNTA	Newark, N.J.	970
WNTT	Tazewell, Tenn.	1250
WNUE	Ft. Walton Beach, Fla.	950
WNUZ	Talladega, Ala.	1230
WNVA	Norton, Va.	1350
WNVY	Pensacola, Fla.	1230
WNXT	Portsmouth, Ohio	1260
WNYC	New York, N.Y.	830
WOAI	San Antonio, Tex.	1200
WOAP	Owosso, Mich.	1080
WOAY	Oak Hill, W.Va.	860
WOBS	Jacksonville, Fla.	1360
WOBT	Rhinelander, Wis.	1240
WOC	Davenport, Iowa	1420
WOCB	W. Yarmouth, Mass.	1240
WOCH	North Vernon, Ind.	1460
WODY	Bassett, Va.	900
WOGA	Chattanooga, Tenn.	1450
WOHI	E. Liverpool, Ohio	1490
WOHO	Toledo, Ohio	1470
WOHP	Bellefontaine, Ohio	1390
WOHS	Shelby, N.C.	730
WOI	Ames, Iowa	640
WOIA	Saline, Mich.	1290
WOIC	Columbia, S.C.	1470
WOKB	Winter Garden, Fla	1600
WOKE	Charleston, S.C.	1340
WOKK	Meridian, Miss.	1450
WOKJ	Jackson, Miss.	1590
WOKO	Albany, N.Y.	1460
WOKS	Columbus, Ga.	1340
WOKY	Milwaukee, Wis.	920
WOKZ	Alton, Ill.	1570
WOL	Washington, D.C.	1450
WOLF	Syracuse, N.Y.	1490
WOLS	Florence, S.C.	1230
WOMI	Owensboro, Ky.	1490
WOMP	Bellaire, Ohio	1290
WOMT	Manitowoc, Wis.	1240
WONA	Winona, Miss.	1570
WOND	Pleasantville, N.J.	1400
WONE	Dayton, Ohio	980
WONG	Oneida, N.Y.	1600
WONN	Lakeland, Fla.	1230
WONW	Defiance, Ohio	1280
WOOD	Grand Rapids, Mich.	1300
WOOF	Dothan, Ala.	560
WOOK	Washington, D.C.	1340
WOOO	Deland, Fla.	1310
WOOW	Greenville, N.C.	1340
WOPA	Oak Park, Ill.	1490
WOPI	Bristol, Tenn.	1490
WOR	New York, N.Y.	710
WORA	Mayaguez, P.R.	760
WORC	Worcester, Mass.	1310
WORD	Spartanburg, S.C.	910
WORK	York, Pa.	1350
WORL	Boston, Mass.	950
WORM	Savannah, Tenn.	1010
WORT	New Smyrna Beach, Florida	1550
WORX	Madison, Ind.	1270
WOSC	Fulton, N.Y.	1300
WOSH	Oshkosh, Wis.	1490
WOSU	Columbus, Ohio	820
WOTR	Corry, Pa.	1370
WOTT	Watertown, N.Y.	1410
WOTW	Nashua, N.H.	900
WOUB	Athens, Ohio	1340
WOVE	Welch, W.Va.	1340
WOW	Omaha, Nebr.	590
WOWE	Allegan, Mich.	1580
WOWI	New Albany, Ind.	1570
WOWL	Florence, Ala.	1240
WOWO	Ft. Wayne, Ind.	1190
WOWW	Naugatuck, Conn.	860
WOWY	Clewiston, Fla.	500d
WOXF	Oxford, N.C.	1340
WOZK	Ozark, Ala.	900
WPAB	Ponce, P.R.	550
WPAC	Patchogue, N.Y.	1580
WPAD	Paducah, Ky.	1450
WPAG	Ann Arbor, Mich.	1050
WPAL	Charleston, S.C.	730
WPAM	Pottsville, Pa.	1450
WPAP	Fernandina Beach, Florida	1570
WPAQ	Mount Airy, N.C.	740
WPAR	Parkersburg, W.Va.	1450
WPAT	Paterson, N.J.	930
WPAW	Pawtucket, R.I.	550
WPAX	Thomasville, Ga.	1240
WPAY	Portsmouth, Ohio	1400
WPAZ	Pottstown, Pa.	1370
WPBC	Minneapolis, Minn.	980
WPCC	Clinton, S.C.	1400
WPCF	Panama City, Fla.	1430
WPCO	Mt. Vernon, Ind.	1590
WPDM	Potsdam, N.Y.	1470
WPDQ	Jacksonville, Fla.	600
WPDR	Portage, Wis.	1350
WPDX	Clarksburg, W.Va.	750
WPEG	Winston-Salem, N.C.	1550
WPEH	Louisville, Ga.	1420
WPEL	Montrose, Pa.	1250
WPEN	Philadelphia, Pa.	950
WPEO	Peoria, Ill.	1020
WPEP	Taunton, Mass.	1570
WPET	Greensboro, N.C.	950
WPFA	Pensacola, Fla.	790
WPFB	Middletown, Ohio	910
WPFP	Park Falls, Wis.	1450
WPGA	Perry, Ga.	980
WPGC	Bradbury Hghts., Md.	1580
WPGW	Portland, Ind.	1440
WPHB	Philipsburg, Pa.	1260
WPIC	Sharon, Pa.	790
WPID	Piedmont, Ala.	1280
WPIK	Alexandria, Va.	730
WPIN	St. Petersburg, Fla.	680
WPIT	Pittsburgh, Pa.	730
WPKE	Pikeville, Ky.	1240
WPKO	Waverly, Ohio	1380
WPKY	Princeton, Ky.	1580
WPLA	Plant City, Fla.	910
WPLB	Greenville, Mich.	1380
WPLH	Huntington, W.Va.	1470
WPLK	Rockmart, Ga.	1220
WPLM	Plymouth, Mass.	1390
WPLO	Atlanta, Ga.	590
WPLY	Plymouth, Wis.	1420
WPME	Punxsutawney, Pa.	1540
WPMP	Pascagoula, Miss.	1580
WPNC	Plymouth, N.C.	1470
WPNF	Brevard, N.C.	1240
WPNX	Phenix City, Ala.	1460
WPOM	Pompano Beach, Fla.	1470
WPON	Pontiac, Mich.	1460
WPOP	Hartford, Conn.	1410
WPOR	Portland, Maine	1490
WPOW	New York, N.Y.	1330
WPPA	Pottsville, Pa.	1360
WPRA	Mayaguez, P.R.	990
WPRC	Lincoln, Ill.	1370
WPRE	Prairie Du Chien, Wis.	980
WPRN	Butler, Ala.	1220
WPRO	Providence, R.I.	630
WPRP	Ponce, P.R.	910
WPRS	Paris, Ill.	1440
WPRT	Prestonsburg, Ky.	960
WPRW	Manassas, Va.	1460
WPRY	Perry, Fla.	1400
WPTF	Raleigh, N.C.	680
WPTR	Albany, N.Y.	1540
WPTS	Pittston, Pa.	1540
WPTW	Piqua, Ohio	1570
WPTX	Lexington Pk., Md.	920
WPUV	Pulaski, Va.	1580
WPVA	Colonial Hghts., Va.	1290
WPVL	Painesville, Ohio	1460
WQAM	Miami, Fla.	560
WQBC	Vicksburg, Miss.	1420
WQDY	Calais, Maine	1230
WQIC	Meridian, Miss.	1390
WQIK	Jacksonville, Fla.	1280
WQMN	Superior, Wis.	1320
WQMR	Silver Spring, Md.	1050
WQOK	Greenville, S.C.	1440
WQSN	Charleston, S.C.	1450
WQTE	Monroe, Mich.	560
WQTY	Arlington, Fla.	1220
WQUA	Moline, Ill.	1230
WQXI	Atlanta, Ga.	790
WQXQ	Ormond Bch., Fla.	1380
WQXR	New York, N.Y.	1560
WQXT	Palm Beach, Fla.	1340
WRAC	Racine, Wis.	1460
WRAD	Radford, Va.	1460
WRAG	Carrollton, Ala.	590
WRAJ	Anna, Ill.	1440
WRAK	Williamsport, Pa.	1400
WRAL	Raleigh, N.C.	1240
WRAM	Monmouth, Ill.	1330
WRAN	Dover, N.J.	1510
WRAP	Norfolk, Va.	850
WRAW	Reading, Pa.	1340
WRAY	Princeton, Ind.	1250
WRBC	Jackson, Miss.	1300
WRBL	Columbus, Ga.	1420
WRC	Washington, D.C.	980
WRCD	Dalton, Ga.	1430
WRCO	Richland, Wis.	1450
WRCS	Ahoskie, N.C.	970
WRCV	Philadelphia, Pa.	1060
WRDB	Reedsburg, Wis.	1400
WRDO	Augusta, Maine	1400
WRDW	Augusta, Ga.	1480
WREA	E. Palatka, Fla.	1480
WREB	Holyoke, Mass.	930
WREC	Memphis, Tenn.	600
WREL	Lexington, Va.	1450
WREM	Remsen, N.Y.	1480
WREN	Topeka, Kans.	1250
WREO	Ashtabula, Ohio	970
WREV	Reidsville, N.C.	1220
WRFB	Tallahassee, Fla.	1580
WRFC	Athens, Ga.	900
WRFD	Worthington, Ohio	880
WRFS	Alexander City, Ala.	1050
WRGA	Rome, Ga.	1470
WRGR	Starke, Fla.	1490
WRGS	Rogersville, Tenn.	1370
WRHC	Jacksonville, Fla.	1400
WRHI	Rock Hill, S.C.	1340
WRIB	Providence, R.I.	1220
WRIC	Richlands, Va.	540
WRIG	Wausau, Wis.	1400
WRIM	Pahokee, Fla.	1250
WRIO	Rio Piedras, P.R.	1320
WRIP	Rossville, Ga.	980
WRIS	Roanoke, Va.	1410
WRIT	Milwaukee, Wis.	1340
WRIV	Riverhead, N.Y.	1390
WRIX	Griffin, Ga.	1410
WRJN	Racine, Wis.	1400
WRJS	San German, P.R.	1050
WRJW	Picayune, Miss.	1320
WRKD	Rockland, Maine	1450
WRKH	Rockwood, Tenn.	580
WRKM	Carthage, Tenn.	1350
WRKT	Cocoa Beach, Fla.	1300
WRLD	Lanett, Ala.	1490
WRMA	Montgomery, Ala.	950
WRMF	Titusville, Fla.	1050
WRMN	Elgin, Ill.	1410
WRMS	Beardstown, Ill.	790
WRMT	Rocky Mount, N.C.	1490
WRNB	New Bern, N.C.	1490
WRNL	Richmond, Va.	910
WRNY	Rome, N.Y.	1350
WROA	Gulfport, Miss.	1390
WROB	West Point, Miss.	1450
WROO	Daytona Beach, Fla.	1340

C.L.	Location	Kc.
WROK	Rockford, Ill.	1440
WROL	Fountain City, Tenn.	1490
WROM	Rome, Ga.	710
WRON	Ronceverte, W.Va.	1400
WROS	Scottsboro, Ala.	1330
WROV	Roanoke, Va.	1240
WROW	Albany, N.Y.	590
WROX	Clarksdale, Miss.	1450
WROY	Carmi, Ill.	1460
WRPB	Warner Robbins, Ga.	1350
WRR	Dallas, Tex.	1310
WRRF	Washington, N.C.	930
WRRR	Rockford, Ill.	1330
WRRZ	Clinton, N.C.	880
WRSA	Saratoga Sprgs., N.Y.	1280
WRSW	Warsaw, Ind.	1480
WRTA	Altoona, Pa.	1240
WRUF	Gainesville, Fla.	850
WRUM	Rumford, Maine	790
WRUN	Utica, N.Y.	1150
WRUS	Russellville, Ky.	610
WRVA	Richmond, Va.	1140
WRVK	Mt. Vernon, Ky.	1460
WRVM	Rochester, N.Y.	680
WRWD	Augusta, Ga.	1480
WRWH	Cleveland, Ga.	1380
WRWJ	Selma, Ala.	1570
WRXO	Roxboro, N.C.	1430
WSAC	Fort Knox, Ky.	1470
WSAF	Sarasota, Fla.	1220
WSAI	Cincinnati, Ohio	1360
WSAJ	Grove City, Pa.	1340
WSAL	Logansport, Ind.	1230
WSAM	Saginaw, Mich.	1400
WSAN	Allentown, Pa.	1470
WSAR	Fall River, Mass.	1480
WSAT	nr. Salisbury, N.C.	1280
WSAU	Wausau, Wis.	550
WSAV	Savannah, Ga.	630
WSAY	Rochester, N.Y.	1370
WSAZ	Huntington, W.Va.	930
WSB	Atlanta, Ga.	750
WSBA	York, Pa.	910
WSBB	New Smyrna Beach, Florida	1230
WSBC	Chicago, Ill.	1240
WSBS	Gt. Barrington, Mass.	860
WSBT	South Bend, Ind.	960
WSCM	Panama City Beach, Florida	1290
WSCR	Scranton, Pa.	1320
WSDB	Homestead, Fla.	1430
WSDR	Sterling, Ill.	1240
WSEB	Sebring, Fla.	1340
WSEN	Baldwinsville, N.Y.	1050
WSET	Glen Falls, N.Y.	1410
WSEV	Sevierville, Tenn.	930
WSFB	Quitman, Ga.	1490
WSFC	Somerset, Ky.	1240
WSFR	Sanford, Fla.	1360
WSFT	Thomaston, Ga.	1220
WSGA	Savannah, Ga.	1400
WSGC	Elberton, Ga.	1400
WSGN	Birmingham, Ala.	610
WSGW	Saginaw, Mich.	790
WSHE	Raleigh, N.C.	570
WSHH	Latrobe, Pa.	1570
WSIC	Statesville, N.C.	1400
WSID	Baltimore, Md.	1010
WSIG	Mount Jackson, Va.	790
WSIP	Paintsville, Ky.	1490
WSIR	Winter Haven, Fla.	1490
WSIV	Pekin, Ill.	1140
WSIX	Nashville, Tenn.	980
WSJC	Magee, Miss.	1280
WSJM	St. Joseph, Mich.	1400
WSJS	Winston-Salem, N.C.	600
WSKI	Montpelier-Barre, Vt.	1240
WSKP	Miami, Fla.	1450
WSKY	Asheville, N.C.	1230
WSLB	Ogdensburg, N.Y.	1400
WSLI	Jackson, Miss.	930
WSLM	Salem, Ind.	1220
WSLS	Roanoke, Va.	610
WSM	Nashville, Tenn.	650
WSMB	New Orleans, La.	1350
WSME	Sanford, Maine	1220
WSMI	Litchfield, Ill.	1540
WSMN	Nashua, N.H.	1590
WSMT	Sparta, Tenn.	1050
WSNJ	nr. Bridgeton, N.J.	1240
WSNO	Barre, Vt.	1450
WSNT	Sandersville, Ga.	1490
WSNW	Seneca Twnshp., S.C.	1150
WSNY	Schenectady, N.Y.	1240
WSOC	Charlotte, N.C.	930
WSOK	Savannah, Ga.	1230
WSOL	Tampa, Fla.	1300
WSON	Henderson, Ky.	860
WSOO	Slt. Ste. Marie, Mich.	1230
WSOQ	No. Syracuse, N.Y.	1220
WSOR	Windsor, Conn.	1480
WSOY	Decatur, Ill.	1340
WSPA	Spartanburg, S.C.	950
WSPB	Sarasota, Fla.	1450
WSPD	Toledo, Ohio	1370
WSPN	Saratoga Sprgs., N.Y.	900
WSPR	Springfield, Mass.	1270
WSPT	Stevens Pt., Wis.	1010
WSRA	Milton, Fla.	1490
WSRC	Durham, N.C.	1410
WSRO	Marlborough, Mass.	1470
WSRW	Hillsboro, Ohio	1590
WSSB	Durham, N.C.	1490
WSSC	Sumter, S.C.	1340
WSSO	Starkville, Miss.	1230
WSSV	Petersburg, Va.	1240
WSTC	Stamford, Conn.	1400
WSTK	Woodstock, Va.	1230
WSTL	Eminence, Ky.	1600
WSTN	St. Augustine, Fla.	1420
WSTP	Salisbury, N.C.	1490
WSTR	Sturgis, Mich.	1230
WSTS	Massena, N.Y.	1050
WSTU	Suart, Fla.	1450
WSTV	Steubenville, Ohio	1340
WSUB	Groton, Conn.	980
WSUG	Clewiston, Fla.	1050
WSUH	Oxford, Miss.	1420
WSUI	Iowa City, Iowa	910
WSUN	St. Petersburg, Fla.	620
WSUX	Seaford, Del.	1280
WSUZ	Palatka, Fla.	800
WSVA	Harrisonburg, Va.	550
WSVL	Shelbyville, Ind.	1520
WSVS	Crewe, Va.	800
WSWN	Belle Glade, Fla.	900
WSWV	Pennington Gap, Va.	1570
WSWW	Platteville, Wis.	1590
WSYB	Rutland, Vt.	1380
WSYD	Mt. Airy, N.C.	1300
WSYL	Sylvania, Ga.	1490
WSYR	Syracuse, N.Y.	570
WTAB	Tabor City, N.C.	1370
WTAC	Flint, Mich.	600
WTAD	Quincy, Ill.	930
WTAG	Worcester, Mass.	580
WTAL	Tallahassee, Fla.	1270
WTAN	Clearwater, Fla.	1340
WTAO	Cambridge, Mass.	740
WTAP	Parkersburg, W.Va.	1230
WTAQ	LaGrange, Ill.	1300
WTAR	Norfolk, Va.	790
WTAW	Bryan, Tex.	1150
WTAX	Springfield, Ill.	1240
WTAY	Robinson, Ill.	1570
WTBC	Tuscaloosa, Ala.	1230
WTBF	Troy, Ala.	970
WTBO	Cumberland, Md.	1450
WTCB	Flomaton, Ala.	990
WTCH	Shawano, Wis.	960
WTCJ	Tell City, Ind.	1230
WTCM	Traverse City, Mich.	1400
WTCN	Minneapolis, Minn.	1280
WTCO	Campbellsville, Ky.	1450
WTCR	Ashland, Ky.	1420
WTCS	Fairmont, W.Va.	1490
WTCW	Whitesburg, Ky.	920
WTEL	Philadelphia, Pa.	860
WTHE	Spartanburg, S.C.	1400
WTHG	Jackson, Ala.	1290
WTHI	Terre Haute, Ind.	1480
WTHR	Panama City Fla.	1480
WTIC	Hartford, Conn.	1080
WTID	Newport News, Va.	1270
WTIF	Tifton, Ga.	1340
WTIG	Massillon, Ohio	900
WTIK	Durham, N.C.	1310
WTIL	Mayaguez, P.R.	1300
WTIM	Taylorville, Ill.	1410
WTIP	Charleston, W.Va.	1240
WTIX	New Orleans, La.	690
WTJH	East Point, Ga.	1260
WTJS	Jackson, Tenn.	1390
WTKM	Hartford, Wis.	1540
WTKO	Ithaca, N.Y.	1470
WTKY	Tompkinsville, Ky.	1370
WTLB	Utica, N.Y.	1310
WTLD	Somerset, Ky.	1480
WTLS	Tallasee, Ala.	1300
WTMA	Charleston, S.C.	1250
WTMB	Tomah, Wis.	1390
WTMC	Ocala, Fla.	1290
WTMJ	Milwaukee, Wis.	620
WTMP	Tampa, Fla.	1150
WTMT	Louisville, Ky.	620
WTNC	Thomasville, N.C.	790
WTND	Orangeburg, S.C.	920
WTNS	Coshocton, Ohio	1560
WTNT	Tallahassee, Fla.	1450
WTOB	Winston-Salem, N.C.	1380
WTOC	Savannah, Ga.	1290
WTOD	Toledo, Ohio	1560
WTOE	Spruce Pine, N.C.	1470
WTOJ	Tomah, Wis.	1460
WTOL	Toledo, Ohio	1230
WTON	Staunton, Va.	1240
WTOP	Washington, D.C.	1500
WTOR	Torrington, Conn.	1490
WTOT	Marianna, Fla.	980
WTPR	Paris, Tenn.	710
WTRA	Latrobe, Pa.	1480
WTRB	Ripley, Tenn.	1570
WTRC	Elkhart, Ind.	1340
WTRL	Bradenton, Fla.	1490
WTRN	Tyrone, Pa.	1340
WTRO	Dyersburg, Tenn.	1330
WTRP	LaGrange, Ga.	620
WTRR	Sanford, Fla.	1400
WTRU	Muskegon, Mich.	1600
WTRW	Two Rivers, Wis.	1590
WTRX	Flint, Mich.	1330
WTRY	Troy, N.Y.	980
WTSA	Brattleboro, Vt.	1450
WTSB	Lumberton, N.C.	1340
WTSL	Hanover-Lebanon, New Hampshire	1400
WTSN	Dover, N.H.	1270
WTSV	Claremont, N.H.	1230
WTTB	Vero Beach, Fla.	1490
WTTC	Towanda, Pa.	1550
WTTF	Tiffin, Ohio	1600
WTTH	Port Huron, Mich.	1380
WTTL	Madisonville, Ky.	1310
WTTM	Trenton, N.J.	920
WTTN	Watertown, Wis.	1580
WTTR	Westminster, Md.	1470
WTTS	Bloomington, Ind.	1370
WTUG	Tuscaloosa, Ala.	790
WTUP	Tupelo, Miss.	1490
WTUX	Wilmington, Del.	1290
WTVB	Coldwater, Mich.	1590
WTVL	Waterville, Maine	1490
WTVN	Columbus, Ohio	610
WTWA	Thomson, Ga.	1240
WTWB	Auburndale, Fla.	1570
WTWN	St. Johnsbury, Vt.	1340
WTXL	W. Spgfd., Mass.	1490
WTYC	Rock Hill, S.C.	1150
WTYM	East Longmeadow, Mass.	1600
WTYN	Tryon, N.C.	1550
WTYS	Marianna, Fla.	1340
WULA	Eufaula, Ala.	1240
WUSJ	Lockport, N.Y.	1340
WUST	Bethesda, Md.	1120
WVAM	Altoona, Pa.	1430
WVAR	Richwood, W.Va.	1280
WVCG	Coral Gables, Fla.	1070
WVCH	Chester, Pa.	740
WVEC	Hampton, Va.	1490
WVET	Rochester, N.Y.	1280
WVIM	Vicksburg, Miss.	1490
WVIP	Mt. Kisco, N.Y.	1310
WVJP	Caguas, P.R.	1110
WVJS	Owensboro, Ky.	1420
WVKO	Columbus, Ohio	1580
WVLD	Valdosta, Ga.	1450
WVLK	Lexington, Ky.	590
WVLN	Olney, Ill.	740
WVMC	Mt. Carmel, Ill.	1360
WVMI	Biloxi, Miss.	570
WVNA	Tuscumbia, Ala.	1590
WVNJ	Newark, N.J.	620
WVOK	Birmingham, Ala.	690
WVOL	Berry Hill, Tenn.	1470
WVOM	Iuka, Miss.	1270
WVOP	Vidalia, Ga.	970
WVOS	Liberty, N.Y.	1240
WVOT	Wilson, N.C.	1420
WVOX	New Rochelle, N.Y.	1460
WVPO	Stroudsburg, Pa.	840
WVSC	Somerset, Pa.	990
WVVW	Grafton, W.Va.	1260
WVBC	Bay City, Mich.	1250
WVBD	Bamberg, S.C.	790
WVBZ	Vineland, N.J.	1360
WVCA	Gary, Ind.	1270
WVCC	Bremen, Ga.	1440
WVCH	Clarion, Pa.	1300
WVCO	Waterbury, Conn.	1240
WVDC	Washington, D.C.	1260
WVGP	Sanford, N.C.	1050
WVGS	Tifton, Ga.	1430
WVHG	Hornell, N.Y.	1320
WVIL	Ft. Lauderdale, Fla.	1580
WVIN	Baltimore, Md.	1400
WVIS	Black River Falls, Wis.	1260
WVIT	Canton, N.C.	970
WVIZ	Lorain, Ohio	1380
WVJ	Detroit, Mich.	950
WVJB	Brooksville, Fla.	1450
WVKY	Winchester, Ky.	1380
WVL	New Orleans, La.	870
WVNC	Asheville, N.C.	570
WVNH	Rochester, N.H.	930
WVNR	Beckley, W.Va.	620
WVNS	Statesboro, Ga.	1240
WVNY	Watertown, N.Y.	790
WVOD	Lynchburg, Va.	1390
WVOK	Charlotte, N.C.	1480
WVOL	Buffalo, N.Y.	1120
WVOM	New Orleans, La.	600
WVON	Woonsocket, R.I.	1240
WVOW	Conneaut, Ohio	1360
WVPA	Williamsport, Pa.	1340
WVPF	Palatka, Fla.	1260
WVRI	W. Warwick, R.I.	1450
WVRJ	White River Junc., Vt.	910
WVRL	Woodside, N.Y.	1600
WVSC	Glens Falls, N.Y.	1480
WVSR	St. Albans, Vt.	1420
WVST	Wooster, Ohio	960
WVSW	Pittsburgh, Pa.	970
WVVA	Wheeling, W.Va.	1170
WVWB	Jasper, Ala.	1360
WVWF	Fayette, Ala.	990
WVWR	Russellville, Ala.	920
WVWW	Rio Piedras, P.R.	1520
WVXL	Manchester, Ky.	1450
WVYO	Pineville, W.Va.	970
WXAL	Demopolis, Ala.	1400
WXGI	Richmond, Va.	950
WXLI	Dublin, Ga.	1230
WXLW	Indianapolis, Ind.	950
WXMT	Merrill, Wis.	730
WXOK	Baton Rouge, La.	1260
WXRF	Guayama, P.R.	1590
WXTN	Lexington, Miss.	1150
WXXX	Hattiesburg, Miss.	1310
WXYZ	Detroit, Mich.	1270
WYAL	Scotland Neck, N.C.	1280
WYAM	Bessemer, Ala.	1450
WYCL	York, S.C.	1580
WYDE	Birmingham, Ala.	850
WYLD	New Orleans, La.	940
WYMB	Manning, S.C.	1410
WYND	Sarasota, Fla.	1280
WYNG	Warwick-East Greenwich, R.I.	1590
WYNK	Baton Rouge, La.	1380
WYNN	Florence, S.C.	540
WYRN	Louisburg, N.C.	1480
WYSE	Lakeland, Fla.	1330
WYSL	Kenmore, N.Y.	1080
WYSR	Franklin, Va.	1250
WYTH	Madison, Ga.	1250
WYTI	Rocky Mount, Va.	1570
WYVE	Wytheville, Va.	1280
WYZE	Atlanta, Ga.	1480
WZEP	DeFuniak Sprgs., Fla.	1460
WZKY	Albemarle, N.Dak.	1580
WZOB	Ft. Payne, Ala.	1250
WZOK	Jacksonville, Fla.	1320
WZRO	Jacksonville Beach, Florida	1010
WZST	Tampa, Fla.	1550
WZYX	Cowan, Tenn.	1440

Canadian AM Stations By Call Letters

C.L.	Location	Kc.
CBA	Sackville, N.B.	1070
CBAF	Moncton, N.B.	1300
CBE	Windsor, Ont.	1550
CBF	Montreal, Que.	690
CBG	Gander, Nfld.	1450
CBH	Halifax, N.S.	1340
CBI	Sydney, N.S.	1140
CBJ	Chicoutimi, Que.	1580
CBK	Regina, Sask.	540
CBL	Toronto, Ont.	740
CBM	Montreal, Que.	940
CBN	St. John's, Nfld.	640
CBO	Ottawa, Ont.	910
CBT	Grand Falls, Nfld.	990
CBU	Vancouver, B.C.	690
CBV	Quebec, Que.	980
CBW	Winnipeg, Man.	990
CBX	Edmonton, Alta.	1010
CBXA	Edmonton, Alta.	740
CBY	Corner Brook, Nfld.	560
CFAB	Windsor, N.S.	1450
CFAC	Calgary, Alta.	960
CFAM	Altona, Man.	1290
CFAR	Flin Flon, Man.	590
CFAX	Victoria, B.C.	810
CFBC	Saint John, N.B.	930
CFBR	Sudbury, Ont.	550
CFCB	Corner Book, Nfld.	570
CFCF	Montreal, Que.	600
CFCH	North Bay, Ont.	600
CFCL	Timmins, Ont.	620
CFCN	Calgary, Alta.	1060
CFCO	Chatham, Ont.	630
CFCP	Courtenay, B.C.	1440
CFCW	Camrose, Alta.	1230
CFCY	Charlottetown, P.E.I.	630
CFDA	Victoriaville, Que.	1380
CFGB	Goose Bay, Nfld.	1340
CFGP	Grande Prairie, Alta.	1050
CFGR	Gravelbourg, Sask.	1230
CFGT	St. Joseph d'Alma, Que.	1270
CFJC	Kamloops, B.C.	910
CFJR	Brockville, Ont.	1450
CFKL	Scheffierville, Que.	1230
CFLM	LaTuque, Que.	1240
CFML	Cornwall, Ont.	1110
CFNB	Fredericton, N.B.	550
CFNS	Saskatoon, Sask.	1170
CFNW	Norman Wells, Northwest Territory	1240
CFOB	Fort Frances, Ont.	800
CFOR	Orillia, Ont.	1570
CFOS	Owen Sound, Ont.	560
CFOX	Pointe Claire, Que.	1470
CFPA	Port Arthur, Ont.	1230
CFPL	London, Ont.	980
CFPR	Prince Rupert, B.C.	1240
CFQC	Saskatoon, Sask.	600
CFRA	Ottawa, Ont.	560
CFRB	Toronto, Ont.	1010
CFRC	Kingston, Ont.	1490
CFRG	Gravelbourg, Sask.	710
CFRN	Edmonton, Alta.	1260
CFRS	Simcoe, Ont.	1560
CFRY	Portage la Prairie, Man.	1570
CFSL	Weyburn, Sask.	1340
CFTK	Terrace, B.C.	1140
CFUN	Vancouver, B.C.	1410
CFWH	Whitehorse, Yukon T.	1240
CFYK	Yellowknife, N.W.T.	1340
CFYT	Dawson, Yukon T.	1230
CHAB	Moose Jaw, Sask.	800
CHAD	Amos, Que.	1340
CHAT	Medicine Hat, Alta.	1270
CHEC	Lethbridge, Alta.	1090
CHED	Edmonton, Alta.	1080

C.L.	Location	Kc.
CHEF	Granby, Que.	1450
CHEX	Peterborough, Ont.	980
CHFA	Edmonton, Alta.	680
CHFC	Churchill, Man.	1280
CHGB	St. Anne de la Pocatiere, Que.	1350
CHIC	Brampton, Ont.	1090
CHIQ	Hamilton, Ont.	1280
CHLN	Three Rivers, Que.	550
CHLO	St. Thomas, Ont.	680
CHLP	Montreal, Que.	1410
CHLT	Sherbrooke, Que.	630
CHML	Hamilton, Ont.	900
CHNC	New Carlisle, Que.	610
CHNO	Sudbury, Ont.	900
CHNS	Halifax, N.S.	960
CHOK	Sarnia, Ont.	1070
CHOV	Pembroke, Ont.	1350
CHOW	Welland, Ontario	1470
CHQM	Vancouver, BC.	1320
CHRC	Quebec, Que.	800
CHRO	Drummondville, Que.	1340
CHRL	Roberval, Que.	910
CHRS	St. Jean, Que.	1090
CHSJ	Saint John, N.B.	1150
CHUB	Nanaimo, B.C.	1570
CHUC	Port Hope, Ont.	1500
CHUM	Toronto, Ont.	1050
CHVC	Niagara Falls, Ont.	1600
CHWK	Chilliwack, B.C.	1270
CHWO	Oakville, Ont.	1250
CJAD	Montreal, Que.	800
CJAF	Cabano, Que.	1340
CJAT	Trail, B.C.	610
CJAV	Port Alberni, B.C.	1240
CJBC	Toronto, Ont.	860
CJBQ	Belleville, Ont.	800
CJBR	Rimouski, Que.	900
CJCA	Edmonton, Alta.	930
CJCB	Sydney, N.S.	1270
CJCH	Halifax, N.S.	920
CJCJ	Woodstock, N.B.	920
CJCS	Stratford, Ont.	1240
CJDC	Dawson Creek, B.C.	1350
CJEM	Edmundston, N.B.	570
CJET	Smiths Falls, Ont.	630
CJFP	Riviere du Loup, Que.	1400
CJFX	Antigonish, N.S.	580
CJGX	Yorkton, Sask.	940
CJIB	Vernon, B.C.	940
CJIC	Sault Ste. Marie, Ont.	1050
CJKL	Kirkland Lake, Ont.	560
CJLM	Joliette, Que.	1350
CJLR	Quebec, Que.	1060
CJLS	Yarmouth, N. S.	1340
CJLX	Ft. Williams, Ont.	800
CJME	Regina, Sask.	1300
CJMS	Montreal, Que.	1280
CJMT	Chicoutimi, Que.	1420
CJNB	N. Battleford, Sask.	1460
CJNR	Blind River, Ont.	730
CJOB	Winnipeg, Man.	680
CJOC	Lethbridge, Alta.	1220
CJON	St. John's, Nfld.	930
CJOR	Vancouver, B.C.	600
CJOY	Guelph, Ont.	1460
CJQC	Quebec, Que.	1340
CJRH	Richmond Hill, Ont.	1310
CJRL	Kenora, Ont.	1220
CJRW	Summerside, P.E.I.	1240
CJSO	Sorel, Que.	1320
CJSP	Leamington, Ont.	710
CJSS	Cornwall, Ont.	1220
CJVI	Victoria, B.C.	900
CKAC	Montreal, Que.	730
CKAR	Huntsville, Ont.	590
CKAR-1	Parry Sound, Ont.	1340
CKBB	Barrie, Ont.	950
CKBC	Bathurst, N.B.	1400
CKBI	Prince Albert, Sask.	900
CKBL	Matane, Que.	1250
CKBM	Montmagny, Que.	1490
CKBS	St. Hyacinthe, Que.	1240
CKBW	Bridgewater, N.S.	1000
CKCH	Hull, Que.	970
CKCK	Regina, Sask.	620
CKCL	Truro, N.S.	600
CKCQ	Quesnel, B.C.	570
CKCQ-1	Williams Lake, B.C.	1240
CKCR	Kitchener, Ont.	1490
CKCV	Quebec, Que.	1280
CKCW	Moncton, N.B.	1220
CKCY	Sault Ste. Marie, Ont.	1400
CKDA	Victoria, B.C.	1220
CKDH	Amherst, N.S.	1400
CKDM	Dauphin, Man.	730
CKEC	New Glasgow, N.S.	1320
CKEK	Cranbrook, B.C.	570
CKEN	Kentville, N.S.	1350
CKEY	Toronto, Ont.	580
CKFH	Toronto, Ont.	1430
CKGB	Timmins, Ont.	680
CKGM	Montreal, Que.	980
CKGR	Galt, Ont.	1110
CKJL	St. Jerome, Que.	900
CKKW	Kitchener, Ont.	1320
CKLB	Oshawa, Ont.	1350
CKLC	Kingston, Ont.	1380
CKLD	Thetford Mines, Que.	1230
CKLG	N. Vancouver, B.C.	730
CKLN	Nelson, B.C.	1390
CKLS	LaSarre, Que.	1240
CKLW	Windsor, Ont.	800
CKLY	Lindsay, Ont.	910
CKMP	Midland, Ont.	1230
CKMR	Newcastle, N.B.	790
CKNB	Campbellton, N.B.	950
CKNW	New Westminster, British Columbia	980
CKNX	Wingham, Ont.	920
CKOC	Hamilton, Ont.	1150
CKOK	Penticton, B.C.	800
CKOM	Saskatoon, Sask.	1420
CKOT	Tillsonburg, Ont.	1510
CKOV	Kelowna, B.C.	630
CKOX	Woodstock, Ont.	1340
CKOY	Ottawa, Ont.	1310
CKPC	Brantford, Ont.	1380
CKPG	Prince George, B.C.	550
CKPR	Fort William, Ont.	580
CKPT	Peterborough, Ont.	1420
CKRB	Ville St. Georges, Que.	1460
CKRC	Winnipeg, Man.	630
CKRD	Red Deer, Alta.	850
CKRM	Regina, Sask.	980
CKRN	Rouyn, Que.	1400
CKRS	Jonquiere, Que.	590
CKSA	Lloydminster, Alta.	1150
CKSB	St. Boniface, Man.	1050
CKSL	London, Ont.	1290
CKSM	Shawinigan, Quebec	1220
CKSO	Sudbury, Ont.	790
CKSW	Swift Current, Sask.	1400
CKTB	St. Catharines, Ont.	610
CKTR	Three Rivers, Que.	1150
CKTS	Sherbrooke, Que.	900
CKUA	Edmonton, Alta.	580
CKVD	Val d'Or, Que.	1230
CKVL	Verdun, Que.	850
CKVM	Ville Marie, Que.	710
CKWS	Kingston, Ont.	960
CKWX	Vancouver, B.C.	1130
CKX	Brandon, Man.	1150
CKXL	Calgary, Alta.	1140
CKY	Winnipeg, Man.	580
CKYL	Peace River, Alta.	630
VOAR	St. John's, Nfld.	1230
VOCM	St. John's, Nfld.	590
VOWR	St. John's, Nfld.	800

Mexican and Cuban AM Stations

Mexican stations audible in the Southwest; the more powerful Cuban stations

Abbreviations: C.L., call letters; Kc., frequency in kilocycles; W.P., watt power

Location	C.L.	Kc.	W.P.
Mexico			
BAJA CALIFORNIA			
Ensenada	XEPF	1400	250
Mexicali	XED	1050	5000
	XEAA	1340	250
	XEAO	910	250
	XECL	990	5000
	XEGE	1570	1000
Tijuana	XEC	1310	250
	XEAK	690	50000
	XEAU	1470	5000
	XEAZ	1270	500
	XEBG	1550	1000
	XEGM	950	2500
	XEMO	860	5000
	XEXX	1420	2000
CHIHUAHUA			
Chihuahua	XEM	1390	500
	XEBU	620	1000
	XEBW	1280	1000
	XEFI	1440	1000
	XERA	1490	250
Ciudad Camargo	XEHA	580	1000
Ciudad Delicias	XEBN	1240	250
	XEJK	1340	250
Ciudad Juarez	XEF	1420	250
	XEJ	970	5000
	XEP	1300	500
	XEFV	1240	250
	XELO	800	150000
	XEWG	1490	250
	XEYC	1460	1000
Hidalgo	XEJS	1150	500
N. Casas Grandes	XETX	1010	250
COAHUILA			
Ciudad Acuna	XEKO	1010	1000
Monclova	XEMF	1260	250
Piedras Negras	XEMJ	920	1000
	XEMU	580	5000
Sabinas	XEBK	610	5000
Saltillo	XESJ	1250	500
	XESG	1510	1000
Torreon	XEBP	1310	5000
Villa Acuna	XEDH	1340	250
	XERF	1570	250000
DISTRITO FEDERAL			
Mexico City	XEL	1260	5000
	XEN	690	20000
	XEQ	940	150000
	XEW	900	250000
	XEX	730	500000
	XEFR	1180	5000
	XEJP	1150	10000
	XELA	830	10000
	XELZ	1440	5000
	XEMX	1380	5000
	XENK	620	5000
	XEOY	1000	50000
	XEPH	590	5000
	XEQK	1350	1000
	XEQR	1030	10000
	XERC	790	1000
	XERCN	1110	50000
	XERH	1500	50000
	XERPM	660	10000
	XESM	1470	10000
	XEUN	860	5000
DURANGO			
Durango	XEDU	860	1000
NUEVO LEON			
Linares	XER	1260	250
Monterrey	XEG	1050	150000
	XEH	1420	1000
	XET	990	5000
	XEAR	1480	1000
	XEAW	1280	1000
	XEFB	630	5000
	XEMR	1370	500
	XEOK	920	500
SAN LUIS POTOSI			
San Luis Potosi	XEWA	540	150000
SONORA			
Agua Prieta	XEAQ	1490	250
	XEFH	1310	1000
Cananea	XEFQ	980	500
Ciudad Obregon	XEOX	1430	1000
Hermosillo	XEBH	920	5000
	XEDL	1250	500
	XEDM	1580	50000
	XEHQ	590	500
Magdalena	XEDJ	1450	100
Naco	XETM	1350	1000
Nogales	XEHF	1370	5000
San Luis	XECB	1450	250
Santa Ana	XEAB	1400	250
TAMAULIPAS			
Matamoros	XEO	970	1000
	XEAM	1450	250
	XEMT	1340	250
Nuevo Laredo	XEAS	1410	250
	XEBK	1340	100
	XEDF	790	1000
	XEFE	960	1000
	XERG	1090	2500
	XEXO	1550	50000
Reynosa	XEOR	1390	1000
	XERT	590	5000
Rio Bravo	XEFD	1170	1000
Tampico	XEFW	810	50000
Cuba			
Camaguey	CMJB	880	1000
	CMJL	920	5000
	CMJN	960	1000
	CMJE	1000	1000
	CMJR	1030	1000
	CMJC	1270	1000
	CMJF	1340	1000
Camajuani	CMHD	890	1000
Ciego de Avila	CMJY	760	1000
Habana	CMW	550	2500
	CMCY	590	15000
	CMQ	630	25000
	CMCU	660	1000
	CMBC	690	50000
	CMCD	740	10000
	CMCH	790	10000
	CMBZ	830	5000
	CMBL	860	15000
	CMCF	910	10000
	CMBF	950	5000
	CMCK	980	5000
	CMBQ	1010	5000
	CMCX	1060	10000
	CMCA	1150	10000
	CMCB	1330	1000
Holguin	CMKJ	730	5000
Holguin Orte	CMKM	560	5000
	CMKV	600	1000
	CMKD	970	1000
	CMDC	1290	1000
Marianao	CMZ	1560	5000
Pinar del Rio	CMAB	760	5000
	CMAN	840	1000
	CMAQ	920	1000
Santa Clara	CMHI	570	10000
	CMHQ	640	15000
	CMHW	810	1000
	CMHO	1310	1000
	CMHM	1130	1000
Sancti Spiritus	CMHT	990	1000
Santiago	CMDA	650	1000
	CMKC	770	1000
	CMKW	800	2000
	CMKU	850	2000
	CMKN	930	1000
	CMKB	1170	1000

U. S. FM Stations by States

Abbreviations: Mc., megacycles; asterisk (*) indicates educational station

Location	C.L.	Mc.
ALABAMA		
Albertville	WAVU-FM	105.1
Alexander City	WRFS-FM	106.1
Andalusia	WCTA-FM	98.1
Anniston	WHMA-FM	100.5
Athens	WJDF	104.3
Birmingham	WAPI-FM	99.5
	WBRC-FM	106.9
	WSFM	93.7
Clanton	WKLF-FM	100.9
Cullman	WFMH-FM	101.1
Decatur	WHOS-FM	102.1
Homewood	WJLN	104.7
Huntsville	WAHR	99.1
	WNDA	92.9
Mobile	WKRG-FM	99.9
Montgomery	WFMI	98.9
Sylacauga	WMLS-FM	98.3
Tuscaloosa	WTBO-FM	95.7
	WUOA	*91.7
ALASKA		
Anchorage	KTVA-FM	105.5
ARIZONA		
Globe	KWJB-FM	100.3
Mesa	KBUZ-FM	104.7
Phoenix	KELE	95.5
	KFCA	*88.5
	KOOL-FM	94.5
	KITH	101.3
	KOY-FM	92.5
	KPHO-FM	96.9
	KTAR-FM	98.7
	KYEW	93.3
Tempe	KUPD-FM	97.9
Tucson	KFMM	99.5
ARKANSAS		
Blytheville	KLCN-FM	96.1
Ft. Smith	KFPW-FM	94.9
Jonesboro	KBTM-FM	101.9
	KASU	91.9
Mammoth Springs	KAMS	103.9

Location	C.L.	Mc.
Osceola	KOSE-FM	98.1
Pine Bluff	KOTN-FM	92.3
Siloam Springs	KUOA-FM	105.7

CALIFORNIA

Alameda	KJAZ	92.7
Anaheim	KEZY-FM	95.9
Arcata	KTOO	*90.5
Arlington	KNFP	*89.7
Atherton	KPEN	101.3
Avalon	KBIQ	104.3
Bakersfield	KERN-FM	94.1
	KQXR	101.5
Berkeley	KPFA	94.1
	KPFB	*89.3
	KRE-FM	102.9
Claremont	KSPC	*88.9
Coachella	KCHV-FM	93.7
El Cajon	KUFM	93.3
Eureka	KRED-FM	96.3
Fresno	KARM-FM	101.9
	KMJ-FM	97.9
	KRFM	93.7
	KXQR	102.7
Glendale	KFMU	97.1
	KUTE	101.9
Hayward	KBBM	101.7
Inglewood	KTYM-FM	103.9
Lodi	KCVR-FM	97.7
Long Beach	KFOX-FM	102.3
	KLON	*88.1
	KNOB	97.9
Los Altos	KPGM	97.7
Los Angeles	KABC-FM	95.5
	KBBI	107.5
	KBCA	105.1
	KBMS	105.9
	KCBH	98.7
	KFAC-FM	92.3
	KGLA	*103.5
	KHJ	101.1
	KMLA	100.3
	KNX-FM	93.1
	KPFK	*90.7
	KPOL-FM	93.9
	KRHM	94.7
	KRKD-FM	96.3
	KLAC-FM	102.7
	KUSC	*91.5
	KXLU	*88.7
	KHDF	99.5
Marysville	KMYC-FM	99.9
Modesto	KBEE-FM	103.3
	KTRB-FM	104.1
Mountain View	KFJC	*88.5
Newport Beach	KNBB	103.1
Oakland	KAFE	98.1
Ontario	KASK-FM	93.5
Oxnard	KAAR	104.7
Palm Springs	KPSR	92.1
Pasadena	KPCS	89.3
Redondo Beach	KAPP	93.5
Riverside	KPLI	99.1
	KACE-FM	92.7
	KDUO	97.5
Sacramento	KCRA-FM	96.1
	KFBK-FM	96.9
	KEBR	100.5
	KHIQ	105.1
	KJML	95.3
	KRAK-FM	92.9
	KSFM	96.9
	KXRQ	98.5
	KXOA-FM	107.9
Salinas	KSBW-FM	102.5
San Bernardino	KVCR	*91.9
	KFMW	99.9
	KEBS	*89.5
San Diego	KFSD	94.1
	KFMB-FM	100.7
	KFMX-FM	98.5
	KGB-FM	101.5
	KITT	105.3
	KJLM	98.1
	KLRO	94.9
	KPRI	106.5
	KSDS	*88.3
San Fernando	KVFM	94.3
San Francisco	KALW	*91.7
	KBAY-FM	104.5
	KBCO	105.3
	KCBS-FM	98.9
	KDFC	102.1
	KEAR	97.3
	KGO-FM	103.7
	KNBC-FM	99.7
	KHIP	106.9
	KRON-FM	96.5
	KSFR	94.9
	KQBY-FM	95.7
	KYA-FM	93.3
San Jose	KSJO-FM	92.3
	KRPM	98.5
San Luis Obispo	KATY-FM	96.1
San Mateo	KCSM	*90.9
Santa Ana	KWIZ-FM	96.7
	KFIL	108.3
Santa Barbara	KRCW	97.5
	KDB-FM	93.7
	KMUZ	103.3
Santa Clara	KSCU	*90.1
Santa Maria	KEYM	99.1
	KSMA-FM	102.5
Santa Monica	KCRW	*89.9

Location	C.L.	Mc.
	KSRF	103.1
Sierra Madre	KMAX	107.1
Stockton	KCVN	*91.3
	KSTN-FM	107.3
	KWG-FM	105.7
Ventura-Oxnard	KVEN-FM	100.7
Walnut Creek	KWME-FM	92.1
West Covina	KDWC	98.3
Woodland	KATT	95.3

COLORADO

Boulder	KRNW	97.3
Colorado Springs	KRCC	*91.3
	KFMH	96.5
	KSHS	*90.5
	KVOR-FM	92.9
Cortez	KZFM	94.1
Denver	KFML-FM	98.5
	KDEN-FM	99.5
	KLIR-FM	100.3
	KTGM	105.1
Grand Junction	KREX-FM	92.3
Manitou Springs	KCMS-FM	102.7

CONNECTICUT

Bridgeport	WJZZ	99.9
Brookfield	WGHF	95.1
Danbury	WLAD-FM	98.3
Hartford	WHCN	105.9
	WDRC-FM	102.9
	WCCC-FM	106.9
	WFNQ	93.7
	WRTC-FM	*89.3
	WTIC-FM	96.5
	WINF-FM	107.9
Manchester	WBMI	95.7
Meriden	WESU	88.1
Middletown	WNHC-FM	99.1
New Haven	WYBC-FM	94.3
	WSTC-FM	96.7
Stamford	WHUS	*90.5
Storrs	WATR-FM	92.5
Waterbury		

DELAWARE

Dover	WDOV-FM	94.7
Wilmington	WDEL-FM	93.7
	WJBR	99.5

D. C.

Washington	WASH-FM	97.1
	WFAN	100.3
	WGAY	99.5
	WGMS-FM	103.5
	WGTB	*90.1
	WMAL-FM	107.3
	WOL-FM	98.7
	WRC-FM	93.9
	WTOP-FM	96.3
	WWDC-FM	101.1

FLORIDA

Coral Gables	WVCG-FM	105.1
Daytona Beach	WNDB-FM	94.5
Fort Lauderdale	WWIL-FM	103.5
	WFLM	105.9
	WMFP	100.7
Gainesville	WRUF-FM	*104.1
Jacksonville	WJAX-FM	95.1
	WZOK-FM	96.9
	WMBR-FM	96.1
Miami	WKAT-FM	93.3
	WCKR-FM	97.3
	WGBS-FM	96.3
	WTHS	*91.7
	WWPB-FM	101.5
Miami Beach	WKAT-FM	93.1
	WMET-FM	93.9
Ocala	WMOP-FM	93.7
Orlando	WDBO-FM	92.3
	WHOO-FM	96.5
	WKIS-FM	100.3
Palm Beach	WQXT-FM	97.9
Pensacola	WPEX-FM	94.1
St. Petersburg	WTCX	99.5
Sarasota	WYAK	102.5
Tallahassee	WFSU-FM	*91.5
Tampa	WDAE-FM	100.7
	WFLA-FM	93.3
	WPKM	104.7
	WTUN	*88.9
Winter Park	WPRK	*91.5

GEORGIA

Athens	WGAU-FM	102.5
Atlanta	WABE	*90.1
	WPLO-FM	103.3
	WGKA-FM	92.9
	WSB-FM	98.5
Augusta	WAUG-FM	105.7
	WBBQ-FM	103.7
Columbus	WRBL-FM	93.3
Gainesville	WDUN-FM	103.9
Lagrange	WLAG-FM	104.1
Macon	WMAZ-FM	99.1
Marietta	WBIE-FM	101.5
	WKLS	96.1
Newnan	WCOH-FM	96.7
Savannah	WTOC-FM	97.3
Swainsboro	WJAT-FM	101.7
Toccoa	WLET-FM	106.1

HAWAII

Honolulu	KAIM-FM	95.5

Location	C.L.	Mc.
	KVDK	*88.1
	KUOH	*90.5

IDAHO

Boise	KBOI-FM	97.9
Lewiston	KOZE-FM	96.7

ILLINOIS

Anna	WRAJ-FM	92.7
Arlington Heights	WNWC	92.7
Aurora	WKKD-FM	95.9
Bloomington	WJBC-FM	101.5
Carbondale	WSIU	*91.9
Carmi	WROY-FM	97.3
Champaign	WDWS-FM	97.5
Chicago	WBBM-FM	96.3
	WBEZ	*91.5
	WCLM	101.9
	WDHF	95.5
	WEBH	93.9
	WEFM	99.5
	WEHS	97.9
	WENR-FM	94.7
	WFMF	100.3
	WFMQ	107.5
	WFMT	98.7
	WKFM	103.5
	WMAQ-FM	101.1
	WMBI-FM	*90.1
	WNIB	97.1
	WSBC-FM	93.1
	WJJD-FM	104.3
	WSOY-FM	102.9
Decatur	WNIC	*91.1
DeKalb	WAMV-FM	101.1
E. St. Louis	WSEI	95.7
Effingham	WELG	103.9
	WRMN-FM	94.3
Elgin	WEPS	*88.1
Elmwood Park	WXFM	105.9
Evanston	WEAW	105.1
	WNUR	*89.3
Harrisburg	WEBQ-FM	99.9
Jacksonville	WLDS-FM	100.5
	WAJP	93.5
Joliet	WJOL-FM	96.7
Kewanee	WKSD	*91.9
Litchfield	WSMI-FM	106.1
Macomb	WWKS	*91.3
Mattoon	WLBH-FM	96.9
Mt. Carmel	WSAB	94.9
	WVMC-FM	101.1
Mt. Vernon	WMIX-FM	94.1
Oak Park	WOPA-FM	102.7
Olney	WVLN-FM	92.9
Paris	WPRS-FM	98.3
Park Forest	WRHS	*88.1
Park Ridge	WMTH	*88.5
Peoria	WMBD-FM	92.5
Quincy	WGEM-FM	105.1
	WTAD-FM	99.5
Rockford	WROK-FM	97.5
Rock Island	WHBF-FM	98.9
Springfield	WTAX-FM	103.7
Taylorville	WGGM	95.0
Urbana	WILL-FM	*90.9
Winnetka	WNTH	*88.1

INDIANA

Anderson	WAFM	97.9
Bloomington	WFIU	*103.7
	WTTV-FM	92.3
Columbus	WCSI-FM	98.3
Connersville	WCNB-FM	100.3
Crawfordsville	WBBS-FM	106.3
Elkhart	WCMR-FM	95.1
	WTRC-FM	100.7
Evansville	WIKY-FM	104.1
	WEVC	*91.5
	WPSR	90.7
Franklin	WFCI	*89.3
Fort Wayne	WPTH	95.1
Gary	WGVE	*88.1
Goshen	WGCS	91.1
Greencastle	WGRE	*91.7
Hammond	WYCA	92.3
Hartford City	WHCI	*91.9
Huntington	WVSH	*91.9
Indianapolis	WAJC	*104.5
	WFBM-FM	94.7
	WFMS	95.5
	WIAN	*90.1
	WIBC-FM	93.1
Jasper	WITZ-FM	104.7
Madison	WORX-FM	96.7
Marion	WMRI-FM	106.9
	WBST	*90.7
Muncie	WMUN	104.1
	WWHI	*91.5
New Albany	WNAS	*88.1
New Castle	WCTW-FM	102.5
	WYSN	*91.1
Princeton	WRAY-FM	98.1
Salem	WSLM-FM	98.9
South Bend	WETL	*91.9
Terre Haute	WTHI-FM	99.9
	WVTS	100.7
Wabash	WSKS	*91.3
Warsaw	WRSW-FM	107.3
Washington	WFML	106.5
West Lafayette	WBAA-FM	99.1

IOWA

Ames	WOI-FM	*90.1
Boone	KFGQ	*99.3
Cedar Falls	KTCF	*88.1
Clinton	KROS-FM	96.1

Location	C.L.	Mc.
Davenport	WOC-FM	103.7
Des Moines	KDPS	*88.1
	KDMI	97.3
	KSO	98.5
	WHO-FM	100.3
Dubuque	WDBQ	103.3
Iowa City	KSUI	*91.7
Mason City	KGLO-FM	101.1
Muscatine	KWPC-FM	99.7
Sioux City	KDVR	97.9
Storm Lake	KAYL-FM	101.5
Waverly	KWAR	89.1

KANSAS

Emporia	KSTE	*88.7
Kansas City	KCJC	98.1
Lawrence	KANU	*91.5
Manhattan	KSDB-FM	*88.1
Newton	KJRG-FM	92.1
Ottawa	KTJO-FM	*88.1
Parsons	KPPS-FM	*91.1
Salina	KAFM	99.9
Topeka	KTOP-FM	100.3
Wichita	KFH-FM	100.3
	KMUW	*89.1
	KCBM-FM	107.3

KENTUCKY

Ashland	WCMI-FM	93.7
Central City	WNES-FM	101.9
Fulton	WFUL-FM	104.9
Glasgow	WGGC	95.1
Hazard	WKIC-FM	96.5
Henderson	WSON-FM	99.5
Hopkinsville	WRLX	98.7
	WKOF	100.3
Lexington	WBKY	*91.3
	WLAP-FM	94.5
Louisville	WFPK	*91.9
	WFPL	*89.3
	WLVL	97.5
Madisonville	WFMW-FM	93.9
	WNGO-FM	94.7
Owensboro	WOMI-FM	92.5
	WVJS-FM	96.1
Paducah	WPAD-FM	96.9
	WKYB-FM	93.3

LOUISIANA

Alexandria	KALB-FM	96.9
Baton Rouge	WJBO-FM	98.1
Monroe	KMLB-FM	104.1
New Orleans	WBEH	89.3
	WDSU-FM	105.3
	WRCM	97.1
	WMMT	95.7
Shreveport	KRMD-FM	101.1
	KBCL-FM	96.5
	KWKH-FM	94.5

MAINE

Augusta	WFAU-FM	101.3
Bangor	WABI-FM	97.1
Brunswick	WBOR	*91.1
Caribou	WFST-FM	97.7
Lewiston	WCOU-FM	93.9
	WRJR	91.5
Poland Springs	WMTW-FM	94.9
Portland	WLOB-FM	97.9

MARYLAND

Annapolis	WNAV-FM	99.1
	WANN-FM	107.9
	WXTC	107.9
	WAQE-FM	101.9
Baltimore	WBJC	*88.1
	WCAO-FM	102.7
	WCBM-FM	106.5
	WFMM-FM	93.1
	WRBS	95.1
	WSID	92.3
	WBAL-FM	97.9
	WITH-FM	104.3
	WYOU	92.3
Bethesda	WJMD	106.3
Bradbury Heights	WPGC	95.5
Cumberland	WCUM-FM	102.9
Frederick	WFMD-FM	99.9
Hagerstown	WJEJ-FM	104.7
	WARK-FM	106.9
Havre de Grace	WASA-FM	103.7
Oakland	WBUZ	95.5
Tacoma Park	WGTS-FM	*91.9
Westminster	WTTR-FM	100.7

MASSACHUSETTS

Amherst	WAMF	*88.1
	WMUA	*91.1
Boston	WBUR	*90.9
	WBCN	104.1
	WBZ-FM	106.7
	WCOP-FM	100.7
	WEEI-FM	103.3
	WERS	*88.9
	WHDH-FM	94.5
	WRKO-FM	98.5
	WXHR	96.9
Brockton	WBET-FM	97.7
Brookline	WBOS-FM	92.9
Cambridge	WGBH-FM	*89.7
	WHRB-FM	95.3
Fitchburg	WFGM-FM	104.7
Framingham	WKOX-FM	105.7
Greenfield	WHAI-FM	98.3

Location	C.L.	Mc.
Haverhill	WHAV-FM	92.5
Lawrence	WGHJ	93.7
Lowell	WLLH-FM	99.5
Medford	WISK	107.9
New Bedford	WBSM-FM	97.3
	WNBH-FM	98.1
S. Hadley	WMHC	*88.5
Springfield	WHYN-FM	93.1
	WEDK	*91.7
	WSCB	*88.9
	WMAS-FM	94.7
Waltham	WCRB-FM	102.5
W. Yarmouth	WOCB-FM	94.3
Williamstown	WCFM	*90.1
Winchester	WHSR-FM	*91.9
Worcester	WTAG-FM	96.1

MICHIGAN

Ann Arbor	WUOM	*91.7
Bay City	WBCM-FM	96.1
Benton Hrbr.	WHFB-FM	99.9
Birmingham	WHFI	94.7
Coldwater	WTVB-FM	98.3
Dearborn	WKMH-FM	100.3
Detroit	WDET-FM	*101.9
	WCHD	105.9
	WDTM	106.7
	WABX	99.5
	WOTR	*90.9
	WJBK-FM	93.1
	WMUZ	103.5
	WMZK	97.9
	WJR-FM	96.3
	WQRS-FM	105.1
	WWJ-FM	97.1
	WXYZ-FM	101.1
E. Lansing	WKAR-FM	*90.5
	WSWM	99.1
Flint	WFBE	*95.1
Grand Rapids	WFUR-FM	102.9
	WJEF-FM	93.7
	WLAV-FM	96.9
Highland Pk.	WHPR	*88.1
Holland	WJBL-FM	94.5
Interlochen	WGYA	*103.1
Jackson	WBBC	94.1
Kalamazoo	WMCR	*102.1
Lansing	WJIM-FM	97.5
	WMRT-FM	100.7
Oak Park	WLDM	95.5
Royal Oak	WOAK	*89.3
	WOMC	104.3
Saginaw	WSAM-FM	98.1
Sturgis	WSTR-FM	103.1

MINNESOTA

Brainerd	KLIZ-FM	95.7
Mankato	KYSM-FM	103.5
Minneapolis	KTIS-FM	*98.5
	KWFM	97.1
	WLOL-FM	99.5
	WPBC-FM	101.3
	WAYL	96.1
St. Cloud	KFAM-FM	104.7
St. Paul	KNOF	95.3
Worthington	KWOA-FM	94.9

MISSISSIPPI

Jackson	WJDX-FM	102.9
Laurel	WNSL-FM	100.3
Meridian	WMMI	*88.1

MISSOURI

Clayton	KFUO-FM	99.1
Joplin	WMBH-FM	96.1
	KSYN	92.5
Kansas City	KCMO-FM	94.9
	KBEY	104.3
	KTSR	*90.1
	KDAF-FM	102.1
	KCMK	93.3
	KCUR-FM	89.3
	KXTR	96.5
Kennett	KBOA-FM	98.9
Poplar Bluff	KWCC-FM	94.5
St. Louis	KCFM	93.7
	KADI	96.5
	WAMV-FM	101.1
	WIL-FM	92.3
	KSLH	*91.5
	KSTL-FM	98.1
	KWIX	102.5
	KRFD	106.9
Springfield	KTTS-FM	94.7
West Plains	KWPM-FM	93.9

NEBRASKA

Kearney-Holdrege		
	KHOL-FM	98.9
Lincoln	KFMQ	95.3
Omaha	KQAL-FM	94.3
	KFAB-FM	99.9
	WOW-FM	92.3
	KDIL-FM	96.1

NEVADA

Reno	KNEV	95.5

NEW HAMPSHIRE

Berlin	WMOU-FM	103.7
Claremont	WTSV-FM	106.1
Manchester	WKBR-FM	95.7
Mt. Washington	WMTW-FM	94.9
Nashua	WOTW-FM	106.3

Location	C.L.	Mc.

NEW JERSEY

Asbury Park	WJLK-FM	94.9
Bridgeton	WSNJ-FM	107.7
Camden	WKDN-FM	106.9
E. Orange	WFMU	*91.1
Hackettstown	WNTI	*91.9
Long Branch	WRLB	107.1
Newark	WNTA-FM	94.7
	WBGO	*88.3
New Brunswk.	WCTC-FM	98.3
Paterson	WPAT-FM	93.1
Princeton	WPRB	103.9
Red Bank	WFHA-FM	106.3
South Orange	WSOU	*89.5
Trenton	WTOA	97.5
Wildwood	WCMC-FM	100.7
Zarephath	WAWZ-FM	99.1

NEW MEXICO

Albuquerque	KANW	*89.1
	KHFM	96.3
Aztec	KNDE-FM	94.9
Los Alamos	KRSN-FM	98.5
Mountain Park	KMFM	97.9
Roswell	KBIM-FM	97.1

NEW YORK

Albany	WAMC	*90.3
Auburn	WMBO-FM	96.1
Babylon	WTFM	103.5
	WBAB-FM	102.3
Binghamton	WNBF-FM	98.1
	WKOP-FM	95.3
Brooklyn	WNYE	*91.5
Buffalo	WBEN-FM	106.5
	WBFO	*88.7
	WEBR	94.5
	WGR-FM	96.9
	WBUF	92.9
	KWOL-FM	104.1
Cherry Valley	WRRC	101.9
Corning	WCLI-FM	106.1
Cortland	WKRT-FM	99.9
DeRuyter	WRRD	105.1
Elmira	WECW	*88.1
Floral Park	WSHS	*90.3
Garden City	WLIR	92.7
Hempstead	WHLI-FM	98.3
	WVHC	*88.7
Hornell	WWHG-FM	105.3
Ithaca	WHCU-FM	97.3
	WICB	*91.7
	WRRA-FM	103.7
	WVBR-FM	101.7
Jamestown	WJTN-FM	93.3
Kenmore	WYSL-FM	103.3
Massena	WMSA-FM	105.3
Mt. Kisco	WRNW	107.1
New Rochelle	WVOX-FM	93.5
New York	WABC-FM	95.5
	WBAI	99.5
	WBFM	101.9
	WCBS-FM	101.1
	WEVD-FM	97.9
	WFUV	*90.7
	WHOM-FM	92.3
	WKCR-FM	*89.9
	WNCN	104.3
	WNEW-FM	102.7
	WNYC-FM	93.9
	WNYE	91.5
	WOR-FM	98.7
	WQXR-FM	96.3
	WNBC-FM	97.1
	WRFM	105.1
	WRVR	106.7
Niagara Falls	WHLD-FM	98.5
Olean	WHOL-FM	95.7
Plattsburgh	WEAV-FM	99.9
Patchogue	WALK-FM	97.5
	WPAC-FM	106.1
Peekskill	WLNA-FM	100.7
Poughkeepsie	WKIP-FM	104.7
Rochester	WHFM	98.9
	WBBF-FM	101.3
	WCMF	96.5
	WIRQ	*90.9
	WROC-FM	97.9
	WGFM	99.5
Scheneetady	WRRE	95.1
South Bristol	WSPE	*88.1
Springville	WAER	*88.1
Syracuse	WDDS-FM	93.1
	WONO	100.9
	WSYR-FM	94.5
Troy	WFLY	92.3
	WRPI	*91.5
Utica	WRUN-FM	105.7
Wethersfield	WRRL	107.7
White Plains	WFAS-FM	103.9

NORTH CAROLINA

Albemarle	WABZ-FM	100.9
Asheboro	WGWR-FM	92.3
Asheville	WLOS-FM	104.3
Burlington	WBBB-FM	101.1
	WFNS-FM	93.9
Burlington-Graham		
	WBAG-FM	92.9
Chapel Hill	WUNC	*91.5
Charlotte	WSOC-FM	103.5
	WYFM	104.7
Clingman's Pk.	WMIT	106.9
Durham	WDNC-FM	105.1
Elkin	WIFM-FM	100.9
Fayetteville	WFNC-FM	98.1
Forest City	WBBO-FM	93.3
	WAGY-FM	105.3
Gastonia	WGNC-FM	101.9
Goldsboro	WEQR	96.9
Greensboro	WMDE	98.7
Greenville	WWWS	*91.3
Henderson	WHNC-FM	92.5
	WHKP-FM	102.5
Hendersonville	WHKP-FM	102.5
Hickory	WHKY-FM	102.9
High Point	WHPE-FM	95.5
	WHPS	*89.3
	WMFR-FM	99.5
	WNOS-FM	100.3
Laurinburg	WEWO-FM	96.5
Leaksville	WLOE-FM	94.5
Lexington	WBUY-FM	94.3
Lumberton	WTSB-FM	95.7
Raleigh	WKIX-FM	96.1
	WPTF-FM	94.7
	WRAL-FM	101.5
Reidsville	WREV-FM	102.1
Rocky Mount	WEED-FM	92.1
	WFMA	100.7
Roxboro	WRXO-FM	96.7
Salisbury	WSTP-FM	106.5
Sanford	WWGP-FM	105.5
Shelby	WOHS-FM	96.1
Statesville	WFMX	105.7
Tarboro	WCPS-FM	104.3
Thomasville	WTNC-FM	98.3
Wilmington	WPRV	93.9
Winston-Salem	WAIR-FM	93.1
	WYFS	107.5
	WFDD-FM	*88.1
	WSJS-FM	104.1

OHIO

Akron	WAKR-FM	97.5
	WAPS	*89.1
Alliance	WFAH-FM	101.7
Ashland	WNCO-FM	101.3
Ashtabula	WREO-FM	103.7
Athens	WOUB-FM	*91.5
Barberton	WDBN	94.9
Bellaire	WOMP-FM	100.5
Berea	WBWC	*88.3
Bowling Green	WBGU	*88.1
Canton	WHBC-FM	94.1
	WAND	106.9
	WCNO	106.9
Cincinnati	WCPO-FM	105.1
	WAEF-FM	104.3
	WGUC	*90.9
	WKRC-FM	101.9
	WSAI-FM	102.7
Cleveland	KYW-FM	105.7
	WXEN-FM	106.6
	WBOE	*90.3
	WCRF	103.3
	WDGO	95.5
	WDOK-FM	102.1
	WERE-FM	98.5
	WGAR-FM	99.5
	WHK-FM	100.7
	WJW-FM	104.1
	WNOB	107.9
Cleveland Hts.	WCUY-FM	92.5
Columbus	WCBE	*90.5
	WBNS-FM	97.1
	WCOL-FM	92.3
	WOSU-FM	*89.7
	WTVN-FM	96.3
	WVKO	94.7
Dayton	WHIO-FM	99.1
	WIFE	104.7
Delaware	WSLN	*91.1
East Liverpool	WOHI-FM	104.3
Eaton	WCTM	92.9
Elyria	WEOL-FM	107.3
Findlay	WFIN-FM	100.5
Fostoria	WFOB	96.7
Fremont	WFRO-FM	99.3
Hamilton	WQMS	96.7
	WHOH	103.5
Kent	WKSU-FM	*88.1
Lancaster	WHOK-FM	95.5
Lima	WIMA-FM	102.1
Marietta	WCMO	*89.3
Marion	WMRN-FM	106.9
Miamisburg	WFCJ	93.9
Middletown	WPFB-FM	105.9
Mt. Vernon	WMVO-FM	93.7
Newark	WCLT-FM	100.3
Oxford	WMUB	*88.5
	WOXR	97.7
Piqua	WPTW-FM	95.7
Portsmouth	WPAY-FM	104.1
Salem	WSOM-FM	105.1
Sandusky	WLEC-FM	102.7
Springfield	WBLY-FM	103.9
Steubenville	WSTV-FM	103.5
Toledo	WSPD-FM	101.5
	WMHE	92.5
	WTDS	*91.3
	WTOL-FM	104.7
	WTRT	99.9
Westerville	WOBN	*91.5
Wooster	WWST-FM	104.5
Yellow Springs	WYSO	*91.5
Youngstown	WKBN-FM	98.9
	WBBW-FM	93.3
	WRED	101.1

OKLAHOMA

Durant	KSEO-FM	107.3
Norman	WNAD-FM	*90.9
Oklahoma City	KOKH	*88.9
	KIOO	100.5
	KEFM	94.7
	KYFM	98.9
Shawnee	KBGC	*89.9
Stillwater	KOSU-FM	*91.7
	KSPI-FM	93.9
Tulsa	KWGS	*90.5
	KIHI	95.5
	KOCW	97.5
	KOGM-FM	92.9

OREGON

Eugene	KRVM	*91.9
	KEED-FM	98.1
	KFMY	97.9
	KUGN-FM	99.1
	KWAX	*91.1
Grants Pass	KGPO	96.9
Medford	KBOY-FM	95.3
Oretech	KTEC	*88.1
Portland	KEX-FM	92.3
	KGMG	95.5
	KOIN-FM	101.1
	KPFM	97.1
	KPOJ-FM	98.7
	KQFM	100.3
	KRRC	*89.3

PENNSYLVANIA

Allentown	WFMZ	100.7
	WAEB-FM	104.1
Altoona	WVAM-FM	100.1
	WFBG-FM	98.1
Beaver Falls	WBVP-FM	106.7
Bethlehem	WGPA-FM	95.1
Bloomsburg	WHLM-FM	106.5
Boyertown	WBYC-FM	107.5
Braddock	WLOA-FM	96.9
Butler	WBUT-FM	97.7
Carlisle	WHYL-FM	102.3
Chambersburg	WCHA-FM	95.1
Dubois	WCED-FM	102.1
Easton	WEST-FM	107.9
	WEEX-FM	99.9
Erie	WERC-FM	99.9
Glenside	WIFI	92.5
Harrisburg	WHP-FM	97.3
Havertown	WHHS	*89.3
Hazleton	WAZL-FM	97.9
Jenkintown	WIBF	103.9
Johnstown	WARD-FM	92.1
	WJAC-FM	95.5
Lancaster	WGAL-FM	101.3
	WDAC	94.5
	WLAN-FM	96.9
Lebanon	WLBR-FM	100.1
Meadville	WMGW-FM	100.3
Montrose	WPEL-FM	96.5
Oil City	WDJR	98.5
Palmyra	WJWR	92.1
Philadelphia	WCAU-FM	98.1
	WDAS-FM	105.3
	WFIL-FM	102.1
	WFLN	95.7
	WHAT-FM	96.5
	WHYY	*90.9
	WIFI	92.5
	WIBG-FM	94.1
	WIP-FM	93.3
	WPEN-FM	102.9
	WPWT	*91.7
	WQAL	106.1
	WRTI-FM	*90.1
	WXPN	*88.9
Pittsburgh	KDKA-FM	92.9
	WAZZ	105.9
	WCAE-FM	96.1
	WDUQ	*91.5
	WINE	102.9
	WILY	105.9
	WJAS-FM	99.7
	WKJF	93.7
	WPIT-FM	101.5
	WWSW-FM	94.5
Pottsville	WPPA-FM	101.9
Red Lion	WGCB-FM	96.1
Scranton	WGBI-FM	101.3
	WUSV	*88.9
Sharon	WPIC-FM	102.9
State College	WDFM	*91.1
Sunbury	WKDK-FM	94.1
Towanda	WTTC-FM	92.7
Warren	WRRN	92.3
Washington	WJPA-FM	104.3
Waynesboro	WAYZ-FM	101.5
Wilkes-Barre	WBRE-FM	98.5
	WYZZ	103.3
Williamsport	WLYC-FM	105.1
	WRAK-FM	100.3
York	WNDW-FM	105.7

RHODE ISLAND

Cranston	WLOV	99.9
Providence	WPJB-FM	105.1
	WICE-FM	107.7
	WPFM	95.5
	WPRO-FM	92.3
	WXCN	101.5
Woonsocket	WWON-FM	106.3

SOUTH CAROLINA

Anderson	WCAC	101.1
Charleston	WCSC-FM	96.9
	WTMA-FM	95.1

Location	C.L.	Mc.
Clemson	WSBF-FM	*88.1
Columbia	WCOS-FM	97.9
	WNOK-FM	104.7
	WUSC-FM	*89.9
Dillon	WDSC-FM	92.9
Greenville	WESC-FM	92.5
	WFBC-FM	93.7
	WMVU-FM	94.5
Rock Hill	WRHI-FM	98.3
Seneca	WSNW-FM	98.1
Spartanburg	WSPA-FM	98.9

TENNESSEE

Bristol	WOPI-FM	96.9
Chattanooga	WDOD-FM	96.5
Collegedale	WSMC-FM	*88.1
Gallatin	WFMG	104.5
Greeneville	WGRV-FM	94.9
Jackson	WTJS-FM	104.1
Johnson City	WJCW-FM	100.7
Kingsport	WKPT-FM	98.5
Knoxville	WBIR-FM	93.3
	WKOS	*91.1
	WUOT	*91.9
Memphis	WMC-FM	99.7
	WMPS-FM	97.1
	WDIA-FM	102.7
	WQMM	95.5
Nashville	WFMB	105.9
	WSIX-FM	97.5

TEXAS

Abilene	KACC-FM	*91.1
Amarillo	KGNC-FM	93.1
Austin	KHFI	98.3
	KAZZ	95.5
	KTBC-FM	93.7
	KUT-FM	*90.7
Beaumont	KRIC-FM	97.5
Brownwood	KHPC	88.1
Cleburne	KCLE-FM	94.9
Corpus Christi	KMFM	95.5
Dallas	KIXL-FM	104.5
	KNER	*88.1
	KRLD-FM	92.5
	WRR-FM	101.1
	KVTT	*91.7
	KQRO	102.9
Denton	KDNT-FM	106.3
DiBoll	KSPL-FM	95.5
Dumas	KDDD-FM	95.3
El Paso	KVOF-FM	*88.5
	KHMS	94.7
Ft. Worth	WBAP-FM	96.3
	KFJZ-FM	97.1
Gainesville	KGAF-FM	94.5
Harlingen	KELT	94.5
Hillsboro	KHBR-FM	102.3
Houston	KHGM	102.9
	KHUL	95.7
	KFMK	97.9
	KARO	94.5
	KQUE	102.9
	KRBE	104.1
	KTRH-FM	101.1
	KUHF	*91.3
Lubbock	KRKH-FM	93.7
	KBFM	96.3
Marshall	KMHT-FM	97.3
Midland	KNFM	92.3
Odessa	KQIP	96.7
Pampa	KBMF-FM	100.3
Plainview	KHBL	*88.1
Port Arthur	KFMP	93.3
San Antonio	KISS	99.5
	KEEZ	97.3
	KAKI-FM	98.1
	KITY	92.9
Texarkana	KCMC-FM	98.1
Waco	KEFC	95.5
Waxahachie	KBEC-FM	93.5

UTAH

Ephraim	KEPH	*88.9
Logan	KUSU-FM	*88.1
Provo	KBYU-FM	*88.9
Salt Lake City	KCPX-FM	98.7
	KLUB-FM	87.1
	KSL-FM	100.3

VIRGINIA

Arlington	WAVA-FM	105.1
	WCCV-FM	97.5
Charlottesville	WINA-FM	95.3
	WTJU	91.3
Crewe	WSVS-FM	104.7
Fredericksburg	WFVA-FM	101.5
Gretna	WMNA-FM	103.3
Harrisonburg	WEMC	*91.7
	WSVA-FM	100.7
Lynchburg	WWOD-FM	100.1
Martinsville	WMVA-FM	96.3
Newport News	WGH-FM	97.3
Norfolk	WMTI	*91.5
	WRVC	102.5
	WYFI-FM	99.7
Portsmouth	WAVY-FM	96.9
Richmond	WCOD	98.1
	WRFK	91.1
	WRVA-FM	94.5
	WRNL-FM	102.1
Roanoke	WDBJ-FM	94.9
	WLRJ	92.3
	WROV-FM	103.7
	WSLS-FM	99.1
South Boston	WHLF-FM	97.5
South Norfolk	WFOS	*90.5
Staunton	WSGM-FM	93.5
Williamsburg	WCWM	89.1
Winchester	WRFL	92.5
Woodbridge	WXRA	105.9

WASHINGTON

Bellingham	KGMI	92.9
Cheney	KEWC-FM	*89.9
Edmonds	KGFM	105.3
Lynden	KLYN-FM	106.5
Opportunity	KZUN-FM	96.1
Seattle	KING-FM	98.1
	KETO-FM	101.5
	KGMJ	95.7
	KIRO-FM	100.7
	KISW	99.9
	KLSN	96.5
	KMCS	98.9
	KUOW	94.9
Spokane	KREM-FM	92.9
	KXLY-FM	99.9
	KHQ-FM	98.1
Tacoma	KCPS	90.9
	KLAY-FM	106.3
	KTNT-FM	97.3
	KTOY	*91.7
	KTWR	103.9

WEST VIRGINIA

Beckley	WBKW	99.5
Charleston	WKAZ-FM	97.5
	WKNA	98.5
Huntington	WKEE-FM	100.5
Martinsburg	WEPM-FM	94.3
Morgantown	WAJR-FM	99.3
Oak Hill	WOAY-FM	94.1
Wheeling	WKWK-FM	97.3
	WWVA-FM	98.7

WISCONSIN

Appleton	WLFM	*91.1
Chilton	WHKW	*89.3
Colfax	WHWC	*88.3
Delafield	WHAD	*90.7
Eau Claire	WIAL	94.1
Fort Atkinson	WFAW	107.3
Green Bay	WBAY-FM	101.1
Greenfield Twp.	WWCF	94.9
Highland	WHHI	91.3
Highland Twp.	WHSA	*89.9
Janesville	WCLO-FM	99.9
La Crosse	WHLA	*90.3
Madison	WHA-FM	*88.7
	WIBA-FM	101.5
	WISM-FM	98.1
	WMFM	104.1
	WRVB-FM	102.5
Merrill	WLIN	100.7
Milwaukee	WFMR	96.5
	WMIL-FM	95.7
	WISN-FM	97.3
	WRIT-FM	102.9
	WMKE	102.1
	WQFM	98.3
	WTMJ-FM	94.1
	WEKZ-FM	93.7
Monroe	WRJN-FM	100.7
Racine	WJMC-FM	96.3
Rice Lake	WCOW-FM	97.1
Sparta	WTTN-FM	104.7
Watertown	WAUK-FM	106.1
Waukesha	WHRM	*91.9
Wausau	WTOS	103.7
Wauwatosa	WBKV-FM	92.5
West Bend	WFHR-FM	103.3
Wisc. Rapids		

U. S. FM Stations by Call Letters

FM frequency listings begin on p. 177

Abbreviations: (s)—broadcasts stereo

C.L.	Location
KAAR	Oxnard, Calif.
KABC-FM	Los Angeles, Calif.
KACE-FM	Riverside, Calif.
KADI	St. Louis, Mo.
KAFE	Oakland, Calif.
KAFI	Auburn, Calif.
KAFM	Salina, Kans.
KAIM-FM	Honolulu, Hawaii
KAJS	Newport Beach, Calif.
KAKC	Tulsa, Okla.
KAKI	San Antonio, Tex.
KALB-FM	Alexandria, La.
KALH	Denver, Colo.
KALW	San Francisco, Calif.
KAMS	Mammoth Spring, Ark.
KANG	St. Louis, Mo.
KANT-FM	Lancaster, Calif.
KANU	Lawrence, Kans.
KANW	Albuquerque, N.Mex.
KAPP	Redondo Beach, Calif.
KARM-FM	Fresno, Calif.
KARO	Houston, Tex.
KASK-FM	Ontario, Calif.
KASU	Jonesboro, Ark.
KATT	Woodland, Calif.
KATY-FM	San Luis Obispo, Calif.
KAZZ	Austin, Tex.
KBAY	San Francisco, Calif.
KBBI	Los Angeles, Calif.
KBBL	Wichita, Kans.
KBBM	Hayward, Calif.
KBBW	San Diego, Calif.
KBCA	Los Angeles, Calif.
KBCL-FM	Shreveport, La.
KBCO	San Francisco, Calif.
KBEC-FM	Waxahachie, Tex.
KBEE-FM	Modesto, Calif.
KBEY	Kansas City, Mo.
KBFI	Boise, Idaho
KBFM	Lubbock, Tex.
KBIM-FM	Roswell, N.Mex.
KBIQ	Los Angeles, Calif.
KBMF	Pampa, Tex.
KBMS	Los Angeles, Calif.
KBOA-FM	Kennett, Mo.
KBOI-FM	Boise, Idaho
KBOY-FM	Medford, Oreg.
KBTM-FM	Jonesboro, Ark.
KBUZ-FM	Mesa, Ariz.
KBYR-FM	Anchorage, Alaska
KBYU-FM	Provo, Utah
KCAL-FM	Redlands, Calif.
KCBH	Beverly Hills, Calif.
KCBS-FM	San Francisco, Calif.
KCFM	St. Louis, Mo.
KCHV-FM	Coachella, Calif.
KCJC	Kansas City, Kans.
KCLE-FM	Cleburne, Tex.
KCMB-FM	Wichita, Kans.
KCMC-FM	Texarkana, Tex.
KCMI	Los Angeles, Calif.
KCMK	Kansas City, Mo.
KCMO-FM	Kansas City, Mo.
KCMS-FM	Manitou Springs, Colo.
KCOM	Omaha, Nebr.
KCPA-FM	Dallas, Tex.
KCPS	Tacoma, Wash.
KCPX-FM	Salt Lake City, Utah
KCRA-FM	Sacramento, Calif.
KCRW	Santa Monica, Calif.
KCSM	San Mateo, Calif.
KCUF	Redwood City, Calif.
KCUI	Pella, Ia.
KCUR-FM	Kansas City, Mo.
KCVN	Stockton, Calif.
KCVR-FM	Lodi, Calif.
KDB-FM	Santa Barbara, Calif.
KDDD-FM	Dumas, Tex.
KDEF-FM	Albuquerque, N.Mex.
KDEN-FM	Denver, Colo.
KDFC	San Francisco, Calif.
KDKA-FM	Pittsburgh, Pa.
KDMC	Corpus Christi, Tex.
KDMI	Des Moines, Iowa
KDNT-FM	Denton, Tex.
KDPS	Des Moines, Iowa
KDUD	Riverside, Calif.
KDVR	Sioux City, Ia.
KDWC	West Covina, Calif.
KEAR	San Francisco, Calif.
KEAX	National City, Calif.
KEBJ	Phoeniz, Ariz.
KEBR	Sacramento, Calif.
KEBS	San Diego, Calif.
KEED-FM	Springfield-Eugene, Oregon
KEEN-FM	San Jose, Calif.
KEEZ	San Antonio, Tex.
KEFC	Waco, Tex.
KEFM	Oklahoma City, Okla.
KEFW	Honolulu, Hawaii
KELE	Phoenix, Ariz.
KELT	Harlingen, Tex.
KEMO	St. Louis, Mo.
KERN-FM	Bakersfield, Calif.
KETO-FM	Seattle, Wash.
KEX-FM	Portland, Oreg.
KEYM	Santa Maria, Calif.
KEZE	Anaheim, Calif.
KFAB-FM	Omaha, Nebr.
KFAC-FM	Los Angeles, Calif.
KFAM-FM	St. Cloud, Minn.
KFBK-FM	Sacramento, Calif.
KFCA	Phoenix, Ariz.
KFGQ-FM	Boone, Iowa
KFH-FM	Wichita, Kans.
KFIL	Santa Ana, Calif.
KFJC	Mountainview, Calif.
KFJZ	Fort Worth, Tex.
KFMA	Little Rock, Ark.
KFMB-FM	San Diego, Calif.
KFMC	Portland, Oreg.
KFMH	Colorado Springs, Colo.
KFMK	Houston, Tex.
KFML-FM	Denver, Colo.
KFMM	Tucson, Ariz.
KFMP	Port Arthur, Tex.
KFMQ	Lincoln, Nebr.
KFMU	Los Angeles, Calif.
KFMV	Minneapolis, Minn.
KFMW	San Bernardino, Calif.
KFMX	San Diego, Calif.
KFMY	Eugene, Oreg.
KFOX-FM	Long Beach, Calif.
KFRC-FM	San Francisco, Calif.
KFSD-FM	San Diego, Calif.
KFUO-FM	Clayton, Mo.
KGAF-FM	Gainesville, Tex.
KGB-FM	San Diego, Calif.
KGBN-FM	Caldwell, Idaho
KGFM	Edmonds, Wash.
KGGK	Garden Grove, Calif.
KGLA	Los Angeles, Calif.
KGLO-FM	Mason City, Iowa
KGMG	Portland, Oreg.
KGMI	Bellingham, Wash.
KGNC-FM	Amarillo, Tex.
KGO-FM	San Francisco, Calif.
KGPO	Grants Pass, Oreg.
KGUD-FM	Santa Barbara, Calif.
KHBL	Plainview, Tex.
KHBR-FM	Hillsboro, Tex.
KHFI	Austin, Tex.
KHFM	Albuquerque, N.Mex.
KHGM	Houston, Tex.
KHIP	San Francisco, Calif.
KHIQ	Sacramento, Calif.
KHJ-FM	Los Angeles, Calif.
KHMS	El Paso, Tex.
KHOF	Los Angeles, Calif.
KHOL-FM	Kearney-Holdredge, Nebraska
KHPC	Brownwood, Tex.
KHQ-FM	Spokane, Wash.
KHSC	Arcata, Calif.
KHUL	Houston, Tex.
KHVR	Biloxi, Calif.
KHYI	Fremont, Calif.
KIHI	Tulsa, Okla.
KING-FM	Seattle, Wash.
KIOO	Oklahoma, Okla.
KIRO-FM	Seattle, Wash.
KISA	Kansas City, Mo.
KISS	San Antonio, Tex.
KISW	Seattle, Wash.
KITH	Phoenix, Ariz.
KITT	San Diego, Calif.
KITY	San Antonio, Tex.
KIXL-FM	Dallas, Tex.
KJAZ	Alameda, Calif.
KJEM-FM	Okla. City, Okla.
KJLM	San Diego, Calif.
KJML	Sacramento, Calif.
KJPO	Frosno, Calif.
KJRG	Newton, Kans.
KJSB	Houston, Tex.
KLAC-FM	Los Angeles, Calif.
KLAY-FM	Tacoma, Wash.
KLCN-FM	Blytheville, Ark.
KLFM	Beverly Hills, Calif.
KLIR-FM	Denver, Colo.
KLIZ-FM	Brainerd, Minn.
KLON	Long Beach, Calif.
KLRO	San Diego, Calif.
KLSN	Seattle, Wash.
KLUB-FM	Salt Lake City, Utah
KLYD-FM	Bakersfield, Calif.
KLYN-FM	Lynden, Wash.
KMAK-FM	Fresno, Calif.
KMAX	Sierra Madre, Calif.
KMCP	Portland, Oreg.
KMCS	Seattle, Wash.
KMER	Fresno, Calif.
KMFM	Tularosa, N. Mex.
KMHJ	Marshall, Tex.
KMJ-FM	Fresno, Calif.
KMLA	Los Angeles, Calif.
KMLB-FM	Monroe, La.
KMMK	Little Rock, Ark.
KMOX-FM	St. Louis, Mo.
KMUW	Wichita, Kans.
KMYC-FM	Marysville, Calif.
KMUZ	Santa Barbara, Calif.
KNBC-FM	San Francisco, Calif.
KNDE-FM	Aztec, N.Mex.
KNEB-FM	Scottsbluff, Nebr.
KNER	Dallas, Tex.
KNEV	Reno, Nev.
KNFM	Midland, Tex.
KNFP	Arlington, Calif.
KNOB	Long Beach, Calif.

C.L.	Location
KNOF	St. Paul, Minn.
KNX-FM	Los Angeles, Calif.
KOA-FM	Denver, Colo
KOCW	Tulsa, Okla.
KOGM-FM	Tulsa, Okla.
KOIN-FM	Portland, Oreg.
KOKH	Oklahoma City, Okla.
KOL-FM	Seattle, Wash.
KONG-FM	Visalia, Calif.
KOOL-FM	Phoenix, Ariz.
KOSE-FM	Osceola, Ark.
KOST	Dallas, Tex.
KOSU-FM	Stillwater, Okla.
KOTN-FM	Pine Bluff, Ark.
KOY-FM	Phoenix, Ariz.
KOZE-FM	Lewiston, Idaho
KPAT	Albuquerque, N. Mex.
KPCS	Pasadena, Calif.
KPEN	Atherton, Calif.
KPFA	Berkeley, Calif.
KPFB	Berkeley, Calif.
KPFK	Los Angeles, Calif.
KPFM	Portland, Oreg.
KPGM	Los Altos, Calif.
KPLR-FM	St. Louis, Mo.
KPOI-FM	Honolulu, Hawaii
KPOJ-FM	Portland, Oreg.
KPOL-FM	Los Angeles, Calif.
KPPS-FM	Parsons, Kans.
KPRI	San Diego, Calif.
KPRN	Seattle, Wash.
KPSD	Dallas, Tex.
KPSR	Palm Springs, Calif.
KQAL-FM	Omaha, Nebr.
KQBY-FM	San Francisco, Calif.
KQFM	Portland, Oreg.
KQIP	Odessa, Tex.
KQRO	Dallas, Tex.
KQUE	Houston, Tex.
KQXR	Bakersfield, Calif.
KRAK-FM	Stockton, Calif.
KRAM-FM	Las Vegas, Nev.
KRBE	Houston, Tex
KRCC	Colorado Springs, Colo.
KRCW	Santa Barbara, Calif.
KRE-FM	Berkeley, Calif.
KRED	Eureka, Calif.
KREM-FM	Spokane, Wash.
KREX-FM	Grand Junction, Colo.
KRFM	Fresno, Calif.
KRHM	Los Angeles, Calif.
KRIC-FM	Beaumont, Tex.
KRKD-FM	Los Angeles, Calif.
KRKH-FM	Lubbock, Tex.
KRKY	Denver, Colo.
KRLD-FM	Dallas, Tex.
KRMD-FM	Shreveport, La.
KRNW	Boulder, Colo.
KRON-FM	San Francisco, Calif.
KROS-FM	Clinton, Iowa
KROW	Santa Barbara, Calif.
KROY-FM	Sacramento, Calif.
KRPM	San Jose, Calif.
KRRC	San Jose, Calif.
KRSN-FM	Los Alamos, N. Mex.
KRVM	Eugene, Oreg.
KSBW-FM	Salinas, Calif.
KSDB-FM	Manhattan, Kans.
KSDS	San Diego, Calif.
KSEA	San Diego, Calif.
KSEO-FM	Durant, Okla.
KSFM	Dallas, Tex.
KSFR	San Francisco, Calif.
KSFV	San Fernando, Calif.
KSFX	San Francisco, Calif.
KSHE	Crestwood, Mo.
KSHS	Colorado Springs, Colo.
KSJO-FM	San Jose, Calif.
KSL-FM	Salt Lake City, Utah
KSLH	St. Louis, Mo.
KSMA-FM	Santa Maria, Calif.
KSO-FM	Des Moines, Iowa
KSPC	Claremont, Calif.
KSPI-FM	Stillwater, Okla.
KSPL-FM	Diboll, Tex.
KSRF	Santa Monica, Calif.
KSTE	Emporia, Kans.
KSTL-FM	St. Louis, Mo.
KSTN-FM	Stockton, Calif.
KSUI	Iowa City, Iowa
KSWI-FM	Omaha, Nebr.
KSYN	Joplin, Mo.
KTAP	Tucson, Ariz.
KTAR-FM	Phoenix, Ariz.
KTCF	Cedar Falls, Iowa
KTEC	Oretech, Oreg.
KTGM	Denver, Colo.
KTIS-FM	Minneapolis, Minn.
KTJO-FM	Ottawa, Kans.
KTNT-FM	Tacoma, Wash.
KTOP-FM	Topeka, Kans.
KTOY	Tacoma, Wash.
KTRB-FM	Modesto, Calif.
KTRH-FM	Houston, Tex.
KTSR	Kansas City, Mo.
KTTS-FM	Springfield, Mo.
KTVA-FM	Anchorage, Alaska
KTWR	Tacoma, Wash.
KTXT-FM	Lubbock, Tex.
KTYM-FM	Inglewood, Calif.
KUDE-FM	Oceanside, Calif.
KUDU-FM	Ventura-Oxnard, Calif.
KUER	Salt Lake City, Utah
KUFM	El Cajon, Calif.
KUGN-FM	Eugene, Oreg.
KUHF	Houston, Tex.
KUMD-FM	Duluth, Minn.
KUOA-FM	Siloam Springs, Ark.
KUOH	Honolulu, Hawaii
KUOW	Seattle, Wash.
KUPD-FM	Tempe, Ariz.
KUSC	Los Angeles, Calif.
KUT-FM	Austin, Tex.
KUTE	Glendale, Calif.
KVCR	San Bernardino, Calif.
KVEC-FM	San Luis Obispo, Calif.
KVEN-FM	Ventura, Calif.
KVFM	San Hernando, Calif.
KVOF-FM	El Paso, Tex.
KVOK	Honolulu, Hawaii
KVOP-FM	Plainview, Tex.
KVOR-FM	Colorado Springs, Colo.
KVSC	Logan, Utah
KVTT	Dallas, Tex.
KWAR	Waverly, Iowa
KWAX	Eugene, Oreg.
KWFM	Minneapolis, Minn,
KWG-FM	Stockton, Calif.
KWGS	Tulsa, Okla.
KWIX	St. Louis, Mo.
KWIZ-FM	Santa Ana, Calif.
KWJB-FM	Globe, Ariz.
KWKH-FM	Shreveport, La.
KWME	Walnut Creek, Calif.
KWMO	Odessa, Tex.
KWOA-FM	Worthington, Minn.
KWOC-FM	Poplar Bluff, Mo.
KWPC-FM	Muscatine, Iowa
KWPM-FM	West Plains, Mo.
KXJK-FM	Forrest City, Ark.
KXLU	Los Angeles, Calif.
KXOA-FM	Sacramento, Calif.
KXQR	Fresno, Calif.
KXRQ	Sacramento, Calif.
KXTR	Kansas City, Mo.
KXYZ-FM	Houston, Tex.
KYA-FM	San Francisco, Calif.
KYEW	Phoenix, Ariz.
KYFM	Oklahoma City, Okla.
KYSM-FM	Mankato, Minn.
KYW-FM	Cleveland, Ohio
KZAM	Seattle, Wash.
KZFM	Cortez, Colo.
KZOM	Oklahoma City, Okla.
KZUN-FM	Opportunity, Wash
WAAB-FM	Worcester, Mass.
WAAM-FM	Parkersburg, W.Va.
WABC-FM	New York, N.Y.
WABE	Atlanta, Ga.
WABQ	Cleveland, Ohio
WABX	Detroit, Mich.
WABZ-FM	Albemarle, N.C.
WAEB-FM	Cincinnati, Ohio
WAEF	Syracuse, N.Y.
WAER	Syracuse, N.Y.
WAHR-FM	Miami Beach, Fla.
WAIR-FM	Winston-Salem, N.C.
WAJC	Indianapolis, Ind.
WAJP	Joliet, Ill.
WAJR-FM	Morgantown, W.Va.
WAKR-FM	Akron, Ohio
WALK-FM	Patchogue, N.Y.
WAMC	Albany, N.Y.
WAMF	Amherst, Mass.
WAMU-FM	Washington, D.C.
WAPI-FM	Birmingham, Ala.
WAPS	Akron, Ohio
WAQE-FM	Towson, Md.
WARD-FM	Johnstown, Pa.
WARK-FM	Hagerstown, Md.
WARL-FM	Arlington, Va.
WARN-FM	Fort Pierce, Fla.
WASA-FM	Havre De Grace, Md.
WASH	Washington, D.C.
WATR-FM	Waterbury, Conn.
WAUG-FM	Augusta, Ga.
WAUX-FM	Waukesha, Wis.
WAVI-FM	Dayton, Ohio
WAVQ	Atlanta, Ga.
WAVU-FM	Albertville, Ala.
WAVY-FM	Portsmouth, Va.
WAWZ-FM	Zarephath, N.J.
WAYL	Minneapolis, Minn.
WAYZ-FM	Waynesboro, Pa.
WAZL-FM	Hazelton, Pa.
WAZZ	Pittsburgh, Pa.
WBAA-FM	W. Lafayette, Ind.
WBAB-FM	Babylon, N.Y.
WBAI	New York, N.Y.
WBAP-FM	Ft. Worth, Tex.
WBAY-FM	Green Bay, Wis.
WBBB-FM	Burlington, N.C.
WBBC	Jackson, Mich.
WBBF-FM	Rochester, N.Y.
WBBM-FM	Chicago, Ill.
WBBO-FM	Forest City, N.C.
WBBQ-FM	Augusta, Ga.
WBBS	Crawfordsville, Ind.
WBBW-FM	Youngstown, Ohio
WBCB-FM	Levittown-Fairless Hills, Pa.
WBCI-FM	Williamsburg, Va.
WBCM-FM	Bay City, Mich.
WBCN	Boston, Mass.
WBEN-FM	Buffalo, N.Y.
WBET-FM	Brockton, Mass.
WBEZ	Chicago, Ill.
WBFM	New York, N.Y.
WBFO	Buffalo, N.Y.
WBGO	Newark, N.J.
WBGU	Bowling Green, Ohio
WBIE-FM	Marietta, Ga.
WBIR-FM	Knoxville, Tenn.
WBJC	Baltimore, Md.
WBKV-FM	West Bend, Wis.
WBKW	Beckley, W.Va.
WBKY	Lexington, Ky.
WBLY-FM	Springfield, Ohio
WBMI	Meridan, Conn.
WBNS-FM	Columbus, Ohio
WBOE	Cleveland, Ohio
WBOR	Brunswick, Maine
WBOS-FM	Brookline, Mass.
WBRB-FM	Mt. Clements, Mich.
WBRC	Birmingham, Ala.
WBRE-FM	Wilkes-Barre, Pa.
WBSM-FM	New Bedford, Mass.
WBST	Muncie, Ind.
WBUF	Buffalo, N.Y.
WBUR	Boston, Mass.
WBUT-FM	Butler, Pa.
WBUY-FM	Lexington, N.C.
WBVA	Woodbridge, Va.
WBVP-FM	Beaver Falls, Pa.
WBWC	Berea, Ohio
WBZ-FM	Boston, Mass.
WCAC	Anderson, S.C.
WCAE-FM	Pittsburgh, Pa.
WCAO-FM	Baltimore, Md.
WCAU-FM	Philadelphia, Pa.
WCBC-FM	Anderson, Ind.
WCBE	Columbus, Ohio
WCBM-FM	Baltimore, Md.
WCBS-FM	New York, N.Y.
WCCC-FM	Hartford, Conn.
WCCV-FM	Charlottesville, Va.
WCED-FM	Dubois, Pa.
WCFM	Williamstown, Mass.
WCHA-FM	Chambersburg, Pa.
WCHD	Detroit, Mich.
WCKR-FM	Miami, Fla.
WCLI-FM	Corning, N.Y.
WCLM	Chicago, Ill.
WCLO-FM	Janesville, Wis.
WCLT-FM	Newark, Ohio
WCMC-FM	Wildwood, N.J.
WCME-FM	Brunswick, Maine
WCMF-FM	Rochester, N.Y.
WCMI-FM	Ashland, Ky.
WCMO	Marietta, Ohio
WCMR-FM	Elkhart, Ind.
WCNB-FM	Connersville, Ind.
WCNO	Canton, Ohio
WCOD	Richmond, Va.
WCOH-FM	Newnan, Ga.
WCOL-FM	Columbus, Ohio
WCOP-FM	Boston, Mass.
WCOS-FM	Columbia, S.C.
WCOU-FM	Lewiston, Maine
WCOW-FM	Sparta, Wis.
WCPO-FM	Cincinnati, Ohio
WCPS-FM	Tarbor, N.C.
WCRB-FM	Waltham, Mass.
WCRF-FM	Cleveland, Ohio
WCRT-FM	Birmingham, Ala.
WCSC-FM	Charleston, S.C.
WCSI-FM	Columbus, Ind.
WCSQ	Central Square, N.Y.
WCTA-FM	Andalusia, Ala.
WCTC-FM	New Brunswick, N.J.
WCTM	Eaton, Ohio
WCTW-FM	New Castle, Ind.
WCUE-FM	Akron, Ohio
WCUM-FM	Cumberland, Md.
WCUY-FM	Cleveland Hts., Ohio
WCWM	Williamsburg, Va.
WDAC	Lancaster, Pa.
WDAE-FM	Tampa, Fla.
WDAS-FM	Philadelphia, Pa.
WDBJ-FM	Roanoke, Va.
WDBO-FM	Orlando, Fla.
WDBQ-FM	Dubuque, Iowa
WDDE	Hamden, Conn.
WDDS-FM	Syracuse, N.Y.
WOEL-FM	Wilmington, Del.
WDET-FM	Detroit, Mich.
WDFM	State College, Pa.
WDGO	Cleveland, Ohio
WDHA-FM	Dover, N.J.
WDHF	Chicago, Ill.
WDIA-FM	Memphis, Tenn.
WDJK	Atlanta, Ga.
WDJR	Oil City, Pa.
WDMB-FM	Statesville, N.C.
WDNC-FM	Durham, N.C.
WDOC-FM	Prestonsburg, Ky.
WDOD-FM	Chattanooga, Tenn.
WDOK-FM	Cleveland, Ohio
WDOV-FM	Dover, Del.
WDRC-FM	Hartford, Conn.
WDSC-FM	Dillon, S.C.
WDSU-FM	New Orleans, La.
WDTM	Detroit, Mich.
WDTR	Detroit, Mich.
WDUB	Granville, Ohio
WDUN-FM	Gainesville, Ga.
WDUQ	Pittsburgh, Pa.
WDUZ-FM	Green Bay, Wis.
WOWS-FM	Champaign, Ill.
WEAV-FM	Plattsburgh, N.Y.
WEAW-FM	Evanston, Ill.
WEBH	Chicago, Ill.
WEBQ-FM	Harrisburg, Ill.
WEBR-FM	Buffalo, N.Y.
WECW	Elmira, N.Y.
WEDK	Springfield, Mass.
WEED-FM	Rocky Mount, N.C.
WEEI-FM	Boston, Mass.
WEEP-FM	Pittsburgh, Pa.
WEEX-FM	Easton, Pa.
WEFA	Waukegan, Ill.
WEFM	Chicago, Ill.(s)
WEGO-FM	Concord, N.C.
WEHS	Chicago, Ill.
WEKZ-FM	Monroe, Wis.
WELF	Glen Ellyn, Ill.
WELG	Elgin, Ill.
WEMC	Harrisonburg, Va.
WEMP-FM	Milwaukee, Wis.
WENR-FM	Chicago, Ill.
WEOL-FM	Elyria, Ohio
WEPM-FM	Martinsburg, W.Va.
WEPS	Elgin, Ill.
WEQR	Goldsboro, N.C.
WERC-FM	Erie, Pa.
WERE-FM	Cleveland, Ohio
WERI-FM	Westerly, R.I.
WERS	Boston, Mass.
WESC-FM	Greenville, S.C.
WEST-FM	Easton, Pa.
WETL	South Bend, Ind.
WEVC	Evansville, Ind
WEVD-FM	New York, N.Y.
WEWO-FM	Laurinburg, N.C.
WFAA-FM	Dallas, Tex.
WFAH-FM	Alliance, Ohio
WFAN	Washington, D.C.
WFAS-FM	White Plains, N.Y.
WFAU-FM	Augusta, Maine
WFAW	Fort Atkinson, Wis.
WFBC-FM	Greenville, S.C.
WFBE	Flint, Mich.
WFBG-FM	Altoona, Pa.
WFBM-FM	Indianapolis, Ind.
WFBS-FM	Winston-Salem, N.C.
WFCI	Franklin, Ind.
WFCJ	Miamisburg, Ohio
WFCR	Amherst, Mass.
WFDS-FM	Baltimore, Md.
WFFM	Cincinnati, Ohio
WFGM-FM	Fitchburg, Mass.
WFHA-FM	Red Bank, N.J.
WFHR-FM	Wisconsin Rapids, Wis.
WFID	Rio Piedras, P.R.
WFIL-FM	Philadelphia, Pa.
WFIN-FM	Findlay, Ohio
WFIU	Bloomington, Ind.
WFLA-FM	Tampa, Fla.
WFLM	Ft. Lauderdale, Fla.
WFLN-FM	Philadelphia, Pa.
WFLY	Troy, N.Y.
WFMA	Rocky Mount, N.C.
WFMB	Nashville, Tenn.
WFMD-FM	Frederick, Md.
WFME	Detroit, Mich.
WFMF	Chicago, Ill.
WFMG	Gallatin, Tenn.
WFMF-FM	Cullman, Ala.
WFMI	Montgomery, Ala.
WFML	Washington, Ind.
WFMM-FM	Baltimore, Md.
WFMQ	Chicago, Ill.
WFMS	Indianapolis, Ind.
WFMT	Chicago, Ill.
WFMU	East Orange, N.J.
WFMW-FM	Madisonville, Ky.
WFMX	Statesville, N.C.
WFMZ	Allentown, Pa.
WFNC-FM	Fayetteville, N.C.
WFNQ	Hartford, Conn.
WFNS-FM	Burlington, N.C.
WFOB-FM	Fostoria, Ohio
WFOL	Hamilton, Ohio
WFOS	South Norfolk, Va.
WFPK	Louisville, Ky.
WFPL	Louisville, Ky.
WFQM	San Juan, P.R.
WFRO-FM	Fremont, Ohio
WFST-FM	Caribou, Maine
WFSU-FM	Tallahassee, Fla.
WFUL-FM	Fulton, Ky.
WFUR-FM	Grand Rapids, Mich.
WFUV	New York, N.Y.
WFVA-FM	Fredericksburg, Va.
WGAL-FM	Lancaster, Pa.
WGAR-FM	Cleveland, Ohio
WGAU-FM	Athens, Ga.
WGAY	Silver Spring, Md.
WGBH-FM	Cambridge, Mass.
WGBI-FM	Scranton, Pa.
WGBS-FM	Miami, Fla.
WGCB-FM	Red Lion, Pa.
WGCS	Goshen, Ind.
WGEM-FM	Quincy, Ill.
WGFM	Schenectady, N.Y. (s)
WGGC	Glasgow, Ky.
WGGM	Taylorville, Ill.
WGH-FM	Newport News, Va.
WGHF	Newton, Conn.
WGHJ	Lawrence, Mass.
WGKA-FM	Atlanta, Ga.
WGLM	Richmond, Ind.
WGMS-FM	Washington, D.C.
WGNC-FM	Gastonia, N.C.
WGPA-FM	Bethlehem, Ga.
WGPS	Greensboro, N.C.
WGR-FM	Buffalo, N.Y.
WGRE	Greencastle, Ind.
WGRV-FM	Greenville, Tenn.
WGTB-FM	Washington, D.C.
WGTS-FM	Takoma Park, Md.
WGUC	Cincinnati, Ohio
WGVE	Gary, Ind.
WGWR-FM	Asheboro, N.C.
WGYA	Interlochen, Mich.
WHA-FM	Madison, Wis.
WHAD	Delafield, Wis.
WHAI-FM	Greenfield, Mass.
WHAT-FM	Philadelphia, Pa.
WHAV-FM	Haverhill, Mass.
WHBC-FM	Canton, Ohio
WHBF-FM	Rock Island, Ill.
WHCI	Hartford City, Ind.

C.L.	Location
WHCN	Hartford, Conn.
WHCU-FM	Ithaca, N.Y.
WHDH-FM	Boston, Mass.
WHDL-FM	Allegheny, N.Y.
WHEN-FM	Syracuse, N.Y.
WHFB-FM	Benton Harbor, Mich.
WHFI	West Paterson, N. J.
WHFM	Rochester, N.Y.
WHFS	Bethesda, Md.
WHHI	Highland, Wis.
WHHS	Havertown, Pa.
WHIM-FM	Providence, R.I.
WHIO-FM	Dayton, Ohio
WHK-FM	Cleveland, Ohio
WHKP-FM	Hendersenville, N.C.
WHKW	Chilton, Wis.
WHKY-FM	Hickory, N.C.
WHLA	Holmen, Wis.
WHLD-FM	Niagara Falls, N. Y.
WHLI-FM	Hempstead, N.Y.
WHLM-FM	Bloomsburg, Pa.
WHMA-FM	Anniston, Ala.
WHNC-FM	Henderson, N.C.
WHO-FM	Des Moines, Iowa
WHOH	Hamilton, Ohio
WHOK-FM	Lancaster, Ohio
WHOM-FM	New York, N.Y.
WHOO-FM	Orlando, Fla.
WHOS-FM	Decatur, Ala.
WHP-FM	Harrisburg, Pa.
WHPE-FM	High Point, N.C.
WHPR	Highland Park, Mich.
WHPS	High Point, N.C.
WHRB-FM	Cambridge, Mass.
WHRM	Wausau, Wis.
WHSA	Highland Twp., Wis.
WHSR-FM	Winchester, Mass.
WHTG-FM	Eatontown, N.J.
WHUS	Storrs, Conn.
WHWC	Colfax, Wis.
WHYL-FM	Carlisle, Pa.
WHYN-FM	Springfield, Mass.
WHYY	Philadelphia, Pa.
WIAL	Eau Claire, Wis.
WIAN	Indianapolis, Ind.
WIBA-FM	Madison, Wis.
WIBC-FM	Indianapolis, Ind.
WIBG-FM	Philadelphia, Pa.
WICB	Ithaca, N.Y.
WIFI	Glenside, Pa.
WIFM-FM	Elkin, N.C.
WIKY-FM	Evansville, Ind.
WIL-FM	St. Louis, Mo.
WILL-FM	Urbana, Ill.
WIMA-FM	Lima, Ohio
WINA-FM	Charlottesville, Va.
WINE-FM	Kenmore, N.Y.
WINF-FM	Manchester, Conn.
WINZ-FM	Miami, Fla.
WIP-FM	Philadelphia, Pa.
WIPR-FM	San Juan, P.R.
WIRA-FM	Ft. Pierce, Fla.
WIRQ	Rochester, N.Y.
WISH-FM	Indianapolis, Ind.
WISK	Medford, Mass.
WISN-FM	Milwaukee, Wis.
WISZ-FM	Madison, Wis.
WITA-FM	San Juan, P.R.
WITH-FM	Baltimore, Md.
WITZ-FM	Jasper, Ind.
WIUS	Christiansted, V.I.
WJAC-FM	Johnstown, Pa.
WJAS-FM	Pittsburgh, Pa.
WJAX-FM	Jacksonville, Fla.
WJBC-FM	Bloomington, Ill.
WJBK-FM	Detroit, Mich.
WJBL-FM	Holland, Mich.
WJBO-FM	Baton Rouge, La.
WJBR	Wilmington, Del.
WJCD-FM	Seymour, Ind.
WJDX-FM	Jackson, Miss.
WJEF-FM	Grand Rapids, Mich.
WJEJ-FM	Hagerstown, Md.
WJHL-FM	Johnson City, Tenn.
WJIM-FM	Lansing, Mich.
WJJD-FM	Chicago, Ill.
WJLK-FM	Asbury Park, N.J.
WJLN	Birmingham, Ala.
WJMC-FM	Rice Lake, Wis.
WJOF	Athens, Ala.
WJOL-FM	Joliet, Ill.
WJR-FM	Detroit, Mich.
WJTN-FM	Jamestown, N.K.
WJW-FM	Cleveland, Ohio
WJWR	Palmyra, Pa.
WJZZ	Bridgeport, Conn.
WKAQ-FM	San Juan, P.R.
WKAR-FM	E. Lansing, Mich.
WKAT-FM	Miami, Fla.
WKAY-FM	Glasgow, Ky.
WKAZ-FM	Charleston, W.Va.
WKBC-FM	Winston-Salem, N.C.
WKBN-FM	Youngstown, Ohio
WKBR-FM	Manchester, N.H.
WKBV-FM	Richmond, Ind.
WKCQ	Berlin, N.H.
WKCR-FM	New York, N.Y.
WKCS	Knoxville, Tenn.
WKDN-FM	Camden, N.J.
WKEE-FM	Huntington, W.Va.
WKFM	Chicago, Ill.
WKIC-FM	Hazard, Ky.
WKIP-FM	Poughkeepsie, N.Y.
WKIS-FM	Orlando, Fla.
WKIX-FM	Raleigh, N.C.
WKJP	Pittsburgh, Pa.
WKLF-FM	Clanton, Ala.
WKLS	Marietta, Ga.
WKMH-FM	Dearborn, Mich.
WKNA	Charleston, W.Va.
WKOF	Hopkinsville, Ky.
WKOK-FM	Sunbury, Pa.
WKOP-FM	Binghamton, N.Y.
WKOX-FM	Framingham, Mass.
WKPT-FM	Kingsport, Tenn
WKRC-FM	Cincinnati, Ohio
WKRG-FM	Mobile, Ala.
WKRT-FM	Cortland, N.Y.
WKSD	Kewanee, Ill.
WKSU-FM	Kent, Ohio
WKTM-FM	Mayfield, Ky.
WKWK-FM	Wheeling, W.Va.
WKYB-FM	Paducah, Ky.
WLAD-FM	Danbury, Conn.
WLAG-FM	LaGrange, Ga.
WLAN-FM	Lancaster, Pa.
WLAP-FM	Lexington, Ky.
WLAV-FM	Grand Rapids, Mich.
WLBG-FM	Laurens, S.C.
WLBH-FM	Mattoon, Ill.
WLBR-FM	Lebanon, Pa.
WLDM	Oak Park, Mich.
WLDS-FM	Jacksonville, Ill.
WLEC-FM	Sandusky, Ohio
WLET-FM	Toccoa, Ga.
WLFM	Appleton, Wis.
WLIN	Merrill, Wis.
WLIR	Hicksville, N.Y.
WLLH-FM	Lowell, Mass.
WLNA-FM	Peekskill, N.Y.
WLOA-FM	Braddock, Pa.
WLOB-FM	Portland, Maine
WLOE-FM	Leaksville, N.C.
WLOL-FM	Minneapolis, Minn.
WLOM	Chattanooga, Tenn.
WLOS-FM	Asheville, N.C.
WLOV	Cranston, R.I.
WLRJ	Roanoke, Va.
WLVL	Louisville, Ky.
WLYC-FM	Williamsport, Pa.
WMAL-FM	Washington, D.C.
WMAM-FM	Marinette, Wis.
WMAQ-FM	Chicago, Ill.
WMAS-FM	Springfield, Mass.
WMAX-FM	Grand Rapids, Mich.
WMAZ-FM	Macon, Ga.
WMBO-FM	Peoria, Ill.
WMBI-FM	Chicago, Ill.
WMBO-FM	Auburn, N.Y.
WMBR-FM	Jacksonville, Fla.
WMCF	Memphis, Tenn.
WMCR	Kalamazoo, Mich.
WMDE	Greensboro, N.C.
WMER	Celina, Ohio
WMET-FM	Miami, Fla.
WMEV-FM	Marion, Va.
WMFM	Madison, Wis.
WMFP	Ft. Lauderdale, Fla.
WMFR-FM	High Point, N.C.
WMGW-FM	Meadville, Pa.
WMHC	South Hadley, Mass.
WMHE	Toledo, Ohio
WMIL-FM	Milwaukee, Wis.
WMIT	Marion, N.C.
WMIX-FM	Mt. Vernon, Ill.
WMLS-FM	Sylacauga, Ala.
WMLW	Milwaukee, Wis.
WMNA-FM	Gretna, Va.
WMPS-FM	Memphis, Tenn.
WMRI-FM	Marion, Ind.
WMRN-FM	Marion, Ohio
WMRO-FM	Aurora, Ill.
WMRT	Lansing, Mich.
WMSA-FM	Massena, N.Y.
WMTH	Park Ridge, Ill.
WMTI	Norfolk, Va.
WMTW-FM	Mt. Washington, N.H.
WMUA	Amherst, Mass.
WMUB	Oxford, Ohio
WMUN	Muncie, Ind.
WMUU-FM	Greenville, S.C.
WMUZ	Detroit, Mich.
WMVA-FM	Martinsville, Va.
WMVO-FM	Mount Vernon, Ohio
WMZK	Detroit, Mich.
WNAD-FM	Norman, Okla.
WNAS	New Albany, Ind.
WNAV-FM	Annapolis, Md
WNBC-FM	New York, N.Y.
WNBF-FM	Binghamton, N.Y.
WNBH-FM	New Bedford, Mass.
WNCN	New York, N.Y.
WNCO-FM	Ashland, Ohio
WNDA	Huntsville, Ala.
WNBD-FM	Daytona Beach, Fla.
WNEM-FM	Bay City, Mich.
WNES-FM	Central City, Ky.
WNEW-FM	New York, N.Y.
WNEX-FM	Macon, Ga.
WNGO-FM	Mayfield, Ky.
WNHC-FM	New Haven, Conn.
WNIB	Chicago, Ill.
WNIC	DeKalb, Ill.
WNNJ-FM	Newton, N.J.
WNOB	Cleveland, Ohio
WNOK-FM	High Point, N.C.
WNOS-FM	High Point, N.C.
WNOW-FM	York, Pa.
WNSL-FM	Laurel, Miss.
WNTA-FM	Newark, N.J.
WMTH	Winnetka, Ill.
WNTI	Hackettstown, N.J.
WNUR	Evanston, Ill.
WNWC-FM	Arlington Hts., Ill.
WNYC-FM	New York, N.Y.
WNYE	New York, N.Y.
WOAK	Royal Oak, Mich.
WOAY-FM	Oak Hill, W.Va.
WOBN	Westerville, Ohio
WOC-FM	Davenport, Iowa
WOCB-FM	W. Yarmouth, Mass.
WOHS-FM	Shelby, N.C.
WOI-FM	Ames, Iowa
WOIO	Cincinnati, Ohio
WOL-FM	Washington, D.C.
WOMC	Royal Oak, Mich.
WOMI-FM	Owensboro, Ky.
WOMP-FM	Bellaire, Ohio
WONO	Syracuse, N.Y.
WOPA-FM	Oak Park, Ill.
WOPI-FM	Bristol, Tenn.
WOR-FM	New York, N.Y.
WORA-FM	Mayaguez, P.R.
WORX-FM	Madison, Ind.
WOSC-FM	Fulton, N.Y.
WOSJ-FM	Atlantic City, N.J.
WOSU-FM	Columbus, Ohio
WOTW-FM	Nashua, N.H.
WOUB-FM	Athens, Ohio
WOW-FM	Omaha, Nebr.
WOXR	Oxford, Ohio
WPAC-FM	Patchogue, N.Y.
WPAD-FM	Paducah, Ky.
WPAT-FM	Paterson, N.J.
WPAY-FM	Portsmouth, Ohio
WPBC-FM	Minneapolis, Minn.
WPBS	Philadelphia, Pa.
WPCA-FM	Philadelphia, Pa.
WPEL-FM	Montrose, Pa.
WPEN-FM	Philadelphia, Pa.
WPEX-FM	Pensacola, Fla.
WPFB-FM	Middletown, Ohio
WPFM	Providence, R.I.
WPGO-FM	Bradbury Hts., Md.
WPGI	Pittsburgh, Pa.
WPIC-FM	Sharon, Pa.
WPIT-FM	Pittsburgh, Pa.
WPJB-FM	Providence, R.I.
WPKM	Tampa, Fla.
WPLM-FM	Plymouth, Mass.
WPLO-FM	Atlanta, Ga.
WPPA-FM	Pottsville, Pa.
WPRB	Princeton, N.J.
WPRK	Winter Park, Fla.
WPRM	San Juan, P.R.
WPRO-FM	Providence, R.I.
WPRS-FM	Paris, Ill.
WPSR	Evansville, Ind.
WPTF-FM	Raleigh, N.C.
WPTH	Fort Wayne, Ind.
WPTW-FM	Piqua, Ohio
WPWT	Philadelphia, Pa.
WQAL	Philadelphia, Pa.
WQFM	Milwaukee, Wis.
WQMM	Memphis, Tenn.
WQMS	Hamilton, Ohio
WQRS-FM	Detroit, Mich.
WQTI	Detroit, Mich.
WQXI-FM	Atlanta, Ga.
WQXR-FM	New York, N.Y.
WQXT-FM	Palm Beach, Fla.
WRAJ-FM	Anna, Ill.
WRAK-FM	Williamsport, Pa.
WRAL-FM	Raleigh, N.C.
WRAY-FM	Princeton, Ind.
WRBL-FM	Columbus, Ga.
WRBS	Baltimore, Md.
WRC-FM	Washington, D.C.
WRCM	New Orleans, La.
WRED	Youngstown, Ohio
WREO-FM	Ashtabula, Ohio
WREV-FM	Reidsville, N.C.
WRFD-FM	Worthington-Columbus, Ohio
WRFK	Richmond, Va.
WRFL	Winchester, Va.
WRFM	Woodside, N.Y.
WRFS-FM	Alexander City, Ala.
WRHS	Park Forest, Ill.
WRIT-FM	Milwaukee, Wis.
WRJN-FM	Racine, Wis.
WRJR	Lewiston, Maine
WRKO-FM	Boston, Mass.
WRLB	Long Branch, N.J.
WRLX	Hopkinsville, Ky.
WRLD-FM	Lanett, Ala.
WRNJ	Atlantic City, N.J.
WRNL-FM	Richmond, Va.
WRNW	Mount Kisco, N.Y.
WROC-FM	Rochester, N.Y.
WROK-FM	Rockford, Ill.
WROW-FM	Albany, N.Y.
WROY-FM	Carmi, Ill.
WRPI	Troy, N.Y.
WRPN-FM	Ripon, Wis.
WRR-FM	Dallas, Tex.
WRRA	Ithaca, N.Y.
WRRC	Cherry Valley, N.Y.
WRRD	De Ruyter, N.Y.
WRRE	S. Bristol, N.Y.
WRRL	Wetherfield, N.Y.
WRRN	Warren, Pa.
WRSW-FM	Warsaw, Ind.
WRTC-FM	Hartford, Conn.
WRTI-FM	Philadelphia, Pa.
WRUF-FM	Gainesville, Fla.
WRUN-FM	Utica, N.Y.
WRVA-FM	Richmond, Va.
WRVB-FM	Madison, Wis.
WRVC	Norfolk, Va.
WRVP	New York, N.Y.
WRXO-FM	Roxboro, N.C.
WSAB	Mt. Carmel, Ill.
WSAI-FM	Cincinnati, Ohio
WSAM-FM	Saginaw, Mich.
WSB-FM	Atlanta, Ga.
WSBC-FM	Chicago, Ill.
WSBF-FM	Clemson, S.C.
WSCB	Springfield, Mass.
WSEI	Effingham, Ill.
WSEV-FM	Sevierville, Tenn.
WSFM	Birmingham, Ala.
WSHS	Floral Park, N.Y.
WSIU	Carbondale, Ill.
WSJG	Hallandale, Fla.
WSJS-FM	Winston-Salom, N.C.
WSKS	Wabash, Ind.
WSIX-FM	Nashville, Tenn.
WSLM-FM	Salem, Ind.
WSLN	Delaware, Ohio
WSLS-FM	Roanoke, Va.
WSMC-FM	Collegedale, Tenn.
WSMI-FM	Litchfield, Ill.
WSNJ-FM	Brigeton, N.J.
WSNW-FM	Seneca, S.C.
WSOC-FM	Charlotte, N.C.
WSOM	Salem, Ohio
WSON-FM	Henderson, Ky
WSOU	S. Orange, N.J.
WSOY-FM	Decatur, Ill.
WSPA-FM	Spartanburg, S.C.
WSPD-FM	Toledo, Ohio
WSPE	Springville, N.Y.
WSPT-FM	Stevens Point, Wis.
WSRW-FM	Hillsboro, Ohio
WSTC-FM	Stamford, Conn.
WSTP-FM	Salisbury, N.C.
WSTR-FM	Sturgis, Mich.
WSTV-FM	Steubenville, Ohio
WSVA-FM	Harrisonburg, Va.
WSVS-FM	Crewe, Va.
WSWM	East Lansing, Mich.
WSYR-FM	Syracuse, N.Y.
WTAD-FM	Quincy, Ill.
WTAG-FM	Worcester, Mass.
WTAX-FM	Springfield, Ill.
WTBC-FM	Tuscaloosa, Ala.
WTBO-FM	Cumberland, Md.
WTBS	Cambridge, Mass.
WTCX	St. Petersburg, Fla.
WTDS	Toledo, Ohio
WTFM	Babylon, N.Y.
WTHI-FM	Terre Haute, Ind.
WTHS	Miami, Fla.
WTIC-FM	Hartford, Conn.
WTJS-FM	Jackson, Tenn.
WTJU	Charlottesville, Va.
WTMA-FM	Charleston, S.C.
WTMJ-FM	Milwaukee, Wis.
WTNC-FM	Thomasville, N.C.
WTOA	Trenton, N.J.
WTOC-FM	Savannah, Ga.
WTOL-FM	Toledo, Ohio
WTOP-FM	Washington, D.C.
WTOS	Wauwatosa, Wis.
WTRC-FM	Elkhart, Ind.
WTRT	Toledo, Ohio
WTSB-FM	Lumberton, N.C.
WTSV-FM	Claremont, N.H.
WTTC-FM	Towanda, Pa.
WTTR-FM	Westminster, Md.
WTTV-FM	Bloomington, Ind.
WTUN	Tampa, Fla.
WTVB-FM	Coldwater, Mich.
WTVN-FM	Columbus, Ohio
WUCB-FM	Chicago, Ill.
WULX-FM	Richmond, Ind.
WUNC	Chapel Hill, N.C.
WUOA	Tuscaloosa, Ala.
WUOM	Ann Arbor, Mich.
WUOT	Knoxville, Tenn.
WUPY	Lynn, Mass.
WUSC-FM	Columbia, S.C.
WUST-FM	Bethesda, Md.
WUSV	Scranton, Pa.
WVAM-FM	Altoona, Pa.
WVBR-FM	Ithaca, N.Y.
WVCG-FM	Coral Gables, Fla.
WVEC-FM	Hampton, Va.
WVHC	Hempstead, N.Y.
WVJS-FM	Owensboro, Ky.
WVKO-FM	Columbus, Ohio
WVLN-FM	Olney, Ill.
WVMC-FM	Mt. Carmel, Ill.
WVNJ-FM	Newark, N.J.
WVOT-FM	Wilson, N.C.
WVOX-FM	New Rochelle, N.Y.
WVSH	Huntington, Ind.
WVST	St. Petersburg, Fla.
WVTS	Terre Haute, Ind.
WWCF	Greenfield, Wis.
WWCO-FM	Waterbury, Conn.
WWDC-FM	Washington, D.C.
WWGP-FM	Sanford, N.C.
WWHG-FM	Hornell, N.Y.
WWHI	Muncie, Ind.
WWIL-FM	Ft. Lauderdale, Fla.
WWJ-FM	Detroit, Mich.
WWKS	Macomb, Ill.
WWMT	New Orleans, La.
WWOD-FM	Lynchburg, Va.
WWOL-FM	Buffalo, N.Y.
WWON-FM	Woonsocket, R.I.
WWPB	Miami, Fla.
WWST-FM	Wooster, Ohio
WWSW-FM	Pittsburgh, Pa.
WWTV-FM	Cadillac, Mich.
WWVA-FM	Wheeling, W.Va.

C.L.	Location
WWWS	Greenville, N.C.
WXCN	Providence, R.I.
WXFM	Elmwood Park, Ill.
WXHR	Cambridge, Mass.
WXPN	Philadelphia, Pa.

C.L.	Location
WXTC	Annapolis, Md.
WXUR-FM	Media, Pa.
WXYZ-FM	Detroit, Mich.
WYAK	Sarasota, Fla.
WYBC-FM	New Haven, Conn.

C.L.	Location
WYCA	Hammond, Ind.
WYCR	York-Hanover, Pa.
WYFI	Norfolk, Va.
WYFM	Charlotte, N.C.
WYFS	Winston-Salem, N.C.

C.L.	Location
WYOU	Baltimore, Md.
WYSO	Yellow Springs, Ohio
WYZZ	Wilkes-Barre, Pa.
WZFM	Jacksonville, Fla.
WZIP-FM	Cincinnati, Ohio

Canadian FM Stations by Location

Location	C.L.	Mc.
Brampton, Ont.	CHIC-FM	102.1
Brantford, Ont.	CKPC-FM	92.1
Cornwall, Ont.	CJSS-FM	104.5
Edmonton, Alta.	CFRN-FM	100.3
	CJCA-FM	99.5
	CKUA-FM	98.1
Ft. William, Ont.	CKPR-FM	94.3
Halifax, N.S.	CHNS-FM	96.1
Kingston, Ont.	CFRC-FM	91.9
	CKLC-FM	99.5
	CKWS-FM	96.3
Kitchener, Ont.	CKCR-FM	96.7
Lethbridge, Alta.	CHEC-FM	100.9
London, Ont.	CFPL-FM	95.9
Montreal, Que.	CBF-FM	95.1
	CBM-FM	100.7
	CFCF-FM	106.5
Oshawa, Ont.	CKLB-FM	93.5
Ottawa, Ont.	CBO-FM	103.3
	CFRA-FM	93.9
Quebec, Que.	CHRC-FM	98.1
Rimouski, Que.	CJBR-FM	101.5
St. Catharines, Ont.	CKTB-FM	97.7
Sherbrooke, Que.	CHLT-FM	102.7
Timmins, Ont.	CKGB-FM	94.5
Toronto, Ont.	CBC-FM	99.1
	CFRB-FM	99.9
	CHFI-FM	98.1
	CJRT-FM	91.1
Vancouver, B.C.	CBU-FM	105.7
	CHQM-FM	103.5
Verdun, Que.	CKVL-FM	96.9
Victoria, B.C.	CKDA-FM	98.5
Windsor, Ont.	CKLW-FM	93.9
Winnipeg, Man.	CJOB-FM	97.5

Canadian FM Stations by Call Letters

C.L.	Location
CBC-FM	Toronto, Ont.
CBF-FM	Montréal, Que.
CBM-FM	Montreal, Que.
CBO-FM	Ottawa, Ont.
CBU-FM	Vancouver, B.C.
CFCF-FM	Montreal, Que.
CFPL-FM	London, Ont.
CFRA-FM	Ottawa, Ont.
CFRB-FM	Toronto, Ont.
CFRC-FM	Kingston, Ont.
CFRN-FM	Edmonton, Alta.
CHEC-FM	Lethbridge, Alta.
CHFI-FM	Toronto, Ont.
CHLT-FM	Sherbrooke, Que.
CHNS-FM	Halifax, N.S.
CHRC-FM	Quebec, Que.
CJBR-FM	Rimouski, Que.
CJCA-FM	Edmonton, Alta.
CJCB-FM	Sydney, N.S.
CJOB-FM	Winnipeg, Man.
CJRT-FM	Toronto, Ont.
CJSS-FM	Cornwall, Ont.
CKCR-FM	Kitchener, Ont.
CKDA-FM	Victoria, B.C.
CKGB-FM	Timmins, Ont.
CKLB-FM	Oshawa, Ont.
CKLC-FM	Kingston, Ont.
CKLW-FM	Windsor, Ont.
CKPC-FM	Brantford, Ont.
CKPR-FM	Ft. William, Ont.
CKSF-FM	Cornwall, Ont.
CKTB-FM	St. Catharines, Ont.
CKUA-FM	Edmonton, Alta.
CKVL-FM	Verdun, Que.
CKWS-FM	Kingston, Ont.

U. S. Television Stations

Territories and possessions follow states. Chan., channel number; asterisk (*) indicates educational station.

Location	C.L.	Chan.
ALABAMA		
Andalusia	WAIQ	*2
Birmingham	WAPI-TV	13
	WBIQ	*10
	WBRC-TV	6
Decatur	WMSL-TV	23
Dothan	WTVY	9
Florence	WOWL	15
Huntsville	WAFG-TV	31
Mobile	WALA-TV	10
	WKRG-TV	5
Montgomery	WCOV-TV	20
	WSFA-TV	12
Munford	WCIQ	*7
Selma	WSLA	8
ALASKA		
Anchorage	KENI-TV	2
	KTVA	11
Fairbanks	KFAR-TV	2
	KTVF	11
Juneau	KINY-TV	8
ARIZONA		
Douglas	KCDA	3
Phoenix	KOOL-TV	10
	KAET	*8
	KPHO-TV	5
	KTVK	3
	KTAR-TV	12
Tucson	KGUN-TV	9
	KOLD-TV	13
	KVOA-TV	4
	KUAT	*6
Yuma	KIVA	11
ARKANSAS		
El Dorado	KTVE	10
Ft. Smith	KFSA-TV	5
Hot Springs	KFOY-TV	9
Little Rock	KARK-TV	4
	KTHV	11
	KATV	7
Texarkana	KCMC-TV	6
CALIFORNIA		
Bakersfield	KBAK-TV	29
	KERO-TV	10
	KLYO-TV	17
Chico	KHSL-TV	12
El Centro	XEM-TV	3
Eureka	KIEM-TV	3
	KVIQ-TV	6
Fresno	KFRE-TV	30
	KAIL	53
	KJEO	47
	KMJ-TV	24
Los Angeles	KABC-TV	7
	KCOP	13
	KHJ-TV	9
	KNXT	2
	KRCA	4
	KTLA	5
	KTTV	11
Oakland	KTVU	2
Redding	KVIP-TV	7
Sacramento	KXTV	10
	KCRA-TV	3
	KVUE	40
	KVIE	*6
Salinas	KSBW-TV	8
San Diego	KFMB-TV	8
	KOGO-TV	10
(Tijuana, Mex.)	XETV	6
San Francisco	KGO-TV	7
	KPIX	5
	KQED	*9
	KRON-TV	4
	KEZE-TV	20
San Jose	KNTV	11
San Luis Obispo	KSBY-TV	6
Santa Barbara	KEY-T	3
Stockton	KDVR	13
COLORADO		
Colorado Springs	KKTV	11
	KRDO-TV	13
Denver	KBTV	9
	KLZ-TV	7
	KOA-TV	4
	KRMA-TV	*6
	KTVR	2
Grand Junction	KREX-TV	5
Montrose	KREY-TV	10
Pueblo	KCSJ-TV	5
Bridgeport	WICC-TV	43
Hartford	WTIC-TV	3
	WHCT	18
CONNECTICUT		
New Britain	WHNB-TV	30
New Haven	WNHC-TV	8
Waterbury	WATR-TV	53
DIST. OF COLUMBIA		
Washington	WMAL-TV	7
	WRC-TV	4
	WTOP-TV	9
	WTTG	5
FLORIDA		
Daytona Beach	WESH-TV	2
Fort Pierce-Vero Beach	WTVI	19
Fort Myers	WINK-TV	11
Gainesville	WUFT	*5
Jacksonville	WFGA-TV	12
	WJCT	*7
	WJXT	4
Miami	WCKT	7
	WLBW-TV	10
	WPST-TV	10
	WTHS-TV	*2
	WTVJ	4
Orlando	WDBO-TV	6
	WLOF-TV	9
Palm Beach	WPTV	5
Panama City	WJDM-TV	7
Pensacola	WEAR-TV	3
St. Petersburg	WSUN-TV	38
Tallahassee	WFSU-TV	*11
Tampa	WFLA-TV	8
	WEDU	*3
	WTVT	13
W. Palm Beach	WEAT-TV	12
GEORGIA		
Albany	WALB-TV	10
Athens	WGTV	*8
Atlanta	WAGA-TV	5
	WSB-TV	2
	WETV	*30
	WLW-A	11
Augusta	WJBF	6
	WRDW-TV	12
Columbus	WRBL-TV	3
	WTVM	9
Macon	WMAZ-TV	13
Savannah	WSAV-TV	3
	WEGA-TV	*9
	WTOC-TV	11
Thomasville	WCTV	6
Waycross	WEGS-TV	*8
HAWAII		
Hilo	KHBC-TV	9
	KHJK	13
Honolulu	KGMB-TV	9
	KONA	2
	KHVH-TV	4
Wailuku	KMAU	3
	KALA	7
	KMVI-TV	12
IDAHO		
Boise	KBOI-TV	2
	KTVB	7
Idaho Falls	KID-TV	3
	KIFI-TV	8
Lewiston	KLEW-TV	3
Nampa	KCIX-TV	6
Twin Falls	KLIX-TV	11
ILLINOIS		
Carbondale	WSIU-TV	*8
Champaign	WCIA	3
	WCHU	33
Chicago	WBBM-TV	2
	WBKB	7
	WGN-TV	9
	WNBQ	5
	WTTW	*11
Danville	WICD	24
Decatur	WTVP	17
Harrisburg	WSIL-TV	3
La Salle	WEEQ-TV	35
Peoria	WEEK-TV	43
	WMBD	31
	WTVH	19
Quincy	WGEM-TV	10
Rockford	WREX-TV	13
	WTVO	39
Rock Island	WHBF-TV	4
Springfield	WICS	20
Urbana	WILL-TV	*12
INDIANA		
Bloomington	WTTV	4
Elkhart	WSJV-TV	28
Evansville	WFIE-TV	14
	WEHT	50
	WTVW	7
Ft. Wayne	WANE-TV	15
	WKJG-TV	33
	WPTA	21
Indianapolis	WFBM-TV	6
	WLWI	13
	WISH-TV	8
Lafayette	WFAM-TV	18
Muncie	WLBC-TV	49
South Bend	WNDU-TV	16
	WSBT-TV	22
Terre Haute	WTHI-TV	10
IOWA		
Ames	WOI-TV	5
Cedar Rapids	KCRG-TV	9
	WMT-TV	2
Davenport	WOC-TV	6
Des Moines	KRNT-TV	8
	KDPS-TV	*11
	WHO-TV	13
Fort Dodge	KQTV	21
Mason City	KGLO-TV	3
Ottumwa	KTVO	3
Sioux City	KTIV	4
	KVTV	9
Waterloo	KWWL-TV	7
KANSAS		
Ensign	KTVC	6
Garden City	KGLD	11
Goodland	KWHT-TV	10
Great Bend	KCKT	2
Hays	KAYS-TV	7
Hutchinson	KTVH	12
Pittsburg	KOAM-TV	7
Topeka	WIBW-TV	13
Wichita	KAKE-TV	10
	KARD-TV	3
KENTUCKY		
Lexington	WLEX-TV	18
	WKYT	27
Louisville	WAVE-TV	3
	WFPK-TV	*15
	WHAS-TV	11
	WQXL-TV	41
Paducah	WPSD-TV	6
LOUISIANA		
Alexandria	KALB-TV	5
Baton Rouge	WAFB-TV	28
	WBRZ	2
Lafayette	KLFY-TV	10
Lake Charles	KPLC-TV	7
	KTAG-TV	25
Monroe	KNOE-TV	8
	KLSE	*13
New Orleans	WDSU-TV	6
	WVUE	13
	WWL-TV	4
	WYES	*8
Shreveport	KSLA-TV	12
	KTBS-TV	3

Location	C.L.	Chan.
MAINE		
Augusta	WCBB	10
Bangor	WABI-TV	5
	WLBZ-TV	2
Poland Spring	WMTW-TV	8
Portland	WCSH-TV	6
	WGAN-TV	13
Presque Isle	WAGM-TV	8
MARYLAND		
Baltimore	WJZ-TV	13
	WBAL-TV	11
	WMAR-TV	2
Salisbury	WBOC-TV	16
MASSACHUSETTS		
Adams	WCDC	19
Boston	WBZ-TV	4
	WGBH-TV	*2
	WHDH-TV	5
	WNAC-TV	7
Greenfield	WRLP	32
Springfield	WHYN-TV	40
	WWLP	22
Worcester	WWOR-TV	14
MICHIGAN		
Bay City	WNEM-TV	5
Cadillac	WWTV	13
Cheboygan	WTOM-TV	4
Detroit	WJBK-TV	2
	WTVS	*56
	WWJ-TV	4
	WXYZ-TV	7
(Windsor, Ont.)	CKLW-TV	9
Flint	WJRT	12
Grand Rapids	WOOD-TV	8
Kalamazoo	WKZO-TV	3
Lansing	WJIM-TV	6
Marquette	WLUC-TV	6
Onondaga	WILX-TV/WMSB	10
Saginaw	WKNX-TV	57
Traverse City	WPBN-TV	7
MINNESOTA		
Alexandria	KCMT	7
Austin	KMMT	6
Duluth	KDAL-TV	3
	WDSM-TV	6
Mankato	KEYC-TV	12
Minneapolis	KMSP	9
	WCCO-TV	4
	WTCN-TV	11
Rochester	KROC-TV	10
St. Paul	KSTP-TV	5
	KTCA-TV	*2
MISSISSIPPI		
Columbus	WCBI-TV	4
Greenwood	WABG-TV	6
Jackson	WJTV	12
	WLBT	3
Laurel	WDAM-TV	7
Meridian	WTOK-TV	11
	WCOC-TV	30
Tupelo	WTWV	9
MISSOURI		
Cape Girardeau	KFVS-TV	12
Columbia	KOMU-TV	8
Hannibal	KHQA-TV	7
Jefferson City	KRCG-TV	13
Joplin	KODE-TV	12
Kansas City	KCMO-TV	5
	KCSD-TV	*19
	KMBC-TV	9
	WDAF-TV	4
Kirksville	KTVO	3
Poplar Bluff, Mo.	KPOB-TV	15
St. Joseph	KFEQ-TV	2
St. Louis	KETC	*9
	KMOX-TV	4
	KSD-TV	5
	KTVI	2
	KPLR-TV	11
Sedalia	KMOS-TV	6
Springfield	KTTS-TV	10
	KYTV	3
MONTANA		
Billings	KOOK-TV	2
	KGHL-TV	8
Butte	KXLF-TV	4
Glendive	KXGN-TV	5
Great Falls	KFBB-TV	5
	KRTV	3
Helena	KBLL-TV	12
Kalispell	KULR	9
Missoula	KMSO-TV	13
NEBRASKA		
Hastings	KHAS-TV	5
Hay Springs	KDUH-TV	4
Hayes Center	KHPL-TV	6
Kearney	KHOL-TV	13
Lincoln	KOLN-TV	10
	KUON-TV	*12
McCook	KOMC	8
North Platte	KNOP	2
Omaha	KMTV	3
	KETV	7
Scottsbluff	WOW-TV	6
	KSTF	10
NEVADA		
Henderson	KLRJ-TV	2
Las Vegas	KLAS-TV	8
	KSHO-TV	13
Reno	KOLO-TV	8
NEW HAMPSHIRE		
Durham	WENH-TV	*11
Manchester	WMUR-TV	9
NEW JERSEY		
Newark	WNTA-TV	13
NEW MEXICO		
Albuquerque	KGGM-TV	13
	KNME-TV	*5
	KOAT-TV	7
	KOB-TV	4
Carlsbad	KAVE-TV	6
Clovis	KVER-TV	12
Roswell	KSWS-TV	8
NEW YORK		
Albany	WTEN	10
	WAST	13
	WTRI	35
	WCDA	41
Binghamton	WINR-TV	40
	WNBF-TV	12
Buffalo	WBEN-TV	4
	WNED-TV	*17
	WGR-TV	2
	WKBW-TV	7
Carthage	WCNY-TV	7
Elmira	WSYE-TV	18
New York	WABC-TV	7
	WNEW-TV	5
	WCBS-TV	2
	WOR-TV	9
	WPIX	11
	WNBC-TV	4
Plattsburg	WPTZ-TV	5
Rochester	WHEC-TV	10
	WROC-TV	5
	WVET-TV	10
	WRGB	6
Schenectady	WHEN-TV	8
Syracuse	WSYR-TV	3
Utica	WKTV	2
NORTH CAROLINA		
Asheville	WISE-TV	62
	WLOS-TV	13
Chapel Hill	WUNC-TV	*4
Charlotte	WBTV	3
	WSOC-TV	9
Durham	WTVD	11
Greensboro	WFMY-TV	2
Greenville	WNCT	9
Raleigh	WRAL-TV	5
Washington	WITN	7
Wilmington	WECT	6
Winston-Salem	WSJS-TV	12
NORTH DAKOTA		
Bismarck	KXMB-TV	12
	KFYR-TV	5
Dickinson	KDIX-TV	2
Fargo	WDAY-TV	6
	KXGO-TV	11
Grand Forks	KNOX-TV	10
Minot	KXMC-TV	13
	KMOT	10
Pembina, N.D.	KCND-TV	12
Valley City	KXJB-TV	4
Williston	KUMV-TV	8
OHIO		
Akron	WAKR-TV	49
Cincinnati	WCET	*48
	WCPO-TV	9
	WKRC-TV	12
	WLW-T	5
	WCIN-TV	54
Cleveland	KYW-TV	3
	WEWS	5
	WJW-TV	8
Columbus	WBNS-TV	10
	WLW-C	4
	WOSU-TV	*34
	WTVN-TV	6
Dayton	WHIO-TV	7
	WLW-D	2
Lima	WIMA-TV	35
Oxford	WMUB-TV	14
Steubenville	WSTV-TV	9
Toledo	WSPD-TV	13
	WGTE-TV	*30
	WTOL-TV	11
Youngstown	WFMJ-TV	21
	WKBN-TV	27
	WKST-TV	33
	WXTV	45
Zanesville	WHIZ-TV	18
OKLAHOMA		
Ada	KTEN	10
Ardmore	KXII	12
Enid	KOCO-TV	5
Lawton	KSWO-TV	7
Oklahoma City	KETA	*13
	KOKH-TV	25
	KWTV	9
	WKY-TV	4
Tulsa	KOTV	6
	KOED-TV	*11
	KTUL-TV	8
	KVOO-TV	2
OREGON		
Coos Bay	KCBY-TV	11
Corvallis	KOAC-TV	*7
Eugene	KVAL-TV	13
	KEZI-TV	9
	KOAP-TV	*10
Klamath	KOTI	2
Medford	KBES-TV	5
Portland	KGW-TV	8
	KHTV	27
	KOIN-TV	6
	KPTV	12
Roseburg	KPIC	4
PENNSYLVANIA		
Altoona	WFBG-TV	10
Erie	WICU	12
	WSEE-TV	35
Harrisburg	WHP-TV	55
	WTPA	27
Johnstown	WARD-TV	56
	WJAC-TV	6
Lancaster	WGAL-TV	8
Lebanon	WLVH-TV	15
Lockhaven	WBPZ-TV	32
New Castle	WKST-TV	45
Philadelphia	WCAU-TV	10
	WFIL-TV	6
	WHYY-TV	*35
	WPCA-TV	17
	WRCV-TV	3
Pittsburgh	KDKA-TV	2
	WIIC	11
	WQED	*13
	WQEX	*16
	WTAE	4
Scranton	WNEP-TV	16
	WDAU-TV	22
Wilkes-Barre	WBRE-TV	28
York	WSBA-TV	43
RHODE ISLAND		
Providence	WJAR-TV	10
	WPRO-TV	12
SOUTH CAROLINA		
Anderson	WAIM-TV	40
Charleston	WCSC-TV	5
	WUSN-TV	2
Clemson	WSBF-FM	*88.1
Columbia	WIS-TV	10
	WNOK-TV	67
Florence	WBTW	8
Greenville	WFBC-TV	4
Spartanburg	WSPA-TV	7
SOUTH DAKOTA		
Aberdeen	KXAB-TV	9
Deadwood	KDSJ-TV	5
Florence	KDLO-TV	3
Mitchell	KORN-TV	5
Rapid City	KOTA-TV	3
	KRSD-TV	7
Reliance	KPLO-TV	6
Sioux Falls	KELO-TV	11
	KSOO-TV	13
Vermilion	KUSD-TV	*2
TENNESSEE		
Chattanooga	WDEF-TV	12
	WRGP-TV	3
	WTVC	9
Jackson	WDXI-TV	7
Johnson City	WJHL-TV	11
Knoxville	WATE-TV	6
	WBIR-TV	10
	WTVK	26
Memphis	WHBQ-TV	13
	WKND	*10
	WMCT	5
	WREC-TV	3
Nashville	WLAC-TV	5
	WSIX-TV	8
	WSM-TV	4
TEXAS		
Abilene	KRBC-TV	9
Alpine	KULF-TV	12
Amarillo	KFDA-TV	10
	KGNC-TV	4
	KVII	7
Austin	KTBC-TV	7
Beaumont	KFDM-TV	6
Big Spring	KEDY-TV	4
Bryan	KBTX-TV	3
Corpus Christi	KRIS-TV	6
	KZTV	10
Dallas	KRLD-TV	4
	KERA-TV	*13
	WFAA-TV	8
El Paso	KELP-TV	13
	KROD-TV	4
	KTSM-TV	9
(Ciudad Juarez, Mex.)	XEJ-TV	5
Ft. Worth	KTVT	11
Harlingen	WBAP-TV	5
Houston	KGBT-TV	4
	KPRC-TV	2
	KHOU-TV	11
	KTRK-TV	13
	KUHT	*8
Laredo	KGNS-TV	8
Lubbock	KCBD-TV	11
	KDUB-TV	13
	KTRE-TV	9
Lufkin	KMID-TV	2
Midland	KVKM-TV	9
Monahans	KOSA-TV	7
Odessa		
Port Arthur-Beaumont	KPAC-TV	4
Richardson	KRET-TV	*23
San Angelo	KCTV	8
San Antonio	KUAL-TV	41
	KENS-TV	5
	KLRN	*9
	KONO-TV	12
	WOAI-TV	4
Sweetwater	KPAR-TV	12
Temple	KCEN-TV	6
Texarkana	KTAL-TV	6
Tyler	KLTV	7
Waco	KWTX-TV	10
Weslaco	KRGV-TV	5
Wichita Falls	KFDX-TV	3
	KSYD-TV	6
UTAH		
Ogden	KVOG-TV	9
	KWCS-TV	*18
Provo	KLOR-TV	11
Salt Lake City	KSL-TV	5
	KCPX-TV	4
	KUED	*7
	KUTV	2
VERMONT		
Burlington	WCAX-TV	8
VIRGINIA		
Bristol	WCYB-TV	5
Hampton	WVEC-TV	13
Harrisonburg	WSVA-TV	3
Lynchburg	WLVA-TV	13
Norfolk	WTAR-TV	3
Petersburg	WXEX-TV	8
Portsmouth	WAVY-TV	10
Richmond	WRVA-TV	12
	WTVR	6
Roanoke	WDBJ-TV	7
	WSLS-TV	10
WASHINGTON		
Bellingham	KVOS-TV	12
Ephrata	KBAS-TV	16
Paseo	KEPR-TV	19
Seattle	KCTS-TV	*9
	KING-TV	5
	KIRO-TV	7
	KOMO-TV	4
Spokane	KHQ-TV	6
	KREM-TV	2
	KXLY-TV	4
Tacoma	KTNT-TV	11
	KPEC-TV	*56
	KTPS	*62
	KTVW	13
Yakima	KIMA-TV	29
	KNDO-TV	23
WEST VIRGINIA		
Bluefield	WHIS-TV	6
Charleston	WCHS-TV	8
Clarksburg	WBOY-TV	12
Fairmont	WJPB-TV	5
Huntington	WHTN-TV	13
	WSAZ-TV	3
Oak Hill	WOAY-TV	4
Parkersburg	WTAP-TV	15
Wheeling	WTRF-TV	7
WISCONSIN		
Eau Claire	WEAU-TV	13
Green Bay	WBAY-TV	2
	WFRV	5
	WLUK-TV	11
La Crosse	WKBT	8
Madison	WHA-TV	*21
	WISC-TV	3
	WKOW-TV	27
	WMTV	33
Marinette	WMBV-TV	11
Milwaukee	WISN-TV	12
	WITI-TV	6
	WMVS-TV	*10
	WTMJ-TV	4
	WXIX	18
Wausau	WSAU-TV	7
WYOMING		
Casper	KTWO-TV	2
Cheyenne	KFBC-TV	5
Riverton	KWRB-TV	10
PUERTO RICO		
Aguadilla	WOLE-TV	12
Caguas	WKBM-TV	11
Mayaguez	WORA-TV	5
	WIPM-TV	*3
Ponce	WRIK-TV	7
	WSUR-TV	9
San Juan	WAPA-TV	4
	WIPR-TV	6
	WKAQ-TV	2

Canadian Television Stations

Location	C.L.	Chan.
ALBERTA		
Calgary	CHCT-TV	2
	CFCN-TV	4
Edmonton	CFRN-TV	3
Lethbridge	CJLH-TV	7
Lloydminster	CHSA-TV	2
Medicine Hat	CHAT-TV	6
Red Deer	CHCA-TV	6
	CHCA-TV-2	10
BRITISH COLUMBIA		
Burnaby	CHAN-TV	8
Dawson Creek	CJOC-TV	5
Kamloops	CFCR-TV	4
Kelowna	CHBC-TV	2
	CHGP-TV-1	72
Nelson	CBUAT-1	9
Oliver	CHBC-TV-3	8
Penticton	CHBC-TV	13
Saddle Mountain	CHHC-TV-1	4
Trail	CBUAT	11
Vancouver	CBUT	2
Vernon	CHBC-TV	7
Victoria	CHEK-TV	6
LABRADOR		
Goose Bay	CFLA-TV	8
MANITOBA		
Baldy Mountain	CKOS-TV-1	8
Brandon	CKX-TV	5
Winnipeg	CBWT	3
	CBWFT	6
	CJAY-TV	7
NEW BRUNSWICK		
Campbellton	CKAM-TV	12
Moncton	CKCW-TV	2
	CBAFT	11
Saint John	CHSJ-TV	4
NEWFOUNDLAND		
Argentia	CJOX-TV	10
Corner Brook	CBYT	5
	CHEK-TV	6
Grand Falls	CJCN-TV	4
St. John's	CJON-TV	6
Stephenville	CFSN-TV	8
NOVA SCOTIA		
Halifax	CBHT	3
	CJCH-TV	5
Inverness	CJCB-TV-1	6
Liverpool	CBHT-1	12
New Glasgow	CFCY-TV-1	7
Shelburne	CBHT-2	8
Sydney	CJCB-TV	4
Yarmouth	CBHT-3	11
ONTARIO		
Barrie	CKVR-TV	3
Cornwall	CJSS-TV	8
Elk Lake	CFCL-TV-2	2
Elliot Lake	CKSO-TV-1	3
Hamilton	CHCH-TV	11
Kapuskasing	CFCL-TV-1	3
Kenora	CBWAT	8
Kingston	CKWS-TV	11
Kitchener	CKCO-TV	13
London	CFPL-TV	10
North Bay	CKGN-TV	10
Peterborough	CHEX-TV	12
Ottawa	CBOFT	9
	CBOT	4
	CJOH-TV	13
Port Arthur	CFCJ-TV	2
Sault Ste. Marie	CJIC-TV	2
Sturgeon Falls	CBFST	7
Sudbury	CKSO-TV	5
Timmins	CFCL-TV	6
Toronto	CBLT	6
	CFTO-TV	9
Windsor	CKLW-TV	9
Wingham	CKNX-TV	8
PRINCE EDWARD ISLAND		
Charlottetown	CFCY-TV	13
QUEBEC		
Carleton	CHAU-TV	5
	CJAQ-TV-1	80
	CHSM-TV	7
Clermont	CFCV-TV-1	75
Estcourt	CJES-TV-1	70
Jonquiere	CKRS-TV	12
Matane	CKBL-TV	9
Montreal	CBFT	2
	CFCF-TV	12
	CFTM-TV	10
	CBMT	6
New Carlisle	CHAU-TV	5
Quebec	CFCM-TV	4
	CKMI-TV	5
Rimouski	CJBR-TV	3
Rouyn	CKRN-TV	4
Sherbrooke	CHLT-TV	7
Three Rivers	CKTM-TV	13
SASKATCHEWAN		
Moose Jaw	CHAB-TV	4
Prince Albert	CKBI-TV-1	10
Regina	CKCK-TV	2
Saskatoon	CFQC-TV	8
Swift Current	CFJB-TV	5
Wanganui	CKBI-TV-2	7
Yorkton	CKOS-TV	3

World-Wide Short-Wave Stations

Most international broadcasting is done within frequency limits agreed upon at International conventions. These frequency ranges are listed here, at the right, expressed both in frequency and by meter bands (wave-length).

Reception in the various bands varies according to the time of day and season of the year. Reception in the 60, 49 and 41 meter bands is best at night during the winter months. Reception in the 31 and 25 M. bands is best at night, but all year. Reception in the 19, 16, 13 and 11 M. bands is best during the day, also at night during the summer in the 16 and 19 M. bands.

Abbr.: AIR—All India Radio; RAI—Radiotelevisione Italiana; RTF—Radiodiffusion Television Francaise; VOA—Voice of America; RFE—Radio Free Europe. • denotes stations beaming evening (U.S. time) broadcasts to the U.S., † morning or afternoon broadcasts.

METER BANDS	
4750 to	5060 kc/s (60 meter band)
5950 to	6200 kc/s (49 meter band)
7100 to	7300 kc/s (41 meter band)
9500 to	9775 kc/s (31 meter band)
11700 to	11975 kc/s (25 meter band)
15100 to	15450 kc/s (19 meter band)
17700 to	17900 kc/s (16 meter band)
21450 to	21750 kc/s (13 meter band)
25600 to	26100 kc/s (11 meter band.

Kcs.	Call and Location
4630	HCGBI, Quito, Ecua.,
4765	HJEF, Cali, Col.
4770	ELWA, Monrovia, Lib.
4770	YVMW, Punto Fiji, Ven.
4775	Libreville, Gabon Rep.
4780	YVLA, Valencia, Ven.
4790	YVQN, Puerto La Cruz, Ven.
4795	Rangoon, Burma
4805	ZYS8, Manaus, Braz.
4810	YVMG, Maracaibo, Ven.
4830	YVOA, San Cristobal, Ven.
4835	HJKE, Bogota, Col.
4840	Lourenco Marques, Moz.
4840	YVOI, Valera, Ven.
4845	HJGF, Bucaramanga, Col.
4850	YVMS, Barquisimeto, Ven.
4870	Cotonou, Dahomey Rep.
4880	YVKF, Caracas, Ven.
4893	Dakar, Mali Fed.
4895	PRF6, Manaus, Braz.
4898	HJAG, Barranquilla, Col.
4900	YVKP, Caracas, Ven.
4905	HRQN, Puerto Cortes, Hon.
4910	HCIMI, Quito, Ecua.
4910	Conakry, Guinea
4915	Accra, Ghana
4920	VLM4, Brisbane, Aus.
4920	YVKR, Caracas, Ven.
4930	HCIRC, Quito, Ecua.
4935	HJLF, Ibague, Col.
4940	Abidjan, Ivory Coast
4940	YVMO, Barquisimeto, Ven.
4945	HJCW, Bogota, Col.
4945	Paradys. So. Afr.
4950	Dakar, Mali Fed.
4950	YVMM, Coro, Ven.
4955	CR6RZ, Luanda, Ang.
4960	YVQA, Cumana, Ven.
4970	YVLK, Caracas, Ven.
4975	Yaounde, Cameroun
4990	Lagos, Nigeria
4990	YVMQ, Barquisimeto, Ven.
5010	HCRCX, Quito, Ecua.
5010	St. George, Grenada, B.W.I.
5020	HJFW, Manizales, Col.
5020	Niamey, Niger Rep.
5030	YVKM, Caracas, Ven.
5040	YVMA, Maracaibo, Ven.
5045	Lome, Togo
5050	YVKD, Caracas, Ven.
5075	HJGC, Bogota, Col.
5873	HRN, Tegucigalpa, Hond.
5940	Moscow, U.S.S.R.
5952	TGNA, Guatemala, Guat.
5954	TIQ, Puerto Limon, C. R.
5960	HJCF, Bogota, Col.
5965	YNWW, Granada, Nic.
5980	TGAR, Guatemala, Guat.
5981	Georgetown, Br. Guiana
5982	4VB, Port-au-Prince, Haiti
5990	Andorra, Andorra
5990	TGJA, Guatemala, Guat.
5995	Fort-de-France, Mart.
6002	4VEC, Cap Haitien, Haiti
6005	RIAS, Berlin, Ger.
6006	TIHBG, San Jose, C. R.
6010	XEOL, Mexico City, Mexico
6015	PRA8, Recife, Braz.
6020	Amman, Jordan
6020	Kiev, Ukrainian S.S.R.
6025	Kuala Lumpur, Malaya
6025	Hilversum, Neth.
6030	Baghdad, Iraq
6035	Rangoon, Burma
6035	HRTL, Tegucigalpa, Hond.
6037	TIFC, San Jose, C. R.
6037	Monte Carlo, Mon.
6040	HJLB, Ibague, Col.
6045	YDF, Djakarta, Indon.
6045	HOU3I, David, Pan.
6050	HCJB, Quito, Ecua.
6050	BBC, London, Eng.
6055	HJEX, Cali, Col.
6055	JOZ2, Tokyo, Japan
6060	RAI, Caltanissetta, It.
6065	XEXG, Leon, Mex.
6065	Horby, Sweden
6070	Sofia, Bulgaria
6070	BBC, London, Eng.
6075	Norden, Ger.
6080	ZL7, Wellington, N.Z.
6082	DAX4Z, Lima, Peru
6085	Munich, Ger.
6090	VLI6, Sydney, Aus.
6090	Luxembourg, Lux.
6090	XECMT, C. El Mante, Mex.
6095	ZYB7, Sao Paulo, Braz.
6100	VOA, Munich, Ger.
6100	Belgrade, Yugo,
6108	Peking, China
6105	XEQM, Merida, Mex.
6105	Tunis, Tunisia
6110	BBC, London, Eng.
6115	ZYC7, Rio de Jan., Braz.
6115	Khabarovsk, U.S.S.R.
6120	LRX1, Buenos Aires
6120	BBC, Limassol, Cyprus
6130	Port Moresby, New Guinea
6130	Madrid, Spain •
6135	HRMF, La Ceiba, Hond.
6135	Papeete, Tahiti
6135	Singapore, Sing.
6140	HCOV5, Azogues, Ecua.
6140	VLW6, Perth, Aus.
6145	Algiers, Algeria
6147	PRL9, Rio de Jan., Braz.
6150	VLR6, Melbourne, Aus.
6150	BBC, London, Eng.
6155	4VWA, Cap Haitien, Haiti
6155	VOA, Salonika, Greece
6160	HJKJ, Bogota, Col.
6160	FEN, Tokyo, Japan
6165	HER3, Bern, Switz. •
6165	XEWW, Mexico City, Mex.
6165	Saigon, Vietnam
6170	BBC, Limassol, Cyprus
6170	Cayenne, Fr. Guiana
6175	RTF, Paris, France
6180	BBC, London, England
6185	HJCT, Bogota, Col.
6190	VOA, Munich, Ger.
6190	HVJ, Vatican City
6195	HJEZ, Cali, Col.
6195	HRD2, La Ceiba, Hond.
6195	Pyongyang, N. Korea
6200	HI2LR, C. Trujillo, D.R.
6200	4VHW, Port-au-Prince, Haiti
6208	TGHC, Guatemala, Guat.
6215	Pyongyang, N. Korea
6225	Peking, China
6305	Andorra, Andorra
6327	COCF, Havana, Cuba
6345	Ulan Bator, Mong.
6373	Lisbon, Port.
6790	BBC, Limassol, Cyprus
7105	Madrid, Spain
7110	VOA, Colombo, Ceylon
7110	BBC, London, England
7115	Rabat, Morocco
7115	RFE, Germ,
7120	BBC, London, England
7120	BBC, Singapore
7125	Warsaw, Poland
7140	Monte Carlo, Monaco
7145	RFE, Ger.
7150	Khabarovsk, U.S.S.R.
7160	RTF, Paris, France
7160	VOA, Tanglor, Mor.
7165	RFE, Germ.
7170	Algiers, Alg.
7180	Baghdad, Iraq
7185	BBC, London, Eng.
7200	BBC, London, Eng.
7200	R. Malaya, Sing.
7200	Omdurman, Sudan
7205	VOA, Salonika, Gr.
7210	BBC, London, Eng.
7210	Dakar, Mali Fed.
7210	Khabarovsk, U.S.S.R.
7220	VLO7, Melbourne, Aus.
7220	Budapest, Hung.
7230	BBC, London, Eng.
7235	Taipei, Taiwan, China
7235	VOA, Munich, Ger.
7240	RTF, Paris, France
7250	BBC, London, Eng.
7255	Sofia, Bulg.
7260	Saigon, Vietnam
7270	Motala, Sweden
7270	Magadan, U.S.S.R.
7275	RAI, Rome, It.
7280	Teheran, Iran
7280	HVJ, Vat. City
7285	Ankara, Turk.
7290	RAI, Rome, It.
7295	Makassar, Celebes
7295	RFE, Ger.
7320	BBC, London, Eng.
7398	Damascus, U.A.R.
7505	Peking, China
7650	YNMS, Leon, Nic.
7670	Sofia, Bulg.
7850	Tirana, Alb.
8002	Beirut, Leb.
8900	HCJC3, Zaruma, Ecua.
9009	Tel Aviv, Israel
9026	COBZ, Havana, Cuba
9065	Peking, China
9210	Leopoldville, Congo
9360	Madrid, Spain •
9363	COBC, Havana, Cuba
9380	Alma Ata, Kazakh S.S.R.
9385	Leopoldville, Congo
9410	BBC, London, Eng.
9440	CP38, La Paz, Bol.
9458	Peking, China
9500	XEWW, Mexico City, Mex.
9500	Magadan, U.S.S.R.
9500	Moscow, U.S.S.R.
9505	PRB22, Sao Paulo, Braz.

Kcs.	Call and Location
9505	Rabat, Mor.
9505	HOLA, Colon, Pan.
9510	Peking, China
9510	VOA, Tangier, Mor.
9515	RAI, Caltanissetta, It.
9515	Ankara, Turkey ●
9520	Colombo, Ceylon
9520	Copenhagen, Den. ●
9520	VOA, Salonika, Gr.
9520	OAX8E, Iquitos, Peru
9523	Paradys, S. Afr.
9525	BBC, London, Eng.
9525	JOB9, Tokyo, Japan
9525	Warsaw, Poland
9530	COCO, Havana, Cuba
9530	VOA, Munich, Ger.
9530	AIR, Delhi, India
9530	VOA, Courier, Rhodes
9530	YVMZ, Maracaibo, Ven.
9535	Lagos, Nigeria
9535	VOA, Manila, P.I.
9535	HER4, Bern, Switz. ●
9540	ZL2, Wellington, N.Z.
9540	Warsaw, Poland
9540	Omdurman, Sudan
9545	ZYS43, Curitiba, Braz.
9545	HED5, Bern, Switz.
9550	Prague, Czecho. ●
9550	AIR, Bombay, India
9550	OAX1Z, Tumbes, Peru
9555	CP6, La Paz, Bol.
9555	BBC, London, Eng.
9555	XETT, Mexico City, Mex.
9560	RTF, Paris, France
9560	Tokyo, Japan
9563	OAX4R, Lima, Peru
9565	ZYK3, Recife, Braz.
9565	Radio Liberty, Ger.
9565	Khabarovsk, U.S.S.R.
9570	Bucharest, Rom. ●
9575	ZYZ27, Rio de Jan., Braz.
9575	Taipei, Formosa
9575	RAI, Rome, Italy ●
9580	VLA9, Melbourne, Aus.
9580	BBC, London, Eng.
9585	ZYR56, Sao Paulo, Braz.
9585	RTF, Paris, France
9588	Peking, China
9590	Djakarta, Indon.
9590	Hilversum, Neth.
9590	Bucharest, Rom. ●
9595	JOZ3, Tokyo, Japan
9598	CE960, Santiago, Chile
9600	BBC, London, Eng.
9605	Cologne, Ger.
9607	Athens, Greece
9610	VLX9, Perth, Aus.
9610	ZYC8, Rio de Jan., Braz.
9610	Oslo, Norway ●
9610	OAX8C, Iquitos, Peru
9615	VOA, Tangier, Morocco
9620	ZYR98, Sao Paulo, Braz.
9620	Peking, China
9620	VOA, Tangier, Mor.
9620	Saigon, Vietnam
9625	Brazzaville, Equat. Un.
9625	BBC, London, Eng.
9625	OAX8K, Iquitos, Peru
9625	Moscow, U.S.S.R.
9630	CR6RL, Luanda, Ang.
9630	VLG9, Melbourne, Aus.
9630	RAI, Rome, Italy
9630	Komsomolsk, U.S.S.R.
9635	ZYR83, Aparecida, Braz.
9635	VOA, Munich, Ger.
9635	Lisbon, Portugal ●
9640	BBC, London, Eng.
9640	Cologne, Germany ●
9640	Accra, Ghana
9640	HLK5, Seoul, Korea
9640	Moscow, U.S.S.R.
9645	TIFC, San Jose, C.R.
9645	HVJ, Vatican City
9650	BBC, Limassol, Cyprus
9655	Radio Free Europe, Ger.
9660	LRX, Buenos Aires, Arg.
9660	VLQ9, Brisbane, Aus.
9660	Radio Liberty, Ger.
9660	Teheran, Iran
9660	Komsomolsk, U.S.S.R.
9665	Moscow, U.S.S.R.
9667	Hargeisa, Somalia
9667	TGNA, Guatemala, Guat. ●
9670	COCQ, Havana, Cuba
9670	Prague, Czecho.
9675	BBC, London, Eng.
9675	RTF, Paris, France
9675	JOB9, Tokyo, Japan
9675	Warsaw, Poland ●
9680	VLH9, Melbourne, Aus.
9680	XEQQ, Mexico City, Mex.
9680	VOA, Tangier, Mor.
9680	Paradys, S. Afr.
9685	Algiers, Algeria
9690	LRA, Buenos Aires, Arg. ●
9690	BBC, London, Eng.
9690	BBC, Singapore
9700	Sofia, Bulgaria ●
9700	Rabat, Morocco
9705	Kabul, Afghan.
9705	Brussels, Belg.
9705	AIR, Delhi, India
9705	Radio Free Europe, Port.
9710	BBC, London, Eng.
9710	RAI, Rome, It.
9715	Hilversum, Neth. ●
9715	Radio Free Europe, Ger.
9720	Paradys, S. Afr.
9725	Tel Aviv, Israel
9725	RFE, Port.
9725	BBC, Singapore
9730	Brazzaville, Equat. Un.
9730	Leipzig, E. Ger.
9730	DZH7, Manila, P.I.
9735	Peking, China
9735	BBC, London, Eng.
9735	Cologne, Germany
9735	AIR, Madras, India
9740	VOA, Tangier, Mor.
9742	LRS1, Buenos Aires, Arg.
9745	Brussels, Belg.
9745	HCJB, Quito, Ecua. ●
9745	Ankara, Turk.
9745	Moscow, U.S.S.R.
9750	BBC, London, Eng.
9750	Radio Free Europe, Port.
9750	Khabarovsk, U.S.S.R.
9755	ZYW23, Goiania, Braz.
9755	RTF, Paris, France
9755	Saigon, Vietnam
9760	BBC, London, Eng.
9762	Hanoi, N. Vietnam
9765	Moscow, U.S.S.R.
9770	Brazzaville, Equat. Un.
9770	BBC, London, Eng.
9775	Moscow, U.S.S.R.
9795	Cairo, U.A.R. ●
9800	Peking, China
9800	Moscow, U.S.S.R.
9805	Cairo, U.A.R.
9825	BBC, London, Eng. ●
9833	Budapest, Hung. ●
9840	Hanoi, N. Vietnam
9850	AIR, Delhi, India
9860	Peking, China
9870	Djakarta, Indon.
9895	Bengazi, Libya
9915	BBC, London, Eng.
9973	Peking, China
10335	Ulan Bator, Mong.
10530	Alma Ata, Kazakh S.S.R.
11290	Peking, China
11570	Moscow, U.S.S.R.
11600	Peking, China
11630	Moscow, U.S.S.R.
11650	Peking, China
11665	Cairo, U.A.R.
11675	Peking, China
11675	Karachi, Pak.
11680	BBC, London, Eng.
11685	HVJ, Vat. City
11690	Moscow, U.S.S.R. ●
11700	RTF, Paris, France
11705	JOA11, Tokyo, Japan
11705	Horby, Sweden
11705	Moscow, U.S.S.R.
11710	VLB11, Melbourne, Aus. †
11710	AIR, Delhi, India
11710	WBOU, New York, N.Y.
11715	VOA, Munich, Ger.
11715	Moscow, U.S.S.R.
11717	Athens, Greece
11720	Brazilia, Brazil
11720	BBC, Limassol, Cyprus
11725	Brazzaville, Equat. Un.
11725	Prague, Czecho.
11725	BBC, Singapore
11730	Hilversum, Neth. ●
11735	Rabat, Morocco
11735	Moscow, U.S.S.R. ●
11740	VLC11, Melbourne, Aus.
11740	CE1174, Santiago, Chile
11740	Peking, China
11740	VOA, Tangier, Mor.
11745	RFE, Germ.
11750	BBC, London, Eng.
11750	FEN, Tokyo, Japan
11755	RFE, Port.
11755	Hilversum, Neth. ●
11755	Komsomolsk, U.S.S.R.
11760	VLB11, Melbourne, Aus.
11760	VOA, Munich, Ger.
11760	VOA, Tangier, Mor.
11760	Lourenco Marques, Moz.
11760	Hanoi, N. Vietnam
11765	ZYB8, Sao Paulo, Braz.
11765	Berlin, E. Germany
11770	Colombo, Ceylon
11770	BBC, London, Eng.
11775	ZYZ28, Rio de Jan., Braz.
11775	Moscow, U.S.S.R.
11780	BBC, London, Eng. ●
11785	Djakarta, Indon.
11785	VOA, Tangier, Morocco
11790	BBC, London, Eng.
11790	VOA, Manila, P.I.
11790	Moscow, U.S.S.R.
11795	Cologne, Ger. ●
11795	Djakarta, Indon.
11800	BBC, London, Eng.
11802	Warsaw, Poland ●
11805	RAI, Rome, It.
11805	VOA, Courier, Rhodes
11810	VLB11, Melbourne, Aus. †
11810	RAI, Rome, It.
11810	Amman, Jordan
11810	Bucharest, Rom. ●
11810	Horby, Sweden ●
11815	Madrid, Spain
11820	Peking, China
11820	BBC, London, Eng.
11820	XEBR, Hermosillo, Mex.
11825	ELWA, Monrovia, Lib.
11830	WRUL, Boston, U.S.A.
11830	Moscow, U.S.S.R.
11835	Algiers, Alg.
11835	VOA, Colombo, Ceylon
11835	CXA19, Montevideo, Urug.
11840	Prague, Czecho.
11840	VOA, Tangier, Mor.
11840	Lisbon, Port. ●
11840	Khabarovsk, U.S.S.R.
11840	Hanoi, N. Vietnam
11845	RTF, Paris, France
11845	Karachi, Pak.
11850	Sofia, Bulg.
11850	AIR, Bombay, India
11850	Oslo, Norway ●
11855	Brussels, Belg. ●
11855	Radio Free Europe, Ger.
11855	DZH8, Manila, P.I.
11860	Peking, China
11860	BBC, London, Eng.
11860	Moscow, U.S.S.R.
11865	PRA8, Recife, Braz.
11865	VOA, Tangier, Mor.
11865	HER5, Bern, Switz. ●
11865	Tunis, Tun.
11870	Moscow, U.S.S.R.
11875	ZYN32, Salvador, Braz.
11875	VOA, Colombo, Ceylon
11875	VOA, Tangier, Mor.
11880	BBC, London, Eng.
11880	XEHH, Mexico City, Mex.
11885	Peking, China
11885	Karachi, Pak.
11885	Radio Free Europe, Ger.
11890	Moscow, U.S.S.R.
11895	Dakar, Mali Fed.
11895	VOA, Tangier, Mor.
11895	VOA, Manila, P.I.
11900	Bucharest, Rumania ●
11900	CXA10, Montevideo, Ur.
11900	Moscow, U.S.S.R.
11905	RAI, Rome, Italy ●
11905	WDSI, New York, U.S.A.
11910	BBC, London, Eng.
11910	Budapest, Hung. ●
11910	Bangkok, Thal.
11915	HCJB, Quito Ecua. ●
11915	Hilversum, Neth.
11920	RAI, Paris, France
11920	DXF2, Manila, P.I.
11920	WLWO, Cincinnati, U.S.A.
11925	ZYR78, Sao Paulo, Braz.
11925	HLK6, Seoul, Korea †
11925	Warsaw, Pol.
11925	Moscow, U.S.S.R.
11930	BBC, London, Eng.
11930	BBC, Singapore
11935	Radio Liberty, Ger.
11940	CE1190, Valparaiso, Chile
11940	JOB11, Tokyo, Japan
11945	Peking, China
11945	BBC, London, Eng.
11945	Cologne, Germany ●
11950	Warsaw, Poland
11950	Jidda, Saudi Arab.
11950	Moscow, U.S.S.R.
11955	BBC, London, Eng.
11955	BBC, Singapore
11960	CE1196, Santiago, Ch.
11960	Moscow, U.S.S.R. ●
11965	Radio Liberty, Ger.
11970	Caracas, Ven.
11972	Brazzaville, Equat. Un. ●
11972	Peking, China
11975	Moscow, U.S.S.R. ●
11985	Moscow, U.S.S.R.
11986	ELWA, Monrovia, Lib. ●
11990	Prague, Czecho.
12000	Moscow, U.S.S.R.
12010	Hanoi, N. Vietnam
12020	AIR, Delhi, India
12020	Moscow, U.S.S.R.
12040	BBC, London, Eng.
12050	Cairo, U.A.R.
12095	BBC, London, Eng.
15020	Hanoi, N. Vietnam
15030	Peking, China
15060	Peking, China
15070	BBC, London, Eng.
15085	Grenada, Windward Is., BWI
15095	Peking, China
15100	Lisbon, Port.
15100	Moscow, USSR
15105	ZYZ32, Rio de Jan., Braz.
15105	AIR, Delhi, India
15110	BBC, London, Eng.
15110	Moscow, USSR ●
15115	HCJB, Quito, Ecuador ●
15115	Peking, China
15120	Colombo, Ceylon
15120	RAI, Rome, Italy
15120	Warsaw, Poland †
15120	HVJ, Vatican City
15125	ZYN31, Salvador, Brazil
15125	Prague, Czecho.
15125	Seoul, Korea ●
15125	VOA, Manila, P.I.
15125	Lisbon, Portugal ●
15130	RTF, Paris, France
15130	VOA, Manila, P.I.
15130	KCBR, Delano, Calif.
15130	WBOU, New York, USA
15130	Moscow, USSR
15135	PRB23, Sao Paulo, Braz.
15135	JOB15, Tokyo, Japan
15135	Radio Free Europe, Port.
15140	Peking, China
15140	BBC, London, Eng.
15140	AIR, Delhi, India
15140	Komsomolsk, USSR
15145	ZYK33, Recife, Brazil
15145	Radio Free Europe, Port.
15148	CE1515, Santiago, Chile
15150	Djakarta, Indonesia
15150	Lourenco Marques, Moz.
15150	Lisbon, Portugal
15150	Moscow, USSR ●
15153	OAX4T, Lima, Peru
15155	ZYB9, Sao Paulo, Brazil
15155	Karachi, Pakistan
15155	VOA, Manila, P.I.
15155	WBOU, New York, USA
15155	Moscow, USSR
15160	VLA15, Melbourne, Aus.
15160	RTF, Paris, France
15160	XEWW, Mexico City, Mex.
15160	Ankara, Turkey
15160	Moscow, USSR
15165	ZYN7, Fortaleza, Braz.
15165	Copenhagen, Denmark
15165	Damascus, UAR
15170	Tromso, Norway
15170	OBX4C, Lima, Peru
15170	Radio Free Europe, Port.
15175	Peking, China
15175	Oslo, Norway ●
15180	BBC, London, Eng.
15180	AIR, Delhi, India
15180	Moscow, USSR
15185	VOA, Manila, P.I.
15185	Radio Free Europe, Port.
15185	WDSI, New York, USA
15190	Brazzaville, Congo Rep.
15190	Helsinki, Finland †
15190	Komsomolsk, USSR
15190	Moscow, USSR
15195	Prague, Czecho.
15195	Radio Free Europe, Ger.
15195	Ankara, Turkey
15200	Paradys, South Africa
15200	WDSI, New York, USA
15200	Moscow, USSR
15205	XESC, Mexico City, Mex.
15205	WDSI, New York, USA
15210	VLG15, Melbourne, Aus.
15210	VOA, Manila, P.I.
15210	KCBR, Delano, Cal., USA
15210	Moscow, USSR
15215	Radio Free Europe, Port.
15215	VOA, Okinawa, Ryukyu Is.
15220	Hilversum, Neth. †
15225	Taipei, Taiwan, China
15225	Radio Liberty, Germany
15225	Moscow, USSR
15230	VLH15, Melbourne, Aus.
15230	VOA, Colombo, Ceylon
15230	BBC, London, Eng.
15235	JOB15, Tokyo, Japan
15235	VOA, Tangier, Morocco
15235	Komsomolsk, USSR
15240	VLA15, Melbourne, Aus.
15240	Horby, Sweden
15240	Moscow, USSR
15240	Belgrade, Yugoslavia
15245	ZYE21, Belem, Brazil
15250	VOA, Manila, P.I.
15250	Bucharest, Rumania ●
15250	WLWO, Cincinnati, USA
15255	Radio Free Europe, Port.
15257	FEN, Tokyo, Japan
15260	BBC, London, England
15265	Colombo, Ceylon
15265	Moscow, USSR
15270	Peking, China ●
15270	AIR, Bombay, India
15270	VOA, Tangier, Morocco
15270	WBOU, New York, (VOA)
15270	WDSI, New York, USA
15275	Cologne, Germany
15275	Karachi, Pakistan
15275	VOA, Manila, P.I.
15275	Warsaw, Poland ● †
15280	ZL4, Wellington, N.Z.
15280	Moscow, USSR
15285	Brussels, Belgium
15285	Prague, Czecho.
15285	AIR, Bombay, India
15285	WBOU, New York, USA
15290	LRU, Buenos Aires, Arg.
15290	Peking, China
15290	KCBR, Delano, Cal., USA
15290	WLWO, Cincinnati, USA
15295	Rio de Janeiro, Brazil
15295	RTF, Paris, France
15295	VOA, Tangier, Morocco
15295	Moscow, USSR ●
15300	BBC, London, Eng. †
15300	DZH9, Manila, P.I.
15305	Dacca, Pakistan
15305	Moscow, USSR
15310	BBC, London, England ●
15310	BBC, Singapore
15310	KCBR, Delano, Cal., USA
15315	VLC15, Melbourne, Aus.
15315	Peking, China
15315	HEU6, Bern, Switz. ●
15315	Moscow, USSR
15320	VLC15, Melbourne, Aus.
15320	AIR, Delhi, India

Kcs.	Call and Location
15320	VOA, Tangier, Morocco
15325	ZYR228, Sao Paulo, Braz.
15325	RAI, Rome, Italy
15325	JOB15, Tokyo, Japan ●
15330	VOA, Munich, Germany
15330	VOC, Salonika, Greece
15330	WBOU, New York, USA
15330	WGEO, Schenectady, USA
15335	Brussels, Belgium †
15335	ZYU68, Porto Alegre, Braz.
15335	Karachi, Pakistan
15335	VOA, Manila, P.I.
15335	Komsomolsk, USSR
15340	Radio Liberty, Germany
15340	Moscow, USSR
15345	LRA, Buenos Aires, Arg.
15345	Taipei, Taiwan, China
15345	Athens, Greece
15345	Rabat, Morocco
15350	RTF, Paris, France
15350	WLWO, Cincinnati, USA
15355	Radio Free Europe, Port.
15360	BBC, London, England
15360	Moscow, USSR
15365	WLWO, Cincinnati, Ohio
15370	ZYC9, Rio de Jan., Braz.
15370	Radio Liberty, Germany
15375	BBC, London, Eng.
15375	Cologne, Germany †
15380	VOA, Tangier, Morocco
15380	VOA, Okinawa, Ryukyu Is.
15380	WRUL, Boston, USA
15385	DZF3, Manila, P.I.
15385	CXA60, Montevideo, Urug.
15385	Moscow, USSR
15390	BBC, London, Eng.
15390	Moscow, USSR
15395	Radio Liberty, Germany
15400	RTF, Paris, France
15400	RAI, Rome, Italy
15405	Cologne, Germany
15405	Moscow, USSR
15407	Paramaribo, Surinam
15410	Prague, Czecho. ●
15410	Radio Liberty, Germany
15410	VOA, Tangier, Morocco
15415	AFRS, Munich, Germany
15415	Budapest, Hungary ●
15417	Peking, China
15417	BBC, London, Eng.
15420	Brazzaville, Congo Rep.
15420	Madrid, Spain
15420	Moscow, USSR
15425	VLX15, Perth, Aus.
15425	Hilversum, Neth.
15430	Peking, China ●
15430	Cairo, UAR
15430	Moscow, USSR
15435	BBC, London, Eng.
15435	BBC, Singapore
15440	VOA, Munich, Germany
15440	Moscow, USSR
15445	Brazzaville, Congo Rep.
15445	Hilversum, Neth.
15447	BBC, London, Eng.
15450	Komsomolsk, USSR
15465	Paramaribo, Surinam
15470	Moscow, USSR
15475	Cairo, UAR

Kcs.	Call and Location
15480	Peking, China
15480	AIR, Delhi, India
15520	Peking, China
15555	Peking, China
15610	Peking, China
17605	Peking, China
17675	Peking, China
17690	Cairo, UAR
17695	BBC, London, Eng.
17700	BBC, London, Eng.
17700	Moscow, USSR
17705	AIR, Delhi, India
17705	VOA, Tangier, Morocco
17710	VLG17, Melbourne, Aus.
17710	WLWO, Cincinnati, USA
17710	Moscow, USSR
17715	BBC, London, Eng. ●
17715	VOA, Colombo, Ceylon
17720	Peking, China ●
17720	Brazzaville, Congo Rep.
17720	Radio Liberty, Germany
17720	Moscow, USSR
17722	San Jose dos Campos, Braz.
17725	Radio Free Europe, Port.
17725	AIR, Delhi, India
17730	BBC, London, Eng.
17730	Radio Liberty, Germany
17735	Radio Free Europe, Port.
17735	KCBR, Delano, Calif.
17735	HVJ, Vatican City
17740	WLWO, Cincinnati, USA
17740	BBC, London, Eng.
17740	Moscow, USSR
17745	BBC, London, Eng.
17745	Karachi, Pakistan
17745	VOA, Manila, P.I.
17747	Peking, China ●
17750	WRUL, Boston, USA
17750	VOA, Tangier, Morocco
17750	Moscow, USSR
17755	Prague, Czecho.
17755	BBC, Singapore
17760	WGEO, Schenectady, USA
17760	AIR, Delhi, India
17760	Moscow, USSR
17765	RTF, Paris, France
17765	Peking, China ●
17770	RAI, Rome, Italy
17770	Radio Free Europe, Port.
17770	KCBR, Delano, Cal., USA
17773	Athens, Greece
17775	Hilversum, Neth.
17780	WBOU, New York, USA
17780	VOA, Manila, P.I.
17780	Moscow, USSR
17785	HER7, Berne, Switz.
17785	AIR, Delhi, India
17788	Taipei, Formosa, China
17790	BBC, London, Eng.
17790	Prague, Czecho.
17790	AIR, Delhi, India
17795	KGEI, San Fran., USA
17795	WLWO, Cincinnati, USA
17795	Moscow, USSR
17795	CR6RZ, Luanda, Angola
17800	Helsinki, Finland †
17800	RAI, Rome, Italy
17800	Warsaw, Poland †

Kcs.	Call and Location
17805	Radio Free Europe, Port.
17805	DZI6, Manila, P.I.
17810	BBC, London, Eng. †
17810	AIR, Delhi, India
17810	Hilversum, Neth.
17810	Moscow, USSR
17815	Prague, Czecho.
17815	Cologne, Germany
17815	KCBR, Delano, Calif.
17815	Moscow, USSR †
17820	ZLI4, Wellington, N.Z.
17823	Ankara, Turkey
17825	JOAI7, Tokyo, Japan ●
17825	Oslo, Norway
17825	Moscow, USSR
17830	AIR, Delhi, India
17830	WDSI, New York (VOA)
17830	WLWO, Cincinnati, USA
17835	Radio Free Europe, Port.
17840	VLB17, Melbourne, Aus.
17840	Horby, Sweden †
17840	Moscow, USSR
17840	HVJ, Vatican City
17845	Brussels, Belgium
17845	Cologne, Germany
17845	WRUL, Boston, USA
17850	RTF, Paris, France
17850	Moscow, USSR
17855	VOA, Tangier, Morocco
17855	JOAI7, Tokyo, Japan ●
17855	Radio Free Europe, Port.
17860	Brussels, Belgium
17860	BBC, London, Eng.
17860	Damascus, UAR
17865	Radio Liberty, Germany
17870	BBC, London, Eng.
17870	WLWO, Cincinnati, USA
17875	PRL2, Rio de Jan., Braz.
17875	Cologne, Germany
17875	Radio Free Europe, Port.
17880	Lisbon, Portugal
17880	Tunis, Tunisia
17880	Komsomolsk, USSR ●
17880	Moscow, USSR
17885	Radio Free Europe, Port.
17888	Taipei, Formosa, China
17890	HCJB, Quito, Ecuador
17890	BBC, London, Eng.
17890	HLK42, Seoul, Korea ●
17892	Voice of Free Africa
17895	Lisbon, Port.
17895	Moscow, USSR
17900	Peking, China
17920	Cairo, UAR
18080	BBC, London, Eng.
21450	Prague, Czecho.
21455	VOA, Tangier, Morocco
21460	KCBR, Delano, Calif.
21460	WRUL, Boston, USA
21470	BBC, London, Eng.
21480	Hilversum, Neth.
21485	Radio Free Europe, Port.
21485	WLWO, Cincinnati, USA
21490	BBC, London, Eng.
21490	Cologne, Germany
21495	Lisbon, Port.
21495	DZI8, Manila, P.I.
21500	Brazzaville, Congo Rep.
21505	WDSI, New York, USA

Kcs.	Call and Location
21505	Moscow, USSR
21510	Brussels, Belgium
21515	HVJ, Vatican City
21520	HER8, Berne, Switz.
21525	Moscow, USSR
21530	BBC, London, Eng.
21535	ELWA, Monrovia, Liberia ●
21540	VLD21, Melbourne, Aus.
21540	WBOU, New York, USA
21550	BBC, London, Eng.
21550	Moscow, USSA
21560	RAI, Rome, Italy
21565	Hilversum, Neth.
21570	WBOU New York (VOA)
21575	Moscow, USSR
21580	RTF, Paris, France
21590	Karachi, Pakistan
21590	WGEO, Schenectady, USA
21600	VLG21, Melbourne, Aus.
21600	Radio Free Europe, Port.
21605	AIR, Delhi, India
21605	HEI9, Berne, Switz.
21610	WLWO Cincinnati (VOA)
21615	BBC, London, Eng.
21620	RTF, Paris, France
21620	AIR, Delhi, India
21620	JOB21, Tokyo, Japan
21625	Moscow, USSR
21630	BBC, London, Eng.
21640	BBC, London, Eng.
21650	Cologne, Germany
21650	AIR, Delhi, India
21650	WDSI, New York, USA
21655	VOA, Manila, P.I.
21660	BBC, London, Eng.
21665	Radio Free Europe, Port.
21670	Oslo, Norway
21675	BBC, London, Eng.
21680	VLC21, Melbourne, Aus.
21685	Dacca, Pakistan
21690	WDSI, New York, USA
21700	AIR, Delhi, India
21700	Lisbon, Port.
21705	VOA, Tangier, Morocco
21710	BBC, London, Eng.
21720	Radio Free Europe, Port.
21730	Brussels, Belgium
21735	Cologne, Germany
21735	WLWO, Cincinnati, USA
21740	BBC, London, Eng.
21740	KCBR, Delano, Cal., USA
21745	Radio Free Europe, Port.
25610	Hilversum, Neth.
25630	KCBR, Delano, Cal., USA
25650	BBC, London, Eng.
25670	BBC, London, Eng.
25720	BBC, London, Eng.
25735	VLY25, Melbourne, Aus.
25750	BBC, London, Eng.
25800	Paradys, S. Afr.
25840	BBC, London, Eng.
25880	VOA, Tangier, Morocco
25900	Oslo, Norway
25920	BBC, London, Eng.
26040	WBOU, New York, USA
25950	WBOU, New York, USA
26080	BBC, London, Eng.

Canadian Short-Wave—Domestic and International

*Transmitter at Sackville, New Brunswick

Kc.	C.L.	Location
5970	CBNX	St. John's, Nfld.
5970	CKNA	Montreal, Que.*
5990	CHAY	Montreal, Que.*
6005	CFCX	Montreal, Que.
6010	CJCX	Sydney, N.S.
6030	CFVP	Calgary, Alta.
6060	CKRZ	Montreal, Que.*
6070	CFRX	Toronto, Ont.
6080	CKFX	Vancouver, B.C.
6090	CBFW	Montreal, Que.
6090	CKOB	Montreal, Que.*

Kc.	C.L.	Location
6130	CHNX	Halifax, N.S.
6160	CBUX	Vancouver, B.C.
6160	CHAC	Montreal, Que.*
9520	CBFR	Montreal, Que.
9585	CKLP	Montreal, Que.*
9610	CBFX	Montreal, Que.
9610	CHLS	Montreal, Que.*
9630	CBFO	Montreal, Que.
9630	CKLO	Montreal, Que.*
9710	CHLR	Montreal, Que.*
9740	CHFO	Montreal, Que.*

Kc.	C.L.	Location
11705	CBFY	Montreal, Que.
11705	CKXA	Montreal, Que.*
11720	CBFL	Montreal, Que.
11720	CHOL	Montreal, Que.*
11760	CBFA	Montreal, Que.
11760	CKRA	Montreal, Que.*
11900	CKEX	Montreal, Que.*
11945	CKEX	Montreal, Que.*
15090	CKLX	Montreal, Que.*
15105	CKUS	Montreal, Que.*
15190	CBFZ	Montreal, Que.

Kc.	C.L.	Location
15190	CKCX	Montreal, Que.*
15255	CKSR	Montreal, Que.*
15275	CKBR	Montreal, Que.*
15320	CKCS	Montreal, Que.*
17710	CHSB	Montreal, Que.*
17735	CHRX	Montreal, Que.*
17820	CKNC	Montreal, Que.*
17865	CHYS	Montreal, Que.*
21600	CKRP	Montreal, Que.*
21710	CHLA	Montreal, Que.*

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"Now in charge of sound effects for CBC. NRI opened doors to greater opportunity for me." F. TUDOR, Toronto, Ontario.

"Averaged $150 a month spare time before I graduated. Now have my own full time business." F. W. COX, Hollywood, Cal.

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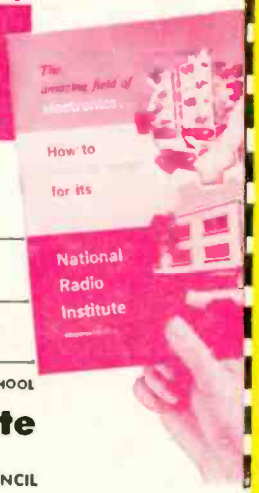

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