

the choice of TUNING, STANDBY, PHONE, and C.W. operation. The EXCITATION CONTROL is a variable capacitor in the plate circuit of the 6AU6 oscillator, and is adjusted for proper drive at the final grid. The DRIVER CONTROL tunes the plate tank circuit of the driver, and is adjusted with the meter in the GRID position. Both the driver and the final, incidentally, are neutralized.

High voltage (about 650 volts) for the transmitter is supplied by a husky power supply using a 5U4-GB rectifier through a single-section filter which has 40 $\mu\text{f.}$ of capacitance and a 5-henry choke. Fuses are in the power plug. Power consumption of the transmitter is about 115 watts in the standby position and 250 watts when on c.w. — R. L. B

The Deluxe LW-51 50-Mc. Transmitter

HERE is a 50-watt 50-Mc. transmitter, complete with audio equipment and full metering facilities, in a package 5 by 6 by 9 inches in size. Circuitwise and in appearance it bears a family resemblance to earlier LW v.h.f. transmitters, but several new features have been added. Two models are available. One is assembled on a chassis only; the other, a deluxe version, is housed in a case of perforated metal. The latter has all its controls brought out to the front panel and includes metering of the various stages, the r.f. output and the modulation percentage.

A 6U8 overtone oscillator-doubler drives a 6146 amplifier, in a circuit quite similar to that employed in the simple 50-Mc. transmitter in the 1959 *Handbook*. The modulator uses a 6U8 speech amplifier, with provision for crystal or carbon microphone, driving a pair of 6CZ5s as modulators. The LW-72 power supply, a similarly packaged unit, delivers 225 or 450 volts, selectable with a front-panel switch, allowing the transmitter to be run conveniently on low power whenever the maximum capability of 50 watts input is not needed. Any other power supply capable of delivering 450 volts at 250 ma. may be used, provided that a simple voltage divider system consisting of two 0A2 regulator tubes and a 3000-ohm 10-watt resistor is added. The equipment may also be run from a single 300-volt 150-ma. supply for mobile or low-power home-station service.

An appearance of extreme simplicity is achieved in the LW r.f. units through the use of wafer sockets. All socket lugs that are to be grounded are soldered directly to the cadmium-plated chassis, a procedure that also pays dividends in stability, through the elimination of r.f. ground leads.

Connection between the r.f. assembly and the power supply is made through a cable with 8-pin

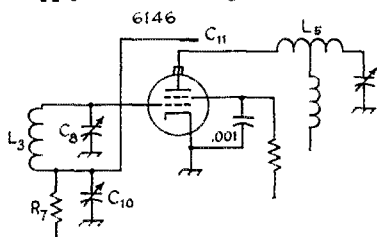
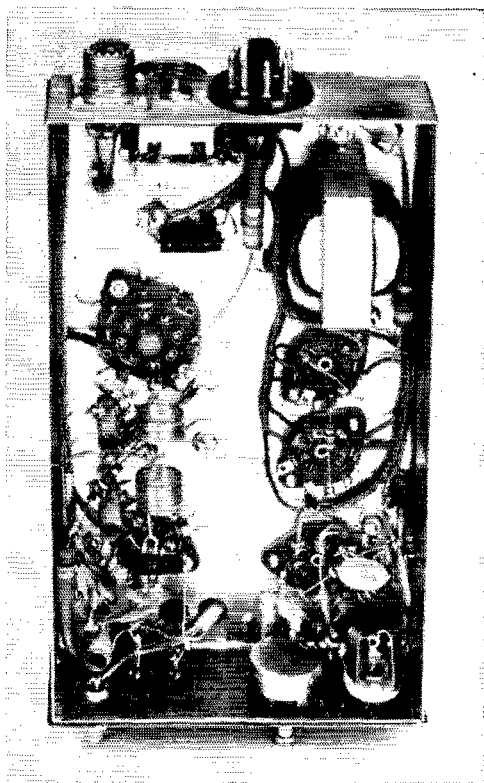


Fig. 1—Basic amplifier circuit of the LW-51 50-Mc. transmitter, showing the neutralizing system used. Designations are those of the manufacturer. A high-capacitance mica padder, C_{10} , is used in place of the usual fixed capacitor.



Bottom view of the deluxe LW-51. Doubler plate and amplifier grid coils are near the lower middle of the photograph. Note use of wafer sockets for effective grounding and wiring simplicity.

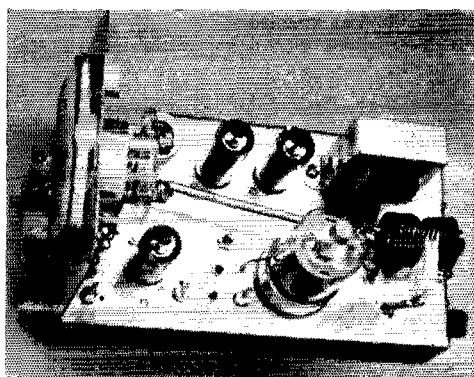
plugs and chassis fittings. The amplifier may be keyed for c.w. work by inserting a keying adapter between the transmitter and the power cable. Keying should be done with a relay, as the screen circuit is broken, and the high voltage appears across the contacts.

The method of neutralizing the 6146 amplifier may be of interest to those who have had trouble tuning tetrodes at 50 Mc. The circuit is shown in Fig. 1. It will be seen that it is a variation of the familiar capacity-bridge system, in that both capacitive elements are variable. C_{11} is merely a stiff wire lead brought up through the chassis and run vertically for about a half inch, close to the envelope of the 6146. C_{10} is a high-capacitance mica padder, adjustable from either the bottom

or top of the chassis. Making the larger of the two capacitors in the bridge system variable gives a smooth control over the feedback introduced for neutralization. The method more commonly employed is to use a fixed capacitor for C_{10} , usually about 250 μf . at 50 Mc., and then adjust the neutralizing capacitance. As the range with a neutralizing wire or other small capacitance is very limited, it is often necessary to do some cut-and-try work with the value of the bypass (C_{10}) when a fixed capacitor is used there.

The LW-51 50-Mc. transmitter is sold in kit form or completely wired and tested, and it may be purchased with or without tubes and crystal. The companion power supply, LW-72, is also sold in kit form or ready for use. Chassis soldering is done in all LW kits. LW Electronic Laboratory, Route 2, Jackson, Mich.

— E. P. T.



The deluxe LW-51 50-Mc. transmitter with cover removed. Audio tubes appear in the upper portion of the picture.

Sound-N-Sight Code Course

FOR many years the radiotelegraph code has been taught by means of a system which is described in the ARRL publication *Learning the Radiotelegraph Code*. Basically, this system calls for the student to learn that a given sound represents a certain letter. For example, "di dah" is the letter "a". At no point in this method of training is one supposed to memorize the notation "dot dash". This system calls for the student to learn the sounds that represent the different letters of the alphabet, and the numbers, and then practice copying these sounds at gradually increasing speeds.

A new course published by the John F. Rider Company and called "Sound-N-Sight" goes at this task of learning the code in a rather different method. The procedure is this. The student first listens to some records which transmit various code characters. Three seconds after each character is sent a voice announces the verbal equivalent, as "didididit." This is aimed at helping the student distinguish between a dit and a dah, and may even weed out those who are unable to make such a distinction. Following this, the student puts the records aside and picks up a set of flash cards. This part of the course is really unique. Each flash card carries a letter of the alphabet on one side and its dot-dash equivalent on the other. Thus, on one side of the first card is the capital letter A; and . — is on the other side. After shuffling the cards, the student (who up to this point is not supposed to have any idea of what dot-dash combinations stand for what letters) looks at the dot-dash side of each card and *guesses* what letter it might represent. Having guessed, he turns the card over and determines whether his guess is correct. If it is, the card goes in one pile; if not, into another pile. And so on through the entire alphabet. (The same procedure is subsequently followed for numerals and punctuation marks, but we'll restrict our description of this

course to the alphabet portion.) Then, the cards are gone through again and again until all are "guessed" correctly in a single run. The theory apparently is that as the student looks at each card after he has guessed what letter its symbols represent, learning takes place. According to the publisher, this is "reinforced learning."

So the student has listened to dits and dahs and has learned to distinguish between them, and then he has learned what the printed dot and dash equivalent for each symbol is. Now he goes back to the records and listens. A code character is sent at a slow speed, and three seconds later the announcer gives the dit-dah equivalent and the phonetic name of the letter. (The new military phonetic alphabet is used, so that R comes out Romeo.) After the student is able to go through this a couple of times without error, he begins copying from the records at three w.p.m. The announcer no longer speaks; instead, after each run of 80 characters the student checks back in the instruction manual and corrects his own copy. Again, after the student is able to go through each run with only a couple of errors, he is told to proceed to the next higher speed. However, speed jumps are in multiples of one w.p.m., and the student is cautioned against increasing speed more than once per day. This is said to do away with the learning plateaus that most of us have experienced in learning the code. The Sound-N-Sight course comes in two parts. The Novice portion takes the student up to 8 w.p.m., while the Advanced portion goes on up to 20 w.p.m. It is manufactured for use on 33 r.p.m. turntables, but can also be used on 45 r.p.m. tables with a corresponding increase in speed.

The Sound-N-Sight course, in an expanded version, has also been tried out by the Army's Signal Corps, and faster learning has been reported. It will be interesting to see what the experience of would-be amateurs is.

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