HUGO GERNSBACK, *Editor*

RADIO CRAFT

RADIO — ELECTRONICS

ELECTRONIC KISSMETER

SEE ELECTRONICS SECTION

SEPT
1948

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U. S. and

RADIO-ELECTRONICS IN ALL ITS PHASES

COVER FEATURE

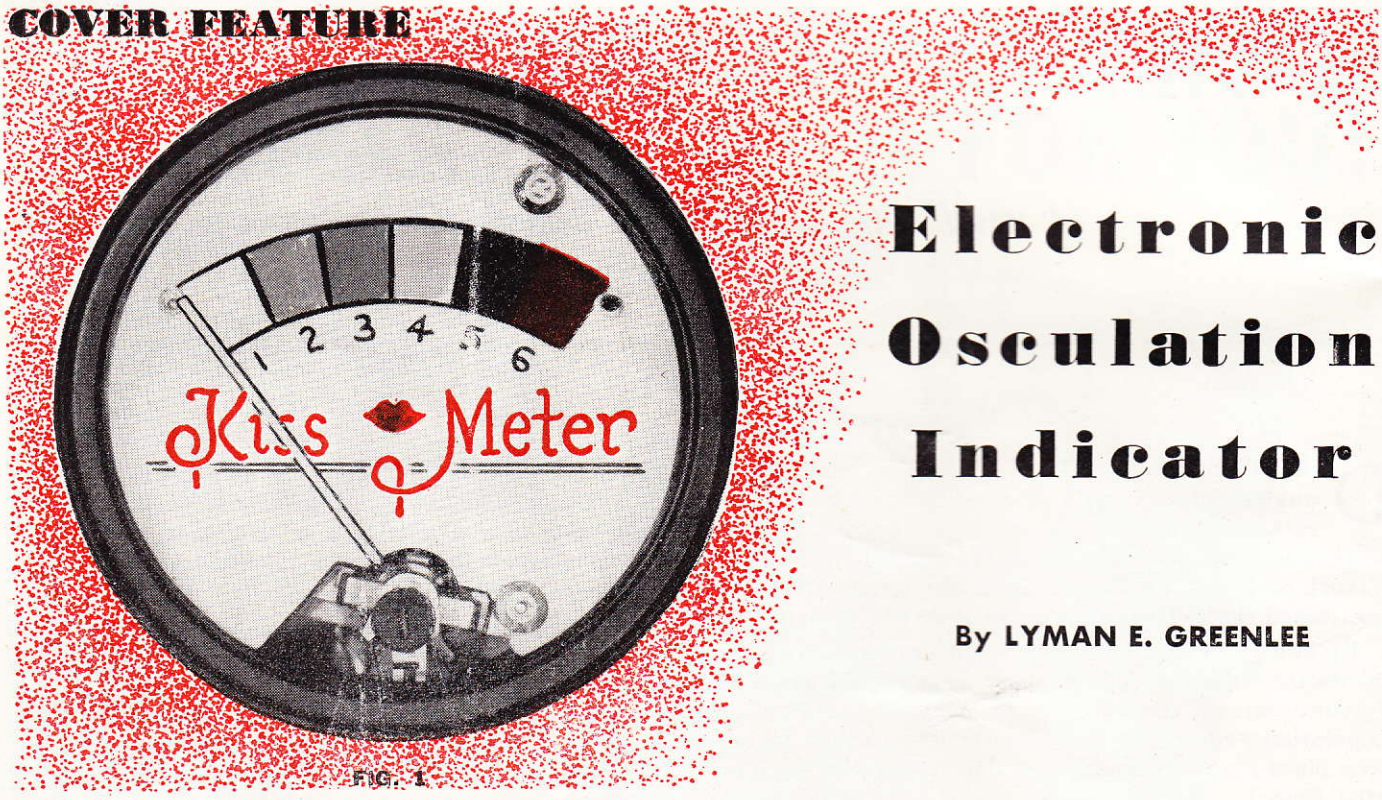


FIG. 1

Electronic Osculation Indicator

By LYMAN E. GREENLEE

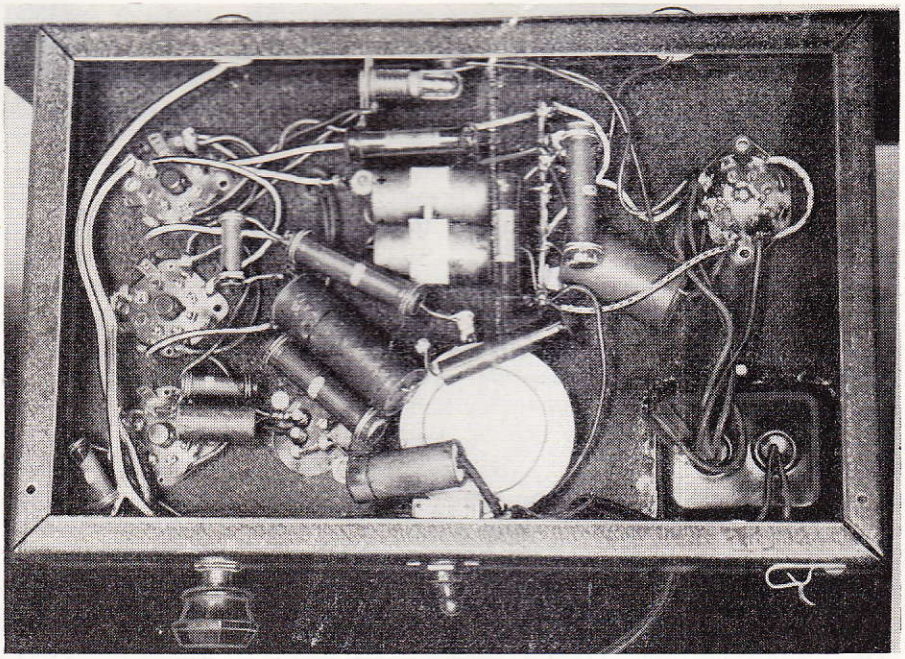
THE Kiss Meter is a scientific instrument designed to measure oscillation reaction. With it you can tell whether blondes have more resistance than brunettes or redheads. An adept Lothario can probably find this out without the aids of science, but the meter gives us a good insight into biological electronics.

The meter measures the a.c. impedance of the human body at a frequency of about 400 cycles. Two electrodes formed of spring brass or copper are shaped to fit the wrists of the two persons undergoing the test. The electrodes are connected to the meter terminals. The applied a.c. voltage is very small, and this reduces the possibility of a disagreeable shock to the experimenters. Actually there is little or no sensation to be felt, although a very sensitive person will usually imagine that there is a slight tingling effect. A vacuum-tube voltmeter is required for adequate sensitivity. A balanced bridge circuit was chosen to insure stability.

A large cabinet happened to be on hand. Its use makes the instrument look impressive, but there would be plenty of room in a smaller case. As Fig. 2 indicates two 6J5's are used in a bridge circuit with a 0-200 or 0-500 microammeter to form a stable, highly sensitive vacuum-tube voltmeter. If a 0-500-μa meter is used, the 1,500-ohm shunt will not be needed. A special scale (shown in Fig. 1) was drawn for the meter on white bristol board and colored to represent six degrees of osculatory intensity: 1 white, 2 blue, 3 green, 4 yellow, 5 orange, and 6 red. This covers the whole emotional range from "frigid" to "torrid."

A third 6J5 is used to generate the 400-cycle current for making the impedance measurements. A small push-pull output transformer was used, with the 6J5 cathode connected to the center tap of the secondary. No capacitor was necessary across the secondary winding with the particular transformer used, but some transformers may require about .005 μf. The output is taken from the voice-coil winding. This keeps the voltage low enough so that little or no shock can be felt. Some transformers may not work successfully in this circuit. In case of difficulty try another transformer.

The power supply uses a 7Y4 connected as a half-wave rectifier and a small power transformer from a midget radio. If a center-tapped transformer is used, half the secondary winding may be disregarded. Since there was no separate filament winding for the rectifier on the power transformer used in the model, all the tubes were operated from the same 6.3-volt secondary; but, if a separate winding is available for the rectifier, it should be used to avoid excessive voltage between heaters and cathodes of the other tubes. Note that the output from the power supply is con-



Under-chassis view of the Kiss Meter. Sensitivity control is at back, zero on chassis.

BIOLOGICAL ELECTRONICS — By HUGO GERNSBACK

WHEN the accompanying article by Mr. Greenlee was first received, it was thought that its publication might strike some individuals as too fanciful. But, biological electronics being something rather new, I believe it deserves a great deal more publicity. There is much to be learned about the effect of disease on the human anatomy, and it is quite possible that in the future we may investigate many diseases and illnesses by means of electronics.

Karl Friedrich Burdach, German physiologist and biologist, probably was the first scientist to investigate human osculation. He defined it as a "Galvanic contact between a positively and negatively electrified body: it increases sexual polarity and permeates the entire body."

Since this early pronouncement, nearly 100 years ago, other scientists have preoccupied themselves with the subject, particularly on the basis of sexual selection. The propagation of the human race depends upon many factors; and many of our senses are involved in this selection, be they visual, oral, or tactile. Osculation is one of these, and up to now it has not been investigated too seriously.

Dr. G. W. Crile has demonstrated that the human life stream is continuously discharging electrical potential. It is a fact that many parts of the human animal are actively affected by *galvanotropism*—response of living things to electric stimuli.

It has been shown experimentally that during the act of kissing there is an actual exchange of electrical potential as well. Although only a weak current, it exists nevertheless.

Some years ago the writer did some research work along these lines and the following were noted:

To begin with, lips are covered with a mucoid membranous skin. This very sensitive skin is subject to many and varied influences. In different individuals and in different races, for instance, the thickness varies a great deal. Speaking generally, the male lip has somewhat thicker skin than the female. Age changes the thickness and consistency of this skin a great deal. Repeated measurements with an electrical potential have shown that the electrical response of the lip skin varies over a wide range. Thus, as might be expected, pressure affects the resistance. So does lipstick, which sometimes increases the electrical resistance, depending on the type used.

Moisture, of course, lowers the resistance a great deal, the degree depending upon the nature of the moisture. If the lips are moistened with the tongue, the resistance varies greatly with the state of health of the individual as well as with what foods had been ingested. Thus, for instance, the lip response of an individual was measured before and after drinking lemonade. After drinking this acidulous liquid, the resistance of the lip skin fell almost to the lowest point.

It was also found that emotions greatly affect electrical resistance of the human lip skin. Thus, fright —as is well known—dries up mucoid skin, and under this influence the resistance went up enormously. We all know from experience that during great emotional stress, such as fright, shock, etc., most individuals automatically lick their parched lips, which have become almost completely dry with an accompanying increase of electrical resistance.

nected to a voltage divider to supply about 150 volts positive plate potential, and 80 volts negative bias. No filter, other than the single 8-μf electrolytic capacitor and the two 2-μf electrolytics, is required. Larger capacitors can be used, but they are not necessary.

A 1-megohm potentiometer shunted with a 250,000-ohm resistor controls the input sensitivity, but a 200,000-ohm potentiometer may be used without the resistor. The 5,000-ohm zero-adjustment potentiometer should be wire-wound.

Fig. 2 shows two .005-μf capacitors connected across the input of the power transformer and grounded to the chassis. A single .005-μf capacitor connected directly across the line may also be tried. The meter is very sensitive and has a tendency to respond to any 60-cycle a.c. voltage introduced between the chassis and either side of the power line. In some cases it may be necessary to reverse the a.c. line plug or have the users stand on rubber matting.

The photographs show the wiring and placement of parts. The correct voltages at various points in the circuit are indicated in Fig. 2. These voltages were all measured from chassis using a 1,000-ohms-per-volt meter. If correct voltages do not appear, vary the resistors in the voltage-divider circuit until voltages are correct. It may be necessary to insert an additional resistor in series with the 20,000-ohm bleeder to cut the plate voltage at this point to 150.

The two controls that require adjustment are mounted, one at the rear and one on the top of the chassis, to prevent tampering with the calibration. The 5,000-ohm potentiometer is used to adjust the zero point of the meter with the arm electrodes disconnected. The 1-megohm potentiometer is used to set the sensitivity so that the meter reads full-scale with the arm electrodes shorted together. These are the only two adjustments required and they will rarely need to be altered, as the instrument is very stable in operation.

To insure adequate contact with the experimenter's wrist, it is a good idea to dampen the spring contactors with a little salt water. Small wads of cotton soaked with salt water or vinegar can be inserted between wrist and wristbands for better contact, if necessary.

The instrument was constructed for a specialized purpose, but the circuit might find much wider use. It is an a.c. impedance meter, which could easily be used to check inductors and capacitors, resistors, etc. For such purposes a multi-scale instrument would perhaps be desirable. The author has not tried to adapt the instrument to the service bench, but the idea is attractive.

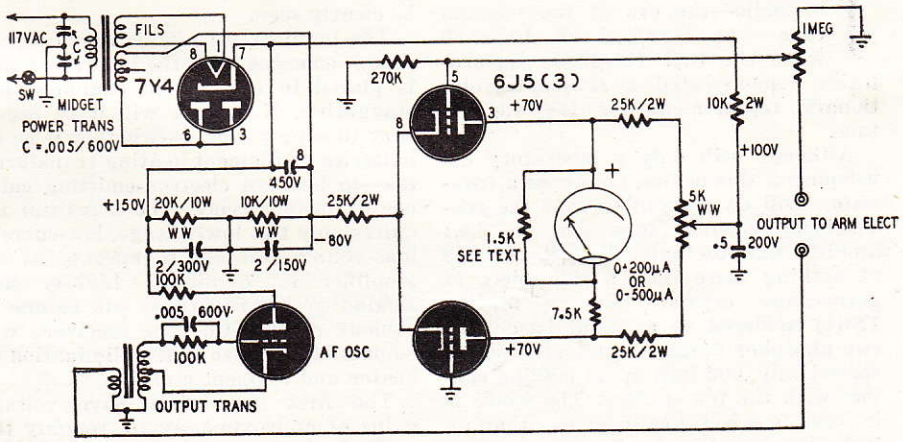
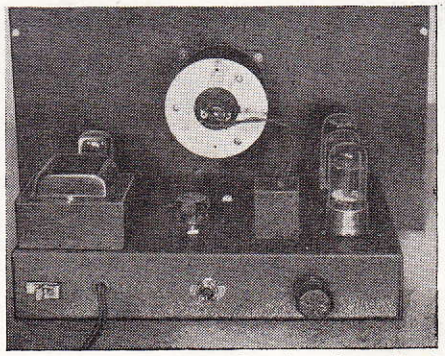


Fig. 2—Schematic. With some transformers, the oscillator plate may need bypassing to ground.



The chassis is much smaller than the cabinet.