

Ideal Beam Power AMPLIFIER

By I. A. Mitchell

Part Two

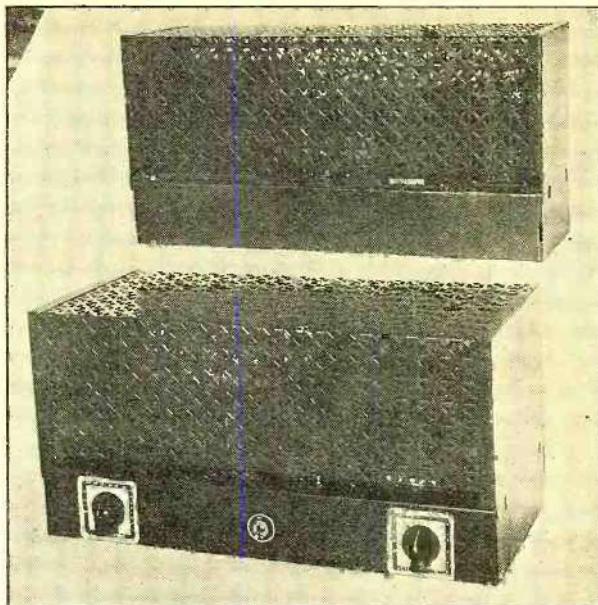
THERE are many applications in P.A. and home-amplifier operation where tone equalization is very desirable. Acoustic conditions may require an increase in highs or lows. Frequently, amplifiers of this type are used with microphones or loudspeakers which are deficient in highs or lows. To take care of such contingencies, the first audio transformer used in this amplifier includes a self-contained equalization circuit which is brought out to a control on the chassis which is calibrated directly in db. With the control rotated to the left, both low and high frequencies are raised simultaneously. With the control rotated to the right, low frequencies alone are increased. Figure 8 illustrates typical frequency curves that are obtainable with this amplifier. When the equalization is set

at the zero point, the overall response is fairly uniform from 60 to 10,000 cycles.

Circuit Modifications

As mentioned before, this amplifier is suitable for operation with either self or fixed bias. Figure 1, shown last month, illustrates the normal self-bias operation. Where fixed bias is used, the power is increased from 35 to 55 watts. The output transformer must be changed to a larger unit as shown in Figure 2a in the preceding article. The bias resistor is removed, the cathodes are grounded and a 22½ volt C battery is inserted to apply bias to the grid circuits. A mounting bracket

is provided for this C battery underneath the audio deck. For mobile service, it is desirable that a minimum of plate power be taken. In this operating condition, the C battery is used again to permit the use of the full generator output for plate supply. Operating in this manner, a power output of 20

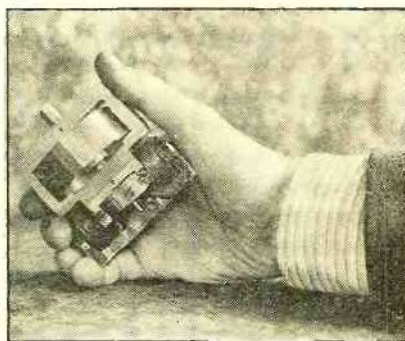


Synchronous MOTOR for Television

By Frederick Siemens

A NEW midget motor, which automatically synchronizes optical-mechanical television receivers to all transmissions, whether they are intended for mechanical or cathode-ray use, has just been designed by William Hoyt Peck, president and chief engineer of the Peck Television Corporation. It is driven by an amplified component of the signal radiated by the station broadcasting, its speed being governed by the number of impulses (picture elements per image, multiplied by the number of frames) per second, much as an electric clock motor is kept at constant speed by the usual 60-cycle house current.

The incoming signal is put through the usual tuning, intermediate and detection circuits, and then is fed into two audio amplifiers. One of these feeds the light-modulator cell, which controls the brilliance of the beam which scans the screen.

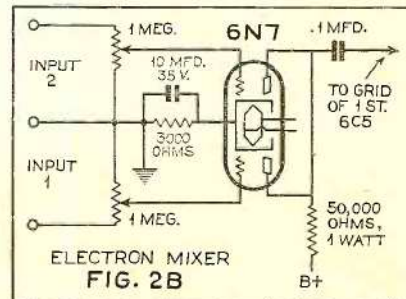


The second operates a relay tube, the output of which is connected directly to the fields of the motor. In tests at the Peck laboratories, the motor has been synchronized at speeds ranging from 300 to 2800 revolutions-per-minute.

Using oil-less bearings, which require no attention over a period of years, the motor is claimed to be entirely trouble free. It employs no brushes, working entirely upon an induction principle. The power developed is approximately 1/100 horsepower, more than ample to drive a 2-inch disc, weighing 1¾ ounces, with which scanning is accomplished.

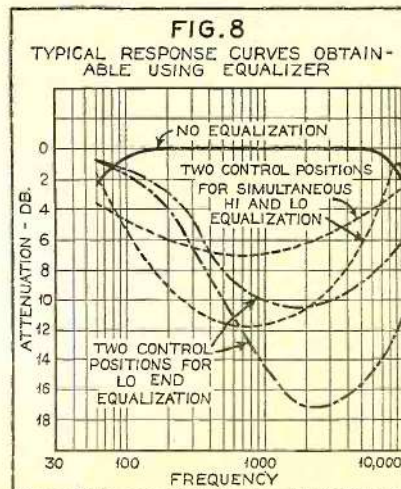
The new motor was designed primarily for use in the 180-line, 24-frame transmission and reception equipment which Mr. Peck is now using in the Toronto area. It was refined so that receivers equipped with the Peck optical-mechanical system will automatically synchronize with any other transmitters that may be on the air, for the motor will enable the reception of all scanning frequencies from 45 lines to 503

(Turn to page 253)



watts can be obtained using a 350 volt, 100 ma. genemotor.

With the increased use of high-impedance microphones such as the crystal microphone and the ribbon microphone with self-contained transformer, there are frequent (Turn to page 256)



A New Service Contest

WITH this issue, RADIO NEWS announces another popular servicemen's prize contest with five cash prizes of \$10, \$5, \$4, \$3 and \$2 for good photographs of service activities accompanied with full details. Other illustrative material, such as clever advertisements, sales literature, etc., may be entered. The subject matter may be your Service Bench, a novel Window or Counter Display, a Sales Campaign, Publicity Stunt, a successful P. A. Set-up, etc. All material used, other than that of prize-winning caliber, will be paid for at our usual rates. Prize winners will be announced in the November issue. Send your contribution to—

Yours for better servicing,
THE CONTEST EDITOR.

the capacity of the fixed padding condenser, employed in the oscillator circuit. The only remedy is replacement with an identical capacity secured from the United Motors Service, as the capacity value is critical, and is not easily duplicated among the common range of condenser values on the open market."

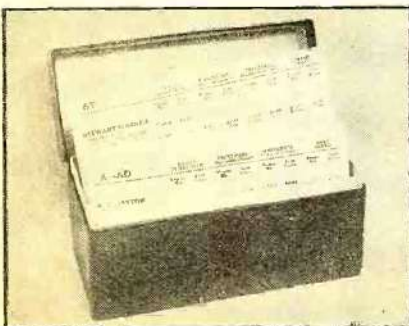
Stewart Warner Auto Radio

"A late model, installed on a Ford, 1935, VS. The complaint was severe motor noise, and several other radio repair shops had given up in disgust. We found that by shielding the wire from the dial to the set, and grounding the shield, that the motor noise was practically eliminated. The interference could be noticed only with the volume full on and between stations."—J. O. Roberts, Roberts Radio Service, St. Louis, Mich.

While on the matter of automobile radio it might be well to point out that the new auto-pole type of antenna is the solution to many of the serviceman's problems with such sets. These serials can be almost instantly mounted on the rear bumper bracket of any car. Extended they provide up to eight feet of vertical antenna, which means effective height and which in turn means taking advantage of "microvolts-per-meter." Mounted far aft of the motor, there is less pick-up of ignition interference which still further increases the signal-to-noise ratio. Operated with a transmission line or shielded lead-in and properly designed transformers, at both antenna and set terminals, a highly efficient noise-reduction antenna system can be had.

There are thousands of auto-radio owners who are not satisfied with the purely local reception from a few stations to which they are limited by the older types of antenna systems in modern cars. This

STANCOR FILE BOX



means profits to the serviceman who will circularize such potential customers with the promise of improved auto radio reception.

About the only sales resistance encountered has been an objection to the appearance of the rod antenna. However, this has been largely overcome by chromium plating and a psychological revision as a result of their common use during the last three months. Telescoped, such auto poles extend about two feet above the rear bumper.

Zelton

"I replaced an 80 tube in a Zelton (746 and 747) recently. A week later the electrolytic condensers went 'haywire.' This is not an uncommon experience with these receivers. The best policy to follow is to replace the condensers whenever a new 80 is installed."—J. L. Hoard, Providence, R. I.

As a matter of fact, it is always a good idea to check the electrolytics when replacing rectifying tubes—particularly if the rectifying tube has been short-lived. The check is best made on a capacity bridge, such as the Tobe or Solar, and measure the power factor of the condenser. Power factors in excess of .05 indicate deterioration and anything over .2 certainly should not be used for filtering purposes in a power supply.

SERVICE NOTES

There is every indication that the manufacturers are extending their cooperation to the radio servicemen, particularly in the direction of sales resistance. Some of the old timers will have no difficulty in recalling the days when the serviceman couldn't get a wiring diagram—let alone a boost on the service sales end. Figure 3 shows Philco's (RMS) flashing sign for the counter or window display. Sylvania is co-operating with the handsome steel shelf and cabinet combination shown in Figure 4. It is designed to hold a full stock of replacement tubes on the two shelves, while there is adequate space for other parts and equipment in the different size drawers and the large bin at the bottom. Available to servicemen from their jobbers at cost.

Television Motor

(Continued from page 214)

lines, and from 12 to 60 frames-per-second. These, Mr. Peck believes, represent the extremes likely to be encountered within the next few years.

Besides automatic synchronization with all television broadcasts, other advantages claimed for the Peck system are more brilliant images on the screen, a larger screen (about 20 by 24 inches), simpler tuning, lower replacement costs, and greater freedom from high voltages than are possible with other systems.

Mr. Peck, who has been prominent in the optical industry since 1907, has been devoting his attention to television for the past seven years. Among his inventions in this field are the compact light-modulator cell, the 1440 r.p.m. synchronous motor, the hemispherical reflecting lens, and the spheric reflector, which increases the light available from a standard source by about 600%.

Television In France

Paris, France—The antenna power of the Eiffel Tower television station has been increased from 1 kw. to 10 kw. It is estimated that this will insure a service radius of 70 kilometers. A number of French manufacturers are now making television receivers.

MORE THAN

3,000,000

**RADIOS, NOW IN USE,
HAVE UTAH PARTS AS
ORIGINAL EQUIPMENT**

FOR THE PAST FIFTEEN YEARS, UTAH HAS BUILT THE BEST SPEAKERS, VIBRATORS, TRANSFORMERS, CHOKES, VOLUME CONTROLS, TONE CONTROLS, RESISTORS, JACKS, JACK SWITCHES, PUSH BUTTON SWITCHES AND PLUGS. USE GENUINE UTAH PARTS! WITH ONLY TWENTY MODELS, UTAH CAN SUPPLY REPLACEMENT SPEAKERS FOR PRACTICALLY ANY MAKE OR MODEL OF RECEIVER! VISIT OUR EXHIBIT AT THE R. S. M. SHOW, BOOTH 25, HOTEL PENNSYLVANIA, SEPTEMBER 18, 19, 20.

PART OF THE HUGE PUNCH-PRESS LINE IN THE UTAH FACTORY WHERE THE STURDY, RIGID SPEAKER FRAME AND BASKETS ARE FABRICATED.

"15 YEARS OF LEADERSHIP"

RADIO ENGINEERING

RCA Institutes offers an intensive course of high standard embracing all phases of Radio. Practical training with modern equipment at New York and Chicago schools. Also specialized courses and Home Study Courses under "No obligation" plan. Catalog Dept. RN-36.

RCA INSTITUTES, Inc.
75 Varick St., New York 1154 Merchandise Mart, Chicago
Recognized Standard in Radio Instruction Since 1909.

Glenn and Fred's
POCKET
TROUBLE SHOOTER
"GAMES"
"GAMES"

**POCKET
TROUBLE
SHOOTER**

Buy this ingenious servicemen's reminder and time-saver. Take it with you on all your service calls.

25
CENTS

Radio & Technical Publishing Company
45 Astor Place, New York City, Dept. RN-106