The Jenkins "Radio-Movie" Reception Methods

Some Operating Hints Which Will Be Valuable to Television Experimenters in Constructing Their Receiving Apparatus

REGULAR schedules of radio movies have been established by the Jenkins Laboratories, 1519 Connecticut Avenue, Washington, on 46.72 meters (6,420 kilocycles) with 48-line pictures. They run from 8:00 to 9:00 p. m., E. S. T., on Monday, Wednesday and Friday nights (or 0100 to 0200 GMT on Tuesday, Thursday and Saturday mornings). When a sufficient number of amateurs have shown that they are in position to receive these, the broadcasts will be made nightly. Preliminary announcements are made from the station, whose call is 3XK, in both code and phone. At the end of each picture the letters END are shown, to indicate that it is time to return to reception by ear.

The transmitting system, which was described in RADIO NEWS for August ("Radio Movies and Television for the home," page 116) operates to send silhouette images, which are printed on standard moving-picture film. Scanning these with a very small beam of intense light gives an impulse much sharper than that obtained in televising faces, clothing, etc., by reflected light. The images are sent out at the rate of 15 a second, or 900 per minute.

While the Jenkins laboratory-model receiver, described in the article above mentioned, is of very high-grade workmanship, and too complicated for home construction, the television experimenter will find it possible to receive the radio movies on a 48-hole disc running at 900 revolutions per minute.

Later, it is promised, "halftone" or shaded motion pictures will be sent, when it is to be expected that the technique of the receiving amateurs has improved. For the present, a gradual progression in the complexity of the images is being attempted; the earliest film transmitted was only that of a dancing figure, comparable with the "zoetrope" toys, which were the forerunner of the moving picture. Elaborate subjects and later actual stories followed. The broadcasting has been in charge of Stuart Jenks and Paul Tomsen.

"We have discovered," says Mr. Jenkins' announcement, "that stories in silhouette are as entertaining as movie cartoons in the theater; plus, also, the appeal of the mystery of movies by radio.

BEGINNING A NEW INDUSTRY

"Picture subjects and picture stories in silhouette are easier for the amateur to pick up at first; and obviously the width of the picture-frequency band is very much less and, therefore, greater latitude is available.

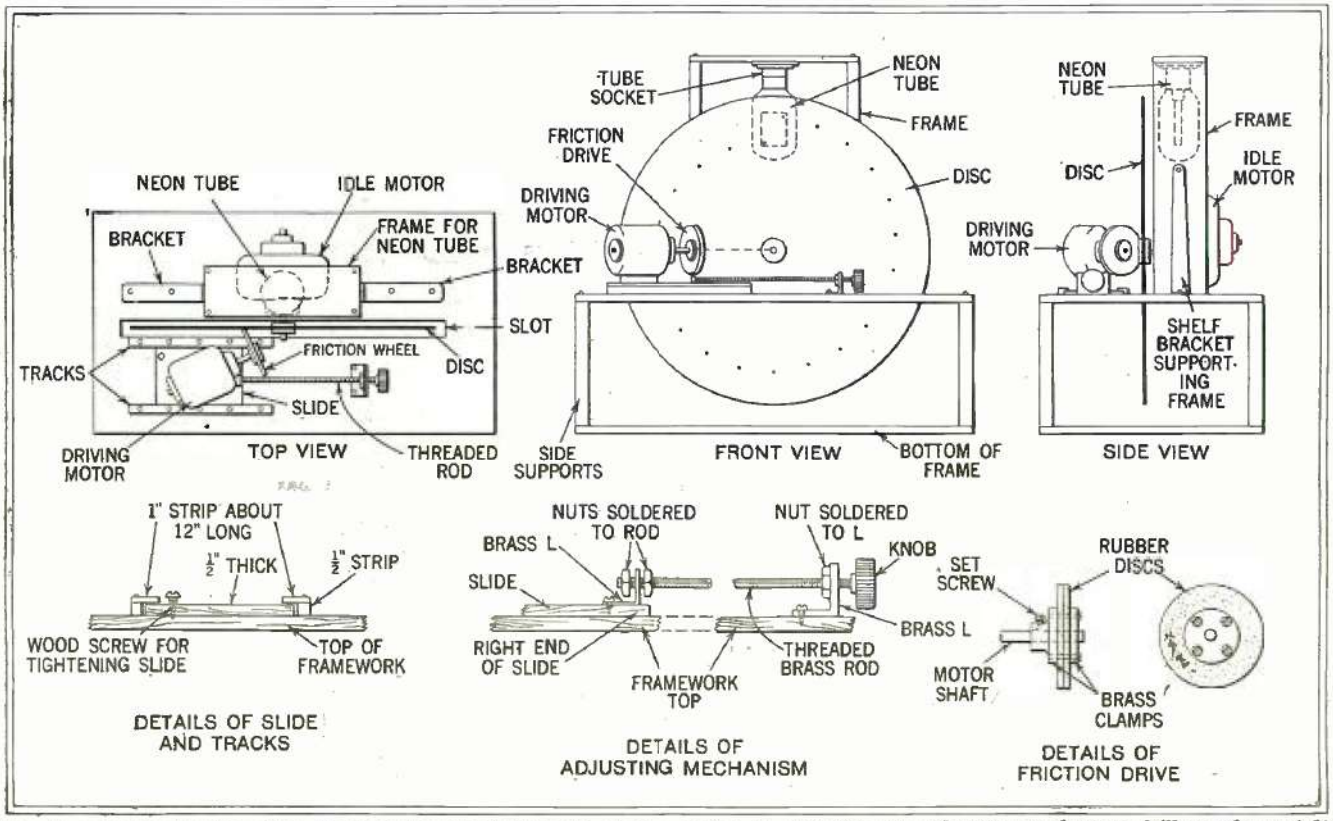
"Our immediate interest in the broadcasting of radio movies is to enable the amateurs of America and Canada to become familiar with the principles involved, in the belief that they will assist in this development. The American radio amateur has shown his remarkable cleverness in the development of 'worthless frequencies' below the 200-meter band, as is now generally and officially acknowledged. I expect as great a surprise when the amateur takes up this new work.

"This is the beginning of a new industry —a new form of radio entertainment. With these motion-picture broadcasts we are hoping to contribute to its rapid development. Your reports on our signal strength, fading, echo images and quality of picture reception will greatly help.

"Ultimately, this pantomine story-teller will come to all our firesides as a fascinating teacher and entertainer, without language, literacy or age limitation; a visitor to the homestead with photoplays, the opera, and a direct vision of world activities, without the hindrance of muddy roads, or snow blockades."

While the radio movies are vision only at second-hand, in contrast to the true television, the mechanism reproducing them is the same as that required for television; and it is quite possible that they will find places in television schedules even after the perfection of television, even more so than mechanically-reproduced music does in the radio broadcast schedules of the world today. For instance, many events of great interest in the world take place at hours when the inhabitants of distant lands are busy or sleeping; and their repetition by the radio movies a few hours later, with or without an accompanying sound broadcast, will be a desirable news service.

(*Continued on page* 492)



The three upper drawings show the arrangement of the parts of an excellent television or "radio-movie" receiver; the support for the disc may be an idle motor or a small polishing head. Mount the neon tube so that it is not affected by the vibration of the driving motor. In assembling the adjusting mechanism, drill out the upright arms of the L-shaped brackets so that the threaded brass rod will revolve in them easily. Once the proper position for the slide has been found, turn in the wood-screw, so that the motor will not "walk."

he obtained suitable photoelectric cells, he had a complete transmitter and test receiver working in the Pilot laboratories in Brooklyn and, the first time he turned the apparatus on, a crude but recognizable image appeared in the receiver.

With a regular television service now under way at WRNY, Mr. Geloso is perfecting numerous details of the system, such as automatic synchronization, proper control and mixing of the outputs of the photoelectric cells, the design of a small motor for the receiving disc, etc. Further news of his accomplishments will be published in forthcoming numbers of RADIO NEWS.

Reception of the Jenkins "Radio Movies"

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SIMPLE SYNCHRONISING DEVICE

A very simple and practicable method of adjusting the speed of the scanning disc of a television receiver is suggested by the Jenkins Laboratories in a recent bulletin which they have issued to radio experimenters. The idea is to support the disc on any suitable set of bearings, and to drive it by the friction of a small wheel (attached to the shaft of a motor) pressed against its surface. By varying the distance between the friction wheel and the center of the disc, the experimenter can find a setting at which the disc turns at exactly the same rate of speed as the transmitting disc. At different positions on the radius of the disc, the circumference of the friction wheel bears different "reduction-ratios" to the circle of active contact; so, naturally, it drives the disc at different speeds. (See page 420.)

In this arrangement, the driving motor should be run at its natural speed, without being controlled externally by a rheostat. Once the correct position has been found, the motor should be clamped in place, or at least the position noted accurately so that the proper setting can be made quickly. Using a 48-hole disc, a television experimenter can find two positions of the motor, for 900 and 450 revolutions per minute (the former will be at half the distance from the center, except for slippage), and then will be able to receive either the Jenkins or the WRNY broadcasts, respectively, without other change. This scheme is considerably cheaper and more flexible than one involving the use of gears, which require accurate mounting and alignment.

If you already have a scanning disc mounted on a motor, use the latter merely as a support for the disc and drive the disc itself with another small motor of 1/20- or 1/16-horsepower, say. A suitable mechanical arrangement of all the parts used in a complete television receiver is shown in the illustration on page 420. The details are all obvious; the actual dimensions of the wooden members supporting the motors and the glow lamp will depend, of course, on the particular apparatus the individual experimenter has on hand.

CAREFUL ADJUSTMENT DESIRABLE

The friction wheel may be made of two discs of rubber cut from an old inner tube; they should be about 2½ or 3 inches in diameter, and will work best if clamped between two brass or iron flanges, one of which fits over the motor shaft. The flanges

should be only about one inch smaller in diameter than the rubber discs, in order to prevent the edges of the latter from folding over when they are pressed against the scanning disc.

It will pay the experimenter to have these flanges turned out for him by the local machinist, or by the garage man if he has a lathe; they will cost only a dollar or so, and will be well worth their price. Unless these flanges fit the driving motor's shaft smoothly, the rubber discs will wobble and will make the scanning disc wobble also.

Use any small induction or synchronous motor that is obtainable. Universal motors which spark excessively at the commutator should be avoided; as this sparking will affect the neon-gas glow-tube and cause spots to appear in the images. However, this interference can generally be eliminated by a pair of ordinary 0.5- or 0.1-mf. by-pass condensers connected in series, and across the motor brushes, with the center connection of the condensers going to the ground lead of the radio set.

Naturally, the only way to determine the proper position for the driving motor is to tune in the television or "radio-movie" signals from WRNY-W2XAL, or from 3XK (the Jenkins station on 46.7 meters), and to turn the adjusting screw shown in the diagrams until the images appear. A little patience is required for this adjustment; if you do not obtain pictures on the first trial, try again.

On the Short Waves

(*Continued from page 457*)

SHORT WAVES AND BROADCAST LISTENERS

Editor, RADIO NEWS:

The letter entitled "Short-Wave Reception on a Standard Ultradyne" in RADIO NEWS for September (page 254) deals with a matter that is surely not new to anyone who has ever operated a superhet within a few miles of an amateur transmitter. The fact that most any superhet (and particularly the Ultradyne) has this failing is never mentioned in the "how-to-build" articles, probably due to the commercial slant of these articles. In many instances the publishers seem to deliberately connive with the advertisers to "work" the reader by failing to tell the whole story. However, the tendency of the Ultradyne to suffer from its own oscillator harmonics was mentioned in *Q.S.T.* at least three years ago.

With my own superhet (just the ordinary nameless standard variety) I found some time ago that it was the third or fourth oscillator harmonic that was heterodyning the short-wave signal to the frequency of the intermediate transformers; and thus permitting the short-wave signals to "come through" on broadcast settings of the oscillator dial. Practically every superhet owner in this vicinity has the same complaint.

There are a number of methods of partially overcoming the difficulty:

(1) Suppressing the undesired S.W. signal in the loop by mounting a tunable absorption circuit on the loop frame. (Who ever heard of a *real* superhet that required more than a loop for coast-to-coast reception?)

(2) Suppressing the undesired oscillator harmonic by surrounding the pick-up coil with a tunable absorption circuit.

(3) Suppressing the S.W. interference at its source by applying the homeopathic treatment ("like cures like") to the amateur operator who persists in going on the air before 11 p. m. or a Sunday afternoon while the rest of the city is enjoying the broadcast programs. Most anyone past the radio kindergarten "knows how."

Only "one-way" communication soon sends the troublesome operator to bed and permits the rest of the city to again turn on their receivers. An even simpler way is to make friends with the family next door to the "source" and arrange with them to turn on the vacuum sweeper upon phoned request. If they own a receiving set the phone call is unnecessary.

(4) It has been claimed that reducing the oscil-