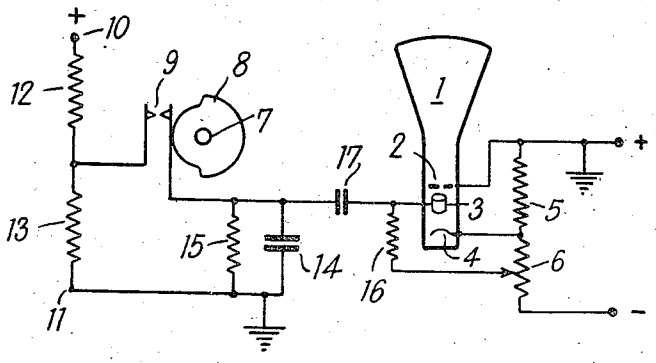
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RADIO RECEIVER

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RADIO RECEIVER

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In Great Britain August 8, 1941

1 Claim. (Cl. 250—20)

This invention relates specifically to so-called "panoramic" radio receivers the nature of which was described in "Electronics," June, 1940. In brief, by such a receiver a waveband or it may be any selected one of a plurality of wavebands, is scanned from end to end by the automatic variation of a tuning parameter at a rate comparable with the frequency of the persistence of vision, the output or outputs due to any received radio transmissions which may be taking place within the waveband being indicated as peak components perpendicular to a time base waveband component on the screen of a cathode ray tube, the time base component being provided synchronously with the scanning such as by means of a sawtooth type (preferably pyramidal) of generator. Provision can be made whereby any selected one of the thus indicated transmissions can be tuned into and its modulation listened to or recorded or otherwise indicated. In such a panoramic receiver it has been convenient, for the purpose of the rapid scanning of the waveband, to "wobble" the value of certain tuning components of a frequency changer valve of a superheterodyne circuit.

In a panoramic receiver, when the scanning is effected by the continuous rotation by a motor of the rotors of tuning condensers the return sweep, for various reasons, will almost certainly not coincide with the forward sweep, so that the signal traces will be blurred or appear double or the time base looped. This difficulty may arise with condensers of the semi-circular plate type which give substantially straight line law capacitance change during half only of each revolution. When condensers having special capacitance laws are used the aforesaid defects may be increased.

According to the present invention, to avoid possibility of the abovementioned defects, provision is made for suppressing the cathode ray beam during one half or a part or parts of each revolution of the condensers. This suppression of the beam is conveniently effected by a switch operated by a cam on the condenser shaft or equivalently. It will be appreciated that this switch applies a rectangular voltage wave of a frequency of say 12 cycles per second, going positive and negative with respect to the mean potential of the grid of the cathode ray tube. It will be appreciated further that if the rectangular voltage wave is applied to the grid through a condenser, then when the receiver is switched over to manual scanning, the grid will assume its steady potential so that the brightness of the spot on the screen is desirably reduced.

Features of the present invention are notably applicable with the features forming the subject of U. S. application Serial No. 503,276, filed September 21, 1943, and are also applicable with the features forming the subject of U. S. application Serial No. 514,479, filed December 16, 1943.

The single figure of the accompanying drawing is a circuit diagram illustrating a preferred way of carrying out the invention.

In the drawing 1 represents the cathode ray tube of the panoramic receiver, having the anode 2, grid 3 and cathode 4 energised through the potentiometer system 5, 6 from the source marked +, —.

At 7 is shown the shaft, rotated continuously by a motor, of the straight line capacitance condensers for effecting the scanning automatically. The shaft 7 has fixed on it a cam 8 which at every half revolution of the shaft is adapted to cause the successive opening and closing of switch contacts 9 whereby the potential on the grid 3 of the cathode ray tube (or alternatively on the cathode 4 thereof) is varied according to the square wave form in relation to the mean potential of the grid (or cathode). This square wave potential is conveniently derived from the source of potential indicated at 10, 11 by means of the resistances 12, 13 and 15. Thus, when contacts 9 become closed, potential is applied from the source 10, 11 to one end of the resistance 15 the other end of which is permanently earthed as shown, whilst with contacts 9 open, that is at the end of one half-revolution of shaft 7, the connection of the source 10, 11 to resistance 15 is interrupted so that the potential previously impressed on the unearthed end of resistance 15 falls away due to earth leakage, this cycle being continuous during rotation of the shaft 7, with the net result that a voltage is derived across resistance 15 which is of a wave-form approximately square with respect to time. This square voltage wave derived across resistance 15 is applied through condenser 17 to resistance 16 connected as shown between the grid 3 and the potentiometer tapping 6. With the mean potential of grid 3 in relation to the cathode 4 determined by adjustment of potentiometer 6, the square wave voltage continuously generated across resistance 16 when the shaft 7 is rotating, results in the potential of the grid becoming alternately positive and negative with respect to its mean potential.

The condenser 14 shown connected across re-

sistor 15 functions to bypass unwanted "stray" voltage which might otherwise appear at the grid 3 from various sources, as for example from the motor driving shaft 7.

With the voltage between grid 3 and cathode 4 alternated continuously from positive to negative with respect to its mean value as will be the case so long as the shaft 7 is rotated, the cathode ray beam will be alternately extinguished and rendered effective to illuminate the screen with the maximum desired brightness.

However, with the shaft 7 stationary, as will be the case when a chosen station is being received, the square wave voltage will no longer be generated across resistance 16, so that the grid voltage will assume the mean value determined by the existing setting of the potentiometer 6 and accordingly the brightness of the illumination of the screen will be desirably reduced.

In this manner, the screen may be adequately illuminated during scanning although, however, by virtue of the reduction in the brightness obtained as described when the shaft is stationary, the possibility of damage to the screen, such as might otherwise result from intense illumination at a spot on the screen during such time as a chosen station is being received, is obviated.

We claim:

In a panoramic receiver, a cathode ray tube provided with a control grid, electron beam producing means, and a fluorescent screen upon which the electron beam impinges; adjustable means for applying a steady bias potential to the control grid; a potential source and associated switching means synchronized with operation of the receiver arranged to provide a substantially square wave of potential; and a condenser connected between said switching means and said control grid for superimposing the square wave of potential upon the steady bias potential applied to said control grid; whereby the electron beam is intensified during panoramic sweeps of the receiver and suppressed during the fly-back periods, and whereby during non-panoramic operation of the receiver the electron beam is of low intensity

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