CIRCUIT ARRANGEMENT FOR SEPARATING ELECTRICAL SIGNAL PULSES


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A television receiving system embodying the invention includes a circuit arrangement for affecting selection of frame synchronising pulses from a mixture of line synchronising pulses and frame synchronising pulses of longer duration than said line synchronising pulses and a network including parallel paths one of which contains a delay network which effects delay greater than the duration of a line synchronising pulse but less than that of a frame synchronising pulse and less than the period between consecutive line pulses, said parallel paths feeding a circuit containing at least one non-linear device which only gives an output when the delayed and undelayed frame pulses overlap. The mixture of pulses may also include picture signals which are not transmitted by said parallel paths.

The non-linear device may be a thermionic valve forming part of a circuit for generating a voltage of saw-tooth waveform or a valve the output of which is used to drive such a circuit and, in particular circuit arrangements embodying the invention, the parallel paths are constituted by separate electron paths in a thermionic valve or in separate thermionic valves.

In order that the invention may be more clearly understood and readily carried into effect, some circuit arrangements embodying the invention will now be more fully described by way of example with reference to the accompanying drawing in which:

Figs. 1, 2, 3, 4 and 5 are alternative forms of circuit for separating the frame pulses from the mixture of picture signals and line and frame pulses in television receiving systems.

Referring to Fig. 1 of the drawing, 1 and 2 are the input terminals to a pulse separating circuit including triode valves 3 and 4, and a blocking oscillator valve 5. The mixture of signals including picture signals and line and frame synchronising signals are applied to the terminals 1 and 2, the picture signals being in the negative sense and the synchronising signals in the positive sense. The grid of the valve 3 is so biased for example, automatically that the valve is unresponsive to the picture signals and only line and frame synchronising signals are transmitted through that valve to the screen grid of the blocking oscillator valve 5 through a coupling condenser 6. The valve 4 acts similarly to the valve 3, but the signals applied to its grid are delayed by the network represented by the rectangle 7. Thus, there will be continually applied to the screen grid of the valve 5 one set of line and frame synchronising signals and another...
identical set of signals displaced in time from the first set. The delay introduced by the network T is such that the line signals in both sets of pulses are always separated and never overlap. The frame pulses are caused to overlap so that a pulse of increased amplitude is applied to the screen grid of the valve 5. The potentials applied to the electrodes of that valve are such that only a pulse of such increased amplitude will cause it, in conjunction with the associated circuit to generate a current of sawtooth waveform which can be applied in the usual manner to the frame deflecting means connected to terminals 9 and 10 of a cathode ray tube.

In the arrangement shown in Fig. 2 of the drawing the two sets of line and frame synchronizing signals are applied in a positive sense to the two control grids of a hexode valve 11, delay of one set with respect to the other being introduced by the delay network T. The valve 11 will only pass anode current when pulses are applied simultaneously to the control grids of the valve, that is to say, during the period after overlap of frame pulses, the output from the valve being applied through a condenser 12 to a cathode 21, 1942 lead is such that the potential variations at the cathode follow those of the most positive grid. The delayed and undelayed pulses are applied to the two control grids and drive potentials for a frame deflecting blocking oscillator are taken from terminals 24 and 25. Two separate triodes may, of course, be used instead of the combined valve 23. Also, in Fig. 4, the separate diodes may be used instead of the double diode 18.

1. A circuit arrangement for effecting selection of those pulses exceeding a given duration from a mixture of electrical signal pulses which are of differing duration, comprising a network which is not a mixture of pulses is applied, said network including parallel paths one of which contains a delay network which effects delay substantially equal to said given duration, said parallel paths feeding a circuit containing at least one non-linear device which only gives an output when there is an overlap between the delayed and undelayed pulses.

2. A television receiving system including a circuit arrangement for effecting selection of frame synchronizing pulses from a mixture of line synchronizing pulses of longer duration than said line synchronizing pulses comprising a network including parallel paths one of which contains a delay network which effects delay greater than the duration of a line synchronizing pulse but less than that of a frame synchronizing pulse and less than the period between consecutive line pulses, said parallel paths feeding a circuit containing at least one non-linear device which only gives an output when the delayed and undelayed frame pulses overlap.

3. A television receiving system according to claim 2 wherein said mixture of pulses also includes picture signals which are not transmitted by said parallel paths.

4. A circuit arrangement according to claim 1 wherein said non-linear device is a thermionic valve forming part of a circuit for generating a voltage of sawtooth waveform.

5. A circuit arrangement as included in a television receiving system according to claim 2 wherein said non-linear device is a thermionic valve forming part of a circuit for generating a voltage of sawtooth waveform.

6. A television receiving system as claimed in claim 2 wherein said mixture of pulses also includes picture signals which are not transmitted by said parallel paths and wherein said non-linear device is a thermionic valve forming part of a circuit for generating a voltage of sawtooth waveform.

7. A circuit arrangement according to claim 1 wherein said parallel paths are constituted by separate electron paths and said non-linear device is a thermionic valve forming part of a sawtooth waveform generating circuit.

8. A circuit arrangement as included in a television receiving system according to claim 2 wherein said mixture of pulses also includes picture signals which are not transmitted by said parallel paths, said parallel paths being constituted by separate electron paths and said non-linear device being a thermionic valve forming part of a sawtooth waveform generating circuit.

9. A television receiving system according to claim 2 wherein said mixture of pulses also includes picture signals which are not transmitted by said parallel paths and wherein said parallel paths are provided by a multi-grid thermionic
valve, the delayed and undelayed pulses being applied to separate control grids of said valve, the output of which provides pulses for operating a frame deflecting circuit.

10. A television receiving system according to claim 2 wherein said parallel paths are provided by a multi-electrode thermionic valve of the triode hexode type, the delayed pulses being applied to the control grid nearest the cathode and the undelayed pulses being applied to an outer control grid which is connected with the control grid of the triode portion of the valve, pulses for operating frame and line deflecting circuits being obtained from the anode of said triode hexode valve and the anode of the triode portion of said valve respectively.

11. A television receiving system according to claim 2 wherein the said parallel paths are provided by a thermionic valve having two anodes connected together and two separate control grids co-operating with a single cathode, a resistance which is large compared with the impedance of either of the paths between the cathode and the separate anodes being connected in the cathode lead and wherein the delayed and undelayed pulses are applied to the control grids, drive potentials for a frame deflecting circuit being taken from the opposite ends of the resistance connected in the cathode lead.

ERIC LAWRENCE CASLING WHITE.