SWITCH PULSE GENERATORS GE2/506 and GE2/506A

Introduction

The GE2/506 and GE2/506A are used in Split-screen Effects Units[1,2]; both units accept:

(a) a rectangular line-frequency waveform which may contain a field-frequency component
(b) a field-frequency sawtooth waveform which contains line-frequency and d.c. components
(c) mixed-sync pulses.

The GE2/506A accepts also a feed of caption-switch pulses[3].

Both units provide:

(a) push-pull switch-drive waveforms for use in an electronic switch[4]
(b) clamp-trigger pulses[5] at line-frequency
(c) a d.c. field-control signal.

The switch-drive output of the GE2/506A can be modified by the caption-switch pulse input when caption effects are required. The GE2/506 does not have this facility.

Both units are constructed on CH1/12A chassis with index-peg positions 7 and 30. Power supplies at +12 volts are required[6]. Attached to the GE2/506A is a printed-wiring board which is coded NE1/512. This board carries the additional components required to provide the caption-effects facility.

General Specification

See parent unit[1,2].

Circuit Description

GE2/506

The circuit diagram is shown in Fig. 1. Transistors TR7 and TR8 form a schmitt-trigger circuit which produces a rectangular waveform from the field-sawtooth input signal; the mark-to-space ratio of the waveform is dependent on the d.c. component of the input signal. The schmitt-trigger output is fed to transistor TR2 which is cut off when TR8 conducts. However, when the parent split-screen unit generates line and diagonal wipes the field component is not required and so relay RL is energised. When this happens TR8 is cut off, whereupon TR2 conducts and is driven by the line-pulse output of TR1.

From TR2 the signal is applied via emitter-follower TR3 and the contacts of relay CP to the long-tailed pair phase-splitter formed by transistors TR4 and TR6. Transistor TR5 functions as a constant-current generator for the phase-splitter stage. When relay CP is not energised, the input signal to the phase-splitter is applied to the base of TR6 and the output signal polarities are as shown in Fig. 1. When CP is energised, the input signal is applied to the base of TR4 and the output signals are reversed in polarity.

While the contacts of CP are changing over, both TR4 and TR6 are momentarily disconnected from their base-bias supply. If the current in both transistors were to fall to zero the d.c. conditions in the following video switch unit[2] would be upset. Therefore diode D1 is incorporated in the base-bias circuit of TR6. This diode ensures that TR6 remains in conduction during the relay changeover period, the diode has a relatively high forward conduction voltage (0·7 volt) so that under normal conditions it does not conduct appreciably.

Mixed-sync pulses are applied via delay network DN1 to transistor TR9. The delayed pulses are amplified and are then fed via emitter-follower TR10 and capacitor C6 to the clamp-trigger output of the unit. Capacitor C6 in conjunction with the low input resistance of the following clamp pulse generator[5] differentiates the output waveform; the positive-going spikes of the differentiated waveform are removed by the action of the clamp-pulse generator.

The polarity of the field potentiometer supply is determined by the operation of relay CR. The adjustment of the limit controls RV2, RV3, RV4 and RV5 is given under the parent unit.

GE2/506A

The circuit diagram is given in Fig. 2. Only that portion of the circuit which differs from the GE2/506 is described below.

The signal developed at the collector of TR2 is fed to a phase-splitter comprising transistors TR1 and TR2 on the NE1/512 board, and the phase splitter outputs are fed back to the contacts of CA-1. From the wiper of CA-1 the selected signal is fed to a gating amplifier on the NE1/512 board comprising transistors TR3, TR4 and TR5. When there is not a signal at the base of TR5 the signal applied to the input of the gating amplifier appears at the output and is fed back to TR3 on the GE2/506A unit. When TR5 is fed with

caption-switching pulses the transistor is cut off for the duration of the pulses and a caption effects facility (e.g. black-edged captions) is added to the switch-drive output of the GE2/506A.

Alignment

See parent unit.

References to Typical Associated Equipment

1. Split-screen Effects Unit UN4/501
2. Split-screen Effects Unit UN4/502B
3. Caption Pulse Generator GE2/526
4. Two-channel Video Switch UN9/514
5. Clamp Pulse Generator GE2/505
6. Stabilised Power Supplier PS2/503A

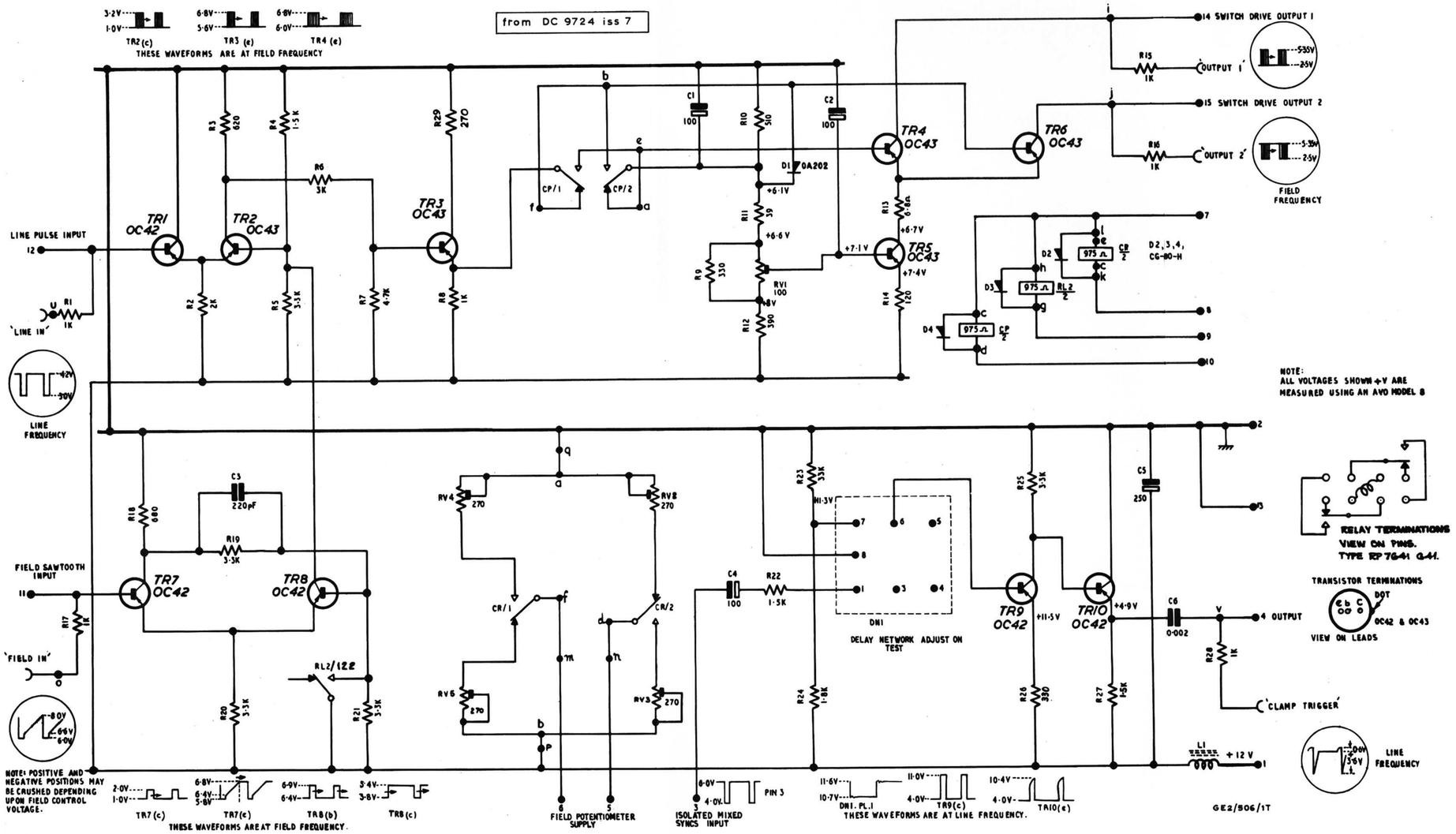


Fig.1. Circuit of the Switch–Pulse Generator GE2/506