PULSE GENERATOR GE2/504

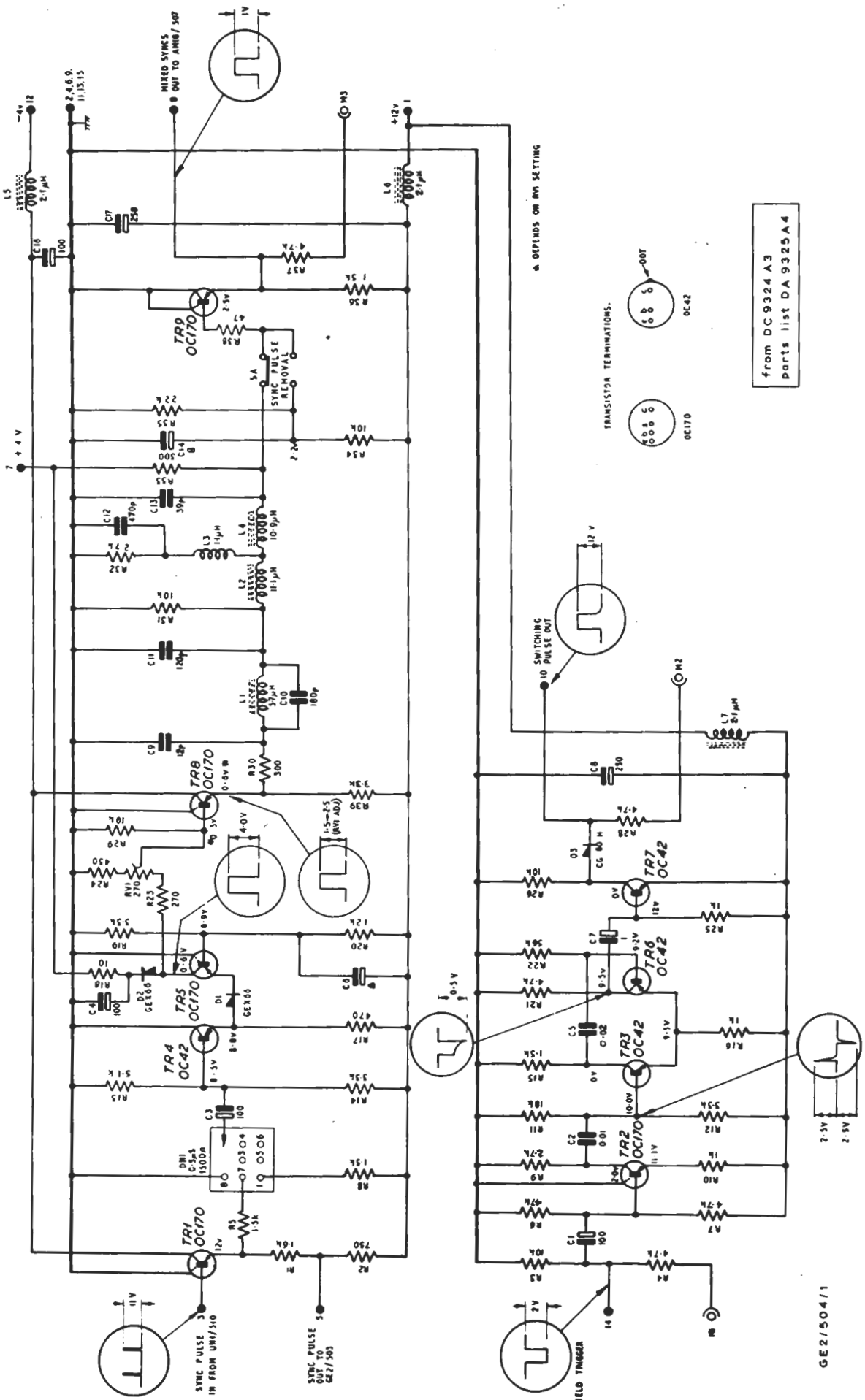

Fig. 1 Circuit of the GE2/504

Introduction

The GE2/504 accepts a feed of positive-going mixed-sync pulses[1,2] and a feed of field-trigger pulses and provides outputs of:

(a) negative-going, delayed, clipped and shaped sync pulses[3,4,5]
(b) positive-going sync pulses[6]
(c) positive-going switching pulses[7]

The unit is constructed on a CH1/12A chassis with index peg positions 3 and 12. A *Sync Pulse Removal* switch and a *Sync Pulse Gain* control are mounted on the front panel. Power supplies at +12 volts, +4 volts and −4 volts are obtained from a stabilised power supplier[8].

General Specification

The specification is given, in conjunction with associated units, under AM18/513[4].

Circuit Description

A circuit diagram is shown in Fig. 1.

Sync Pulse Processor

Positive-going sync pulses are applied to the base of emitter-follower TR1. Two outputs are derived from the emitter of this transistor; one is applied to delay line DN1 and the other is fed from the junction of R1 and R2 to a pulse generator GE2/503 or GE2/503A. The delay provided by DN1, together with the delay present in the shaping network connected between transistors TR8 and TR9, ensures that sync and video signals have the same time relationship when they are recombined in a processing amplifier. The maximum delay obtainable from DN1 is 0·5 μs and the line is tapped at 0·1 μs intervals to give shorter delays if required. The delayed signal is fed to emitter-follower TR4. Resistor R13 is adjusted on test to compensate for sync width errors (of up to 50 ns) in the parent stabilising amplifier.

From TR4 the signal is applied to a clipping stage consisting of D1, TR5 and D2. When the emitter potential of TR4 exceeds the base potential of TR5, D1 conducts and removes the negative end of the pulse; whereupon TR5 conducts heavily and, as soon as the collector becomes more positive than the cathode of D2 (4V), D2 conducts and connects C4 in parallel with the collector load. This prevents any further increase in the collector potential and clips the positive end of the pulse. The clipped signal is then applied, via sync amplitude control RV1, to the base of TR8.

Emitter-follower TR8 drives a sine-squared pulse-shaping network formed by capacitors C9-C13, inductors L1-L4 and resistors R31-R32. The shaped pulses are applied, via the normally-closed switch SA, to the base of the output emitter-follower TR9.

Switch SA enables the supply of sync pulses to be interrupted for test purposes. When the switch is operated a potential divider is connected to the base of TR9 so that its d.c. conditions are not disturbed.

Switching Pulse Generator

Field-trigger pulses are applied, via amplifier-inverter TR2, to the base of TR3. Transistors TR3 and TR6 form a monostable multivibrator (see Television Engineering, Volume 3) which is triggered by the negative-going portion of the waveform applied to the base of TR3. Negative-going pulses, with a duration of about 180 μs, are developed at the collector of TR6 and applied to the base of the output transistor TR7. This transistor, which is cut off in the absence of a signal, is driven into saturation by the pulses applied to its base and so positive pulses, equal in amplitude to the 12-volt supply voltage, appear at the collector. These pulses, the leading edges of which coincide with the trailing edges of the field-trigger input pulses, are applied, via D3, to the switching pulse output of the unit.

In some applications the output connections of two stabilising amplifiers may be paralleled and either amplifier may be switched off independently of the other. When this happens the impedance at the collector of TR7 in the inactive switching-pulse generator becomes very low and, in the absence of D3, the pulse signal from the other generator would be short-circuited. D3 prevents this by offering a low resistance to positive-going signals developed at the collector of TR7 and a high resistance to positive-going signals at the output of the unit.

Maintenance and Alignment

These units are aligned and maintained as part of the parent unit. The waveforms shown in Fig. 1 are for 405-line operation and represent conditions when the unit is functioning as part of a stabilising amplifier.

References to Typical Associated Equipment

1. Pulse Generator GE2/519.
2. Sync Pulse Separator UN1/510.
3. Processing Amplifier AM18/514, Instruction
4. Sync Pulse Stabilising Amplifier AM18/503,
5. Sync Pulse Stabilising Amplifier AM18/513.
6. Gating Pulse Generator GE2/503
7. Sync Source Switch UN9/511.
8. Stabilised Power Supplier PS2/10A.

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