

SECTION 17

SYNCHRONISING AND SUPPRESSION PULSE GENERATOR GE2/517 AND GE2/517A

Introduction

The GE2/517 and GE2/517A units both accept inputs of positive-going mixed sync pulses (see GE2/504, D.D. Technical Memorandum No. 8.172), and from them produce separate outputs of mixed synchronising, mixed suppression and field suppression pulses. Remotely controlled relay switching allows either unit to be operated on a number of different television standards.

The GE2/517 is equipped with a single relay which selects operation on any one of the 405, 525 or 625 line-standards. The GE2/517A is equipped with two relays, and has a modified field-sync separator circuit which enables it to operate on the 819-line standard also.

Each generator is constructed on a single printed wiring board and is mounted on a CH1/12A chassis. The GE2/517 has index peg positions 2 and 20, whereas the GE2/517A has positions 20 and 24.

General Specification

Signal Input

Inverted mixed sync pulses 1 volt p-p

Signal Outputs (across 75 ohms)

Mixed sync pulses (normal polarity) 2 volts p-p
Mixed suppression pulses 2 volts p-p
Field suppression pulses 2 volts p-p

Duration of Output Pulses

Mixed sync pulses Determined by input signal

Line-suppression pulses:
405-line 15-18 μ s
625/525-line 9.5-11.5 μ s
819-line (GE2/517A) 8.0-9.5 μ s

Field-suppression pulses:
405-line 1.2-1.6 ms
625/525-line 1.0-1.2 ms
819-line (GE2/517A) 1.6-2.0 ms

Output-pulse Times of Rise and Fall

Mixed sync pulses:
(Input-pulse rise-time 0.2-0.25 μ s) 0.1-0.13 μ s
Line-suppression pulses 0.2 μ s
Field-suppression pulses:
Rise time 0.5 μ s
Fall time 10 μ s

Impedances

Mixed sync input 2.5 kilohm
(approximately)
Pulse outputs 75 ohms \pm 5%

Relay Supplies

50 volts,
20 mA d.c.
each relay

Circuit Description

Figs. 17.1 and 17.2 are the circuit diagrams for units Type GE2/517 and GE2/517A respectively. The drawings show that the two versions differ in respect of the field-sync separator circuit and in the switching arrangements for operation on various television standards. The circuit operation of the complete unit Type GE2/517 will be described; the alternative circuits of the GE2/517A are dealt with subsequently.

Positive-going mixed sync pulses are amplified and inverted in the emitter-coupled pair TR1 and TR2. An output of mixed sync pulses of normal polarity and standard level is taken from the cascaded emitter-followers TR3 and TR4. The impedance of this signal source is increased to 75 ohms by the series resistor R14.

An output of inverted mixed sync pulses is taken from TR2 and fed via emitter follower TR5 to a differentiating network comprising fixed and variable resistors selected by the standards-changing relay RLA. The resultant positive-going spikes, coincident with the leading edge of the mixed sync pulses, are used to trigger the monostable multivibrator (see Television Engineering Volume 3) formed by TR6 and TR7. The duration of the unstable state of this circuit is determined by the time constant of C7 and the resistor network which includes either RV1 or RV2. These two controls can be adjusted independently to produce a pulse duration applicable to the selected television standard.

In addition to the triggering pulse received from TR5 emitter, TR6 is fed with a positive-going field-frequency pulse from the collector of TR11. The multivibrator is maintained in the unstable state for the whole of the time that this pulse is present. As a result of this inhibiting signal, negative-going mixed suppression pulses are produced at the collector of TR6, and fed to TR8 and

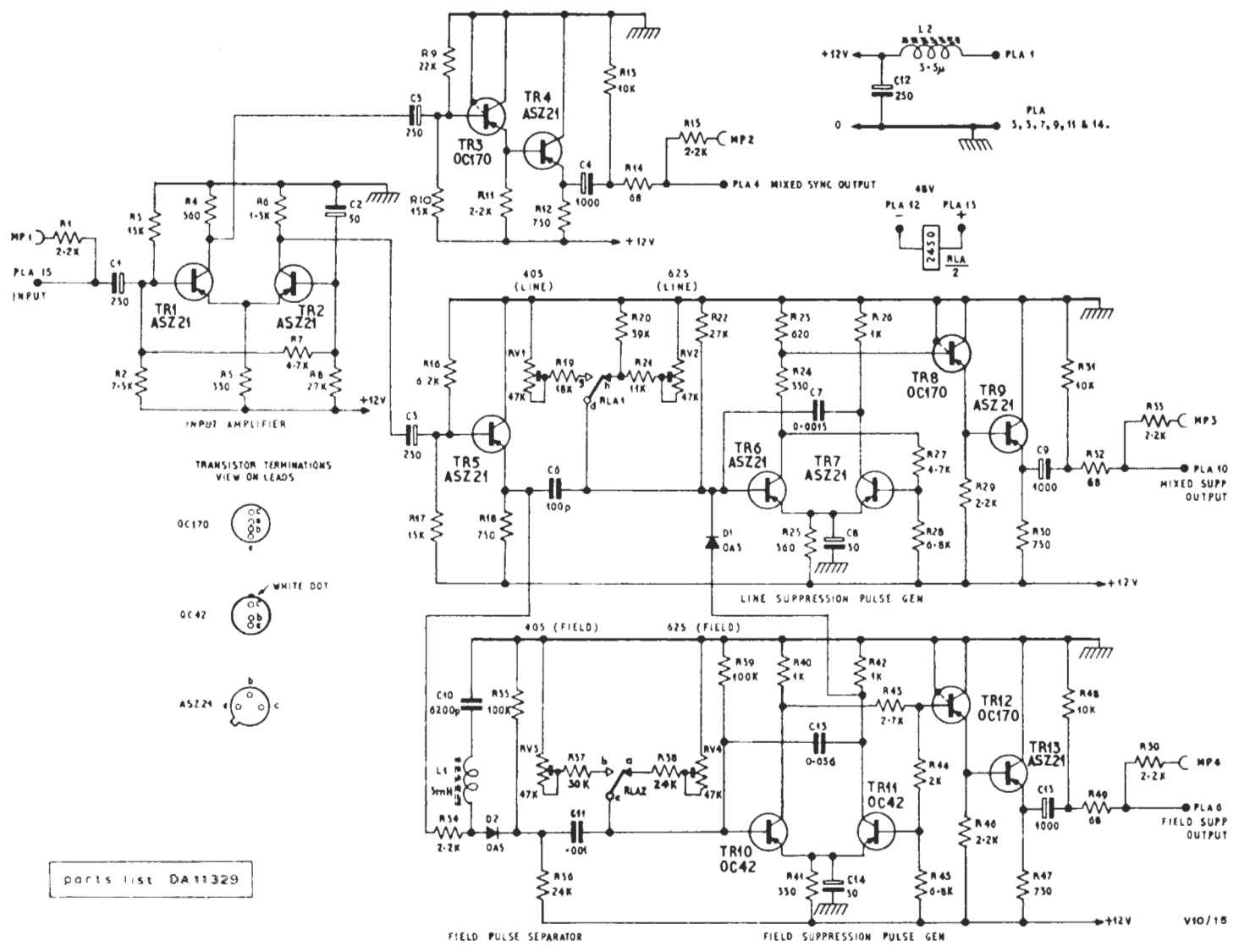
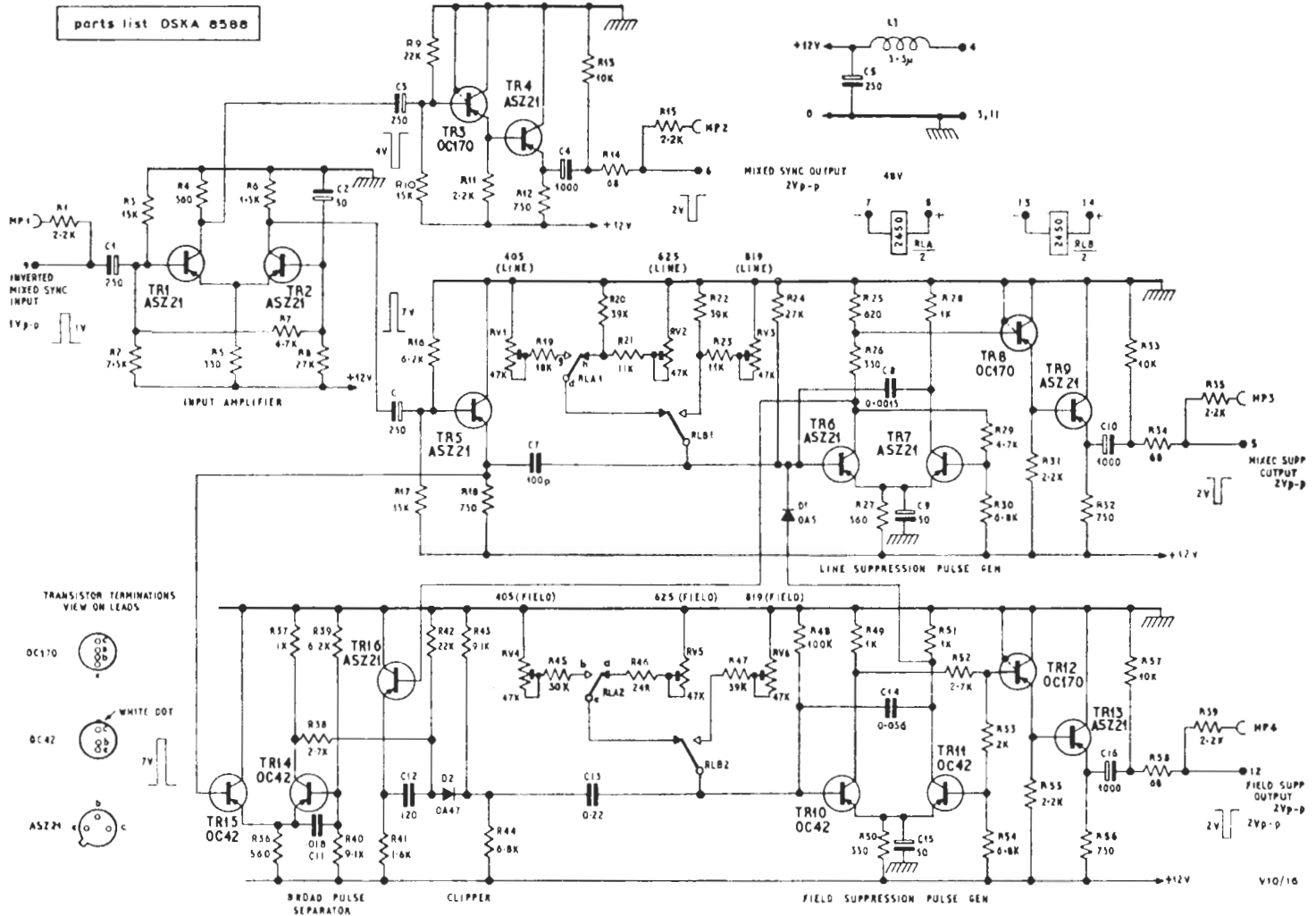


Fig. 17.1 Circuit of the GE2/517

17.2

parts list DSKA 8588



17.3

Fig. 17.2 Circuit of the GE2/517A

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TR9 which form an output circuit identical to that of TR3 and TR4.

The output from the emitter of TR5 is fed also to a field-pulse separator circuit comprising the shunt acceptor circuit L1, C10, and the diode D2. The tuned circuit differentiates the line-sync pulses, but acts as an integrator of the lower-frequency field-sync pulses. Thus, the signal from TR5, which contains both types of pulses, is modified so that the waveform at the junction of D2 and L1 consists of a series of sharp positive-going and negative-going spikes (coincident with the leading and trailing edges, respectively, of the line-sync pulses), superimposed on positive-going near-rectangular pulses which are coincident with field-sync pulses. The diode D2 is biased so that only the most positive part of the signal at its anode reaches the base of TR10. TR10 and TR11 form a monostable circuit similar to that of TR6 and TR7. The first positive spike to overcome the reverse bias on D2 (coincident with the leading edge of the second broad pulse) triggers this circuit into its unstable state.

The duration of the pulse produced by TR10 and TR11 is determined by the position of the standards-changing relay, RLA, which selects either RV3 or RV4.

Negative-going, field frequency pulses are taken from the collector of TR10 and provide a feed of normal polarity, standard-level field-suppression pulses via a circuit identical to that used for the other two outputs from the unit.

The input signal and the three output signal waveforms can be monitored at points MPI-MP4.

GE2/517A; Circuit Differences

The GE2/517A employs a limiting and gating field-pulse separator circuit in place of the tuned-circuit type used in the GE2/517. This modification is necessary in order that the unit can derive the

required output signals from an 819-Line input signal. The modification, shown in Fig. 17.2, comprises transistors TR14, TR15 and TR16.

Positive-going mixed sync pulses from TR5 are fed to the emitter-coupled pair TR15, TR14. TR14 is cut off by the conduction of TR15 except during the period of the broad pulses, and the resultant positive pulse from the collector of TR14 is used to forward-bias diode D2 during this period.

Negative-going line suppression pulses from TR6 are fed via an emitter follower, TR16, to a differentiating circuit, and then applied to D2. Because of the inhibiting action of the field pulse through diode D1, TR6 produces only one line-frequency suppression pulse during each field pulse period, and this coincides with the leading edge of the first broad pulse. A positive-going spike, coincident with the trailing edge of this single line-suppression pulse is gated through D2 by the pulse from TR14, and triggers the monostable circuit of TR10 and TR11. This circuit generates field-suppression pulses (and inhibiting pulses to TR6) as described previously for the GE2/517 unit.

Multi-standard Operation of GE2/517A

As in the GE2/517, multivibrators TR6, TR7 and TR10, TR11 can be switched to provide output pulses of different durations according to the required television standard. However, because of the extra facility of 819-line operation, the GE2/517A uses two relays (RLA and RLB) and each multivibrator has three pre-set controls (RV1—RV3 and RV4—RV6).

Note that both units will operate on 525-line standards when switched to the 625-line position. However, there is no separate adjustment for output-pulse durations to suit each standard independently and therefore, if exact durations are required, the appropriate control must be set for whichever standard is to be used.

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