

SECTION 52

GATING PULSE GENERATOR GE2/552

Introduction

The GE2/552 accepts a mixed sync-pulse input signal and provides positive-going pulses at the start of three pre-determined lines in each field; see also Automatic Monitor (Major) MN2M/506, Instruction V.15.

The GE2/552 is constructed on a CH1/12A chassis with index positions 18 and 25.

The leading edges of the output pulses are timed by the outputs of three monostable multivibrators which are triggered in sequence. The first of these multivibrators is triggered at the end of the first half-line interval in the mixed-sync waveform. The second and third multivibrators are triggered from the outputs of the first and second Schmitt circuits respectively.

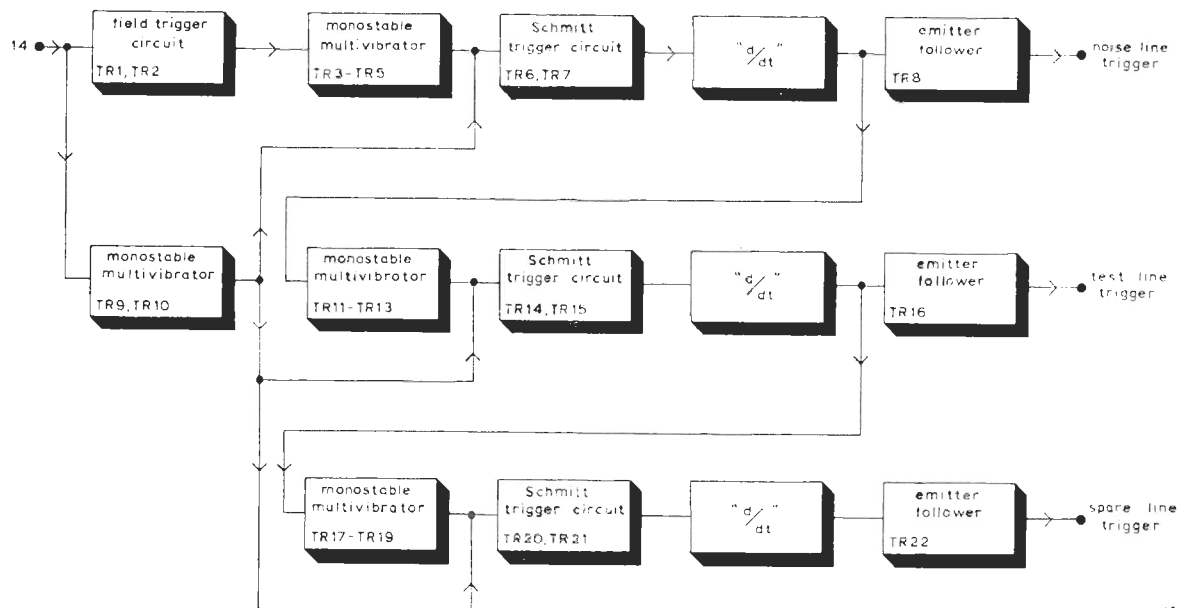


Fig. 52.1 Block Diagram of the GE2/552

General Description

Fig. 52.1 shows a block diagram of the GE2/552. The three output pulses are derived from three Schmitt trigger circuits which are biased in their backlash region thereby behaving as bistable circuits. The output of each Schmitt circuit is a negative-going pulse in which the trailing edge corresponds with the start of the selected line and the leading edge occurs at some time during the previous line.

The trailing edges of the output pulses are timed by the output of a monostable multivibrator triggered by mixed-sync pulses.

Circuit Description

The circuit of the GE2/552 is given in Fig. 52.2. Some of the waveforms to be observed in the unit are given in Figs. 52.3 and 52.4.

Schmitt Trigger Circuit

The bistable Schmitt trigger circuits^{1,2} are triggered by two sets of pulses of opposite polarity. The collector load of the output transistor is corrected to make it a constant-resistance by the inclusion of an inductor³. This has the effect of reducing the rise-time of the trailing edge of the output pulse.

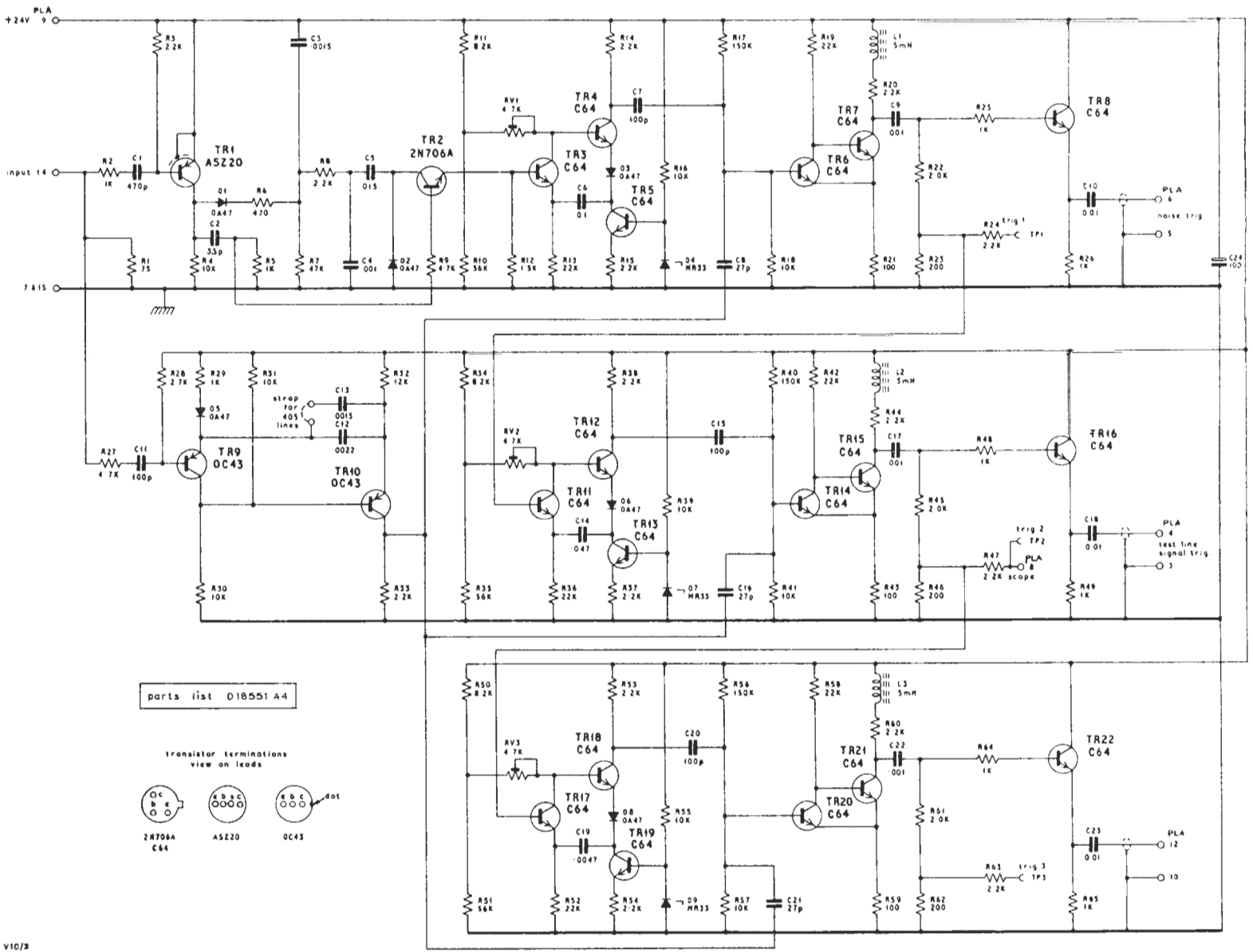


Fig. 52.2 Circuit of the GE2/552

52.2

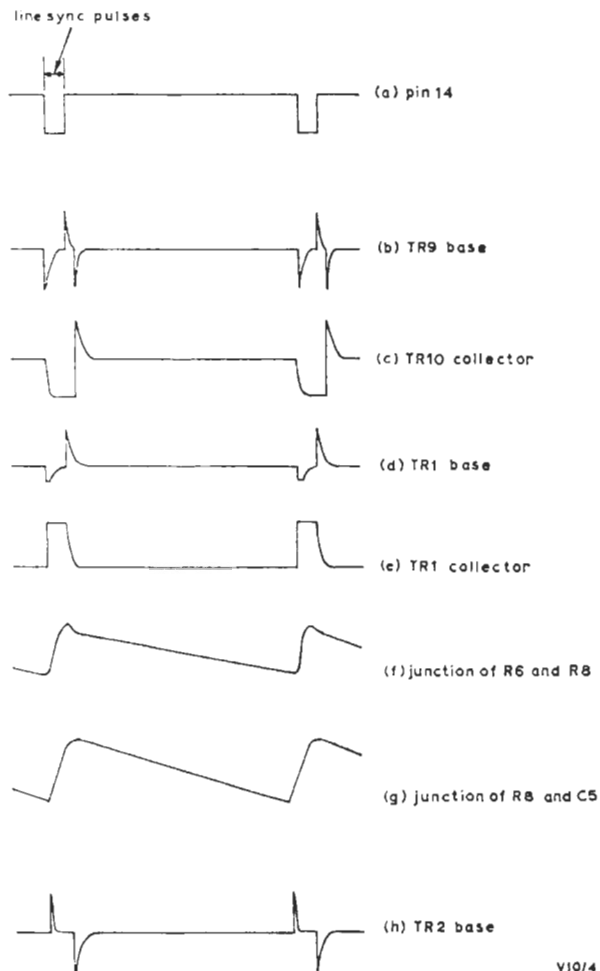


Fig. 52.3 Line-frequency Waveforms in the GE2/552

Monostable Multivibrators

These multivibrators are an emitter-coupled type⁴. The three sequentially connected multivibrators each include a third transistor to provide a constant current source. This linearises the discharge of the timing capacitor. The output

waveform from this type of multivibrator has a large overshoot on the trailing edge and this is used as the input pulse for the following stage.

Field Circuit

The interval between the field-sync datum and the test line is half a line shorter on even fields than it is on odd fields. To allow for this half-line difference, trigger pulses are produced at the end of the first half-line interval in the mixed-sync waveform. This is either at the start of the first or second equalising pulse (625-lines) or at the start of the first or second broad pulse (405-lines).

The input sync-pulses, inverted by transistor TR1, discharge capacitor C3 through diode D1. Capacitor C3 charges through resistor R7 to give the waveform shown in Fig. 52.4(b). This waveform, d.c. restored through diode D2, is fed to the collector of the switching transistor TR2. The base of this transistor is fed from the emitter of transistor TR1 and so the sawtooth waveform is sampled at its negative peaks. The sampled waveform, Fig. 52.4(c), consists of a series of positive-going pulses during the field signal period.

Test Procedure

The GE2/552 is tested as part of an Automatic Monitor Major.

Bibliography

1. Towers, T. D.; *Pumps and Schmitts*: Wireless World, Aug. 1964.
2. Newell, A. F., and Tourtel, P. A.; *Transistor Backlash Circuits*: Mullard Technical Communications, Vol. 6, No. 51.
3. *Studio Engineering for Sound Broadcasting*, Chapter 7.8: Iliffe.
4. *Emitter-timed Monostable Circuit*: Mullard Technical Communications, Vol. 5, No. 49, July 1961.

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See overleaf for Fig. 52.4

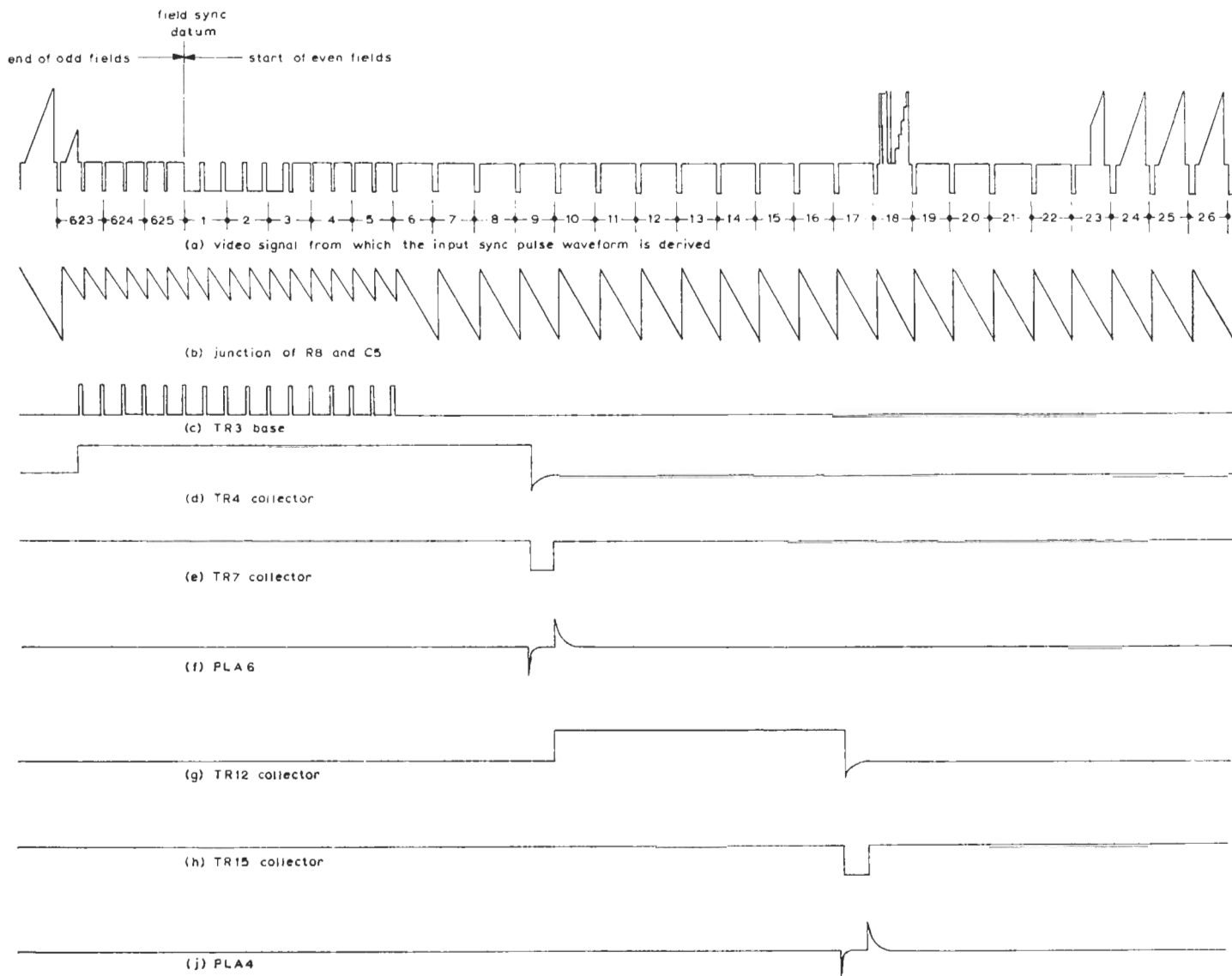


Fig. 52.4 Field-Frequency Waveforms in the GE2/552

52.4