

AUXILIARY WAVEFORM AND TIMING PULSE GENERATOR GE2M/547

Introduction

The GE2/547 provides:

- (a) Feeds of sync pulses and delayed trigger pulses which are used to initiate the generation of the component parts of an augmented pulse-and-bar waveform^{1,2,3}.
- (b) A 50-Hz waveform. (This consists of a 50- μ s bar which is switched alternately on and off at 10-ms intervals.)
- (c) A line-frequency sawtooth waveform.

If it is required to produce a fully-blanked waveform, inputs of mixed-sync and mixed-blanking pulses are required. The unit is designed to work on the 625-line standard but can be used for 405 lines or 525 lines with minor component changes.

The unit consists of two printed boards mounted on a CH1/26 chassis with index-peg positions 2 and

41; the smaller board is separately coded as a GE2/548 Timing Pulse Generator. A three-position switch and a two-position switch are mounted on the front panel of the unit. The three-position switch selects the output of the unit and is labelled *Pulse and Bar, 50 c/s and Sawtooth*. The two-position switch selects syncs and is labelled *Int Syncs, Ext. Syncs*. Power supplies of +12 volts at 40 mA and -12 volts at 100 mA are required⁴.

Circuit Description

A block diagram of the complete unit (GE2/547 and GE2/548) is shown in Fig. 1 and a circuit diagram is shown in Fig. 2.

50-Hz Generator

When switch SB is in either the 50 c/s or the

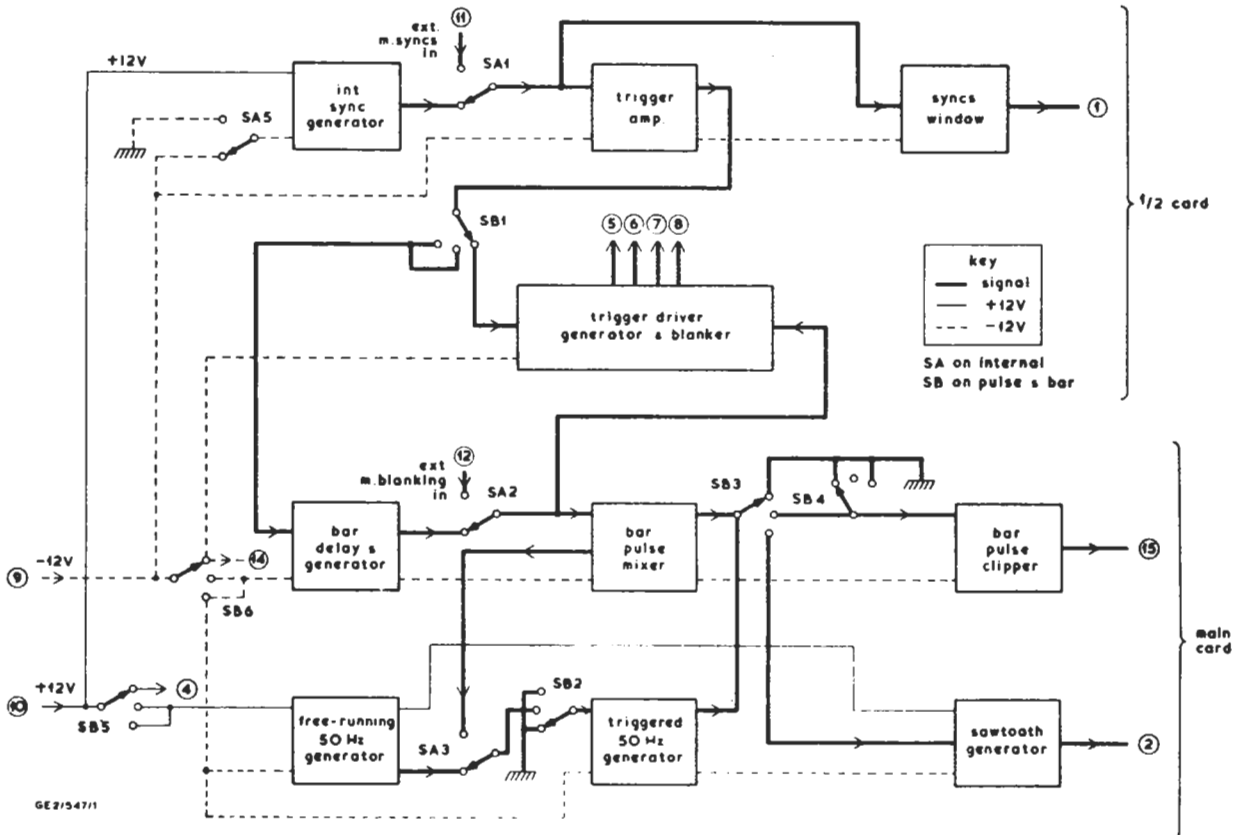


Fig. 1 Block Diagram of the GE2M/547

Sawtooth positions positive-going trigger pulses (derived from TR3 in the GE2/548 sub-unit) are applied, via diode D1, to the base of TR1. Transistors TR1 and TR2 form a monostable multivibrator (see Television Engineering, Volume 3) which triggers on the positive spikes of the applied waveform; the duration of the unstable state is about $12\mu\text{s}$. The output of the stage is taken from the collector of TR2 and applied, via a differentiating network and buffer-inverter stage TR3, to the base of TR4.

Transistors TR4 and TR5 form a monostable multivibrator which functions as a bar generator and changes state when a positive-going pulse is applied to the base of TR4. The output of the stage is a positive-going pulse with a duration of $50\mu\text{s}$. This is taken from the collector of TR5 and applied via switch SA2 to the base of TR6.

Transistors TR6 and TR7 form an emitter-coupled pair. Two outputs, of opposite polarity, are taken from the stage. The positive-going output is taken from the collector of TR7 and applied, via switch SB3, either to the bar-pulse clipper or to the sawtooth generator. The negative-going output is used to trigger the 50-Hz generator.

When SA is in the *Ext Syncs* position the negative-going signal developed at the collector of TR6 is applied, via a differentiating circuit, to the base of emitter-follower TR12. Transistor TR12 drives a monostable multivibrator formed by transistors TR13 and TR14. The output from the collector of TR14 is added to the signal present at the collector of TR7 so that the bar signal is switched on and off at 10-ms intervals.

Transistors TR8 and TR9 form a slicer or window stage which clips both positive and negative-going extremities of the signal so that, across the collector load of TR9, a positive-going waveform appears; the amplitude of this waveform is approx 2 volts and the duration is $50\mu\text{s}$. This constitutes the bar output of the unit.

When SA is in the *Int Syncs* position the pulses

which drive the triggered 50-Hz generator are derived from a free-running relaxation oscillator formed by transistors TR10 and TR11. The pulses appearing at the collector of TR11 are applied to TR12 via switches SA3 and SB2.

Sawtooth Generator

When SB is in the *Sawtooth* position, the signal developed at the collector of TR7 is applied, via SB3, to the base of emitter-follower TR15. This stage, which is biased almost to cut-off in the absence of a signal, is driven into conduction by the negative-going portions of the signal and the pulses appearing at the emitter cut off diode D7. When D7 is cut off transistor TR16 bottoms and C18 is discharged. Transistors TR17 to TR19 form a bootstrap sawtooth-generator and during each active line-period, i.e. when TR16 is cut off, C18 charges linearly to provide a sawtooth waveform. (For a description of sawtooth generators see Television Engineering, Volume 3.) The output of the generator is developed at the collector of TR19 and consists of a line-frequency sawtooth with an amplitude of 0.7 volts.

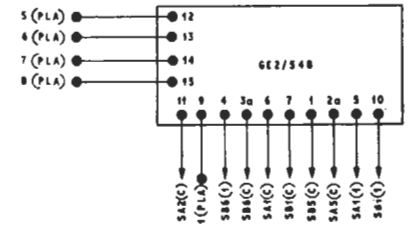
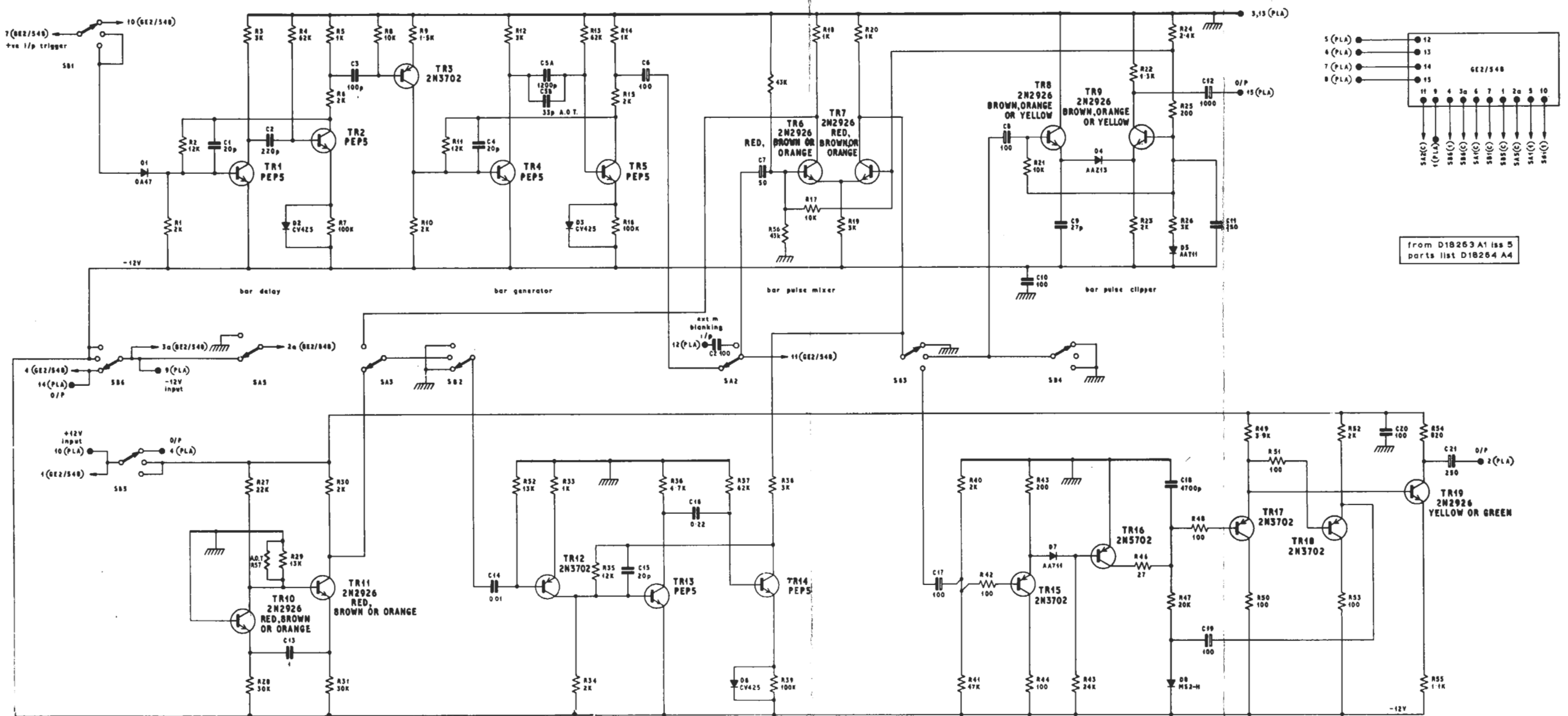
Pulse and Bar

When SB is in the *Pulse and Bar* position trigger pulses are not applied to TR1 but to the trigger generator circuits of the GE2/548 sub-unit, via switch SB1. Other banks of switch SB earth the input to the triggered 50-Hz generator, the positive-going output of the bar-pulse mixer stage and the input of the bar-pulse clipper stage.

References to Typical Associated Equipment

1. Augmented Pulse and Bar Generator GE2M/543.
2. Pulse and Bar Generators GE4/516 Series.
3. Modulated Pulse Generator OS2/516, Instruction V.9.
4. Stabilised Power Supplier PS2/13F, Instruction G.2.

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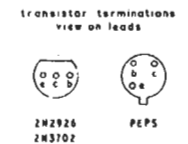
from D18263 A1 iss 5
parts list D18264 A4

free running 50 Hz generator

triggered 50 Hz generator

sawtooth generator

Note: switch bank SA1 shown on circuit GE2/548



GE2/547/2T