

SECTION 9

IRIS PULSE GENERATOR GE2/509

Introduction

The GE2/509 accepts line and field frequency sawtooth waveforms, a key blanking waveform and a d.c. line-control input: it produces an iris keying waveform (see PA1/512, Instruction V.13).

The GE2/509 is constructed on a CH1/12A chassis with index peg positions 5 and 23.

Circuit Description

The circuit of the GE2/509, given in Fig. 9.1, has two similar input chains; one for the line frequency input and the other for the field frequency input. The line frequency sawtooth is integrated by a circuit, similar to that described for the GE1/511, which includes transistors TR1 to TR3. Transistor TR4 is an additional emitter follower output stage for the integrator circuit. The line frequency parabola is clamped at the base of transistor TR7 to a reference potential fed via the emitter follower TR5. Differentiated line clamp pulses at the base of an npn transistor TR6 effectively short circuit the base of transistor TR7 to the emitter of transistor TR5. The reference potential is derived from the field frequency input chain and consists of a field-frequency parabola clamped to the base potential of transistor TR13. Clamping the line-frequency parabola to the field-frequency parabola mixes these waveforms and also removes most of the noise generated in the integrator circuits.

The mixed parabolic waveform is fed to a stage which includes transistors TR15 to TR18. Transistor TR15 is a common emitter amplifier whose gain can be varied by means of a variable resistor RV1. Transistor TR17, in the emitter circuit of transistor TR15, conducts and so alters the gain of transistor TR15 at a point on its transfer characteristic determined by potential divider RV2.

The d.c. input to the GE2/509 on pin 5 is fed via an emitter follower TR18 to the base of transistor TR16. The current through this transistor is diverted from the collector load of transistor TR15 (resistors R28 and R29). The output waveform

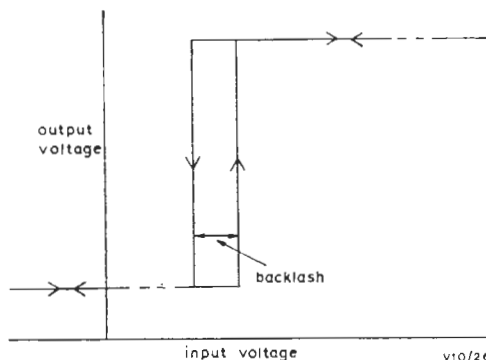


Fig. 9.2 Input-output Characteristic of a Schmitt Trigger Circuit

of transistor TR15 is clipped by diodes D1 and D2 and fed to a Schmitt trigger circuit^{1,2} which includes transistors TR19 and TR20. This circuit has an input-output characteristic of the type shown in Fig. 9.2. Adjustment of capacitor C10 and potential divider RV3 reduces the amount of backlash and improves the symmetry of the circle which is generated by the output of the GE2/509 used as a keying waveform.

Blanking pulses on the base of transistor TR21 cause it to cut off. This effectively switches resistor R43 in parallel with the collector load R38 of transistor TR20 via diode D3. Between pulses transistor TR21 is bottomed and diode D3 is cut off.

Relay contact RL7-1 connects the parabolic waveform to the output of the GE2/509. The Generator also contains part of a diode matrix (see PA1/512, Instruction V.13).

Test Procedure

The GE2/509 is tested as part of its parent unit.

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.

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See page 9.3 for Fig. 9.1

