

PILOT TONE GENERATOR GE1/546

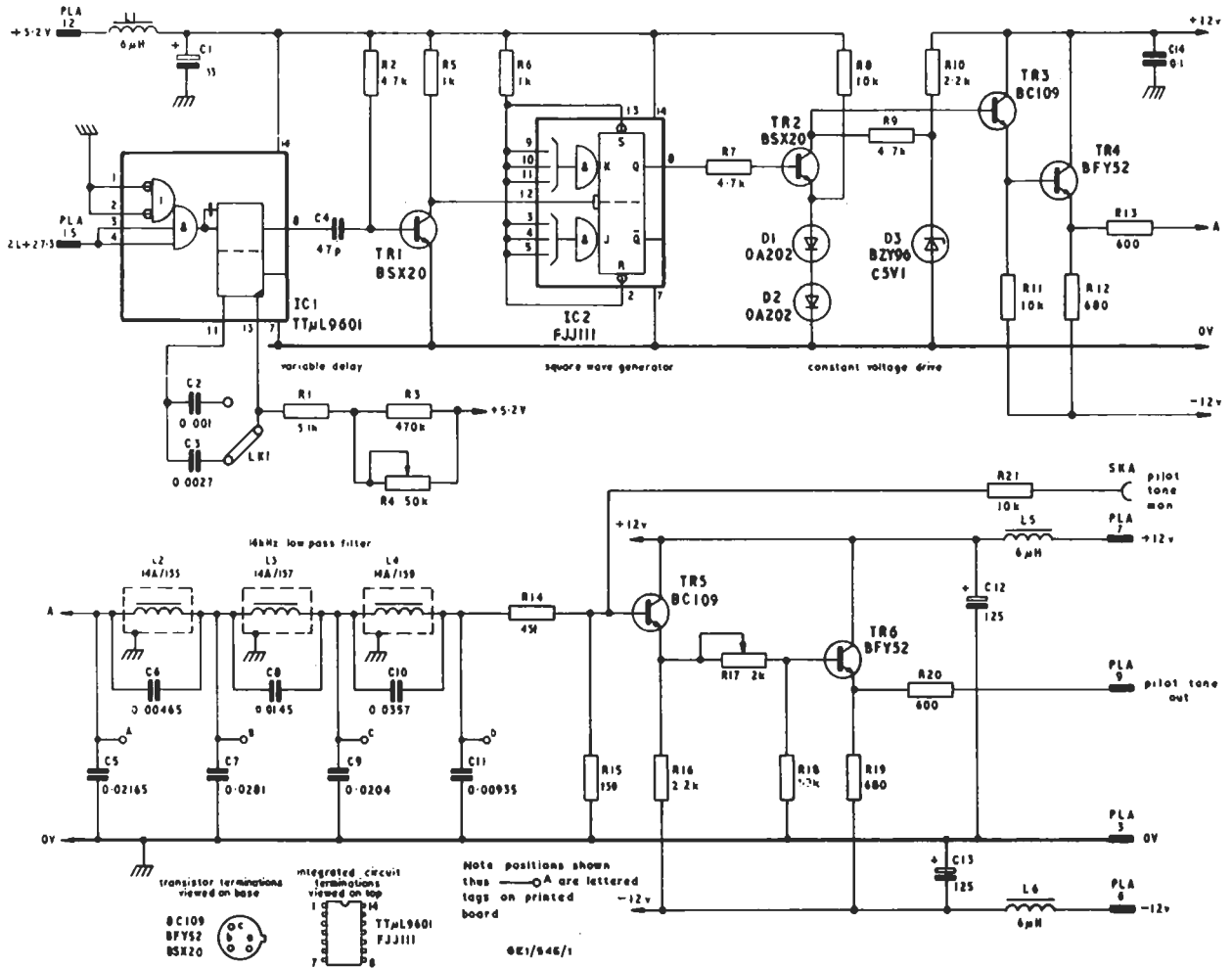


Fig. 1 Circuit of the Pilot-tone Generator GE1/546

Introduction

The GE1/546 pilot tone generator forms part of a sound-in-syncs coder¹. The unit accepts a twice-line-frequency trigger pulse (625-line standard) and produces a line-frequency sine-wave output which is locked to the trigger input. The phase of the output signal is adjustable over a range of 170 degrees with respect to the input signal.

The unit is constructed on a CH1/2A chassis with index pegs 29 and 40. Power supplies at +12V, -12V and +5V are required.

General Specification

| | |
|---------------------------|--|
| <i>Input Signal</i> | Twice-line-frequency positive-going pulses (logic level 1) with duration of 2.35 μ s (normally obtained from UN23/522) |
| <i>Output Signal</i> | line-frequency sine-wave at -25 dB w.r.t. 1 mW |
| <i>Output Impedance</i> | 600 ohms |
| <i>Power Requirements</i> | 50 mA at +12V 55 mA at -12V 36 mA at +5V |

Circuit Description

A circuit diagram of the GE1/546 is given in Fig. 1. The incoming trigger pulses are applied to a re-triggerable monostable stage, IC1, which is capable of operating with a 95% duty cycle. The delay introduced by IC1 is finely controlled by adjustment of R4 and coarsely controlled by means of LK1 which can be used to select either of the two timing capacitors. When the delay provided by IC1 is varied, the phase of the subsequently-generated signal is varied also; thus R4 functions as a phase control.

The output of IC1 is differentiated and the negative-going trailing edge cuts off TR1 and so provides a positive-going clock pulse for IC2. Integrated circuit IC2 is a divide-by-two bistable stage which produces a 15.625-kHz square wave. This

square wave is applied to transistor TR2 which functions as a constant voltage driver. The signal developed at the collector of TR2 has its negative excursion held at +1.2V by diodes D1 and D2 and its positive excursion held at 5.1V by zener diode D3.

The output from the constant-voltage stage is fed via emitter-followers TR3 and TR4 to a 16-kHz low-pass filter in which the square-wave signal is turned into a sine-wave. The rejection figure for out-of-band signal components is approximately 60 dB. From the filter the signal is fed to the output of the unit via emitter-followers TR5 and TR6. Variable resistor R17 functions as a gain control with a range of ± 3 dB.

Maintenance and Alignment

The following adjustments form part of the line-up procedure for the coder audio equipment as a whole.

Note that, once a unit has been adjusted for a particular coder, it must be used only in that coder. If any of the coder audio units (AM6/9, FL1/36, GE1/546) are changed, the audio section of the coder must be re-aligned.

Low-pass Filter

Inductors L2, L3 and L4 do not need routine adjustment but, as a guide to fault finding, the resonance frequency of each inductor can be checked by applying the output of an oscillator to the inductor input and monitoring the output with a suitable detector. The injection and monitoring points, together with the frequencies used, are given in Table 1.

TABLE 1

| <i>Inject at Tag</i> | <i>Frequency</i> | <i>Tune for Min. Response</i> | <i>Detect at Tag</i> |
|----------------------|------------------|-------------------------------|----------------------|
| A | 28.8 kHz | L1 | B |
| B | 19.1 kHz | L2 | C |
| C | 17.3 kHz | L3 | D |

References to Typical Associated Equipment

1. Sound-in-syncs Coder CD2M/505