PULSE GENERATOR GE2/577

Introduction

The GE2/577 forms part of a stabilising amplifier[1] and is used as a replacement for the Pulse Generator GE2/519 in certain studio video mixers[2]. The unit accepts a syncs-and-colour-burst signal and produces:

(a) amplified positive-going sync pulses
(b) wide clamping pulses
(c) narrow clamping pulses

The unit is constructed on a CH1/12A chassis with index-peg positions 4 and 25. Power supplies at +12 volts, +4 volts and −4 volts are required.

General Specification

Input	300 mV p−p syncs-and-burst (labelled colour black level)
Input Impedance	high w.r.t. 75 ohms
Outputs	positive-going syncs at 12V p−p two feeds of negative-going clamp pulses at 1·8 V p−p
Power Consumption	65 mA at +12 V 1 mA at −4 V 2 mA at −4 V

Circuit Description

The circuit of the GE2/577, together with the waveforms and voltages present at various points in circuit, is shown in Fig.1.

The incoming syncs-and-colour-burst signal is applied to amplifier-inverter stage TR1; the tuned circuit connected to the emitter of TR1 resonates at sub-carrier frequency and so the burst component of the signal developed at the collector is attenuated. From the collector of TR1 the signal is fed, via emitter-follower stage TR7, to the base of TR2. Transistors TR2 and TR3 form an emitter-coupled window or slicer stage in which both positive and negative extremities of the signal are clipped and the residual burst component removed. Two outputs are taken from TR3; the signal appearing at the collector constitutes the sync pulse output of the unit, and the signal appearing at the junction of R11 and R12 is fed to TR4.

Emitter-follower TR4 drives a series-connected delay network comprising delay lines DN1 and DN2. Each line has a delay of 1·0 μs and is tapped at 0·2 μs intervals; the output of DN2 is connected to the +4 volt line and is thus short-circuited to signals. A positive-going voltage pulse transmitted along the delay line is inverted in polarity on reaching the short circuit and reflected back to the emitter of TR4, which it reaches 4 μs after the start of the pulse. Thus the waveform at the emitter of TR4 consists of a 4-μs positive-going pulse followed after a short period by a 4-μs negative-going pulse.

A signal is taken from the 0·8-μs tap delay line and fed to the base of TR6. This signal starts 0·8 μs later than, and finishes 0·8 μs sooner than, the signal at the emitter of TR4; consequently signals with a pulse duration of 2·4 μs are produced at the emitter of TR6. These constitute the wide clamp pulse output of the unit. Only the negative-going pulse is used, the residual positive-going pulse is removed in the subsequent unit[3].

A second signal, taken from a tap 0·4 μs further along the delay network, is applied to the base of TR5; the pulses at this point have a duration of 1·6 μs. The pulses produced at the emitter of TR5 constitute the narrow clamp pulse output of the unit. As before, the residual positive-going pulse is removed in the subsequent unit.

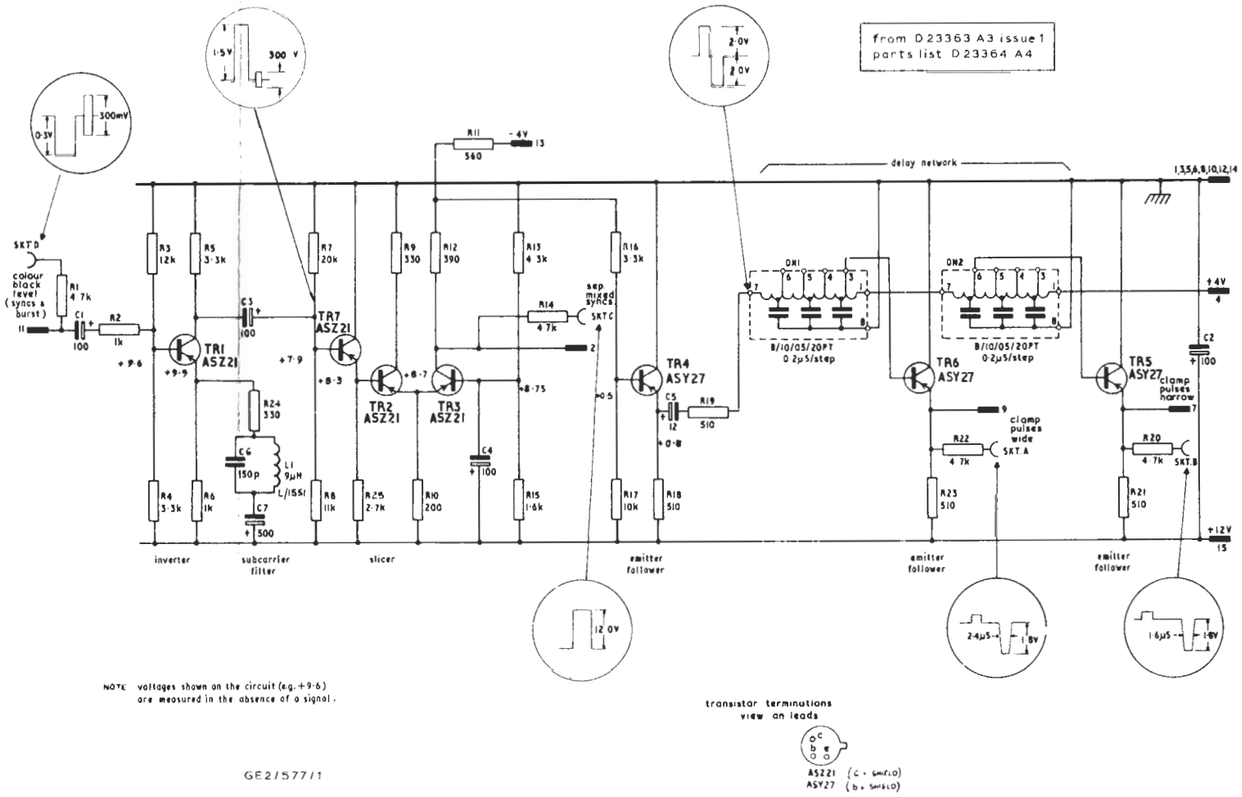

Fig. 1. Circuit of the GE2/577

Maintenance and Alignment

See parent stabilising amplifier[1]. The waveforms shown in Fig. 1 represent conditions when the unit is functioning as part of a stabilising amplifier.

References to Typical Associated Equipment

1. Sync Pulse Stabilising Amplifier AM18/513D
2. Studio Video Mixers EP5/502B and EP5/503B
3. Error Signal Amplifier AM3/503.