

BURST LOCKED OSCILLATOR (GENLOCK) OS1/519

Introduction

The OS1/519 accepts a colour video signal and burst gating pulses¹; it provides an output of colour subcarrier signal locked in frequency to the frequency of the colour burst of the video signal and locked in phase to the mean phase of the colour burst. It also produces a 7.8-kHz pulse waveform related to the V-axis switch signal. Without colour burst on the video input, the output frequency of the oscillator is approximately that of colour subcarrier.

The OS1/519 is electrically identical to the OS1/513, except for a changed component in the phase discriminator. This reduces the pull-in rate to enable the oscillator to be used in the BBC fast-genlock system².

The oscillator is constructed on a CH1/12A chassis with index-peg positions 63 and 64.

General Specification**Inputs**

Composite video or syncs and burst	burst component must be 0.3 V p-p ± 6 dB
Gating pulses	6 V p-p positive-going

Outputs

Subcarrier	two at 1 V p-p into 75 ohms one at 2 V p-p into high impedance
7.8-kHz signal	0.5 V p-p in phase with V-axis switch

Impedances

Input	high w.r.t. 75 ohms
Outputs	
(a) subcarrier	two at 75 ohms one high w.r.t. 75 ohms
(b) 7.8-kHz signal	high

Output Phase

input mean burst phase
 $\pm 0.5^\circ$ jitter

Output Frequency

Locked	same as burst input
Unlocked	4.433 618 7 MHz ± 5 Hz

Power Input

+6 V, 90 mA, d.c.
-6 V, 95 mA, d.c.
12 V, 400 mA, a.c. or d.c.

Temperature Range

0°C to 45°C ambient

Weight

0.6 kg (1 lb 4 oz)

Index Pegs

63 and 64

General Description

A block diagram of the OS1/519 is given in Fig. 1 and some of the waveforms to be found are given in Fig. 2. The colour video signal is fed to a burst-gating circuit via a high-pass filter which removes the luminance component. The output of this gate comprises amplified colour bursts which are fed to a phase discriminator. The discriminator, also fed with the output of a reactance-controlled crystal oscillator, produces a d.c. output related to the difference between the phase of the oscillator output and the mean phase of the colour bursts.

Circuit Description

The circuit diagram of the OS1/519 is given in Fig. 4 on page 5. The high-pass filter inductor L1 is adjusted during manufacture to adjust the phase of the colour bursts and is then locked in position.

Burst-gating pulses at the base of transistor TR2 are d.c.-restored via the base-emitter junction diode so that this transistor is cut off except during the pulses.

The 6-volt p-p colour bursts at the collector of transistor TR2 are auto-transformed into a signal 20 volts p-p across inductor L2. Capacitor C10 provides neutralisation for transistor TR2.

A simplified circuit of the phase discriminator is given in Fig. 3. The signal voltages in approximate phase quadrature v_a and v_b are added vectorially to produce voltages $(v_a - v_b)$ and $-(v_a + v_b)$ which are applied to the two diode-capacitor combinations. The rectified voltages V_d and V_e are proportional to the amplitudes of the signal voltages $(v_a - v_b)$ and $(v_a + v_b)$. The difference voltage $V_d - V_e$ is approximately proportional to the sine of the quadrature phase-error angle α .

The output voltage of the discriminator V_f , which controls the frequency of the oscillator, differs from $V_d - V_e$ by half the difference voltage $(V_d - V_e)$.

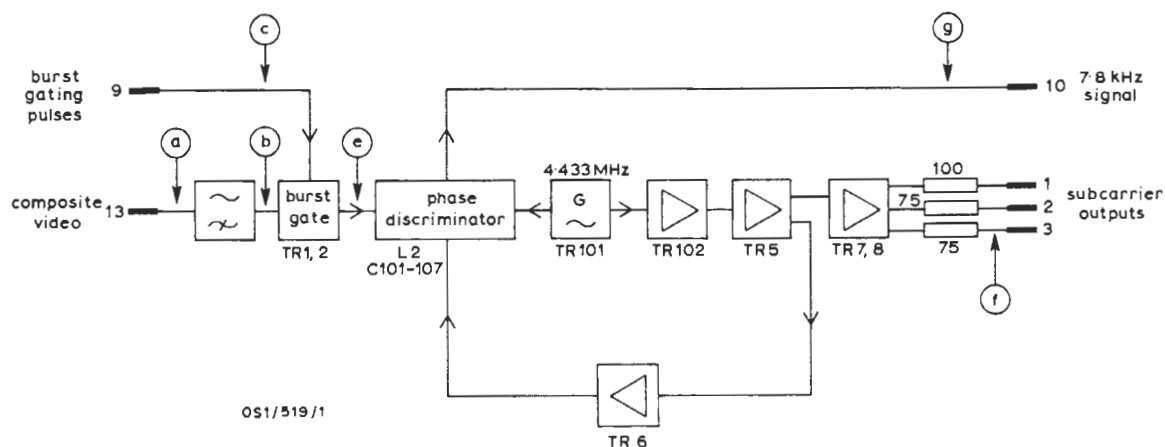


Fig. 1. Block Diagram of the Burst-locked Oscillator OS1/519

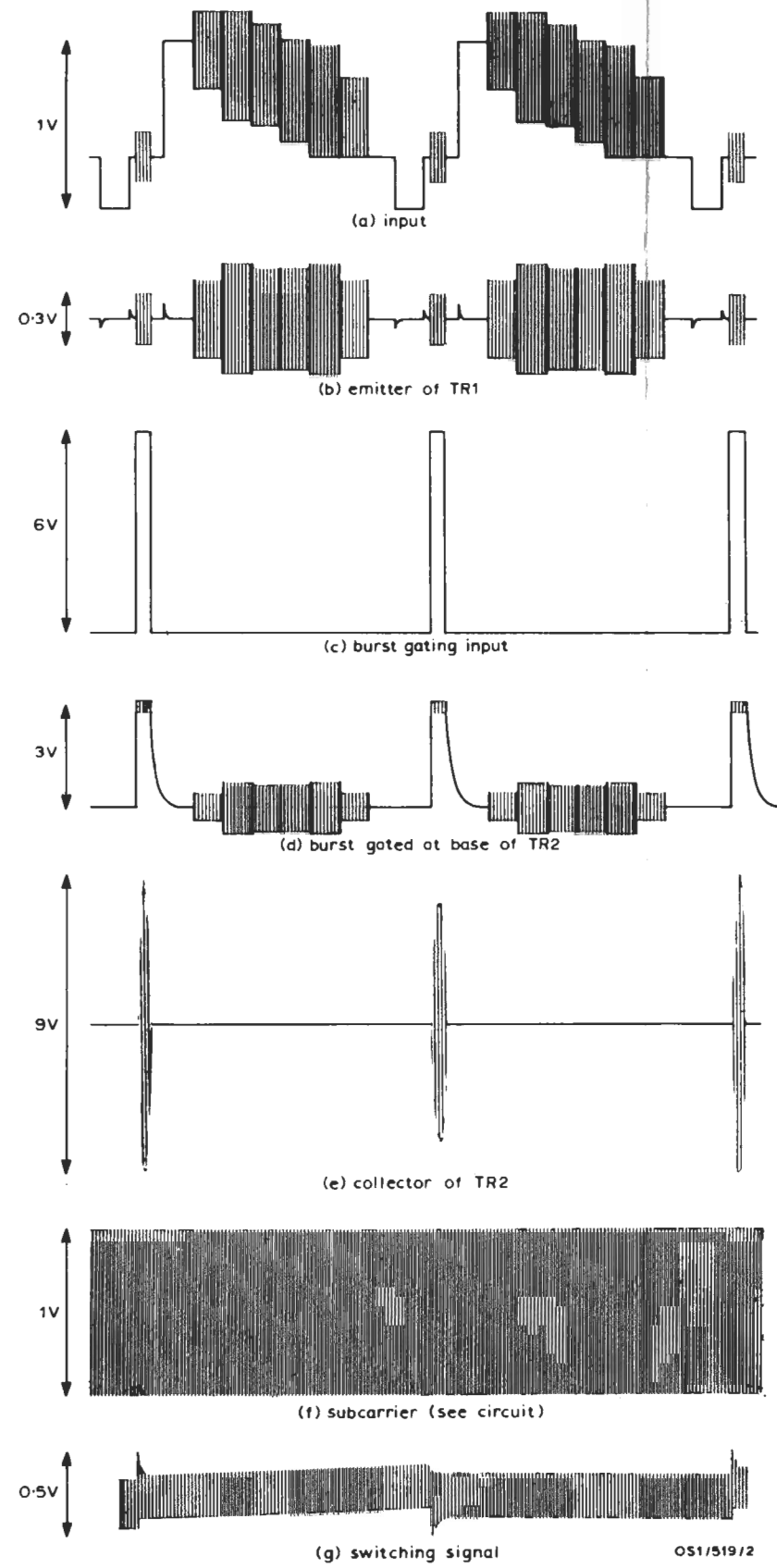


Fig. 2. Waveforms in the OS1/519

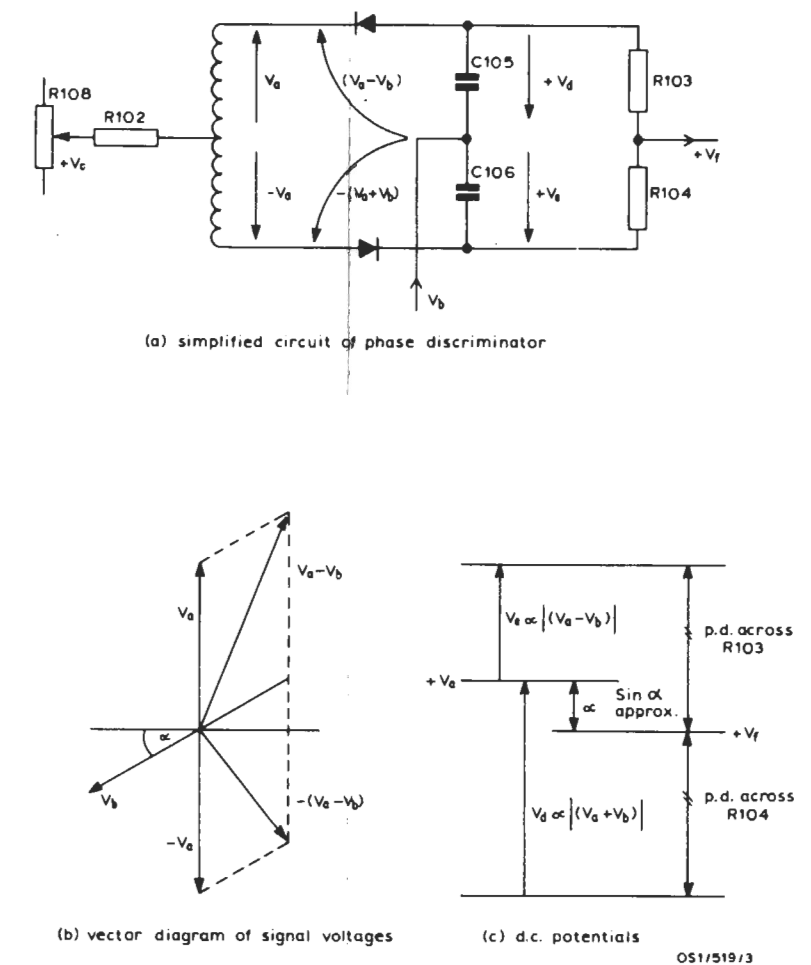


Fig. 3. Simplified Circuit of the Phase Discriminator in the OS1/519

OS1/519/3

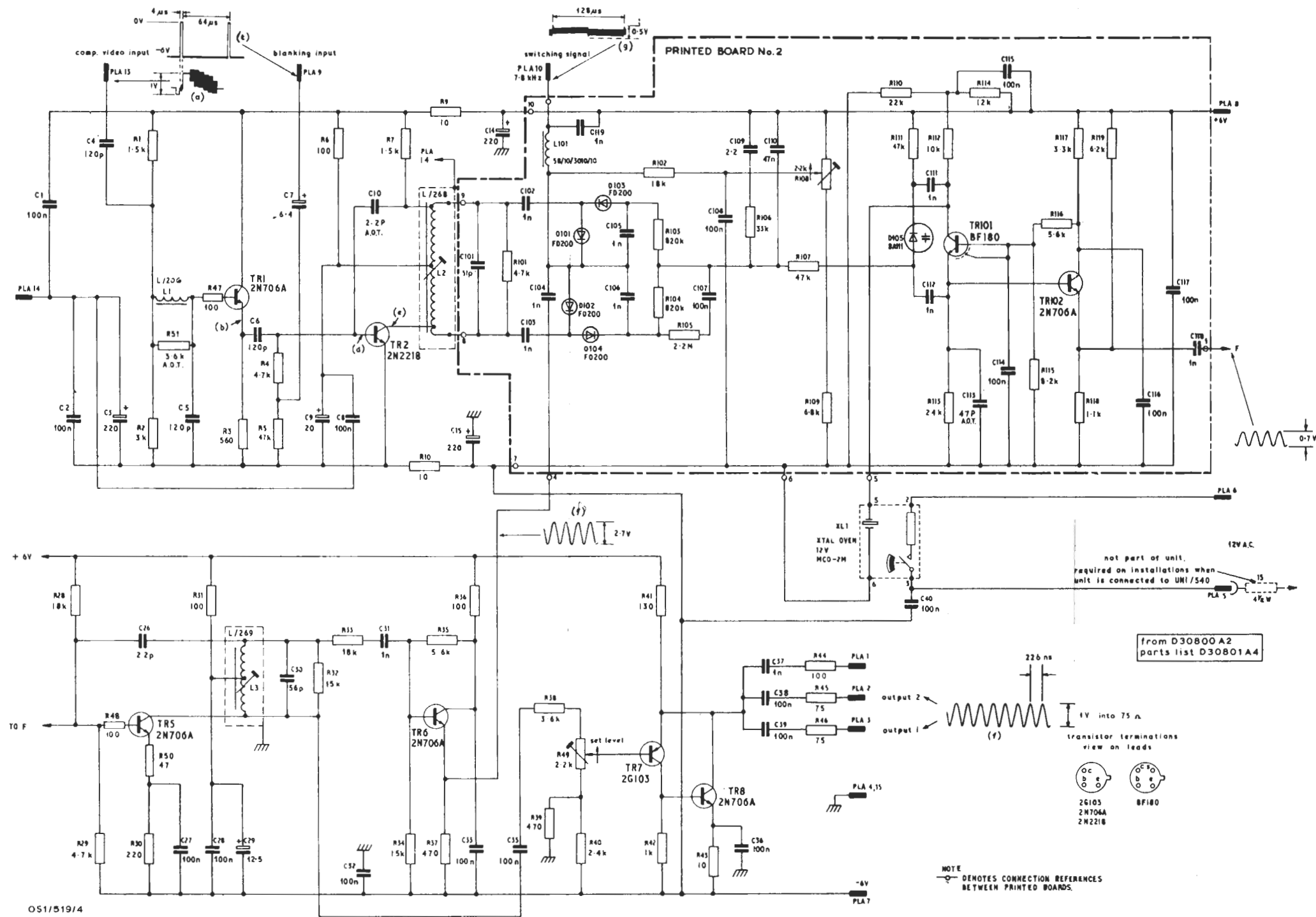


Fig. 4. Circuit of the Burst-locked Oscillator OS1/519