SYNC SOURCE SWITCHES UN9/511 AND UN9/511A

Introduction

This unit consists of three identical solid-state switches. It accepts two video signals and one mixed-sync signal (mixed-sync plus colour burst for the UN9/511A) and selects one of the three input signals as an output. The switches are operated by means of positive-going trigger pulses; a separate trigger input is used to turn on each switch and this pulse is also used, via a switch-latch circuit, to turn off any switch which previously was on.

Both versions of the unit are used in stabilising amplifiers[1,2]; the UN9/511 for monochrome operation and the UN9/511A for colour operation. The differences between the two versions are dealt with in the circuit description. Both versions are constructed on CH1/12A chassis with index-peg positions 3 and 18. Each switch is mounted on a separate printed-wiring card. Power supplies at +12 volts are required[3,4].

General Specification

See parent unit[1,2].

Circuit Description

UN9/511

The circuit of a complete UN9/511 is given in Fig. 1 and the circuit of one of the switch cards (Card 1) is shown in Fig. 2. The component numbers for cards 2 and 3 are given in Fig. 2.

The two video input signals are fed via emitter-follower stages to their respective switch cards. The sync input signal is fed via an emitter-follower to a tapped delay line, which enables the timing of mixed-syncs with respect to the video signals to be varied in 0·2 μs steps over a range of 1 μs. The delayed sync pulses are then applied via a further emitter-follower stage to switch-card 1.

The signal path from input to output of switch-card 1 is through diodes MR2 and MR4. When the potential at the junction of these diodes is higher than that at the input and output terminals of the card, the diodes conduct and the switch is closed. When the potential at the junction of the diodes is lower than that at the input and output terminals, the diodes are reverse-biased and the switch is open. The state of the diode switch is determined by the condition of transistor TR7. When TR7 is cut off, diode MR3 in its collector circuit conducts, the junction of the switch diodes is connected to a potential divider consisting of R26, R28 and RV1, and the switch is open. When TR7 conducts, MR3 is reverse-biased and the switch is closed.

Transistors TR6 and TR7 form a bistable multivibrator (see Television Engineering, Vol. 3). If, initially, TR7 is cut off and TR6 is conducting then a positive-going trigger pulse applied to the *Trigger Mixed Syncs* input passes through MR6, cuts off TR6 and drives TR7 into conduction, thus closing the diode switch. The trigger pulse is applied also, via MR9 and the switch-latch line, to cards 2 and 3 to open the switches on these cards. Additionally, this pulse is fed via MR8 and R29 to the base of TR7. When it reaches TR7 the pulse is not of sufficient amplitude to cancel the input pulse and so affect the state of the multivibrator, but it might upset the correct functioning of the switch and so a correction circuit is provided to prevent this. The correction circuit consists of MR7 and R22 connected in series between the trigger-pulse input to the card and the common emitter connection of the two transistors. When an attenuated positive-going pulse is applied to the base of TR7 the current through emitter resistor R25 falls, but the current flow through R22 is added to the current through R25 to restore it to its previous value, thus the emitter potential is maintained at the correct value.

If a trigger pulse applied to the card is of low amplitude it may close the switch but, because of the attenuation provided by the resistors equivalent to R29 on the other cards, fail to open the previously selected switch. If this happens MR5 and R21, together with the equivalent diode and resistor on the previously selected switch, are connected via the common diode-catch line to transistor TR4 (see Fig. 1). The impedance provided by the two forward-biased diode-resistor networks in parallel is sufficiently low to drive TR4 into conduction and a positive-going pulse is developed at the collector of the transistor and fed along the common switch-latch line to the switches. This pulse opens the previously-selected switch and so rectifies the fault condition.

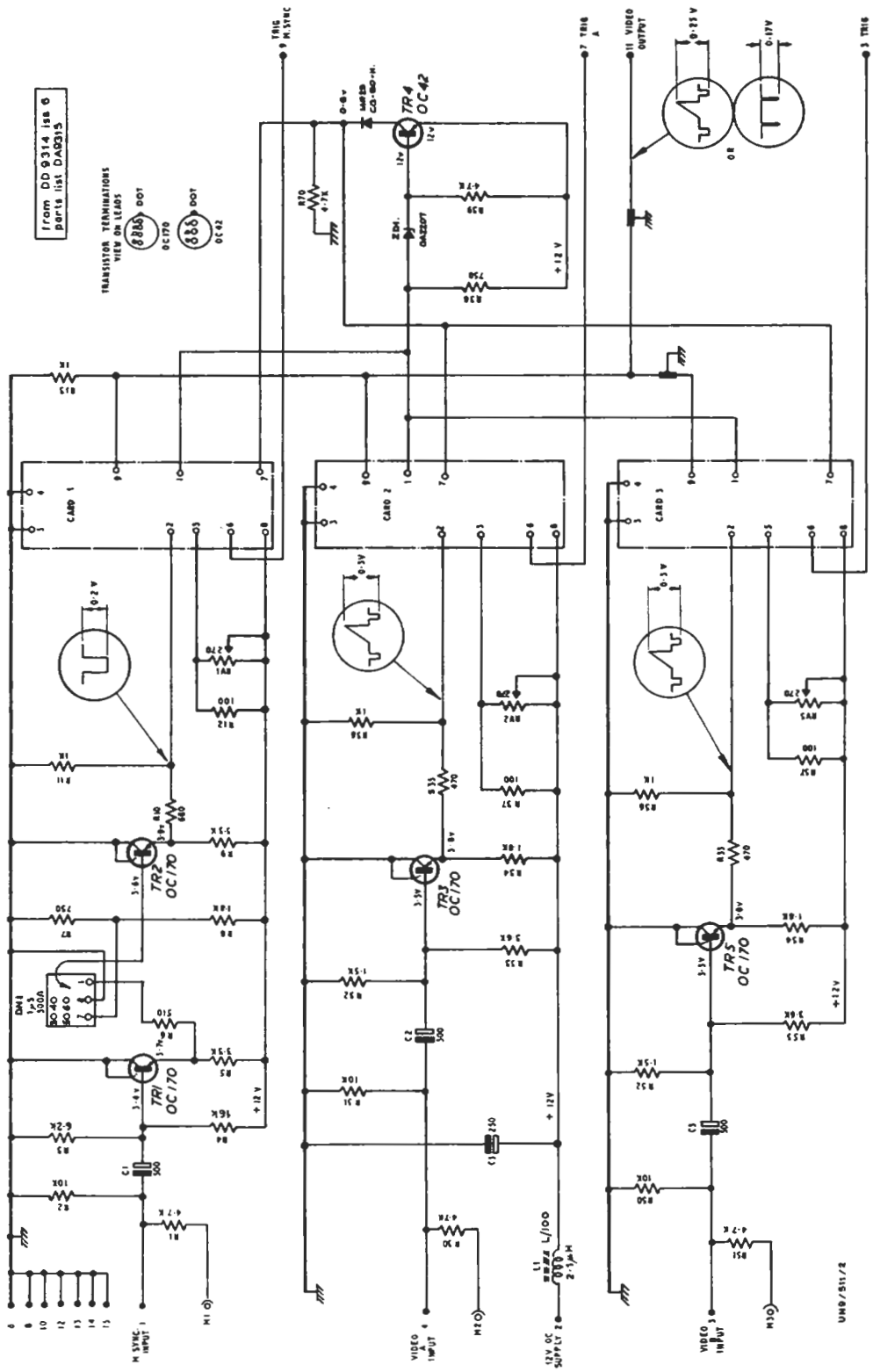

Fig. 1 Circuit of the Sync-source Switch UN9/511

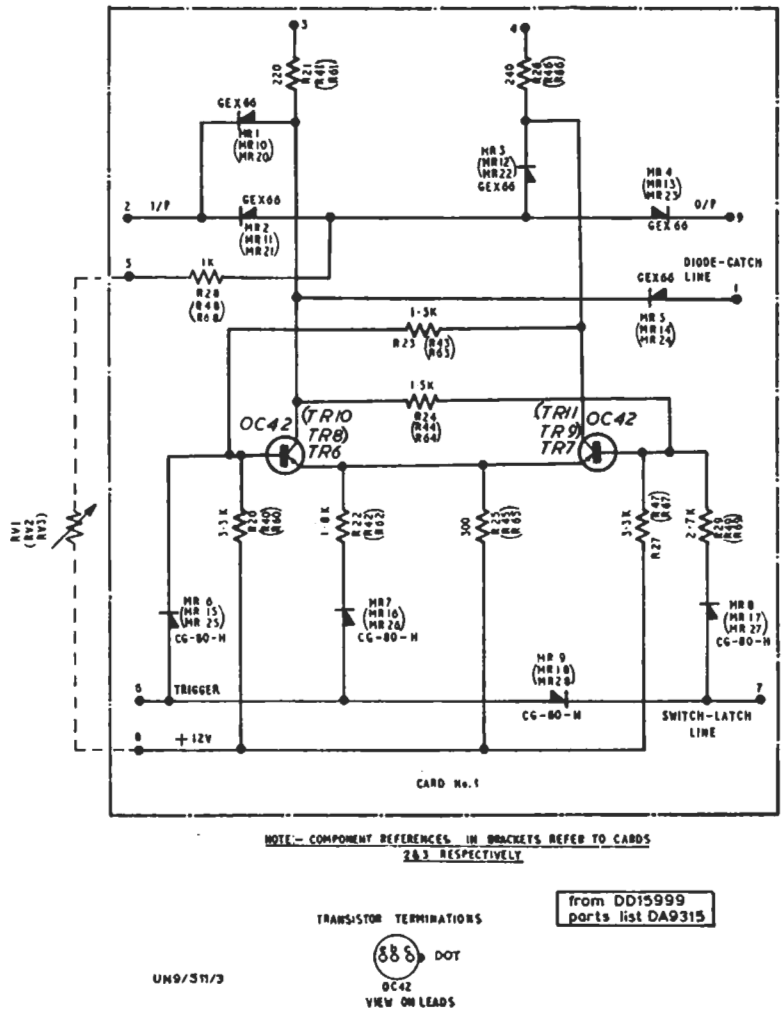

Fig. 2 Circuit of Switch Card 1

UN9/511A

The circuit diagram of a complete UN9/511A is given on Fig. 3, the switch cards are identical to those shown in Fig. 2. The UN9/511A does not have a delay line in the sync-input circuit, thus all three input circuits are identical.

Maintenance and Alignment

See parent unit.

References to Typical Associated Equipment

1. Sync Pulse Stabilising Amplifier AM18/503.
2. Sync Pulse Stabilising Amplifier AM18/503A.
3. Stabilised Power Supplier PS2/10.
4. Stabilised Power Supplier PS2/57.

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See overleaf for Fig. 3.

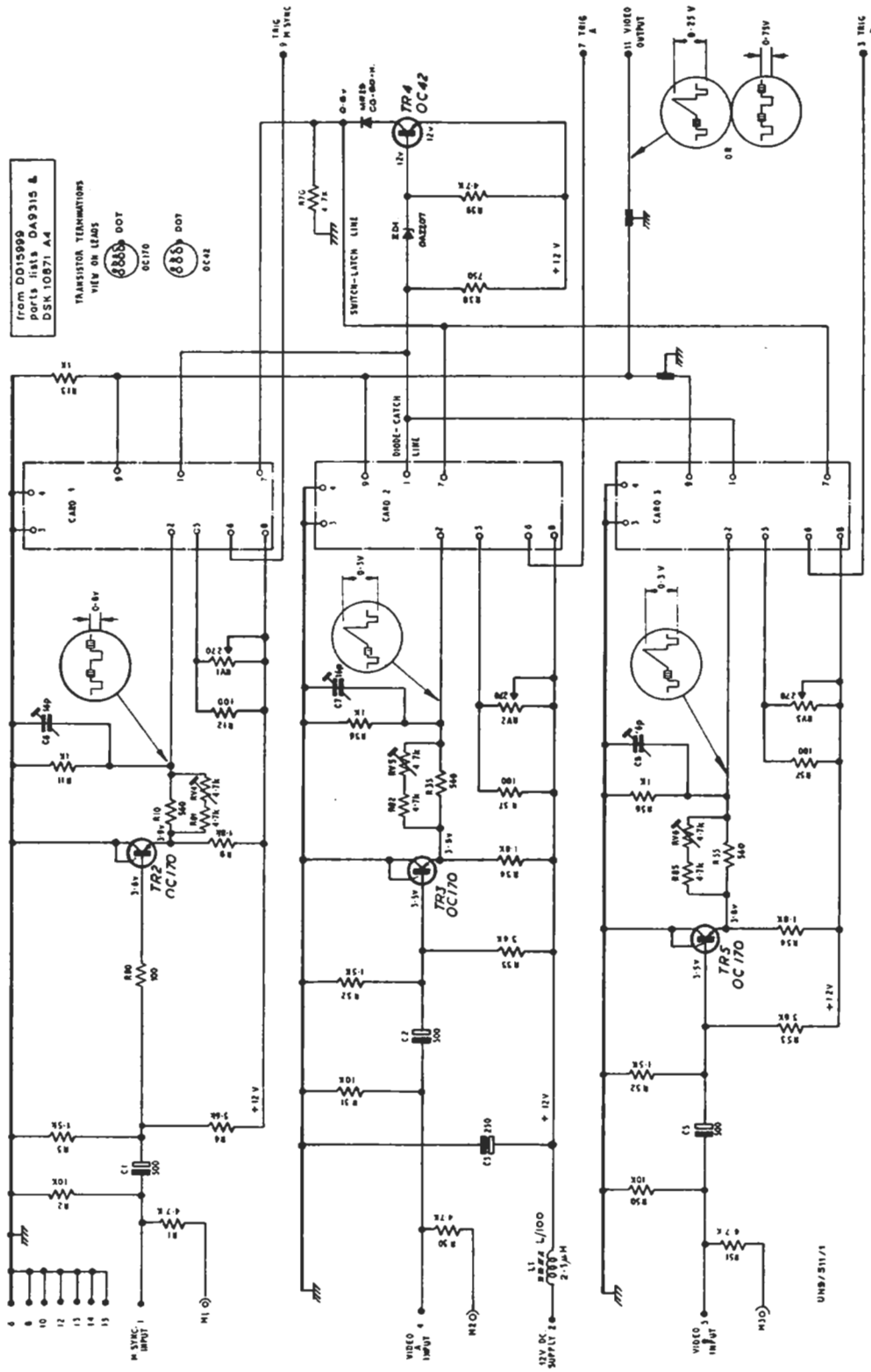

Fig. 3 Circuit of the Sync-source Switch UN9/511A