

PAL ANALYSIS UNIT UN17/517

Introduction

The UN17/517 accepts the following pulse inputs:

- (a) local field-frequency pulses
- (b) local picture-frequency pulses
- (c) local V-axis switch
- (d) remote line-frequency pulses
- (e) remote picture-frequency pulses
- (f) remote PAL colour burst

It modifies pulses (a), (b) and (e) from a two-field monochrome sequence to the appropriate four-field PAL sequence. The modified pulse outputs are re-labelled respectively:

- (g) picture half-time pulses
- (h) local PAL-picture pulses
- (i) remote PAL-picture pulses.

When remote PAL colour burst is not present, pulses (a), (b), and (e) are passed unchanged.

The unit requires d.c. supplies of +12 volts and -12 volts at about 50 mA each.

The UN17/517, which includes a bistable unit type UN9/528 on an individual printed wiring board, is constructed on a single board and is accommodated in a CH1/12A chassis using index pegs 8 and 41.

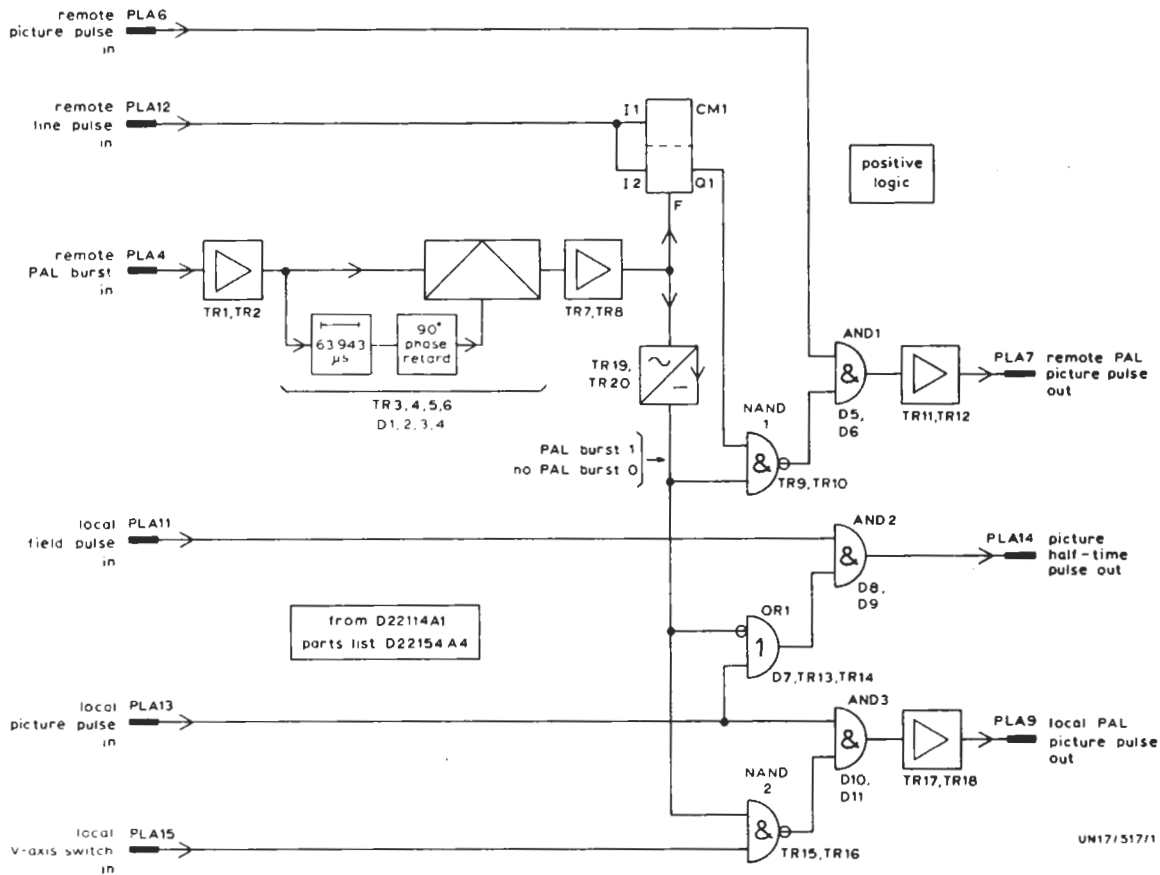


Fig. 1. Block Diagram of the PAL Analysis Unit UN17/517

Circuit Description

A block diagram of the UN17/517 is given in Fig.1 and the circuit diagram in Fig. 2. This description is broken down into the four functions of the unit.

Remote V-axis Switch Regeneration and Detection

PAL colour burst (f) is amplified from 0.3 volts to 5 volts p-p by amplifier TR1, TR2. Two outputs are taken from the emitter of TR2, one direct to the burst phase-demodulator via C3 and TR6 and the second via TR3 to the 64-μs delay line DL1.

The output burst from DL1 is phase-advanced by 90° in the network R12, 13, 14, C6 to provide an overall delay through DL1 and the phase-shift network of 283.75 cycles of PAL subcarrier. Delayed and undelayed bursts are fed to the burst phase-demodulator the output from which is a positive pulse for a 135° burst and a negative pulse for a 225° burst. (See also Instruction P.1.)

The burst-phase pulses are amplified by TR7, TR8. One output is passed to the detector TR19, TR20 which gives a logic 1 output (0 volts) when PAL burst phase pulses are detected and a logic 0 (-6 volts) when there is no PAL burst input.

The second output of burst phase pulses from TR8 emitter supplies the *Feedback* (F) input of CM1 which

is a Bistable Unit type UN9/528. Remote line-frequency pulses feed I₁ and I₂ inputs. Initially a logic 1 pulse (about 2 V positive) on the F input resets the Q₁ output to logic 0. Then the subsequent transitions of the Q₁ output are determined by the positive-going edges of remote line pulses (coincident with leading edges of remote syncs) at the I₁ and I₂ inputs. Thus the Q₁ output is remote V-axis switch with polarity reset in the correct sense by the positive burst-phase pulse and with every transition coincident with the leading edge of remote syncs.

Local Field-pulse Gating

The gate OR 1 gives two used output signals. When PAL burst is not detected the output is a logic 1, thus allowing AND 2 to pass the local field pulses (a) without change. If PAL burst is detected OR 1 passes the second used output of local picture pulses to AND 2; the output from that gate is thus a train of pulses with the same sequence as the local picture pulses, namely picture half-time pulses (g).

Local Picture-pulse Gating

Alternate local picture pulses occurring in each field 4 are gated out by AND 3 because the V-axis switch waveform is positive during line 314 of field 4.

When PAL burst is not detected the corresponding level 1 output from NAND 2 allows local picture pulses to pass unchanged.

Remote Picture-pulse Gating

Incoming remote picture pulses (e) are gated by NAND 1 and AND 1 in the same manner as for the local picture pulses.

Remote V-axis switch is fed from the Q₁ output of CM1 to NOR 1. The output of remote PAL picture pulses (i) is amplified by the compound emitter-follower TR11, TR12.

Alignment

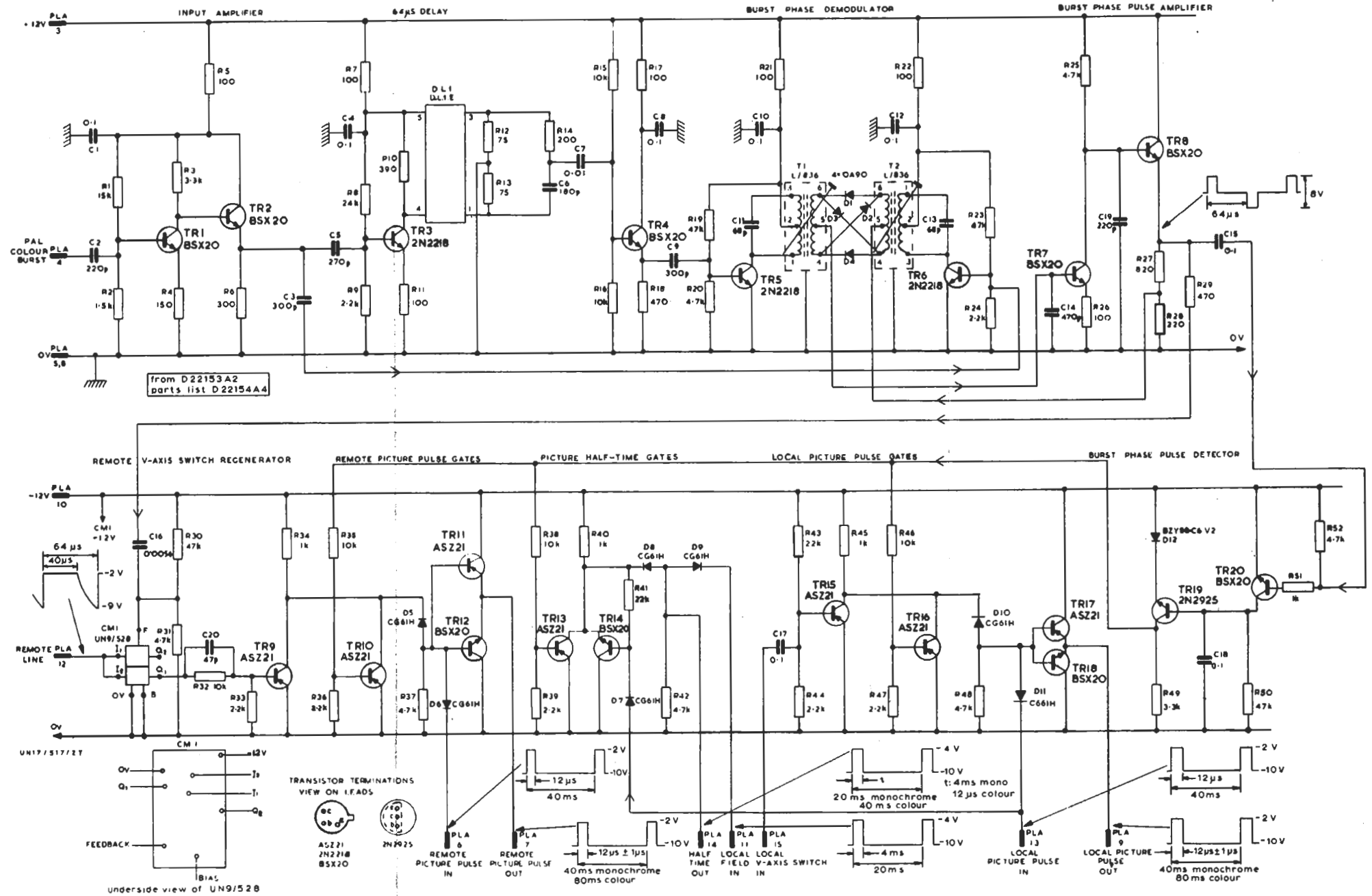
The unit can be tested completely only as part of its parent unit¹ but if necessary, preliminary testing to check detection of the burst phase pulse and regeneration of the remote V-axis switch can be carried out as follows.

Equipment and Signals Required

- Oscilloscope with bandwidth greater than 6 MHz
- +12 volts d.c. and -12 volts d.c., 75-mA power suppliers
- 36-ohm resistor
- Avo 8
- 75-ohm source of PAL colour burst, 0.3 V p-p terminated, as supplied by a UN1/589 Sync Separator from a colour video signal
- 15-way Painton socket.

Procedure

1. Connect power and PAL colour burst to the unit as indicated by the circuit diagram in Fig.2. The burst feed should be unterminated and have an amplitude of 0.6 volts p-p.
2. Connect the probe to TR5 collector. The burst amplitude should be about 10 volts p-p. (The core of T1 is adjusted for the first maximum from the top of the can.)
3. Transfer the probe to TR6 collector. The burst amplitude should be about 28 volts p-p. (The core of T2 is adjusted for the first maximum from the top of the can.)
4. Transfer the probe to pin F on CM1. If necessary trim the cores of T1 and T2 to give a positive pulse amplitude in excess of 2.5 volts.
5. Transfer the probe to TR19 collector which should be at 0 volts. Remove the burst input. The voltage should change to -6 volts ±1 volt.
6. Connect the 36-ohm resistor across the burst input. Repeat test 4 and check that the positive pulse amplitude is greater than 1.8 volts.
7. Repeat test 5.



Typical Associated Equipment

1. Error Signal Generators (PAL) GE1L/532, GE1M/540
2. Binary Unit UN9/528
3. Sync Process Unit UN17/505
4. Comparator Unit UN17/506.

Fig. 2. Circuit Diagram of the UN17/517