SECTION 4

PULSE-BAR DETECTOR UN20/504

Introduction

The UN20/504, as used in an Automatic Monitor Major MN2M/506 (see Instruction V.11), gauges the pulse-to-bar ratio of the gated portion of a test-line signal and releases a relay if the ratio differs from unity by more than 15 per cent.

The UN20/504 is constructed on a CH1/12A chassis with index peg positions 19 and 30.

Circuit Description

The circuit of the UN20/504 is given on page 4.2. Fig. 4.2 shows a block diagram of a UN20/504. Transistors TR1 to TR3 form part of a negative-feedback amplifier with a voltage gain of 30 dB. The output of the amplifier is d.c. restored on the positive extremity of the bar portion of the waveform by transistor TR4 which behaves as a low impedance diode. Inductor L1 slows up the restoration so that it does not take place on the pulse portion of the waveform.

The restored waveform is passed through a differentiating circuit R16 and C7 which has a relatively long time constant (about 10μs). The negative-going trailing edge of the bar switches on two bistable Schmitt trigger circuits TR5 to TR8 (see GE2/552, Instruction V.10) via diodes D1 and D4. The Schmitt circuits may be switched off again almost immediately by the pulse, fed via diodes D2 and D3, so that the output signal of the Schmitt circuits has a small mark-to-space ratio. If the amplitude of the pulse is insufficient to switch off the Schmitt circuits they are switched off by the leading edge of the bar in the following field thus giving a large mark-to-space ratio. Although the Schmitt circuits are switched on and off once per field, the wide variation in their output waveform mark-to-space ratio enables them to be considered as either on or off the whole time. The switching-off pulse to the second Schmitt circuit which includes transistors TR7 and TR8 is attenuated by resistors R17, R28 and R29. The behaviour of the Schmitt circuits with variations in the pulse-to-bar ratio is summarised in the table below:

Pulse/bar	*1st Schmitt*	*2nd Schmitt*	*Relay RLA*
Low	on	on	released
Normal ± 15%	off	on	operated
High	off	off	released

Test Procedure

The UN20/504 is tested as part of an Automatic Monitor Major.

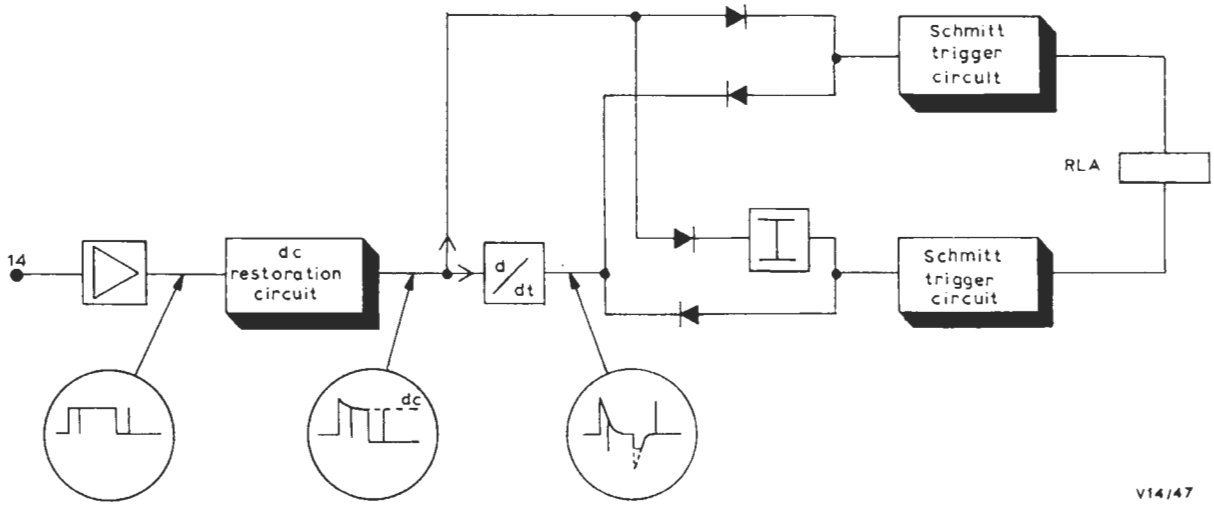

Fig. 4.2 Block Diagram of the UN20/504

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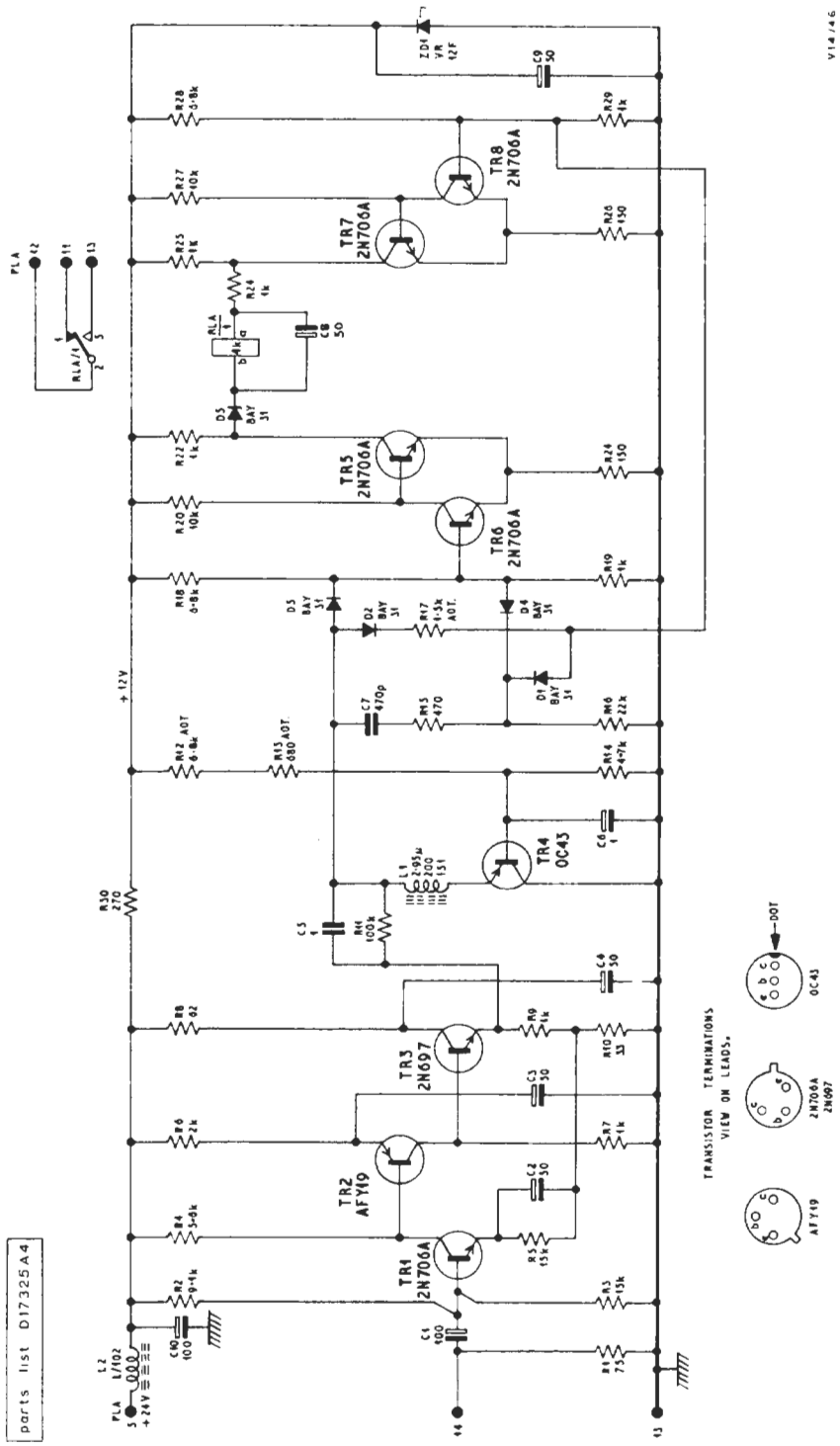

Fig. 4.1 Circuit of the UN20/504