SECTION 1

PROCESSING AND COMPARATOR UNIT UN20/501

Introduction

The UN20/501 compares the amplitudes and timing of two separate but nominally identical composite video signals, known as the *reference signal* (R channel) and the *compared signal* (C channel) and produces an error signal.

The input signals are d.c. restored and, after processing, are compared in a differential amplifier. Any difference signal appears at two outputs one of which is balanced and the other unbalanced with respect to earth. Test sockets are provided on the front panel.

The unit is housed in a CH1/13A chassis with index peg positions 15 and 29. It forms part of the Television Automatic Monitor (Transmitter) MN2M/505 which is described in Instruction V.11.

General Description

The circuit is given in Fig. 1.1. The input signals are d.c. restored with respect to the tips of the sync pulses by the diodes D1 and D5. A common reference potential, set by the zener diode D2, is used for both circuits. This is desirable because direct coupling is used and any change of potential in one circuit would unbalance the channels.

After d.c. restoration the signals pass through emitter-follower Darlington pairs to the diodes D3 and D4. As the signal is all positive-going at these points, C3 and C7 tend to charge to the white-level potential. The forward time constant of the diode circuits is short but the reverse time constant is approximately equal to the time of half a line. The short forward time constant is essential as sensitivity is required to any impulsive noise which may arrive with the compared signal. The longer reverse time constant extends the effect of the noise pulses and the integrators C4-R6 and C6-R19 remove the fast leading edges. This process of deriving low-frequency signals from the higher frequency components of the input signal effectively neutralises any unbalance due to timing differences between the signals.

From the integrators the signals are passed to the inputs of the long tail pair differential amplifier. The tail of the amplifier is formed by TR7 acting as a constant current generator. Thus a high common impedance is provided for the signals with the advantage of a low d.c. voltage drop across it. R13 is the balancing control.

The output from the amplifier, which consists only of any out-of-balance signal occurring between the two channels, is taken from the emitter-followers TR4 and TR10 to two rectifier bridges. These bridges act as switches such that, whatever the polarity of any error signal between TR4 and TR10, the base of TR14 is always driven negatively and terminal 10 of output 2 always positively. Zener diode D14, limits the signal across the emitter/base junction of TR14.

The meter in parallel with output 2 gives an indication whenever an unbalance exists between the channels.

The output from the differential amplifier can be inspected with an oscilloscope connected to test points on the front panel.

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See page 1.3 for Fig. 1.1.

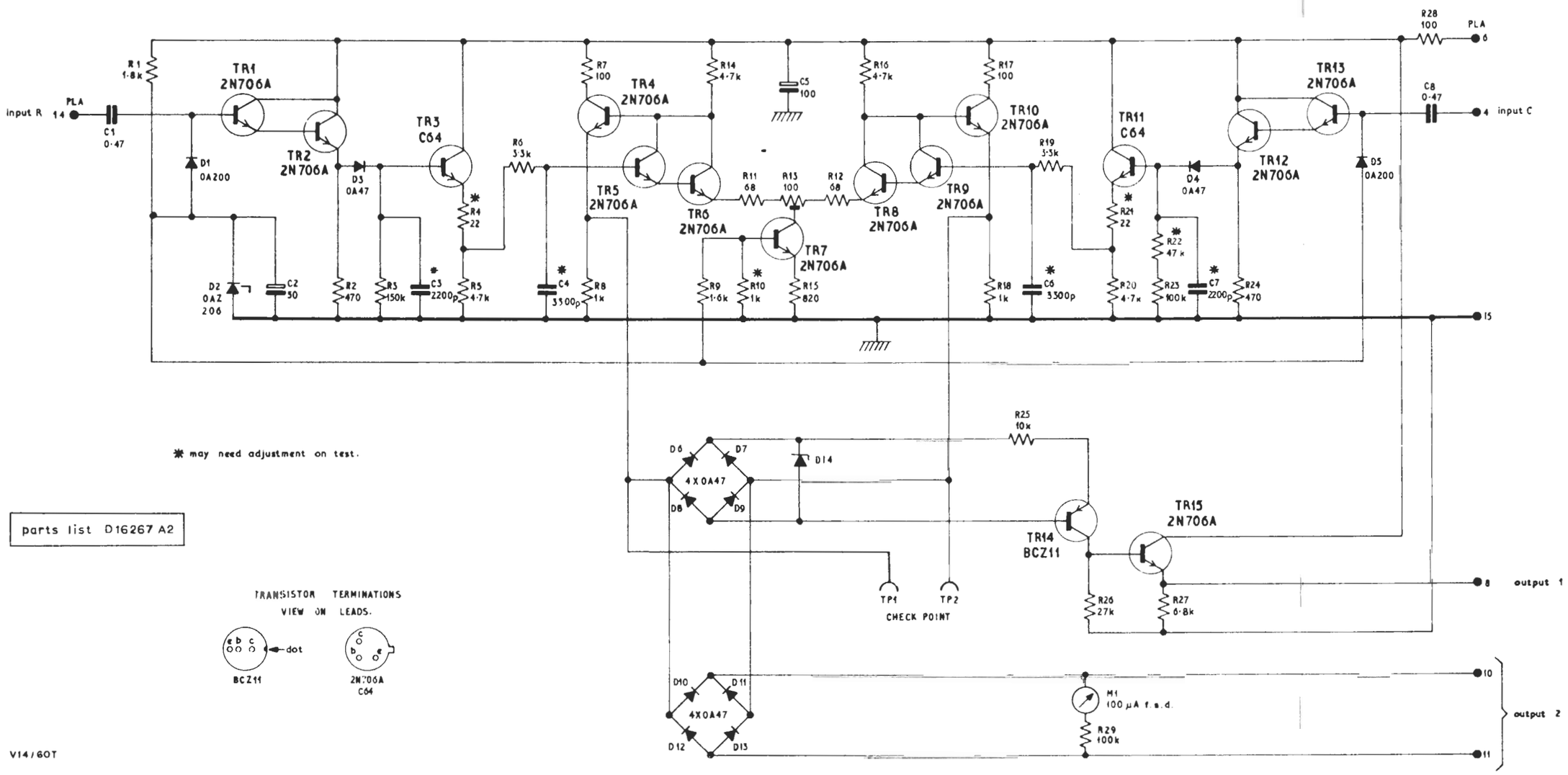

Fig. 1.1 Circuit of the UN20·501

✱ may need adjustment on test.

parts list D16267 A2

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