

SECTION 17

PICTURE DISCRIMINATOR UN1/517

Introduction

The Picture Discriminator UN1/517 is used in Picture Synchronisers UN1/528 and UN1/522. It accepts feeds of picture-frequency pulses from two sources and produces a voltage which is used to control a twice-line-frequency external oscillator during picture phasing.

Picture-frequency pulses from a slaved sync separator are used to generate a square-wave signal; this is sampled by picture-frequency pulses from a reference sync separator. The pulses produced by sampling are integrated by a capacitor to give the control voltage. To avoid any loss of interlace, owing to sampling at picture repetition rate, a second sampling circuit is provided to operate on alternate fields.

The Discriminator is constructed on a CH1/12A chassis with index peg positions 7 and 18.

Circuit Description

The picture-frequency input pulses to the Discriminator, whose circuit is shown in Fig. 17.1 are given in Table 1:

TABLE 1

Source	Field	Polarity	Input pin No.
From slaved	odd	positive	12
sync separator	even	negative	14
From reference	odd	positive	11
sync separator	even	negative	13

The negative-going pulses from the reference sync separator are inverted by transistor TR7. The remainder of the sampling circuits are similar to that described in Section 18. Capacitors C1 and C2 provide a source of charge for the output integrating capacitor C3. The zener diodes ZD1 and ZD2 limit the negative voltage excursion at the collectors of transistors TR2 and TR4 ensuring that transistors TR5 and TR6 remain cut-off except during the sampling pulses. Application of a negative voltage to pin 7 short-circuits the sampling pulses.

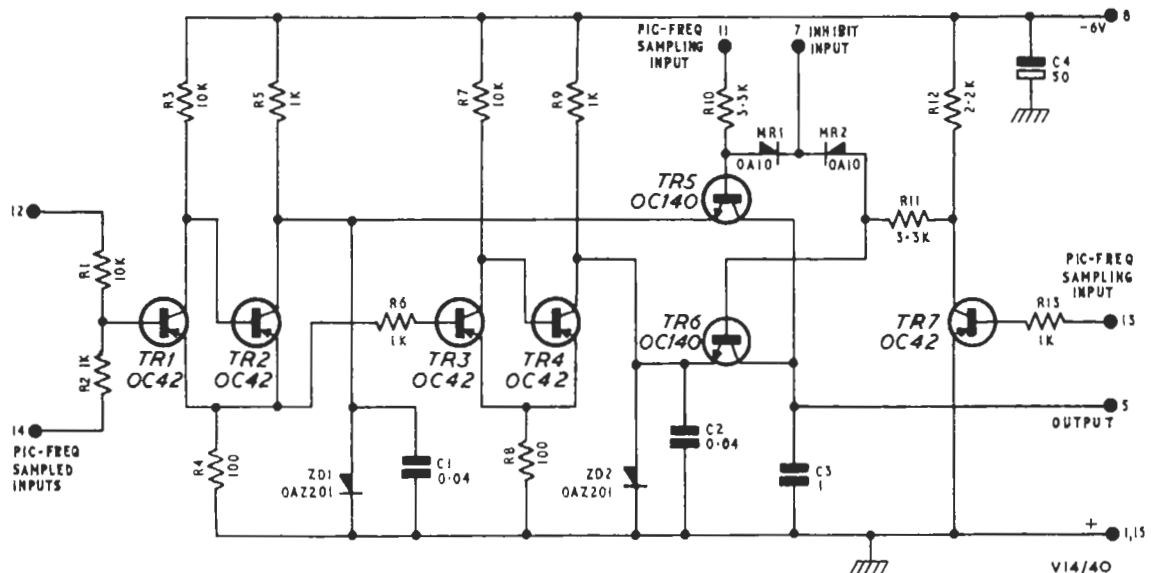


Fig. 17.1 Circuit of the Picture Discriminator UN1/517

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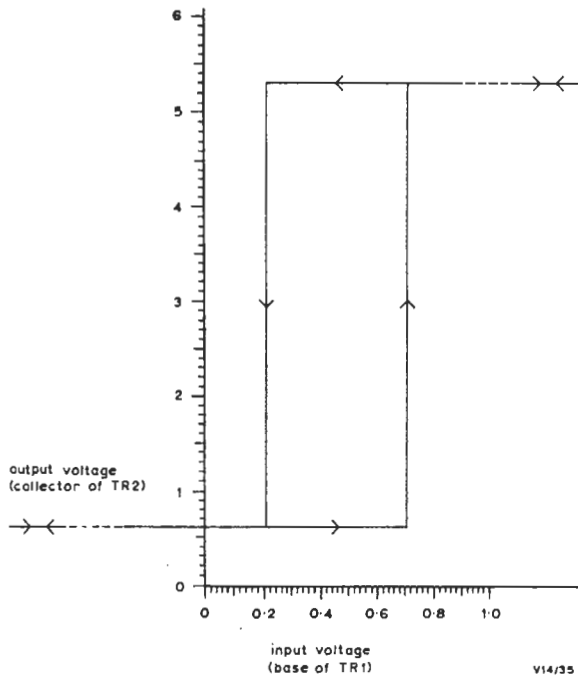


Fig. 17.2 Input-output Characteristic of the Bistable Schmitt Trigger Circuit used in the UNI/517

Transistors TR1 and TR2 and transistors TR3 and TR4 form two bistable Schmitt trigger circuits^{1,2} which have an input-output characteristic of the type shown in Fig. 17.2. Resistors R1 and R2 are chosen to bias the first trigger circuit in the backlash region so that the alternate-field input pulses, from the slaved sync separator, produce a picture-frequency square-wave at the collector of transistor TR2. Because of the inequality of the collector loads of transistors TR1 and TR2, an inverted picture-frequency waveform appears across the emitter resistor R4. This inverted waveform has an overshoot on its negative-going edge due to the discharge of capacitor C1 which enables it to trigger the second Schmitt circuit.

Test Procedure

The Picture Discriminator is tested as part of the Picture Synchronisers described in Section 28.

Bibliography

1. Towers, T. D.; Pumps and Schmitts: Wireless World, Aug., 1964.
2. Newell, A. F. and Tourtel, P. A.; Transistor Backlash Circuits: Mullard Technical Communications, Vol. 6, No. 51.

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