

INPUT CHANGE DETECTOR UNIT UN20/5

Introduction

The UN20/5 has six inputs and seven outputs. Normally each input is earthed and each output is held at about two volts positive. If any input is open-circuited, the associated output rises to about 12 volts positive. The seventh output, also normally at two volts positive, rises to about 12 volts positive if one or more of the six inputs is open-circuited.

Each output can be reset from 12 volts positive to two volts positive by the application of an external earth connection to the appropriate output pin. The action of each detector can be inhibited by connecting six volts negative from an external source to a muting terminal.

The unit is built on a BBC/I.S.E.P. printed wiring board fitted with a 25-pin output connector. Sections 3, 5 and 9 are removed from the coding device on the connector.

Circuit Description (Fig. 1)

The unit comprises six identical detector circuits. Circuit A is shown in Fig. 1, and component numbers given in the following description refer to that circuit.

Normally the input to the detector, pin 24, is earthed. Transistors TR1 and TR2 form a conventional bistable circuit; TR1 is cut off and TR2 is conducting. Transistor TR3 is also cut off. The output, at pin 12, is held at about two volts positive.

If the input is open circuited, TR3 conducts, and the output rises to about 12 volts positive. The detector can be reset by making a momentary earth connection to pin 12. A negative step is applied to the base of transistor TR2 via D6 and C2. The bistable changes state, transistor TR1 conducts and TR2 is cut off. The potential at TR1 collector falls and this is transferred via diodes D2 and D6 to the output at pin 12 which reverts to a potential of two volts positive.

The action of the detector can be inhibited by applying a six-volt negative potential at pin 4. This prevents the potential at the output from rising and overrides any attempt to reset the bistable.

Each detector circuit has a second output. These outputs are connected together to pin 18. Normally the output is held at about two volts positive. If any input is raised above earth potential, the output at pin 18 rises to 12 volts positive.

Maintenance

As an aid to fault-finding, so-called 'node numbers' are printed on the wiring board and are shown also on the circuit diagram. Table 1 shows typical voltages measured at these points.

Measurements should be made with pins 19 to 25 connected together and all the muting-inputs open-circuited.

Test Schedule

Apparatus Required

Six-volt and 12-volt Power Suppliers
Avometer Model 8

Test Procedure

1. Apply power to the UN20/5.
2. Connect pins 19 to 24 to pin 25.
3. Check that pins 12 and 8 are at two volts positive.
4. Open-circuit pin 19.
5. Check that pin 12 is at about 12 volts positive. Reconnect pin 19 to pin 25.
6. Repeat step 4 for each of the pins 20 to 24.
7. Repeat step 5 and check that each time a pin is open-circuited the potential at pin 18 is about 11 volts positive.
8. Connect a negative six-volt supply to pin 4.
9. Open-circuit pin 24. Check that the voltage at pin 12 does not change from 12 volts positive.
10. Repeat step 8 for each input and the corresponding mute-input.

TABLE 1

Circuit Point	Node Number	Voltage
Pin 1	1	-6.0
Pin 4	4	+2.3
Pins 6, 7, 8, 10, 11	6, 7, 8, 10, 11	+2.3
Pin 12	12	+2.3
Pin 15	15	+12.0
Pin 18	18	+2.0
Pins 19, 20, 21, 22, 23	19, 20, 21, 22, 23	0
Pin 24	24	0
Pin 25	25	0
Collector TR1	27	+11.0
Base TR1	29	-1.6
Collector TR2	30	+0.1
Base TR2	28	+0.6
Collector TR3	31	+0.5
Base TR3	34	-1.0
Junction D1, R3	26	+2.3
Junction D4, D5, R13	32	+2.3
Junction D1, D8	33	+2.0

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