TAPE REPRODUCER RP 4/3

Introduction

The RP4/3 is a four-track tape reproducer which contains a loop of standard quarter-inch recording tape. Up to four coded signals or voice announcements can be recorded on the tape. The operation of the reproducer is controlled by other units[1]. The output of each reproducing head is connected directly to a connector at the rear of the chassis.

The RP4/3 is built on a CH1/18E chassis with index pegs in positions 6 and 39.

Drive Motor

The drive motor is a four-pole single-phase induction motor of shaded-pole construction. The shaft of the motor is machined so that it forms the capstan for the tape transport mechanism. The motor requires a 30-volt a.c. supply which is obtained from another unit[4].

Control and Cut-out Circuit

Normally transistors TR2 and TR3 are conducting and relay RLA is energised. A negative six-volt supply

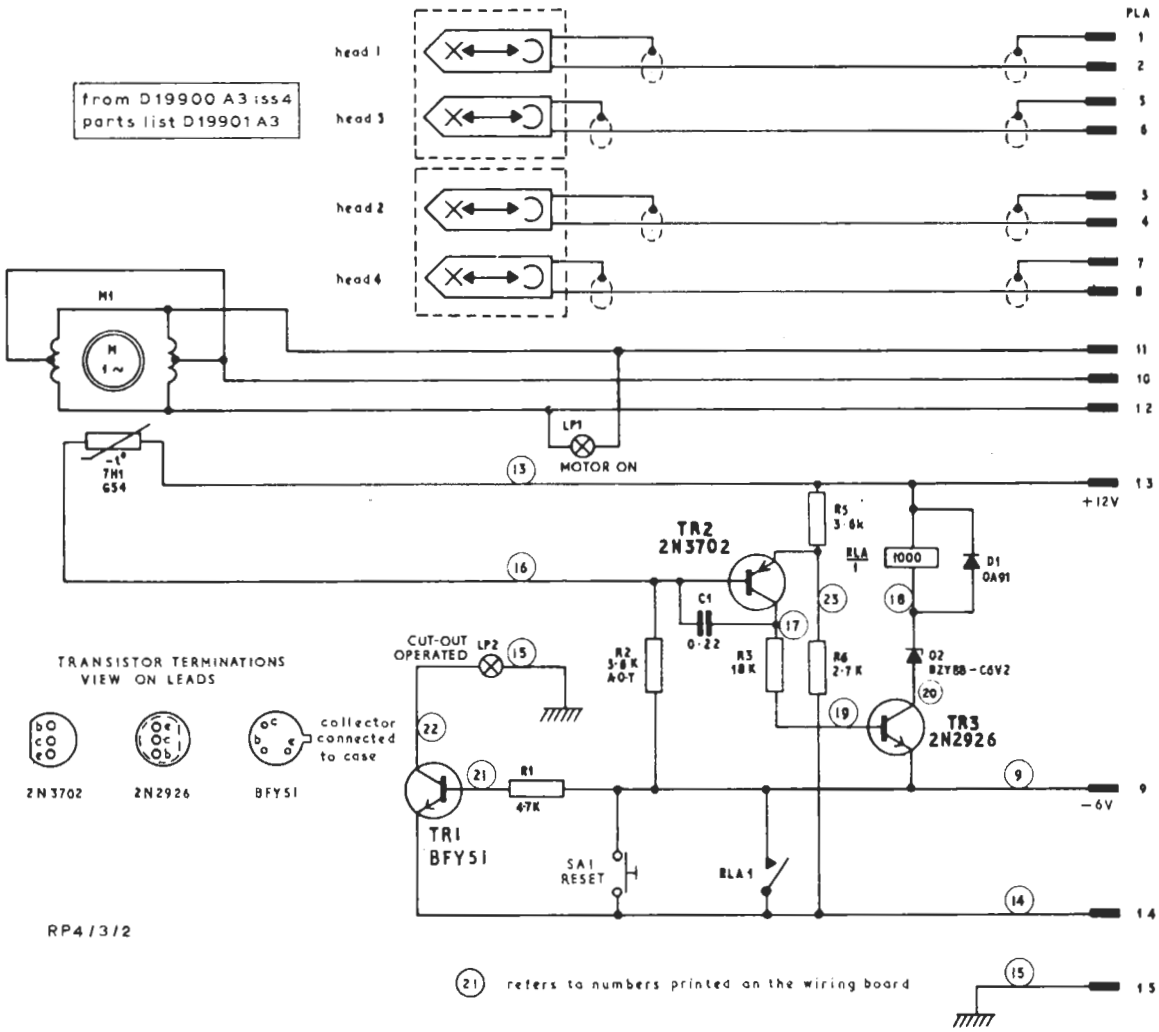

Fig. 1. Circuit of the RP4/3

Circuit Description (Fig. 1)

Reproducing Heads

Two heads are mounted in each of two separate stacks. The heads are positioned so that four separate tracks on the tape can be reproduced. Separate amplifiers for each head are contained in associated units[2,3]

is taken via pin PLA14 and relay contact RLA-1 to pin PLA9, to power other associated units[1]. The drive motor is powered by applying the external 30-volt a.c. supply to pins PLA10, 11 and 12; lamp LP1, *Motor On*, lights when the external supply is present.

If the temperature of the motor exceeds about 65

degrees C the resistance of thermistor TH1 is reduced and transistors TR2 and TR3 are cut off. Relay RLA is de-energised and the negative six-volt output at pin PLA9 is broken; indirectly this breaks the supply to the motor. When contact RLA-1 opens, TR1 conducts and lamp LP2, *Cut-out Operated,* lights. The circuit can be restored to normal only after the motor has cooled and a *Reset Cut-out* pushbutton switch, SA1, is operated.

Mechanical Description (Fig. 2)

Fig. 2 shows the mechanical layout of the tape transport mechanism.

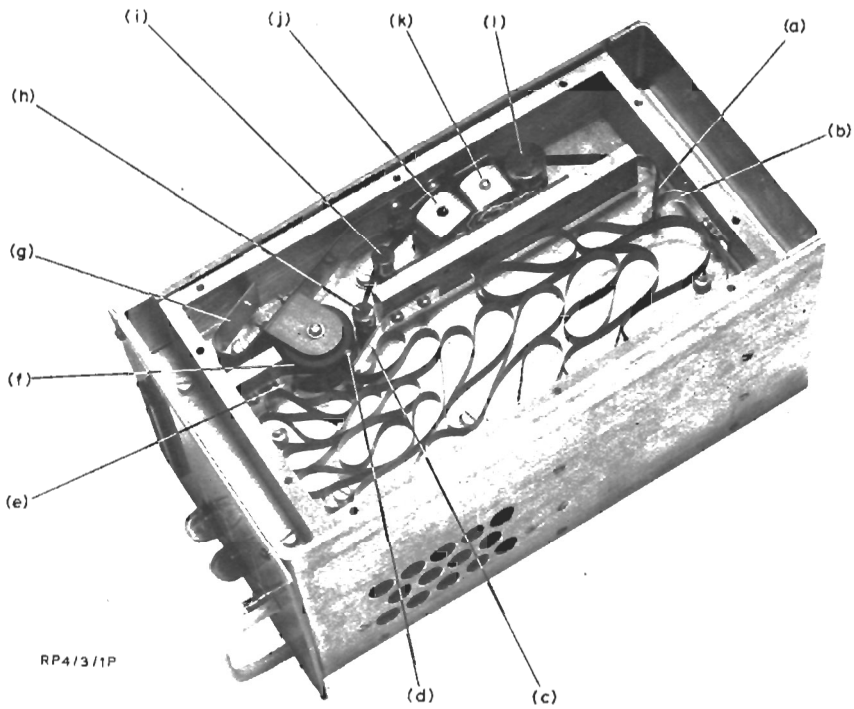

Fig. 2. Tape Transport Mechanism of the RP4/3

The tape loop is about eight feet in circumference, and is stored randomly in a space formed between two sheets of transparent plastic material. The tape is drawn past the reproducing head stacks (j) and (k) by the capstan (d) which presses against a pinch-wheel (f). The tape is pushed between shaped metal blades (c) and (e) to ensure that it is freed from the capstan and pinch-wheel.

The tape loop is drawn out of its storage space, between two more shaped metal blades (a) and (b) and across a guiding pillar (l). The blades at the exit prevent adjacent loops of tape in the storage compartment from sticking to each other. A pressure pad mounted on a spring holds the tape against the guiding pillar and provides back tension for the tape.

The head stacks are positioned so that the heads in the first stack replay tracks one and three and those in the second stack replay tracks two and four.

After being drawn across the heads the tape is passed round two identical guiding pillars (h) and (i) and then passes between the capstan and the pinch-wheel.

The pinch-wheel pressure and the tape tension are individually adjusted by means of separate screws which bear against springs.

Maintenance

Pinch-wheel Pressure and Tape Tension

Adjustments to the tape tension can be made only with the aid of a special test jig TE1/10. The reproducer should be returned to Equipment Department if it is in need of adjustment.

Pinch-wheel Pressure

To adjust the pinch-wheel pressure:

1. Adjust the pinch-wheel pressure screw until the capstan is just failing to drive the tape.
2. Tighten the pressure screw by one complete turn.

Thermal Cut-out

If the thermistor is replaced the following procedure must be carried out to ensure that resistor R2 is of the correct value.

1. Measure the resistance of the thermistor with an Avometer.
2. Measure the ambient temperature.

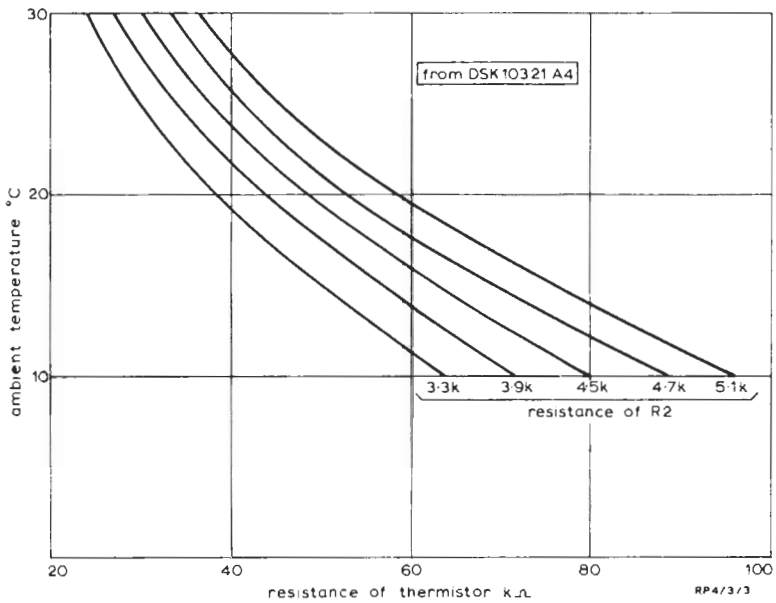

Fig. 3. Effect of Ambient Temperature Variations on Thermistor Resistance

3. Use Fig. 3 to determine the required value of resistor R2, which should be Type MR25.

The action of the cut-out circuit can be checked by momentarily connecting a 5·1-kilohm resistor in parallel with the thermistor to operate the cut-out.

References to Typical Associated Equipment

1. Automatic Fault Reporter PA2M/7A.
2. Central Control Unit UN3/12A.
3. Peripheral Control Unit UN3/13A.
4. Motor Supply Generator GE1/4.

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