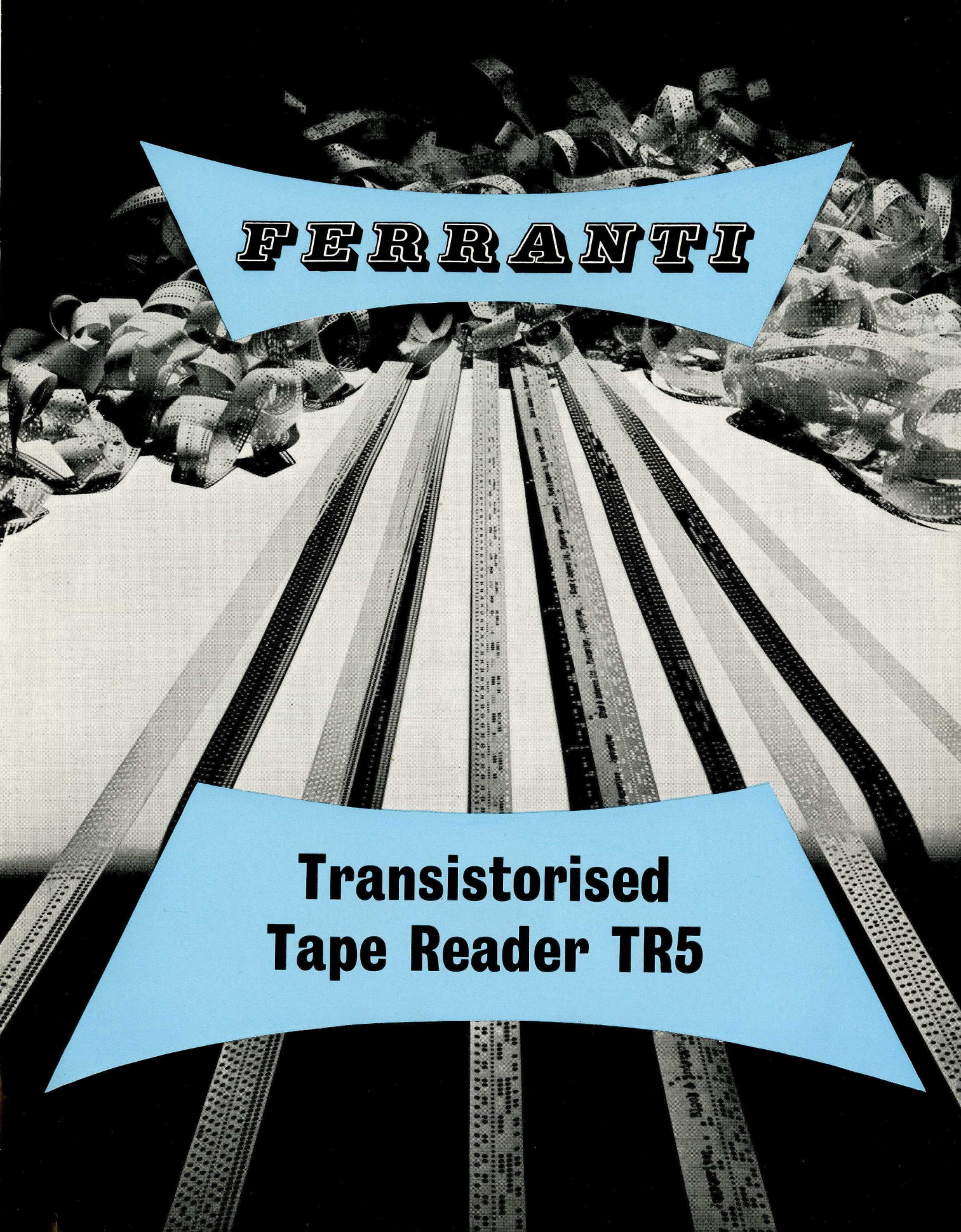
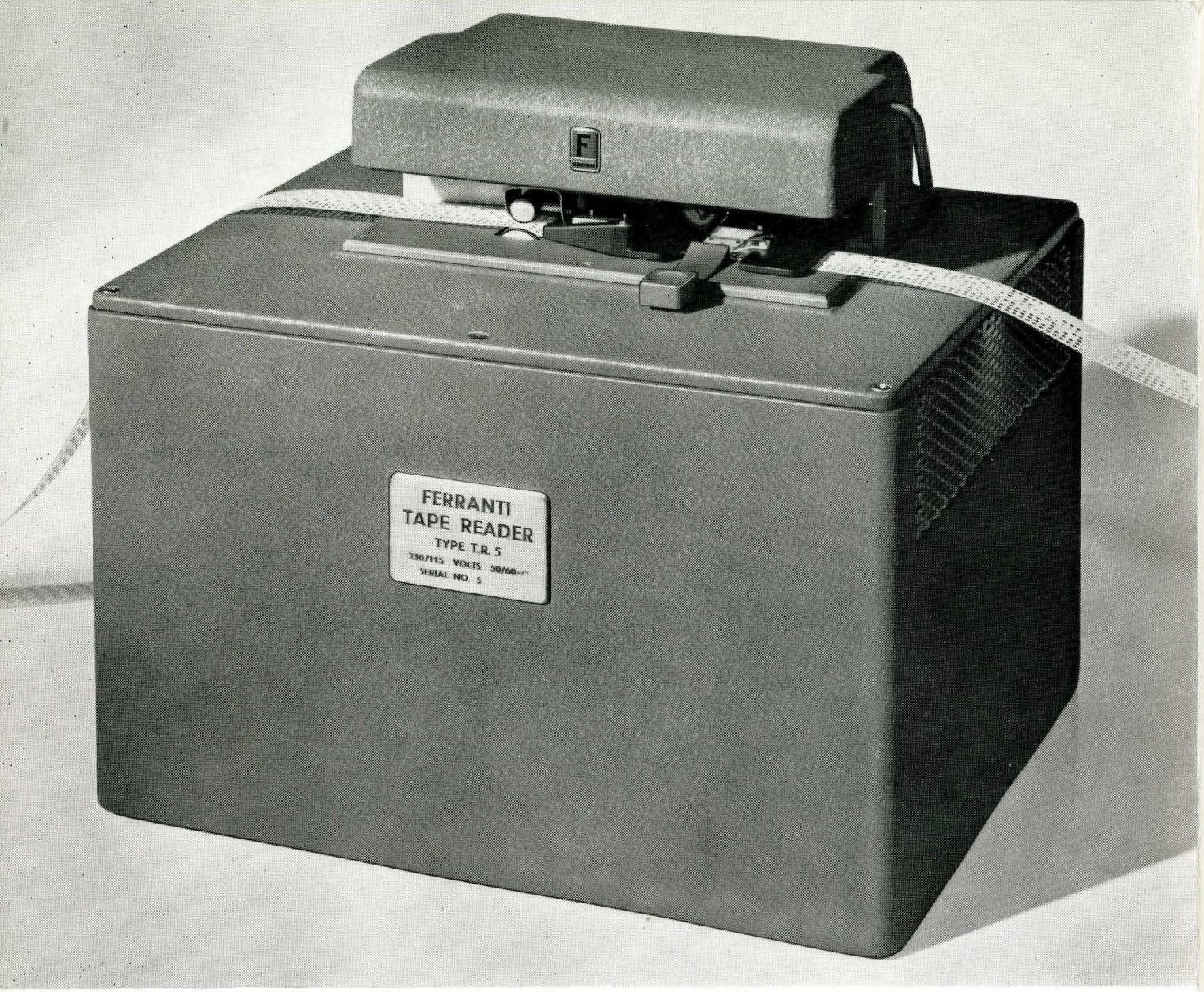

FERRANTI
Transistorised
Tape Reader TR5



SPECIAL FEATURES

- Proven mechanism of Tape Readers TR2 and TR3.
- New Transistorised Circuits.
- Reading speed up to 300 characters per second, stopping on a character.
- Many design features to meet practical requirements of the user.

The TR5 is used in the Pegasus Common-Language Data-Processing System which employs high speed paper tape input and output.

Ferranti TRANSISTORIS

INTRODUCTION

Ferranti Ltd. have had seven years' experience in the design and manufacture of high speed punched paper tape readers. Nearly 1,000 Ferranti tape readers are in use in several countries throughout the world. Their most frequent application is with electronic digital computers, for which they were originally designed, and they provide an extremely fast rate of input of data.

They also have uses in the field of communications.

GENERAL DESCRIPTION

The TR5 embodies the experience gained from earlier readers. It uses the proven mechanism of the TR2 and TR3 together with new completely transistorised circuits and several novel design features.

It operates at any speed up to 300 characters per second, with the ability to stop on any one character. A character is an arrangement of holes and no-holes across the width of the tape representing a number, a letter or a symbol. Other maximum speeds will be available at a later date.

It can accept 5, 7 or 8 track punched paper tape, provision being made for reading all tracks. Simple adjustment of a slide instantly adapts the reader for the required width of tape.

In the design careful attention has been given to the practical requirements of the user.

The tape is easily inserted or removed at any point along its length. When the tape has stopped at the reading station ten complete characters are visible, making it easy to see on which character the stop has occurred. It is also simple to mark the character with a pencil to identify the point in case it should need subsequent attention. The tape can be left stationary in the reading position without fear of damage from overheating. Spliced tapes are taken without difficulty. This is because friction drive feeds the tape through the reader. There are no sprocket wheels and a tape may be passed through thousands of times without appreciable wear.

The sprocket hole track is used to indicate the location of a new character. Provision has been made for interchanging the connections from the reading head so that the position of the sprocket hole track may be chosen according to the customer's requirements. This can be done by means of connecting links within the reader.

A photoelectric system of reading is used. Light from a festoon lamp is focused by means of a simple lens on to the tape. Immediately underneath the tape is a single silicon crystal with nine photosensitive elements. The output from each of these elements is connected to plug-in printed circuits on which the information is stored in transistor flip-flops whose output signal level changes from +0·5 volt to —5 volts. By means of connecting links either polarity of output can be selected.

The tape need not be stopped in order to read a character, if the computer or other equipment can assimilate the information quickly enough. The movement is however under the control of signals

ED TAPE READER TR5

derived from the tape sprocket hole and from the computer, and the tape may be stopped or started very rapidly.

The tape may be stopped from full speed within 0·06 inch. Because the information has been stored within the reader it is available for reading although the tape has in fact passed the reading station. The tape is accelerated from rest to its full speed of 30 inches per second within 8 milliseconds and the next character is ready for reading within 5 milliseconds.

The driving roller forms part of a differential-gear system whose cage is driven continuously by an induction motor. The roller is started or stopped by the application of electro-magnetically operated brakes to one or other of the output shafts of the differential. Built-in current switching transistors operate the brakes under the control of a two-state circuit, so that at any time one brake or the other is engaged. The brake shoes are always held lightly against the brake drums and are thus applied very quickly when required. The inertia of the moving parts of the system is kept to a minimum.

The feeding of the tape through the reader is controlled by a self-contained flip-flop, the state of which is controlled by electrical signals derived from the location photodiode, activated by light passing through the tape sprocket-holes, and by signals derived from the equipment to which the reader is connected.

The unit is operated from 50/60 cycle mains at 115 or 230 volts. A transformer in the unit provides power for the 10 watt festoon lamp and the low voltage D.C. power supplies. Two twelve-pin plugs are provided to carry the A.C. mains supply, and interconnections with the computer or other equipment.

Only a minimum amount of maintenance is required. All the components are mounted from the top casting and so are readily accessible for servicing. Operating and maintenance instructions are supplied with each reader. Kits of minor and major spares are also available.

The complete reader comprises the following parts, all within the one unit:

1. Motor-driven tape feed mechanism.
2. Current switching transistors for energising the tape feed mechanism.
3. Plug-in printed circuits for controlling the tape feed.
4. Lamp, lens, and photodiode reading head.
5. A one-character store, in the form of plug-in printed circuits, producing both positive and negative going outputs as required.
6. Transformer feed power supplies for the lamp and internal circuits.

Dimensions: $9\frac{1}{4}'' \times 11\frac{1}{2}'' \times 10''$ high.

Weight: 32 lb.

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