REVISED

USER'S MANUAL

RC 2000 PAPER TAPE READER

GIER
ELECTRONICS

# CONTENTS

1. INTRODUCTION

The RC 2000 Paper Tape Reader incorporates a servo input buffer system, where-by the number of unprocessed characters in a 256-word core store regulates the reading speed. By employing this core store as a buffer between RC 2000 and the computer (or other processing device), it has been possible to let the tape be driven by a simple servo motor, thus eliminating abrupt starting and stopping.

The speed of the Tape Drive Capstan of the Reader is so controlled by the num-ber of characters stored in the Input Buffer that when the latter is approximately half-full, the Capstan is stationary. As the characters are taken out of the Buffer and processed, the speed of the Capstan is regulated so that an equilibrium is obtained between the speed of the Capstan and the processing speed.

This is shown in the graph below.
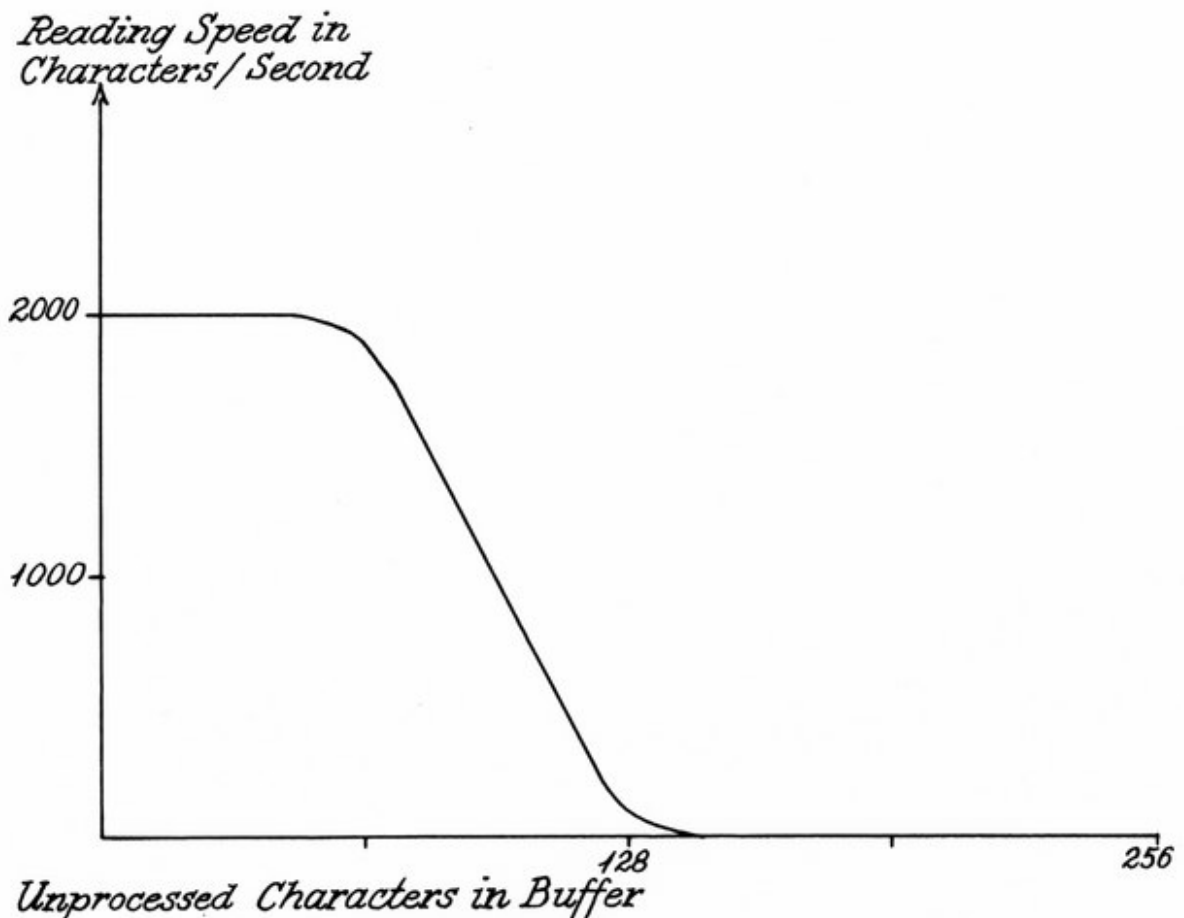
2. PARTS AND CONTROLS

All parts and controls relevant to operating RC 2000 are found on the front
panel of the Reader, which is illustrated on page 4.

The TAPE GUIDE contains the Tape Drive Capstan, the two Tape Width
Selector Blocks, and the Read Head with Photocells that sense the holes in
the tape. A Screw used for aligning the Photocells is situated on the face
of the Tape Guide.

The PRESSURE LID holds the tape in position in the Tape Guide, and is
mounted on a sliding post so that it can be raised to permit insertion of tape.
A Lens, through which the Photocells are illuminated, is housed in the Lid.

Through the TAPE CORRIDOR the tape is drawn past the DEFLECTION POST
before entering the Tape Guide.

In the TAPE ROLL ROOM rolls of tape are allowed to unwind freely, the
leading end being drawn over the ROLLER at the upper end of the Tape
Corridor. The DOOR on the right-hand side of the Tape Roll Room must be
closed before the Reader can be operated. The OPENING at the top of the
Door is used when strips of tape are read.

The DOOR RELEASE BUTTON, situated in the upper-hand corner of the front
panel, opens the Door to the Tape Roll Room and raises the Pressure Lid.

A SELECTOR KNOB for setting tape width is situated at each end of the Tape
Guide. On each of the four sides of these identical Knobs is a mark - 8, 7,
5, or OL - that corresponds to one of the four types of tape accepted by
RC 2000. Turning the two Tape Width Selector Knobs causes the corresponding
Selector Blocks in the Tape Guide to be set for the tape desired.

The PUSH BUTTONS, situated in the lower left-hand corner of the front panel, have various functions.
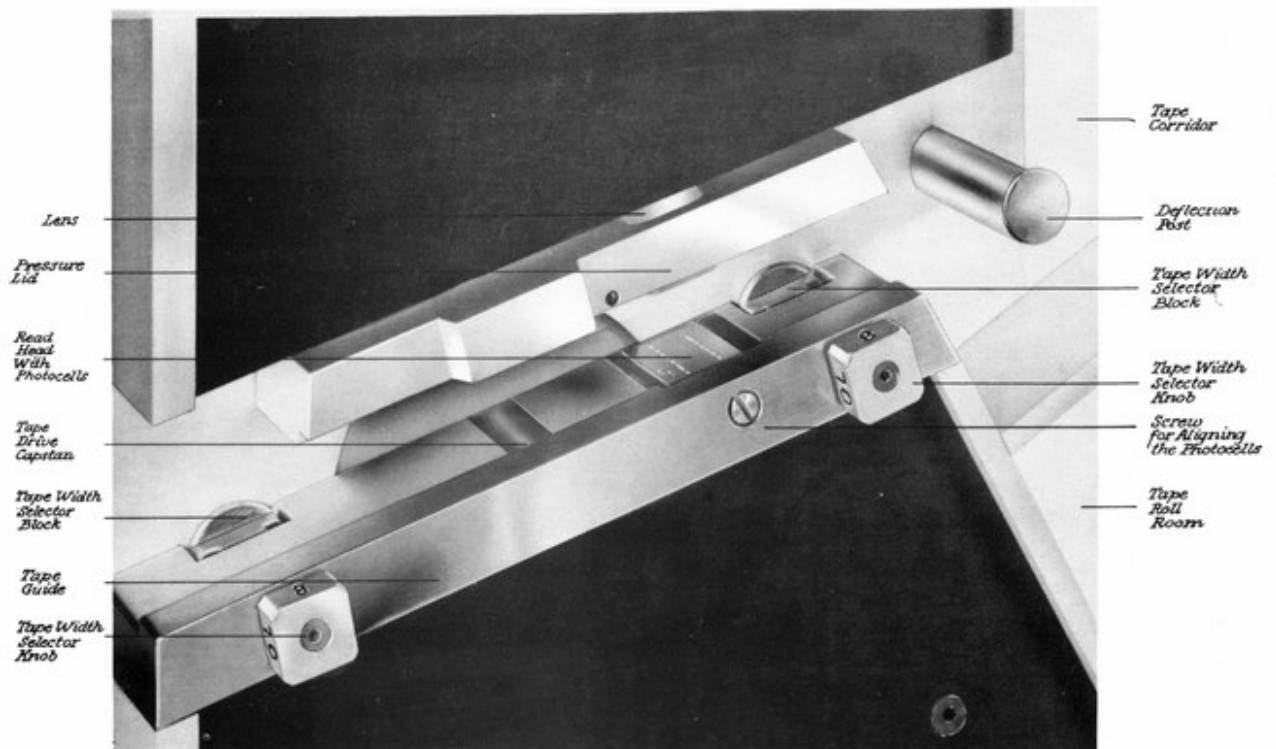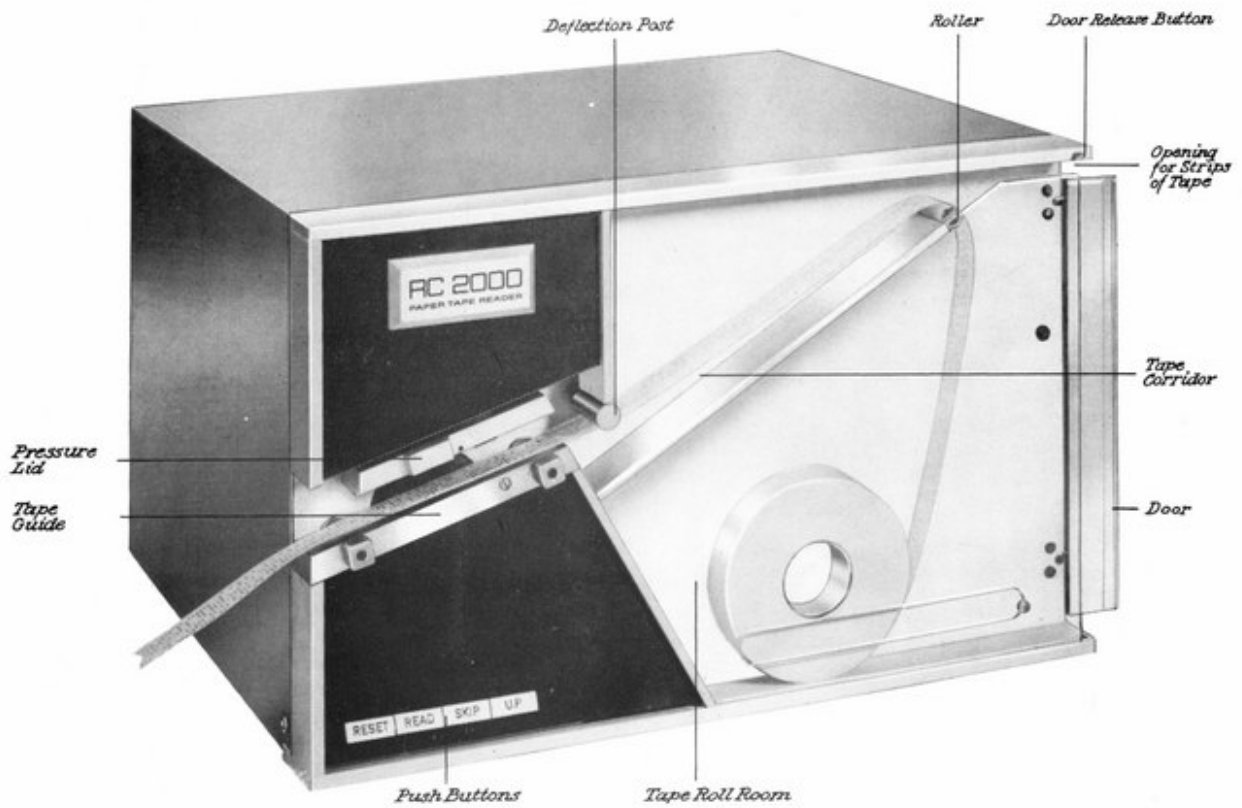
RESET clears the Input Buffer, whereupon the first 100-200 characters are read in.

READ allows characters to be read in from tape to the Input Buffer in continuation of those already read in.

SKIP activates the motor circuits directly, enabling tape to be run out at full speed. No characters are read in to the Buffer.

UP raises the Pressure Lid.

FRONT PANEL

Deflection Post

Roller

Door Release Button

Opening for Strips of Tape

Tape Corridor

Door

Pressure Lid

Tape Guide

RC 2000
PAPER TAPE READER

RESET READ SKIP UP

Push Buttons

Tape Roll Room

Tape Corridor

Lens

Deflection Post

Pressure Lid

Tape Width Selector Block

Read Head With Photocells

Tape Width Selector Knob

Tape Drive Capstan

Screw for Aligning the Photocells

Tape Width Selector Block

Tape Roll Room

Tape Guide

Tape Width Selector Knob

TAPE GUIDE AREA

4.   LOADING TAPE

4.1 Rolls of Tape

1.   Push the Door Release Button. This opens the Door to the Tape Roll Room and raises the Pressure Lid.

2.   Place a roll of tape in the Room, drawing the free end over the Roller, along the Tape Corridor, under the Deflection Post, and between the Pressure Lid and the Tape Guide.

3.   Close the Door to the Tape Roll Room.

4.   Lay the leading end of the tape in the Tape Guide, so that the first character to be read lies to the right of the Photocells in the Read Head.

5.   Push the Pressure Lid down gently over the tape. The tape is now ready for input to the Buffer (see Section 5).

4.2 Strips of Tape

1.   Push UP. This raises the Pressure Lid.

2.   Insert the leading end of the strip between the Pressure Lid and the Tape Guide, allowing the trailing end to pass under the Deflection Post, into the Tape Corridor, and through the Opening above the Door, as necessary.

3.   Lay the leading end of the tape in the Tape Guide, so that the first character to be read lies to the right of the Photocells in the Read Head.

4.   Push the Pressure Lid down gently over the tape. The tape is now ready for input to the Buffer (see Section 5).

5. INPUT TO THE BUFFER

5.1 Initializing the Buffer

Push RESET. This clears the Input Buffer, after which the first 100-200 characters are read in.

When RC 2000 is connected to the GIER Computer, the first character read in is automatically transferred from the Buffer to the Computer's bl register.

5.2 Replenishing the Buffer

Push READ. This allows characters to be read in from tape to the Input Buffer in continuation of those already read in.

Normally this is used only when the physical end of the tape has been sensed and the Buffer not yet emptied.

6. END OF TAPE

6.1 Paper Out Control

According to the setting of the Tape Width Selector Blocks in the Tape Guide (see diagrams in Section 7.2 and 8.1), either one or two Photocells in the Read Head can sense the absence of paper in positions where normally there are no holes. This provides an effective means of sensing the physical end of tape.

As soon as the end of tape is sensed, the Pressure Lid is released and input to the Buffer is blocked, until either RESET or READ is pushed.

6.2 Removing the Tape from the Reader

When reading from tape is terminated before the physical end of tape is reached, the Pressure Lid is not released and the unread portion of the tape remains in the Tape Guide. The tape can be removed from the reader in two ways.

1. Push UP or, if necessary, the Door Release Button. The Pressure Lid will be released, and it is then possible to remove the remainder of the tape from the Reader.

2. Push SKIP. This activates the motor circuits directly, so that the rest of the tape is run out of the reader at full speed. At the end of the tape, the Paper Out Control is activated and the Pressure Lid released.
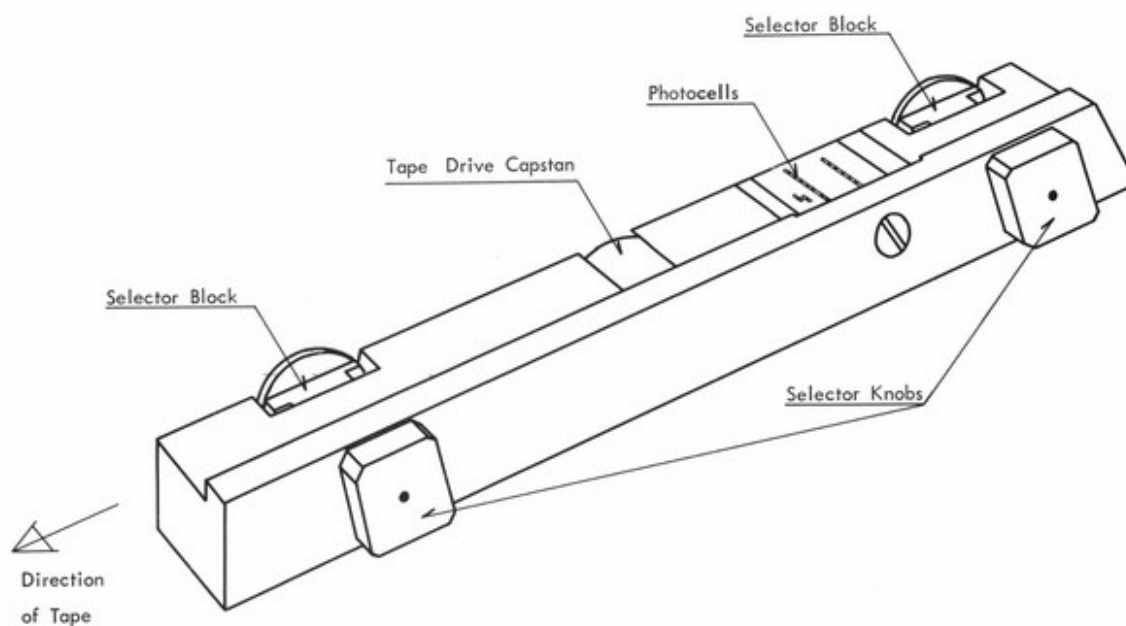
7.   THE TAPE GUIDE

7.1 Types of Tape Accepted

Normally RC 2000 accepts perforated paper tapes in standard widths equivalent to the following types:

1.   One Inch   8 tracks maximum
2.   Seven-Eighths Inch   7 tracks maximum
3.   Olivetti   6 tracks, rectangular holes
4.   Eleven-Sixteenths Inch   5 tracks

For a detailed description, see Tape Specifications (Section 9).

In order to accomodate the various tape widths, the two Tape Width Selector Knobs on the Tape Guide must be set appropriately.

TAPE GUIDE

7.2 Tape Width Selection

Changes in the width of the Tape Guide are made by turning the Tape Width Selector Knobs, which causes the two Tape Width Selector Blocks to rotate. According to the setting of the Selector Blocks, the width of the Tape Guide will correspond to one of the four above-mentioned tape types. The Knobs can be turned in either direction, snapping successively into the four positions indicated by the markings on the sides of the Knobs.
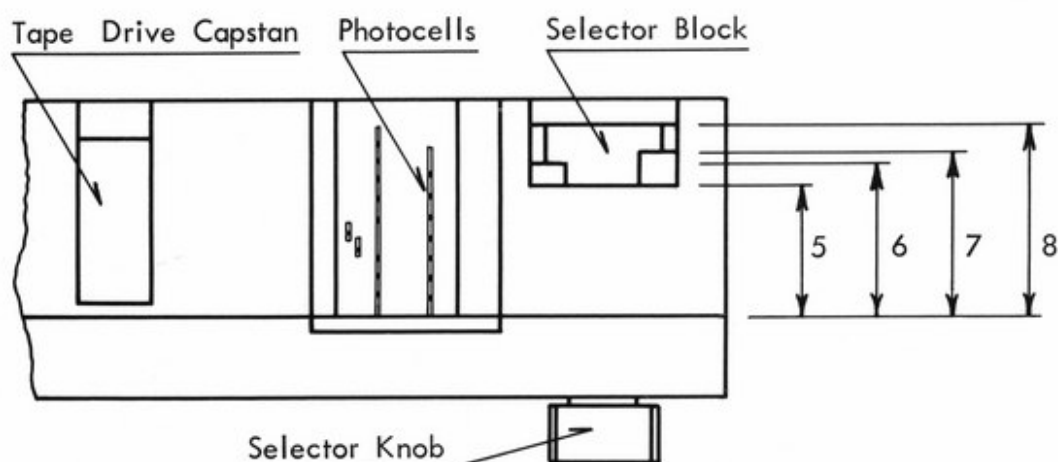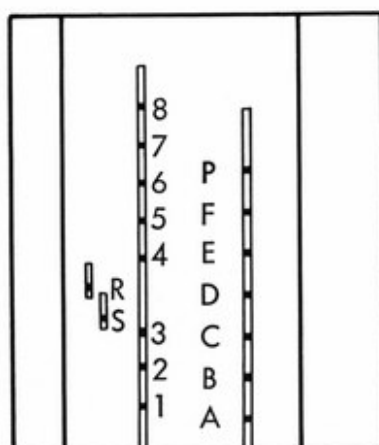

TAPE GUIDE (seen from above)

8. THE READ HEAD

8.1 Photocell Connections

As the following drawing shows, the Read Head contains two main groups of Photocells: 8-1 and P-A.

READ HEAD

Group P-A (the right-hand column) is used exclusively for Olivetti tapes, the uppermost cell, P, being employed to sense the Paper Out condition for these tapes.

In Group 8-1 (the left-hand column), all eight cells are used for One Inch (8 track) tapes, the first seven cells for Seven-Eights Inch (7 track) tapes, and the first 5 cells for Eleven-Sixteenths Inch (5 track) tapes.

Cells R and S, the two at the extreme left, are used to sense Paper Out for tapes of 8, 7, and 5 tracks, and the sprocket holes on these tapes should accordingly fall between these two cells.

The table on the next page shows Selector Knob settings and Photocell connections. Refer also to Tape Specifications (Section 9).

SELECTOR KNOB SETTINGS

SETTINGS of KNOBS		"8"	"7"	"5"	"OL"
TYPE of TAPE		1 Inch	7/8 Inch	11/16 Inch	Olivetti
CONNECTION	7	8	x	x	x
of	6	7	7	x	x
PHOTOCELLS	5	6	6	x	F
to	4	5	5	5	E
CHARACTER	3	4	4	4	D
in	2	3	3	3	C
BUFFER	1	2	2	2	B
	0	1	1	1	A
PAPER OUT		R + S	R + S	R + S	P
x indicates no connection, i.e. absence of hole.					

If the two Tape Width Selector Knobs are not set identically, e.g. both Knobs with the marking "8" facing up, the Reader cannot be operated.

8.2 Aligning the Photocells

The position of the Photocells in the Read Head in relation to the reference edge of the Tape Guide can be aligned laterally by turning the Screw on the face of the Tape Guide. The normal setting assumes a distance of 9.96 mm between the edge and the center of the sprocket holes.

9. TAPE SPECIFICATIONS

9.1 Types

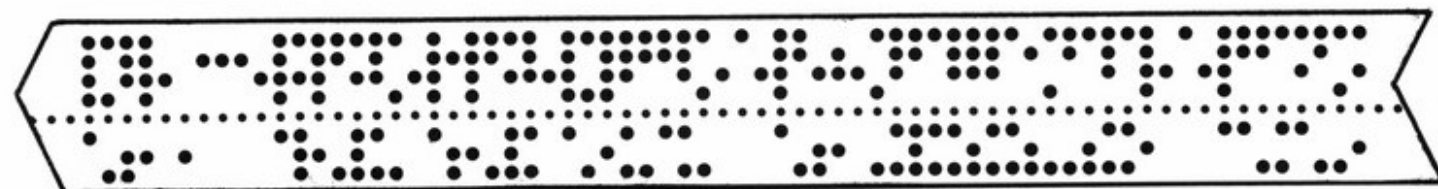RC 2000 accepts tapes with widths equivalent to these four standard types.

ONE INCH TAPE (8 tracks maximum)
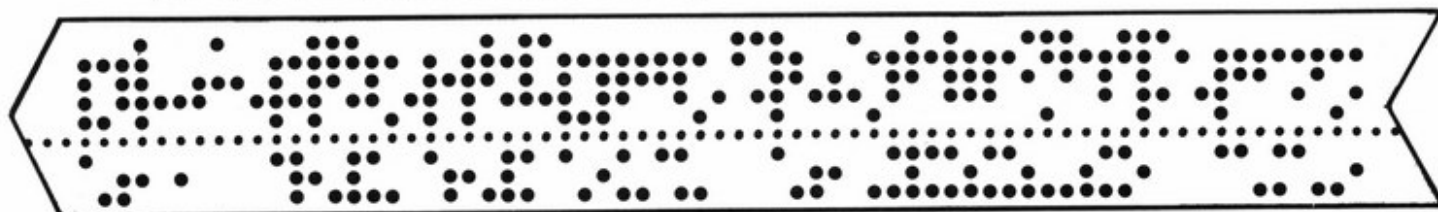
Nominal Width: 25.4 mm

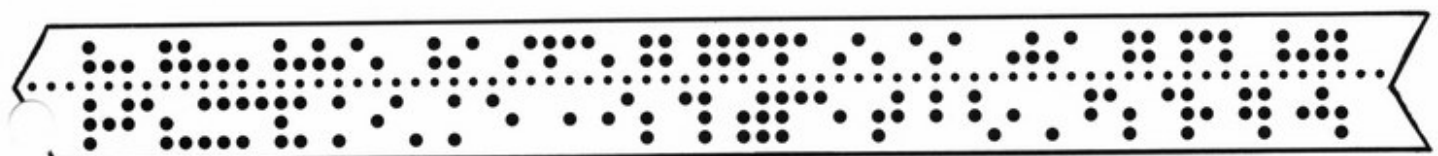Width of Tape Guide: 25.5 (+ 0.05, − 0.00) mm

SEVEN-EIGHTHS INCH TAPE (7 tracks maximum)

Nominal Width: 22.2 mm
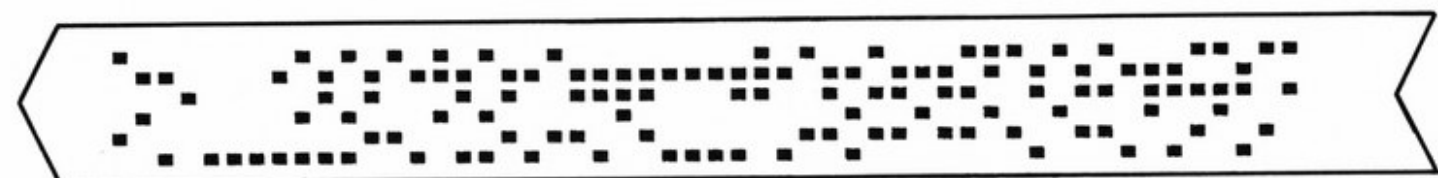
Width of Tape Guide: 22.3 (+ 0.05, − 0.00) mm

ELEVEN-SIXTEENTHS INCH TAPE (5 tracks)

Nominal Width: 17.5 mm

Width of Tape Guide: 17.6 (+ 0.05, − 0.00) mm

OLIVETTI TAPE (6 tracks, rectangular holes)

Nominal Width: 20.5 mm

Width of Tape Guide: 20.6 (+ 0.00, − 0.05) mm

Longitudinal Spacing: 3 mm minimum between characters

The specifications for One Inch and Eleven - Sixteenths Inch tapes comply with the RS - 227 standard of the American Electronic Industries Association.

9.2 Media

RC 2000 reads tapes punched in any suitable opaque medium, e.g. paper, oiled paper, mylar, or metalized mylar.

9.3 Spliced Tapes

RC 2000 can also read spliced tapes. Splicing is done using a special transparent, adhersive tape.

All relevant holes covered by the splicing tape must be punched out using a hand punch.

9.4 Thickness

The distance between the Pressure Lid and the Tape Guide is adjustable, but is normally set to permit thicknesses of from two to three times that of normal tape to pass through the Reader.

When splicing tape, care should be taken not to exceed this thickness.

9.5 Tape Roll Diameters

Outer: 200 mm maximum
Inner: 50 mm minimum