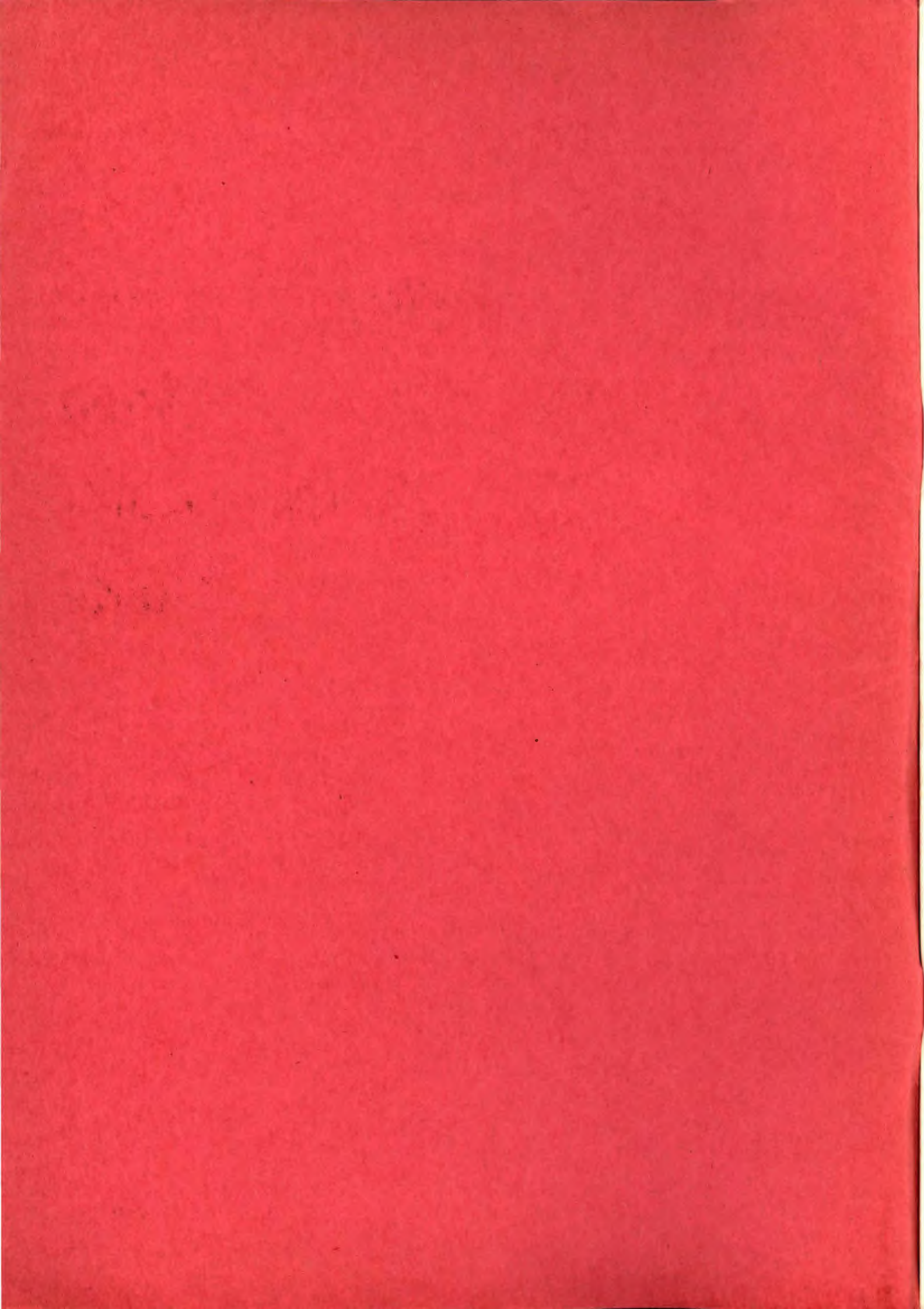




TOPS

9200

**Operator's
Guide**



BRITISH RAIL 9200 - OPERATORS GUIDE

I N D E X

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Page 5	Description of Datapoint 2200
Page 12	Description of Decision Data 9645
Page 21	Description of E.N.M. Needle Printer
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SECTION III

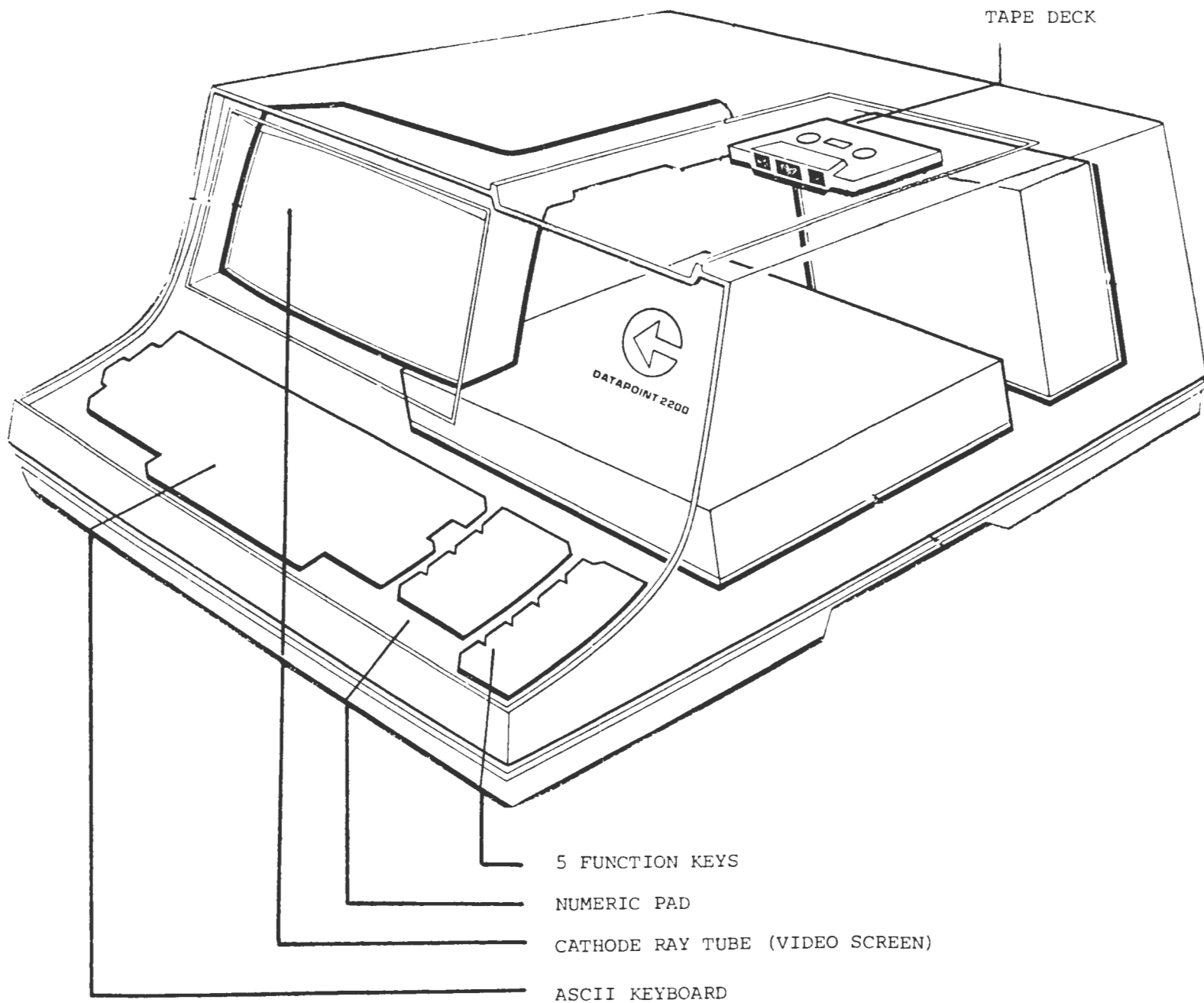
Page 41	Use of TOPS Office Machine Program
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SECTION I

Introduction

A 9200 Terminal consists of :

1. A Computer Terminal Corporation Datapoint 2200.
2. A Decision Data Computer Corporation 9645
96 Column Card Printing, Reader/Punch.
3. A Centronics Type/101. Serial Printer. (Or any
other compatible printer.)



The Datapoint 2200 (Fig. 1)

The 2200 has the capability of interface to a number of external peripheral devices (i.e. card reader/punch, serial printer, etc.)

The elements of the Datapoint are :

1. The Cathode Ray Tube (CRT)
2. The Keyboard
3. Cassette Tape Decks
1. The Cathode Ray Tube (CRT)

The viewing area of the tube is 7" by 2½", allowing 12 lines each of 80 characters to be displayed.

2. The Keyboard (Fig. 1)

- (i) A standard typewriter keyboard (plus certain additional keys).
- (ii) An additional bank of 10 numeric keys. (Either the main board numerics or the bank of 10 may be used.)
- (iii) Five Function Keys

Restart
Stop
Run
Keyboard
Display

'RUN' and 'STOP' are never used although the 'RUN' key will ;
illuminate when the machine is running.

'RESTART' is only used when the machine is switched on to
initiate the loading of the 'PROGRAM' from a cassette tape.

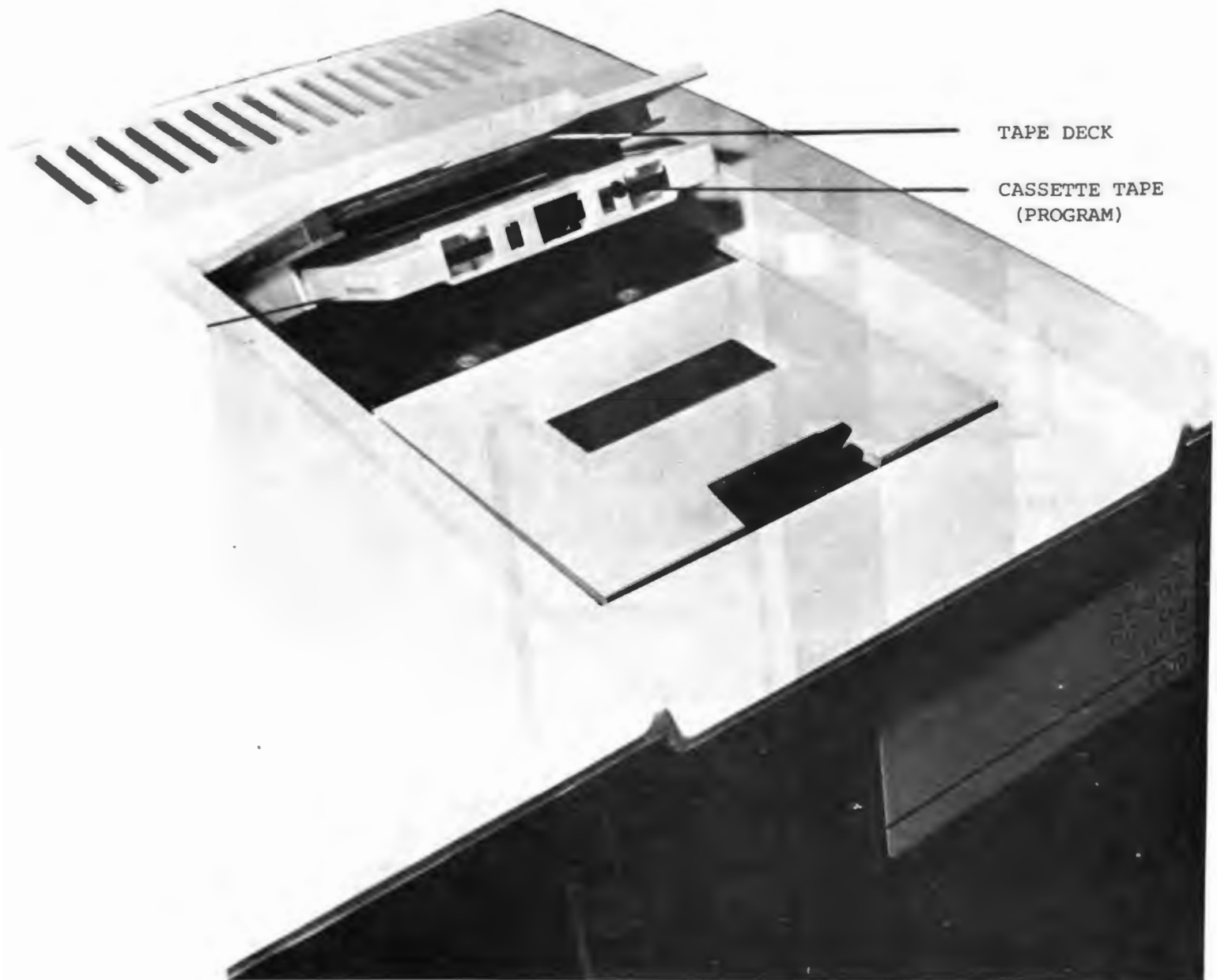
'KEYBOARD' and 'DISPLAY' are solely function keys and will be
detailed on later pages

- (iv) Five Alternative Code keys on the main board

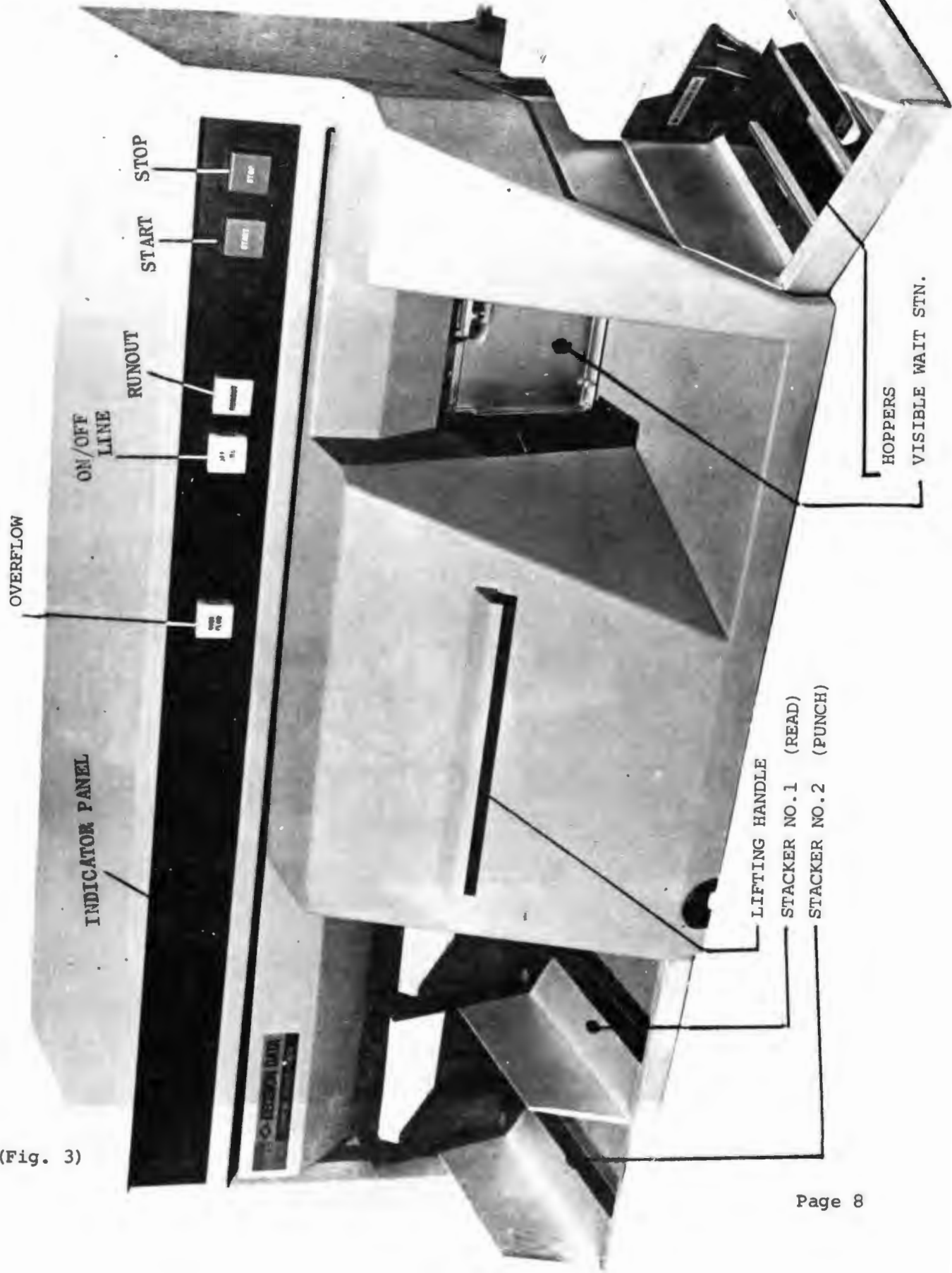
The Five Alternate Code keys on the main keyboard have a
special meaning. (See Section II)



(Fig. 1)



(Fig. 2)



(Fig. 3)

2. The Keyboard (Fig. 1) (Continued)

(iv)

1.

READ
(EOT)
2.

EOT
3.

SETTAB
TAB
4.

LEVEL 3
(ENTER)
5.

SP
Ø

Cassette Tape Decks (Fig. 2)

There are two cassette decks on the top of the machine : only the rear deck is used, and this will hold the cassette containing the system instructions. This cassette contains the PROGRAM instructions and is referred to as the 'PROGRAM'. This program should always be removed from the deck prior to switching the 2200 power switch off. The ON/OFF switch to the 2200 is on the right hand side of the machine below the lower rim. On any configuration the 2200 should be the last machine to be switched to power.

The Decision Data 9645 - Card Reader/Punch (Fig. 3)

Operation Panel Switches

STOP
START
RUNOUT
ON/OFF LINE
OVERFLOW

'STOP/START' switches : Self explanatory when the power has been switched on.

However, they are also used to clear any interlock when the machine is on.

e.g. if a card wreck necessitates the lifting of the front cover the 'INTERLOCK' and 'FEED CHECK' warning lights will illuminate. With the front cover back in place, press 'STOP/START' : the warning lights will now be extinguished and the machine will be operational.

The Decision Data 9645 - Card Reader/Punch (Fig. 3) (Continued)'STOP/START' switches : (Continued)

This applies to other faults which may arise :
these are indicated on the facia panel. When
they have been put right, press 'STOP/START'.

'RUNOUT' : This switch is used to remove single card left standing at
the visible wait station.

To remove the standing card :

Press STOP
Press ON/OFF LINE
Press RUNOUT - the card will now be removed
Press ON/OFF LINE
Press START

ON/OFF LINE' : This refers to the line connection between the 9645 and
the 2200.

An 'OFF LINE' illuminated indicator on the facia panel
indicates that the 9645 and 2200 are not connected. In
order to connect these two, the 9645 must be placed 'ON-
LINE'; this is carried out as follows :

Press STOP
Press ON/OFF LINE
Press START

The illuminated 'OFF LINE' indicator will now be extinguished
and on 'ON-LINE' situation will exist.

'OVERFLOW' : Switch not used.

Other windows on the facia panel illuminate as follows :

'POWER ON' : When the machine is switched on, it will always start in
'OFF-LINE' mode; before pressing 'START' button, press
'ON/OFF LINE' switch to get the 9645 'ON-LINE' to the 2200,
then press the 'START' switch.

'READY' : Illuminates when all systems are ready to proceed - providing no
other fault is displayed.

'HOPPER EMPTY' : Illuminates when either or both hoppers are empty.

'INTERLOCK' : If the front cover is lifted the power is switched off.

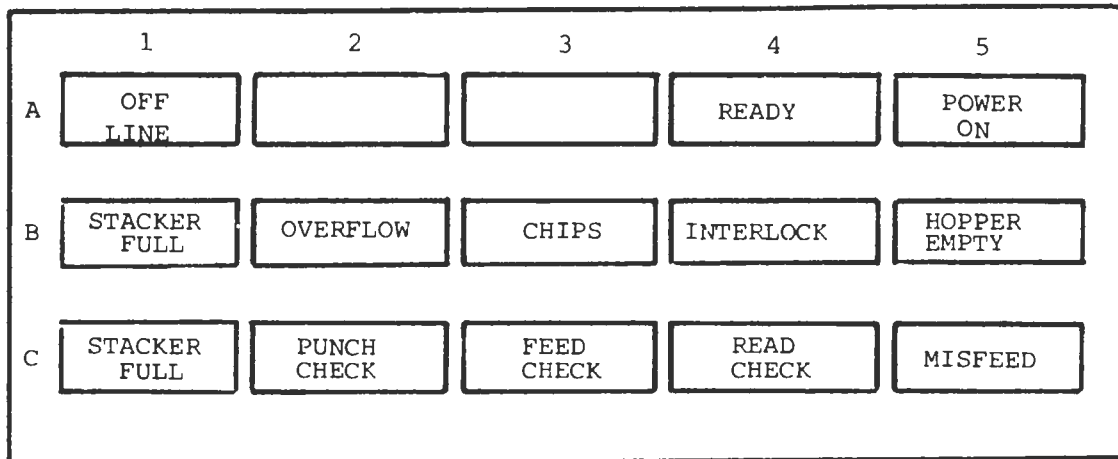
'FEED CHECK' : Usually illuminates due to a card wreck between the card
hopper and read station.

'MISFEED' : Faulty feed into the read station.

The Decision Data 9645 - Card Reader/Punch (Fig. 3) (Continued)

All of the above faults are first of all rectified by the operator, and the interlock to the 2200 cleared, by pressing 'STOP' and 'START'.

FACIA PANEL 9645 (LEFT SIDE)



(Fig. 3A)

For the 9645 to be operational only indicators 4A & 5A should be lit up. Any other indicators lit indicate a fault which requires rectification except in the case of 5B when the 9645 will remain in operation if the hopper which is empty is not the one supplying the cards for the particular operation in use.

The ON/OFF switch (Fig. 4) is beneath the desk top on the right hand side of the machine. Adjacent to the ON/OFF switch is a mains protection circuit breaker : if an overload occurs the circuit breaker will spring out.

Action :

Switch off the power; wait 60 seconds; reset the circuit breaker by pressing the red button; and then switch on the power.

If the circuit breaker is again activated : switch off the power and report to the engineer.

Chad Box

The box is for collecting the chad from the punch station, is shown on Fig. 4. This box should be cleared periodically dependent on the use of the machine

The Decision Data 9645 - Card Reader/Punch (Fig. 3) (Continued)Card Handling Facilities (Fig. 3)

1. Two hoppers
2. A read station
3. A visible wait station
4. A punch station
5. A print station
6. Two stackers

The card reader/punch will read and punch a 96 column card, but at this time the 'PROGRAM' only allows the use of the first 80. This meets the requirement of TOPS. However it will be possible to make use of the remaining columns for use within the TOPS Office.

Cards to be punched

Blank cards are placed in the front hopper (Fig. 5) on the right hand side of the 9645. The cards should be placed printed side facing the operator with the cut corner on the left. The cards feed from the rear, and when punched and printed they will come out in the correct order in the left hand stacker (stacker 2). The hopper should always be well stocked. When the hopper has been stocked with cards it is necessary to press the 'STOP'/START switches in order to clear the interlock which will be created. If there are no cards in the rear hopper the 'HOPPER EMPTY' light will remain on. The 9645 will however be operative as a punch.

Cards to be Read

Previously punched cards are placed in the rear hopper (Fig. 5) on the right hand side of the 9645. The cards are placed in the hopper printed side to the operator with the cut corner on the left. The cards feed from the front of the pack, and, when read and dealt with, they will be placed in one of the stackers on the left hand side of the 9645. After loading the hopper it is necessary to press the 'STOP/START' switches in order to clear the interlock created. As the front hopper should always contain blank cards, when the interlock is cleared then the 'HOPPER EMPTY' display should be extinguished.

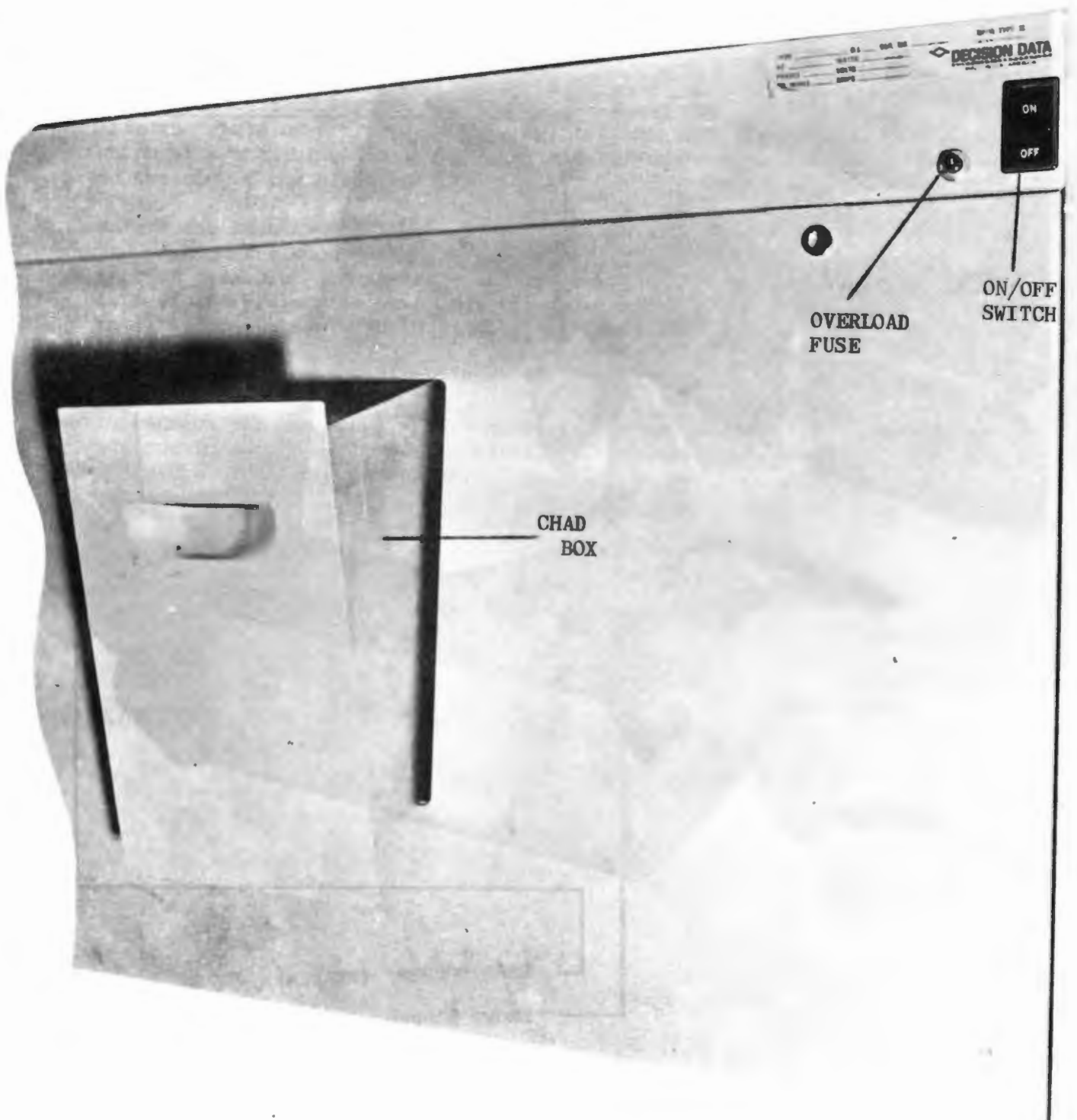
Card Wrecks

If there is a card wreck, switch off the power at the main switch.

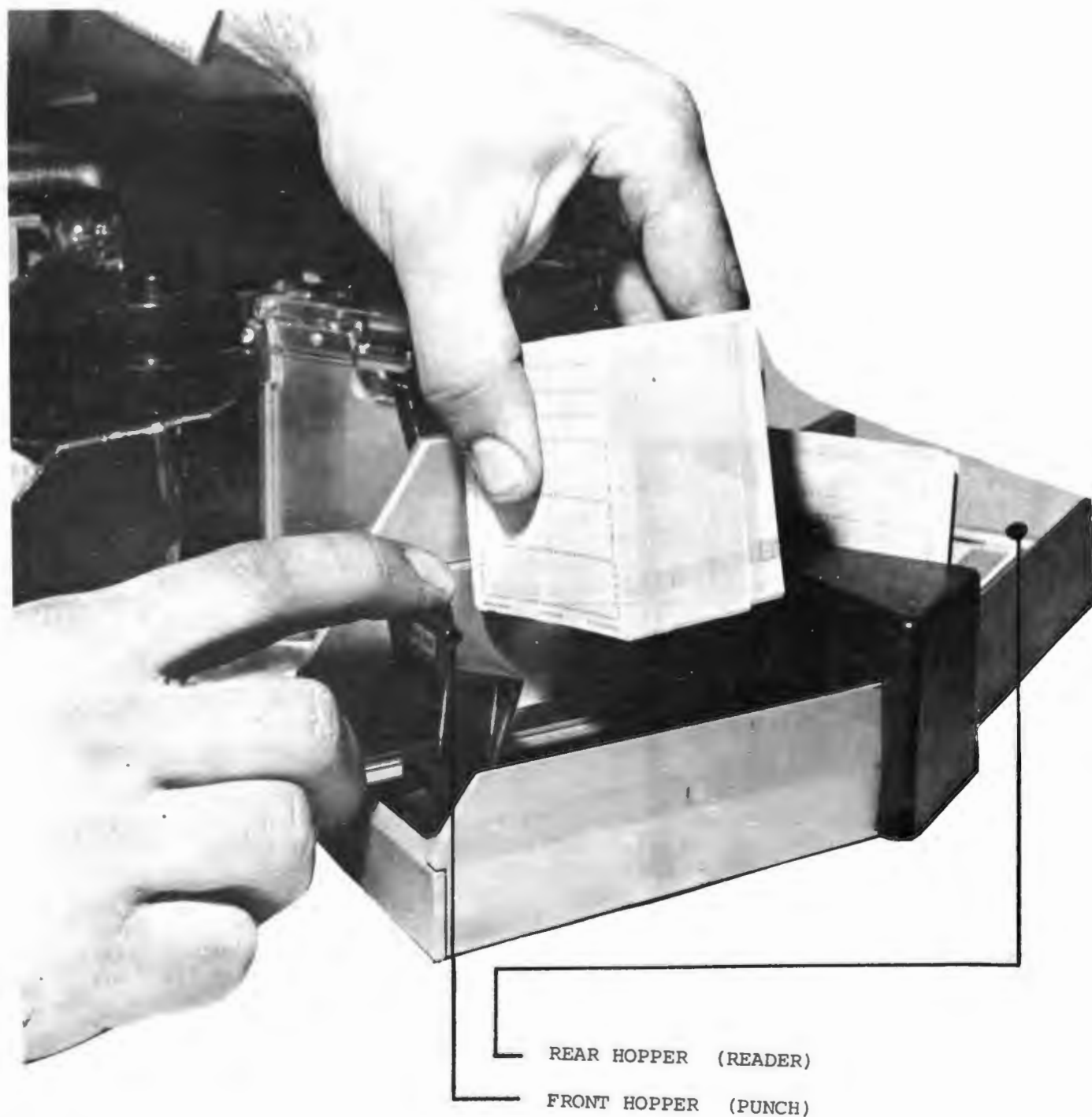
Card Wreck at the Visible Wait Station - by lifting the handle (Fig. 3) open the front cover (Fig. 6). This will give ready access to the read parabola and the wait station window.

The wait station can be removed by a light pull from the top; it is replaced by positioning the bottom first and a gentle push forward.

To remove the read parabola (Fig. 7) push the top lightly down, pull forward and up; it is replaced by positioning the bottom and engaging the top springs. If the machine has a re-read parabola, the removal procedure is the same. The parabolas should be kept free of dust.



VIEW OF THE PANEL UNDER THE TABLE TOP OF 9645



9645 CARD LOADING IN FRONT HOPPER

(Fig. 5)

The Decision Data 9645 - Card Reader/Punch

(Continued)

Card Wrecks Continued

Card Wreck left of Visible Wait Station - leave the front cover open and lift the whole of the top cover from the right hand side of the machine, which will then hinge to the left. (Fig. 8) exposing the aligning knob on the top of the black hood (Fig. 7).

Rotate the knob in a clockwise direction and align the white line with the mark on the hood. Put the forefinger, palm upwards, between the re-read parabola - if fitted - and the chad shute, and feel under the left of the protection cover for the drive wheel. Turn the drive wheel in either direction with the finger tip until the card can be extracted.

Removal of the Ink Cartridge (Fig. 9)

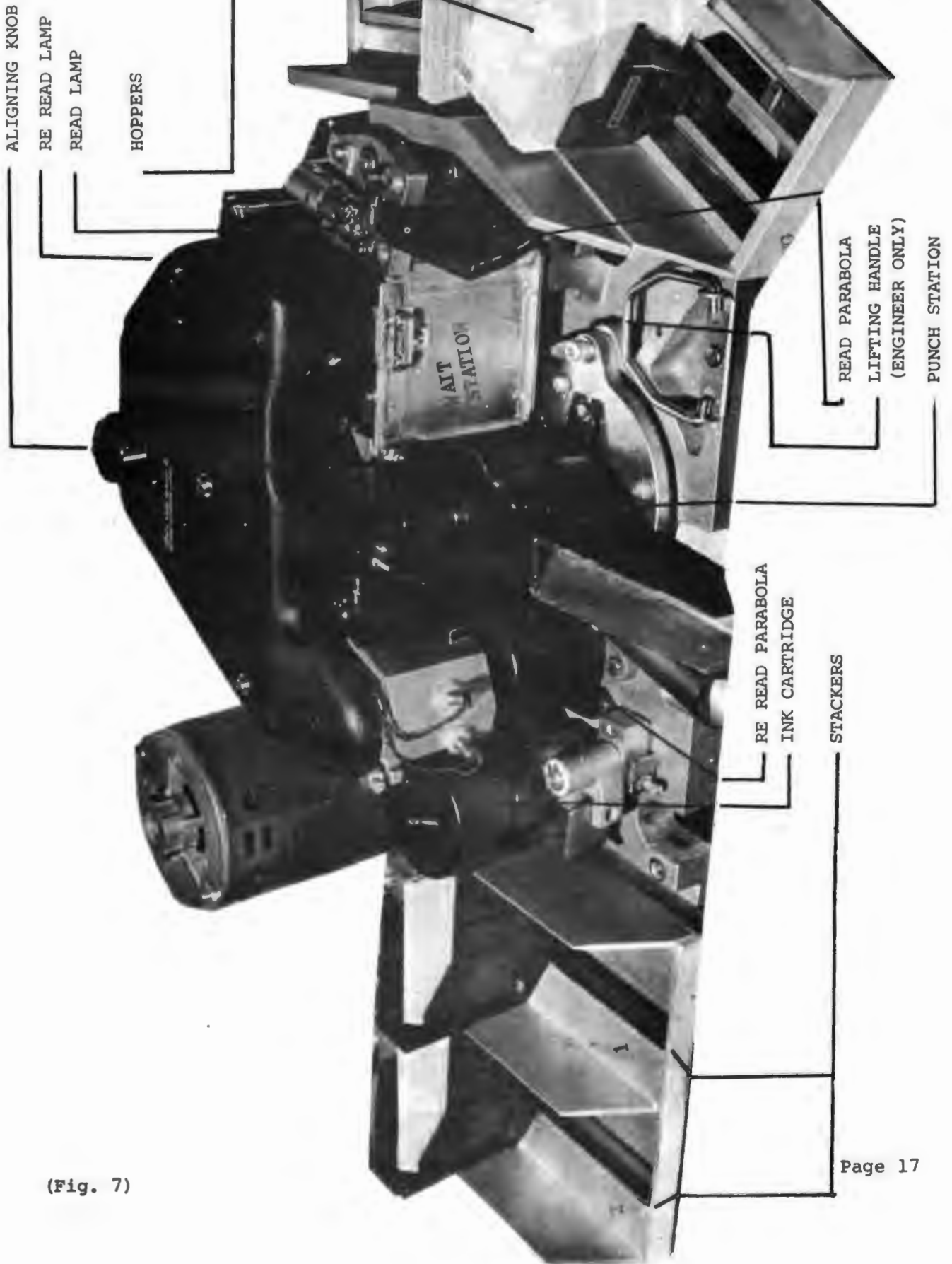
To retract the ink wheel, pull the brass lever forward, and follow the instructions on the top of the cartridge. To re-engage the ink wheel, press the brass lever back as far as possible until it clicks, then release the lever.



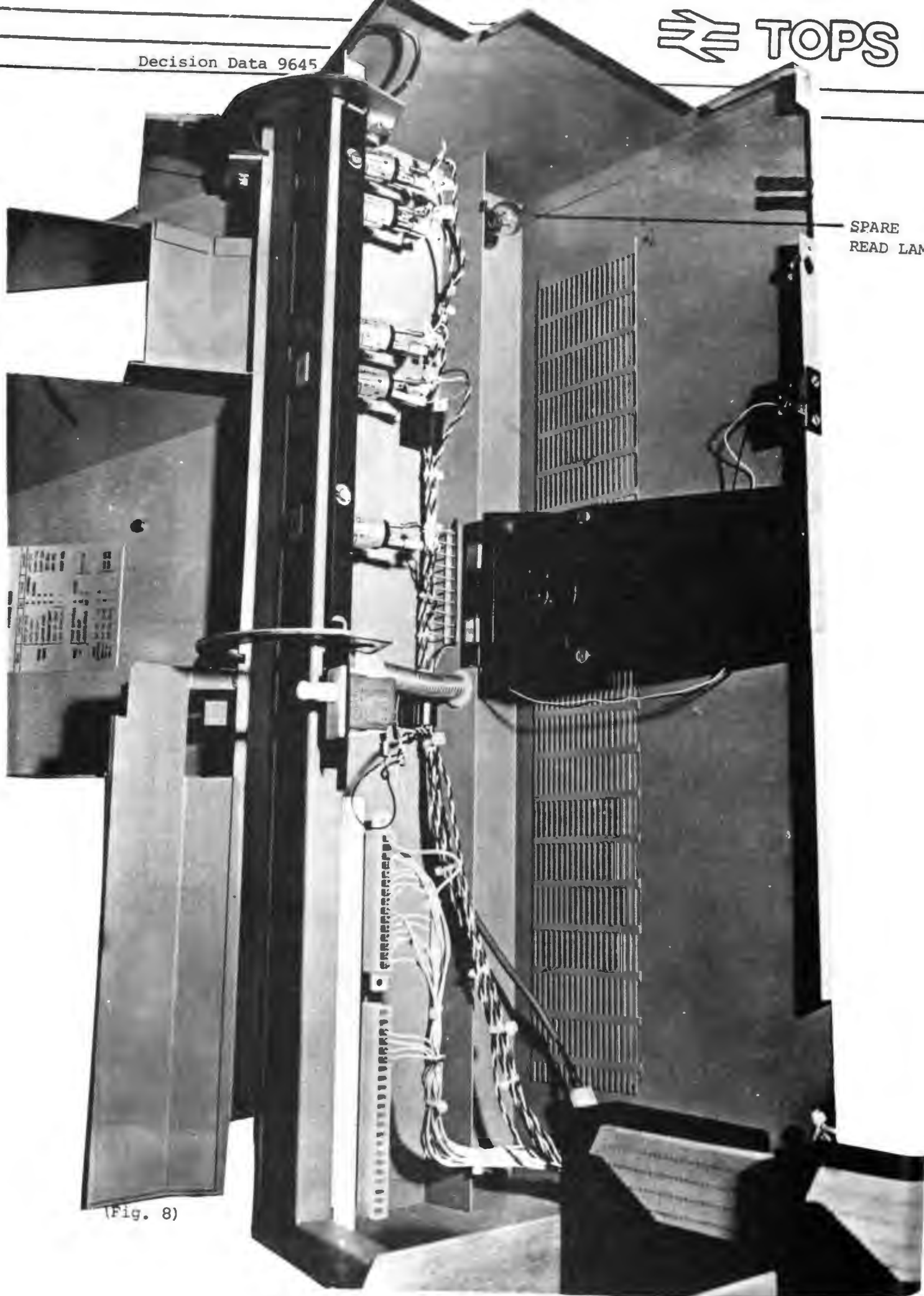
(Fig. 6)

9645 WITH FRONT COVER UP

Decision Data 9645



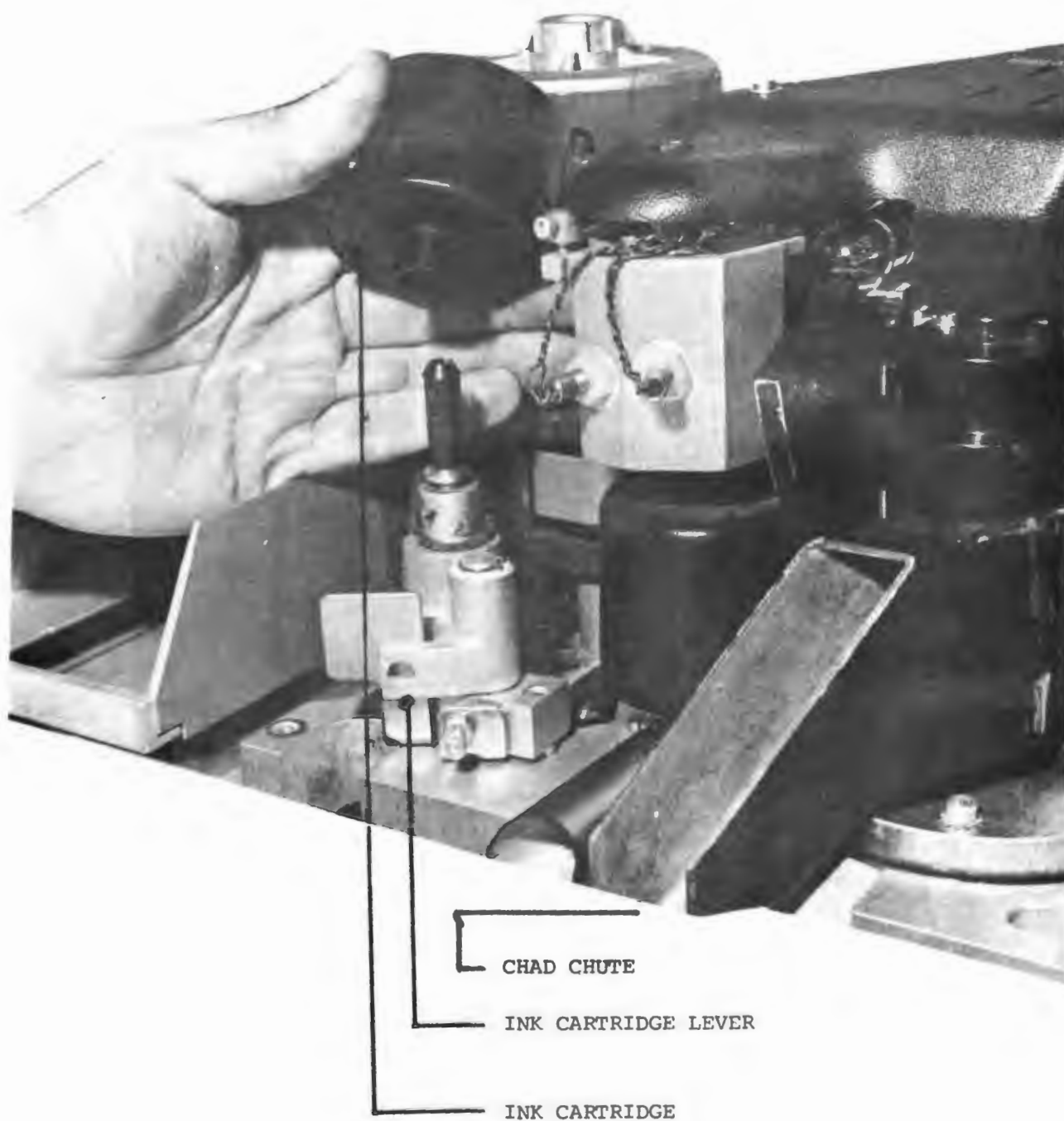
(Fig. 7)



SPARE
READ LAMP

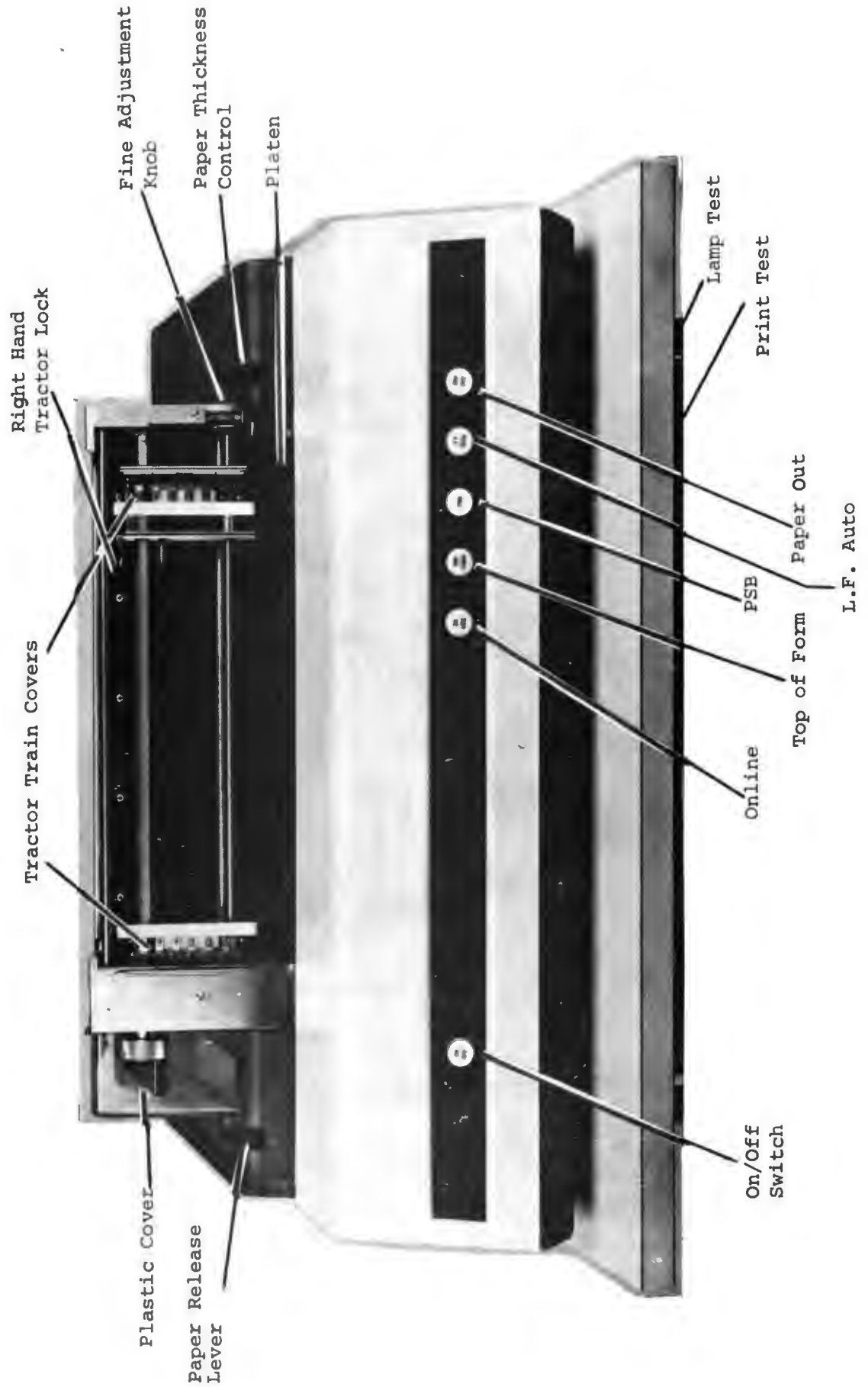
(Fig. 8)

ASSEMBLY COVER UP

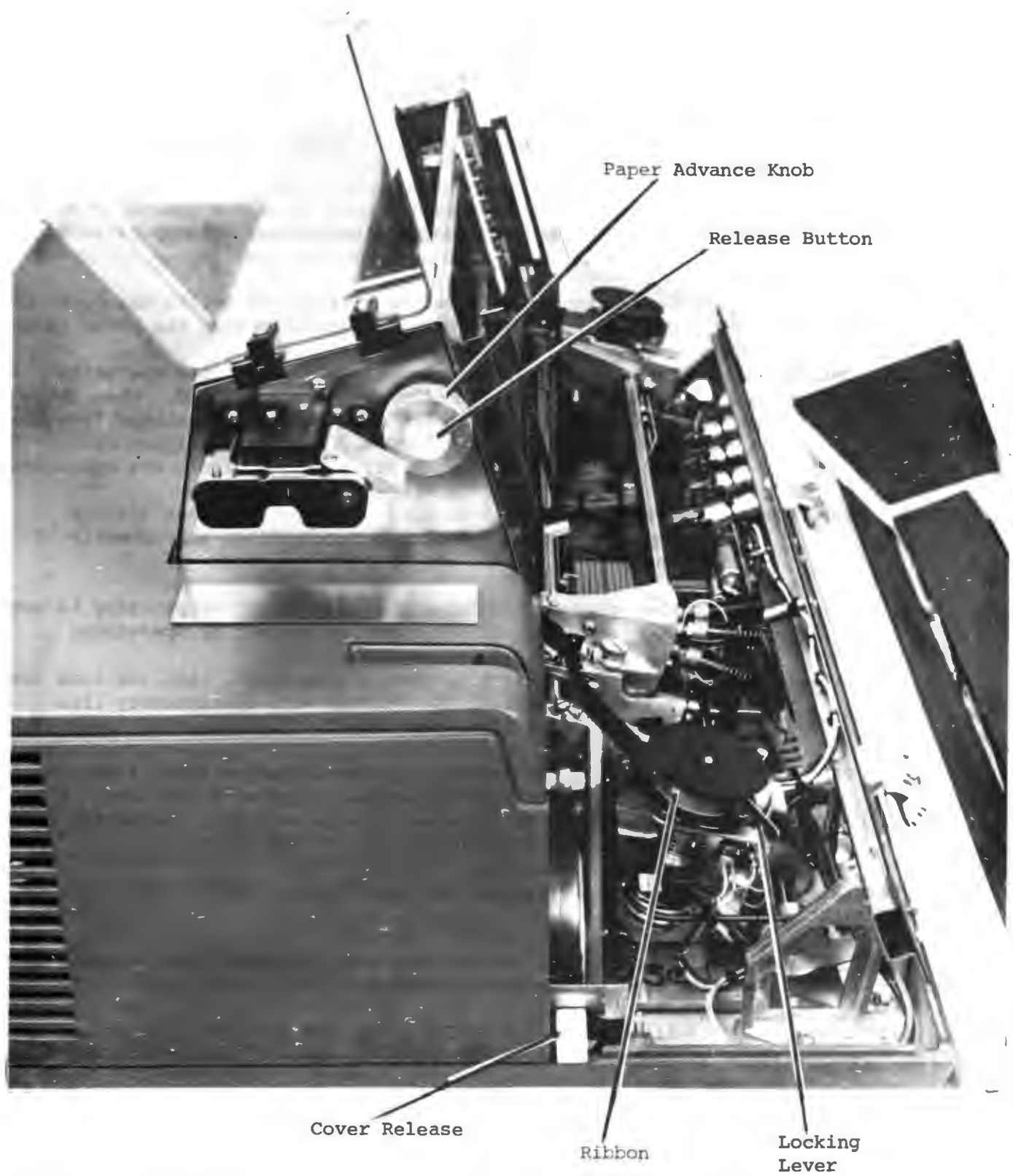


9645 REPLACING INK CARTRIDGE

(Fig. 9)



(Fig 10)



(Fig 11)

E.N.M. Needle Printer

The Operator Panel (Fig 10)

The Operator Panel is located at the front of the printer, and operates as follows :

1. ON/OFF Depression of this switch will either switch the power on or off, the switch being illuminated when the power is on.
2. ONLINE Press this switch to bring the printer into operation with the 2200, the switch then being illuminated. When the switch is not illuminated the Printer is isolated from the 2200 and is in a LOCAL MODE. In this condition the TOP FORM, L.F. AUTO and Print Test Control, are operative.
3. TOP OF FORM Press this switch to move the paper one line for one depression of the switch, or skip lines continuously if the switch is held on.
4. P S B When pressed indicates to the source that printing is not required. Should not normally be used by Operators.
5. L.F. AUTO Press this switch to give a line shift. All the time the switch is pressed, the Printer will continuously line feed, at four lines per second.
6. PAP OUT This is not a switch, only an indicator which lights up when the last page of fanfold paper is being used. A Hooter also produces an Audible warning. The Hooter can be cancelled by pressing the ONLINE switch.

There are two Controls (Fig 10) underneath the Printer base at the front, on the right hand side.

- | | |
|------------|---|
| PRINT TEST | When pressed, prints one line of characters. It will only operate when in LOCAL MODE. |
| LAMP TEST | Illuminates the ONLINE lamp, PAP OUT lamp, and sounds the hooter. |

Procedure to Change the Paper

1. Put the printer in LOCAL MODE by pressing the ONLINE switch. Then switch the printer OFF.
2. Depress the two COVER RELEASE buttons (Fig 11), one either side of the printer, and swing the FRONT cover open.

Procedure to Change the Paper (Continued)

3. Move the PAPER RELEASE LEVER (Fig 10) to the front of the printer, and the PAPER THICKNESS CONTROL (Fig 10) to the back of the printer.
4. Lift TRACTOR CHAIN COVERS (Fig 10) and remove last pages of paper.
5. Place paper underneath the printer table. Feed paper end through slot in table and bottom of printer, upwards to front of platen (Fig 10). This is made easier if the paper is doubled along the first perforation. Pull up enough paper for about a 12" length to show.



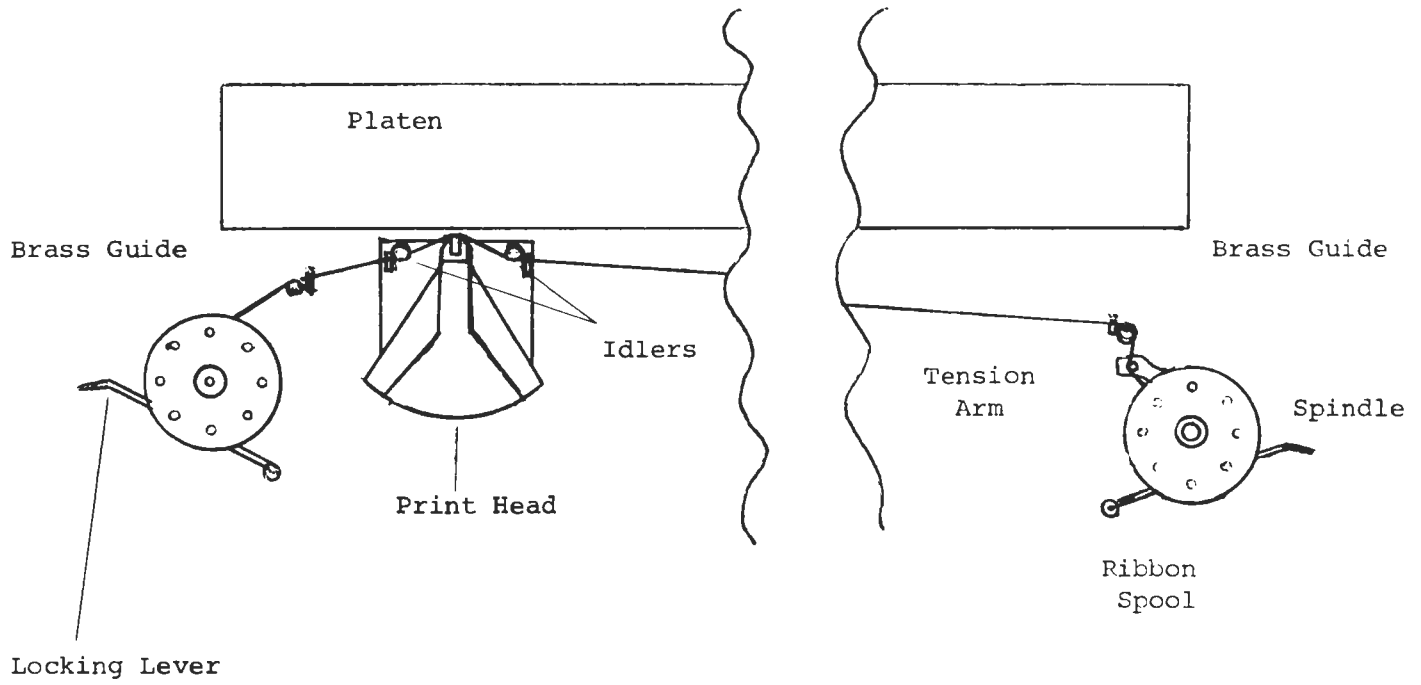
6. If paper width is different from the paper used previously, depress RIGHT HAND TRACTOR LOCK (Fig 10) and move tractor feed to appropriate position.
7. Place the paper's holes over the Chain Drive Teeth (Fig 10), making sure that it is correctly positioned by checking that horizontal lines are level.
8. Release the TRACTOR CHAIN COVERS (Fig 10) and take up any slack on the paper tension with the FINE ADJUSTMENT KNOB (Fig 10).
9. Replace the PAPER RELEASE LEVER towards the back of the printer.
10. Close the lid and turn the printer ON.
11. Lift the PLASTIC COVER (Fig 10), press in the RELEASE BUTTON (Fig 11) on the PAPER ADVANCE KNOB (Fig 11) and turn this knob to position the paper as required.

Procedure to Change the Paper (Continued)

12. Release the RELEASE BUTTON and ensure that the PAPER ADVANCE KNOB is locked by trying to turn it. If this knob still moves depress and release the button again. Close PLASTIC COVER.
13. Carry out PAPER THICKNESS AND PRINT TEST. (See below).
14. PRESS ONLINE BUTTON. PAPER CHANGE COMPLETE.

Paper Thickness and Print Test

1. Push PAPER THICKNESS CONTROL (Fig 10) towards back of printer.
2. Press PRINT TEST (Fig 10) followed by a LINE FEED AUTO.
3. If print density is dark, but not smudged position is correct. Otherwise, move PAPER THICKNESS CONTROL a notch and repeat (2) until the print is as stated in (3).



(Fig 15)

Changing the Ribbon (or Turning it over) (Fig 3)

When the print quality has deteriorated the ribbon should be turned over or changed. The print density can be increased by bringing the PAPER THICKNESS CONTROL forward. This is only a short term improvement and is not recommended.

1. Carry out the first two Procedures for Paper changing.
2. For each RIBBON SPOOL in turn, move its locking lever towards front of machine. Lift spool off its SPINDLE.
3. Ease ribbon from the two BRASS GUIDES at either end of carriage.
4. Lift the ribbon clear of the PRINT HEAD and the two IDLERS.
5. Turn ribbon over i.e. interchange the SPOOLS, or fit new ribbon.
6. Fit ribbon spools back on spindles and lock into position. Allow ribbon to rest on PRINT HEAD CARRIAGE.
7. Fit ribbon around the two brass guides making sure that the ribbon is not twisted.
8. Fit ribbon behind head, and in front of the two idlers making sure ribbon lies flat.
9. Turn Spindles gently to take up any slack ribbon.
10. Close the front cover, carry out PAPER THICKNESS and PRINT TEST.
11. Press ONLINE BUTTON. RIBBON CHANGE COMPLETE.

Centronics 101 Serial Printer (Fig. 10)The Operator Panel (Fig. 11)

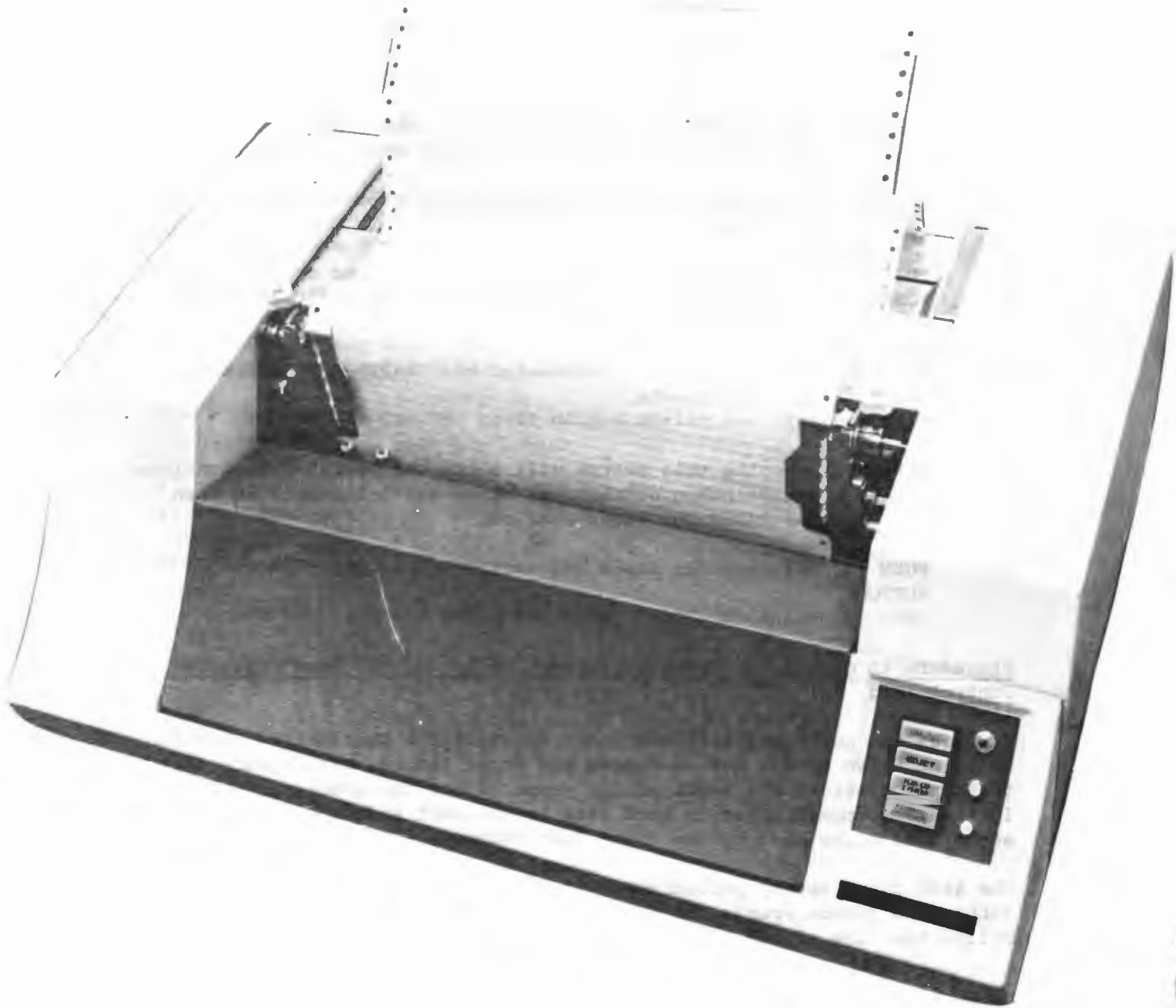
The operator panel is located on the right side of the printer, and operates as follows :

1. ON/OFF Depression of this switch will either switch the power on or off, the switch being illuminated when the power is on.
2. SELECT Press this switch to bring the printer into operation with the 2200.
3. TOP OF
 FORM Press this switch for throwing the paper to the head of the form, as controlled by the vertical format control tape.
4. PAPER
 OUT
 Light When the paper is exhausted the 'PAPER OUT' indicator will illuminate.
5. OVERRIDE Pressing this switch will allow the operator to continue the printing of the form which was being printed when the PAPER OUT light came on.
6. PUSH
 BUTTON Advances the paper one line.

Procedure to Change the Paper or Ribbon, or to use the Form Thickness Control (Fig. 12)

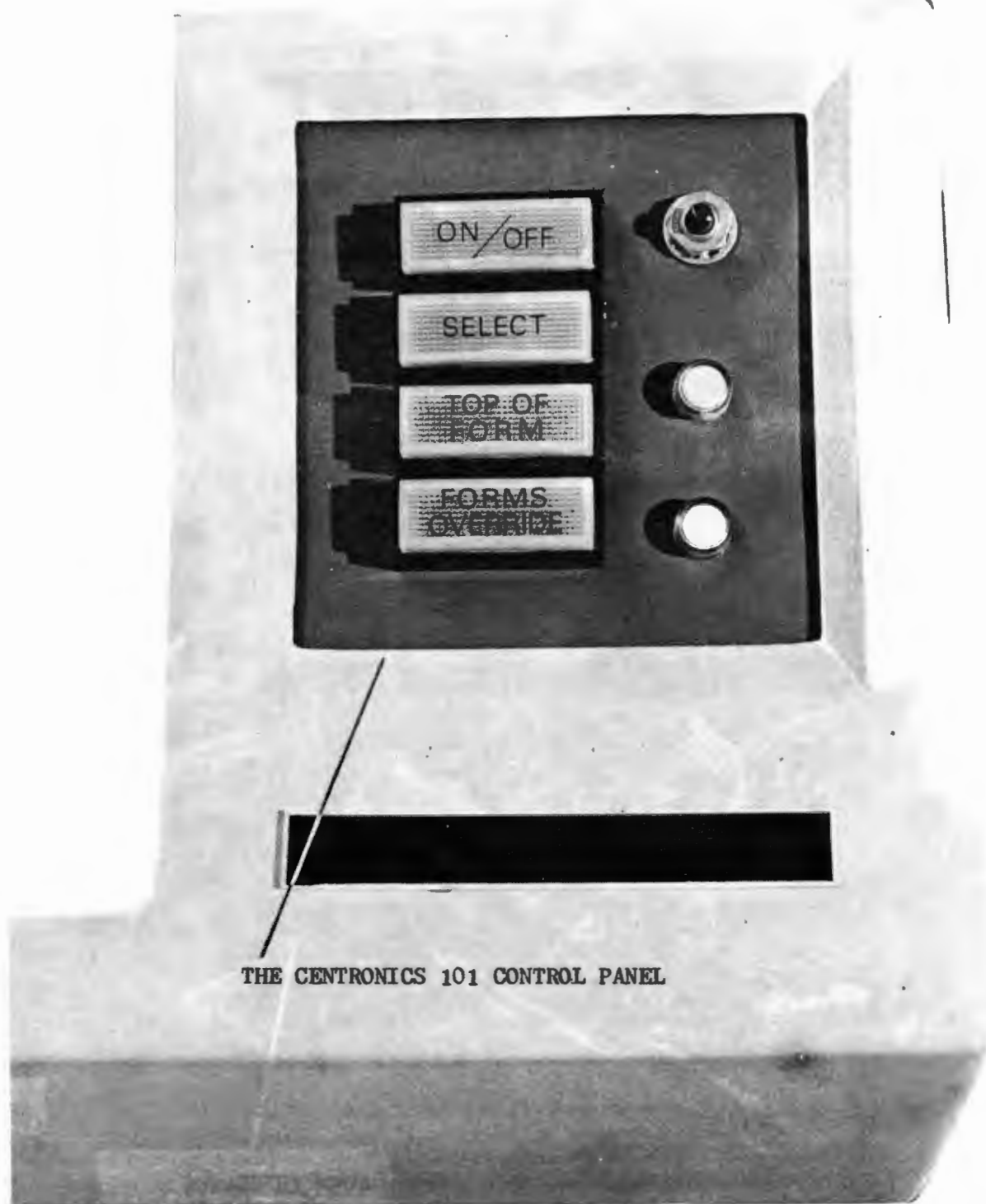
Turn off the power and lift the front cover of the Centronics. Now the sprocket drive covers may be opened and paper fed in, making sure that the tension across the width of the paper is not too great, and that the left hand sprocket drive is hard over to the left side of the machine - adjustment being made by the right hand drive.

The side flaps may be pulled clear if the ribbon requires changing. The ribbon and ribbon spools can now be removed and a new ribbon fitted. Follow the line of the ribbon when fitting the new ribbon.

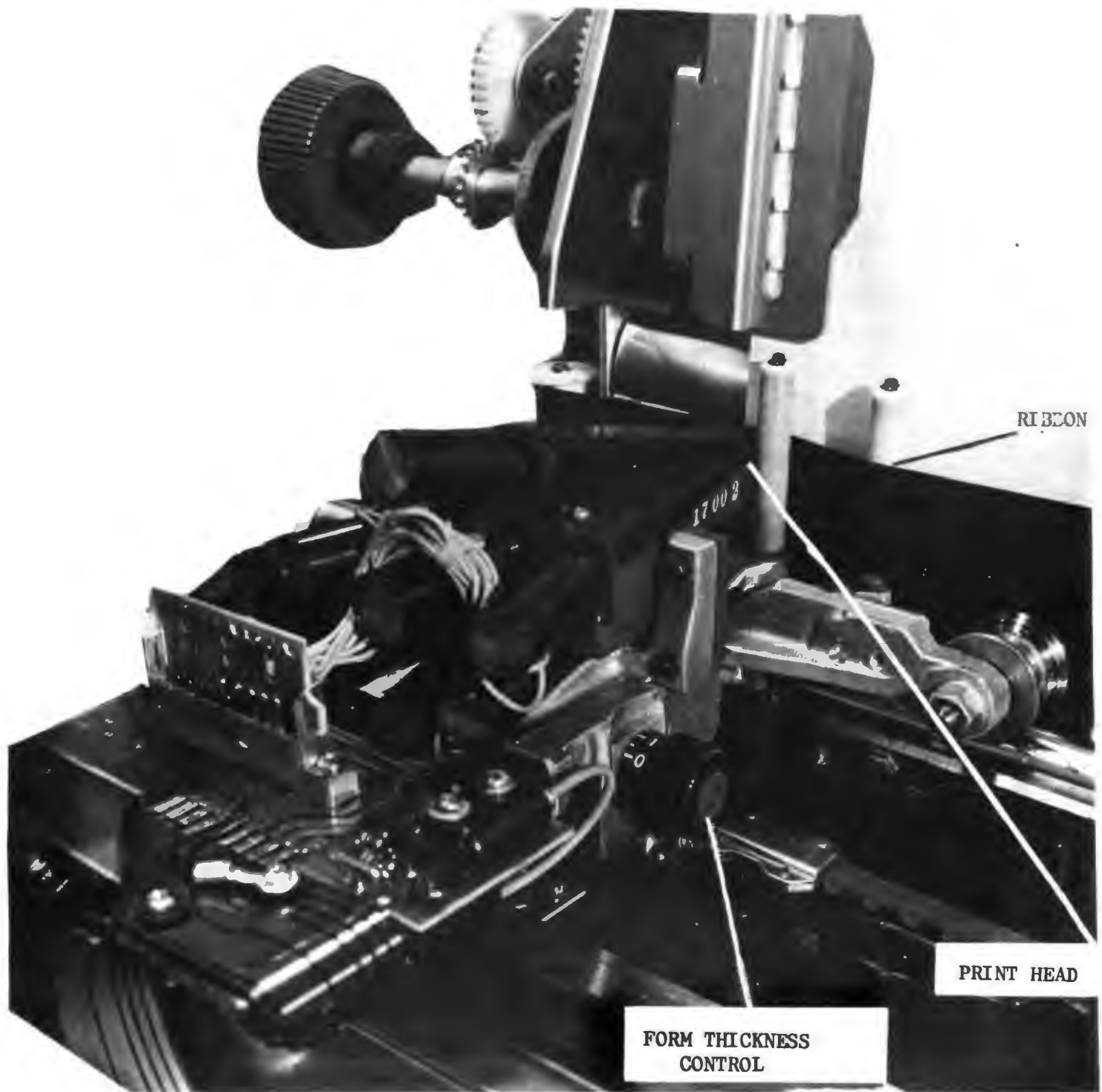


CENTRONICS 101 PRINTER

(Fig. 10)



(Fig. 14)



MATRIX PRINT HEAD AND FORM THICKNESS CONTROL

(Fig. 15)

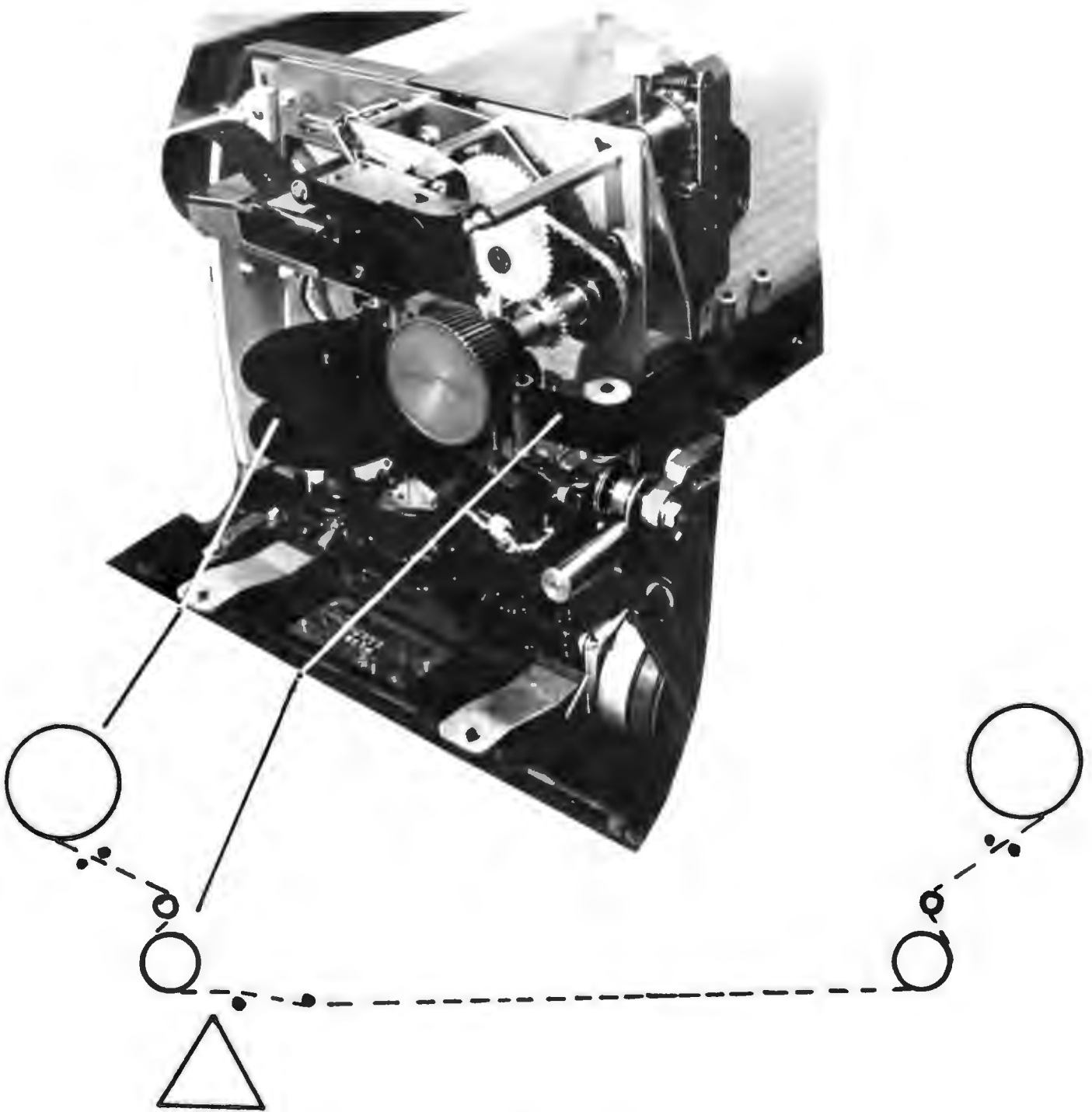


DIAGRAM SHOWING LINE OF RIBBON

(Fig. 16)

SECTION II

BR Terminal Program (BR1050)

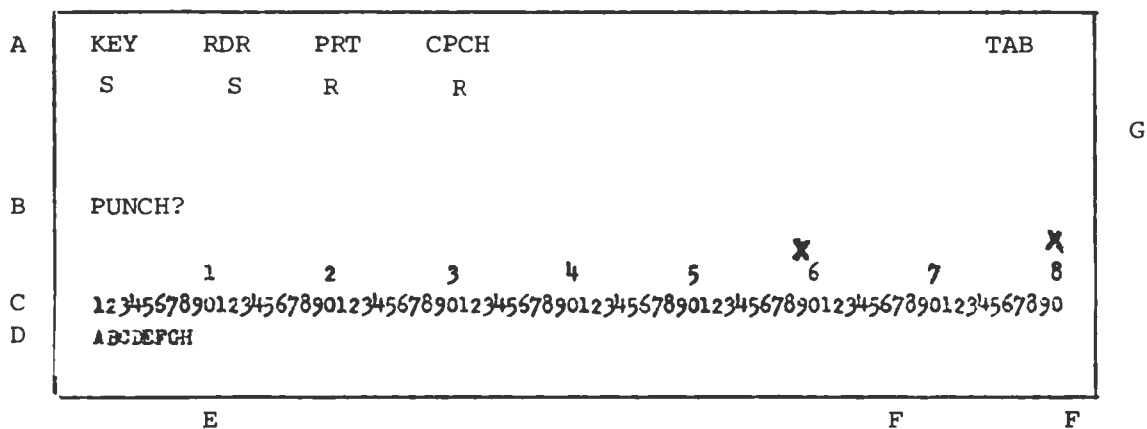
This program is the primary program for the 9200 and it contains the control which permits you to communicate with the 370 computer through the 9200 configuration.

Program Loading (Fig. 2)

The PROGRAM is placed in the rear deck, making sure that the locking bar is pushed firmly home, then press the 'RESTART' key. This action will load the program into the 2200.

When the program is first loaded, all peripherals are automatically switched to line mode and will appear on the screen

The screen indicates the current state of the terminal, and will look something like this :



- A. Shows the current state of any switches that have been selected i.e.: KEY - Keyboard in home loop.
H
(Full details are given in later pages)
- B. Visual display of errors i.e.: PUNCH? - indicating a fault on the punch, which includes, the punch not switched on, or no cards in the Hopper, etc.
- C. The standard 80 columns of a card in use for TOPS.
- D. A visual indication of what has been keyed (ABCDEFGH).
- E. A visual indicator (Blinking Cursor) resting at the next column to be keyed.
- F. Tabulation settings (Col.59 & 80) can be changed to the operator's requirements.
- G. Release date of this version of the program cassette, communication line speed (134 or 600 baud) + terminal address letter (A - Z).

Program Loading (Continued)Screen Description

KEY = Keyboard
RDR = Reader (9645)
PRT = Centronics (165 CPS) printer
CPCH = Card Punch (9645)
TAB = Tabulation (for home loop only)

For switch setting purposes the first character of each heading identifies the switch e.g. Keyboard = K, Reader = R. A second character is necessary to set the mode and these are :

H = HOME
S = SEND
R = RECEIVE
F = OFF
D = DOUBLE SPACING OF PRINTER (Home Loop)

When setting switches it is necessary first to press the function key DISPLAY and while holding this down set your switches. The mode character (except F) will be displayed under the switch, to which it refers, when 'F' has been used the switch will be blank on the line below.

An analysis of the line mode setting as shown above is :

KEY	RDR	PTR	CPCH
S	S	R	R
Keyboard in send to CPU.	Reader in send to CPU.	Printer in receive from CPU and also print INPUT from Keyboard or Reader.	Card punch in receive from CPU.

The TAB is of course off as it can only be used in home loop mode. The tab settings set are shown by the 'X' above the card column indicator. These settings can be changed, details will be given later.

The numerics 1 to 80 indicate the columns of an 80 column card.

The cursor in the bottom left hand side of the screen indicates the print line, the cursor showing the next column available for information. While the cursor blinks, it awaits your instruction.

Any error messages are shown on three lines above the row of numerics; the machine will 'BLEEP' and display the error for a few seconds then erase, if the fault persists the error will again display. The errors that can be displayed are :

BR TERMINAL PROGRAM

Program Loading (Continued)

Screen Description (Continued)

LOST CARRIER

NO READ LEVEL

UNABLE TO TRANSMIT

PRINTER?

DATA CHECK

READER?

PRINTER ADDRESSED

PUNCH?

PUNCH ADDRESSED

"A ***** Diagnostic message - Depress Display - Q to turn off".
The error message on the video screen indicates where the probable fault lies, and action should be taken to remedy this.

In the case of the Lost Carrier and Unable to Transmit response, when this is screened and persists you should take up with the TOC.

In addition the machine will 'BLEEP' if an incorrect key selection is made when switching connections are keyed.

FIVE ALTERNATIVE CODE KEYS ON THE MAIN KEYBOARD

	When pressed on its own	When pressed with Shift Key
1. READ (EOT)	EOT To be used when (2) inoperative	READ
EOT	EOT	EOT
SETTAB TAB	TAB	SETTAB
LEVEL 3 (ENTER)	Enter to be used if 'ENTER' key inoperative	SET READ LEVEL 3
SP Ø	Ø	USE IF SPACE BAR INOPERATIVE

Switch Settings

A valid switch setting table is shown below:

First Character Switch	Second character or mode				
	H	S	R	F	D
K	X	X		X	
R	X	X		X	
C	X		X	X	
P	X		X	X	X
T	X			X	

Read Levels

A read level is a means of determining which columns should be read from a card. These are referred to numerically. There are five and are numbered 1,2,3,4 and 5. All levels can be used in home mode but only 1, 2 and 4 in line mode. The amount of data read by each level is as under :

- 1 will read card cols. 1-19
- 2 will read card cols. 1-16 and 59-80
- 3 will read card cols. 1-80 or as set
- 4 will read card cols. 1-80
- 5 will read card cols. 1-80

The first card of any input must contain a read level. This is always punched in card column one. A fault display 'NO READ LEVEL' will appear on the screen if the read level character is omitted. In the case of read levels 1,2,3 or 4 the read level remains effective until a different read level is encountered or whenever an EOT is read.

In the case of Read Level 5 this continues until the pack has been read whether or not any other read levels are contained in the pack. The main difference between read level 5 and the others is the read level 5 reads and prints card col. 1 whereas the others read card col. 1 but do not print or transmit the column.

Change Read Level 3 Format

Set switches KH/CH and punch a card with an X in the columns that you wish to read from the main pack of cards, and blank in the columns to be skipped or omitted.

02 E 123456LBD05450105900231
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

36600IRNETL SPD 2882400
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96

B
A
8
4
2
1
B
A
8
4
2
1
B
A
8
4
2
1

87 88 89 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128

33 34 35 36 37 38 39 40 41 42

Wagon number (E 123456)
Loading (L)
Wagon type (BDO)
Tonnage (059)
Brake force (00)
Destination (36500)

[illegible]

If the printer and reader are now switched to home mode (PH and RH) the print out from the main pack of cards will now read :

Read Levels (Continued)

Change Read Level 3 Format (Continued)

An alternative to compressing the information in this way is to space the message by fields, and this can be achieved by replacing the X at the start of a field by a number 1 - 9, this number representing the number of spaces you wish to insert, the effect on the X format card would then appear as :

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32																																																																
X				XXXXXXXXXX												XXXXX																																																																															
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64																																																																
XXXXX																																																																																															
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96																																																																
97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128																																																																
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The format card is now passed through the reader by loading into the rear hopper. Press 'STOP/START' then put keyboard in home mode (KH) press and hold 'SHIFT' key and press 'LEVEL 3' key, the card will be read, the existing format replaced, and a printout of the desired effect will be achieved thus :

E 123456 L BDO 059 00 36500

Use of Basic Card Punch

To use the device as a basic card punch put the card punch in home mode (CH) and the keyboard in home mode (KH). It is used for ordinary card punching into blank cards as well as for:

- Punching into pre-punched cards
- Copying all or part of previous card
- Changing the TAB position
- Changing Read Level 3 format

Punching into a Blank Card

For ordinary card punching, the operator first keys the data to be punched, and this will appear on the screen. At this stage the operator may backspace, correct or cancel his typing. When satisfied with the visual display, press the 'ENTER' key. This action will activate the punch, and the screen display will be punched and printed into the card

Punching into Pre-punched Cards

Load the cards into the rear hopper, set keyboard home (KH) and card punch home (CH) and (RF) then hold the shift key down the press the 'READ' key. This will cause the first card to be read, displayed on screen and left waiting to be punched, the cursor being at the beginning of the image. If the TAB switch is set to home (TH) before the card is read, the cursor will automatically move to the first TAB stop, which on screen display on page 2 would be column 59. Key in as necessary and press shift/read together, this will punch and print the card in the wait station and read and display the next card.

If there are no more cards to be read, the last card should be terminated by 'ENTER' not 'SHIFT/READ'.

Copying All or Part of Previous Card

If an operator has keyed in data and punched a card, the data of this card is retained in memory, and an exact copy can be displayed by depressing and holding control key 'KEYBOARD'.

If the 'KEYBOARD' is released during the display, the display will stop immediately if TAB is off (or at the next TAB stop if TAB is on) alterations/additions can then be made. If the 'KEYBOARD' is then depressed again it will continue the display. Press 'ENTER' to punch a new card.

If alterations require to be made to a pre-punched card it can be Shift READ into the reader, the necessary alterations made on the screen and then 'ENTER' can be pressed. This will over punch the alterations on the card in the wait station, so the card is invalid. However, by pressing 'KEYBOARD' the whole image can be displayed and a new card punched when 'ENTER' is pressed.

Use of Basic Card Punch (Continued)Changing the TAB position

The 'TAB' has been pre-set in columns 59 and 80 (Page 26) but can be changed by the operator.

Set keyboard and card punch to 'HOME' mode (KH/CH) and prepare a punched card with X in column(s) where the 'TAB' stop is required, this is a TAB format card and can be retained for further use.

With the keyboard in home mode (KH) load the prepared punched card in the rear hopper; press 'STOP/START', press and hold 'SHIFT' key, press 'TAB SET' key. The card will be read and the 'TAB' reset in the position dictated by the X's on the card. The new tab settings will now displace any previously on the screen.

Special Alternative Code Keys

When using the 9200 in 'HOME' mode, the CPU can address your machine, in that a message will appear on the screen :

PRINTER/PUNCH addressed

To get back to 'LINE' mode it is only necessary to press and hold 'DISPLAY' and then press the letter 'L', the original screen switch display will be instantaneously reset, leaving the 'TAB' stops and read level '3' in the select positions.

If difficulties arise, when using the 9200 in 'HOME' mode, to re-initialise mode, press and hold 'DISPLAY' then press the letter 'I'. This should only be used as a last resort as it breaks communication with the CPU. The original screen display will be instantaneously reset, and the 'TAB' stops will reset to 59 and 80 and read level '3' reset to read columns 1 to 80. In addition this action will automatically request a poll from the CPU, for a keyboard input, but subsequent keyboard inputs must be requested by the 'KEYBOARD'.

Summary of Special Card Punch Function

Backspace key

Pressing the backspace key will cause the last character to be erased from the screen, but if the printer has also been selected a ($\backslash$) character will be printed.

The screen will not be erased if the data includes a card read by the 'READ' key.

Cancel key

Pressing the cancel key will cause the current line to be erased from the screen and the cursor returned to column 1.

The screen will not be erased if the data includes a card read by the 'READ' key.

Delete key (Used only after a card has been read by the 'READ' key)

If the delete key is pressed an underline character will appear on the screen. All holes will be punched in the card to effectively delete any character already punched in the card. When this code is read from a card, it is treated (and transmitted) as a space.

"DISPLAY - M

Under instruction from an engineer, push the red button on the modem, then depress display - M and, if the Modem is operating properly, the word "SATISFACTORY" will be displayed".

Use of Line ModeReceiving a message

Whenever possible a printer should always be assigned to receive 'PR' and the card punch to receive 'CR'. If they are not so assigned when the CPU addresses them, the machine will bleep and display 'PRINTER/PUNCH addressed', the operator should revert to an ON-LINE condition. 'PR/CR' as soon as possible, ready to receive the output from the CPU when the device is re-addressed.

Sending card messages from the reader

The printer should be assigned to print out the data being sent (PR). The card message to be sent is now placed in the rear hopper. Press 'STOP/START' to clear 'HOPPER EMPTY' light. The reader must now be assigned to Reader Send (RS). It is now in a ready state, waiting for the CPU to poll the reader.

N.B. : A valid read level must be contained in column 1 of appropriate cards and the last card must be the signature card and EOT (blank-2 or 3 initials-EOT).

Sending messages from the keyboard

The printer should be assigned to print out the data being sent (PR). The keyboard is then switched to send mode (KS) and the function key 'KEYBOARD' is depressed, this has the effect of requesting permission to transmit from the keyboard.

When the CPU polls the keyboard, it acknowledges the request to transmit by illuminating the 'KEYBOARD' key and the machine will 'click'. The operator can now key in the data, pressing 'ENTER' at the end of each line. If a mistake is made on a line he should key??? and 'ENTER' and restart the line. Alternatively, he can 'cancel' that line.

N.B. : When an ON-LINE keyboard INPUT is being made, the Backspace key is inoperative.

If more than 30 seconds elapse before the first character is keyed or between subsequent characters, the 'KEYBOARD' light will go out, and the operator must press 'KEYBOARD' key again and wait until polled. You must then start the message from the beginning.

Error or attention responses from the computer

When an input message is incorrect or a message calling for special attention is output, after the end of the message and when the paper has been rolled up some 10 line feeds the word **A T T E N T I O N** will be printed.

Multi-useHome-Line mode

Card Punching can be carried out in Home mode, while cards are being sent via the reader to the CPU.

DISPLAY-Y

When DISPLAY-Y is pressed it will load the TOPS Office Machine Yard programs in Section III.

SECTION III

1. General Description

The program is accessed from the Terminal program by Display-Y and consists of a number of routines accessible from the same program. Because there is not room to hold all of these at once, there will occasionally be a short delay after the selection of some of the routines.

These routines are divided into 5 main types:

- (a) off-line input
- (b) Listing cards
- (c) Listening to the 370 to address the terminal
- (d) Facility to return to the Terminal Program
- (e) Selection of cards by wagon number

The basic structure revolves round a 'series' of available options. These options are displayed on the screen on entry from the Terminal Program and after the completion of each process. The operator selects the routine required by typing the 2 alphabetic characters shown in brackets followed by 'enter'. Any routines not immediately available will be so indicated on the screen. The selection of one of these routines will result in "LOADING OTHER TOM" to be displayed.

At all times, the line listening routine will monitor any 370 attempts to address the terminal and, should that happen, a message will be displayed on the screen (see 4 below).

2. Off-line Input

This section comprises 4 routines:

- (a) Free Punching
- (b) Punch Allocation Cards
- (c) Read Allocation Cards
- (d) Input Date

2.1 Free Punching

This routine allows all the facilities available in the Terminal Program in 'KH,CH' mode. These comprise punching a new card with tab and keyboard facilities, reading a card and adding or deleting data and setting tabs. It contains two facilities which are not in Terminal Program.

- (a) If a card has been read for amendment and one or more characters are altered, the original card will have an X in column 1 and will be put into the reject (right hand) stacker and a 'clean' copy of the card punched into the left hand stacker.
- (b) At any stage after pressing 'ENTER', display-S will return to the options.

In all other respects, except the setting of level 3 cards which has no meaning in TOM, the routine operates exactly as the Terminal Program KH/CH.

2.2 Punch Allocation cards

This program is the basis of the allocation of wagons to sidings. The operator should key in the rules for such allocation and a pack of cards will be produced. All input is monitored by the machine and this is the only way of forming the rules.

The rules cover a number of fields and combinations and may be summarised as follows:

(i) Rules

- (a) All cards with a particular field containing a particular value eg. Destination 12345.
- (b) All cards with a field containing several specific values e.g. Tag 123, 139 or 156 (may have any number of entries)
- (c) All cards with a field within a range e.g. Brake type A-W
- (d) All cards with a field containing anything except a value, series on range of values - e.g. not E (loaded), not destination 60000-75000, not wagon types VVV, VSV.
- (e) All 'not-to-go' cripples.
- (f) Any combination of above e.g. Empty, going to dest. 12345-23000, except 12712, 12933.
- (g) Any which do not satisfy other rules (may also be qualified) - e.g. Rest which are unbraked.

(ii) Fields concerned

Tag, Wagon Type, Destination, Commodity, Cripple Code, Special handling, Brake Type, Load Category, Rest.

In order to effect the allocation, cards formed in this way must be read into core using "Read Allocation Cards", section 2.4.

2.3 Input Date

This routine allows the operator to key in the date for use in the other programs - e.g. on the lists' headings.

The input is monitored to receive DD mm YY. (07 08 73)

If the date stored in the program has become corrupted, e.g. by loading another program or turning off the machine, the program will enter this routine before going to the options. The current date will be shown on the top line of the options.

2.4 Read allocation cards.

This program replaces any existing table for allocation with a table formed from the input cards. Any unacceptable cards are displayed and rejected.

3. LISTING CARDS

3 lists are available:

- (a) Train List
- (b) Shunt List
- (c) Location List

3.1 General

The cards to be listed should be placed in the rear hopper and the appropriate routine entered from the available options.

Each routine offers as options:

- (a) Single or double spacing
- (b) Allocation to sidings
- (c) Print on one or more remote printers and/or locally in the TOPS office.

All three programs will format 01, 02 and 06 cards and accumulate fields accordingly. Any card which is not 01,02 or 06 will be listed in full but otherwise ignored.

For all lists except the shunt list, for which no totals are printed, totals will be produced when all cards in the hopper have been read.

These totals show:

Total length in feet

Total weight

Available Brakeforce (Air)) from the leading wagon to the first non-

Available Brakeforce (Vacuum)) compatible brake fitting or unfitted vehicle.

Maximum speed

Route Availability.

It should be noted that TOPS holds only the lesser brake force in the case of dual braked vehicles. Thus, the amount of brakeforce calculated will err on the side of safety when dual fitted wagons are entered with a difference in brakeforce between air and vacuum brakes.

Each 01 or 02 card is numbered sequentially. A maximum of 60 lines is printed on a page.

3.2 Train List

This contains a print-out of the following fields for 01, 02 and 06 cards:

- ** if cripple code present
- Wagon Sequence Number starting at 01
- Wagon Number last 6 digits only
- Load Category
- Wagon Type
- Weight
- Brake type
- Destination
- Tag no.
- Siding no.

3. LISTING CARDS (Contd.)

3.3 Shunt List

This contains identical information to the train list but no totals are printed.

3.4 Location List

As for Train List

The Location List varies from the other 2 in that totals may be achieved on receipt of a card with an 'L' in column 3. On receipt of this card, totals are produced and the printing continues starting with the siding card. Totals are suppressed if this card is the first in the pack.

4. LISTENING TO THE LINE

At all times, even when moving between BR1050 and TOM this routine is operational. It does not appear on menu but operates in parallel with all other processes.

5. RETURN TO THE TERMINAL PROGRAM

A routine on the options which reads the Terminal program from the rear tape. The process takes approximately 20 seconds. This operation will overwrite all of TOM except today's date and the allocation table formed by Read Allocation Cards.

6. FAST CARD SELECTION

This routine is to enable the operator to isolate certain wagon cards from a large pack.

The operator keys in the last 6 digits of the wagon number in the order that he wishes the train to be made up. When all numbers have been keyed in, he depresses the "keyboard" key, having placed the wagon cards in the rear hopper. When an O1 or O2 card is found which satisfies one of the keyed-in values, it and all follower cards associated with it are moved into the left hand stacker, the sequence number is punched into columns 95+96 and the number deleted from the screen. Otherwise, cards are moved into the right hand stacker. When all cards are found or read, a print-out of the results of the run in summary form may be achieved.

1. LOADING THE PROGRAM

When using the Terminal Program depress the display key and press Y. The screen will show "LOADING YARD PROGRAMS". In approximately 40 seconds, TOM will be loaded.

N.B. Keep the program tape in the rear deck throughout TOM use.

If the date is not present on loading the program, you will be asked to key it in Day, Month, Year format. Otherwise the options of available programs will be displayed.

2. USING THE OPTIONS

If the date shown on the top line is not the one required, you should go immediately to the date routine. Otherwise select any program as instructed as follows:-

If "FREE PUNCHING" is required, type FP (enter). All routines available have their two letter code shown on the options.

If you have typed in the wrong letters, press any characters other than enter and have a second attempt. If you press enter with a wrong code, the words "NO SUCH PROGRAM" will be displayed for a few seconds and the options will be redisplayed.

Otherwise, the appropriate routine will be entered. If the routine required has the words "short delay" against them, the routine will be entered after a few seconds and the words "Loading other TOM" displayed.

3. USING FREE PUNCHING (FP)

All the facilities of the Terminal Program home mode (just keyboard and card reader, punch) are available as though you were in KH/CH mode.

These are fully described in the Terminal Program procedures. A summary of the special functions are:-

(Shift) READ will read a card from the rear hopper and allow additions or alterations to be made to it.

ENTER will punch into the card in the wait station of the reader/punch, what is currently on the screen.

(Display) TH invokes the tab function as indicated by characters above the grid.

(Display) TF indicates that the tab facility is not required. The tab settings remain in force.

N.B. TH and TF will have different effects on the use of (shift) read and keyboard in exactly the same way as in the Terminal Program.

TAB If TH, move cursor to next tab position.

3. USING FREE PUNCHING (FP).

(Shift) TAB (set tab) Read card from rear hopper. Any non-space character will be displayed above the grid.

N.B Any tab settings will be retained while you remain in TOM but will not have any effect once you leave TOM - i.e. return to the Terminal Program.

Keyboard Copy from the position of the cursor onwards the previous record.

The rules for this are the same as for the Terminal Program.

Delete Used only after (shift) read to delete a character from the input card.

Space If this is on a card which has been read, it will not delete any character in the current position but will move to the right.

Otherwise, a space will be put in the cursor position.

Backspace As for space except cursor moves to the left.

Cancel As for space except cursor positioned at left of screen (column 1).

There are two facilities not in the Terminal program

(a) If a card is read and any character originally on the card is overwritten with anything except delete, the original card will be rejected into the right hand stacker, an X put in column 1, and a new copy of the card produced.

(b) Returning to the options - type (display) S

When the cursor is at column 1.

4. USING INPUT DATE (DA)

Type in under the displayed letters DD MM YY the date required. Leading zeros must be inserted - e.g. 7th August 1973 is input as 07 08 73. The program will check that it is a valid date, beeping if it is not. As soon as the machine is satisfied it will return to the options, displaying the date at the top.

This date is used for the headings of listings etc. Spacing and insertion of full stops is done automatically by the program.

5. USING THE LISTS (TR - Train List, SH - Shunt List, LL - Location List)

Load a pack of cards into the rear hopper for listing.

Each list asks the questions:-

- (a) Single or Double Spacing. Reply "S" or "D" to get one or two line feeds between wagon cards.

- (b) Allocation required?

If Y, a further question will be asked:

"Override required?" This refers to the facility for overriding any allocation made by the program. An example of when this may be required is as follows:

If a wagon card indicates that the wagon is in good order out inspection shows otherwise, then allocation should be made to a cripple siding and not to the normal one.

Normally the answer to this subsidiary question will be "N".

- (c) If the TOPS office has the facility for remote printing, another question will be asked:

"Local, Remote or both printers?"

If no remote printing capability exists, the question will not be asked

If response is "L", printing will occur in the TOPS Office only

" " " "R", " " " at remote locations only

" " " "B", " " " both TOPS office & remote location.

If the response is 'R' or 'B', the appropriate remote printer (s) must be selected. Thus a further question is asked:

"which remote". The answer may be any or all of 1 through to 8, referring to the remote locations.

If a printer is not available when selected, this will be indicated and further selection may take place.

Note that if 'B' is chosen, the local (TOPS office) printer will not print as quickly as usual as it will be tied to the speed of the remote printers. All printing operates simultaneously.

Totals will be taken when the last card has been read, except on the Shunt List.

In the case of Location Lists, by inserting cards into the pack which have an 'L' in column 3 these will be taken as headers for the following cards and will be preceded by a total. Thus if a list of several sidings is required at once, this can be achieved from a single entry to LL.

5.1 Use of the allocation facility

If 'Y' is the answer to "Allocation Required?", the following will occur:

- (a) if no table is present - i.e. the program to Read Allocation Cards has not been used - every card read will be displayed with an allocation of ***. The operator will then be asked to key in up to 3 characters to allocate the wagon to a siding. The keyed in value will be printed under "siding No." and punched in columns 83-5 of the card.

5.1 Use of the allocation facility (Contd.)

- (b) if a table is present, a match found and override is required, a similar situation to (a) will occur except as follows:
 - instead of ***, the siding number that the machine would have allocated is shown.
 - if that is satisfactory, hit enter.
 - if not, key in the new siding no. The question "Is override still required??" will be asked.
 - If not, then the override condition will be cancelled.
- (c) if override is not present and a match is found, no operator intervention is required.
- (d) if no match can be found, even for the "REST" card, condition (a) will occur.

6. USING RETURN TO THE TERMINAL PROGRAM (BK)

On the top line of the screen will appear a message if the 370 is trying to send a message to you. While you are in TOM, it is not possible to receive it.

The message displayed is of the format:-

To return, finish the process you are currently occupied in, get back to the options and hit BK (enter). The screen will display "LOADING LINE PROGRAM" and in about 20 seconds the Terminal Program will be loaded.

It is good practice to return as soon as possible to the Terminal Program when addressed or on completion of any work in TOM.

7. FAST CARD SELECTION

This program will select up to 80 '01' or '02' cards (and follower cards where appropriate) at a time.

It is selected by keying-in 'FC' and 'enter' from the options.

The cards from which the selection is to be made should be placed in the rear hopper, and the 'Stop' and 'start' buttons pressed.

Care should be taken to ensure that there is a supply of blank cards in the front hopper, as although this program does not use cards from there, the machine will beep and display the error message 'reader/punch?' if the front hopper is empty.

The program will display the first sequence number (01) and invite the operator to key-in a wagon number.

A wagon number will consist of up to six characters and will be terminated by depressing the 'enter' key. Both 'backspace' and 'cancel' keys may be used to amend any wagon number before the 'enter' key is depressed. After a wagon number has been entered the next sequence number will be displayed ready for the next wagon number.

7. FAST CARD SELECTION (Contd.)

When dealing with 'private owner' wagons, if the number of the wagon, including the slash, is more than six characters in length, only the last six characters of the number should be keyed-in. If the number consists of six or less characters, then the complete number should be keyed-in.

e.g. /A234582 = 8 characters ---- key-in 234582

 /A245 = 5 characters ---- key-in /A245

Input will be terminated when the screen is full (i.e. 80 numbers) or when the 'keyboard' key is depressed. The cards in the rear hopper will then be read and any 'O1' or 'O2' cards with a wagon number identical to one on the screen will have the sequence number punched into columns 95/96, and deposited into the left hand-stacker, the wagon number being deleted from the screen. Should the wagon number not be matched by one on the screen, the card will be deposited in the right-hand stacker. The remaining cards will be dealt with in similar fashion until either:-

- (1) All the cards have been read and the rear hopper is empty.
- OR (2) All the numbers on the screen have been matched with cards.

In the case of (1) the question 'anymore?' will be screened and if the operator wishes to search through more cards he should key-in 'Y'. This will produce the message 'hit enter when ready' to remind him to put more cards in the rear hopper. When the 'enter' key has been pressed the program will cause these cards to be read searching for the wagon numbers still on the screen.

In the case of (2) all the wagons numbers have been found and the reading of cards will cease.

The question 'print-out required?' should be answered by keying-in a 'Y' or an 'N' turning on the printer as necessary. Return to the options is automatic.

8. Using the Punch Allocation Cards Program

Ensure that front hopper has enough blank cards.
The screen will contain the word "SDG".

- (a) The siding number should be typed in 3 characters will be generated as follows:-

<u>Operator types</u>	<u>Result</u>	
1	OO1	Any other type of
A1	AO1	Keying - e.g. A1A,
AB1	AB1	ABC will result in
12	O12	a 'beep' and request
A12	A12	to re-key.
123	123	

8. Using the Punch Allocation Cards program - (Contd.)

- (b) The siding number must be followed by a field code:

Tag	T
Wagon Type	N
Destination	D
Commodity	C
Cripple Code	X
Special handling	S
Brake Type	B
Load category	L
Rest	R

This determines the field to which the following values refer and selects the type of monitoring that the routine will adopt.

- (c) This may be followed with either the value of the field or a slash (/) indicating "NOT" and then the value. The value will be checked for validity as follows:

Tag	3 numerics	card cols.	(30-32)
Wagon Type	3 alphas	" "	(17-19)
Destination	5 numerics	" "	(34-38)
Commodity	6 alphas	" "	(39-44)
Cripple Code	1 character	" "	(58)
Special handling	3 characters	" "	(40-48)
Brake type	1 alpha	" "	(19)
Load Category	1 alpha	" "	(16)
Rest	must be followed by letters 'EST' - i.e. REST. the R may not be followed by a '/'.		

When the data has been satisfactorily input, the cursor will move to a position 8 characters on from the field code - i.e. all fields, however long, will occupy 8 characters on the card and screen. In the event of an error, a beep will sound & the cursor will remain over the offending character.

- (d) At any time, backspace, cancel and keyboard may be used. They have the following functions:

Cancel will always clear the line and start again at siding number.

Keyboard will copy the previous line on the screen into the remaining positions on this line. This is useful if cards are produced with several fields the same - e.g.

Sdg. 001 LE D12345-30000, /20000-21000 B/O

Sdg. 002 LL " - " " - "

For the second line, only the keys 2,L,L, keyboard, enter need be depressed.

Backspace has different functions in different circumstances:

within a field it will perform the normal function of moving the cursor one place to the left.

if it is positioned on the field code, it will move 8 positions to the left - i.e. to the field code of the previous entry.

if it is after siding no, it will return to siding no. - i.e. same as cancel.

Backspace, if it skips back 8 places, must always be followed by another field type.

8. (Contd.)

- (e) When the first value has been successfully input and the cursor is on column 16, the following options are available:
 - (i) Enter - this is the only rule to apply to this siding.
 - (ii) ' - a further alternative value follows for the same field - e.g. N VVV, VSV
 - (iii) - (hyphen) a range is required - e.g. T100-131
 - (iv) a field code - a new field follows whose values must also be satisfied.
- (f) For (ii) & (iii) the rules still apply for the original field.
N.B. the effect of a '/' - 'NOT' - is retained until after the next field code or to the end of a rule. Thus, D/10000-13000, 14000-20000 means any destination in the ranges 00000-09999 and 13001-13999 and 20001-99999.
- (g) If a single card will not accommodate the full rule, hit enter and, using the same siding number, continue on another card -
N.B. your first rule will have to start with a field code. It is not possible to split a range over 2 cards.
- (h) When all rules are complete, hit display - S to return to the options when SDG is displayed.
- (i) All cards will contain an asterisk in column 82 to indicate that the contents are valid.
- (j) Examples of allocation cards
 - (i) SDG EO9 T 350, 351 D10200 - 38999,/16600-18999 BO-Z,/V-X
means that in siding EO9 put any wagons which satisfies the following conditions:

Tag 350 or 351
and has a Destination of 10200-16599 or 19000-38999
and has a Brake type of O,P,Q,R,Z.
as long as it is a good order wagon.
 - (ii) SDG EO3 T 520, 521

All wagons with a tag of 520 or 521 in good order
 - (iii) SDG EO4 T/350, 351, 520, 521 LL

All loaded wagons with any tag except 350, 351, 520, 521 if in good order.
 - (iv) SDG WO7 X/space BO

All unbraked cripples.
 - (v) SDG W11 REST T000-499

Any wagon in good order which has a Tag of less than 500 which does not have another applicable rule.

(j) Examples of allocation cards (Contd.)

(vi) SDG 123 T 350 D 16600-18999 C 1RNSTL NSAA - SAZ
Any wagon in good order which has:

Tag 350
and Destination between 16600-18999
and Commodity 1RNSTL
and Wagon type beginning SA

9. USING THE READ ALLOCATION CARDS PROGRAM

Put all rule cards which should apply into the rear hopper. These will be read and a new allocation table formed. This will remain in existence until either the machine is turned off or this program is entered again. If a card is found without the * put in by the punch allocation cards program its contents will be displayed with an error message and the card will be rejected. On empty hopper, the routine will return to the options.

