

**A SHORT GUIDE TO THE
USE OF THE CR8
MICROCOMPUTER**

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CONTENTS

PAGE

1.	INTRODUCTION	5
2.	INSTALLATION & START-UP	6
	Workstation	6
	Printer	6
	Single sheet feeder	10
	System Start-up	13
3.	CONCERNING CP/M	15
4.	DISKETTES	17
	Inserting a diskette	17
	Care and storage of diskettes	18
5.	FORMATTING DISCS	20
	When to format a disc	20
	How to format a disc	20
6.	COPYING DISCS	22
	Copying a complete floppy disc on the dual floppy system	22
	Copying single files	22
7.	SYSTEM RESET	23
8.	THE DAISY-WHEEL PRINTER AND SINGLE SHEET FEEDER	24
	The Printer	24
	Control panel	24
	On line/off line switch	24
	Line feed switch	25
	Page advance	25
	Set page	25
	Alert detectors	25
	Paper Out mechanism	26
	Paper Insertion	27

CONTENTS

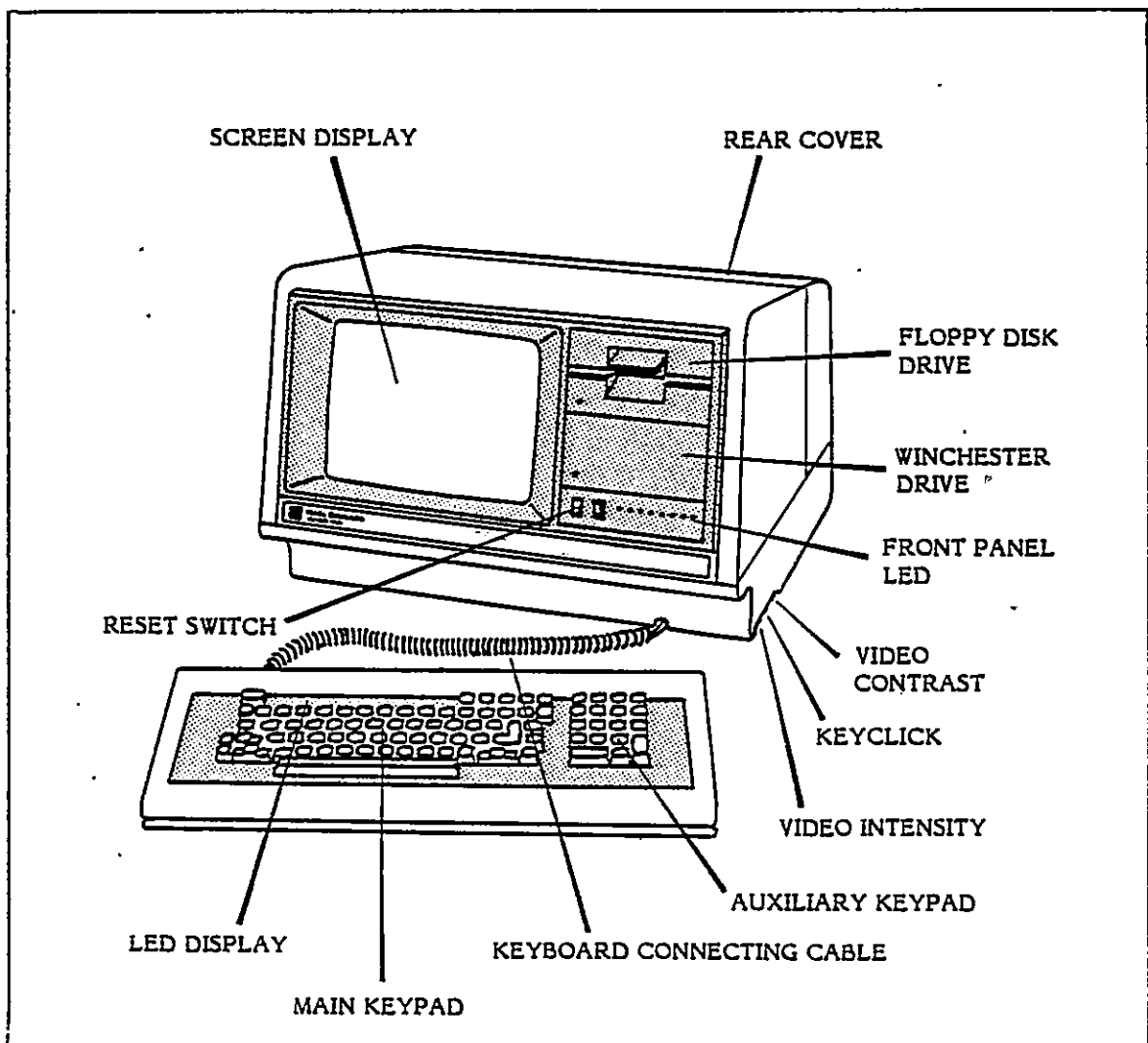
PAGE

Ribbon Cartridge	27
Daisy Wheel	28
DIP Switches	29
Setting the Paper Length	30
Selecting the Character Spacing	30
The Single Sheet feeder	31
Main feeder unit	31
Refilling the Paper tray	32
Tray capacity	32
Paper type	32
Paper insertion	33
Setting Top-of-form	33

I. INTRODUCTION

There are several possible configurations of the CR8 microcomputer; this document is aimed at users of the single-user, single processor, integrated workstation model, with the TEC model F10 daisy wheel printer and the ASF 160 single sheet feeder.

This is intended to be merely the briefest of introductions to the CR8, for greater detail the reader is referred to "CR8 Microcomputer User Guide". (ref. CSD-MIC/001/USM/0010) and to Digital Research's documentation on the CP/M 2.X operating system.



CR8 INTEGRATED WORKSTATION

2.

INSTALLATION AND START-UP

Workstation

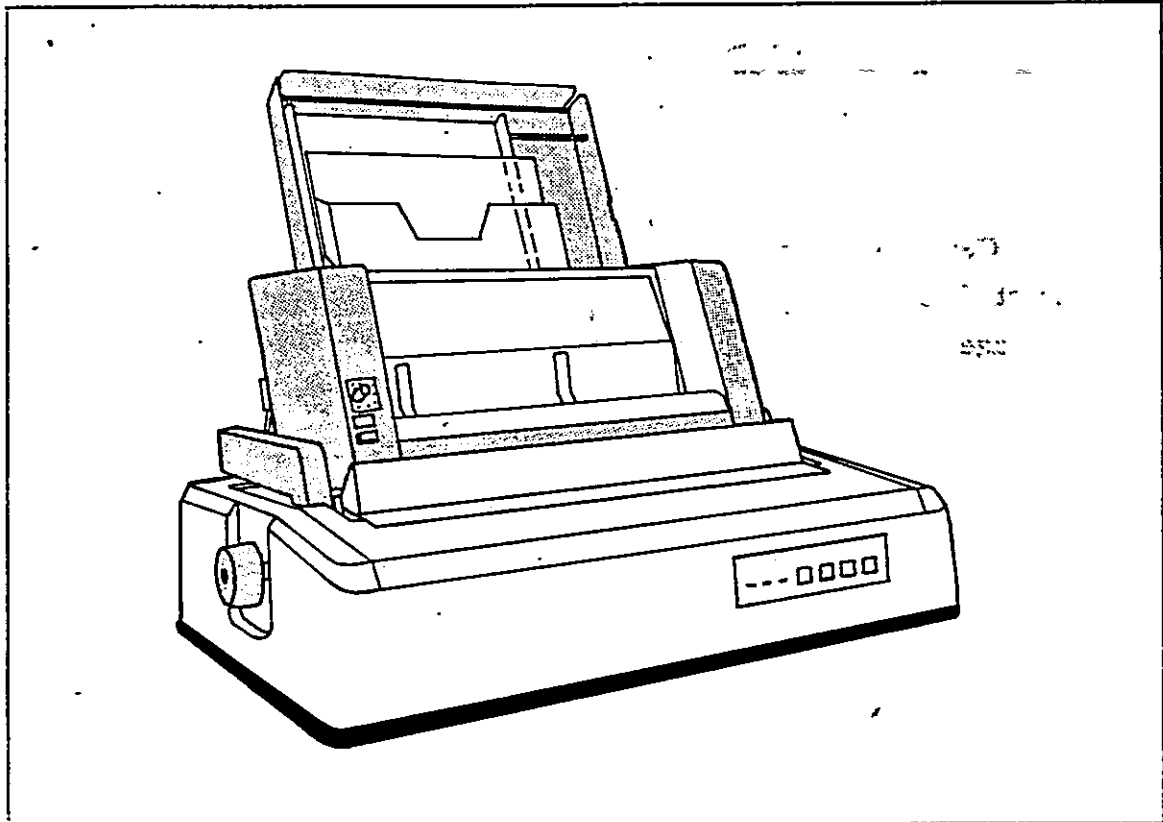
The CR8 may be used in any normal office environment. After unpacking it, you must check that the rated voltage matches that of your mains supply. The rated voltage is stated on a panel at the rear of the main workstation unit. In the unlikely event of it being wrong, the rear panel will have to be removed and the voltage setting changed using the switch at the top of the rear compartment. The rear panel is removed by removing the two screws at the rear then tilting the panel as though it were hinged where it joins the rest of the cabinet at the top.

Notice the two small sets of Dip switches on the left hand side at the back. These are clearly described on a label nearby. These should normally be left alone, unless you want to change the cursor shape or blinking, or switch to inverse video.

Make sure that the keyboard is connected to the main part of the workstation using the coiled lead supplied. See illustration on page 5 for positions of sockets.

Printer

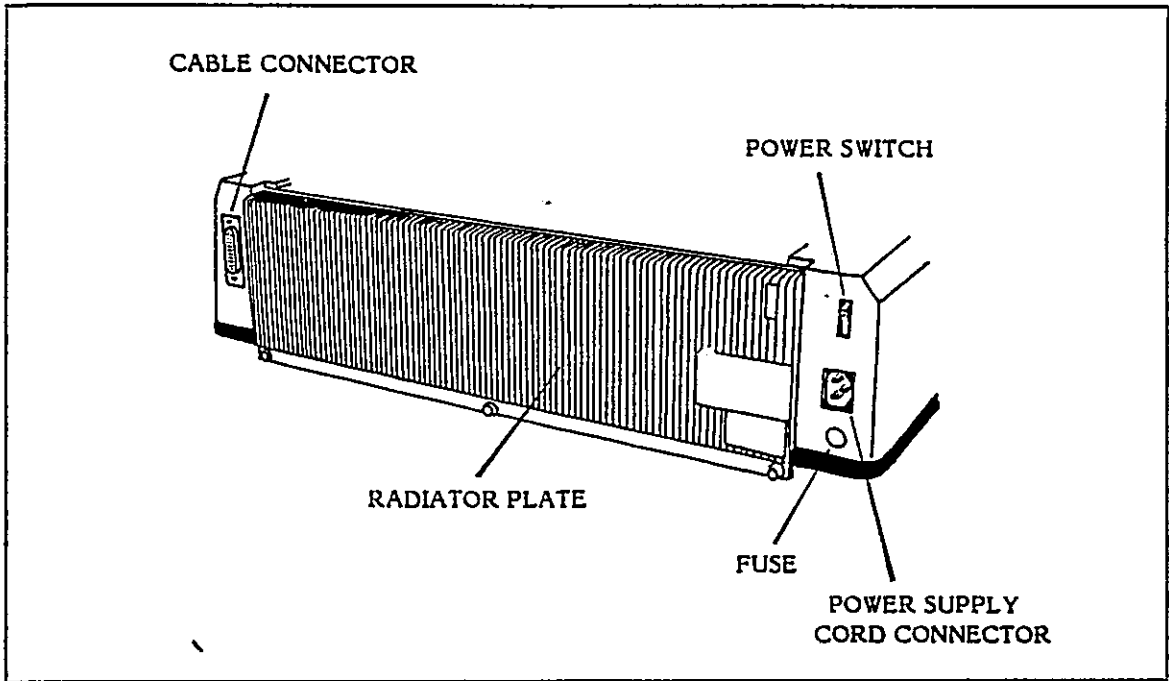
Next, the printer should be unpacked. The printer must be connected to the workstation via a cable with 25-pin Cannon connectors on each end. The connection socket on the workstation is at the rear, to the right; the socket on the printer is at the rear, to the left. (see page 8)



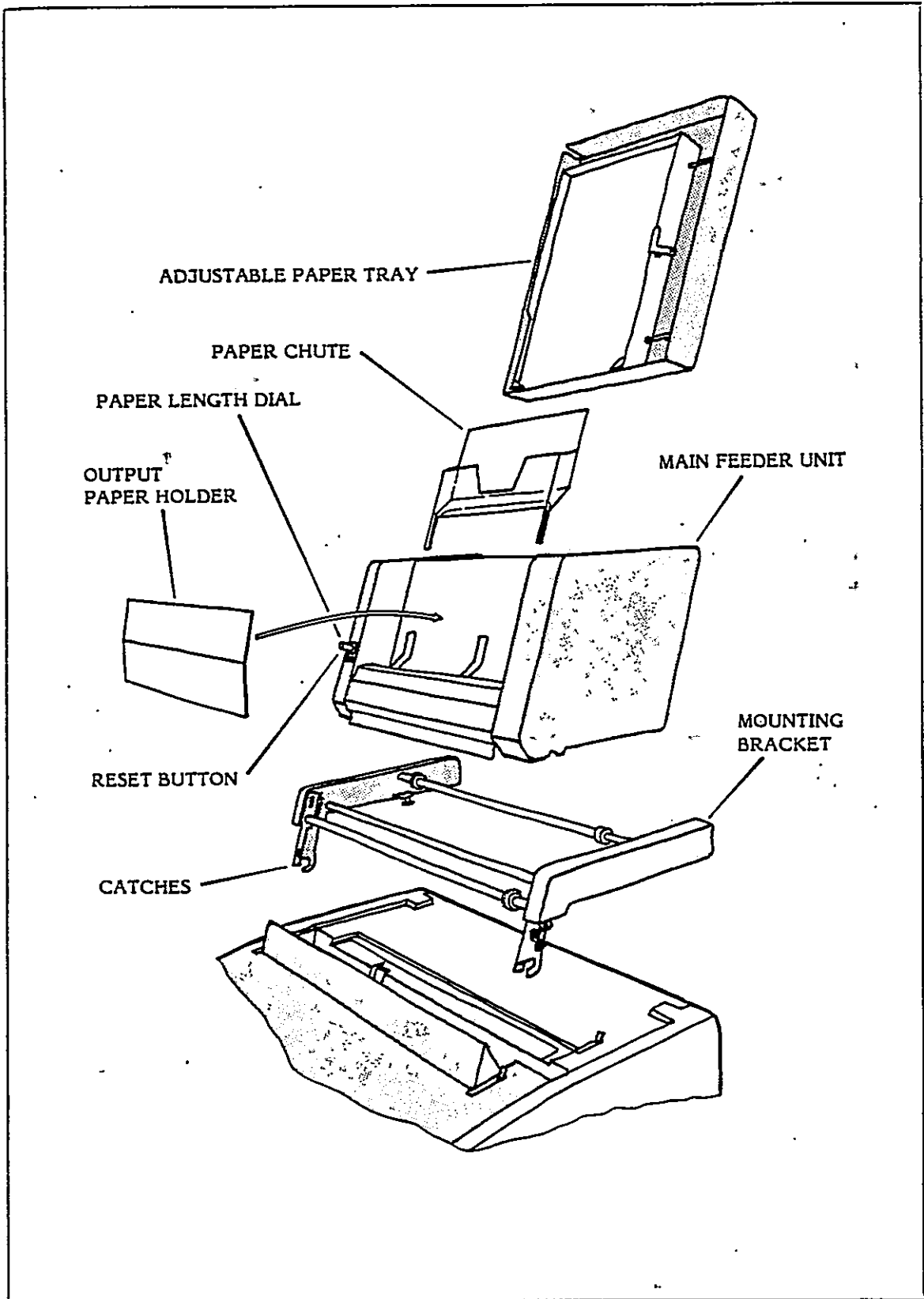
TEC PRINTER WITH SINGLE SHEET FEEDER

Before operating the printer the following items should be checked:

1. Be sure the power switch at the low left side of the printer is OFF before plugging in the power cord. (The printer is off when the marked side of the switch is depressed.)
2. Ensure that the long, cylindrical piece of expanded polystyrene packing material has been removed from the carrier mechanism (inside the front of the printer).
3. On the name plate on the back of the printer is the voltage rating. Before plugging into the mains, check that the rating is correct (it should say "AC 220V -240V" for use in Europe).



REAR VIEW OF TEC PRINTER

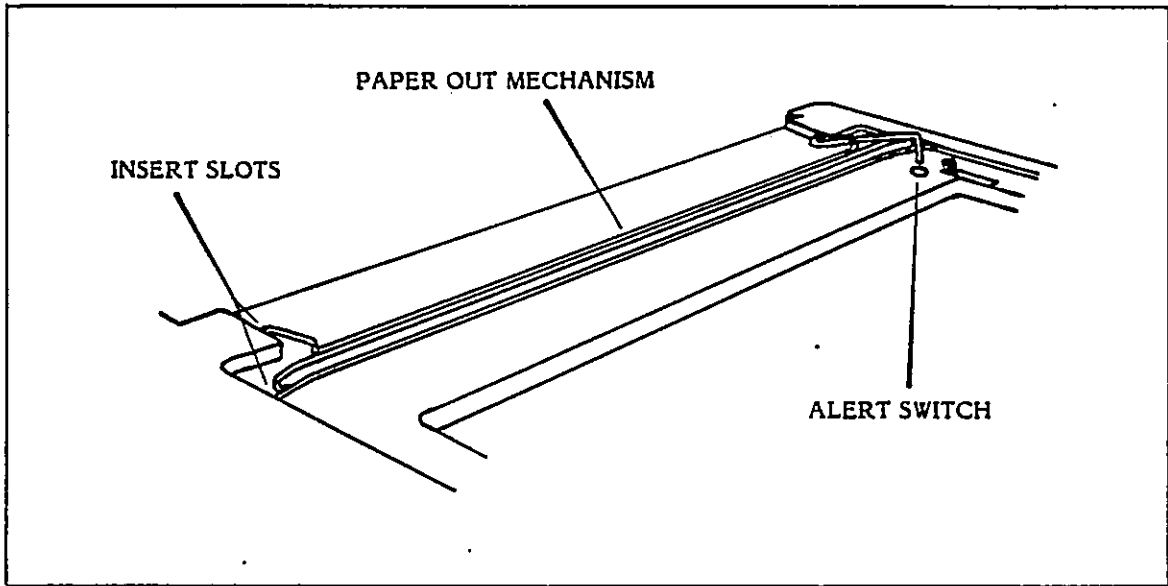


PRINTER AND SHEET FEEDER - EXPLODED VIEW

Single Sheet Feeder

After you have unpacked the single sheet feeder, you must fit the mounting bracket on to the printer, as follows (please refer to page 9):

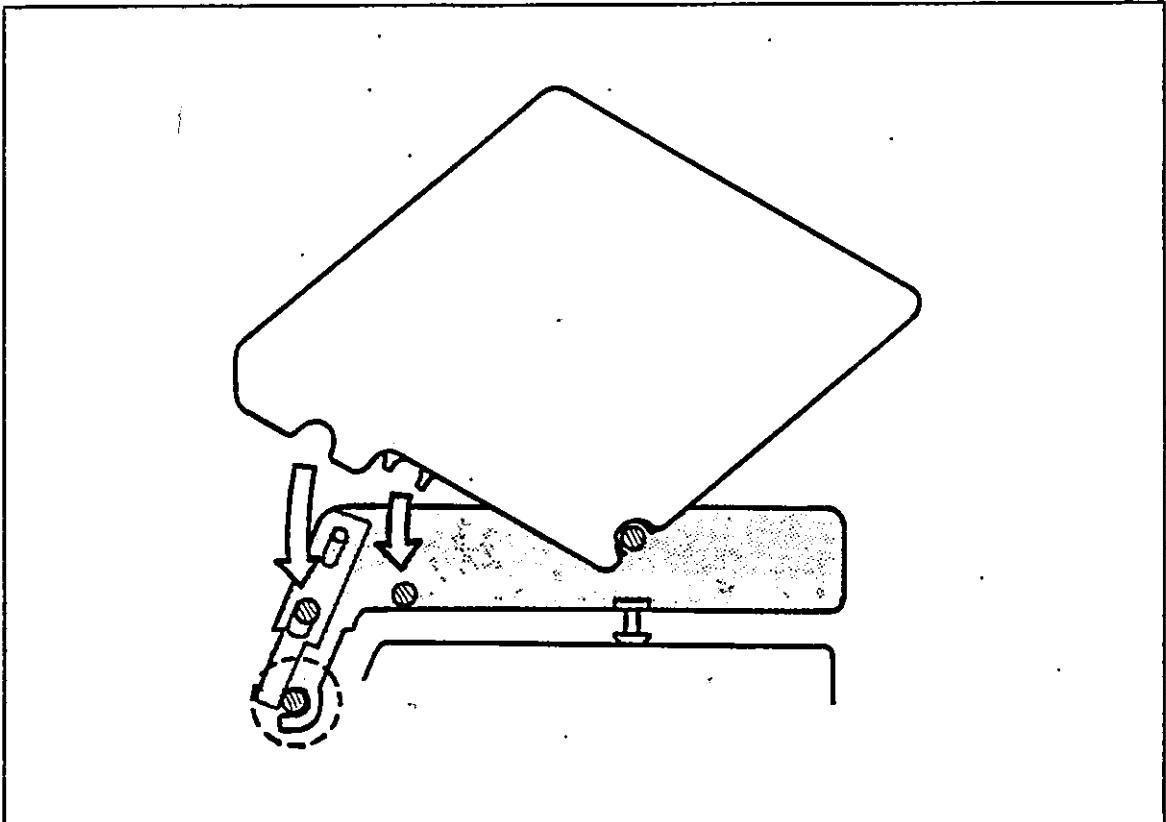
Note that to do this the Paper Out mechanism must be removed.



PAPER OUT MECHANISM OF PRINTER

Then pull the Roller Pressure-Bar towards you and remove the front panel. While holding the mounting bracket with the two catches (on the left and right hand side) nearest to you, the two catches must be pulled upwards to allow correct fitting. On the right hand side of the mounting bracket are four small cogwheels. The last of these cog-wheels must mesh with the cog-wheel on the platen shaft (the one nearest to the rubber part of the platen).

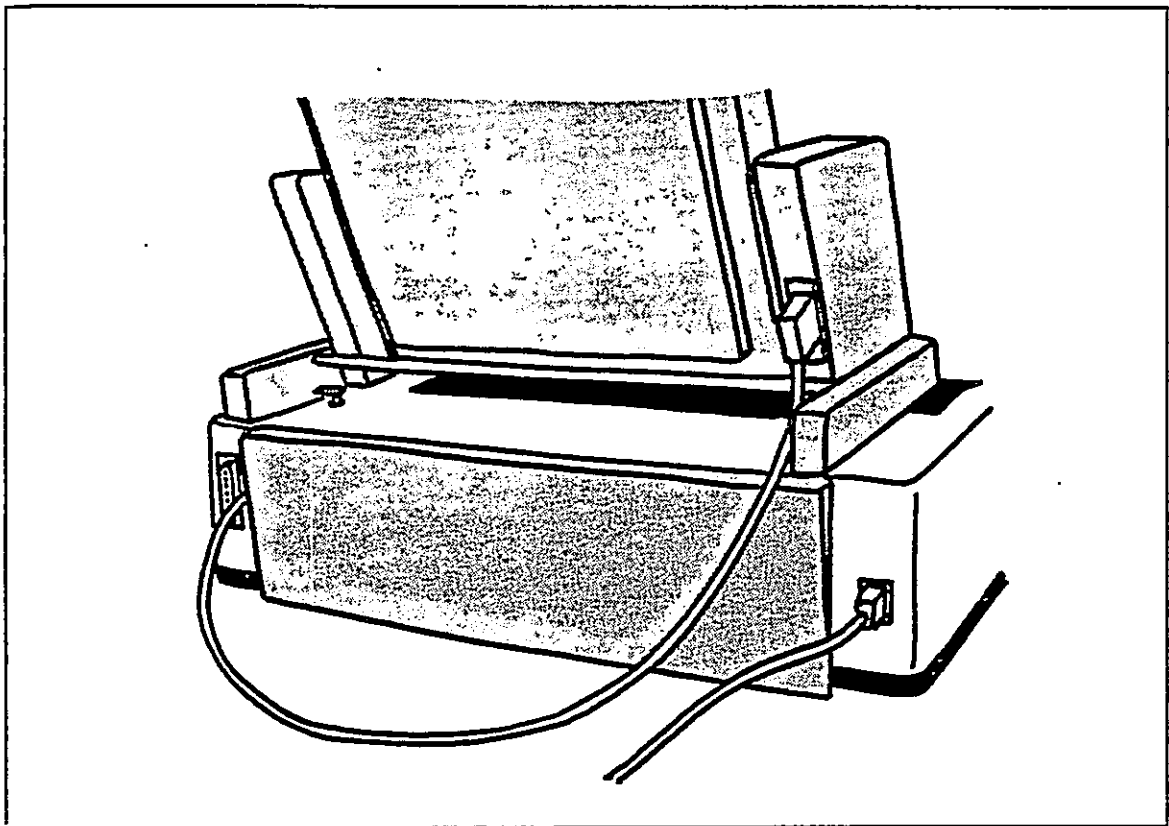
To fit the main feeder unit on to the mounting bracket, see the figure shown below:



MAIN FEEDER UNIT

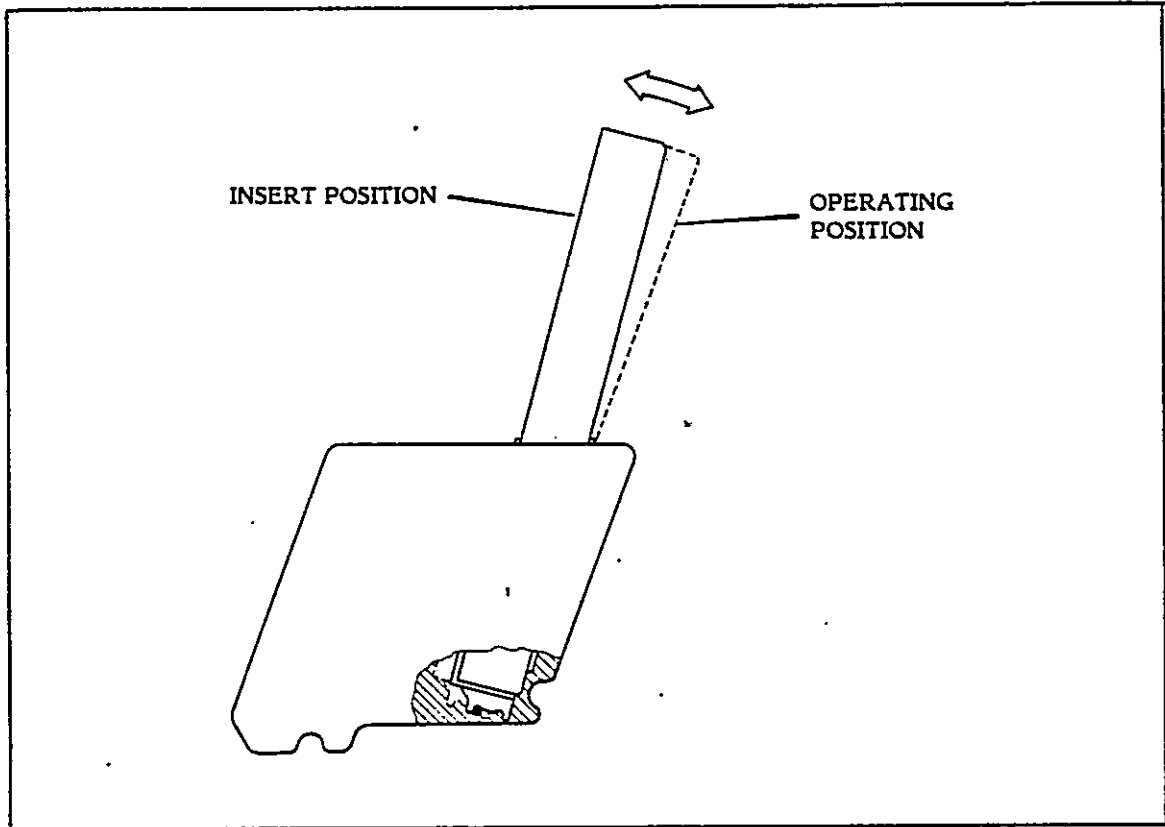
Next make the electrical connection between the feeder and printer by plugging the lead from the printer into the nine-pin connector on the rear right hand side of the feeder - see illustration on page 12.

This cable provides both power to the feeder, and communication of commands between feeder and printer.



CONNECTION OF SHEET FEEDER TO PRINTER

Finally, the paper feed tray (including the paper chute and output paper holder) should be fitted. The paper feed tray is a self contained assembly which fits into the feeder by two feed tray supports. The feed tray supports have two locking positions.



PAPER TRAY POSITIONING

When you have filled the tray with paper, slide the paper feeder into the tray supports. Then push the paper tray backwards (a slight click will be heard when the tray is in position). This will press the paper in the tray against the pick-up rollers.

Both printer and feeder have to be switched on and set to the correct paper size. This is described in section 8 (page 24).

System Start-up

Two types of disc storage are available in the CR8 - Winchester (hard) disc and floppy diskettes which may be removed. If your system includes a Winchester, then the operating system will already be present on Winchester drive B. If you have a floppy-only system, you will have to insert the system diskette -supplied with the CR8 - into the upper slot, after switching on. This is described in section 4 (page 17).

Both workstation and printer should now be ready for action, so plug them into the mains and switch on (both have mains switches at the rear). The CP/M operating system will be automatically loaded. Once the video monitor has warmed up you will be able to see a message on the screen like this for the Winchester/floppy system:

```
CHRISTIAN ROVSING A/S 64K CP/M VER 2.2          820105
SEAGATE ST506 HARD DISK/5 1/4 MINI FLOPPY BIOS, V.1.0
B>          ST 406
```

or like this for a dual floppy system

```
CHRISTIAN ROVSING A/S 64K CP/M VER 2.2          820330
TANDON TM100 96TPI 5 1/4 MINI FLOPPY BIOS, VER 2.0
A>
```

This verifies that the system is now up and running.

If you have a dual floppy system, you should now make a copy of your system diskette as a precaution. This is described in sections 4 to 6. Keep the original diskette safe and use the copy you have just made in drive A. (upper drive).

The Winchester/floppy CR8 comes with a copy of the system disc already made onto a floppy diskette. In either case, the spare system diskette should be stored somewhere safely, away from damp, heat, dust, and magnetic fields.

If you are using the printer and single sheet feeder, the top-of-form should be set on both items (see page 32). This must be done every time the system is switched on (if the printer is required).

The CR8 and its powerful CP/M operating system are now at your disposal . . .

3.

CONCERNING CP/M

CP/M 2.2 is the operating system supplied with the single user, single processor CR8. It is the program that co-ordinates and controls all other programs that may run in the CR8. A large part of its work is to handle the storage and retrieval of information from the disc drives.

CP/M is very widely used in the microcomputer industry, so there are many application program already available for it.

Each user may be assigned a number on the system so that the disc files of one user may be separated from those of other users, though it is easy to copy files from one user to another if desired. Another feature of CP/M 2.2 is that files can be accessed randomly; for instance, if you want to read the 11th record on the file, you do not necessarily have to read no. 1 to 10 (sequentially) first.

Various utility programs are provided by CP/M, including ones for the following:

- o Editor for entering and changing text (ED)
- o Debugging tool for assistance in program development (DDT)
- o Assemblers - low-level programming language (ASM)
- o Status command - checks and changes status of users and discs (STAT)
- o Directory utility to list the names and sizes of files (DIR, ADIR)
- o Various copying programs for files or whole discs (PIP, FCOPY)
- o Renaming files (REN)
- o Submitting a series of commands to carry out without user intervention ("batch processing"). (SUBMIT)
- o Displaying text file (TYPE)
- o Setting user number (USER)
- o Load command. This is used to convert a user's own application program object code into executable format (otherwise known as a linker.) (LOAD)
- o Running a user's program - merely type the name of the executable (.COM) file and it will run.
- o Dump command - displays binary files in Hexadecimal on the console. (DUMP)

In addition, the following needs are catered for (though the programs are not strictly part of CP/M)

- o Formatting discs (see next section)
- o Setting up speed of printer (not needed for TEC printer) (LPBAUD)

4.

DISKETTES

A diskette, or floppy disk, is a thin plastic disk coated with magnetic recording material, used for storing quite large amounts of information.

The diskette is sealed in a cardboard envelope. The inner plastic disk rotates constantly inside the envelope when the diskette is in use.

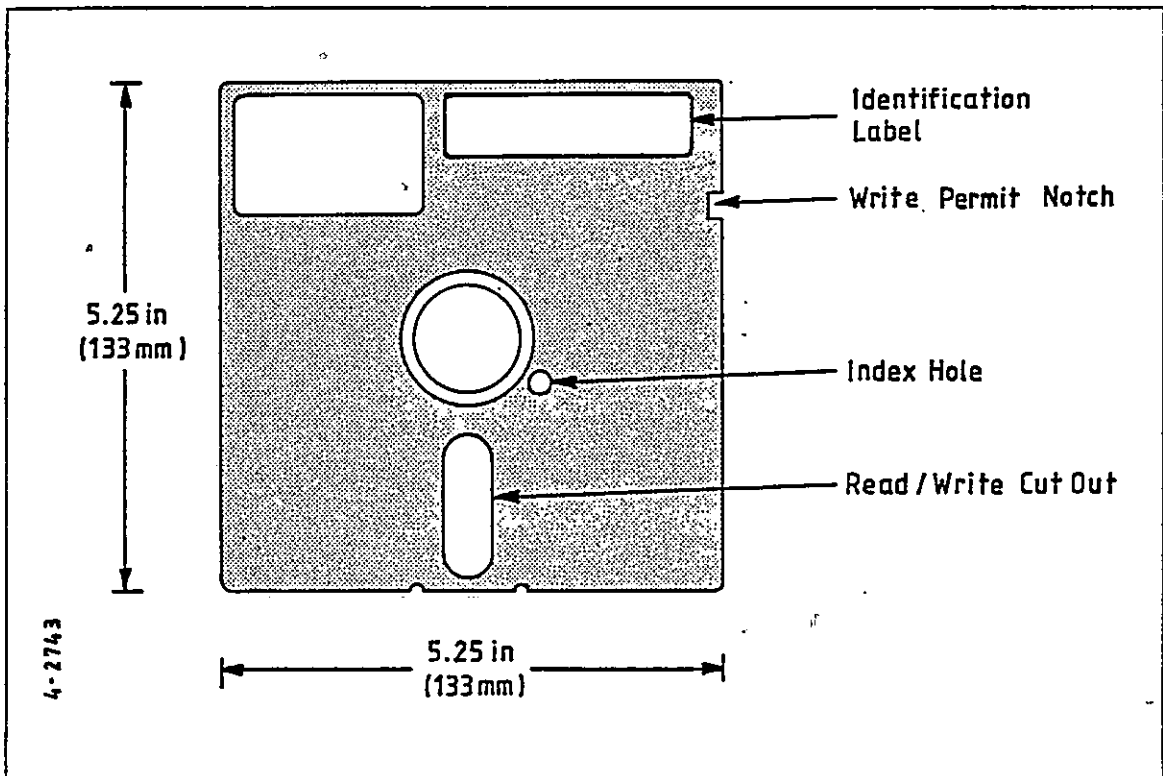


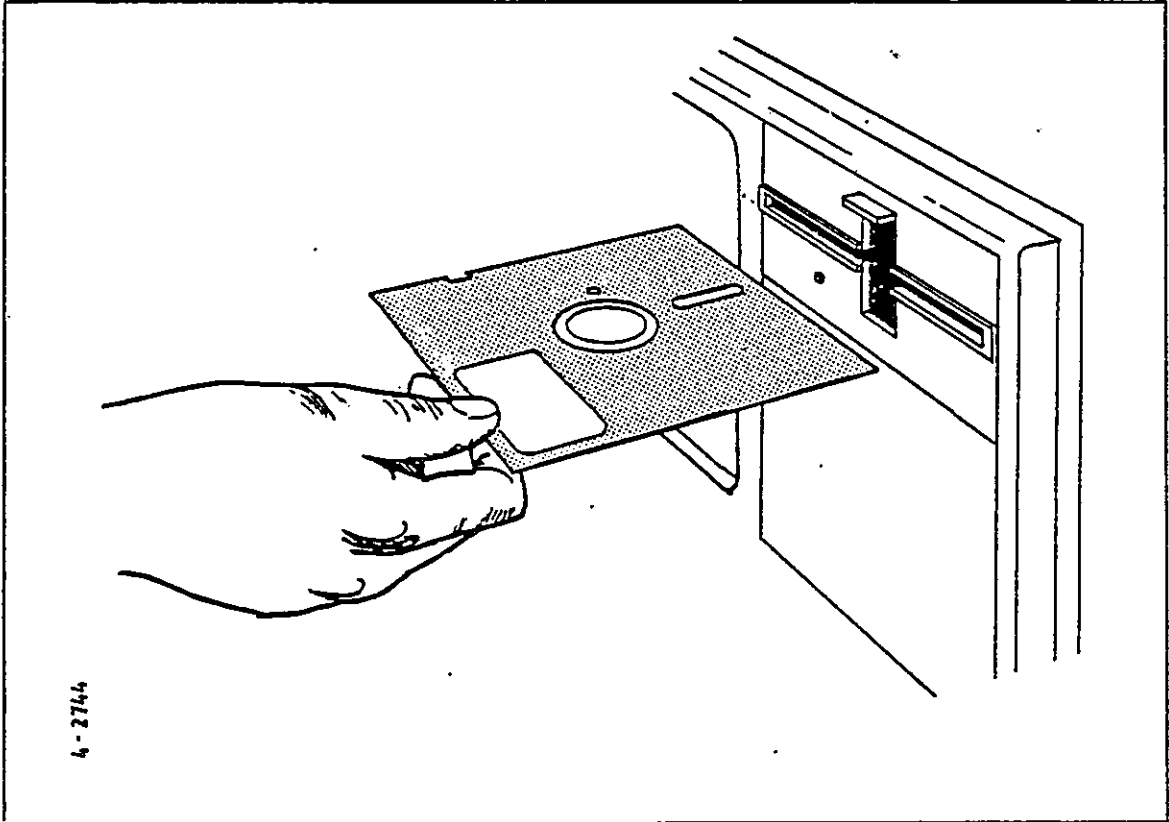
ILLUSTRATION OF A CR8 DISKETTE

The write-permit notch may be used to prevent the diskette from being accidentally overwritten. When this notch is covered (with a piece of hard tape), the diskette can only be read from, not written to.

Inserting a diskette

Lift the small lid on the disk drive up (it should be already up if the drive is empty). Then, holding the diskette the right way up - write protect notch on the left - slide the diskette into the drive slot completely to the end stop. Never force

the diskette in. Now close the lid by pushing it gently down. Again, do not force it down. The diskette is now ready for use.



INSERTING A DISKETTE

A diskette is removed by simply lifting the lid and withdrawing the diskette. Remember to remove all your diskettes before the computer's power supply is turned off.

Care and storage of diskettes

Diskettes last almost indefinitely if handled carefully. The following is a useful guide to the care of diskettes.

- o Hold the cardboard envelope. When the diskette is removed from the protective paper sleeve do not touch the exposed surface or allow dust to settle on it.

- o Do not bend diskettes.
- o Insert gently. Do not force diskettes into drive slots.
- o Avoid heat. Direct heat from strong sunlight or radiators may warp the diskette.
- o Do not switch the computer ON/OFF with diskettes in the drives.
- o Store safely. Specially made diskette storage boxes are available. These boxes hold the diskettes vertical, and may be locked for security.
- o Use felt-tip pens. The identifying label on the diskette should never be written on with ball-point pens or sharp pencils. Whenever possible, write on the label before sticking it to the envelope.

5. FORMATTING DISCS

Before any disc (Winchester or floppy) can be used for the first time, it must be formatted. This means that certain signals are "written" onto the disc to define where the different areas to be used start and finish. If the disc has been used before, formatting it again causes the information on it to be lost, so, . . .

When to format a disc

1. Before using a brand new floppy diskette.
2. Before using a used diskette or disc which has no files on it that are of any further interest.
3. As an attempt to rectify a disc that is giving hardware errors (though all data will be lost).

Note that the Winchester disc in the CR8 will already be formatted since it contains the system files, thus in normal circumstances you will never need to format a Winchester.

How to format a disc

The formatting program supplied with the CR8 comes in three versions - FORMAT1 for the dual floppy system, FORMAT6 for 6 Mbyte Winchester with floppy system and FORMAT12 for 12 Mbyte Winchester with floppy systems. The operating instructions for FORMAT6 are given below (the others are similar).

1. Check that the diskette is not write-protected. The notch must be present (see section 4, pg 17) Insert the diskette in the drive (the lower drive, B, in dual floppy systems). Close the lid.
2. Type FORMAT⁽⁶⁾<CR> after the prompt from CP/M.
3. A menu of choices appears on the screen. Enter option E to format a floppy disk in drive E, or B for the dual floppy system.
4. Type "Y" to the next question, then "G" to the next.

5. Disk formatting will now begin. During floppy formatting, the track number currently being formatted is displayed on the screen, counting up from 00 to 99 (hexadecimal).

TRACK**

FORMATTING COMPLETE

6. You may now format another diskette by entering "Y" in response to the next message. The program will return to step 3. Enter "N" to exit from the formatting program.

Be careful not to format a diskette which already has important information on it. Formatting will completely erase a diskette.

6. COPYING DISCS

Copying a complete floppy disc on the dual floppy system

The following procedure should be followed when making a copy of a complete floppy diskette, for example when saving your original system diskette. Assuming that the operating system is ready (displaying "A>") with the system diskette in its normal position in drive A...

1. Type "FCOPY" and press RETURN
2. Insert disks as instructed and answer the questions appropriately.)

Copying single files

To copy on a file-by-file basis, use CP/M's PIP utility, for example the command:

```
PIP E: = B: * . *
```

will copy all files from drive B (part of the Winchester) to drive E (the floppy in a Winchester/Floppy system).

7. SYSTEM RESET

If at any time you or one of your programs gets stuck, you can re-start the entire operating system as though it had just been switched on. For the dual floppy system, insert the system diskette in drive A and close the lid. Then for either system, press the Reset button on the front of the CR8 (below the disc drives).

Note that all information stored in memory prior to pressing the Reset will be lost; thus for example if you had been editing a file, then all changes since the last "save to disk" command would be lost.

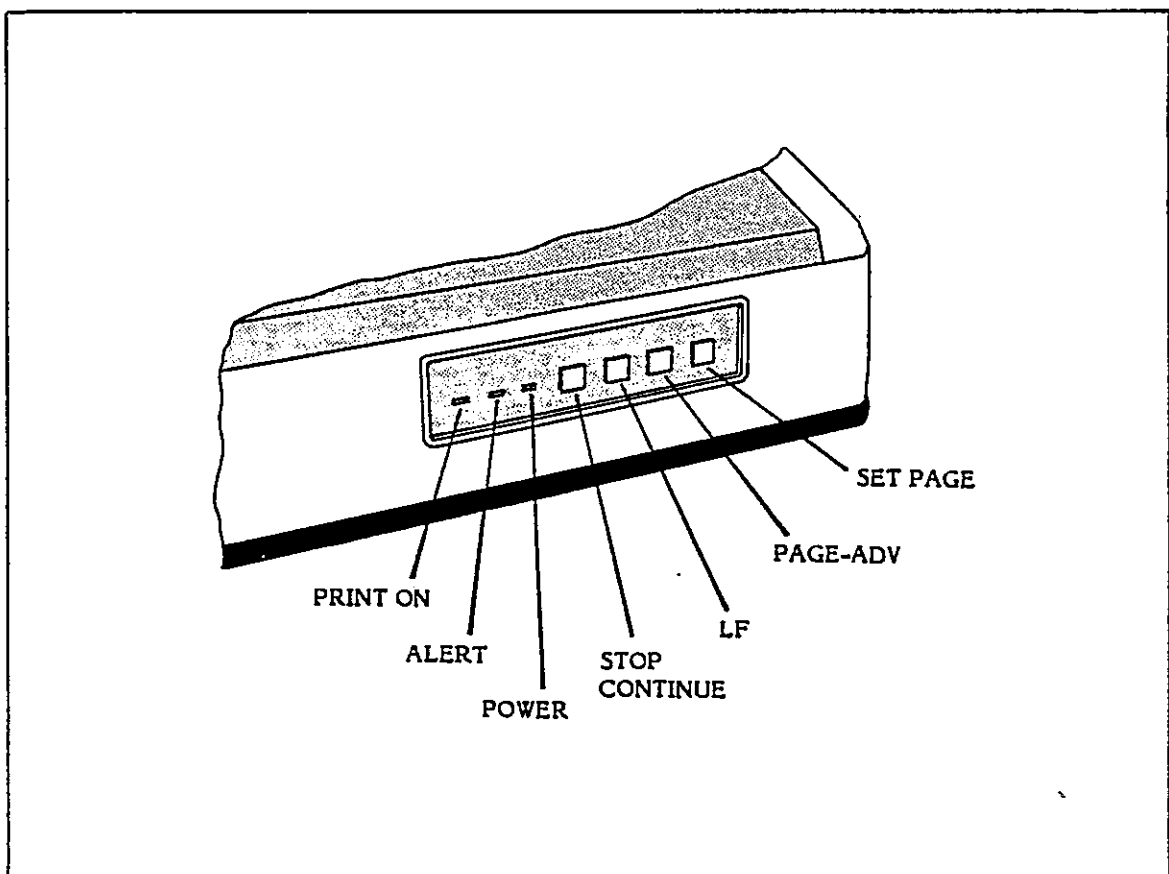
8. THE DAISY-WHEEL PRINTER AND SINGLE SHEET FEEDER

The assembly of the printer and sheet feeder has been described in section 2.

THE PRINTER

Control Panel

On the right hand side of the front panel is the control panel. When the printer is fully set up and ready for use, the PRINT ON and POWER lamps should be lit (green).



CONTROL PANEL

On-line/Off-line Switch

Next to the power lamp is a STOP CONTINUE switch (on-line/off-line switch) which alternates between on- and off-line each time it is pushed. When this switch

is off-line (the PRINT light will be off), the printer operation ceases immediately. When the printer is set on-line again (by pressing STOP CONTINUE), printing will continue from where it left off without loss of text.

LF (Line Feed) Switch

The line feed is also a push button switch. Each time the switch is pressed a line feed occurs. If this switch is held down continuous line feeds will occur.

Page Advance

The PAGE ADV is also a push button switch. By pressing this switch the paper will be fed to the next top of form. However, for the PAGE ADV function to work correctly the DIP switches must be set according to the paper length being used. (see pg. 30)

Set Page

When this switch is pressed the line which the printer head rests on becomes the top of form. The printer will acknowledge when this switch has been pressed by moving three spaces to the right and then returning to its original position.

Alert Detectors

If any of the three detectors described below operates, the red ALERT lamp on the front panel will light.

Front Panel Alert

This is a microswitch positioned inside the case on the right hand side of the front panel. When the front cover is open, the printer goes off-line, stops printing and the red ALERT light comes on. To restore operation, close the front cover and press the STOP CONTINUE switch again.

Paper Out Alert

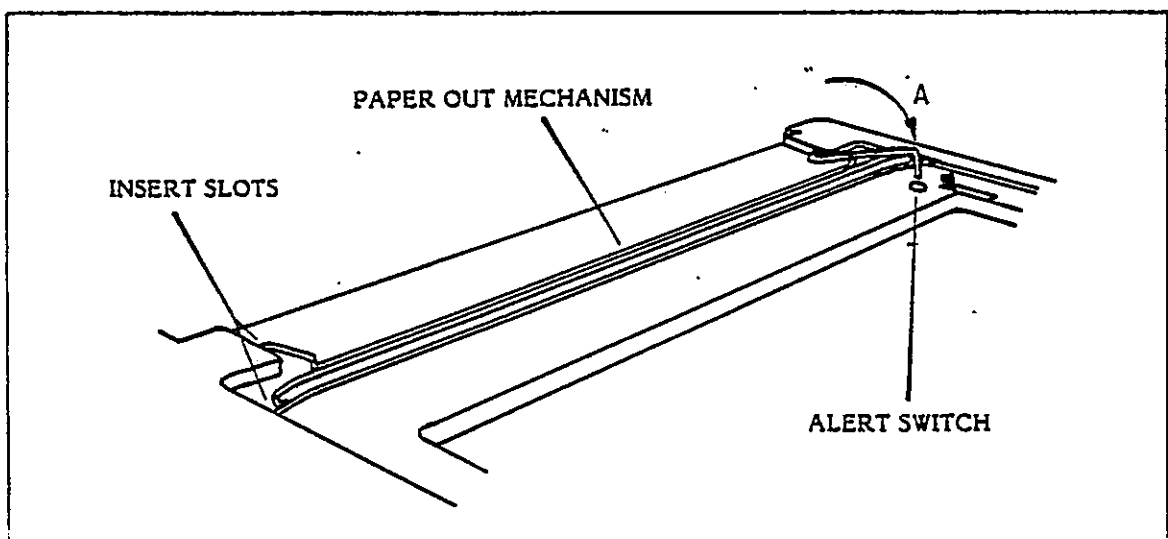
Again, this is a microswitch attached to the paper sensor block. The switch is activated by a small rod attached to the (optional) Paper Out mechanism. When the last sheet of paper has gone through the mechanism, the small rod falls through the hole in the top cover and activates the switch. After the sensor detects that the paper is near the end, the printer goes off-line, stops printing and the red ALERT light comes on, on the front control panel. When the printer has been furnished with paper, press the STOP CONTINUE switch to restore operation.

Ribbon Out Alert

The Ribbon Out alert is a reflecting photoelectric sensor attached to the carriage. When the ribbon becomes to an end the printer ceases to function and the ALERT light on the front panel lights up. Printing operation is restored by replacing the ribbon and pressing the STOP CONTINUE switch. It is in two sections.

Paper Out Mechanism

The TEC printer is provided with a Paper Out mechanism which can be attached to the rear top of the printer. The mechanism is inserted into the designated slots as shown in the figure below. It is in two sections.



PAPER OUT MECHANISM

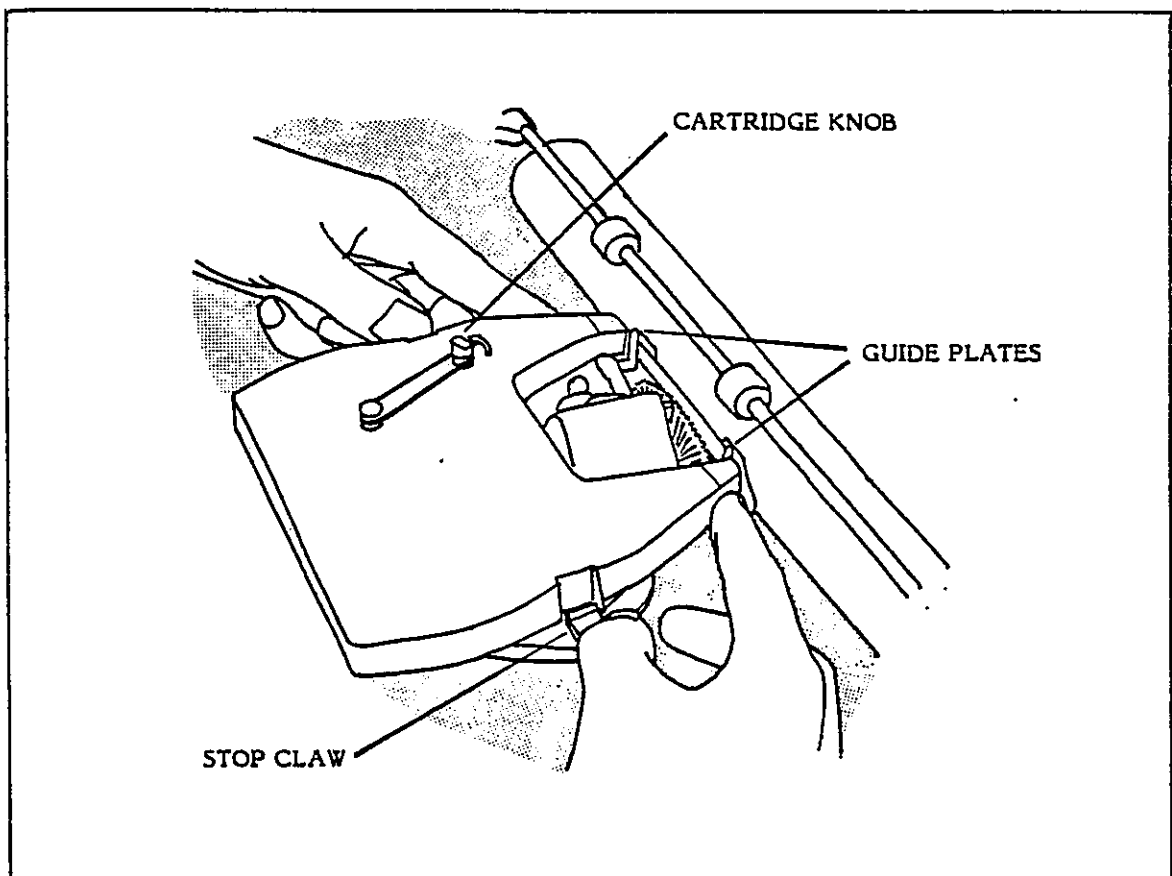
When using single sheets of paper (without the automatic single sheet feeder option), the Paper Out mechanism should be rendered inoperative. If you fail to do so the printer will be in a perpetual state of "Paper Out". To do this just move the push shaft backwards. To render the Paper Out mechanism operative again, move the push shaft toward you (arrow A).

Paper Insertion

To insert paper into the printer (when not using the automatic single sheet feeder): position the Paper Release Lever to CLOSED; pull the Roller Pressure-Bar Lever towards you to release the bar from the platen; insert the paper along the edge of the paper guide, while turning the platen knob. The paper can be adjusted as necessary by moving the Paper Release Lever to OPEN.

Ribbon Cartridge (Cartridge Removal)

The cartridge is under the front cover. To remove the cartridge simply lift it up while holding down the (blue) carrier stop claws.

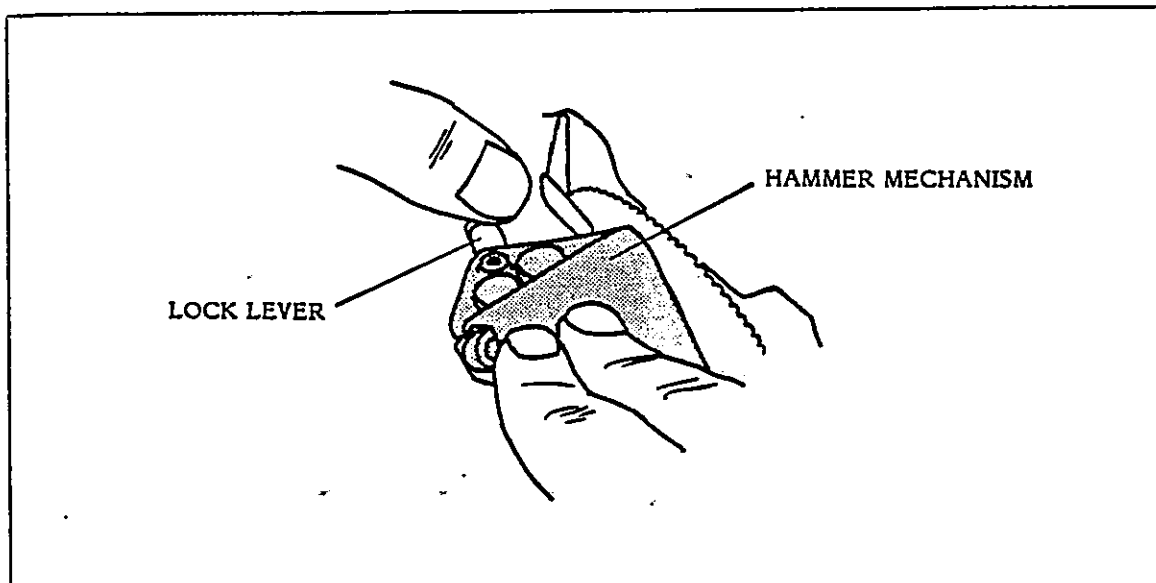


REMOVING RIBBON CARTRIDGE

To insert the cartridge, slip the ribbon in between the two guide plates and push the cartridge into place, fitting the stop claws into the appropriate cartridge slots. Be careful to ensure that the ribbon lies between the daisy wheel and the paper or roller. Then turn the cartridge knob in the direction of the arrow, until a "click" is heard.

Daisy Wheel

To change the daisy wheel remove the front cover and the ribbon cartridge. The next step is to release the hammer mechanism with one hand and push the lock lever down with the other.



CHANGING THE DAISY WHEEL

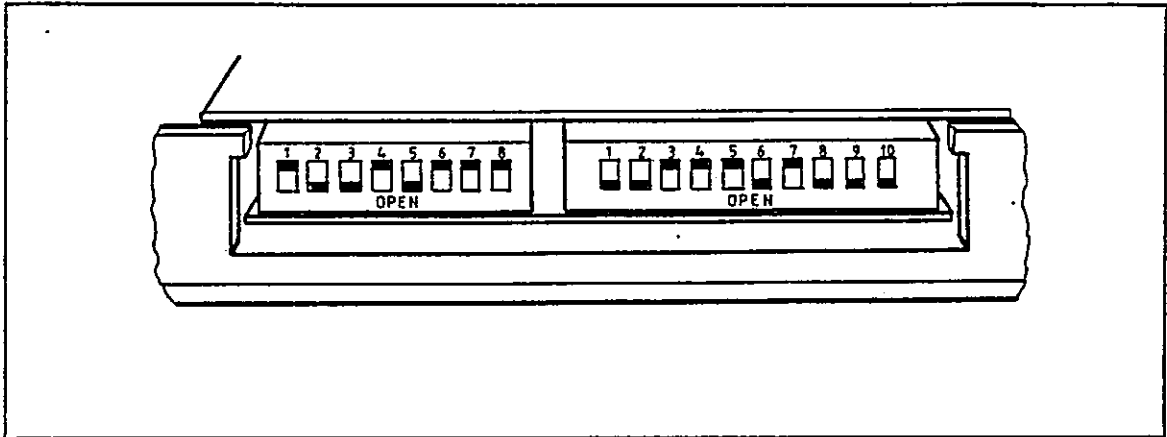
Once the lock lever is released, tilt the hammer mechanism towards the control panel. The daisy wheel is now in a position whereby it can be removed, by grasping the rubber centre and carefully pulling upwards. Be careful not to break any "petals" off the daisy wheel by jarring it against parts of the printer.

To replace the daisy wheel, follow the removal process in reverse order. Bear in mind that the gauge key protruding from the small hole in the daisy wheel should be fully emerged, and that the lock lever locks into place when pulled upwards to secure the hammer mechanism.

DIP Switches

There are two sets of DIP switches both located directly behind the alert lamps on the front panel.

These switches should be set as follows:



DIP SWITCHES

Setting the paper length

The switches 6-9 on the right hand side specify the length of paper, and therefore must be set according to the paper length being used. However, note that the switch number 6 on the right hand side must be open when using A4 paper. Below we have given you a small chart on the inch value when those switches are open. With switches 6, 8 and 9 in the OPEN position (as shown above) the form feed length is set at 13 inches.

No. of Inches	Switch No.
1 inch	6
2 inches	7
4 inches	8
8 inches	9

Selecting the character spacing

Different daisy wheels operate at different character spacings - generally 10 or 12 characters per inch. The wheel marked for example "Courier 12" is a 12 c.p.i. wheel. The printer must be set to the correct spacing. Use switch number 4

on the right hand set of DIP switches. "Open" means 12 c.p.i., "Closed" means 10 c.p.i.

SINGLE SHEET FEEDER

Main Feeder Unit

The main feeder unit consists of a microprocessor system which controls and monitors all functions.

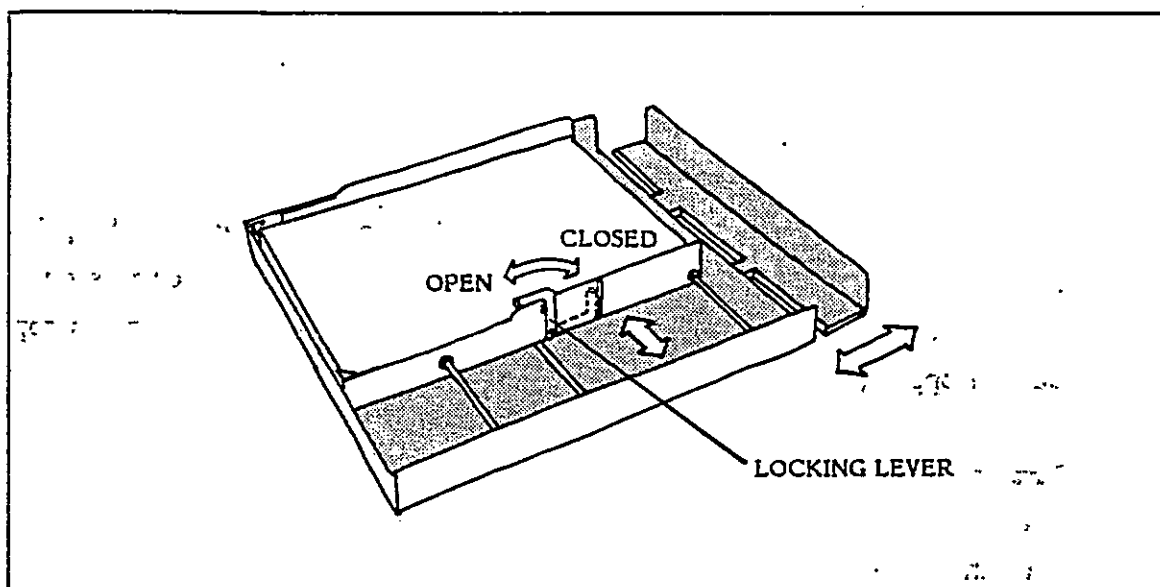
The operator control panel on the front left hand side consists of a dial switch to set the paper length, a RESET button (marked ON/OFF), and a control lamp.

The control lamp indicates to the operator the following conditions:

1. ASF 160 ready (light OFF)
2. End of paper/paper jam (the light will blink)
3. ASF 160 not ready (light on continuously until paper reaches the sensor).

The dial switch is calibrated in inches. Starting with the smallest number on the dial - 9, which is for 8 inch paper. The highest number, 15, is for 14 inch paper. One inch must be added to the exact paper length to allow for the gap between single sheets of paper.

Note, for standard A4 paper, the dial must be set at 13.



PAPER TRAY

Refilling the paper tray

To replenish the printer with paper, simply pull the tray forward and up. When putting paper into the tray be sure it fits under the small paper retaining arms (bottom left and right hand corners). See diagram above.

Tray Capacity

The paper tray supplied by Christian Roving A/S is adjustable for different paper sizes. The minimum width is 20 cm and the maximum is 30.5 cm. The height can also be adjusted to a maximum of 38 cm.

The amount of paper the tray can hold is approximately 230 sheets (for paper 80 g/m² in weight).

Paper Type and Quality

Plain bond, typewriter quality paper containing little or no wood.

All other types of paper: medium or high wood content, very light or very heavy, must be operationally tested prior to regular use.

The paper used must be well cut and in new condition with no creases, surface or edge damage.

Paper Insertion

After the single feeder is completely assembled and plugged into the printer, the first sheet of paper must be inserted. This is done manually. For this purpose the feeder also comes supplied with a manual paper chute, which sits on top of the Outer Hopper (see page 9).

Setting Top-of-Form

Turn the printer ON. Press the red button on the single sheet feeder. If it remains "in" press it again so it comes "out". Red light should now be lit.

Insert the first sheet of paper through the manual paper chute and turn the platen knob clockwise (as you would with any standard typewriter), until the top of form is set as desired. As the first sheet of paper goes in, red lamp on feeder should go

out.

Check on the printer control panel that the PRINT and POWER lamps are ON. On the main feeder unit check the RESET switch is out (in-off and out-on) and the control lamp is OFF.

Then press the SET PAGE switch on the printer control panel. The printer will acknowledge that this switch has been pressed and will move three spaces right and then return to its previous position.

The printer is now ready for use.

