DFC155 & DWC155c Service Manual & Spare Parts Catalogue 602E52970Important Note

This is a first edition of the Service Manual and Spare Parts Catalogue.
To read the manual Adobe Acrobat 3.0 is needed as the .pdf files are not 2.1 compatible.

In the contents section there is a reference to remote diagnostics in chapter 5.
The section on this has been removed, as remote diagnostics are not legal in all countries.
Additionally a master unit is required. This master unit is no longer sold.

There are no references to the Linkfax softswitches in section 4 (DWC155c only). These will be included in the next revision of the manual.

DFC155
DWC155c

SERVICE MANUAL

Part Number 602E52970

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WARNING

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

PREFACE

This manual, intended for service engineers responsible for installing, servicing and repairing the facsimile machines described herein, consists of eight chapters covering:

- Chapter 1: the *General Features* and *Technical Specifications*
- Chapter 2: the facsimile machine's *Internal and external structure*
- Chapter 3: the *Installation and setup* procedures
- Chapter 4: how to set the *Software Parameters*
- Chapter 5: the *Diagnostic and testing* procedures
- Chapter 6: the *Settings and adjustments*
- Chapter 7: the *Maintenance and replacement* procedures
- Chapter 8: the *Optional devices*

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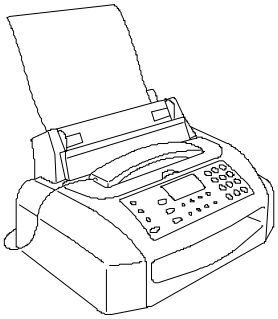
REFERENCES: User Manual

Spare parts catalogue

CONTENTS

1. INTRODUCTION

This device is a desktop fax machine with inkjet printing, complying with the ITU-TS G3 standard for the transmission and reception of documents.



1.1 MAIN FEATURES

- Bubble ink jet printing

  Allows the use of normal paper with individual sheets of A4, Letter and Legal format.

- Memory capacity

  The fax machine has a memory which enables operations such as *One-touch Dialling*, *Speed Code Dialling* and *Substitute Reception*, as well as the storage of parameters, data and documents. This memory is powered by a backup battery in the event of a power failure.

- Half tones

  In the scanning of documents, a scale of 64 half tones can be used for a higher quality reproduction of photographs and pictures.

- Automatic Document Feeder (ADF)

  The fax machine allows automatic feeding of up to 5 documents in A4, Letter or Legal format, with a maximum thickness of 0.1 mm/sheet.

- Telephone answering device (TAD)

  The model without a built-an TAD can be connected to an external one.

1.2 TECHNICAL SPECIFICATIONS

Physical characteristics	
Type	Desktop transceiver
Dimensions (L, D, H)	359 x 264 (+ 84[1]) x 193 (+ 138[1]) mm
Weight	5 kg
Operator console	
Display	2 lines of 16 characters
Keypad	- 15 function keys of which 4 are dual function and two are triple function - 12 dual-function keys for normal dialling and user name setting - 10 one-touch dialling keys - 1 light indicator
Power supply	
Operating range	220-240V, 50/60Hz
Absorption	6W (in standby); max 30W
Communication characteristics	
Type of connection	Public telephone network (PSTN) or private branch exchange (PBX)
Compatibility	ITU-TS G3 standard
Type of modulation	CCITT V29 / V27ter
Transmission speed	2400 / 4800 / 7200 / 9600 bps
Type of communication	Half duplex
Coding methods	MH, MR (DFC 155) MH, MR, MMR (DWC155c)
Transmission time	About 15 s for ITU-TS test sheet n°1 (Slerexe Letter) at 9600 bps in standard resolution

([1]) with the document output tray >>

Scanner	
Scanning system	Contact Sensor (CIS)
Resolution	Vertical: 3.85 (standard) / 7.7 (fine) lines/mm Horizontal: 8 dots/mm
Document size (width x length)	From 210 x 148 mm (minimum length) to 216 x 600 mm (maximum length)
Actual scanning area	Horizontal: 216 mm Vertical: within 2 mm of the edge of the document
Automatic document feeder (ADF)	Capacity: 5 sheets of A4 / US Letter / Legal format (max thickness 0.1 mm/sheet) Sheet thickness: min 0.06 mm, max 0.12 mm
Half tones	The facsimile machine can emphasize the contrast of text areas and reproduce pictures with 64 half tones.
Contrast	Three levels are handled: dark, normal and light
Printer	
Printing method	Bubble ink jet on plain paper
Printing speed	ITU-TS test sheet n°1 (Slerexe Letter) / about 40 s
Automatic sheet feeder	Capacity: 40 sheets of A4 / US Letter/ Legal format (weight 70-90g/m^2)
Print resolution	300 x 300 dpi
Actual printing area	208 x 290 (A4) / 273 (Letter US) / 349 (Legal) mm
Memory	
Capacity	512 kbytes, of which about 450 available to the user, powered by a backup battery
Dialling	
Dialling mode	Pulse and tone
Dialling on facsimile machine	The number can be dialled directly on the facsimile machine's keypad

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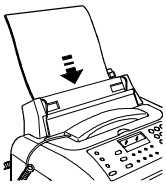
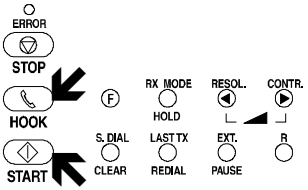
Redialling	A number can be redialled in automatic or manual mode
One-touch dialling	10 numerical keys (0 χ 9) are available
Speed code dialling	32 memory locations are available, and each may be assigned a facsimile or telephone number ID
Other features	
Automatic reception	The facsimile machine can be set to receive a document automatically
Polling	Polling is available both for transmission and reception
Reports	Various kinds of reports may be printed (transmission, activity, etc.)
Environmental conditions	
Temperature	Operating: from 5°C to 35°C Storage:from 0°C to +45°C Transport:from -15°C to +45°C
Relative humidity	Operating: from 15% to 85 % (without condensation) Storage: from 15% to 85 % (without condensation) Transport: from 5% to 95 % (without condensation)

1.3 QUICK REFERENCE GUIDE

1.3.1 Sending a Fax

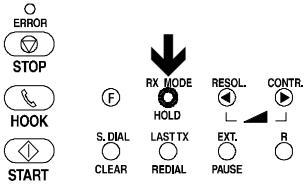


1. Insert the document into the automatic document feeder.



2. Press the HOOK key and dial the correspondent's number on the *numeric keypad*.

1.3.2 Receiving a Fax



1. The facsimile machine is normally set for *automatic reception:* the message AUTOMATIC RX is displayed.

2. If you want to receive a fax in manual mode, press the RX MODE key: the message MANUAL RX will be displayed.

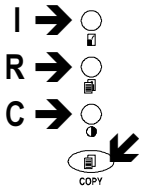
1.3.3 Using the Facsimile Machine as a Photocopier

1. Insert the document (max 5 sheets) into the automatic document feeder

2. Type on the numeric keypad the number of copies to make (max. 9 copies)

3. If necessary, set contrast (C), resolution (R) and enlargement or reduction rate (I)

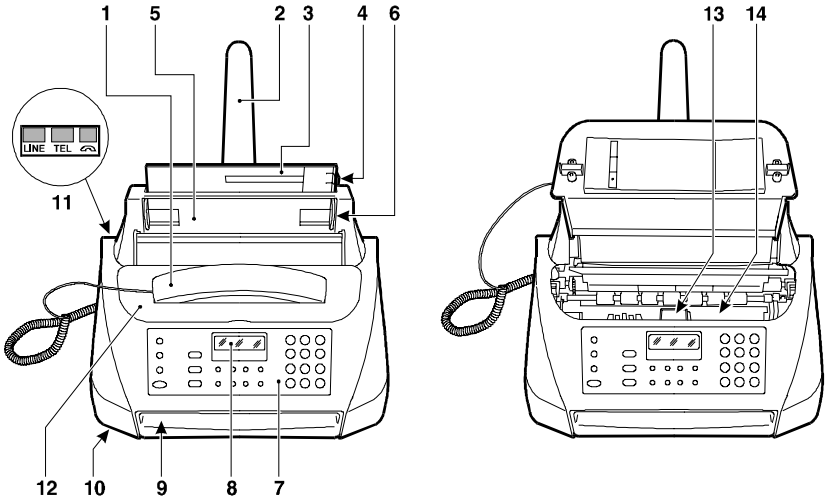
4. Press the COPY key.



2. GENERAL DESCRIPTION

2.1 EXTERNAL PARTS

The figure shows the main external parts, of the facsimile machine.



1. Handset
2. Paper support extension
3. Automatic sheet feeder (ASF)
4. Paper format adjustment lever
5. Automatic document feeder (ADF)
6. Document guides
7. Console
8. Display
9. Outlet for original documents and documents received or copied
10. Loudspeaker
11. Connection sockets
12. Printer lid
13. Print carriage
14. Optical reader

Fig. 2-1 External parts of the facsimile machine

2.1.1 Console

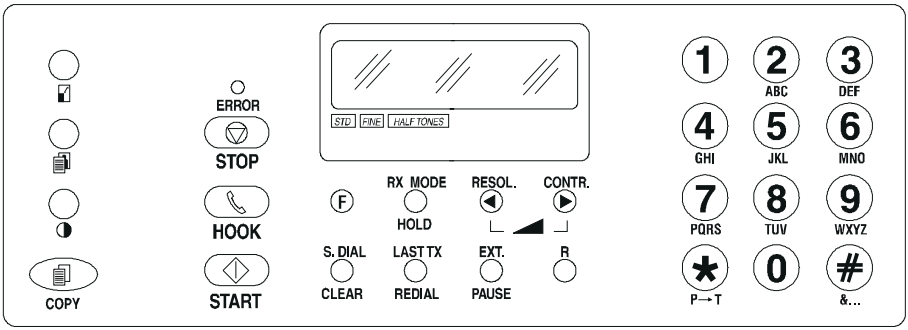


Fig. 2-2 Console layout

The console comprises:

- a *display* consisting of *2 lines of 16 characters* each
- a *keypad* consisting of:
  - 15 function keys (◑-🗐-☑-COPY - STOP - HOOK - START - F - RX/STANDBY MODE - RESOL. - CONTR. - S. DIAL/CLEAR - LAST TX/REDIAL - EXT./PAUSE - R) of which 4 are dual function keys (RX/STANDBY MODE - S.DIAL/CLEAR - LAST TX/REDIAL - EXT./PAUSE) and two are triple function keys (RESOL. /◀/ ⌞ ◢ - CONTR./▶/ ◢ ⌟)
  - 12 triple-function keys: for *normal dialling* (0 - 1 - 2- 3- 4- 5 - 6 - 7 - 8 - 9 - * - #), for *user name setting* (ABD - DEF - GHI - JKL - MNO - PQRS - TUV - WXYZ - I→T - &...), for *one-touch dialling* (0 - 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9) or, in pairs, for *speed dialling*
  - 1 LED for indicating ERROR conditions.

2.1.2 Functions of the Console Keys

Some keys perform different functions according to the current operating mode of the facsimile machine:

① *Stand-by* mode *with document* on the ADF
② *Stand-by* mode *without document* on the ADF
③ *Function* mode (activated by pressing the FUNCTION key), irrespective of the presence of a document on the ADF
④ *Hook* mode (activated by pressing the Hook key or lifting the handset).

Key	Mode	Functions
Number keys	①④	Used for *dialling numbers*.
	③	Select *alphanumeric* characters for setting the user's name.
P→T	①③④	In pulse dialling mode, *changes the dialling mode* to tone. In tone dialling mode, *emits a tone* on line for special network services.
★	①②④	In tone dialling mode, *emits a tone* on line for special network services.
★	③	Scrolls *forward through the special characters and symbols* for the user's name; selects the + character for the user's telephone number; used to dial remote control codes.
#	①④	In tone dialling mode, *emits a tone* on line for special network services.
&...	③	Scrolls *backwards* through the *special characters and symbols* available for the mnemonic ID.
F	①②	Provides *access to* operator selection *menus and submenus*.
RX MODE	①②	*Changes the reception mode*: automatic, manual, FAX/TEL, FAX/TAD.
HOLD	①	During a telephone conversation, *puts the call on hold*.
RESOL.	①	Selects the *type of resolution* of the document to be transmitted.
◄	③	*Moves the cursor left* during entry of the user's name and number.
∟ ◢	④	*Reduces the volume* of the speaker.

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Key	Mode	Functions
CONTR.	①	Selects the *type of contrast* of the document to be transmitted.
▶	③	*Moves the cursor right* during entry of the user's name and number.
◖ ⌟	②④	*Increases the volume* of the speaker.
S. DIAL	①②	*Enables* the setting of a *two-digit code* for speed dialling.
CLEAR	①②③	Clears wrong settings.
LAST TX	①②	Pressed once, *displays the result of the last transmission*.
REDIAL	①②	Pressed twice, *redials the last number*.
EXT.	①	When the facsimile machine is connected to a private branch exchange, *enables access to the public line*.
PAUSE	①②③	*Inserts a pause* in dialling the number of the called party.
R	④	Enables to access the special functions made available by the network operator and commonly known as REGISTER RECALL.
	①	*Switches off* the ERROR LED.
		Stops copying, sending or receiving a document.
STOP	③	Sets the facsimile machine in *standby* mode.
HOOK	①②	Enables the user to *dial the number without lifting the receiver* and to *monitor the tones* through the speaker.
	①	*Starts* manual reception (with the handset lifted)
	①②	After the number has been dialled, *starts sending* the document on the ADF.
START	②	After the handset is lifted, it places the facsimile in *manual reception* mode.
	③	*Confirms* menus, submenus, parameters and values.
	④	Sets the facsimile in *manual reception* mode.

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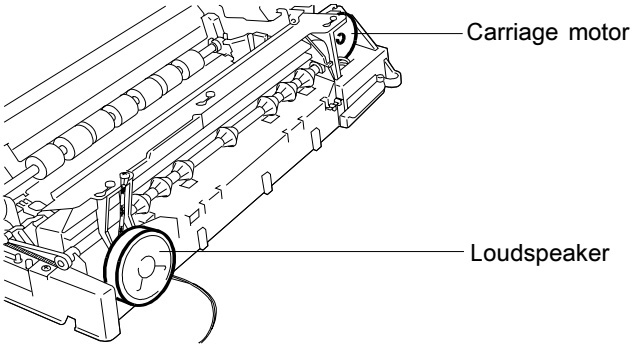
Key	Mode	Functions
	①	Selects the *enlargement* (140%) or the *reduction* (70%) of the document to be copied.
	①	Selects the *type of resolution* of the document to be copied.
	①	Selects the *type of contrast* of the document to be copied.
COPY	①	*Starts copying* the document inserted in ADF.

2.2 ELECTROMECHANICAL PARTS

2.2.1 Motors, Electromagnet and Loudspeaker

Behind the front side



Rear left-hand side

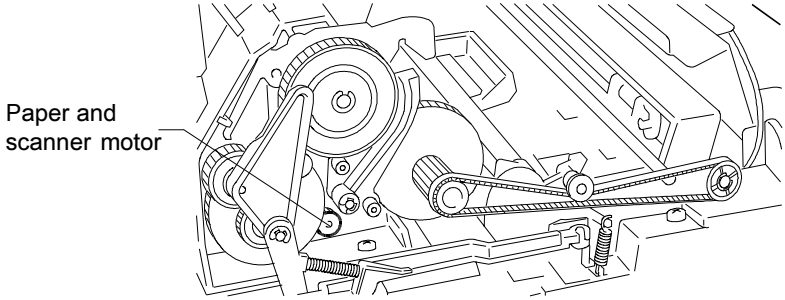


Fig. 2-3 Locating the motors

Underneath the scanning plane

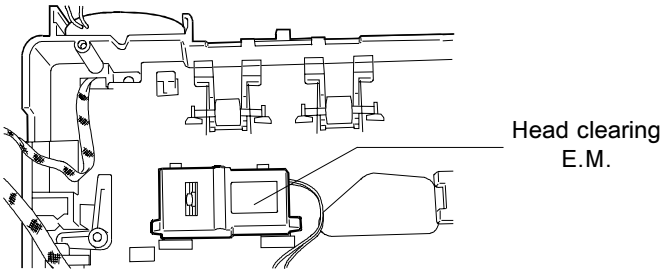


Fig. 2-4 Locating the Head clearing E.M.

2.2.2 Sensors

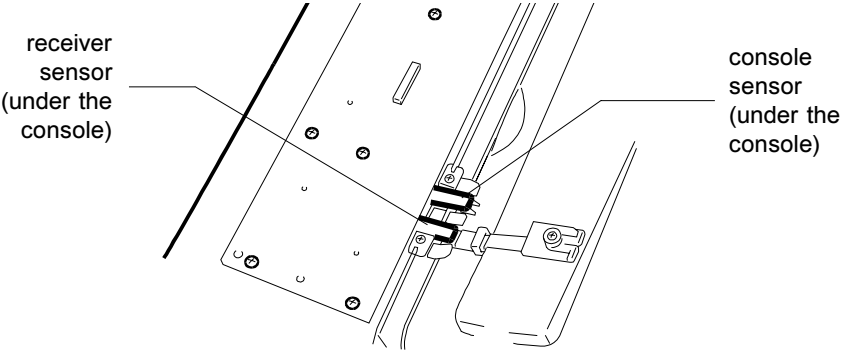


Fig. 2-5 Locating the paper and printer sensors

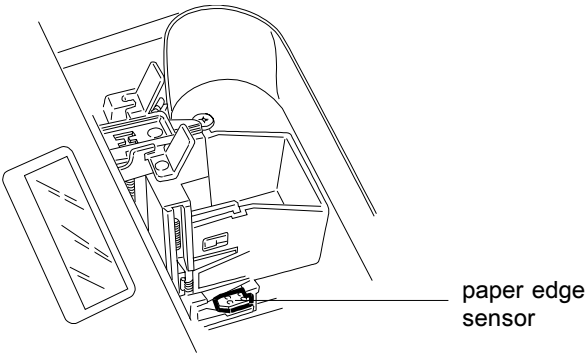


Fig. 2-6 Locating the carriage sensor

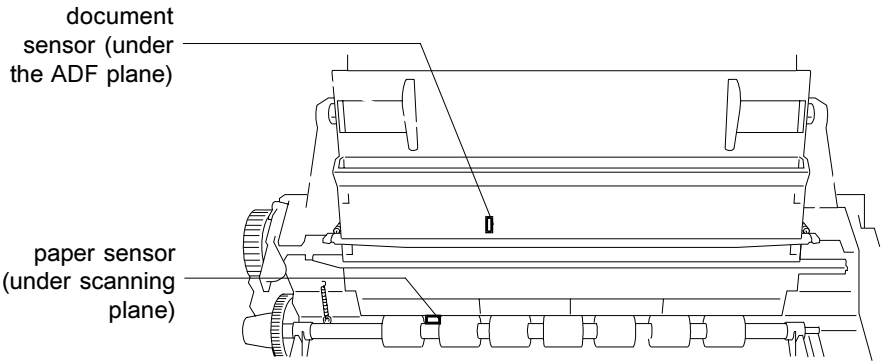


Fig. 2-7 Locating the paper sensors

2.3 ELECTRONIC PARTS

Figure 2-8 shows the boards assembled on the facsimile machine.

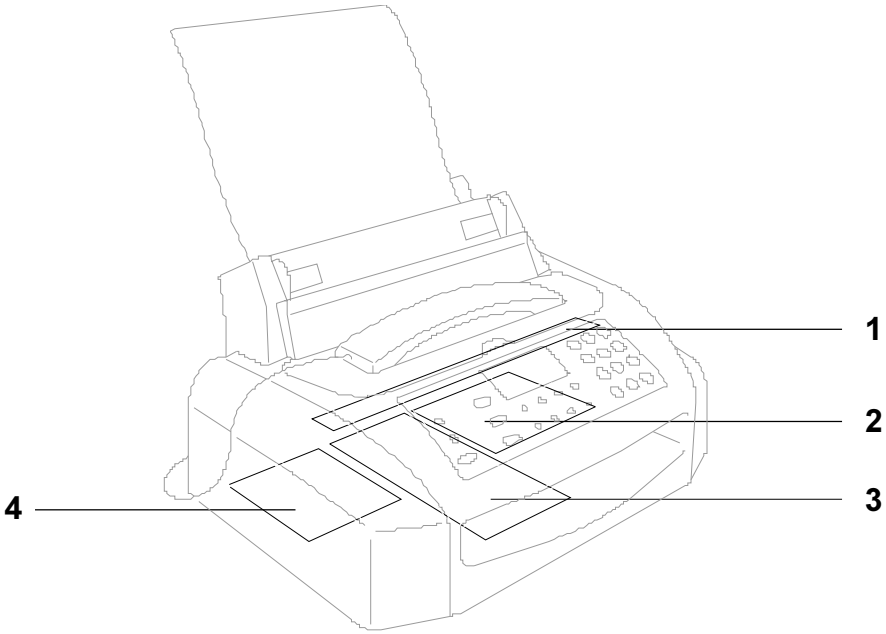


Fig. 2-8 Locating the boards

1. Contact Sensor (CIS)
2. Power supply board
3. Motherboard
4. Network Control Unit board

2.3.1 General Block Diagram

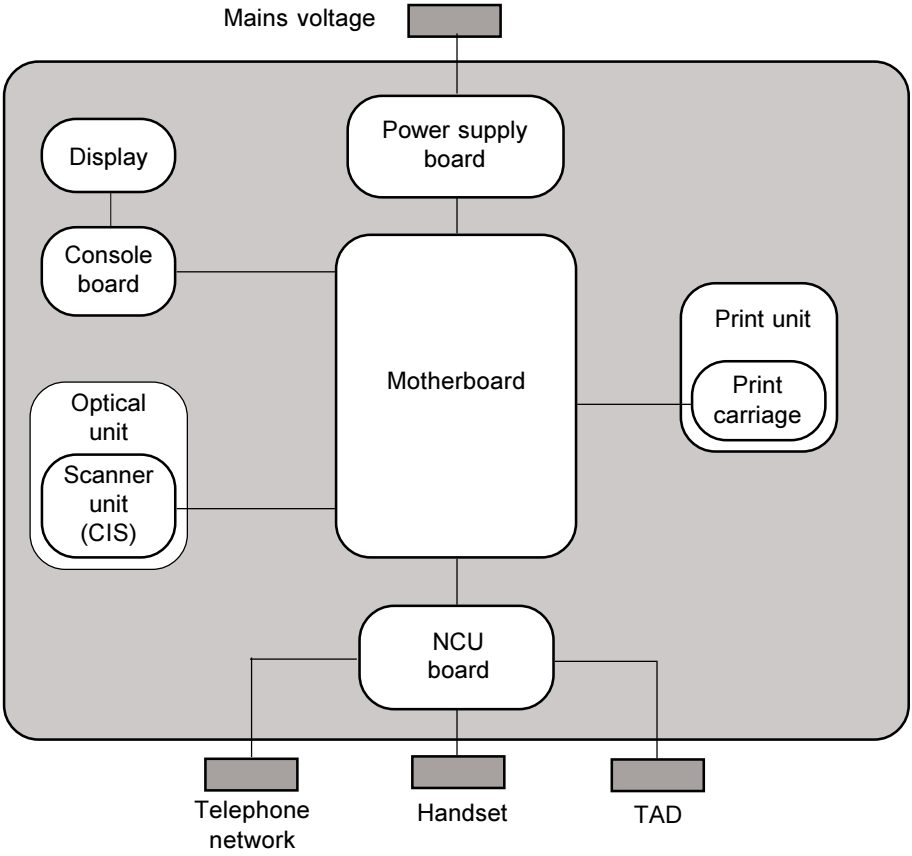


Fig. 2-9 General block diagram

The facsimile machine comprises the following main units:

- Motherboard
- Network Control Unit (NCU) board, which also includes the integrated phone circuit
- Console board, with the display
- Power supply board
- Optical unit, consisting of the scanner unit and CIS board
- Printer unit, comprising the carriage and the carriage drive mechanism.

2.3.2 Block Diagram of the Motherboard

The motherboard controls the entire machine by means of a central processing unit (CPU) which uses special circuits to handle four main functional units: the image processor (for processing the scanned document), the motors and the E.M. (for activating all the mechanical parts), the print head (for printing both received and copied documents) and the modem (for controlling the signals to and from the telephone network).

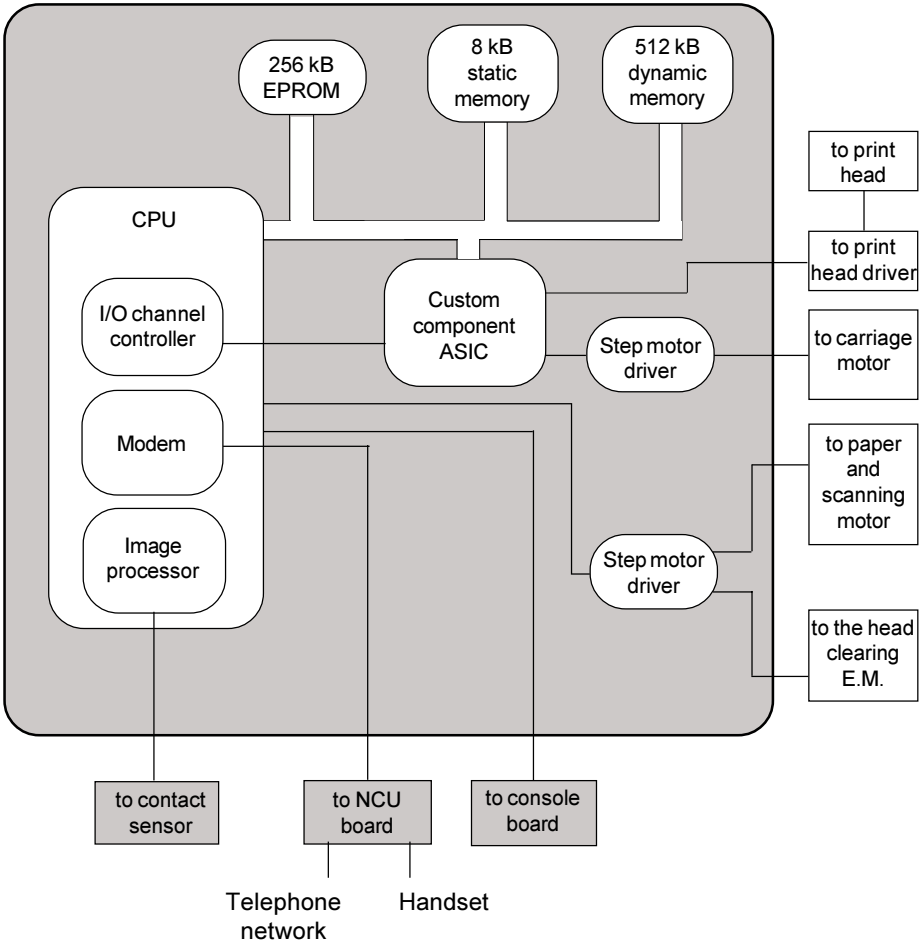


Fig. 2-10 Block diagram of the motherboard

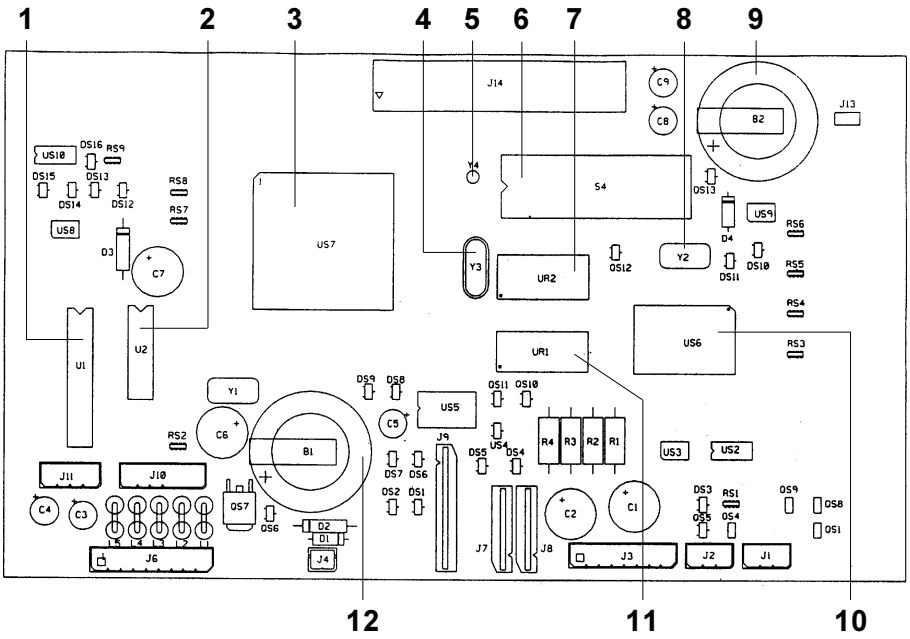


Fig. 2-10a Locating the motherboard components

1 CARRIAGE MOTOR DRIVER

2 PAPER AND SCANNING MOTOR DRIVER

3 CPU (WITH BUILT-IN MODEM AND IMAGE PROCESSOR)

4 QUARTZ CRYSTAL FOR MODEM CLOCK (20.736 MHz)

5 QUARTZ CRYSTAL FOR RTC (32.768 kHz)

6 SYSTEM FIRMWARE EPROM (256 kbytes)

7 STATIC RAM (8 X 8 kbytes)

8 QUARTZ CRYSTAL FOR ASIC (16 MHz)

9 BACK-UP RECHARGEABLE BATTERY FOR DYNAMIC RAM (Li, 3 Volts, 72 hour duration)

10 CUSTOM COMPONENT ASIC

11 DYNAMIC RAM (512 kbytes)

12 SYSTEM BATTERY (Lithium, 3 volts, 5-year duration)

The memory block, divided into the following three sections, is an integral part of the motherboard:

- **EPROM** (256 Kbytes), this memory contains the system ***firmware***, the default settings of the software parameters and the ***messages*** in the various languages

- **STATIC RAM** (8 kbytes), this memory contains:

  - the ***current user and service software parameters***

  - the ***calibration settings*** (alignment settings)

  - the ***telephone number list*** (one-touch dialling numbers and speed code dialling numbers)

  - the ***power failure report*** with the ***memory erasure report*** if needed.

- **DYNAMIC RAM** (512 kbytes), this memory contains:

  - the ***compression and decompression buffer***

  - the ***scanning buffer***

  - the ***print buffer***

  - the ***transaction memory*** (activity reports)

  - the ***user memory*** (documents to send, documents received in the memory).

The data is retained in the dynamic memory even during a power failure by a ***backup battery*** capable of powering the system for 72 hours. The facsimile machine ***must be left powered for 24 hours*** to ***recharge*** this battery.

The data is retained in the static memory by the ***5-year duration system battery***.

2.3.3 Block Diagram of the Network Control Unit Board

The NCU (Network Control Unit) board acts as the physical interface with the telephone line. The NCU board is available in several versions, to suit the specific needs of each country.

The NCU board also contains the integrated phone circuitry.

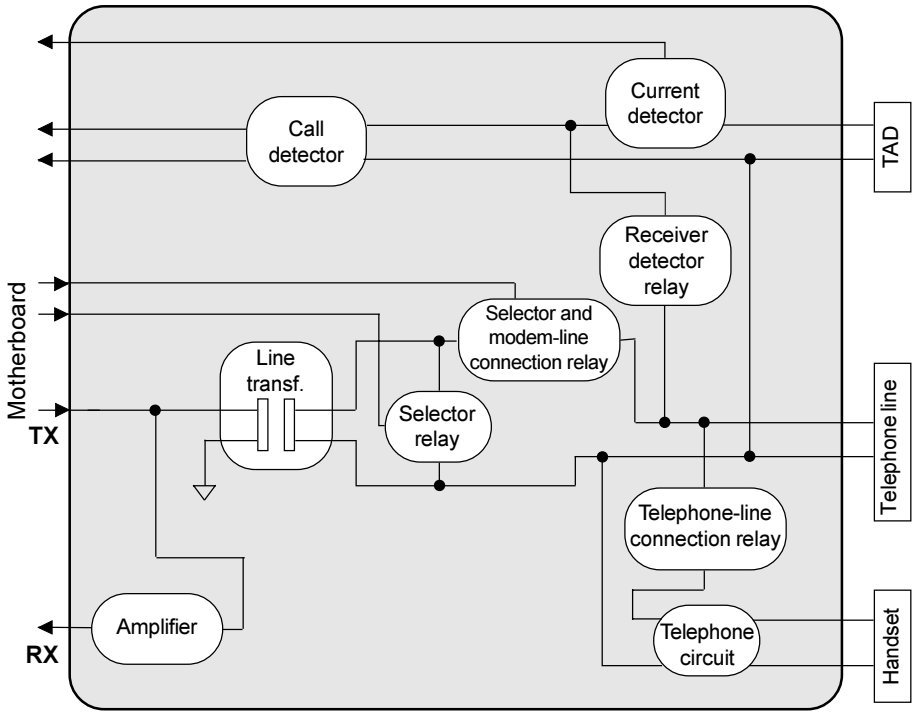


Fig. 2-11 Block diagram of a generic NCU board

2.3.4 Block Diagram of the Power Supply Board

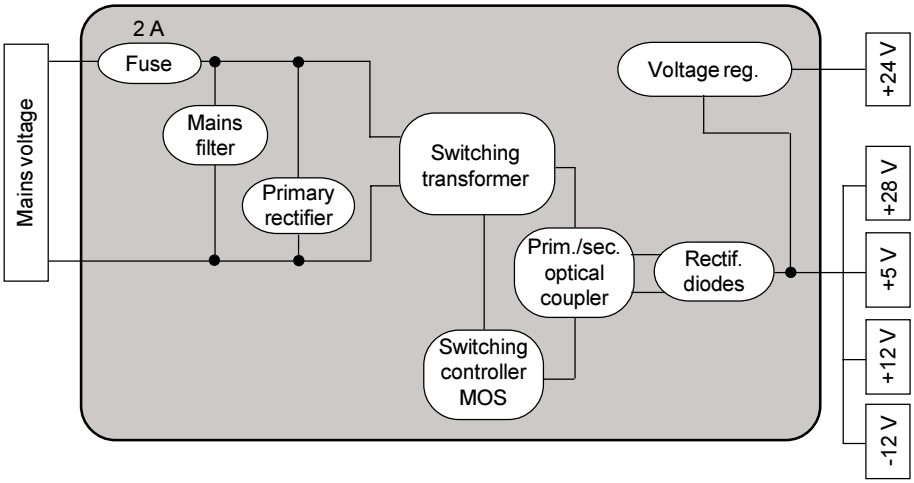


Fig. 2-12 Block diagram of the power supply board

The power supply board provides a maximum power of 30 Watts and supplies, via the switching circuit, the following direct voltages:

- +28 VDC (±10%), for the motors, variable according to the load
- +24 VDC (±2%), for CIS and the print head
- +12 VDC (±10%), for NCU and logic circuits
- -12 VDC (+10% -15%), for logic circuits
- +5 VDC (±5%) for CSI sensors and logic circuits.

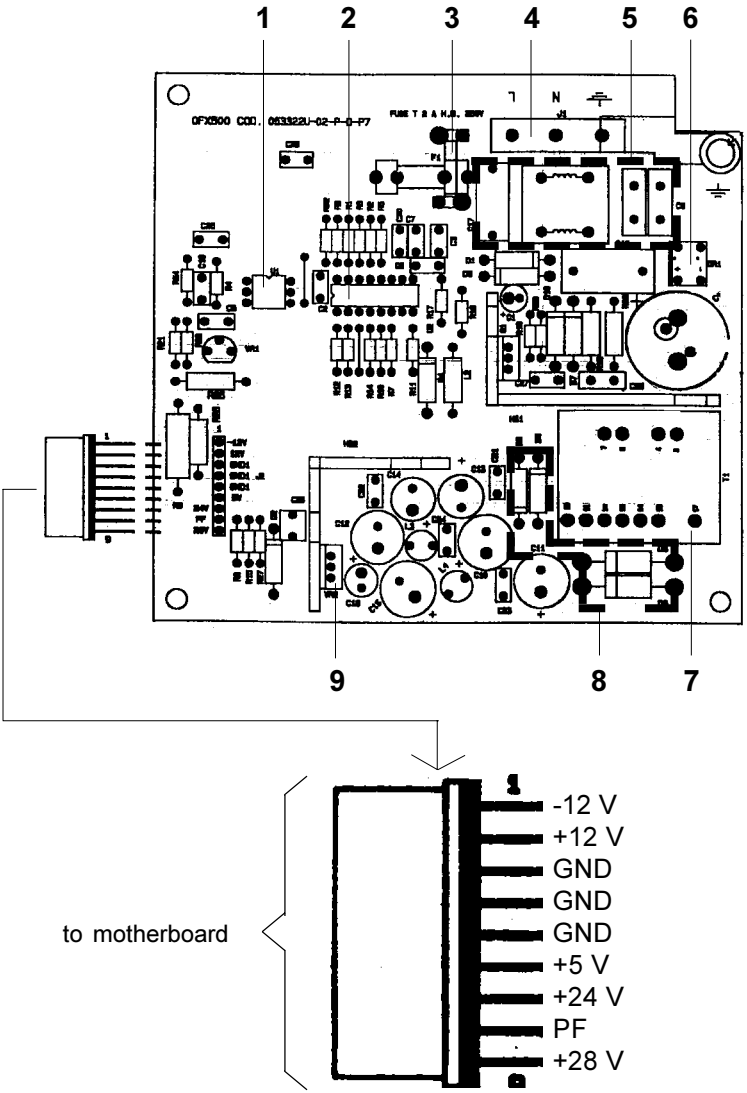


Fig. 2-12a Locating the power supply components

1	Prim/sec optical coupler	4	Mains connector	7	Transformer
2	Switching controller MOS	5	Mains filter	8	Diode rectifier
3	Fuse (2A)	6	Stabiliser	9	+24 V regulator

2.3.5 Printer Unit

The facsimile machine has a bubble ink jet system which uses a special head and prints on plain paper.

The bubble ink jet print head consists of an interchangeable cartridge, which contains a sponge soaked with liquid ink, which is ejected from 50 nozzles made of a nickel and gold component, under the control of the signals that reach an electrical circuit consisting of 50 resistors (Fig. 2-13).

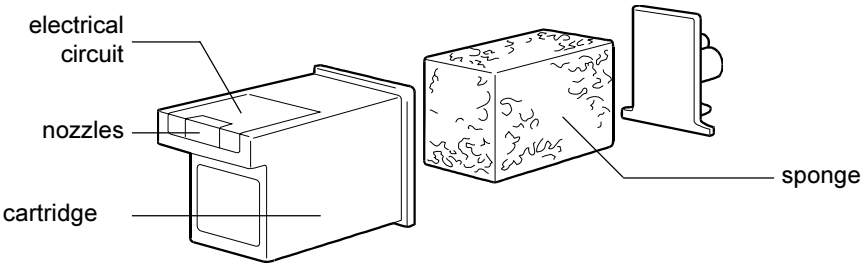
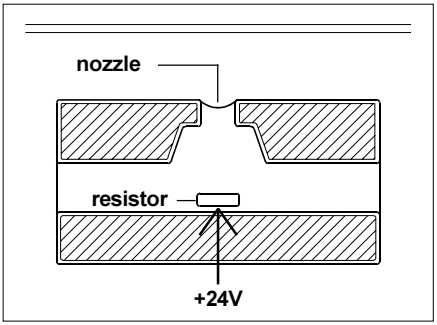
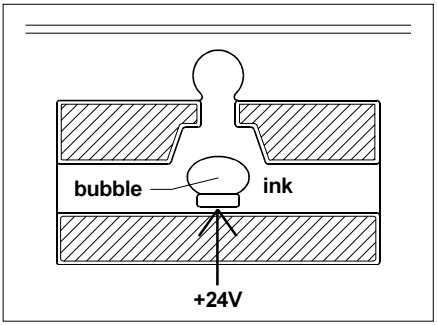


Fig. 2-13 Composition of the print head

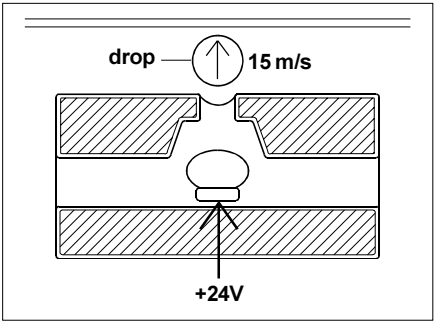
Each nozzle generates a drop of ink when the corresponding resistor is powered (+24 Volt) for a few microseconds.



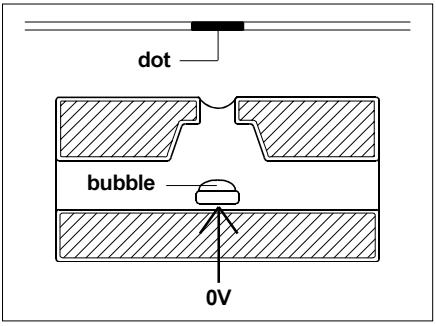
The resistor is heated and the ink that is in direct contact with it evaporates, expanding like a bubble and pressing the rest of the ink against the nozzle.



As a result, a drop of ink is ejected from the nozzle at a speed of 15 metres a second until it strikes the paper on which it makes a dot.



When the resistor is powered off, the bubble collapses quickly, drawing from the sponge a quantity of ink equal to the amount ejected. 800 microseconds after the ink has been ejected, the nozzle is ready to eject another drop.



2.3.6 Paper Feeding

The fax machine feeds both the originals (placed in the **ADF**) and the documents received or copied (in the **ASF**) through a single series of rollers **RS** which conveys them towards a single outlet, comprising rear **RP** and front **RA** rollers (fig. 2-14):

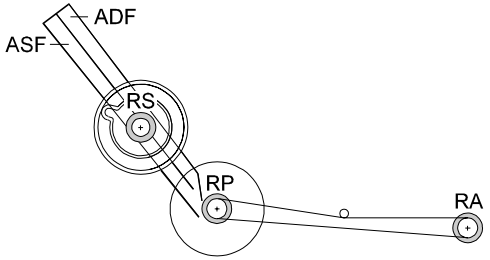


Fig. 2-14 Paper path

A single motor, able to rotate in both directions, can feed the ***originals*** (***clockwise rotation*** of the RS rollers) (fig. 2-15):

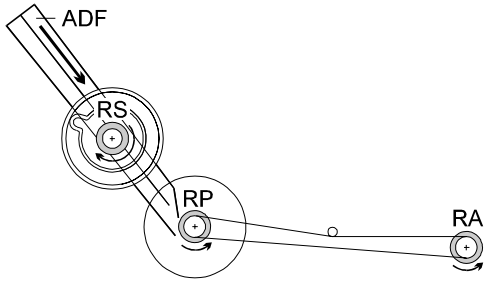


Fig. 2-15 Original document feeding

... or ***received or copied documents*** (***counter-clockwise rotation*** of the RS rollers) (fig. 2-16):

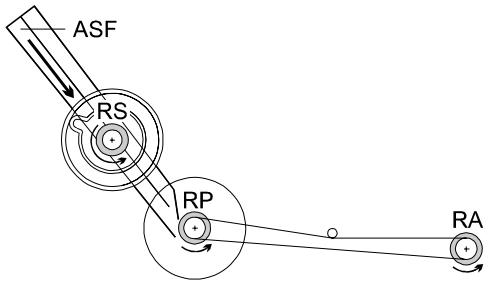


Fig. 2-16 Received or copied document feeding

The **RS** roller shaft comprises (fig. 2-17):

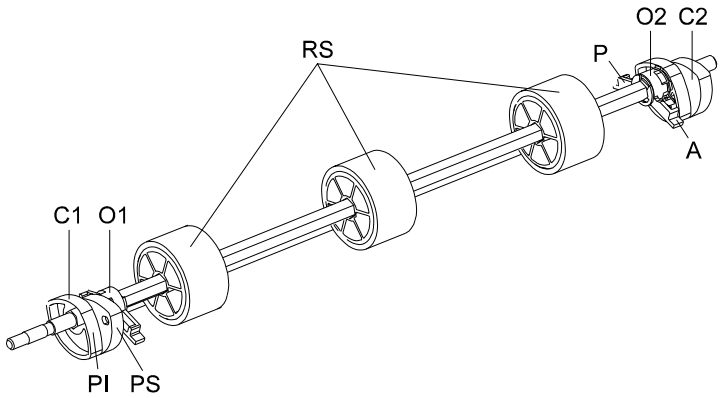


Fig. 2-17 RS roller shaft

- two series of symmetrical cams **C1** and **C2**, integral with the shaft, which:
  - through the upper profile **PS** move the ADF (or ASF) away from the RS rollers
  - through the lower profile **PI** at the same time allow the ASF (or ADF) to come in contact with the RS rollers
- two oscillating rockers **O1** and **O2**, moved in the shaft rotation, which maintain the ADF (or ASF) in the position detached from the RS rollers, respectively through steps **A** or **P**).

Rotation to the RS shaft is imparted by motor **M** through a series of gear wheels, rocker **B1** and feeler pin **T2** which supports rocker **B2** (Fig. 2-18):

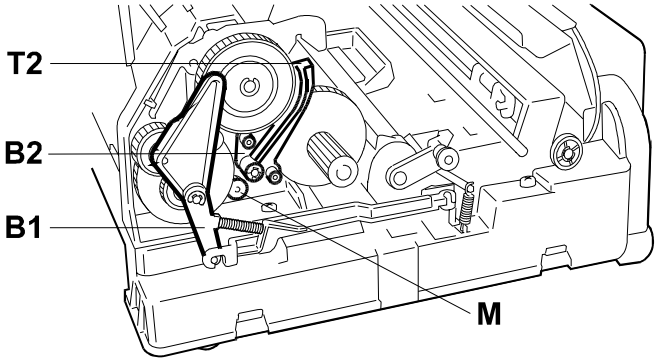


Fig. 2-18 Paper feed mechanisms

A paper feeding cycle is started by the ***carriage against the left side***. In this position, the motion shown in fig. 2-19 is started, which frees cam **CRS** (integral to the RS roller shaft) from feeler pin **T1** of the rocker **B1**, and simultaneously accomplishes the connection between motor **M** and the cam (in detail) thus allowing the shaft to rotate:

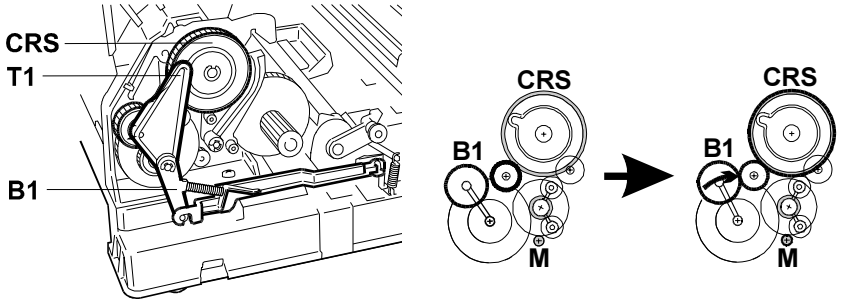


Fig. 2-19 Paper feeding cycle start

Paper feeding conditions in the case of the ADF and in the case of the ASF are described separately below.

Original document feeding (ADF)

Motor **M** rotates ***counter-clockwise*** so that the **CRS** cam (and thus the RS roller shaft) rotates clockwise, allowing the original documents contained in the ADF to be fed (Fig. 2-20):

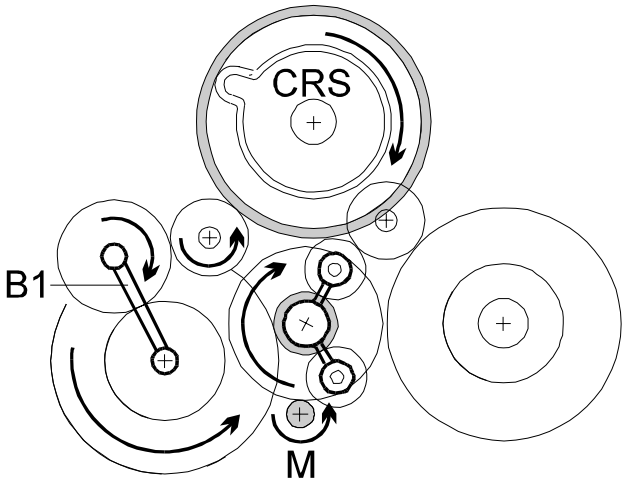


Fig. 2-20 Original document feeding

During the first 360° of rotation of the **CRS** cam, the original is aligned against rear rollers **RP** which are still stationary because, thanks to feeler pin **T2**, neither one of the wheels **R1** and **R2** of the rocker **B2** is engaged with the remaining mechanisms (Fig. 2-21):

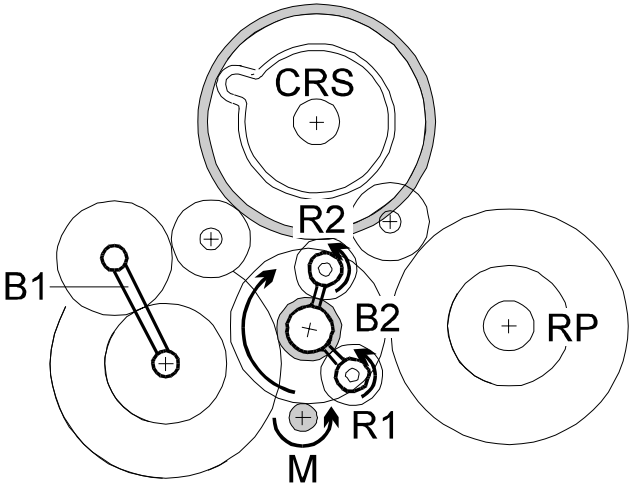


Fig. 2-21 Original document alignment

Subsequently, the feeler **T2** allows rocker **B2**, which is set in motion by friction, to transmit the motion to the rear rollers **RP** thanks to its wheel **R2** (Fig. 2-22):

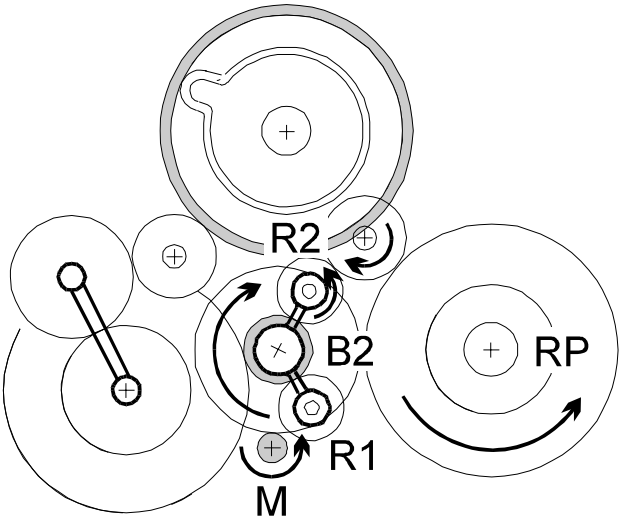


Fig. 2-22 Original document ejection

Received or copied document feeding (ASF)

Motor **M** rotates ***clockwise***, so that cam **CRS** (and thus the RS roller shaft) rotates counter-clockwise, allowing the paper in the ASF to be fed (Fig. 2-23):

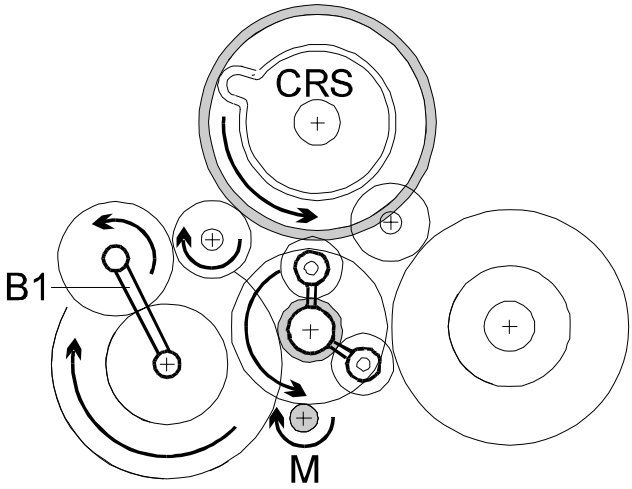


Fig. 2-23 Received or copied document feeding

In this case as well, during the first 360° of rotation of the **CRS** cam, the paper is aligned against the rear rollers **RP**. Subsequently, feeler pin **T2** allows rocker **B2** to transmit motion to rear rollers **RP** thanks to its wheel **R1**. Note that rotation of the RP rollers is always counter-clockwise (Fig. 2-24):

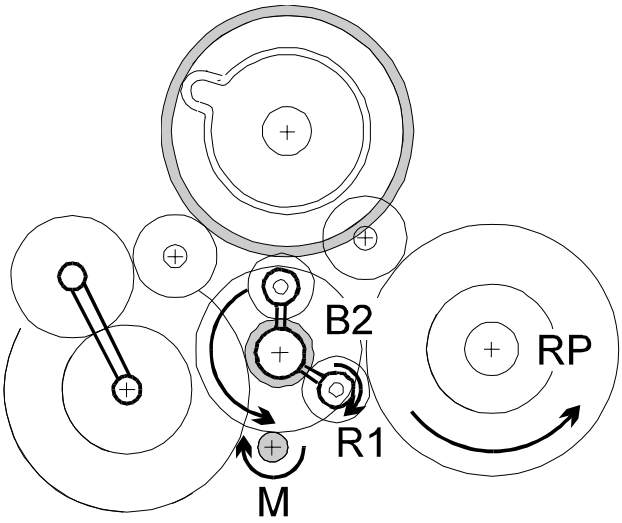


Fig. 2-24 Received or copied document ejection

■

3. INSTALLATION AND INITIALIZATION PROCEDURES

Installation of the facsimile machine consists of three separate phases:

1. PRELIMINARY OPERATIONS, or *fitting together the parts* supplied in the packaging and subsequent *connection* of the facsimile machine and telephone, if present, *to the telephone network*

2. INSTALLATION, or *setting the parameters indispensable* for the facsimile machine's operation.

3. SETUP, or *setting the customization parameters*.

3.1 PRELIMINARY OPERATIONS

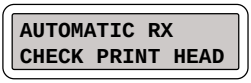
3.1.1 Unpacking the Facsimile Machine

Having removed the facsimile machine and the other parts from the packaging, check that the following elements are present:

- the facsimile machine (complete with power cord)
- a packet containing the print head
- the telephone cable (with two international RJ11 connectors)
- the handset (complete with connection cord)
- the telephone plug
- the paper support extension
- three clear films with back sheet to use as holders for documents in non-standard formats
- the "User Guide", complete with the "Quick Reference Guide".

3.1.2 Connecting the Power Cord

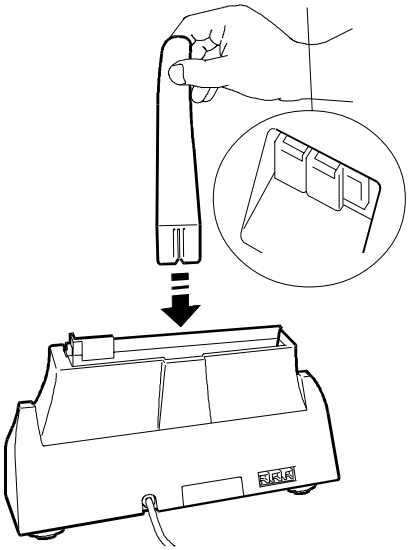
Plug the power cord into the wall socket. The fax machine performs a brief self-test and then shows the following message on the display:



CAUTION: If the message does not appear in your language, carry out the country setup procedure described in section 3.2.2 and continue with this procedure starting from the next step.

3.1.3 Inserting the Paper Support Extension

Insert the paper support extension in its slot pushing downward until you hear the latching click.



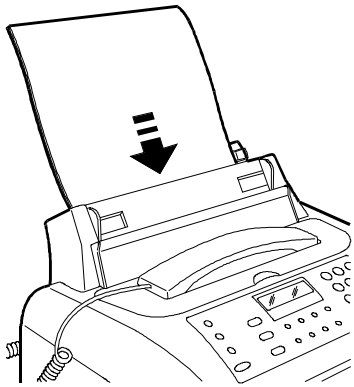
3.1.4 Paper Supply

When supplying the paper to print received and copied documents, always pay attention to the following two factors, which must *always coincide* to guarantee that the print is properly contained within the width of the sheet in use:

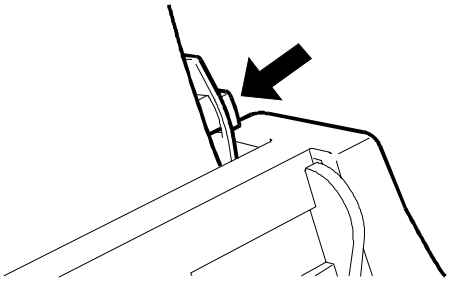
- *paper format*, i.e. width of the sheet in use

- *print format*, i.e. the value of the FORMAT parameter in the PRINT PARAMETERS menu (see sect. 3.2.1).

1) Insert the sheets without going beyond the maximum quantity indicator notch, letting them fall into the tray without bending or forcing them.



2) Push the sheets *against the left side* of the tray using the adjustment lever.



CAUTION: When you need to add paper in the tray, insert the sheets under those already present.

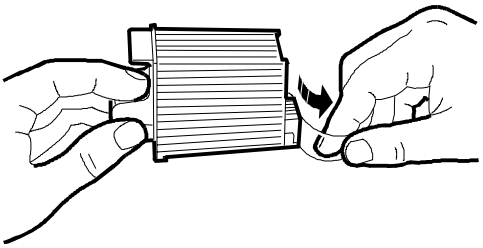
3) Set the FORMAT parameter of the PRINT PARAMETERS menu to the value *corresponding to the format of the paper* (see sect. 3.2.1)

3.1.5 Installing the Print Head

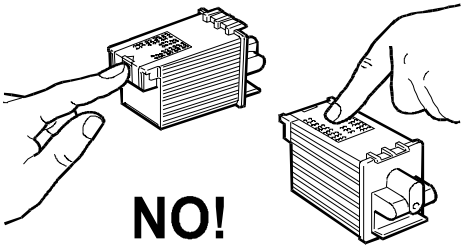
1) Flip open the printer lid

2) Open the print head packet and remove the sealed box containing the print head.

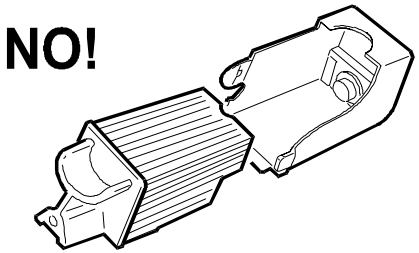
3) Open the box and remove the print head, holding it by the grip, then remove the label covering the nozzles.



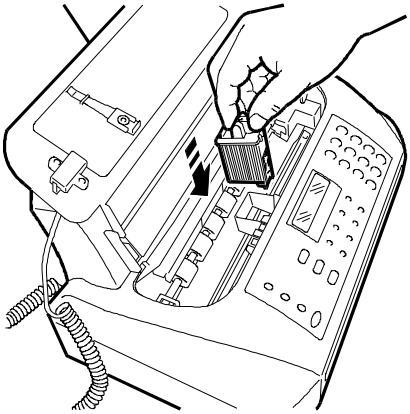
WARNING: *do not touch the electrical contacts or the print head nozzles*



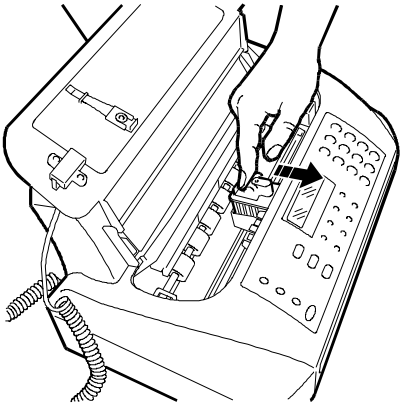
In addition, if the print head has an interchangeable cartridge, *do not separate the cartridge from the print head*



4) Tilt the printer cover, then insert the print head in position with the *electrical contacts facing the front* of the machine.



5) Taking care not to obstruct the hole on the top, insert your index finger in the recess on the print head and pull it *until you hear it clearly click into position*.



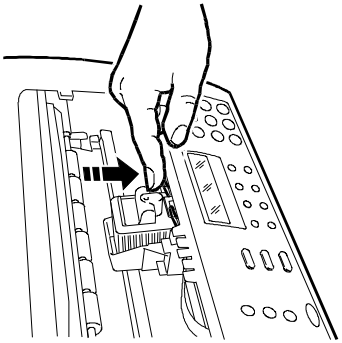
6) Having inserted the print head, close the printer cover

WARNING: if a *disposable print head* has been inserted, the following message generally appears:

```
NEW  PRINT  HEAD?
1=YES        0=NO
```

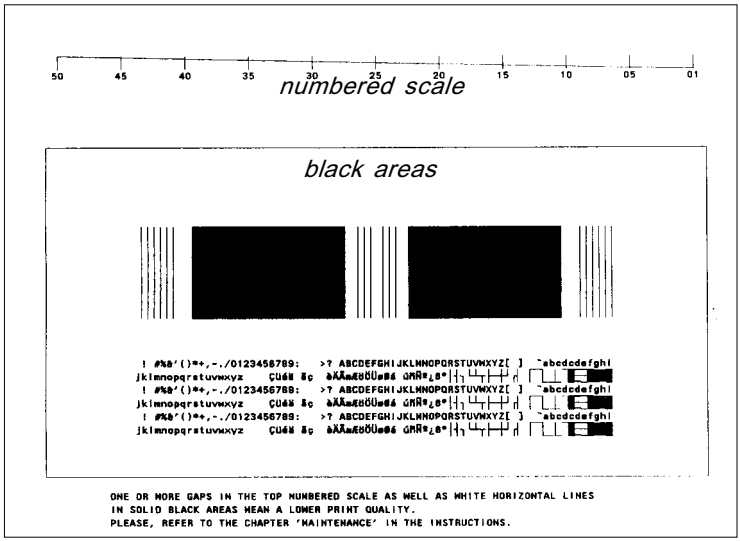
Set the value 1.

7) If the CHECK PRINT HEAD appears again, remove the print head pulling the small levers forward:



and visually check for the presence of a particle on the print nib: if so, remove the particle with care, without touching the electrical contacts. If not, the facsimile machine automatically loads a sheet of paper and starts the *nozzle cleaning and checking procedure*, which ends by:

- *printing out* the following *print chart* on the automatically loaded sheet (*)



which contains:

– a *numbered scale*, for checking the flow of ink and the electrical circuits controlling the print head nozzles

– a section of *graphics and text*, for evaluating print quality

(*) only if bit 2 of SW09 is set to 1.

- the following message appears

```
CHECK PRINTOUT
1=EXIT  0=REPEAT
```

8) Analyse the print chart as follows:

- Check that there are *no gaps* in the numbered scale and that there are *no horizontal white lines* in the black areas: under these conditions, which indicate that the print head has been inserted correctly and is in perfect working order, type 1: the facsimile machine returns to stand-by and is ready for use

- If there are *gaps or white lines*, type 0 to repeat the nozzle cleaning procedure: if the new print chart is still unsatisfactory, repeat the procedure again

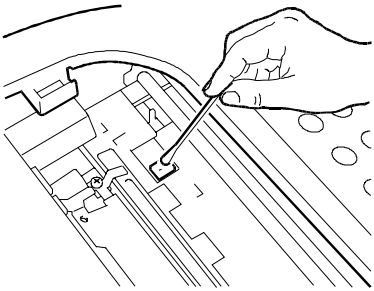
- If the printing quality is still not up to the required standard after the procedure has been performed three times, proceed as follows until a satisfactory print chart is obtained:

  - Make a copy of a document with the desired type of graphics and text and assess its quality.

  - Change the type of paper (the paper you are using may be too porous) and repeat the procedure.

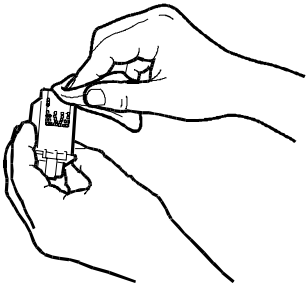
  - Remove and reinsert the print head.

  - Remove the print head and check that there is no foreign body on the printing nib; if there is, remove it with care, taking care not to touch the electrical contacts; slide the print carriage to the right, then clean the print head cleaning pad using a cotton swab soaked in water, taking care not to leave any fluff;

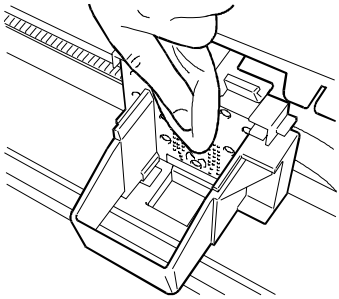


Reinsert the print head.

- Remove the print head and clean the contacts with a piece of felt, pressing firmly;



Clean the contacts on the print carriage with a soft, dry cloth;



Reinsert the print head.

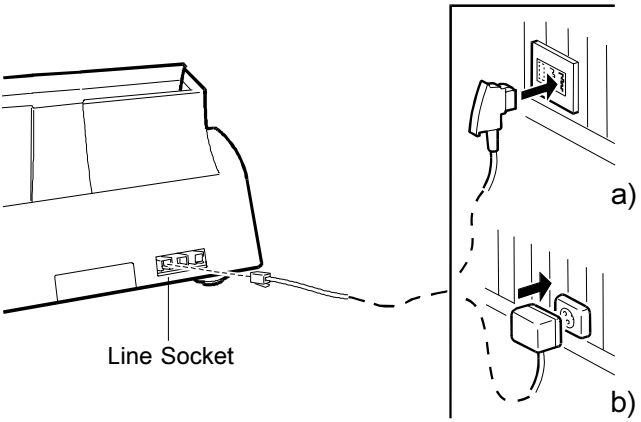
- Replace the print head

- Replace the print carriage (see section 7.2.15).

3.1.6 Connecting to the Telephone Line

CAUTION: check that the *power cable* is *plugged into the power outlet*, before connecting the facsimile machine to the telephone line.

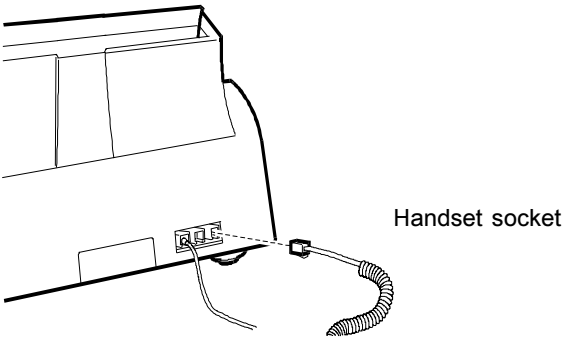
To connect the *facsimile machine* to the telephone line, plug one end of the telephone cable to the line socket (LINE) on the facsimile machine and the other end into a wall socket (a) or using the adapter if necessary (b).



CAUTION: If the telephone exchange the fax machine is inserted on is of the type with multiple sockets in series, then the telephone cord must be plugged into the primary socket.

3.1.7 Connecting the Handset

Insert the handset cord into the fax machine socket bearing the corresponding symbol, then place the handset in its cradle.

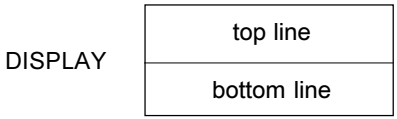


3.2 INSTALLING AND SETTING UP THE MACHINE

The procedures used for installing and setting up the machine may be divided into *indispensable* procedures (marked by the background ⬬) and procedures that *depend on the characteristics of the telephone exchange or the user's requirements* (marked by the background ⬭).

3.2.1 Organization of the Installation and Setup Parameters

The *installation and setup* parameters are organized into *menus* and *submenus*, shown on the display as follows:



- the *top line* is used for displaying:
  - · *menu* and *submenu* items, which represent the operating selections available on the facsimile machine
  - · *parameters*, to which a value is to be assigned to make an operating selection

- the *bottom line* is used for displaying the *keys that handle* the items indicated on the top line, that is:

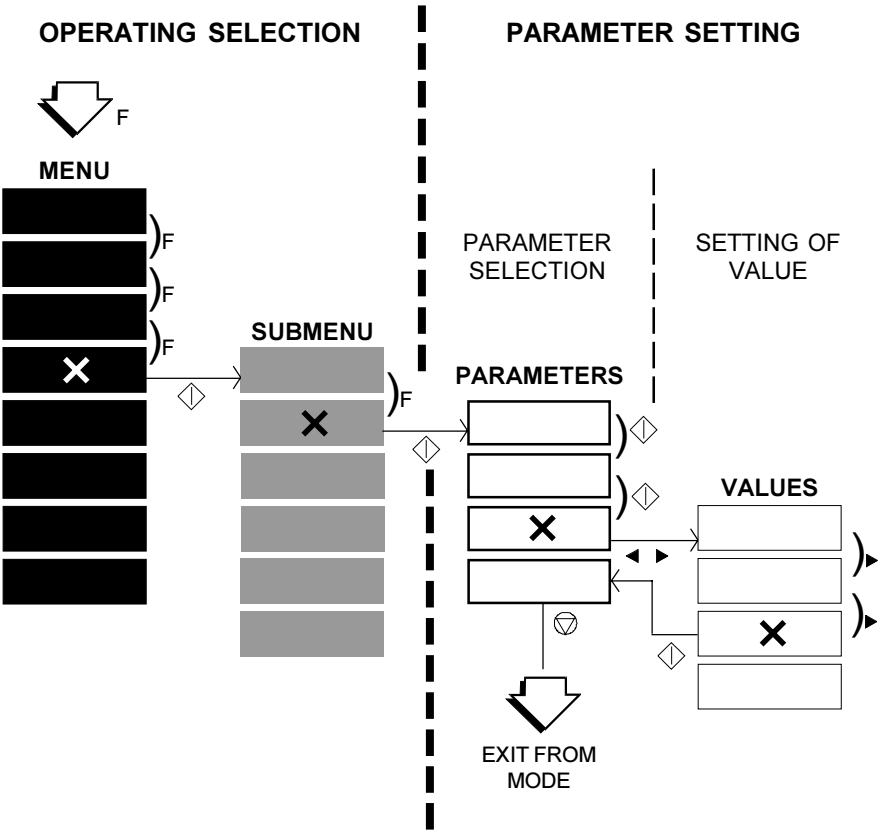
  F for *selecting menu* and *submenu* items, which can be scrolled cyclically *forwards only*, i.e. from the first to the last and then skipping straight back to the first again

  ◇ (START) for *confirming menu* and *submenu* items, *parameters* and *values*:
  - · by confirming a *menu*, you access the corresponding *submenu*
  - · by confirming a *submenu*, you access the corresponding *parameters*
  - · by confirming a *parameter* or its *value*, you access the *next parameter*

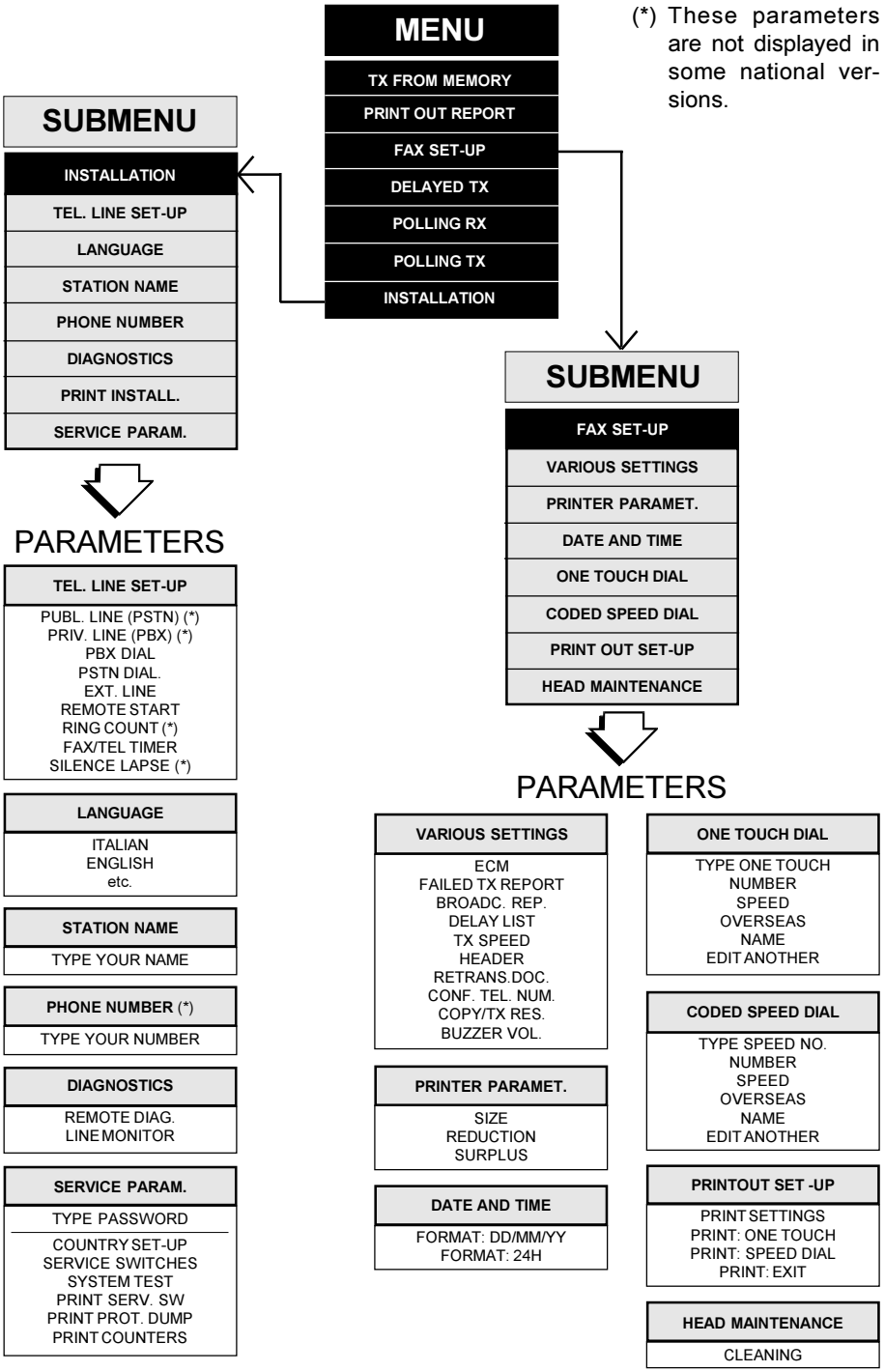
◄ ► for ***selecting the values*** of a parameter, scrolling forwards and backwards through those available on the machine, or for ***moving*** along the characters that make up the parameter value. In the latter case, the value must then be ***set*** using the numeric keypad

▽ (STOP) for ***exiting from installation or setup mode.***

A schematic diagram of parameter management is provided below:



The figure that follows provides a detailed illustration of the organization of the installation and setup parameters.


MENU
TX FROM MEMORY
PRINT OUT REPORT
FAX SET-UP
DELAYED TX
POLLING RX
POLLING TX
INSTALLATION
(*) These parameters are not displayed in some national versions.
SUBMENU
INSTALLATION
TEL. LINE SET-UP
LANGUAGE
STATION NAME
PHONE NUMBER
DIAGNOSTICS
PRINT INSTALL.
SERVICE PARAM.
PARAMETERS
TEL. LINE SET-UP
PUBL. LINE (PSTN) (*)
PRIV. LINE (PBX) (*)
PBX DIAL
PSTN DIAL.
EXT. LINE
REMOTE START
RING COUNT (*)
FAX/TEL TIMER
SILENCE LAPSE (*)
LANGUAGE
ITALIAN
ENGLISH
etc.
STATION NAME
TYPE YOUR NAME
PHONE NUMBER (*)
TYPE YOUR NUMBER
DIAGNOSTICS
REMOTE DIAG.
LINE MONITOR
SERVICE PARAM.
TYPE PASSWORD
COUNTRY SET-UP
SERVICE SWITCHES
SYSTEM TEST
PRINT SERV. SW
PRINT PROT. DUMP
PRINT COUNTERS
SUBMENU
FAX SET-UP
VARIOUS SETTINGS
PRINTER PARAMET.
DATE AND TIME
ONE TOUCH DIAL
CODED SPEED DIAL
PRINT OUT SET-UP
HEAD MAINTENANCE
PARAMETERS
VARIOUS SETTINGS
ECM
FAILED TX REPORT
BROADC. REP.
DELAY LIST
TX SPEED
HEADER
RETRANS.DOC.
CONF. TEL. NUM.
COPY/TX RES.
BUZZER VOL.
PRINTER PARAMET.
SIZE
REDUCTION
SURPLUS
DATE AND TIME
FORMAT: DD/MM/YY
FORMAT: 24H
ONE TOUCH DIAL
TYPE ONE TOUCH
NUMBER
SPEED
OVERSEAS
NAME
EDIT ANOTHER
CODED SPEED DIAL
TYPE SPEED NO.
NUMBER
SPEED
OVERSEAS
NAME
EDIT ANOTHER
PRINTOUT SET -UP
PRINT SETTINGS
PRINT: ONE TOUCH
PRINT: SPEED DIAL
PRINT: EXIT
HEAD MAINTENANCE
CLEANING

3.2.2 Setting the Country Parameters

This procedure enables you to adapt some specific parameters automatically to the values preset for a particular country.

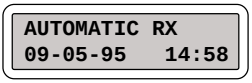
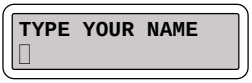
Setting	Display
a) The facsimile machine is in stand-by mode	AUTOMATIC RX 09-05-95 14:58
b) Press **F** to access the main menu	FAX SET-UP (F)/◇/▽
c) Select the SERVICE SWITCHES submenu of the INSTALLATION menu.	SERVICE SWITCHES (F)/◇/▽
d) Press ◇	TYPE PASSWORD ▯
e) Enter the number **5 0 0** and press ◇ to enter "***service***" mode	COUNTRY SETUP ◇/▽/←/→
f) Press ◇ to confirm the COUNTRY SETUP item	AMERICA ◇/▽/←/→
g) Select the desired country (for example, **U.K.**), and then press ◇: the values for the selected country are automatically loaded, then the facsimile machine returns to stand-by mode.	U.K. ◇/▽/←/→ AUTOMATIC RX 09-05-95 14:58

WARNING: After setting the country parameters it is possible, whenever necessary, to reload the default values for the current country, by means of the following simplified procedure;

- press in rapid sequence ▽ # #

COUNTRY SETUP
◇/▽/←/→

3.2.3 Storing the User's Number and Name

Setting	Display
a) The facsimile machine is in stand-by mode	
b) Access the main menu and select the STATION NAME item on the INSTALLATION menu	
c) Press ◇	

d) Enter the user's ***mnemonic ID***:

- you can use a ***maximum of 16 alphanumeric characters***

- select ***one character at a time*** using the numeric keys, as shown below:

  key **0** characters: **0**
  key **2**, characters: **2 A B C**
  key **3**, characters: **3 D E F**
  key **4**, characters: **4 G H I**
  key **5**, characters: **5 J K L**
  key **6**, characters: **6 M N O**
  key **7**, characters: **7 P R S**
  key **8**, characters: **8 T U V**
  key **9**, characters: **9 W X Y**
  key **0**, characters: **0 Q Z**
  key *, characters: **symbols** (selected "forwards")
  key **#**, characters: **symbols** (selected "backwards")

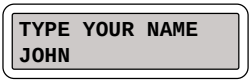
- each key selects the characters ***cyclically***, starting from the numeric character and displaying each of the other characters when pressed

- confirm the character selected by pressing the ▶ key: the cursor will move one place to the right

- to correct an error, move the cursor to the character to be changed using the ▶ and ◀ keys, and select the desired character

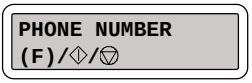
- to delete the entire entry, press **CLEAR**.

Example

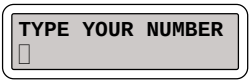


>>

- having made the entry, press ◇ to access the PHONE NUMBER item



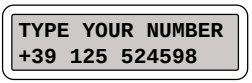
e) Press ◇



f) Enter your ***number***:

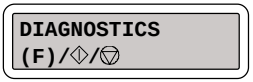
Example

- you can enter a ***maximum of 16 characters*** using the ***numeric keys*** (0÷9), the * key (to enter the + character) and the **>** key (to enter a space)

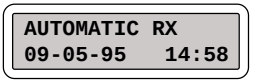


- to correct or delete, proceed as for the mnemonic ID

- having made the entry, press ◇



g) Press ▽ to return to stand-by mode.



3.2.4 Setting Up the Telephone Line

According to the type of network to which the facsimile machine is connected (PUBLIC NETWORK or PRIVATE BRANCH EXCHANGE), the following specific parameters must be set:

- type of ***dialling*** (established by the Telephone Service Manager):
  - ***tone*** (or ***multifrequency***) (PBX/PSTN DIAL: TONE)
  - ***pulse*** (PBX/PSTN DIAL: PULSE)

- type of ***access*** from private line to public line:
  - numeric ***prefix*** (EXT. LINE: PREFIX)
  - ***earth pulse*** (EXT. LINE: EARTH)
  - ***flash pulse*** (EXT. LINE: FLASH).

In addition to these indispensable parameters, the following parameters may also be set:

- ***enabling of extension telephone*** for activating the facsimile machine (REMOTE START), ***by means of a one-digit code*** (0-9)

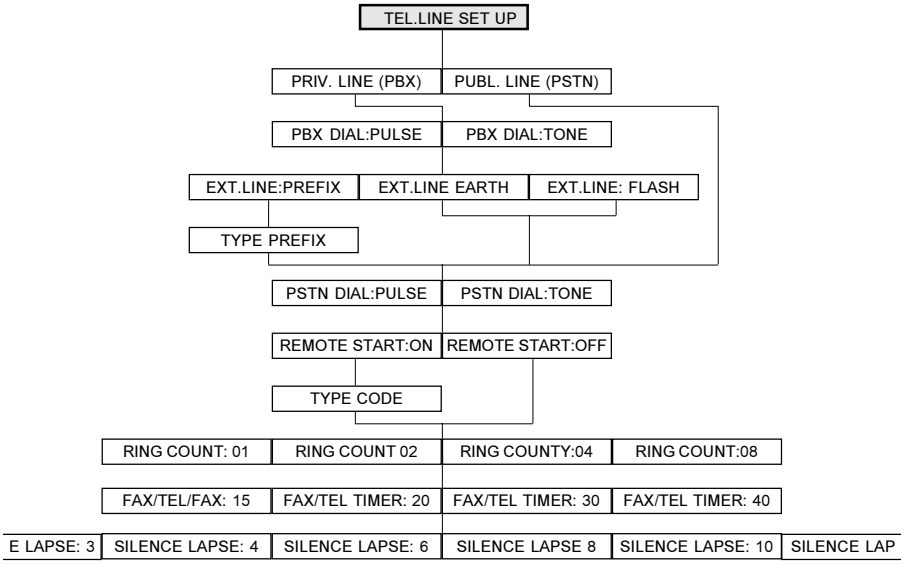
- ***number of rings*** after which the facsimile machine prepares for automatic reception (RING COUNT: 01 / 02 / 04 / 08)

- ***time*** (in ***seconds***) after which the facsimile machine with the fax/phone feature enabled ***switches to fax mode*** (FAX/TEL TIMER: 15 / 20 / 30 / 40)

- ***time*** (in ***seconds***) after which the facsimile machine connected to an external telephone answering machine ***switches to fax mode***, when there is no incoming message (SILENCE LAPSE: 3 / 4 / 6 / 8 / 10 / NO).

Setting	**Display**
a) The facsimile machine is in stand-by mode	AUTOMATIC RX 09-05-95 14:58
b) Access the main menu and select the TEL.LINE SETUP submenu of the INSTALLATION menu.	TEL.LINE SETUP (F)/◇/▽
c) Press ◇	PUBL.LINE (PSTN) ◇/▽/←/→

d) Set the parameters to the desired values, following the explanatory flow chart shown below:



3.2.5 Completing Installation

Installation may be completed by setting the FAX SET-UP to suit the user's needs. See the User Manual for a description of the procedure to be followed.

Various parameters

- ECM (error correction mode): allows to enable (YES) or disable (NO) the function for *correcting errors caused* by line interference; this function is effective if it is enabled on both connected fax machines.

- TX FAILURE REPORT: allows to enable (TX REPORT: ALWAYS) or disable (TX REPORT: NO) the *automatic transmission report print* in case of failed transmission.

- DELAYED LIST: allows to enable (YES) or disable (NO) the *automatic print of the delayed transmission parameters* after they have been set.

- SPEED: allows to define *transmission speed* (9600 bps / 4800 bps).

- HEADER: allows the sender to choose how to send the line with his/her identification data:

  - INT, as the *internal part* of the document to be transmitted (in which case, the header is overlaid onto the contents of the document)

  - EXT, as the *external part* of the document to be transmitted (in which case, the header is transmitted before the document)

- RESOLUTION: allows to define the current degree of *transmission resolution* (STD / FINE). The resolution can be changed momentarily at any instant afterwards, using the RESOL. key.

- VOLUME: it allows to change the *volume of the sound indications* (LOW / HIGH).

Print Parameters

- FORMAT: allows to define the *format of the sheets* to be used for reception and copying (A4 / LETTER / LEGAL).

- REDUCTION: allows to *reduce automatically the size of the printed document* (always received in A4 format) into the following percentages: 94% / 80% / 76% / 70%, or to leave it unchanged (NO).

- EXCESS: allows to define how to print a received document, whose length exceeds that of the paper in use on the fax machine.
  - YES, *on multiple consecutive sheets*
  - NO, *losing* the part of document that exceeds the length of the paper in use
  - AUTO, if the document exceeds the format of the paper in use by a quantity exceeding that set through the software parameter SW03, bit 7 (8 mm / 12 mm), then it is printed *on multiple consecutive sheets*; otherwise, the excess part is lost.
- COPY: allows to define *print quality when copying* (HIGH QUAL. / NORMAL).

Date and time

- FORMAT: allows to define the *order* in which the three components of the *date* are displayed (MM/GG/AA - AA/MM/GG - GG/MM/AA).
- TIME FORMAT: allows to define how the *time* is to be displayed:
  - 24 H; the time is expressed over *24 hours* (e.g. 17:35)
  - 12 H, the time is expressed over *12 hours* differentiating *ante meridian* hours (preceded by the letter a; for instance, a 09:47) from the *post-meridian* hours; for instance, p 11:05).

3.2.6 Resetting the Fax Machine

Having installed the machine, if it does not work properly in reception and transmission, reset the parameters to restore the default values and repeat the installation procedure from the start.

Setting	Display
a) The facsimile machine is in stand-by mode	AUTOMATIC RX 09-05-95 14:58
b) Access the main menu and select the SERVICE SWITCHES submenu of the INSTALLATION menu.	SERVICE SWITCHES (F)/◇/▽
c) Press ◇	TYPE PASSWORD ▯
d) Enter the number **5 0 0** and press **START** to enter "***service***" mode	COUNTRY SETUP ◇/▽/←/→
e) Select the SYSTEM TEST item and press ◇	SYSTEM TEST ◇/▽/←/→
f) Select LOAD DEFAULT and press ◇ twice: the default values for U.K./SOUTH AFRICA are loaded automatically in place of those set previously	LOAD DEFAULT ◇/▽/←/→
g) Press ▽ to return to stand-by mode.	AUTOMATIC RX 09-05-95 14:58
h) Perform fax machine nationalisation and reset installation and configuration parameters.	

WARNING: having installed the machine successfully, ***never repeat the reset procedure*** or you will have to reset all personal data set by the user.

4. SERVICE SWITCHES

The term *service switches* is intended to mean parameters that *cannot be accessed by the user* and that can *only be accessed by service technicians* with the facsimile machine in "*service*" mode (see section 3.2.2).

These parameters are given *default values* which depend on the country specifications made by the telephone network manager. As a result, the technician should only change these values in order to correct the functioning of the machine or to adapt it to particular local features.

Before changing any of the service switch settings, it is advisable to print them, as described below:

Setting	**Display**
a) The facsimile machine is in standby mode	**AUTOMATIC RX** **09-05-95 14:58**
b) Access the main menu and select the SERVICE SWITCHES submenu of the INSTALLATION menu	**SERVICE SWITCHES** **(F)/◇/▽**
c) Press ◇	**TYPE PASSWORD** ▯
d) Enter the number 5 0 0 and press ◇ to enter "*service mode*"	**COUNTRY SETUP** **◇/▽/←/→**
e) Select the PRINT SERV. SW option	**PRINT SERV. SW** **◇/▽/←/→**
f) Press the ◇ key: the *current default values* will be printed (see fig. 4-1)	**PRINTING...** **STOP**
g) Press ▽ to return to standby mode.	**AUTOMATIC RX** **09-05-95 14:58**

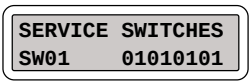
SERVICE SWITCHES

	U.K./S. AFRICA
SW01	01000101
SW02	00100100
SW03	10000010
SW04	00000000
SW05	01100111
SW06	00101011
SW07	00000000
SW08	00010001
SW09	10101100
SW10	10101111
SW11	00000101
SWA	0
SWB	2
SWC	10
SWD	10
SWE	70
SWF	10
SWG	10
SWH	10
SWI	16
SWJ	63
SWK	7
SWL	4
SWM	15
SWN	10
SWO	6
SWP	70
SWQ	3
SWR	120

Fig. 4-1 Example of a printout of the service switch settings

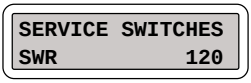
Two types of service switches are available in the SERVICE SWITCHES menu:

- SW01 - SW11: these switches consist of *8 bits* and can be programmed either individually or in group



bit no. 76543210

- SWA - SWR: these switches consist of a *value ranging from 1 to 3 digits*



Warning: 1) Whenever *no value* is printed in correspondence with a service switch *SWA-SWR*, this means that the value is *0* (zero).

2) Some of the service switches can be set by the user; in these cases, the *user setting takes priority* over the service setting. The parameters concerned are:

User parameter	Software parameter
RING COUNT	SWB
FAX/TEL TIMER	SWM
SILENCE LAPSE	SWO

4.1 SERVICE SWITCH TABLES

The tables that follow describe the functions carried out by the bits and combinations of bits for each service switch. In order to correctly interpret some of the functions required, a knowledge of the communication protocol is required. The default values may undergo some modifications due to both homologation and user's peculiarities. For this reason, you are recommended to print out the service switches of the facsimile machine to be serviced, always before modifying them.

Switch SW01

bit	Function	set to 1	set to 0
7	Error code generated on failed reception	YES	NO
6	Next page sent from the ADF or resent from memory despite bad reception signal (RTN) from the receiver	YES	NO
5 4	Multifrequency output level (dBm)	bit 5 4 = 0 0, -11 / -9 bit 5 4 = 0 1, -8 / -6 bit 5 4 = 1 0, -12 / -10 bit 5 4 = 1 1, -6 / -4	
3 2	Cable equalizer in reception (*)	bit 3 2 = 0 0, 0 km (0 dB) bit 3 2 = 0 1, 1.8 km (4 dB) bit 3 2 = 1 0, 3.6 km (8 dB) bit 3 2 = 1 1, 5.6 km (12 dB)	
1 0	Cable equalizer in transmission (*)	bit 1 0 = 0 0, 0 km (0 dB) bit 1 0 = 0 1, 1.8 km (4 dB) bit 1 0 = 1 0, 3.6 km (8 dB) bit 1 0 = 1 1, 5.6 km (12 dB)	

(*) Distances refer to a cable radius = 0.4 mm. With smaller or greater cable radii, distances respectively decrease or increase, with equal attenuation.

Switch SW02

bit	Function	set to 1	set to 0
7	Answer to second signal from the receiver (anti-echo device)	YES	NO
6 5 4	Tone duration / pause in tone dialling (ms / ms)	bit 6 5 4 = 0 0 0, 70 / 70 bit 6 5 4 = 0 0 1, 70 / 140 bit 6 5 4 = 0 1 0, 87 / 87 bit 6 5 4 = 0 1 1, 120 / 120 bit 6 5 4 = 1 0 0, 200 / 200	
3	Disable non standard features (NSF)	YES	NO
2	Reception start speed	9600-2400 (V.29,V.27ter)	4800-2400 (V.27ter only)
1 0	Transmission start speed	bit 1 0 = 0 0, 9600 bps bit 1 0 = 0 1, 7200 bps bit 1 0 = 1 0, 4800 bps bit 1 0 = 1 1, 2400 bps	

Switch SW03

bit	Function	set to 1	set to 0
7	Page loss when SURPLUS = AUTO	12 mm	8 mm
6	Automatic transmission in HOOK mode without pressing START at the end of dialling	YES	NO
5	Transmission of the tone emitted by the receiver during reception (CED)	NO	YES
4	Anti-echo protect tone in transmission	YES	NO
3	Reception sensitivity	-47 dBm	-43 dBm
2 1	Wait time for signal from receiver during transmission	bit 2 1 = 0 0, 35 s (*) bit 2 1 = 0 1, 60 s (*) bit 2 1 = 1 0, 90 s (*) bit 2 1 = 1 1, 130 s (*)	
0	Frequency of the tone emitted by the receiver during reception (CED)	1100 Hz	2100 Hz

(*) In some countries these bits are set to a single specific value.

bit	Function	set to 1	set to 0
7 6	Reception channel evaluation criteria	bit 7 6 = 0 0, strict bit 7 6 = 0 1, average bit 7 6 = 1 0, moderate bit 7 6 = 1 1, loose	
5	Pause between digits in pulse dialling	800 ms	900 ms
4 3	Dial pulses (N = digits dialled)	bit 4 3 = 0 0, N bit 4 3 = 0 1, N + 1 bit 4 3 = 1 0, 10 - N	
2	Pulse dialling frequency	20 p/s (*)	10 p/s
1	Report printing inhibited	always	(**)
0	PBX dialling tone detection	YES	NO

(*) only valid if the value of switch SWP is halved.

(**) as programmed via TX REPORT user parameter.

bit	Function	set to 1	set to 0
7	Earth pulse duration	100 ms	300 ms
6	Flash pulse duration	110 ms	270 ms
5 4	Pause time	bit 5 4 = 0 0, 2 s bit 5 4 = 0 1, 3 s bit 5 4 = 1 0, 4 s bit 5 4 = 1 1, 5 s	
3	PAUSE key enabling	NO	YES
2	Limit to the number of pauses that may be inserted	unlimited number	for 11 s max
1 0	Predialling pause (*)	bit 1 0 = 0 0, 1 s bit 1 0 = 0 1, 2 s bit 1 0 = 1 0, 3 s bit 1 0 = 1 1, 4 s	

(*) only valid if dial tone detection is not enabled (SW06, bit 2 = 0).

Switch SW06

bit	Function	set to 1	set to 0
7 6	Dialling tone frequency range	bit 7 6 = 0 0, 320 / 570 Hz bit 7 6 = 0 1, 360 / 520 Hz bit 7 6 = 1 0, 300 / 640 Hz bit 7 6 = 1 1, 300 / 640 Hz	
5 4 3	Dialling tone detection time	bit 5 4 3 = 0 0 0, 400 ms bit 5 4 3 = 0 0 1, 800 ms bit 5 4 3 = 0 1 0, 900 ms bit 5 4 3 = 0 1 1, 1200 ms bit 5 4 3 = 1 0 0, 1800 ms bit 5 4 3 = 1 0 1, 2000 ms	
2	PSTN dialling tone detection	YES	NO
1	Shortcircuit between digits in pulse dialling	YES	NO
0	Shortcircuit time on relay, before and after dialling pulse	260 / 70 ms	86 / 48 ms

Switch SW07

bit	Function	set to 1	set to 0
7	Busy tone detected after dialling	YES	NO
6	Exchange tones detected during preliminary phase of reception	YES	NO
5	Rapid preamble recognition during the handshake phase	YES	NO
4	Reserved	128 kbytes	17 kbytes
3	Report always printed on failed transmission	YES	NO
2	Busy tone seek time after dialling	20 s	standard (*)
1	Frequency range of second dialling tone	1120÷1160 Hz Belgian type	as for the 1st dialling tone
0	Dialling tone wait time	40 s	10 s

(*) i.e., as established by the couple of bits 1 and 2 of switch SW03

Switch SW08

bit	Function	set to 1	set to 0
7	Full line monitoring	YES	NO
6	Not used		
4 5	Dialling tone detection threshold	bit 5 4 = 0 0, -40 dBm bit 5 4 = 0 1, -30 dBm bit 5 4 = 1 0, -26 dBm bit 5 4 = 1 1, -35 dBm	
3	R Key function	REGISTER RECALL (*)	REGISTER RECALL (**)
2	Exit from HOOK mode	after 1 h	after 1 min
1	Busy tone detected before dialling	YES	NO
0	Busy tone sequence	4 sequences	2 sequences

(*) by Earth pulse

(**) by Flash pulse

Switch SW09

bit	Function	set to 1	set to 0
7	Switching off ERROR LED	manual	automatic after 1 min
5 6	Maximum reception/transmission time for one page	bit 6 5 = 0 0, 8 min bit 6 5 = 0 1, 16 min bit 6 5 = 1 0, 32 min bit 6 5 = 1 1, unlimited	
4	Size of data block packets in ECM	64 bytes (*)	256 bytes
3	Compression method	MR & MH	MH
2	Print chart enabled	YES	NO
1	Frequency and sequence of answer tone in FAX/TEL mode	Type B (**)	Type A (***)
0	Extended error codes	YES	NO

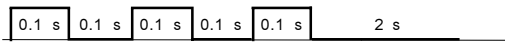
(*) only to be used on lines with interference

(**) Frequency: 425 Hz

Sequence:

(***) Frequency: 700 Hz

Sequence:



Switch SW10 (to enable / disable user-level functions)

bit	Function	set to 1	set to 0
7	Change in dialling mode by pressing the ✶ key disabled	YES	NO
6	Not used		
5	Enable remote diagnostics	YES	NO
4	Set number of rings(*)	YES	NO
3	Enable pulse mode during dialling	YES	NO
2	Set silence time detection	YES	NO
1	FAX/TEL switch	YES	NO
0	Set call time in FAX/TEL mode	YES	NO

(*) if this is set to zero the customer cannot set the number of rings

Switch SW11 (to enable / disable user-level functions)

bit	Function	set to 1	set to 0
7	Enable FAX/TAD	NO	YES
6	Not used		
5	Reserved		
4	Protection for telephone credit card (*)	YES	NO
3	Reserved		
2	Linking between letters and numeric keys	fixed to 1 (never set to 0)	
1	Disable "second tone" function of HOLD - 2.TONE key	NO	YES
0	Enable entry of sender's number	YES	NO

(*) In order to prevent the secret card code from being either displayed or printed, only the last 10 digits of the telephone number are displayed or printed.

Switch SWA

Format	Function
1 digit (0 ÷ 9)	Time before answering (in seconds)

Switch SWB

Format	Function
2 digits (01 ÷ 10)	Number of rings before answering

Switch SWC

Format	Function
max 3 digits (001 ÷ 255)	First ring detection time (in tens of ms)

Switch SWD

Format	Function
max 3 digits (001 ÷ 255)	Second ring detection time (in tens of ms)

Switch SWE

Format	Function
max 3 digits (001 ÷ 255)	Ring reset time (in hundreds of ms)

Switch SWF

Format	Function
max 2 digits (00 ÷ 15)	Maximum percentage of incorrect lines on a page without an error message (00 = function disabled)

Switch SWG

Format	Function
max 2 digits (00 ÷ 15)	Maximum number of incorrect lines on a page without an error message (00 = function disabled)

Switch SWH

Format	Function
max 2 digits (00 ÷ 15) (*)	Transmission level code (in dBm)

(*) 03 ÷ 15 for Italy.

Switch SWI

Format	Function
max 3 digits (010 ÷ 100)	Minimum ring duration (Max Freq) (in ms)

Switches I and J set the ring frequency detection range NOT the duration of the ring.

Switch SWJ

Format	Function
max 3 digits (010 ÷ 100)	Maximum ring duration (Min Freq) (in ms)

Switch SWK

Format	Function
max 2 digits (00 ÷ 99)	Number rings before answering in manual reception mode (00 = no answer in manual RX)

Switch SWL

Format	Function
max 2 digits (01 ÷ 99)	Wait time of the tone emitted by the sender before alarm to the operator in FAX/TEL mode (in seconds)

Switch SWM

Format	Function
max 2 digits (01 ÷ 99)	Alarm duration in FAX/TEL mode (in seconds)

Switch SWN

Format	Function
max 2 digits (01 ÷ 99)	Reserved

Switch SWO

Format	Function
max 2 digits (01 ÷ 59)	Silence recognition time in FAX/TAD mode (in seconds)

Switch SWP

Format	Function
max 2 digits (50 ÷ 80)	Break time in pulse dialling (in ms) (*)

(*) with a pulse dialling frequency of 20 p/s, halve the value used with the 10 p/s frequency.

Switch SWQ

Format	Function
max 2 digits (00 ÷ 99)	Number of redials

Switch SWR

Format	Function
max 3 digits (000 ÷ 999)	Time between redials (in seconds) (000 = no redials)

5. DIAGNOSTICS

5.1 SELF-DIAGNOSTICS

The facsimile machine *automatically runs a diagnostic program* (SELF-DIAGNOSTIC TEST) the first time it is powered on and on reactivation after a power failure or disconnection from the mains:

- if the self-diagnostic test is *passed*, the facsimile machine enters *standby mode*

- If instead the self-diagnostic test is *failed*, the fax machine shows an *error code* on the display (SYSTEM ERROR xx). In this case, the fax machine needs to be disconnected from the power supply socket before eliminating the related problem.

The self-diagnostic routine tests the following components:

- EPROM
- static RAM
- printer.

The self-diagnostic test stops at the first test in which a fault is detected.

5.1.1 Description of the Self-Diagnostic Program

Diagnostic step	Error message
1) The facsimile machine is powered on: the error LED lights up	
2) The EPROM is tested	SYSTEM ERROR 93 (1)
3) The static RAM is tested	SYSTEM ERROR 16 (2)
4) Printer startup: check that the print carriage is reset.	SYSTEM ERROR 03 (3)
5) The paper edge sensor is tested.	SYSTEM ERROR 04 (4)
6) Self-diagnostic program ended successfully: error LED switches off.	AUTOMATIC RX 09-05-95 14:58

(1) To solve this problem, replace the EPROM.

(2) This error means that the data of the static memory have been damaged, so U.K./ S. AFRICA country software parameters have automatically been loaded. To solve this problem, proceed as follows:

- disconnect and reconnect the fax machine from the power supply socket: if the error message persists, replace first the rechargeable battery then, if the error still persists, replace the motherboard. If instead the message disappears, proceed as follows:
- perform LOAD DEFAULT (see sect. 6.1.7), ALIGNMENT TEST (see sect. 6.1.1) and SCANNER SHADING (see sect. 6.1.8) procedures
- perform fax machine nationalisation and reset installation and configuration parameters (see sect. 3.2).

(3) This problem could be caused by the absence of the carriage limit stop plate (right side), by the paper edge sensor (replace carriage) or by a failure in the carriage motor (replace the defective part: motor, belt, etc.).

4) This problem could be caused by the absence of the carriage limit stop plate (right

side) or by the paper edge sensor (replace the carriage).

5.2 ERROR CODES

The error codes are *printed* on the journals (see section 5.3).

The format of these error codes, excluding those referring to the self-diagnostic test (described in section 5.1.1), may be:

- one group of two digits (xx)

- two groups of two digits separated by a dot (xx.xx); this extended format:

  - indicates the *category* to which the error belongs, by means of the *first group*,:

    01 Document incorrectly positioned
    02 Unable to connect
    03 No answer from correspondent
    04 Failed transmission
    05 Incomplete transmission
    07 Document too long
    08 Document jam
    10 Failed or incomplete reception
    11 No reception due to memory full
    13 Failed polling reception
    16 Power failure

  - provides *more detailed information* about the error, by means of the *second group*, and may be requested by the technician with the machine in "service" mode (see section 3.2.2), by setting *bit 0* of switch SW09 to 1 (see section 4.1).

In the tables that follow, the error codes are indicated in their *extended format* and in *ascending numeric order*.

For an explanation of the meaning of the protocol signal codes that appear in the description of the causes of errors, see the next section (5.2.1).

Important: to ensure correct identification of the cause of the error, we recom-

mend you always print the communication protocol (PROTOCOL DUMP, see section 5.2.3).

5.2.1 Meaning of Protocol Signal Codes

Code	Name	Type of signal
CRP	Command Repeat	GENERIC
CED	Called (Station Identification)	INITIAL IDENTIFICATION
CIG	Calling (Subscriber Identification)	
CSI	Called asubscriber Identification	
DIS	Digital Identification Signal	
NSC	Non-Standard Command	
NSF	Non-Standard Facilities	
NSS	Non-Standard Set-up	
TCF	Training Check Frame	
TSI	Transmitting Subscriber Identification	
DTC	Digital Transmit Command	POLLING COMMANDS
DCS	Digital Command Signal	TRANSMISSION COMMANDS
CFR	Confirmation To Receive	PRE-MESSAGE ANSWERS
FTT	Failure To Train	
CTC	Continue To Correct	POST-MESSAGE COMMANDS
EOM	End-of-Message	
EOP	End-of-Procedure	
EOR	End-of-Retransmission	
MPS	Multipage Signal	

PPS	Partial Page signal	
		>>
PRI	Procedure Interrupt	
RR	Receive Ready	
CTR	Response to CTC	
ERR	Response to EOR	
MCF	Message Confirmation	
PIN	Procedure Interrupt Negative	
PIP	Procedure Interrupt Positive	POST-MESSAGE ANSWERS
PPR	Partial Page Request	
RNR	Receive Not ready	
RTN	Retrain Negative	
RTP	Retrain Positive	

DCN	Disconnect	DISCONNECTION

5.2.2 Meaning of Error Codes

Code	Cause of Error	Action
02.00	No dial tone	Check telephone connection
03.00	No answer from correspondent	Call again manually
04.00	No connection due to disconnected correspondent (DCN received)	Print and analyse protocol dump
04.01	No connection due to incompatible correspondent (during handshake phase)	Print and analyse protocol dump
04.02	No connection due to incompatible correspondent	Print and analyse protocol dump
04.03	No connection due to incompatible correspondent (incompatible confirmation signal)	Print and analyse protocol dump
04.04	No connection due to incompatible correspondent (DCN instead of confirmation signal)	Print and analyse protocol dump
04.05	Line error as no further speed fall-back is possible	Print and analyse protocol dump
04.06	No connection due to problems on receiver's side (no answer)	Call again manually
04.07	No answer during post-message phase	Print and analyse protocol dump
04.08	Answer not allowed during post-message phase	Print and analyse protocol dump
04.09	No development of protocol	Print and analyse protocol dump

04.10	Answer not allowed during post-message phase in ECM	Print and analyse protocol dump

>>

Code	Cause of Error	Action
04.11	No answer during post-message phase in ECM	Call again
04.12	Insufficient memory on receiver's side	Call again
05.00	Transmission incomplete due to RTN reception	Call back and send missing pages again
07.00	Transmission duration exceeding time set with SW09, bit 5-6	Call again
08.00	Document jam	Remove document
09.00	STOP pressed during TX or RX	None
10.00	Text coding error at start of message	Print and analyse protocol dump
10.01	No connection due to incompatible correspondent	Print and analyse protocol dump
10.02	No reception due to no answer from correspondent during handshake, or at the end of the block, or at the end of a page with change in resolution	Print and analyse protocol dump
10.03	Line error due to incompatible speed	Print and analyse protocol dump
10.04	No commands received from correspondent	Print and analyse protocol dump
10.05	Text coding error (5 seconds without data)	Print and analyse protocol dump
10.06	No signal during reception of the message	Print and analyse protocol dump

>>

10.07	No commands received from correspondent at start of message	Print and analyse protocol dump

Code	Cause of Error	Action
10.08	No document present on polling request	Print and analyse protocol dump
10.09	Page received incorrectly (RTN transmitted)	Print and analyse protocol dump
10.10	No commands received from correspondent at start of message (in ECM)	Print and analyse protocol dump
10.11	Page received incorrectly in ECM (ERR sent)	Print and analyse protocol dump
10.12	Busy tone recognized during handshake	Print and analyse protocol dump
10.13	Text coding error during reception of the message	Print and analyse protocol dump
11.00	Reception incomplete due to user memory full	Clear unwanted documents from the memory
11.10	Reception incomplete due to user memory full in ECM	Clear unwanted documents from the memory
13.00	Failed polling reception	Call again

5.2.3 Printing the Communication Protocol

Setting	Display
1) The facsimile machine is in standby mode.	AUTOMATIC RX 09-05-95 14:58
b) Enter "*service*" mode and select PRINT PROT. DUMP	PRINT PROT DUMP ◇/▽/←/→
c) Make sure that there is paper in the ASFand then press ◇: the data shown in fig. 5-1 will be printed and then the facsimile machine will return to standby mode.	PRINT PROT.DUMP ◇/▽

PROTOCOL DUMP

TIMER	LOCAL	REMOTE	FIF
00:14	40 CSI		20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00:14	80 DIS		00 CE B8 04
00:17		FA DCN	00 00
			END SESSION
00:17	FA DCN		10 01

Fig. 5-1

The protocol status is presented, session by session, by means of the following fields:

TIMER Indicates the times, in *minutes : seconds*, at which the signals were exchanged during the session

LOCAL Indicates the signals, represented by a *hexadecimal code* and a *mnemonic code*, sent by the local facsimile machine

REMOTE Indicates the signals sent by the correspondent's facsimile machine

FIF Indicates the *structure of the signals* (FIF = Facsimile Information Field) in hexadecimal code.

Remarks:

1) The LOCAL field, during the session in which the message was sent, indicates the message's *transmission level*, followed by the word MESSAGE (fig. 5-2)

```
00:14    43  TSI                  20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
00:14    83  DCS                  00 86 F8 04
00:20                84  CFR
00:21    06  dBm  MESSAGE
00:38    BF  PPSEOP               00 00 47
00:41                8C  MCF
```

Fig. 5-2

2) If there is a data inconsistency error in any session, the LOCAL field contains the message CRC ERROR

3) At the end of the session, the FIF indicates the extended code of the *result* of the session (fig. 5-3):

```
00:14    80  DIS                  00 CE B8 04
00:17                FA  DCN      00 00
                                          END SESSION
00:17    FA  DCN                  10 01
```

Fig. 5-3

- positive result (00 00)
- positive result with document received incorrectly (00 01)
- negative result (*extended error code*, e.g. 10 01)
- busy status (06 00)

- STOP key pressed status (09 00).

5.3 REPORTS

The facsimile machine controls and updates various kinds of transaction reports which are described in this section for the technician's benefit, though a more detailed description is provided in the Instruction manual. Some of these reports are printed automatically and others on request by the operator:

- Transmission report (LAST TX REPORT): printed automatically and manually
- Broadcast transmission report (LAST BROAD. REP.): printed automatically and manually
- Journal (ACTIVITY REPORT): printed automatically and manually
- Power failure report: printed automatically only.

A report is printed by selecting the PRINT OUT REPORT option on the main menu (see section 3.2.1).

5.3.1 Transmission Report (TX REPORT)

The methods for printing the transmission report (automatically or manually) are selected by means of the SET MISCELLANEOUS option of the FAX SET-UP menu (see section 3.2.1):

- TX REPORT: OFF, if you do *not* want the report to be printed *automatically*
- TX REPORT: ALWAYS, if you want the report to be printed *automatically after each transmission transaction*
- FAILED TX REPORT, if you want the report to be printed *automatically only when an error is detected* (*).

(*) if bit *3* of switch SW07 is set to 1 (see section 4.1), the report is *always printed* when *transmission is failed* even if the TX REPORT: OFF option is selected.

The transmission report contains the following information (fig. 5-5):

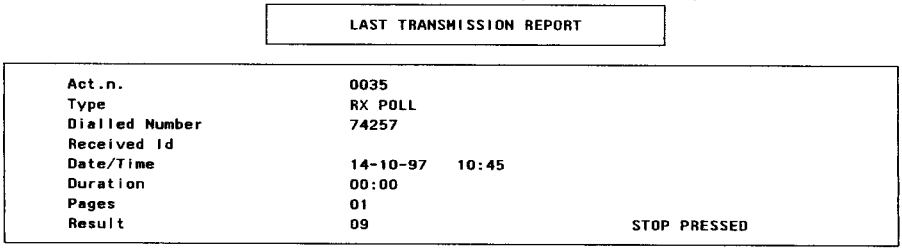


Fig. 5-5

- *Act. n.* progressive number of activity or transaction (4 digits)
- *Type* transaction (TX / TX ECM / RX / RX ECM / POLL / POLL ECM)
- *Dialled number* correspondent's number dialled
- *Received Id* correspondent's number (and name, if recorded) (*)
- *Date/Time* date and time of start of transaction
- *Duration* duration of transaction (minutes : seconds)
- *Page* number of pages in document
- *Result* result of transaction (OK / error code).

(*) this is the *ID recorded* on the correspondent's facsimile machine, the numeric part of which should correspond to the *actual telephone number* of the fac-

simile machine: if it does not, call the correspondent and ask him/her to correct the ID.

5.3.2 Journal (ACTIVITY REPORT)

Provides information about all transactions (transmission / reception) and is printec *automatically every 32 transactions* (and the information printed is subse quently cleared from the memory) or on request by the operator (fig. 5-6):

ACTIVITY REPORT

Act.n.	Type	Dialled Number	Received Id	Date/Time	Duration	Pages	Result
0005	RX ECM			25-09-97 15:42	00:36	01	OK
0006	TX	222		26-09-97 08:17	00:03	01	08
0007	TX	222		26-09-97 08:18	00:03	01	08
0008	TX	222		26-09-97 08:19	00:03	01	08
0009	TX ECM	222		26-09-97 08:21	00:18	01	09
0010	RX POLL			26-09-97 08:24	00:00	01	09
0011	TX ECM	222		26-09-97 08:25	00:16	01	09
0012	TX ECM	222		26-09-97 08:29	00:11	01	09
0013	RX POLL			26-09-97 08:32	00:00	01	09
0014	RX ECM			26-09-97 08:34	00:17	01	10
0015	RX			26-09-97 09:02	00:11	01	10
0016	RX			26-09-97 09:24	00:24	01	10
0017	RX			26-09-97 09:25	00:11	01	10
0018	RX ECM			26-09-97 10:57	00:18	01	10
0019	TX POLL ECM			26-09-97 11:00	00:31	01	OK
0020	RX			26-09-97 11:58	00:22	01	10
0021	TX POLL ECM			26-09-97 11:58	00:40	01	04

Fig. 5-6

5.3.3 Loss of Mains Power Supply Report

When operating conditions are restored after a loss of mains power supply, the fax machine may behave in three different ways:

- if power was lost during a transaction (transmission or reception), then a report with the transmission data will *automatically* be printed (fig. 5-7):

POWER FAILURE

Act.n.	0046	
Type	TX	
Dialled Number	2	
Received Id	+49 681 123 709	
Date/Time	16-10-97 10:22	
Duration	00:04	
Pages	01	
Result	16	POWER FAILURE ON PAGE 01

Fig. 5-7

or with the reception data (fig. 5-8):

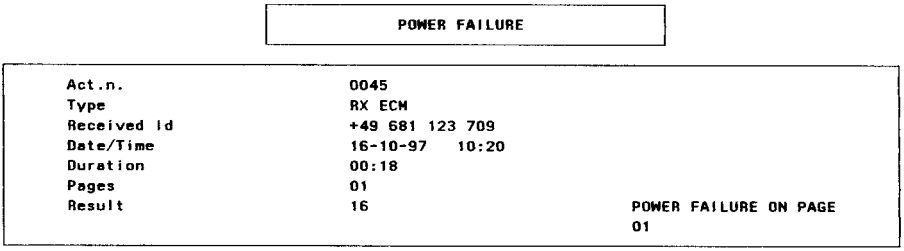


Fig. 5-8

- if power was lost *during reception* and the received document was *damaged*, the same report as in fig. 5-8 is printed, with the addition of data pertaining to the last 16 receptions (fig. 5-9):

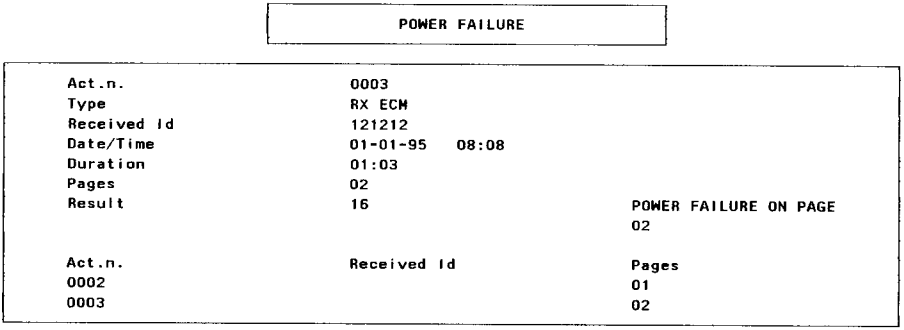


Fig. 5-9

- if power was lost *after a substitute reception and the document still in memory* is damaged, a report is automatically printed with the data for the last 16 receptions (fig. 5-10):

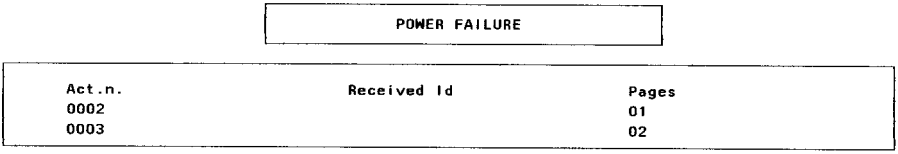


Fig. 5-10

- if power was lost *after a substitute reception* and the received document *is not damaged*, no report is printed.

■

6. SYSTEM TEST AND ADJUSTMENTS

6.1 SYSTEM TEST

The *SYSTEM TEST* is a collection of *utility programs*, which are not available to the user but are provided to enable the service technician to carry out specific *tests* on components and modules.

The system tests are arranged into menus under the SYSTEM TEST item (see section 3.2.1) and can be accessed either with the machine in "*service*" mode (see section 3.2.2) or pressing in rapid sequence START ★ ★. *Underlined tests* cannot be activated with a colour print head:

- PRINT OUT SET-UP (*)
- ALIGNMENT TEST
- NOZZLES TEST
- CLEANING
- PRINT CHART
- ASF TEST
- ADF TEST
- SYSTEM TEST MSG (*)
- MODEM TEST (*)
- KEYB. SIMULATION (*)
- RAM TEST (*)
- AGING TEST (*)
- FIRMWARE RELEASE (*)
- LOAD DEFAULT
- SCANNER SHADING
- KEYBOARD TEST (*)
- DISPLAY TEST (*)
- CARRIAGE TEST.
- PRINT SIMULATION (*)
- CLEANER TEST (*).

Warning: each test in progress can be interrupted or terminated in either of the following ways:

- by pressing *the STOP key once*, if you want *to stay in test mode* (the test that follows the interrupted or terminated one appears on the display)

- by pressing *the STOP key twice*, if you want to exit from test mode and *return to stand-by mode*.

(*) These tests are used exclusively for special production requirements or during laboratory tests and, consequently, no description is provided in this manual.

6.1.1 ALIGNMENT TEST (not active with a colour print head)

This test MUST be carried out after replacing: the printer unit, motherboard, carriage or carriage motor.

Setting	Display
a) The facsimile machine is in standby mode	AUTOMATIC RX 09-05-95 14:58
b) Get access to the system test menu and select the ALIGNMENT TEST option	ALIGNMENT TEST ◇/▽/←/→
c) Make sure that there is paper in the ASF, and then press ◇: the test chart shown in fig. 6-1 is printed out	ALIGNMENT TEST ▽
d) At the end of the printout, the message VALUE 'A' xx will appear on the display; look carefully at the *scale* printed in the top left corner of the print chart (use a magnifying lens or make an enlarged copy of the scale) and detect the *value of its length* (*from 0 to 15*): Subtract 5 from the value to give the correct value 'A'.	VALUE 'A' xx ◇/▽/←/→
e) Enter the detected value as *xx* (in order to adjust the print left margin) and press ◇; the message VALUE 'B' xx will appear on the display:	VALUE 'B' xx ◇/▽/←/→

- identify the *best vertical alignment* from the ten shown on the test chart
- enter the *number corresponding* to the best alignment using the left and right arrow keys; note that an *intermediate value,* which is not printed on the test chart, may be selected as the best alignment, there are therefore 20 values available (*0–19*)
- press ◇: the test chart in fig. 6-2 showing both the margin alignment (the example shows VALUE 'A' = 07) and the vertical alignment (the example shows VALUE 'B' = 11) is printed out.

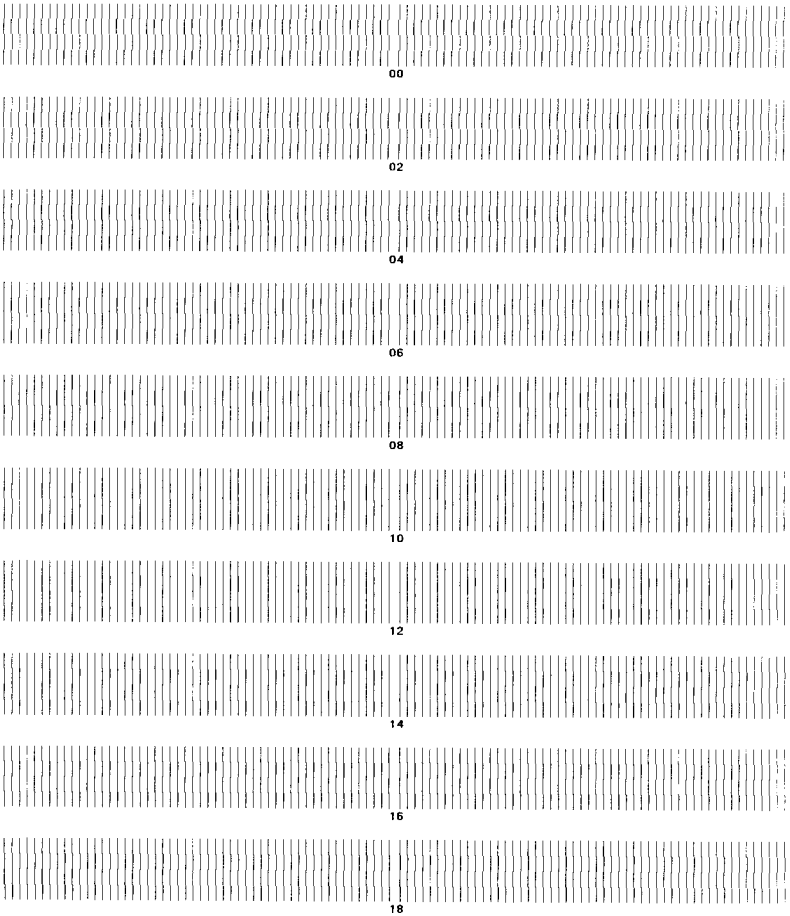


Fig. 6-1

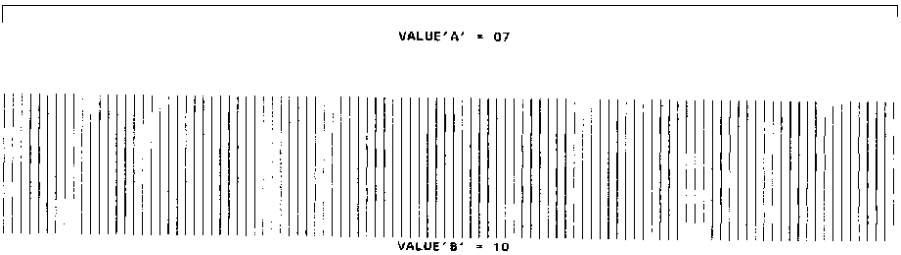


Fig. 6-2

6.1.2 NOZZLES TEST

This test may be carried out to identify the cause of printing errors.

Setting	Display
a) The facsimile machine is in standby mode	AUTOMATIC RX 09-05-95 14:58
b) Get access to the system test menu and select the NOZZLES TEST option	NOZZLES TEST ◇/▽/←/→
c) Press ◇: the test result is immediately displayed	NOZZLES TEST OK ◇/▽ or NOZZLES TEST OK ◇/▽
d) Make sure that there is paper in the ASF, and then press ◇; if you have installed a *monochrome print head*, the following chart is printed out (see fig. 6-3):	

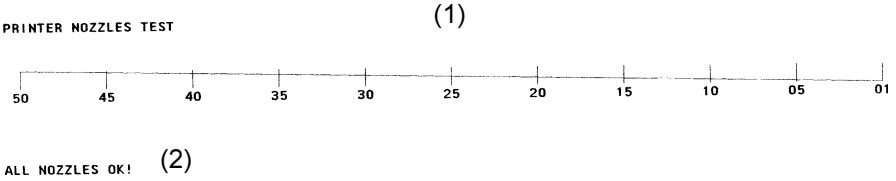


Fig. 6-3

The chart consists of:

(1) a *numbered scale* for *checking the flow of ink*, with the nozzles numbered from 01 to 50

(2) a message providing the *result of the test run on the electrical print head circuits*.

6.1.2.1 Checking the Ink Flow

Check the numbered scale:

- if *all the lines* that make up the scale are *present*, all the nozzles are working
- if *one or more lines are missing*, the fault could be due to one of the following:
  - dirty printing nib: clean the rubber print head pad

- foreign body on printing nib: remove it taking care to avoid touching the electrical contacts on the print head

- air bubble in the ink: carry out the CLEANING (see section 6.1.3) followed by the PRINT CHART test (see section 6.1.4); if the fault persists, repeat the CLEANING up to three times, and then replace the print head if this does not have the desired effect.

6.1.2.2 Checking the Electrical Circuits

Check the message indicating the result of the test:

- ALL NOZZLES OK — all the electrical circuits are working

- NOZZLES DAMAGED: xx yy zz — circuit(s) xx (yy, zz) error: remove the print head, clean the electrical contacts on the print head with a dry swab and the electrical contacts of the print carriage with a soft, dry cloth, then reinsert the print head and repeat the NOZZLES TEST. If another faulty circuit is indicated, reinsert the print head several times until the fault has been eliminated; if the fault persists on the same circuit (xx / yy / zz) after installing a new print head, replace the print carriage (see section 7.2.14).

6.1.3 PRINT CHART (not active with a colour print head)

This test MUST be carried out after replacing: the printer unit, motherboard, carriage, carriage motor or paper motor.

Setting	Display
a) The facsimile machine is in standby mode	AUTOMATIC RX 09-05-95 14:58
b) Get access to the system test menu and select the PRINT CHART option	PRINT CHART ◇/▽/←/→
c) Make sure that there is paper in the ASF and then press ◇: the test chart shown in fig. 6-4 is printed out.	PRINT CHART ▽

d) With reference to the figure, check that:

- lines 1, 10, 11 and 12 delimit the *printable area* on an A4-size sheet (about 208 x 290 mm)

- area 2 is used to evaluate that the *transport speed* of the print carriageis uniform: no shadings should result in the strip

- area 3 is used for checking *vertical alignment*; run the printer alignment test, if necessary, to modify the alignment parameters (see section 6.1.1)

- areas 4, 5 and 7 are used for checking that the *line feed mechanism is uniform*:

  - in area 4, groups of lines are printed close together but must never cross or overlap (═══════); the groups alternate in lines corresponding to the central nozzle on the print head (number 25)

  - in area 5, groups of lines are printed one on top of another and there must be no space between them (———————); the groups alternate in lines corresponding to the central nozzle on the print head (number 25)

  - in area 7 dark grey and light grey patterns are printed forming a uniform strip, that is, without black or white lines distributed irregularly across it; if the lines appear at regular intervals along the strips, some of the nozzles are faulty

  Faults found in areas 4, 5 and 7 indicate line feed errors

- four areas 6 are used for checking "*all black*" printing; check that there are no white lines present; if there are, some print nozzles may be blocked. In this case, run CLEANING (see section 6.1.3)

- area 8 is used for checking the printing of *ASCII characters*

- area 9 is used for checking printing with the nozzles spraying at *maximum frequency*: there must be no white or broken lines; if there are, run the nozzles test (see section 6.1.2).

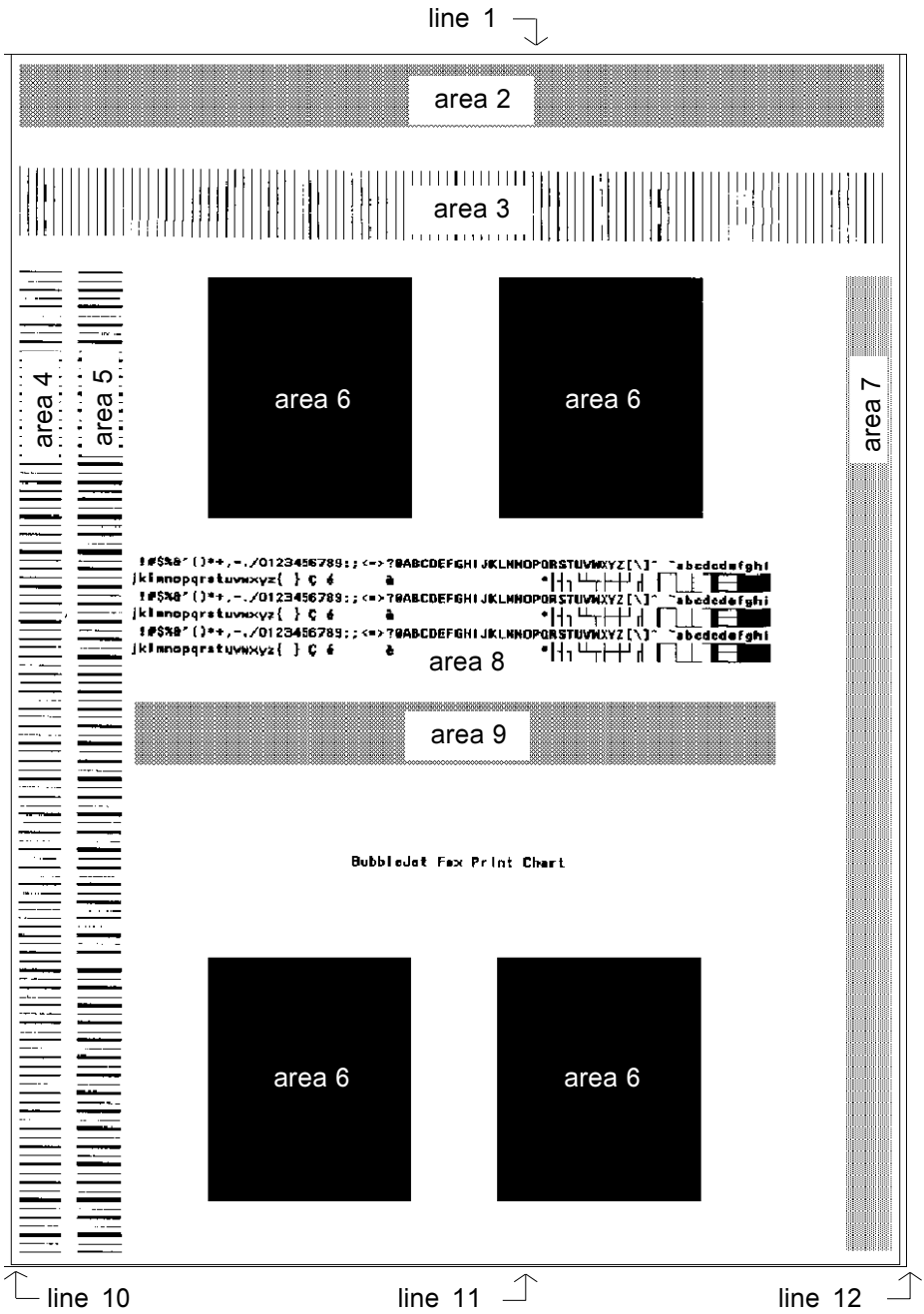

line 1
area 2
area 3
area 4
area 5
area 6
area 6
area 7
area 8
area 9
BubbleJet Fax Print Chart
area 6
area 6
line 10
line 11
line 12

Fig. 6-4

6.1.4 ASF TEST (not active with a colour print head)

This test MUST be carried out after replacing: the paper motor or the printer unit.

Setting	Display
a) The facsimile machine is in standby mode.	AUTOMATIC RX 09-05-95 14:58
b) Get access to the system test menu and select the ASF TEST option	ASF TEST ◇/▽/←/→
c) Place an A4-size blank sheet of paper in the ASF and then press ◇: the same line is printed on both top and bottom of sheet as in the case of the alignment test (fig. 6-2):	ASF TEST ▽
d) If the paper gets jammed, the message PAPER ERROR appears on the display.	PAPER ERROR PRESS ▽

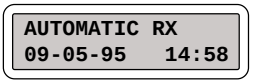
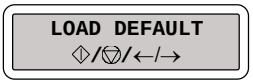
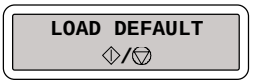
6.1.5 ADF TEST

This test MUST be carried out after replacing: the feeder rollers or the scanner unit.

Setting	Display
a) The facsimile machine is in standby mode	AUTOMATIC RX 09-05-95 14:58
b) Get access to the system test menu and select the ADF TEST option	ADF TEST ◇/▽/←/→
c) Place one or more sheets with text and pictures in the automatic document feeder and then press ◇: the documents are scanned one at a time and, at the end of the operation, a message appears indicating the number of documents scanned (xx)	xx: ADF TEST ▽
d) If you want to repeat the test, insert more sheets in the feeder and press ◇.	

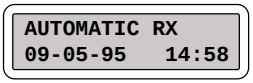
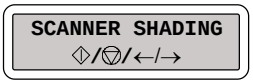
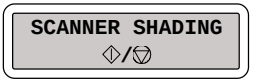
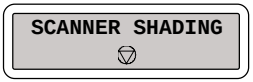
6.1.6 LOAD DEFAULT

This procedure is used for loading the default values of the service switches for the current country version of the facsimile machine.

Setting	Display
a) The facsimile machine is in standby mode	
b) Get access to the system test menu and select the LOAD DEFAULT option	
c) Press ◇	
d) Press ◇ once again: the default values of the U.K. service switches are automatically set in place of the current ones, *clearing the static RAM* and thus deleting all data (reports) set by the user.	

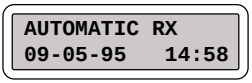
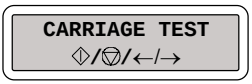
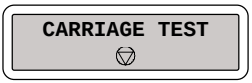
6.1.7 SCANNER SHADING

This test MUST be carried out after replacing: the scanner unit, motherboard or CCD board. It must also be carried out after making the CCD adjustment (see section 6.3).

Setting	Display
a) The facsimile machine is in standby mode	
b) Get access to the system test menu and select the SCANNER SHADING option	
c) Press ◇	
d) Press ◇	
e) Press ▽	

6.1.8 CARRIAGE TEST

This test MUST be carried out after replacing: the carriage, carriage motor or printer unit.

Setting	Display
a) The facsimile machine is in standby mode	
b) Get access to the system test menu and select the CARRIAGE TEST option	
c) Press ◇: the carriage starts moving from right to left and gradually increases its field of movement until it reaches the left-hand side of the machine, and then it repeats this procedure.	

6.2 CHECKS AND ADJUSTMENTS

6.2.1 Checking the Direct Voltages

1) Remove the power supply/NCU assembly (see section 7.2.3) without disconnecting it from the motherboard

2) Measure the direct voltages at connector J2 on the power supply board.

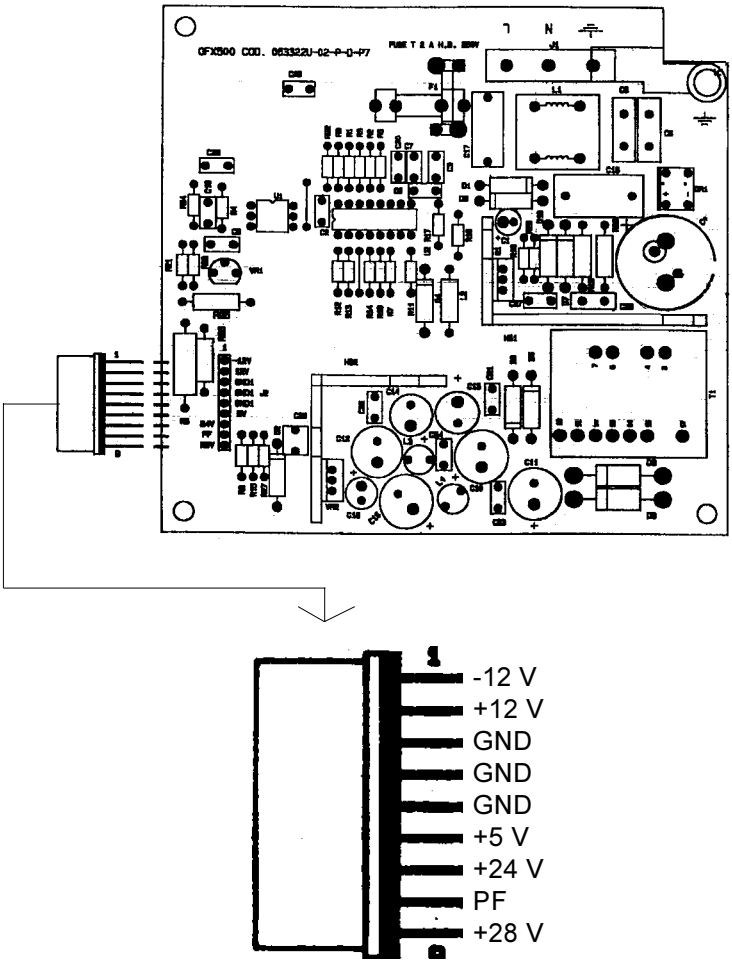


Fig. 6-5

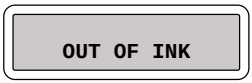
7. MAINTENANCE AND REPLACEMENT PROCEDURES

7.1 MAINTENANCE

The facsimile machine's maintenance includes *periodic preventive procedures* (such as optical unit cleaning), and *action to be taken following a message* on the display (such as the ink out message): the procedures are normally carried out by the user so they will be described in detail in the User Guide. Here only a brief description is provided.

7.1.1 OUT OF INK Message

The facsimile machine has a built-in counter for keeping track of ink consumption, so as to provide an ink out message at the right time. When the ink present in the cartridge runs out, the display shows the following message:



to prompt the operator to:

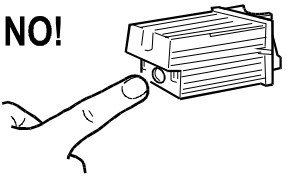
- replace the *ink cartridge*, if the print head is of the *rechargeable* type
- replace the *entire print head*, if it is of the *disposable* type.

If a rechargeable print head is used, the ink cartridge can be replaced several times. When a deterioration in the printing quality is observed, after several replacements, this means that the entire print head is to be replaced.

While replacing the *cartridge only*, but not the entire print head, a little ink may be ejected, to prevent the printing area from getting dirty, when the out of ink message appears, *a sheet of paper is automatically inserted* under the print carriage.

7.1.2 Replacing the rechargeable Ink Cartridge

1. Tilt the printer cover.
2. Remove the used cartridge, *without removing the print head*, by pressing the catch.
3. Remove the new cartridge from its sealed packing and peel the protective film off the ink supply hole.



WARNING
Do not touch the inked area!

4. Insert the cartridge in its housing immediately and press it in until the catch clicks into place to indicate that the cartridge is correctly inserted.

5. Close the printer cover: if the *head cleaning* feature is enabled (bit 2 of software parameter SW09 =1, see section 4.1), the facsimile machine automatically starts the *nozzle cleaning and testing procedure* (see section 3.1.5, step 7). If it is not, the sheet of paper is unloaded.

7.1.3 Replacing the Print Head

See section 3.1.5 (starting from step 4).

7.1.4 Cleaning the Print Head

If print quality deteriorates, the print nozzles need to be tested first (see sect. 6.1.2) to determine whether it is necessary to perform the print head CLEARING procedure, which entails drawing ink to free the print head from any air bubbles it may contain.

Setting	Display
1) The facsimile machine is in stand-by mode	AUTOMATIC RX 09-05-95 14:58
2) Access the main menu and select the HEAD MAINTENANCE submenu of the FAX SETUP menu	HEAD MAINTENANCE (F)/◇/▽
3) Press ◇ twice to start procedure.	PRINTING

7.1.5 Cleaning the Electrical Contacts

If a deterioration of the print quality is observed, it may be necessary to clean the electrical contacts on the print head

1) Unplug the power cable from the mains socket and tilt the printer cover

2) Remove the print head and clean the electrical contacts using a dry cotton swab (see figure 7-1)

Warning: *Do not touch the printing nib.*

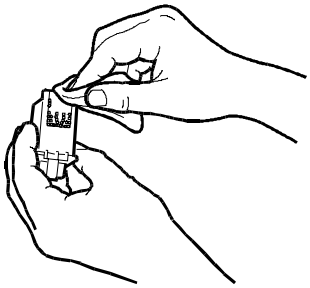


Fig. 7-1

3) Clean also the electrical contacts on the print carriage using a dry soft cloth (see figure 7-2).

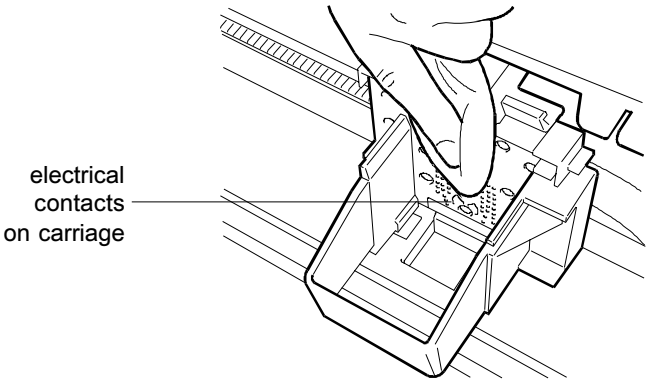


Fig. 7-2

4) After reinserting the print head, close the printer cover.

7.1.6 Cleaning the Print Head Cleaning Pad

1) Unplug the power cord from the mains socket and flip open the printer lid.

2) Remove the print head and move the carriage against the left side (figure 7-3).

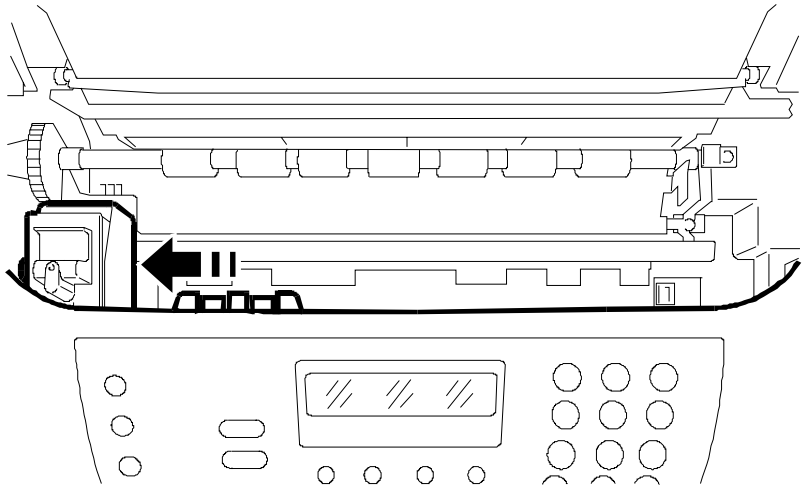


Fig. 7-3

3) Clean the print head cleaning pad using a dry cotton swab (fig. 7-4), then re-install the print head and close the printer lid.

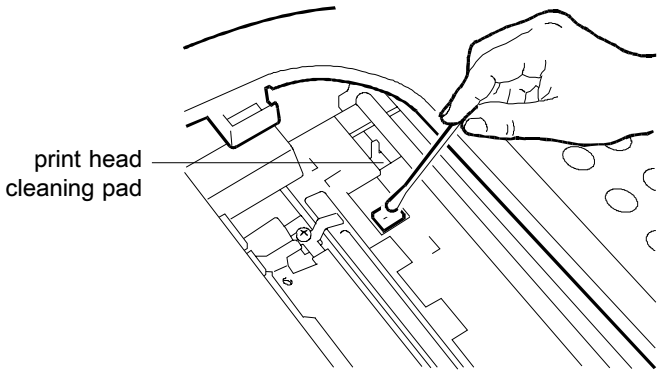


Fig. 7-4

7.1.7 Cleaning the Optical Unit

Dust may accumulate on the optical unit glass, causing document scanning problems: it is thus advisable to clean the glass periodically.

1) Unplug the power cord from the mains socket and flip open the printer cover.

2) Move the print head against the left side, then lift the optical unit screen acting on the right side lever (fig. 7-5).

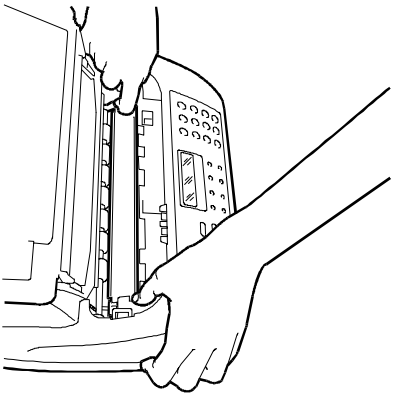


Fig. 7-5

3) Keeping the screen raised, clean the optical unit glass using a cloth dampened with a specific glass cleaning product, then carefully wipe dry (fig. 7-6).

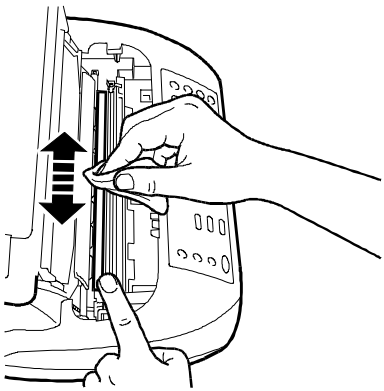


Fig. 7-6

7.2 DISASSEMBLY AND REPLACEMENT PROCEDURES

This section describes how to disassemble and replace the main units of the facsimile machine.

WARNING: Should a procedure require ***one or more connectors to be unplugged from the motherboard***, we recommend the following:

1) ***before starting the procedure***, print all configuration parameters (both user-level and service-level) and the user's telephone list
2) ***upon completion of the procedure***, restore the facsimile as referenced in paragraph 7.2.21.

Before starting to disassemble the facsimile machine, unplug the power cable from the wall outlet and the telephone line.

7.2.1 Wirings

Figures 7-7 and 7-8 show the motherboard connectors and their connection to the fax machine assemblies, to facilitate re-installation of the replaced assemblies.

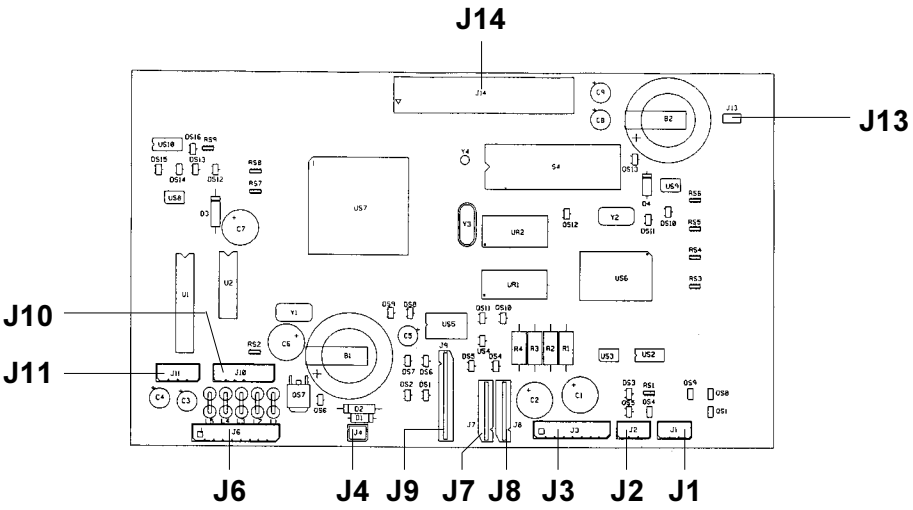


Fig. 7-7 Locating the connectors on the motherboard

J1 Paper edge sensor
J2 Document sensor
J3 Contact sensor (CIS)
J4 Print head cleaner E.M.
J6 Power supply
J7-8 Print head
J9 Keypad
J10 Interline motor
J11 Carriage motor
J13 Dynamic memory Reset
J14 NCU board

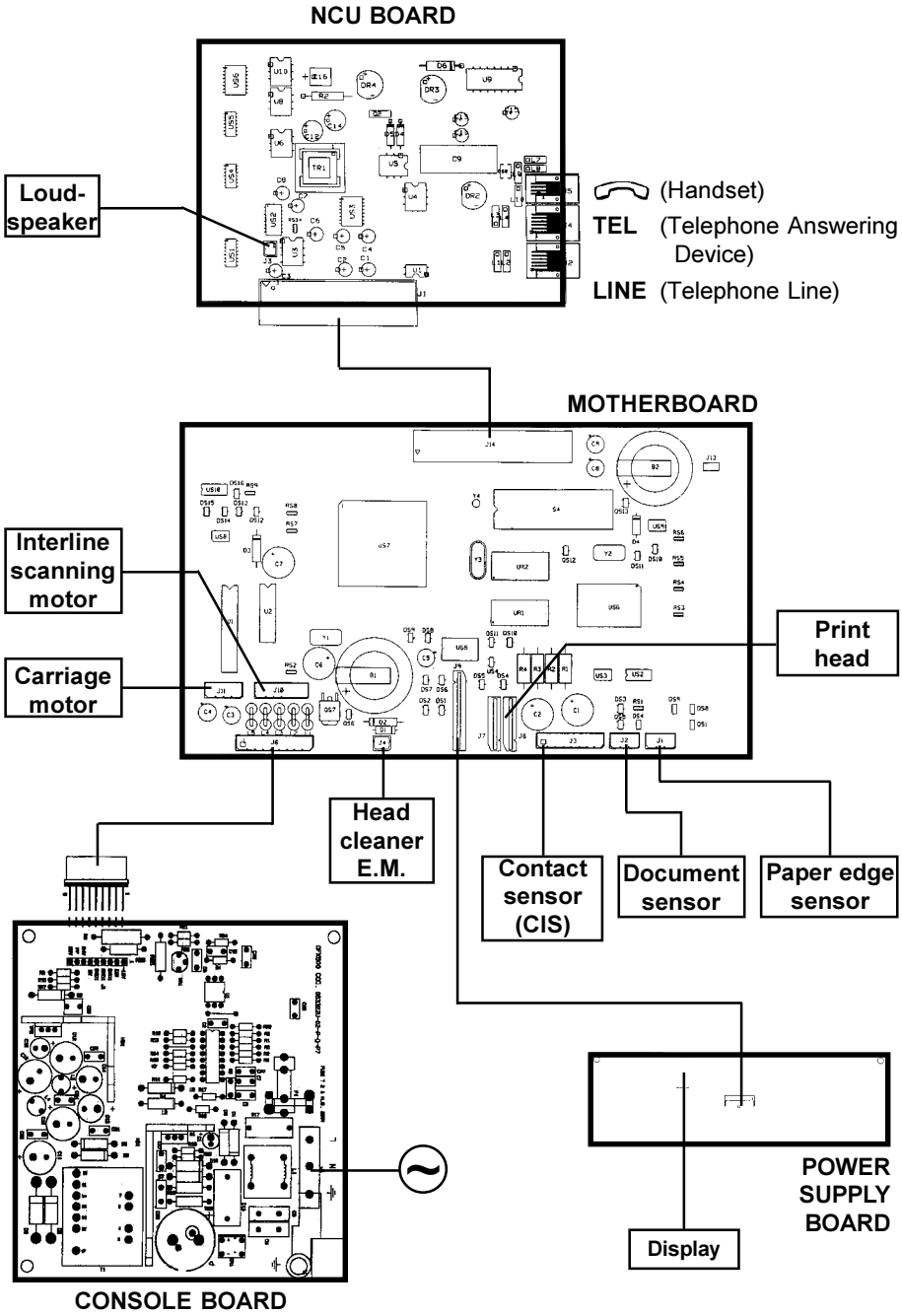


Fig. 7-8 Wirings diagram

7.2.2 Removing the Casing

1) Disconnect the handset from its plug and remove it from the casing

2) Release the casing from the base, flexing outward and lifting upward the points indicated in order in the figure (Fig. 7-9):

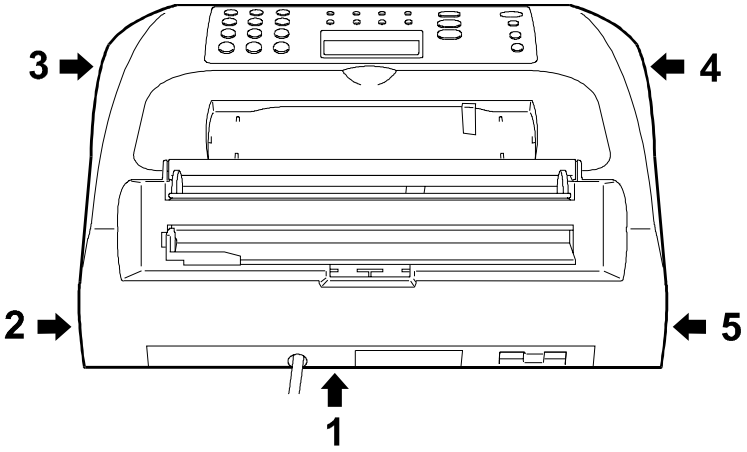


Fig. 7-9

3) Lift the casing upwards and flip it forward, then remove flat cable **F** from the console board (Fig. 7-10):

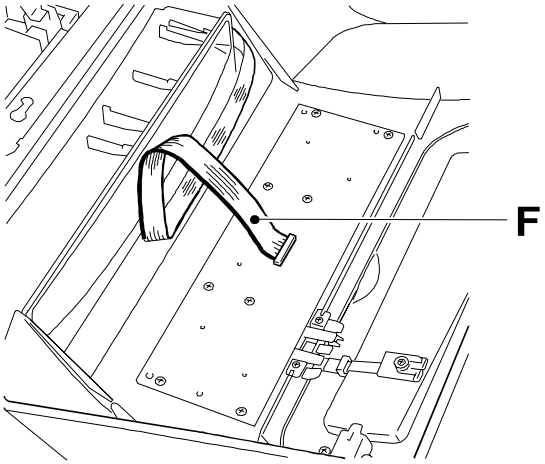


Fig. 7-10

7.2.3 Disassembling the Base

1) Disassemble the casing (see sect. 7.2.2)

2) Release the outlet **C** flexing it upward with both hands, then rotating it forward (Fig. 7-11):

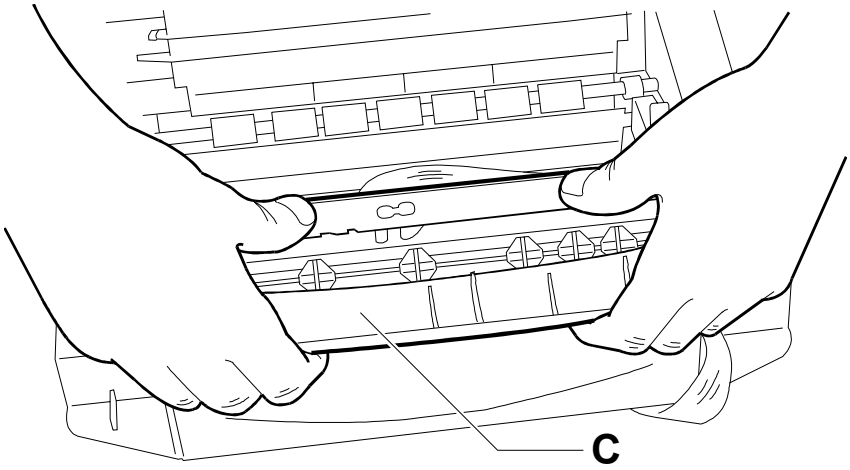


Fig. 7-11

3) Put the fax machine in the vertical position and remove the two screws **V** (Fig. 7-12):

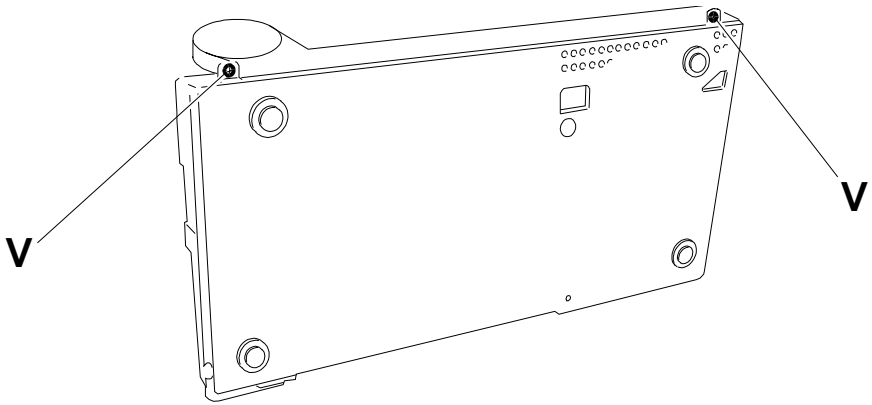


Fig. 7-12

4) Flip the base forward and disconnect earthing leads **C**, then remove the base from the body of the machine (Fig. 7-13):

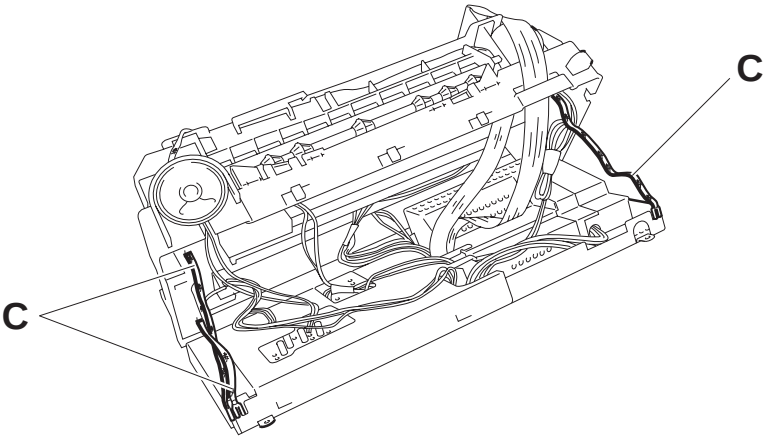


Fig. 7-13

5) Free all wires from their fastening and disconnect them from the underlying board (Fig. 7-14), then retrieve the base:

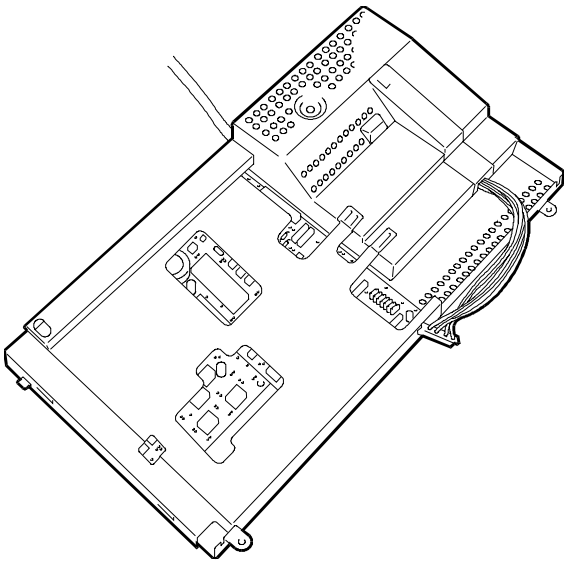


Fig. 7-14

Caution In reassembling the machine, ensure that the rear tabs (**A**) of the base are properly inserted in the corresponding slots **F** (Fig. 7-15):

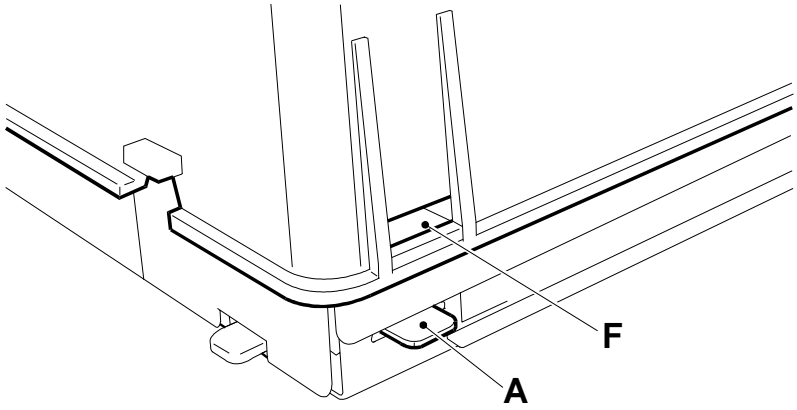


Fig. 7-15

7.2.4 Replacing the Motherboard and the NCU Board

1) Remove the base (sect. 7.2.3)

2) Remove screen **S** releasing it in the points indicated by the arrows (Fig. 7-16):

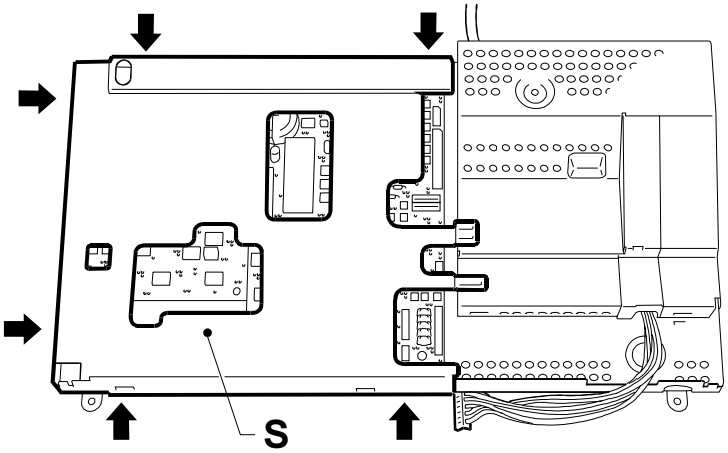


Fig. 7-16

3) Release the assembly of motherboard **B** and board **NCU** from the related latches **F** and extract it from the base, then separate the boards (Fig. 7-17):

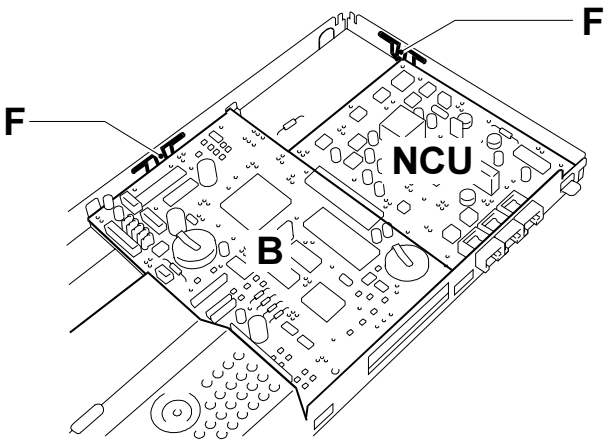


Fig. 7-17

4) Once the motherboard has been replaced, perform the LOAD DEFAULT (see sect. 6.1.7), ALIGNMENT TEST (see sect. 6.1.1) and SCANNER SHADING (see sect. 6.1.8) procedures.

Caution During re-assembly, ensure that the boards are properly inserted in the related guides **G** (Fig. 7-18):

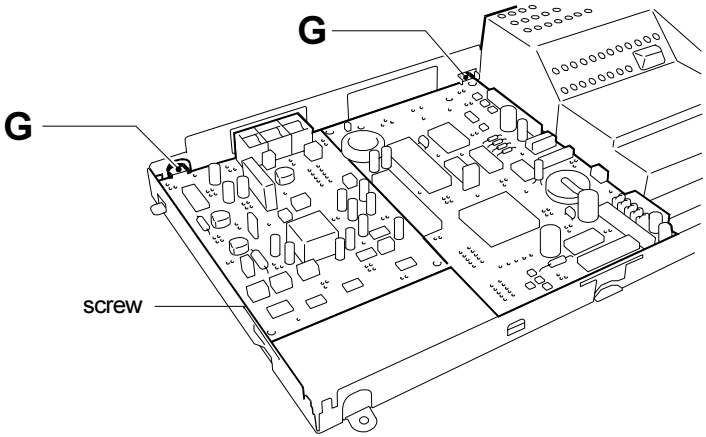


Fig. 7-18

7.2.5 Replacing System Firmware

1) Before replacing the system software EPROM - operation which entails the loss of all data and of all configuration and installation parameters - it is necessary to:

   - ensure that there are no documents in the memory, eliminating any causes which prevent them from being printed (paper end, ink end, etc.)

   - print the activity report, the installation and configuration parameters and the list of one-touch dial and speed dialling numbers

2) Flip the basement upside down (steps 1 through 4 of sect. 7.2.3) and replace the EPROM (Fig. 7-19):

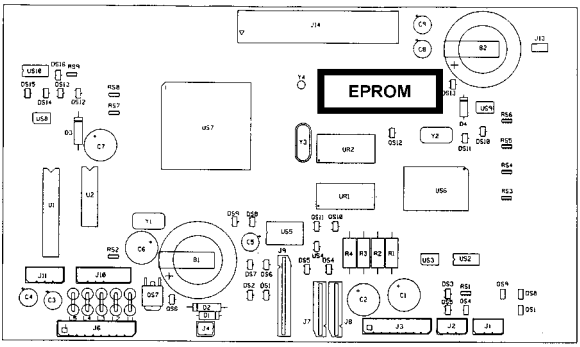


Fig. 7-19

3) Perform the LOAD DEFAULT (see sect. 6.1.7), ALIGNMENT TEST (see sect. 6.1.1) and SCANNER SHADING (see sect. 6.1.8) procedures

4) Perform the fax machine nationalisation procedure, reset installation and configuration parameters as well as the one-touch and speed dialling numbers, using the data printed previously (see sect. 3.2).

7.2.6 Replacing the Power Supply Board

1) Disassemble the base (sect. 7.2.3) and remove the screen of the motherboard (see sect. 7.2.4)

2) Remove screen **S** releasing it in the points indicated by the arrows (Fig. 7-20):

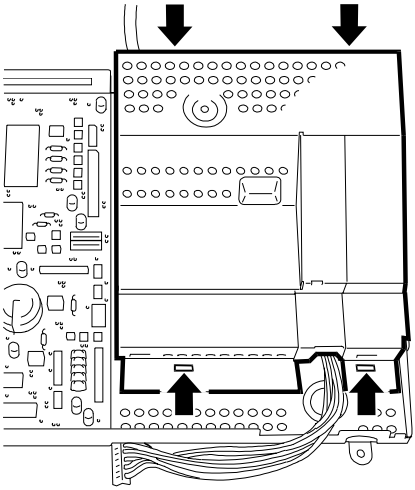


Fig. 7-20

3) Disconnect the power supply cable from the terminal board **M**, then unscrew the screw **V**, compress pin **P** and remove the power supply board from their guide **G** (Fig. 7-21):

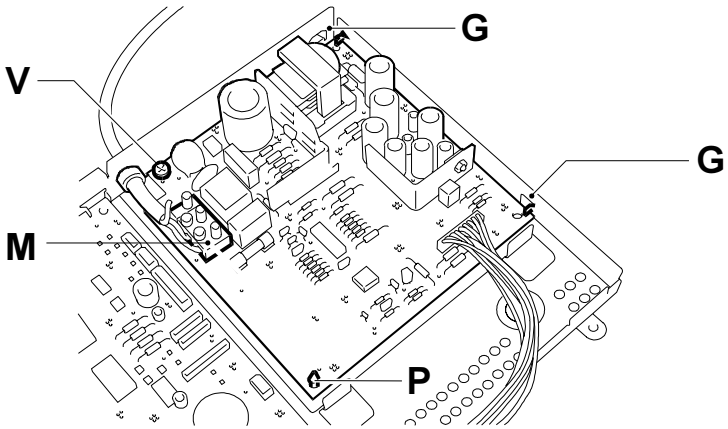


Fig. 7-21

Caution: While reassembling, ensure that the board is properly inserted in the related guides **G** (Fig. 7.21).

7.2.7 Replacing the Loudspeaker

1) Disassemble the base (see sect. 7.2.3)

2) Remove loudspeaker **A** from its housing by extracting it downward (fig. 7-22):

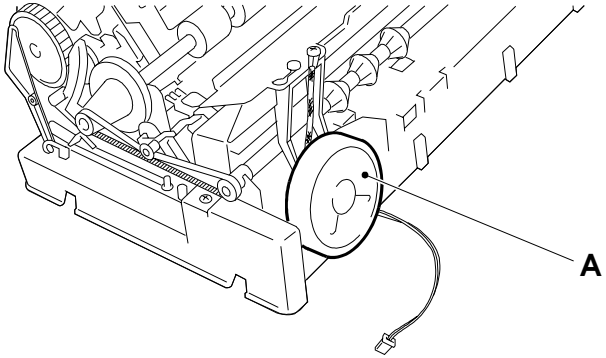


Fig. 7-22

7.2.8 Replacing the Print Head Cleaner Solenoid

1) Disassemble the base (see sect. 7.2.3)

2) Flip over the fax machine and release container **C** of the E.M. by flexing tabs **A** (Fig. 7-23):

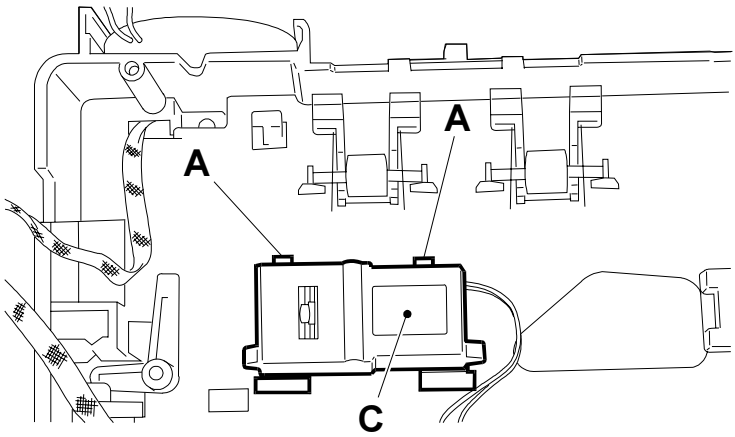


Fig. 7-23

3) Extract the components from the container (head cleaner **T**, slider **C**, spring **M**, armature **A**, **E.M.**) starting from the head cleaner (Fig. 7-24):

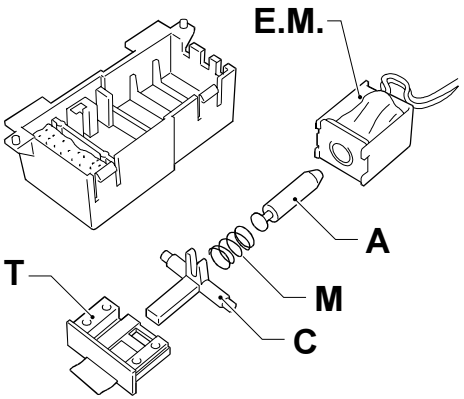


Fig. 7-24

7.2.9 Replacing the Scanning/Interline Motor

1) Disassemble the base (see sect. 7.2.3)

2) Remove bracket **A** and extract rocker **L**, taking care not to lose spring **M** and wheels **R1** and **R2** (Fig. 7-25):

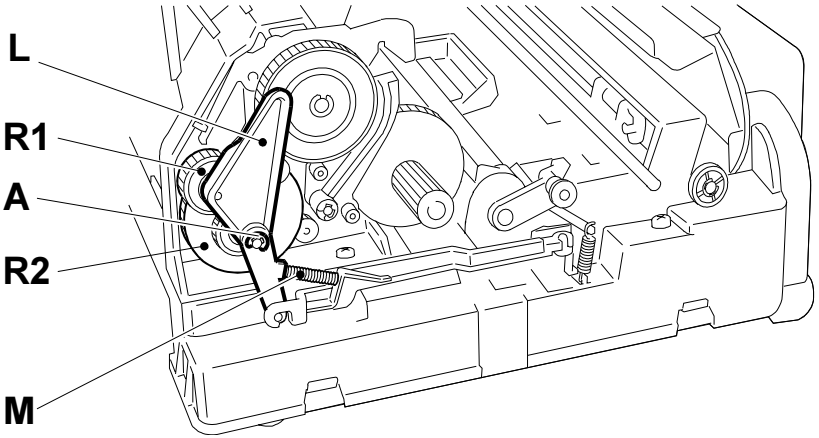


Fig. 7-25

3) Release the two springs **M** and remove the automatic switch **A** flexing the two sides of the structure and taking care not to rip the wires from the sensor (Fig. 7-26):

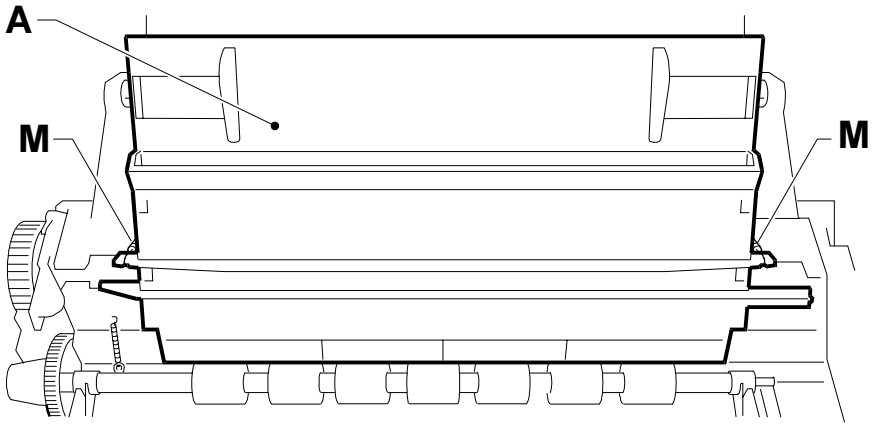


Fig. 7-26

4) Release the two bushings **B** and rotate them forward, then extract the shaft of the paper shifter roller **A** forward (Fig. 7-27):

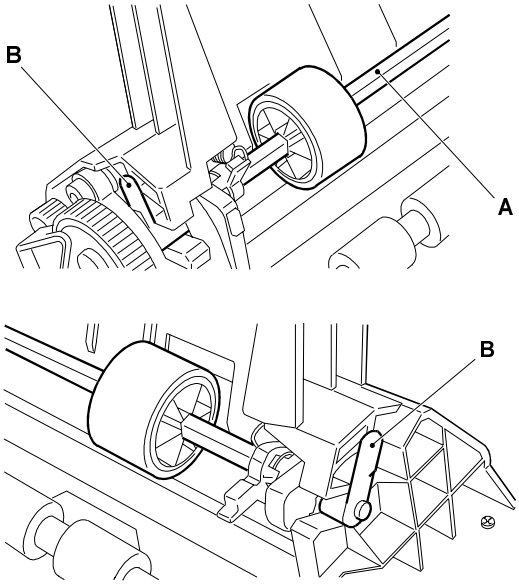


Fig. 7-27

5) Remove the five screws **V** and remove the paper tray assembly (Fig. 7-28):

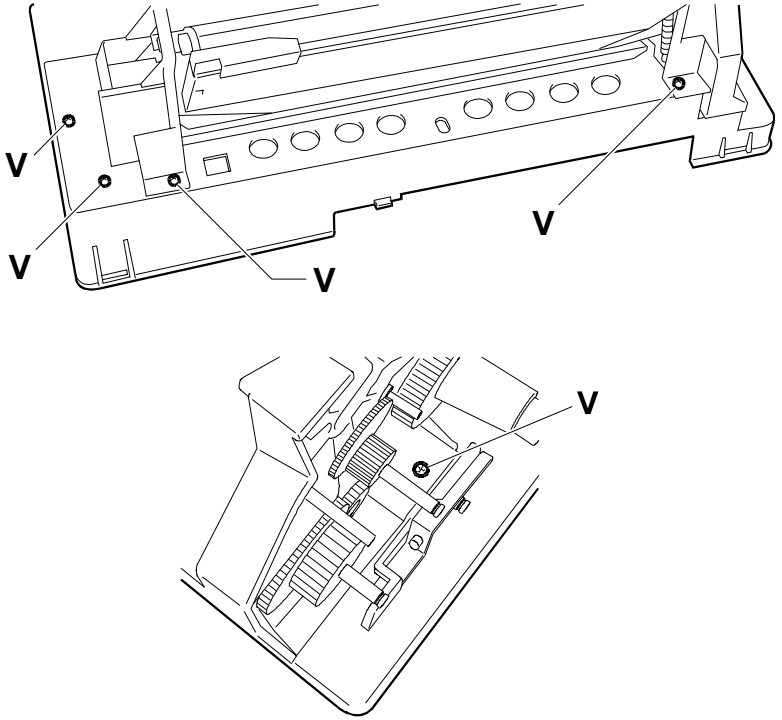


Fig. 7-28

6) Remove the two screws **V** and retrieve the motor (Fig. 7-29):

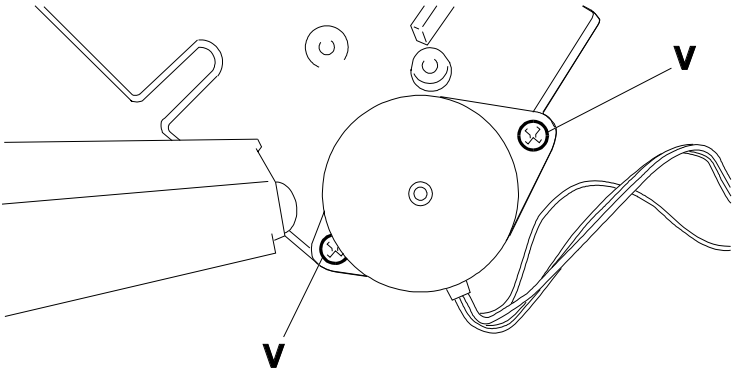


Fig. 7-29

Caution When reassembling, comply with the following precautions:

- reassemble the paper freeing lever **L** before the paper shifter roller shaft (Fig. 7-30):

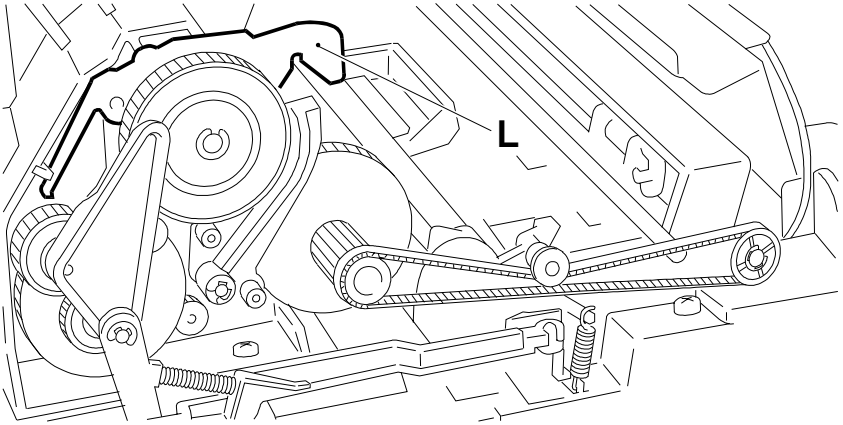


Fig. 7-30

- reassemble the paper shifter roller shaft with cams **C** facing downward and rockers **B** positioned so as to be able to oscillate between the stops of the ASF and of the ADF (Fig. 7-31):

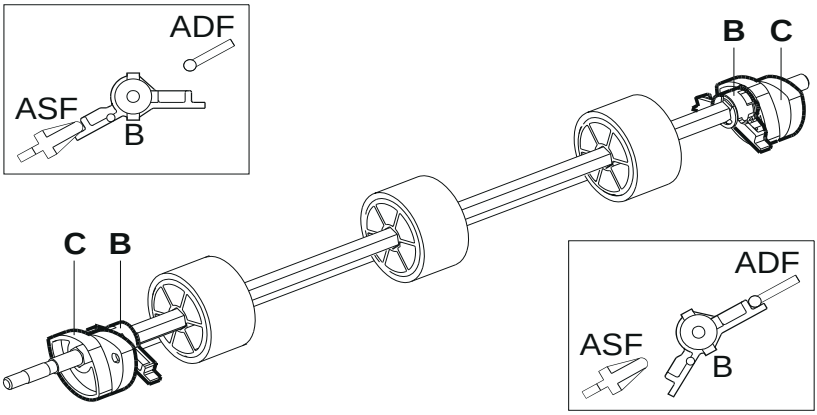


Fig. 7-31

- position the two springs **M** of the automatic inserter above the paper shifter roller shaft, so as to be able to re-latch them easily (Fig. 7-32):

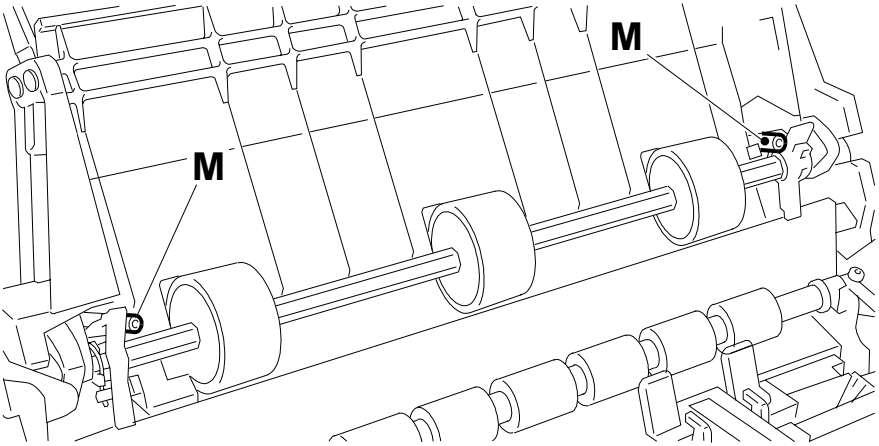


Fig. 7-32

- position lever **L** inside the notch **T** of the cam (Fig. 7-33):

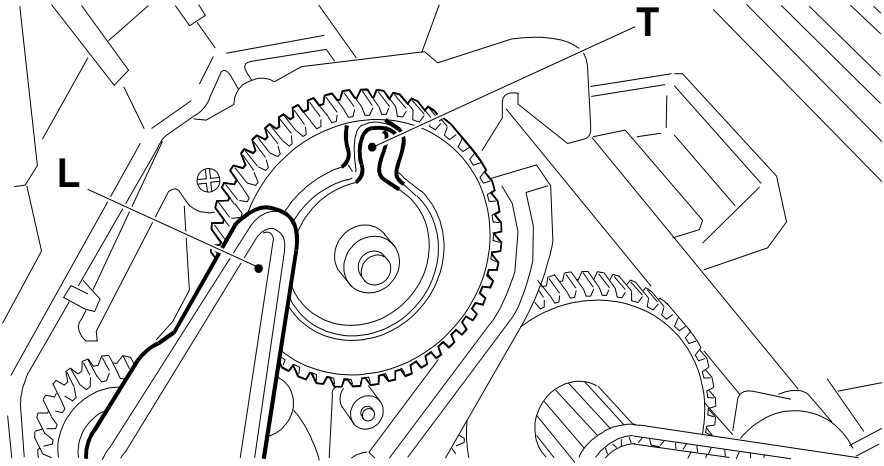


Fig. 7-33

7.2.10 Replacing the Carriage Motor

1) Disassemble the base (see sect. 7.2.3)

2) Disconnect the belt from sprocket **P** of the motor (Fig. 7-34):

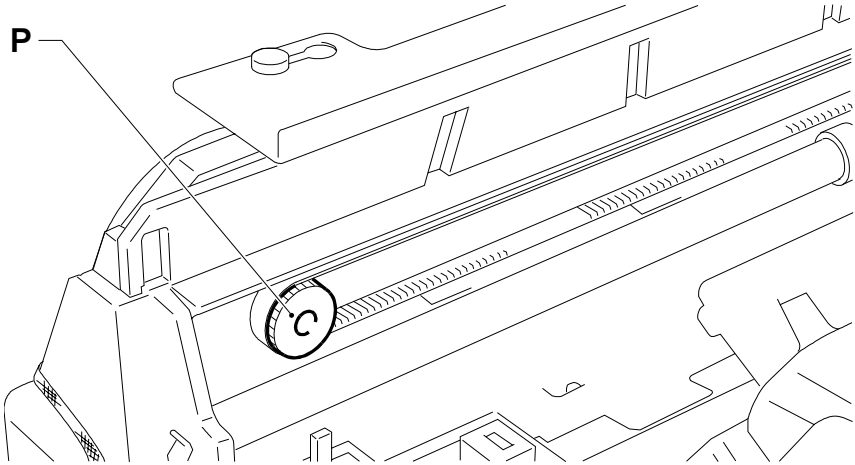


Fig. 7-34

3) Rotate the motor counter-clockwise until it is released from the latches **F** (Fig. 7-35):

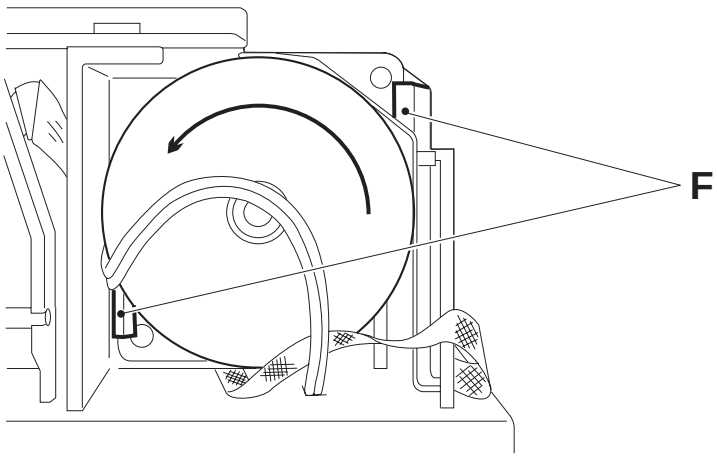


Fig. 7-35

7.2.11 Replacing the Print Head Pad

1) Disassemble the base (see sect. 7.2.3)

2) Flip over the fax machine and release the pad by flexing the two tabs **A**, then extract it rightward (Fig. 7-36):

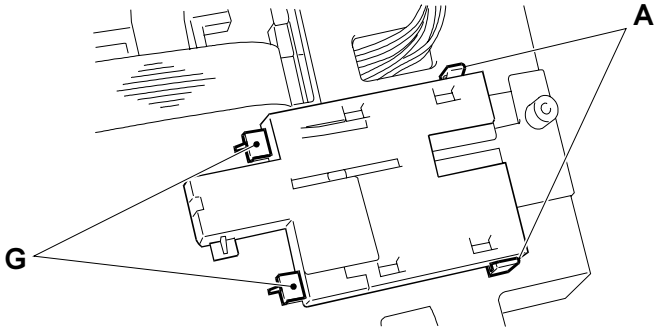


Fig. 7-36

Caution When reassembling, ensure that the pad is properly inserted within its guides **G** (Fig. 7-36).

7.2.12 Replacing the Carriage

1) Disassemble the base (see sect. 7.2.3) and remove the print head

2) Flex pawl **A** forward, move bar **B** rightward and extract it rotating it backward (Fig. 7-37):

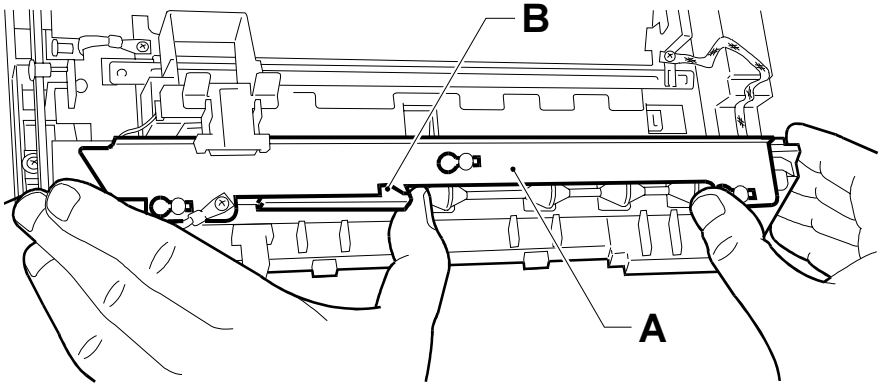


Fig. 7-37

3) Disconnect belt **C** from the driving rollers (Fig. 7-38):

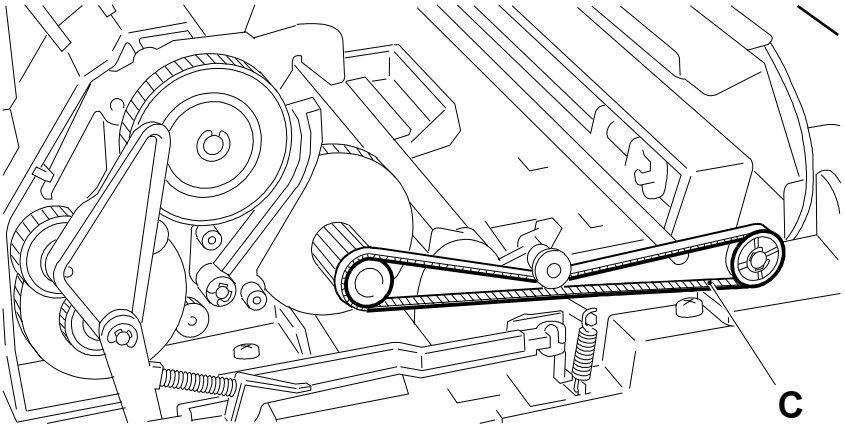


Fig. 7-38

4) Extract the two screws **V** and flip frame **T** forward, then disconnect the belt from the motor sprocket and flex the sides of the frame to release the guide shaft **A** (Fig. 7-39):

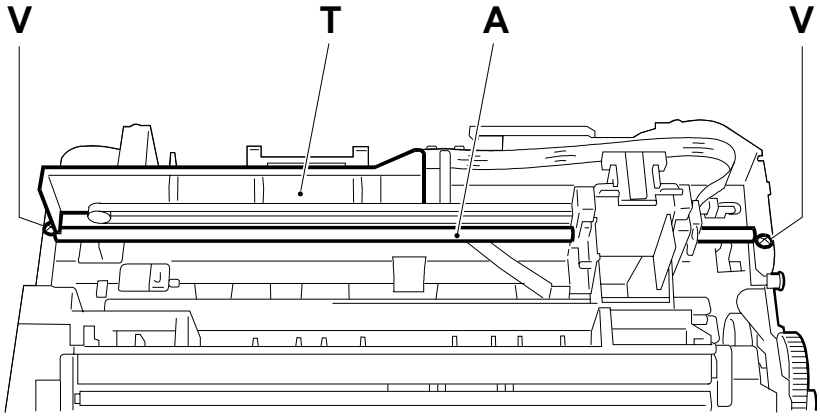


Fig. 7-39

6) Remove the carriage from the guide shaft and disconnect the belt from the carriage (Fig. 7-40):

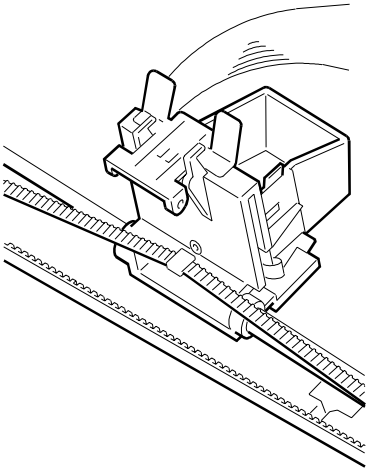


Fig. 7-40

Caution During re-assembly, ensure that bushings **B** of the forward roller shaft have not come out of their housings (Fig. 7-41):

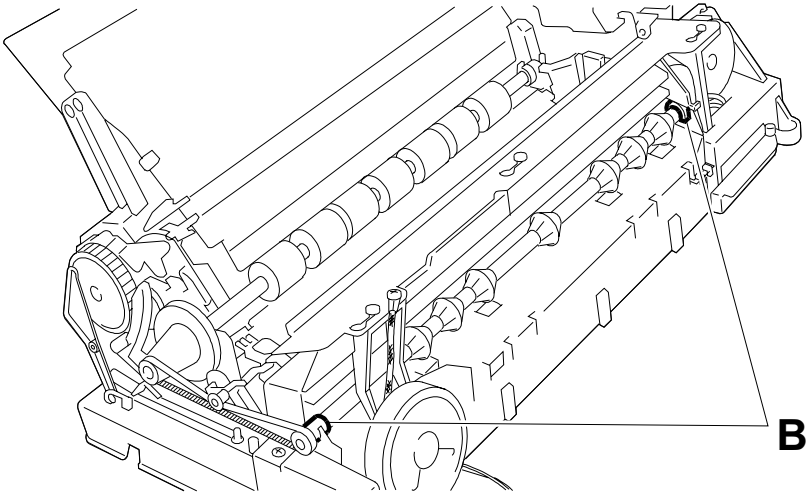


Fig. 7-41

Further ensure that belt tensioner **T** can slide freely within its housing (Fig. 7-42):

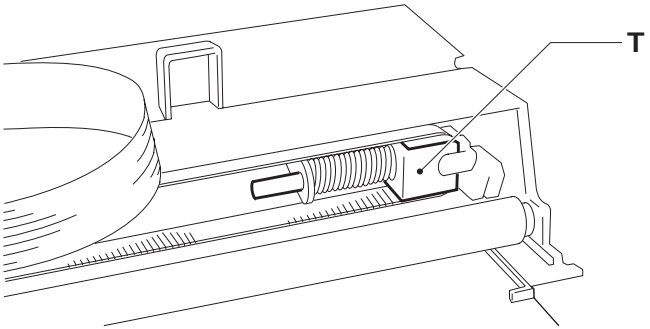


Fig. 7-42

7.2.13 Replacing the Forward Driving Rollers

1) Perform steps 1 through 4 of the procedure in sect. 7.2.12

2) Remove left bushing **B** from its housing, then extract the shaft leftward (Fig. 7-43):

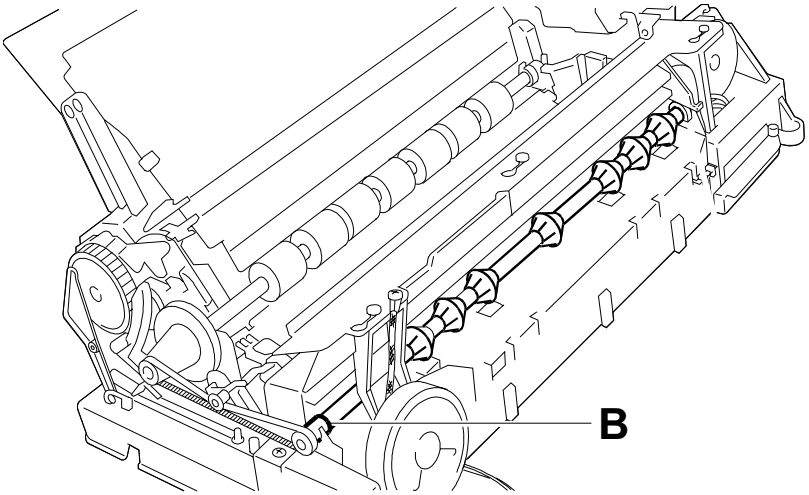


Fig. 7-43

Caution During re-assembly, ensure that both bushings are properly inserted in their housings.

7.2.14 Replacing Paper Shifter Rollers

1) Perform steps 1 through 4 of the procedure in section 7.2.9

2) Replace elastic rings **A** covering the paper shifter rollers (Fig. 7-44):

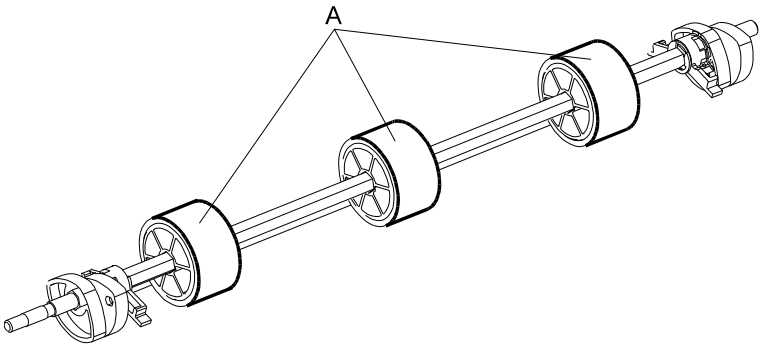


Fig. 7-44

7.2.15 Replacing Rear Driver Rollers

1) Perform steps 1 through 4 of the procedure in section 7.2.9

2) Disconnect belt **C** of the driver rollers (Fig. 7-45):

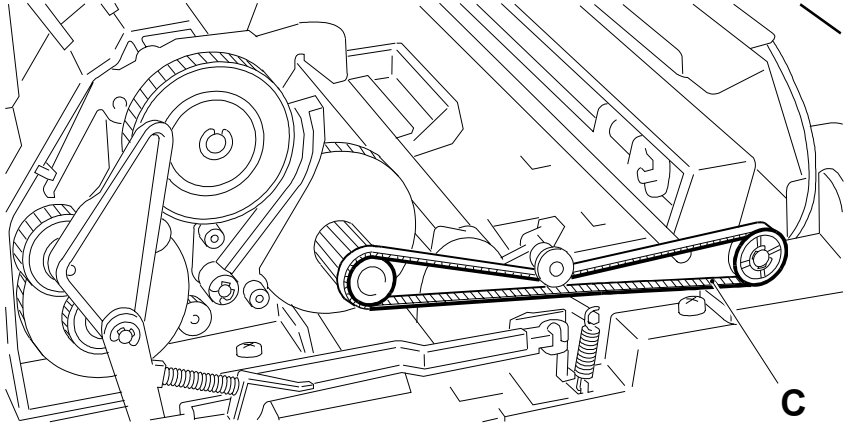


Fig. 7-45

3) Remove bracket **A** and extract lever **L** with the related mechanisms (Fig. 7-46):

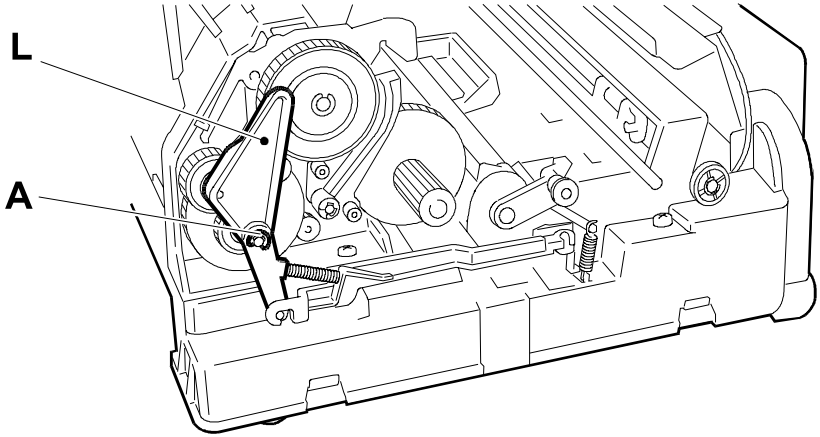


Fig. 7-46

4) Release spring **M** and move the carriage against the left side to be able to remove the lid of the optical unit **A** forward (Fig. 7-47):

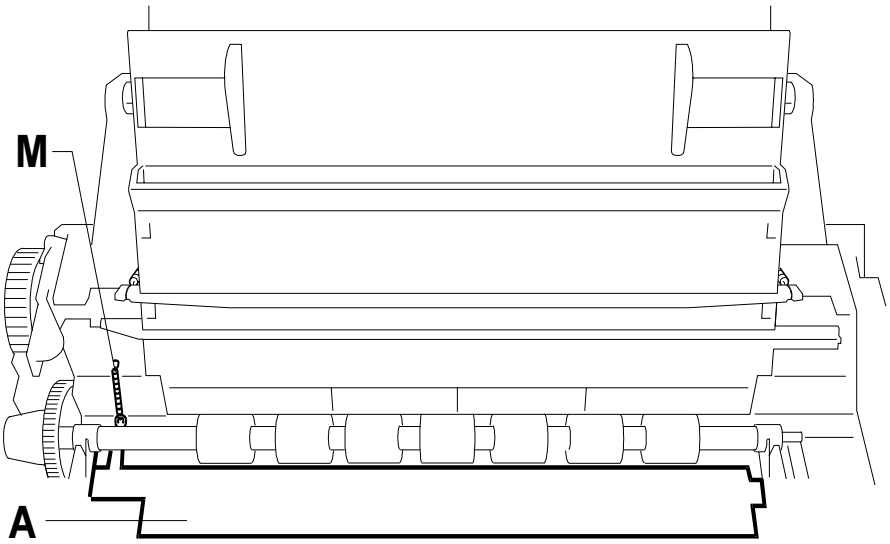


Fig. 7-47

5) Flip the fax machine over and release from the side the left support S of the roller shaft (Fig. 7-48):

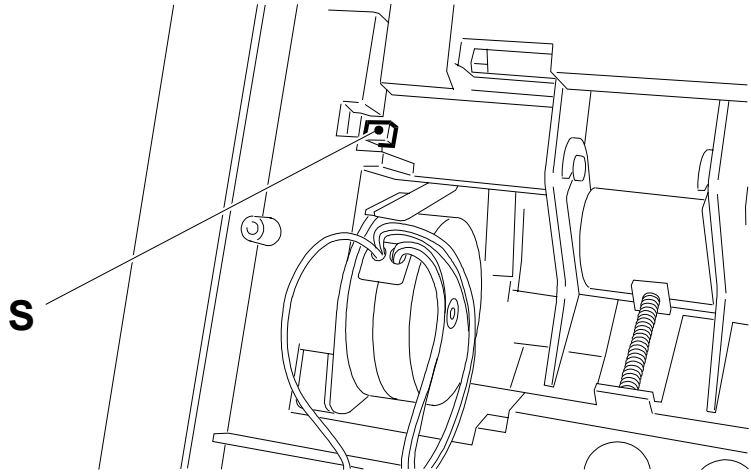


Fig. 7-48

6) Put the fax machine back in the starting position and extract the roller shaft leftward.

Caution During re-assembly, comply with the following precautions:

- ensure the left support of the shaft is properly re-latched to the side
- reassemble the paper freeing lever **L** before the paper shifter roller shaft (Fig. 7-30)
- reassemble the paper shifter roller shaft with cams **C** facing downward and the two rockers **B** in the horizontal position (Fig. 7-31)
- position the two springs **M** of the automatic inserter above the paper shifter roller shaft to be able to re-latch them easily (Fig. 7-32)
- position lever **L** inside notch **T** of the cam (Fig. 7-33).

7.2.16 Replacing the Optical Unit (CIS)

1) Disassemble the rear driver roller shaft (see sect. 7.2.15)

2) Unscrew the two screws **V**, then remove the unit by pushing it downward (Fig. 7-49):

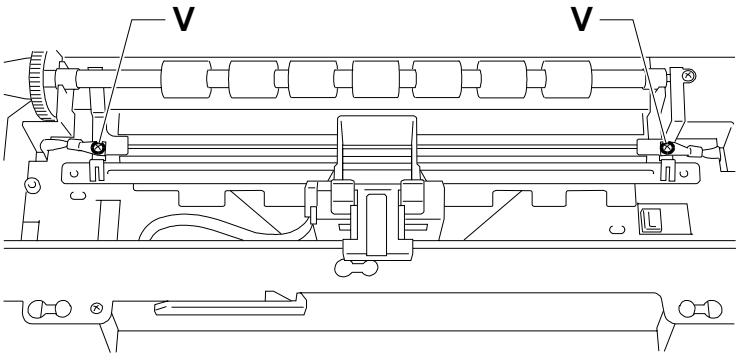


Fig. 7-49

7.2.17 Replacing the Document Sensor

1) Perform steps 1 through 3 of the procedure in section 7.2.9

2) Extract sensor **S** from its housing flexing the side stops **F** (Fig. 7-50):

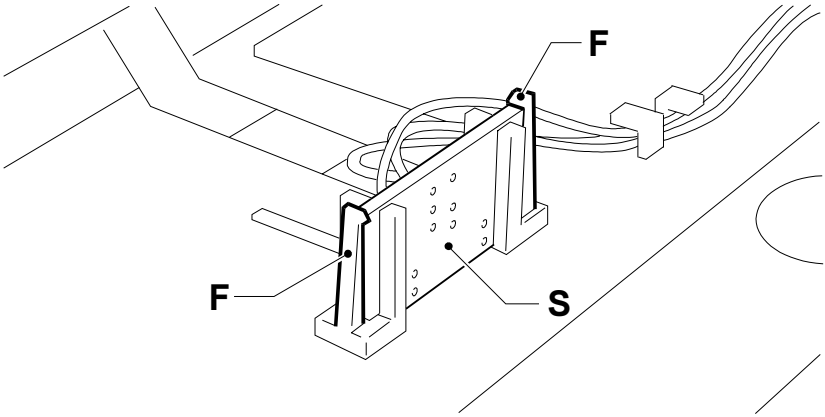


Fig. 7-50

7.2.18 Replacing the Paper Sensor

1) Perform steps 1 through 5 of the procedure in section 7.2.9

2) Flip the fax machine over and release lid **C** of the sensor by flexing its latch **F** (Fig. 7-51):

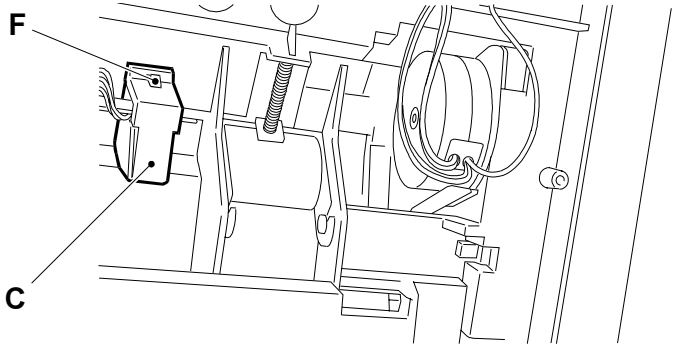


Fig. 7-51

3) Take the fax machine back to the starting position, remove lid **C** and extract sensor **S** upward (Fig. 7-52):

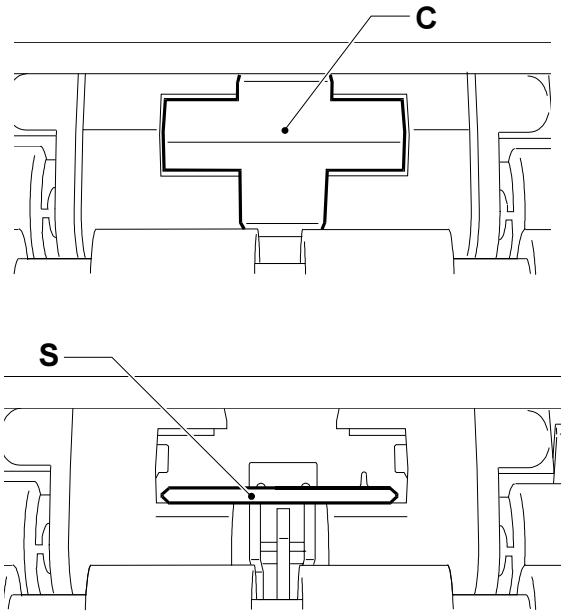


Fig. 7-52

7.2.19 Replacing the Console Board

1) Disassemble the casing (see sect. 7.2.2)

2) Unscrew the eight screws indicated by the arrows and flip over the board (Fig. 7-53):

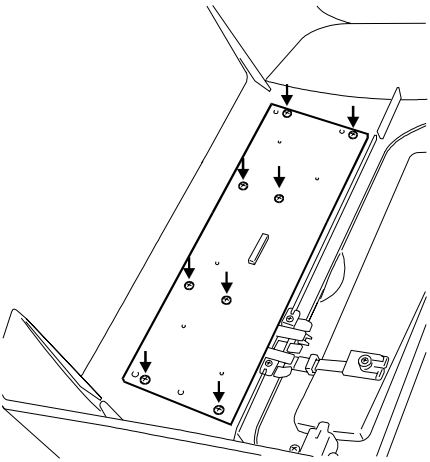


Fig. 7-53

3) Disconnect flat cable **F** of the display from the board (Fig. 7-54):

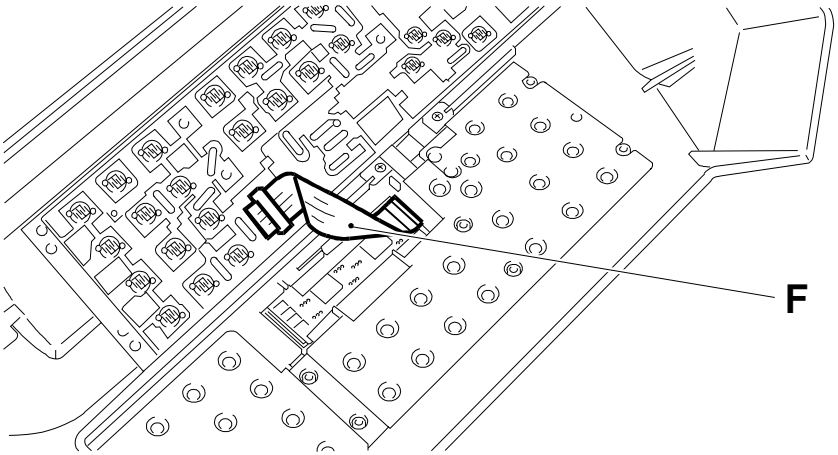


Fig. 7-54

Caution During re-assembly, ensure that the two levers L are properly inserted in their housings (Fig. 7-55):

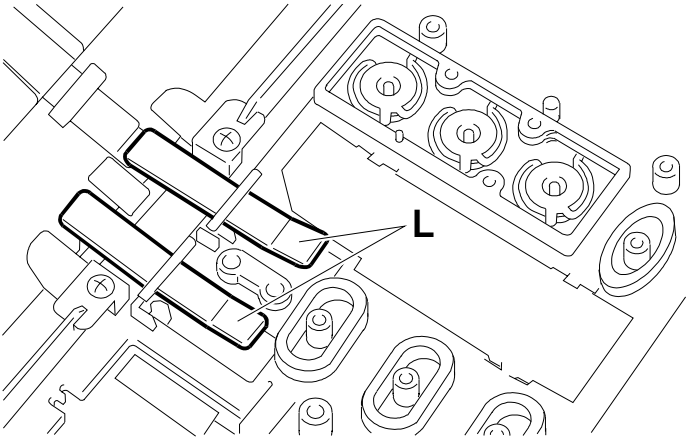


Fig. 7-55

7.2.20 Replacing the Display

1) Disassemble the console board (see sect. 7.2.19)

2) Release the display from latch **F** and extracted it from its guide (Fig. 7-56):

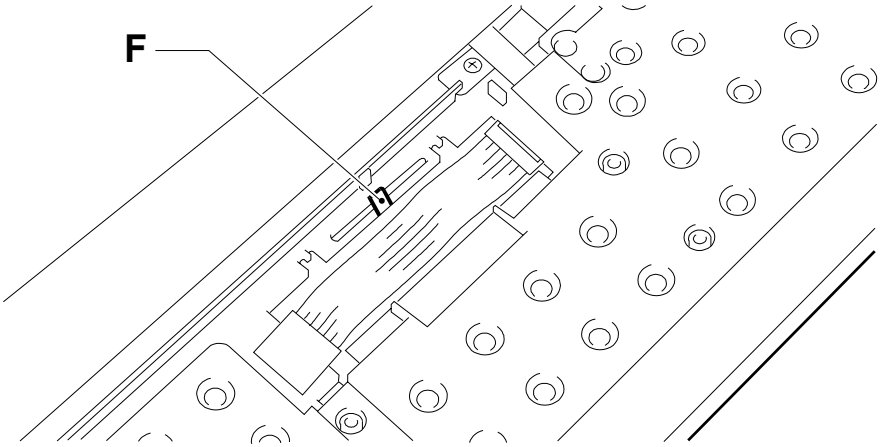


Fig. 7-56

Caution During re-assembly, ensure that the two levers L are properly inserted in their housings (Fig. 7-55):

7.2.21 Restoring the Facsimile Machine

During every disassembly or replacement procedure in which one or more connectors have been unplugged from the motherboard, it is advisable to restore the facsimile machine prior to complete the procedure.

1) Remove the motherboard, unplug the short-pin **P** (see fig. 7-42) and plug it again after one second to be sure that the dynamic memory has been cleared

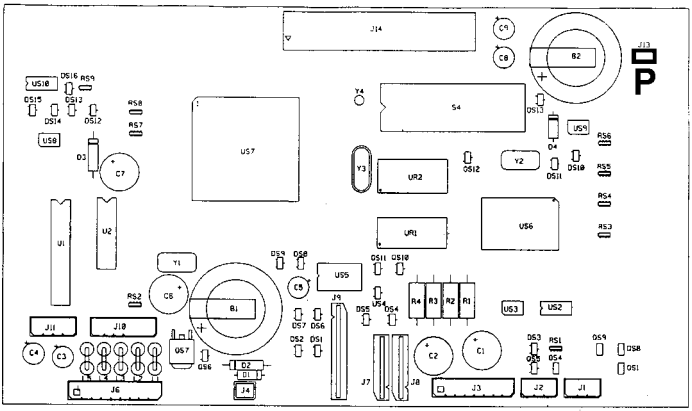


Fig. 7-42

2) Reassemble the motherboard and complete the disassembly or replacement procedure

3) Perform the LOAD DEFAULT (see sect. 6.1.7), ALIGNMENT TEST (see sect. 6.1.1) and SCANNER SHADING (see sect. 6.1.8) procedures

4) Perform the fax machine nationalisation procedure, reset installation and configuration parameters as well as the one-touch and speed dialling numbers, using the data printed previously.

8. OPTIONAL DEVICES

The facsimile machine offers the following optional features:

- ***Back to back connection***

- ***Connecting the telephone answering device or an emergency phone set***

8.1 SETTING UP A BACK TO BACK CONNECTION

The ***back to back connection*** between facsimile machines of the same model or line of products does not require any particular setting: simply connect the two facsimile machines with a telephone cable plugged into the LINE socket on each machine (fig. 8-1).

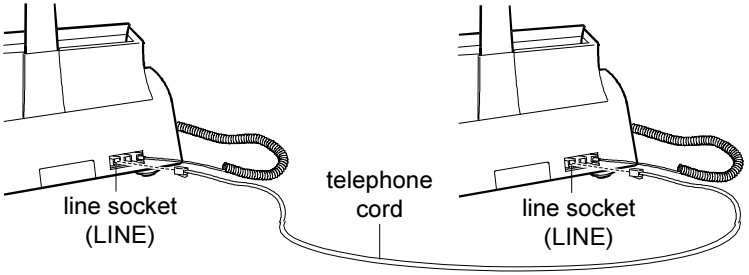


Fig. 8-1

8.2 CONNECTING THE TELEPHONE ANSWERING DEVICE OR AN EMERGENCY PHONE SET

1) Plug the cord of the telephone answering device or of the emergency phone set into the TEL socket (Fig. 8-2).

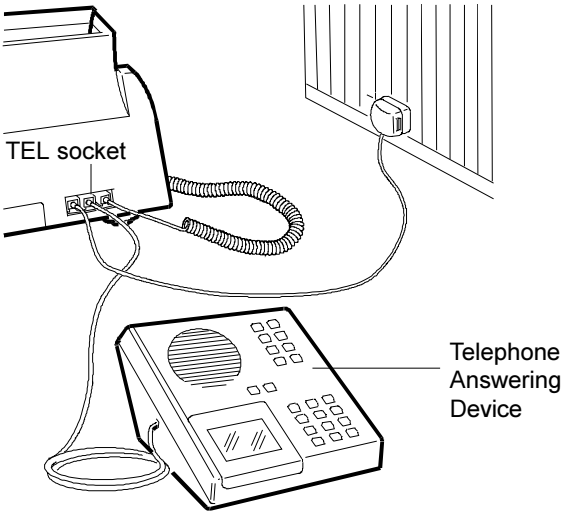


Fig. 8-2

2) In the case of the telephone answering device, press the RX MODE key until the display reads RX SEGR./FAX.

Caution : To guarantee the proper operation of the TAD, ensure the value of the silence time (SWO software parameter, sect. 4.1) is lower than the TAD's own time.

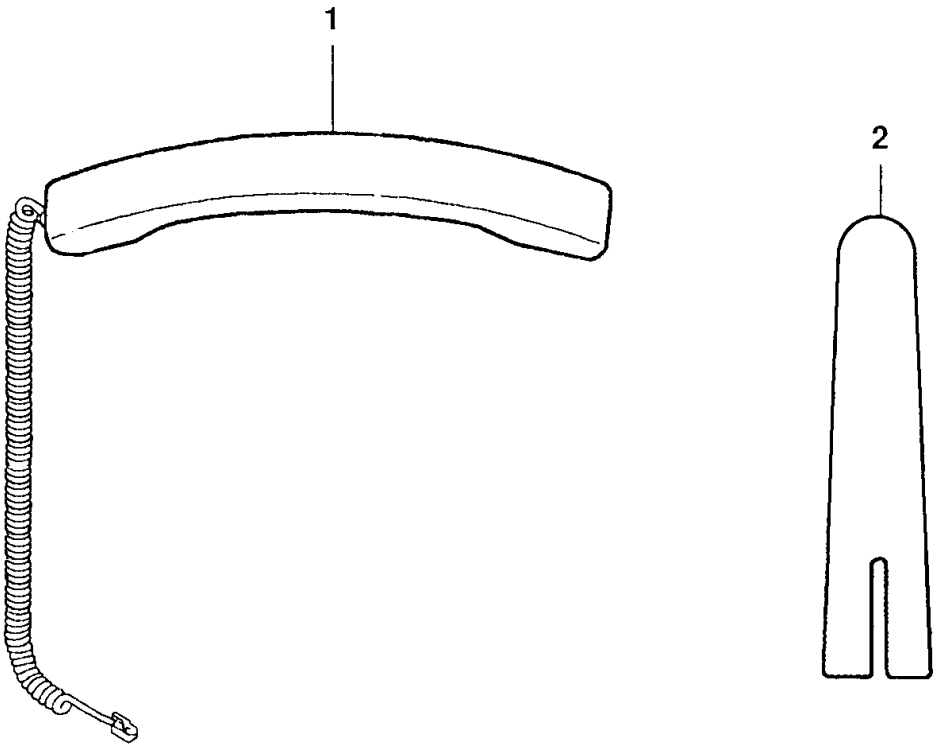
DFC155
DWC155c

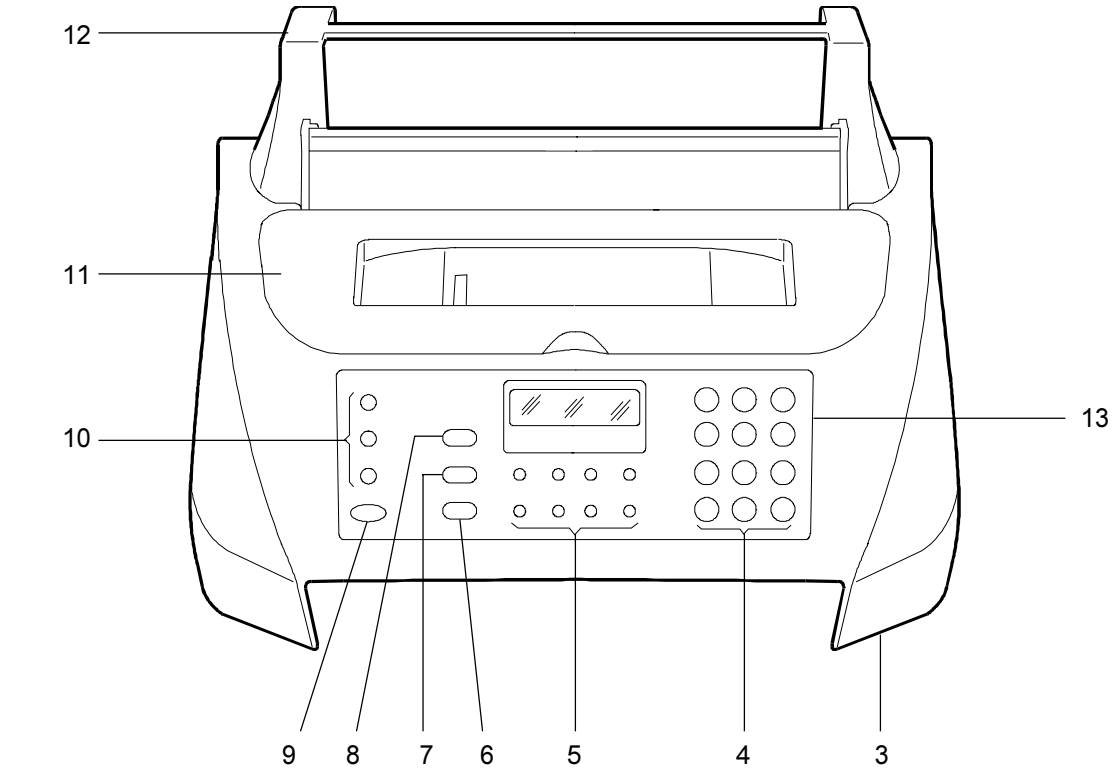
INDEX

DFC155- DWC155c

CASING

REF.	Part #		DESCRIPTION
	2N01544		FULL CABIN GROUP (DFC155)
	2N01545		FULL CABIN GROUP (DWC155c)
1	130N00844		TELEPHONE GROUP
2	120N00280		PAPER SUPPORT
3	2N01546		CABIN (DFC155)
	2N01547		CABIN (DWC155c)
4	110N00807		NUMERIC KEY BUNCH
5	110N00808		FUNCTION KEY BUNCH
6	110N00809		START KEY
7	110N00810		HOOK KEY
8	110N00811		STOP KEY
9	110N00812		COPY KEY
10	110N00813		COPY KEY BUNCH
11	2N01548		COVER GROUP
12	2N01549		COVER FOR ASF / ADF
13	91N00494		KEYBOARD LABEL GRAPHIC ITALY
	91N00495		KEYBOARD LABEL GRAPHIC U.K.
	91N00496		KEYBOARD LABEL GRAPHIC FRANCE
	91N00497		KEYBOARD LABEL GRAPHIC GERMANY
	91N00498		KEYBOARD LABEL GRAPHIC SPAIN
	91N00499		KEYBOARD LABEL GRAPHIC DENMARK
14	9N00990		SPRING FOR LEVER
15	11N00402		LEVER FOR MICRO
16	110N00815		RUBBER KEY CARPET
17	55N00177		LED DIFFUSOR
18	123N00175		LCD
19	110N00814		KEYBOARD
20	117N01215		KEYBOARD FLAT CABLE

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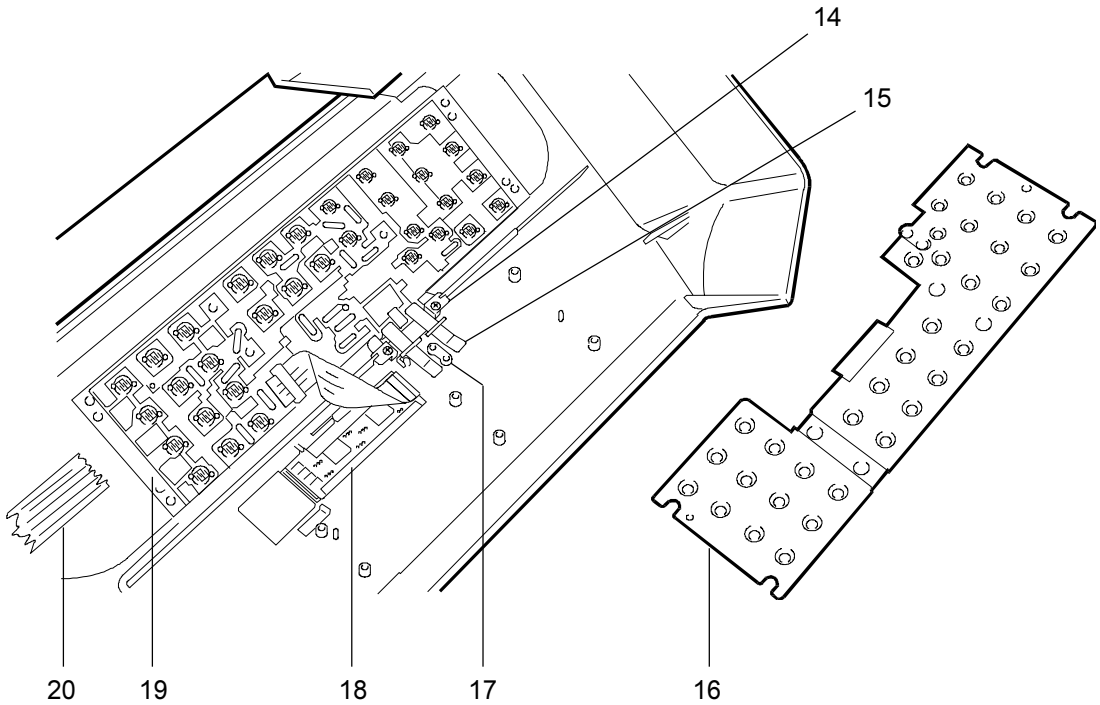
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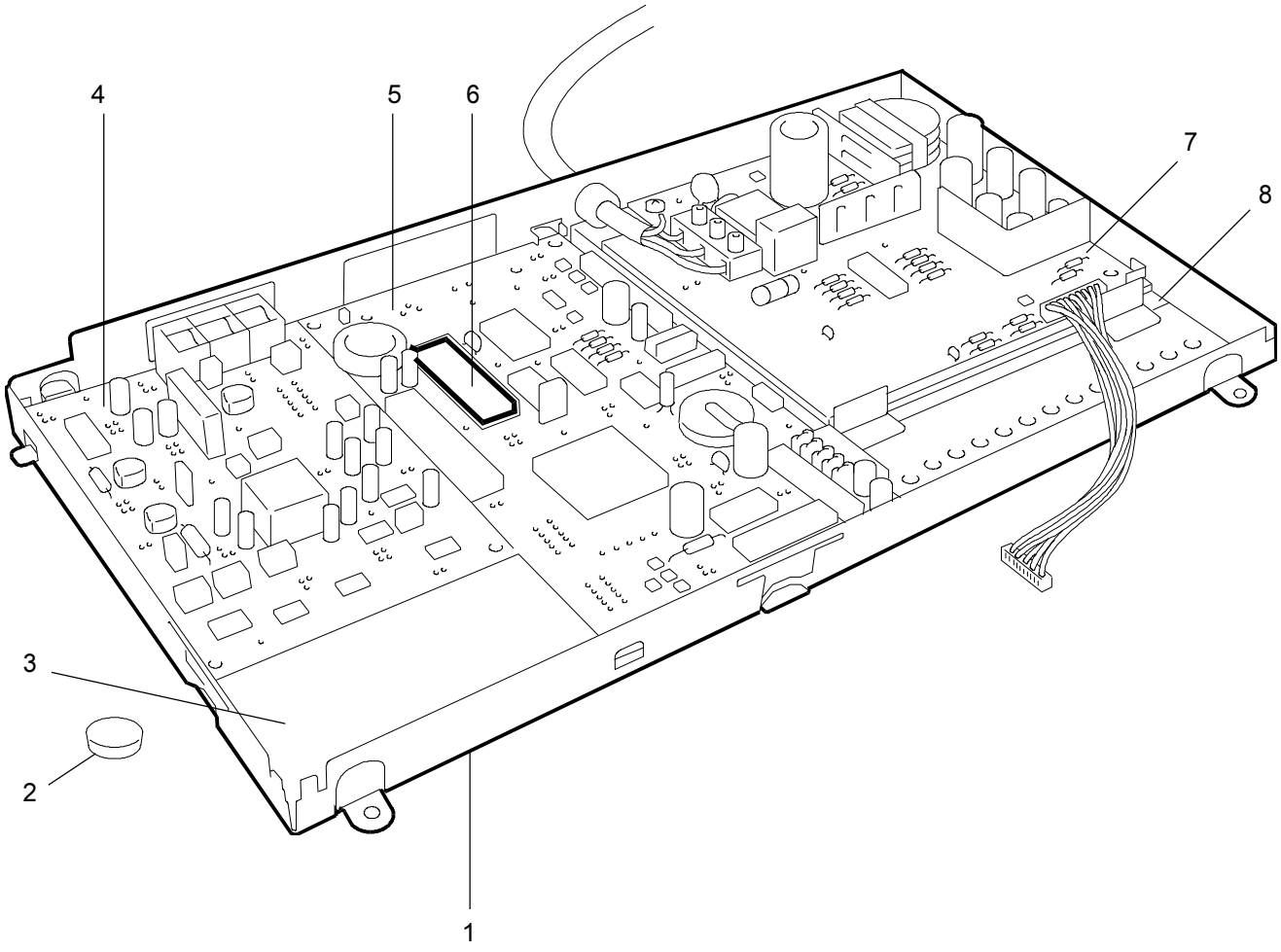
BASE AND ELECTRONICS BOARDS

REF.	Part #		DESCRIPTION
1	140N05173		BASE (DFC155)
	140N05190		BASE (DWC155c)
2	17N00159		RUBBER FOOT
3	140N05174		MAIN BOARD MYLAR
4	140N05175		NCU BOARD ITALY
	140N05176		NCU BOARD U.K.
	140N05177		NCU BOARD GERMANY
	140N05178		NCU BOARD AUSTRIA
	140N05179		NCU BOARD SWITZERLAND
	149N05180		NCU BOARD DENMARK / SWEDEN
	140N05181		NCU BOARD SPAIN
	140N05182		NCU BOARD FRANCE
	140N05183		NCU BOARD BELGIUM
	140N05184		NCU BOARD FINLAND
	140N05185		NCU BOARD HOLLAND
	140N05186		NCU BOARD NORWAY
	140N05187		NCU BOARD PORTUGAL
5	140N05188		MAIN BOARD (DFC155)
	140N05189		MAIN BOARD (DWC155c)
6	537N0100		EPROM (DFC155)
	537N00101		EPROM (DWC155c)
7	105N01243		ALI SWITCHING BOARD
8	105N01244		POWER SUPPLY BOARD MYLAR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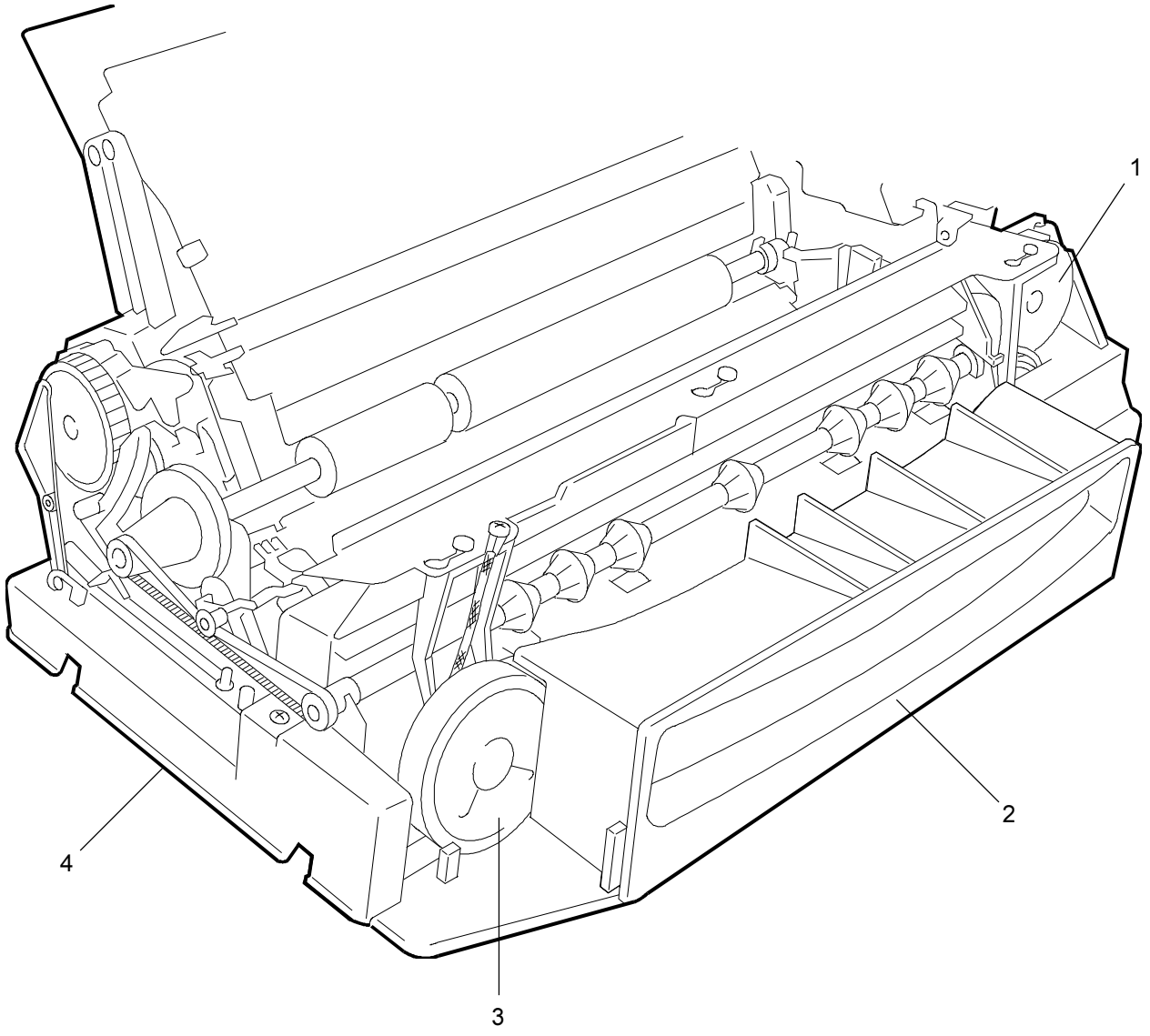
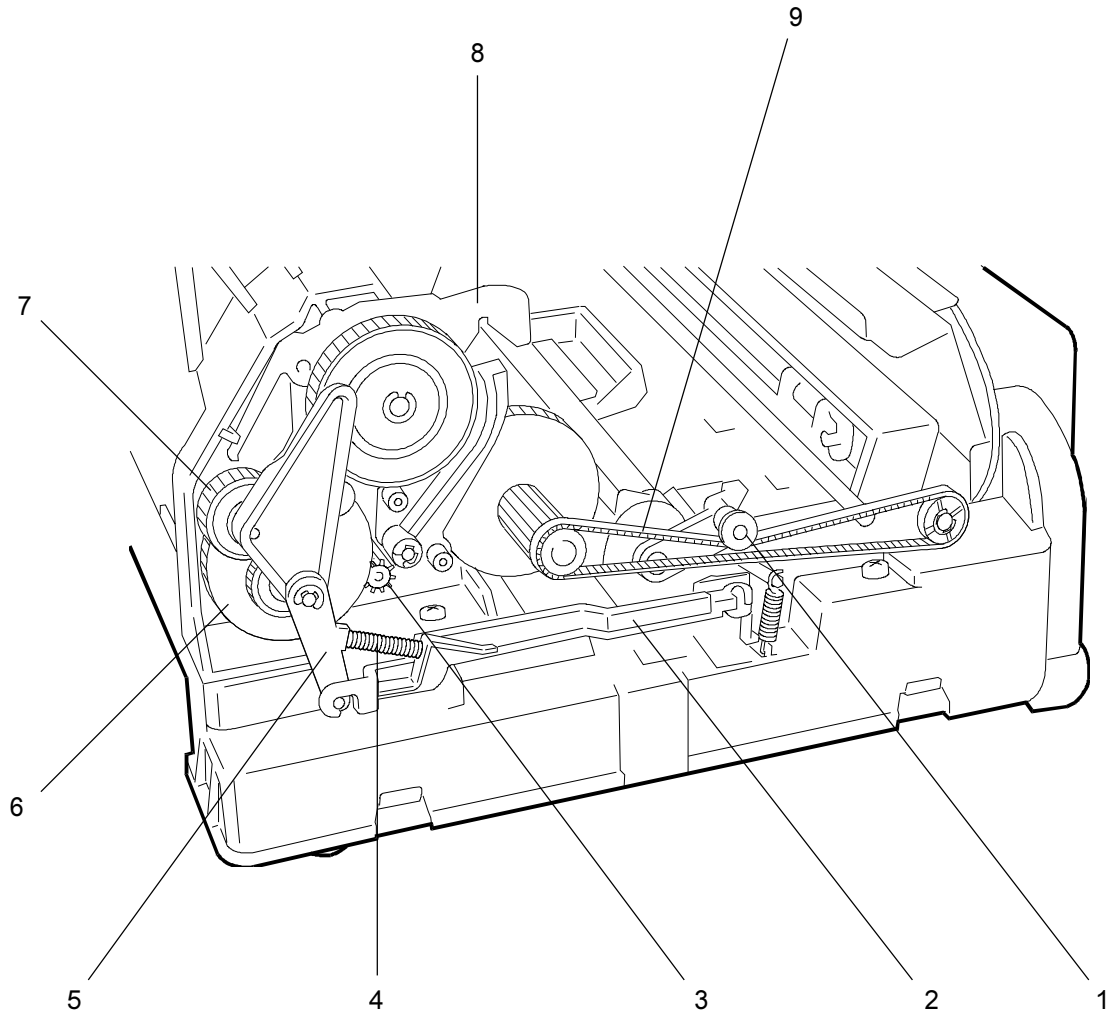
INTERNAL MECHANISM 1

REF.	Part #		DESCRIPTION
1	12N00981		TRANSPORT MOTOR GROUP
2	38N00248		PAPER EXIT GUIDE
3	130N00845		SPEAKER GROUP
4	1N00277		FRAME (DFC155)
	1N00278		FRAME (DWC155c)

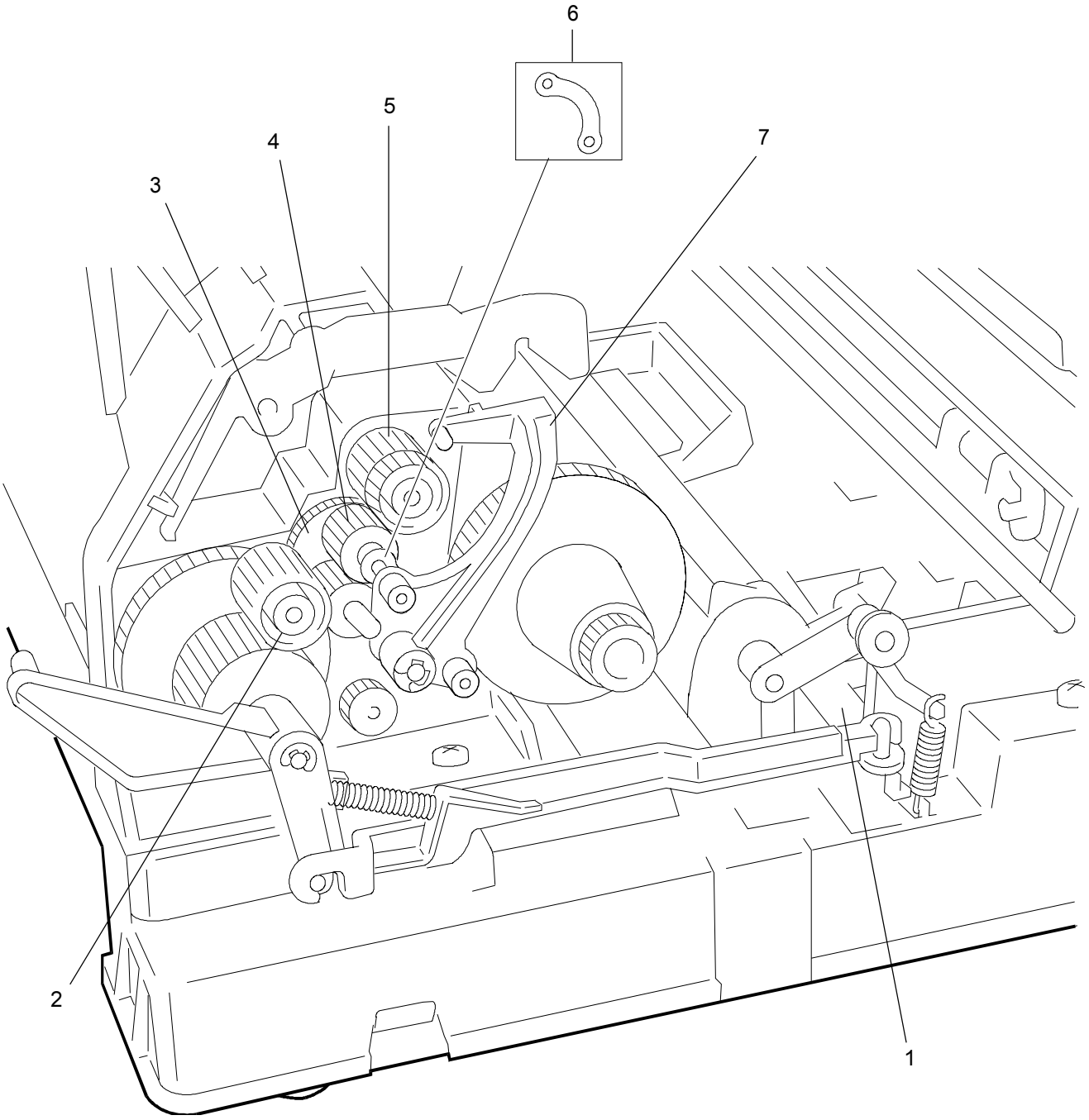


INTERNAL MECHANISM 2

REF.	PART #		DESCRIPTION
1	23N00611		TENSIONING BELT GROUP
2	10N00062		PAPER FEED COMMAND SLIDE
3	127N00982		PAPER FEED MOTOR GROUP
4	9N00991		COMPRESSION SPRING
5	11N00403		DELECTION LEVER GROUP
6	7N00729		GEAR T=70/37
7	7N00730		GEAR T=35
8	38N00249		FREE PAPER FEED
9	23N00612		INTERLINE BELT

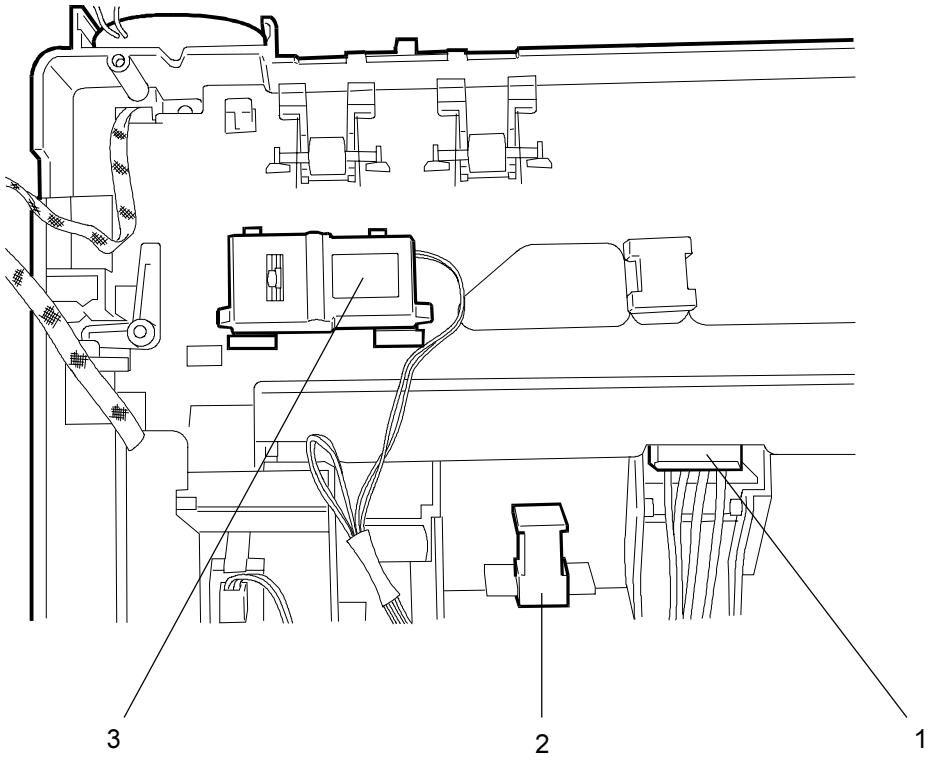


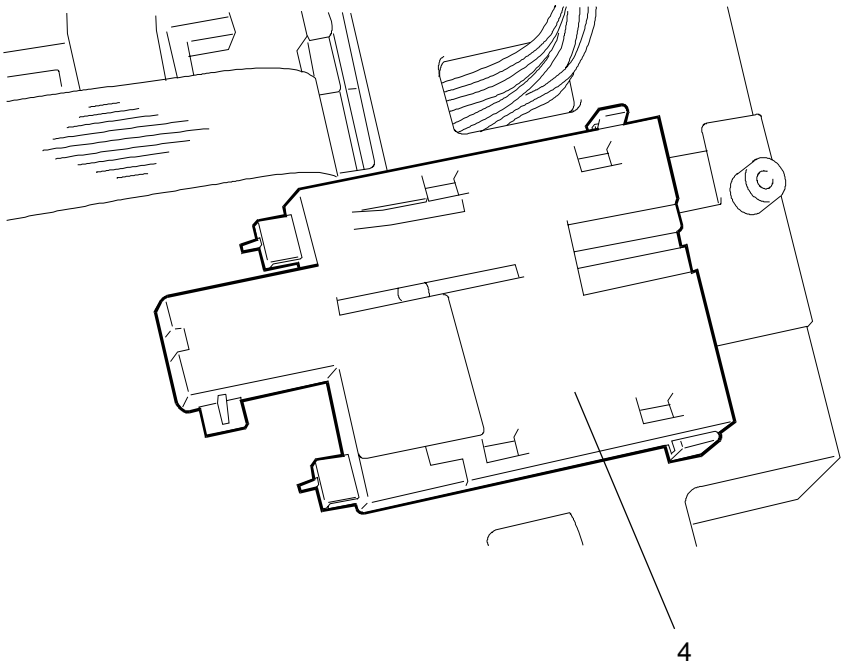
REF.	Part #		DESCRIPTION
1	10N00063		PAPER FEED COMMAND SLIDE
2	7N00731		GEAR T=24
3	7N00732		GEAR T=55/20
4	7N00733		GEAR T=18 (Pcs=2)
5	7N00734		SCANNING FEEDING GEAR T=20/26
6	28N00238		FRICTION WASHER
7	11N00404		FEEDING SWITCHING LEVER GROUP



INTERNAL MECHANISM 4

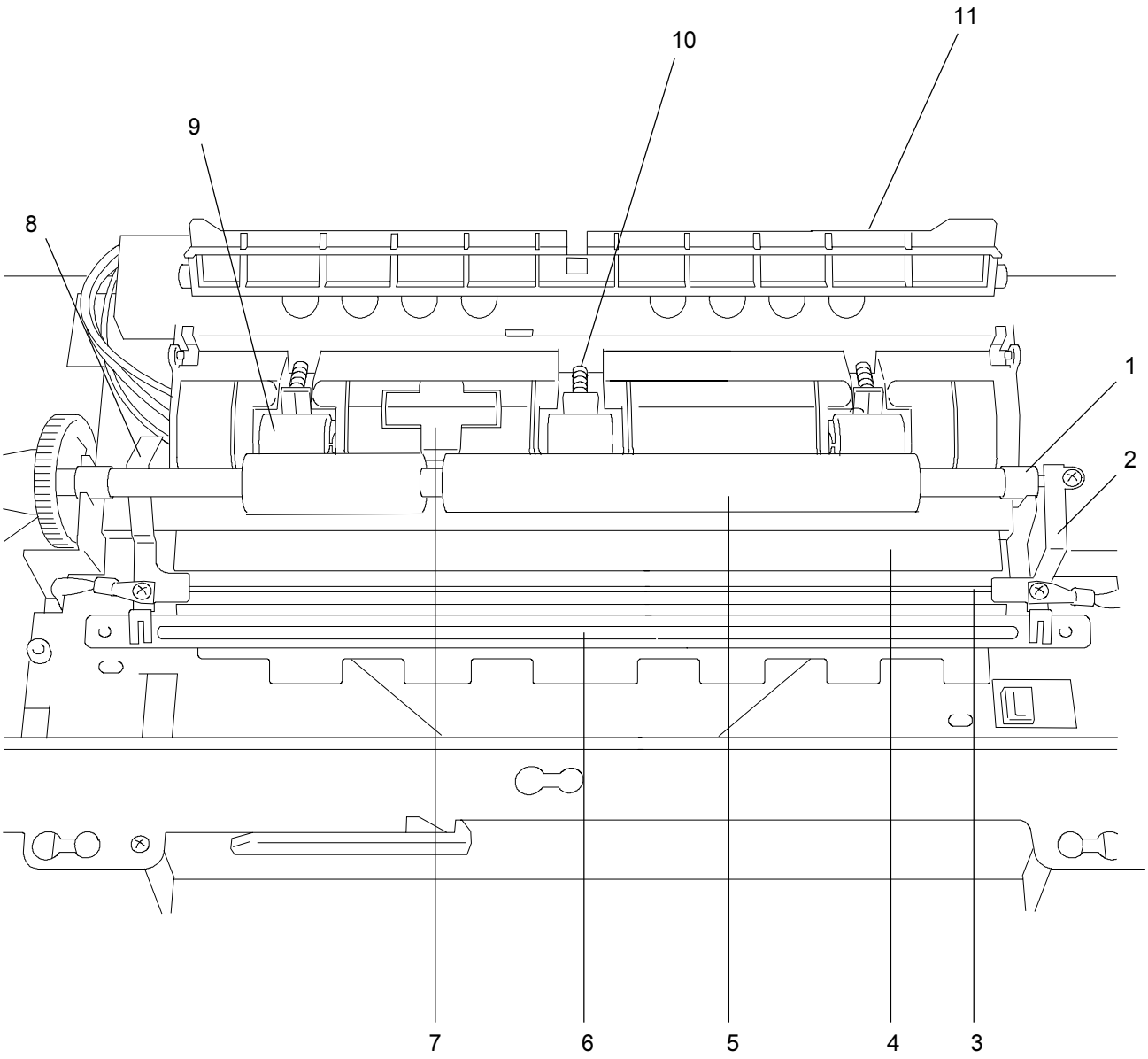
REF.	PART #		DESCRIPTION
1	130N00846		TOP SENSOR GROUP
2	130N00847		ADF SENSOR GROUP
3	42N00071		CLEANER GROUP (DFC155)
	42N00072		CLEANER GROUP (DWC155c)
4	21N00068		CAPPING GROUP (DFC155)
	21N00069		CAPPING GROUP (DWC155c)





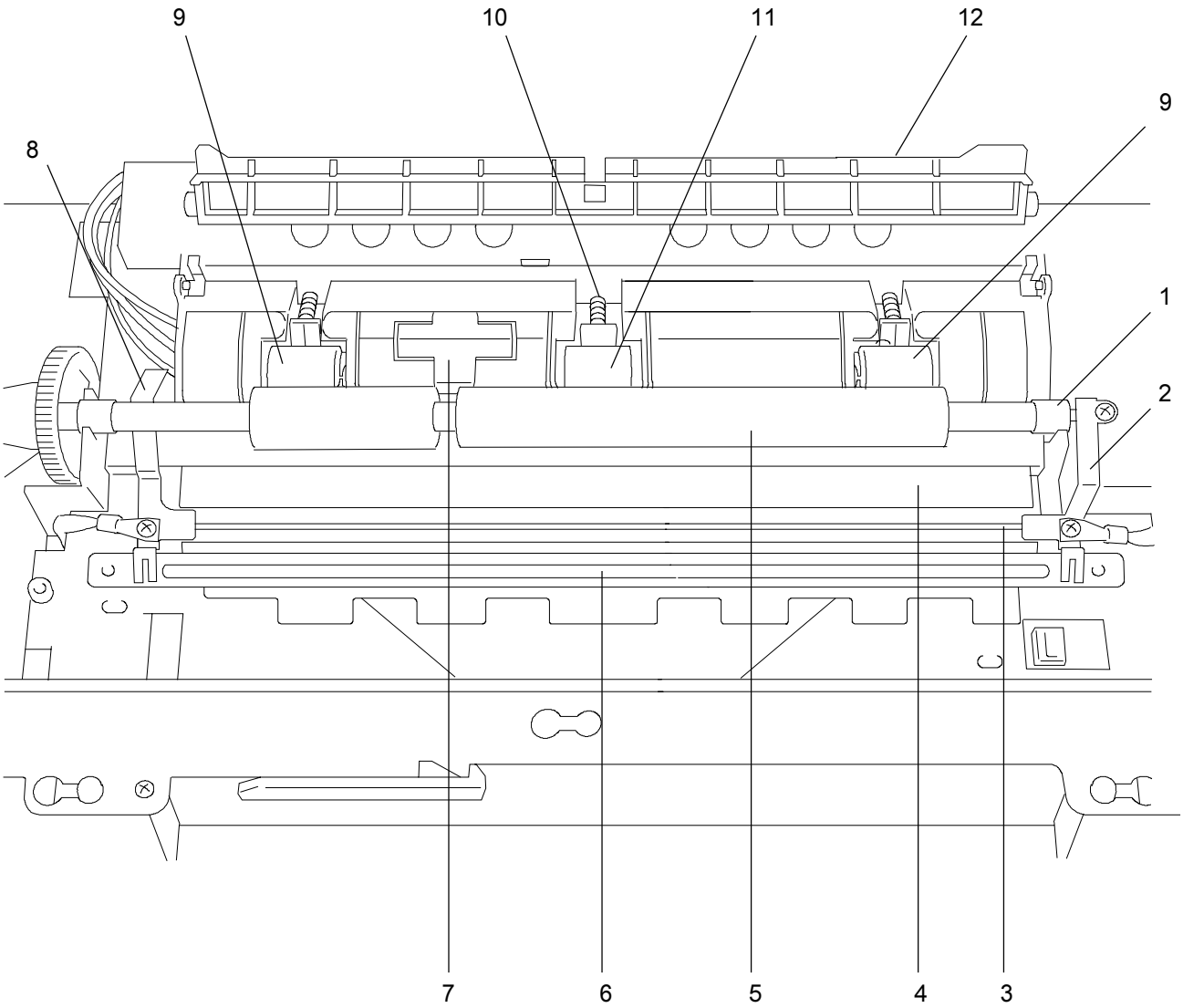
INTERNAL MECHANISM 5

REF.	Part #		DESCRIPTION
1	13N00371		BUSH FOR PAPER FEED SHAFT GROUP
2	9N00992		RIGHT GROUND SPRING
3	62N00144		SCANNER C.I.S.
4	1N00279		MYLAR FOR C.I.S.
5	38N00250		PAPER FEED SHAFT TOTAL ASSY
6	54N00041		PAPER CONVEYOR GROUP
7	130N00848		TOP SENSOR COVER
8	9N00993		LEFT GROUND SPRING
9	22N00958		CONTRAST ROLLER GROUP
10	9N00994		SPRING FOR CONTRAST ROLLER
11	2N01550		ASF TILE



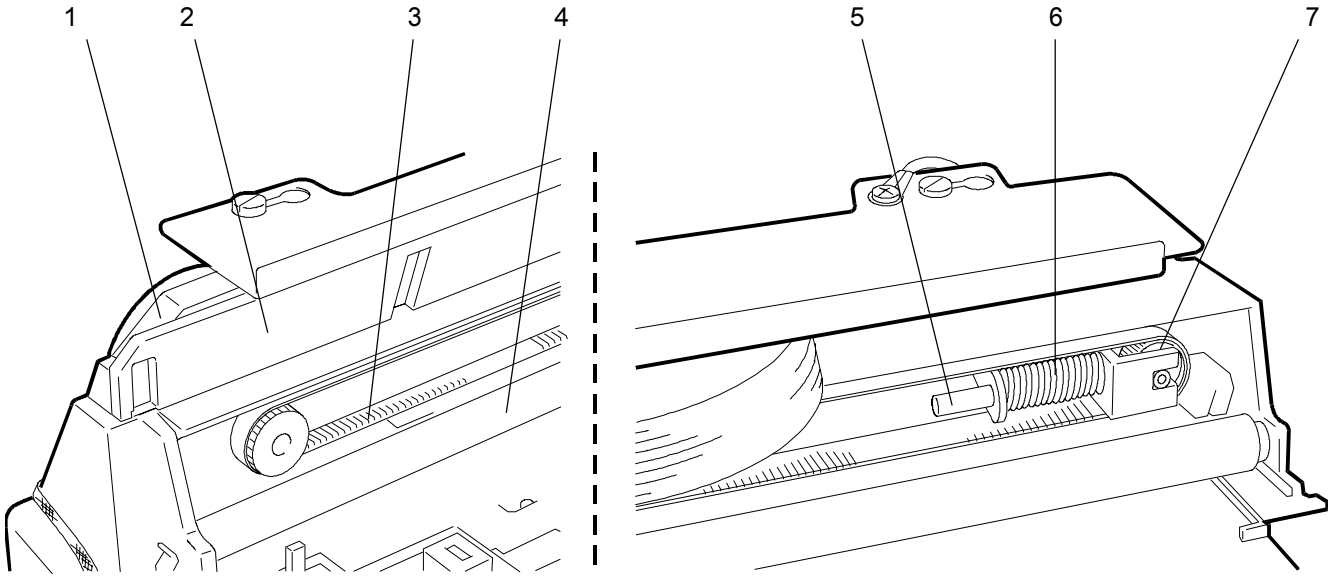
INTERNAL MECHANISM 5

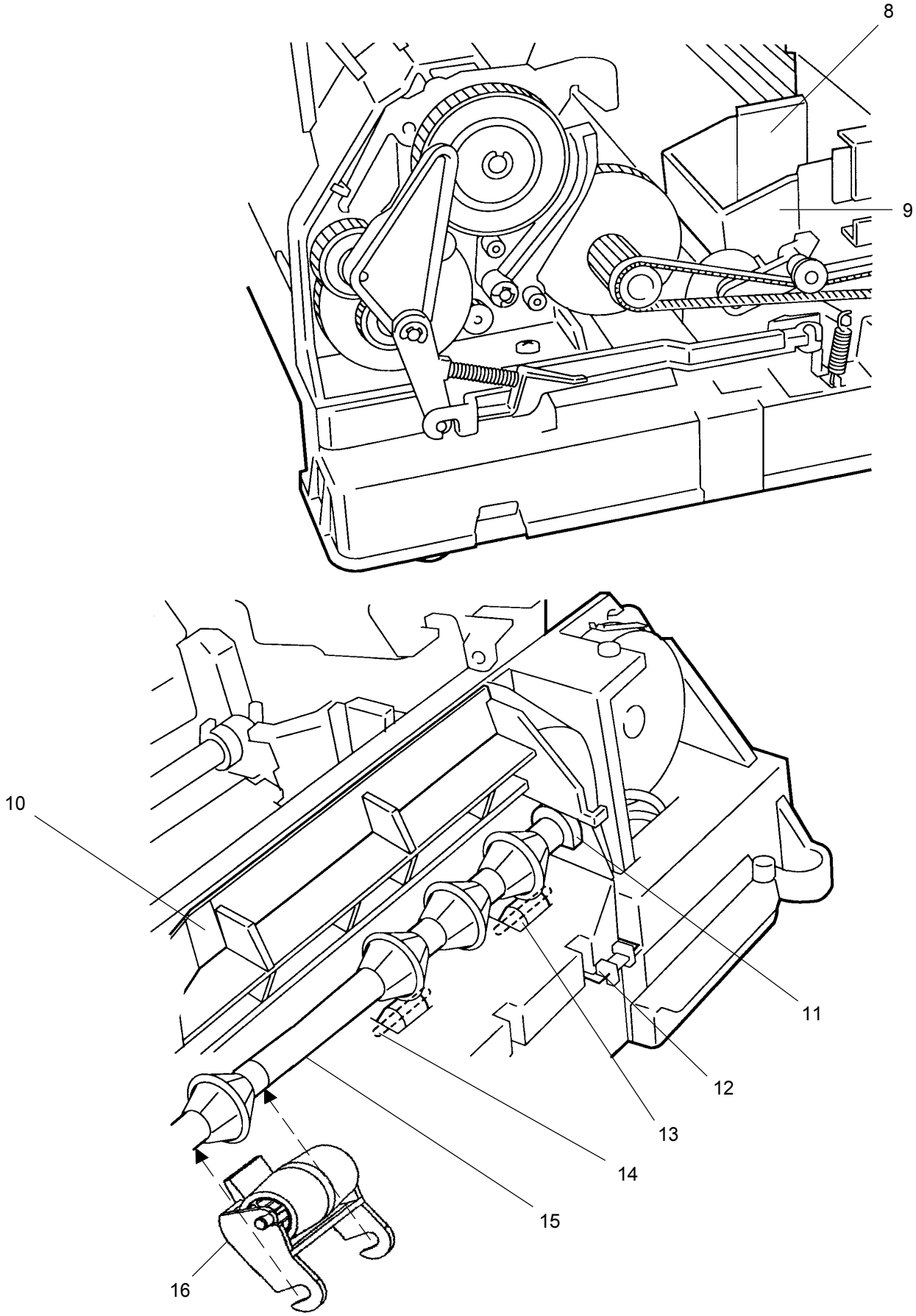
REF.	PART #		DESCRIPTION
1	13N00371		BUSH FOR PAPER FEED SHAFT GROUP
2	9N00992		RIGHT GROUND SPRING
3	62N00144		SCANNER C.I.S.
4	1N00279		MYLAR FOR C.I.S.
5	38N00250		PAPER FEED SHAFT TOTAL ASSY
6	54N00041		PAPER CONVEYOR GROUP
7	130N00848		TOP SENSOR COVER
8	9N01000		LEFT GROUND SPRING
9	22N00963		LATERAL CONTRAST ROLLER GROUP
10	9N00994		SPRING FOR CONTRAST ROLLER
11	22N00964		CENTRAL CONTRAST ROLLER GROUP
12	2N01550		ASF TILE



INTERNAL MECHANISM 6

REF.	Part #		DESCRIPTION
1	9N00995		TRANSPORT GROUND SPRING
2	30N00409		TRANSPORT SUPPORT
3	23N00613		CARRIAGE BELT
4	41N00191		CARRIAGE SHAFT
5	30N00410		PULLEY TENSIONING BRAKET
6	9N00996		BELT TENSIONING SPRING
7	20N00437		IDLE PULLEY
8	41N00192		BONDED CARRIAGE GROUP
9	32N00216		HEAD GUIDE (DFC155)
	32N00217		HEAD GUIDE (DWC155c)
10	9N00997		GROUND SPRING FOR CARRIAGE FLAT
11	13N00372		BUSH FOR EJECTOR ROLLER GROUP
12	9N00998		WIRE SPRING FOR ROLLER
13	22N00959		ROLLER
14	22N00960		SHAFT FOR ROLLER
15	22N00961		EJECTOR ROLLER GROUP
16	22N00965		ABSORBING ROLLER GROUP Pcs=7 (DWC155c)

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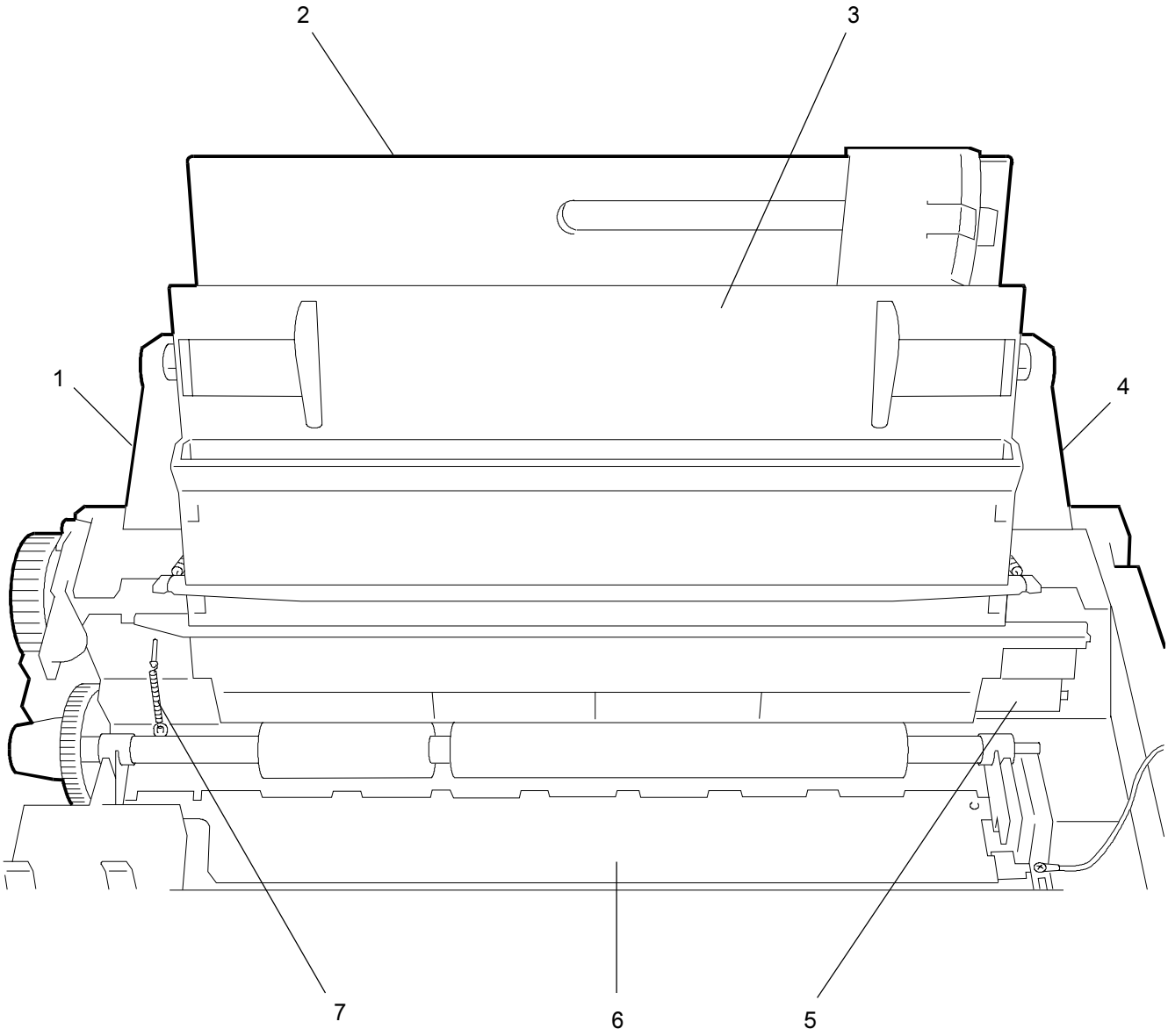
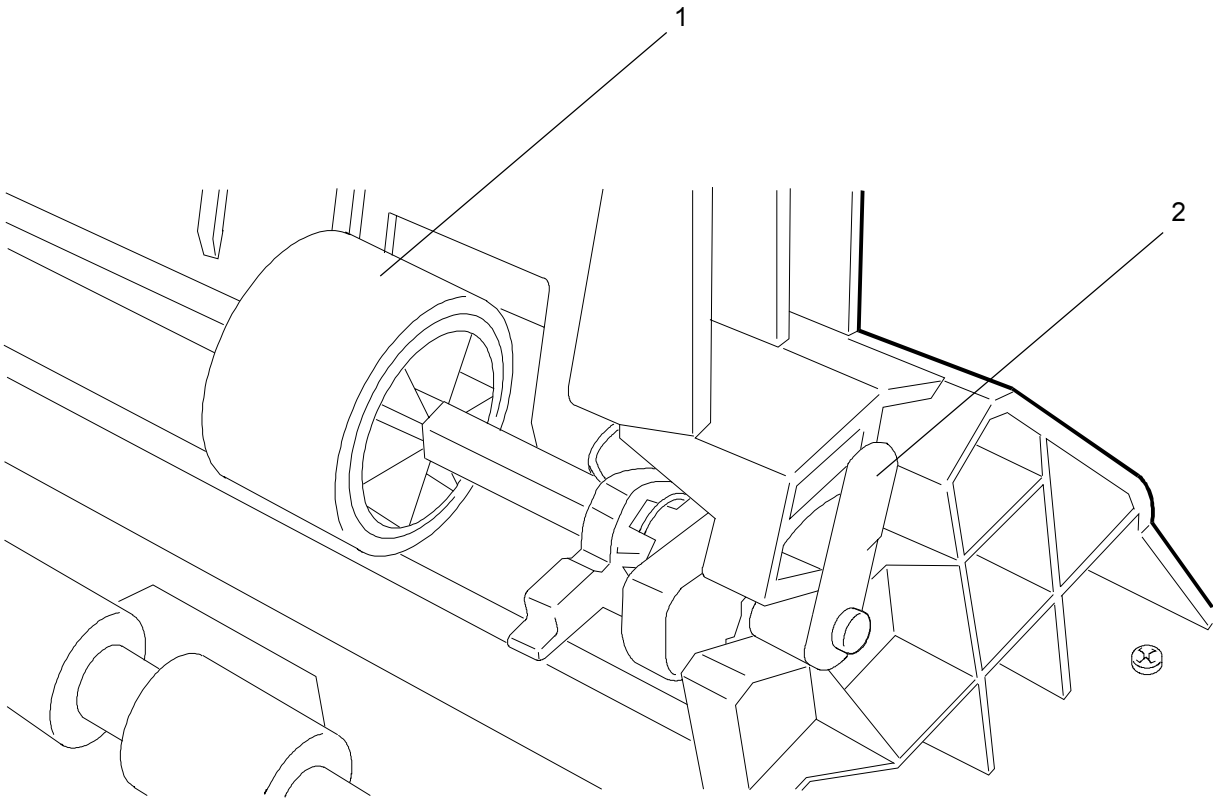
INTERNAL MECHANISM 7

REF.	Part #		DESCRIPTION
1	22N01551		LEFT FLANK GROUP
2	60N00013		ASF PAPER BOX GROUP
3	60N00014		ADF PAPER BOX GROUP
4	2N01552		RIGHT FLANK
5	60N00015		PAPER BOX SEPARATOR
6	2N01554		C.I.S. PAPER CONTRAST (DFC155)
	2N01553		C.I.S. PAPER CONTRAST (DWC155c)
7	9N00999		SPRING FOR C.I.S. CONTRAST



INTERNAL MECHANISM 8

REF.	PART #		DESCRIPTION
1	22N00962		ADF / ASF SHAFT ASSEMBLY
2	13N00373		ADF / ASF BUSH FOR SHAFT



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