FAX3000L/3200L

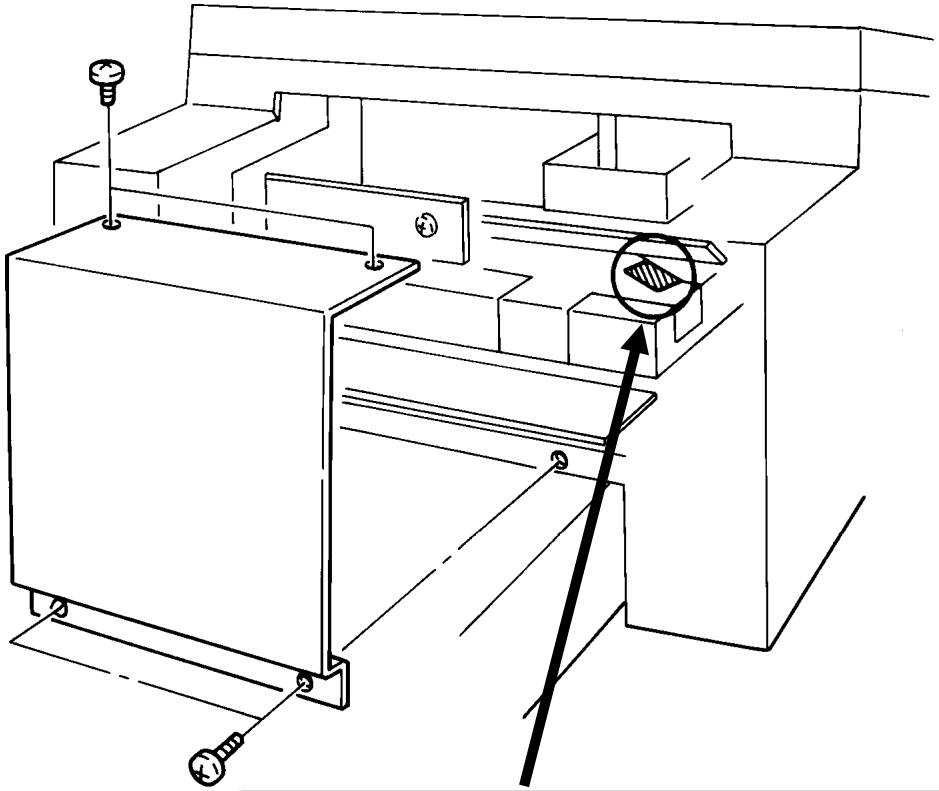
SERVICE MANUAL

Throughout this manual, the machines are referred to as follows.

Type 1: FAX3000L
Type 2: FAX3200L

WARNING

THIS MACHINE CONTAINS A LASER BEAM GENERATOR. LASER BEAMS CAN CAUSE PERMANENT EYE DAMAGE. DO NOT OPEN THE LASER UNIT OR LOOK ALONG THE LASER BEAM PATH WHILE THE MAIN POWER IS ON.



DANGER INVISIBLE LASER RADIATION WHEN OPEN AVOID DIRECT EXPOSURE TO BEAM	DANGER RAYON LASER INVISIBLE LORS DE L'OUVERTURE EVITER L'EXPOSITION DIRECTE
VORSICHT Unsichtbare Laserstrahlung unter dieser Abdeckung. Nicht in den laserstrahl blicken.	PELIGRO RADIACION LASER INVISIBLE AL ABRIR. EVITAR LA EXPOSICION DIRECTA AL HAZ

Lithium Batteries (Memory Back-up)

CAUTION:
The danger of explosion exists if a battery of this type is incorrectly replaced. Replace only with the same or an equivalent type recommended by the manufacturer. Discard used batteries in accordance with the manufacturer's instructions.

1. OVERALL MACHINE INFORMATION

1.1. SPECIFICATIONS

Type
Desktop transceiver

Circuit
PSTN, PABX

Connection
Direct couple

Document Size
Length: 105 - 1200 mm
[4.1 - 47.2 ins]
Up to 100 m [328 ft] after adjustment
Width: 148 - 304 mm
[5.8 - 12.0 ins]
Thickness: 0.05 to 0.2 mm
[2 to 8 mils]

Document Feed
Automatic feed, face down

ADF Capacity
50 sheets (using 80 g/m^2 paper)

Scanning Method
Flat bed, with CCD

Maximum Scan Width
256 mm [10.1 ins] ± 1%

Scan Resolution
Main scan: 8 dots/mm [203 dpi]
Sub scan:
Standard - 3.85 lines/mm [98 lpi]
Detail - 7.7 lines/mm [196 lpi]
Fine - 15.4 lines/mm [392 lpi]

Memory Capacity
ECM: 128 kbytes (double buffer)
SAF: Type A - 256 kbytes (14 pages)
Type B - 256 kbytes (14 pages), with optional extra 1 Mbyte or 2 Mbytes (max 71 or 128 pages respectively)

Compression
MH, MR, EFC, MMR, SSC
Storage to SAF memory for tx: MH
MMR only with ECM

Modulation
V.29 (QAM), V.27ter (PHM), V.21 (FM)

Protocol
Group 3 with ECM

Data Rate
9600/7200/4800/2400 bps; automatic fallback

I/O Rate
With ECM: 0 ms/line
Without ECM: 5, 10, 20, or 40 ms/line

Transmission Time
10 s at 9600 bps (G3 ECM using memory) for a CCITT # 1 test document (Slerexe letter) using standard resolution

Printing System
Laser printing, using the Ricoh CS (Compact Seamless) Engine, plain paper, dry toner

Paper Size
Standard Cassette
Europe: A4, A5
Asia: A4, A5, F, F4
Lower Cassette
Europe: A4, A5
Asia: A4, A5, F, F4, B4

Maximum Printout Width
210 mm [8.3 ins]

Maximum Printer Resolution
Main scan: 16 dots per mm [406 dpi]
Sub scan: 15.4 lines/mm [392 lpi]

Power Supply
220 - 240 Vac, 50 Hz

Power Consumption (Base Machine Only)
Standby: 35 W
Transmit: 50 W
Receive: 200 W
Copying: 270 W

Operating Environment
Temperature: 17 - 28 °C [63 - 82 °F]
Humidity: 40 - 70 %Rh

Dimensions (W x D x H)
496 x 459 x 293 mm [19.5 x 18.1 x 11.5 ins]
Excluding handset, trays, and optional units

Weight
19 kg [41.8 lbs]
Excluding handset, trays, and optional units

1.2. FEATURES

KEY: O = Used, X = Not Used,
A = Type A with optional memory only,
B = Type A with lower cassette only,
G = Not used in Germany,
S = Service mode in some countries

Equipment	
ADF	O
Bar code reader	X
Built-in handset	X
Cabinet	X
Connection for ans. machine	X
Connection for handset	O
Cutter	X
Handset (option only in Europe)	O
Hard disk	X
Magnetic card reader	X
Manual feed mechanism	O
Marker	O
Microphone	X
Monitor speaker	O
Remaining memory indicator	O
Speakerphone	X

Video Processing Features	
Contrast	O
Halftone (Basic & Error Diffusion)	O
MTF	O
Reduction	O
Resolution	O
Smoothing to 16 x 15.4 l/mm	O

Communication Features - Auto	
Automatic fallback	O
Automatic redialling	O
Confidential reception	A
Dual Access	O
Substitute reception	O
Transmission Reserve	X

Communication Features - User Selectable	
Action as a transfer broadcaster	X
Al Redial	O
Alternative Destination	O
Answering machine	X
Authorized Reception	O
Auto-answer delay time	X
Auto dialling (pulse or DTMF)	O
Auto Document	O
Automatic Voice Message	X
Auto-note	X
Batch Transmission (max 5 files)	A
Broadcasting	O
Chain Dialling	O
Confidential ID Override	O
Confidential Transmission	O
Forwarding (4 stations)	A
Free Polling	O
Groups (7 groups)	O
Hold	X
Immediate Redialling	O
Immediate transmission	O
Keystroke Programs	O
Mailbox	X
Memory transmission (this is the default mode)	O
Notify	X
On Hook Dial	O (G)
Page Count	O
Personal Codes	O
Personal Codes with Conf ID	O
Polling Reception	O
Polling Transmission	O
Quick Dial (32 stations)	O
Reception modes (Fax, Tel, ~~Auto~~)	O
Reduction	O
Remote control features	X
Remote Transfer	X
Restricted Access (10 codes, without cards)	O
Secured Polling	O
Secured Polling with Stored ID Override	O
Send Later	O

Silent ringing detection	X
Speed Dial (100 stations)	O
Telephone Directory	O
Tonal Signal Transmission	O
Transfer Request	O
Transmission Deadline	X
Turnaround Polling	X
Voice Request (immed. tx only)	O

Communication Features - Service Selectable	
AI Short Protocol	X
Auto-reduction override option	O
Busy tone detection	O
Closed Network (tx and rx)	O
Continuous Polling Reception	O
Dedicated tx parameters	O
ECM	O
EFC	O
MV1200 compatibility	X
Page retransmission	O
Page separation mark	O
Polling tx file lifetime in the SAF	O
Protection against wrong conn.	O
Resol'n stepdown override option	X
Short Preamble	O
Well log	O

Other User Features	
Auto Service Call	O
Center mark	O
Chequered mark	X
Clearing a memory file	O
Clearing a polling file	O
Clock	O
Confidential ID	O
Copy mode	O
Counters	O
Dialled number check	X
Direct entry of names	O
Function Programs	O
ID Code	O
Label Insertion	O
Language Selection	O
LCD contrast control	Service
Memory Lock	A
Memory Lock ID	A

Modifying a memory file	X
Multi Sort Document Reception	A
Multicopy mode	A
Night Timer	O
Own telephone number	O
Printing a memory file	O
RDS on/off	O
Reception Mode Switching Timer	X
Reception Time (non-memory rx only)	O
Remote ID	X
Reverse Order Printing	A
RTI, TTI, CSI	O (S)
Speaker volume control	O
Specified Cassette Selection	B
Substitute reception on/off	O
Telephone line type	O (S)
TTI on/off	O
User Function Keys	X
User Parameters	O
Wild Cards	O

Reports - Automatic	
Charge Control Report	X
Communication Failure Report	O
Confidential File Report	O
Error Report	O
Memory Storage Report	O
Mode Change Report	X
Polling Clear Report	O
Polling Reserve Report	O
Polling Result Report	O
Power Failure Report	O
Journal	O
Transfer Result Report	X
Transmission Result Report	O

Reports - User-initiated	
Authorized Reception List	O
Charge Control Report	X
File List	O
Forwarding List	A
Group List	O
Personal Code List	O
Program List	O
Quick Dial List	O
Specified Cassette Selection List	B

Reports - User-initiated	
Speed Dial List	O
Journal	O
Transmission Status Report	X
User Function List	X
User Parameter List	O

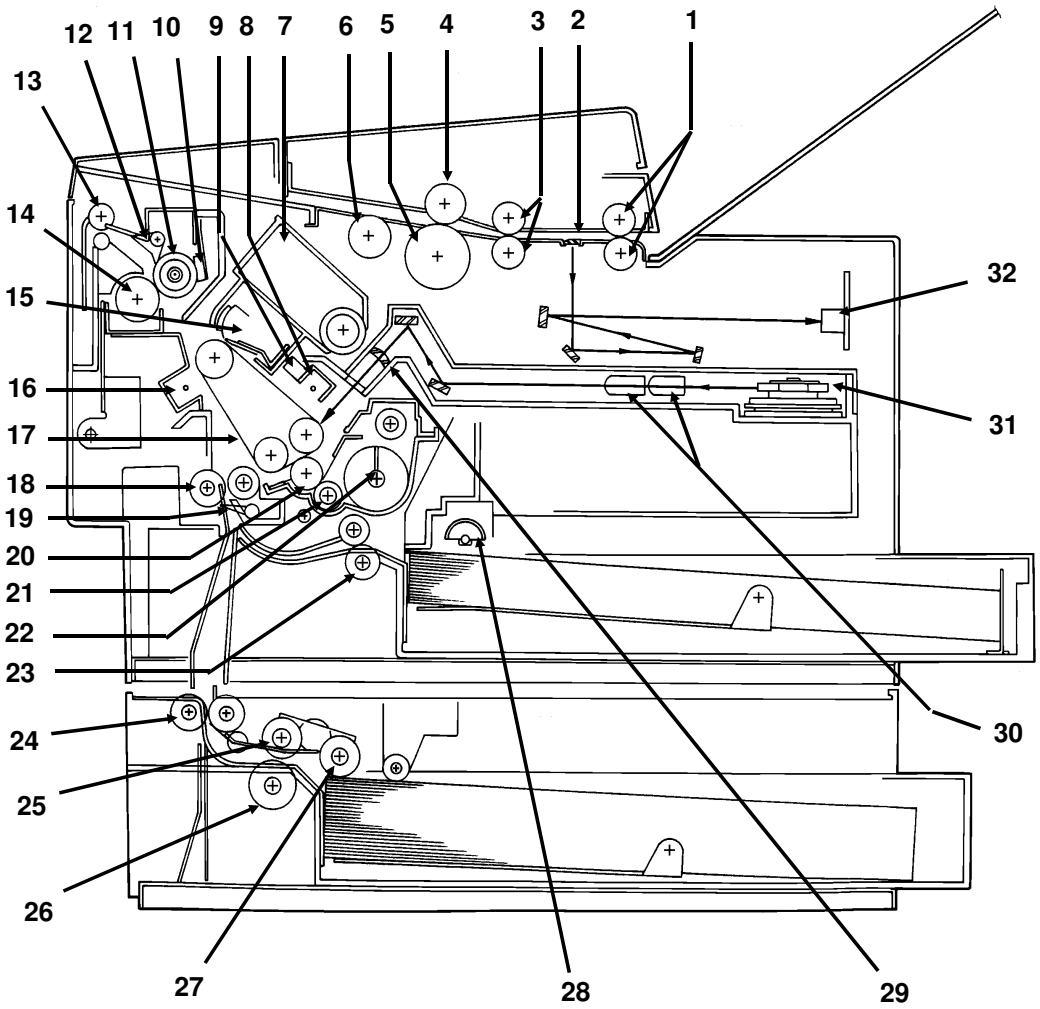
Service Mode Features	
Back-to-back test	O
Bit switch programming	O
Buzzer test	O
Cable equalizer (rx only)	O
Comm. parameter display	O
DTMF tone test	O
Echo countermeasure	O
Error code display	O
LCD contrast adjustment	O
Memory file forwarding	O
Memory file printout (all files)	O
Modem test	O
NCU parameters	O
Operation panel test	O
Printer mechanism test	X
Printer test patterns	O
Programmable attenuation	X
Protocol dump list	O
RAM display/rewrite	O
RAM dump	O
Ringer test	X
Scanner lamp test	O
Scanner mechanism test	O
Sensor initialization	X
Serial number	O
Service monitor report	O
Service station number	O
System parameter list	O
Technical data on the Journal	O
Thermal head parameters	X
Transmission Status Report	X

Memory Files

Max. number of files: 100
Max. number of stations/file: 142
Max. number of stations overall: 299
Max. number of pages overall: 200
(including pages stored as Auto Documents)

1.3. COMPONENT LAYOUT

1.3.1. Mechanical Components



1.	R2 Rollers	Feed the document through the scanner.
2.	Exposure Glass	Exposes the original to light from the xenon lamp.
3.	R1 Rollers	Feed the document through the scanner.
4.	Separation Roller	Allows one page into the scanner.
5.	Document Feed Roller	Feeds the document into the scanner.
6.	Pick-up Roller	Picks up pages of the document from the document table.
7.	Toner Cartridge	This supplies toner to the development unit. It is part of the CTM (Cleaning/Toner Magazine).
8.	Charge Corona Unit	This applies a charge to the master at the start of the print cycle.
9.	Quenching Lamp	This removes excess charge from the master at the end of the print cycle.
10.	Thermistor	This measures the temperature in the fusing unit.
11.	Hot Roller	Heat from this roller fuses the toner to the copy paper.

12.	Hot Roller Strippers	These take the paper off the hot roller after fusing.
13.	Copy Feed-out Rollers	These feed the paper out of the printer.
14.	Pressure Roller (Fusing)	This applies pressure to the paper during the fusing process.
15.	Cleaning Unit/Used Toner Tank	This removes excess toner from the master after image transfer and stores it. It is part of the CTM (Cleaning/Toner Magazine).
16.	Transfer Corona Unit	This applies a charge to the paper to pull the toner off the master and onto the copy paper.
17.	Master Belt	Also known as the CS (Compact Seamless) Engine. The latent image is written to this organic photoconductor belt.
18.	Registration Roller	This carries out the registration process.
19.	Registration Sensor	This detects when paper is approaching the registration roller.
20.	Development Roller	This roller applies toner to the latent image on the master belt.
21.	Toner Supply Bar	This feeds toner to the development roller.
22.	Toner Mixing Bar	This stirs up the toner in the development unit, so that it does not collect into lumps.
23.	Upper Relay Rollers	These feed paper from the upper cassette into the printer.
24.	Lower Relay Rollers	These feed paper from the lower cassette into the printer.
25.	Lower Paper Feed Roller	This feeds paper out of the lower cassette.
26.	Lower Paper Separation Roller	This ensures that only one sheet of paper at a time leaves the lower cassette.
27.	Lower Paper Pick-up Roller	This picks up the top sheet of paper from the stack in the lower cassette and passes it to the feed roller.
28.	Upper Paper Feed Rollers	These pick up the top sheet of paper from the stack in the upper cassette and feed it into the printer.
29.	Focusing Lens	This focuses the laser beam onto the master belt.
30.	Fθ Lenses	These ensure that the thickness of the laser beam is uniform across the main scan.
31.	Hexagonal Mirror	This passes the laser beam across the master belt.
32.	CCD (Charge Coupled Device)	This converts the light reflected from the document into an analog video signal.

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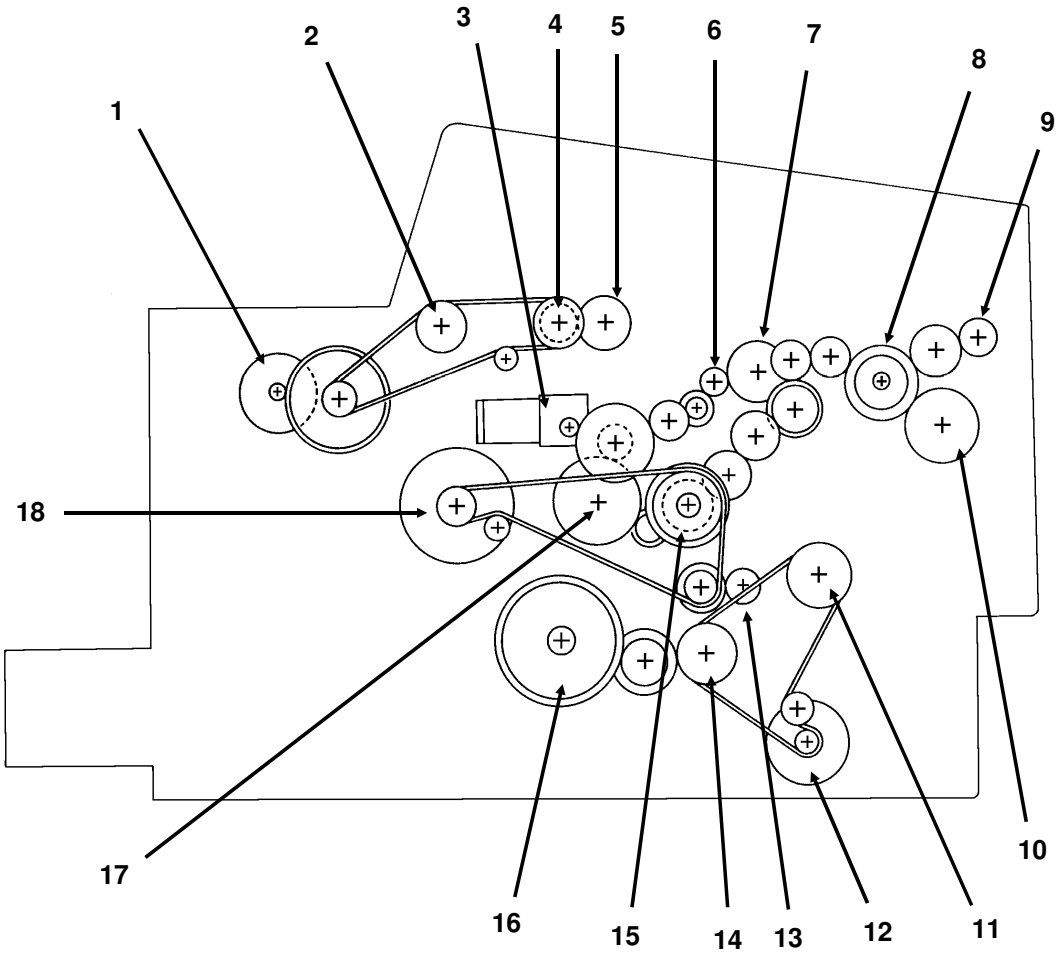
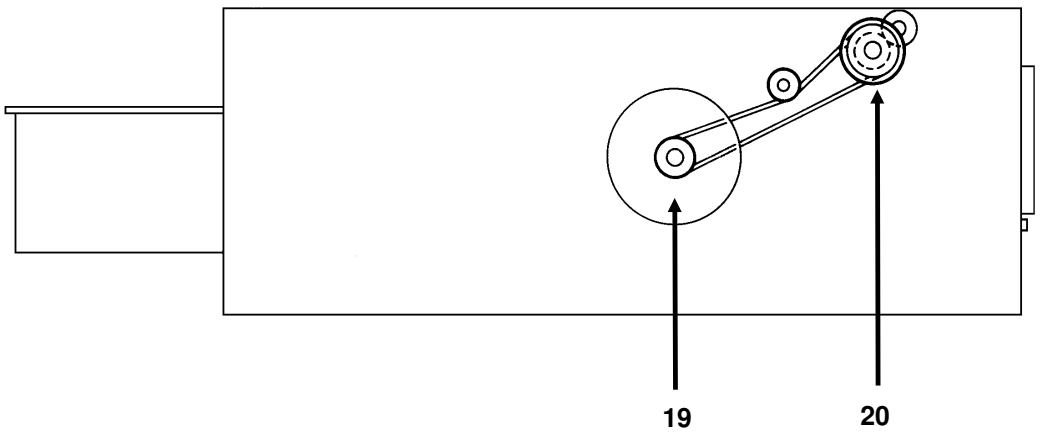
1.3.2. Drive Components





1.	Tx Motor	This stepper motor drives the scanner.
2.	R2 Roller	This feeds the original through the scanner.
3.	Toner Supply Motor	This dc motor drives the toner supply mechanism.
4.	R1 Roller	This feeds the original through the scanner.
5.	Shutter Drive Gear	This ensures that the shutter moves out of the document feed path at the correct time.
6.	Toner Supply Gear (CTM)	This ensures the supply of toner from the CTM into the development unit. It is part of the CTM.
7.	Cleaning Brush Drive Gear	This drives the cleaning brush in the CTM.
8.	Hot Roller	This fuses the toner to the copy paper.
9.	Copy Feed-out Roller	This feeds printouts out of the machine.
10.	Pressure Roller	This applies pressure to the copy paper in the fusing unit.
11.	Registration Roller Drive Gear	This drives the registration roller.
12.	Upper Paper Feed Motor	This drives the paper feed mechanism in the upper cassette.
13.	Development Roller Drive Gear	This drives the development roller.
14.	Upper Paper Feed Roller Drive Gear	This drives the upper paper feed roller.
15.	Master Belt Drive Gear	This drives the master belt.
16.	Paper Feed Clutch	This transfers drive from the upper paper feed motor to the upper paper feed mechanism.
17.	Toner Supply Gear (Development)	This ensures the collection of toner from the CTM, and its distribution across the full length of the development unit.
18.	Main Motor	This brushless dc motor drives the master belt, fusing unit, development unit, and cleaning unit.
19.	Lower Paper Feed Motor	This drives the paper feed mechanism in the lower cassette.
20.	Lower Paper Feed Clutch	This transfers drive from the lower paper feed motor to the lower paper feed mechanism.

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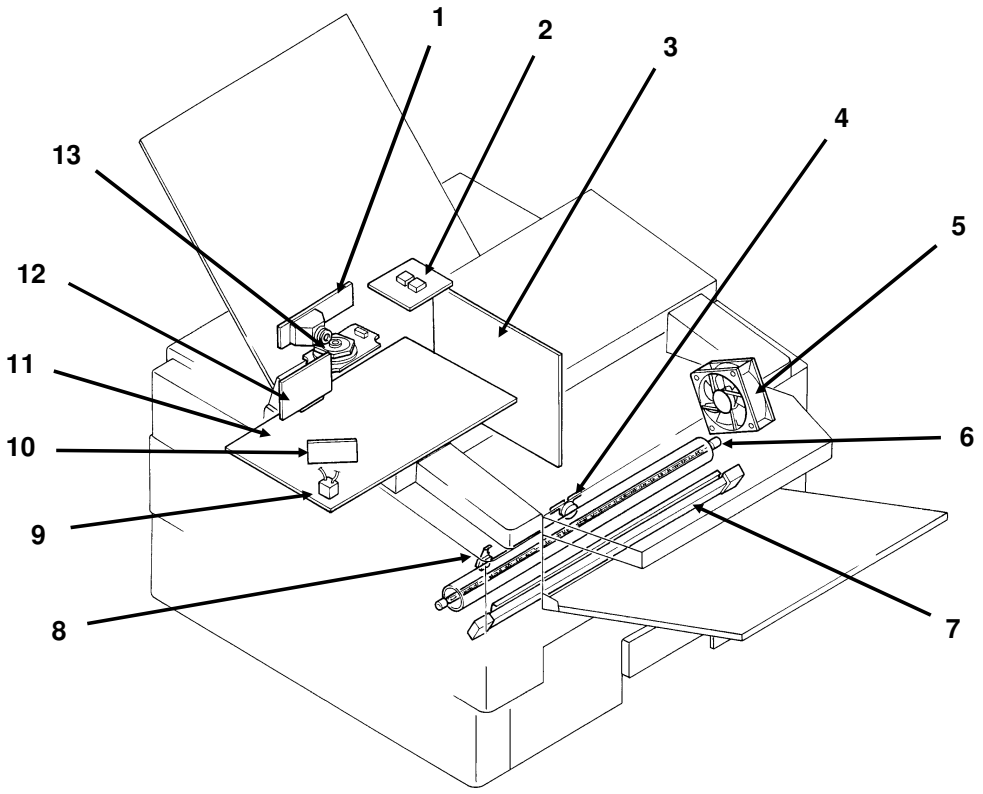
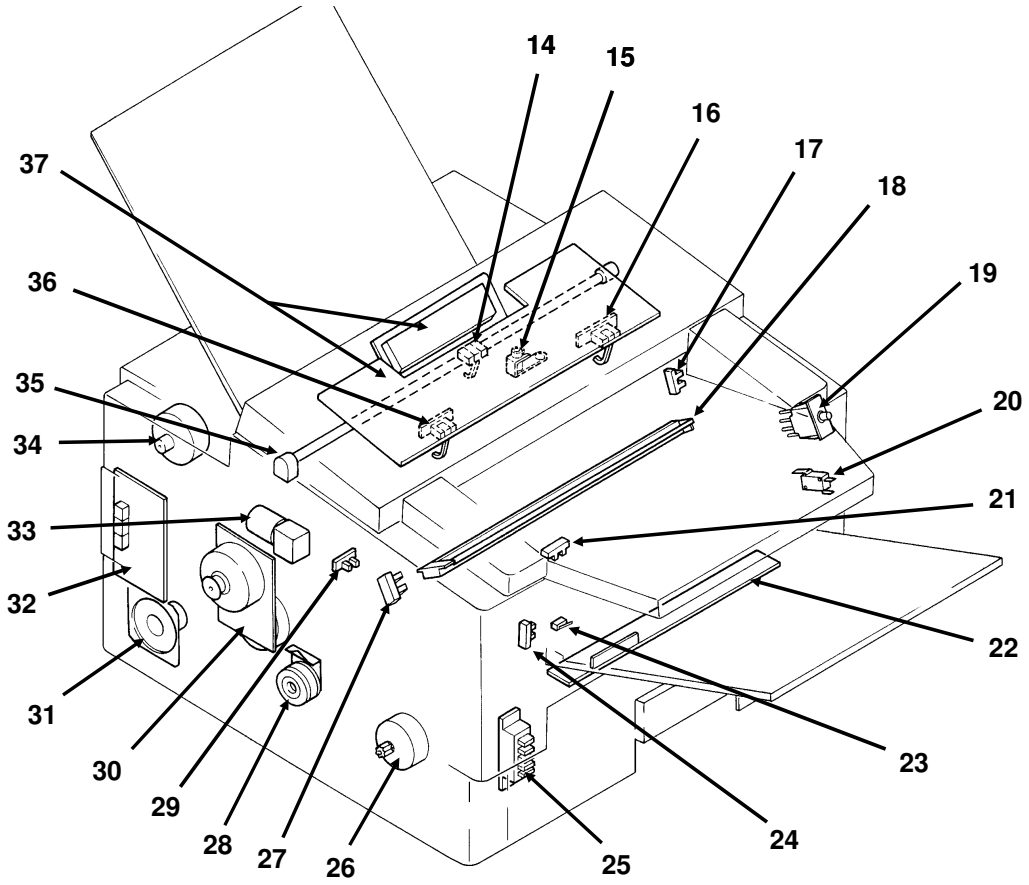
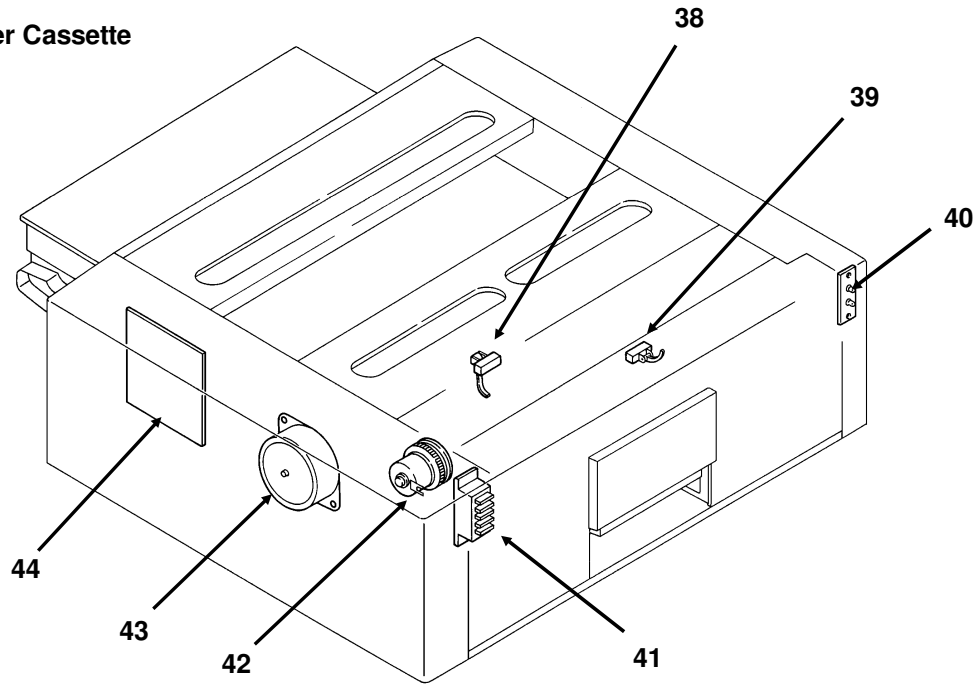
1.3.3. Electrical Components





Lower Cassette



Name	Description	No.
PCBs		
FCU	This board controls the machine.	11
MBU	This board contains the system ROM and RAM for storing system parameters such as bit switch settings and programmed telephone numbers.	12
SBU	This board contains the CCD.	1
OP-PORT	This board controls the operation panel.	37
NCU	This board contains relays and switches for interfacing the machine to the network and the handset.	32
PSU	This board supplies power to the machine.	3
LD Unit	This board drives the laser diode.	10
PFU	This board controls the lower paper feed unit.	44
MOTORS		
Tx Motor	This stepper motor drives the scanner.	34
Main Motor	This dc motor drives the fusing unit, master belt, development roller, and cleaning unit.	30
Upper Paper Feed Motor	This stepper motor drives the upper paper feed mechanism and the registration roller.	26
Lower Paper Feed Motor	This stepper motor drives the lower paper feed mechanism.	43
Toner Supply Motor	This dc motor drives the toner supply mechanism.	33
Hexagonal Mirror Motor	This high-speed dc motor drives the hexagonal mirror in the laser printer optics.	13
Ozone Fan	This removes ozone-laden air from the vicinity of the master unit, and filters out the ozone.	5
CLUTCHES		

Name	Description	No.
Upper Paper Feed Clutch	This transfers drive from the upper paper feed motor to the paper feed roller in the upper cassette.	28
Lower Paper Feed Clutch	This transfers drive from the lower paper feed motor to the paper feed roller in the lower cassette.	42
SENSORS		
Document Sensor	This detects the presence of a document in the feeder.	36
Scan Line Sensor	This detects when a page is approaching the auto shading position.	14
Document Width Sensor	This detects when a B4-width [10.1"] document has been placed in the feeder.	16
Toner Near-end Sensor	This detects when the toner has almost run out.	17
Upper Paper Size Detector	This detects the paper size installed in the upper cassette. The user must install the correct actuator.	25
Upper Paper End Sensor	This detects when the paper in the upper cassette has run out.	29
Registration Sensor	This detects when paper has arrived at the registration rollers.	21
Paper Feed-out Sensor	This detects when the paper has been fed out of the printer.	24
Front Cover Switch	This detects whether the front cover is open or closed.	23
CTM Sensor	This detects when a CTM has been installed in the machine.	27
Lower Paper Size Detector	This detects the paper size installed in the lower cassette. The user must install the correct actuator.	41
Lower Paper End Sensor	This detects when the paper in the lower cassette has run out.	38
Lower Paper Feed Sensor	This sensor detects the presence of paper at the lower paper feed roller.	39
INTERLOCK SWITCHES		
Front Cover Interlock Switches	If the front cover is open, these interlock switches interrupt the + 5VLD power supply for the laser diode and the + 24VD power supply for the power pack, motors, and other components.	19, 20
OTHERS		
Speaker	This allows the user to listen to the condition of the telephone line.	31
Xenon Lamp	This lamp illuminates the document.	35
Xenon Lamp Driver	This drives the xenon lamp.	2
Charge Corona and Quenching Lamp Unit	The charge corona unit charges the master belt at the start of the print cycle. The quenching lamp removes excess charge from the master belt at the end of the print cycle.	18
Transfer Corona Unit	This pulls the toner off the master and onto the copy paper.	7
Varistor	This ensures that the charge given to the master by the charge corona wire does not exceed -750 Volts.	9
Marker	This stamps a red circle on each page that is successfully fed through the scanner.	15

Name	Description	No.
Power Pack	This supplies high voltages to the corona wires and the development bias terminal.	22
Fusing Lamp	This fuses the toner to the paper.	6
Thermistor	This monitors the temperature inside the fusing unit.	8
Thermostat	This interrupts the ac power supply to the fusing lamp if the temperature exceeds 400 °C.	4
Lower Cassette Indicator Panel	This contains indicators to show the status of the lower cassette.	40

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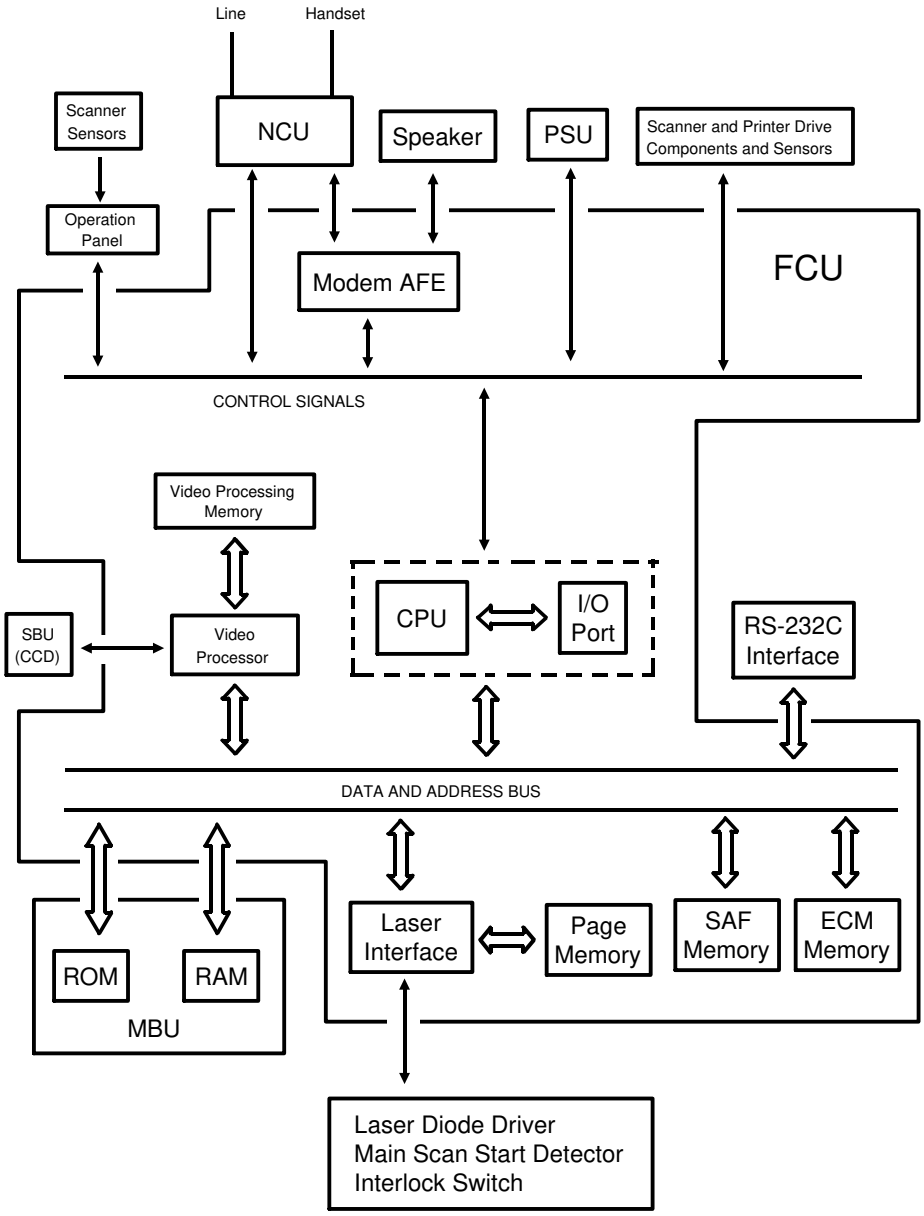
1.4. OVERALL MACHINE CONTROL



The cpu on the FCU board controls the machine, as shown in the above drawing.

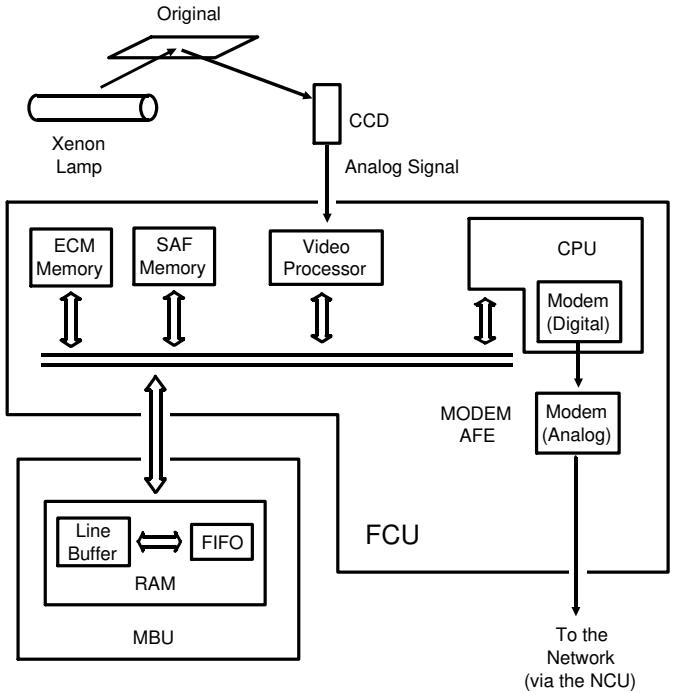
There is no modem board in the machine. The cpu performs the digital functions of a modem and carries out digital to analog conversion of facsimile data. There is a separate analog modem chip, called the Modem AFE, which does the rest of the modem operations.

1.5. VIDEO DATA PATH

The following diagrams show the data path for this model.

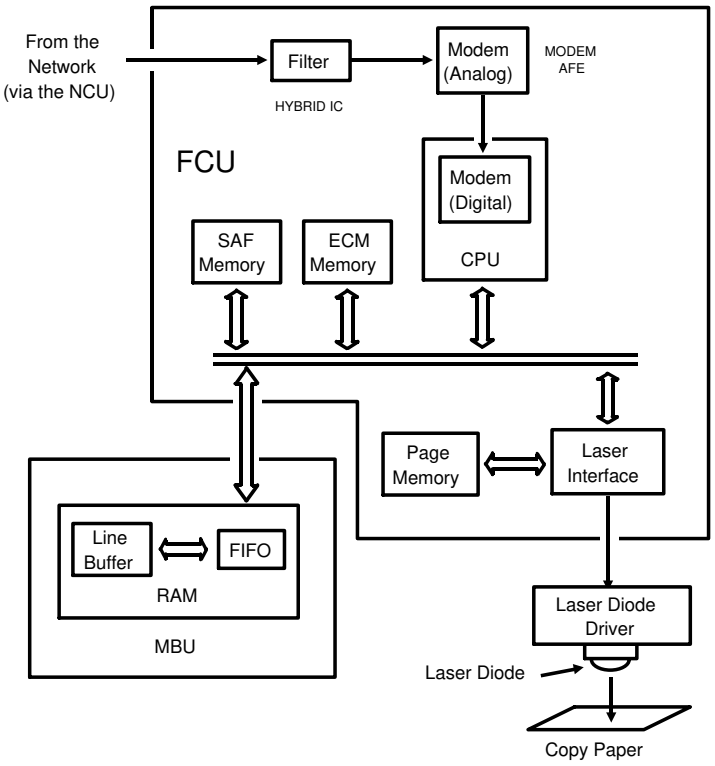
1.5.1. Transmission

Reference:
Group 3 Facsimile Manual, section 1-3-1



1.5.2. Reception

Reference:
Group 3 Facsimile Manual, section 1-3-2



1.6. POWER DISTRIBUTION

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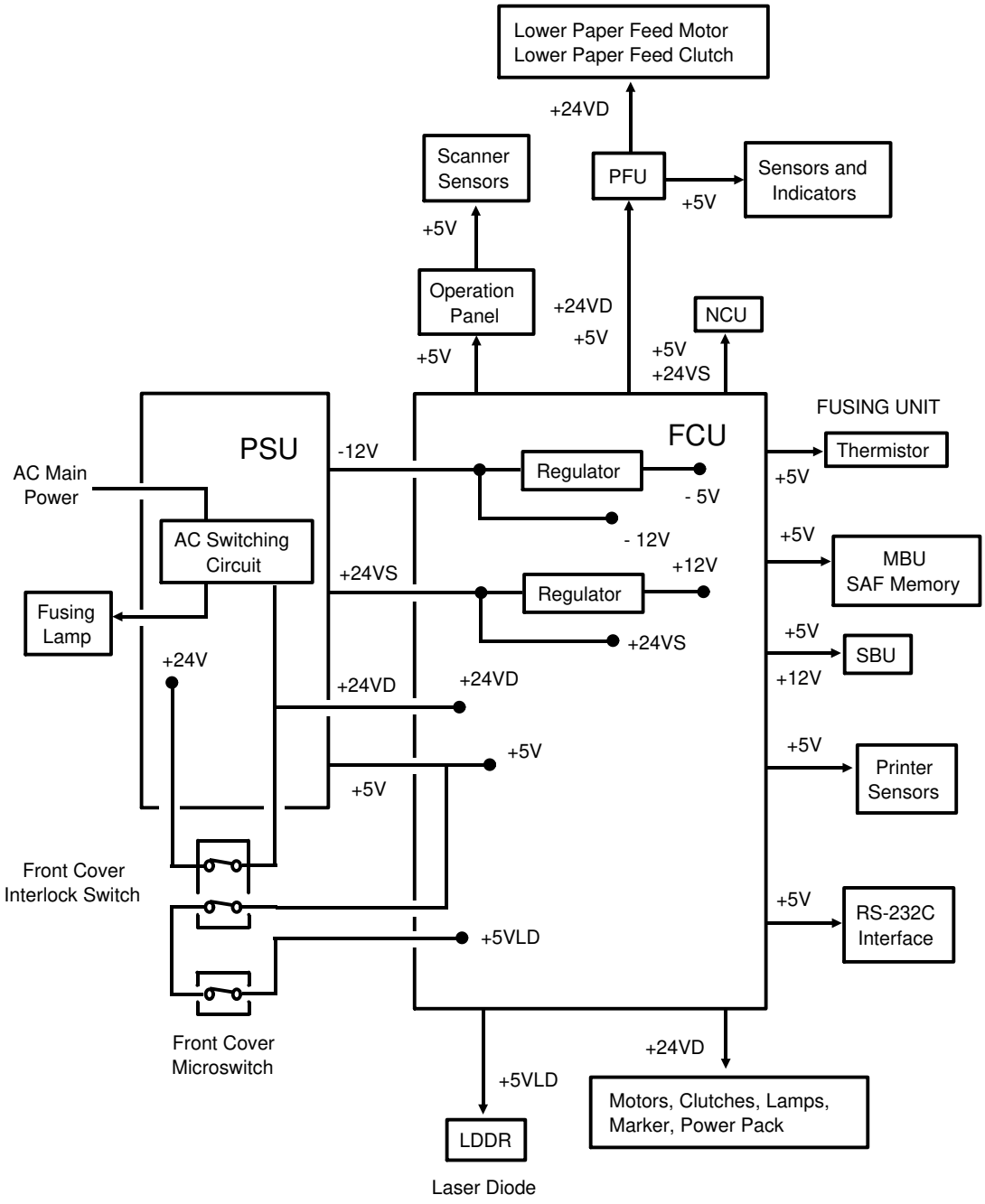
1.6.1. Distribution Diagram

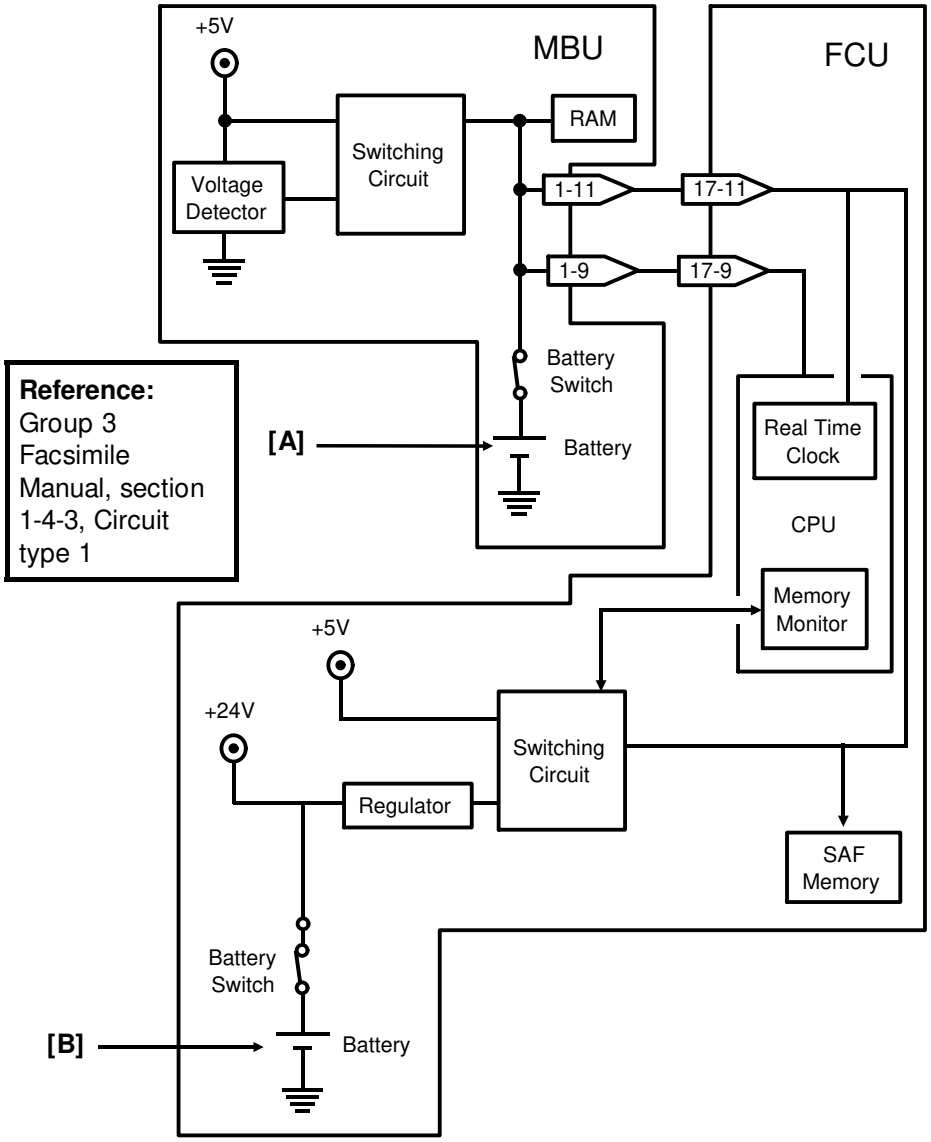


The laser diode is powered by a special + 5V supply, called + 5VLD.

There are two + 24V power supplies:

- + 24VS: This is always on when the main switch is on.
- + 24VD: This is interrupted if the front cover interlock switch opens. There is no + 24VD activation signal from the cpu to the PSU.

1.6.2. Memory Back-up Circuit



The battery [A] on the MBU backs up the RAM on the MBU, which contains system parameters. It also backs up the real time clock in the cpu. This battery is not rechargeable. CN1-9 tells the cpu whether back-up power (CN1-11) comes from the battery or the + 5V power supply.

A rechargeable battery [B] on the FCU board backs up the SAF memory and the real time clock for 1 hour. While the main power is on, the + 24V supply recharges the battery.

If there is data in the SAF memory, the rechargeable battery [B] also backs up the real time clock, to preserve the MBU battery.