RICOH RS232 PC–FAX EXPANDER TYPE 100
SERVICE MANUAL

RICOH RS232 PC–FAX EXPANDER TYPE 100
PARTS CHECKLIST

1. Installation Guide
2. User's Guide
3. DIU PWA Assembly
4. IC, System ROM (Flash) Type 100 Upgrade
5. Harness, Internal DIU–FCE
6. Bracket
7. Screws, M3 x 6, (5)
8. Wrist Strap, Disposable Ground
9. Ricoh Bitware by Cheyenne Faxing Software
10. Ricoh CFM TWAIN Driver

Additional Requirements:

RS-232 Serial Cable, User Supplied
Flash/SRAM Copy Tool
Universal EPROM PCB

Standards Applied

- EIA/TIA RS-232 (up to 19.2k bps internal speed)
- EIA/TIA-578 (Class 1)
- EIA/TIA-SP2388A (Class 2)

Installation Method

- Service installation
- Program is downloaded with FLASH/RAM copy tool from EPROM board

Agency Approvals

- FCC part 15, Class A (USA)
- IC Class A (CANADA)
- UL, cUL

Compatibility

PC/AT:	Hardware:	80386DX-33MHz, 80486DX2-66MHz, Pentium 100MHz
	OS:	DOS 6.X, Windows 3.1, WFW 3.11, Windows 95
	FAX Applications:	Ricoh Bitware by Cheyenne, WinFax PRO, WinFax Lite, FaxWorks, Eclipse FAX, WinFax Pro for Networks, DOS Fax, BitFax
Apple:	Hardware:	68040 33/66MHz, Power PC 60MHz to 100MHz
	OS:	Mac OS (System 7.X)
	FAX Applications:	Fax Pro

1. INTRODUCTION

The Ricoh RS-232 PC–FAX Expander Type 100 is a service-installed fax option kit that will add an RS-232 serial interface—the Digital Interface Unit (DIU)—to the Ricoh FAX2400L, FAX2700L, and FAX3700L fax machines. With a serial transmission cable provided by the customer, the DIU is connected from the fax machine to a personal computer serial communication port. When installed, it will allow the PC to use the fax machine to

- **TRANSMIT AND RECEIVE** fax messages directly from the PC through the FAX machine.
- **SCAN** documents, from the FAX machine into the PC
- **PRINT** fax messages from the PC through the FAX machine.

NOTE: The PC–FAX Expander Type 100 will operate with the 300 dpi Type 100 Printer Interface option for improved print quality.

The option's new software will load a new User Parameter switch (14) to the fax machine's parameter switches; it will add a new fax function (16) to enable scanning from the fax machine to PC, and function (24) to reduce time the fax is occupied with redials.

The option kit includes

- **FIRMWARE** that modifies the fax machine's System flash ROM,
- **A FAXING APPLICATION** (Ricoh Bitware by Cheyenne) to be installed in the PC.
- **A TWAIN DRIVER** (Ricoh CFM TWAIN) to be installed in the PC.

Not included in the option are

- The RS-232 serial cable used to connect the fax machine with the PC.
- A null modem adapter. (The null modem function is built into the DIU.)

Foreign Language Capability

The standard base fax machine comes with multi-lingual capability. Space considerations for the PC-Fax Expander has forced the elimination of this ability. After the PC-Fax Expander option is installed, the fax machine will not display instructions or print reports in French or Spanish. Function 93, language selection, will not be available.

2. FUNCTIONS

2.1 PC–FAX EXPANDER TYPE 100 FUNCTIONS

- Direct transmission and reception
- Fax SAF memory transmission and reception
- Local printout
  - PC–FAX Expander modem emulation (no printer emulation)
  - 200 x 200 dpi with Super Smoothing
  - 1 ppm
- Local scanning
  - PC–FAX Expander modem emulation
  - 200 x 200 dpi
  - 1 ppm

2.2 PC–FAX EXPANDER TYPE 100 FEATURES

- Class 1 communication
- Class 2 communication

2.3 FUNCTIONS AND COMMUNICATION CLASS MODES

Direct Transmission	Class 1 and Class 2
Direct Reception	Class 1 and Class 2
SAF Memory Transmission	Class 2
SAF Memory Reception	Class 2
PC Scan	Class 1 and Class 2
PC Print	Class 1 and Class 2

2.4 FAXING APPLICATION

The PC must contain a faxing application. The Ricoh Bitware by Cheyenne faxing software included in the PC-Fax Expander kit, can be installed by following the manual instructions.

2.5. TWAIN CAPABILITY

When the TWAIN driver is installed, scanning parameters such as contrast, resolution, and halftone, can be set at the PC. Also, the PC will work with TWAIN compatible scanners.

3. QUICK LOOK AT THE PC–FAX EXPANDER TYPE 100

Comparison

Feature	Type 100	FAX2500L, FAX2600L, FAX3500L
Modem Class	Class 1 Class 2	Class 2
(Dual Access)*	(Yes)	No: Fax is busy
Null Modem	Built into DIU	Additional hardware requirement
Memory File Deletion	Function 24	Function 21
User Parameter Switch	Switch 14	Switch 7
Scanning Function	Function 16	Function 17
TWAIN	Compatible	No

3.1 BASIC TRANSMISSION PROCEDURE

- Check the settings.

	Class 1 Direct	Class 2 Direct	Class 2 Memory
•	Fax machine is on. PC is on and running the faxing application.		
•	PC: Modem is Class 1.	PC: Modem is Class 2.	PC: Modem is Class 2.
•	FAX needs no special setting.	FAX: User Parameter BitSw 14-0 is 0.	FAX: User Parameter BitSw 14-0 is 1 FAX: User Parameter BitSw 14-2 is: 0 Send No TTI 1 TTI
1.	PC: Prepare file or message for sending.		
2.	PC: Call up dialing (or sending) dialog box.		
3.	PC: Enter recipient's name.		
4.	PC: Dial recipient's fax number.		PC: Dial number, or use: # (Quick Dial No.), # * (Speed Dial No.), # * * (Group No).
5.	PC: Click Start (Send).		

To change the user parameter switch 14 settings, see section 5.1.

3.2 THE DIALING CODES

Quick Dial, Speed Dial, and Group Dial numbers must be pre-programmed at the fax machine. They can be used as memory transmission destination addresses by the PC faxing application when preceded by the symbols, # , # *, or # * * .

Example:

TO DIAL	ENTER (AT PC)
QUICK DIAL 01	# 01
SPEED DIAL 2 0	# * 2 0
GROUP 6	# * * 6

3.3 BASIC RECEPTION

- Check the settings.

	Class 1 Direct	Class 2 Direct	Class 2 Memory
•	Fax machine is on. PC is on and running the faxing application.		
•	PC is set for automatic answering.		
•	PC: Modem is Class 1.	PC: Modem is Class 2.	PC: Modem is Class 2.
•	FAX needs no special setting.	FAX: User Parameter BitSw 14-1 is 0.	FAX: User Parameter BitSw 14-1 is 1. FAX: User Parameter BitSws 14-3 and 4 are: 0 0 print at FAX 1 0 send to PC 1 1 print at FAX and send to PC

To change the user parameter switch 14 settings, see section 5.1.

3.4 USING THE FAX MACHINE'S SCANNER

- Check the settings.

	Class 1 or Class 2
•	Fax machine is on. PC is on and running the faxing application.
•	PC is set for automatic answering.
•	FAX: Check for Contrast, Resolution (Standard or Detail), Halftone
1.	FAX: Place document in feeder.
2.	FAX: Press **Function** key
3.	FAX: Type numbers **1 6**. at the ten-key pad.
4.	FAX: Press **Yes**.
5.	FAX: Press **Start**.

3.5 USING THE FAX MACHINE'S PRINTER

- Check the settings

	Class 1 or Class 2
•	Fax machine is on. PC is on and running the faxing application.
1.	PC: Change printer selection to faxing software option.
2.	PC: Select the file to print.
3.	PC: Select the Print command and print options. Click OK.
4.	PC (dialing or sending dialog box) Dial **0 0 0 0**.
5.	PC: Click Start (Send).

4. PC–FAX EXPANDER TYPE 100 DESCRIPTION

The DIU is (Digital Interface Unit) connected directly to the fax machine's data/address bus. The signal flow is controlled by two settings: the PC modem setup, and a special PCFE Type 100 fax bitswitch, User Parameter Switch 14. The PCFE Type 100 is compatible with Class 1 and Class 2 communication modes. Either mode can be selected for PC modem setup.

When the PC modem is set for Class 1, the Parameter switch is inactive. When the PC modem is set for Class 2, The User Parameter switch governs the data flow through the fax machine. It can also restrict the sending the fax machine's TTI.

4.1 DIRECT TRANSMISSION

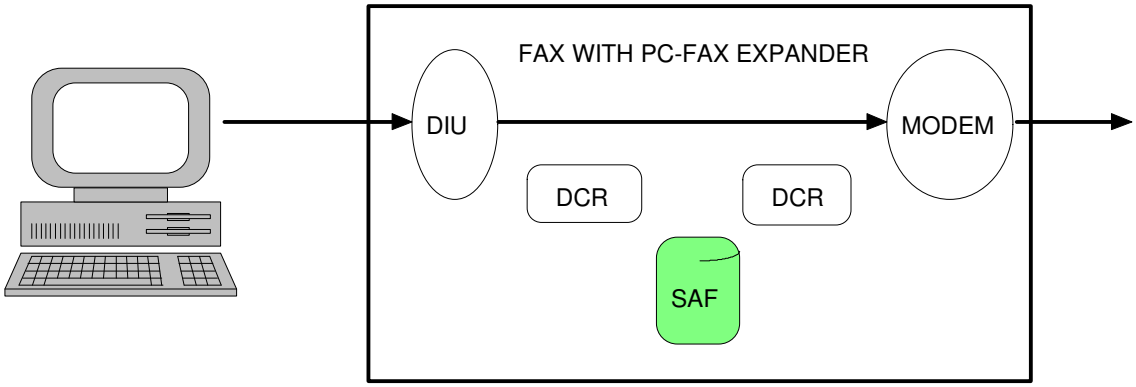
Class 1 **ALL** Class 1 transmissions are **direct** transmissions, bypassing the fax machine processes, such as data compression and ECM/SAF memory. The PC–FAX Expander will not use the communication protocol signals that are originated by a PC faxing application. The data that is faxed by the PC is sent directly through the fax machine modem. The resources of the fax machine are not used, except for it's modem.

The communications have the characteristics provided by the PC faxing application. For example, faxing applications use MH compression and the MMR technique resident in the fax machine DCR (Data Compression and Reconstructor) will not be available.

Class 1 communications will allow ECM and Binary File Transfer (BFT) from PC application files to remote devices capable of receiving such files.

Class 2 Direct Class 2 transmissions will bypass the fax machine DCR and memory functions and use the fax machine as an external faxmodem. In Class 2, the fax machine modem originates and exchanges protocols with remote devices, resulting in more reliable communication than Class 1.

Class 2 communications do not permit BFT.



4.2 DIRECT RECEPTION

Class 1 and Class 2 receptions use the PCFE Type 100 fax machine as an external faxmodem. The process is similar to direct transmission—the fax data route will bypass the fax machine processes, such as DCR and ECM/SAF memory.

Signal flow is controlled by:

- selecting Class 1 or Class 2 at the PC modem setup and
- the bitswitch settings of User Parameter Switch 14.

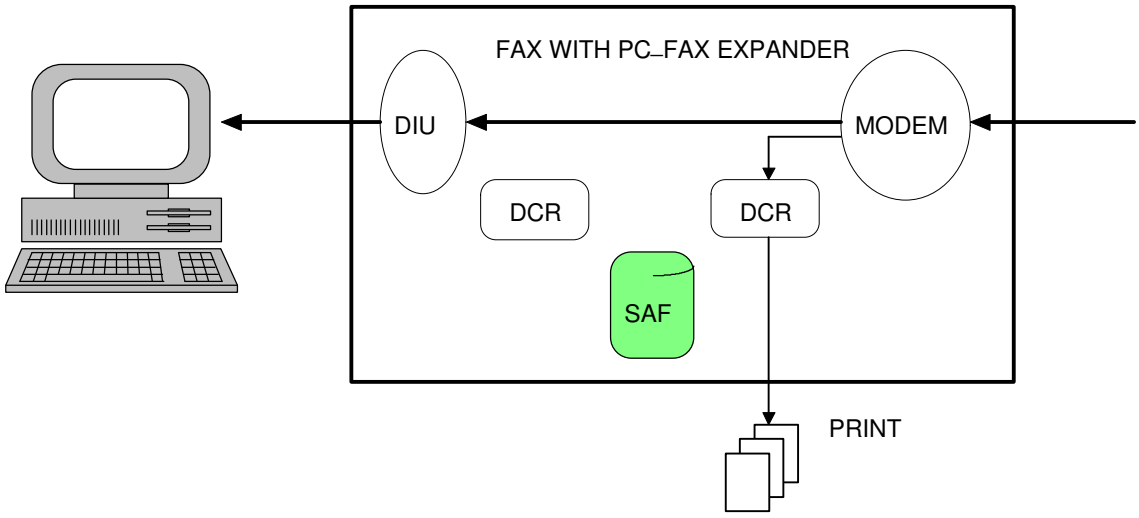
To receive a direct communication, the PC power must be on, and the PC faxing application must be running and set for Auto Receive.

Class 1 **ALL** Class 1 receptions are **direct** receptions. The fax machine DCR and ECM/SAF processes are bypassed, **UNLESS** the PC is unable to receive. Then, the incoming fax data will be sent to the DCR as in a normal G3 reception. The message will then be reconstructed and printed by the fax machine.

The PC–FAX Expander will pass on the communication protocol signals that were originated by a PC faxing application.

Class 2 Direct Class 2 receptions will not use the fax machine DCR and memory functions, **UNLESS** the PC is unable to receive. Then, the incoming message is printed by the fax machine.

The fax machine is used as an external faxmodem, exchanging protocols with remote devices.



4.3 MEMORY TRANSMISSION

PC–FAX Expander Type 100 memory transmissions are always in the Class 2 mode, which is selected at the PC faxing application modem setup. The PCFE Type 100 User Parameter Switch 14 settings become effective only in Class 2 mode. If Class 1 is selected, the transmission will automatically becomes a direct transmission, regardless of the switch setting.

In memory transmissions, the PC will send the image data and the destination address to the fax machine, which accumulates the information in the SAF memory. After all the information is accumulated, the fax machine will send it on to its destination as a normal fax transmission.

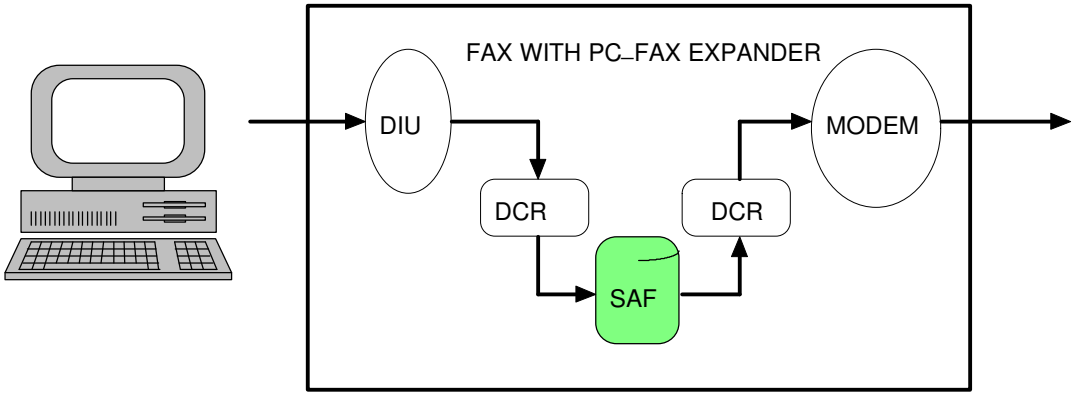
The following fax machine functions are available to the user with Class 2 memory transmissions:

- ECM and MMR
- Special PC codes for programmed Quick Dials, Speed Dials, and Group Numbers (#, # ∗, and # ∗ ∗)
- Additional TTI processing
- Automatic redialing
- Fax TCR and Error Report items
- PC Document accumulation result report

Quick Dials, Speed Dials, and Group Numbers must be pre-programmed in the fax machine before the special dialing codes can be used at the PC.

SAF Memory Overflow

If the SAF memory capacity is reached, the accumulated image data in memory will be sent as one file. An error report is issued by the fax machine.



Memory TX File Quick Delete (Fax Function 24)

The fax machine will redial a destination automatically if it does not receive an answer, or if it encounters a busy signal, or if a message is rejected because of excessive errors or protocol problems. The fax machine is set at the factory to redial 4 times every 5 minutes for memory transmissions. PCFE has added Fax Function 24 to the base machine's functions to privide a quick way to delete a memory transaction file to cirumvent redialing.

Ready Mode display	READY 100% 10:00AM SET DOC. OR DIAL NO.
Press **Function 2 4 Yes**	FILE NO.*** KPAD/ ◄► PRINT LIST ◄/SEARCH ►
Press ►	FILE NO. 002 Y/ ◄► [DIALING NO. OR NAME]
Press **Yes**	FILE NO. 002 Y/N CLEAR?
Press **Yes**	FILE NO. 002 Y/N CLEARED
Wait	READY 100% 10:00AM SET DOC. OR DIAL NO.

4.4 MEMORY RECEPTION

PC–FAX Expander Type 100 memory receptions are always in the Class 2 mode, which is selected at the PC faxing application modem setup. The PCFE Type 100 User Parameter Switch 14 settings become effective only in Class 2. If Class 1 is selected, the reception will automatically become a direct reception, regardless of the switch setting. In the memory reception mode, the Fax Machine will accumulate the incoming data and will direct it to the location specified by the user parameter switch 14, bits and 3 and 4.

Parameter Switch 14 bits 3 and 4 have several options for directing the output in memory receptions:

Bit 4 3

- (00) image data is printed as a normal fax reception
- (01) accumulated in the SAF memory and transferred to the PC
- (11) accumulated in the SAF memory, transferred to the PC **AND** printed by the fax machine

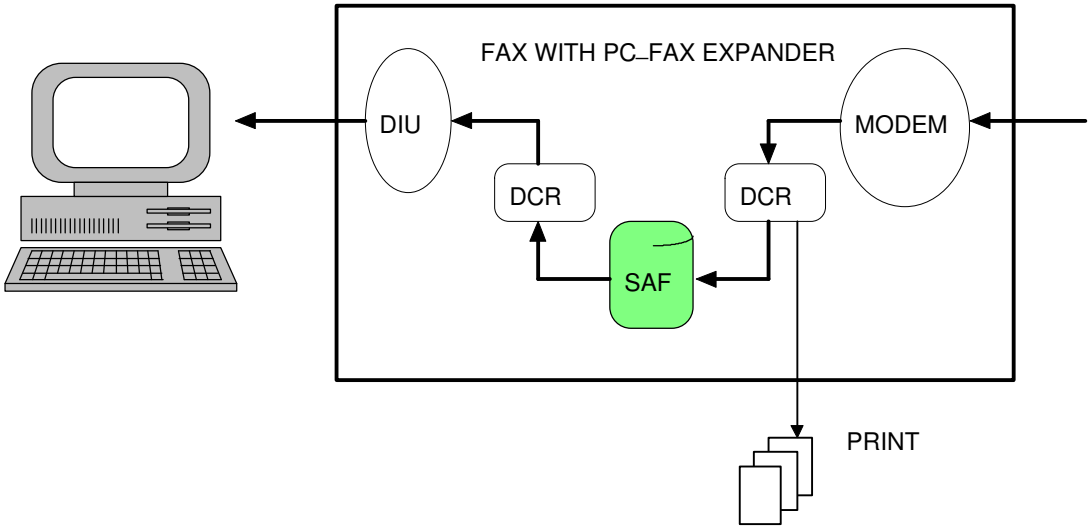
Fax machine resources are available in Class 2 memory receptions:

- ECM and MMR
- Re-transmit to the PC

If the PC is unable to answer the fax machine, the incoming message will be printed by the fax machine.

SAF Memory Overflow

If the SAF memory capacity is reached, the accumulated pages in memory will be sent as one file. An error report is issued by the fax machine.



4.5 SCANNING (Fax Function 16)

With Function 16, the fax machine will scan a document and send it to the PC, where it will be received by the faxing application.

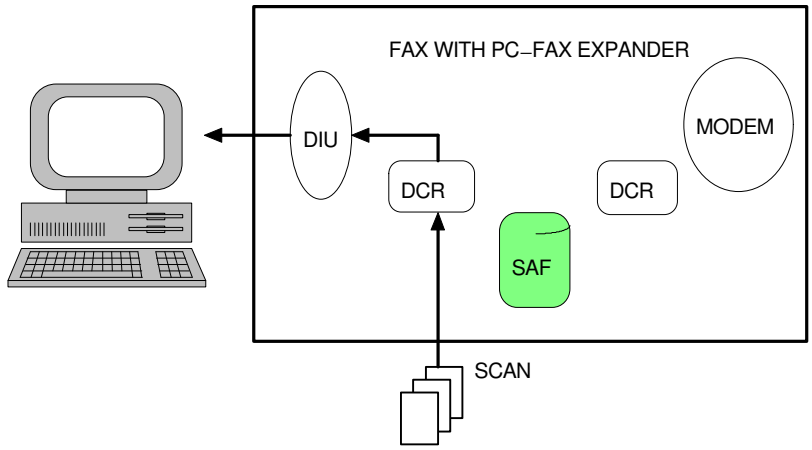
Scanning rom the FAX machine is like sending a FAX message to the PC. For the PC, receiving the scanned image is the same as receiving a fax as described in the faxing software manual. Scanning can be performed in either class 1 or class 2 communication mode.

Function 16 changes the resolution selections. The available resolutions are:

- STD (normal characters)
- DTL (small characters)

Fine Mode is not available. If it is set, the resolution will default to DTL.

All other transmission options are disabled during the scanner operation, including TTI. The transaction will be identified in the TCR. An error will terminate the process and generate an error report.



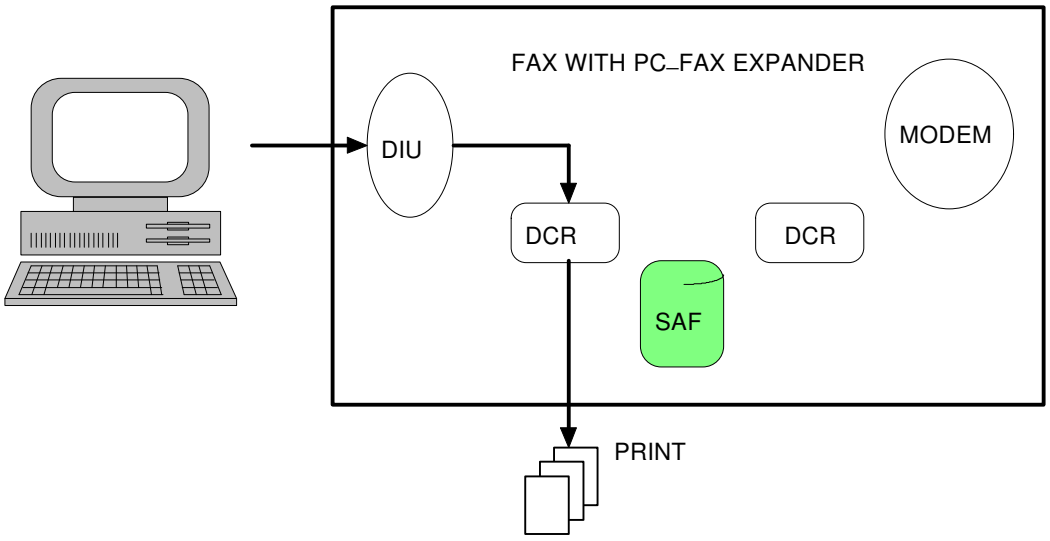
4.6 PRINTING

The PC–FAX Expander can use the fax machine as a printer for the PC. Using the special four digit number, 0 0 0 0 as a destination number. The faxing application can send a document to the PC–FAX Expander for printing. The communication mode can be either Class 1 or 2.

If the fax machine is out of paper or a jam occurs, the document will accumulate in the SAF memory, **IF**

- the PC is set for Class 2, **AND**
- the User Parameter Switch 14, Bit 1 is set to1 (memory reception).

The document will be printed after the problem has been corrected.



5. PC–FAX EXPANDER USER PARAMETER SWITCH 14

The PC–FAX Expander adds a new user parameter switch to the fax machine's operations. It is only effective when the PC faxing application is set for Class 2 mode.

BIT	FUNCTION	DEFAULT
0	CLASS 2 TRANSMISSION 0 : DIRECT 1 : MEMORY	0
1	CLASS 2 RECEPTION 0 : DIRECT 1 : MEMORY	0
2	FAX TTI CLASS 2 MEMORY TRANSMISSIONS (BIT 0 IS 1) 0 : NO FAX TTI 1 : SEND FAX TTI	0
3 4	OUTPUT DESTINATION FOR MEMORY RECEPTION. (BIT 1 IS 1) PRINT AT FAX / SEND TO PC* / SEND TO PC AND PRINT AT FAX 0 / 1 / 1 0 / 0 / 1	0 0
5	DO NOT CHANGE THE FACTORY SETTING.	0
6	DO NOT CHANGE THE FACTORY SETTING.	0
7	DO NOT CHANGE THE FACTORY SETTING.	0

* If the PC is unable to receive the fax message, it will be printed by the fax machine.

5.1 PROGRAMMING THE PARAMETER SWITCH

Bold type indicates the operator panel key to be pressed.

Ready Mode display

```
READY   100%  10:00AM
SET DOC. OR DIAL NO.
```

Press **Function 6 2 2 2 2 6 3 Yes**.

```
SETTING?          Y/◄
PRINT LIST ◄
```

At this time, print the User Parameter list, press ◄ and **Start**.

Press **Yes** and ◄.

```
            KPAD/ Y/◄►
SWITCH 14 : 0000 0000
```

To change a setting, press a keypad number corresponding to the bit number. For example, for Class 2 Memory transmission:

Press **0**.

```
            KPAD/ Y/◄►
SWITCH 14 : 0000 0001
```

Press **Yes**.

```
            KPAD/ Y/◄►
      PROGRAMMED
```

Wait.

```
FUNCTION     Y/NEXT/ ►
6 INITIAL MODE
```

Press **Function**.

```
READY   100%  10:00AM
SET DOC. OR DIAL NO.
```

6. PC–FAX EXPANDER SCANNING FUNCTION 16

The PC–FAX Expander has added a new function (16) to the fax machine's set of user functions. It is used to scan documents into the PC faxing application.

- The PC fax software should be running and set for automatic answering.
- Check image quality selections: Contrast, Resolution (Standard and Detail only), and Halftone .

Bold type indicates the operator panel key to be pressed.

Ready Mode Display	READY 100% 10:00AM SET DOC. OR DIAL NO.
Press **Function 1 6 Yes**.	SCANNER MODE SET DOCUMENT
Set the document, face down, in the document tray.	SCANNER MODE START PUSH START
Press **Start**. *Wait.* * If programmed.	[PC ID APPEARS*] A4→A4 TRANSMIT
Wait.	READY 100% 10:00AM SET DOC. OR DIAL NO.

7. SERVICE LEVEL FUNCTIONS

For PC–FAX Expander maintenance purposes, a service level function has been modified and a new service test function has been added to the basic machine service level capabilities.

- Protocol Dump Function 05 has a new selection for the PC–FAX Expander.
- DIU Diagnostics Function 15 is a new function to test the PC–FAX Expander hardware.

Bold face type indicates the key to be pressed.

7.1 PC–FAX EXPANDER PROTOCOL DUMP

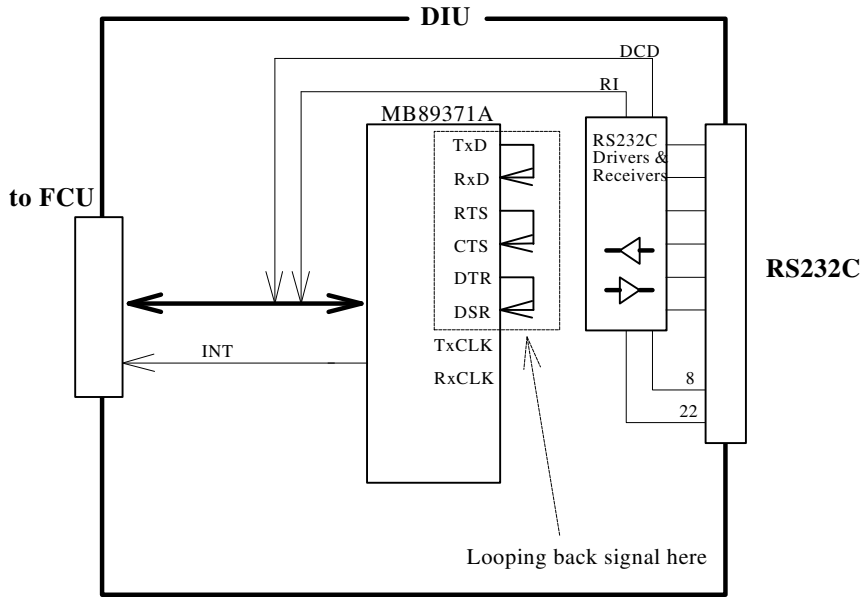
Ready Mode display	READY 100% 10:00AM SET DOC. OR DIAL NO.
Press **Function 6 1 9 9 5 Yes**.	FUNCTION KPAD/NEXT ▶ $ $ SERVICE FUNCTIONS
Press **0 5**.	SERVICE Y/NEXT ▶ 05 PROTOCOL DUMP
Press **Yes**.	0–G3 1–PC
Press **1**.	START PC PROTOCOL DUMP
Press **Start**. (Printing)	PC PROTOCOL DUMP
(PC–FAX Expander Protocol List has printed.)	START PC PROTOCOL DUMP
Press **Function**.	READY 100% 10:00AM SET DOC. OR DIAL NO.

7.2 PC–FAX EXPANDER DIU HARDWARE TEST

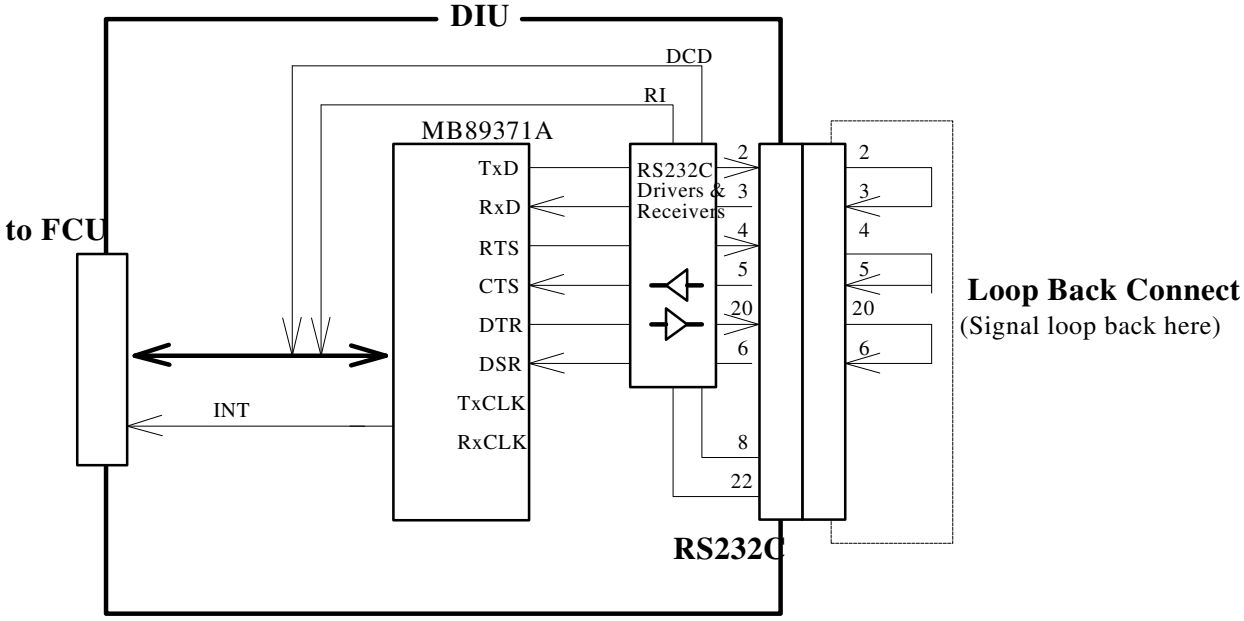
1. DIU Diagnostic Test Diagrams

Function 15 contains two hardware inspection tests for the PC–FAX Expander, an internal test and an external test.

- An internal DIU LSI loop back test, which does not require additional hardware.



- An external test of the RS-232 drivers and receivers, which will require a loop back connector onto the RS-232 connector BEFORE selecting this test mode.



2. DIU Internal Test

Ready Mode display	READY 100% 10:00AM SET DOC. OR DIAL NO.
Press **Function 6 1 9 9 5 Yes**.	FUNCTION KPAD/NEXT ▶ $ $ SERVICE FUNCTIONS
Press **1 5**.	SERVICE Y/NEXT ▶ 15 DIU TEST
Press **Yes**.	DIAGNOSTICS MODE 0–DIU 1–LOOP BACK
Press **0**.	TEST RUNNING WAIT ABORT PRESS STOP
(DIU is OK)	DIU TEST COMPLETED
(DIU is not OK)	DIU ERROR
(Cable failure)	DIU NOT FOUND
Press **Function**.	READY 100% 10:00AM SET DOC. OR DIAL NO.

3. DIU External Test

This test requires connecting a Loop Back connector onto the DIU RS-232 **BEFORE** the test begins.

Ready Mode display	READY 100% 10:00AM SET DOC. OR DIAL NO.
Press **Function 6 1 9 9 5 Yes**.	FUNCTION KPAD/NEXT ▶ $ $ SERVICE FUNCTIONS
Press **1 5**.	SERVICE Y/NEXT ▶ 15 DIU TEST
Press **Yes**.	DIAGNOSTICS MODE 0–DIU 1–LOOP BACK
Press **1**.	TEST RUNNING WAIT ABORT PRESS STOP
(RS-232 driver is OK)	L.B. TEST COMPLETED
(Driver is not OK)	LOOP BACK ERROR
(Cable failure)	DIU NOT FOUND
Press **Function**.	READY 100% 10:00AM SET DOC. OR DIAL NO.

8. PC–FAX EXPANDER REPORTS

8.1 TRANSMISSION CONFIRMATION REPORT – TCR

```
                        ***  TCR(JUN 10 1995  5:00PM)  ***
                                                TTI    XYZ COMPANY
<TX>
DATE    TIME      ADDRESS           MODE   TIME    PAGE   RESULT PERS. NAME  FILE
------------------------------------------------------------------------------
JUN 10   9:00AM   NEW YORK OFFICE   TS     0'40"   P. 1     OK               001
        10:21AM   PCFAX (CSI)       T*D    0'32"   P. 1     OK               002
         1:00PM   TOKYO OFFICE      TMS    1'30"   P. 1     OK               004
         3:03PM   PCFAX (CSI)       T*M@S  0'58"   P. 1     OK               005
         4:57PM   NEW YORK OFFICE   T%S    0'58"   P. 1     OK               006
<RX>
DATE    TIME      ADDRESS           MODE   TIME    PAGE   RESULT PERS. NAME  FILE
------------------------------------------------------------------------------
JUN 10  11:30AM   PCFAX (CSI)       R*S    0'44"   P. 1     OK               003
        12:58PM   PCFAX (CSI)       R*MS   2'15"   P. 1     OK               004
         3:03PM   LONDON OFFICE     RMS    0'30"   P. 1     OK               005
         4:30PM   NEW YORK OFFICE   R%S    0'30"   P. 1     OK               007


TX        000004              RX             000003

# : BATCH        C : CONFIDENTIAL      $ : TRANSFER        P : POLLING
M : MEMORY       L : SEND LATER        @ : FORWARDING      E : ECM
S : STANDARD     D : DETAIL            F : FINE            > ; REDUCTION
* : PC           % : PC DIRECT
```

New Symbols

- * : PC with Fax Application
- % : Direct TX or RX

"PCFAX" represents the Called Station Identifier (CSI) for the PC's faxing application.

Transmit Files for June 10

File 1 (9:00AM)	Standard G3 fax to New York.
File 2 (10:21AM)	Scanning to PC. Function 16
File 4 (1:00PM)	Memory transmission (Receive File 4) to Tokyo.
File 5 (3:03PM)	Forwarding fax (Receive File 5) from memory to PC.
File 6 (4:57PM)	Direct PC transmission to NewYork.

Receive Files for June 10

File 3 (11:30AM)	Printing from PC. Dial 0000.
File 4 (12:58PM)	Memory reception from PC. See also Transmit File 4.
File 5 (3:03PM)	Memory reception from London. See also Transmit File 5.
File 7 (4:30PM)	Direct PC reception from New York.

8.2 MEMORY TRANSMISSION COMMUNICATION REPORTS

Result Report

```
          ***  COMMUNICATION RESULT REPORT(JUN 11 1995 11:00AM)  ***
                                                          TTI         XYZ  COMPANY

FILE   MODE             OPTION       ADDRESS (GROUP)    RESULT          PAGE
-------------------------------------------------------------------------------
001    PC MEMORY TX                  408-434-5390       OK

-------------------------------------------------------------------------------
REASON FOR ERRORS
             1)HANG UP LINE FAIL          2)BUSY
             3)NO ANSWER                  4)NO FACSIMILE CONNECTION
```

Failure Report

```
          ***  COMMUNICATION FAILURE REPORT(JUN 11 1995 11:05AM)  ***
                                                          TTI         XYZ  COMPANY

FILE   MODE             OPTION       ADDRESS (GROUP)    RESULT          PAGE
-------------------------------------------------------------------------------
002    PC MEMORY TX                  408-434-5390       E-2)2)2)2)2)    P. 1

-------------------------------------------------------------------------------
REASON FOR ERRORS
             1)HANG UP LINE FAIL          2)BUSY
             3)NO ANSWER                  4)NO FACSIMILE CONNECTION
```

"PC MEMORY TX" is a new mode name for PC–FAX Expander memory transmissions.

9. INSTALLATION

9.1 WITHOUT PRINTER INTERFACE

Tools required : Philips metric screwdriver set; Flash/SRAM copy tool, and the unicersal EPROM PCB.
Additional part required : RS-232 male-female serial cable fitted with either DB25-pin and DB25-socket connectors, or DB25-pin and DB9-socket connectors.

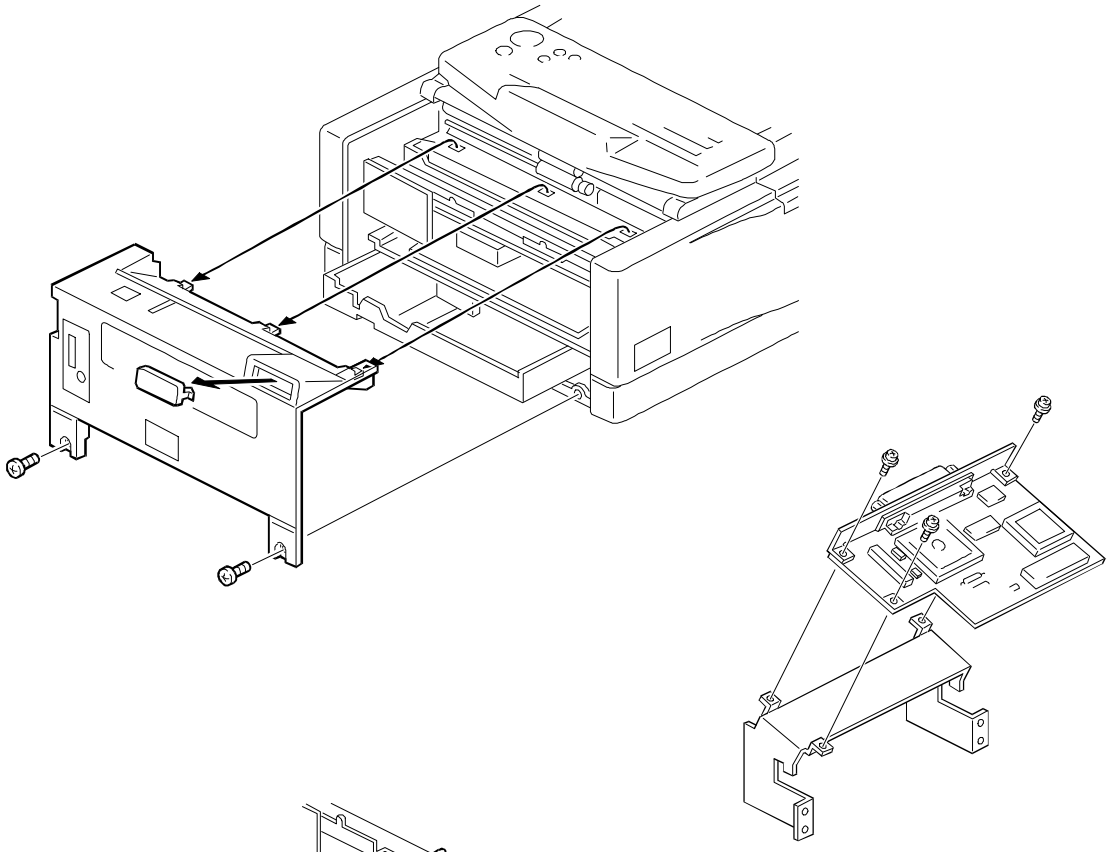
1. Print all messages that are stored in the SAF memory.
2. Turn off the power and unplug the machine from the wall outlet.
3. Remove the rear cover and the small RS-232 cover (2 screws).
4. Fasten the DIU assembly onto the bracket (3 screws).
5. Mount the DIU-and-bracket assembly onto the chassis (2 screws).
6. Plug the Expander's internal harness to the DIU at CN2.
7. Connect the other end of the harness to the FCE at CN3.
8. Re-install the rear cover.
9. Turn off and unplug the PC from the wall outlet.
10. Connect the fax machine from the DIU port to the PC 25-pin or 9-pin port with the serial cable.

CAUTION : Ensure that all connections have been properly made before turning on the power and performing to the next steps.

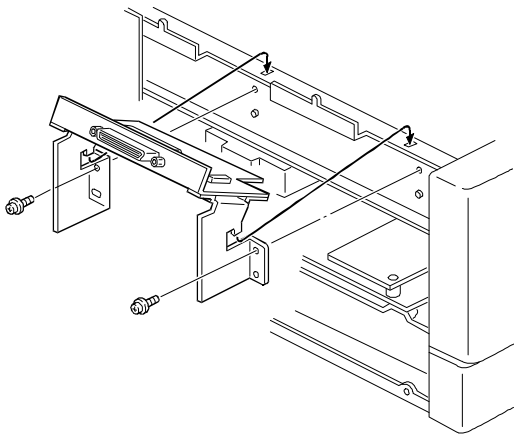
11. Perform the procedure in FSM section 4.1.20 and download the new software from the enclosed system ROM into the Flash ROM of the FAX machine.
12. Re-program the fax machine as necessary.

Ensure that the correct PC port has been selected, the MS–DOS diagnostics program should be run to check the COM port availability and the IRQ status.

WITHOUT PRINTER INTERFACE



5



9.2 WITH PRINTER INTERFACE

Tools required : Philips metric screwdriver set; Flash/SRAM copy tool and the universal EPROM PCB.
Additional part required : RS-232 male-female serial cable fitted with either DB25-pin and DB25-socket connectors, or DB25-pin and DB9-socket connectors.

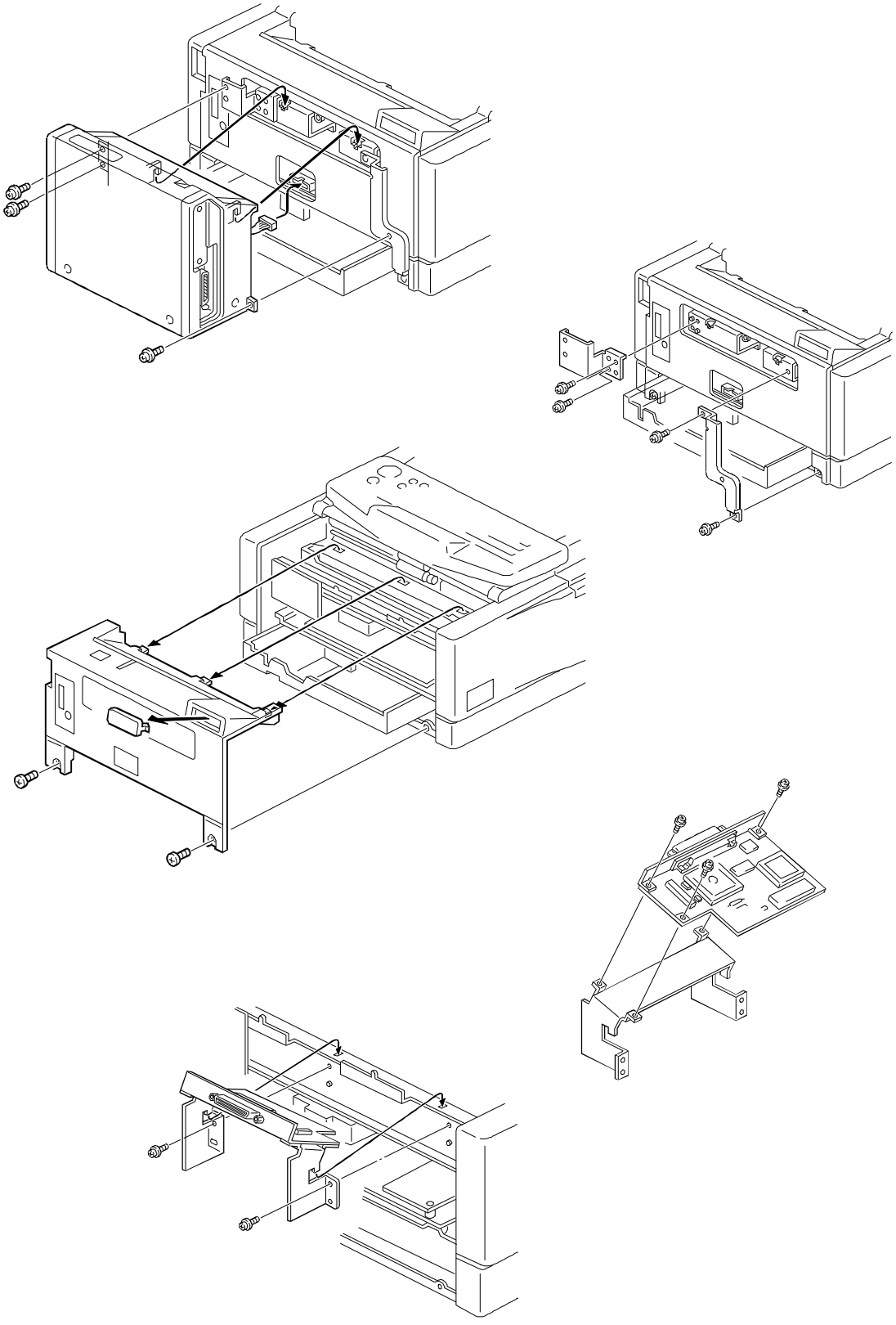
1. Print all messages that are stored in the SAF memory.
2. Turn off the power and unplug the machine from the wall outlet.
3. Remove the Printer Interface, disconnecting the harness (2 hooks, 3 screws).
4. Remove the outer brackets (4 screws).
5. Remove the rear cover, and the small RS-232 cover (2 screws).
6. Fasten the DIU assembly onto the bracket (3 screws).
7. Mount the DIU-and-bracket assembly onto the chassis (2 screws).
8. Plug the Expander's internal harness to the DIU at CN2.
9. Connect the other end of the harness to the FCE at CN3.
10. Replace the rear cover, the brackets, and the Printer Interface.
11. Turn off and unplug the PC from the wall outlet.
12. Connect the fax machine from the DIU port to the PC 25-pin or 9-pin port of the PC with the serial cable.

CAUTION : Ensure that all connections have been properly made before turning on the power and performing to the next steps.

13. Perform the procedure in FSM section 4.1.20 and download the new software from the enclosed system ROM to the Flash ROM.
14. Re-program the fax machine as necessary.

Ensure that the correct PC port has been selected, the MS–DOS diagnostics program should be run to check the COM port availability and the IRQ status.

WITH PRINTER INTERFACE



10. INSTALLATION SUGGESTIONS

If the faxing application has a difficulty in locating the modem, check the fax machine to ensure that it is on and ready: turn it off, wait a few seconds then turn it back on. Run the MS-DOS diagnostics to review the COM ports and IRQs for possible conflicts. Review the faxing application's manual for possible solutions.

10.1 COMMUNICATION PORTS

The PC's serial ports are usually configured as COM1 and COM2, and are assigned the Interrupt Request numbers (IRQs). IRQs are used to establish priorities which will prevent conflicts from ocurring when two devices want to use the same resources at the same time. It is very important to ensure that

1. the PC has a COM port available for the PC–FAX Expander cable, and
2. the COM ports are not in potential conflict.

For Windows users, run the MS-DOS diagnostics program. At the DOS command prompt, type **msd** <ENTER>

When the diagnostics menu appears, choose COM ports. The next screen will indicate if the COM ports (1 through 4) are enabled or available. Choose IRQ to indicate the Interrupt Request status of each COM port. The COM ports must not have the same IRQ. The PC's serial ports are usually configured with IRQ4 and IRQ3. For example,

```
                              IRQ Status
IRQ   Address       Description     Detected                 Handled By

  3   F000: EF6F    COM2: COM4:     COM2:                    BIOS
  4   CE29: 0096    COM1: COM3:     COM1:      Serial Mouse  Unknown
```

The installation of an internal modem may cause an IRQ conflict to occur between two ports, even if no device is using the second port. The second port may have to be disabled to overcome this problem.

One solution is to remove the internal modem and re-enable the COM port for PC–FAX Expander use. Another solution is to install a third serial port.