RICOH FAX 4500F ISDN KIT

SERVICE MANUAL

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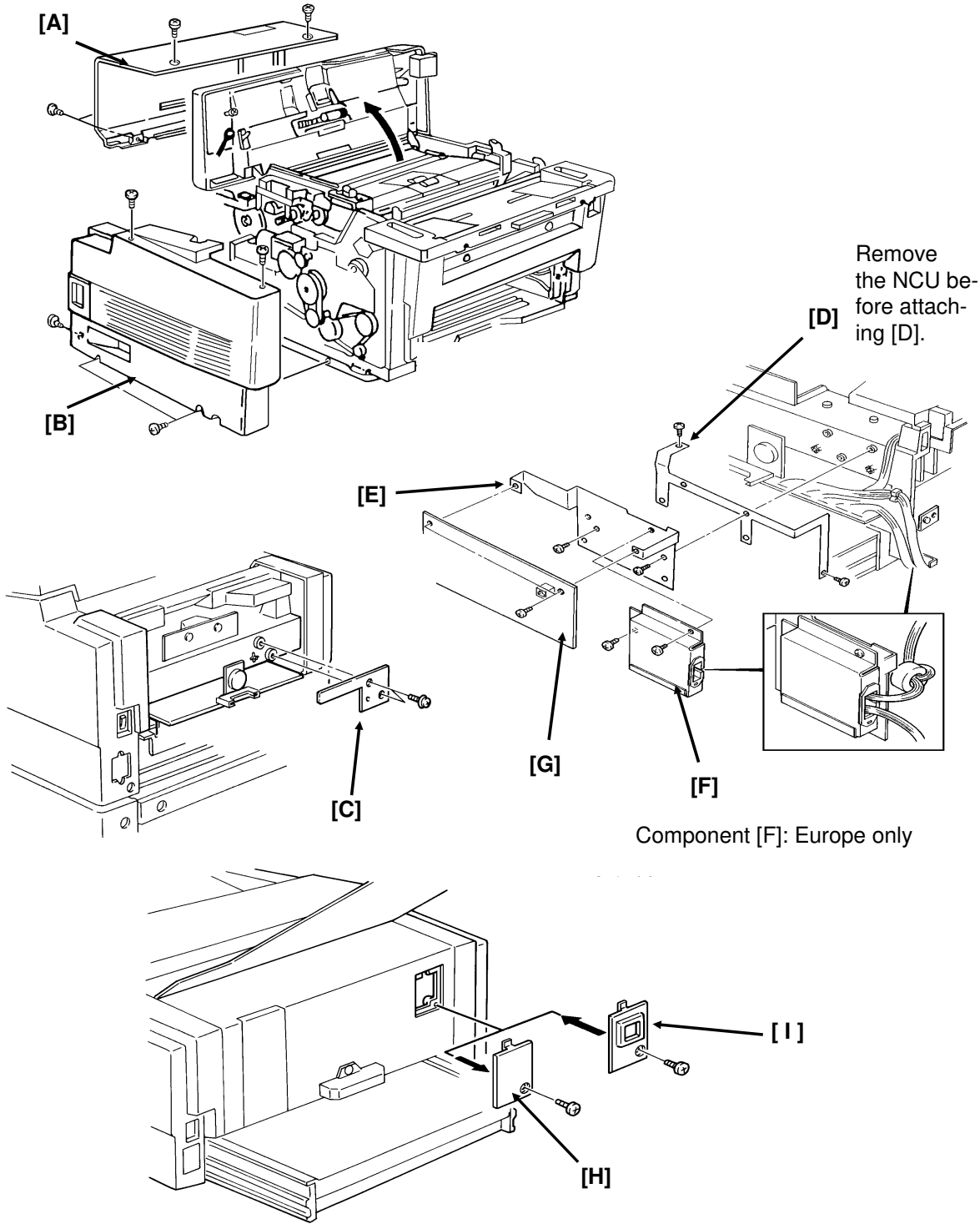
1. INSTALLATION

1.1. INSTALLATION PROCEDURE



Caution: Do not plug in or switch on until everything is connected up.

1.2. FACTORY SETTINGS

The following tables show how to program the G4 Internal Bit Switches (Function 01) and G4 Parameter Switches (Function 02) for each country. Make sure that these values are correct at installation.

USA

Bit Switches All at 00 (H), except: Switch 00: 11(H)
Switch 14: 01(H)
Switch 19: 01(H)

Parameter Switches

SW 00	SW 01	SW 02	SW 03	SW 04	SW 05	SW 06	SW 07
00(H)	00(H)	00(H)	00(H)	07(H)	02(H)	00(H)	0B(H)
SW 08	SW 09	SW 0A	SW 0B	SW 0C	SW 0D	SW 0E	
07(H)	00(H)	01(H)	0B(H)	01(H)	00(H)	B2(H)	

Europe

Bit SwitchesAll at 00 (H), except: Switch 00: 02(H)
Switch 10: 01(H)
Switch 13: 04 (H) [Sweden]
Switch 14: 01 (H) [UK]
Switch 15: 40 (H) [France, Germany]

Parameter Switches

SW 00	SW 01	SW 02	SW 03	SW 04	SW 05	SW 06	SW 07
00(H)	01(H)	00(H)	00(H)	07(H)	02(H)	00(H)	0B(H)
SW 08	SW 09	SW 0A	SW 0B	SW 0C	SW 0D	SW 0E	
07(H)	00(H)	01(H)	0B(H)	01(H)	00(H)	B2(H)	

Asia

Bit Switches All at 00 (H), except: Switch 00: 12(H)

Parameter Switches

SW 00	SW 01	SW 02	SW 03	SW 04	SW 05	SW 06	SW 07
00(H)	01(H)	00(H)	00(H)	07(H)	02(H)	00(H)	0B(H)
SW 08	SW 09	SW 0A	SW 0B	SW 0C	SW 0D	SW 0E	
07(H)	00(H)	01(H)	0B(H)	01(H)	00(H)	B2(H)	

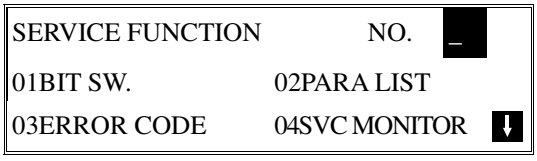
2. SERVICE TABLES AND PROCEDURES

2.1. SERVICE LEVEL FUNCTIONS

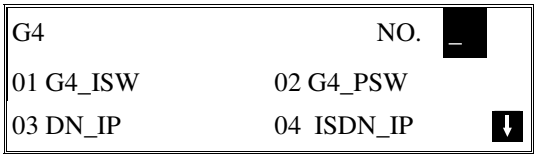
To enter G4 service mode, press the following sequence of keys:

Function 6 0 1 9 9 1

then immediately **Yes**



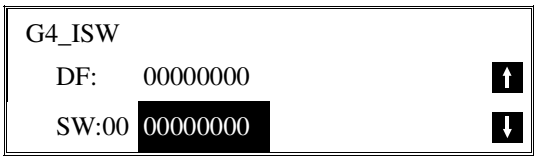
Then press 1 8



After completing a G4 service mode operation, you must reset the machine by switching it off, waiting for a few minutes, then switching back on. THere is no need to do this for any of the G3 service modes.

2.1.1. G4 Internal Switch Programming (Function 01)

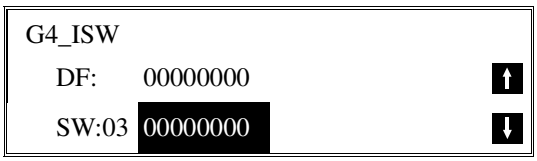
1. After entering G4 service mode, press 0 1



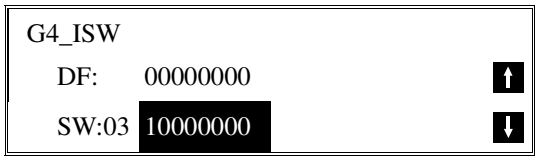
Bit 7 is displayed at the left, and bit 0 at the right. The default settings are shown on the top line, and the current settings on the bottom.

2. • Increment bit switch: ↓
   • Decrement bit switch: ↑

Example:
Display bit switch 3: ↓ x 3



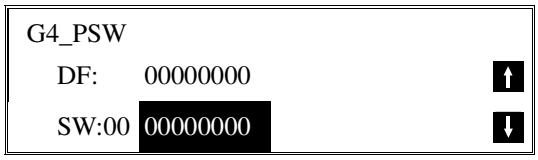
3. Adjust the bit switch.
   Example: To change the value of bit 7, press **7**



4. Either:
   - Adjust more bit switches - go to step 2.
   - Finish - **Yes**

2.1.2. G4 Parameter Switch Programming (Function 02)

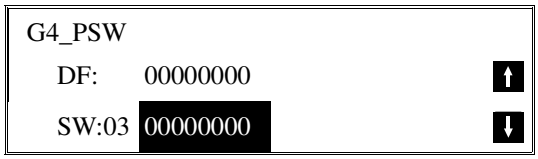
1. After entering G4 service mode, press **0** **2**



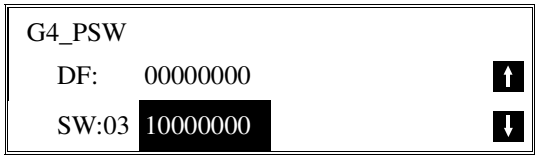
   Bit 7 is displayed at the left, and bit 0 at the right. The default settings are shown on the top line, and the current settings on the bottom.

2. - Increment bit switch: ↓
   - Decrement bit switch: ↑

   Example:
   Display bit switch 3: ↓ x 3



3. Adjust the bit switch.
   Example: To change the value of bit 7, press **7**



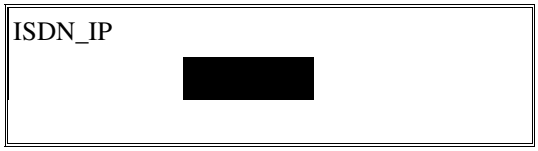
4. Either:
   - Adjust more bit switches - go to step 2.
   - Finish - **Yes**

2.1.3. Storing the DNIP (Function 03)

Do not use this function.

2.1.4. Storing the ISDN-IP (Function 04)

1. After entering G4 service mode, press **0** **4**



2. Input the ISDN International Prefix (ISDN-IP).
   Example: **1** **2** **3** **4** **Yes**

2.1.5. Storing the First G4 Subscriber Number (Function 05)

Program the Second Subscriber Number when you have two units connected to the same line. Program the number of the other unit as the Second Subscriber Number. When a call comes in, if the other unit is busy, your machine will answer the call. Also, note the following:

- When calling, the first subscriber number will be added to the Setup signal as the Calling ID.
- When receiving, the Called ID will be compared with the first and second subscriber numbers.

1. After entering G4 service mode, press **0** **5**

2. Input the number. Include a pause at the start of the number.
   Then press **Yes**

2.1.6. Storing the Second G4 Subscriber Number (Function 06)

1. After entering G4 service mode, press **0** **6**

2. Input the number. Include a pause at the start of the number.
   Then press **Yes**

2.1.7. Storing the First ISDN G3 Subscriber Number (Function 07)

The function of this is similar to the G4 Subscriber Number, except that it operates for G3 communications on the IDSN.

1. After entering G4 service mode, press **0** **7**

2. Input the number. Include a pause at the start of the number. Then press **Yes**

2.1.8. Storing the Second ISDN G3 Subscriber Number (Function 08)

1. After entering G4 service mode, press **0** **8**

2. Input the number. Include a pause at the start of the number. Then press **Yes**

2.1.9. Storing the ISDN Access Unit No 1 (Function 09)

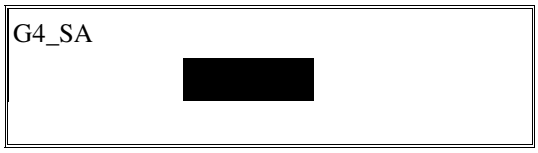
This is only for use during PTT approval tests.

2.1.10. Storing the ISDN Access Unit No 2 (Function 10)

Do not use this function

2.1.11. Storing the G4 Subaddress (Function 11)

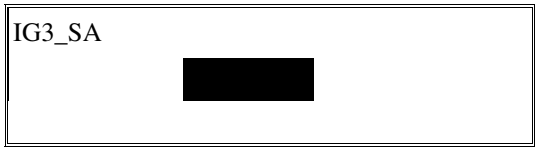
1. After entering G4 service mode, press **1** **1**



2. Input the subaddress. Then press **Yes**

2.1.12. Storing the ISDN G3 Subaddress (Function 12)

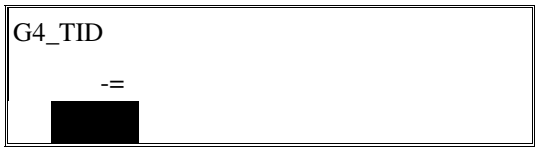
1. After entering G4 service mode, press **1** **2**



2. Input the subaddress. Then press **Yes**

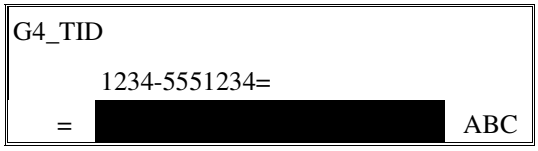
2.1.13. Storing the G4 Terminal ID (Function 13)

1. After entering G4 service mode, press **1** **3**

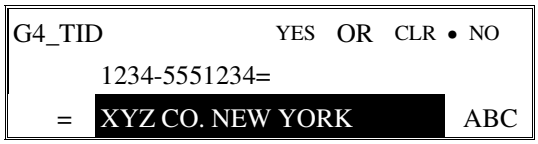


2. First, input the ISDN's country code.
   For example: **1** **2** **3** **4** **Yes**

3. Input the machine's telephone number, then press **Yes**



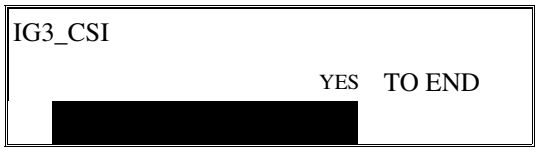
4. Input the G4 terminal name.



5. Press **Yes**

2.1.14. Storing the ISDN G3 CSI (Function 14)

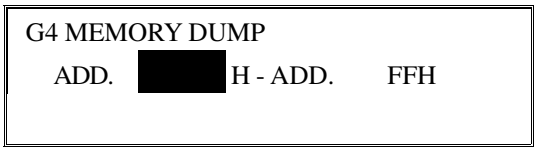
1. After entering G4 service mode, press **1** **4**



2. Input the CSI. Then press **Yes**

2.1.15. Printing a G4 Memory Dump (Function 15)

1. After entering G4 service mode, press **1** **5**



2. Input the range of addresses that you wish to print.
   Example: Addresses 22AA00 to 22BBFF

   2 **2** **A** **A** **2** **2** **B** **B** **Start**

2.1.16. Printing a G4 Protocol Dump List (Function 16)

1. After entering G4 service mode, set parameter switch E bit 1 to 1 (use G4 function 02). Then make a test communication.
2. From the G4 service mode menu, press **1** **6**

3. Either:
   - Print a protocol dump list for the B and D channels: **0** **Start**
   - Print a protocol dump list for the D channel: **1** **Start**
   - Print a protocol dump list for the B channel link layer: **2** **Start**
   - Print a protocol dump list for the D channel link layer: **3** **Start**
4. Reset parameter switch E bit 0 to 0 after you have finished.

2.1.17. Printing the G4 System Parameter List (Function 17)

1. After entering G4 service mode, press **1** **7**

2. **Start**

2.1.18. Modem/DTMF Tone Tests (Function 18)

This is only for use during PTT approval tests.

2.2. BIT SWITCHES

WARNING
Do not adjust a bit switch that is described as "Not used", as this may cause the machine to malfunction or to operate in a manner that is not accepted by local regulations. Such bits are for use only in other areas, such as Japan.

2.2.1. G4 Internal Switches

Bit Switch 00

	FUNCTION	COMMENTS
0	Country code	
1	Bit 4 3 2 1 0 Country	Bit 4 3 2 1 0 Country
	0 0 0 0 0 France	0 1 1 0 1 Holland
2	0 0 0 0 1 Germany	0 1 1 1 0 Spain
	0 0 0 1 0 UK	0 1 1 1 1 Israel
3	0 0 0 1 1 Italy	1 0 0 0 1 USA
	0 0 1 0 0 Austria	1 0 0 1 0 Asia
4	0 0 1 0 1 Belgium	1 0 0 1 1 Japan
	0 0 1 1 0 Denmark	1 0 1 0 0 Hong Kong
5	0 0 1 1 1 Finland	1 0 1 0 1 South Africa
	0 1 0 0 0 Ireland	1 0 1 1 0 Australia
6	0 1 0 0 1 Norway	1 0 1 1 1 New Zealand
	0 1 0 1 0 Sweden	1 1 0 0 0 Singapore
7	0 1 0 1 1 Switzerland	1 1 0 0 1 Malaysia
	0 1 1 0 0 Portugal	

Bit switches 01 and 02 are not used.

Bit Switch 03

	FUNCTION	COMMENTS
0	Frame save area status after each communication **0:** Erased **1:** Kept	If you wish to keep the protocol frames of communications in the memory buffer, set this bit to 1. The buffer can record several communications
1	Not used	Do not change the factory settings.
2		
3		
4		
5		
6		
7		

Bit Switch 04		
	FUNCTION	**COMMENTS**
0	Not used	Do not change the factory settings.
1		
2		
3		
4		
5	RCBCTR **0:** Not valid **1:** Valid	This bit is used in Germany; set it to 1 for German PTT approval tests. **1:** RCBCTR counts consecutive R:RNR. If the counter reaches the value of N2, the link is disconnected.
6	Not used	Do not change the factory settings.
7		

Bit Switch 05		
	FUNCTION	**COMMENTS**
0	Not used	Do not change the factory setting.
1	Logical channel number (LCN) **0:** Not controlled **1:** Fixed at 01	This bit is normally 0. However, some networks may require a fixed LCN. In such cases, this bit should be 1, and you may have to set a different value for the LCN using G4 Parameter Switch A.
2	Protocol ID check **0:** Yes **1:** No	The Protocol ID is in the CR packet.
3	Not used	Do not change the factory settings.
4		
5		
6		
7		

Bit Switch 06		
	FUNCTION	**COMMENTS**
0	Inclusion of the DTE address in the S:CR packet **0:** No **1:** Yes	When the CR packet format matches IS8208 protocol, some networks may require this bit to be set at 1. This bit is only effective if bit 0 of G4 Parameter switch 6 is at 1.
1	Calling and called DTE addresses **0:** Not used **1:** Used	This is only for packet networks. The CR packet should contain the rx side's DTE address, but does not have to include the tx side's; it can include it as an option.
2	Not used	Do not change the factory setting.
3		
4		
5		
6		
7		

Bit switch 07 and 08 are not used.

Bit Switch 09		
	FUNCTION	**COMMENTS**
0	Not used	Do not change the factory setting.
1	New session within the same call **0:** Not accepted **1:** Accepted	**0:** If a new R:CSS is received, the machine sends back S:RSSN. **1:** If a new R:CSS is received, the machine sends back S:RSSP. Set this bit to 1 for German PTT approval tests.
2	Not used	Do not change the factory settings.
3		
4		
5		
6		
7		

Bit switches 0A to 0F are not used.

Bit Switch 10		
	FUNCTION	**COMMENTS**
0	Connection detector **0:** Disabled **1:** Enabled	**0:** USA and Japan **1:** Europe
1 **2**	Layer 1 T3 timer **Bit 2 1 Time** 0 0 5 s 0 1 29 s 1 0 10 s 1 1 Not used	This should be kept at 5 s (both bits at 0) for normal operation. However, you may have to change this during PTT approval tests.
3	Layer 1 T4 timer **0:** Not used **1:** Used	Set this bit to 1 for French PTT approval tests.
4	Not used	Do not change the factory settings.
5		
6		
7	Loop back 4 mode **0:** Disabled **1:** Enabled	This is normally kept at 0. However, set it to 1 for British PTT approval tests.

Bit Switch 11		
	FUNCTION	**COMMENTS**
0	Action in reply to a link release request **0:** Link is released **1:** Link is not released	Do not change the factory setting.
1	Type of TEI used **0:** Dynamic TEI **1:** Static TEI	This is normally fixed at 0. However, some networks such as the Northern Telecom ISDN may require this bit to be set at 1 (see below). In this case, you may have to change the values of bits 2 to 7.
2 **3** **4** **5** **6** **7**	Static TEI value	This is used in the USA with the DMS100 (Northern Telecom ISDN) exchanger. Store the low bit of the TEI at bit 7 and the high bit of the TEI at bit 2. Example: If the static TEI is 011000, set bits 3 and 4 to 1 and bits 2, 5, 6, and 7 to 0.

Bit switch 12 is not used. Do not change any of the factory settings.

Bit Switch 13: D channel layer 3 (Attachment IE in S: SETUP)		
	FUNCTION	**COMMENTS**
0 **1**	Not used	Do not change the factory settings.
2	Attachment of calling ID **0:** No **1:** Yes	Normally, this bit should be at 0. However, some networks may require this ID, and in these cases, this bit should be at 1.
3	Attachment of the Lower Layer Capabilities **0:** No **1:** Yes	This bit determines whether Lower Layer Capabilities are informed in the [Setup] signal or not.
4	Attachment of the Higher Layer Capabilities **0:** Yes **1:** No	This bit determines whether Higher Layer Capabilities are informed in the [Setup] signal or not.
5 **6** **7**	Not used	Do not change the factory settings.

Bit Switch 14: D channel layer 3 (Selection IE in S: SETUP)		
	FUNCTION	**COMMENTS**
0	G3 calling mode **0:** 3.1 kHz audio **1:** Speech	This determines the bearer capability informed in the [Setup] message. Set this bit to 1 if the ISDN does not support 3.1 kHz audio. This bit is only used in the USA and the UK.
1 **2**	Not used	Do not change the factory settings.
3 **4**	Channel selection in [SETUP] in tx mode Bit 4 3 Setting 0 0 Any channel 0 1 B1 channel 1 0 B2 channel 1 1 Not used	**Any channel:** When this is informed to the exchanger, the exchanger will select either B1 or B2.
5	Called ID mapping **0:** Called party number **1:** Keypad facility	**0:** Called ID is mapped to the called party number. **1:** Called ID is mapped to the keypad facility. On the 5ESS network (USA), set it to 1.
6	Numbering plan for the called party number **0:** Unknown **1:** E.164	**E.164:** This may be used in Sweden if the AXE10 exchanger is fitted with old software. **Unknown:** This is the normal setting.
7	Subaddress **0:** IA5 **1:** BCD	This is normally kept at 0. However, some networks require this bit to be at 1.

Bit Switch 15: D channel layer 3 (Judgement R: MSG)		
	FUNCTION	**COMMENTS**
0	Action when receiving [Setup] containing no called subaddress, if the subaddress was programmed in the dialed number **0:** A reply is sent **1:** No reply is sent	This bit depends on user requirements. If it is at 1, communication will be halted if the other terminal has not input their subaddress value.
1 **2** **3** **4**	Not used	Do not change the factory settings
5	Global call reference **0:** Ignored **1:** Global call number is used	Global call reference means 'call reference value = 0'. This bit determines how to deal with such an incoming call if received from the network. Keep this bit at 1 in France and Germany.
6 **7**	Not used	Do not change the factory settings.

Bit Switch 16: D channel layer 3 (Approval)		
	FUNCTION	**COMMENTS**
0	Not used	Do not change the factory settings.
1		
2		
3		
4		
5	Indicated bearer capabilities **0:** 56 k **1:** 64 k	1: 64 k calling is indicated in the Bearer Capabilities, but communication is at 56 k.
6	Not used	Do not change the factory settings.
7		

Bit Switch 17: Fallback from ISDN G4 to ISDN G3		
	FUNCTION	**COMMENTS**
0 **1** **2** **3** **4** **5** **6**	Condition for fallback from G4 to G3 Bits 0 to 6 of bit switch 17 contain a CPS code, and bits 0 to 6 of bit switch 18 contain another CPS code. If a CPS code is received which is the same as either of these, communication will fall back from ISDN G4 mode to ISDN G3 mode. The CPS codes must be the same as those specified in table 4-13 of CCITT recommendation Q.931. Examples: Bit 6 5 4 3 2 1 0 1 0 0 0 0 0 1 CPS code 65 1 0 1 1 0 0 0 CPS code 88 This feature may not be available in Germany; this is not decided yet. For the codes in bits 0 to 6 of bit switches 17 and 18 to be recognized, bit 7 of bit switch 17 must be 1. Also, bit 0 of RAM address 00015C (Service Switch 1C) must be at 0, or Fallback from G4 to G3 will be disabled.	
7	This bit determines whether fallback from G4 to G3 occurs on receipt of one of the CPS codes programmed in bit switch 17 or 18, or on receipt of a certain standard code. **0:** Fallback occurs on receipt of the following CPS codes. UK: 3, 63, 65, or 88, Germany: 53, Other areas: 3, 65, or 88 **1:** Fallback from G4 to G3 occurs on receipt of one of the CPS codes programmed in bit switch 17 or 18	

Bit Switch 18: Fallback from ISDN G4 to ISDN G3		
	FUNCTION	**COMMENTS**
0 **1** **2** **3** **4** **5** **6**	Condition for fallback from G4 to G3 See the explanation for bits 0 to 6 of bit switch 17	
7	Not used	Do not change the factory setting.

Bit Switch 19		
	FUNCTION	**COMMENTS**
0	Permanence of the link **0:** Set/released each LAPD call **1:** Permanent	Keep this at 1 in the USA. In other areas, this bit is normally 0, depending on network requirements.
1	Channel used in ISDN L2 (64k) mode **0:** B1 **1:** B2	When making an IDSN L2 back-to-back test, you can select either the B1 or B2 channel with this bit switch.
2 **3** **4** **5** **6** **7**	Not used	Do not change the factory settings.

Bit switches 1A to 1F are not used. Do not change any of the factory settings.

2.2.2. G4 Parameter Switches

Parameter Switch 0		
	FUNCTION	**COMMENTS**
0 **1** **2**	Network type Bit 2 1 0 Type x 0 0 Circuit switched ISDN Other settings: Not used	
3 **4** **5** **6** **7**	Not used	Do not change the factory settings.

Parameter Switch 1		
	FUNCTION	**COMMENTS**
0	Voice coding **0:** μ law **1:** A law	**0:** This setting is used in Japan, Taiwan, and the USA. **1:** This setting is used in Europe and Asia.
1 **2** **3** **4** **5** **6** **7**	Not used	Do not change the factory settings.

Parameter Switch 2		
	FUNCTION	**COMMENTS**
0 **1**	Data rate (kbps) Bit 1 0 Setting 0 0 64 kbps 0 1 56 kbps	Other settings: Not used
2 **3**	Not used	Do not change the factory settings.
4 **5**	Transmission mode Bit 5 4 Mode 0 0 CS	Other settings: Not used
6 **7**	Not used	Do not change the factory settings.

Parameter Switch 3		
	FUNCTION	**COMMENTS**
0	Link modulus **0:** 8 **1:** 128	This setting determines whether protocol frame numbering is done using 3 bits (0 to 7 then start again at 0) or 7 bits (0 to 127 then start again at 0). Set this bit switch to match the network's specifications.
1	Not used	Do not change the factory settings.
2		
3		
4		
5		
6		
7		

Parameter Switch 4 is not used. Do not change any of the factory settings.

Parameter Switch 5		
	FUNCTION	**COMMENTS**
0 **1** **2** **3**	Link timer Bit 3 2 1 0 Value 0 0 0 0 0 0 0 0 1 1 0 0 1 0 2 and so on until 1 0 1 0 10	The link timer is the maximum allowable time between sending a protocol frame and receiving a response frame from the remote terminal.
4	Not used	Do not change the factory settings.
5		
6		
7		

Parameter Switch 6		
	FUNCTION	**COMMENTS**
0	Layer 3 protocol **0:** ISO8208 **1:** T.70NULL	Set this bit to match the type of layer 3 signalling used by the ISDN.
1	Not used	Do not change the factory settings.
2		
3		
4	Packet modulus **0:** 8 **1:** 128	Do not change the factory setting, unless the machine is experiencing compatibility problems.
5	Not used	Do not change the factory settings.
6		
7		

Parameter Switch 7		
	FUNCTION	**COMMENTS**
0 **1** **2** **3**	Packet size Bit 3 2 1 0 Value 0 1 1 1 128 1 0 0 0 256 1 0 0 1 512 1 0 1 0 1024 1 0 1 1 2048	This value is sent in the CR packet. This value must match the value stored in the other terminal, or communication will stop (CI will be returned). If the other end returns CI, check the value of the packet window size with the other party. Note that this value must be the same as the value programmed for the transport block size (G4 Parameter Switch B, bits 0 to 3).
4 **5** **6** **7**	Not used	Do not change the factory settings.

Parameter Switch 8		
	FUNCTION	**COMMENTS**
0 **1** **2** **3**	Packet window size Bit 3 2 1 0 Value 0 0 0 1 1 0 0 1 0 2 and so on until 1 1 1 1 15	This is the maximum number of unacknowledged packets that the machine can send out before having to pause and wait for an acknowledgement from the other end. This should be kept at 7 normally. If the packet modulus (G4 Parameter Switch 6, bit 4) is 8, the packet window size cannot be more than 7. However, if the packet modulus is 128, the window size can be up to 15. Also, if the layer 3 protocol setting (G4 Parameter Switch 6, bit 0) is at IS8208, the packet window size cannot be more than 7.
4 **5** **6** **7**	Not used	Do not change the factory settings.

Parameter Switch 9		
	FUNCTION	**COMMENTS**
0 **1** **2** **3**	LCGN Bit 3 2 1 0 Value 0 0 0 0 0 0 0 0 1 1 0 0 1 0 2 and so on until 1 1 1 1 15	Keep the value of the LCGN at 0.

Parameter Switch 9		
	FUNCTION	**COMMENTS**
4	Not used	Do not change the factory settings.
5		
6		
7		

Parameter Switch A		
	FUNCTION	**COMMENTS**
0 **1** **2** **3** **4** **5** **6** **7**	LCN Bit 7 6 5 4 3 2 1 0 Value 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 1 0 2 0 0 0 0 0 0 1 1 3 and so on until 1 1 1 1 1 1 1 1 255	Keep at the value of the LCN at 1.

Parameter Switch B		
	FUNCTION	**COMMENTS**
0 **1** **2** **3**	Transport block size Bit 3 2 1 0 Value 0 1 1 1 128 1 0 0 0 256 1 0 0 1 512 1 0 1 0 1024 1 0 1 1 2048	This value must match the value set in the other terminal. Note that this value must be the same as the value programmed for the packet size (G4 Parameter Switch 7, bits 0 to 3). Also, the transport block size is limited by the amount of memory in the remote terminal.
4	Not used	Do not change the factory settings.
5		
6		
7		

Parameter Switch C is not used. Do not change any of the factory settings.

Parameter Switch D		
	FUNCTION	**COMMENTS**
0 **1**	Back-to-back test mode Bit 1 0 Setting 0 0 Off 0 1 Not used 1 0 ISDN L2 test mode (TE mode) 1 1 ISDN L2 test mode (NT mode)	When doing a back-to-back test, use these bits to set up one of the machines in TE mode, and the other in NT mode. After the test, return both bits to 0.

Parameter Switch D		
	FUNCTION	**COMMENTS**
2	Not used	Do not change the factory settings.
3		
4		
5		
6		
7		

Parameter Switch E		
	FUNCTION	**COMMENTS**
0	Debug mode - real time display **0:** Off **1:** On	If this is switched on, a status code will be displayed in the bottom right corner of the LCD. These codes are explained in the Troubleshooting section.
1	Debug mode - C/R frame save **0:** Off **1:** On	Set this bit to 1 when you wish to print a protocol dump list. Set it back to 0 after printing.
2	Not used	Do not change the factory settings.
3		
4		
5		
6		
7		

2.3. DEDICATED TRANSMISSION PARAMETERS

The following G4 communication parameter bytes have been added for each Quick Dial and Speed Dial. For how to program Dedicated Transmission Parameters, refer to the Service Manual for the base machine.

Bytes 1 to 4 are for use with Group 3 communication and are explained in the Service Manual for the base machine. Byte 5 is not used.

Byte 6	
	FUNCTION
0 **1** **2** **3**	Data rate Bit 3 2 1 0 Setting 0 0 0 0 64 kbps 0 0 0 1 56 kbps 1 1 1 1 As in Parameter Switch 2, bits 0 and 1 Other settings: Not used
4	Not used
5	
6	
7	

Byte 7	
	FUNCTION
0 **1** **2** **3**	Link modulus Bit 3 2 1 0 Setting 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 As in Parameter Switch 3, bit 0 Other settings: Not used
4	Not used
5	
6	
7	

Byte 8	
	FUNCTION
0 **1** **2** **3**	Layer 3 protocol Bit 3 2 1 0 Setting 0 0 0 0 IS.8208 0 0 0 1 T.70 NULL 1 1 1 1 As in Parameter Switch 6, bit 0 Other settings: Not used
4 **5** **6** **7**	Packet modulus Bit 3 2 1 0 Setting 0 0 0 0 Modulo 8 0 0 0 1 Modulo 128 1 1 1 1 As in Parameter Switch 6, bit 4 Other settings: Not used

3. TROUBLESHOOTING

3.1. ERROR CODES

The following error codes will be printed on the Service Monitor Report. See the Service Manual for the base machine for instructions on how to print this report.

The meaning of the numbers in the Action column is as follows.

1. Check Layer 1 signalling with a protocol analyzer to determine the cause of the problem. This may require assistance from a G4 specialist.
2. Repeat the communication. If the problem does not repeat itself, the problem was a temporary one caused by the user connecting the machine to another interface. However, if the problem remains, there is a network problem.
3. There is a network problem.
4. There is a network problem. Do the following:
   - Check the error bit rate of the network. If it is high, contact the network and ask them to improve the line.
   - Check the network speed (is it 56 or 64 kbps), and make sure that the bit switch setting is correct. You may also use the dedicated transmission parameters if this problem only occurs when dialling certain numbers.
   - Check that the user dialled the correct number.
5. There is a network problem, or a problem in the machine at the other end.
6. There is a problem in the machine at the other end; ask a technician to check it.
7. The machine at the other end is not a Group 4 fax terminal.
8. The machine is not compatible with the machine at the other end. A compatibility test is needed.

3.1.1. D-channel, Layer 1

Code	Probable Cause	Action
7-00	T3 timeout (layer 1 activation error)	1
7-01	No connection on the S0 interface	1
7-02	Deactivated	1

3.1.2. D-channel Link Layer

Code	Probable Cause	Action
7-20	At the start of link set-up, the machine received an unsolicited S (F=1).	2
7-21	At the start of link set-up, the machine received an unsolicited DM (F=1).	2
7-22	At TEI release, the machine received an unsolicited UA (F=1).	2
7-23	At the start of link set-up, the machine received an unsolicited DM (F=0).	2
7-24	At TEI release, the machine received an unsolicited UA (F=0).	2
7-25	SABME received at the start of network link set-up	No error
7-26	N200 retransmission error for SABME	2
7-27	N200 retransmission error for DISC	2
7-28	N200 retransmission error for situation enquiry (RR)	2
7-29	N(R) sequence number error	3
7-30	N(S) sequence number error	3
7-31	FRMR received	3
7-32	Non-standard frame received	3
7-33	Abnormal frame length	3
7-34	N201 error; information field N in the I frame exceeded N201	3
7-35	T201 timeout; timeout while waiting for checking	3
7-36	T202 timeout; timeout while waiting for ID assignment	3

3.1.3. D-channel Network Layer

Code	Probable Cause	Action
7-40	Insufficient mandatory information elements	3
7-41	Abnormal LI for a mandatory information element	3
7-42	T301 timeout; timeout while waiting for R:CONN	3
7-43	T303 timeout; timeout while waiting for R:CALL-PROC etc.	3
7-44	T304 timeout; timeout while waiting for R:CALL-PROC etc.	3
7-45	T305 timeout; timeout while waiting for R:REL	3
7-46	T308 timeout; timeout while waiting for R:REL-COMP	3
7-47	T310 timeout; timeout while waiting for R:ALERT etc.	3
7-48	T313 timeout; timeout while waiting for R:CONN-ACK	3
7-49	Internal error	3
7-51	Release call reference during communication	3

3.1.4. B-channel Link Layer

Code	Probable Cause	Action
7-60	T3 timeout; timeout while waiting for flag	4
7-61	T3 timeout; timeout while waiting for SABM during an incoming call	4
7-62	T1 timeout x N2; timeout while waiting for UA after sending SABM	5
7-63	T1 timeout x N2; timeout while waiting for a response to a transmitted S frame (P=1)	5
7-64	T1 timeout x N2; timeout while waiting for SABM or DISC after sending FRMR	5
7-65	T1 timeout x N2; timeout while waiting for a response to DISC	5
7-66	RNR x N2 (other end busy, RCB counter error)	5
7-67	Invalid (Ad) frame received	5
7-68	Invalid short frame received	5
7-69	Link reset error	5
7-70	FRMR received	5
7-71	Non-standard (Cn) frame received	5
7-72	An S or U frame having an information field was received	5
7-73	A frame longer than the maximum N1 length was received	5
7-74	An S or I frame having an N(R) error was received	5
7-75	CRC error	3

3.1.5. B-channel Network Layer

Code	Probable Cause	Action
7-80	A packet having an abnormal GFI was received	6
7-81	A packet was received that had a logical channel number different from the logical channel being used for the communication	6
7-82	A packet containing a format error was received	6
7-83	A packet containing an LI error was received	7
7-84	A CN packet was received that had a PID different from 02	7
7-85	Unsupported packet type received	7
7-86	Abnormal or unsupported facility received	7
7-87	P(s) sequence number error	6
7-88	P(r) sequence number error	6
7-89	A reset using S:RQ or R:RI occurred	6
7-90	A restart using S:RQ or R:SI occurred	6
7-91	Call set-up error; in reply to S:CR, R:CI was received to indicate rejection of the call	7
7-92	T20 timeout; timeout while waiting for an SF packet	6
7-93	T21 timeout; timeout while waiting for a CC packet	6
7-94	T22 timeout; timeout while waiting for an RF packet	6
7-95	T23 timeout; timeout while waiting for a CF packet	6
7-96	T10 timeout; timeout while waiting for the first frame	6

3.1.6. Transport Layer

Code	Probable Cause	Action
8-00	Invalid block received	8
8-01	TCC block received	8
8-02	TBR block received	8
8-05	TCR block; block format error	8
8-06	TCR block; block size parameter LI error	8
8-07	TCR block; extended addressing LI error	8
8-08	TCR block; block size length error	8
8-10	TCA block; block format error	8
8-11	TCA block; Tx origin reference data in TCR disagreed with the address reference data in TCA	8
8-12	TCA block; octet 7 did not equal 0	8
8-13	TCA block; extended addressing LI error	8
8-14	TCA block; block size exceeded that set by TCR	8
8-15	TCA block; block size parameter LI error	8
8-20	TDT block; block format error	8
8-21	TDT block; octet 3 did not equal either 00 or 80(H)	8
8-22	TDT block; the end indicator was "Continue" even though there was no field data	8
8-23	TDT block; and end block with no field data was received after an end indicator of "End"	8
8-26	Timeout during state 0.2	8
8-27	Timeout during state 1.1	8
8-28	Timeout during state 0.3	8

3.1.7. Session Layer

Code	Probable Cause	Action
8-30	Invalid frame received	8
8-31	RSSN received	8
8-32	CSA received	8
8-34	Calling terminal identification error in CSS	8
8-35	Date and time error in CSS	8
8-36	Window size error in CSS	8
8-37	Service identification error in CSS	8
8-38	Session user data error in CSS	8
8-39	CSS rejected (new session rejected)	8
8-40	Called terminal identification error in RSSP	8
8-41	Date and time error in RSSP	8
8-42	Date and time in RSSP was not the same as that in CSS	8
8-43	Window size error in RSSP	8
8-44	Service identification error in RSSP	8
8-45	Session user data error in RSSP	8
8-47	Message synchronization error inside the CCU	8
8-48	Document task busy	8

Code	Probable Cause	Action
8-50	Ti timeout; non-communication surveillance timer (T.62)	8
8-51	T2 timeout; timeout while waiting for a response (T.62)	8
8-52	T3 timeout; CSA timer timeout (T.62)	8
8-53	G4 board load timer timeout; calling side waited too long for a new session	8
8-54	G4 board load timer timeout; calling side waited too long for transport probability	8
8-55	G4 board load timer timeout; called side waited too long for S:RSSP	8
8-56	G4 board load timer timeout; document transmission surveillance timer timeout	8
8-57	G4 board load timer timeout; timeout while waiting for a user abort request after a provider fail	8

3.1.8. Document Layer

Code	Probable Cause	Action
8-60	T.62 coding format error (LI error)	8
8-61	A mandatory PI was absent, or the LI for a mandatory PI was 0	8
8-62	Calling/called terminal identification LI was different from that specified by F.184 (LI = 24)	8
8-63	The LI for session user data exceeded the maximum value (512)	8
8-64	The LI for CDUI was not 0	8
8-65	Checkpoint and document reference numbers LI error, or they were not in T.61 (ASCII) coding	8
8-66	The checkpoint reference number differed from the expected value	8
8-70	RDGR received	8
8-71	A non-standard PDU was received while in calling mode	8
8-72	A non-standard PDU was received while in called mode	8
8-73	Abnormal PDU received while in calling state ds1	8
8-74	15 consecutive CDCL signals received	8
8-75	Session window size control error (size not equal to 0)	8
8-76	Internal error	8

3.1.9. Presentation Layer

Code	Probable Cause	Action
8-80	X.209 coding error in session user data (LI error)	8
8-81	PV error in session user data	8
8-82	PI error in session user data	8
8-83	The capabilities in the session user data of CDS/CDC were not the same as those in RDCLP	8
8-84	X.209 coding error in the DP (LI error)	8
8-85	X.209 coding error in the SLD (document descriptor/page descriptor) (LI error)	8
8-86	SLD object type absent	8

Code	Probable Cause	Action
8-87	PI error in the SLD (document descriptor/page descriptor)	8
8-88	The capabilities in the SLD (document descriptor/page descriptor) are duplicated or are not the same as those in RDCLP	8
8-89	No document descriptor at the start of the document	8
8-90	No page descriptor at the start of the page	8
8-91	Page descriptor PV error	8
8-92	X.209 coding error in the TU (LI error)	8
8-93	The TU was absent	8
8-94	PV error in the TU	8
8-95	TI error	8
8-96	X.209 coding nest level > 8, or an LI form error	8
8-97	CDPB/CDE received while TU/TI not yet completed, or an unexpected PDU was received while analyzing an SLD	8

3.1.10. Hardware Errors

Code	Meaning	Suggested Cause/Action
3-00	CIG4 reset The CIG4 did not send a response to the FCU	• Replace the CIG4 or the FCU. • Check the ISDN line.
3-10	Disconnection during ISDN G3 communication	• Check the condition of the other terminal. • Check the ISDN line. • The other party accidentally dialled this machine by mistake.
3-11	Disconnection during ISDN G4 communication	• Check the condition of the other terminal. • Check the ISDN line.
3-20	A CSA signal was received during ISDN G4 communication	• Check the condition of the other terminal. • Check the ISDN line.
3-21	A CSA signal was sent out after the Stop key was pressed during ISDN G4 communication	• The Stop key was pressed.
3-30	Mismatched specifications (rx capabilities)	• Check the specifications of the other terminal.

3.2. G4CCU STATUS CODES

The display of G4CCU status codes is affected by the Real Time Display On/off setting (G4 Parameter Switch E, bit 0).

- If Real Time Display is off (the bit is 0; this is the default setting), there is no indication on the operation panel.
- If Real Time Display is on (the bit is 1), the codes are fully displayed on the operation panel.

The codes are defined in the following pages.

3.2.1. Layer 1 (Physical Layer)

Code (H)	Status	Code (H)	Status
10	Ready	E0	R: [DISC]
01	S: [SETUP]	E1	S: [REL]
02	R: [CALL_PROC]	E3	R: [REL_COMP]
03	R: [CONN]	E4	R: [STAT]
04	S: [CONN_ACK]	E5	R: [STAT_ENQ]
05	R: [SETUP ACK]	F0	S: [DISC]
06	R: [ALERT]	F1	R: [REL]
11	R: [SETUP]	F2	S: [REL_COMP]
12	S: [CALL_PROC]	F3	S: [STAT]
13	S: [CONN]		
14	R: [CONN_ACK]		

3.2.2. Layer 2 (Link Layer)

Code (H)	Status	Code (H)	Status
20	S: SABM, or R: SABM	D0	S: DISC, or R: DISC
21	S: UA, or R: UA	D1	S: DM, or R: DM
22	S: FRMR, or R: FRMR		
28	S: SABME, or R: SABME		

3.2.3. Network Layer (Layer 3)

Code (H)	Status	Code (H)	Status
30	S: CR	C2	S: SQ
31	R: CC	C3	R: SF
38	R: CN	CA	R: SI
39	S: CA	CB	S: SF
32	S: GF	C4	S: RQ
3A	R: GQ	C5	R: RF
3B	R: GF	CC	R: RI
C0	S: CQ	CD	S: RF
C1	R: CF	C6	R: IT
C8	R: CI	C7	R: IF
C9	S: CF	CE	R: DIAG

3.2.4. Transport Layer (Layer 4)

Code (H)	Status	Code (H)	Status
40	S: TCR, or R: TCR	42	S: TBR, or R: TBR
41	S: TCA, or R: TCA	43	S: TCC or R: TCC

3.2.5. Session Layer, Session Control Layer (Layer 5)

Code (H)	Status	Code (H)	Status
50	S: CSS, or R: CSS	56	S: RSUI, or R: RSUI
51	S: RSSP, or R: RSSP	A0	S: CSA, or R: CSA
52	S: RSSN, or R: RSSN	A1	S: RSAP, or R: RSAP
53	S: CSCC, or R: CSCC	A2	S: CSE, or R: CSE
54	S: RSCCP, or R: RSCCP	A3	S: RSEP, or R: RSEP

3.2.6. Session Layer, Document Control Layer (Layer 5)

Code (H)	Status	Code (H)	Status
60	S: CDCL, or R: CDCL	90	S: CDE, or R: CDE
61	S: RDCLP, or R: RDCLP	91	S: RDEP, or R: RDEP
62	S: CDS, or R: CDS	92	S: CDD, or R: CDD
63	S: CDC, or R: CDC	93	S: RDDP, or R: RDDP
64	S: CDPB, or R: CDPB	94	S: CDR, or R: CDR
65	S: RDPBP, or R: RDPBP	95	S: RDRP, or R: RDRP
70	S: CDUI, or R: CDUI (Data phase - layer 6 and facsimile data)	96	S: RDGR, or R: RDGR
		97	S: RDPBN, or R: RDPBN

3.3. G4CCU LED DISPLAY

There are six LEDs on the G4CCU board, as shown below.

		LED 5	LED 6
LED 1	LED 2	LED 3	LED 4

These LEDs give the following information about the status of the machine.

O = ON, -- = OFF

Initial Settings				
Power-up/Reset			O	O
	--	--	--	--
Initial setting request from FCU			--	O
	--	--	--	--
Initial setting confirmation to FCU			--	--
	--	--	--	--
Communication				
Layer 1 activated			--	--
	O	--	--	--
Layer 2 set			--	--
	O	O	--	--
B channel connected (ISDN G4)			--	--
	O	O	O	--
B channel connected (ISDN G3)			--	--
	O	O	--	O
B channel released			--	--
	O	O	--	--
Layer 2 released			--	--
	O	--	--	--
Layer 1 deactivated			--	--
	--	--	--	--
The following will be displayed if bit 1 of G4 parameter switch E is at 1.				
B channel: send I frame (A blinks at this time if bit 1 of			--	A
G4 parameter switch E is at 1)	O	O	O	--
B channel: receive I frame (B blinks at this time if bit 1 of			B	--
G4 parameter switch E is at 1)	O	O	O	--

Note: At the start and end of communication, both A and B will blink.

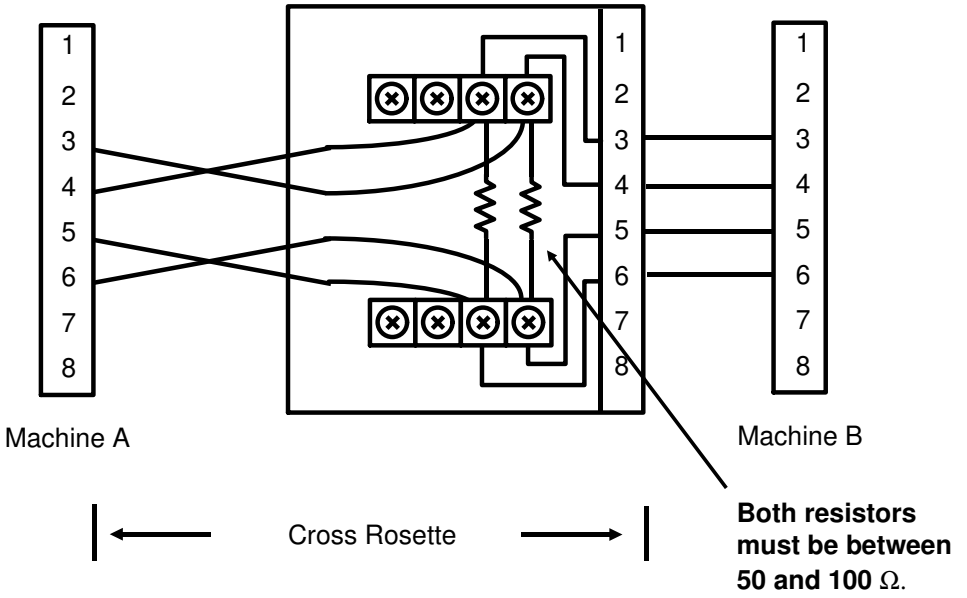
3.4. BACK-TO-BACK TESTING

To make a back-to-back test, you need:

- Two machines (they must be the same model)
- Cross rosette

The procedure is as follows.

1. Switch off the machines
2. Connect two machines back-to-back using the cross rosette as follows.



3. Make the following bit switch adjustments:
   - In the machine acting in NT mode, set bits 0 and 1 of G4 parameter switch 0D to 1.
   - In the machine acting in TE mode, set bit 0 of G4 parameter switch 0D to 0 and bit 1 to 1.
4. Reset the machine by switching it off, waiting a few seconds, then switching back on.
5. Place a document in one of the machines, dial a number, then press Start.
6. After you have finished the test, set bits 0 and 1 of G4 parameter switch 0D back to 0. then reset the machine.

Note: The following cannot be tested using this procedure:

- ISDN G3 communication
- P to M