# G4 "I" KIT TYPE 90 SERVICE MANUAL

## **1.1. INSTALLATION PROCEDURE**

Refer to the service manual for the main body.

## **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 06: 03 (H)	Switch 14:21 (H)
Switch 03: 01 (H)	Switch 11:01 (H)*	Switch 19:01 (H)
	57 (H)**	



\* For AT&T 5ESS switch

\*\* For Northern Telecom DMS-100 Switch

Parameter Switch

SW 00	SW 01	SW 02	SW 03	SW 04	SW 05	SW 06	SW 07
00 (H)	00 (H)	01 (H)	01 (H)	07 (H)	02 (H)	11 (H)	0B (H)
SW 08	SW 09	SW 0A	SW 0B	SW 0C	SW 0D	SW 0E	SW 0F
07 (H)	00 (H)	01 (H)	0B (H)	01 (H)	00 (H)	B2 (H)	00 (H)

## **1.3. SERVICE TABLES AND PROCEDURES**

#### **1.3.1. SERVICE LEVEL FUNCTIONS**

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



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.

# 1.3.2. 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.

Increment bit switch: ↓
Decrement bit switch: ↑
Example:
Display bit switch 3: ↑ x 3

G4_ISW		
DF:	0000000	î
SW:03	00000000	Ų

G4_ISW		
DF:	0000000	t
SW:00	00000000	Ļ

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

G4_ISW		
DF:	00000000	Ť
SW:03	10000000	ţ

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

#### 1.3.3. G4 Parameter Switch Programming (Function 02)

1. After entering G4 service mode,

press	0	2
-------	---	---

G4_PSW		
DF:	0000000	Î
SW:00	00000000	Ŧ

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:  $\Box$  x 3

G4_PSW		
DF:	0000000	1
SW:03	00000000	ţ

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

G4_PSW		
DF:	0000000	î
SW:03	10000000	Ŧ

4. Either:

Adjust more bit switches - go to step 2.

• Finish - Yes

#### **1.3.4. Storing the DNIP (Function 03)**

Do not use this function.

#### 1.3.5. Storing the ISDN-IP (Function 04)

- 1. After entering G4 service mode, press **0 4**
- 2. Input the ISDN International Prefix (ISDN-IP). Example: 1234 Yes



#### 1.3.6. 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 in the following format.



# 1.3.7. Storing the Second G4 Sub - scriber Number (Function 06)

ss 06



2. Input the number as explained in the previous section. Then press **Yes** 



#### 1.3.8. 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

IG3\_SN1

2. Input the number in the following format.

Area Code	Pause (-)	Local Subscriber Number
Then press	Yes	

# 1.3.9. Storing the Second ISDN G3 Sub - scriber Number (Function 08 )

IG3_SN2		

- 1. After entering G4 service mode, press 0 8
- 2. Input the number as explained in the previous section. Then press **Yes**

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

This is only for use during PTT approval tests.

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

Do not use this function

#### 1.3.12. Storing the G4 Sub-address (Function 11)

- 1. After entering G4 service mode, press **111**
- 2. Input the sub-address. Then press

G4_SA		

#### 1.3.13. Storing the ISDN G3 Subaddress (Function 12)

1. After entering G4 service mode,

press 1 2

2. Input the sub-address. Then press Yes



# 1.3.14. Storing the G4 Terminal ID (Func - tion 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**



G4_TII	)	
	1234-=	
G4 TĪI		
	1234-5551234=	
=		ABC

- 4. Input the G4 terminal name.
- 5. Press Yes

G4_TID	YES	OR	CLR	• NO
1234-5551	234=			
= XYZ CO.	NEW Y	YORI	Χ	ABC

#### 1.3.15. Storing the ISDN G3 CSI (Function 14)

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

IG3_CSI		
	YES	TO END

2. Input the CSI. Then press Yes

#### 1.3.16. Printing a G4 Memory Dump (Function 15)

1. After entering G4 service mode, press **15** 

2. Input the range of addresses that you wish to print.

Example	e: Ac	Idres	sses	s 22/	4A0	0 to	22BBFF
2 2	Α	Α	2	2	В	В	Start

#### 1.3.17. 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 **16**

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.

#### 1.3.18. Printing the G4 System Parameter List (Function 17)

1. After entering G4 service mode, press **17** 

G4 SYSTEM PARAMETER LIST PRESS START

#### 2. Start

#### 1.3.19. Modem/DTMF Tone Tests (Function 18)

This is only for use during PTT approval tests.

SM

G4\_DMP2 0 D+Bch1 PRESS START

7

## **1.4. 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.

#### 1.4.1. G4 Internal Switches

Bit	Bit Switch 00													
	FUNCTION								CO	ММЕ	NTS	;		
0	Οοι	untr	у сс	de										
1	Bit	4	3	2	1	0	Country	Bit	4	3	2	1	0	Country
2		0	0	0	0	0	France		0	1	1	0	1	Holland
		0	0	0	0	1	Germany		0	1	1	1	0	Spain
3		0	0	0	1	0	UK		0	1	1	1	1	Israel
4		0	0	0	1	1	Italy		1	0	0	0	1	USA
-		0	0	1	0	0	Austria		1	0	0	1	0	Asia
5		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
6		0	0	1	1	1	Finland		1	0	1	0	1	South Africa
7		0	1	0	0	0	Ireland		1	0	1	1	0	Australia
		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
		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	If you wish to keep the protocol frames of
	status after each	communications in the memory buffer, set this bit to 1.
	communication	The buffer can record several communications
	0: Erased 1: Kept	
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	This bit is used in Germany; set it to 1 for German PTT
	0: Not valid 1:	approval tests.
	Valid	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	This bit is normally 0. However, some networks may
	number (LCN)	require a fixed LCN. In such cases, this bit should be 1,
	0: Not controlled	and you may have to set a different value for the LCN
	1: Fixed at 01	using G4 Parameter Switch A.
2	Protocol ID check	The Protocol ID is in the CR packet.
	0: Yes 1: No	
3	Not used	Do not change the factory settings.
4		
5		
6		
7		

Bit	Switch 06	
	FUNCTION	COMMENTS
0	Inclusion of the	When the CR packet format matches IS8208 protocol,
	DTE address in	some networks may require this bit to be set at 1.
	the S:CR packet	This bit is only effective if bit 0 of G4 Parameter switch 6
	0: No 1: Yes	is at 1.
1	Calling and called DTE addresses <b>0:</b> Not used <b>1:</b> 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				(	СОММЕ	NTS			
0	Not used	Do	not cha	ange 1	he facto	ory set	ting.			
1	New session within the same call 0: Not accepted 1: Accepted	<ul> <li>0: If a new R:CSS is received, the machine sends back S:RSSN.</li> <li>1: If a new R:CSS is received, the machine sends back S:RSSP.</li> <li>Set this bit to 1 for German PTT approval tests</li> </ul>								
2 3 4 5 6 7	Not used	Do	not cha Bit Value	ange 1 7 32	he facto 6 16	ory set 5 8	tings. 4 4	3 2	2 1	

Bit switches 0A to 0F are not used.

Bit	Switch 10	
	FUNCTION	COMMENTS
0	Connection detector	0: USA and Japan
	0: Disabled 1:	1: Europe
	Enabled	
1	Layer 1 T3 timer	This should be kept at 5 s (both bits at 0) for normal
	Bit 2 1 Time	operation. However, you may have to change this
2	00 5s	during PTT approval tests.
	0129s	
	10 10s	
	1 1 Not used	
3	Layer 1 T4 timer	Set this bit to 1 for French PTT approval tests.
	0: Not used 1: Used	
4	Not used	Do not change the factory settings.
5		
6		
7	Loop back 4 mode	This is normally kept at 0. However, set it to 1 for
	0: Disabled 1:	British PTT approval tests.
	Enabled	

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

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

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

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

Bit	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 <b>0:</b> A reply is sent <b>1:</b> 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.	
1~4	Not used	Do not change the factory settings	
5	Global call reference <b>0:</b> Ignored <b>1:</b> 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.	

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Bit	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	1:64 k calling is indicated in the Bearer Capabilities, but	
	capabilities	communication is at 56 k.	
	<b>0:</b> 56 k <b>1:</b> 64 k		
6	Not used	Do not change the factory settings.	
7			

Bit	Switch 17: Fallback	from ISDN G4 to ISDN G3
	FUNCTION	COMMENTS
0	Condition for fallbac	k from G4 to G3
1 2 3 4 5 6	Bits 0 to 6 of bit swir contain another CPS either of these, com mode. The CPS codes mu recommendation Q. Examples: Bit $1 \ 0 \ 0$ $1 \ 0 \ 1$ This feature may no For the codes in bits bit switch 17 must b 1C) must be at 0, or	ch 17 contain a CPS code, and bits 0 to 6 of bit switch 18 S code. If a CPS code is received which is the same as munication will fall back from ISDN G4 mode to ISDN G3 st be the same as those specified in table 4-13 of CCITT 931. 6 5 4 3 2 1 0 0 0 0 1 CPS code 65 1 0 0 0 CPS code 65 t be available in Germany; this is not decided yet. 5 0 to 6 of bit switches 17 and 18 to be recognized, bit 7 of e 1. Also, bit 0 of RAM address 00015C (Service Switch Fallback from G4 to G3 will be disabled.
7	This bit determines of the CPS codes p certain standard cod 0: Fallback occurs o UK - #3 Germa Others 1: Fallback from G4 programmed in bit s	whether fallback from G4 to G3 occurs on receipt of one rogrammed in bit switch 17 or 18, or on receipt of a de. on receipt of any of the following CPS codes: 8, 63, 65, and 88 ny - #53 - #3, 65, and 88 to G3 occurs on receipt of one of the CPS codes witch 17 or 18

SM

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

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

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

#### 1.4.2. G4 Parameter Switches

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

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

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

Pa	rameter Switch 3	
	FUNCTION	COMMENTS
0	Link modulus <b>0:</b> 8 <b>1:</b> 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 2 3 4 5 6 7	Not used	Do not change the factory settings.

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

Pa	rameter Switch 5	
	FUNCTION	COMMENTS
0	Link timer	The link timer is the maximum allowable time between
4	Bit 3 2 1 0 Value	sending a protocol frame and receiving a response
1	0 0 0 0	frame from the remote terminal.
2	00011	
	00102	
3	and so on until	
	1 0 1 0 10	
4	Not used	Do not change the factory settings.
5		с <u>,</u> с
6		
7		

Pa	rameter Switch 6	
	FUNCTION	COMMENTS
0	Layer 3 protocol <b>0:</b> ISO8208 <b>1:</b> 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	Do not change the factory setting, unless the machine is
	<b>0:</b> 8 <b>1:</b> 128	experiencing compatibility problems.
5	Not used	Do not change the factory settings.
6		
7		

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Par	Parameter Switch 7			
	FUNCTION	COMMENTS		
0	Packet size	This value is sent in the CR packet. This value must		
4	Bit 3 2 1 0 Value	match the value stored in the other terminal, or		
1	0 1 1 1 128	communication will stop (CI will be returned). If the other		
2	1000 256	end returns CI, check the value of the packet window		
	1001 512	size with the other party.		
3	1 0 1 0 1024	Note that this value must be the same as the value		
	1 0 1 1 2048	programmed for the transport block size (G4 Parameter		
		Switch B, bits 0 to 3).		
4	Not used	Do not change the factory settings.		
5				
6				
7				

Pa	rameter Switch 8	
	FUNCTION	COMMENTS
0	Packet window	This is the maximum number of unacknowledged
1	size Bit 3 2 1 0 Value	packets that the machine can send out before having to pause and wait for an acknowledgement from the other
2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	end.
3	and so on until 1 1 1 1 15	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	Not used	Do not change the factory settings.
5		
6		
1		

Pa	Parameter Switch 9			
	FUNCTION	COMMENTS		
0	LCGN	Keep the value of the LCGN at 0.		
	Bit 3 2 1 0 Value			
1	0 0 0 0			
2	00011			
	00102			
3	and so on until			
	1 1 1 1 15			
4	Not used	Do not change the factory settings.		
5				
6				
7				

Pa	Parameter Switch A				
	FUNCTION	COMMENTS			
0	LCN	Keep at the value of the LCN at 1.			
1 2 3 4 5 6 7	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				

Pa	Parameter Switch B			
	FUNCTION	COMMENTS		
0	Transport block	This value must match the value set in the other		
4	size	terminal. Note that this value must be the same as the		
	Bit 3 2 1 0 Value	value programmed for the packet size (G4 Parameter		
2	0 1 1 1 128	Switch 7, bits 0 to 3). Also, the transport block size is		
	1000 256	limited by the amount of memory in the remote terminal.		
3	1001 512			
	1 0 1 0 1024			
	1 0 1 1 2048			
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.

Pa	Parameter Switch D				
	FUNCTIO	N	COMMENTS		
0	Back-to-back test mo	ode	When doing a back-to-back test, use		
	Bit 1 0 Setting		these bits to set up one of the machines		
1	0 0 Off		in TE mode, and the other in NT mode.		
	0 1 Not used		After the test, return both bits to 0.		
	1 0 ISDN L2 test r	node (TE mode)	,		
	1 1 ISDN I 2 tes	t mode (NT			
	mode)				
2	Notused		Do not change the factory settings		
3			Be not onalige the lastery coulings.		
4					
5					
6					
7					
Pa	arameter Switch E				
	FUNCTION		COMMENTS		
0	Debug mode -	If this is switch	ned on, a status code will be displayed in		
	real time display	the bottom rig	ht corner of the LCD. These codes are		
	0: Off 1: On	explained in the Troubleshooting section.			
1	Debug mode -	Set this bit to 1 when you wish to print a protocol dump			
	C/R frame save	list. Set it back to 0 after printing.			
	0: Off 1: On				

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

#### **1.4.3. 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.

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

Ву	rte 7	
		FUNCTION
0	Link modulus	Bit 3 2 1 0 Setting
1		0 0 0 Modulo 8
23		0 0 0 1 Modulo 128
Ū		1 1 1 1 As in Parameter Switch 3, bit 0
		Other settings: Not used
4	Not used	
5		
6		
7		

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

# **1.5. TROUBLESHOOTING**

#### 1.5.1. 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 dialing 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.
- 9. Error codes related with the errors detected by the FCU are listed in the Service Manual of the main body.

#### 1.5.2. D-channel Layer Management

Code	Probable Cause	Action
7-00	Link reset	2
7-01	Link set-up failed because of time-out.	2
7-02	Link release failed because of time-out.	2
7-03	Link set-up parameter error	2

#### 1.5.3. D-channel, Layer 1

Code	Probable Cause	Action
7-10	T3 timeout (layer 1 activation error)	1
7-11	No connection on the S0 interface	1
7-12	Deactivated	1

#### 1.5.4. D-channel Link Layer

Code	Probable Cause	Action
7 00	At the start of link set-up, the machine received an unsolicited	0
7-20	S (F=1).	2
7.04	At the start of link set-up, the machine received an unsolicited	0
7-21	DM (F=1).	2
7-22	At TEI release, the machine received an unsolicited UA (F=1).	2
7.00	At the start of link set-up, the machine received an unsolicited	0
7-23	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

#### 1.5.5. 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

Code	Probable Cause	Action
7-51	Release call reference during communication	3

### 1.5.6. 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

## 1.5.7. B-channel Network Layer

Code	Probable Cause	Action
7-80	A packet having an abnormal GFI was received	6
	A packet was received that had a logical channel number	
7-81	different from the logical channel being used for the	6
	communication	
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
7.01	Call set-up error; in reply to S:CR, R:CI was received to	7
7-91	indicate rejection of the call	1
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

## 1.5.8. 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
0 1 1	TCA block; Tx origin reference data in TCR disagreed with the	0
8-11	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
0.00	TDT block; the end indicator was "Continue" even though there	0
0-22	was no field data	ð
0.00	TDT block; and end block with no field data was received after	0
8-23	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

### 1.5.9. 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
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
0 50	G4 board load timer timeout; calling side waited too long for a	8
8-33	new session	

Code	Probable Cause	Action
0.54	G4 board load timer timeout; calling side waited too long for	0
0-04	transport probability	0
0 55	G4 board load timer timeout; called side waited too long for	0
0-00	S:RSSP	0
0.50	G4 board load timer timeout; document transmission	0
00-00	surveillance timer timeout	8
8-57	G4 board load timer timeout; timeout while waiting for a user	0
	abort request after a provider fail	0

### 1.5.10. 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
0 60	Calling/called terminal identification LI was different from that	8
0.05	specified by F.184 (LI = 24)	0
0.60	The LI for session user data exceeded the maximum value	0
0-03	(512)	0
8-64	The LI for CDUI was not 0	8
9 65	Checkpoint and document reference numbers LI error, or they	Q
0-05	were not in T.61 (ASCII) coding	0
0 66	The checkpoint reference number differed from the expected	0
0-00	value	0
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

### 1.5.11. 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	8
	the same as those in RDCLP	_
8-84	X.209 coding error in the DP (LI error)	8
8-85	X.209 coding error in the SLD (document descriptor/page	8
0-05	descriptor) (LI error)	0
8-86	SLD object type absent	8
8-87	PI error in the SLD (document descriptor/page descriptor)	8
	The capabilities in the SLD (document descriptor/page	
8-88	descriptor) are duplicated or are not the same as those in	8
	RDCLP	
8-89	No document descriptor at the start of the document	8
8-90	No page descriptor at the start of the page	8

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Code	Probable Cause	Action
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
0.07	CDPB/CDE received while TU/TI not yet completed, or an	0
8-97	unexpected PDU was received while analyzing an SLD	ð

## **1.6. 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.

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]		

#### 1.6.1. Layer 1 (Physical Layer)

#### 1.6.2. 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		

#### 1.6.3. 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

#### 1.6.4. 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

#### 1.6.5. 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

#### **1.6.6. 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
	S: CDUI, or R: CDUI (Data	96	S: RDGR, or R: RDGR
70	phase - layer 6 and facsimile data)	97	S: RDPBN, or R: RDPBN

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

## 1.7. G4CCU LED DISPLAY

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

	LED 5	LED 6		
These LEDs give the following informati the status of the machine.	LED 3   on about	LED 4		
Initial Settings		055		
Power-up/Reset	O = ON,	= OFF	0	0
Initial sotting request from ECU				0
initial setting request nonin CO				
Initial setting confirmation to FCU				
C C				
Communication			·	-
Layer 1 activated				
	0			
Lavor 2 cot				
Layer 2 Set	0	0		
		0		
B channel connected (ISDN G4)				
	0	0	0	
		•	<u> </u>	
B channel connected (ISDN G3)				
	0	0		0
B channel released				
	0	0		
Lover O released				-
Layer 2 released				
	0			
Laver 1 deactivated				
The following will be displayed if bit 1 of G4	4 paramete	er switch E i	s at 1.	
B channel: send I frame (A blinks at this tir	nė if bit 1 c	of		А
G4 parameter switch E is at 1)	0	0	0	
B channel: receive I frame (B blinks at this of	time if bit	1	В	
G4 parameter switch E is at 1)	0	0	0	

## **1.8. BACK-TO-BACK TESTING**

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

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

SM

The procedure is as follows.

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



- 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

# 9. MAJOR DIFFERENCES FROM FAX4500L

#### 9.1. Hardware (CiG4 board)

IC15 - DCR chip					
FAX5600L	Not installed	FAX4500L	Installed		
The IC15 dedicated for DCR function is not used with FAX5600L					
system, as DCR	process is done at	QPCR chip on the	e FCU.		

Connection Detector (220V model only)					
FAX5600L Disabled FAX4500L Enabled					
The connection detector circuit (PC1 and IC37) is disabled by the					
jumper switch TE	31.				

Ground Wire (220V model only)					
FAX5600LNot installedFAX4500LInstalled					
The ground wire from CN5 is not installed, since FAX5600L is					
designed to mee	t the VDE class A s	specifications.			

## 10. Software

Connection Detector (220V model only)					
FAX5600L	Disabled	FAX4500L	Enabled		
The bit 0 of internal switch 10 is set at "0" in all countries.					