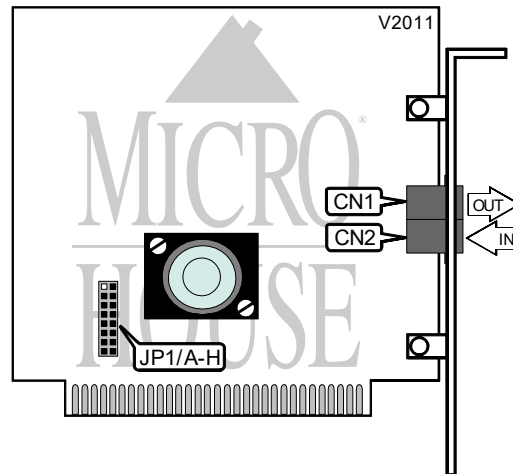


# IBM CORPORATION

## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

<b>Card Type</b>	Fax, Modem (asynchronous)
<b>Chip Set</b>	Unidentified
<b>Maximum Data Rate</b>	14.4Kbps
<b>Maximum Fax Rate</b>	14.4Kbps
<b>Data Bus</b>	8-bit ISA
<b>Fax Class</b>	Class I & II
<b>Data Modulation Protocol</b>	Bell 103/212A
<b>Fax Modulation Protocol</b>	ITU-T V.21, V.22, V.22bis, V.32, V.32bis
<b>Error Correction/Compression</b>	ITU-T V.17, V.21, V.27ter, V.29
	MNP5, V.42, V.42bis



CONNECTIONS				
Function	Label	Function	Label	
Line out	CN1	Line in	CN2	

SERIAL PORT ADDRESS					
Setting	JP1/A	JP1/B	JP1/C	JP1/D	
COM1 (3F8h)	Closed	Open	Open	Open	
COM2 (2F8h)	Open	Closed	Open	Open	
COM3 (3E8h)	Open	Open	Closed	Open	
COM4 (2E8h)	Open	Open	Open	Closed	

INTERRUPT SELECTION					
Setting	JP1/E	JP1/F	JP1/G	JP1/H	
3	Closed	Open	Open	Open	
4	Open	Closed	Open	Open	
5	Open	Open	Closed	Open	
7	Open	Open	Open	Closed	

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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### Proprietary AT Command Set

AUTO-RETRAIN - AUTO-FALLBACK/FALL-FORWARD	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] %En [cmds]
<b>Description:</b>	Controls auto-retrain mode and fallback/fall-forward
Command	Function
%E0	Auto-retrain disabled
í %E1	Auto-retrain enabled
%E2	Auto-fallback/fall-forward enabled

BIT-MAPPED REGISTER S14		
<b>Format:</b>	AT [cmds] S14=n [cmds]	
<b>Default:</b>	138	
<b>Range:</b>	0-174	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls echo, result codes and display, dial mode, and answer/originate mode.	
Bit	Value	Function
0	í 0	Not used
1	0	Command echo disabled
	í 1	Command echo enabled
2	í 0	Result codes enabled
	1	Result codes disabled
3	0	Display result codes in numeric format
	í 1	Display result codes in verbose format
4	í 0	Not used
5	í 0	Tone dial enabled
	1	Pulse dial enabled
6	í 0	Not used
7	0	Answer mode enabled
	í 1	Originate mode enabled

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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BIT-MAPPED REGISTER S21		
<b>Format</b>	AT [cmds] S21= <i>n</i> [cmds]	
<b>Default:</b>	52	
<b>Range:</b>	0-253	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Selects jack type, CTS/DCD/DSR signals, low DTR action, and the long space disconnect function.	
Bit	Value	Function
0	0	Selects RJ-11, RJ-41S, or RJ45S jack
	1	Selects RJ-12 or RJ-13 jack
1	0	Not used
2	0	CTS follows RTS
	1	CTS forced high
4, 3	00	DTR signal ignored
	01	Modem goes to command mode on low DTR
	10	Modem disconnects on low DTR; Auto-Answer is disabled.
	11	Modem is initialized on low DTR
5	0	DCD forced high
	1	DCD normal
6	0	DSR forced high
	1	DSR normal
7	0	Long space disconnect function disabled
	1	Long space disconnect function enabled

BIT-MAPPED REGISTER S22		
<b>Format</b>	AT [cmds] S22= <i>n</i> [cmds]	
<b>Default:</b>	117	
<b>Range:</b>	0-127	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls speaker volume and controls, and limits results codes.	
Bit	Value	Function
1, 0	00	Off volume
	01	Low level volume
	10	Medium level volume
	11	High level volume
3, 2	00	Speaker off
	01	Speaker off on carrier
	10	Speaker always on
	11	Speaker on during handshake
6 - 4	000	Basic result codes only enabled
	100	Basic and connection speed result codes enabled
	101	Basic and connection speed result codes and dialtone detection enabled
	110	All result codes except dialtone detection enabled
	111	All result codes enabled

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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BIT-MAPPED REGISTER S23		
<b>Format</b>	AT [cmds] S23= <i>n</i> [cmds]	
<b>Default:</b>	Unidentified	
<b>Range:</b>	0-189	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Grants/denies remote digital loopback, controls DTE rate and parity, and sets guard tone.	
Bit	Value	Function
0	0	Remote digital loopback denied
	1	Remote digital loopback allowed
3 - 1	000	Sets serial port speed to 0-300bps
	001	Sets serial port speed to 600bps
	010	Sets serial port speed to 1200bps
	011	Sets serial port speed to 2400bps
	100	Sets serial port speed to 4800bps
	101	Sets serial port speed to 9600bps
	110	Sets serial port speed to 19200bps
5, 4	00	Parity even
	01	Not used
	10	Parity odd
	11	No Parity
7, 6	00	Guard tone disabled
	01	Guard tone disabled
	10	Guard tone 1800Hz enabled

BIT-MAPPED REGISTER S27		
<b>Format</b>	AT [cmds] S27= <i>n</i> [cmds]	
<b>Default:</b>	64	
<b>Range:</b>	0-116	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Selects line type, clock source, and ITU-T/Bell modes.	
Bit	Value	Function
3, 1, 0	000	Not used
2	0	Switched line
	1	Leased line
5, 4	00	Local modem generates transmit clock source
	01	Local DTE generates transmit clock source
	10	Remote DCE/DTE generates transmit clock source
6	0	ITU/T mode
	1	Bell mode

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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BIT-MAPPED REGISTER S28		
<b>Format:</b>	AT [cmds] S28= <i>n</i> [cmds]	
<b>Default:</b>	0	
<b>Range:</b>	0-31	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls V.23 split speed, transmit/receive speed, half duplex, and pulse dialing.	
Bit	Value	Function
0	0	V.23 split speed operation disabled
	1	V.23 split speed operation enabled
1	0	75bps transmit, 1200bps receive enabled
	1	1200bps transmit, 75bps receive enabled
2	0	V.23 half-duplex disabled
	1	V.23 half-duplex enabled
4, 3	00	39ms make/61ms break at 10pps
	01	33ms make/67ms break at 10pps
	10	39ms make/61ms break at 20pps
	11	33ms make/67ms break at 20pps

BIT-MAPPED REGISTER S31		
<b>Format:</b>	AT [cmds] S31= <i>n</i> [cmds]	
<b>Default:</b>	2	
<b>Range:</b>	0-10	
<b>Description:</b>	Select automode and extended result code format.	
Bit	Value	Function
0	0	Not used
1	0	Auto-mode detection disabled
	1	In originate mode, handshake begins at line speed designated by the S37 register. Modem can shift to a slower speed if necessary. In answer mode, handshake attempted with the following protocols in order - V.32bis, V.32, V.22bis, V.22 or Bell 212, V.21, and Bell 103
3, 2	00	Enables CONNECT result codes to report DTE speed
	01	Full reporting of CONNECT result codes
	10	Enables CONNECT result codes to report DCE speed

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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BIT-MAPPED REGISTER S40		
<b>Format</b>	AT [cmds] S40= <i>n</i> [cmds]	
<b>Default:</b>	105	
<b>Range:</b>	0-239	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls power level and break handling, selects MNP extended services, link negotiation, and block size.	
Bit	Value	Function
0	0	MNP disabled
	1	MNP enabled
1	0	Power level adjustment enabled
	1	Power level adjustment disabled
2	0	Link will be negotiated at highest possible speed
	1	Link will be negotiated at 1200bps
5, 4, 3	000	\K0
	001	\K1
	010	\K2
	011	\K3
	100	\K4
	101	\K5
7, 6	00	MNP block size is 64 characters
	01	MNP block size is 128 characters
	10	MNP block size is 192 characters
	11	MNP block size is 256 characters

BIT-MAPPED REGISTER S41		
<b>Format</b>	AT [cmds] S41= <i>n</i> [cmds]	
<b>Default:</b>	7	
<b>Range:</b>	0-31	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Selects compression, auto-retrain, flow control, and MNP mode.	
Bit	Value	Function
1 - 0	00	Data compression disabled
	01	MNP5 enabled
	10	V.42bis enabled
	11	MNP5 and V.42bis enabled
2	0	Auto-retrain disabled
	1	Auto-retrain enabled
3	0	Flow control disabled
	1	Flow control enabled
4	0	Stream mode for MNP
	1	Block mode for MNP

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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BREAK SEND	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] \Bn [cmds]
<b>Default:</b>	3
<b>Range:</b>	1-9
<b>Unit:</b>	.1 second
<b>Description:</b>	Sends break to modem

BREAK TYPE			
<b>Type:</b>	Configuration		
<b>Format:</b>	AT [cmds] \Kn [cmds]		
<b>Description:</b>	Configures action of break signal		
Command	Break from DTE while in Normal or MNP mode	Break from DTE while in Direct mode	Break received from remote modem
\K0	On-line command mode enabled, send no break to remote modem	On-line command mode enabled, send no break to remote modem	Buffers cleared, break sent to DTE
\K1	Break sent to remote modem and buffers cleared	On-line command mode enabled, send no break to remote modem	Buffers cleared, break sent to DTE
\K2	On-line command mode enabled, send no break to remote modem	Send break to remote modem immediately	Break sent immediately to DTE
\K3	Send break to remote modem immediately	On-line command mode enabled, send no break to remote modem	Break sent immediately to DTE
\K4	On-line command mode enabled, send no break to remote modem	Send break to remote modem immediately	Break sent with received data to the DTE
î \K5	Send break with transmitted data	Send break to remote modem immediately	Break sent with received data to the DTE

COMPRESSION	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] %Cn [cmds]
<b>Description:</b>	Selects data compression
Command	Function
%C0	Data compression disabled
%C1	Not used
%C2	V.42bis enabled
î %C3	MNP5 and V.42bis enabled

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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CONNECT MODE	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] \Nn [cmds]
<b>Description:</b>	Controls the type of connection the modem will operate in
Command	Function
\N0	Normal mode enabled
í \N1	Direct mode enabled
\N2	Reliable mode enabled
\N3	Auto-reliable mode enabled
\N4	V.42 reliable mode enabled
\N5	MNP reliable mode enabled

DIAL	
<b>Type:</b>	Immediate
<b>Format:</b>	AT [cmds] D<#> [cmds]
<b>Description:</b>	Dials telephone number according to any modifiers included in the string
<b>Note:</b>	Any combination of modifiers can be used to produce the desired dial functions in sequence.
Modifier	Function
L	Re-dial last number
í P	Pulse dialing enabled
S=n	Dial stored telephone number <i>n</i>
T	Tone dialing enabled
W	Dialing resumed following dial tone detection
,	Dialing paused for amount of time specified in S8 register
!	Flash function initiated
@	Wait for quiet answer enabled
;	Modem returned to command state after dialing
^	Calling tone disabled

FLOW CONTROL	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] \Gn [cmds]
<b>Description:</b>	Selects modem port flow control
Command	Function
í \G0	Flow control disabled
\G1	Flow control enabled

FLOW CONTROL	
<b>Type:</b>	Register
<b>Format</b>	AT [cmds] S39? [cmds]
<b>Description:</b>	Displays the current flow control
Value	Meaning
0	Flow control disabled
í 3	RTS/CTS flow control enabled
4	XON/XOFF flow control enabled
5	Transparent XON/XOFF flow control enabled

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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FLOW CONTROL CHARACTER - XOFF	
<b>Type:</b>	Register
<b>Format:</b>	AT [cmds] S33= <i>n</i> [cmds]
<b>Default:</b>	19
<b>Range:</b>	0-255
<b>Unit:</b>	ASCII
<b>Description:</b>	Sets the character used to represent XOFF

FLOW CONTROL CHARACTER - XON	
<b>Type:</b>	Register
<b>Format:</b>	AT [cmds] S32= <i>n</i> [cmds]
<b>Default:</b>	17
<b>Range:</b>	0-255
<b>Unit:</b>	ASCII
<b>Description:</b>	Sets the character used to represent XON

INACTIVITY TIMER	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] \T <i>n</i> [cmds]
<b>Default:</b>	0
<b>Range:</b>	0-42
<b>Unit:</b>	1 minute
<b>Description:</b>	Sets the length of time that the modem does not receive information before it disconnects.

LINE SIGNAL LEVEL	
<b>Type:</b>	Immediate
<b>Format:</b>	AT [cmds] %L [cmds]
<b>Default:</b>	Unidentified
<b>Range:</b>	9-43
<b>Unit:</b>	-dBm
<b>Description:</b>	Returns a value which indicates the received line signal level

LINE SIGNAL QUALITY	
<b>Type:</b>	Immediate
<b>Format:</b>	AT [cmds] %Q [cmds]
<b>Description:</b>	Returns a value which indicates line signal quality
<b>Value</b>	<b>Meaning</b>
0 - 7	Auto-retrain disabled
8 - 255	Auto-retrain enabled

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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MAXIMUM BLOCK SIZE FOR TRANSMISSION	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] \An [cmds]
<b>Description:</b>	Sets the maximum transmittable block size
Command	Function
\A0	MNP block size is 64 characters
í \A1	MNP block size is 128 characters
\A2	MNP block size is 192 characters
\A3	MNP block size is 256 characters

MNP - STREAM/BLOCK MODE	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] \Ln [cmds]
<b>Description:</b>	Selects the transfer mode for MNP link
Command	Function
í \L0	Stream mode for MNP enabled
\L1	Block mode for MNP enabled

MNP - LINK NEGOTIATION	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] *Hn [cmds]
<b>Description:</b>	Sets the speed at which an MNP link negotiation will occur
Command	Function
í *H0	Link will be negotiated at highest possible speed
*H1	Link will be negotiated at 1200bps

REPORT INFORMATION	
<b>Type:</b>	Immediate
<b>Format:</b>	AT [cmds] In [cmds]
<b>Description:</b>	Displays information requested
Command	Function
I0	Reports product identification code
I1	Reports ROM checksum as OK or ERROR
I2	Tests and reports ROM checksum
I3	Reports firmware revision level
I4	Reports OEM-defined identifier string
I5	Reports country code
I6	Reports Modem data pump model

SLEEP TIMER	
<b>Type:</b>	Register
<b>Format</b>	AT [cmds] S24=n [cmds]
<b>Default:</b>	0
<b>Range:</b>	0-255
<b>Unit:</b>	1 second
<b>Description:</b>	Maximum duration of DTE and DCE inactivity allowed prior to initiating low-power sleep mode.

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SPLIT-SPEED CONTROL		
<b>Type:</b>	Configuration	
<b>Format:</b>	AT [cmds] \Wn [cmds]	
<b>Description:</b>	Controls split-speed mode	
Command	Function	
í \W0	V.23 split-speed mode disabled	
\W1	V.23 split-speed mode enabled	

SPLIT-SPEED MODE		
<b>Type:</b>	Configuration	
<b>Format:</b>	AT [cmds] %Fn [cmds]	
<b>Description:</b>	Controls split-speed direction	
Command	Function	
%F0	Not used	
%F1	75bps transmit, 1200bps receive	
í %F2	1200bps transmit, 75bps receive; when AT\W1 is set.	

SWITCH TO NORMAL MODE		
<b>Type:</b>	Immediate	
<b>Format:</b>	AT [cmds] \Z [cmds]	
<b>Description:</b>	Switches to normal mode from MNP mode	

TEST MODES		
<b>Type:</b>	Register	
<b>Format:</b>	AT [cmds] S16=n [cmds]	
<b>Default:</b>	0	
<b>Range:</b>	0-125	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls loopback tests: analog, digital, remote digital, and self tests.	
Bit	Value	Function
0	í 0	Local analog loopback not in progress
	1	Local analog loopback in progress
1	í 0	Not used
2	í 0	Local digital loopback not in progress
	1	Local digital loopback in progress
3	í 0	Modem not in remote digital loopback
	1	Remote digital loopback in progress
4	í 0	Remote digital loopback not requested
	1	Remote digital loopback requested
5	í 0	Remote digital loopback w/ error count not in progress
	1	Remote digital loopback w/ error count in progress
6	í 0	Local analog loopback w/ self-test not in progress
	1	Local analog loopback w/ self-test in progress

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## 14.4KBPS DATA/FAX MODEM INTERNAL ISA

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TRANSMISSION LEVEL - PSTN	
<b>Type</b>	Register
<b>Format</b>	AT [cmds] S91= <i>n</i> [cmds]
<b>Default</b>	10
<b>Range</b>	0-15
<b>Unit</b>	-1 dBm
<b>Description</b>	Sets the signal level for transmission over switched phone lines