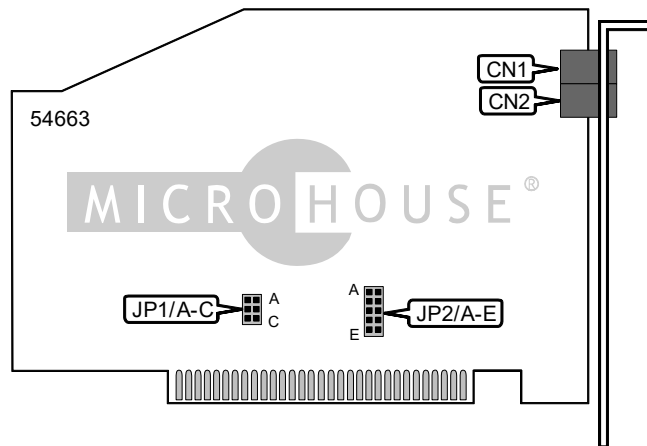


# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

<b>Card Type</b>	Modem/Fax card
<b>Chip Set</b>	Unidentified
<b>I/O Options</b>	Line in, line out
<b>Maximum Modem Rate</b>	56Kbps
<b>Maximum Fax Rate</b>	14.4Kbps
<b>Data Modulation Protocol</b>	Bell 103A/212A
<b>Fax Modulation Protocol</b>	ITU-T V34, V.32bis, V.32, V.22bis, V.23, V.22, V.21
<b>Error Correction/Compression</b>	ITU-T V.17, V.27ter, V.29, V.21
<b>Fax Class</b>	MNP5, V.42, V.42bis
<b>Data Bus</b>	Class I & II
	8-bit ISA



CONNECTIONS			
Function	Label	Function	Label
RJ-11 connector	CN1	RJ-11 connector	CN2

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

INTERRUPT					
Setting	JP2/A	JP2/B	JP2/C	JP2/D	JP2/E
IRQ2/9	Open	Open	Open	Open	Closed
IRQ3	Open	Open	Open	Closed	Open
IRQ4	Open	Open	Closed	Open	Open
IRQ5	Open	Closed	Open	Open	Open
IRQ7	Closed	Open	Open	Open	Open
Plug & Play enabled	Open	Open	Open	Open	Open

Continued on next page . . .

CARDINAL TECHNOLOGIES, INC.  
CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

SUPPORTED COMMAND SET	
Basic AT Commands	
AT, +++, A/, A>	
A, B, E, F, H, M, O, P, T, V	
&G, &T, &W, &Z	
S Registers	
S0, S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S18, S25 S38	
<b>Note:</b> See MHI Help File for full command documentation.	

## PROPRIETARY AT COMMAND SET

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.
Command	Function
DL	Re-dial last number
DP	Pulse dialing enabled
DR	Answer mode enabled; originate mode disabled following handshake initiation.
DS=n	Dial stored telephone number <i>n</i>
DT	Tone dialing enabled/Pulse dialing disabled
DW	Dialing resumed following dial tone detection
D,	Dialing paused for amount of time specified in S8 register
D"WXY"	Optional method of denoting telephone numbers. Letters enclosed in quotes are interpreted as numbers according to the system found on a telephone keypad.
D!	Flash function initiated. Modem commanded to go off-hook for specified time before returning on-hook.
D@	Wait for Quite Answer function enabled. Modem waits until a "quiet answer," a ring-back signal followed by silence up to the time specified in S7, is received prior to executing the rest of the dial string.
D/	Delays 125 ms. Before proceeding with dial string
D;	Modem returned to idle state after dialing. The semicolon can only be placed at the end of the dial command.

Continued on next page . . .

. . . continued from previous page

REPORT INFORMATION	
<b>Type:</b>	Immediate
<b>Format:</b>	AT [cmds] ln [cmds]
<b>Description:</b>	Displays information requested
Command	Function
I0	Reports four digit product code
I1	Reports firmware checksum
I2	Reports RAM checksum
I3	Reports ID string
I4	Reports current modem settings
I5	Reports NVRAM settings
I6	Reports data connection information
I7	Reports manufacturer and model information

SPEAKER VOLUME	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] Ln [cmds]
<b>Description:</b>	Controls speaker volume
Command	Function
L0	Low volume setting
L1	Low volume setting
L2	Medium volume setting
L3	Highest volume setting

RESULT CODES	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] Qn [cmds]
<b>Description:</b>	Enables modem to send result codes to the DTE
Command	Function
iQ0	Result code sending enabled
Q1	Result code sending disabled
Q2	Result code sending only in originate mode

SELECT CALL PROGRESS RESULT CODES	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] Xn [cmds]
<b>Description:</b>	Enables selection of tone detection and associated result code format options
Command	Function
X0	Busy and dial tone detection disabled; result codes 0 - 4, 155 - 236 enabled.
X1	Busy and dial tone detection disabled; result codes 0 - 5, 10, 13 - 236 enabled.
X2	Busy tone detection disabled, dial tone detection enabled; result codes 0 - 6, 10 13 - 236 enabled.
X3	Busy tone detection enabled, dial tone detection disabled; result codes 0 - 5, 7, 8, 10-236 enabled.
X4	Busy and dial tone detection enabled; result codes 0 - 8, 10, 13-236 enabled.

Continued on next page . . .

CARDINAL TECHNOLOGIES, INC.  
CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

LONG SPACE DISCONNECT	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] Yn [cmds]
<b>Description:</b>	Commands disconnection configuration
Command	Function
í Y0	Profile 0 in NVRAM
Y1	Profile 1 in NVRAM

SOFT RESET	
<b>Type:</b>	Immediate
<b>Format:</b>	AT [cmds] Zn [cmds]
<b>Description:</b>	Restores modem profiles previously saved in non-volatile RAM using the &W command.
Command	Function
Z0	Restore setting to profile selected by Y
Z1	Restore setting NVRAM profile 0
Z2	Restore setting NVRAM profile 1
Z3	Restores setting to factory default profile 0
Z4	Restores setting to factory default profile 1
Z5	Restores setting to factory default profile 2

AUTO-ANSWER - ORIGINATE/ANSWER	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &An [cmds]
<b>Description:</b>	Enables or disables additional result code subsets
Command	Function
&A0	ARQ result codes disabled
í &A1	ARQ result codes enabled
&A2	V.32 modulation indicator added in calls 4800bps or higher
&A3	Protocol indicators added

SERIAL PORT RATE	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Bn [cmds]
<b>Description:</b>	Manages the serial port rate
Command	Function
í &B0	Variable, follows connection rate
&B1	Fixed serial port rate
&B2	Fixed in ARQ mode, variable in non-ARQ mode

*Continued on next page . . .*

CARDINAL TECHNOLOGIES, INC.  
CONNECTA 56K INTERNAL FAX MODEM (8714)

*. . . continued from previous page*

DATA CARRIER DETECT (DCD)

<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Cn [cmds]
<b>Description:</b>	Selects whether the DCD option is enabled or disabled
<b>Command</b>	<b>Function</b>
&C0	DCD override enabled
&C1	DCD enabled after carrier signal detected

DATA TERMINAL READY (DTR)	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Dn [cmds]
<b>Description:</b>	Selects modem response to DTR
<b>Command</b>	<b>Function</b>
&D0	DTR override
&D1	DTR toggle causes online command mode
i &D2	Normal DTR operations
&D3	Resets on receipt of DTR

FACTORY DEFAULT PROFILE	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &F [cmds]
<b>Description:</b>	Sets values in active profile to values found in the default profile
<b>Command</b>	<b>Function</b>
&F0	Generic template
&F1	Factory configuration 1; hardware flow control template
&F2	Factory configuration 2; software flow control template

TRANSMIT DATA FLOW CONTROL	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Hn [cmds]
<b>Description:</b>	Enables TD flow control options
<b>Command</b>	<b>Function</b>
i &H0	Flow control disabled
&H1	CTS flow control enabled
&H2	Software flow control enabled
&H3	Hardware and software flow control enabled

RECEIVE DATA FLOW CONTROL	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &In [cmds]
<b>Description:</b>	Enables RD flow control options
<b>Command</b>	<b>Function</b>
i&I0	Flow control disabled
&I1	XON/XOFF signals to modem and remote system. Responds to S22, S23.
&I2	XON/XOFF signals only to modem. Responds to S22, S23.

*Continued on next page . . .*

## CARDINAL TECHNOLOGIES, INC. CONNECTA 56K INTERNAL FAX MODEM (8714)

*. . . continued from previous page*

DATA COMPRESSION	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Kn [cmds]

<b>Description:</b> Enables/disables flow control	
<b>Command</b>	<b>Line Type</b>
í &K0	Data compression disabled
&K1	Automatic enable/disable
&K2	Data compression enabled
&K3	MNP data compression disabled: MNP error correction enabled.

ERROR CONTROL	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &M <i>n</i> [cmds]
<b>Description:</b>	Sets error control for connections at 1200bps and higher
<b>Command</b>	<b>Mode</b>
&M0	Error control disabled
í &M4	Normal/ARQ mode.
&M5	ARQ mode

*Continued on next page . . .*

# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

CONNECTION SPEED UPPER LIMIT	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &N <i>n</i> [cmds]
<b>Description:</b>	Sets required connection speed if &U is set to 0; otherwise, sets fastest allowed connection speed.
Command	Function
í &N0	No maximum connect speed.
&N1	Set maximum connect speed to 300bps.
&N2	Set maximum connect speed to 1200bps.
&N3	Set maximum connect speed to 2400bps.
&N4	Set maximum connect speed to 4800bps.
&N5	Set maximum connect speed to 7200bps.
&N6	Set maximum connect speed to 9600bps.
&N7	Set maximum connect speed to 12Kbps.
&N8	Set maximum connect speed to 14.4Kbps.
&N9	Set maximum connect speed to 16.8Kbps.
&N10	Set maximum connect speed to 19.2Kbps.
&N11	Set maximum connect speed to 21.6Kbps.
&N12	Set maximum connect speed to 24Kbps.
&N13	Set maximum connect speed to 26.4Kbps.
&N14	Set maximum connect speed to 28.8Kbps.
&N15	Set maximum connect speed to 31.2Kbps.
&N16	Set maximum connect speed to 33.6Kbps.
&N17	Set maximum connect speed to 28.8Kbps. (X2)
&N18	Set maximum connect speed to 31.2Kbps. (X2)
&N19	Set maximum connect speed to 33.6Kbps. (X2)
&N20	Set maximum connect speed to 42.6Kbps.
&N21	Set maximum connect speed to 44.0Kbps.
&N22	Set maximum connect speed to 45.3Kbps.
&N23	Set maximum connect speed to 46.6Kbps.
&N24	Set maximum connect speed to 48.0Kbps.
&N25	Set maximum connect speed to 49.3Kbps.
&N26	Set maximum connect speed to 50.6Kbps.
&N27	Set maximum connect speed to 52.0Kbps.
&N28	Set maximum connect speed to 53.3Kbps.
&N29	Set maximum connect speed to 54.6Kbps.
&N30	Set maximum connect speed to 56.0Kbps.
&N31	Set maximum connect speed to 57.3Kbps.

Continued on next page . . .

CARDINAL TECHNOLOGIES, INC.  
CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

PULSE DIALING RATIO	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &P <i>n</i> [cmds]
<b>Description:</b>	Selects pulse dial make/break ratio
Command	Function
&P0	39/61ms at 10pps (North America)
&P1	33/67ms at 10pps (Europe)

RTS	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &R <i>n</i> [cmds]
<b>Description:</b>	Selects RTS/CTS options
Command	Function
í &R1	RTS ignored
&R2	Received data to computer only on RTS

DATA SET READY (DSR)	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &S <i>n</i> [cmds]
<b>Description:</b>	Selects DSR options
Command	Function
í &S0	DSR forced high
&S1	DSR high only while modem is handshaking or connected

Continued on next page . . .



# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

CONNECTION SPEED LOWER LIMIT	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Un [cmds]
<b>Description:</b>	Sets slowest allowed connection speed if &N is set to 1 or higher.
Command	Function
&U0	No minimum connect speed.
&U1	Set minimum connect speed to 300bps.
&U2	Set minimum connect speed to 1200bps.
&U3	Set minimum connect speed to 2400bps.
&U4	Set minimum connect speed to 4800bps.
&U5	Set minimum connect speed to 7200bps.
&U6	Set minimum connect speed to 9600bps.
&U7	Set minimum connect speed to 12Kbps.
&U8	Set minimum connect speed to 14.4Kbps.
&U9	Set minimum connect speed to 16.8Kbps.
&U10	Set minimum connect speed to 19.2Kbps.
&U11	Set minimum connect speed to 21.6Kbps.
&U12	Set minimum connect speed to 24Kbps.
&U13	Set minimum connect speed to 26.4Kbps.
&U14	Set minimum connect speed to 28.8Kbps.
&U15	Set minimum connect speed to 31.2Kbps.
&U16	Set minimum connect speed to 33.6Kbps.
&U17	Set minimum connect speed to 28.8Kbps. (X2)
&U18	Set minimum connect speed to 31.2Kbps. (X2)
&U19	Set minimum connect speed to 33.6Kbps. (X2)
&U20	Set minimum connect speed to 42.6Kbps.
&U21	Set minimum connect speed to 44.0Kbps.
&U22	Set minimum connect speed to 45.3Kbps.
&U23	Set minimum connect speed to 46.6Kbps.
&U24	Set minimum connect speed to 48.0Kbps.
&U25	Set minimum connect speed to 49.3Kbps.
&U26	Set minimum connect speed to 50.6Kbps.
&U27	Set minimum connect speed to 52.0Kbps.
&U28	Set minimum connect speed to 53.3Kbps.
&U29	Set minimum connect speed to 54.6Kbps.
&U30	Set minimum connect speed to 56.0Kbps.
&U31	Set minimum connect speed to 57.3Kbps.

Continued on next page . . .

# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

BREAK HANDLING	
<b>Type:</b>	Configuration
<b>Format:</b>	AT [cmds] &Y <i>n</i> [cmds]
<b>Description:</b>	Sets destructive/nondestructive break handling
Command	Function
&Y0	Destructive, but doesn't send break
i &Y1	Destructive, expedited
&Y2	Nondestructive, expedited

### S(STATUS) -REGISTERS

BIT-MAPPED REGISTER S13		
<b>Format:</b>	AT [cmds] S13= <i>n</i> [cmds]	
<b>Range:</b>	0-174	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls reset, dial mode	
Bit	Value	Function
0	0	Unidentified
	1	Resets when DTR drops
1	0	Unidentified
	1	Resets non-MNP transmit buffer from 1.5K to 128bytes
2	0	Unidentified
	1	Sets backspace key to delete
3	0	Unidentified
	1	On DTR signal, auto dials number stored at NVRAM position 0
4	0	Unidentified
	1	At power on/reset, auto dials number stored at NVRAM position 0
5	0	Enables V.32bis ASL mode
	1	Disables V.31bis ASL mode
6	0	Enables quick retrains
	1	Disables quick retrains
7	0	Unidentified
	1	Disconnect on escape code

Continued on next page . . .

# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

... continued from previous page

BIT-MAPPED REGISTER S15		
<b>Format:</b>	AT [cmds] S15= <i>n</i> [cmds]	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Disable/Enable MNP	
Bit	Value	Function
0	0	Enable ARQ/MNP for V.22
	1	Disable ARQ/MNP for V.22
1	0	Enable ARQ/MNP for V.22bis
	1	Disable ARQ/MNP for V.22bis
2	0	Enable ARQ/MNP for V.32/V.32bis/V.32terbo
	1	Enable ARQ/MNP for V.32/V.32bis/V.32terbo
3	0	Enable MNP handshake
	1	Disable MNP handshake
4	0	Enable MNP level 4
	1	Disable MNP level 4
5	0	Enable MNP level 3
	1	Disable MNP level 3
6	0	MNP compatibility
	1	MNP incompatibility
7	0	Enable V.42 operation
	1	Disable V.42 operation

TEST MODES		
<b>Type:</b>	Register	
<b>Format:</b>	AT [cmds] S16= <i>n</i> [cmds]	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Controls touch tone dialing test.	
Bit	Value	Function
0	0	Reserved
1	0	Touch tone dialing test not in progress
	1	Touch tone dialing test in progress
2	0	Test pattern generation not in progress
	1	Test pattern generation in progress
3-7	0	Reserved

INACTIVITY TIMER	
<b>Type:</b>	Register
<b>Format</b>	AT [cmds] S19= <i>n</i> [cmds]
<b>Unit:</b>	10 seconds
<b>Description:</b>	Maximum duration of DTE and DCE inactivity allowed prior to initiating hang-up process.
<b>Note:</b>	S19=0 disables the timer and allows indefinite inactivity.

Continued on next page ...

# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

BREAK LENGTH	
<b>Type:</b>	Register
<b>Format:</b>	AT [cmds] S21= <i>n</i> [cmds]
<b>Unit:</b>	10ms
<b>Description:</b>	Sets duration of breaks sent from the modem to the computer
<b>Note:</b>	Applies to MNP or V.42 mode only.

FLOW CONTROL CHARACTER - XON	
<b>Type:</b>	Register
<b>Format:</b>	AT [cmds] S22= <i>n</i> [cmds]
<b>Range:</b>	0-255
<b>Unit:</b>	ASCII
<b>Description:</b>	Sets the character used to represent XON

FLOW CONTROL CHARACTER - XOFF	
<b>Type:</b>	Register
<b>Format:</b>	AT [cmds] S23= <i>n</i> [cmds]
<b>Range:</b>	0-255
<b>Unit:</b>	ASCII
<b>Description:</b>	Sets the character used to represent XOFF

BIT-MAPPED REGISTER S27		
<b>Format:</b>	AT [cmds] S27= <i>n</i> [cmds]	
<b>Range:</b>	0-255	
<b>Unit:</b>	Bit-mapped	
<b>Description:</b>	Enables/disables modulation protocols	
Bit	Value	Function
0	0	Disable ITU-T modulation at 300bps for overseas calls: in V.21 mode, the modem answers both overseas and domestic calls, but only originates V.21 calls
	1	Enable ITU-T modulation at 300bps for overseas calls: in V.21 mode, the modem answers both overseas and domestic calls, but only originates V.21 calls
1	0	Disable unencoded modulation in V.32 mode
	1	Enable unencoded modulation in V.32 mode
2	0	Enable V.32 modulation
	1	Disable V.32 modulation
3	0	Enable 2100Hz answer tone
	1	Disable 2100Hz answer tone
4	0	Disable V.23 fallback mode
	1	Enable V.23 fallback mode
5	0	Enable V.32bis mode
	1	Disable V.32bis mode
6	0	Reserved
7	0	Enable codes
	1	Disable codes and enters software compatibility mode

Continued on next page . . .

# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

. . . continued from previous page

CONNECTION TIME	
<b>Type:</b>	Register
<b>Format</b>	AT [cmds] S28= <i>n</i> [cmds]
<b>Unit:</b>	.1 second
<b>Description:</b>	Sets V.32 duration
Command	Function
S28=0	Eliminates the V.32 answer tone for a faster connection
S28=8	Times are in .1 second
S28=255	Disable connections except V.32 at 9600bps

FALLBACK TIMER	
<b>Type:</b>	Register
<b>Format</b>	AT [cmds] S29= <i>n</i> [cmds]
<b>Range:</b>	0-255
<b>Unit:</b>	.01 second
<b>Description:</b>	Sets the duration of the V.21 answer mode fallback timer

BIT-MAPPED REGISTER S32		
<b>Format:</b>	AT [cmds] S32= <i>n</i> [cmds]	
<b>Range:</b>	0-255	
<b>Description:</b>	Select setup for 28.8 and higher speed modems	
Bit	Value	Function
0	0	Disable V.8 call indicate
	1	Enable V.8 call indicate
1	0	Disable V.8 mode
	1	Enable V.8 mode
2	0	Enable V.FC modulation
	1	Disable V.FC modulation
3	0	Enable V.34 modulation
	1	Disable V.34 modulation
4	0	Enable V.34+ modulation
	1	Disable V.34+ modulation
5	0	Enable X2 modulation
	1	Disable X2 modulation
6-7	0	Reserved

Continued on next page . . .

# CARDINAL TECHNOLOGIES, INC.

## CONNECTA 56K INTERNAL FAX MODEM (8714)

... continued from previous page

BIT-MAPPED REGISTER S33		
<b>Format:</b>	AT [cmds] S33= <i>n</i> [cmds]	
<b>Range:</b>	0-255	
<b>Description:</b>	Disable/enable data rates	
Bit	Value	Function
0	0	Enable 2400 symbol rate
	1	Disable 2400 symbol rate
1	0	Enable 2743 symbol rate
	1	Disable 2743 symbol rate
2	0	Enable 2800 symbol rate
	1	Disable 2800 symbol rate
3	0	Enable 3000 symbol rate
	1	Disable 3000 symbol rate
4	0	Enable 3200 symbol rate
	1	Disable 3200 symbol rate
5	0	Enable 3429 symbol rate
	1	Disable 3429 symbol rate
6	0	Reserved
7	0	Enable shaping
	1	Disable shaping

BIT-MAPPED REGISTER S34		
<b>Format:</b>	AT [cmds] S34= <i>n</i> [cmds]	
<b>Range:</b>	0-255	
<b>Description:</b>	Disable/enable trellis encoding	
Bit	Value	Function
0	0	Enable 8S-2D trellis encoding
	1	Disable 8S-2D trellis encoding
1	0	Enable 16S-4D trellis encoding
	1	Disable 16S-4D trellis encoding
2	0	Enable 32S-2D trellis encoding
	1	Disable 32S-2D trellis encoding
3	0	Enable 64S-4D trellis encoding
	1	Disable 64S-4D trellis encoding
4	0	Reserved
5	0	Enable TX level deviation
	1	Disable TX level deviation
6	0	Enable pre-emphasis
	1	Disable pre-emphasis
7	0	Enable pre-coding
	1	Disable pre-coding

BIT-MAPPED REGISTER S41		
<b>Format:</b>	AT [cmds] S41= <i>n</i> [cmds]	
<b>Range:</b>	0-255	
<b>Description:</b>	Enable/disable distinctive ring	
Bit	Value	Function
0	0	Disable distinctive ring
	1	Enable distinctive ring
1-7	0	Reserved