TP560i / TP560x
56Kbps Data/Fax/Voice Modem Chip Set

User’s Manual
AT Command Set
**Introduction**

This is a high performance ITU-V.90 56Kbps modem; Computer can make connection with remote terminal, send a fax and be a telephone answer machine by this modem. In data mode, this modem provides ITU V.90, V.34, V.32bis, V.32, V.22bis, V.22, V.23, V.21 and bell212A/103 connection protocol speed from 300bps to 56Kbps. This modem also provides MNP class 5 and V.42bis compression method during data transmission. In Fax mode, this modem can send and receive Fax in 14.4kbps that is compatible to ITU-V.17 standard, Fax function is follow ITU Group 3 fax standard. More detail information, please refer to user’s manual of communication software and AT command set.

**Packing information**

1. User’s manual
2. Communication Software
3. RJ-11 telephone cable
4. 3.5 inch Disk (Win95/98 Driver & INF files)
5. Ear Phone and Mic Phone

**Hardware Installation**

Starting the installation

1. Turn off your computer and unplug its power cable.
2. Unplug your computer before removing the top or you could hurt yourself and damage the equipment.
3. Remove the computer cover according to the directions in the computer manual.
4. Choose a PCI slot.
5. Remove the rear panel metal bracket that corresponds to the slot you plan to use.
6. Hold the modem over the expansion slot. Place the modem into the slot and push it down so that it is firmly seated.
7. Replace the computer cover.
8. Plug one end of the supplied phone cable into line jack on the modem metal bracket, the other into a modular phone wall jack.
9. You can connect a phone to your modem by plugging the phone modular plug into the modem’s phone jack. With this arrangement you can use your telephone normally when the modem isn’t being used.
10. Turn on the computer.

**Windows 95/98 installation**

If your computer uses Windows 95, plug and play?
Both Windows 95 and your computer support plug & Play. Plug and Play lets you plug in a device such as your modem and then use it immediately.

To finish your Windows 95 installation, follow these steps
1. Turn on your computer if it not already on. If the New Hardware Found dialog box appears, you need to install a modem driver file, as explained in steps 2. If the New Hardware Found box does NOT appear, Windows 95 already has a driver for your Modem. Skip ahead to step 6.
2. Insert the Disk that is provided by hardware manufacture into floppy drive A (or B).
3. Chose Driver source is in floppy drive A (or B).
4. Click on OK. Windows 95 automatically copies the modem driver to your hard disk and uses it.
5. Eject the disk and store it in a safe place.
6. Your modem is now installed. Now install the fax and data software that came with your modem, as explained in your modem manual.

**AT Commands Reference**

AT commands are issued to DTE to control the modem’s operation. AT commands can only be entered while the modem is in command mode. Except for the A/ command and the +++ escape command, all commands must be prefixed with the attention code AT. For instance, the “A” command (below) would be entered as: “ATA<CR>”.

Without the AT prefix, the command line cannot be executed. For example: The format for entering AT commands is “ATXn” where X is the AT command, and n is the specific value for that command.

More than one command can be placed on a single line and (if desired) separated with spaces for readability. Once the carriage return (Enter) key is pressed, the command line is executed. A line with no carriage return is ignored. Any command issued is acknowledged with a response in either text or numeric values known as result codes. In the following, all commands, command-values and result code recognized by the modem are shown; any entries other than those shown cause the ERROR result code. The modem accepts either upper or lower case characters in the command line and ignores any spaces within or between commands. Typing errors can be corrected with the Backspace key. Exceptions are noted in the description of specific commands.

+++AT Escape Sequence
The escape sequence allows the modem to exit data mode and enter online command mode. While in online command mode, you may communicate directly to your modem using AT commands. You may return to data mode by issuing the ATO command.
Section 1. Data Mode Command

A/ Executes Last Command
When modem receives this command, modem executes the last command string entered. Do not conclude it by pressing "Enter".

A Answer Command
This command instructs the modem to go off-hook and answer an incoming call.

Bn Communication Standard Setting
This command determines ITU-T vs. Bell standard.
B0* Selects ITU-T V.22 mode when the modem is at 1200 bits/s. (Default)
B1 Selects Bell 212A when the modem is at 1200 bits/s (Default).

Result Codes:
OK : n = 0, 1
ERROR : Otherwise

Dn Dial
This command instructs the modem to begin the dialing sequence. A dial string can be up to 40 characters long. Any digit or symbol (0-9, *, #, A, B, C, D) could be dialed as touch-tone digits. The following may be used as dial string modifiers:
- P Pulse dialing.
- T* Touch tone dialing (Default).
- W Wait for second dial tone.
- @ Wait for quiet answer. Wait for five seconds of silence after dialing the number.
- 1 Hook flash.
- ； Pause during dialing.
- ； Return to command mode.
- ^ Enable data calling tone transmission.
- S = n Dial a telephone number previously stored using the &Zn = x command (see the &Zn = x command for further information). The range of n is 0,1,2.

En Echo Command
ATEn command controls whether or not the characters entered from your computer keyboard are echoed back to your monitor while the modem is in command mode.
E0 Disables echo to the computer.
E1* Enables echo to the computer (Default).
Result Codes:
OK : n = 0, 1
ERROR : Otherwise

Hn Hook Control
This command instructs the modem to go on-hook to disconnect a call, or off-hook to make the phone line busy.
H0* Modem goes on-hook (Default).
H1 Modem goes off-hook.
Result Codes:
OK : n = 0, 1
ERROR : Otherwise

In Request Identification Information
This command displays specific product information about the modem.
I0 Returns product ID code.
I1 Display Firmware version and checksum on the DTE.
I2 Customer Used.
I3 Returns fix ID information for application software identification. "TP560 Data/Fax/Voice 56K Modem"
I4 Returns firmware version for data pump.
I5 Returns country code.
I6 Blacklist times
I7 Display Firmware version and date on the DTE
I8 Display Firmware version and date for data pump
I9 Return Software Speakerphone or Hardware speakerphone
I10 Checksum

Result Codes:
OK : n = 0, 1, 2, 3, 4, 5,6,7,8,9,10
ERROR : Otherwise

Ln Monitor Speaker Volume
This command sets speaker volume to low, medium, or high.
L0 Select low volume.
L1 Select low volume.
L2* Select medium volume. (Default)
L3 Select high volume.
Result Codes:
OK : n = 0, 1, 2, 3
ERROR : Otherwise

Mn Monitor Speaker Mode
This command turns the speaker on or off.
M0 The speaker is off.
M1* The speaker is on until the modem detects the carrier signal. (Default)
M2 The speaker is always on when modem is off-hook.
M3 The speaker is on until the carrier is detected, except while dialing.
Result Codes:
OK : n = 0, 1, 2, 3
ERROR : Otherwise

Nn Modulation Selection
This command controls whether or not the local modem performs a negotiated handshake at connection time with the remote modem when the communication speed of the two modems is different.
N0 When originating or answering, this is for handshake only at the communication standard specified by AT*In.
N1* During handshake, Highest speed is specified by AT*In. Depend on line quality fallback to a lower speed may occur. (Default)

Result Codes:
OK : n = 0, 1
ERROR : Otherwise
On Return Online to Data Mode
00* Exit online command mode and return to data mode
   (see AT Escape Sequence, +++AT). (Default)
01 This command issues a retrain before returning to
   online data mode.
02 This command issues a rate re-negotiation before
   returning to online data mode.
Result Codes:
OK n = 0, 1, 2
ERROR Otherwise

P Select Pulse Dialing
This command configures the modem for pulse (non-
touch-tone) dialing.
Result Codes: OK

Qn Result Code Control
Result codes are informational messages sent from the
modem and displayed on your monitor.
Q0* Enables modem to send result codes to the DTE.
   (Default)
Q1 Disables modem from sending result codes.
Result Codes:
OK n = 0, 1
ERROR Otherwise

T Select Tone Dialing
This command instructs the modem to send DTMF tones
while dialing.
Result Codes: OK

Vn DCE Response Format
This command controls whether result codes are
displayed as words or their numeric equivalents.
V0* Displays result codes as numeric.
V1* Displays result codes as text. (Default)
Result Codes:
OK n = 0, 1
ERROR Otherwise

Wn Result Code Option
W0 Display “CONNECT DCE speed” without V42/MNP
   extended.
W1 Display “CONNECT DTE speed” without V42/MNP
   extended.
W2* Display “CONNECT DCE speed” with V42/MNP
   extended. (Default)
W3 Display “CONNECT DTE speed” with V42/MNP
   extended.
Result Codes:
OK n = 0, 1, 2, 3
ERROR Otherwise

Xn Result Code Selection and Call Progress detection
This command enables tone detection options during
dialing procedure. As these functions are chosen, the
modern chip set result codes are also affected. Therefore,
this command is frequently used to control the modern
chip set responses and dial tone detection.
X0/X Disables monitoring of busy tones unless
   forced otherwise by country requirements;
   send only OK, CONNECT, RING, NO
   CARRIER, ERROR, and NO ANSWER
   result codes. Blind dialing is
   enabled/disabled by country parameters. If
   busy tone detection is enforced and busy
   tone is detected, NO CARRIER will be
   reported. If dial tone detection is enforced
   or selected and dial tone is not detected,
   NO CARRIER will be reported instead of
   NO DIAL TONE. (Default)
X1 Disables monitoring of busy tones unless
   forced otherwise by country requirements;
   send only OK, CONNECT, RING, NO
   CARRIER, ERROR, NO ANSWER, and
   CONNECT XXXX(XXXX=rate). Blind
dialing is enabled/disabled by country
parameters. If busy tone detection is
enforced and busy tone is detected, NO
CARRIER will be reported instead of
BUSY. If dial tone detection is enforced or
selected and dial tone is not selected, NO
CARRIER will be reported instead of NO
DIAL TONE.
X2 Disables monitoring of busy tones unless
   forced otherwise by country requirements;
   send only OK, CONNECT, RING, NO
   CARRIER, ERROR, NO ANSWER, and
   CONNECT XXXX. If busy
   tone detection is enforced and busy tone
   is detected, NO CARRIER will be reported
   instead of BUSY.
X3 Enables monitoring of busy tones; send
   only OK, CONNECT, RING, NO CARRIER,
   ERROR, NO ANSWER, and CONNECT
   XXXX. Blind dialing is enabled/disabled by
   country parameters. If dial tone detection
   is enforced and dial tone is not detected,
   NO CARRIER will be reported.
X4* Enables monitoring of busy tones; send all
   messages. (Default)
Result Codes:
OK n = 0, 1, 2, 3
ERROR Otherwise

Zn Recall Stored Profile
This command instructs the modem chip set to go on-
hook and restore the profile saved by the last &W
command.
Z0* Reset modem and retrieve active configuration profit
   from stored profit 0. (Default)
Z1 Reset modem and retrieve active configuration profit
   from stored profit 1.
Result Codes:
OK n = 0, 1
ERROR Otherwise
&Cn Data Carrier Detect (DCD) Control
Data carrier detect is a signal from the modem to your
computer indicating that the carrier signal is being
received from a remote modem. DCD normally turns off
when the modem no longer detects the carrier signal.
&CO The state of the carrier from the remote modem is
ignored. DCD circuit is always on.
&C1* DCD turns on when the remote modem’s carrier
signal is detected, and off when the carrier signal
is not detected. (Default)
Result Codes:
OK n = 0, 1
ERROR Otherwise
&Dn DTR Control (Data Terminal Ready)
This command interprets how the modem responds to the
state of the DTR signal and changes to the DTR signal.
&D0 Ignore.
&D1* If the DTR signal is not detected while in online
data mode, the modem enters command mode,
issues OK result code, and remains connected.
&D2 If the DTR signal is not detected while in online
data mode, the modem disconnects. (Default)
&D3 Monitor DTR signal when an on-to-off transition
occurs, the modem performs a soft reset as if the
ATZ command was received.
Result Codes:
OK n = 0, 1, 2, 3
ERROR Otherwise
&Gn V.22bis Guard Tone Control
This command determines guard tone frequency and is
only used in V.22 and V.22bis mode. This option is not
used in North America and is for international use only.
&G0* Guard tone disabled. (Default)
&G1 Sets guard tone to 550 Hz.
&G2 Sets guard tone to 1900 Hz.
Result Codes:
OK n = 0, 1, 2
ERROR Otherwise
&Kn Local Flow Control Selection
&K0 Disable flow control.
&K1 Reserved.
&K2 Reserved.
&K3* Enable RTS/CTS flow control. (Default)
&K4 Enable XON/XOFF flow control.
&K5 Enable Transparent XON/XOFF flow control.
Result Codes:
OK n = 0, 1, 2, 3, 4, 5
ERROR Otherwise
&Pn Pulse Dial Make-to-Break Ratio Selection
&P0 39/61 make-to-break ratio (10 pps).
&P1 33/67 make-to-break ratio (10 pps).
&P2 39/61 make-to-break ratio (20 pps)
&P3 33/67 make-to-break ratio (20 pps)
(The number of “n” is decided by your PTT requirement.)
Result Codes:
OK n = 0, 1, 2, 3
ERROR Otherwise
&Ln Clear To Send Signal Select
&R0 Modem turns on the Clear To Send signal when it
detects the Request To Send (RTS) signal.
&R1* Modem turns on Clear To Send signal. (Default)
Result Codes:
OK n = 0, 1
ERROR Otherwise
&Sn Data Set Ready (DSR) Option
This command selects DSR action.
&S0* DSR always ON. (Default)
&S1 DSR comes on when establishing a connection
and goes off when the connection ends.
Result Codes:
OK n = 0, 1
ERROR Otherwise
&Un Protocol Selection
&U0* Select V.PCM (Default)
&U1 Select V.34bis/V.34
&U2 Select V.32bis/V.22bis
&U3 Select Bell 103 300bps
&U4 Select V21 300bps
&U5 Select V23
Result Codes:
OK n = 0, 1, 2, 3, 4, 5
ERROR Otherwise
&Vn View Active Configuration and Stored Profile
This command is used to display the active profiles.
Result Codes: OK
### In Connect Speed Selection

- `*0` Selects connect speed 1200bps
- `*1` Selects connect speed 2400bps
- `*2` Selects connect speed 4800bps
- `*3` Selects connect speed 7200bps
- `*4` Selects connect speed 9600bps
- `*5` Selects connect speed 12000bps
- `*6` Selects connect speed 14400bps
- `*7` Selects connect speed 16800bps
- `*8` Selects connect speed 19200bps
- `*9` Selects connect speed 21600bps
- `*10` Selects connect speed 24000bps
- `*11` Selects connect speed 26400bps
- `*12` Selects connect speed 28800bps
- `*13` Selects connect speed 31200bps
- `*14` Selects connect speed 33600bps (Default)

### Country Select

- `*NC0` Australia
- `*NC1` Austria
- `*NC2` Belgium
- `*NC3` Denmark
- `*NC4` Finland
- `*NC5` France
- `*NC6` Germany
- `*NC7` Ireland
- `*NC8` Italy
- `*NC9` Luxembourg
- `*NC10` Netherlands
- `*NC11` Norway
- `*NC12` Portugal
- `*NC13` Spain
- `*NC14` Sweden
- `*NC15` Switzerland
- `*NC16` UK
- `*NC17` Greece
- `*NC18` India
- `*NC19` Czech Republic
- `*NC20` Taiwan
- `*NC21` Thailand
- `*NC22` United States
- `*NC23` Venezuela
- `*NC24` Poland
- `*NC25` Russia
- `*NC26` South Africa
- `*NC27` Spain
- `*NC28` Sweden
- `*NC29` Switzerland
- `*NC30` United Kingdom
- `*NC31` United States

### User Abort Selection

- `*G0` Enables key abort feature (Default)
- `*G1` Disables key abort feature

### Auto Retraining

- `*H0` Disables auto retrain (Default)
- `*H1` Enables auto retrain

### Transmission Level Selection

- `*O0` Selects output level -11dBm (Default)
- `*O1` Selects output level -12dBm
- `*O2` Selects output level -13dBm
- `*O3` Selects output level -14dBm
- `*O4` Selects output level -15dBm
- `*O5` Selects output level -16dBm
- `*O6` Selects output level -17dBm
- `*O7` Selects output level -18dBm
- `*O8` Selects output level -19dBm
- `*O9` Selects output level -20dBm
- `*O10` Selects output level -21dBm
- `*O11` Selects output level -22dBm
- `*O12` Selects output level -23dBm
- `*O13` Selects output level -24dBm
- `*O14` Selects output level -25dBm
- `*O15` Selects output level -26dBm

**Result Codes:**
- `OK`
- `ERROR` Otherwise
Nn Error Control Mode Selection

This command determines the type of error control used by the modem when sending or receiving data.

N0 Normal mode.
N1 Direct mode.
N2 MNP or disconnect mode. The modem attempts to connect using MNP 2-4 error control procedures. If this fails, the modem disconnects. This is also known as MNP reliable mode.
N3 MNP, or buffer. The modem attempts to connect using MNP 2-4 error control procedures. If this fails, the modem will connect in Normal modem.
N4 V.42 without ODP & ADP phase detection, MNP or buffer.
N5* V.42 with ODP & ADP phase detection, MNP, or buffer (default). The modem attempts to connect in V.42 error control mode. If this fails, the modem continues in buffer mode and continues operation. This is also known as V.42/ MNP auto reliable mode.
N6 V.42 without ODP & ADP phase detection or disconnect. The modem attempts to connect in V.42 error control mode. If this fails, the call will be disconnected.
N7 V.42 with ODP & ADP phase detection or disconnect.

Result Codes:
OK n = 0, 1, 2, 3, 4, 5, 6, 7
ERROR Otherwise

Vn Protocol Result Code

V0* Disable protocol result code appended to DCE speed. (Default)
V1 Enable protocol result code appended to DCE speed.

Result Codes:
OK n = 0, 1
ERROR Otherwise

%Cn Data Compression Control

This command determines the operation of V.42bis and MNP class 5 data compression. Online changes do not take effect until a disconnection occurs first.

%C0 V.42bis/ MNP 5 disabled. No data compression.
%C1* V.42bis/ MNP 5 enabled. Data compression enabled (Default).

Result Codes:
OK n = 0, 1
ERROR Otherwise

%Dn Blacklisting Control

%D0 Disable blacklisting.
%D1* Enable blacklisting. (Default)

Result Codes:
OK n = 0, 1
ERROR Otherwise
Section 3. S Registers Definitions

S registers generally affect how the AT commands perform. Contents of the registers can be displayed or modified when the modem is in command mode.

To display the value of an S register: TYPE: ATSn?, where n is the register number.

PRESS: Enter To modify the value of an S register: TYPE: ATSn = r where n is the register number, and r is the new register value.

PRESS: Enter

S0 Auto Answer Ring Number
This register determines the number of rings the modem will count before automatically answering a call. 0 (zero) is that asks modem don't do automatically answer at all. When disabled, the modem can only answer with an ATA command.
Range: 0-255
Default: 0
Units: rings

S1 Ring Counter
This register, ring counter, is read only. The value of S1 is incremented with each ring. If no rings occur over a 6 second interval, this register is cleared.
Range: 0-255
Default: 0
Units: rings

S2 AT Escape Character (User Defined)
This register determines the ASCII valued used for an escape sequence. The default is the "+" character. The escape sequence allows the modem to exit data mode and enter command mode. Values greater than 127 disable the escape sequence.
Range: 0-255
Default: 43
Units: ASCII

S3 Command Line Termination Character (User Defined)
This register determines the ASCII values as the carriage return character. This character is used to end command lines and result codes.
Range: 0-127, ASCII decimal
Default: 13 (carriage return)
Units: ASCII

S4 Response Formatting Character (User Defined)
This register determines the ASCII value used as the line feed character. The modem uses a line feed character in command mode when it responds to the computer.
Range: 0-127, ASCII decimal
Default: 10 (line feed)
Units: ASCII

S5 Command Line Editing Character (User Defined)
This register sets the character recognized as a backspace and pertains to asynchronous only.
Range: 0-127, ASCII decimal
Default: 8 (backspace)
Units: ASCII

S6 Wait Before Dialing
This register sets the length of time, in seconds, that the modem must wait (pause) after going off-hook before dialing the first digit. The modem always pauses for a minimum of two seconds, even if the value of S6 is less than two seconds. Waiting for dial tone call progress features (W dial modifier in the dial string) will override the value in register S6. This operation, however, may be affected by some ATX options according to country restrictions.
Range: 3-7
Default: 6
Units: seconds

S7 Connection Completion Timeout
This register sets the time, in seconds, that the modem must wait before hanging up because carrier is not detected. The timer is started when the modem finishes dialing (originate), or goes off-hook (answer). In originate mode, the timer is reset upon detection of an answer tone if allowed by country restriction. The timer also specifies the wait for silence time for the @ dial modifier in seconds.
S7 is not associated with the W dial modifier.
Range: 1-255
Default: 60
Units: seconds

S8 Comma Dial Modifier Time
This register sets the time, in seconds, that the modem must pause when it encounters a comma (,) in the dial command string.
Range: 1-255
Default: 2
Units: seconds

S9 Carrier Detect Response Time
Register S9 sets the time the remote modem's carrier signal must be present for the local modem to recognize it. This feature ensures that your modem does not mistake a busy signal, ring, or voice for the carrier signal. The value of this register is in tenths of a second. The default value is 600 ms, although you can change it from 1 to 255. For example, entering a value 13 means that the remote modem's carrier signal must be present for 1.3 seconds for the local modem to recognize it. Setting this value higher increases the chances the modem will not mistakenly identify the carrier signal.
Range: 1-255
Default: 6
Units: 0.1 seconds

S10 Automatic Disconnect Delay after Carrier Loss
This register sets the length of time, in tenths of a second, that the modem waits before hanging up after a loss of carrier. This allows for a temporary carrier loss without causing the local modem to disconnect. The actual interval the modem waits before disconnecting is the value in register S10.
Range: 1-255
Default: 14
Units: 0.1 seconds

S11 DTMF Dialing Speed
This register determines the dialing speed which is prefixed for each country.
Range: 50-255
Default: 95
Units: 0.001 seconds
### S12 Escape Guard Time
This register sets the value (in 20 ms increments) for the required pause after the escape sequence (default 1 s).

<table>
<thead>
<tr>
<th>Range</th>
<th>Default</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-255</td>
<td>50</td>
<td>0.02 seconds</td>
</tr>
</tbody>
</table>

### S13 Pulse Dialing Control
This register determines pulse dialing is disabled or enabled.

<table>
<thead>
<tr>
<th>Register</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS13=0</td>
<td>Disable Pulse Dialing</td>
</tr>
<tr>
<td>ATS13=1</td>
<td>Enable Pulse Dialing</td>
</tr>
</tbody>
</table>

| Range | 0-1 |

### S14 Bit-mapped Register
Bit-mapped register S14 lets you control modem echo, responses, dialing method, and the original or answer mode.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Do not echo command (E0)</td>
</tr>
<tr>
<td>1</td>
<td>Echo command (E1) – default</td>
</tr>
<tr>
<td>2</td>
<td>Mapping to ATQn</td>
</tr>
<tr>
<td>3</td>
<td>Numeric responses (V0)</td>
</tr>
<tr>
<td>4,5</td>
<td>Mapping to AT&amp;P</td>
</tr>
<tr>
<td>6</td>
<td>Use touch-tone dialing method (T) – default</td>
</tr>
<tr>
<td>7</td>
<td>Answer incoming calls (A)</td>
</tr>
<tr>
<td>1</td>
<td>Originate calls (D) – default</td>
</tr>
</tbody>
</table>

### S21 Bit-mapped Register
Bit-mapped register S21 lets you control certain data communication control signals.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1</td>
<td>x Undefined</td>
</tr>
<tr>
<td>2</td>
<td>Mapping to AT&amp;R</td>
</tr>
<tr>
<td>3</td>
<td>Modern ignores the DTR signal (&amp;D0)</td>
</tr>
<tr>
<td>1</td>
<td>Modern enters command mode after ON-to-OFF DTR transition (&amp;SD1) – default</td>
</tr>
<tr>
<td>2</td>
<td>Modern hangs up after ON-to-OFF DTR transition (&amp;D2) – default</td>
</tr>
<tr>
<td>3</td>
<td>Modern resets after ON-to-OFF DTR transition (&amp;D3) – default</td>
</tr>
<tr>
<td>5</td>
<td>CD signal always on (&amp;C0)</td>
</tr>
<tr>
<td>1</td>
<td>CD signal on when a remote carrier signal is present (&amp;C1) – default</td>
</tr>
<tr>
<td>6</td>
<td>AT&amp;S=0</td>
</tr>
<tr>
<td>1</td>
<td>AT&amp;S=1</td>
</tr>
</tbody>
</table>

### S22 Bit-mapped Register
Bit-mapped register S22 lets you control internal speaker and the modem responses.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1</td>
<td>Speaker volume off (L0)</td>
</tr>
<tr>
<td>1</td>
<td>Low speaker volume (L1)</td>
</tr>
<tr>
<td>2</td>
<td>Medium speaker volume (L2) – default</td>
</tr>
<tr>
<td>3</td>
<td>Loud speaker volume (L3)</td>
</tr>
<tr>
<td>2,3</td>
<td>Speaker off (M0)</td>
</tr>
<tr>
<td>1</td>
<td>Speaker on until carrier detected (M1) – default</td>
</tr>
<tr>
<td>2</td>
<td>Speaker always on (M2)</td>
</tr>
<tr>
<td>3</td>
<td>Speaker on until carrier detected but off during dialing (M3) – default</td>
</tr>
</tbody>
</table>

### S23 Bit-mapped Register
Bit-mapped register S23 lets you control internal speaker and the modem responses.

<table>
<thead>
<tr>
<th>Bit</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,1</td>
<td>Speaker volume off (L0)</td>
</tr>
<tr>
<td>1</td>
<td>Low speaker volume (L1)</td>
</tr>
<tr>
<td>2</td>
<td>Medium speaker volume (L2) – default</td>
</tr>
<tr>
<td>3</td>
<td>Loud speaker volume (L3)</td>
</tr>
<tr>
<td>2,3</td>
<td>Speaker off (M0)</td>
</tr>
<tr>
<td>1</td>
<td>Speaker on until carrier detected (M1) – default</td>
</tr>
<tr>
<td>2</td>
<td>Speaker always on (M2)</td>
</tr>
<tr>
<td>3</td>
<td>Speaker on until carrier detected but off during dialing (M3) – default</td>
</tr>
</tbody>
</table>

### S25 Data Terminal Ready Delay
When Modem is on-line, it will ignore a Data Terminal Ready signal lasting less than the value of this register. In this mode, the values for this register are 0 to 255 in hundreds of a second, and the default value is 0.05 seconds. If you will be entering synchronous mode after dialing asynchronously, this register determines how long the modem waits before looking for the Data Terminal Ready signal. This lets you detach the asynchronous terminal and connect a synchronous terminal while remaining in the Data Mode. The default value is 5.

<table>
<thead>
<tr>
<th>Range</th>
<th>Default</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-255</td>
<td>5</td>
<td>0.01 seconds</td>
</tr>
</tbody>
</table>

### S26 Request To Send-to-Clear To Send Delay
This register affects synchronous operation only and applies only when you are using the &R0 command. This register determines how long the modem waits to turn on the Clear To Send signal after a Request To Send OFF-to-ON transition in 10 ms increment. The default value is 1.

<table>
<thead>
<tr>
<th>Range</th>
<th>Default</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-255</td>
<td>1</td>
<td>0.01 seconds</td>
</tr>
</tbody>
</table>
Section 4. Class 1 FAX Commands

The modem chip set supports FAX commands conforming to EIA standard 578. These commands are given here with short descriptions; complete explanations are given in the standard, available from the Electronic Industry Association.

FAX Command Set Summary

+FCLASS? Service class indication
+FCLASS = ? Service class capabilities
+FCLASS = n Service class selection (n=0,1,8)
+FTM = <m> Transmit FAX data
+FRM = <m> Receive FAX data
+FTH = <m> Transmit HDLC data
+FRH = <m> Receive HDLC data
+FTM = ? Check transmit FAX modulation
+FRM = ? Check receive FAX modulation
+FTH = ? Check transmit HDLC data modulation
+FRH = ? Check receive HDLC data modulation
+FMI = ? Check manufacturer identification
+FMN = ? Check product identification
+FMR = ? Check version/revision information
+FLO = ? Select Flow Control specified
+FPR = ? Select Serial Port Rate

+FCLASS? Service Class Indication
This command causes the modem to display the current setting. The modem can operate either as a class 0 data modem or a class 1 FAX modem.
Responses: 0 : data mode
1 if in FAX class 1
8 if in voice mode

+FCLASS = ? Service Class Capabilities
This command causes the modem to display the classes it supports.
Typical responses:
+FCLASS = ? 0, 1, 8

+FCLASS = n Service Class Selection
This command sets the modem for class n operation, where n is either a 0, 1 or 8.
Parameters: 0, 1, 8
Default: 0
Command options:
+FCLASS = 0 Select data mode,
+FCLASS = 1 Select facsimile class 1,
+FCLASS = 8 Select voice mode.

+FTM = <m> Transmit FAX Data
This command causes the modem to transmit data at the modulation specified by <m>. The following table shows the values you can enter for this command and the meaning of those values.
+FTM = 24 V.27ter 2400
+FTM = 48 V.27ter 4800
+FTM = 72 V.29 7200
+FTM = 96 V.29 9600
+FTM = 73 V.17 7200
+FTM = 74 V.17 (short train) 7200
+FTM = 97 V.17 9600
+FTM = 98 V.17 (short train) 9600
+FTM = 121 V.17 12000
+FTM = 122 V.17 (short train) 12000
+FTM = 145 V.17 14400
+FTM = 146 V.17 (short train) 14400
Section 5. Voice Commands

+VIP  Initial voice parameter
+VCID=<pmode> Caller ID
   pmode=0: Disable Caller ID
   pmode=1: Enable formatted caller report
   pmode=2: Enable unformatted caller report
+VCDI? Report current parameter
+VCID=? Queries the range that DCE support
Note: Now the CID format that we support is FSK after first ring 1.5 seconds duration

+VDR  Enable the distinctive ring feature
+VDR=? Report current parameter
+VDRM= Setup playback gain
+VGR? Report current parameter
+VGR=? Queries the range that DCE support
+VGRM= Setup record gain
+VGRM=? Report current parameter
+VGRM=? Queries the range that DCE support
+FMI? Report manufacturer ID
+FMM? Report product information
+FMR? Report product revision
+VIT  Enable inactive timer
+VITM= Report current parameter
+VITM=? Queries the range that DCE support
+VTD  Set the default duration for DTMF/tone generation in 10ms increments
+VTDM= Report current parameter
+VTDM=? Queries the range that DCE support
+VSDM=<sds,sdi>  
   sds=128 Normal level of sensitivity (-40dbm)
   sds>=128 More aggressive : ex. sds=129 is –
   sds<= 128 Less aggressive : ex sds=127 is –

+VSDM=  Report current parameter
+VSDM=? Queries the range that DCE support
+VTS= DTMF and tone generation
+VTSM=? Queries the range that DCE support

+VITM= Report current parameter
+VITM=? Queries the range that DCE support

+VSMM=<cml>,<vsr>  
   cml=128 , select linear 8bit PCM
   vsr=xx, Sample rate is always 8000
+VSM? Report current parameter
+VSMM? Queries the range that DCE support
+VPRM=<rate> DTE/DCE rate will be equal 2400*rate , but
   auto-baud if rate=0
+VPR? Report current parameter
+VPRM=? Queries the range that DCE support
+VLSM=<pmode>  
   pmode=0: DCE on-hook, local phone connected
to Telco.
   pmode=1: DCE off-hook, DCE connected to Telco
   pmode=2: DCE off-hook, local phone connected
to DCE
   pmode=3: DCE off-hook, local phone connected
to Telco, DCE to local phone
   pmode=4: Speaker connected to DCE, DCE on-
hook (playback message)
   pmode=5: Speaker connected to DEC, DCE off-
hook (call screening)
   pmode=6: Microphone connected to DCE, DCE
   off-hook (Record greeting)
   pmode=7: Microphone and speaker connected ,
   DCE off-hook (speakerphone)
Section 6. AT%TTn Commands

%tt0=0 erase %TT command

%tt2=A,B,C,D Tx V34 signal parameter

A: symbol rate (parameter range:0-5)
  0:2400
  1:2743
  2:2800
  3:3000
  4:3200
  5:3429

B: data rate (parameter range:1-9 if a=0)
  (parameter range:2-11 if a=1)
  (parameter range:2-12 if a=2)
  (parameter range:2-13 if a=3)
  (parameter range:2-14 if a=5)

  1:2400
  2:4800
  3:7200
  4:9600
  5:12000
  6:14400
  7:16800
  8:19200
  9:21600
  10:24000
  11:26400
  12:28800
  13:31200
  14:33600

C: Min/Exp (parameter range:0-1)
  0:Minimum
  1:Expanded

D: Preemphasis (parameter range:0-9)

Index 0: 0 dB
  1: 2 dB
  2: 4 dB
  3: 6 dB
  4: 8 dB
  5: 10dB
  6: 0.5dB & 1.0dB
  7: 1.0dB & 2.0dB
  8: 1.5dB & 3.0dB
  9: 2.0dB & 4.0dB

example:

at%tt2=5,14,1,8

%tt3=0 : DTMF '0'
%tt3=1 : DTMF '1'
%tt3=2 : DTMF '2'
%tt3=3 : DTMF '3'
%tt3=4 : DTMF '4'
%tt3=5 : DTMF '5'
%tt3=6 : DTMF '6'
%tt3=7 : DTMF '7'
%tt3=8 : DTMF '8'
%tt3=9 : DTMF '9'
%tt3=10: DTMF 'A'
%tt3=11: DTMF 'B'
%tt3=12: DTMF 'C'
%tt3=13: DTMF 'D'
%tt3=14: DTMF '+'
%tt3=15: DTMF '*'
%tt3=16: V32 9600
%tt3=17: V32 14400
%tt3=18: 2100HZ ANSWER TONE
%tt3=19: 1300HZ CALLING TONE
%tt3=20: 1100HZ CALLING TONE
%tt3=21: 
%tt3=22: Silence
%tt4=0 : V21 Org tx mark
%tt4=1 : V21 Org tx space
%tt4=2 : V21 Ans tx mark
%tt4=3 : V21 Ans tx space
%tt4=4 : V23 Org tx mark
%tt4=5 : V23 Org tx space
%tt4=6 : V23 Ans tx mark
%tt4=7 : V23 Ans tx space
%tt4=8 : V22 org
%tt4=9 : V22bis org
%tt4=10: V22 ans (tx guard tone if &g1 or &g2)
%tt4=11: V22bis ans (tx guard tone if &g1 or &g2)
%tt5=0 : V27ter 2400
%tt5=1 : V27ter 4800
%tt5=2 : V29 7200
%tt5=3 : V29 9600
%tt5=4 : V17 7200 short train
%tt5=5 : V17 7200 long train
%tt5=6 : V17 9600 short train
%tt5=7 : V17 9600 long train
%tt5=8 : V17 12000 short train
%tt5=9 : V17 12000 long train
%tt5=10: V17 14400 short train
%tt5=11: V17 14400 long train