# 5634 PCV

# User's Manual

# Table Contents

# Chapter 1    Installation

Chapter 1 provides detailed instructions for installing your modem.

## 1.1 Checking your components

Unpack your components and make sure you have the following items:
- The modem.
- A modular telephone cable to connect your modem to the telephone line.
- This user's manual.
- Communication software and manual.

When you open your package, make sure all of the above items are included and not damaged. If you see that any components are damaged, please notify your dealer immediately.

## 1.2 Installing the modem

The following instructions explain how to install the modem in a IBM compatible type personal computer. If you will be installing the modem into a different computer, refer to the manual that accompanied your computer or contact your computer dealer for instructions on installing the modem in your personal computer.

## 1.3 Removing the computer cover

Turn off the personal computer's power. No power must be applied to your computer when you install the internal modem and computer could be damaged.
Make sure you can freely access the back of the personal computer.
Unscrew the necessary screws to loosen the computer cover. Then set the

screws in a safe place and remove the computer cover.

## 1.4 Inserting the modem

The internal modem can fit into any available PCI slot in your personal computer. To insert the internal modem in your personal computer:

1. Position yourself so that you can easily access the computer's expansion slots.
2. Select any available half-card slot into which you can install the internal modem.
3. Remove any slot cover that may be over the slot. Then remove the slot cover and keep both in a safe place (you will need the screw to secure the internal modem and you may need the slot cover if you decide to remove the internal modem in the future).
4. Hold the internal modem above the slot you selected, making sure the modem's edge connectors are pointing down toward the base of the personal computer (see Figure1-1).
5. Carefully slide the modem into the PCI slot, applying even pressure to both ends of the modem. Stop inserting the modem when its gold-plated edge connectors are aligned with and completely fit into the base of the computer.
6. If you removed a screw from the slot cover, use that screw to secure the modem in the PCI slot. You may want to test the modem's telephone connection (described in the next section) before securing your modem.
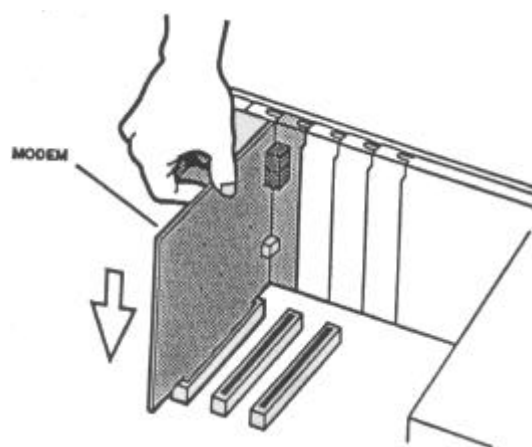7. Use the cover-mounting screws to secure the computer cover.



**Figure 1-1. Inserting the modem**

## 1.5 Connecting to the telephone line

Use the following procedure to connect your modem to the telephone line:

1. Make sure you have an RJ-11 telephone jack. If you need a modular jack, either obtain a telephone adapter from a telephone or electronics store and follow the installation instructions provided with the adapter, or have your local telephone company replace your existing telephone jack with a modular-type jack and your existing telephone cord with a modular cord.
2. Unplug your telephone's cable from the wall jack.
3. Take one end of the modular telephone cable supplied with the modem and plug it into the **LINE** modular telephone jack on the back of the modem (see Figure 1-2).
4. Plug the other end of the telephone cord into the telephone jack on the wall, as you would any modular telephone.

## 1.6 Connecting to your telephone

Your modem is so convenient, it provides a second modular telephone jack that lets you connect your telephone to the same telephone line the modem is using. This lets you manually dial data calls or make voice calls when you are not using your modem.

Use the following procedure to connect your telephone to your modem: Connect the telephone's modular cord into the **PHONE** jack on the back of your modem (see Figure 1-3).

Lift your telephone's handset and listen for a dial tone.
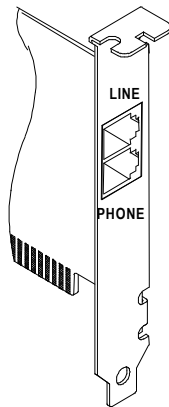
**5634PCV**

**Figure 1-2. Back of the modem**

# 1.7 Verifying your connection

Before you proceed to next step, make sure your connection matches the one shown in Figure 1-3.
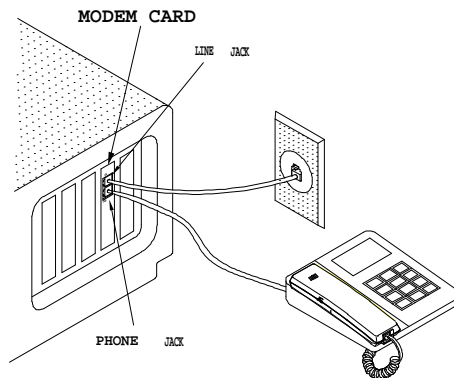


**5634PCV**

**Figure 1-3. Completed modem installation**

If you connected the modem to a computer, place the computer into terminal mode and complete the configuration information required by the software. Refer to your computer manual to find out the appropriate command to use.

Then use the following procedure to verify that your connections:

1. Type **AT** and press the Enter key. If your system is operating properly, your modem sends an **OK** response to your screen and wait for your next command.

If you did not receive a response, make sure your computer is sending commands to your modem. If this does not solve your problem, contact your computer dealer.

2. Use your communication software to prepare your computer to dial a call. Then type **AT D x phone number**, where **x** is either T for touch-tone dialing or **P** for pulse dialing and **phone number** is the telephone number that your modem is using.

   For example, if your modem is connected to the telephone line 555-2121 and Touch-Tone dialing is supported in your calling area, type **ATDT 5552121**.

3. Press the Enter key. You should receive a **BUSY** response and you should hear the busy signal through the modem speaker because the modem is calling itself.

Your modem is now ready for operation. Refer to the manual that came with your communication software to begin communications. If you will be communicating directly with your modem, or if you want to find out more about the modem's operation, proceed to Chapter 2.

# 1.8 Windows95/98

## ModemDriver Installation(PNP)

1. Install the PnP modem into an available slot.
2. Turn On your computer.
3. As you enter Windows you should receive a message saying "PCI communication Device", than "5634PCV V90 modem".
4. Windows will identify the modem and then present you with three choices.

   Do not install a driver

   Driver from disk provided by manufacturer

   Select from a list of alternate drivers.

   Select Driver from disk provided by manufacturer. Windows will ask you to insert your disk.   Put the disk in your drive and select right inf

file then hit OK. You will be presented with a listing of Topic modems. Select the model number of your modem and then hit OK.

5. Click Finish and Windows will install the driver, and then finish booting.

6. To check the modem installation open Control Panel and then Modems. Click on the Diagnostics tab. Click on the port which lists your modem. Click on More Info. Your modem should report back with modem information. Your modem is functioning properly.

# 1.9  Windows NT 4.0                     Modem

## Driver Installation

1. Install the PnP modem into an available slot.
2. Insert Setup program for Windows NT drivers' disk into drive A or B.
3. Execute the "Setup" program to install the PCI agent driver.
4. Then, after the installation is completed, reboot PC.
5. After PC is rebooted and NT is running, follow the steps described in section 1.1 to add the modem and its drivers.

   NOTE: Microsoft does not support plug and play in Windows NT 4.0.

# 1.10 Linux Red Hat 6.0

## Modem Driver Installation

A. Manual mode:

1. At path **/proc**, find file **pci** then use **vi** editor to find **Topic vender ID** "**151f**" and the

   I/O-address, IRQ-number Linux assign to Topic modem.

   For example : **cd /proc**

   **vi pci**

   **……………………………………………**

   **Vendor id=151f.   Device id=0.**

   **Medium devsel.   IRQ=5.**

   **I/O at 0xe400 [0xe401].**

   **(type :q to quit vi)**

2. At path /dev, use setserial tty-number uart 16550A irq IRQ-number port I/O-

address

     For example : **setserial ttyS2 uart 16550A irq 5 port 0xe400**

3. At path /dev, remove default modem link then link modem to the tty you
    assign in step 2

    For example : **rm modem**

          **ln –s ttyS2 modem**

4. Now, you can use minicom to test the modem by type ATI3 to make sure the
    modem is Topic modem.

    For example :    **minicom**

          **………………**
          **ATI3**

## B. Automatic Mode

1. Copy topic.modem excutable file to **/bin**

2. Copy script file **rc.serial** to **/etc/rc.d**

3. When Linux boot again you can see the message " **Setup topic modem …**"
   or you can run **topic.modem** directly.

4. You can use **minicom** to check Topic modem.

# 1.11 MS-DOS                                          Modem

## Driver Installation

Introduction

This program intends to provide the function for hardware resource
configuration via 5634PCV internal modem card. It is only can be executed in
DOS environment, Windows DOS prompt is inhabited to run this program.

Installation

Prior launching the program, 5634PCV PCI modem card must be installed in
the PC in advance. Besides, it can be used to configure the multiple PCI cards.

Configuration

When the program is launched, it will search the 5634PCV PCI card first. If no
card is found, an error message will be shown and the program will be
terminated. If only one card is enumerated, a configuration dialog window will
be popped up immediately. User can set and the IO port address and interrupt
number of PCI card in this configuration dialog. After setting, user may select

'OK' button to set the desired setting to PCI card and exit the program. If user selects 'Cancel' button, the changed setting will not be effective. Please note the changed setting will not be stored and saved in PC BIOS or PCI card after PC is rebooted.

When 'OK' button is selected, the program will automatically test the IO port and interrupt number to see whether the PCI card can be operated normally with the desired setting. If either IO or IRQ verification is failed, the program will pop up a warning message and let user to set another value.

If multiple cards are detected, the program will show a list box to demonstrate the found cards in the sequence (i.e., modem1, modem2...modemN). Then that, user may select any one of the modem from the list to configure.

## Diagnosis
There is push button 'Diagnose' existed in the configuration dialog. When this button is selected, the program will issue some 'AT' commands to modem and display the result for analysis. Before sending the command to UART of PCI card, the program will first verify the IO and interrupt setting. If the verification is failed, it will stop the diagnosis and prompt a waning message to the screen.

After the diagnosis is done, it will show the PCI information, including device ID, vendor ID, subsystem ID and subsystem vendor ID. Moreover, the version number and built date of modem controller and DSP code will be shown as well.

## Command Line
This program also provides the function to set IO and interrupt number in the command line operation. Two optional arguments are defined as follows:
-**io** <I/O window address, e.g. 0x240,0x300...>
-**int** <Hardware interrupt number, e.g. 3,4,5...>
When any one of the arguments is given when the program is run in DOS command line, the program will assume the 'Command line' operation is desired. Then that, it will not prompt the window interface and directly set the IO and interrupt number of PCI card by the given value. After setting, the program will be terminated immediately. Please note the both arguments must be given in the same time. If any one of argument is missed, the program will not set the value to adapter and the error message will be shown.

# Chaper 2   AT Commands Set

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.

## 2.1  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.

**B1** Selects Bell 212A when the modem is at 1200 bits/s (default).

**Result Codes:**

**OK** : n = 0, 1, 15, 16

**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.

**!** Hook flash.

**,** Pause during dialing.

**;** Return to command mode.

**^** Disable 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?.

**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**   Return Local Phone Status (Loop Current Detection)
   0: On-hook, 1: Off-hook

**Result Codes:**

n = 0, 1, 2, 3, 4, 5,6

**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.

**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.

**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*Nn.

**N1*** During handshake, Highest speed is specified by AT*Nn.
Depend on line quality fallback to a lower speed may occur.

**Result Codes:**

**OK** n = 0, 1

**ERROR** Otherwise


### On Return Online to Data Mode

**O0*** Exit online command mode and return to data mode (see AT Escape Sequence, +++AT).

**O1** This command issues a retrain before returning to online data mode.

**O2** This command issues a rate re-negotiation before returning to online data mode.

**Result Codes:**

**OK** n = 0, 1, 3

**ERROR** Otherwise


### P Select Pulse Dialing

This command configures the modem for pulse (non-touch-tone) dialing.

**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.

**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.

**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.

**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.

**W3** Display "CONNECT DTE speed?with V42/MNP extended.

**Result Codes:**

**OK** n = 0, 1, 2

**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 modem chip set result codes are also affected.
Therefore, this command is frequently used to control the modem chip set
responses and dial tone detection.

**Result Codes:**

**OK** n = 0, 1, 2, 3, 4, 5, 6, 7

**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.

**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.

**&C0**  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.

**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.

**&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

### &Fn Load Factory Settings

This command loads the configuration stored and programmed at the factory. This operation replaces all of the command options and the S-register settings in the active configuration with factory values.

### &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.

**&G1**   Sets guard tone to 550 Hz.

**&G2**   Sets guard tone to 1800 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.

**&K4**   Enable XON/XOFF flow control.

**&K5**   Enable Transparent XON/XOFF flow control.

**Result Codes:**

**OK** n = 0,1,2, 3, 4

**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)

**Result Codes:**

**OK** n = 0, 1

**ERROR** Otherwise

**&Rn 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.

**Result Codes:**

**OK** n = 0, 1

**ERROR** Otherwise


**&Sn Data Set Ready (DSR) Option**

This command selects DSR action.

**&S0***   DSR always ON.

**&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

**&U1**   Select V.34Bis/V.34

**&U2**   Select V.32Bis/V.22Bis

**&U3**   Select Bell 103 300bps

**&U4**   Select V21 300bps

**&U5**   Select V23


**&V View Active Configuration and Stored Profile**

This command is used to display the active profiles.


**&Wn Store Current Configuration**

This command stores certain command options and S-register values into the modem nonvolatile memory. The ATZ command or a power up reset of the modem restores this profile.

**&W0***   Stores active configuration profile in configuration profit 0.

**&W1**   Stores active configuration profile in configuration profit 1.

**Result Codes:**

**OK** n = 0

**ERROR** Otherwise

**&Yn Select Stored Profile for Power On or Reset**

This command does not change the behavior of the modem but is included for compatibility with applications that issue the &Y0 command

**&Y0**   Select stored profile 0.

**&Y1**   Select stored profile 1.

**Result Codes:**

**OK** n = 0

**ERROR** Otherwise


**&Zn = x Store Telephone Number**

This command is used to store up to three dialing strings in the modem nonvolatile memory for later dialing. The format for the command is &Zn = stored number where n is the location 0? to which the number should be written. The dial string may contain up to 31 characters. The ATDS = n command dials using the string stored in location n.

**Result Codes:**

**OK** n = 0, 1, 2

**ERROR** Otherwise


**\*In Connect Speed Selection**

**\*I0**   Selects connect speed 1200bps

**\*I1**   Selects connect speed 2400bps

**\*I2**   Selects connect speed 4800bps

**\*I3**   Selects connect speed 7200bps

**\*I4**   Selects connect speed 9600bps

**\*I5**   Selects connect speed 12000bps

**\*I6**   Selects connect speed 14400bps

**\*I7**   Selects connect speed 16800bps

**\*I8**   Selects connect speed 19200bps

**\*I9**   Selects connect speed 21600bps

**\*I10**    Selects connect speed 24000bps

**\*I11**    Selects connect speed 26400bps

**\*I12**    Selects connect speed 28800bps

**\*I13**    Selects connect speed 31200bps

**\*I14\***    Selects connect speed 33600bps

select V.pcm

**\*I1**   Selects connect speed 28000bps

**\*I2**   Selects connect speed 29333bps

**\*I3**   Selects connect speed 30666bps

**\*I4**   Selects connect speed 32000bps

**\*I5**   Selects connect speed 33333bps

**\*I6**   Selects connect speed 34666bps

**\*I7**   Selects connect speed 36000bps

**\*I8**   Selects connect speed 37333bps

**\*I9**   Selects connect speed 38666bps

**\*I10**   Selects connect speed 40000bps

**\*I11**   Selects connect speed 41333bps

**\*I12**   Selects connect speed 42666bps

**\*I13**   Selects connect speed 44000bps

**\*I14\***   Selects connect speed 45333bps

**\*I15**   Selects connect speed 46666bps

**\*I16**   Selects connect speed 48000bps

**\*I17**   Selects connect speed 49333bps

**\*I18**   Selects connect speed 50666bps

**\*I19**   Selects connect speed 52000ps

**\*I20**   Selects connect speed 53333bps

**\*I21**   Selects connect speed 54666bps

**\*I22**   Selects connect speed 56000bps

**\*Gn User Abort Selection**

**\*G0\***   Enables user abort feature

**\*G1**   Disables user abort feature

**\*Hn Auto Retrain Selection**

**\*H0**   Disables auto retrain

**\*H1\***   Enables auto retrain

**\*NCnn Country select**

This command provides customers chose the country for phone line
regulation.

**\*NC40**   Australia

**\*NC1**   Austria

**\*NC2**   Belgium

**\*NC3**   Denmark

**\*NC4**   Finland

**\*NC5**   France

**\*NC6**   Germany

**\*NC17**  Greece

**\*NC10**  Netherlands

**\*NC7**  Ireland

**\*NC8**  Italy

**\*NC43**  Japan

**\*NC26**  Namibia

**\*NC11**  Norway

**\*NC12**  Portugal

**\*NC27**  South Africa

**\*NC13**  Spain

**\*NC14**  Sweden

**\*NC15**  Switzerland

**\*NC16**  UK

**\*NC19**  Czech Republic

**\*NC24**  Poland

**\*NC25**  Russia

**\*NC22**  United States

**\*Tn Trellis Coding Selection**

**\*T0**  Disables Trellis coding

**\*T1\***  Enables Trellis coding

**\*On Transmission Level Selection**

**\*O0\***  Selects output level -11dBm

**\*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

## \ 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 MN 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 with ODP & ADP phase detection.

**\ 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 attempts to connect in MNP mode. If this fails, the modem connects in buffer mode and continues operation. This is also known as V.42/ MNP auto reliable mode.

**\N6**  V.42 or disconnect. The modem attempts to connect in V.42 error control mode. If this fails, the call will be disconnected.

**\ N7**  V.42, MNP, or buffer (default).

## Result Codes:

**OK** n = 0, 1, 2, 3, 4, 5, 6

**ERROR** Otherwise

## \ Vn Protocol Result Code

\V0*  Disable protocol result code appended to DCE speed.

**\ 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

# 2. 2  Result Code

| Long Form | Short Form | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| | | n value in ATXn | | | | |
| OK | 0 | x | x | x | x | x |
| CONNECT | 1 | x | x | x | x | x |
| RING | 2 | x | x | x | x | x |
| NO  CARRIER | 3 | x | x | x | x | x |
| ERROR | 4 | x | x | x | x | x |
| CONNECT  1200 | 5 | | x | x | x | x |
| NO DIALTONE | 6 | | | x | | x |
| BUSY | 7 | | | | x | x |
| NO  ANSWER | 8 | | | | x | x |
| CONNECT 300 | 9 | x | x | x | x | x |
| CONNECT 2400 | 10 | | x | x | x | x |
| CONNECT 4800 | 11 | | x | x | x | x |
| CONNECT 9600 | 12 | | x | x | x | x |
| CONNECT 7200 | 13 | | x | x | x | x |
| CONNECT 12000 | 14 | | x | x | x | x |
| CONNECT 14400 | 20 | | x | x | x | x |
| CONNECT 19200 | 21 | | x | x | x | x |
| CONNECT 38400 | 22 | | x | x | x | x |
| CONNECT 57600 | 23 | | x | x | x | x |
| CONNECT 115200 | 24 | | x | x | x | x |
| CONNECT 1200TX/75RX | 25 | | x | x | x | x |
| CONNECT 75TX/1200RX | 26 | | x | x | x | x |
| RINGBACK | 27 | | x | x | x | x |
| CONNECT BELL 300 | 28 | | x | x | x | x |
| CONNECT V21 | 29 | | x | x | x | x |

( Display DCE speeds by ATW0 and ATW2 )

| Long Form | Short Form | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| CONNECT 16800 | 15 | | x | x | x | x |
| CONNECT 19200 | 16 | | x | x | x | x |
| CONNECT 21600 | 17 | | x | x | x | x |
| CONNECT 24000 | 21 | | x | x | x | x |
| CONNECT 26400 | 30 | | x | x | x | x |

| | | | | | | |
|---|---|---|---|---|---|---|
| CONNECT 28800 | 31 | x | x | x | x | |
| CONNECT 31200 | 32 | x | x | x | x | |
| CONNECT 33600 | 33 | x | x | x | x | |
| (V.90 mode) | | | | | | |
| CONNECT 28000 | 34 | x | x | x | x | |
| CONNECT 29333 | 35 | x | x | x | x | |
| CONNECT 30666 | 36 | x | x | x | x | |
| CONNECT 32000 | 37 | x | x | x | x | |
| CONNECT 33333 | 38 | x | x | x | x | |
| CONNECT 34666 | 39 | x | x | x | x | |
| CONNECT 36000 | 40 | x | x | x | x | |
| CONNECT 37333 | 41 | x | x | x | x | |
| CONNECT 38666 | 42 | x | x | x | x | |
| CONNECT 40000 | 43 | x | x | x | x | |
| CONNECT 41333 | 44 | x | x | x | x | |
| CONNECT 42666 | 45 | x | x | x | x | |
| CONNECT 44000 | 46 | x | x | x | x | |
| CONNECT 45333 | 47 | x | x | x | x | |
| CONNECT 46666 | 48 | x | x | x | x | |
| CONNECT 48000 | 49 | x | x | x | x | |
| CONNECT 49333 | 50 | x | x | x | x | |
| CONNECT 50666 | 51 | x | x | x | x | |
| CONNECT 52000 | 52 | x | x | x | x | |
| CONNECT 53333 | 53 | x | x | x | x | |
| CONNECT 54666 | 54 | x | x | x | x | |
| CONNECT 56000 | 55 | x | x | x | x | |

## 2.3    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: 0-55
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: 0-55
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: 2-10
Default: 2
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: 45
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.

**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: 1-254
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).

Range: 0-255

Default: 50

Units: 0.02 seconds

## S14 Bit-mapped Register

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

Bit    Function

0=0 Do not echo command (E0)

   1 Echo command (E1) – default

1      Reserved

2      Mapping to ATQn

3=0 Numeric responses (V0)

   1    Verbose (Verbal) Responses (V1) – default

4,5= Mapping to AT&P

6=0    Use touch-tone dialing method (T) – default

1      Use pulse dialing method (P)

7=0    Answer incoming calls (A)

   1    Originate calls (D) – default

## S21 Bit-mapped Register

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

Bit    Function

0,1= x Undefined

2= Mapping to AT&R

3,4=0    Modem ignores the DTR signal (&D0)

    1    Modem enters command mode after ON-to-OFF DTR transition (&D1)

    2    Modem hangs up after ON-to-OFF DTR transition (&D2) – default

    3    Modem resets after ON-to-OFF DTR transition (&D3)

5=0    CD signal always on (&C0)

   1    CD signal on when a remote carrier signal is present (&C1) – default

6 =0   AT&S=0

  1   AT&S=1

## S22 Bit mapped Register

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

Bit      Function

0,1= 0 Speaker volume off (L0)

    1   Low speaker volume (L1)

    2   Medium speaker volume (L2) – default

    3   Loud speaker volume (L3)

2,3= 0 Speaker off (M0)

    1 Speaker on until carrier detected (M1) – default

    2 Speaker always on (M2)

    3 Speaker on until carrier detected but off during dialing (M3)

4,5,6=0 Hayes Smart modem compatibility (X0)

    4 Include CONNECT XXX responses (X1)

    5 Same as 4 plus dial tone detection (X2)

    6 Same as 4 plus BUSY response and blind dialing (X3)

    7 Same as 6 plus dial tone detection (X4) – default

7 =0 Undefined

## S23 Bit-mapped Register

Bit            Function

0,1,2,3= 0   0-300bps DTE data rate

    1   1200bps DTE data rate

    2   2400bps DTE data rate

    3   4800bps DTE data rate

    4   9600bps DTE data rate

    5   14400bps DTE data rate

    6   19200bps DTE data rate

    7   34800bps DTE data rate

    8   57600bps DTE data rate

    9   115200bps DTE data rate

4,5= 0      Use even parity

    1      Use none parity

    2      Use odd parity

    3      Use mark parity

6,7= 0       Mapping to AT&G

**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 hundredths 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

Range: 0-255

Default: 5

Units: 0.01 seconds

**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.

Range: 0-255

Default: 1

Units: 0.01 seconds

**S29**

Bit    Value Function

0-4    Mapping to AT*I

5-7    Mapping to AT&U

**S30 Inactivity Timer**

S30 specifies the length of time (in minutes) that the modem will wait before disconnecting when no data is sent or received. This function is only applicable to buffer mode.

Range: 0-255

Default: 0

Units: minutes

**S45 Timer to Control Sleep Mode**

This command displays the number of seconds of inactivity (no characters sent from the DTE, no RING) in the off-line command state before the modem places itself into standby mode. A value of zero prevents standby mode.

**Note:** If a number between 1 and 4 is entered for this register, it will set the

value to 5, and the inactivity before standby will be 5 s. This is done for compatibility with previous products which allowed time-outs down to 1 s.

Range: 0, 5-255

Default: 10

**S95**

Bit <u>Value Function</u>

0,1 Mapping to ATWn

2 Mapping to AT\V

3 Mapping to ATN

4 Mapping to AT*O

**S96 Local Phone Status**

This register tells the status of the Local Phone. It is read only.

0 = local phone on-hook

1 = local phone off-hook

**S97**

Bit <u>Value Function</u>

0-2 Mapping to AT\Nn

7 Mapping to AT%Cn

**S98**

Bit <u>Value Function</u>

0,1 Mapping to AT*H

2 Mapping to AT*G

3 Mapping to AT*T

4-6 Mapping to AT&K

**S99 Energy detection threshold**

This register can use in Call Progress Mode (CPM) mode, for dial tone detection threshold. The default value is 2. This register determines the detection threshold for Call Progress (CPM) tones. The default value is 2.

# 2.4    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
**+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
**+FMM = ?**          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: 000 :data mode

    001 if in FAX class 1

008 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 or 1.

Parameters: 0, 1, 8

Default: 0

Command options:

+FCLASS = 0 Select data mode.

+FCLASS = 1 Select facsimile class 1.

+FCLASS = 8 Select voice mode.

+FTS = <n> Stop transmission and pause

**+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 = 3     V.21 Channel2 300

+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

**+FRM = <m> Receive FAX Data**

This command causes the modem to receive data at the modulation specified
by <m>.

+FRM = 3    V.21 Channel2 300

+FRM = 24    V.27ter 2400

+FRM = 48    V.27ter 4800

+FRM = 72    V.29 7200

+FRM = 96    V.29 9600

+FRM = 73    V.17 7200

+FRM = 74    V.17 (short train) 7200

+FRM = 97    V.17 9600

+FRM = 98    V.17 (short train) 9600

+FRM = 121   V.17 12000
+FRM = 122   V.17 (short train) 12000
+FRM = 145   V.17 14400
+FRM = 146   V.17 (short train) 14400


**+FTH = <m> Transmit HDLC Data**

This command causes the modem to transmit data framed in the HDLC
protocol at the modulation specified by <m>.

+FTH = 3     V.21 Channel2 300
+FTH = 24    V.27ter 2400
+FTH = 48    V.27ter 4800
+FTH = 72    V.29 7200
+FTH = 96    V.29 9600
+FTH = 73    V.17 7200
+FTH = 74    V.17 (short train) 7200
+FTH = 97    V.17 9600
+FTH = 98    V.17 (short train) 9600
+FTH = 121   V.17 12000
+FTH = 122   V.17 (short train) 12000
+FTH = 145   V.17 14400
+FTH = 146   V.17 (short train) 14400


**+FRH = <m> Receive HDLC Data**

This command causes the modem to receive data framed in the HDLC
protocol at the modulation specified by <m>.

+FRH = 3     V.21 Channel2 300
+FRH = 24    V.27ter 2400
+FRH = 48    V.27ter 4800
+FRH = 72    V.29 7200
+FRH = 96    V.29 9600
+FRH = 73    V.17 7200
+FRH = 74    V.17 (short train) 7200
+FRH = 97    V.17 9600
+FRH = 98    V.17 (short train) 9600
+FRH = 121   V.17 12000
+FRH = 122   V.17 (short train) 12000
+FRH = 145   V.17 14400
+FRH = 146   V.17 (short train) 14400

**+FLO = <V> Flow Control Select**

+FLO=0 Xon/Xoff and RTS/CTS flow control Turned off

+FLO=1 Xon/Xoff flow control

+FLO=2 RTS/CTS flow control

**+FPR = <V> Serial Port Rate**


# 2.5    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

**+VCID?**    Report current parameter

**+VCID=?**   Queries the range that DCE support

**+VDR**        Enable the distinctive ring feature

**+VDR?**      Report current parameter

**+VDR=?**    Queries the range that DCE support

**+VGT**         Setup playback gain

**+VGT?**       Report current parameter

**+VGT=?**    Queries the range that DCE support

**+VGR**          Setup record gain

**+VGR?**        Report current parameter

**+VGR=?**     Queries the range that DCE support

**+FMI?**        Report manufacturer ID

**+FMM?**       Report product information

**+FMR?**       Report product revision

**+VIT**           Enable inactive timer

**+VIT?**         Report current parameter

**+VIT=?**        Queries the range that DCE support

**+VTD**           Set the default duration for DTMF/tone generation in 10ms

      increments

**+VTD?**         Report current parameter

**+VTD=?**        Queries the range that DCE support

**+VSD=<sds,sdi>**

      sds=128 Normal level of sensitivity(-40dbm)

sds>= 128 More aggressive ;ex. sds=129 is –39dbm

sds<= 128 Less aggressive :ex sds=127 is –40dbm

sdi :Specify the amount of time the modem will report silence to DTE

**+VSD?**    Report current parameter

**+VSD=?**   Queries the range that DCE support

**+VTS**      DTMF and tone generation

**+VTS=?**    Queries the range that DCE support

ex1:    AT+VTS=1 play DTMF 1 with a duration by the +VTD command

ex2:    AT+VTS=2 play DTMF 2 with a duration by the +VTD command

ex3:    AT+VTS=[1000,1300,50] play tone pair 1000Hz and 1300hz with a
            duration of 50ms

ex4:    AT+VTS={*,6} play DTMF * with a duration of 60ms

ex5:    AT+VTS=9 play DTMF 9 with a duration by the +VTD command

**+VTX**    Enter voice playback mode

**+VRX**    Enter voice record mode

**+VSM=<cml>,<vsr>**

cml=128 , select linear 8bit PCM

cml=132 , select IMA ADPCM

vsr =xx,   Sample rate is always 8000

**+VSM?**    Report current parameter

**+VSM=?**   Queries the range that DCE support

**+VPR=<rate>** DTE/DCE rate will be equal 2400*rate , but auto-baud if rate=0

**+VPR?**      Report current parameter

**+VPR=?**    Queries the range that DCE support

**+VLS=<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 on-hook(Record
            greeting)

pmode=7: Microphone and speaker connected , DCE off-hook
            (speakerphone)

## 2.6    AT% TTn Commands

**%tt0=0** erase %TT command
**%tt1=n** Tx v90 signal
**%tt2=A,B,C,D** Tx v34 signal parameter
A: Baud Rate
B: Data Rate
C: Min/Exp
D: Pre-emphasis

**%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