

TAINET

Network Series Modem

T-336Cx

使用手册

TAINET COMMUNICATION SYSTEM CORP.

INFORMATION TO THE USER

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device. Pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and if not installed and used in accordance with the instructions may cause harmful interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

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The shielded RS-232 cable is to be used in order to ensure compliance with FCC Part 15, and it is the responsibility of the user to provide and use shielded RS-232 cable from MODEM to personal computer.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
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注意：此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

FCC REQUIREMENTS

This equipment complies with Part 68 of the FCC Rules. On the base unit of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. IF REQUESTED, THIS INFORMATION MUST BE GIVEN TO THE TELEPHONE COMPANY.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of the REN's of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN you should contact your local telephone company to determine the maximum REN to your calling area.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But the advance notice isn't practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, please contact the following address and phone number for information on obtaining service or repairs.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

COMPANY: SUMMIT MICRO DESIGN, INC.

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内容

1.1 概述 (Description)

1.2 技术规格 (Technical Specifications)

1.3 订购信息 (Ordering Information)

第一章： TAINET网管系列MODEM介绍

1.1 概述

- TAINETT-336Cx/T-336Nx网管系列MODEM是高性能，同步/异步，全双工，多标准的MODEM，可工作于两线拨号电路及两线/四线专线。

TAINET网管系列MODEM符合ITU-T V.34, V.32bis/V.32, V.22bis, V.22, V.23 and V.21 等标准，传输速率为33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400, 1200, 600及300bps。

在V.34和V.32bis/ V.32模式下，回波消除提供两线全双工的传输，可工作于包括卫星电路在内的所有电话电路。

- 在V.34模式下，采用线路侦测，符号速率及载波频率的选择，提供高达33.6 kbps的全双工传输。
- 在V.34模式下还采用了一些技术来提高性能，包括Adaptive Precoding, Non-Linear Encoding (Warping), Constellation Expansion, Multidimensional Trellis coding, Shell Mapping and Tx power back off (Power Reduction)。
- 本机具有10组出厂设定值，及10组用户设定值，方便配置。
- 机框式（TRS-16）最多可容纳16片卡片。
- 本机前面板具有 2×16 LCD液晶显示屏，带背光控制，可以方便的设置及监控。
- 线路状态监测功能包括收发电平，信噪比，EQM (eye quality monitoring)，接收信号品质，频率偏移，传输延迟，回波，retrain计数，相位抖动，收发波特率，收发载波频率，收发DCE速率，[发送电平降低 \(TX power back-off\)](#) 等。
- 本机具有前面板锁定及密码保护功能，可防止非授权人员误操作。
- 可通过次信道实现远端配置。
- 具有半双工操作模式下的V.13模拟载波控制。
- 自动或手动拨号备分及恢复专线。

1.2 技术规格 (Technical Specifications)

T-336Cx 符合 ITU-T V.34, V.32bis, V.32, V.22bis, V.22, V.21, V.23, V.24, V.28, V.25, V.25bis, V.52, V.54, V.42, V.42bis, V.8, 及 BELL 212A/103 标准。

- Modem 协议 : 详见表 1-1A, 1-1B.
- 时钟信号误差
 - (1) 同步 : $\pm 0.01\%$
 - (2) 异步 : Basic range + 1% to - 2.5%
Extended overspeed range + 2.3% to - 2.5%
- 终端设备速率
 - (1) 同步 : 33600 / 31200 / 28800 / 26400 / 24000 / 21600 / 19200 / 16800 / 14400 / 12000 / 9600 / 7200 / 4800 / 2400 / 1200 bps
 - (2) 异步 : 115200 / 76800 / 57600 / 38400 / 33600 / 32000 / 31200 / 28800 / 26400 / 24000 / 21600 / 19200 / 16800 / 14400 / 12000 / 9600 / 7200 / 4800 / 3600 / 2400 / 1200 / 600 / 300 bps with speed conversion.
- 数据总位数 : 8, 9, 10, 11 bits
- 校验位 : odd, even, none
- 停止位 : 1, 1.5, 2 bit
- 纠错方式 : MNP 4/ITU-T V.42
- 压缩方式 : MNP 5/ITU-T V.42bis
- 流量控制 : 硬件 CTS/RTS, CTS only
软件 X-ON/X-OFF
- 拨号指令 : 扩展 AT 指令集及 ITU-T V.25bis 指令集
- G3 Fax 模式及速率 (可选)
 - V.17 --14400, 12000, 9600, 7200 bps
 - V.29 --9600, 7200 bps
 - V.27ter --4800, 2400 bps
 - V.21 channel 2 --300 bps

表1-1A : Modem工作模式（两线/四线专线或拨号线）

工作模式 (数据模式)	调制方式	载波频率	符号速率	调制点数
V. 34 + 33600	SM	(Table 1-1c)	(Table 1-1c)	4到1024 根据数据速率，调制速率和调制扩展的选择而定
V. 34 + 31200	SM			
V. 34 28800	SM			
V. 34 26400	SM			
V. 34 24000	SM			
V. 34 21600	SM			
V. 34 19200	SM			
V. 34 16800	SM			
V. 34 14400	SM			
V. 34 12000	SM			
V. 34 9600	SM			
V. 34 7200	SM			
V. 34 4800	SM			
V. 34 2400	SM			
V. 32bis 14400 T	TCM	1800	2400	128
V. 32bis 12000 T	TCM	1800	2400	64
V. 32 9600 T	TCM	1800	2400	32
V. 32 9600	QAM	1800	2400	16
V. 32bis 7200 T	TCM	1800	2400	16
V. 32 4800	QAM	1800	2400	4
V. 26bis 2400	DPSK	1800	1200	4
V. 26bis 1200	DPSK	1800	1200	4
V. 22bis 2400	QAM	1200/2400	600	16
V. 22 1200	DPSK	1200/2400	600	4
V. 23 1200/7 5	FSK	1700/420	1200	N/A
V. 21 0-300	FSK	1080/1750	300	N/A
BELL 212A 1200	DPSK	1200/2400	600	4
BELL 103 0-300	FSK	1175/2125	300	N/A

表 1-1B : Modem工作模式 (传真)

工作模式 (数据模式)	调制方式	载波频率	符号速率	调制点数
V. 29 9600	QAM	1700	2400	16
V. 29 7200	QAM	1700	2400	8
V. 27 ter 4800	DPSK	1800	1600	8
V. 27 ter 2400	DPSK	1800	1200	4
V. 21 ch2 300	FSK	1750	300	N/A
V. 17 14400	TCM	1800	2400	128
V. 17 12000	TCM	1800	2400	64
V. 17 9600	TCM	1800	2400	32
V. 17 7200	TCM	1800	2400	16

注: TCM :Trellis Code Modulation

QAM :Quadrature Amplitude Modulation.

DPSK :Differential Phase Shift Keying.

FSK :Frequency Shift Keying.

SM :Shell Mapping with 4 Dimensional Trellis Coded Modulation

表1-1C : V. 34符号速率和载波频率

符号速率(Baud)	低频载波(Hz)	高频载波(Hz)
2400	1600	1800
2800	1680	1867
3000	1800	2000
3200	1829	1920
3429	1959	1959

- 发送电平专线 : 专线: 0~-31dBm, 可调整, 步长 1dB.

拨号线：0~-15dBm，可调整，步长1dB.

- 线路需求 : 2/4线专线或拨号线
- 线路阻抗 : 平衡式 $600\ \Omega \pm 10\%$
- 回流损失 Return Loss : $> 24\ \text{dB}$, 300 – 3400 Hz
- 纵向平衡Longitude Balance : $> 60\ \text{dB}$
- 拨号线特性:
 - 容许最大滞留电流 : 120 mA
 - 滞留电阻 : $50 \sim 220\ \Omega$
 - 滞留电流 : $25 \sim 110\ \text{mA}$
 - 振铃侦测范围 : ON – $> 27\ \text{Vrms}$
OFF – $< 13\ \text{Vrms}$
 - 振铃侦测频率: 16 – 50 Hz
 - DTMF特性 : O/P Lowband $-8 \pm 1\ \text{dBm}$
O/P Highband $-6 \pm 1\ \text{dBm}$
Frequency Tolerance $\leq \pm 1\%$
TONE Duration and Spacing 95 ms (adjustable)
 - 脉冲拨号速率 : $10 \pm 0.5\ \text{PPS}$
 - 脉冲间断比 : 33/67, 39/61 $\pm 3\%$
- 自动回应程序 : 符合ITU-T V.25 & V.25bis
应答音: V.34符合V.8, V.32bis/V.32/V.22 2100 $\pm$ 15Hz
- 呼叫音 : 符合ITU-T V.8, V.25
- 接收范围 : $-4 \sim -43\ \text{dBm}$, $0 \sim -33\ \text{dBm}$
- 动态范围 : $0 \sim -43\ \text{dBm}$
- 均衡器 : 自适应均衡
- 容忍载波频率偏移 : 至少补偿 $\pm 7\text{Hz}$ 的偏移
- 远端回音消除 : 近端及远端回波消除最大能处理到1.2秒的环路延时。
- 扰码和舒码 : 符合ITU-T V.34, V.32bis, V.32, V.26bis, V.22bis, V.22
- 数据和控制信号 : 输出电压 $\pm (6\sim 12)\text{V}$

- (ITU-T V. 28) : 输入电压 $\pm (3 \sim 25)V$
 输出阻抗 $\geq 330 \Omega$
 输入阻抗 $3000 \sim 7000 \Omega$
- 发送时钟源 : 内部/外接/回接
 频率误差 : $\pm 0.01 \%$
 工作周期 : $50 \pm 1 \%$
 - 测试功能 : V. 54/V. 52 , LAL/DL/RDL
 测试码 - 511
 - 电源需求 : 交流电源: $90 \sim 265VAC$, 自适应范围, $47 \sim 63Hz$
 直流电源: $-36 \sim -72 VDC$ (机架式可选)
 - 工作温度 : $0^{\circ}C \sim 50^{\circ}C$
 储存温度 : $-25^{\circ}C \sim 70^{\circ}C$
 相对湿度 : 95% (非凝结)
 - 尺寸重量:
 桌上型 $\Rightarrow W - 180mm, H - 48mm, D - 262mm, Weight 0.9kg$
 机架型卡片 $\Rightarrow W - 220mm, H - 26mm, D - 328mm, Weight 0.6kg$
 机架型机框 $\Rightarrow W - 19", H - 6RU, D - 380mm, Weight 8kg$
 满机框 $\Rightarrow Weight 16kg$
 - DTE接口: EIA RS-232D, CCITT V. 24/V. 28

NO	V. 24	DESCRIPTION	SOURCE
1	101	(PG) Protective Ground	—
2	103	(TXD) Transmit Data	DTE
3	104	(RXD) Receive Data	MODEM
4	105	(RTS) Request To Send	DTE
5	106	(CTS) Clear To Send	MODEM
6	107	(DSR) Data Set Ready	MODEM
7	102	(SG) Signal Ground	—
8	109	(DCD) Data Carrier Detect	MODEM
9		+12VDC	MODEM
10		-12VDC	MODEM
15	114	(TXC) Transmit Clock	MODEM
17	115	(RXC) Receive Clock	MODEM
18	141	(AL) Local Analog Loopback	DTE
20	108	(DTR) Data Terminal Ready	DTE
21	140	(RDL) Remote Digital Loopback	DTE
22	125	(RING) Ring Detect	MODEM
24	113	(XTC) External Clock	DTE

25	142	(TST) Test Mode	MODEM
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1.3 订购信息

- T-336Cx 台式V.34 33.6Kbps modem
- T-336Nx 机架式V.34 33.6kbps modem (用于TRS16机架)
- NMC16 TRS-16的网管模块
- TRS16 19"机框, 可容纳16片modem卡片
- PW-130AC 90 ~ 260 VAC机框交流电源模块
- PW-130DC -36 ~ -72 VDC机框直流电源模块
- Tainet Manager[®] 网络管理系统
for Windows

内容

2.1 简介 (Description)

2.2 拆装 (Unpacking)

2.3 工作环境需求 (Site Requirements)

2.4 安装地点选择 (Site Selection)

2.5 与电源连接 (AC Electrical Outlet Connection)

2.6 与拨号线连接 (Connecting With Dial Line)

2.7 与专线连接 (Connecting With Leased Line)

第二章：安装

2.1 简介 (Description)

This chapter provides the information needed to install the TAINET Network Series Modem and to ensure that it is working properly. You may obtain more information about this subject for rack-mount modem shelf from the User's Manual of TAINET rack-mount modem shelf. 本章告诉使用者各项装机所需注意的事项，以保证 MODEM 能正常地工作。有关机架 MODE 的安装信息，请详阅 TRS16 机框使用手册的相关章节

2.2 拆封 (Unpacking)

拆开包装后，如果需要存入仓库或运到别处，请保存这些包装盒及保护材料。每一完整的 MODEM 包装应包含下列物品：

- * 使用手册一本.
- * 2米电话线一条，两端为 RJ-45 8芯式电话插头
- * 2米电话线一条，两端为 RJ-11 4芯式电话插头
- * 8脚接线盒一个，用于专线
- * 2米电源线一条

运送不良是大部份 MODEM 损坏的原因，当您收到了本产品后，请仔细检查是否有因运送而导致的损坏，如有问题，请与运送者接洽。

其他的损坏或是少了任何附件，请与最近的销售部门联系。

2.3 工作环境需求 (Site Requirements)

根据 FCC 的规定，各种通信设备都必需包括防止雷击等引起的电气冲击 (Electrical Surges) 的设计。本系列产品均符合 FCC 的规定，但使用者必须依照下列注意事项才可完全保护您的设备及人员安全：

- 1) 确定使用正确的电源接地系统(参照 Article 250 of National Electrical Code Handbook)。
- 2) Verify that a good copper wire of the appropriate gauge, as described in Tables 250-94/95 of the NEC Handbook, is permanently connected between the electrical service panel in the building and a proper grounding device such as:
 - ☞ A ground rod buried outside the building at least 8 feet (2.44 meters) deep in the earth.
 - ☞ Several ground rods, connected together, buried outside the building at least 8 feet (2.44 meters) deep in the earth.
 - ☞ A wire (see tables 250-94/95 of the NEC handbook for gauge) that surrounds the outside of the building and is buried at least 2.5 feet (.76 meters) deep in the earth. Note: The three grounding devices described above should be firmly

placed in the earth. Soil conditions should not be dry where the device is buried.

☞ A metal water-supply pipe connected to the water main in the street or a metal cased well. The water pipe used must not have plastic piping between the ground connection and the water main (or the well). The connection should be made where the pipe enters the building. The water meter must be shunted by a copper strap.

- 3) If you are unsure whether the electrical service in your building is properly grounded, have it examined by your municipal electrical inspector.
- 4) Install a surge protector between the modem and AC power outlet. Any additional computer equipment you have connected to the modem (directly or through another device), such as a terminal or printer, should also be plugged into the same surge protector. Make sure that the surge protector is properly rated for the devices you have connected to it.
- 5) Call your telephone company and ask them if your telephone line is equipped with a circuit surge protector.
- 6) If you are operating the modem in an area where the risk of electrical surges from lightning is high, disconnect the modem from the telephone line at the modem's rear panel when it is not in use.

2.4 安装位置选择 (Site Selection)

本机距离终端设备请勿超过15公尺远并使用1.83 米的带接地端子的电源导线。

Install the modem in a clean area that is free from environmental extremes.前面至少应留15cm空间便于操作，后面至少应留10cm空间用于布线。安放的位置应便于观察前面板。在机器上面不要放置别的MODEM。

关于TRS-16机框及MNC-16的安装细节，请参照相关的使用手册。

2.5 与电源连线

检查MODEM底部的标签确认电源规格与您的环境相符，插入电源插头。

2.6 与电话线连接（Connecting With Dial Line）

按如下步骤将MODEM连接到拨号线：

- 1) 使用4芯到4芯的线连接MODEM的RJ-11插座与电话机，可用于手动拨号或
话音通讯。
- 2) 用4芯到4芯的线连接MODEM后背板的DIAL口与电话接线盒。

RJ-11 PHONE口管脚定义：

	Modem 管脚编号	颜色	功能定义
Phone	1	空接	空接
	2	黑	不用
	3	红	Tip
	4	绿	Ring
	5	黄	不用
	6	空接	空接

RJ-11 DIAL口管脚定义：

	Modem 管脚编号	颜色	功能定义
Dial Line	1	空接	空接
	2	黑	不用
	3	红	Tip
	4	绿	Ring
	5	黄	不用
	6	空接	空接

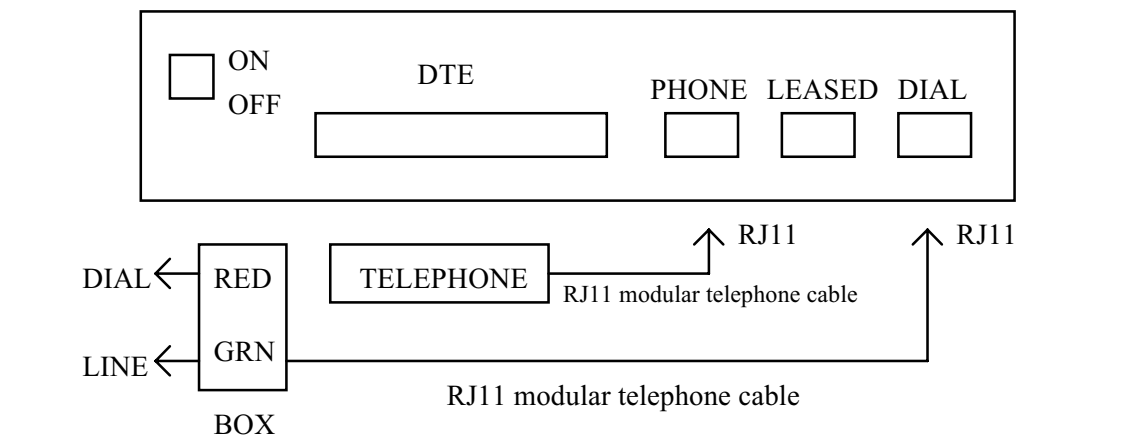


图 2-1：拨号线的接线图

2.7 与专线接线（Connecting With Leased Line）

在专线模式下，使用RJ-45线连接T-336Cx后背板的LEASED口。

		Modem		
Leased Line	Pin No.	Color	2-Wire	4-Wire
	1	Blue	TX/RX	TX
	2	Orange	TX/RX	TX
	3	Black		RX
	4	Red	TX/RX	TX
	5	Green	TX/RX	TX
	6	Yellow		RX
	7	Brown		RX
	8	White (or Gray)		RX

在2线模式下，只需连接1, 2或4, 5脚，在4线模式下，需连接1,2,7, 8或4, 5, 3, 6。

当两台MODEM做背对背测试时，谨记收/发线要交叉。

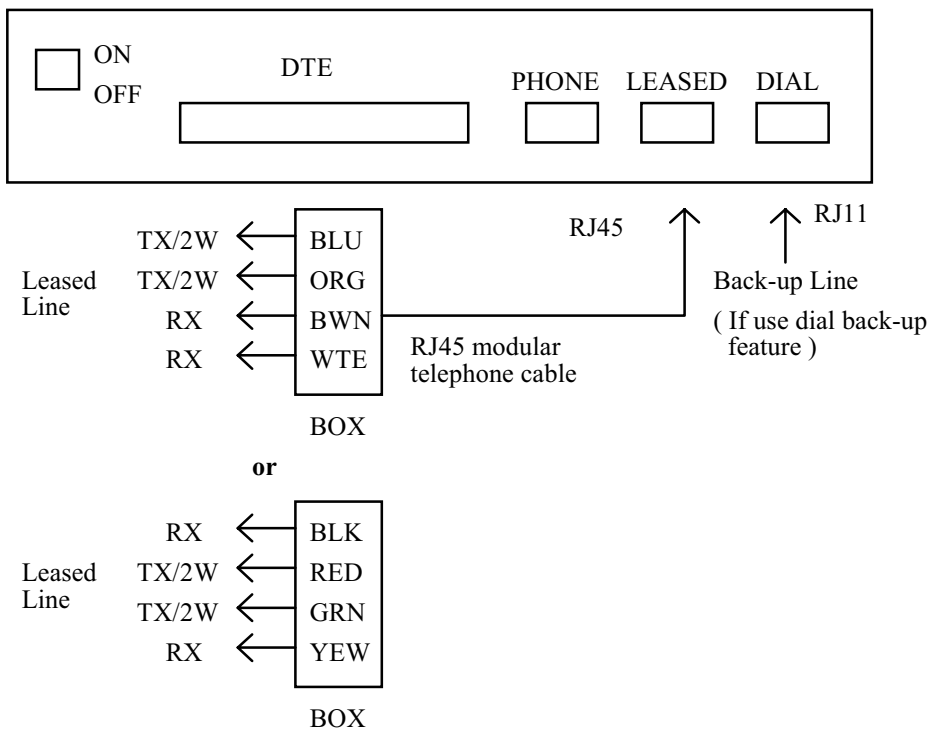


图 2-2：专线连接

第三章

面板LCD及菜单说明

内容

- 3.1 面板介绍
 - 3.2 背板介绍
 - 3.3 操作说明
 - 3.4 树状菜单结构
 - 3.5 菜单树的详细说明
-

第三章： 面板LCD及菜单说明

3.1 面板介绍

TAINET Modem 的前面板包含5个按键 (VO/DA Key, Right Key, Left Key, ENTER Key 和 EXIT Key), 一组 2 x 16 的 LCD 显示器, 及10个 LED. 使用者可经由这些人机介面看到 modem 的工作状态列示如下:

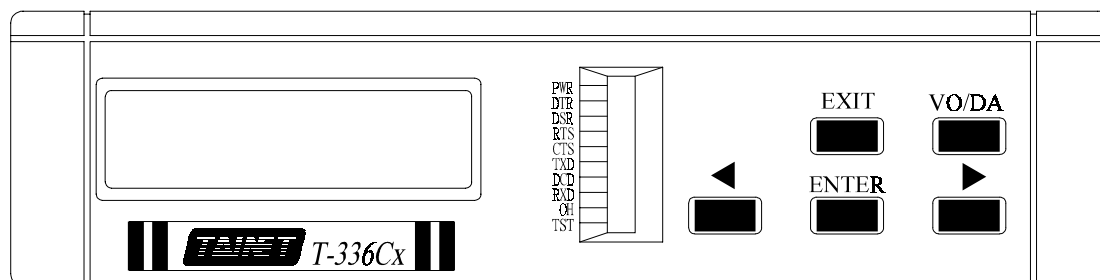


Figure 3-1 T-336Cx Front Panel

3.1.2 背板介绍

The rear panel of TAINET T-336Cx modem contains an IEC 320 AC Power Inlet Connector, a Power On/Off switch, a RS-232 connector (for connecting to DTE Equipment), two RJ11 telephone jack (for connecting to dial line and telephone set), and one RJ45 telephone jack (for connecting to 2-wire or 4-wire leased line), as illustrated below.

For more detailed description, please refer to Chapter 2

"Installation" of this manual. TAINET Modem 的背板包含有一个 IEC 320 AC 电源接头, 一个电源开关, 一个 RS-232 接口 (连接DTE设备), 两个 RJ11 的电话接口 (连接拨号线及电话机), 及一个 RJ45 电话接头 (连接 2W 或 4W 专线), 图示如下. 详细说明请参考本手册第二章"安装"

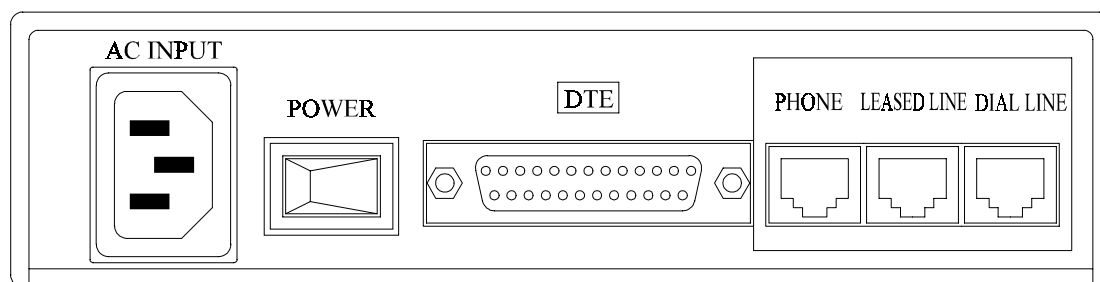


图 3-2 T-336Cx 背板

3.3 操作说明 (Operating The T-336Cx Series Modem)

1. 按键 : 触控型, 共有五个, 分述如下:

VO/DA 在拨接线时, 此按钮用来切换 voice/data 的工作模式 ;
在专线时, 此按钮可用来强制Modem断线或重连线; 而在操作面板菜单选项时,
此按钮则提供快速回到主菜单的功能 ("HOME"按钮).

◀ 选择前一菜单选项.

▶ 选择下一菜单选项

ENTER 确定菜单选择选择结果或进入更下一层的菜单选项.

EXIT 跳回上一层菜单

2. LED 指示灯 : 共有10个LED灯, 分述如下:

PWR -- 亮代表电源正常供电.

DTR	--	亮代表介面收到 DTR 信号.
DSR	--	亮代表 DSR 信号送出介面.
RTS	--	亮代表介面收到 RTS 信号.
CTS	--	亮代表CTS信号送出介面.
TXD	--	亮为"0", 熄为"1", 代表终端机送出数据信号 TXD.
DCD	--	亮代表接收到远端送来载波信号 (DCD).
RXD	--	亮为"0", 熄为"1", 代表收到远端送来数据信号 RXD.
OH	--	亮代表Off Hook状态.
TST	--	亮代表测试中.

3. LCD 液晶显示屏：

T-336Cx具有2x16字符的液晶显示屏，具有背光照明，以下列出几种不同的显示状态：

A. 主菜单画面

Example:

V34+	336
V.42bis	
D ANS	CONNECT 9

说明:

- 1) 调制模式: V.34+ 336, V.34+ 312, V34 288, V32b 144T, V32 96T, V22b 24,...
- 2) 数据协议: V.42bis, V.42, MNP-5, Normal, Direct,.....
- 3) 线路类型: D (Dial Line), L (Leased Line).
- 4) 模式: ANS-应答端, ORG-主叫端.
- 5) 目前状态: Stanby, Handshaking, Connect, Retrain, Ring...
- 6) SQ: 线路品质 9, 8, 7, 6, ..., 0

B. 菜单选择

Example 1 :

Example 2 :

L MENU Select
STATUS

L MENU Select
TEST

说明:

- 1) 由主画面按 "ENTER" 即进入本画面
- 2) 如已连线中, 则必须先选择 "local" 或 "remote" 才会进入本画面
- 3) 左上角的 "L" 代表操作本端(Local)设备.
- 4) 利用"▶" 或 "◀" 键选择菜单
- 5) 按 "ENTER" 键可进入选定的下一级菜单.
- 6) 按 "EXIT" 键退出当前画面.
- 7) 未连线前, STATUS/(Remote STATUS) MENU 无法进入.

C. 菜单画面

Example 1 : Example 2 :

L STATUS RX Level =-10dBm

R CONFIG MODEM TX clock

Example 3 : Example 4 :

L TEST LAL (ON)

L DIAL Dial a number

说明

- 1) L=Local 近端, R=Remote 远端
- 2) 菜单名称: STATUS, TEST, DIAL.....
- 3) 状态或设定: RX Level=-10dBm, LAL = ON
- 4) 使用 "▶"键 或 "◀" 键可左右移动选项, 按"ENTER"则进入选定菜单画面

D. 设置菜单

例 1 : 例 2 :

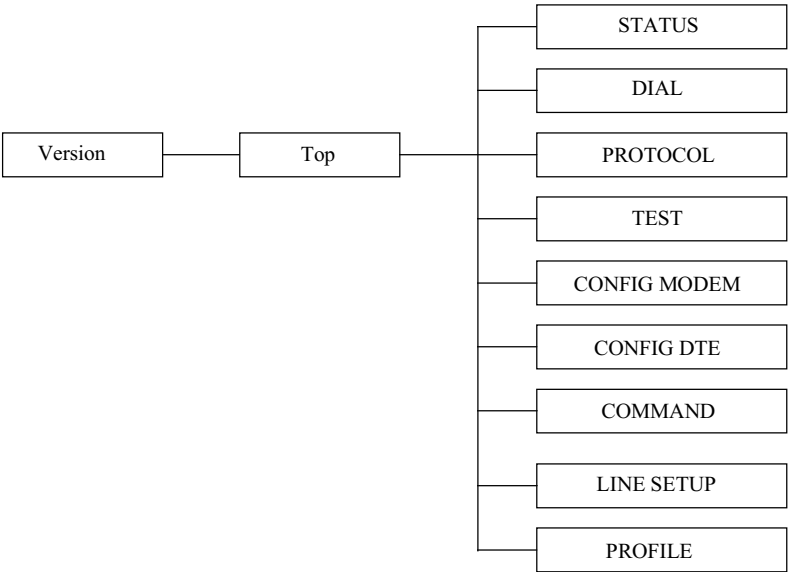
LL TX Level -10dBm ←

R Protocol type Auto MNP/V42 ←

Description :

- 1) 使用 "▶"键 或 "◀" 键可左右移动选项, 按"ENTER"确认, 待←出现表示已设定。
- 2) 按"EXIT"退出当前菜单。

3.4 树状菜单结构
主菜单



A. STATUS 状态菜单

- ➔ Tx Level = -XX dBm
- ➔ Rx Level = -XX dBm
- ➔ S/N Ratio = XX dB
- ➔ EQM Value = XXX
- ➔ F-Shift = X. X Hz
- ➔ F F-Shift = X. X Hz
- ➔ *Delay = XXXX ms
- ➔ *P jitter = X Deg.
- ➔ *F Echo = XX. X dB
- ➔ DTE = XXXXX ASY XX
- ➔ Retrains = XXXXX times
- ➔ */RX Speed = XXXX
- ➔ */TX Speed = XXXX
- ➔ */RX Baud = XXXX
- ➔ */TX Baud = XXXX
- ➔ */RX Freq = XXXX Hz
- ➔ */TX Freq = XXXX Hz
- ➔ */TX PowerOff = X dB
- ➔ Menu Retrain
- ➔ Interface indicators = TR MR RS CS CD T

注: (*)号表示只有在V.32以上的调变方式时,才提供该功能
(*/)表示只有在V.34调变方式时,才提供该功能

B. DIAL 菜单

- ➔ Dial a Number #0 nnnn\#1 nnnn\...\#9 nnnn
- ➔ Edit a Number #0 nnnn\#1 nnnn\...\#9 nnnn
- ➔ Ring Times Auto ANS Off\1 Time\...\255 Times
- ➔ Progress Tone Basic Code\Don't Care\Dial Tone
\Busy Tone\Dial+Busy Tone
- ➔ Dial Type Tone\Pulse
- ➔ SPK. Control Until DCD on\Always on\Off when dial\Off
- ➔ SPK. VolumeLow\Medium\High

C. PROTOCOL 菜单

- ➔ Protocol Type Normal\Direct\Reliant MNP\Auto
\Reliant LAPM\LAPM Normal
\LAPM MNP\MNP Normal
- ➔ Security check off\By modem\By NMS
- ➔ Discon. Method Immediate\With Clear-down\Modem Reset
- ➔ Connect Code DTE Speed\DCE/EC/DTE Speed
\DCE Speed
- ➔ Compress Off\On

D. TEST 菜单

- ➔ Clear All Has Been Done
- ➔ LAL Off\On
- ➔ DL Off\On
- ➔ RDL Off\On
- ➔ RDL Grant Off\On
- ➔ Error Count 0 ... 65535
- ➔ B.E.R Test Off\511

E. CONFIG MODEM 菜单

- ➔ Modem Speed V34 Adaptive \V34+ 336 \V34+ 312 \V34 288 \V34 264
\V34 240 \V34 216 \V34 192 \V34 168 \V34 144 \V34 120 \V34 96 \V34 72
\V34 48 \V34 24 \V32b Adaptive \V32b 144 \V32b 120 \V32 96Q \V32 96T
\V32b 72 \V32 48 \V26b 24 \V26b 12 \V23 1200 \V22b 2400 \V22 1200
\BELL 212A \BELL 103 \V21 300
- ➔ ORG/ANS Mode Answer Mode\Originate Mode
- ➔ Auto Retrain On\Off
- ➔ Tx Clock Internal\External\Loopback
- ➔ Retrain Threshold High \Medium \Low
- ➔ ASI Overspeed +1%.....-2.5% \ +2.3%.....-2.5%
- ➔ Make/Break US (39%)\UK (33.3%)
- ➔ Force Off Hook Force a off hook activity using "Enter" key
- ➔ OH By DTR On\Off
- ➔ Pump edit □□□ : □□□□

- ➔ LL Tx Level 0 dBm...-31 dBm
- ➔ DL Tx Level 0 dBm...-15 dBm
- ➔ FB\FF Ctrl off\on
- ➔ Remote Access On\Off
- ➔ Dynamic Range -4 ~ -43dBm \ 0 ~ -33dBm

F. CONFIG DTE 菜单

- ➔ DTE Speed 115200 bps \76800 bps \57600 bps \38400bps \32000 bps \28800 bps \26400 bps \24000 bps \21600 bps \19200 bps \16800 bps \14400 bps \12000 bps \9600 bps \7200bps \4800 bps \3600 bps \2400 bps \1800 bps \1200 bps \600 bps \300 bps \33600 bps\31200 bps
- ➔ Flow Control Off\X-On, X-Off\RTS/CTS\CTS only
- ➔ DTR Control 108-2\108-1
- ➔ DTR Off Action Force On\Command Mode \Disconnect\Modem Reset
- ➔ RTS Control Force On\ Normal
- ➔ DSR Control Normal\Force On
- ➔ DCD Control Force On\Normal\V.13 HDX
- ➔ Data Format ASYNC\SYNC
- ➔ Total Bits 8\9\10\11
- ➔ AL by 141 Off\On
- ➔ RDL by 140 Off\On

G. COMMAND 菜单

- ➔ Command Mode AT Command\V.25bis Command \Dumb Mode
- ➔ Auto Baud Off\On
- ➔ Framing ASYNC\HDLC\SDLC \BSC
- ➔ Async Form 7-0-1 \7-E-1\7-N-2\8-N-1
- ➔ Idle Char Idle\Sync

H. LINE SETUP 菜单

- ➔ Line type Dial\2W Leased Line\4W Leased Line
- ➔ Leased to Dial Manual\Auto
- ➔ Backup Tel No Dial Backup\#0nnnn\#1nnnn\...\#9nnnn
- ➔ Backup Speed V34 Adaptive \V34+ 336 \V34+ 312 \V34 288 \V34 264 \V34 240 \V34 216 \V34 192 \V34 168 \V34 144 \V34 120 \V34 96 \V34 72 \V34 48 \V34 24 \V32b Adaptive \V32b 144 \V32b 120 \V32 96Q \V32 96T \V32b 72 \V32 48 \V26b 2400 \V26b 1200 \V23 1200 \V22b 2400 \V22 1200 \BELL 212A \BELL 103 \V21 300
- ➔ Dial to Leased Manual\Auto
- ➔ Dial to Leased Timer Forever\0 ~255 Minutes

I. PROFILE 菜单

- ➔ Load User Profile #0
 \User Profile #1\...\User Profile #9
 \0:AS-DL-AT- AUTO
 \1:AS-DL-AT- NONE
 \2:SY-DL-V25-NONE
 \3:AS-2L-ANS-V34
 \4:AS-2L-ORG-V34
 \5:SY-2L-ANS-V34
 \6:SY-2L-ORG-V34
 \7:SY-4L-ANS-V34
 \8:SY-4L-ORG-V34
 \9:AS-2L-ANS-AUTO
- ➔ Power Up User Profile #0\...\User Profile #9
- ➔ Initial Are You Sure?
- ➔ Front Lock Unlock\Lock
- ➔ Password Edit Input:----
- ➔ Sreg Edit BASE=DECIMAL\BINARY
- ➔ Save User Profiles#0\...\User Profile #9

3.5 菜单树的详细说明

3.5.1 STATUS 状态菜单

ITEM	NAME	COMMAND	DESCRIPTION
	TX LEVEL= -XX dBm	AT%S	Transmitted signal level. This value is equal to the "TX level" of config modem. Normally, for the 2w leased line and the dial line, the recommended value is between -10 and -13dBm. It can be increased of in order to obtain a more satisfactory S/N ratio (siganl to noise ratio) by setting a higher level as possible, but a saturation of the active transmission equipment should be avoided. The Tx level level should be setting under -13dBm while to operating V.34 mode. 发送信号电平, 与 CONFIG MODEM 中的"TX LEVEL"相同. 通常二线式专线及拨接线路应为 -10 到 -13 dBm之间, 可以通过提高发送电平获得更好的信噪比, 但应避免传输设备的饱和。在 V.34 模式下, 发送电平应低于-13dBm。
	RX LEVEL= -XX dBm	AT%S	Received signal level. This value is the result of the line attenuation from the transmitted signal. Normally, the RX level of 2w leased line and the dial line is between -15 and -33dBm. 接收信号电平, 是对方发送信号经过线路衰减的结果。通常二线专线及拨号线的接收电平在-15和-33dBm之间。

S/N. RATIO=XX dB	AT%S	Signal to noise ratio. The bigger the S/N ratio, the better quality of a line is. A higher operating speed needs a higher S/N ratio. Normally, the S/N requirement of running 14400 bps should be more than 24 dB while to operate at 9600 bps, a S/N better than 20 dB is required. 信号噪声比。信噪比越大表示线路质量越好。越高的速率要求越高的信噪比。通常 14400 bps 要求信噪比应大於 24 dB , 9600 bps 应大於 20dB
EQM VALUE=XXX	AT%S	Eye pattern quality monitoring. 该值表示接收信号的质量。
F-SHIFT=X. X Hz	AT%S	Frequency-shift (offset). It is the shift of the carrier central frequency caused by the transmission link. This shift normally should be less than + / - 7 Hz. The smaller is better. 频率偏移(offset), 代表由线路造成的载波中心频率的偏移量, 通常应小於正负 7 Hz , 愈小愈好
F F-SHIFT=X. X Hz	AT%S	Far end frequency-shift (offset). The frequency shift of the far end received carrier signal. It normally should be less than +/- 7 Hz. The smaller is better. The value will not accurate once level is too small from the remote site. 远端频率偏移(offset), 代表远端接收载波频率的偏移量, 通常应小於正负 7 Hz , 愈小愈好。当从远端来的电平太小时, 该值将不准确。

DELAY=XXXX ms	AT%S	Round trip delay time. This delay is caused by a round trip of a long distance line , especially in a satellite circuit. Usually, round trip of a satellite link shall create a time delay of 0.5 second (500ms). The modem will accept a maximum time delay of 1.2 seconds. 全程延迟时间, 代表经长途线路所造成的延迟, 尤其是卫星电路, 通常每一来回会造成约 0.5秒(500 ms) 之延迟, 本机可有效处理长达 1.2秒 的延迟.
P JITTER=-X Deg	AT%S	Monitoring the phase jitter of the phone line. 监测外线的相位抖动
F ECHO=-XX.X dB	AT%S	Far end echo. This echo is caused when the far end line impedance is not matched. A smallest far end echo level is always required. Normally, the far end echo level is between -20 dB and -55 dB 远端回音, 代表因远端线路阻抗不匹配造成的反射, 越小越好, 通常应於 -20dB 到 -55dB 之间.
DTE=XXXXX ASY 10	AT%S	Indication of speed and data format of DTE. For examples: DTE = 19200 ASY 10 stands for 19200 bps Asynchronous 10 bits in total bit length. DTE=14400 SYN means 14400 bps synchronous. 显示数据终端设备的速率与数据格式, 如: DTE = 19200 ASY 10 代表 19200 bps 异步总数据位 10 位; DTE = 14400 SYN 代表 14400 bps 同步

RETRAINS=XXXX	AT%S	Total retrain count. From the total retrain count, you will find the total times of line interference occurred. This value will not be cleared automatically unless pressing the "ENTER" key or power off. 重调适(Retrain)的计数, 可看出曾经发生线路干扰的次数, 本值可按"ENTER"键归零, 否则除非关闭电源, 将不自动归零
RX BAUD=XXXX	AT%S	Indication of the signalling rate of received signal. For examples: RX Baud=3429 means the switching speed or number of transitions is 3429, however, one baud can be made to represent more than one bit per second. (This value is only available when operating on V. 34). 表示接收信号的调变率 (signalling rate)。如: Rx Baud=3429 表示每秒调变 3429 次, 每调变一次可表示一或数个bits (此值只在 V.34 模式时显示).
TX BAUD=XXXX	AT%S	Indication of the signalling rate of transmitted signal. (This value is only available when operating on V. 34). 表示发送信号的调变率。(此值只在 V.34 模式时显示)
RX FREQ=XXXXHz	AT%S	Indication of the carrier frequency of received signal. For examples: RX Freq = 1959Hz means the unique frequency used to to "carry" data is 1959 Hz. (This value is only available when operating on V. 34). 接收信号的中心载波频率。如: RX Freq = 1959Hz 表示用来承载数据的唯一频率是 1959Hz (此值只在 V.34 功能显示)
TX FREQ=XXXXHz	AT%S	Indication of the carrier frequency of transmitted signal. (This value is only available when operating on V. 34). 发送信号的中心载波频率。(此值只在 V.34 功能显示)

TX POWEROFF=XdB	AT%S	Indication of a reduction of transmit power level. For examples: TX PowerOff = 6dB means the transmit power level is requested to reduce 6 dB by the remote modem. (This value is only available when operating on V.34). 发送信号功率降低的程度, 例如: TX poweroff= 6dB 代表远端modem要求本端发送电平降低 6dB 才能达到最佳接收状况.(此值只在 V.34 时有效)
TX SPEED=XXXXbps	AT%S	Indication of the DCE speed of transmission. 表示发送的DCE速率
RX SPEED=XXXXbps	AT%S	Indication of the DCE speed of receiving. 表示接收的DCE速率
MANU RETRAIN	AT02	Force modem to issue a retrain action. 强制mdoem做重调适 (retrain) 动作
TR, MR, RS, CS, CD, T	AT%S	Indication of the RS-232 interface lead status. 显示RS-232界面信号

3.5.2 DIAL 拨号菜单

ITEM	NAME	COMMAND	DESCRIPTION
DIAL A NUMBER		ATDSn	Dial out a preset telephone number #n(n=0..9). This function can interact with the auto redial function or dial line auto establishment function. 拨出一组预先设定的电话号码#n(n=0..9), 此功能可和自动重拨功能或拨号线自动重建功能连用
➔/#0.....#9			
EDIT A NUMBER		AT&Zn=xx	Edit telephone number #n (n=0..9) for 30 digits each group. 编辑电话号码#n (n=0..9), 每组号码最长30位。
➔/#0.....#9			
RING TIMES		ATS0=n	Auto answer activates when detected ring count = n (default=1). *If 108.1 (DTR ON Auto Dial/Ans) is used for auto answer, it must be set to OFF and the answer shall be activated by DTR provided by DTE (default value=1 times). 自动应答前侦测响铃次数(出厂值=1) *如使用 108.1(DTR ON Auto Dial/Ans)功能作自动应答时, 此设定必需为 Off, 而由 DTE 送出的 DTR来启动应答
➔AUTO ANS OFF		ATS0=0	/Turn off the auto answer function. /关闭自动应答功能
➔1..255 TIMES			/An auto answer will be given when bell rings 1..255 times. /振铃1..255次后自动应答
PROGRESS TONE		ATXn	Enable detecting of busy tone or dial tone to proceed dialing and showing the connection. 选择是否侦测忙音或拨号音再拨号及显示连线
➔BASIC CODE		ATX0	/Don't care any tone and do not show line connection speed. /不侦测任何音且不显示连线速度

➔DON' T CARE	ATX1	/Don't care any tone and show the line connection speed. /不侦测任何音但显示连线速度
➔DIAL TONE	ATX2	/Don't care any tone and show the line connection speed. /不侦测忙音但显示连线速度
➔BUSY TONE	ATX3	/Don't care dial tone and show the line connection speed. /不侦测拨号音但显示连线速度
➔DIAL + BUSY TONE	ATX4	/Do care dial tone, busy tone and show the extended result code (default). /侦测拨号音,忙音及显示扩充状态码(出厂值)

DIAL TYPE

➔TONE	ATT	/Tone (DTMF) dialing mode/使用双音频拨号 (出厂值)
➔PULSE	ATP	/Pulse dialing mode/使用脉冲拨号
SPK. CONTROL	ATMn	Monitoring speaker switch control. 监听喇叭开关控制
➔OFF	ATM0	/Keep speaker always off. /永远关闭
➔UNTIL DCD ON	ATM1	/Speaker turn on until DCD ON, then turn off (default). /开启喇叭, 侦测到载波后才关闭 (出厂值)
➔ALWAYS ON	ATM2	/Keep speaker always on. /永远开启
➔OFF WHEN DIAL	ATM3	/Turn on speaker after dialing is completed, and then detect until to find out carrier and then turn off speaker. /拨号完毕开启喇叭, 侦测到载波再关闭喇叭
SPK. VOLUME	ATLn	Speaker vloume control. 设定喇叭音量控制

➔LOW	ATL0	/Set speaker volume to low. 设定喇叭音量为小声
➔MEDIUM	ATL1	/Set to medium (default). 设定喇叭音量为中声(出厂值)
➔HIGH	ATL2	/Set to high.. 设定喇叭音量为大声

3.5.3 PROTOCOL 协议菜单

ITEM	NAME	COMMAND	DESCRIPTION
	PROTOCOL TYPE	AT\Nn	Select error correction and data com-pression function for async mode only. *This setting is ineffective in sync mode. It will automatically become direct mode regardless of setting made once the link established. 选择异步模式下错误更正及数据压缩功能。该设定在同步模式下无效，连线后，无论如何设置都自动转成direct模式。
➔	NORMAL	AT\N0	/with DTE speed conversion only. Note that the flow control function must be active. /具 DTE 速度转换，需使用数据流量控制
➔	DIRECT	AT\N1	/disable error correction, data com-pression, and DTE speed conversion. (modem speed=DTE speed) /不使用纠错、数据压缩和DTE 速率转换 (modem speed=DTE speed)
➔	RELIANT MNP	AT\N2	/Link con be established only when MNP function is enabled on the remote modem. 只有在远端也支持MNP功能时才能连线
➔	AUTO	AT\N3	/Automatically negotiate V42/MNP level with the remote modem. The negotiation sequence is V42bis-V42-MNP5-MNP4-NORMAL. 与远端modem 自动协商V42/MNP等级，协商顺序是：V42bis-V42-MNP5-MNP4-NORMAL
➔	RELIANT LAPM	AT\N4	/Link can be established only when V42 function is enabled on the remote modem. 只有在远端也支持V42功能时才能连线
➔	LAPM, NORMAL	AT\N5	/Negotiate V42 level with the remote modem. The sequence is V42bis-V42-NOMAL. 与远端mdoem协商V42等级，顺序是V42bis-V42-NOMAL

➔LAPM, NMP	AT\N6	/Automatically negotiate V42/MNP level with the remote modem. The negotiation sequence is V42bis-V42-MNP5-MNP4. 与远端modem自动协商V42/MNP等级，协商顺序是：V42bis-V42-MNP5-MNP4
➔MNP NORMAL	AT\N7	/Negotiate MNP level with the remote modem. The sequence is MNP5-MNP4-NORMAL. 与远端modem协商MNP等级，顺序是MNP5-MNP4-NORMAL
CONNECT CODE	ATWn	Select the extended CONNECT result code. 选择扩展CONNECT回应码
➔DTE SPEED	ATW0	/with DTE speed回应DTE速率
➔DTE/EC/DCE	ATW1	/with CARRIER, PROTOCOL, and DTE speed回应载波，协议，DTE速率
➔DCE SPEED	ATW2	/with DCE speed回应DCE速率
DISCON. METHOD	ATS28=n (bit3, 2)	Disconnect method for V34/V32bis/V32 V34/V32bis/V32模式下的断线方式
➔Immediate		/Disconnect immediatelly/立即断线
➔With Clear-down		/Send clear-down sequence before disconnection/先送clear-down序列再断线
➔Modem Reset		/Reset modem after disconnection断线后重置modem
SECURITY CHECK	ATS31=n (bit3, 2)	Control of the security check function. 控制安全检查功能
➔NONE		/disable security check by modem禁止安全检查
➔BY MODEM		/enable security check by modem使用modem做安全检查
➔BY NMS		/enable security check by NMS使用NMS做安全检查

COMPRESS	AT%Cn	Control of the data compression function控制数据压缩功能
➔Off	AT%C0	/disable data compression function (use V42 or MNP4 error correction only)禁止数据压缩功能（只使用V42或MNP4纠错）
➔On	AT%C1	/enable data compression function (use V42bis or MNP5 data compression in addition to V42 or MNP4 error correction)可以使用数据压缩功能（用V42或MNP4纠错，V42bis或MNP5压缩）

3. 5. 4 TEST 测试菜单

ITEM	NAME	COMMAND	DESCRIPTION
	CLEAR ALL	AT&T0	Clear all the tests in one time, and a statement "Has been done" shall be shown. 一次清除所有测试, 执行完毕会显示" Has been done "
	LAL	AT&T1	Local analog loop test (ON/OFF). This test is normally used to certify if the modem is in normal operation condition. Also, this test is usually carried out together with B.E.R test. 本地模拟环路测试(ON/OFF). 通常用来测试mdoem本身收发是否正常, 本测试常与 B.E.R.Test 连用
	→ON		
	→OFF		
	RDL	AT&T6	For remote digital loop test (ON/OFF). This test can control remote modem to executive digital loop for BER test to find out if the modem and line of both ends are in normal condition. 远端数字环路测试(ON/OFF). 本测试能遥控远端modem做数字环路, 可测试双方modem和线路是否都正常.
	→ON		
	→OFF		
	DL	AT&T3	For digital loop test (ON/OFF). This test enable the received digital data demodulated and send back to match with the far end test. 数字环路测试(ON/OFF). 本测试将所收到的数字信号再调制转送回去, 可配合远方作测试.
	→ON		
	→OFF		
	RDL GRANT	AT&Tn	Set for accepting remote digital loop(RDL) test. 是否接受远端数字环路测试(RDL)
	→ON	AT&T4	/Enable. (default). 接受 (出厂值)
	→OFF	AT&T5	/Disable. 不接受
	ERROR COUNT		Bit error count display function. 误码计数显示

➔0....65535		/Press Left or Right shift key to insert error. Press "ENTER" key to clear. 按左右键插入一些误码。按"ENTER"键计数清零。
B. E. R. TEST	AT&T10	Set bit error rate test function. 设置误码率测试功能
➔OFF		/Disable (default). 不使用误码率测试功能
➔511		/use the 511 test pattern使用511测试码

3. 5. 5 CONFIG MODEM 设置modem菜单

ITEM	NAME	COMMAND	DESCRIPTION
SPEED		AT%Bn	Set modem speed 选择modem速率
➔V34 ADAPT		AT%B0	/Set modem speed to be V.34 adaptive (multi-standard hand-shaking) mode, connectable speed from V.34 / V.32b / V.32 / V.22bis / V.22 /V.21.modem 速率设为V.34自适应（多标准握手multi-standard hand-shaking）模式
➔V34+ 336		AT%B42	/modem速率设为V34+ 33600 bps...4DTCM (SM)
➔V34+ 312	312	AT%B41	/ modem速率设为V34+ 31200 bps...4DTCM (SM)
➔V34 288		AT%B28	/Modem速率设为V34 28800bps....4DTCM (SM)
➔V34 264		AT%B37	/Modem速率设为V34 26400bps....4DTCM (SM)
➔V34 240		AT%B27	/Modem速率设为V34 24000bps....4DTCM (SM)
➔V34 216		AT%B36	/Modem速率设为V34 21600bps....4DTCM (SM)
➔V34 192		AT%B26	/Modem速率设为V34 19200bps....4DTCM (SM)
➔V34 168		AT%B35	/Modem速率设为V34 16800bps....4DTCM (SM)
➔V34 144		AT%B34	/Modem速率设为V34 14400bps....4DTCM (SM)
➔V34 120		AT%B38	/Modem速率设为V34 12000bps....4DTCM (SM)
➔V34 96		AT%B33	/Modem速率设为V34 9600bps....4DTCM (SM)
➔V34 72		AT%B32	/Modem速率设为V34 7200bps....4DTCM (SM)

➔V34 48		AT%B31	/Modem速率设为V34 4800bps....4DTCM (SM)
➔V34 24		AT%B40	/Modem速率设为V34 2400bps....4DTCM (SM)
➔V32b	ADAPT	AT%B47	/V.32b adaptive (multi-standard hand-shaking) mode, connectable speed from V.32b / V.32 / V.22bis / V.22 /V.21. /modem速率设为V.32b自适应(多标准握手multi-standard hand-shaking)模式,可连线速率包括V.32b / V.32 / V.22bis / V.22 /V.21
➔V32b	144	AT%B20	/Modem速率设为V.32bis 14400 bps TCM.
➔V32b	120	AT%B19	/Modem速率设为V.32bis 12000 bps TCM.
➔V32 96Q		AT%B18	/Modem速率设为V.32 9600 bps QAM.
➔V32 96T		AT%B17	/Modem速率设为V.32 9600 bps TCM.
➔V32b	72T	AT%B16	/Modem速率设为V.32 7200 bps TCM.
➔V32 48		AT%B15	/Modem速率设为V.32 4800 bps QAM.
➔V26b	2400	AT%B9	/Modem速率设为V.26bis 2400 DPSK
➔V26b	1200	AT%B8	/Modem速率设为V.26bis 1200 DPSK
➔V23 1200		AT%B7	/Modem速率设为V.23 1200 bps FSK.
➔V22b	2400	AT%B5	/Modem速率设为V.22bis 2400 bps QAM.
➔V22 200		AT%B3	/Modem速率设为V.22 1200 bps DPSK.
➔V21 300		AT%B1	/Modem速率设为V.21 300 bps FSK.
➔BELL	212A	AT%B4	/Modem速率设为BELL 212A 1200 bps DPSK.
➔BELL	103	AT%B2	/Modem速率设为BELL 103 300 bps FSK.
ORG/ANS MODE		ATS14=n	Set modem as the originate or answer mode. 设定modem为呼叫端(Originate)或应答端(Answer)

	(bit7)	
➔ORIGINATE MODE		/For V. 34/ V. 32/ V. 32bis/ V. 22bis/ V. 22/ V. 21/ V. 23 / BELL-212A /
➔ANSWER MODE		BELL103 in 2-wire FDX operation. It must be set in different mode on each side. / 在V. 34/ V. 32/ V. 32bis/ V. 22bis/ V. 22/ V. 21/ V. 23 / BELL-212A / BELL103协议2线全双工方式下, 两端必须设为不同模式。
AUTO RETRAIN	AT%En	The automatic adaptive equalizer can be re-adjusted via retrain procedure activated automatically when the S/N become worse than the preset threshold. 自适应均衡器再调适功能, 当 S/N比低于预设的临界值时将自动启动再调适程序
➔ON	AT%E1	/Retrain occurs automaticly according to SQ/EQM value. (default) 根据SQ/EQM值自动发生再调适
➔OFF	AT%E0	/Auto retrain disable. 关闭自动再调适
TX CLOCK	AT&Xn	Select transmit clock source. 选择发送时钟源。
➔INTERNAL	AT&X0	/Internal clock source, for most point to point application (default). / 使用内部时钟源, 用于大部份点对点的应用(出厂值)
➔EXTERNAL	AT&X1	/External clock source, for cascade and TDM/STDM network application. 使用外部时钟源, 常用于级联或TDM/STDM的应用
➔LOOPBACK	AT&X2	/Received clock source, for used in slave side of polling networks or the modem in the most far end of a cascading network. 使用接收时钟源, 通常用于 Polling 网路的 从端或级联网路的最远端。
LL TX LEVEL	ATS30=n	Set leased line transmit level. 设定专线发送电平

➔0..-31 dBm		/-13dBm (出厂值)
DL TX LEVEL	ATS56=n	Set dial line transmit Level.
➔0..-15 dBm		/-13dBm (出厂值)
ASI OVERSPEED	AT%An	Select async data speed tolerance. (ITU-T V.14) 选择异步数据速率容许误差 (ITU-T V.14)
➔+1%	AT%A0	/Basic range. 基本范围 +1% to -2.5% (出厂值)
➔+2.3%	AT%A1	/Extended overspeed range +2.3% to -2.5%. 扩展范围+2.3% to -2.5%
MAKE/BREAK	AT&Pn	Pulse dial make / break ratio selection. 拨号脉冲接续比选择
➔UK (33.3%)	AT&P1	/33.3\66.7% (出厂值).
➔US (39%)	AT&P0	/39\61%.
FORCE OFF HOOK	ATH1	Force modem off-hooking the line to busy out the in coming calls. 强制 modem 摘机以占线禁止呼叫进来
OH BY DTR	ATS19=n (bit 6)	Make the modem to off-hook the line when DTR being off for a period of time 当DTR置off一段时间后, 令modem摘机
➔On		/enable the OH By DTR function 使用该功能
➔Off		/disable the OH By DTR function (default) 不使用该功能 (出厂值)
RERTRAIN THRESHOLD	ATS57=n (bit 1,0)	Select the scaleable retrain threshold for determining the data rate of the connection. 选择再调适门限值以决定连接的数据速率
➔High		/Issue a retrain or rate change in normal line condition 在普通线路上进行再调适或改变速率

➔Medium		/Issue a retrain or rate change in poor line condition在条件较差的线路上进行再调适或改变速率
➔Low		/Issue a retrain or rate change in worse line condition在条件很差的线路上进行再调适或改变速率
PUMP EDIT		product designer use only.
FB\FF CTRL	AT%Gn	Auto speed fallback and fall forward 自动升降速
➔ON	AT%G1	/Enable (Dial Line Default)打开（拨号线出厂值）
➔OFF	AT%G0	/Disable (Leased Line Default)关闭（专线出厂值）
REMOTE ACCESS	ATS27=n (bit 3)	enable the modem to monitor and control the remote modem through the secondary channel允许mdoem通过次信道监视控制远端modem
➔On		/enable remote access function允许远端访问功能
➔Off		/disable remote access function (default)禁止远端访问功能（出厂值）
DYNAMIC RANGE	ATS28=n (bit 0)	Select the dynamic range of receiving signal.选择接受信号的动态范围
➔-4..-43 dBm		/-4 to -43 dBm（出厂值）
➔0..-33dBm		/0 to -33 dBm

3. 5. 6 CONFIG DTE 设置DTE菜单

ITEM	NAME	COMMAND	DESCRIPTION
	DTE SPEED	AT	This setting is used to determine DTE speed when auto speed conversion is ON in V.42 / MNP / normal mode. 于 V42/MNP/NORMAL 模式, 且设定 Auto Speed Conversion ON 时, 此设定用来指定DTE Speed
→	300bps		*When using direct mode and all the synchronous modes, this setting will not available and DTE speed will be determined by modem speed, DTE speed = modem speed. 在 Direct Mode 及所有同步模式时此设定无作用, 而由modem的连线速度决定, 即DTE速率=modem速率 *The throughput is improved by using data compression, enhance this set higher than the modem speed is suggested to enable more effective operation. 由于数据压缩后吞吐量(Throughput)增加, 建议将此设定设为高于modem速率, 才可发挥功效 *When use "AT" command and auto baud rate detect function "ON", this setting will be replaced by identified speed. 在使用"AT"指令, 且自动辨速功能ON 时,此设定将被所识别的速度取代 *The Auto baud rate function can detect all the listed DTE speed. 自动辨速功能可识别所有列出的DTE 速率 /出厂值 = 57600 bps.
→	600bps		
→	1200bps		
→	1800bps		
→	2400bps		
→	3600bps		
→	4800bps		
→	7200bps		
→	9600bps		
→	12000bps		
→	14400bps		
→	16800bps		
→	19200bps		
→	21600bps		
→	24000bps		
→	26400bps		
→	28800bps		
→	32000bps		
→	31200bps		
→	33600bps		
→	38400bps		
→	57600bps		
→	76800bps		
→	115200bps		
→			

FLOW CONTROL	AT\Qn	Used to set flow control between terminal and modem when using V.42/MNP and normal mode (asynchronous mode only). 在V42/MNP及命令模式时, 设定终端和modem间的流量控制的方法, (仅用于异步)
→OFF	AT\Q0	/No flow control不作流量控制
→X-ON, X-OFF	AT\Q1	/Software control, used in text data. 软件流量控制, 可用于数据是文本时
→CTS ONLY	AT\Q2	/Hardware control identical to RTS/CTS control, but modem send the data in spite of RTS from DTE, unilateral control. 硬件流量控制, 类似于RTS/CTS方式, 但modem发送数据时不考虑DTE的RTS信号, 单向控制
→RTS/CTS	AT\Q3	/Hardware control, bilateral, accept any type of data (default). 硬件流量控制, 作用于双向的, 可接受任何类型的数据 (出厂值)
DTR CTRL	AT%Dn	Modem action select for DTR from OFF to ON. 当DTR从OFF到ON时, modem动作方式选择
→108-2	AT%D0	/Same as V.25 108.2 DTR operation (default). 同V.25 108.2 DTR operation (出厂值)
→108-1	AT%D1	/Same as V.25/V.25bis 108.1 DTR operation. When DTR is from OFF to ON, the modems will dial the designed preset telephone number or answer according to the current ring count. 同V.25/V.25bis 108.1 DTR的动作。当DTR从Off到On时, modem会自动拨预设电话号或依照当前振铃计数做应答

DTR OFF ACTION	AT&Dn	On originate and answer site respectively modem action select for DTR from ON to OFF. 主叫或应答端在DTR从ON到OFF时, modem动作方式选择
→FORCE ON	AT&D0	/Force DTR in ON position A power-on auto dial operation can be achieved when operating with DTR ON auto dial (default). 强制DTR一直为ON, 若同时打开DTR ON自动拨号功能, 可以实现开机自动拨号。
→COMMAND MODE	AT&D1	/Return to the command mode. 回到命令模式
→DISCONNECT	AT&D2	/Disconnect. Normally used with 108.1. 断线. 常与 108.1 联用
→MODEM RESET	AT&D3	/Force Modem reset. 重置modem
DSR CONTROL	AT&Sn	DSR signal control selection.
→NORMAL	AT&S1	/DSR ON after Modem handshaking.
→FORCED ON	AT&S0	/Force DSR in ON position.
DCD CONTROL	AT&Cn	DCD signal control selection.
→FORCE ON	AT&C0	/Forece DCD in ON position.
→NORMAL	AT&C1	/DCD ON means line is in connection while DCD OFF means line is OFF (default).
→V.13 HDX	AT&C2	/ITU-T V.13 standard simulated carrier in half-duplex mode.
RTS CONTROL	AT&Rn	RTS signal control selection.
→NORMAL	AT&R0	/Controlled by RTS.
→FORCED ON	AT&R1	/Keep RTS in ON position.
DATA FORMAT	AT&Mn	Data format selection in data mode.

➔ASYNC	AT&M0	/Async.
➔SYNC	AT&M1	/Sync.
TOTAL BITS	ATS19=n (bit5, 4)	Total bit length for async data format
➔8		/Total bit length includes start, stop, parity and data bits. (default = 10)
➔9		
➔10		
➔11		
AL BY 141	ATS23=n (bit2)	DTE control AL through EIA RS-232 pin18
➔ON		/Enable
➔OFF		/Disable (default)
RDL BY 140	ATS23=n (bit1)	DTE control RDL through EIA RS-232 pin21
➔ON		/Enable
➔OFF		/Disable (default)

3. 5. 7 COMMAND MENU

ITEM	NAME	COMMAND	DESCRIPTION
COMMAND MODE		ATS19=n (bit1,0)	Intelligent function command set selection.
→AT	COMMAND		/Hayes compatible "AT" command set with async format.
→V.25bis	COMMAND		/ITU-T V.25bis command set with async, Bisync and HDLC\SDLC formats.
→DUMB	MODE		/Dumb mode, don't accept any command. This mode is set for all leased line and most of the sync dial line to prevent modem from interference made by the data of the terminal, and protect the terminal against any malfunction caused by the return result code from the modem.
AUTO BAUD		AT%Un	Auto baud rate detection function control for AT command mode.
→ON		AT%U1	/Enable (default).
→OFF		AT%U0	/Disable.
FRAMING		ATS19=n (bit1..0)	V.25bis command data format.
→ASYNC			/Async (default).
→HDLC/SDLC			/HDLC(SDLC).
→BSC			/Bisync/monosync.
ASYNC FORM		ATS19=n (bit5,4)	Select the Async data parity
→7-0-1			/7 Data Bits, odd parity 1 stop bit
→7-E-1			/7 Data Bits, even parity 1 stop bit
→7-N-2			/7 Data Bits, none parity 2 stop bits

➔8-N-1		/8 Data Bits, none parity 1 stop bit (default)
IDLE CHAR.	ATS19=n (bit3)	Select the char to be transmitted for the BSC & HDLC framing
➔ Idle		/No character to be Tx when idle.
➔ SYNC		/SYNC char be Tx when idle.

3.5.8 LINE SET UP MENU

ITEM	NAME	COMMAND	DESCRIPTION
	LINE TYPE	AT&Ln	Select line type and also set dial back-up function.
➔	Dial	AT&L0	/Dial line.
➔	2W Leased Line	AT&L1	/2 wire leased line.
➔	4W Leased Line	AT&L2	/4 wire leased line.
	LEASED TO DIAL	ATS 31=n (bit0)	Auto dial back-up control while leased line is out of service.
➔	Manual		/Manual control dial back-up (default).
➔	Auto		/Auto dial back-up.
	BACKUP TEL.		Select backup telephone number #n (n=0~9)
➔	No dial backup		/Disable backup function (default)
➔	#0 nnnn...to #9 nnnn		/Enable backup function and make a choice of the phone number group.
	BACKUP SPEED	ATS55=n	Select modem speed used in the auto dial backup mode.
➔	V34 Adapt...V21 300		/(default = V.34 288).
	DIAL TO LEASED	ATS31=n (bit 1)	Select whether return to leased line automatically or not during dial back-up mode.
➔	Manual		/Manual control (default).
➔	Auto		/Return to the leased line automatically when leased line is recovered.

D TO L TIMER	ATS36=n	When operate in dial back-up mode, to select how long it will take to detect if the leased line is recovered or not.
➔Forever		/No dial to leased
➔1...255 mins.		/(default=60 mins)

3. 5. 9 PROFILE MENU

ITEM	NAME	COMMAND	DESCRIPTION
LOAD		ATZn (n=0~9)	This machine provides 20 groups of load configuration profile. Among them 10 groups configuration profile which cover the most required applications for normal use. The other 10 groups are set by the user which can be revised by the user before filing for use.
➔USER Profile #0~#9			/User defined load profile #0..#9. Through this operation, required settings can be made for the next operation when the modem is power on.
FACTORY PROFILES		AT&Fn&W	Load factory profile #0..#9.
➔0 AS-DL-AT-AUTO		AT&F0&W	/Async, dial line, AT command, Auto reliable mode, V34 Adapt, this mode is most applicable to BBS networks.
➔1 AS-DL-AT-NONE		AT&F1&W	/Async, dial line, AT command, direct mode and V34 Adapt, this is a typical operating mode for Hayes compatible modem.
➔2 SY-DL-V25-NONE		AT&F2&W	/Sync, dial line, V.25bis command, V34 Adapt, this mode is applicable to IBM AS-400 series sync dial networks.
➔3 AS-2L-ANS-V34		AT&F3&W	/Async, 2W leased line, answer, applicable to the most of the async, non-compressed 2 wire leased line.
➔4 AS-2L-ORG-V34		AT&F4&W	/Async, 2W leased line, originate, applicable to the most of the Async, non-compressed 2 wire leased line.

➔5 SY-2L-ANS-V34	AT&F5&W	/Sync, 2W leased, answer, applicable to the most of the Sync, 2 wire leased line.
➔6 SY-2L-ORG-V34	AT&F6&W	/Sync, 2W leased line, originate, applicable to the most of the Syne, 2 wire leased line.
➔7 SY-4L-ANS-V34	AT&F7&W	/Sync, 4W leased, answer, applicable to the most of the Sync, 4 wire leased line.
➔8 SY-4L-ORG-V34	AT&F8&W	/Sync, 4W leased line, originate, applicable to the most of the Syne, 4 wire leased line.
➔9 AS-2L-ANS-AUTO	AT&F9&W	/Async, 2W leased line, answer, applicable to the most of the async, compressed, 2 wire leased line.
SAVE	AT&Wn (n= 0~9)	Store the revised configuration in the user-defined configuration profile.
➔USER Profile #0~#9		/Store in the nth group in the user's configuration profile. Usually, the 0th group is provided for the working area, setting store in this area or load the factory default will change the set parameters for next power-on operation. If you want the nth group is to be used for the next power-on working profile, operate the load user profile #n.
FRONT LOCK	ATS29=n (bit4)	Front panel lock control.
➔UNLOCK		/No limitation for any front panel operation (default).

➔LOCK		/Allow view the status and current setting of the modem, but can not make any changes of setting.
PASSWORD EDIT		For changing password, use left key-L, right key-R, enter key-E, exit key-X, Home key-V.
➔Input: _ _ _ _		/The password by the factory are "REEE" (right moving key, ENTER, ENTER, ENTER).
POWER UP	AT&Yn	select the user profile to be used on power up.
➔USER Profile #0~#9		
INITIAL	AT&F10	Re-initialize the user profiles to the Factory profile#0, and flush the stored telephone numbers.
➔Are you sure???		/confirm the initializing action. Press enter key to confirm or any other key to quit.
SERG EDIT	AT&Sn=m	Edit the contain of the selected sreg.
➔Base = DEC		/Edit the value of the S-register in decimal form.
➔Base= Bin		/Edit the value of the S-register in binary form. After selecting the form, press Enter to starting editing S-register shown in the following format.
➔➔xx : ΔΔΔ□□□□□□□□		xx: Use left key, right key and enter key to select the S-register to be edited.

ΔΔΔ: Use left key, right key and enter key to edit the value of the selected S-register in decimal form.

□□□□□□□□: Use left, right, and enter key to edit the value of the selected S-register in binary form.

To discard editing, press exit key.

内容

- 4.1 前言 (Preview)
- 4.2 拨号线和专线 (Dieal Line VS. Leased Line)
- 4.3 二线和四线专线 (2W/4W Leased Line)
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- 4.5 同步和异步 (Synchronous VS. Asynchronous)
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- 4.15 面板锁定及密码保护 (Front Panel Lock And) Password Protect
- 4.16 半双工模拟载波 (ITU-T V.13 Simnlated Carrier In Half Duplex Mode)
- 4.17 G3 FAX收发功能 (G3 Fax Send/Receive)

第四章：一般功能应用指南

4.1 前言 (Preview)

本章对几种较常见的使用方法做一介绍，让使用者能够很快的使用台联系列 modem，并可做初步的设定工作。对大部份应用而言，本章所介绍的用法应足够了。

4.2 拨号线和专线

电话网络可分为两种型式：拨号线路及租用专线，分述如下：

A. 租用专线 - 提供使用者一条专属的通讯线路，电路的每个端点都固定不变，提供不间断的服务和绝对的保密性，不会受到其它电路的干扰，所以线路品质较好，并且稳定不变。

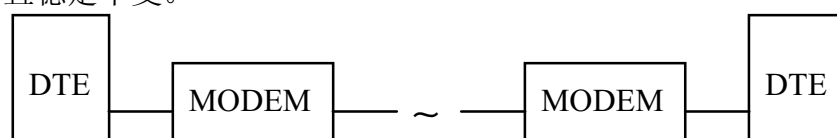


图. 4-1: 专线

B. 拨号线路 - 必需经过拨号程序才能接通者，如电话、传真线路皆为拨号线路。对需要与不定对象交换信息者比较方便。例如：电子布告栏(BBS)，公用服务网络和各种应答端付费的电话但由于需先执行拨号程序(约45到60秒)，甚至拨不通，效率较差。每次拨通的路由不定，线路品质较差而且不稳定，保密性也较差。

菜单有关2/4线专线与拨号线的设定，位于"LINE SETUP" 菜单 中的"Line Type"。

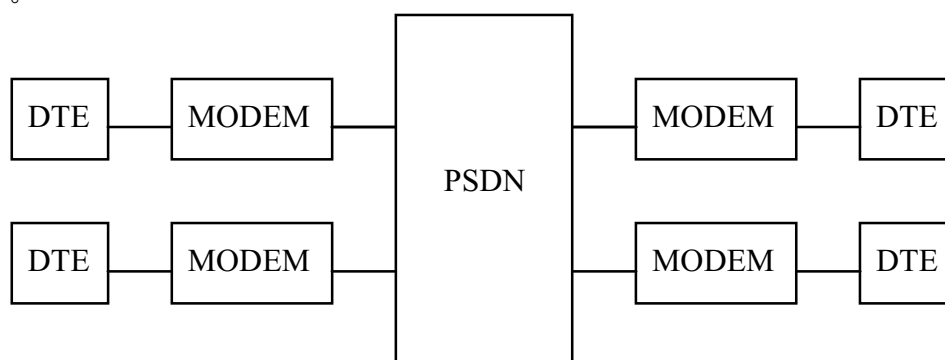


图 4-2: 拨号线

4.3 2W/4W 专线

前面一节提到modem操作。其中专线分为二线专线和四线专线。

二线式只使用两条线，同时作双向送收工作(Full Duplex)，正因送收必需用同一对线，如何避免互相干扰的技术较为困难，在 V.21、V.22、V.22Bis的模式时，是利用送收使用不同的频带来分开成两个通路，而 V.32、V.32bis、V.34模式的送与收使用完全一样的频带，必需使用回音消除技术(Echo Cancel)，将本身所送出的信号与线路反射回来的回音，有效的抵消，免造成干扰。

四线式利用两条线供单方向的传输，另外两条作反方向的传输，而达成全双工的功能。因为送和收分开处理，所以较为不容易产生干扰。

四线式专线的品质明显优于二线式，但T-336Cx优异的性能使得即使在二线式专线，甚至拨号线上，都能有极佳的表现。

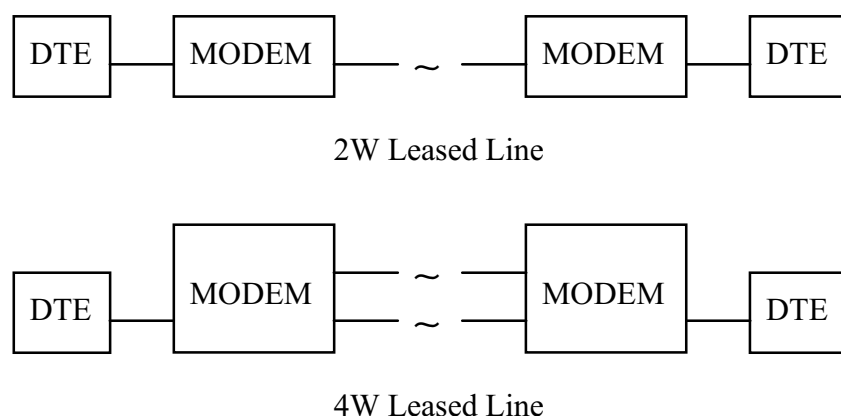


图. 4-3: 2W/4W 专线

4.4 应答端及呼叫端

使用拨号式通讯时，会先有一方拨出电话号码，交换机确认该号码后，便将所指定的通讯端接通，发出振铃给应答端。应答端经由人工或自动方式接答，并发出应答音与呼叫端完成连线程序。通常，我们称拨出电话的一方为主叫端(Originate)，另一端便为应答端(Answer)。在modem工作时，依据ORG/ANS端不同，其连线程序(Training Sequence)，甚至其工作频带都可能不相同，即使在专线使用时也不一样。

在二线式全双工模式(Protocol)下，如V.21，V.22，V.22bis，V.23，V.32，V.32bis，V.34及BELL 103，BELL 212A等通讯的两端，如一端为Originate，则另一端必需为Answer，才可连线成功。

有关应答端及呼叫端的设定，位于 "CONFIG MODEM" 菜单 中的 "ORG/ANS MODE"，注意如使用"AT" command或前面板自动拨号，或自动应答时，MODEM会自动决定为"ORG"或"ANS"。

4.5 同步和异步

MODEM连线成功后，终端的数据格式(Data Format)必须相符，才可正确的交换数据。

数据传输格式分为同步式(Synchronous)和异步式(Asynchronous)，一般个人电脑或终端为异步式。主机(HOST)和其终端，则多使用同步模式。

如接用复用器，也多为同步式。使用者必须知道所使用终端设备的数据格式为那一种，才能设定MODEM正确的工作。

本机中除 V.21，V.23 及 BELL 103 只能工作于异步式，其余格式均可工作于异步或同步型式。

有关同步和异步的设定，位于"CONFIG DTE" 菜单 中的"Data Format"，注意如选用"Asyn"格式，尚需设定"Total Bits"和 "DTE Speed"，但如使用"AT"command 操作，则这些可不必设定，MODEM会自动辨识。

4.6 除错与压缩

于异步传输时，台联modem可提供纠错与压缩的功能，除能达成百分的百零误差外，还能将数据作 2-4 倍的压缩，使有效吞吐量提高

MNP-4 提供数据除错，MNP-5提供数据压缩，最多可达两倍。另一种方式为 ITU-T V.42 & V.42bis，其中V.42 提供数据除错，V.42bis提供数据压缩，最多可达四倍。

由于经过压缩后的数据吞吐量大为增加，台联modem的DTE Speed可达 115200。

在连线时，台联modem会自动识别另一端MODEM使用的协议，来决定使用那一种，其优先顺序为：

FLOW CTRL.	RTS/CTS	Xon/Xoff	Off	Off	Off	Off	Off	Off	Off	RTS/CTS
RTS CTRL.	ON	ON	Normal	ON	ON	Normal	Normal	Normal	Normal	Normal
DCD CTRL	Normal	ON	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
DTR OFF	ON	ON	DISCNT	ON	ON	ON	ON	ON	ON	ON
DSR CTRL.	ON	ON	Normal	ON	ON	ON	ON	ON	ON	ON
Disconnect Method	clear down	immediate	clear down	clear down	clear down	clear down	clear down	clear down	clear down	clear down

4.8 远端遥控功能

可透过次通道(Sec. channel)来实施远端遥控。可在本地读取或修改远端modem的参数。

相关设定位于“CONFIG MODEM”下的“Remote Access”。

4.9 通信协定自动识别功能

The T-336Cx符合ITU-T V. 34, V. 32bis, V. 32, V. 22bis, V. 22, V. 21, V. 8, V. 42, V. 42bis等操作标准。

主叫端和应答端都可以自动识别对端modem支持的标准并相应地连线。

4.10 自动拨号备份功能

T-336Cx应用于专线时，无论使用那一种通信协定，当专线无法正常工作时，可利用拨号线，拨出预存的电话号码重新建立链路。称为备份线路。使用备份拨号时，并可定时检查专线是否已恢复，如已恢复便可自动回到专线传输，以节省拨号的电话费用。

要使用此功能，必须在MODEM的“LINE SETUP”菜单中，设定“Leased To Dial”及“Dial To Leased”为“AUTO”或manual，并设定“Backup Tel#1”的号码及恢复时间。

4.11 自动升降速功能

在V. 34 or V. 32bis协议下当Modem设定在自动升降速时若线路品质有了变化，会自动发出V.34或V.32速率识别信号 确保选择最合适的速率以尽量减少用户数据传输的中断。

该设定位于“CONFIG MODEM”菜单的“FF/FB control”。

4.12 线路状态监视

为让使用者随时掌握传输状况，在LCD主画面显示的右下方提供信号品质(Signal Quality)显示，范围为0-9，该值与误码率(B.E.R.)的大约关系如下：

9	--	$< 10^{-9}$
8	--	$< 10^{-8}$
7	--	$< 10^{-7}$
6	--	$< 10^{-6}$
5	--	$< 10^{-5}$
4	--	$< 10^{-4}$
3	--	$< 10^{-3}$
2	--	$< 10^{-2}$
1	--	$< 10^{-1}$
0	--	NO Connect

基本上误码率要求至少在 10^{-5} 到 10^{-6} 以上，如果达不到这一条件，如果是专线用户需向电信局申报障碍，拨号线用户应断线重拨。

为实际了解传输线路品质，T-336CX能即时提供线路状态显示，使用者可藉此判断线路不良的原因，显示的参数有：

- | | | |
|-----|--------|--------------------|
| 1. | 发送信号电平 | Tx level = -10 dBm |
| 2. | 接受信号电平 | Rx level = -25 dBm |
| 3. | 信噪比 | S/N Ratio = 35 dB |
| 4. | 接受频率偏移 | F-Shift = 0.2 Hz |
| 5. | 远端频率偏移 | F F-Shift = 1.7 Hz |
| 6. | 环回延时 | Delay = 560 ms |
| 7. | 相位抖动 | P J = 1 Degree |
| 8. | 远端回音 | F Echo = -40 dB |
| 9. | 终端模式 | DTE = 19200 ASY 10 |
| 10. | 再调适计数 | Retrains = 1 |

这些参数位于"STATUS"菜单.

4.13 误码率测试功能

除上述状态监视功能外，T-336Cx还提供了内置的误码率测试功能，而无须外接测试仪表。

误码率测试的使用方法为，先完成连线，t再进入"TEST"菜单中设定"BER Test"为ON，再选到"Error count". 注意如果是作两点对测，双方都要如上设定测试中为确定操作正确，可按"→"或"←"键送出一些误码让对方侦测，每按以下会发出2到5个误码。测试开始时则需先按"ENTER"键将错误计数清除为0，测试一段时间后，即可由收到的误码除以总传送位数得到误码率。只有一种测试码，即511可选择。相关选项位于"TEST"菜单下。注意两端modem的设定应该保持一致。

如远端无人仍可执行测试，方法是利用远端数字环路(RDL)功能，将送到远端的信号返回到本端。操作步骤为先连线，在"Test"菜单中执行"RDL"，再执行上述

误码率测试即可。此时送出误码将由本机自己接收，得到的误码是线路双方向收发的总和。

如执行本地模拟环路(AL)后，再执行误码率测试，则可判定本机是否正常，正常时无论测试多久，误码都必需为 0。

4.14 智慧型拨号

有些终端设备如复用器、controller、同步终端可能不能下"AT"指令拨号。Modem提供了通过面板拨号的方便的功能。除了可预设10组电话号码，还可通过打开108/1自动拨号功能实现开机或DTR ON自动拨预设号码。

4.15 面板锁定及密码保护

为防止未经授权的人员误操作，T-336Cx提供了前面板锁定功能，在"PROFILE"菜单中将"Front Lock"设定为"Lock"后，虽然按键仍会动作，还是可以观察所有设定及线路状态，但任何设定的更改及影响传输的动作，都无法操作。解除锁定状态(Unlock)的操作必需输入密码>Password)，密码为面板按键：

"EXIT"	---	X
"ENTER"	---	E
"HOME"	---	V
"→"	---	R
"←"	---	L

出厂时的设定为 "REEE"，使用者也可以自行修改，要修改密码同样必需先输入正确密码，请特别注意修改密码后需妥为记录保存。

4.16 ITU-T V.13模拟载波半双工传输模式

一般Modem大多使用在全双工的环境，但某些应用（例如SNA网络环境）要求Modem利用RTS信号控制远端DCD信号，而实际上并没有载波切换。

相关设定位于"D CD CONTROL"菜单的"D CD control".

4.17 G3传真功能

TAINET网络系列mdoem提供G3传真功能和EIA-TIA class 1传真命令组。

表 4.17.1 Fax Class 指令组

指令	概要
	Capabilities Identification And Control
+FCLASS?	Service Class Indication
+FCLASS=?	Service Class Capabilities
+FCLASS=	Service Class Selection
	Service Class 1 Action Commands
D	Originate a call

A	Answer a call
+FTS=n	Stop transmission and pause, (10 ms intervals, n=0-55)
+FRS=n	Wait for silence, (10 ms intervals n=0-255)
+FTM=<MOD>	Transmit data with <MOD> carrier
+FRM=<MOD>	Receive data with <MOD> carrier
+FTH=<MOD>	Transmit HDLC data with <MOD> carrier
+FRH=<MOD>	Receive HDLC data with <MOD> carrier
The MOD parameter may take on the following values :	
Value	Modulation & Speed
3	V. 21 ch. 2 300
24	V. 27 ter 2400
48	V. 27 ter 4800
72	V. 29 7200
73	V. 17 7200 (long train)
74	V. 17 7200 (short train)
96	V. 29 9600
97	V. 17 9600 (long train)
98	V. 17 9600 (short train)
121	V. 17 12000 (long train)
122	V. 17 12000 (short train)
145	V. 17 14400 (long train)
146	V. 17 14400 (short train)

关于传真功能的详细描述1请参阅附录2。

内容

5.1 AT指令集 (AT Command Set)

5.2 拨号指令附属码 (Dial Modifiers)

5.3 AT指令回应码 (Result Codes)

5.4 V.25bis 自动拨号指令集 (V.25bis Auto Call Unit)

第五章：指令集

5.1 AT指令集

表 5-1: AT指令集

指令	功能描述
A/	重复上一个指令
ATA	应答指令
ATD	拨号指令
ATEn	回显 0 : 关闭 1 : 打开
ATHn	摘挂机 0 : 挂机 1 : 摘机
ATIn	mdoem识别指令 0 : report product code显示产品代码 1 : ROM checksum 2 : 校验ROM checksum 3 : Report ROM components 4 : modem能力及版本 5 : pump controller : CS 6 : pump DSP : CS 7 : OK 8 : OK 9 : OK
ATLn	喇叭音量控制 0 : 低 1 : 中 2 : 高
ATMn	喇叭控制 0 : 喇叭永远关闭 1 : 开直到DCD后关 2 : 永远开启 3 : 只有HANDSHAKING 时开启，拨号时也关闭
ATOn	go online 0 : 回到数据模式 1 : 改变速率 2 : 再调适

ATP	脉冲拨号
ATQn	显示指令回应码 0 : 显示 1 : 不显示
ATS	读写S-寄存器 ATSnn? : 显示 S-寄存器 nn 的内容 ATSnn=mm : 修改 S-寄存器 nn 的内容为 mm(十进制)
ATT	双音频拨号
ATVn	回应码形式 (长/短) 0 : 数字式短回应码 1 : 英文式长回应码
ATWn	extended result code formats扩展回应码格式 0 : CONNECT+DTE速率 1 : CONNECT+载波+协议+DTE速率 2 : CONNECT +DCE速率
ATXn	回应码格式/呼叫进程参数 0 : CONNECT+速率, blind dial, no busy tone 1 : CONNECT +速率, blind dial, no busy tone 2 : CONNECT +速率, wait for dial tone, no busy tone 3 : CONNECT +速率, blind dial, check busy tone 4 : CONNECT +速率, wait for dial tone, check busy tone
ATZn	载入第n组 user profile (n=0~9) 0 : 载入第0组 user profile n : 载入第n组 user profile
AT&Cn	载波控制 0 : DCD永远ON 1 : DCD normal 2 : V.13 模拟载波半双工
AT&Dn	DTR 从ON到OFF动作 0 : 忽略 (DTR 永远 ON) 1 : 回到指令模式 2 : 自动断线 3 : 重置MODEM
AT&Fn	载入第n组出厂设定值 n = 0 .. 9

AT&Gn	保护音选项 0 : 不送防护音 1 : 送550 Hz 2 : 送1800 Hz
AT&Kn or AT\Qn	DTE流量控制选项 0 : 无流量控制 1 : 软件流量控制 2 : CTS only硬件流量控制 3 : RTS/CTS硬件流量控制
AT&Ln	线路类型选择 0 : 拨号线 1 : 二线式专线 2 : 四线式专线
AT&Mn or AT&Qn	数据格式选项 0 : 异步 1 : 同步
AT&Pn	脉冲式拨号接续比dial pulse (MAKE/BREAK) ratio 0 : USA (39/61%) 1 : UK (33/67%)
AT&Rn	RTS/CTS选项 0 : RTS由DTE控制 1 : RTS强制On
AT&Sn	DSR控制 0 : DSR强制On 1 : DSR连线后On
AT&Tn	测试指令 0 : 清除所有测试 1 : 本地模拟环路测试 3 : 数字环路测试 4 : 允许远端数字环路测试 5 : 禁止远端数字环路测试 6 : 远端数字环路测试 7 : 远端数字环路+测试码 8 : 本地欧姆你环路+测试码 10 : 打开测试码
AT&Vn	查看当前参数/用户存储参数/存储电话号码 0 : 查看当前激活设定 n : 查看用户参数设定第n组 (n=1~9)
AT&Wn	将设定保存到用户参数设定第n组 n = 0 to 9
AT&Xn	同步发送时钟源选项 0 : 内部时钟 1 : 外部时钟 2 : 环路时钟

AT&Yn	指定下次重开机时使用第 n 组 user profile 的工作参数 0 : 使用第0组 n : 使用第n组
AT&Zn	查看/存储第n组电话号码 (n=0~9) n = 0 .. 9, AT&Zn? : 查看第n组电话号码 AT&Zn=string : 存储第n组电话号码
ATJn	DTE/DCE速率转换 0 : 允许转换 1 : 禁止转换
AT\Nn	协议类型选项（见菜单详述） 0 : normal mode 1 : driret mode 2 : MNP reliable mode 3 : auto-reliable mode 4 : LAPM reliable 5 : LAPM reliable with fallback to normal mode 6 : LAPM reliable with fallback to MNP mode 7 : MNP reliable with fallback to normal mode
AT%An	异步误差容忍度 0 : 基本ASI (+1% to -2.5%) 1 : 扩展ASI (+2.3% to -2.5%)

AT%Bn	modem速率 0 : V.34自适应 1 : V21_300 / FAX 300 2 : B103_300 3 : V22_1200 4 : B212_1200 5 : V22_2400 7 : V23_1200 8 : V26b_1200 9 : V26b_2400 10 : V27_2400 / FAX 2400 11 : V27_4800 / FAX 4800 13 : V29_7200 / FAX 7200 14 : V29_9600 / FAX 9600 15 : V32_4800 16 : V32b_7200 17 : V32_9600T 18 : V32_9600Q 19 : V32b_12000 20 : V32b_14000 26 : V34_19200 27 : V34_24000 28 : V34_28800 29 : V32t_16800 30 : V32t_19200 31 : V34_4800 32 : V34_7200 33 : V34_9600 34 : V34_14400 35 : V34_16800 36 : V34_21600 37 : V34_26400 38 : V34_12000 40 : V34_2400 41 : V34_31200 42 : V34_33600 43 : V17_7200/FAX 7200 44 : V17_9600/FAX 9600 45 : V17_12000/FAX 12000 46 : V17_14400/FAX 14400 47 : V32b自适应
AT%Cn	数据压缩 0 : 关闭 1 : 打开
AT%Dn	DTROff到On时的动作 0 : 正常(108.2) 1 : DTR off-to-on 拨号/根据振铃应答(108.1)

AT%En	自动再调适功能 0 : 关闭 1 : 打开
AT%Sn	显示当前线路状态 0 : 显示本端状态 1 : 显示远端状态
AT%Gn	自动升降速功能 0 : 关闭 1 : 打开
AT%Un	自动侦测波特率功能 0 : 关闭 1 : 打开
AT-Cn	calling tone on/off 0 : calling tone off 1 : calling tone on
AT-V	显示版本
AT-Rn	读取DSP ram内容 (仅供测试用)
AT-Wn=mm	写入DSP ram内容 (仅供测试用)

5.2 拨号指令附属码（Dial Modifiers）

表 5-2 AT指令及V25bis指令拨号指令附属码

指令	功能说明
'T' or 't'	双音频拨号
'P' or 'p'	脉冲拨号
'0' to '9' 'A' to 'D' 'a' to 'd' '*', '#'	号码
','	加入暂停
'''	快速挂机摘机（相当于拍插簧）
'W' or 'w' or ':'	等待拨号音
';'	return to idle after dial
'@' or '='	wait for quiet answer (silence)
'R' or 'r'	reverse to the answer mode
'Sn' or 'sn'	拨存储的第n组号码
'+'	cascade the tel number to the next one
'-' or '(' or ')' or ' '	无动作

5.3 回应码

表 5-3 AT指令回应码

短格式	长格式
0	OK
2	RING
3	NO CARRIER
4	ERROR
6	NO DIAL TONE
7	BUSY
8	NO ANSWER TONE
9	CONNECT
10	CONNECT 300
11	CONNECT 600
12	CONNECT 1200
13	CONNECT 1800
14	CONNECT 2400
15	CONNECT 3600
16	CONNECT 4800
17	CONNECT 7200
18	CONNECT 9600
19	CONNECT 12000
20	CONNECT 14400
21	CONNECT 16800
22	CONNECT 19200
23	CONNECT 21600

表 5-3 回应码 (续.)

短格式	长格式
24	CONNECT 24000
25	CONNECT 26400
26	CONNECT 28800
27	CONNECT 32000
28	CONNECT 38400
29	CONNECT 57600
30	CONNECT 76800
31	CONNECT 115200
32	CONNECT 31200
33	CONNECT 33600

5.4 V.25bis自动拨号指令集 (V.25bis Auto call Unit)

V.25bis自动拨号指令是用来在异步或同步的数据格式下自动拨号的。

1. V.25bis 指令

- | | |
|-----------|------------------------------------|
| a. CRNx | - 拨号指令，由DTE键盘输入的x为电话号码。 |
| b. CRSy | - 拨号指令，指令的后 y 为已储存电话号码的代号。y=0-9. |
| c. PRNy;x | - 储存指令， y 为组别，y=0-9， x 为欲储存的电话号码。 |
| d. RLN | - 将储存的电话号码显示出来。 |
| e. CIC | - 回答一个呼叫，当CIC<CR>被键入，则MODEM开始应答动作。 |
| f. DIC | - 此指令用来让MODEM 不应答。 |

2. V.25bis指令回应

- | | |
|--------|------------------------|
| a. INC | - MODEM 侦测到振铃信号 |
| b. INV | - MODEM 收到不正确指令 |
| c. VAL | - MODEM 收到正确指令 |
| d. LSN | - MODEM 收到RLN指令，则回应LSN |
| e. CNX | - 指示已进入DATA MODE |

3. V.25bis拨号失败回应码

- | | |
|----------|---------------------------------------|
| a. CFIET | - 侦测到忙音 (Busy tone had been detected) |
| b. CFIAB | - Modem 中止呼叫 (aborted a call.) |
| c. CFIRT | - 对方不应答 (Ringback timeout.) |
| d. CFICB | - Modem无法接受指令 (busy) . |
| e. CFINS | - 无存储的号码 (No phone number is stored.) |
| f. CFIND | - 无拨号音 (No dial tone is detected.) |

内容

6.1 概述 (Description)

6.2 测试仪器 (Instruments)

6.3 定期维护 (Periodic Maintenance)

6.4 故障排除步骤 (Troubleshooting)

6.5 送修程序 (Return Procedure)

第六章：维护须知

6.1 概述

本章叙述台联mdoem的维护信息、所需仪器，以便迅速修复。

6.2 测试仪器

本机已内置数字和模拟测试功能，所以只需万用电表。

6.3 定期维护

每三个月需做如下检查

- (A) 关掉电源，清除灰尘，检查插头，确认所有的接头连接牢固。
- (B) 检查指示灯是否正常。.

6.4 故障排除步骤

当TAINET网络系列modem故障时，请先查看当时LED 指示灯及LCD的状态并记录下来，然后关掉电源。确实检查印刷电路板上的IC是否松动，再打开电源检查，如还有不正常时，请按下列步骤排除故障。

1) 电源部分

- * 首先确认电源符合要求。如所有指示灯都不亮，则可能是电源部份故障。* 查电源保险丝，如烧断，更换之

2) 检查RS-232C接口

- * 做AL测试，用终端敲入一些数据并检查是否正确返回
- * 请确认接口是否接触不良，并检查电缆好坏。

6.5 送修程序

联系电话：010-62226961~6965

APPENDIX 1: T-336Cx S-REGISTER TABLE

No	Default	Unit	Function Description	
S0	1	times	Auto-answer Ring Count	
S1	0	times	Current Ring Count (read only)	
S2	43	decimal	Escape Char	
S3	13	decimal	CR Char	
S4	10	decimal	LF Char	
S5	8	decimal	Backspace Char	
S6	2	second	Pause Before Blind Dial	
S7	45	second	Wait for Carrier Time	
S8	2	second	Pause for Comma	
S9	6	100ms	Carrier Validation Time	
S10	15	1/.1s	Lost Carrier Detect Time (1 sec unit for V34/V32bis/V32) (0.1 sec unit for V22bis/V22)	
S11	95	ms	DTMF Tone Duration	
S12	14	100 ms	Guard Time (Escape Sequence Pause)	
S13	19	binary	Bit-Mapped Options bit 4,3,2,1,0 - DTE Speed 0 - 300 bps 1 - 600 bps 2 - 1200 bps 3 - 1800 bps 4 - 2400 bps 5 - 3600 bps 6 - 4800 bps 7 - 7200 bps 8 - 9600 bps 9 - 12000 bps 10 - 14400 bps 11 - 16800 bps 12 - 19200 bps 13 - 21600 bps 14 - 2400 bps 15 - 26400 bps 16 - 28800 bps 17 - 32000 bps 18 - 38400 bps 19 - * 57600 bps 20 - 76800 bps 21 - 115200 bps 22 - 31200 bps 23 - 33600 bps bit 7,6,5 - reserved	
S14	00001010	binary	Bit Mapped Options bit 0 *0 - AT-C0 calling tone off 1 - AT-C1 calling tone on bit 1 0 - ATE0 echo off *1 - ATE1 echo on bit 2 *0 - ATQ0 response on 1 - ATQ1 response off bit 3 0 - ATV0 response code *1 - ATV1 response word bit 4 - reserved bit 5 *0 - ATT Tone Dial 1 - ATP Pulse Dial	

No	Default	Unit	Function Description	
S15	01000000	binary	bit 6	- reserved
			bit 7	*0 - ATA Answer 1 - ATD Originate
S16	01000000	binary	reserved	
S16	01000000	binary	Bit Mapped Options	
			bit 0	*0 - AT&T0 Test Pattern off 1 - AT&T10,&T7,&T8 Test Pattern on
			bit 1	*0 - RDL off 1 - RDL on
			bit 2	*0 - AT&T0 LAL off 1 - AT&T1,T8 LAL on
			bit 3	0 - AT&T0 LDL off *1 - AT&T3 LDL on
			bit 4	*0 - AT&T0 RDL off 1 - AT&T6,T7 RDL on
			bit 5	- reserved
			bit 7,6	- test pattern selection
				00 - AT%T0 none
				*01 - AT%T1 511 pattern
				10 - reserved
				11 - reserved
S17			reserved	
S18	0	minute	Modem Test Timer	
S19	00011100	binary	Bit Mapped Options	
S19	00011100	binary	bit 0,1	- V25bis character framing
				*00 - Async
				01 - HDLC/SDLC
				10 - BSC
				11 - reserved
			bit 2	*1 - NRZ / 0 NRZI
			bit 3	*1 - flag idle / 0 mark idle
			bit 5,4	- word length
				00 - 7-bit data, even parity, 1 stop bit
				*01 - 8-bit data, no parity, 1 stop bit
				10 - 7-bit data, odd parity, 1 stop bit
				11 - 7-bit data, no parity, 2 stop bit
			bit 6	- DTR off cause busy out /* nothing
			bit 7	*0 - V.32bis fast training disable 1 - V.32bis fast training enable
S20			reserved	
S21	00000101	binary	Bit Mapped Options	
S21	00000101	binary	bit 1,0	- DCD control
				00 - AT&C0 DCD forced on
				*01 - AT&C1 DCD normal
				10 - AT&C2 V.13 HDX
				11 - reserved
			bit 2	0 - AT&R0 RTS normal *1 - AT&R1 RTS forced on
			bit 4,3	- DTR on-to-off action
				*00 - AT&D0 ignore
				01 - AT&D1 recall command mode
				10 - AT&D2 disconnect
				11 - AT&D3 reset modem
			bit 5	*0 - CTS off in retrain (CCITT)* 1 - CTS follows RTS (EIA)

No	Default	Unit	Function Description	
S22	01110110	binary	bit 6	*0 - AT&S0 DSR forced on 1 - AT&S1 DSR on after connect
			bit 7	- reserved
			Bit Mapped Options	
			bit 1,0	- speak volume
				00 - low
				*01 - medium
				10 - high
			bit 3,2	11 - reserved
				- speak control
				00 - off
				*01 - until DCD on
			bit 6,5,4	10 - always on
				11 - off when dial
				- result code and call progress
				000 - ATX0 CONNECT without speed message, blind dial, no busy tone
				001 - reserved
				010 - reserved
				011 - reserved
				100 - ATX1 CONNECT with speed message, blind dial, no busy tone
				101 - ATX2 CONNECT with speed message, wait for dial tone, no busy tone
				110 - ATX3 CONNECT with speed message, blind dial, check busy tone
				*111 - ATX4 CONNECT with speed message, wait for dial tone, check busy tone
			bit 7	0 - AT&P0 Make/Break ration USA (39%)
				*1 - AT&P1 Make/break ratio UK (33.3%)
S23	00100001	binary	Bit Mapped Options	
			bit 0	0 - AT&T5 slave RDL disabled
				*1 - AT&T4 slave RDL enabled
			bit 1	*0 RDL by 140 disable
				1 RDL by 140 enable
			bit 2	*0 AL by 141 disable
				1 AL by 141 enable
			bit 3	*0 - AT%A0 basic ASI (-2.5% to +1%)
				1 - AT%A1 extended ASI (-2.5% to +2.3%)
			bit 5,4	- data length on direct mode
				00 - 8 bits
				01 - 9 bits
				*10 - 10 bits
			bit 7,6	11 - 11 bits
				- guard tones
				*00 - AT&G0 disabled
				01 - AT&G1 550 Hz
				10 - AT&G2 1800 Hz
				11 - reserved

No	Default	Unit	Function Description
S24	01000000	binary	Bit Mapped Options bit 1,0 - DTR off-to-on control *00 - AT%D0 normal (108.2) 01 - AT%D1 dial/ans according to ring-in (108.1) 10 - reserved 11 - reserved bit 3,2 - ring off time - 2 seconds - 3 seconds - 4 seconds - 5 seconds bit 7,6,5,4 - TX compromise equalizer (default 4 dB)
S25	00	100ms	DTR Debounce Time bit 3,2,1,0 - DTR drop detection time bit 7,6,5,4 - DTR rising detection time
S26	0	10ms	RTS to CTS Delay
S27	00001000	binary	Bit Mapped Options bit 2,1,0 - data mode data format *000 - AT&Q0,&M0 async data mode 001 - AT&Q1,&M1 sync data mode 010 - reserved 011 - reserved bit 3 *remote access on / remote access off bit 5,4 - sync transmit clock source *00 - AT&X0 internal clock 01 - AT&X1 external clock 10 - AT&X2 slave (loopback) clock 11 - reserved bit 7,6 - line type *00 - AT&L0 dial line 01 - AT&L1 2-wired leased line 10 - AT&L2 4-wired leased line 11 - reserved
S28	00000000	binary	Bit Mapped Options bit 0 0 0 to -33 dBm receive dynamic range *1 -4 to -43 dBm receive dynamic range bit 1 - reserved bit 3,2 - disconnect option *00 - send clear down before disconnect 01 - immediately disconnect 10 - reset modem on disconnect 11 - reserved bit 5,4 - ENQ/ACK control *00 - AT\H0 no ENQ/ACK 01 - AT\H1 to host (simulate peripheral) 10 - AT\H2 to peripheral (simulate host) 11 - reserved bit 6 - reserved bit 7 0 -disable Auto FF/FB & retrain function *1 -enable Auto FF/FB & retrain function
S29	10101101	binary	Bit Mapped Options bit 1,0 - command selection 00 - dumb mode

No	Default	Unit	Function Description
			*01 - Hayes AT command mode 10 - V.25bis command mode 11 - reserved
		bit 2	- reserved
		bit 3	0 - AT%E0 auto retrain off *1 - AT%E1 auto retrain on
		bit 4	*0 - front panel unlock 1 - front panel lock
		bit 5	0 - AT%G0 auto FB/FF disable *1 - AT%G1 auto FB/FF enable
		bit 6	- reserved
		bit 7	0 - AT%U0 autobauding off *1 - AT%U1 autobauding on
S30	13	-dBm	Leased Line Tx Level (0..-31 dBm)
S31	00000000	binary	Bit Mapped Options
		bit 0	- leased to dial 0 - manual 1 - auto
		bit 1	- dial to leased 0 - manual 1 - auto
		bit 3,2	- security check *00 - disabled 01 - by modem 10 - by NMS 11 - reserved
S32	0	times	bit 7,6,5,4 - backup tel. (#0~9)/no dial backup bit 3,2,1,0 - retrain times bit 7,6,5,4 - reserved
S33			reserved
S34			reserved
S35	30	second	OH by DTR timer (default 30 seconds)
S36			D to L timer (default 60 mins)
S37			reserved
S38			reserved
S39			reserved
S40			reserved
S41	00000001	binary	Bit Mapped Options
		bit 1,0	- connect message display 00 - ATW0 CONNECT with DTE speed *01 - ATW1 CONNECT with CARRIER, PROTOCOL and DTE speed 10 - ATW2 CONNECT with DCE speed 11 - reserved
		bit 2	- V.26bis Scrambler *0 - Enable 1 - Disable
		bit 3	- reserved
		bit 4	- V.26bis descrambler *0 - Enable 1 - Disable
		bit 5	- reserved

No	Default	Unit	Function Description	
			bit 7,6	- DTMF level Selection (Low/High band) *00 - 8/-6 dBm 01 - 10/-8 dBm 10 - 12/-11 dBm 11 - 5/-3 dBm
S42	00000010	binary	Bit Mapped Options	
			bit 0	*0 - far echo canceler off 1 - far echo canceler on
			bit 1	0 - receive power drop control off *1 - receive power drop control on
			bit 2	*0 - enable V.34 asymmetrical rate 1 - disable V.34 asymmetrical rate
S43			bit 7,6,5,4,3	- reserved
S44			reserved	
S45			reserved	
S46			reserved	
S47			reserved	
S48			reserved	
S49			reserved	
S50	00000000	binary	Bit Mapped Options	
			bit 1,0	- FAX/DATA Mode Selection *00 - AT+FCLASS=0 FAX disabled (DATA mode) 01 - AT+FCLASS=1 FAX Class I mode 10 - AT+FCLASS=2 FAX class II mode 11 - reserved
			bit 2	*0 - AT+FAA0 data auto answer mode 1 - AT+FAA1 data/fax auto answer mod
S51	00000011	binary	bit 7,6,5,4,3	- reserved
			Bit Mapped Options	
			bit 1,0	- flow control 00 - AT\Q0,AT&K0 no flow control 01 - AT\Q1,AT&K1 XON/XOFF flow control 10 - AT\Q2,AT&K2 CTS only flow control *11 - AT\Q3,AT&K3 RTS/CTS flow control
			bit 3,2	- DTE/DCE speed convert *00 - AT\J0 enable DTE/DCE speed convert 01 - AT\J1 disable DTE/DCE speed convert 10 - reserved 11 - reserved
S52	0	dec	bit 7,6,5,4	- auto dial telephone number
			AT%B Desired Highest DCE Speed	
				*0 - V34_Adaptive 1 - V21_300 / FAX 300 2 - B103_300

No	Default	Unit	Function Description
			3 - V22_1200
			4 - B212_1200
			5 - V22_2400
			7 - V23_1200
			8 - V26b_1200
			9 - V26b_2400
			10 - V27_2400 / FAX 2400
			11 - V27_4800 / FAX 4800
			13 - V29_7200 / FAX 7200
			14 - V29_9600 / FAX 9600
			15 - V32_4800
			16 - V32b_7200
			17 - V32_9600T
			18 - V32_9600Q
			19 - V32b_12000
			20 - V32b_14400
			26 - V34_19200
			27 - V34_24000
			28 - V34_28800
			29 - V32t_16800
			30 - V32t_19200
			31 - V34_4800
			32 - V34_7200
			33 - V34_9600
			34 - V34_14400
			35 - V34_16800
			36 - V34_21600
			37 - V34_26400
			38 - V34_12000
			40 - V34_2400
			41 - V34+_31200
			42 - V34+_33600
			43 - V17_7200
			44 - V17_9600
			45 - V17_12000
			46 - V17_14400
			47 - V32b_Adaptive
S53	00010011	binary	Bit Mapped Options
			bit 3,2,1,0 protocol type
			0000 - ATN0 normal mode
			0010 - ATN2 MNP reliable mode
			*0011 - ATN3 auto-reliable mode
			0100 - ATN4 LAPM reliable
			0101 - ATN5 LAPM reliable with fallback to normal mode
			0110 - ATN6 LAPM reliable with fallback to MNP mode
			0111 - ATN7 MNP reliable with fallback to normal mode
		bit 4	0 - AT%C0 data compression off
			*1 - AT%C1 data compression on
		bit 7,6,5 reserved	- reserved
S54			

No	Default	Unit	Function Description
S55			backup speed
S56	13	-dBm	Dial Line Tx Level (-6..-15dBm)
S57	00	binary	Bit Mapped Options
			bit 1,0 - retrain threshold
			*00 - High
			01 - medium
			10 - Low
			11 - reserved
			bit 7,6,5,4,3,2 - reserved
S58			reserved
S59			EEPROM Checksum (read only)
S60	0	decimal	AT&Yn Power-up user Profile

APPENDIX 2: AUXILIARY SUMMARY FOR FAX FUNCTION

The DTE-facsimile DCE communications link shall provide full duplex character data at rates fast enough to accommodate the transfer of synchronous T.30 Phase C data. 12,000 bit/s is the minimum rate needed to support 9600 bit/s V.29 Phase C data. 19,200 bit/s is sufficient to support V.29 signaling at 9600 bit/s. With flow control, it is not necessary, and not recommended, to change the DTE-DCE communications link data rate during facsimile operation.

Flow control is necessary to match the DTE-DCE data rate to the line signaling rate and to the requirements of Group 3 data transmission. (For example, provision must be made for minimum scan line times.) In band unidirectional DC1/DC3 (XON/XOFF) flow control is mandatory; flow control using V.24 circuits 106 and 105 is optional. In the verbose format, result code responses are preceded by the ASCII characters <CR><LF>, and followed by <CR><LF>. In the non-verbose format, result code responses are preceded by no characters, and followed by a single <CR>.

The ASCII <DLE> character (hex \$10) is used as a special character, to shield special characters. The <DLE><ETX> character pair (hex \$10, hex \$03) is used to mark the end of a stream. The following patterns are used:

any data	<DLE> <ETX>	end of stream
any data	<DLE> <DLE>...	single \$10 in data stream
any data	<DLE> <not DLE or ETX>	delete both <DLE> & next character

A2.1 Command Summary

All of these commands, except +FTS and +FRS, must be the last command on the command line. The commands are:

<u>Command</u>	<u>Description</u>
+FTS=<Time>	Stop transmission and pause,(10 ms intervals 0-255)
+FRS=<Time>	Wait for silence,(10 ms intervals 0-255)
+FTM=<MOD>	Transmit data with <MOD> carrier
+FRM=<MOD>	Receive data with <MOD> carrier
+FTH=<MOD>	Transmit HDLC data with <MOD> carrier
+FRH=<MOD>	Receive HDLC data with <MOD> carrier

The MOD parameter may take on the following values:

<u>Value</u>	<u>Modulation & Speed</u>	
3	V.21 ch.2	300
24	V.27 ter	2400
48	V.27 ter	4800
72	V.29	7200
73	V.17	7200 (long train)
74	V.17	7200 (short train)
96	V.29	9600
97	V.17	9600 (long train)
98	V.17	9600 (short train)
121	V.17	12000(long train)
122	V.17	12000 (short train)
145	V.17	14400 (long train)
146	V.17	14400 (short train)

A2.2 Capabilities Identification and Control

A2.2.1 Service Class Indication, +FCLASS?

The current Service Class setting of a facsimile DCE is interrogated by the "+FCLASS?" command. The information text response is a single value:

- 0 indicates a data modem
- 1 indicates a Service Class 1 facsimile DCE
- 2 indicates a Service Class 2 facsimile DCE
- other values are reserved

A2.2.2 Service Class Capabilities, +FCLASS=?

The Service Classes available from a facsimile DCE are probed by the "FCLASS=?" command. The information text response is a list of values, separated by commas. For example, a DCE that supported data communication and facsimile Service Class 1 would respond: "0,1".

A2.2.3 Service Class Selection, +FCLASS=<value>

The Service Class may be set by the DTE from the choices available (see above) , using the "+FCLASS=<value>" command. To configure a DCE for Service Class 1, the DTE issues the command: "AT+FCLASS=1".

A2.3 Service Class 1 Action Commands

A2.3.1 Stop Transmission and Wait, +FTS=<Time>

The command +FTS=<Time> causes the DCE to stop any transmission. The DCE then waits for the specified amount of time, and then sends the OK result code to the DTE. The value <Time> is in 10 millisecond intervals.

A2.3.2 Receive Silence, +FRS=<Time>

The command +FRS=<Time> causes the DCE to listen, and to report back an OK result code when silence has been present on the line for the amount of time specified. The value <Time> is in 10 millisecond intervals. The command will terminate when the required amount of silence on the line is detected or the DTE sends the DCE another character, which is discarded. In either event, the OK result code will be returned to the DTE.

A2.3.3 Facsimile Transmit, +FTM=<MOD>

The command +FTM=<MOD> causes the DCE to transmit data using the modulation selected in <MOD>. <MOD> may have the values shown in section 1.1.

The DCE returns the CONNECT result code and transmits the proper training sequence in the selected mode, followed by constant 1 bits, until data is received from the DTE.

The DCE buffers data in this mode. The configured flow control method will be used by the DCE as necessary to pause the DTE.

If the DCE's transmit buffer becomes empty and the last transmitted character is ASCII NUL (00), the DCE shall continue to transmit NULs until the DTE sends more data or 5 seconds elapses. After 5 second elapse with an empty transmit buffer, the DCE will turn off transmit carrier and return to command state, returning the ERROR result code.

NOTE: 00 replication is useful for generating TCF (1.5 seconds of 0s) and zero-fill within lines.

When the DCE's transmit buffer becomes empty and the last transmitted character was not NUL, the DCE shall turn off transmit carrier, return to command state and send the OK result code to the DTE.

A2.3.4 Facsimile Receive, +FRM=<MOD>

The command +FRM=<MOD> causes the DCE to enter receive mode using the modulation specified in <MOD>. <MOD> may have the values shown in section 1.1

When the selected carrier is detected, the DCE will send the CONNECT result code to the DTE.

The DCE shall return to command state upon loss of carrier, and send the NO CARRIER result code to the DTE.

The DCE shall obey the configured flow control from the DTE. If the DTE sends any character to the DCE other than DC1 or DC3 while the DCE is in this mode, the DCE shall enter command state and send the OK result code to the DTE.

A2.3.5 HDLC Transmit, +FTH=<MOD>

The command +FTH=<MOD> causes the DCE to transmit data framed in HDLC protocol using the modulation mode selected. <MOD> may have the values shown in section 1.1.

The DCE will send the CONNECT result code to the DTE, and transmit signal converter training (if required) followed by flags until the first byte of data is sent by the DTE.

When the buffer becomes empty the DCE shall compute and append the Frame Check Sequence (FCS) and a closing flag to the frame. The DCE will insure that the minimum number of flags required by T.30 are sent before the data from the DTE begins to be transmitted.

The DCE shall check the Final Frame bit in the control field of each frame; this is the 5th received bit of the second byte of each frame. If the Final Frame bit is 1, the DCE shall cease transmitting after the frame is sent, return to command state, and send the OK result code to the DTE. If the Final Frame bit is 0, the DCE shall send the CONNECT result code to the DTE and continue to transmit flags until one of the following actions is taken by the DTE:

- * If the DTE sends additional data, the DCE shall transmit another frame.
- * If the DTE sends only <DLE> <ETX> (a null frame), the DCE shall turn off transmit carrier and send the OK result code to the DTE.
- * If 5 seconds elapses from the time when the DCE reported the CONNECT result code without any additional data transmitted from the DTE, the DCE shall turn off transmit carrier, return to command mode, and send the ERROR result code to the DTE.

The DCE performs HDLC transparency functions and FCS generation while in this mode.

The DCE buffers data in HDLC transmit mode. The DCE will use the configured method of flow-control to pause the DTE as necessary.

A2.3.6 HDLC Receive, +FRH=<MOD>

The command +FRH=<MOD> causes the DCE to receive HDLC framed data using the modulation mode selected in <MOD>, and deliver the next received frame to the DTE. <MOD> may have the values shown in section 1.1.

If the DCE detects the selected carrier with an HDLC flag, the DCE shall send the CONNECT result code to the DTE. The DCE will return to command state upon loss of carrier, sending the NO CARRIER result code to the DTE.

The DCE strips flags, and receives and buffers frames. The received data, starting with the first non-flag byte and continuing through the last FCS byte shall be transferred to the DTE. The DTE should ignore the value of the FCS bytes. The DCE performs HDLC zero-bit deletion and error checking.

After the FCS bytes are transferred, the DCE shall mark the end of the frame with the characters <DLE><ETX>, and report the status of the frame reception to the DTE:

If the frame was received correctly (FCS is OK), the DCE shall return the OK result code.

If the frame was received in error (FCS is not OK, or carrier lost, or data lost due to data overflow), the DCE shall return the ERROR result code; the DTE should discard the frame.

After the status result code, the DCE shall accept new commands from the DTE.

The DCE shall obey the configured flow control from the DTE. If the DTE sends any character to the DCE other than DC1 or DC3 while the DCE is in this mode, the DCE shall enter command state and return the OK result code.

After sending the result code indicating that frame reception is complete, the DCE shall continue to receive and buffer data in the selected mode. If the DTE issues another +FRH=<MOD> command, the DCE shall return another CONNECT result code and continue with HDLC reception. If the DTE issues any command that changes modulation, the DCE shall stop the receive process; any buffered data will be discarded and the command will be obeyed.

A2.4 Calling Sequence, Transmitting a Single Page Facsimile

DTE commands	DCE responses	Local DCE action	Remote Station Action	Notes
AT+FCLASS=1	OK	Set Class 1		
ATD<string>	CONNECT <NSF frame> <DLE><ETX> OK	Dial & send CNG Look for V.21 Detect flags	Answers Sends CED,V.21 Send HDLC flags Sends NSF Frame	AT+FRH=3 implied by dialing with +FCLASS=1
AT+FRH=3	CONNECT <CSI frame data> <DLE><ETX> OK	Detect flags get CSI get FCS accept FCS	Send CSI Frame check FCS	frame status OK
AT+FRH=3	CONNECT <DIS frame data> <DLE><ETX> accept FCS OK NO CARRIER	Detect flags get DIS get FCS send FCS detect loss of carrier	Send DIS frame DTE must detect final frame bit drop carrier	to anticipate loss of carrier
AT+FTH=3 <TSI frame data> <DLE><ETX> <DCS frame data> <DLE><ETX>	CONNECT CONNECT OK	send V.21 carrier send flags send TSI frame send FCS send flags send DCS frame send FCS flags drop carrier	detect carrier detect flags get TSI frame get DIS frame	Final frame bit clear tells the DCE to expect another frame Final frame bit set tells the DCE not to expect another frame
AT+FTS=8;+FTM=96 <TCF data pattern> <DLE><ETX>	CONNECT OK	wait 80 ms send V.29 carrier send TCF data drop carrier	detect carrier get TCF data	
AT+FRH=3	CONNECT <CFR frame data> <DLE><ETX> OK NO CARRIER	detect carrier detect flags get CFR frame check FCS accept FCS detect loss of carrier	send V.21 carrier send flags send CFR frame send FCS drop carrier	Final frame bit set frame OK
AT+FTM=96 <page image data> <DLE><ETX>	CONNECT OK	send V.29 carrier send page data drop carrier	detect carrier receive page	
AT+FTS8;+FTH=3 <EOP frame data> <DLE><ETX>	CONNECT OK	wait 80 ms send V.21 carrier send flags send EOP frame send FCS drop carrier	detect carrier detect flags receives EOP	final frame

A2.4 Calling Sequence, Transmitting a Single Page Facsimile (cont.)

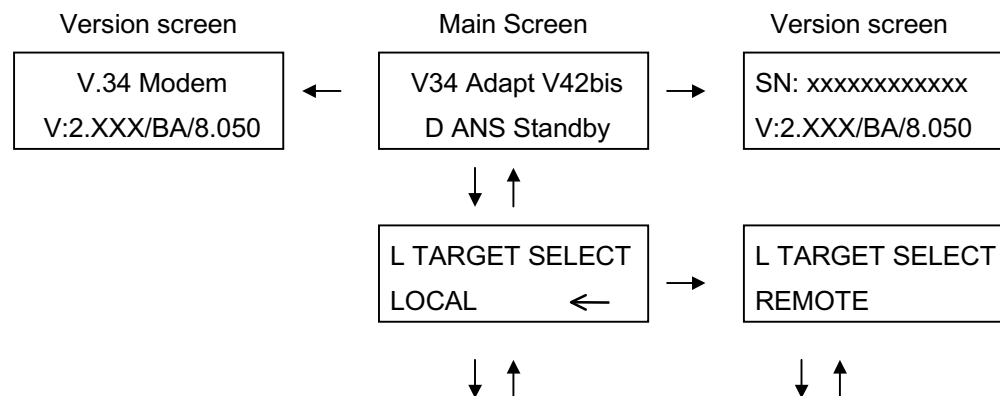
DTE commands	DCE responses	Local DCE action	Remote Station Action	Notes
AT+FRH=3	CONNECT <MCF frame data> <DLE><ETX> OK NO CARRIER	detect carrier detect flags get MCF frame check FCS accept FCS detect loss of carrier	send V.21 carrier send flags send MCF frame send FCS drop carrier	Final frame bit set frame OK
AT+FRH=3 <DCN frame> <DLE><ETX>	CONNECT OK	send V.21 carrier send flags send DCN frame send FCS drop carrier	detects carrier detects flags receives DCN	final frame
ATH0	OK	Hang Up	hang-up	

A2.5 Answering and Receiving a Single Page Facsimile

DTE commands	DCE responses	Local DCE action	Remote Station Action	Notes
AT+FCLASS=1	OK RING<-	Set Class 1 detect Ringing	Dials [,send CNG]	
ATA <CSI frame data> <DTE><ETX>	CONNECT OK	off hook, send CED, send V.21 carrier send flags send CSI data drop carrier	get CED, detect carrier detect flags receive CSI	AT+FRH=3 implied by answering with +FCLASS=1 not final frame
AT+FTH=3 <DIS frame data> <DTE><ETX>	CONNECT OK	send DIS data send FCS drop carrier	receive DSI	final frame
AT+FRH=3	CONNECT <TSI frame data> <DLE><ETX> OK	detect carrier detect flags receive TSI receive FCS accept FCS	sends V.21 carrier send flags send TSI frame send FCS	frame OK
AT+FRH=3	CONNECT <DSC frame data> <DLE><ETX> OK	receive DCS receive FCS accept FCS	send DCS frame send FCS	final frame bit set frame OK
AT+FTH=3	NO CARRIER	detect loss of carrier	drop carrier	DTE didn't check final frame bit and issued +FRH=3 command again
AT+FRM=96	CONNECT <TCF data> <DLE><ETX> NO CARRIER	detect carrier receive TCF detect loss of carrier	wait 75 ms send V.29 carrier send TCF data drop carrier	
AT+FRH=3 <CFR frame data> <DLE><ETX>	CONNECT OK	send V.21 carrier send flags send CFR frame send FCS drop carrier	detects carrier detects flags receives CFR	final frame
AT+FTM=96	CONNECT <page image data> <DLE><ETX> NO CARRIER	detect carrier receive page detect loss of carrier	send V.29 carrier send page data drop carrier	
AT+FRH=3	CONNECT <EOP frame data> <DLE><ETX> OK	detects carrier detects flags receives EOP receive FCS accept FCS	waits 75 ms sends V.21 carrier sends flags send FCS drop carrier	frame OK

A2.5 Answering and Receiving a Single Page Facsimile (cont.)

DTE commands	DCE responses	Local DCE action	Remote Station Action	Notes
AT+FTH=3 <MCF frame data> <DLE><ETX>	CONNECT OK	send V.21 carrier send flags send MCF frame send FCS drop carrier	drop carrier	final frame
AT+FTH=3	CONNECT <DCN frame data> <DLE><ETX> OK	receives carrier detect flags receives DCN receives FCS accepts FCS	send V.21 carrier send flags send DCN frame send FCS	
AT+FRH=3	NO CARRIER	detect loss of carrier	drops carrier	
ATH0	OK	hang up		end of session

T-336Cx LCD MENU QUICK REFERENCE

MENU	STATUS	DIAL	PROTOCOL	TEST	CONFIG. MODEM	CONFIG. DTE	COMMAND	LINE SETUP	PROFILE
I T E M	Tx Level	Dial a Number	Protocol Type	Clear All	Modem Speed	DTE Speed	Command Mode	Line Type	Load
	Rx Level	Edit a Number	Security check	LAL	ORG/ANS Mode	Flow Control	Auto Baud	Leased To Dial	Power Up
	S/N Ratio	Ring Times	Discon. method	DL	Auto Retrain	DTR Control	Framing	Backup Tel	Initial
	EQM	Progress Tone	Connect Code	RDL	Tx Clock	DTR Off Action	Async form	Backup Speed	Front Lock
	F-Shift	Dial Type	Compress	RDL Grant	Retrain Threshold	RTS Control	Idle Char	Dial to Leased	Password Edit
	F F-Shift	SPK Control		Error Count	ASI Overspeed	DSR Control		Dial to Leased Timer	Sreg Edit
	Delay	SPK Volume		B.E.R Test	Make/Break	DCD Control			Save
	Phase jitter				Force Off Hook	Data Format			
	F Echo				OH By DTR	Total Bits			
	DTE				Pump edit	AL by 141			
	Retrains				LL Tx Level	RDL by 140			
	RX Speed				DL Tx Level				
	TX Speed				FB\FF Ctrl				
	RX Baud				Remote Access				
	TX Baud				Dynamic Range				
	RX Freq								
	TX Freq								
	TX PowerOff								
	Menu Retrain								
	Interface indicators								