



**TC-1082**

**MLX-82<sup>TM</sup>**

**CALLER IDENTIFICATION  
INTERFACE**

**TECHNICAL INFORMATION**

**APPROVED:** *TR*

**DIRECTOR OF ENGINEERING**

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## TC-1082

### 8-LINE CALLER IDENTIFICATION INTERFACE

#### TECHNICAL INFORMATION

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ISSUE 3 12/11/91	ISSUE 2 04/10/91	TC-1082 REV. 1
ISSUE 4 02/20/92	ISSUE 3 06/27/91	TC-1082 REV. 1
ISSUE 5 07/30/93	ISSUE 3 06/27/91	TC-1082 REV. 1
ISSUE 6 05/24/94	ISSUE 3 06/27/91	TC-1082 REV. 1
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**An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.**

## Equipment Attachment Limitations

### Section 1.10.1

#### **NOTICE**

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, user's should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

User's should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

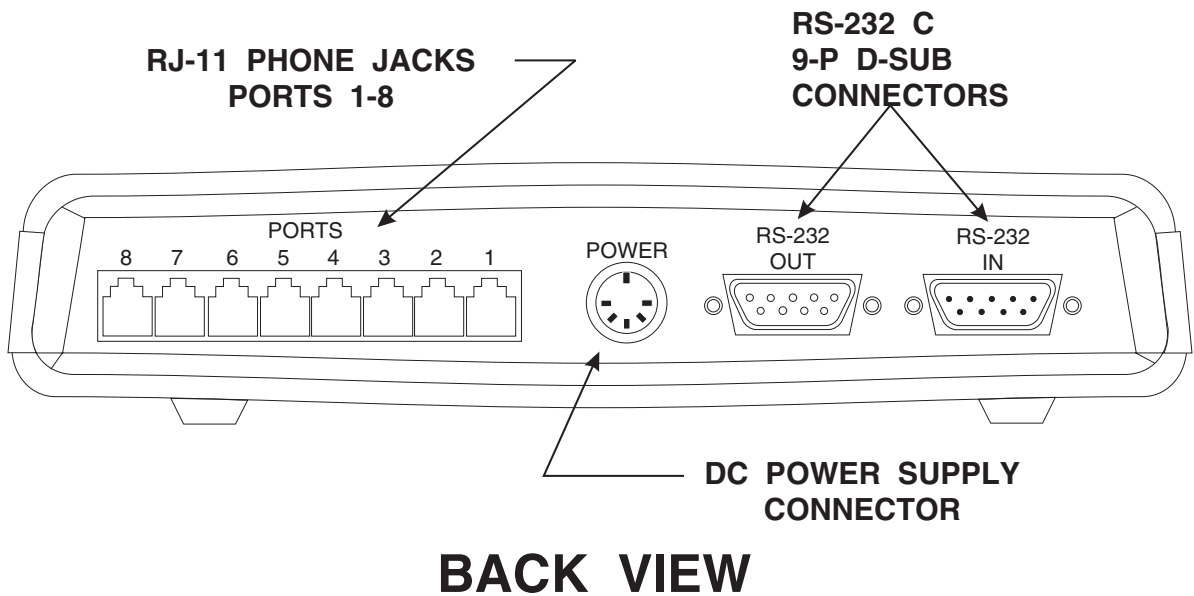
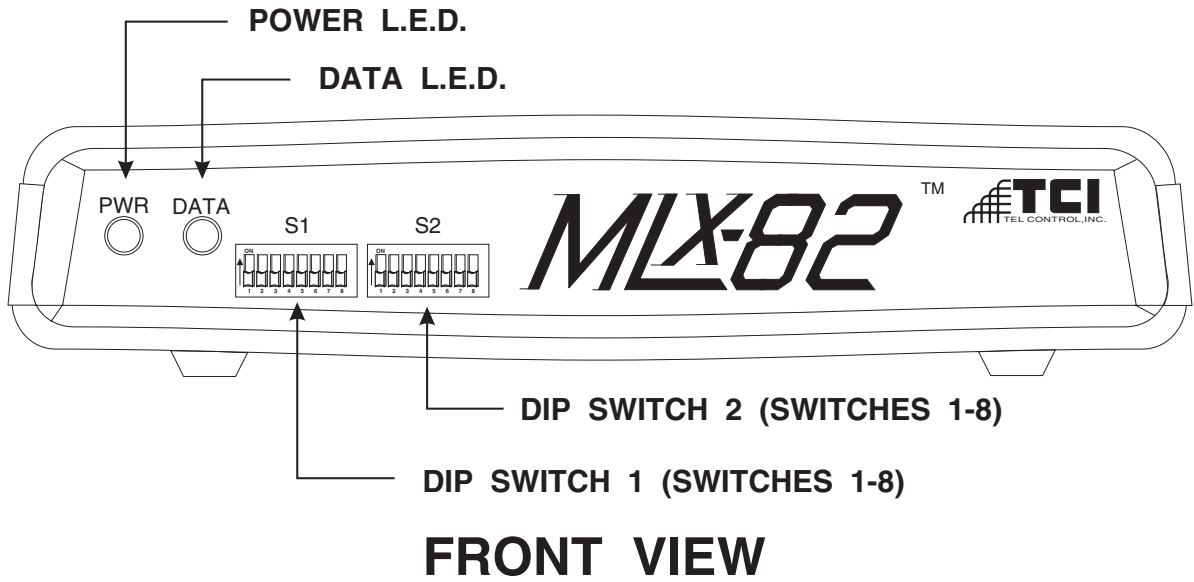
The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

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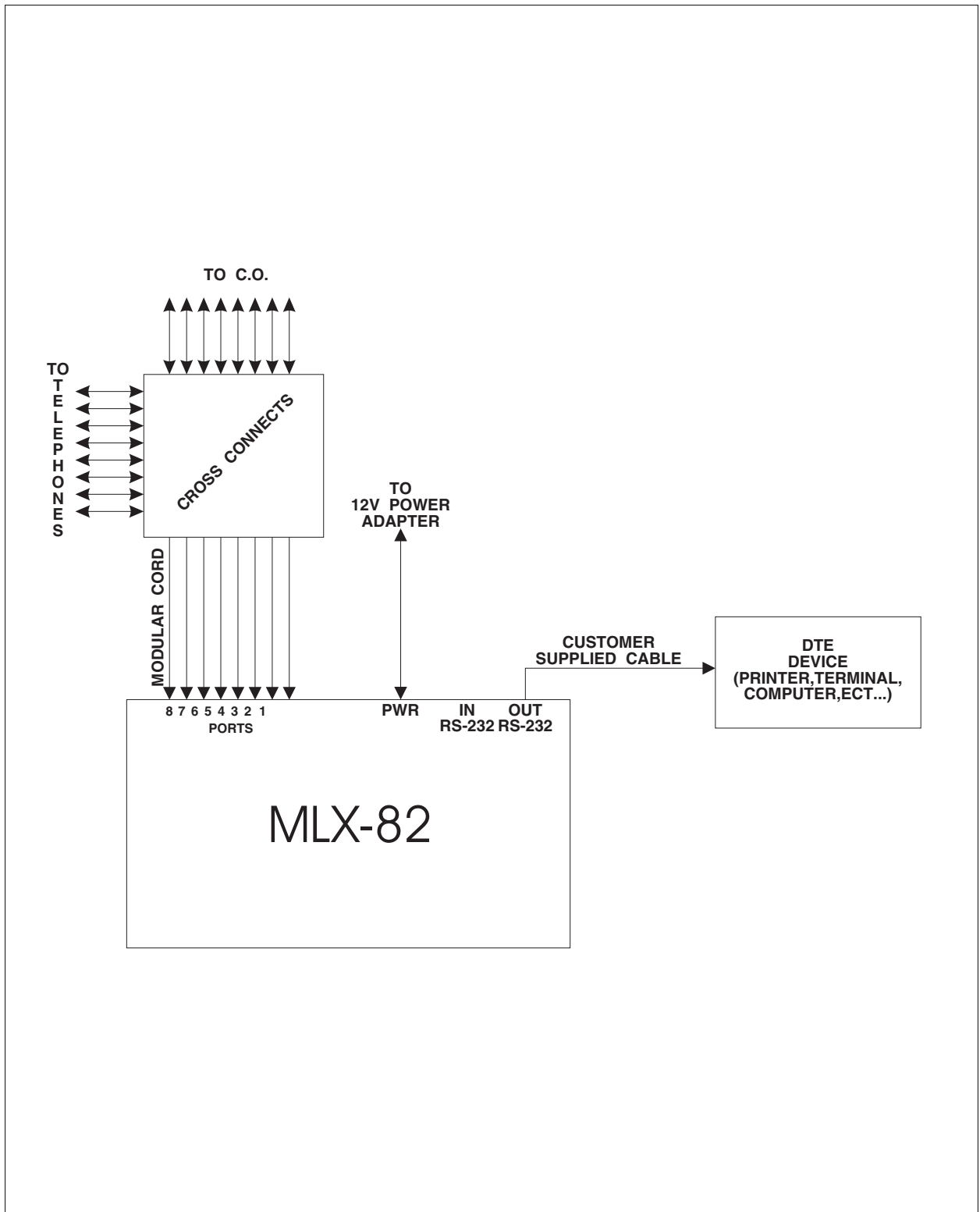
## 1. GENERAL DESCRIPTION

- 1.0.0.001** The MLX-82 receives the ICLID (Incoming Call Line Identification) data from the Telephone Company and sends the data, in ASCII RS-232C format to a printer, terminal, computer or DTE (Data Terminal Equipment) device. As an interface, the MLX-82 only receives, converts and then resends the the ICLID information to a DTE device. All or any printing or displaying of the data is done by the (customer furnished) DTE device.
- 1.0.0.002** The MLX-82 is compatible with most key systems and PBX's, and is also compatible with most of the current C.O. based message waiting services. This device is single and multiple message compatible.
- 1.0.0.003** ICLID services are currently being offered by many telephone companies as a subscribed service (check for service availability).
- 1.0.0.004** There are also Dip Switches 1 and 2 (S1 and S2) which are located on the faceplate. These Dip Switches contain eight switches each which control the Baud Rate, Data Bits, Parity, voltage and line or port specifications for configuring MLX-82 to the DTE device.
- 1.0.0.005** Ports 1 through 8 are located on the Back Panel. These are RJ-11C input jacks are connected (via modular telephone connections) directly to the incoming central office telephone lines. These PORT inputs will be parallel connections with the telephone device associated with that line.
- 1.0.0.006** The Power Supply connector is also located on the Back Panel. This is an external A.C. power adapter requiring a common AC outlet.
- 1.0.0.007** On the Back Panel there are two connectors, **RS-232 IN** and **RS-232 OUT**, these connectors enable up to eight (8) MLX-82's to be connected together and provide up to 64 lines or PORTS with a single RS-232 output.

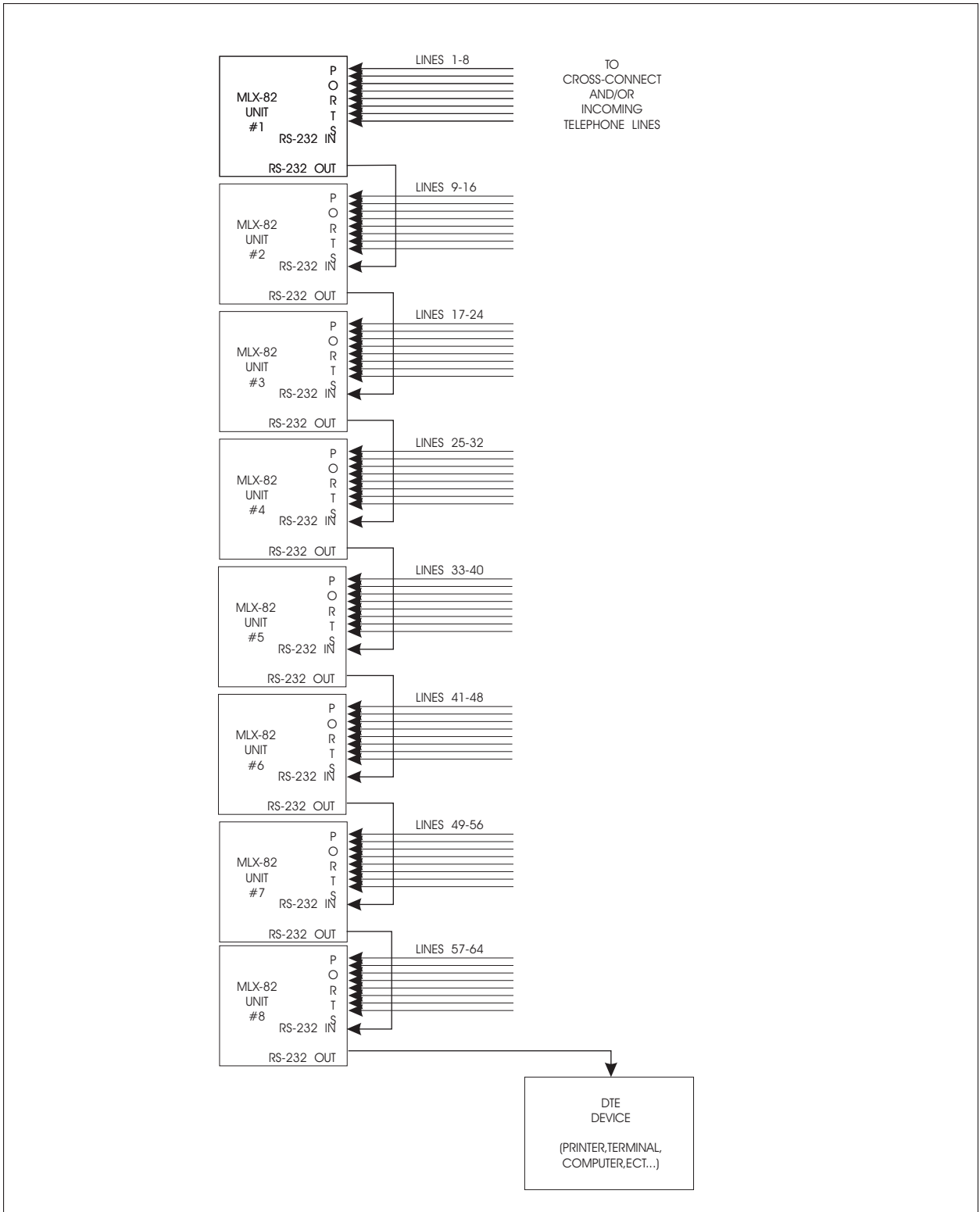
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## 2. DETAILED DESCRIPTION

- 2.0.0.001** The MLX-82 receives the ICLID data from the local telephone company and converts this information into ASCII, RS-232C format. After converting the data, the information is then transmitted out the **RS-232 OUT** connection (**J2**).
- 2.0.0.002** Calls are received via any of the eight RJ-11C input jacks (PORTS 1-8). The modular connections are connected directly to the incoming central office telephone lines in parallel with the telephone, Key System or PBX (see Figure 1, Page 2).
- 2.0.0.003** Upon receiving the data, the MLX-82 stamps the incoming ICLID information with the port number and then converts it to ASCII, RS-232. After converting the data the information is sent to the **RS-232 OUT** connection. The MLX-82 will indicate that data has been received only if a DTE device is connected to the **RS-232 OUT** port. The "DATA" L.E.D. will indicate the unit is attempting to send data to the **RS-232 OUT** port.
- 2.0.0.004** After the data has been transmitted to the DTE device, it will be up to the user to apply the data in any fashion required. This may include purchasing or writing a software program to use this data with a data base or computer. However, it is not required to have a program to use the MLX-82; the ASCII, RS-232 data format is accepted by most printers and/ or terminals. Therefore, the MLX-82 can be connected directly to a DTE device, and the data will be readable.



**FIGURE 1**  
**MLX-82 CONFIGURATION**



**FIGURE 2**  
**MULTIPLE MLX-82's**

## 2.1. CONNECTIONS

### NOTE

*The RS-232 OUT connector pin 7 (CTS input) must be pulled active (High) for the MLX-82 to turn on its "DATA" L.E.D. when receiving Caller ID information from the telephone line.*

**2.1.0.001** The RS-232 OUT (9 pin) "D"-sub connector is configurable for most DTE devices, using a cable furnished (or built) by the end user. The baud rate, parity, data bits and handshake protocol are all user selectable via external Dip Switches (S1 & S2).

**2.1.0.002** When only one MLX-82 is used, the RS-232 OUT connection will connect directly to the DTE device and the RS-232 IN connection will be unused.

**2.1.0.003** An Input RS-232C connection (RS-232 IN) is also provided. This connection allows up to eight (8) MLX-82's to be "multiplied" together to provide up to sixty-four (64) lines or ports, with one (1) RS-232C output.

**2.1.0.004** When multiple MLX-82's are connected together, the RS-232C IN connector will not be used for the first MLX-82 (Unit #1) or Ports 1-8. However, the RS-232C IN connector will be used for all other units (2-8). Refer to Figure 2, Page 3.

Unit #2 will house Ports 9-16.

Unit #3 will house Ports 17-24.

Unit #4 will house Ports 25-32.

Unit #5 will house Ports 33-40.

Unit #6 will house Ports 41-48.

Unit #7 will house Ports 49-56.

Unit #8 will house Ports 57-64.

**2.1.0.005** For ease of installation, the RS-232 OUT to RS-232 IN cable (for multiplying units together) is a straight (1 to 1) cable (see Figure 3, Page 5). However, the RS-232 OUT to DTE device cable will need to be constructed according to the compatibility requirements of the DTE device (i.e. input connector and signal pins).

**2.1.0.006** Signal assignments for the RS-232C IN connector are listed in Table 1 below. The input/output designations are in relationship to the MLX-82.

MLX-82's RS-232 IN CONNECTOR PIN ASSIGNMENTS		
PIN NUMBER	SIGNAL NAME	INPUT/ OUTPUT
2	RXD Receive Data	Input
5	SG Signal Ground	-
7	CTS Clear To Send	Output
8	RTS Request To Send	Input
9	<b>BUSY</b> (USED ONLY FOR THE RS-232 OUT TO RS-232 IN CABLE)	Input

TABLE 1

**2.1.0.007** Signal assignments for the RS-232C OUT connector are listed in Table 2, page 6. The input/output designations are in relationship to the MLX-82.

**2.1.0.008** Figure 4 on page 5, shows the connector pin connections for constructing a RS-232 OUT to DTE device cable when using a 25 pin "D"-sub connector. The pin connections shown should work in most applications involving a terminal or P.C.. However, always consult the manual for the DTE device before constructing a cable.



MLX-82's RS-232 OUT CONNECTOR PIN ASSIGNMENTS		
PIN NUMBER	SIGNAL NAME	INPUT/ OUTPUT
1	CD Carrier Detect	Output
2	TXD Transmit Data	Output
5	SG Signal Ground	-
6	DTR Data Terminal Ready	Output
7	CTS Clear To Send	Input
8	RTS Request To Send	Output
9	<b>BUSY</b> (USED ONLY FOR THE RS-232 OUT TO RS-232 IN CABLE)	Output (Input for the RS-232 IN connector)

TABLE 2

## 2.2. DIP SWITCH

### 2.2.1. DIP SWITCH 1 - (S1)

**2.2.1.0.01** S1, switches 1-8, are used to select the signaling protocol of the **RS-232 OUT** connector. These switches will assist in matching the MLX-82's signals with that of the DTE device. Refer to the manual of the DTE device before configuring S1, switches 1-8. Refer to Figure 5.

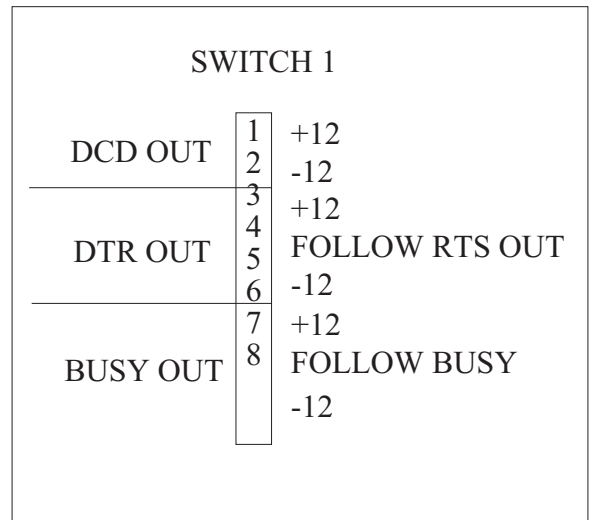


FIGURE 5

Switches 1 **ON** and 2 **OFF** places a +12V continuously out on the DCD OUT lead, Pin 1 of the 9 pin RS-232C OUT "D"- sub connector.

Switches 1 **OFF** and 2 **ON** places a -12V OUT continuously on the DCD OUT lead, Pin 1 of the 9 pin RS-232C OUT "D"-sub connector.

**Switches** 1 **OFF** and 2 **OFF** disables DCD output. This is the default setting from the factory.

Switches 1 **ON** and 2 **ON** - **WARNING, NOT A VALID SELECTION.** May cause damage to the equipment or the equipment not to function.

**Switches** 3, 4 and 5 **OFF**; disables DTR OUT for Pin 6 of the 9 pin RS-232C OUT D sub connector. This is the default setting from the factory.

- Switches 3 **ON**, 4 **OFF** and 5 **OFF**; Places a +12V OUT continuously on Pin 6 of the 9 pin RS-232C OUT D sub connector.
- Switches 3 **OFF**, 4 **ON**, 5 **OFF**; will force DTR OUT (Pin 6) to follow RTS (Pin 8) of a 9 pin RS-232C OUT D sub connector.
- Switches 3 **OFF**, 4 **OFF** and 5 **ON**; will place a -12V OUT continuously on Pin 6 of the 9 pin RS-232C OUT 'D'-sub connector.
- Switches 3, 4 and 5 **ON**; **WARNING, INVALID SWITCH SETTING**, May cause damage to equipment or cause equipment to be inoperable.
- Switches 3 **ON**, 4 **ON** and 5 **OFF**; **WARNING, INVALID SWITCH SETTING**, May cause damage to equipment or cause equipment to be inoperable.
- Switches 3 **OFF**, 4 **ON** and 5 **ON**; **WARNING, INVALID SWITCH SETTING**, May cause damage to equipment or cause equipment to be inoperable.
- Switches 6, 7 and 8 **ON**; **WARNING, INVALID SWITCH SETTING**, May cause damage to equipment or cause equipment to be inoperable.
- Switches** 6, 7 and 8 **OFF**; is no Busy OUT output on pin 9 of the 9 pin RS-232C OUT "D"- sub connector. This is the default setting from the factory.
- Switches 6 **ON**, 7 **OFF** and 8 **OFF**; Places a +12V OUT on the Busy OUT lead of the 9 pin RS-232C OUT "D"-sub connector.
- Switches 6 **OFF**, 7 **ON** and 8 **OFF**; is a Busy out on Pin 9 RS-232C OUT will follow a Busy IN lead (Pin 9 of RS-232C IN connector). Switch 7 should be on when multipling units together.
- Switches 6 **OFF**, 7 **OFF** and 8 **ON**; will place a -12V OUT busy OUT lead on Pin 9 of RS-232C OUT connector continuously.

## **WARNING**

*If two or more switches are ON for Dip Switch 1, switches 6, 7 and 8, then damage may be caused to the equipment or the equipment may become inoperable.*

### **2.2.2. DIP SWITCH 2 (S2)**

**2.2.2.01** These switches are divided into two major functions. The first is for switches 1-5 which are selected to configure the MLX-82 to the DTE device (Baud Rate, Data Bits and Parity). The second is for switches 6-8, which are used to select the MLX-82's Unit number when multiple units are connected in series. If only one unit is used, these switches (6-8) should be set for UNIT #1.

#### **2.2.2.1. BAUD RATE**

**2.2.2.1.01** The Baud rate is selectable between 1200, 2400, 4800 and 9600 when sending data. The Baud rate is specified by the settings of Switches 1 and 2 on Dip Switch 2 (S2).

SWITCH 1	SWITCH 2	BAUD RATE
OFF	OFF	1200
ON	OFF	2400
OFF	ON	4800
ON	ON	9600

**TABLE 3  
BAUD RATE SELECTION**

### 2.2.2.2. DATA BITS

**2.2.2.2.01** The number of Data Bits being sent is specified by the **ON** or **OFF** position of S2, Switch 3.

SWITCH 3	DATA BITS
OFF	7
ON	8

**TABLE 6**  
**DATA BIT SELECTION**

### 2.2.2.3. PARITY

**2.2.2.3.01** The **ON** and **OFF** position of Dip Switch 2 (S2), switches 4 and 5 specify Parity; *NONE*, *ODD* or *EVEN*.

SWITCH 4	SWITCH 5	PARITY
OFF	OFF	NO PARITY
ON	OFF	ODD
OFF	ON	EVEN
ON	ON	EVEN

**TABLE 4**  
**PARITY SELECTION**

**2.2.2.3.02** When there are 2 or more units (8 maximum) connected together, the incoming call path will be specified by the **ON/OFF** position of Switches 6 through 8 on Dip Switch 2 (S2).

SWITCH 6	SWITCH 7	SWITCH 8	UNIT NUMBER
OFF	OFF	OFF	1
ON	OFF	OFF	2
OFF	ON	OFF	3
ON	ON	OFF	4
OFF	OFF	ON	5
ON	OFF	ON	6
OFF	ON	ON	7
ON	ON	ON	8

**TABLE 5**  
**UNIT NUMBER SELECTION**

## 2.3. OPTIONS AND FEATURES

### 2.3.1. COMPATIBILITY

**2.3.1.0.01** The MLX-82 can be used with a printer, terminal, personal computers, etc. (DTE device), and is also compatible with most C.O. based message waiting services equipped with an RS-232 input port.

**2.3.1.0.02** A MLX-82 has the ability to send data in single and multiple message formats.

### 2.3.2. L.E.D.'s and CONNECTORS

**2.3.2.0.01** The MLX-82 is equipped with two green L.E.D.'s (Light Emitting Diodes) located on the front panel labeled **PWR** and **DATA**. When power is applied to the MLX-82, the green power (**PWR**) L.E.D. will illuminate. The **DATA** L.E.D. will flash **ON** as data is sent from the MLX-82 to the DTE device. The DTE device must be connected and online before the MLX-82 "DATA" L.E.D. will illuminate to indicate data is being sent.

**2.3.2.0.02** The **RS-232 OUT** connector (located on the Back Panel) uses a standard cable with a 9-pin, "D"-sub connector connected as a DCE device. This connection goes to the DTE device (if only one MLX-82 is used) or the next MLX-82's **RS-232 IN** connector (if more than one unit is "multiplied"). Also, if the MLX-82 is the last unit in the sequence, then the **RS-232 OUT** connection will go the DTE device. Refer to Figure 2, Page 3.

**2.3.2.0.03** A **RS-232 IN** "D"-sub connector (also located on the back panel) enables the MLX-82 to be connected in sequence with up to eight units, for a maximum of sixty-four possible ports. This connector will only be used if multiple MLX-82's are connected together.

**NOTE**

**THE RS-232C "D"-SUB CONNECTORS  
AND CABLING WILL BE SUPPLIED BY  
THE CUSTOMER.**

### 2.3.3. DATA SENT

**2.3.3.0.01** Data is sent between the first and second ring cycles. The data received (202A modem tones) will be converted into the standard ASCII, RS-232 format. After the data is formatted, it is sent to the **RS-232 OUT** port.

**NOTE**

**IF HANDSHAKING IS PROLONGED,  
DATA WAITING TO BE RECEIVED  
WILL BE LOST.**

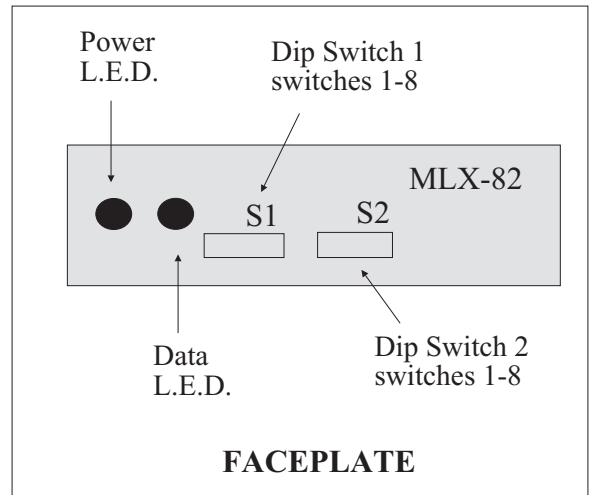
### 2.3.4. DATA RECEIVED

**2.3.4.0.01** After transmitting data in the specified format, the screen and/or printer will show the following information:

### 2.3.5. L.E.D.'s

**Power (PWR) GREEN L.E.D.** - This L.E.D. illuminates when power is applied to the MLX-82.

**Data (DATA) GREEN L.E.D.** - This L.E.D. illuminates when data is being sent from the MLX-82 to the DTE device.



**FIGURE 7**

### 2.3.6. CONNECTORS

**POWER** - This is an external power supply adapter connection.

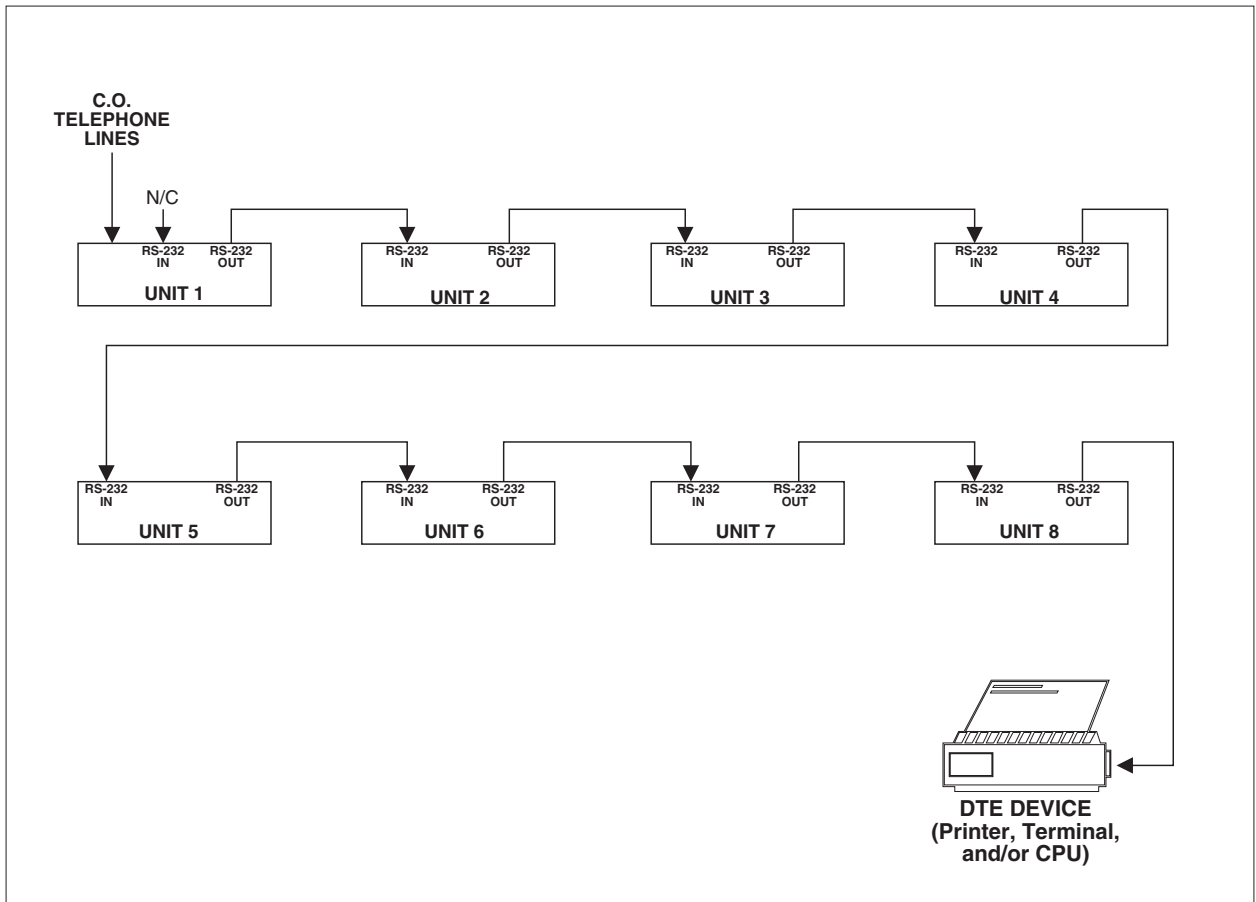
**PORTS 1-8** - These are RJ11 phone jacks which connect directly with the central office telephone lines.

**RS-232 IN** - Connect the **RS-232 OUT** connector of the first unit, to the **RS-232 IN** connector of the second or next unit using a standard (1:1) 9 pin "D"-sub connector.

**RS-232 OUT** - This connector is used to connect the MLX-82 to the DTE device. If more than one unit is installed, cable from the **RS-232 OUT** connector of the previous unit to the **RS-232 IN** connector of the next unit in the chain (using a 1:1 cable). Connect the **RS-232 OUT** connector, of the last

PORT	DATE	TIME	PHONE NUMBER	NAME
08	3/24	9:15 AM	OUT OF AREA	
01	3/24	9:16 AM	1-205-881-4000	Jane Doe
03	3/24	10:03 AM	881-4000	Joe Smith
02	3/25	10:03 AM	PRIVATE	
05	3/25	10:06 AM	555-1234	John Doe
04	3/27	8:00 PM	1-205-555-1234	Sam Jones

**FIGURE 6**  
**SAMPLE DATA OUTPUT**



**FIGURE 8**  
**MULTIPLE OF EIGHT MLX-82's**

unit, directly to the DTE device (this will be the cable constructed to connect specifically between the MLX-82 and the DTE device). Refer to Figure 9.

### 2.3.7. MESSAGE FORMAT AND DATA OUTPUT

**2.3.7.0.01** The MLX-82 receives the standard ICLID format from the central office, formats the data, and sends it to the **RS-232 OUT** port. This data is sent (by the telephone company) between the first and second ring cycles to the MLX-82.

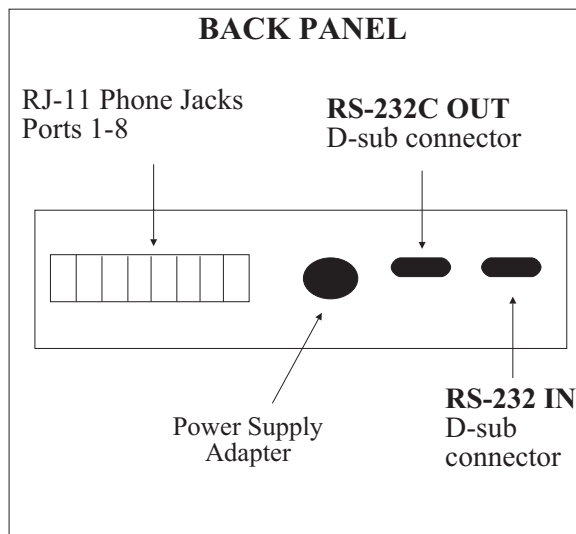


FIGURE 9

**2.3.7.0.02** The Caller Identification information is automatically displayed on the terminal and/or printed in the format shown in Figure 10. The Port number indicator will be the only part of the data supplied by the MLX-82. All other information is supplied by the telephone company.

**Port #** - This tells the operator what line is being seized for a specific call. Sent by the MLX-82.

**Date** - Records date call was made. Sent by the local Telco.

**Time** - Records time (Hour: Minutes: AM/PM) call was received. Sent by the local Telco.

**Phone Number** - Displays phone number of calling party (maximum of 11 digits displayed). Sent by the local Telco.

**Long Distance Indicator** - If the call originated from another area code, an "L" may appear in this column, indicating a Long Distance call. Sent by the local Telco.

**Name** - The name of the calling party will appear in this column (up to 15 characters) and is case sensitive. This field is used only where Multiple Message format and "Call Name Delivery" service is available and the name is sent by the local Telco.

PORT	DATE	TIME	PHONE NUMBER	NAME
08	3/24	9:15 AM	OUT OF AREA	
01	3/24	9:16 AM	1-205-881-4000	Jane Doe
03	3/24	10:03 AM	881-4000	Joe Smith
02	3/25	10:03 AM	PRIVATE	
05	3/25	10:06 AM	555-1234	John Doe
04	3/27	8:00 PM	1-205-555-1234	Sam Jones

FIGURE 10  
SAMPLE DATA OUTPUT

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## 3. INSTALLATION

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### 3.1. ITEMS REQUIRED

- AC Power Supply (TC-3937)
- One internal fuse: 1 amp, in-line.
- RS-232 **IN** Cable(s), 1 per added unit (*user supplied*).
- One Small flat-head screwdriver (*user supplied*).
- One Printer/Terminal or PC Computer (DTE Device) user supplied.
- A Modular cord for each incoming Telephone Line (*user supplied*).
- For each MLX-82 in sequence, one AC outlet is required (*e.g.* if eight units are being used, 8 AC Power outlets are required). There must be plenty of distance between the outlets for the power adapters.

**3.1.0.0.01** Unpack the unit and verify that the Power Adaptor has been included.

### 3.2. LOCATION

**3.2.0.0.01** The MLX-82 is the size of a large modem which can be placed on a table top or placed next to the DTE Device.

- Construct **RS-232 OUT** cable using cabling information on page 5.
- The **RS-232 OUT** cable should be no longer than 50 feet when using RS-232 shielded cable.
- Plug the 9 pin, **RS-232 OUT** cable into the **RS-232 OUT** connector and the remaining end into the DTE device.
- Secure using appropriate hardware.
- Plug telephone Line 1 into **PORT 1**, Line 2 into **PORT 2**, Line 3 into **PORT 3**, etc. These should be parallel connections.
- Plug the Power Supply adapter into a convenience outlet 120V AC. At this time the Power (**PWR**) L.E.D. should illuminate.

### 3.3. INSTALLATION FOR 9 THROUGH 64 LINES

**3.3.0.0.01** One **RS-232 OUT** cable is required from the last MLX-82 in the multiple to the DTE Device (Printer, Terminal and/or CPU). A cable is also needed per each added unit from **RS-232 OUT** to **RS-232 IN** connectors to the next MLX-82, in sequence.

**3.3.0.0.02** Connect a cable from the **RS-232 OUT** connector of the 1<sup>st</sup> MLX-82 unit to the **RS-232 IN** connector on 2<sup>nd</sup> MLX-82 unit. Continue connecting in sequence as required. (Maximum of 8 units). Refer to Figure 2, Page 3.

**Secure using appropriate hardware.**

**3.3.0.0.03** Plug the C.O. lines into the appropriate PORT connection (set S2, switches 6, 7 and 8 on each unit for the correct board number). Connect C.O. lines ...

1- 8 to PORTS 1-8 of the 1<sup>st</sup> unit.  
9-16 to PORTS 1-8 of the 2<sup>nd</sup> unit.  
17-24 to PORTS 1-8 of the 3<sup>rd</sup> unit.  
25-32 to PORTS 1-8 of the 4<sup>th</sup> unit.  
33-40 to PORTS 1-8 of the 5<sup>th</sup> unit.  
41-48 to PORTS 1-8 of the 6<sup>th</sup> unit.  
49-56 to PORTS 1-8 of the 7<sup>th</sup> unit.  
57-64 to PORTS 1-8 of the 8<sup>th</sup> unit.

**3.3.0.0.04** See Figure 8, Page 10.

**3.3.0.0.05** Plug the AC Power Supply into a convenience outlet. The Power (**PWR**) L.E.D. for each unit should illuminate.

### 3.4. GROUNDING

<p style="text-align: center;"><b><u>WARNING</u></b></p> <p style="text-align: center;"><b>Your computer must be properly Grounded. Failure to properly ground your computer may result in the intermittent operation of the unit.</b></p> <p style="text-align: center;"><b>DO NOT USE A.C. ISOLATION PLUGS.</b></p>
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**3.4.0.001** The MLX-82 derives its ground through the serial data cable. It is important the computer be properly grounded. A proper ground eliminates noise, and provides proper lightning protection.

**3.4.0.002** The ground obtained through a 3-prong A.C. outlet and power cord to your computer will be sufficient, providing the A.C. outlet has been properly installed.

### 3.5. TESTING

- Go Off-Hook from an outside test line and dial the telephone number of the line to be tested.
- Between the first and second ring cycles, the **DATA** L.E.D. will flash as the ICLID information is being sent to the DTE device.
- Monitoring the DTE device, the data (as shown in Figure 10, Page 11) will be displayed and/or printed.
- Hang-up the test line and then repeat the process for the next line to be tested. Do this for all lines connected.

### 3.6. TROUBLE SHOOTING

**If the Power (PWR) L.E.D. does not illuminate, check the following:**

- ❑ Connection of the external Power Supply to the MLX-82. Ensure that it is securely plugged in.
- ❑ Check the AC convenience outlet for power.
- ❑ Try to place a call. If call/data is delayed, lost or if unit does not respond (Power (PWR) L.E.D. illuminates) the unit and/or L.E.D. is defective and the unit should be returned for repair.

**If the data is not printed and/or displayed at the DTE device (printer, terminal, CPU), check the**

**Power (PWR) and data (DATA) L.E.D.'s for illumination and flashing. If illumination is not occurring, see section on Power (PWR) and data (DATA) L.E.D.'s.**

- ❑ Check C.O. Line to **PORT** positions connections.
- ❑ Check **RS-232 OUT** cable connection to DTE device.
- ❑ Ensure proper Dip Switch selections are made for baud rate, data bits and Parity. Do these selections conform to the DTE device specifications?
- ❑ If multiple units are installed, check each **RS-232 OUT** cable to each **RS-232 IN** connection.
- ❑ Check construction of cable for correct pin outs according to Table 1, Page 4.

**If information at DTE device is "GARBLED", check the baud rate switch selections for the MLX-82.**

- ❑ Check the parity and data bit selections for the DTE device and ensure that they are selected in accordance with that of the MLX-82.
- ❑ When 1 of the 8 lines is not functioning, check the data (DATA) L.E.D. to see if it flashes when data is sent.
- ❑ Check the lines going into all multiplied MLX-82's. The units 2-8 should be specified as 2-8 (See Dip Switch selections for proper settings).

**The lines for the last MLX-82 unit will transmit to the DTE device but, the MLX-82's preceding the last unit will not transmit to the DTE device.**

- ❑ Check the cable connection from the previous MLX-82 (**RS-232 OUT**) to the next MLX-82 (**RS-232 IN**) connector in sequence.



NUMBER OF CHARACTERS FIELD				TOTAL NUMBER OF CHARACTERS = 72								
(2)	(5)	(5)	(5)	(8)	(5)	(14)	(5)	(1)	(5)	(15)	(1)	(1)
LIN E#	SPACE FILLED	DATE	SPACE FILLED	TIME	SPACE FILLED	PHONE NUMBER	SPACE FILLED	LD IND	SPACE FILLED	NAME	CR	LF
01			MESSAGE WAITING							(Name can be case sensitive)	ODH	OAH
02			MESSAGE RETRIEVED								ODH	OAH
03			INVALID DATA								ODH	OAH
14		1/07		12:56 PM		1-205-881-4000					ODH	OAH
25		2/14		4:00 PM		205-881-4000					ODH	OAH
36		4/01		10:45 AM		881-4000				John Doe	ODH	OAH
47		10/10		3:57 PM		PRIVATE					ODH	OAH
58		11/25		2:30 PM		OUT OF AREA					ODH	OAH
64		12/15		7:35 AM		1-205-881-4000		L			ODH	OAH

**TABLE 6**  
**MLX-82 PROGRAMMING CHART**  
**FOR SINGLE OR MULTIPLE MESSAGE FORMATS**

## FCC REQUIREMENTS

This equipment complies with Part 68 of the FCC Rules. On the underside 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, provide this information to your telephone company.

1. The Federal Communications Commission (FCC) has established Rules which permit this device to be directly connected to the telephone network. Standardized jacks are used for these connections. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. (Contact your state public utility commission or corporation commission for information.)
2. If this device is malfunctioning, it may also be causing harm to the telephone network; this device should be disconnected until the source of the problem can be determined and until repairs have been made. If this is not done, the telephone company may temporarily disconnect service. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.
3. The telephone company may make changes in its technical operation and procedures; if such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.
4. If the telephone company requests information on what equipment is connected to their lines, inform them of the following:

Port ID	REN/SOC	FIC	USOC
TC-1082	0.0B/9.0F	02LS2, 02GS2	RJ11C

The ringer equivalence (REN) is used to determine how many devices can be connected to your telephone line. In most areas, the sum of the REN's of all devices on any one line should not exceed five (5.0). If too many devices are attached, they may not ring properly.

## SERVICE REQUIREMENTS

5. In the event of equipment malfunction, all repairs should be performed by our Company or an authorized agent. It is the responsibility of users requiring service to report the need for service to our Company or to one of our authorized agents. Service can be obtained at:

**TEL-CONTROL, Inc.**  
**P.O. Box 4087**  
**Huntsville, Al 35815-4087**

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR ANY TYPE OF MOISTURE.**

## **RADIO INTERFERENCE**

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY TCI, INC. WILL VOID THE USER'S AUTHORITY TO OPERATE THIS DEVICE.**

The user may find the following booklet prepared by the Federal Communications Commission helpful:

### **HOW TO IDENTIFY AND RESOLVE RADIO-TV INTERFERENCE PROBLEMS**

This booklet is available from the  
U.S. Government Printing Office, Washington, D.C. 20402,  
Stock number 004-000-00345-4.