CDSU–SR
CDSU–MR2

CDSU–SR (MD270A)
CDSU–MR2 (MD271A)

INSTALLATION AND OPERATION MANUAL

FEDERAL COMMUNICATIONS COMMISSION

RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment generates, uses and can radiate radio frequency energy and if not installed and used properly, that is in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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— Figures and Tables —

1.0   SPECIFICATIONS

CDSU–SR (MD270A)

Standards –	CCITT V.35 for CPE
Speed –	V.35 interface: 56 Kbps
	DDS: 56 Kbps
FCC Registration –	1KGUSA-61472-DD-N
Diagnostics –	ST (self test), DL (digital loop),
	LL (local loop), RL (remote loop)
Interface –	V.35/Synchronous
Connectors –	(1) 34-pin M block;
	(1)RJ-48S
Power –	117 VAC +/-10%, 60 Hz, 12 watts
Size –	2.5"H x 8"W x 6.25"D (6.4 x 20.3 x 15.9 cm)
Weight –	1 lb. 5.5 oz. (.61 kg)

CDSU–MR2 (MD271A)

Protocol –	V.35: Synchronous; RS232: Asynchronous/synchronous
Speed –	V.35: 56 Kbps
	RS232 (async or sync): 1200, 2400, 4800, 9600, 19,200, 38,400 bps
Operation –	Full Duplex
FCC Registration –	1KGUSA-61472-DD-N
Diagnostics –	ST (self test), DL (digital loop),
	LL (local loop), RL (remote loop)
Connectors –	(1) 34-pin M block; (2) DB25S–female;
	(1)RJ-48S
Power –	117 VAC +/-10%, 60 Hz, 12 watts
Size –	2.5"H x 8"W x 6.25"D (6.4 x 20.3 x 15.88 cm)
Multiplexor Type –	Time-division
User Channels –	2
Speed –	Channel: 1200, 2400, 4800, 9600, 19,200, 38,400 bps
	Composite: 56 Kbps
Data Format –	Asynchronous/synchronous
Interface –	Channels: RS232; V.35
	Composite: DDS-Direct Connect
Connectors –	Channels: (2) DB25S–female; (1) 34-pin M block;
	Composite: (1)RJ-48S
Power –	117 VAC +/-10%, 60 Hz, 12 watts
Size –	2.5"H x 8"W x 6.25"D (6.4 x 20.3 x 15.9 cm)
Weight –	1 lb. 7.5 oz. (.67 kg)

2.0   INTRODUCTION

Both the MD270A and the MD271A are engineered and designed using LSI (large scale integration) technology. The circuits for each unit are integrated into a small number of semiconductor chips, which means fewer parts used in production, a lower power consumption by the unit when in use (and less heat generated), and a small chassis.

The results: fewer parts mean fewer chances for breakdowns; low power consumption saves you money in energy costs; less heat generated reduces stress on this unit and other equipment nearby; and the size of the unit makes it a convenient component in your telephone closet.

2.1   The CDSU–SR (MD270A)

The CDSU–SR is a high-performance, inexpensive CSU/DSU for 56 Kbps DDS lines. This device provides a V.35 interface for customer premise equipment, and it can be used in point-to-point and multipoint synchronous applications. The MD270A provides line conditioning functions and a selection of diagnostics to help maintain your entire DDS link.

- Use the CDSU–SR to establish the link between your DTE(s) and remote CPE (customer premise equipment, like multiplexors, PBXs, etc.)

- Send data in synchronous format at the full rate of 56 Kbps

2.2   Benefits and Features of the CDSU–SR (MD270A)

- **Two of the fastest data transmission standards (CCITT V.35 and DDS).**
The CDSU–SR provides a V.35 interface for customer premise equipment, like synchronous host computers. That enables you to send data from the computer to the CDSU–SR at 56 Kbps. The CDSU–SR provides all of the clock buffering and data synchronization required to ensure accurate data transmission.

- **Run your DDS circuit at peak performance and be assured of accurate signals.**
The CDSU–SR features adaptive distance compensation circuitry that auto-matically analyzes your DDS link and compensates for signal distortions. Distortions are cleaned out of the signal and it is restored to its proper form.

- **Test and troubleshoot every portion of your DDS link.**
The CDSU–SR comes complete with diagnostics: Self Test, Digital Loop, Local Loop and Remote Loop. These built-in test functions, including an Internal Test Pattern Generator, enable you to check your entire DDS link for malfunctioning circuits: the

unit itself, the unit's connection to your on-site DTE, and the connection between your local and remote units. The CDSU–SR also responds to Bell-defined CSU/DSU loopbacks generated from the TELCO office.

- **Full compatibility ensures proper data transmission.**
The MD270A performs all Bell-compatible encoding and decoding functions, system timing and the proper interfacing for your DDS hookup. Your DDS link complies with all of the accepted standards for DDS transmissions.

- **The right connectors for your applications.**
The CDSU–SR has the connectors to make your in-house connections – conveniently located on the rear panel: one RJ-48 jack (DDS interface) and one 34-pin M block (V.35 interface). (See Figure 3-1.)

2.3   The CDSU–MR2 (MD271A)

The CDSU–MR2 is a CSU/DSU with a built-in time-division multiplexor for DDS lines. This device splits a 56 Kbps DDS data stream into two independent sub-channels, offers a variety of data speeds for both sub-channels, and allows them to transmit data in either asynchronous or synchronous format.

The CDSU–MR2 can also be used as a basic CSU/DSU, using the full capacity of the 56 Kbps digital line for transmission of synchronous data.

This product provides both V.35 and EIA RS232 interfaces for the customer premise equipment, and it can be used in point-to-point and multipoint applications (the split-channel mode operates only in point-to-point applications).

The CDSU–MR2 provides line conditioning functions and a selection of diagnostics to help maintain and troubleshoot your entire DDS link.

You can make more efficient use of your leased digital line and your TELCO equipment with the MD271A because:

- You can operate the unit in three different modes (one channel/one speed; two channels, varying speeds per channel; and two channels, matching speeds)

- You can send data in asynchronous and/or synchronous format

2.4 Benefits and Features of the CDSU–MR2 (MD271A)

- **Improve the utility of your DDS line.**
The CDSU–MR2 provides fully-compatible CCITT V.35 operation for a single 56 Kbps DDS line. It also features a built-in multiplexor that splits the line into two separate RS232-compliant sub-channels, allowing you to send two different signals across the same DDS line. The CDSU–MR2 provides all of the clock buffering and data synchronization required to ensure accurate data exchange.

- **Send async data through this CSU/DSU and out across your DDS line**.
The CDSU–MR2 features two built-in interface converters (one for each sub-channel) that enable the unit to accept asynchronous data for transmission over the DDS line to a remote asynchronous device. Motorola-built data set interface (DSI) chips serve as the sync-to-async converters. The DSI chips:
    – allow the CDSU–MR2 to accept asynchronous data through either of the two DB25 connectors (RS232 interface),
    – convert the async data to sync data format, and then
    – transmit the data across DDS lines.
  The sync data arrives at the remote site, enters a companion CDSU–MR2, is reconverted into asynchronous format, and passed along through the remote unit's DB25 connector to an async host computer or computer terminal.
  The CDSU–MR2 does not need to use oversampling techniques to handle transmission of async data. By using proper data streaming techniques, this unit reduces the risk of error during data transmission. It also allows the use of the higher end async data speeds (19.2 Kbps and 38.4 Kbps) which cannot be used when you apply oversampling to async data streams.

- **Add flexibility to your digital data communications.**
User-programmable options enable you to custom-configure the sub-channels:
    – One channel (V.35 interface)/one speed (56 Kbps)
    – Two channels (RS232 interface)/different or matching speeds speeds/channel
        (1200, 2400, 4800, 9600, 19,200 or 38,400 bps)
  Both sub-channels can transmit sync or async data formats (RS232 interface) at any of the available speeds. Run one channel in sync, the other in async.

- **Run your DDS circuit at peak performance and be assured of accurate signals.**
The CDSU–MR2 features adaptive distance compensation circuitry that auto-matically analyzes your DDS link and compensates for signal distortions. Distortions are cleaned out of the signal and it is restored to its proper form.

- **Test and troubleshoot every portion of your DDS link.**
The CDSU–MR2 comes complete with diagnostics: Self Test, Digital Loop, Local Loop and Remote Loop. These built-in test functions, including an Internal Test Pattern Generator, enable you to check your entire DDS link for malfunctioning circuits: the unit itself, the unit's connection to your on-site DTE, and the connection

between your local and remote units. The CDSU–MR2 also responds to Bell-defined CSU/DSU loopbacks generated from the TELCO office.

- **Full compatibility ensures proper data transmission.**
The MD271A performs all Bell-compatible encoding and decoding functions, system timing and the proper interfacing for your DDS hookup. Your DDS link complies with all of the accepted standards for DDS transmissions.

- **The right connectors for your applications.**
The CDSU–MR2 has the connectors to make your in-house connections – conveniently located on the rear panel: one RJ-48 jack (DDS interface), one 34-pin M block (V.35 interface), and two DB25 connectors (EIA RS232 interface). See Figure 3-1.

2.5   Applications for the CDSU–SR/CDSU–MR2

#1
You have one asynchronous minicomputer and one DDS line. Install the CDSU–SR and you're ready to go. If you think you'll add DTEs to your network someday, you need a CSU/DSU that will provide standard DDS service today and be able to handle more equipment in the future; install the CDSU–MR2.

#2
You have a minicomputer and four high-end workstations at one site. You have a mainframe, some storage devices, and printer devices at another site. You need to transmit five asynchronous signals across one DDS line to the mainframe, etc. You install the CDSU–MR2 and link the minicomputer to one of the unit's RS232 ports, running data on that channel at full RS232 speed (19,200 bps). You connect the other RS232 port to a multiplexor, allowing the four workstations to share the second sub-channel. Each workstation can send data to the multiplexor), which combines the signals onto one channel at the CDSU–MR2.

2.6   Where to Begin

This chapter should have given you an understanding of the functions, capabilities and applications of the CDSU–SR and the CDSU–MR2. Now you are ready to install the unit. The first thing to do is to run the simple and quick self test described at the beginning of *Chapter 3, Installation*.

After running the initial test please be sure that the DIP switches are set properly for your particular mode of operation.

Contact your dealer for assistance if you have any questions concerning your installation that are not answered in this manual.

3.0   INSTALLATION

3.1   Initial Self Test

Follow the instructions listed below to perform the initial self test for your CDSU unit

1. PLUG THE UNIT INTO A POWER SOURCE.
   Plug the transformer into a 110 volt AC receptacle.
   Plug the coaxial transformer connector into the back of the unit.

2. Do not connect the TELCO line or terminal equipment yet.

   Observe the two groups of LEDs on the front panel of the unit. The left group monitors the interfaces, while the right group displays the test mode.

3. The INS LED should be blinking red at this point (the transformer plugged in and no lines or equipment connected). All of the LEDs in the right group should be dark. These two states are the normal condition on power-up.

4. Push the SELECT button once to place the unit in the Self Test mode. The first LED in the right group (ST) will blink red, then 5 seconds later this LED will start blinking green.

5. The MD270A/MD271A has passed the initial Self Test.

6. To complete and terminate the Self Test, push and hold the SELECT button momentarily until all of the test mode (right group) LEDs are dark.

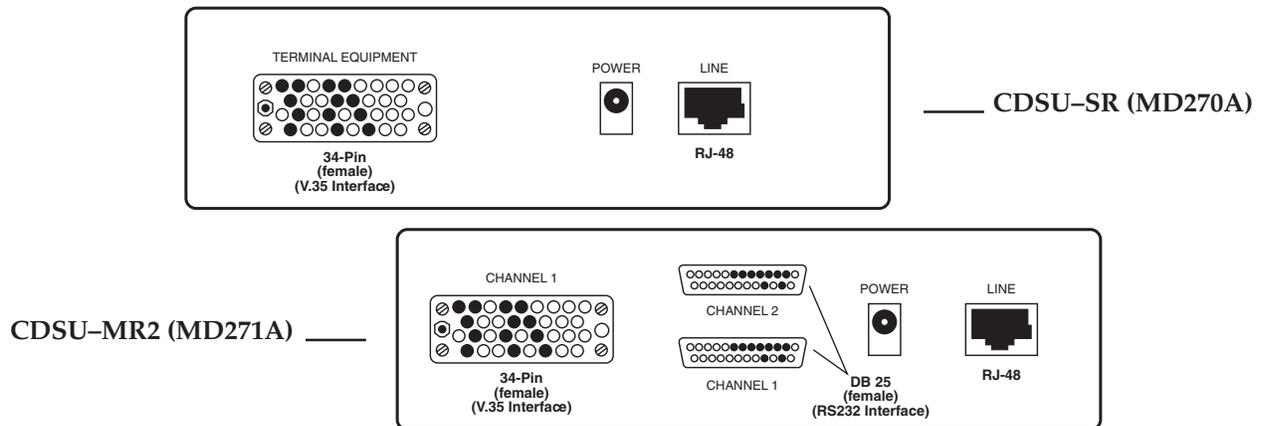The MD270A/MD271A is ready for connection to the TELCO circuit and the terminal equipment.

Figure 3-1. Rear Panel View Showing Connectors (active pins shaded black)

3.2   Installation Instructions

The installation of either of these units is a simple procedure and can be completed in minutes. There are no operator adjustments or controls necessary to install either unit. The Adaptive Distance Equalization circuitry in both units compensates for distance and line quality automatically.

Installation is simply a matter of plugging in the power transformer, connecting the terminal(s) to the terminal connector(s), selecting the proper mode of operation (MD271A only) and connecting the TELCO connector to the TELCO jack.

3.2.1   CDSU–SR (MD270A)

The CDSU–SR is supplied with the approved RJ-48s modular jack (see Figure 3-1). Your installation may have a different TELCO jack. For your information the RJ-48s is wired as follows:

- •   Transmit Pair Pins – 1 & 2
- •   Receive Pair Pins – 7 & 8

After you make the TELCO connection, your installation is complete. The INS LED will be on (illuminated) steady, thus indicating a successful installation.

3.2.2   CDSU–MR2 (MD271A)

There are three terminal connectors on the back of the CDSU–MR2 (see Figure 3-1). The 34-pin M block (V.35 interface) connector is used when a single channel, running 56KBPS speed, is selected. The two DB-25 connectors are used for sub-56KBPS rates and when the multiplexing feature is used. The top DB-25 connector is Channel 2, while the bottom connector is Channel 1.

Refer to the mode of operation description to determine how best to connect your terminal equipment. The CDSU–MR2 is supplied with the approved RJ-48s modular jack. For your information the RJ-48s connector is wired as follows:

- •   Transmit Pair Pins – 1 & 2
- •   Receive Pair Pins – 7 & 8

After you make the TELCO connection, your installation is complete. The INS LED will be on (illuminated) steady, thus indicating a successful installation when both ends are properly connected and configured.

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4.0   OPERATION

4.1   DIP Switch Settings for the CDSU–SR (MD270A)

DIP-Switch (S1) inside the unit provides limited option settings (see Figure 4-1).

S1-1   When ON provides continuous RTS (CONTINUOUS carrier mode)
        When OFF carrier is under RTS control
        (*Factory setting is* On)

S1-2   When ON unit is configured as limited distance modem
        When OFF unit runs normal for CSU/DSU service
        (*Factory setting is* Off)

S1-3   Not used

S1-4   When ON local user diagnostics are enabled
        When OFF defeats user diagnostics (TELCO and remote diagnostics still work)
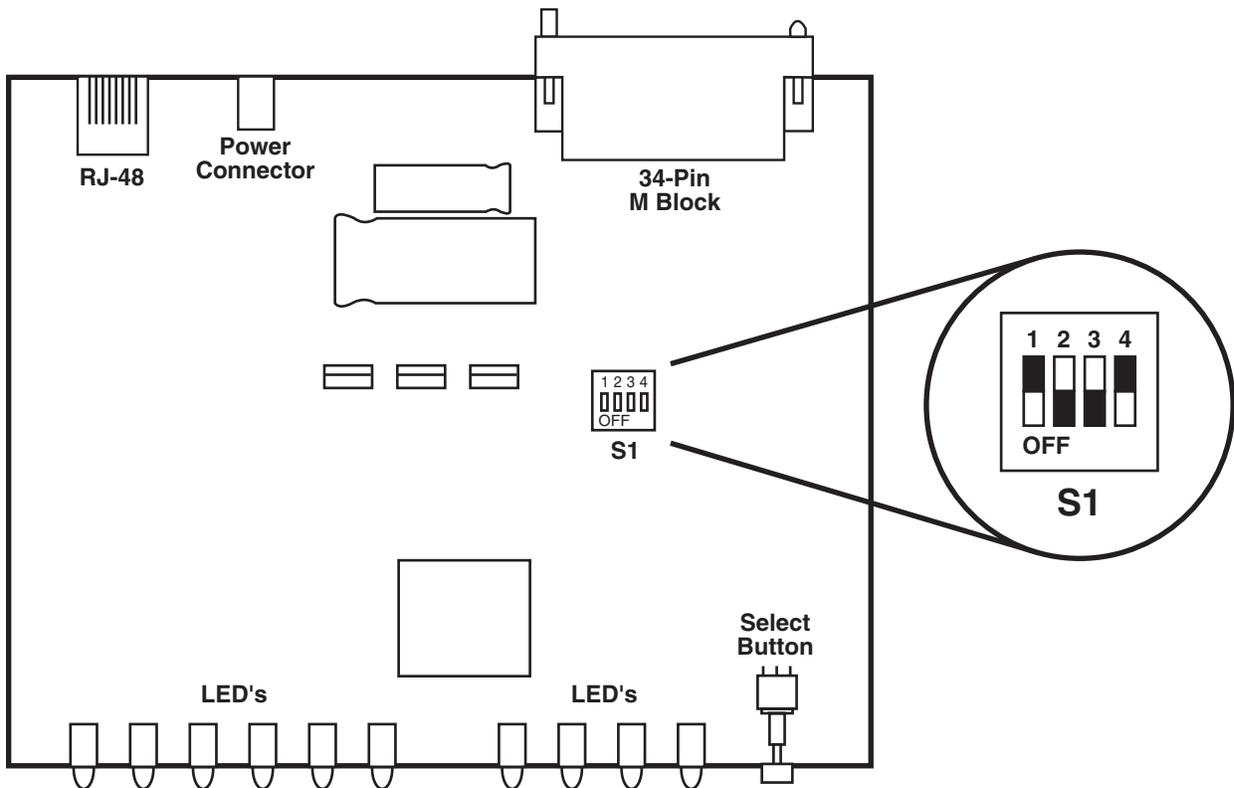   (*Factory setting is* ON)

Figure 4-1. Overhead View of CDSU–SR (MD270A)
Showing DIP-Switch S1 Location and Factory Switch Settings

4.2   Modes of Operation for the CDSU–MR2 (MD271A)

The CDSU–MR2 has several modes of operation; each is illustrated by the Table 4-1.
DIP switch S-1 is used to select the various modes. Please note that signals appear
simultaneously at the V.35 connector and channel 1 connector. They are the same
except for the interface levels.

Table 4-1. CDSU–MR2 Operation Mode Settings

MODE 1

	CHANNEL 1				CHANNEL 2*		
Speed	Interface	Sync	Async	Speed	Interface	Sync	Async
56.0K	V.35	YES	NO	N/A	N/A	N/A	N/A

MODE 2

	CHANNEL 1				CHANNEL 2*		
Speed	Interface	Sync	Async	Speed	Interface	Sync	Async
38.4K	RS-232	YES	YES	9.6K	RS-232	YES	YES
19.2K	RS-232	YES	YES	4.8K	RS-232	YES	YES
9.6K	RS-232	YES	YES	2.4K	RS-232	YES	YES
4.8K	RS-232	YES	YES	1.2K	RS-232	YES	YES

MODE 3

	CHANNEL 1				CHANNEL 2*		
Speed	Interface	Sync	Async	Speed	Interface	Sync	Async
19.2K	RS-232	YES	YES	19.2K	RS-232	YES	YES
9.6K	RS-232	YES	YES	9.6K	RS-232	YES	YES
4.8K	RS-232	YES	YES	4.8K	RS-232	YES	YES
2.4K	RS-232	YES	YES	2.4K	RS-232	YES	YES

* Channel 2 is not used in mode 1.
* Channel 2 speeds are independent of Channel 1 speed settings in modes 2 and 3.

4.3   DIP Switch Settings for the CDSU–MR2 (MD271A)

The various options and configurations for the CDSU–MR2 are selected by the two DIP Switches S1 and S2. These switches are located on the front of the circuit board located inside the box. To open the box remove the two Phillips head screws that hold together the top and bottom shells.

The various positions of DIP Switch S1 operate the following functions:

      S1-1   Selects split operation *
      S1-2   Selects split ratio
      S1-3   Enables Async on channel 1
      S1-4   Enables Async on channel 2
      S1-5   Sets channel 1 speed
      S1-6   Sets channel 1 speed
      S1-7   Sets channel 2 speed
      S1-8   Sets channel 2 speed

DIP Switch S2 selects additional options and is located next to Switch S1.

      S2-1   Selects data bits in async mode, 8 bits is normal. *
      S2-2   Selects data bits in async mode, 8 bits is normal. *
      S2-3   Selects master or slave clock. CSU/DSU mode needs
                master clock off.
      S2-4   Not used
      S2-5   Not used
      S2-6   Not used
      S2-7   When on gives continuous RTS to CSU/DSU
      S2-8   Must be on to enable test modes. *

      * Shipped in the "on" position from the factory

Figure 4-2 on page 15 illustrates the location and factory settings for DIP switches S1 and S2.

Figure 4-3 on page 16 illustrates the functions and available options for DIP switches S1 and S2.
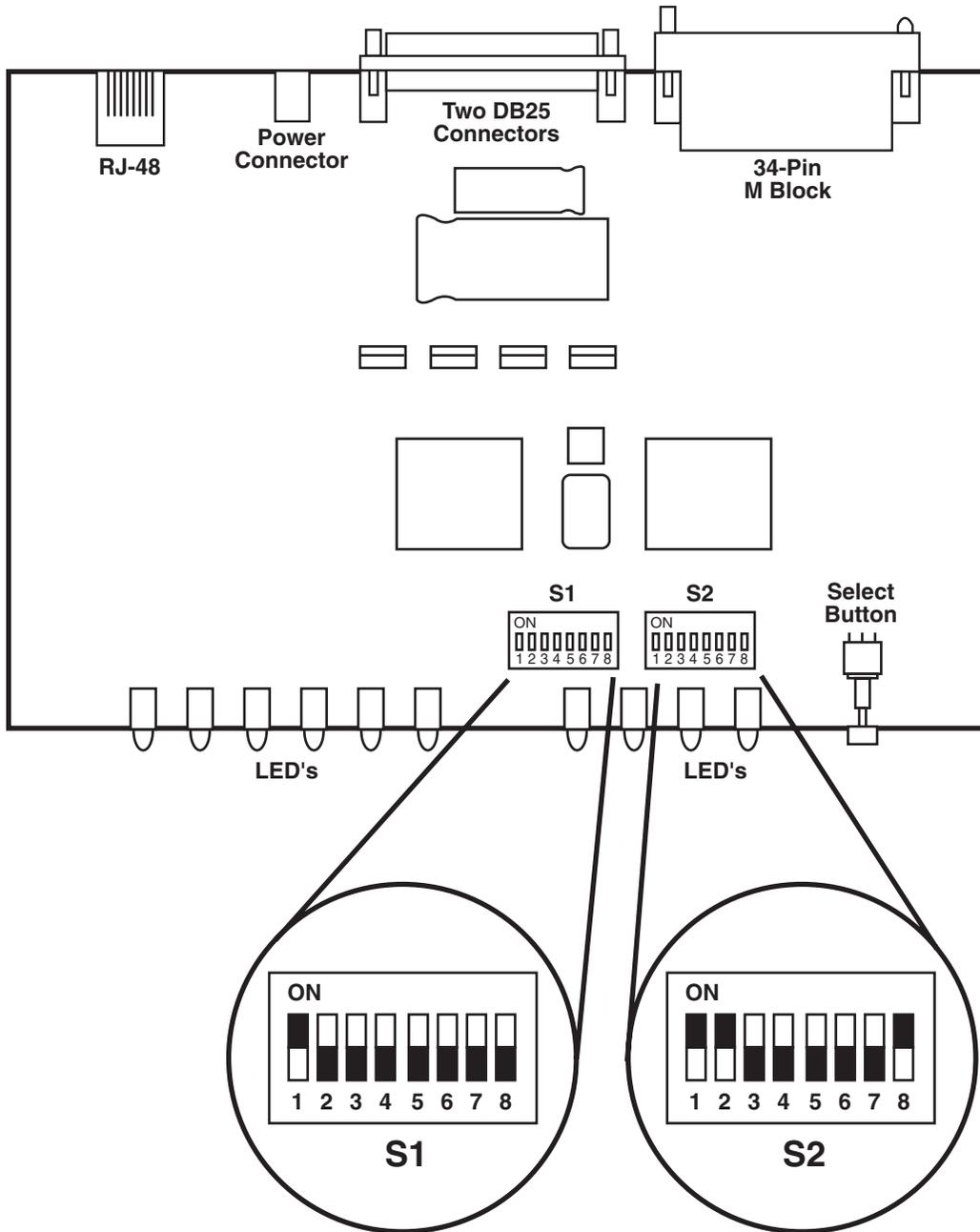
Figure 4-2. Overhead View of CDSU–MR2 (MD271A)
Showing DIP-Switches S1 and S2 Locations and Factory Switch Settings

S1

		POS 5/6		POS 7/8	
	19.2K	↑	↑	19.2K	↑ ↑
	9.6K	↑	↓	9.6K	↑ ↓
	4.8K	↓	↑	4.8K	↓ ↑
	2.4K	↓	↓	2.4K	↓ ↓

ON/ CLOSE ↑

OFF/ OPEN ↓

56K/C	19.2 / 19.2	ASYNC-1	ASYNC-2	SUBRATES		SUBRATES	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
				CHANNEL 1		CHANNEL 2	
SPLIT	38.4 / 9.6	SYNC-1	SYNC-2	SUBRATES		SUBRATES	

		POS 5/6		POS 7/8	
	38.4K	↑	↑	9.6K	↑ ↑
	19.2K	↑	↓	4.8K	↑ ↓
	9.6K	↓	↑	2.4K	↓ ↑
	4.8K	↓	↓	1.2K	↓ ↓

S2

ON/ CLOSE ↑

OFF/ OPEN ↓

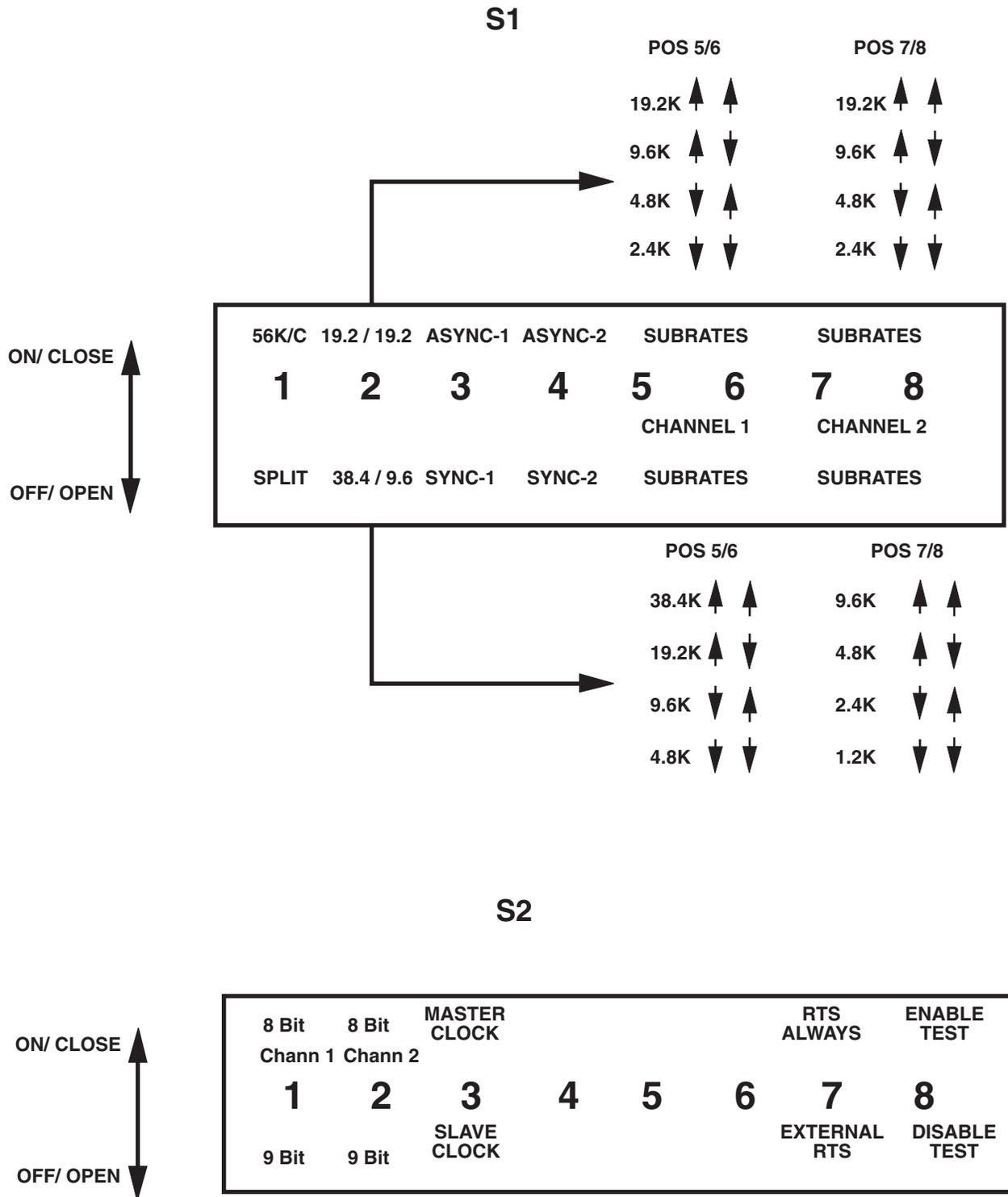| 8 Bit Chann 1	8 Bit Chann 2	MASTER CLOCK				RTS ALWAYS	ENABLE TEST
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
9 Bit	9 Bit	SLAVE CLOCK				EXTERNAL RTS	DISABLE TEST

Figure 4-3. CDSU–MR2 (MD271A)
DIP-Switches S1 and S2 Setting Options

5.0   TESTING AND DIAGNOSTICS

This section should help you to determine the nature and locaton of problems and troublespots in your DDS link. You will be able to troubleshoot with greater accuracy and efficiency if you have at least a basic understanding of the following:

- the circuits and services supplied by your particular local telephone company

- the circuits and services supplied by your long distance carrier,

- the data communications and telecommunications equipment involved in your installation, including computers, line splitters and line drivers, mulitplexors, PBX equipment, switches, cables, etc.

5.1   Front Panel LEDs

Trouble shooting requires the use of the testing and diagnostic features of the CDSU–SR (MD270A) or the CDSU–MR2 (MD271A), and an understanding of the front panel LEDs. The following list describes the LEDs and the front panel SELECT push button.

INS –   When on steady indicates correct (In Service) pattern from the TELCO. Flashes when there is no receive line, when out of service pattern is sent by TELCO or unit is out of frame, or when in self test or Line Loop Mode.

CD –   When on indicates actual valid data being received
When off either not In Service or Idle Signal is Received

RTS –   When on indicates RTS present from the terminal
When off indicates no RTS

CTS –   When on indicates that you are in service and have a valid RTS
When off indicates one of the above conditions does not exist.

TXD –   Flashes when transmit data is present. (Space turns on LED)

RXD –   Flashes when receive data is present. (Space received turns on LED).

ST –   Flashes red while awaiting confirmation of correct self test. Flashes green when unit passes self test.

DL –   When flashing indicates bi-directional digital loop selected. When on steady indicates telco central office has commanded DSU loop.

LL –   When flashing Line Loop has been selected. When on steady indicates

telco has commanded a CSU loop.

RT –   When on steady green indicates other end sending remote test. Flashes red while local end is awaiting valid response from remote end, flashes green when valid response is received.

Select –Push button that selects test mode.

5.2   Testing Your CDSU–SR and CDSU–MR2

The test modes are selected by the front panel push button (SELECT). Each time the button is pushed the test mode steps one position (LED) to the right.

5.2.1   Self Test

Push the SELECT button once. The self test LED will flash red. Internally, the transmitter is connected to the receiver (as shown below). An internal test pattern generator will run a complete diagnostic on the unit. In about 5 seconds the ST LED should change from flashing RED to flashing GREEN.

To return to the normal mode push the front panel push button until all of the right four LEDs are out.

5.2.2   Line Loop

Self Test and Line Loop Test
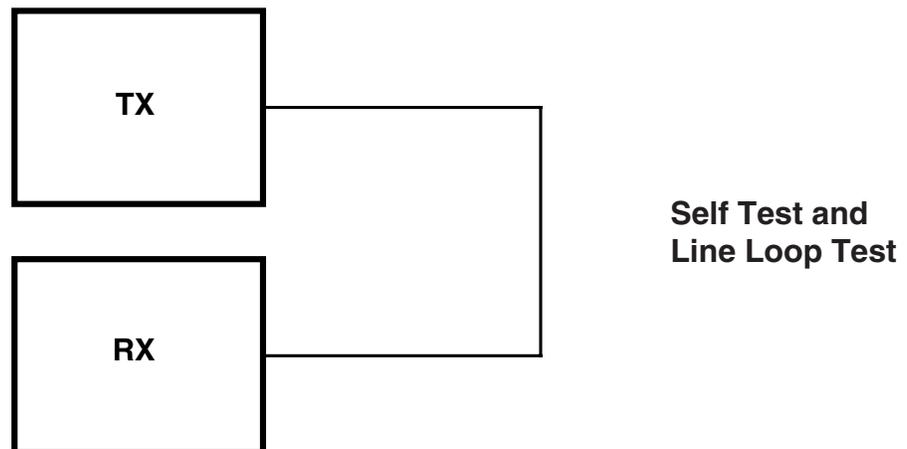
Push the SELECT button until the Line Loop LED flashes. The unit is connected internally from transmitter to receiver, as shown above. A tester can be used to run addional tests; plug the tester into the TERMINAL connector. This test is functionally the same as the Self Test, except that the internal pattern generator is not used.

5.2.3 Digital Loop

This test allows the user to run a complete "round trip" test between the user's DTE/DDS connection and the local telephone company. Push the SELECT button until the DL LED flashes. The unit is configured internally as shown in the diagram below.

TERMINAL   **TELCO**

| TERMINAL INTERFACE | CSU/DSU DIGITAL INTERFACE |

Digital Loop Test
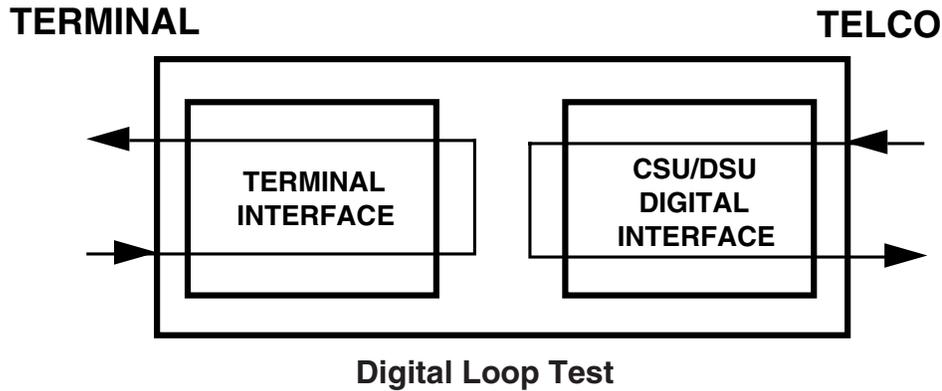
5.2.4 Remote Test

The Remote Test (shown below) can be performed only between two identical units (that is, you must have a local and remote CDSU–SR /CDSU–MR2; you cannot use this test with a CDSU–SR/CDSU–MR2 and a service unit by another manufacturer).

Push the SELECT button until the RT light flashes. It will flash red until it detects an"OK" pattern from the remote unit. The RT light will then flash green. The remote unit is in a remote test condition and a complete "round trip" test is being performed by the internal pattern generator.

To exit this mode push the SELECT button until none of the right side LEDs are illuminated or flashing.
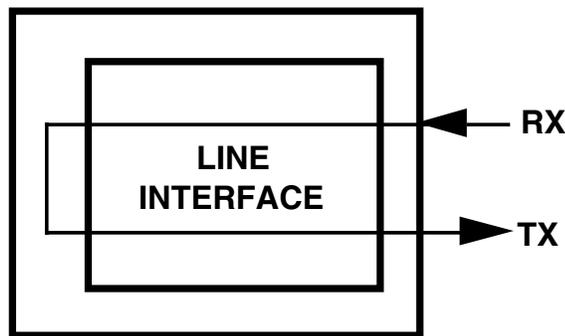
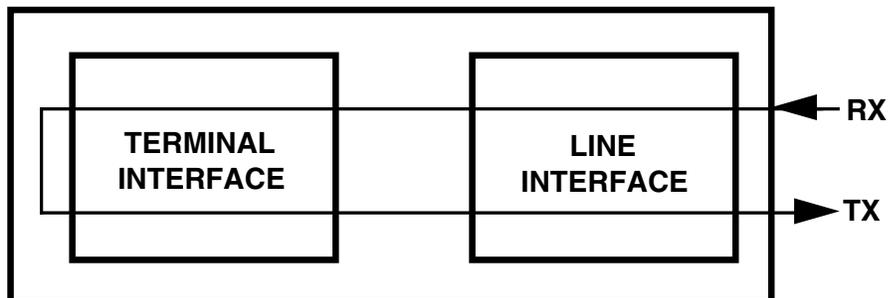**LOCAL**   **REMOTE**
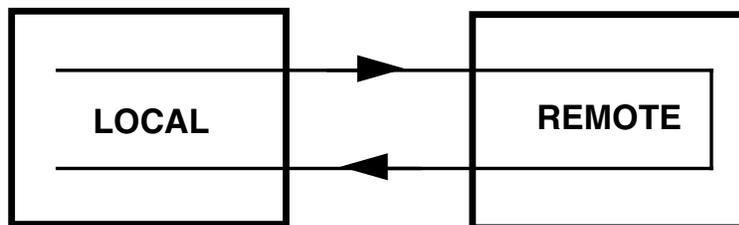
Remote Test

5.2.5 TELCO TESTING

The telephone company can perform two types of testing from the central office: DSU loop and CSU loop. The DL light flashes when the DSU loop test is being performed. The LL light is on steady when a CSU loop is being performed by the central office. The loop configurations are shown in the diagrams below.

CSU Loop

```
                    ┌─────────────────┐
                    │  ┌───────────┐  │
                    │  │           │──┼──◄─── RX
                    │  │   LINE    │  │
                    │  │ INTERFACE │  │
                    │  │           │──┼──►─── TX
                    │  └───────────┘  │
                    └─────────────────┘
```

DSU Loop

```
        ┌──────────────────────────────────────┐
        │  ┌───────────┐     ┌───────────┐      │
        │  │           │     │           │──────┼──◄─── RX
        │  │ TERMINAL  │     │   LINE    │      │
        │  │ INTERFACE │     │ INTERFACE │      │
        │  │           │     │           │──────┼──►─── TX
        │  └───────────┘     └───────────┘      │
        └──────────────────────────────────────┘
```

5.3   Equipment Repair and Returns

Equipment that needs to be repaired should be returned to your dealer. If you can't identify/correct a fault using the procedures in this manual, contact your dealer.

Please follow the suggestions listed below prior to contacting your dealer. However, if you are unsure of any procedure described in this document, or if the CDSU–SR/ CDSU–MR2 is not operating in a way not described herein, DO NOT ATTEMPT TO REPAIR OR ALTER THE UNIT; CONTACT YOUR DEALER FOR ASSISTANCE.

5.3.1   Before Calling Your Dealer

Follow the suggestions listed below before calling your dealer.

1. If you are having difficulty installing hardware or software on or in your network, see the user or technical documentation supplied for the equipment in question; repeat the procedures described in *Chapter Three, Installation*.

    •   Perform any tests described in the hardware and/or software documentation to verify the current installation.

2. Check the cables and connectors to ensure that they have been correctly attached and that no cables/wires have been crimped or broken during cable installation.

5.3.2   Calling Your Dealer

Have the following information readily available before you contact your dealer.

1. A complete description of the problem, including the following points:
    •   The nature and duration of the problem;
    •   Situations when the problem occurs;
    •   The components involved in the problem;
    •   Any particular application that, when used, appears to create the problem.

2. An accurate list of network equipment models and related serial, version and/or revision numbers.

3. An accurate list of DTE devices, including make and model information; plus, a list of the third party software you may be using.

4. A record of changes that have been made to your network configuration prior to the occurrence of the problem; changes to hardware and to software (both network and user applications), and changes to system administration procedures should all be noted in this record.

5.3.3   Shipping and Packaging Information

Should you need to transport or ship your CDSU–SR/CDSU–MR2 follow these suggestions:

- Package the unit carefully; it is recommended that you use the original container.

- Units should be wrapped in a "bubble-wrap" plastic sheet or bag.

- To avoid equipment damage due to static electric discharge, do not pack the unit in styrofoam "popcorn."

- Retain all connectors and this *Installation and Operation Manual*.

APPENDIX A: CONNECTOR PIN OUTS

TERMINAL EQUIPMENT		
PIN IDENTIFICATION	ABBREVIATION	DESCRIPTION
B	SG	SIGNAL GROUND
C	RTS	REQUEST TO SEND
D	CTS	CLEAR TO SEND
E	DSR	DATA SET READY
F	CD	CARRIER DETECT
R	RXD	RECEIVE DATA
T	RXD	RECEIVE DATA
V	SCR	SERIAL CLOCK RX
X	SCR	SERIAL CLOCK RX
Y	SCT	SERIAL CLOCK TX
AA	SCT	SERIAL CLOCK TX
S	TXD	TRANSMIT DATA
P	TXD	TRANSMIT DATA

LINE INTERFACE	
PIN NUMBER	DESCRIPTION
J1-1	TRANSMIT
J1-2	TRANSMIT
J1-7	RECEIVE
J1-8	RECEIVE

BLACK BOX

NETWORK SERVICES