

TANDY®

Direct-Connect Modem DCM-6

OPERATION MANUAL

CAT. NO. 26-1393



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The FCC Wants You to Know

This equipment generates and uses radio frequency energy. If not installed and used properly, that is in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception.

It has been type tested and found to comply with the limits for a Class B 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 in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause 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 the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

Warning

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

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Direct-Connect Modem DCM-6 Operation Manual

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Introduction

By adding the Direct-Connect Modem DCM-6 to your computer system, you can access national and international information networks and data bases, or you can exchange information with another computer user over the phone lines.

MODEM is an acronym that stands for Modulator/Demodulator. A modem transforms a typical two-level (binary) computer signal into a form suitable for transmission over the telephone network. With the DCM-6, this two-level computer signal is converted into a two-frequency sequence of tone signals, allowing you to originate and answer calls and communicate.

You can use your Modem to send or receive programs and to contact information services. Data transmission of the DCM-6 is at 300 bits per second (bps).

Your Modem can be used with any Tandy computer or data terminal that has RS-232C interface capabilities. With optional acoustic cups (Cat.No. 26-3805/26-3818), you can use your Modem virtually anywhere that AC power is available—no need to connect semi-permanently to the phone line.

Description of the DCM-6 1

The DCM-6 is a self-contained, Frequency Shift Keying (FSK) telephone interface. This FSK method of frequency modulation for transmitting digital signals is the same as that method used in low-speed modems. When the DCM-6 is connected to your telephone wall jack, your phone can only be used for conversation when the CONNECT switch is off. Be sure this switch is set to OFF when you are not using the Modem.

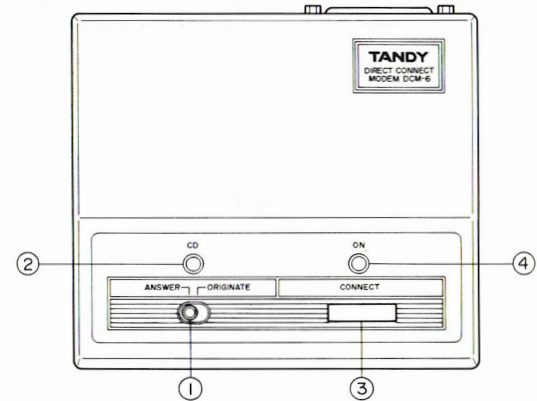


Figure 1. Top Panel View

- ① **MODE Switch.** Selects either ORIGINATE or ANSWER mode.
- ② **Carrier Detect Indicator.** Lights when a carrier tone is detected. A carrier tone is the sound you hear when you pick up the receiver while the Modem is communicating with another modem.
- ③ **CONNECT Switch.** Connects the Modem to the telephone line. Push this switch to turn power on.
- ④ **Power ON Indicator.** Lights when the Modem's power is on and connected to the telephone line.

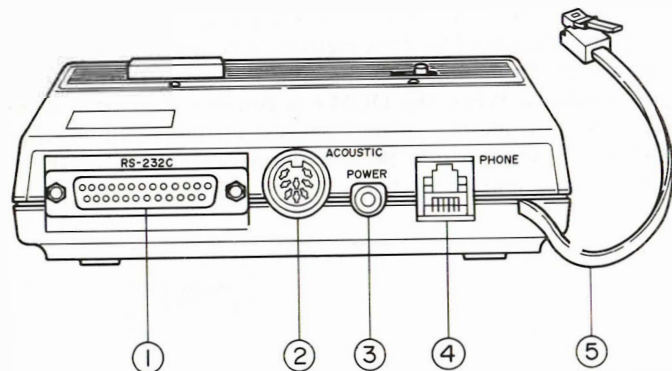


Figure 2. Rear Panel View

- ① **RS-232C Connector.** Standard DB-25 jack for connection to the RS-232C interface of most computers.
- ② **Acoustic Coupler Jack.** Accepts the DIN connector of the acoustic cups (26-3805/26-3818). When connected, the phone jack is disabled.
- ③ **Power Jack.** Connects the Modem to the AC adapter.
- ④ **Phone Jack.** Connect the telephone's modular plug to this connector.
- ⑤ **Modem-to-Telephone Line Connector.** Insert the Modem's modular plug (RJ-11) into the telephone wall jack.

If you have not already connected the DCM-6 to your computer system, refer to Appendix A, **Setting up the DCM-6.**

Before you begin using your Modem, find out the communications conventions of the computer or modem with which you are going to communicate. Specifically, you will need to know:

- Baud rate (not to exceed 300)
- Word length
- Parity (odd,even,none)
- Number of stop bits
- Who will use originate mode, who will use answer mode

Communications parameters must be set to match those of the computer on the other end before communications can take place. Set up your computer accordingly. If you need assistance in setting the communications protocol (baud rate, word length, parity, and stop bits) of your computer, refer to your computer owner's manual.

To operate in originate mode

1. Set the MODE switch to the ORIGINATE position.
2. With the CONNECT switch off, pick up the handset of your telephone and dial the number of the "host" computer.
3. When you hear the high-pitched carrier tone, press the CONNECT switch to the ON position, and gently hang up the phone. Or, if using acoustic cups, place the phone in the cups.
4. When the Carrier Detect (CD) indicator lights up, you can start communicating. When communications are finished, be sure to sign off. The sign-off will depend on the "host" computer; however, BYE or GOODBYE is commonly used.
5. After signing off, press the CONNECT switch to the OFF position. If you are using the acoustic cups, detach the cups and hang up the handset.

To operate in answer mode

1. Set the MODE switch to the ANSWER position.
2. Wait for the remote computer operator to call you.
3. Upon receiving the call, pick up the handset. When you hear the carrier tone, press the CONNECT switch to the ON position. Hang up the phone or, if using the acoustic cups, place the phone in the cups.
4. When the CD indicator lights, begin data communications.
5. When finished with the data transfer, press the CONNECT switch to the OFF position. If you are using the acoustic cups, detach the cups and hang up the handset.

Using with Videotex software

A modem that is connected to a Tandy computer running a Videotex software package constitutes one of the most common ways to use your Modem. This section describes how to use the DCM-6 with VIDTEX (the Videotex program) on most Tandy computers:

1. Connect the system as described in Appendix A. Be sure the MODE switch is set to ORIGINATE.
2. Load and run your version of VIDTEX.
3. Dial the information service's telephone number and listen for the high-pitched carrier tone. Press the CONNECT switch to ON. When the tone changes, hang up the phone. Or, if using the acoustic cups, place the phone in the cups.
4. When the CD indicator lights, you are ready for communication.
5. Complete the logon sequence for your information service by following the procedure described in your Videotex package and information service user's guide.

Appendices

Setting up the DCM-6 **A**

Before making any connections, turn off the power to your computer system.

Be sure that your DCM-6 is properly connected. Incorrect connection will result in data errors. To avoid these errors, just follow the instructions below.

Connecting to a power supply

An AC adapter is supplied with your DCM-6. Connect the appropriate end of the adapter to the POWER jack on the rear side of the Modem. Connect the other end of the adapter into a standard AC outlet or U.L. approved power strip, such as Tandy's automatic power controller strip (26-1395/26-1396) or power switching system (26-203).

Be sure to connect the adapter to the Modem before you plug the adapter into the wall outlet. Otherwise, damage to the adapter could result.

Connecting to a computer

When connecting the DCM-6 to a computer or data terminal, be sure to use the correct cable. The cable you use will depend on the type of computer you have.

Table 1 indicates the appropriate cables; table 2 provides quick instructions on computer connection locations. If you need further information, refer to your computer instruction manual.

Table 1. Modem-to-Computer Cables

Computer	Cable Catalog No.
Model I	26-1145*
Model II/16	26-4403
Model III/4/4P/4D/12/16B	26-1408
DT-1/DT-100	26-1408
Tandy 1000/1200/2000/6000	26-1408
Tandy 3000	26-1399
Color Computer	26-3014 or 26-1408 with 26-2226 RS-232 Program Pak

* The Model I RS-232C cable is supplied with the RS-232C interface board (26-1145).

Table 2. RS-232C Connection Points

Computer	RS-232C Connection Points
Model I	Front of expansion interface
Model II/4P/12/16/16B	Rear side of computer
Model III/4	Underside of computer
Tandy 2000	Expansion panel on rear side of computer (with RS-232C)
DT-1/DT-100	Rear side/underside of terminal
Tandy 1000/1200	Expansion panel on rear side of computer (with RS-232C)
Tandy 3000/6000	Rear side of computer
Color Computer	Rear side of computer

To Connect the DCM-6 to your computer:

1. Connect one end of the appropriate cable to the RS-232C connector on the DCM-6.
2. Connect the other end of the cable to the computer's RS-232C interface connector.

Connecting to a telephone

Important Notes*:

Your DCM-6 has been designed and constructed to conform to federal regulations and can be connected to the phone line as described in this manual.

Please note that each product connected to the telephone line places a certain load on the line. We designate this as the unit's "Ringer Equivalence Number."

When using more than one product on the line, total all the ringer equivalence numbers. If they total more than 5, your phone may not ring. In rural areas a total of 3 may impair ringer operation. To be sure, check with your local telephone company.

The registration number as well as ringer equivalence number, are located on the bottom of the unit.

1. The DCM-6 must not be connected to:
 - Coin-operated phones
 - Party-line phones
2. It is very unlikely ... but if your DCM-6 causes problems on the phone line, the telephone company has the right to temporarily discontinue your service. If this happens, the telephone company will notify you and give you a chance to have the problem

corrected. Also, the telephone company has the right to make changes in their lines and/or equipment. If these changes affect your DCM-6 or require changes in its connection, the phone company will notify you in writing so you can take the necessary steps to ensure uninterrupted service.

- * These notes do not apply if you connect your Modem via the optional acoustic cups (26-3805/26-3818).

How you connect the DCM-6 to a telephone depends on how your telephone is connected to the wall:

1. If your telephone has the modular wall connection, attach the DCM-6 as shown in Figure 3.

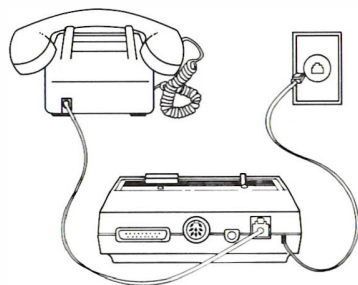


Figure 3. Modular Wall Telephone Connection

If you will be using your DCM-6 outside the USA, you may need a modular-to-modular cable (279-374) and a duplex modular jack (279-357).

2. If your telephone has the older style, four-prong connection, use an adapter (279-360) to connect your DCM-6 as shown below.

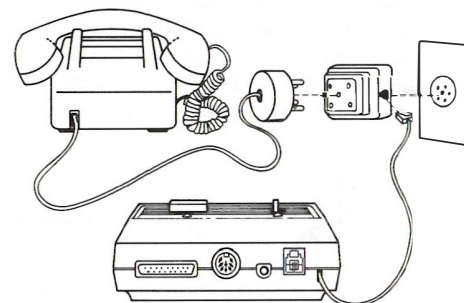


Figure 4. Connection to a Four-Prong Jack

3. If your telephone is wired directly to the wall, use a quick-connect jack(279-355), or contact your telephone company about updating the wiring to the modular system.

Note: The telephone company is authorized to charge you for any work that they do to install such jacks. They might ask you for the U.S.O.C. number for the plug connection. This number is RJ-11C.



Figure 5. Wall Connection

4. Or, use the optional acoustic cups (see next section) to make the telephone connection.

Connecting acoustic cups

By using the optional acoustic cups (26-3805/26-3818) with your DCM-6, you can avoid the more complex types of telephone connections. Just connect the DIN connector of the acoustic cups to the acoustic coupler jack of the DCM-6, as illustrated in Figure 6. For further information, refer to the acoustic cup's owner's manual.

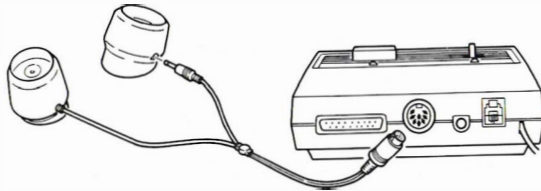


Figure 6. Acoustic Cups Connection

Note: Modem operation with acoustic cups is not as reliable as direct connect operation.

Troubleshooting and maintenance **B**

Care and maintenance

For trouble-free operation, handle and use your DCM-6 with care. It is a sensitive electromechanical instrument. Avoid rough treatment, temperature extremes and areas with high levels of dust and humidity.

Check the cables and connections periodically. The most common cause of problems is a bad telephone connection. Noise on the line or a weak signal can result in lost or invalid data during data communications. Try to redial the call to ensure that the connection is free from noise and interference.

Troubleshooting

If you experience garbled data, intermittent errors, etc., check the following:

1. The phone connection is clean and noise-free.
2. No one is talking on the telephone line.
3. The phone and all extension phones are on-hook, unless you are using the acoustic cups.
4. The baud rate of the terminal is 300 bps.

Symptom	Problem	Solution
Carrier detect light off	AC adapter is not plugged in.	Plug it in.
	Improper telephone connections.	Check connections and refer to Setting up the DCM-6.
	Mode switch is not in proper position.	Refer to pages 5-6.
	Modem at other end is not compatible.	It should be a Bell-system 103 or equivalent.
Garbled display	Phone is not hung up.	Hang up phone.
	Communications protocol is set incorrectly (baud rate, word length, parity, stop bit).	Check and change, if necessary.
With acoustic cups	Vibration or noise is picked up.	Place the acoustic cups on flat, sturdy surface. Be sure that the cups are firmly linked with the handset or poor acoustic characteristics may result.

If you are unable to locate the problem, check with your local Radio Shack Computer Center or store.

LIGHTNING

The DCM-6 has built-in protection circuits that meet or exceed F.C.C. requirements to reduce the risk of damage from surges in telephone line current. However, a lightning strike near, or on, the telephone line may cause an excessive surge of voltage that can damage the DCM-6, as well as your telephone.

Lightning damage is uncommon, but it can occur to phones and other electronic devices. If you are concerned about it or live in an area with frequent and/or severe electrical storms, we suggest that you unplug your electronic products during the storms.

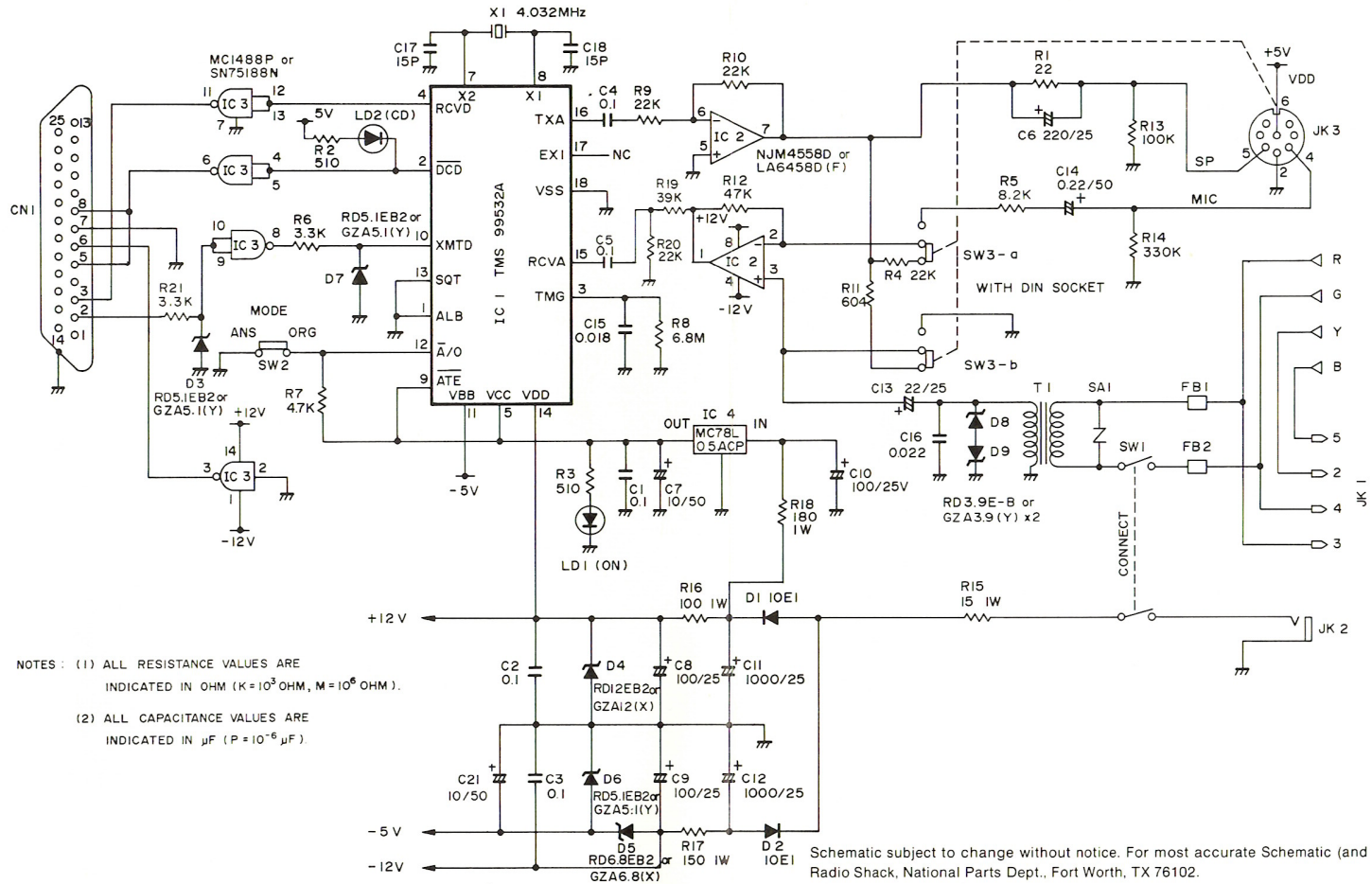
Specifications **C**

Receiver Frequencies		
Answer	Mark	1270 Hz
	Space	1070 Hz
Originate	Mark	2225 Hz
	Space	2025 Hz
Transmit Frequencies		
Answer	Mark	2225 Hz
	Space	2025 Hz
Originate	Mark	1270 Hz
	Space	1070 Hz
Transmit Power (Loop current at 40 mA)		-15 dBm
Receive Sensitivity (No error)		-35 dBm
Baud Rate		300 bps
Output Impedance		600 ohms
Operating Temperature		55° F - 85° F (12.8° C - 29.4° C)
Electrical Requirements		15 V AC at 300 mA (AC adapter)
Dimensions		1 ¹⁷ / ₆₄ " x 5 ¹ / ₈ " x 5 ⁴⁵ / ₆₄ "
(H x D x W)		(3.2 x 13 x 14.5 cm)
Weight		8.5 oz (246g)
Humidity		
Operating Environment		90% relative humidity (no condensation)
Storage		90% (no condensation)

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Schematic Diagram D



Schematic subject to change without notice. For most accurate Schematic (and parts) contact Radio Shack, National Parts Dept., Fort Worth, TX 76102.

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