TANDY PROTOCOL MODE OPERATION
     This chapter will give you an idea of what the DCM-7 can do in the Tandy
protocol mode. A Videotex Plus communications package for Tandy's II,12,16,
and 6000 microcomputers is used in the sample sequences following. With this
software package you can communicate with a variety of information services
and host computer systems. The examples will help familiarize you with some
of the operations the Modem is capable of performing.
     If you are using an MS-DOS operating system, move directly to the auto
logon session using DeskMate's Telecom in Chapter 3, Hayes Protocol Mode Op-
eration. Xenix users may want to skip to Appendix D. For a detailed discus-
sion of all the available commands in Tandy protocol, refer to Appendix A.

MANUAL V. AUTOMATIC OPERATION
     When you want to dial an information service (such as CompuServe or Dow
Jones) or communicate with another person whose computer is also using
VIDTEX, set the Modem to manual operation mode. In this mode, you can control
what the system does by manually dialing and answering the phone.
     When you want the DCM-7 to dial a phone number or answer the phone for
you, set it to automatic operation mode. In this mode, the Modem dials the
phone number you store in its memory or answers the phone when someone calls
you. Automatic mode, for instance, lets you dial the information service
number without picking up the phone--just type the number along with the
proper DCM-7 programming commands on the computer keyboard.
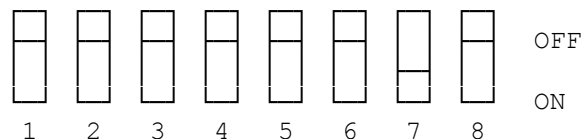
ORIGINATE V. ANSWER MODE
     To place a call to an information service or another person using VIDTEX,
set the DCM-7 to originate mode. In this mode, the call originates from your
computer. When you want to receive a call (answer the phone), set the DCM-7
to answer mode. Note that originate and answer modes can be used either man-
ually or automatically.

SAMPLE PROGRAMMING SESSIONS
     All Modem functions are controlled by ASCII encoded commands that you
send from your computer keyboard. Use the wake-up command* to open the DCM-7
for programming.
1. Check again that all peripherals are correctly connected and receiving
   power.
2. Set the DIP switches as follows:

```
 ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐     OFF
 │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
 │ │ │ │ │ │ │ │ │ │ │ │ └─┘ └─┘
 └─┘ └─┘ └─┘ └─┘ └─┘ └─┘             ON
  1   2   3   4   5   6   7   8
```

3. Flip the Modem's power switch on the front panel to the ON position.
4. Load and run the Videotex Plus communications program. Refer to your
   Videotex user's guide as well.
5. At TRSDOS Ready, type VIDTEX <ENTER>. TERMINAL READY indicator lights.
6. Set the communications protocol. Be sure the operation speed is set to
   300 bps.
7. Open the Modem for programming by pressing * for the wake-up command.
   The Modem is now in the command receptive state and is waiting for your
   to begin programming or setting the internal switches that will tell it
   what operations are to be performed.
8. When the * echoes on your computer screen, enter LIST command L to dis-
   play or list the Modem's current parameters. When the Modem is turned on,

```
    the list shows:
     MODE = A        Automatic
     TYPE = O        Originate
     F CD = Y        Forced Carrier Detect ON
     SPKR = Y        Monitor speaker ON
     ANSW = 2        2 rings before Auto Answer
     DTRY = 1        1 automatic dial try
     TEST = N        Test mode OFF
     NUMB =          Telephone number stored in memory
     RATE = S        Slow Dialing rate
     EXIT = 0F       Exit communication upon receiving <CTRL> <O> (ASCII 0F)


    NOTE: The default parameter of line F CD = varies with the position of
          DIP switches 2 and 6.
```

After the parameters are listed, the Modem returns to the command receptive
state where it waits for further instructions.

MANUAL MODE OPERATIONS
     When operating in the manual mode, you control the system by manually
dialing and answering the telephone. Manual mode (answer or originate) is
useful when you want to talk by telephone to a friend at a remote location,
an later exchange computer data without redialing.

EXAMPLE 1. MANUAL ANSWER MODE
     The phone rings and you answer by picking up the receiver, After talking
a while to your friend, you decide to exchange information by computer
(telecommunications) without breaking voice call:
1. Your friend selects to be the originating station, while you are the
   answering station. Set up your Modem by entering:
    *   Wake up!
    M   Select manual mode
    A   Select answer mode
2. Give your friend time to set up the originating modem.
3. Press <X>. The Modem transmits carrier tone. The carrier is the sound you
   hear through the built-in speaker or when you pick up the receiver while
   the Modem is in communication with another modem.
4. The answer station always issues the X command first. After hearing the
   answer modem's carrier tone, the originate station sends the X command to
   complete the connection. The Modem goes on line, and you'll see the CON-
   NECT result code on the screen.
5. Hang up both handsets.
   Be sure to keep quiet when the handset is OFF HOOK. Noise picked up
   could cause errors in the data being passed by the modems.

     Be careful when you hang up the telephone since slamming or dropping the
phone back on the hook while the modem are controlling the lines could dis-
rupt carrier long enough to start a loss-of-carrier disconnect sequence.

To return to voice communications after transmitting data:
1. Carefully pick up the handset (both modem stations).
2. Type at the keyboard that you will be aborting carrier. For example, you
   might signal your friend by typing: THAT'S ALL! I'M ABORTING CARRIER.
3. After making sure your handset is OFF HOOK, enter the abort character
   <CTRL> <O> to force the Modem OFF LINE. If your computer does not have
   the CRTL key, refer to your computer manual to find out the key of hex
   value 0F, or change the abort character using abort character redefinit-

ion @.

Refer to Appendix A, @ COMMAND.
After 3 seconds of inactivity, your Modem logs out with the DISCONNECT result
code, and your friend's modem (if automatic) shuts down, too. The Modem is
in OFF LINE mode. Press <*> to return to the command receptive mode.

EXAMPLE 2: MANUAL ORIGINATE MODE
1. Set the Modem for manual originate mode. Press <M> for manual and <O> for
   originate. Then, press <L> to check the current parameter settings. The
   first two parameters should show:
    MODE = M
    TYPE = O
2. Now pick up the telephone and dial the information service phone number.
   When the information service answers the phone, you will hear a
   high-pitched tone.
3. Press <X>. The OFF HOOK indicator lights. As soon as the Modem detects
   the carrier tone, it issues a low-pitched tone. Then it goes ON LINE and
   sends the CONNECT result code to the screen.
4. Gently hang up the phone. You can then begin following the instructions
   detailed in your Videotex and information service user's guides.

AUTOMATIC MODE OPERATIONS
     The DCM-7 can be programmed to make a call or answer your telephone
automatically. In automatic mode operation, you can call an information
service without picking up the phone--just type in the phone number on your
computer keyboard. You can also tell the Modem to auto-answer your telephone.

EXAMPLE 3: AUTOMATIC ANSWER MODE
1. To set the Modem for automatic mode, first type * to enter command mode,
   then type L to display the current parameter settings. If screen shows
   MODE = M, then press <M> for automatic mode. Type L to confirm that the
   mode is now A for automatic.
2. Type A to set the Modem to the answer mode if the TYPE parameter does not
   show the value A.
3. Press <X> to force the Modem out of command receptive state and into
   auto-answer mode. The Modem will then wait for the telephone to ring and
   sends: WAITING FOR RING
4. When the phone rings, the Modem begins counting the rings and sends the
   RING result code to display for each ring. After 2 rings, it answers by
   seizing the telephone line and asserts carrier. The calling modem replies
   with its carrier. Both modems are now ON LINE and telecommunications can
   begin.

 The ring number is set to 2 at power-on. this means your Modem will seize
the phone line after 2 rings. When you want to change this number, press <I>
for the ring change command when the Modem is in command receptive mode. The
display prompts: ANSWER ON 1-9 RINGS OR CR FOR NO CHANGE =

     When you do not need to change the number of rings, answer this prompt
by pressing <ENTER>, which is the CR (Carriage Return) key. To change the
ring number, type in the new number. Note that only a number key or the ENTER
key is accepted. If you press any other key, the DCM-7 will "echo" the typed
key (if displayable) and ask the question again.

If the key you press in a valid entry, the Modem sends the next prompt:
RETRY FOR 1-9 TIMES OR CR FOR NO CHANGE =

For the time being, press <ENTER> to skip.

If either modem breaks the connection after a successful data exchange with the abort character, the DCM-7 will send the DISCONNECT result code, then the WAITING FOR RING result code. This means it returns to auto answer mode and monitors the line. As long as the Modem is in auto answer mode, it will continue to monitor the telephone line for an incoming call. You can turn OFF this call-waiting mode by pressing *. When the Modem detects the *, it will change to auto originate mode and return to the command receptive state.

EXAMPLE 4: AUTOMATIC ORIGINATE MODE
1. Follow the procedure in Step 1 of Example 3, AUTOMATIC ANSWER MODE.
2. Type O to set the Modem to originate mode if the TYPE parameter does not show the value O.
3. Enter the telephone number you want to dial using the D command (See Appendix A, DIALER PROGRAMMING MODE). You can also specify the dialing method (either pulse or touch-tone), the dialing speed and any pause which may be necessary to access an outside line in a PBX. For example, in the phone number below: DT9P1234567
   T indicates tone, 9 is the access code to the outside line, p is the 2-second pause and the digits 1234567 are to be dialed. For more information on storing a telephone number, refer to Appendix A.
4. Press <X> to force the Modem out of command receptive state and to begin dialing the number.
5. After detecting the carrier tone of the answer modem, after the telephone line is connected, the Modem is ON LINE.

If the Modem does not detect the carrier tone of the answer modem within 30 seconds after dialing (due to busy or no answer condition, etc.), it goes off line after sending the NO CARRIER and DISCONNECT result code. To dial the number again, press <*> <X>. The Modem automatically dials the number stored in dialers memory. If you press <X> without having stored a number, the Modem displays the NO NUMBER result code.

You can also program the Modem to automatically redial (RETRY) the number in advance. In this case, press (I) for the dial retry command. After you respond to the first prompt, a second prompt appears:
RETRY FOR 1-9 TIMES OR CR FOR NO CHANGE =

Again, a valid entry is a number or <ENTER>. Input the desired number of tries. If no change is required, just press <ENTER>.

ALWAYS AUTO-ANSWER MODE OPERATION

The Modem assumes always automatic answer mode operation when the DIP Switch 6 is set to on at power up, and begins monitoring the telephone line. When you type *, the Modem enters command receptive mode and changes to automatic originate mode as in normal automatic answer mode. After disconnecting, or after receiving the C (clear memory) command, the Modem returns to automatic originate mode as in normal automatic answer mode.

This setting is useful when you use the Modem mainly in the answer mode.

ON-LINE ABORT CONDITIONS

After establishing communications with a remote modem, the DCM-7 is in monitor mode. In this mode, the parameters are constantly scanned,. if any one of these parameters fails, the DCM-7 will break communications and go OFF LINE immediately. The parameters monitored include loss of carrier, the abort character and space disconnect.

LOSS OF CARRIER

The carrier monitored is the one that is sent over the telephone line,

not the false carrier generated by the DCM-7. In all modes, except TEST, if carrier is removed for longer than 0.3 seconds, the Modem will exit monitor mode and drop the phone line. If the carrier interruption is less than 0.3 seconds, loss of carrier is ignored.

In automatic originate mode, when the Modem is waiting for a call to be completed (a 30-second delay time between dialing and disconnect where the DCM-7 is looking for a valid carrier signal), you can command the DCM-7 to abort the call by inputting any keys including *. If you aborted with other keys, press <*> to set the Modem to command receptive mode.

MANUAL ABORT ENTRY

When you send a CTRL O (0F HEX) or another character you programmed with the @ key and do not send any other character for 2 seconds, the DCM-7 will exit monitor mode.

DTR (Data Terminal Ready) is also scanned in this mode. If the DTR is OFF, the DCM-7 will terminate communications, just as if the carrier had failed.

SPACE DISCONNECT

Your DCM-7 will drop the phone line any time it receives a continuous RS-232C SPACE (ASCII BREAK or null with no start and stop bits) for 3 seconds from the remote modem or for 1.5 seconds from your computer. This is called space disconnect and is in accordance with Bell 103J standards for short and long space disconnect.

To regain control over the Modem after disconnection, input wake-up code *> The Modem returns to the command receptive state with the same parameter settings as before. When you want to change the parameters to the default settings, press <C>.

NOTE: The clear memory command C sets the Modem to off line mode. Press <*> again to enter command receptive mode.
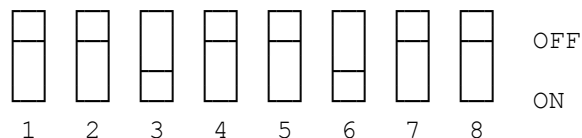
HAYES PROTOCOL MODE OPERATION

In Hayes protocol mode, commands instruct the DCM-7's operation and register values determine how the commands will be executed. The command structure is patterned from the industry standard AT-string-interface command, which makes the DCM-7 Hayes-software compatible.

LOGONS IN MS-DOS OPERATING SYSTEMS

With DeskMate's Telecom applications program and you Tandy Personal Computer, you can easily program your DCM-7 to log on to a host computer, information service or another terminal either manually or automatically. Follow the instructions in your DeskMate Tutorial and Reference Manual for setting the parameters and using the functions available. Depending on the computer you are using, the procedures may differ slightly from those shown. A Tandy 1000 PC is used for the examples following.
1. Power up the computer and load your communications software. Set the DIP switches on the DCM-7 as follows:

```
 ┌──┐┌──┐┌──┐┌──┐┌──┐┌──┐┌──┐┌──┐   OFF
 │  ││  ││  ││  ││  ││  ││  ││  │
 │  ││  ││  ││  ││  ││  ││  ││  │
 └──┘└──┘└──┘└──┘└──┘└──┘└──┘└──┘   ON
  1   2   3   4   5   6   7   8
```

2. At the Main Menu, select Telecom and change the TELECOM-STATUS screen to show:

Autodial Modem	YES
BAUD Rate	300
Data Word Length	8 BITS

```
   Parity                           NONE
   Number of Stop Bits              1 BIT
   XON/XOFF Flow Control            ON
   ASCII Character Filter           OFF
   Line Feed Filter                 OFF
   Echo (Half Duplex)               OFF
   Redial (# of Retries)            0
```
3. Select "Yes" for the Autodial Modem status setting and press <F2>. When
   the DEFINE MODEM FOR COMPUTER DIALING screen appears, change the dialing
   sequence to show:
```
   PAUSE: 2       Pause for 2 seconds.
   SEND:  ATDT    Wake up and originate a call using touch-tone dialing.
   NUMBER         Send number which will be input at terminal mode.
   SEND: ^M       Send ^M to force the DCM-7 to execute the commands:
   WAITC          Wait for carrier detect before continuing.
```
NOTE: If your telephone system requires pulse, rather than touch-tone
dialing, change ATDT to ATDP in the first SEND line.
4. Press <F12> twice to return to the TELECOM-STATUS screen after saving the
   dialing sequence.

MANUAL LOGON
1. Enter terminal mode from the TELECOM-STATUS screen (<F5>).
2. At the TERMINAL MODE screen, press <F8> and type in the telephone number
   of the information service, the press <ENTER>.
3. After the connection has been made successfully, proceed with the logon
procedures step by step.

AUTOMATIC LOGON
1. At the TELECOM-STATUS screen, press <F4> to create an autolog file and
   enter your log file name, then press <ENTER>. Press <F1> to create STATUS
   line. After selecting the parameters, press <F12> to return to the orig-
   inal screen and complete the rest of file. When completed, the screen for
   your autolog file might show:
```
   STATUS: Y,30,8,N,ON,OFF,OFF,OFF,0
   CALL:   123-4567 (Use your local TELENET number.)
   PAUSE:  5
   SEND:   ^M^M
   RECV:   TERMINAL=
   SEND:   D1^M
   RECV:   @
   SEND:   C 60942^M
   RECV:   ????
   SEND:   DJNS^M
```
2. Press <F12> <ENTER> to save this autolog file and return to the
   TELECOM-STATUS screen.
3. Input <F3> filename <ENTER> to execute you autolog file. When the logon
   sequence is entered correctly, the DCM-7 will dial your local access num-
   ber, connect to the service, then automatically execute the rest of the
   autolog file.

(css 08/05/93)