

Repeater Programming By Modem

This chapter describes how to program the CAT-1000 controller using the computer interface through the on board 300 baud modem or RS-232 port.

300 Baud Modem Connect

Call the repeater by telephone. When the CAT-1000 answers the phone a beep will be heard. Enter the control operator prefix code followed by a [#]. The voice will say: "CONTROL READY." Enter the modem activation command [*9#] to hear the modem tone. Connect your modem to the line and check for a lock indication. Press the carriage return and the screen will display Password. The default password is "cat1000." Type: **cat1000 (C/R)**

300 Baud Modem Auto Answer

Call the repeater by telephone. When the CAT-1000 answers the phone a beep will be heard. Enter the control operator prefix code followed by a [#]. The voice will say: "CONTROL READY." Turn on Zone 5 channel 6. (Modem Automatic Answer Enable). Exit the control operator mode by entering [*0#]. The CAT-1000 is now set to answer the next telephone ring by automatically placing the modem tone on the line. This mode is identical to calling a computer store bulletin board service. Program your computer to dial the repeater and watch for the "CONNECT" prompt. Press the carriage return and the screen will display Password. Type: **cat1000 (C/R)**

Command Definition

area	Display and change AREA CODE numbers.
call	Display and change CW ID.
clck	Display and set the CLOCK.
code	Display and change CODE and PREFIX numbers.
dial	Display and program SPEED DIAL numbers.
dtmf	Display and program DTMF commands.
extn	Extend modem program timer.
flsh	FLUSH selected memory areas.
hdwr	Display and program HARDWARE input switch action.
link	Display and program LINK SERIAL TUNE frequencies.
lock	Display and program LOCK-OUT phone numbers.
mcro	Display and program MACRO commands.
menu	Displays this MENU of computer terminal commands.
page	Display and program PAGING tones.
pass	Enter a new PASSWORD to establish modem communications.
quit	EXIT the computer terminal mode.
schd	Display and program SCHEDULER activity.
stat	Display ACTIVITY counters.
talk	Display and program VOICE synthesizer messages.
test	Perform diagnostic TEST of controller.
time	Display and change TIMER settings.
tone	Display and program COURTESY tone.
ufsw	Display and program SWITCHES on MF-1000 card.
vers	Display current software VERSION and release date.
xfer	Xmodem file UPLOAD and DOWNLOAD to save to disk.

Computer Modem Parameters

Mode	ORIGINATE
Baud Rate	300
Data Bits	8
Parity	N
Stop Bits	1

RS-232 Serial Port

4800
8
N
1

Default Password: **cat1000** Password Buffer: (15 Characters Max)

Notes:

The command prompt is: -> The password is case sensitive. Entries can be in upper or lower case. In the examples, all prefix numbers are default values and the carriage return is displayed as (C/R).

Area Code - area

To **DISPLAY** the AREA CODE table Type: **area(C/R)**. The terminal will display the list of AREA CODES.

To **READ** an individual AREA CODE stored at table position 12 Type: **area/r12(C/R)**.

To **PROGRAM** an AREA CODE at table position 2, Example:305 Type: **area/w2,305(C/R)**.

To **ERASE** an AREA CODE at table position 5 Type: **area/e5(C/R)**.

Call Letter Identification - call

To **READ** the CW call letter identification buffers, including tone frequency and speed, Type: **call(C/R)**.

To **PROGRAM** the CW call letter identification, Example: [W4XYZ-800Hz-20WPM] Type: **call/w1,4,2,w4xyz(C/R)**.

To **ERASE** the CW ID Type: **call/e1(C/R)**. To transmit CW ID Type: **call/t1(C/R)**. CW selection is limited to the frequencies and speeds listed in Figure 6-1.

Tone Frequency Hz	1=500	2=600	3=700	4=800	5=900	6=1000	7=1100	8=1200
W.P.M.	1=25	2=20	3=18	4=15	5=13	6=10	Entry 0-9 A-Z / . , ; : ? (SPACE	

Figure 6-1

Time Clock - clk

To **READ** the time Type: **clk(C/R)**. The terminal will display the current time in hours, minutes, day of week, day of month and month of year.

To **SET** time: Example: [1:30 PM MONDAY 7 DECEMBER] Type: **clk/13,30,2,7,12(C/R)**. Refer to the Clock Programming Table Figure 6-2 for inputs.

hour	00-23	Sun=1	
minute	00-59	Mon=2	Fri=6
day of week	1-7---	Tue=3	Sat=7
day of month	01-31	Wed=4	
month of year	01-12	Thr=5	

Clock Programming Table
Figure 6-2

Control And Prefix Numbers - code

To **LIST** and display all CAT-1000 prefix codes Type: **code(C/R)**.

To **READ** the setting of the autopatch access code [*513*]. Type: **code/r513(C/R)**. The terminal will display: [code 513 set to *].

To **PROGRAM** code [*513*] to 456 Type: **code/w513,456(C/R)**.

Speed Dial - dial

To **DISPLAY** the speed dial list for group 2, Type: **dial/2(C/R)**. Numbers and letters will be displayed. Other voice words will be displayed as [*]. The terminal will display page one of the group 2 speed dial table. There are a total of five pages containing twenty numbers with call letter identifications.

To **DISPLAY** the emergency speed dial list, Type: **dial/4(C/R)**.

To **READ** an individual speed dial number stored in group 1, position 22 Type: **dial/r122(C/R)**. The voice words are displayed as three digit numbers from the

voice vocabulary list.

To **PROGRAM** a phone number at speed dial number in group 3, position 15, Example: 978-6171 W4XYZ. Type: **dial/w315,9786171,890,004,920,930,950 (C/R)** .

To **PROGRAM** an emergency speed dial number at position 5, Example: 722-5500 POLICE DEPARTMENT. Type: **dial/w405,7225500,692,321 (C/R)** .

To **PROGRAM** a speed dial number with dialing delays enter [\$] at the desired location. Each [\$] represents a one second delay. To program a phone number at speed dial number in group 1, position 5, Example: 9, 2 second delay, 978-6171 W4XYZ. Type: **dial/w315,9\$\$9786171,890,004,920,930,950 (C/R)** .

To **ERASE** a speed dial number stored in group 2, position 55 Type: **dial/e255 (C/R)** . Emergency speed dial numbers are assigned group 4 positions 00 to 09.

DTMF Generator - dtmf

To **DISPLAY** the DTMF GENERATOR table Type: **dtmf (C/R)** . The terminal will display the list of DTMF commands.

To **READ** an individual DTMF command stored at table position 9 Type: **dtmf/r9 (C/R)** .

To **PROGRAM** a DTMF command at table position 15, Example: 4075*2AB Type: **dtmf/w2,4075*2ab (C/R)** .

To **ERASE** the DTMF command at table position 2 Type: **dtmf/e2 (C/R)** .

Extend Modem Connect Timer - extn

The modem connect time is determined by the [*618*] timer. To reset the timer type: **extn (C/R)** . A warning is given one minute prior to the system timing out.

During X-Modem file transfers, the CRT will not time out. When the file transfer is complete, the timer will be reset to one minute and a warning message will be issued to the user. During initialization, the [*618*] defaults to 20 minutes.

Flush Selected Memory Area - flsh

This command is used to flush certain blocks of memory without disturbing others. To flush Speed Dial Block #1 type: **flsh/1 (C/R)** .

COMMAND	DESCRIPTION	COMMAND	DESCRIPTION
flsh/1	Flush Speed Dial Block #1.	flsh/4	Flush Emergency Speed Dials
flsh/2	Flush Speed Dial Block #2.	flsh/5	Flush Scheduler Memory
flsh/3	Flush Speed Dial Block #3.	flsh/6	Flush Macro Memory

Hardware Input Switches - hdwr

To **DISPLAY** the HARDWARE input switch table Type: **hdwr (C/R)** . The terminal will display a list of eight commands that are programmed to activate when a positive input is applied to one of the CAT-1000 input lines.

To **READ** an HARDWARE command activated by input switch 3, Type: **hdwr/r3 (C/R)** .

To **PROGRAM** a HARDWARE command to be activated by input switch 8, Example: Turn on Zone 3 channel 5. Type: **hdwr/w8,1351 (C/R)** .

+-----Internal Command (See Figure 5-1)

To **ERASE** the HARDWARE command for switch 5 Type: **hdwr/e5 (C/R)** .

Remote Base Serial Tuning - link

To **DISPLAY** the Remote Base Serial Frequency list Type: **link (C/R)** . The terminal will display the remote base frequency load commands.

To **READ** a Remote Base Frequency stored at table position 18 Type: **link/r18(C/R)**

To **PROGRAM** a Remote Base Frequency memory, Example: At table position 5, load 146.940 MHz, offset (-), transmitter power HIGH.

Type: **link/w5,694011(C/R)**
| | | | | | +-- Transmitter Power 0=Low,1=High)
Table Position --+ | | | | | +---- Offset 1=Minus,2=Simplex,3=Plus
MHz 1's-----+ | | +----- Khz 1's (0 or 5)
KHz 100's-----+ +----- Khz 10's

To **PROGRAM** a Remote Base Frequency memory for the RBI-1 Interface. Example: At table position 3, load 443.175 MHz, offset (+), CTCSS encoder frequency 131.8 Hz.

Type: **link/w3,4,4,1,7,5,3,20 (C/R)**
Table Position--+ | | | | | | +---- CTCSS Tone (See Figure 17-3)
Band Number-----+ | | | | | +----- Offset 1=Minus,2=Simplex,3=Plus
MHz 1's-----+ | | +----- Khz 1's (0 or 5)
KHz 100's-----+ +----- Khz 10's

To **ERASE** a Remote Base Frequency at table position 2 Type: **link/e2(C/R)**

Telephone Number Lock-out - lock

To **DISPLAY** the lock-out phone number list Type: **lock(C/R)**.

To **READ** a locked out number stored at table position 3 Type: **lock/r3(C/R)**.

To **PROGRAM** a number at table position 15, Example: 555-1212
Type: **lock/w15,5551212(C/R)**.

To lock-out an entire telephone prefix at table position 15, Example: All 976 numbers Type: **lock/w15,976****(C/R)**.

To **ERASE** a lock-out number stored at table position 1 Type: **lock/e01(C/R)**.

Macro - mcro

To **DISPLAY** the MACRO command table Type: **mcro(C/R)**. The terminal will display the macro command strings stored at each of the forty table positions. Each table will hold ten commands.

To **READ** the MACRO command stored at table position 15 Type: **mcro/r15(C/R)**.

To **PROGRAM** a MACRO at table position 6, Example: With a macro command number of 84163, turn on repeater CTCSS Zone 1 CH 2, turn off autopatch Zone 4 CH 1, Turn on User Function switch 5, and announce the time.

Type: **mcro/w6,84163/1121,1410,1851,2000(C/R)**.
Macro Code Number--+ +-----Internal Command (See Figure 5-1)

To **ERASE** a MACRO command at table position 2 Type: **mcro/e2(C/R)**.

Menu - menu

To **DISPLAY** this menu of terminal commands Type: **menu(C/R)**.

Paging Tone - page

To **DISPLAY** the PAGING TONE table Type: **page(C/R)**. The terminal will display the list of PAGING TONES.

To **READ** the PAGING TONE stored at table position 19 Type: **page/r19(C/R)**.

To **PROGRAM** a PAGING TONE at table position 2, Example: 879Hz-1395Hz
Type: **page/w2,28,68(C/R)**. See figure 5-16.

To **TRANSMIT** a PAGING TONE at table position 14, Type: **page/t14 (C/R)** .

To **ERASE** a PAGING TONE at table position 16 Type: **page/e16 (C/R)** .

Enter New Password - pass

To provide security, a password must be entered to establish communications with the CAT-1000 through the 300 baud modem or the local RS-232 Serial port. The default password is **cat1000**.

To **CHANGE** the password, Example: w4xyz Type: **pass (C/R)** .

The terminal will display the prompt: Enter new password: Type: **w4xyz (C/R)** .

The terminal will display the prompt: Please retype it: Type: **w4xyz (C/R)** .

The terminal will display: Password has been changed.

Exit Terminal Routine - quit

To **EXIT** the terminal mode and return the CAT-1000 to normal operation

Type: **quit (C/R)** . The sign-off message will appear.

Scheduler - schd

To **DISPLAY** the CAT-1000 scheduler Type: **schd (C/R)** . The terminal will display page one of the scheduler table. There are three pages containing twenty positions each. Each position displays the time and scheduled command. To schedule a command Example: Turn off the autopatch every night at 11:00 P.M.

```

                                           +-----Internal Command Structure
Type: schd/w5/23,00,0,0,0/1410 (C/R) (See Figure 5-1)
Table Position----+ | | | | | | | | | | | +----Off
      Hours-----+ | | | | | | | | | | | +---Channel Number
      Minutes-----+ | | | | | | | | | | | +---Zone Number
      Day of Week-----+ | | | | | | | | | | | +---Pointer Number
      Day of Month-----+ +-----Month of Year
  
```

Example: Transmit voice message 9, Tuesday night at 7:30 P.M.

```

                                           +----Internal Command Structure
Type: schd/w6/19,30,3,0,0/3009 (C/R) . (See figure 5-1)
Table Position---+ | | | | | | | | | | | +--+
      Hours-----+ | | | | | | | | | | | +----Message Number
      Minutes-----+ | | | | | | | | | | | +---Pointer
      Day of Week-----+ | | | | | | | | | | | +-----Month of Year
      Day of Month-----+ +-----Month of Year
  
```

Table Position		1-60	+-----	*=Every Hour	
Hour		0-23-*	----	+	+
Minutes		0-59	+		+
Day of Week		0-9 --	0=Daily	4=Tuesday	8=Weekdays
Day of Month		1-31	1=Sunday	5=Wednesday	9=Weekends
Month of Year		1-12	2=Monday	6=Thursday	
			3=Tuesday	7=Saturday	

Scheduler Programming Table

Figure 6-3

To **ERASE** a scheduler command at table position 2 Type: **schd/e2 (C/R)** .

Statistics - stat

The CAT-1000 counts various repeater activities. Once the counters reach 9999 they will roll over to 0000. The counters can be reset with the erase command.

To **LIST** the status counters Type: **stat(C/R)**. The terminal will display the following status report:

```
Repeater operation status report:
  Manual autopatch: 0059
    Speed dials: 0023
Emergency speed dials: 0011
  Reverse autopatch: 0012
    Off air control: 0009
  Telephone control: 0003
    Off air programming: 0000
  Telephone programming: 0015
  Telephone ring detect: 0122
    CRT logins: 0005
```

To manually **RESET** the counters to 0000 Type: **stat/e(C/R)**.

Voice Synthesizer - talk

To **READ** voice message [12], Type: **talk/r12(C/R)**.

To **PROGRAM** voice message [5], Type: **talk/w5,890,004,920,930,950,746(C/R)**.

```
Table Position--+ W 4 X Y Z +--REPEATER
```

To **ERASE** voice message [7], Type: **talk/e7(C/R)**.

To **TRANSMIT** voice message [14], Type: **talk/t14(C/R)**. The CAT-1000 will key the transmitter and say the message.

Diagnostics Test - test

The CAT-1000 contains a series of diagnostics test designed to evaluate operational performance of the controller and the over all repeater system.

To perform a checksum test on both the program and voice ROM's Type: **test/c(C/R)**. The terminal will display:

```
Checksum ROM1 (Program): 4752
Checksum ROM2 (Voice): 5DAC
```

Checksum will vary with different software revisions.

To perform a barber pole data shift to the MF-1000 Serial Interface Card Type: **test/s(C/R)**.

To exercise the sixteen output ports Type: **test/o(C/R)**. Each output will be switched on for a half second in the order listed below.

```
+-----+
| 1. PTT #1      | 5. Strobe #1  | 9. UF Switch #1 | 13. UF Switch #5 |
| 2. PTT #2      | 6. Strobe #2  | 10. UF Switch #2 | 14. UF Switch #6 |
| 3. Serial Data | 7. Off Hook * | 11. UF Switch #3 | 15. UF Switch #7 |
| 4. Serial Clock | 8. Modem *   | 12. UF Switch #4 | 16. UF Switch #8 |
+-----+
```

* Off Hook and Modem outputs are not exercised when this test is conducted through the modem.

To perform a test and display the twenty-four input ports Type: **test/i(C/R)**. Each of the inputs will be displayed. A [0] indicates the port is low, while a [1] indicates the port is high. Figure 6-7 defines the terminal display. The 0 - 1 display is an example only and may vary with each repeater configuration. Key-up on the repeater input and watch COR #1 display change state. Strike any key to terminate the input display.

MF-1000 Board #1, #2 and DVR-1000 Switches - ufs

To **DISPLAY** the serial board switch logic command table Type: **ufsw(C/R)**. The terminal will display the logic switch assignments for the eight expanded user function switches on the MF-1000 Serial Interface Card and the DVR-1000 Digital Voice Recorder. Table positions 01-40 are reserved for the eight logic switches on Serial Card #1 (Link Transceiver Tuning). Table positions 41-80 are reserved for the eight logic switches on Serial Card #2 and the Digital Voice Recorder. The CAT-1000 must be in the remote base mode. Set dip-switch #3 or #4 to ON.

To **READ** an individual serial board switch logic command stored at table position 9 Type: **ufsw/r9(C/R)**.

To **PROGRAM** a serial board switch logic command at table position 15, Example: set switches [1-2-6-7 ON], switches [3-4-5-8 OFF].

```
      Type: ufsw/w15,11000110(C/R) .
Table Position--+ |||+-----Switch #8
Switch #1-----+|||+-----Switch #7
Switch #2-----+|||+-----Switch #6
Switch #3-----+||+-----Switch #5
                  +-----Switch #4
```

To **ERASE** a serial board switch logic command at table position 2
Type: **ufsw/e2(C/R)**.

Version - vers

The CAT-1000 will display on the terminal, the current software version and release date for both the program and voice PROMs. To list and display the software version Type: **vers(C/R)**.

Transfer Data Up/Down - xfer

This command is used to transfer the contents of the CAT-1000 memory between the controller and a computer were it can be stored on disk as a back-up file or used with the editor program. The memory is divided into eight blocks. Data transfer is limited to one block at a time using the [xfer] command. Three and a half minutes are required to transfer each block using the internal 300 baud modem. If the RS-232 4800 baud port is used, block transfer takes approximately twenty seconds. You may change the file name however you must keep the [.001 through .008] extensions.

To **DOWNLOAD** memory block #1 of the CAT-1000 RAM memory and save it to disk, Type: **xfer/d1(C/R)**. The CAT-1000 will send the block using Xmodem download protocol. Select the Xmodem transfer function on your computer. Type the file name: **cat.001(C/R)**. Once the download sequence starts, monitor the activity display of packet count, until the download is complete.

To **UPLOAD** memory block #4 to the CAT-1000 RAM memory from disk, Type: **xfer/u4(C/R)**. The CAT-1000 will send: [select Xmodem download protocol]. Select the Xmodem transfer function on your computer. Type the file name: **cat.004(C/R)**. Once the upload sequence starts, monitor the activity display of packet count, until the upload is complete. Memory is transferred in blocks. Each block contains 4096 bytes of data. Select the block number to be transferred.