

D S R T T Y  
RADIO DATA  
COMMUNICATIONS SOFTWARE

OPERATOR'S MANUAL

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870-32010

February, 1987 Printing

# DSRTTY RADIO DATA COMMUNICATIONS SOFTWARE

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# DSRTTY RADIO DATA COMMUNICATIONS SOFTWARE

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HAL COMMUNICATIONS CORP.  
URBANA, IL

This manual discusses how to use the software supplied with the DS-3200. A complete reading of this manual is of course recommended. However, section 1 contains a summary of operation that will get the experienced RTTY operator going.

## 1.0 Getting Started

A few easy steps are required to start DSRTTY. These steps are much the same as you would perform for any other program and will become very familiar after some practice.

### 1.1 Software Installation

#### 1.1.1 DS-3200 Installation

The dual-floppy drive DS-3200 model requires that DSRTTY be run from a floppy diskette in Drive A (top drive). DSRTTY software is supplied on one 5.25" floppy diskette. Make back-up copies of this diskette BEFORE attempting operation.

It is desirable to have DSRTTY on a "bootable" diskette - a diskette that will allow you to turn on the DS-3200 and immediately start using DSRTTY. To do this, it is first necessary to format a "system" diskette and then copy DSRTTY files to that diskette. This is a familiar procedure to experienced computer operators. If you are not experienced (or need a reminder), the following procedure is recommended.

1. Locate the MS-DOS diskette and place it in Drive A (top) - leave the door lever OPEN.
2. Turn ON AC power to the DS-3200. Be sure the Display is also turned ON (pilot lamp ON).
3. Close Drive A door lever.
4. The upper left corner of the display will show an incrementing number, the parity check of RAM.
5. Enter Time and Date if requested.
6. Locate a BLANK double-density, double-sided floppy diskette and insert it in Drive B, closing the door lever.
7. Type: FORMAT B:/S [enter]

8. The diskette in Drive B will be formatted so that it may be used to cold-start or "boot" the DS-3200. When done, answer "N" in response to "Format Another?"
9. Remove the DOS diskette from Drive A.
10. Locate the original HAL DSRTTY diskette and put a write-protect tab over the small notch in one side. Place the DSRTTY diskette in Drive A and close the door.
11. Type: COPY \*.\* B:/V [enter] All of the files on the DSRTTY diskette will now be copied and verified to the newly formatted diskette.
12. When all copying has been completed, remove the original HAL DSRTTY diskette from Drive A and store it in a safe location. Label and use the copy!
13. Place the new copy diskette in Drive A and list the directory (Type DIR [enter]). The following files should be on the diskette:

```
COMMAND.COM
DSRTTY.EXE
DSRTTY.CNF
TIMER.COM
AUTOEXEC.BAT
```

14. The file "AUTOEXEC.BAT" is a batch file that automatically loads time and then DSRTTY when the DS-3200 is turned On.
15. The file "DSRTTY.EXE" is the main DSRTTY program and may be run at any time by typing DSRTTY [enter].
16. The file "DSRTTY.CNF" is the configuration file in which are stored power-on default parameters. When copying "DSRTTY.EXE", be sure to also copy "DSRTTY.CNF".

### 1.1.2 DS-3200HD Installation

The DS-3200HD is supplied with "DSRTTY.EXE", "DSRTTY.CNF", "TIMER.COM", "AUTOEXEC.BAT", and all DOS files preloaded on the hard disk drive. Therefore, the procedures of the previous section are not required for the DS-3200HD. However, a complete set of floppy diskettes (DSRTTY & MS-DOS) is supplied in case you should have to re-load the hard disk. Also, no sub-directories have been included on the factory prepared hard disk. You may wish to set-up a separate hard disk directory (such as RTTY) for radio work and move "DSRTTY.EXE" and "DSRTTY.CNF" to this directory. The DS-3200HD is set so that "DSRTTY" is automatically loaded when AC power is turned On. If this is inconvenient, use a text editor to modify the "AUTOEXEC.BAT" file (remove the call to "DSRTTY").

## 1.2 Running DSRTTY

Be sure that you have followed the above instructions and have the DOS system files on the copied DSRTTY diskette or have DSRTTY on the hard disk (DS-3200HD). The software for the DS-3200 is controlled by an "AUTOEXEC.BAT" file that automatically sets-up the time and date and then loads the main program called "DSRTTY". The software may be loaded using either a "cold boot" or a "warm boot". The full procedure for a "cold boot" is listed below. For a "warm boot", simply press ALT-CTRL-DEL and start at step No. 4. You may also run the program by typing "DSRTTY" in response to the system prompt.

### BOOTING THE SOFTWARE:

1. Insert the DSRTTY software diskette in disk drive "A" (top drive). Have you made back-up copies? If not, do it NOW and use the copy! DON'T close the door lever until after power is turned on. (This step does not apply for DS-3200HD).
2. Turn-on the DS-3200 power switch.
3. After the terminal power is on, close Drive A door lever. (DS-3200 only - NOT DS-3200HD).
4. After the DS-3200 memory check is completed, the Drive A light will come on and the screen will request the time. The AUTOEXEC.BAT program includes the "TIMER" program, setting the time and date automatically.
5. The executive file will now call "DSRTTY" and the title page will be displayed. Note that a version number is displayed on this page. Write-down this number in your manual for future reference.
6. After a short delay, the operating screen will be displayed.

DSRTTY may now be used for radio data communications. See the following sections for a full description of the features. If you are anxious to try the program, type ALT-H [enter] to display the help menu. to exit to DOS, type CTRL-1 and then Option 7.

## 2.0 DSRTTY CONTROL KEYS AND SCREEN

The DS-3200 keyboard has ten "function" keys, labeled F1 through F10. These keys, in conjunction with the ALT, SHIFT, and CTRL keys are used to control the various features of DSRTTY. The ALT, SHIFT, and CTRL keys are used in the same manner as the SHIFT key of a typewriter - you must press and hold the ALT, SHIFT, or CTRL keys down while pressing and releasing a second key (Function key F1 - F10). Each function key may perform 4 different operations, depending upon which additional control key is pressed (F#, ALT-F#, SHIFT-F#, CTRL-F#). A quick review of the various function key operations is shown on the HELP screen, accessed by typing ALT-H. The HELP screen is shown in Figure 1 below.

### DS-3200 System Help

FN Keys	Alt-FN Keys	Ctrl-FN Keys	Shift-FN Keys
Here Is 1-10	F1=Select Code	F1=DOS Options	F1=Save Buffers
FN ENTER Load	F2=Select Speed	F2=Configure Sys	F2=Load Buffers
	F3=USOS Toggle	F3=Reserved	F3=Copy RX to TX
FN FN Program	F4=Half/Full Duplex	F4=LPT1: On/Off	F4=36 RYs to TX
ENTER to End	F5=Reserved	F5=Reserved	F5=Buffer 1/2 Sel
	F6=Reserved	F6=Reserved	F6=Block Operations
	F7=Word/Char/Line	F7=Reserved	F7=Clear Receive
	F8=Sync Idle On/Off	F8=Reserved	F8=Clear Transmit
	F9=Auto/Cont	F9=Reserved	F9=Screen Format
	F10=Xmit Enable	F10=Reserved	F10=Xmit From Disk

To insert the time and date in the transmit buffer or HERE IS message, use:

Alt-T = TIME, Alt-D = DATE, Alt-B = BOTH TIME & DATE

To force the receive buffer to LTRS and FIGS shift, use Alt-L and Alt-F

To insert 12 BAUDOT LTRS characters in the transmit buffer, use Alt-N

Press any key to continue >

Figure 1. ALT-H HELP Screen

## 2.1 Use of the FN Keys

The ten function (FN) keys of the DS-3200 are used to set and control many hardware and software features. A "HELP" menu page explaining the function key uses is available at any time by typing "ALT-H". The following tables present a complete list of the controls available. The features will be discussed in detail in following sections of this chapter.

TABLE 1  
FN KEYS  
HERE IS MESSAGES

KEYS	OPERATION
F1 CR to F10 CR	Load contents of HERE IS message No. 1-10 into TX buffer to be transmitted.
F1 F1 to F10 F10	Program selected HERE IS message. Message displayed on top status line of screen; maximum of 72 characters. Old message is first displayed; RETURN to keep. Type any other keys to erase old and write new message; end program with RETURN.

NOTE: All ten HERE IS messages are saved in the DSRTTY.CNF file (CTRL-F2 / SAVE).

TABLE 2  
ALT-FN KEYS  
COMMUNICATIONS CONTROL

KEYS	OPERATION
ALT-F1	Select code: ASCII or BAUDOT
ALT-F2	Set speed: 45-9600 baud; Increase or decrease speed with each press, depending upon SCROLL-LOCK status.
ALT-F3	Turn Unshift-on-space (USOS) ON/OFF
ALT-F4	Set half or full duplex (HDX/FDX)
ALT-F5	Reserved
ALT-F6	Reserved
ALT-F7	Set WORD/LINE/CHAR transmit mode
ALT-F8	Set RTTY Sync-idle ON/OFF
ALT-F9	Autosend/Continuous TX Control
ALT-F10	Transmit Enable/Inhibit Control

NOTE: Default modes are set in DSRTTY.CNF file (CTRL-F2 / SAVE).

TABLE 3  
CTRL-FN KEYS  
SYSTEM CONTROL

KEYS	OPERATION
CTRL-F1	DOS Options - Directory; Rename, Delete, Copy, or Combine Files; Exit DSRTTY to DOS.
CTRL-F2	System configuration parameters: ASCII & Baudot format, line length, Screen Attributes, Save/Load System Parameters (DSRTTY.CNF), Communications Parameters.
CTRL-F3	Reserved
CTRL-F4	Turn line printer ON/OFF (LP1:)
CTRL-F5	Reserved
CTRL-F6	Reserved
CTRL-F7	Reserved
CTRL-F8	Reserved
CTRL-F9	Reserved
CTRL-F10	Reserved

NOTE: System Configuration (CTRL-F2) and Line Printer (CTRL-F4) parameters are stored in DSRTTY.CNF file.

TABLE 4  
SHIFT-FN KEYS  
SCREEN AND BUFFER CONTROL

KEYS	OPERATION
SH-F1	Save receive or transmit buffers to disk. Store received text to disk.
SH-F2	Load receive or transmit buffers from disk.
SH-F3	Copy lines from receive to transmit buffer.
SH-F4	Enter 18 pairs of "RY" into transmit buffer (36 characters total).
SH-F5	Select alternate transmit buffer, "B1" or "B2" (indicated on status line).
SH-F6	Block Move Operation
SH-F7	Clear receiver buffer.
SH-F8	Clear selected transmit buffer.
SH-F9	Change equally split RX/TX screen to 20 line RX / 4 lines TX.
SH-F10	Transmit from Disk



2.2 Status Indicators

DSRTTY provides on-screen indication of the status of many of the communications parameters and conditions. The top line of the screen is devoted to display of these STATUS INDICATORS. These indicators show the code, data rate, transmit/receive status, communications channel, time, and other operation parameters. An explanation of these STATUS INDICATORS is shown below in Table 5.

TABLE 5  
STATUS LINE

↑↓	BAUDOT	0074	HDX	US	WRD	RX	DIS	ASR	SYN	B1	COM1:	LP	10:31	UTC
SCROLL	CODE	SPEED		USOS	MODE	-----			Sync	TX	Serial	Line	Time	
LOCK			HDX	on/		TX OUTPUT CONTROL			Idle	Buffer	I/O	Printer	Time	
Status	ASCII	45	or	off	Word	-----				Select	Port	Control	Zone	
(↑)	Baudot	9600	FDX	(Baudot)	Char									
Scroll		baud		(only)	Line	TX	TX	AUTO	on/	B1	COM1	CTRL-F4		
Rx scrn	ALT-F1		ALT-F4			PTT	buffer	TX/RX	off	B2	or			
and		ALT-F2		ALT-F3	ALT-F7	STATE	control	control			COM2			
Incr.						RX	DIS	AUTO/			CTRL-F2			
Speed						TX	EN	CONT		SH-F5	Menu			
(↓)						-----								
Tx scrn						ALT-F10		ALT-F9						
Decr Speed														

### 2.3 Screen Format

In addition to the STATUS INDICATORS, a split-screen display is used to show RECEIVE text in the upper section and TRANSMIT text in the LOWER section of the screen. Line numbers are given for both RECEIVE and TRANSMIT sections of the screen. In the RECEIVE section, Line 1 shows the most recently received text. In the TRANSMIT section, the next to be transmitted text is shown in Line 1. Transmit and receive text is further delineated by setting different video attributes to the two screen sections. Factory supplied DSRTTY sets the receive text section to bright monochrome attribute and transmit section to dim monochrome attribute. These attributes may be set to other intensities, colors, reverse, or flashing by using Option 7 of CTRL-F2 System Control. The screen split position may also be set to 12 lines receive, 12 lines transmit, or to 20 lines receive, 4 lines transmit by using SHIFT-F9. The receive and transmit line numbers are useful when scrolling the screen buffers.

The display screen may be thought of as two independently movable "windows" through which portions of large receive and transmit buffers may be viewed. The SCROLL LOCK key on the far right of the keyboard sets cursor control for the receive or transmit display areas. The SCROLL LOCK condition is shown on the left end of the STATUS LINE: an up-arrow ( ↑ ) indicates cursor control over the receive display - a down-arrow ( ↓ ) indicates cursor control over the transmit display area. The displayed section of the receive or transmit buffer may then be controlled by using the four arrow keys and HOME, END, PGUP, and PGDN keys. As will be discussed in section 3.3, text in the transmit buffer may also be edited using the cursor control keys.

The SCROLL LOCK key also affects the direction of the data rate control (ALT-F2). When the SCROLL LOCK arrow is up ( ↑ ), the data rate increases with each ALT-F2 key press; if down ( ↓ ), the data rate decreases with each ALT-F2.

The two buffer areas may be CLEARED at any time by using SHIFT-F7 (Clear RECEIVE) or SHIFT-F8 (Clear TRANSMIT). Use caution with these controls - the whole buffer, not just the displayed section is cleared.

### 3.0 OPERATION

DSRTTY uses the serial I/O port to send and receive RTTY transmissions using either Baudot or ASCII data codes at data rates between 45 and 9600 baud. The code is selected by using ALT-F1 to show the desired code on the STATUS LINE. The transmit/receive data rate is selected by using ALT-F2. Available data rates are:

DSRTTY Data Rates: 45, 50, 57, 74, 100, 110, 150,  
300, 600, 1200, 2400, 4800, 9600 baud

#### 3.1 Receive Features

Either Baudot or ASCII RTTY signals at the above data rates may be received and displayed. Other codes or data rates (such as SITOR) will NOT be decoded or displayed correctly. All received text is shown on the upper section of the screen as it is received. The receive display area is normally set-up for bright video attribute, but may reset by use of CTRL-F2 options. Unshift On Space (USOS) is a Baudot Receive-only feature and has no effect on ASCII reception.

##### 3.1.1 Receive Buffer

The receive display may also show the "echo" of transmit text if Half-Duplex (HDX) is selected (ALT-F4). In this case, transmitted text is shown as dim video in the receive display area. If Full-Duplex is chosen (FDX with ALT-F4), transmit text is NOT echoed into the receive display. Note, however, that the external modem may provide an echo feature which is external to the DS-3200. In this case, both receive and externally echoed transmit text will be shown in bright video in the receive display.

The receive buffer is 250 lines long (up to 18,000 characters), 12 or 20 lines of which may be viewed by scrolling the receive display area. To view other sections of the receive buffer, set the SCROLL LOCK status line arrow to UP and use the up/down arrow and PGUP/PGDN cursor control keys. Regardless of the position of the display window, newly received text is always entered in Line 1 of the receive buffer.

### 3.1.2 Storing Receive Text

Receive text may be stored to disk in two slightly different ways: (1) store the receive buffer to disk, or (2) store receive text directly to disk.

#### 3.1.2.1 Receive Buffer Storage

Storing the receive buffer to disk is an operation that is done after text has accumulated in the receive buffer. This mode is particularly useful for "after the fact" storage. However, a MAXIMUM of 250 lines of text (receive buffer limit) may be stored at a time. To store part or all of the receive buffer, use SHIFT-F1, select (R)ecieve buffer, specify the start and end line numbers of the segment to be stored, and give a file name. The START line number is the highest, the "top" of the section to be stored. Full file name parameters may be used including name, extension, and path, if desired. Regardless of the choice of Baudot or ASCII receive code, text is always stored as ASCII characters. The resulting ASCII text file may later be transmitted, printed, or edited using either DSRTTY or any good text editor program.

#### 3.1.2.2 Continuous Receive Storage

Receive text may also be stored on the disk as it is received. This is the mode generally used to collect messages for later retransmission. In this case, the only limit to the size of the stored text file is the size of the diskette (or hard disk) used. There are also several options to be selected for storage format and single or auto-increment file storage. The following procedure summarizes the steps involved and options available.

1. Use SHIFT-F1 and Option C to select Continuous Receive storage option.
2. Continuous receive storage may be done in either (N)ormal or (A)uto-formatted modes. As noted above, Baudot is converted to ASCII before storage - LTRS and FIGS are NOT stored. In (N)ormal mode, no additional end-of-line carriage return (CR) or line feed (LF) characters are stored; multiple sequential CR are converted to single CR and no attempt is made to adjust the length of the stored line. In (A)uto-formatted mode, ALL received CR characters are ignored and each LF is stored as a CR/LF pair. If a received line exceeds the specified display line length, a CR/LF is inserted with the proper word wrap (when optioned).

When storing messages in which the exact format is important, use the (N)ormal option. When storing general text under particularly noisy conditions, use (A)uto-formatted mode.

3. Continuous receive storage to disk may be done as either one large continuous file or as a sequence of related files. If general receive text is to be stored, use the (S)ingle storage mode. After (S) is selected, DSRTTY asks for the file name. Specify up to 8 characters for the name and three characters for an extension (optional). A disk drive and directory path may also be specified. After entry of the file name, ALL received text will be stored on the designated storage drive until stopped or until storage is exhausted (360K maximum on a floppy - much more on a hard disk!). To stop continuous storage, use SHIFT-F1, select CONTInuous receive, and answer (Y)es to the "TERMINATE?" query.
4. To store a sequence of related message files, select (A)uto-increment mode. This mode assumes that received text is organized in messages or files, each ending with the "NNNN" (4N) letter sequence. Upon reception of "NNNN", the current receive storage file is closed and a new file in the sequence is opened. The procedure continues until terminated with a SHIFT-F1, and (Y)es to TERMINATION. The file name extension is used to reflect the automatic file incrementing feature. When queried, specify ONLY the file name, NOT the extension. The file extension is automatically started at ".000" and increments to ".001", ".002", etc upon each reception of "NNNN". The files may be edited, combined, and renamed after collection.
5. Selection of either Continuous Receive mode causes the name of the file being stored to appear on the right half of the status line. The display form is:

```
RX ON: C:\DIR\DIR\filename.ext
```

This message serves as a prompt until the continuous save mode is terminated. If (A)uto-increment mode is used, the extension will indicate the currently saved file parameter.

A summary of the continuous receive file save options is given in Table 6:

TABLE 6

## CONTINUOUS SAVE RECEIVE FILE OPTIONS

ACTION	CHOICES	OPTIONS
SHIFT-F1	R/X/C/D	Save Features R = Store designated lines of receive buffer X = Store designated lines of transmit buffer C = Continuous receive storage D = Display active directory
C	N/A	Continuous Receive Save Mode N = Normal format A = Auto format
N	A/S	Collection Mode A = Auto Increment S = Single File
S	[filename.ext]	Single File Storage - give filename.ext
A	[filename]	Auto-increment - give filename
SHIFT-F1	C Y	TERMINATE Continuous Save

## 3.2 Transmit Features

DSRTTY will transmit from text typed on the keyboard or text stored in disk files. Use of disk files will be discussed in section 3.2.4. The normal communications mode of DSRTTY is to transmit text typed on the keyboard. As mentioned above, the keyboard-entered text is shown in dim video on the lower section of the screen.

## 3.2.1 Pre-typing Transmit Text

To pre-type text, set ALT-F9 for ASR on the status line and ALT-F10 for RX and DIS. Enter text as it is to be sent, including the ENTER key to end each line. When WRD (word) mode is selected (ALT-F7), lines are automatically terminated with word wrap-around so that no words are split at the end of a line. The typist therefore need not use the ENTER key until the last line of transmit text.

Because of the AUTO transmit-receive control, ALWAYS end a transmission with ENTER as the last key typed! Otherwise, the transmitter will remain on until the built-in timer turns the transmitter off.

The word wrap-around feature is disabled when CHARACTER mode is selected, but the terminal will automatically limit the transmit line to the selected length (20-75 characters, default at 72 characters) and split words as required. Other transmit line lengths may be set in Option 5 of the CTRL-F2 System Control.

After all transmit text has been entered, use ALT-F10 to start transmission. A second ALT-F10 will halt transmission. After all text in the transmit buffer has been sent, DSRTTY returns to receive, showing "RX" and "EN" on the status line. This means that the transmit output is ENABLED (EN) and transmission will resume automatically whenever a new key is pressed. To return to the pretype state while receiving, type ALT-F10 again to get "RX DIS" status to DISABLE (DIS) the transmitter output.

To achieve total manual control of the transmitter output, use ALT-F9 to set CONT instead of AUTO on the status line. When in CONT mode, the transmitter will turn on and stay on whenever activated with the ALT-F10 key. The transmitter is turned off with a second ALT-F10 key operation.

The time and/or date can be inserted in the transmit text at any time with one of three key combinations. ALT-T will send only the time, ALT-D sends only the date, and ALT-B sends both the time and then the date. These key operations will be shown in the transmit buffer as "ö" for time only (ALT-T), "â" for date only (ALT-D), and "□" for both time and date (ALT-B). The correct time and date will be inserted and sent when the transmit buffer contents are actually sent.

### 3.2.2 Transmit Buffers

Two independent transmit buffers are available, buffer "B1" and buffer "B2". The currently active transmit buffer is shown on the status line ("B1" or "B2"). The two buffers allow the operator to do both pre-typing while receiving the other station AND give a "fast-break" response to questions without erasing the pre-typed text. The active transmit buffer is selected with keys SHIFT-F5. The selected buffer may be scrolled, edited or erased with SHIFT-F8.

### 3.2.3 Transmit Options

RTTY transmission will be made at the same code, speed, polarity, and shift set for receive using ALT-F1, ALT-F2, ALT-F5, and ALT-F6 keys. When HDX (half-duplex) mode is selected (normal radio communications), transmitted text is "echoed" into the receive buffer using dim video. Also, receive data input is disabled

while transmitting in HDX mode. When FDX mode is used (computer and modem systems), transmit text is NOT echoed in the receive buffer and both transmit and receive data circuits are simultaneously active.

The Baudot USOS (unshift-on-space) feature affects both received and transmitted text output. When USOS is turned ON, the receive case downshifts to LTRS case after receipt of EACH space-bar character. The case does NOT automatically shift to LTRS at the end of a received line. When transmitting text with USOS turned ON, transmit case is returned to LTRS after each space-bar character (extra LTRS and FIGS characters are inserted as required). When USOS is turned OFF, the receive case is ONLY changed when LTRS or FIGS characters are part of the received RTTY text. Likewise, when transmitting, Baudot FIGS and LTRS codes are only inserted as needed.

The end-of-line (E-O-L) sequence transmitted operates INDEPENDENTLY of USOS condition and may be set to many conditions using CTRL-F2. The default for factory supplied software is to send CR/LF/LTRS for Baudot RTTY. All Baudot text received is displayed as upper-case or capital letters. Transmit text may be typed using either upper or lower case. Keys with no Baudot equivalent are ignored (CTRL-H, for example). The keys necessary to produce unique Baudot codes are listed in Table 7.

TABLE 7

## UNIQUE BAUDOT KEY COMBINATIONS

CHARACTER	TYPE	DISPLAY
BELL	CTRL-G	( ◇ )
LTRS	SHIFT-,	( < )
FIGS	SHIFT-.	( > )
CR	ALT-M	( ⏏ )
LF	CTRL-J	(inverse O)
FIGS-H	SHIFT-3	( # )
Blank	ESC	( -- )
BREAK	ALT-CTRL	(continuous space)

All standard 96 characters of the ASCII code are supported by DSRTTY. Use the SHIFT and CTRL keys as you would on any other ASCII terminal. Use of CTRL keys will produce graphics symbols in the transmit section of the screen. The symbols correspond to those listed in your MS-DOS Manual. USOS is a Baudot-only feature and has NO effect on ASCII operation. The ASCII end-of-line (E-O-L) sequence is also set using CTRL-F2. The factory default for ASCII E-O-L is CR only.



Sync-idle (also called "diddle") may be activated with ALT-F8. When ON (indicated on status line), pauses in typing are filled with LTRS (Baudot) or NUL (ASCII) characters. The sync character continues UNTIL a new character or word is to be sent OR a blank line with NO TEXT is to be sent. It is therefore VERY IMPORTANT to always end each transmission with a BLANK LINE, particularly if SYNC IDLE is ON.

### 3.2.4 Transmitting Stored Files

Text files may be transmitted by either first loading a transmit buffer (B1 or B2) and then sending the buffer using ALT-F10 OR by transmitting a file directly from disk storage.

#### 3.2.4.1 Sending Files Using Transmit Buffers

Any ASCII text file on disk may be transmitted by loading it into the active transmit buffer (B1 or B2) with the SHIFT-F2 command. The status line prompts for the name of the file. The file is loaded into the active or displayed transmit buffer (B1 or B2). Because the transmit buffers have a maximum length of 250 lines, files longer than 250 lines should be split into multiple files when editing. Otherwise, text beyond 250 lines will NOT be transmitted. All of the transmit output controls with ALT-F9 and ALT-F10 may be used to start and stop transmission of disk files.

#### 3.2.4.2 Transmitting Files Directly from Disk

The key combination SHIFT-F10 may be used to transmit files directly from disk without first loading them into a transmit buffer. Such files may be text, computer program source listings, or object code files. If ASCII 8-bit (no-parity) format is set-up (CTRL-F2), the files may also be binary.

Transmitting direct from disk allows two modes - (N)ormal or (F)ile Dump mode. In (F)ile Dump mode, the disk file is transmitted without any changes, and the line length is not monitored. Use this mode to send binary computer files using 8 bit ASCII code.

(N)ormal mode adds the selected End-of-line sequence to the end of each line sent. Use this mode to send text messages. (N)ormal mode assures that the desired Baudot End-of-line sequence is sent for each line, regardless of how it was stored (or received in the case of files produced in continuous receive save mode). Blank lines cause the transmission of ONLY a LF, not the full End-of-line sequence.

Up to ten files may be sent sequentially by entering the filename of each in response to the status line prompt to SHIFT-F10. To end the list, hit [ENTER] instead of a file name. "Wildcard" file name specifications may also be used to send a batch of

files. For example, to send files named "RX.001", "RX.002", and "RX.003", give the file name response "RX.00\*". Any file name matching the wildcard specification will be sent. A file name response of "\*.\*" will send ALL files of the active storage device!

While files are being transmitted, the file name of the current file is shown on the right side of the status line as:

```
TXON: C:\DIR\DIR\filename.ext
```

The normal full status line is restored when all files of the sequence have been sent. When sending in Baudot mode, the transmission of each file ends with 12 LTRS characters as required by procedure NTP-8A. In addition, ALT-N may be used at any time to add 12 LTRS characters to the transmit buffer.

Transmission of a batch of files is terminated by using the SHIFT-F10 key combination. Three options are provided: (1) immediate termination, (2) stop at the end of the current file, or (3) skip to the next file in the list.

### 3.3 Editing Text

DSRTTY includes a text editor that may be used on ANY file that is in the active transmit buffer (B1 or B2). Available edit key combinations are shown in Table 8 below. All typed text and any text file stored on diskette may be edited. If you wish to edit a text file that is on diskette, you must first load that file into the transmit buffer (SHIFT-F2).

Editing operations involve movement of the keyboard cursor between characters and lines of the display. Some cursor movements such as the arrow keys are "NON-DESTRUCTIVE" (cursor movement does not change text); other movements such as DEL are DESTRUCTIVE (text is modified). Still other key operations involve changing the displayed section of the transmit (or receive) buffer (SCREEN SCROLL commands).

Editing may be done by inserting characters between existing characters or by over-writing previous text. Choice of which mode is used is controlled by the INS key (0 key in right-side number pad area). The DSRTTY editor always defaults to INSERT-OFF or OVER-TYPE mode when first run. To operate in the INSERT-ON mode, hit the INS key once. The INSERT ON/OFF feature toggles with each INS key press.

The four arrow keys in the number key-pad area may be used for non-destructive cursor movement. The left and right arrow keys (4 and 6) move the cursor one character left or right, respectively. CTRL plus either the left or right arrow keys

gives a one word left or right movement. The up and down arrows (8 and 2) move the cursor up or down one line. The HOME key will move the cursor to the top left corner of the DISPLAYED SECTION of the transmit buffer; SHIFT-HOME moves the cursor to the beginning of the file. Similarly, the END key moves the cursor to the beginning of the last DISPLAYED LINE of the buffer; SHIFT-HOME moves the cursor to the end of the file. The HOME and END keys may be used in either the RX or TX buffer displays, depending upon the setting of the SCROLL LOCK key. For editing, be sure that the SCROLL LOCK status indicator shows the down arrow ( ↓ ).

TABLE 8  
EDITING KEYS

KEY	OPERATION
→	Move edit cursor one position right
←	Move edit cursor one position left (arrow on "4" key)
↑	Move cursor one line up
↓	Move cursor one line down
CTRL →	Move cursor one word right
CTRL ←	Move cursor one word left (arrow on "4" key)
HOME	Move cursor to top left display
CTRL-HOME	Move cursor to top of buffer
END	Move cursor to bottom display line
CTRL-END	Move cursor to end of buffer
DEL	Remove cursor character
RUB OUT	Remove character to left of cursor (large arrow key right of "=")
INSERT	Toggle INSERT or TYPE-OVER mode
SHIFT-F6	Mark start and end of block, select block options.

#### DISPLAY

SCROLLING: Select RX/TX buffer with SCROLL-LOCK  
PAGE UP Scroll displayed buffer up one line  
CTRL-PG UP Scroll display up 2 lines less than  
total shown for buffer.  
PAGE DOWN Scroll display down one line  
CTRL-PG DN Scroll display down 2 line less than  
total shown for buffer.

- NOTES: 1. Editing available only for TX  
buffer displayed (B1 or B2).  
2. Any file may be loaded into TX  
buffer, edited, and saved.

Edit mode is ended by leaving the cursor at the  
END of the file.

The displayed section of the file may be moved by scrolling the display window with the PAGE UP and PAGE DOWN keys. Each operation of these keys moves the display one line up or down. More rapid scrolling is obtained when CTRL-PAGE UP or CTRL-PAGE DOWN is used. In this case, the displayed portion of the buffer scrolls by two less lines than the total displayed. For example, if the screen is split equally showing 12 line RX and 12 lines TX, CTRL-PAGE DOWN scrolls the display down 10 lines. If the 2ORX/4TX display format is used, the TX display would move two lines for each CTRL-PAGE UP or CTRL-PAGE DOWN operation and the RX buffer would scroll 18 lines. The PAGE UP and PAGE DOWN keys also operate on either the RX or TX displays as set by the SCROLL LOCK key. Be sure the down arrow ( ↓ ) is shown on the status line when editing.

The DEL key causes the cursor character itself to be erased. The RUB OUT key (large key next to = key) causes the character to the left of the cursor to be removed.

Either transmit or receive files may be edited by first storing the file on the diskette and by then loading this file into the transmit buffer. The editing changes are then made and the file is again saved on the diskette. Editing of such files may be made while receiving. When text is being transmitted, cursor movement to text that has already been sent is prohibited. Text in the transmit buffer, but not yet transmitted, may be edited while sending. It is simpler to edit files when you are not transmitting and then either send the file directly from the transmit buffer or from a disk file at a later time.

To use block move features, set the keyboard cursor to the first line of the text block and press SHIFT-F6. Now, move the cursor to the last line of the block and press SHIFT-F6 again. The entire block will change attribute (dim to bright) or color. Press SHIFT-F6 a third time and a menu of block operation selections and further instructions will be shown. MOVE, DELETE, SAVE, and UNMARK are available block features.

### 3.4 HERE IS Messages

DSRTTY provides a total of ten keyboard-programmable HERE IS messages, one for each function key (F1 to F10). To transmit the contents of any HERE IS message simply type the associated FN key followed by the RETURN key. (F1 for HERE IS 1). To program a HERE IS message, type the associated FN key twice (F1 F1 to program HERE IS 1). The status line will change to show the programming field and you may now enter the desired message. End the programming mode and return to normal operation by typing RETURN as the last key. Each HERE IS message may contain up to 72 characters. The previously stored HERE IS message is shown when first entering program mode. To retain this message, simply type RETURN with no additional characters. All ten HERE IS messages are stored in the DSRTTY.CNF file.

## 4.0 OTHER DSRTTY FEATURES

### 4.1 Time and Date

DSRTTY makes use of the real-time clock and calender of the DS-3200. The time is normally displayed on the top-right corner of the screen as shown in Table 5. Since the changing display time may defeat the operation of some screen save programs, you may wish to turn-off the status line time display by selecting the TIME option from the CTRL-F2 menu. This option turns the status line display OFF, but does NOT effect time keeping or the ability to send time. Status line time display may be restored at any time through the CTRL-F2 menu.

Time and date may be transmitted by typing ALT-T (time) or ALT-D as part of the transmit text. The time and date are set external to DSRTTY by using the "TIMER" program.

### 4.2 Communications Parameters

The communications parameters of DSRTTY are set through the CTRL-F2 menu. Each parameter may be changed for just the current operating session or changed and then saved in the DSRTTY.CNF file for future use. See section 4.3 for further details.

The first two menu options are for ASCII parameters - "Low Speed" for data rates up to 110 baud and "High Speed" above 110 baud. ASCII parity bit 8 may be set for (N)one, (O)dd, or (E)ven (None is standard). Either 7 or 8 bit data may be chosen (7 is standard for text). Either 1 or 2 unit stop pulse length may be set (standard is 2 for Low Speed and 1 for High Speed).

Separate End-of-line sequences (EOL) are provided for ASCII and Baudot. The standard factory settings are CR for ASCII and CR/LF/LTRS for Baudot. NTP-8A format communications requires use of CR/CR/LF for the Baudot EOL sequence.

The standard line length is set for 72 characters, but may be changed to any value from 20 to 75 characters.

Two slightly different versions of the Baudot RTTY code are supported by DSRTTY - U.S. or CCITT No. 2 Baudot (U.S. Baudot is standard). The two codes differ only in the FIGS case presentation of 4 characters as shown in Table 9.

TABLE 9  
BAUDOT CODE DIFFERENCES

CODE	CHARACTER	U.S. BAUDOT	CCITT #2
00100	FIGS-S	BELL	'
01011	FIGS-J	'	BELL
10001	FIGS-Z	"	+
11110	FIGS-V	;	=

As mentioned in section 2.3, the screen attributes may be set using option (7) of the CTRL-F2 menu. The attribute/color of the status line, receive section, and transmit section of the screen may be set independently (background and foreground).

Option 9 allows control of the status line display and specification of the time zone characters (4 maximum). These parameters are normally set for time display ON and UTC time zone.

Option (A) allows setting the transmit turn ON and turn OFF delays for ASCII and Baudot transmissions. Both delays are set at 0800 at the factory (typical DS-3200 operation). Increase the number for a longer time delay - decrease for a shorter delay.

Option (B) allows choice of COM1 (default) or COM2 as the serial I/O port to be used. The radio equipment MUST be connected to the designated port.

The use of the RS232 RTS and CTS control signals is also specified in Option (B). RTS (Request To Send) may be used as a Receive/Transmit control signal. RTS = NORMAL sets the RTS line (pin 4) "high" for Transmit and "low" for receive (default setting). Choose RTS = REVERSE for the opposite polarity. Set RTS = NORMAL for operation with the ARQ-1000.

The CTS (Clear To Send) signal may also be set for ACTIVE or IGNORE condition. Unless your external modem equipment supports CTS flow-control, choose the IGNORE condition (default). In ACTIVE condition, data will NOT be transmitted unless CTS (pin 5) is held "low" by the external device. This feature is used to prevent transmit buffer overflow in the ARQ-1000 and other buffered devices. Choose the ACTIVE condition when using the ARQ-1000.

Option (8) of the CTRL-F2 menu is used to (S)ave or (L)oad DSRTTY.CNF configuration files. Changes in any HERE IS or communication parameters are made immediately but are only made permanent and stored in "DSRTTY.CNF" if Option (8) is used AFTER the changes are made. When (S)ave is chosen, any previous DSRTTY.CNF file is over-written with the new parameters. If it is desired to retain the previous DSRTTY.CNF parameters, first use the CTRL-F1 menu to rename the previous file ("DSRTTY.CNF" to "OLD.CNF" for example). The old parameters may be regained at any time by using the (L)oad option and specifying "OLD.CNF". However, DSRTTY always starts with parameters set in the "DSRTTY.CNF" file. The turn-on or default parameters stored in the "DSRTTY.CNF" file are shown in Table 10. Factory default values are underlined.

TABLE 10  
DSRTTY.CNF STORED PARAMETERS

PARAMETER	OPTIONS
CODE	<u>BAUDOT</u> or ASCII
SPEED	Separate speed for each code ( <u>45</u> )
HDX/FDX	Half- or full-duplex ( <u>HDX</u> )
USOS	Unshift-on-space (Baudot)
MODE	<u>WORD</u> , LINE, CHARACTER
SYN	RTTY Sync Idle ON/ <u>OFF</u>
PRINTER	Printer ON (LP) / <u>OFF</u>
HERE IS	All 10 HERE IS message texts
COMM	<u>COM1</u> /COM2 Options
ASCII FORMAT	Low and High speed format
E-O-L	RTTY End of line sequences
TX LINE	Length of TX line ( <u>72</u> )
BAUDOT	<u>U.S.</u> or CCITT No. 2 Code
DELAY	Transmit ON & OFF Delays ( <u>800</u> )
ATTRIBUTES	Screen attributes or colors
TIME	Status line display and zone
RTS	<u>NORMAL</u> or REVERSE condition
CTS	<u>IGNORE</u> or ACTIVE condition

#### 4.3 DOS Functions

The CTRL-F1 menu provides DOS file operations without having to exit DSRTTY. Option (1) shows the directory of the currently selected disk. Option (2) shows or allows changing of the active disk and directory, including paths (C:\DS3200 for example). Files may be RENAMED, DELETED, COPIED, or COMBINED using options (3) through (6). Use CTRL-F1, Option (7) to exit DSRTTY to DOS.

#### 4.4 Further ALT Key Combinations

DSRTTY also provides ALT-key control options shown in Table 11:

TABLE 11  
ALT-KEY OPTIONS

KEY	ACTION
ALT-H	HELP Page
ALT-T	Enter Time in transmit buffer
ALT-D	Enter Date in transmit buffer
ALT-B	Enter Both Time and Date in transmit buffer
ALT-F	Force Baudot receive mode to FIGS
ALT-L	Force Baudot receive mode to LTRS
ALT-N	Insert 12 LTRS characters in transmit buffer (Baudot mode ONLY - no effect in ASCII)
ALT-CTRL	BREAK (Continuous Space condition)

#### 4.5 Future Software Revisions

As errors or inconsistencies in DSRTTY are discovered, the DSRTTY.EXE program may be modified at the discretion of HAL Communications Corp. Software revisions will be available to all DSRTTY owners of record under the following conditions:

1. HAL cannot notify each DSRTTY owner each time a new software version is released. If you notice a problem, call HAL (NO COLLECT CALLS, PLEASE). We may have already solved the problem. HAL reserves the right to interpret what is a software "bug" and what constitutes normal operation.
2. If you desire a copy of the latest software version, mail your ORIGINAL HAL diskette back to HAL requesting the new revision. Be sure to pack it properly to avoid damage. You pay the postage and handling to HAL.
3. When your diskette is received, HAL will copy the new software and mail the diskette back to you. HAL will pay the return postage to addresses within the 48 contiguous United States.
4. If the diskette is damaged when received by HAL, we will supply a new diskette containing the software. In this case, the new diskette will be sent COD for \$5.00.



5. This policy applies only to corrections of problems discovered with features described in this DSRTTY manual and such addenda as HAL may issue. This policy in no way obligates HAL or its representatives to provide revisions or custom features.

6. DSRTTY owners outside the 48 contiguous United States may also receive software updates for a fee of \$7.00 in U.S. funds (no checks, please).

7. DSRTTY is written for the HAL DS-3200 and DS-3200HD Radio Data Communications Terminals and will provide all of the described features when used with these HAL products. DSRTTY may also be used with some models of "IBM-compatible" computers. However, HAL assumes no responsibility for proper operation of DSRTTY software when used with any device other than the HAL DS-3200 or DS-3200HD.

8. Documentation of software revisions will be included on the updated diskette file that may be typed on your printer.

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#### PERMITTED USES:

1. Use DSRTTY on the HAL DS-3200 or DS-3200HD
2. Copy DSRTTY for the purpose of backup as described in section 1.1.1 of this DSRTTY manual.

#### PROHIBITED USES:

1. Distribution, rental, sub-lease, lease or otherwise making available the software, documentation or copies to others.
2. Modification, translation, adaptation, disassembly, or creation of derivative works from the software or documentation.

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This software and documentation are sold "AS IS" without warranty as to their performance, merchantability, or fitness for any particular purpose. The entire risk as to the quality and performance of the software is assumed by the user.

HAL Communications Corp. warrants to the original purchaser ONLY that the diskette on which DSRTTY is furnished is recorded free from defects in materials and workmanship for a period of ninety (90) days from the date of purchase. If during this period a defect in the diskette should occur, return the defective diskette to HAL Communications Corp. and we will replace the diskette without charge. This is your sole and exclusive remedy in the event of a defect. A dated copy of the original sales receipt or invoice must be submitted with the diskette as proof of original purchase.

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PCRTTY/DSRTTY SOFTWARE VERSION 3.2  
Manual Update - June 7, 1987

INTRODUCTION

With any developing product, the HAL PCI-2000 and DS-3200 software continues to mature and grow as more user feedback is received and evaluated. The challenge for you, the user, is the most up to date operational software when you purchase your HAL product. Unfortunately, manual revisions generally lag behind the software release while we attempt to write in those changes that you already appreciate. Thus, this memorandum describes the features available in the PCRTTY V3.2 and DSRTTY V3.2 software release. Note that this revision assumes you have a copy of the DSRTTY RADIO DATA COMMUNICATIONS SOFTWARE Operator's Manual, HAL Part Number 870-32010 and, if you are a PCI-2000 user, the PCI-2000 Operator's Manual that came with your PCI-2000 interface card.

Version 3.2 software enhancements involve the general operation of DSRTTY and PCRTTY, HERE-IS message use, file transmission, and the ALT- keys definitions. Without further delay, let us review in enhancement in detail.

EXPANDED HELP

In the current software versions, the ALT-H key displays a list of the available function keys and their respective operation. In Version 3.2 the HELP screen has been expanded from one screen to three in order to provide a list of the key functions and list the EDIT keys. At the end of each screen, you are given the option to see the next screen (SPACE BAR) or leave the help sequence with the RETURN key.

CONFIGURATION FILE

Several current users have suggested that we include a method for using more than one PCRTTY.CNF or DSRTTY.CNF configuration file. One file might configure operation for HF RTTY and another might be used for VHF packet operation, for example. In Version 3.2 you have the option of using any number of configuration files by defining the file name when PCRTTY or DSRTTY is first executed. For example, if you wish to use a configuration file called "PACKET.CNF" for your packet TNC, you might use the following command:

C:\> DSRTTY PACKET                    or                    A:\> PCRTTY PACKET





that ALT-B, the transmit both time and date function, has been eliminated. If you used that function, you should now enter the following text:

ALT-T SPACE ALT-D

ALT-J and ALT-M have been added to store Line Feed (LF) and Carriage Return characters, respectively, in the transmit buffer or HERE-IS buffer. When these special keys are used, they do not generate an End Of Line sequence -- characters are simply sent. There is no way to insert an EOL sequence in a HERE-IS message unless it is programmed using ALT-J and ALT-M.

#### HERE-IS MESSAGES

A new feature in Version 3.2 is included to permit one HERE-IS message to call another HERE-IS message. To program this function, simply press the desired key while programming a HERE-IS buffer. When the first HERE-IS is expanded into the transmit buffer, the call to the second HERE-IS buffer will be displayed as a graphic character. During actual transmission, this graphic character will cause the selected HERE-IS message to be transmitted.

In addition to HERE-IS messages, you may also include any of the ALT- functions in a HERE-IS message. For example, to send your call and the current time, you could program HERE-IS #1 with the following text:

HI1: ALT-I ALT-T K ALT-M ALT-M ALT-J

which will transmit as:

DE K9CW 0342 UTC K<CR><CR><LF>

The function of HERE-IS #5 has changed in this new software release. This HI5 buffer is now transmitted immediately before any disk file transmission. If you use SHIFT-F10 to transmit a disk file, the contents of HI5, if any, are transmitted before the first disk file. HI5 is transmitted only one time. This feature has been added to permit a user to send a special character header before the actual text begins. In the MARS service, one needs to send the following sequence before the file:

LTRS LTRS SPACE SPACE SPACE SPACE SPACE CR CR LF

This sequence may be programmed into HI5 using the following method:

1. Press F5 two times to enter programming mode.
2. Press SPACE if there is any text stored to clear it.
3. Press "<<" to store two LTRS and five SPACE characters.
4. Press ALT-M two times to store two CR characters.
5. Press ALT-J to store one LF character.
6. Press RETURN to save the buffer.

When programmed, this sequence will be transmitted before the first file when the SHIFT-F10 function is used to send disk files. If you wish to save the HI5 contents in the configuration file, press Ctrl-F2 and select option <8>.

## EXIT

last of the new features is a faster way to leave PCRTTY or DSRTTY and return to DOS. When you press Ctrl-F3, you are asked whether you are sure that you want to leave the RTTY program. If you answer "Y" at this prompt, PCRTTY or DSRTTY will be terminated and you will be returned to the system prompt. Note that all unsaved HERE-IS buffers, transmit buffers, and the receive buffer are lost when the program is terminated. If you have changed any HERE-IS message or PCRTTY configuration, you may wish to save the new configuration using option <8> on the Ctrl-F2 page.

## SOME BUGS -- FIXED!

Even HAL software sometimes has undiscovered bugs that you, our customers, identify and report to us. Version 3.2 fixes several minor operational bugs that have surfaced from time to time. First, the PCI-2000 frequently would produce the output AFSK tones after a SHIFT-F10 disk transmit operation; this problem was located and repaired. The other problems dealt with edit mode in the transmit buffer. Cursor movements, character insert, and character overwrite mode now should work as intended without leaving extraneous characters between the line number and the left margin. In addition, the cursor no longer permits adding inserting characters beyond the right hand margin.

Well, that's it. As we continue to improve PCRTTY and DSRTTY, new features will be added. If you have any comment concerning the operation of these programs or concerning features that you would like to see, let us know.

/pc