

**Technical
Bulletin**

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OS/3 TECHNICAL BULLETIN

This bulletin contains information on:

UTS 400 CHARACTER PROTECTION MODE UTILITY

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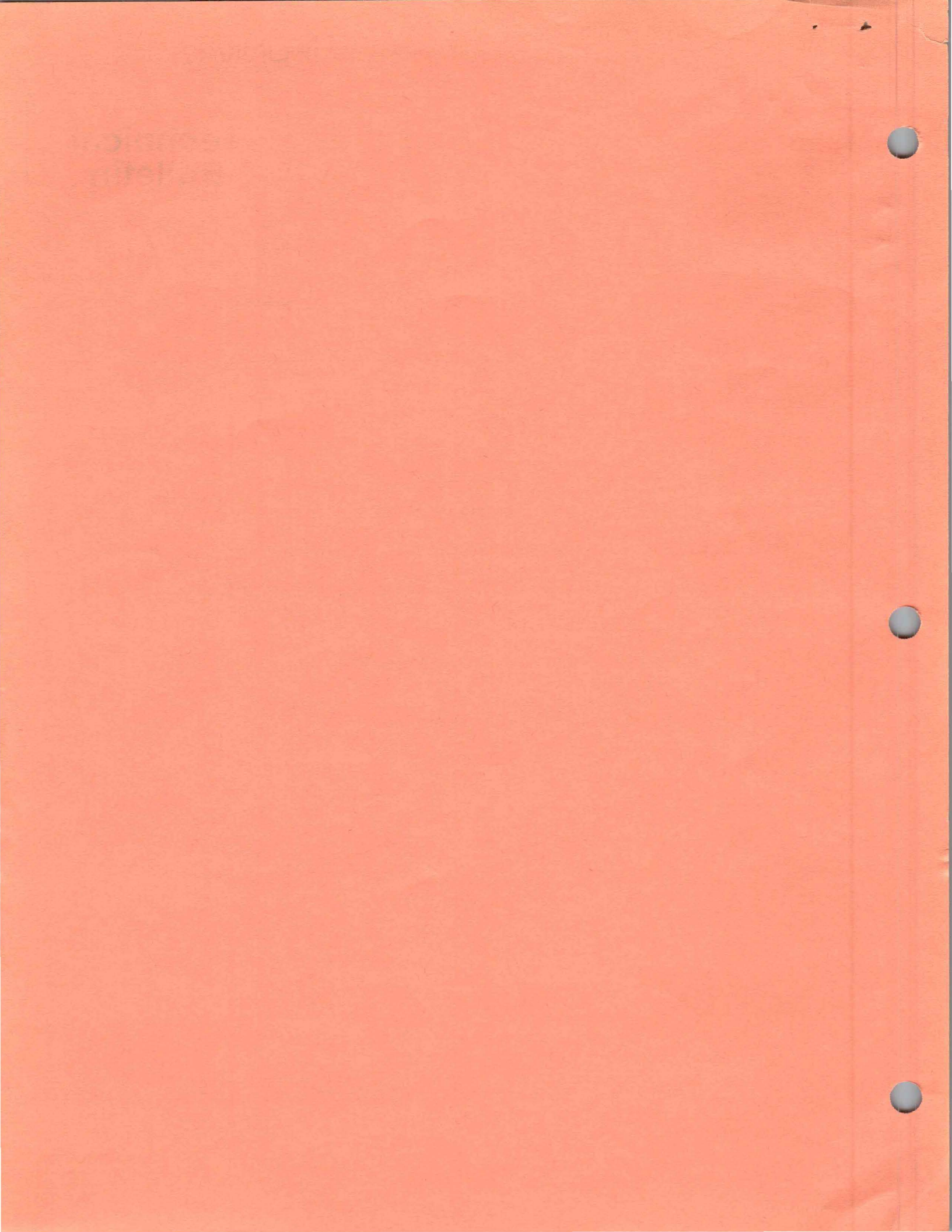
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OS/3 TECHNICAL BULLETIN SUMMARY

The following Technical Bulletins are published for the OS/3 system. Current items are identified with an "*" in column one; scheduled items are identified with an "***" in the date column:

<u>SYSTEM</u>	<u>DATE</u>	<u>ORDER#</u>	<u>ITEM and DESCRIPTION</u>
*OS/3	1/78	UP-8605.1	OS/3 Technical Bulletin #1 (This document presents an overview of the UTS400 support and gives some user guidelines.)
*OS/3	3/78	UP-8605.1-A	OS/3 Technical Bulletin #1,-A (This update contains page replacements to UP-8605.1.)
*OS/3	4/78	UP-8605.2	OS/3 Technical Bulletin#2 (This document provides a list of the options that can affect the performance of an OS/3 IMS 90 system.)
*OS/3	1/78	UP-8605.3	OS/3 Technical Bulletin #3 (This document is a User Guide for the UTS400 CHARACTER PROTECTION MODE available with release 4.3.)
*OS/3	7/78	UP-8605.3-R1	OS/3 Technical Bulletin #3-R1 (This document contains updated guidelines for the UTS400 CHARACTER PROTECTION MODE available with release 5.0.)
*OS/3	11/78	UP-8605.4	OS/3 Technical Bulletin #4 (This document contains information on the use of the 8413 DISKETTE FILE CREATION UTILITY.)
*OS/3	5/79	UP-8605.5	OS/3 Technical Bulletin #5 (This document contains information on the use of DATA UTILITIES for OS/3 Release 5.2.)
*OS/3	12/78	UP-8605.6	OS/3 Technical Bulletin #6 (This document contains information on the use of IMS 90 Multi-Thread.)

OS/3 TECHNICAL BULLETIN SUMMARY (cont'd)

<u>SYSTEM</u>	<u>DATE</u>	<u>ORDER#</u>	<u>ITEM and DESCRIPTION</u>
*OS/3	3/78	UP-8605.7	OS/3 Technical Bulletin #7 (This document contains information concerning techniques for processing unordered IRAM files.)
*OS/3	5/79	UP-8605.8	OS/3 Technical Bulletin #8 (This document contains information on the use of CHARACTER PROTECTION MODE UTILITY for the UTS400; this utility is available with Releases 5.2/5.2.1 and 6.0.
*OS/3	5/79	UP-8605.9	OS/3 Technical Bulletin #9 (This document contains information on the use of the IBM 3741 MEDIA COMPATIBILITY UTILITY for the UTS400; this utility is available with Releases 5.2/5.2.1 and 6.0.

Note: Technical Bulletins are issued as they become available, and may or may not be issued in sequential order.

CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

CHARACTER PROTECTION MODE
UTILITY PROGRAM USERS GUIDE
FOR THE
UTS400

Release 2 Version 9
(2R0)



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CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

1. CHARACTER PROTECTION MODE on the UTS400

The CHARACTER PROTECTION MODE Utility Program is designed to run as a user program in the UTS400 random access memory (RAM). It must be loaded downline from the host processor, or offline from tape or disk, in the same way that any other user program is loaded into the UTS400 RAM. The beginning address is always A000 hex, and must have the transfer address set to A015 hex.

It is imperative that the user thoroughly understand the limitations imposed upon running the UTS400 in CHARACTER PROTECTION mode.

These limitations are summarized in the following list:

- Protected format and non-significant space suppression on transmission to the host are the major features of the utility program.
- User programmability cannot co-exist with the utility program.
- A terminal on a UTS400 cluster that has the Character Protect Utility running cannot use the Katakana character set while that terminal is in Character Protect Mode.
- Comparable U100/U200 performance is not possible.
- Power transients, power down, or malfunctions due to bad data from the host, requires reloading of the utility program.
- Upon initialization or when changing modes the entire screen is erased.
- The utility program requires 6K bytes of RAM in the UTS400.
- This utility is designed to operate with level G firmware.
- The FCC/PROTECT switch must be in the FCC position.
- The host system generation must include the UTS400 clusters using the utility program as UTS400s and not as U100s or U200s.
- Character Protection can be used in conjunction with and concurrently with FCC's as provided in the UTS400.
- Terminals in the cluster on which the Character Protect Utility is executing may run either in the Character Protection Mode or in Normal U400 Mode, depending upon individual terminal requirements.

CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

1.1. Protected Format.

The CHARACTER PROTECTION feature is accomplished by means of the SO/SI character sequences. Text from the host may be designated as protected by bracketing the text with the SO and SI characters in the following manner:

. . . SO...text...SI . . .

The SO character conditions the text following as protected, while the SI character conditions the text following as unprotected.

The utility program provides compatibility for the CHARACTER PROTECTION capability by utilizing the bit normally designating the Katakana character set. Thus, if a UTS400 terminal is used that has the Katakana character generator, all protected symbols will appear on the screen in Katakana, if that terminal is in Character Protect Mode. If in Normal U400 Mode, they will, in fact, be Katakana characters and not protected characters.

1.2. Non-significant Space Suppression.

The non-significant space suppression feature causes all non-significant spaces at the end of unprotected fields to be suppressed except for the field under the cursor.

Since this is not done by the UTS400, the utility program provides compatibility for this feature through software each time data is transmitted to the host.

In order to accomplish software compatibility of the above two features, the following sections are devoted to discussing the methodology under two main headings as follows:

- Keyboard operation
- Processor-controlled operation

1.3. Cursor Movement.

The movement of the cursor defined here is to be applied to the following definitions any time the cursor is moved. The overall definition is given here, and abbreviated definitions later, i.e. "the cursor is moved to the right" is to be understood to include this definition.

The cursor is never allowed to remain on a protected position when moved via keyboard entries. It may remain on a protected position if moved via control codes received on the comm or aux input lines, except for horizontal tab. If FCC's are enabled, a protected position is any

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character within an FCC protected field or an individually protected character within an FCC unprotected field. If FCC's are not enabled, a protected position is an individually protected character either in an FCC protected or unprotected field. A non-protected position is a unprotected character within an FCC unprotected field, if FCC's are enabled, and an unprotected character in any FCC field if FCC's aren't enabled.

If movement of the cursor causes it to be in a protected position, it is moved to the right until a non-protected position is found. If the end of a line is encountered, it is moved to column 1 of the next line, and the above rule applied. If the end of the display is encountered, it is moved to home position, and the above rule applied unless all display positions are protected. In this case it may exist only in home position.

1.4. Keyboard Operation.

The following sections define what happens when a key stroke is entered on a terminal of a UTS400 cluster when the Character Protect Utility is running and that terminal is in Character Protect Mode. When a terminal on the UTS400 cluster is running in Normal U400 Mode, that terminal will react as a UTS400 even if the Character Protect Utility is running.

1.4.1. Alpha-Numeric/Symbolics Group

These keys are used to enter data which is displayed on the screen. Both upper and lower case characters, the number set, and special symbol set are included in this group.

Each time an alpha-numeric key is pressed, the character it represents is placed on the screen at the current cursor position. The cursor is then moved to the next position to the right. If the current cursor is over an individually protected character, the alpha-numeric character or symbol will not be placed on the screen and the alarm will sound.

The following control keys are part of this group, and function as described in the following paragraphs.

- Cursor Return
- Tab Forward
- Line Feed
- Form Feed
- SOE

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1.4.1.1. Numerics Group

These keys include the numerals and space key on the right of the keyboard. They are handled in exactly the same manner as the alpha-numerics described above.

1.4.1.2. Character Erase.

Insert a space at the current cursor position and move the cursor one position right. If the new position is protected, move right to next unprotected position.

1.4.1.3. Cursor Return.

Move the cursor to the beginning of the next line. If the new position is protected, move it to the next non-protected position to the right.

1.4.1.4. Horizontal Tab.

The cursor is moved to the right, and down, until an HT (tab marker) or an FCC with tab set is found. The cursor is then positioned one position to the right of the HT or FCC. If the new cursor position is protected, the cursor is moved right to a non-protected position. If the entire screen following the HT or FCC is protected, the cursor goes to the HOME position.

1.4.1.5. Form Feed, Line Feed.

These control symbols are placed into the screen memory and the cursor moved one position right. They are not displayable symbols, so they appear as a blank. They have no effect on the screen display.

1.4.1.6. SOE, Start of Entry.

The SOE is placed on the screen at the current cursor position, and the cursor moved to the next unprotected position to the right.

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1.4.2. Function Keys.

1.4.2.1. Erase Unprotected Display.

Place spaces into unprotected positions from the current cursor position to the end of the display. The cursor does not move.

1.4.2.2. Erase to End of Line.

All unprotected positions are replaced with spaces from the current cursor position to either the end of the line, the next FCC, or the next individually protected character, whichever occurs first. The cursor does not move.

1.4.2.3. Erase to end of Field.

Erase all unprotected data from the cursor position to the end of the display, to the next FCC, or to the next individually protected character, whichever occurs first. The cursor does not move.

1.4.2.4. Erase Display.

All protected, unprotected, and FCC characters are replaced with spaces between the cursor and the end of the display. The cursor does not move.

1.4.2.5. Delete in Line.

The character under the cursor is deleted, and all characters to the right of the cursor to the end of the line, next FCC, or protected character are moved left one position. A space is inserted in the rightmost position of the field so moved. The cursor is not moved.

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1.4.2.6. Delete in Display.

The character under the cursor is deleted, and all characters to the right of the cursor to the end of the display, next FCC, or protected character are moved left one position. A space is inserted in the rightmost position of the field so moved. The cursor is not moved.

1.4.2.7. Delete Line.

This key is supported as a UTS400 function and as such is described in manuals UP-8358 and UP-8359.

1.4.2.8. Insert in Line.

The character under the cursor and all characters to the right of the cursor to the end of the line, next FCC, or protected character, are moved one position to the right. The last position of the line or field is deleted. The cursor is not moved and a space is inserted in the position under it.

1.4.2.9. Insert in Display.

The character under the cursor and all characters to the right of the cursor to the end of the display, next FCC, or protected character, are moved one position to the right. The last position of the display or field is deleted. The cursor is not moved and a space is inserted in the position under it.

1.4.2.10. Insert Line.

This is supported as a UTS400 function and as such is described in manuals UP-8358 and UP-8359.

1.4.2.11. Backspace.

Backspace causes the cursor to be moved one position to the left. If this position is protected, the Cursor remains where it was before the operation started. If the cursor is in column one, it is moved into the last column of the previous line, if that character or field is not

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protected.

1.4.2.12. Forward Space.

When pressed, it causes the cursor to be moved one position to the right. If the new position is protected, the cursor is moved to the right until a non-protected position is found.

1.4.2.13. Tab Stop Set.

The tab set code, HT, is placed at the current cursor position and the cursor moved one position to the right. If the character under the current cursor position is character protected the tab set will not be placed on the screen and the alarm will sound.

1.4.2.14. Cursor to Home.

Move the cursor to home position. If it is in a protected field it will be advanced to the first unprotected position. If the entire screen is protected it will remain at the home position.

1.4.2.15. Backward Tab.

This key is supported as a UTS400 function as described in manuals UP-8358 and UP-8359 with the exception that after a tabbed FCC or tab set character is found the Cursor will be moved off an individually protected character and moved to the right until an unprotected character within an FCC unprotected (or FCC protected if FCC's aren't enabled) field is located. If the entire screen is FCC and/or character protected the Cursor will be moved to HOME.

1.4.2.16. Line Duplicate.

This key is supported as a UTS400 function as such is described in manuals UP-8358 and UP-8359.

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1.4.2.17. Clear Changed Bits.

This key is supported as a UTS400 function in conjunction with FCC's and as such is described in manuals UP-8358 and UP-8359.

1.4.2.18. Report Address.

This function is used in conjunction with peripheral IO operations. See manuals UP-8358 and UP-8359 for further information.

1.4.2.19. Control Page.

This key causes the control page to be placed on or removed from the screen. The Control Page is supported the same as the UTS400 normal operation with the exception of two new entries into the MM field to control the mode when the Character Protect Utility is loaded. To switch a terminal from Character Protect Mode to normal U400 Mode a 'U4' is entered into the MM field of the Control Page of the specified terminal. To switch back to Character Protect Mode a 'U2' is entered into the MM field. None of the other terminals on the cluster are affected when the mode is changed at a terminal. These two new entries will be ignored by the firmware when the Character Protect Utility is not loaded.

1.4.2.20. Transmit.

All U400 transmits are supported. They are Transmit Display, Transmit Unprotected Display, and Transmit Changed. The type of Transmit to be executed is determined by the contents of the XMIT entry in the control page.

1.4.2.20.1. Transmit Unprotected Display.

A Transmit Unprotected is selected by entering 'VAR' into the XMIT field of the Control Page and depressing the Transmit key. A Transmit Unprotected transmits all unprotected data between the SOE (or HOME) and the Cursor position to the host. Unprotected data is defined as unprotected characters within FCC unprotected fields. Unprotected characters within FCC protected fields are protected characters as are protected characters within FCC unprotected fields. Unprotected FCC sequences are sent to the host and a SUB character is sent to mark

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protected characters in FCC unprotected fields. Protected FCC's and all characters within the FCC protected fields are ignored. Non-significant space suppression is performed at the end-of-line and at the end of unprotected fields, except for the cursor line.

1.4.2.20.2. Transmit Display.

A Transmit Display is selected by entering 'ALL' in the XMIT field of the Control Page and depressing the transmit key. A Transmit Display transmits all protected and unprotected characters from the SOE (or HOME) to the current Cursor position (inclusive). Protected and unprotected FCC's are sent to the host as normal UTS400 FCC sequences and protected characters are sent as unprotected characters. End-of-line space suppression is performed except on the Cursor Line.

1.4.2.20.3 Transmit Changed.

A Transmit Changed is selected by entering 'CHG' in the XMIT field of the Control Page and depressing the transmit key. The Transmit Changed function will execute the same as in the UTS400 with individually protected or unprotected characters sent to the host if they are within an FCC field that has been changed.

1.4.2.21. Print, Enable Auxiliary Device.

This key causes the data on the screen between the cursor and the SOE (inclusive) to be copied to an auxiliary device. Both protected and unprotected data are transferred. There is no distinction made between protected and unprotected data. The character sequences associated with communications line transmission are not generated for the auxiliary interface. The UTS400 control page is used for control of the auxiliary devices.

1.4.2.22. Transfer.

This function is used in support of the U400 peripheral IO. See manuals UP-8358 and UP-8359 for more information.

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1.4.2.23. Status.

This function is used in support of the UTS400 peripheral IO. See manuals UP-8358 and UP-8359 for more information.

1.4.2.24. Hang Up.

This function is used in support of the UTS400 com line control. See manuals UP-8358 and UP-8359 for more information.

1.4.2.25. Load Program.

This is not supported by the utility program as a keyboard function.

1.4.2.26. FCC Control Keys.

The following FCC control keys are used in support of the UTS400, refer to manuals UP-8358 and UP-8359 for a detailed description of their operation:

- Clear
- Locate
- Reenable
- Generate

1.4.2.27. Search Cassette.

This function is used in support of the UTS400 peripheral IO. See manuals UP-8358 and UP-8359 for more information.

1.4.2.28. Backward One Block.

This function is used in support of the UTS400 peripheral IO. See manuals UP-8358 and UP-8359 for more information.

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1.4.2.29. Release/Recover Aux Buffer.

This function is used in support of the U400 peripheral IO. See manuals UP-8358 and UP-8359 for more information.

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1.4.3. Cursor Scan Keys.

1.4.3.1. Scan Left.

The cursor is moved to the left until the key is released. If the cursor stops on a protected position, it is moved to the right until a non-protected position is found.

1.4.3.2. Scan right

The cursor is moved to the right until the key is released. If the cursor stops on a protected position, it is moved to the right until a non-protected position is found.

1.4.3.3. Scan up

The cursor is moved up until the key is released. If the cursor stops on a protected position, it is moved to the right until a non-protected position is found.

1.4.3.4. Scan down.

The cursor is moved down until the key is released. If the cursor stops on a protected position, it is moved to the right until a non-protected position is found.

1.4.4. Attention Keys.

Keys F1 thru F4 are handled by the firmware in UTS400 mode. Keys F5 thru F22 are ignored.

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1.5. Processor-controlled Operation

Text coming from the host is examined for control sequences which are supported by the utility program. All others are ignored. Also all text coming from the host will overlay protected fields except when preceded by a horizontal tab character and the tab stop character located by the HT is immediately followed by a protected field.

The utility program handles the control sequences in the manner described in the following paragraphs:

1.5.1. Cursor Return, CR.

The cursor return character causes the cursor on the display to move to the beginning of the next line. If it falls in a protected position, it remains there.

1.5.2. Erase to End of Display, ESC a.

All unprotected positions of the display from the current cursor position to the end of the display are replaced by spaces. The cursor position is unchanged.

1.5.3. Erase to End of Line, ESC b.

All unprotected positions are replaced with spaces from the current cursor position to either the end of the immediate unprotected field, or the end of that line, whichever occurs first. The cursor does not move. If the cursor is left in a protected field by a previous action, this process is not done until the cursor is moved into a non-protected position.

1.5.4. Delete in Display, ESC C.

The character at the cursor position is deleted. All of the following characters to the end of the display or first unprotected field are moved left one position, and a space inserted at the end of the display or unprotected field.

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1.5.5. Delete in Line, ESC c.

The character at the cursor position is deleted. All of the following characters to the end of the line, or unprotected field on that line, are moved left one position, and a space inserted at the end of the line or unprotected field. The cursor does not move.

1.5.6. Insert in Display, ESC D.

Beginning with the character under the cursor to the end of the display or unprotected field, all characters are moved one position to the right. The rightmost character is lost, and a space is placed in the cursor position. The cursor does not move.

1.5.7. Insert in Line, ESC D.

Beginning with the character under the cursor to the end of the line or unprotected field, all characters are moved one position to the right. The rightmost character is lost, and a space is placed in the cursor position. The cursor does not move.

1.5.8. Scan Left, ESC g.

Move the cursor one position to the left. If the new position is protected, leave the cursor there. This function wraps the screen.

1.5.9. Scan Right, ESC h.

Move the cursor one position to the right. If the new position is protected, leave the cursor there. This function wraps the screen.

1.5.10. Scan Down, ESC i.

Move the cursor down one position. If the new position is protected, leave the cursor there. This function wraps the screen.

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1.5.11. Scan Up, ESC f.

Move the cursor up one position. If the new position is protected, leave the cursor there. This function wraps the screen.

1.5.12. Character erase, SP.

The character at the current cursor position is replaced by a space character.

1.5.13. Tab, HT.

Move the cursor to the next tab stop set in the display memory. The cursor will stop at the next unprotected position or home position if all are protected.

1.5.14. Tab Set, ESC HT.

Place the tab stop (HT) in the current position of the cursor, and advance the cursor.

1.5.15. Message Waiting, BEL.

Not processed by the utility program. If the BEL character occurs inside STX-ETX it is placed as a BEL character in the screen memory.

1.5.16. Cursor to Home, ESC e.

Place the cursor in home position.

1.5.17. Erase Field, ESC K.

Erase all unprotected data from the cursor position to the end of the unprotected field within which the cursor is positioned, or end of display if it is found first. If, at the end of a transmission, the cursor remains positioned within a protected field, this code sequence and the associated key will not function. The cursor must be moved to

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an unprotected field for this code sequence to again function.

1.5.18. Erase Display, ESC M.

Erase all data (protected and unprotected) from the cursor position to the end of the display.

1.5.19. Print, DC2.

Initiate a data transaction between the terminal storage and the auxiliary interface for either an input or an output device, whichever is selected (this is controlled by the DID). The format for the exchange is similar to that for exchanges via the communications channel; that is, the area to be transmitted is defined by the SOE character and the cursor, with suppression of non-significant spaces and the automatic insertion of cursor returns. The data exchanged between terminal storage and auxiliary interface appears in the screen format. Both protected and unprotected data are transferred under control of the DC2 code. There is no distinction made between protected and unprotected data. The character sequences associated with communications line transmission are not generated for the auxiliary interface.

1.5.20. SOE, RS.

The SOE defines the beginning of the area to be transmitted to the processor or to the auxiliary interface device. If no SOE is present on the screen, the home position serves as the starting point up to the cursor location given by an inserted cursor sequence. More than one SOE character may be on the display at one time. The SOE character nearest to the left of the cursor defines the beginning of the area that will actually be transmitted or transferred. The ability to have multiple SOE characters on the screen eliminates, for the programmer, the problem of removing these characters in instances where successive transmissions remain on the screen. It should be remembered that the cursor - and, thus, the text - will wrap around the display. Also, the programmer can place multiple SOE characters on the screen from the processor in order to aid the formatting of the next text to be transmitted.

CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

1.5.21. Transmit Unprotected, DC1.

Data within the unprotected areas on the display are to be transmitted to the host. The SOE symbol is the only exception since it may be positioned in a protected area. The area transmitted is defined as the unprotected area between the SOE symbol nearest to the left of the cursor, and the cursor. In transmission of data, each time a character protected area is reached, the SUB code (32 octal) is inserted as a marker to indicate the omission of protected data. Non-significant space suppression is performed from the end of an unprotected field as well as from the end of a line; if there is more than one unprotected field on a line, non-significant space suppression occurs more than once, except on the line of the cursor. FCC protected fields are ignored and unprotected FCC sequences are sent to the host.

1.5.22. Transmit Display, ESC DC1.

Transmit both protected and unprotected data to the host with the protected fields not marked or identified.

1.5.23. Transmit Changed, ESC t.

Transmit all data within changed fields, as determined by the FCC's for each field, from the SOE or HOME to the current Cursor position.

1.5.24. Cursor positioning, ESC VT Y X SI.

Place the cursor in row Y and column X.

1.5.25. Print transparent, ESC DC2.

Initiate auxiliary interface activity between the terminal memory and the auxiliary interface in the same manner as the DC2 code. The area transmitted is the same as in the DC2 process, but the cursor return character normally inserted is not transmitted to the auxiliary interface. This makes the line length of the device on the auxiliary interface independent of the line length of the terminal inuse. Non-significant space suppression will not occur.

CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

1.5.26. Insert Line, ESC j.

The line containing the cursor, and all following lines, move down one line. A blank line results at the row the cursor is in, and the bottom line is deleted from the screen if it is in the last line of the display. The cursor remains in the same position throughout this operation.

1.5.27. Delete Line, ESC k.

The line containing the cursor is deleted. All of the lines below the line containing the cursor position are moved up one line position, and a blank line is placed at the bottom of the display.

1.5.28. Start blink, FS.

The start blink character (FS) is placed in the display at the current cursor position and the cursor moved one position right.

1.5.29. End blink, GS.

The end blink character (FS) is placed in the display at the current cursor position and the cursor moved one position right.

1.5.30. Lock keyboard, DC4 or ESC DC4.

When the transmit key is pressed, the keyboard becomes locked (disabled). The keyboard is also locked when the start-of-text character (STX) is received from the host. The keyboard is automatically unlocked at the end of the message (ETX followed by a satisfactory BCC) unless the lock keyboard character (DC4 or ESC DC4) is included at the end of the text.

1.5.31. Shift in, Shift Out, SI, SO.

The SO code indicates that the following data is to be placed in display memory as protected. The SI code indicates that the following data is to be placed in display memory as unprotected.

CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

1.5.32. Form Feed, Line Feed, FF, LF.

These codes are placed into display memory at the current cursor position, and the cursor moved one position to the right. They are displayed as spaces and have no control over the display. If the display area in which they reside is sent to a printer, they will control the printer.

CHARACTER PROTECTION MODE ON THE UTS400 (2R0)

APPENDIX A. FUNCTION CODES

The following table shows the function codes which are supported by the utility program. Those designated '--', or omitted from the list are not supported by the utility program.

FUNCTION	From Keyboard	From Host
Cursor positioning	--	ESC VT y x SI
Cursor return	CR	CR
Erase to end of display	Func a	ESC a
Erase to end of line	Func b	ESC b
Delete in line	Func c	ESC c
Delete in display	Func C	ESC C
Insert in line	Func d	ESC d
Insert in display	Func D	ESC D
Scan Left	Func g	ESC g
Scan right	Func h	ESC h
Scan down	Func i	ESC i
Scan up	Func f	ESC f
Character erase	SP	SP
Tab	HT	HT
Tab stop set	Func HT	ESC HT
Cursor to home	Func e	ESC e
Insert Line	Func j	ESC j
Delete line	Func k	ESC k
Erase field	Func K	ESC K
Erase display	Func M	ESC M
Message waiting	Func BEL	BEL *
Start blink marker	--	FS
End blink marker	--	GS
Lock keyboard	--	DC4 or ESC DC4
Start of entry	RS	RS
Shift in	--	SI
Shift out	--	SO
Line feed	LF	LF
Form feed	FF	FF
Print	Func q	DC2
Print transparent	--	ESC DC2
Transmit unprotected	Func p	DC1
Transmit display (Release/Recover aux buffer)	Func I/J	ESC DC1
F1	Func EOT	--
F2	Func ETX	--
F3	Func STX	--
F4	Func SOH	--
F5, F6, . . . , F22	--	--

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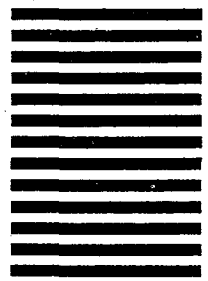
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