TECHNICAL DOCUMENTATION

UPDATE NOTICE

Word Processing System
Communications Options User's Manual

AA-5264C-TK and AD-5264C-T1

June 1979

Insert this Update Notice page in the manual as a means of maintaining an up-to-date record of changes to the manual.

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INSTRUCTIONS

The following pages are to be placed in the *Word Processing System Communications Options User's Manual* as replacements for, or additions to, current pages.

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AA-5264C-TK

and

AD-5264C-T1

Word Processing System
Communications Options User's Manual

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PREFACE

The *Word Processing System Communications Options User's Manual* is intended for the person who is familiar with using a Digital Equipment Corporation word processing system and wishes to send documents or messages between word processing systems.

Information described in this manual is applicable to DIGITAL's WS100, WS102, WS78, WS81, WS82, and WPS-11M word processing systems, Versions 3.0 and 3.1.

Knowledge of other word processing functions can be obtained from:

- *Word Processing Operator Training Manual*, part number JB034-1,
- *WPS-8 Word Processing System Reference Manual (Versions 2.7 and 3.0)*, part number AA-5267C-TA,
- *WPS-11M Word Processing System Reference Manual*, part number AA-D727B-TC.

This manual supplies the additional information necessary to operate the word processing communications options. The manual is organized as follows.

- Chapter 1, Introduction, describes the communications options and the systems on which they are available.
- Chapter 2, Establishing A Connection, describes the techniques necessary to transmit and receive documents and messages.
- Chapter 3, Communication with a Word Station or Word Terminal, describes how to use the options to communicate with a DIGITAL word station or word terminal.
- Chapter 4, Error Messages, gives an alphabetic list of communications error messages, the conditions that caused the error, and recovery techniques.

- Appendix A, Communications, describes the equipment configurations required to use the options. This information is intended for the manager rather than the operator.

- Appendix B, Changing the Communications Characteristics, describes how to adjust your system for different line characteristics and protocols.

- **Appendix C, IBM Communicating Mag Card I Emulator, contains instructions for communication between a word processing system and an IBM communicating Mag Card I.**

- The Communications Options Glossary provides definitions of special communications terms used in this manual.

If you have never used this manual before, read Chapter 1 for general information. When you are ready to transmit data, turn to the instructions in Chapters 2 and 3, or Chapter 2 and Appendix C or D for the appropriate option. If an error occurs, try to recover using the procedures in Chapter 4. If repeated attempts at recovery fail, call your System Manager, if you have one, or else your assigned marketing support representative.

STEP 7

Type the name of the document (or just the number) on the AX system and press the RETURN key, or just press the RETURN key to fetch the document whose name appears on the screen. You will see the display shown in Figure 3-39.

NOTE

If you specified a document which does not exist on the other system, the notification "CANNOT TRANSFER DOCUMENT" will appear on the screen. You cannot fetch that document, but you can still use any of the options displayed.

Your system is now preparing to transfer the document. There will be a short pause. When transmission begins, displays similar to Figure 3-30 will appear on the DX and AX systems. The rest of the transfer will occur automatically and is described in Section 3.2.3, step 7.

ALTERNATE STEP 7

You can end the transmission before the entire document is transmitted by typing the letter B, a space, a message, and pressing the RETURN key. Further information is given in Section 3.1, alternate step 7, and again in Section 3.2.3, alternate step 7.

3.3 CHARACTER TRANSMISSION (CX)

3.3.1 How To Use CX

This section describes the word processing CX character transmission option. It permits communications between a DIGITAL word processing system and a computer system or other device that transmits and receives ASCII characters. The computer system or other device is called the "host."

Before using the CX option, you may wish to determine by a telephone call or other method that the host is operating and able to be called. If you do not, and the host is not able to be called, you may waste time trying to make a connection.

3.3.1.1 Originating the Call - First, originate the call to the host modem. If the other system is a time-sharing system, you may log into and use it. If there is a host greeting message, it should appear on the screen as soon as the connection is established. If it does not, the connection is not established. Keep trying. After a few minutes, you can assume that the connection cannot be made, and stop trying.

If you are using a DIGITAL host system and the screen does not change, keep pressing the RETURN key or keep holding the CTRL key down while typing the letter C. The greeting message should appear. If it does not, the connection is not established. Try again. If after repeated attempts you are still unable to establish a connection, the settings in your word processing System Options Menu may not be correct (see Appendix B). If they are correct, contact a DIGITAL field service representative to determine whether the equipment is malfunctioning.

Now type the letters CX and press the RETURN key. You will see the display shown in Figure 3-40. Each command consists of two letters. Notice that the letters KH HS appear at the bottom. Those commands will be used if you do not erase them and type others in.

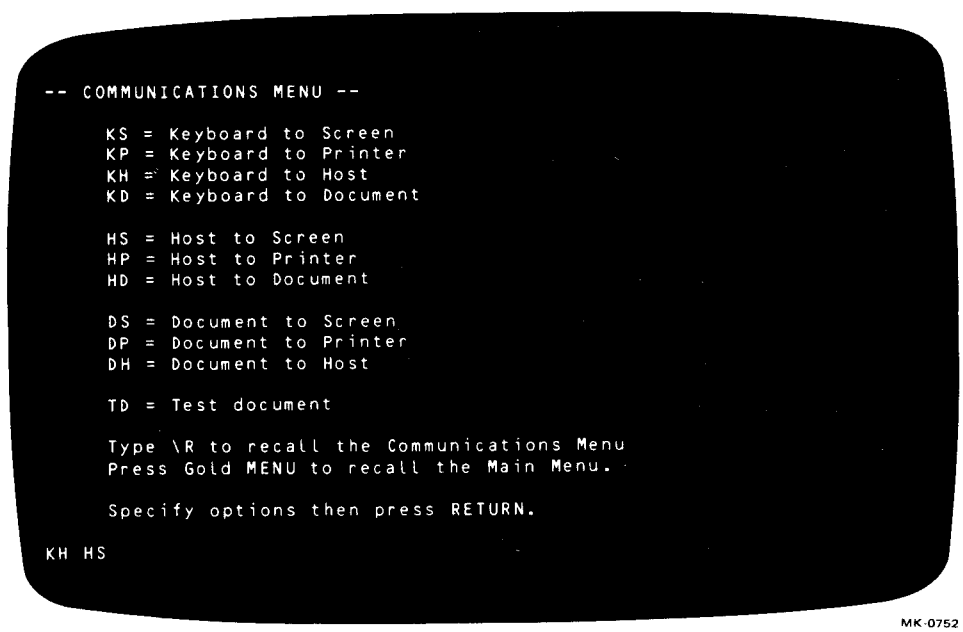

Figure 3-40 Character Transfer Menu Displaying Communications Options

3.3.3 CX Print-Control Commands

The four print-control commands that take effect whenever CX sends a document to the host (DH option) are as follows:

- The SEND EOL command tells CX what to send to the host when it finds the end of a line in the document. Normally CX sends a carriage return and then a null (octal 015 000).

- The SEND EOP command tells CX what to send to the host when it finds a NEW PAGE or PAGE MARKER in the document. Normally CX sends a form feed (octal 014).

- The SEND PARA command tells CX what to send to the host when it finds a PARA MARKER in the document. Normally CX sends a carriage return (octal 015).

- The SEND TAB command tells CX what to send to the host when it finds a TAB in the document. Normally CX uses the ASCII TAB character (octal 011).

If the characters used by the host are the same as the characters normally used by CX, the commands need not be changed. You can change the settings – the characters that the print-control commands set CX to send. For example, when CX finds the end of a line, it does not have to send a carriage return and then a null (octal 015 000); it can send any one or more characters you specify.

There are two ways to change the settings. For either way, first type the print-control commands in a document, following the instructions in Section 3.3.3.1.

1. Create a document containing only CX print-control commands, and tell CX (by following the instructions in Section 3.3.3.3) to use that document as the control document. The settings specified in the control document override the normal settings given above.

2. Type CX print-control commands in the document that CX sends to the host. The settings specified by those CX print-control commands override the settings given in the control document, if there is one. They take effect wherever they occur in the document. For example, commands at the top of a document govern that entire document. From the point where they occur in a document, the commands are in effect for the remainder of that document and for any others sent to the host. These continue until CX finds print-control commands that change the settings, or until you leave CX and recall the Main Menu.

If there is no control document, and CX has not found a print-control command in a document it is sending to the host, CX uses the normal settings given above.

3.3.3.1 Typing Print-Control Commands – Print-control commands must be typed in a document, as explained in Section 3.3.3. Here are the typing instructions:

STEP 1

Press the gold key and the CMND key to start print control.

STEP 2

Type the letters CX and press the RETURN key.

STEP 3

Type a command as explained below.

Type as many commands as you like, but each command must be on one line. Begin each command on a separate line, and press the RETURN key to end each command.

There are two kinds of print-control commands: RECEIVE and SEND.

The RECEIVE command has mainly one purpose: to make the word processing system send a reply automatically to a request received from the host. A request consists of one character, such as a character used to request identification of the word processing system.

1. For a RECEIVE command, type the following parts:

   - the word RECEIVE,
   - a space, and
   - the octal number (listed in Appendix D) of any one character. When the word processing system receives the specified character from the host, the system sends to the host the one or more characters specified in the rest of the command. Continue with:
   - a space,
   - the word SEND (here the word SEND is merely a part of a RECEIVE command; it does not begin a SEND command. A SEND command follows the rule that requires each command to begin on a separate line),
   - a space, and

- the octal number of a character or the octal numbers of two or more characters. If you type the numbers of two or more characters, type a space after the number of each character except the last. Press the RETURN key to end the command.

If a character you specify anywhere in a RECEIVE command is one of those in the following list, you can type its name instead of its number.

Name of Character	**Octal Number of Character**
NULL (nothing)	0
LF (line feed)	12
CR (carriage return)	15
XON (start transfer)	21
XOF (stop transfer)	23

Here is an example of a RECEIVE command:

----------START PRINT CONTROL----------

```
CX
RECEIVE 52 SEND 117 113 40 112 101 116 105 124
```

----------END PRINT CONTROL----------

The above command tells the word processing system to send "OK JANET" to the host after receiving "*" from the host.

In a RECEIVE command, there is another way of expressing the one or more characters specified after the word SEND. (This way cannot be used for the one character specified after the word RECEIVE.) For any capital letter, small letter, or decimal numeral from 0 to 9, you may type the character itself instead of its octal number. For a space, you may press the space bar instead of typing 40. To specify characters in this way, type a backslash (\) immediately before the first and after the last character.

Here is another form of the RECEIVE command shown in the first example:

----------START PRINT CONTROL----------

```
CX
RECEIVE 52 SEND\OK JANET \
```

----------END PRINT CONTROL----------

The above command tells the word processing system to send "OK JANET" to the host after receiving "*" from the host.

If there are two or more RECEIVE commands, the first remains active until the second replaces it, the second remains active until the third, and so on.

2. For a SEND command, type the following parts:

   - the word SEND,
   - a space, and
   - any one acronym you choose from the seven listed below. At the point named by the acronym, the word processing system sends to the host the one or more characters specified in the rest of the command.

Acronym	What the Word Processing System Does to Fulfill the Command
SOD	Sends the specified character(s) before sending the text of a document. (SOD = start of document)
SOL	Sends the specified character(s) before sending the text of a line. (SOL = start of line)
EOL	Sends the specified character(s) when it finds the end of a line. (EOL = end of line)
EOP	Sends the specified character(s) when it finds a NEW PAGE or PAGE MARKER. (EOP = end of page)
EOD	Sends the specified character(s) after sending a document. (EOD = end of document)
PARA	Sends the specified character(s) when it finds a PARA MARKER.
TAB	Sends the specified one or two characters when it finds a TAB.

If a SEND command does not include one of the above acronyms, the system fulfills the SEND command immediately. Therefore, type this kind of SEND command at the point in the document where you want the system to fulfill it. Continue with:

- a space, and
- the octal number of a character or the octal numbers of the two or more characters you choose. If you type the numbers of two or more characters, type a space after the number of each character except the last. Press the RETURN key to end the command.

If the character you specify in a SEND command is one of those in the following list, you may type its name instead of its number.

Name of Character	**Octal Number of Character**
NULL (nothing)	0
LF (line feed)	12
CR (carriage return)	15
XON (start transfer)	21
XOF (stop transfer)	23

Before pressing the RETURN key to end the command, you can modify the command by typing the following parts:

- a space,
- the word WAIT,
- a space, and
- any character you choose.

The word processing system fulfills the command as far as the word WAIT. Then the system waits for the host to send the character specified after the word WAIT.

Here is an example of a SEND command:

```
----------START PRINT CONTROL----------

CX
SEND EOL CR LF XOF WAIT XON

----------END PRINT CONTROL----------
```

The above command tells the word processing system to send a carriage return, a line feed, and an XOF at the end of each line, and then to wait until the host sends an XON before resuming transfer.

STEP 4

Press the gold key and the CMND key to end print control.

3.3.3.2 Testing a Document for its Print-Control Commands – The TD (Test Document) option tests a document for its print-control commands to insure that the commands are error-free.

The Communications Menu (Figure 3-40) lists the TD option as TD = Test Document. To use the TD option, type TD and press the RETURN key. Then the display shown in Figure 3-44 appears.

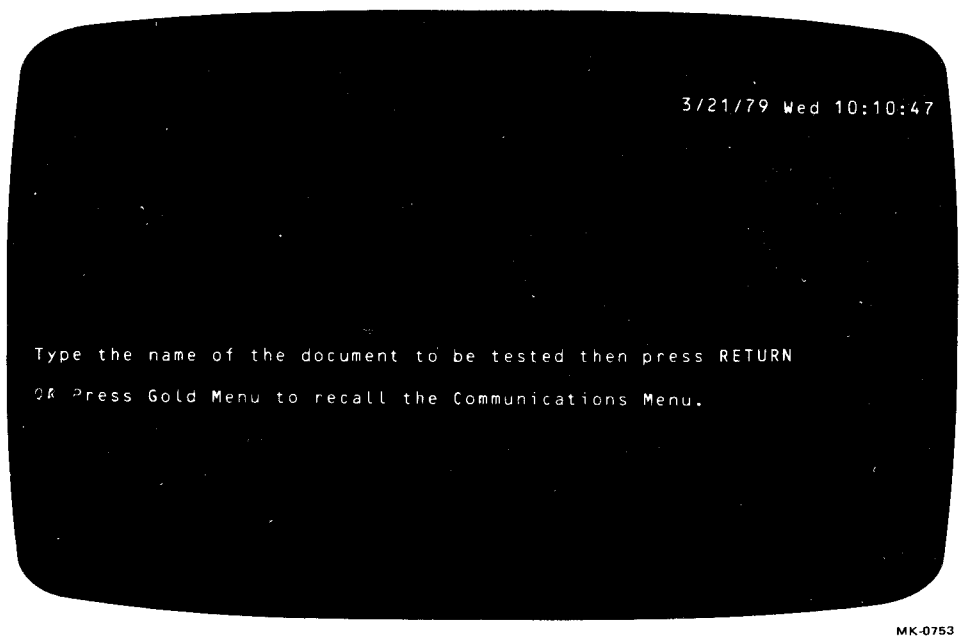

Figure 3-44 Character Transfer Display Requesting the Name of the Document Whose Print-Control Commands Are To Be Tested

Type the name of the document whose print-control commands are to be tested, and press the RETURN key. The TD option determines whether the parts of each command are correct in their arrangement and whether each part is correct in itself. If errors are detected, messages reveal them specifically. To correct errors, refer to the directions and examples in Section 3.3.3.1 or to the list of ASCII characters and their octal numbers in Appendix D. If no errors are detected, a message says there are no errors in the document. Press the RETURN key to recall the Communications Menu.

3.3.3.3 Making a Document the Control Document – After creating a document containing only CX print-control commands, make it the control document by fulfilling the instructions in this Section.

STEP 1

While any Main Menu page is displayed, type the letters SO and press the RETURN key. You will see the System Options Menu shown in Figures 3-45 and 3-46. Look for this line:

CD = Document with CX transfer format.

Below that line is the name of the control document whose settings are in effect. If there is no control document, the word NONE appears instead. When there is no control document, CX uses the normal settings until it finds CX print-control commands that change the settings

STEP 2

Type the letters CD and press the RETURN key. You will see the display shown in Figure 3-47. Type the name of the document containing only CX print-control commands, and press the RETURN key. At that moment, that document becomes the control document, and the commands contained in that document override the normal CX settings. (Anything in the document besides a CX print-control command is ignored.)

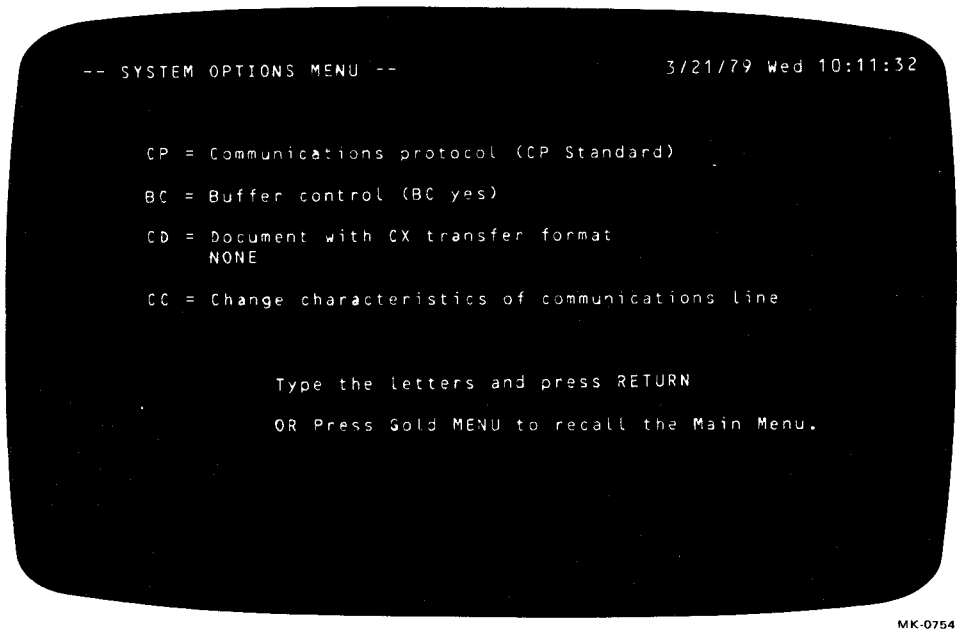

Figure 3-45 System Options Menu (See also Figure 3-46)

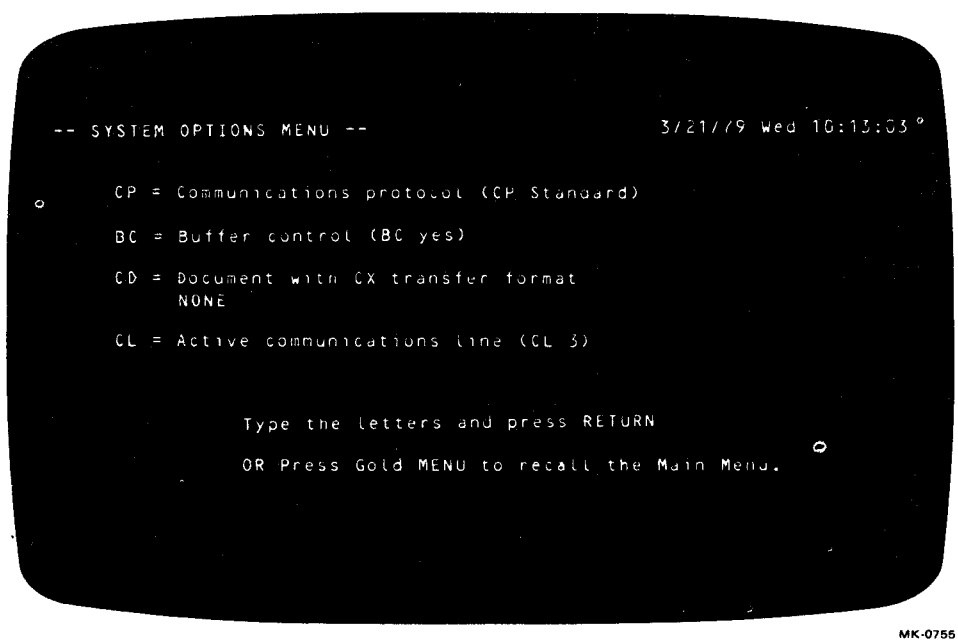

Figure 3-46 System Options Menu (WS81 and WS82 Only)

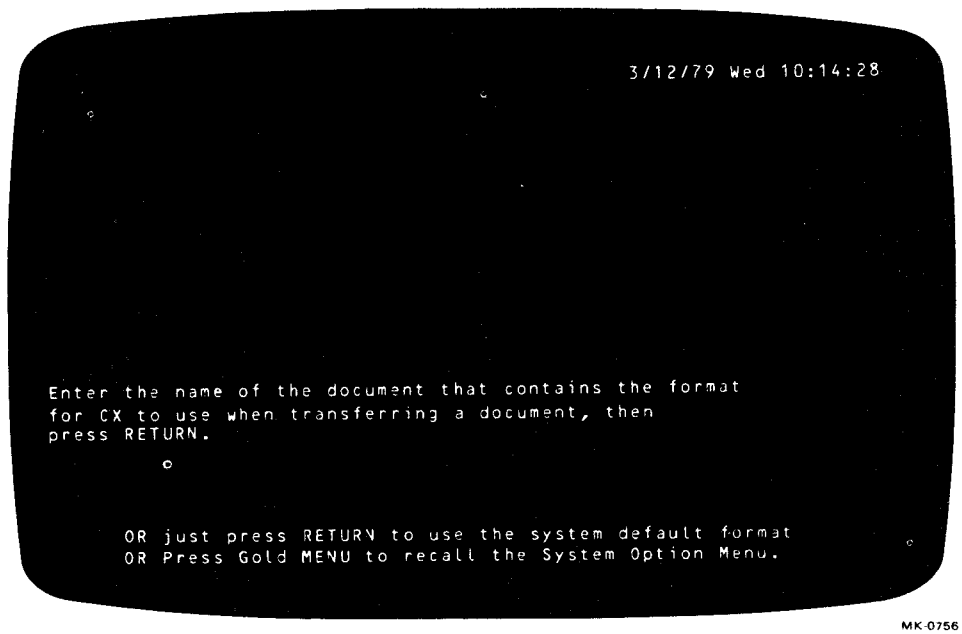

Figure 3-47 System Options Display Requesting the Name of the Document Whose Print-Control Commands Are To Be Used By CX in Transferring Documents

APPENDIX B
CHANGING THE COMMUNICATIONS CHARACTERISTICS

The word processing System Options Menu permits you to change the CX transmission characteristics to conform to your system or computer-related equipment. Changes in protocol, buffer control, baud rate, parity, data bits, and stop bits should be made by a programmer or the System Manager. Here are the characteristics you can modify, followed by instructions on how to change them.

Characteristics	Choices
Protocol	A protocol is a set of rules that govern transmission. Two protocols are available in CX transmission: one for the IBM Mag Card I, and one for all other systems or computer-related equipment. The latter protocol is called "standard" in this manual and in displays.
Buffer Control	Data coming in over the line is placed in a temporary storage area called a buffer. The buffer is a device for controlling the rate at which characters are sent. When the buffer is full, a stop character (XOF) is sent to the sender. When the buffer is almost empty, a start character (XON) is sent to the sender. Two choices are available in CX transmission: not to use XOF and XON or to use XOF and XON.
Baud Rate	The speed at which data is sent over the line (not to be confused with the regulation of data flow by buffers) is measured by the Baud rate. The Baud rates available are 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, and 19200 (if using a WT78 only).
Parity	Three parities are available: even, odd, and no parity (that is, the parity bit is set at 0).

Data Bits	The size of the data byte can be varied from 5 to 8 bits.
Stop Bits	A stop bit or stop bits signify the end of a character being transmitted over the line. Different systems may require a different number of stop bits. Two choices are available in the CX option: one or two stop bits.
Print-Control Commands	The System Options Menu (Figures 3-45 and 3-46) displays this line: CD = Document with CX transfer format. Below that line is the name of the control document whose settings are in effect. If there is no control document, the word NONE appears instead. When there is no control document, CX uses the normal settings (explained in Section 3.3.3) until it finds CX print-control commands that change the settings. When the System Options Menu displays the name of a document, the system automatically tests the document through the TD option–even though you may have previously tested it. If errors are detected, messages reveal them specifically. To correct errors, refer to the directions and examples in Section 3.3.3.1 or to Appendix D. If a document is deleted after it has been entered as the control document, the CX print-control commands it contained remain in effect, but the deletion makes it impossible to display the commands.
Communications Line (WS81 and WS82 only)	There are three communications lines on WS81 and on WS82. The three lines are numbered 1, 2, and 3. The original line is number 3. The System Options Menu (Figure 3-46) shows the number of the line that the system is currently using. You can change to either of the other two lines.

To change the characteristics, follow the instructions below.

STEP 1

Type the letters SO and press the RETURN key when any Main Menu page is displayed.

STEP 2

You will see the System Options Menu shown in Figures 3-45 and 3-46. Notice that the options currently in effect are shown within parentheses. The following table describes the five options and how to change each.

Option	Explanation	Action
CP	Allows you to select "standard" or IBM MAG CARD I protocol.	Type the letters CP and press the RETURN key. You will see the display shown in Figure B–1. Type SP or MC and press the RETURN key or press the gold and the MENU keys.
BC	Allows you to select overflow control or no control.	Type the letters BC and press the RETURN key. You will see the display shown in Figure B–2. Type YES or NO and press the RETURN key or press the gold and the MENU keys.
CC	Allows you to select Baud rate, parity, data bits, and stop bits. This option exists only on WS78s and WT78s.	Type the letters CC and press the RETURN key. You will see the display shown in Figure B–3. Now type B, P, D, or S and press the RETURN key. You will see a message on the screen listing the choices for the letter you typed. Type the choice and press the RETURN key. You can also set the Baud rate for the secondary data port, if you are using it, by typing the letters DP2 and pressing the RETURN key, typing the Baud rate, and pressing the RETURN key again. You will see the choices you have made displayed in parentheses. If you are satisfied with them, press the gold and MENU keys.
CD	Allows you to replace the normal CX settings or the settings of a control document, or to add other print-control commands. See Section 3.3.3.	Type the letters CD and press the RETURN key. You will see the display shown in Figure 3–47. Type the name of the document containing only CX print-control commands, and press the RETURN key. Or press the gold and MENU keys to recall the System Options Menu. To put the normal settings back into effect, type the letters CD and press the RETURN key. You will see the display shown in Figure 3–47. Press the RETURN key again, or press the gold and MENU keys to recall the System Options Menu.
CL	Allows you to change from one communications line to another in a system that has three lines (WS81 and WS82 only).	Type the letters CL and press the RETURN key. You will see the display shown in Figure B–4. Type a number from 1 to 3, and press the RETURN key. Or press the gold and MENU keys to recall the System Options Menu.

STEP 3

You will see the CP and BC choices you have made displayed in parentheses. **If you are satisfied with them, press the gold and MENU keys to return to the Main Menu.**

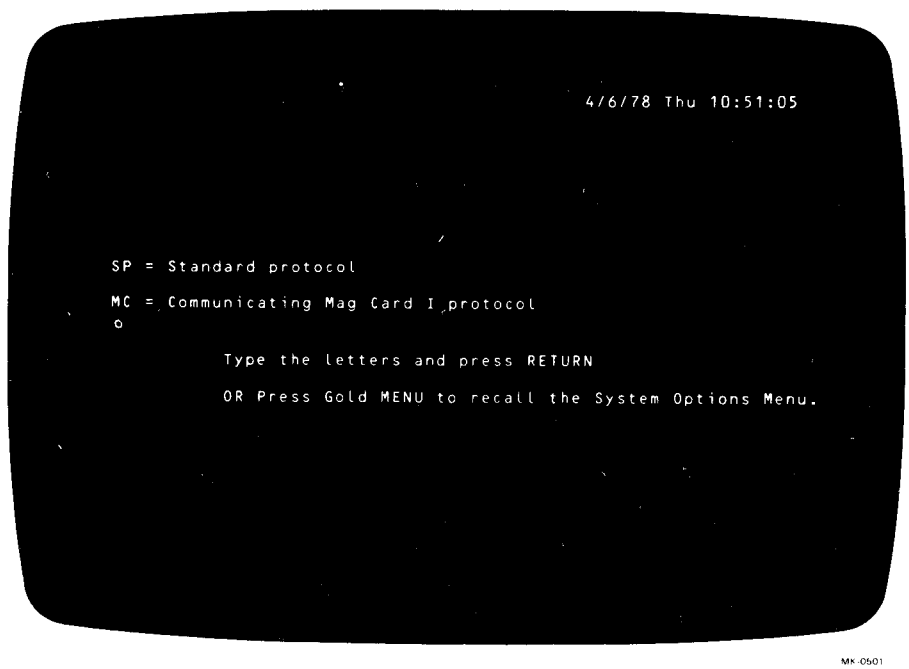

Figure B-1 Communications Setting Menu Appearing When a Change in Protocol Is Specified

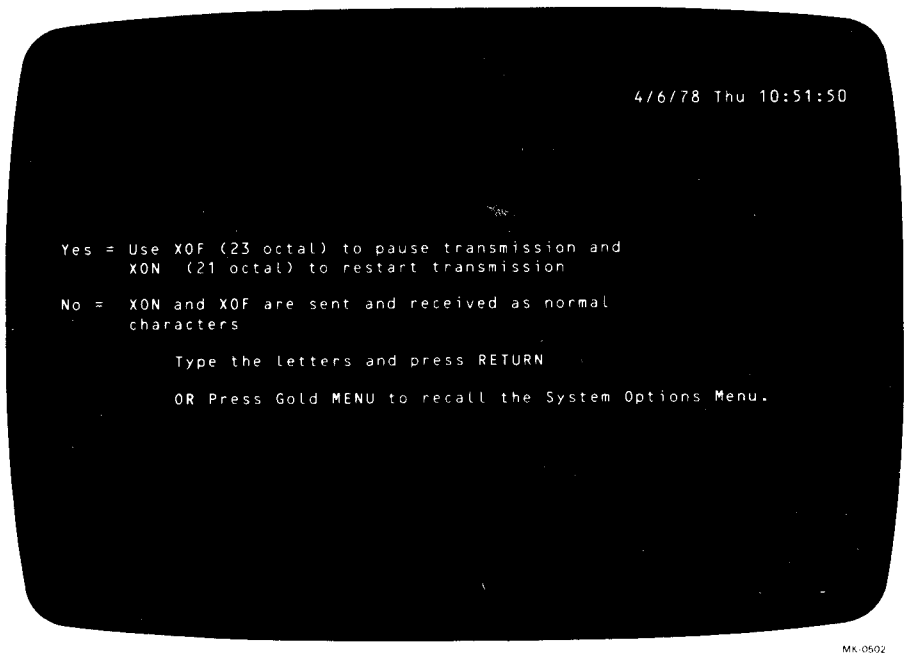

Figure B-2 Communications Setting Menu Appearing When a Change in Buffer Control Is Specified

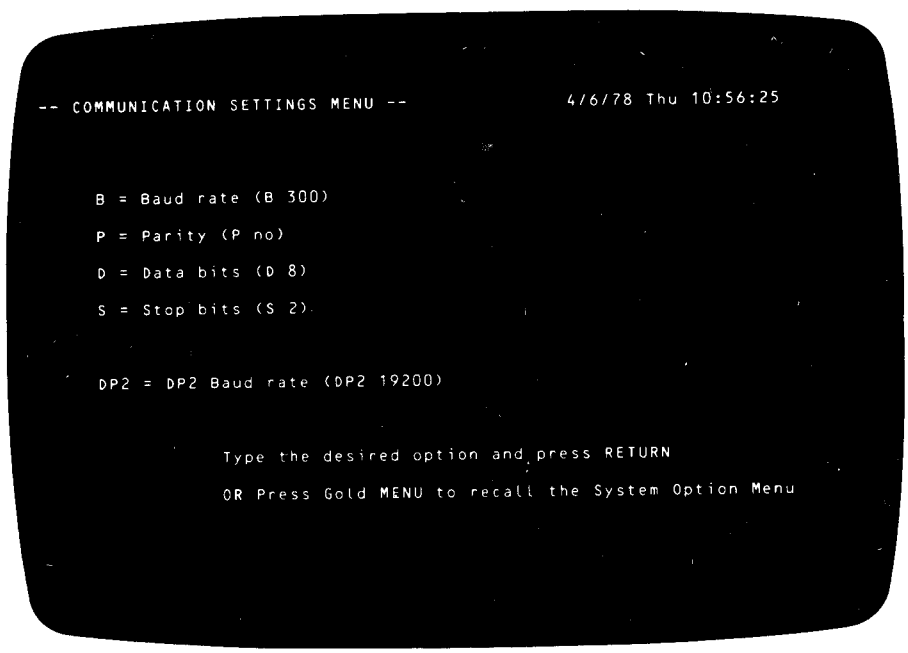

Figure B-3 The Communications Setting Menu Appearing When a Change in Other Transmission Characteristics Is Specified

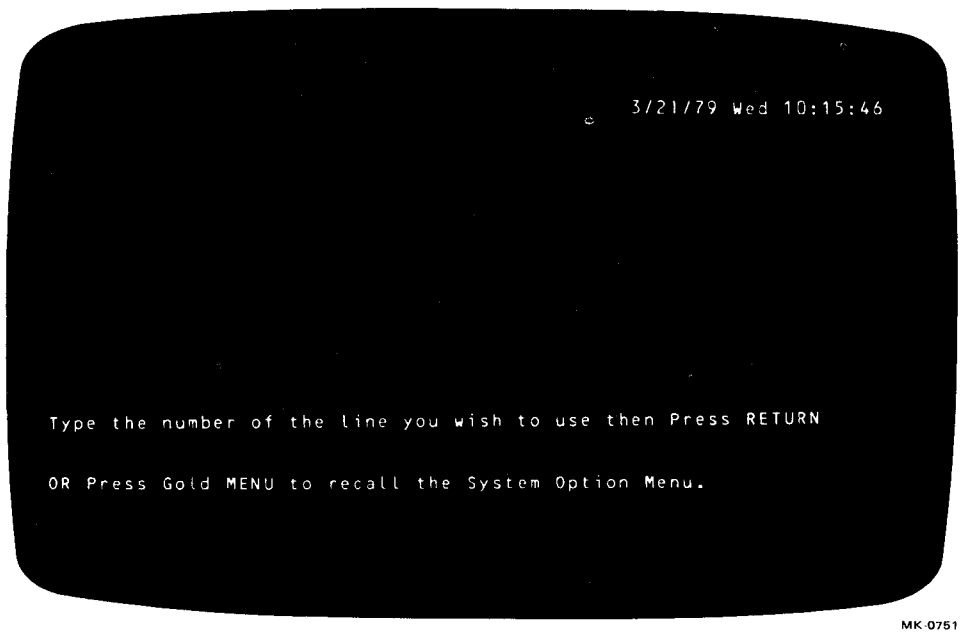

Figure B-4 System Options Display (WS81 and WS82 Only) Requesting the Number of the Communications Line To Be Used

APPENDIX D
ASCII CHARACTERS

Character	Octal Number of Character	Character	Octal Number of Character
NUL	000	SP	040
SOH	001	!	041
STX	002	"	042
ETX	003	#	043
EOT	004	$	044
ENQ	005	%	045
ACK	006	&	046
BEL	007	'	047
BS	010	(	050
HT	011	)	051
LF	012	*	052
VT	013	+	053
FF	014	,	054
CR	015	-	055
SO	016	.	056
SI	017	/	057
DLE	020	0	060
DC1	021	1	061
DC2	022	2	062
DC3	023	3	063
DC4	024	4	064
NAK	025	5	065
SYN	026	6	066
ETB	027	7	067
CAN	030	8	070
EM	031	9	071
SUB	032	:	072
ESC	033	;	073

Character	Octal Number of Character	Character	Octal Number of Character
FS	034	<	074
GS	035	=	075
RS	036	>	076
US	037	?	077
@	100	a	140
A	101	b	141
B	102	c	142
C	103	d	143
D	104	e	144
E	105	f	145
F	106	g	146
G	107	h	147
H	110	i	150
I	111	j	151
J	112	k	152
K	113	l	153
L	114	m	154
M	115	n	155
N	116	o	156
O	117	p	157
P	120	q	160
Q	121	r	161
R	122	s	162
S	123	t	163
T	124	u	164
U	125	v	165
V	126	w	166
W	127	x	167
X	130	y	170
Y	131	z	171
Z	132	{	172
[	133		173
\	134	}	174
]	135		175
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–	137		177

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