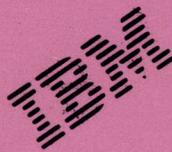


Customer
Center

**IBM 5520 Administrative System/
Personal Computer
Attachment Seminar
Student Handout**



Customer
Center

**IBM 5520 Administrative System/
Personal Computer
Attachment Seminar
Student Handout**

S. G. Alexander
Market Support Center
Austin



G320-0119
September 1983

Preface

This handout is intended for anyone who will attend the IBM 5520/Personal Computer Attachment Seminar. This volume addresses uses and benefits of the IBM Personal Computer as a display station on the IBM 5520 Administrative System. It provides a step-by-step guide to installing the necessary hardware and software. Finally, it provides instructions for a short demonstration of the Personal Computer in both 5520 mode and Personal Computer mode. One of the highlights of the seminar is an explanation of the conversion profiles provided by the emulation program; that is, what they are, how to use them, and how to create new ones.

This guide assumes that the reader has a good understanding of the 5520's profiles and functions. In these pages, the IBM Personal Computer may be referred to simply as the PC, and the IBM 5520 Administrative System as the 5520.

First Edition (September 1983)

G320-0119

Changes are periodically made to the information herein; any such changes will be reported in subsequent editions or Technical Newsletters.

Use this publication only for the purposes stated in the Preface.

The following document contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples contain the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

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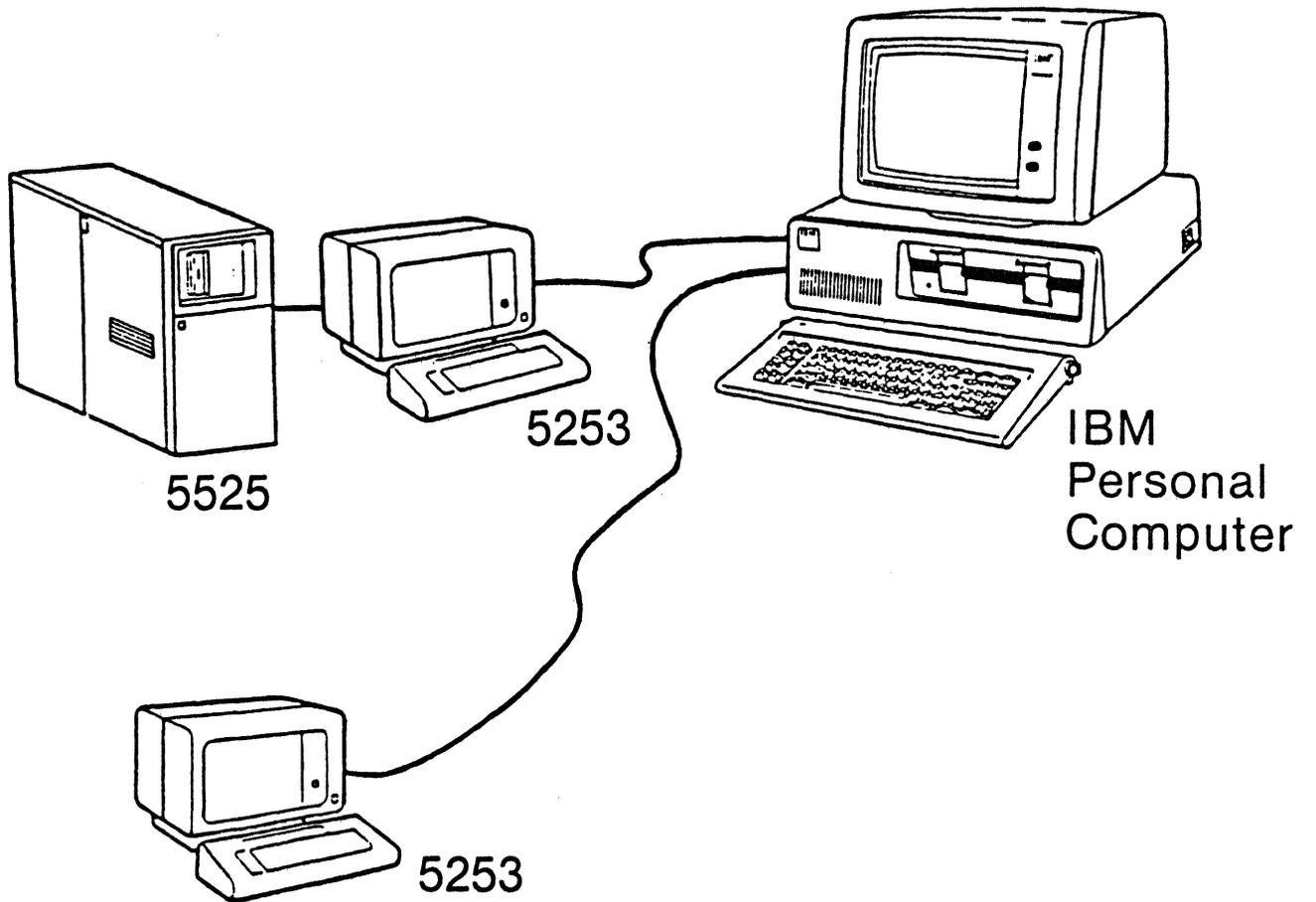
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OVERVIEW AND BENEFITS

IBM Personal Computer Attach to 5520



HIGHLIGHTS

- PERSONAL COMPUTER
 - EMULATES A 5253 DISPLAY STATION
 - OPERATES AS STANDALONE COMPUTER
- SOFTWARE TRANSFORMS
 - PC DOS FILES TO 5520 DOCUMENTS
 - 5520 DOCUMENTS TO PC DOS FILES
- PROVIDES THE PRINCIPAL WITH THE POWER OF BOTH THE PC AND 5520
- ALL PC FUNCTIONS/OPTIONS AVAILABLE
- ALL 5253 FUNCTIONS/OPTIONS AVAILABLE

HARDWARE AND SOFTWARE

- NO CHANGES TO 5520 AT ALL:
 - BOTH VERSIONS OF 5520 SOFTWARE
 - ALL 8 MODELS OF 5520 SUPPORTED
- AT LEAST ONE 5253 MUST BE ATTACHED

- MINIMUM PC CONFIGURATION
 - 64K BYTES MEMORY
 - 1 DISKETTE DRIVE
 - IBM MONOCHROME DISPLAY
- PC DOS REQUIRED

- IBM PC PRINTER MAY BE USEFUL

- FOLLOWING PARTS PROVIDED:
 - PC ADAPTER PRINTED CIRCUIT CARD
 - TWINAX CABLE CONNECTOR
 - KEYBOARD TEMPLATE
 - USER'S GUIDE
 - PROGRAM DISKETTE - 5 1/4"
 - DIAGNOSTIC DISKETTE

BENEFITS TO AN IBM 5520 USER

- **LARGE APPLICATION PROGRAM BASE**
- **PC ASYNC COMMUNICATIONS**
- **SEVERAL PROGRAMMING LANGUAGES AVAILABLE**
- **SINGLE PROFESSIONAL WORKSTATION FOR MULTIPLE USES**

BENEFITS TO IBM PERSONAL COMPUTER USER

- **SHARE IN FULL 5520 FUNCTION**
 - **TEXT**
 - **FILES**
 - **EDD**
- **ACCESS TO LARGE STORAGE FACILITIES**
- **ACCESS SNA/SDLC AND BSC PROTOCOLS THROUGH 5520**
- **IBM 3278 EMULATION THROUGH 3270 CAPABILITIES OF 5520**
- **QUALITY PRINT AVAILABILITY**
 - **INK JET**
 - **6670**
 - **5219, 5229**

APPLICATIONS

- VISICALC (R)¹ OUTPUT FILES, CONVERT TO 5520 DOCUMENTS
- EASYWRITER (R)² TEXT OFFLINE, CONVERT TO 5520 DOCUMENTS
- ASYNC TO DOW JONES, CONVERT TO 5520 DOCUMENTS
- PC FILE TO 5520 FILE FOR SORTING
- PC FILE TO 5520 FOR MERGE FILE/TEXT
- PRINT 5520 SCREENS ON PC PRINTER
- 5520 DOCUMENTS TO PC FOR ASYNC COMMO

¹ VisiCalc is a registered trademark of Personal Software, Inc.

² EasyWriter is a registered trademark of Information Unlimited Software, Inc.

WORKSTATION DIFFERENCES

- **KEYBOARD**
 - TYPAMATIC ON PC
 - TEMPLATE PROVIDED
- **DISPLAY**
 - DISPLAYABLE CHARACTER DIFFERENCES
 - DISPLAY INDICATORS
 - WP CHARACTERS NON-DISPLAY
- **PC PRINTER**
 - PRINTABLE CHARACTER DIFFERENCES

IBM IBM 5520/Personal Computer Attachment Program Template

MSG	CURSOR CONTROL	±	1	2	3	4	5	6	7	8	9	0	-	=	BKSP	PAGE ADV	PAGE RET		
DEV MSG	MAIN MENU	RETURN TO DOS			RECD PE				SPLIT PAGE		STOP		RECD		RECD	DEL	RESTR		
LEFT MAR	INSERT REPL	TAB	Q	W	E	R	T	Y	U	I	O	P	1/2	1/2		PAR ADV	BLOCK DEF	BLOCK CUT	BLOCK INSERT
RIGHT MAR	END	RECD	-	I	ALT FMT	L FMT RET	TYP CHG	1/2↑	KVB CHG	WORD UND	TYP RET	PAR ADJ		AUTO RET	RET	DEL	DEL	COPY	REPL
SET ALL	TAB SET	LOCK	A	S	D	F	G	H	J	K	L	:	"	3		LINE RET	WORD RET	CHAR RET	
CLEAR ALL	CLEAR	SYSTEM RESET	<	>	PRI FMT	L FMT CHG	GET	1/2↓	FIELD ADV		ALT KVB			RECD		CONTROL CHAR			
REQST	CTR SET	SHIFT	'	Z	X	C	V	B	N	M	:	.	?	SHIFT	Prt Sc	LINE ADV	WORD ADV	CHAR ADV	FRAME ADV
CANCL	RIGHT SET		␣	FND			PAGE	[	↑	]				SHIFT	PRT PAGE	DEL	DEL	DEL	
RESET	DEC. SET	CODE												ENTER	VAR ADV	OPT ADV			
HELP	DEC. SET	SYSTEM RESET	REQUIRED											AGAIN	RET	RET	SYSTEM RESET	SGMNT	

Keyboard Template

PRINT SCREEN FUNCTION

- STANDARD DOS FUNCTION
- SINGLE KEYSTROKE INVOKES IT
- PRINT ENTIRE SCREEN
 - 25 LINES
 - DISPLAY INDICATORS
 - SCALE LINE
 - ETC.
- CHARACTER SUBSTITUTION FOR UNPRINTABLE CHARACTERS
- USED TO DOCUMENT 5520 MENUS

PRINT SCREEN EXAMPLE

SYSTEM AVAILABLE
Menu ----- IPC SEMINAR ----- 10001.0.01 ----- 1 ----- 1001112
Change Primary Document Format

<.2.....3.....4.....5... :...6.....7.....8.....>.....

First Line First Page: 10 First Line Other Pages: 7 Last Line: 60
Header Margin Text Line: 3 Footer Margin Text Line: 63
Line Spacing: 1 Zone Width: 6 Type Style: 86
Lines Per Inch: 6 Line Alignment: Left Adjust: No
Print Quantity: 1 Printer Paper Source: 1
Paper Size: 8.5-11
Page Number: None Start Page Number: 1
Page Number Increment: 1 System Page Number: None
Stop Print Instructions:

.....

Left Line Number: None Number Blank Lines: No Sequence: Continuous
Right Line Number: None Start Line Number: 1
Line Number Interval: 1 Line Number Increment: 1
Display/Change Margin Text: No
Header Margin Text: None Footer Margin Text: All Pages

ENTER to continue or finish; otherwise, CANCEL
0000-OK

PC ATTACH TASK SELECTION MENU

IBM 5520/Personal Computer Attachment Task Selection

(EMU) IBM 5253 Display Station Emulation
(DFC) IBM Personal Computer DOS File Conversion
(FCP) IBM Personal Computer DOS File Conversion Profile
(PRP) Print Page Option Selection

To select default (underlined above), press ENTER (Caps Lock)
For another selection, type the abbreviation, press ENTER (Caps Lock)

PRINT PAGE FUNCTION

- PRINTS CONTENTS OF CURRENT PAGE OF DOCUMENT IN USE
- DEFAULT PRINT OPTIONS OR USER SELECT
 - DOUBLE WIDTH
 - EMPHASIZED MODE
 - DOUBLE STRIKE MODE
 - LEFT MARGIN
- TRUNCATION OF LONG LINES
- CHARACTER SUBSTITUTION FOR UNPRINTABLE CHARACTERS
- CHANGE DISPLAY MODE WILL INCLUDE MARGIN TEXT
- RESOLVES EMBEDDED INSTRUCTIONS WHOSE CONTENTS ARE HELD SOMEWHERE IN PAGE BUFFER
 - DOCUMENT INSTRUCTION
 - PAG OR SYS INSTRUCTIONS
 - DAT INSTRUCTION
- CAN BE COPIED INTO DOS FILE

PAGE PRINT MENU

IBM Personal Computer Print Page Option Selection

Output Device: IBM_Personal_Computer_Printer
Compressed Mode (Ignored if in Emphasized Mode): Off
Double Width Mode: Off
Emphasized Mode: Off
Double Strike Mode: Off
Left Paper Edge Start: Left_Margin

Possible Mode Combinations

40-Character Line: Compressed Mode Off, Double Width Mode On
66-Character Line: Compressed Mode On, Double Width Mode On
80-Character Line: Compressed Mode Off, Double Width Mode Off
132-Character Line: Compressed Mode On, Double Width Mode Off

ENTER (Caps Lock) to continue; otherwise CODE CANCEL (Alt and F7)

FILE CONVERSION

- CONTROLLED BY CONVERSION PROFILE (S)
- CHARACTERS TRANSLATED TO EQUIVALENTS IN RECEIVING SYSTEM
- UNSUPPORTED ASCII CHARACTERS TRANSLATED TO
 - REQUIRED SPACE
 - REQUIRED BACKSPACE
 - DEGREE SIGN
 - HEX
 - HEX
 - EXAMPLE: PC "HAPPY FACE" = X'01' TRANSLATES TO
"41 16 90 FO F1"
- UNSUPPORTED 5520 CONTROLS TRANSLATED TO ASCII ESCAPE SEQUENCE + 5520 BINARY STRING
 - EXAMPLE: TYPESTYLE CHANGE TO TS 11 =

"2B D1 07 05 00 0B 01 44 01"

5520 ESCAPE TS IDENT

- TRANSLATES TO

"1B 01 00 0B 01 44 01"

PC ESC TS IDENT

CONVERT MENU

Convert IBM 5520 Document to IBM DOS File

Output IBM DOS File Name: _.....

Conversion Profile Name: CONVERT

Number of Pages to be Converted: All

ENTER (Caps Lock) to continue; otherwise CODE CANCEL (Alt and F7)

CONVERT PROFILE MENU

Control Character Map

IBM 5520			IBM 5520		
<u>Control Character</u>	<u>()</u>	<u>ASCII VALUE</u>	<u>Control Character</u>	<u>()</u>	<u>ASCII VALUE</u>
Null	(00)	00	Switch	(2A)	FAFO
TAB	(05)	09	Stop	(2F)	F0
REQD RET	(06)	0A0D	Index Return	(33)	FA0A0D
1/2 Up	(09)	17	Numeric Bksp	(36)	F90B
Repeat	(0A)	FC	1/2 Down	(38)	19
Page End	(0C)	0C0D0A	REQD TAB	(39)	FA09
ZICR	(0D)	FA0D	REQD P E	(3A)	04
RET	(15)	0D0A	Sys Ret	(3B)	F4
REQD BKSP	(16)	0B	Substitute	(3F)	F6
BKSP	(1A)	FA0B	REQD Space	(41)	1F
L FMT RET	(1E)	FE	REQD Hyphen	(60)	2D
WORD UND	(23)	FA5F	Syllable Hyphen	(CA)	FA2D
Index	(25)	0A	Numeric Space	(E1)	FA20
Other	...	.....	Other	...	.....
Other	...	.....	Other	...	.....

ENTER (Caps Lock) to continue; otherwise CODE CANCEL (Alt and F7)

CONVERT PROFILE MENU

Control Sequence Map

IBM 5520 Control Sequence	ASCII Control Characters	IBM 5520 Control Sequence	ASCII Control Characters
Insert Esc Graphic	<u>1B00</u> -----	Typestyle Change	<u>1B01</u> -----
Ret Master Line Fmt	<u>1B02</u> -----	Align Text Line	<u>1B03</u> -----
Ret Master Font	<u>1B04</u> -----	Align Text Field	<u>1B05</u> -----
Release Left Margin	<u>1B06</u> -----	Begin Instruction	<u>1B07</u> -----
Param. Separator	<u>1B08</u> -----	End Instruction	<u>1B09</u> -----
Left Margin	<u>1B0A</u> -----	Right Margin	<u>1B0B</u> -----
Adjust	<u>1B0C</u> -----	Alignment	<u>1B0D</u> -----
Zone Width	<u>1B0E</u> -----	Line Spacing	<u>1B0F</u> -----
Font ID	<u>1B10</u> -----	Font Width	<u>1B11</u> -----
Font Attribute	<u>1B12</u> -----	Line Numbering	<u>1B13</u> -----
Horizontal Tab	<u>1B14</u> -----	Prompted Stop	<u>1B15</u> -----
All Others	<u>1B16</u> -----		

ENTER (Caps Lock) to continue; otherwise CODE CANCEL (Alt and F7)

CONVERT PROFILE MENU

Data File Format

Text Lines Per Page: 56
Characters Per Line: 132
IBM 5520 Line Ender: Carrier_Return
Exclude ASCII Sequences: NO

ENTER (Caps Lock) to continue; otherwise CODE CANCEL (Alt and F7)

CONVERT PROFILE MENU

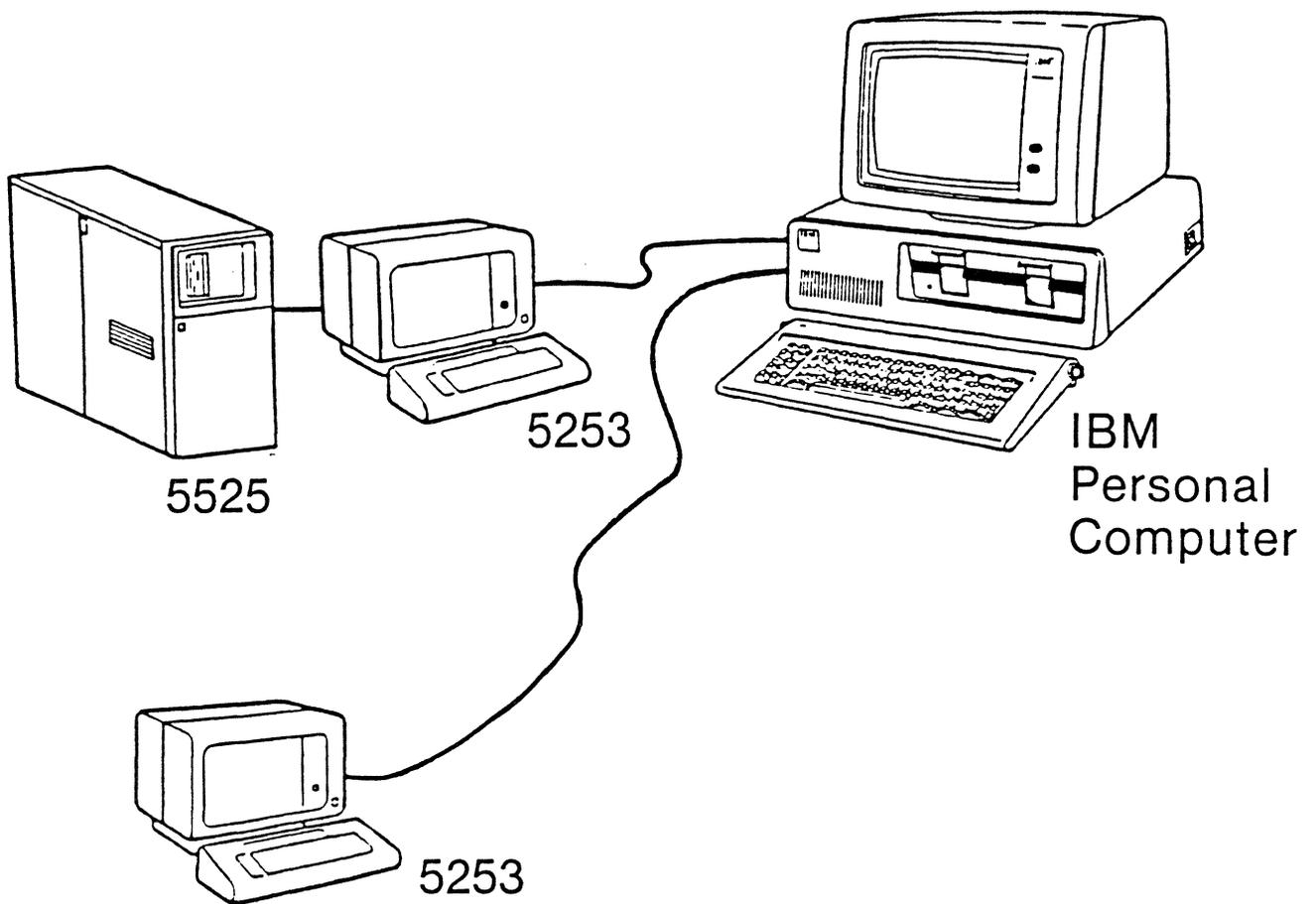
ASCII Sequence Exclusion Range

Enter Beginning and Ending Characters Below:

From:	To:

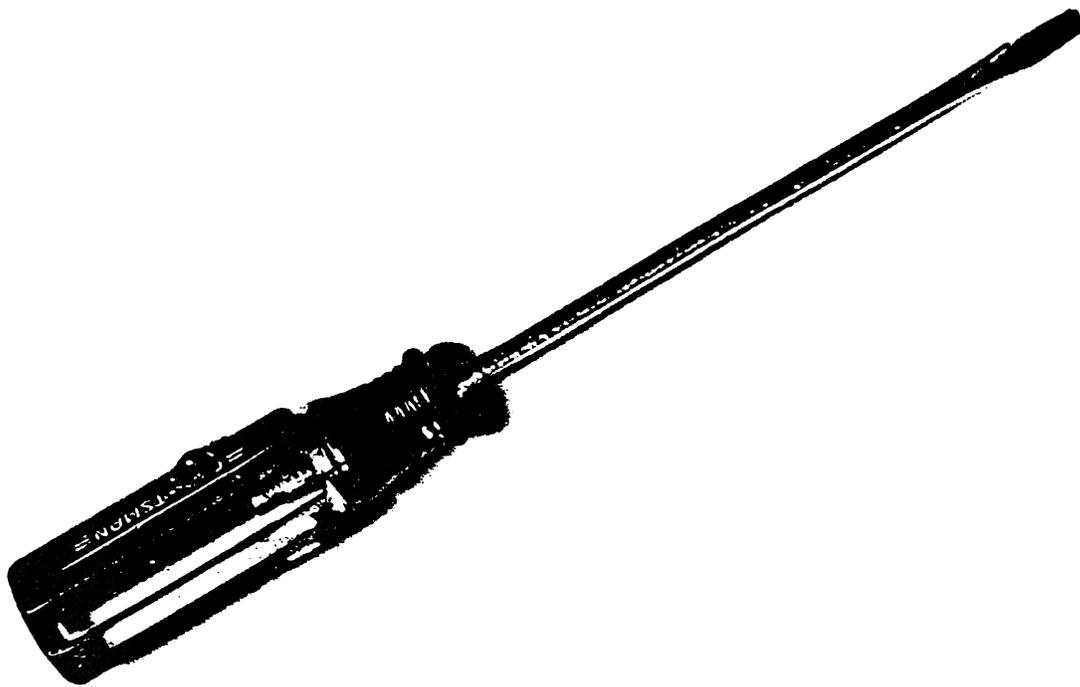
ENTER (Caps Lock) to continue; otherwise CODE CANCEL (Alt and F7)

IBM Personal Computer Attach to 5520

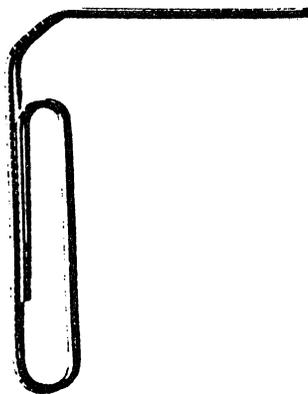


HARDWARE AND SOFTWARE INSTALLATION

QUIZ TIME!







STEP 1:

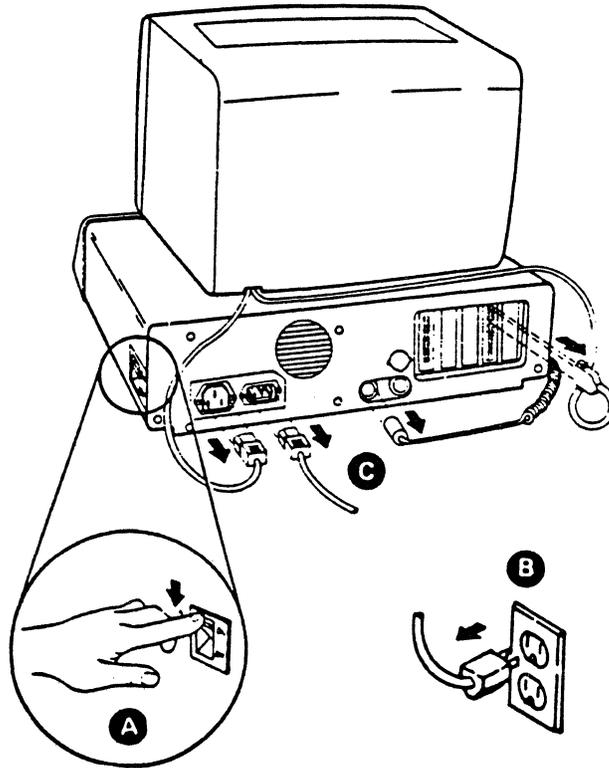
- POWER PC ON AND LET PC "SELF CHECK"
- SAMPLE "GOOD" SELF TEST

```
The IBM Personal Computer Basic  
Version C1.00 Copyright IBM Corp 1981  
61404 Bytes free  
Ok
```

```
1LIST 2RUN 3LOAD" 4SAVE" 5CONT 6,"LPT1 7TRON 8TROFF9KEY 0SCREEN
```

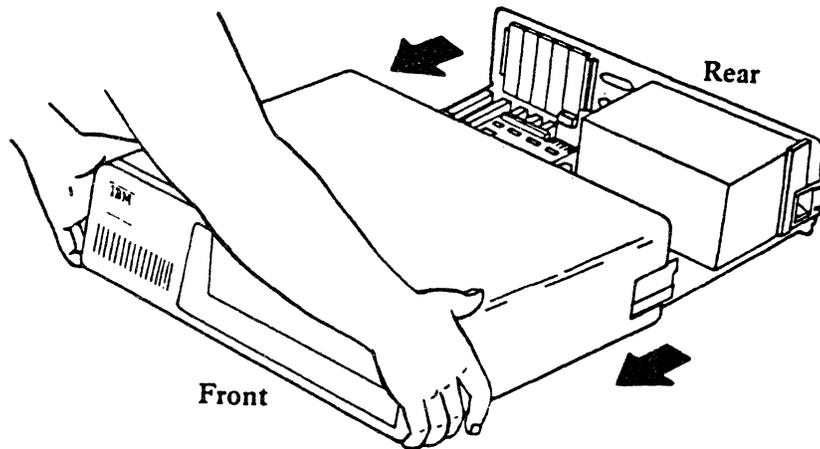
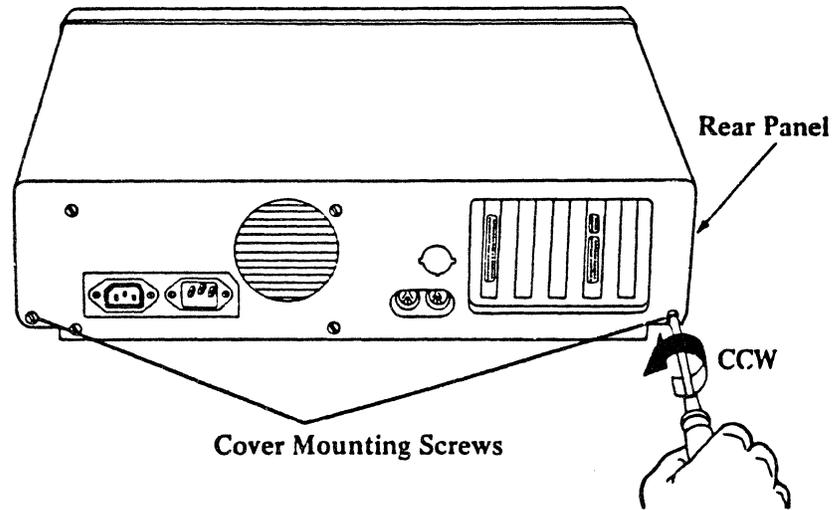

STEP 2:

- **POWER OFF PC AND PRINTER**
- **UNPLUG PC AND PRINTER FROM WALL OUTLET**
- **DISCONNECT ALL CABLES FROM PC**



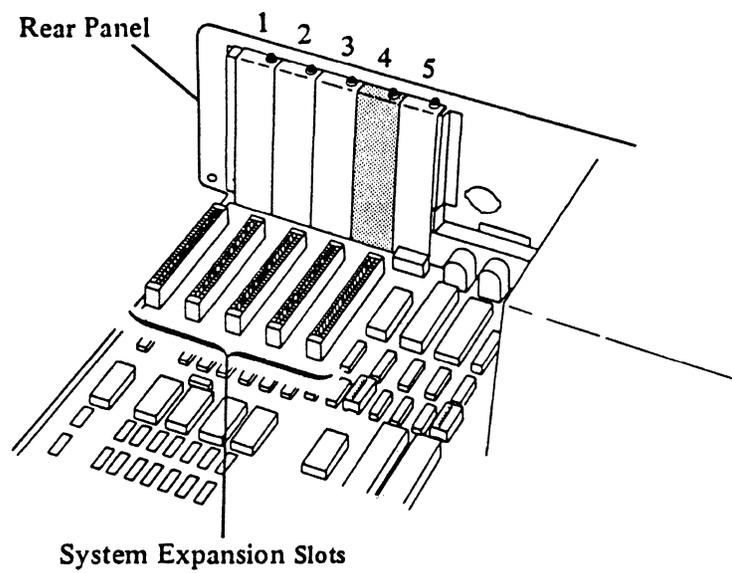
STEP 3:

- REMOVE THE PC'S COVER.



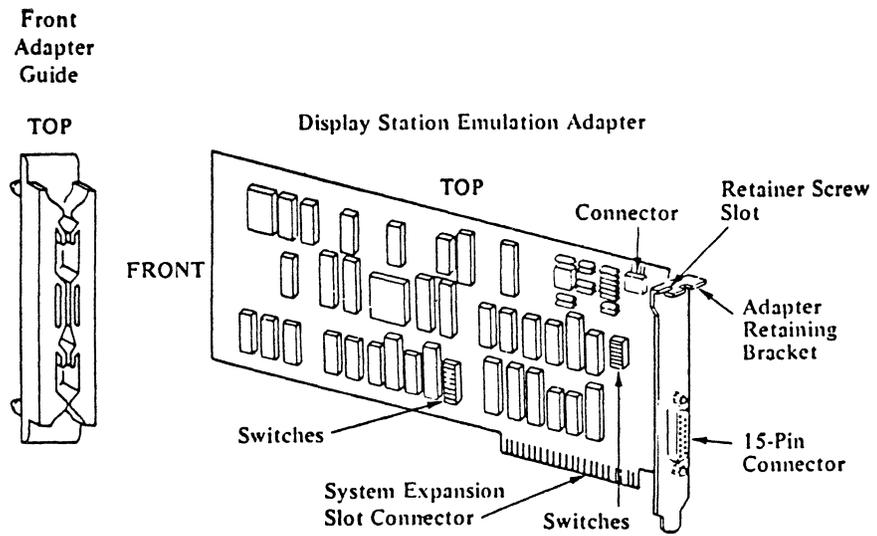
STEP 4:

- REMOVE SCREW HOLDING SYSTEM EXPANSION SLOT COVER
- USE ONLY SLOTS 2 THROUGH 4



STEP 5:

- **MARK INTERRUPT LEVEL = 3**
- **MARK UNIT ADDRESS = _____**
- **TERMINATE OPTION = OFF**



STEP 6:

- **SET SWITCHES AS SHOWN HERE**

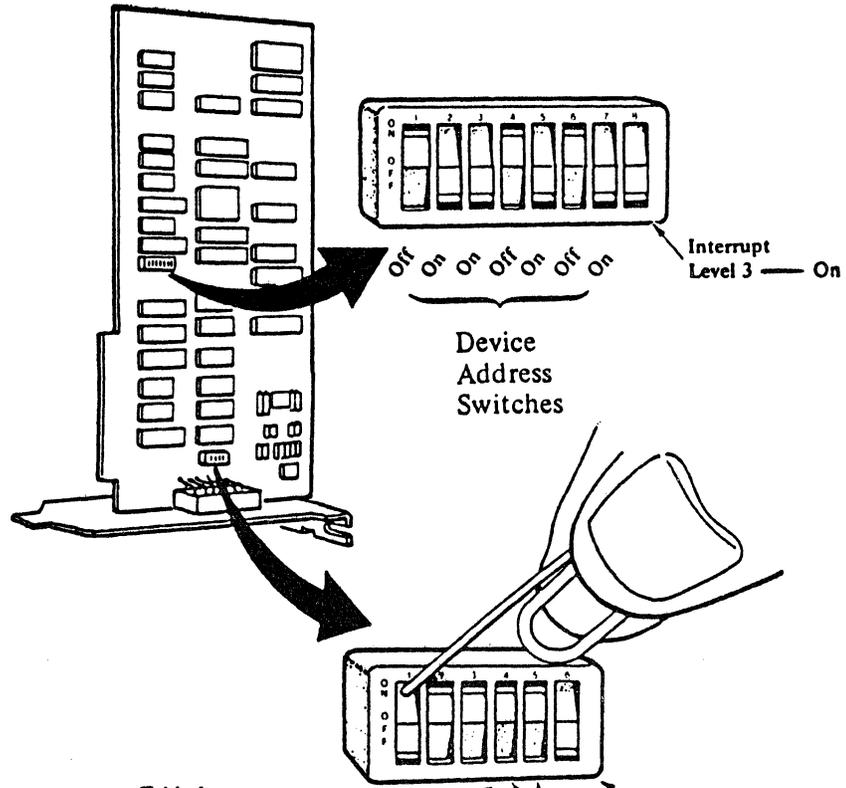
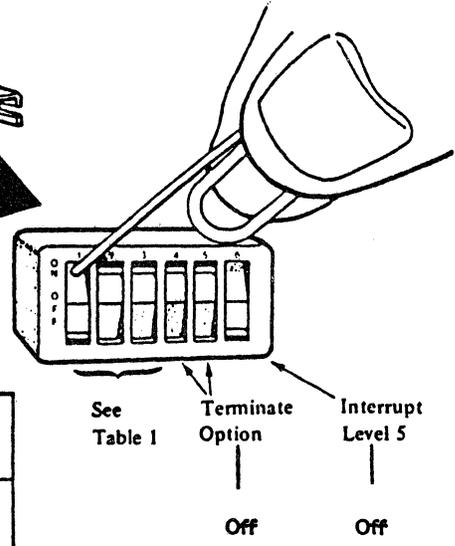


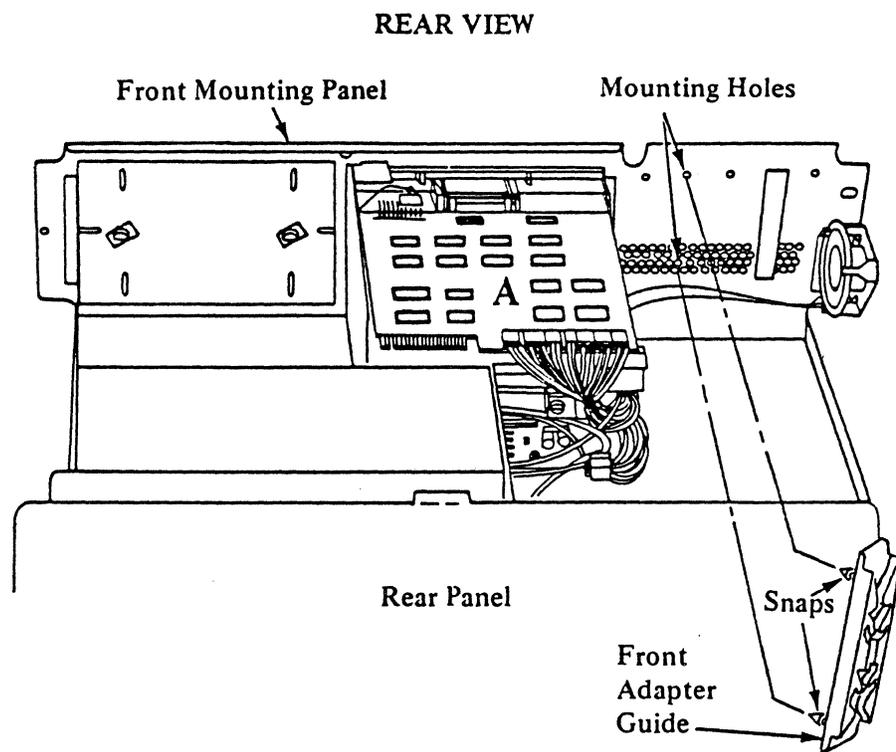
Table 1

Display Station Addresses	Switch Settings		
	1	2	3
0	Off	Off	Off
1	Off	Off	On
2	Off	On	Off
3	Off	On	On
4	On	Off	Off
5	On	Off	On
6	On	On	Off
Invalid (7)	On	On	On



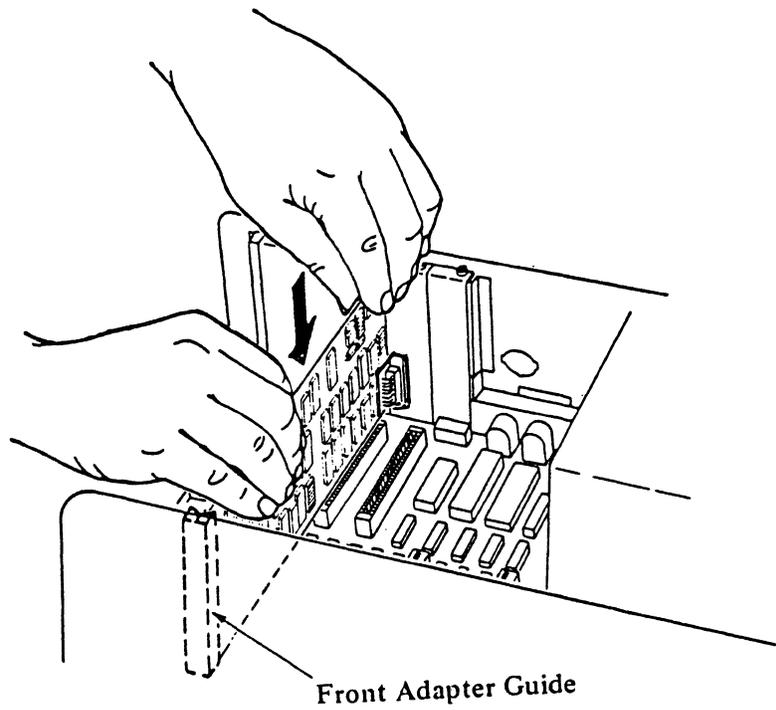
STEP 7:

- **INSTALL FRONT ADAPTER GUIDE**



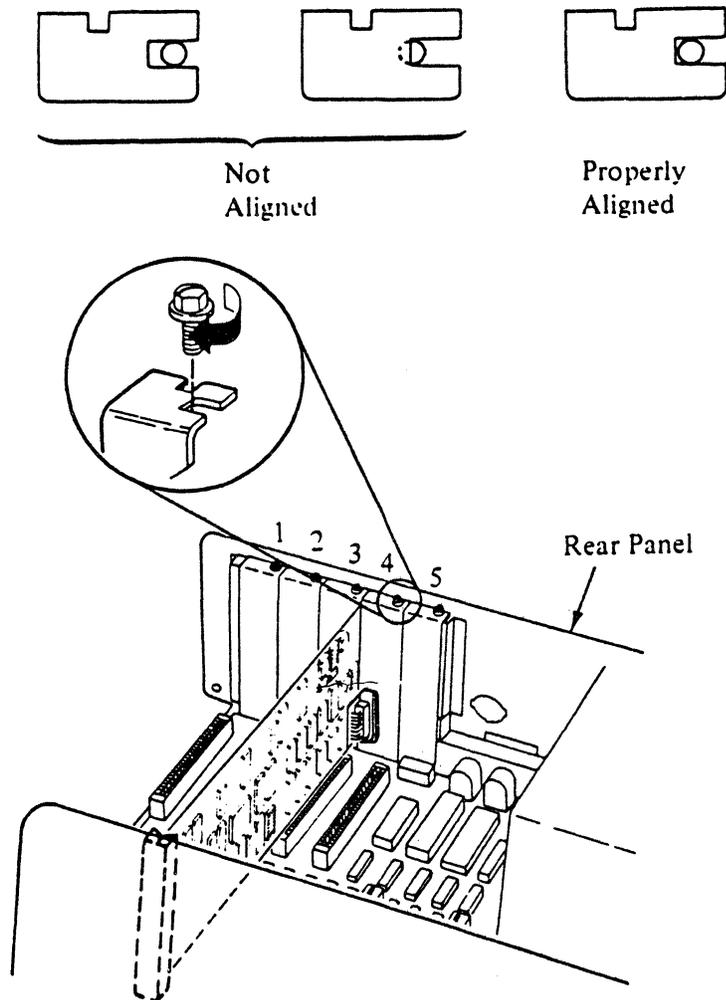
STEP 8:

- **INSTALL EMULATION ADAPTER CARD**



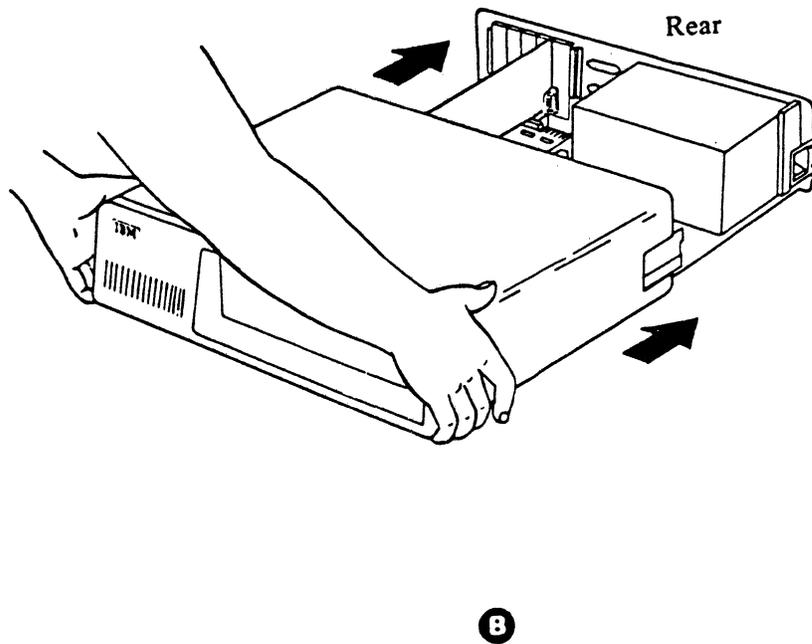
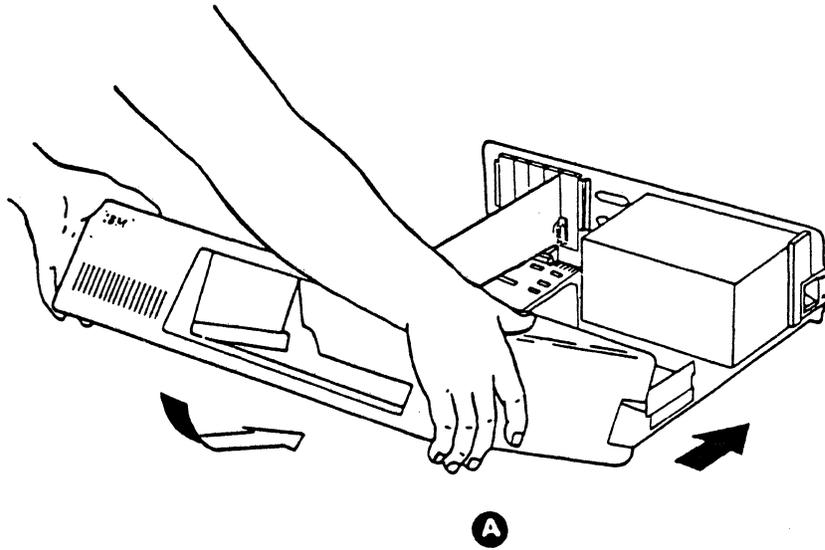
STEP 9:

- **ALIGN ADAPTER RETAINING BRACKET WITH REAR PLATE**
- **REPLACE AND TIGHTEN SCREW**



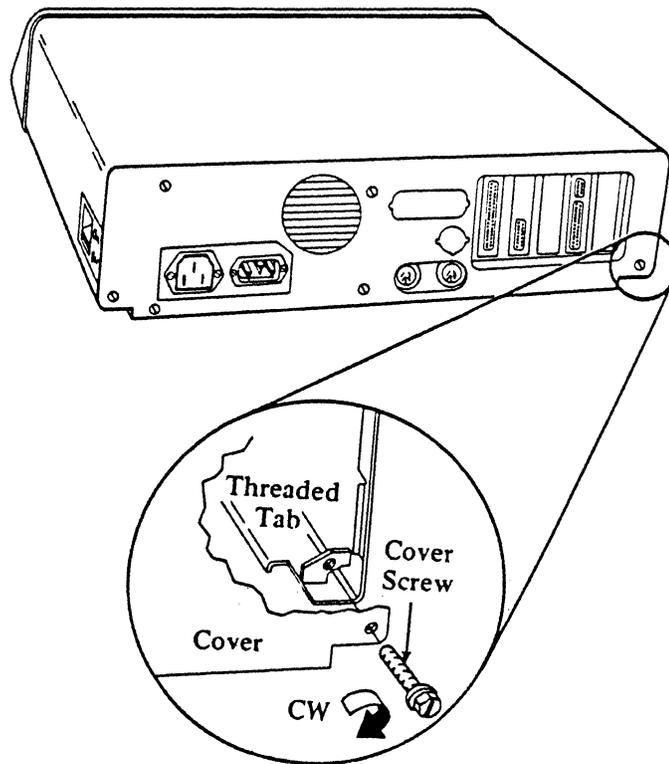
STEP 10:

- **REPLACE COVER ON PC**



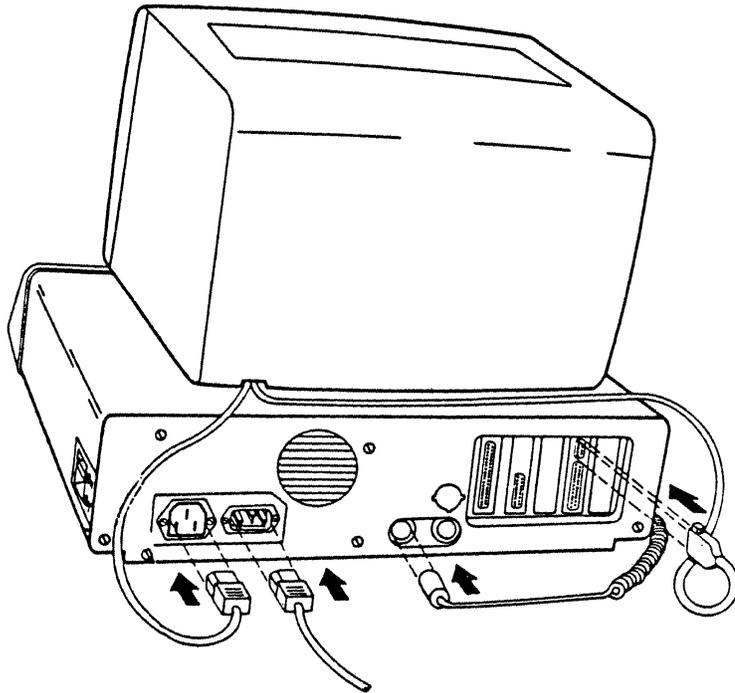
STEP 11:

- **ALIGN SCREWS WITH THREADED TABS AND TIGHTEN**



STEP 12:

- RECONNECT ALL CABLES TO PC
- TURN TO DISPLAY STATION EMULATION ADAPTER CHECKOUT SECTION

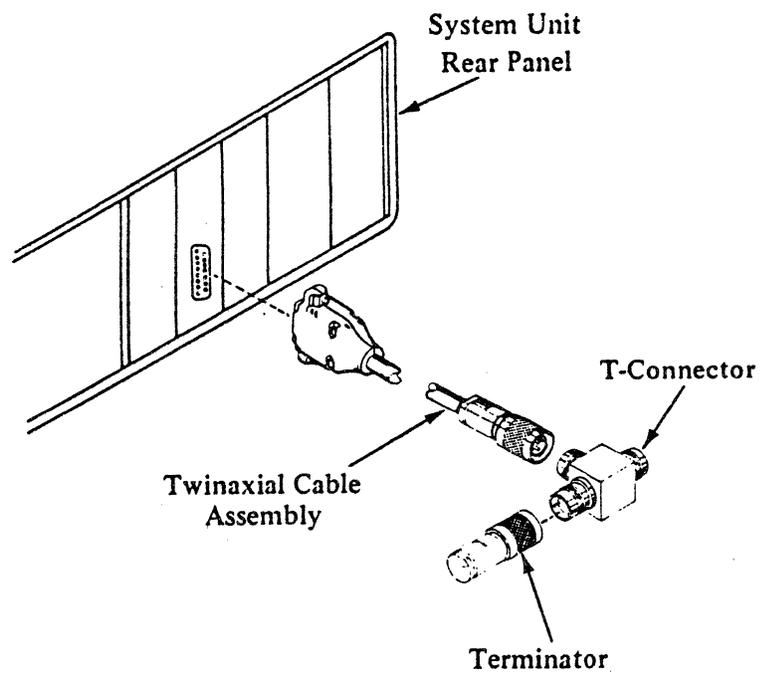


STEP 13:

- **READ "DISPLAY STATION EMULATION CHECKOUT"**
- **PERFORM STEPS 1-9 OF PROBLEM DETERMINATION PROCEDURES**
- **VERIFY DISPLAY STATION ADDRESS AND INTERRUPT LEVEL**

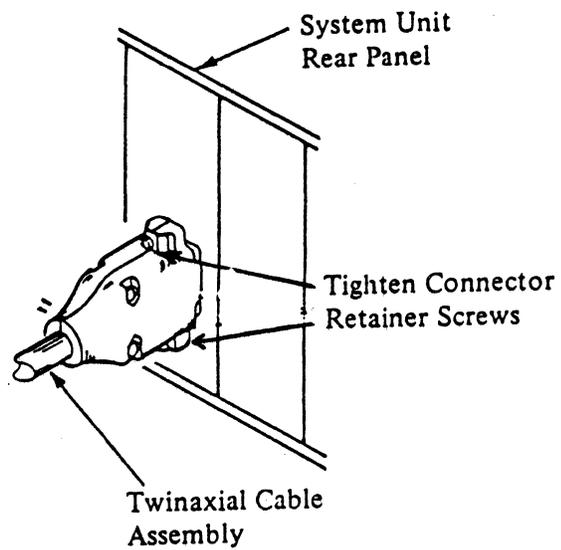
STEP 14:

- **EXAMINE DIAGRAM TO SEE HOW TWINAXIAL CABLE ASSEMBLY, T-CONNECTOR, AND TERMINATOR FIT TOGETHER**



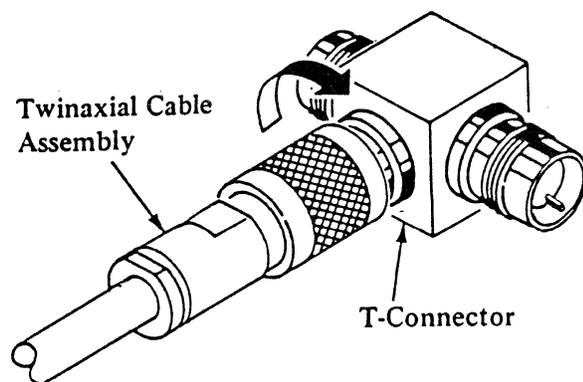
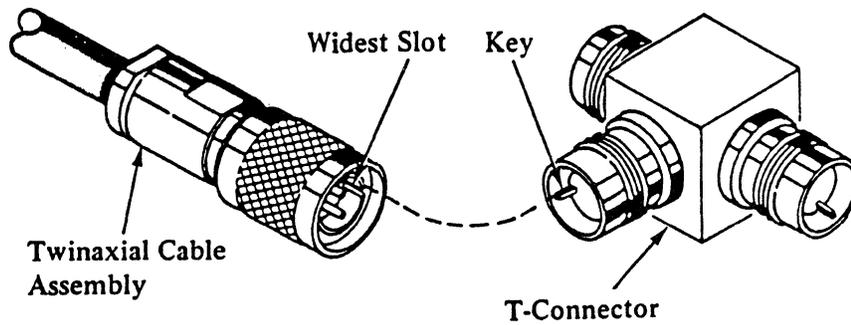
STEP 15:

- **CONNECT THE 15-PIN CONNECTOR END OF CABLE TO REAR PANEL**
- **TIGHTEN CONNECTOR RETAINER SCREWS**



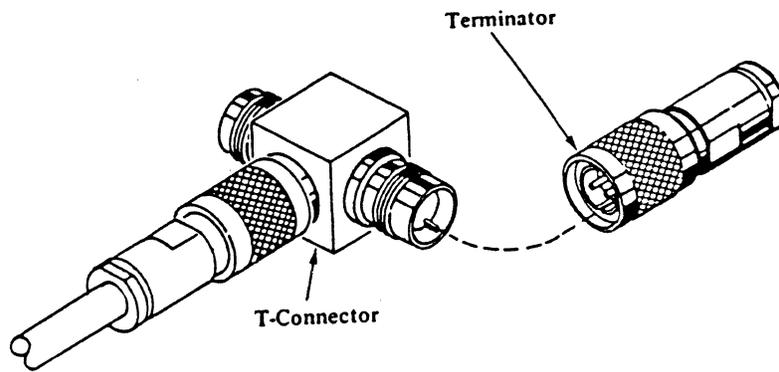
STEP 16:

- **CONNECT OTHER END OF CABLE ASSEMBLY TO CENTER SOCKET OF T-CONNECTOR**



STEP 17:

- IF PC IS LAST DISPLAY ON THE LINE, INSTALL TERMINATOR



STEP 18:

- **CONNECT TWINAXIAL CABLE FROM 5525 SYSTEM UNIT TO T-CONNECTOR**
- **PERFORM ON-LINE TEST (IN HANDOUT)**

STEP 19:

- **POWER OFF PC. INSERT EMULATION DISKETTE IN DRIVE A.**
- **POWER ON PC AND WAIT FOR 5520 SIGN ON SCREEN.**

STEP 20:

- **CONGRATULATIONS! YOU ARE READY TO PROCEED TO THE DEMONSTRATION**

DEMONSTRATION INSTRUCTIONS

PC DEMO GUIDE

DEMONSTRATION FOR DEMO1

1. Load the EMULATE diskette in drive A and the 5520/PC DEMO diskette in drive B. Power on. The PC comes up in emulation mode.
 - a. Notice the status line at the top of the screen.
 - b. Examine the template to see where all the keys are on the emulated keyboard. Note some of the keys you will be using frequently in this demonstration: the CODE key (labeled ALT on the PC), the Main Menu key (on the front of the key labeled F2), the RET key (labelled with a bent arrow), and the ENTER key (labelled CAPS LOCK). For the demonstration instructions, when you are in 5520 mode, the keys are called by their 5520 names; when you are in PC mode, they are called by their PC names.
2. Sign on to the 5520 as DEMO1 (no password).
 - a. Request USE "pc profit report." Note the lack of visible WP controls. LINE ADVANCE and CHAR RET to show carrier return in the audit window.
 - b. Press CODE + Control Char (5 on the ten-key pad) to show visible WP controls.
 - c. Press CODE + Main Menu to display the IBM 5520/Personal Computer Attachment Task Selection Menu (after this point referred to as the PC Main Menu). Note that the defaults work just as they do on the 5520, but this menu is only available with the emulation program. We will come back to this menu several times to try out the various options, but for now press ENTER to return to the document.
3. Pretend you are a financial analyst who uses VisiCalc to prepare a financial report. You have created the letter that you looked at in Step 2 above (pc profit report) and now you want to attach to it the VisiCalc report you have prepared with all the calculations. In order to include this report, you must first convert it to a 5520 format:
 - a. PAGE ADVANCE to an empty page 3.
 - b. Press CODE + Main Menu and key "dfc" for data file convert. We are going to convert a report you have stored on the demo diskette from its DOS format to a 5520 document.
 - c. Key FC2 for DOS to 5520 file convert.
 - d. The report has been saved as a file called "profit" on the diskette in drive B. Key "b:profit" for the file name (the "b:" tells the system which drive to go to). On the next line, option advance and key "b:convc" for the name of the conversion profile. IBM provides instructions for creating conversion profiles such as this one that we are using to convert the VisiCalc report. Press ENTER.
 - e. ENTER twice more. We have the diskettes already inserted.
 - f. When the conversion is complete, you will get a message. ENTER to get back into the document.

- g. Look at the report you have just converted. It should be a page of numbers. PAGE RETURN and VAR ADVANCE to get to end of page 2. JOIN PAGE (CODE + SPLIT PAGE).
 - h. Look at page one of this document. You have combined a 5520 text document with a VisiCalc report. You could distribute the document to your chief financial officer or print the document. Distribute it to "sherwood" using the DID command.
4. Now pretend you are a professional who uses EasyWriter on your PC at home to do some rough draft work instead of handwriting it. You can take the PC diskette with you to work and convert the rough draft to 5520 document for revision, formatting, and high quality printing.
- a. CREATE an empty document to hold the EasyWriter file you have on the diskette in drive B. Call it Easydemol.
 - b. Press CODE + Main Menu and key "dfc" for data file convert. You are going to convert the rough draft document called "5520pc" into Easydemol.
 - c. Key "FC2" for DOS to 5520 file conversion.
 - d. Key "b:5520pc" for file name and on the next line, option advance once so you can key "b:coneasy" for the name of the conversion profile. You can have multiple conversion profiles on the PC, since different programs use different control characters. With the instructions provided in the User's Guide, we have created a conversion profile called "coneasy" to handle conversions to and from EasyWriter. Press ENTER.
 - e. ENTER twice more.
 - f. When the conversion is complete, you will get a message. Press ENTER to get back in the document called Easydemol.
 - g. END the document when you have had a chance to look at it.
5. As a professional, you may have occasion to prepare formal presentations of your work to others. The PC printer can help you produce high quality, easily read foil masters. Let's look at how it works.
- a. Make sure the PC printer is powered on and online.
 - b. Request USE "pc presentation."
 - c. Look at this page to see how it has been typed. Press CODE + Main Menu, and key "prp" for page print.
 - d. Choose double width = ON, emphasized mode = ON, double strike = ON. Press ENTER.
 - e. When the print is complete, ENTER to get back into the document. Another benefit of using the PC printer is your ability to print the screen exactly as it appears. This can be very helpful to a lead operator in documenting procedures for others in the organization to follow. For example, still using the "pc presentation" document:

- f. Request CDF and press ENTER to get to the Change Primary Document Format menu. Press SHIFT + PrtSc to see the screen print function. CANCEL to get out of this CDF menu.
 - g. END the document when you have had a chance to examine your results.
6. Now pretend that you are the manager in charge of collecting overdue accounts receivable (AR) payments. You process the data on the Personal Computer, and every day you produce a file called "arfile" every day of the accounts with overdue amounts. To automate the notices you must send to each overdue customer, you created a procedure on the 5520 called "overdue." Let's see how it works.
- a. CREATE an empty 5520 text document to hold the AR file. Call it "ardemol."
 - b. Press CODE + Main Menu, and key "dfc" for data file convert.
 - c. Key "FC2" for DOS to 5520 file convert.
 - d. Key "b:arfile" for file name and on the next line option advance once so you can key "b:consfile" for the name of the convert profile. Remember, the "b:" simply tells the PC which drive to examine when looking for the diskette file. We have created yet another conversion profile for simple sequential files called "consfile." Press ENTER.
 - e. ENTER twice more.
 - f. When the message arrives telling you that the conversion is complete, ENTER to get back into the document "ardemol."
 - g. END the document.
 - h. Request RUN for the procedure called "OVERDUE." Key in the name of the document you created in step a above when prompted to "Enter input document." Key in the name of the printer you are using for the seminar on the Output Action Menu if the printer name displayed is unavailable.
 - i. In a few minutes you should be able to retrieve your letters and envelopes generated by the OVERDUE procedure from the printer.
7. See how easy it is to switch from PC to 5253 mode.
- a. First sign off from the 5520 system (request SOF).
Press CODE + RETURN TO DOS.
 - b. You are now in PC DOS mode. You could load and run any programs you might have for the IBM Personal Computer. We have a program you as a professional might need to call up.
 - c. Key "basica music" and press the PC enter key which is marked with the bent arrow. (You have been using it as the carrier return key in 5520 mode.) Now you are using PC BASIC.
 - d. Follow the instructions on the screen to provide yourself with some professional mood music.
 - e. Key "system" and press enter to return to DOS. At the A>, key "e" to return to 5520 emulation mode.

DEMO CLEANUP

1. Delete the documents "easydemo1" and "ardemo1".
2. Request PDQ for the local address "SHERWOOD". On the next line OPT RET to select "All" items to be deleted. You must do this step before you can do step 3.
3. USE "PC PROFIT REPORT" and delete bottom portion of page 2.
4. Request DLJ and clear out print queues, if necessary.

PC DEMO GUIDE

DEMONSTRATION FOR DEMO2

1. Load the EMULATE diskette in drive A and the 5520/PC DEMO diskette in drive B. Power on. The PC comes up in emulation mode.
 - a. Notice the status line at the top of the screen.
 - b. Examine the template to see where all the keys are on the emulated keyboard. Note especially some of the keys you will be using frequently in this demonstration: the CODE key (labeled ALT on the PC), the Main Menu key (on the front of the key labeled F2), the RET key (labelled with a bent arrow), and the ENTER key (labelled CAPS LOCK). For the demonstration instructions, when you are in 5520 mode, the keys are called by their 5520 names; when you are in PC mode, they are called by their PC names.
2. Sign on to the 5520 as DEMO2 (no password).
 - a. Request USE "pc profit report 1." Note the lack of visible WP controls. LINE ADVANCE and CHAR RET to show carrier return in the audit window.
 - b. Press CODE + Control Char (5 on the 10-key pad) to show visible WP controls.
 - c. Press CODE + Main Menu to display the IBM 5520/Personal Computer Attachment Task Selection Menu (after this point referred to as the PC Main Menu). Note that the defaults work as they do on the 5520, but this menu is only available with the emulation program. We will come back to this menu several times to try out the various options, but for now just press ENTER to return to the document.
3. Pretend you are a financial analyst who uses VisiCalc to prepare a financial report. You have created the letter that you looked at in Step 2 above (pc profit report 1) and now you want to attach to it the VisiCalc report you have prepared with all the calculations. In order to include this report, you must first convert it to a 5520 format:
 - a. PAGE ADVANCE to an empty page 3.
 - b. Press CODE + Main Menu and key "dfc" for data file convert. We are going to convert a report you have stored on the demo diskette from its DOS format to a 5520 document.
 - c. Key FC2 for DOS to 5520 file convert.
 - d. The report has been saved as a file called "profit" on the diskette in drive B. Key "b:profit" for the file name (the "b:" tells the system which drive to go to). On the next line, option advance and key "b:convc" for the name of the conversion profile. IBM provides instructions for creating conversion profiles such as this one that we are using to convert the VisiCalc report. Press ENTER.
 - e. ENTER twice more. We have the diskettes already inserted.
 - f. When the conversion is complete you will get a message. ENTER to get back into the document.

- g. Look at the report you have just converted. It should be a page of numbers. PAGE RETURN and VAR ADVANCE to get to end of page 2. JOIN PAGE (CODE + SPLIT PAGE).
 - h. Look at page one of this document. You have combined a 5520 text document with a VisiCalc report. You could distribute the document to your chief financial officer or print the document. Distribute it to "hjones" using the DID command.
4. Now pretend you are a professional who uses EasyWriter on your PC at home to do some rough draft work instead of handwriting it. You can take the PC diskette with you to work and convert the rough draft to a 5520 document for revision, formatting, and high quality printing.
- a. CREATE an empty document to hold the EasyWriter file you have on the diskette in drive B. Call it Easydemo2.
 - b. Press CODE + Main Menu and key "dfc" for data file convert. You are going to convert the rough draft document called "5520pc" into Easydemo2.
 - c. Key "FC2" for DOS to 5520 file conversion.
 - d. Key "b:5520pc" for file name and on the next line, option advance once so you can key "b:coneasy" for the name of the conversion profile. You can have multiple conversion profiles on the PC, since different programs use different control characters. With the instructions provided in the User's Guide, we have created a conversion profile called "coneasy" to handle conversions to and from EasyWriter. Press ENTER.
 - e. ENTER twice more.
 - f. When the conversion is complete you will get a message. Press ENTER to get back in the document called Easydemo2.
 - g. END the document when you have had a chance to look at it.
5. As a professional you may have occasion to prepare formal presentations of your work. The PC printer can help you produce high quality, easily read foil masters. Let's look at how it works.
- a. Make sure the PC printer is powered on and online.
 - b. Request USE "pc presentation."
 - c. Look at this page to see how it has been typed. Press CODE + Main Menu, and key "prp" for page print.
 - d. Choose double width = ON, emphasized mode = ON, double strike = ON. Press ENTER.
 - e. When the print is complete, ENTER to get back into the document. Another benefit of using the PC printer is your ability to print the screen exactly as it appears. This can be very helpful to a lead operator in documenting procedures for others in the organization to follow. For example, still using the "pc presentation" document:

- f. Request CDF and press ENTER to get to the Change Primary Document Format menu. Press SHIFT + PrtSc to see the screen print function. CANCEL to get out of this CDF menu.
 - g. END the document when you have had a chance to examine your results.
6. Now pretend that you are the manager in charge of collecting overdue accounts receivable (AR) payments. You process the data on the Personal Computer, and it produces a file called "arfile" for you every day of the accounts with overdue amounts. To automate the notices you must send to each overdue customer, you created a procedure on the 5520 called "overdue 1". Let's see how it works.
 - a. CREATE an empty 5520 text document to hold the AR file. Call it "ardemo2."
 - b. Press CODE + Main Menu, and key "dfc" for data file convert.
 - c. Key "FC2" for DOS to 5520 file convert.
 - d. Key "b:arfile" for file name and on the next line option advance once so you can key "b:consfile" for the name of the convert profile. Remember, the "b:" simply tells the PC which drive to examine when looking for the diskette file. We have created yet another conversion profile for simple sequential files called "consfile." Press ENTER.
 - e. ENTER twice more.
 - f. When the message arrives telling you that the conversion is complete, ENTER to get back into the document "ardemo2."
 - g. END the document.
 - h. Request RUN for the procedure called "OVERDUE 1." Key in the name of the document you created in step a above when prompted to "Enter input document." Key in the name of the printer you are using for the seminar on the Output Action Menu if the printer name displayed is unavailable.
 - i. In a few minutes you should be able to retrieve your letters and envelopes generated by the OVERDUE 1 procedure from the printer.
 7. See how easy it is to switch from PC to 5253 mode.
 - a. First sign off from the 5520 system (request SOF).
Press CODE + RETURN TO DOS.
 - b. You are now in PC DOS mode. You could load and run any programs you might have for the IBM Personal Computer. We have a program as a professional you might need to call up.
 - c. Key "basica music" and press the PC enter key which is marked with the bent arrow. (You have been using it as the Carriage Return key in 5520 mode.) Now you are using PC BASIC.
 - d. Follow the instructions on the screen to provide yourself with some professional mood music.
 - e. Key "system" and press enter to return to DOS. At the A>, key "e" to return to 5520 emulation mode.

DEMO CLEANUP

1. Delete the documents "easydemo2" and "ardemo2."
2. Request PDQ for the local address "HJONES." On the next line OPT RET to select "All" items to be deleted. You must do this step before you can do step 3.
3. USE "PC PROFIT REPORT 1" and delete the bottom portion of page 2.
4. Request DLJ and clear out print queues, if necessary.

DISPLAY STATION EMULATION ADAPTER CHECKOUT

1. Read through this entire step and then perform Steps 1 through 9 of the Problem Determination Procedures
 - a. Verify that the display station address and the interrupt level displayed in Step 9 of the Problem Determination Procedures matches the information you recorded on Foil 9, step 5.
 - b. If all tests have completed successfully through Step 9 of the Problem Determination Procedures, the Display Emulation Adapter is working properly. Go to Foil 18, step 14.
 - c. If a failure is detected in Step 6 of the Problem Determination Procedures perform the repair actions listed in that step.
 - d. If any other failure is detected in Steps 1 through 9 of the Problem Determination Procedures, do NOT perform the repair action called out in that step, but return here and continue with the next step (Step 2).
2. Perform the following if a failure was detected in Steps 1 through 9 of the Problem Determination Procedures:
 - a. Position the IBM Personal Computer System Unit and all other elements power switches to the OFF position.
 - b. Unplug the IBM Personal Computer System Unit and all other elements from the wall outlet.
 - c. Remove the IBM Personal Computer System Unit cover. Remove the Display Station Emulation Adapter from the IBM Personal Computer System Unit and make sure that all switches are set correctly.
 - d. Make sure that the Display Station Emulation Adapter and all options are properly seated in the system expansion slots.
 - e. If the cause of the failure **has** been determined and repaired, complete the installation and repeat Steps 1 through 9 of the Problem Determination Procedures.
 - f. If the cause of the failure **has not** been determined, contact your point-of-sale for the Display Station Emulation Adapter on what to do.

PROBLEM DETERMINATION PROCEDURES

Introduction

What is Problem Determination?

Problem determination is a set of procedures to help you resolve operational or system failures. This guide will direct you to make a series of observations and answer YES or NO when checking the results. By following the steps outlined in this guide, you can determine what action to take to make your system operational again or determine if service is needed.

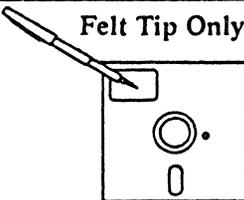
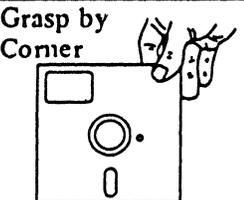
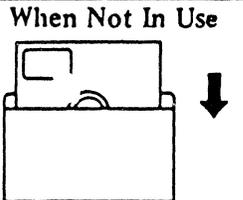
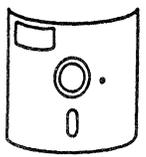
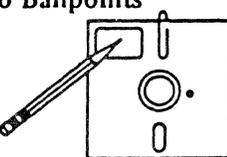
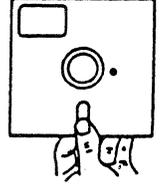
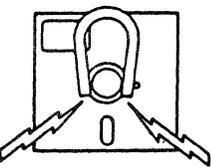
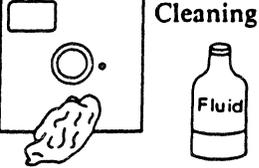
Part of your problem determination will include loading the IBM Personal Computer/Display Station Emulation Adapter Diagnostic Aid Diskette.

The Diagnostic Aid Diskette contains tests to help locate a problem with the Display Station Emulation Adapter installed on your IBM Personal Computer.

The Problem Determination Procedures will help you isolate a problem to the System Unit. The System Unit is one of four Customer Replaceable Units (CRUs).

Diskette Handling Procedures

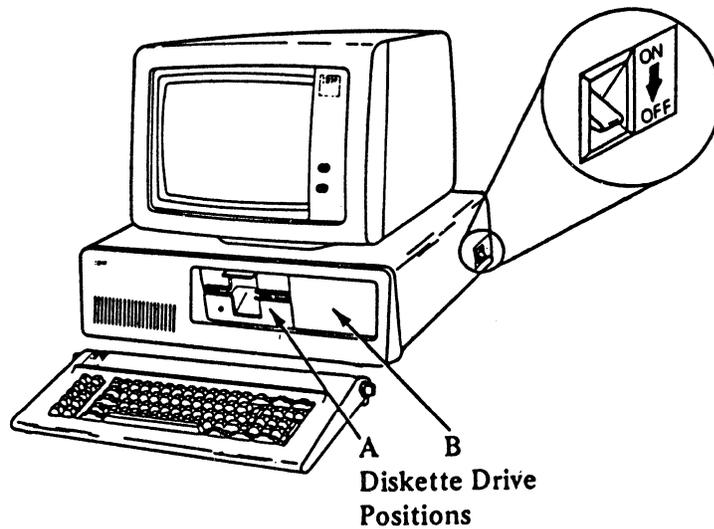
- This series of Problem Determination Procedures (PDPs) uses a diskette.
- Refer to the following chart before continuing.
- Do's and Don'ts for Handling Diskette.

DO's		
Felt Tip Only 	Grasp by Corner 	When Not In Use 
DON'Ts		
Don't Bend 	No Pencils, No Clips, No Ballpoints 	Don't Touch Disk 
No Sun Not Too Hot 	No Magnets 	No Cleaning 

Power-On Diagnostics

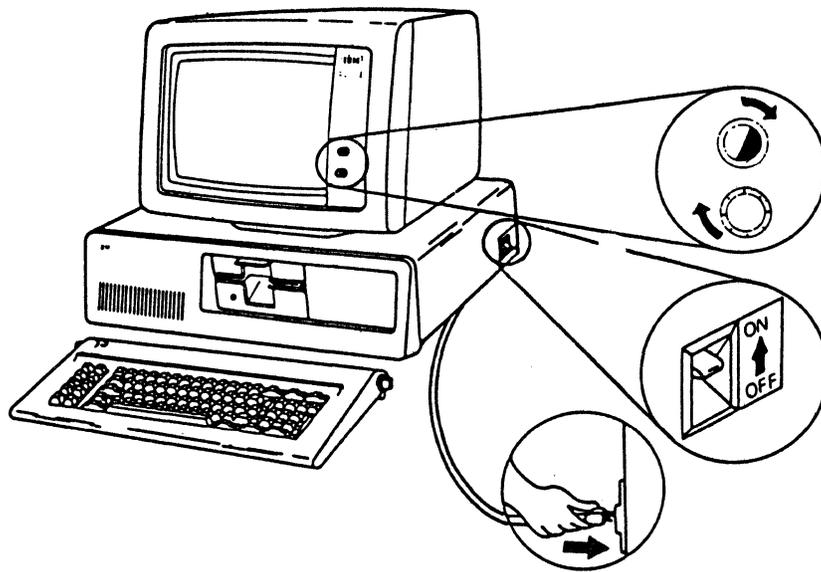
WARNING: Always position the IBM Personal Computer System Unit power switch to off, and remove power cord from the wall outlet before checking cables or connectors.

1. a. Position the System Unit Power switch to off.
b. Remove any diskette from diskette drive position A (and B if present).

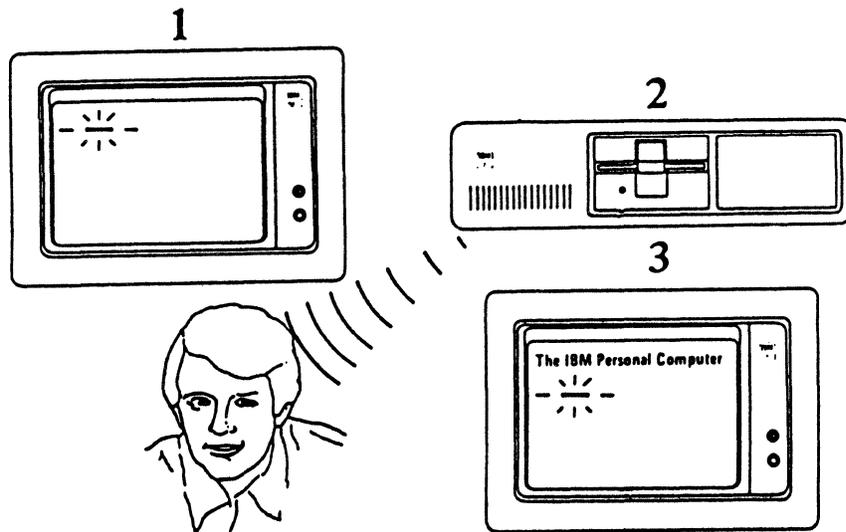


Continue on the next page.

2. a. Connect the System Unit power cord into a properly functioning, grounded wall outlet.
- b. Position the System Unit power switch to on.
- c. Turn the brightness and contrast knobs fully clockwise (CW).



3. The Power-On Self Test (POST) will complete in three to 90 seconds depending on the amount of memory installed in your system.
 - a. **Observe** the display screen and **listen** to the System Unit. Note any responses that you **see** and **hear**.
 - b. The following three responses are the correct responses that you should see and hear:
 - 1) A cursor appears on the screen in approximately four seconds.
 - 2) One short beep sounds after the memory is tested.
 - 3) The IBM Personal Computer BASIC and copyright statement displays.
 - c. If you missed these responses, position the System Unit power switch to off, wait five seconds, and position the power switch to on again.



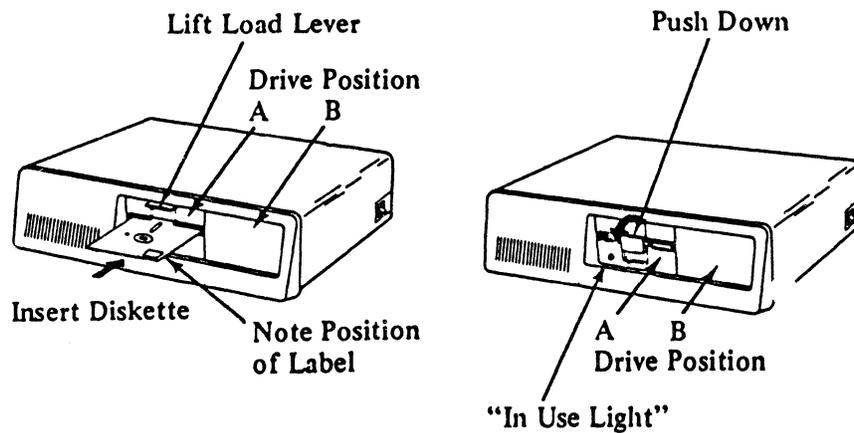
Continue on the next page.

Were the Three Responses Correct?

- **NO**
 - Position the System Unit power switch to off.
 - Use the Problem Determination Procedures in the IBM Personal Computer Guide to Operations manual, (IBM Part 6025000)
- **YES**
 - Adjust the contrast and brightness knobs for eye comfort.
 - Continue on the next page.

Loading the Diagnostic Aid Diskette

4. Select the diskette labeled IBM Personal Computer/Display Station Emulation Adapter Diagnostic Aid Diskette.
5. Perform the following to load the Diagnostic Aid Diskette:
 - a. Position the System Unit power switch to off.
 - b. Lift the load lever on drive position A.
 - c. Insert the diskette in drive position A until it contacts the rear stop. The label should be **toward you** and **face-up**.
 - d. Push the load lever down.
 - e. Position the System Unit power switch to on.



Continue on the next page.

Loading the Display Station Emulation Adapter Diagnostics

6. When the Diagnostic Aid Diskette is loaded in diskette drive position A, the Display Station Emulation Adapter Diagnostics are loaded after the normal power-on self test (POST) completes. There will be a time delay while these actions are taking place, and a menu will appear on the display screen as shown below.

The IBM Personal Computer
Display Station Emulation Adapter Diagnostics
Version 1.20 (C)Copyright IBM Corp. 1982

ADAPTER CHECKOUT

- 0 - RUN TESTS ONE TIME
- 1 - RUN TESTS MULTIPLE TIMES
- 5 - RUN ON-LINE TEST
- 9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED

?

Does the Display Screen Match the Screen Shown on the Previous Page?

- **NO**
 - Position the System Unit power switch to off.
 - Remove the diskette and make sure the diskette is the IBM Personal Computer/Display Station Emulation Adapter Diagnostic Aid Diskette.
 - Was the diskette loaded properly? (Refer to page 10-8.)
 - Use the Problem Determination Procedures in the IBM Personal Computer Guide to Operations manual (IBM Part 6025000).
- **YES**
 - Continue on the next page.

Running the Display Station Emulation Adapter Diagnostics

7. Perform the following:

a. Press  to select "RUN TESTS ONE TIME"

b. Press  (Enter)

After pressing the ENTER key the diagnostics will run and check the Display Station Emulation Adapter.

The IBM Personal Computer
Display Station Emulation Adapter Diagnostics
Version 1.20 (C)Copyright IBM Corp. 1982

ADAPTER CHECKOUT

0 – RUN TESTS ONE TIME
1 – RUN TESTS MULTIPLE TIMES
5 – RUN ON-LINE TEST
9 – EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED
?0

Continue on the next page

8. If the Display Station Emulation Adapter Diagnostics detects a failure, an error message is displayed on the bottom of the display screen.

Note: The display station address message is displayed only if a valid display station address 0 through 6 is recognized by the diagnostics. The interrupt level message is displayed only if a valid interrupt occurs and is recognized by the diagnostics.

The IBM Personal Computer
Display Station Emulation Adapter Diagnostics
Version 1.20 (C)Copyright IBM Corp. 1982

ADAPTER CHECKOUT

0 – RUN TESTS ONE TIME
1 – RUN TESTS MULTIPLE TIMES
5 – RUN ON-LINE TEST
9 – EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED
?

Display Station Emulation Adapter Diagnostics
– FAILURE DETECTED – XXXX

Display Station Address Switches Are Set To 3 .

Interrupt Level Switches Are Set For Level 3 .

Is the Error Message "Display Station Emulation Adapter Diagnostics - Failure Detected -- XXXX" Displayed on the Display Screen? (Note: 'XXXX' will be a four digit error code.)

- NO

- Continue on the next page.

- YES

- Make sure that the Display Station Emulation Adapter is installed on your IBM Personal Computer.

If the Display Station Emulation Adapter is installed:

- a. Record the error message that is displayed on the display screen including the four digit error code.
- b. Position the System Unit power switch to off.
- c. Have the System Unit serviced.

9. If the Display Station Emulation Adapter Diagnostics completes without an error, a "NO TROUBLE FOUND" message displays on the display screen.

Note: Display Station Address X can be any number between 0 and 6. For the 5520, the interrupt level must be 3.

```
The IBM Personal Computer
Display Station Emulation Adapter Diagnostics
Version 1.20 (C)Copyright IBM Corp. 1982

ADAPTER CHECKOUT

0 - RUN TESTS ONE TIME
1 - RUN TESTS MULTIPLE TIMES
5 - RUN ON-LINE TEST
9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED
?

Display Station Emulation Adapter Diagnostics
Completed Successfully -- NO TROUBLE FOUND.

Display Station Address Switches Are Set To X.

Interrupt Level Switches Are For Level X .
```

Is the message "Display Station Emulation Adapter Diagnostics Completed Successfully-NO TROUBLE FOUND" displayed on the Display Screen? (This message should display within 10 seconds.)

- NO
 - Position the System Unit power switch to off.
 - Have the System Unit serviced.
- YES
 - Return to Foil 18, step 14.

DISPLAY STATION EMULATION ADAPTER ON-LINE TEST

The on-line test will check if your IBM Personal Computer/Display Station Emulation Adapter can communicate with a system through the twinaxial cables.

Do not perform this on-line test until the following prerequisites have been met:

- The IBM Personal Computer is connected to the twinaxial cable of the system with which you will run the on-line test.
- The system is powered on and running a licensed program product that communicates with your IBM Personal Computer Display Station Emulation Adapter.

Check with the system implementor or lead operator for the system to which your IBM Personal Computer is connected if you are not sure.

Note: For specific system licensed program product requirements, refer to the user's guide included with your application software for the Display Station Emulation Adapter.

Have the Prerequisites for Running the Display Station Emulation Adapter On-Line Test Been Met?

- **NO**
 - Contact the system implementor or lead operator for assistance.
- **YES**
 - Continue on the next page.

1. Perform the following:

a. Press to select "RUN ON-LINE TEST"

b. Press (Enter)

After the ENTER key is pressed, the following message displays on the display screen:

```
"**RUN ON-LINE TESTS MULTIPLE  
TIMES? (Y OR NO)= =>"
```

c. Press (No)

d. Press (Enter)

After pressing the ENTER key, the on-line test checks if your IBM Personal Computer is communicating with the system.

2. If the Display Station Emulation Adapter on-line test detects a failure, an error message is displayed on the bottom of the display screen.

```
The IBM Personal Computer
Display Station Emulation Adapter Diagnostics
Version 1.20 (C)Copyright IBM Corp. 1982

ADAPTER CHECKOUT

0 - RUN TESTS ONE TIME
1 - RUN TESTS MULTIPLE TIMES
5 - RUN ON-LINE TEST
9 - EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED
?
```

Display Station Emulation Adapter ON-
LINE Test -FAILURE DETECTED -XXXX

Display Station Address Switches Are Set To 3 .

Is the error message "Display Station Emulation Adapter ON-LINE Test -- FAILURE DETECTED -- XXXX" displayed on the Display Screen? ('XXXX' will be a four digit error code.)

- NO
 - Go to step 4.
- YES
 - Continue with step 3.

3. Perform the following checks:

- a. Check with the system implementor or lead operator for the system to which your IBM Personal Computer is connected to make sure that the system is operating and is able to recognize your IBM Personal Computer. (This may require activating your IBM Personal Computer on the system or other operator action.)
- b. Check with the system implementor or lead operator to make sure that your IBM Personal Computer has the correct display station address switch setting. (The display station address switch setting of your IBM Personal Computer is displayed on the display screen.)
- c. Your IBM Personal Computer may be on a twinaxial cable with other display stations. If so, have the system implementor or lead operator check that each display station on the cable has the correct display station address switch settings. The system implementor or lead operator should make sure that the twinaxial cable is not terminated at any other display station between your IBM Personal Computer and the system.
- d. Make sure that the terminator accessory (if required) is installed on the T-connector if your IBM Personal Computer is the last or only display station on the twinaxial cable. Check with the system implementor or lead operator if you are not sure.
- e. Record the error message that is displayed on the display screen including the four-digit error code.
- f. Position the IBM Personal Computer System Unit power switch to off.
- g. Check that the connectors on the twinaxial cable from the external connector on the Display Station Emulation Adapter to the T-connector are properly connected and tightened.

If you have not fixed the problem after performing the checks listed above, have the IBM Personal Computer System Unit serviced.

Note: The terminator accessory may not be used on the system to which your IBM Personal Computer is attached. Some IBM systems use an on-card termination option.

4. When the Display Station Emulation Adapter on-line test completes without an error, the following message displays on the display screen:

"Display Station Emulation Adapter ON-LINE Test Completed Successfully
-- NO TROUBLE FOUND.

Display Station Address Switches Are Set To X."

Note: Display Station Address can be any number between 0 and 6.

The IBM Personal Computer
Display Station Emulation Adapter Diagnostics
Version 1.20 (C)Copyright IBM Corp. 1982

ADAPTER CHECKOUT

- 0 – RUN TESTS ONE TIME
- 1 – RUN TESTS MULTIPLE TIMES
- 5 – RUN ON-LINE TEST
- 9 – EXIT TO SYSTEM DISKETTE

ENTER THE ACTION DESIRED
?

Display Station Emulation Adapter
ON-LINE Test Completed Successfully
-NO TROUBLE FOUND.

Display Station Address Switches Set to X.

SUMMARY

This concludes the IBM Personal Computer/Display Station Emulation Adapter Problem Determination Procedures.

1. Perform the following to exit to the system diskette:

a. Press  to select "EXIT TO SYSTEM DISKETTE"

b. Press  (Enter)

c. Remove the Diagnostics Aids diskette from drive position A and place it in the protective jacket.

d. Resume normal operations.

2. If you encounter further problems use the Problem Determination Procedures in the IBM Personal Computer Guide to Operations manual (IBM Part 6025000) for the IBM Personal Computer.

GLOSSARY

- 3270** A family of terminals which attach or communicate to a large number of IBM computers.
- ASCII** American Standard Code for Information Interchange. A standard 8-bit code (usually 7 data bits and 1 parity bit) used to represent data. The IBM Personal Computer Disk Operating System uses ASCII.
- async** An abbreviation for "asynchronous" which is a mode of data communications for computers. Asynchronous communications is characterized by sending one character of data at a time synchronized by using a start bit and a stop bit. It is also called "start-stop" transmission. The IBM Personal Computer can communicate to other systems using asynchronous transmission.
- BASIC** A programming language available on the IBM Personal Computer and many other computer systems.
- bisync** An abbreviation for "binary synchronous" which is a mode of data communications for computers. It is also often abbreviated "BSC." Bisync communications is characterized by sending a series or block of characters, synchronized on either side of the block with control bits. The IBM 5520 communicates to many office systems devices using binary synchronous communications.
- DISOSS** Distributed Office Systems Support. A program written to run on the IBM 370 family of computers that allows various IBM office systems devices to distribute documents, store documents on the host computer disk library, and request other host computer services such as use of a host-attached printer. As of June, 1983, DISOSS support has been announced for 8100 DOSF, 5520, Displaywriter, and Scanmaster.
- DOS** Disk Operating System. An operating system program used by the IBM Personal Computer. It is the required operating system when using IBM Personal Computers as display stations on the IBM 5520 Administrative System.
- Dow Jones** The registered trademark name of a service provided by Dow Jones, Inc. This service allows computer users to communicate with a large computer owned by the service to obtain financial information about the stock market.
- EasyWriter** A registered trademark of Information Unlimited Software, Inc. for a text processing program that runs on the IBM Personal Computer.
- emulate** To appear as, to act like. When used in conjunction with phrases such as "The IBM Personal Computer can 'emulate' the 5253 display," it implies that the IBM PC can perform the same functions as the 5253 display.

- hex** An abbreviation for "hexadecimal." Many computers use a hexadecimal numbering system instead of the normal decimal (10-based) numbering system. The hexadecimal system uses powers of 16 instead of 10 for counting. As examples, the decimal number 25 is expressed as the hexadecimal 19; the number 11 is expressed as the letter B.
- host** A term for a large computer, the controlling or highest level system in a communications configuration.
- K** An abbreviation for kilobytes. One kilobyte equals approximately 1000 characters of data. Thus, when a system is said, for example, to have 64K of memory, it means that the working area of the computer has 64,000 available positions for the storage of characters.
- PASCAL** A programming language available on the IBM Personal Computer.
- SNA** Systems Network Architecture. A generalized architecture intended to standardize a diverse environment which includes a variety of hardware (computers, terminals, printers); common carrier offerings (lines, satellites); and system software (operating systems, control programs, microcode) into a logically consistent whole. The ultimate goal of SNA is to define the relationship among the system elements in such a standardized way that any user may be attached to any application function on demand.
- SDLC** Synchronous Data Link Control. A mode of data communications for computers. SDLC was designed as the line control discipline for SNA communication links. SDLC allows message and control information to be sent in a single transmission, and multiple frames can be transmitted before a response is required. SDLC supports transmission in both directions simultaneously - resulting in efficient utilization of the communications line. This capability was not available with previous (BSC and Async) IBM line controls. The 5520 uses SDLC communications to other 5520s and to DISOSS.
- transform** To change from one form into another. For example, the 5520/PC attach program provides conversion profiles to change data or documents from their form on the PC (a DOS ASCII file) to its form on the 5520 and vice versa.
- VisiCalc** A registered trademark of Personal Software, Inc., for a program that runs on the IBM Personal Computer (and other small computers). This program does "spread sheet" types of calculations and allows users to create reports with these calculations.

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