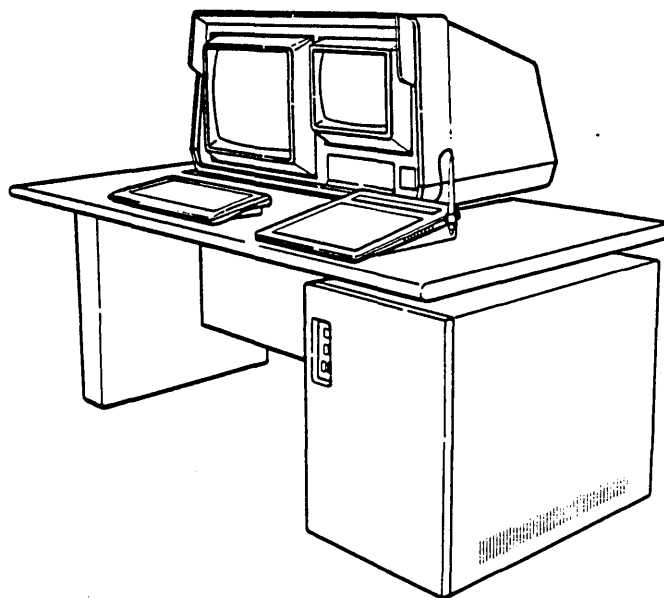


PRELIMINARY

**CDC® 790 ICEM
ERGONOMIC WORKSTATION**





PREFACE

Your CONTROL DATA® 790 ICEM (Integrated Computer-Aided Engineering and Manufacturing) Ergonomic Workstation is a tool for designing, drafting, and recording engineering and manufacturing documents and information. And it is designed for operator comfort and ease of use.

If you have never operated a CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) system, you should use this manual to become familiar with the 790 and to get a glimpse of what the workstation can do. You have at your command a very powerful tool.

You will find the workstation is interesting and fun to use. You can use color, move lines and figures, change sizes, change perspectives, dimension drawings, and add text and notes easily.

Even if you are an experienced operator, you should glance through this manual to see how to adjust the workstation for your comfort, to learn how the 790 workstation is different from the workstations you have used, and to notice some of the material contained in this manual that you may want to refer to in the future.

When the 790 is connected to a remote computer, such as a CONTROL DATA® CYBER® 120 or CONTROL DATA CYBER 170, by a direct line or by using a modem (a device that connects the workstation to the telephone), numerous application programs are available for use with the workstation.

An application program is a program with a specific purpose, such as mechanical design, printed-circuit layout, parts-list generation, etc. You will be using the workstation with an application program, but first get acquainted with the 790 by going through this manual.



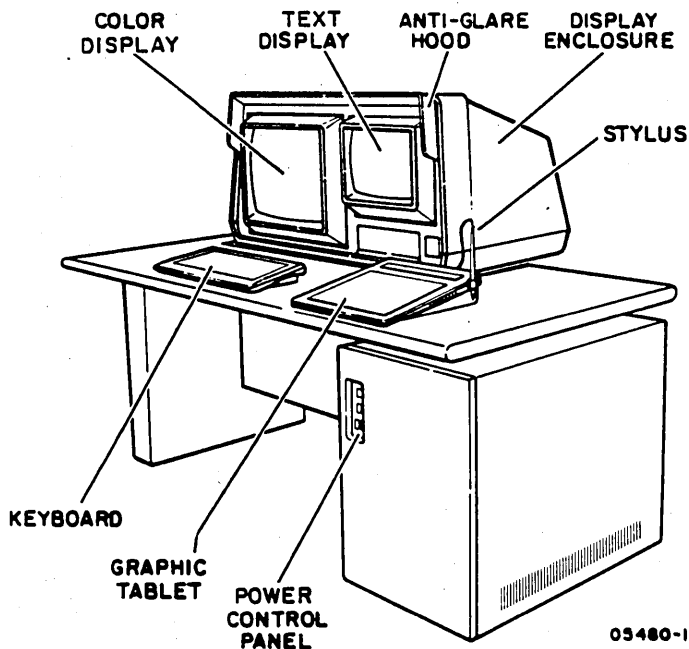
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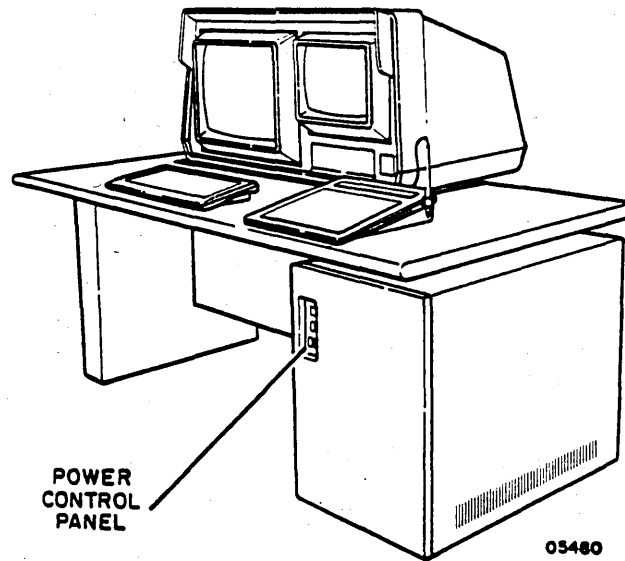


Your workstation has a color display (sometimes called a color monitor) and a text display (sometimes called an alphanumeric display or alphanumeric monitor). A keyboard is attached to the text display. You will use the color display to see drawings as they are created or modified. By typing on the keyboard, you can give instructions to the workstation and to the computer associated with the workstation. Your typed instructions will normally appear on the text display, also messages received from the computer and the workstation will appear on the text display.

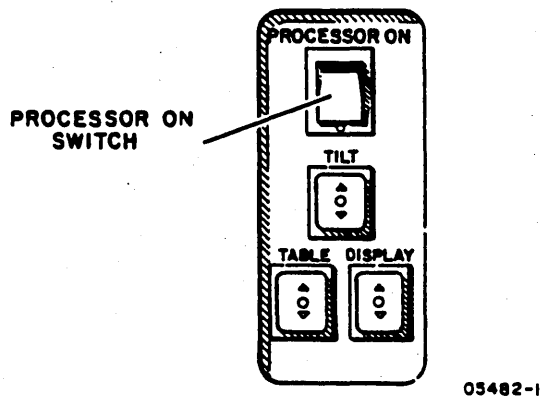
A graphic tablet with a stylus is also attached to the workstation and various overlays may be purchased for the graphic tablet. Printed on the overlays are instructions to the workstation/computer system. By positioning the stylus over an overlay instruction and pressing on the stylus, you can send the selected instruction to the workstation/computer system.



- 1) To get started, find the power control panel.



- 2) If the PROCESSOR ON switch is lit, the workstation is turned on. If the PROCESSOR ON switch is not lit, press the PROCESSOR ON switch to turn on the workstation. (If the green PROCESSOR ON light does not light, the circuit breakers may be turned off - see appendix C.)

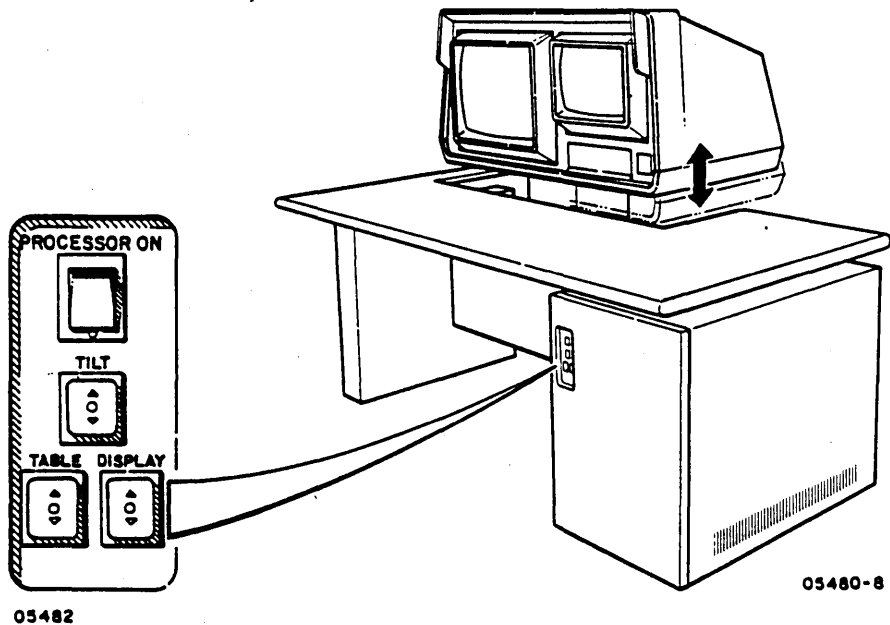


WARNING

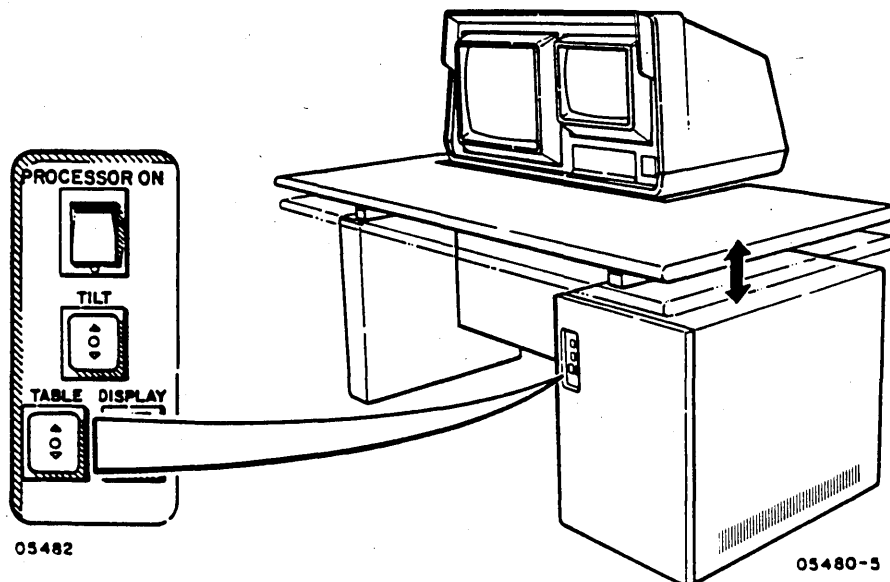
While using the TILT, TABLE, or DISPLAY switches, keep hands and objects away from the opening between the table top and the display enclosure.

NOTE: For now, ignore any messages appearing on the screen of the text display.

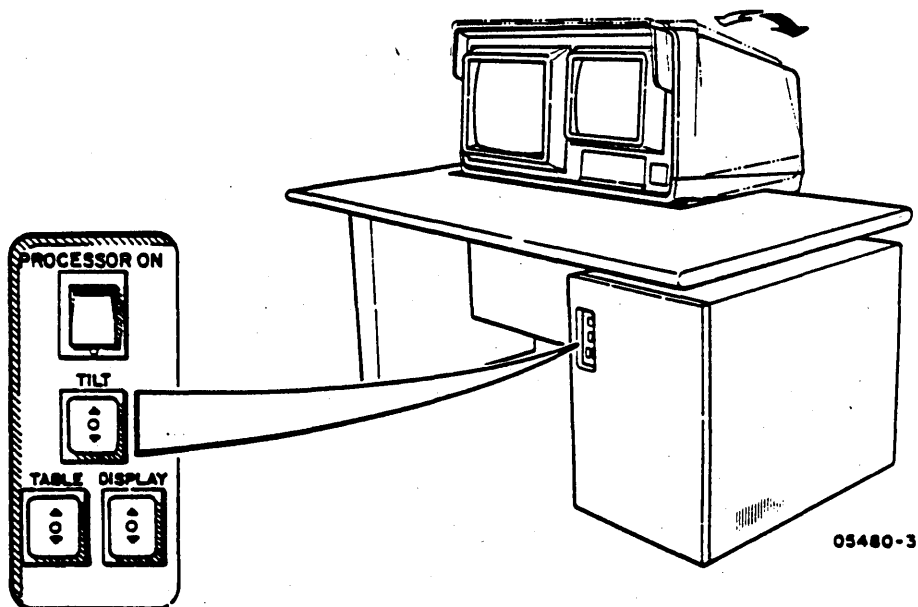
- 3) Use the TABLE switch on the power control panel to raise or lower the workstation table top. Position the table top where it is comfortable for you.



- 4) Use the DISPLAY switch on the power control panel to raise or lower the displays to the best viewing position. Note that an interlock switch prevents the bottom of the display enclosure from being lowered below the table top.

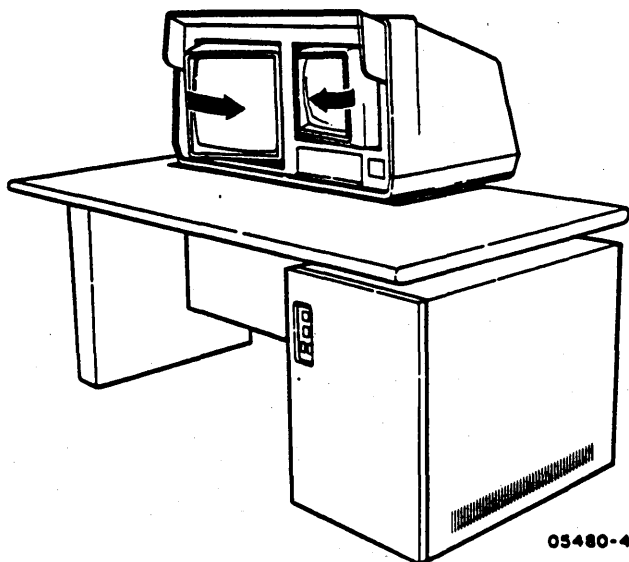


- 5) Use the TILT switch on the power control panel to tilt the displays backward or forward to the best viewing position.

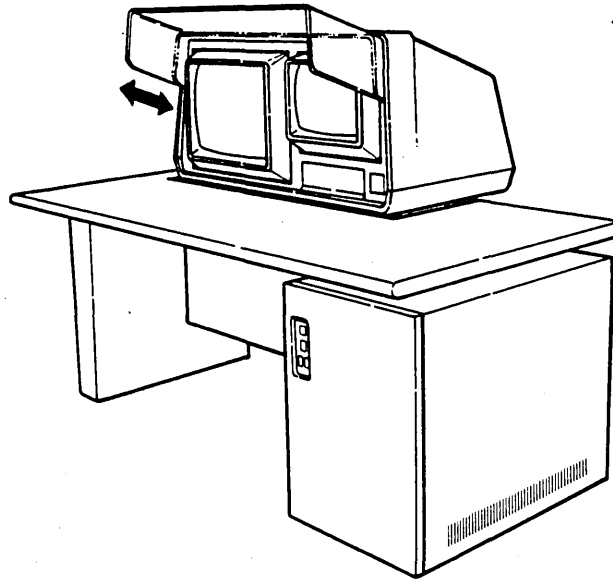


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- 6) The displays also swivel horizontally. Press on the edges of the displays to swivel them to the best viewing angle.



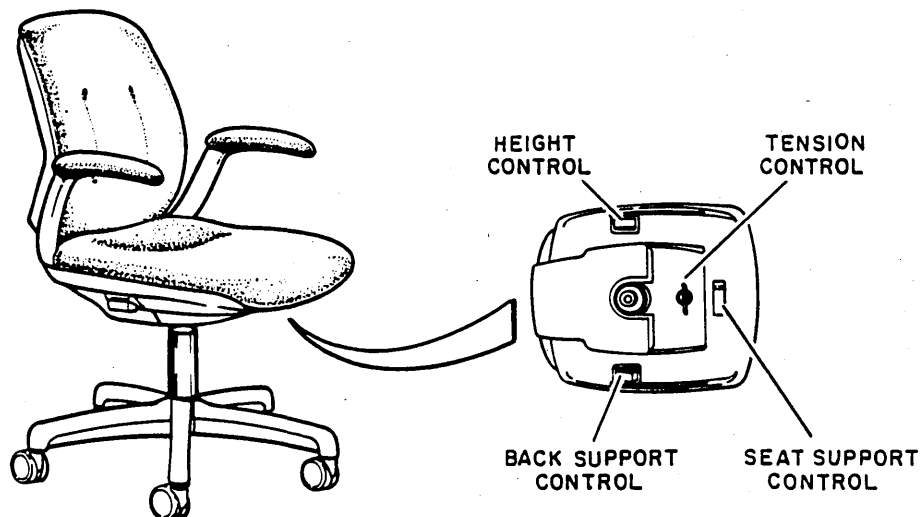
- 7) At the top of the display cover is an anti-glare hood, which when extended, will minimize glare on the display screens from overhead lights. When overhead lights are not a problem, the hood may be pushed in toward the display cover.



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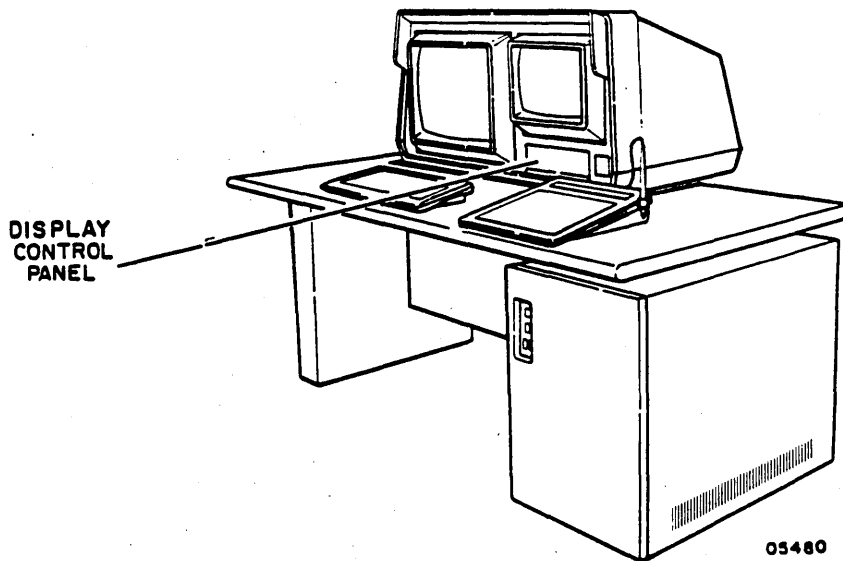
- 8) The height of your workstation chair seat, the tilt of the front of the seat, and the rigidity of the chair back support are adjustable.

When sitting in the chair, adjust the height of the chair seat by pressing on the height control. Slide the seat support control sideways to change the tilt of the front of the seat. Press on the back half of the back support control to keep the back support rigid; press on the front half of the back support control to allow the back support to flex; turn the tension control to adjust the flexing tension of the back.



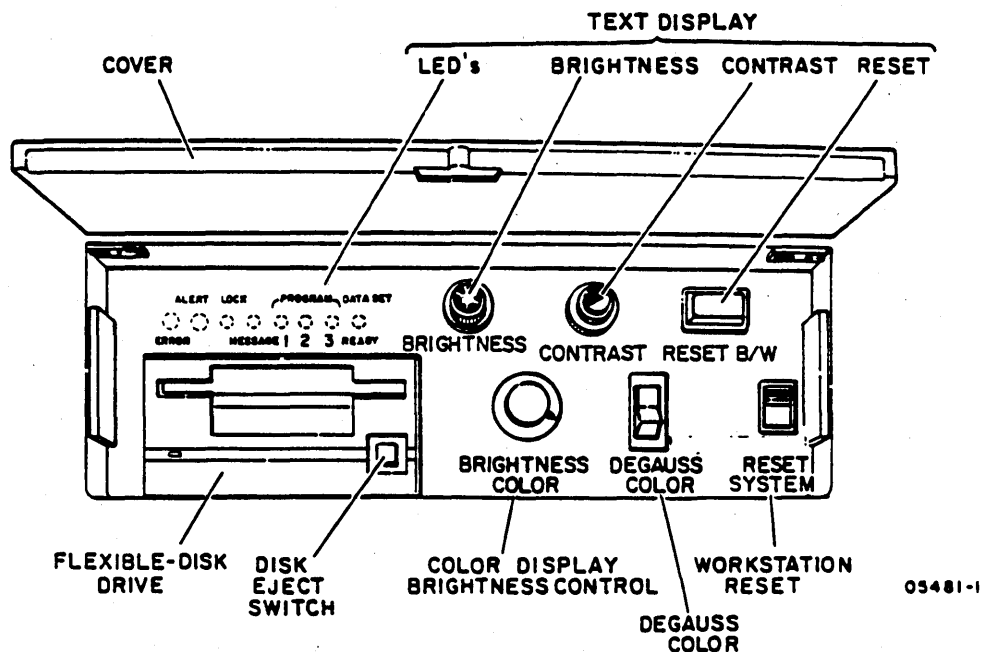
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- 9) Lift the display control panel door so you can see the controls, indicators, switches, and flexible-disk drive.

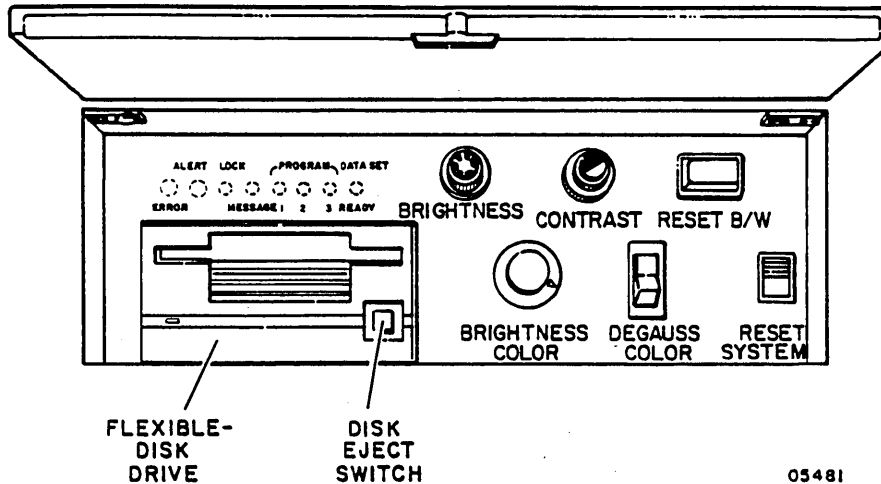


- 10) The BRIGHTNESS and CONTRAST controls adjust the intensity of the image on the text display. The BRIGHTNESS COLOR control adjusts the brightness of the color display. You will use these controls to adjust the brightness of the displays so messages and images are easily seen but are not excessively bright.

CAUTION: To prevent etching images into the display screen, turn down the brightness controls when the workstation is not in use.



- 11) Is there a flexible disk already in the flexible-disk drive? (Flexible disks are sometimes called "floppys," or "diskettes," or sometimes just "disks.") If you can't tell by looking or if you can see there is a flexible disk in the drive, press the Disk Eject switch. If a disk is in the drive, the disk will pop part way out so you can remove it.

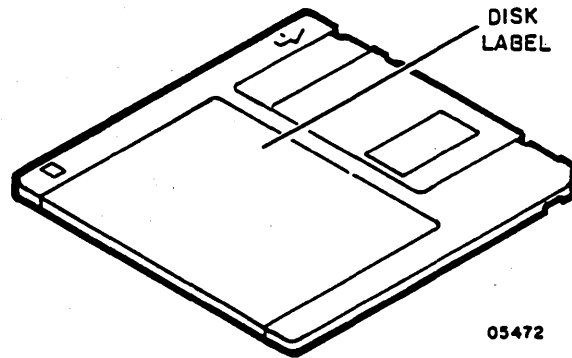


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- 12) When you look at a flexible disk, what you actually see is the case covering the flexible disk. Inside the case, there really is a disk of material upon which information (text, numbers, programs, etc.) can be magnetically recorded. The disk drive rotates the disk within the case and also writes information on or reads information from the disk.

The flexible disks received with the workstation have microcode written (recorded) on them. Microcode is a short, permanently recorded, computer program. Because microcode is written on each of the flexible disks, from here on the flexible disks will be called microcode disks, or simply, disks.

Two microcode disks are shipped with each workstation. The name and number of each disk appears on the disk label.



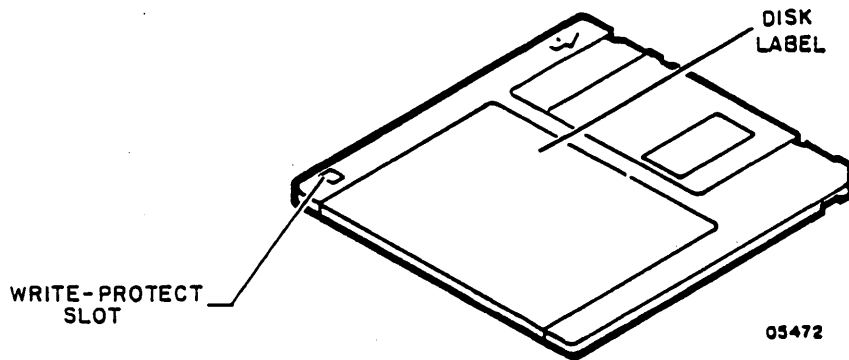
There is a diagnostic microcode flexible disk, number 510868-02 and a TEKEM or a TEKEM+ microcode flexible disk, number 510716-02. (The TEKEM+ disk is used with workstations that have some optional performance features.)

The diagnostic microcode disk contains a program used for troubleshooting the workstation. The TEKEM (or TEKEM+) disks tell the workstation how to operate similar to (emulate) a Tektronix workstation.

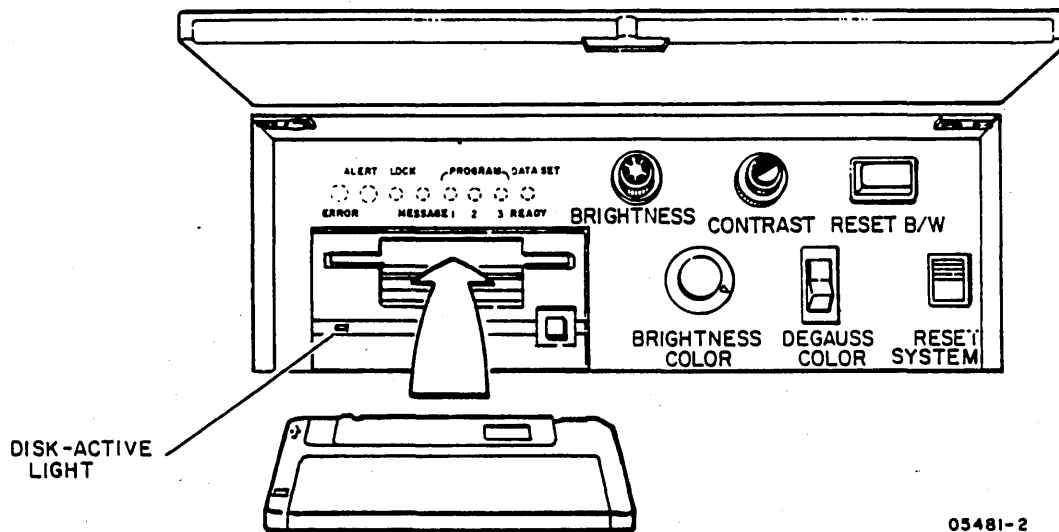
TENDER LOVING CARE OF FLEXIBLE DISKS

Flexible disks are somewhat fragile. They are especially subject to damage from magnetic fields and dirt. When not in use, file the disks in a place where they will not be exposed to magnetic fields or dirt. Smoky air or air containing traces of chemicals or grease can damage the disks.

- 13) If you ejected a flexible disk from the disk drive and it was the diagnostic disk, number 511049-01; be sure the write-protect slot is open (a tab on the back of the disk closes or opens the slot).



- 14) With the disk label up, insert the metal edge of the disk into the drive and push the disk into the drive until the disk seats. If there wasn't a disk in the drive, find the diagnostic disk, be sure the write-protect slot is open, and insert the disk (label up, metal edge first) into the disk drive. (With the write-protect slot open, you cannot accidentally write over and destroy the microcode on the disk.)



If you leave the display control panel cover up after inserting the disk, you will see the red disk-active light come on momentarily to indicate the workstation is ready to read the disk.

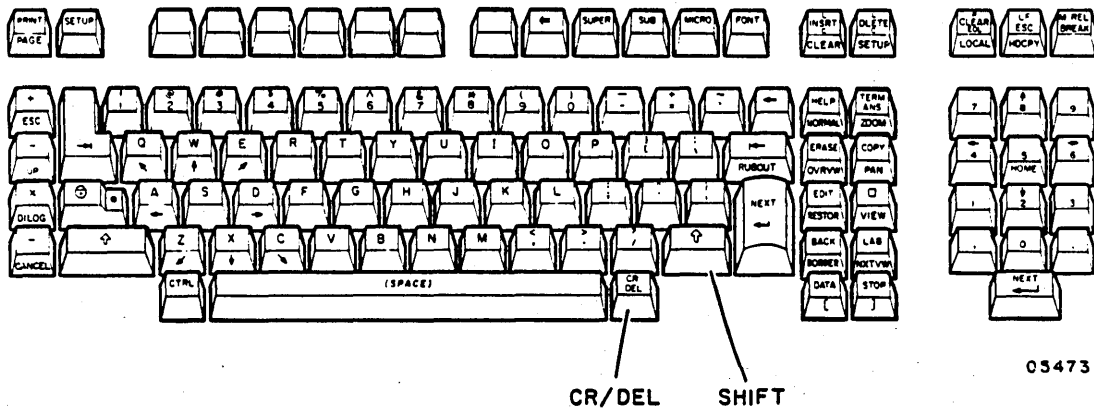
- 15) Press the RESET SYSTEM switch on the display control panel and the workstation will start reading the program on the disk. As the microcode is read from the disk into the workstation's memory ("loading," or "booting," are terms often used to describe this operation), the disk-active light will alternately come on and go off. After about 65 seconds, the message:

DLP Diskette Based Diagnostics

Please type CTRL and A simultaneously followed by CR

will appear on the text display screen.

- 16) Hold down one of the Shift keys and press the CR/DEL key. The shift keys have a wide arrow that points up. The CR/DEL key is to the right of the spacebar. (You will have to hold down one of the Shift keys and press the CR/DEL key a number of times while running the diagnostic. From here on, when you see Shift+CR/DEL, hold down one of the shift keys and press the CR/DEL key.)



- 17) The message:

Memory Mask (enter 8 HEX digits, 0 enables writing) =
appears on the text display screen.

- 18) Type ffffffff0 (note that you type 7 f's and a zero, not 7 f's and the letter O) and then Shift+CR/DEL.

- 19) A list of tests then appears on the text display screen followed by:

Test =

20) Type 6 and then Shift+CR/DEL.

You should see V's of white, black, red, green, yellow, dark blue, magenta (purplish red), and light blue moving on the color display screen. If you see the moving V's as described, press any key to stop the movement and continue with the next step. If colors are missing from the pattern, start again at step 15, but at step 17, when you see:

Memory Mask (enter 8 HEX digits, 0 enables writing) =

appear on the text display screen. Type ffffffff00 (note this is 6 f's and 2 zeros, not 6 f's and 2 letter O's) and then Shift+CR/DEL. Then, before going to step 21, repeat step 20 (this step) so you can see the various colors displayed.

21) When

TEST =

appears on the screen, type 1 and do Shift+CR/DEL

and

*** CONVERGENCE TEST ***

appears on the text display screen. On the color display you should see a grid pattern with some small, barely visible, dots in the middle of each square. Each of these dots is called a "pixel." The screen of the color display has thousands of pixels. You can see a pixel when it is lighted by a beam of electrons from within the color display tube. Thousands of pixels may be lighted to show a drawing or picture on the color monitor. The grid pattern you see is made up of hundreds of lighted pixels.

Press any key to end this test. You can end most of the tests by pressing any key on the keyboard and the test menu followed by TEST = will appear on the text display so you can enter the number of the next test. Some tests take awhile to run, so the test may not end immediately.

21) For some tests, a "Test Passed," or "Test Done," message appears on the text display screen. If you cancel a test before the test completes, a "Test Aborted" message appears.

If you select a test number that is not on the menu, an "Illegal Test No. Entered" message appears. If this happens, just press any key and the menu followed by TEST = will again appear. When a test is ended, passed, or aborted, the prompt (message):

Test =

appears on the text display screen. You can then type in the number (or the number and the letter) of the next test and do Shift+CR/DEL to start the test.

NOTE: Test = is a "prompt." Prompts are messages from the workstation or computer that ask you a question, give you some information, or indicate what you should do next.

Here is a list containing the the test numbers (or numbers and letters) that you may enter and what you should see on the screen of the color monitor while the test is active. Do not run test 35. Test 35 is for maintenance personnel only. Do not run test 2F unless you have a tablet with a stylus attached to your workstation. If you select test 35 or test 2F by mistake, press the RESET SYSTEM switch and start over at step 15.

<u>TEST</u>	<u>WHAT APPEARS ON COLOR DISPLAY</u>
1	A 64-square grid with a dot in the middle of each square.
2	The screen fills with white from bottom to top, then slowly erases from the bottom up.
5	A moving triangle - The triangle must reach the top of the screen before you can cancel this test.
6	V's of various colors moving up the screen.
10	A vertical column with white numbers 0 through 3 or 0 through 7.
12	The screen fills with a magenta rectangle.

- 17 A moving line in a box.
- 18 A moving line in a box.
- 1B A flash on the color display screen.
- 1D A vertical line moves across a horizontal line.
Both lines change color as the vertical line moves.
- 20 A moving wheel.
- 25 Nothing on the color display screen, but the
messages:

Writing memory
Reading memory

appear on the text display screen. This test will
keep repeating until you stop it by pressing a key.
- 2B Nothing on the color display, but when you press an
alphabetical or number key on the keyboard, the
symbol for the key you typed and the key code
appear on the text display screen. Press the NEXT
key twice to exit this test.
- 2D Nothing on the color monitor.
- 2F (Do not run this test unless you have a tablet with
a stylus attached to the workstation.) A white
9-square grid. Touch the tablet surface with the
stylus (the pen attached to the tablet). A
crosshair cursor appears on the color display
screen. Move the stylus on the tablet surface.
The cursor on the screen will follow the movement
of the stylus.
- 38 Three pairs of red, green, and blue horizontal bars.

When you have tried the diagnostic tests, press the Eject switch on the disk drive to remove the diagnostic disk. File the diagnostic disk in a safe place. You can now continue by running the TEKEM VERIFICATION TEST described in the next section.



When a TEKEM or TEKEM+ disk, number 510716-xx, has been loaded in the workstation, the 790 workstation should operate as if it were a Tektronix 4115 workstation. The TEKEM test checks that the 790 is operating similar to a 4115 workstation. The test checks that the workstation will:

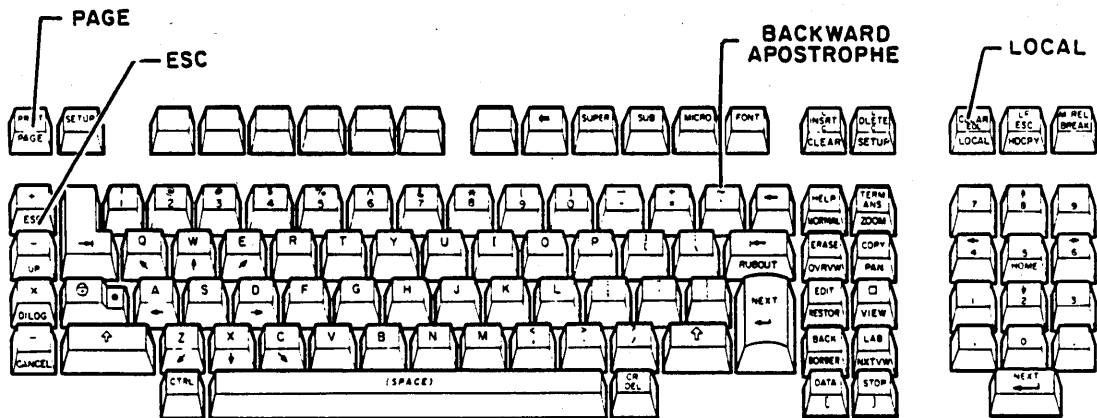
- Display the basic background colors
- Display some primitives and attributes (Primitives are basic drawing parts, such as lines and text. Attributes are qualities that change the appearance of a drawing, such as color and shading.)
- Display a crosshair cursor and allow the crosshair cursor to be moved vertically and horizontally on the color display screen (The crosshair cursor is a horizontal line and a vertical line that intersect to define a location on the screen of the color display.)
- Test that the tablet is working correctly

Preparing to Run the Test

1. Check that the PROCESSOR ON switch is lit, put the TEKEM or TEKEM+ disk into the disk drive, metal edge first, label side up. The red disk-active light will come on for a moment. When the disk-active light goes off, press the RESET SYSTEM switch, and the disk will begin to load the microcode into the workstation. It will take about 80 seconds to load. When READY FOR INPUT appears on the text display, you are ready to run the TEKEM Verification Test.

NOTE: You will now use the keyboard to tell the workstation to run four parts of the TEKEM Verification Test. When you use the keyboard for this test, remember the following:

- The letter O is not used, but the number 0 is used.
- When brackets [] appear in the instructions, you are to press the special (non-character) key named within the brackets.
- Do not use the NEXT (carriage-return) key.
- Type the uppercase or lowercase characters as shown in the instructions. To type uppercase characters, hold down one of the Shift keys while you type the character. Do not use the Shift Lock key. Upper case characters used in the test are the capital letters of the alphabet, the ?, the (, the +, and the @ characters.
- Only type a space when it is shown like this [space].
- When you see ' in the instructions, type a backward apostrophe, which is the key (lowercase) between the backspace (<-->) key and the +/- key.
- Be careful when you type. If you make a mistake, go back to the last [ESC] in the instructions, press the ESC key and continue with the rest of the step. If this doesn't allow you to continue, press the RESET SYSTEM switch on the disk drive and start over when READY FOR INPUT appears. You may start at step (a) of any of the tests.



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NOTE: Keys that have the function printed on the front of the key will do that function when using TEKEM (or TEKEM+).

2. Run the background test as follows:

<u>DO THIS</u>	<u>AND THIS SHOULD HAPPEN</u>
a. Press the LOCAL key	This places the workstation in the local mode. <u>Nothing visible happens.</u>
b. Type [ESC] TM lll	Nothing visible happens.
c. Type [ESC] TBF 4 F 4 F 4	Color display screen should turn white.
d. Type [ESC] TBF 400	Color display screen should turn red.
e. Type [ESC] TB 0 F 40	Color display screen should turn green.
f. Type [ESC] TB 00 F 4	Color display screen should turn blue.
g. Type [ESC] TB 000	Color display screen should turn black.
h. Press the LOCAL key	The workstation returns to REMOTE mode. <u>Nothing visible happens.</u>

3. Run the primitive/attribute test as follows:

<u>DO THIS</u>	<u>AND THIS SHOULD HAPPEN</u>
a. Press the LOCAL key	This places the workstation in the local mode. <u>Nothing visible happens.</u>
b. Type [ESC] MT 1 [ESC] LF [space] , [space] @ [ESC] LG 9cs ?S	A diagonal white line should appear across the color display screen.
c. Type [ESC] MT 7 [ESC] LF+ 'w/ W [ESC] LT 7 CDC [space] 790	A yellow CDC 790 should appear near the center of the color display screen.

//////////////////The primitive/attribute test is continued//////////////////
//////////////////on the next page. ////////////////////

DO THIS

AND THIS SHOULD HAPPEN

d. Type

[ESC]
TM
111
[ESC]
TG
148
F
400
[ESC]
MP(
[ESC]
UB
0
[ESC]
UR
2
+
'w/
W
;ck
?K

A red rectangle should appear in the upper right corner of the color display screen.

e. Press the PAGE key.

The color display screen should become black.

f. Press the LOCAL key

The workstation returns to REMOTE mode. Nothing visible happens.

4. Run the crosshair cursor test:

DO THIS

AND THIS SHOULD HAPPEN

a. Press the LOCAL key.

This places the workstation in the local mode. Nothing visible happens.

b. Type

[ESC]
MT
1
[ESC]
LF+
'w/
W
[ESC]
LT
4
HERE

A white HERE should appear near the center of the color display screen.

c. Type

[ESC]
IE01

The crosshair cursor (intersecting vertical and horizontal lines) should appear somewhere on the color display screen.

d. Use the arrow keys (the 2, 4, 6, and 8 keys on the right side of the keyboard) to move the crosshair cursor.

You should be able to move the intersection of the crosshair cursor lines over the R in the word HERE.

e. Press the LOCAL key

The workstation returns to REMOTE mode. Nothing visible happens.

5. Tablet test:

DO THIS

AND THIS SHOULD HAPPEN

a. Press the LOCAL key.

This places the workstation in the local mode. Nothing visible happens.

b. Type

[ESC]
MT
l
[ESC]
LF+
'w/
W
[ESC]
LT
4
HERE

A white HERE should appear near the center of the color display screen.

c. Type

[ESC]
IE
81

The crosshair cursor should appear somewhere on the color display screen.

d. Pick up the tablet stylus and lightly move the tip of the stylus across the surface of the tablet. (If you press too hard on) (the stylus, the cross-) (hairs will disappear.)

You should be able to move the crosshair cursor appearing on the color display screen over the R in the word HERE.*

e. Press the LOCAL key.

The workstation returns to REMOTE mode. Nothing visible happens.

f. Push down on the stylus and then let up.

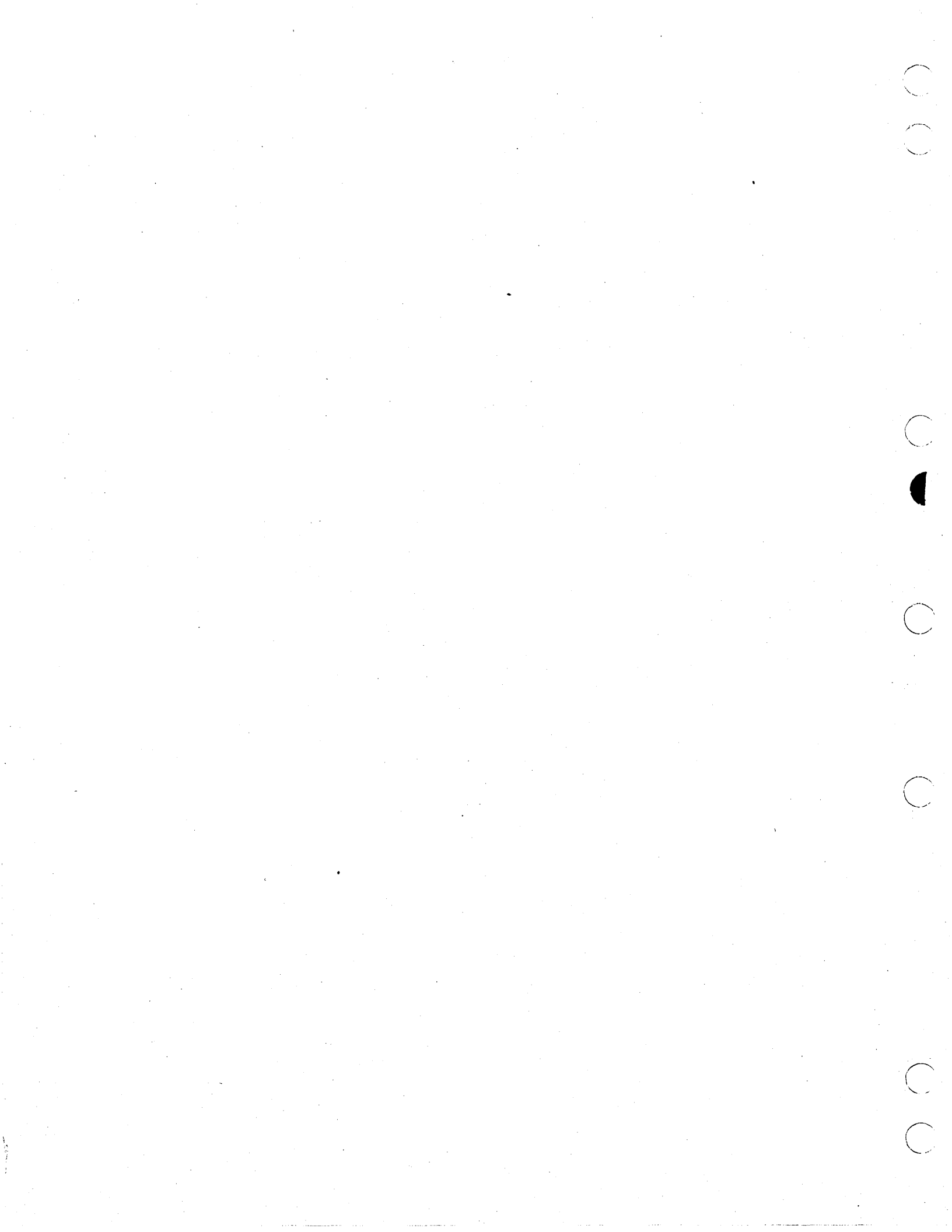
The crosshair cursor should disappear.

g. Press the PAGE key.

The screen of the color monitor should turn black.

7. You have completed the TEKEM VERIFICATION tests. Review the rest of this manual before running an application program.

* If the cursor does not move, press the reset switch on the back of the tablet.



To use an application program, the workstation must be connected to a computer that has the application program; and the microcode from the appropriate flexible disk must be loaded in the workstation.

If the workstation is turned off, the computer is not connected and the microcode is not loaded. To use an application program, you must:

1. Turn on the workstation.
2. If a disk is in the drive, press the Eject switch, remove the disk and check that the disk is the one to make the workstation operate as the type of workstation you want to use. For example, if you want the workstation to operate similar to a Tektronx 4115 workstation, you want to use a TEKEM (or TEKEM+) disk. Check that the write-protect slot of the disk is open. Insert the disk, metal edge first, label side up. The red disk-active light will come on for a moment. When it goes off, press the RESET SYSTEM switch.

NOTE

The only time the write-protect slot of a TEKEM (or TEKEM+) disk should be closed, is the first time the disk is used on a workstation - see appendix F, Initial Terminal Status Communications Setup.

3. It will take the disk about 80 seconds to load. When the READY FOR INPUT prompt appears on the screen of the text display, you are ready to connect to and/or log on to the host computer system.
4. How to connect and log on to the host system depends upon how your workstation is connected to the host computer, to which host computer you are connected, and what application program you will use. See your supervisor for this information.

5. If you have logged on to a NOS 2.0 or later system, when NOS is ready, enter the following commands as required:

TRMDEF, OC=Y (this turns output flagging on)

TRMDEF, PA=N (for no parity)

or

TRMDEF, PA=E (for even parity)

or

TRMDEF, PA=O (for odd parity)

TRMDEF, EP=Y (for host to echo)

or

TRMDEF, EP=N (for host not to echo)

Note: If you should have to reload the microcode (reboot the system) by using the RESET SYSTEM switch, you will have to enter these parameters again.

CLEANING THE EXTERNAL SURFACE OF THE WORKSTATION

Clean the external surface of the workstation by using a soft rag moistened with a solution of a liquid commercial cleaner and water.

CLEANING THE SCREENS OF THE COLOR AND TEXT DISPLAYS

Clean the color and text display screens by using a soft, lint-free, rag moistened with a commercial window cleaner.

CAUTION

Do not spray cleaning solution on the display screens. Do not allow any cleaning solution to enter any internal areas of the workstation.

COMMON SENSE PRECAUTIONS

Everybody knows you shouldn't put softdrinks, coffee cups, or any container holding a spillable liquid on the workstation table or on top of the display enclosure, but people do. So don't do it; or someday, the liquid will spill over your work or into the workstation and then you'll be sorry. Remember, you read it here.



Are you trying to use the workstation and things just aren't going right? I hope this section can help.

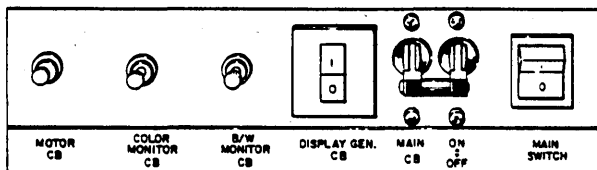
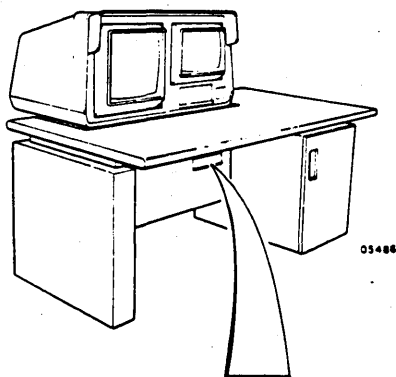
This section divides problems with the workstation into seven categories:

- PROCESSOR ON switch will not light and nothing else will work.
- The text display will not come on.
- Error messages appear on the text display screen.
- The color display will not come on.
- Colors are contaminated with other colors.
- You cannot connect the workstation to the remote (host) computer.
- The table will not move and the displays will not tilt.

CAUTION

If any circuit breaker has turned off by itself, there may be an equipment problem that requires service, if so, call for service. If someone has turned a circuit breaker off, just turn it on.

The circuit breaker panel is under the workstation table, on the front of the workstation frame, directly under the text display.



PROCESSOR-ON SWITCH WILL NOT LIGHT AND NOTHING ELSE WILL WORK

The most likely reasons are:

1. The WORKSTATION circuit breaker is OFF. Turn it ON.
2. The MAIN SWITCH, located next to the workstation circuit breaker is turned off. Press on the 1 on the MAIN SWITCH to turn it on.
3. The circuit supplying power to the workstation may be off. Check with building maintenance.

THE TEXT DISPLAY WILL NOT COME ON

1. Be sure the BRIGHTNESS and CONTRAST controls are turned up (clockwise).
2. Check that the B/W MONITOR CB circuit breaker is pushed in to the ON position.

ERROR MESSAGES APPEAR ON THE TEXT DISPLAY SCREEN

Generally there are three kinds of error messages:

- Error messages from the workstation - See the ERROR MESSAGES appendix.

- Error messages relating to the communications line between the workstation and the host computer - See information supplied by the network.
- Error messages from the host computer relating to the application program - See manuals supplied by the application program.

THE COLOR DISPLAY WILL NOT COME ON

1. Check that the COLOR BRIGHTNESS control is turned up (clockwise).
2. Check that the COLOR MONITOR CB circuit breaker is pressed in to the ON position.

COLORS ARE CONTAMINATED WITH OTHER COLORS

1. Press the COLOR DEGAUSS switch, located under the text display, to the ON position to purify the colors.

YOU CANNOT CONNECT THE WORKSTATION TO THE REMOTE (HOST) COMPUTER

1. The remote computer may be out of service. Check by calling the computer site or the application-program hotline.
2. If your system uses a modem, the modem may not be turned ON or the modem may be set up wrong. See the modem manual.

THE TABLET DOES NOT WORK RIGHT

1. Press the RESET switch on the back edge of the tablet and try using the tablet again.

THE TABLE WILL NOT MOVE AND THE DISPLAY ENCLOSURE WILL NOT TILT

1. Check that the MOTOR CB circuit breaker is pressed in to the ON position.



ORDERING MICROCODE FLEXIBLE DISK

A

Additional copies of the microcode flexible disks may be ordered from your CDC salesperson. Please use the following numbers and description when ordering.

<u>Product Number</u>	<u>Description</u>	<u>Disc Number</u>	<u>Part Number</u>
790-203	DIAGNOSTIC MICROCODE	510868-02	66330399
790-202	790-20 TEK-EMULATION MICROCODE	510716-02	66330350
790-205	790-20+* TEK-EMULATION MICROCODE	**	66330476

*Used with Performance Option 3-D

** Disk number not available



You can tell what assemblies are in your workstation by looking at the Equipment Configuration tag inside the back door of the workstation. Each assembly is identified by an assembly number. The Display List Processor, Raster Processor, Memory, and Video C assemblies are standard with each workstation. The Memory (Dynamic Refresh Memory) can be either an 8-bit or 4-bit memory.

EQUIPMENT CONFIGURATION TAG

Control Data Corporation Equipment Configuration					
Model 790-20			Serial Number <input style="width: 100px;" type="text"/>		
LOCATION	DESCRIPTION	ASSEMBLY NO.	REV LEVEL	SERIAL NO.	INSTALLATION DATE
A1					
A2					
A3	Display List Processor				
A4					
A5					
A6	Raster Processor				
A7	Memory				
A8					
A9					
A10					
A11	Video C				
A12					
ITEM	HARDWARE & FIRMWARE LIST DESCRIPTION	ASSEMBLY NO.	REV LEVEL	INSTALLATION DATE	
1	Takem Disk				
2	Native Serial / Parallel Disk				
3	Diagnostics Disk				
4					
5					
6					
FCO LOG					
FCO #					
DATE					

51042-01

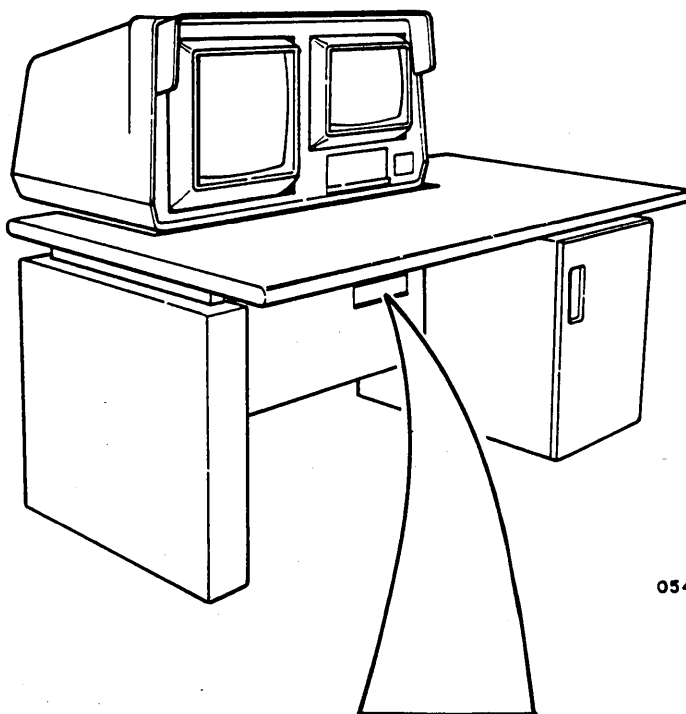
1156-001



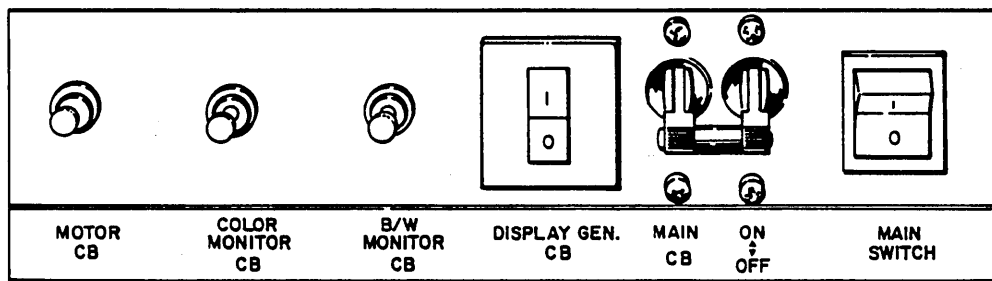
MAIN SWITCH AND CIRCUIT BREAKERS

C

The workstation circuit breaker panel is centered under the workstation table. The handle of the MAIN CB (circuit breaker) should be up to provide power to the workstation. To turn on the workstation, press the 1 on the MAIN SWITCH. To turn on the DISPLAY GEN. CB (display generator circuit breaker), press the 1 on the circuit breaker. The remaining circuit breakers (MONITOR CB, COLOR MONITOR CB, and B/W MONITOR CB) are in the ON position when they are pushed in.



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The following error messages may occur before the workstation is connected to the host (remote) computer. The error messages you may see, why the message appeared, and what you should do are listed in the following table. For error messages that may occur after connecting to the host computer, see the applicable application manuals.

<u>ERROR MESSAGE</u>	<u>TAKE THIS ACTION</u>
Error: drive not ready	If this message appears while you are loading a disk but the disk still loads, everything is OK, just ignore the message. This message will also appear if you do not have a disk properly inserted in the disk drive. Insert the disk, metal edge in first, and label up.
Error: crc or lost data	You do not have a disk properly inserted in the disk drive. Insert the disk, metal edge in first, and label up. Or the disk may be damaged. Insert a disk or try another disk.
Files not found	You do not have a disk properly inserted in the disk drive. Insert the disk, metal edge in first, and label up. Or the disk may be damaged, or the file you requested is not on the disk. Enter the correct file name and retry, or type DIR and press NEXT to check the disk directory.
Illegal jump: address X (etc.)	You do not have a disk in the drive or there is a program problem. Insert a disk or try another copy of the disk.
OSXX Boot Error	A disk is not properly inserted in the drive or the disk does not contain the workstation operating system. Try another disk.



The following manuals are available for the CDC 790 ICEM Ergonomic Workstation:

CUSTOMER PLANNING GUIDE - Publication number 62950147

Tells how to prepare the site for installation of the workstation and the communications interfaces.

SOFTWARE REFERENCE MANUAL - Publication number 62950148

Provides information for writing programs for the workstation. This manual is intended for programmers.

TEKTRONIX EMULATION -Publication number 62950166

Explains the differences between Tektronix on the 4115 and TEKEM on the 790.

WORKSTATION, ON-SITE HARDWARE MAINTENANCE MANUAL - Publication number 62950149

Tells how to install and maintain the workstation.

WORKSTATION COMMUNICATIONS INTERFACES, ON-SITE HARDWARE MAINTENANCE MANUAL - 62950153

Tells how to install and maintain the communications interfaces.

Copies of this Owner's Guide and of the preceding manuals are available from:

Control Data Corporation
Literature and Distribution Services
308 North Dale Street
St. Paul, Minnesota 55103

The following manuals are available from Tektronix Inc.

4115B Host Programmer's Manual, part number 070-4664-00

4110 Command Reference Manual, part number 070-3892-00

Order these manuals from:

Tektronix, Inc.
P.O. Box 500
Beverton, Oregon 97077

Telephone: 1-800-323-1654

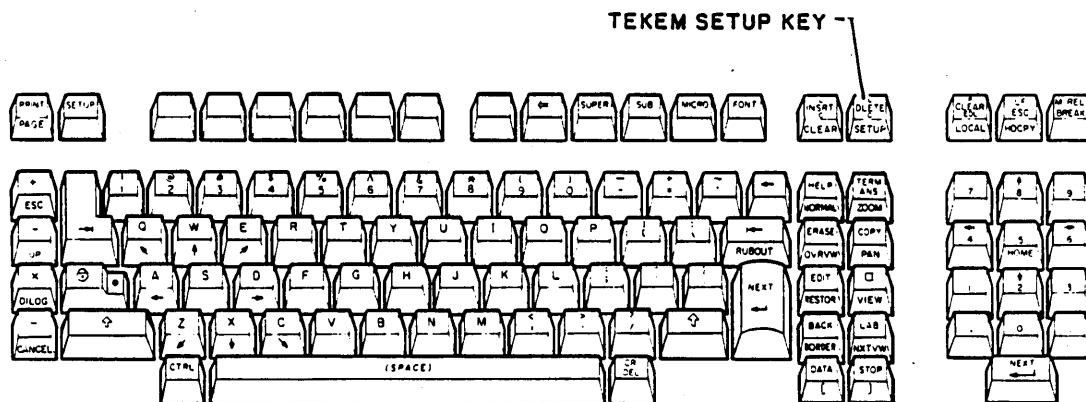
(Version 02A)

NOTE: Normally, you only do the steps described here if this is the first time your workstation is communicating with a network by using a modem. If the workstation has previously used a modem to communicate with the network, ignore these steps.

1. Turn on the workstation.
2. Check that the write-protect slot of the disk is closed. Insert the disk, metal edge first, label side up. The red disk-active light will come on for a moment. When it goes off, press the RESET SYSTEM swtich.
3. It will take the disk about 80 seconds to load. When the READY FOR INPUT prompt appears on the screen of the text display, press the key that is marked on top as L DELETE C and on the front as SETUP (this is the TEKEM SETUP key). An asterisk (*) appears on the text display screen.

NOTE

Keys with their function marked on the front, perform that function only when the TEKEM microcode is being used.



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4. Type STA and press NEXT and the Setup Screen appears. The Setup Screen lists the way the terminal is set to operate.

SETUP SCREEN

TERMINAL STATUS

GENERAL

ECHO	YES
LOCKKEYBOARD	NO
DAENABLE	YES
IGNOREDEL	NO
LFCR	NO
CRLF	NO
SAVECONFIG	NO
SCROLLING	YES
SNOOPY	NO
TABLETECHO	NO
ERRORLEVEL	2

COMMUNICATIONS

BAUDRATE	9600
STOPBITS	2
PARITY	NONE
PROMPTSTRING	'? '
PROMPTMODE	NO
QUEUESIZE	8100
FLAGGING	NONE
BYPASSCANCEL	(NL)
LOCAL/REMOTE	REMOTE

5. The Setup screen shows how the workstation is set to operate when it leaves the factory. You may have to change some of these settings (parameters).

NOTE

If you know that all the parameters are correct, reset the system using the RESET SYSTEM switch. Your workstation is prepared to use a modem to communicate with the host system. Remove the disk and open the write protect slot.

The BAUDRATE is the setting you are most likely to have to change. Usually, the other settings are correct. The BAUD RATE should be set to the same baud rate as the modem (which should agree with the baud rate of the communication channel of the host computer). If in doubt about the baud rate, check with your supervisor or the communications network you will use.

To change the baud rate, type BAUD, a space, and then type the rate, such as:

BAUD 4800

Then press the NEXT key.

If it is necessary to change any of the other parameters, change them before going to the next step. Following is a list of the parameters that most often need to be changed. If you change any of these parameters, press the NEXT key after typing each change.

ECHO - If the host is doing the echo, type ECHO N, otherwise type ECHO Y.

PARITY - This parameter should agree with the parity required by the host computer. Select none, even, or odd, by typing PARITY N, PARITY E, or PARITY O, respectively.

FLAGGING - If the host computer supports XON/XOFF flagging, type FLAG INPUT, otherwise, type FLAG NONE.

6. Type STA and press NEXT and the parameters will again be displayed on the screen. If you have made any changes, they should appear on the parameter display.

CAUTION

Changing the SAVECONFIG parameter, as described in the next step, is normally only done when the workstation is initially being setup to operate with a network.

7. Type: SAVEC Y and press NEXT.
8. Press the L DEL C/SETUP key to save the changes on the disk.

CAUTION

To prevent possible damage to the microcode disk, the SAVECONFIG parameter must now be changed to NO as described in the next step.

9. After the disk has been updated with the changes, press the L DEL/SETUP key and type SAVEC N and press NEXT. Then, press the L DEL C/SETUP key and the disk will again be updated.

10. Remove the TEKEM disk and move the write-protect tab to the open position. Then re-insert the disk in the disk drive.
11. If the TEKEM program does not work with the settings as they now are, consult the information from the network, and the application program manuals. If you want to permanently change any more of the Setup Screen settings, follow this same procedure and remember to close the write-protect slot before making the change and to open the write-protect slot after making the change.
12. What you do after viewing or changing the SETUP SCREEN depends upon the communication network, the host computer, and the application program you will use. You may have to log on to the system using the procedure defined by the network. Consult the information from the network or the manuals that came with your application program. Also, see the Preparing to Use An Application Program, section 3, of this manual.

If you still have a problem, call the Control Data Applications Central Support at:

1-800-227-9999

or

In Minnesota, 1-612-639-4040

or

CONTROLNET 239-4040

SETTING TEXT-DISPLAY PARAMETERS

G

The text display (monochrome monitor) has an ordinary nine-volt, alkaline, internal battery that eventually will need to be replaced. The battery maintains the text display parameters in memory when the workstation power is turned off. The text display parameters are instructions, typed in from the keyboard, that tell the text display how to operate, such as, how many characters to display on a line, should the cursor blink, etc.

If you see the message

BATTERY LOW

appear on the screen, the battery will soon have to be replaced.

Replacing the battery is a service procedure. If the battery low message appears, you should have a replacement battery on hand so the battery can be replaced on the next service call.

If battery power is missing while the workstation is turned off, or if the text display parameters are accidentally changed, use the following procedure to restore the proper text-display parameters.

1. With the workstation power turned on, press the SETUP key on the upper left of the keyboard. Then, press the F10 (SUB) key twice. Now, hold down the CTRL key and press the SETUP key again. The first group of parameter blocks appear at the bottom of the screen. They should appear as follows:

F	RETURN	F	CONFIG	F	CONFIG	F	CONFIG	F	RETURN	F	ASXY	F	L ID	F	PORTA	F	PORTB	F	inst
1		2	100000	3	000000	4	100000	5	000000	6	1 0 0	7	0 0 0 0 0	8	C A	9	C A	10	mode n

2. If any of the parameter blocks are not as shown, use the space bar, the backspace key, and the F keys (at the top of the keyboard) to position the cursor. Then type in the correct numbers or letters.

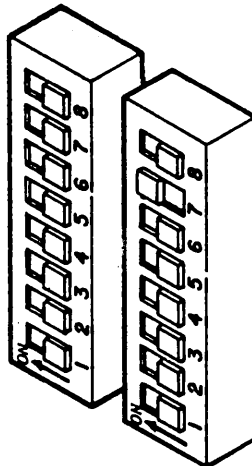
3. When all the parameter blocks are correct, press the COPY key to store the changes.
4. Press the F10 (SUB) key and when ENTER MODE n (1-6) appears, type a 1.
5. The second group of parameter blocks appears. Check that they appear as follows:

F	RETURN	F	CONFIG	F	CONFIG	F	CONFIG	F	RETURN	F	OPRDF	F	A-DIAL	F	A-DIAL	F	DPTR	F	ACCESS
1		2	100000	3	001001	4	000000	5	010000	6	4625	7	000000	8	000000	9	00 A A	10	0000

6. If any of the parameter blocks are not as shown, use the space bar, the backspace key, and the F keys (at the top of the keyboard) to position the cursor. Then type in the correct number of letter.
7. When all corrections have been made, press the COPY key.
8. Press the F1 key twice to return to normal operation.

Flexible disks used with the 790 ICEM Workstation may be copied by using this procedure.

1. To do a disk copy, you must change the setting of the dip switches on the display list processor board. To change these switches, use the Processor On switch to turn off the workstation.
2. Use a Phillips screwdriver to rotate the latches on the door of the right-hand pedestal. Open the door and set the switches on the Display List Processor (DLP) board, slot A3, as shown.



05488-1

3. Find the TEKEM (510716-02) or TEKEM+ disk . These disks contain the copy program. Make sure the write-protect slot is open. Then, insert the disk, metal edge first, label up, into the disk drive and turn on the workstation with the Processor On switch.

NOTE

In this procedure, when you see Shift+CR/DEL, hold down a Shift key and press the CR/DEL key. (The CR/DEL key is to the right of the space bar.) Note that the disk you copy from is called the "source" disk and the disk you copy to, is called the "destination" disk.

4. After about 80 seconds, when the TEKEM disk has loaded,
Enter Date
appears on the display screen.
5. Do a Shift+CR/DEL and
Enter Time
appears on the screen.
6. Do a Shift+CR/DEL and
OS:
appears on the screen.
7. If the disk to be copied is the TEKEM disk, leave it in the drive. If the disk to be copied is not the TEKEM disk, remove the TEKEM disk; check that the write-protect slot on the disk to be copied (source disk) is open and insert the disk into the drive, metal edge first, label up.
8. Type:
COPY 1 2
and do a Shift+CR/DEL.
9. When a message is displayed asking if it is OK to copy disk 1 to disk 2, type a Y and do a Shift+CR/DEL. The source disk will then be copied into the workstations RAM. You may monitor the progress of the copy by watching the display screen.
10. When OS: appears on the display (OS: may appear near the top of the screen), remove the source disk from the drive.
11. Close the write-protect slot on the disk you will copy to (destination disk).
12. Insert the destination disk in the drive.

13. Type:

FORMAT 1

and do a Shift+CR/DEL. A message on the display will ask if it is OK to format disk 1. Type Y and do a Shift+CR/DEL. Formatting the disk takes between 2 and 3 minutes. You may monitor the formatting process by watching the display screen.

14. Type:

INIT 1

and do a Shift+CR/DEL. A message on the display will ask if it is OK to initialize disk drive 1. Type Y and do a Shift+CR/DEL. Then go to the next step. (You may see the message, Disk is Write Protected: Operation Aborted. If you have closed the write-protect slot of the destination disk, as described in step 11, ignore this message.)

15. Type:

COPY 2 1

and do a Shift+CR/DEL. A message on the display will ask if it is OK to copy disk 2 to disk 1. Type Y and do a Shift+CR/DEL. You may monitor the copy progress by watching the display screen.

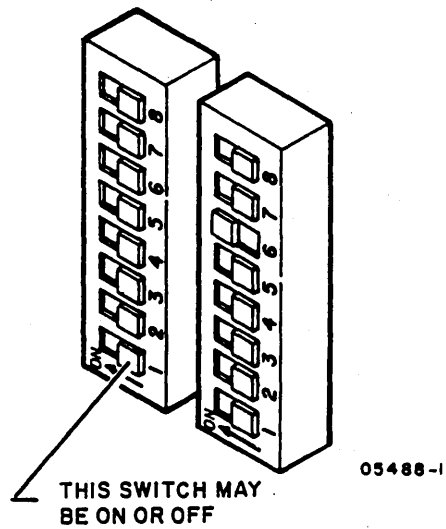
16. Before removing the destination disk, you may verify a successful copy by typing DIR and doing a Shift+CR/DEL. Note the directory (list of files) displayed for the destination disk. Then remove the destination disk and insert the source disk. Again, type DIR and do a Shift+CR/DEL. The displayed directory of the source disk should match the previously displayed directory of the destination disk.

17. To make more copies of the same disk, repeat steps 11 through 16.

18. To make a copy of a different source disk, remove the disk in the drive, type INIT 2 and do a Shift+CR/DEL. A message on the display will ask if it is OK to initialize. Type Y and do a Shift+CR/DEL. When OS: appears on the screen (the OS: may overwrite an OS: that is already on the screen), insert the disk to be copied in the drive and do steps 8 through 16.

19. Remember to open the write-protect slot after removing the destination disks from the drive. With the write-protect slot open, the workstation cannot accidentally write unwanted data onto the disk.

20. When you are through copying disks, restore the dip switches to the normal operating position as shown, close and relatch the pedestal door.



GLOSSARY

This glossary, by using commonly understood words, defines terms used in this guide as those terms relate to the 790 workstation. As a result, the definitions may not always be complete or entirely technically correct; however, the definitions given should help the reader to understand the terms as they are used in this guide and related manuals. For more complete, precise definitions, refer to a technical dictionary or encyclopedia.

- Alphanumeric display** A device with a typewriter-like keyboard and a screen on which text and symbols are displayed. Sometimes referred to as a display, a monitor, or a terminal. In this manual we call it a text display.
- Attribute**
(graphics term) Attributes determine the size, shape, or appearance. Size, spacing, and color are attributes. There are two types of attributes. Geometric attributes affect size or shape. Non-geometric attributes affect appearance (color and type font).
- Baud rate** How fast computer system devices send or receive signals or data. Some common baud rates are 300, 1200, and 9600.
- Boot** An abbreviated form of the word bootstrap - see bootstrap.
- Bootstrap** This term comes from the expression "Pulling yourself up with your own bootstraps." When a computing device starts up, there are no instructions in its memory. To "boot" the system is to use a keyboard key, switch, or disk to give the system the first few instructions. These instructions enable the device to load its memory with more instructions.
- Bundled Attributes**
(graphics term) When attributes (see attribute) are selected along with a primitive (see primitive), the attribute and the primitive are bundled. For example, if your system allows you to make

one selection to select a line that is solid, narrow, and red, the line is bundled with the line attributes. If you select a solid line and then must also select the width and color, the attributes are not bundled with the line.

CPU Central Processing Unit (a computer).

CR Carriage Return. On the workstation keyboard, the NEXT key works as a carriage-return key.

Color display A cathode-ray tube unit that will display colors. Very similar to a color TV. Sometimes called a color monitor or color terminal. It may or may not have a keyboard.

Color monitor See color display.

Control character Usually relates to a code or signal that has a special function. The ESC (escape) key on the workstation keyboard, when pressed, generates the escape control character. Control characters usually start, change, or stop some workstation or computer operation.

Deadstart See Bootstrap.

Diagnostic A test run on a device (or program) to find out what is wrong.

Direct-coupled When a communication wire or cable runs directly from one device to another, the devices are direct-coupled.

Direct link The cable or wire used to direct couple one device to another. See direct-coupled.

Display See alphanumeric display and color display.

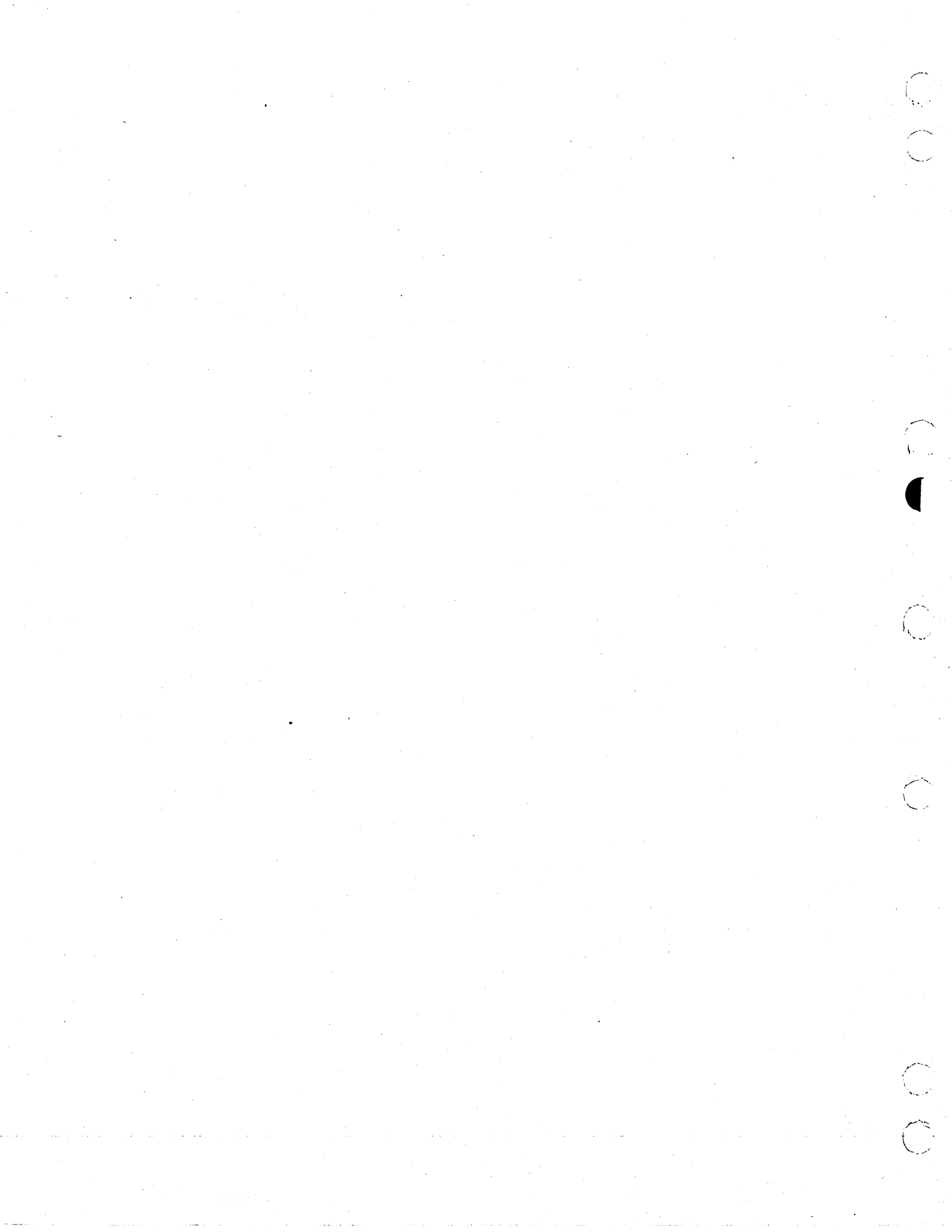
EC See equipment number.

Equipment number A special number given by Control Data to a piece of equipment for tracking purposes. Actually an Equipment Configuration (EC) number. The equipment number of the workstation is TN234-A or TN271-A.

Ergonomics	The science or skill of making devices easy to use and comfortable.
Fill area (graphics term)	A polygon, which may be filled with a color or a pattern.
Flexible disk	Often called a floppy or diskette. A round flat recording surface enclosed in a protective case. Information is written on and read from the flexible disk by a disk drive.
Format (flexible disk)	The way in which the recording surface is divided so the storage areas on the disk match the requirements of the system using the disk. New, blank disks are usually unformatted and must be formatted by a special procedure by the system using the disk. Before copying information from one disk to another disk, the receiving disk must be formatted.
Host	A remote computer connected to the workstation by a cable or by a modem and telephone lines.
Initialize	To set counters, switches, addresses, etc. to their starting value.
Load	To copy or move information or programs, from one device to another. When a microcode disk is placed in the disk drive, the program on the disk is read (copied) (or loaded) from the disk into the workstation's memory.
Local	When the functions performed are done by the workstation (not by a remote computer). Selected by the LOCAL/REMOTE key.
Marker (graphics term)	A figure whose center defines a point.
Microcode	A short, permanently recorded, program on a flexible disk that when read into the workstation's memory makes the workstation operate in a predetermined manner. (The TEKEM microcode makes the workstation act like a Tektronix workstation.)

Modem	A device, that when connected between the workstation and the telephone line, allows the workstation to communicate with a remote device (the host computer) over the telephone line.
NEXT (key)	The NEXT key on the workstation keyboard generates the CR (Carriage-Return) code and is used in the same way as the CR key on other keyboards.
Native	Although the 790 workstation will operate similar to (emulate) other workstations, such as a Tektronix workstation, the 790 is designed to operate very efficiently in its own (native) way.
Operating System	The basic program in a computing device that controls the device's operation with other programs and external devices.
Option	A device or program that does not come with the basic unit unless specifically ordered.
Parameter	A specific value or function assigned to a variable. (If you have cruise control on your car and you set it for 55 mph, you have selected 55 mph as the speed parameter.)
Parity	A way of checking transmitted data.
Password	A word known by a user and the computer system that identifies the user to the computer system.
Peripheral	A device in the same general area of the workstation that works with the workstation but is physically separate.
Polyline (graphic term)	Two or more lines of the same type (_____, or -----, or +++++, etc.) with their ends connected.
Primitive (graphics term)	A basic part of a drawing, such as a line, polyline, marker, fill area, and text.

Prompt	A message or question from the computer or workstation that appears on the screen of a display. Prompts usually require some response from you, such as a keyboard entry.
Remote	A way the workstation can operate (selected by the LOCAL/REMOTE key or during the workstation set-up mode) where the functions done at the workstation are controlled by a host computer.
Reset	To restart the operation of the workstation by pressing the SYSTEM RESET switch.
Tek-emulation	To operate similar to a Tektronix workstation.
Terminal	See alphanumeric display and color display.
Text (graphics term)	Alphabetical/numerical information on a drawing (titles, notes, etc.).
Text display	See alphanumeric display and color display.
User number	A number assigned by a network or remote (host) computer that identifies the workstation.



COMMENT SHEET

MANUAL TITLE: 790 Ergonomic Workstation, Owners Manual

PUBLICATION NO.: 62950150

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COMPANY: _____

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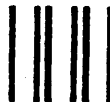
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