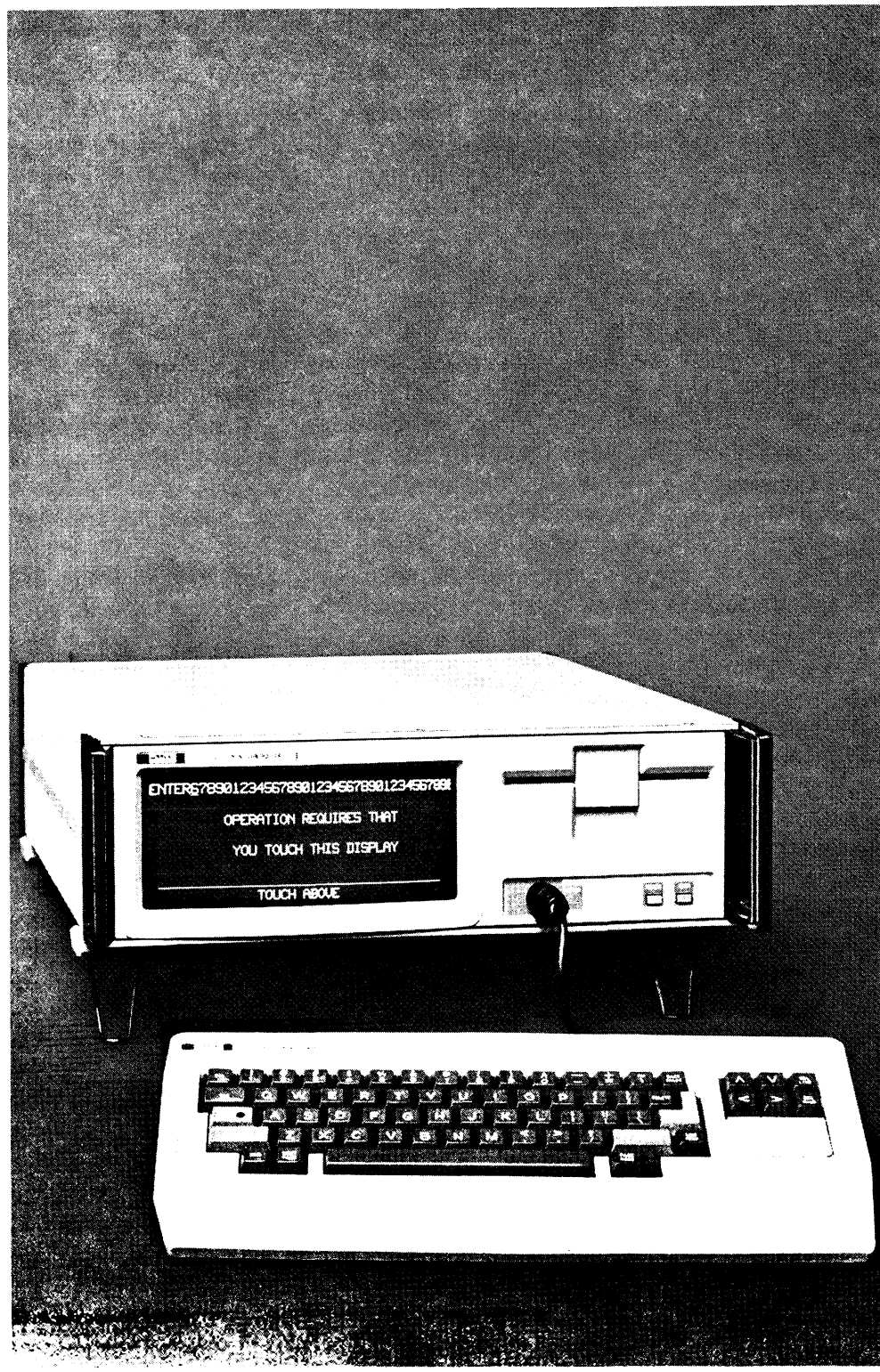
1720A
Instrument Controller

Operator Manual

P/N 518647
February 1980
Rev. 1 7/80

FLUKE®



1720A Instrument Controller

1720A
Operator Manual

INTRODUCTION

The 1720A instrument controller is designed for you, the operator. We have designed it so you can control instruments easily and clearly without having to be a computer programmer or electronics engineer. It has a minimum of controls and adjustments, not even a keyboard. Starting a procedure is a simple matter of inserting a flexible disk and turning on the power. The controller will even tell you when it's not working correctly. The touch sensitive display allows the 1720A to be programmed so your choices while conducting a test procedure will be simple, quick, and accurate.

This book will be your guide to using the controller. It contains information on start-up procedures, safety precautions, practical information on the modules that make up the controller and information on possible system errors.

GENERAL SAFETY REQUIREMENTS

WARNING

TO AVOID ELECTRICAL SHOCK HAZARDS, THE 1720A CONTROLLER MUST BE ADEQUATELY GROUNDED, EITHER WITH THE STANDARD GROUND PLUG OR THROUGH THE SYSTEM GROUND ON THE REAR OF THE CONTROLLER. ALWAYS CONNECT THE POWER CORD TO A GROUNDED OUTLET.

OPERATING FEATURES

The controls, indicators, and connectors for the 1720A are shown in Figure 1 and described in Table 1.

OPERATING NOTES

The following paragraphs describe various operator functions that you should consider before operating the 1720A.

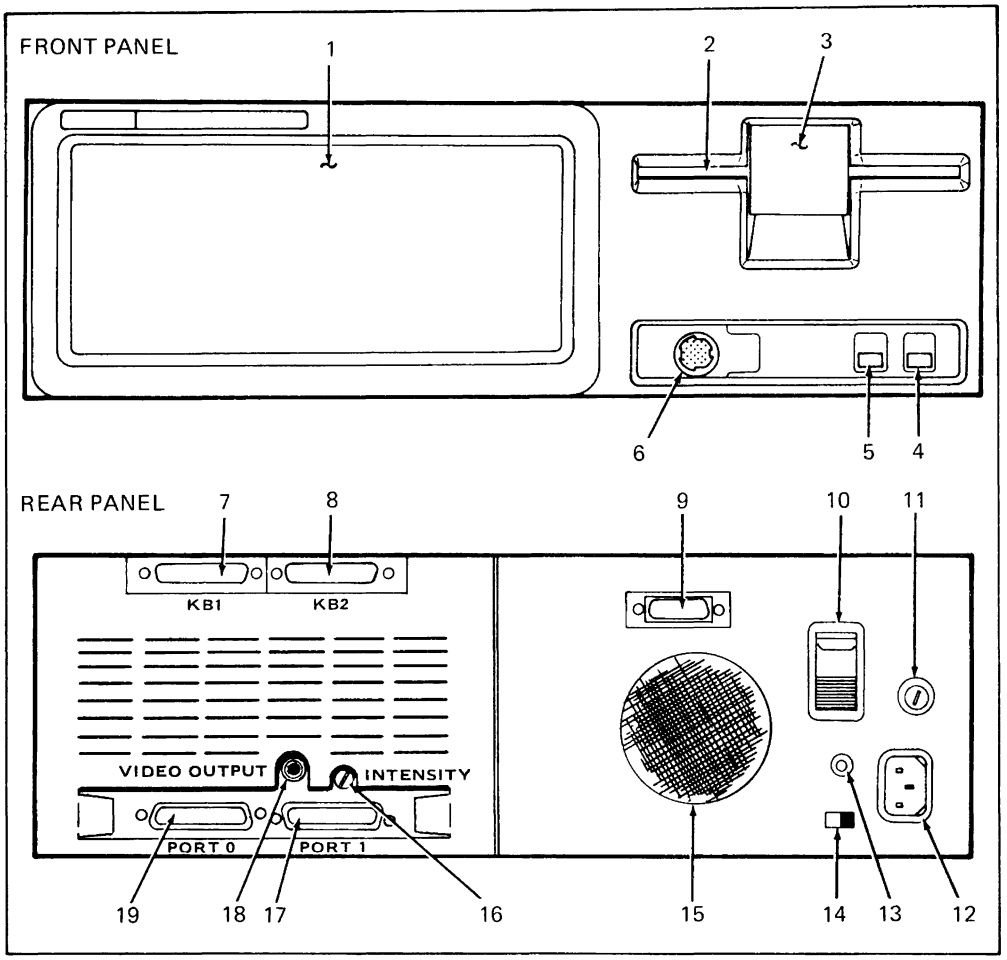


Figure 1. Front and Rear Panel Controls, Indicators and Connectors

Table 1. Front and Rear Panel Controls, Indicators and Connectors

REF. NO.	NAME	FUNCTION
1	TOUCH SENSITIVE DISPLAY	A display with touch sensitive areas which allows operation of a program by touch according to commands shown on the screen. The commands are program controlled and generated.
2	Disk Loading Slot	The floppy disk is loaded into the disk loading slot for program execution and data storage. See "Loading the Disk" for details.
3	Disk Entry Latch	Seats disk for operation.
4	ABORT pushbutton switch	Clears devices on the IEEE-488 buses and either stops the program or allows automatic program continuation, depending on your application program.
5	RESTART pushbutton switch	Initiates self test, clears all of main memory, and re-loads program.

Table 1. Front and Rear Panel Controls, Indicators and Connectors (cont)

REF. NO.	NAME	FUNCTION
6	Keyboard Connector	For connecting the detachable keyboard.
7	RS-232-C Connector #1	Standard I/O port for peripheral devices.
8	RS-232-C Connector #2	Standard I/O port for peripheral devices.
9	Remote Interface Connector	Provides for external E-Disk battery back-up, external control of ABORT and RESTART switches, and two software controlled lines.
10	Main Power Switch	Applies and removes line power to the controller.
11	Fuse	Power supply fuse.
12	Power Connector	Input line power connector.
13	System Ground	A common ground for system components.
14	E-Disk Enable Switch	Provides battery back-up for E-Disk
15	Air Filter	Filters air used to cool power supply. See maintenance procedures.
16	Display Intensity Control	A screwdriver adjust which controls the brightness of the display.
17	IEEE-488 Port 1 Connector	Standard IEEE-488-1978 Connector for instrumentation.
18	Composite Video Connector	Drives standard data display monitor.
19	IEEE-488 Port 0 Connector	Standard IEEE-488-1978 Connector for instrumentation.

Ventilation

The controller must have adequate ventilation to maintain its operating temperature. Keep it at least 4 inches, (12 cm), from a wall so that the fan may cool it properly. There is no minimum distance from top or bottom placement as the controller is designed to be mounted in a rack with other instruments.

Display Intensity

Adjust the display intensity for ease of viewing. The phosphor coating in the display will last longer at lower intensities.

Environmental Considerations

The operating range of the controller is 10°C to 40°C (50°F to 104°F), 8% to 80% humidity. Operation below 8% humidity can cause static electric discharges in the disk which may damage it and other components in the controller.

Electronic-Disk and Floppy Disk

If you turn off the controller while a test or procedure is in progress, you may lose the information being written on the floppy disk or on the Electronic-Disk, if included. Leave the system running while it is in a write operation.

E-Disk Enable Switch

The E-Disk enable switch must be in the enable mode for battery back-up of the E-Disk, should external power be interrupted.

NOTE

Battery back-up for the E-Disk will come on if the E-Disk enable switch on the controller is not in the disable mode when the system power is turned off.

System Shutdown

The controller will automatically shutdown under any one of the following conditions:

1. Internal temperature exceeds 70°C (158°F).
2. Overcurrent (controller is drawing too much current and may be overheating).
3. Overvoltage (controller regulated voltage is above limits).
4. Low Line (line voltage is below 90 volts or 180 volts).

The Flexible Disks

LOADING THE DISK

1. Open the disk slot latch by pressing in on the top of the square panel on the disk loading slot. (See Figure 2.)

2. Insert the disk as shown in Figure 3, label side up.

3. Gently relatch the disk slot by partially closing it several times to insure seating, then close it fully.

CAUTION

If the disk-entry latch is closed when the disk is improperly seated, the disk center hole may be damaged. This can be prevented by partially lowering and raising the latch to seat the drive hub prior to total closure of the disk-entry latch.

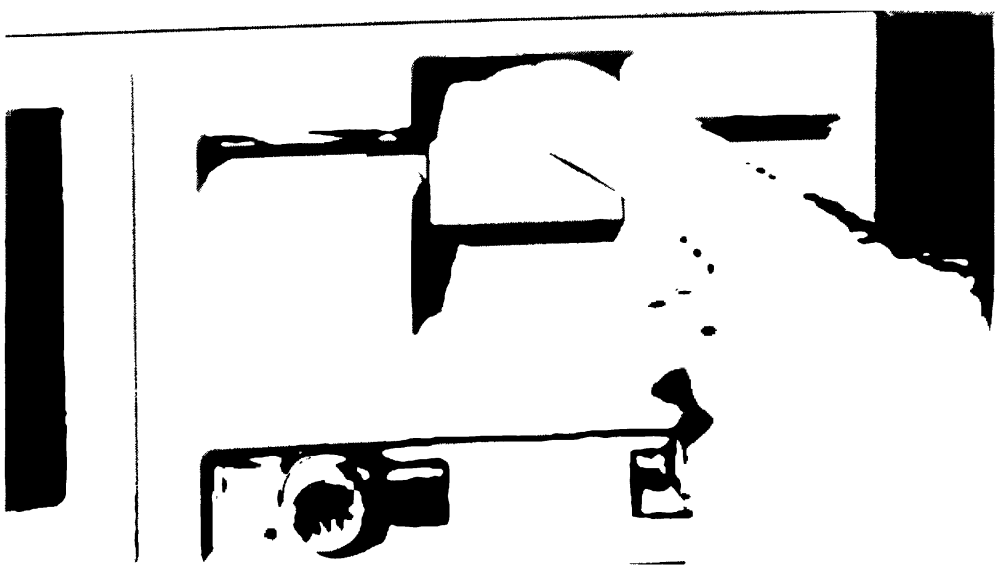


Figure 2. Opening the Disk Slot Latch

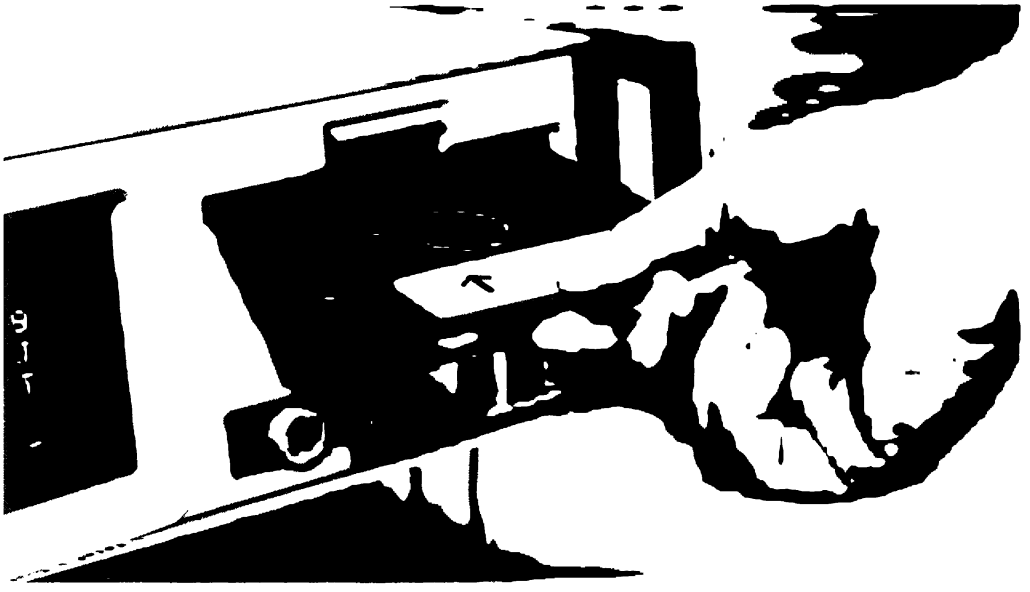


Figure 3. Inserting the Disk

CARE AND HANDLING (See Figure 4)

1. Always keep the disk in its protective folder when not in use.

2. The disk surface can be easily damaged. Do not touch the exposed disk surface with your hands or any material which may damage it.

3. Careless handling of the disks may damage them. Avoid dropping, throwing, or twisting the disks.

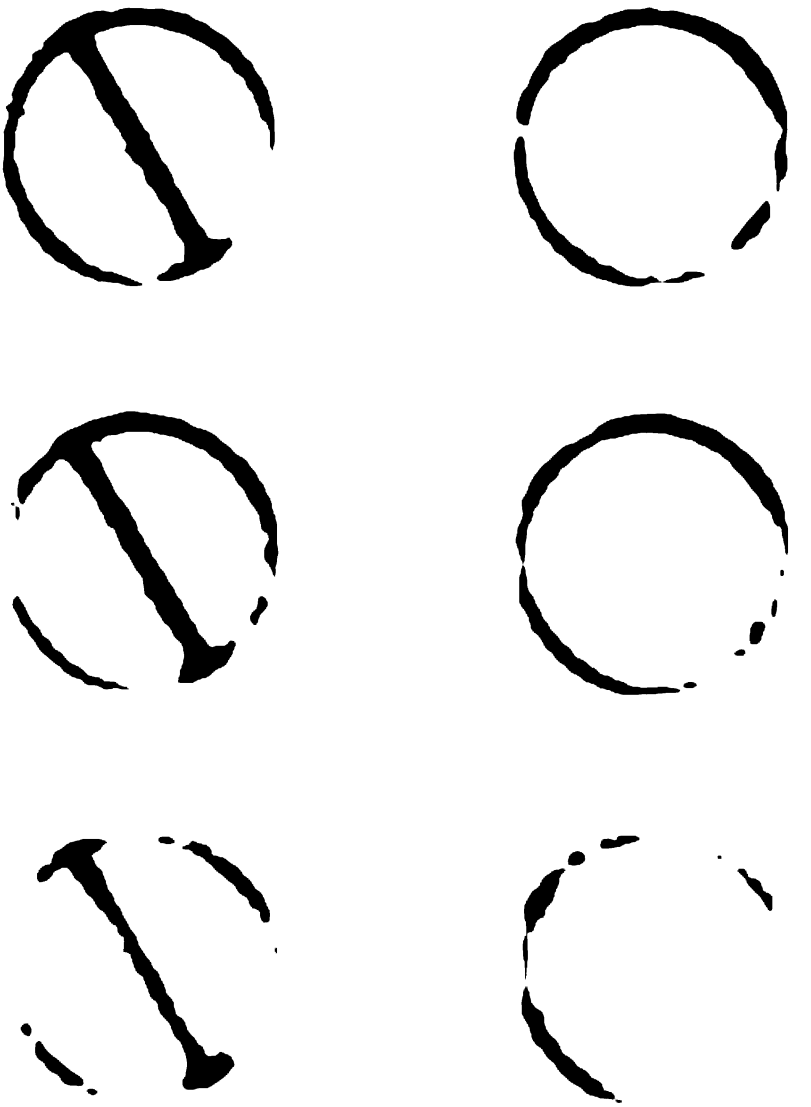
4. Store the disks vertically and support them so they will not bend. Stacking may distort them and affect their contents by pressing the side covers into the disk. Also avoid placing heavy objects on the disks.

5. Direct sunlight may warp the disks. Protect them from the heat of the sun.

6. Magnetic sources may erase data on the disks. Keep them away from electric motors, generators, and transformers.

7. Mark disk labels before placing them on the disk envelope or use a felt tip pen. Pressure from a ball point pen or pencil through the envelope may destroy the data on the disk.

8. Temperature affects the disk's performance. Do not use a disk that is overheated or overcooled until it has reached room temperature.



USE OF CONTROLS

The controls you will use are:

Touch Sensitive Display: touch sensitive display panel can be programmed to operate by simple commands, individual letters, numbers, or areas which must be touched one at a time. The programmer will write system programs to display information on the screen that may require your response. Touch the screen where indicated to respond to system queries. (See Figure 5.) If you view the display at too great an angle, the resulting parallax may cause you to touch the wrong area. Make sure you are facing the screen directly when making choices. Figure 6 illustrates the importance of the viewing angle when operating the touch sensitive display keyboard.

RESTART: Initiates SELF TEST, clears all of main memory and reloads programs.

ABORT: Clears instruments on IEEE ports and depending on the program, either stops the program or reinitializes the instrument and continues.

Display brightness: (rear of panel) a screwdriver slot controls brightness of characters on the display screen. Use only as much brightness as necessary.

OPERATION

Here's how to operate your controller once the program has been written and connections made to instruments and peripheral devices. (See Figure 7.)

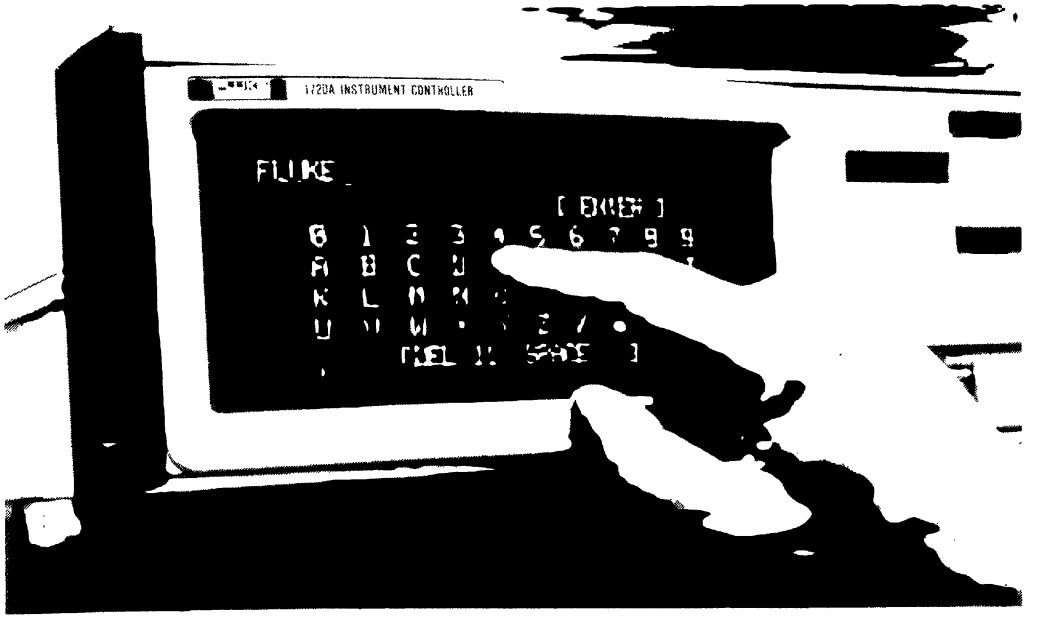


Figure 5. Touch Sensitive Display

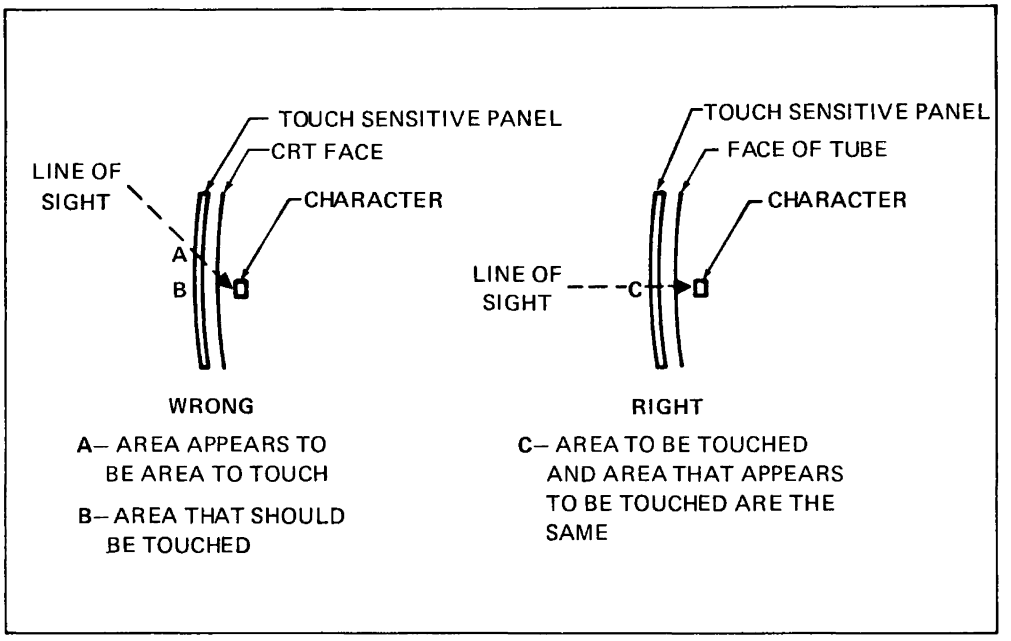


Figure 6. Parallax Distortion, Correct and Incorrect Viewing Angles

Power on Sequence (See Figure 7)

1. Insert the floppy disk. Follow the procedure outlined previously and note handling care.

2. If your 1720A is part of a system that includes a system power control, turn on system power. If system power is applied on an individual instrument basis, turn on all system instruments, including the 1720A, using the individual instrument power switches.

3. Controller runs SELF TEST once the power is turned on. (See Figure 6.) Observe any messages produced by the SELF TEST or any system test developed by your programmer. See the next section about error procedures. See your programmer for any in-house system error codes.

4. Once the SELF TEST is completed, and there are no errors, the system is ready.

NOTE

E-Disk enable switch must be in the enable mode for battery back-up.

Restart Procedure

1. Remove the floppy disk.

2. Insert a new disk as outlined in the Operating Features section and as illustrated in Figure 3.

3. Press RESTART.

4. Observe any messages which may occur.

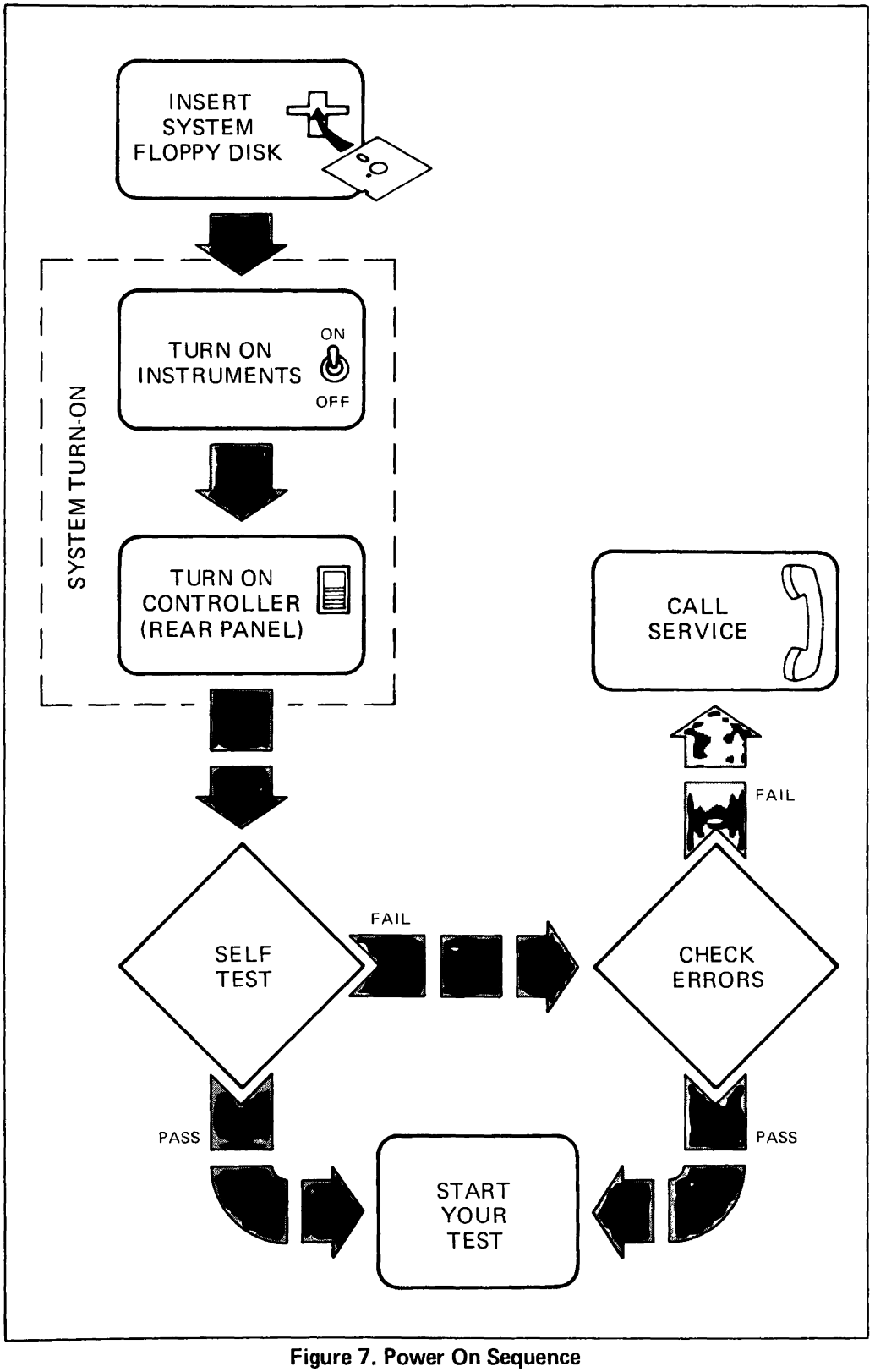


Figure 7. Power On Sequence

Power Off Sequence

1. Remove the floppy disk.

2. Turn off the system power switch or the 1720A power switch, whichever is applicable to the system you are using.

NOTE

Battery back-up for the E-Disk will come on if the E-Disk enable switch on the controller is not in the disable mode when the system power is turned off.

Error Conditions

Fluke has provided a system SELF TEST which automatically checks a number of system features at start-up. The following message is displayed on the screen while the SELF TEST is operating:

```
FLUKE 1720A CONTROLLER
HELLO
SELF TEST
SELF TEST ERRORS
```

If all components are working properly, the programs especially written for your system will start processing. The errors in Table 2 might be displayed if any module is not operating properly. Follow the procedure for action required if you observe any of the following messages:

PROGRAM PROCESSING ERRORS

After the SELF TEST is completed, the controller will start processing the program written by your programmer. Table 2 lists some common errors which may occur during program processing.

PROGRAM ERRORS

If any of the errors listed in Table 3 occur, notify your programmer. We suggest you keep a log of them for reference by a programmer. A log space is provided at the rear of the manual.

NOTE

Only the more common program errors have been presented. If you see other error indications on the display, such as, `VRBL error 901 at line 10`, *you must contact your programmer.*

Table 2. Self Test Errors

MESSAGE	ACTION
!Memory Error	Indicates a problem with the memory board. Service may be required.
!Video Error	Indicates a problem with the video board. Service may be required.
!IEEE Missing or Faulty	Indicates a problem with the IEEE Interface board. Check whether all IEEE instruments attached to the controller are on and whether all cables are securely in place. If everything seems correct and the message still displays when you depress the RESTART switch again, service may be required. You may also wish to disconnect the IEEE cables from the controller to confirm whether the instruments are the source of trouble.
!Floppy Error	Indicates a problem with the floppy disk drive or its control board.
?No System on Device	Check that the disk in the drive is a system disk. Try another system disk. You may have inserted the wrong disk or inserted it incorrectly.
?Disk not Mounted	Insert or re-insert a system disk. Either you forgot to insert a disk or it was improperly inserted. Check whether the disk is upside down or the entry latch has not been closed.
?Floppy Error	The inserted disk is faulty. Try another system disk.
?Bad Directory on Device	The directory on the disk is incorrect. Use another disk.

ERROR	ACTION
301 Write protected disk	You probably should have a data disk inserted.
306 No more room for data on E-DISK or floppy disk	Insert another disk or check with your programmer.
400 IEEE-488 Bus timing error	Check that all devices are properly connected. If message repeats, check with your programmer.
401 IEEE-488 range error	Instrument probably turned off. Check specific instrument operation.

Table 3. Common Program Error Indications

ERROR INDICATION	MEANING
0	Too much data to fit in main memory.
1	Too large a data space was reserved by the program on E-Disk or floppy disk.
2	Too much data to fit into space reserved for it on E-Disk or floppy disk.
100	System error detected by Fluke FDOS operating software system.
101	The application program on your disk is in lexical form not compatible with this version of Fluke BASIC.*
309	Data from an RS-232-C serial port either came in too fast or was ignored by the program.
310	Input from the disk or instrument was longer than 80 characters.
800	Out of data in read: an error in your application program usually caused by failure to RESTORE a DATA statement.
801	Too many data items from disk or instrument in response to an INPUT statement in your program.
802	Not enough data items from disk or instrument in response to an INPUT statement in your program.

*Programmer's Note: obtain an ASCII (.BAS) backup file to your lexical program, enter and save it lexically under the new version of Fluke BASIC.

MAINTENANCE

You can safely perform maintenance procedures. These are limited to fuse replacement and cleaning. All other maintenance requirements should be referred to qualified personnel.

Fuse Replacement

Either a 3A Slo-Blo fuse for 120V service or MDL 1½A Slo-Blo fuse for 240V service is used to protect the power line from an accidental overload. Use the following procedure to replace a fuse:

1. Turn off the instrument power.
2. Remove the power cord from the back panel.
3. Locate the fuse holder on the rear panel.
4. Replace the fuse by pressing in the fuse cap and turning it 1/8 turn counterclockwise. Use a suitable screwdriver.
5. Install the new fuse in the fuse cap and install both in the fuse holder.
6. Turn on the power.

Touch Sensitive Display

Clean the display with a soft cloth and any commercially available glass cleaner. Avoid abrasive cleaners and paper towels on the mylar surface as they may scratch it.

Air Filter

A dirty air filter may cause the system to overheat and shutdown. Use the following procedure to clean the air filter:

1. Locate the air filter on the rear panel.

2. Remove the air filter by pinching it in the center with two fingers and pulling it from the housing.

3. Clean the air filter in water and mild detergent or a mild solvent.

4. Dry the air filter thoroughly and replace it.

CAUTION

Replacing a filter which is still wet may damage internal components.

Disk Drive

The disk drive requires no operator maintenance.

CAUTION

Lubrication of the disk drive mechanism is unnecessary. Never apply oil to the disk drive mechanism. Never insert an object into the disk drive opening other than a disk, you may damage the mechanism if you do. If there is trouble with the drive, contact a Fluke Service Center.

Table 4. Fluke Technical Service Centers, U.S. and Canada

UNITED STATES

CA, Burbank
Fluke Technical Center
2020 N. Lincoln Street
Burbank, CA 91504
(213) 849-4641

CA, Santa Clara
Fluke Technical Center
2300 Walsh Avenue
Santa Clara, CA 95050
(408) 985-1200

CO, Denver
Fluke Technical Center
1980 S. Quebec Street, Unit 4
Denver, CO 80231
(303) 750-1228

FL, Orlando
Fluke Technical Center
940 N. Fern Creek Avenue
Orlando, FL 32803
(305) 896-2296

IL, Rolling Meadows
Fluke Technical Center
1400 Hicks Road
Rolling Meadows, IL 60008
(312) 398-5800

MA, Waltham
Fluke Technical Center
244 Second Avenue
Waltham, MA 02154
(617) 890-1604

MD, Rockville
Fluke Technical Center
5640 Fishers Lane
Rockville, MD 20852
(301) 770-1576

MN, Apple Valley
Fluke Technical Center
7373 West 147th Street, Suite 196
Apple Valley, MN 55124
(612) 432-9400

NC, Greensboro
Fluke Technical Center
1310 Beaman Place
Greensboro, NC 27408
(919) 273-1918

NJ, Paramus
Fluke Technical Center
West 75th Century Road
Paramus, NJ 07652
(210) 262-9550

TX, Dallas
Fluke Technical Center
14400 Midway Road
Dallas, TX 75240
(214) 233-9945

WA, Mountlake Terrace
John Fluke Mfg. Co., Inc.
21707 66th Avenue W., Suite 1
Mountlake Terrace, WA 98043
(206) 774-2206

CANADA

ALB, Calgary
Allan Crawford Assoc., Ltd.
1935 30th Avenue N.E. #14
Calgary, ALB T2E 6Z5
(403) 230-1341

ONT, Mississauga
Allan Crawford Assoc., Ltd.
6503 Northam Drive
Mississauga, ONT L4V 1J5
(416) 678-1500

QUE, St. Laurent
Allan Crawford Assoc., Ltd.
7018 Cote de Liesse
St. Laurent, QUE H4T 1E7
(514) 731-8564

Table 5. Sales and Service Locations, International

ARGENTINA
Fluke Latin American
Service Headquarters
Virrey del Pino 4071
Buenos Aries, Argentina
Tel: 523185

AUSTRALIA
Elmeasco Instrument Pty Ltd.
P.O. Box 30
Concord, N.S.W.
Australia 2137
Tel: (02) 736-2888

AUSTRIA
Walter Rekirsch
Elektronische Gerate GmbH & Co.
Vertriebs-KG.
Liechtensteinstrasse 97/6
A-1090 Vienna, Austria
Tel. 09-43-222-347646

BELGIUM
Fluke (Belgium)S.A./N.V
6, Rue de Geneve
1140 Brussels, Belgium
Tel: 09-32-2-2164090

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Industria e Comercio
Av Pacaembu 811
01234 Sao Paulo S.P., Brazil
Tel 826-2266

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Intronica Chile Ltda.
Casilla 16228
Santiago 9, Chile
Tel: 44940

COLOMBIA
Coasin Ltda
Carrera 13, # 37-37, Of. 407
Ap Aero 29583
Bogota DE, Colombia
Tel: 285-0230

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DK-2750 Ballerup
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Edificia "Jerico"
Ave. 12 de Octubre #2285y
Ave, Orellana (Planta Baja)
Quito, Ecuador
Tel: 526759

EGYPT
Lotus Engineering Organisation
P.O Box 1252
Cairo, Egypt
Tel. 71617

FINLAND
Oy Findip AB
Teollisuustie 7
02700 Kauniainen
Finland
Tel: 09-358-0-502255

FRANCE
M.B. Electronique S.A.
Rue Fourny
ZAC de BUC
B.P. #31
78530 BUC, France
Tel: 09-33-1-9568131

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Hellenic Scientific
Representations Ltd.
11, Vrassida Street
Athens 615, Greece
Tel: 09-30-1-711140

HONG KONG
Gilman Industrial Bldg., 9F
107-109 Wai Yip Street
Kwun Tong
Kowloon, Hong Kong
Tel: 3-427144

Table 5. Fluke Technical Service Centers - International (cont)

INDIA
Hinditron Services Pvt. Ltd.
"Hinditron House"
412 Raj Mahal Vilas Extension
Bangalore 560 006, India
Tel: 33139

Hinditron Services Pvt. Ltd.
69 A.L. Jagmohandas Marg
Bombay 400 006, India
Tel: 365344

INDONESIA
P.T. Dwi Tunggal Jaya Sakti
Sangga Buana Bldg., 1st Floor
J1. Senen Raya 44, P.O. Box 4435
Jakarta, Indonesia
Tel: 376608

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Irantronics Company Ltd.
20 Salm Road
Roosevelt Avenue
Tehran, Iran
Tel: 828294/831564

ISRAEL
R.D.T. Electronics Engineering Ltd.
P.O. Box 75
46, Sokolov Street
Ramat Hasharon 47235
Israel
Tel. 09-972-3-483211

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Sistrel S.p.A.
Via Timavo 66
20099 Sesto S. Giovanni (Milan)
Italy
Tel: 09-39-2-2476693

Sistrel S.P.A.
Via Guiseppe Armellini #37
00143 Rome, Italy
Tel: 09-39-6-5915551

JAPAN
John Fluke Mfg. Co., Inc.
Japan Branch
1 Higashikata-machi
Midori-ku
Yokohama 226, Japan
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Electro-Science Korea Co.
C P.O. Box 8446
Room 1201 Bowon Bldg.
490 Chongro - 5 Ka
Chongro-ku
Seoul, Korea
Tel: 261-7702

MALASIA
O'Connor's (Malaysia) SDN. BHD.
P.O. Box 91
Petaling Jaya, Selangor
West Malaysia
Tel: 51563

MEXICO
C.J. Christensen S.A. De C.V.
Melchor Ocampo 150-8
Mexico 4 D.F., Mexico
Tel: (905) 535-2258

NETHERLANDS
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P.O. Box 5053
5004 EB Tilburg
The Netherlands
Tel: (013) 673973

NEW ZEALAND
W & K McLean Ltd
P.O. Box 18065
Glen Innes
Auchland, New Zealand
Tel. 587-037

NORWAY
Morgenstierne & Co A/A
Kongheilegate 3
P O Box 6688, Rodelokka
Oslo 5, Norway
Tel. 09-47-2-356110

PAKISTAN
Pak International Operations
505 Mohammadi House
1.1. Chundrigar Road
Katrachi-2 Pakistan
Tel: 221127/239052

PERU
Importaciones Y Representaciones Electronicas S.A
Avda. Franklin D. Roosevelt 105
Lima 1, Peru
Tel: 288650

PORTUGAL
Equipamentos de Laboratorio, Ltda
P.O. Box 1100
Lisbon 1002, Portugal
Tel: 09-351-1-578936/547512

REPUBLIC OF SINGAPORE
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98 Pasir Panjang Road
Singapore 0511
Republic of Singapore
Tel: 637944

REPUBLIC OF SOUTH AFRICA
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Bramley 2018
Republic of South Africa
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SPAIN
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Apartado de Correos 48
Alcorcon (Madrid)
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Tel: 09-3416194108

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Teleinstrument AB
P.O. Box 490
S-162 Vallingby 4
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Tel: 09-46-8-380370

SWITZERLAND
Traco Electronic AG
Jenatschstrasse 1
8002 Zurich
Switzerland
Tel 09-41-1-2010711

TAIWAN
CCT Associates, Inc
P.O. Box 24209
Taipei, Taiwan
Republic of China
Tel (02) 391-6894/393-5760

THAILAND
Dynamic Supply Engineering R.O P
56 Ekamai, Sukhumvit 63
Bangkok-11, Thailand
Tel: 914434/928532

TURKEY
Erkman Electronik Aletler
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Necatiby Cad 92/3
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Casilla de Correos 1400
Correo Central
Montevideo, Uruguay
Tel: 917978

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WEST GERMANY
Fluke (Deutschland) GmbH
Krausstrasse 32
8045 Ismaning
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Customers in the following countries: Bulgaria, Czechoslovakia, Hungary, Poland, Romania, U.S.S.R., and Yugoslavia, contact: Amtest Associates Ltd., P.O. Box 55, Addlestone, Surrey, KT 15 1DU, England, Tel. (0932) 52121

PROGRAM NAME	ERROR PRODUCING SITUATION	ERROR INDICATION