

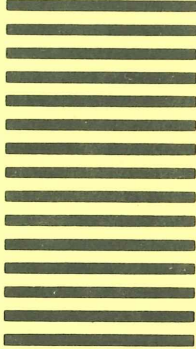
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John Fluke Mfg. Co., Inc.
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the attached information is a

Preliminary Manual

for the enclosed instrument

The final manual will soon be completed and sent to you at no charge. Please fill out and return the lower portion of this card to assure proper delivery of the final Instruction Manual.

To: John Fluke Mfg. Co., Inc.

Please send (at no charge) a final Instruction Manual for

Manual P/N: _____

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PRELIMINARY

5700A
CALIBRATOR

Service Manual

P/N 791996
September 1988 Rev. 1, 3/89
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FLUKE

WARRANTY

John Fluke Mfg. Co., Inc. (Fluke) warrants this instrument to be free from defects in material and workmanship under normal use and service for a period of 1 year from date of shipment. Software is warranted to operate in accordance with its programmed instructions on appropriate Fluke instruments. It is not warranted to be error free. This warranty extends only to the original purchaser and shall not apply to fuses, computer media, batteries or any instrument which, in Fluke's sole opinion, has been subject to misuse, alteration, abuse or abnormal conditions of operation or handling.

Fluke's obligation under this warranty is limited to repair or replacement of an instrument which is returned to an authorized service center within the warranty period and is determined, upon examination by Fluke, to be defective. If Fluke determines that the defect or malfunction has been caused by misuse, alteration, abuse, or abnormal conditions of operation or handling, Fluke will repair the instrument and bill the purchaser for the reasonable cost of repair. If the instrument is not covered by this warranty, Fluke will, if requested by purchaser, submit an estimate of the repair costs before work is started.

To obtain repair service under this warranty purchaser must forward the instrument, (transportation prepaid) and a description of the malfunction to the nearest Fluke Service Center. The instrument shall be repaired at the Service Center or at the factory, at Fluke's option, and returned to purchaser, transportation prepaid. FLUKE ASSUMES NO RISK FOR IN-TRANSIT DAMAGE.

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The purchaser assumes all risk of loss or damage to instruments upon delivery by Fluke to the carrier. If an instrument is damaged in transit, PURCHASER MUST FILE ALL CLAIMS FOR DAMAGE WITH THE CARRIER to obtain compensation. Upon request by purchaser, Fluke will submit an estimate of the cost to repair shipment damage.

Fluke will be happy to answer all questions to enhance the use of this instrument. Please address your requests or correspondence to: JOHN FLUKE MFG. CO., INC., P.O. BOX C9090, EVERETT, WA 98206,

Declaration of the Manufacturer or Importer

We hereby certify that the Fluke Model 5700A is in compliance with Postal Regulation Vfg. 1046 and is RFI suppressed. The marketing and sale of the equipment was reported to the German Postal Service. The right to retest this equipment to verify compliance with the regulation was given to the German Postal Service.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß Fluke Model 5700A in Übereinstimmung mit den Bestimmungen der Amtsblattverfügung Vfg. 1046 funk-entstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

John Fluke Mfg. Co., Inc.

INTERFERENCE INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the equipment with respect to the receiver
- Move the equipment away from the receiver
- Plug the equipment into a different outlet so that the computer and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

OPERATOR SAFETY SUMMARY

WARNING



HIGH VOLTAGE

is used in the operation of this equipment

LETHAL VOLTAGE

MAY BE PRESENT ON THE TERMINALS. OBSERVE ALL SAFETY PRECAUTIONS!

TO AVOID ELECTRICAL SHOCK HAZARD, THE OPERATOR SHOULD NOT ELECTRICALLY CONTACT THE OUTPUT HI OR SENSE HI BINDING POSTS. DURING OPERATION, LETHAL VOLTAGES OF UP TO 1100V AC OR DC MAY BE PRESENT ON THESE TERMINALS.

WHENEVER THE NATURE OF THE OPERATION PERMITS, KEEP ONE HAND AWAY FROM EQUIPMENT TO REDUCE THE HAZARD OF CURRENT FLOWING THROUGH VITAL ORGANS OF THE BODY.

TERMS IN THIS MANUAL

This instrument has been designed and tested in accordance with IEC Publication 348, Safety Requirements for Electronic Measuring Apparatus. This Operator Manual contains information and warnings which have to be followed by the user to ensure safe operation and to retain the instrument in safe condition.

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

OPERATOR SAFETY SUMMARY (Cont)

SYMBOLS MARKED ON EQUIPMENT



DANGER — High voltage.



Protective ground (earth) terminal.



Attention — refer to the manual. This symbol is to indicate that information about usage of a feature is contained in the manual.

POWER SOURCE

The 5700A is intended to operate from a power source that will not apply more than 264V ac rms between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

USE THE PROPER FUSE

To avoid fire hazard, use only the fuse specified on the line voltage selection switch label, and which is identical in type, voltage rating, and current rating.

GROUNDING THE 5700A

The 5700A is a Safety Class I (grounded enclosure) instrument as defined in IEC 348. The enclosure is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired earth grounded receptacle before connecting anything to any of the 5700A terminals. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

USE THE PROPER POWER CORD

Use only the power cord and connector appropriate for proper operation of a 5700A in your country.

Use only a power cord that is in good condition.

For detailed information on power cords refer to Figure 2-3 in Section 2.

Refer cord and connector changes to qualified service personnel.

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERES

To avoid explosion, do not operate the 5700A in an atmosphere of explosive gas.

DO NOT REMOVE COVER

To avoid personal injury, do not remove the 5700A cover. Do not operate the 5700A without the cover properly installed. There are no user-serviceable parts inside the 5700A, so there is no need for the operator to ever remove the cover.

SERVICING SAFETY SUMMARY

PROCEDURES IN THIS MANUAL ARE FOR QUALIFIED SERVICE PERSONNEL ONLY

Also refer to the preceding Operator Safety Summary

DO NOT SERVICE ALONE

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid and resuscitation is present.

USE CARE WHEN SERVICING WITH POWER ON

Dangerous voltages exist at several points inside this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing protective panels, soldering, or replacing components.



FIRST AID FOR ELECTRIC SHOCK

RESCUE

**FREE VICTIM FROM CONTACT WITH LIVE CONDUCTOR QUICKLY.
AVOID CONTACT WITH EITHER LIVE CONDUCTOR OR VICTIM'S BODY.**

Shut off high voltage at once and ground circuit. If high voltage cannot be turned off quickly, ground circuit.

An ax with a dry wooden handle may be used to cut high voltage line. Use extreme caution to avoid resulting electric flash.

If circuit cannot be broken or grounded, use a dry board, dry clothing, or other nonconductor to free victim.

SYMPTOMS

NEVER ACCEPT ORDINARY AND GENERAL TESTS FOR DEATH.

Symptoms of electric shock may include unconsciousness, failure to breathe, absence of pulse, pallor, and stiffness, as well as severe burns. **WHENEVER VICTIM IS NOT BREATHING PROPERLY, GIVE ARTIFICIAL RESPIRATION.**

TREATMENT

START ARTIFICIAL RESPIRATION IMMEDIATELY.

Perform artificial respiration at scene of accident, unless victim's or operator's life is endangered. **IN THIS CASE ONLY**, remove victim to safe location nearby. If new location is more than a few feet away, give artificial respiration while victim is being moved.

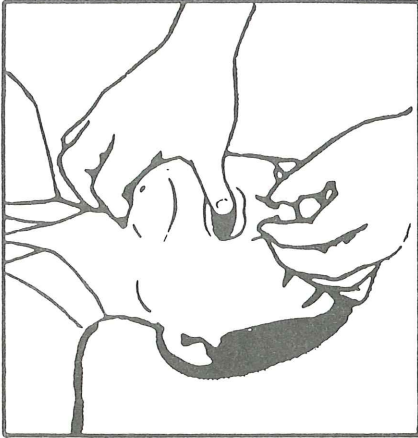
After starting artificial respiration, continue without loss of rhythm for at least **FOUR HOURS**, or until victim is breathing without help. If you have to change operators while giving artificial respiration, do so without losing rhythm of respiration.

AFTER VICTIM REVIVES

Be prepared to resume artificial respiration, as he may stop breathing again.

When victim is **COMPLETELY CONSCIOUS**, give him a stimulant (**NOT AN ALCOHOLIC DRINK**) such as a teaspoonful of aromatic spirits of ammonia in a small glass of water, hot coffee, or hot tea.

Keep victim warm and lying down until he has been conscious for at least fifteen minutes.



POSITION VICTIM

Place victim in face-upward position and kneel close to his ear.

CLEAR THROAT

Turn head to one side and quickly wipe out any fluid, mucus, or foreign body from mouth and throat with fingers.

OPEN AIR PASSAGE

Tilt head back and extend neck to open air passage.

LIFT JAW FORWARD

Place thumb in victim's mouth and grasp jaw firmly. Lift jaw forward to pull tongue out of air passage. Do not attempt to hold or depress tongue.



PINCH NOSTRILS CLOSED

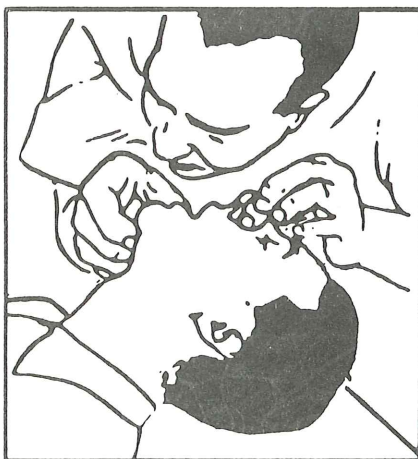
With other hand pinch nostrils closed to prevent air leak.

FORM TIGHT SEAL WITH LIPS

Rescuer's wide-open mouth completely surrounds and seals open mouth of victim. This is not a kissing or puckered position — mouth of rescuer must be wide-open.

BLOW

Exhale firmly into victim's mouth until chest is seen to lift. This can be seen by rescuer without difficulty.



REMOVE MOUTH AND INHALE

During this time, rescuer can hear and feel escape for air from lungs. Readjust position if air does not flow freely in and out of victim's lungs.

Continue at a rate of 12 to 20 times per minute.

Breathing should be normal in rate with only moderate increase in volume, so that rescue breathing can be continued for long periods without fatigue. Do not breathe too forcibly or too large a volume if victim is an infant or small child.

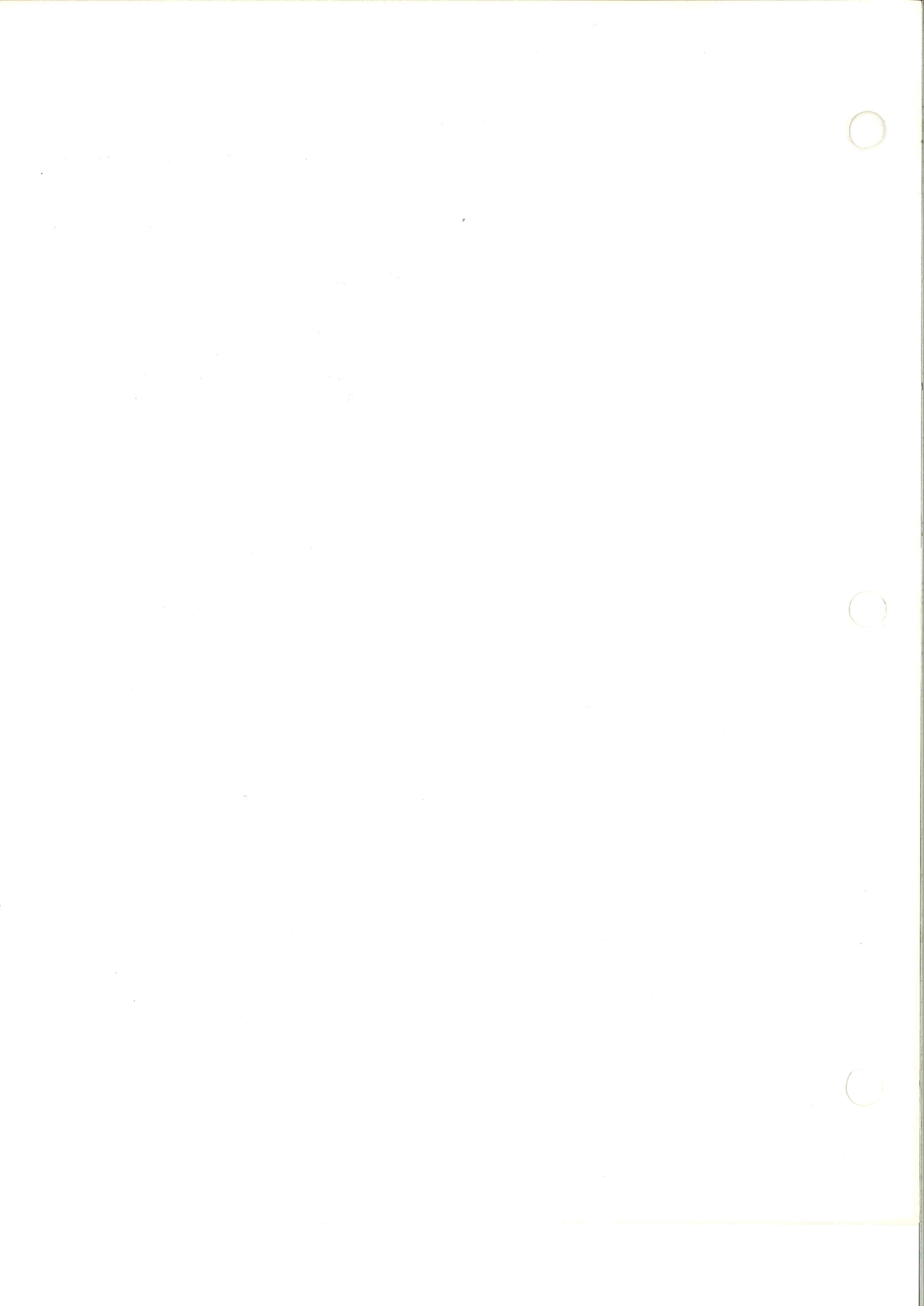


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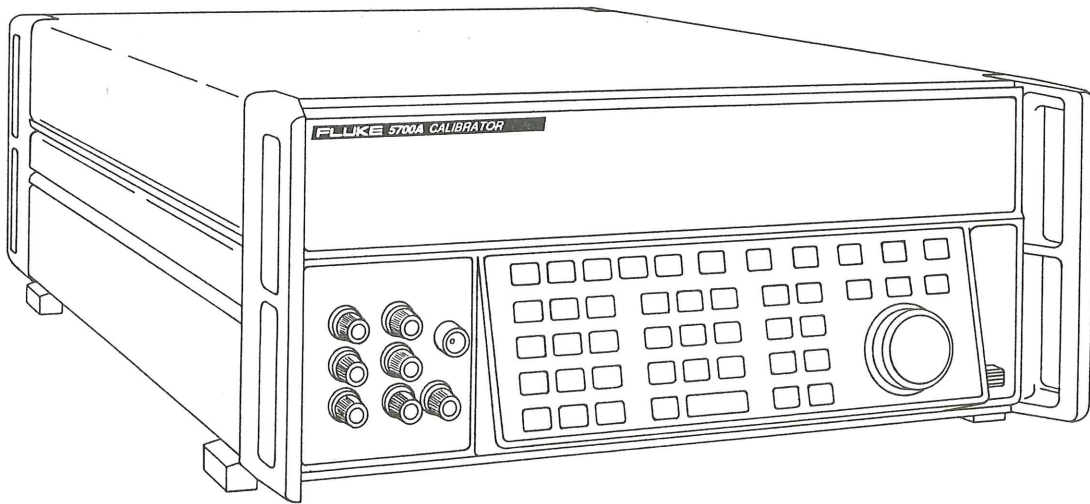
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5700A Calibrator

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1-1. INTRODUCTION

The Fluke Model 5700A Calibrator is a precise instrument that calibrates a wide variety of electrical measuring instruments. The 5700A maintains high accuracy over a wide ambient temperature range, allowing it to test instruments wherever they are, rather than only in a temperature-controlled standards laboratory. With a 5700A, you can calibrate precision multimeters that measure ac or dc voltage, ac or dc current, and resistance. Option 5700A-03 Wideband AC Voltage extends this workload to include many rf meters.

Specifications for the 5700A are provided at the end of this section. The 5700A is a fully-programmable precision source of the following:

- o DC voltage to 1100V
- o AC voltage to 1100V, with output available from 10 Hz to 1.2 MHz
- o AC and DC current to 2.2A, with output available from 10 Hz to 10 kHz.
- o Resistance in values of 1×10^n and 1.9×10^n from short to 100 megohms
- o Optional wideband ac voltage from 300 uV to 3.5V (-57 dBm to +24 dBm) 10 Hz to 30 MHz.

The 5700A contains many features that make it an easy-to-use and powerful tool in and out of the standards lab. For a thorough list of these features, refer to the 5700A Operator Manual. The Operator Manual is the primary source of information on all topics relating to operating the instrument in local and remote modes. Descriptions of all the books supplied with the 5700A, including this Service Manual, are provided next.

1-2. HOW TO USE THE MANUAL SET

The 5700A Manual Set provides complete information for the operator and service or maintenance personnel. The set includes the following manuals:

- | | | |
|---|--|------------|
| o | 5700A Getting Started Guide | P/N 791962 |
| o | 5700A Operator Manual | P/N 791905 |
| o | 5700A Operator Reference Guide | P/N 813568 |
| o | 5700A Remote Programming Reference Guide | P/N 813550 |
| o | 5700A Service Manual | P/N 791996 |

Each of the manuals listed above is shipped with every instrument. The two reference guides are packaged inside the 5700A Operator Manual. Order additional copies of the manuals or reference guides separately using the part number provided. For ordering instructions, refer to the Fluke Catalog, or ask a Fluke sales representative.

1-6. 5700A Operator Reference Guide

The 5700A Operator Reference Guide contains a summary of operating instructions from the Operator Manual. This reference guide contains information needed to start up and operate the 5700A. It contains a front and rear feature reference and a softkey menu tree. The guide is included with the 5700A Operator Manual.

1-7. The 5700A Remote Programming Reference Guide

The 5700A Remote Programming Reference Guide contains a summary of remote commands for the 5700A. It also contains information needed to determine system status using the status byte and registers. This reference guide is also included with the 5700A Operator Manual.

1-8. SPECIFICATIONS

The following tables provide specifications for the 5700A, including operation with the Wideband AC Module (Option 5700A-03) and the 5725A Amplifier.

Specifications are valid after allowing a warm-up period of 30 minutes, or twice the time the 5700A has been turned off. For example, if the 5700A has been turned off for five minutes, the warm-up period is ten minutes.

To simplify evaluation of how the 5700A covers your calibration workload, use the 5700A Absolute Uncertainty specifications. Absolute uncertainty includes stability, temperature coefficient, linearity, line and load regulation, and the traceability to external standards. You do not need to add anything to absolute uncertainty to determine the ratios between 5700A uncertainties and the uncertainties of your calibration workload.

Relative Uncertainty specifications are provided for enhanced accuracy applications. These specifications apply when range constants are adjusted (see "Range Calibration"). To calculate absolute uncertainty, you must combine the uncertainties of your external standards and techniques with relative uncertainty.

Secondary Performance Specifications and Operating Characteristics are included in uncertainty specifications. They are provided for special calibration requirements such as stability or linearity testing.

AC Voltage

Range	Resolution	Frequency	Absolute Uncertainty ± 5°C from calibration temperature				Relative Uncertainty ± 1°C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			Hz	± (ppm output + μV)				± (ppm output + μV)
2.2 mV	1 nV	10-20	500 + 5	550 + 5	600 + 5	600 + 5	500 + 5	550 + 5
		20-40	200 + 5	220 + 5	230 + 5	240 + 5	200 + 5	220 + 5
		40-20k	100 + 5	110 + 5	120 + 5	120 + 5	60 + 5	65 + 5
		20k-50k	340 + 5	370 + 5	390 + 5	410 + 5	100 + 5	110 + 5
		50k-100k	800 + 8	900 + 8	950 + 8	950 + 8	220 + 8	240 + 8
		100k-300k	.11% + 15	.12% + 15	.13% + 15	.13% + 15	400 + 15	440 + 15
		300k-500k	.15% + 30	.17% + 30	.17% + 30	.18% + 30	.10% + 30	.11% + 30
500k-1M	.30% + 30	.33% + 30	.35% + 30	.36% + 30	.3% + 30	.33% + 30		
22 mV	10 nV	10-20	500 + 6	550 + 6	600 + 6	600 + 6	500 + 6	550 + 6
		20-40	200 + 6	220 + 6	230 + 6	240 + 6	200 + 6	220 + 6
		40-20k	100 + 6	110 + 6	120 + 6	120 + 6	60 + 6	65 + 6
		20k-50k	340 + 6	370 + 6	390 + 6	410 + 6	100 + 6	110 + 6
		50k-100k	800 + 8	900 + 8	950 + 8	950 + 8	220 + 8	240 + 8
		100k-300k	.11% + 15	.12% + 15	.13% + 15	.13% + 15	400 + 15	440 + 15
		300k-500k	.15% + 30	.17% + 30	.17% + 30	.18% + 30	.10% + 30	.11% + 30
500k-1M	.30% + 30	.33% + 30	.35% + 30	.36% + 30	.3% + 30	.33% + 30		
220 mV	100 nV	10-20	500 + 16	550 + 16	600 + 16	600 + 16	500 + 16	550 + 16
		20-40	200 + 10	220 + 10	230 + 10	240 + 10	200 + 10	220 + 10
		40-20k	95 + 10	100 + 10	110 + 10	110 + 10	60 + 10	65 + 10
		20k-50k	300 + 10	330 + 10	350 + 10	360 + 10	100 + 10	110 + 10
		50k-100k	750 + 30	800 + 30	850 + 30	900 + 30	220 + 30	240 + 30
		100k-300k	940 + 30	.1% + 30	.11% + 30	.11% + 30	400 + 30	440 + 30
		300k-500k	.15% + 40	.17% + 40	.17% + 40	.18% + 40	.1% + 40	.11% + 40
500k-1M	.30% + 100	.33% + 100	.35% + 100	.36% + 100	.3% + 100	.33% + 100		
2.2V	1 μV	10-20	500 + 100	550 + 100	600 + 100	600 + 100	500 + 100	550 + 100
		20-40	150 + 30	170 + 30	170 + 30	180 + 30	150 + 30	170 + 30
		40-20k	70 + 7	75 + 7	80 + 7	85 + 7	40 + 7	45 + 7
		20k-50k	120 + 20	130 + 20	140 + 20	140 + 20	100 + 20	110 + 20
		50k-100k	230 + 80	250 + 80	270 + 80	280 + 80	200 + 80	220 + 80
		100k-300k	400 + 150	440 + 150	470 + 150	480 + 150	400 + 150	440 + 150
		300k-500k	.10% + 400	.11% + 400	.12% + 400	.12% + 400	.1% + 400	.11% + 400
500k-1M	.20% + 1 mV	.22% + 1 mV	.23% + 1 mV	.24% + 1 mV	.2% + 1 mV	.22% + 1 mV		
22V	10 μV	10-20	500 + 1 mV	550 + 1 mV	600 + 1 mV	600 + 1 mV	500 + 1 mV	550 + 1 mV
		20-40	150 + 300	170 + 300	170 + 300	180 + 300	150 + 300	170 + 300
		40-20k	70 + 70	75 + 70	80 + 70	85 + 70	40 + 70	45 + 70
		20k-50k	120 + 200	130 + 200	140 + 200	140 + 200	100 + 200	110 + 200
		50k-100k	230 + 400	250 + 400	270 + 400	280 + 400	200 + 400	220 + 400
		100k-300k	500 + 1.7 mV	550 + 1.7 mV	550 + 1.7 mV	600 + 1.7 mV	500 + 1.7 mV	550 + 1.7 mV
		300k-500k	.12% + 5 mV	.13% + 5 mV	.13% + 5 mV	.14% + 5 mV	.12% + 5 mV	.13% + 5 mV
500k-1M	.26% + 9 mV	.28% + 9 mV	.29% + 9 mV	.30% + 9 mV	.26% + 9 mV	.28% + 9 mV		
			± (ppm output + mV)				± (ppm output + mV)	
220V	100 μV	10-20	500 + 10	550 + 10	600 + 10	600 + 10	500 + 10	550 + 10
		20-40	150 + 3	170 + 3	170 + 3	180 + 3	150 + 3	170 + 3
		40-20k	75 + 1	80 + 1	85 + 1	90 + 1	45 + 1	50 + 1
		20k-50k	200 + 4	220 + 4	240 + 4	250 + 4	100 + 1	110 + 1
		50k-100k	500 + 10	550 + 10	600 + 10	600 + 10	300 + 10	330 + 10
		100k-300k	.15% + 110	.15% + 110	.16% + 110	.16% + 110	.15% + 110	.15% + 100
		300k-500k	.50% + 110	.52% + 110	.53% + 110	.54% + 110	.50% + 110	.52% + 110
500k-1M	1.20% + 220	1.25% + 220	1.25% + 220	1.30% + 220	1.20% + 220	1.20% + 220		
1100V	1 mV	50-1k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4
5725A Amplifier:								
1100V	1 mV	40-1k	75 + 4	80 + 4	85 + 4	90 + 4	50 + 4	55 + 4
		1k-20k	105 + 6	125 + 6	135 + 6	165 + 6	85 + 6	105 + 6
		20k-30k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
750V		30k-50k	230 + 11	360 + 11	440 + 11	600 + 11	160 + 11	320 + 11
		50k-100k	600 + 45	.13% + 45	.16% + 45	.23% + 45	380 + 45	.12% + 45

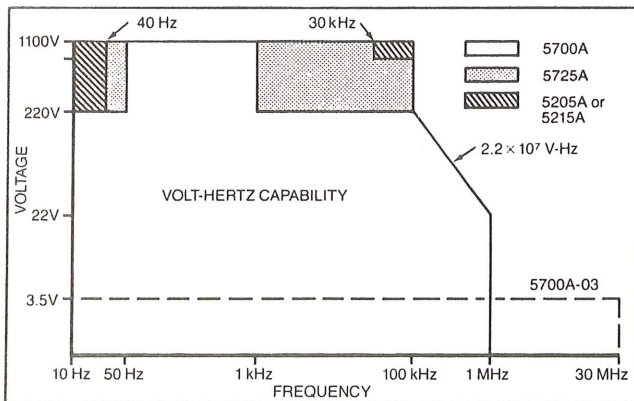
AC Voltage (continued)

Secondary Performance and Operating Characteristics (continued)
Included in Uncertainty Specifications

5725A Amplifier:						
Range	Frequency	Stability ± 1°C 24 Hours	Temperature Coefficient		Load Regulation [Note 2]	Distortion Bandwidth 10 Hz-10 MHz
			10°-40°C	0°-10°C and 40°-50°C		
	Hz	± (ppm output + mV)	± (ppm output)/°C		± (ppm output + mV)	± (% output)
						150 pF 1000 pF
1100V	40-1k	10 + .5	5	5	10 + 1	.07
	1k-20k	15 + 2	5	5	90 + 6	.10
	20k-50k	40 + 2	10	10	275 + 11	.30
	50k-100k	130 + 2	30	30	500 + 30	.30

Voltage Range	Maximum Current Limits	Load Limits
2.2V [Note 1] 22V 220V	50 mA, 0°C-40°C 20 mA, 40°C-50°C	>50Ω, 1000 pF
1100V	6 mA	600 pF
5725A Amplifier:		1000 pF [Note 2]
1100V	40 Hz-5 kHz	50 mA
	5 kHz-30 kHz	70 mA
	30 kHz-100 kHz	70 mA [Note 3]
		300 pF
		150 pF

- Notes:
- 2.2V Range, 100 kHz-1.2 MHz only: uncertainty specifications cover loads to 10 mA or 1000 pF. For higher loads, load regulation is added
 - The 5725A will drive up to 1000 pF of load capacitance. Uncertainty specifications include loads to 300 pF and 150 pF as shown under "Load Limits." For capacitances up to the maximum of 1000 pF, add "Load Regulation."
 - Applies from 0°C to 40°C.



Output display formats: Voltage or dBm, dBm reference 600Ω.

Minimum output: 10% on each range

External sense: Selectable for 2.2V, 22V, 220V, and 1100V ranges; 5700A <100 kHz, 5725A <30 kHz

Settling time to full accuracy:

Frequency (Hz)	Settling time (seconds)
<120	7
120-120k	5
>120k	2

+ 1 second for amplitude or frequency range change; + 2 seconds for 5700A 1100V range; + 4 seconds for 5725A 1100V range

Overshoot: <10%

Common mode rejection: 140 dB, DC to 400 Hz

Frequency:

Range: 10 Hz to 1.1999 MHz

Uncertainty: ± 0.01%

Resolution: 4½ digits

Phase lock: Selectable rear panel BNC input

Phase uncertainty (except 1100V range):

>30 Hz: ± (1° + 0.05°/kHz), <30 Hz: ± 3°

Input voltage: 1V to 10V rms sine wave

Frequency range: 10 Hz to 1.1999 MHz

Lock range: ± 2% of frequency

Lock-in time: Larger of 10/frequency or 10 msec

Phase reference: Selectable, rear panel BNC output

Range: ± 180°

Phase Uncertainty (except 1100V range):

± 1° at quadrature points (0°, ± 90°, ± 180°) elsewhere ± 2°

Stability: ± 0.1°

Resolution: 1°

Output level: 2.5V rms ± 0.2V

Frequency range: 50 Hz to 1 kHz, useable 10 Hz to 1.1999 MHz

Current Derating Factors

Nominal Value	Value of Derating Factor K for Over or Under Current		
	Two-Wire Comp $I < I_L$ (Note 1)	Four-Wire $I < I_L$ (Note 1)	Four-Wire $I_U < I < I_{MAX}$ (Note 2)
Ω			
SHORT	4.4	300	—
1	4.4	300	4×10^{-5}
1.9	4.4	160	1.5×10^{-4}
10	4.4	30	1.6×10^{-3}
19	4.4	16	3×10^{-3}
100	4.4	3.5	1×10^{-2}
190	4.4	1.8	1.9×10^{-2}
1k	4.4	0.4	0.1
1.9k	4.4	0.21	0.19
10k	5000	50	2.0
19k	5000	26	3.8
100k	—	7.5	2×10^{-5}
190k	—	4.0	3.8×10^{-5}
1M	—	1.0	1.5×10^{-4}
1.9M	—	0.53	2.9×10^{-4}
10M	—	0.2	1×10^{-3}
19M	—	0.53	1.9×10^{-3}
100M	—	0.1	—

Notes:

- For $I < I_L$, errors occur due to thermally generated voltages within the 5700A. Use the following equation to determine the error, and add this error to the corresponding UNCERTAINTY or STABILITY specification.

$$\text{Error} = K(I_L - I)/(I_L \times I)$$

Where: Error is in m Ω for all TWO-WIRE COMP values and FOUR-WIRE SHORT, and in ppm for the remaining FOUR-WIRE values.

K is the constant from the above table;
 I and I_L are expressed in mA for SHORT to 1.9 k Ω ;
 I and I_L are expressed in μ A for 10 k Ω to 100 M Ω

- For $I_U < I < I_{MAX}$ errors occur due to self-heating of the resistors in the 5700A. Use the following equation to determine the error in ppm, and add this error to the corresponding UNCERTAINTY or STABILITY specification.

$$\text{Error in ppm} = K(I^2 - I_U^2)$$

Where: K is the constant from the above table;
 I and I_U are expressed in mA for SHORT to 19 k Ω ;
 I and I_U are expressed in μ A for 100 k Ω to 100 M Ω

AC Current

Range	Resolution	Frequency	Absolute Uncertainty ± 5°C from calibration temperature				Relative Uncertainty ± 1°C	
			24 Hours	90 Days	180 Days	1 Year	24 Hours	90 Days
			± (ppm output + nA)					
220 µA	1 nA	10-20	650 + 30	700 + 30	750 + 30	800 + 30	450 + 30	500 + 30
		20-40	350 + 25	380 + 25	410 + 25	420 + 25	270 + 25	300 + 25
		40-1k	120 + 20	140 + 20	150 + 20	160 + 20	110 + 20	120 + 20
		1k-5k	500 + 50	600 + 50	650 + 50	700 + 50	450 + 50	500 + 50
		5k-10k	.15% + 100	.16% + 100	.17% + 100	.18% + 100	.14% + 100	.15% + 100
2.2 mA	10 nA	10-20	650 + 50	700 + 50	750 + 50	800 + 50	450 + 50	500 + 50
		20-40	350 + 40	380 + 40	410 + 40	420 + 40	270 + 40	300 + 40
		40-1k	120 + 40	140 + 40	150 + 40	160 + 40	110 + 40	120 + 40
		1k-5k	500 + 500	600 + 500	650 + 500	700 + 500	450 + 500	500 + 500
		5k-10k	.15% + 1 µA	.16% + 1 µA	.17% + 1 µA	.18% + 1 µA	.14% + 1 µA	.15% + 1 µA
22 mA	100 nA	10-20	650 + 500	700 + 500	750 + 500	800 + 500	450 + 500	500 + 500
		20-40	350 + 400	380 + 400	410 + 400	420 + 400	270 + 400	300 + 400
		40-1k	120 + 400	140 + 400	150 + 400	160 + 400	110 + 400	120 + 400
		1k-5k	500 + 5 µA	600 + 5 µA	650 + 5 µA	700 + 5 µA	450 + 5 µA	500 + 5 µA
		5k-10k	.15% + 10 µA	.16% + 10 µA	.17% + 10 µA	.18% + 10 µA	.14% + 10 µA	.15% + 10 µA
220 mA	1 µA	10-20	650 + 5	700 + 5	750 + 5	800 + 5	450 + 5	500 + 5
		20-40	350 + 4	380 + 4	410 + 4	420 + 4	280 + 4	300 + 4
		40-1k	120 + 4	150 + 4	170 + 4	180 + 4	110 + 4	130 + 4
		1k-5k	500 + 50	600 + 50	650 + 50	700 + 50	450 + 50	500 + 50
		5k-10k	.15% + 100	.16% + 100	.17% + 100	.18% + 100	.14% + 100	.15% + 100
2.2A	10 µA	40-1k	600 + 40	650 + 40	700 + 40	750 + 40	600 + 40	650 + 40
		1k-5k	700 + 100	750 + 100	800 + 100	850 + 100	650 + 100	750 + 100
		5k-10k	.80% + 200	.90% + 200	.95% + 200	1.0% + 200	.75% + 200	.85% + 200
5725A Amplifier:								
11A	100 µA	40-1k	370 + 170	400 + 170	440 + 170	460 + 170	300 + 170	330 + 170
		1k-5k	800 + 380	850 + 380	900 + 380	950 + 380	700 + 380	800 + 380
		5k-10k	.3% + 750	.33% + 750	.35% + 750	.36% + 750	.28% + 750	.32% + 750

Wideband AC Voltage (Option -03)

Specifications apply to the end of the cable and 50Ω termination used for calibration:

Range		Resolution	Absolute Uncertainty ±5°C from calibration temperature 30 Hz-500 kHz			
Volts	dBm		24 Hours	90 Days	180 Days	1 Year
± (% output + μV)						
1.1 mV	-46	10 nV	.4 + .4	.5 + .4	.6 + .4	.8 + 2
3 mV	-37	10 nV	.4 + 1	.45 + 1	.5 + 1	.7 + 3
11 mV	-26	100 nV	.2 + 4	.35 + 4	.5 + 4	.7 + 8
33 mV	-17	100 nV	.2 + 10	.3 + 10	.45 + 10	.6 + 16
110 mV	-6.2	1 μV	.2 + 40	.3 + 40	.45 + 40	.6 + 40
330 mV	+3.4	1 μV	.2 + 100	.25 + 100	.35 + 100	.5 + 100
1.1V	+14	10 μV	.2 + 400	.25 + 400	.35 + 400	.5 + 400
3.5V	+24	10 μV	.15 + 500	.2 + 500	.3 + 500	.4 + 500

Frequency	Frequency Resolution	Amplitude Flatness, 1 kHz Reference			Temperature Coefficient	Settling Time To Full Accuracy	Harmonic Distortion
		Voltage Range					
		1.1 mV	3 mV	>3 mV			
Hz	Hz	± %			± ppm/°C	Seconds	dB
10-30	.01	.3	.3	.3	100	7	-40
30-120	.01	.1	.1	.1	100	7	-40
120-1.2k	.1	.1	.1	.1	100	5	-40
1.2k-12k	1	.1	.1	.1	100	5	-40
12k-120k	10	.1	.1	.1	100	5	-40
120k-1.2M	100	.2 + 3 μV	.1 + 3 μV	.1 + 3 μV	100	5	-40
1.2M-2M	100k	.2 + 3 μV	.1 + 3 μV	.1 + 3 μV	100	0.5	-40
2M-10M	100k	.4 + 3 μV	.3 + 3 μV	.2 + 3 μV	100	0.5	-40
10M-20M	1M	.6 + 3 μV	.5 + 3 μV	.4 + 3 μV	150	0.5	-34
20M-30M	1M	1.5 + 15 μV	1.5 + 3 μV	1 + 3 μV	300	0.5	-34

Additional Operating Information:

dBm reference = 50Ω

Range boundaries are at voltage points, dBm levels are approximate.

$$\text{dBm} = 10 \log \left(\frac{\text{Power}}{1 \text{ mW}} \right)$$

0.22361V across 50Ω = 1 mW or 0 dBm

Minimum output: 300 μV (-57 dBm)

Frequency uncertainty: ±0.01%

Overload protection: A short circuit on the wideband output will not result in damage. After settling time, normal operation is restored upon removal.