067-0543-99

D.C. VOLTAGE BRIDGE

067-0543-99

D.C. Voltage Bridge

ELECTRICAL PARTS LIST

Ckt No.	Tek P/N	Description		
		BULBS		
B152	150-0043-00	Incandescent 10V, white		
B153	150-0043-00	Incandescent 10V, white		
B175	150-0027-00	Neon, 5AB		
		CAPACITORS		
C105	290-0019-00	150µf	EMC	250V
C115	290-0201-00	100µf	EMT	15V
C117	283-0003-00	.01µf	Cer	150V
C156	283-0059-00	1µf	Cer	25V
C157	290-0278-00	550µf	EMC	50V
C159	283-0059-00	1µf	Cer	25V
C161	283-0082-00	.01µf	Fxd	4KV
C175	285-0622-00	0.1µf	Mylar	100V
C176	285-0622-00	o.1µf	Mylar	100V
C177	285-0622-00	0.1µf	Mylar	100V
C181	283-0003-00	.01µf	Fxd	150V
C182	283-0003-00	.01µf	Fxd	150V
C184	283-0059-00	1µf	Fxd	25V
C185	285-0622-00	0.1µf	Mylar	100V
C192	283-0079-00	.01µf	Fxd	250V
C197	290-0219-00	5µf	Tant	25V
C199	283-0082-00	.01µf	Fxd	4KV
C205	283-0059-00	1µf	Cer	25V
C207	283-0079-00	.01µf	Fxd	250V
C213	281-0524-00	150pf	Cer	500V
C215	283-0059-00	1µf	Cer	25V
C225	283-0059-00	1µf	Cer	25V
C233	281-0525-00	270pf	Cer	
C235	290-0219-00	5µf	Tant	25V
C243	283-0079-00	.01µf	Fxd	250V
C247	283-0081-00	0.1µf	Fxd	25V
		CONNECTORS		
P101	131-0102-02	Connector, motor base		
J161	129-0063-00	Connector, binding post, char.		
J162	131-0106-00	Connector, BNC		
J171	136-0140-00	Connector, Banana Jack, char.		
J173	129-0063-00	Connector, Binding post, char.		
J175	129-0051-00	Connector, Binding post		
J199	131-0106-00	Connector, BNC		

Ckt. No.	Tek P/N	Description		
		DIODES		
D102	152-0107-00	Silicon	1N647	400V
D103	152-0107-00	Silicon	1N647	400V
D104	152-0107-00	Silicon	1N647	400V
D105	152-0107-00	Silicon	1N647	400V
D107	152-0147-00	Zenner	Z1N971	27V
D110	152-0166-00	Zenner	Z1N953	6V
D111	152-0107-00	Silicon	1N647	400V
D112	152-0107-00	Silicon	1N647	400V
D115	152-0171-00	Zenner	1N944	11.7V (selected)
D151	152-0107-00	Selicon	1N647	400V
D152	152-0107-00	Silicon	1N647	400V
D153	152-0107-00	Silicon	1N647	400V
D154	152-0107-00	Silicon	1N647	400V
D159	152-0149-00	Zenner	1N961	10V
D193	152-0233-00	Silicon	CD61128	100V
D194	152-0233-00	Silicon	CD61128	100V
D201	152-0185-00	Silicon	6185	100V
		FUSES		
F101	159-0054-00	.15A	3AG	SloBlo
		RESISTORS		
R102	302-0100-00	10Ω	½W	10%
R107	308-0053-00	8K	8W	WW
R109	322-0156-00	412Ω	¼W	1%
R112	323-0183-00	787Ω	½W	1%
R114	323-0259-00	4.87K	½W	1%
R118	301-0113-00	11K	½W	5%
R119	302-0561-00	560Ω	½W	10%
R120	311-0558-00	500Ω	Var	
R121	321-0297-00	12.1K	⅛W	1%
R123	321-0664-00	100K	¼W	¼%
R124	309-0351-00	6.67M	½W	1%
R125	311-0509-00	1K	Var	
R127	308-0323-00	1K	¼W	WW (set of 12)
R128				
R129				
R130				
R131				
R132				
R133				
R134				
R135				
R136				
R137				
R138				
R140	311-0558-00	500Ω	Var	
R141	308-0316-00	3.1K	¼W	1%
R145	E311-0557-00	5K	Var	
R151	316-0271-00	270Ω	¼W	10%
R152	315-0121-00	120Ω	¼W	5%
R153	315-0121-00	120Ω	¼W	5%
R154	316-0271-00	270Ω	¼W	10%
R155	316-0473-00	47K	¼W	10%
R157	316-0103-00	10K	¼W	10%

Ckt No.	Tek P/N	Description		
R159	316-0272-00	2.7K	1/4W	10%
R161	302-0106-00	10M	1/2W	10%
R163	E308-0525-00	Matched set of 6 ea		
R164				
R165				
R166				
R167				
R168				
R170	311-0204-00	10K	Var	
R171	323-0383-00	95.3K	1/2W	10%
R173	E314-0008-00	99.8M	3W	2%
R174	306-0224-00	220K	2W	10%
R176	306-0224-00	220K	2W	10%
R177	302-0224-00	220K	1/4W	10%
R181	316-0101-00	100Ω	1/4W	10%
R182	316-0101-00	100Ω	1/4W	10%
R191	316-0103-00	10K	1/4W	10%
R192	316-0475-00	4.7M	1/4W	10%
R193	316-0225-00	2.2M	1/4W	10%
R195	316-0475-00	4.7M	1/4W	10%
R196	316-0394-00	390K	1/4W	10%
R197	316-0393-00	39K	1/4W	10%
R198	302-0105-00	1M	1/2W	10%
R199	302-0106-00	10M	1/2W	10%
R202	316-0823-00	82K	1/4W	10%
R203	316-0474-00	470K	1/4W	10%
R212	316-0823-00	82K	1/4W	10%
R213	316-0474-00	470K	1/4W	10%
R222	316-0823-00	82K	1/4W	10%
R223	316-0474-00	470K	1/4W	10%
R232	316-0682-00	6.8K	1/4W	10%
R233	316-0154-00	150K	1/4W	10%
R241	316-0103-00	10K	1/4W	10%
		SWITCHES		
SW180	119-1016-00	Chopper Airpax		
SW125	E260-0875-00	Rotary, Range		
SW115	E260-0874-00	Rotary, Polarity		
SW145	E260-0876-00	Rotary, Readout		
SW101	260-0134-00	Toggle, Power On		
		TRANSISTORS		
Q114	151-0164-00	2N3702		
Q154	151-0190-00	2N3904		
Q157	151-0190-00	2N3904		
Q195	151-0190-00	2N3904		
Q197	151-0190-00	2N3904		
Q204	151-0190-00	2N3904		
Q214	151-0190-00	2N3904		
Q224	151-0190-00	2N3904		
Q234	151-0190-00	2N3904		
Q244	151-0183-00	2N2192		
		TRANSFORMER		
T101	E120-0479-00	#25-71		

067-0543-99

D.C. VOLTAGE BRIDGE

Mechanical Parts List

Qty	Tek P/N	Description
1	124-0092-00	Ceramic strip, 3 notch
6	124-0095-00	Ceramic strip, 9 notch
2	124-0106-00	Ceramic strip, 11 notch
2	E129-0115-00	Post, non metallic, delrin
1	E129-0121-00	Post, nylon
2	136-0164-00	Socket, Dialco
1	136-0181-00	Socket, transistor, 3 pin
1	136-0183-00	Socket, transistor, 3 pin
8	136-0220-00	Socket, transistor, 3 pin
2	E136-0245-00	Light conductor
1	E136-0256-00	Socket ass'y, electron tube
2	166-0025-00	Spacer, 3/16 x 1/4
1	E179-1180-00	Cable Harness
1	200-0256-00	Cover, cap
1	200-0538-00	Cover, cap
1	200-0582-00	Cap, fuse
1	214-0488-00	Lug, pot indicator index
1	214-0553-00	Latch, screw
1	E214-0923-00	Insulator plate
1	331-0091-00	Duo dial
1	E333-0973-01	Front panel
2	343-0002-00	Clamp, cable 3/16
1	343-0043-00	Strap, neon
4	344-0131-00	Clip, EC Board
1	348-0050-00	Grommet, 3/4
2	348-0056-00	Grommet, 3/8
1	348-0055-00	Grommet, 1/4
1	348-0064-00	Grommet, 5/8
2	348-0067-00	Grommet, 5/16
1	351-0096-00	Guide, corner rail extrusion
1	352-0010-00	Holder, fuse
1	354-0234-00	Ring, transistor socket
2	358-0169-00	Bushing, binding post
2	358-0216-00	Bushing, panel
1	358-0255-00	Bushing, latch
1	E348-0415-00	Bushing
17	361-0008-00	Spacer, ceramic strip
2	366-0113-00	Knob, charcoal
1	366-0279-00	Knob, lg. char.
1	376-0007-00	Coupling
2	376-0011-00	Coupling
3	384-0615-00	Rod, plug-in rail
1	E384-0659-00	Extension shaft Long, from DUO DIAL to POT
2	E384-0669-00	Extension shaft SHAFT, for SWITCH to DIAL
1	386-0252-00	Flange, sm. fiber
1	386-0254-00	Flange, lg. fiber

ORDER PARTS FROM 55-660 CUSTOMER SERVICE

6663

Qty	Tek P/N	Description
1	E386-1179-00	Plate, rear
1	E386-1180-00	Plate, front sub.
1	E388-0840-00	Board, EC
1	E407-0348-00	Bracket, angle
1	432-0048-00	Base, cap. mtg.
1	E441-0716-00	Chassis
1	390-0006-00	Cabinet, bottom
1	390-0007-00	Cabinet, top

FACTORY CALIBRATION PROCEDURE

CONTENTS:

This is the guide for calibrating new instruments in Product Manufacturing. The procedure consists of 4 sections:

Equipment Required

Factory Test Limits - Factory Test Limits are limits an instrument must meet before leaving Manufacturing. These limits are often more stringent than advertised performance requirements. This is to insure that the instrument will meet advertised requirements after shipment, allows for individual differences in test equipment used, and (or) allows for changes in environmental conditions.

Short Form Procedure - The Short Form Procedure has the same sequence of steps and the same limits on checks or adjustments as the Main Procedure.

Main Procedure - The Main Procedure gives more detailed instructions for the calibration of the instrument. This procedure may require that some checks and adjustments be made so that performance is better than that required by the Factory Test Limits. This insures the Factory Test Limits will be met when side panels are added, permits some normal variation in test equipment and plug-in scopes, etc.

Abbreviations in this procedure will be found listed in TEKTRONIX STANDARD A-100. Definitions of terms used in this procedure may be found in TEKTRONIX STANDARD A-101.

In this procedure, all front panel control labels and Tektronix instrument names are in capital letters (VOLT/DIV, etc). Internal adjustment labels are capitalized only (Gain Adj, etc).

This procedure is company confidential

DC VOLTAGE BRIDGE
067-0543-99

February, 1970

For all serial numbers.

CHANGE INFORMATION:

This procedure has been prepared by Staff Engineering. For information on changes made to this procedure, to make suggestions for changing this procedure, or to order additional copies: please contact Staff Engineering, 39-307.

EQUIPMENT REQUIRED

All TEKTRONIX test equipment must be calibrated to Factory Test Limits using methods specified in the applicable TEKTRONIX Factory Calibration Procedure. Other test equipment should be calibrated to its manufacturer's specifications. Exceptions to calibration procedures, which are necessary to improve the measurement capability of some test equipment, e.g. calibrated to ±0.5% accuracy at some specific setting, are noted on this Equipment Required List.

Equivalent test equipment may be used. A Test-Final Staff Engineer must approve any substitutions.

a. TEKTRONIX Instruments

1 TYPE 560-Series OSCILLOSCOPE
1 TYPE 3A3 DUAL TRACE DIFFERENTIAL UNIT
1 TYPE 2B67 TIME-BASE UNIT

b. Calibration Fixtures and Accessories

1	Standard Amplitude Calibrator (SAC)	(067-0502-01)
1	P6028 1X Probe	(010-0074-00)
1	50Ω 42" Cable BNC	(010-0057-00)
1	Lead, Banana to Alligator Clip, Black	(012-0014-00)
1	Lead, Banana to Alligator Clip, Red	(012-0015-00)
1	TU76 Line Voltage Control	(067-0048-00)

c. Other Manufacturer's Equipment

1 Multimeter, 20,000Ω/VDC
*1 Voltmeter: accurate within 0.004% at 11.0VDC (H-P Model 3460B)

*Equipment must be traceable to NBS for certification of measurement characteristcs.

Factory Test Limits are qualified by the conditions specified in the main body of the Factory Calibration Procedure. The numbers and letters to the left of the limits correspond to the procedure steps where the check or adjustment is made. Steps without Factory Test Limits (setups, presets, etc.) are not listed. Instruments may not meet Factory Test Limits if calibration or checkout methods and test equipment differ substantially from those in this procedure.

*6. READOUT DIVIDERS

Max error: ±(0.05% of indicated value +1div)

7. INPUT DIVIDERS

a. 1.1V to 1.1kV ranges: ±(0.05% +1div) max error

b. 4 to 11kV ranges: ±(1% for each kV minus 2%) max error

9. DIFFERENCE OUTPUT

b. Ripple: ≤3mV P-P

10. NULL INDICATOR

b. Correct NULL light must be completely extinguished before the following limits are reached:

RANGE	READOUT Dial Max rotation from null
1.1V	±2 minor div
11V	±1 minor div
110V	±0.5 minor div
1.1kV	±0.5 minor div
11kV	±0.5 minor div

THE END

*Indicates measurement characteristic; test equipment must be traceable to NBS for instrument certification.

This instrument must meet Factory Test Limits before it leaves Manufacturing; therefore, it must be possible to inspect to these limits. Because of normal variations in test equipment and plug-in scopes, addition of side panels, etc, this procedure may require that some checks and adjustments be made so that performance is better than that required by Factory Test Limits.

1. PRELIMINARY

a. Check fuse: MDL 15/100 slo-blo
b. Check connections and helidial zero

2. PRESETS

Set controls

3. RESISTANCE CHECKS

a. Check motor base to gnd: ∞
b. Check COMMON jack to gnd: ∞
c. Check resistance from COMMON to ± INPUT:

RANGE	Resistance
1.1V	∞
11V	∞
110V	1M Ω
1.1kV	1M Ω

d. Check resistance from COMMON to ± HV INPUT: 100MΩ
e. Check resistance across 11.7V zener (D115): ≈6kΩ and ≈11kΩ

4. POWER SUPPLIES

a. Check 11.7V zener (D115), 90 to 136 VAC line voltage: <0.5mV variance
b. Check 11.7V zener (D115) ripple: <0.5mV
c. Check 20V supply: ≈24V; <50mV ripple
d. Check 10V supply: ≈10V; <0.5mV ripple

5. REFERENCE ADJUSTMENTS

a. Set R120: 11.000V
b. Set R140: 10.000V
c. Set R125: 1.100V

6. READOUT DIVIDERS

Max error: ±0.05%

7. INPUT DIVIDERS

a. Check RANGE of 1.1V to 1.1kV: ±0.01% +1div
b. Set R170 (11kV Cal)

8. RIPPLE OUTPUT

Check for correct signal at RIPPLE OUTPUT jack

9. DIFFERENCE OUTPUT

a. Check for correct signal at DIFFERENCE OUTPUT jack
b. Check ripple: ≤3mV P-P

10. NULL INDICATOR

a. Check that NULL lights indicate direction of nulls
b. Check that correct NULL light is completely extinguished before the following limits are exceeded:

10b.

RANGE	READOUT Dial max rotation from null
1.1V	±2 minor div
11V	±1 minor div
110V	±0.5 minor div
1.1kV	±0.5 minor div
11kV	±0.5 minor div

11. HIGH VOLTAGE BREAKDOWN

No arc-over at 3kV

THE END

1. PRELIMINARY

a. Check fuse: MDL 15/100 slo-blo

b. Check connections and helidial

Check for solid mechanical and electrical connections on the RANGE switch and helipot.

wiggle helipot knob & sideways movement must be less than minor div.

Set the helidial for 0.0 and check that it will rotate at leaset 1 minor div past 10.0. Make certain the dial will not slip.

2. PRESETS

Set controls:

DCVB	
RANGE	1.1V
POLARITY	+
READOUT	
OUTER	10
INNER	10.0
TYPE 560-Series test scope	
POWER	ON
TYPE 3A3	
MODE	CH 1
TRIGGER	CH 1
CH 1 VOLTS/DIV	1mV
VARIABLE	CAL
BANDWIDTH	500kHz
CH 1 AC-GND-DC	AC
TYPE 2B67	
TIME/DIV	1mSEC
VARIABLE	CALIBRATED
MODE	NORM
LEVEL	AUTO
SLOPE	+
COUPLING	AC SLOW
SOURCE	INT

3. RESISTANCE CHECKS

a. Check resistance from power line connector: ∞

Using the multimeter check from gound to both terminals of the motor base for ∞.

b. Check from COMMON jack to gnd: ∞

Using the multimeter check from gound to the COMMON jack for ∞.

c. Check from COMMON to ±INPUT:

RANGE	Resistance
1.1V	∞
11V	∞
110V	≈1MΩ
1.1kV	≈1MΩ

d. Check from COMMON to ±HV INPUT: ≈100MΩ

Set RANGE to 11kV and using the multimeter, check from COMMON to ±HV INPUT for ≈100MΩ.

e. Check resistance across 11.7V zener (D115): ≈6k or 11kΩ

Using the miltimeter connected across (D115) 11.7V zener, measure the resistance in forward and reverse direction for ≈6kΩ and ≈11kΩ.

4. POWER SUPPLIES

a. Check 11.7V zener (D115) regulator, 90 to 136VAC line voltage: <0.5mV variance

Connect the voltmeter (HP3460B or equivalent) across the 11.7V zener (D115). Apply power using the TU76 and measure ≈11.7 volts @ 115VAC. While varying the line from 90 to 136VAC check that the voltage across D115 does not vary more than ±0.5mV. Disconnect the voltmeter.

Switch RANGE switch to 11V, REA[illegible] [illegible] dial to 10, helidial to 10. [illegible] the HP 3460B between COMMON jack [illegible] wiper [illegible] [illegible] helipot.

4. (Cont.)

b. Check 11.7V zener (D115) ripple: <0.5mV

Connect the 1X (P6022) probe to the TYPE 3A3 input. Using the probe, check ripple on D115 while changing line voltage from 90 to 136VAC: <0.5mV. Set the TU76 for 117VAC.

c. Check 20V supply: ≈24V, <50mV ripple

Using the multimeter check the voltage at the + terminal of C157 for ≈24V. Using the test scope check the ripple at the same point: <50mV.

d. Check 10V supply: ≈10V, <0.5mV ripple

Using the multimeter check the 10V supply at D159 for ≈10V. Using the test scope at the same point, check ripple: <0.5mV.

5. REFERENCE ADJUSTMENTS

a. Set R120 (11 volts adj): 11.000V

Switch RANGE switch to 11V, READOUT outer dial to 10, helidial to 10.0. Connect the HP3460B between COMMON jack and wiper terminal on helipot (rear terminal). Adjust R120 (11 volts adj) for 11.000V.

b. Set R140 (1 volt Cal): 10.000V

Change the helidial to 0.0. Adjust 1 Volt Cal (R140) to 10.000V.

Repeat steps a and b until no interaction occurs.

c. Set R125 (1.1 volt Cal): 1.100V

Change RANGE switch to 1.1V and helidial to 10.0. Adjust R125 (1.1 Volt Cal) for 1.100V.

6. READOUT DIVIDERS max error: ±0.05%

Set RANGE to 11V, check for the following:

READOUT	helidial	DVM reading	max deviation
0	05	50mV	0.025mV
	10	100mV	0.05mV
	20	200mV	0.10mV
	30	300mV	0.15mV
	40	400mV	0.20mV
	50	500mV	0.25mV
	60	600mV	0.30mV
	70	700mV	0.35mV
	80	800mV	0.40mV
	90	900mV	0.45mV
0	100	1.000V	0.5mV
1		2.00V	1.0mV
2		3.00V	1.5mV
3		4.00V	2.0mV
4		5.00V	2.5mV
5		6.00V	3.0mV
6		7.00V	3.5mV
7		8.00V	4.0mV
8		9.00V	4.5mV
9		10.00V	5.0mV
10		11.00V	5.5mV

Change RANGE to 1.1V. Check for 1.100V ±0.55mV.

Change POLARITY to - (Neg) and repeat the entire step.

Disconnect the HP3460B.

7. INPUT DIVIDERS

a. Check error of 1.1V to 1.1kV Ranges: ±0.01% +1div

Apply a known voltage between COMMON and ±INPUT jacks. Set the helidial for a null. Change RANGE to each position and readjust READOUT for null. READOUT should indicate the proper voltage ±0.01% +1div.

b. Set R170 (11kV Cal)

Change RANGE to 11kV and apply a known voltage between COMMON and ±HV INPUT. Adjust READOUT to the proper voltage. Set R170 (11kV Cal) for a null indication.

Remove test equipment.

8. RIPPLE OUTPUT

Check for AC coupling, check at 3kV

Connect a coax cable between RIPPLE OUTPUT and test oscilloscope. Connect the COMMON and ±INPUT to a 3kV power supply. Measure the ripple on the test scope. Disconnect the bridge from the supply and measure the ripple with the X1 probe and the oscilloscope. The ripple should be the same in both cases.

Ripple measurement will change with changes in cable lashup.

9. DIFFERENCE OUTPUT

a. Check for DIFFERENCE OUTPUT signal at connector

Connect a 50Ω cable between DIFFERENCE OUTPUT and test scope input. Connect a DC voltage between COMMON and ±INPUT jacks. Adjust READOUT controls for minimum vertical display on the test scope (null). This should correspond to NULL indicated by the NULL lights on the voltage bridge.

b. Check ripple: ≤3mV P-P

Check that the ripple on the test scope display does not exceed 3mV P-P. Do not include HF hash or chopper switching transients.

Disconnect the test scope and 50Ω cable from the DCVB.

10. NULL INDICATING

a. Check for correct direction of null

The arrows over the indicator lights show the direction the READOUT controls must rotate to obtain a null. If the direction is incorrect reverse the connections to pin 3 and 4 on the chopper socket.

10. (Cont.)

b. Check sensitivity

Check that correct NULL light is completely extingushied before the following limits are reached:

RANGE	READOUT Dial max rotation from null
1.1V	±2 minor div
11V	±1 minor div
110V	±0.5 minor div
1.1kV	±0.5 minor div
11kV	±0.5 minor div

11. HIGH VOLTAGE BREAKDOWN

No arc-over @ 3kV

Apply 3kVDC to the COMMON jack and make certian there is no arc-over to ground.

Disconnect the 3kVDC.

THE END

T101
R102 10 ½W,10%
D102 T160
D103 T160
D104 T160
D105 T160
C105 150µF 250V
R107 8K 8W 3%
D107 27V 1W
R109 680 ½W,5%
D110 6.2V
D111 T160
D112 T160
R112 787 ½W,1%
Q114 2N3702
R114 4.87K ½W,1%
C115 100µF 15V
D115 11.7V
C117 .01 150V
R118 11K ½W,5%
11 VOLTS CAL
OFF
R119
R120 500
R123 100K ¼W, ¼%
R124 6.67M 1%
R121 12.1K ⅛W,1%
R125 1K
1.1V CAL
1.1V
11V
110V
1.1KV
11KV
SW115 POLARITY
NULL
C157 550µF
+20V SUPPLY
+10V SUPPLY
R151 270
D151 T160
D152 T160
R152 120 5%
D153 T160
R153 120 5%
R154 270
D154 T160
B152
B153
NULL
R165 47K
Q157 151-190
C156 1µF
D159 10V
R157 10K
R159 2.7K
C159 1µF
Q154 151-190
MATCHED TO ± .02% ± 7 PPM/°C
R127 1K
R128 1K
R129 1K
R130 1K
R131 1K
R132 1K
R133 1K
R134 1K
R135 1K
R136 1K
R137 1K
R138 1K
R141 3.1K
R140 500
R145 5K
1 VOLT CAL
READOUT (VERNIER)
CONCENTRIC CONTROLS
READOUT SW145
F101
SW101
P101
POWER ON
R181 100
R182 100
C181 .01
C182 .01
6.3V AC 0.6A
C161 .01
J162
RIPPLE OUTPUT
R161 10M
J161
INPUT
R175 220K 2W
R176 220K 2W
R176 220K 10%
R177 220K 10%
C175 0.1 100V
C176 0.1 100V
C177 0.1 100V
SW180
C184 1µF
C185 0.1
B175
R163*
R164*
R165*
R166*
R167*
R168*
1.1V
11V
110V
1.1KV
11KV
J171
R173 99.8M 2%
R171 95.3K ½W, 1%
R170 10K
HIGH VOLTS CAL
J173
J175
RANGE SW125
R191 10K
R192 4.7M
D193
R193 2.2M
C192 .01
Q195 151-190
R195 4.7M
Q197 151-190
R196 390K
C19 5µF
R19 39K
D201
R202 82K
R203 470K
C205 1µF
C207 .01
Q204 151-190
R212 82K
C213 150
R213 470K
C215 1µF
Q214 151-190
R222 82K
R223 470K
C225 1µF
Q224 151-190
R232 6.8K
C233 470
R233 150K
C235 5µF
Q234 151-190
R241 10K
C243 .01
Q244 151-183
C247 0.1
R198 1M ½W
C199 .01
J199
R199 10M ½W,10%
DIFFERENCE OUTPUT

* MATCHED SET OF 6
R163 - 10K
R164 - 90K
R165 - 225K
R166 - 225K
R167 - 225K
R168 - 225K

NOTE:
ALL RESISTORS ¼W, 10% EXCEPT AS NOTED.

REV A - 2-12-68 PEC
R152 R153 WAS 47Ω

067-0572-00 DC VOLTAGE BRIDGE 1650-B

STANDARDS LAB TEST
MAINTENANCE RECORD

INSTRUMENT TYPE 067-0543-99 (DCVB) CAL. FREQ 39 Weeks SER. NO. 343

LOCATION PROC. NO. FCP: Feb. 1970

CAL. STANDARDS HP 3460B #813-00832; HV Divider #7498

PROC. STEP NO	FUNCTION TESTED	CALIBRATION TOLERANCES	CAL DATE 5-24-74 CAL'D BY R Bowman BEFORE	AFTER	CAL DATE CAL'D BY BEFORE	AFTER	CAL DATE CAL'D BY BEFORE	AFTER
7a	Input Range:							
	1.1V @ 1V	.9994-1.0006		1.00002				
	11V @ 10V	9.994-10.006		10.0000				
	110V @ 100V	99.94-100.06		99.997				
	1.1KV @ 1KV	999.4-1000.6		999.98				
7b	11KV @ 3300V(adj)	3245.55-3354.45		3300.1				
	6000V			5996.8				
5a	11V adj.	10.9935-11.0065		11.0001				
5b	1V adj.	.9985-1.0015		1.00000				
5c	1.1V adj.	1.09935-1.10065		1.10001				
6*	Helipot Linearity:	(mV)						
	0V	±.5mV		✓				
	.1V	98.95-101.05		↓				
	.2V	198.90-201.10						
	.3V	298.85-301.15						
	.4V	398.80-401.20						
	.5V	498.75-501.25						
	.6V	598.70-601.30						
	.7V	698.65-701.35						
	.8V	798.60-801.40						
	.9V	898.55-901.45		✓				
	Main Decade:	(V)						
	1V	.9985-1.0015		✓				
	2V	1.9980-2.0020		↓				
	3V	2.9975-3.0025						
	4V	3.9970-4.0030						
	5V	4.9965-5.0035						
	6V	5.9960-6.0040						
	7V	6.9955-7.0045						
	8V	7.9950-8.0050						
	9V	8.9945-9.0055						
	10V	9.9940-10.006		✓				
	Reverse Polarity:	10.9935-11.0065		✓				
10b	Null Sens./1.1V	±2 minor div.		✓				

*Note: In step 6, check to insure that the additive error between the helipot and the main decade (Kelvin Varley Divider) does not exceed ±(.05% + 1 min. div.)

MAINTENANCE 5-24-74 CLEANED & RECAL'D. CLEANED RANGE & POLARITY SWITCHES

STANDARDS LAB TEST
MAINTENANCE RECORD

INSTRUMENT TYPE 067-0543-99 (DCVB) CAL. FREQ 39 Weeks SER. NO. _____

LOCATION _____ PROC. NO. FCP: Feb. 1970

CAL. STANDARDS HP 3460B #813-00832; HV Divider #7498

PROC. STEP NO	FUNCTION TESTED	CALIBRATION TOLERANCES	CAL DATE _____ CAL'D BY _____ BEFORE	AFTER	CAL DATE _____ CAL'D BY _____ BEFORE	AFTER	CAL DATE _____ CAL'D BY _____ BEFORE	AFTER
7a	Input Range:							
	1.1V @ 1V	.9994-1.0006						
	11V @ 10V	9.994-10.006						
	110V @ 100V	99.94-100.06						
	1.1KV @ 1KV	999.4-1000.6						
7b	11KV @ 3300V(adj)	3245.55-3354.45						
5a	11V adj.	10.9935-11.0065						
5b	1V adj.	.9985-1.0015						
5c	1.1V adj.	1.09935-1.10065						
6*	Helipot Linearity:	(mV)						
	0V	±.5mV						
	.1V	98.95-101.05						
	.2V	198.90-201.10						
	.3V	298.85-301.15						
	.4V	398.80-401.20						
	.5V	498.75-501.25						
	.6V	598.70-601.30						
	.7V	698.65-701.35						
	.8V	798.60-801.40						
	.9V	898.55-901.45						
	Main Decade:	(V)						
	1V	.9985-1.0015						
	2V	1.9980-2.0020						
	3V	2.9975-3.0025						
	4V	3.9970-4.0030						
	5V	4.9965-5.0035						
	6V	5.9960-6.0040						
	7V	6.9955-7.0045						
	8V	7.9950-8.0050						
	9V	8.9945-9.0055						
	10V	9.9940-10.006						
	Reverse Polarity:	10.9935-11.0065						
10b	Null Sens./1.1V	±2 minor div.						

*Note: In step 6, check to insure that the additive error between the helipot and the main decade (Kelvin Varley Divider) does not exceed ±(.05% + 1 min. div.)

MAINTENANCE