

VALHALLA SCIENTIFIC INC.

**2555A
AC-DC CURRENT CALIBRATOR**

OPERATION MANUAL



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CERTIFICATION

Valhalla Scientific, Inc. certifies that this instrument was thoroughly tested and inspected and found to meet published specifications when shipped from the factory. Valhalla Scientific, Inc. further certifies that its calibration measurements are traceable to the National Institute of Standards and Technology to the extent allowed by NIST's calibration facility.

WARRANTY

The warranty period for this instrument is stated on your invoice and packing list. Please refer to these to determine appropriate warranty dates. We will repair or replace the instrument during the warranty period provided it is returned to Valhalla Scientific, Inc. freight prepaid. No other warranty is expressed or implied. We are not liable for consequential damages. Permission and a return authorization number must be obtained directly from the factory for warranty repairs. No liability will be accepted if returned without such permission. In the interest of continuing product refinement and due to possible parts manufacturer changes we reserve the right to change any or all specifications without notice.

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SECTION I UNPACKING AND INSTALLATION

1-1. Unpacking

If the shipping carton is damaged, request that the carrier's agent be present when the instrument is unpacked. If the 2555A appears damaged when unpacked, notify the carrier's agent immediately. Even if the instrument appears undamaged it may have suffered internal damage in transit that may not be evident until the instrument is operated or tested to verify performance. If the instrument fails to meet the performance specifications in Section II, notify the carrier's agent and Valhalla Scientific. Retain the shipping carton for the carrier's inspection.

Do not return equipment without obtaining prior authorization from Valhalla Scientific.

1-2. Initial Adjustments

Before operating the 2555A, verify that the correct local power source voltage is selected. The supply voltages and circuit breaker values are listed below:

105 to 125VAC 50/60 Hz 20 Amp Circuit Breaker
210 to 250VAC 50/60 Hz 10 Amp Circuit Breaker

NOTE: Line voltage selection is internal and requires rewiring of the main transformer. It is recommended that this procedure be performed at the factory. All units are wired for 105-125VAC unless a placard attached to the unit indicates otherwise.

1-3. Bench Use

The 2555A is delivered ready for operation in bench use. Before connecting the 2555A to the AC power source, the user should verify that the power cord is equipped with a three-terminal connector (see the Safety Precautions, Section 1-5).

1-4. Rack Mounting

Optional rack mounting brackets are available for mounting the 2555A in a standard 19" equipment rack. These are listed in Section III of this manual. The size and weight of the 2555A require that the unit be supported on both sides along its entire length by the use of trays or slides. When transporting while mounted in a rack, support the unit to prevent vertical movement.

It is recommended that sufficient room be allowed for airflow around the 2555A since performance is diminished at temperatures above 50°C. This may be accomplished by placing at least 1.75" blank panels above and below the 2555A in the rack and ensuring that there are no obstructions within 5" of either the air inlet or outlet on the rear panel of the 2555A.

Under no circumstances should the air temperature surrounding the 2555A be allowed to exceed 50°C in operation or 70°C in storage.

1-5. Safety Precautions

A three-contact power connector and grounded outlet is required for safe operation of the 2555A. If an extension cable is used, it must be a heavy-duty three-contact type capable of carrying at least 15 amps. It must also provide a continuous ground. Unsuitable extension cords will essentially "choke" the 2555A and may cause clipping at high output currents.

CAUTION!

Operation of the 2555A without proper grounding can be hazardous to personnel and equipment.

SECTION II SPECIFICATIONS & OPTIONS

2-1. Description

The Valhalla Scientific Model 2555A AC-DC Current Calibrator is a wide-range voltage-to-current converter that produces an output current directly proportional to the input AC or DC voltage. AC voltage produces an output current of the same frequency and phase that is directly proportional in magnitude.

2-2. Performance Specifications

Ranges:	2mA, 20mA, 200mA, 2A, 20A, 100A
DC Accuracy:	(360 days 23°C ± 5°C) 20 Amp range and below: ± 0.015% of range ± 0.03% of output 100 Amp Range: ± 0.03% of range ± 0.03% of output
AC Accuracy:	(360 days 23°C ± 5°C) 20 Amp range and below: ± 0.15% of range ± 0.1% of output to 100Hz ± 0.2% of range ± 0.2% of output to 400Hz ± 0.3% of range ± 0.3% of output to 1000Hz 100 Amp range: ± 0.3% of range ± 0.1% of output to 100Hz ± 0.4% of range ± 0.2% of output to 400Hz ± 0.6% of range ± 0.3% of output to 1000Hz
Input Impedance:	100kΩ
Compliance Voltage:	(At nominal line voltage and frequency) 100 ampere range typically 3V; 20 amperes and below 5V
Input/Output Ratio:	2.0000V input produces full scale output. (1.0000V input maximum on 100A range)
Maximum Input:	3VDC or Peak AC
Input Common Mode:	60dB at DC linearly decreasing to 40dB at maximum frequency
Temperature Coefficient:	±.0002% of output ±.004% of range/°C for DC below 20°C and above 30°C (double above figures for AC Temperature Coefficient)

2-3. Environmental Specifications

Temperature Range:	Operating: 0°C to 50°C Storage: -25°C to +75°C
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2-4. Physical Specifications

Size:	10.5" H x 17" W x 23" D (Fan included)
Weight:	100 lbs. net, 140 lbs. shipping 45 Kg. net, 66 Kg. shipping

2-5. Accessories

The Model 2555A is shipped from the factory with mating 100 ampere outlet connectors and an instruction manual.

2-6. Rack Mount Option R3

This option allows the 2555A to be mounted in a standard 19" equipment rack enclosure.

2-7. Cable Option BBL

Option BBL provides dual banana leads on 48" cable, shielded to provide low leakage.

2-8. 100A Cable Option HMF

Option HMF provides 4-gauge copper welding cable terminated in 100A plugs and Option Jaws heavy duty 2" Kelvin clips.

2-9. 100A Cable Option HC

Option HC provides a 6-foot cable set terminated on one end in copper ring lugs and on the other end with banana plugs that mate with the 2555A's 100A terminals. Recommended for use with the Valhalla 2575A Current Shunt.

2-10. Buffer Amplifier Model 2009

Model 2009 Buffer Amplifier provides high impedance circuit measurement. This is used to eliminate voltmeter loading effects. The 2009 is a battery operated precision buffer amplifier with a gain of 1.0000. The input impedance is greater than $1 \times 10^{10}\Omega$ and the output impedance is 1Ω maximum (0.1Ω typical).

2-11. Option RV

Option "RV" provides a rear-mounted BNC connector wired in parallel with the front panel Voltage Input Terminals. This becomes useful when rack mounting or for other custom applications.

2-12. Option R-100

Option "R-100" provides rear-mounted cables wired in parallel with the 100 Amp Output Terminals. This becomes useful when rack mounting or for other custom applications.

2-13. Spare 100-ampere Connectors

Spare mating plugs are available for making connections to the 100A terminals of the 2555A. Red plugs may be ordered as Valhalla Stock Number 05-10106. White plugs may be ordered as Stock Number 05-10105.

SECTION III OPERATION

3-1. Input Voltage

The polarity and level of the input voltage determines the polarity and level of the output current. If the input voltage is zero, the output current will be zero. As the input voltage is increased, the output current will increase linearly within the selected range (i.e. for the selected range of 1mA an input voltage of 1.0000 volts DC will produce an output current of 1.0000mA. If the input is increased to 1.5000 volts DC, the output current will increase to 1.5000mA.

If the 10mA range is selected, the output currents will be 10.000mA and 15.000mA for inputs of 1.0000 volts DC and 1.5000 volts DC, respectively. Positive polarity input will produce positive polarity output, and vice-versa.

AC voltage input will produce output current with the same amplitude, frequency and phase characteristics. The maximum input voltage is 2 volts RMS or DC on all ranges except the 100 ampere range. The 100 ampere range is limited to 1 volt RMS or DC.

3-2. Range Selection

To select a different range, move the cable connections to the set of jacks with the required range. Only a single range may be used at any one time. The instrument ranges are defined in decade increments of 2mA, 20mA, 200mA, 2A, 20A, and 100A. For example, if the 2mA range is selected and 1 volt is applied, the output current will be 1 milliampere. If 1 volt AC RMS is

applied, the output will be 1 milliampere AC RMS. Heavy duty connectors are provided for the 100 ampere range. Plugs of the same current rating are supplied for insertion. Wire size AWG #4 or larger should be used to minimize the voltage drop in the connecting leads for the 100 ampere range.

3-3. Output Current

The output current is proportional to the input voltage. A 2-volt input will produce an output current that is 100% of the selected range. For example, if the 2mA range is selected, the output current is 2mA. The 100 Amp range is limited to a 1 volt maximum input; therefore, 1 volt produces 100% of range on the 100 Amp range.

The effective output impedance of the current calibrator approaches infinity; therefore, the output current generating circuit attempts to deliver the requested current into any load impedance applied to the output terminals. A 1mA current output applied to a 1 kohm load impedance produces 1 volt across that load impedance. A 1mA input current applied to a 2 kohm load impedance produces 2 volts.

The maximum output compliance voltage for the 20A range and below is ± 7 volts DC or peak AC. The 7 volt DC maximum compliance voltage corresponds to 4.95 volts RMS maximum compliance voltage for sine wave output currents. The 100A range has a compliance voltage of ± 3 volts DC or peak AC. This requires the use of the highest quality connections and cables to reduce any resistance in the leads.

3-4. Range Limit Indicators

Three LED indicators provide the operator with indication of range limit conditions. The green LED indicates the output voltage is within compliance limits. The yellow LED indicates the output voltage is greater than 5 volts. The red LED indicates the output voltage is 7 volts or out of compliance.

3-5. Standby/Operate Switch

The Standby/Operate switch disables the instrument in the "standby" mode preventing current from being supplied to the load. The "operate" position restores normal operation. The input impedance = ∞ in the standby mode. Do not open the input terminals unless the unit is in standby mode.

CAUTION!

In high current systems using more than one 2555A in parallel, reduce input signal to zero volts before selecting STANDBY.

3-6. Error Sources

Input Impedance: There are potential error sources associated with current calibration. One possible source of error is caused when the impedance of the input voltage source, demonstrated as R_s in Figure 3-1, forms a resistor divider with the 100 kohm input impedance of the current calibrator, R_1 . To reduce the error to 0.01% or less, the ratio of R_1/R_s must be maintained at 10,000/1 or greater. Since R_1 is 100 kohms, the maximum impedance for R_s must be less than 10 ohms.

Output Impedance: The second potential for error occurs at the current output of the AC-DC current calibrator when the input

impedance of the DVM, R_z in Figure 3-1, acts in parallel with the load impedance, R_L . To reduce this error to 0.01% or less the ratio of R_z/R_L must be maintained at 10,000/1 or greater. If the input impedance to the DVM is 10 megohms, the maximum shunt impedance should not exceed 1 kohm. For a shunt impedance of 1 megohm the input impedance of the DVM must be at least 10,000 megohms. To eliminate this problem we offer an optional high impedance buffer, Model 2009. The 2009 is a precision buffer amplifier with an AC/DC gain of 1.0000. See section 2-10 for details.

Inductance In Series: Another potential error source is inductance in series with the load resistor, shown as R_L in Figure 3-2. If the load resistance is 0.001 ohm and the series inductance is 100 nanohenries, the effective load impedance at 1kHz is:

$$Z = \sqrt{0.001\Omega^2 + [2\pi (1\text{kHz}) (100 \times 10^{-9} \text{Henries})]^2}$$

$$Z = \sqrt{0.000001 + 0.0000003}$$

$$Z = 0.001181\Omega$$

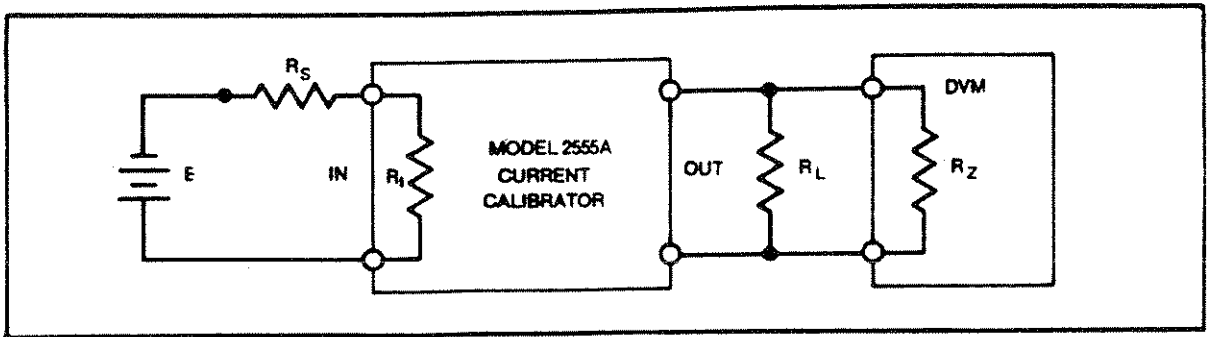


Figure 3-1. Block Diagram, DC Error Sources.

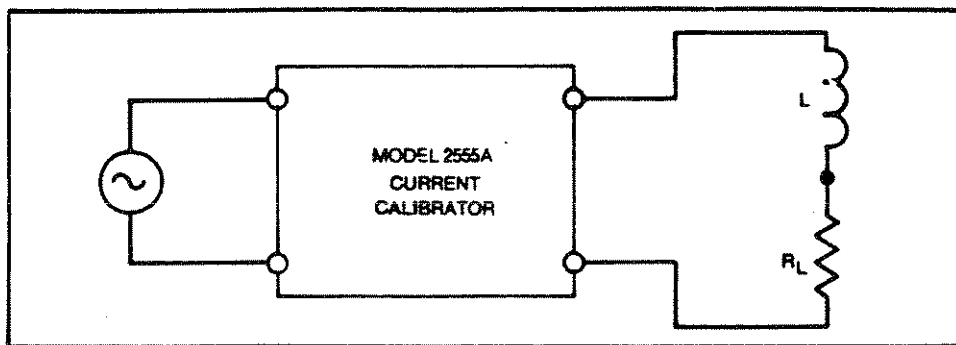


Figure 3-2. Block Diagram, AC Error Sources.



SECTION IV THEORY OF OPERATION

4-1. General

This section of the manual provides a description of the circuits of the 2555A Current Calibrator. The circuit descriptions are referenced to the schematic diagrams at the end of the manual.

4-2. Power Supply

The circuits of the 2555A require two dual power sources. One circuit provides nominal positive and negative 15 volts DC and the other nominal positive and negative 10 volts DC. T1 and diodes CR10 through CR13 generate positive and negative potentials in the range of 20 volts DC. These are regulated to ± 15 volts DC by IC8 and IC9. The positive and negative 10 volt DC sources are obtained from a separate winding on T1 and diodes CR14 through CR17. These sources do not require regulation and are the collector supplies for Q3, Q5-Q44 and Q46.

4-3. Voltage to Current Converter Transconductance Amplifier (U.S. Patent 4,091,333)

A simplified diagram of the voltage-to-current converter is shown in Figure 4-1. The first amplifier, IC1, operates with a gain of 1 due to the operational feedback loop provided by R3. The output of the first amplifier drives the inverting input of the second amplifier, which operates open loop and at very high gain.

The output of the second amplifier, IC2, provides a potentiometric feedback to the non-inverting input of the first amplifier. The system operates to maintain the output of the first amplifier, and the inverting input of the second amplifier, at approximately the same potential as that applied to the non-inverting input of the second amplifier. Very small differences between the inputs of the second amplifier are sufficient to drive it to full scale output.

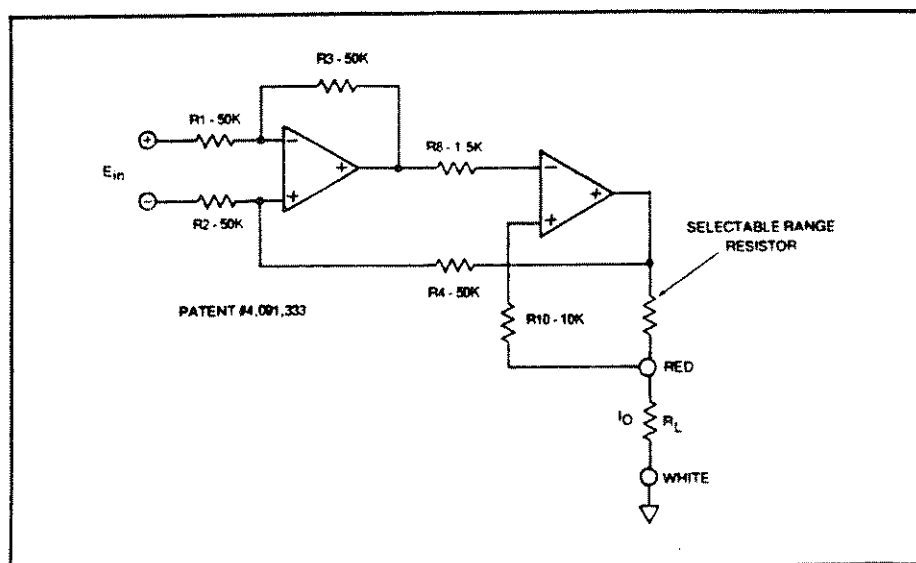


Figure 4-1. Simplified Diagram, Transconductance Amplifier.

Assume the output terminals are shorted and 1 volt DC is applied to the input terminals with the RED input terminal positive. To equalize the inputs of the second amplifier, IC1 must be driven to zero. This is accomplished when the voltage drops across R1 and R2 and those across R3 and R4 are equal.

This condition will be obtained when the output of the second amplifier is at 1 volt. The currents through R1, R2, R3, and R4 are the same. Since the output of IC1 must be zero, the drop across R3 must be 0.5 volts, making the non-inverting input of IC1 +0.5 volts. R4 will have the same drop, making the inverting input +0.5 volts. The drop across R1 and R2 will be the same. Since the inputs of IC1 are essentially equal, the output of IC1 is zero (offset by the few microvolts necessary to drive the output of the second amplifier to 1 volt.) The sum of the voltages across the four resistors, R1 through R4, equal the sum of the input voltage and second amplifier output voltage.

When the short circuit is removed from the output terminals and 100 ohm resistor is connected across them, the reference level to the non-inverting input of the second amplifier is now above ground due to the current through the load resistor, R_L . This drives the output of the second amplifier in a positive direction and a point of stability is reached when the output of the first amplifier is equal to the level applied to the non-inverting input of the second amplifier.

Again, this condition exists when the voltage drops across R1 and R2 are equal and those across R3 and R4 are equal. This occurs when the output of the second amplifier is at 2 volts. The drop across the range resistor, R_g is 1 volt, as it was when the output terminals were shorted. The current through the load is 10 milliamperes. Although the resistance across the input terminals has been increased from zero to

100 ohms, the current flowing across the output terminals remains at 10 milliamperes. The voltage difference between the output of the first amplifier and the second amplifier is always equal to the voltage applied to the input terminals.

When the input signal is increased to 2.0 volts DC, the potential difference between the output of the first amplifier and the output of the second amplifier increases to 2.0 volts. The drops across resistors R1 and R2 are one volt and the drops across resistors R3 and R4 are one volt.

The current through the 100 ohm resistor is increased to 20 milliamperes, proportional to the input voltage increase. If a 200 ohm resistor is connected across the output terminals, the output of the second amplifier increases to 2.2 volts and the current through the combination of range and load resistors remains at 20 milliamperes.

The system maintains a voltage across the range resistor proportional to the input voltage. Selecting different values for the range resistor results in different current levels through those resistors to maintain a 1 volt DC drop with 1 volt DC at the input terminals.

The second amplifier, shown as a single operational amplifier in the simplified diagram of Figure 4-1, is actually a current amplifier comprised of IC2 and 46 transistors, Q1 through Q46. The transistors are connected in four groups, in series parallel to form a "totem pole" configuration. The complete circuit is shown in the schematic diagram 2555-070 at the end of this manual. Q2 and Q3 operate as constant current sources to bias the parallel connected sets of output transistors. R7 and R9 provide adjustment of the operational amplifier offsets.

4-4. Range Selection

The current output range is selected by manually inserting the load connector into the appropriate range jacks. This inserts resistors of different values in series with the load, effectively changing the value of the range resistor of Figure 4-1. This is best illustrated by reference to the complete schematic diagram 2555-070. Calibration potentiometers in the resistor matrix permit precise adjustments of the proportion between input voltage and output current. The adjustments of these potentiometers are covered in Section V.

4-5. Range Indicators

Refer to schematic 2555-070. Level sensors of IC3 and IC4 provide the drive for the three range indicator LED's, DS1 through DS3. Those of IC3 are compared to the output of IC1, which is proportional to the output voltage levels developed in the voltage divider comprised of R12 through R21. This divider is connected across the +15 and -15 volts supply lines. The inputs to IC3-1 and IC3-7 from the divider are positive with respect to ground and those to IC3-8 and IC3-14 are negative. When the output of IC1 is between 0 and +5 volts, all of IC3's outputs are at -15V and the junction of R22, R23 and R28 is at -10V. Thus, the output of IC4-1 and IC4-7 are also at -15V which forces the output of IC4-8 to +15V to light DS3 (GRN). As the output transitions above +5V, the output of IC7-3 goes to +15V, forcing the output of IC4-1 to +15V, turning on DS2 (YEL), forcing the output of IC4-8 to -15V which extinguishes DS3. As the voltage transitions to +7 volts, the output of IC3-1 goes to +15V. This forces the output of IC4-7 to 15V, turning on DS1. The output of IC4-1 is forced low, turning off DS2. The output of IC4-7 holds IC4-8 at -15V, keeping DS3 turned off.

When the output is forced in the negative

direction, a similar sequence occurs. However, IC3-8 and IC3-14 outputs will transition rather than those of IC3-7 and IC3-1.

4-6. Standby/Operate Switch

The Standby/Operate switch, when in the "standby" position, connects the non-inverting input of IC2 directly to 0 volts DC. This removes any drive signal from the output power transistor circuits, preventing current from being supplied to the load. The Voltage Input Terminals are disconnected from the circuitry in the "Standby" mode.

4-7. Power Supplies (Detail)

The ± 20 volt power supplies are formed by diodes CR14, CR15, CR16 and CR17. These supplies are unregulated and voltage varies from 18.5 to 21.5 volts, depending on the line voltage and load.

The ± 15 volt power supplies are formed by integrated circuit voltage regulators IC8 and IC9. Their voltages will vary slightly from unit to unit due to component tolerances and will typically be near 14.8-15.2 volts.

The 5 volt supplies for the current shunt amplifier are comprised of CR1 through CR4 and integrated circuit amplifiers IC5 and IC6. These voltages will vary slightly from unit to unit and are typically 4.95 volts.



SECTION V MAINTENANCE

5-1. Required Test Equipment

The test equipment required for the calibration procedures are:

- 1) DC Voltage Standard:
0-2VDC, $\pm 0.0003\%$ Accuracy
(Valhalla 2701C or equivalent)
- 2) 5-Digit DVM:
 $\pm 0.0003\%$ Accuracy, 10 Megohms
Input Impedance
- 3) AC Voltage Standard:
0-2V, $\pm 0.03\%$ Accuracy
(Valhalla 2703 or equivalent)
- 4) External Shunt System:
 $\pm 0.01\%$ Accuracy
(Valhalla 2575A or equivalent)
- 5) 4K Ω 1% 1/4 W metal-film resistor

5-2. Calibration Procedure

5-2-1. Output Impedance Adjustment

- 1) Connect the equipment as shown in Figure 5-1 using a Valhalla 2575A Current Shunt, 2mA range, (or equivalent) for RL and a 4 kohm 1% resistor in series for RS.

Set the Valhalla 2701C DC Voltage Standard (or equivalent) output to zero volts DC. Connect the 2mA output range of the 2555A directly to RL with RS shorted.

Adjust R7 for an indication of zero volts DC ± 30 microvolts or less on the DVM.

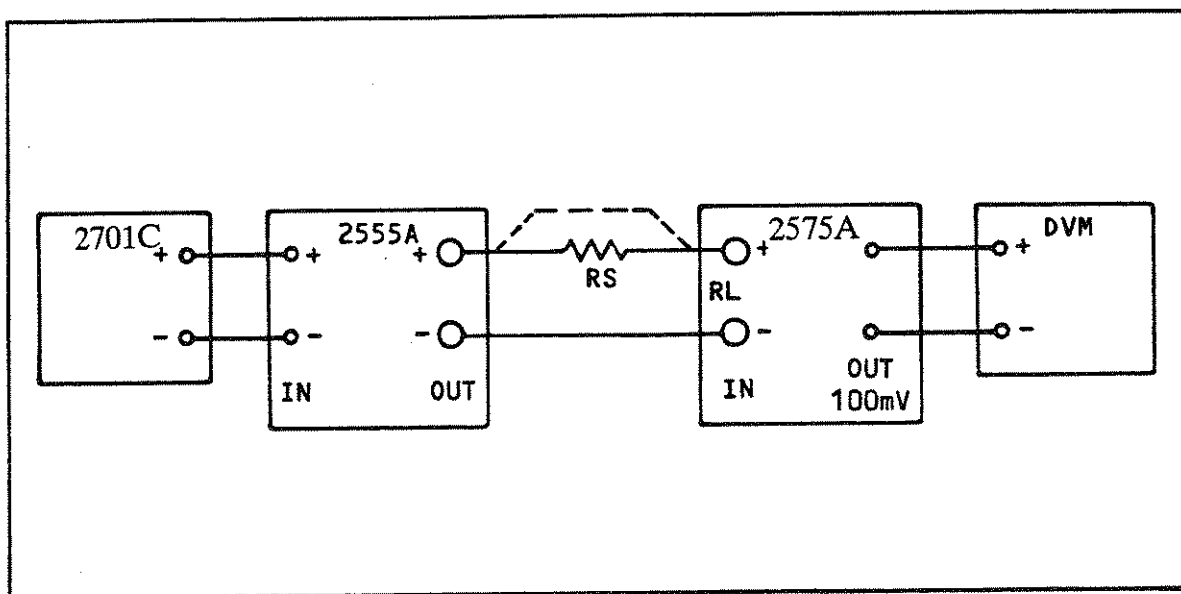


Figure 5-1. Output Impedance Test Equipment Set-Up

- 2) Set the DC Voltage Standard (2701C) to 1VDC and adjust R96 for a reading of 100.00 mV on the DVM.
- 3) Remove the Current Hi lead of the 2555A from the current shunt (Valhalla 2575A) and connect a 4K Ω 1% resistor between the 2555A and the current shunt (RS). Observe the direction and magnitude of change on the DVM. Adjust R110 for 100.00 \pm 75 microvolts on the DVM.
- 4) Repeat steps 2 and 3 adjusting
- 5) Connect the equipment as shown in Figure 5-2.
- 6) Calibrate the 2555A according to Table 5-1, checking the DC zero at the beginning of each step by reducing the voltage input to the 2555A to zero and adjusting R7 to zero volts DC \pm 30 microvolts, if necessary.

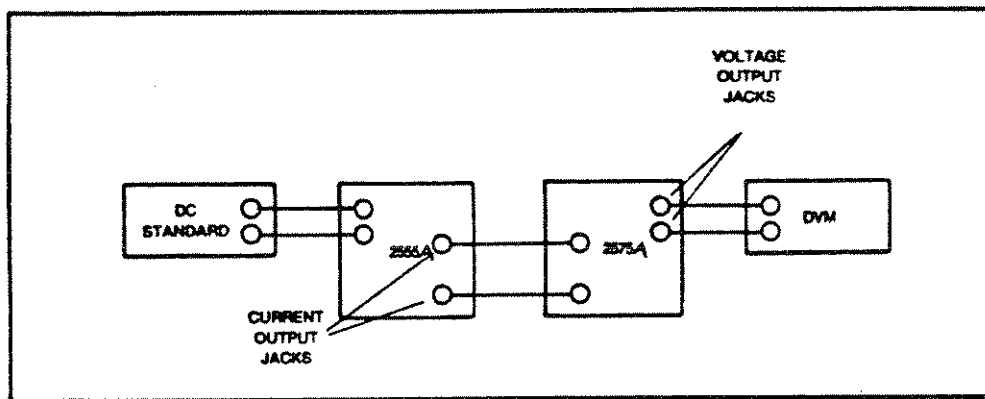


Figure 5-2. DC Calibration Test Equipment Set-Up

Voltage Input	2555A Range	2575A Range	2555A Adjustment	DVM Indication
1 VDC	100 Amp	100 Amp	See Note*	100 mV \pm 60 μ V
1 VDC	20 Amp	20 Amp	R108	100 mV \pm 60 μ V
1 VDC	2 Amp	2 Amp	R105	100 mV \pm 60 μ V
1 VDC	200 mA	200 mA	R102	100 mV \pm 60 μ V
1 VDC	20 mA	20 mA	R99	100 mV \pm 60 μ V
1 VDC	2 mA	2 mA	R96	100 mV \pm 60 μ V

Note: If the specified DVM indications are not obtained, it will be necessary to either file or shunt R107B, as required.

Table 5-1. Calibration Equipment Settings

5-2-2. Frequency Response

The frequency response test need not be performed on a routine basis. When required, use Figure 5-3 and check each range to 1kHz. Before attempting to perform this test, Section 3-6 Error Sources should be reviewed.

The frequency response test has no adjustments. If any range fails to meet specifications, the DC calibration in both polarities and zero will need to be checked.

5-2-3. Range Indicator Adjustment

Connect the DC Standard plus (+) output to the plus (RED) input terminal of the Model 2555A and the minus (-) output to the minus (BLACK) input of the Model 2555A. Connect a 5K kohm 1% resistor across the 2 mA output jack of the Model 2555A and connect the DVM across the resistor. Increase the DC Standard output until the DVM reads +5 volts. Adjust the +YEL potentiometer to just turn on the yellow panel indicator. The green indicator will be turned off. Increase the DC Standard output for a +7 volt reading on the DVM. Adjust the +RED potentiometer to just turn on the red indicator. The yellow indicator will be turned off. Reverse polarity of the input to the Model 2555A and repeat the procedure, but adjust the -YEL and -RED potentiometers instead.

5-3. Troubleshooting

Difficulties with precision equipment often occur from misinterpretation of the specifications. Make a careful check to determine that the equipment is truly malfunctioning before initiating repair procedures.

5-4. Amplifier Servicing

Note: If IC1, IC2, Q6 through Q14, Q16 through Q24, Q26 through Q34, Q36 through Q44 or R44 through R110 are replaced, the AC frequency response test must be performed.

Before attempting to service the amplifiers of the 2555A, it is recommended that the technician review the Theory of Operation in Section IV. The following procedure is only an aid to isolate a catastrophic malfunction to a local area.

Short the input terminals and short the output terminals. With the differential DC voltmeter, measure the voltage between the common connections of the power transistor emitter resistors and pin 6 of IC1. This voltage must be less than 15 millivolts. If it is greater than 15 millivolts, IC1 is most likely defective. If it is less than 15 millivolts, the malfunction is somewhere in the second amplifier (and/or the current amplifiers) or the feedback network.

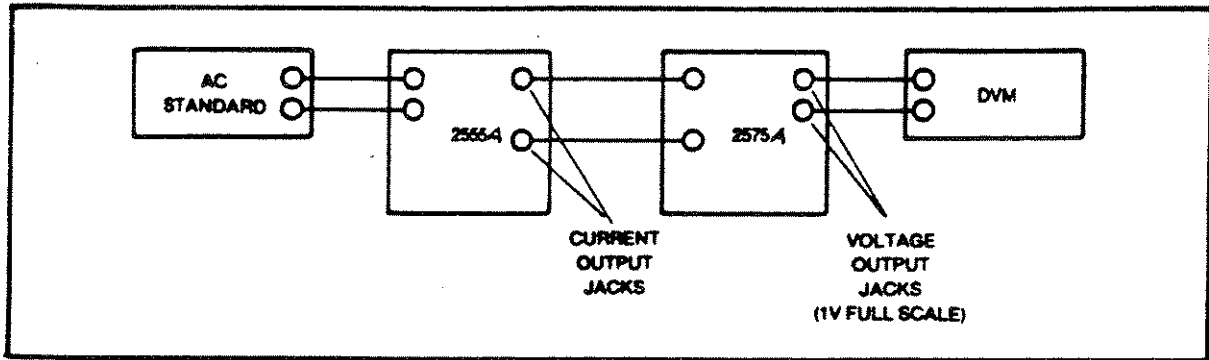


Figure 5-3. AC Frequency Response Test Equipment Set-Up

SECTION VI
MANUAL CHANGES AND ADDENDUMS

This section contains manual change information. If no addendums follow this page, your manual is complete as printed.



**SECTION VII
PARTS LISTS**

The following parts lists are included in this manual:

2555A Final Assembly.....	2555-400
2555A Front Panel and PCB Assembly.....	2555-402
2555A Shunt Assembly.....	2555-401



REF.DES.	STOCK #	QUANTITY			DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
		A	T	N			
2	2555-402	1			2555A Front-Panel and PCB Assembly	Assembly 2555-402	
3	05-10991	1			Handle, 5/16"rd, 5/16-18 threads w/ Ferrules	RAF 8445-3118-S-5	
20	04-10106	2			2555 Bus bar	DWG 2555-203	
21	04-10107	1			2555 Ground bar	DWG 2555-204	
22	04-10125	2			2555 Heat sink bracket	DWG 2555-209	
23	04-10126	2			2555 Rectifier heat sink	DWG 2555-210	
24	04-10116	4			2555 Output bus bar	DWG 2555-214	
25	04-10117	4			2555 Output bus bar bracket	DWG 2555-213	
26	04-10103	1			2555 Raer panel	DWG 2555-200	
27	04-10165	4			2555 Copper washer 1.25"OD, .4"ID, .06"THK	DWG 2555-219	
28	05-10119	1			Strain relief, large,gray	Lapp SL11-GRAY	
29	05-10110	1			Fan guard, 10"	Rotron 476323	
30	05-10107	1			Cable, power	Belden 17629S	
31	04-10135	1			2555 Chassis, TDJ	B-51050-17-1700H	
32	04-10185	1			2555 Phenloic plate	DWG 2555-220	
33	04-10188	2			2555 Mounting bracket 1/2" wide	DWG 2555-221	
34	04-10189	2			2555 Mounting bracket 1 1/2" wide	DWG 2555-222	
35	04-10190	1			2555 Rear panel phenolic insulator	DWG 2555-223	
36	04-10191	1			2555 Fan spacer	DWG 2555-224	
37	04-10192	2			2555 Bus supply	DWG 2555-225	
38	04-10193	4			2555 Output strap	DWG 2555-226	
39	04-10194	1			2555 Transformer bracket rear	DWG 2555-227	
40	04-10195	1			2555 Transformer bracket front	DWG 2555-228	
41	04-10205		1		2555 Shunt connector strap	DWG 2555-235	
42	04-10206	1			2555 Terminal strip/transformer support	DWG 2555-236	
43	04-10207	1			2555 IC Hold down	DWG 2555-237	
44	05-10128	3			Ring lug, 3/8"x4 AWG	Napa 721-134	
45	05-10015	4			Foot, rubber, white	Acc. Rubber 2089W-017	
46	05-10508	16			Washer, shoulder, nylon, #10	Smith 2666	
47	05-10160	14			Ring lug, 1/4 stud, 4 awg	Smith 9681	
48	80-10007	72			Battery Cable 4awg	Belden 736102	
49	04-10208	2			2555 Modified chassis (top/bottom covers)	DWG 2555-238 using 04-10135	
50	04-10209	8			2555 Output heat sink	DWG 2555-239	
51	96-00038	1			Aluminum Screen Wire, 7" x 10"	(SUPPLIED BY VENDER)	
52	96-00039	1			Mylar Paper, 4" x 6"		
53	04-10199		4		2555 Shunt insulator "A"	DWG 2555-232	
54	04-10200		2		2555 Shunt insulator "B"	DWG 2555-233	
55	04-10201		1		2555 Shunt spacer	DWG 2555-234	
56	90-06206	2			#6-32 x 3/8" Phil Pan Black		
57	90-06207	4			#6-32 x 7/16" Phil Pan Black		
58	91-06006	28			#6-32 x 3/8" Phil Flat 82 Deg. S.S.		
59	91-06008	16			#6-32 x 1/2" Phil Flat 82 Deg. S.S.		
60	96-00040	8			#6-32 x 5/8" Phil Flat 100 Deg. S.S.		
61	90-06008	88			#6-32 x 1/2 Phil Pan S.S.		
62	90-06010	23			#6-32 x 5/8" Phil Pan S.S.		
63	90-06016	10			#6-32 x 1" Phil Pan S.S.		
64	98-06002	126			#6 Internal Star Washer, S.S.		
65	98-06000	20			#6 Flat Washer STD S.S.		
66	97-06000	21			#6-32 Standard Hex Nut, S.S.		
67	97-06001	80			#6-32 Hex Nut, Small Pattern, Stainless-Steel		
70	95-10110	12			#10-32 x 5/8" Hex Bolt S.S.		

REF.DES.	STOCK #	QUANTITY			DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
		A	T	N			
71	95-10016	32			#10-32 x 1" Hex Bolt S.S.		
72	98-10001	44			#10 Split Lock Washer		
73	95-41006	7			1/4"-28 x 3/8" Hex Bolt S.S.		
74	95-40012	12			1/4"-20 x 3/4" Hex Bolt S.S.		
75	95-40072	3			1/4"-20 x 4 1/2" Hex Bolt S.S.		
76	95-40080	2			1/4"-20 x 5" Hex Bolt S.S.		
77	98-40001	18			1/4" Split Lock Washer		
78	98-40000	6			1/4" Flat Washer		
79	97-40000	8			1/4"-20 Hex Nut S.S.		
80	98-40300	8			1/4" Flat Washer (Brass)	WORLDWIDE	
81	97-40300	12			1/4"-20 Brass Hex Nut		
82	95-60016	2			3/8"-16 x 1" Hex S.S.		
83	98-60002	6			3/8" Internal Star Washer		
84	97-60000	2			3/8"-16 Hex Nut		
85	98-40300	3			1/4" Flat Washer (Brass)	WORLDWIDE	
86	95-40364	1			1/4"-20 x 4" Hex Bolt (Brass)		
87	95-40332	1			1/4"-20 x 2" Hex Bolt (Brass)		
88	99-04000	1			#4 18-22AWG Ring Lug		
89	99-06100	2			#6 14-16awg Ring Lug (Blue)	PANDUIT PV14-6B	
90	99-06000	1			#6 18-22awg Ring Lug (Red)	PANDUIT PV18-6R	
91	99-10000	1			#10 18-22awg Ring Lug (Red)		
92	98-40002	10			1/4" Internal Star Washer		
93	90-04003	3			#4-40 x 3/16" Phil Pan S.S.		
94	98-04002	3			#4 Internal Star Washer S.S.		
95	90-06018	2			#6-32 x 1 1/8" Phil Pan S.S.		
96	97-06001	2			#6-32 Hex Nut, Small Pattern, Stainless-Steel		
97	95-40306	1			1/4"-20 x 3/8" Hex Bolt (Brass)		
98	92-06008	8			#6-32 x 1/2" Phil Truss Head S.S.		
99	96-00002	12			#6-32 x 1/2" Phil Oval S.S.		
100	96-00026	16			Washer,Shoulder,Nylon,#6	Smith 2660	
101	05-10159	96			Grommet, caterpillar, black, 0.052"	Smith 2692	
102	05-10158	96			Black Silicone U-Channel	Acc. Rubber 51281AH	
103	05-10163	4			Terminal strip, 3 pos, #6 hole	Smith 830	
104	05-10331	9			Socket, For Conn. Housing (0.62 DIA) 18-22awg	Molex 02-06-1103	
105	05-10700	9			Pin For Conn. Housing (0.62 Dia)(18-22awg)	MOLEX 02-06-2103	
106	05-10701	1			Conn Housing, Male, 0.62 Dia, Locking	MOLEX 03-06-2092	
107	05-10702	1			Conn. Housing, Female, 0.62 Dia Locking	MOLEX 03-06-1092	
108	05-10560	2			Butt Splice Connector	T & B 54507	
109	98-10302	12			#10 Int. Star, Brass		
110	98-50002	2			5/16" Internal Star Washer, Stainless-Steel		
B1	05-10092	1			Fan, 10"	Rotron 020188,CL2L2	
C5	02-40007	1			110000u 20V Aluminum Radial	Sangamo 500R114U020DF2B	
C6	02-40007	1			110000u 20V Aluminum Radial	Sangamo 500R114U020DF2B	
C7	02-40007	1			110000u 20V Aluminum Radial	Sangamo 500R114U020DF2B	
C8	02-40007	1			110000u 20V Aluminum Radial	Sangamo 500R114U020DF2B	
C9	02-40007	1			110000u 20V Aluminum Radial	Sangamo 500R114U020DF2B	
C10	02-40007	1			110000u 20V Aluminum Radial	Sangamo 500R114U020DF2B	
C17	02-60005	1			4.7u 100V Mylar		
C18	02-60005	1			4.7u 100V Mylar		
C19	02-60002	1			0.1uF 250V Mylar	Illinois 104MSR250K	
C20	02-10009	1			0.001uF 50V Ceramic Disc	NIC NCD102KIVX5P	

REF.DES.	STOCK #	QUANTITY	DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
CR10	03-20013	1	Diode, rectifier, 100A,(DO-8)	1N3288A	
CR11	03-20013	1	Diode, rectifier, 100A,(DO-8)	1N3288A	
CR12	03-20014	1	Diode, rectifier, 100A (reverse),(DO-8)	1N3288AR	
CR13	03-20014	1	Diode, rectifier, 100A (reverse),(DO-8)	1N3288AR	
Q3	03-10002	1	PNP Transistor (TO5)	2N4036	
Q4	03-10007	1	NPN Transistor (TO5)	2N2102	
Q5	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q6	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q7	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q8	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q9	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q10	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q11	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q12	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q13	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q14	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q15	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q16	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q17	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q18	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q19	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q20	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q21	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q22	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q23	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q24	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q25	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q26	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q27	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q28	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q29	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q30	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q31	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q32	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q33	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q34	03-10008	1	NPN Transistor (TO3 steel)	2N3055 (steel)	
Q35	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q36	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q37	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q38	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q39	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q40	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q41	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q42	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q43	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q44	03-10009	1	PNP Transistor (TO3 steel)	2N6246-8 (steel)	
Q45	03-10002	1	PNP Transistor (TO5)	2N4036	
Q46	03-10007	1	NPN Transistor (TO5)	2N2102	
R13	01-01033	1	470 5% 1/4W Carbon Film	RC07GF471J	
R15	01-01033	1	470 5% 1/4W Carbon Film	RC07GF471J	
R53	01-01033	1	470 5% 1/4W Carbon Film	RC07GF471J	

REF.DES.	STOCK #	QUANTITY	DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
R54	01-01033	1	470 5% 1/4W Carbon Film	RC07GF471J	
R55	01-01015	1	47 5% 1/4W Carbon Film	RC07GF470J	
R56	01-01015	1	47 5% 1/4W Carbon Film	RC07GF470J	
R57	01-01015	1	47 5% 1/4W Carbon Film	RC07GF470J	
R58	01-01015	1	47 5% 1/4W Carbon Film	RC07GF470J	
R59	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R60	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R61	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R62	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R63	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R64	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R65	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R66	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R67	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R68	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R69	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R70	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R71	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R72	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R73	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R74	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R75	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R76	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R77	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R78	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R79	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R80	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R81	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R82	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R83	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R84	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R85	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R86	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R87	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R88	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R89	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R90	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R91	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R92	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R93	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
R94	01-30008	1	0.2 10% 8W power wire wound	Mills MRP-7A OR2 10%	
T1	04-20014	1	2550/2555 Power transformer	DWG 2550-010	

REF.DES.	STOCK #	QUANTITY	DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
2	04-30032	1	2555 Main Board	DWG 2555-700	
3	04-10108	1	2555 Front panel (screened)	DWG 2555-205	
4	05-10005	2	Standoff, swage, 1/4 od, 3/16 lg, 6-32	Useco B1530B-3/16-11	
C3	02-10001	1	200p 100V Ceramic disc	Sprague 5GAT20	
C11	02-40008	1	470u 25V Aluminum	Illinois 477TTA025	
C12	02-40008	1	470u 25V Aluminum	Illinois 477TTA025	
C15	02-30001	1	10uF 25V Tantalum Bead	AVX TAP106K025SP	
C16	02-30001	1	10uF 25V Tantalum Bead	AVX TAP106K025SP	
CR5	03-20000	1	Diode, general purpose	1N4148 or 1N914	
CR6	03-20000	1	Diode, general purpose	1N4148 or 1N914	
CR7	03-20000	1	Diode, general purpose	1N4148 or 1N914	
CR8	03-20000	1	Diode, general purpose	1N4148 or 1N914	
CR9	03-20000	1	Diode, general purpose	1N4148 or 1N914	
CR14	03-20002	1	Diode, rectifier, 1A, 50V	1N4001-1N4007	
CR15	03-20002	1	Diode, rectifier, 1A, 50V	1N4001-1N4007	
CR16	03-20002	1	Diode, rectifier, 1A, 50V	1N4001-1N4007	
CR17	03-20002	1	Diode, rectifier, 1A, 50V	1N4001-1N4007	
DS1	05-01028	1	LED,Red,Panel Mount	Hewlett Packard,HLMP3301	
DS2	05-01012	1	LED,Yellow,Panel Mount	Hewlett Packard,5082-4555	
DS3	05-01013	1	LED,Green,Panel Mount	Hewlett Packard,5082-4955	
DS4	05-01005	1	Single LED,Red,Small	Hewlett Packard,HLMP1000	
DS5	05-01005	1	Single LED,Red,Small	Hewlett Packard,HLMP1000	
DS6	05-01005	1	Single LED,Red,Small	Hewlett Packard,HLMP1000	
IC1	03-30117	1	Precision JFET Op-amp	National LH0052H	
IC2	03-30117	1	Precision JFET Op-amp	National LH0052H	
IC3	03-30031	1	Quad Op-Amp,General Purpose	LM324N	
IC4	03-30031	1	Quad Op-Amp,General Purpose	LM324N	
IC8	03-30037	1	Regulator,-15V,0.5A,TO202 or TO220	79M15CP or LM320T-15	
IC9	03-30036	1	Regulator,+15V,0.5A,TO202 or TO220	78M15CP or LM340T-15	
IC10	03-30069	1	Unity Gain Current Booster	National LH0002CH	
J1	05-10104	1	Socket, Panel Mount, Red, 100 amp	Superior RS100GR	
J2	05-10103	1	Socket, Panel Mount, White, 100 amp	Superior RS100GWT	
J3	05-10021	1	Binding post, red, 30 amp	Superior BP30R	
J4	05-10102	1	Binding post, white, 30 amp	Superior BP30WTC	
J5	05-10021	1	Binding post, red, 30 amp	Superior BP30R	
J6	05-10102	1	Binding post, white, 30 amp	Superior BP30WTC	
J7	05-10021	1	Binding post, red, 30 amp	Superior BP30R	
J8	05-10102	1	Binding post, white, 30 amp	Superior BP30WTC	
J9	05-10021	1	Binding post, red, 30 amp	Superior BP30R	
J10	05-10102	1	Binding post, white, 30 amp	Superior BP30WTC	
J11	05-10021	1	Binding post, red, 30 amp	Superior BP30R	
J12	05-10102	1	Binding post, white, 30 amp	Superior BP30WTC	
J27	05-10021	1	Binding post, red, 30 amp	Superior BP30R	
J28	05-10020	1	Binding post, black, 30 amp	Superior BP30B	
P1	05-10104	1	Socket, Panel Mount, Red, 100 amp	Superior RS100GR	
P2	05-10103	1	Socket, Panel Mount, White, 100 amp	Superior RS100GWT	
Q1	03-10007	1	NPN Transistor (T05)	2N2102	
Q2	03-10002	1	PNP Transistor (T05)	2N4036	
R1	01-20034	1	50K 0.05% 5ppm/C wire wound	Goldstar GS711-50K-0.05%-5ppm	
R2	01-20034	1	50K 0.05% 5ppm/C wire wound	Goldstar GS711-50K-0.05%-5ppm	
R3	01-20034	1	50K 0.05% 5ppm/C wire wound	Goldstar GS711-50K-0.05%-5ppm	

REF.DES.	STOCK #	QUANTITY			DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
		A	T	N			
R4	01-20034	1			50K 0.05% 5ppm/C wire wound	Goldstar GS711-50K-0.05%-5ppm	
R5	01-10012	1			20K 1% 50ppm/C 1/4W Metal Film	RN60C2002F	
R6	01-10012	1			20K 1% 50ppm/C 1/4W Metal Film	RN60C2002F	
R7	01-50023	1			10K End Adjust	Beckman 89PR10K	
R8	01-01043	1			1.5K 5% 1/4W Carbon Film	RC07GF152J	
R9	01-50023	1			10K End Adjust	Beckman 89PR10K	
R10	01-01061	1			10K 5% 1/4W Carbon Film	RC07GF103J	
R11	01-01004	1			4.7 5% 1/4W Carbon Film	RC07GF4R7J	
R12	01-01058	1			7.5K 5% 1/4W Carbon Film	RC07GF752J	
R13	01-50022	1			1K End Adjust	Beckman 89PR1K	
R14	01-01058	1			7.5K 5% 1/4W Carbon Film	RC07GF752J	
R15	01-50022	1			1K End Adjust	Beckman 89PR1K	
R16	01-01041	1			1K 5% 1/4W Carbon Film	RC07GF102J	
R17	01-50022	1			1K End Adjust	Beckman 89PR1K	
R18	01-01041	1			1K 5% 1/4W Carbon Film	RC07GF102J	
R19	01-50022	1			1K End Adjust	Beckman 89PR1K	
R20	01-01053	1			4.7K 5% 1/4W Carbon Film	RC07GF472J	
R21	01-01053	1			4.7K 5% 1/4W Carbon Film	RC07GF472J	
R22	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R23	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R24	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R25	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R26	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R27	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R28	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R29	01-01041	1			1K 5% 1/4W Carbon Film	RC07GF102J	
R30	01-01021	1			100 5% 1/4W Carbon Film	RC07GF101J	
R31	01-01021	1			100 5% 1/4W Carbon Film	RC07GF101J	
R32	01-01021	1			100 5% 1/4W Carbon Film	RC07GF101J	
R33	01-01021	1			100 5% 1/4W Carbon Film	RC07GF101J	
R49	01-01043	1			1.5K 5% 1/4W Carbon Film	RC07GF152J	
R50	01-01043	1			1.5K 5% 1/4W Carbon Film	RC07GF152J	
R51	01-01021	1			100 5% 1/4W Carbon Film	RC07GF101J	
R52	01-01021	1			100 5% 1/4W Carbon Film	RC07GF101J	
R95	01-20050	1			909 0.1% 5ppm/C wire wound	Goldstar GS809-909R-0.1%-5ppm	
R96	01-50031	1			100K End Adjust	Beckman 89PR100K	
R97	01-10072	1			64.9K 1% 50ppm/C 1/4W Metal Film	RN60C6492F	
R98	01-20049	1			90.9 0.1% 5ppm/C wire wound	Goldstar GS809-909R-0.1%-5ppm	
R99	01-50023	1			10K End Adjust	Beckman 89PR10K	
R100	01-10071	1			6.49K 1% 50ppm/C 1/4W Metal Film	RN60C6491F	
R101	01-20048	1			9.09 0.1% 5ppm/C wire wound	Goldstar GS811-9R09-0.1%-5ppm	
R102	01-50022	1			1K End Adjust	Beckman 89PR1K	
R103	01-10070	1			649 1% 50ppm/C 1/4W Metal Film	RN60C6490F	
R104	01-20047	1			0.909 0.1% Manganin	Goldstar R0004 (Lollipop)	
R105	01-50025	1			100 End Adjust	Beckman 89PR100ohm	
R106	01-10069	1			64.9 1% 50ppm/C 1/4 Metal Film	RN60C6499F	
R108	01-50021	1			10 End Adjust	Beckman 89PR10ohm	
R109	01-10068	1			7.15 1% 50ppm/C 1/4 Metal Film	RN60C7R15F	
R110	01-50025	1			100 End Adjust	Beckman 89PR100ohm	
R111	01-01063	1			15K 5% 1/4W Carbon Film	RC07GF153J	
R112	01-01081	1			100K 5% 1/4W Carbon Film	RC07GF104J	

REF.DES.	STOCK #	QUANTITY	DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
		A T N			
R107A	01-20059	1	2555A Shunt Assy (100/10 Amp)	ASSY 2555-101	
R107B	01-20059	1	2555A Shunt Assy (100/10 Amp)	ASSY 2555-101	
S1	05-03014	1	Circuit Breaker, 1 Pole, 20Amp	Heinemann, JA-1-A3-A-20-2	
S2	05-03061	1	Switch, 2PDT, Black w/yellow eye	Schadow ZFNE152UEE11010106B	
XIC1	05-10070	1	Socket, DIL, 8 pin, Gold Machine Pin Sockets	Robinson Nugent ICA083STG	
XIC2	05-10070	1	Socket, DIL, 8 pin, Gold Machine Pin Sockets	Robinson Nugent ICA083STG	
XIC3	05-10041	1	Socket, dil, 14 pin	Burndy 8514-01	
XIC4	05-10041	1	Socket, dil, 14 pin	Burndy 8514-01	
XIC10	05-10070	1	Socket, DIL, 8 pin, Gold Machine Pin Sockets	Robinson Nugent ICA083STG	

REF.DES.	STOCK #	QUANTITY			DESCRIPTION	MANUFACTURING/PURCHASING DATA	ALTERNATE
		A	T	N			
1	05-10425	1			2555 100 Amp Shunt Stock 36" Lg.	DWG 2555-241	
2	05-10426	2			2555 10 Amp Shunt Stock 36" lg.	DWG 2555-242	
3	04-10205	1			2555 Shunt connector strap	DWG 2555-235	
4	04-10297	1			2300 Bar connector upper (100A shunt)	DWG 2300-208	
5	04-10199	4			2555 Shunt insulator "A"	DWG 2555-232	
6	04-10198	2			2555 Shunt Terminal "C"	DWG 2555-231	
7	04-10196	1			2555 Shunt Terminal "A"	DWG 2555-229	
8	04-10201	1			2555 Shunt spacer	DWG 2555-234	
9	05-10160	2			Ring lug, 1/4 stud, 4 awg	Smith 9681	
10	80-10177	7			Cable Welding 4awg	B-Line PC-4	
11	98-40300	4			1/4" Flat Washer (Brass)	WORLDWIDE	
12	98-40002	1			1/4" Internal Star Washer		
13	95-40006	1			1/4"-20 x 3/8" Hex Bolt		
14	90-04006	3			#4-40 x 3/8" Phil Pan S.S.		
15	98-04002	3			#4 Internal Star Washer S.S.		
16	99-99020	1			SOLDER SILVER Bearing CADMIUM-FREE	JW Harris 10001 Stay-Brite, 1/16 DIA	
17	99-04000	1			#4 18-22AWG Ring Lug		
18	99-06100	3			#6 14-16awg Ring Lug (Blue)	PANDUIT PV14-6B	
19	80-01622	8			22AWG Wire, Blue PVC	M16878/1-BFE-6	
20	80-01514	8			14awg Wire, Green PVC	M16878/1-BKE-5	
21	80-01414	7			14awg Wire, Yellow PVC	M16878/1-BKE-4	
22	95-40364	1			1/4"-20 x 4" Hex Bolt (Brass)		
23	95-40332	1			1/4"-20 x 2" Hex Bolt (Brass)		
24	04-10200	2			2555 Shunt insulator "B"	DWG 2555-233	

SECTION VIII
SCHEMATIC DIAGRAMS

The following schematic drawings are included in this manual:

2555A Main Board Schematic.....	2555-070
2555A Main Board Assembly.....	2555-600

