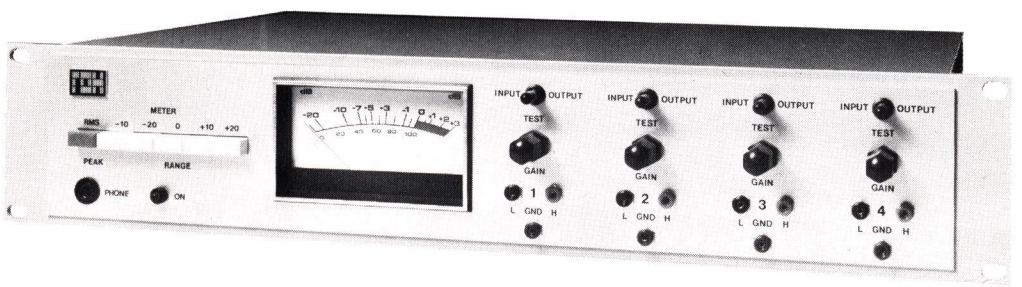
Distribution Amplifier

Model 120



The Model 120, distribution amplifier, offers high performance and established reliability for demanding applications in commercial communication service. Dual and four channel units are available in totally self-contained 19 inch rack mount packaging. These units incorporate the latest developments in solid state technology, combined with premium components and rigorous construction detail. Internal assembly is modular and may be serviced by the exchange of plug-in assemblies. Each channel includes a separate regulated power supply to enhance system reliability and minimize channel crosstalk. Both test jacks and the gain adjustments are provided on the front panel. The test jacks can be switched to either the input or output circuitry for external test and level measurement. An optional VU meter is available for monitoring the input/output levels of each channel. The meter sensitivity is switch selected between −20 and +20 dB in 10 dB steps. The 0 dB calibration can be adjusted over a 10 dB range to include the 0, +4, or +8 dBm standard references. Meter response balistics may be selected for standard VU characteristics or a peak responding indication, which will indicate signal peaks quickly without overshoot or averaging. Termination of the equipment is made to nonbreakable plastic barrier blocks. Terminals are screw compressed wire clamps which make a secure connection without requiring wire lugging or wrapping. Power requirements are compatable with 115/230 Vac, 50 or 60 Hz line sources.

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NORCROSS, GA 30071
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Specifications

Gain:	0 to +30 dB, potentiometer adjustment
Input:	10 K ohms balanced bridging 60 dB CMR at 60 Hz +20 dBm maximum common mode input
Outputs:	Eight 600 ohm source terminated differential outputs ±1% balance to equipment common
Output Level:	+20 dBm
Output Isolation:	70 dB at 10 kHz
Frequency Response:	20 Hz to 20 kHz ±.5 dB at rated output
Distortion, THD or IM:	−50 dB, ⅓% maximum at rated output
Noise:	85 dB S/N ratio, −65 dBm residual
Meter Range:	−20 to +20 dB in 10 dB steps
Meter Calibration:	0, +4 or +8 dBm for 0 dB indication
Meter Accuracy:	±3% of reading and ±2% of range
Meter Response:	20 Hz to 20 kHz ±.5 dB
Meter Balistics:	Standard VU or Peak Responding
Ambient Temperature:	0° to +50° C operating range
Power Requirement:	115/230 Vac, ±10%, 50 to 60 Hz, 50 watts
Size:	3.5'' H × 19'' W × 13'' D
Weight:	10 lbs.

Model Number and Name

Model 122	Dual 1×8 Distribution Amplifier
Model 124	Quad 1×8 Distribution Amplifier

Options

01	Add Input/Output Metering

MODEL 120

DISTRIBUTION AMPLIFIER

OPERATORS INSTRUCTIONS

Your ROH 120 Series distribution amplifier was carefully inspected, both electrically and mechanically before shipment. It should be physically free from mars or scratches, and in perfect electrical order upon receipt. The unit should be carefully inspected for damage in transit and if any damage is noted, ROH Corporation should be contacted immediately. This unit is designed to mount in an EIA standard, 19 inch width rack.

The 120 Series amplifiers may be powered from either 115 or 230 V ac, 50 or 60 Hertz. Before connecting the 120 to an ac power source, verify that the voltage selector switch on the rear panel matches that being used. A pilot lamp on the front panel will glow when power is applied to the unit.

Input and output connections are made on the rear panel terminal blocks. There is a separate terminal block for each channel, and the individual terminals are clearly labeled. Separate gain adjustment for each channel is provided by potentiometers located on the front panel. These may be adjusted after removing the screw-on cap. The front panel test jacks for each channel may be switched to either the input or output circuitry for external test or level measurements. This is accomplished by pulling out the switch, and then moving it to either the input or output position. A phone jack is also provided for listening to the input/output signal selected by the switches. A detailed schematic and parts list for the distribution amplifier is attached.

If the meter option is ordered, the front panel switches also select which input or output is to be measured by the meter circuit. The meter range and response are selected with interlocking pushbutton switches. When the INPUT/OUTPUT switch is in its center position, the test jacks provide an external input to the meter circuit. If the meter option is ordered, see the attached pages for more detailed information on the meter circuit. Unless otherwise requested, the meter circuit is factory calibrated to read 0 VU for a 0 dBm level.

MODEL 120

1120 DISTRIBUTION AMPLIFIER MODULE

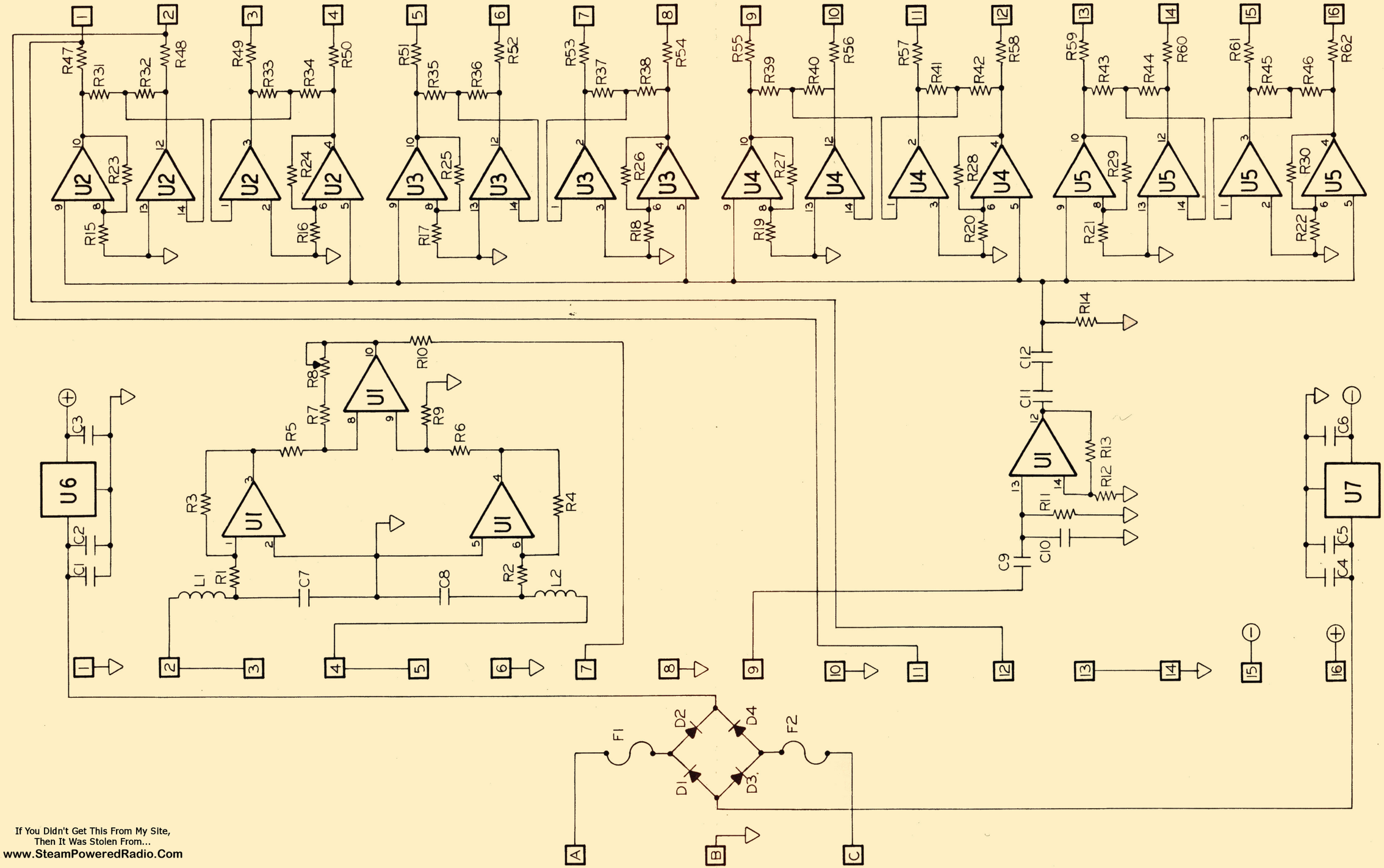
PARTS LIST

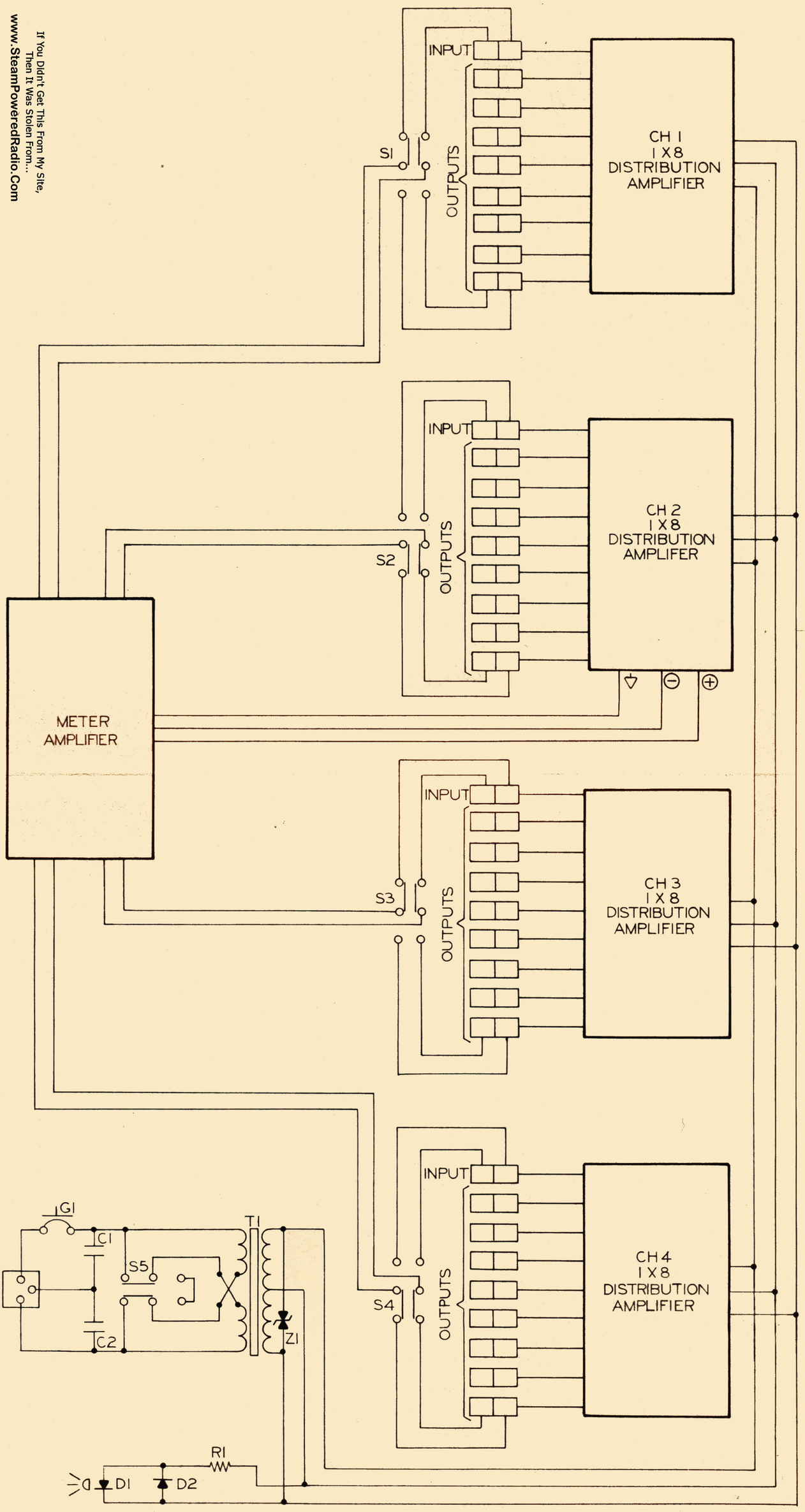
Item	Description	Part Number or Type	Manufacturer
C1,4	3.3 uf/35 V tant	T392C335K035AS	Kemet
C2,5	0.03 uf/100 V cera	TG-S30	Sprague
C3,6	560 uf/30 V elec	TCG 561U030G1L3P	Mallory
C7,8,10	0.001 uf/250 V cera	2SSD10	Sprague
C9	1 uf/50 V cera	CZ5U105	Sprague
C11,12	33 uf/16 V tant	T392D336K016AS	Kemet
D1-4	1 A/50 V Si	1N4002	Motorola
F1,2	1/2 A/250 V	MDL	Bussman
L1,2	1000 uH 10% 50 mA	RFC-S-1000	Nytronics
R1-4,14-21	4.99 k ohms 1/4 W 1%	RN55D	Allen Bradley
R5,6,7	20.0 k ohms 1/4 W 1%	RN55D	Allen Bradley
R8	1 k ohms 1/2 W 10%	3389P	Bourns
R9	20.5 k ohms 1/4 W 1%	RN55D	Allen Bradley
R10	100 k ohms 1/4 W 5%	RCR07	Allen Bradley
R11	1 k ohms 1/4 W 5%	RCR07	Allen Bradley
R12,30-45	10.0 k ohms 1/4 W 1%	RN55D	Allen Bradley
R13	5.1 k ohms 1/4 W 5%	RCR07	Allen Bradley
R22-29	10 k ohms 1/4 W 1%	RN55D	Allen Bradley
R46-61	301 ohms 1/4 W 1%	RN55D	Allen Bradley
U1	-18 V Regulator	MC7918 CP	Motorola
U2	+18 V Regulator	MC7818 CP	Motorola

CHASSIS PARTS LIST

Item	Description	Part Number or Type	Manufacturer
1	LED	FLV 540	Fairchild
2	Input/Output Switch	Type 7203	C & K
3	Potentiometer	CM 40333	Clarostat
4	Test Point (Black)	105-0803-001	E.F. Johnson
5	Test Point (Green)	105-0804-001	E.F. Johnson
6	Test Point (Red)	105-0802-001	E.F. Johnson
7	1.5 A Circuit Breaker	815175	Littlefuse
8	Voltage Switch	46256LFR	Switchcraft
9	AC Line Cord Receptacle	EAC-203	Switchcraft
10	Transformer	354	Triad

MODEL 120 PARTS LIST





METER ASSEMBLY

1001 METER ASSEMBLY

TECHNICAL DESCRIPTION

The meter assembly includes the amplifier circuitry, the meter movement, the meter lamps and the ganged pushbutton panel switch. The amplifier provides up to four balanced bridging inputs which are isolated and produce nominal line loading. The number of inputs used depends on the requirements of the instrument with which the meter is associated. The inputs are isolated by the summing amplifiers U1A,B which combine each side of the input line. The differential amplifier U1D converts the balanced inputs to an unbalanced output to drive the range switch and remaining circuitry. Resistors R16-20 in conjunction with the pushbutton range switch form a step attenuator prior to the circuit voltage amplifier section comprised of U1C and U2A. The overall voltage gain is adjusted by the calibration potentiometer R23 which provides a 10 dB variation in circuit sensitivity. IC amplifiers U2D,C drive separate full wave rectifier circuits for the RMS and peak response functions. The meter movement is switched between the two circuits depending on the desired response. An additional amplifier U2B is employed to accelerate the meter pointer travel in the peak response mode. Capacitor C6 and resistor R38 and the meter coil are enclosed in the feedback loop of U2B which helps overcome the response delay caused by the mechanical inertia of the meter movement.

PARTS LIST

Item	Description	Part Number or Type	Manufacturer
C1,2	0.1 uF 16 V cera	HY-450	Sprague
C3	0.001 uF 250 V cera	2SS-D10	Sprague
C4	1.5 uF 50 V	7CZ5U155D8	Sprague
C5	33 uF 16 V tant	T392D336K016AS	Kemet
C6	330 uF 6.3 V	T392F337K006AS	Kemet
D1-4	100 mA 50 V Ge	1N270	ITT
I1,2	55 V 0.05 A	1835	Chicago Miniature
M	Meter	13-1001	ROH
R1-8,17	30.1 k ohms 1/4 W 1%	RN55D	Allen Bradley
R9-14	10 k ohms 1/4 W 1%	RN55D	Allen Bradley
R15	100 ohms 1/4 W 5%	RCR07	Allen Bradley
R16	100 k ohms 1/4 W 1%	RN55D	Allen Bradley
R18	9090 ohms 1/4 W 1%	RN55D	Allen Bradley
R19	2150 ohms 1/4 W 1%	RN55D	Allen Bradley
R20,21,26	1000 ohms 1/4 W 1%	RN55D	Allen Bradley
R22,27	11 k ohms 1/4 W 1%	RN55D	Allen Bradley
R23,32	10 k ohms 1/2 W 10%	3389-103	Bourns
R24	2.4 k ohms 1/4 W 5%	RCR07	Allen Bradley
R25	51 k ohms 1/4 W 5%	RCR07	Allen Bradley
R28	5.1 k ohms 1/4 W 5%	RCR07	Allen Bradley
R29,30	24 k ohms 1/4 W 5%	RCR07	Allen Bradley
R31,33	7.5 k ohms 1/4 W 5%	RCR07	Allen Bradley
R34,35	10 k ohms 1/4 W 5%	RCR07	Allen Bradley
R36	1 k ohms 1/4 W 5%	RCR07	Allen Bradley
R37	1 k ohms 1/2 W 10%	3389-102	Bourns
R38	200 ohms 1/4 W 1%	RN55D	Allen Bradley
S1	4PDT 7 position switch	PB15	CRL
U1,2	Integrated Circuit	TL075CN or RC4136N	Texas Instrument

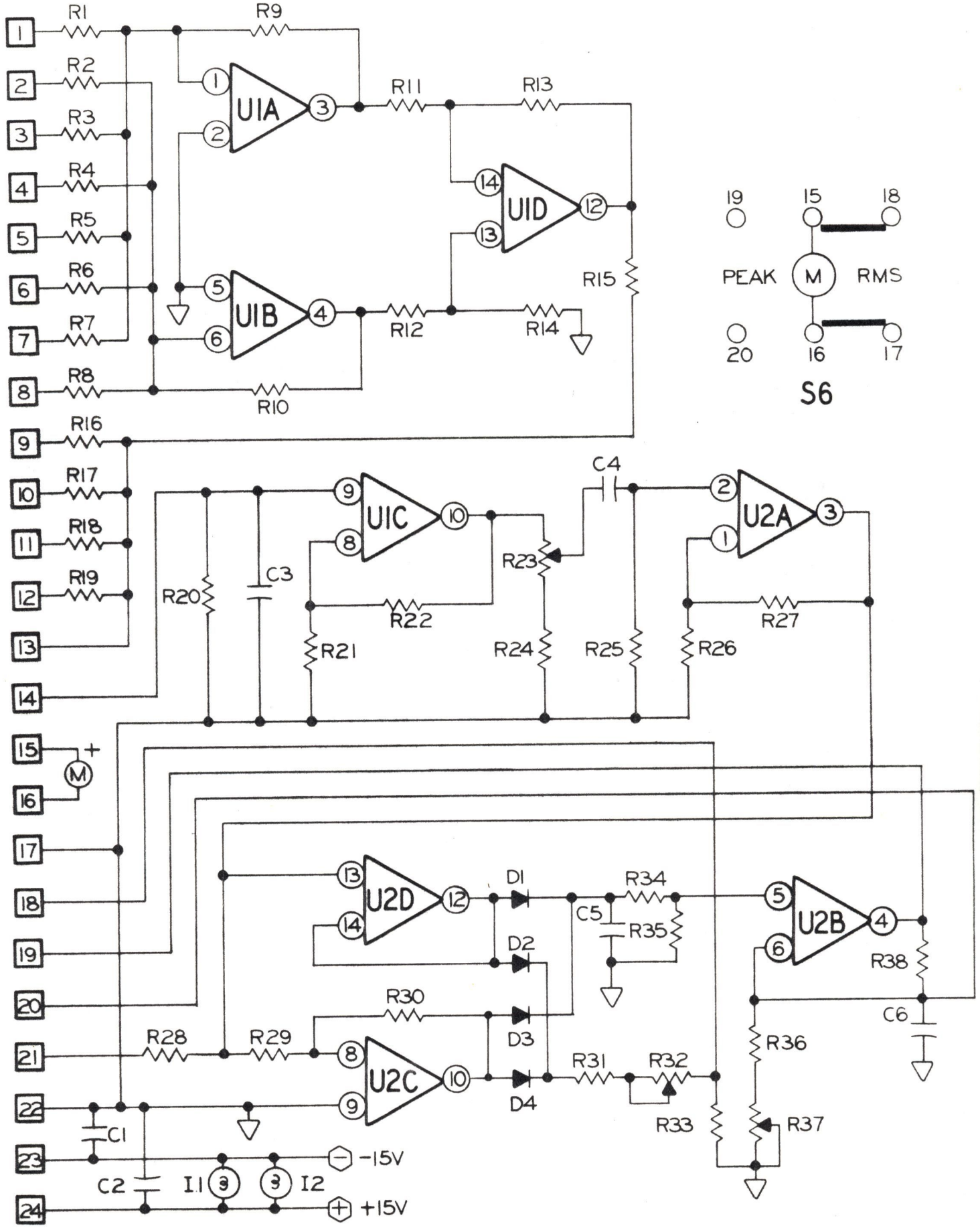


FIGURE 5.1.1

1001 METER ASSEMBLY

CALIBRATION PROCEDURE

Meter Zero Adjustment: For maximum accuracy, the meter mechanical zero should be checked periodically. The meter is properly zero-set when the pointer rests over the zero calibration mark and the unit is in its normal operating environment and is turned off. If it is necessary to reset the zero, proceed as follows: Turn the ac power off and wait one minute for all capacitors to discharge. Rotate the zero adjustment screw clockwise so that the pointer is left of zero and moving upscale. Continue to rotate screw clockwise until the pointer is exactly at zero.

Calibration Adjustment: Potentiometer R23 located at the top edge of the meter amplifier board is used to calibrate the meter assembly. The range of adjustment will accommodate 0, +4, and +8 dBm input for a 0 dB scale indication. A 1 kHz test frequency of certified amplitude should be used for the calibration adjustment.

Peak Response Adjustment: Potentiometer R37 located immediately below the calibration potentiometer adjusts damping of the meter movement. The meter response switch button should be in the released position. Apply a 1 kHz test frequency to the instrument input and observe the pointer deflection. The meter pointer will advance rapidly to the 0 dB scale mark with a minimum of overshoot. The damping should be adjusted at the 0 dB mark with approximately 10% initial overshoot. The return to 0 is slow and requires several seconds.

RMS(VU) Tracking Adjustment: The remaining potentiometer R32 on the circuit board adjusts the RMS calibration to indicate the same as the peak when the response button is depressed. With a continuous input signal the meter indication should not change when the response button is depressed or released. After the above performance is obtained the calibration potentiometer will simultaneously provide the overall calibration adjustment for both response functions.