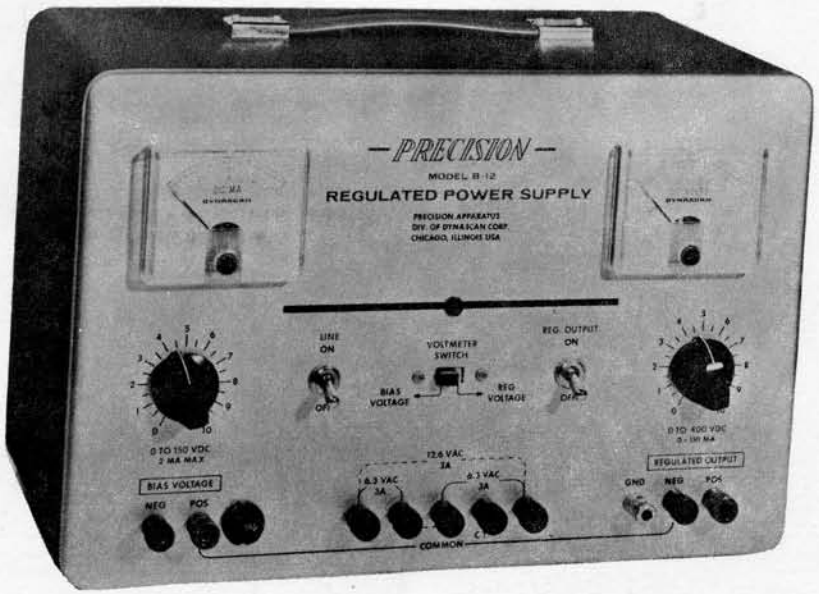
OPERATING MANUAL

MODEL B-12

REGULATED POWER SUPPLY



PRECISION APPARATUS DIVISION

OF DYNASCAN CORPORATION

1801 W. BELLE PLAINE AVE. • CHICAGO, ILL. 60613

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GENERAL DESCRIPTION

The Model B-12 Regulated Power Supply is a reliable source of d-c voltage, bias voltage, and filament power. The B-12 is a most valuable device for testing and developing any new circuit you may build. The B-12 is also useful for testing during normal servicing of electronic instruments. The power supply offers regulated d-c voltages from 0 to +400 volts, and from 0 to -150 volts. Each output is variable throughout its range, with a front panel control. The 0 to +400 volt, d-c supply voltage and current are monitored with a voltmeter and milliammeter, both mounted on the front panel for easy viewing. The voltage of the 0 to 150 volt bias supply is also monitored. Filament voltages of 6.3 volts a-c center tapped, 6.3 volts a-c (no center tap), and 12.6 volts a-c are available at terminals on the front of the unit, as are the d-c bias voltages.

SPECIFICATIONS

REGULATED DC OUTPUT - Continuously variable from 0 to 400 volts:

Continuous Current at 0 to 200 volts:	0 to 100 ma
Continuous Current at 200 to 400 volts:	0 to 150 ma
Intermittent Current at 0 to 200 volts:	0 to 125 ma

BIAS OUTPUT - Continuously variable from 0 to 150 volts at 2 ma (max)

REGULATION

Output variation less than 1/3 of 1% or 0.3 volt (whichever is greater) from no load to 100 ma. load

Output variation less than 0.4% or 0.5 volt (whichever is greater) for ±10-volt line variation

RIPPLE - Less than 3 mv RMS

OUTPUT IMPEDANCE - Less than 10 ohms from dc to 1 mc

UNREGULATED AC

6.3 volts at 3 amperes and 6.3 volts at 3 amperes, center tapped

12.6 volts at 3 amperes (available through series connection of the two 6.3-volt supplies)

6.3 volts at 6 amperes (available through parallel connection of two 6.3-volt supplies)

INPUT VOLTAGE - 117 volts ±10%, 50- to 60-cps, 160 watts (approximate)

METERS - Rugged double-jewelled, D'Arsonval meters in modern clear plastic: Voltmeter Scale - 0 to 400 volts, 0 to 200 volts; Milliammeter Scale - 0 to 200 ma

DIMENSIONS - 13 x 8-1/2 x 7 inches

SHIPPING WEIGHT - 20 pounds

CIRCUIT DESCRIPTION

The Model B-12 Regulated Power Supply is a convenient and reliable source of regulated d-c plate voltage, regulated bias voltage, and filament voltage. This is accomplished with separate outputs and associated circuitry for each as described below.

1. REGULATED BIAS VOLTAGE OUTPUT. This channel consists of halfwave rectifier tube V5 type 6X4 tube), a standard pi-type R-C filter, and bleeder potentiometer R14 (in series with resistor R15), connected across the filtered output. The potentiometer supplies the continuously variable bias voltage. Transformer T1 supplies power to rectifier V5. Gas-filled regulator tubes V6 and V7, connected in series across the -150 volt output, provide regulation for the bias supply. Potentiometer R14 permits adjustment of the bias voltage available at the BIAS VOLTAGE terminals. Setting the VOLTMETER SELECTOR switch to BIAS VOLTAGE connects the voltmeter across the bias voltage for monitoring the output.

2. REGULATED D-C PLATE VOLTAGE. The circuit consists of fullwave rectifier tube V1 (type GZ34/5AR4 tube), an electronic series regulator consisting of tubes V2 and V3 (6L6 tubes), connected in parallel, regulator control tube V4 (6AU6) and filter. Transformer T1 supplies power to rectifier V1 through its center-tapped hi-voltage winding. The center tap is the negative return for the rectifier. The negative return of the 400-volt supply is also the positive return of the bias supply. Regulation of the d-c output is accomplished by placing the parallel connected series regulator tubes in the positive leg of the B supply. Screen grid voltage for the regulator tubes is supplied by a separate halfwave rectifier SR1 and filter. Any current drawn from the supply passes through the 6L6 tubes; plate current through the regulator is controlled by the control voltage from the control tube (6AU6). The control voltage is obtained from a voltage divider network, R14, R15, R20, R19, R18, R16 and R21 across the B supply output. Changes in the output voltage cause a similar increase or decrease in the voltage sampled at R18. This voltage change is reflected to the control grids of the series regulator tubes, thus changing the load current taken from the supply and returning the output voltage to its original value. Potentiometers R16 and R19 enable calibration of the supply at the 0 and 400 volt limits. Potentiometer R18 enables continuous adjustment between 0 and 400 volts. With REG. OUTPUT switch at ON, connections are made so that the output current is monitored through the milliammeter. Connections are made to place the voltmeter across the 0 to 400 volt output when the VOLTMETER SWITCH is at "REG. VOLTAGE".

3. FILAMENT VOLTAGE. Filament voltages of 6.3 volts at 3 amperes, and 6.3 volts center-tapped, are supplied by two separate filament windings (one center-tapped) on transformer T1. Filament voltages of 12.6 volts at 3 amperes, or 6.3 volts at 6 amperes, are obtained by series or parallel connecting the 6.3 volt terminals of the unit.

OPERATING INSTRUCTIONS

WARNING: The voltages available from the Regulated Power Supply can be fatal. Before connecting the power supply to a load, set the LINE switch to the OFF position to eliminate any shock hazards.

The B-12 is designed for operation only on a 105- to 130-volt, 50- to 60-cycle line. Serious damage will result if any other type of power is used.

The Regulated Power Supply provides regulated d-c, bias and filament output voltages. These output voltages are either available as individual outputs, or they can all be used simultaneously. The individual current ratings, as listed in FEATURES AND SPECIFICATIONS, must not be exceeded.

REGULATED OUTPUT VOLTAGES

1. With the LINE and the REG. OUTPUT switches set to the OFF position, connect the load across the REGULATED OUTPUT POS and NEG terminals. Connect the NEG and GND terminals together to obtain a minimum hum level.

2. Set the VOLTMETER SWITCH to the REG VOLTAGE position and turn the REGULATED OUTPUT control counterclockwise to 0.

3. Throw the LINE switch to the ON position. Allow approximately 1 minute for the Regulated Power Supply to stabilize.

4. Set the REG. OUTPUT toggle switch to ON and turn the REGULATED OUTPUT control clockwise until the desired voltage is indicated on the upper scale of the DC VOLTS meter. Read the current drawn by the load on the DC MA meter. The current should not exceed 100 ma for output voltages from 0 to 200 volts, or 150 ma, from 200 to 400 volts. Note that for intermittent operation, the maximum current for output voltages from 0 to 200 volts can be increased to 125 ma.

5. Set the LINE switch to the OFF position before disconnecting the load.

NOTE: If it is desired to maintain the Regulated Power Supply in a standby status to eliminate the warm-up period, set the REG. OUTPUT toggle switch to OFF.

BIAS VOLTAGE

1. With the LINE switch set to the OFF position, connect the bias load (or other light load not exceeding 2 ma) across the BIAS VOLTAGE NEG and POS terminals. Normally the NEG terminal is connected to the point where negative bias is required, and the POS terminal is connected to the chassis or common B-line.

NOTE: The POS BIAS VOLTAGE terminal and the NEG REGULATED OUTPUT terminals are internally connected.

2. Set the VOLTMETER SWITCH to the BIAS VOLTAGE position and turn the BIAS VOLTAGE control counterclockwise to 0.

3. Throw the LINE switch to the ON position. Allow approximately 1 minute for the Regulated Power Supply to stabilize.

4. Turn the BIAS VOLTAGE clockwise until the desired voltage is indicated on the lower scale of the DC VOLTS meter.

NOTE: The bias current is not indicated on the DC MA meter.

5. Set the LINE switch to the OFF position or turn the BIAS VOLTAGE control counterclockwise to 0 when changing connections to protect the Regulated Power Supply from accidental "shorts".

FILAMENT VOLTAGES

1. Set the LINE switch to the OFF position to prevent accidental shorting of the filament supply while making connections.

2. To obtain 6.3 volts ac from the Regulated Power Supply, connect the filament load across either set of terminals marked 6.3VAC 3A. Use both sets of terminals, if two isolated sources of 6.3 volts ac are required. Use the set of three terminals if a center-tapped filament winding is required. Do not exceed the individual current ratings of 3 amperes.

3. To obtain 3.15 volts ac, connect the filament load across the CT terminal and either of the adjacent terminals. The maximum current rating at 3.15 volts ac, is 3 amperes.

4. To obtain 12.6 volts ac, connect the filament load across the 12.6VAC 3A terminals as indicated by the dashed lines on the front panel. Connect a jumper between the two 6.3-volt windings as indicated by the dashed line on the front panel. Do not exceed the maximum current rating of 3 amperes.

5. To obtain 6.3 volts ac at 6 amperes, connect the two 6.3VAC 3A outputs in parallel. Connect a jumper to the left binding posts and connect another jumper to the right binding posts.

6. After establishing the required connections, set the LINE switch to the ON position.

MAINTENANCE

Your Regulated Power Supply is capable of fulfilling continuous daily service requirements over a period of many years. However, in order for you, the user, to fully realize these capabilities, the same degree of care in operation and maintenance should be accorded to your instrument that would be given any fine piece of equipment.

There is always the possibility that repairs will be necessary with any piece of equipment. Should your power supply require servicing, just remember that the same logical processes of elimination apply as they do for any electrical circuit, and you should experience no difficulty. The checks outlined under "WHAT TO DO IN CASE OF TROUBLE", will aid you considerably. Proper operating voltages are shown on the schematic. A variation of ±20% in these readings is entirely acceptable.

The tubes used in this instrument can be checked periodically with a tube checker.

Should failure of the meter movement coils be suspected, continuity may be checked with an ohmmeter if a limiting resistor of approximately 10K ohms is first connected in series with the ohmmeter test leads. Never test meter coil continuity directly with an ohmmeter. Excessive current from the ohmmeter battery will invariably ruin the meter coil and will definitely result in an open condition.

Do NOT attempt repair of the meter movement at any time. This will automatically void our standard warranty coverage of the meter movement.

The clear plastic meter cover may occasionally, through repeated polishing or cleaning, accumulate charges of static electricity. This will cause the pointer to deflect erratically regardless of whether the instrument is turned on or off. These static charges may easily be removed by using one of the commercially available anti-static solutions, or a solution of any good liquid detergent (of the type used for washing dishes) and water. Simply dip a clean, soft cloth in the solution and wipe the surface of the meter cover. The cover need not be removed for this operation.

WHAT TO DO IN CASE OF TROUBLE

Check all tubes, using a reliable tube tester. This instrument uses tubes which require no special selection, and replacement should be no problem.

If the pilot lamp fails to light, check the pilot lamp and the fuse for continuity. If the fuse is blown, perform resistance and continuity checks. Resistance readings should not differ by more than ± 20% from the values shown on the schematic diagram.

Measure voltages from tube socket pins to ground, using a vacuum tube voltmeter with a high input impedance and setting the controls as indicated on the schematic diagram. Compare the measured voltages with those on the schematic diagram. If any voltage reading differs by more than ±20%, disconnect power and perform appropriate resistance and continuity checks. Resistance readings should not differ by more than ±20% from the values shown on the schematic diagram.

IMPORTANT: If at any time this instrument is to be returned to the factory for repair, a COMPLETE description of suspected faulty operation, as noted by the operator, MUST accompany the instrument. The more details submitted to the Service Department of Dynascan Corp., the more quickly and efficiently the instrument can be repaired and returned. It is very important that this description of suspected faulty operation be given in unusually exact detail due to the fact that in many cases, faulty operation can be traced to difficulties in other items of test equipment and/or improper analysis of results obtained.

ANY WRITTEN INQUIRIES TO THE FACTORY REGARDING YOUR POWER SUPPLY MUST INCLUDE COMPLETE SERIAL NUMBER OF YOUR INSTRUMENT. IF YOU NEGLECT TO INCLUDE THE SERIAL NUMBER, IT WILL BE NECESSARY FOR THE FACTORY TO REQUEST THE NUMBER IN ORDER TO ANALYZE YOUR PROBLEM.

WARRANTY SERVICE INSTRUCTIONS

1. Refer to the instruction manual for adjustments that may be applicable.
2. Check common electronic parts. Always check instruction manual for applicable adjustments after such replacement.
3. Defective parts removed from units which are within the warranty period should be sent to the factory prepaid with model and serial number of product from which removed and date of product purchase. These parts will be exchanged at no charge.
4. If the above mentioned procedures do not correct the difficulty, pack the product securely using the same packing arrangement as supplied by the manufacturer. A detailed list of troubles encountered must be enclosed as well as your name and address. Forward prepaid (express preferred) to the nearest Dynascan authorized service agency.

Contact your local Precision Apparatus Distributor for the name and location of your nearest service agency, or write to

Service Department

DYNASCAN CORPORATION

1801 West Belle Plaine Avenue

Chicago, Illinois 60613

K4XL's  BAMA

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MODEL B-12 PARTS AND PRICE LIST

PRECISION APPARATUS

DIVISION OF DYNASCAN CORPORATION

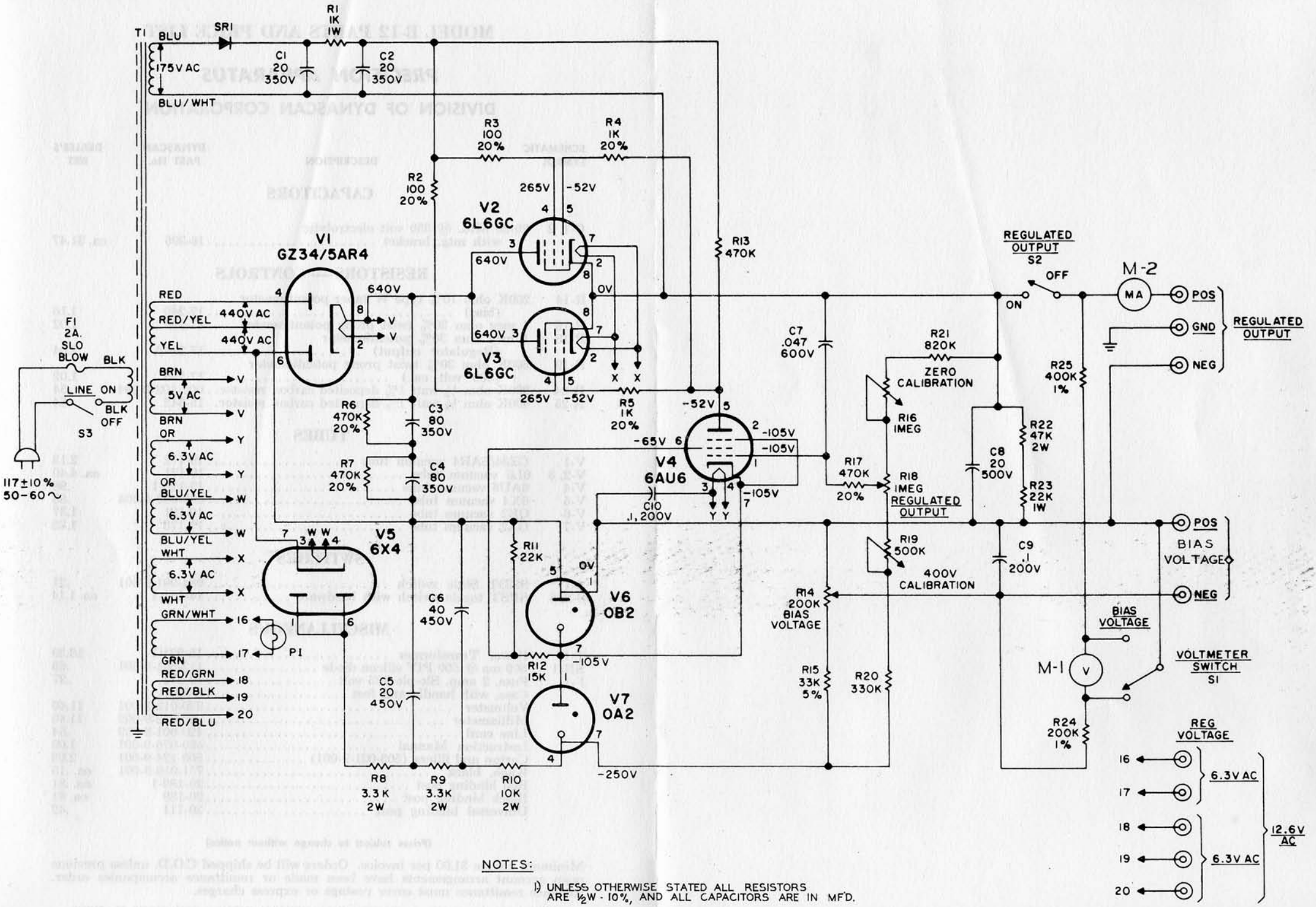
SCHEMATIC SYMBOL	DESCRIPTION	DYNASCAN PART No.	DEALER'S NET
	CAPACITORS		
C-1, 2	20-20 Mfd. @ 350 volt electrolytic with mtg. bracket	16-305	ea. $1.47
	RESISTORS — CONTROLS		
R-14	200K ohm 10% type W taper potentiometer (bias)	17-240	1.16
R-16	1 meg ohm 30% twist prong potentiometer	17-238	1.02
R-18	1 meg ohm 30% potentiometer (Regulator output)	17-210A	2.04
R-19	500K ohm 30% twist prong potentiometer (400 volt cal.)	17-239	1.02
R-24	200K ohm ½ watt 1% deposited carbon resistor	002-102-3-204	.54
R-25	400K ohm ½ watt 1% deposited carbon resistor	15-342	.54
	TUBES		
V-1	GZ34/5AR4 vacuum tube	19-172	2.13
V-2, 3	6L6 vacuum tube	19-171	ea. 4.40
V-4	6AU6 vacuum tube	19-128-1	.98
V-5	6X4 vacuum tube	235-062-4-004	.83
V-6	OB2 vacuum tube	19-121	1.37
V-7	OA2 vacuum tube	19-173	1.32
	SWITCHES		
S-1	SPDT Slide switch	084-001-9-001	.21
S-2, 3	SPST toggle switch with hardware	14-151-1	ea. 1.14
	MISCELLANEOUS		
T-1	Power Transformer	18-224C	18.39
SR-1	500 ma @ 500 PIV silicon diode	112-501-0-501	.66
F-1	Fuse, 2 amp. Slo-blo 125 volt	19-174	.27
	Case, with handle and feet	S-2903	
	Voltmeter	320-012-9-001	11.40
	Milliameter	320-012-9-002	11.40
	Line cord	420-001-9-009	.54
	Instruction Manual	480-076-9-001	1.00
	Carton and fillers (503-021-9-001)	500-124-9-001	2.03
	Knob, black	751-010-9-001	ea. .15
	Red binding post	20-189-1	ea. .81
	Black binding post	20-189	ea. 81
	Universal binding post	20-111	.42

(Prices subject to change without notice)

Minimum charge $1.00 per invoice. Orders will be shipped C.O.D. unless previous open account arrangements have been made or remittance accompanies order. Advance remittance must cover postage or express charges.

SPECIFY SERIAL # WHEN ORDERING REPLACEMENT PARTS

488-058-9-001 1-67



NOTES:

1) UNLESS OTHERWISE STATED ALL RESISTORS ARE ½W - 10%, AND ALL CAPACITORS ARE IN MF'D.

2) ALL UNDERLINED SWITCHES, CONTROLS AND JACKS ARE ON THE FRONT PANEL.

3) LAST "R" #24.
LAST "C" #9.

Warranty

This is to certify that we guarantee this Instrument, manufactured by us, to be free from defects in material and workmanship under normal use and service. Our obligation under the guarantee is limited to repairing or replacing this instrument through the Service Department, provided that original purchase has been duly registered and instrument is returned prepaid within 90 days from date of sale. Stamped and addressed registration card is furnished with every instrument.

This guarantee is expressly in lieu of all other guarantees, expressed or implied and of all other obligations on our part, and no other Representative or person is authorized or permitted to make any guarantee or to assume for this Company any liability not strictly in accordance with the foregoing.

This guarantee will not apply to any product which has been tampered with or altered in any way, or which has been subjected to misuse, negligence or accident, or which has the serial number altered, effaced or removed.

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