OPERATING INSTRUCTIONS

1201-A

TYPE 1201-A UNIT REGULATED POWER SUPPLY

. . . . SINCE 1915

manufacturers of

electronic apparatus

for science and industry

GENERAL RADIO COMPANY

CAMBRIDGE 39, MASSACHUSETTS, USA

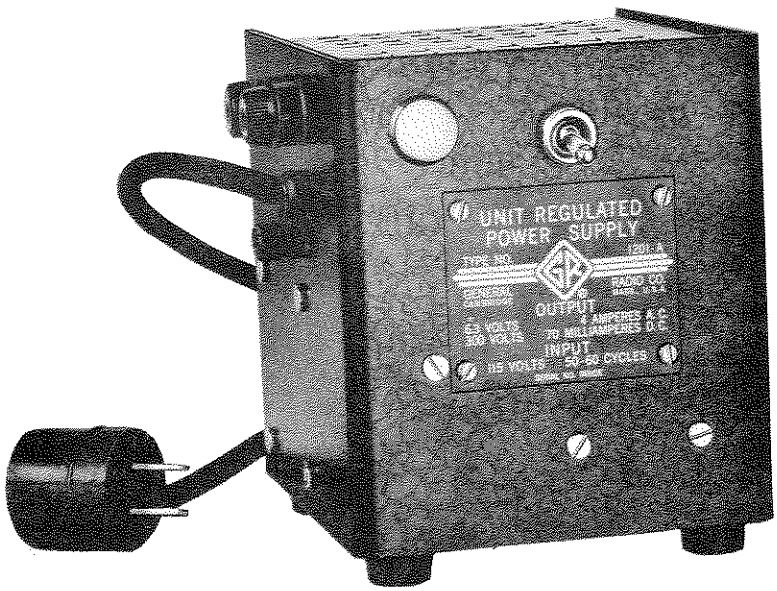

Figure 1. Panel View, Type 1201-A Unit Regulated Power Supply.

SPECIFICATIONS

OUTPUT	300 v dc (±1%) at 70 ma. 6.3 v ac at 4 amp (unregulated).
REGULATION	D-c output voltage is constant within ±1/2% for all values of load current and line voltage.
RIPPLE	Less than 2 mv (120 cps) at full load.
INTERNAL IMPEDANCE	3 ohms (approx).
INPUT	105-125 volts, 50-60 cps, 85 w, full load at 115 v.
CONNECTORS	Line cord permanently attached to instrument. Standard 4-point connector mounted on cabinet side for other Unit Instruments.
ACCESSORIES SUPPLIED	Line cord; mating plug for equipment other than Unit Instruments.
MOUNTING	Black-crackle-finish aluminum panel and sides. Aluminum cover finished in clear lacquer.
DIMENSIONS	Width 5 in., height 5 3/4 in., depth 6 1/4 in. over-all, not including power cord.
WEIGHT	6 lb.

TYPE 1201-A

UNIT REGULATED POWER SUPPLY

1 INTRODUCTION.

1.1 PURPOSE. The Type 1201-A Unit Regulated Power Supply (Figure 1) is designed to provide a source of regulated power for other Unit Instruments. It can also supply instruments other than those of the Unit Line, by means of a mating connector provided.

1.2 DESCRIPTION. The dimensions and output voltage ratings of the Type 1201-A Unit Regulated Power Supply are identical to those of the Type 1203-A Unit Power Supply. The Type 1201-A, which features increased current ratings, greatly reduced ripple voltage, and constant output voltage, is recommended in critical applications demanding maximum performance.

2 PRINCIPLES OF OPERATION. (See Figure 2.)

2.1 GENERAL. A full-wave voltage doubler with selenium rectifiers provides the input voltage for the series regulator. The output voltage, through a voltage divider, is compared to a reference tube (Type 5651) to produce an error voltage. The error voltage is amplified by a high-gain cascode amplifier (Type 12AX7), which drives a series regulator tube (triode-connected Type 6AV5GT) to provide constant output voltage.

2.2 FEEDBACK. For further protection against line-voltage fluctuation, a small amount of feedback (R502 and R512) is provided from the input of the series regulator tube to the output voltage divider to aid cancellation of input variations. The amount of feedback is a compromise between that needed to cancel input voltage variations and that needed for heater voltage changes in the high-gain amplifier.

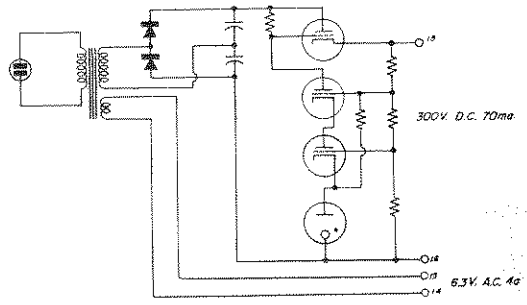

Figure 2.
Elementary Schematic Diagram

3 INSTALLATION.

3.1 CONNECTIONS. Connect the Unit Regulated Power Supply to an a-c line (105-125 v, 50-60 cps).

If the Power Supply is to be used with a Unit Instrument, plug the Unit Instrument into the four-point connector on the right side of the Power Supply.

If the Power Supply is to be used with equipment other than Unit Instruments, use the mating connector provided. Terminal numbers are marked on the plug. Connect to terminals No. 13 and 14 for 6.3 volts ac, to terminals No. 15 and 16 for 300 volts dc. (The positive terminal is No. 15.)

Both the 6.3-volt a-c and 300-volt d-c supplies are isolated from ground and from each other, to give greater latitude in external connections.

4 CHECKS AND ADJUSTMENTS.

4.1 OUTPUT VOLTAGE ADJUSTMENT. A single adjustment, R508 (Figure 3) is provided to set output voltage to 300 volts ±1%. Readjustment of the potentiometer is usually unnecessary, except after replacement of V503 (Type 5651). Adjust with offset screwdriver or pliers so that an accurate voltmeter indicates 300 volts at the output terminals.

5 SERVICE AND MAINTENANCE.

5.1 GENERAL. This service information, together with the information given in preceding paragraphs, should enable the user to locate and correct ordinary difficulties resulting from normal use.

Major service problems should be referred to our Service Department, which will cooperate as much as possible by furnishing information and instructions as well as by supplying any replacement parts needed.

When notifying our Service Department of any difficulties in operation or service, specify the serial and type numbers of the instrument. Also give a complete report of trouble encountered and steps taken to eliminate the trouble.

Before returning an instrument or parts for repair, please write to our Service Department, requesting a Returned Material Tag, which includes shipping instructions. Use of this tag will insure proper handling and identification. A purchase order covering repair of material returned should be forwarded to avoid any unnecessary delay.

5.2 FUSES. The Type 1201-A Unit Regulated Power Supply uses 0.8-amp fuses. When the Power Supply is used with Unit Instruments, full output power is not required, and input current is below 0.8 amp. However, if both output voltages are fully loaded and the Power Supply is run on a 125-volt line, input current is just over 0.8 amp, and fuses may blow after several hours. Therefore, substitute 1-amp fuses for continuous operation at high line voltage and full load.

5.3 COVER REMOVAL. To remove the cover, loosen the black thumbscrew on the left side of the cabinet. Slide the cover off, away from the panel.

5.4 TUBE REPLACEMENT

CAUTION

Insert tubes carefully so as not to damage etched circuit.

If a Type 6AV5GT tube is not available, a Type 6AU5GT can be substituted.

The Type 6AU5GT may not perform as well. With this tube, the Power Supply may not regulate for input voltages below 106 or 107 if loaded to 70 milliamperes.

The Type 6AU5GT (the same size as the Type 6AV5GT) may not perform as well. With this tube, the Power Supply may not regulate for input voltages below 106 or 107 if loaded to 70 milliamperes.

The Power Supply is operable with the etched circuit folded out for servicing.

5.5 EXCESSIVE RIPPLE. Measure ripple voltage at full load. If ripple is excessive only at low line voltages, replace V501 (6AV5GT). If ripple is excessive even at high line voltages, also check C1 and C2. Ripple across C1 and C2, from the positive terminal of C2 to the negative terminal of C1, should be less than 10 volts peak to peak, and should be predominantly 120 cps (100 cps on 50-cps lines).

5.6 INCORRECT OUTPUT VOLTAGE. If the output voltage is incorrect, but near 300 volts, reset R508 (refer to paragraph 4.1). If this adjustment drifts, replace V503 (5651).

If the output voltage is not near the correct value, replace V501 (6AV5GT) and check the input voltage across C1 and C2. Voltage from the positive terminal of C2 to the negative terminal of C1 should be 412 volts with full load and with 115-volt input. If the input voltage is low, check C1, C2, RX1, and RX2. If the input voltage is normal, replace V502 (12AX7) and check the output voltage divider (R504, R505, R507, and R508) for a faulty resistor or a leaky capacitor shunting a resistor.

If components check out satisfactorily, check the wiring on the etched circuit. Joints around the tube sockets can be damaged by a tube being forced into a socket.

Voltages at key points during normal operation are indicated on the schematic diagram, Figure 4.

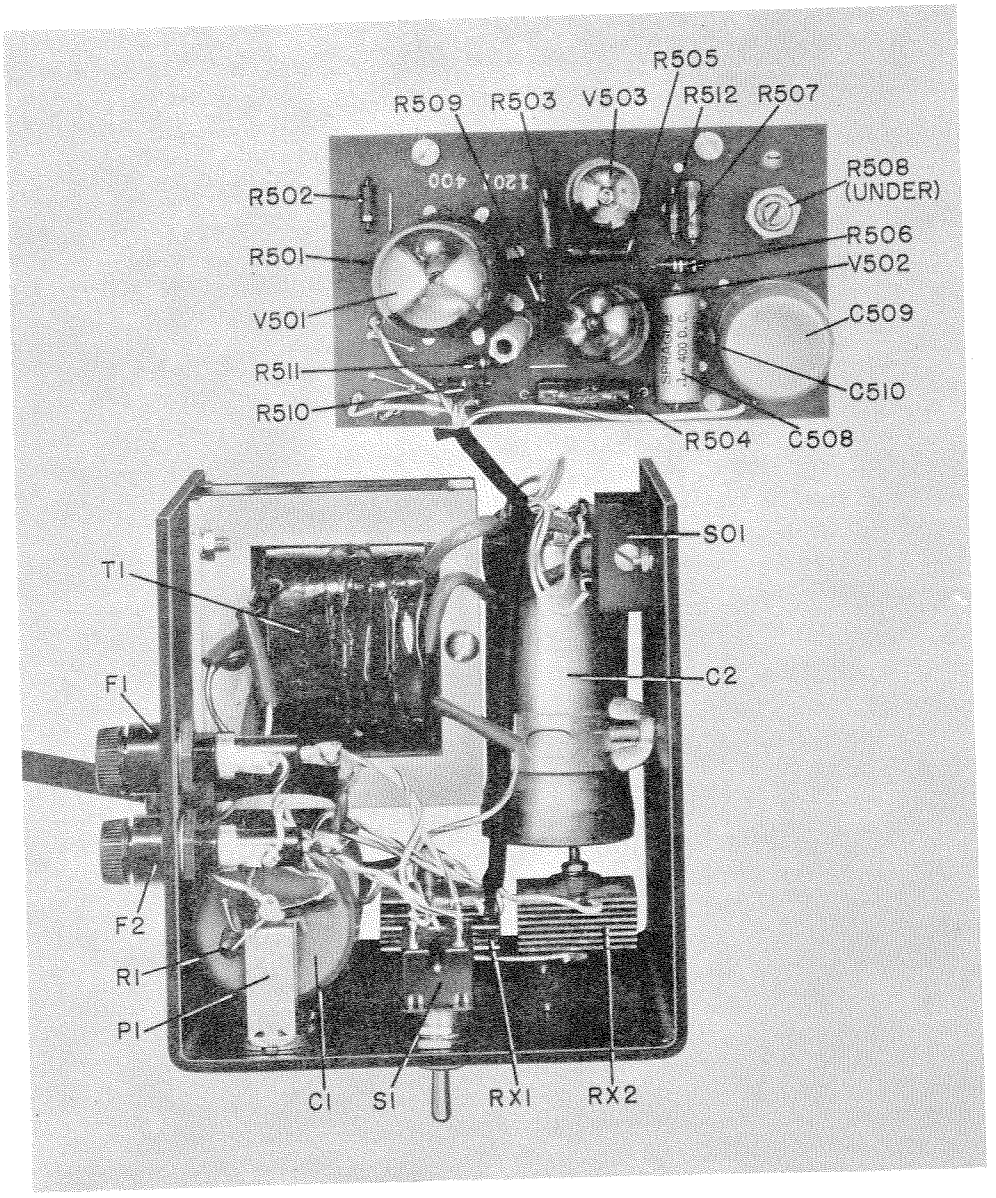

Figure 3. Interior View of Type 1201-A Unit Regulated Power Supply

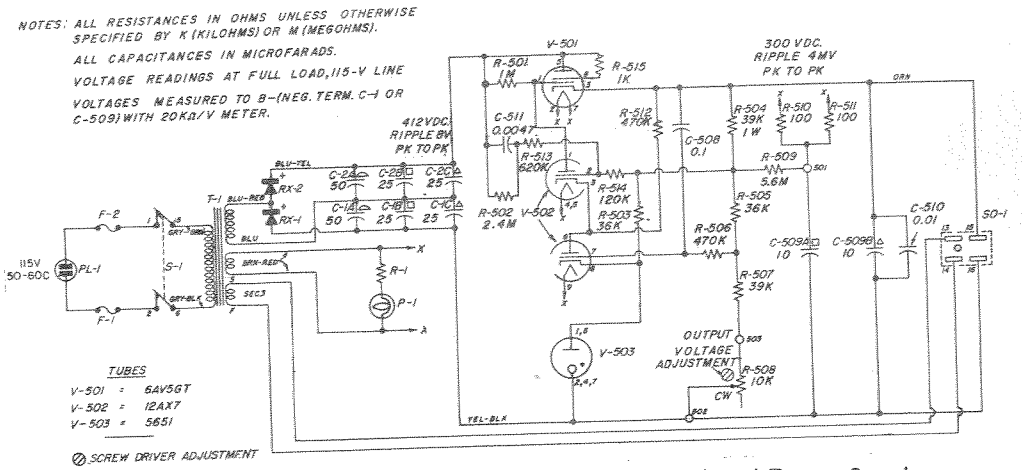

Figure 4. Wiring Diagram for Type 1201-A Unit Regulated Power Supply

PARTS LIST

				GR No. (Note A)
RESISTORS (Note B)	*R-1	15	±10% ½w	REW-3C
	R-501	1M	±10% ½w	REC-20BF
	R-502	2.4M	± 5% ½w	REC-20BF
	R-503	36k	± 1% ½w	REF-2
	R-504	39k	± 1% 1 w	REF-2-2
	R-505	36k	± 1% ½w	REF-2
	R-506	470k	± 5% ½w	REC-20BF
	R-507	39k	± 1% ½w	REF-2
	R-508	10k	±10%	POSW-3
	R-509	5.6M	±10% ½w	REC-20BF
	R-510	100	±10% ½w	REC-20BF
	R-511	100	±10% ½w	REC-20BF
	R-512	470k	± 5% ½w	REC-20BF
	R-513	620k	± 5% ½w	REC-20BF
	R-514	120k	± 5% ½w	REC-20BF
	R-515	1k	± 5% ½w	REC-20BF

				GR No. (Note A)
CAPACITORS (Note C)	C-1A	50	450dcwv	COE-10
	C-1B	25		
	C-1C	25		
	C-2A	50	450dcwv	COE-10
	C-2B	25		
	C-2C	25		
	C-508	0.1	±10% 400dcwv	COW-25
	C-509A	10	450dcwv	COE-5
	C-509B	10		
	C-510	0.01	+100%-0 500dcwv	COC-63
	C-511	0.0047	±10% 600dcwv	COL-71
MISCELLANEOUS	PL-1	Plug		Part of 1201-21
	SO-1	Socket		CDMS-11-4
	F-1, F-2	Fuse 0.8 amp Slo-Blo 3AG (for 115v)		FUF-1
	P-1	Pilot Light 6.3v		2LAP-939
	RX-1	Rectifier		2RE-11
	RX-2	Rectifier		2RE-11
	S-1	Switch DPST		SWT-333,NP
	T-1	Transformer		485-486

* Part of P1 Socket

NOTES

(A) Type designations for resistors and capacitors are as follows:

COC - Capacitor, ceramic
COE - Capacitor, electrolytic
COW - Capacitor, wax
POSW - Potentiometer, wire-wound
REC - Resistor, fixed, composition
REF - Resistor, fixed, film
REW - Resistor, fixed, wire-wound

(B) All resistances are in ohms, unless otherwise indicated by k (kilohms) or M (megohms).

(C) All capacitances are in microfarads.

OTHER GENERAL RADIO UNIT INSTRUMENTS

Type 1202-A Unit Vibrator Power Supply
Type 1203-A Unit Power Supply
Type 1204-B Unit Variable Power Supply
Type 1206-B Unit Amplifier
Type 1208-B Unit Oscillator (65 - 500 Mc)
Type 1209-B Unit Oscillator (250 - 920 Mc)
Type 1210-B Unit R-C Oscillator (20c to 0.5 Mc)
Type 1211-B Unit Oscillator (0.5 - 50 Mc)
Type 1212-A Unit Null Detector
Type 1213-C Unit Time/Frequency Calibrator
Type 1214-A Unit Oscillator (400 and 1000 cycles)
Type 1215-B Unit Oscillator (50 - 250 Mc)
Type 1216-A Unit I-F Amplifier
Type 1217-A Unit Pulser
Type 1218-A Unit Oscillator (900 - 2000 Mc)
Type 1219-A Unit Pulse Amplifier
Type 1220-A Unit Klystron Oscillator

GENERAL RADIO COMPANY

275 MASSACHUSETTS AVENUE
CAMBRIDGE 39 MASSACHUSETTS

BRANCH ENGINEERING OFFICES

NEW YORK: Broad Avenue at Linden
Ridgefield, New Jersey

CHICAGO: 920 South Michigan Avenue
Chicago 5, Illinois

PHILADELPHIA: 1150 York Road
Abington, Pennsylvania

WASHINGTON: 8055 13th Street
Silver Spring, Maryland

LOS ANGELES: 1000 North Seward Street
Los Angeles 38, California

SAN FRANCISCO: 1182 Los Altos Avenue
Los Altos, California

REPAIR SERVICES

WEST COAST

Western Instrument Company
826 North Victory Boulevard
Burbank, California

EAST COAST

General Radio Company
Service Department
275 Massachusetts Avenue
Cambridge 39, Massachusetts

CANADA

Bayly Engineering, Ltd.
First Street
Ajax, Ontario

Printed in U.S.A.