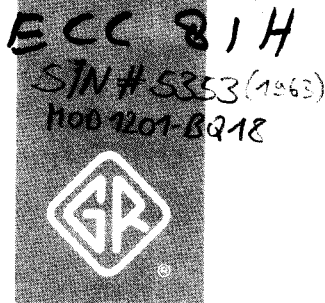


OPERATING INSTRUCTIONS

**TECHNISCHE HOGESCHOOL EINDHOVEN
AFDELING DER ELEKTROTECHNIEK
GROEP RADIOSYSTEMEN**

Orickel Boek MAART 2006



TYPE 1201-B

**UNIT REGULATED
POWER SUPPLY**

G E N E R A L R A D I O C O M P A N Y

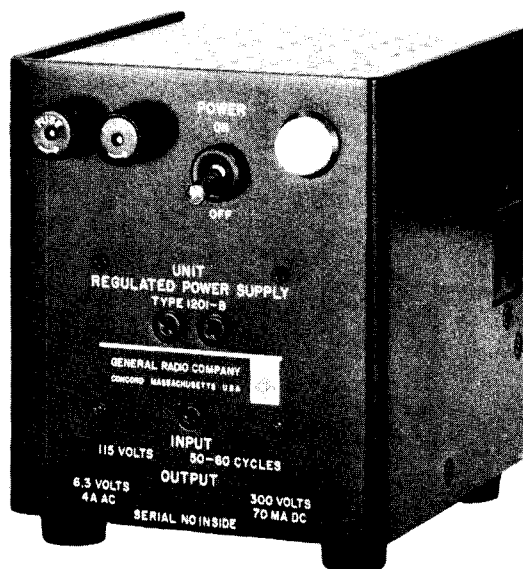


Figure 1. Panel View, Type 1201-B Unit Regulated Power Supply.

SPECIFICATIONS

Output: Dc, 300 volts $\pm 1\%$, regulated to 0.25%, 70 ma, max; ac, 6.3 volts, unregulated, 4 amp.

120-Cycle Ripple: Less than one millivolt.

Tube Complement: One each 12AX7, 6AV5GA, 5651, 12AT7, 6AN8.

Input: 105 to 125 volts, 50 to 60 cps, 90 watts. Three-wire power cord is permanently attached. Can also be operated from a 400-cycle supply for applications where a 400-cycle 6.3-volt supply can be tolerated.

Accessories Supplied: Output plug for connection to equipment other than Unit Instruments, spare fuses.

Mounting: Aluminum panel and cabinet.

Dimensions: Width 5, height $5\frac{3}{4}$, depth $6\frac{1}{4}$ inches (130 by 150 by 160 mm).

Net Weight: 6 pounds (2.8 kg).

TYPE 1201-B

UNIT REGULATED POWER SUPPLY

1 INTRODUCTION.

1.1 PURPOSE. The Type 1201-B 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-B Unit Regulated Power Supply are identical to those of the Type 1203 Unit Power Supply. The Type 1201-B, 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) by means of a differential cascode amplifier. The amplified error voltage is applied to a series regulator tube, through a cathode follower, to provide constant output voltage.

2.2 FEEDBACK. In addition to the main feedback loop described above, two additional signal paths inside this feedback loop are provided for improved performance. A network comprising R533 and C531 reduces the effects of input fluctuations, and R540 is used to make the open loop gain infinite. This provides a very low output impedance and reduces the effect of load changes on output voltage.

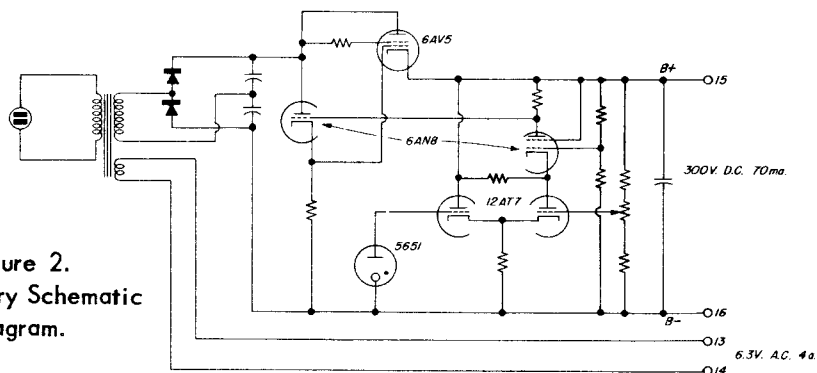


Figure 2.
Elementary Schematic
Diagram.

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3 INSTALLATION.

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

NOTE

The Type 1201-B will operate satisfactorily from a 400-cycle line. For load currents above 50 ma, the minimum line voltage should be 107 volts.

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, R551 (Figure 3), is provided to set output voltage to 300 volts $\pm 1\%$. Readjustment of the potentiometer is usually unnecessary, except after replacement of V534 (Type 5651). Adjust so that an accurate voltmeter indicates 300 volts at the output terminals.

5 SERVICE AND MAINTENANCE.

5.1 GENERAL. The two-year warranty given with every General Radio instrument attests the quality of materials and workmanship in our products. When difficulties do occur, our service engineers will assist in any way possible.

In case of difficulties that cannot be eliminated by the use of these service instructions, please write or phone our Service Department, giving full information of the trouble and of steps taken to remedy it. Be sure to mention the serial and type numbers of the instrument.

Before returning an instrument to General Radio for service, please write to our Service Department or nearest district office (see back cover), requesting a Returned Material Tag. Use of this tag will ensure proper handling and identification. For instruments not covered by the warranty, a purchase order should be forwarded to avoid unnecessary delay.

5.2 FUSES. The Type 1201-B 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

TYPE 1201-B UNIT REGULATED POWER SUPPLY

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 REMOVAL OF ETCHED BOARD. While it is possible to replace all tubes and measure all voltages without removal of the etched board, access to components requires swinging the etched board out of the instrument. Remove V531 (6AV5GA) and the two screws at the rear of the etched board (see Figure 3). The board will now swing out on the hinges provided. If V531 (6AV5GA) is replaced, the instrument may be operated in this position.

5.5 TROUBLE-SHOOTING PROCEDURE.

5.5.1 EXCESSIVE RIPPLE.

5.5.1.1 120-Cycle Ripple. Measure ripple at full load. If output ripple is excessive only at low line voltages, replace V531 (6AV5GA). If voltage across C1 and C2 is less than 400 volts at full load and 115-volt line, replace RX1 and RX2. If ripple across C1 and C2 is greater than 6 volts peak to peak (2 volts rms), replace C1 and C2.

5.5.1.2 60-Cycle Ripple. If 60-cycle ripple is excessive only at full load, one rectifier (RX1 or RX2) or one capacitor (C1 or C2) is probably faulty. If ripple is independent of load, it may be caused by heater-cathode leakage in V532 (6AN8) or V533 (12AT7). Measure d-c voltage from pin 4 or 5 of V533 (12AT7) with a vacuum-tube voltmeter. If this voltage is above 130 volts when the output voltage is 300 volts, V532 (6AN8) probably has excessive heater-cathode leakage. If this voltage is less than 110 volts when the output voltage is 300 volts, V533 (12AT7) probably has heater-cathode leakage. If this voltage is incorrect and tubes are good, check R536 and R549. Check C532.

5.5.2 INCORRECT OUTPUT VOLTAGE. If the output voltage is regulated and within a few volts of 300, reset R551 (refer to paragraph 4.1). If this adjustment drifts, replace V534 (5651).

If the output voltage drops only at low line and full load, replace V531 (6AV5GA) and check the voltage across C1 and C2. Voltage from the positive terminal of C2 to the negative terminal of C1 should be 405 volts with full load and 115-volt line. If this voltage is less than 400 volts, check RX1, RX2, C1, and C2.

If the output voltage is completely unregulated, replace V533 (12AT7) and V532 (6AN8). If tubes are not faulty, measure voltages at key points with a vacuum-tube voltmeter, comparing them with those given in Figure 4.

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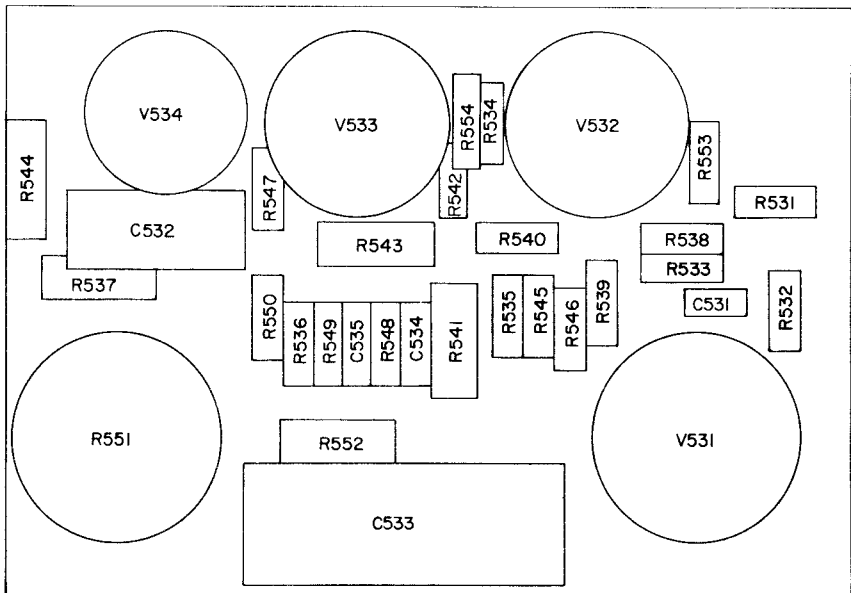
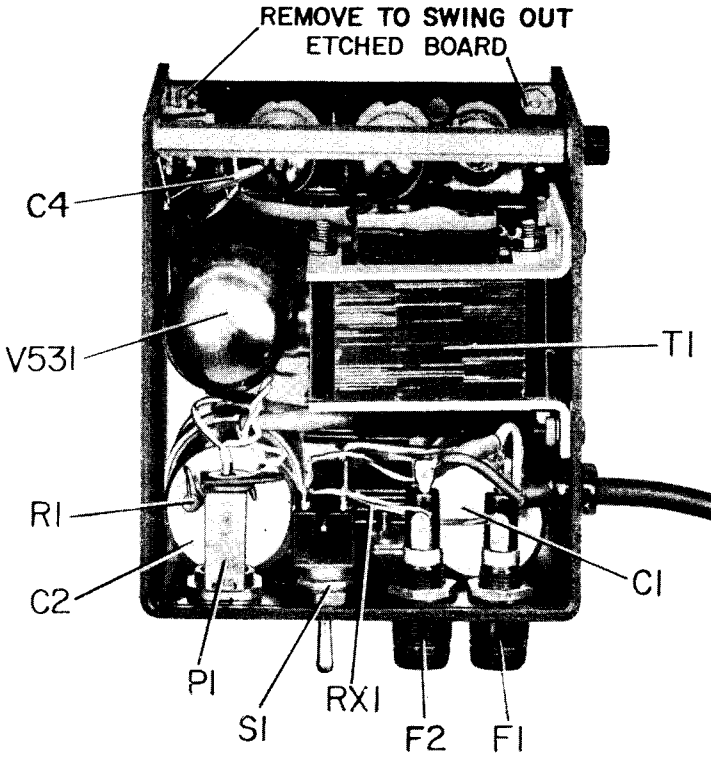


Figure 3. Interior View and Etched-Board Layout.

OTHER GENERAL RADIO UNIT INSTRUMENTS

- Type 1203 Unit Power Supply**
- Type 1205 Adjustable Regulated Power Supply**
- Type 1206 Unit Amplifier**
- Type 1208 Unit Oscillator (65 - 500 Mc)**
- Type 1209-B Unit Oscillator (250 - 920 Mc)**
- Type 1209-BL Unit Oscillator (180 - 600 Mc)**
- Type 1210 Unit R-C Oscillator (20 c - 0.5 Mc)**
- Type 1211 Unit Oscillator (0.5 - 50 Mc)**
- Type 1212 Unit Null Detector**
- Type 1213 Unit Time/Frequency Calibrator**
- Type 1214 Unit Oscillator (400 and 1000 cycles)**
- Type 1215 Unit Oscillator (50 - 250 Mc)**
- Type 1216 Unit I-F Amplifier**
- Type 1217 Unit Pulser**
- Type 1218 Unit Oscillator (900 - 2000 Mc)**
- Type 1219 Unit Pulse Amplifier**
- Type 1220 Unit Klystron Oscillator**

⊗ SCREWDRIVER ADJUSTMENT

-30V
50V
42

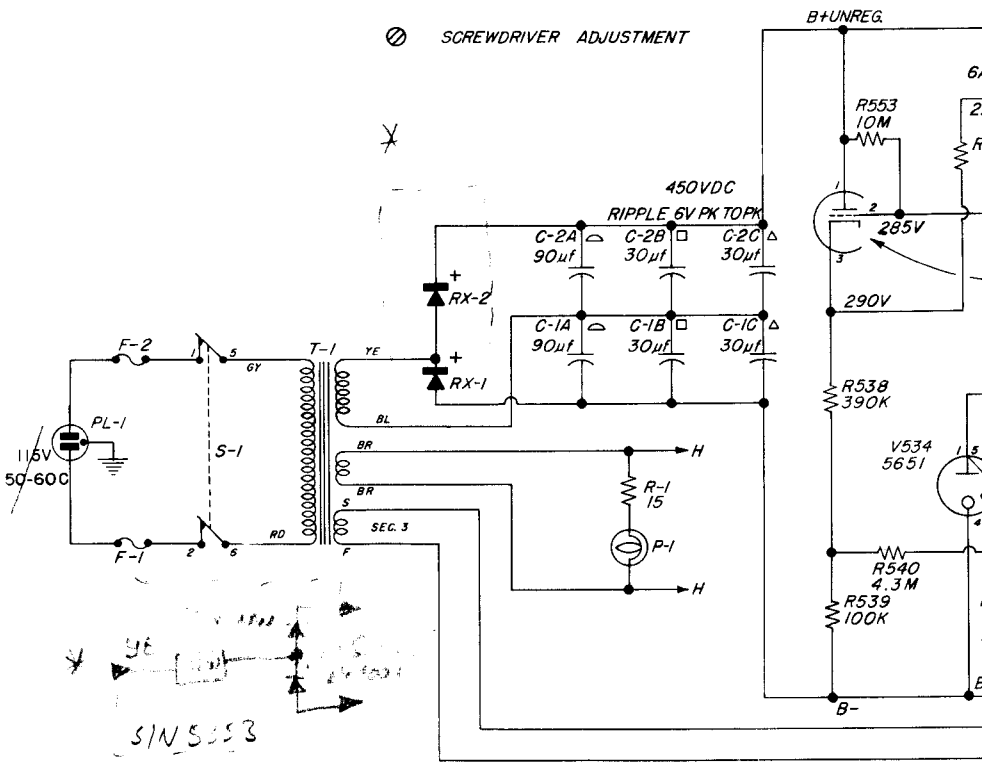


Figure 4. Wiring Diagram for Typ

				PART NO. (NOTE A)					PART (NOT		
RESISTORS (NOTE B)	R1	15	±10%	1/2w	REC-20BF	R546	180	k ± 5%	1/2w	REC-	
	R531	1	k ± 5%	1/2w	REC-20BF	R547	1	k ± 5%	1/2w	REC-	
	R532	1	k ± 5%	1/2w	REC-20BF	R548	5.6	k ± 5%	1/2w	REC-	
	R533	12	M ± 5%	1/2w	REC-20BF	R549	1.5	M ± 5%	1/2w	REC-	
	R534	2.7	M ± 5%	1/2w	REC-20BF	R550	470	k ± 5%	1/2w	REC-	
	R535	120	k ± 5%	1/2w	REC-20BF	R551	10	k ± 10%		POSV	
	R536	2.2	M ± 5%	1/2w	REC-20BF	R552	33	k ± 1%	1/4w	REF	
	R537	261	k ± 1%	1/4w	REF-65	R553	10	M ± 5%	1/2w	REC-	
	R538	390	k ± 5%	1/2w	REC-20BF	R554	33	k ± 5%	1/2w	REC-	
	R539	100	k ± 5%	1/2w	REC-20BF	CAPACITORS (NOTE C)	C1A	90			
	R540	4.3	M ± 5%	1/2w	REC-20BF		C1B	30		300 dcwv	COE
	R541	75	k ± 1%	1/4w	REF-65		C1C	30			
	R542	1	k ± 5%	1/2w	REC-20BF		C2A	90			
	R543	100	k ± 1%	1/4w	REF-65		C2B	30		300 dcwv	COE
	R544	82	k ± 5%	1w	REC-30BF		C3C	30			
R545	33	k ± 5%	1/2w	REC-20BF	C4		0.01	±20%	500 dcwv	COC	

⊗ SCREWDRIVER ADJUSTMENT

230V
50-400
Hz

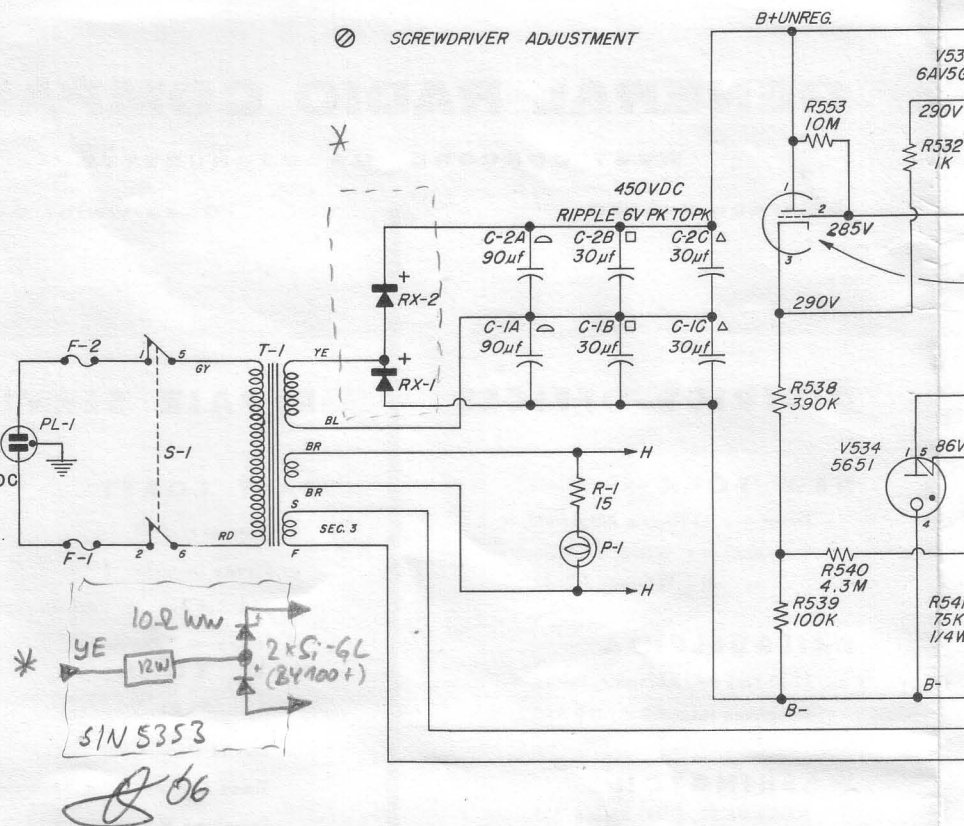
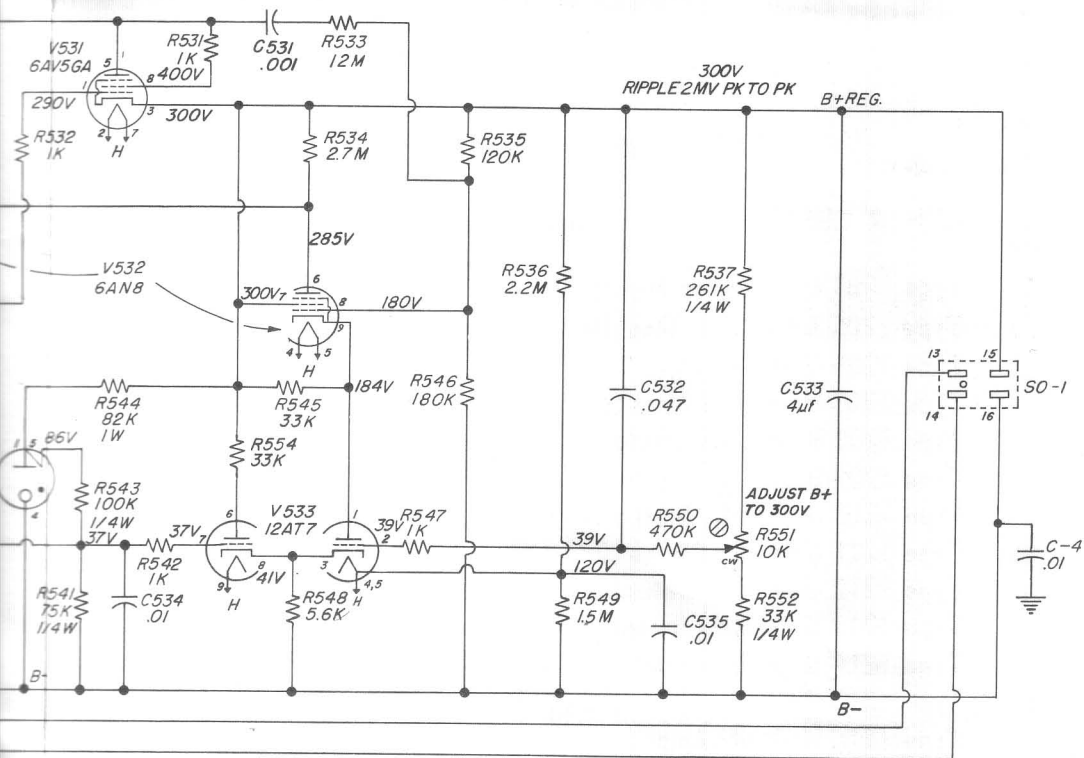


Figure 4. Wiring Diagram for Type

				PART NO. (NOTE A)				PART NO. (NOTE A)			
RESISTORS (NOTE B)	R1	15	±10%	1/2w	REC-20BF	R546	180	k ± 5%	1/2w	REC-20BF	
	R531	1	k ± 5%	1/2w	REC-20BF	R547	1	k ± 5%	1/2w	REC-20BF	
	R532	1	k ± 5%	1/2w	REC-20BF	R548	5.6	k ± 5%	1/2w	REC-20BF	
	R533	12	M ± 5%	1/2w	REC-20BF	R549	1.5	M ± 5%	1/2w	REC-20BF	
	R534	2.7	M ± 5%	1/2w	REC-20BF	R550	470	k ± 5%	1/2w	REC-20BF	
	R535	120	k ± 5%	1/2w	REC-20BF	R551	10	k ± 10%		POSW-3	
	R536	2.2	M ± 5%	1/2w	REC-20BF	R552	33	k ± 1%	1/4w	REF-65	
	R537	261	k ± 1%	1/4w	REF-65	R553	10	M ± 5%	1/2w	REC-20BF	
	R538	390	k ± 5%	1/2w	REC-20BF	R554	33	k ± 5%	1/2w	REC-20BF	
	R539	100	k ± 5%	1/2w	REC-20BF	CAPACITORS (NOTE C)	C1A	90			
	R540	4.3	M ± 5%	1/2w	REC-20BF		C1B	30		300 dcwv	COE-52
	R541	75	k ± 1%	1/4w	REC-20BF		C1C	30			
	R542	1	k ± 5%	1/2w	REC-20BF		C2A	90			
	R543	100	k ± 1%	1/4w	REC-20BF		C2B	30		300 dcwv	COE-52
	R544	82	k ± 5%	1w	REC-30BF		C3C	30			
R545	.33	k ± 5%	1/2w	REC-20BF	C4		0.01		±20% 500 dcwv	COC-62	



Type 1201-B Unit Regulated Power Supply.

1201-BQ18 S/N#5353 806

PARTS LIST

PART NO. (NOTE A)				PART NO. (NOTE A)	
EC-20BF	C531	0.001	±20%	500 dcwv	COC-60
EC-20BF	C532	0.047	±10%	400 dcwv	COW-25
EC-20BF	C533	4		450 dcwv	COE-32
EC-20BF	C534	0.01	±20%	500 dcwv	COC-62
EC-20BF	C535	0.01	±20%	500 dcwv	COC-62
OSW-3	F1*	FUSE, 0.8 amp Slo-Blo 3AG		FUF-1	
EF-65	F2*	FUSE, 0.8 amp Slo-Blo 3AG		FUF-1	
EC-20BF	P1	LAMP, 6.3 v, Mazda #44		2LAP-939	
EC-20BF	RX1	RECTIFIER ***		2RE-11	
	RX2	RECTIFIER ***		2RE-11	
OE-52	S1	SWITCH, dpst		SWT-333, NP	
	T1	TRANSFORMER**		485-495	
	V531	TUBE		6AV5GA	
OE-52	V532	TUBE		6AN8	
	V533	TUBE		12AT7	
OC-62	V534	TUBE		5651	

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, composition
- REF - Resistor, film

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

(C) All capacitances are in microfarads.

When ordering replacement components, be sure to include complete description as well as Part Number. (Example: R85, 51 k ±10%, 1/2w, REC-20BF.)

* $T_1 = T_2 = 0.5A$

** 485-473 BQ18

*** Si-Diode Rectifier 1KV/1A 806

M. BOELE

GENERAL RADIO COMPANY

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Printed in USA

S/N 5353



TYPE 1201-BQ18

Unit-Regulated Power Supply

The Type 1201-BQ18 Unit-Regulated Power

Supply is identical to the Type 1201-B except:

Input is 210-250 volts, 50-60 cps

T1 = 485-473BQ18

F1 and F2 = 0.5 amp.

GENERAL RADIO COMPANY
West Concord Massachusetts

Form 921-BQ18B

April, 1960