Magnavox
SERVICE MANUAL

4337

THE MAGNAVOX COMPANY • SERVICE DEPARTMENT
FORT WAYNE, INDIANA

A595 SERIES AMPLIFIER CHASSIS

GENERAL

The A595 Series Amplifiers are designed to work in conjunction with a separate AM-FM Tuner. These amplifiers utilize twelve transistors and eight silicon diodes and provides approximately 150-watts (75-watts per channel) of Music Power Output (MPO-EIA). Due to the design of the output stages it is necessary that both positive and negative voltages be provided in the power supply circuit.

These amplifiers are the transformerless output type designed to use the speaker voice coil as the load. The voice coil impedance, therefore, plays an important part in the overall performance of this amplifier and speakers should be connected to these amplifiers at all times when the amplifier is turned on. The total speaker impedance should not be less than 8-ohms when servicing these amplifiers.

The transistor in the first stage in each channel utilizes the familiar "boot-strap" circuit to increase the reflected input impedance. This circuit provides a reflected input impedance which is approximately 100 times the emitter resistor. This is necessary to match the impedance of the tone control circuits to that of the amplifier.

The output of the first stage is DC coupled to the base of the second stage where it is amplified and then transformer coupled to the base of the output transistors for final amplification before being coupled to the speaker system.

Each channel contains 4-power transistors in the output stage. These transistors are connected in what is called a Single Ended Series Arranged Push-Pull Circuit. A positive 39V is required for one half the output circuit in each channel and a negative 39V for the other half.

Assume that a positive audio peak is present at the top of the primary of the driver transformer (T1). The two secondary windings are connected in such a manner that a negative voltage is applied to the base of Q4 and a positive voltage is applied to the base of Q6. The positive voltage cuts off Q6 and since Q5 is in series with Q6 it also will be cut off.

Q4 in the other half of the circuit has a negative voltage applied to the base which forward biases it into conduction. As Q4 conducts its collector becomes less negative. Since the collector of Q4 is connected directly to the emitter of Q3, it also becomes forward biased and begins conduction.

Now assuming that the audio peak across the driver primary is negative, Q4 will have a positive signal applied to its base cutting it off and Q6 will be forward biased into conduction. The same sequence of events occur and a complete negative cycle is developed by the transistors Q5 and Q6. Thus both halves of the audio signal have been reproduced and coupled through the speaker system for that channel.

The diodes D1 and D2 sense the amount of heat being dissipated by the transistors in channel one. An increase in heat dissipation will reduce the resistance of these diodes thus effectively increasing their forward bias. An increase in forward bias reduces the voltage drop across the 1.8 ohm and 4.7 ohm resistors (R17, 18 & R14, 19) which reduces the gain of the output transistors.

Since both channels have identical circuitry the operation of channel two is the same as that for channel one and stereo information is reproduced through the speaker system.

Replacement of Output Transistors

In order to obtain optimum performance and insure minimum harmonic distortion, it is often necessary to "match" the output transistors of an amplifier. With the type of circuit used in these A595 Amplifiers it is still necessary to match transistors but only those which are connected in a common-emitter circuit. These are Q6 and Q4 in Channel One and Q56 and Q54 in Channel Two. Because of this matching it is necessary to replace both of these transistors in a channel if either one fails.

Transistor Identification

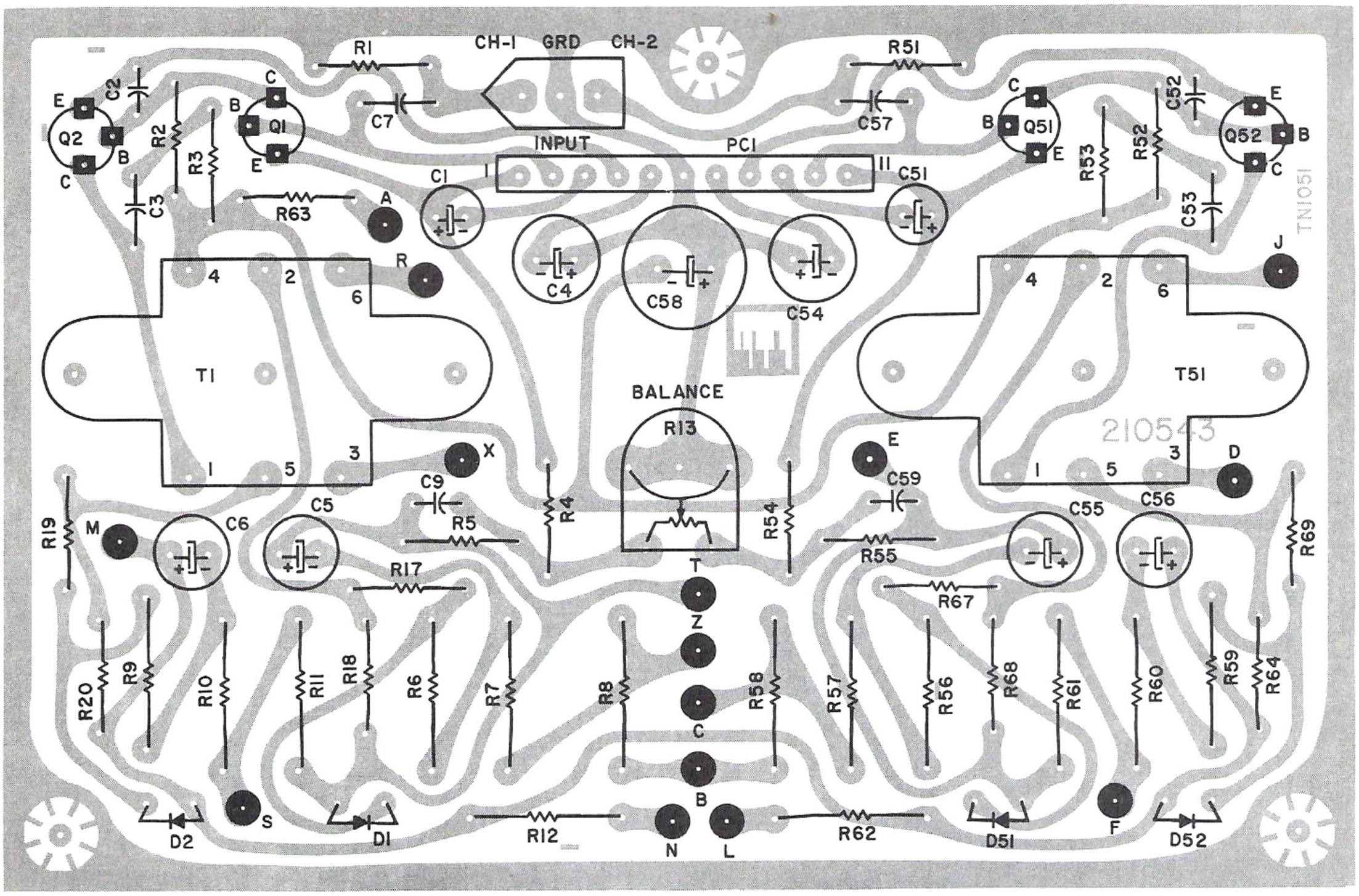
All transistors used in these chassis are identified by a special type number such as 99P2. This same identification also appears on the schematic diagram. The basic Magnavox Part Number is a six digit number followed by the group number. The first two (or three digits stamped on the transistor correspond to the last two (or three) digits of the part number. Following these is either the letter "P" or "N" which identifies the transistor as either a PNP or NPN type. Following this letter designation will appear one or more digits which identifies the group number of the transistor.

Chassis Identification

These amplifiers are identified by a production code printed on a label and affixed to the chassis. The first three numbers (595) identify the basic chassis series. The next two numbers identify the version within the series and the last two letters are used to identify production changes; (AA) indicating the initial production. A change in the first letter will indicate a major electrical change and a change in the second letter will indicate a major mechanical change. Minor changes are not identified.

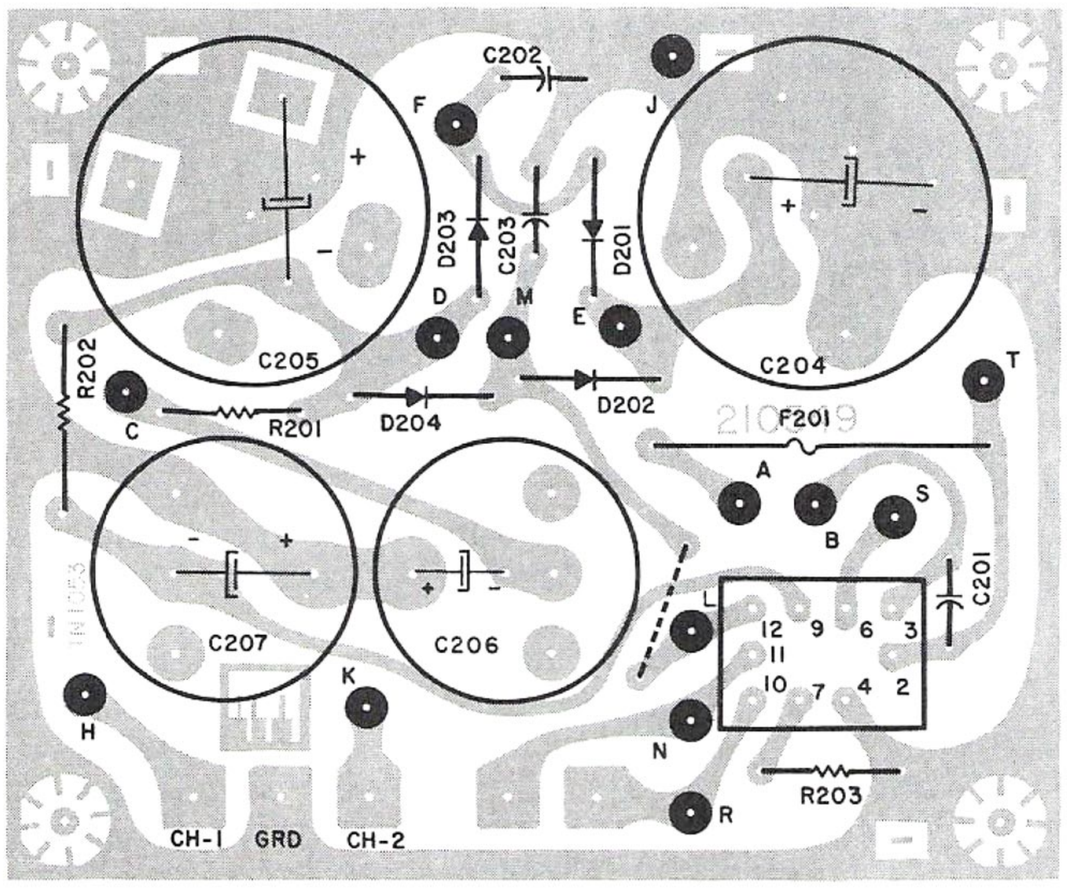
ISSUED: NOVEMBER, 1968

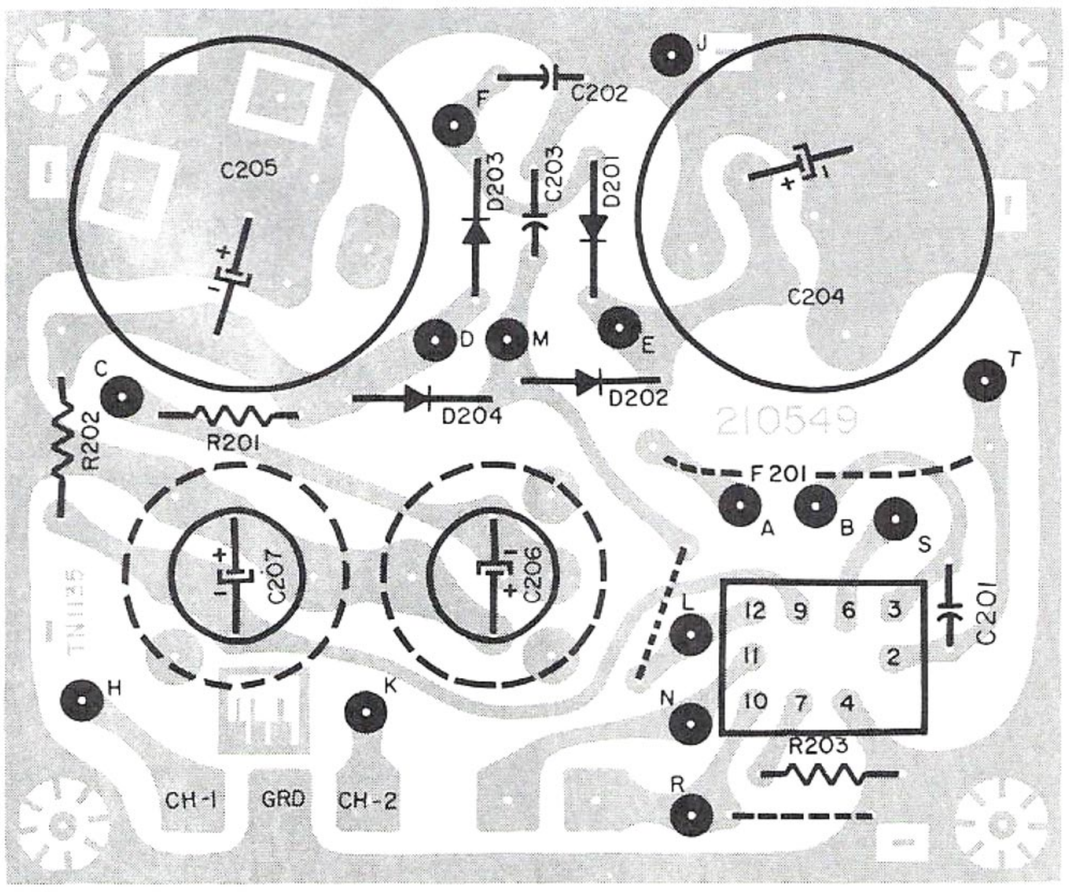
CIRCUIT BOARD LAYOUT
(VIEWED FROM COPPER SIDE)



A595-01

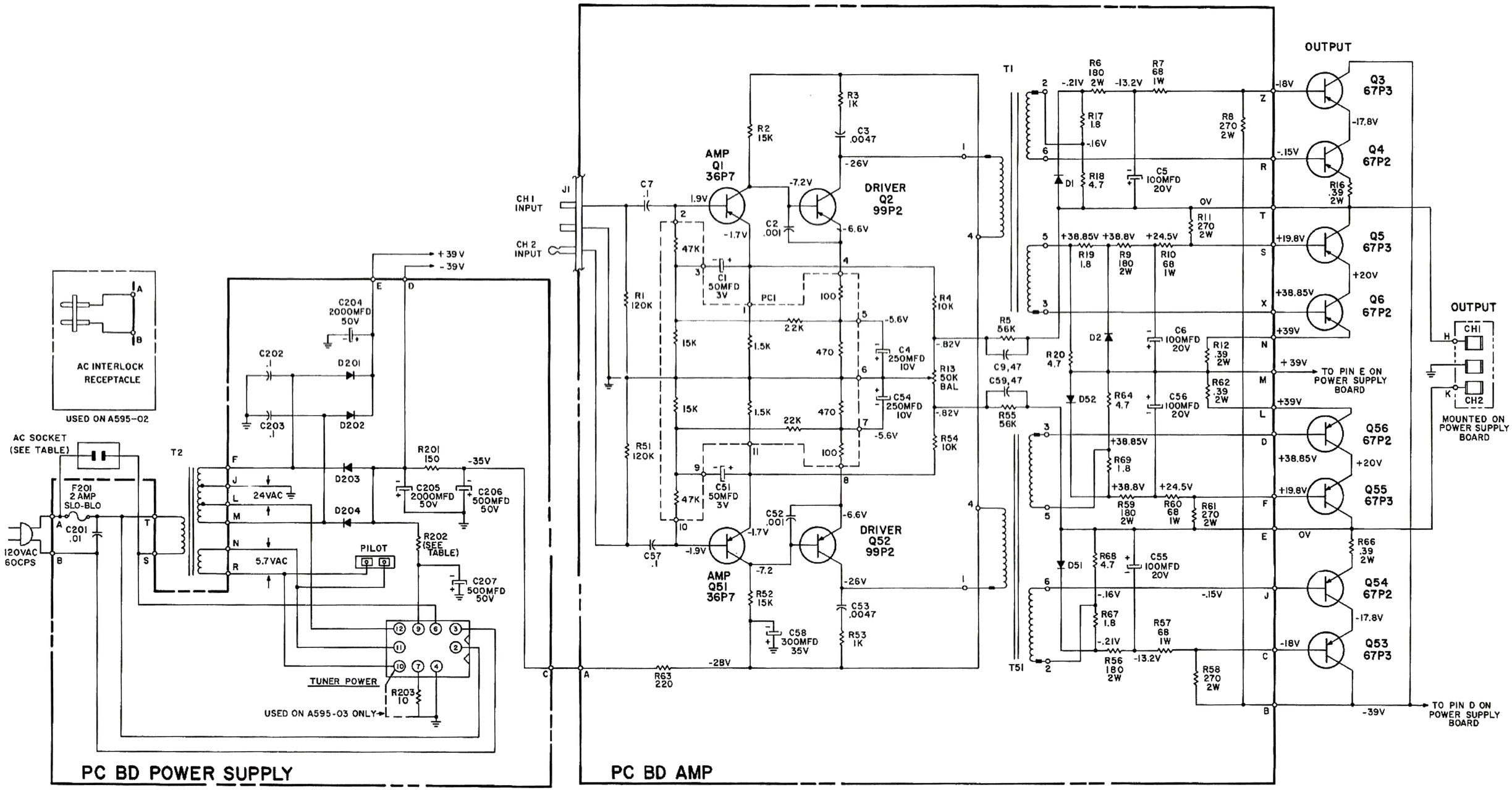
A595-02, 03





4337-3

SCHEMATIC DIAGRAM



AMP	R202	AC SOCKET
595-01	150,1W	——
595-02	150,1W	REQUIRED
595-03	68,2W	REQUIRED

NOTES:

1. ALL VOLTAGES ARE MEASURED WITH RESPECT TO GROUND CHASSIS WITH NO INPUT SIGNAL. (USE 470 OHMS, 2W RESISTOR BETWEEN PIN 9 AND 7).
2. ALL VOLTAGES MAY VARY ±10% OF THE INDICATED VALUE.
3. ALL RESISTORS ARE 1/2 WATT, 10%.
4. CAPACITANCE VALUES OF 1 AND LESS ARE IN MICROFARADS.

CH-1 LAST NO'S USED	CH-1 NO'S NOT USED	CH-2 LAST NO'S USED	CH-2 NO'S NOT USED
C9	C8	C59	R65
R20	R14	R69	
D2	R15	D52	

REPLACEMENT PARTS LIST

NOTE: WHEN ORDERING REPLACEMENT PARTS PLEASE SPECIFY THE PART NUMBER AS SHOWN IN THIS LIST INCLUDING DESCRIPTION, CHASSIS, AND MODEL NUMBER. COMPLETE INFORMATION WILL HELP EXPEDITE THE ORDER. REPLACEMENT PARTS MAY OCCASIONALLY DIFFER IN PART NUMBER OR VALUE FROM THE FACTORY INSTALLED PART. IN EITHER EVENT THE REPLACEMENT PART HAS BEEN CHOSEN TO PROVIDE EQUAL OR IMPROVED PERFORMANCE.

REF. NO.	DESCRIPTION	PART NO.
	TRANSFORMERS	
T1	CH-1 Driver Transformer	320344-1
T2	Power Transformer	300250-1
T51	CH-2 Driver Transformer	320344-1
	CAPACITORS	
C1	Electrolytic, 50 mfd., 3V	270068-113
C2	Ceramic, 1000 pf., GMV, 500V	250415-5
C3	Ceramic, 4700 pf., 20%, 500V	250415-213
C4	Electrolytic, 250 mfd., 10V	270068-324
C5	Electrolytic, 100 mfd., 20V	270068-519
C6	Electrolytic, 100 mfd., 20V	270068-519
C7	Mylar, .1 mfd., 20%, 100V	250369-6
C9	Ceramic, 47 pf., 20%, 500V	250549-4709
C51	Electrolytic, 50 mfd., 3V	270068-113
C52	Ceramic, 1000 pf., GMV, 500V	250415-5
C53	Ceramic, 4700 pf., 20%, 500V	250415-213
C54	Electrolytic, 250 mfd., 10V	270068-324
C55	Electrolytic, 100 mfd., 20V	270068-519
C56	Electrolytic, 100 mfd., 20V	270068-519
C57	Mylar, .1 mfd., 20%, 100V	250369-6
C58†	Electrolytic, 300 mfd., 35V	270068-825
C59	Ceramic, 47 pf., 20%, 500V	250549-4709
C201	Ceramic, .01 mfd., 20%, 1400V	250219-2
C202	Ceramic, .1 mfd., 20%, 250V	250581-1083
C203	Ceramic, .1 mfd., 20%, 250V	250581-1083
C204	Electrolytic, 2000 mfd., 50V	270103-1
C204	Electrolytic, 2000 mfd., 50V (A595-02-CC, A595-03)	270099-6
C205	Electrolytic, 2000 mfd., 50V	270103-1
C205	Electrolytic, 2000 mfd., 50V (A595-02-CC, A595-03)	270099-6
C206	Electrolytic, 500 mfd., 50V	270093-2
C206	Electrolytic, 500 mfd., 50V (A595-02-CC, A595-03)	270068-728
C207	Electrolytic, 500 mfd., 50V	270093-2
C207	Electrolytic, 500 mfd., 50V (A595-02-CC, A595-03)	270068-728
	RESISTORS	
R1	120K, 10%, .5W	230144-87
R2	15K, 10%, .5W	230144-76
R3	1000, 10%, .5W	230144-62
R4	10K, 10%, .5W	230144-74
R5	56K, 10%, .5W	230144-83
R6	180, 10%, 2W (WW)	230164-77
R7	68, 10%, 1W	230145-48
R8	270, 10%, 2W (WW)	230164-79
R9	180, 10%, 2W (WW)	230164-77
R10	68, 10%, 1W	230145-48
R11	270, 10%, 2W (WW)	230164-79
R12	.39, 10%, 2W (WW)	230164-45
R13	50K, Balance Control	220193-16
R16	.39, 10%, 2W (WW)	230164-45
R17	1.8, 10%, .5W	230174-53
R18	4.7, 10%, .5W	230144-358
R19	1.8, 10%, .5W	230174-53
R20	4.7, 10%, .5W	230144-358
R51	120K, 10%, .5W	230144-87
R52	15K, 10%, .5W	230144-76
R53	1000, 10%, .5W	230144-62
R54	10K, 10%, .5W	230144-74
R55	56K, 10%, .5W	230144-83
R56	180, 10%, 2W (WW)	230164-77
R57	68, 10%, 1W	230145-48
R58	270, 10%, 2W (WW)	230164-79
R59	180, 10%, 2W (WW)	230164-77
R60	68, 10%, 1W	230145-48
R61	270, 10%, 2W (WW)	230164-79
R62	.39, 10%, 2W (WW)	230164-45
R63	220, 10%, .5W	230144-54
R64	4.7, 10%, .5W	230144-358
R66	.39, 10%, 2W (WW)	230164-45
R67	1.8, 10%, .5W	230174-53
R68	4.7, 10%, .5W	230144-358
R69	1.8, 10%, .5W	230174-53
R201	150, 10%, .5W	230144-52
R202	150, 10%, 1W	230145-52
R202	68, 10%, 2W (WW) (A595-03)	230164-72
R203	10, 10%, .5W	230144-38
	SEMICONDUCTORS	
D1	Germanium Diode	530133-1
D2	Germanium Diode	530133-1
D51	Germanium Diode	530133-1
D52	Germanium Diode	530133-1
D201	Silicon Rectifier	530071-1002
D202	Silicon Rectifier	530071-1002
D203	Silicon Rectifier	530071-1002
D204	Silicon Rectifier	530071-1002
Q1	PNP Germanium Transistor	610036-7
Q2	PNP Silicon Transistor	610099-2
Q3	PNP Germanium Transistor	610067-3
Q4, Q6	PNP Germanium Transistor (Matched Pair)	170850-1
Q5	PNP Germanium Transistor	610067-3
Q51	PNP Germanium Transistor	610036-7
Q52	PNP Silicon Transistor	610099-2
Q53	PNP Germanium Transistor	610067-3
Q54, Q56	PNP Germanium Transistor (Matched Pair)	170850-1
Q55	PNP Germanium Transistor	610067-3
	MISCELLANEOUS	
PC-1	Printed Pac	250488-2
F201	Fuse	180475-7
	Power Transistor Mica Insulator	180701-3
	Power Transistor Socket Assembly	180791-1
	Heat Sink	637480-17
	Connector Housing (12-Pin Molex)	180728-2
	Molex Contact	180859-1
	AC Interlock Receptacle (A595-02, 03)	180635-5
	AC Receptacle (A595-02, 03)	180879-1

† Indicates new part recommended for your service department parts stock.