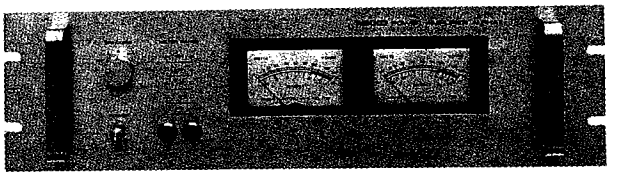
STEREO

POWER AMPLIFIER

ALPHA II



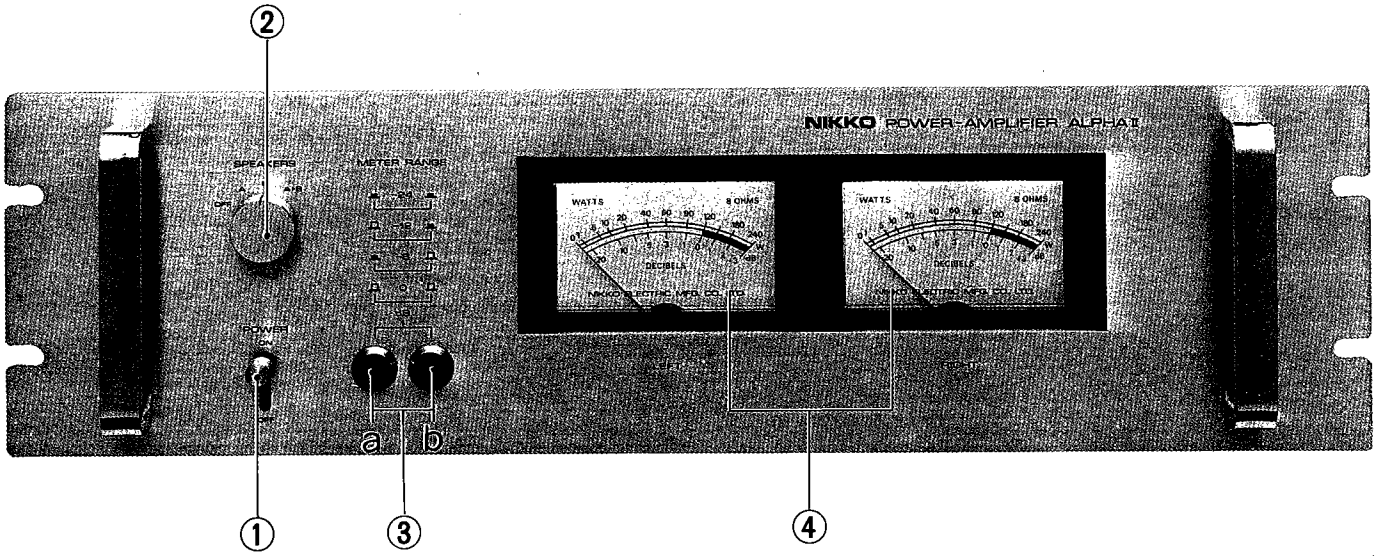
SERVICE MANUAL

TYPE AND VOLTAGE

W-TYPE UL and CSA type	120V
E-TYPE europe standard (universal) type	220/240V
N-TYPE DEMKO and SEMKO type	
D-TYPE DIN type	

NIKKO

OPERATING PARTS



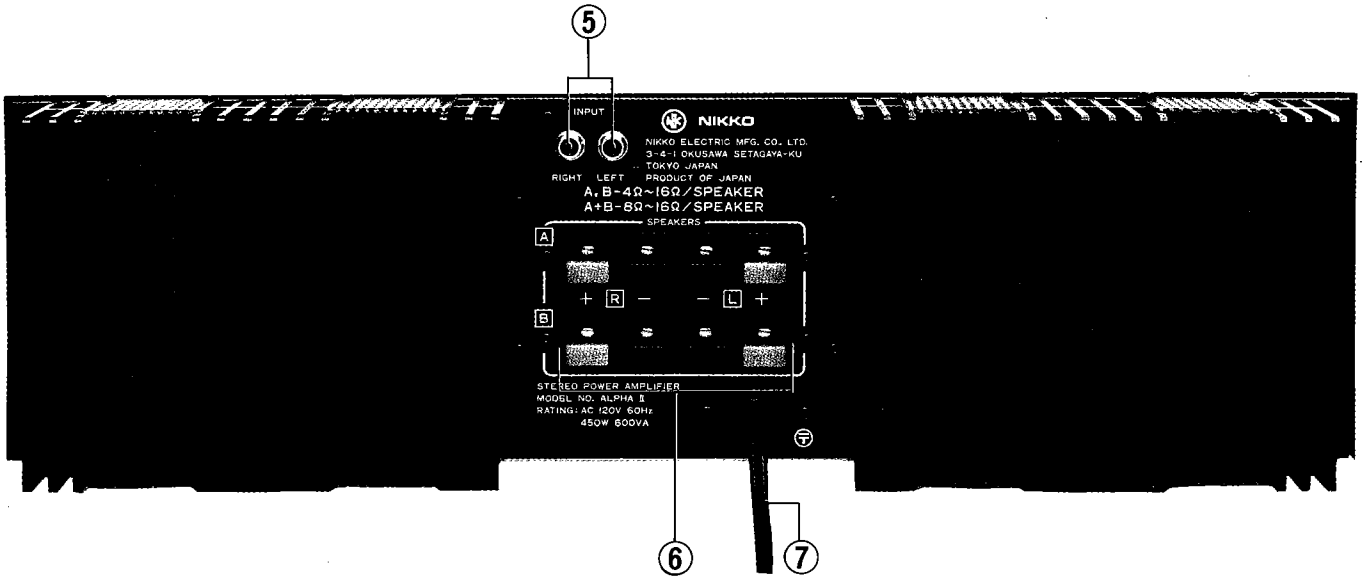
1. POWER
   Set the power switch to the ON position and the power is turned on. The power meters will be illuminated, indicating that the power is on. The unit will become active 3 to 6 seconds later because of the employment of a protective circuit and relay.

2. SPEAKERS
   This switch is used to select speakers connected to the A and B speaker terminals on the rear panel. When the switch is set to the A+B position, both speakers connected to the A and B terminals are operated at the same time. Speakers may be connected to the A or B terminals only, if desired. At the OFF position of the switch, no speakers will operate.

3. METER RANGE
   These two pushbutton switches are used to select the sensitivity of the power meters in 4 steps.
   With the switches ('a' and 'b') in the released position (⊓), the power meters will indicate 0dB when the output power of a single tone sign-wave signal reaches 120W (at 8-ohm load).
   By pressing the button switches as shown on the front panel, the 0dB position on the power meters represents 30W for −6dB setting, 7.6W for −12dB setting and 0.48W for −24dB setting, respectively.

4. POWER METER
   The power meters indicate the levels of left and right channel output power in dB. Power levels can be read directly on the meters with the meter range switches (3) set in the 0dB (released) position.

TERMINALS ON REAR PANEL



5. INPUT Terminals
Connect the input of the preamplifier using a pin-plug cord.

6. SPEAKERS Terminals
The unit has provision for connecting 2 sets of speaker systems. Connect your right speakers to right speaker terminals and left speakers to left speaker terminals. Each speaker terminal is color coded to indicate polarity; the red mark indicates "positive" and the black one "negative". Use these marks for correct connections of your speakers. When connecting, make sure that the bare portions of connecting cords are not in contact with any metallic parts such as the panel of the unit.
* Your speakers must have more than 4 ohms of impedance. If 2 sets of speaker systems are connected, each speaker must have at least 8-ohm impedance.
* Use connecting cords having sufficient current capacity. Connect the cords firmly. If the cords have insufficient capacity or they are loosely connected, the result is deterioration of sound quality, overheating or breaks in cords.

7. AC Power Cord
Connect the AC power cord to your convenient wall-outlet. The power switch must be turned to OFF before connecting. The unit is rated at 450W of power consumption. If it becomes necessary to use an extension power cord, it must be the same in size as the AC power cord, or larger. When the power cord is connected to the AC outlet provided on the preamplifier, the power cord of the preamplifier must be connected to a wall-outlet having sufficient capacity.

CONTENTS

Nikko Audio
218 Sherwood Avenue/Farmingdale, L.I., New York 11735/(516) 293-2906

MODIFICATION FOR ALPHA 2

1. CUT C710 and C 709 from the circuit.

2. ADD 5 pfd cap. between test points A and B (see diagram.)

3. IF C 711 is valued at 33 pfd, add another 33 pfd cap. in parallel with C711. (test points C and D.)

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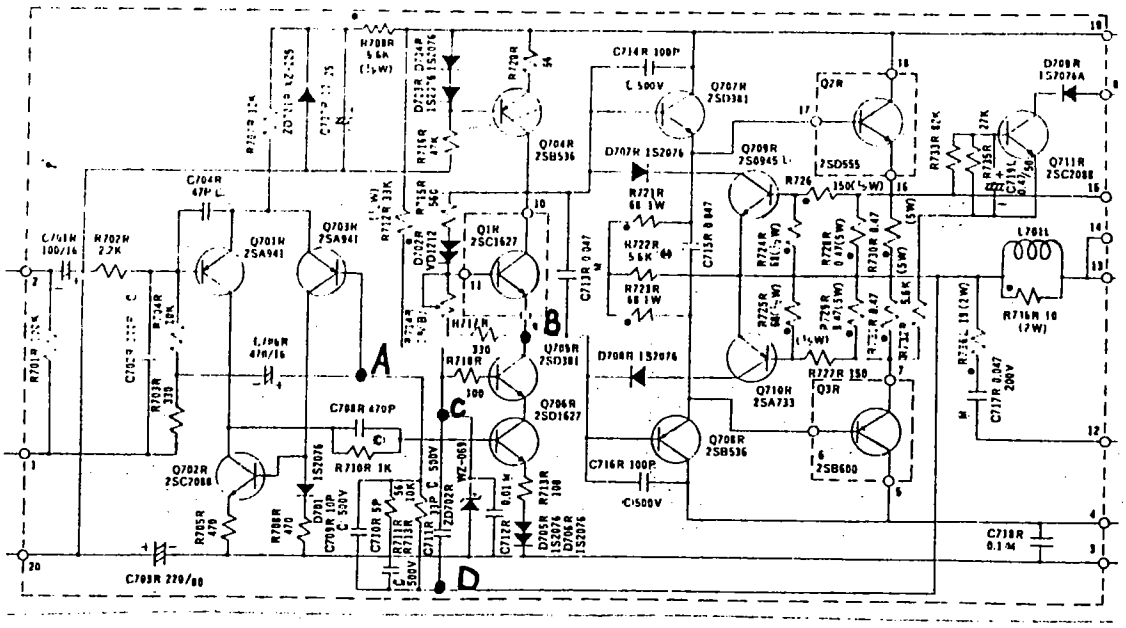
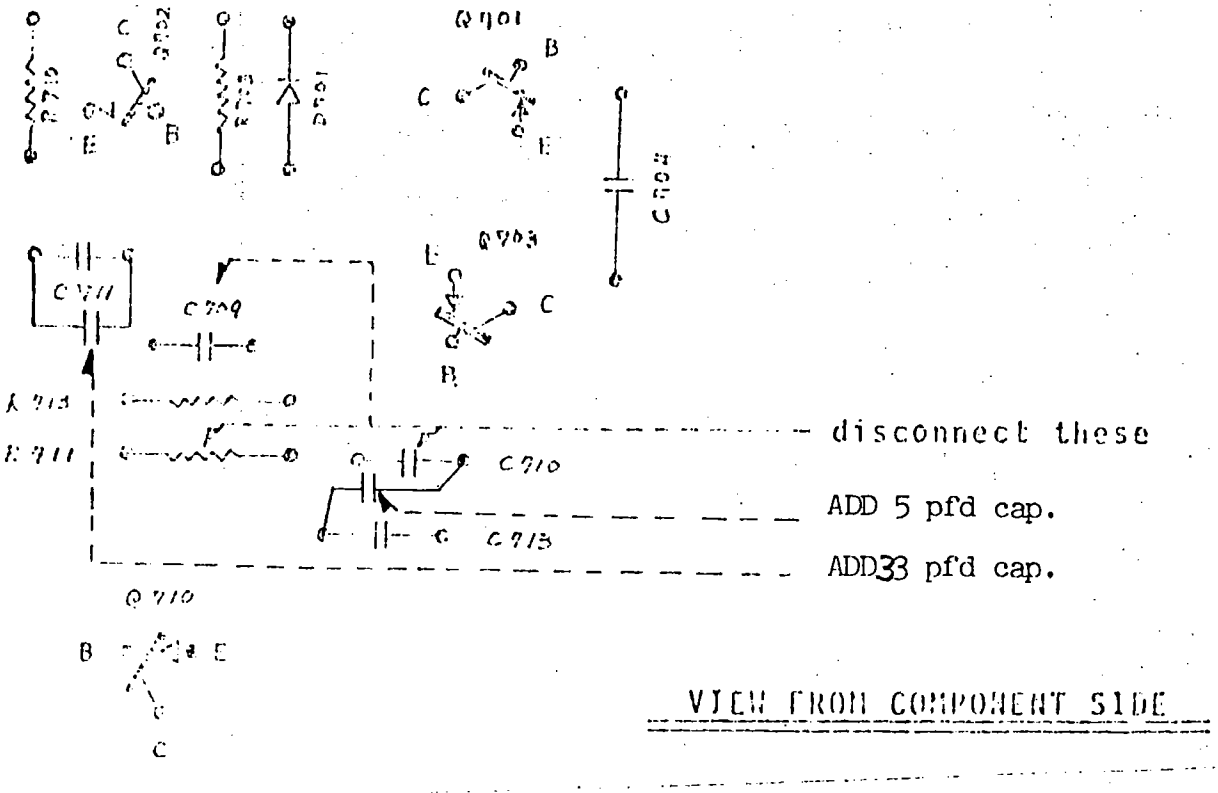


CONNECT 5 pfd cap. to points A and B

CONNECT 33 pfd cap. to points C and D



VIEW FROM COMPONENT SIDE

SPECIFICATIONS (W-TYPE, E-TYPE, N-TYPE)

	UNIT	NOMINAL	LIMIT
Continuous Power Output per channel 8 ohm loads:			
15Hz–20KHz@ 0.03% THD	watts.	120.	110
1KHz @ 0.03 % THD	watts.	130.	110
TH Distortion, 8 ohm loads, 15Hz–20KHz:			
@Continuous Power Output	%		<0.03
@ 1 watt Power Output	%		<0.02
IM Distortion, 8 ohm loads:			
@Continuous Power Output	%		<0.03
@1 watt Power Output	%		<0.02
IHF Power Bandwidth, 8 ohm loads	Hz–KHz	5 – 60.	5 – 50
Damping Factor, 8 ohm loads, 1KHz.		80	70
Frequency Response, 8 ohm loads:			
@ 1 watt Power Output	dB@Hz–KHZ.		+0, –2 @10 – 100
Input Sensitivity	mV.	1000.	1000 ±2dB
Signal-to-Noise Ratio, IHF	dB	105.	100
Residual Hum & Noise, 8 ohm load.	mV.	0.2	0.25
Idling Current.	mA.	100.	60 –150
Midpoint Voltage	mV.	0	± 50
Power Switch Muting Delay Time	second.	4	4 ± 2

SPECIFICATIONS (D – TYPE)

	UNIT	NOMINAL	LIMIT
Continuous Power Output per channel 4 ohm loads:			
15Hz–20KHz@ 0.08 % THD	watts.	130.	120
1KHz @ 1% THD	watts.	150.	140
TH Distortion, 4 ohm loads, 15Hz–20KHz:			
@Continuous Power Output	%		<0.08
@ 1 watt Power Output	%		<0.05
IM Distortion, 4 ohm loads:			
@ Continuous Power Output	%		<0.08
@ 1 watt Power Output	%		<0.05
Power Bandwidth, 4 ohm loads	Hz–KHz	5 – 50.	10 – 30
Damping Factor, 4 ohm loads, 1KHz.		45	40
Frequency Response, 4 ohm loads:			
@ 1 watt Power Output	dB@Hz–KHZ.		+0, –3@5 – 80
Input Sensitivity	mV.	800.	800 ±2dB
Signal-to-Noise Ratio, DIN	dB	85	80
Residual Hum & Noise, 4 ohm load.	mV.	0.2	0.25
Idling Current.	mA.	100.	60 –150
Midpoint Voltage	mV.	0	± 50
Power Switch Muting Delay Time	second.	4	4 ± 2

INSTRUMENT DISASSEMBLY AND PARTS REPLACEMENT

NOTE: Numbers of three figures put a (⬭) around on Photo 1 thru 7 relate to "KEY NO." marked with a (★) on parts list.

CABINET TOP STEEL COVER

Remove four (4) tapping screws (116) (1 thru 4), remove four (4) tapping screws (114) (5 thru 8), lift steel cover (113) up and out of the instrument (Photo 1).

Do not lose these screws and four (4) washers.

To reassemble, reverse above procedure.

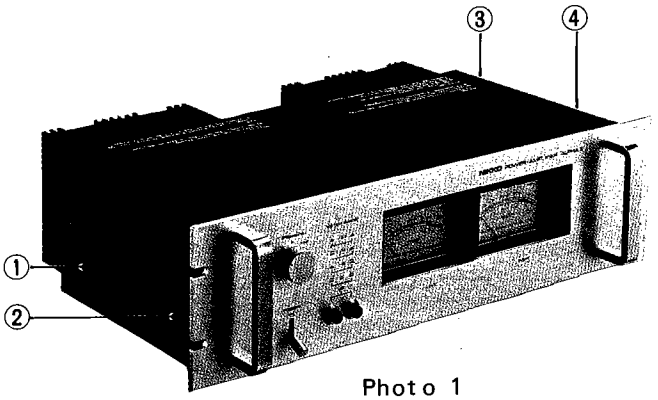


Photo 1

BOTTOM PLATE REMOVAL

Remove twelve (12) tapping screws (118) from the bottom of the cabinet, lift Bottom Plate (117) up and out of the instrument.

To reassemble, reverse above procedure.

FRONT PANEL REMOVAL

1. Using hexagonal wrench, remove SPEAKERS knob.
2. Remove POWER knob by pulling it out Front Panel.
3. Remove six(6) nuts (1 thru 6), lift the Front Panel out of the instrument (Photo 2).
4. To reassemble, reverse above procedure.

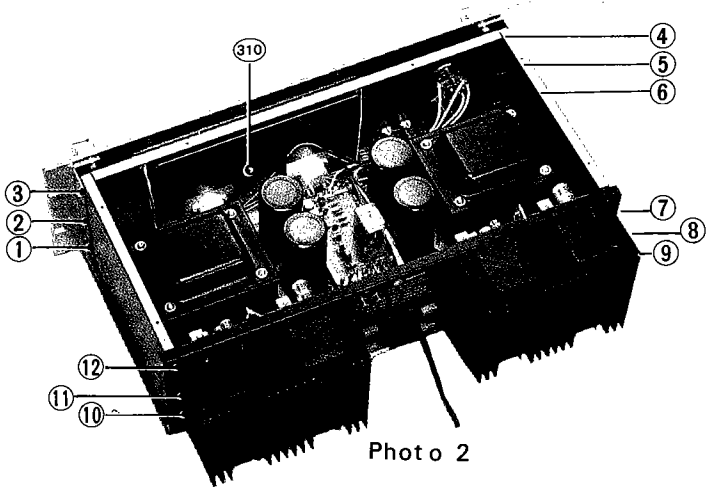


Photo 2

METER REMOVAL

1. Two meters are held by "meter holder".
   To remove the meter holder, remove six (6) tapping screws (1 thru 3, 8 thru 10) (Photo 3). Then, while moving Front Plate slightly, remove four (4) tapping screws (5,6,12,13) from the rear of the Front Plate (Photo 3). Lift the meter holder up and out of the Front Plate.
2. The meters are now free to be pulled off. Disconnect cables connecting to the meters.
3. To reassemble, reverse above procedure

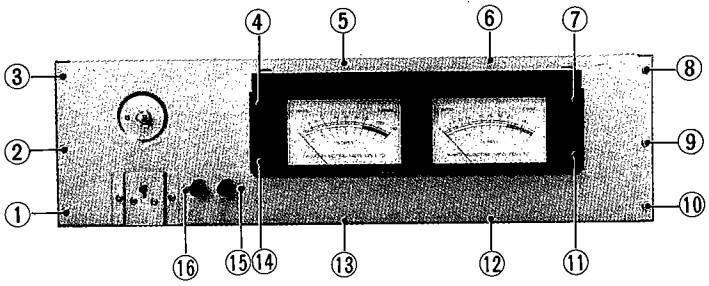
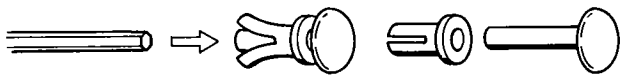


Photo 3

LAMP REPLACEMENT AND LAMP CIRCUIT BOARD REMOVAL

1. Remove "meter holder" as shown in the procedure 1 of "Meter Removal".
2. Remove four (4) tapping screws (4,7,11,14), lift Back Ground Panel out of Front Plate (Photo 3).
3. To replace lamps, use soldering iron.
4. Push the center of "push rivet" from the rear of front panel by small screwdriver (See Figure 1), then pull three (3) push rivets (1 thru 3) (Photo 4).
5. Disconnect calbes, lift the Lamp Circuit Board up and out of the Front Panel.
6. To reassemble, reverse above procedure.



PUSH RIVET (314)

Fig. 1

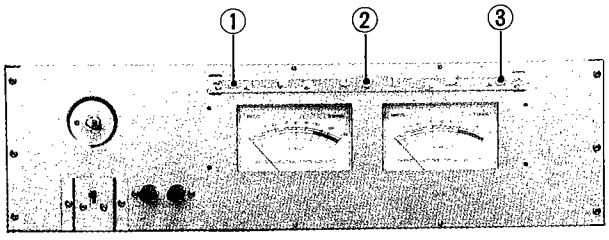


Photo 4

METER SWITCH CIRCUIT BOARD REMOVAL

Disconnect all calbes. Remove two (2) tapping screws (15,16) (Photo 3). Pull Circuit Board back, lift up and out of chassis.

To reassemble, reverse above procedure.

REGULATOR CIRCUIT BOARD REMOVAL AND PART REPLACEMENT

1. To replace regulator circuit's parts, dismount Regulator Circuit Board from "PCB Support Pin". Then lift the front of the Regulator Circuit Board as upward as possible for service as indicated in Photo 5.
2. To remove the Regulator Circuit Board, disconnect all cables, lift the Regulator Circuit Board up and out of chassis.
3. To reassemble, reverse above procedure.

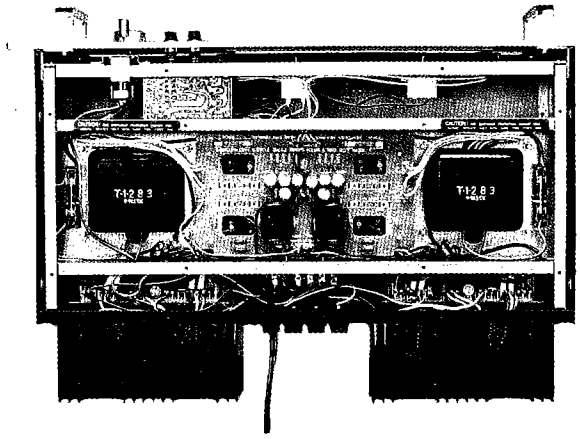


Photo 5

PROTECTOR CIRCUIT BOARD REMOVAL AND PARTS REPLACEMENT

1. To replace protector circuit's parts, dismount Protector Circuit Board from "PCB Support Pin". Then, lift the Protector Circuit Board up for service.
2. To remove the Protector Circuit Board, disconnect all cables, lift the Protector Circuit Board up and out of chassis.
3. To reassemble, reverse above procedure.

POWER TRANSISTOR REMOVAL (Q2R only)

1. To remove Heatsink Cover, remove four (4) tapping screws (1 thru 4) (Photo 6).
2. To remove Power Transistor, remove two (2) screws (5,6) (Photo 6). Pull the Power Transistor out Power Transistor socket.
3. To reassemble, reverse above procedure.

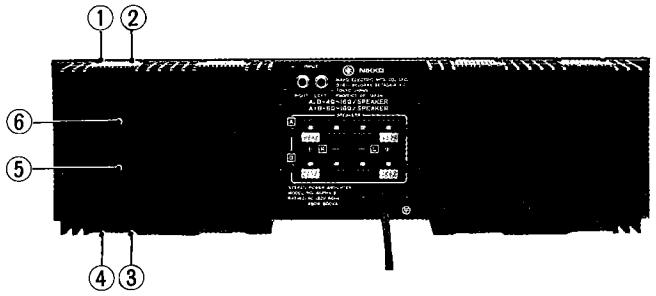


Photo 6

PARTS REPLACEMENT

1. To replace main amp circuit's parts, it is necessary to remove six (6) tapping screws (7 thru 12) (Photo 2) and incline Back Plate Assembly as indicated in Photo 7.

   WARNING: Do not pull the Back Plate Assembly back strongly, if so, circuit boards may be broken or cables are cut.
2. Dismount the Main Amp Circuit Board from "PCB Support Pin", lift the top of the Main Amp Circuit Board forward for service as indicated in Photo 7.

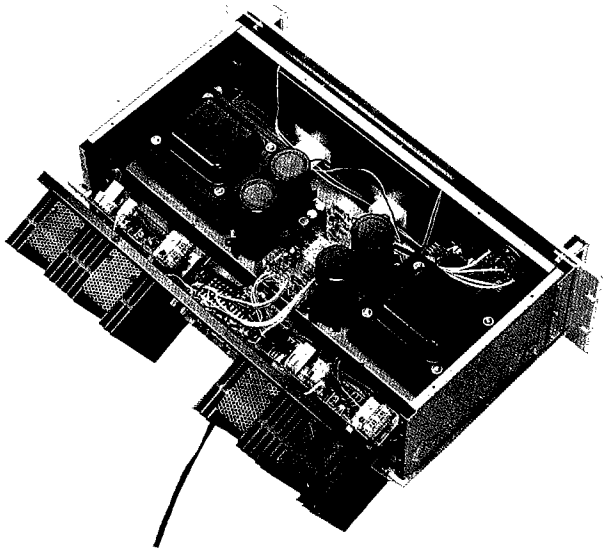
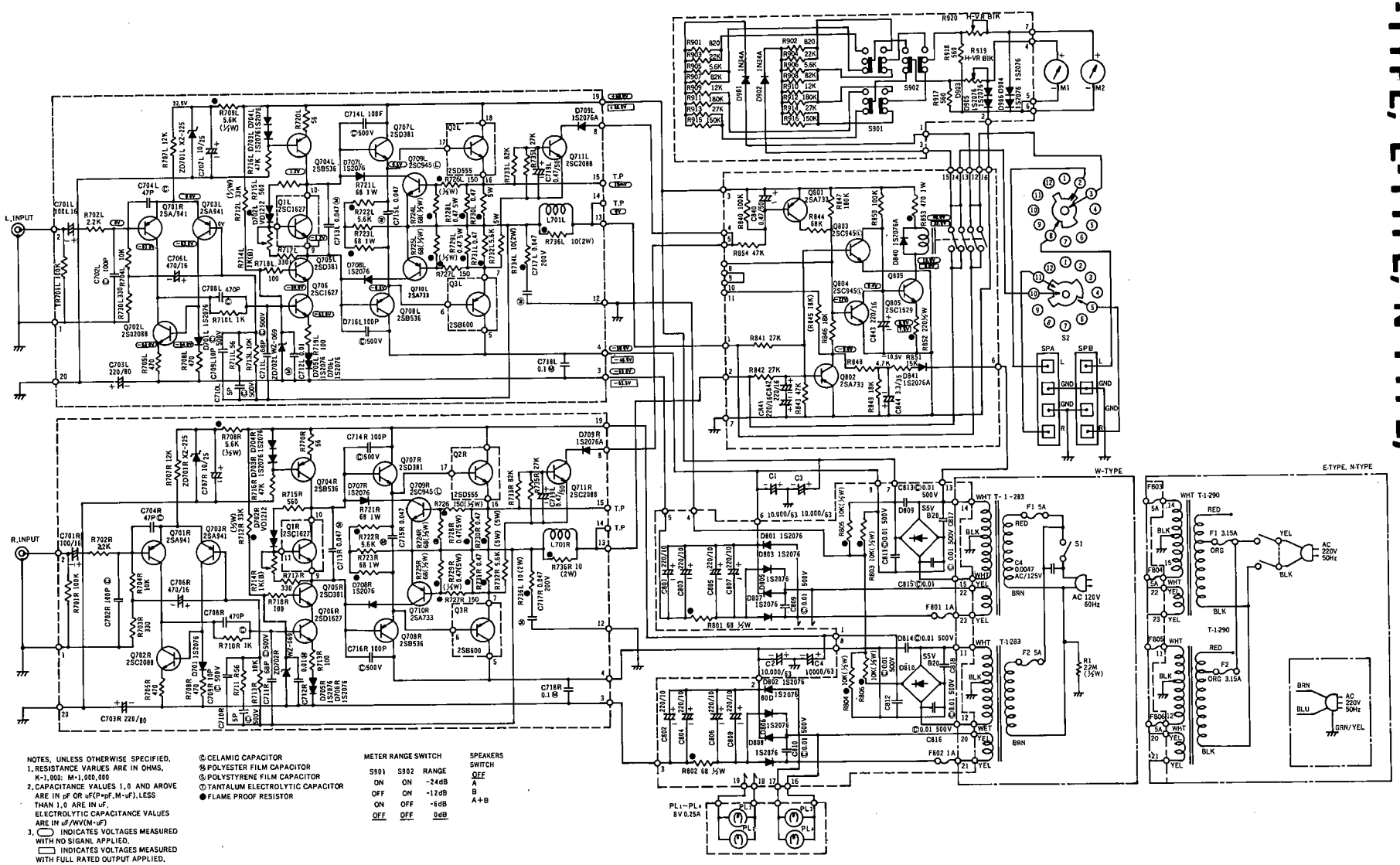


Photo 7

OVERALL SCHEMATIC DIAGRAM



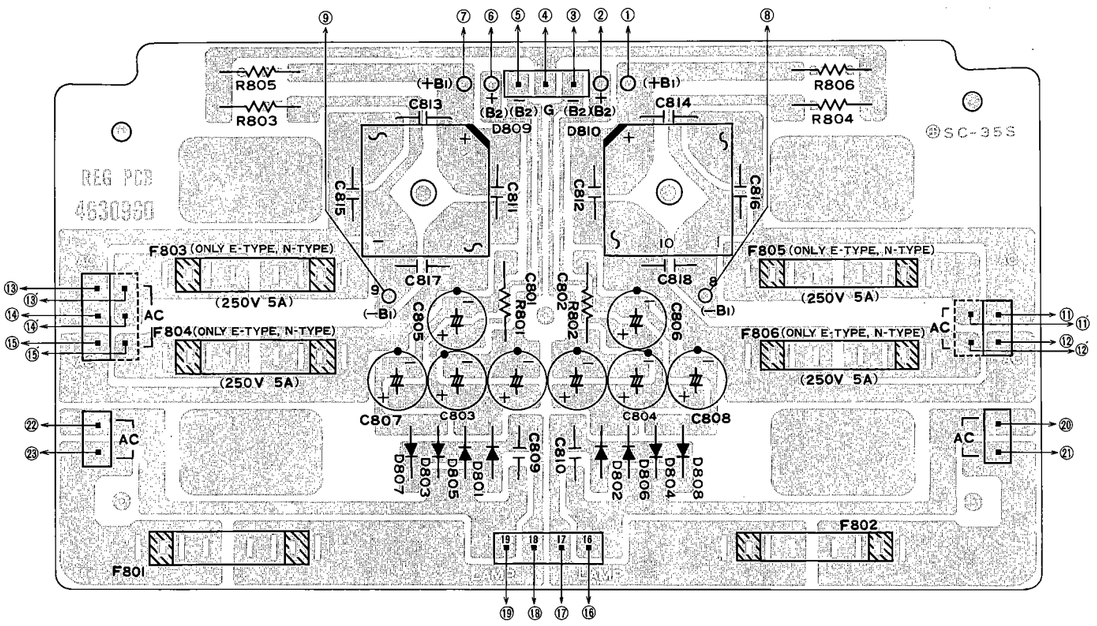
NOTES, UNLESS OTHERWISE SPECIFIED,
1. RESISTANCE VARUES ARE IN OHMS, K=1,000; M=1,000,000
2. CAPACITANCE VALUES 1.0 AND AROVE ARE IN pF OR uF(P=pF, M=uF). LESS THAN 1.0 ARE IN uF. ELECTROLYTIC CAPACITANCE VALUES ARE IN uF/WV(M=uF)
3. ⬭ INDICATES VOLTAGES MEASURED WITH NO SIGANL APPLIED. ▭ INDICATES VOLTAGES MEASURED WITH FULL RATED OUTPUT APPLIED. SPECIFICATIONS AND CRCUIT ARE SUBJECT TO CHANGE WITHOUT NOTICE.

© CELAMIC CAPACITOR
Ⓟ POLYESTER FILM CAPACITOR
Ⓢ POLYSTYRENE FILM CAPACITOR
Ⓣ TANTALUM ELECTROLYTIC CAPACITOR
● FLAME PROOF RESISTOR

METER RANGE SWITCH			SPEAKERS SWITCH
S901	S902	RANGE	OFF
ON	ON	-24dB	A
OFF	ON	-12dB	B
ON	OFF	-6dB	A+B
OFF	OFF	0dB	

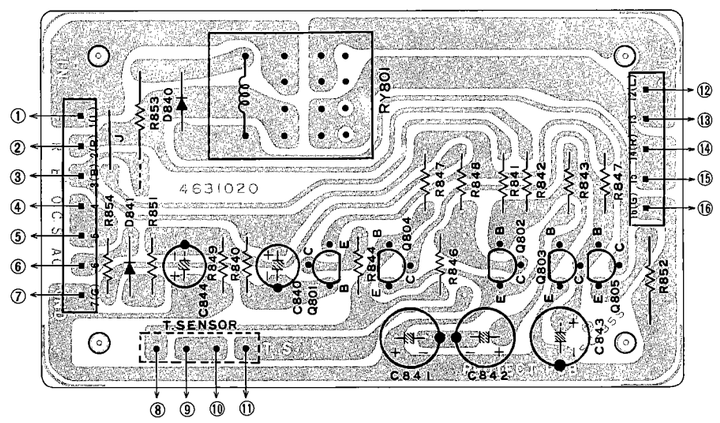
OVERALL SCHEMATIC DIAGRAM AND CIRCUIT BOARDS (W-TYPE, E-TYPE, N-TYPE)

REGURATOR CIRCUIT BOARD (BOTTOM VIEW)



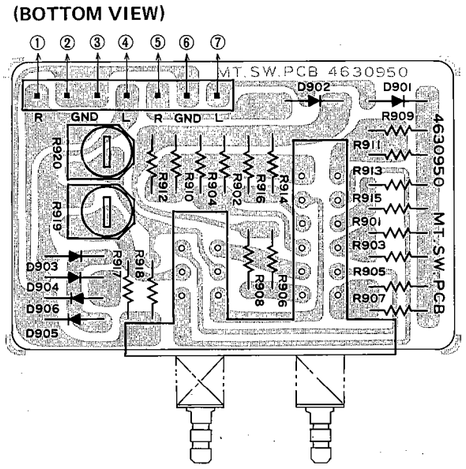
① To C4⊕
② To C2⊖
③ To MAIN AMP C.B. (R)③
④ To R-CH EARTH LUG
⑤ To MAIN AMP C.B. (L)③
⑥ To C1⊖
⑦ To C3⊕
⑧ To C2⊖
⑨ To C1⊖
⑩
⑪ ⑫ To R-CH P.T. (WHT) (Only W-TYPE, D-TYPE)
⑪′ ⑫′ To R-CH P.T. (WHT) (Only E-TYPE, N-TYPE)
⑬ To PROTECTOR C.B. (Only W-TYPE, D-TYPE)
⑬′ To PROTECTOR C.B. (Only E-TYPE, N-TYPE)
⑭ ⑭′ To L-CH P.T. (WHT) (Only W-TYPE, D-TYPE)
⑮ ⑮′ To L-CH P.T. (WHT) (Only E-TYPE, N-TYPE)
⑱ ⑲ To R-CH LAMP
⑳ ㉑ To R-CH P.T. (YEL)
㉒ ㉓ To L-CH P.T. (YEL)

PROTECTOR CIRCUIT BOARD (BOTTOM VIEW)



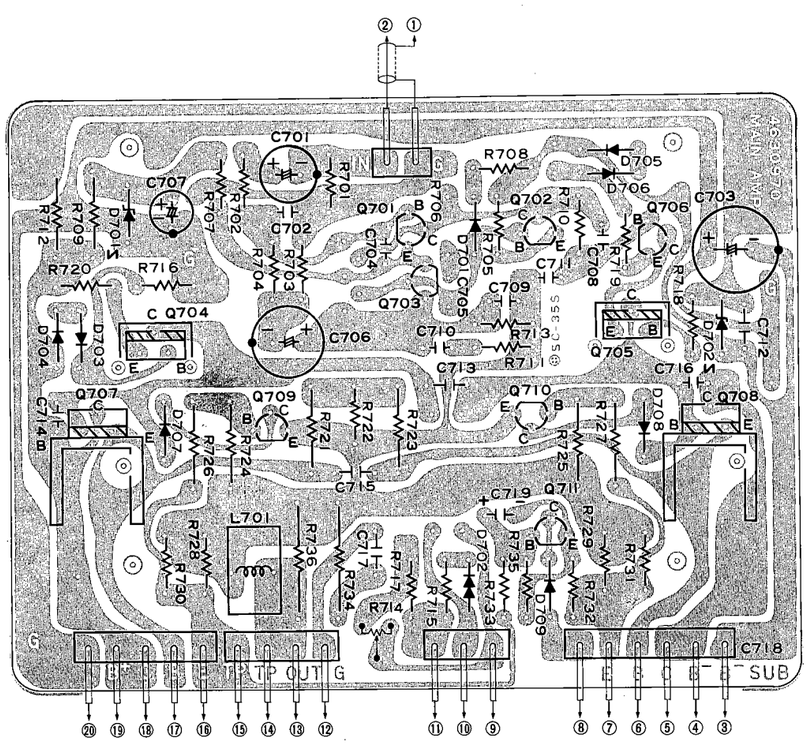
① To MAIN AMP C.B. (L) ⑬
② To MAIN AMP C.B. (R) ⑬
③ To C3⊕
④ To MAIN AMP C.B. (L)⑧
⑤ To MAIN AMP C.B. (R)⑧
⑥ To REGURATOR C.B. ⑬
⑦ To EARTH LUG (L)
⑧ ⑨ To THERMOSTAT
⑩ ⑪ To THERMOSTAT
⑫ To SPEAKER SWITCH
⑬ To METER SWITCH C.B.①
⑭ To SPEAKER SWITCH
⑮ To METER SWITCH C.B.③
⑯ To METER SWITCH C.B.②

METER SWITCH CIRCUIT BOARD (BOTTOM VIEW)



① To PROTECTOR C.B. ⑬
② To PROTECTOR C.B. ⑯
③ To PROTECTOR C.B. ⑮
④ To METER (L)⊕
⑤ To METER (L)⊖
⑥ To METER (R)⊕
⑦ To METER (R)⊕

MAIN AMP CIRCUIT BOARD (BOTTOM VIEW)

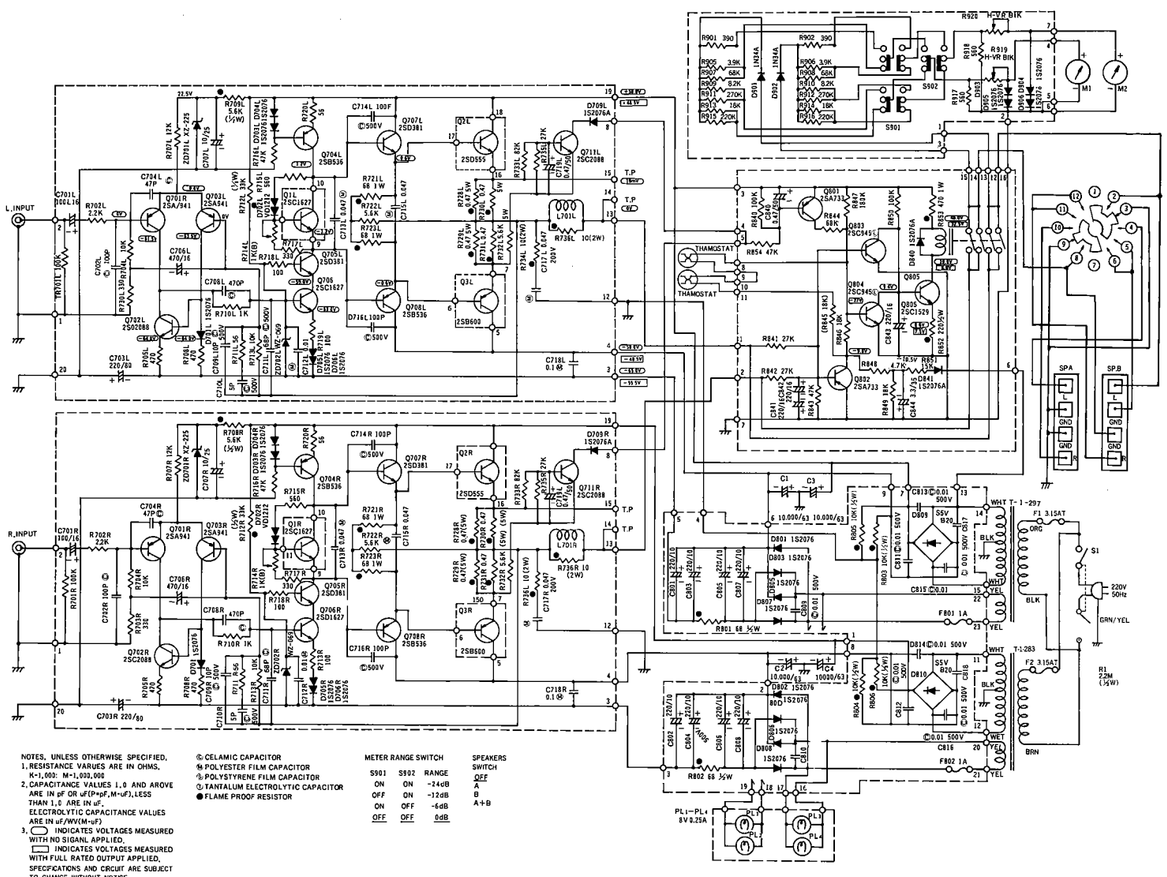


L-CHANNEL
① To INPUT TERMINAL L (GROUND)
② To INPUT TERMINAL L
③ To REGURATOR C.B. ⑤
④ To C1⊖
⑤ To Q3L(2SB600) C
⑥ To Q3L(2SB600) B
⑦ To Q3L(2SB600) E
⑧ To PROTECTOR C.B. ④
⑨ To Q1L(2SC1627) E
⑩ To Q1L(2SC1627) C
⑪ To Q1L(2SC1627) B
⑫ To EARTH LUG
⑬ To PROTECTOR C.B. ①
⑭ ⑮ To TEST POINT (FOR IDLING CURRENT ADJUSTMENT)
⑯ To Q2L(2SD555) E
⑰ To Q2L(2SD555) B
⑱ To Q2L(2SD555) C
⑲ To C3⊕
⑳ To EARTH LUG

R-CHANNEL
① To INPUT TERMINAL R (GROUND)
② To INPUT TERMINAL R
③ To REGURATOR C.B. ③
④ To C2⊖
⑤ To Q3R(2SB600) C
⑥ To Q3R(2SB600) B
⑦ To Q3R(2SB600) E
⑧ To PROTECTOR C.B. ⑤
⑨ To Q1R(2SC1627) E
⑩ To Q1R(2SC1627) C
⑪ To Q1R(2SC1627) B
⑫ To EARTH LUG
⑬ To PROTECTOR C.B. ②
⑭ ⑮ To TEST POINT (FOR IDLING CURRENT ADJUSTMENT)
⑯ To Q2L(2SD555) E
⑰ To Q2L(2SD555) B
⑱ To Q2L(2SD555) C
⑲ To C4⊕
⑳ To EARTH LUG

OVERALL SCHEMATIC DIAGRAM AND CIRCUIT BOARDS (D-TYPE)

OVERALL SCHEMATIC DIAGRAM



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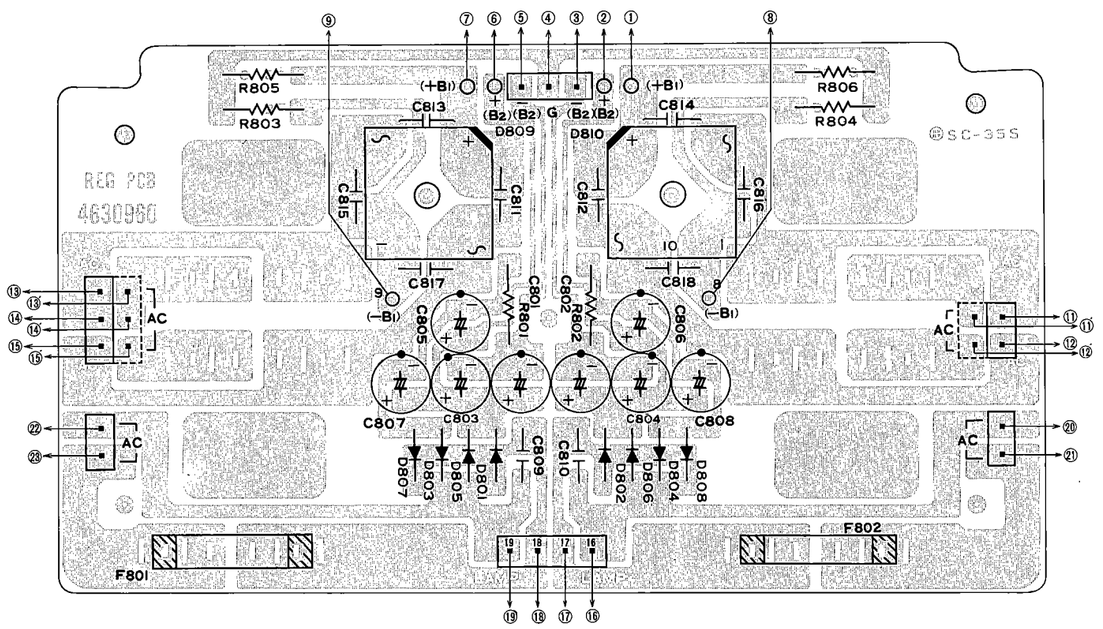
©:CELAMIC CAPACITOR
Ⓜ:POLYESTER FILM CAPACITOR
Ⓢ:POLYSTYRENE FILM CAPACITOR
⊖:TANTALUM ELECTROLYTIC CAPACITOR
●:FLAME PROOF RESISTOR

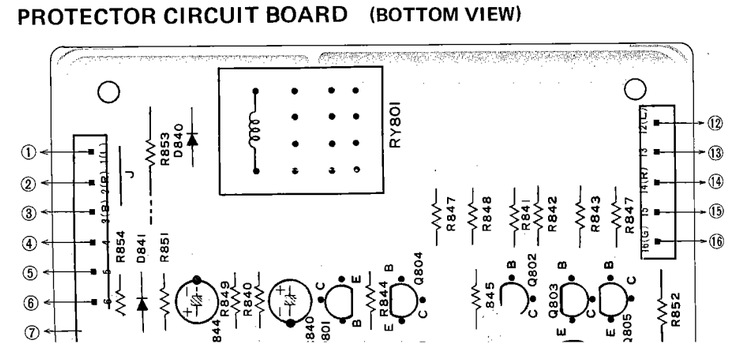
METER RANGE SWITCH			SPEAKERS SWITCH
S901	S902	RANGE	
ON	ON	-24dB	OFF
OFF	ON	-12dB	A
ON	OFF	-6dB	B
OFF	OFF	0dB	A+B

REGURATOR CIRCUIT BOARD (BOTTOM VIEW)

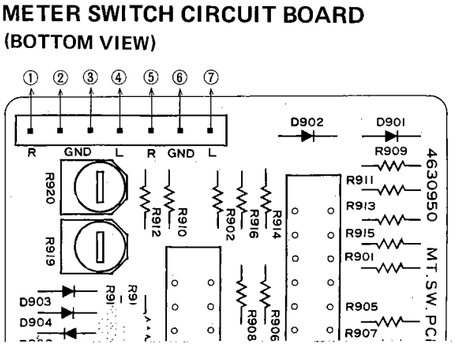


① To C4⊕
② To C2⊖
③ To MAIN AMP C.B. (R)③
④ To R-CH EARTH LUG
⑤ To MAIN AMP C.B. (L)③
⑥ To C1⊖
⑦ To C3⊕
⑧ To C2⊖
⑨ To C1⊖
⑩
⑪⑫ To R-CH P.T. (WHT)
⑬ To PROTECTOR C.B.
⑭⑭ To L-CH P.T. (WHT)
⑱⑲ To R-CH LAMP
⑳㉑ To R-CH P.T. (YEL)
㉒㉓ To L-CH P.T. (YEL)

PROTECTOR CIRCUIT BOARD (BOTTOM VIEW)



METER SWITCH CIRCUIT BOARD (BOTTOM VIEW)



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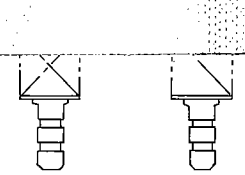
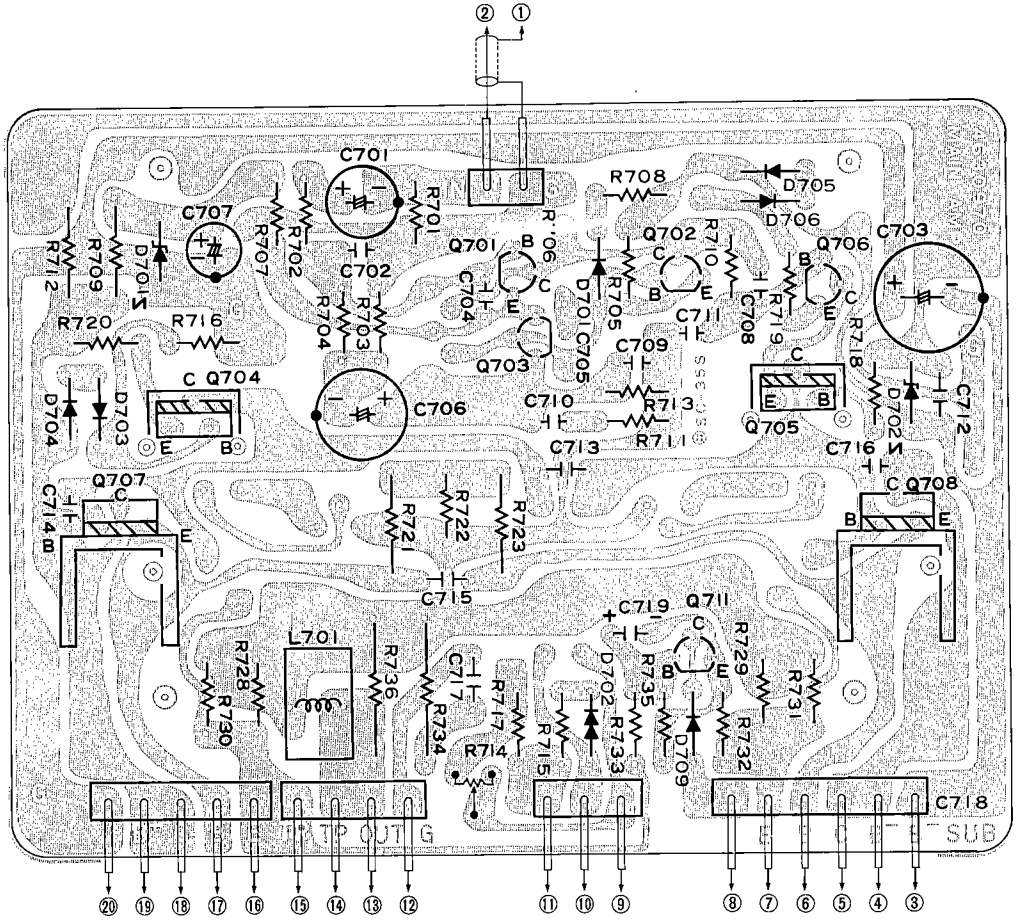
② To MAIN AMP C.B. (R) ⑬
③ To C3⊕
④ To MAIN AMP C.B. (L) ⑧
⑤ To MAIN AMP C.B. (R) ⑧
⑥ To REGURATOR C.B. ⑬
⑦ To EARTH LUG (L)
⑧ ⑨ To THERMOSTAT
⑩ ⑪ To THERMOSTAT
⑫ To SPEAKER SWITCH
⑬ To METER SWITCH C.B. ①
⑭ To SPEAKER SWITCH
⑮ To METER SWITCH C.B. ③
⑯ To METER SWITCH C.B. ②



① To PROTECTOR C.B. ⑬
② To PROTECTOR C.B. ⑯
③ To PROTECTOR C.B. ⑮
④ To METER (L)⊕
⑤ To METER (L)⊖
⑥ To METER (R)⊕
⑦ To METER (R)⊕

MAIN AMP CIRCUIT BOARD (BOTTOM VIEW)



L-CHANNEL

① To INPUT TERMINAL L (GROUND)
② To INPUT TERMINAL L
③ To REGURATOR C.B. ⑤
④ To C1⊖
⑤ To Q3L(2SB600) C
⑥ To Q3L(2SB600) B
⑦ To Q3L(2SB600) E
⑧ To PROTECTOR C.B. ④
⑨ To Q1L(2SC1627) E
⑩ To Q1L(2SC1627) C
⑪ To Q1L(2SC1627) B
⑫ To EARTH LUG
⑬ To PROTECTOR C.B. ①
⑭ ⑮ To TEST POINT (FOR IDLING CURRENT ADJUSTMENT)
⑯ To Q2L(2SD555) E
⑰ To Q2L(2SD555) B
⑱ To Q2L(2SD555) C
⑲ To C3⊕
⑳ To EARTH LUG

R-CHANNEL

① To INPUT TERMINAL R (GROUND)
② To INPUT TERMINAL R
③ To REGURATOR C.B. ③
④ To C2⊖
⑤ To Q3R(2SB600) C
⑥ To Q3R(2SB600) B
⑦ To Q3R(2SB600) E
⑧ To PROTECTOR C.B. ⑤
⑨ To Q1R(2SC1627) E
⑩ To Q1R(2SC1627) C
⑪ To Q1R(2SC1627) B
⑫ To EARTH LUG
⑬ To PROTECTOR C.B. ②
⑭ ⑮ To TEST POINT (FOR IDLING CURRENT ADJUSTMENT)
⑯ To Q2L(2SD555) E
⑰ To Q2L(2SD555) B
⑱ To Q2L(2SD555) C
⑲ To C4⊕
⑳ To EARTH LUG

PARTS LOCATION

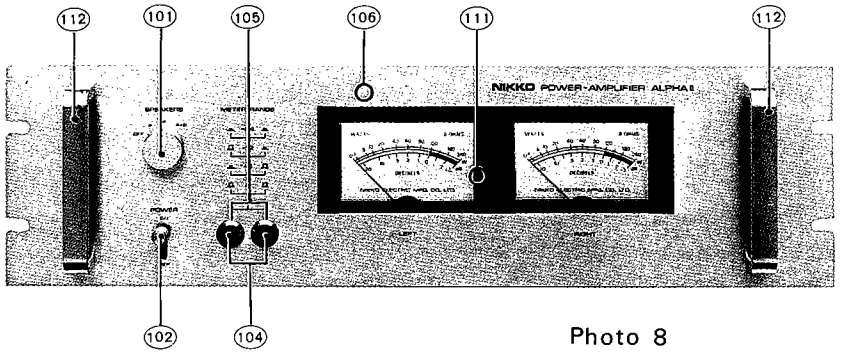


Photo 8

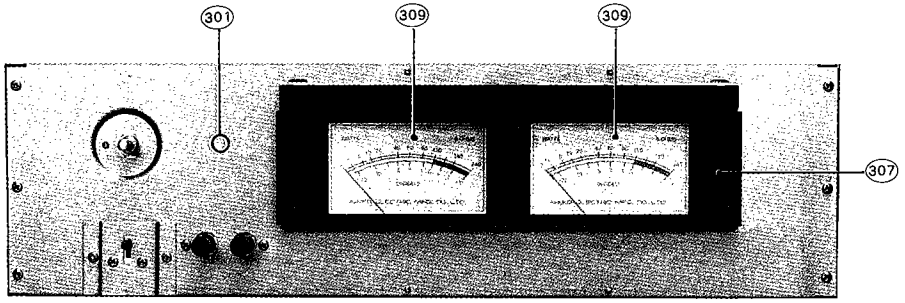


Photo 9

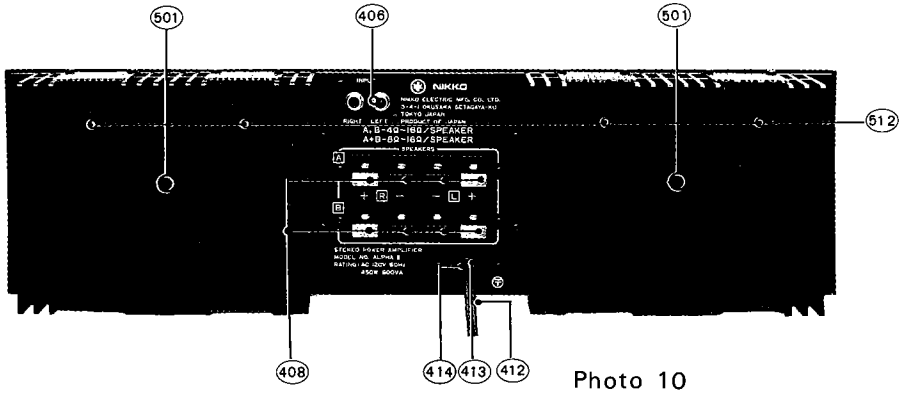


Photo 10

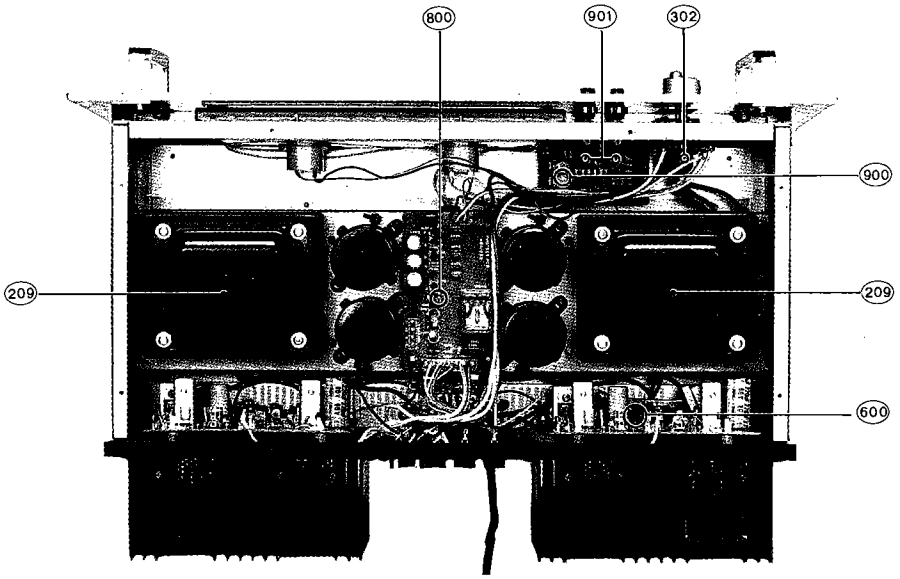


Photo 11

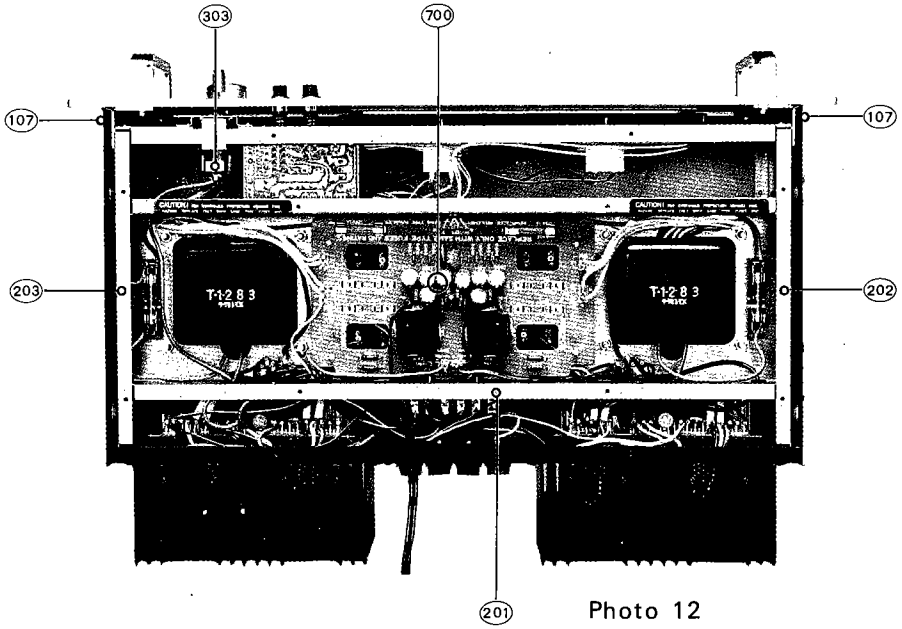


Photo 12

PARTS LIST

NOTES

1. "KEY NO." marked with a (★) on parts list relate to numbers of three figures put a (⬭) around on Photo 1 thru12.

2. + Numbers in file indicate the quantity of parts used in one type.

3. ++ TR: Transistor
FET: Field effect transistor
IC: Integrated circuit
VR: Volume control (Variable resistor)
POT: Potentiometer (Semi-fixed variable resistor)
RES: Carbon file fixed resistor
MO-RES: Metal oxide film fixed resistor
CEM-RES: Cemented wire-wound fixed resistor
FP: Flame proof
C-CAP: Ceramic capacitor
E-CAP: Aluminium electrolytic capacitor
M-CAP: Polyester film capacitor
S-CAP: Polystyrene film capacitor
T-CAP: Tantalum electrolytic capacitor
BP-CAP: Bipolar electrolytic capacitor

E-CAP, T-CAP and BP-CAP values(1x10uF) are in (1)uF, (10)V.

4. Assemblies and parts is subject to change without notice.

5. Parts ordering procedure:
Include in any order
a. Part number.
b. Part description.
c. Model number.
(any of the above lacking from an order may delay shipment of the order.)

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
			PACKING MATERIALS & ACCESSORRIES	
001		1 1 1 1	CARTON BOX	9825290
002		2 2 2 2	STYROL PAD	9840670
003		1 1 1 1	VINYL CLOTH BAG–POLY SACK	9640660
004		1 1 1 1	VINYL CLOTH BAG–POLY SACK#13	9640320
005a		1 – – –	INSTRUCTION MANUAL E	960187E
005b		– 1 1 –	INSTRUCTION MANUAL K	960199K
005c		– – – 1	INSTRUCTION MANUAL G	960202G
006		1 – – –	WARRANTY CARD (N)	967003A
007		1 1 1 1	POLISHING CLOTH	9690040
008		1 1 1 1	DRYER SILICA GEL	9690010
			CABINET ASSEMBLY	
			(CHAMPAGNE-GOLD TYPE)	
★101a		1 1 1 1	KNOB 2GL-26D (speakers)	7851470
★102a		1 1 1 1	KNOB PC-16 (power)	7850590
103		1 1 1 1	DUST COVER	7001760
★104		2 2 2 2	PUSHBUTTON P10B (meter)	7851680
★105		2 2 2 2	PUSHBUTTON GUIDE	7851690
★106a		1 1 1 1	FRONT PANEL–PNL ALPHA II G	7883650
★107		2 2 2 2	PANEL BRACKET	7031250
108		4 4 4 4	SCREW PMS 5 x 14	810514S
109		4 4 4 4	WASHER TW (I) 5ϕ	893405U
110		6 6 6 6	SCREW PTS 3 x 8	814308S
★111		1 1 1 1	PANEL SMOKE (meter)	7802220
★112a		2 2 2 2	HANDLE A-42-A-6	7890140
★113a		1 1 1 –	STEEL COVER–COV ALPHA II W-E-N	7820730
113b		– – – 1	STEEL COVER–COV ALPHA II D	7820760
114		4 4 4 4	SCREW TFTS 4 x 10 B	887410W
115		4 4 4 4	WASHER W 4ϕ B	893104W
116		4 4 4 4	SCREW PTS 3 x 6 B	814306W
★117		1 1 1 1	BOTTOM PLATE	7324650
118		6 6 6 6	SCREW PTS 3 x 6	814306S
118		6 6 6 6	SCREW PTS 3 x 6	814306S

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
			(BLACK TYPE)	
101b		1 1 1 1	KNOB 2BK-26D (speakers)	7851760
102b		1 1 1 1	KNOB PC-16B (power)	7851790
103		1 1 1 1	DUST COVER	7001760
104		2 2 2 2	PUSHBUTTON P10B (meter)	7851680
105		2 2 2 2	PUSHBUTTON GUIDE	7851690
106b		– – – 1	FRONT PANEL–PNL ALPHA II BY	7883720
106c		1 1 1 –	FRONT PANEL–PNL ALPHA II BW	7883750
107		2 2 2 2	PANEL BRACKET	7031250
108		4 4 4 4	SCREW PMS 5 x 14	810514S
109		4 4 4 4	WASHER TW (I) 5ϕ	893405U
110		6 6 6 6	SCREW PTS 3 x 8	814308S
111		1 1 1 1	PANEL SMOKE (meter)	7802220
112b		2 2 2 2	HANDLE (B) A-42	7890150
113a		1 1 1 –	STEEL COVER–COV ALPHA II W-E-N	7820730
113b		– – – 1	STEEL COVER–COV ALPHA II D	7820760
114		4 4 4 4	SCREW TFTS 4 x 10 B	887410W
115		4 4 4 4	WASHER W 4ϕ B	893104W
116		4 4 4 4	SCREW PTS 3 x 6 B	814306W
117		1 1 1 1	BOTTOM PLATE	7324650
118		6 6 6 6	SCREW PTS 3 x 6	814306S
118		6 6 6 6	SCREW PTS 3 x 6	814306S
			CHASSIS ASSEMBLY	
200a		1 – – –	COMPLETE ASSEMBLY–CHASS ASS W	9534390
200b		– 1 – –	COMPLETE ASSEMBLY–CHASS ASS E	9534400
200c		– – 1 –	COMPLETE ASSEMBLY–CHASS ASS N	9534410
200d		– – – 1	COMPLETE ASSEMBLY–CHASS ASS D	9534550
★201		1 1 1 1	CHASSIS	7324660
★202		1 1 1 1	SIDE ANGLE (R)	7226240
★203		1 1 1 1	SIDE ANGLE (L)	7226250
204		6 6 6 6	SCREW PTS 3 x 6 (FRONT PLATE ASSEMBLY)	814306S
205		6 6 6 6	SCREW PTS 3 x 6 (BACK PLATE ASSEMBLY)	814306S
206		6 6 6 6	SCREW PTS 3 x 6 (REG PCB ASS)	814306S
207		5 5 5 5	PCB SUPPORT PIN (PROTECT PCB ASS)	7401320
208		4 4 4 4	PCB SUPPORT PIN	7401320
★209a		2 – – –	POWER TRANSFORMER T-1-283 120V	1102830

PART ORDERING PROCEDURE ---------- Include in any order: A. Part number, B. Part description, C. Model number.
(any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
209b		– 2 2 –	POWER TRANSFORMER T-290 220V/240V	1102900
209c		– – – 2	POWER TRANSFORMER T-297 220V/240V	1102970
210		8 8 8 8	NUT IN 4ϕ	892014S
211		8 8 8 8	WASHER TW (I) 4ϕ	893404U
212	C1 C4	4 4 4 4	E-CAP 63R10000uF	212650S
213		8 8 8 8	SCREW BLTS 3 x 6	874306S
214a		2 – – –	FUSE 5A 250V (UL)	4700540
215a		2 – – –	FUSE HOLDER 1P	4581840
216a		2 – – –	SCREW PTS 3 x 8	814308S
214b		– 2 2 2	MIDGET FUSE (S) 3.15A	4720390
215b		– 2 2 2	MIDGET FUSE HOLDER 1P	4581430
216b		– 2 2 2	SCREW PTS 3 x 6	814306S
217		3 3 3 3	SNAP BUSHING B-500-375	7401090
218		4 4 4 4	SNAP BUSHING B-312-250	7401100
219		2 2 2 2	EARTH LUG 4P WP	4400100
220		2 2 2 2	SCREW PTS 3 x 6	814306S
221		2 2 2 2	WASHER TW(I) 3ϕ	893403U
222	R1	1 – – –	RES 2.2M-ohm 5% 1/2W	325225K
223		1 1 1 1	T-LUG 2L4P (W)	442241W
224		2 2 2 2	SCREW PTS 3 x 6	814306S
			FRONT PLATE ASSEMBLY	
300a		1 – – –	COMPLETE ASSEMBLY FRONT PLT ASS W	9521820
300b		– 2 – –	COMPLETE ASSEMBLY FRONT PLT ASS E	9521830
300c		– – 1 –	COMPLETE ASSEMBLY FRONT PLT ASS N	9521840
300d		– – – 1	COMPLETE ASSEMBLY FRONT PLT ASS D	9521920
★301		1 1 1 1	FRONT PLATE	7324670
★302a	S2	1 1 1 –	ROTARY SWITCH 1-2-4 (speakers)	4051130
302b	S2	– – – 1	ROTARY SWITCH 1-4-4(speakers)	4051170
★303a	S1	1 – – –	LEVER ACTION SWITCH LV SW SY02 U74SM (power)	4025090
303b	S1	– 1 1 1	LEVER ACTION SWITCH LV SW SY02 80DB (power)	4025150
304		2 2 2 2	SCREW PMS 3 x 6	810306S
305		1 1 1 1	POWER SWITCH BRACKET	7031260
306		2 2 2 2	SCREW PTS 3 x 6	814306S
★307		1 1 1 1	BACK GROUND PANEL	7226260
308		4 4 4 4	SCREW PTS 3 x 6	814306S
★309a		2 2 2 –	METER 677 (8OHM)	4582040
309b		– – – 2	METER 677 (4OHM)	4582130
★310		1 1 1 1	METER HOLDER	7226270
311		4 4 4 4	SCREW PTS 3 x 6	814306S
312		1 1 1 1	LAMP PCB	4630930
313		4 4 4 4	LAMP PL-8 8V 0.25A BLUE	5808130
★314		3 3 3 3	PUSH RIVET FNRP 3 x 4.5 (MT SW PCB S, ASS)	7401240
315		2 2 2 2	SCREW PMS 3 x 6	810306S
316	C4	1 – – –	C-CAP 0.0047uF	239472C
317		1 – – –	C-CAP COVER (M)	7400980
			BACK PLATE ASSEMBLY	
400a		1 – – –	COMPLETE ASSEMBLY–BACK PLT ASS W	9512880
400b		– 1 – –	COMPLETE ASSEMBLY–BACK PLT ASS E	9512890
400c		– – 1 –	COMPLETE ASSEMBLY–BACK PLT ASS Nd	9512900
400d		– – – 1	COMPLETE ASSEMBLY–BACK PLT ASS D	9513060
★401a		1 – – –	BACK PLATE W	7324680
401b		– 1 – –	BACK PLATE E	7324890
401c		– – 1 –	BACK PLATE N	
401d		– – – 1	BACK PLATE D (MAIN AMP PCB ASS)	7324880
402		8 8 8 8	PCB SUPPORT PIN LCBS-8	7401310
403		4 4 4 4	SNAP BUSHING (HEATSINK S. ASS)	7401090
404		8 8 8 8	SCREW PTS 3 x 8 B	814308W
405		8 8 8 8	WASHER W 3ϕ	893103S
★406		1 1 1 1	WP PIN TERMINAL 2P (SE) (input)	4442020
407		2 2 2 2	SCREW PMS 3 x 8 B	810308W
★408		2 2 2 2	4P PUSH TERMINAL (speaker)	4460480
409		4 4 4 4	SCREW PTS 3 x 10 B	814310W
★412a		1 – – –	POWER SUPPLY CORD KP-2	606006A
412b		– 1 1 –	POWER SUPPLY CORD CEE-2T	600506J
412c		– – – 1	POWER SUPPLY CORD CEE-3T	601809A
★413a		1 – – –	CORD STOPPER SR-3P-4	7400620
413b		– 1 1 –	CORD STOPPER SR-4N-4	7400690
413c		– – – 1	CORD STOPPER SR-6W-1	7400740
★414a		1 – – –	CORD BRACKET (UL)	7029300
414b		– 1 1 1	CORD BRACKET (EH)	7029800
415		2 2 2 2	SCREW PTS 3 x 6 B	814306W
			HEATSINK ASSEMBLY	
500a		1 1 1 –	COMPLETE ASSEMBLY H-SINK S. ASS	
500b		– – – 1	COMPLETE ASSEMBLY H-SINK S. Ass	
★501		2 2 2 2	HEATSINK	7480310
502	Q2L	1 1 1 1	TR 2SD555 (Q,R)	513768S
503	Q2R	1 1 1 1	TR 2SD555 (Q,R)	513768S
504	Q3L	1 1 1 1	TR 2SB600 (Q,R)	513067S
505	Q3R	1 1 1 1	TR 2SB600 (Q,R)	513067S
506		4 4 4 4	POWER TRANSISTOR SOCKET	4510080
507		8 8 8 8	SCREW PMS 3 x 16	810316S
508		8 8 8 8	WASHER TW(I) 3ϕ	893403U
509		2 2 2 2	BIAS CONTROL PCB	4630940
510	Q1L	1 1 1 1	TR 2SC1627 (O,Y)	511017S
511	Q1R	1 1 1 1	TR 2SC1627 (O,Y)	511017S
★512		4 4 4 4	HEATSINK COVER	7226280
513		8 8 8 8	SCREW PTS 3 x 6 B	814306W
514		8 8 8 8	SCREW PTS 3 x 6 B	814306W
515		8 8 8 8	SCREW PTS 3 x 8 B (heatsink)	814308W
516		8 8 8 8	WASHER W 3ϕ	893103S
517		– – – 2	THERMOSTAT US-601-80	4900720
518		– – – 4	SCREW PTS 3 x 6 B	814306W
			MAIN AMP CIRCUIT BOARD (only left channel)	
★600a		1 1 1 –	COMPLETE CIRCUIT BOARD–MAIN AMP PCB ASS WEN	9430640

PART ORDERING PROCEDURE ---------- Include in any order: A. Part number, B. Part description, C. Model number.
(any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
600b		– – – 1	COMPLETE CIRCUIT BOARD–MAIN AMP PCB ASS D	9430650
	C701L	1 1 1 1	E–CAP 16R100uF	211230Q
	C702L	1 1 1 1	C-CAP 100pF 10% 50V SL	232101K
	C703L	1 1 1 1	E-CAP 80R220uF	211732Q
	C704L	1 1 1 1	C-CAP 47pF 10% 50V SL	232470K
	C705L		Out of use	
	C706L	1 1 1 1	E-CAP 16uF470uF	211235Q
	C707L	1 1 1 1	E-CAP 25R10uF	211320V
	C708L	1 1 1 1	C-CAP 47pF 10% 50V SL	232470K
	C709L	1 1 1 1	C-CAP 10pF 10% 500V SL	234100K
	C710L	1 1 1 1	C-CAP 5pF ±0.5pF 500V SL	234509D
	C711L	1 1 1 1	C-CAP 68pF 10% 500V SL	234680K
	C712L	1 1 1 1	M-CAP 0.01uF 10% 50V	222103K
	C713L	1 1 1 1	M-CAP 0.047uF 10% 50V	222473K
	C714L	1 1 1 1	C-CAP 100pF 10% 500V SL	234101K
	C715L	1 1 1 1	M-CAP 0.047uF 10% 50V	222473K
	C716L	1 1 1 1	C-CAP 100pF 10% 500V SL	234101K
	C717L	1 1 1 1	M-CAP 0.047uF 1-% 200V	272473K
	C718L	1 1 1 1	M-CAP 0.1uF 20% 50V	222104M
	C719L	1 1 1 1	E-CAP 50R 0.47uF	211505Q
	D701L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D702L	1 1 1 1	DIODE VD1212	505016S
	D703L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D704L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D705L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D706L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D707L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D708L	1 1 1 1	DIODE 1S2076 (LIGHT BLUE)	501019S
	D709L	1 1 1 1	DIODE 1S2076A (NAVY BLUE)	501020S
	L701L	1 1 1 1	CHOKE COIL	1210830
	R701L	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R702L	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R703L	1 1 1 1	RES 330Kohm 5% 1/4W	328331J
	R704L	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R705L	1 1 1 1	RES 470ohm 5% 1/4W	328471J
	R706L	1 1 1 1	Out of use	
	R707L	1 1 1 1	RES 12Kohm 5% 1/4W	328123J
	R708L	1 1 1 1	RES 470ohm 5% 1%4W	328471J
	R709L	1 1 1 1	FP-MO-RES 5.6Kohm 5% 1/2W	360562L
	R710L	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R711L	1 1 1 1	RES 56Kohm 5% 1/4W	328563J
	R712L	1 1 1 1	FP-MO-RES 33Kohm 5% 1/2W	360333L
	R713L	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R714L	1 1 1 1	POT–H-VR SR29R207 B 1Kohm	4300620
	R715L	1 1 1 1	RES 560ohm 5% 1/4W	328561J
	R716L	1 1 1 1	RES 47Kohm 5% 1/4W	328473J
	R717L	1 1 1 1	RES 330ohm 5% 1/4W	328331J
	R718L	1 1 1 1	RES 100ohm 5% 1/4W	328101J
	R719L	1 1 1 1	RES 100ohm 5% 1/4W	328101J
	R720L	1 1 1 1	RES 56ohm 5% 1/4W	328560J
	R721L	1 1 1 1	FP-MO-RES 68ohm 5% 1/4W	360680J
	R722L	1 1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R723L	1 1 1 1	FP-MO-RES 68ohm 5% 1/4W	360680L
	R724L	1 1 1 –	FP-MO-RES 68ohm 5% 1/2W	360680L
	R725L	1 1 1 –	FP-MO-RES 68ohm 5% 1/2W	360680L
	R726L	1 1 1 –	FP-MO-RES 150ohm 5% 1/2W	360151L
	R727L	1 1 1 –	FP-MO-RES 150ohm 5% 1/2W	360151L
	R728L	1 1 1 1	FP-CEM-RES 0.47ohm 10% 1/2W	384479W
	R729L	1 1 1 1	FP-CEM-RES 0.47ohm 10% 1/2W	384479W
	R730L	1 1 1 1	FP-CEM-RES 0.47ohm 10% 1/2W	384479W
	R731L	1 1 1 1	FP-CEM-RES 0.47ohm 10% 1/2W	384479W
	R732L	1 1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R733L	1 1 1 1	RES 82Kohm 5% 1/4W	328823J
	R734L	1 1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
	R735L	1 1 1 1	RES 27Kohm 5% 1/4W	328273L
	R736L	1 1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
	Q701L	1 1 1 1	TR 2SA941 (BL)	510048S
	Q702L	1 1 1 1	TR 2SC2088 (BL)	511023S
	Q703L	1 1 1 1	TR 2SA941 (BL)	510048S
	Q704L	1 1 1 1	TR 2SB536 (L,M)	510039S
		1 1 1 1	HEATSINK	7081820
		1 1 1 1	SCREW PMS 3 x 5	810305S
	Q705L	1 1 1 1	TR 2SD381 (L,M)	510038S
		1 1 1 1	HEATSINK	7081820
		1 1 1 1	SCREW PMS 3 x 5	810305S
	Q706L	1 1 1 1	TR 2SC1627 (O,Y)	511017S
	Q707L	1 1 1 1	TR 2SD381 (L,M)	510038S
		1 1 1 1	HEATSINK 1627NT	7780270
		2 2 2 2	SCREW PMS 3 x 5	810305S
	Q708L	1 1 1 1	TR 2SB536 (L,M)	510039S
		1 1 1 1	HEATSINK 1627NT	7480270
		2 2 2 2	SCREW PMS 3 x 5	810305S
	Q709L	1 1 1 –	TR 2SC945Ⓛ (P,Q)	515077S
	Q710L	1 1 1 –	TR 2SA733 (R,Q)	514074S
	Q711L	1 1 1 1	TR 2SC2088 (BL)	511023S
	Z701L	1 1 1 1	ZENER DIODE XZ-225	502036S
	Z702L	1 1 1 1	ZENER DIODE WZ-069	502035S
700a		1 – – –	COMPLETE CIRCUIT BOARD–REG PCB ASS W	9450660
700b		– 1 1 –	COMPLETE CIRCUIT BOARD–REG PCB ASS EN	9450670
700c		– – – 1	COMPLETE CIRCUIT BOARD–REG PCB ASS D	9450700
	C801 ~C808	8 8 8 8	E-CAP 10R220uF	211132Q
	C809	1 1 1 1	C-CAP 0.01uF 100, –0% 500V	238103P
	C810	1 1 1 1	C-CAP 0.01uF 100, –0% 500V	238103P
	C811 ~C818	8 8 8 8	C-CAP 0.01uF 100, –0% 500V	238103P
	D801 ~D808	8 8 8 8	DIODE 1S2076	501019S
	D809	1 1 1 1	DIODE S5VB20	560042S
	D810	1 1 1 1	DIODE S5VB20	560042S
	F801	1 – – –	FUSE 1A 125V (–B SUB)	4700020
	F802	1 – – –	FUSE 1A 125V (–B SUB)	4700020
		4 – – –	FUSE HOLDER	7050420
	F801	– 1 1 1	MIDGET FUSE (S) 1AT (–B SUB)	4720330
	F802	– 1 1 1	MIDGET FUSE (S) 1AT (–B SUB)	4720330
		– 4 4 4	MIDGET FUSE HOLDER	7050430
	F803 F806	– 4 4 –	MIDGET FUSE (S) 5AT (+B/–B)	4720410
		– 8 8 –	MIDGET FUSE HOLDER	7050430
	R801	1 1 1 1	FP-MO-RES 68ohm 5% 1/2W	360680L
	R802	1 1 1 1	FP-MO-RES 68ohm 5% 1/2W	360680L
	R803 R806	4 4 4 4	FP-MO-RES 10Kohm 1/2W	360103L

PART ORDERING PROCEDURE ---------- Include in any order: A. Part number, B. Part description, C. Model number.
(any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
			PROTECTOR CIRCUIT BOARD	
800a		1 1 1 –	COMPLETE CIRCUIT BOARD PROTECT PCB ASS WEN	9450680
800b		– – – 1	COMPLETE CIRCUIT BOARD PROTECT PCB ASS D	9450690
	C840	1 1 1 1	E-CAP 50R0.47uF	211505Q
	C841	1 1 1 1	E-CAP 16R220uF	211232Q
	C842	1 1 1 1	E-CAP 16R220uF	211232Q
	C843	1 1 1 1	E-CAP 16R220uF	211232Q
	C844	1 1 1 1	E-CAP 35R3.3uF	211413Q
	D840	1 1 1 1	DIODE 1S2076A	501020S
	D841	1 1 1 1	DIODE 1S2076A	501020S
	R840	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R841	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R842	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R843	1 1 1 1	RES 47Kohm 5% 1/4W	328473J
	R844	1 1 1 1	RES 68Kohm	328683J
	R845	– – – 1	RES 18Kohm 5% 1/4W	328183J
	R846	1 1 1 –	RES 18Kohm 5% 1/4W	328183J
	R847	1 1 1 1	RES 180Kohm 5% 1/4W	328184J
	R848	1 1 1 1	RES 4,7Kohm 5% 1/4W	328472J
	R849	1 1 1 1	RES 18Kohm 5% 1/4W	328183J
	R850	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R851	1 1 1 1	RES 15Kohm 5% 1/4W	328153J
	R852	1 1 1 1	MO-RES 220ohm 5% 1/2W	360221L
	R853	1 1 1 1	MO-RES 470ohm 5% 1W	361471L
	Q801	1 1 1 1	TR 2SA733 (Q,R)	514074S
	Q802	1 1 1 1	TR 2SA733 (Q,R)	514074S
	Q803	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	Q804	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	Q805	1 1 1 1	TR 2SC1627 (O,Y)	511017S
801		1 1 1 1	RELAY MAT4B-211R	1700210
			METER SWITCH CIRCUIT BOARD	
★900a		1 1 1 –	COMPLETE CIRCUIT BOARD– MT SW PCB S.ASS W-E-N	9492380
900b		– – – 1	COMPLETE CIRCUIT BOARD– MT SW PCB S.ASS D	9492490
	D901	1 1 1 1	DIODE 1N34A	500010G
	D902	1 1 1 1	DIODE 1N34A	500010G
	D903	1 1 1 1	DIODE 1S2076	501019S
	D904	1 1 1 1	DIODE 1S2076	501019S
	D905	1 1 1 1	DIODE 1S2076	501019S
	D906	1 1 1 1	DIODE 1S2076	501019S
	R919	1 1 1 1	POT 1Kohm–H-VR RVA-7B	4300750
	R920	1 1 1 1	POT 1Kohm–H-VR RVA-7B	4300750
	R901	1 1 1 –	RES 820ohm 5% 1/4W	328821J
	R901	– – – 1	RES 390ohm 5% 1/4W	328391J
	R902	1 1 1 –	RES 820ohm 5% 1/4W	328821J
	R902	– – – 1	RES 390ohm 5% 1/4W	328391J
	R903	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R904	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R905	1 1 1 –	RES 5.6Kohm 5% 1/4W	328562J
	R905	– – – 1	RES 3.9Kohm 5% 1/4W	328392J
	R906	1 1 1 –	RES 5.6Kohm 5% 1/4W	328562J
	R906	– – – 1	RES 3.9Kohm 5% 1/4W	328392J
	R907	1 1 1 –	RES 82Kohm 5% 1/4W	328823J
	R907	– – – 1	RES 68Kohm 5% 1/4W	328683J
	R908	1 1 1 –	RES 82Kohm 5% 1/4W	328823J
	R908	– – – 1	RES 68Kohm 5% 1/4W	328683J
	R909	1 1 1 –	RES 12Kohm 5% 1/4W	328123J
	R909	– – – 1	RES 8.2Kohm 5% 1/4W	328822J
	R910	1 1 1 –	RES 12Kohm 5% 1/4W	328123J
	R910	– – – 1	RES 8.2Kohm 5% 1/4W	328822J
	R911	1 1 1 –	RES 180Kohm 5% 1/4W	328184J
	R911	– – – 1	RES 270Kohm 5% 1/4W	328274J
	R912	1 1 1 –	RES 180Kohm 5% 1/4W	328184J
	R912	– – – 1	RES 270Kohm 5% 1/4W	328274J
	R913	1 1 1 –	RES 27Kohm 5% 1/4W	328273J
	R913	– – – 1	RES 18Kohm 5% 1/4W	328183J
	R914	1 1 1 –	RES 27Kohm 5% 1/4W	328273J
	R914	– – – 1	RES 18Kohm 5% 1/4W	328183J
	R915	1 1 1 –	RES 150Kohm 5% 1/4W	328154J
	R915	– – – 1	RES 220Kohm 5% 1/4W	328224J
	R916	1 1 1 –	RES 150Kohm 5% 1/4W	328154J
	R916	– – – 1	RES 220Kohm 5% 1/4W	328224J
	R917	1 1 1 1	RES 560ohm 5% 1/4W	328561J
	R918	1 1 1 1	RES 560ohm 5% 1/4W	328561J
901	S901, S902	1 1 1 1	TWIN PUSH BUTTON SWITCH SUE-24 (meter)	4040910

CHASSIS ALIGNMENT

TEST EQUIPMENT

Generator – Audio Frequency
DC Voltmeter – High Sensitivity
Vacuum Tube Voltmeter
(Oscilloscope)

Connect Generator to INPUT of the instrument to be tested. Connect two (2) 8 ohm (D-type: 4 ohm) dammy loads to L-channel and R-channel speaker terminals.

Apply AC power to the instrument.

Allow minimum of 10 minute warm-up period for the instrument and test equipment.

Maintain line voltage at rated voltage.

MIDPOINT VOLTAGE ADJUSTMENT

Left Channel: Using DC Voltmeter, make certain that the voltage between TP 12 and TP 13 on Main Amp Circuit Board is 0mV ± 20mV.

Right Channel:The same procedure as left channel.

IDLING CURRENT ADJUSTMENT

Left Channel: Using DC Voltmeter, adjust potentiometer R714 so that the voltage between TP 14 and TP 15 on Main Amp Circuit Board is 19mV ± 3mV.

Right Channel:The same procedure as left channel.

METER SENSITIVITY ADJUSTMENT

Left Channel:

1. Connect VTVM to speaker terminals. Set Meter Renge Switches (S901, S902) to 0dB position. Set Generator frequency to 1KHz.
2. Set Generator to produce 120 watts (D-type: 130 watts) power output, Adjust potentiometer R919 on Meter Switch Circuit Board so that Meters are 0dB ± 0.5dB.

Right Channel: The same procedure as left channel. Adjust potentiometer R920 instead of potentiometer R919.

SEMICONDUCTORS DATA

TRANSISTORS DATA

NOTES†

Ge : Germanium
Si : Sillicon

A : Alloy
B : Base
D : Diffused
Dd : Double-diffused

Df : Drift-field
E : Epitaxial
G : Grown
J : Junction

M : Mesa
P : Planer
Pc : Point-contact
Td : Triple-diffused

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA=25° C unless otherwise specified)					ELECTRICAL CHARACTERISTICS Tipical Values: (TA=25° C unless otherwise specified)														MANUFACTURE
			Collector-to-Base Voltage VCBO (V)	Emitter-to-Base Voltage VEBO (V)	Collector Current IC (mA)	Collector Dissipation PC (mW)	Junction Temperature Tj (C)	Collector Cutoff Current ICBO (uA)	VCB (V)	Static Forward-Current Transfer Ratio hFE	VCE (V)	IC (mA)	Collector-Emitter Saturation Voltage VCE(sat) (V)	IC (mA)	IB (mA)	Gain-Bandwidth Product fT (MHz)	VCE VCB* (V)	IE IC* (mA)	Base Spreading Resistance rbb' hie(real)* (Ω)	VCE VCB* (V)	IE (mA)	Output Capacitance Cob (pF)	
2SA733 (Q,R)	AF	PNP Si-E	−50	−5	−100	250	125	−0.1	−40	90 ~270	−6	−1	−0.5	−30	−3	180	−6	10				8	NEC
2SA817 (O,Y)	AF,Voltage amp., Driver	PNP Si-E	−80	−5	−300	600	150	−0.1	−50	70 ~240	−2	−50	−0.4	−200	−20	100	−10	10				14	TOSHIBA
2SA872 (D,E)	AF,Low noise small signal	PNP Si-E	−90	−5	−50	300	125	−0.5	−75	250 ~800	−12	−2	−0.5	−10	−1.0								HITACHI
2SA941 (B,L)	AF, Low noise	PNP Si-E	−120	−5	−50	300	125	−0.1	−120	350 ~700	−6	−2	−0.4	−10	−1	40	−5	0.1A				5.0 max	TOSHIBA
2SB536 (Q,R)	AF,Driver	PNP Si-E	−200	−5	−1.5A	20W (TC=25°C)	150	−1	−120	60 ~160	−5	−3A	−2	−1A	−0.1A	40	−5	0.1A				35	NEC
2SB600 (Q,R)	AF,Power	PNP Si-E	−200	−5	−10A	200W (TC=25°C)	150	−100	−200	60 ~200	−5	−2A	−3	−10A	−1A	4	−10	−1A				400	NEC
2SC945Q (P,Q)	AF,Low noise general	NPN Si-E	60	5	100	250	125	100	60	135 ~400	6	1	0.15	100	10	250	6	−10				3.5	NEC
2SC1627 (O,Y)	AF,Voltage amp., Driver	NPN Si-E	80	5	300	600	150	0.1	50	70 ~240	12	50	0.5	200	10	100	10	−1				10	TOSHIBA
2sc1775 (D,E)	AF, Low noise Small Signal	NPN Si-E	90	5	50	300	125	0.5	75	250 ~800	12	2	0.5	10	1.0								HITACHI
2SC2088 (B,L)	AF, Low noise	NPN Si-E	120	5	50	300	125	0.1	120	350 ~700	6	2	0.3	10	1	150	6	−1				3.0 max	TOSHIBA
2SD381 (L,M)	AF,Driver	NPN Si-E	130	5	1.5A	20W (TC=25°C)	150	1	120	60 ~160	5	3A	2	1A	0.1A	45	5	−0.1A				25	NEC
2SD555 (Q,R)	AF, Power	NPN Si-TdM	250	5	10A	200W (TC=25°C)	150	100	200	60 ~200	5	2A	3	10A	1A	6	10	−1A				300	NEC

FIELD EFFECT TRANSISTORS DATA

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25 C unless otherwise specified)						ELECTRICAL CHARACTERISTICS Tipical Values: (TA = 25°C unless otherwise specified)																MANUFACTURE
			Gate-to-Drain Voltage VGDO (V)	Gate-to-Source Voltage BGSO (V)	Gate Current IG (mA)	Drain Current ID (mA)	Total Power Dissipation Tj (mW)	Junction Temperature Tj (°C)	Date Leak Current Test Conditions	IGSS (nA)	Gate to Drain Breakdown Voltage Test Conditions	V(BR) GDO (V)	Drain Current Test Conditions	IDSS (mA)	Gate to Source Cutoff Voltage Test Conditions	VGS (V)	Forward Transfer Admittance Test Conditions	|Yfs|	Feed back Capacitance Test Conditions	CRSS (pF)	Power Gain (Common source) Test Conditions	GPS (dB)	Noise Figure Test Conditions	NF (dB)	
2SK68A (L,M)	AF, Low noise	N-channel Junction FET	−50	−50	10	20	250	125	VGS= −20V VDS= 0	−1.0 max			VDS= 10V VGS= 0	0.5 min 3.0 typ 12 max	VDS= 10V ID= 10uA	−0.5	VDS= 10V ID= 0.5mA f=1KHz	5.2	VDS= 10V VGS= 0 f=1MHz	2.6			VDS= 10V VGS= 0 RG= 1Kohm	10 max (10Hz) 1.5 max (1KHz)	NEC

ZENER DIODES DATA

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA=25°C unless otherwise specified)			ELECTRICAL CHARACTERISTICS Tipical Values: (TA = 25° C unless otherwise specified)												MANUFACTURE
			Total Power Dissipation PD (mW)	Zener Current IZ (A)	Junction Temperature Tj (°C)	Zener Voltage VZ MIN (V)	VZ TYP (V)	VZ MAX (V)	Test Condition IZ (mA)	Differential Resistance rd TYP	rd MAX	Test Condition IZ (mA)	Temperature Coefficient γz TYP (/C)	γz MAX (/C)	Test Condition IZ (mA)	Reverse Current IR MAX (uA)	Test Condition VR (V)	
WZ069			500			6.5	6.9	7.3	10	10		10	0.041			1	2	JRC
XZ122			500			11.6	12.2	12.8	5	15		5	0.069			1	10	JRC
XZ225			500			21.4	22.5	23.8	5	30		5	0.0845			1	19.5	JRC

DIODES LEDS DATA

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA=25°C unless otherwise specified)								ELECTRICAL CHARACTERISTICS Tipical Values: (TA=25° C unless otherwise specified)							MANUFACTURE
			Reverse Surge Voltage VR surge (V)	Peak Reverse Voltage VRM (V)	Reverse Voltage VR (V)	Peak Forward Voltage VFM (V)	Peak Forward Current IFM (mA)	Average Rectified Current IO (mA)	Forward Surge Current IF surge (A)	Junction Temperature Tj (C)	Total Power Dissipation PD (mW)	Forward Current IF min (mA)	Test Condition VF (V)	Forward Voltage VF (V)	Test Condition IF (mA)	Reverse Current IR max (uA)	Test Condition VR (V)	
S5VB20	Rectifier	Si-D		−200				6A	200 (TC=25°C)	150				1.05	3A	10		SHINDENGEN
VD1212		Si-D					30				50			1.24	1.5			NEC
IN34A	Logical circuit	Ge-P		−75	−60		150	50	0.5 (1 sec.)	70		5	1			30 500	−10 −50	HITACHI
1S1885		Si-A		−100		70		1A (Ta=65°C)	60					1.2	1.5A	10	100	TOSHIBA
1S2076	Various Detector, Modulator, Demodulator	Si-EP		−35	−30		450	150	1	175	250			0.8	10	1	−30	HITACHI
1S2076A	Various detector, Modulator, Demodulator	Si-EP		−70	−60		450	150	1	175	250			0.8	10	1	−30	HITACHI
GD-4-207RD	LED				−3			IFDC = 50		100	100			1.7	20	100	3	Brightness MIN. 25ft-L (IF=20mA) TYP. 45ft-L STANLEY

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