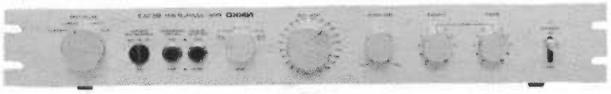
STEREO

PRE AMPLIFIER

BETA II



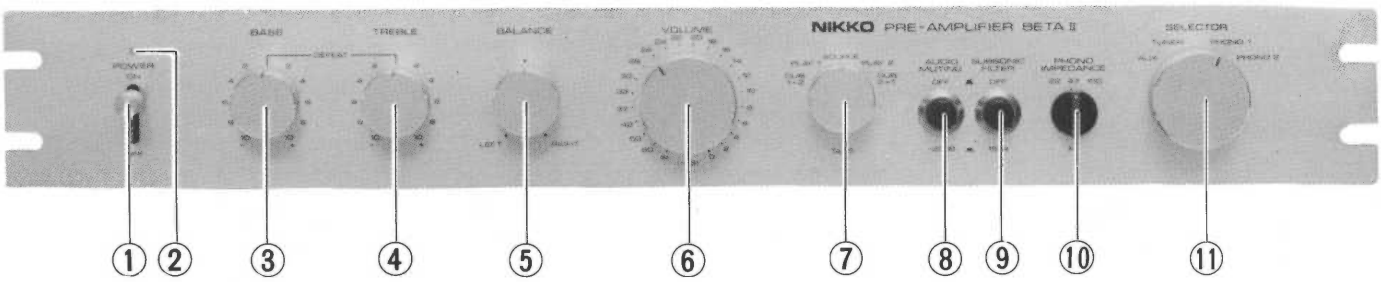
SERVICE MANUAL

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 and 2. PILOT LAMP
   To turn on the power, set the power switch to the ON position. The pilot lamp will light, indicating that the power is on. The unit will become active a few seconds later because of the employment of a built-in relay.

3. BASS
   To increase bass tone, turn this control clockwise. The tone is flat at the center (DEFEAT) position.

4. TREBLE
   To increase treble tone, turn this control clockwise. The tone is flat at the center (DEFEAT) position.

5. BALANCE
   This control adjusts unbalance of volume between the left and right channels. Turning the control to left will increase the volume of left channel while decreasing the volume of right channel, and vice versa.

6. VOLUME
   The 42-position, dual volume control adjusts the volume of both the left and right channels simultaneously with minimum error. Turning the knob clockwise will increase volume.

7. TAPE
   This switch is used for tape playback or tape dubbing.
   PLAY 1: For playing tape with tape deck connected to TAPE 1 terminals.
   PLAY 2: For playing tape with tape deck connected to TAPE 2 terminals.
   For tape dubbing from one tape deck to another, simply set the switch to DUB1–2 or DUB 2–1 position.
   When you are not using tape deck, set the switch to SOURCE position.

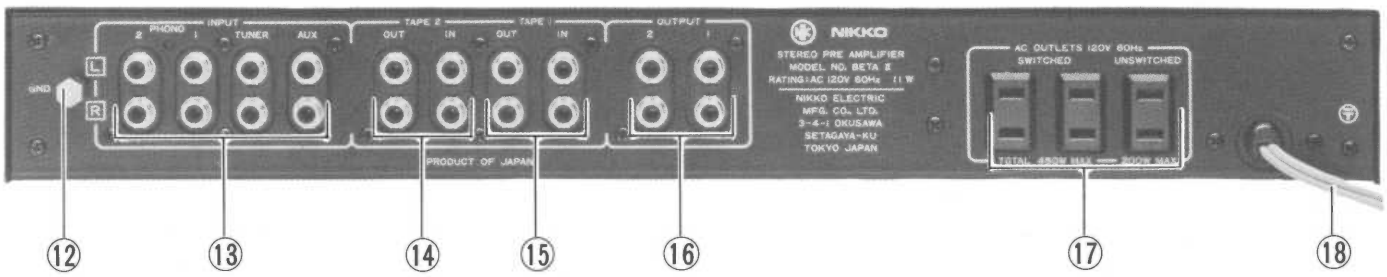
8. AUDIO MUTING
   By pressing this switch, the level of the signal fed to your power amplifier is reduced to –20dB (1/10). If you wish to reduce the volume for a brief period of time, simply press the switch until locks.
   This feature is also useful for fine adjustment of volume control while listening at low volume. In this case, the volume control is normally set at the approximate center position.

9. SUBSONIC FILTER
   Pressing this switch to ON will shut off extremely low frequency noise possibly generated from warped records.

10. PHONO IMPEDANCE Selector Switch
    This 3-position switch selects the impedance of record player cartridge being used, 22K, 47K or 100K ohms. Normally, it is set to the "47" position.

11. SELECTOR
    This switch is used to select and program source connected to the input terminals.
    AUX: For playback of program connected to to AUX input.
    TUNER: For reception of broadcast with stereo tuner.
    PHONO 1,2: For playback with record player.

TERMINALS ON REARPANEL



12. GND
Connect the earth lead of your record player. The earth lead is provided on the motor or tonearm of the player.

13. INPUT Terminal
PHONO 1,2: Connect the left and right pin-plug cords of record player.
TUNER: Connect your stereo tuner.
AUX: Connect your second radio tuner, a tape player or a TV (audio section).

14. TAPE 2 Terminal
IN: Connect the output (LINE OUT) of your tape deck.
OUT: Connect the input (LINE IN) of your tape deck.

15. TAPE 1 Terminal
IN: Connect the output (LINE OUT) of your tape deck.
OUT: Connect the input (LINE IN) of your tape deck.

16. OUTPUT Terminal
Connect the input of your power amplifier to this terminal using a pin-plug cord. Two sets of output terminals are provided for connection to two power amplifiers.

17. AC OUTLETS
Connect power cords of your tuner, record player, etc., to the AC outlets provided. The AC outlet marked UNSWITCHED is powered at all times regardless of the position of the power switch, while the other outlet marked SWITCHED is interlocked with the power switch and, hence, it is powered when the power switch is turned on.
The allowable capacity of each SWITCHED outlet is 450W and that of the UNSWITCHED outlet is 200W. When using the two SWITCHED outlets, be sure that the total power consumption of your equipment does not exceed the wattage marked on the outlets.

18. AC POWER CORD
Before connecting the power cord to AC outlet, check to make sure that the volume control is turned fully counter-clockwise and the power switch is OFF.

CONTENTS

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

	UNIT	NOMINAL	LIMIT
Input Sensitivity for 1 volt Output/Input Impedance			
PHONO 1,2	mV/Kohm	2/22, 47, 100	2±2dB/22, 47, 100
TUNER, AUX, TAPE IN 1,2	mV/Kohm	110/43	110±2dB/43
Maximum Input before Overload Distortion			
PHONO 1,2@0.01%THD	mV	270	250
TUNER, AUX, TAPE IN@0.1%THD	mV	1000	650
Output Level/Output Impedance			
PHONE 1,2→TAPE OUT 1,2	mV/Kohm	110/2.2	110±2dB/2.2
TH Distortion@4 volt Output, 20Hz–20KHz			
PHONE 1,2→TAPE OUT 1,2	%		<0.006
TH Distortion@1 volt Output, 1KHz			
TUNER, AUX, TAPE 1,2→OUTPUT	%		<0.007
Frequency Response			
PHONO 1,2→TAPE OUT 1,2 (RIAA)	dB@Hz–KHz		<±1@30–15
TUNER, AUX, TAPE IN 1,2→OUTPUT	dB@Hz–KHz		<±2@10–100
Signal to Noise Ratio (IHFA–Network)			
PHONO 1,2→OUTPUT	dB	77	75
TUNER, AUX, TAPE IN 1,2→OUTPUT	dB	85	80
Tonal Compensation			
BASS CONTROL	±dB@50Hz	±10	±10±2
TREBLE CONTROL	±dB@10KHz	±10	±10±2
SUBSONIC FILTER	–dB@20Hz	–3	–3±2
Audio Muting	–dB@20Hz	–20	–20±2
Muting Delay Time	second	7	7±2
Midpoint Voltage	mV	0	0±100

SPECIFICATIONS (D – TYPE)

	UNIT	NOMINAL	LIMIT
Input Sensitivity for 1 volt Output/Input Impedance			
PHONO 1,2	mV/Kohm	2/22, 47, 100	2±2dB/22, 47, 100
TUNER, AUX, TAPE IN 1,2	mV/Kohm	150/470	150±2dB/470
Maximum Input before Overload Distortion			
PHONO 1,2@0.01%THD	mV	230	200
TUNER, AUX, TAPE IN@0.1%THD	mV	1000	800
Output Level/Output Impedance			
PHONE 1,2→TAPE OUT 1,2	mV/Kohm	150/2.2	150±2dB/2.2
TH Distortion@4 volt Output, 20Hz–20KHz			
PHONE 1,2→TAPE OUT 1,2	%		<0.006
TH Distortion@1 volt Output, 1KHz			
TUNER, AUX, TAPE 1,2→OUTPUT	%		<0.01
Frequency Response			
PHONO 1,2→TAPE OUT 1,2 (RIAA)	dB@Hz–KHz		<±1@30–15
TUNER, AUX, TAPE IN 1,2→OUTPUT	dB@Hz–KHz		<±2@10–100
Signal to Noise Ratio			
PHONO 1,2→OUTPUT (with 2.2Kohm on input)	dB	61	58
TUNER, AUX, TAPE IN 1,2→OUTPUT (with 47Kohm//250pF on input)	dB	79	75
Tonal Compensation			
BASS CONTROL	±dB@50Hz	±10	±10±2
TREBLE CONTROL	±dB@10KHz	±10	±10±2
SUBSONIC FILTER	–dB@20Hz	–3	–3±2
Audio Muting	–dB@20Hz	–20	–20±2
Muting Delay Time	second	7	7±2
Midpoint Voltage	mV	0	0±100

INSTRUMENT DISASSEMBLY

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 REMOVAL

Remove four (4) tapping screws (114) (1 thru 4), remove four (4) tapping screws (112) (5 thru 8), lift steel cover (111) up and out of the instrument (Photo 1). Do not lose these screws and four (4) washers.

To reassemble, reverse above procedure.

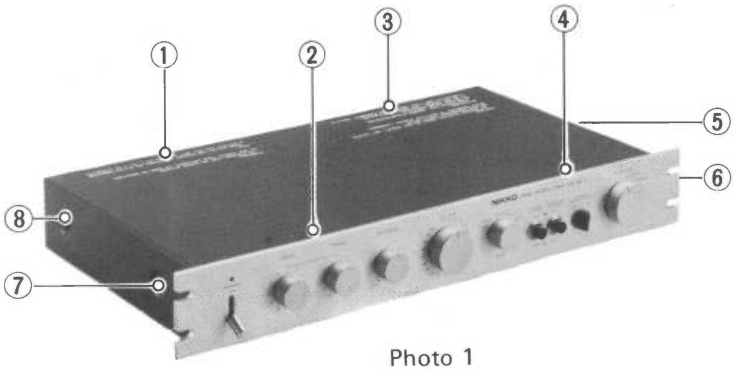


Photo 1

BOTTOM PLATE REMOVAL

Remove eight (8) tapping screws (116) (1 thru 8) from the bottom of the cabinet, lift bottom plate (115) up and out of the instrument.

To reassemble, reverse above procedure.

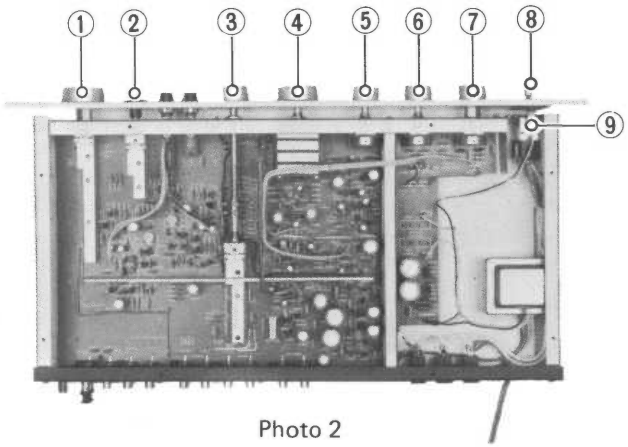


Photo 2

FRONT PANEL REMOVAL

1. Disconnect LED socket (9) connecting to LED (Photo 2).
2. Remove POWER knob (8) by pulling it out front panel (Photo 2).
3. Using hexagonal wrench, remove BASS, TREBLE, BALANCE, VOLUME,TAPE, PHONO IMPEDANCE, SELECTOR knobs (1 thru 7) (Photo 2). The PHONO IMPEDANCE knob's hexagonal set screw (3) is not visible from the front panel side but is located at the rear of front panel as indicated in Photo 3.
4. Remove two (2) nuts (1,2), lift out front panel (Photo 4).
5. To reassemble, reverse above procedure.

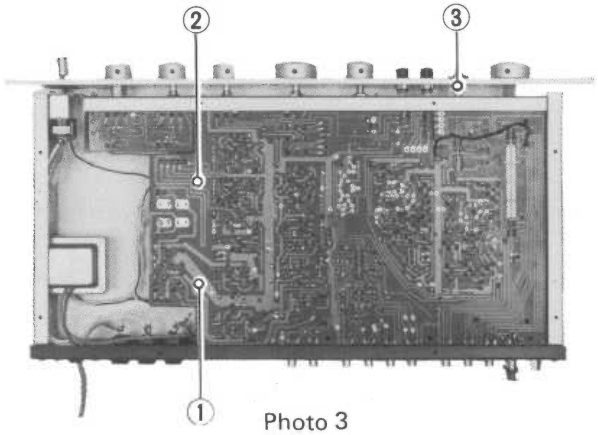


Photo 3

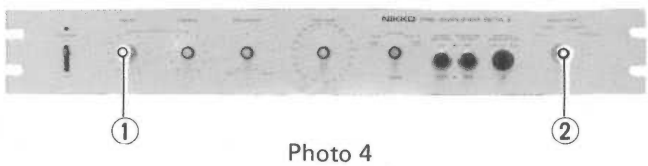


Photo 4

MAIN CIRCUIT BOARD REMOVAL

1. Disconnect all cables connecting to the circuit board from the outside.
2. Remove two (2) nuts (1,2), two (2) screws (3,4), and spacer # 785 (203) (5) (Photo 5).
3. Remove two (2) tapping screws (1,2) (Photo 3).
4. Remove ten (10) tapping screws (2 thru 6, 11 thru 15) (Photo 6).
5. To remove the circuit board, remove six (6) tapping screws (1,7 thru 10, 16) and slide back plate back a short distance. The circuit board is now free to be pulled off chassis (Photo 6).
6. To reassemble, reverse above procedure.

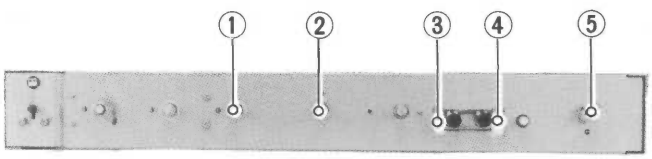


Photo 5

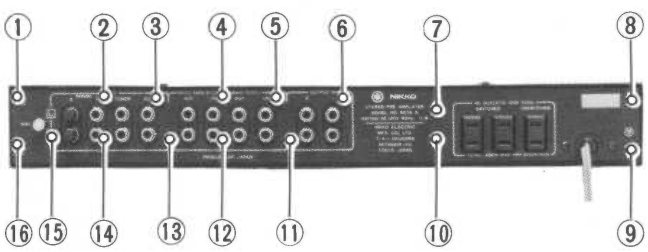
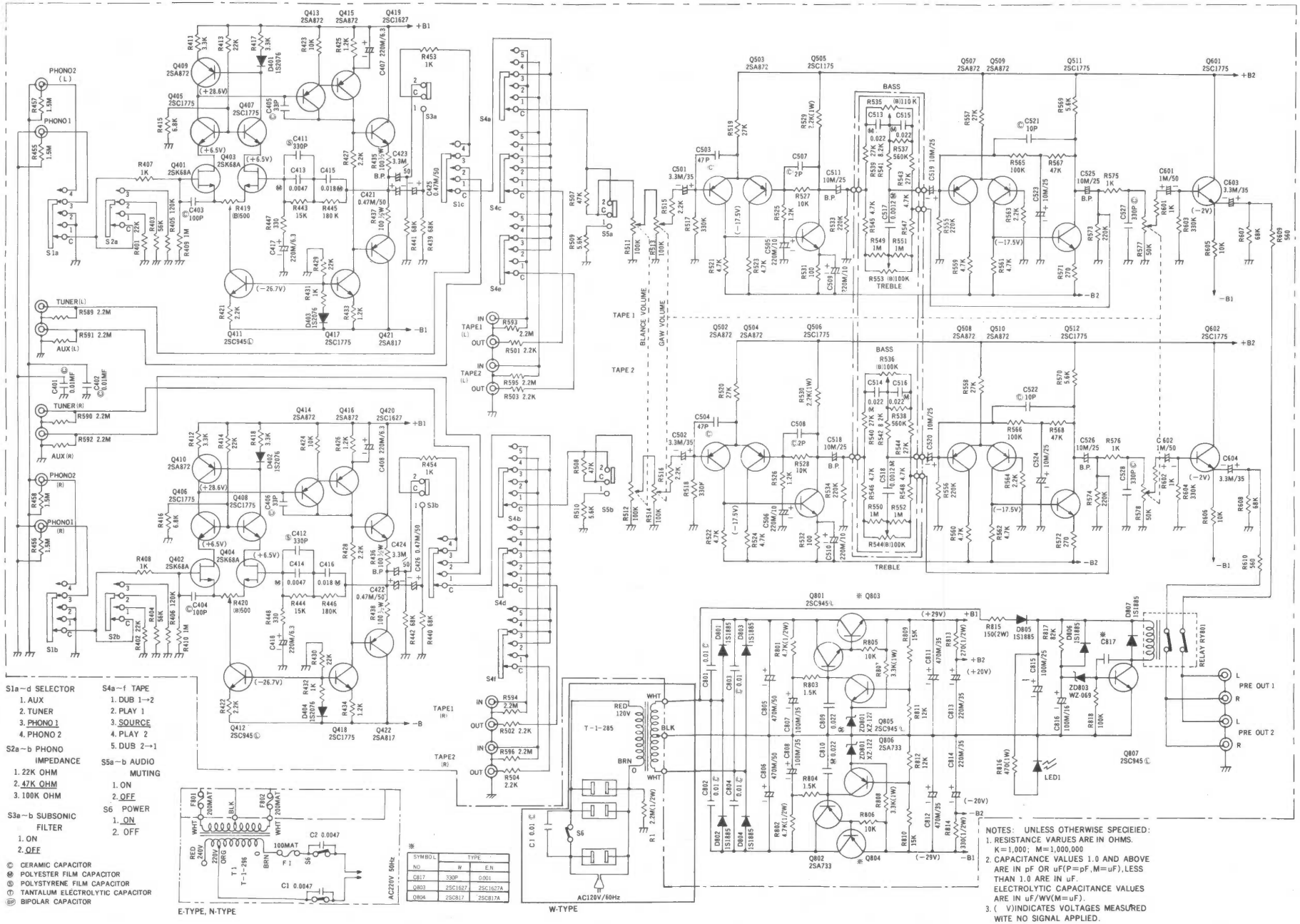


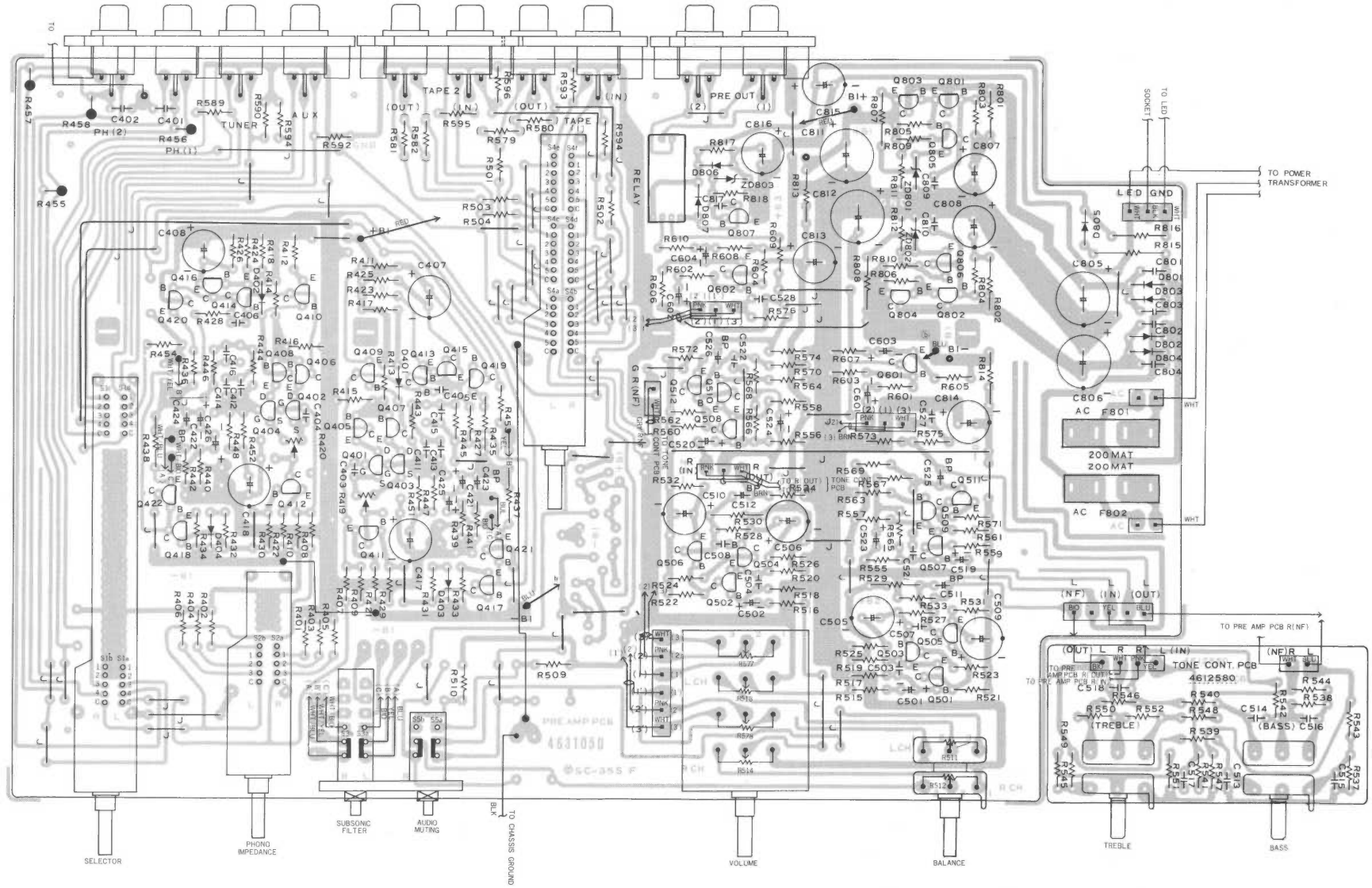
Photo 6

OVERALL SCHMATIC DIAGRAM (W-TYPE, E-TYPE, N-TYPE)

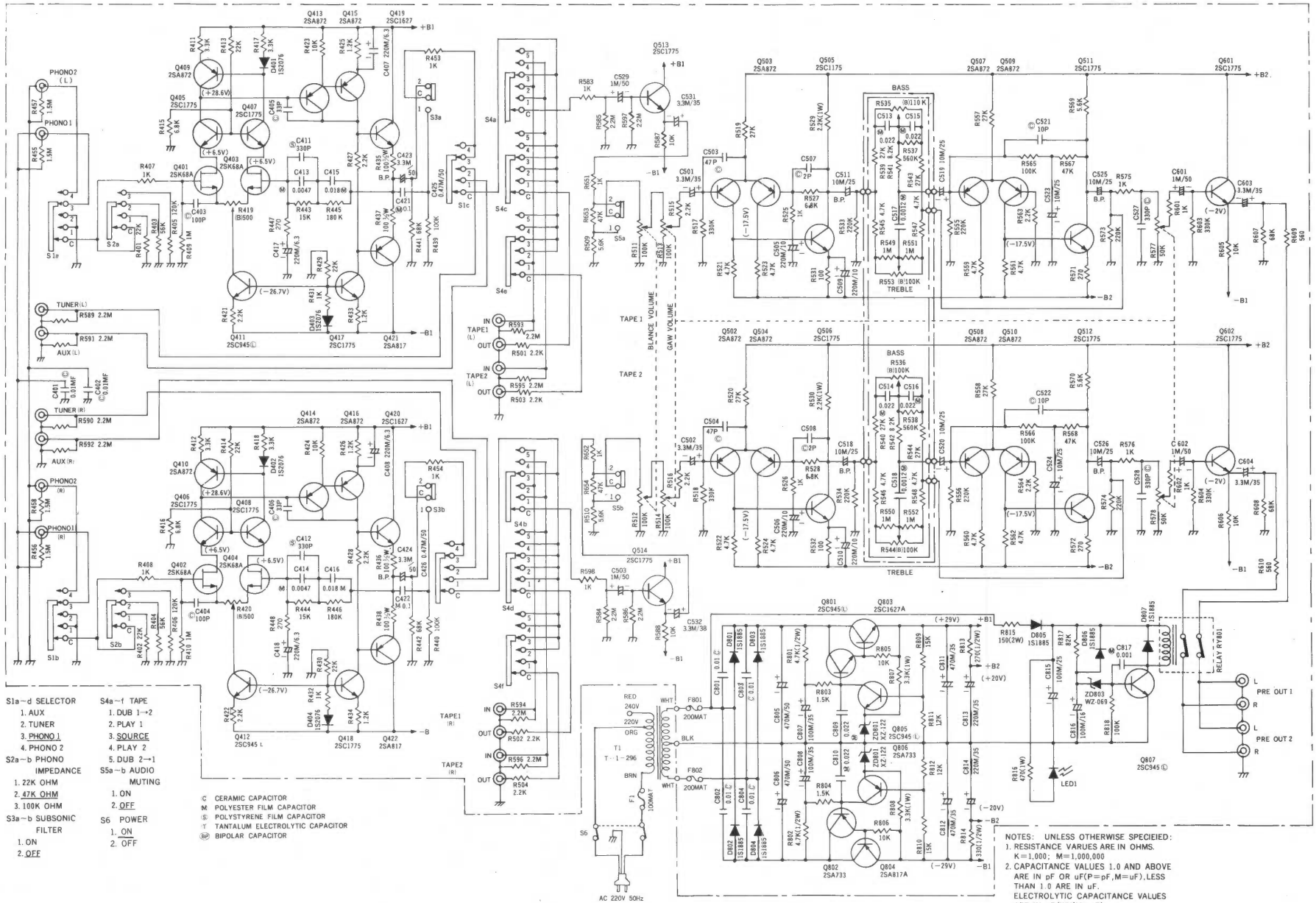


SYMBOL	TYPE	
NO	W	E,N
C817	330P	0.001
Q803	2SC1627	2SC1627A
Q804	2SC817	2SC817A

PREAMP PCB&TONE PCB



OVERALL SCHEMATIC DIAGRAM (D-TYDE)



S1a–d SELECTOR
1. AUX
2. TUNER
3. PHONO 1
4. PHONO 2

S2a–b PHONO IMPEDANCE
1. 22K OHM
2. 47K OHM
3. 100K OHM

S3a–b SUBSONIC FILTER
1. ON
2. OFF

S4a–f TAPE
1. DUB 1→2
2. PLAY 1
3. SOURCE
4. PLAY 2
5. DUB 2→1

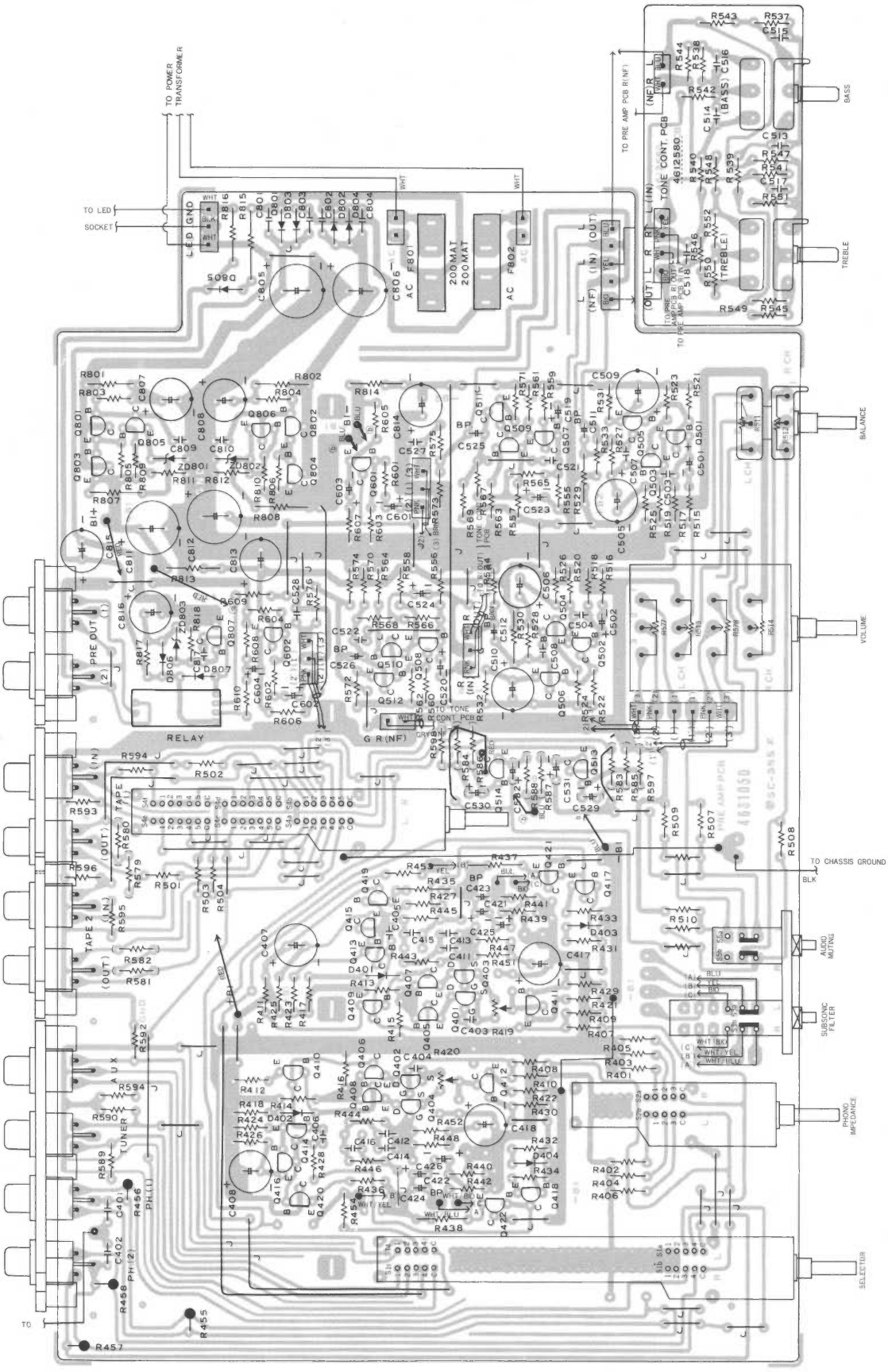
S5a–b AUDIO MUTING
1. ON
2. OFF

S6 POWER
1. ON
2. OFF

© CERAMIC CAPACITOR
Ⓜ POLYESTER FILM CAPACITOR
Ⓢ POLYSTYRENE FILM CAPACITOR
Ⓣ TANTALUM ELECTROLYTIC CAPACITOR
Ⓑ BIPOLAR CAPACITOR

NOTES: UNLESS OTHERWISE SPECIEIED:
1. RESISTANCE VARUES ARE IN OHMS. K=1,000; M=1,000,000
2. CAPACITANCE VALUES 1.0 AND ABOVE 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. (V)INDICATES VOLTAGES MEASURED WITE NO SIGNAL APPLIED.

PREAMP PCB&TONE PCB (D-TYPE)



PARTS LOCATION

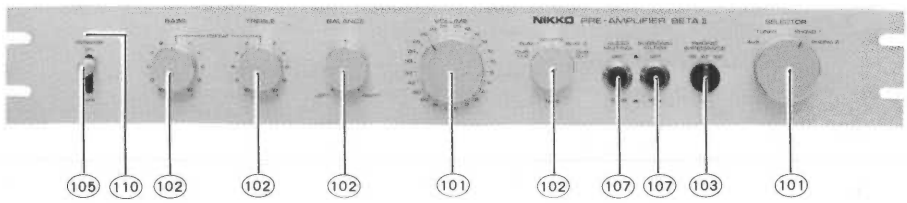


Photo 7

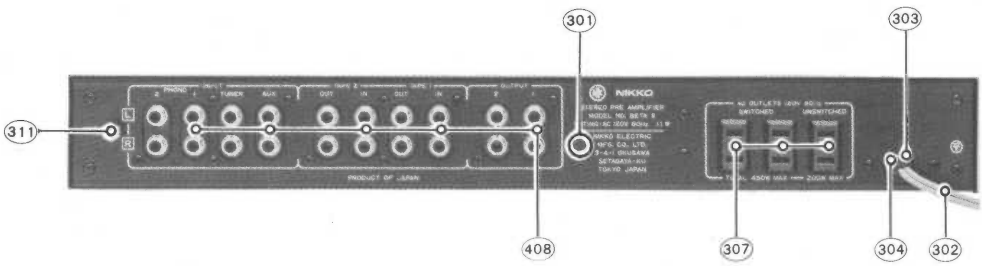


Photo 8

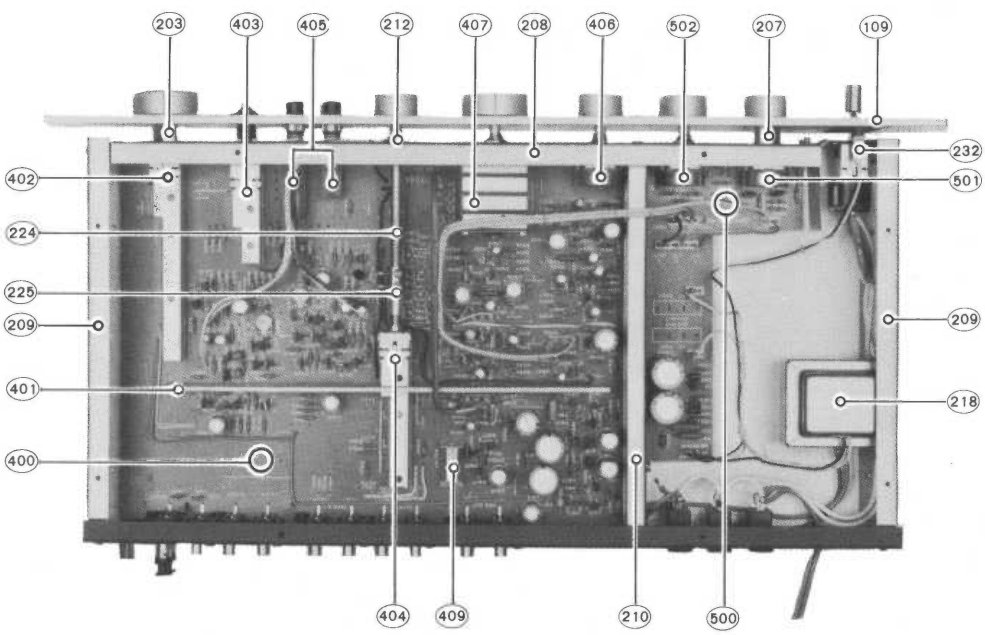


Photo 9

PARTS LIST

NOTES

1. "KEY NO." marked with a (★) on parts list relate to number of three figures put a (⬭) around on Photo 1 thru 9.

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.
001		1 1 1 1	CARTON BOX	9825300
002		2 2 2 2	STYROL PAD	9840660
003		1 1 1 1	VINYL CLOTH BAG-POLY SACK	9640680
004		1 1 1 1	VINYL CLOTH BAG-POLY SACK #13	9640320
005a		1 – – –	INSTRUCTION MANUAL E	960188E
005b		– 1 1 –	INSTRUCTION MANUAL K	960200K
005c		1 – – –	INSTRUCTION MANUAL G	960203G
006		1 – – –	WARRANTY CARD (N)	967003A
007		1 1 1 1	POLISHING CLOTH	9690040
008		1 1 1 1	DRYER-SILICA GEL	9690010
009		1 1 1 1	PIN PLUG CORD 2T	962012J

CABINET ASSEMBLY

(CHAMPAGNE-GOLD TYPE)

★101a		2 2 2 2	KNOB 2GL-34D (selector, gain)	7851460
★102a		4 4 4 4	KNOB 2GL-23D (bass, treble, balance, tape)	7851670
★103		1 1 1 1	KNOB 2BK-16LBD (phono impedance)	7851490
104	†	1 1 1 1	WASHER-POLY WASH 15φ	7001770
★105a		1 1 1 1	KNOB PC-16 (power)	7850590
106	†	1 1 1 1	DUST COVER	7001760
★107		2 2 2 2	PUSHBUTTON P10B (subsonic filter, audio muting)	7851680
108	‡	2 2 2 2	PUSHBUTTON GUIDE	7851690
★109a		1 1 1 1	FRONT PANEL-PNL BETA II	7883820
★110	†	1 1 1 1	LED 3φ x 4.5 GD-4-207RD	506001S
★111a		1 – – –	STEEL COVER-COV BETA II	7820740
111b		– 1 1 1	STEEL COVER-COV BETA II D	7820750
112	†	4 4 4 4	SCREW TFTS 4 x 10 B	887410W
113	†	4 4 4 4	WASHER W 4φ B	893104W
114	†	4 4 4 4	SCREW PTS 3 x 6 B	814306W
115		1 1 1 1	BOTTOM PLATE-BTM PLT	7324720
116	†	8 8 8 8	SCREW PTS 3 x 6	814306S
117		4 4 4 4	FOOT (TG) 22 x 10	7401350
118	†	4 4 4 4	SCREW PTS 3 x 8	814308S

(BLACK TYPE)

101b		2 2	KNOB 2BK-34D (selector, gain)	7851740
102b		4 4	KNOB 2BK-23D (bass, treble, balance, tape)	7851770
★103		1 1	KNOB 2BK-16LVD (phono impedance)	7851490
104	†	1 1	WASHER-POLY WASH 15	7001770
105b		1 1	KNOB PC-16B (power)	7851790
106	†	1 1	DUST COVER	7001760
★107		2 2	PUSHBUTTON P10B (sobsonic filter, audio muting)	7851680
108	‡	2 2	PUSHBUTTON GUIDE	7851690
109b		1 –	FRONT PANEL-PNL BETA II B	7883830
108c		– 1	FRONT PANEL-PNL BETA II B D	7883840
★110	†	1 1	LED 3 x 4.5 GD-4-207RD	506001S
★111a		1 –	STEEL COVER-COV BETA II	7820740
111b		– 1	STEEL COVER-COV BETA II D	7820750
112	†	4 4	SCREW TETS 4 x 10 B	887410W
113	†	4 4	WASHER W 4 B	893104W
114	†	4 4	SCREW PTS 3 x 6 B	814306W
115		1 1	BOTTOM PLATE BTM PLT	7324720
116	†	8 8	SCREW PTS 3 x 6	814306S
117		4 4	FOOT (TG) 22 x 10	7401350
118	†	4 4	SCREW PTS 3 x 8	814308S

CHASSIS ASSEMBLY

300			(BACK PLATE ASSEMBLY)	
201	†	6 5 6 5	SCREW PTS 3 x 6 B	814306W
202	†	5 5 5 5	SCREW PTS 3 x 8 B	814308W
202	†	5 6 5 6	SCREW PTS 3 x 8 B	814308W
400			(PRE AMP PCB ASS)	
★203	†	1 1 1 1	SPACER #785 (selector)	7152330
204	†	2 2 2 2	SCREW PTS 3 x 8 (c. angle)	814308S
205	†	1 1 1 1	WASHER TW(I) 3 (c. angle)	893403U
206	†	2 2 2 2	SCREW PMS 3 x 6 (push sw)	810306S
500			(TONE PCB ASS)	
★207	†	1 1 1 1	SPACER#885 (bass)	7152230
★208		1 1 1 1	FRONT PLATE	7324700
★209		2 2 2 2	SIDE ANGLE	7226290
★210		1 1 1 1	CENTER ANGLE	7226300
211	†	6 6 6 6	SCREW PTS 3 x 6	814306S
★212		1 1 1 1	BEARING (tape)	7152340
213	†	1 1 1 1	NUT SN 9φ	892249S
214	†	1 1 1 1	WASHER TW(I) 9φ	893409V
★215a		1 – – –	SWITCH LV SW SYO2 U74SM TV-5 (power)	4025090
215b		– 1 1 1	SWITCH LV SW SYO2 80DV (power)	4025150 4025150
216	†	2 2 2 2	SCREW PMS 3 x 6	810306S
★217a		1 – – –	C-CAP 0.0047uF 125V AC	239472C
217b		– 2 2 –	C-CAP 0.0047uF 250V AC	238472E

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.
★218a		1 – – –	POWER TRANSFORMER T-I-285 120V	1102850
218b		– 1 1 1	POWER TRANSFORMER T-I-296 220V/240V	1102960
219	†	2 2 2 2	SCREW PMS 4 x 8	810408S
220	†	2 2 2 2	PT STOPPER PLATE	7031290
221		– 1 1 1	MIDGET FUSE (S) 100MAT	4720430
222		– 1 1 1	MIDGET FUSE HOLDER 1P	4581430
223	†	– 1 1 1	SCREW PTS 3 x 8	814308S
★224		1 1 1 1	SHAFT (tape)	7152370
★225		1 1 1 1	JOINT	7121060
226	†	4 4 4 4	SCREW–SET SCW 3 x 4	7121070
227		1 1 1 1	EARTH LUG	4400000
228	†	1 1 1 1	SCREW PTS 3 x 6	814306S
229		1 1 1 1	WASHER TW(I) 3φ	893403U
★230		1 1 1 1	SHIELD PLATE	7031540
231	†	2 2 2 2	SCREW PTS 3 x 6	814306S
★232		1 1 1 1	LED SOCKET–MINI SKT 3021-2-N LED	4510090

BACK PLATE ASSEMBLY

300a		1 – – –	COMPLETE BACK PLATE ASSEMBLY Wu	9512950
300b		– 1 – –	COMPLETE BACK PLATE ASSEMBLY Eu	9512960
300c		– – 1 –	COMPLETE BACK PLATE ASSEMBLY Nd	9512970
300d		– – – 1	COMPLETE BACK PLATE ASSEMBLY D	9513020
★301a		1 – – –	BACK PLATE W	7324710
301b		– 1 1 1	BACK PLATE END	7324870
★302a		1 – – –	POWER SUPPLY CORD KP-2	606002J
302b		– 1 1 –	POWER SUPPLY CORD CEE-2T	600506J
302c		– – – 1	POWER SUPPLY CORD CEE-3T BLK	601809A
★303a		1 – – –	CORD STOPPER SR-3P-4	7400620
303b		– 1 –	CORD STOPPER SR-4N-4	7400690
303c		– – – 1	CORD STOPPER SR-6W-1	7400740
★304a		1 – – –	CORD BRACKET (UL)	7029300
304b		– 1 1 1	CORD BRACKET (EH)	7029800
305	†	2 1 2 1	SCREW PTS 3 x 6 B	814306W
306	†	– 1 – 1	SCREW PTS 3 x 8 B	814308W
★307		3 – – –	AC OUTLET AC SKT	4500150
308	R1	1 – – –	RES 2.2M 1/2W	325225K
309		1 – – –	EARTH LUG	440000D
310		1 1 1 1	GROUND TERMINAL SHAFT	7152050
★311	†	1 1 1 1	GROUND TERMINAL NUT	7152060
312	†	1 1 1 1	WASHER W 3φ	893203D
313	†	1 1 1 1	NUT IN 3φ	892013S
314	†	1 1 1 1	WASHER TW(I) 3φ	893403U
315		1 1 1 1	EARTH LUG	4400000
316		1 1 1 1	T-LUG 2L4P	442241W
317	†	2 2 2 2	SCREW PMS 3 x 8 B	810308W
318	†	2 2 2 2	NUT IN 3φ	892013S
319	†	2 2 2 2	WASHER TW (I) 3	893403U
320		1 1 1 1	BLIND PLATE	7031690
321		2 2 2 2	SHORT PIN PLUG	4440180

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.

PREAMP CIRCUIT BOARD

★400a		1 – – –	COMPLETE CIRCUIT BOARD PRE AMP PCB ASS W	
400b		– 1 – –	COMPLETE CIRCUIT BOARD PRE AMP PCB ASS E	
400c		– – 1 –	COMPLETE CIRCUIT BOARD PRE AMP PCB ASS N	
400d		– – – 1	COMPLETE CIRCUIT BOARD PRE AMP PCB ASS D	

(EQ AMP SECTION)

	C401	1 1 1 1	C-CAP 0.01uF + 80, –20% 50V YG	231103Z
	C402	1 1 1 1	C-CAP 0.01uF + 80, –20% 50V YG	231103Z
	C403	1 1 1 1	C-CAP 100pF 10% 50V SL	232101K
	C404	1 1 1 1	C-CAP 100pF 10% 50V SL	232101K
	C405	1 1 1 1	C-CAP 33pF 10% 50V SL	232330K
	C406	1 1 1 1	C-CAP 33pF 10% 50V SL	232330K
	C407	1 1 1 1	E-CAP 6.3R220uF	211032V
	C408	1 1 1 1	E-CAP 6.3R220uF	211032V
	C411	1 1 1 1	S-CAP 330pF 5% 50V	223331V
	C412	1 1 1 1	S-CAP 330pF 5% 50V	223331V
	C413	1 1 1 1	M-CAP 0.0047uF 5% 50V	222472J
	C414	1 1 1 1	M-CAP 0.0047uF 5% 50V	222472J
	C415	1 1 1 1	M-CAP 0.018uF 5% 50V	222183J
	C416	1 1 1 1	M-CAP 0.018uF 5% 50V	222183J
	C417	1 1 1 1	E-CAP 6.3R 220uF	211032V
	C418	1 1 1 1	E-CAP 6.3R 220uF	211032V
	C421	1 1 1 –	E-CAP 50R0.47uF	211505Q
	C421	– – – 1	M-CAP 0.1uF 10% 50V	222104K
	C422	1 1 1 –	E-CAP 50R0.47uF	211505Q
	C422	– – – 1	M-CAP 0.1uF 10% 50V	222104K
	C423	1 1 1 1	BP-CAP 50R3.3uF	215513N
	C424	1 1 1 1	EP-CAP 50R3.3uF	215513N
	C425	1 1 1 –	E-CAP 50R0.47uF	211505Q
	C426	1 1 1 –	E-CAP 50R0.47uF	211505Q
	D401 ~D404	4 4 4 4	DIODE 1S2076	501019S
	Q401	1 1 1 1	FET 2SK68A	516019S
	Q402	1 1 1 1	FET 2SK68A	516019S
	Q403	1 1 1 1	FET 2SK68A	516019S
	Q404	1 1 1 1	FET 2SK68A	516019S
	Q405	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q406	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q407	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q408	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q409	1 1 1 1	TR 2SA872 (D.E)	510043S
	Q410	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q411	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	Q412	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	Q413	1 1 1 1	TR 2SA872 (D.E)	510043S
	Q414	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q415	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q416	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q417	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q418	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q419	1 1 1 1	TR 2SC1627 (O,Y)	511017S
	Q420	1 1 1 1	TR 2SC1627 (O,Y)	511017S
	Q421	1 1 1 1	TR 2SA817 (o,Y)	510047S
	Q422	1 1 1 1	TR 2SA817 (O,Y)	510047S
	R401	1 1 1 1	RES 22kohm 5% 1/4W	328223J
	R402	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R403	1 1 1 1	RES 56Kohm 5% 1/4W	328563J
	R404	1 1 1 1	RES 56Kohm 5% 1/4W	328563J
	R405	1 1 1 1	RES 120Kohm 5% 1/4W	328124J

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.
	R406	1 1 1 1	RES 120Kohm 5% 1/4W	328124J
	R407	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R408	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R409	1 1 1 1	RES 1Mohm 5% 1/4W	328105J
	R410	1 1 1 1	RES 1Mohm 5% 1/4W	328105J
	R411	1 1 1 1	RES 3.3Kohm 5% 1/4W	328332J
	R412	1 1 1 1	RES 3.3Kohm 5% 1/4W	328332J
	R413	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R414	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R415	1 1 1 1	RES 6.8Kohm 5% 1/4W	328682J
	R416	1 1 1 1	RES 6.8Kohm 5% 1/4W	328682J
	R417	1 1 1 1	RES 3.3Kohm 5% 1/4W	328332J
	R418	1 1 1 1	RES 3.3Kohm 5% 1/4W	328332J
	R421	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R422	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R423	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R424	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R425	1 1 1 1	RES 1.2Kohm 5% 1/4W	328122J
	R426	1 1 1 1	RES 1.2Kohm 5% 1/4W	328122J
	R427	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R428	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R429	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R430	1 1 1 1	RES 22Kohm 5% 1/4W	328223J
	R431	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R432	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R433	1 1 1 1	RES 1.2Kohm 5% 1/4W	328122J
	R434	1 1 1 1	RES 1.2Kohm 5% 1/4W	328122J
	R435	1 1 1 1	FP-MO-RES 100 ohm 5%	329101N
	R436	1 1 1 1	FP-MO-RES 100 ohm 5%	329101N
	R437	1 1 1 1	FP-MO-RES 100 ohm 5%	329101N
	R438	1 1 1 1	FP-MO-RES 100ohm 5%	329101N
	R439	1 1 1 1	RES 68Kohm 5% 1/4W	328683J
	R440	1 1 1 1	RES 68Kohm 5% 1/4W	328683J
	R441	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R442	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R443	1 1 1 1	M-RES 15Kohm 2% 1/4W	304153G
	R444	1 1 1 1	M-RES 15Kohm 2% 1/4W	304153G
	R445	1 1 1 1	M-RES 180Kohm 2% 1/4W	304184G
	R446	1 1 1 1	M-RES 180Kohm 2% 1/4W	304184G
	R447	1 1 1 1	RES 270ohm 5% 1/4W	328271J
	R448	1 1 1 1	RES 270ohm 5% 1/4W	328271J
	R453	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R454	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R455	1 1 1 1	RES 1.5Mohm 5% 1/4W	328155J
	R456	1 1 1 1	RES 1.5Mohm 5% 1/4W	328155J
	R457	1 1 1 1	RES 1.5Mohm 5% 1/4W	328155J
	R458	1 1 1 1	RES 1.5Mohm 5% 1/4W	328155J
			(TONE AMP SECTION)	
	C501	1 1 1 1	E-CAP 35R3.3uF LC	211413L
	C502	1 1 1 1	E-CAP 35R3.3uF LC	211413L
	C503	1 1 1 1	C-CAP 47pF 10% 50V SL	232470K
	C504	1 1 1 1	C-CAP 47pF 10% 50V SL	232470K
	C505	1 1 1 1	E-CAP 10R220uF	211132V
	C506	1 1 1 1	E-CAP 10R220uF	211132V
	C507	1 1 1 1	C-CAP 2pF±0.5pF 50V SL	232209D
	C508	1 1 1 1	C-CAP 2pF±0.5pF 50V SL	232209D
	C509	1 1 1 1	E-CAP 10R220uF	211132V
	C510	1 1 1 1	E-CAP 10R220uF	211132V
	C511	1 1 1 1	BP-CAP 25R10uF	215320N
	C512	1 1 1 1	BP-CAP 25R10uF	215320N
	C519	1 1 1 1	E-CAP 25R10uF LC	211320L
	C520	1 1 1 1	E-CAP 25R10uF LC	211320L
	C521	1 1 1 1	C-CAP 10pF±5pF 50V SL	232100D
	C522	1 1 1 1	C-CAP 10pF±5pF 50VSL	232100D
	C523	1 1 1 1	E-CAP 25R10uF	211320Q

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
	C524	1 1 1 1	E-CAP 25R10uF	211320Q
	C525	1 1 1 1	BP-CAP 25R10uF	215320N
	C526	1 1 1 1	BP-CAP 25R10uF	215320N
	C527	1 1 1 1	C-CAP 330pF 10% 50V SL	232331K
	C528	1 1 1 1	C-CAP 330pF 10% 50V SL	232331K
	C529	– – – 1	E-CAP 50R1uF LC	211510L
	C530	– – – 1	E-CAP 50R1uF LC	211510L
	C531	– – – 1	E-CAP 35R3.3uF LC	211413L
	C532	– – – 1	E-CAP 35R3.3uF LC	211413L
	Q501	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q502	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q503	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q504	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q505	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q506	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q507	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q508	1 1 1 1	TR 2SA872 (D,E)	
	Q509	1 1 1 1	TR 2SA872 (D,E)	
	Q510	1 1 1 1	TR 2SA872 (D,E)	510043S
	Q511	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q512	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q513	– – – 1	TR 2SC1775 (D,E)	511015S
	Q514	– – – 1	TR 2SC1775 (D,E)	511015S
	Q601	1 1 1 1	TR 2SC1775 (D,E)	511015S
	Q602	1 1 1 1	TR 2SC1775 (D,E)	511015S
	R501	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R502	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R503	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R504	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R505		Out of use	
	R506		Out of use	
	R507	1 1 1 –	RES 47Kohm 5% 1/4W	328473J
	R508	1 1 1 –	RES 47Kohm 5% 1/4W	328473J
	R509	1 1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R510	1 1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R511		Out of use	
	R512		Out of use	
	R513		Out of use	
	R514		Out of use	
	R515	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R516	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R517	1 1 1 1	RES 330Kohm 5% 1/4W	328334J
	R518	1 1 1 1	RES 330Kohm 5% 1/4W	328334J
	R519	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R520	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R521	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R522	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R523	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R524	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R525	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R526	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R527	1 1 1 1	RES 6.8Kohm 5% 1/4W	328682J
	R528	1 1 1 1	RES 6.8Kohm 5% 1/4W	328682J
	R529	1 1 1 1	MO-RES 2.2Kohm 5% 1W	361222B
	R530	1 1 1 1	MO-RES 2.2Kohm 5% 1W	361222B
	R531	1 1 1 1	RES 100ohm 5% 1/4W	328101J
	R532	1 1 1 1	RES 100ohm 5% 1/4W	328101J
	R533	1 1 1 1	RES 220Kohm 5% 1/4W	328224J
	R534	1 1 1 1	RES 220Kohm 5% 1/4W	328224J
	R551	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R552	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R553	1 1 1 1	RES 47Kohm 5% 1/4W	328473J
	R554	1 1 1 1	RES 47Kohm 5% 1/4W	328473J
	R555	1 1 1 1	RES 220Kohm 5% 1/4W	328224J
	R556	1 1 1 1	RES 220Kohm 5% 1/4W	328224J
	R557	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R558	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R559	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R560	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R561	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J

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.
	R562	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R563	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R564	1 1 1 1	RES 2.2Kohm 5% 1/4W	328222J
	R565	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R566	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	R567	1 1 1 1	RES 47Kohm 5% 1/4W	328473J
	R568	1 1 1 1	RES 47Kohm 5% 1/4W	328473J
	R569	1 1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R570	1 1 1 1	RES 5.6Kohm 5% 1/4W	328562J
	R571	1 1 1 1	RES 270ohm 5% 1/4W	328271J
	R572	1 1 1 1	RES 270ohm 5% 1/4W	328271J
	R573	1 1 1 1	RES 220Kohm 5% 1/4W	328224J
	R574	1 1 1 1	RES 220Kohm 5% 1/4W	328224J
	R575	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R576	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R583	– – – 1	RES 1Kohm 5% 1/4W	328102J
	R584	– – – 1	RES 2.2Mohm 5% 1/4W	328225J
	R585	– – – 1	RES 2.2Mohm 5% 1/4W	328225J
	R586	– – – 1	RES 2.2Mohm 5% 1/4W	328225J
	R587	– – – 1	RES 10Kohm 5% 1/4W	328103J
	R588	– – – 1	RES 10Kohm 5% 1/4W	328103J
	R593	1 1 1 1	RES 2.2Mohm 5% 1/4W	328225J
	R594	1 1 1 1	RES 2.2Mohm 5% 1/4W	328225J
	R595	1 1 1 1	RES 2.2Mohm 5% 1/4W	328225J
	R596	1 1 1 1	RES 2.2Mohm 5% 1/4W	328225J
	R597	– – – 1	RES 2.2Mohm 5% 1/4W	328225J
	R598	– – – 1	RES 1Kohm 5% 1/4W	328102J
	R601	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R602	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R603	1 1 1 1	RES 330Kohm 5% 1/4W	328334J
	R604	1 1 1 1	RES 330Kohm 5% 1/4W	328334J
	R605	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R606	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R607	1 1 1 1	RES 68Kohm 5% 1/4W	328683J
	R608	1 1 1 1	RES 68Kohm 5% 1/4W	328683J
	R609	1 1 1 1	RES 560ohm 5% 1/4W	328561J
	R610	1 1 1 1	RES 560ohm 5% 1/4W	328561J

(REGUATOR SECTION)

	C801	1 1 1 1	C-CAP 0.01uF + 80, –20% 50V YG	231103Z
	C802	1 1 1 1	C-CAP 0.01uF + 80, –20% 50V YG	231103Z
	C803	1 1 1 1	C-CAP 0.01uF + 80, –20% 50V YG	231103Z
	C804	1 1 1 1	C-CAP 0.01uF + 80, –20% 50V YG	231103Z
	C805	1 1 1 1	E-CAP 50R470uF	211535Q
	C806	1 1 1 1	E-CAP 50R470uF	211535Q
	C807	1 1 1 1	E-CAP 35R100uF	211430Q
	C808	1 1 1 1	E-CAP 35R100uF	211430Q
	C809	1 1 1 1	M-CAP 0.022uF 10% 50V	222223K
	C810	1 1 1 1	M-CAP 0.022uF 10% 50V	222223K
	C811	1 1 1 1	E-CAP 35R470uF	211435Q
	C812	1 1 1 1	E-CAP 35R470uF	211435Q
	C813	1 1 1 1	E-CAP 35R220uF	211432Q
	C814	1 1 1 1	E-CAP 35R220uF	211432Q
	D801 ~D804	4 4 4 4	DIODE 1S1885	560032S
	Q801	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	Q802	1 1 1 1	TR 2SA733 (Q,R)	514074S
	Q803	1 – – 1	TR 2SC1627 (O,Y)	511017S
	Q803	– 1 1 –	TR 2SC1627A (O,Y)	512101S
	Q804	1 – – 1	TR 2SA817 (O,Y)	510047S
	Q804	– 1 1 –	TR 2SA817A (O,Y)	510101S
	Q805	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	Q806	1 1 1 1	TR 2SA733 (Q,R)	514074S

KEY NO.	SYMBOL NO.	TYPE+ (W-type-u E-type-u N-type-d D-type-g)	DESCRIPTION++	PART NO.
	R801	1 1 1 1	FP-MO-RES 4.7Kohm 5% 1/2W	329472N
	R802	1 1 1 1	FP-MO-RES 4.7Kohm 5% 1/2W	329472N
	R803	1 1 1 1	RES 1.5Kohm 5% 1/4W	328152J
	R804	1 1 1 1	RES 1.5Kohm 5% 1/4W	328152J
	R805	1 1 1 1	RES 10Kohm 5% 1/4W	328103J
	R806	1 1 1 1	RES 10Kohm 5% /4W	328103J
	R807	1 1 1 1	MO-RES 3.3Kohm 5% 1W	364332B
	R808	1 1 1 1	MO-RES 3.3Kohm 5% 1W	361332B
	R809	1 1 1 1	RES 15Kohm 5% 1/4W	328153J
	R810	1 1 1 1	RES 15Kohm 5% 1/4W	328153J
	R811	1 1 1 1	RES 12Kohm 5% 1/4W	328123J
	R812	1 1 1 1	RES 12Kohm 5% 1/4W	328123J
	R813	1 1 1 1	FP-MO-RES 270ohm 5% 1/2W	329271N
	R814	1 1 1 1	FP-MO-RES 330ohm 5% 1/2W	329331N
	ZD801	1 1 1 1	ZENER DIODE XZ122	502020S
	ZD802	1 1 1 1	ZENER DIODE XZ122	502020S

(RELAY DRIVER SECTION)

	C815	1 1 1 1	E-CAP 25R100uF	211330Q
	C816	1 1 1 1	E-CAP 16R100uF	211230Q
	C817	1 – – 1	C-CAP 330pF 10%50V SL	232331K
	C817	– 1 1 –	M-CAP 0.001uF 10%50V	222102K
	D805 ~D807	3 3 3 3	DIODE 1S1885	560032S
	Q807	1 1 1 1	TR 2SC945 L (P,Q)	515077S
	R815	1 1 1 1	MO-RES150ohm 5% 2W	362121B
	R816	1 1 1 1	MO-RES470ohm 5% 1W	361471B
	R817	1 1 1 1	RES 82Kohm 5% 1/4W	328823J
	R818	1 1 1 1	RES 100Kohm 5% 1/4W	328104J
	ZD803	1 1 1 1	ZENER DIODE WZ069	502035S

(OTHERS)

★401		1 1 1 1	PCB STAY	7031280
★402	S1	1 1 1 1	ROTARY SLIDE SWITCH SRZ-V124S 25R (selector)	4055100
★403	S2	1 1 1 1	ROTARY SLIDE SWITCH SRZ-V043S 25R (impedance)	4055090
★404	S4	1 1 1 1	ROTARY SLIDE SWITCH SRZ-V065N 25R (tape)	4055080
★405	S3,S5	1 1 1 1	TWIN PUSHBUTTON SWITCH SUE-24 (subsonic filter, audio muting)	4040900
★406	R511, ~R512	1 1 1 1	VR V24L5G4PHN IZ100Kohm x2 25R (balance)	4320760
★407	R513, ~R514	1 1 1 1	VR AP355G 100Kohm x 2/ 50Kohm x 2 25R (gain)	4390110
★408		5 5 5 5	CB PIN TERMINAL 2P x 2 (SE)	4444030
★409		1 1 1 1	REED RELAY	1700200
410	R419	1 1 1 1	POT HV R RVA-7 B500ohm	4300830
411	R420	1 1 1 1	POT H-VR RVA-7 B500ohm	4300830
412	F801	– 1 1 1	MIDGET FUSE (S) 200mAT	4720440
413	F802	– 1 1 1	MIDGET FUSE (S) 200mAT	4720440
414	†	– 4 4 4	MIDGET FUSE HOLDER	7050430

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.
	TONE CONTROL CIRCUIT BOARD			
★500			COMPLETE CIRCUIT BOARD TONE PCB ASS	9441230
	C513	1 1 1 1	M-CAP 0.022uF 10% 50V	222223K
	C514	1 1 1 1	M-CAP 0.022uF 10% 50V	222223K
	C515	1 1 1 1	M-CAP 0.022uF 10% 50V	222223K
	C516	1 1 1 1	M-CAP 0.022uF 10% 50V	222223K
	C517	1 1 1 1	M-CAP 0.0012uF 10% 50V	222122K
	C518	1 1 1 1	M-CAP 0.0012uF 10% 50V	222122K
★501	R535, ~ R536	1 1 1 1	VR B100Kohm x 2 V24L5G4-PHN 25R (bass)	4320750
	R538	1 1 1 1	RES 560Kohm 5% 1%4W	328564J
	R538	1 1 1 1	RES 560Kohm 5% 1/4W	328564J
	R539	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R540	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R541	1 1 1 1	RES 8.2Kohm 5% 1/4W	328822J
	R542	1 1 1 1	RES 8.2Kohm 5% 1/4W	328822J
	R543	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R544	1 1 1 1	RES 27Kohm 5% 1/4W	328273J
	R545	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R546	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R547	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R548	1 1 1 1	RES 4.7Kohm 5% 1/4W	328472J
	R549	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R550	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R551	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
	R552	1 1 1 1	RES 1Kohm 5% 1/4W	328102J
★502	R553, ~ R554	1 1 1 1	VR B100Kohm x 2 V24L5G4-PHN 25R (treble)	4320740

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)	fT fαb (MHz)	VCE VCB* (V)	IE IC* (mA)	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
2SC945Ⓓ (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 (BL)	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)												MANUFUCTURE
			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	23.6	5	30		5	0.0845			1	19.5	JRC

DIODE 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=66°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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