



SERVICE MANUAL

1020B

INTEGRATED STEREO AMPLIFIERS

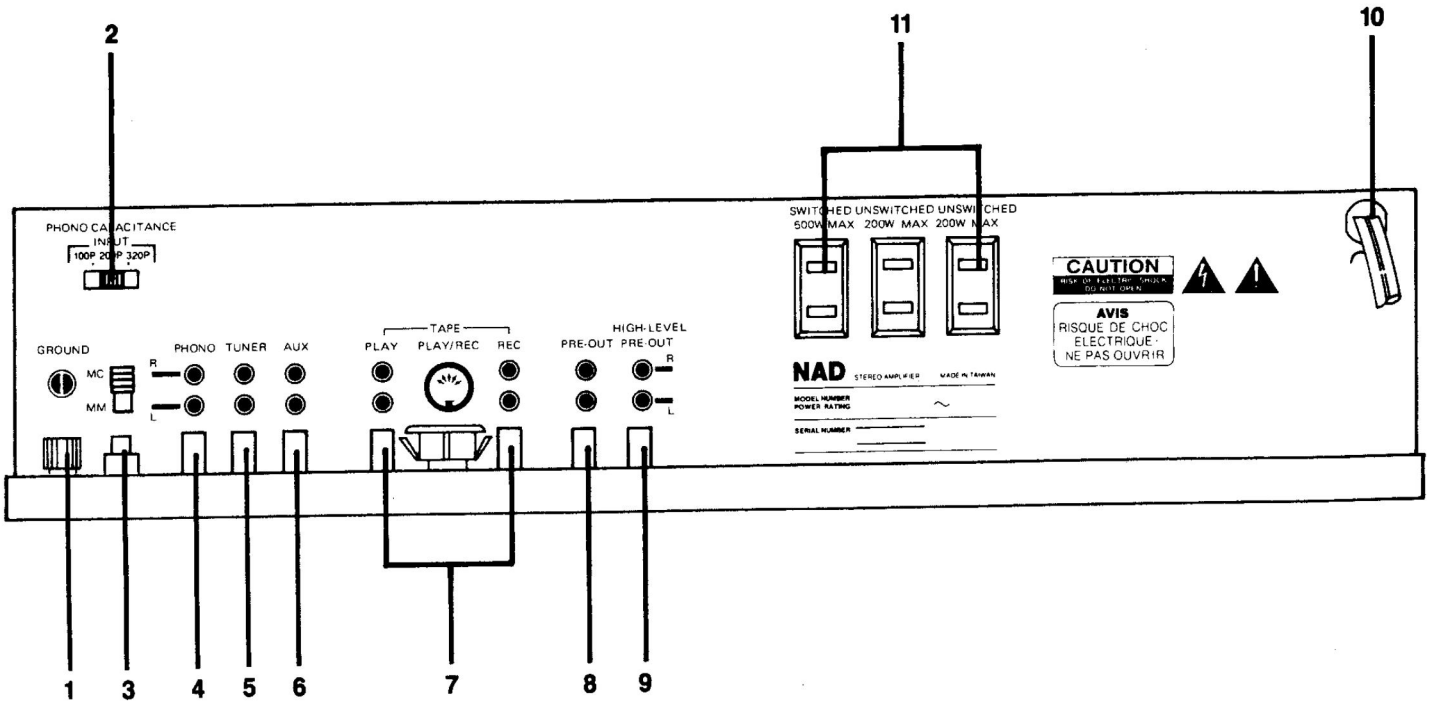
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- ENGLISH**
1. Ground
 2. Phono Capacitance Selector
 3. MM/MC Phono Selector
 4. Phono
 5. Tuner
 6. Auxiliary Input
 7. Tape Rec/Play
 8. Pre Out
 9. Hi-Level Pre Out
 10. AC Line Cord
 11. AC Convenience Outlets

- FRANÇAIS**
1. Masse
 2. Sélecteur de charge pour entrée tourne-disques
 3. Sélecteur Bobine mobile/Aimant mobile
 4. Tourne-disques
 5. Tuner
 6. Auxiliaire
 7. Enregistreur: enregistrement-lecture
 8. Sortie préampli
 9. Sortie préampli haut niveau
 10. Cordon secteur
 11. Sorties secteur

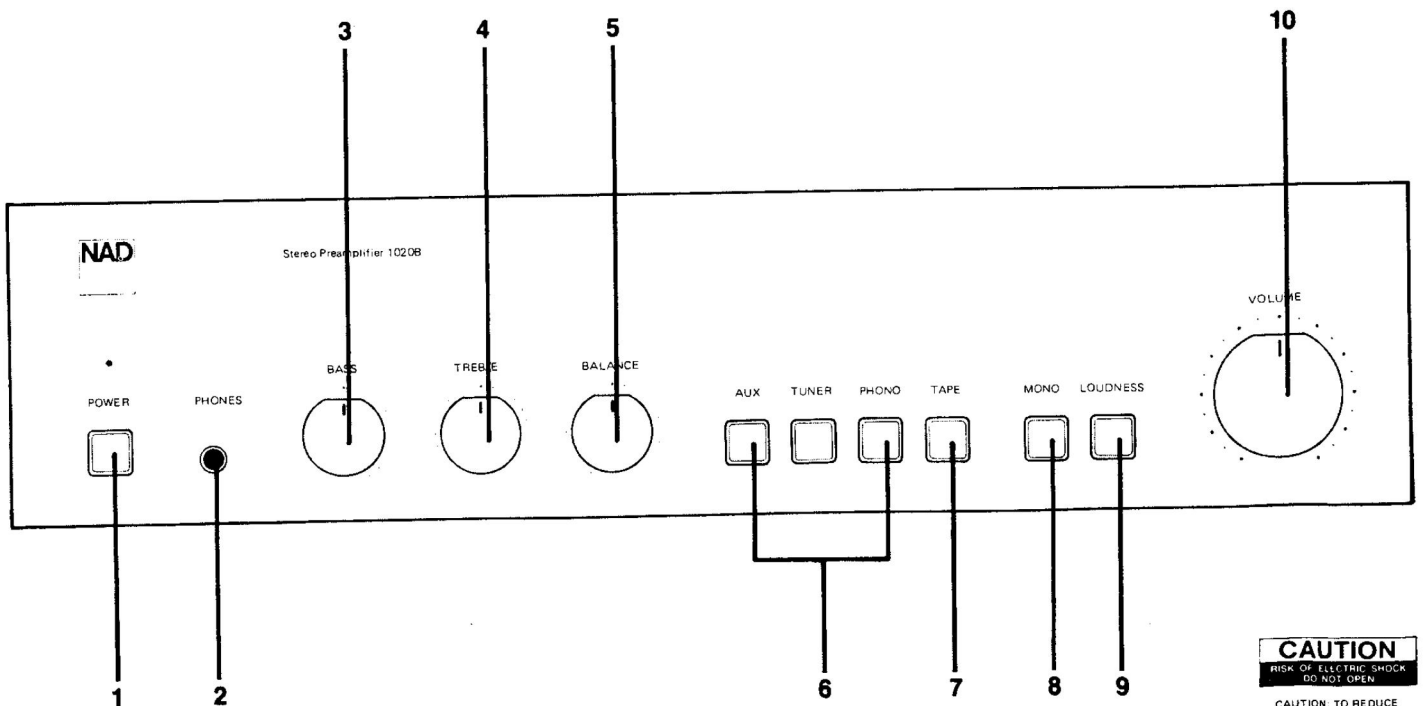
- DEUTSCH**
1. Massenschluß
 2. Plattenspieler-kapazitäts-Wählschalter
 3. MM/MC Schalter
 4. Plattenspieler-Anschluß
 5. Rundfunk-Empfangsteil
 6. Zusatzzeigang
 7. Bandgerät Aufnahme/Wiedergabe
 8. Vorverstärker-Ausgang
 9. Hocheufiger Ausgang
 10. Netzanschlußkabel



- ENGLISH**
1. Power
 2. Phones
 3. Bass
 4. Treble
 5. Balance
 6. Aux/Tuner/Phono Selectors
 7. Tape
 8. Mono
 9. Loudness
 10. Volume

- FRANÇAIS**
1. Secteur
 2. Casque
 3. Graves
 4. Aigus
 5. Balance
 6. Sélecteur auxiliaire: radio-tourne-disques
 7. Enregistreur
 8. Mono
 9. Correction physiologique
 10. Volume

- DEUTSCH**
1. Netz
 2. Kopfhören-Anschluß
 3. Baßregler
 4. Höhenregler
 5. Balance
 6. Zusatzgerät, Radio, Plattenspieler
 7. Tonbandschalter
 8. Monoschalter
 9. Gehörchtige Lautstärkenregelung
 10. Lautstärkenregler



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

SPECIFICATIONS

PHONO INPUT

Input impedance, MM and MC

Input Sensitivity for 0.5V out
for 2V out

Signal-to-Noise Ratio with cartridge connected, A-weighted

Input Overload at 20 Hz/1 KHz/20 KHz

RIAA Accuracy, MM and MC HIGH-LEVEL INPUTS (TUNER, AUX, TAPE)

Input Impedance for 0.6 volt out
Input Sensitivity for 2 volts out

Signal-to-Noise ratio, A-weighted

Input Overload
Frequency Response
Infrasonic Filter

TAPE OUTPUTS

Output impedance

Nominal Level
Output Impedance
Nominal Level

LINE OUTPUT

Output Impedance
Rated Output
Rated Distortion (THD and IM)
Maximum Output

HEADPHONE AND HIGH-LEVEL OUTPUTS

Output Impedance

Maximum Output Level

PHYSICAL SPECIFICATIONS

Height
Width
Depth
Net Weight
Shipping Weight
Power Consumption

R 47 Kohm

C 100,200, or 320 pF

MM 1.25mV

MC 90 μ V

MM 5mV

MC 360 μ V

MM 75 dB re 5 mV in

MC 72 dB re 0.5 mV in

MM 20/200/1800 mV

MC 1.5/15/135 mV

+0.5 dB

20 Kohm 220 pF

80 mV

320 mV

94 dB re 0.5 volt out

106 dB re 2 volts out

> 25 V

20 Hz-20 KHz \pm 0.5 dB

.3 dB at 20 Hz

12 dB/octave

1.5 Kohm

Source Z + 1 Kohm

320 mV

68 Kohm

100 mV

1.5 μ A

600 ohm

2 volts

0.02%

15 volts

5 volts

150 ohm will drive all
headphone impedances.

15 volts into 50 Kohm

5 volts into 600 ohm

250 mV into 8 ohm

9.6 cm (3.8 in)

42 cm (16.5 in)

24 cm (9.5 in)

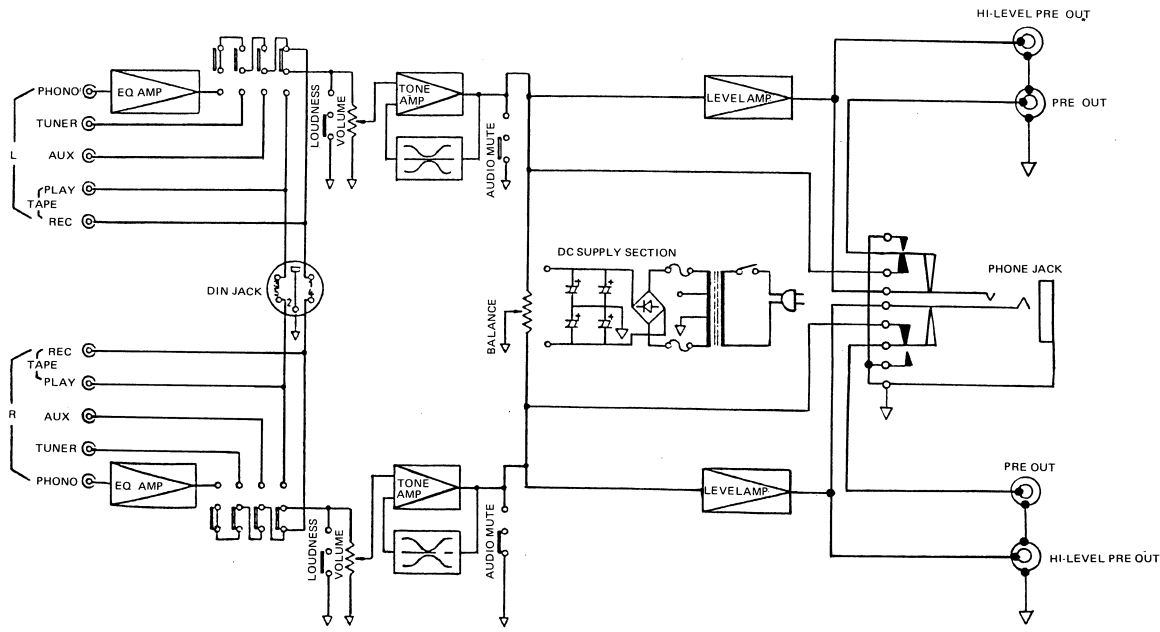
3.75 Kg (8.3 lbs.)

4.8 kg (10.10 lbs.)

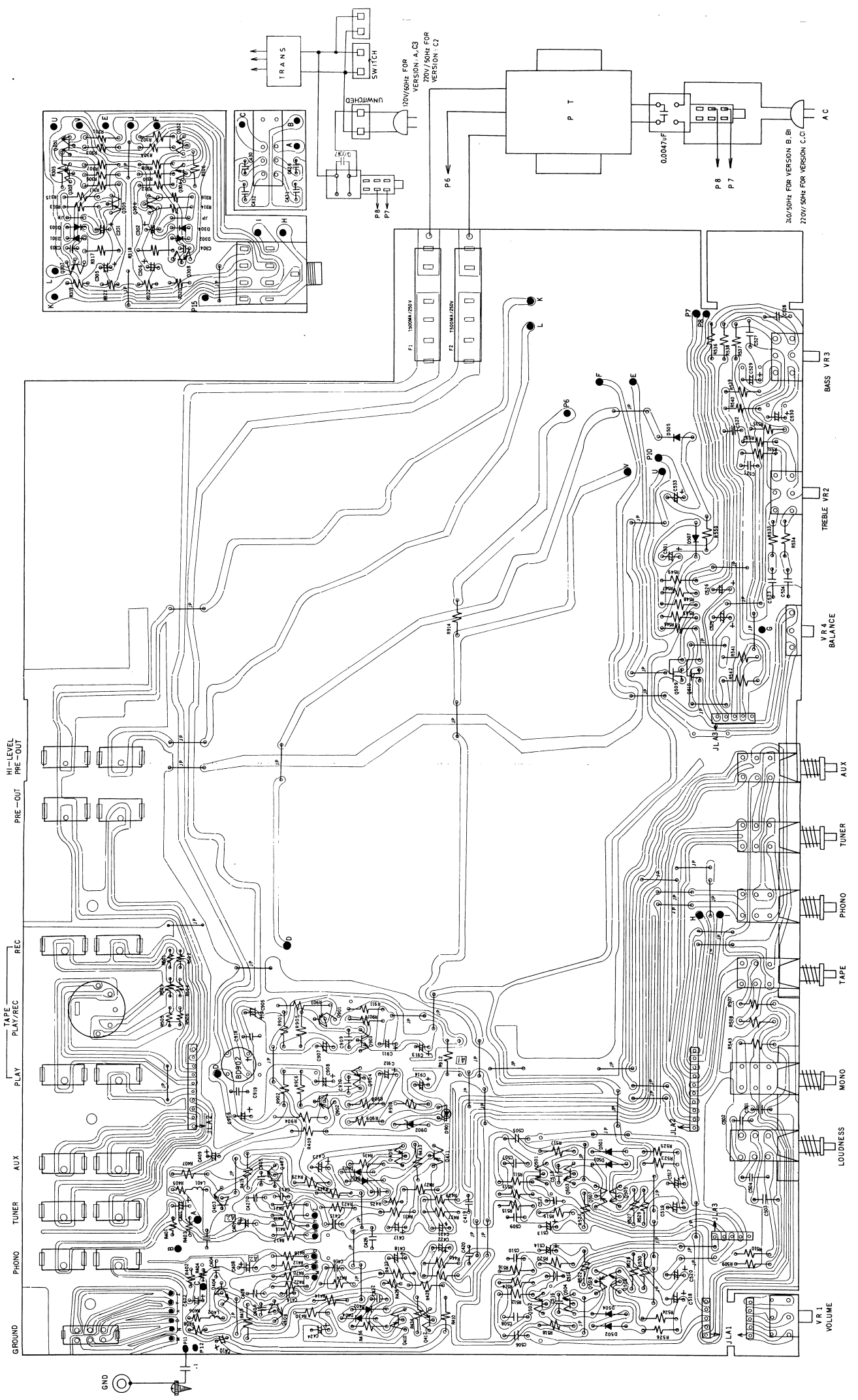
50-60 Hz, 110-240 VAC.

5 watts

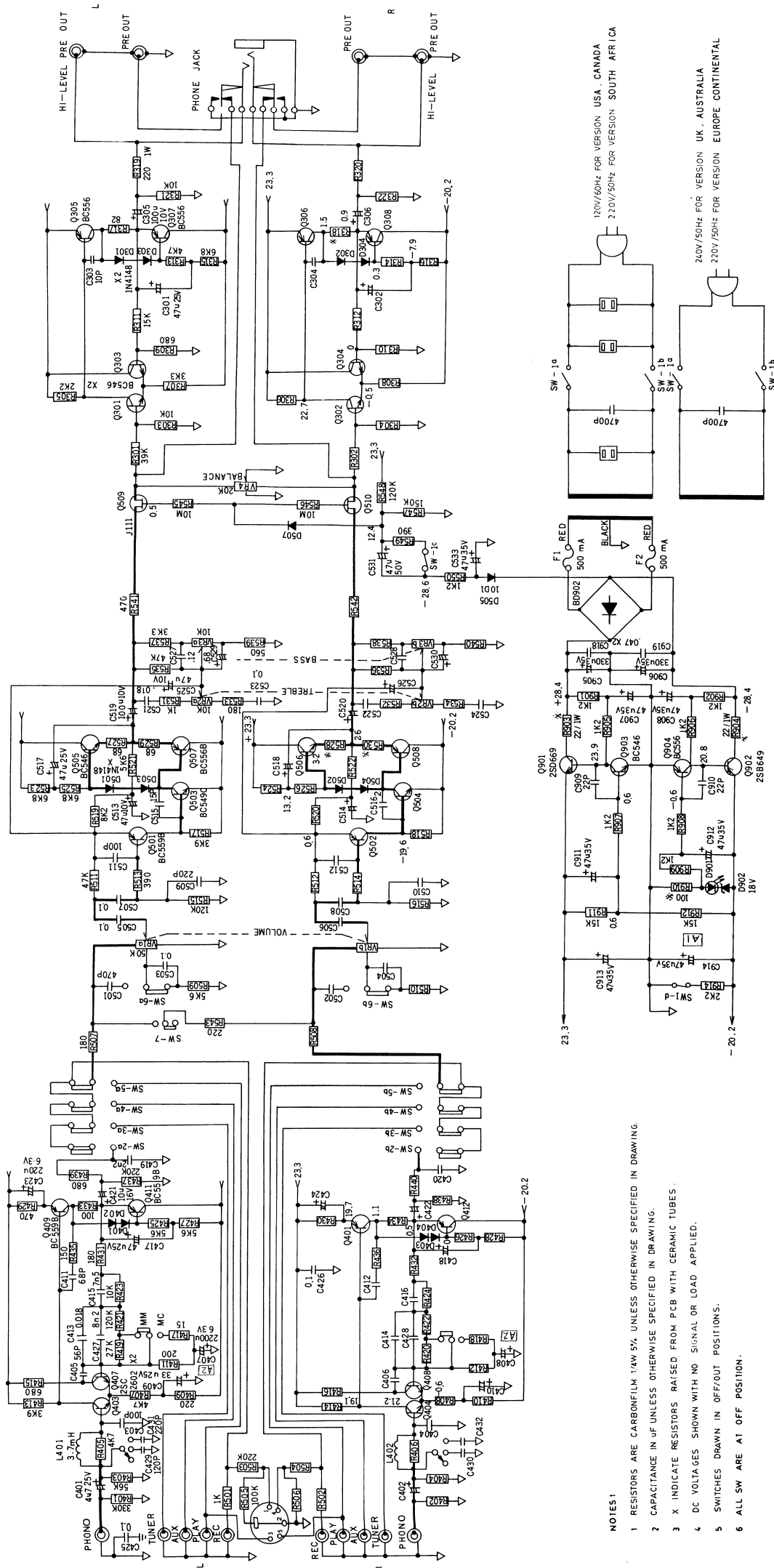
BLOCK DIAGRAM



PCB PARTS LOCATION



SCHEMATIC DIAGRAM



NOTES 2

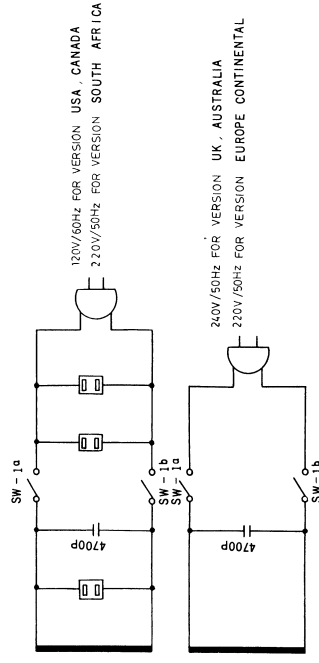
- 1 SW-1 a,b,c,d : POWER SW.
- 2 SW-2 a,b : PHONO SW.
- 3 SW-3 a,b : TUNER SW.
- 4 SW-4 a,b : AUX SW
- 5 SW-5 a,b : TAPE MONITOR SW.
- 6 SW-6 a,b : LOUDNESS SW.
- 7 SW-7 : MONO

NOTES 3

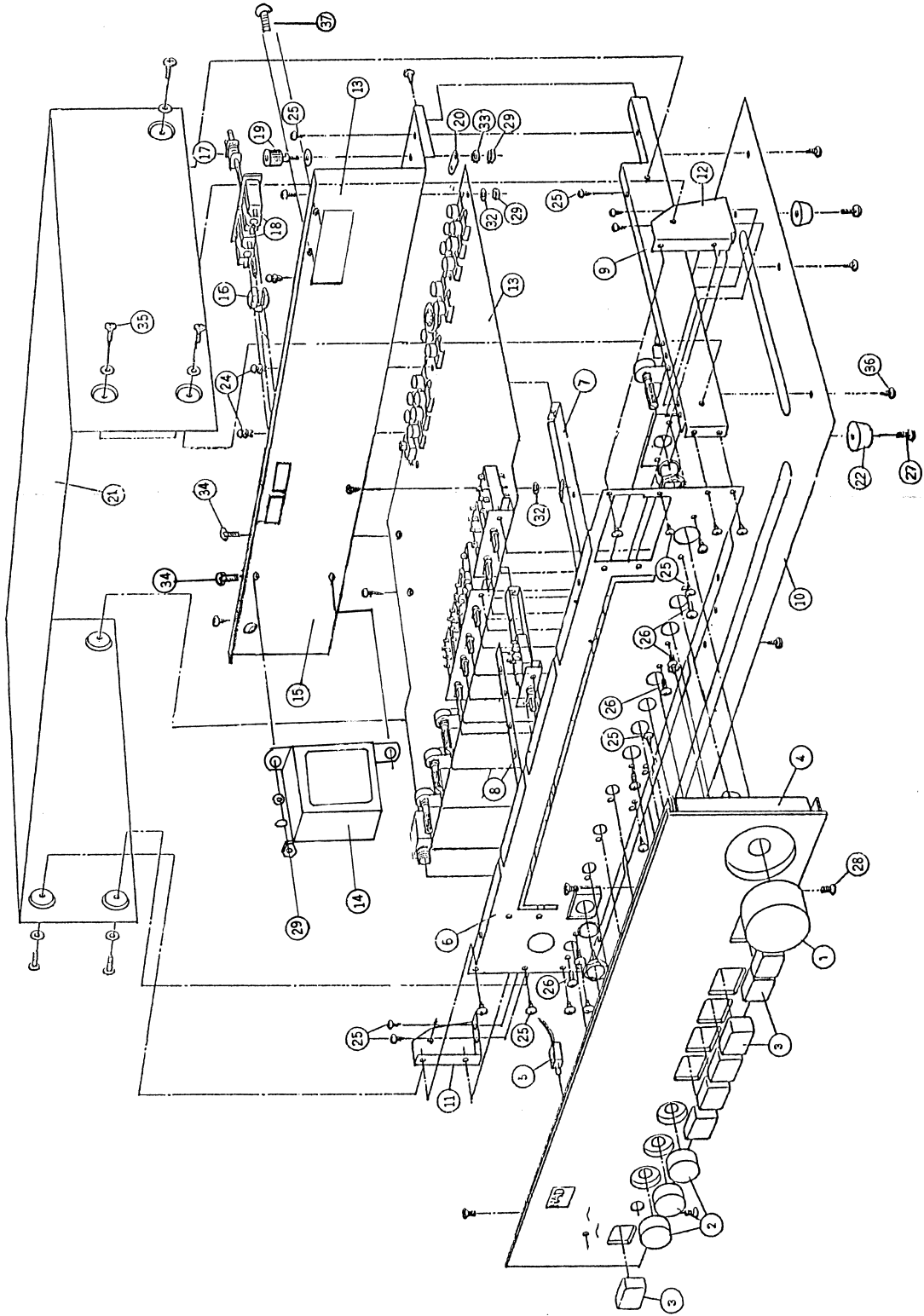
- ECB
- D5G
- CBE
- BCE
- BCE
- 25D069 J111 BC546 25C7602
- 25B849 BC549
- BC556
- BC559
- BC547
- BC557

NOTES 1

- 1 RESISTORS ARE CARBONFILM 1/4W 5% UNLESS OTHERWISE SPECIFIED IN DRAWING.
- 2 CAPACITANCE IN UF UNLESS OTHERWISE SPECIFIED IN DRAWING.
- 3 X INDICATE RESISTORS RAISED FROM PCB WITH CERAMIC TUBES.
- 4 DC VOLTAGES SHOWN WITH NO SIGNAL OR LOAD APPLIED.
- 5 SWITCHES DRAWN IN OFF/OUT POSITIONS.
- 6 ALL SW ARE AT OFF POSITION.



1020 ASSEMBLY DIAGRAM



| Item | Parts NO. | Name | Qty |
|------|--------------|---------------------------|-----|
| 1 | 70449500016 | Knob Volume | 1 |
| 2 | 70449490011 | Knob Tonecontrols/Balance | 3 |
| 3 | 70449480015 | Knob Push | 7 |
| 4 | 70016671019 | Frontpanel | 1 |
| 5 | 45400250013 | Connector Power LED | 1 |
| 6 | 56025592018 | Front subchassis | 1 |
| 7 | 54935180019 | Center support | 1 |
| 8 | 54935351019 | Sidechassis Left | 1 |
| 9 | 54935140017 | Sidechassis Right | 1 |
| 10 | 71025710014 | Bottomcover | 1 |
| 11 | 54345370014 | Subchassis Bracket Left | 1 |
| 12 | 54345360019 | Subchassis Bracket Right | 2 |
| 13 | 24125230038 | Main PCB complete | 1 |
| 14 | 3500022066 | Power transformer | 1 |
| 15 | 70016682029 | Rear Panel | 1 |
| 16 | 45500010014 | Bushing strain relief | 1 |
| 17 | 40845130028 | AC Cord | 1 |
| 18 | 45100380019 | AC Outlet | 2 |
| 19 | 53146880011 | Grounding screw | 1 |
| 20 | 68530000000 | Washer Lug | 1 |
| 21 | 71015310013 | Cabinett | 1 |
| 22 | 76545230011 | Foot Rubber | 4 |
| 23 | 673400110034 | CAN NOT FIND ON DRAWING | 3 |
| 24 | 67240011032 | Plastic rivet | 3 |
| 25 | 666120300831 | Screw-Tap BGR+3x8 | 8 |
| 26 | 650060300607 | Screw-M PF+3x6 | 8 |
| 27 | 650070401004 | Screw-M PG+4x10 | 4 |
| 28 | 651070300504 | SCREW-M FG+3x5 | 4 |
| 29 | 670113060251 | Nut Hex | 8 |
| 30 | 67045050016 | CAN NOT FIND ON DRAWING | 1 |
| 31 | 670223055249 | CAN NOT FIND ON DRAWING | 4 |
| 32 | 680303080051 | Fiber Washer 3x8x0.5 | 1 |
| 33 | 681300000002 | Lock Washer | 1 |
| 34 | 656070300803 | SCREW-M BG+3x8 | 4 |
| 35 | 652075400800 | SCREW-M/W TG+4x8 | 6 |
| 36 | 666080300803 | SCREW-T BH+3x6 | 8 |
| 37 | 656070260300 | SCREW-M BG+26x3 | 2 |

1020B PARTS LIST

| SYMBOL NO. | PART NO. | DESCRIPTION | REF |
|------------------|------------|---------------------------|-----|
| R301, R302 | 1003936231 | Carbon res 39K ± 5% 1/4W | |
| R303, R304 | 1001036233 | Carbon res 10% ± 5% 1/4W | |
| R305, R306 | 1002226239 | Carbon res 2.2K ± 5% 1/4W | |
| R307, R308 | 1003326235 | Carbon res 3.3K ± 5% 1/4W | |
| R309, R310 | 1006816237 | Carbon res 680 ± 5% 1/4W | |
| R311, R312 | 1001536231 | Carbon res 15K ± 5% 1/4W | |
| R313, R314 | 1004726232 | Carbon res 4.7K ± 5% 1/4W | |
| R315, R316 | 1006826231 | Carbon res 6.8K ± 5% 1/4W | |
| R317, R318 | 1008206211 | Carbon res 82 ± 5% 1/4W | |
| R319, R320 | 1002216412 | Carbon res 220 ± 5% 1/4W | |
| R321, R322 | 1001036226 | Carbon res 10K ± 5% 1/4W | |
| R401, R402 | 1003346227 | Carbon res 330K ± 5% 1/4W | |
| R403, R404 | 1005636229 | Carbon res 56K ± 5% 1/4W | |
| R405, R406, R408 | 1004726225 | Carbon res 4.7K ± 5% 1/4W | |
| R407 | 1004726232 | Carbon res 4.7K ± 5% 1/4W | |
| R409, R410 | 1002216234 | Carbon res 220 ± 5% 1/4W | |
| R411, R412 | 1002016237 | Carbon res 200 ± 5% 1/4W | |
| R413, R414 | 1003926237 | Carbon res 3.9K ± 5% 1/4W | |
| R415, R416 | 1006816237 | Carbon res 680 ± 5% 1/4W | |
| R417, R418 | 1001506238 | Carbon res 15 ± 5% 1/4W | |
| R419, R420 | 1002735236 | Carbon res 27K ± 2% 1/4W | |
| R421, R422 | 1001245230 | Carbon res 120K ± 2% 1/4W | |
| R423, R424 | 1001035238 | Carbon res 10K ± 2% 1/4W | |
| R425, R426 | 1005626224 | Carbon res 5.6K ± 5% 1/4W | |
| R427, R428 | 1005626231 | Carbon res 5.6K ± 5% 1/4W | |
| R429, R430 | 1004716238 | Carbon res 470 ± 5% 1/4W | |
| R431, R432 | 1001816233 | Carbon res 180 ± 5% 1/4W | |
| R433, R434 | 1001016234 | Carbon res 100 ± 5% 1/4W | |
| R435, R436 | 1001516232 | Carbon res 150 ± 5% 1/4W | |
| R437, R438 | 1002246238 | Carbon res 220K ± 5% 1/4W | |
| R439, R440 | 1006816237 | Carbon res 680 ± 5% 1/4W | |
| R501, R502 | 1001026221 | Carbon res 1K ± 5% 1/4W | |
| R503, R504 | 1002246221 | Carbon res 220K ± 5% 1/4W | |
| R505, R506 | 1001046221 | Carbon res 100K ± 5% 1/4W | |
| R507, R508 | 1001816233 | Carbon res 180 ± 5% 1/4W | |
| R509, R510 | 1005626231 | Carbon res 5.6K ± 5% 1/4W | |
| R511, R512 | 1004736237 | Carbon res 47K ± 5% 1/4W | |
| R513, R514 | 1003916232 | Carbon res 390 ± 5% 1/4W | |
| R515, R516 | 1001246235 | Carbon res 120K ± 5% 1/4W | |
| R517, R518 | 1003926237 | Carbon res 3.9K ± 5% 1/4W | |

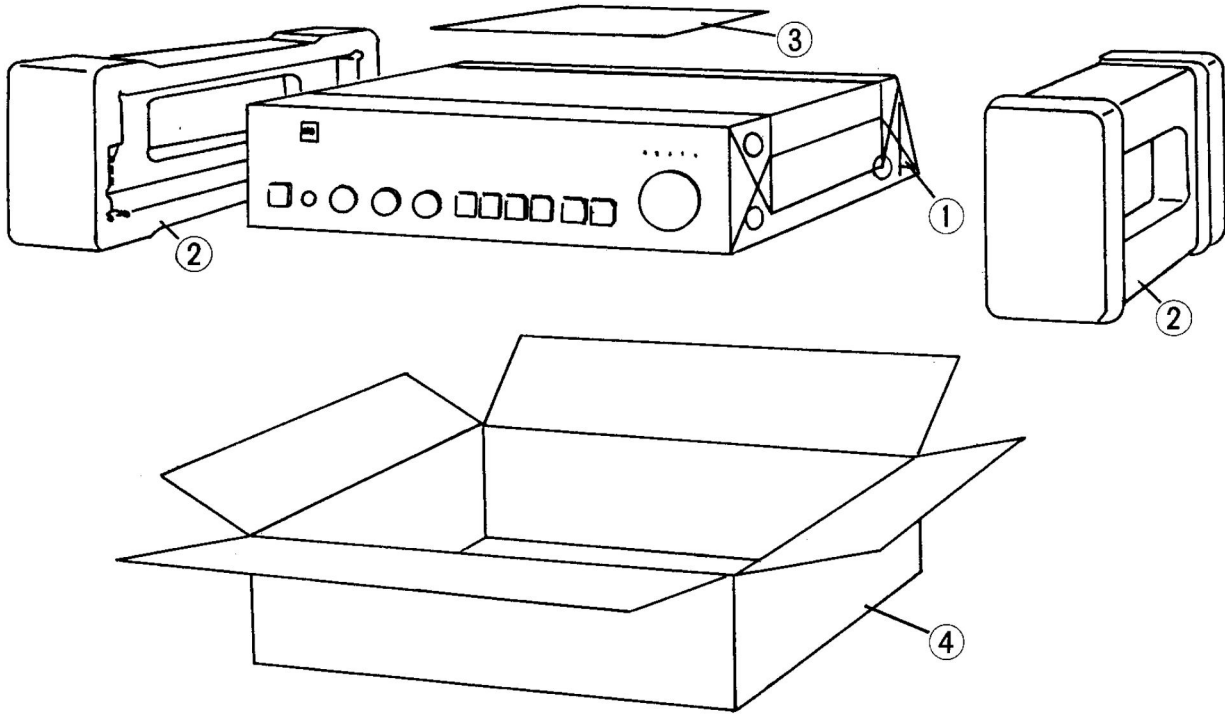
| SYMBOL NO. | PART NO. | DESCRIPTION | REF |
|------------------|--------------|--------------------------------|-----|
| R519, R520 | 1008226235 | Carbon res 8.2K ± 5% 1/4W | |
| R521, R522 | 1005626231 | Carbon res 5.6K ± 5% 1/4W | |
| R523, R524 | 1006826231 | Carbon res 6.8K ± 5% 1/4W | |
| R525, R526 | 1006826231 | Carbon res 6.8K ± 5% 1/4W | |
| R527, R528 | 1006806232 | Carbon res 68 ± 5% 1/4W | |
| R528, R530 | 1006806232 | Carbon res 68 ± 5% 1/4W | |
| R531, R532 | 1001026239 | Carbon res 1K ± 5% 1/4W | |
| R533, R534 | 1001816233 | Carbon res 180 ± 5% 1/4W | |
| R535, R536 | 1004736237 | Carbon res 47K ± 5% 1/4W | |
| R537, R538 | 1003326235 | Carbon res 3.3K ± 5% 1/4W | |
| R539, R540 | 1005616237 | Carbon res 560 ± 5% 1/4W | |
| R541, R542 | 1004716238 | Carbon res 470 ± 5% 1/4W | |
| R545, R546 | 1001066237 | Carbon res 10 M ± 5% 1/4W | |
| R547 | 1001546236 | Carbon res 150K ± 5% 1/4W | |
| R548 | 1001246235 | Carbon res 120K ± 5% 1/4W | |
| R549 | 1003916232 | Carbon res 390 ± 5% 1/4W | |
| R550 | 1001226236 | Carbon res 1.2K ± 5% 1/4W | |
| R901, R902 | 1001226236 | Carbon res 1.2K ± 5% 1/4W | |
| R903, R904 | 1002206418 | Carbon res 22 ± 5% 1W | |
| R905, R906 | 1001226236 | Carbon res 1.2K ± 5% 1/4W | |
| R907, R908, R909 | 1001226236 | Carbon res 1.2K ± 5% 1/4W | |
| R910 | 1001016234 | Carbon res 100 ± 5% 1/4W | |
| R911, R912 | 1001536231 | Carbon res 15K ± 5% 1/4W | |
| R913 | 1001546236 | Carbon res 150K ± 5% 1/4W | |
| R914 | 1002226239 | Carbon res 2.2K ± 5% 1/4W | |
| C301, C302 | 160476250146 | Elec. Capa. 47μF±50—10% 25V | |
| C303, C304 | 166100647026 | Ceramic Capa. 10pF±0.5pF 50WV | |
| C305, C306 | 160107100121 | Elec. Capa. 100μF+50—10% 10V | |
| C401, C402 | 160475500601 | Elec. Capa. 4.7μF+75—10% 50V | |
| C403, C404 | 166101647021 | Ceramic Capa. 100pF±10% 50WV | |
| C404, C406 | 166560647029 | Ceramic Capa. 56pF±10% 50WV | |
| C407, C408 | 160228063603 | Elec. Capa. 2200μF+50—10% 6.3V | |
| C409, C410 | 160336250603 | Elec. Capa. 33μF+50—10% 25V | |
| C411, C412 | 166680647029 | Ceramic Capa. 68pF±10% 50WV | |
| C413, C414 | 162183524 | Mylar Capa. 0.018μF±5% 50WV | |
| C415, C416 | 162752525 | Mylar Capa. 0.0075μF±5% 50WV | |
| C417, C418 | 160476250601 | Elec. Capa. 47μF+50—10% 25V | |
| C419, C420 | 162222521 | Mylar Capa. 0.0022μF±5% 50WV | |
| C421, C422 | 160106160608 | Elec. Capa. 10μF+50—10% 16V | |

| SYMBOL NO. | PART NO. | DESCRIPTION | | REF |
|------------|------------------------------|--------------------------|---------------------|------------------------------|
| C423, C424 | 160227100604 | Elec. | Capa. | 220 μ F+50-10% 10V |
| C425, C426 | 167104800021 | Ceramic | Capa. | 0.1 μ F+80-20% 50WV |
| C427, C428 | 162822527 | Mylar | Capa. | 0.0082 μ F \pm 5% 50WV |
| C429, C430 | 166121647028 | Ceramic | Capa. | 120pF \pm 10% 50WV |
| C431, C432 | 166221647021 | Ceramic | Capa. | 220pF \pm 10% 50WV |
| C501, C502 | 166471547029 | Ceramic | Capa. | 470pF \pm 5% 50WV |
| C503, C504 | 162104520 | Mylar | Capa. | 0.1 μ F \pm 5% 50WV |
| C505, C506 | 162104520 | Mylar | Capa. | 0.1 μ F \pm 5% 50WV |
| C507, C508 | 162104520 | Mylar | Capa. | 0.1 μ F \pm 5% 50WV |
| C509, C510 | 166221647021 | Ceramic | Capa. | 220pF \pm 10% 50WV |
| C511, C512 | 166101647021 | Ceramic | Capa. | 100pF \pm 10% 50WV |
| C513, C514 | 160476100503 | Elec. | Capa. | 47 μ F+50-10% 10V |
| C515, C516 | 166150647024 | Ceramic | Capa. | 15pF \pm 10% 50WV |
| C517, C518 | 160476250601 | Elec. | Capa. | 47 μ F+50-10% 25V |
| C519, C520 | 160107100604 | Elec. | Capa. | 100 μ F+50-10% 10V |
| C521, C522 | 162183524 | Mylar | Capa. | 0.018 μ F \pm 5% 50WV |
| C523, C524 | 162104520019 | Mylar | Capa. | 0.1 μ F \pm 5% 50WV |
| C525, C526 | 160476100603 | Elec. | Capa. | 47 μ F+50-10% 10V |
| C527, C528 | 162124527 | Mylar | Capa. | 0.12 μ F \pm 5% 50WV |
| C529, C530 | 160684500697 | Elec. | Capa. | 0.68 μ F+75-10% 50V |
| C531 | 160476500605 | Elec. | Capa. | 47 μ F+50-10% 50V |
| C533 | 160476350606 | Elec. | Capa. | 47 μ F+50-10% 35V |
| C905, C906 | 160337350602 | Elec. | Capa. | 330 μ F+50-10% 35V |
| C907, C908 | 160476350606 | Elec. | Capa. | 47 μ F+50-10% 35V |
| C909, C910 | 166220647026 | Ceramic | Capa. | 22pF \pm 10% 50WV |
| C911, C912 | 160475500601 | Elec. | Capa. | 4.7 μ F+50-10% 50V |
| C913, C914 | 160476350606 | Elec. | Capa. | 47 μ F+50-10% 35V |
| C918, C919 | 167473800020 | Ceramic | Capa. | 0.047 μ F+80-20% 50WV |
| Q301, Q302 | 260180546021 260180546011 | Transistor | BC546B or BC546A | |
| Q303, Q304 | 260180546021 260180546011 | Transistor | BC546B or BC546A | |
| Q305, Q306 | 260180556027 | Transistor | BC556B | |
| Q307, Q308 | 260180556027 | Transistor | BC556B | |
| Q403, Q404 | 260032602075 | Transistor | 2SC2602G | |
| Q407, Q408 | 260032602075 | Transistor | 2SC2602G | |
| Q409, Q410 | 260180556027 | Transistor | BC556B | |
| Q411, Q412 | | | | |
| Q501, Q502 | 260180559029 260180556027 | Transistor Transistor | BC559B or BC556B | |

| SYMBOL NO. | PART NO. | DESCRIPTION | REF |
|------------|--------------|------------------------|-----|
| Q503, Q504 | 260180549031 | Transistor BC549C | |
| Q505, Q506 | 260180546011 | Transistor BC546A or | |
| | 260180546021 | BC546B | |
| Q507, Q508 | 260180556027 | Transistor BC556B | |
| Q509, Q510 | 262000001112 | FET E(J) 111 | |
| Q901 | 260040669032 | Transistor 2SD669C | |
| | 260040669041 | 2SD669D | |
| | 260040669598 | 2SD669AC | |
| | 260040669604 | 2SD669AD | |
| Q903 | 260020649032 | Transistor 2SB649C | |
| | 260020649041 | 2SB649D | |
| | 260020649598 | 2SB649AC | |
| | 260020649604 | 2SB649AD | |
| Q903 | 260180546011 | Transistor BC546A or | |
| | 260180546021 | BC546B | |
| Q904 | 260180556027 | Transistor BC556B | |
| D301, D302 | 270041480007 | Diode 1N4148 | |
| D303, D304 | 270041480007 | Diode 1N4148 | |
| D401-D404 | 270041480007 | Diode 1N4148 | |
| D501-D504, | 270041480007 | Diode 1N4148 | |
| D507 | 270041480007 | Diode 1N4148 | |
| D901 | 26301302042 | LED Red 3 ϕ | |
| BD902 | 272200221515 | Diode Bridge 1.5A/200V | |
| | 272240216 | | |
| D902 | 273000180428 | DZ 18BM or | |
| | 273000180526 | DZ 18BH | |

| SCCELLANEOUS | |
|--------------|----------------------------|
| Slide SW | 43100200019 |
| Push SW | 43200160019 |
| Push SW | 43200180010 |
| VR 50KBx2 | 12000210014 |
| VR 10KCx2 | 12000190013 |
| VR 20KWx1 | 12000200019 |
| Rca Jack | 45100340017 |
| Din Jack | 45100330011 or 45100331018 |
| H/Phone Jack | 45100450017 |
| Slide SW | 43150892011 |

PACKING DIAGRAM



| Ref. No. | Partnumber | Description | Q'ty |
|----------|--------------|--------------------|------|
| 1 | 83145970014 | Polyester bag | 1 |
| 2 | 82525610019 | Styrofoam support | 2 |
| 3 | 871001020018 | Instruction manual | 1 |
| 4 | 80046340044 | Single carton | 1 |