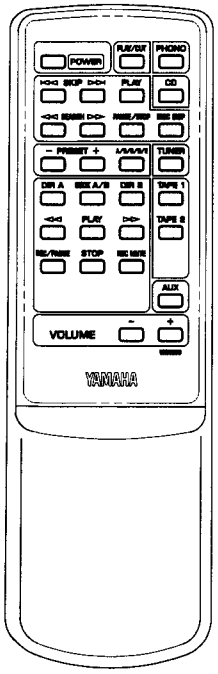
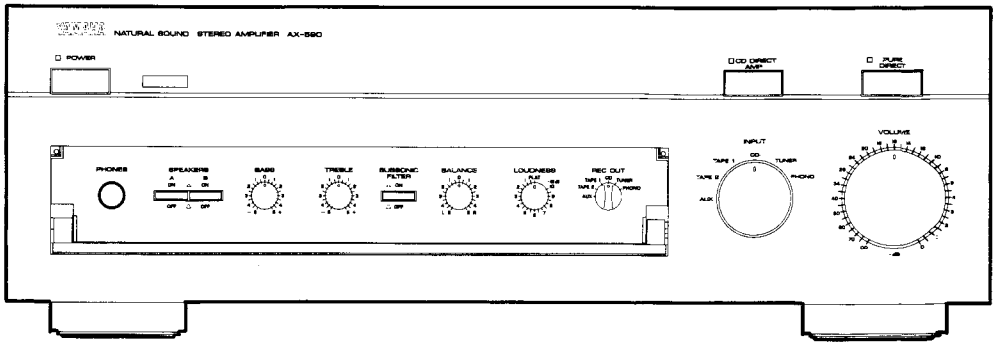
# STEREO INTEGRATED AMPLIFIER

# AX-590

## SERVICE MANUAL







### IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel.
It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products.
Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

**IMPORTANT:** Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

## ■ CONTENTS


TO SERVICE PERSONNEL ..... 1
REAR PANEL ..... 1
SPECIFICATIONS ..... 3
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PRINTED CIRCUIT BOARD ..... 8~11
SCHEMATIC DIAGRAM ..... 12, 13
PARTS LIST ..... 14~22
REMOTE CONTROL TRANSMITTER ..... 23



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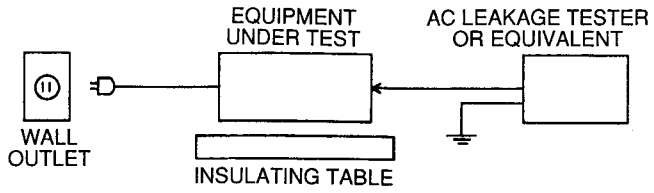
YAMAHA
YAMAHA CORPORATION
Hamamatsu, Japan

1. 95K-86. 562 Printed in Japan '95. 4

## ■ TO SERVICE PERSONNEL

1. Critical Components Information.
   Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.
2. Leakage Current Measurement (For 120 V Model Only).
   When service has been completed. It is imperative that you verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohms shunted by 0.15 µF.
- Leakage current must not exceed 0.5 mA.
- Be sure to test for leakage with the AC plug in both polarities.




## ■ WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

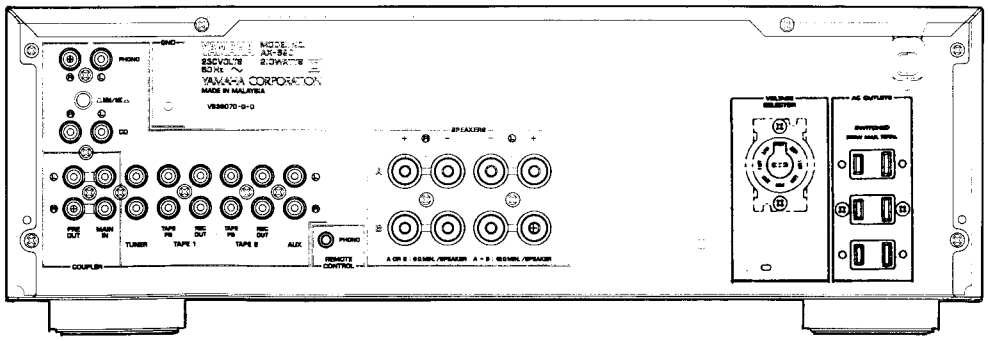
DO NOT PLACE SOLDER. ELECTRICAL/ ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHAT SO EVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

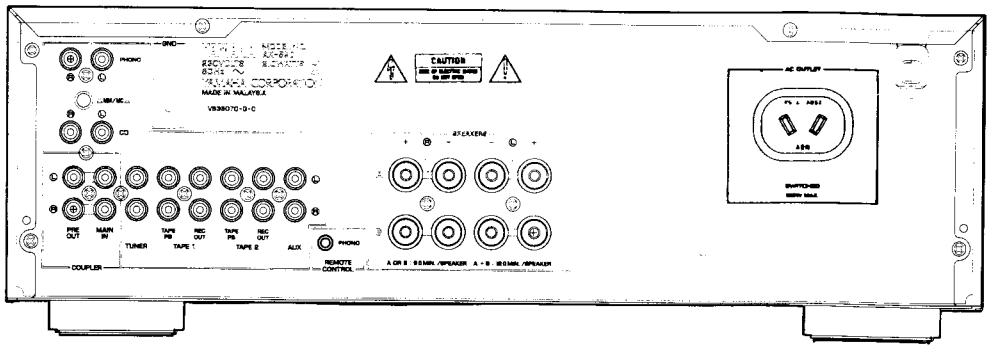
If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

## ■ REAR PANELS

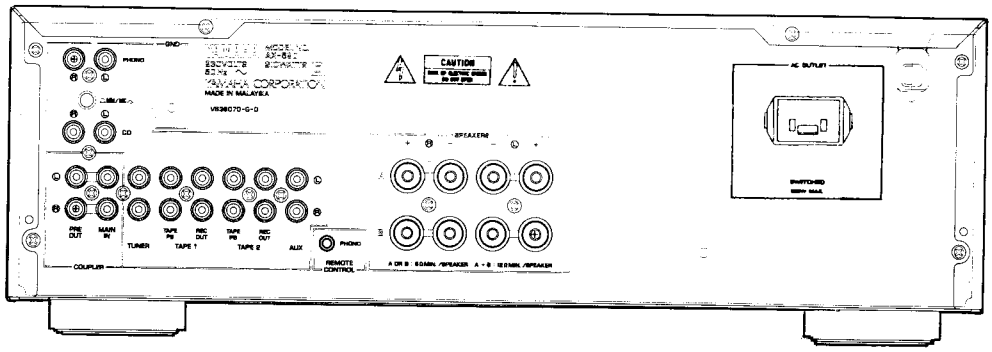
### ● R model



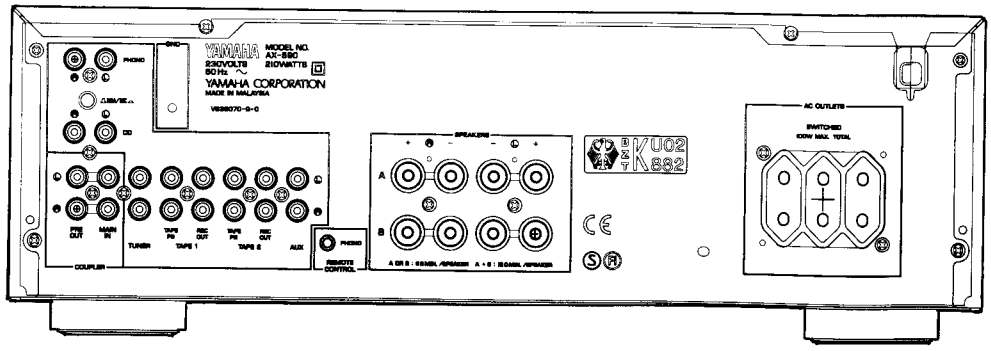
● A model



● B model



● G model



# ■ SPECIFICATIONS

## ■ AUDIO SECTION

**Minimum RMS Output Power per Channel**
8Ω, 20Hz to 20kHz, 0.015% THD ..... 100W
6Ω, 20Hz to 20kHz, 0.03% THD ..... 120W

**Dynamic Power per Channel** (IHF)
8/6/4/2Ω ..... 140/170/220/290W

**DIN Standard Output Power per Channel** (G model)
1kHz, 0.7% THD, 4Ω ..... 150W

**IEC Power** (G model)
1kHz, 0.015% THD, 8Ω ..... 110W

**Power Band Width**
8Ω, 50W, 0.03% THD ..... 10Hz to 50kHz

**Damping Factor** (A, B, G models)
8Ω, 20Hz to 20kHz ..... 320 or more

**Damping Factor** (DIN)
8Ω, 40Hz to 12.5kHz ..... 160 or more

**EIAJ Maximum Power** (R model)
1kHz, 10% THD, 8Ω ..... 145W
1kHz, 10% THD, 6Ω ..... 170W

**Input Sensitivity/Impedance**
PHONO MC ..... 160μV/220kΩ
PHONO MM ..... 2.5mV/47kΩ
CD etc. ..... 150mV/47kΩ
MAIN IN ..... 1.0V/10kΩ

**Maximum Input Signal Level** (1kHz, 0.007% THD)
PHONO MC ..... 10mV
PHONO MM ..... 150mV

**Output Level/Impedance**
REC OUT ..... 150mV/470Ω
PRE OUT ..... 1.0V/1kΩ

**Headphone Jack Rated Output/Impedance**
0.015% THD, RL = 8Ω ..... 0.33V/680Ω

**Frequency Response** (20Hz to 20kHz)
CD etc. ..... 0±0.5dB
MAIN IN ..... 0±0.5dB

**RIAA Equalization Deviation** (20Hz to 20kHz)
PHONO MC ..... 0±0.5dB
PHONO MM ..... 0±0.3dB

**Total Harmonic Distortion** (20Hz to 20kHz)
PHONO MC to REC OUT (3V) ..... 0.007%
PHONO MM to REC OUT (3V) ..... 0.003%
CD etc. to PRE OUT (1V) ..... 0.005%
CD etc. to SP OUT (50W/8Ω) ..... 0.008%

**Signal-to-Noise Ratio** (IHF-A Network)
PHONO MC (500μV Input Shorted) ..... 76dB
PHONO MM (5mV Input Shorted) ..... 92dB
CD DIRECT AMP SW ON (Shorted) ..... 110dB

**Residual Noise** (IHF-A Network)
CD DIRECT AMP SW ON ..... 35μV
PURE DIRECT SW ON ..... 90μV

**Channel Separation**
CD etc. (Input 5.1kΩ Terminated) 1kHz/10kHz ..... 65dB/50dB

**Tone Control Characteristics**
BASS : Boost/cut ..... ±10dB (20Hz)
Turnover Frequency ..... 350Hz
TREBLE : Boost/cut ..... ±10dB (20kHz)
Turnover Frequency ..... 3.5kHz

**Filter Characteristics** ..... −18dB/oct (15Hz)
**Continuous Loudness Control** ..... −30dB(1kHz)
**Gain Tracking Error** (0 to −60dB) ..... 2dB

**Remote Control Custom Code** ..... 7A

## ■ GENERAL

**Power Supply**
A, B models ..... AC 240V, 50Hz
G model ..... AC 230V, 50Hz
R model ..... AC 110/120/220/240V, 60/50Hz

**Power Consumption** ..... 210W

**AC Outlets**
Switched x 3
G, R models ..... 100W max. (Total)
Switched x 1
A, B models ..... 100W max.

**Dimensions** (W x H x D) ..... 435 x 146 x 388.5mm (17-1/8" x 5-3/4" x 15-5/16")

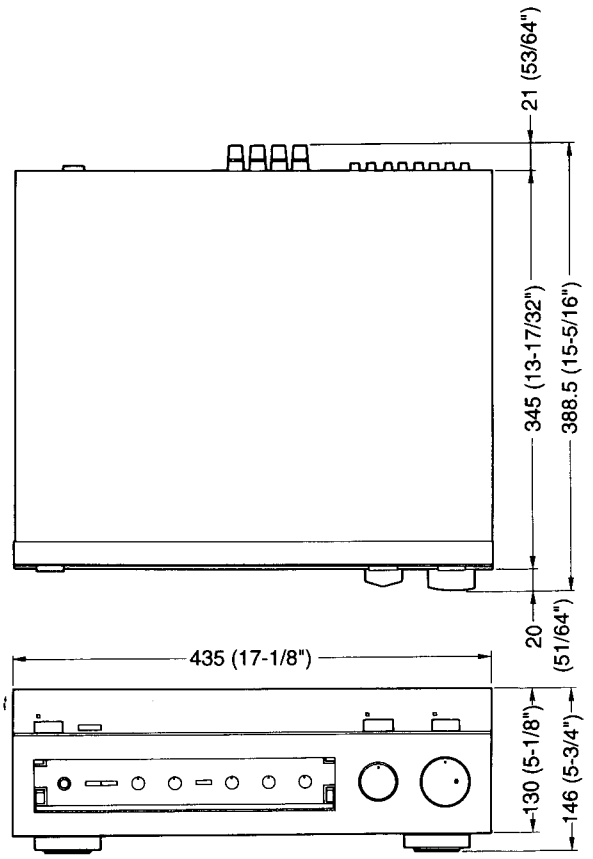
**Weight** ..... 10.4kg (22 lbs 14 oz)

**Accessories** ..... Remote Control Transmitter x 1
Battery (size "AA", R06) x 2

* Specifications subject to change without notice.

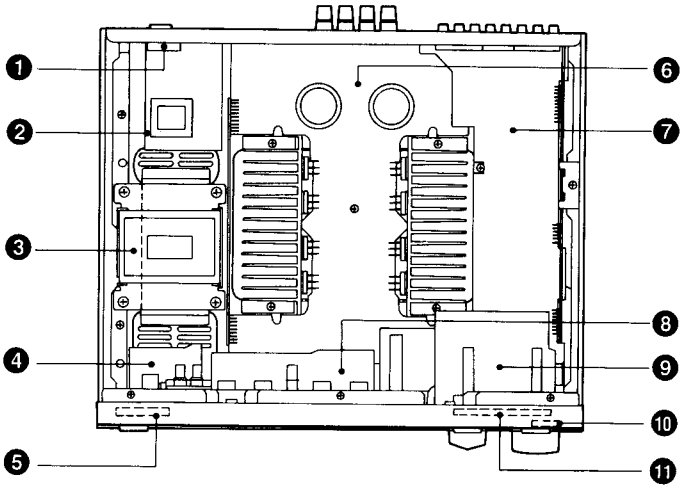
***A ..... Australian model*** ***B ..... British model***
***G ..... German model*** ***R ..... General model***

# ■ DIMENSIONS




unit: mm (inch)

## ■ INTERNAL VIEW



❶ MAIN CIRCUIT BOARD (6), (R model)
❷ MAIN CIRCUIT BOARD (2)
❸ POWER TRANSFORMER
❹ FUNCTION CIRCUIT BOARD (8)
❺ FUNCTION CIRCUIT BOARD (5)
❻ MAIN CIRCUIT BOARD (1)
❼ FUNCTION CIRCUIT BOARD (1)
❽ FUNCTION CIRCUIT BOARD (4)
❾ FUNCTION CIRCUIT BOARD (3)
❿ FUNCTION CIRCUIT BOARD (7)
⓫ FUNCTION CIRCUIT BOARD (6)



## ■ DISASSEMBLY PROCEDURES

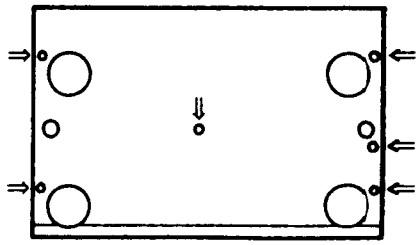
(Remove parts in disassembly order as numbered)

1. **Removal of Top Cover**
   Remove 6 screws (① to ③, in Fig. 1), and slide the Top Cover back.

2. **Removal of Front Panel**
   a. Open the sub panel, and remove 5 knobs (Ⓐ) in Fig. 1.
   b. Remove 6 screws (④ and ⑤) in Fig. 1, and pull the Front Panel forward.

3. **Removal of Bottom Cover**
   a. Remove 6 screws (⑥) in Fig. 1.
   b. Remove 6 screws (⑦) in Fig. 1.
   c. Remove 5 screws (⑧) in Fig. 1.

**CAUTION FOR SERVICING-USE ONLY COPPER COLORED SCREWS (3X10 ø8) FOR POINTS INDICATED BY ARROWS (⇐).**



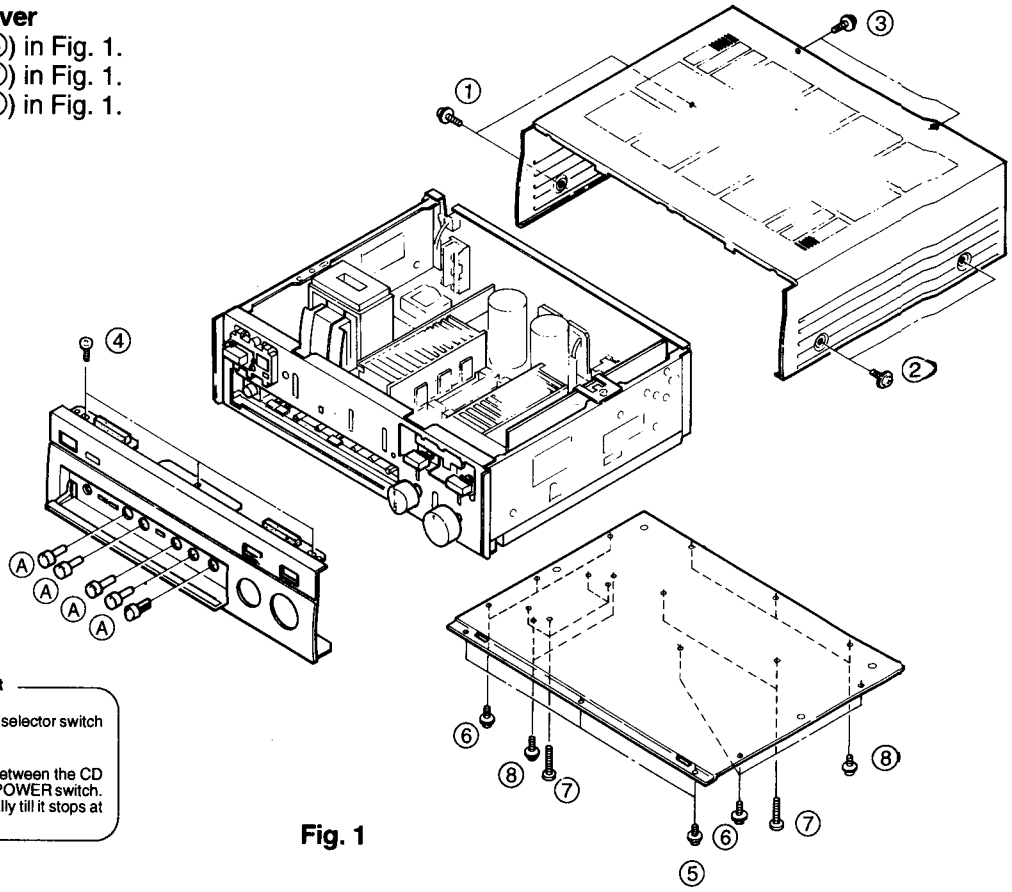



Fig. 1

**Precautions for Replacement of Input Selector Switch**

Make sure to perform initial setting of the input selector switch after its replacement.

• **How to perform initial setting**
Position the selector switch at the mid-point between the CD position and TUNER position and turn ON the POWER switch. Then the SELECTOR switch turns automatically till it stops at the "CD" position finally.

# ■ ADJUSTMENTS

**1. Before Adjustment**

● Make sure that AC line voltage is within:

| Models | AC line voltage |
|---|---|
| R | 110/120/220/240 V ± 10% |
| G | 230 V ± 10% |
| A, B | 240 V ± 10% |

**2. Instruments required**

● AC VM or dual channel AC VM
● DC VM

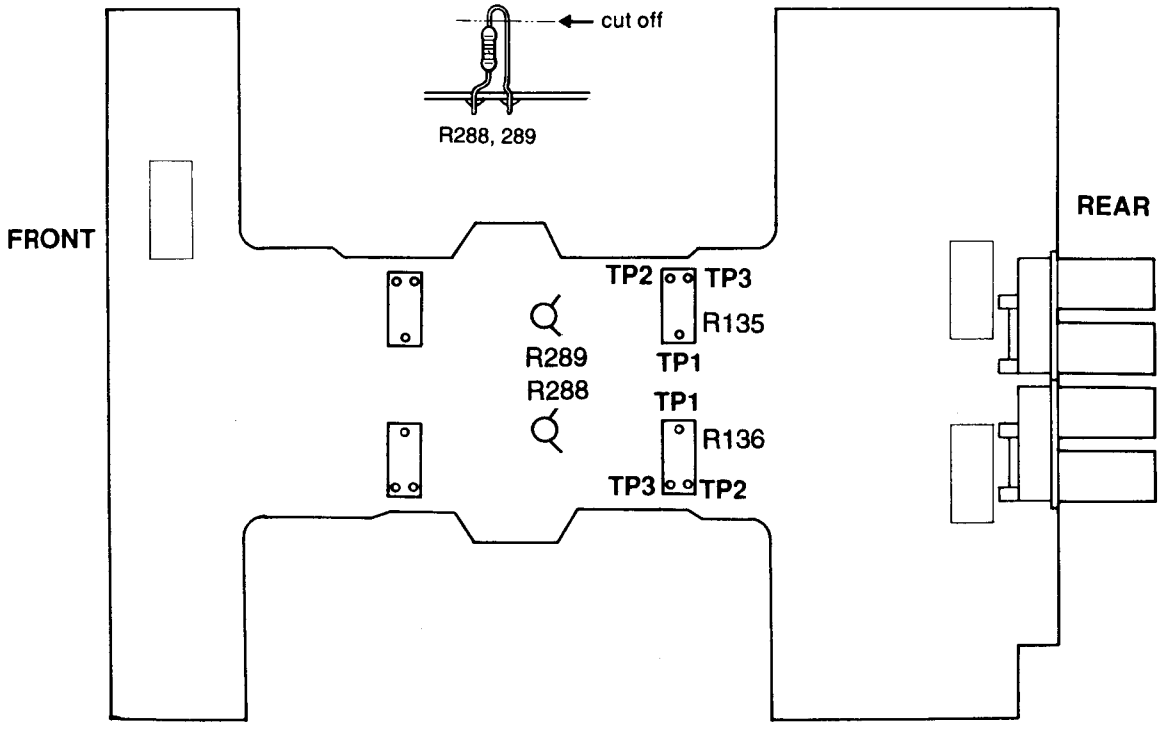


**● IDLING CURRENT CONFIRMATION**

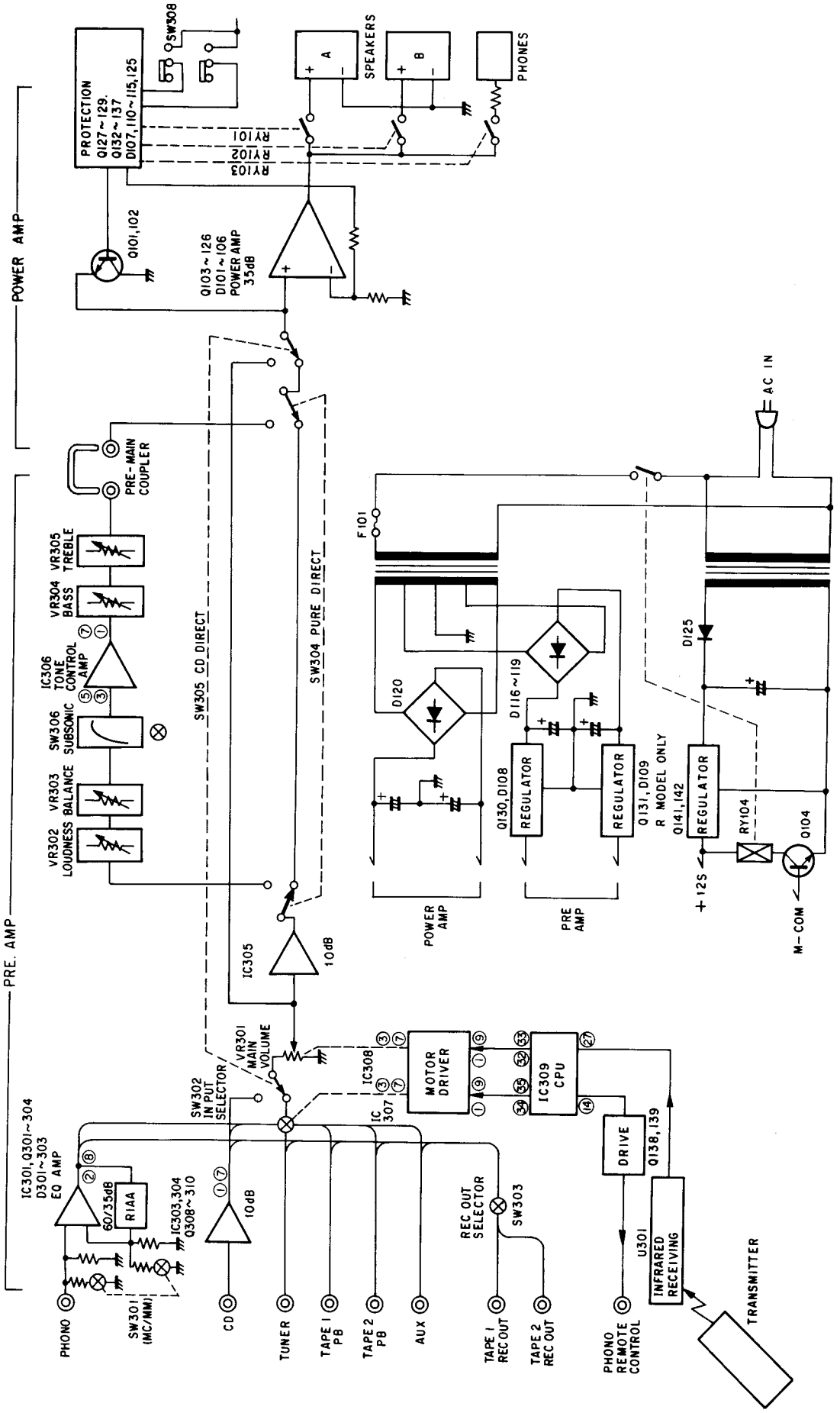
- After replacing the power and drive transistors, confirm idling current.
- After the power has been turned on, confirm that the voltage across R135 (Lch), R136 (Rch) is between 0.2 mV to 6 mV.
  If it exceeds 6.1 mV, open (cut off) R289 (Lch) or R288 (Rch) and reconfirm it.
- If R289 (Lch) or R288 (Rch) have been already cut and the idling current does not flow, re-solder the resistor (680Ω) at R289 (Lch) or R288 (Rch).
- Q117 and Q118 are transistors for temperature correction. Apply silicone grease to the contact surface with the heat sink.

| | Test points | Confirmation point | Rating |
|---|---|---|---|
| Lch | Across the terminals of R135 (TP1 and 2 or 1 and 3) | R289 | 0.2 ~ 6 mV |
| Rch | Across the terminals of R136 (TP1 and 2 or 1 and 3) | R288 | 0.2 ~ 6 mV |

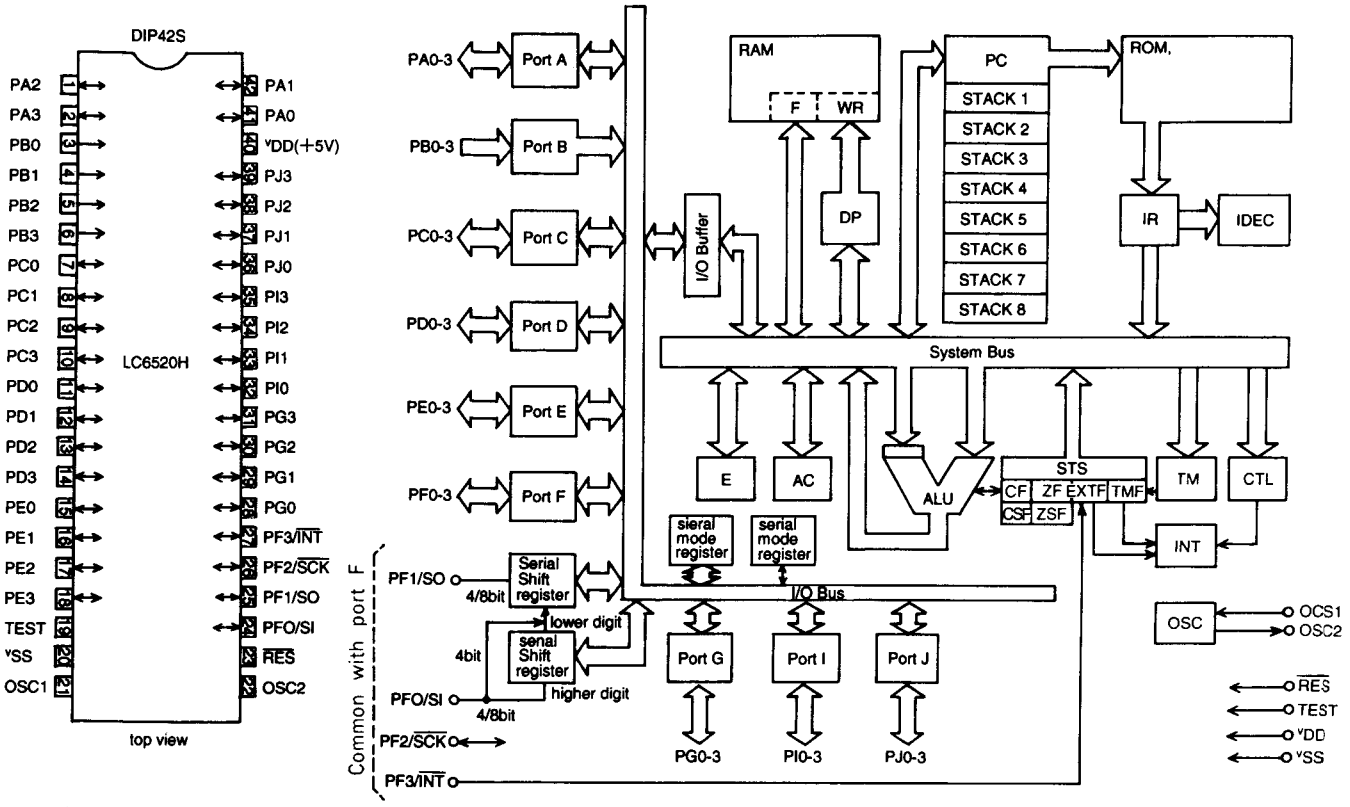
**● TEST POINTS**



## ■ BLOCK DIAGRAM



# ■ μ-COM DATA (IC309: LC6520H - 4B14)




| PIN NO. | PIN NAME | I/O | FUNCTION | PIN No. | PORT NAME | I/O | FUNCTION |
|---|---|---|---|---|---|---|---|
| 1 | PA2 | - | | 22 | OSC2 | | Crystal Oscillator (4MHz) |
| 2 | PA3 | I | VDD | 23 | RES | | Reset input |
| 3 | PB0 | I | Selector position data | 24 | PF0 | | |
| 4 | PB1 | I | Selector position data | 25 | PF1 | I | Power on start H: Reset PON |
| 5 | PB2 | I | Selector position data | 26 | PF2 | I | Remote control power on/off H: on |
| 6 | PB3 | I | Selector position data | 27 | PF3 | I | Remote control data |
| 7 | PC0 | I | Selector position data | 28 | PG0 | I | Power switch data |
| 8 | PC1 | I | Selector position data | 29 | PG1 | I | Power control H: on L: off |
| 9 | PC2 | I | Selector position data | 30 | PG2 | O | Power output H: on |
| 10 | PC3 | I | Selector position data | 31 | PG3 | O | Stand-by H: on |
| 11 | PD0 | I | Selector cam position data | 32 | PI0 | O | Volume motor data |
| 12 | PD1 | I | Selector 6 or 7 Select L: 6 | 33 | PI1 | O | Volume motor data |
| 13 | PD2 | I | Audio mute key data | 34 | PI2 | O | Selector motor data |
| 14 | PD3 | O | PLAY/CUT(Player control) | 35 | PI3 | O | Selector motor data |
| 15 | PE0 | I | Power data H: G | 36 | PJ0 | I | GND |
| 16 | PE1 | I | Power down data | 37 | PJ1 | O | |
| 17 | PE2 | | | 38 | PJ2 | O | |
| 18 | PE3 | I | Stop select H: Non stop | 39 | PJ3 | O | Muting control H: on |
| 19 | TEST | | GND | 40 | VDD | | +5V |
| 20 | VSS | | GND | 41 | PA0 | | |
| 21 | OSC1 | | Crystall oscillator (4MHz) | 42 | PA1 | | |

# ■ PRINTED CIRCUIT BOARD AX-590

● Component Location

| Ref. No. | Location | Ref. No. | Location | Ref. No. | Location | Ref. No. | Location | Ref. No. | Location | Ref. No. | Location | Ref. No. | Location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IC301 | C6 | IC309 | E6 | Q307 | D5 | Q315 | D6 | D301 | B6 | D308 | E5 | D316 | H3 |
| IC302 | I5 | | | Q308 | D5 | Q316 | D6 | D302 | B6 | D309 | D6 | D317 | I4 |
| IC303 | C5 | Q301 | B6 | Q309 | D6 | Q317 | D6 | D303 | B6 | D310 | D6 | D318 | H4 |
| IC304 | C6 | Q302 | B6 | Q310 | D6 | Q318 | C6 | D304 | E6 | D311 | E6 | D319 | F6 |
| IC305 | H5 | Q303 | B6 | Q311 | F6 | Q319 | D6 | D305 | E6 | D312 | E6 | D320 | F6 |
| IC306 | C2 | Q304 | B6 | Q312 | E6 | Q320 | D6 | D306 | H6 | D313 | C6 | D321 | F6 |
| IC307 | E6 | Q305 | B5 | Q313 | F5 | Q321 | D6 | D307 | H6 | D314 | D6 | D322 | B3 |
| IC308 | E6 | Q306 | B5 | Q314 | F6 | | | | | D315 | D6 | | |

FUNCTION P.C.B(4)

LOUDNESS BALANCE SUBSONIC FILTER TREBLE BASS

FUNCTION P.C.B(8)

SPEAKERS

❷ To MAIN(1)
❸ To MAIN(1)

PHONES

FUNCTION P.C.B(5)

POWER

FUNCTION P.C.B(1),(2)

PRE OUT
MAIN IN
TUNER
TAPE PB TAPE1 REC OUT
TAPE PB TAPE2 REC OUT
AUX
PHONO
MM/MC
CD

❹ To MAIN (1)

REC OUT
INPUT
VOLUME
PURE DIRECT
CD DIRECT

FUNCTION P.C.B(7)

VOLUME

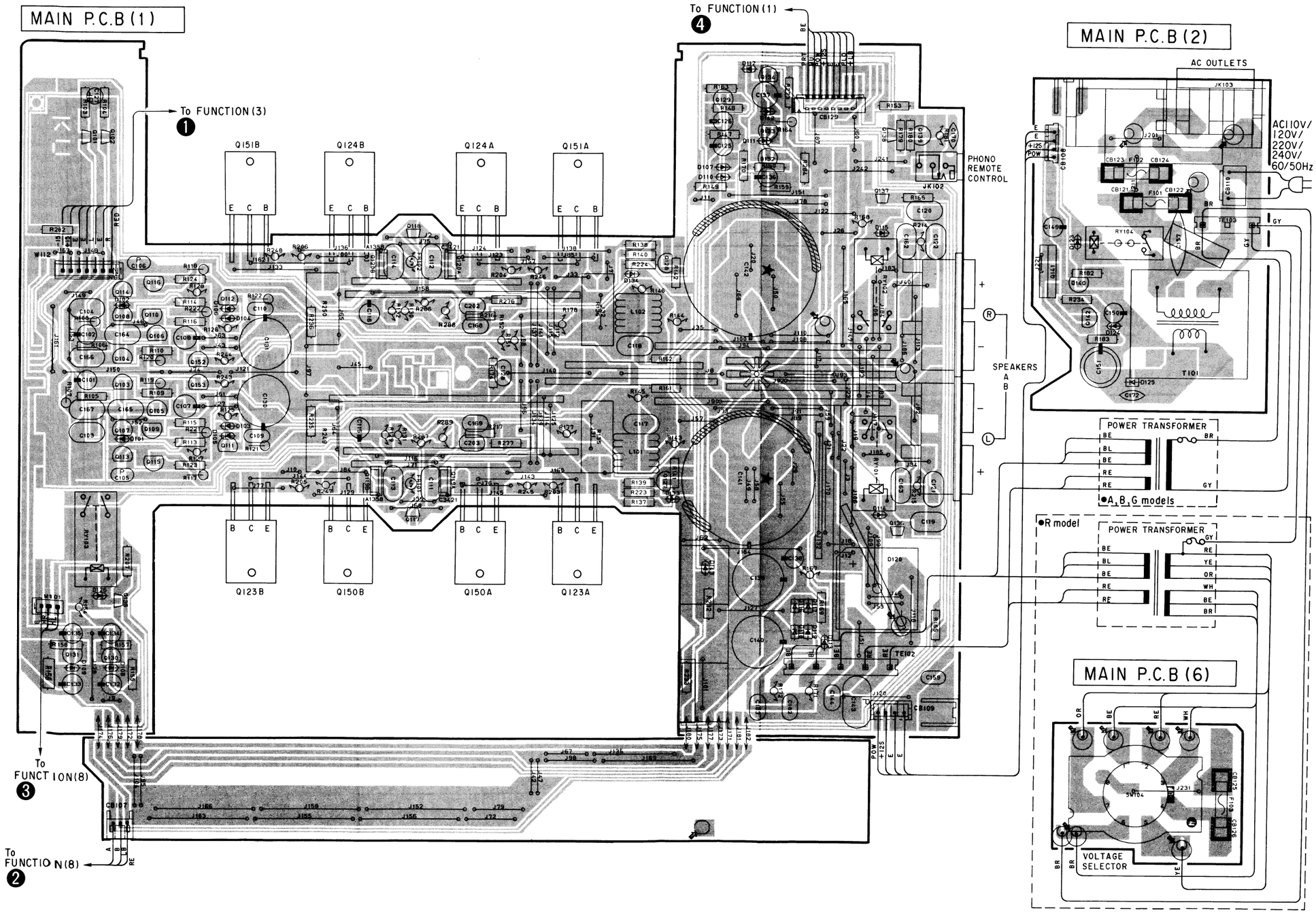
FUNCTION P.C.B(6)

CD DIRECT AMP
PURE DIRECT

FUNCTION P.C.B(3)

❶ To MAIN (1)

# ■ PRINTED CIRCUIT BOARD AX-590




● Component Location

| Ref. No. | Location |
|---|---|
| Q101 | A2 |
| Q102 | A2 |
| Q103 | A3 |
| Q104 | A3 |
| Q105 | B4 |
| Q106 | B3 |
| Q107 | A4 |
| Q108 | A3 |
| Q109 | B4 |
| Q110 | B3 |
| Q111 | B4 |
| Q112 | B3 |
| Q113 | A4 |
| Q114 | A3 |
| Q115 | B4 |
| Q116 | B3 |
| Q117 | C4 |
| Q118 | C3 |
| Q119A | C4 |
| Q119B | C4 |
| Q120A | C3 |
| Q120B | C3 |
| Q123A | D5 |
| Q123B | B5 |
| Q124A | D2 |
| Q124B | C2 |
| Q127 | E4 |
| Q128 | E3 |
| Q129 | E2 |
| Q130 | A5 |
| Q131 | A5 |
| Q132 | E2 |
| Q133 | E2 |
| Q134 | E2 |
| Q135 | A5 |
| Q136 | F4 |
| Q137 | F2 |
| Q138 | F2 |
| Q139 | F2 |
| Q140 | G3 |
| Q141 | G3 |
| Q142 | G3 |
| Q150A | D5 |

| Ref. No. | Location |
|---|---|
| Q150B | C5 |
| Q151A | D2 |
| Q151B | B2 |
| Q152 | B3 |
| Q153 | B4 |
| D101 | A4 |
| D102 | A3 |
| D103 | B4 |
| D104 | B3 |
| D105 | B4 |
| D106 | B3 |
| D107 | E2 |
| D108 | A5 |
| D109 | A5 |
| D110 | E2 |
| D111 | E2 |
| D112 | E2 |
| D113 | F5 |
| D114 | F4 |
| D115 | F3 |
| D116 | E5 |
| D117 | F5 |
| D118 | E5 |
| D119 | F5 |
| D120 | F5 |
| D123 | G3 |
| D124 | G3 |
| D125 | G4 |
| D126 | A5 |
| D133 | E4 |
| D134 | D3 |
| D142 | E2 |
| D143 | E5 |

# ■ SCHEMATIC DIAGRAM (Main) AX-590

CAPACITOR

| REMARKS | PARTS NAME | |
|---|---|---|
| NO MARK | ELECTROLYTIC CAPACITOR | # |
| ⊗ | TANTALUM CAPACITOR | # |
| NO MARK | CERAMIC CAPACITOR | ‡‡ |
| ◉ | CERAMIC TUBULAR CAPACITOR | ‡‡ |
| ◎ | POLYESTER FILM CAPACITOR | ‡‡ |
| ○ | POLYSTYRENE FILM CAPACITOR | ‡‡ |
| Ⓘ | MICA CAPACITOR | ‡‡ |
| Ⓟ | POLYPROPYLENE FILM CAPACITOR | ‡‡ |
| ● | SEMICONDUCTIVE CERAMIC CAPACITOR | ‡‡ |

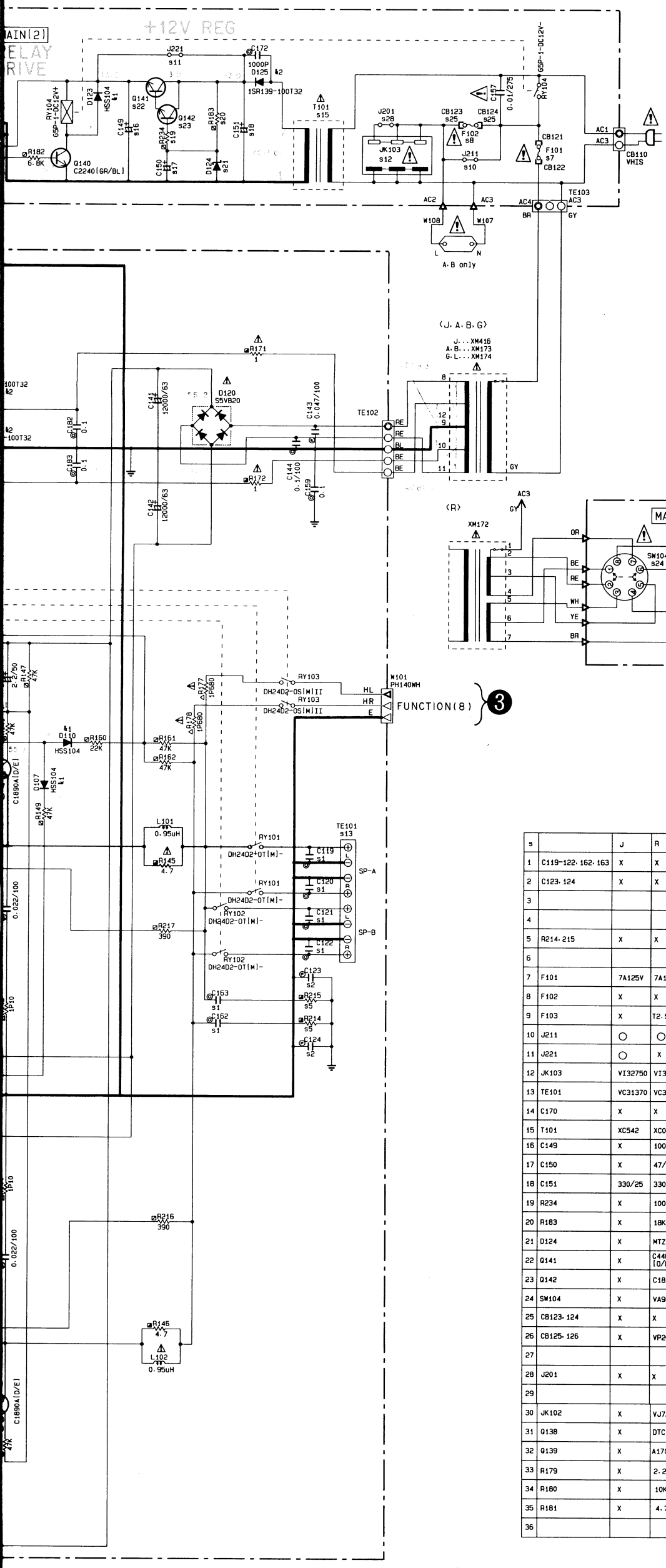
RESISTOR

| REMARKS | PARTS NAME |
|---|---|
| NO MARK | CARBON FILM RESISTOR (P=5) |
| ⊠ | CARBON FILM RESISTOR (P=10) |
| △ | METAL OXIDE FILM RESISTOR |
| ▲ | METAL FILM RESISTOR |
| ⊠ | METAL PLATE RESISTOR |
| ◪ | FIRE PROOF CARBON FILM RESISTOR |
| □ | CEMENT MOLDED RESISTOR |
| ⊘ | SEMI VARIABLE RESISTOR |
| ■ | CHIP RESISTOR |

NOTICE
(J)····· Japanese model
(U)····· U.S.A model
(C)····· Canadian model
(A)····· Australian model
(G)····· European model
(B)····· British model
(R)····· General model
(P)····· RP model

Interchangeable Parts at Manufacture-Stage

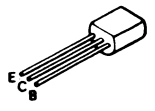
| Mark | Reference Parts Number | Parts Name |
|---|---|---|
| &1 | D101-107. 110. 112. 114. 115 123. 126. 142 | HSS104 1SS133 1SS176 |
| &2 | D116. 119. 125 | 1SR139-100T32 11ES4-TA1 |
| &3 | | |



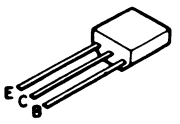

| s | | J | R | A.B | G |
|---|---|---|---|---|---|
| 1 | C119-122. 162. 163 | X | X | 0.01 | 0.01 |
| 2 | C123. 124 | X | X | 0.022/100 | 0.022/100 |
| 3 | | | | | |
| 4 | | | | | |
| 5 | R214. 215 | X | X | 4.7 | 4.7 |
| 6 | | | | | |
| 7 | F101 | 7A125V | 7A125V | T2.5A250V | T2.5A250V |
| 8 | F102 | X | X | X | T2.5A250V |
| 9 | F103 | X | T2.5A250V | X | X |
| 10 | J211 | ○ | ○ | ○ | X |
| 11 | J221 | ○ | X | ○ | ○ |
| 12 | JK103 | VI32750 | VI32750 | X | VP72860 |
| 13 | TE101 | VC31370 | VC31370 | VK50620 | VK50620 |
| 14 | C170 | X | X | 1000P | 1000P |
| 15 | T101 | XC542 | XC082 | XC084 | XC084 |
| 16 | C149 | X | 100/16 | X | X |
| 17 | C150 | X | 47/16 | X | X |
| 18 | C151 | 330/25 | 330/63 | 330/25 | 330/25 |
| 19 | R234 | X | 100 | X | X |
| 20 | R183 | X | 18K | X | X |
| 21 | D124 | X | MTZJ16A | X | X |
| 22 | Q141 | X | C4466 [O/P/Y] | X | X |
| 23 | Q142 | X | C1815[Y] | X | X |
| 24 | SW104 | X | VA96180 | X | X |
| 25 | CB123. 124 | X | X | X | VP20650 |
| 26 | CB125. 126 | X | VP20650 | X | X |
| 27 | | | | | |
| 28 | J201 | X | X | X | ○ |
| 29 | | | | | |
| 30 | JK102 | X | VJ72680 | VJ72680 | VJ72680 |
| 31 | Q138 | X | DTC124ES | DTC124ES | DTC124ES |
| 32 | Q139 | X | A1708 | A1708 | A1708 |
| 33 | R179 | X | 2.2K | 2.2K | 2.2K |
| 34 | R180 | X | 10K | 10K | 10K |
| 35 | R181 | X | 4.7 | 4.7 | 4.7 |
| 36 | | | | | |

**PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.**

2SA893A
2SA970GR
2SA1015Y
2SA1145
2SC1815Y
2SC1890A
2SC2240



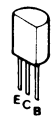

2SD1915F
DTA123ES
DTC124ES
2SC3330




2SC4488
2SA1708 (S, T)



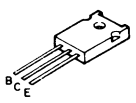

2SC2705 (O, Y)



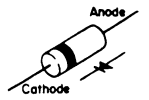

2SA1694 (O, P, Y)
2SC4466 (O, P, Y)
2SC4467 (O, P, Y)



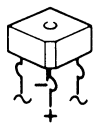

2SA1358
2SC3421




All Diodes




S5VB20




- *All voltages are measured with a 10MΩ/V DC electric volt meter.*
- *Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.*
- *Schematic diagram is subject to change without notice.*

# ■ SCHEMATIC DIAGRAM (Function) AX-590

RESISTOR

| REMARKS | PARTS NAME |
|---|---|
| NO MARK | CARBON FILM RESISTOR (P=5) |
| ◪ | CARBON FILM RESISTOR (P=10) |
| △ | METAL OXIDE FILM RESISTOR |
| ▲ | METAL FILM RESISTOR |
| ⊠ | METAL PLATE RESISTOR |
| ◪ | FIRE PROOF CARBON FILM RESISTOR |
| □ | CEMENT MOLDED RESISTOR |
| ⊘ | SEMI VARIABLE RESISTOR |
| ■ | CHIP RESISTOR |

CAPACITOR

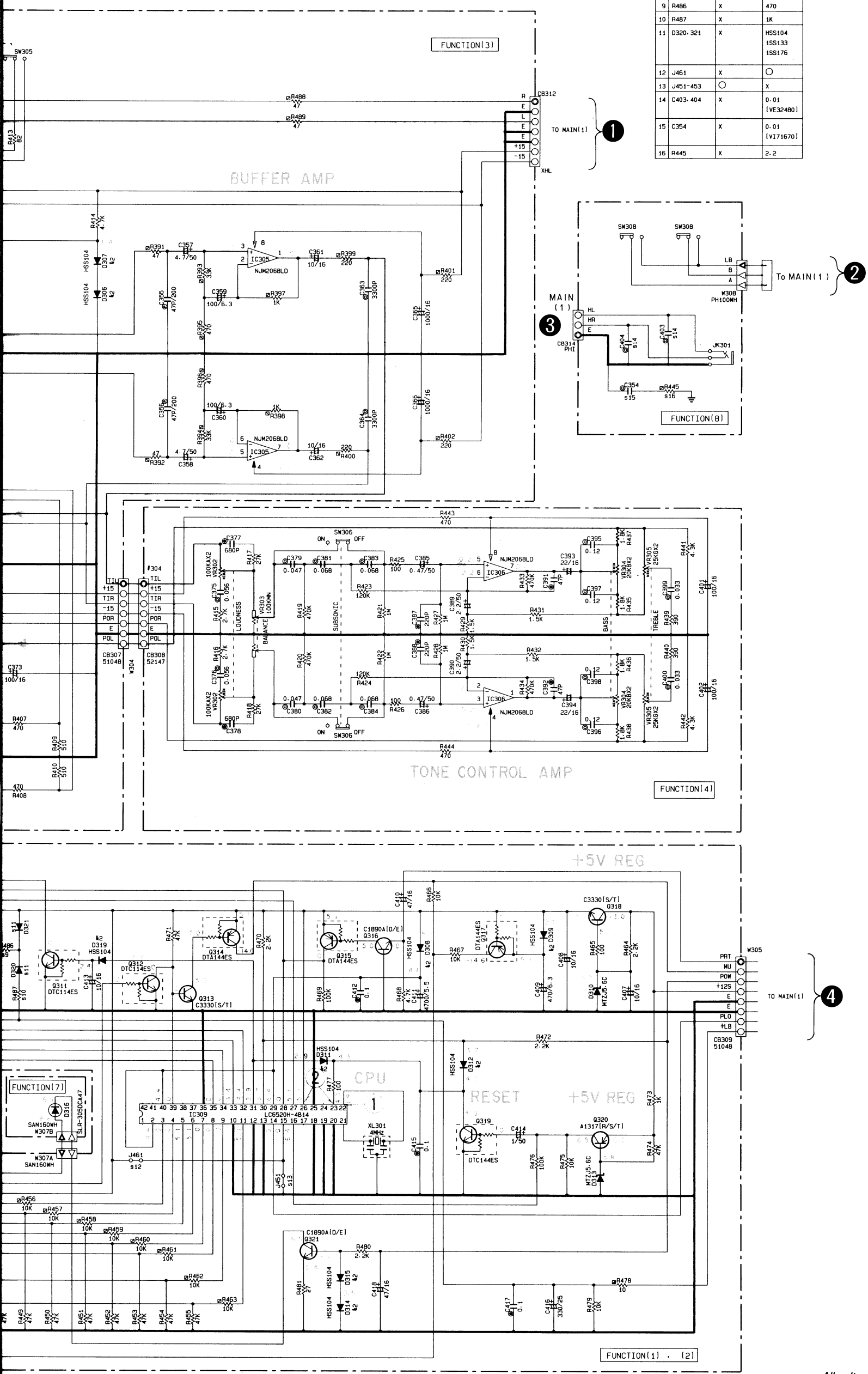
| REMARKS | PARTS NAME |
|---|---|
| NO MARK | ELECTROLYTIC CAPACITOR |
| ⊗ | TANTALUM CAPACITOR |
| NO MARK | CERAMIC CAPACITOR |
| ◉ | CERAMIC TUBULAR CAPACITO |
| ◎ | POLYESTER FILM CAPACITOR |
| ○ | POLYSTYRENE FILM CAPACIT |
| Ⓜ | MICA CAPACITOR |
| Ⓟ | POLYPROPYLENE FILM CAPAC |
| ● | SEMICONDUCTIVE CERAMIC CA |

EQ AMP
MUTING
BUFFER AMP
MUTING
MOTOR DRIVE
FUNCTION(6)
FUNCTION(5)
CD-DIRECT
PURE-DIRECT
MM/MC SELECTOR
REC SELECTOR
INPUT SELECTOR
PHONO
CD
PRE OUT
MAIN IN
TUNER
TAPE1 PB
TAPE1 REC OUT
TAPE2 PB
TAPE2 REC OUT
AUX
IC303 NJM2068LD
IC304 NJM2068LD
IC301 UPC4570HA
IC302 NJM4558L-D
IC307 TA7291S
IC308 TA7291S
SPS-422-1

Interchangeable Parts at Manufacture-Stage

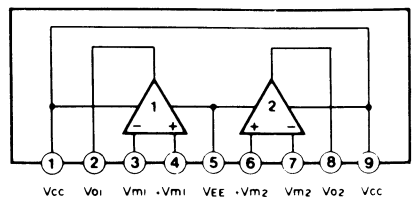
| Mark | Reference Parts Number | Parts Name |
|---|---|---|
| ‡1 | | |
| ‡2 | D301. 302. 306-309. 311<br>312. 314. 315. 319 | HSS104<br>1SS133<br>1SS176 |

| S | | J. A. A | B. G |
|---|---|---|---|
| 1 | L301. 302 | X | 15μH |
| 2 | L303. 304 | X | 220μH |
| 3 | | | |
| 4 | R303. 304 | 10 | 33 |
| 5 | R307. 308 | 33 | 2.2K |
| 6 | C309. 310 | X | 100P |
| 7 | | | |
| 8 | R485 | 1.5K | X |
| 9 | R486 | X | 470 |
| 10 | R487 | X | 1K |
| 11 | D320. 321 | X | HSS104<br>1SS133<br>1SS176 |
| 12 | J461 | X | ○ |
| 13 | J451~453 | ○ | X |
| 14 | C403. 404 | X | 0.01<br>[VE32480] |
| 15 | C354 | X | 0.01<br>[VI71670] |
| 16 | R445 | X | 2.2 |

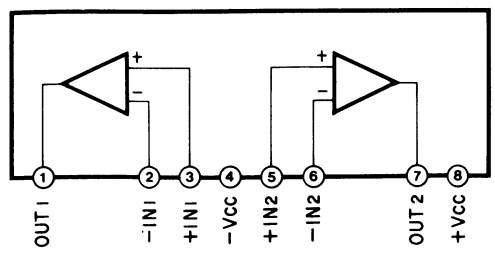



## ■ IC BLOCK

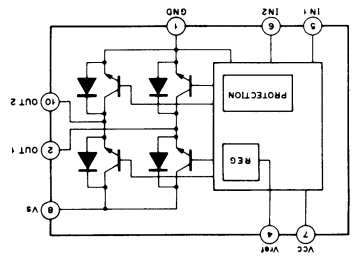
### IC301 : μPC4570HA (Dual OP-amp)



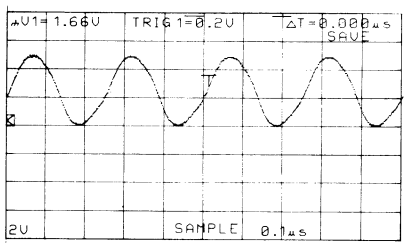

### IC302, 304, 305, 306 : NJM2068LD (Dual OP-amp)



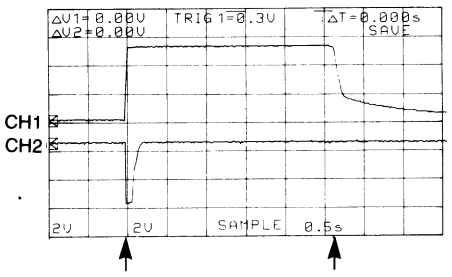

### IC307, 308 : TA7291S (Motor Driver)



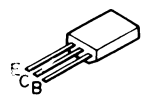
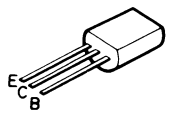
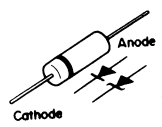
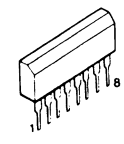
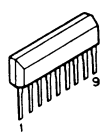
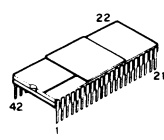

**Point ①** (Pin 22 of IC 309)
V : 2V/div H : 0.1μsec/div
DC range 1 : 1 probe




**Point ②**
(CH1 : Pin 26 of IC 309)
(CH2 : Pin 23 of IC 309)
V : 2V/div H : 0.5sec/div
DC range 1 : 1 probe




**PIN CONNECTION DIAGRAM OF TRANSISTORS, DIODES AND ICS.**

| | |
|---|---|
| 2SC3330 DTA144ES<br>2SD1915 DTC144ES<br>2SA1317 DTC114ES | 2SA970<br>2SC11890 |
|  |  |
| All Diodes | NJM2068LD |
|  |  |
| μPC4570HA<br>TA7291S | LC6520H |
|  |  |

- *All voltages are measured with a 10MΩ/V DC electric volt meter.*
- *Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.*
- *Schematic diagram is subject to change without notice.*

# PARTS LIST

## ■ ELECTRICAL PARTS

**■ WARNING**

Components having special characteristics are marked ⚠ and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the pats No. of the carbon resestors, refer to last page.

**ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :**

| | | | |
|---|---|---|---|
| C.A.EL.CHP | : CHIP ALUMI. ELECTROLYTIC CAP | L.EMIT | : LIGHT EMITTING MODULE |
| C.CE | : CERAMIC CAP | LED.DSPLY | : LED DISPLAY |
| C.CE.ARRAY | : CERAMIC CAP ARRAY | LED.INFRD | : LED, INFRARED |
| C.CE.CHP | : CHIP CERAMIC CAP | MODUL.RF | : MODULATOR, RF |
| C.CE.ML | : MULTILAYER CERAMIC CAP | PHOT.CPL | : PHOTO COUPLER |
| C.CE.M.CHP | : CHIP MULTILAYER CERAMIC CAP | PHOT.INTR | : PHOTO INTERRUPTER |
| C.CE.SAFTY | : RECOGNIZED CERAMIC CAP | PHOT.RFLCT | : PHOTO REFLECTOR |
| C.CE.TUBLR | : CERAMIC TUBULAR CAP | PIN.TEST | : PIN, TEST POINT |
| C.CE.SMI | : SEMI CONDUCTIVE CERAMIC CAP | PLST.RIVET | : PLASTIC RIVET |
| C.EL | : ELECTROLYTIC CAP | R.ARRAY | : RESISTOR ARRAY |
| C.MICA | : MICA CAP | R.CAR | : CARBON RESISTOR |
| C.ML.FLM | : MULTILAYER FILM CAP | R.CAR.CHP | : CHIP RESISTOR |
| C.MP | : METALLIZED PAPER CAP | R.CAR.FP | : FLAME PROOF CARBON RESISTOR |
| C.MYLAR | : MYLAR FILM CAP | R.FUS | : FUSABLE RESISTOR |
| C.MYLAR.ML | : MULTILAYER MYLAR FILM CAP | R.MTL.CHP | : CHIP METAL FILM RESISTOR |
| C.PAPER | : PAPER CAPACITOR | R.MTL.FLM | : METAL FILM RESISTOR |
| C.PLS | : POLYSTYRENE FILM CAP | R.MTL.OXD | : METAL OXIDE FILM RESISTOR |
| C.POL | : POLYESTER FILM CAP | R.MTL.PLAT | : METAL PLATE RESISTOR |
| C.POLY | : POLYETHYLENE FILM CAP | RSNR.CE | : CERAMIC RESONATOR |
| C.PP | : POLYPROPYLENE FILM CAP | RSNR.CRYS | : CRYSTAL RESONATOR |
| C.TNTL | : TANTALUM CAP | R.TW.CEM | : TWIN CEMENT FIXED RESISTOR |
| C.TNTL.CHP | : CHIP TANTALUM CAP | R.WW | : WIRE WOUND RESISTOR |
| C.TRIM | : TRIMMER CAP | SCR.BND.HD | : BIND HEAD B-TITE SCREW |
| CN | : CONNECTOR | SCR.BW.HD | : BW HEAD TAPPING SCREW |
| CN.BS.PIN | : CONNECTOR, BASE PIN | SCR.CUP | : CUP TITE SCREW |
| CN.CANNON | : CONNECTOR, CANNON | SCR.TERM | : SCREW TERMINAL |
| CN.DIN | : CONNECTOR, DIN | SCR.TR | : SCREW, TRANSISTOR |
| CN.FLAT | : CONNECTOR, FLAT CABLE | SUPRT.PCB | : SUPPORT, P.C.B. |
| CN.POST | : CONNECTOR, BASE POST | SURG.PRTCT | : SURGE PROTECTOR |
| COIL.MX.AM | : COIL, AM MIX | SW.TACT | : TACT SWITCH |
| COIL.AT.FM | : COIL, FM ANTENNA | SW.LEAF | : LEAF SWITCH |
| COIL.DT.FM | : COIL, FM DETECT | SW.LEVER | : LEVER SWITCH |
| COIL.MX.FM | : COIL, FM MIX | SW.MICRO | : MICRO SWITCH |
| COIL.OUTPT | : OUTPUT COIL | SW.PUSH | : PUSH SWITCH |
| DIOD.ARRAY | : DIODE ARRAY | SW.RT.ENC | : ROTARY ENCODER |
| DIODE.BRG | : DIODE BRIDGE | SW.RT.MTR | : ROTARY SWITCH WITH MOTOR |
| DIODE.CHP | : CHIP DIODE | SW.RT | : ROTARY SWITCH |
| DIODE.VAR | : VARACTOR DIODE | SW.SLIDE | : SLIDE SWITCH |
| DIOD.Z.CHP | : CHIP ZENER DIODE | TERM.SP | : SPEAKER TERMINAL |
| DIODE.ZENR | : ZENER DIODE | TERM.WRAP | : WRAPPING TERMINAL |
| DSCR.CE | : CERAMIC DISCRIMINATOR | THRMST.CHP | : CHIP THERMISTOR |
| FER.BEAD | : FERRITE BEADS | TR.CHP | : CHIP TRANSISTOR |
| FER.CORE | : FERRITE CORE | TR.DGT | : DIGITAL TRANSISTOR |
| FET.CHP | : CHIP FET | TR.DGT.CHP | : CHIP DIGITAL TRANSISTOR |
| FL.DSPLY | : FLUORESCENT DISPLAY | TRANS | : TRANSFORMER |
| FLTR.CE | : CERAMIC FILTER | TRANS.PULS | : PULSE TRANSFORMER |
| FLTR.COMB | : COMB FILTER MODULE | TRANS.PWR | : POWER TRANSFORMER ASS'y |
| FLTR.LC.RF | : LC FILTER ,EMI | TUNER.AM | : TUNER PACK, AM |
| GND.MTL | : GROUND PLATE | TUNER.FM | : TUNER PACK, FM |
| GND.TERM | : GROUND TERMINAL | TUNER.PK | : FRONT-END TUNER PACK |
| HOLDER.FUS | : FUSE HOLDER | VR | : ROTARY POTENTIOMETER |
| IC.PRTCT | : IC PROTECTOR | VR.MTR | : POTENTIOMETER WITH MOTOR |
| JUMPER.CN | : JUMPER CONNECTOR | VR.SW | : POTENTIOMETER WITH ROTARY SW |
| JUMPER.TST | : JUMPER, TEST POINT | VR.SLIDE | : SLIDE POTENTIOMETER |
| L.DTCT | : LIGHT DETECTING MODULE | VR.TRIM | : TRIMMER POTENTIOMETER |

**Note)** Those parts marked with "#" are not included in the P.C.B. ass'y.

# MAIN P.C.B.

| | Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|---|
| * | | VS972500 | P.C.B. | MAIN(R) | |
| * | | VS972600 | P.C.B. | MAIN(AB) | |
| * | | VS972700 | P.C.B. | MAIN(G) | |
| | CB107 | VB858200 | CN.BS.PIN | 3P | |
| | CB108 | VS839400 | CN | 4P | |
| | CB110 | VG879900 | CN.BS.PIN | 2P | |
| | CB121 | VP206500 | HOLDER.FUS | EYF-52BC | |
| | CB122 | VP206500 | HOLDER.FUS | EYF-52BC | |
| | CB123 | VP206500 | HOLDER.FUS | EYF-52BC(G) | |
| | CB124 | VP206500 | HOLDER.FUS | EYF-52BC(G) | |
| | CB125 | VP206500 | HOLDER.FUS | EYF-52BC(R) | |
| | CB126 | VP206500 | HOLDER.FUS | EYF-52BC(R) | |
| | CB129 | VK025200 | CN.BS.PIN | 8P | |
| | C101 | VE021900 | C.EL | 4.7uF | 100V |
| | C102 | VE021900 | C.EL | 4.7uF | 100V |
| | C103 | VK533800 | C.PP | 47pF | 200V |
| | C104 | VK533800 | C.PP | 47pF | 200V |
| | C105 | VP917800 | C.PP | 1000pF | 100V |
| | C106 | VP917800 | C.PP | 1000pF | 100V |
| Δ | C107 | VK679700 | C.EL | 100uF | 6.3V |
| Δ | C108 | VK679700 | C.EL | 100uF | 6.3V |
| | C109 | FU451150 | C.MICA | 15pF | 500V |
| | C110 | FU451150 | C.MICA | 15pF | 500V |
| | C111 | VK533900 | C.PP | 100pF | 200V |
| | C112 | VK533900 | C.PP | 100pF | 200V |
| | C113 | VK533900 | C.PP | 100pF | 200V |
| | C114 | VK533900 | C.PP | 100pF | 200V |
| Δ | C115 | VE742600 | C.EL | 47uF | 25V |
| Δ | C116 | VE742600 | C.EL | 47uF | 25V |
| | C117 | VP918300 | C.PP | 0.022uF | 100V |
| | C118 | VP918300 | C.PP | 0.022uF | 100V |
| | C119 | Vi716700 | C.MYLAR | 0.01uF | 50V(G) |
| | C119 | Vi716700 | C.MYLAR | 0.01uF | 50V(ABG) |
| | C120 | Vi716700 | C.MYLAR | 0.01uF | 50V(ABG) |
| | C120 | Vi716700 | C.MYLAR | 0.01uF | 50V(G) |
| | C121 | Vi716700 | C.MYLAR | 0.01uF | 50V(ABG) |
| | C121 | Vi716700 | C.MYLAR | 0.01uF | 50V(G) |
| | C122 | Vi716700 | C.MYLAR | 0.01uF | 50V(ABG) |
| | C122 | Vi716700 | C.MYLAR | 0.01uF | 50V(G) |
| | C123 | VK534200 | C.PP | 0.022uF | 100V(G) |
| | C123 | VK534200 | C.PP | 0.022uF | 100V(ABG) |
| | C124 | VK534200 | C.PP | 0.022uF | 100V(G) |
| | C124 | VK534200 | C.PP | 0.022uF | 100V(ABG) |
| | C125 | VG290600 | C.EL | 2.2uF | 50V |
| | C126 | UJ895220 | C.EL | 0.22uF | 100V |
| | C127 | VN283200 | C.EL | 1uF | 50V |
| | C128 | VK534000 | C.PP | 220pF | 200V |
| Δ | C130 | VP918500 | C.EL | 680uF | 63V |
| Δ | C131 | VP918500 | C.EL | 680uF | 63V |
| | C132 | VG287800 | C.EL | 330uF | 16V |
| | C133 | VG287800 | C.EL | 330uF | 16V |
| | C134 | VG291200 | C.EL | 47uF | 50V |
| | C135 | VG291200 | C.EL | 47uF | 50V |
| | C136 | VF760000 | C.EL | 100uF | 10V |

| | Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|---|
| | C137 | VK679700 | C.EL | 100uF | 6.3V |
| Δ | C138 | VG290500 | C.EL | 1uF | 50V |
| | C139 | VG289400 | C.EL | 3300uF | 25V |
| | C140 | VG289400 | C.EL | 3300uF | 25V |
| | C141 | VK574600 | C.EL | 12000uF | 63V |
| | C142 | VK574600 | C.EL | 12000uF | 63V |
| | C143 | VK534400 | C.PP | 0.047uF | 100V |
| | C144 | VR325400 | C.MYLAR | 0.1uF | 100V |
| | C149 | VG290900 | C.EL | 10uF | 50V(R) |
| | C150 | VG290900 | C.EL | 10uF | 50V(R) |
| | C151 | VG289100 | C.EL | 330uF | 25V |
| | C151 | VG289100 | C.EL | 330uF | 25V(ABG) |
| | C151 | VK699400 | C.EL | 330uF | 63V(R) |
| | C157 | VS741700 | C.CE.SAFTY | 0.01uF | 275V |
| | C159 | VE326000 | C.MYLAR.ML | 0.1uF | 50V |
| | C162 | Vi716700 | C.MYLAR | 0.01uF | 50V(ABG) |
| | C162 | Vi716700 | C.MYLAR | 0.01uF | 50V(G) |
| | C163 | Vi716700 | C.MYLAR | 0.01uF | 50V(G) |
| | C163 | Vi716700 | C.MYLAR | 0.01uF | 50V(ABG) |
| | C164 | VK533900 | C.PP | 100pF | 200V |
| | C165 | VK533900 | C.PP | 100pF | 200V |
| | C166 | VK534000 | C.PP | 220pF | 200V |
| | C167 | VK534000 | C.PP | 220pF | 200V |
| | C168 | Vi716700 | C.MYLAR | 0.01uF | 50V |
| | C169 | Vi716700 | C.MYLAR | 0.01uF | 50V |
| | C170 | FG213100 | C.CE | 1000pF | 50V(G) |
| | C170 | FG213100 | C.CE | 1000pF | 50V(ABG) |
| | C172 | UA253100 | C.MYLAR | 1000pF | 50V |
| | C182 | VE326000 | C.MYLAR.ML | 0.1uF | 50V |
| | C183 | VE326000 | C.MYLAR.ML | 0.1uF | 50V |
| | C202 | VE326200 | C.MYLAR.ML | 0.15uF | 50V |
| | C203 | VE326200 | C.MYLAR.ML | 0.15uF | 50V |
| | D101 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D102 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D103 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D104 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D105 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D106 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D107 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D108 | VG441000 | DIODE.ZENR | MTZJ16A | 16V |
| | D109 | VG441000 | DIODE.ZENR | MTZJ16A | 16V |
| | D110 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D111 | VG435800 | DIODE.ZENR | MTZJ3.0A | 3.0V |
| | D112 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D113 | VN008700 | DIODE | 1SS270A | |
| | D114 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D115 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| Δ | D116 | VH770800 | DIODE | 1SR139-100 | |
| Δ | D117 | VH770800 | DIODE | 1SR139-100 | |
| Δ | D118 | VH770800 | DIODE | 1SR139-100 | |
| Δ | D119 | VH770800 | DIODE | 1SR139-100 | |
| Δ | D120 | VM702000 | DIODE.BRG | S5VB20 | 3.5A 200V |
| | D123 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| | D124 | VG440300 | DIODE.ZENR | MTZJ12C | 12V(R) |

* New Parts

# MAIN P.C.B.

| Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|
| D125 | VH770800 | DIODE | 1SR139-100 | |
| D126 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| D133 | VN008700 | DIODE | 1SS270A | |
| D134 | VN008700 | DIODE | 1SS270A | |
| D142 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| D143 | VG436700 | DIODE. ZENR | MTZJ4.3A 4.3V | |
| △ F101 | KB000690 | FUSE | T2.5A 250V(ABG) | |
| △ F101 | KB000690 | FUSE | T2.5A 250V(G) | |
| △ F101 | VP909900 | FUSE | T7.0A 125V(R) | |
| △ F102 | KB000690 | FUSE | T2.5A 250V(G) | |
| △ F103 | KB000690 | FUSE | T2.5A 250V(R) | |
| △ FR101 | VK188200 | R.FUS | 220Ω 1/4W | |
| △ FR102 | VK188200 | R.FUS | 220Ω 1/4W | |
| JK102 | VJ726800 | JACK.MNI | | |
| JK102 | VJ726800 | JACK.MNI | (G) | |
| JK103 | Vi327500 | OUTLET.AC | 3P(R) | |
| JK103 | VP728600 | OUTLET.AC | 3P(G) | |
| L101 | VR906600 | COIL | 0.95uH | |
| L102 | VR906600 | COIL | 0.95uH | |
| Q101 | VK432900 | TR | 2SD1915F S,T | |
| Q102 | VK432900 | TR | 2SD1915F S,T | |
| △ Q103 | iA097000 | TR | 2SA970 GR,BL | |
| △ Q104 | iA097000 | TR | 2SA970 GR,BL | |
| △ Q105 | iA097000 | TR | 2SA970 GR,BL | |
| △ Q106 | iA097000 | TR | 2SA970 GR,BL | |
| △ Q107 | iC1815C0 | TR | 2SC1815 Y | |
| △ Q108 | iC1815C0 | TR | 2SC1815 Y | |
| △ Q109 | iC1815C0 | TR | 2SC1815 Y | |
| △ Q110 | iC1815C0 | TR | 2SC1815 Y | |
| △ Q111 | VE198700 | TR | 2SA1145 O,Y | |
| △ Q112 | VE198700 | TR | 2SA1145 O,Y | |
| △ Q113 | iA101521 | TR | 2SA1015 Y | |
| △ Q114 | iA101521 | TR | 2SA1015 Y | |
| △ Q115 | VE198800 | TR | 2SC2705 O,Y | |
| △ Q116 | VE198800 | TR | 2SC2705 O,Y | |
| △ Q117 | VC218900 | TR | 2SC3330 R,S,T | |
| △ Q118 | VC218900 | TR | 2SC3330 R,S,T | |
| △ Q119 | iX603580 | TR | 2SA1358 | |
| △ Q119 | iX603590 | TR | 2SC3421 | |
| △ Q120 | iX603580 | TR | 2SA1358 | |
| △ Q120 | iX603590 | TR | 2SC3421 | |
| △ # Q123B | iX615750 | TR | 2SA1694 O,P,Y | |
| △ # Q123A | iX615760 | TR | 2SC4467 O,P,Y | |
| △ # Q124B | iX615750 | TR | 2SA1694 O,P,Y | |
| △ # Q124A | iX615760 | TR | 2SC4467 O,P,Y | |
| Q127 | VP883100 | TR | 2SC1890A D,E | |
| △ Q128 | VP883100 | TR | 2SC1890A D,E | |
| Q129 | VP883000 | TR | 2SA893A D,E | |
| △ Q130 | VP872700 | TR | 2SC4488 S,T | |
| △ Q131 | VP872600 | TR | 2SA1708 S,T | |
| Q132 | iC1815C0 | TR | 2SC1815 Y | |
| Q133 | iA101521 | TR | 2SA1015 Y | |
| Q134 | VP883100 | TR | 2SC1890A D,E | |
| △ Q135 | VF325300 | TR.DGT | DTA123ESTP | |

| Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|
| △ Q136 | VF325300 | TR.DGT | DTA123ESTP | |
| △ Q137 | VF325300 | TR.DGT | DTA123ESTP | |
| Q138 | VF331200 | TR.DGT | DTC124ES | |
| Q138 | VF331200 | TR.DGT | DTC124ES(G) | |
| △ Q139 | VP872600 | TR | 2SA1708 S,T(G) | |
| Q139 | VP872600 | TR | 2SA1708 S,T | |
| Q140 | iC224030 | TR | 2SC2240 GR,BL | |
| Q141 | VP768300 | TR | 2SC4466 O,P,Y(R) | |
| Q142 | iC1815C0 | TR | 2SC1815 Y(R) | |
| △ # Q150B | iX615750 | TR | 2SA1694 O,P,Y | |
| △ # Q150A | iX615760 | TR | 2SC4467 O,P,Y | |
| △ # Q151B | iX615750 | TR | 2SA1694 O,P,Y | |
| △ # Q151A | iX615760 | TR | 2SC4467 O,P,Y | |
| △ Q152 | VP883000 | TR | 2SA893A D,E | |
| △ Q153 | VP883000 | TR | 2SA893A D,E | |
| △ R125 | HV455100 | R.CAR.FP | 100Ω 1/4W | |
| △ R126 | HV455100 | R.CAR.FP | 100Ω 1/4W | |
| △ R127 | HL315100 | R.MTL.OXD | 100Ω 1W | |
| △ R128 | HL315100 | R.MTL.OXD | 100Ω 1W | |
| △ R129 | HV456270 | R.CAR.FP | 2.7KΩ 1/4W | |
| △ R130 | HV456270 | R.CAR.FP | 2.7KΩ 1/4W | |
| △ R131 | HV456100 | R.CAR.FP | 1KΩ 1/4W | |
| △ R132 | HV456100 | R.CAR.FP | 1KΩ 1/4W | |
| △ R135 | VJ695400 | R.WW | 0.22Ωx2 3W | |
| △ R136 | VJ695400 | R.WW | 0.22Ωx2 3W | |
| △ R143 | HL314100 | R.MTL.OXD | 10Ω 1W | |
| △ R144 | HL314100 | R.MTL.OXD | 10Ω 1W | |
| △ R145 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| R146 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R151 | HL314470 | R.MTL.OXD | 47Ω 1W | |
| △ R152 | HL314470 | R.MTL.OXD | 47Ω 1W | |
| △ R154 | HL315560 | R.MTL.OXD | 560Ω 1W | |
| △ R167 | HL315560 | R.MTL.OXD | 560Ω 1W | |
| △ R168 | HL315560 | R.MTL.OXD | 560Ω 1W | |
| △ R171 | HV453100 | R.CAR.FP | 1Ω 1/4W | |
| △ R172 | HV453100 | R.CAR.FP | 1Ω 1/4W | |
| △ R177 | HL315680 | R.MTL.OXD | 680Ω 1W | |
| △ R178 | HL315680 | R.MTL.OXD | 680Ω 1W | |
| R181 | HV453470 | R.CAR.FP | 4.7Ω 1/4W(G) | |
| R181 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R203 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R204 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R205 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R206 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| R214 | VP939700 | R.MTL.FLM | 4.7Ω 1W(G) | |
| R214 | VP939700 | R.MTL.FLM | 4.7Ω 1W(ABG) | |
| R215 | VP939700 | R.MTL.FLM | 4.7Ω 1W(G) | |
| R215 | VP939700 | R.MTL.FLM | 4.7Ω 1W(ABG) | |
| △ R243 | HL315560 | R.MTL.OXD | 560Ω 1W | |
| △ R244 | HL315560 | R.MTL.OXD | 560Ω 1W | |
| △ R245 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R246 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R247 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |
| △ R248 | HV453470 | R.CAR.FP | 4.7Ω 1/4W | |

* New Parts

# MAIN & FUNCTION P.C.B.

| | Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|---|
| △ | R249 | VJ695400 | R.WW | 0.22Ω x2 | 3W |
| △ | R250 | VJ695400 | R.WW | 0.22Ω x2 | 3W |
| | R286 | HV455270 | R.CAR.FP | 270Ω | 1/4W |
| | R287 | HV455270 | R.CAR.FP | 270Ω | 1/4W |
| | R288 | HV455680 | R.CAR.FP | 680Ω | 1/4W |
| | R289 | HV455680 | R.CAR.FP | 680Ω | 1/4W |
| △ | RY101 | VK438300 | RELAY | DH24D2-0TM-Ⅱ | |
| △ | RY102 | VK438300 | RELAY | DH24D2-0TM-Ⅱ | |
| △ * | RY103 | VT561500 | RELAY | DC JW2ASN-DC24V | |
| | RY104 | VH230800 | RELAY | G5P-1-DC12V | |
| | SW104 | VA961800 | VOLT.SELCT | ESE-37247-F(R) | |
| △ | T101 | XC082A00 | TRANS.PWR | (R) | |
| △ | T101 | XC084A00 | TRANS.PWR | (G) | |
| △ | T101 | XC084A00 | TRANS.PWR | (ABG) | |
| | TE101 | VC313700 | TERM.SP | 8P(JR) | |
| | TE101 | VK506200 | TERM.SP | 8P(G) | |
| | TE101 | VK506200 | TERM.SP | 8P(ABG) | |
| | TE102 | LA002340 | TERM.WRAP | 5P | |
| | TE103 | LA002320 | TERM.WRAP | 3P | |
| | | VJ828000 | PIN | IMSA-6024-03E | |
| | | BB071360 | SCR.TERM | 8.3x13 | |
| | | BB070700 | GND.MTL | | |
| * | | VS972200 | P.C.B. | FUNCTION(JRA) | |
| * | | VS972300 | P.C.B. | FUNCTION(BG) | |
| | CB301 | Vi878600 | CN.BS.PIN | 8P | |
| | CB302 | VK025200 | CN.BS.PIN | 8P | |
| | CB303 | Vi878500 | CN.BS.PIN | 7P | |
| | CB304 | VK025100 | CN.BS.PIN | 7P | |
| | CB305 | VK025100 | CN.BS.PIN | 7P | |
| | CB306 | Vi878500 | CN.BS.PIN | 7P | |
| | CB307 | Vi878500 | CN.BS.PIN | 7P | |
| | CB308 | VK025100 | CN.BS.PIN | 7P | |
| | CB309 | Vi878600 | CN.BS.PIN | 8P | |
| | CB310 | VR357800 | CN.BS.PIN | 7P | |
| | CB311 | VR361400 | CN.BS.PIN | 7P | |
| | CB312 | LB919070 | CN.BS.PIN | 7P | |
| | CB313 | VD004600 | CN.BS.PIN | 3P | |
| | CB314 | VD004600 | CN.BS.PIN | 3P | |
| | C303 | Vi716700 | C.MYLAR | 0.01uF | 50V |
| | C304 | Vi716700 | C.MYLAR | 0.01uF | 50V |
| | C305 | VG290300 | C.EL | 0.47uF | 50V |
| | C306 | VG290300 | C.EL | 0.47uF | 50V |
| | C307 | VQ462600 | C.MYLAR | 220pF | 50V |
| | C308 | VQ462600 | C.MYLAR | 220pF | 50V |
| | C309 | UA652100 | C.MYLAR | 100pF | 50V(BG) |
| | C310 | UA652100 | C.MYLAR | 100pF | 50V(BG) |
| | C311 | UA653330 | C.MYLAR | 3300pF | 50V |
| | C312 | UA653330 | C.MYLAR | 3300pF | 50V |
| | C313 | Vi460900 | C.EL | 2200uF | 6.3V |
| | C314 | Vi460900 | C.EL | 2200uF | 6.3V |
| | C315 | UA654330 | C.MYLAR | 0.033uF | 50V |
| | C316 | UA654330 | C.MYLAR | 0.033uF | 50V |
| | C317 | UA653910 | C.MYLAR | 9100pF | 50V |
| | C318 | UA653910 | C.MYLAR | 9100pF | 50V |
| | C319 | VG290900 | C.EL | 10uF | 50V |
| | C320 | VG290900 | C.EL | 10uF | 50V |
| | C321 | Vi715900 | C.MYLAR | 2200pF | 50V |
| | C322 | Vi715900 | C.MYLAR | 2200pF | 50V |
| | C323 | VG287800 | C.EL | 330uF | 16V |
| | C324 | VG287800 | C.EL | 330uF | 16V |
| | C325 | VG291000 | C.EL | 22uF | 50V |
| | C326 | VE326000 | C.MYLAR.ML | 0.1uF | 50V |
| | C327 | VK534000 | C.PP | 220pF | 200V |
| | C328 | VK534000 | C.PP | 220pF | 200V |
| | C329 | VE021900 | C.EL | 4.7uF | 100V |
| | C330 | VE021900 | C.EL | 4.7uF | 100V |
| | C331 | VQ082700 | C.EL | 10uF | 16V |
| | C332 | VQ082700 | C.EL | 10uF | 16V |
| | C333 | Vi715900 | C.MYLAR | 2200pF | 50V |
| | C334 | Vi715900 | C.MYLAR | 2200pF | 50V |
| | C335 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C336 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C337 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C338 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C339 | UA652470 | C.MYLAR | 470pF | 50V |
| | C340 | UA652470 | C.MYLAR | 470pF | 50V |
| | C341 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C342 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C343 | VG722100 | C.EL | 1uF | 50V |
| | C344 | VE326000 | C.MYLAR.ML | 0.1uF | 50V |
| | C345 | UA652100 | C.MYLAR | 100pF | 50V |
| | C346 | UA652100 | C.MYLAR | 100pF | 50V |
| | C347 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C348 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C349 | UA652100 | C.MYLAR | 100pF | 50V |
| | C350 | UA652100 | C.MYLAR | 100pF | 50V |
| | C351 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C352 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| | C353 | VE326000 | C.MYLAR.ML | 0.1uF | 50V |
| | C354 | Vi716700 | C.MYLAR | 0.01uF | 50V(BG) |
| | C355 | VK533800 | C.PP | 47pF | 200V |
| | C356 | VK533800 | C.PP | 47pF | 200V |
| | C357 | VE021900 | C.EL | 4.7uF | 100V |
| | C358 | VE021900 | C.EL | 4.7uF | 100V |
| | C359 | VF760000 | C.EL | 100uF | 10V |
| | C360 | VF760000 | C.EL | 100uF | 10V |
| | C361 | VQ082700 | C.EL | 10uF | 16V |
| | C362 | VQ082700 | C.EL | 10uF | 16V |
| | C363 | UA653330 | C.MYLAR | 3300pF | 50V |
| | C364 | UA653330 | C.MYLAR | 3300pF | 50V |
| | C365 | VG288000 | C.EL | 1000uF | 16V |
| | C366 | VG288000 | C.EL | 1000uF | 16V |
| | C367 | UA653100 | C.MYLAR | 1000pF | 50V |
| | C368 | UA653100 | C.MYLAR | 1000pF | 50V |
| | C369 | VG290500 | C.EL | 1uF | 50V |

* New Parts

## FUNCTION P.C.B.

| Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|
| C370 | VG290500 | C.EL | 1uF | 50V |
| C371 | VG291200 | C.EL | 47uF | 50V |
| C372 | VG291200 | C.EL | 47uF | 50V |
| C373 | VG288900 | C.EL | 100uF | 25V |
| C374 | VG288900 | C.EL | 100uF | 25V |
| C375 | UA654560 | C.MYLAR | 0.056uF | 50V |
| C376 | UA654560 | C.MYLAR | 0.056uF | 50V |
| C377 | VG278900 | C.CE.TUBLR | 680pF | 50V |
| C378 | VG278900 | C.CE.TUBLR | 680pF | 50V |
| C379 | UA654470 | C.MYLAR | 0.047uF | 50V |
| C380 | UA654470 | C.MYLAR | 0.047uF | 50V |
| C381 | VE325800 | C.POL.MLT | 0.068uF | 50V |
| C382 | VE325800 | C.POL.MLT | 0.068uF | 50V |
| C383 | VE325800 | C.POL.MLT | 0.068uF | 50V |
| C384 | VE325800 | C.POL.MLT | 0.068uF | 50V |
| C385 | VG290300 | C.EL | 0.47uF | 50V |
| C386 | VG290300 | C.EL | 0.47uF | 50V |
| C387 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| C388 | VG278400 | C.CE.TUBLR | 220pF | 50V |
| C389 | VG290600 | C.EL | 2.2uF | 50V |
| C390 | VG290600 | C.EL | 2.2uF | 50V |
| C391 | VF466700 | C.CE.TUBLR | 47pF | 50V |
| C392 | VF466700 | C.CE.TUBLR | 47pF | 50V |
| C393 | VG291000 | C.EL | 22uF | 50V |
| C394 | VG291000 | C.EL | 22uF | 50V |
| C395 | UA655120 | C.MYLAR | 0.12uF | 50V |
| C396 | UA655120 | C.MYLAR | 0.12uF | 50V |
| C397 | UA655120 | C.MYLAR | 0.12uF | 50V |
| C398 | UA655120 | C.MYLAR | 0.12uF | 50V |
| C399 | UA654330 | C.MYLAR | 0.033uF | 50V |
| C400 | UA654330 | C.MYLAR | 0.033uF | 50V |
| C401 | VG288900 | C.EL | 100uF | 25V |
| C402 | VG288900 | C.EL | 100uF | 25V |
| C403 | VE324800 | C.MYLAR.ML | 0.01uF | 50V(BG) |
| C404 | VE324800 | C.MYLAR.ML | 0.01uF | 50V(BG) |
| C405 | VF760000 | C.EL | 100uF | 10V |
| C406 | VF760000 | C.EL | 100uF | 10V |
| C407 | VG290900 | C.EL | 10uF | 50V |
| C408 | VG290900 | C.EL | 10uF | 50V |
| C409 | VG287100 | C.EL | 470uF | 10V |
| C410 | VG291200 | C.EL | 47uF | 50V |
| C411 | VF992600 | C.EL | 4700uF | 5.5V |
| C412 | VH053100 | C.CE.TUBLR | 0.1uF | 50V |
| C413 | VG290900 | C.EL | 10uF | 50V |
| C414 | VG290500 | C.EL | 1uF | 50V |
| C415 | VH053100 | C.CE.TUBLR | 0.1uF | 50V |
| C416 | VG289100 | C.EL | 330uF | 25V |
| C417 | VH053100 | C.CE.TUBLR | 0.1uF | 50V |
| C418 | VG291200 | C.EL | 47uF | 50V |
| C419 | VE324800 | C.MYLAR.ML | 0.01uF | 50V |
| C420 | UM049220 | C.EL | 2200uF | 16V |
| C421 | UM049220 | C.EL | 2200uF | 16V |
| D301 | VD631600 | DIODE | 1SS133,176,HSS104 | |
| D302 | VD631600 | DIODE | 1SS133,176,HSS104 | |

| Schm Ref. | PART NO. | Description | |
|---|---|---|---|
| D303 | VG437800 | DIODE.ZENR | MTZJ5.6C 5.6V |
| D304 | VG435800 | DIODE.ZENR | MTZJ3.0A 3.0V |
| D305 | VG436700 | DIODE.ZENR | MTZJ4.3A 4.3V |
| D306 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D307 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D308 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D309 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D310 | VG437800 | DIODE.ZENR | MTZJ5.6C 5.6V |
| D311 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D312 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D313 | VG437800 | DIODE.ZENR | MTZJ5.6C 5.6V |
| D314 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D315 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D316 | VP593800 | LED(or) | SLR-305DCA47 |
| D317 | VP593800 | LED(or) | SLR-305DCA47 |
| D318 | VP593800 | LED(or) | SLR-305DCA47 |
| D319 | VD631600 | DIODE | 1SS133,176,HSS104 |
| D320 | VD631600 | DIODE | 1SS133,176,(BG) |
| D321 | VD631600 | DIODE | 1SS133,176,(BG) |
| D322 | VP594000 | LED(re) | SLR-305VCA47 |
| IC301 | XB247301 | IC | uPC4570HA |
| IC302 | XQ212A00 | IC | NJM4558LD |
| IC303 | XM356A00 | IC | NJM2068LD |
| IC304 | XM356A00 | IC | NJM2068LD |
| IC305 | XM356A00 | IC | NJM2068LD |
| IC306 | XM356A00 | IC | NJM2068LD |
| IC307 | XF557A00 | IC | TA7291S |
| IC308 | XF557A00 | IC | TA7291S |
| IC309 | XM088B00 | IC | LC6520H-4B14 |
| JK301 | VS899700 | JACK.PHONE | JY-6317-02-030 |
| L301 | VF541100 | COIL | 15uH(BG) |
| L302 | VF541100 | COIL | 15uH(BG) |
| L303 | VB056900 | COIL | 220uH(BG) |
| L304 | VB056900 | COIL | 220uH(BG) |
| PJ301 | VR765100 | JACK.PIN | 2P |
| PJ302 | VF645900 | JACK.PIN | 2P |
| PJ303 | VJ794600 | JACK.PIN | 6P |
| PJ304 | VT029000 | JACK.PIN | 4P |
| PJ305 | VJ794600 | JACK.PIN | 6P |
| Q301 | iA097000 | TR | 2SA970 GR,BL |
| Q302 | iA097000 | TR | 2SA970 GR,BL |
| Q303 | iA097000 | TR | 2SA970 GR,BL |
| Q304 | iA097000 | TR | 2SA970 GR,BL |
| Q305 | VK432900 | TR | 2SD1915F S,T |
| Q306 | VK432900 | TR | 2SD1915F S,T |
| Q307 | VK432900 | TR | 2SD1915F S,T |
| Q308 | VK432900 | TR | 2SD1915F S,T |
| Q309 | VG721700 | TR.DGT | DTA144ES |
| Q310 | VD678700 | TR.DGT | DTC114ES |
| Q311 | VD678700 | TR.DGT | DTC114ES |
| Q312 | VD678700 | TR.DGT | DTC114ES |
| Q313 | VC218900 | TR | 2SC3330 R,S,T |
| Q314 | VG721700 | TR.DGT | DTA144ES |
| Q315 | VG721700 | TR.DGT | DTA144ES |

* New Parts

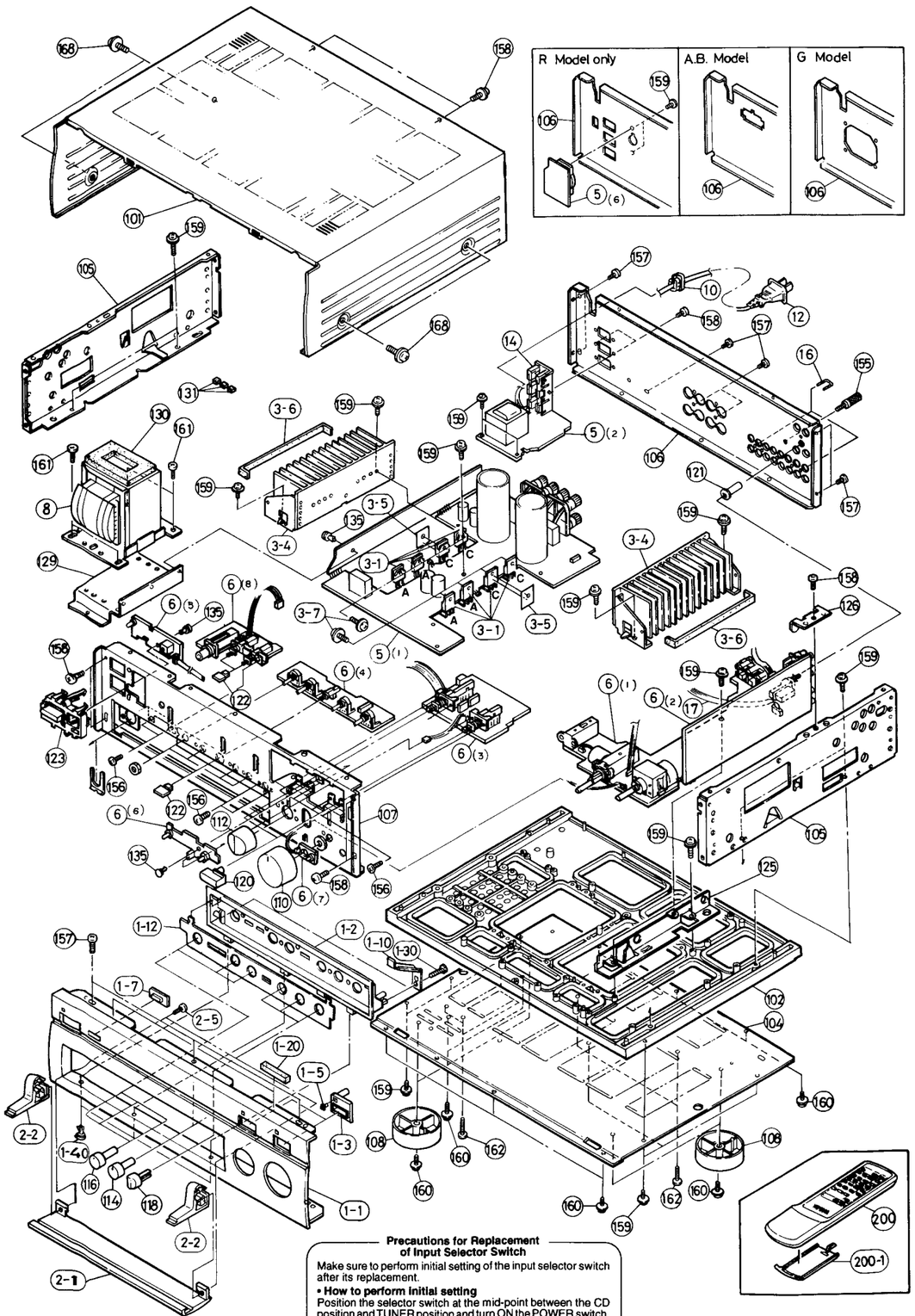


## FUNCTION P.C.B.

| Schm Ref. | PART NO. | Description | | |
|---|---|---|---|---|
| Q316 | VP883100 | TR | 2SC1890A D,E | |
| Q317 | VG721700 | TR.DGT | DTA144ES | |
| Q318 | VC218900 | TR | 2SC3330 R,S,T | |
| Q319 | VG722000 | TR.DGT | DTC144ES | |
| Q320 | VC218700 | TR | 2SA1317 R,S,T | |
| Q321 | VP883100 | TR | 2SC1890A D,E | |
| R358 | HL314470 | R.MTL.OXD | 47Ω | 1W |
| R359 | HL314470 | R.MTL.OXD | 47Ω | 1W |
| R478 | HV454100 | R.CAR.FP | 10Ω | 1/4W |
| SW301 | VK333500 | SW.PUSH | SPUN19 | |
| * SW302 | VS892300 | SW.RT | SRBAA46 | |
| SW303 | VT021200 | SW.RT | RS003-A046BHN-20F4 | |
| SW304 | VP870900 | SW.PUSH | SPUL12 | |
| SW305 | VP870800 | SW.PUSH | SPUL12 | |
| SW306 | VJ850300 | SW.PUSH | PSEOYP-CF2KX | |
| SW307 | VG392900 | SW.TACT | SKHVAA | |
| SW308 | VJ850200 | SW.PUSH | PSE021A2KP 2 | |
| TE301 | LA002110 | TERM.WRAP | 2P | |
| TE302 | LA002110 | TERM.WRAP | 2P | |
| U301 | VR860700 | L.DTCT | SPS-422-1 | |
| * VR301 | VS405800 | VR | Y100KΩ | |
| VR302 | VP700700 | VR | A100KΩ | |
| VR303 | VP742000 | VR | MN50KΩ | |
| VR304 | VP741800 | VR | B20KΩ | |
| VR305 | VP741900 | VR | G25KΩ | |
| W301 | VR759300 | CN.FLAT | 8P 200mm | |
| W305 | VR759300 | CN.FLAT | 8P 200mm | |
| XL301 | VB759100 | RSNR.CE | 4MHz | |
| | VJ828000 | PIN | IMSA-6024-03E | |
| | BB071360 | SCR.TERM | 8.3x13(BG) | |

* New Parts

## ■ EXPLODED VIEW AX-590






AX-590

## ■ MECHANICAL PARTS Note) ø : Diameter

| Ref. No. | PART NO. | Description | | Remarks | Markets |
|---|---|---|---|---|---|
| * | 1- 1 VS359300 | FRONT PANEL BL | | BL | |
| * | 1- 1 VS359400 | FRONT PANEL TI | | TI | |
| * | 1- 2 VS363000 | SUB PANEL | | BL | |
| * | 1- 2 VS363100 | SUB PANEL | | TI | |
| | 1- 3 VH816700 | BUTTON GUIDE | 10x25 | | |
| | 1- 3 VH816800 | BUTTON GUIDE | 10x25 | | |
| | 1- 5 VH897700 | LENS | 2.2Lx2.2 | | |
| | 1- 7 VH897500 | LENS | | | |
| * | 1-10 VS586100 | SPRING | HINGE | | |
| * | 1-12 VS363400 | PLATE, SP | | BL | |
| * | 1-12 VS363500 | PLATE, SP | | TI | |
| | 1-20 VQ122400 | CUSHION, TOP | | | |
| | 1-30 EX600310 | BIND HEAD P-TITE SCREW | 3x8 FCRM3-BL | | |
| | 1-40 VQ368600 | PUSH RIVET | P3555-B | | |
| * | 2- 1 VS360100 | PANEL, LID | | BL | |
| * | 2- 1 VS360200 | PANEL, LID | | TI | |
| * | 2- 2 VS585900 | HINGE, LID | | BL | |
| * | 2- 2 VS586000 | HINGE, LID | | TI | |
| | 2- 5 EX601590 | BIND HEAD P-TITE SCREW | 2.6x8 FCRM3-BL | | |
| △ # | 3- 1 iX615750 | TRANSISTOR | 2SA1694 O,P,Y | Q123B,Q124B, | |
| △ # | 3- 1 iX615750 | TRANSISTOR | 2SA1694 O,P,Y | Q150B,Q151B | |
| △ # | 3- 1 iX615760 | TRANSISTOR | 2SC4467 O,P,Y | Q123A,Q124A, | |
| △ # | 3- 1 iX615760 | TRANSISTOR | 2SC4467 O,P,Y | Q150A,Q151A | |
| | 3- 4 VP492400 | HEAT SINK ASS'Y | | | |
| | 3- 5 VK195900 | SHEET | 19x24 | | |
| | 3- 6 VP922500 | DAMPER | 2x10x170 | | |
| | 3- 7 VK173200 | SCREW, TRANSISTOR | 3x15 SP FCM3 | | |
| * | 5 VS972500 | P.C.B. ASS'Y | MAIN | | (R) |
| * | 5 VS972600 | P.C.B. ASS'Y | MAIN | | (AB) |
| * | 5 VS972700 | P.C.B. ASS'Y | MAIN | | (G) |
| * | 6 VS972200 | P.C.B. ASS'Y | FUNCTION | | (RA) |
| * | 6 VS972300 | P.C.B. ASS'Y | FUNCTION | | (BG) |
| △ | 8 XM172A00 | POWER TRANSFORMER | | | (R) |
| △ | 8 XM173A00 | POWER TRANSFORMER | | | (AB) |
| △ | 8 XM174A00 | POWER TRANSFORMER | | | (G) |
| | 10 VN158600 | CORD STOPPER | No.2104 | | |
| △ | 12 VQ508500 | POWER CORD ASS'Y | | | (R) |
| △ | 12 VQ508600 | POWER CORD ASS'Y | | | (A) |
| △ * | 12 VS168400 | POWER CORD ASS'Y | | | (G) |
| △ * | 12 VS680700 | POWER CORD ASS'Y | | | (B) |
| △ | 14 VJ775000 | AC OUTLET | 2P | | (B) |
| △ | 14 VP418700 | AC OUTLET | 2P | | (A) |
| | 16 VQ194100 | SHORT PLUG | CNT31-0 | | |
| * | 17 VT020000 | CONNECTOR, FLAT CABLE | 7P 400mm | | |
| * | 101 VS001200 | TOP COVER | | BL | |
| * | 101 VS001300 | TOP COVER | | TI | |
| | 102 VN946400 | CHASSIS | | | |
| | 104 VL664700 | BOTTOM COVER | | | |
| | 105 VL664800 | FRAME, SIDE | | | |
| * | 106 VS360500 | REAR PANEL | | | (R) |
| * | 106 VS360600 | REAR PANEL | | | (AB) |
| * | 106 VS360700 | REAR PANEL | | | (G) |
| * | 107 VS362800 | SUB CHASSIS | | | |
| | 108 VQ780300 | LEG | D60xH16 | | |
| | 110 VQ945500 | KNOB WITH LED | D42 | BL | |

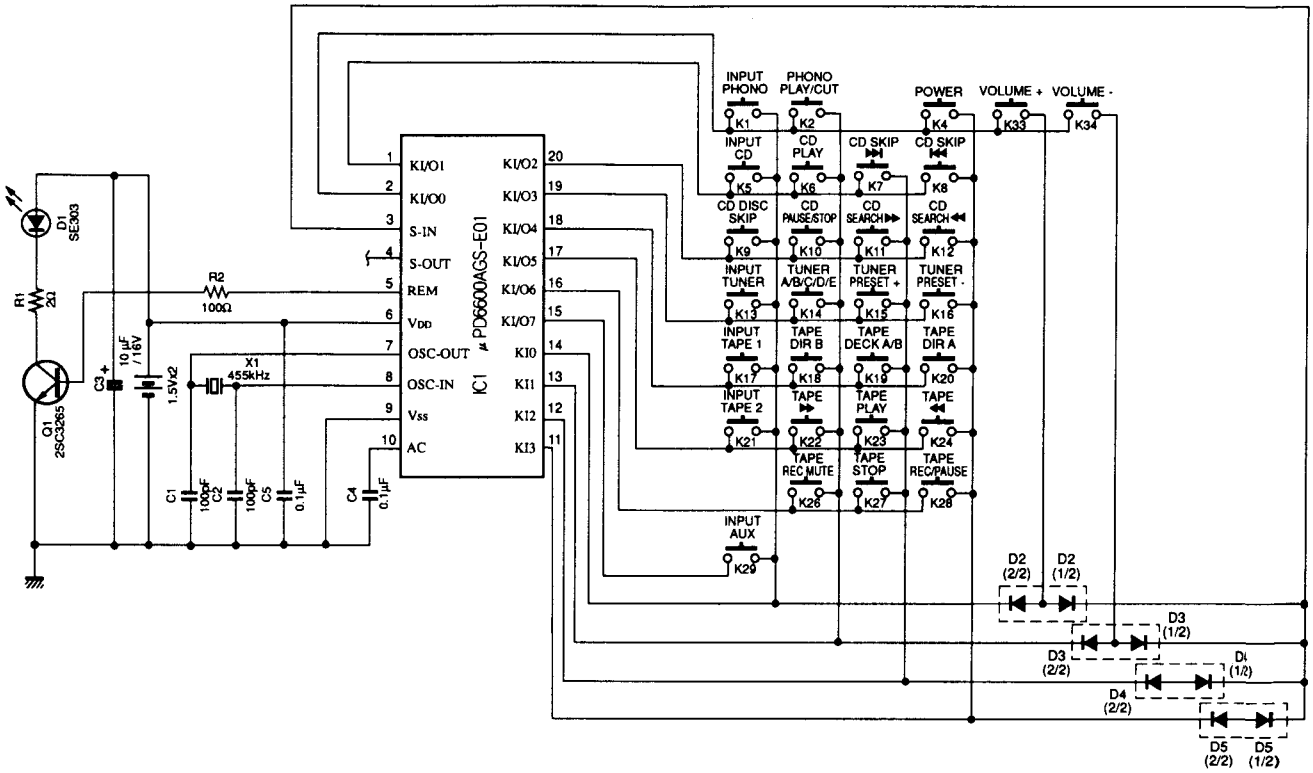
* New Parts

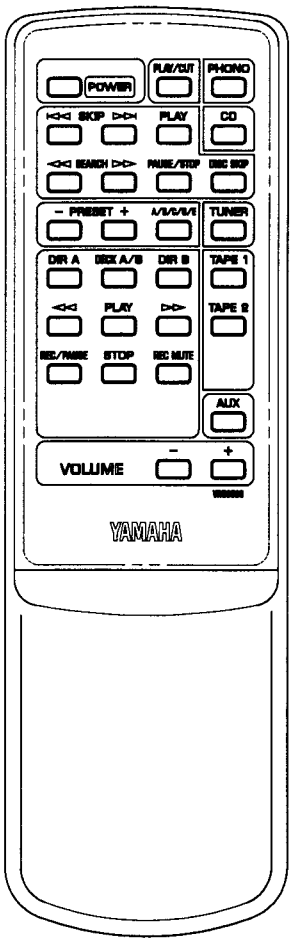
| | Ref. No. | PART NO. | Description | | Remarks | Markets |
|---|---|---|---|---|---|---|
| * | 110 | VS983900 | KNOB, LED | D42 | | |
| | 112 | VK219900 | KNOB, LED | D32 | | |
| | 112 | VK220000 | KNOB, LED | D32 | | |
| * | 114 | VS757400 | KNOB, PL | D12 | BL | |
| * | 114 | VS757500 | KNOB, PL | D12 | TI | |
| * | 116 | VS757200 | KNOB, P | D12 | BL | |
| * | 116 | VS757300 | KNOB, P | D12 | TI | |
| * | 118 | VT275100 | KNOB, R | D12 | | |
| * | 118 | VT275200 | KNOB, R | D12 | TI | |
| | 120 | VQ780000 | BUTTON | | BL | |
| | 120 | VQ780100 | BUTTON | | TI | |
| * | 121 | VS048300 | BUTTON | D7 | BL | |
| | 122 | VQ779000 | BUTTON | 3x14 | BL | |
| | 122 | VQ779100 | BUTTON | 3x14 | TI | |
| * | 123 | VS363200 | BUTTON, POWER | | BL | |
| * | 123 | VS363300 | BUTTON, POWER | | TI | |
| * | 125 | VS362900 | SUPPORT, PCB | | | |
| * | 126 | VS757100 | SUPPORT, PCB-2 | | | |
| | 129 | VP596200 | FRAME | | | |
| | 130 | VP922800 | DAMPER | 10x50x80 | | |
| | 131 | VP857700 | DAMPER | 4x6x5 | | |
| | 135 | VQ368500 | PUSH RIVET | P3545-B | | |
| | 155 | AA627310 | GROUND TERMINAL | | | |
| | 156 | ED330066 | BIND HEAD SCREW | 3x6 | FCRM3-BL | |
| | 157 | EN301010 | BIND HEAD BONDING TAP. SCREW | 3x8 | FCRM3-BL | |
| | 158 | Ei330086 | BIND HEAD B-TITE SCREW | 3x8 | FCRM3-BL | |
| | 159 | VB770200 | BW HEAD P-TITE SCREW | 3x10-8 | FCM3 | |
| | 160 | EX602240 | BW HEAD B-TITE SCREW | 3x10 | FCRM3-BL | |
| | 161 | EN330060 | BIND HEAD B-TITE SCREW | 4x16 | FCRM3-BL | |
| | 162 | VL184400 | BIND HEAD B-TITE SCREW | 4x22 | FCRM3-BL | |
| | 168 | EL300470 | BW HEAD S-TITE SCREW | 4x8-10 | FCRM3-BL | BL |
| | 168 | EX601150 | BW HEAD S-TITE SCREW | 4x8-10 | FNM3-BL | TI |
| | | | ACCESSORIES | | | |
| | 200 | VR505900 | REMOTE CONTROL TRANSMITTER | CX675300 | | |
| | 200-1 | CX675300 | LID | 70x31BLSMK | | 103RRS-028-01MR |
| | | | BATTERY, MANGANESE | SUM-3,AA,R06 | | |

* New Parts

# REMOTE CONTROL TRANSMITTER

## ■ SCHEMATIC DIAGRAM AX-590




| Key No. | Function | HEX | |
|---|---|---|---|
| | | CUSTOM | DATA |
| 1 | INPUT PHONO | 7A | 14 |
| 2 | PHONO PLAY/CUT | 7A | 0E |
| 4 | POWER | 7A | 1F |
| 5 | INPUT CD | 7A | 15 |
| 6 | CD PLAY | 7A | 08 |
| 7 | CD SKIP ▶▶\| | 7A | 0A |
| 8 | CD SKIP \|◀◀ | 7A | 0B |
| 9 | CD DISC SKIP | 7A | 4F |
| 10 | CD PAUSE/STOP | 7A | 09 |
| 11 | CD SEARCH ▶▶ | 7A | 0C |
| 12 | CD SEARCH ◀◀ | 7A | 0D |
| 13 | INPUT TUNER | 7A | 16 |
| 14 | TUNER A/B/C/D/E | 7A | 12 |
| 15 | TUNER PRESET + | 7A | 10 |
| 16 | TUNER PRESET – | 7A | 11 |
| 17 | INPUT TAPE 1 | 7A | 18 |
| 18 | TAPE DIR B | 7A | 40 |
| 19 | TAPE DECK A/B | 7A | 06 |
| 20 | TAPE DIR A | 7A | 07 |
| 21 | INPUT TAPE 2 | 7A | 19 |
| 22 | TAPE ▶▶ | 7A | 02 |
| 23 | TAPE PLAY | 7A | 00 |
| 24 | TAPE ◀◀ | 7A | 01 |
| 26 | TAPE REC MUTE | 7A | 05 |
| 27 | TAPE STOP | 7A | 03 |
| 28 | TAPE REC/PAUSE | 7A | 04 |
| 29 | INPUT AUX | 7A | 17 |
| 33 | VOLUME + | 7A | 1A |
| 34 | VOLUME – | 7A | 1B |

# Parts List for Carbon Resistors

| Value | 1/4W Type Part No. | 1/6W Type Part No. | Value | 1/4W Type Part No. | 1/6W Type Part No. |
|---|---|---|---|---|---|
| 1.0 Ω | HJ35 3100 | HF85 3100 | 10 kΩ | HF45 7100 | HF45 7100 |
| 1.8 Ω | HJ35 3180 | * | 11 kΩ | HF45 7110 | HF45 7110 |
| 2.2 Ω | HJ35 3220 | HF85 3220 | 12 kΩ | HJ35 7120 | HF85 7120 |
| 3.3 Ω | HJ35 3330 | HF85 3330 | 13 kΩ | HF45 7130 | HF45 7130 |
| 4.7 Ω | HJ35 3470 | HF85 3470 | 15 kΩ | HF45 7150 | HF45 7150 |
| 5.6 Ω | HJ35 3560 | HF85 3560 | 18 kΩ | HF45 7180 | HF45 7180 |
| 10 Ω | HF45 4100 | HF45 4100 | 22 kΩ | HF45 7220 | HF45 7220 |
| 15 Ω | HJ35 4150 | HF85 4150 | 24 kΩ | HF45 7240 | HF45 7240 |
| 22 Ω | HF45 4220 | HF45 4220 | 27 kΩ | HJ35 7270 | HF85 7270 |
| 27 Ω | HJ35 4270 | HF85 4270 | 30 kΩ | HF45 7300 | HF45 7300 |
| 33 Ω | HF45 4330 | HF45 4330 | 33 kΩ | HF45 7330 | HF45 7330 |
| 39 Ω | HJ35 4470 | HF85 4390 | 36 kΩ | HF45 7360 | HF45 7360 |
| 47 Ω | HF45 4470 | HF45 4470 | 39 kΩ | HF45 7390 | HF45 7390 |
| 56 Ω | HF45 4560 | HF45 4560 | 47 kΩ | HF45 7470 | HF45 7470 |
| 68 Ω | HF45 4680 | HF45 4680 | 51 kΩ | HF45 7510 | HF45 7510 |
| 75 Ω | HF45 4750 | HF45 4750 | 56 kΩ | HF45 7560 | HF45 7560 |
| 82 Ω | HF45 4820 | HF45 4820 | 62 kΩ | HF45 7620 | HF45 7620 |
| 91 Ω | HF45 4910 | HF45 4910 | 68 kΩ | HF45 7680 | HF45 7680 |
| 100 Ω | HF45 5100 | HF45 5100 | 82 kΩ | HF45 7820 | HF45 7820 |
| 110 Ω | HJ35 5110 | HF85 5110 | 91 kΩ | HF45 7910 | HF45 7910 |
| 120 Ω | HF45 5120 | HF45 5120 | 100 kΩ | HF45 8100 | HF45 8100 |
| 150 Ω | HF45 5150 | HF45 5150 | 110 kΩ | HF45 8110 | HF45 8110 |
| 160 Ω | HJ35 5160 | * | 120 kΩ | HF45 8120 | HF45 8120 |
| 180 Ω | HF45 5180 | HF45 5180 | 150 kΩ | HF45 8150 | HF45 8150 |
| 200 Ω | HF45 5200 | HF45 5200 | 180 kΩ | HF45 8180 | HF45 8180 |
| 220 Ω | HF45 5220 | HF45 5220 | 220 kΩ | HJ35 8220 | HF85 8220 |
| 270 Ω | HF45 5270 | HF45 5270 | 270 kΩ | HF45 8270 | HF45 8270 |
| 330 Ω | HF45 5330 | HF45 5330 | 300 kΩ | HF45 8300 | HF45 8300 |
| 390 Ω | HF45 5390 | HF45 5390 | 330 kΩ | HF45 8330 | HF45 8330 |
| 430 Ω | HF45 5430 | HF45 5430 | 390 kΩ | HJ35 8390 | HF85 8390 |
| 470 Ω | HF45 5470 | HF45 5470 | 470 kΩ | HF45 8470 | HF45 8470 |
| 510 Ω | HF45 5510 | HF45 5510 | 560 kΩ | HJ35 8560 | HF85 8560 |
| 560 Ω | HF45 5560 | HF45 5560 | 680 kΩ | HJ35 8680 | HF85 8680 |
| 680 Ω | HF45 5680 | HF45 5680 | 820 kΩ | HJ35 8820 | HF85 8820 |
| 820 Ω | HF45 5820 | HF45 5820 | 1.0 MΩ | HF45 9100 | HF45 9100 |
| 910 Ω | HF45 5910 | HF45 5910 | 1.2 MΩ | HJ35 9120 | * |
| 1.0 kΩ | HF45 6100 | HF45 6100 | 1.5 MΩ | HJ35 9150 | HF85 9150 |
| 1.2 kΩ | HF45 6120 | HF45 6120 | 1.8 MΩ | HJ35 9180 | HF85 9180 |
| 1.5 kΩ | HF45 6150 | HF45 6150 | 2.2 MΩ | HJ35 9220 | HF85 9220 |
| 1.8 kΩ | HF45 6180 | HF45 6180 | 3.3 MΩ | HJ35 9330 | HF85 9330 |
| 2.0 kΩ | HJ35 6200 | HF85 6200 | 3.9 MΩ | HJ35 9390 | * |
| 2.2 kΩ | HF45 6220 | HF45 6220 | 4.7 MΩ | HJ35 9470 | HF85 9470 |
| 2.4 kΩ | HJ35 6240 | HF85 6240 | | | |
| 2.7 kΩ | HF45 6270 | HF45 6270 | | | |
| 3.0 kΩ | HF45 6300 | HF45 6300 | | | |
| 3.3 kΩ | HF45 6330 | HF45 6330 | | | |
| 3.6 kΩ | HJ35 6360 | HF85 6360 | | | |
| 3.9 kΩ | HF45 6390 | HF45 6390 | | | |
| 4.7 kΩ | HF45 6470 | HF45 6470 | | | |
| 5.1 kΩ | HF45 6510 | HF45 6510 | | | |
| 5.6 kΩ | HF45 6560 | HF45 6560 | | | |
| 6.8 kΩ | HF45 6680 | HF45 6680 | | | |
| 8.2 kΩ | HF45 6820 | HF45 6820 | | | |
| 9.1 kΩ | HF45 6910 | HF45 6910 | | | |

