

# STR-AV220/AV220A/AV320R/AV320RA

## SERVICE MANUAL

*AEP Model*  
STR-AV220A/320RA

*UK Model*  
STR-AV320R

*West Germany Model*

STR-AV220/320R



Photo : STR-AV320

### SPECIFICATIONS

#### Amplifier section

Continuous RMS power output

STR-AV220/AV220A :

25 W + 25 W (4/8 ohms, at 40 Hz - 20 kHz  
less than 0.8% total harmonic distortion)

STR-AV320R(WG)/AV320RA :

40 W + 40 W (4/8 ohms, at 40 Hz - 20 kHz  
less than 0.8% total harmonic distortion)

STR-AV320R(UK) : 50W+50W (4/8 ohms, at 40Hz-20kHz  
less than 0.8% total harmonic distortion)

Power output

IEC/DIN : STR-AV220/AV220A

30 W + 30 W (4 ohms at 1 kHz 0.7%)

STR-AV320R (WG) /AV320RA

50 W + 50 W (4 ohms at 1 kHz 0.7%)

STR-AV320R (UK)

55W+55W (8 ohms at 1kHz 0.7%)

Harmonic distortion

Less than 0.8% at rated output

Frequency response

PHONO: RIAA equalization curve  $\pm 0.5$  dB

CD

VIDEO | 40 Hz - 50 kHz  $\pm 0.5$  dB

TAPE

Inputs

|                     | Sensitivity | Impedance  | S/N (weighting network, input level) |
|---------------------|-------------|------------|--------------------------------------|
| PHONO               | 2.5 mV      | 50 kilohms | 74 dB<br>72 dB* (A, 2.5 mV)          |
| CD<br>VIDEO<br>TAPE | 150 mV      | 50 kilohms | 95 dB<br>80 dB* (A, 150 mV)          |

\* '78 IHF

#### Outputs

|                            |   |
|----------------------------|---|
| REC OUT, VIDEO (AUDIO) OUT | Voltage 150 mV<br>Impedance 10 kilohms    |
| SPEAKER A, B               | Accepts speakers of 4 - 16 ohms           |
| HEADPHONES                 | Accepts low and high impedance headphones |

Tone controls

BASS:  $\pm 10$  dB at 100 Hz

TREBLE:  $\pm 10$  dB at 10 kHz

Muting

-20 dB (STR-AV320RA only)

DBFB

+12 dB at 70 Hz

#### Tuner section

|                               | FM tuner section  | AM tuner section                            |
|-------------------------------|---|---|
| Tuning range                  | 87.5 - 108 MHz  | 531 - 1,602 kHz                             |
| Antenna terminals             | 75 ohms, unbalanced   | External antenna terminal                   |
| Sensitivity at 50 dB quieting | 18.3 dBf, 4.5 $\mu$ V (mono)<br>38.3 dBf, 45 $\mu$ V (stereo) | —   |
| Usable sensitivity            | 11.2 dBf, 2 $\mu$ V (IHF)                                     | Loop antenna:<br>500 $\mu$ V (at 1,000 kHz) |

- Continued on page 2 -



FM STEREO FM-AM RECEIVER  
**SONY**®

|                       | FM tuner section                    | AM tuner section          |
|-----------------------|-------------------------------------|---------------------------|
| Signal-to-noise ratio | 76 dB (mono)<br>70 dB (stereo)      | 54 dB (at 50 mV/m)        |
| Harmonic distortion   | 0.3% (mono), 0.5% (stereo) at 1 kHz | 0.5% (at 50 mV/m, 400 Hz) |
| Selectivity           | 60 dB at 400 kHz                    | 30 dB at 9 kHz            |
| Separation            | 45 dB at 1 kHz                      | —                         |
| Frequency response    | 30 Hz - 15 kHz $\pm 1.5$ dB         | —                         |

**General System**

Tuner section: PLL quartz-locked digital synthesizer system  
 Pre-amplifier section: low-noise NF type equalizer amp  
 Power amplifier section: quasi-complementary SEPP

**Power requirements**

220V AC, 50/60Hz : AEP, West Germany Model  
 240V AC, 50/60Hz : UK Model

**Power consumption**

STR-AV220 / AV220A : 85W  
 STR-AV320R (WG) / AV320RA : 120W  
 STR-AV320R (UK) : 230W  
 In standby condition: 5 watts (STR-AV320RA / AV320R)

**AC outlets**

One switched (100 watts) (STR-AV320RA / AV320R)

**Dimensions**

Approx. 430 × 110 × 300 mm (w/h/d)  
 (17 × 4 3/16 × 11 7/8 inches)  
 including projecting parts and controls

**Weight**

Approx. 5.8 kg (12 lb 13 oz) net (STR-AV220 / AV220A)  
 Approx. 6.5 kg (14 lb 5 oz) net (STR-AV320R / AV320RA)

**Accessories supplied**

FM wire antenna (1)  
 AM loop antenna (1)  
 Remote Commander RM-S103 (1)  
 Remote Commander RM-U203 (1) (STR-AV320R:UK)  
 Sony batteries SUM 3(NS) (2)

Design and specifications subject to change without notice.

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**CAUTION**

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

**ADVARSEL**

Lithiumbatteri-Eksplosjonsfare ved feilagtig handling.  
 Udskiftning ma kun ske med batteri af samme fabrikat og type.  
 Lever det brugte batteri tilbage til leverand  $\phi$  ren.

**ADVARSEL**

Lithiumbatteri-Eksplosjonsfare.  
 Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.  
 Brukt batteri returneres apparatleverand  $\phi$  ren.

**VARNING**

Explosionsfara vid felaktigh batteribyte.  
 Anvand samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.  
 Kassera anvant batteri enligt fabrikantens instruktion.

**VAROITUS**

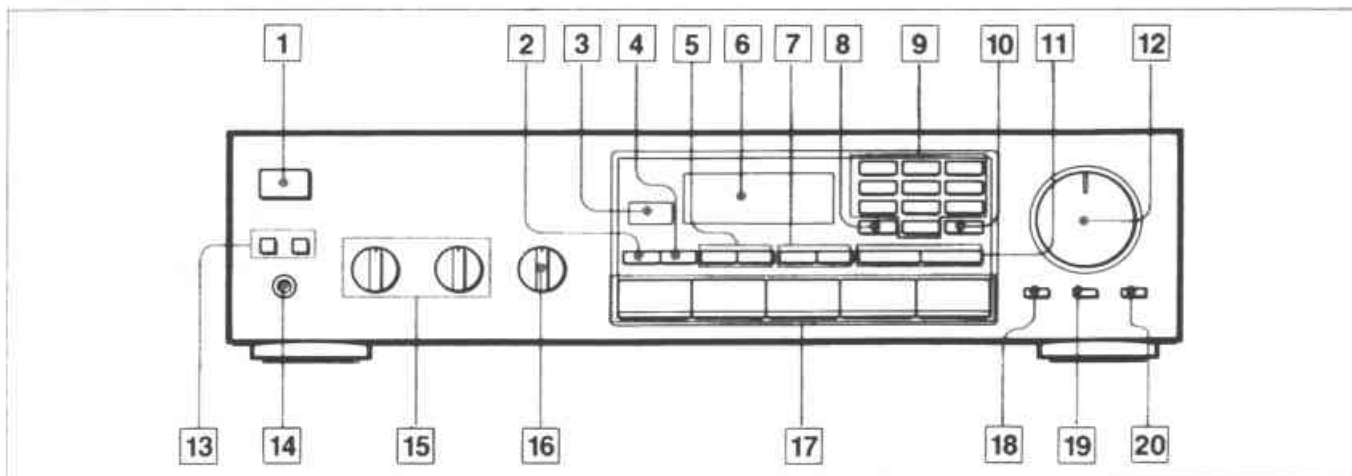
Paristo voi rajahtaa, jos se on virheellisesti asennettu.  
 Vaihda paristo aincastaan laitevalmistajan suosittelemaan tyyppiin. Havita kaytetty paristo valmistajan ohjeiden mukaisesti.

**SAFETY-RELATED COMPONENT WARNING!!**

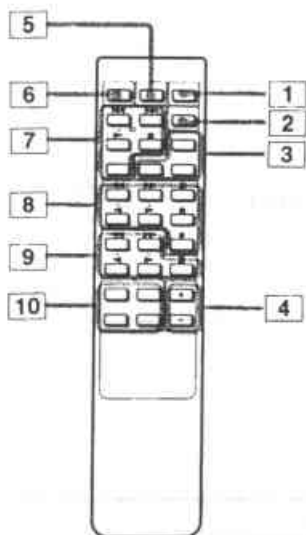
COMPONENTS IDENTIFIED BY MARK  $\Delta$  OR DOTTED LINE WITH MARK  $\Delta$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

## SECTION 1 GENERAL

### 1-1. LOCATION AND FUNCTION OF CONTROLS




- [1] POWER switch**
- [2] DIRECT TUNING button**
- [3] Remote sensor (STR-AV320RA only)**
- [4] FM MODE button**  
When an FM stereo program is noisy or hard to receive, press this button. The STEREO indicator goes out (the sound is heard in monaural, but the reception will be improved). To return to the stereo mode, press again or change the frequency.
- [5] BAND selectors**
- [6] Display window**
- [7] TUNING +/- buttons**
- [8] MEMORY button**
- [9] Numeric buttons**
- [10] SHIFT button**
- [11] PRESET +/- buttons**
- [12] VOLUME control and indicator**  
The indicator is only equipped with the STR-AV320RA.
- [13] SPEAKERS selectors**  
Depress to select which speaker system to drive. For both speaker systems, depress A and B.
- [14] HEADPHONES jack (stereo phone jack)**
- [15] TONE controls**  
Turn the TREBLE control to adjust the high frequency sound. Turn BASS control to adjust the low frequency sound.
- [16] BALANCE control**  
Turn clockwise to decrease the left channel volume, and turn counterclockwise to decrease the right channel volume.
- [17] Function selectors**
- [18] DBFB (Dynamic Bass Feed Back) button and indicator**  
To reinforce the bass frequency sound, press this button.
- [19] MUTING button and indicator (STR-AV320RA only)**  
Press to attenuate the sound level immediately (-20 dB attenuation). Pressing this button makes the indicator be lighted. To restore the sound level, press again.
- [20] SURROUND button and indicator**  
To obtain the surround effect, press this button.



- [1] POWER button**
- [2] DBFB button**
- [3] TUNER PRESET +/- and SHIFT buttons**
- [4] VOLUME +/- buttons**
- [5] SURROUND button**
- [6] MUTING button**

- [7] CD player operation buttons**  
D. (disc) SKIP: When your CD player is equipped with a multi-disc changer, use this button to select loaded disc.  
CD ▶: Selects the CD function and starts CD-playback.
- [8] DECK B operation buttons (also for single tape deck)**  
DECK B ◀/▶: Select tape function and start tape playback on deck B.
- [9] DECK A operation buttons**  
DECK A ◀/▶: Select tape function and start tape playback on deck A.
- [10] Function select buttons**

#### Notes on the remote commander

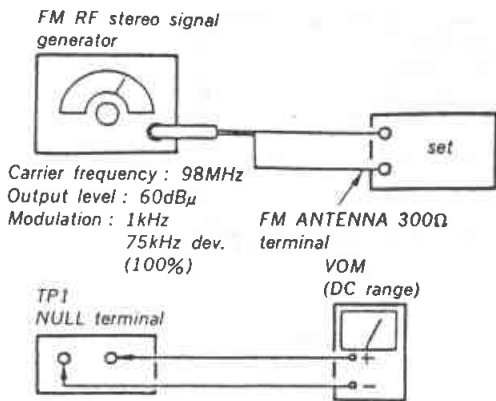
For the functions other than the receiver's own ones, the remote commander is effective only with Sony components having a remote sensor with  mark.

## SECTION 2 ELECTRICAL ADJUSTMENTS

### FM SECTION

#### • FM Discriminator (NULL) Adjustment

Setting :



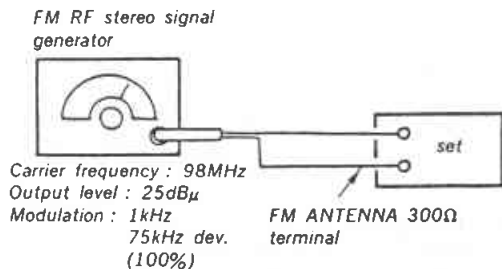
#### Procedure :

1. Tune the set to 98MHz.
2. Adjust T21 for 0V reading on the VOM.

Note : FM Tuning Level adjustment should be made after FM discriminator adjustment.

#### • FM Stereo Operation Level Adjustment

Setting :

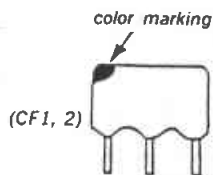


#### Procedure :

1. Tune the set to 98MHz.
2. Adjust RV24 so that the STEREO LED goes on.

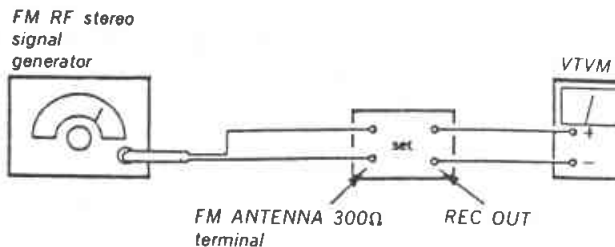
#### Note on Ceramic Filter (CF1, 2) Replacement.

This set employs two ceramic filters (CF1, 2) which should have the same color marking to identify their center frequency. Therefore FM IF offset adjustment by (\* A, \* B) connection is necessary to match the center frequency of the ceramic filters used with FM intermediate frequency.



#### • FM Stereo Separation Adjustment

Setting :



#### Procedure :

Tune the set to 98MHz.

| FM stereo signal generator output channel | VTVM connection | VTVM reading (dB)                     |
|---|-----------------|---------------------------------------|
| L-CH                                      | L-CH            | Ⓐ                                     |
| R-CH                                      | L-CH            | Ⓑ<br>Adjust RV21 for minimum reading. |
| R-CH                                      | R-CH            | Ⓒ                                     |
| L-CH                                      | R-CH            | Ⓓ<br>Adjust RV21 for minimum reading. |

L-CH Stereo separation : Ⓐ - Ⓑ

R-CH Stereo separation : Ⓒ - Ⓓ

The separations of both channels should be equal.

○ : short

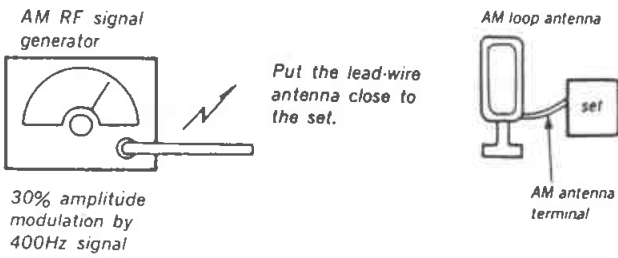
× : open

| Ceramic filter |                        | Connection |            | FM intermediate frequency (MHz) |
|----------------|------------------------|------------|------------|---------------------------------|
| Color mark     | Center frequency (MHz) | * A (D326) | * B (D327) |                                 |
| White          | 10.750                 | ×          | ○          | 10.750                          |
| Red            | 10.700                 | ×          | ×          | 10.700                          |
| Black          | 10.650                 | ○          | ○          | 10.650                          |

**AM SECTION**

• AM Meter Adjustment

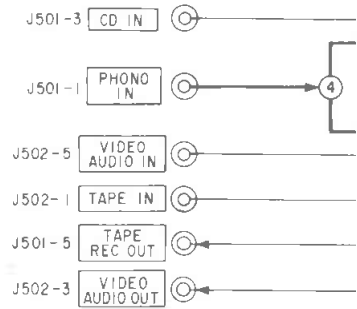
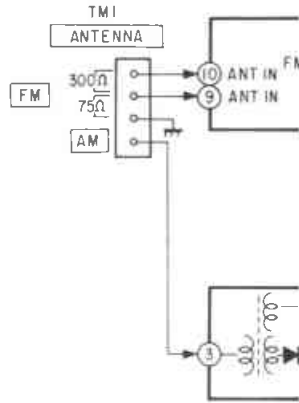
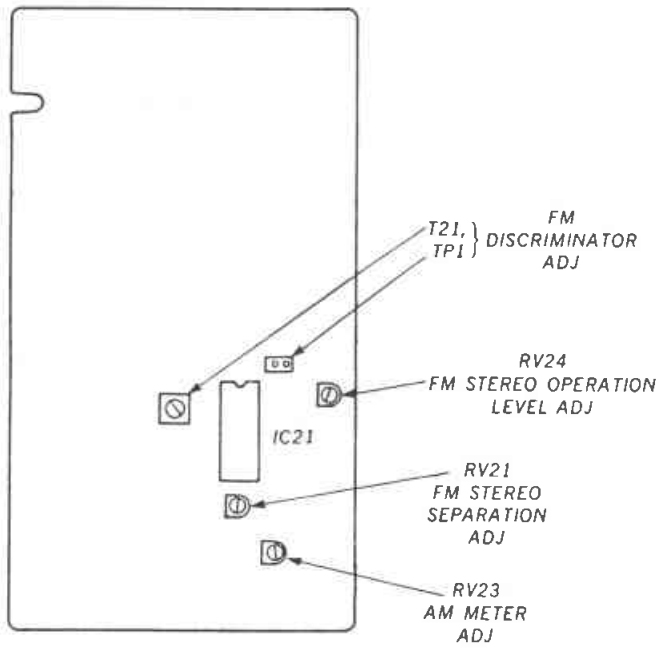
Setting :



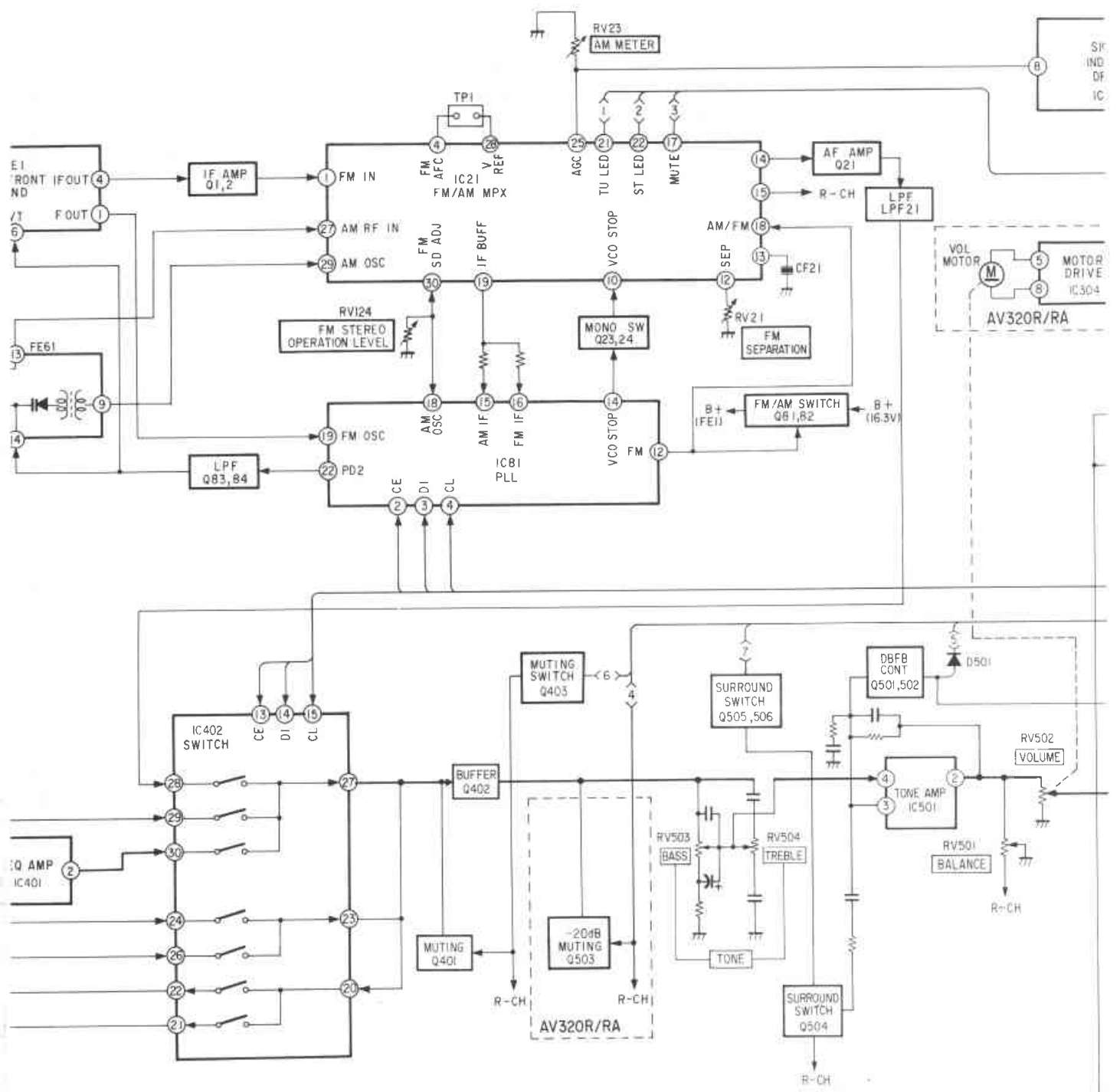
**Procedure :**

1. Tune the set to 1,050kHz.
2. Adjust the RV23 so that the 5 point segment of the signal meter goen on.

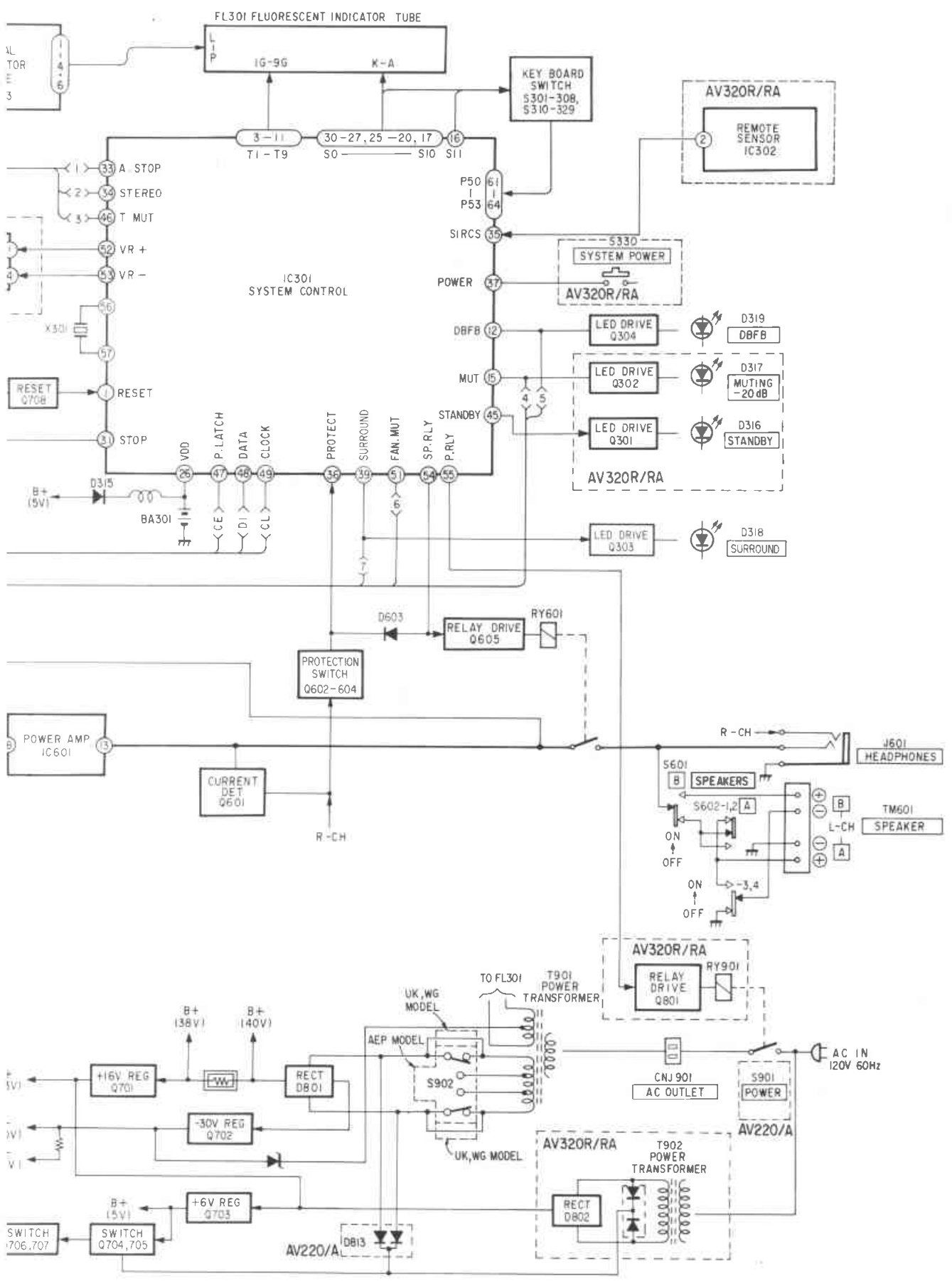
Adjustment Location : tuner board



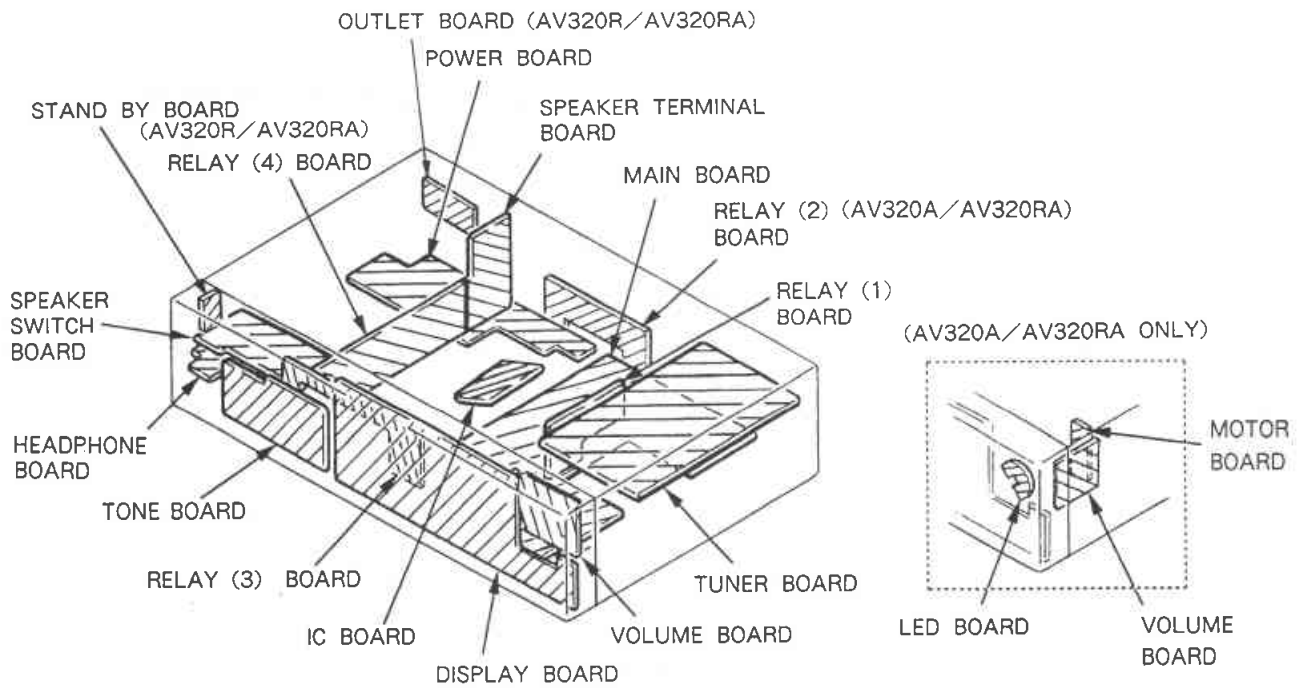
— R-CH IS OM



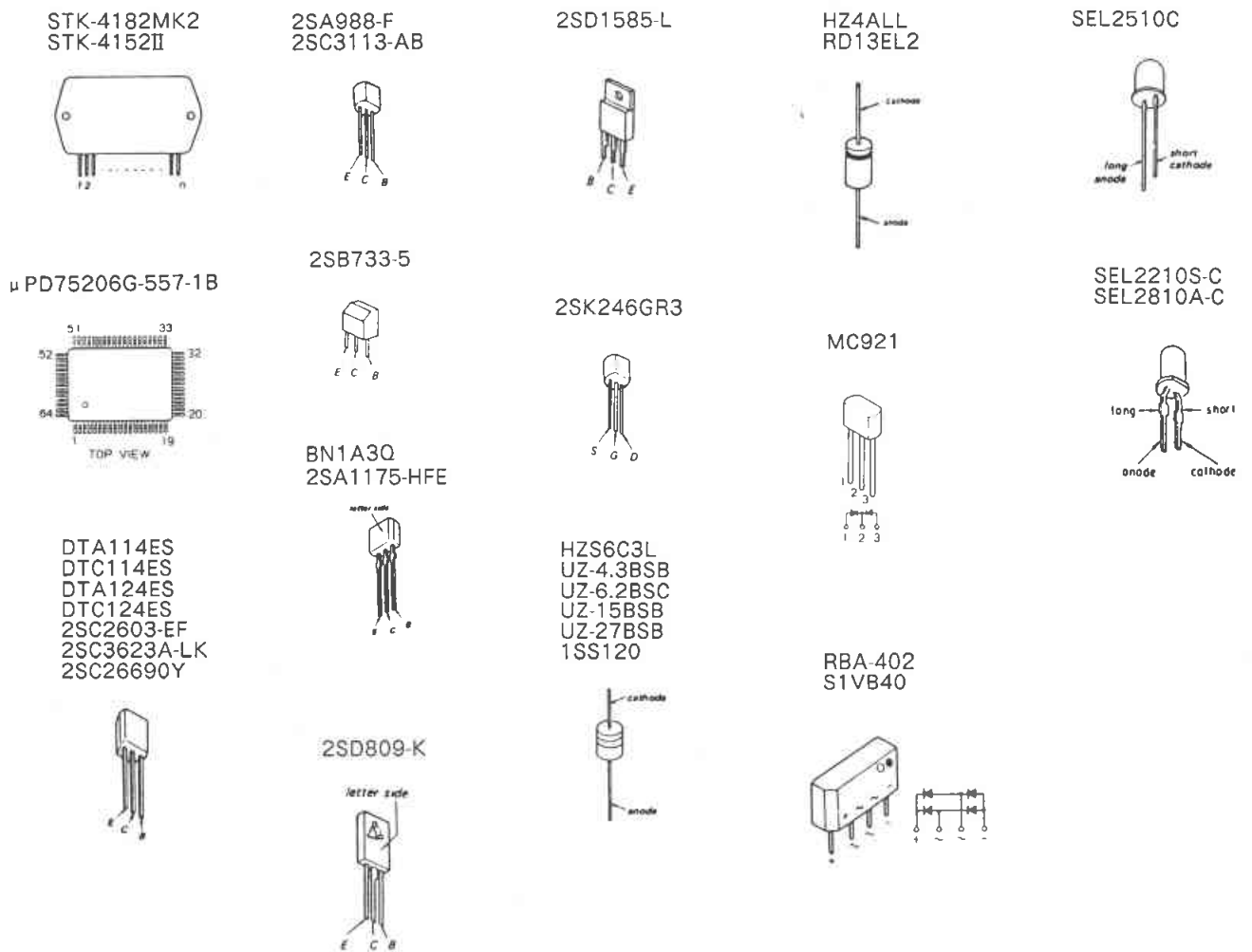
MISSION —



### CIRCUIT BOARDS LOCATION



### 3.2. SEMICONDUCTOR LEAD LAYOUTS



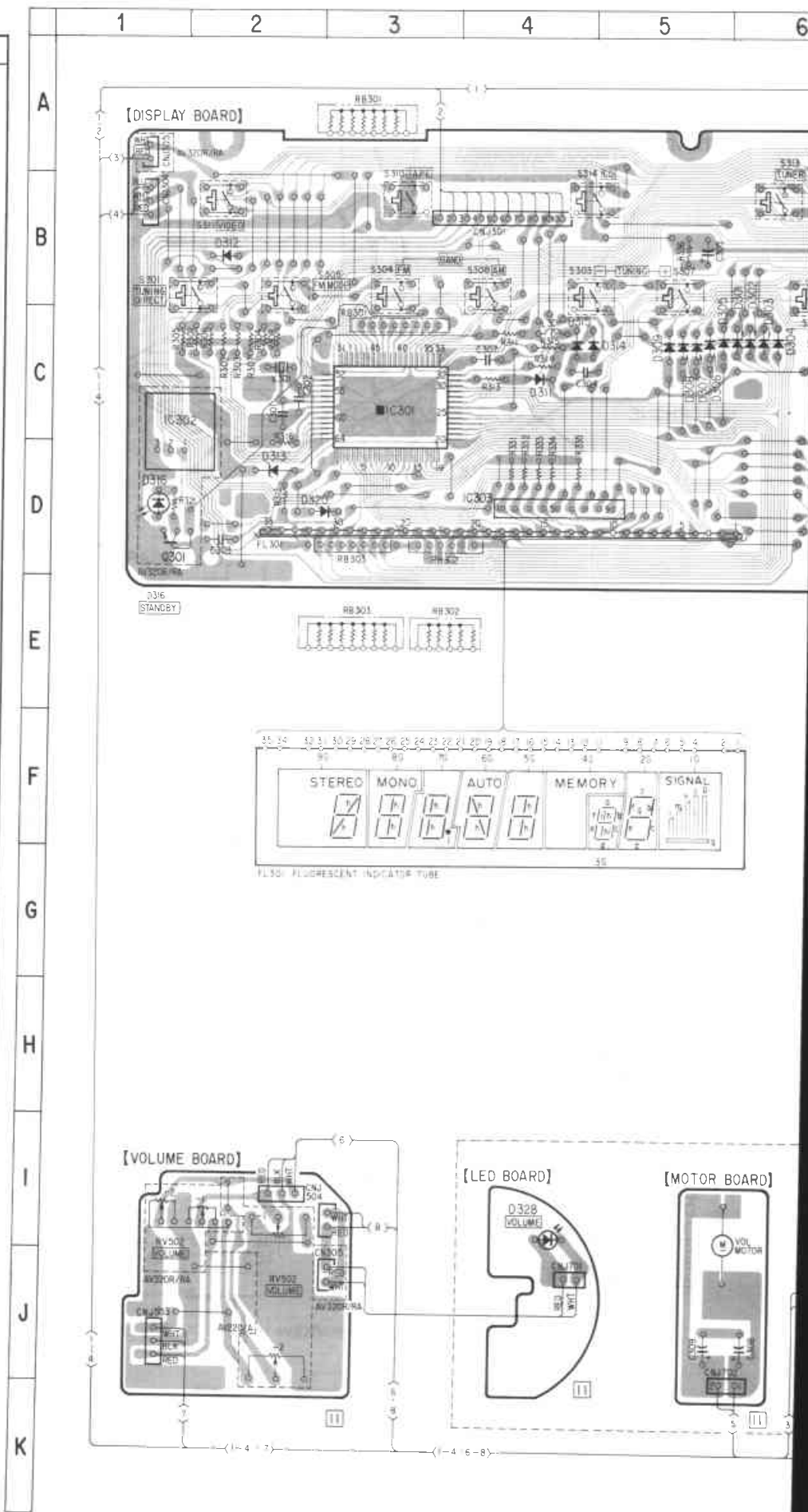


• SEMICONDUCTOR LOCATION

| Ref. No. | Location | Ref. No.       | Location |
|----------|----------|----------------|----------|
| IC301    | C-3      | D312           | B-2      |
| IC302    | C-1      | D313           | D-2      |
| IC303    | D-4      | D314           | C-4      |
| IC304    | B-10     | D315           | C-4      |
| IC401    | C-13     | D316           | D-1      |
| IC402    | D-15     | D317           | B-10     |
| IC501    | C-30     | D318           | B-10     |
| IC601    | F-19     | D319           | B-9      |
|          |          | D320           | D-3      |
|          |          | D322           | D-8      |
| Q301     | D-1      |                |          |
| Q302     | C-8      |                |          |
| Q303     | C-8      | D323           | D-8      |
| Q304     | C-8      | D324           | D-8      |
| Q401     | D-16     | D326           | C-8      |
|          |          | D327           | D-8      |
|          |          | D328           | I-4      |
| Q402     | F-15     |                |          |
| Q403     | I-15     |                |          |
| Q451     | D-16     | D401           | I-15     |
| Q452     | F-15     | D402           | I-15     |
| Q501     | C-28     | D501           | C-28     |
|          |          | D502           | C-28     |
|          |          | D601           | F-17     |
| Q502     | C-29     |                |          |
| Q503     | C-27     |                |          |
| Q504     | C-28     | D602           | I-16     |
| Q505     | C-27     | D603           | I-17     |
| Q506     | C-28     | D604           | J-16     |
|          |          | D605           | J-15     |
|          |          | D607           | I-17     |
| Q551     | C-28     |                |          |
| Q552     | C-29     |                |          |
| Q553     | C-27     | D651           | F-17     |
| Q601     | F-17     | D702           | I-16     |
| Q602     | E-17     | D703           | J-17     |
|          |          | D704           | H-16     |
|          |          | D705           | H-16     |
| Q603     | E-18     |                |          |
| Q604     | E-18     |                |          |
| Q605     | I-17     | D706           | B-17     |
| Q651     | F-18     | D707           | B-17     |
| Q701     | I-16     | D708           | C-17     |
|          |          | D709           | J-15     |
|          |          | D710           | I-14     |
| Q702     | H-16     |                |          |
| Q703     | C-17     |                |          |
| Q704     | C-17     | D711           | I-14     |
| Q705     | C-17     | D801           | D-17     |
| Q706     | D-17     | D802           | J-21     |
|          |          | D803           | H-21     |
| Q707     | D-17     |                |          |
| Q708     | J-14     | AV220/AV220A   |          |
| Q709     | I-14     | D813 B-18      |          |
| Q801     | I-21     | AV320R/AV320RA |          |
| D301     | C-6      | D813 J-21      |          |
| D302     | C-6      |                |          |
| D303     | C-6      |                |          |
| D304     | C-6      |                |          |
| D305     | C-5      |                |          |
| D306     | C-5      |                |          |
| D307     | C-5      |                |          |
| D308     | C-5      |                |          |
| D309     | C-5      |                |          |
| D311     | C-4      |                |          |

Note :

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- \*A, \*B : See Page 4 for Note on Ceramic Filter (CF1, 2) Replacement.



7

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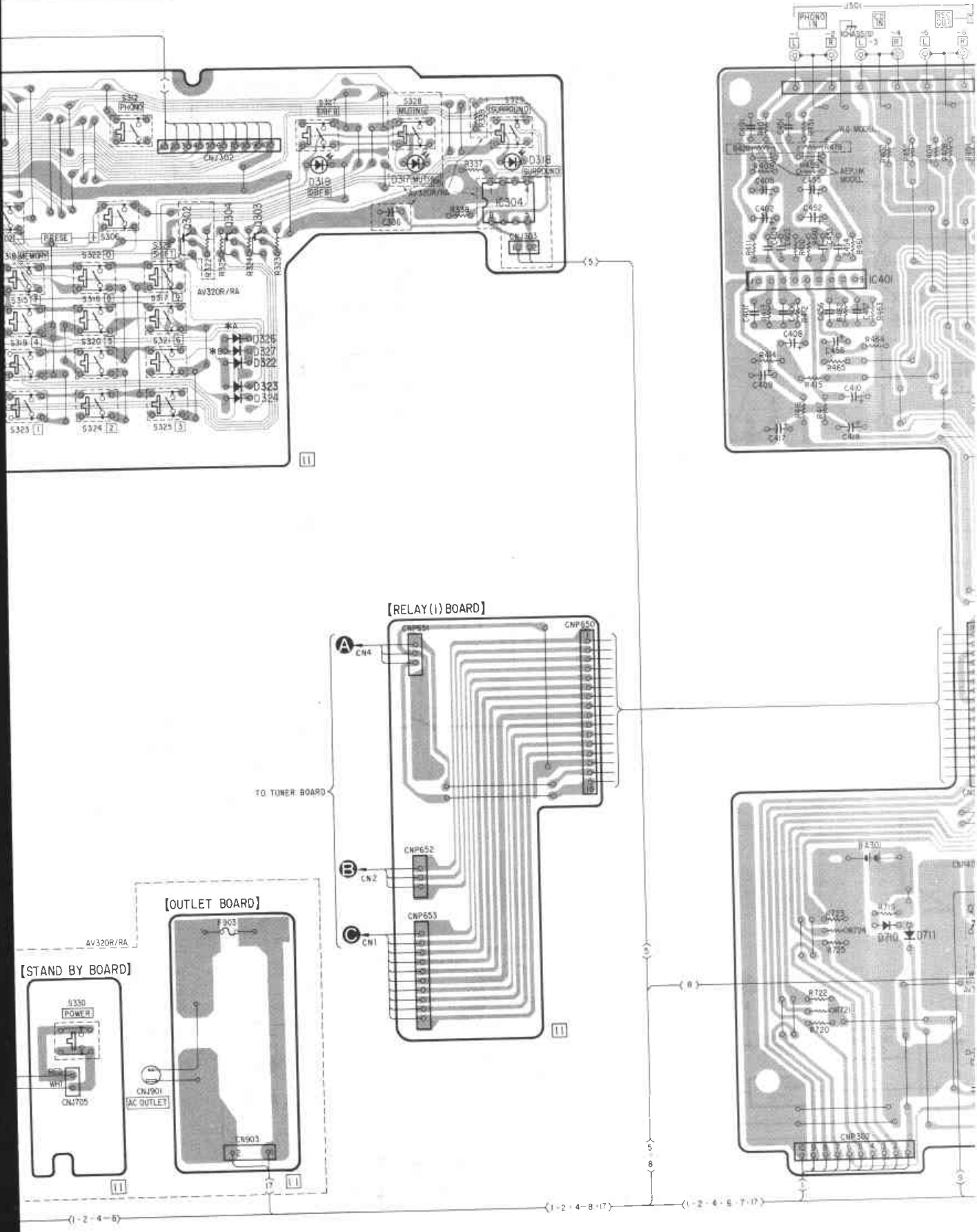
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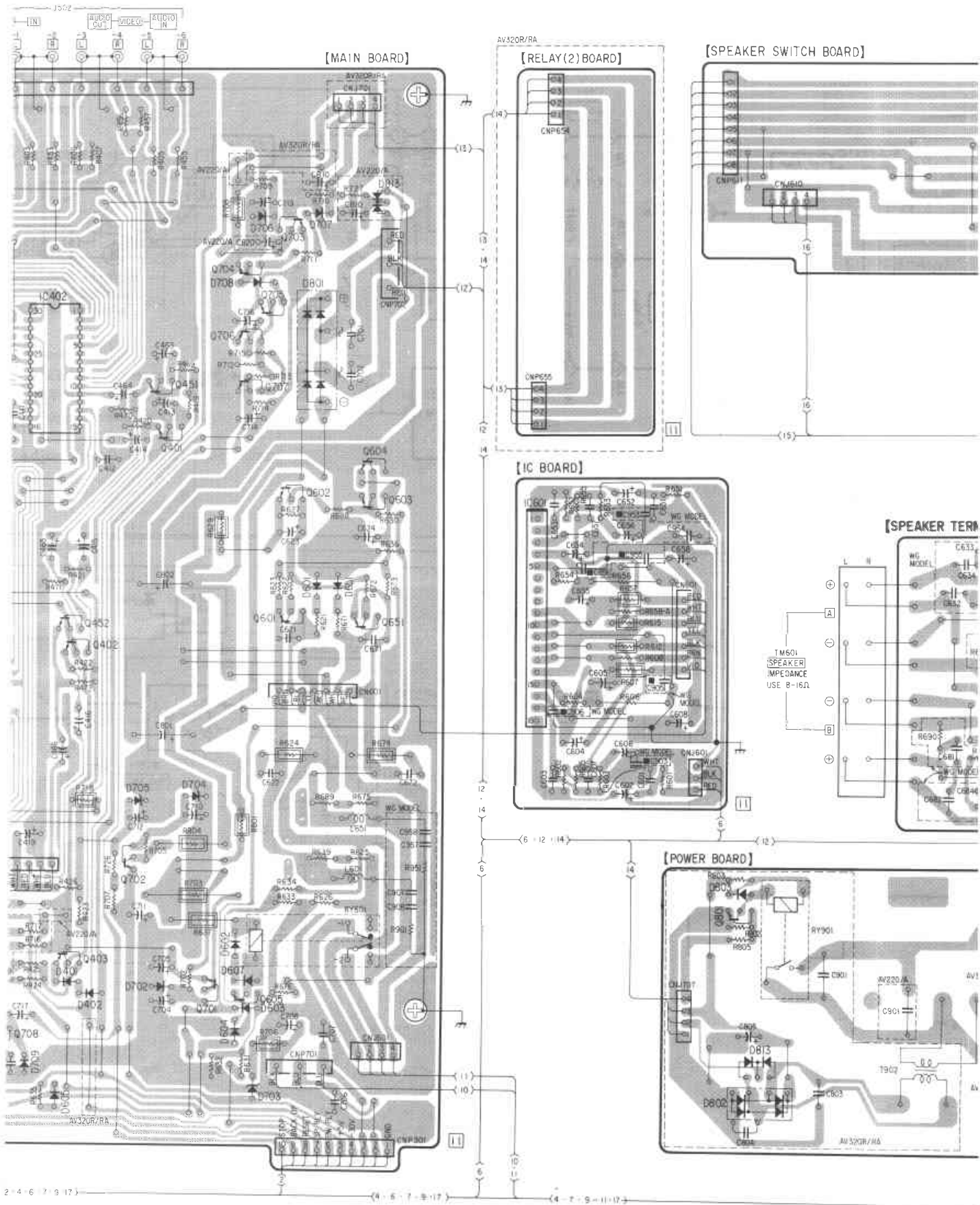
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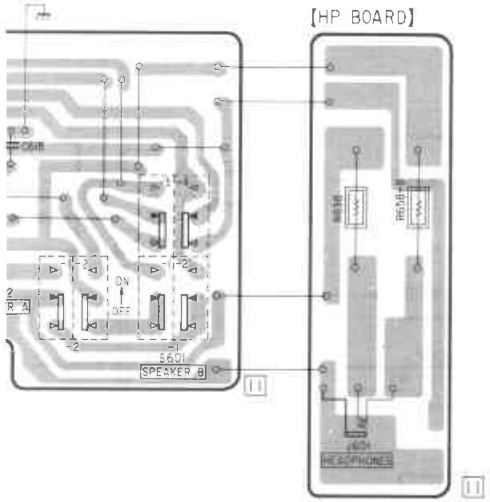
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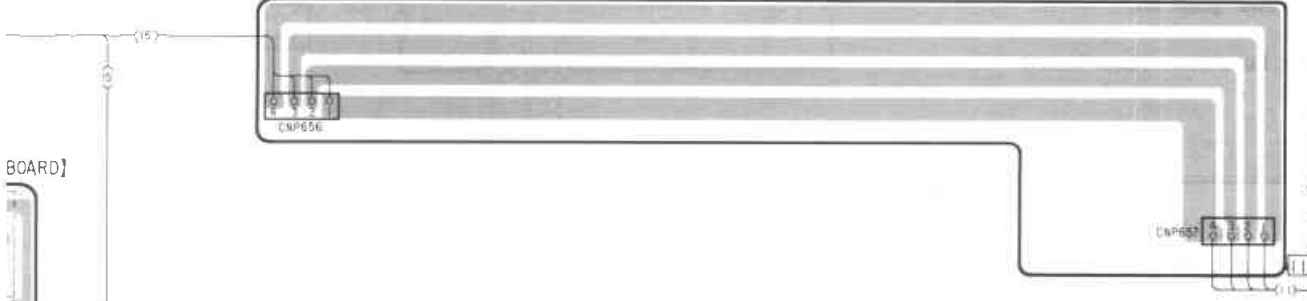


[HP BOARD]

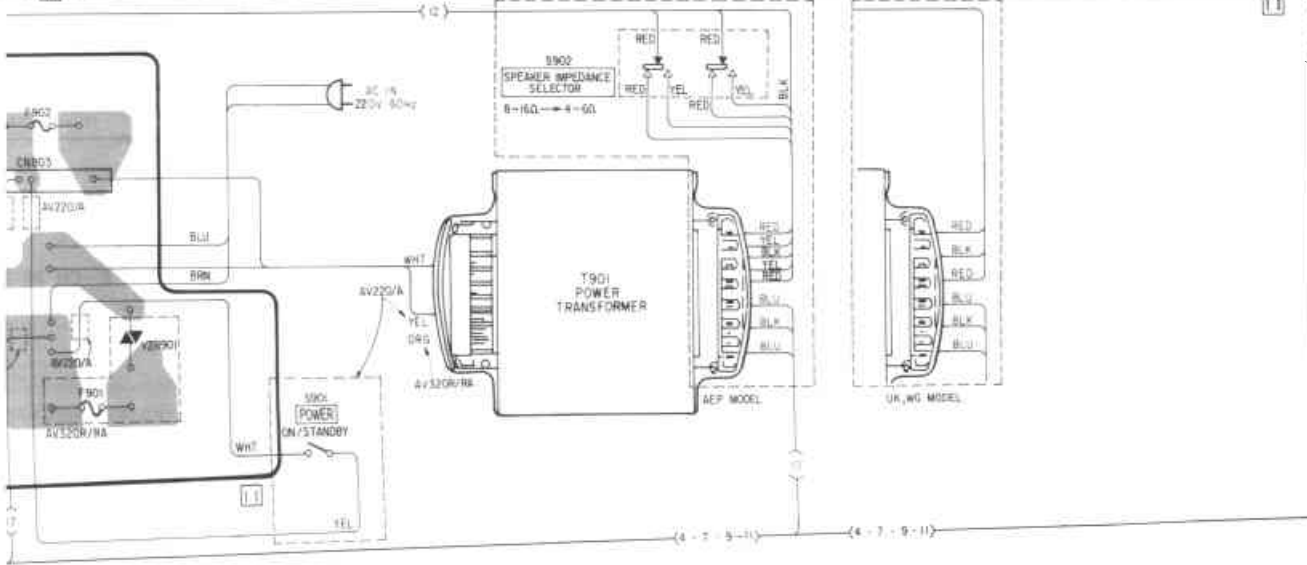
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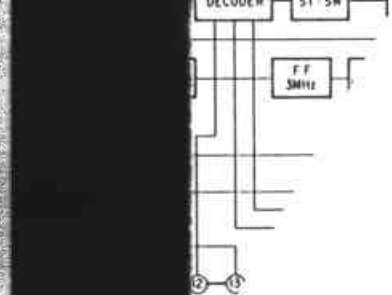


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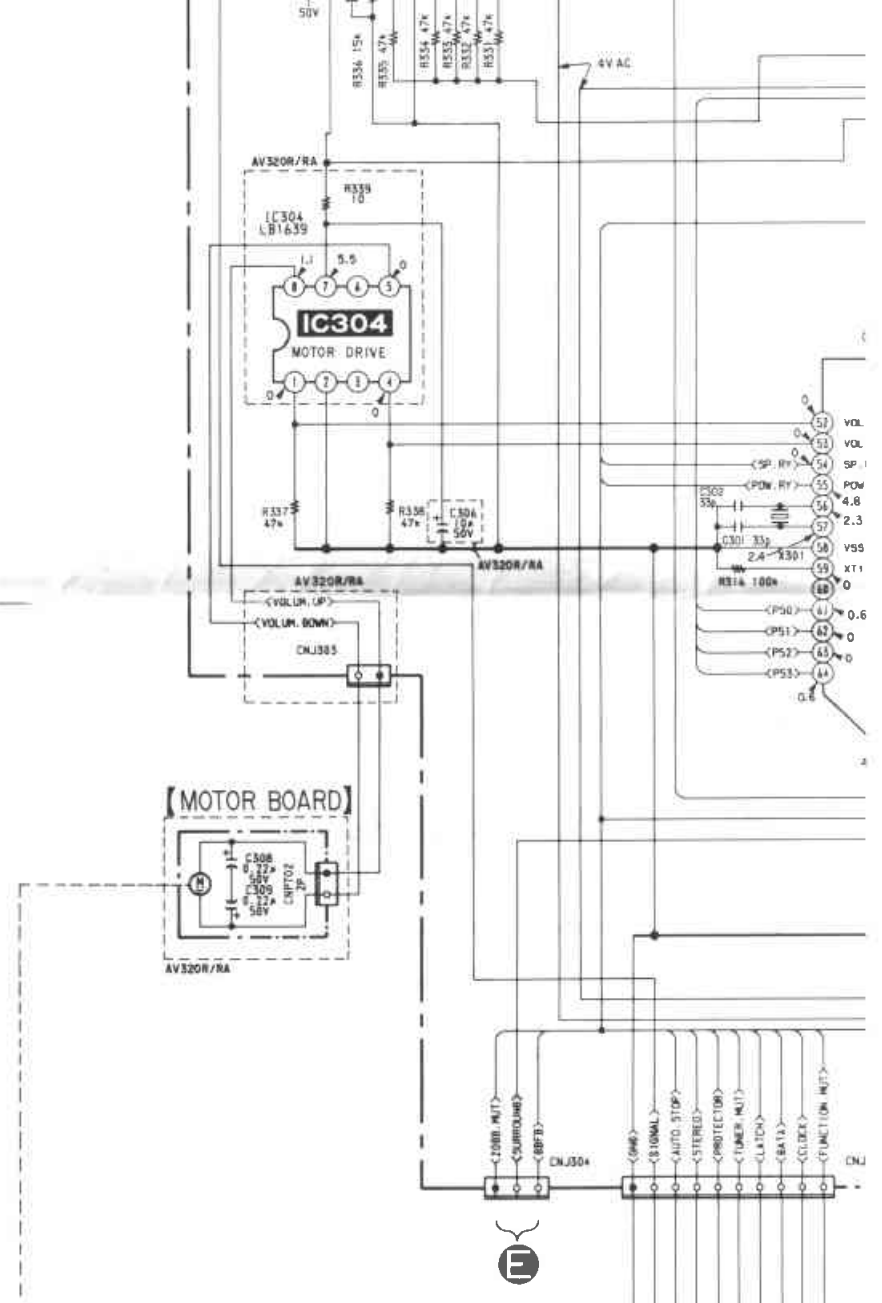


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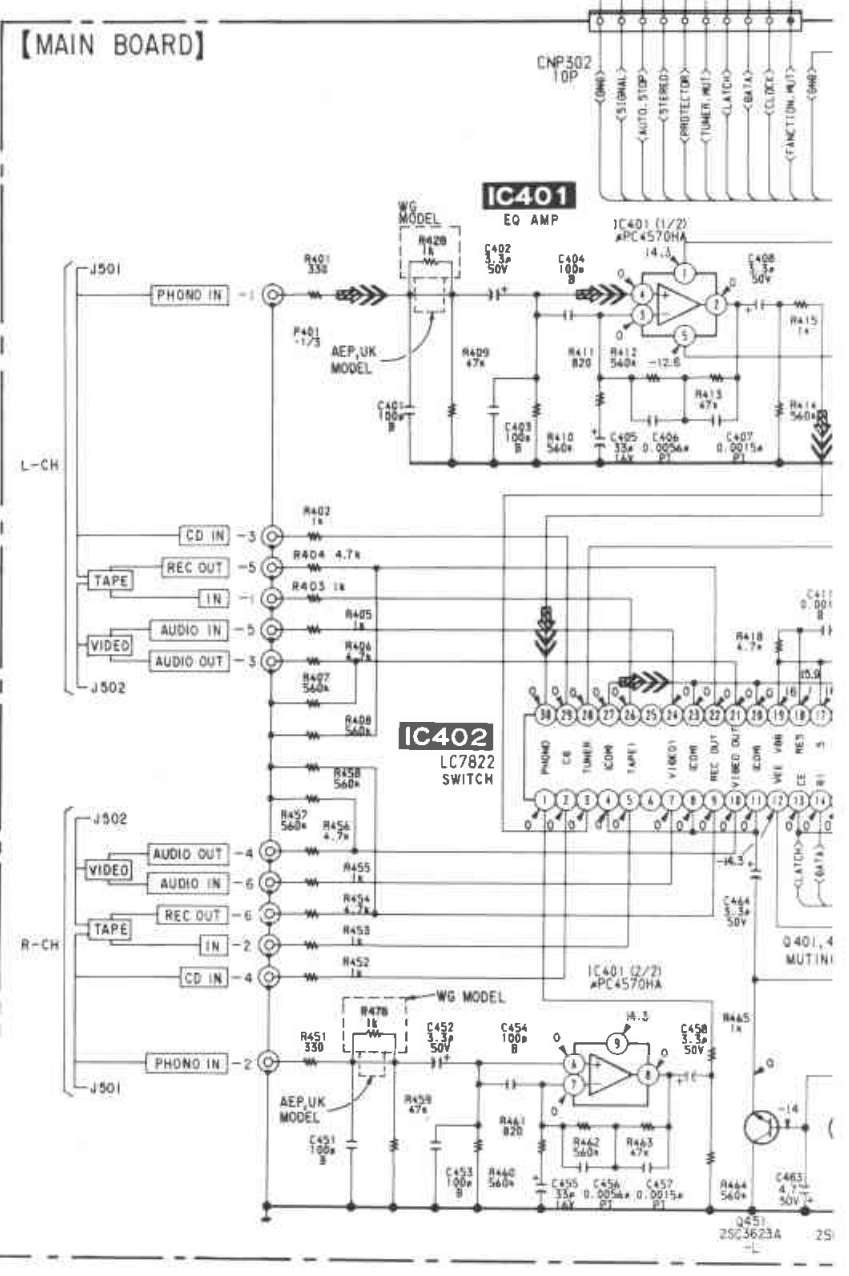
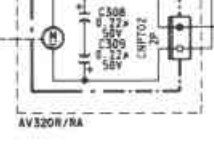


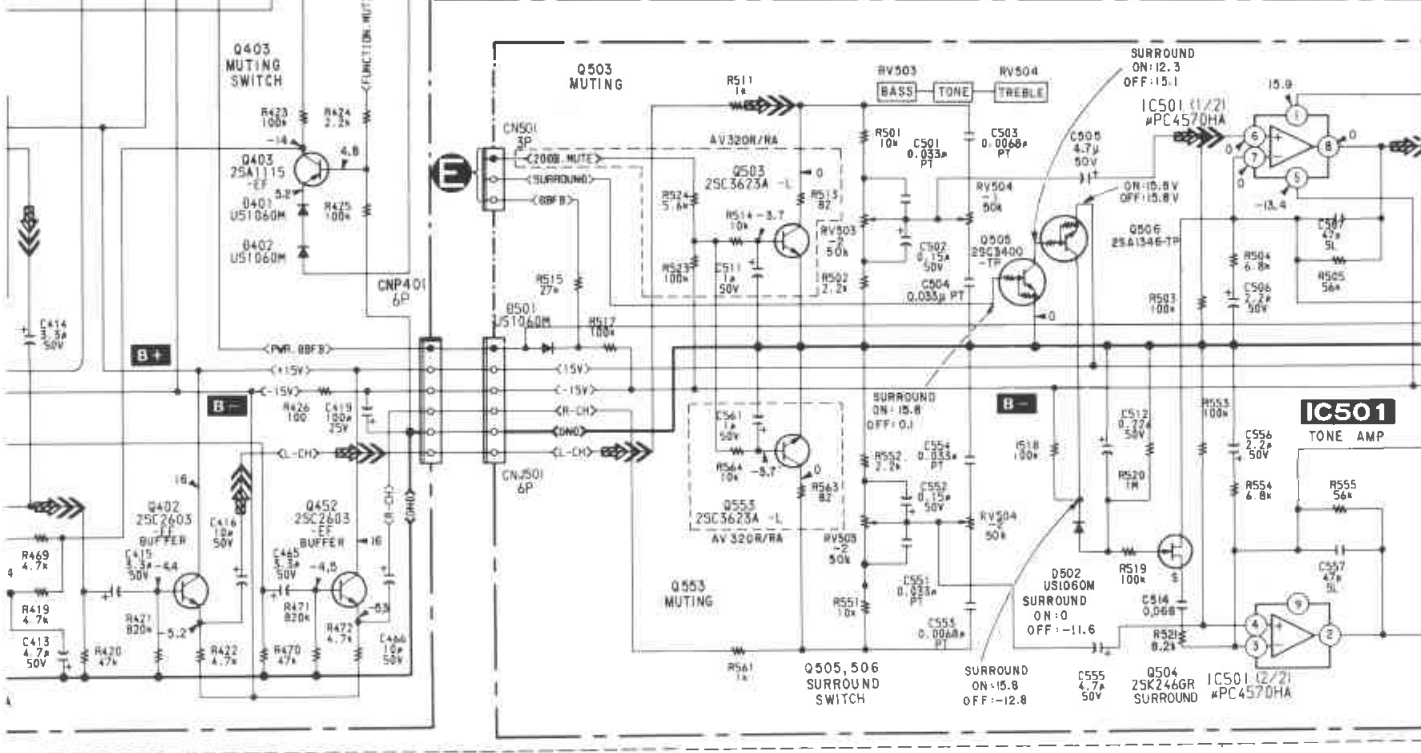
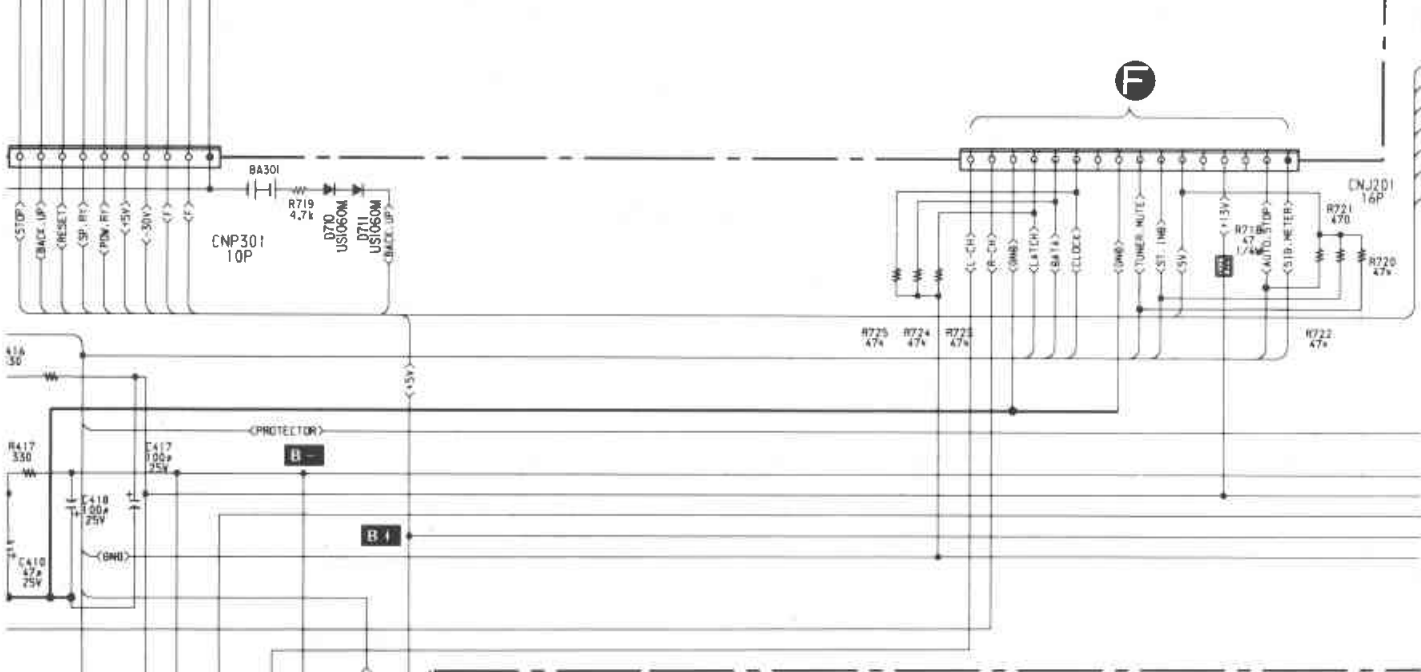
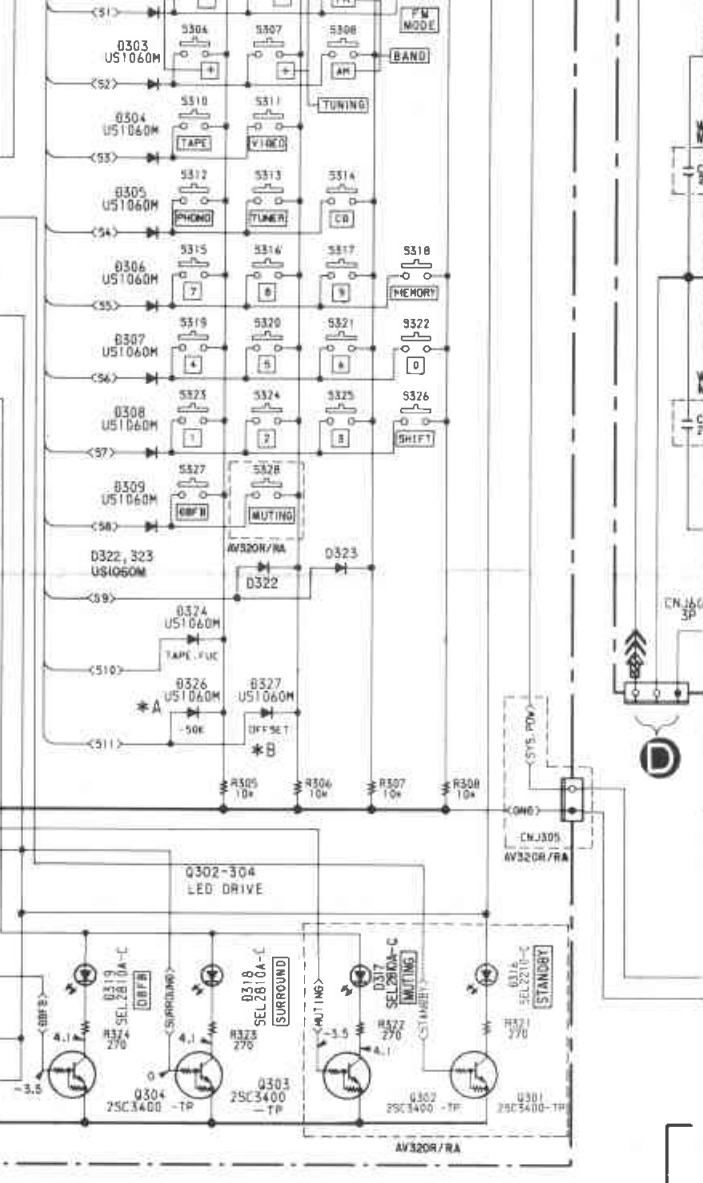
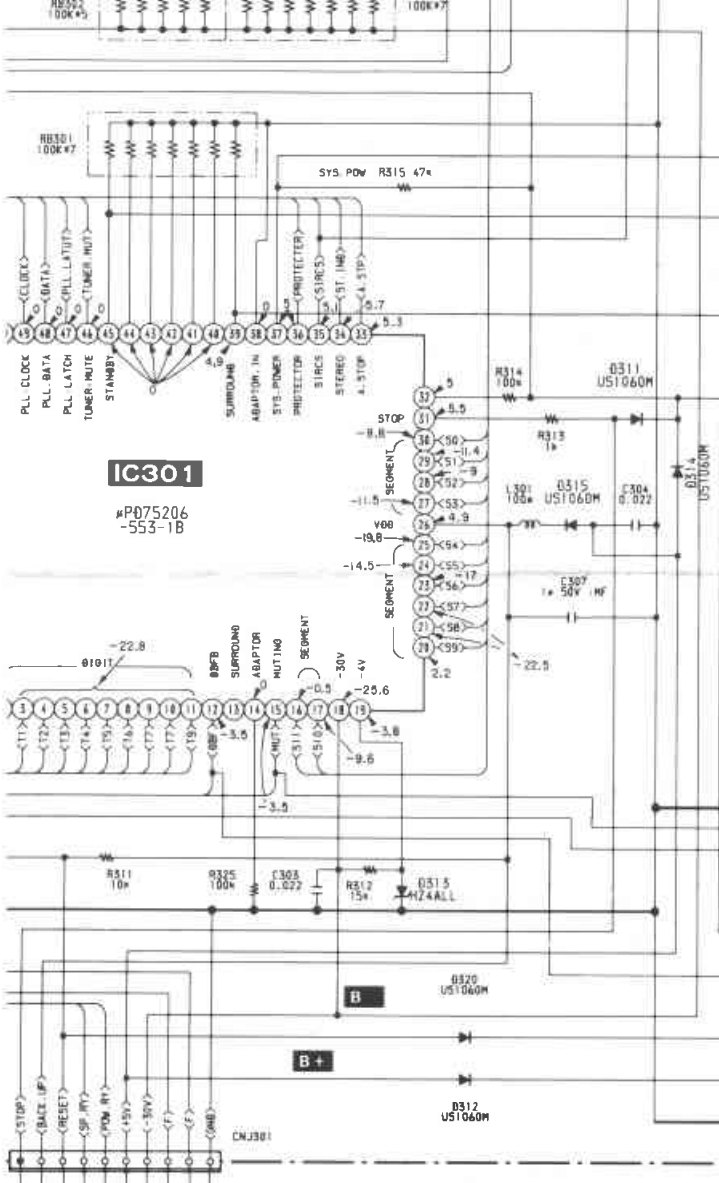


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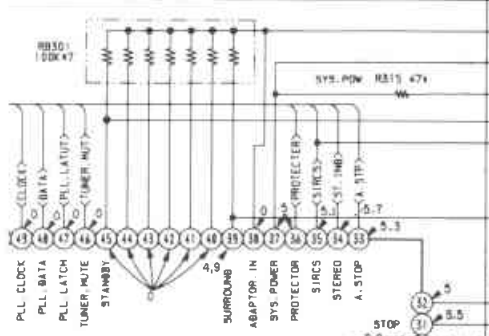
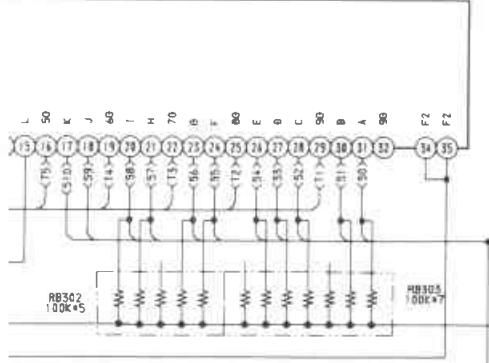
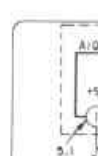


**[MOTOR BOARD]**



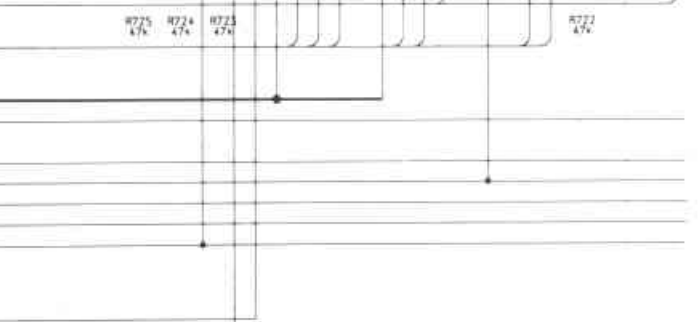
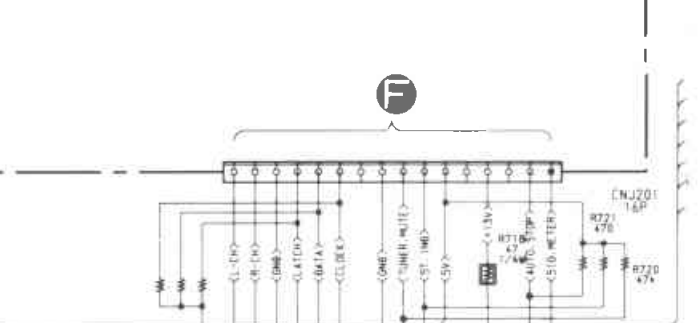
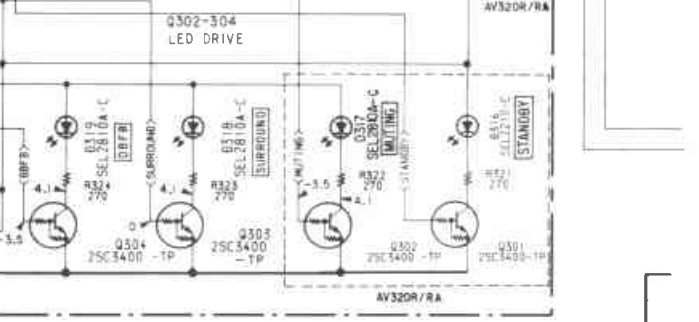
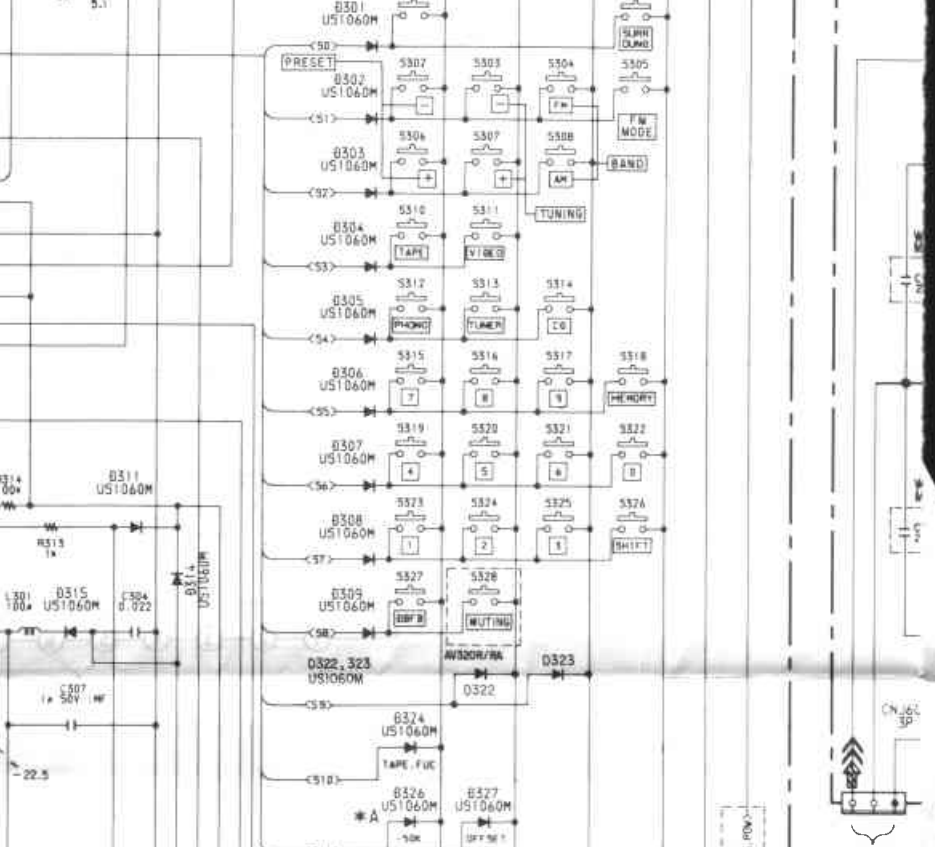
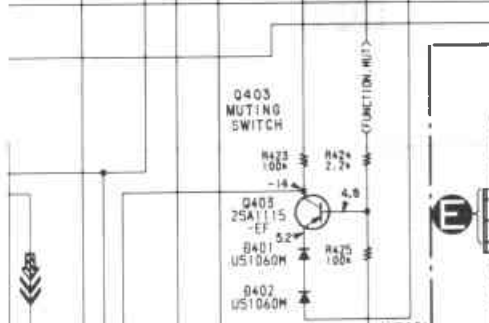
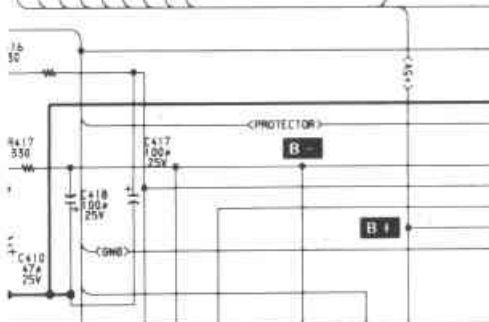
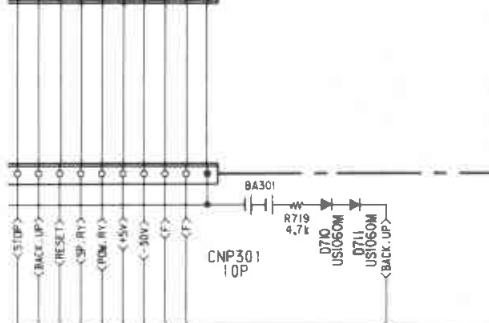
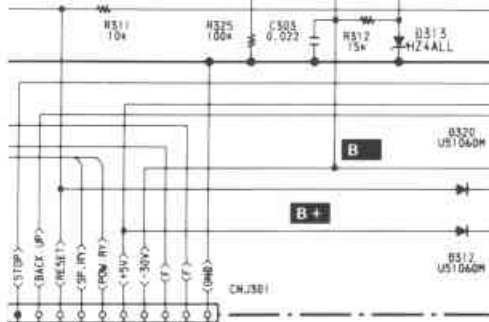
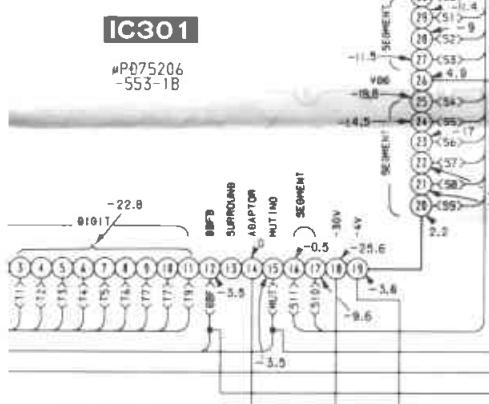


**IC302**  
REMOTE  
DETECTOR



**IC301**

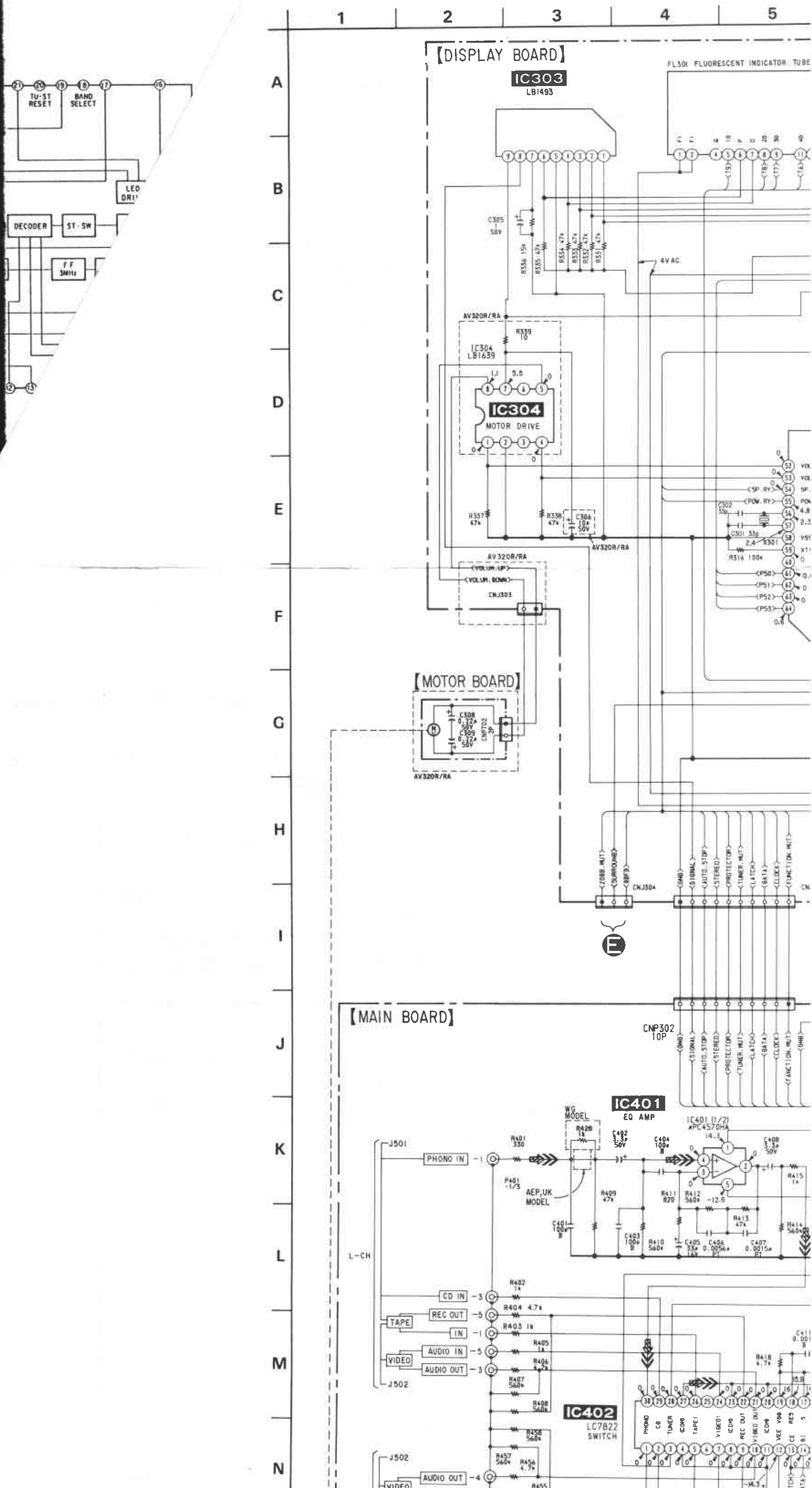
#P075206  
-553-1B



IC BO

IC601  
AV220/A  
AV320R/RA

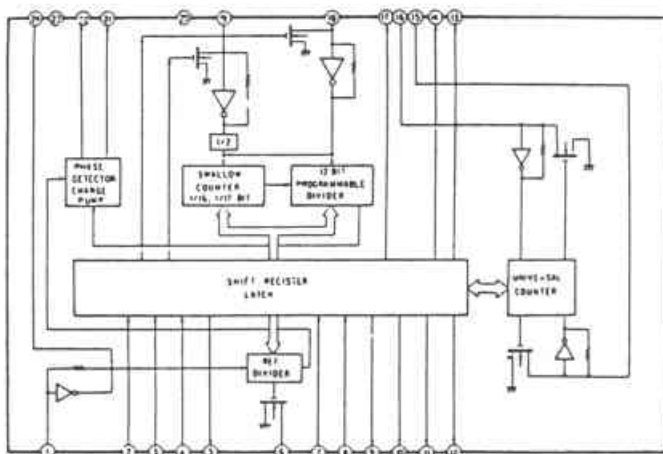
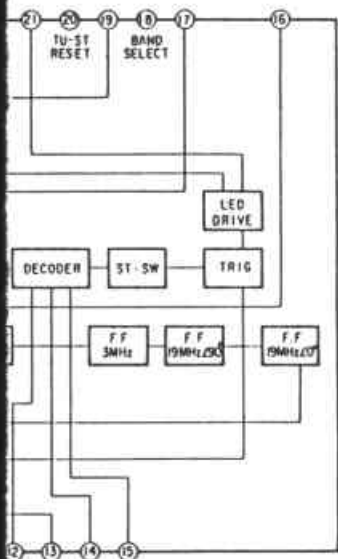






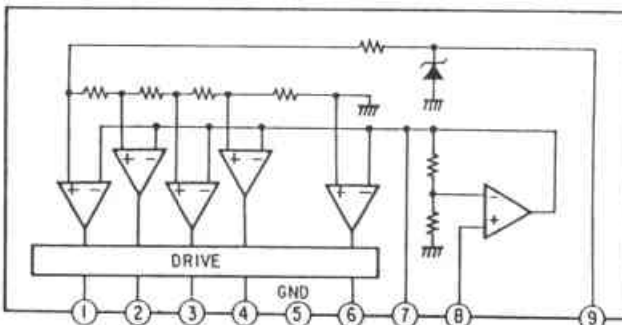
IC81 LC7218

IC50



IC303 LB1493

IC5

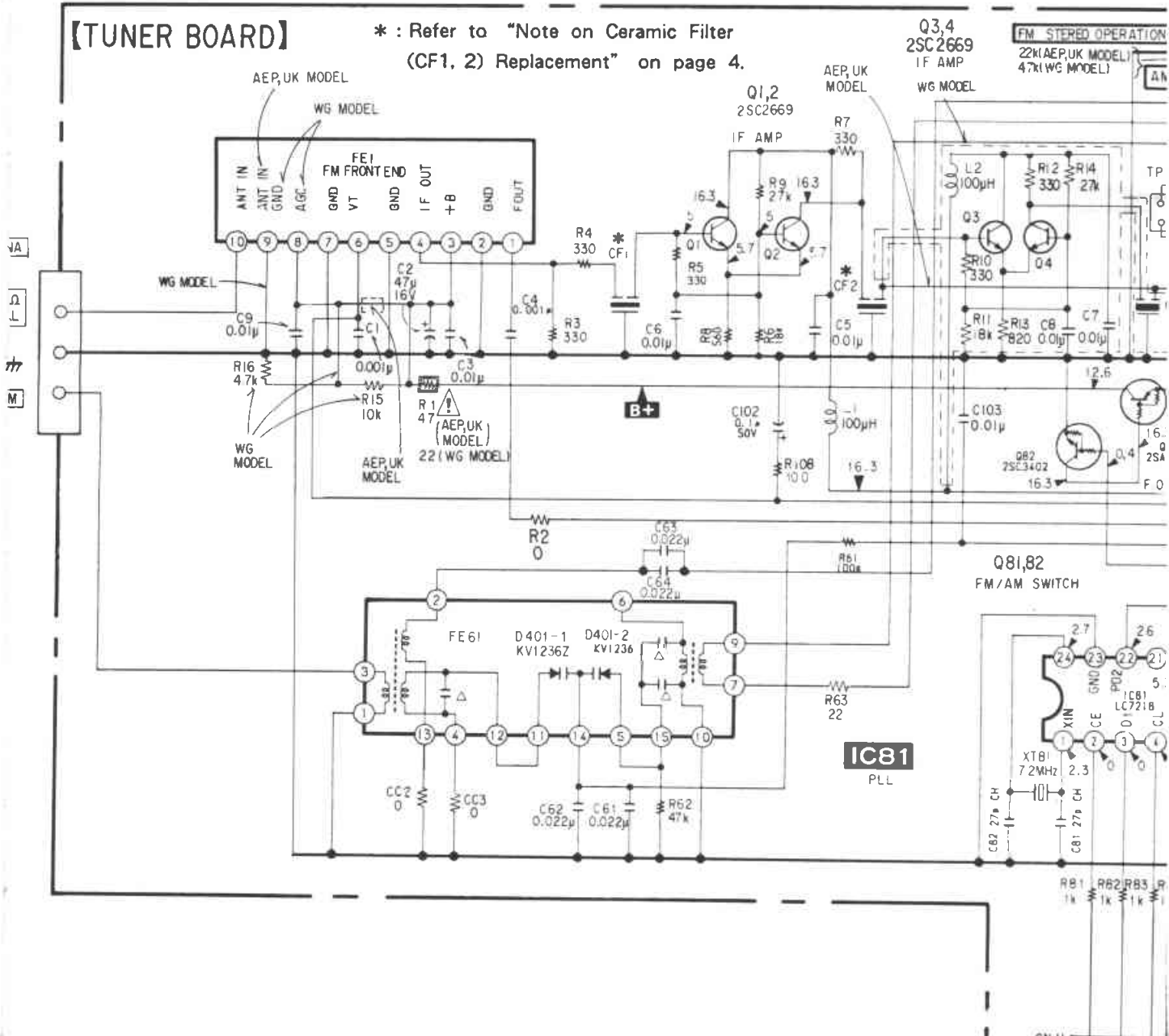


AGRAM - TUNER SECTION -

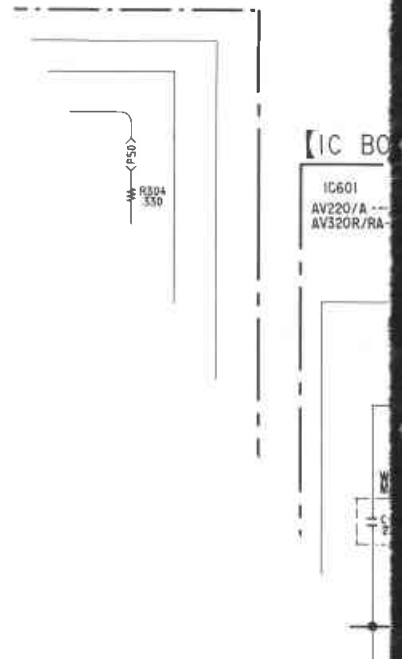
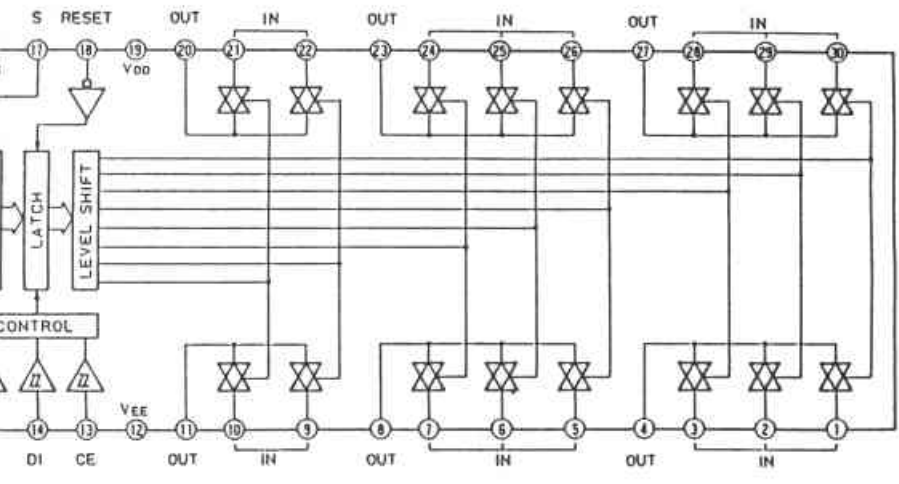


[TUNER BOARD]

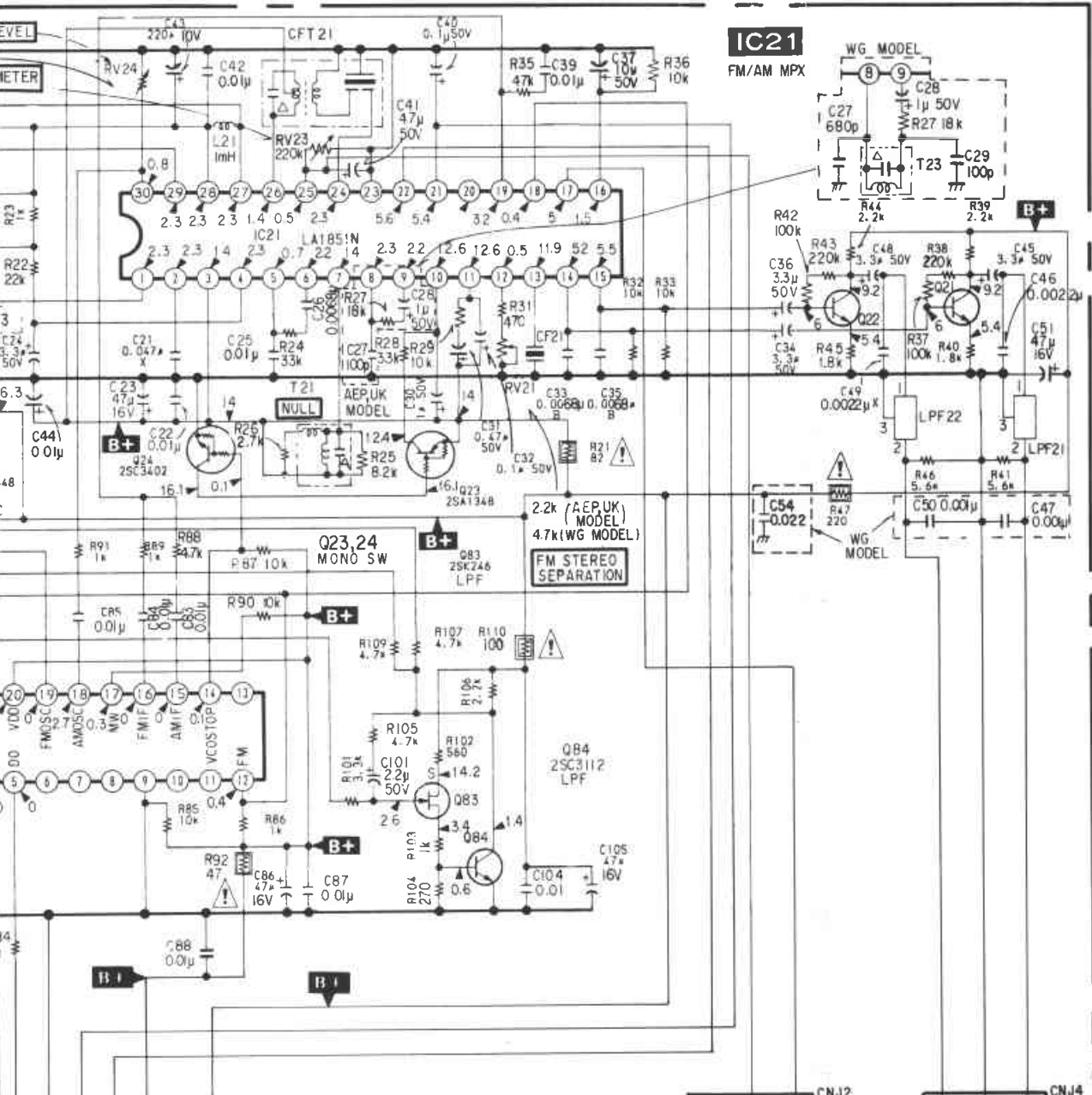
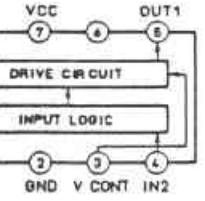
\* : Refer to "Note on Ceramic Filter (CF1, 2) Replacement" on page 4.



LC7822



3 LB1639



IC BO

IC601  
AV220/A  
AV320R/RA

IC21  
FM/AM MPX

B+

B+

B+

B+

B+

B+

B+

B+

B+

B+

B+

B+

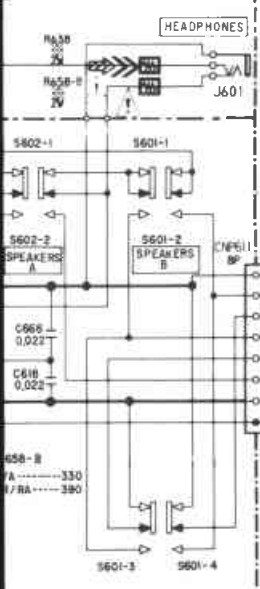
B+

B+

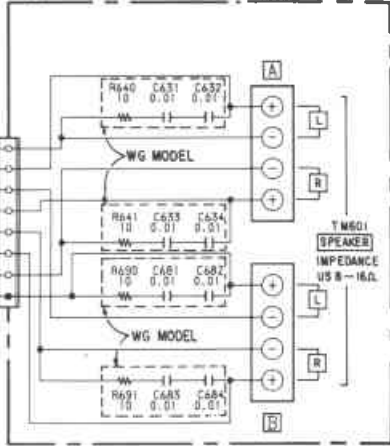
CNJ2

CNJ4

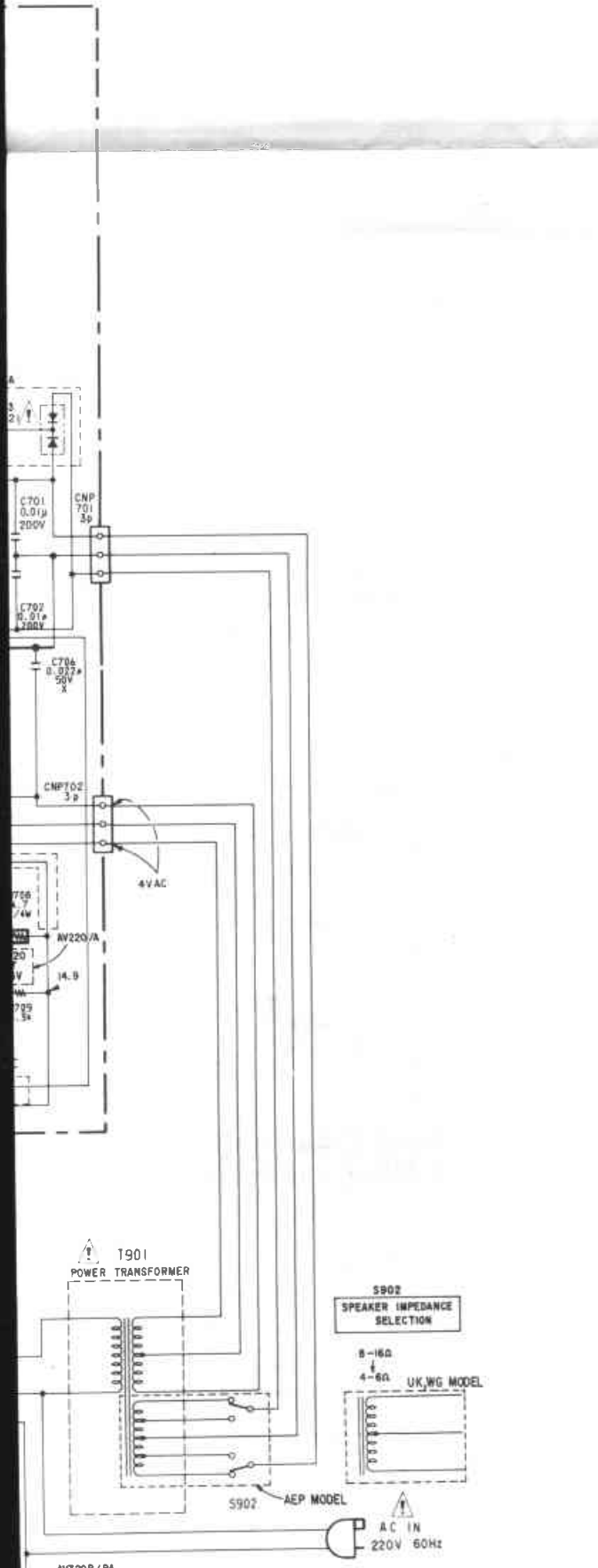
BOARD]



[SP TERMINAL BOARD]



AKER SWITCH BOARD]



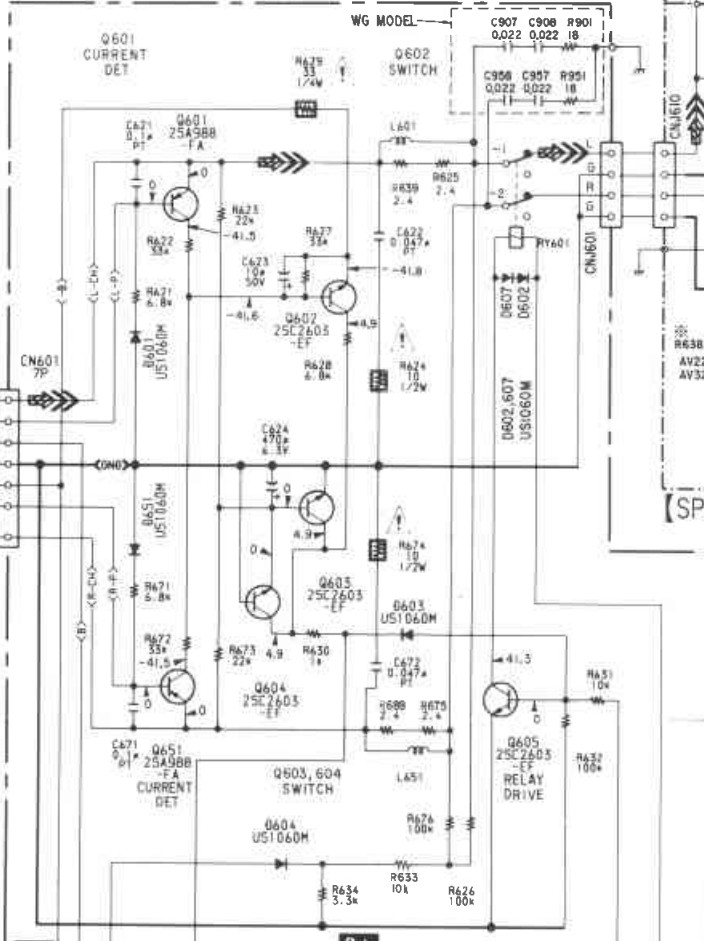
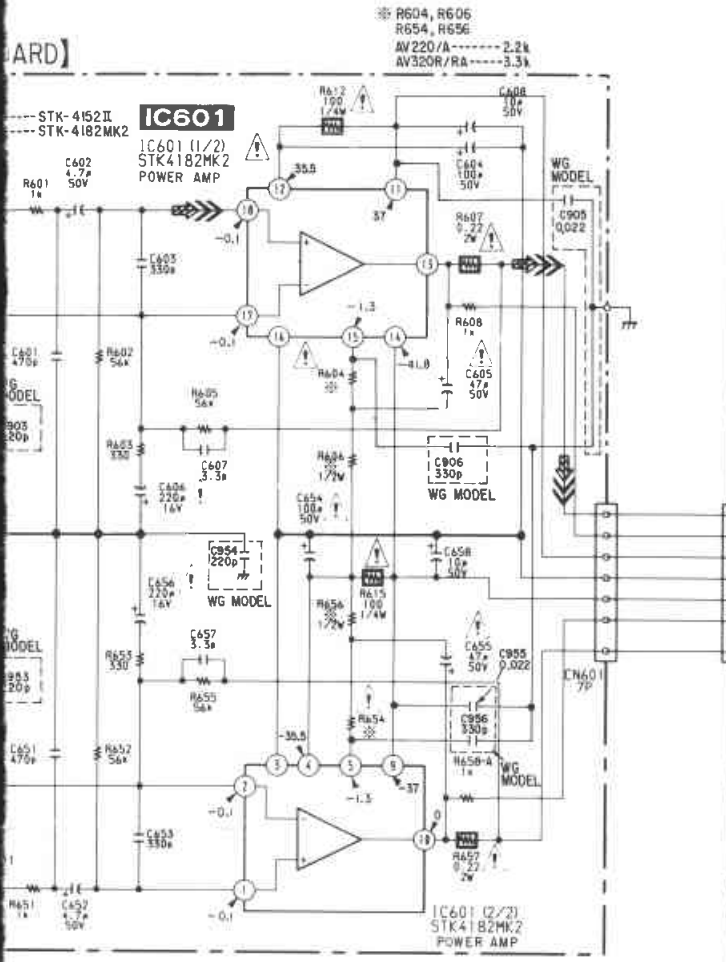
Note :

- \*A, \*B : See Page 4 for Note on Ceramic Filter (CF1, 2 and 3) Replacement.
- All capacitors are in  $\mu F$  unless otherwise noted. pF :  $\mu \mu F$  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $\frac{1}{4}W$  or less unless otherwise specified.
- % : indicates tolerance.
- $\Delta$  : internal component.
- : nonflammable resistor.

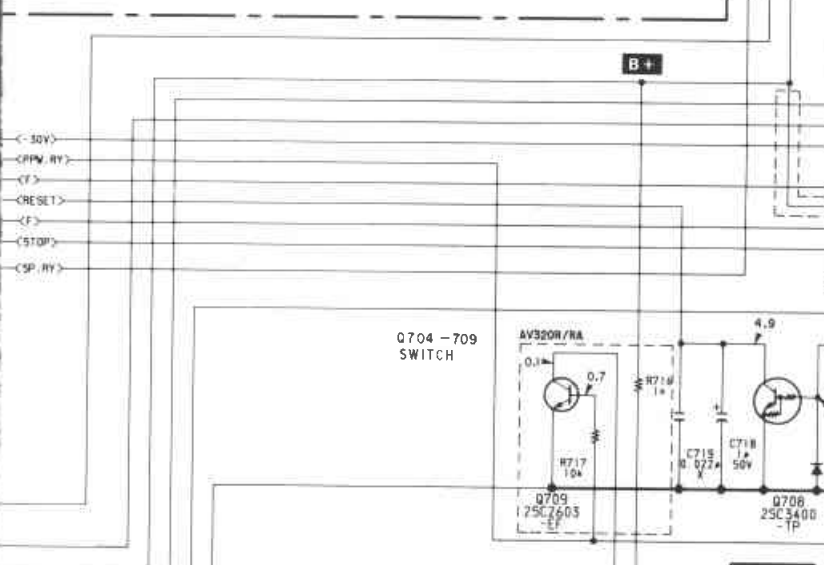
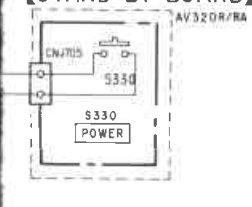
Note: The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

— : B+ Line

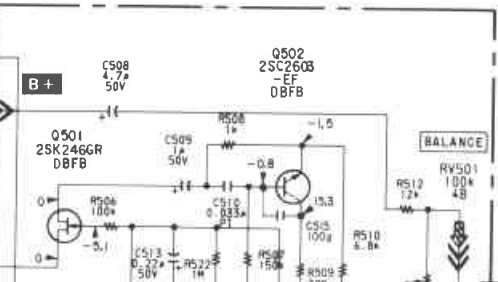
[ARD]



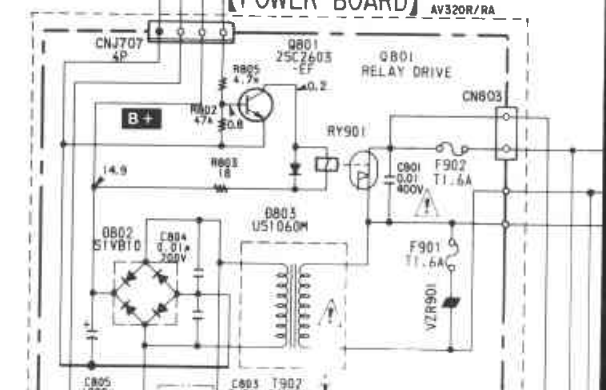
[STAND BY BOARD]

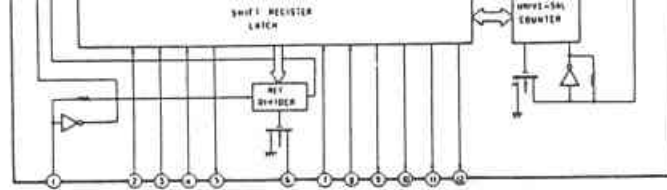
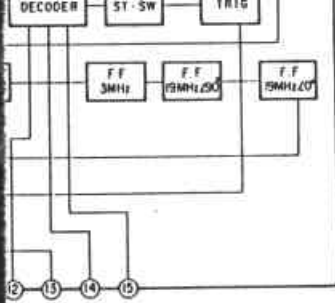


[LED BOARD]

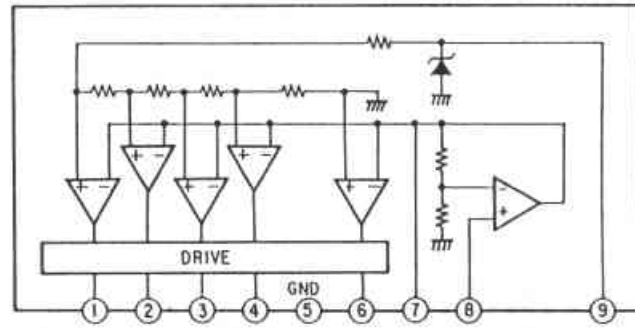


[POWER BOARD]



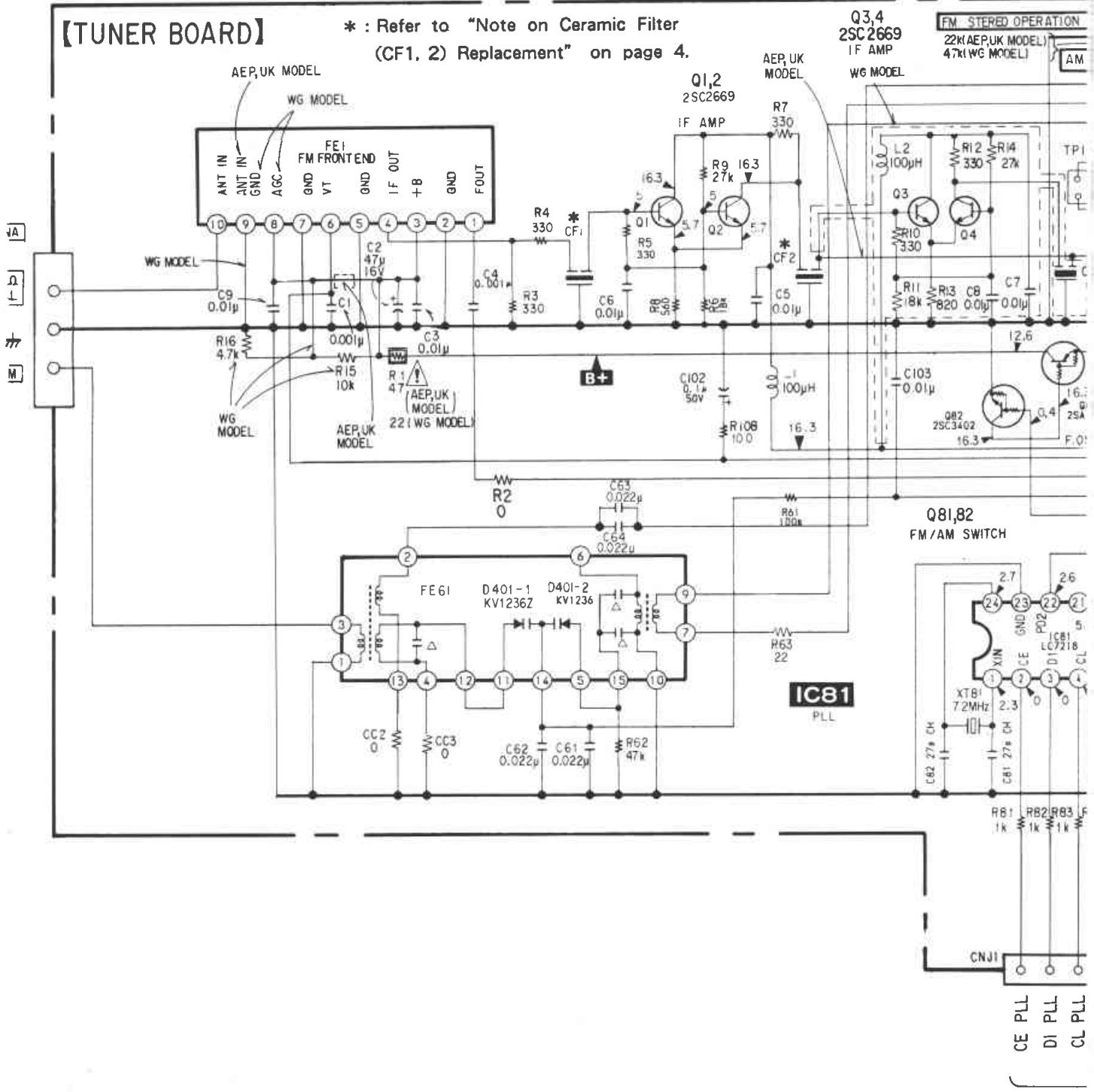


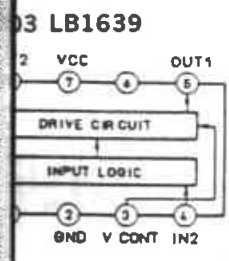
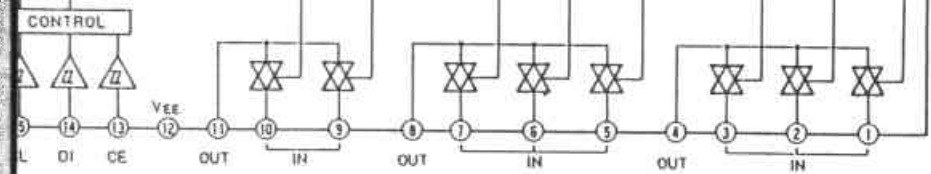
IC303 LB1493



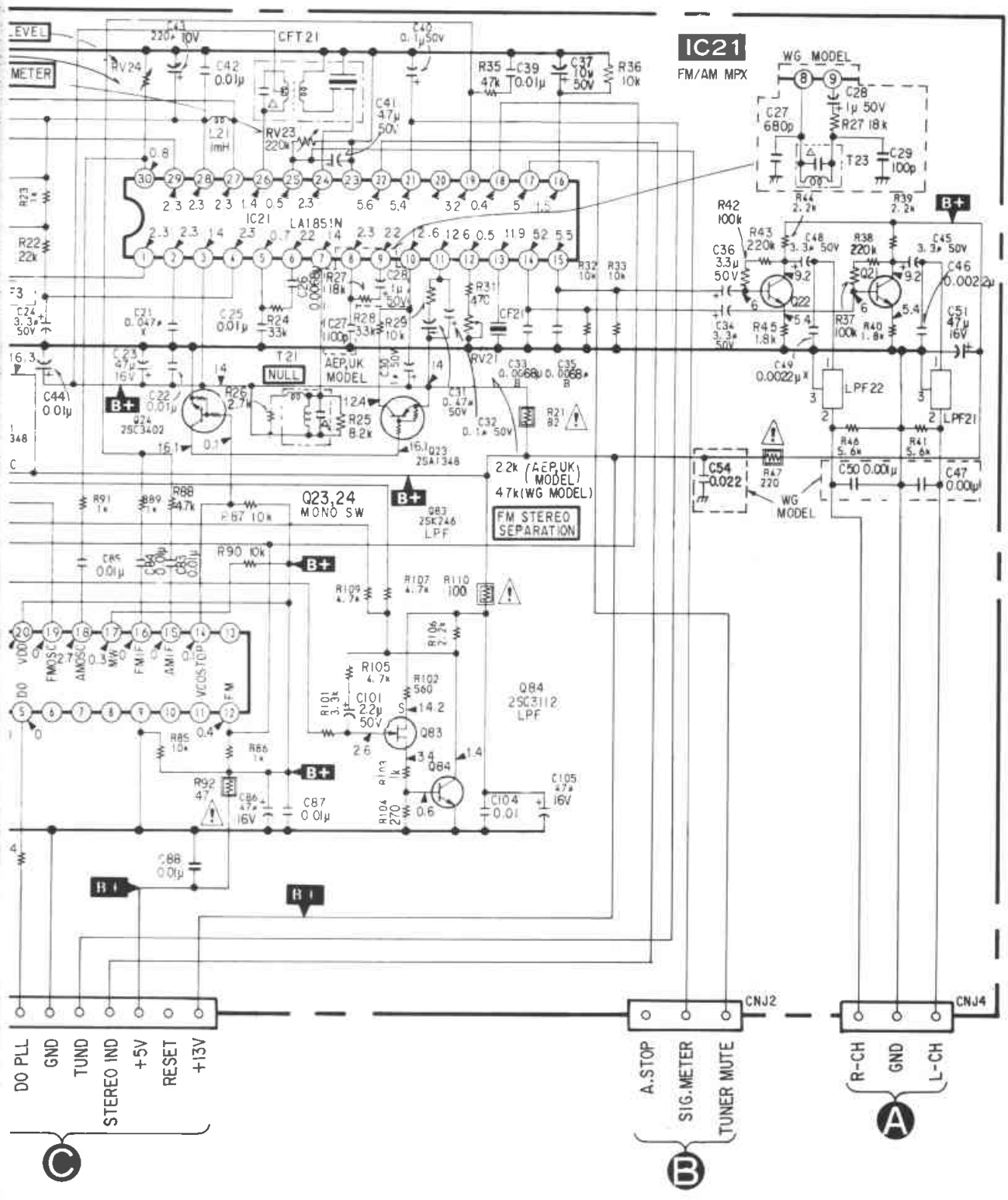
IC50

AGRAM -TUNER SECTION-

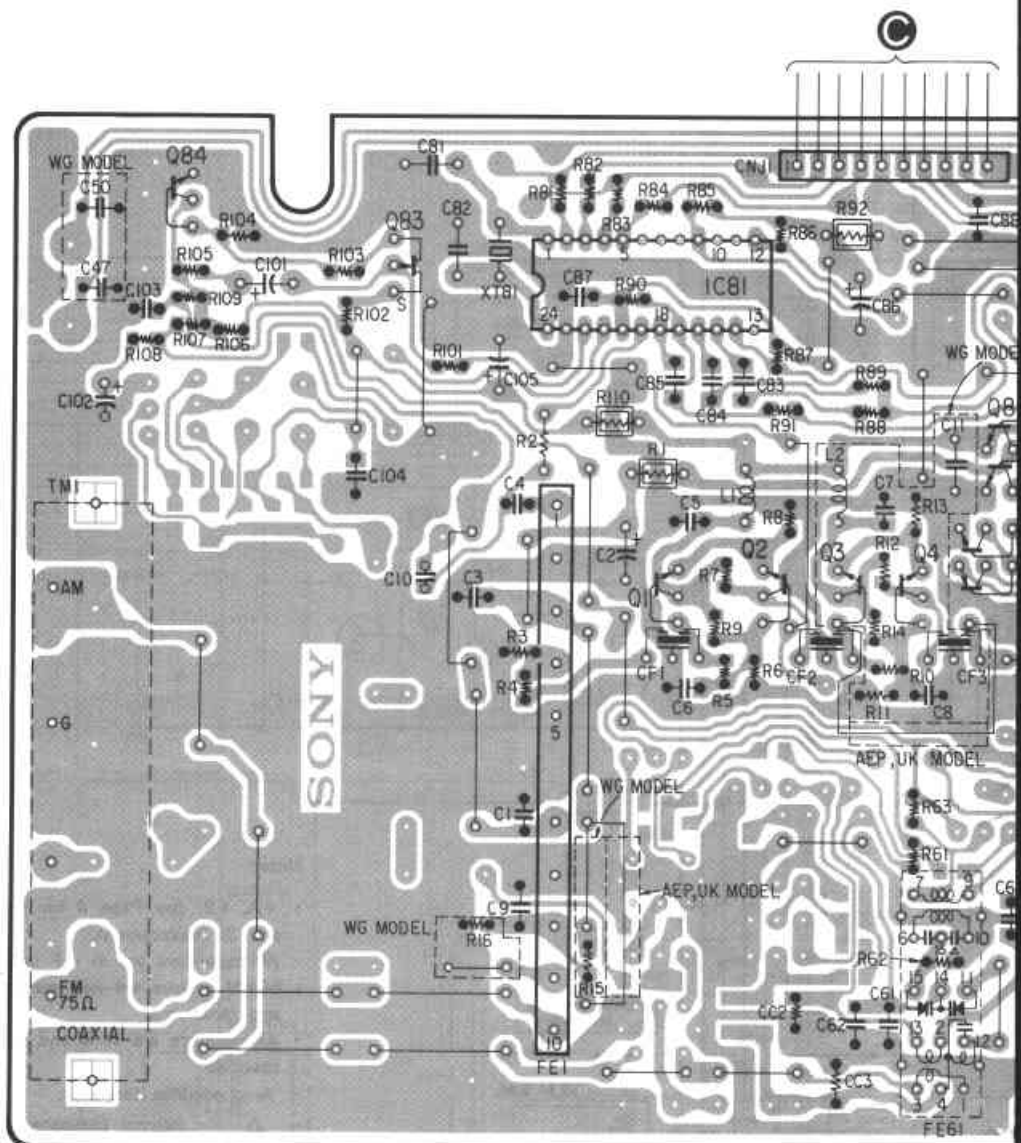




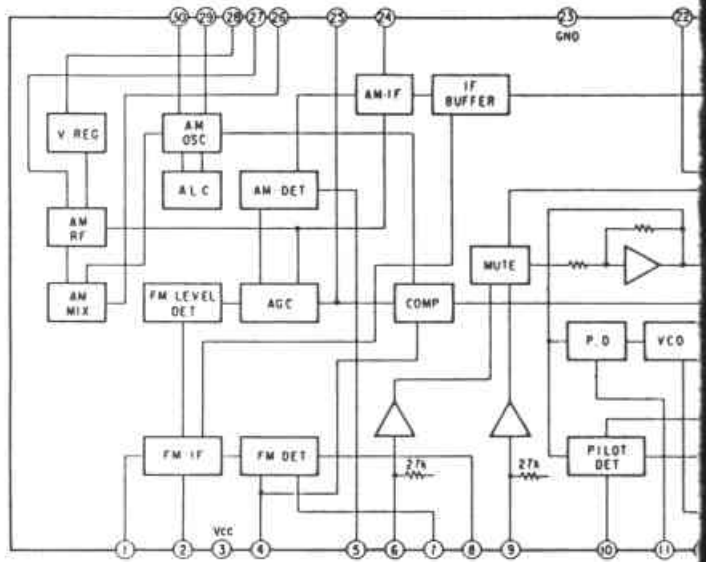
10 11 12 13 14 15 16



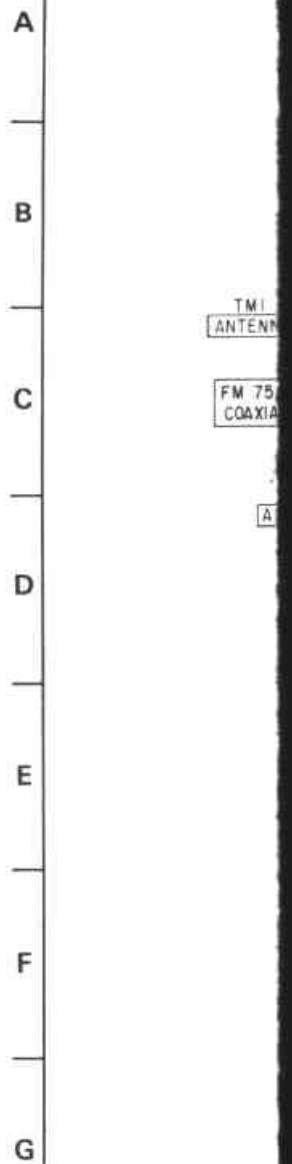
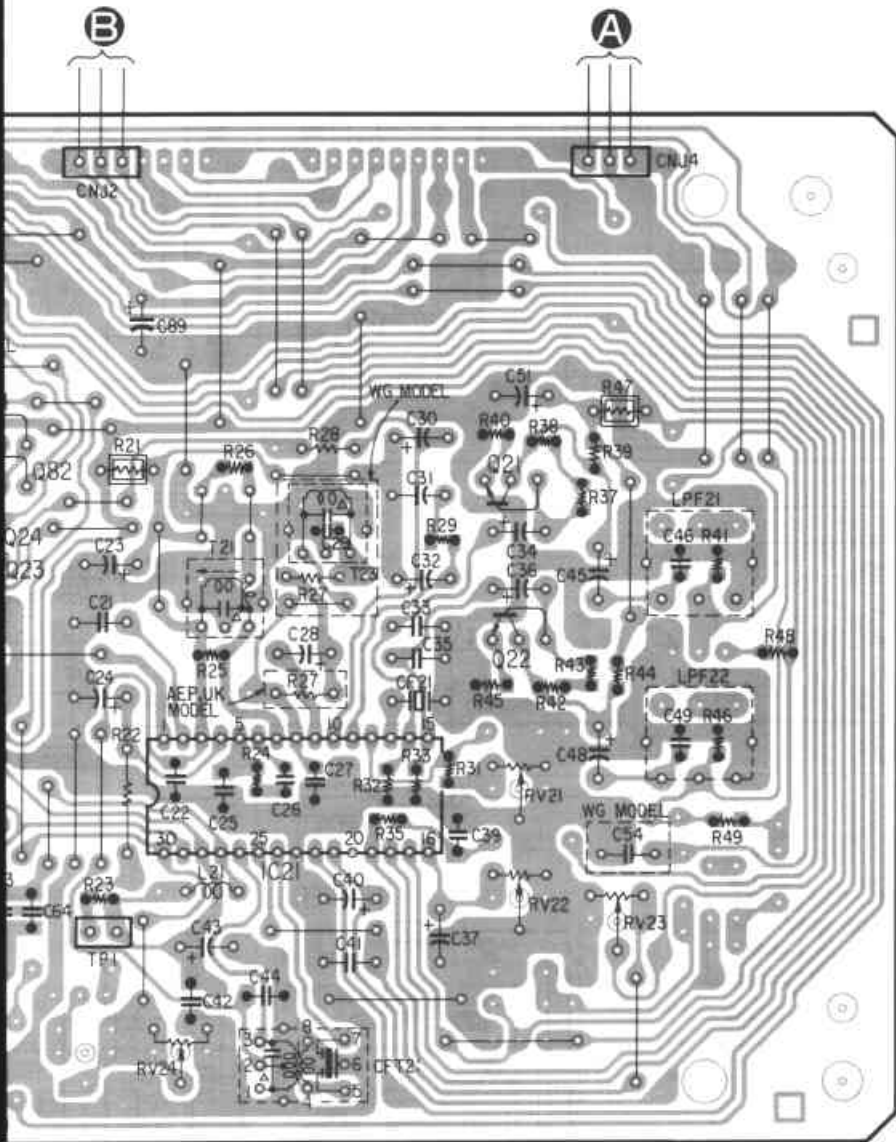
3-5. PRINTED WIRING BOARDS - TUNER SECTION -



IC21 LA1851N



3-6. SCHEMATIC DI





3-7. EXPLANATION OF IC301 ( $\mu$ PD75206)

| PIN No. | SIGNAL NAME | FUNCTION                                   | I/O       | ACTIVE |
|---------|-------------|--|-----------|--------|
| 1       | RESET       | Micro Computer RESET                       | I         | L      |
| 2       | T0          | FL tube indication (invalid) digit         | O         | H      |
| 3       | T1          | FL tube indication digit                   | T1 O      | H      |
| 4       | T2          | FL tube indication digit                   | T2 O      | H      |
| 5       | T3          | FL tube indication digit                   | T3 O      | H      |
| 6       | T4          | FL tube indication digit                   | T4 O      | H      |
| 7       | T5          | FL tube indication digit                   | T5 O      | H      |
| 8       | T6          | FL tube indication digit                   | T6 O      | H      |
| 9       | T7          | FL tube indication digit                   | T7 O      | H      |
| 10      | T8          | FL tube indication digit                   | T8 O      | H      |
| 11      | T9          | FL tube SIGNAL indication digit            | T9 O      | H      |
| 12      | T10/PH3     | DBFB Output                                | O         | H      |
| 13      | T11/PH2     | IF WIDE/NARROW Output                      | O         | H      |
| 14      | T12/PH1     | Adapter Output                             | O         | H      |
| 15      | T13/PH0     | -20dB Muting Output                        | O         | H      |
| 16      | T14/S11     | FL tube indication Segment/Diode           | S11 O     | H      |
| 17      | T15/S10     | FL tube indication Segment/Diode           | S10 O     | H      |
| 18      | V road      | FL tube pulldown power supply              | -         | -      |
| 19      | V pre       | FL tube driver power supply                | -         | -      |
| 20      | S9          | FL tube indication Segment/Diode           | S9 O      | H      |
| 21      | S8          | FL tube indication Segment/Key Scan        | S8 O      | H      |
| 22      | S7          | FL tube indication Segment/Key Scan        | S7 O      | H      |
| 23      | S6          | FL tube indication Segment/Key Scan        | S6 O      | H      |
| 24      | S5          | FL tube indication Segment/Key Scan        | S5 O      | H      |
| 25      | S4          | FL tube indication Segment/Key Scan        | S4 O      | H      |
| 26      | Vdd         | Micro Computer power supply                | -         | -      |
| 27      | S3          | FL tube indication Segment/Key Scan        | S3 O      | H      |
| 28      | S2          | FL tube indication Segment/Key Scan        | S2 O      | H      |
| 29      | S1          | FL tube indication Segment/Key Scan        | S1 O      | H      |
| 30      | S0          | FL tube indication Segment/Key Scan        | S0 O      | H      |
| 31      | P00/INT4    | Signal to cut power supply                 | STOP I    | L      |
| 32      | P01/SCK     | Serial latch for electrical adjustment use | SI. LAT I | L      |

-Continued on page 22-

| PIN No. | SIGNAL NAME | FUNCTION                                | I/O | ACTIVE |
|---------|-------------|---|-----|--------|
| 33      | P02/S0      | Tuner Auto Stop input<br>ASTP           | I   | L      |
| 34      | P03/S1      | Tuner Stereo input<br>STEREO            | I   | L      |
| 35      | P10/INT0    | Remote Control Signal input<br>SIRCS    | I   | L      |
| 36      | P11/INT1    | Protector input<br>PROTECT              | I   | L      |
| 37      | P12/INT2    | System Power Key input<br>PKEY          | I   | L      |
| 38      | P13/T10     | Adapter Mechanical Switch input<br>AKEY | I   | H      |
| 39      | P20         | Surround output<br>SURROUND             | O   | H      |
| 40      | P21         | Video Control A<br>VCRA                 | O   | H      |
| 41      | P22         | Video Control B<br>VCRB                 | O   | H      |
| 42      | P23/BUZ     | Video Inhibit<br>VCRI                   | O   | H      |
| 43      | P30         | Protector Muting<br>PMUT                | O   | L      |
| 44      | P31         | Source Direct Output                    | O   | H      |
| 45      | P32         | Standby LED Output<br>STANBY            | O   | H      |
| 46      | P33         | Tuner Muting<br>TMUTE                   | O   | H      |
| 47      | P60         | PLL/7822 Latch<br>PLAT                  | O   | H      |
| 48      | P61         | PLL/7822/SI Data<br>DATA                | I/O | H      |
| 49      | P62         | PLL/7822/SI Clock<br>CLOCK              | I/O | H      |
| 50      | P63         | IF WIDE/NARROW Display output           | O   | H      |
| 51      | P40         | Function Muting<br>FMUTE                | O   | L      |
| 52      | P41         | Motor Volume UP<br>VOL+                 | O   | H      |
| 53      | P42         | Motor Volume DOWN<br>VOL-               | O   | H      |
| 54      | P43         | Speaker Relay<br>SP. RY                 | O   | H      |
| 55      | PP0         | Power Relay<br>POW. RY                  | O   | H      |
| 56      | X1          | Ceramic Oscillator                      | -   | -      |
| 57      | X2          | Ceramic Oscillator                      | -   | -      |
| 58      | Vss         | Micro Computer GND                      | -   | -      |
| 59      | XT1         | -                                       | -   | -      |
| 60      | XT2         | -                                       | -   | -      |
| 61      | P50         | P50<br>Key Scan Input                   | I   | H      |
| 62      | P51         | P51<br>Key Scan Input                   | I   | H      |
| 63      | P52         | P52<br>Key Scan Input                   | I   | H      |
| 64      | P53         | P53<br>Key Scan Input                   | I   | H      |

## SECTION 4 EXPLODED VIEWS

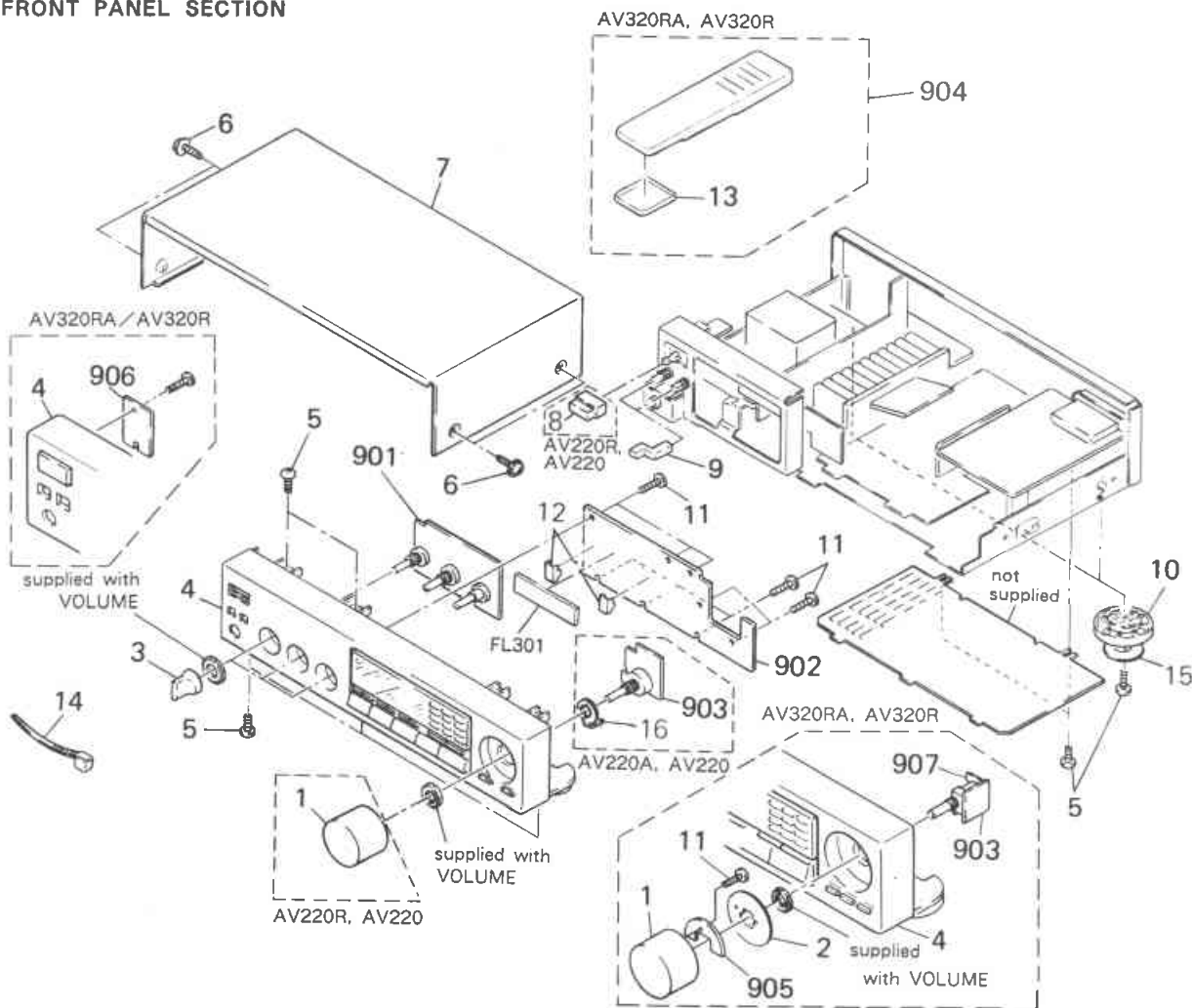
**NOTE:**

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts  
 Example:  
 (RED) ... KNOB, BALANCE (WHITE)  
 ↑                                 ↑  
 Cabinet's Color                     Parts Color  
 • WG : West Germany

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

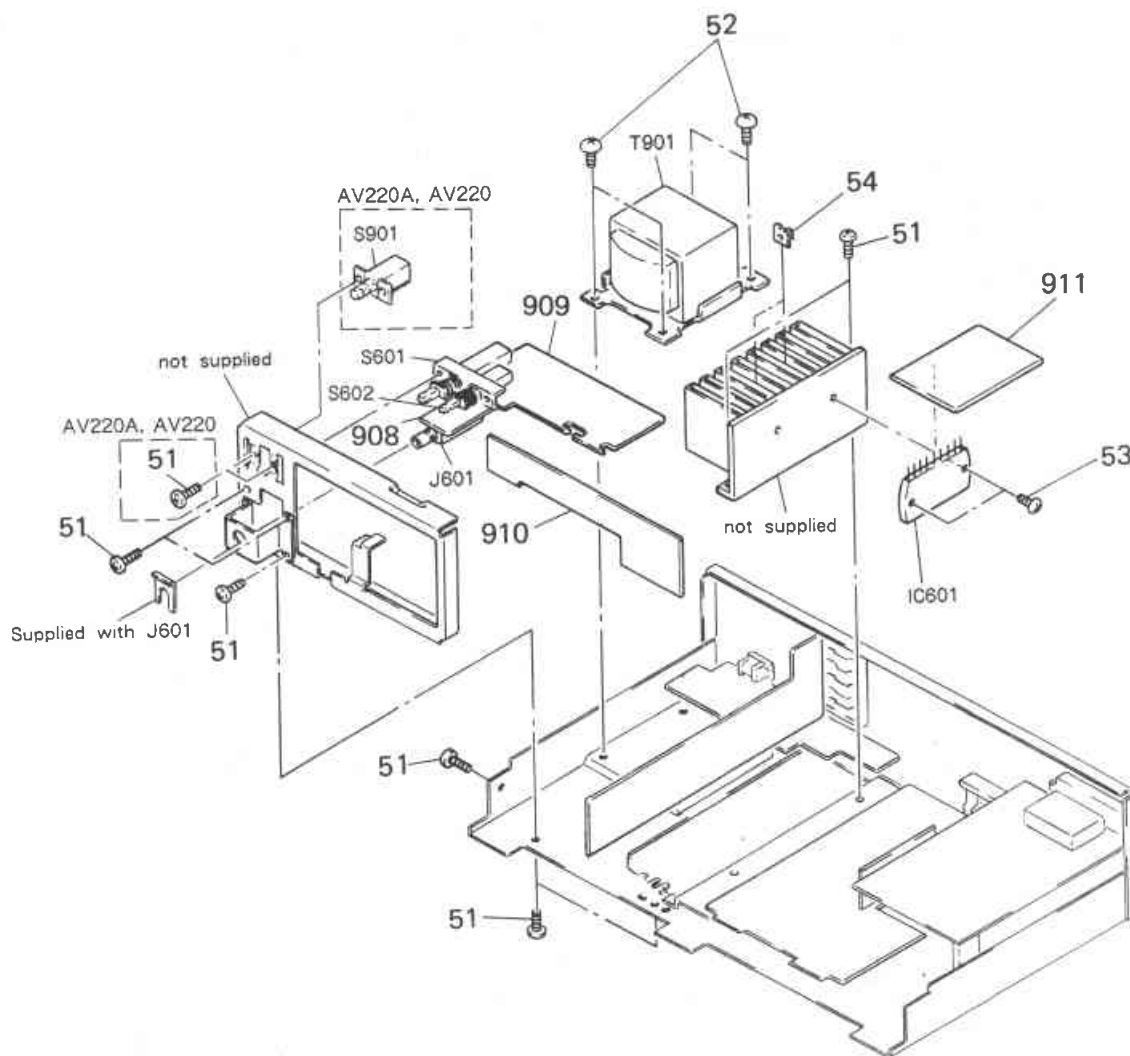
(1) FRONT PANEL SECTION



| No. | Part No.      | Description                           | Remarks |
|-----|---------------|---------------------------------------|---------|
| 1   | 4-925-121-01  | {AV320R/RA}...KNOB (V2)               |         |
|     | 4-925-121-71  | {AV220/A}...KNOB (V2)                 |         |
| 2   | *4-931-603-01 | {AV320R/RA}...SPACER                  |         |
| 3   | 4-916-745-01  | KNOB (DIA.21)                         |         |
| 4   | X-4906-831-1  | {AV320R/RA}...PANEL ASSY, FRONT       |         |
|     | X-4906-834-1  | {AV220/A}...PANEL ASSY, FRONT         |         |
| 5   | 7-682-548-04  | SCREW +BVTT 3X8 (S)                   |         |
| 6   | 3-704-366-01  | SCREW (CASE) (M3X8)                   |         |
| 7   | 4-925-066-11  | CASE                                  |         |
| 8   | 3-354-912-01  | {AV220/A}...KNOB, POWER               |         |
| 9   | 4-906-872-01  | KNOB, SQUARE                          |         |
| 10  | X-3304-938-2  | FOOT ASSY                             |         |
| 11  | 7-685-534-19  | SCREW +BTP 2.6X8 TYPE2 N-S            |         |
| 12  | *4-924-989-11 | HOLDER (FL TUBE)                      |         |
| 13  | 2-181-754-01  | {AV320RA, AV320R:WG}...COVER, BATTERY |         |
|     | 4-925-079-01  | {AV320R:UK}...COVER(6), BATTERY       |         |
| 14  | 3-701-748-00  | CLAMP                                 |         |

| No.   | Part No.      | Description                                       | Remarks |
|-------|---------------|---|---------|
| 15    | 4-923-836-11  | CUSHION   |         |
| 16    | *4-925-044-01 | {AV220/A}...BRACKET (VOL GROUND)                  |         |
| 901   | *A-4334-398-A | {AV320R/RA}...MOUNTED PCB, TONE                   |         |
|       | *A-4334-413-A | {AV220/A}...MOUNTED PCB, TONE                     |         |
| 902   | *A-4334-002-A | {AV220/A}...MOUNTED PCB, DISPLAY                  |         |
|       | *A-4334-997-A | {AV320R/RA}...MOUNTED PCB, DISPLAY                |         |
| 903   | *I-634-063-11 | PC BOARD, VOLUME                                  |         |
| 904   | I-465-420-11  | {AV320R:UK}...REMOTE COMMANDER (RM-U203)          |         |
|       | I-465-423-11  | {AV320RA, AV320R:WG}...REMOTE COMMANDER (RM-S103) |         |
| 905   | *I-634-064-11 | {AV320R/RA}...PC BOARD, LED                       |         |
| 906   | *I-634-068-11 | {AV320R/RA}...PC BOARD, STAND BY                  |         |
| 907   | *I-634-061-11 | {AV320R/RA}...PC BOARD, MOTOR                     |         |
| FL301 | I-519-509-11  | INDICATOR TUBE, FLUORESCENT                       |         |

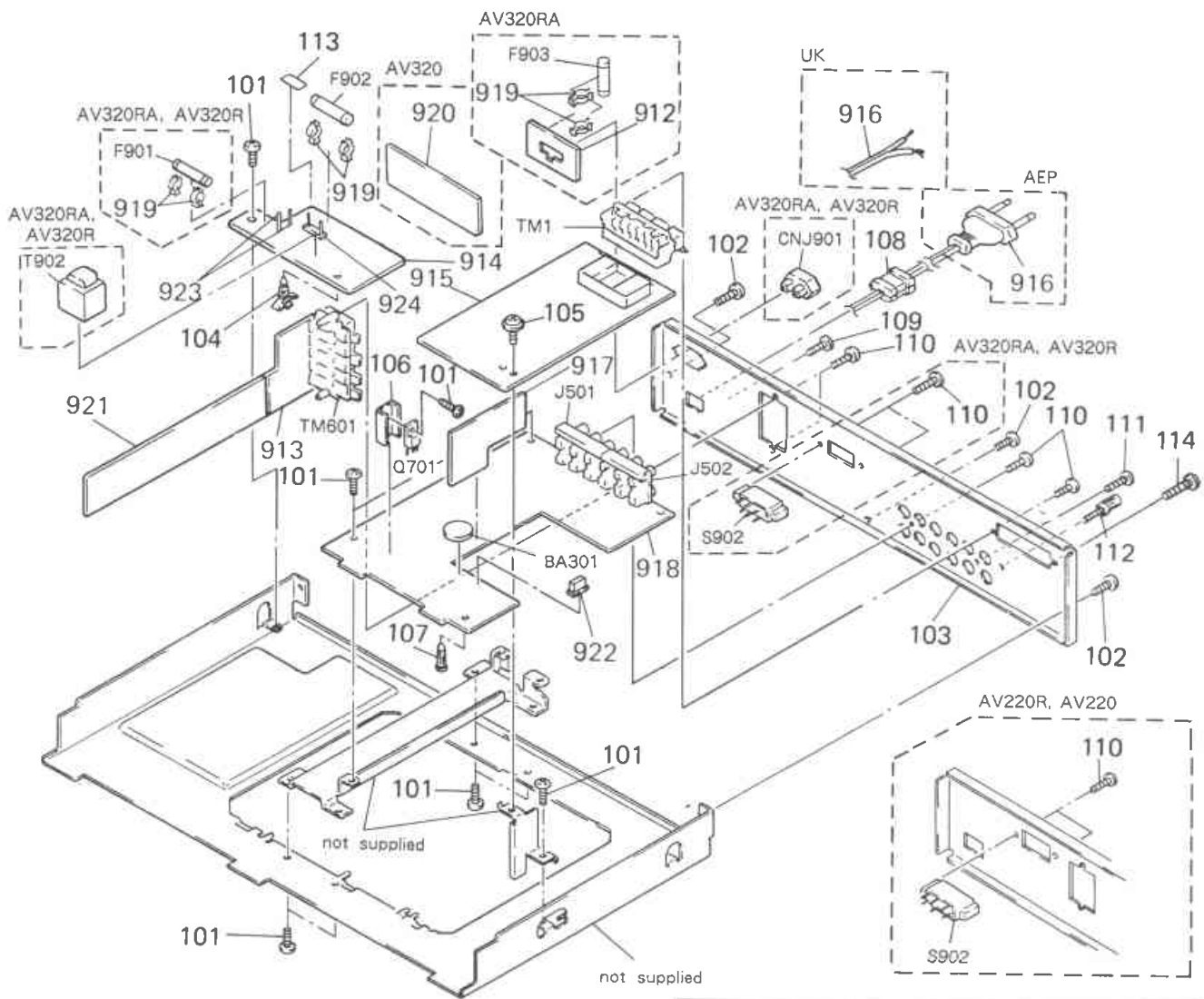
(2) CHASSIS SECTION-1



**Note:** The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

| No.   | Part No.              | Description                 | Remarks | No.  | Part No.              | Description                                | Remarks |
|-------|-----------------------|-----------------------------|---------|------|-----------------------|--|---------|
| 51    | 7-682-548-04          | SCREW +BVTT 3X8 (S)         |         | J601 | 1-507-863-51          | JACK, LARGE TYPE (HEADPHONES)              |         |
| 52    | 7-682-560-04          | SCREW +BVTT 4X6 (S)         |         | S601 | 1-571-485-11          | SWITCH, PUSH (2 KEY)(SPEAKER A)            |         |
| 53    | 7-685-650-79          | SCREW +BVTP 3X16 TYPE2 N-S  |         | S602 | 1-571-485-11          | SWITCH, PUSH (2 KEY)(SPEAKER B)            |         |
| 54    | *4-881-752-01         | (WG)...NUT, PLATE, SPECIAL  |         | S901 | $\Delta$ 1-554-685-11 | (AV220/A)...SWITCH, PUSH (AC POWER)(1 KEY) |         |
| 908   | *1-634-070-11         | PC BOARD, HEADPHONE         |         | T901 | $\Delta$ 1-449-758-11 | (AV320R:UK)...TRANSFORMER, POWER           |         |
| 909   | *1-634-069-11         | PC BOARD, SPEAKER SWITCH    |         | T901 | $\Delta$ 1-449-760-11 | (AV320R:WG)...TRANSFORMER, POWER           |         |
| 910   | *1-634-067-11         | PC BOARD, RELAY (3)         |         | T901 | $\Delta$ 1-449-761-11 | (AV220).....TRANSFORMER, POWER             |         |
| 911   | *1-634-060-11         | PC BOARD, IC                |         | T901 | $\Delta$ 1-450-140-11 | (AV320RA).....TRANSFORMER, POWER           |         |
| IC601 | 8-749-900-34          | (AV320R/RA)...IC STK4182MK2 |         | T901 | $\Delta$ 1-450-141-11 | (AV220A).....TRANSFORMER, POWER            |         |
| IC601 | $\Delta$ 8-749-941-52 | (AV220/A)...IC STK4152IT    |         |      |                       |  |         |

## (3) CHASSIS SECTION-2



Note: The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

| No. | Part No.              | Description                         | Remarks | No.    | Part No.              | Description                                   | Remarks |
|-----|-----------------------|-------------------------------------|---------|--------|-----------------------|---|---------|
| 101 | 7-682-548-04          | SCREW +BVTT 3X8 (S)                 |         | 917    | *1-634-065-11         | PC BOARD, RELAY (1)                           |         |
| 102 | 7-682-548-09          | SCREW +BVTT 3X8 (S)                 |         | 918    | *A-4334-070-A         | (AV220).....MOUNTED PCB, MAIN                 |         |
| 103 | *4-931-096-41         | (AV320RA).....PANEL, BACK           |         |        | *A-4334-073-A         | (AV320R:WG).....MOUNTED PCB, MAIN             |         |
|     | *4-931-096-51         | (AV320R:WG).....PANEL, BACK         |         |        | *A-4334-996-A         | (AV320RA,AV320R:UK).....MOUNTED PCB, MAIN     |         |
|     | *4-931-096-61         | (AV220A).....PANEL, BACK            |         |        | *A-4334-999-A         | (AV220A).....MOUNTED PCB, MAIN                |         |
|     | *4-931-096-71         | (AV220).....PANEL, BACK             |         | 919    | 1-533-183-11          | HOLDER, FUSE                                  |         |
|     | *4-931-096-81         | (AV320R:UK).....PANEL, BACK         |         | 920    | *1-634-066-11         | (AV320R/RA)....PC BOARD, RELAY (2)            |         |
| 104 | *3-346-265-11         | HOLDER, PC BOARD                    |         | 921    | *1-634-073-11         | PC BOARD, RELAY (4)                           |         |
| 105 | 2-383-566-00          | SCREW                               |         | 922    | *1-565-514-11         | SOCKET, CONNECTOR 2P                          |         |
| 106 | *4-800-403-11         | HEAT SINK                           |         | 923    | 1-535-416-00          | TERMINAL                                      |         |
| 107 | *3-669-610-00         | SPACER                              |         | 924    | *1-560-265-00         | BASE POST (U-TYPE)                            |         |
| 108 | *3-703-244-00         | BUSHING (2104), CORD                |         | BA301  | 1-528-120-00          | BATTERY, LITHIUM (CR-2025)                    |         |
| 109 | 7-685-647-79          | SCREW +BTP 3X10 TYPE2 N-S           |         | CNJ901 | $\Delta$ 1-526-751-00 | (AV320R:UK).....OUTLET, AC(AC OUTLET)         |         |
| 110 | 7-685-647-79          | SCREW +BVTP 3X10 TYPE2 N-S          |         | CNJ901 | $\Delta$ 1-526-794-11 | (AV320RA,AV320R:WG).....OUTLET, AC(AC OUTLET) |         |
| 111 | 7-621-849-00          | SCREW, TAPPING                      |         | F901   | $\Delta$ 1-532-973-11 | (AV320R/RA)....FUSE (1.6A)                    |         |
| 112 | 3-706-165-00          | SCREW                               |         | F902   | $\Delta$ 1-532-967-11 | (AV220/A).....FUSE (1.25A)                    |         |
| 113 | 3-701-947-12          | (AV220/A)....LABEL (T1.25A), FUSE   |         | F902   | $\Delta$ 1-532-973-11 | (AV320R/RA)....FUSE (1.6A)                    |         |
| 114 | 3-704-242-01          | (WG)....SCREW, TERMINAL, +BVTP CLAW |         | F903   | $\Delta$ 1-532-973-11 | (AV320R/RA)....FUSE (1.6A)                    |         |
| 912 | *1-635-428-11         | (AV320R/RA)....PC BOARD, OUTLET     |         | J501   | 1-565-320-11          | JACK, PIN 6P (PHONE/CD/TAPE)                  |         |
| 913 | *1-634-071-11         | PC BOARD, SPEAKER TERMINAL          |         | J502   | 1-565-320-11          | JACK, PIN 6P (VIDEO/TAPE)                     |         |
| 914 | *A-4334-003-A         | (AV220/A).....MOUNTED PCB, POWER    |         | Q701   | R-729-107-25          | TRANSISTOR 2SD1585-L                          |         |
|     | *A-4334-998-A         | (AV320R/RA)....MOUNTED PCB, POWER   |         | S902   | 1-570-046-21          | (AEP)....SWITCH, VOLTAGE CHANGE               |         |
| 915 | *A-4303-280-A         | (AEP,UK)....MOUNTED PCB, TUNER      |         |        |                       | (SPEAKER IMPEDANCE SELECTOR)                  |         |
|     |                       | (TCB007-2JK2)                       |         | T902   | $\Delta$ 1-448-523-11 | (AV320R/RA)....TRANSFORMER, POWER             |         |
|     | *A-4303-281-A         | (WG).....MOUNTED PCB, TUNER         |         | TM1    | *1-537-138-31         | (AEP,UK)....TERMINAL BOARD (ANT)              |         |
|     |                       | (TCB007-2KK2)                       |         | TM601  | $\Delta$ 1-153-706-00 | TERMINAL BOARD(SP) (SPEAKER A/B)              |         |
| 916 | $\Delta$ 1-555-750-00 | (AEP,WG).....CORD, POWER            |         |        |                       |   |         |
|     | $\Delta$ 1-556-035-00 | (AV320:UK)....CORD, POWER           |         |        |                       |   |         |

## SECTION 5 ELECTRICAL PARTS LIST

**NOTE:**

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

**CAPACITORS:**  
MF:  $\mu$ F, PF:  $\mu$ F.

**RESISTORS**  
• All resistors are in ohms.  
• F: nonflammable

**COILS**  
• MMH: mH, UH:  $\mu$ H

**SEMICONDUCTORS**  
In each case, U:  $\mu$ , for example:  
UA...:  $\mu$ A..., UPA...:  $\mu$ PA...,  
UPC...:  $\mu$ PC, UPD...:  $\mu$ PD...  
• WG: West Germany



The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

| Ref.No. | Part No.      | Description  | Ref.No. | Part No.     | Description                           |
|---------|---------------|--|---------|--------------|---------------------------------------|
| 901     | *A-4334-398-A | (AV320R/RA)...MOUNTED PCB, TONE                    | C7      | 1-162-440-11 | (WG)...CERAMIC MELF 0.01MF 20% 16V    |
|         | *A-4334-413-A | (AV220/A)....MOUNTED PCB, TONE                     | C8      | 1-162-440-11 | (WG)...CERAMIC MELF 0.01MF 20% 16V    |
|         |               |  | C9      | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
| 902     | *A-4334-002-A | (AV220/A)....MOUNTED PCB, DISPLAY                  | C10     | 1-162-516-11 | CERAMIC CHIP 100PF 10% 50V            |
|         | *A-4334-997-A | (AV320R/RA)...MOUNTED PCB, DISPLAY                 | C11     | 1-101-005-00 | (WG)...CERAMIC 0.022MF                |
| 903     | *1-634-063-11 | PC BOARD, VOLUME                                   | C21     | 1-161-021-11 | CERAMIC 0.047MF X                     |
| 904     | 1-465-420-11  | (AV320R:UK)...REMOTE COMMANDER(RM-U203)            | C22     | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
|         | 1-465-423-11  | (AV320R/RA:AEP,WG)<br>...REMOTE COMMANDER(RM-S103) | C23     | 1-124-477-11 | ELECT 47MF                            |
|         |               |  | C24     | 1-123-382-00 | ELECT 3.3MF                           |
| 905     | *1-634-064-11 | (AV320R/RA)...PC BOARD, LED                        | C25     | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
| 906     | *1-634-068-11 | (AV320R/RA)...PC BOARD, STAND BY                   | C26     | 1-162-527-11 | CERAMIC CHIP 6800PF 20% 12V           |
| 907     | *1-634-061-11 | (AV320R/RA)...PC BOARD, MOTOR                      | C27     | 1-162-521-11 | (WG)....CERAMIC CHIP 6800PF 20% 50V   |
| 908     | *1-634-070-11 | PC BOARD, HEADPHONE                                | C27     | 1-162-516-11 | (AEP,UK)...CERAMIC CHIP 100PF 10% 50V |
| 909     | *1-634-069-11 | PC BOARD, SPEAKER SWITCH                           | C28     | 1-124-791-11 | ELECT 1.0MF                           |
| 910     | *1-634-067-11 | PC BOARD, RELAY (3)                                | C30     | 1-124-791-11 | ELECT 1.0MF                           |
| 911     | *1-634-060-11 | PC BOARD, 1C                                       | C31     | 1-124-902-00 | ELECT 0.47MF                          |
| 912     | *1-635-428-11 | (AV320R/RA)...PC BOARD, OUTLET                     | C32     | 1-124-463-00 | ELECT 0.1MF                           |
| 913     | *1-634-071-11 | PC BOARD, SPEAKER TERMINAL                         | C33     | 1-130-481-00 | PE TEREPHTHALATE 0.0068MF             |
| 914     | *A-4334-003-A | (AV220/A)....MOUNTED PCB, POWER                    | C34     | 1-123-382-00 | ELECT 3.3MF                           |
|         | *A-4334-998-A | (AV320R/RA)...MOUNTED PCB, POWER                   | C35     | 1-130-481-00 | PE TEREPHTHALATE 0.0068MF             |
| 915     | *A-4303-280-A | (AEP,UK)<br>...MOUNTED PCB, TUNER                  | C36     | 1-123-382-00 | ELECT 3.3MF                           |
|         |               | (TCB007-2JK2)                                      | C37     | 1-123-875-11 | ELECT 10MF                            |
|         | *A-4303-281-A | (WG)...MOUNTED PCB, TUNER                          | C39     | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
|         |               | (TCB007-2KK2)                                      | C40     | 1-124-463-00 | ELECT 0.1MF                           |
|         |               |  | C41     | 1-124-927-11 | ELECT 4.7MF                           |
| 916     | 1-555-750-00  | (AEP,WG)....CORD, POWER                            | C42     | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
|         | 1-556-035-00  | (AV320:UK)...CORD, POWER                           | C43     | 1-126-176-11 | ELECT 220MF                           |
| 917     | *1-634-065-11 | PC BOARD, RELAY (1)                                | C44     | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
| 918     | *A-4334-070-A | (AV220).....MOUNTED PCB, MAIN                      | C45     | 1-123-382-00 | ELECT 3.3MF                           |
|         | *A-4334-073-A | (AV320R:WG).....MOUNTED PCB, MAIN                  | C46     | 1-162-524-11 | CERAMIC CHIP 2200PF 20% 12V           |
|         | *A-4334-996-A | (AV320RA,AV320R:UK)....<br>MOUNTED PCB, MAIN       | C47     | 1-162-522-11 | (WG)...CERAMIC CHIP 1000PF 20% 25V    |
|         | *A-4334-999-A | (AV220A).....MOUNTED PCB, MAIN                     | C48     | 1-123-382-00 | ELECT 3.3MF                           |
| 919     | 1-533-183-11  | HOLDER, FUSE                                       | C49     | 1-162-524-11 | CERAMIC CHIP 2200PF 20% 12V           |
| 920     | *1-634-066-11 | (AV320R/RA)...PC BOARD, RELAY (2)                  | C50     | 1-162-522-11 | (WG)...CERAMIC CHIP 1000PF 20% 12V    |
| 921     | *1-634-073-11 | PC BOARD, RELAY (4)                                | C51     | 1-124-477-11 | ELECT 47MF                            |
| 922     | *1-565-514-11 | SOCKET, CONNECTOR 2P                               | C54     | 1-101-005-00 | (WG)...CERAMIC 0.022MF                |
| 923     | 1-535-416-00  | TERMINAL   | C61     | 1-162-624-11 | CERAMIC MELF 22000PF 25V              |
| 924     | *1-560-265-00 | BASE POST (U-TYPE)                                 | C62     | 1-162-624-11 | CERAMIC MELF 22000PF 25V              |
| 8A301   | 1-528-120-00  | BATTERY, LITHIUM (CR-2025)                         | C63     | 1-162-624-11 | CERAMIC MELF 22000PF 25V              |
| C1      | 1-162-522-11  | CERAMIC CHIP 1000PF 20% 25V                        | C64     | 1-162-624-11 | CERAMIC MELF 22000PF 25V              |
| C2      | 1-124-477-11  | ELECT 47MF   | C81     | 1-102-961-00 | CERAMIC 27PF CH                       |
| C3      | 1-162-440-11  | CERAMIC MELF 0.01MF 20% 16V                        | C82     | 1-102-961-00 | CERAMIC 27PF CH                       |
| C4      | 1-162-522-11  | CERAMIC CHIP 1000PF 20% 25V                        | C83     | 1-162-440-11 | CERAMIC MELF 0.01MF 20% 16V           |
| C5      | 1-162-440-11  | CERAMIC MELF 0.01MF 20% 16V                        |         |              |                                       |
| C6      | 1-162-440-11  | CERAMIC MELF 0.01MF 20% 16V                        |         |              |                                       |

| Ref.No. | Part No.     | Description          |          |     |     |  | Ref.No. | Part No.     | Description         |          |     |      |  |
|---------|--------------|----------------------|----------|-----|-----|--|---------|--------------|---------------------|----------|-----|------|--|
| C84     | 1-162-440-11 | CERAMIC MELF         | 0.01MF   |     |     |  | C507    | 1-101-880-00 | CERAMIC             | 47PF     | 10% | 50V  |  |
| C85     | 1-162-440-11 | CERAMIC MELF         | 0.01MF   | 20% | 16V |  | C508    | 1-126-163-11 | ELECT               | 4.7MF    | 20% | 50V  |  |
| C86     | 1-124-477-11 | ELECT                | 47MF     | 20% | 16V |  | C509    | 1-131-347-00 | TANTALUM            | 1MF      | 10% | 25V  |  |
| C87     | 1-162-440-11 | CERAMIC MELF         | 0.01MF   | 20% | 16V |  | C510    | 1-130-489-00 | MYLAR               | 0.033MF  | 5%  | 50V  |  |
| C88     | 1-162-440-11 | CERAMIC MELF         | 0.01MF   | 20% | 16V |  | C511    | 1-124-791-11 | (AV320R/RA)...ELECT | 1MF      | 20% | 50V  |  |
| C101    | 1-124-925-11 | ELECT                | 2.2MF    |     |     |  | C512    | 1-124-464-11 | ELECT               | 0.22MF   | 20% | 50V  |  |
| C102    | 1-124-463-00 | ELECT                | 0.1MF    |     |     |  | C513    | 1-124-464-11 | ELECT               | 0.22MF   | 20% | 50V  |  |
| C103    | 1-162-440-11 | CERAMIC MELF         | 0.01MF   | 20% | 16V |  | C514    | 1-130-493-00 | MYLAR               | 0.068MF  | 5%  | 50V  |  |
| C104    | 1-162-440-11 | CERAMIC MELF         | 0.01MF   | 20% | 16V |  | C515    | 1-102-106-00 | CERAMIC             | 100PF    | 10% | 50V  |  |
| C105    | 1-124-477-11 | ELECT                | 47MF     |     |     |  | C551    | 1-130-489-00 | MYLAR               | 0.033MF  | 5%  | 50V  |  |
| C301    | 1-162-211-31 | CERAMIC              | 33PF     | 5%  | 50V |  | C552    | 1-124-250-00 | ELECT               | 0.15MF   | 20% | 50V  |  |
| C302    | 1-162-211-31 | CERAMIC              | 33PF     | 5%  | 50V |  | C553    | 1-130-481-00 | MYLAR               | 0.0068MF | 5%  | 50V  |  |
| C303    | 1-161-055-00 | CERAMIC              | 0.022MF  | 10% | 50V |  | C554    | 1-130-489-00 | MYLAR               | 0.033MF  | 5%  | 50V  |  |
| C304    | 1-161-055-00 | CERAMIC              | 0.022MF  | 10% | 50V |  | C555    | 1-126-163-11 | ELECT               | 4.7MF    | 20% | 50V  |  |
| C305    | 1-124-791-11 | ELECT                | 1MF      | 20% | 50V |  | C556    | 1-124-925-11 | ELECT               | 2.2MF    | 20% | 50V  |  |
| C306    | 1-123-875-11 | (AV320R/RA)          |          |     |     |  | C557    | 1-101-880-00 | CERAMIC             | 47PF     | 10% | 50V  |  |
| C307    | 1-136-746-11 | FILM ...ELECT        | 10MF     | 20% | 50V |  | C558    | 1-126-163-11 | ELECT               | 4.7MF    | 20% | 50V  |  |
| C308    | 1-124-464-11 | (AV320R/RA)          |          |     |     |  | C559    | 1-131-347-00 | TANTALUM            | 1MF      | 10% | 25V  |  |
| C309    | 1-124-464-11 | (AV320R/RA) ...ELECT | 0.22MF   | 20% | 50V |  | C560    | 1-130-489-00 | MYLAR               | 0.033MF  | 5%  | 50V  |  |
| C401    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C561    | 1-124-791-11 | (AV320R/RA)...ELECT | 1MF      | 20% | 50V  |  |
| C402    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C565    | 1-102-106-00 | CERAMIC             | 100PF    | 10% | 50V  |  |
| C403    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C601    | 1-162-286-31 | CERAMIC             | 220PF    | 10% | 50V  |  |
| C404    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C602    | 1-124-927-11 | ELECT               | 4.7MF    | 20% | 50V  |  |
| C405    | 1-124-963-11 | ELECT                | 33MF     | 20% | 16V |  | C603    | 1-162-288-31 | CERAMIC             | 330PF    | 10% | 50V  |  |
| C406    | 1-130-480-00 | MYLAR                | 0.0056MF | 5%  | 50V |  | C604    | 1-124-122-11 | ELECT               | 100MF    | 20% | 50V  |  |
| C407    | 1-130-473-00 | MYLAR                | 0.0015MF | 5%  | 50V |  | C605    | 1-124-910-11 | ELECT               | 47MF     | 20% | 50V  |  |
| C408    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C606    | 1-124-120-11 | ELECT               | 220MF    | 20% | 16V  |  |
| C409    | 1-124-477-11 | ELECT                | 47MF     | 20% | 25V |  | C607    | 1-162-193-31 | CERAMIC             | 3.3PF    | 10% | 50V  |  |
| C410    | 1-124-477-11 | ELECT                | 47MF     | 20% | 25V |  | C608    | 1-123-875-11 | ELECT               | 10MF     | 20% | 50V  |  |
| C411    | 1-102-074-00 | CERAMIC              | 0.001MF  | 10% | 50V |  | C618    | 1-161-055-00 | CERAMIC             | 0.022MF  | 10% | 25V  |  |
| C412    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C621    | 1-130-495-00 | MYLAR               | 0.1MF    | 5%  | 50V  |  |
| C413    | 1-124-927-11 | ELECT                | 4.7MF    | 20% | 50V |  | C622    | 1-130-491-00 | MYLAR               | 0.047MF  | 5%  | 50V  |  |
| C414    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C623    | 1-123-875-11 | ELECT               | 10MF     | 20% | 50V  |  |
| C415    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C624    | 1-124-472-11 | ELECT               | 470MF    | 20% | 6.3V |  |
| C416    | 1-123-875-11 | ELECT                | 10MF     | 20% | 50V |  | C630    | 1-161-055-00 | CERAMIC             | 0.022MF  | 10% | 50V  |  |
| C417    | 1-124-478-11 | ELECT                | 100MF    | 20% | 25V |  | C631    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C418    | 1-124-478-11 | ELECT                | 100MF    | 20% | 25V |  | C632    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C419    | 1-124-478-11 | ELECT                | 100MF    | 20% | 25V |  | C633    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C451    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C634    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C452    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C651    | 1-162-286-31 | CERAMIC             | 220PF    | 10% | 50V  |  |
| C453    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C652    | 1-124-927-11 | ELECT               | 4.7MF    | 20% | 50V  |  |
| C454    | 1-102-106-00 | CERAMIC              | 100PF    | 10% | 50V |  | C653    | 1-162-288-31 | CERAMIC             | 330PF    | 10% | 50V  |  |
| C455    | 1-124-963-11 | ELECT                | 33MF     | 20% | 16V |  | C654    | 1-124-122-11 | ELECT               | 100MF    | 20% | 50V  |  |
| C456    | 1-130-480-00 | MYLAR                | 0.0056MF | 5%  | 50V |  | C655    | 1-124-910-11 | ELECT               | 47MF     | 20% | 50V  |  |
| C457    | 1-130-473-00 | MYLAR                | 0.0015MF | 5%  | 50V |  | C656    | 1-124-120-11 | ELECT               | 220MF    | 20% | 16V  |  |
| C458    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C657    | 1-162-193-31 | CERAMIC             | 3.3PF    | 10% | 50V  |  |
| C463    | 1-126-163-11 | ELECT                | 4.7MF    | 20% | 50V |  | C658    | 1-123-875-11 | ELECT               | 10MF     | 20% | 50V  |  |
| C464    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C668    | 1-161-055-00 | CERAMIC             | 0.022MF  | 10% | 25V  |  |
| C465    | 1-123-382-00 | ELECT                | 3.3MF    | 20% | 50V |  | C671    | 1-130-495-00 | MYLAR               | 0.1MF    | 5%  | 50V  |  |
| C466    | 1-123-875-11 | ELECT                | 10MF     | 20% | 50V |  | C672    | 1-130-491-00 | MYLAR               | 0.047MF  | 5%  | 50V  |  |
| C501    | 1-130-489-00 | MYLAR                | 0.033MF  | 5%  | 50V |  | C681    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C502    | 1-124-250-00 | ELECT                | 0.15MF   | 20% | 50V |  | C682    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C503    | 1-130-481-00 | MYLAR                | 0.0068MF | 5%  | 50V |  | C683    | 1-161-051-00 | (WG)...CERAMIC      | 0.01MF   | 10% | 50V  |  |
| C504    | 1-130-489-00 | MYLAR                | 0.033MF  | 5%  | 50V |  | C701    | 1-106-367-00 | MYLAR               | 0.01MF   | 5%  | 200V |  |
| C505    | 1-126-163-11 | ELECT                | 4.7MF    | 20% | 50V |  |         |              |                     |          |     |      |  |
| C506    | 1-124-925-11 | ELECT                | 2.2MF    | 20% | 50V |  |         |              |                     |          |     |      |  |

| Ref.No. | Part No.      | Description                                  |         |     |      |  |
|---------|---------------|--|---------|-----|------|--|
| C702    | 1-106-367-00  | MYLAR  | 0.01MF  | 5%  | 200V |  |
| C704    | 1-124-478-11  | ELECT  | 100MF   | 20% | 25V  |  |
| C705    | 1-124-477-11  | ELECT  | 47MF    | 20% | 25V  |  |
| C706    | 1-161-055-00  | CERAMIC                                      | 0.022MF | 10% | 50V  |  |
| C707    | 1-161-055-00  | CERAMIC                                      | 0.022MF | 10% | 50V  |  |
| C708    | 1-124-927-11  | ELECT  | 4.7MF   | 20% | 50V  |  |
| C710    | 1-124-910-11  | ELECT  | 47MF    | 20% | 50V  |  |
| C711    | 1-124-910-11  | ELECT  | 47MF    | 20% | 50V  |  |
| C712    | 1-123-875-11  | ELECT  | 10MF    | 20% | 50V  |  |
| C713    | 1-124-477-11  | ELECT  | 47MF    | 20% | 25V  |  |
| C714    | 1-124-477-11  | ELECT  | 47MF    | 20% | 25V  |  |
| C716    | 1-124-464-11  | ELECT  | 0.22MF  | 20% | 50V  |  |
| C717    | 1-124-902-00  | ELECT  | 0.47MF  | 20% | 50V  |  |
| C718    | 1-124-791-11  | ELECT  | 1MF     | 20% | 50V  |  |
| C719    | 1-161-055-00  | CERAMIC                                      | 0.022MF | 10% | 50V  |  |
| C801    | 1-126-307-11  | ELECT  | 6800MF  | 20% | 50V  |  |
| C802    | 1-126-307-11  | ELECT  | 6800MF  | 20% | 50V  |  |
| C803    | 1-106-367-00  | (AV320R/RA)..MYLAR                           | 0.01MF  | 5%  | 200V |  |
| C804    | 1-106-367-00  | (AV320R/RA)..MYLAR                           | 0.01MF  | 5%  | 200V |  |
| C805    | 1-124-557-11  | (AV320R/RA)..ELECT                           | 1000MF  | 20% | 25V  |  |
| C810    | 1-124-791-11  | ELECT  | 1MF     | 20% | 50V  |  |
| C820    | 1-124-477-11  | (AV220/A)..ELECT                             | 47MF    | 20% | 25V  |  |
| C901    | 1-161-744-00  | CERAMIC                                      | 0.01MF  |     | 400V |  |
| C903    | 1-162-286-31  | (WG)..CERAMIC                                | 220PF   | 10% | 50V  |  |
| C905    | 1-161-055-00  | (WG)..CERAMIC                                | 0.022MF | 10% | 50V  |  |
| C906    | 1-162-288-31  | (WG)..CERAMIC                                | 330PF   | 10% | 50V  |  |
| C907    | 1-161-055-00  | (WG)..CERAMIC                                | 0.022MF | 10% | 50V  |  |
| C908    | 1-161-055-00  | (WG)..CERAMIC                                | 0.022MF | 10% | 50V  |  |
| C953    | 1-162-286-31  | (WG)..CERAMIC                                | 220PF   | 10% | 50V  |  |
| C954    | 1-162-286-31  | (WG)..CERAMIC                                | 220PF   | 10% | 50V  |  |
| C955    | 1-161-055-00  | (WG)..CERAMIC                                | 0.022MF | 10% | 50V  |  |
| C956    | 1-162-288-31  | (WG)..CERAMIC                                | 330PF   | 10% | 50V  |  |
| C957    | 1-161-055-00  | (WG)..CERAMIC                                | 0.022MF | 10% | 50V  |  |
| C958    | 1-161-055-00  | (WG)..CERAMIC                                | 0.022MF | 10% | 50V  |  |
| CC2     | 1-249-366-11  | CARBON MELF                                  | 0       | 5%  | 1/5W |  |
| CC3     | 1-249-366-11  | CARBON MELF                                  | 0       | 5%  | 1/5W |  |
| CC11    | 1-249-366-11  | (AEP,UK)..CARBON MELF                        | 0       | 5%  | 1/5W |  |
| CC12    | 1-249-366-11  | (WG).....CARBON MELF                         | 0       | 5%  | 1/5W |  |
| CF1     | 1-567-389-11  | FILTER, CERAMIC                              |         |     |      |  |
| CF2     | 1-567-389-11  | FILTER, CERAMIC                              |         |     |      |  |
| CF3     | 1-567-389-11  | (WG)..FILTER, CERAMIC                        |         |     |      |  |
| CF21    | 1-577-075-11  | OSCILLATOR, CERAMIC                          |         |     |      |  |
| CFT21   | 1-404-853-11  | TRANSFORMER, IF (CERAMIC FILTER)             |         |     |      |  |
| CN305   | *1-564-777-11 | (AV320R/RA).. PLUG, CONNECTOR (2.5MM) 2P     |         |     |      |  |
| CN803   | *1-535-139-00 | BASE POST 19MM (10MM PITCH) 2P               |         |     |      |  |
| CNJ1    | *1-569-387-11 | SOCKET, CONNECTOR (PC BOARD) 10P             |         |     |      |  |
| CNJ2    | *1-569-380-11 | SOCKET, CONNECTOR (PC BOARD) 3P              |         |     |      |  |
| CNJ4    | *1-569-380-11 | SOCKET, CONNECTOR (PC BOARD) 3P              |         |     |      |  |
| CNJ201  | *1-569-411-11 | SOCKET, CONNECTOR (PC BOARD) 16P             |         |     |      |  |
| CNJ301  | *1-562-334-00 | SOCKET, CONNECTOR 10P                        |         |     |      |  |
| CNJ302  | *1-562-334-00 | SOCKET, CONNECTOR 10P                        |         |     |      |  |
| CNJ303  | *1-506-778-11 | (AV320R/RA).. PLUG, CONNECTOR (2.5MM) 2P     |         |     |      |  |
| CNJ304  | *1-506-680-11 | PLUG, CONNECTOR (2.5MM) 3P                   |         |     |      |  |
| CNJ305  | *1-506-778-11 | (AV320R/RA).. PLUG, CONNECTOR (2.5MM) 2P     |         |     |      |  |
| CNJ503  | *1-506-707-31 | PLUG, CONNECTOR (2.5MM) 3P                   |         |     |      |  |
| CNJ601  | *1-506-680-11 | PLUG, CONNECTOR (2.5MM) 3P                   |         |     |      |  |
| CNJ610  | *1-569-509-11 | CONNECTOR (SOCKET) 4P                        |         |     |      |  |
| CNJ611  | *1-562-573-11 | SOCKET, CONNECTOR 8P                         |         |     |      |  |
| CNJ701  | *1-564-778-11 | (AV320R/RA).. PLUG, CONNECTOR (2.5MM) 4P     |         |     |      |  |
| CNJ901  | 1-526-751-00  | (AV320R:UK)..OUTLET, AC (AC OUTLET)          |         |     |      |  |
| CNJ901  | 1-526-794-11  | (AV320RA:AV320R:WG) ..OUTLET, AC (AC OUTLET) |         |     |      |  |

| Ref.No.  | Part No.      | Description                              |
|----------|---------------|--|
| CNP301   | 1-565-419-11  | PIN, CONNECTOR 10P                       |
| CNP302   | 1-565-419-11  | PIN, CONNECTOR 10P                       |
| CNP401   | *1-564-779-11 | PLUG, CONNECTOR (2.5MM) 6P               |
| CNP611   | *1-569-508-11 | PIN, CONNECTOR 8P                        |
| CNP650   | *1-569-410-11 | PIN, CONNECTOR (PC BOARD) 16P            |
| CNP651   | *1-569-388-11 | PIN, CONNECTOR (PC BOARD) 3P             |
| CNP652   | *1-569-388-11 | PIN, CONNECTOR (PC BOARD) 3P             |
| CNP653   | *1-569-395-11 | PIN, CONNECTOR (PC BOARD) 10P            |
| CNP654   | *1-506-529-11 | (AV320R/RA)..PIN CONNECTOR, B-B 4P       |
| CNP655   | *1-506-529-11 | (AV320R/RA)..PIN CONNECTOR, B-B 4P       |
| CNP656   | *1-506-529-11 | PIN CONNECTOR, B-B 4P                    |
| CNP657   | *1-506-529-11 | PIN CONNECTOR, B-B 4P                    |
| CNP658   | *1-565-513-11 | PIN, CONNECTOR 2P                        |
| CNP701   | *1-535-116-00 | TERMINAL                                 |
| CNP701-A | *1-564-777-11 | (AV320R/RA).. PLUG, CONNECTOR (2.5MM) 2P |
| CNP702   | *1-535-116-00 | TERMINAL                                 |
| D301     | 8-719-912-20  | DIODE 1SS120                             |
| D302     | 8-719-912-20  | DIODE 1SS120                             |
| D303     | 8-719-912-20  | DIODE 1SS120                             |
| D304     | 8-719-912-20  | DIODE 1SS120                             |
| D305     | 8-719-912-20  | DIODE 1SS120                             |
| D306     | 8-719-912-20  | DIODE 1SS120                             |
| D307     | 8-719-912-20  | DIODE 1SS120                             |
| D308     | 8-719-912-20  | DIODE 1SS120                             |
| D309     | 8-719-912-20  | DIODE 1SS120                             |
| D311     | 8-719-912-20  | DIODE 1SS120                             |
| D312     | 8-719-912-20  | DIODE 1SS120                             |
| D313     | 8-719-914-11  | DIODE HZ4ALL                             |
| D314     | 8-719-912-20  | DIODE 1SS120                             |
| D315     | 8-719-912-20  | DIODE 1SS120                             |
| D316     | 8-719-301-38  | (AV320R/RA)..DIODE SEL2210S-C (STANDBY)  |
| D317     | 8-719-301-52  | (AV320R/RA)..DIODE SEL2810A-C (MUTING)   |
| D318     | 8-719-301-52  | DIODE SEL2810A-C (SURROUND)              |
| D319     | 8-719-301-52  | DIODE SEL2810A-C (DBFB)                  |
| D320     | 8-719-912-20  | DIODE 1SS120                             |
| D322     | 8-719-912-20  | DIODE 1SS120                             |
| D323     | 8-719-912-20  | DIODE 1SS120                             |
| D324     | 8-719-912-20  | DIODE 1SS120                             |
| D326     | 8-719-912-20  | DIODE 1SS120                             |
| D327     | 8-719-912-20  | DIODE 1SS120                             |
| D328     | 8-719-303-00  | (AV320R/RA)..DIODE SEL2510C (VOLUME)     |
| D401     | 8-719-912-20  | DIODE 1SS120                             |
| D402     | 8-719-912-20  | DIODE 1SS120                             |
| D501     | 8-719-912-20  | DIODE 1SS120                             |
| D502     | 8-719-912-20  | DIODE 1SS120                             |
| D601     | 8-719-912-20  | DIODE 1SS120                             |
| D602     | 8-719-912-20  | DIODE 1SS120                             |
| D603     | 8-719-912-20  | DIODE 1SS120                             |
| D604     | 8-719-912-20  | DIODE 1SS120                             |
| D605     | 8-719-912-20  | DIODE 1SS120                             |
| D607     | 8-719-912-20  | DIODE 1SS120                             |
| D651     | 8-719-912-20  | DIODE 1SS120                             |
| D702     | 8-719-010-86  | DIODE RD13EL2                            |
| D703     | 8-719-010-29  | DIODE UZ-4.3BSB                          |
| D704     | 8-719-011-07  | DIODE UZ-27BSB                           |
| D705     | 8-719-010-82  | DIODE UZ-15BSB                           |
| D706     | 8-719-010-47  | DIODE UZ-6.2BSC                          |
| D707     | 8-719-933-41  | DIODE HZS6C3L                            |
| D708     | 8-719-914-11  | DIODE HZ4ALL                             |
| D709     | 8-719-912-20  | DIODE 1SS120                             |
| D710     | 8-719-912-20  | DIODE 1SS120                             |
| D711     | 8-719-912-20  | DIODE 1SS120                             |

Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.



| Ref.No. | Part No.       | Description                       |
|---------|----------------|-----------------------------------|
| D801    | 8-719-312-09   | DIODE RBA-402                     |
| D802    | 8-719-511-40   | (AV320R/RA)...DIODE S1VB40        |
| D803    | 8-719-912-20   | (AV320R/RA)...DIODE 1SS120        |
| D813    | 8-719-000-06   | DIODE MC921                       |
| F901    | △ 1-532-973-11 | (AV320R/RA)...FUSE (1.6A)         |
| F902    | △ 1-532-967-11 | (AV220/A)...FUSE (1.25A)          |
| F902    | △ 1-532-973-11 | (AV320R/RA)...FUSE (1.6A)         |
| F903    | △ 1-532-973-11 | (AV320R/RA)...FUSE (1.6A)         |
| FE1     | 1-463-857-11   | (WG).....FRONT END, FM            |
| FE1     | 1-463-862-21   | (AEP,UK)...FRONT END, FM          |
| FE61    | 1-236-461-11   | ENCAPSULATED COMPONENT            |
| FL301   | 1-519-509-11   | INDICATOR TUBE, FLUORESCENT       |
| IC21    | 8-759-821-45   | IC LA1851N                        |
| IC81    | 8-759-820-91   | IC LC7218                         |
| IC301   | 8-759-149-47   | IC UPD75206G-557-1B               |
| IC302   | 8-749-920-59   | (AV320R/RA)...IC AIQH3020S        |
| IC303   | 8-759-800-95   | IC LB1493                         |
| IC304   | 8-759-820-62   | (AV320R/RA)...IC LB1639           |
| IC401   | 8-759-112-93   | IC UPC4570HA-1                    |
| IC402   | 8-759-805-14   | IC LC7822                         |
| IC501   | 8-759-112-93   | IC UPC4570HA-1                    |
| IC601   | 8-749-900-34   | (AV320R/RA)...IC STK4182MK2       |
| IC601   | 8-749-941-52   | (AV220/A)...IC STK415211          |
| J501    | 1-565-320-11   | JACK, PIN 6P (PHONE/CD/TAPE)      |
| J502    | 1-565-320-11   | JACK, PIN 6P (VIDEO/TAPE)         |
| J601    | 1-507-863-51   | JACK, LARGE TYPE (HEADPHONES)     |
| L1      | 1-410-521-11   | MICRO INDUCTOR 100UH              |
| L2      | 1-410-521-11   | (WG)...MICRO INDUCTOR 100UH       |
| L21     | 1-410-171-11   | MICRO INDUCTOR 1MMH               |
| L301    | 1-410-521-11   | INDUCTOR 100UH                    |
| L601    | *1-420-872-00  | COIL, AIR CORE                    |
| L651    | *1-420-872-08  | COIL, AIR CORE                    |
| LPF21   | 1-235-164-00   | FILTER, LOW PASS                  |
| LPF22   | 1-235-164-00   | FILTER, LOW PASS                  |
| Q1      | 8-729-230-99   | TRANSISTOR 2SC26690Y              |
| Q2      | 8-729-230-99   | TRANSISTOR 2SC26690Y              |
| Q3      | 8-729-230-99   | (WG)...TRANSISTOR 2SC26690Y       |
| Q4      | 8-729-230-99   | (WG)...TRANSISTOR 2SC26690Y       |
| Q21     | 8-729-119-78   | TRANSISTOR 2SC2785-HFE            |
| Q22     | 8-729-119-78   | TRANSISTOR 2SC2785-HFE            |
| Q23     | 8-729-900-61   | TRANSISTOR DTA114ES               |
| Q24     | 8-729-900-80   | TRANSISTOR DTC114ES               |
| Q81     | 8-729-900-61   | TRANSISTOR DTA114ES               |
| Q82     | 8-729-900-80   | TRANSISTOR DTC114ES               |
| Q83     | 8-729-202-67   | TRANSISTOR 2SK246GR3              |
| Q84     | 8-729-230-93   | TRANSISTOR 2SC3113-AB             |
| Q301    | 8-729-900-36   | (AV320R/RA)...TRANSISTOR DTC124ES |
| Q302    | 8-729-900-36   | (AV320R/RA)...TRANSISTOR DTC124ES |
| Q303    | 8-729-900-36   | TRANSISTOR DTC124ES               |
| Q304    | 8-729-900-36   | TRANSISTOR DTC124ES               |
| Q401    | 8-729-107-84   | TRANSISTOR 2SC3623A-LK            |
| Q402    | 8-729-620-05   | TRANSISTOR 2SC2603-EF             |
| Q403    | 8-729-119-76   | TRANSISTOR 2SA1175-HFE            |
| Q451    | 8-729-107-84   | TRANSISTOR 2SC3623A-LK            |
| Q452    | 8-729-620-05   | TRANSISTOR 2SC2603-EF             |
| Q501    | 8-729-202-67   | TRANSISTOR 2SK246-GR3             |
| Q502    | 8-729-620-05   | TRANSISTOR 2SC2603-EF             |

| Ref.No. | Part No.     | Description                          |
|---------|--------------|--------------------------------------|
| Q503    | 8-729-141-30 | (AV320R/RA)...TRANSISTOR 2SC3623A-LK |
| Q504    | 8-729-202-67 | TRANSISTOR 2SK246-GR3                |
| Q505    | 8-729-900-36 | TRANSISTOR DTC124ES                  |
| Q506    | 8-729-900-63 | TRANSISTOR DTA124ES                  |
| Q551    | 8-729-202-67 | TRANSISTOR 2SK246-GR3                |
| Q552    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q553    | 8-729-141-30 | (AV320R/RA)...TRANSISTOR 2SC3623A-LK |
| Q601    | 8-729-108-14 | TRANSISTOR 2SA988-F                  |
| Q602    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q603    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q604    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q605    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q651    | 8-729-108-14 | TRANSISTOR 2SA988-F                  |
| Q701    | 8-729-107-25 | TRANSISTOR 2SD1585-L                 |
| Q702    | 8-729-113-34 | TRANSISTOR 2SB733-5                  |
| Q703    | 8-729-180-92 | TRANSISTOR 2SD809-K                  |
| Q704    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q705    | 8-729-115-22 | TRANSISTOR BN1A3Q                    |
| Q706    | 8-729-119-76 | TRANSISTOR 2SA1175-HFE               |
| Q707    | 8-729-620-05 | TRANSISTOR 2SC2603-EF                |
| Q708    | 8-729-900-36 | TRANSISTOR DTC124ES                  |
| Q709    | 8-729-620-05 | (AV320R/RA)...TRANSISTOR 2SC2603-EF  |
| Q801    | 8-729-620-05 | (AV320R/RA)...TRANSISTOR 2SC2603-EF  |
| R1      | 1-249-397-11 | (WG)...CARBON (SMALL) 22             |
| R1      | 1-249-401-11 | (AEP,UK)...CARBON (SMALL) 47         |
| R3      | 1-249-329-11 | CARBON MELF 330 5% 1/8W              |
| R4      | 1-249-329-11 | CARBON MELF 330 5% 1/8W              |
| R5      | 1-249-329-11 | CARBON MELF 330 5% 1/8W              |
| R6      | 1-249-350-11 | CARBON MELF 18K 5% 1/8W              |
| R7      | 1-249-329-11 | CARBON MELF 330 5% 1/8W              |
| R8      | 1-249-332-11 | CARBON MELF 560 5% 1/8W              |
| R9      | 1-249-352-11 | CARBON MELF 27K 5% 1/8W              |
| R10     | 1-249-329-11 | (WG)...CARBON MELF 330 5% 1/8W       |
| R11     | 1-249-350-11 | (WG)...CARBON MELF 18K 5% 1/8W       |
| R12     | 1-249-329-11 | (WG)...CARBON MELF 330 5% 1/8W       |
| R13     | 1-249-334-11 | (WG)...CARBON MELF 820 5% 1/8W       |
| R14     | 1-249-352-11 | (WG)...CARBON MELF 27K 5% 1/8W       |
| R15     | 1-249-347-11 | (WG)...CARBON MELF 10K 5% 1/8W       |
| R16     | 1-249-343-11 | (WG)...CARBON MELF 4.7K 5% 1/8W      |
| R21     | 1-249-404-00 | CARBON (SMALL) 82                    |
| R22     | 1-249-433-11 | CARBON (SMALL) 22K                   |
| R23     | 1-249-335-11 | CARBON MELF 1K 5% 1/8W               |
| R24     | 1-249-353-11 | CARBON MELF 33K 5% 1/8W              |
| R25     | 1-249-346-11 | CARBON MELF 8.2K 5% 1/8W             |
| R26     | 1-249-340-11 | (WG)...CARBON MELF 2.7K 5% 1/8W      |
| R27     | 1-249-432-11 | CARBON (SMALL) 18K                   |
| R28     | 1-249-423-11 | CARBON (SMALL) 3.3K                  |
| R29     | 1-249-347-11 | CARBON MELF 10K 5% 1/8W              |
| R31     | 1-249-331-11 | CARBON MELF 470 5% 1/8W              |
| R32     | 1-249-347-11 | CARBON MELF 10K 5% 1/8W              |
| R33     | 1-249-347-11 | CARBON MELF 10K 5% 1/8W              |
| R35     | 1-249-355-11 | CARBON MELF 47K 5% 1/8W              |
| R36     | 1-249-429-11 | CARBON (SMALL) 10K                   |
| R37     | 1-249-359-11 | CARBON MELF 100K 5% 1/8W             |
| R38     | 1-249-363-11 | CARBON MELF 220K 5% 1/8W             |

**Note:** The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

| Ref.No. | Part No.     | Description          |      |    |      |  |
|---------|--------------|----------------------|------|----|------|--|
| R39     | 1-249-339-11 | CARBON MELF          | 2.2K | 5% | 1/8W |  |
| R40     | 1-249-338-11 | CARBON MELF          | 1.8K | 5% | 1/8W |  |
| R41     | 1-249-344-11 | CARBON MELF          | 5.6K | 5% | 1/8W |  |
| R42     | 1-249-359-11 | CARBON MELF          | 100K | 5% | 1/8W |  |
| R43     | 1-249-363-11 | CARBON MELF          | 220K | 5% | 1/8W |  |
| R44     | 1-249-339-11 | CARBON MELF          | 2.2K | 5% | 1/8W |  |
| R45     | 1-249-338-11 | CARBON MELF          | 1.8K | 5% | 1/8W |  |
| R46     | 1-249-344-11 | CARBON MELF          | 5.6K | 5% | 1/8W |  |
| R47     | 1-249-409-11 | CARBON (SMALL) 220   |      |    |      |  |
| R48     | 1-249-359-11 | CARBON MELF          | 100K | 5% | 1/8W |  |
| R49     | 1-249-359-11 | CARBON MELF          | 100K | 5% | 1/8W |  |
| R61     | 1-249-359-11 | CARBON MELF          | 100K | 5% | 1/8W |  |
| R62     | 1-249-355-11 | CARBON MELF          | 47K  | 5% | 1/8W |  |
| R63     | 1-249-315-11 | CARBON MELF          | 22   | 5% | 1/8W |  |
| R81     | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R82     | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R83     | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R84     | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R85     | 1-249-347-11 | CARBON MELF          | 10K  | 5% | 1/8W |  |
| R86     | 1-249-355-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R87     | 1-249-347-11 | CARBON MELF          | 10K  | 5% | 1/8W |  |
| R88     | 1-249-343-11 | CARBON MELF          | 4.7K | 5% | 1/8W |  |
| R89     | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R90     | 1-249-347-11 | CARBON MELF          | 10K  | 5% | 1/8W |  |
| R91     | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R92     | 1-249-401-11 | CARBON (SMALL) 47    |      |    |      |  |
| R101    | 1-249-341-11 | CARBON MELF          | 3.3K | 5% | 1/8W |  |
| R102    | 1-249-332-11 | CARBON MELF          | 560  | 5% | 1/8W |  |
| R103    | 1-249-335-11 | CARBON MELF          | 1K   | 5% | 1/8W |  |
| R104    | 1-249-328-11 | CARBON MELF          | 270  | 5% | 1/8W |  |
| R105    | 1-249-343-11 | CARBON MELF          | 4.7K | 5% | 1/8W |  |
| R106    | 1-249-339-11 | CARBON MELF          | 2.2K | 5% | 1/8W |  |
| R107    | 1-249-343-11 | CARBON MELF          | 4.7K | 5% | 1/8W |  |
| R108    | 1-249-323-11 | CARBON MELF          | 100  | 5% | 1/8W |  |
| R109    | 1-249-343-11 | CARBON MELF          | 4.7K | 5% | 1/8W |  |
| R110    | 1-249-405-11 | CARBON (SMALL) 100   |      |    |      |  |
| R301    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R302    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R303    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R304    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R305    | 1-249-429-11 | CARBON               | 10K  | 5% | 1/4W |  |
| R306    | 1-249-429-11 | CARBON               | 10K  | 5% | 1/4W |  |
| R307    | 1-249-429-11 | CARBON               | 10K  | 5% | 1/4W |  |
| R308    | 1-249-429-11 | CARBON               | 10K  | 5% | 1/4W |  |
| R311    | 1-249-429-11 | CARBON               | 10K  | 5% | 1/4W |  |
| R312    | 1-249-431-11 | CARBON               | 15K  | 5% | 1/4W |  |
| R313    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R314    | 1-249-441-11 | CARBON               | 100K | 5% | 1/4W |  |
| R315    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R316    | 1-249-441-11 | CARBON               | 100K | 5% | 1/4W |  |
| R321    | 1-249-410-11 | (AV320R/RA)...CARBON | 270  | 5% | 1/4W |  |
| R322    | 1-249-410-11 | CARBON               | 270  | 5% | 1/4W |  |
| R323    | 1-249-410-11 | CARBON               | 270  | 5% | 1/4W |  |
| R324    | 1-249-410-11 | CARBON               | 270  | 5% | 1/4W |  |
| R325    | 1-249-441-11 | CARBON               | 100K | 5% | 1/4W |  |
| R331    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R332    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |

| Ref.No. | Part No.     | Description          |      |    |      |  |
|---------|--------------|----------------------|------|----|------|--|
| R333    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R334    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R335    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R336    | 1-249-431-11 | CARBON               | 15K  | 5% | 1/4W |  |
| R337    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R338    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R339    | 1-249-393-11 | (AV320R/RA)...CARBON | 10   | 5% | 1/4W |  |
| R401    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R402    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R403    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R404    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R405    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R406    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R407    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R408    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R409    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R410    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R411    | 1-249-416-11 | CARBON               | 820  | 5% | 1/4W |  |
| R412    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R413    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R414    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R415    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R416    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R417    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R418    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R419    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R420    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R421    | 1-247-901-11 | CARBON               | 820K | 5% | 1/4W |  |
| R422    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R423    | 1-249-441-11 | CARBON               | 100K | 5% | 1/4W |  |
| R424    | 1-249-421-11 | CARBON               | 2.2K | 5% | 1/4W |  |
| R425    | 1-249-441-11 | CARBON               | 100K | 5% | 1/4W |  |
| R426    | 1-249-405-11 | CARBON               | 100  | 5% | 1/4W |  |
| R428    | 1-249-417-11 | (WG)...CARBON        | 1K   | 5% | 1/4W |  |
| R451    | 1-249-411-11 | CARBON               | 330  | 5% | 1/4W |  |
| R452    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R453    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R454    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R455    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R456    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R457    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R458    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R459    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R460    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R461    | 1-249-416-11 | CARBON               | 820  | 5% | 1/4W |  |
| R462    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R463    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R464    | 1-247-897-11 | CARBON               | 560K | 5% | 1/4W |  |
| R465    | 1-249-417-11 | CARBON               | 1K   | 5% | 1/4W |  |
| R469    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R470    | 1-249-437-11 | CARBON               | 47K  | 5% | 1/4W |  |
| R471    | 1-247-901-11 | CARBON               | 320K | 5% | 1/4W |  |
| R472    | 1-249-425-11 | CARBON               | 4.7K | 5% | 1/4W |  |
| R478    | 1-249-417-11 | (WG)...CARBON        | 1K   | 5% | 1/4W |  |
| R501    | 1-249-429-11 | CARBON               | 10K  | 5% | 1/4W |  |
| R502    | 1-249-421-11 | CARBON               | 2.2K | 5% | 1/4W |  |
| R503    | 1-249-441-11 | CARBON               | 100K | 5% | 1/4W |  |

| Ref.No. | Part No.      | Description           |      |    |        |
|---------|---------------|-----------------------|------|----|--------|
| R504    | 1-249-427-11  | CARBON                | 6.8K | 5% | 1/4W   |
| R505    | 1-249-438-11  | CARBON                | 56K  | 5% | 1/4W   |
| R506    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R507    | 1-247-883-00  | CARBON                | 150K | 5% | 1/4W   |
| R508    | 1-249-417-11  | CARBON                | 1K   | 5% | 1/4W   |
| R509    | 1-249-412-11  | CARBON                | 390  | 5% | 1/4W   |
| R510    | 1-249-427-11  | CARBON                | 6.8K | 5% | 1/4W   |
| R511    | 1-249-417-11  | CARBON                | 1K   | 5% | 1/4W   |
| R512    | 1-249-430-11  | CARBON                | 12K  | 5% | 1/4W   |
| R513    | 1-249-404-00  | (AV320R/RA)...CARBON  | 82   | 5% | 1/4W   |
| R514    | 1-249-429-11  | (AV320R/RA)...CARBON  | 10K  | 5% | 1/4W   |
| R515    | 1-249-434-11  | CARBON                | 27K  | 5% | 1/4W   |
| R516    | 1-249-434-11  | CARBON                | 27K  | 5% | 1/4W   |
| R517    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R518    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R519    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R520    | 1-247-903-00  | CARBON                | 1M   | 5% | 1/4W   |
| R521    | 1-249-428-11  | CARBON                | 8.2K | 5% | 1/4W   |
| R522    | 1-247-903-00  | CARBON                | 1M   | 5% | 1/4W   |
| R523    | 1-249-441-11  | (AV320R/RA)...CARBON  | 100K | 5% | 1/4W   |
| R524    | 1-249-426-11  | (AV320R/RA)...CARBON  | 5.6K | 5% | 1/4W   |
| R551    | 1-249-429-11  | CARBON                | 10K  | 5% | 1/4W   |
| R552    | 1-249-421-11  | CARBON                | 2.2K | 5% | 1/4W   |
| R553    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R554    | 1-249-427-11  | CARBON                | 6.8K | 5% | 1/4W   |
| R555    | 1-249-438-11  | CARBON                | 56K  | 5% | 1/4W   |
| R556    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R557    | 1-247-883-00  | CARBON                | 150K | 5% | 1/4W   |
| R558    | 1-249-417-11  | CARBON                | 1K   | 5% | 1/4W   |
| R559    | 1-249-412-11  | CARBON                | 390  | 5% | 1/4W   |
| R560    | 1-249-427-11  | CARBON                | 6.8K | 5% | 1/4W   |
| R561    | 1-249-417-11  | CARBON                | 1K   | 5% | 1/4W   |
| R562    | 1-249-430-11  | CARBON                | 12K  | 5% | 1/4W   |
| R563    | 1-249-404-00  | (AV320R/RA)...CARBON  | 82   | 5% | 1/4W   |
| R564    | 1-249-429-11  | (AV320R/RA)...CARBON  | 10K  | 5% | 1/4W   |
| R601    | 1-249-417-11  | CARBON                | 1K   | 5% | 1/4W   |
| R602    | 1-249-438-11  | CARBON                | 56K  | 5% | 1/4W   |
| R603    | 1-249-411-11  | CARBON                | 330  | 5% | 1/4W   |
| R604    | 1-249-421-11  | (AV220/A)...CARBON    | 2.2K | 5% | 1/4W   |
| R604    | 1-249-423-11  | (AV320R/RA)...CARBON  | 3.3K | 5% | 1/4W   |
| R605    | 1-249-438-11  | CARBON                | 56K  | 5% | 1/4W   |
| R606    | 1-247-756-11  | (AV220/A)...CARBON    | 2.2K | 5% | 1/2W   |
| R606    | 1-247-758-11  | (AV320R/RA)...CARBON  | 3.3K | 5% | 1/2W   |
| R607    | △1-217-151-00 | RES, METAL PLATE 0.22 |      |    |        |
| R608    | 1-249-417-11  | CARBON                | 1K   | 5% | 1/4W   |
| R612    | △1-249-405-11 | CARBON                | 100  | 5% | 1/4W F |
| R615    | △1-249-405-11 | CARBON                | 100  | 5% | 1/4W F |
| R621    | 1-249-427-11  | CARBON                | 6.8K | 5% | 1/4W   |
| R622    | 1-249-435-11  | CARBON                | 33K  | 5% | 1/4W   |
| R623    | 1-249-433-11  | CARBON                | 22K  | 5% | 1/4W   |
| R624    | △1-247-727-11 | CARBON                | 10   | 5% | 1/2W F |
| R625    | 1-247-768-00  | CARBON                | 2.4  | 5% | 1/4W   |
| R626    | 1-249-441-11  | CARBON                | 100K | 5% | 1/4W   |
| R627    | 1-249-435-11  | CARBON                | 33K  | 5% | 1/4W   |
| R628    | 1-249-427-11  | CARBON                | 6.8K | 5% | 1/4W   |
| R629    | △1-249-399-11 | CARBON                | 33   | 5% | 1/4W F |

| Ref.No. | Part No.      | Description               |      |    |        |
|---------|---------------|---------------------------|------|----|--------|
| R630    | 1-249-417-11  | CARBON                    | 1K   | 5% | 1/4W   |
| R631    | 1-249-429-11  | CARBON                    | 10K  | 5% | 1/4W   |
| R632    | 1-249-441-11  | CARBON                    | 100K | 5% | 1/4W   |
| R633    | 1-249-429-11  | CARBON                    | 10K  | 5% | 1/4W   |
| R634    | 1-249-423-11  | CARBON                    | 3.3K | 5% | 1/4W   |
| R635    | 1-249-441-11  | CARBON                    | 100K | 5% | 1/4W   |
| R636    | 1-247-903-00  | CARBON                    | 1M   | 5% | 1/4W   |
| R637    | △1-215-866-11 | (AV220/A)...METAL OXIDE   | 330  | 5% | 1W F   |
| R637    | △1-216-432-00 | (AV320R/RA)...METAL OXIDE | 820  | 5% | 1W F   |
| R638    | △1-215-889-00 | (AV220/A)...METAL OXIDE   | 330  | 5% | 2W F   |
| R638    | △1-216-454-11 | (AV320R/RA)...METAL OXIDE | 390  | 5% | 2W F   |
| R639    | 1-247-768-00  | CARBON                    | 2.4  | 5% | 1/4W   |
| R640    | 1-249-393-11  | (WG)...CARBON             | 10   | 5% | 1/4W   |
| R641    | 1-249-393-11  | (WG)...CARBON             | 10   | 5% | 1/4W   |
| R651    | 1-249-417-11  | CARBON                    | 1K   | 5% | 1/4W   |
| R652    | 1-249-438-11  | CARBON                    | 56K  | 5% | 1/4W   |
| R653    | 1-249-411-11  | CARBON                    | 330  | 5% | 1/4W   |
| R654    | 1-249-421-11  | (AV220/A)...CARBON        | 2.2K | 5% | 1/4W   |
| R654    | 1-249-423-11  | (AV320R/RA)...CARBON      | 3.3K | 5% | 1/4W   |
| R655    | 1-249-438-11  | CARBON                    | 56K  | 5% | 1/4W   |
| R656    | 1-247-756-11  | (AV220/A)...CARBON        | 2.2K | 5% | 1/2W   |
| R656    | 1-247-758-11  | (AV320R/RA)...CARBON      | 3.3K | 5% | 1/2W   |
| R657    | 1-217-151-00  | RES, METAL PLATE 0.22     |      |    |        |
| R658-A  | 1-249-417-11  | CARBON                    | 1K   | 5% | 1/4W   |
| R658-B  | 1-215-889-00  | (AV220/A)...METAL OXIDE   | 330  | 5% | 2W F   |
| R658-B  | 1-216-454-11  | (AV320R/RA)...METAL OXIDE | 390  | 5% | 2W F   |
| R671    | 1-249-427-11  | CARBON                    | 6.8K | 5% | 1/4W   |
| R672    | 1-249-435-11  | CARBON                    | 33K  | 5% | 1/4W   |
| R673    | 1-249-433-11  | CARBON                    | 22K  | 5% | 1/4W   |
| R674    | △1-247-727-11 | CARBON                    | 10   | 5% | 1/2W F |
| R675    | 1-247-768-00  | CARBON                    | 2.4  | 5% | 1/4W   |
| R676    | 1-249-441-11  | CARBON                    | 100K | 5% | 1/4W   |
| R689    | 1-247-768-00  | CARBON                    | 2.4  | 5% | 1/4W   |
| R690    | 1-249-393-11  | (WG)...CARBON             | 10K  | 5% | 1/4W   |
| R691    | 1-249-393-11  | (WG)...CARBON             | 10K  | 5% | 1/4W   |
| R702    | 1-249-422-11  | CARBON                    | 2.7K | 5% | 1/4W   |
| R703    | △1-216-448-11 | METAL OXIDE               | 39   | 5% | 2W F   |
| R705    | 1-249-423-11  | CARBON                    | 3.3K | 5% | 1/4W   |
| R706    | △1-249-405-11 | CARBON                    | 100  | 5% | 1/4W F |
| R707    | 1-249-410-11  | CARBON                    | 270  | 5% | 1/     |
| R708    | △1            |                           |      |    |        |
| R709    | 1-249-423-11  | CARBON                    | 3.3K | 5% | 1/4W   |
| R710    | 1-249-429-11  | (AV220/A)...CARBON        | 10K  | 5% | 1/4W   |
| R710    | 1-249-433-11  | (AV320R/RA)...CARBON      | 22K  | 5% | 1/4W   |
| R711    | 1-249-429-11  | CARBON                    | 10K  | 5% | 1/4W   |
| R712    | 1-249-429-11  | CARBON                    | 10K  | 5% | 1/4W   |
| R713    | 1-249-426-11  | CARBON                    | 5.6K | 5% | 1/4W   |
| R714    | 1-249-417-11  | CARBON                    | 1K   | 5% | 1/4W   |
| R715    | 1-249-426-11  | CARBON                    | 5.6K | 5% | 1/4W   |
| R716    | 1-249-417-11  | (AV320R/RA)...CARBON      | 1K   | 5% | 1/4W   |

Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

| Ref.No. | Part No.              | Description  | Ref.No.                                 | Part No.  | Description   |
|---------|-----------------------|--|---|---|---|
| R717    | 1-249-429-11          | (AV320R/RA)...CARBON<br>10K 5% 1/4W                                | S317                                    | 1-554-303-21  | SWITCH, KEY BOARD (9)   |
| R718    | $\Delta$ 1-249-401-11 | CARBON 47 5% 1/4W F  | S318                                    | 1-554-303-21  | SWITCH, KEY BOARD (MEMORY)                                    |
| R719    | 1-249-425-11          | CARBON 4.7K 5% 1/4W  | S319                                    | 1-554-303-21  | SWITCH, KEY BOARD (4)   |
| R720    | 1-249-437-11          | CARBON 47K 5% 1/4W   | S320                                    | 1-554-303-21  | SWITCH, KEY BOARD (5)   |
| R721    | 1-249-413-11          | CARBON 470 5% 1/4W   | S321                                    | 1-554-303-21  | SWITCH, KEY BOARD (6)   |
| R722    | 1-249-437-11          | CARBON 47K 5% 1/4W   | S322                                    | 1-554-303-21  | SWITCH, KEY BOARD (0)   |
| R723    | 1-249-437-11          | CARBON 47K 5% 1/4W   | S323                                    | 1-554-303-21  | SWITCH, KEY BOARD (1)   |
| R724    | 1-249-437-11          | CARBON 47K 5% 1/4W   | S324                                    | 1-554-303-21  | SWITCH, KEY BOARD (2)   |
| R725    | 1-249-437-11          | CARBON 47K 5% 1/4W   | S325                                    | 1-554-303-21  | SWITCH, KEY BOARD (3)   |
| R726    | 1-249-410-11          | (AV320R/RA)...CARBON 270 5% 1/4W                                   | S326                                    | 1-554-303-21  | SWITCH, KEY BOARD (SHIFT)                                     |
| R726    | 1-249-430-11          | (AV220/A)...CARBON 12K 5% 1/4W                                     | S327                                    | 1-554-303-21  | SWITCH, KEY BOARD (DBFB)                                      |
| R727    | 1-249-437-11          | (AV220/A)... CARBON 47K 5% 1/4W                                    | S328                                    | 1-554-303-21  | (AV320R/RA)...SWITCH, KEY BOARD<br>(MUTING -20dB)             |
| R801    | $\Delta$ 1-249-389-11 | CARBON 4.7 5% 1/4W F   | S329                                    | 1-554-303-21  | SWITCH, KEY BOARD (SURROUND)                                  |
| R802    | 1-249-437-11          | (AV320R/RA)...CARBON 47K 5% 1/4W                                   | S330                                    | 1-554-303-21  | (AV320R/RA)..SWITCH, KEY BOARD<br>(SYSTEM POWER)(POWER)       |
| R803    | 1-249-396-11          | (AV320R/RA)...CARBON 18 5% 1/4W                                    | S601                                    | 1-571-485-11  | SWITCH, PUSH (2 KEY)(SPEAKER A)                               |
| R804    | $\Delta$ 1-247-739-11 | (AV320R/RA)...CARBON<br>100 5% 1/2W F                              | S602                                    | 1-571-485-11  | SWITCH, PUSH (2 KEY)(SPEAKER B)                               |
| R804    | $\Delta$ 1-249-482-11 | (AV220/A)...CARBON<br>4.7 5% 1/2W F                                | S901                                    | $\Delta$ 1-554-685-11                                 | (AV220/A)...SWITCH, PUSH<br>(AC POWER)(1 KEY)                 |
| R805    | 1-249-425-11          | (AV320R/RA)...CARBON<br>4.7K 5% 1/4W                               | S902                                    | 1-570-046-21  | (AEP)..SWITCH, VOLTAGE CHANGE<br>(SPEAKER IMPEDANCE SELECTOR) |
| R901    | 1-249-396-11          | (WG)...CARBON 18 5% 1/4W   | T21                                     | 1-404-807-11  | TRANSFORMER, DISCRIMINATOR                                    |
| R951    | 1-249-396-11          | (WG)...CARBON 18 5% 1/4W   | T23                                     | 1-236-465-11  | (WG)...ENCAPSULATED COMPONENT                                 |
| RB301   | 1-233-081-11          | COMPOSITION CIRCUIT BLOCK  | T901                                    | $\Delta$ 1-449-758-11                                 | (AV320R:UK)...TRANSFORMER, POWER                              |
| RB302   | 1-232-955-11          | COMPOSITION CIRCUIT BLOCK  | T901                                    | $\Delta$ 1-449-760-11                                 | (AV320R:WG)...TRANSFORMER, POWER                              |
| RB303   | 1-232-998-11          | COMPOSITION CIRCUIT BLOCK  | T901                                    | $\Delta$ 1-449-761-11                                 | (AV220)...TRANSFORMER, POWER                                  |
| RV21    | 1-238-013-11          | RES. ADJ. CARBON 2.2K<br>(FM STEREO SPARATION)                     | T901                                    | $\Delta$ 1-450-140-11                                 | (AV320RA)...TRANSFORMER, POWER                                |
| RV23    | 1-238-021-11          | RES. ADJ. CARBON 220K (AM METER)                                   | T901                                    | $\Delta$ 1-450-141-11                                 | (AV220A)...TRANSFORMER, POWER                                 |
| RV24    | 1-236-019-11          | (WG).....<br>RES. ADJ. CARBON 47K<br>(FM STEREO OPERATION LEVEL)   | T902                                    | $\Delta$ 1-448-523-11                                 | (AV320R/RA)...TRANSFORMER, POWER                              |
| RV24    | 1-238-017-11          | (AEP,UK)...<br>RES. ADJ. CARBON 22K<br>(FM STEREO OPERATION LEVEL) | TM1                                     | *1-537-138-31   | (AEP,UK)...TERMINAL BOARD (ANT)                               |
| RV501   | 1-238-942-11          | RES. VAR. CARBON 100K (BALANCE)                                    | TM601                                   | $\Delta$ 1-536-706-00                                 | TERMINAL BOARD (SPEAKER A/B)                                  |
| RV502   | 1-238-074-11          | (AV220/A)...RES. VAR. CARBON<br>100K/100K (VOLUME)                 | TP1                                     | *1-560-060-00   | PIN, CONNECTOR 2P   |
| RV502   | 1-238-943-11          | (AV320R/RA)...RES. VAR. CARBON<br>100K/100K (VOLUME)               | VZR901                                  | $\Delta$ 1-807-180-11                                 | (AV320R/RA)..VARISTOR SNR-14A300K                             |
| RV503   | 1-238-941-11          | RES. VAR. CARBON 50K/50K<br>(TONE BASS)                            | X301                                    | 1-567-170-00  | OSCILLATOR, CERAMIC (4.194MHz)                                |
| RV504   | 1-238-941-11          | RES. VAR. CARBON 50K/50K<br>(TONE TREBLE)                          | XT81                                    | 1-577-126-11  | VIBRATOR, CRYSTAL   |
| RY601   | 1-515-533-11          | RELAY  | <b>ACCESSORY &amp; PACKING MATERIAL</b> |   |   |
| RY901   | 1-515-720-11          | (AV320R/RA)...RELAY  | 1-465-420-11                            | (AV320R:UK)...REMOTE COMMANDER<br>(RM-U203)           |   |
| S301    | 1-554-303-21          | SWITCH, KEY BOARD (TUNING DIRECT)                                  | 1-465-420-11                            | (AV320RA, AV320R:WG)...<br>REMOTE COMMANDER (RM-S103) |   |
| S302    | 1-554-303-21          | SWITCH, KEY BOARD (PRESET -)                                       | 1-501-369-11                            | (AEP,UK)...ANTENNA                                    |   |
| S303    | 1-554-303-21          | SWITCH, KEY BOARD (TUNING -)                                       | 1-501-374-11                            | ANTENNA, LOOP   |   |
| S304    | 1-554-303-21          | SWITCH, KEY BOARD (BAND FM)  | 2-181-754-01                            | (AV320RA/AV320R)...COVER, BATTERY                     |   |
| S305    | 1-554-303-21          | SWITCH, KEY BOARD (FM MODE)  | 3-751-607-11                            | (AEP)...MANUAL, INSTRUCTION<br>(ENGLISH, F, E)        |   |
| S306    | 1-554-303-21          | SWITCH, KEY BOARD (PRESET +)                                       | 3-751-607-41                            | (UK)...MANUAL, INSTRUCTION<br>(ENGLISH)               |   |
| S307    | 1-554-303-21          | SWITCH, KEY BOARD (TUNING +)                                       | 3-751-607-51                            | (AEP)...MANUAL, INSTRUCTION<br>(D, NL, S)             |   |
| S308    | 1-554-303-21          | SWITCH, KEY BOARD (BAND AM)  | 3-751-607-61                            | (WG)...MANUAL, INSTRUCTION (D)                        |   |
| S310    | 1-554-303-21          | SWITCH, KEY BOARD (TAPE)   | 3-751-651-41                            | INSTRUCTION   |   |
| S311    | 1-554-303-21          | SWITCH, KEY BOARD (VIDEO)  | 4-925-079-01                            | (AV320R:UK)...COVER(6), BATTERY                       |   |
| S312    | 1-554-303-21          | SWITCH, KEY BOARD (PHONO)  | *4-931-010-01                           | CUSHION (BOTTOM)                                      |   |
| S313    | 1-554-303-21          | SWITCH, KEY BOARD (TUNING)   | *4-931-011-01                           | CUSHION (TOP)   |   |
| S314    | 1-554-303-21          | SWITCH, KEY BOARD (CD)   | *4-938-141-01                           | (AV320R/RA)...INDIVIDUAL CARTON                       |   |
| S315    | 1-554-303-21          | SWITCH, KEY BOARD (7)  | *4-931-097-01                           | (AV220/A)...INDIVIDUAL CARTON                         |   |
| S316    | 1-554-303-21          | SWITCH, KEY BOARD (8)  | F : FRENCH                              | D : GERMAN  |   |
|         |                       |  | E : SPANISH                             | NL : DUTCH  |   |
|         |                       |  |   | S : SWEDISH   |   |