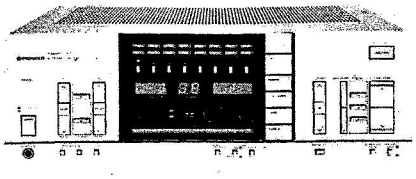
PIONEER

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ARP-043-0

COMPUTER CONTROLLED STEREO RECEIVER

SX-8

MODEL SX-8 COMES IN FOUR VERSIONS DISTIGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC 120V only	U.S.A. model
S	AC 110V, 120V, 220V and 240V (Switchable)	General export model
S/G	AC 110V, 120V, 220V and 240V (Switchable)	U.S. Military model
KC	AC 120V only	Canada model

- This service manual is applicable to the KU type. When repairing the S and S/G types, please see the additional service manual (pp.45–52).
- For the circuit description, please refer to the model SX-9 service manual (ARP-088).
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

CONTENTS

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

1. SPECIFICATIONS

Power Amplifier Section

Continuous Average Power Output is 100 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.005% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms)
- continuous rated power output: No more than 0.005%
- 50 watts per channel power output ..... No more than 0.005%

Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4:1)
- continuous rated power output ..... No more than 0.005%
- 50 watts per channel power output ..... No more than 0.005%

Frequency Response ... 5 Hertz to 450,000 Hertz $^{+0}_{-3}$ dB
Input Sensitivity/Impedance (POWER AMP IN) ..... 1V/50 kilohms
Output: Speaker ..... A, B, A series B
Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms): 50
Hum and Noise (IHF, short-circuited, A network): 115dB

Preamplifier Section

Input (Sensitivity/Impedance)
- PHONO MM ..... 2.5mV/50 kilohms
- PHONO MC ..... 0.25mV/100 ohms
- AUX/VIDEO, TAPE PLAY 1, 2/ADAPTOR IN ..... 150mV/50 kilohms

Phono Overload Level (T.H.D. 0.009%, 1,000 Hertz)
- PHONO MM 150mV

Output (Level/Impedance)
TAPE REC 1, 2/ADAPTOR OUT : 150mV/2.2 kilohms
- PREAMP OUT (R_L : 50 kilohms) ..... rated 1V/1 kilohms

Frequency Response
- PHONO (RIAA Equalization) ..... 20Hz to 20,000 Hertz±0.3dB
- AUX, TAPE PLAY 1, 2/ADAPTOR IN ..... 5Hz to 100,000 Hertz $^{+0}_{-3}$ dB

Tone Control
- BASS ..... ±10dB (100Hz)
- TREBLE ..... ±10dB (10kHz)

Subsonic Filter 15Hz (6dB/oct.)
Loudness Contour (Volume control set at –40dB position) .... +6dB (100Hz), +3dB (10,000Hz)
Hum and Noise (IHF, short-circuited, A network)
- PHONO MM/MC 80dB/67dB

Muting ..... –25dB

FM Tuner Section

Usable Sensitivity (IHF) ..... 10.3dBf (0.9μV, 75 ohms)
50dB Quieting Sensitivity
- MONO ..... 15.7dBf (1.6μV, 75 ohms)
- STEREO ..... 37dBf (19.5μV, 75 ohms)

Signal-to Noise Ratio
- MONO ..... 80dB (at 85dBf)
- STEREO ..... 76dB (at 85dBf)

Distortion (at 65dBf)
- MONO 100Hz 0.1%
- 1kHz 0.07%
- 6kHz 0.15%
- STEREO 100Hz 0.15%
- 1kHz 0.1%
- 6kHz 0.2%

Capture Ratio 1.0dB
Alternate Channel Selectivity
- 400kHz 80dB

Stereo Separation
- 1kHz 45dB
- 30Hz to 15kHz 35dB

Frequency Response ..... 20Hz to 15kHz±0.5dB
Spurious Response Ratio 90dB
Image Response Ratio 80dB
IF Response Ratio 90dB
AM Suppression Ratio 55dB
Subcarrier Product Ratio 55dB
SCA Rejection Ratio 60dB
Muting Threshold 29.3dBf (8μV)
Antenna Input ..... 300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Sensitivity (IHF, Ferrite antenna) 300μV/m
(IHF, Ext. antenna) 15μV
Selectivity 27dB
Signal-to-Noise Ratio 50dB
Image Response Ratio 40dB
IF Response Ratio 80dB
Antenna ..... Ferrite loopstick antenna

Miscellaneous

Power Requirements ..... AC 120V, 60Hz
Power Consumption ..... 295W (UL)
Dimensions ..... 420(W) x 151(H) x 448(D) mm
16-9/16(W) x 5-15/16(H) x 17-5/8(D) in
Weight (without package) ..... 15 kg (33 lb 1 oz)

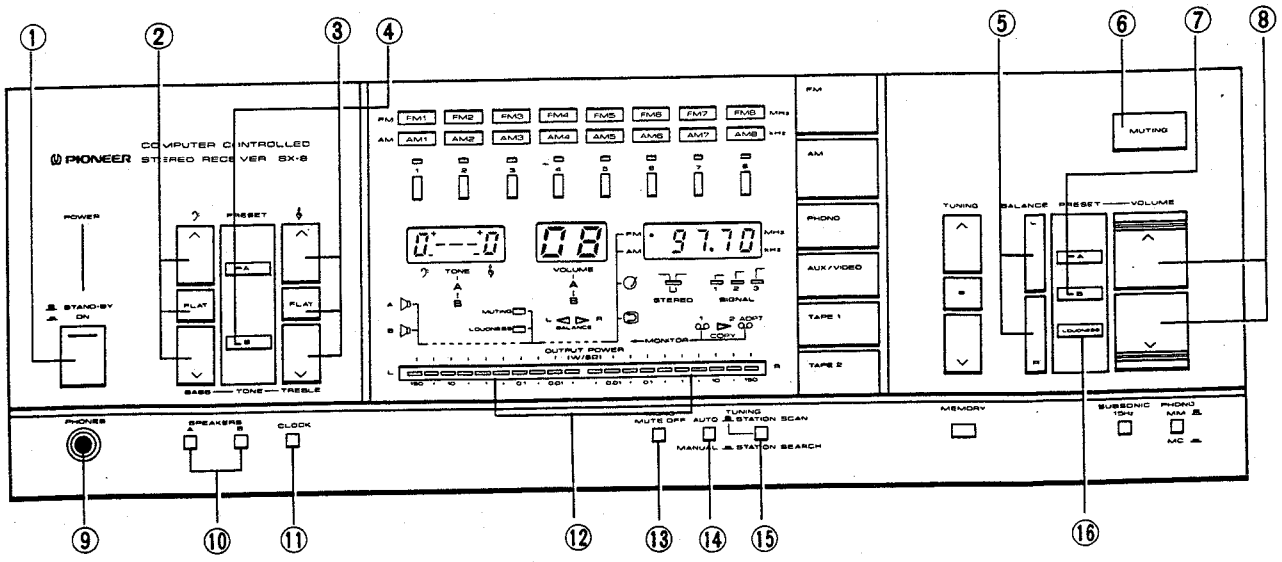
Furnished Parts

Operating instructions 1
FM T-type antenna 1
Station Card 2

**Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.*

NOTE:
Specifications and the design subject to possible modifications without notice due to improvements.

2. FRONT PANEL FACILITIES



① POWER SWITCH (STAND-BY ▟ , ON ▁)

When this switch is set to the ON (depressed) position, power is supplied to all the circuits. When set to the STAND-BY position, the power to the main circuits is cut off but still supplied to the clock. The clock continues to function until the power cord is disconnected.

NOTES:

- *Immediately after the power switch has been set to ON, the protection circuit is activated and no sound is heard through the speakers. The VOLUME STEP display blinks at the volume level heard before as a warning. When the numbers of the two digits blink, the output can be expected to be high. In this case, depress the VOLUME control " ∨ " and reduce the numerical display.*
- *Even when the power cord has been disconnected, the STATION CALL switch, PRESET-VOLUME and PRESET-TONE presetting information in the memory is preserved for about one week.*
  When the presetting information has been erased from the memory, follow the relevant instructions and proceed with presetting again.

② BASS TONE CONTROLS

These controls are used to adjust the bass level to your preference. To enhance the bass response, depress the " ∧ " control; to attenuate the response, depress " ∨ ". The increase or reduction in the bass response can be monitored on the ㉖ TONE CONTROL STEP display ♭. The response itself can be varied in 7 steps in either the "+" or "−" direction. When the center FLAT control is depressed, the bass frequency response is made flat.

③ TREBLE TONE CONTROLS

These controls are used to adjust the treble level to your preference. To enhance the treble response, depress the " ∧ " control; to attenuate the response, depress " ∨ ". The increase or reduction in the treble response can be monitored on the ㉖ TONE CONTROL STEP display 𝄞 . The response itself can be varied in 7 steps in either the "+" or "−" direction. When the center FLAT control is depressed, the treble frequency response is made flat.

④ PRESET-TONE SWITCHES

Switches A and B can memorize the bass and treble frequency responses which you have set to your preference, along with the ㊳ MEMORY switch, in two patterns (A and B). The bass and treble levels are set using the ② and ③ TONE controls while observing the ㉖ TONE CONTROL STEP display. When the ㊳ MEMORY switch is depressed, the ㉗ PRESET-TONE indicator starts to blink. When PRESET-TONE switch A or B is depressed, the set frequency response pattern is memorized in the switch. After having completed the memory operation, all you have to do to recall the frequency response which you have set is depress switch A or B.

⑤ BALANCE CONTROLS

These controls are used to adjust the balance in the volume of sound heard through the left and right speakers. When the sound tends to be louder at the left speaker, depress the R control; when it tends to be louder at the right speaker, depress the L control. When no sound is being delivered through the speakers, the balance can be checked by the ㉛ BALANCE indicators (L ◅ or ▻ R). Normally, both controls are depressed simultaneously and set to the center position (L ◅ and ▻ R light).

⑥ MUTING SWITCH

Depress this switch to attenuate the audio output indicated on the ㉜ VOLUME STEP display by 25dB. There is no need to adjust the VOLUME level when turning down the audio output temporarily and when changing over records or tapes.

NOTE:
By adjusting the VOLUME controls in combination with the MUTING switch, it is possible to adjust the volume more finely across a very wide range.

⑦ PRESET-VOLUME SWITCHES

Switches A and B can memorize the volume level which you have set to your preference, along with the ㊳ MEMORY switch, at two levels. The volume level is set using the ⑧ VOLUME controls while observing the ㉜ VOLUME STEP display. When the ㊳ MEMORY switch is depressed, the PRESET-VOLUME indicator starts to blink. When PRESET-VOLUME switch A or B is depressed, the set volume level is memorized in the switch. After having completed the memory operation, all you have to do to recall the volume level which you have set is depress switch A or B.

⑧ VOLUME CONTROLS

Use these controls to adjust the output level to the speakers and headphones. Depress the ∧ switch to increase the output level. Depress the ∨ switch to decrease the output level.

⑨ PHONES JACK

Plug the headphones plug into this jack when you want to listen through your stereo headphones.
Release both SPEAKERS switches if you want to listen to the sound through your headphones only.

⑩ SPEAKERS SWITCHES

Depress the switch corresponding to the speakers connected to the SPEAKERS terminals (A and B) on the rear panel. "A" refers to the speakers which have been connected to the SPEAKERS terminals (A and B) on the rear while "B" refers to the speakers which have been connected to the B SPEAKERS terminals.

NOTE:
No sound will be heard through the speakers when both A and B switches are depressed if only one set of speakers has been connected to either A or B SPEAKERS terminals.

⑪ CLOCK SWITCH

The time appears on the ⑲ FREQUENCY/CLOCK display when this switch is depressed. The display changes when the AM or FM switch is depressed. To adjust the present time, keep this switch in the depressed position and adjust using the ㉓ TUNING controls (∧ or ∨).

⑫ OUTPUT POWER METER

This meter allows you to read out the rated power level on the bar display when speakers with a nominal impedance of 8 ohms are connected to the SPEAKERS terminals.

⑬ MONO MUTE OFF SWITCH

The sound is heard in mono when this switch is set to the depressed position. Normally, the switch is kept at the released position. During FM or AM reception, the noise is reduced and reception is made clear. When the station is distant and its signals are weak, depress the switch and tune in the station manually.

⑭ AUTO/MANUAL SELECTOR

This is used to select the reception mode.

AUTO (released position): Auto tuning is selected in accordance with the position selected by the STATION SCAN/STATION SEARCH selector on the right.

MANUAL (depressed position): For manual tuning
Depress the TUNING controls and tune in the station manually. Each time the TUNING controls are depressed, the frequency changes in 100kHz steps during FM reception and in 9kHz or 10kHz steps during AM reception in accordance with the position of the AM CHANNEL STEP switch. When the TUNING controls are kept depressed, the frequency is continuously scanned. Tuning stops when the upper or lower limit of the frequency band is reached.

⑮ STATION SCAN/STATION SEARCH SELECTOR

This is used to select the auto tuning mode when the AUTO/MANUAL selector on the left is at AUTO.

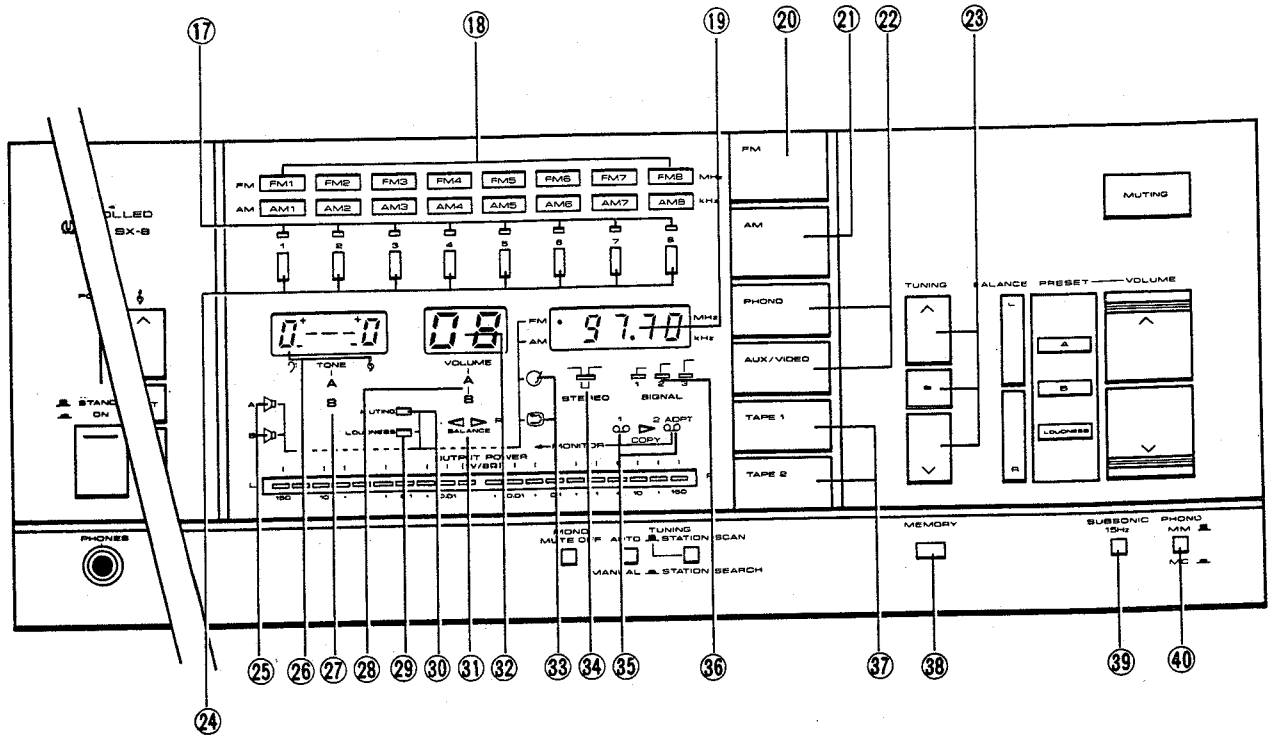
STATION SCAN (released position): When the TUNING controls are depressed, the broadcasting stations start to be scanned and this procedure stops once a station has been picked up. After 5 seconds, the program of that station is heard for about 5 seconds. The tuning operation then resumes and sound is heard in the same way. Each of the station is thus picked up in turn.
When the (㉓ Frequency stop " ■ " switch is depressed once you hear the sound of the desired program, the tuning operation stops and the unit is set to the reception mode.

STATION SEARCH (depressed position): When the TUNING controls are depressed, the broadcasting stations start to be scanned, but this operation stops once a station has been picked up and the unit is set to the reception mode. Depress the TUNING controls again if the station picked up is not the one desired. The tuning operation now starts over again.

⑯ LOUDNESS SWITCH

When listening to a performance with the VOLUME level is low, depress this switch and the bass and treble will be accentuated.
When the volume is low, the human ear finds it harder to hear the bass and treble than when the volume is high. The LOUDNESS switch is thus designed to compensate for this deficiency.

(Continued to next page)



⑰ STATION INDICATORS

The indicator that corresponds to the STATION CALL switch which has been depressed lights.

NOTE:
When presetting a station, all eight indicators light in sequence for about 5 seconds.

⑱ STATION DISPLAY WINDOWS

Insert the frequency cards of the broadcasting stations which have been preset into the STATION CALL switches.

⑲ FREQUENCY/CLOCK DISPLAY

This indicates the broadcasting frequency when a station has been tuned in. When the clock switch is depressed, it indicates the present time.

NOTE:
When the power is switched off, the present time is displayed.

⑳ FM SWITCH

Depress this switch for FM reception.

㉑ AM SWITCH

Depress this switch for AM reception.

㉒ INPUT SELECTOR

PHONO: Press this switch when playing a record on the turntable connected to the PHONO jacks.

AUX/VIDEO: Press this switch when listening to an audio component connected to the AUX/VIDEO jacks.

㉓ TUNING CONTROLS

These controls are used to tune in the broadcast stations. Depress the " ∧ " control to tune in a station with a higher frequency than that indicated on the display; depress the " ∨ " control to tune in a station with a lower frequency. The center " ■ " control is used to suspend auto tuning operations using the STATION SEARCH and STATION SCAN functions.

NOTE:
For further details on the tuning, refer to the ⑭ AUTO/MANUAL SELECTOR.

㉔ STATION CALL SWITCHES

These are pressed to call out preset broadcasting stations or to preset the station.

To call out a station, first set the desired frequency band using the FM or AM switches and then press the desired switch.

㉕ SPEAKERS INDICATORS (A/B)

These light when SPEAKERS switch (A and/or B) has been depressed.

㉖ TONE CONTROL STEP DISPLAY (𝄢 TONE 𝄞)

This display indicates the level of the frequency response which has been increased or reduced using the TONE CONTROLS by the two symbols, " ⌐ " and " ⌊ " and numbers in 7 steps. " 𝄢 " indicates the bass range while 𝄞 indicates the treble range.

㉗ PRESET-TONE INDICATORS (A/B)

These indicators blink when the frequency response curves are memorized using the PRESET memory function, and they light when the curves are recalled using the PRESET-TONE switches to indicate that the curves have been memorized.

㉘ PRESET-VOLUME INDICATORS (A/B)

These indicators blink when the volume, loudness and muting level are memorized using the PRESET memory function, and light when the level is recalled using the PRESET-VOLUME switches to indicate that the level has been memorized.

㉙ LOUDNESS INDICATOR

This lights when the LOUDNESS switch is depressed. It also lights up to indicate that the loudness level has been memorized using the PRESET memory function.

㉚ MUTING INDICATOR

This lights when the MUTING switch is depressed. It also lights up to indicate that the muting level has been memorized using the PRESET memory function.

㉛ BALANCE INDICATOR

This lights as the BALANCE CONTROLS are operated. The arrows indicate whether the sound tends to be louder at the left or right speaker. When both the L and R arrows light, this indicates that the balance has been set to the center position.

㉜ VOLUME STEP DISPLAY

This display indicates the volume level in 32 steps from 00 to 31 in accordance with the adjustment of the VOLUME controls.

NOTE:

When the power is switched on, the volume step display blinks to indicate the volume level. After blinking, the volume step lights.

㉝ INPUT INDICATORS

These light when the ㉒ INPUT (PHONO or AUX/VIDEO) switch is pressed.

㉞ FM STEREO INDICATOR

This lights when receiving an FM stereo program.

㉟ TAPE MONITOR INDICATOR

This indicates the tape deck which is playing back in accordance with the position selected by the TAPE 1, 2 switches.

㊱ SIGNAL INDICATOR

This indicator lights in sequence from 1 to 3 during the tuning of an AM or FM broadcast in accordance with the strength of the signals being received. The optimum tuning point is where the maximum number of indicators lights.

㊲ TAPE SWITCHES

TAPE 1: Depress this switch to use the tape deck connected to the TAPE 1 jacks (REC and PLAY).

TAPE 2: This is depressed when using a tape deck or adaptor unit connected to the rear panel TAPE 2/ADAPT (Adaptor) jacks.

NOTE:

Depress TAPE 1 and release TAPE 2 when dubbing a tape in the deck connected to the TAPE 1 jacks onto a tape in the deck connected to the TAPE 2/ADPT jacks.

㊳ MEMORY SWITCH

This switch is used to preset stations into the STATION CALL switches. It is also used when presetting the frequency response curves into the PRESET-TONE switches and the volume patterns into the PRESET-VOLUME switches.

㊴ SUBSONIC 15Hz SWITCH

The subsonic filter with the 15Hz cut-off frequency is actuated when this switch is depressed. This filter serves to attenuate the frequencies lower than 15Hz with a 6dB/oct. slope and, therefore, it can be used to suppress the ultra-low-range noise which is generated by record warp and other factors. This noise cannot actually be heard by the ear but it can cause cross modulation distortion and even speaker damage. Use this switch when required during record play.

㊵ PHONO MM/MC SELECTOR

This selector can be set to the position corresponding to the type of cartridge which you are using for record play.

MM ▂ : For moving magnet cartridges

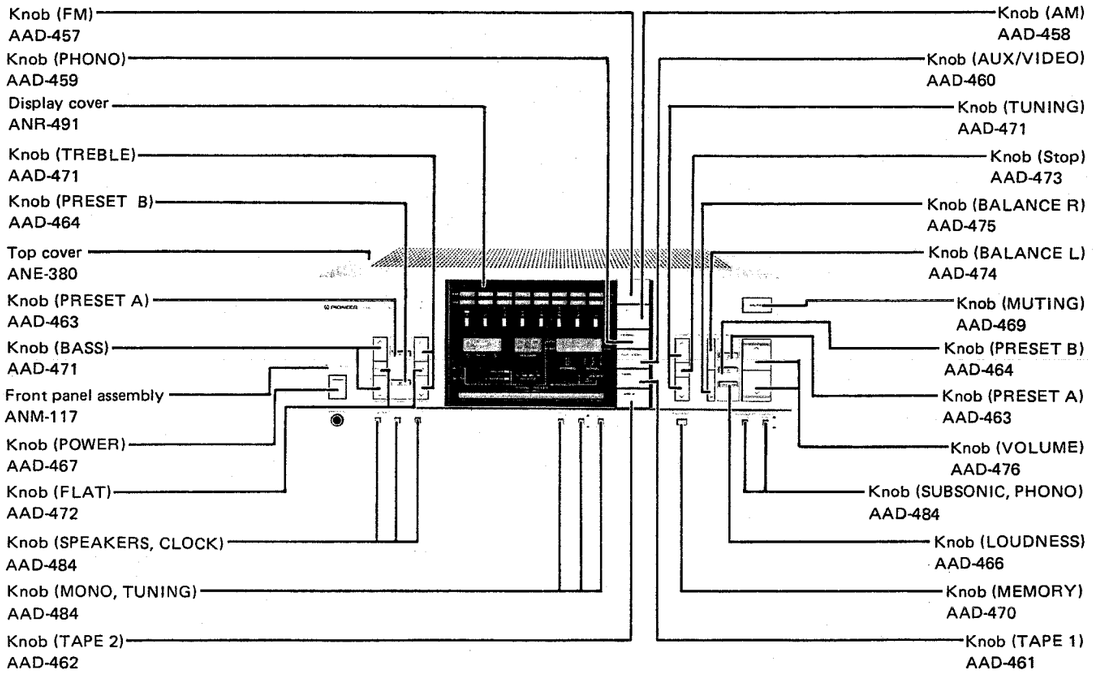
MC ▂ : For moving coil cartridges

3. PARTS LOCATION

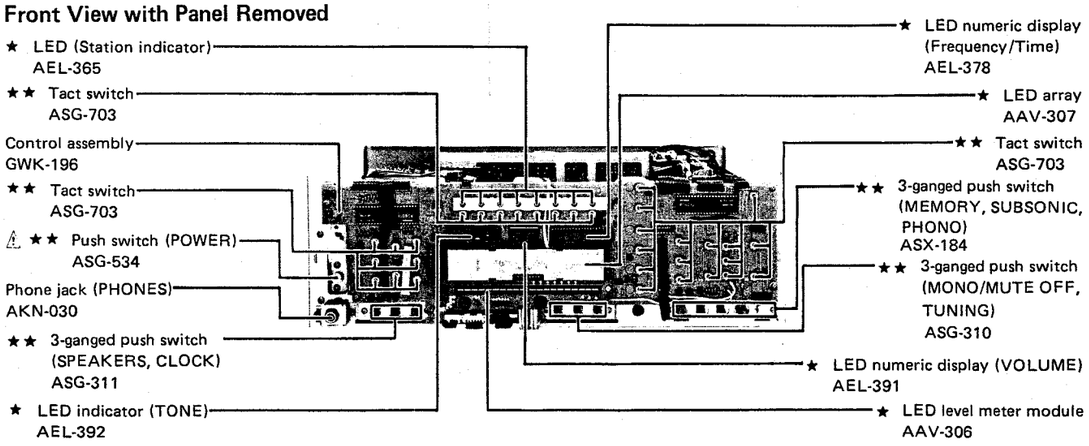
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

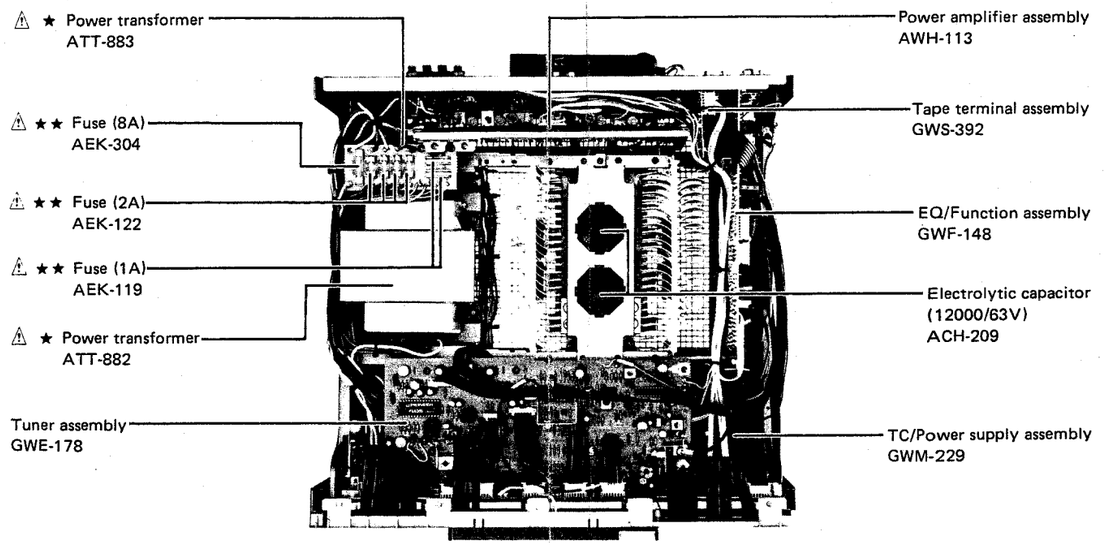
Front Panel View



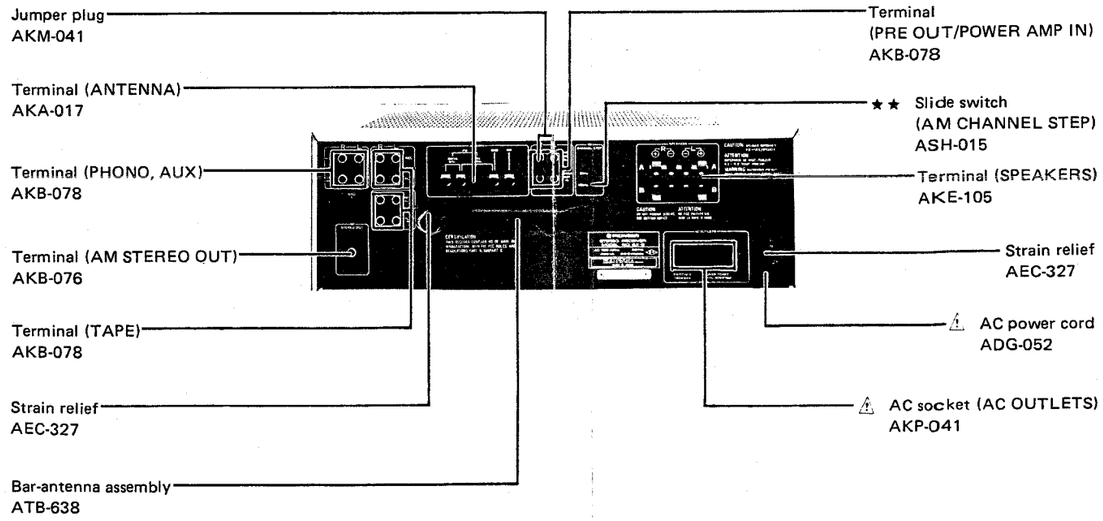
Front View with Panel Removed



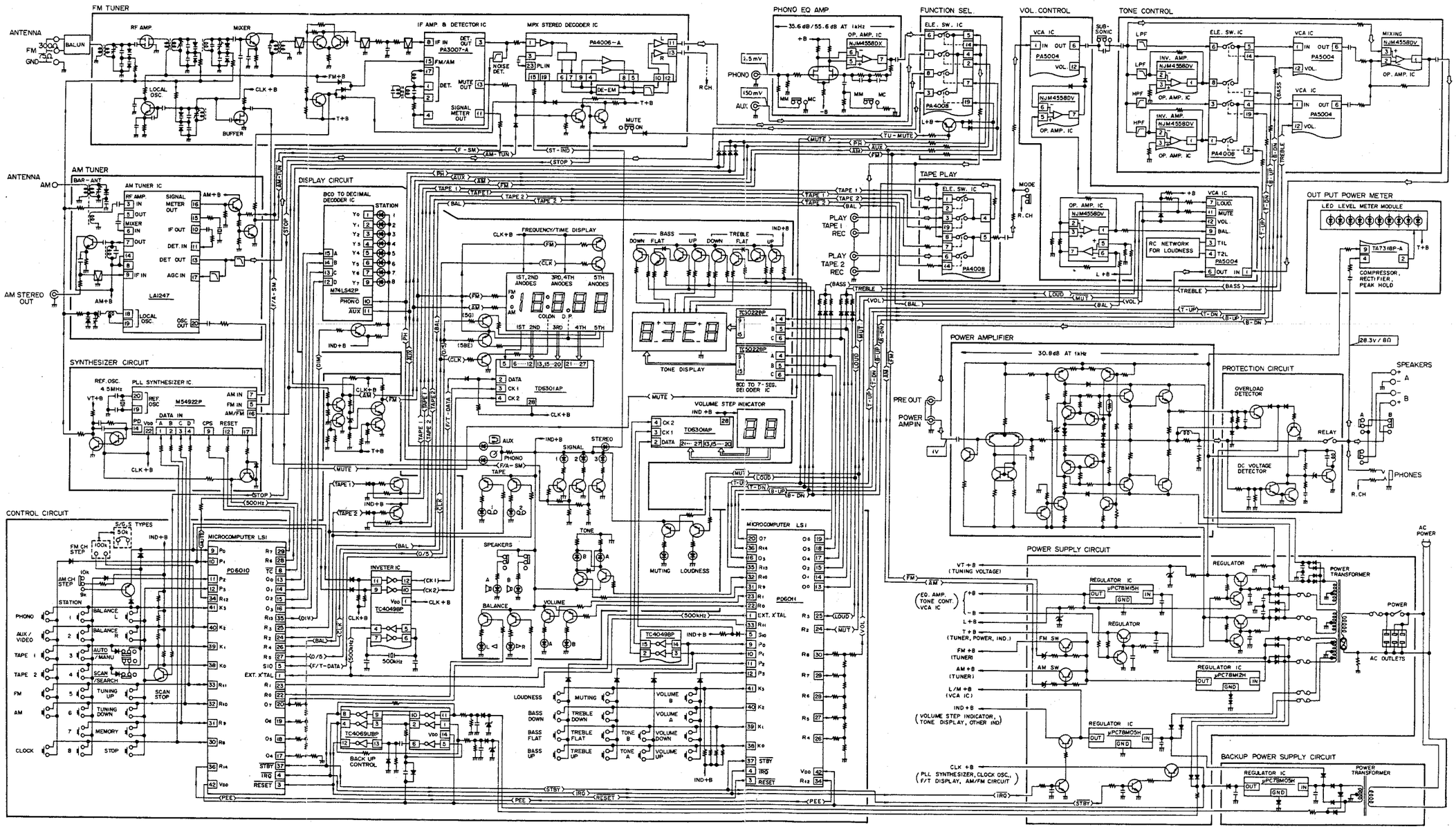
Top View



Rear Panel View

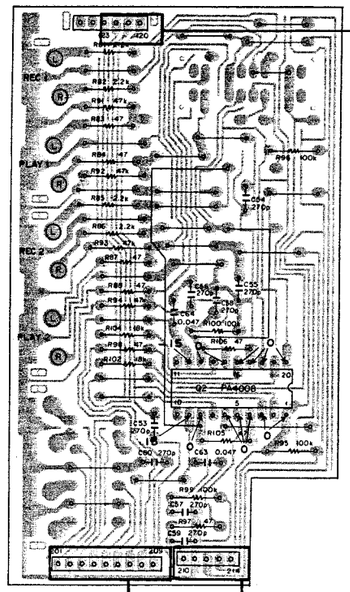


4. BLOCK DIAGRAM



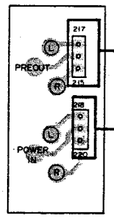
5. P.C. BOARDS CONNECTION DIAGRAM

TAPE TERMINAL Ass'y (GWS-392)



CONNECTOR Ass'y
120~123

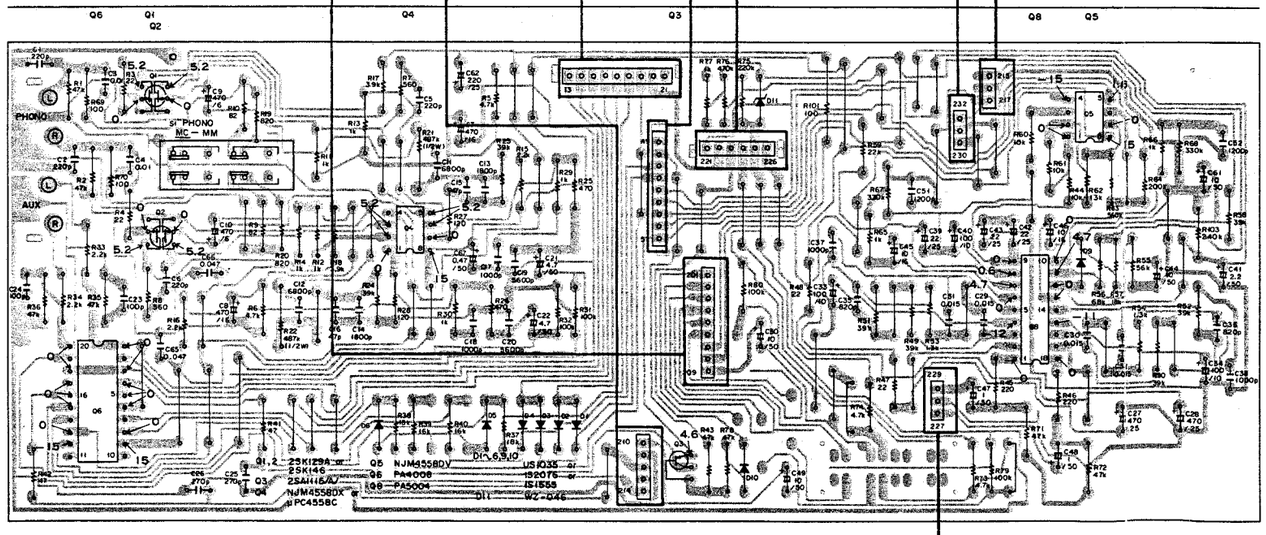
TERMINAL Ass'y



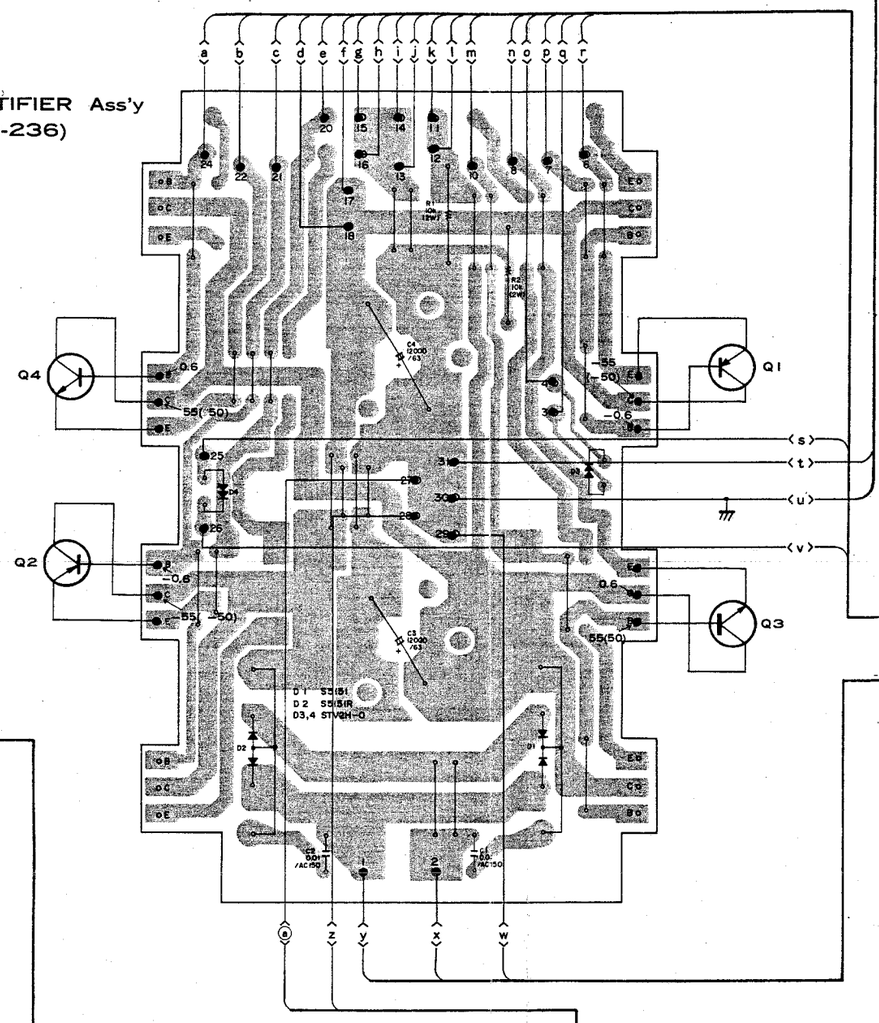
TUNER Ass'y
13~21

CONNECTOR Ass'y
49~57

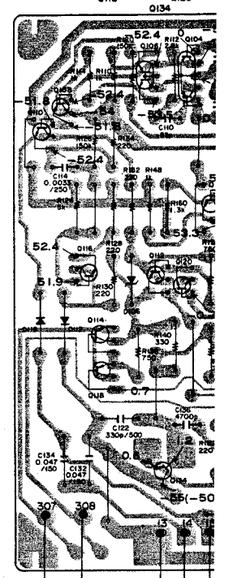
EQ/FUNCTION Ass'y
(GWF-148)



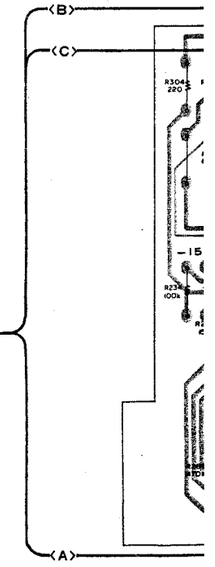
RECTIFIER Ass'y
(AWR-236)



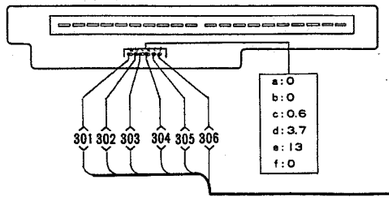
POWER AMP As



TC/PO



LED LEVEL METER MODULE
(AAV-306)



7 8 9 10 11 12

A B C D

Ass'y (AWH-113)

/POWER SUPPLY Ass'y (GWM-229)

FUSE HOLDER Ass'y

S AND S/G TYPES : ABSENCE

C1 0.01/AC125

S36 : POWER

S36

SWITCHED 100W MAX.

UNSWITCHED TOTAL 200W MAX.

R1 2.2M(1/2W) (M)

C2 0.01/ AC125

AC120V 60Hz

T1

T2

GRN BRN WHT

OR BLK OR RED GRY RED GRN BLU WHT BLU GRN

BRN WHT

HEADPHONES JACK Ass'y

HEAD-PHONES

LCH RCH SP-A

LCH RCH SP-B

28.2V/8Ω

CONNECTOR Ass'y 37~42, 44~48

TUNER Ass'y 22~27

CONNECTOR Ass'y 28~36

13 14 15 16 17 18

A B C D

TUNER Ass'y (GWE-178)

AM STEREO OUT

EQ/FUNCTION Ass'y
13~21

TC/POWER SUPPLY Ass'y
22~27

CONTROL Ass'y (GWK-19

KU : CONNECT
S, S/G : CUT

ANTENNA TERMINAL
Ass'y

BAR-ANTENNA
RED
BLU
YEL
BLK

CONNECTOR Ass'y

JP149 : FM C
KU : CUT (100
S, S/G : CONN

TC/POWER SUPPLY Ass'y
28~36

TC/POWER SUPPLY Ass'y
37~42, 44~48

13 14 15 16 17 18

16 17 18 19 20 21

A

B

C

D

CONTROL Ass'y (GWK-196)

KU : CONNECT
S, S/G : CUT

JP149 : FM CHANNEL STEP
KU : CUT (100k)Ω
S, S/G : CONNECT (50k)

Q202, 203 2SA1115/A
Q204, 215 2SC2603/A2
D201, 203 2-1K26I
D202 1S1555 or 1S2473 or US1035

TC/POWER SUPPLY Ass'y
130~132

TC/POWER SUPPLY Ass'y
37~42, 44~48

TAPE TERMINAL Ass'y
120~123

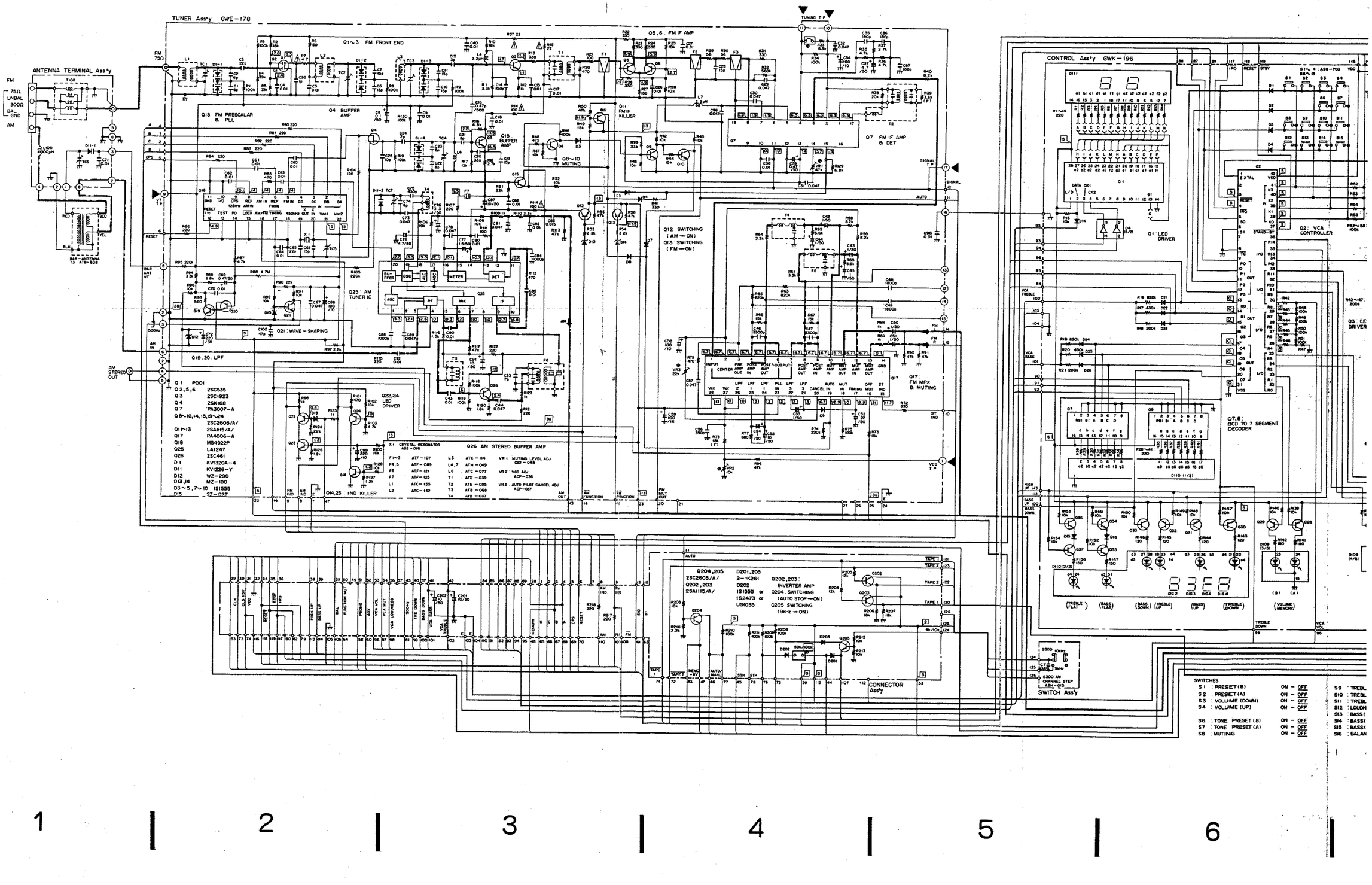
EQ/FUNCTION Ass'y
49~57

SWITCH Ass'y

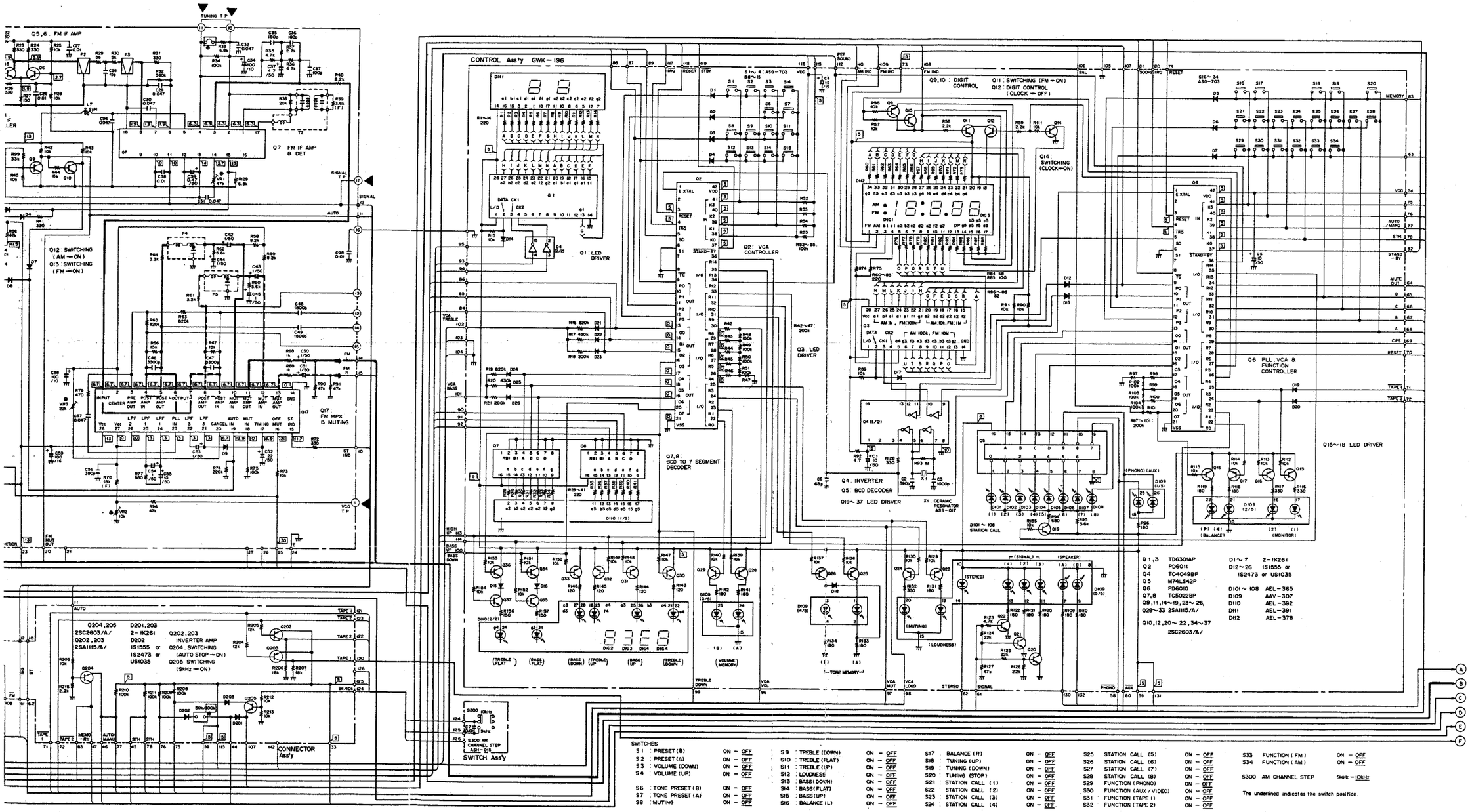
NNECTOR Ass'y

VER SUPPLY Ass'y

6. SCHEMATIC DIAGRAM



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



Q 1,3 TD6301AP
Q 2 PD6011
Q 4 TC40498P
Q 5 M74LS42P
Q 6 PD6010
Q 7,8 TC5022BP
Q 9,11,14~19,23~26, Q28~33 2SA1115/A/
Q 10,12,20~22,34~37 2SC2603/A/

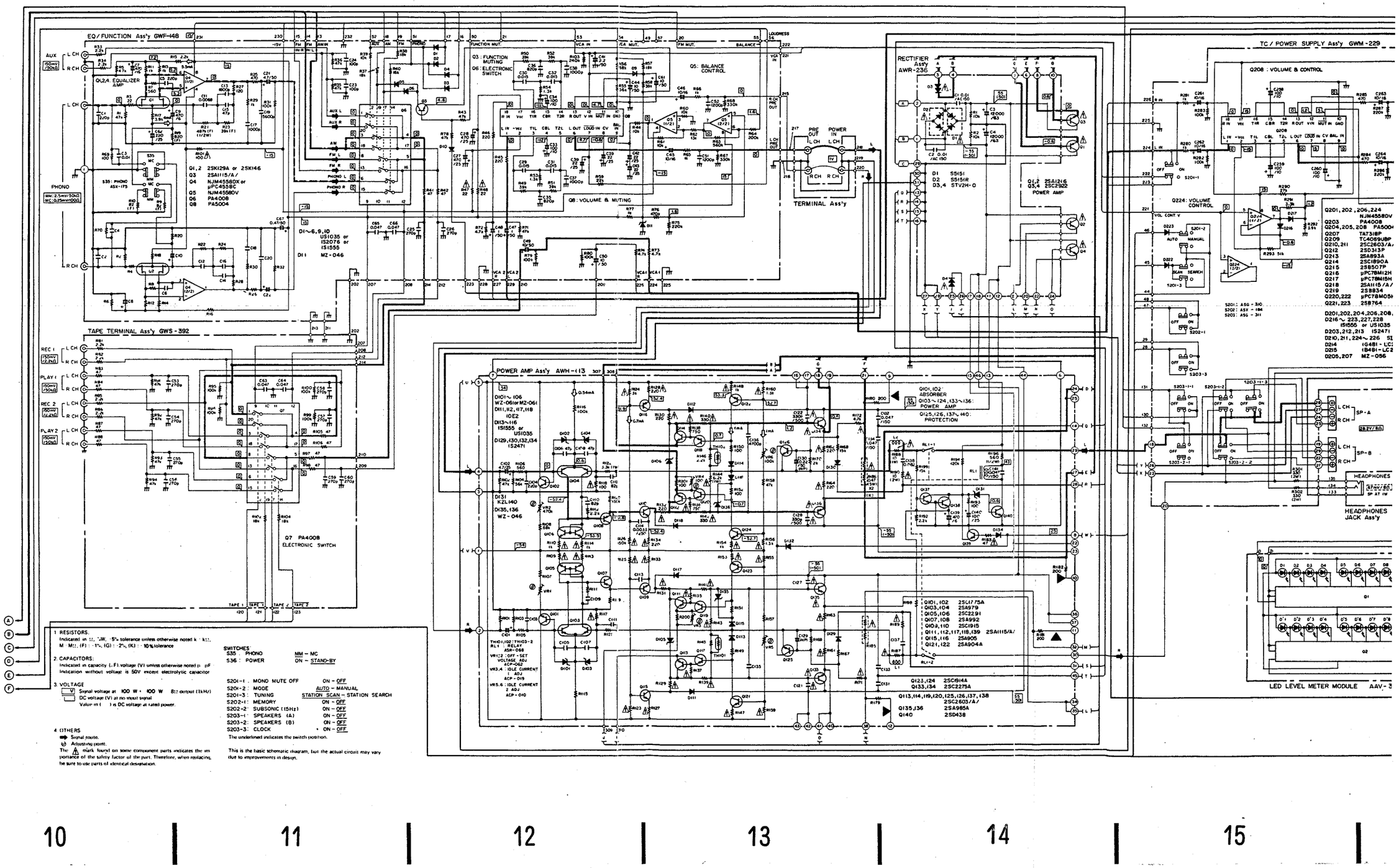
D 1~7 2-1K261
D 12~26 1S1555 or 1S2473 or US1035
D 101~108 AEL-365
D 109 AAV-307
D 110 AEL-392
D 111 AEL-391
D 112 AEL-378

SWITCHES

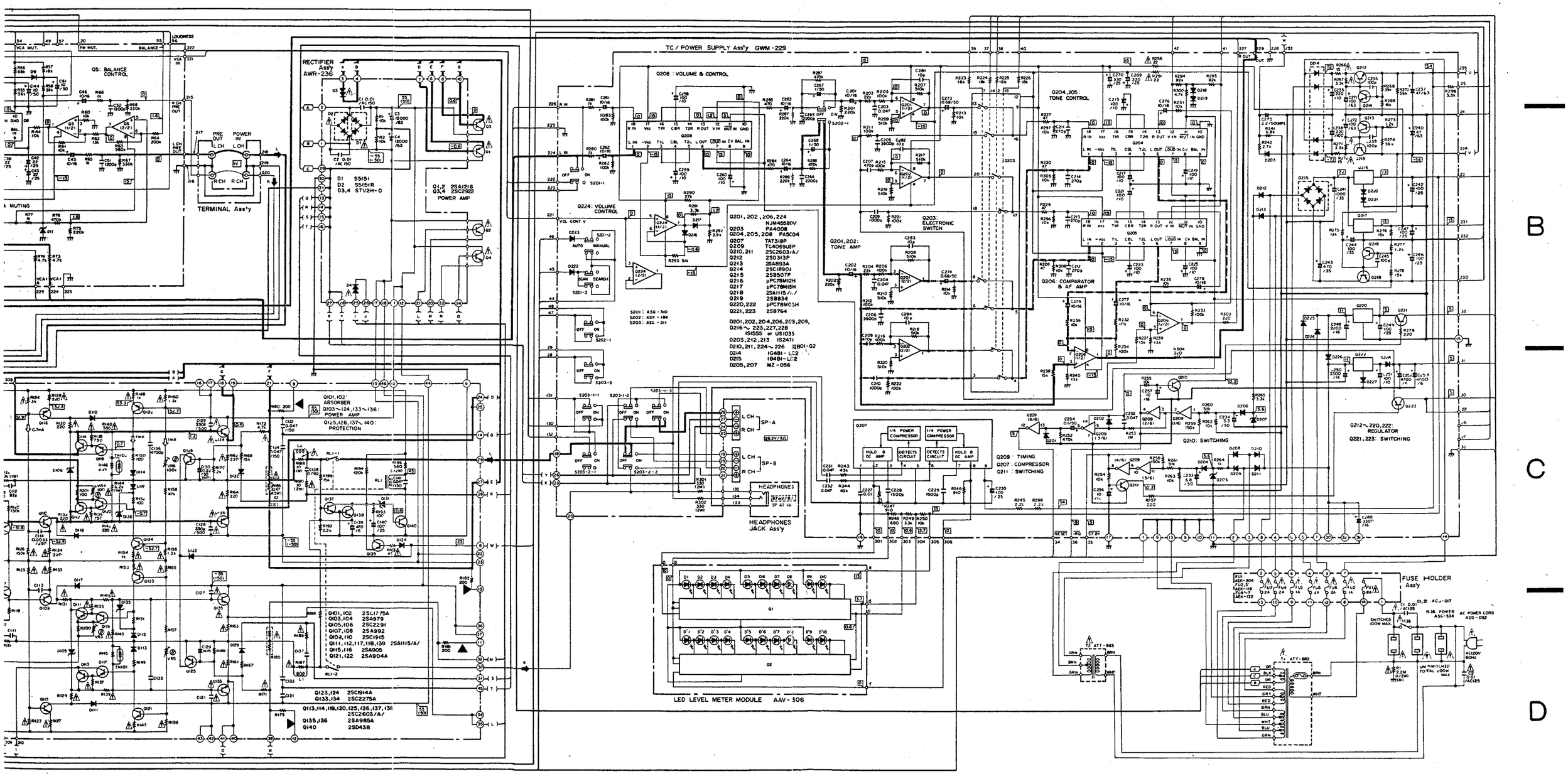
S 1	: PRESET (B)	ON — OFF	S 9	: TREBLE (DOWN)	ON — OFF	S 17	: BALANCE (R)	ON — OFF	S 25	: STATION CALL (5)	ON — OFF
S 2	: PRESET (A)	ON — OFF	S 10	: TREBLE (FLAT)	ON — OFF	S 18	: TUNING (UP)	ON — OFF	S 26	: STATION CALL (6)	ON — OFF
S 3	: VOLUME (DOWN)	ON — OFF	S 11	: TREBLE (UP)	ON — OFF	S 19	: TUNING (DOWN)	ON — OFF	S 27	: STATION CALL (7)	ON — OFF
S 4	: VOLUME (UP)	ON — OFF	S 12	: LOUDNESS	ON — OFF	S 20	: TUNING (STOP)	ON — OFF	S 28	: STATION CALL (8)	ON — OFF
			S 13	: BASS (DOWN)	ON — OFF	S 21	: STATION CALL (1)	ON — OFF	S 29	: FUNCTION (PHONO)	ON — OFF
S 6	: TONE PRESET (B)	ON — OFF	S 14	: BASS (FLAT)	ON — OFF	S 22	: STATION CALL (2)	ON — OFF	S 30	: FUNCTION (AUX / VIDEO)	ON — OFF
S 7	: TONE PRESET (A)	ON — OFF	S 15	: BASS (UP)	ON — OFF	S 23	: STATION CALL (3)	ON — OFF	S 31	: FUNCTION (TAPE 1)	ON — OFF
S 8	: MUTING	ON — OFF	S 16	: BALANCE (L)	ON — OFF	S 24	: STATION CALL (4)	ON — OFF	S 32	: FUNCTION (TAPE 2)	ON — OFF

S 33	: FUNCTION (FM)	ON — OFF
S 34	: FUNCTION (AM)	ON — OFF
S300	: AM CHANNEL STEP	9kHz — 10kHz

The underlined indicates the switch position.

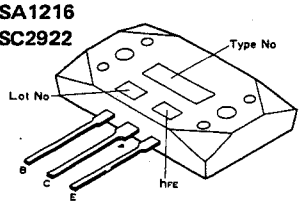

EQ / FUNCTION Ass'y GWF-148
TAPE TERMINAL Ass'y GWS-392
POWER AMP Ass'y AWH-113
RECTIFIER Ass'y AWR-236
TC / POWER SUPPLY Ass'y GWM-229
TERMINAL Ass'y
Q7 PA4008 ELECTRONIC SWITCH
Q3 : FUNCTION MUTING
Q6 : ELECTRONIC SWITCH
Q5 : BALANCE CONTROL
Q8 : VOLUME & MUTING
Q208 : VOLUME & CONTROL
Q224 : VOLUME CONTROL
POWER AMP
PROTECTION
HEADPHONES JACK Ass'y
LED LEVEL METER MODULE AAV-3
1. RESISTORS.
2. CAPACITORS.
3. VOLTAGE
4. OTHERS
SWITCHES
S35 PHONO MM – MC
S36 : POWER ON – STAND-BY
The underlined indicates the switch position.
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

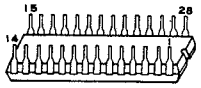


External Appearance of Transistors and ICs

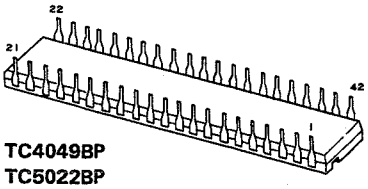
2SA1216
2SC2922



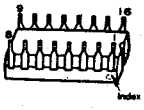
TD6301AP



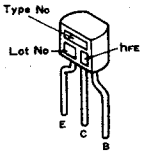
PD6010
PD6011



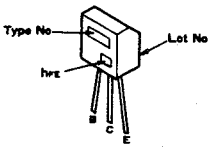
TC4049BP
TC5022BP
M74LS42P



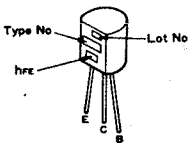
2SA1115/A/
2SC2603/A/



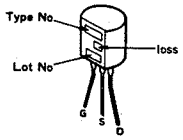
2SC461
2SC535



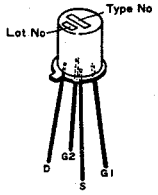
2SC1923



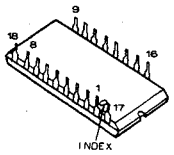
2SK168



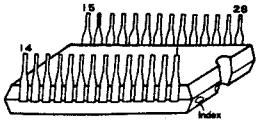
P001



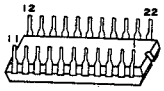
PA3007-A



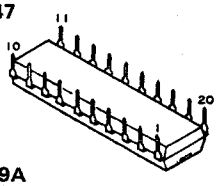
PA4006-A



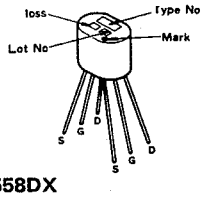
M54922P



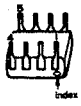
LA1247



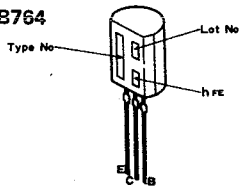
2SK129A



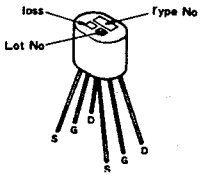
NJM4558DX
NJM4558DV
μPC4558C-P



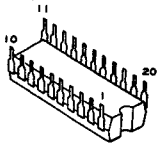
2SD438
2SB764



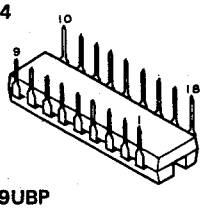
2SK146



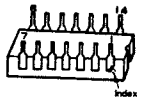
PA4008



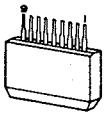
PA5004



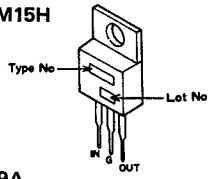
TC4069UBP



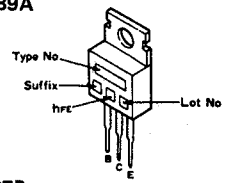
TA7318P



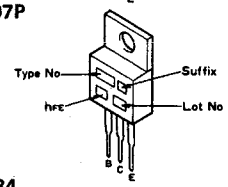
μPC78M05H
μPC78M12H
μPC78M15H



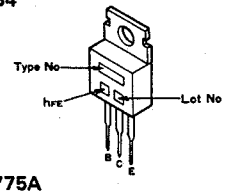
2SA839A



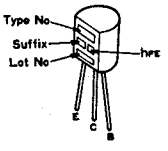
2SB507P



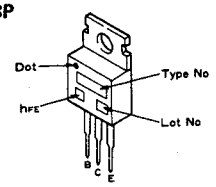
2SB834



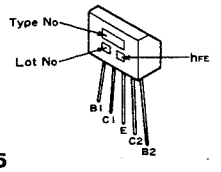
2SC1775A
2SC1890A



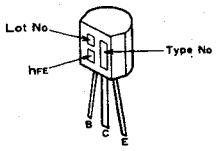
2SD313P



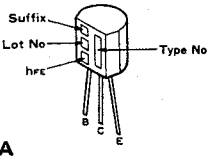
2SA979



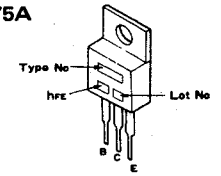
2SA905
2SC1915



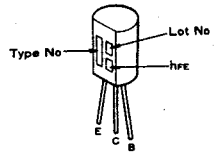
2SA904A
2SC1914A



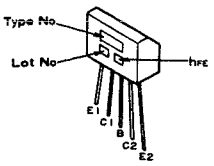
2SA985A
2SC2275A



2SA992



2SC2291



7. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 ..... RD¼PS* 5 6 1	*J*
47kΩ	*47 × 10³*	*473 ..... RD¼PS* 4 7 3	*J*
0.5Ω	*0R5 ..... RN2H* 0 R 5		*K*
1Ω	*010 ..... RS1P* 0 1 0		*K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 .... RN¼SR* 5 6 2 1	*F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
⚠ ★★	2SA1216-G* (2SA1216-O*) (2SA1216-Y*)	Q1,Q2
⚠ ★★	2SC2922-G* (2SC2922-O*) (2SC2922-Y*)	Q3,Q4

*hfe of these transistors (Q1—Q4) should have the same value.

★	AAV-306	LED level meter module

FUSES

Mark	Part No.	Symbol & Description
⚠ ★★	AEK-304	FU1 Fuse (8A/125V)
⚠ ★★	AEK-119	FU2,FU3 Fuse (1A/125V)
⚠ ★★	AEK-122	FU4—FU7 Fuse (2A/125V)

P. C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	GWK-196	Control assembly Connector assembly Switch assembly
	GWE-178	Tuner assembly Antenna terminal assembly
	GWF-148	EQ/Function assembly
	GWS-392	Tape terminal assembly
	GWM-229	TC/Power supply assembly Headphones jack assembly Terminal assembly Fuse holder assembly
	AWR-236	Rectifier assembly
	AWH-113	Power amplifier assembly

OTHERS

Mark	Part No.	Symbol & Description	
⚠	ACG-017	C1,C2	Ceramic capacitor (0.01/AC125V)
⚠	ACN-029	R1	Carbon composition resistor (2.2M/½W)
⚠ ★	ATT-882	T1	Power transformer
⚠ ★	ATT-883	T2	Power transformer
	ATB-638	T3	Bar-antenna assembly
⚠ ★★	ASG-534	S36	Push switch (POWER)
⚠	AKP-041	AC socket (AC OUTLETS)	
⚠	ADG-052	AC power cord	
	AKB-076	Terminal (AM STEREO OUT)	
	AKE-105	Terminal (SPEAKERS)	
	AKM-041	Jumper plug	

Control Assembly (GWK-196)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEJA 100M 50	C1,C5
	CKDYB 391K 50	C2
	CKDYB 102K 50	C3
	CEB 100P 16	C4
	CCDSL 680J 50	C6

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R1—R21, R28—R104, R109—R134, R136, R137, R139—R157

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TD6301AP	Q1,Q3
★★	PD6010	Q6
★★	PD6011	Q2
★★	TC4049BP	Q4
★★	M74LS42P	Q5
★★	TC5022BP	Q7,Q8
★★	2SA1115/A/	Q9, Q11, Q14–Q19, Q23–Q26, Q28–Q33
★★	2SC2603/A/	Q10,Q12,Q20–Q22,Q34–Q37
★	2-1K261	D1–D7
★	1S1555 (1S2473) (US1035)	D12–D26
★	AEL-365	D101–D108 LED (Red)
★	AAV-307	D109 LED array
★	AEL-392	D110 LED indicator (Tone)
★	AEL-391	D111 LED numeric display (Volume step)
★	AEL-378	D112 LED numeric display (Frequency/Time)

OTHERS

Mark	Part No.	Symbol & Description
★	ASS-017	X1 Ceramic resonator
★★	ASG-703	S1–S4,S6–S34 Tact switch

Connector Assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 100M 50L	C201,C202

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□ J	R203–R213,R216–R218

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q202,Q203
★★	2SC2603/A/	Q204,Q205
★	2-1K261	D201,D203
★	1S1555 (1S2473) (US1035)	D202

Switch Assembly

Mark	Part No.	Symbol & Description
★★	ASH-015	S300 Slide switch (AM CHANNEL STEP)
	CKDYF 103Z 50	C7

Tuner Assembly (GWE-178)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACM-014	TC1–TC3 Ceramic trimmer
	ACM-006	TC4 Ceramic trimmer
	ACM-017	TC5 Ceramic trimmer
	ACM-015	TC7 Ceramic trimmer
	CEANL 010M 50	C42,C43,C50,C51,C53,C54
	CEA 100M 50L	C55,C87,C91
	CEA 101M 16L	C59
	CEA 101M 10L	C34,C58,C68
	CEA 010M 50L	C44,C45
	CEA 220M 50L	C52
	CEA 0R1M 50L	C8
	CEANL R47M 50	C69
	CEA 4R7M 50L	C37,C76
	CCDRH 150J 50	C6,C7,C10,C11,C19
	CCDCH 150J 50	C66
	CCDCH 220J 50	C65
	CCDRH 060D 50	C1,C2
	CCDRH 330J 50	C20
	CCDTH 080D 50	C21–C23,C74
	CCDCH 030C 50	C12
	ACG-018	C56 Ceramic (390p/50V, CH)
	CCDSL 220J 50	C3
	CCDSL 181J 50	C35,C36
	CCDSL 101J 50	C14
	CEA 3R3M 50L	C77
	CEA 1R5M 50L	C79
	CEA 221M 10L	C99
	CKDYB 102K 50	C84,C88
	CCDSL 010C 50	C95
	CQMA 153K 50	C83
	CQMA 103J 50	C64
	CQSA 332J 50	C46,C47
	CQSA 431J 50	C75
	CQSA 182J 50	C48,C49
	CCDCH 100D 50	C25
	CCDCH 020C 50	C24
	CGB R47K 500	C16
	CCDSL 151J 50	C28
	CEA 221M 35L	C72
	CKDYF 103Z 50	C4, C5, C9, C15, C17, C18, C26, C27, C38, C40, C60–C63, C70, C80, C82, C85, C86, C90, C92, C93, C98
	CKDYF 473Z 50	C29–C32, C57, C67, C73, C78, C81, C89, C94, C96
	CCDSL 070D 50	C33
	CCDSL 470J 50	C100
	CEA R47M 50L	C39

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
★	C92-048	VR1	Semi-fixed (47k-B)
★	ACP-036	VR2	Semi-fixed (10k-B)
★	ACP-037	VR3	Semi-fixed (22k-B)
	RD¼PM □□□ J	R1–R6, R8–R13, R16–R38, R40–R56, R58–R77, R99–R113, R115–R131	
	RN¼PQ □□□□ F	R39,R78	
⚠	RD¼PMF □□□ J	R7,R14,R15,R57,R114	

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SA1115/A/	Q11–Q13
★★	2SC2603/A/	Q8–Q10,Q15,Q19–Q21
★★	2SC2603/A/-F	Q14,Q22–Q24
★★	2SC461	Q26
★★	2SC535	Q2,Q5,Q6
★★	2SC1923	Q3
★★	2SK168	Q4
★★	P001	Q1
★★	PA3007-A (PA3007)	Q7
★★	PA4006-A	Q17
★★	M54922P	Q18
★★	LA1247	Q25
★	SZ-027	D15
★	WZ-290	D12
★	MZ-100 (WZ-100)	D13,D14
★	1S1555	D3–D5,D7–D10
★	KV1320A-4	D1
★	KV1226-Y	D11

*KV1320A-4 consists of four twin vari-cap diode with the indentical characteristics.

*KV1226-Y consists of two vari-cap diodes with indentical characteristics.

COILS AND FILTERS

Mark	Part No.	Symbol & Description	
	ATC-155	L1	FM ANT. coil
	ATC-142	L2	FM RF coil
	ATC-114	L3	FM RF coil
	ATH-049	L4,L7	RF choke coil
	ATC-077	L6	FM osc. coil
	ATE-039	T1	FM IF transformer
	ATE-055	T2	FM det. transformer
	ATB-068	T3	AM IF coil
	ATB-067	T4	AM osc. coil
	ATF-107	F1–F3	FM ceramic filter
	ATF-089	F4,F5	FM low-pass filter
	ATF-121	F6	AM ceramic filter
★	ATF-125	F7	Ceramic resonator

OTHERS

Mark	Part No.	Symbol & Description	
★	ASS-016	X1	Crystal resonator
	AKB-025	Terminal (From balun)	

Antenna Terminal Assembly

Mark	Part No.	Symbol & Description	
	ACM-015	TC6	Ceramic trimmer
	CKDYF 103Z 50	C71	
	ATX-013	T100	Balun
	AKA-017	Terminal (ANTENNA)	
	AKB-025	Terminal (To FM frontend)	

EQ/Function Assembly (GWF-148)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 471M 6L	C9,C10
	CEA 471M 16L	C7,C8
	CEANL 4R7M 50	C21,C22
	CEANL 100M 50	C49,C50
	CEANL 010M 50	C47,C48
	CEANL 100M 16	C45,C46
	CEA 101M 10L	C33,C34,C40
	CEA 2R2M 50L	C41
	CEA 221M 25L	C62
	CEA 471M 25L	C27,C28
	CEA 220M 25L	C39,C42,C43
	CEA 100M 50L	C44,C61
	CCDSL 101J 50	C23,C24
	CCDSL 271J 50	C25,C26
	CCDSL 221J 50	C1,C2,C5,C6
	CQMA 182J 50	C13,C14
	CCDSL 470J 50	C15,C16
	CQMA 682J 50	C11,C12
	CKDYB 102K 50	C17,C18,C37,C38
	CKDYB 562K 50	C19,C20
	CKDYB 821K 50	C35,C36
	CQMA 153J 50	C29–C32
	CQMA 122J 50	C51,C52
	CQMA 103J 50	C3,C4
	CKDYF 473Z 50	C65,C66
	CEA R47M 50L	C67

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RN½PQ □□□□ F	R21,R22
	RN¼PQ □□□□ F	R9,R10,R19,R20,R23,R24
⚠	RD¼PMF □□□ J	R47,R48,R101
	RD¼PM □□□ J	R1–R8, R11–R18, R25–R46, R49–R80, R103

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SK129A (2SK146)	Q1,Q2
★★	2SA1115/A/	Q3
★★	NJM4558DX (μPC4558C-P)	Q4
★★	NJM4558DV	Q5
★★	PA4008	Q6
★★	PA5004	Q8
★	US1035 (1S2076) (1S1555)	D1–D6,D9,D10
★	WZ-046	D11

OTHERS

Mark	Part No.	Symbol & Description
★★	ASX-175	S1 Remote slide switch (MM/MC)
	AKB-078	Terminal (PHONO, AUX)

Tape Terminal Assembly (GWS-392)

CAPACITORS

Mark	Part No.	Symbol & Description
	CCDSL 271J 50	C53–C60
	CKDYF 473Z 50	C63,C64

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD¼PM □□□ J	R81–R88, R91–R100, R102, R104–R106

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA4008	Q7

OTHERS

Mark	Part No.	Symbol & Description
	AKB-078	Terminal (TAPE)

TC/Power Supply Assembly (GWM-229)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 221M 100L	C235,C238
	CEA 101M 63L	C271,C272
	CEA 470M 63L	C237,C240
	CEA 102M 35L	C241
	CEA 471M 35L	C243
	CEA 101M 35L	C244
	CEA 331M 25L	C269,C270
	CEA 101M 25L	C246,C247,C230
	CEA 222M 16L	C248
	CEA 101M 25L	C242,C249
	CEA 101M 10L	C215, C217, C219, C221, C223, C225, C258–C260, C251
	CEA 472M 6L	C252,C253
	CEA 6R8M 50L	C233
	CEA 3R3M 50L	C234
	CEA 010M 50L	C267,C268
	CEA 100M 16L	C201, C202, C256, C257, C261–C264, C276–C279
	CEANP 2R2M 50	C275
	CEA R68M 50L	C273, C274
	CQMA 473K 50	C203,C204,C231,C232,C255
	CQMA 392K 50	C205,C206
	CKDYB 471K 50	C207,C208
	CKDYB 102K 50	C209,C210
	CCDSL 271J 50	C211–C214
	CCDSL 101J 50	C236,C239,C245
	CKDYB 103K 50	C227
	CKDYB 152K 50	C228,C229
	CKDYB 222K 50	C265,C266
	CEANL 0R1M 50	C254
	CEA 332M 16L	C250,C280
	CCDSL 100D 50	C281–C284

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
⚠	RD¼PMF □□□ J	R251, R256, R266, R267, R271, R272
	RS2P □□□ J	R301,R302
	RD¼PM □□□ J	R201–R250, R252–R255, R257–R265, R268–R270, R273–R300, R303–R306

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA839A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211
★★	2SD313P	Q212
★	1S2471	D203,D212,D213
★	1S1555 (US1035)	D201, D202, D204, D206, D208, D209, D216–D223, D227, D228
★	1B4B1-LC2	D215
★	1G4B1-LC2	D214
★	SIB01-02	D210,D211,D224–D226
★	MZ-056	D205,D207

OTHERS

Mark	Part No.	Symbol & Description
★★	ASG-310	S201 3-ganged push swich (MONO/MUTE OFF, TUNING)
★★	ASX-184	S202 3-ganged push switch (SUBSONIC, MEMORY, MM/MC-remote)
★★	ASG-311	S203 3-ganged push switch (SPEAKERS, CLOCK)
	PBZ30P060FMC	Screw 3 x 6

Headphones Jack Assembly

Mark	Part No.	Symbol & Description
	AKN-030	Phone jack (PHONES)

Terminal Assembly

Mark	Part No.	Symbol & Description
	AKB-078	Terminal (PRE OUT/POWER AMP IN)

Rectifier Assembly (AWR-236)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACG-019	C1,C2 Ceramic (0.01/150V)
	ACH-209	C3,C4 Electrolytic (12000/63V)

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RS2P 103J	R1,R2

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
⚠ ★	S5151	D1
⚠ ★	S5151R	D2
⚠ ★	STV2H-O	D3,D4

Power Amplifier Assembly (AWH-113)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 823K 50	C137,C138
	CQMA 332K 250	C113,C114
	CKDYB 472K 50	C135,C136
⚠	CCDSL 331K 500	C121,C122,C127,C128
	CCDSL 470J 50	C105–C108
	CCDSL 820J 50	C109–C112
	CCDSL 221J 50	C103,C104
	ACG-009	C131–C134,C141 Ceramic (0.047/150V)
	CEANL 4R7M 50	C101,C102
	CEA 471M 6L	C139
	CEA 101M 25L	C140
	CEANP R22M 50	C129,C130

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACP-062	VR1,VR2 Semi-fixed (470k-B)
★	ACP-019	VR3,VR4 Semi-fixed (100-B)
★	ACP-010	VR5,VR6 Semi-fixed (100k-B)
⚠	ACN-114	R185,R186 Wire wound (0.47 + 0.47/5W + 5W)
⚠	RS2P □□□ J	R189,R190
⚠	RS1P □□□ J	R121,R122,R143,R144
⚠	RS1PF □□□ J	R187,R188
	RD½PS □□□ J	R196
⚠	RD¼PMFL □□□ J	R131–R138
⚠	RD¼PMF □□□ J	R109, R110, R113, R114, R117, R118, R123, R124, R127–R130, R139–R142, R147, R148, R153–R156, R159–R164, R171, R172, R183
	RD¼PM □□□ J	R101–R108, R111, R112, R115, R116, R119, R120, R125, R126, R145, R146, R149–R152, R157, R158, R167–R170, R179–R182, R191–R194, R199–R201

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1775A-E*	Q101,Q102
★★	or 2SC1775A-F*	
★★	2SA979-F*	Q103,Q104
★★	or 2SA979-G*	

*hfe of Q101 and Q102 should have the E-rank, if Q103 and Q104 have the F-rank.
*hfe of Q101 and Q102 should have the F-rank, if Q103 and Q104 have the G-rank.

	★★	2SC1915	Q109,Q110
	★★	2SC1914A	Q123,Q124
⚠	★★	2SC2275A-P* (2SC2275A-Q*)	Q133,Q134
⚠	★★	2SA985A-P* (2SA985A-Q*)	Q135,Q136

*hfe of these transistors (Q133—Q136) should have the same value.

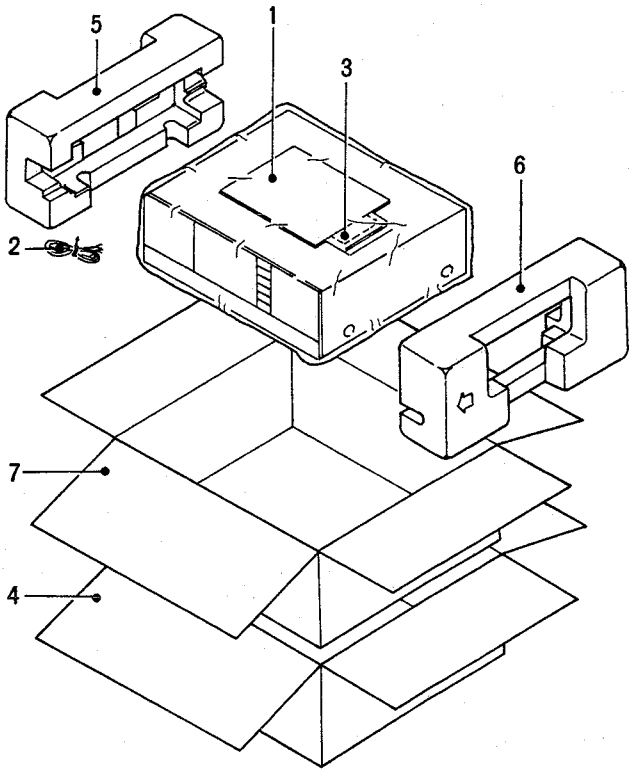
	★★	2SC2603/A/	Q113, Q114, Q119, Q120, Q125, Q126, Q137, Q138
	★★	2SC2291	Q105,Q106
	★★	2SA992-E	Q107,Q108
	★★	2SA904A	Q121,Q122
	★★	2SA905	Q115,Q116
	★★	2SA1115/A/	Q111,Q112,Q117,Q118,Q139
	★★	2SD438	Q140
	★	WZ-061 (MZ-061)	D101—D106
	★	KZL140	D131
	★	1S1555 (US1035)	D113—D116
	★	WZ-046	D135,D136
	★	1S2471	D129,D130,D132,D134
	★	10E2	D111,D112,D117,D118
	★	TH103-2	Th101,Th102

OTHERS

Mark	Part No.	Symbol & Description
★★	ASR-068	RL1 Relay
	PBZ30P060FMC	Screw 3 x 6

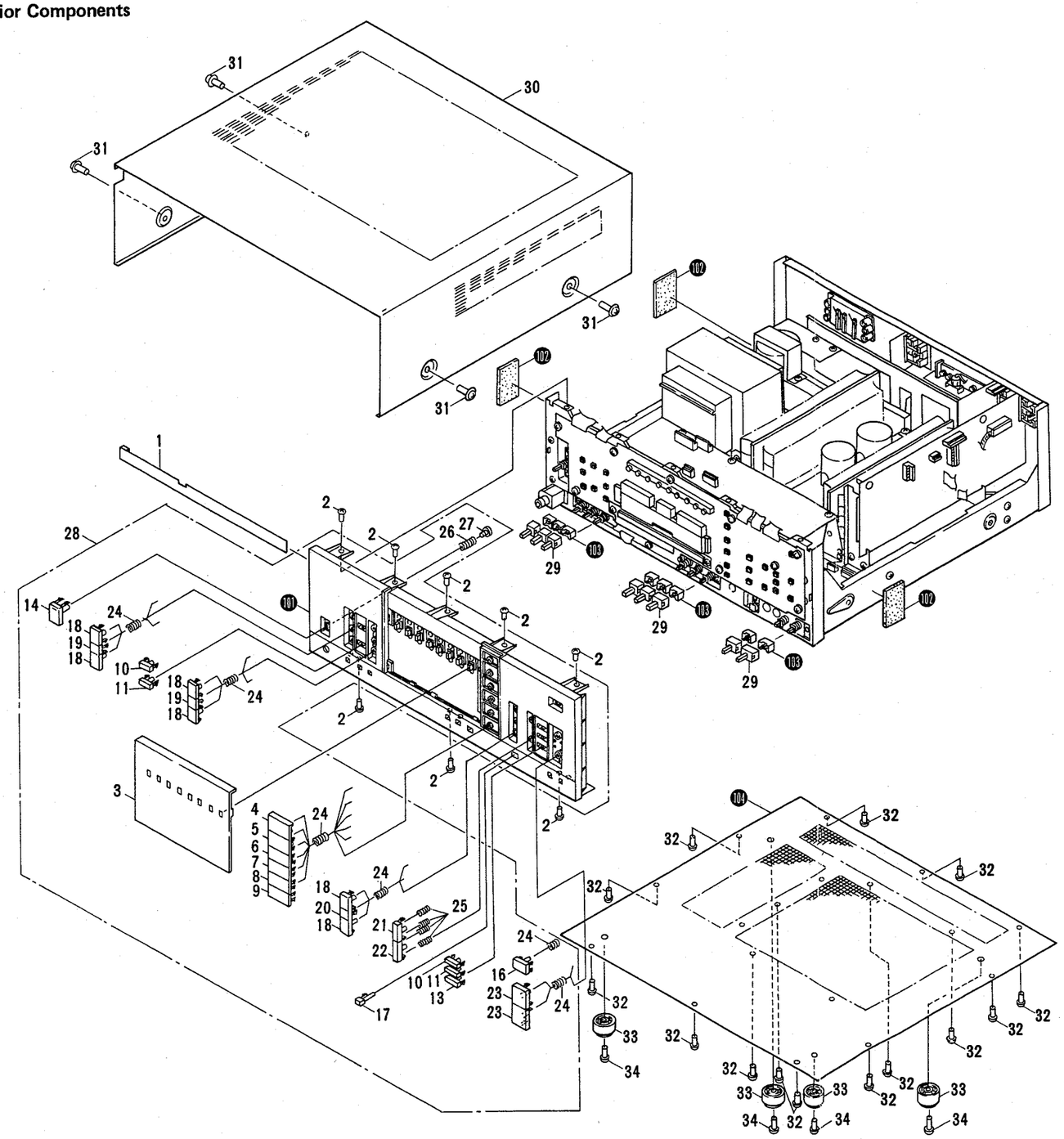
8. PACKING

Mark	No.	Part No.	Description
	1.	ARB-467	Operating instructions
	2.	ADH-004	T-type FM antenna
	3.	AAN-028	Station card set
	4.	AHE-019	Packing case
	5.	AHA-313	Side pad L
	6.	AHA-314	Side pad R
	7.	AHC-063	Inside packing



9. EXPLODED VIEW

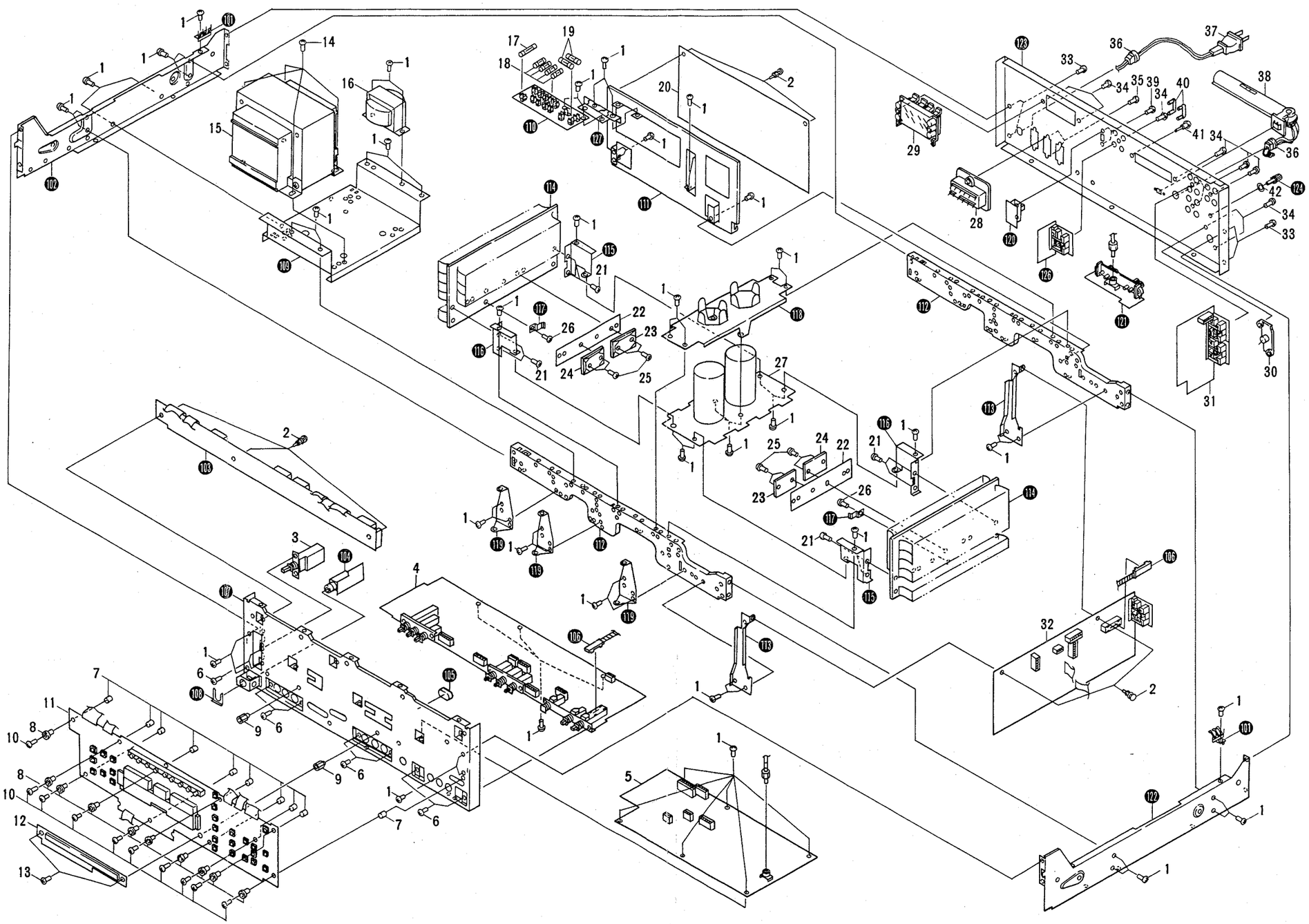
Exterior Components



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ *GENERALLY MOVES FASTER THAN* ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	ANR-450	Slider assembly
	2.	VMZ30P060FMC	Screw 3 x 6
	3.	ANR-491	Display cover
	4.	AAD-457	Knob (FM)
	5.	AAD-458	Knob (AM)
	6.	AAD-459	Knob (PHONO)
	7.	AAD-460	Knob (AUX/VIDEO)
	8.	AAD-461	Knob (TAPE 1)
	9.	AAD-462	Knob (TAPE 2)
	10.	AAD-463	Knob (PRESET A)
	11.	AAD-464	Knob (PRESET B)
	12.	.....	
	13.	AAD-466	Knob (LOUDNESS)
	14.	AAD-467	Knob (POWER)
	15.	.....	
	16.	AAD-469	Knob (MUTING)
	17.	AAD-470	Knob (MEMORY)
	18.	AAD-471	Knob (TONE, TUNING)
	19.	AAD-472	Knob (TONE, FLAT)
	20.	AAD-473	Knob (STOP)
	21.	AAD-474	Knob (BALANCE L)
	22.	AAD-475	Knob (BALANCE R)
	23.	AAD-476	Knob (VOLUME)
	24.	ABH-091	Coiled spring
	25.	ABH-092	Coiled spring
	26.	ABH-093	Coiled spring
	27.	AEC-875	Stopper
	28.	ANM-117	Front panel assembly
	29.	AAD-484	Knob
	30.	ANE-380	Top cover
	31.	ABA-193	Screw 4 x 8
	32.	VBZ30P060FMC	Screw 3 x 6
	33.	AEC-083	Foot assembly
	34.	VTZ40P100FMC	Screw 4 x 10
	35.	.....	
	101.		Front panel
	102.		Cushion
	103.		Flexible joint
	104.		Bottom plate



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	VBZ30P060FMC	Screw 3 x 6
	2.	AEC-352	Nylon rivet
⚠ ★★	3.	ASG-534	Push switch (POWER)
	4.	GWM-229	TC/Power supply assembly
	5.	GWE-178	Tuner assembly
	6.	VMZ30P060FMC	Screw 3 x 6
	7.	AEC-883	Collar
	8.	AEC-884	Bush
	9.	ABN-068	Stud
	10.	VBZ30P160FMC	Screw 3 x 16
	11.	GWK-196	Control assembly
★	12.	AAV-306	LED level meter module
	13.	BMT30P050FZK	Screw 3 x 5
	14.	VTZ40P080FMC	Screw 4 x 8
⚠ ★	15.	ATT-882	Power transformer
⚠ ★	16.	ATT-883	Power transformer
⚠ ★★	17.	AEK-304	Fuse (8A)
⚠ ★★	18.	AEK-122	Fuse (2A)
⚠ ★★	19.	AEK-119	Fuse (1A)
	20.	AWH-113	Power amplifier assembly
	21.	VBZ30P080FMC	Screw 3 x 8
	22.	AEC-885	Mica wafer
⚠ ★★	23.	2SA1216-G or O or Y*	(Q1, Q2)
⚠ ★★	24.	2SC2922-G or O or Y*	(Q3, Q4)
	25.	ABA-258	Screw with washer

* hfe of these transistors (Q1–Q4) should have the same value.

Mark	No.	Part No.	Description
	26.	ABA-234	Screw with washer 3 x 12
	27.	AWR-236	Rectifier assembly
⚠	28.	AKP-041	AC socket (AC OUTLETS)
	29.	AKE-105	Terminal (SPEAKERS)
	30.	AKB-076	Terminal (AM STEREO OUT)
	31.	GWS-392	Tape terminal assembly
	32.	GWF-148	EQ/Function assembly
	33.	BBT30P080FZK	Screw 3 x 8
	34.	BBZ30P100FZK	Screw 3 x 10
	35.	MTZ30P100FZK	Screw 3 x 10
	36.	AEC-327	Strain relief
⚠	37.	ADG-052	AC power cord
	38.	ATB-638	Bar-antenna assembly
	39.	PMZ30P050FZB	Screw 3 x 5
	40.	AKM-041	Jumper plug
	41.	ABA-115	Terminal screw
	42.	WA35F100N080	Flat washer
	43.	.....	
	44.	.....	
	45.	.....	
	101.		Ground terminal 7-P
	102.		Side frame L
	103.		Connector assembly
	104.		Headphones jack assembly
	105.		Cushion
	106.		Remote belt
	107.		Panel stay
	108.		Stopper
	109.		Transformer frame
	110.		Fuse holder assembly
	111.		P. C. board holder
	112.		Center frame
	113.		P. C. board holder
	114.		Heat sink
	115.		Heat sink holder B
	116.		Heat sink holder A
	117.		Varistor holder
	118.		Capacitors holder
	119.		P. C. board holder
	120.		Switch assembly
	121.		Antenna terminal assembly
	122.		Side frame R
	123.		Rear panel
	124.		Terminal (GND)
	125.		.....
	126.		Terminal assembly

10. ADJUSTMENTS

Power Amplifier Section

- Turn VR3, VR5 (L) and VR4, VR6 (R) fully around in the counter-clockwise direction, but set VR1 (L) and VR2 (R) to the center positions.
- Without any load or input signal, turn the POWER switch ON.

Adjustment point	Prescribed value	Measuring terminals
DC Balance		
VR1 (L)	DC 0V ±30mV	Output terminals (SPEAKERS)
VR2 (R)	DC 0V ±30mV	
Idle Current		
VR3 (L)	DC 56mV	JP1 (+) and JP2 (–)
VR5 (L)	DC 70mV	
VR4 (R)	DC 56mV	JP4 (+) and JP3 (–)
VR6 (R)	DC 70mV	

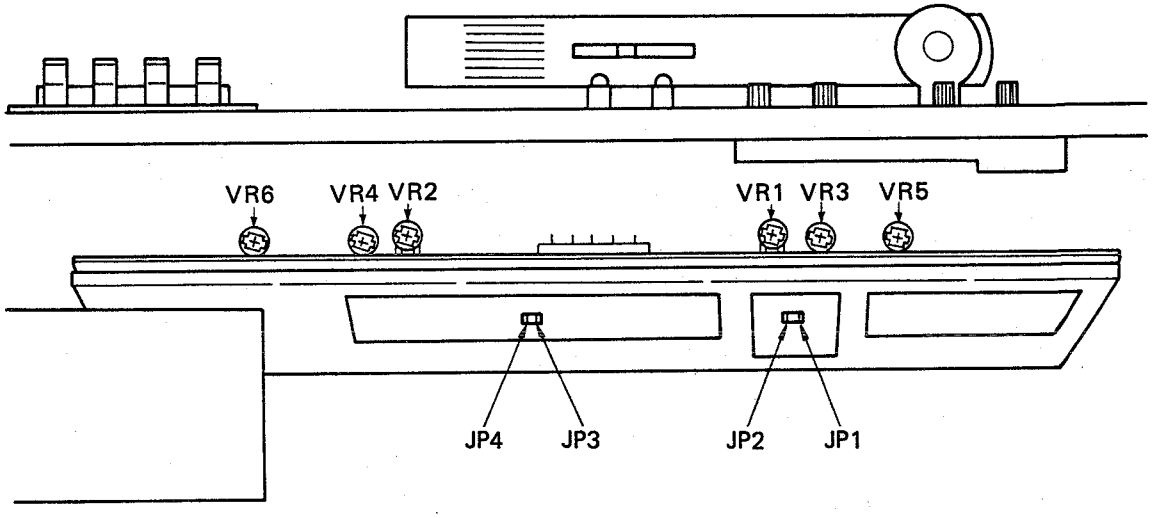


Fig. 10-1

FM Tuner Section

- Connect the FM signal generator (FM SG) to the FM ANTENNA 300Ω terminal through a 300Ω dummy antenna.
- Set the AUTO/MANUAL switch to the MANUAL position, the FM (FUNCTION) switch to the ON position and the MODE MONO (MUTE OFF) switch to the MONO (MUTE OFF) position.

(*1) Tune the FM SG to the SX-8.

(*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Pilot 19kHz/±7.5kHz deviation only.

(*3) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L +R/±67.5kHz deviation, Pilot 19kHz/±7.5kHz deviation.

Step	FM SG (400Hz, ±75kHz deviation)		SX-8 Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	No signal		87.5MHz	L6	7.2V DC between terminal no. 9 and ground.
2.	No signal		108.0MHz	TC4	24V DC between terminal no. 9 and ground.
3.	Repeat steps 1 and 2 until both specifications are correct.				
4.	90.0MHz (*1)	60dB	90.0MHz	L1,L2,L3	Adjust until DC voltage between terminal no. 17 and ground is maximum.
5.	106.0MHz (*1)	60dB	106.0MHz	TC1,TC2,TC3	
6.	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7.	98.0MHz (*1)	60dB	98.0MHz	T1	Adjust until DC voltage between terminal no. 17 and ground is maximum.
8.	98.000MHz**	60dB	98.0MHz	T2 (CENTER)	0V DC between terminal no. 10 and no. 11.
9.	98.000MHz**	60dB	98.0MHz	T2 (DIST)	Adjust until distortion at TAPE 1 REC terminal is minimum.
10.	Repeat steps 8 and 9 until both requirements are satisfied.				
11.	Set the MODE MONO switch to the STEREO position.				
12.	98.0MHz (*1)	60dB (not modulation)	98.0MHz	VR2	Adjust signal at terminal no.1 to 76kHz (± 500Hz)
13.	98.0MHz (*1) Set to pilot modulation (*2)	60dB	98.0MHz	VR3	Adjust so that a leakage of 19kHz at TAPE 1 REC terminal is balanced between R and L channels and minimized at the same time.
14.	98.0MHz (*1) Set to stereo modulation (*3)	60dB	98.0MHz	T1 (within ±90°)	Adjust until distortion at TAPE 1 REC L or R terminal is minimum.
15.	98.0MHz (*1) Set to stereo modulation (*3)	31dB	98.0MHz	VR1	Obtain a position just prior to activation of the muting circuit and light up the STEREO indicator.

**Frequency must be accurate.

AM Tuner Section

- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the AM (FUNCTION) switch to the ON position and AM CHANNEL STEP switch (on the rear panel) to 10kHz position.

(*4) Tune the AM SG to the SX-8.

Step	AM SG (400Hz, 30% modulation)		SX-8 Frequency display	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	No signal		520kHz	T4	2V DC between terminal no. 9 and ground.
2.	No signal		1620kHz	TC7	24V DC between terminal no. 9 and ground.
3.	Repeat steps 1 and 2 until both specifications are correct.				
4.	600kHz (*4)	40dB	600kHz	Bar-antenna	Adjust until DC voltage between terminal no. 17 and ground is maximum.
5.	1400kHz (*4)	40dB	1400kHz	TC6	
6.	Repeat steps 4 and 5 until maximum sensitivity is attained.				

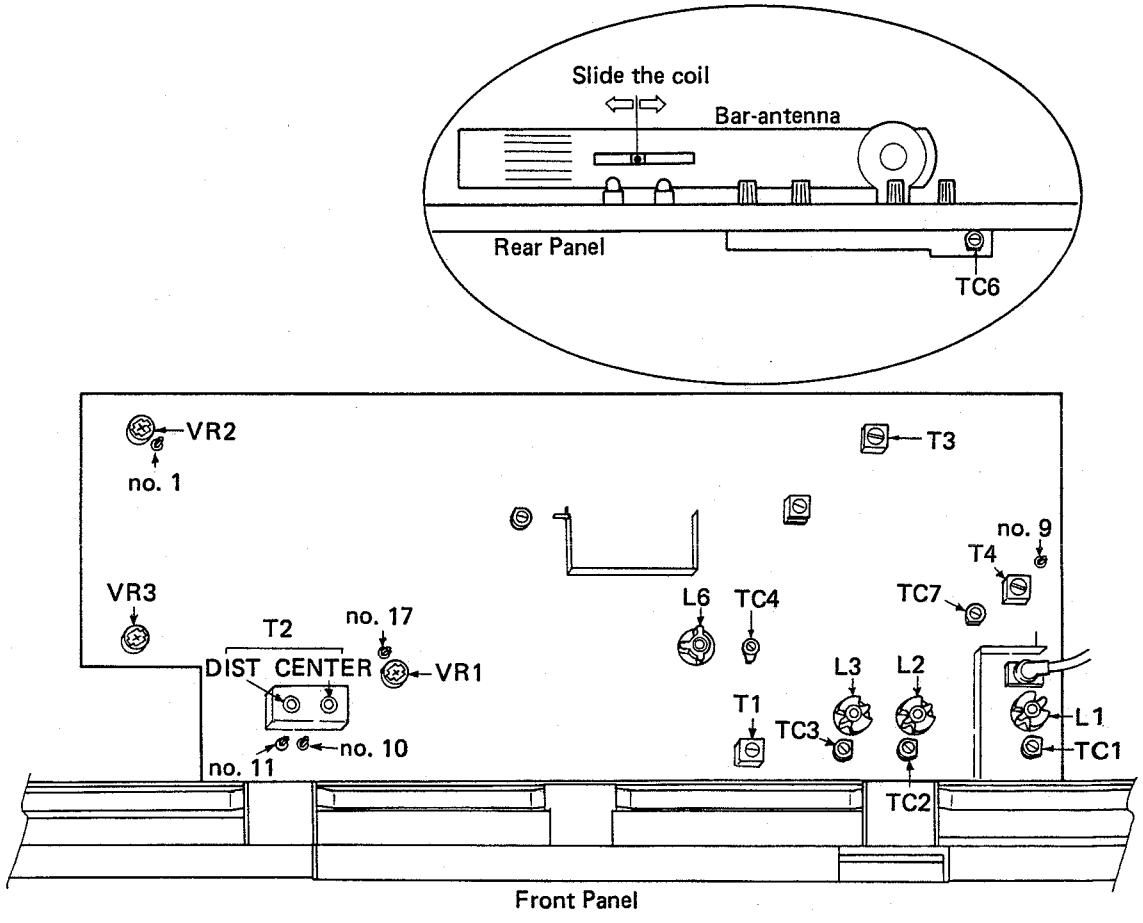


Fig. 10-2

10. RÉGLAGE

Section d'amplificatuer de puissance

- Tourner VR3, VR5 (gauche) et VR4, VR6 (droite) à fond au sens contraire du mouvement des aiguilles d'une montre, mais laisser VR1 (gauche) et VR2 (droite) sur la position centrale.
- Régler l'interrupteur général sur ON sans appliquer de charge ou de signal d'entrée.

Point de réglage	Valeur prescrite	Bornes de mesure
Balance CC		
VR1 (gauche)	0V ± 30 mV, CC	Bornes de sortie (SPEAKERS)
VR2 (droite)	0V ± 30 mV, CC	
Courant déwatté		
VR3 (gauche)	56 mV, CC	JP1 (+) et JP2 (–)
VR5 (gauche)	70 mV, CC	
VR4 (droite)	56 mV, CC	JP4 (+) et JP3 (–)
VR6 (droite)	70 mV, CC	

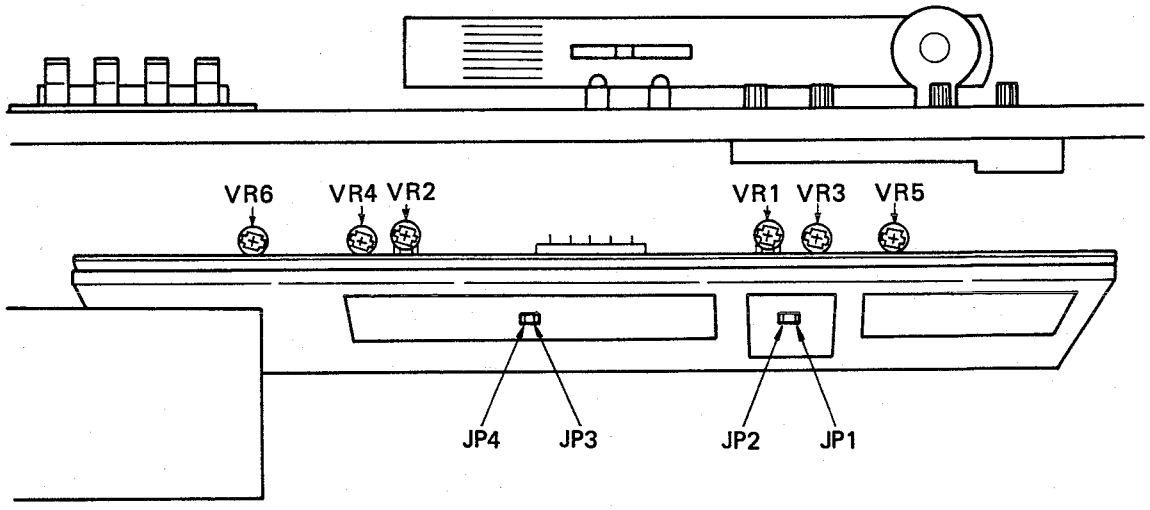


Fig. 10-1

Section de Tuner FM

- Raccorder le générateur de signaux (FM SG) sur la borne de l'antenne FM (FM ANTENNA) 300Ω par l'intermédiaire d'une antenne factice 300Ω.
- Régler le commutateur AUTO/MANUAL sur la position MANUAL, le commutateur FM (FUNCTION) sur la position ON et le commutateur MODE MONO (MUTE OFF) sur la position MONO (MUTE OFF).

(*1) Accorder le générateur de signaux FM sur SX-8.

(*2) Raccorder le générateur de signaux FM stéréo multiplex sur la borne du modulateur externe FM SG. Régler la modulation sur déviation pilote 19 kHz/±7,5 kHz seulement.

(*3) Raccorder le générateur de signaux FM stéréo multiplex sur la borne du modulateur externe FM SG. Régler la modulation sur déviation principale 1 kHz/gauche+droit (L+R)/±67,5 kHz, déviation de synchronisation 19 kHz/± 7,5 kHz.

Phase	FM SG (400Hz, ±75kHz déviation)		Affichage de fréquence SX-8	Point de réglage	Procédure de réglage
	Fréquence	Niveau			
1	Pas de signal		87,5MHz	L6	7.2V CC entre la borne nº 9 et la borne de terre.
2	Pas de signal		108,0MHz	TC4	24V CC entre la borne nº 9 et la borne de terre.
3	Répéter les phases 1 et 2 afin d'obtenir les deux caractéristiques correctes.				
4	90,0MHz (*1)	60dB	90,0MHz	L1, L2, L3	Régler afin d'obtenir la tension CC maximum entre la borne nº 17 et la borne de terre.
5	106,0MHz (*1)	60dB	106,0MHz	TC1, TC2, TC3	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	98,0MHz (*1)	60dB	98,0MHz	T1	Régler afin d'obtenir la tension CC maximum entre la borne nº 17 et la borne de terre.
8	98,000MHz**	60dB	98,0MHz	T2 (CENTRE)	0V CC entre la borne nº 10 et la borne nº 11.
9	98,000MHz**	60dB	98,0MHz	T2 (DIST)	Régler afin d'obtenir la distorsion minimum à la borne TAPE 1 REC.
10	Répéter les phases 8 et 9 afin d'obtenir les deux conditions requises.				
11	Régler le commutateur MODE MONO sur la position STEREO.				
12	98,0MHz (*1)	60dB (pas de modulation)	98,0MHz	VR2	Régler le signal à la borne nº 1 to 76 kHz (±500 Hz).
13	98,0MHz (*1) Régler sur modulation pilote (*2).	60dB	98,0MHz	VR3	Régler de sorte que la fuite de 19 kHz à la borne REC de TAPE 1 soit équilibrée entre les canaux R et L, et réduite au minimum en même temps.
14	98,0MHz (*1) Régler sur modulation stéréo (*3).	60dB	98,0MHz	T1 (entre ±90°)	Régler afin d'obtenir la distorsion minimum à la borne TAPE 1 REC L ou R.
15	98,0MHz (*1) Régler sur modulation stéréo (*3).	31dB	98,0MHz	VR1	Régler sur la position précédant l'excitation du circuit d'atténuation el allumant l'indicateur STEREO.

**La fréquence doit être précise.

Section de Tuner AM

- Raccorder le générateur de signaux AM (AM SG) sur la borne d'antenne AM (AM ANTENNA) par l'intermédiaire d'un résisteur de 10KΩ.
- Régler le commutateur AM (FUNCTION) sur la position ON et le commutateur AM CHANNEL STEP (situé sur le panneau arrière) sur la position 10kHz.

(*4) Accorder le générateur de signaux AM SG sur SX-8.

Phase	AM SG (400Hz, 30% modulation)		Affichage de fréquence SX-8	Point de réglage	Procédure de réglage
	Fréquence	Niveau			
1	Pas de signal		520kHz	T4	2V CC entre la borne nº 9 et la borne de terre.
2	Pas de signal		1620kHz	TC7	24V CC entre la borne nº 9 et la borne de terre.
3	Répéter les phases 1 et 2 afin d'obtenir les deux caractéristiques correctes.				
4	600kHz (*4)	40dB	600kHz	Antenne -tige	Régler afin d'obtenir la tension CC maximum entre la borne nº 17 et la borne de terre.
5	1400kHz (*4)	40dB	1400kHz	TC6	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				

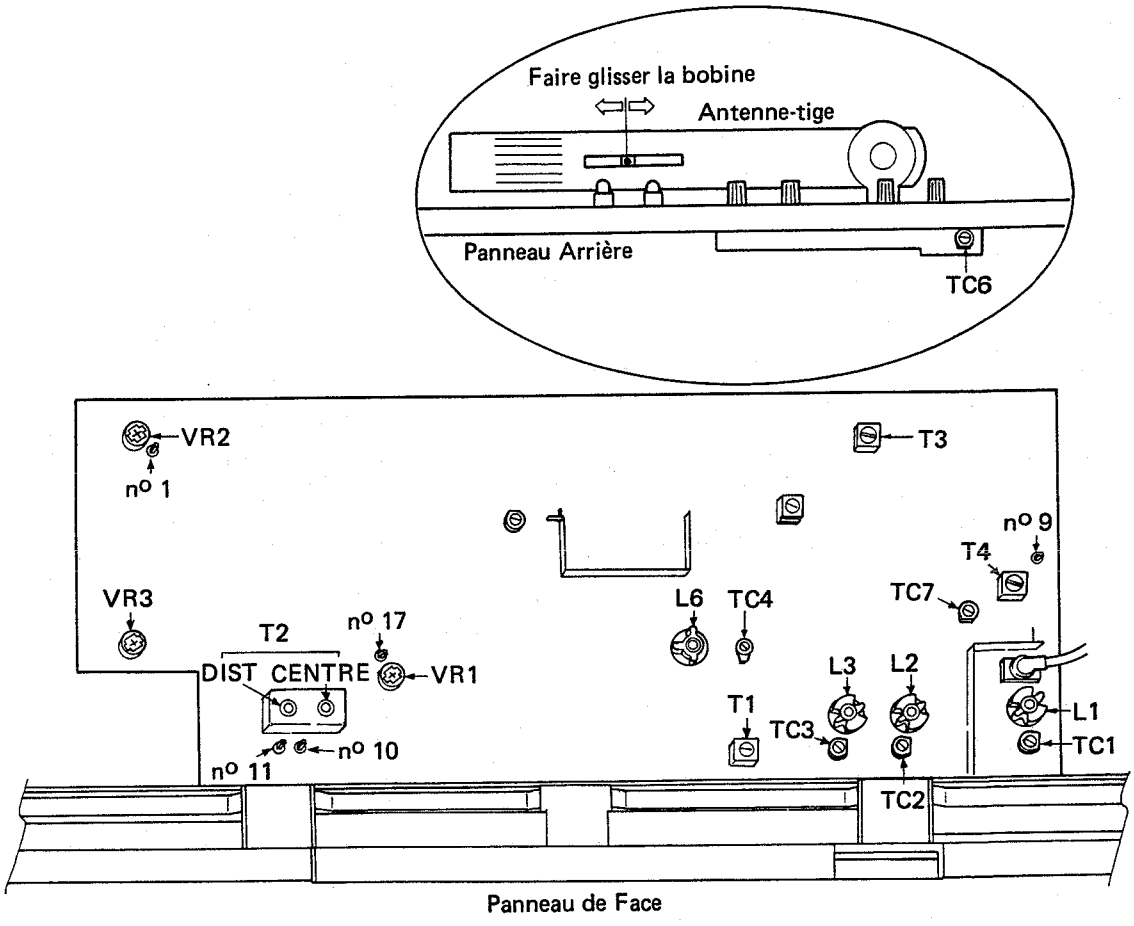


Fig. 10-2

10. AJUSTE

Sección de amplificador de potencia

- Girar completamente VR3, VR5 (izq.) y VR4, VR6 (der.) en el sentido del movimiento de las manecillas del reljo, pero dejar VR1 (iqz.) y VR2 (der.) en la posición central.
- Sin ninguna carga ni señal de entrada, poner el interruptor de la alimentación (POWER) en la posición ON.

Punto de ajuste	Valor prescrito	Terminales de medición
Equilibrio de CC		
VR1 (izq.)	0V ± 30 mV, CC	Terminales de salida (SPEAKERS)
VR2 (der.)	0V ± 30 mV, CC	
Corriente devatiada		
VR3 (izq.)	56 mV, CC	JP1 (+) y JP2 (–)
VR5 (izq.)	70 mV, CC	
VR4 (der.)	56 mV, CC	JP4 (+) y JP3 (–)
VR6 (der.)	70 mV, CC	

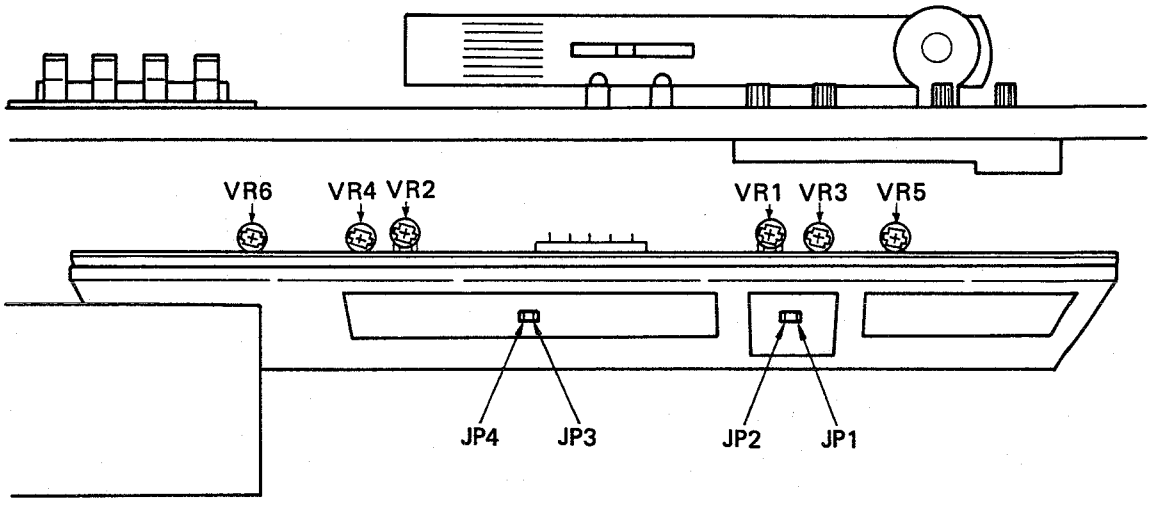


Fig. 10-1

Sección de Sintonizador de FM

- Conectar el generador de señales de FM (FM SG) al terminal FM ANTENNA 300Ω a través de una antena ficticia de 300ohmios.
- Conectar el selector AUTO/MANUAL en la posición MANUAL, el selector de función de FM en la posición ON y el de modo de MONO (MUTE OFF) en la posición MONO (MUTE OFF).

(*1) Sintonizar el FM SG con el SX-8.

(*2) Conectar un generador de señales estereofónicas de FM multiplex al terminal modulador exterior del FM SG.
Ajustar la modulación a Piloto 19 kHz/±7,5 kHz de desviación solamente.

(*3) Conectar un generador de señales estereofónicas de FM multiplex al terminal modulador exterior del FM SG.
Ajustar la modulación a Principal 1 kHz/Izq. + Der. (L+R)/±67,5 kHz de desviación; Piloto 19kHz/ ±7,5 kHz de desviación.

Paso	FM SG (400Hz, ±75kHz desviación)		Frecuencí-metro del SX-8	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		87,5MHz	L6	7.2V CC entre el terminal no. 9 y masa.
2	Sin señal		108,0MHz	TC4	24V CC entre el terminal no. 9 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	90,0MHz (*1)	60dB	90,0MHz	L1, L2, L3	Ajustar hasta que la tensión de CC entre el terminal no. 17 y masa sea la máxima.
5	106,0MHz (*1)	60dB	106,0MHz	TC1, TC2, TC3	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				
7	98,0MHz (*1)	60dB	98,0MHz	T1	Ajustar hasta que la tensión de CC entre el terminal no. 17 y masa sea la máxima.
8	98,000MHz**	60dB	98,0MHz	T2 (CENTER)	0V CC entre el terminal no. 10 y el no. 11.
9	98,000MHz**	60dB	98,0MHz	T2 (DIST)	Ajustar hasta que la distorsión en el terminal TAPE 1 REC sea la mínima.
10	Repetir los pasos 8 y 9 hasta que se satisfagan ambos requisitos.				
11	Poner el selector MODE MONO en la posición STEREO.				
12	98,0MHz (*1)	60dB (sin modulación)	98,0MHz	VR2	Ajustar la señal en el terminal no. 1 to 76 kHz (±500 Hz).
13	98,0MHz (*1) Ajustar a modulación piloto(*2)	60dB	98,0MHz	VR3	Ajustar de manera tal que la fuga de 19 kHz en el terminal REC de TAPE 1 sea equilibrada entre los canales R y L, y minorizada al mismo teimpo.
14	98,0MHz (*1) Ajustar a modulación estereofónica (*3)	60dB	98,0MHz	T1 (dentro de ±90°)	Ajustar hasta que la distorsión en el terminal TAPE 1 REC L o R sea la mínima.
15	98,0MHz (*1) Ajustar a modulación estereofónica (*3)	31dB	98,0MHz	VR1	Obtener una posición anterior a la activación del circuito de silenciamiento y antes de que se ilumine el indicador STEREO.

**La frecuencia tiene que ser precisa.

Sección de Sintonizador de AM

- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10Kohmios.
- Poner el selector de función de AM en la posición ON y el de AM CHANNEL STEP (del panel posterior) en la posición de 10kHz.

(*4) Sintonizar el AM SG con el SX-8.

Paso	AM SG (400Hz, 30% modulación)		Frecuencímetro del SX-8	Punto de ajuste	Procedimientos de ajuste
	Frecuencia	Nivel			
1	Sin señal		520kHz	T4	2V CC entre el terminal no. 9 y masa.
2	Sin señal		1620kHz	TC7	24V CC entre el terminal no. 9 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	600kHz (*4)	40dB	600kHz	Antena de barra	Ajustar hasta que la tensión de CC entre el terminal no. 17 y masa sea la máxima.
5	1400kHz (*4)	40dB	1400kHz	TC6	
6	Repetir los pasos 4 y 5 hasta logarse la máxima sensibilidad.				

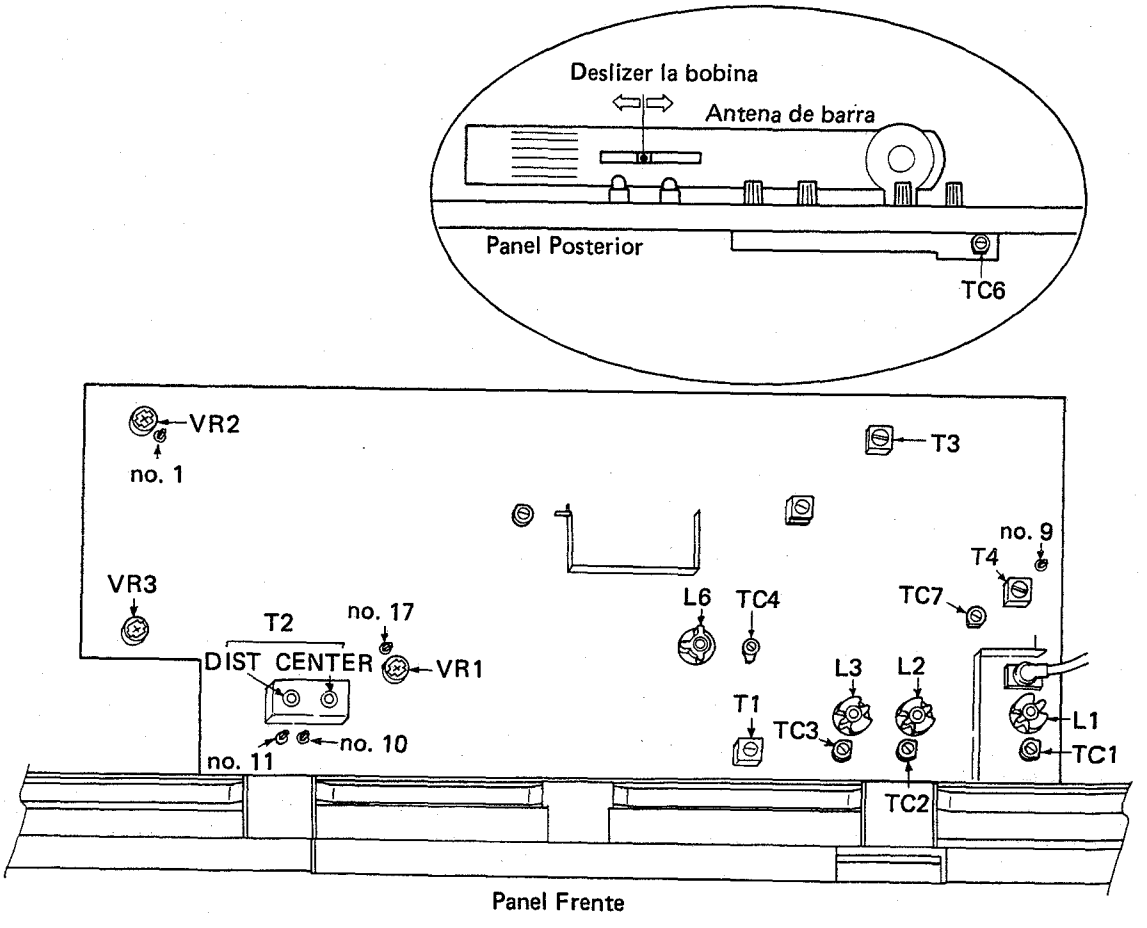


Fig. 10-2

ADDITIONAL

Service Manual

PIONEER

COMPUTER CONTROLLED STEREO RECEIVER

SX-8 S, S/G

The basic performance of the S/G type (U.S. Military model) and S type (General export model) is the same as the KU type (U.S.A. model). This additional service manual is applicable to the S/G and S types, please refer to the KU type sercice manual (pp.1—44) with the exception of this supplement.

SPECIFICATIONS

The specifications for S/G and S types are the same as the KU type except for following sections:

Miscellaneous

Power Requirements . . . . . AC110/120/220/240V(Switchable), 50/60Hz
Power Consumption 225W
Weight (without package) . . . . . 15.2kg (33 lb 8 oz)

Furnished Parts

Fuse . . . . . (8A) x 1
(4A) x 1

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

ELECTRICAL PARTS

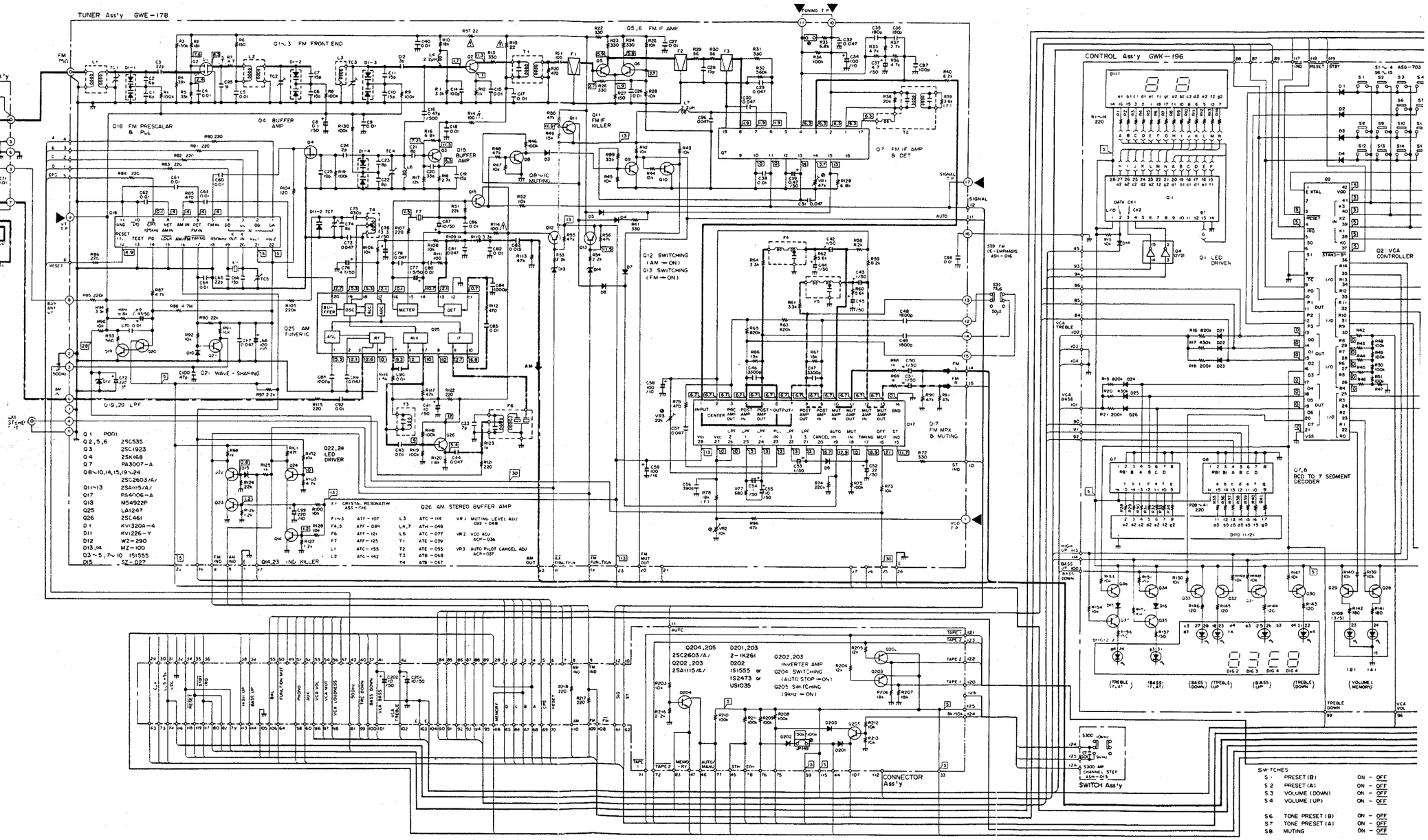
Mark	Symbol & Description	Part No. KU type	Part No. S type	Part No. S/G type	Remarks
⚠ ★	T1 Power transformer (120V)	ATT-882	. . . .	. . . .	
	(110/120/220/240V)	. . . .	ATT-888	ATT-888	
⚠ ★	T2 Power transformer (120V)	ATT-883	. . . .	. . . .	
	(110/120/220/240V)	. . . .	ATT-887	ATT-887	
⚠ ★★	FU1 Fuse (8A)	AEK-304	(AEK-304)	AEK-304	110/120V
	Fuse (4A)	. . . .	AEK-100	(AEK-100)	220/240V
⚠ ★★	S36 Push switch (POWER)	ASG-534	ASG-533	ASG-533	
⚠ ★★	S37 Line voltage selector	. . . .	AKR-031	AKR-031	with fuse holder
⚠ ★★	S38 Line voltage selector	. . . .	AKX-063	AKX-063	
★★	S39 Slide switch (DE-EMPHASIS)	. . . .	ASH-016	ASH-016	
⚠	C1,C2 Ceramic capacitor	ACG-017	ACG-001	ACG-001	
⚠	R1 Carbon composition resistor (2.2M/½W)	ACN-029	. . . .	. . . .	
⚠	AC power cord	ADG-052	ADG-049	ADG-049	

PACKING AND FURNISHED PARTS

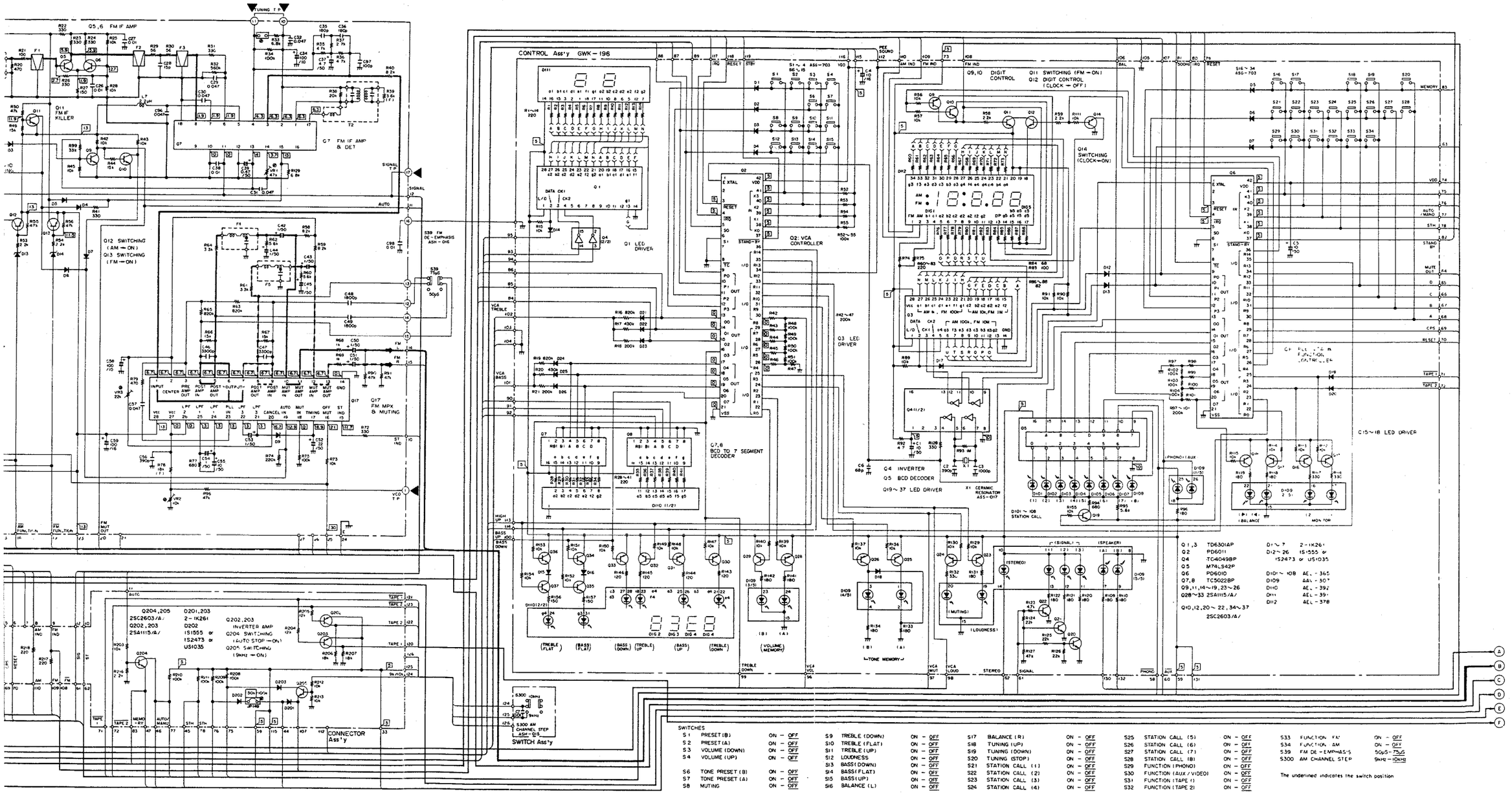
Mark	Symbol & Description	Part No. KU type	Part No. S type	Part No. S/G type	Remarks
	Packing case	AHE-019	AHE-019	AHE-021	
	Inside packing	AHC-063	AHC-063	AHC-064	
	Cardboard spacer	. . . .	. . . .	AHB-111	
	Operating instructions	ARB-467	ARB-468	ARB-468	
	Station card set	AAN-028	AAN-029	AAN-029	
⚠ ★★	Fuse (8A)	. . . .	AEK-304	AEK-304	
⚠ ★★	Fuse (4A)	. . . .	AEK-100	AEK-100	

- **When replacing the tuner assembly (GWE-178) of S and S/G types, cut the resistor R33 (connected in parallel with R34).**

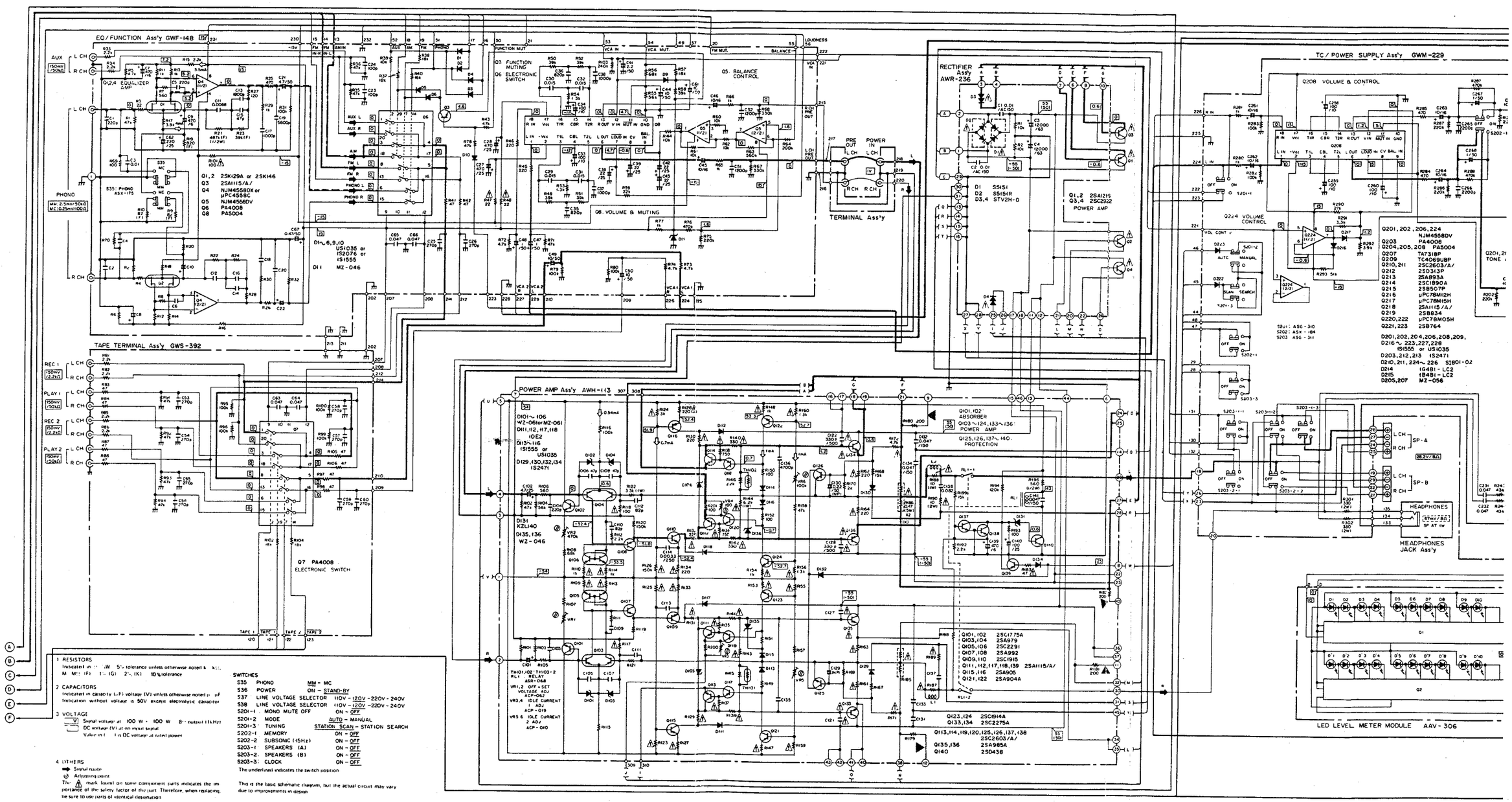
SCHEMATIC DIAGRAM FOR S AND S/G TYPES(1/2)



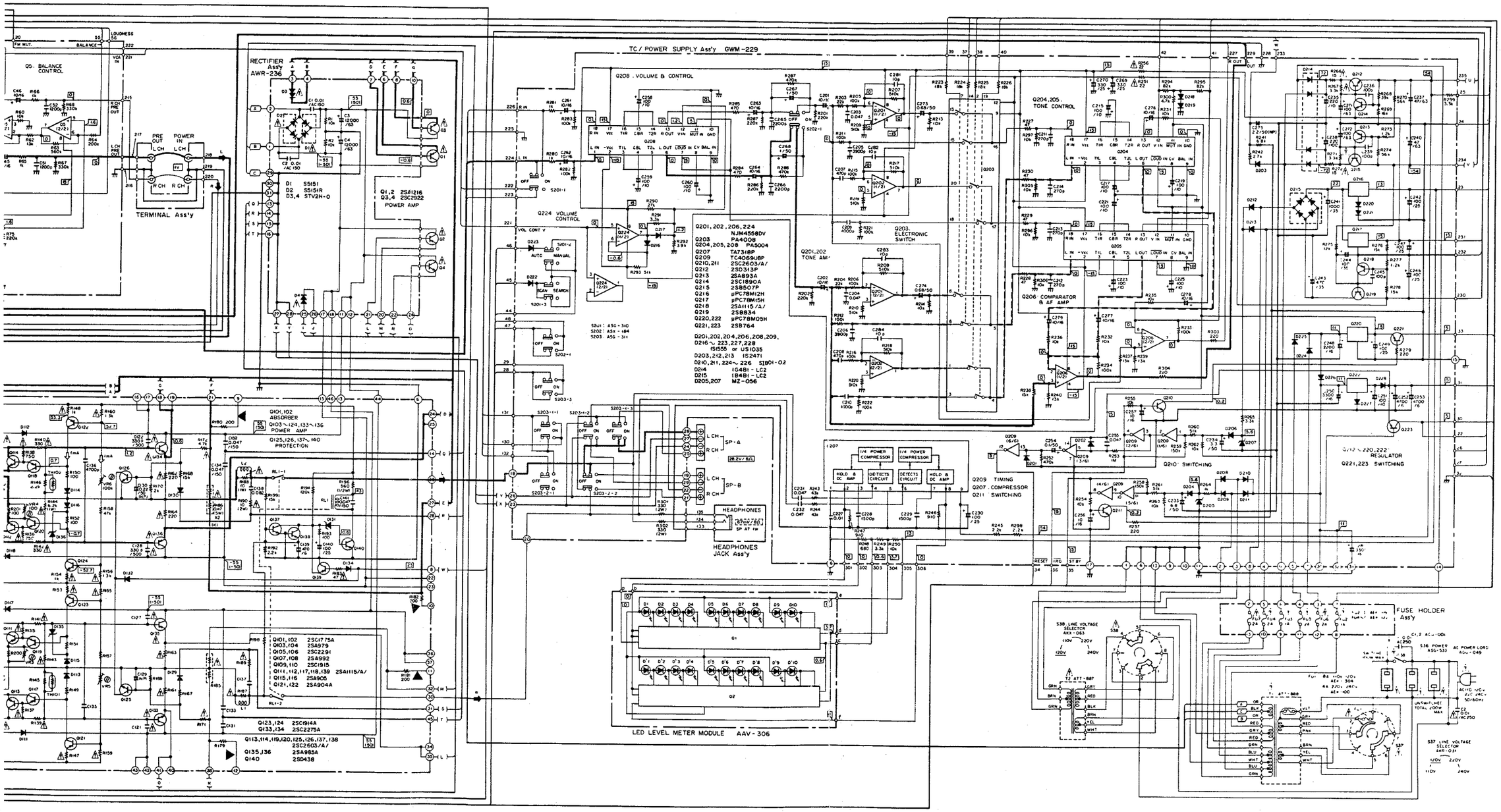
NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



SCHEMATIC DIAGRAM FOR S AND S/G TYPES(2/2)



NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



CORRECTION TO SERVICE MANUAL

PIONEER

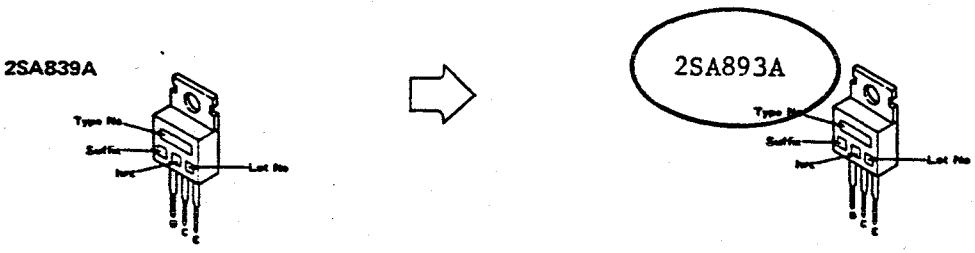
No. SI-A38015
Date. Dec. 14, 1983

MODEL: SX-8 [ARP-043]

PAGE: 24, 29 (Q213)

Please correct Service Manual as follows:

P. 24 ORIGINAL CORRECTION



P. 29 ORIGINAL CORRECTION

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA839A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DV	Q201,Q202,Q206,Q224
★★	PA4008	Q203
★★	PA5004	Q204,Q205,Q208
★★	TC4069UBP	Q209
★★	TA7318P-A	Q207
★★	μPC78M05H	Q220,Q222
★★	μPC78M12H	Q216
★★	μPC78M15H	Q217
★★	2SA893A	Q213
★★	2SA1115/A/	Q218
★★	2SB507P	Q215
★★	2SB764	Q221,Q223
★★	2SB834	Q219
★★	2SC1890A	Q214
★★	2SC2603/A/	Q210,Q211

PIONEER ELECTRONIC CORPORATION

(38-018, SMM-KI-SU 30)

T. Nakagawa, Manager
Service Section, International Division