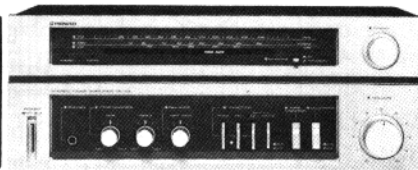


Service Manual

**CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS**



**ORDER NO.
ARP-213-0**

STEREO TUNER AMPLIFIER

TA-110L

MODEL TA-110L COMES IN TWO VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
HE	220V and 240V (Switchable)	European continent model
HB	220V and 240V (Switchable)	United Kingdom model
HEZ	220V and 240V (Switchable)	West Germany Model

- This service manual is applicable to the HE and HB types. For servicing of the other types, please refer to the additional service manual.
- Ce manuel d'instruction se réfère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

CONTENTS

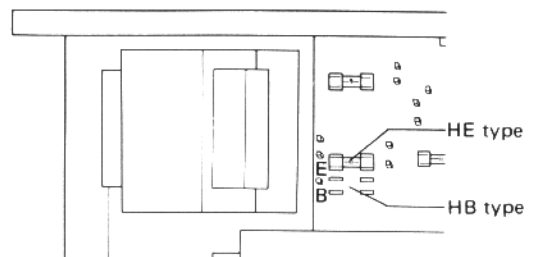
1. SPECIFICATIONS	2
2. FRONT PANEL FACILITIES	3
3. PARTS LOCATION	4
4. DIAL CORD STRINGING	5
5. BLOCK DIAGRAM	6
6. EXPLODED VIEWS AND PARTS LIST	8
7. PACKING	11
8. P.C. BOARDS CONNECTION DIAGRAM	12
9. SCHEMATIC DIAGRAM	15
10. ELECTRICAL PARTS LIST	17
11. ADJUSTMENTS	19
RÉGLAGE	21
AJUSTE	23

Line Voltage Selection

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Take out the fuses from the fuse holder assembly.
4. Re-install the fuses in the correct voltage indication.
5. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label



4. DIAL CORD STRINGING

1. Remove the bonnet.
2. Remove the tuning drum from the shaft of the tuning capacitor.
3. Tie one end of the cord to the stud A located inside the tuning drum.
4. Rotate the tuning capacitor right around until the rotor blades are fully intermeshed.
5. Secure the tuning drum back onto the tuning capacitor shaft, making sure that the securing screw B faces directly upward.
6. Pass the cord out through the small opening in the circumference of the tuning drum (see diagram), and then take it over pulleys C and D in that sequence.
7. Wind the cord around the tuning shaft 3 times.
8. Pass it over pulley E, wind it around the tuning drum 2 times, and finally tie it to the spring hook F so that it is tensioned.
9. Turn the tuning shaft, and check that the cord moves smoothly.
10. Cut off any excess cord.
11. Turn the tuning shaft counter-clockwise as far as it will go.
12. Align the dial pointer with the starting point of the dial scale, and then pass the cord over it.
13. Check that the dial pointer is in line with the starting point of the dial scale.
14. Finally apply the locking paint to the cord securing positions (stud A and spring hook F) and the dial pointer connection.

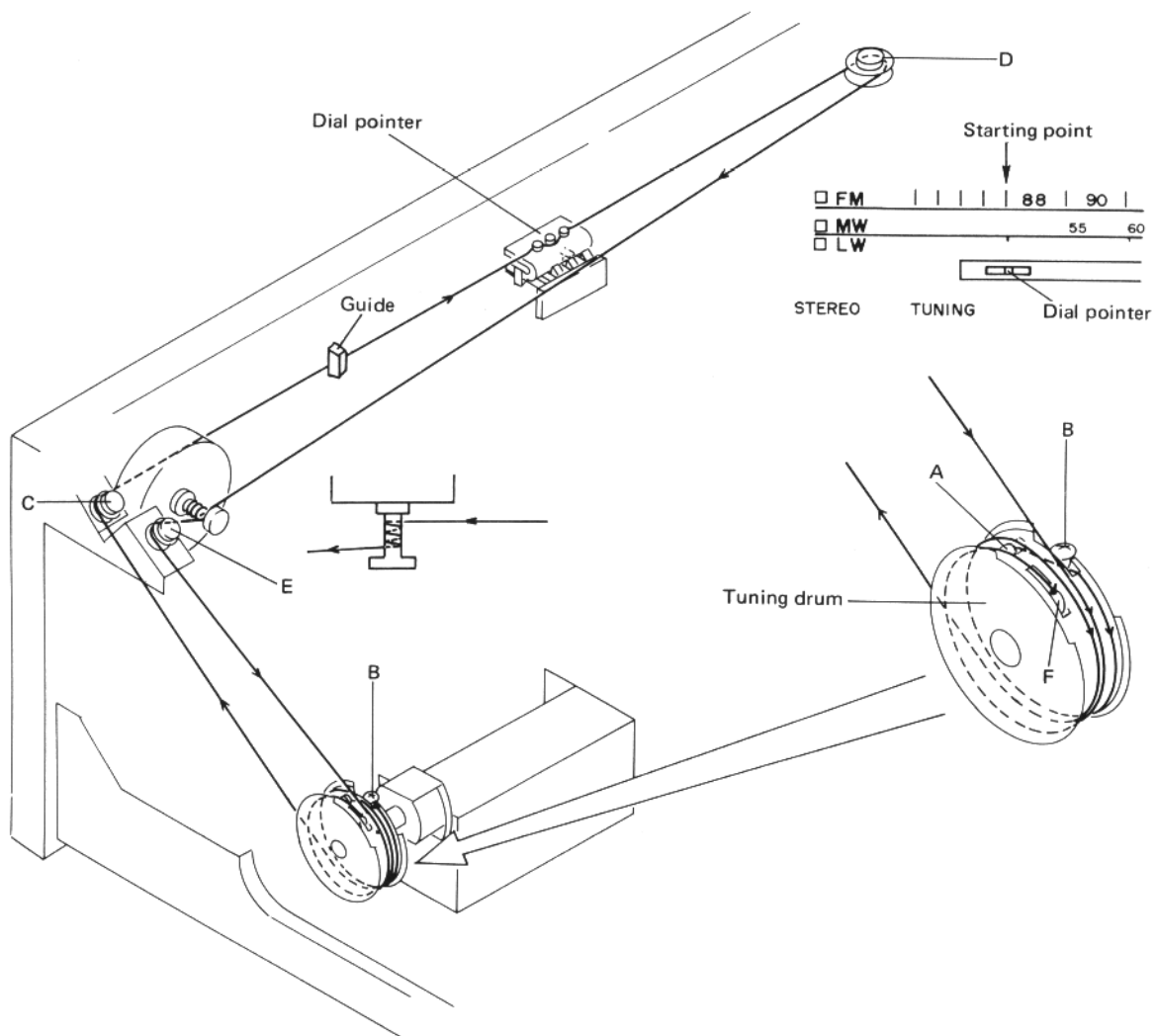


Fig. 4-1 Dial cord stringing

5. BLOCK DIAGRAM

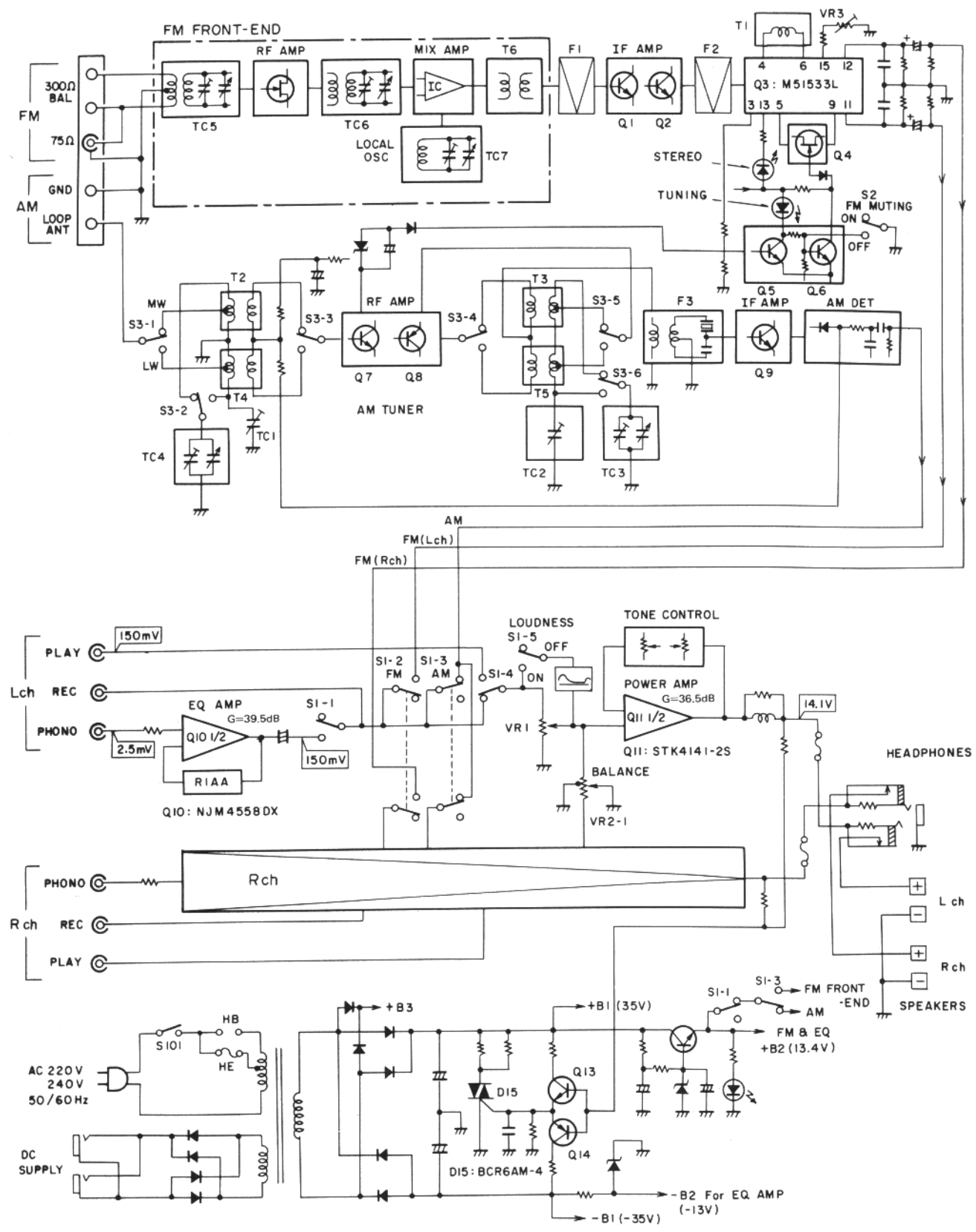


Fig. 5-1 Block diagram

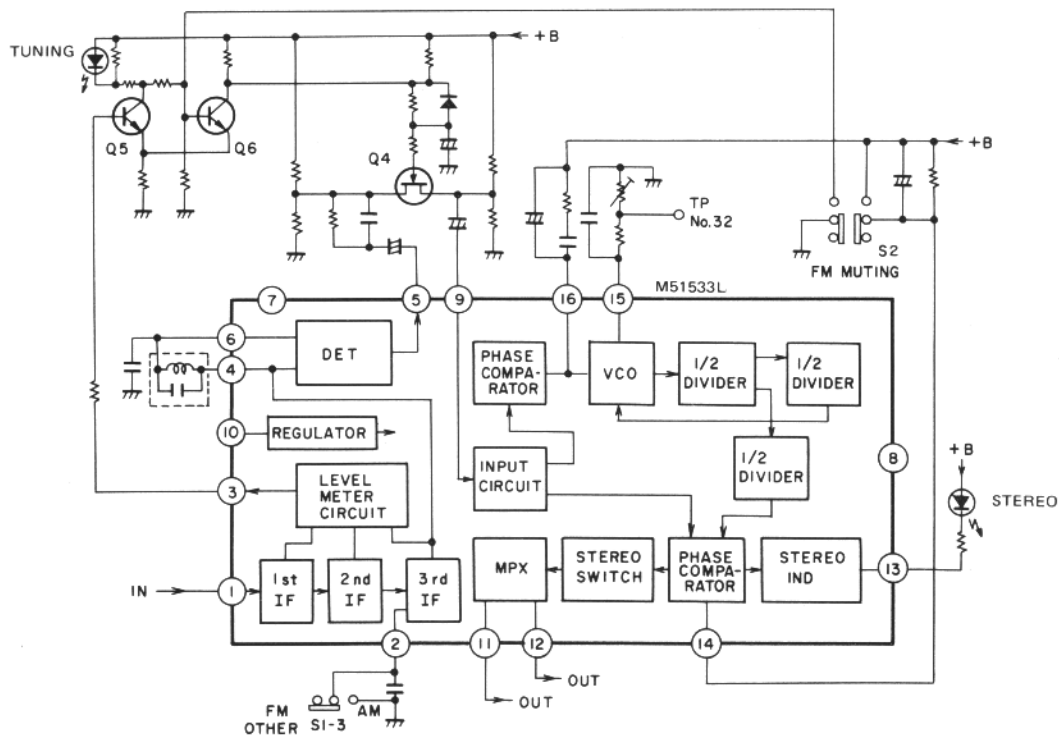


Fig. 5-2 FM IF, Detector and MPX circuit

SWITCHES:

COMPLEX Ass'y

S1-1	: FUNCTION (PHONO)	<u>ON</u> - OFF
S1-2	: FUNCTION (FM)	<u>ON</u> - OFF
S1-3	: FUNCTION (AM)	<u>ON</u> - OFF
S1-4	: TAPE MONITOR	<u>ON</u> - OFF
S1-5	: LOUDNESS	<u>ON</u> - OFF
S3	: MW / LW	<u>MW</u> - LW

SWITCH Ass'y

S2	: FM MUTE	<u>ON</u> - OFF
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OUTSIDE OF PC BOARD

S101	: POWER	<u>ON</u> - OFF
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The underlined indicates the switch position.

8. P.C.BOARDS CONNECTION DIAGRAM

A

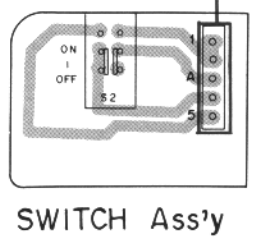
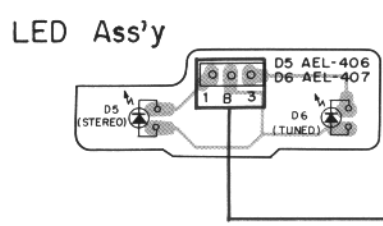
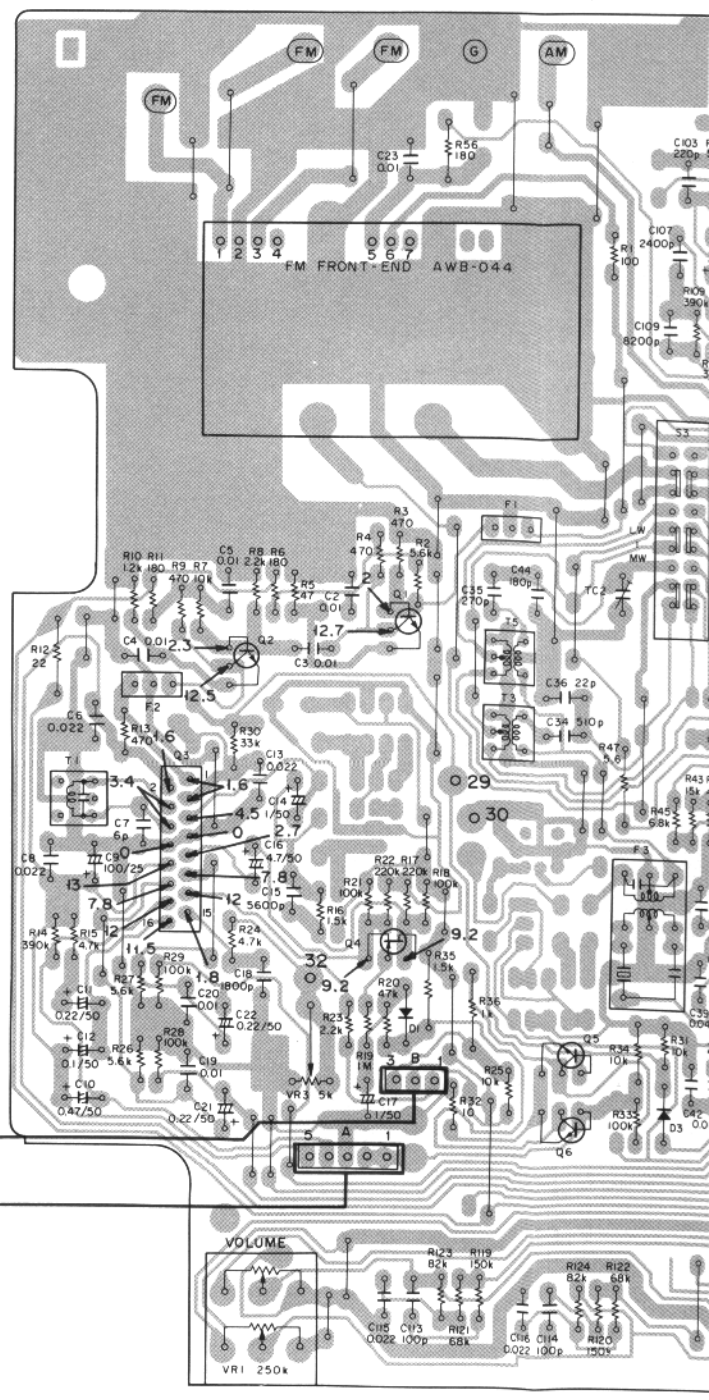
B

C

D

COMPLEX Ass'y GWM -260

Q3 Q2 Q4 Q1 Q6 Q5
VR1 VR3 TC2



60

Q6 Q5

Q9 Q8 Q7 Q10

Q14

Q13

Q12

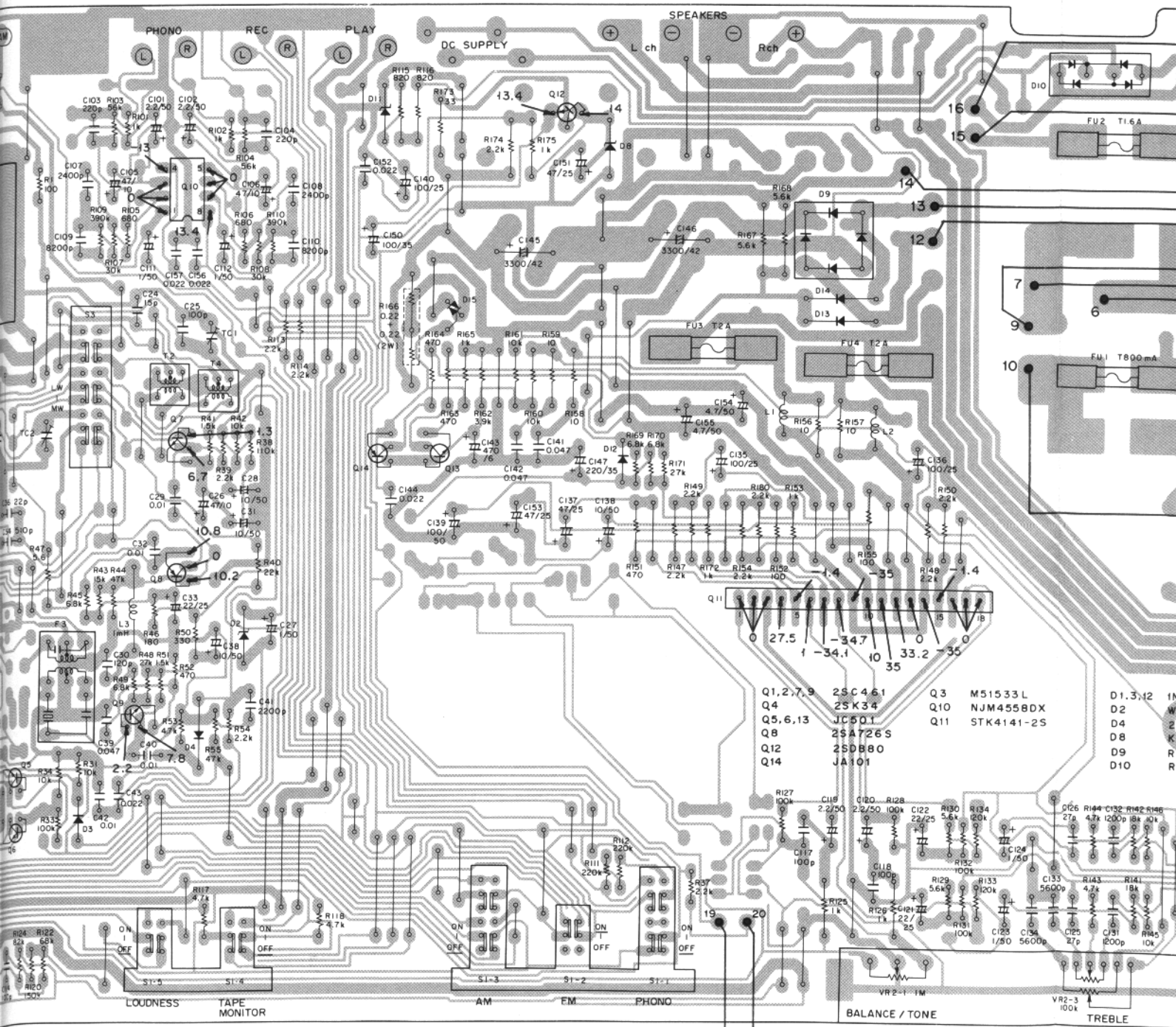
Q11

TC2

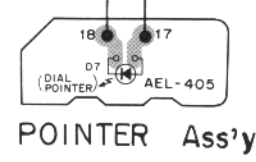
TC1

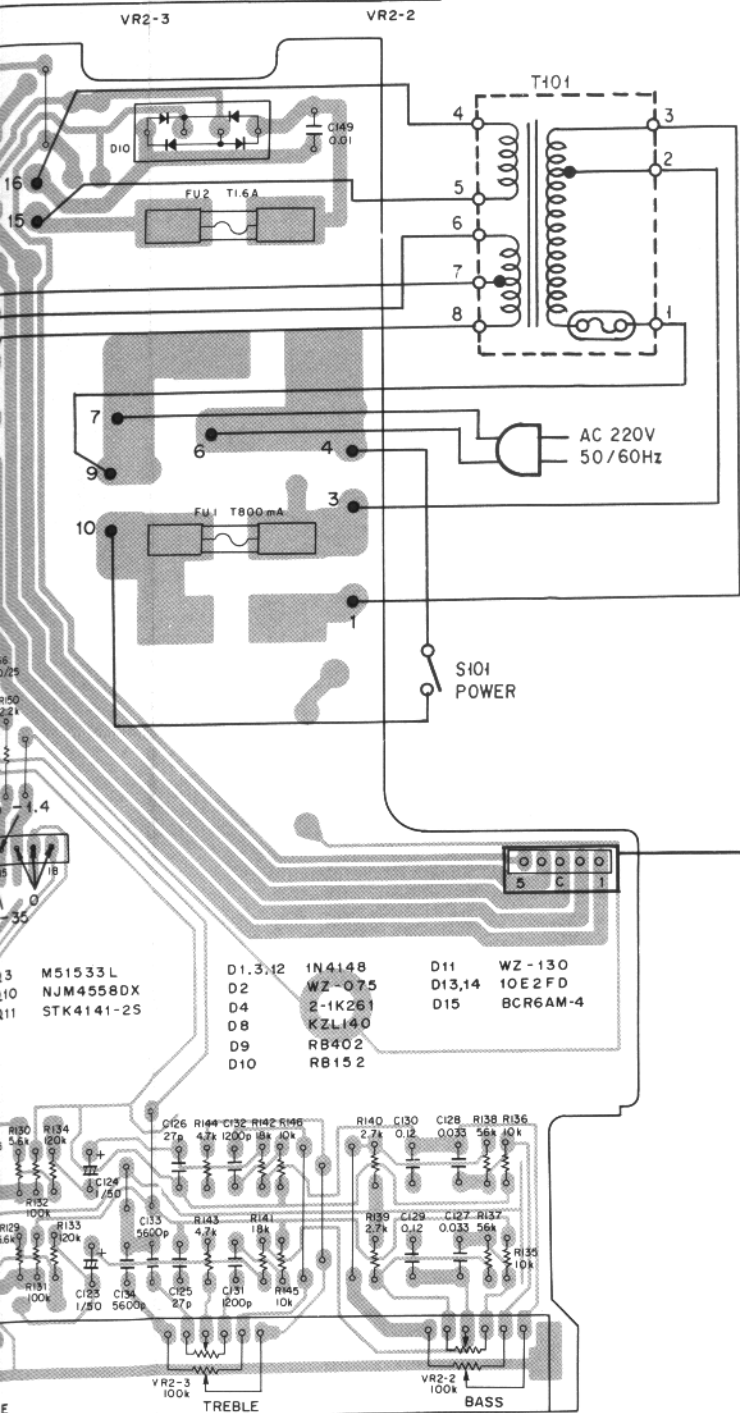
VR2-1

VR2-3

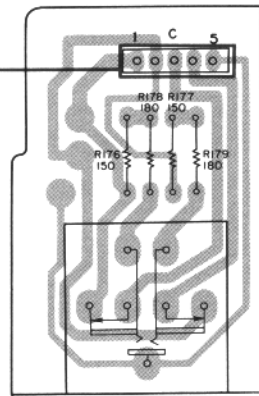


- | | | | | | |
|-------------|---------|-----|------------|-----------|----|
| Q1, 2, 7, 9 | 2SC461 | Q3 | M51533L | D1, 3, 12 | 1N |
| Q4 | 2SK34 | Q10 | NJM4558DX | D2 | W |
| Q5, 6, 13 | JC501 | Q11 | STK4141-2S | D4 | 2 |
| Q8 | 2SA726S | | | D8 | K |
| Q12 | 2SD880 | | | D9 | R |
| Q14 | JA101 | | | D10 | R |





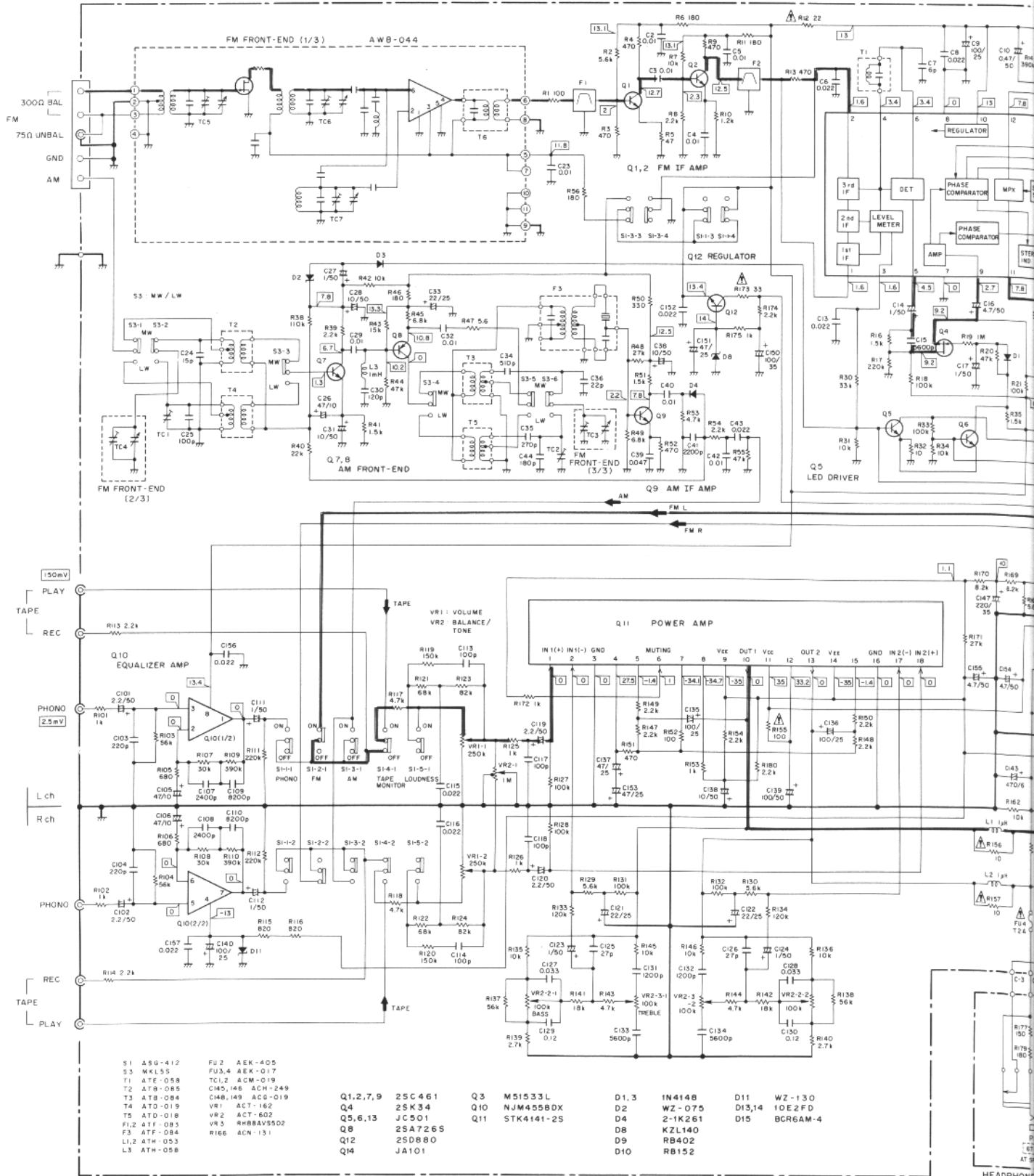
D1,3,12	1N4148	D11	WZ-130
D2	WZ-075	D13,14	10E2FD
D4	2-1K261	D15	BCR6AM-4
DB	KZL140		
D9	RB402		
D10	RB152		



HEADPHONES JACK Ass'y

9. SCHEMATIC DIAGRAM

COMPLEX Ass'y (1/2) GWM-260



A

B

C

D

1

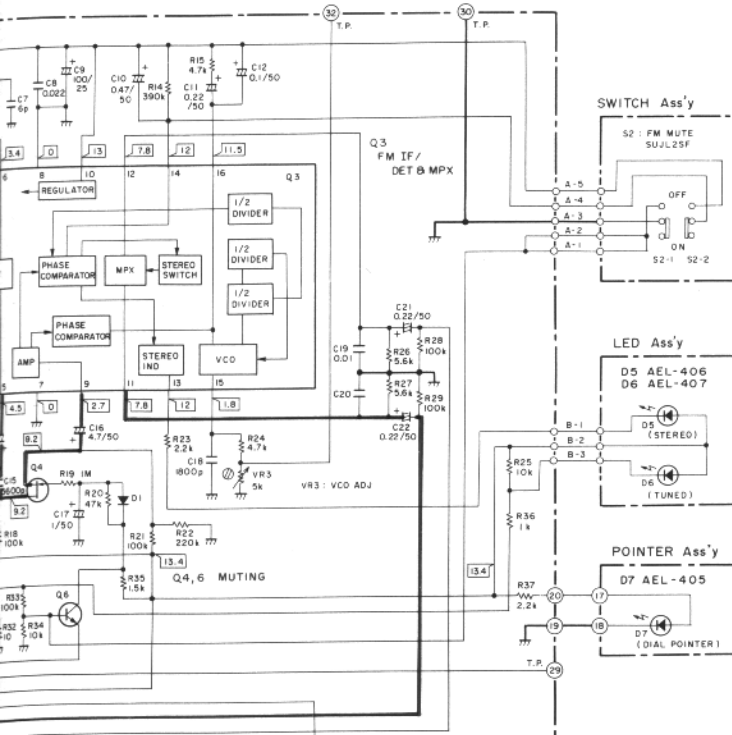
2

3

HEADPHONE

NOTE:

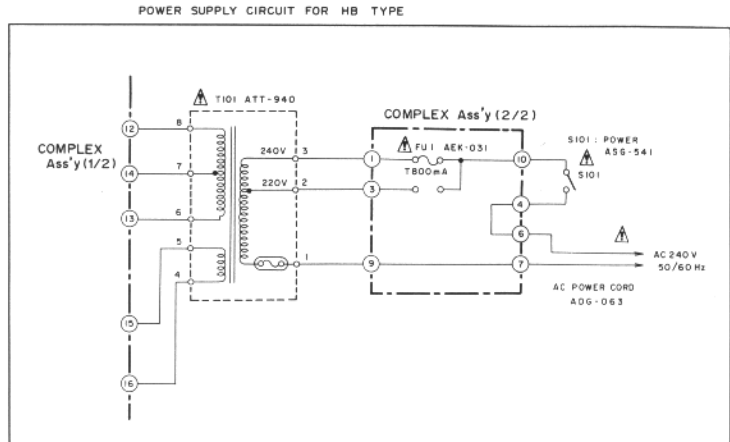
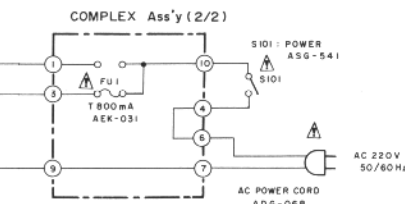
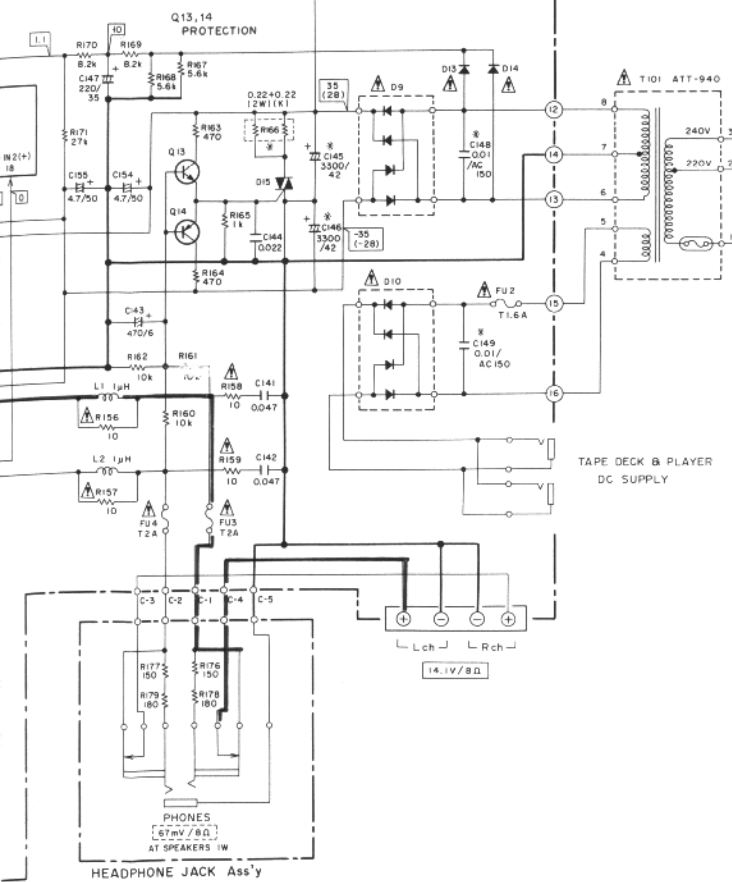
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



- RESISTORS:** Indicated in Ω, kΩ, MΩ, 1/2W, 1/4W, 5% tolerance unless otherwise noted k, kΩ, M, MΩ, (F) ±1%, (G) ±2%, (K) ±10%, (M), +20% tolerance
 - CAPACITORS:** Indicated in capacity (μF)/voltage (V) unless otherwise noted p: pF. Indication without voltage is 50V except electrolytic capacitor.
 - VOLTAGE:**
 - Signal voltage at (2.5 W + 2.5 W 8Ω) output (1kHz)
 - DC voltage (V) at no input signal
 - Value in () is DC voltage at rated power.
 - OTHERS:**
 - ➔ Signal route.
 - ⊗ Adjusting point.
 - 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.
 - * marked capacitors and resistors have parts numbers.
- This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

- COMPLEX Ass'y**
- | | |
|---------------------------|----------|
| S1-1 : FUNCTION (PHONO) | ON - OFF |
| S1-2 : FUNCTION (FM) | ON - OFF |
| S1-3 : FUNCTION (AM) | ON - OFF |
| S1-4 : TAPE MONITOR | ON - OFF |
| S1-5 : LOUDNESS | ON - OFF |
| S3 : MW / LW | MW - LW |
- SWITCH Ass'y**
- | | |
|--------------|----------|
| S2 : FM MUTE | ON - OFF |
|--------------|----------|
- OUTSIDE OF PC BOARD**
- | | |
|--------------|----------|
| S101 : POWER | ON - OFF |
|--------------|----------|
- The underlined indicates the switch position.



A

B

C

D

11. ADJUSTMENTS

FM Tuner Section

- Check that the dial pointer indicates a starting point.
- Connect the SIGNAL meter between terminal no. 29 of complex assembly and the ground.
- In principle, no adjustment should be made on FM tracking. (See page 20, if necessary.)
- Set the FM switch to ON and the FM MUTING switch to OFF.

Step	FM SG (400Hz, ±75kHz deviation)		Position of dial pointer	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	98MHz	66dB	98MHz	T1	Set the output of the REC OUT terminal to the maximum value.
2.	98MHz	46dB	98MHz	T6	Set the SIGNAL meter to the maximum value.
3.	98MHz	66dB	98MHz	T1	Adjust the output of the REC OUT terminal distortion to the minimum level.
4.	Set the FM MUTING switch to ON.				
5.	98MHz Not modulated	66dB	98MHz	VR3	Set the signal of the terminal no. 32 to 76kHz (±200Hz).
6.	98MHz ★ Stereo modulation	66dB	98MHz	T6 (within ±90°)	Minimize the distortion of the REC OUT terminal signal.

★ NOTE:

Connect the MPX SG to the FM SG external modulator terminal and set the modulation of Main (1kHz, L+R) ±67.5kHz deviation, Pilot (19kHz) ±7.5kHz deviation.

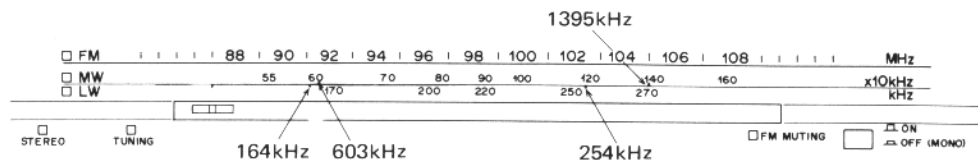
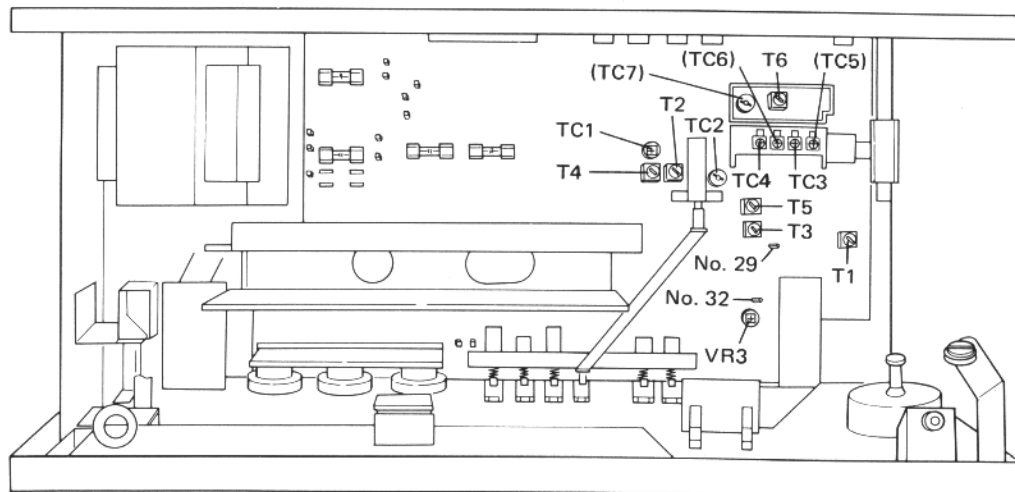


Fig. 11-1 Adjustment points

AM Tuner Section

- Check that the dial pointer indicates a starting point.
- Turn ON the MW switch.
- Connect the SIGNAL meter between the terminal no. 29 of tuner ass'y and the ground.

Step	AM SG (400Hz, 30% modulation)		Position of dial pointer	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	1395kHz	100dB	1395kHz	TC3	Set the SIGNAL meter to the maximum value.
2.	603kHz	100dB	603kHz	T3	
3.	Set the AM SG to 30dB output level, repeat steps 1 to 2 above.				
4.	1395kHz	30dB	1395kHz	TC4	Set the SIGNAL meter to the maximum value.
5.	603kHz	30dB	603kHz	T2	
6.	Repeat steps 4 to 5 until maximum sensitivity is attained.				

Long Wave Section

- Set the AM BAND switch to the LW position.

Step	AM SG (400Hz, 30% modulation)		Position of dial pointer	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	254kHz	100dB	254kHz	TC2	Set the SIGNAL meter to the maximum value.
2.	164kHz	100dB	164kHz	T5	
3.	Set the AM SG to 30dB output level, repeat steps 1 to 2 above.				
4.	254kHz	50dB	254kHz	TC1	Set the SIGNAL meter to the maximum value.
5.	164kHz	50dB	164kHz	T4	
6.	Repeat steps 4 to 5 until maximum sensitivity is attained.				

FM tracking

Step	FM SG (400Hz, ± 75 kHz deviation)		Position of dial pointer	Adjustment point	Adjustment procedure
	Frequency	Level			
1.	106MHz	10dB	106MHz	TC7	Set the SIGNAL meter to the maximum value.
2.				TC5	
3.				TC6	
4.	Confirm that the dial pointer does not get out of position at 106MHz and 98MHz.				