8. ADJUSTMENTS

Before starting adjustment, make sure that the dial pointer indicates the left hand end of the frequency scale (the lowest frequency position) when the tuning knob is turned fully counter-clockwise.

8.1 ADJUSTMENT OF FM SECTION

Caution:
Do not touch the IF transformers (T1 ~ T5) in the AM-FM IF assembly.

FM front end

Switch positions:
FUNCTION switch: FM MONO
MPX NOISE FILTER switch: OFF
FM MUTING switch: OFF

Connection of instruments:
FM signal generator (FM SG): Connect to the FM ANTENNA terminals through a 300-ohm dummy antenna.
AC voltmeter (with the maximum indication of about 1V): Connect to the FIXED L terminal.

Adjustment
1. Position the dial pointer of the TX-9500 at 90MHz.
2. Set the FM SG's output to 90MHz, 10dB with 100% modulation by 400Hz.
3. Adjust T5 so that the AC voltmeter reads a maximum.
4. Reset the TX-9500's dial pointer and the FM SG's output frequency to 106MHz (leaving the output level and degree of modulation as it is).
5. Adjust TC5 so that the AC voltmeter reads a maximum.
6. Reset the TX-9500's dial pointer and the FM SG's output frequency to 90MHz (leaving the output level and degree of modulation as it is).
7. Adjust T1, T2, T3 and T4 so that the AC voltmeter reads a maximum.
8. Reset the TX-9500's dial pointer and the FM SG's output frequency to 106MHz (leaving the output level and degree of modulation as it is).
9. Adjust TC1, TC2, TC3 and TC4 so that the AC voltmeter reads a maximum.
10. Repeat 1 to 9 until the AC voltmeter reads almost the same indications for 90MHz and 106MHz.
11. Resetting the FM SG's output level to 10dB, adjust T6 so that the AC voltmeter reads a maximum.

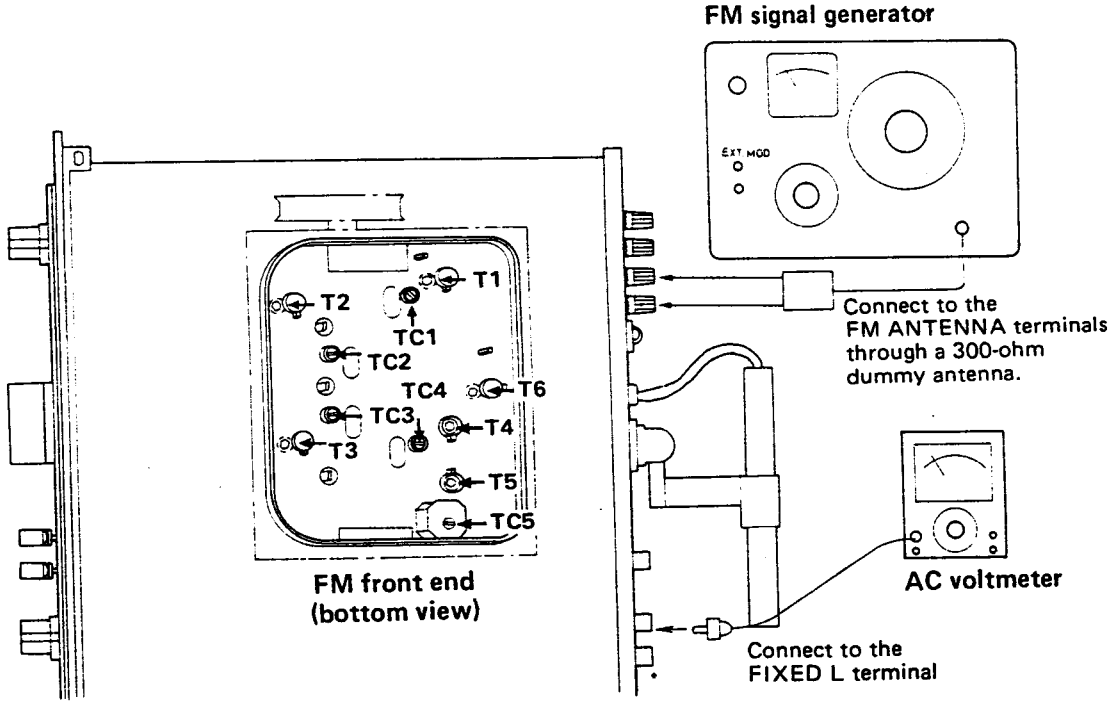


Fig. 7

Muting circuit

Switch positions:
FUNCTION switch: FM MONO
MPX NOISE FILTER switch: OFF
MUTING switch: OFF

Connection of instruments:
FM signal generator (FM SG): Connect to the FM ANTENNA terminals through a 300-ohm dummy antenna.
AC voltmeter (with the maximum indication of about 1V): Connect to the FIXED L terminal.
Distortion meter: Connect to terminal No.12 of the AM-FM IF assembly.

Adjustment
1. Turn VR1 fully counterclockwise.
2. Setting the TX-9500 to a condition, by reducing the FM SG's output level (less than −6dB) or detuning the TX-9500, such that it is receiving no input signals, adjust the primary (lower) core of T6 so that the TUNING meter points to the center of the scale.
3. Resetting the FM SG's output level to 60dB, adjust the secondary (upper) core of T6 so that distortion becomes minimum.
4. Set the FM SG's output to 98MHz, 20dB with 100% modulation by 400Hz.
5. Tune the TX-9500 to 98MHz (Make a fine tuning looking at the TUNING meter).
6. Set the MUTING switch at "1."
7. Turn VR1 clockwise slowly and stop it just when the AC voltmeter abruptly indicates 0V.
8. Reset the MUTING switch "OFF".
9. Setting the TX-9500 to a condition, by reducing the FM SG's output level (less than −6dB), such that it is receiving no input signals, adjust the primary (lower) core of T6 so that the TUNING meter points to the center of the scale.
10. Repeat 8 to 9 for several times.
11. Resetting the FM SG's output level to 100dB, adjust VR2 so that the SIGNAL meter points to "5."

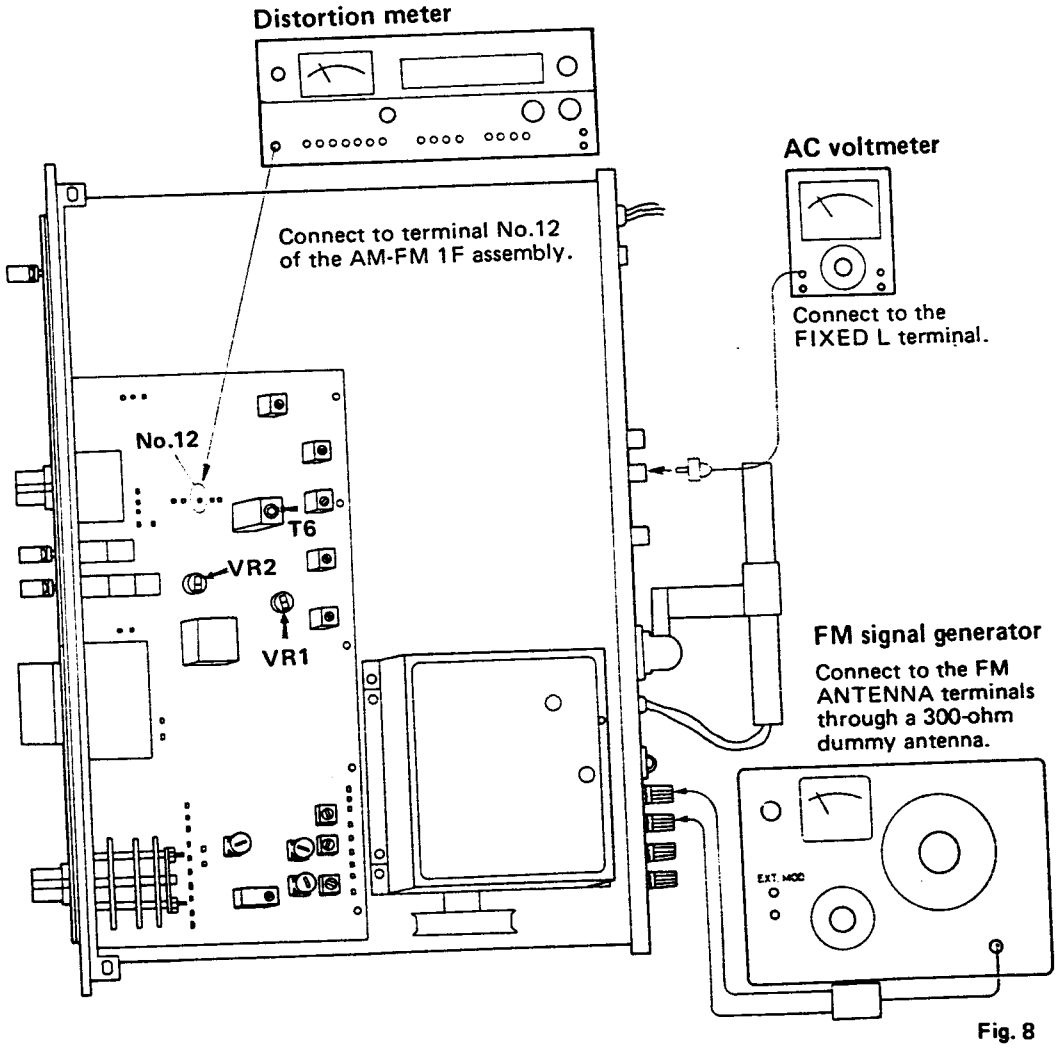


Fig. 8

FM MPX circuit

Switch positions:

FUNCTION switch: FM AUTO
MPX NOISE FILTER: switch: OFF
MUTING switch: OFF

Connection of instruments:

FM signal generator (FM SG): Connect to the FM ANTENNA terminals through a 300-ohm dummy antenna.
MPX signal generator (MPX SG): Connect to the "external modulation" terminals of FM SG.
AC voltmeter: Connect to the FIXED L terminal.
Oscilloscope: Connect the horizontal and vertical input terminals respectively to the MPX SG's PILOT OUT terminal and No.11 terminal of the MPX assembly through a probe.

Adjustment

1. Set the FM SG's output to 98MHz, 60dB with 0% modulation.
2. Tune the TX-9500 to 98MHz. (Make a fine tuning looking at the TUNING meter.)
3. Adjust VR1 so that the Lissajous' figure developed on the oscilloscpe screen becomes stationary.
4. Reset the FM SG's output to 98MHz, 60dB with external modulation and make the MPX SG generate the pilot and R channel signals.
5. Adjust VR2 so that the AC voltmeter reads minimum.

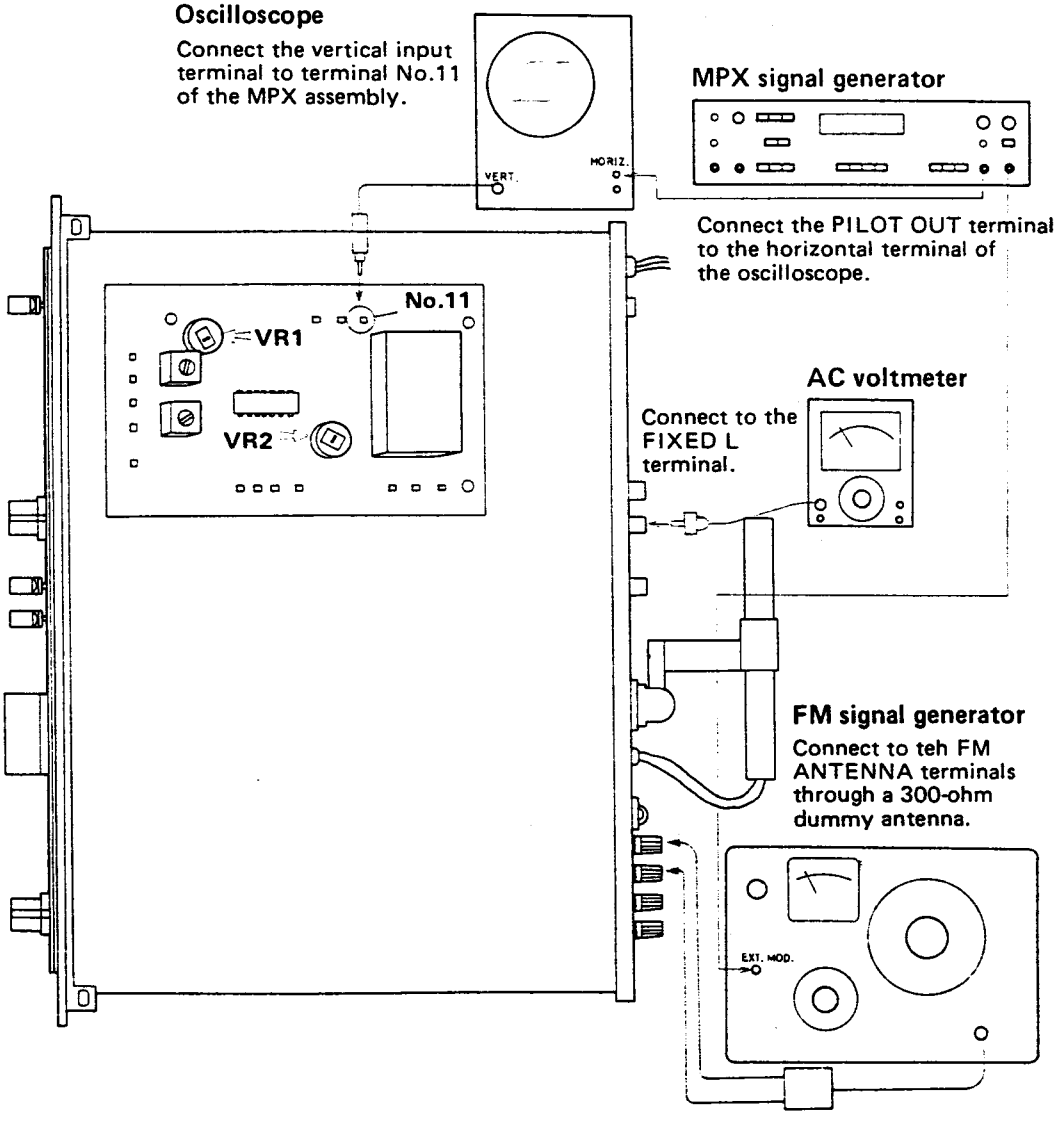


Fig. 9

8.2 ADJUSTMENT OF AM SECTION

Adjustment of IFT

Switch positions:
FUNCTION switch: AM

Connection of instruments:
Sweep generator (400kHz ~ 500kHz): Connect the output terminal to No.2 terminal of the AM-FM IF assembly.
Oscilloscope: Connect the vertical and horizontal input terminals respectively to the TX-9500's FIXED L terminal and the sweep generator's time axis output terminal.

Adjustment

1. Set the sweep generator output level to 80dB.
2. Adjust F5 and T9 so that the figure developed on the oscilloscope becomes laterally symmetrical with the axis of symmetry at 455kHz and it has a maximum amplitude as well.

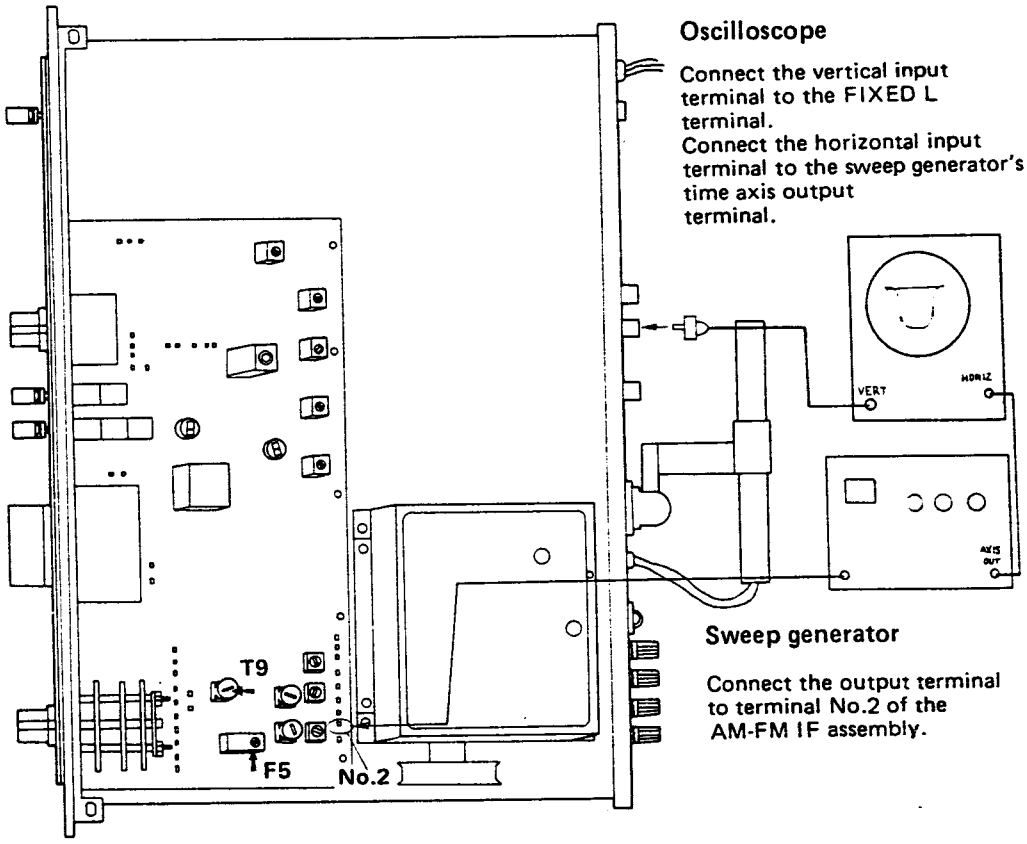


Fig. 10

• Tracking adjustment

Switch position:
FUNCTION switch: AM

Connection of instruments:
AM signal generator (AM SG): Connect to the AM ANTENNA terminals through a 1k-ohm resistor.
AC voltmeter: Connect to the FIXED L terminal.

Adjustment

1. Position the TX-9500's dial pointer at 600kHz.
2. Set the AM SG's output to 600kHz, 30dB with 30% modulation by 400Hz.
3. Adjust the cores of T8, T7 and the bar antenna so that the AC voltmeter reads maximum.
4. Reset the TX-9500's dial pointer and the AM SG's output frequency to 1,400kHz (leaving the output level and degree of modulation as it is set).
5. Adjust TC1, TC2 and TC3 so that the AC voltmeter reads maximum.
6. Repeat 1 to 5 until the AC voltmeter reads almost the same indications for 600kHz and 1,400kHz.

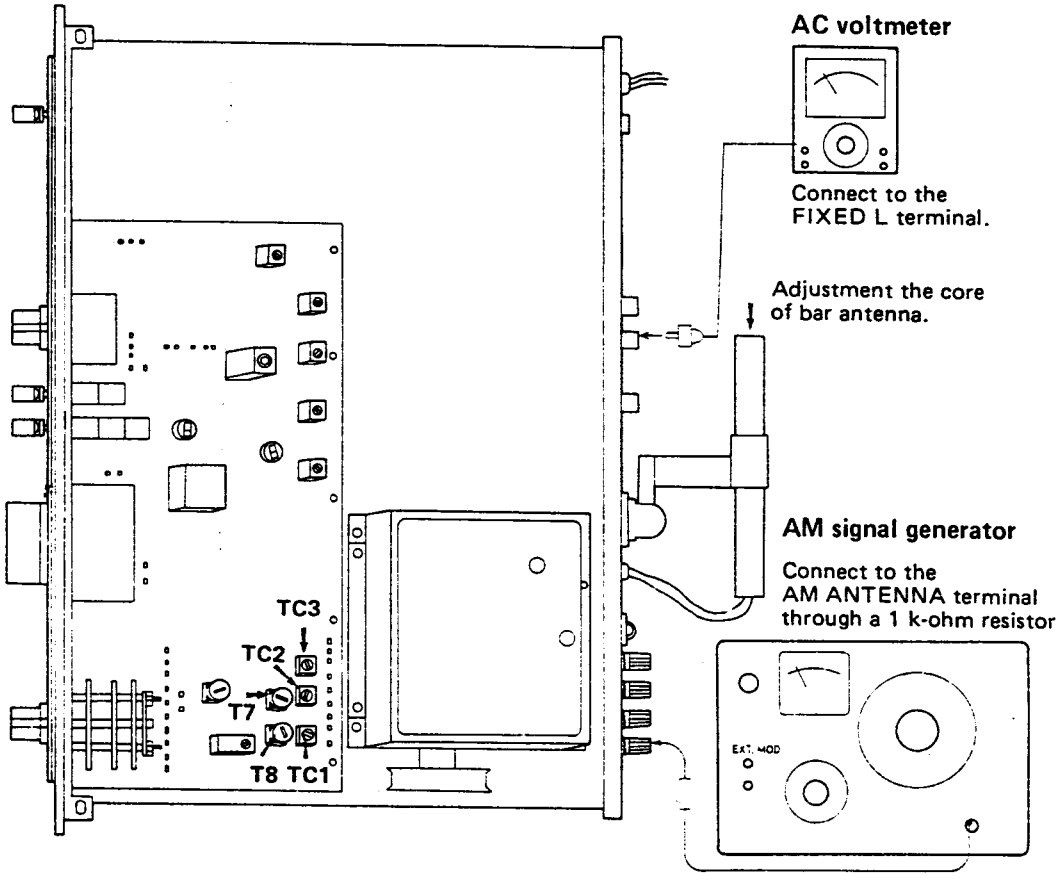


Fig. 11

8.3 ADJUSTMENT OF AUDIO FREQUENCY OSCILLATOR

Switch position:
FUNCTION switch: REC LEVEL CHECK

Connection of instrument:
AC voltmeter: Connect to the FIXED L terminal.

1. Make sure that the AC voltmeter deflects intermittently.
2. Adjust VR1 so that the AC voltmeter reads half of the rated output.*

*The output level of audio signal when the TX-9500 is receiving FM signals of 60dB with 100% 400Hz modulation.

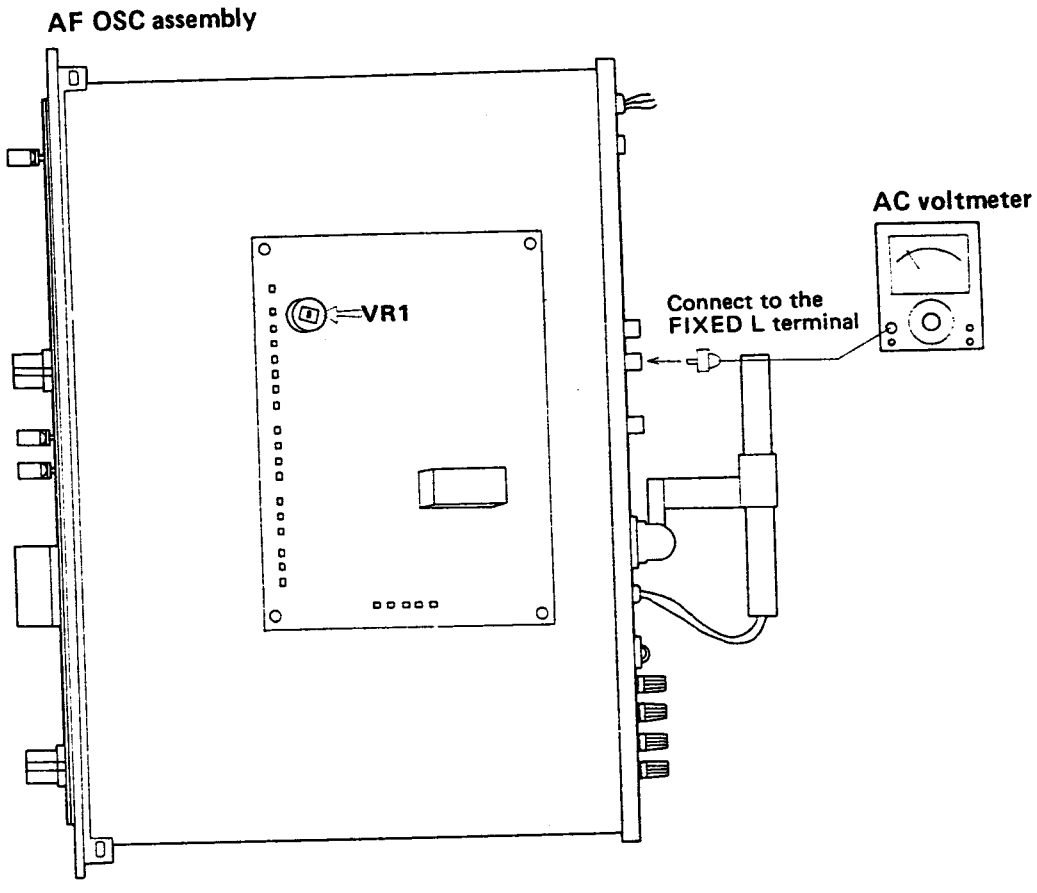
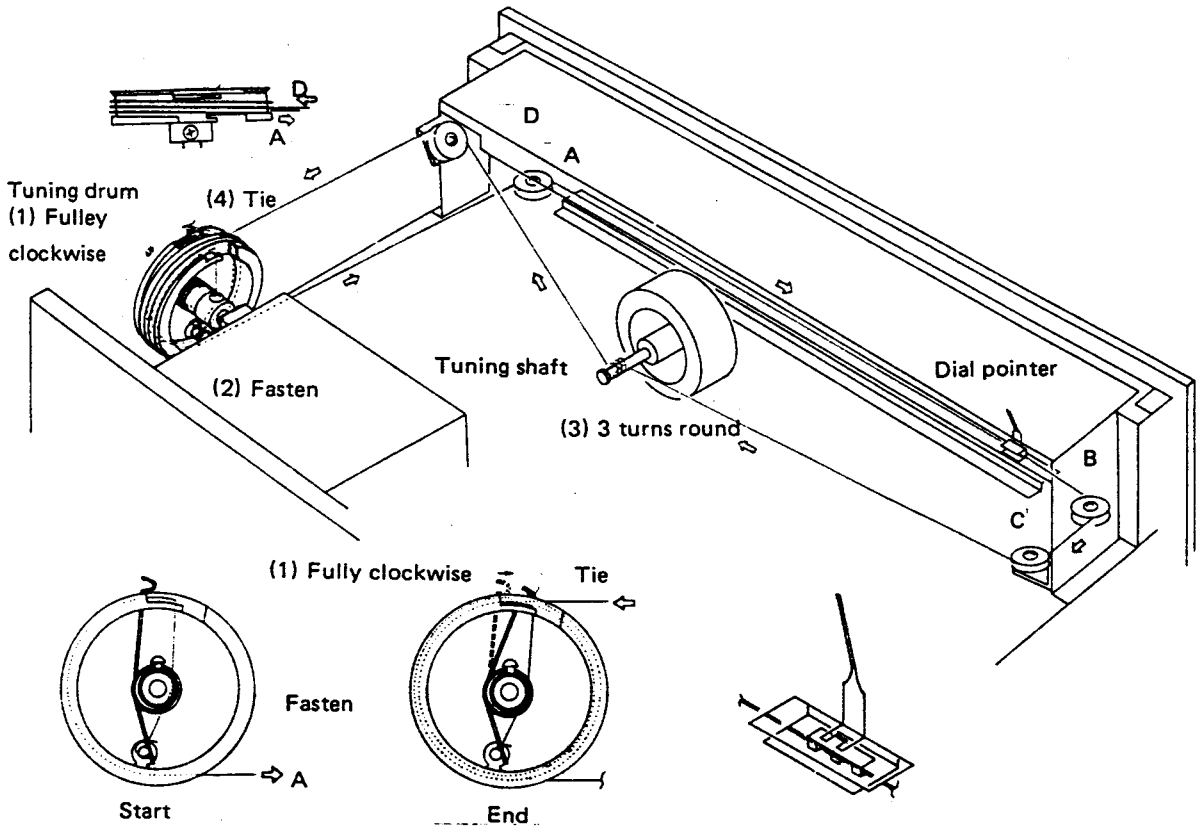
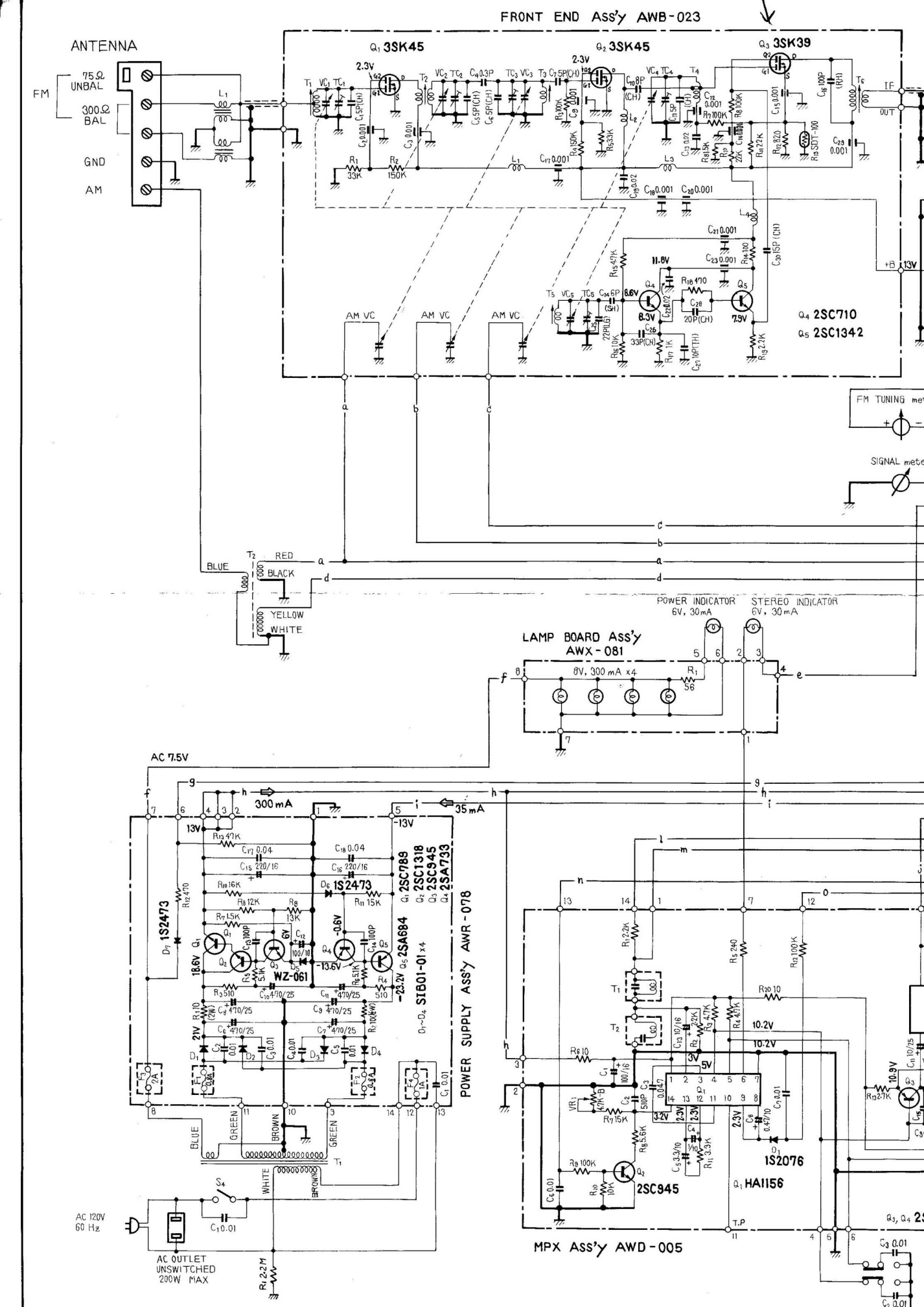


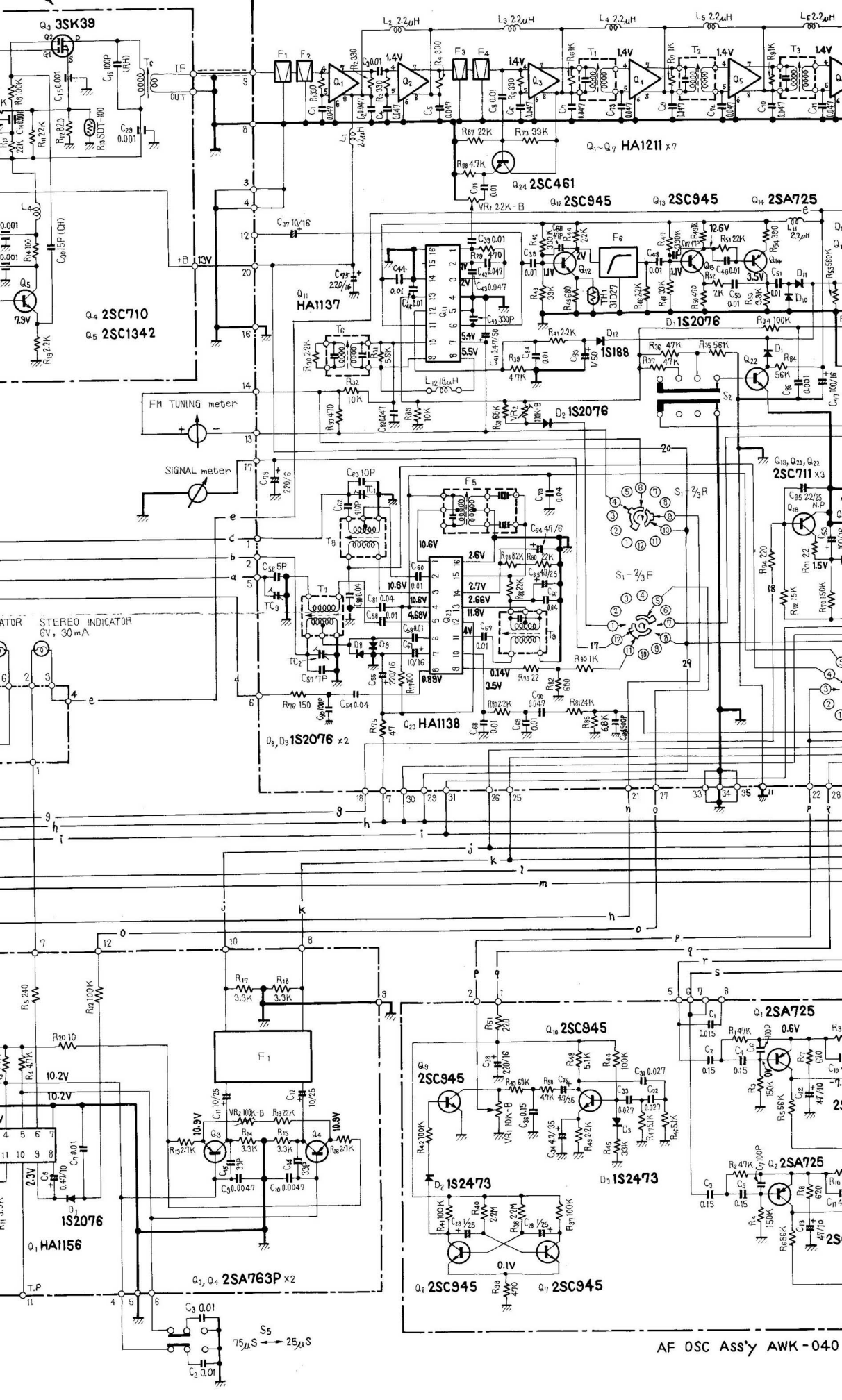
Fig. 12

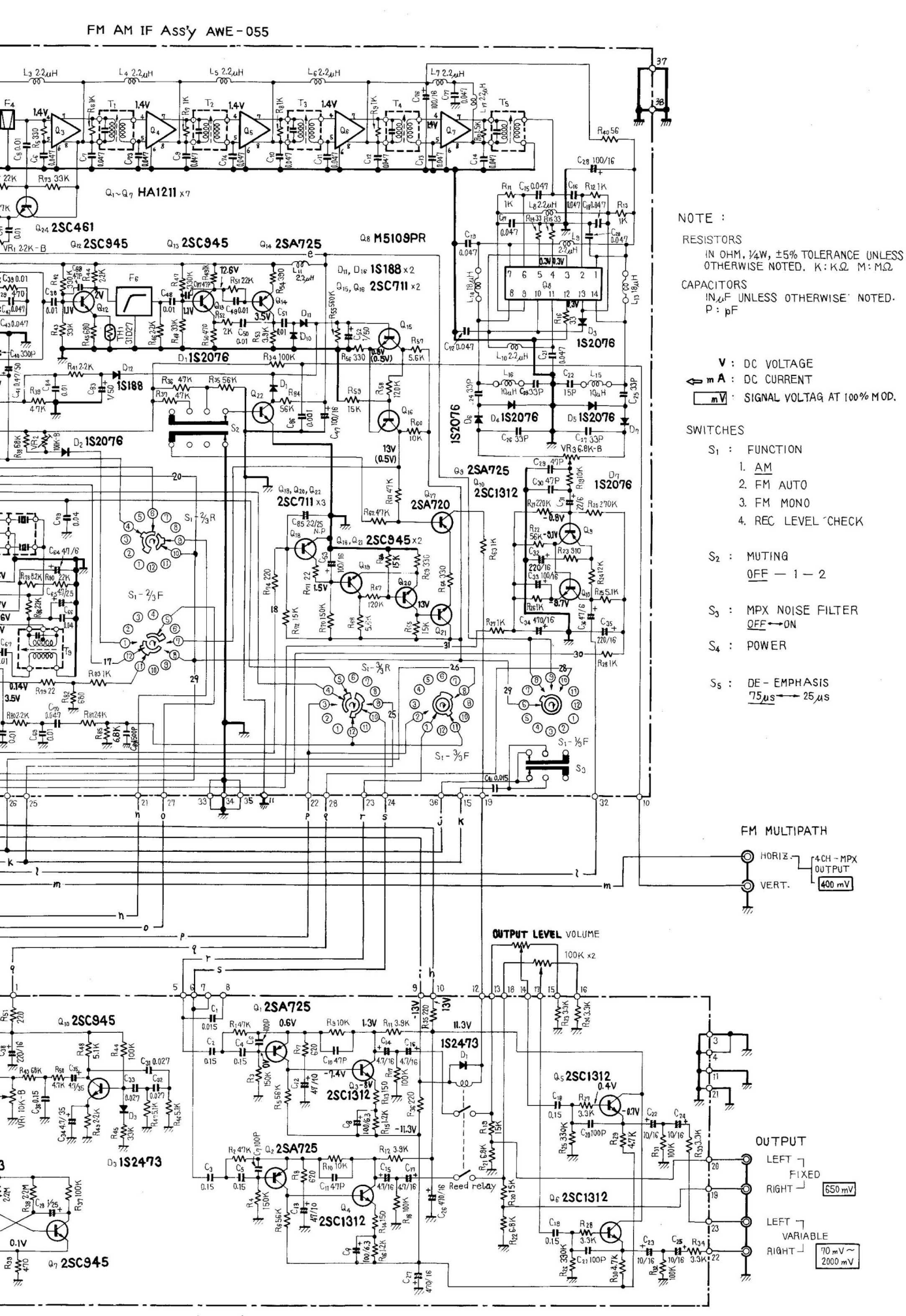
9. DIAL CORD STRINGING

1. Set the tuning capacitor to maximum capacitance, fully clockwise.
2. Fasten one end of the cord to the protrusion on the tuning drum and lead it round pulleys A, B and C.
3. Wind the cord 3 turns round the tuning shaft and run it round pulley D.
4. Wind the cord 2 turns round the dial pulley and tie the end to the spring while tensioning the spring slightly.
5. Confirm that dial stringing moves smoothly. If so, cut the unnecessary portion of string.
6. Turn the tuning knob fully counterclockwise and fix the dial pointer to string so that it indicates low end on the dial scale.




FRONT END ASS'y AWB-023
ANTENNA
FM
75Ω UNBAL
300Ω BAL
GND
AM
Q1 3SK45
Q2 3SK45
Q3 3SK39
2.3V
IF OUT
AM VC
Q4 2SC710
Q5 2SC1342
11.8V
8.6V
8.3V
7.9V
+B 13V
FM TUNING
SIGNAL
BLUE
RED
BLACK
YELLOW
WHITE
POWER INDICATOR
6V, 30mA
STEREO INDICATOR
6V, 30mA
LAMP BOARD ASS'y
AWX-081
8V, 300mA x4
AC 7.5V
300mA
35mA
-13V
13V
18.6V
6V
-0.6V
-13.6V
-23.2V
2V
WZ-061
1S2473
2SC788
2SC1318
2SC945
2SA733
2SA684
SIB01-01 x4
POWER SUPPLY ASS'y AWR-078
BLUE
GREEN
BROWN
GREEN
WHITE
BROWN
AC 120V 60Hz
AC OUTLET UNSWITCHED 200W MAX
10.2V
3V
5V
10.9V
3.2V
2.3V
1S2076
HA1156
2SC945
MPX ASS'y AWD-005


Q3 3SK39
Q4 2SC710
Q5 2SC1342
Q1~Q7 HA1211 x7
Q24 2SC461
Q12 2SC945
Q13 2SC945
Q14 2SA725
Q11 HA1137
D11 1S2076
D12 1S188
D2 1S2076
FM TUNING meter
SIGNAL meter
Q18, Q20, Q22 2SC711 x3
S1-2/3R
S1-2/3F
STEREO INDICATOR 6V, 30mA
D8, D9 1S2076 x2
Q23 HA1138
Q1 HA1156
Q3, Q4 2SA763P x2
D1 1S2076
Q9 2SC945
Q10 2SC945
D2 1S2473
D3 1S2473
Q8 2SC945
Q7 2SC945
Q1 2SA725
Q2 2SA725
S5 75μS ⟷ 25μS
AF OSC Ass'y AWK-040


FM AM IF Ass'y AWE-055
Q1~Q7 HA1211 x7
Q8 M5109PR
Q9 2SA725
Q10 2SC1312
Q11 2SA720
Q12 2SC945
Q13 2SC945
Q14 2SA725
Q15, Q16 2SC711 x2
Q17 2SA720
Q18, Q21 2SC945 x2
Q18, Q20, Q23 2SC711 x3
Q22 2SC945
Q24 2SC461
D1, D16 1S188 x2
D2 1S2076
D3 1S2076
D4 1S2076
D5 1S2076
D6 1S2076
D7 1S2076
D11 1S2076
D12 1S188
D3 1S2473
D1 1S2473
NOTE :
RESISTORS
IN OHM, 1/4W, ±5% TOLERANCE UNLESS OTHERWISE NOTED. K: KΩ M: MΩ
CAPACITORS
IN μF UNLESS OTHERWISE NOTED. P : pF
V : DC VOLTAGE
mA : DC CURRENT
mV : SIGNAL VOLTAG AT 100% MOD.
SWITCHES
S1 : FUNCTION
1. AM
2. FM AUTO
3. FM MONO
4. REC LEVEL CHECK
S2 : MUTING
OFF — 1 — 2
S3 : MPX NOISE FILTER
OFF ⟷ ON
S4 : POWER
S5 : DE-EMPHASIS
75μs ⟷ 25μs
FM MULTIPATH
HORIZ.
VERT.
4CH-MPX OUTPUT
400 mV
OUTPUT LEVEL VOLUME
100K x2
Reed relay
OUTPUT
LEFT FIXED
RIGHT
650 mV
LEFT VARIABLE
RIGHT
70 mV ~ 2000 mV