ORDER NO. SD81051894C8

Service Manual

QUARTZ Synthesizer FM/AM Stereo Tuner

ST-S8(K)

[E], [EG], [EF], [EH],
[EB], [EK], [XA], [XL]

Areas

- [E] is available in Switzerland and Scandinavia.
- [EG] is available in F.R. Germany.
- [EF] is available in France.
- [EH] is available in Holland.
- [EB] is available in Belgium.
- [EK] is available in United Kingdom.
- [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- [XL] is available in Australia.

English

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50~108.02 MHz
Sensitivity	0.95 μV (IHF, usable)
S/N 30 dB	0.95 μV (75Ω)
S/N 26 dB	0.85 μV (75Ω)
S/N 20 dB	0.75 μV (75Ω)
IHF 46 dB stereo quieting sensitivity	20 μV/75Ω
Total harmonic distortion	
MONO (normal)	0.04%
STEREO (normal)	0.06%
S/N	
MONO	72 dB (80 dB, IHF)
STEREO	67 dB (74 dB, IHF)
Frequency response	5 Hz~18 kHz, +0.2 dB~ −0.5 dB
Alternate channel selectivity	
normal ±400 kHz	55 dB
super narrow ±200 kHz	25 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	120 dB
IF rejection at 98 MHz	140 dB
Spurious response rejection at 98 MHz	120 dB
AM suppression	55 dB
Stereo separation	
1 kHz	55 dB
10 kHz	40 dB
Carrier leak	
19 kHz	−65 dB (−70 dB, IHF)
38 kHz	−48 dB (−50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.0 dB
Limiting point	0.75 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	522~1611 kHz (9 kHz-step) 530~1620 kHz (10 kHz-step)
Sensitivity (S/N 20 dB)	30 μV, 250 μV/m
Selectivity (±9 kHz)	55 dB
Image rejection at 999 kHz	55 dB
IF rejection at 999 kHz	45 dB

■ GENERAL

Output voltage	0.3V (0.6V, IHF)
Power consumption	11W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 53 × 390 mm (16-15/16" × 2-3/32" × 15-11/32")
Weight	4.3 kg (9.5 lb.)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN (Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,02 MHz
Eingangsempfindlichkeit	0,95 µV (nutzbar nach IHF)
S/R 30 dB	0,95 µV (75 Ω)
S/R 26 dB	0,85 µV (75 Ω)
S/R 20 dB	0,75 µV (75 Ω)
Stereoumschaltschwelle bei 46 dB nach IHF	20 µV/75 Ω
Gesamtklirrfaktor	
Mono (normal)	0,04%
Stereo (normal)	0,06%
Geräuschabstand	
Mono	72 dB (80 dB nach IHF)
Stereo	67 dB (74 dB nach IHF)
Frequenzgang	5 Hz ~ 18 kHz (+0,2 dB ~ −0,5 dB)
Trennschärfe bei Störsender	
normal ±400 kHz	55 dB
super narrow ±200 kHz	25 dB
Einfangverhältnis	1,0 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	120 dB
ZF-Dämpfung bei 98 MHz	140 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	120 dB
AM-Unterdrückung	55 dB
Übersprechdämpfung	
1 kHz	55 dB
10 kHz	40 dB
Trägerrest	
19 kHz	−65 dB (−70 dB nach IHF)
38 kHz	−48 dB (−50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,0 dB
Begrenzereinsatz	0,75 µV
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	75 Ω (unsymmetrisch)

■ AM-TUNERTEIL

Wellenbereiche	522 ~ 1611 kHz (9-kHz-Shritte) 530~1620 kHz (10-kHz Schritte)
Eingangsempfindlichkeit (S/R 20 dB)	30 µV, 250 µV/m
Trennschärfe (±9 kHz)	55 dB
Spiegelfrequenz-Dämpfung bei 999 kHz	55 dB
ZF-Dämpfung bei 999 kHz	45 dB

■ ALLGEMEINE DATEN

Ausgangsspannung	0,3 V (0,6 V, IHF)
Leistungsaufnahme	11W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 × 53 × 390 mm
Gewicht	4,3 kg

Français

CARACTERSTIQUES (Sujet à changement sans préaris.)

(DIN 45 500)

■ SECTION SYNTONISATEUR FM

Gamme de fréquence	87,50~108,02 MHz
Sensibilité	0,95 µV (IHF utilisable)
S/B 30 dB	0,95 µV (75Ω)
S/B 26 dB	0,85 µV (75Ω)
S/B 20 dB	0,75 µV (75Ω)
Sensibilité stéréo au seuil de 46 dB, IHF	20 µV/75Ω
Distorsion harmonique totale	
MONO (normal)	0,04%
STEREO (normal)	0,06%
Signal/Bruit	
MONO	72 dB (80 dB, IHF)
STEREO	67 dB (74 dB, IHF)
Réponse de fréquence	5 Hz~18 kHz, +0,2 dB~ −0,5 dB
Sélectivité alternée par canal	
normal ±400 kHz	55 dB
super narrow ±200 kHz	25 dB
Taux de capture	1,0 dB
Rejection d'image à 98 MHz	120 dB
Rejection FI à 98 MHz	140 dB
Rejection de réponse parasite à 98 MHz	120 dB
Suppression AM	55 dB
Séparation stéréophonique	
1 kHz	55 dB
10 kHz	40 dB
Fuite de porteuse	
19 kHz	−65 dB (−70 dB, IHF)
38 kHz	−48 dB (−50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	±1,0 dB
Point de limite	0,75 µV
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
Bornes d'antenne	75Ω (asymétrique)

■ SECTION SYNTONISATEUR AM

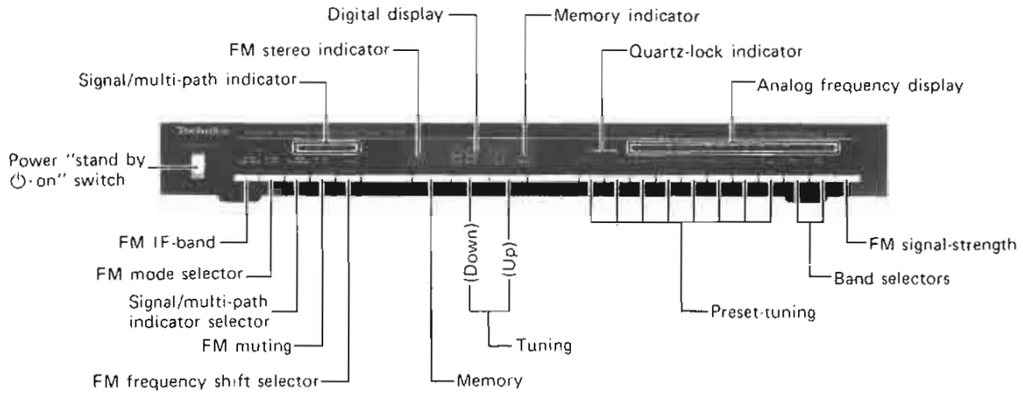
Gamme de fréquence	522~1611 kHz (9 kHz par palier) 530~1620 kHz (10 kHz par palier)
Sensibilité (S/B 20 dB)	30 µV, 250 µV/m
Sélectivité (±9 kHz)	55 dB
Réjection d'image à 999 kHz	55 dB
Réjection FI à 999 kHz	45 dB

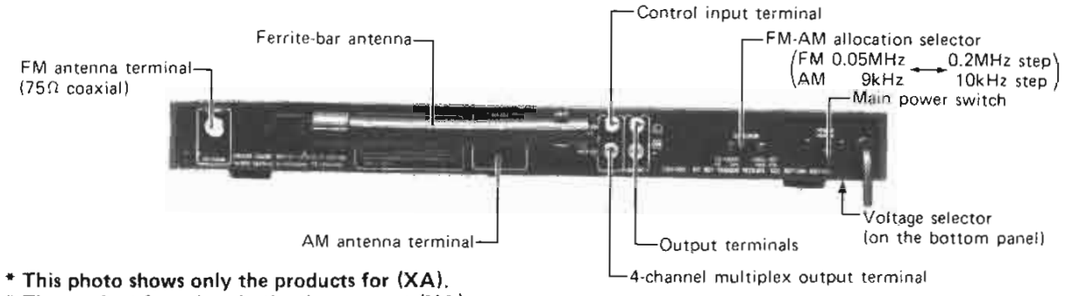
■ DIVERS

Tension de sortie	0,3 V (0,6V, IHF)
Consommation	11W
Alimentation	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	430 × 53 × 390 mm
Poids	4,3 kg

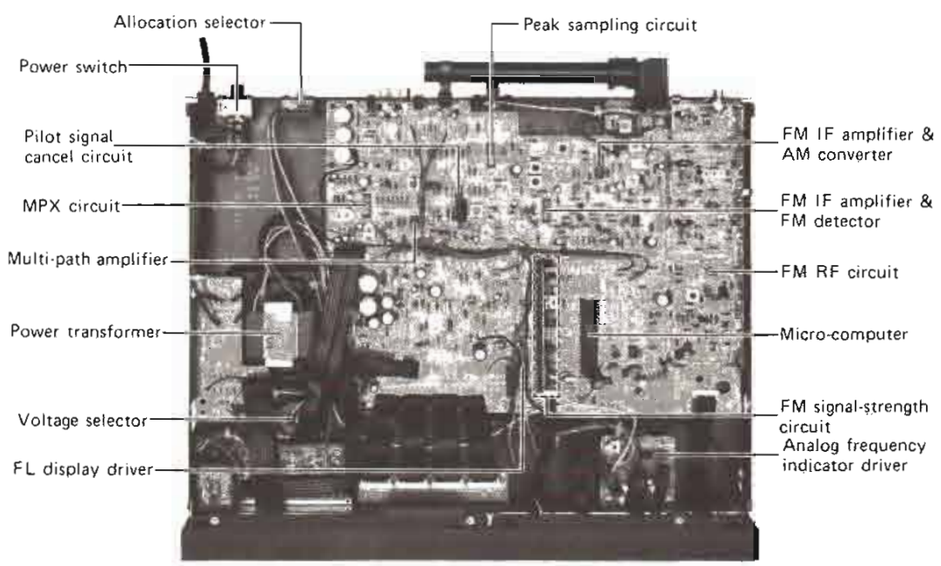
■ CONTENTS

■ LOCATION OF CONTROLS





*** This photo shows only the products for (XA).**
*** The product for other destinations except (XA) is not equipped with FM allocation switch.**



■ DISASSEMBLY INSTRUCTIONS

• How to remove the cabinet

Remove the 4 setscrews (❶ ~ ❹ in Fig. 1) of the cabinet.

• How to remove the front panel

1. Remove the cabinet.
2. Remove the 6 setscrews (❺ ~ ❿ in Fig. 1) of front panel and the setscrew (⓫ in Fig. 1) of reinforcement.
3. Remove the front panel from the chassis as in Fig. 2.

• How to remove the printed circuit board

C Printed circuit boards (FM/AM IF·RF circuit; FM MPX circuit; FL display circuit; Power supply circuit).

1. Remove the cabinet.
2. Remove the 5 setscrews (⓭ ~ ⓱ in Fig. 1) of the printed circuit board, 2 setscrews (⓲, ⓳ in Fig. 1) of the output terminal plate, and 2 setscrews (⓴, ㉑ in Fig. 1) of the shielding plate.
3. Remove the 2 setscrews (㉒, ㉓ in Fig. 1) of the allocation switch.
4. Cut off the lead clamper (⓬ in Fig. 1).
5. Disconnect the 4 leads of the AM bar antenna.
6. When checking the printed circuit board, raise the printed circuit board as shown in Fig. 3.

Note:

1. When checking the state of receiving AM broadcast, connect the 4 leads to the terminals by the use of clip-attached leads, etc.
2. When connecting the leads after checking the printed circuit board, wind each lead around the terminal and solder as shown in Fig. 3 (A).

F Printed circuit board (Preset tuning switch and Analog frequency indicator circuit).

1. Remove the cabinet and front panel
2. Turn over the front panel as shown in Fig. 4.
3. Remove the 2 setscrews (㉔, ㉕ in Fig. 4) of the printed circuit board. Remove the board in the direction of the arrow Ⓐ.

E Printed circuit board (Memory and tuning switch circuit).
Remove the printed circuit board by pressing the lugs (3 portions) with a screwdriver. (Fig. 4)

H Printed circuit board (Signal/multi-path indicator circuit)
Remove the printed circuit board by shifting the lugs (2 portions) in the direction of the arrow Ⓑ. (Fig. 4)

J, **K** Printed circuit board (Scale plate illuminating lamp circuit)
Remove the printed circuit board in the same way as for **H** Printed circuit board. (Fig. 4)

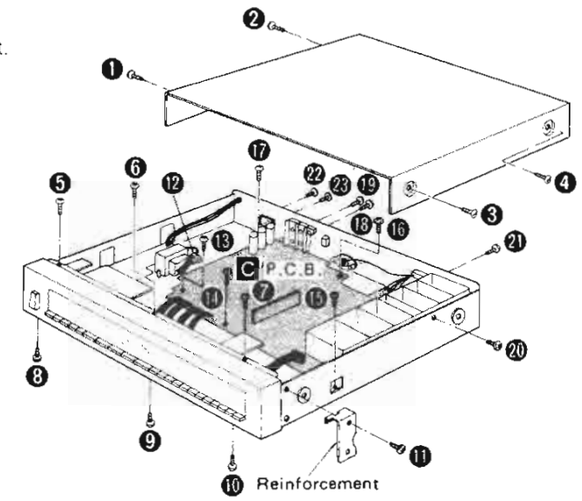


Fig. 1

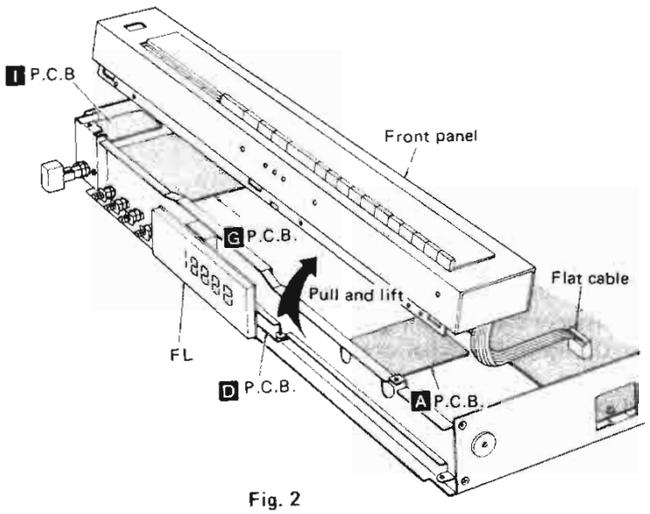


Fig. 2

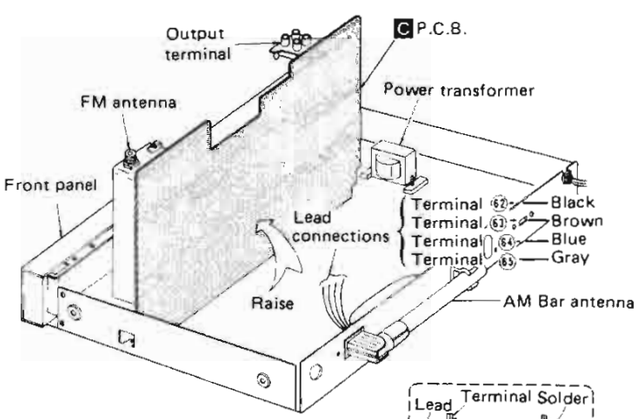


Fig. 3

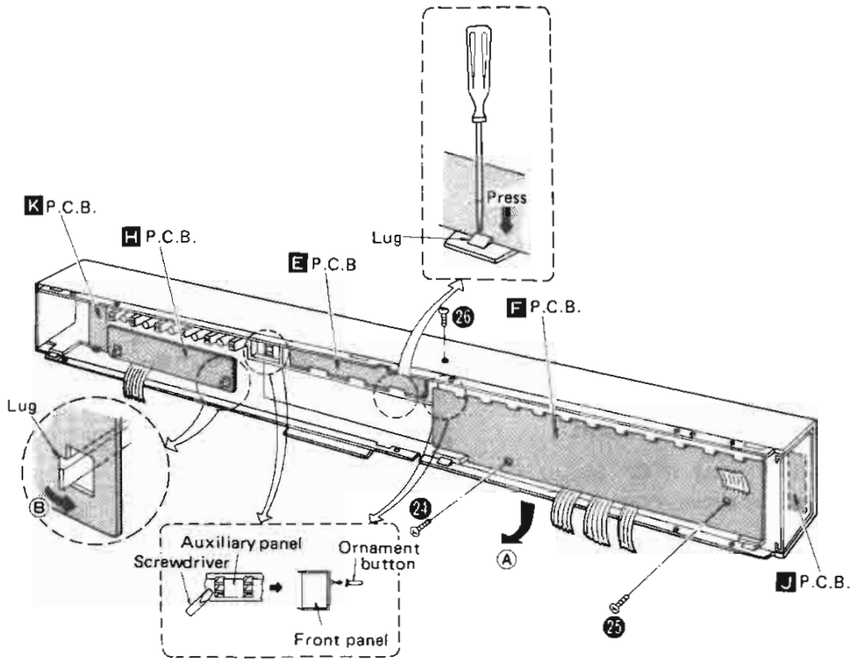


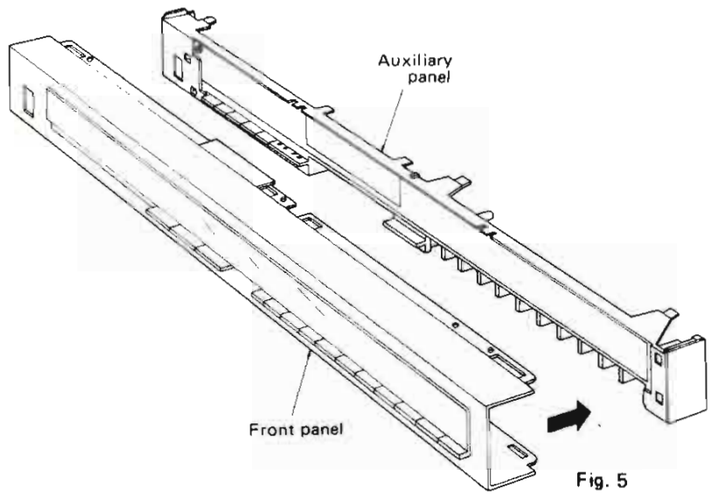
Fig. 4

- **How to remove the auxiliary panel**

1. Remove the cabinet and front panel.
2. Remove the printed circuit board (E , F , H , J , K).
3. Push the 2 ornament buttons with a screwdriver to remove them from the auxiliary panel (See Fig. 4).
4. Remove the setscrew (26 in Fig. 4) of auxiliary panel.
5. Disengage the 6 Lugs of auxiliary panel from the front panel by using a screwdriver to remove the auxiliary panel. (See Fig. 5)

Note:

When mounting the ornament buttons, install the auxiliary panel onto the front panel, then insert the buttons from the front and secure them with bond.



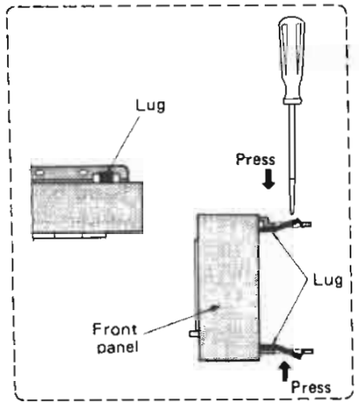


Fig. 5

■ MEASUREMENTS AND ADJUSTMENTS English

AM ADJUSTMENT

• Setting and Equipment used

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. Set band selector to "AM" position.
4. Set AM allocation selector to "9kHz" position.
5. Maintain line voltage at rated voltage.
6. Output of signal generator should be no higher than necessary to obtain an output reading.
7. Adjust the antenna coil (L201) position by using a screwdriver so that it is at approximately 25 degrees to the rear panel.
8. Use a non-metal screwdriver for the adjustment.

Step No.	AM SIGNAL GENERATOR CONNECTION	AM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	AM-IF ADJUSTMENT					
1	Connect AM-SG to AM atnenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450 kHz (30% Mod. with 400 Hz)	Frequency of non-inter-ference	Connect AC VTVM or scope to "OUTPUT" terminals of the set.	L203 (1st IFT) L204 (2nd IFT)	Adjust the input frequency and adjustment points so that the output becomes maximum.
	AM-RF ADJUSTMENT					
2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	522 kHz (30% Mod. with 400 Hz)	522 kHz	Connect DC VTVM to TP201 terminal.	L202 (OSC Coil)	Adjust L202 to 1.0V ± 0.05V.
3		612 kHz (30% Mod. with 400 Hz)	612 kHz	Connect AC VTVM or scope to "OUTPUT" terminals of the set.	L201 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of L201 by screw driver.
4		1503 kHz (30% Mod. with 400 Hz)	1503 kHz	Connect AC VTVM or scope to "OUTPUT" terminals of the set.	CT201 (ANT Trimmer)	1. Adjust for maximum output. 2. Repeat steps (3) and (4) until the frequency correctly matches the dial display.

FM ADJUSTMENT

• Equipment used

1. FM signal generator (FM-SG)
2. Stereo modulator (or separation meter)
3. Distortion analyser
4. Oscilloscope
5. AC and DC electronic voltmeters (VTVM)
6. Frequency counter (19 kHz and 108 MHz measurable)
7. FM 75Ω dummy antenna (Fig. 6) and low-pass filter (fc : 15 kHz ~ 19 kHz)

• Preparation of FM signal generator (FM-SG)

1. Connect stereo modulator to FM-SG.
2. Apply SG output to antenna terminal of the set through 75ΩFM dummy antenna.
3. The standard input of the set is 60 dB (1mV), 400 Hz 100% modulation (Because of using dummy antenna, SG output must be 12 dB plus (IHF). That is, when input is 60 dB, SG output is to be 72 dB.)

• Setting

1. Set FM IF band switch to "normal" position.
2. Set FM mode switch to "auto" position.
3. Set Signal/multi-path indicator selector to "signal" position.
4. Set FM muting switch to "off" position.
5. Set band selector to "FM" position.
6. Other setting are the same as in AM adjustment.

Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	FM-IF ADJUSTMENT					
5	–	No-Signal	100.1 MHz	Connect DC VTVM to between TP102 and TP103 through choke coil. (Refer to Fig. 7)	T102 (Discri. IFT)	Adjust T102 core so that voltage measured in signal mode is 0V in 300mV range.
	FM-RF ADJUSTMENT					
6	–	No-Signal	87.9 MHz	Connect DC VTVM to TP1 terminal.	L10 (OSC Coil)	Adjust L10 (OSC Coil) to 4.1 ± 0.1V.
7	Connect FM-SG to through 75Ω FM dummy antenna.	90.1 MHz (100% Mod. with 400 Hz) weak input	98.1 MHz	Connect scope to "OUTPUT" terminals of the set.	L4, L5, L6, L8 (RF DET Coil) L1, L2 (ANT Coil) T101 (FM IFT)	1. Add weak input so that noise is included in the output wave form. 2. Make the adjustment so that the output wave form is vertically symmetrical. Refer to Fig. 8. 3. Repeat the steps (7) and (8) until the frequency correctly matches the dial display. 4. Check step (6) and if it is deflected readjust of L10.
8		106.1 MHz (100% Mod. with 400 Hz) weak input	106.1 MHz	Connect scope to "OUTPUT" terminals of the set.	CT7 (OSC Trimmer)	

Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	FM MONO DISTORTION ADJUSTMENT					
9	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	Connect distortion analyser to "OUTPUT" terminals of the set.	T103 (Discri. IFT)	1. Check step (5) and if it is deflected, readjust of T102. 2. Adjust T103 core so that distortion of right and left channels are minimized.
	FM MPX PILOT (VCO) ADJUSTMENT					
10	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	100.1 MHz (Non-modulated)	100.1 MHz	Connect frequency counter to TP302 terminal.	VR301 (VCO)	Adjust VR301 to 19 kHz ± 30 Hz.
	PILOT BAND-PASS FILTER ADJUSTMENT					
11	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (Non-modulated)	100.1 MHz	Connect AC VTVM to TP301 terminal.	L302 L303 (Band pass Filter)	Adjust L302 and L303 so that output voltage is maximum.
	PILOT CANCEL ADJUSTMENT					
12	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (Non-modulated)	100.1 MHz	Connect scope to TP303 terminal.	L303 VR303 (Pilot Cancel)	Adjust L303 and VR303 alternately so that the output voltage of TP303 is minimized and the waveform is as shown in Fig. 9.
	PHASE SHIFTER ADJUSTMENT					
13	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	100.1 MHz (100% Mod. with 400 Hz) (L mode)	100.1 MHz	Connect AC VTVM to left ch. "OUTPUT" terminals of the set.	VR302 (Phase Shift)	Adjust VR302 so that L ch. output is maximum.
	STEREO DISTORTION ADJUSTMENT					
14	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (100% Mod. with 400 Hz) (L mode)	100.1 MHz	Connect distortion analyser to "OUTPUT" terminals of the set through low-pass filter. (fc = 15 kHz ~ 19 kHz)	T101 (IFT)	1. Re-adjust the already adjusted T101 within ± 90° from the preset core position so that the distortion of L ch is minimized. 2. Re-check the steps 5, 6, 7, 8 and 9.
	SEPARATION ADJUSTMENT					
15	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (100% Mod. with 1 kHz) (L or R mode)	100.1 MHz	Connect AC VTVM to "OUTPUT" terminals of the set through low-pass filter. (fc = 15 kHz ~ 19kHz)	VR401 (Separation)	Adjust VR401 so that R output is minimized when stereo modulator is in L (L ch modulation) mode and that L output is minimized in R mode.
	SIGNAL LEVEL ADJUSTMENT					
16	Connect FM-SG to FM antenna terminal through 75Ω FM dummy atnenna. (Apply 50 dB to the set.)	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	——	VR501 (Signal level)	1. Turn signal level semi-fixed resistor VR501 to minimum. (counter-clockwise direction) 2. Adjust VR501 so that the 5 th LED illuminate.
	SIGNAL STRENGTH LEVEL ADJUSTMENT * Start the adjustment after power supply for 1 minute at least.					
17	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	——	VR502 (Signal strength level)	1. Apply 80 dB to the set. 2. Push the FM signal key so that F.L indicates the signal strength level. 3. Adjust VR502 so that 78 dB is indicated. 4. Make sure that the signal strength level is 36 ~ 48 dB when the input is 40 dB. * If the level is below 36 dB, cut off R590 and re-adjust and check.

Step No.	FM SIGNAL GENERATOR CONNECTION	FM SIGNAL GENERATOR FREQUENCY	DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	QUARTZ LOCK INDICATOR ADJUSTMENT					
18	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Apply 6.0 dB to the set.)	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	——	VR101 (Quartz lock indicator)	1. Turn VR101 anticlockwise until the quartz lock indicator goes out. 2. Slowly turn VR101 clockwise to adjust it to a point at which the quartz lock indicator lights up.
	ANALOG FREQUENCY INDICATOR ADJUSTMENT					
19	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	107.1 MHz (100% Mod. with 400 Hz)	107.1 MHz	——	VR503 (Analog frequency indicator)	1. Turn VR503 clockwise until the LED, 15 th from the left, goes out. 2. Slowly turn VR503 clockwise to adjust it to a point at which the 15 th LED lights up and 14 th one goes out.

■ EINSTELLUNGSANWEISUNGEN Deutsch

AM (MW)-EINSTELLUNG

• Stellungen und zu benutzende Geräte

1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
2. AM (MW)-Meßsender (AM-SG)
3. Den Wellenbereichsschalter auf die "AM"-Position stellen.
4. Den MW-Intervallgrößenwähler auf die "9kHz"-Position stellen.
5. Netzspannung auf ihren Sollwerthalten.
6. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
7. Nittels eines Schraubenziehers die Stellung der Antennenspule (L201) so einstellen, daß, sie gegen die Rückenplatte einen Winkel von ca. 25° macht.
8. Einen nichtmetallischen Schradbenzieher für die Einstellungen verwenden.

Nr.	AM (MW)-MESSENDER ANSCHLUSS	AM (MW)-MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	AM (MW)-ZF-ABGLEICH					
1	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Anten-neneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400Hz Modulat., 30%)	Kein Empfang	Oszilloskop oder Wech-selstrom-Voltmeter an Ausgangsklemme (OUT-PUT) Schließen	L203 (1. IFT) L204 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adustie-ren, daß der Ausgang den maximalen Wert erreicht.
	AM (MW)-HF-ABGLEICH					
2	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Anten-neneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	522kHz (400Hz Modulat., 30%)	522kHz	Zwischen TP201 und Erdung Gleichstrom-Voltmeter schließen.	L202 (Osc. Spule)	L202 so justieren, daß die mit Voltmeter gemessene. Spannung 1,0V ± 0.05V beträgt.
3		612kHz (400Hz Modulat., 30%)	612kHz	Oszilloskop oder Wech-selstrom-Voltmeter an Ausgangsklemme (OUT-PUT) Schließen.	L201 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L201 mit einem Schraubendreher justieren.
4		1503kHz (400Hz Modulat., 30%)	1503kHz	Oszilloskop oder Wech-selstrom-Voltmeter an Ausgangsklemme (OUT-PUT) Schließen.	CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (3) und (4) wied-erholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.

FM (UKW)-EINSTELLUNG

• Verwendete Einrichtungen
1. UKW-Meßsender (FM-SG)
2. Stereo-Modulator (oder Trennmesser)
3. Verzerrungsmesser
4. Oszilloskop
5. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
6. Signalfrequenzmesser (meßbar für 19kHz und 108 MHz)
7. UKW 75 Ohm Kunstantenne (Abb. 1) und Tiefpaßfilter (fc = 15 ~ 19 kHz)

• Vorbereitung AM UKW-Messender (FM-SG)
1. Stereo-Modulator an FM-SG anschließen.
2. SG-Ausgang über 75-Ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen.
3. Der normale Eingang des Gerätes beträt 60 dB (1 mV), 400 Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12 dB plus (IHF) sein: d.h. beim Eingang von 60 dB soll der Signalausgang 72 dB sein.)

• Zustand des Gerätes
1. Den UKW-ZF-Bandbreitenschalter auf die "normal" position stellen.
2. Den UKW-Betriebsartenschalter auf die "auto" position stellen.
3. Den Signal-/Mehrweg-Wahlschalter auf die "signal" position stellen.
4. Den UKW-Stummabstimmschalter auf die "off".position stellen.
5. Den Wellenbereichsschalter auf die "FM" position stellen.
6. Die anderen Einstellungen entsprechen den AM (MW)-Einstellungen.

Nr.	FM (UKW) MESSENDER ANSCHLUSS	FM (UKW) MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUN	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	UKW-ZF-ABGLEICH					
5	–	Kein Signal	100.1MHz	Ein Gleichstromröhren-voltmeter zwischen TP102 und TP103 über eine Drosselspule verbinden. (Siehe Abb. 2)	T102 (Diskriminator FT)	Den kern von T102 so justieren, daß die gemessene Spannung im signallosen Modus 0 V im 300mV Bereich beträgt.
	UKW-HF-ABGLEICH					
6	–	Kein Signal	87.9MHz	Zwischen TP1 und Erdung Gleichstrom-Voltmeter schließen.	L10 (Osc. Spule)	L10 so justieren, daß die vom Gleichstrom-Voltmeter gemessene Spannung 4,1V ± 0,1V beträgt.
7	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90.1MHz (400 Hz Modulat., 100%)	90.1MHz	Oszilloskop an Ausgangsklemme (OUTPUT) Schließen.	L4, L5, L6, L8 (HF Det. Spule) L1, L2 (Ant. Spule) T101 (IFT)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 3) 3. Die Einstellung von (7) und (8) wiederhoten, bis die Frequenz mit der Skala übereinstimmt. 4. Schritt (6) überprüfen und, falls Abweichung vorhanden, L10 erneut justieren.
8		106.1MHz (400 Hz Modulat., 100%)	106.1MHz	Oszilloskop an Ausgangsklemme (OUTPUT) Schließen.	CT7 (Osc. Trimmer)	
	ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO					
9	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	100.1MHz (400 Hz Modulat., 100%)	100.1MHz	Verzerrungsmesser an rechten und linken Kanäle Ausgangsklemme "OUTPUT" des Gerätes schließen.	T103 (Diskriminator FT)	1. Schritt (5) überprüfen und, falls Abweichung vorhanden, T102 erneut justieren. 2. T103 Kern für minimale Verzerrung der rechten und linken Kanäle justieren.
	UKW-MPX-PILOTABGLEICH (VCO)					
10	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Mono-Signal)	100.1MHz (Un-modulierte Welle)	100.1MHz	Signal frequenzmesser an TP302 schließen.	VR301 (VCO)	VR301 so abgleichen, daß Ausgangsfrequenz von TP302 19kHz ± 30 Hz
	KONTROLL - BANDPASSFILTER - ABGLEICH					
11	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (Un-modulierte Welle)	100.1MHz	Wechselstrom-voltmeter an TP301 schließen.	L302 L303 (Pilot BPF)	L302 und L303 so abstimmen, daß die Ausgangsspannung maximal ist.
	KONTROLL - AUFLÖSEN - ABGLEICH					
12	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (Un-modulierte Welle)	100.1MHz	Oszilloskop an TP303 schließen.	L303 VR303 (Kontrollauflösen)	L303 und VR303 abwechelnd so einstellen, daß die Ausgangsspannung am TP303 minimalisiert wird und die Wellenform wie in Abb. 4 erscheint.

Nr.	FM (UKW) MESSENDER ANSCHLUSS	FM (UKW) MESSENDER FREQUENZ	ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUN	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHSVERFAHREN
	PHASENSCHIFTERABGLEICH					
13	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400 Hz Modulat., 100%) L-Betriebsart	100.1MHz	Wechselstrom-voltmeter an L-Kanal Ausgangsklemme (OUTPUT) schließen.	VR302 (Phasenregelung)	VR302 so abstimmen, daß die Ausgangsleistung des linken Kanals maximal ist.
	STEREO-VERZERRUNGSABGLEICH					
14	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400 Hz Modulat., 100%) L-Betriebsart	100.1MHz	Tiefpaßfilter (fc = 15 ~ 19kHz) über Verzerrungsmesser an Ausgangsklemme (OUTPUT) des Gerätes schließen.	T101 (IFT)	1. Den schon eingestellten T101 erneut, innerhalb von ± 90° von der voreingestellten kernposition einstellen, sodaß die Verzerrung des linken Kanals minimalisiert wird. 2. Die Schritte 5 ~ 8 und 9 noch einmal überprüfen.
	TRENNUNG - ABGLEICH					
15	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400 Hz Modulat., 100%) L- oder R-Betriebsart	100.1MHz	Tiefpaßfilter (fc = 15 ~ 19kHz) über Wechselstrom-voltmeter an Ausg-angsklemme (OUT-PUT) des Gerätes schließen.	VR401	VR401 auf minimale Anzeige des R-Ausgangs bei Stereo-modulator in L-(L-Kanal-modulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen.
	SIGNALPEGEL - ABGLEICH					
16	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (50dB inden Antennen-eingang leiten.)	100.1MHz (400 Hz Modulat., 100%).	100.1MHz	———	VR501	1. Die signalpegel halbfesteinge-stellten Widerstände VR501 auf Minimalstellung drehen. (Entgegen dem Uhrzeigersinn) 2. Den einstellbaren Widerstände VR501 so einstellen, daß die fünfte Leuchtdiode (LED) auf leuchtet.
	UKW-SIGNALPEGEL-ABGLEICH * Mit der Justierung frühestens 1 Minute nach Einschalten der Stromzufuhr beginnen.					
17	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen.	100.1MHz (400 Hz Modulat., 100%)	100.1MHz	———	VR502	1. 80dB an das Gerät anlegen. 2. Die UKW-Signalpegeltaste drücken, damit das FL-In-strument den Signal-stärkepegel anzeigt. 3. VR502 so justieren, daß 78dB angezeigt wird. 4. Überprüfen, daß der Signal-stärkepegel 36 ~ 48dB beträgt, wenn die Ein-gangsleistung 40dB ist. * Falls der Pegel unter 36dB liegt, R590 abtrennen, erneut justieren und kontrollieren.
	QUARZ-VERRIEGEIUNGSANZIGER					
18	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (6dB in den Antennen-eingang leiten.)	100.1MHz (400 Hz Modulat., 100%)	100.1MHz	———	VR101	1. VR101 entgegen dem Uhrzeigersinn drehen, bis der Quarz-Verriegelungsanzeiger erlöscht. 2. VR101 langsam entgegen dem Uhrzeigersinn drehen und auf einen Punkt abstimmen, an welchem der Quarz-Verriege-lungsanzeiger aufleuchtet.
	ANALOGFREQUENZANZEIGE					
19	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen.	107.1MHz (400 Hz Modulat., 100%)	107.1MHz	———	VR503	1. VR503 im Uhrzeigersinn drehen, bis die 15. LED von links erlöscht. 2. VR503 langsam im Uhrzeigersinn drehen und auf einen Punkt abstimmen, an welchem die 15. LED auf-leuchtet und die 14. LED erlöscht.

■ INSTRUCTIONS DE REGLAGE — Français

REGLAGE DE AM

• Réglage et équipment utilisé

1. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
2. Générateur du signal AM (AM-SG).
3. Sélecteurs de gammes d'ondes sur la position "AM".
4. Sélecteur d'intervalle de fréquency AM sur la position "9kHz".
5. Conservel la tension du secteur à la tension nominale.
6. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
7. Régler la position de la bobine (L201) de l'antenne en utilisant un tournevis de telle sorte qu'alle soit environ à 25 degrés de la plaue arrière.
8. Utiliser un tournevis non-métallique pour le réglage.

No.	AM GENERATEUR BRANCHEMENT	AM GENERATEUR FREQUENCE	FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	REGLAGE DE FI-AM					
1	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée sous puissante).	450kHz (modulé à 30% par 400 Hz)	Point sans signal	Brancher le voltmètre à courant alternatif et l' oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	L203 (1 transfo FI) L204 (2 transfo FI)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
	REGLAGE DE RF-AM					
2	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	522kHz (modulé à 30% par 400 Hz)	522kHz	Brancher le voltmètre à courant continue entre TP201 et la prise terre.	L202 (Bobine OSC)	Régler L202 de telle sorte que le voltmètre à courant continu, soit de 1.0 ± 0.05 V.
3		612kHz (modulé à 30% par 400 Hz)	612kHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	L201 (Bobine Ant.)	1. Régler au maximum de signal de sortie. 2. Refaire les étapes (3) et (4) jusqu'à ce que le fréquence s'aligne correctement avec l'affichage du cadran.
4		1503kHz (modulé à 30% par 400 Hz)	1503kHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	CT201 (Trimmer Ant.)	1. Régler au maximum de signal de sortie. 2. Refaire les étapes (3) et (4) jusqu'à ce que le fréquence s'aligne correctement avec l'affichage du cadran.

REGLAGE DE FM

• Equipment utilisé

1. Générateur du signal FM (FM-SG).
2. Commande de réglage stéréophonique (ou vu-mètre de séparation).
3. Jauge de distorsion.
4. Oscilloscope.
5. Voltmètres électronique de courant alternatif et de courant continu (VTVM).
6. Compteur de fréquence (19kH et 108MHz mesurable).
7. Antenne fictive FM, 75 ohms (Fig. 6) et filtre passe-bas (fc = 15 ~ 19kHz)

• Préparation du générateur de signal FM (FM-SG)

1. Brancher la commande de réglage stéréophonique à FM-SG.
2. Alimenter la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 75 ohms.
3. L'entrée standard de l'appareil est de 60dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenne fictive, la sortie SG doit être de plus 12dB (IHF). Ce qui signifie que quand l'entrée est de 60dB, la sortie SG doit être de 72dB).

• Conditions de l'appareil

1. Placer le interrupteur de gamme FM-IF sur la position "normal".
2. Placer le sélecteur de mode FM sur la position "auto".
3. Placer le sélecteur de l'indicateur de signal/distorsion d'écho sur la position "signal".
4. Placer le commutateur de réglage silencieux FM sur la position "off".
5. Placer le sélecteurs de gammes d'ondes sur la position "FM".
6. Les autres réglages sont les mêmes que les réglages de AM.

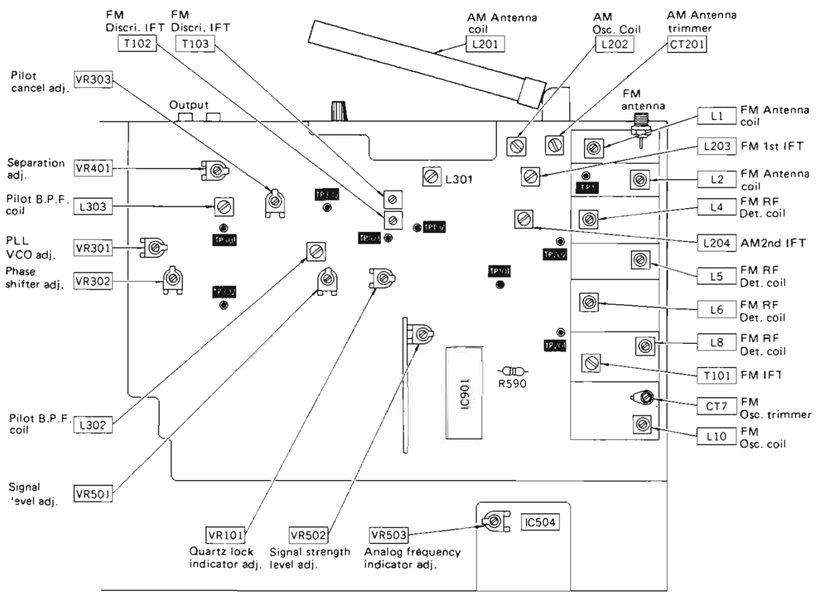
No.	FM GENERATEUR BRANCHEMENT	FM GENERATEUR FREQUENCE	FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	REGLAGE DE FI-FM					
5	–	Sans Signal	100.1MHz	Brancher le voltmètre électronique à C.C. aux bornes TP102 et TP106 (Voir la Fig. 7)	T102 (Transfo FI discri.)	Régler le noyau T102 de telle sorte que le voltage mesuré dans le mode sans signal, soi de 0V dans la gamme des 300 mV.

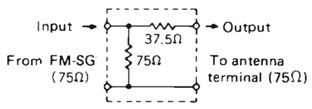
No.	FM GENERATEUR BRANCHEMENT	FM GENERATEUR FREQUENCE	FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	REGLAGE DE RF-FM					
6	–	Sans Signal	87.9MHz	Brancher le voltmètre à courant continu entre TP1 et la prise de terre.	L10 (Bobin Osc.)	Régler L10 de telle sorte que le voltage mesuré par le voltmètre à courant continu soit de 4,1V.
7	Branchez sur la prise d'antenne FM à traves une antenne fictive FM	90.1MHz (modulé à 100% par 400 Hz)	90.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	L4, L5, L6, L8 (Détecteur) L1, L2 (Bobin Ant.) T101 (Transfo FI)	1. Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. 2. Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 8) 3. Refaire les réglages (7) et (8) jusqu'à ce que la fréquence corresponde correctement avec l'échells du cadran. 4. Vérifier l'étape (6) et si elle est déviée régler à nouveau L10.
8		106.1MHz (modulé à 100% par	106.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	CT7 (Trimmer Osc.)	
	REGLAGE DE LA DISTORSION FM EN MONO					
9	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	100.10MHz (modulé à 100% par 400 Hz)	100.1MHz	Brancher le compteur de distorsion à la borne de sortie (OUTPUT) du canal gauche et droit de l'appareil.	T103 (Transfo FI discri.)	1. Vérifier l'étape (5) et si elle est déviée régler à nouveau T102. 2. Régler le noyou T103 de telle sorte que la distorsion des canaux droit et gauche soit la plus faible.
	REGLAGE (VCO) PILOTE MULTIPLEX FM					
10	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal monoscous-tique)	100.1MHz (Non modulé)	100.1MHz	Brancher le compteur de fréquence à TP302 .	VR301	Régler VR301 de telle sorte que la fréquence de sortie de TP302 soit de 19kHz ± 30 Hz.
	REGLAGE FILTRE PILOTE PASSE - BANDE					
11	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (Non modulé)	100.1MHz	Brancher un voltmètre à à courant alternatif à TP301 .	L302 L303 (BPF signal pilote)	Régler la L302 et al L303 de telle sorte que la tension de sortie soit maximale.
	ANNULATION DU SIGNAL PILOTE					
12	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (Non modulé)	100.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope à TP303 .	L303 VR303	Régler les L303 et VR303 alternativement de telle sorte que la tension de sortie du TP303 soit minimale et que la forme d'ondes soit celle montrée sur la Fig. 9.
	REGLAGE DU DEPHASEUR					
13	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (modulé à 100% par 400 Hz) (Mode G)	100.1MHz	Brancher un voltmètre à courant continu à la borne de sortie du canal gauche.	VR302	Régler la VR302 de telle sorte que la sortie du canal gauche, soit maximale.
	REGLAGE DE LA DISTORSION STEREO					
14	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (modulé à 100% par 400 Hz) (Mode G)	100.1MHz	Brancher le filter passe-bas (fc = 15 ~ 19kHz) à la borne de sortie (OUTPUT) de l'appareil par un distorsion à courant alternatif.	T101	1. Rerégler le T101 déjà réglé, à ± 90° de la position préréglée du noyau de telle sorte que la distorsion du canal gauche soit minimale. 2. Revérifier les étapes 5 ~ 8 et 9.

No.	FM GENERATEUR BRANCHEMENT	FM GENERATEUR FREQUENCE	FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	REGLAGE DE LA SEPARATION DES CANAUX					
15	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (modulé à 100% par 400 Hz) (Mode G ou D.)	100.1MHz	Brancher le filter passe-bas (fc = 15 ~ 19kHz) à la borne de sortie (OUTPUT) de l'appareil par un voltmètre à courant alternatif.	VR401	Régler VR401 de telle sorte que la sortie droite soit minimale quand la commande d'accord stéréophonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans mode droit.
	INDICATEUR DE SIGNAL					
16	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 50dB à la borne de l'antenne.)	100.1MHz (modulé à 100% par 400 Hz)	100.1MHz	———	VR501	1. Tourner les résistances VR501 semifixes sur le minimum. (à gauche.) 2. Régler la VR501 de telle sorte que la 5ème LED sállume.
	INDICATEUR D'INTENSITE DES SIGNAUX FM • Commencer la mise au point apres 1 minute au moins la mise en marche de l'alimentation.					
17	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	100.1MHz (modulé à 100% par 400 Hz)	100.1MHz	———	VR502	1. Appliquer 80dB à l'appareil. 2. Appuyer sur la touche de signaux FM de façon à ce que le F.L. indique le niveau d'intensité des signaux. 3. Régler VR502 de façon à ce que 78 dB soit indiqué. 4. S'assurer que le niveau d'intensité des signaux soit de 36 ~ 48dB lorsque l'entrée est de 40dB. • Si le niveau est au-dessous de 36dB, mettre hors circuit R590, régler à nouveau et vérifier.
	INDICATEUR DE VERROUILLAGE QUARTZ					
18	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 6dB á la borne de l'antenne.)	100.1MHz (modulé à 100% par 400 Hz)	100.1MHz	———	VR101	1. Tourner VR101 dans le sens inverse des aiguilles d'une montre jusqu'à ce que l'indicateur de verrouillage à quartz s'éteigne. 2. Tourner lentement VR101 dans le sens des aiguilles d'une montre pour le régler au point auquel l'indicateur de verrouillage à quartz s'allumera.
	INDICATEUR DE ANALOGIQUE					
19	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	107.1MHz (modulé à 100% par 400 Hz)	107.1MHz	———	VR503	1. Tourner VR503 dans le sens des aiguilles d'une montre jusqu'à ce que la diode électro-luminiescente, la 15e à partir de la gauche, s'éteigne. 2. Tourner lentement VR503 dans le sens des aiguilles d'une montre pour le régler au point auquel la 15e diode électro-luminescente s'éclairera et la 14e s'éteindra.

■ ADJUSTMENT POINTS

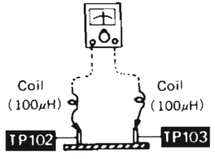
Note: L301 have been already adjusted. so, do not turn the core.





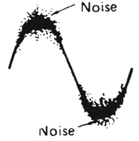
(75Ω FM dummy antenna)

Fig. 6
(Abb. 1)



(IF voltage adjustment)

Fig. 7
(Abb. 2)



(AF output waveform)

Fig. 8
(Abb. 3)

(Pilot signal cancel)

Fig. 9
(Abb. 4)

■ REPLACEMENT PARTS LIST . . . Electric Parts

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Areas
* [E] is available in Switzerland and Scandinavia.
* [EG] is available in F.R. Germany.
* [EF] is available in France.
* [EH] is available in Holland.
* [EB] is available in Belgium.
* [EK] is available in United Kingdom.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.

Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUITS			
IC101		SVIM5215L	IC, FM IF Amplifier
IC102		SVIUPC1198H	IC, FM IF Amplifier
IC103		RVIUPC1018CF	IC, FM IF & AM Converter
IC104		SVIUPC1167C2	IC, FM IF Detector
IC301		SVIUPB553C–E	IC, FM MPX
IC302, 401, 501		AN6552F	IC, Multipath, Buffer and Loop Filter
503			
IC303		SVIUPD4066C	IC, Peak Sampling Switch
IC502		AN6876	IC, LED Driver
IC504		SVIUAA170	IC, LED Driver
IC901		SVID1704C514	IC, Micro-Computer
IC902		SVIUPB553C–E	IC, Pre-Scaler
IC903		SVIMSL915RS	IC, FL Driver
TRANSISTORS			
Q1, 2		3SK74–L1	Transistor, FM RF Amplifier
Q3		**2SC1674–M**	Transistor, FM Mixer
Q4, 5, 6		**2SC1675–L**	Transistor, Oscillator & Buffer (Use in ranks L1 or L2)
Q101, 102, 103		**2SC829–C**	Transistor, Switching
Q104, 301, 501 509, 510, 511 601 ~ 608, 610 611, 613 ~ 616 902 ~ 905		**2SC945–Q**	Transistor, Phase Shift, AM Amplifier Switching, Quartz Lock Lamp Driver, Loop Filter, Muting
Q502, 503, 609 612, 702 ~ 704 901		**2SA733–P1**	Transistor, AM Amplifier, Switching, Muting
Q701		2SD762–O	Transistor, Regulator
Q705		2SC1815–Y	Transistor, Regulator
DIODES			
D1 ~ 7		SVDSVC211	Diode, Variable Capacitor (for FM)
D101, 102		**MA182A**	Diode, AGC
D202, 502, 504 921		**20A90**	Diode, Switching
D201		SVDBB312E	Diode, Variable Capacitor (for AM)
D104, 203, 503 505, 536, 538 605 ~ 608, 610 612 ~ 618, 705 711, 901, 902 904, 905, 907 908, 911 ~ 920 922		**MA162A**	Diode, Switching
D506 ~ 510		SVDGL–9PR9	Light Emitting Diode, Red
D511		SVDGL–9HY9	Light Emitting Diode, Yellow
D512		SVDMZ303BM	Diode, 3V Zener
D513		**MA27A2**	Diode
D516 ~ 531		SVDGL–9PR4	Light Emitting Diode, Red
D532		**MA162A**	Diode
D534, 535, 540		**20A90**	Diode
D537		SVDMZ416	Diode, 16V Zener
D541		**MA27A1**	Diode
D701 ~ 704	△	**SVDSR1K2**	Rectifier
D706		SVDMZ333A	Diode, 33V Zener
D707		**SVDEQA0113RA**	Diode, 13V Zener
D708		SVDMZ330A2	Diode, 3V Zener
D709		**RVDRD6R2EB**	Diode, 6.2V Zener
D710		MA1064A	Diode, 6.4V Zener
D910, 923 (E, EK EG, EF, EH, EB) only		**MA162A**	Diode, Switching
D924, 925 [XA, XL] only		**MA162A**	Diode, Switching
D926		**MA162A**	Diode, Switching

Ref. No.		Part No.	Part Name & Description
COILS and TRANSFORMERS			
L1		SLA4P65	Coil, FM Antenna
L2, 4, 6		SLD4P43	Coil, FM Antenna, RF Detector
L3, 7, 11		SLQAN40G1	Coil, Choke
L5, 8		SLD4P45	Coil, FM Detector
L9		RLQY15G5–Y	Coil, Choke
L10		SLO4P73	Coil, Oscillator
L101, 901		RLQX1013–D	Coil, Choke
L201		SLF2D73	Coil, AM Bar Antenna
L202		SLO2C29–P	Coil, AM Oscillator
L203		SLI2C127	Coil, AM IF
L204		SLI2C413	Coil, AM IF
L301		SLM1C47–P	Coil, Low Pass Filter
L302, 303		SLM1C57–Z	Coil, Pilot Band Pass Filter
T101		SLI4C109	Transformer, FM IF
T102		SLI4C529–Z	Transformer, FM IF
T103		SLI4C531–Z	Transformer, FM IF
T701	△	SLT5K119–W	Transformer, Power Source
T701 [XL] only	△	SLT5K121–W	Transformer, Power Source
CERAMIC FILTERS			
CF101, 105		SVFE107MX2–A	Ceramic Filter, FM 10.7MHz Red
		SVFE107MX2–D	Ceramic Filter, FM 10.65MHz Black
CF102, 103		SVFE107MZ2–A	Ceramic Filter, FM 10.7MHz Red
		SVFE107MZ2–D	Ceramic Filter, FM 10.65MHz Black
CF104		SVFE107MM–A	Ceramic Filter, FM 10.7MHz Red
		SVFE107MM–D	Ceramic Filter, FM 10.65MHz Black (Use pair ranks as same as CF101, CF102, CF103, CF104 and CF105)
CF201		SVFSFP450HT	Ceramic Filter, AM 450kHz
VARIABLE RESISTORS			
VR101		**EVTS3MA00B34**	Quartz Lock LED Adjustment, 30kΩ, (B)
VR301		**EVTS3MA00B53**	VCO Adjustment, 5kΩ (B)
VR302		**EVTS3MA00B14**	Phase Shift Adjustment, 10kΩ (B)
VR303		**EVTS3MA00B54**	Pilot Cancel Adjustment, 50kΩ (B)
VR401		**EVTS3MA00B15**	Separation, Adjustment, 100kΩ (B)
VR501, 503		**EVTS3MA00B24**	Signal LED and Analog Adjustment, 20kΩ (B)
VR502		**EVTS0AA00B14**	Signal Strength LED Adjustment, 10kΩ (B)
CRYSTAL			
X901		SVQ43U452	Crystal, 4.5MHz Counter Oscillator
VARIABLE CAPACITORS			
CT7		SVCTY121B269	Trimmer, FM Oscillator
CT201		SVCTY122D221	Trimmer, AM Antenna
COMPONENT COMBINATIONS			
Z201		EXRP203P104T	Component Combination, 0.02μF, 100kΩ
Z901		EXBP87104K	Component Combination, 100kΩ, (x 7)
Z902		EXFP7331MW	Component Combination, 33pF, (x 7)
THERMISTERS			
TH101		ERTC12FHL103S	Thermister, Thermal Compensation, 10kΩ
TH702 [XA, XL] only		ERTD2FHL103S	Thermister, Thermal Compensation, 10kΩ

Ref. No.		Part No.	Part Name & Description
LAMP			
PL501 ~ 503	△	XAMR68S8	Lamp, 0.07A (8V)
FLUORESCENT DISPLAY TUBE			
FL		SAD7MT29ZA	Fluorescent Display Tube
LIQUID ELECTROLYTE DOUBLE LAYER CAPACITOR			
C717 ~ 719		EECW1RB43R3S	Liquid Electrolyte Double Layer, 3.3F (1.8V)
SWITCHES			
S1 ~ 5		SSH537	Switch, FM Tuning, Muting Display Mode FM Mode, FM IF Select
S1 ~ 5 [XA, XL] only		SSH533	Switch, FM Tuning, Muting, Display Mode FM Mode, FM IF Select
S6		SSG7	Switch, Preset, AM/FM Mode, FM Signal Tuning, Memory
S8	△	SSH183	Switch, Power Source
S10		SSS43	Switch, FM/AM Allocation
S11	△	ESB70133	Switch, Power Source
S12	△	ESE372	Switch, Voltage Adjustor
FUSES			
F1	△	XBA2C10TR0	Fuse, T 1.0A, (250V)
F2	△	XBA2C10TR0	Fuse, T 200mA, (250V)
RESISTORS			
R1		**ERD50TJ104**	Carbon, 1/2W, 100kΩ, ± 5%
R2		**ERD25FJ823**	Carbon, 1/4W, 82kΩ, ± 5%
R3		**ERD50TJ184**	Carbon, 1/2W, 180kΩ, ± 5%
R4, 5		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R6		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R7		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R9		**ERD25FJ100**	Carbon, 1/4W, 10Ω, ± 5%
R10, 11		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R12		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R14		**ERD25FJ100**	Carbon, 1/4W, 10Ω, ± 5%
R15, 16		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R18		**ERD25FJ822**	Carbon, 1/4W, 8.2kΩ, ± 5%
R19		**ERD25TJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R20		**ERD25FJ152**	Carbon, 1/4W, 1.5kΩ, ± 5%
R21		**ERD25FJ221**	Carbon, 1/4W, 220Ω, ± 5%
R22		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R23		**ERD25TJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R24		**ERD25FJ221**	Carbon, 1/4W, 220Ω, ± 5%
R25		**ERD25FJ152**	Carbon, 1/4W, 1.5kΩ, ± 5%
R26		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R27		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R28		**ERD25FJ221**	Carbon, 1/4W, 220Ω, ± 5%
R29		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R30		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R31		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R32		**ERD25TJ154**	Carbon, 1/4W, 150kΩ, ± 5%
R33		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R36		**ERD25FJ221**	Carbon, 1/4W, 220Ω, ± 5%
R101		**ERD15FJ470**	Carbon, 1/4W, 47Ω, ± 5%
R102		**ERD25FJ331**	Carbon, 1/4W, 330Ω, ± 5%
R104		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R105		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
R106		**ERD25FJ331**	Carbon, 1/4W, 330Ω, ± 5%
R107		**ERD25FJ681**	Carbon, 1/4W, 680Ω, ± 5%
R108, 109		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R110, 111		**ERD25TJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R112		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R113		**ERD25FJ331**	Carbon, 1/4W, 330Ω, ± 5%
R114		**ERD25FJ122**	Carbon, 1/4W, 1.2kΩ, ± 5%
R116	△	**ERD25FJ470**	Carbon, 1/4W, 47Ω, ± 5%

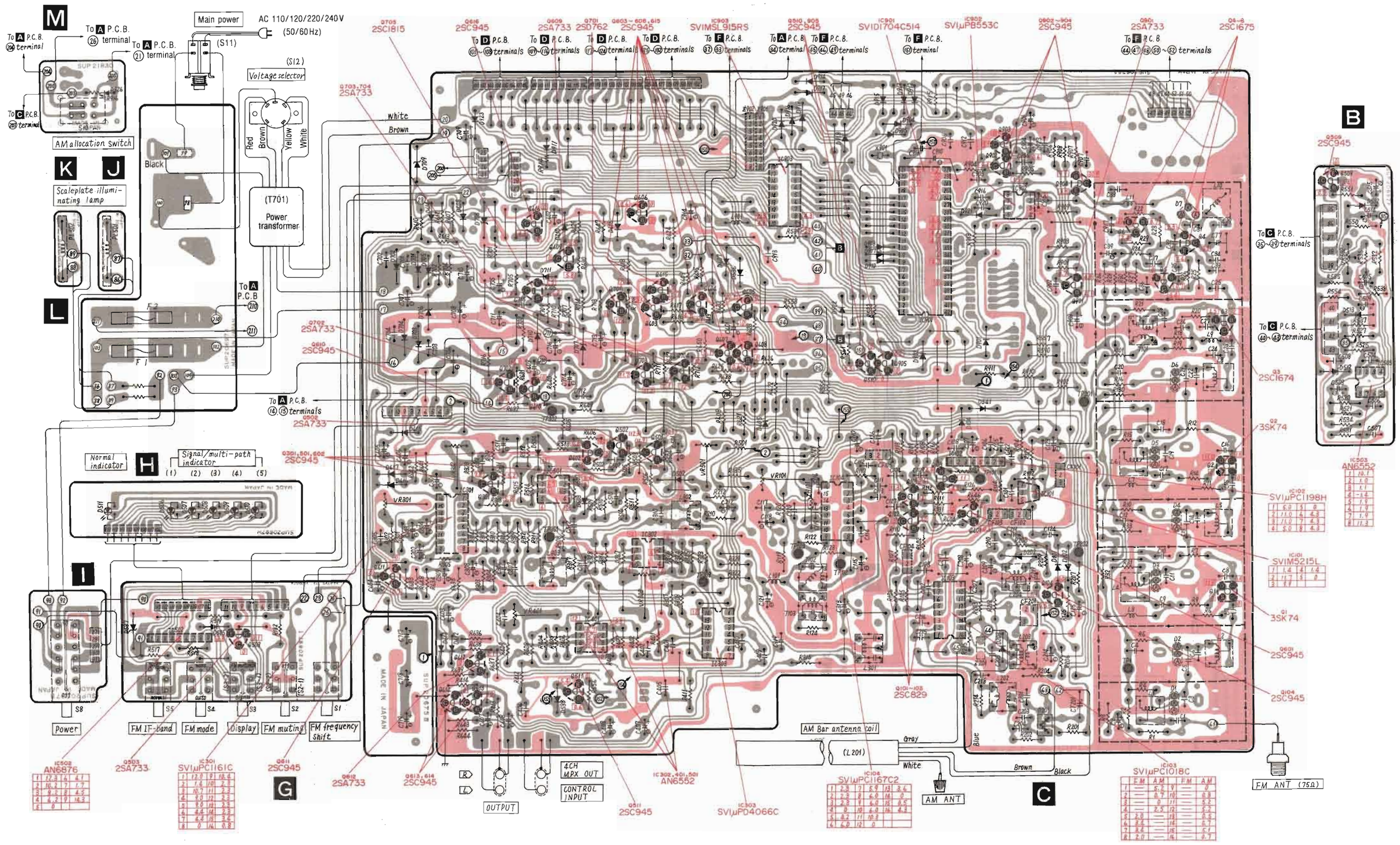
Ref. No.		Part No.	Part Name & Description
R117		**ERD25FJ331**	Carbon, 1/4W, 330Ω, ± 5%
R118 [XA, XL] only		**ERD25TJ123**	Carbon, 1/4W, 12kΩ, ± 5%
R119		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R120		**ERD25FJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R121	△	**ERD25FJ470**	Carbon, 1/4W, 47Ω, ± 5%
R122		**ERD25FJ682**	Carbon, 1/4W, 6.8kΩ, ± 5%
R123		**ERD25TJ183**	Carbon, 1/4W, 18kΩ, ± 5%
R124		**ERD25FJ182**	Carbon, 1/4W, 1.8kΩ, ± 5%
R125		**ERD25TJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R126		**ERD25FJ332**	Carbon, 1/4W, 3.3kΩ, ± 5%
R127		**ERD25TJ183**	Carbon, 1/4W, 18kΩ, ± 5%
R129, 130		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
R131		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R132		**ERD25TJ273**	Carbon, 1/4W, 27kΩ, ± 5%
R135		**ERD25TJ101**	Carbon, 1/4W, 100Ω, ± 5%
R201		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
R202		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R203		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R204		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R206		**ERD25FJ681**	Carbon, 1/4W, 680Ω, ± 5%
R207		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R208		**ERD25FJ471**	Carbon, 1/4W, 470Ω, ± 5%
R209		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R210		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R212		**ERD25FJ332**	Carbon, 1/4W, 3.3kΩ, ± 5%
R213, 214		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R215		**ERD25FJ103**	Carbon, 1/4W, 10Ω, ± 5%
R216		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R301		**ERD25FJ102**	Carbon, 1/4W, 1kΩ, ± 5%
R302		**ERD25TJ153**	Carbon, 1/4W, 15kΩ, ± 5%
R303, 304		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R305		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R306		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R307, 308		**ERD25FJ682**	Carbon, 1/4W, 6.8kΩ, ± 5%
R309		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R310		**ERD25FJ562**	Carbon, 1/4W, 5.6kΩ, ± 5%
R311, 312		**ERD25TJ153**	Carbon, 1/4W, 15kΩ, ± 5%
R313		**ERD25FJ562**	Carbon, 1/4W, 5.6kΩ, ± 5%
R314		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R315		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R316		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R317		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R318		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R319		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R320		**ERD25FJ122**	Carbon, 1/4W, 1.2kΩ, ± 5%
R321		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R322, 323		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R324, 325		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R326		**ERD25FJ472**	Carbon, 1/4W, 4.7kΩ, ± 5%
R327		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R328		**ERD25FJ272**	Carbon, 1/4W, 2.7kΩ, ± 5%
R329		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R401, 402		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R403, 404		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R405, 406		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R407, 408		**ERD25CKF3301**	Metal Film, 1/4W, 3.3kΩ, ± 1%
R409		**ERD25FJ470**	Carbon, 1/4W, 47Ω, ± 5%
R411, 412		**ERD25FJ181**	Carbon, 1/4W, 180Ω, ± 5%
R413, 414		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R501		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R502		**ERD25FJ103**	Carbon, 1/4W, 10kΩ, ± 5%
R503		**ERD25FJ332**	Carbon, 1/4W, 3.3kΩ, ± 5%
R504		**ERD25TJ333**	Carbon, 1/4W, 33kΩ, ± 5%
R505		**ERD25FJ222**	Carbon, 1/4W, 2.2kΩ, ± 5%
R506		**ERD25TJ223**	Carbon, 1/4W, 22kΩ, ± 5%
R507		**ERD25TJ104**	Carbon, 1/4W, 100kΩ, ± 5%
R508		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R509		**ERD25FJ562**	Carbon, 1/4W, 5.6kΩ, ± 5%
R510, 511		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R512		**ERD25FJ822**	Carbon, 1/4W, 8.2kΩ, ± 5%
R513		**ERD25TJ473**	Carbon, 1/4W, 47kΩ, ± 5%
R514		**ERD25TJ154**	Carbon, 1/4W, 150kΩ, ± 5%
R515		**ERD25FJ822**	Carbon, 1/4W, 8.2kΩ, ± 5%
R516		**ERD25TJ683**	Carbon, 1/4W, 68kΩ, ± 5%
R517, 518		**ERD25FJ392**	Carbon, 1/4W, 3.9kΩ, ± 5%
R519		**ERD25FJ561**	Carbon, 1/4W, 560Ω, ± 5%

Continued on page 28

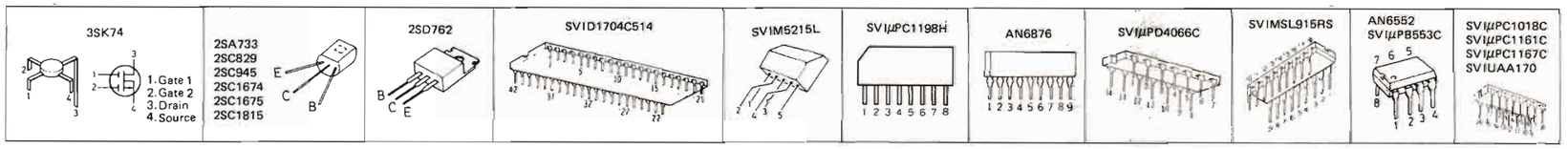
■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines

B FM signal-strength circuit **C** FM/AM tuner and power source circuit **G** Signal/multi-path indicator drive and switches circuit **H** Signal/multi-path indicator circuit **I** Power switch circuit **J** **K** Scale plate illuminating lamp circuit **L** Power supply circuit **M** AM allocation switch circuit



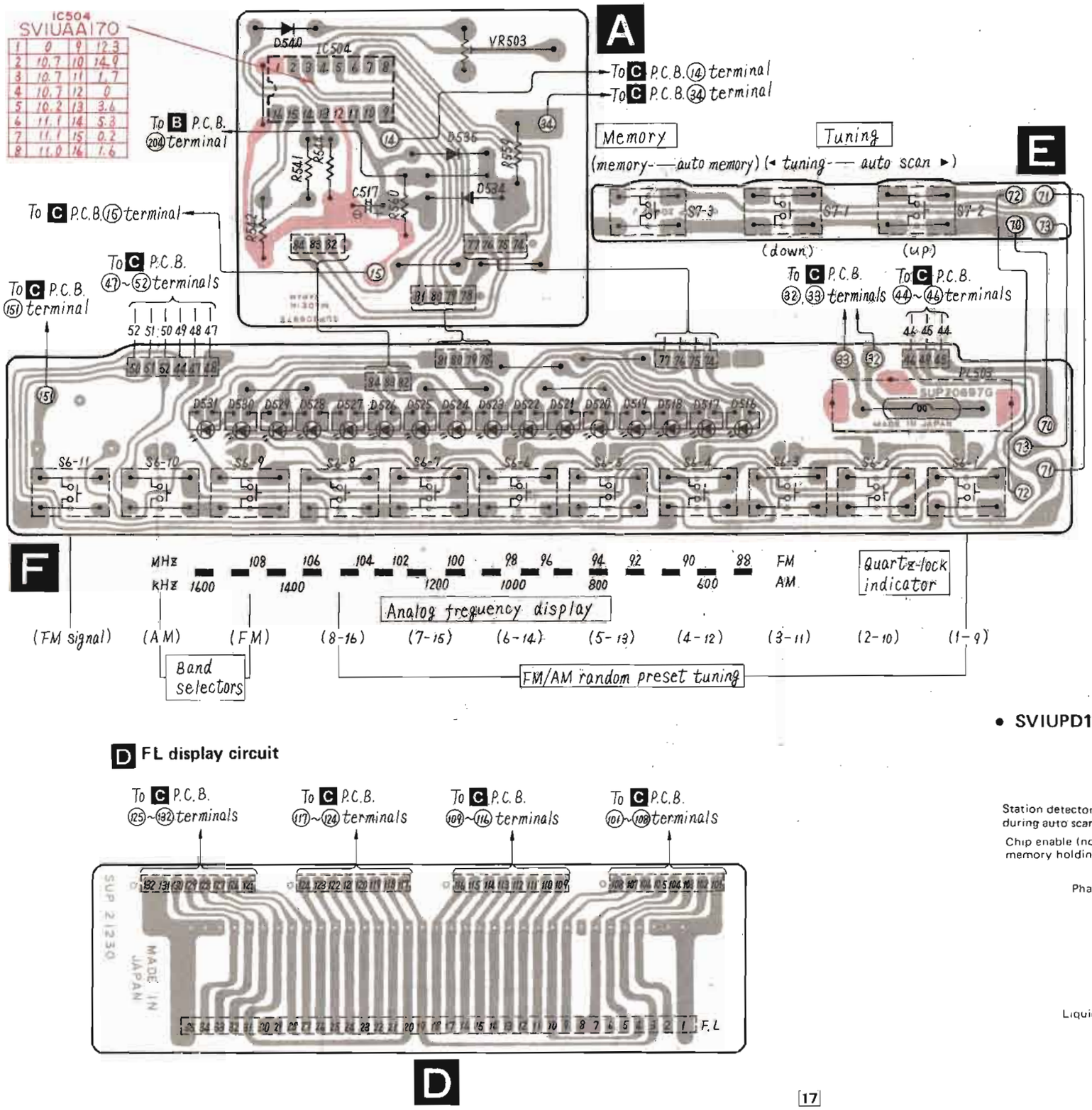
• **Terminal guide of transistors and IC's**



■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

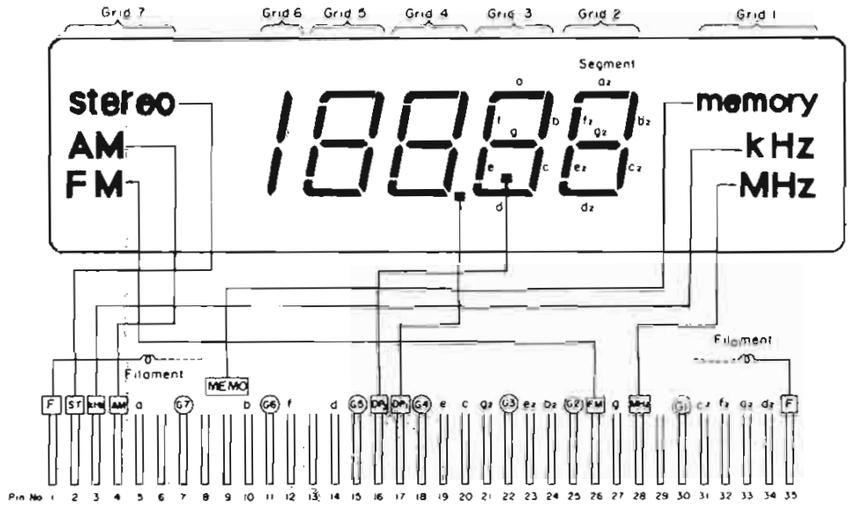
Ground (Earth) lines

A Analog frequency LED drive circuit
E Memory and tuning switches circuit
F Preset-tuning switch and analog frequency LED circuit

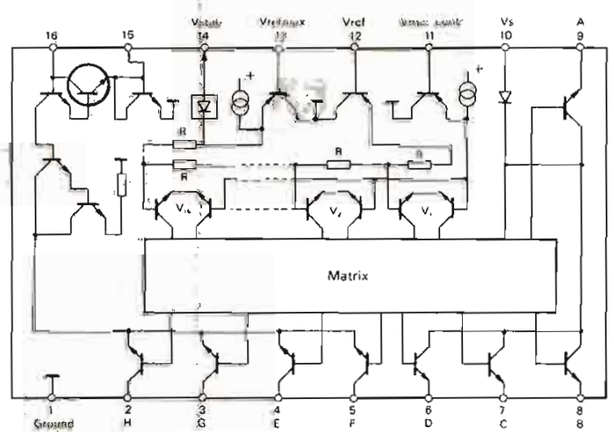


D FL display circuit

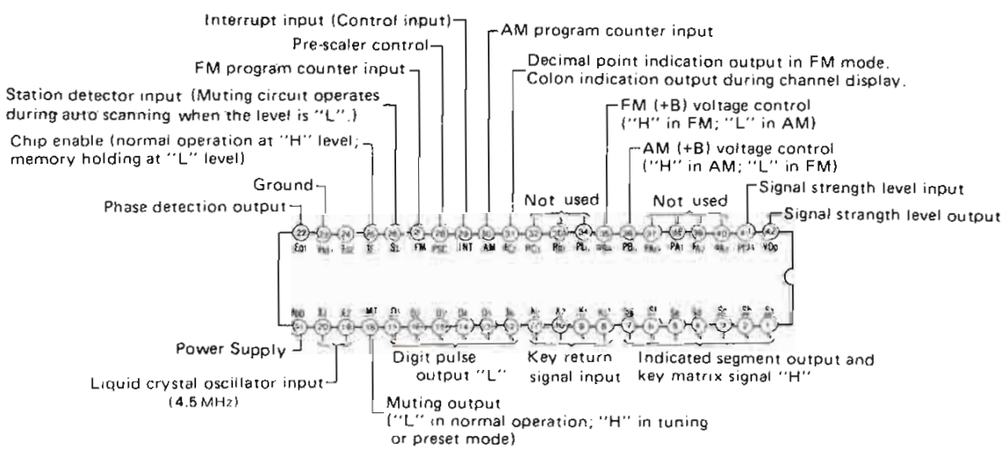
- Fluorescent Display Tube (FL)



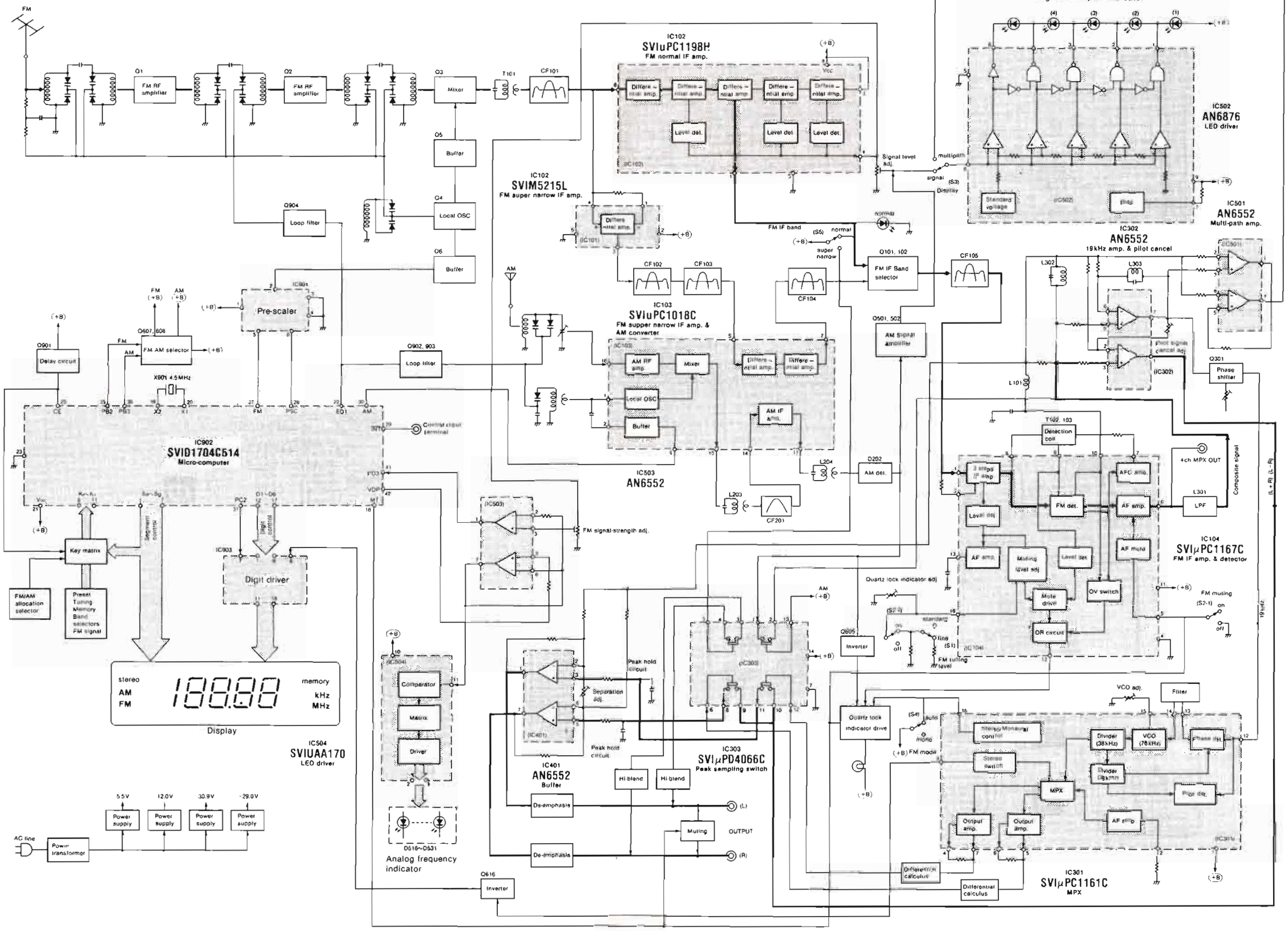
- SVIUAA170 equivalent circuitry



- **SVIUPD1704C514 (Pin names and functions)**



■ BLOCK DIAGRAM

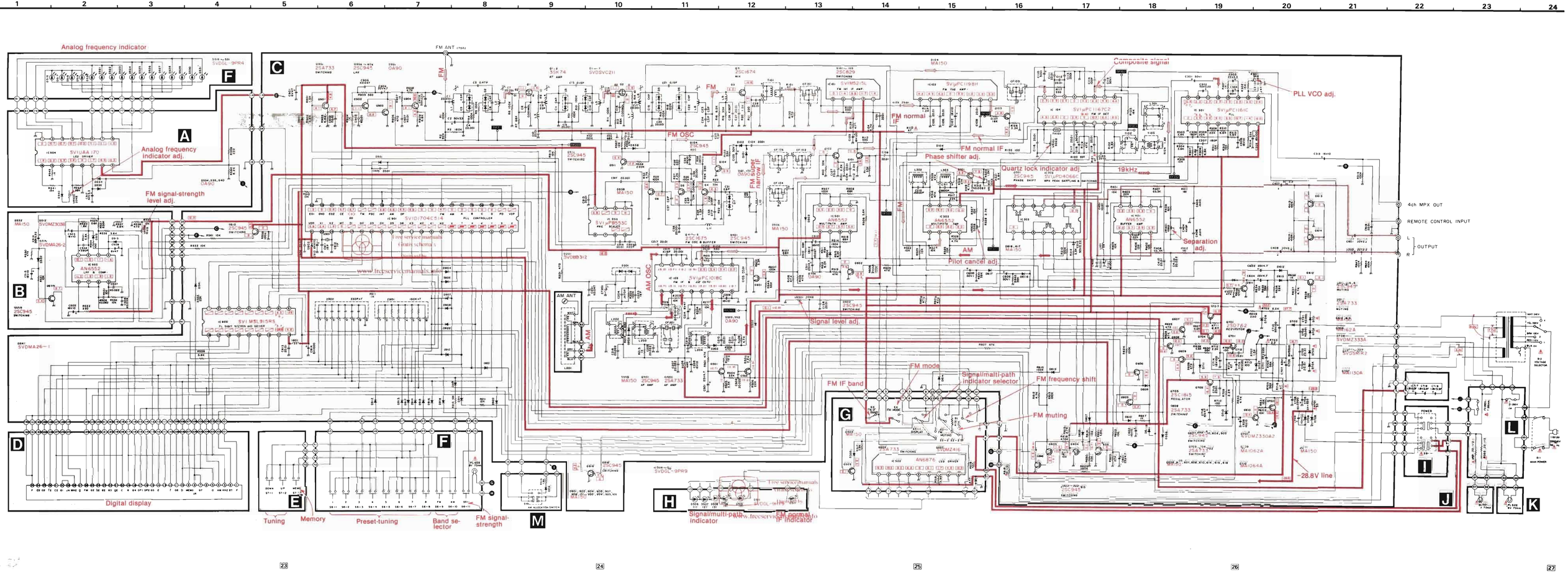


■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

1. **S1** : FM frequency shift selector switch.
2. **S2** : FM muting switch in "**on**" position.
3. **S3** : Display mode switch in "**signal**" position.
   signal ⟵ FM multipath
4. **S4** : FM mode switch in "**auto**" position.
5. **S5** : FM IF band selector switch in "**normal**" position.
   normal ⟵ super narrow
6. **S8-1 ~ S8-8** : FM/AM random preset tuning switch.
   (S8-1 — 1 ch, 9 ch, S8-2 — 2 ch, 10 ch, S8-3 — 3 ch, 11 ch, S8-4 — 4 ch, 12 ch)
   (S8-5 — 5 ch, 13 ch, S8-6 — 5 ch, 14 ch, S8-7 — 7 ch, 15 ch, S8-8 — 8 ch, 16 ch)
   * Slightly push (less than 0.4 sec.) and release it, then 1 through 8 ch. are received.
   Continuously press (over 0.4 sec.) and release it, then 9 through 16 ch. are received.
7. **S8-9, S8-10** : Band selectors switch.
   (S8-9 — FM, S8-10 — AM)
8. **S8-11** : FM signal strength level call switch.
9. **S7-1, S7-2** : Tuning and Auto scan switch.
   (S7-1 — down, S7-2 — up)
   * Slightly push (less than 0.4 sec.) and release it, then FM signal changes in frequency by 0.05 MHz or 0.2 MHz steps while AM by 9 kHz or 10 kHz steps.
   Continuously press (over 0.4 sec.) and release it, then the unit is automatically tuned to FM/AM broadcasting station and is quartz-locked at the station.
   Memory and Auto memory switch.
   * When the memory button is kept released for over 0.4 sec., the unit is automatically tuned to a station of higher frequency and then the mode is stored in the memory.
   In the case of auto memory, FM is preset to 1 through 8 ch., and AM to 9 through 16 ch..
10. **S7-3** :
11. **S8** : Power stand by switch in "**on**" position.
12. **S10** : AM allocation switch in "**10 kHz step**" position. 9 kHz step ⟵ 10 kHz step
13. **S11** : Main power switch in "**on**" position.
14. **S12** : Voltage selector switch in "**220V**" position.
    ① 110V ⟵ ② 120V ⟵ ③ 220V ⟵ ④ 240V
15. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with 8Ω chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
    * Figures in ( ) stand for DC voltage in FM/AM signal reception mode.
    * Figures in [ ] stand for DC voltage in FM stereo signal reception mode.
    * Figures in < > stand for DC voltage in FM (no signal) muting to on mode.
    * Figures in { } stand for DC voltage with the band selectors circuit set.
    * : H : 5V, L : 0V
    * : H : 5V, L : −29V
16. Transistor and IC terminals which carry no voltage indication emit 5V pulse waveforms or are subject to change according to the frequency or input signal levels.
17. Signal lines
    FM composite signal ⟵ AM signal
    Audio frequency signal ⟵ Pilot (19 kHz) signal
18. Positive voltage lines
19. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety.
    When replacing any of these components, use only manufacturer's specified parts.



Continued from page 16

Ref. No.		Part No.	Part Name & Description
R520		ERD25FJ182	Carbon, 1/4W, 1.8kΩ, ± 5%
R521		ERD25FJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R522		ERD25FJ221	Carbon, 1/4W, 220Ω, ± 5%
R525		ERD25FJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R527		ERD25FJ824	Carbon, 1/4W, 820kΩ, ± 5%
R531		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R532		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R534, 535		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R536		ERD25FJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R537		ERD25FJ392	Carbon, 1/4W, 3.9kΩ, ± 5%
R538		ERD25FJ471	Carbon, 1/4W, 470Ω, ± 5%
R539		ERD25FJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R541		ERD25TJ153	Carbon, 1/4W, 15kΩ, ± 5%
R542		ERD25FJ102	Carbon, 1/4W, 1kΩ, ± 5%
R544		ERD25TJ2R0	Carbon, 1/4W, 2Ω, ± 5%
R549	⚠	ERD60FJ220	Carbon, 1/2W, 22Ω, ± 5%
R550		ERD25TJ472	Carbon, 1/4W, 4.7kΩ, ± 5%
R551		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R553	⚠	ERD60FJ220	Carbon, 1/2W, 22Ω, ± 5%
R554		ERD25FJ101	Carbon, 1/4W, 100Ω, ± 5%
R555		ERD25TJ223	Carbon, 1/4W, 22kΩ, ± 5%
R556		ERD25TJ224	Carbon, 1/4W, 220kΩ, ± 5%
R557		ERD25TJ123	Carbon, 1/4W, 12kΩ, ± 5%
R558		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R559		ERD25FJ221	Carbon, 1/4W, 220Ω, ± 5%
R560		ERD25FJ822	Carbon, 1/4W, 8.2kΩ, ± 5%
R561		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R590		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R602		ERD25FJ332	Carbon, 1/4W, 3.3kΩ, ± 5%
R604		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R605		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R606		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R607, 608		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R609		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R610		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R612		ERD25FJ472	Carbon, 1/4W, 4.7kΩ, ± 5%
R613		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R614		ERD25FJ272	Carbon, 1/4W, 2.7kΩ, ± 5%
R616		ERD25TJ474	Carbon, 1/4W, 470kΩ, ± 5%
R617		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R618	⚠	ERD60FJ100	Carbon, 1/2W, 10Ω, ± 5%
R619		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R620		ERD25TJ394	Carbon, 1/4W, 390kΩ, ± 5%
R621		ERD25TJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R622		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R623		ERD25TJ273	Carbon, 1/4W, 27kΩ, ± 5%
R624		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R625, 626		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R627, 628		ERD25FJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R629		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R630		ERD25TJ563	Carbon, 1/4W, 56kΩ, ± 5%
R631, 632		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R633		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R634		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R635, 636		ERD25TJ393	Carbon, 1/4W, 39kΩ, ± 5%
R637		ERD25TJ472	Carbon, 1/4W, 4.7kΩ, ± 5%
R638		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R639		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R640		ERD25TJ473	Carbon, 1/4W, 47kΩ, ± 5%
R641, 642		ERD25TJ393	Carbon, 1/4W, 39kΩ, ± 5%
R643, 644		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R646		ERD25TJ563	Carbon, 1/4W, 56kΩ, ± 5%
R647		ERD25FJ102	Carbon, 1/4W, 1kΩ, ± 5%
R648		ERD25TJ104	Carbon, 1/4W, 100kΩ, ± 5%
R649		ERD25FJ221	Carbon, 1/4W, 220Ω, ± 5%
R650		ERD25TJ333	Carbon, 1/4W, 33kΩ, ± 5%
R701	⚠	ERD25FJ330	Carbon, 1/4W, 33Ω, ± 5%
R702	⚠	ERD25FJ222	Carbon, 1/4W, 2.2kΩ, ± 5%
R703	⚠	EIG12N2R2	Fuse Type Metal, 1/2W, 2.2Ω, ± 5%
R703 [XA, XL] only	⚠	ERD50FJ2R2	Carbon, 1/2W, 2.2Ω, ± 5%
R704, 705		ERD25TJ563	Carbon, 1/4W, 56kΩ, ± 5%
R706 [XA, XL] only	⚠	ERD25FJ2R2	Carbon, 1/4W, 2.2Ω, ± 5%
R707		ERD25FJ152	Carbon, 1/4W, 1.5kΩ, ± 5%
R708		ERD25FJ101	Carbon, 1/4W, 100Ω, ± 5%

Ref. No.		Part No.	Part Name & Description
R709		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R710		ERD25FJ101	Carbon, 1/4W, 100Ω, ± 5%
R711		ERD25FJ682	Carbon, 1/4W, 6.8kΩ, ± 5%
R712		ERD25FJ222	Carbon, 1/4W, 2.2kΩ, ± 5%
R713		ERD25FJ101	Carbon, 1/4W, 100Ω, ± 5%
R714		ERD25FJ470	Carbon, 1/4W, 47Ω, ± 5%
R716	⚠	EIQ12N4470	Fuse Type Metal, 1/2W, 47Ω, ± 5%
R716 [XA, XL] only	⚠	ERD50FJ470	Carbon, 1/2W, 47Ω, ± 5%
R801	⚠	ERC12ZGK335	Solid, 1/2W, 3.3MΩ, ± 10%
R901		ERD25FJ152	Carbon, 1/4W, 1.5kΩ, ± 5%
R902		ERD25FJ392	Carbon, 1/4W, 3.9kΩ, ± 5%
R903		ERD25FJ562	Carbon, 1/4W, 5.6kΩ, ± 5%
R904		ERD25FJ102	Carbon, 1/4W, 1kΩ, ± 5%
R905		ERD25FJ561	Carbon, 1/4W, 560Ω, ± 5%
R906		ERD25FJ471	Carbon, 1/4W, 470Ω, ± 5%
R907		ERD25FJ102	Carbon, 1/4W, 1kΩ, ± 5%
R908		ERD25FJ472	Carbon, 1/4W, 4.7kΩ, ± 5%
R909		ERD25FJ912	Carbon, 1/4W, 9.1kΩ, ± 5%
R910		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R911		ERD25FJ102	Carbon, 1/4W, 1kΩ, ± 5%
R913		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R914 [XA, XL] except		ERD25FJ223	Carbon, 1/4W, 22kΩ, ± 5%
R915		ERD25FJ103	Carbon, 1/4W, 10kΩ, ± 5%
R916		ERD25FJ182	Carbon, 1/4W, 1.8kΩ, ± 5%

CAPACITORS

Ref. No.		Part No.	Part Name & Description
C1		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C2		ECEA0GZ3R3	Electrolytic, 50V, 3.3μF
C3		ECCD1H500CC	Ceramic, 50V, 50pF, ± 0.25pF
C4		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C5		ECQN5474YX	Polystyrene, 500V, 470pF, ± 10%
C6		ECKD1H040CC	Ceramic, 50V, 4pF, ± 0.25pF
C7		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C8		ECKD1H102MDA	Ceramic, 50V, 0.001μF, ± 20%
C9		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C10		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C11		ECCD1H040CC	Ceramic, 50V, 4pF, ± 0.25pF
C12		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C13		ECCD1H150JC	Ceramic, 50V, 15pF, ± 5%
C14		ECCD1H300CC	Ceramic, 50V, 3pF, ± 0.25pF
C15		ECCD1H220KC	Ceramic, 50V, 22pF, ± 10%
C16		ECKD1H102MDA	Ceramic, 50V, 0.001μF, ± 20%
C17		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C18		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C19		ECKD1H820CC	Ceramic, 50V, 82pF, ± 10%
C21		ECGN5R15K	Ceramic, special, 500V, 0.15pF, ± 10%
C22		ECCD1H040CC	Ceramic, 50V, 4pF, ± 0.25pF
C23		ECCD1H030CC	Ceramic, 50V, 3pF, ± 0.25pF
C24		ECCD1H050CC	Ceramic, 50V, 5pF, ± 0.25pF
C25		ECCD1H030CC	Ceramic, 50V, 3pF, ± 0.25pF
C26		ECCD1H181K	Ceramic, 50V, 180pF, ± 10%
C27, 28		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C29		ECCD1H040CC	Ceramic, 50V, 4pF, ± 0.25pF
C31		ECCD1H080DC	Ceramic, 50V, 8pF, ± 0.5pF
C32		ECCD1H390KC	Ceramic, 50V, 39pF, ± 10%
C33		ECCD1H070DC	Ceramic, 50V, 7pF, ± 0.5pF
C34		ECKD1H102MDA	Ceramic, 50V, 0.001μF, ± 20%
C35		ECKD1H040CC	Ceramic, 50V, 4pF, ± 0.25pF
C36		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C37		ECCD1H020CC	Ceramic, 50V, 2pF, ± 0.25pF
C38		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C39		ECEA1HS100	Electrolytic, 50V, 10μF
C101, 102		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C103, 104		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C105, 106		ECEA1CS100	Electrolytic, 16V, 10μF
C107		ECEA1HS100	Electrolytic, 50V, 10μF
C108, 109		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C110		ECEA0J221	Electrolytic, 6V, 220μF
C111, 112		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C113		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C114		ECCD1H101K	Ceramic, 50V, 100pF, ± 10%

Ref. No.		Part No.	Part Name & Description
C115		ECEA0JZ1	Electrolytic, 50V, 1μF
C116, 117		ECKD1H103ZF	Ceramic, 50V, 0.01μF, + 80%
C118		ECEA0JZR47	Electrolytic, 50V, 0.47μF
C119, 120		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C121		ECEA1ES101	Electrolytic, 25V, 100μF
C122		ECKD1H103ZF	Ceramic, 50V, 0.01μF, + 80%
C123		ECEA1ES101	Electrolytic, 25V, 100μF
C124		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C125		ECEA0J1	Electrolytic, 6V, 1μF
C126, 127		ECKD1H103ZF	Ceramic, 50V, 0.01μF, + 80%
C201		ECQM1H473KZ	Polyester, 50V, 0.047μF, ± 10%
C203		ECCD1H180KC	Ceramic, 50V, 18pF, ± 10%
C204		ECQP1471JZ	Polypropylene, 100V, 470pF, ± 5%
C205		ECKD1H2222F	Ceramic, 50V, 0.022μF, + 80%
C207		ECKD1H2232F	Ceramic, 50V, 0.022μF, + 80%
C208, 209		ECEA1HS100	Electrolytic, 50V, 10μF
C210, 211		ECKD1H103ZF	Ceramic, 50V, 0.01μF, + 80%
C212		ECEA0GZR22	Electrolytic, 50V, 0.22μF
C214		ECEA1A5470	Electrolytic, 10V, 47μF
C215		ECCD1H150KC	Ceramic, 50V, 15pF, ± 10%
C216		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C217		ECKD1H103ZF	Ceramic, 50V, 0.01μF, + 80%
C218, 219		ECKD1H223ZF	Ceramic, 50V, 0.022μF, + 80%
C301		ECEA0JZ1	Electrolytic, 50V, 1μF
C302		ECEA0GMR22R	Electrolytic, 50V, 0.22μF
C303		ECEA0GM3R3R	Electrolytic, 50V, 3.3μF
C304		ECEA0GM1R	Electrolytic, 50V, 1μF
C305		ECQP1471JZ	Polypropylene, 100V, 470pF, ± 5%
C306, 307		ECKD1H181K	Ceramic, 50V, 180pF, ± 10%
C308		ECEA1HS100	Electrolytic, 50V, 10μF
C309		ECEA1ES101	Electrolytic, 25V, 100μF
C310		ECQP1562JZ	Polypropylene, 100V, 5600pF, ± 5%
C311		ECQN5562JZ	Polystyrene, 500V, 5600pF, ± 5%
C312		ECKD1H102KZ	Ceramic, 50V, 0.001μF, ± 10%
C313		ECEA1HS100	Electrolytic, 50V, 10μF
C401, 402		ECKD1H103KZ	Ceramic, 50V, 0.01μF, ± 10%
C404		ECKD1H471KB	Ceramic, 50V, 470pF, ± 10%
C405, 406		ECQN1H153KZ	Polystyrene, 50V, 0.015μF, ± 10%
C407, 408		ECEA0GZ2R2	Electrolytic, 50V, 2.2μF
C409		ECKD1H223ZF	Ceramic, 50V, 0.022μF, + 80%
C410		ECKD1H103ZF	Ceramic, 50V, 0.01μF, + 80%
C501		ECEA1ZS471	Electrolytic, 25V, 470μF
C502		ECKD1H223ZF	Ceramic, 50V, 0.022μF, + 80%
C503		ECEA1HS100	Electrolytic, 50V, 10μF
C504		ECCD1H390JKB	Ceramic, 50V, 39pF, ± 10%
C505		ECEA1HS100	Electrolytic, 50V, 10μF
C506		ECMQ1H822KZ	Polyester, 50V, 0.0082μF, ± 10%

Ref. No.		Part No.	Part Name & Description
C507		ECQM1H223KZ	Polyester, 50V, 0.022μF, ± 10%
C508		ECQM1H333KZ	Polyester, 50V, 0.033μF, ± 10%
C509		ECEA1AS470	Electrolytic, 10V, 47μF
C510		ECEA1HS100	Electrolytic, 50V, 10μF
C511		ECEA2SZ4R7	Electrolytic, 25V, 4.7μF
C512		ECQM1H273KZ	Polyester, 50V, 0.027μF, ± 10%
C514		ECEA0ZU122	Electrolytic, 50V, 0.22μF
C515		ECEA1HS100	Electrolytic, 50V, 10μF
C517		ECEA0GZ3R3	Electrolytic, 50V, 3.3μF
C601		ECEA2SZ4R7	Electrolytic, 25V, 4.7μF
C602		ECEA1HS100	Electrolytic, 50V, 10μF
C603, 604		ECEA2SZ47	Electrolytic, 25V, 47μF
C605, 606		ECEA1AS221	Electrolytic, 50V, 1μF
C607, 608		ECEA0GZ2R2	Electrolytic, 50V, 2.2μF
C609		ECEA1HS100	Electrolytic, 50V, 10μF
C701, 702		ECKD2H102KB	Ceramic, 500V, 0.001μF, ± 10%
C703, 704		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C705		ECEA1VS221	Electrolytic, 35V, 220μF
C706		ECEA1CE222	Electrolytic, 16V, 2200μF
C707		ECEA2AS010	Electrolytic, 100V, 1μF
C708		ECEA1CS222	Electrolytic, 16V, 2200μF
C709		ECEA1AS101	Electrolytic, 10V, 100μF
C710		ECEA1HS101	Electrolytic, 50V, 100μF
C711		ECEA1VS221	Electrolytic, 35V, 220μF
C712		ECKD1H102KF	Ceramic, 50V, 0.001μF, ± 10%
C713		ECEA1CS221	Electrolytic, 16V, 220μF
C714		ECEA1ES101	Electrolytic, 25V, 100μF
C715		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C716		ECEA1AS470	Electrolytic, 10V, 47μF
C717, 718		ECEH1RBA393S	Electrolytic, 1.8V, 0.039F
C719		ECEH1RBA393S	Electrolytic, 1.8V, 0.039F
C901		ECEA1AS4R7	Electrolytic, 10V, 4.7μF
C902		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C903		ECEA1HS334ZF	Electrolytic, 50V, 0.33μF
C904		ECEA50M4R7R	Electrolytic, 50V, 4.7μF
C906		ECQM1H473KZ	Polyester, 50V, 0.047μF, ± 10%
C908		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C907		ECQM1H103KZ	Polyester, 50V, 0.01μF, ± 10%
C908		ECEA1VS221	Electrolytic, 35V, 220μF
C910		ECEA0JA471	Electrolytic, 6V, 470μF
C911		ECCD1H1B0CC	Ceramic, 50V, 1pF, ± 10%
C912		ECCD1H070DC	Ceramic, 50V, 7pF, ± 0.5pF
C913		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C914		ECEA0JS102	Electrolytic, 6V, 1000μF
C915, 916		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C917		ECKD1H102ZF	Ceramic, 50V, 0.001μF, + 80%
C919, 920		ECKD1H102ZF	Ceramic, 50V, 0.01μF, + 80%
C923		ECCD1H200KC	Ceramic, 50V, 20pF, ± 10%

■ REPLACEMENT PARTS LIST ...(Cabinet and Chassis Parts)

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
Components indentified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.		Part No.	Part Name & Description
CABINET and CHASSIS PARTS			
1		SGWTSKE	Front Panel Ass'y
1 [XA, XL] only		SGWTSBKM	Front Panel Ass'y
1—1		SHLC5063—1	Spacer, Front Panel Ass'y
1—2		SBC343	Button, Tuning and Memory
1—3		SHR9541	Holder, Button
1—4		SHS3229—2	Spacer, Holder
1—5		SBC341	Button, FM/AM Preset Tuning, Selector
1—6		QSHR9543	Holder, Button
2		SGXT007	Dynamic Button
3		SGX7063	Ornament, Left and Right
4		SHR401—1	Lock Pin, Dial Scale
5		SKD4032	Dial Scale
6		SKD4033	Dial Scale
6		SBC341	Button, FM I/F Band, Mode, Display Muting, Frequency Shift
7		SUW1B21	Bracket, Front Sub Panel Ass'y
8		SGXTSBKN	Front Sub Panel Ass'y
9		SBC337	Button, Power Source
10		SUS231—1	Spring, Button
11		SBU5031	Holder, Button
12		SHG1595	Rubber Cushion, P.C.B
13		SHG857	Rubber Cushion, FL
14		SKCTSBKM	Cabinet Cover
15		SHR127	Bushing, AC Cord
16 [EK] only		SHR129	Bushing, AC Cord
16	⚠	SJA88	AC Cord
16 [EK] only	⚠	QFC1025M	AC Cord
16 [XL] only	⚠	QFC1028M	AC Cord
17		SHR5025—1	Stopper, Allocation Switch
18		SJF3431—2A	Terminal Board
19		SJF4103	Terminal Board, AM Antenna
20		SUW1641—1	Bracket, PCB Ass'y
21		SGPTSBKE	Rear Panel Ass'y
21 [EG] only		SGPTSBKG	Rear Panel Ass'y
21 [XA, XL] only		SGPTSBKE1	Rear Panel Ass'y
22		SJSA67—1	Socket, Antenna
23		RJT2028	Terminal
24		SKL197	Foot
25		SUW1B15	Bracket, Front Panel
26		SHR5113—1	Fitter, FL
27		SJT347	Holder, Fuse
28		SMN1635	Bracket, Voltage Adjustor Switch
29		SUW472	Cover, Voltage Adjustor Switch
30		SMN1693	Knob, Power Switch
31		SBC157	

Ref. No.		Part No.	Part Name & Description
SCREWS, WASHERS and NUT			
N1		XTB3+8BFZ	Screw, Tapping ⊕ 3 × 8
N2		XSS3+8BV5	Screw, Tapping ⊕ 3 × 8
N3		XTS3+8BFZ	Screw, Tapping ⊕ 3 × 8
N4		XBS3+6S	Screw, ⊕ 3 × 6
N5		XBN3+6S	Screw, ⊕ 3 × 6
N6		XWA38	Washer, Spring, ø3
N7		XTB3+8BFZ	Screw, Tapping ⊕ 3 × 8
N8		XTB3+10BFZ	Screw, Tapping ⊕ 3 × 10
N9		XTB4+8BFZ	Screw, Tapping ⊕ 4 × 8
N10		XWA26BFZ	Washer, Spring, ø2.6
N11		XSN26+6BV	Screw, ⊕ 2.6 × 6
N12		XTB3+8BFZ	Screw, Tapping ⊕ 3 × 8
N13		XWG3	Washer, Plain, ø3
N14		XWC38	Washer, External Toothed Lock, ø3
N15		XTB3+6BFZ	Screw, Tapping ⊕ 3 × 6
N16		XTBS3+8BF21	Screw, Tapping with Detent ⊕ 3 × 8
N17		XWC98	Washer, External Toothed Lock, ø9
N18		XNG85	Nut, ø9
N19		XTB3+8BFZ	Screw, Tapping ⊕ 3 × 8
N20		XTB3+8BFZ	Screw, Tapping ⊕ 3 × 8
N21		XTB3+10BFZ	Screw, Tapping ⊕ 3 × 10
N22		XTB3+16BFZ	Screw, Tapping ⊕ 3 × 16
N23		XWA36	Washer, Spring ø3
N24		XSN3+6S	Screw, ⊕ 3 × 6
N25		XTB3+8BFZ	Screw, Tapping M 3 × 8

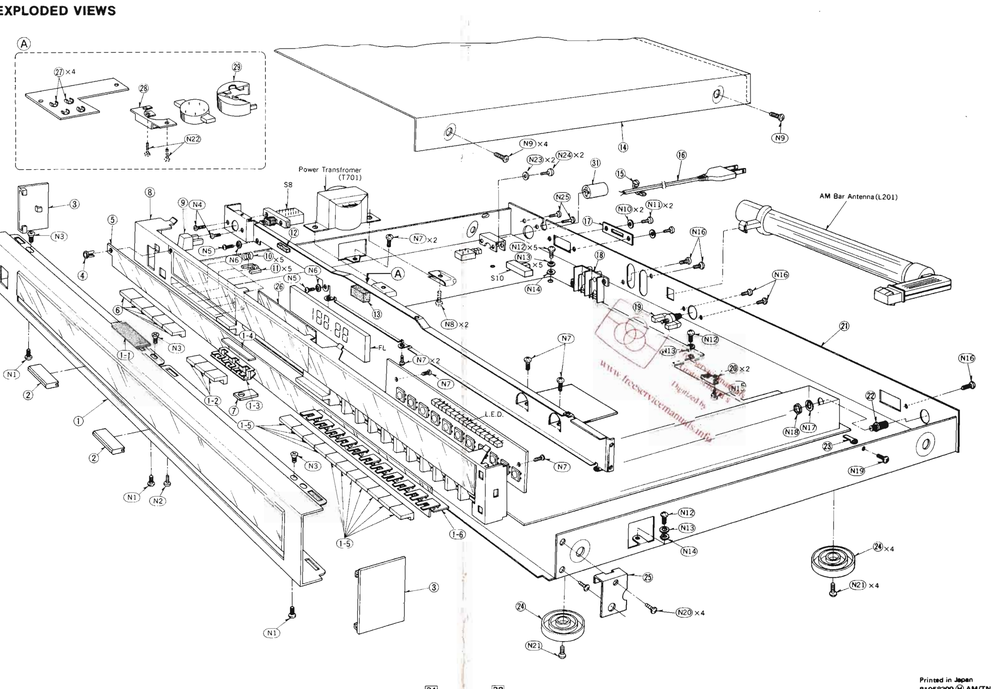
ACCESSORIES			
A1		TJJ8525102	Plug, 300-ohm ═ μ-ohm Impedance Conversion
A2		SSA267	Cord, FM Feeder Antenna
A3		SJSA58—1	Plug, F-Type/Ring (Large)
A4		SJSA74	Plug, Coaxial (WB-ed Band) for "5C—2V"
A5		SJP2129—5	Cord, Stereo Pin-Type Connector
A6 [XA] only	⚠	SJP5213—1	Plug Adapter, AC Power
A7		SQF10743	Instructions Book, Printed Matter
A7 [XA, XL] only		SQF10745	Instructions Book, Printed Matter

PACKING PARTS			
P1		SPN649	Polyethylene Bag
P2		SPS3029—1	Pad, Front
P2 [XL] only		SPS3029—2	Pad, Front
P3		SPS3031—5	Pad, Rear
P3 [XL] only		SPS3031—3	Pad, Rear
P4		SPG3061	Carton Box
P4 [XL] only		SPG3065	Carton Box
P4 [EF] only		SPG3067	Carton Box

Areas

* [E] is available in Switzerland and Scandinavia.
* [EG] is available in F. R. Germany.
* [EF] is available in France.
* [EH] is available in Holland.
* [EB] is available in Belgium.
* [EK] is available in United Kingdom.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.

■ EXPLODED VIEWS



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