

# Service Manual

17

QUARTZ Synthesizer FM/AM Stereo Tuner

SI-S7



ST-S7(K)

## ST-S7

[DX],[DG],[DM],[EB],[XE],  
[XSW],[XGH],[XGF],[XA]

## ST-S7(K)

[DX],[DG],[DM],[EB],  
[XSW],[XGH],[XA]

\* The colors of this model include silver and black.  
The black type model is provided with (K) in the  
Service Manual.

### Areas

- \* [DX] is available in Scandinavia except Denmark.
- \* [DG] is available in Scandinavia and European except Belgium, United Kingdom, Switzerland, Holland and France.
- \* [DM] is available in Denmark.
- \* [EB] is available in Belgium.
- \* [XE] is available in United Kingdom.
- \* [XSW] is available in Switzerland.
- \* [XGH] is available in Holland.
- \* [XGF] is available in France.
- \* [XA] is available in Asia, Latin America, Middle East and Africa.

### Notes:

- \* This unit is provided with the FM/AM allocation selector when needed for the area.
- \* The receivable frequency of FM and AM broadcast varies according to the position of this switch.  
When the FM/AM allocation selector is set at FM 50kHz/AM 9kHz step (or the unit is not provided with this switch), the receivable frequency is as follows: (FM: 87.50 ~ 108.00MHz) (AM: 522 ~ 1611kHz)
- \* When the FM/AM allocation selector is set at FM 200kHz/AM 10kHz step, the receivable frequency is as follows: (FM: 87.9 ~ 107.9MHz) (AM: 530 ~ 1620kHz)
- \* In the case of the unit without the FM/AM allocation selector, the broadcast can be received at FM 50kHz/AM 9kHz.

English

## TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

(DIN 45 500)

### FM TUNER SECTION

<b>Frequency range</b> (Refer to Notes)	87.50 ~ 108.00 MHz
<b>Sensitivity</b>	0.95 $\mu$ V (IHF, usable)
S/N 30 dB	0.95 $\mu$ V (75 $\Omega$ )
S/N 26 dB	0.85 $\mu$ V (75 $\Omega$ )
S/N 20 dB	0.75 $\mu$ V (75 $\Omega$ )
<b>IHF 46 dB stereo quieting sensitivity</b>	20 $\mu$ V/75 $\Omega$
<b>Total harmonic distortion</b>	
<b>MONO</b>	0.1%
<b>STEREO</b>	0.15%
<b>S/N</b>	
<b>MONO</b>	69 dB (77 dB, IHF)
<b>STEREO</b>	65 dB (72 dB, IHF)
<b>Frequency response</b>	5 Hz ~ 18 kHz, +0.2 dB ~ -0.5 dB $\pm$ 1.5 dB (5 Hz ~ 18 kHz)
<b>Alternate channel selectivity</b> ( $\pm$ 400 kHz)	85 dB
( $\pm$ 300 kHz)	55 dB
<b>Capture ratio</b>	1.0 dB
<b>Image rejection at 98 MHz</b>	80 dB
<b>IF rejection at 98 MHz</b>	110 dB
<b>Spurious response rejection at 98 MHz</b>	95 dB

<b>AM suppression</b>	55 dB
<b>Stereo separation</b>	
<b>1 kHz</b>	55 dB
<b>10 kHz</b>	40 dB
<b>Carrier leak</b>	
<b>19 kHz</b>	-65 dB (-70 dB, IHF)
<b>38 kHz</b>	-48 dB (-50 dB, IHF)
<b>Channel balance (250 Hz ~ 6,300 Hz)</b>	$\pm$ 1.0 dB
<b>Limiting point</b>	0.7 $\mu$ V
<b>Bandwidth</b>	
<b>IF amplifier</b>	180 kHz
<b>FM demodulator</b>	1000 kHz
<b>Antenna terminals</b>	75 $\Omega$ (unbalanced) F-type coaxial

### AM TUNER SECTION

<b>Frequency range</b> (Refer to Notes)	522 ~ 1611 kHz
<b>Sensitivity (S/N 20 dB)</b>	30 $\mu$ V, 250 $\mu$ V/m
<b>Selectivity (<math>\pm</math>9 kHz)</b>	55 dB
<b>Image rejection at 999 kHz</b>	50 dB
<b>IF rejection at 999 kHz</b>	45 dB

# Technics

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

## TIMER SECTION

<b>Clock</b>	Quartz-lock type 24-hour indication
<b>Precision</b>	Within 0 sec.~+10 sec. monthly (at 25°C)
<b>Functions</b>	24-hour programmable; everyday (2 times), once only (1 time)
<b>Programmable content</b>	On/off of program source (FM, AM) Designation of preset station
<b>Setting intervals</b>	1 minute~23 hours, 59 minutes (at 1-min. intervals)
<b>Priority order</b>	Once, everyday 2, everyday 1
<b>Memory "back-up"</b>	About 3 months (without AC power)

## GENERAL

<b>Output voltage</b>	0.3 V (0.6 V, IHF)
<b>Power consumption</b>	9.9W
<b>Batteries</b>	DC 4.5 V (3"AA" size batteries, UM-3 or equivalent for memory "back-up")
<b>Power supply</b>	AC 50 Hz/60 Hz, 110V/120V/220V/240V
<b>Dimensions (W×H×D)</b>	430 × 53 × 310 mm (16-15/16" × 2-3/32" × 12-7/32")
<b>Weight</b>	4.0 kg (8.8 lb.)

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Deutsch

## TECHNISCHE DATEN (DIN 45 500)

Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

### UKW-TUNERTEIL

<b>Wellenbereich</b>	87,50~108,00 MHz
<b>Eingangsempfindlichkeit</b>	0.95 $\mu$ V (nutzbar nach IHF)
<b>S/R 30 dB</b>	0.95 $\mu$ V (75 $\Omega$ )
<b>S/R 26 dB</b>	0.85 $\mu$ V (75 $\Omega$ )
<b>S/R 20 dB</b>	0.75 $\mu$ V (75 $\Omega$ )
<b>Stereoumschaltswelle bei 46 dB nach IHF</b>	20 $\mu$ V/75 $\Omega$
<b>Gesamtklirrfaktor</b>	
<b>Mono</b>	0.1%
<b>Stereo</b>	0.15%
<b>Geräuschabstand</b>	
<b>Mono</b>	69 dB (77 dB nach IHF)
<b>Stereo</b>	65 dB (72 dB nach IHF)
<b>Frequenzgang</b>	5 Hz ~ 18 kHz (+0.2 dB ~ -0.5 dB) $\pm$ 1.5 dB (5 Hz~18 kHz)
<b>Trennschärfe bei Störsender (<math>\pm</math>400 kHz)</b>	85 dB
( $\pm$ 300 kHz)	55 dB
<b>Einfangverhältnis</b>	1.0 dB
<b>Spiegelfrequenz-Dämpfung bei 98 MHz</b>	80 dB
<b>ZF-Dämpfung bei 98 MHz</b>	110 dB
<b>Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz</b>	95 dB
<b>AM-Unterdrückung</b>	55 dB
<b>Übersprechdämpfung</b>	
<b>1 kHz</b>	55 dB
<b>10 kHz</b>	40 dB
<b>Trägerrest</b>	
<b>19 kHz</b>	-65 dB (-70 dB nach IHF)
<b>38 kHz</b>	-48 dB (-50 dB nach IHF)
<b>Kanalabweichung (250 Hz ~ 6300 Hz)</b>	$\pm$ 1.0 dB
<b>Begrenzereinsatz</b>	0.7 $\mu$ V
<b>Bandbreite</b>	
<b>ZF-Verstärker</b>	180 kHz
<b>UKW-Demodulator</b>	1000 kHz
<b>Antennenanschluß</b>	75 $\Omega$ (unsymmetrisch) 75 $\Omega$ F-Typ

### AM-TUNERTEIL

<b>Wellenbereiche</b>	522 ~ 1611 kHz
<b>Eingangsempfindlichkeit (S/R 20 dB)</b>	30 $\mu$ V, 250 $\mu$ V/m
<b>Trennschärfe (<math>\pm</math>9 kHz)</b>	55 dB
<b>Spiegelfrequenz-Dämpfung bei 999 kHz</b>	50 dB
<b>ZF-Dämpfung bei 999 kHz</b>	45 dB

### TIMER

<b>Uhr</b>	Quarzuhr mit 24-Stunden-Anzeige
<b>Genauigkeit</b>	max. 10 Sek./Monat (bei 25°C)
<b>Funktionen</b>	24-Stunden-Programmierung für täglichen (2-fach) und einmaligen Betrieb (einfach)
<b>Programmierung</b>	Ein- und Ausschalten der Tonquelle (FM, AM)
<b>Einschaltdauer</b>	1 Min. bis 23 Stdn. 59 Min. (in 1-Minuten-Intervallen)
<b>Prioritätenfolge</b>	"once", "everyday 2", "everyday 1"
<b>Sicherung der im Speicher enthaltenen Informationen</b>	etwa 3 Monate (ohne Netzstromversorgung)

### ALLGEMEINE DATEN

<b>Ausgangsspannung</b>	0.3 V (0.6 V, IHF)
<b>Leistungsaufnahme</b>	9.9 W
<b>Batterien für den Speicher (Sonderzubehör)</b>	drei Batterien "AA" (4.5 V)
<b>Netzspannung</b>	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
<b>Abmessungen (B · H · T)</b>	430 × 53 × 310 mm
<b>Gewicht</b>	4,0 kg

# ST-S7 ST-S7

## CARACTERISTIQUES TECHNIQUES (DIN 45 500) Sujet à changement sans préavis.

### SECTION SYNTONISATEUR FM

<b>Gamme de fréquence</b>	87,50~108,00 MHz
<b>Sensibilité</b>	0,95 $\mu$ V (IHF utilisable)
<b>S/B 30 dB</b>	0,95 $\mu$ V (75 $\Omega$ )
<b>S/B 26 dB</b>	0,85 $\mu$ V (75 $\Omega$ )
<b>S/B 20 dB</b>	0,75 $\mu$ V (75 $\Omega$ )
<b>Sensibilité stéréo au seuil de 46 dB, IHF</b>	20 $\mu$ V/75 $\Omega$
<b>Distorsion harmonique totale</b>	
<b>MONO</b>	0,1%
<b>STEREO</b>	0,15%
<b>Signal/Bruit</b>	
<b>MONO</b>	69 dB (77 dB, IHF)
<b>STEREO</b>	65 dB (72 dB, IHF)
<b>Réponse de fréquence</b>	5 Hz~18 kHz, +0,2 dB~-0,5 dB $\pm$ 1,5 dB (5 Hz~18 kHz)
<b>Sélectivité alternée par canal (<math>\pm</math>400 kHz)</b>	85 dB ( $\pm$ 300 kHz) 55 dB
<b>Taux de capture</b>	1,0 dB
<b>Rejection d'image à 98 MHz</b>	80 dB
<b>Rejection FI à 98 MHz</b>	110 dB
<b>Rejection de réponse parasite à 98 MHz</b>	95 dB
<b>Suppression AM</b>	55 dB
<b>Séparation stéréophonique</b>	
<b>1 kHz</b>	55 dB
<b>10 kHz</b>	40 dB
<b>Fuite de porteuse</b>	
<b>19 kHz</b>	-65 dB (-70 dB, IHF)
<b>38 kHz</b>	-48 dB (-50 dB, IHF)
<b>Equilibrage de canaux (250 Hz~6,300 Hz)</b>	$\pm$ 1,0 dB
<b>Point de limite</b>	0,7 $\mu$ V
<b>Largeur de bande</b>	
<b>Amplificateur FI</b>	180 kHz
<b>Démodulateur FM</b>	1000 kHz
<b>Bornes d'antenne</b>	75 $\Omega$ (asymétrique) 75 $\Omega$ F-type

### SECTION SYNTONISATEUR AM

<b>Gamme de fréquence</b>	522~1611 kHz
<b>Sensibilité (S/B 20 dB)</b>	30 $\mu$ V, 250 $\mu$ V/m
<b>Sélectivité (<math>\pm</math>9 kHz)</b>	55 dB
<b>Réjection d'image à 999 kHz</b>	50 dB
<b>Réjection FI à 999 kHz</b>	45 dB

### PROGRAMMATEUR

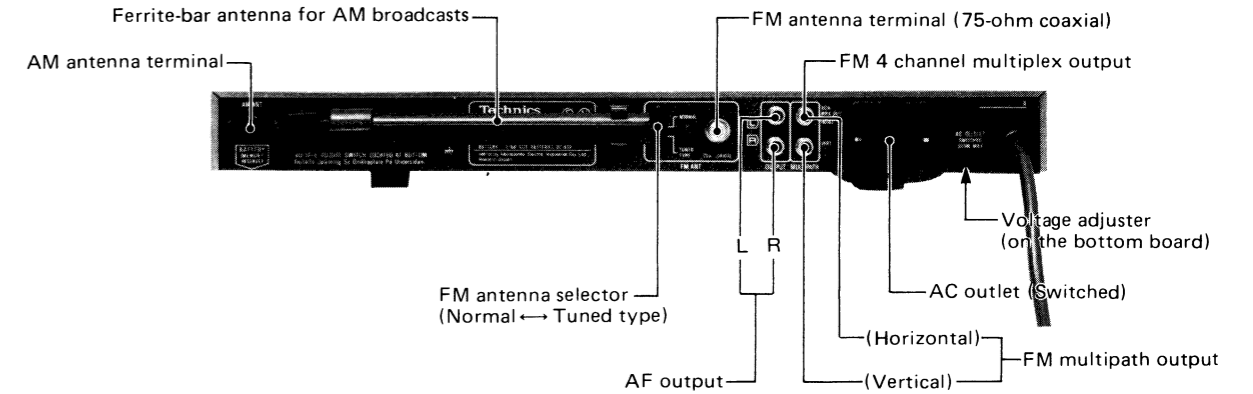
<b>Horloge</b>	Du type verrouillage à quartz
<b>Précision</b>	Affichage basé sur le système des 24 heures. Marge de 0 à +10 secondes. mensuellement (à 25°C)
<b>Fonctions</b>	Programmations possibles sur 24 heures: tous les jours (deux fois), une fois seulement (une fois)
<b>Éléments de programmation</b>	Programmation de sources sonores (marche/arrêt) (FM, AM)
<b>Intervalles de réglage</b>	De 1 minute à 23 heures, 59 minutes (par intervalles de 1 minute)
<b>Ordre de priorité</b>	"once" (une fois), "everyday 2" (tous les jours 2), "everyday 1" (tous les jours 1)
<b>Durée des fonctions de mémoire</b>	Environ 3 mois (sans alimentation CA)

### DIVERS

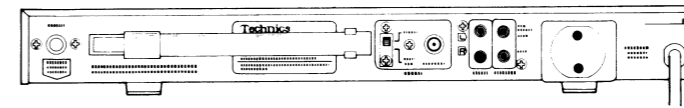
<b>Tension de sortie</b>	0,3V (0,6V, IHF)
<b>Consommation</b>	9,9W
<b>Piles pour préservation des mémoires (en option)</b>	trois piles de type AA (C. C.: 4,5V)
<b>Alimentation</b>	CA 50 Hz/60 Hz, 110V/120V/220V/240V
<b>Dimensions (L·H·Pr)</b>	430 x 53 x 310 mm
<b>Poids</b>	4,0 kg

### ● Rear panel view

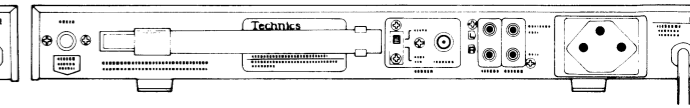
This photo is available in [DX, DG, EB, XGH] and [XGF] areas.



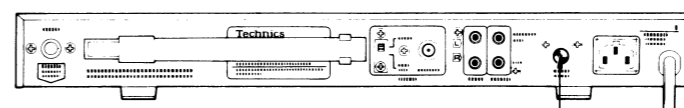
This figure is available in [DM] area.  
(for Denmark)



This figure is available in [XSW] area.  
(for Switzerland)

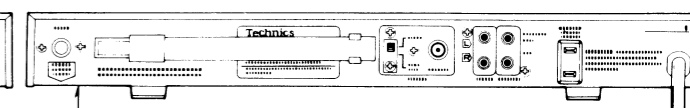


This figure is available in [XE] area.  
(for United Kingdom)



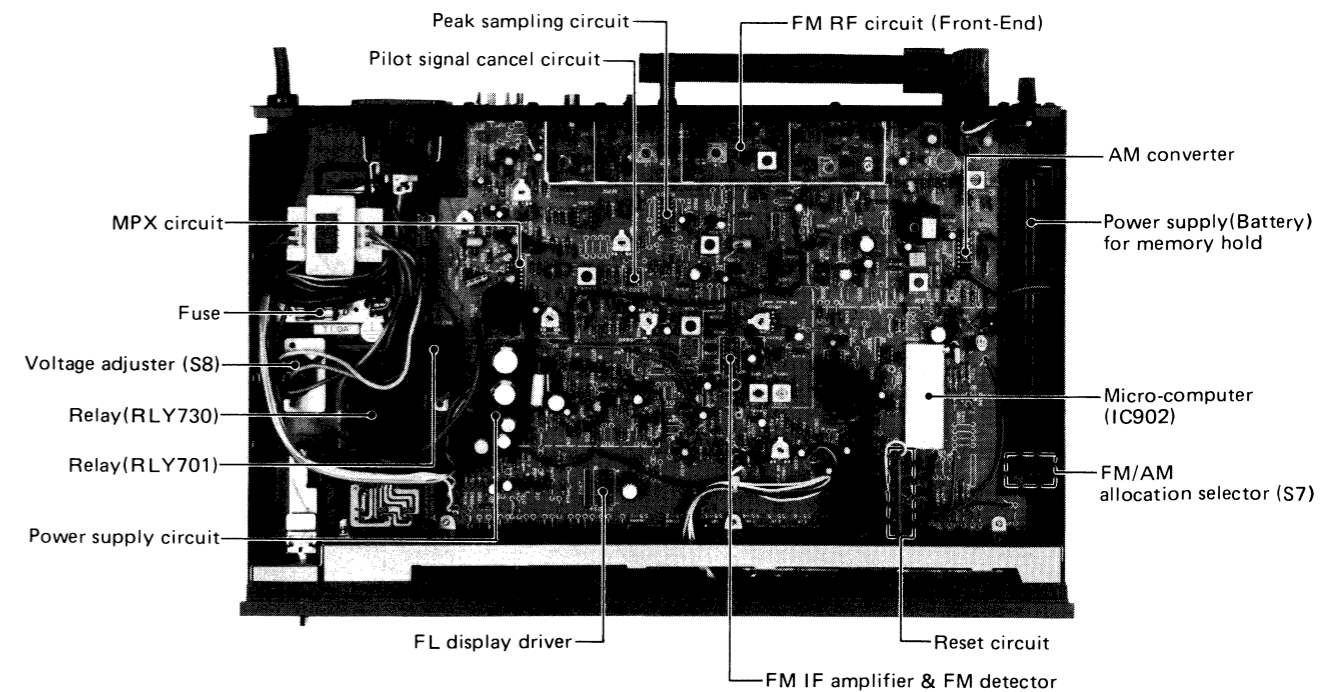
Power source switch (S9)

This figure is available in [XA] area.  
(for Asia, Latin America, Middle East and Africa)



FM/AM allocation selector (on the bottom board)

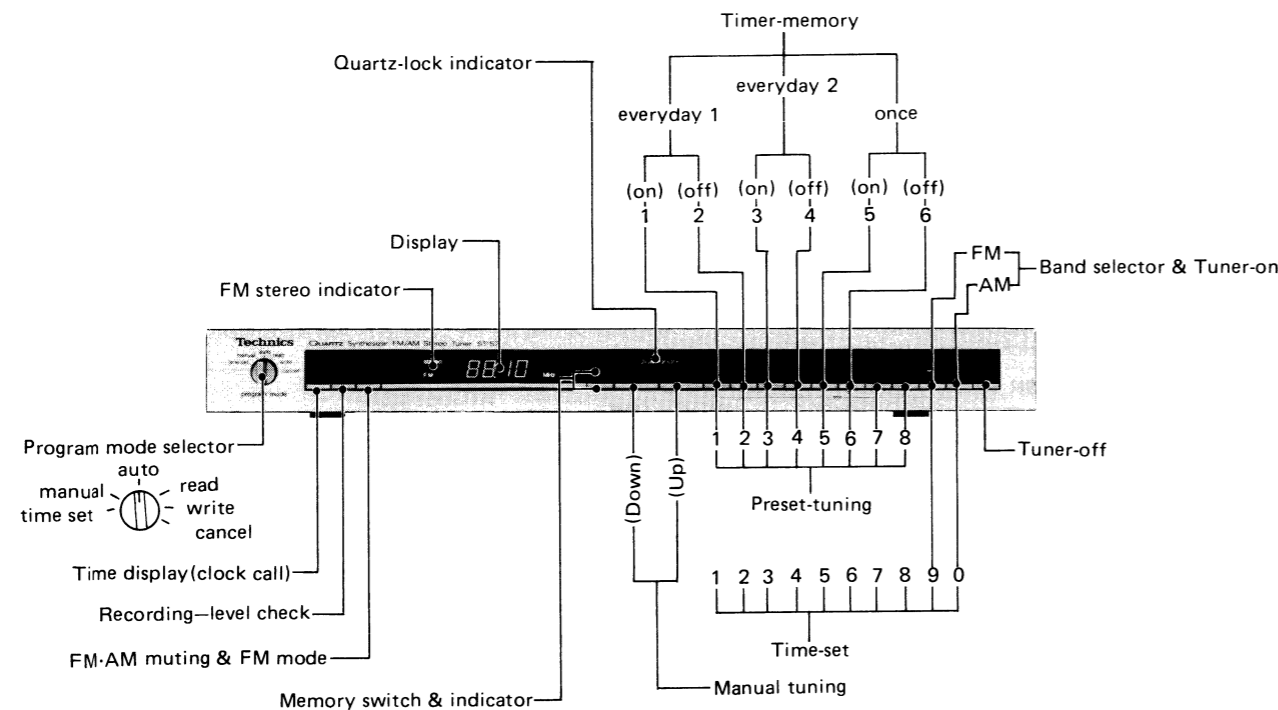
### ● Inside view



Relay (RLY730) and FM/AM allocation selector are not equipped on units some areas.

## ■ LOCATION OF CONTROLS

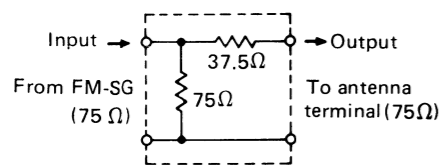
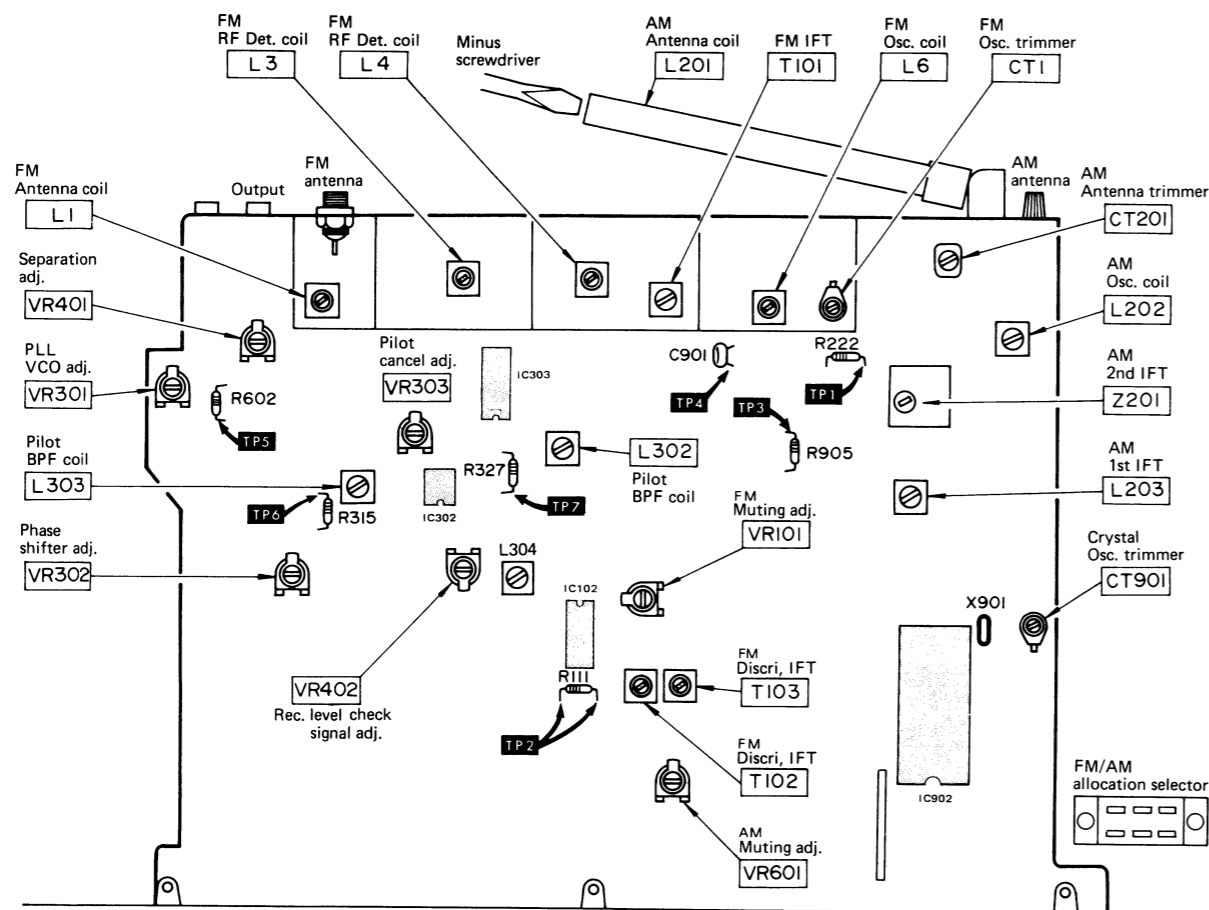
### ● Front panel view



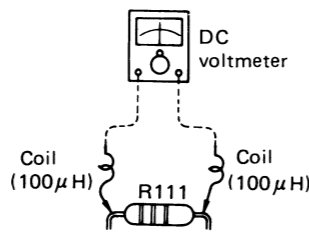
ADJUSTMENT POINTS

(Abgleichpunkte)  
(Points de réglage)

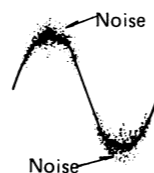
Notes: \* L304 have been already adjusted.  
So, do not turn the core.  
\* FM/AM allocation selector is not equipped on units some areas.



(75Ω FM dummy antenna)  
Fig. 1 (Abb. 1)



(IF voltage adjustment)  
Fig. 2 (Abb. 2)



(AF output waveform)  
Fig. 3 (Abb. 3)



(Pilot signal cancel)  
Fig. 4 (Abb. 4)

ADJUSTING INSTRUCTIONS

ENGLISH

\* In the case of the unit without the FM/AM allocation selector, the broadcast can be received at FM 50kHz/AM 9kHz.  
In the case of the unit with the FM/AM allocation selector, shift the switch to FM 200kHz/AM 10kHz step.  
The AM adjusting frequency for the unit provided with this switch is shown in the parenthesis.

AM ADJUSTMENT

• Setting and Equipment used					
1. AC and DC electronic voltmeters (VTVM)		2. AM signal generator (AM-SG)		3. Set program mode selector to "manual" position.	
4. Maintain line voltage at rated voltage.		5. Output of signal generator should be no higher than necessary to obtain an output reading.		6. Adjust the antenna coil (L201) position by using a screwdriver so that it is at approximately 25 degrees to the rear panel.	
7. Set input selector to "AM" position.		8. Use a non-metal screwdriver for the adjustment.		9. Set AM muting switch to "off" position.	
AM SIGNAL GENERATOR		DISPLAY FREQUENCY BY PRESET	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
CONNECTION	FREQUENCY				
<b>AM-IF ADJUSTMENT</b>					
1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450kHz (30% Mod. with 400Hz)	Frequency of non-interference	L203 (1st IFT) Z201 (2nd IFT)	• Adjust the input frequency and adjustment points so that the output becomes maximum.
<b>AM-RF ADJUSTMENT</b>					
2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	522kHz (530kHz) (30% Mod. with 400Hz)	522kHz (530kHz)	L202 (OSC Coil)	Adjust L202 to 1.0V (1.1V) ± 0.05V.
3		612kHz (610kHz) (30% Mod. with 400Hz)	612kHz (610kHz)	L201 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of L201 by screw driver.
4		1503kHz (1500kHz) (30% Mod. with 400Hz)	1503kHz (1500kHz)	CT201 (ANT Trimmer)	1. Adjust for maximum output 2. Repeat steps (3) and (4) until the frequency correctly matches the dial display.
<b>AM MUTING ADJUSTMENT</b>					
5	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Apply about 35dB to antenna terminal.)	1503kHz (1500kHz) (30% Mod. with 400Hz)	1503kHz (1500kHz)	VR601 (AM Muting)	With the AM muting switch set to "on" adjust VR601 so that the output is given with muting condition released.

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 (19kHz and 108MHz measurable)	
7. FM 75Ω dummy antenna (Fig. 1) and low-pass filter (fc: 15kHz ~ 19kHz)		8. Preparation of FM signal generator (FM-SG)		9. Connect stereo modulator to FM-SG.	
10. Apply SG output to antenna terminal of the set through 75Ω FM dummy antenna.		11. The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of using dummy antenna, SG output must be 12dB plus (1HF). That is, when input is 60dB, SG output is to be 72dB.)		12. Set input selector to "FM" position.	
13. Set recording-level check switch to "off" position.		14. Other setting are the same as in AM adjustment.			
FM SIGNAL GENERATOR		DISPLAY FREQUENCY BY PRESET	INDICATOR	ADJUSTMENT POINTS	REMARKS
CONNECTION	FREQUENCY				
<b>FM-IF ADJUSTMENT</b>					
6	No-Signal	Frequency of non-interference	Connect DC VTVM to TP2 (both side of R111) through choke coil. (Refer to Fig. 2)	T102 (Discr. IFT)	Adjust T102 core so that voltage measured in signal mode is 0V in 300mV range.
<b>OSC ADJUSTMENT</b>					
7	No-Signal	87.9MHz	Connect DC VTVM to TP3 terminal.	L6 (OSC Coil)	Adjust L6 so that voltage measured by DC voltmeter is 4.1V.

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY BY PRESET	INDICATOR	ADJUSTMENT POINTS	REMARKS
	CONNECTION	FREQUENCY				
<b>CRYSTAL OSC ADJUSTMENT</b>						
8	—	No-Signal	87.9MHz	<ul style="list-style-type: none"> <li>Connect frequency counter to <b>TP4</b> terminal.</li> <li>Check the color marking of ceramic filter (CF101~104). (All 4 filters are of same color.)</li> </ul>	CT901 (Crystal OSC Trimmer)	When blue-marked ceramic filter is used, adjust the output frequency from <b>TP4</b> to 98.5751 MHz. Also, adjust the frequency to 98.6251MHz in orange-marked, and to 98.6001MHz in red-marked.
<b>FM RF ADJUSTMENT</b>						
9	—	No-Signal	87.9MHz	Connect DC VTVM to <b>TP3</b> terminal	L6 (OSC Coil)	Adjust L6 (OSC Coil) to 4.1V.
10	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	90.1MHz (100% Mod. with 400Hz) weak input	90.1MHz	Connect scope to "OUTPUT" terminals of the set.	L3 (RF DET Coil, 1st) L4 (RF DET Coil, 2nd) L1 (ANT Coil) T101 (FM IFT)	<ol style="list-style-type: none"> <li>Add weak input so that noise is included in the output wave form.</li> <li>Make the adjustment so that the output wave form is vertically symmetrical. Refer to Fig. 3.</li> <li>Repeat the steps (10) and (11) until the frequency correctly matches the dial display.</li> </ol>
11		106.1MHz (100% Mod. with 400Hz)	106.1MHz	Connect scope to "OUTPUT" terminals of the set.	CT1 (OSC Trimmer)	
<b>FM MONO DISTORTION ADJUSTMENT</b>						
12	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna.	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect distortion analyser to "OUTPUT" terminals of the set.	T103 (Discr. IFT)	<ol style="list-style-type: none"> <li>Set the FM muting/FM mode switch to "on/auto" and then check step (6) in no signal mode.</li> <li>If it is deflected, readjust of T102.</li> <li>Adjust T103 core so that distortion of right and left channels are minimized.</li> </ol>
<b>FM MUTING LEVEL ADJUSTMENT</b>						
13	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Apply 10dB to the set.)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect AC VTVM or scope to "OUTPUT" terminals of the set.	VR101 (Muting Level)	<ol style="list-style-type: none"> <li>Set the FM muting/FM mode switch to "off/mono".</li> <li>With the FM muting/FM mode switch set to "on/auto", adjust VR101 so that the output is given with muting condition released.</li> </ol>
<b>FM MPX PILOT (VCO) ADJUSTMENT</b>						
14	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Monaural signal)	100.1MHz (Non-modulated)	100.1MHz	Connect frequency counter to <b>TP5</b> terminal.	VR301 (VCO)	<ol style="list-style-type: none"> <li>Set the FM muting/FM mode switch to "on/auto".</li> <li>Adjust VR301 to 19kHz±30Hz.</li> </ol>
<b>PILOT BAND-PASS FILTER ADJUSTMENT</b>						
15	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (Non-modulated)	100.1MHz	Connect AC VTVM to <b>TP6</b> terminal.	L302 L303 (Band Pass Filter)	<ol style="list-style-type: none"> <li>Set the FM muting/FM mode switch to "on/auto".</li> <li>Adjust L302 and L303 so that output voltage is maximum.</li> </ol>
<b>PILOT CANCEL ADJUSTMENT</b>						
16	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (Non-modulated)	100.1MHz	Connect scope to <b>TP7</b> terminal.	L302 VR303 (Pilot Cancel)	<ol style="list-style-type: none"> <li>Set the FM muting/FM mode switch to "on/auto".</li> <li>Adjust L302 and VR303 alternately so that the output voltage of <b>TP7</b> is minimized and the waveform is as shown in Fig. 4.</li> </ol>
<b>PHASE SHIFTER ADJUSTMENT</b>						
17	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 400Hz (L mode))	100.1MHz	Connect AC VTVM to left ch. "OUTPUT" terminals of the set.	VR302 (Phase Shift)	<ol style="list-style-type: none"> <li>Set the FM muting/FM mode switch to "on/auto".</li> <li>Adjust VR302 so that L ch. output is maximum.</li> </ol>

FM SIGNAL GENERATOR		DISPLAY FREQUENCY BY PRESET	INDICATOR	ADJUSTMENT POINTS	REMARKS	
CONNECTION	FREQUENCY					
<b>STEREO DISTORTION ADJUSTMENT</b>						
Step No. 18	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 400Hz) (L mode)	100.1MHz	Connect AC VTVM to "OUTPUT" terminals of the set through low-pass filter. (fc=15kHz~19kHz)	T101 (IFT)	<ol style="list-style-type: none"> <li>1. Set the FM muting/FM mode switch to "on/auto".</li> <li>2. Re-adjust the already adjusted T101 within ±90° from the preset core position so that the distortion of Lch is minimized.</li> <li>3. Re-check the steps 6, 7, 10, 11 and 12.</li> </ol>
<b>SEPARATION ADJUSTMENT</b>						
Step No. 19	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 1kHz) (L or R mode)	100.1MHz	Connect AC VTVM to "OUTPUT" terminals of the set through low-pass filter. (fc=15kHz~19kHz)	VR401 (Separation)	<ol style="list-style-type: none"> <li>1. Set the FM muting/FM mode switch to "on/auto".</li> <li>2. Adjust VR401 so that R output is minimized when stereo modulator is in L (Lch modulation) mode and that L output is minimized in R mode.</li> </ol>
<b>RECORDING-LEVEL CHECK SIGNAL ADJUSTMENT</b>						
Step No. 20	Connect FM-SG to FM antenna terminal through 75Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (90% Mod. with 400Hz) (L+R mode)	100.1MHz	Connect AC VTVM to "OUTPUT" terminals of the set.	VR402 (Rec. level)	<ol style="list-style-type: none"> <li>1. Adjust so that output voltage is 0dB when 60dB signal is applied to the set.</li> <li>2. Set the rec level switch to "on".</li> <li>3. Adjust VR402 so that output is -6dB.</li> </ol>

## ■ PRECAUTIONS FOR REPAIR

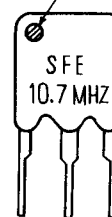
### ● Ceramic filters (CF101 ~ CF104)

The ceramic filters for FM-IF circuit are available in 3 ranks. In this set, be sure to use ceramic filters of the same rank in pair. Since the ceramic filters are different in rank, the use of diodes (D916, D917) and the crystal adjusting frequency must vary in accordance with the rank of ceramic filter. (Refer to "Crystal Osc Adjustment" on page 7.)

RANK (color)	D916	D917	ADJUSTMENT FREQUENCY	CENTER FREQUENCY
Red	X	X	98.6001 MHz	10.700 MHz
Orange	X	○	98.6251 MHz	10.725 MHz
Blue	○	○	98.5751 MHz	10.675 MHz

Note: ○ Mark → Diode is used.  
 X Mark → Diode is not used.

Color marking  
 (Red, Blue, or Orange)



When frequency is not indicated, FL (display tube), FL driver, digit circuit, and micro-computer must be checked by oscilloscope. In this case, take care not to allow shortcircuit between IC terminals or application of voltage from measuring instrument to IC terminals.

**EINSTELLUNGSANWEISUNGEN DEUTSCH**

- \* Falls die Einheit keinen UKW/MW-Wellenverteilungs-Wahlschalter hat, kann die Rundfunksendung auf UKW 50 kHz/MW 9 kHz empfangen werden.
- \* Falls die Einheit mit einem UKW/MW-Wellenverteilungs-Wahlschalter ausgestattet ist, den Schalter auf UKW 50kHz/MW 9kHz einstellen.

**AM (MW) -EINSTELLUNG**

- **Stellungen und zu benutzende Geräte**
  1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
  2. AM (MW) -Meßsender (AM-SG)
  3. Den Programm-Betriebsart-Wahlschalter auf "manual" einstellen.
  4. Netzspannung auf ihren Sollwerthalten.
  5. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
  6. Mittels eines Schraubenziehers die Stellung der Antennenspule (L201) so einstellen, daß, sie gegen die Rückenplatte einen Winkel von ca. 25° macht.
  7. Den Eingangswähler auf die "AM"-Position stellen.
  8. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.
  9. Den MW-Stummabstimmungsschalter auf die "off" (aus)-Stellung stellen.

AM (MW) -MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHVERFAHREN
ANSCHLUSS	FREQUENZ				

**AM(MW) -ZF-ABGLEICH**

Nr. 1	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400Hz Modul., 30%)	Kein Empfang	Oszilloskop oder Wechselstrom-Voltmeter an Ausgangsklemme (OUTPUT) Schließen.	L203 (1. IFT) Z201 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adjustieren, daß der Ausgang den maximalen Wert erreicht.
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**AM(MW) -HF-ABGLEICH**

Nr. 2 3 4	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	522kHz (400Hz Modul., 30%)	522kHz	Zwischen TP1 und Erdung Gleichstrom-Voltmeter schließen.	L202 (Osc. Spule)	L202 so justieren, daß die vom Gleichstrom-Voltmeter gemessene.
		612kHz (400Hz Modul., 30%)	612kHz	Oszilloskop oder Wechselstrom-Voltmeter an Ausgangsklemme (OUTPUT) Schließen.	L201 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L201 mit einem Schraubendreher justieren.
		1503kHz (400Hz Modul., 30%)	1503kHz	Oszilloskop oder Wechselstrom-Voltmeter an Ausgangsklemme (OUTPUT) Schließen.	CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (3) und (4) wiederholen, bis die Frequenz genau mit der Skalanzeige übereinstimmt.

**AM (MW) -STUMMABSTIMMUNGSABGLEICH**

Nr. 5	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Ungefähr 35dB in den Antenneneingang leiten.)	1503kHz (400Hz Modul., 30%)	1503kHz	Oszilloskop oder Wechselstrom-Voltmeter an Ausgangsklemme (OUTPUT) Schließen.	VR601	"Muting" Schalter auf "on" stellen, VR601 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird.
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**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 19 kHz 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 beträgt 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-Stummabstimmungsschalter ausschalten.
  2. Den UKW-Antennenwahlschalter auf die "normal"-Stellung bringen.
  3. Den Aussteuerungsprüfschalter ausschalten.
  4. Den Eingangswähler auf die "FM"-Position stellen.
  5. Die anderen Einstellungen entsprechen den AM (MW)-Einstellungen.

FM (UKW) MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHVERFAHREN	
ANSCHLUSS	FREQUENZ					
<b>UKW-ZF-ABGLEICH</b>						
Nr. 6	-	Kein Signal	Kein Empfang	Ein Gleichstromröhrenvoltmeter mit <b>TP2</b> (beide Seiten von R111) über eine Drosselspule verbinden. (Siehe Abb. 2)	T102 (Diskriminator FT)	Den Kern von T102 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt.
<b>ÜBERLAGERUNGS-FREQUENZ-ABGLEICH</b>						
7	-	Kein Signal	87.9MHz	Zwischen <b>TP3</b> und Erdung Gleichstrom-Voltmeter schließen.	L6 (Osc. Spule)	L6 so justieren, daß die vom Gleichstrom-Voltmeter gemessene Spannung 4,1V beträgt.
<b>KRISTALLSCHWINGEREINSTELLUNG</b>						
8	-	Kein Signal	87.9MHz	<ul style="list-style-type: none"> <li>• Signal frequenzmesser an <b>TP4</b> schließen.</li> <li>• Die Farbmarkierung der keramischen Filter (CF101 ~104) überprüfen. (Alle vier Filter haben die gleiche Farbe.)</li> </ul>	CT901 (Kristallschwinger-trimmer)	Wenn blaue Keramikfilter benutzt werden, die Ausgangsfrequenz von TP4 auf 98.5751 MHz, bei rosa Filtern, die Frequenz auf 98.6251MHz und bei roten Filtern, die Frequenz auf 98.6001 MHz einstellen.
<b>UKW-HF-ABGLEICH</b>						
9	-	Kein Signal	87.9MHz	Zwischen <b>TP3</b> und Erdung Gleichstrom-Voltmeter schließen.	L6 (Osc. Spule)	L6 so justieren, daß die vom Gleichstrom-Voltmeter gemessene Spannung 4,1V beträgt.
10	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90.1MHz (400Hz Modulat., 100%)	90.1MHz	Oszilloskop an Ausgangsklemme (OUTPUT) Schließen.	L3 (HF Det. Spule 1) L4 (HF Det. Spule 2) L1 (Ant. Spule) T101 (IFT)	<ol style="list-style-type: none"> <li>1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird.</li> <li>2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 3)</li> <li>3. Die Einstellung von (9), (10) und (11) wiederholen, bis die Frequenz mit der Skala übereinstimmt.</li> </ol>
11		106.1MHz (400Hz Modulat., 100%)	106.1MHz	Oszilloskop an Ausgangsklemme (OUTPUT) Schließen.	CT1 (Osc. Trimmer)	
<b>ABGLEICH AUF MIN. VERZERRUNG IN STELLUNG UKW-MONO</b>						
12	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen	100.1MHz (400Hz Modulat., 100%)	100.1MHz	Verzerrungsmesser an rechten und linken Kanäle Ausgangsklemme "OUTPUT" des Gerätes schließen.	T103 (Diskriminator FT)	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/ auto" einstellen und dann Schritt (6) im signallosen Zustand prüfen.</li> <li>2. Wenn Abweichung vorliegt (primäre Seite) von T102 wieder einstellen.</li> <li>3. T103 (B) Kern für minimale Verzerrung der rechten und linken Kanäle justieren.</li> </ol>
<b>UKW-STUMMABSTIMMUNGS PEGELANZEIGER</b>						
13	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (10dB in den Antenneneingang leiten.)	100.1MHz (400Hz Modulat., 100%)	100.1MHz	Oszilloskop oder Wechselstrom-Voltmeter an Ausgangsklemme (OUTPUT) Schließen.	VR101 (UKW-Muting)	<ol style="list-style-type: none"> <li>1. Len UKW Muting/UKW-Betriebsartschalter auf "off/ mono" einstellen.</li> <li>2. "Muting" Schalter auf "on" stellen. VR101 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird.</li> </ol>
<b>UKW-MPX-PILOTABGLEICH (VCO)</b>						
14	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Mono-Signal)	100.1MHz (Unmodulierte Welle)	100.1MHz	Signal frequenzmesser an <b>TP5</b> schließen.	VR301 (VCO)	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/ auto" einstellen.</li> <li>2. VR301 so abgleichen, daß Ausgangsfrequenz von <b>TP5</b> 19kHz ± 30Hz</li> </ol>
<b>KONTROLL - BANDPASSFILTER - ABGLEICH</b>						
15	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (Unmodulierte Welle)	100.1MHz	Wechselstrom-voltmeter an <b>TP6</b> schließen.	L302 L303 (Pilot BPF)	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/ auto" einstellen.</li> <li>2. L302 und L303 so abstimmen, daß die Ausgangsspannung maximal ist.</li> </ol>



FM (UKW) MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverFAHREN	
ANSCHLUSS	FREQUENZ					
<b>KONTROLL - AUFLÖSEN - ABGLEICH</b>						
Nr. 16	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (Un-modulierte Welle)	100.1MHz	Oszilloskop an <b>TP7</b> schließen.	L302 VR303 (Kontrollauflösen)	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen.</li> <li>2. L302 und VR303 abwechselnd so einstellen, daß die Ausgangsspannung am <b>TP7</b> minimalisiert wird und die Wellenform wie in Abb. 4 erscheint.</li> </ol>
<b>PHASENSCHIFTERABGLEICH</b>						
17	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400Hz Modulat., 100%) L-Betriebsart	100.1MHz	Wechselstrom-voltmeter an L-Kanal Ausgangsklemme (OUTPUT) schließen.	VR302 (Phasenregelung)	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen.</li> <li>2. VR302 so abstimmen, daß die Ausgangsleistung des linken Kanals maximal ist.</li> </ol>
<b>STEREO-VERZERRUNGSABGLEICH</b>						
18	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400Hz Modulat., 100%) L-Betriebsart	100.1MHz	Tiefpaßfilter (fc = 15 ~ 19kHz) über Wechselstrom-voltmeter an Ausgangsklemme (OUTPUT) des Gerätes schließen.	T101 (IFT)	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen.</li> <li>2. Den schon eingestellten T101 erneut, innerhalb von <math>\pm 90^\circ</math> von der voreingestellten Kernposition einstellen, sodaß die Verzerrung des linken Kanals minimalisiert wird.</li> <li>3. Die Schritte 6, 12 und 13 noch einmal überprüfen.</li> </ol>
<b>TRENNUNG - ABGLEICH</b>						
19	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400Hz Modulat., 100%) L- oder R-Betriebsart	100.1MHz	Tiefpaßfilter (fc = 15 ~ 19kHz) über Wechselstrom-voltmeter an Ausgangsklemme (OUTPUT) des Gerätes schließen.	VR401	<ol style="list-style-type: none"> <li>1. Den UKW Muting/UKW-Betriebsartschalter auf "on/auto" einstellen.</li> <li>2. 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.</li> </ol>
<b>AUFNAHMEAUSSTEUERUNGS-CHECKSIGNALEINSTELLUNG</b>						
20	Meßsender über eine Kunstantenne an den UKW-Antennen-eingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1MHz (400Hz Modulat., 100%) L- und R-Betriebsart	100.1MHz	Wechselstrom-voltmeter an Ausgangsklemme (OUTPUT) des Gerätes schließen.	VR402	<ol style="list-style-type: none"> <li>1. So einstellen, daß die Ausgangsspannung auf 0dB kommt, wenn dem Gerät ein 60dB-Signal zugeleitet wird.</li> <li>2. Den Aufnahmeaussteuerungsschalter auf "on" stellen.</li> <li>3. VR402 so einstellen, daß der Ausgang auf -6dB kommt. L304 und L305 sind schon eingestellt. Deshalb den Kern nicht drehen.</li> </ol>

\* Dans le cas d'un appareil sans sélecteur FM/AM, l'émission peut être recue sur FM 50 kHz/AM 9 kHz.

\* Quand l'appareil présente un sélecteur FM/AM, placer le commutateur sur l'étape de FM 50kHz/AM 9kHz.

### REGLAGE DE AM

● **Réglage et équipement utilisé**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Voltmètres électronique de courant alternatif et de courant continu (VTVM)</li> <li>2. Générateur du signal AM (AM-SG)</li> <li>3. Placer le sélecteur de mode de programme sur la position "manual".</li> <li>4. Conserver la tension du secteur à la tension nominale.</li> <li>5. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.</li> </ol> | <ol style="list-style-type: none"> <li>6. Régler la position de la bobine (L201) de l'antenne en utilisant un tournevis de telle sorte qu'elle soit environ à 25 degrés de la plaque arrière.</li> <li>7. Sélecteur d'entrée sur la position "AM"</li> <li>8. Utiliser un tournevis non-métallique pour le réglage.</li> <li>9. Régler le commutateur de réglage silencieux de AM sur la position "off".</li> </ol> |
|---|---|

AM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGES	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE	
BRANCHEMENT	FREQUENCE					
<b>REGLAGE DE FI-AM</b>						
No. 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 400Hz)	Point sans signal	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	L203 (1 transfo FI) Z201 (2 transfo FI)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
<b>REGLAGE DE RF-AM</b>						
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 400Hz)	522kHz	Brancher le voltmètre à courant continu entre TP1 et la prise de terre.	L202 (Bobine OSC)	Régler L202 de telle sorte que le voltage mesuré par le voltmètre à courant continu, soit de $1.0 \pm 0.05$ V.
3		612kHz (modulé à 30% par 400Hz)	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. Régler le noyau ferrite de L201 à l'aide d'un tournevis.
4		1503kHz (modulé à 30% par 400Hz)	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.
<b>REGLAGE DU REGLAGE SILENCIEUX AM</b>						
5	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Appliquer environ 35dB à la borne de l'antenne.)	1503kHz (modulé à 30% par 400Hz)	1503kHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	VR601	Avec le commutateur de silencieux AM réglé sur la position "on", régler le VR601 de telle sorte que la sortie fournie avec le réglage silencieux en position déclenchée.

### 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 (19kHz et 108MHz mesurable).
7. Antenne fictive FM, 75 ohms (Fig. 1) 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**

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Placer le commutateur de réglage silencieux de FM sur la position "off".</li> <li>2. Placer le sélecteur de l'antenne FM sur la position "normal".</li> <li>3. Placer le commutateur de vérification du niveau d'enregistrement sur la position "off".</li> </ol> | <ol style="list-style-type: none"> <li>4. Sélecteur d'entrée sur la position "FM"</li> <li>5. Les autres réglages sont les mêmes que les réglages de AM.</li> </ol> |
|---|---|

FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE	
BRANCHEMENT	FREQUENCE					
<b>REGLAGE DE FI-FM</b>						
No. 6	—	Sans Signal	Point sans signal	Brancher le VTVM CC à <b>TP2</b> (des deux côtés de R111), par la bobine d'arrêt. (Voir la Fig. 2)	T102 (Transfo FI discri.)	Régler le noyau T102 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0V dans la gamme des 300mV.
<b>REGLAGE DU FRÉQUENCE D'OSCILLATION LOCAL</b>						
7	—	Sans Signal	87.9MHz	Brancher le voltmètre à courant continu entre <b>TP3</b> et la prise de terre.	L6 (Bobin Osc.)	Régler L6 de telle sorte que le voltage mesuré par le voltmètre à courant continu soit de 4,1V.
<b>REGLAGE DE L'OSCILLATEUR A CRISTAL</b>						
8	—	Sans Signal	87.9MHz	<ul style="list-style-type: none"> <li>• Brancher le compteur de fréquence entre <b>TP4</b> et la prise de terre.</li> <li>• Vérifier la couleur de filtres céramiques (CF101 à CF104) (Les quatre filtres sont de la même couleur).</li> </ul>	CT901 (Trimmer de l'osc à cristal)	Quand un filtre céramique marqué en bleu est utilisé, régler la fréquence de sortie de sortie de <b>TP4</b> à 98,5751 MHz. Régler aussi la fréquence des filtres oranges à 98,6251 MHz et des filtres rouges à 98,6001 MHz.
<b>REGLAGE DE RF-FM</b>						
9	—	Sans Signal	87.9MHz	Brancher le voltmètre à courant continu entre <b>TP3</b> et la prise de terre.	L6 (Bobin Osc.)	Régler L6 de telle sorte que le voltage mesuré par le voltmètre à courant continu soit de 4,1V.
10	Branchez sur la prise d'antenne FM à travers une antenne fictive FM	90.1MHz (modulé à 100% par 400Hz)	90.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	L3 (1er détecteur) L4 (2e détecteur) L1 (Bobin Ant.) T101 (Transfo FI)	<ol style="list-style-type: none"> <li>1. Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie.</li> <li>2. Faire le réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir fig. 3)</li> <li>3. Refaire les réglages (9), (10) et (11) jusqu'à ce que la fréquence corresponde correctement avec l'échelle du cadran.</li> </ol>
11		106.1MHz (modulé à 100% par 400Hz)	106.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	CT1 (Trimmer Osc.)	
<b>REGLAGE DE LA DISTORSION FM EN MONO</b>						
12	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	100.10MHz (modulé à 100% par 400Hz)	100.10MHz	Brancher le compteur de distorsion à la borne de sortie (OUTPUT) du canal gauche et droit de l'appareil.	T103 (Transfo FI discri.)	<ol style="list-style-type: none"> <li>1. Placer le commutateur de réglage silencieux de FM/ mode de FM sur la position "on/auto" et vérifier l'étape (6) dans le mode sans signal.</li> <li>2. S'il est déplacé, re-régler (côté primaire) de T102.</li> <li>3. Régler le noyau T103 de telle sorte que la distorsion des canaux droit et gauche soit la plus faible.</li> </ol>
<b>REGLAGE DU SEUIL DU SILENCIEUX D'ACCORD</b>						
13	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 10dB à la borne de l'antenne.)	100.1MHz (modulé à 100% par 400Hz)	100.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	VR101	<ol style="list-style-type: none"> <li>1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "off/mono".</li> <li>2. Avec le commutateur de mode/régulation silencieux FM réglé sur la position "on/auto", régler le VR101 de telle sorte que la sortie fournie avec le réglage silencieux en position déclenchée.</li> </ol>
<b>REGLAGE (VCO) PILOTE MULTIPLEX FM</b>						
14	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal monoscus-tique)	100.1MHz Non modulé	100.1MHz	Brancher le compteur de fréquence à <b>TP5</b> .	VR301	<ol style="list-style-type: none"> <li>1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto".</li> <li>2. Régler VR301 de telle sorte que la fréquence de sortie de <b>TP5</b> soit de 19kHz ± 30Hz.</li> </ol>

FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE	
BRANCHEMENT	FREQUENCE					
<b>REGLAGE FILTRE PILOTE PASSE - BANDE</b>						
15	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (Non module)	100.1MHz	Brancher un voltmètre à courant alternatif à <b>TP6</b>	L302 L303 (BPF signal pilote)	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. Régler la L302 et al L303 de telle sorte que la tension de sortie soit maximale.
<b>ANNULATION DU SIGNAL PILOTE</b>						
16	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1MHz (Non module)	100.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope à <b>TP7</b>	L302 VR303	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. Régler les L302 et VR303 alternativement de telle sorte que la tension de sortie du <b>TP7</b> soit minimale et que la forme d'ondes soit celle montrée sur la Fig. 4.
<b>REGLAGE DU DEPHASEUR</b>						
17	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 400Hz) (Mode G)	100.1MHz	Brancher un voltmètre à courant continu à la borne de sortie du canal gauche.	VR302	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. Régler la VR302 de telle sorte que la sortie du canal gauche, soit maximale.
<b>REGLAGE DE LA DISTORSION STEREO</b>						
18	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 400Hz) (Mode G)	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.	T101	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. Rerégler le T101 déjà réglé, à ± 90% de la position préréglée du noyau de telle sorte que la distorsion du canal gauche soit minimale. 3. Vérifier les étapes 6, 12 et 13.
<b>REGLAGE DE LA SEPARATION DES CANAUX</b>						
19	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 400Hz) (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	1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. 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.
<b>REGLAGE DU SIGNAL DE VERIFICATION DU NIVEAU D'ENREGISTREMENT</b>						
20	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 400Hz) (Mode G+D)	100.1MHz	Brancher le voltmètre à courant alternatif et l'oscilloscope aux borne de sortie (OUTPUT) de l'appareil.	VR402	1. Régler de telle sorte que la tension de sortie soit de 0dB quand un signal de 60dB est appliqué à l'appareil. 2. Régler le commutateur de niveau d'enregistrement sur "on". 3. Régler la VR402 de telle sorte que la sortie soit de -6dB.

## ■ DISASSEMBLY INSTRUCTIONS

### ● How to check printed circuit board

1. Remove the 3 setscrews (① ~ ③ in Fig. 5) on the bottom of the set  
(Do not loosen the pin (A) in Fig. 5.)
2. Remove the 4 setscrews (④ ~ ⑦ in Fig. 6) of the cabinet.
3. Remove the 3 setscrews (⑧ ~ ⑩ in Fig. 6) on both sides of the front panel; 4 setscrews (⑪ ~ ⑭ in Fig. 6) on the rear panel.
4. Raise the set as in Fig. 7. Cut off the lead clumper and open the chassis and printed circuit board to the right and left.  
(Ground wire is connected to the pin (A) in Fig. 5 as shown in Fig. 8 (B). If it is hard to open the chassis, remove the ground wire connected to the pin.)
5. When crystal oscillator (X901) has been replaced, solder IC902 shield cover to the crystal case as shown in Fig. 8 in order to prevent noise.

**Note:** For ⑪ and ⑫ in Fig. 6, screw (XTB3+8BFZ1) provided with pin like A encircled by dotted line is used. However, to replace them, use 3x8mm tapping screw (XTB3+8BFZ) and toothed lock washer (XWC3B) like B.

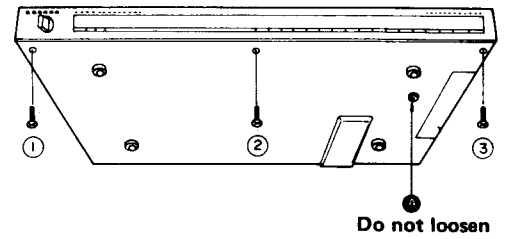


Fig. 5

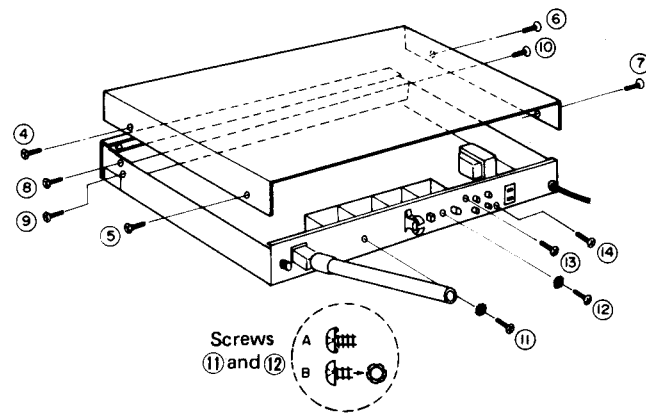


Fig. 6

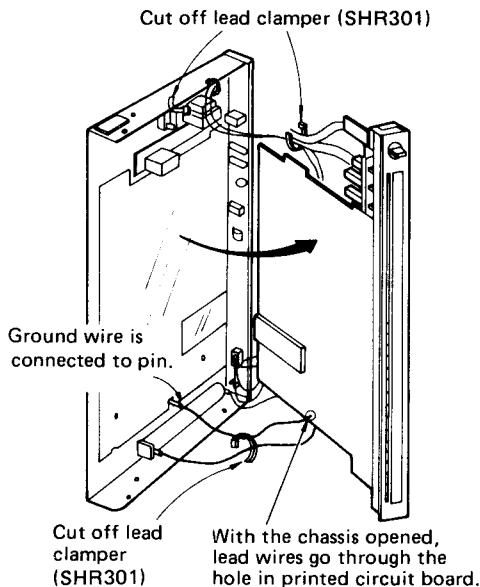


Fig. 7

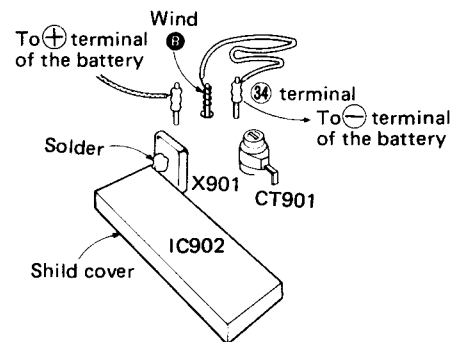


Fig. 8

**■ TECHNICAL GUIDE**

● **Peak sampling hold circuit**

The pilot signal which has passed through the 19kHz cancel circuit is applied to the phase shift circuit in the form of clear sine waves and then goes into IC of PLL. Thus, 38kHz square waves for L and R channels, which are 180° different in phase from each other, can be obtained as the output. In a conventional switching system, this signal was used to separate the composite signal into L and R.

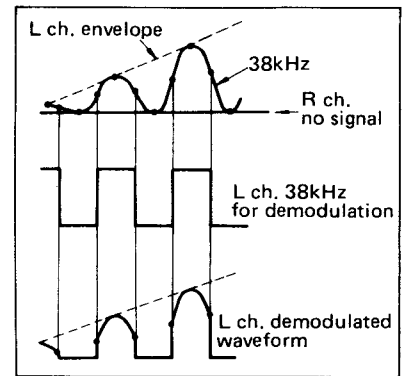
In the present system, the square waves are passed through the differential circuit, and the output signal is used for switching of the composite signal.

To explain this in further detail, suppose to modulate a composite signal which exists only on L channel while no signal on R channel for the convenience of explanation, then in a conventional system, the L channel modulating signal comes to the center of the envelope (peak points) of the composite signal switched at 38kHz as shown in Fig. 9, and the L signal is thus modulated.

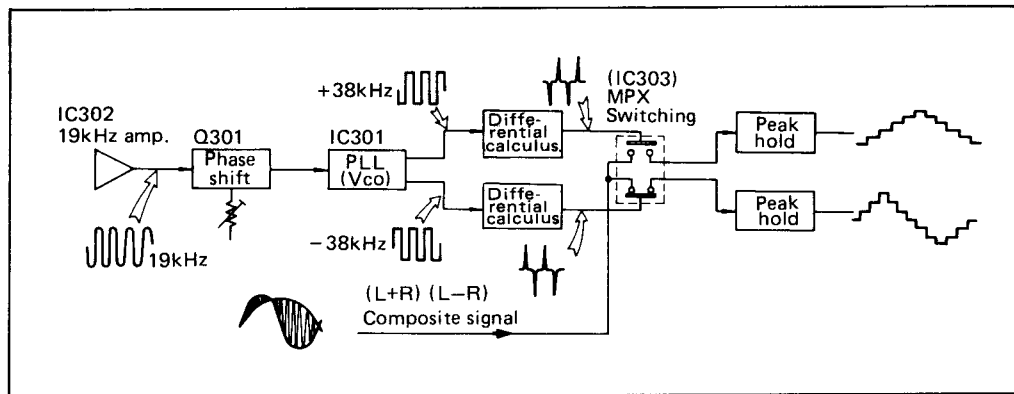
However, the L signal leaks into R channel due to the R channel modulating signal as shown in Fig. 11. This causes worsening of separation.

In the peak sampling system, as shown in Fig. 12, the phase shift circuit serves to correct the modulating signal so that the rise part of the signal comes to the envelope (peak points) and then the signal goes into the differential circuit. The signal is modulated (sampled) by the signal thus obtained. The modulated L and R signals, maintaining the output level, are applied into the AF amplifier through the peak hold circuit to increase the signal to noise ratio. As shown in Fig. 13, there is almost no leakage of L signal into R channel due to the modulating signal of R channel, unlike the case of Fig. 11, and the resultant separation is sufficient.

The peak sampling hold system is compared with the conventional system in Fig. 14.

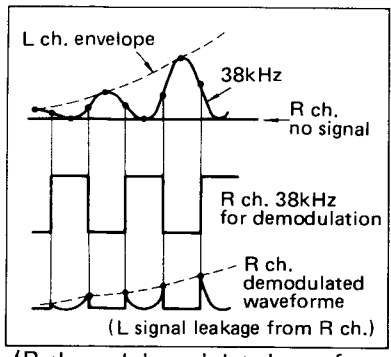


(L channel demodulated waveform in conventional system)  
**Fig. 9**

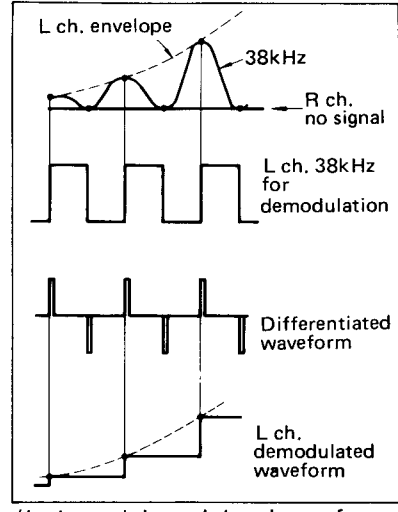


(Peak sampling hold MPX circuit block diagram)

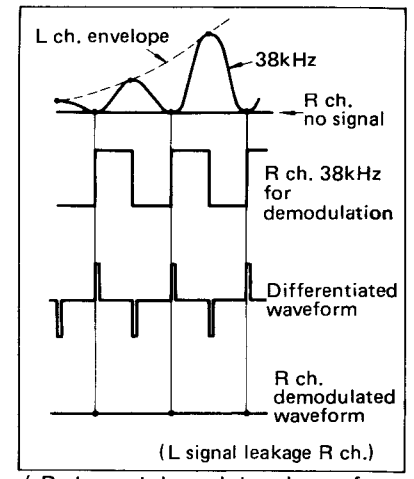
**Fig. 10**



(R channel demodulated waveform in conventional system)  
**Fig. 11**

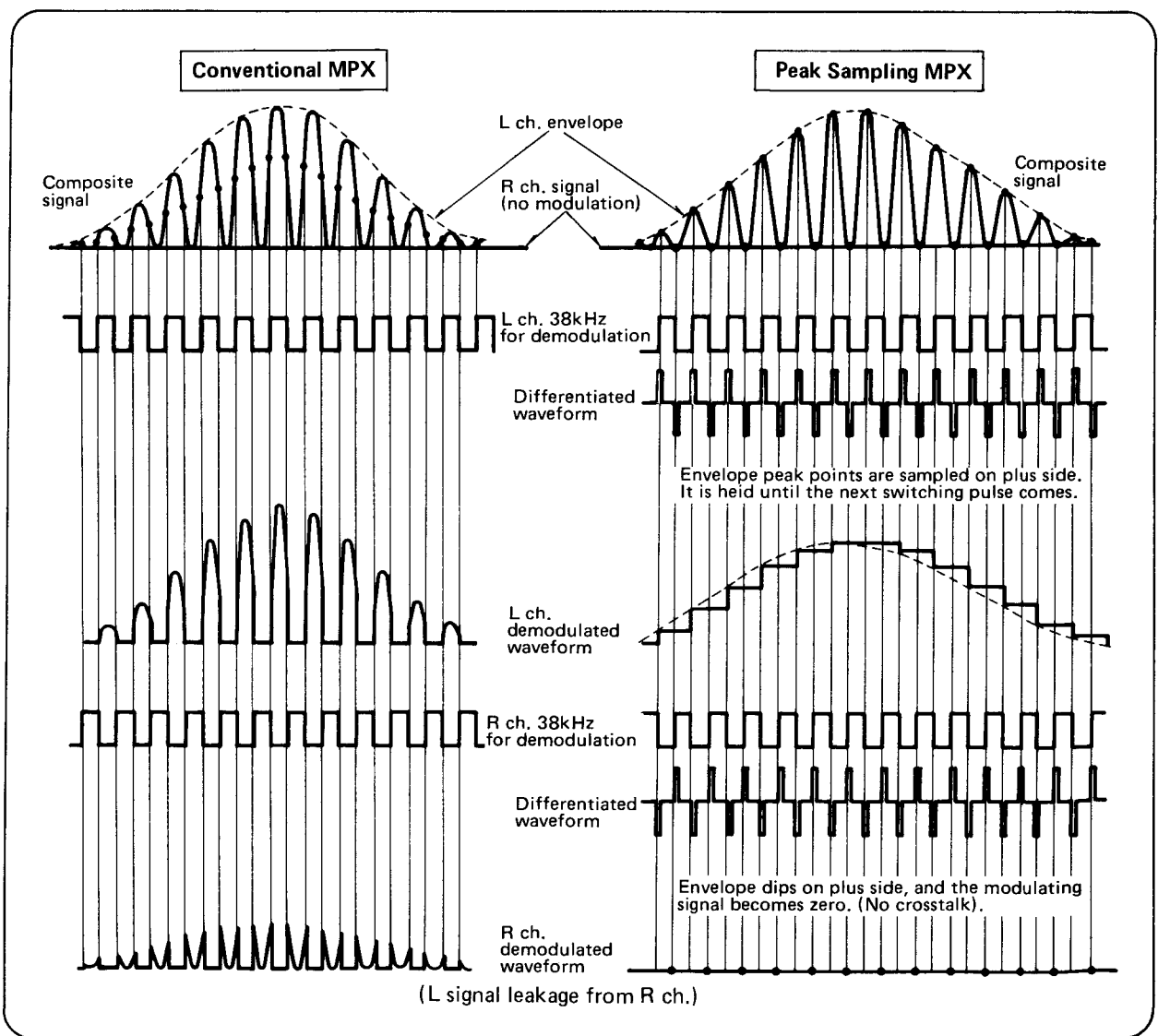


(L channel demodulated waveform in the peak sampling)  
**Fig. 12**



(R channel demodulated waveform in the peak sampling)  
**Fig. 13**

• Comparison of conventional MPX and peak sampling MPX systems



**Fig. 14**

## REPLACEMENT PARTS LIST ..... Electric Parts

- Notes:** 1.  $\Delta$  indicates that only parts specified by the manufacturer be used for safety.  
 2. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

### Areas

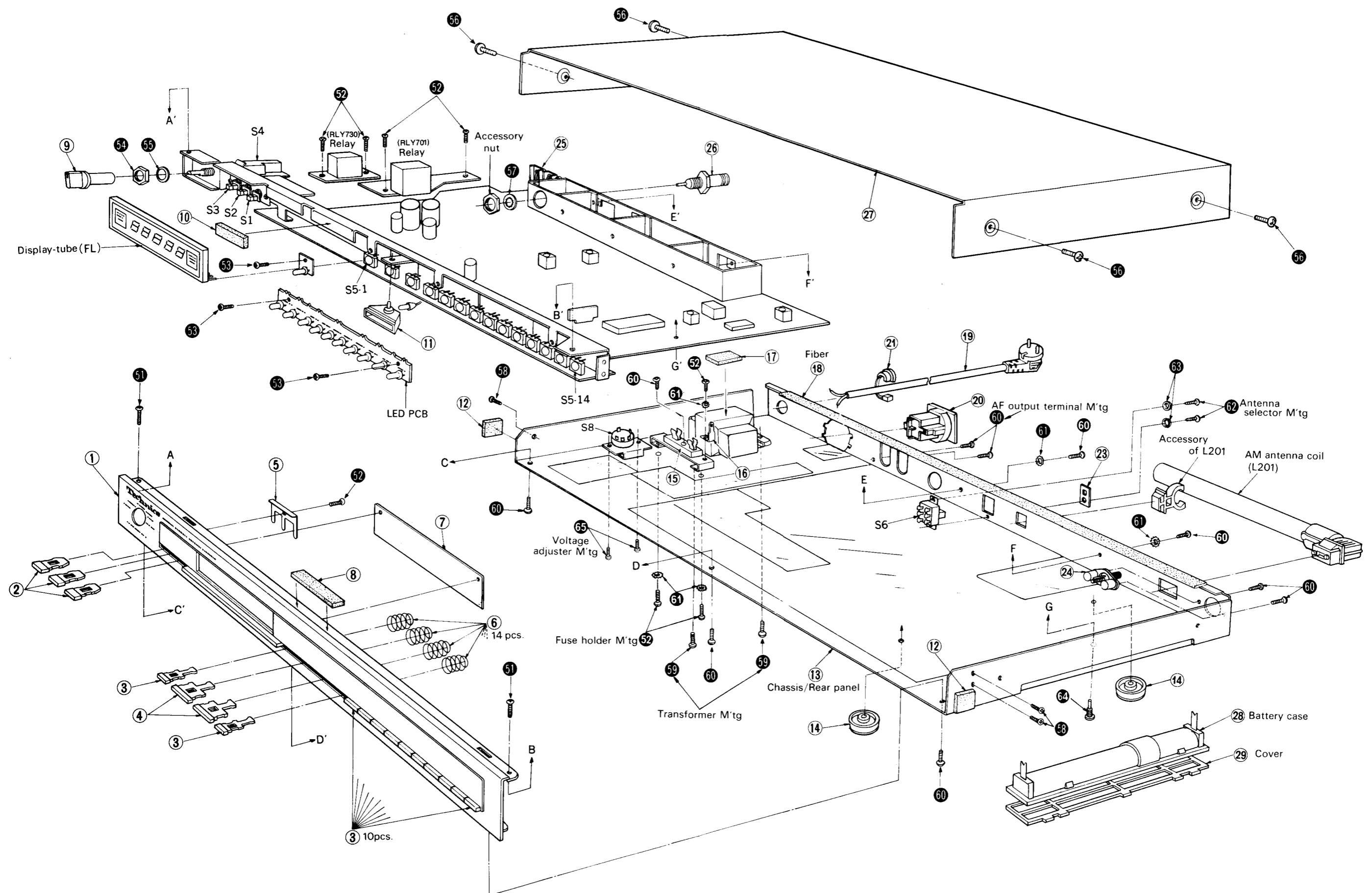
[XE] is available in United Kingdom.  
 [XA] is available in Asia, Latin America, Middle East and Africa.

Ref. No.	Part No.	Part Name & Description
<b>INTEGRATED CIRCUITS</b>		
IC101	SVIAUPC577HF	IC, FM-IF Amplifier
IC102	SVIUPC1161C	IC, FM-IF Amplifier & Detector
IC201	AN217P-BB	IC, AM Converter
IC301	SVIUPC1161C	IC, FM MPX
IC302, 401	AN6552F	IC, 19kHz & AF Amplifier
IC303	SVIUPD4066C	IC, MPX Peak Sampling Circuit
IC901	SVIUPB553C-E	IC, Pre-Scaler
IC902	SVIUPD1704CL	IC, Micro-Computer
IC903	SVITC5067BP	IC, Buffer (Fluorescence Driver)
IC904	SVIM74LS42P	IC, Decoder
<b>TRANSISTORS</b>		
Q1	3SK74-L1	Transistor, FM-RF Amplifier [FET]
Q2	2SC1674-M	Transistor, FM Mixer
Q3, 4, 5	2SC1675-L1	Transistor, Buffer & Oscillator (Use in ranks L1 or L2)
Q201, 202, 301, 302, 401, 402	2SC945-P2	Transistor, Buffer, Phase Shift, Muting & AF Amp. (Use in ranks P1 or P2)
Q404, 405, 601, 602, 604, 605, 606, 608, 609, 702, 704, 705, 709, 710	2SC945-P2	Transistor, Recording Level Check Signal Generator & Switching (Use in ranks P1 or P2)
Q901~908	2SC945-P2	Transistor, Loop Filter & Driver (Use in ranks P1 or P2)
Q403, 603, 607, 701, 707, 708, 909~911	2SA733-P1	Transistor, Muting, Relay Driver & Switching. (Use in ranks P1 or P2)
Q703	2SD571-L	Transistor, Voltage Regulator
Q706	2SD762-O	Transistor, Voltage Regulator (Use in ranks O or P)
Q981, 982	2SC1684-R	Transistor, Reset Circuit (Use in ranks R or T)
Q961 [XA] only	2SC945-P2	Transistor, Switching (Use in ranks P1 or P2)
<b>DIODES</b>		
D1~4	SVDBB204	Diode, Variable Capacitance (for FM)
D201	SVDBB113	Diode, Variable Capacitance (for AM)
D202, 303	<b>RVDKB262C</b>	Diode, AM Detector & Muting
D203, 204, 301, 601~609, 611~613, 616, 620, 621, 650, 705, 901~913, 916~921, 934, 935, 982	<b>MA162A</b>	Diode, Switching
D936 Except for [XA]	<b>MA162A</b>	Diode
D302, 933	$\Delta$ <b>20A90</b>	Diode, Switching
D701~704	<b>SVDSR1K2</b>	Rectifier
D706	<b>SVDMZ330A2</b>	Diode, 30V Zener
D707	<b>RVDRD6R2EB</b>	Diode, 6.2V Zener
D708	MA1064A	Diode, 6.4V Zener
D709	SVDMZ312C2	Diode, 12V Zener
D710	SVDMZ333A	Diode, 33V Zener
D922~932	LN21CP	Light Emitting Diode, Channel Indicator
D981	SVDMZ303A	Diode, 3V Zener
D961 [XA] only	<b>MA162A</b>	Diode
<b>COILS</b>		
L1	SLA4P43	Coil, FM Antenna
L2, 7	<b>SLQAN40G-1</b>	Coil, Choke
L3	SLD4P43	Coil, FM-RF Detector
L4	SLD4P45	Coil, FM-RF Detector
L5	RLQY15G5-Y	Coil, Choke
L6	SLO4P73	Coil, FM Oscillator
L101	SLQW270-1K	Coil, Choke
L201	SLF2D59	Coil, AM Bar Antenna
L202	SLO2C25-P	Coil, AM Oscillator
L203	SLI2C127	Coil, AM IF
L204, 301	SLQX101-2D	Coil, Choke
L302, 303	SLM1C57-Z	Coil, 19kHz Filter (Old part No. SLM1C37-Z)
L304	SLM1C47-P	Coil, Low Pass Filter

Ref. No.	Part No.	Part Name & Description
<b>TRANSFORMERS</b>		
T101	SLI4C109	Transformer, FM-IF
T102	SLI4C511-K	Transformer, FM Discriminator IF
T103	SLI4C513-K	Transformer, FM Discriminator IF
T701	$\Delta$ SLT5J121-W	Transformer, Power
<b>CERAMIC FILTERS</b>		
CF101	SVFE107MX2-A	Ceramic Filter, 10.7MHz (Red)
CF102, 103, 104	SVFE107MX2-B	Ceramic Filter, 10.675MHz (Blue)
	SVFE107MX2-C	Ceramic Filter, 10.725MHz (Orange)
	SVFE107MM-A	Ceramic Filter, 10.7MHz (Red)
	SVFE107MM-B	Ceramic Filter, 10.675MHz (Blue)
CF201	SVFE107MM-C	Ceramic Filter, 10.725MHz (Orange) (Use pair ranks as same as CF101, CF102, CF103 and CF104)
	SVFSFP450HT	Ceramic Filter, AM 450kHz
<b>CRYSTAL</b>		
X901	SVQ43U452-1	Crystal, 4.5MHz Counter Oscillator
<b>VARIABLE RESISTORS</b>		
VR101	<b>EVTS3MA00B53</b>	Muting Level Adjustment, 5k $\Omega$ (B)
VR301	<b>EVTS3MA00B14</b>	PLL IC (VCO) Adjustment, 10k $\Omega$ (B)
VR302	<b>EVTS3MA00B53</b>	Phase Shifter Adjustment, 5k $\Omega$ (B)
VR303	<b>EVTS3MA00B54</b>	Pilot Signal Cancel Adjustment, 50k $\Omega$ (B)
VR401	<b>EVTS3MA00B15</b>	Separation Adjustment, 100k $\Omega$ (B)
VR402	<b>EVTS3MA00B55</b>	Recording Level Check Adjustment, 500k $\Omega$ (B)
VR601	<b>EVTS3MA00B15</b>	AM Muting Adjustment, 100k $\Omega$ (B)
<b>VARIABLE CAPACITORS</b>		
CT1, 901	ECV1ZW06X32E	FM Local Osc. & Counter Osc. Adjustment
CT201	SVCTY1218269	AM Antenna Trimmer
<b>COMPONENT COMBINATIONS</b>		
Z201	SLI9F101-Z	Component Combination, AM Detector Circuit
Z701, 702	EXRFS203ZS	Component Combination, 0.01 $\mu$ F (x2)
Z901, 902	EXBP87104K	Component Combination, 100k $\Omega$ (x7)
<b>THERMISTERS</b>		
TH101	ERTD2FHL103S	Thermister, Thermal Compensation, 10k $\Omega$
<b>LAMP</b>		
PL601	$\Delta$ <b>XAMR38S200B</b>	Lamp, Quartz Lock Indicator, 6.3V 45mA
<b>FUSES</b>		
F1 [XA, XE] only	$\Delta$ XBA2C10TRO	Fuse, T1A (250V)
F1 [Other Areas]	$\Delta$ XBA2C08TRO	Fuse, T800mA (250V)
<b>SWITCHES</b>		
S1, 2, 3	SSH373	Switch, FM Mode, Rec Level & Clock Call
S4	SSR93	Switch, Program Mode
S5~1~5-14	SSG3	Switch, Preset Key
S6	ESD14116	Switch, FM Antenna Selector
S7 [XA] only	ESD14116	Switch, FM/AM Allocation Selector
S8	$\Delta$ ESE372	Switch, Voltage Adjuster
S9 [XE] only	$\Delta$ ESB70133	Switch, Power Source
<b>FLUORESCENT DISPLAY TUBE</b>		
FL	SAD7MT09ZA	Fluorescent Display Tube
<b>RELAY</b>		
RLY701 [XA] only	$\Delta$ SSY77	Relay, AC Outlet
RLY701 [Other Areas]	$\Delta$ SSY81	Relay, AC Outlet
RLY730 Except for [XA & XE]	$\Delta$ SSY81	Relay, AC Outlet



EXPLODED VIEWS

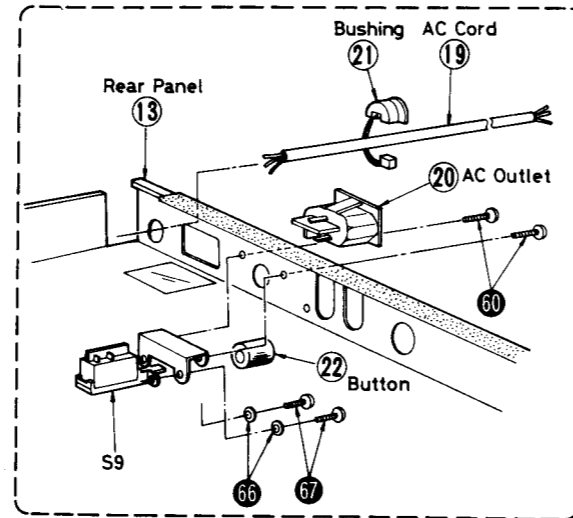


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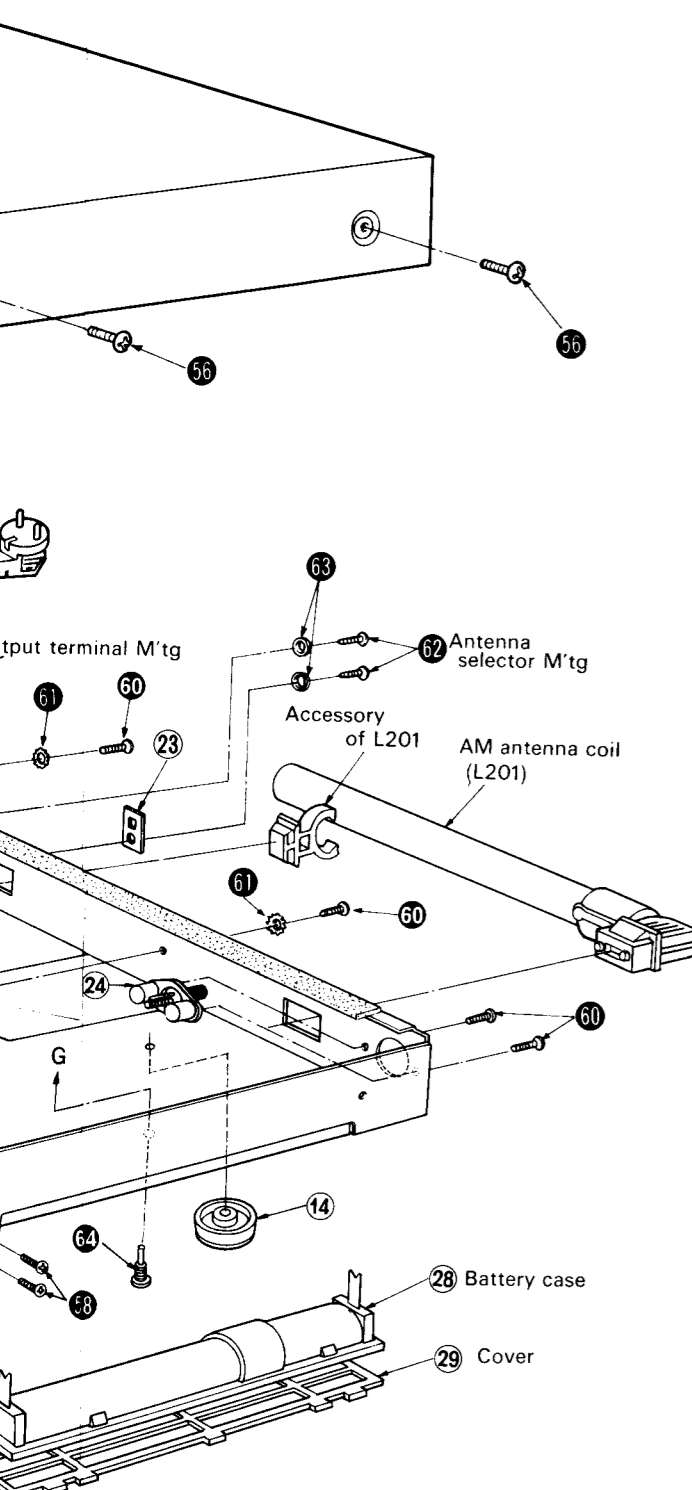
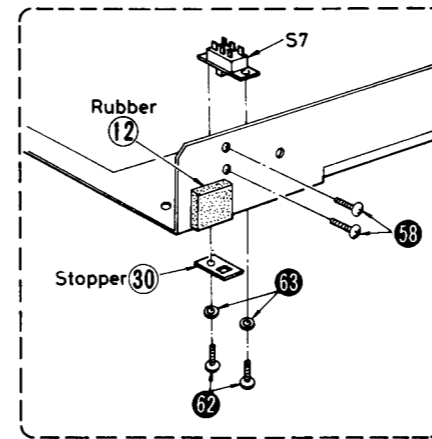
Access

REPLACEMENT PARTS LIST ... Cabinet and

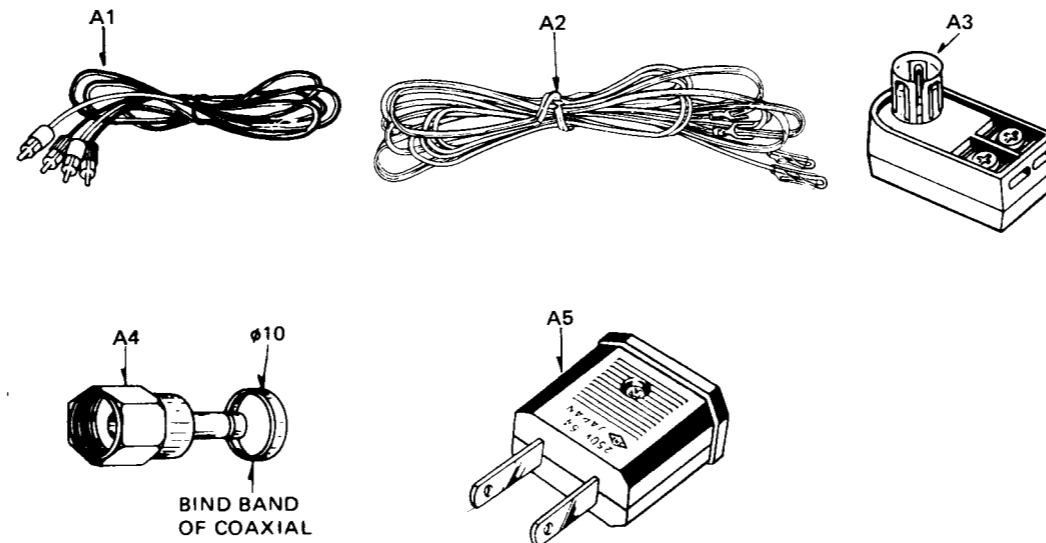
● Exploded view of rear panel for United Kingdom ([XE] area)



● Exploded view of left chassis side for Asia, Latin America, Middle East and Africa ([XA] area)



● Accessories



Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. A indicates that only parts specified by the manufacturer be used for safety.
3. X-marked parts are used for black type only, while O-marked parts are for silver type only.

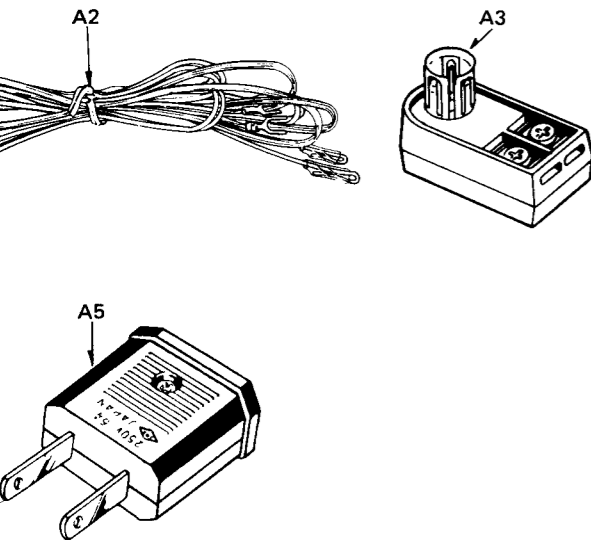
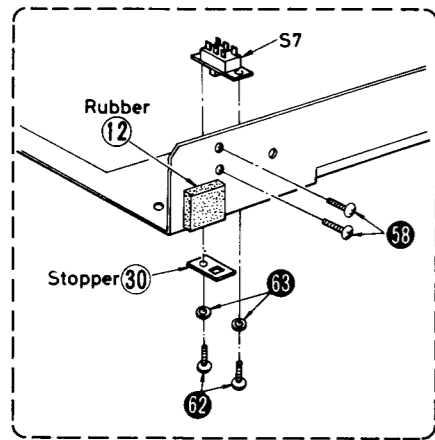
4. Parts other than those specified by the manufacturer and silver type are not included.
5. Bracketed and O-marked parts are for silver type only.

Ref. No.	Part No.	Part Name & Description
<b>CABINET and CHASSIS PARTS</b>		
1	SYWTS7M	Panel, Front Ass'y
1	SYWTS7KD	Panel, Front Ass'y (Black)
2	SBC239	Button, Clock Call/Rec Level/Muting
2	SBC239-1	Button, Clock Call/Rec Level/Muting (Black)
3	SBC235	Button, Memory & Preset
3	SBC235-1	Button, Memory & Preset (Black)
4	SBC237	Button, Tuning
4	SBC237-1	Button, Tuning (Black)
5	SUS167	Spring, Clock Call/Rec Level/Muting Buttons
6	SUS171	Spring, Preset Buttons
7	SHR5047-1	Filter, Display Window
8	SHG6063	Rubber Magnet, Front Panel
9	SBN867	Knob, Program Mode
9	SBN867-1	Knob, Program Mode (Black)
10	SHGA629	Cushion, FL Display Tube (Rubber)
11	SHG1483	Bracket, Quartz Lock Lamp
12	SHG6051-1	Cushion, Chassis Side (Rubber)
13 [DX] only	SGPTS7DX	Rear Panel, With Chassis & Feet Ass'y
13 [DM] only	SGPTS7DM	Rear Panel, With Chassis & Feet Ass'y
13 [XSW] only	SGPTS7W	Rear Panel, With Chassis & Feet Ass'y
13 [XE] only	SGPTS7E	Rear Panel, With Chassis & Feet Ass'y
13 [XA] only	SGPTS7X	Rear Panel, With Chassis & Feet Ass'y
13 [DG, XGH, EB, XGF]	SGPTS7K	Rear Panel, SGPTS7DX with Name Plate SGT21410
14	SKL227	Foot, Set Bottom Side
15	SJFA5101	Holder, Fuse
16	SJT503	Terminal, Ground (1 pin)
17	SHG647	Cushion, Power Transformer (Rubber)
18	SHS1009	Fiber, Rear Panel
19 [DM] only	SJA97	AC Cord, Power Source (With Plug)
19 [XSW] only	SJA119	AC Cord, Power Source (With Plug)
19 [XE] only	QFC1206M	AC Cord, Power Source
19 [DG] only	SJA103-2	AC Cord, Power Source (With Plug)
19 [DX, XGH, XGF, EB, XA]	SJA103-1	AC Cord, Power Source (With Plug)
20 [DM] only	SJS9311	Socket, AC Outlet
20 [XSW] only	SJS9307	Socket, AC Outlet
20 [XE] only	SJS9303	Socket, AC Outlet
20 [XA] only	SJSA66-2	Socket, AC Outlet
20 [DX, DG, EB, XGH, XGF]	SJS9309	Socket, AC Outlet
21 [DM] only	SFSR4N4	Bushing, AC Cord
21 [Other Areas]	SHR131	Bushing, AC Cord
22 [XE] only	SBC159	Button, Power Switch (S9)
23	SHR5073-1	Stopper, FM Antenna Selector

Ref. No.	Part Name & Description
24	
25	
26	
27	
27	
28	
29	
30 [XA] only	
<b>SCREWS, NUTS and</b>	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
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88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	
<b>ACCESSORIES</b>	
A1	
A2	
A3	
A4	
A5 [XA] only	
<b>PACKING PARTS</b>	
P1	
P2	
P3	
P4 [XGF] only	
P4 [Other Areas]	
P5 [XE] only	
P5 [XA] only	
P5 [Other Areas]	

Area:  
\* [D]  
\* [D]  
Bel  
Fra  
\* [D]  
\* [E]  
\* [X]  
\* [X]  
\* [X]  
\* [X]  
\* [X]  
\* [X]  
anc

- Exploded view of left chassis side for Asia, Latin America, Middle East and Africa ([XA] area)



## 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. indicates that only parts specified by the manufacturer be used for safety.
3. -marked parts are used for black type only, while -marked parts are for silver type only.

Ref. No.	Part No.	Part Name & Description
<b>CABINET and CHASSIS PARTS</b>		
1	SYWTS7M	Panel, Front Ass'y
1	SYWTS7KD	Panel, Front Ass'y (Black)
2	SBC239	Button, Clock Call/Rec Level/Muting
2	SBC239-1	Button, Clock Call/Rec Level/Muting (Black)
3	SBC235	Button, Memory & Preset
3	SBC235-1	Button, Memory & Preset (Black)
4	SBC237	Button, Tuning
4	SBC237-1	Button, Tuning (Black)
5	SUS167	Spring, Clock Call/Rec Level/Muting Buttons
6	SUS171	Spring, Preset Buttons
7	SHR5047-1	Filter, Display Window
8	SHG6063	Rubber Magnet, Front Panel
9	SBN867	Knob, Program Mode
9	SBN867-1	Knob, Program Mode (Black)
10	SHGA629	Cushion, FL Display Tube (Rubber)
11	SHG1483	Bracket, Quartz Lock Lamp
12	SHG6051-1	Cushion, Chassis Side (Rubber)
13 [DX] only	SGPTS7DX	Rear Panel, With Chassis & Feet Ass'y
13 [DM] only	SGPTS7DM	Rear Panel, With Chassis & Feet Ass'y
13 [XSW] only	SGPTS7W	Rear Panel, With Chassis & Feet Ass'y
13 [XE] only	SGPTS7E	Rear Panel, With Chassis & Feet Ass'y
13 [XA] only	SGPTS7X	Rear Panel, With Chassis & Feet Ass'y
13 [DG, XGH, EB, XGF]	SGPTS7K	Rear Panel, SGPTS7DX with Name Plate SGT21410)
14	SKL227	Foot, Set Bottom Side
15	<b>SJFA5101</b>	Holder, Fuse
16	SJT503	Terminal, Ground (1 pin)
17	SHG647	Cushion, Power Transformer (Rubber)
18	SHS1009	Fiber, Rear Panel
19 [DM] only	<b>SJA97</b>	AC Cord, Power Source (With Plug)
19 [XSW] only	SJA119	AC Cord, Power Source (With Plug)
19 [XE] only	<b>QFC1206M</b>	AC Cord, Power Source
19 [DG] only	SJA103-2	AC Cord, Power Source (With Plug)
19 [DX, XGH, XGF, EB, XA]	SJA103-1	AC Cord, Power Source (With Plug)
20 [DM] only	SJS9311	Socket, AC Outlet
20 [XSW] only	SJS9307	Socket, AC Outlet
20 [XE] only	SJS9303	Socket, AC Outlet
20 [XA] only	SJSA66-2	Socket, AC Outlet
20 [DX, DG, EB, XGH, XGF]	SJS9309	Socket, AC Outlet
21 [DM] only	SFSR4N4	Bushing, AC Cord
21 [Other Areas]	SHR131	Bushing, AC Cord
22 [XE] only	SBC159	Button, Power Switch (S9)
23	SHR5073-1	Stopper, FM Antenna Selector

4. Parts other than and -marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. ST-S7 (K)

Ref. No.	Part No.	Part Name & Description
24	SJF4103	Terminal, AM Antenna
25	SJF3431N	Terminal, AF Output
26	SJSA67-1	Socket, FM Antenna (75Ω F-Type)
27	SKC150H	Cabinet
27	SKC150B	Cabinet (Black)
28	SYE697	Case, Battery Ass'y
29	SJB9001	Cover, Battery Case
30 [XA] only	SHR5073-1	Stopper, FM/AM Allocation Selector (S7)
<b>SCREWS, NUTS and WASHERS</b>		
	<b>XTS3+8B</b>	Screw, Tapping, $\oplus$ 3 x 8 (Front Panel)
	<b>XTB3+8BFZ</b>	Screw, Tapping, $\oplus$ 3 x 6 (Relay PCB)
	<b>XTB3+8BFN</b>	Screw, Tapping, $\oplus$ 3 x 8 (LED PCB)
	<b>XNS8</b>	Nut, M8 (Program Selector)
	<b>XWV8</b>	Washer, Spring, $\phi$ 8
	<b>XTB3+8BFN</b>	Screw, Tapping, $\oplus$ 3 x 8, (Cabinet)
	<b>XTB3+8BFZ</b>	Screw, Tapping, $\oplus$ 3 x 8, (Cabinet) Black
	<b>XWC9B</b>	Washer, Toothed Lock, $\phi$ 9
	<b>XTS3+8BFZ</b>	Screw, Tapping, $\oplus$ 3 x 8 (Chassis)
	<b>XTB3+8BFZ</b>	Screw, Tapping, $\oplus$ 3 x 8 (P. Transformer)
	<b>XTB3+8BFZ</b>	Screw, Tapping, $\oplus$ 3 x 8 (Front & Rear Panel)
	<b>XWC3B</b>	Washer, Toothed Lock, $\phi$ 3
	<b>XSN3+6BVS</b>	Screw, $\oplus$ 3 x 6 (Antenna Selector & Allocation Selector)
	<b>XWA3BFZ</b>	Washer, Spring, $\phi$ 3
	<b>SNE2053</b>	Screw, Tapping (W/Lapping Terminal)
	<b>XTB3+14BFZ</b>	Screw, Tapping, $\oplus$ 3 x 14 (Voltage Adjuster)
	<b>XWA3B</b>	Washer, Spring, $\phi$ 3
	<b>XSN3+6S</b>	Screw, $\oplus$ 3 x 6 (Power Switch)
<b>ACCESSORIES</b>		
A1	SJP2129-5	Cord, Stereo Pin-Type Connection
A2	SSA267	Cord, FM Indoor Antenna
A3	TJB525100	Plug, 300-ohm $\rightarrow$ 75-ohm Impedance Conversion
A4	SJSA68-1	Plug, F-Type/Ring (Large)
A5 [XA] only	SJP5213-1	Plug Adaptor, AC Power
<b>PACKING PARTS</b>		
P1	SPP647	Polyethylene Bag
P2	SPS2459-2	Pad, Left Side
P3	SPS2459-3	Pad, Right Side
P4 [XGF] only	SPG2423-1	Carton Box
P4 [Other Areas]	SPG2589	Carton Box
P5 [XE] only	SQF10519	Instructions Book, Printed Matter
P5 [XA] only	SQF10551-1	Instructions Book, Printed Matter
P5 [Other Areas]	SQF10349	Instructions Book, Printed Matter

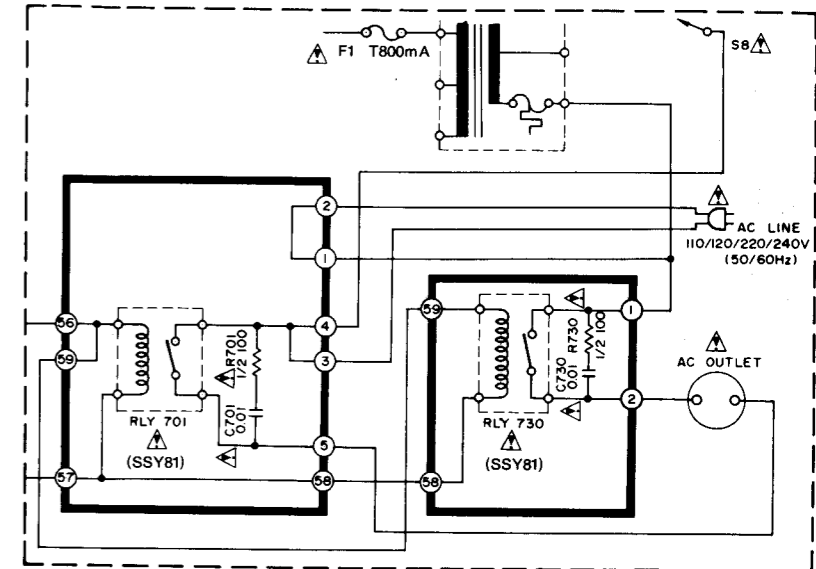
### Areas

- \* [DX] is available in Scandinavia except Denmark.
- \* [DG] is available in Scandinavia and European except Belgium, United Kingdom, Switzerland, Holland and France.
- \* [DM] is available in Denmark.
- \* [EB] is available in Belgium.
- \* [XE] is available in United Kingdom.
- \* [XSW] is available in Switzerland.
- \* [XGH] is available in Holland.
- \* [XGF] is available in France.
- \* [XA] is available in Asia, Latin America, Middle East and Africa.

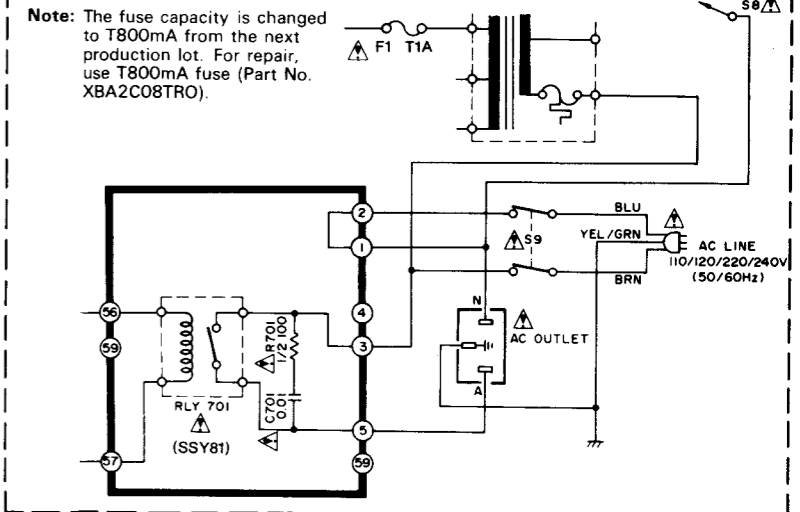
## POWER SOURCE CIRCUITS

These schematic diagrams are available in Denmark [DM], United Kingdom [XE], Asia, Latin America, Middle East and Africa [XA].

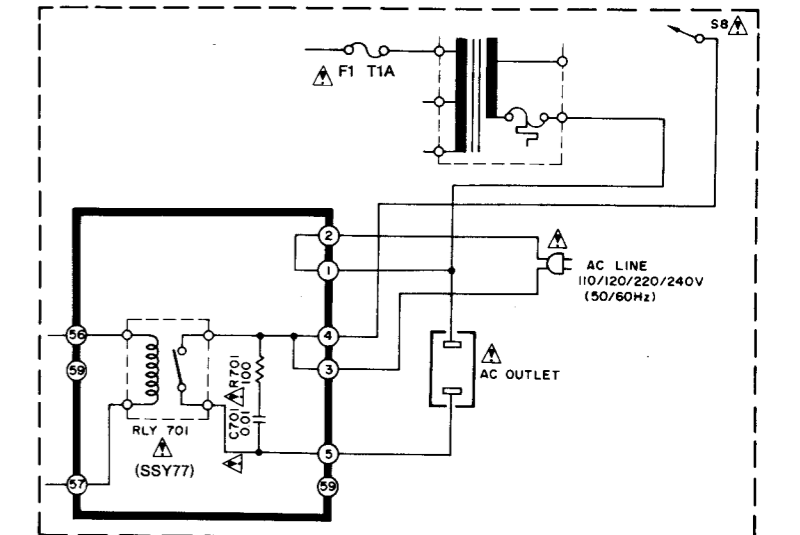
### ● For Denmark [DM]



### ● For United Kingdom [XE]



### ● For Asia, Latin America, Middle East and Africa [XA]



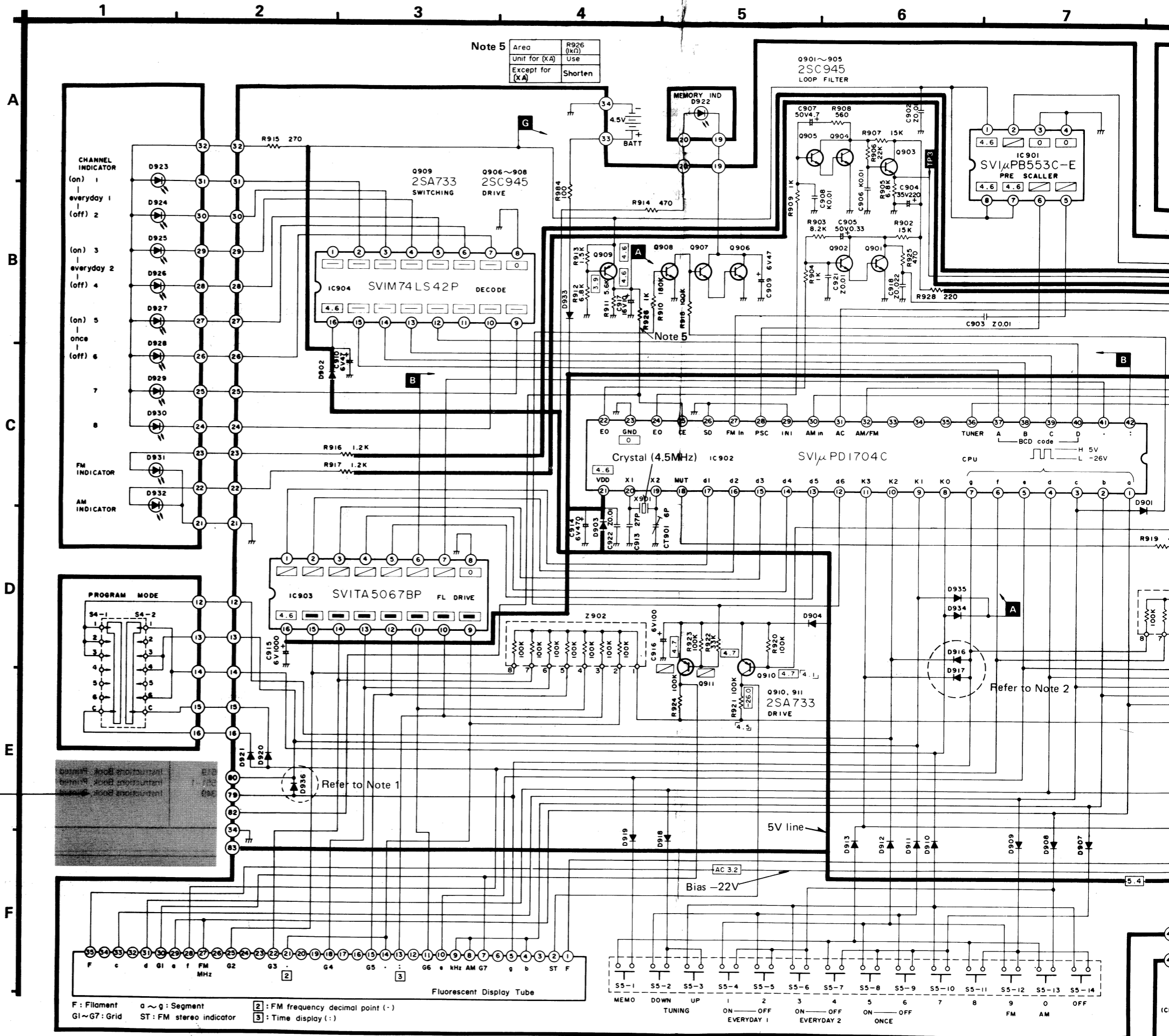
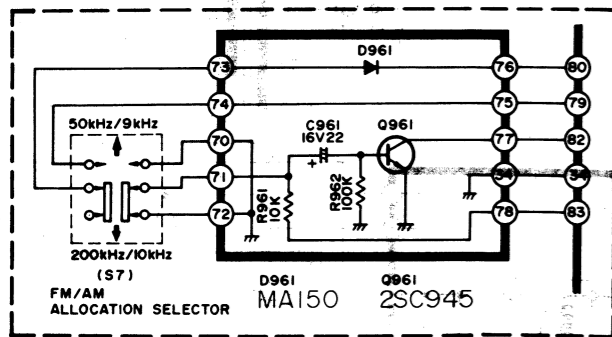
# SCHEMATIC DIAGRAM

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

## Notes:

- S1-1, S1-2** : AM-FM muting/FM mode switch in "on/auto" position. (on/auto ↔ off/mono)
  - S2-1, S2-2** : Recording-level check switch in "off" position.
  - S3** : Time display (clock call) switch in "off" position.
  - S4-1, S4-2** : Program mode selection switch in "time set" position. (① time set ↔ ② manual ↔ ③ auto ↔ ④ read ↔ ⑤ write ↔ ⑥ cancel)
  - S5-1** : Memory switch in no push condition.
  - S5-2, S5-3** : Manual tuning (up/down) switch in no push condition.
  - S5-4 ~ S5-9** : Timer-memory switch in no push condition. (Button No. 1~6) (everyday 1 "on-off", everyday 2 "on-off", once "on-off")
  - S5-4 ~ S5-11** : Preset tuning switch in no push condition. (Button No. 1~8)
  - S5-4 ~ S5-13** : Time-set switch in no push condition. (Button No. 1~0)
  - S5-12, S5-13** : FM/AM band selection and tuner "on" switch in no push condition. (Button No. 9 and 0)
  - S5-14** : Tuner "off" switch in no push condition.
  - S6** : FM antenna selection switch in "normal" position. (normal ↔ tuned type)
  - S7 [XA] only** : FM/AM allocation selection switch in "FM 200kHz/AM 10kHz" step position. (FM 200kHz/AM 10kHz ↔ FM 50kHz/AM 9kHz)
  - S8** : Voltage adjustment switch in "220V" position. 110V↔120V↔220V↔240V
  - S9 [XE] only** : Power source switch in "on" position. (Refer to page 23) (This switch is used to United Kingdom)
16. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the 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 FM/AM selector circuit set at AM.
  - ◻ marked terminal: 5V input and 0V output, receiving the signal.
  - ◻ marked terminal: 5V or 0V output.
  - ◻ marked terminal: 5V or -26V output.
17. Transistor-IC terminals which carry no voltage indication emit 5V pulse waveforms or are subject to change according to the frequency or input signal levels.
18. Signal lines
- FM/FM composite signal
  - Audio frequency signal
  - Positive voltage lines
  - Pilot (19kHz) signal
  - AM signal
19. ⚠ indicates that only parts specified by the manufacturer be used for safety.
21. Areas  
 [XA] is available in Asia, Latin America, Middle East and Africa.  
 [XE] is available in United Kingdom.

- This circuit is FM/AM allocation switch for Asia, Latin America, Middle East and Africa. ([XA] area)
- The units for other areas except [XA] are not equipped with this circuit.



Note 1: D936 is not used to a unit employed FM/AM allocation selector(S7). Note 2: D916 and D917 are used or not used according to the rank of ceramic filter. (Refer to "Precautions for Repair" on page 8.)

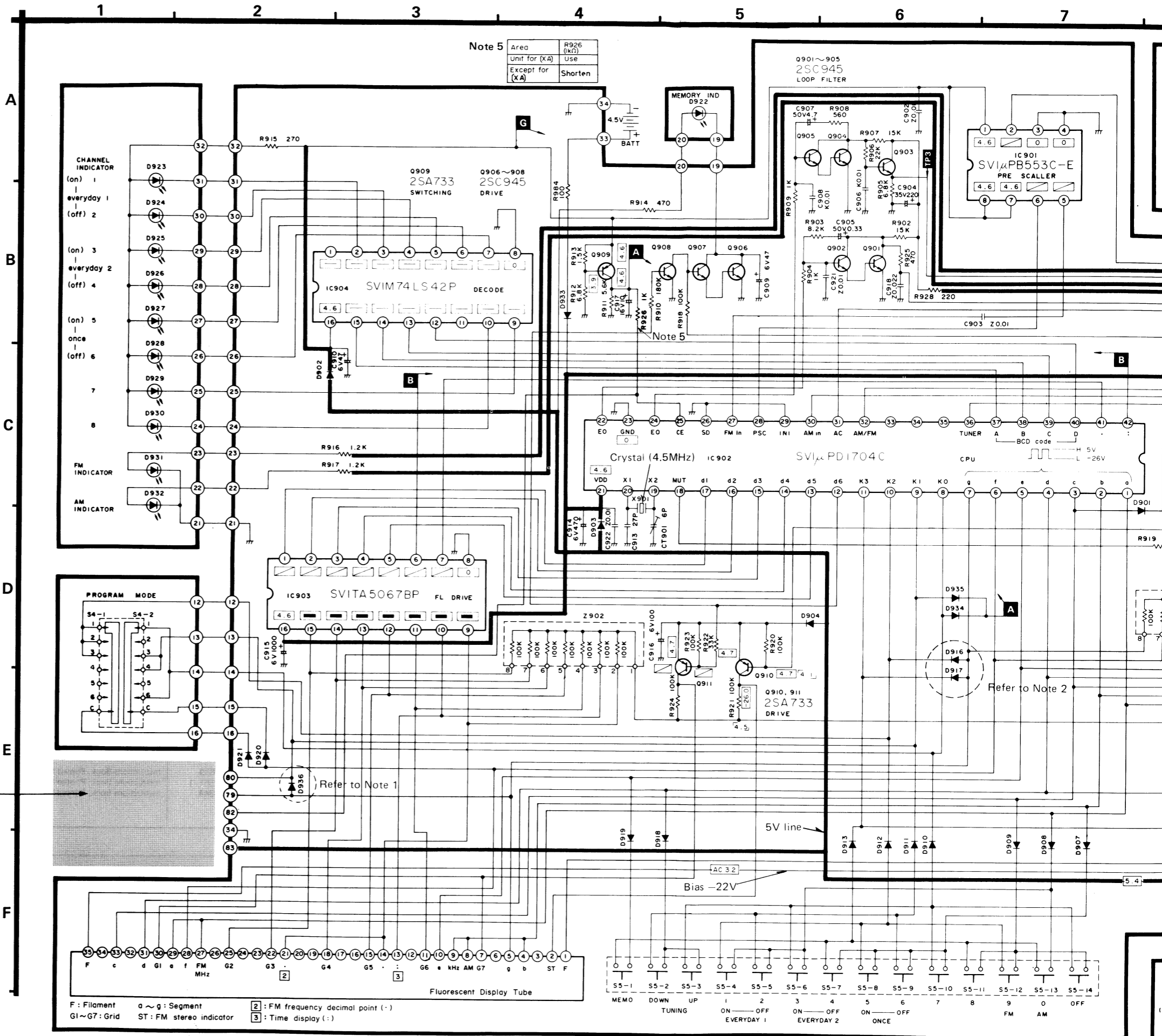
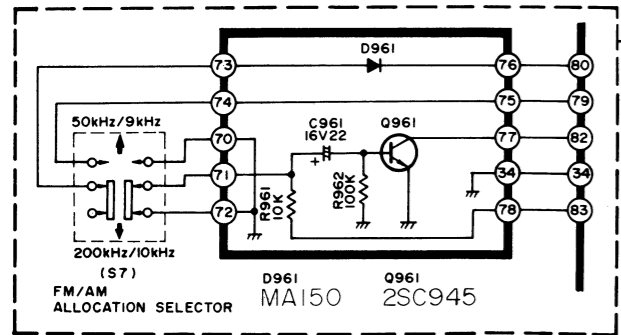
# SCHEMATIC DIAGRAM

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

## Notes:

- S1-1, S1-2** : AM · FM muting/FM mode switch in "on/auto" position. (on/auto ↔ off/mono)
  - S2-1, S2-2** : Recording-level check switch in "off" position.
  - S3** : Time display (clock call) switch in "off" position.
  - S4-1, S4-2** : Program mode selection switch in "time set" position. (① time set ↔ ② manual ↔ ③ auto ↔ ④ read ↔ ⑤ write ↔ ⑥ cancel)
  - S5-1** : Memory switch in no push condition.
  - S5-2, S5-3** : Manual tuning (up/down) switch in no push condition.
  - S5-4 ~ S5-9** : Timer-memory switch in no push condition. (Button No. 1 ~ 6) (everyday 1 "on-off", everyday 2 "on-off", once "on-off")
  - S5-4 ~ S5-11** : Preset tuning switch in no push condition. (Button No. 1 ~ 8)
  - S5-4 ~ S5-13** : Time-set switch in no push condition. (Button No. 1 ~ 0)
  - S5-12, S5-13** : FM/AM band selection and tuner "on" switch in no push condition. (Button No. 9 and 0)
  - S5-14** : Tuner "off" switch in no push condition.
  - S6** : FM antenna selection switch in "normal" position. (normal ↔ tuned type)
  - S7 [XA] only** : FM/AM allocation selection switch in "FM 200kHz/AM 10kHz" step position. (FM 200kHz/AM 10kHz ↔ FM 50kHz/AM 9kHz)
  - S8** : Voltage adjustment switch in "220V" position. 110V ↔ 120V ↔ 220V ↔ 240V
  - S9 [XE] only** : Power source switch in "on" position. (Refer to page 23) (This switch is used to United Kingdom)
16. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the 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 FM/AM selector circuit set at AM.
  - marked terminal: 5V input and 0V output, receiving the signal.
  - marked terminal: 5V or 0V output.
  - marked terminal: 5V or -26V output.
17. Transistor · IC terminals which carry no voltage indication emit 5V pulse waveforms or are subject to change according to the frequency or input signal levels.
18. Signal lines
- FM/FM composite signal
  - Audio frequency signal
  - Pilot (19kHz) signal
  - AM signal
19. Positive voltage lines
20. ⚠ indicates that only parts specified by the manufacturer be used for safety.
21. Areas  
 [XA] is available in Asia, Latin America, Middle East and Africa.  
 [XE] is available in United Kingdom.

- This circuit is FM/AM allocation switch for Asia, Latin America, Middle East and Africa. ([XA] area)
- The units for other areas except [XA] are not equipped with this circuit.



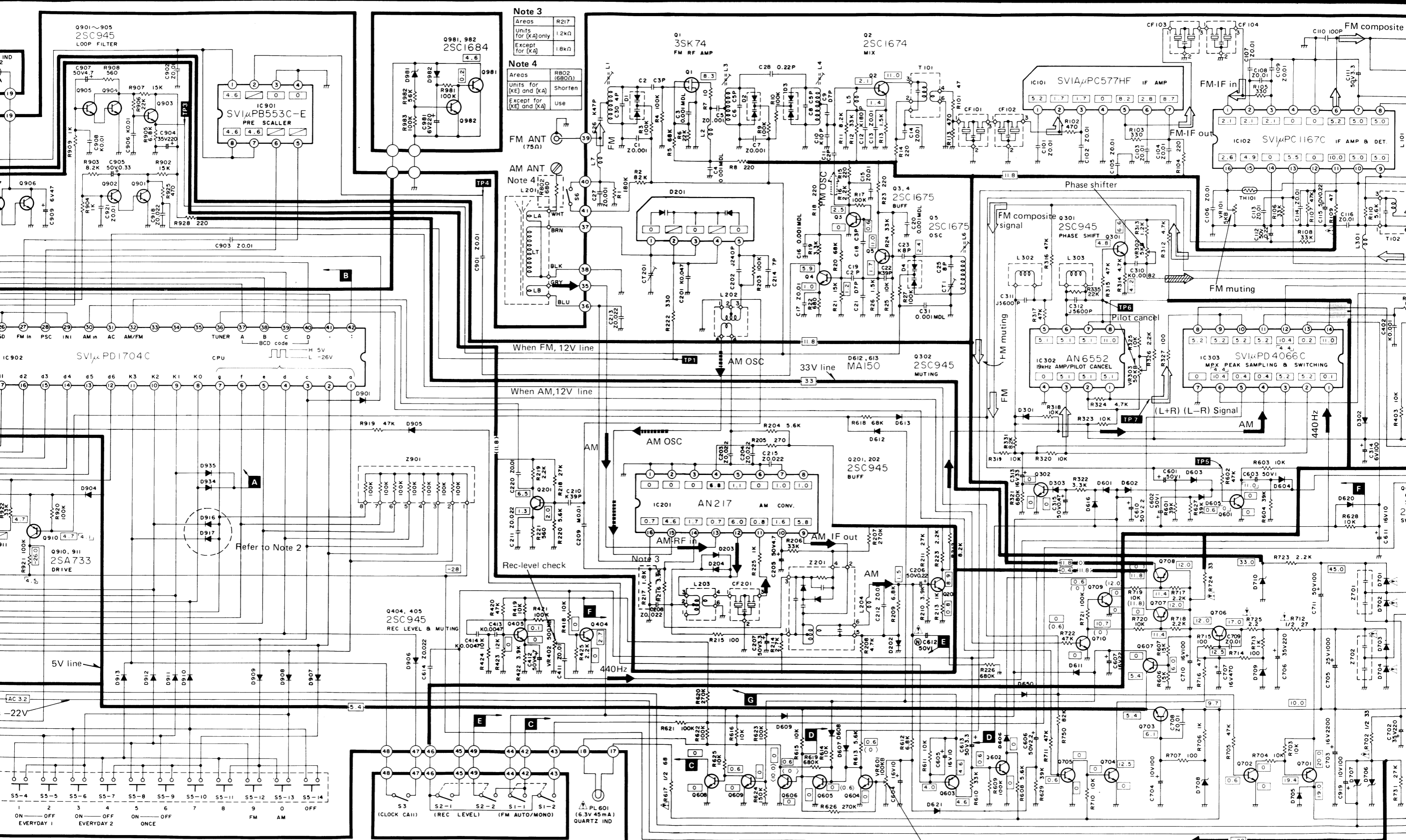
Note 5

Area	R926 (kΩ)
Unit for (XA)	Use
Except for (XA)	Shorten

F: Filament a ~ g: Segment 2: FM frequency decimal point (·)  
 G1 ~ G7: Grid ST: FM stereo indicator 3: Time display (:)

Note 1: D936 is not used to a unit employed FM/AM allocation selector(S7). Note 2: D916 and D917 are used or not used according to the rank of ceramic filter. (Refer to "Precautions for Repair" on page 8.)





**Note 3**  
Areas R217  
Units for (X) only 1.2kΩ  
Except for (X) 1.8kΩ

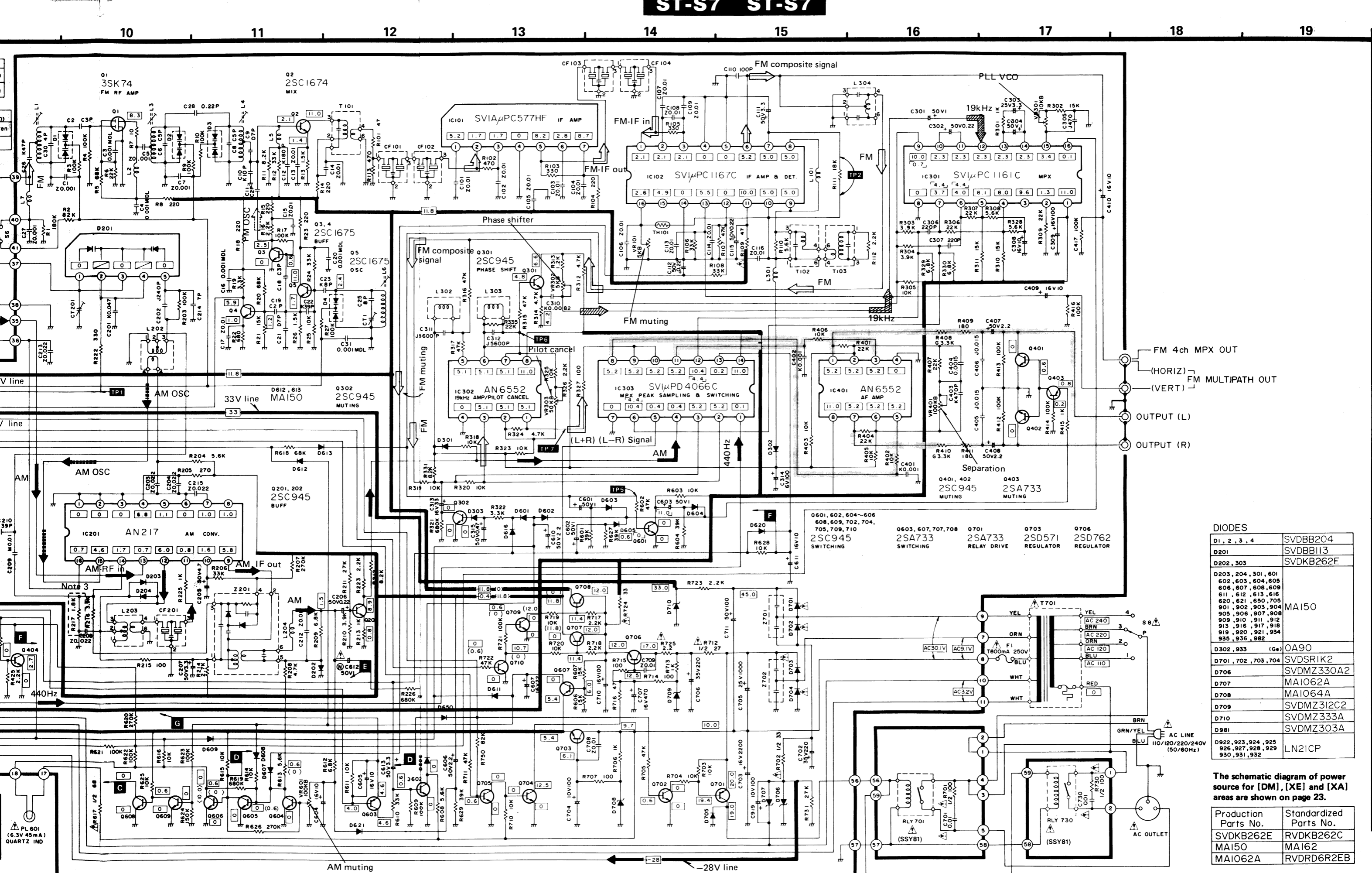
**Note 4**  
Areas R802 (680Ω)  
Units for (X) and (X) Shorten  
Except for (X) and (X) Use

Refer to Note 2

Rec-level check

AM muting

According to the rank of ceramic filter. (Refer to "Precautions for Repair" on page 8.)



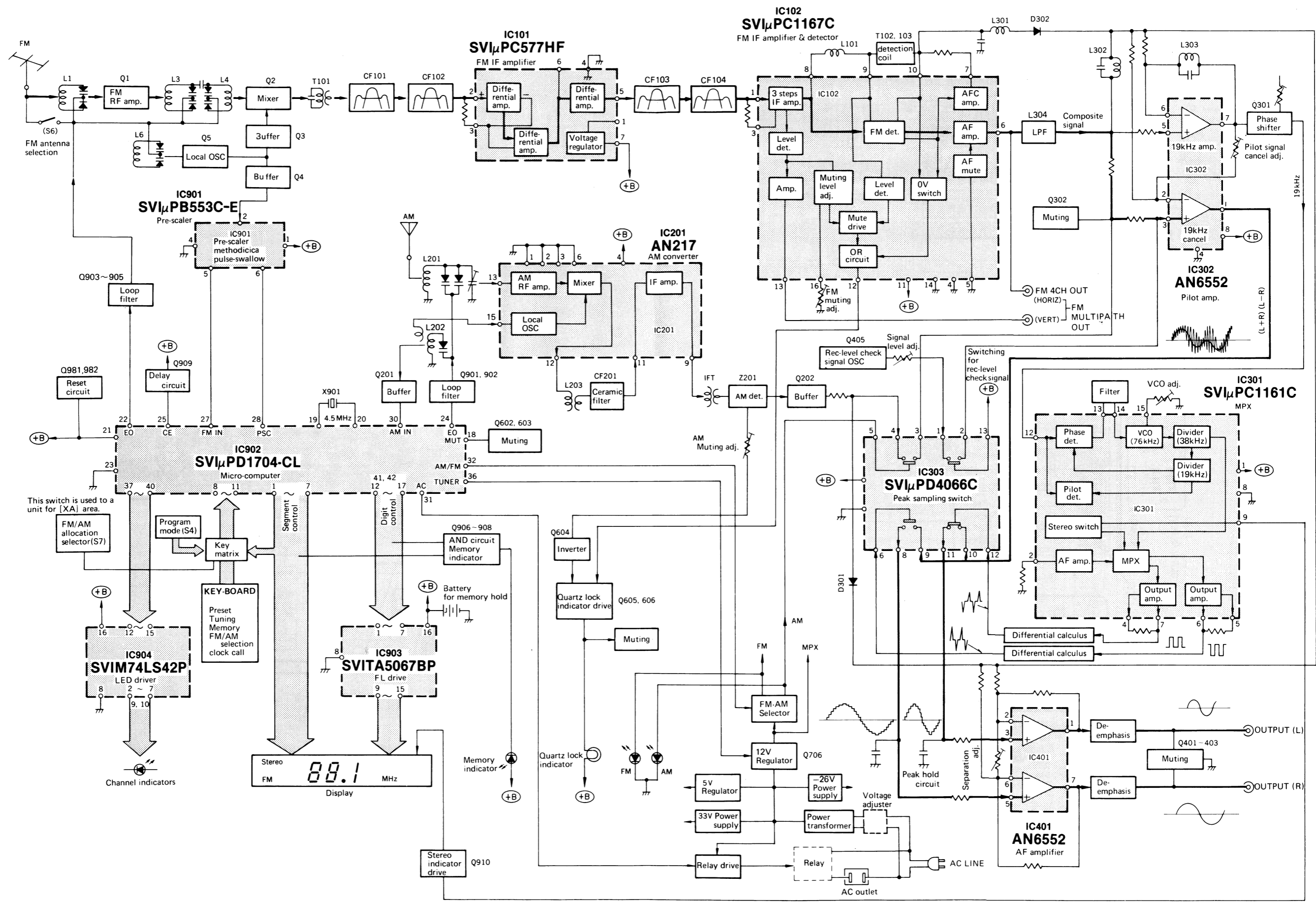
**DIODES**

D1, 2, 3, 4	SVDBB204
D201	SVDBB113
D202, 303	SVDKB262E
D203, 204, 301, 601 602, 603, 604, 605 606, 607, 608, 609 611, 612, 613, 616 620, 621, 650, 705 901, 902, 903, 904 905, 906, 907, 908 909, 910, 911, 912 913, 916, 917, 918 919, 920, 921, 934 935, 936, 982	MA150
D302, 933 (G)	0A90
D701, 702, 703, 704	SVDSRIK2
D706	SVDMZ330A2
D707	MA1062A
D708	MA1064A
D709	SVDMZ312C2
D710	SVDMZ333A
D981	SVDMZ303A
D922, 923, 924, 925 926, 927, 928, 929 930, 931, 932	LN21CP

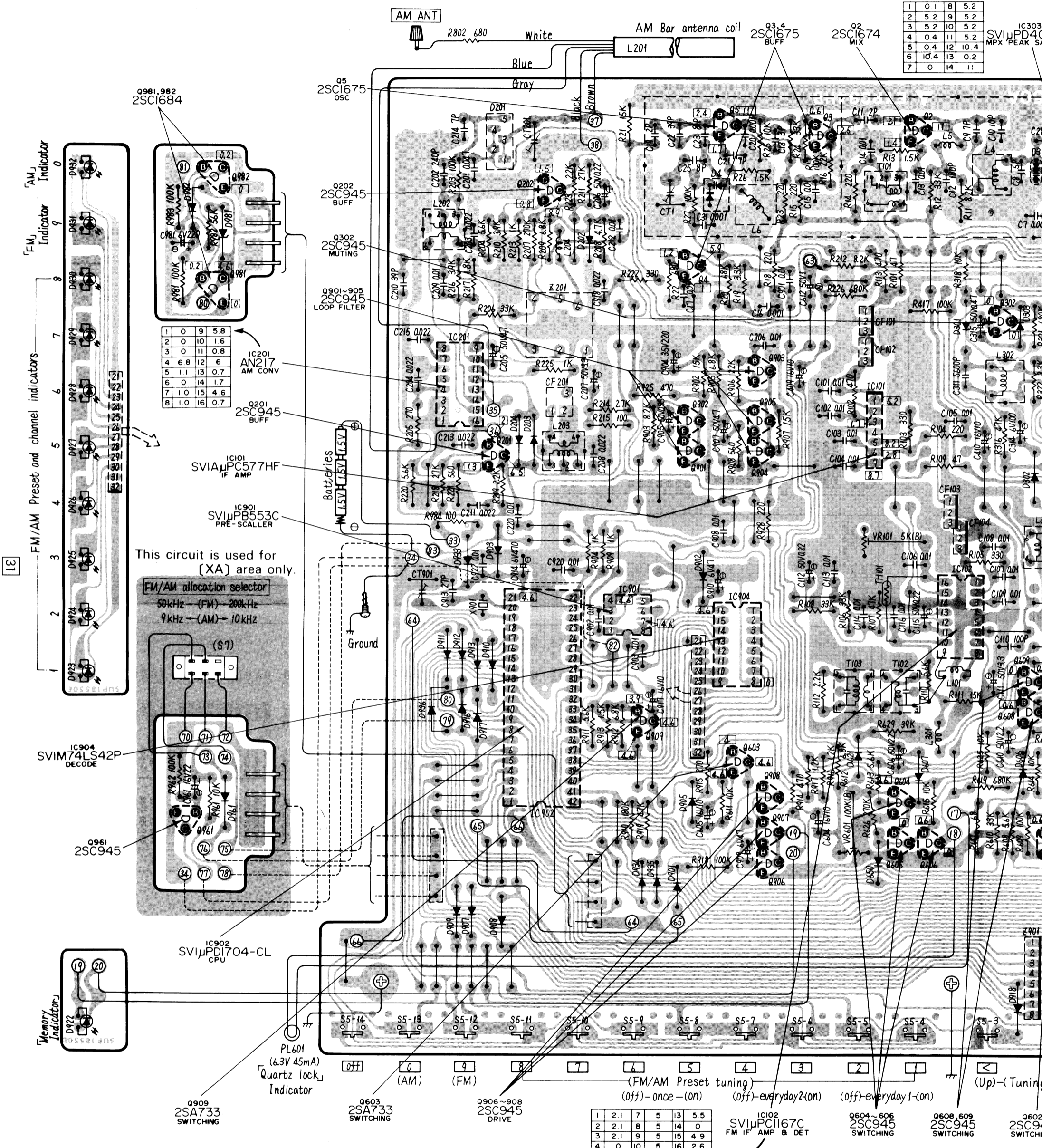
The schematic diagram of power source for [DM], [XE] and [XA] areas are shown on page 23.

Production Parts No.	Standardized Parts No.
SVDKB262E	RVDKB262C
MA150	MA162
MA1062A	RVDRD6R2EB

■ BLOCK DIAGRAM





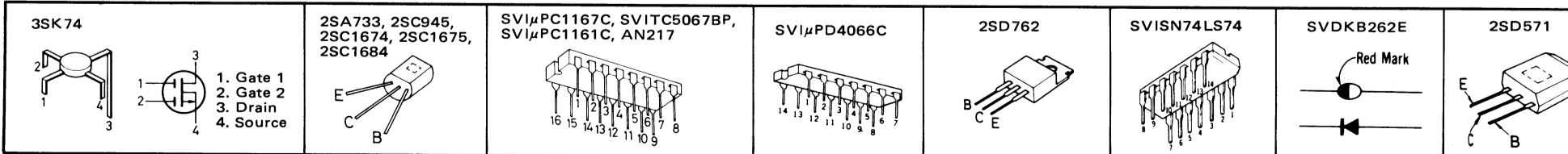


This circuit is used for (XA) area only.

FM/AM allocation selector  
 50kHz - (FM) - 200kHz  
 9kHz - (AM) - 10kHz

31

● Terminal guide of Transistors, IC's and Diodes



32

1	2	1	7	5	13	5
2	2	1	8	5	14	0
3	2	1	9	5	15	4
4	0	10	5	16	2	6
5	0	11	10	17		
6	5	2	12	0		

IC102 SV1μPC1167C FM IF AMP & DET  
 Q604~606 2SC945 SWITCHING  
 Q608, 609 2SC945 SWITCHING  
 Q602 2SC945 SWITCHING



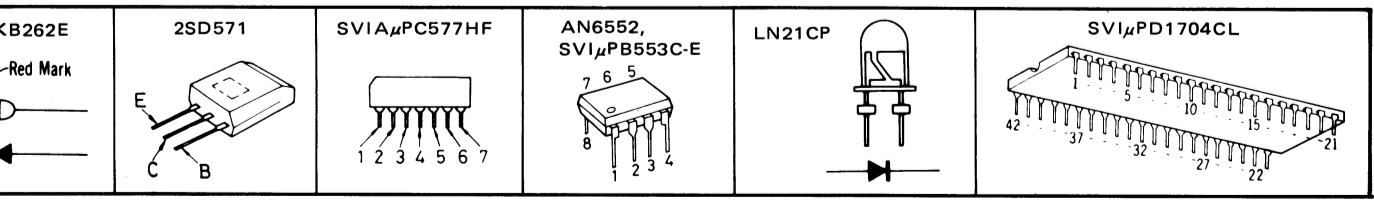
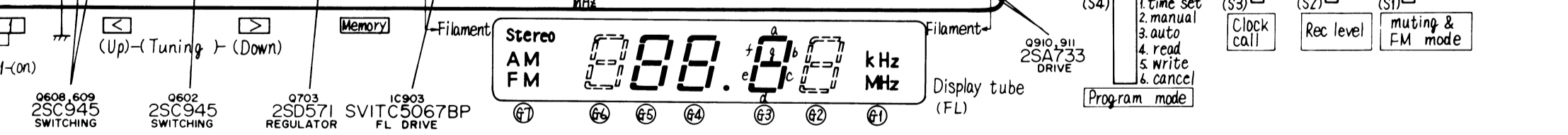
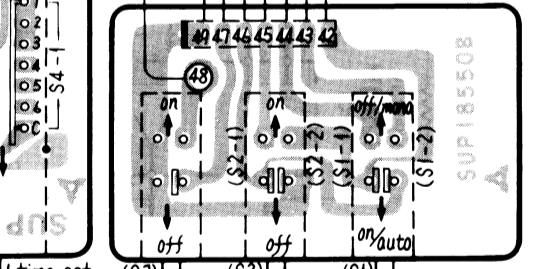
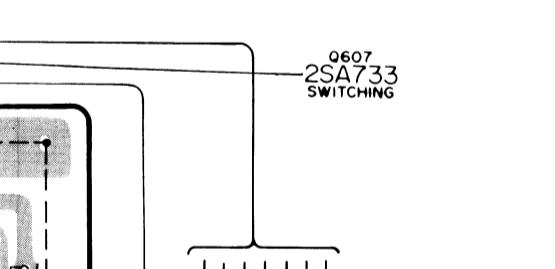
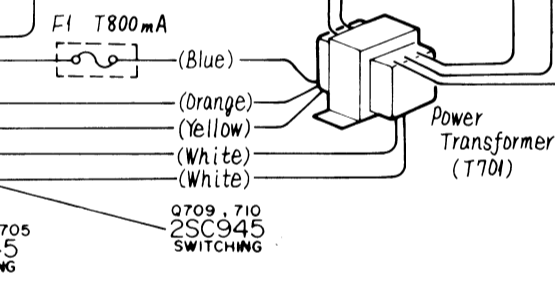
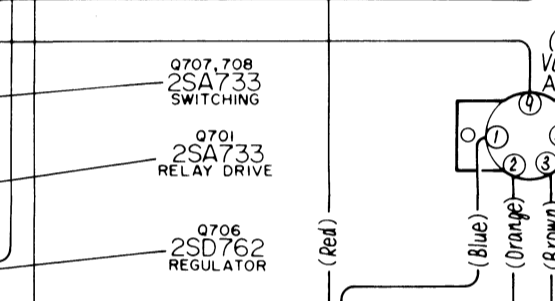
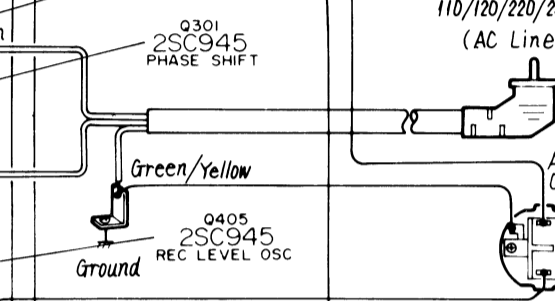
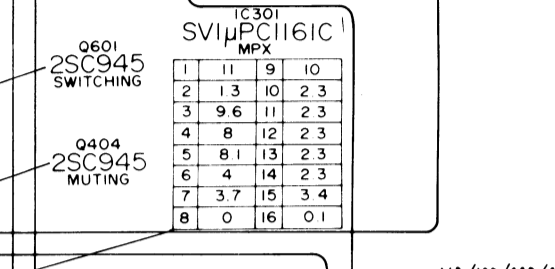
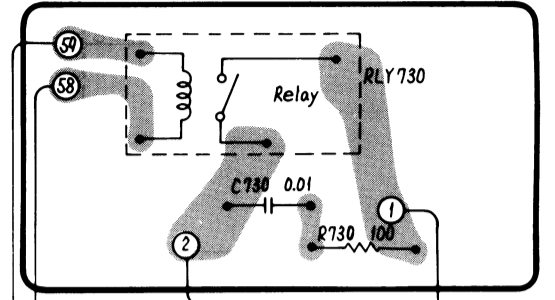
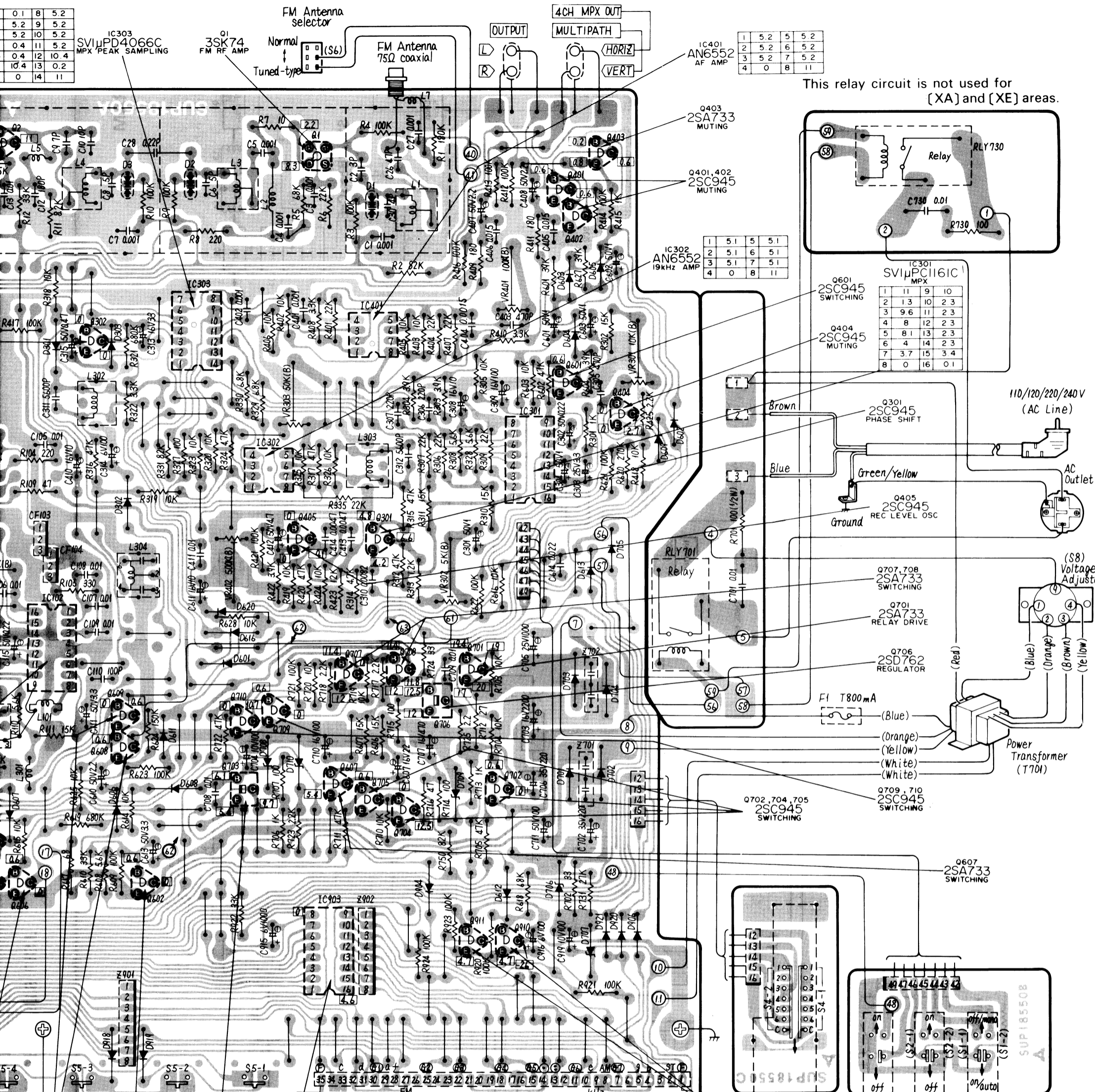
0	1	8	5	2
5	2	10	5	2
0	4	11	10	4
0	4	12	10	4
0	4	13	0	2
0	14	11		

1	5	2	5	5	2
2	5	2	6	5	2
3	5	2	7	5	2
4	0		8		11

1	5	1	5	5	1
2	5	1	6	5	1
3	5	1	7	5	1
4	0		8		11

1	11	9	10	
2	13	10	23	
3	9	6	11	23
4	8	12	23	
5	8	13	23	
6	4	14	23	
7	3	7	15	34
8	0		16	01

This relay circuit is not used for [XA] and [XE] areas.





an alle Kundendienst-Zentralen  
und NPS-Filialen

Nr.: 164	Datum: 13. Januar 1982 EK/He/GS 4/1982
THEMA	TEXT
ST-S 7	<p><u>Druckfehler im Service-Manual ST-S 7</u></p> <p>Im Service-Manual ST-S 7 wurde das IC 102 fälschlicherweise mit SVI UPC 1167 C bezeichnet; in der Parts-Liste mit SVI UPC 1161 C.</p> <p>Die richtige Bezeichnung lautet <u>SVI UPC 1267 C</u> und ist durch kein Ausweichteil ersetzbar.</p> <p>NPS HH E. Koitz</p>