

# SERVICE MANUAL

QUARTZ SYNTHESIZER COMPU-RECEIVER

## SANSUI Z-9000X/7000X



### CAUTION

1. Use only replacement parts recommended by the manufacturer.
2. Measure insulation resistance before returning the appliance to the customer to prevent electrical shock.

**Sansui**

SANSUI ELECTRIC CO., LTD.

### •SPECIFICATIONS

#### Audio section

##### Power output

Min. RMS, both channels driven, from 20 to 20,000 Hz, with no more than 0.005% total harmonic distortion.

<Z-9000X> 130 watts per channel into 8 ohms

<Z-7000X> 100 watts per channel into 8 ohms

Load impedance 4 and 8 ohms

##### Total harmonic distortion

from POWER AMP IN less than 0.005% at or below rated

min. RMS power output

Intermodulation distortion (60 Hz/7 kHz = 4:1 SMPTE method)

from POWER AMP IN less than 0.005% at rated power output

##### Frequency response (at 1 watt)

from POWER AMP IN 5 to 200,000 Hz

+0 dB, -3.0 dB

RIAA curve deviation (PHONO, 20 Hz to 20 kHz)

+0.2 dB, -0.2 dB

##### Input sensitivity and impedance (at 1 kHz)

PHONO-MM 2.5 mV/47 kilohms

PHONO-MC 250µV/100 ohms

TAPE PLAY, AUX/DA 150 mV/47 kilohms

MIC 1.0 mV/10 kilohms

##### Output level (at 1 kHz)

TAPE REC. 150 mV/47 kilohms

PREAMP OUT 1,000 mV/47 kilohms

##### Signal to noise ratio (short-circuit, A-network)

PHONO-MM 82 dB

PHONO-MC 68 dB

##### Channel separation (at 1 kHz)

PHONO-MM 55 dB

TAPE PLAY, AUX/DA 60 dB

#### Controls

##### <Z-9000X>

GRAPHIC EQUALIZER ±10 dB at 60 Hz, 150 Hz, 400 Hz,

1 kHz, 2.5 kHz, 6 kHz, 15 kHz

SUBSONIC -3 dB at 16 Hz (6 dB/oct)

HIGH -3 dB at 5 kHz (6 dB/oct)

##### <Z-7000X>

SUPER BASS ±10 dB at 30 Hz

BASS ±10 dB at 150 Hz

MIDRANGE ±10 dB at 1 kHz

TREBLE ±10 dB at 10 kHz

SUBSONIC -3 dB at 16 Hz (6 dB/oct)

HIGH -3 dB at 5 kHz (6 dB/oct)

#### FM section

Tuning range 88 to 107.9 MHz

##### Usable sensitivity

Mono IHF 10.3 dBf

Stereo IHF 19 dBf

##### 50 dB quieting sensitivity

Mono 14 dBf

Stereo 37 dBf

##### Signal to noise ratio (at 65 dBf)

Mono 80 dB

Stereo 76 dB

##### Distortion (at 65 dBf)

##### <Z-9000X>

Mono less than 0.08% at 100 Hz

less than 0.05% at 1,000 Hz

less than 0.08% at 6,000 Hz

Stereo less than 0.1% at 100 Hz

less than 0.07% at 1,000 Hz

less than 0.1% at 6,000 Hz

##### <Z-7000X>

Mono less than 0.15% at 100 Hz

less than 0.1% at 1,000 Hz

less than 0.15% at 6,000 Hz

Stereo less than 0.25% at 100 Hz

less than 0.15% at 1,000 Hz

less than 0.25% at 6,000 Hz

##### Alternate channel selectivity (at 4000 kHz)

<Z-9000X> WIDE 50 dB

<Z-7000X> 60 dB

Capture ratio 1.0 dB

Image response ratio 85 dB

Spurious response ratio 90 dB

IF response ratio 90 dB

Stereo separation 35 dB at 100 Hz

45 dB at 1,000 Hz

30 dB at 10,000 Hz

30 to 15,000 Hz

+0.3 dB, -0.5 dB

Hum and noise (at 65 dBf) 70 dB

Antenna input impedance 300 ohms balanced

75 ohms unbalanced

#### AM section

Tuning range 530 to 1,600 kHz

Usable sensitivity 49 dB/m

Selectivity 30 dB

Signal to noise ratio 50 dB

Distortion (at 30% Modulation, 80 dB/m)

less than 0.5%

Image response ratio 40 dB at 1,000 kHz

IF response ratio 50 dB at 1,000 kHz

#### Others

##### Power requirements

Power voltage 120, 220, 240V (50/60 Hz)

For U.S.A. and Canada 120V (60 Hz)

##### Power consumption

<Z-9000X> Rated consumption 410 watts 520 VA

<Z-7000X> Rated consumption 360 watts 450 VA

Dimensions 550 mm (21-11/16") W

150 mm (5-15/16") H

386 mm (15-1/4") D

##### Weight

<Z-9000X> 15.2 kg (33.5 lbs.) net

17.0 kg (37.5 lbs.) packed

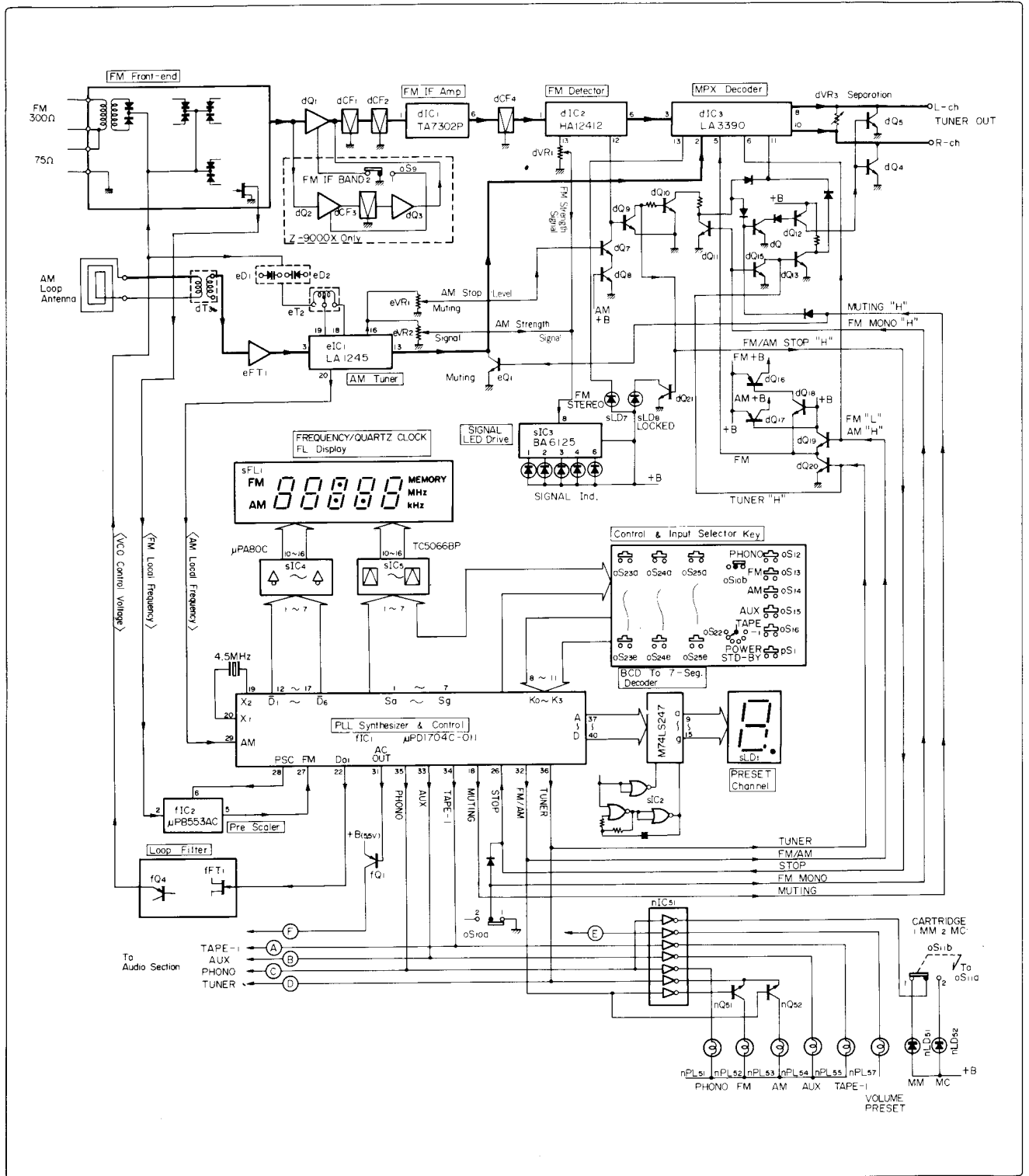
<Z-7000X> 14.3 kg (31.5 lbs.) net

16.1 kg (35.5 lbs.) packed

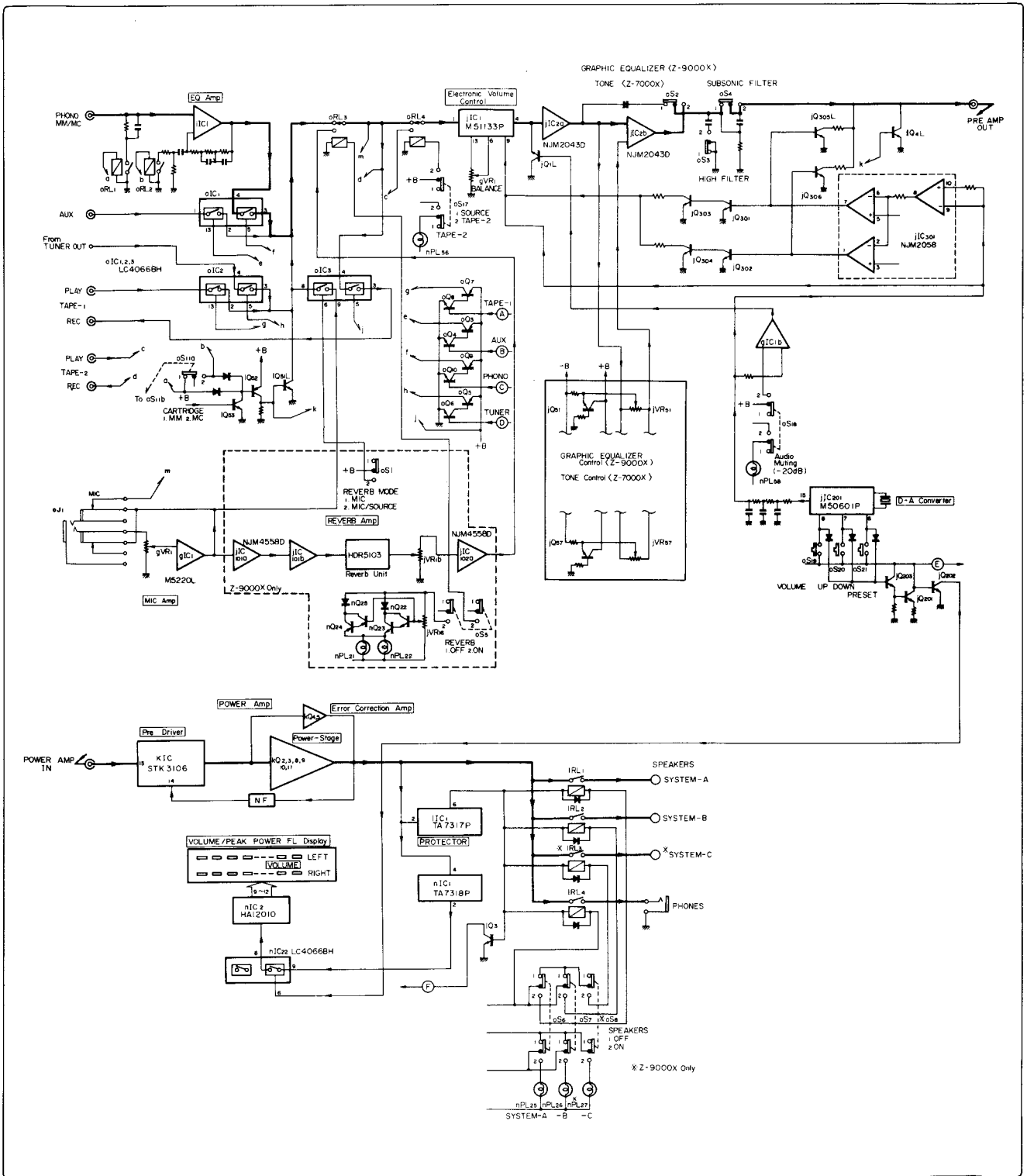
\* Design and specifications subject to changes without notice for improvements.

# 1. BLOCK DIAGRAM

## 1-1. Tuner & Control Section



### 1-2. Audio Section

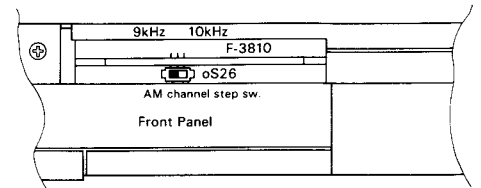


## 2. ADJUSTMENTS

### 2-1. Reference Frequency Adjustment of Synthesizer Control Circuit (See F-3810 Parts Location on Page 11)

- Note:**
1. Input Selector..... AM
  2. TUNING/FM MODE ..... MANUAL/MONO
  3. Remove the Front Panel Ass'y and Sub Panel Ass'y.
  4. The frequency with "\*" mark is for the unit that the AM 9/10 kHz channel step switch (oS26, See Fig. 2-1) is set to 9 kHz and "\*\*" is for the 10 kHz.
  5. The unit without the AM 9/10 kHz channel step switch is "\*" mark frequency.

Fig. 2-1



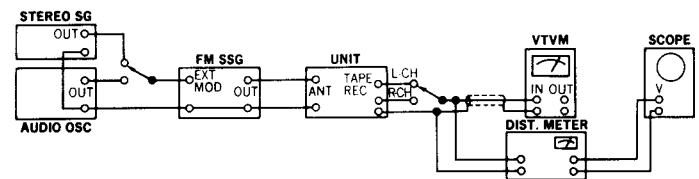
SUBJECT	SETTING	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
X'tal Frequency Adj.	Set frequency display to *999kHz <**1000kHz>	Between eTP2 (eC29) and GND, F-3806, Frequency Counter	fTC1 (F-3810)	*1449kHz ± 10Hz <**1450kHz ± 10Hz>	

### 2-2. FM Adjustments

(See Fig.2-2, 2-4 and Top View on Page 17 and 18)

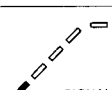
- Note:**
1. Input Selector ..... FM
  2. FM IF BAND ..... WIDE
  3. The frequency with "\*" mark is for the unit that the AM 9/10 kHz channel step switch (oS26, See Fig. 2-1) is set to 9 kHz and "\*\*" is for the 10 kHz.
  4. The unit without the AM 9/10 kHz channel step switch is "\*" mark frequency.

Fig. 2-2



#### 1) FM IF

**Note:** 1. TUNING/FM MODE ..... MANUAL/MONO

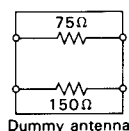
STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	FM IF Coil Adj.	*98MHz <**98.1MHz> ANT Input 20dBf (14.8dB), 1kHz (100% MOD.), FM SSG	ANT terminal 300Ω	Between Point ④ (dD1) and GND, DC Volt Meter	T1 (Front-end)	MAX. DC Volt	
2.	Discriminator Coil Adj.	1	*98MHz <**98.1MHz> ANT Input 65 dBf (59.8dB), 1kHz (100% MOD.), FM SSG	Same as above	Between dTP1 and dTP2, Across dR30 (F-3806), DC Volt Meter	0 ± 20mV	
		2	Same as above	Same as above	REC OUT L-CH or R-CH, VTVM & SCOPE, Dist Meter	Min. THD	
3.	Signal Level Adj.	*98MHz <**98.1MHz> ANT Input 15dBf (9.8dB), 1kHz (100% MOD.), FM SSG	Same as above	SIGNAL Indicator	dVR1 (F-3806)	Make only one LED lighting	

#### ◆ Technical Hint for FM adjustment

- There are two kind in indication of FM SG output attenuator.
  1. Attenuator with marking of 75Ω open ..... open indication type.
  2. Attenuator with marking of 75Ω load or close ..... load or close indication type.
- FM SG output level in this FM adjustment are described as open indication type.
- To feed FM signal, a dummy antenna circuit as Fig. 2-3 must be connected between FM SG output and ANT terminal (300Ω) of the unit.

- The following table shows relations among FM SG attenuator indication (dB), available power ratio (dBf) and antenna terminal voltage (dB/μV) in each indication type.

Fig. 2-3



	FM SG Attenuator Indication	Available Power Ratio	Antenna Terminal Voltage
Open indication type	0 dB	-0.8 dBf	-6 dB/μV
	66 dB	65.2 dBf	60 dB/μV
Load or close indication type	0 dB	5.2 dBf	0 dB/μV
	60 dB	65.2 dBf	60 dB/μV

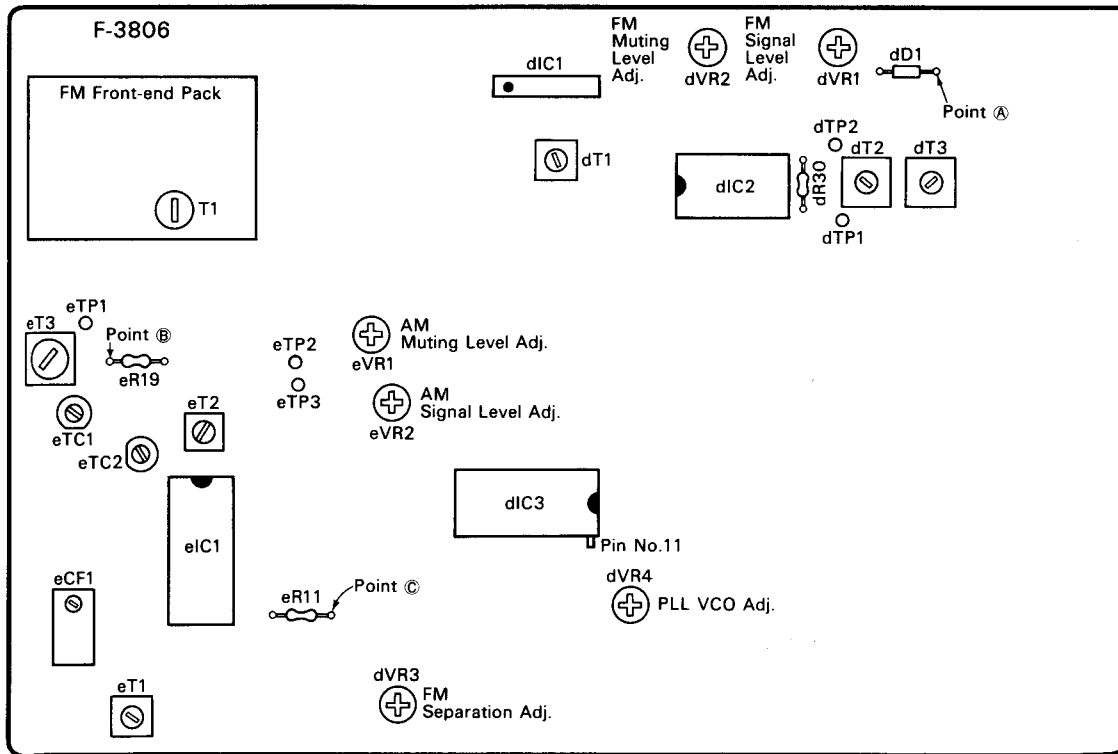


2) FM STEREO

Note: 1. TUNING/FM MODE ..... AUTO/STEREO

STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	PLL V.C.O. Adj.	*98MHz < **98.1MHz > ANT Input 65dBf (59.8dB), FM SSG, Pilot 19kHz (9% MOD.), R or L MODE 1kHz + Pilot (100% MOD.), STEREO SG	ANT terminal 300Ω	STEREO Indicator	dVR4 (F-3806)	Light Indicator	Adjust the dVR4 within center of lighting level.
	PLL V.C.O. Adj. In case of using Frequency counter	*98MHz < **98.1MHz > ANT Input 65dBf (59.8dB), FM SSG, No MOD.	Same as above	Pin No.11 of dIC3 (LA3390) and GND, F-3806, Frequency counter	dVR4 (F-3806)	19kHz ± 30Hz	Before performance this adjustment, turn dVR3 fully counter-clockwise.
2.	Separation Adj.	*98MHz < **98.1MHz > ANT Input 65dBf (59.8dB), FM SSG, Pilot 19kHz (9% MOD.), L MODE 1kHz + Pilot (100% MOD.), STEREO SG.	Same as above	REC OUT L-CH, VTVM & SCOPE	—	Read the indication on VTVM	Confirm R→L-CH
				REC OUT R-CH VTVM & SCOPE	dVR3 (F-3806)	-40 dB from the indication above.	
3.	Muting Level Adj.	*98MHz < **98.1MHz > 20dBf (14.8dB), FM SSG, Pilot 19kHz (9% MOD.), L or R MODE 1kHz + Pilot (100% MOD.), STEREO SG.	Same as above	REC OUT L-CH or R-CH. VTVM & SCOPE	dVR2 (F-3806)	Output Signal comes out.	

Fig. 2-4



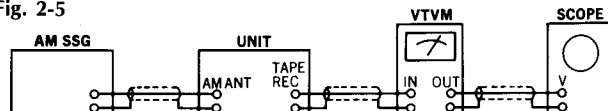
### 2-3. AM Adjustment

(See Figs. 2-4, 2-5, 2-6 and Top View on Page 17 and 18)

- Note:** 1. Input Selector ..... AM  
 2. TUNING/FM MODE ..... MANUAL/MONO  
 3. The frequency with "\*" mark is for the unit that the AM 9/10 kHz channel step switch (oS26, See Fig. 2-1) is set to 9 kHz and "\*\*\*" is for the 10 kHz.  
 4. AM channel step frequency of the unit without the AM channel step switch (oS26) is fixed to 10 kHz, and it is applicable to the USA (UL) and Canada (CSA) under industrial standards.  
 5. Preset the following frequencies to the memories.

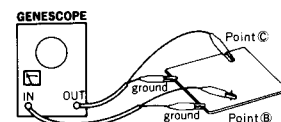
PRESET KEY	AM	
	9 kHz step	10 kHz step
1	522 kHz	530 kHz
2	1611 kHz	1620 kHz
3	603 kHz	600 kHz
4	1404 kHz	1400 kHz


Fig. 2-5



#### 1) AM IF

Fig. 2-6



STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	IF Coil Adj.	Genescope Output 50dB	Point B (eR19), F-3806	Between Point C (eR11) and GND, F-3806	eCF1, eT1, (F-3806)	MAX. Waveform	




#### 2) AM Tuning Voltage

**Note:** Feed Signal is no input

STEP	SUBJECT	SETTING	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
1.	*522kHz < **530kHz > Tuning Voltage	Depress PRESET Key 1 to readout *522kHz < **530kHz >	Between eTP1 (eR20) and GND, F-3806, DC Volt Meter	eT2 (F-3806)	1V ± 0.1V	•Repeat procedures as state in STEP 1 & 2.
2.	*1611kHz < **1620kHz > Tuning Voltage	Depress PRESET Key 2 to readout *1611kHz < **1620kHz >	Same as above	eTC2 (F-3806)	9V ± 0.1V	

#### 3) AM RF, Signal Level and Muting Level

- Note:** 1. Connect AM loop antenna to the AM antenna terminal and GND terminal.  
 2. Repeat procedures as state in STEP 1 and 2.

STEP	SUBJECT	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
		FROM	TO				
1.	*603kHz < **600kHz > RF Adj.	*603kHz < **600kHz > ANT Input 50 dB, 400Hz (30% MOD.), AM SSG	ANT terminal	REC OUT L-CH or R-CH, VTVM & SCOPE	eT3 (F-3806)	MAX. Output 	•Depress PRESET Key 3 to readout *603kHz < **600kHz >
2.	*1404kHz < **1400kHz > RF Adj.	*1404kHz < **1400kHz > ANT Input 50 dB, 400Hz (30% MOD.), AM SSG	Same as above	Same as above	eTC1 (F-3806)	MAX. Output 	•Depress PRESET Key 4 to readout *1404kHz < **1400kHz >
3.	Signal Level Adj.	*999kHz < **1000kHz > ANT Input 55 dB, No MOD., AM SSG	Same as above	SIGNAL Indicator	eVR2 (F-3806)	Make only 1 LED, lighting	
4.	Muting Level Adj.	*999kHz < **1000kHz > ANT Input 55 dB, 400Hz (30% MOD.), AM SSG	Same as above	REC OUT L-CH or R-CH, VTVM & SCOPE	eVR1 (F-3806)	Output signal comes out.	•TUNING/FM MODE switch.....AUTO

## 2-4. Driver Circuit Adjustment

(See Top View on Page 17 and 18)

- Note:** 1. Room Temperature ..... 18°C ~ 28°C  
 2. Master Volume ..... Minimum  
 3. Input Selector ..... AUX

STEP	SUBJECT	MEASURE OUTPUT	ADJUST	ADJUST FOR	REMARKS
1.	DC Offset Voltage Adj.	Pin No.10 of kIC1 (STK3106), F-3804, DC Volt Meter	kVR1 (F-3804)	DC -25V ± 250mV	•Connect dummy load (8Ω) to speaker terminal.
2.	DC Offset Voltage Adj.	Pin No.9 of kIC1 (STK3106), F-3804, DC Volt Meter	kVR3 (F-3804)	DC 25V ± 250mV	
3.	Bias Current Adj. L-CH	Between emitter terminals of kQ10L and kQ11L, F-3804, DC Volt Meter	kVR2L (F-3804)	DC 2mV ± 0.5mV	•Before turning ON power switch, turn kVR2L, R fully counterclockwise. •This bias current value into voltage by ohms law.
4.	Bias Current Adj. R-CH	Between emitter terminals of kQ10R and kQ11R, F-3804, DC Volt Meter	kVR2R (F-3804)		

\* After adjustments STEP 1 and 2, confirm following voltage  
 Speaker terminal voltage ..... ± 200mV

### ◆ Selection of Intermediate Frequencies (FM)

- \* When the center frequency (shown by a color) of the ceramic filter is changed, the following connection must be made by using diodes. (See Parts Location on Page 11 <F-3810>)
- \* Unity the color marks of the FM ceramic filters (dCF1, dCF2, dCF3 <Z-9000X only> and dCF4) on the F-3806 with the same color.

Colouring	Intermediate frequency	Connecting Position of Diode on F-3810	
		fD17	fD18
RED	10.700MHz	—	—
ORANGE	10.725MHz	○	—
BLACK	10.650MHz	—	○
BLUE	10.675MHz	○	○

○: Connect diode

—: Remove diode

### •Abbreviations

#### Equipment

AM FM Generator Oscilloscope ..... Genescope  
 AM Standard Signal Generator ..... AM SSG  
 FM Standard Signal Generator ..... FM SSG  
 FM Stereo Generator ..... Stereo SG  
 Oscilloscope ..... Scope  
 Audio Oscillator ..... Audio Osc.  
 Distortion Meter ..... Dist. Meter

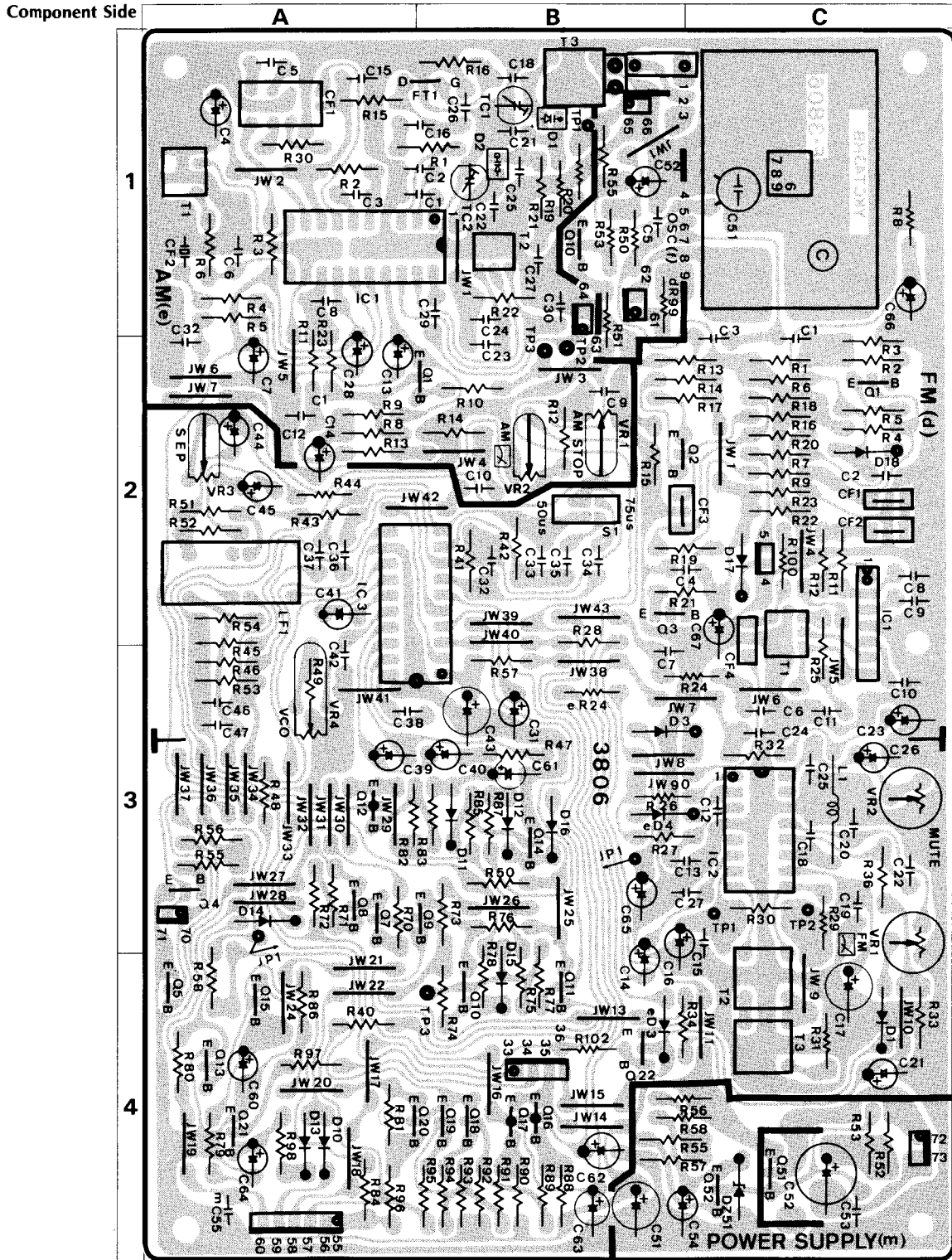
#### Others

Antenna ..... ANT.  
 Modulation ..... MOD.  
 Total Harmonic Distortion ..... T.H.D.

### 3. PARTS LOCATION & PARTS LIST

3-1. F-3806 Tuner Circuit Board (Stock No. 00751201 = Z-9000X/00752401 = Z-7000X)

\*Since some of capacitors and resistors are omitted from parts lists in this service manual, refer to the Common Parts List for capacitors & resistors, which was issued on February 1983.



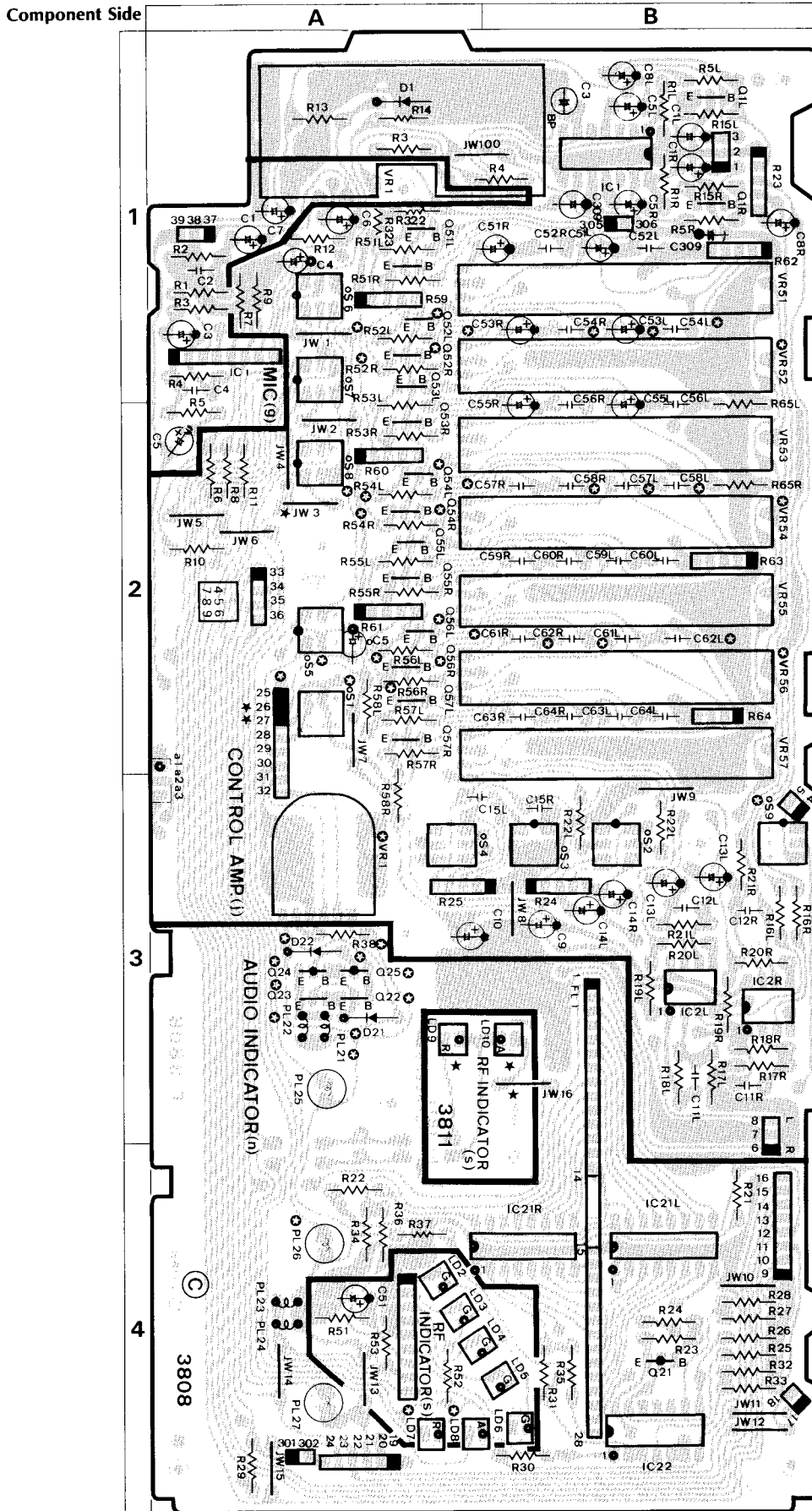
## Parts List &lt;F-3806&gt;

Parts No.	Stock No.	Description
	46392700	FM Frontend Pack FE446U
<b>•Transistor</b>		
dQ1	46202901 or 46393201	2SC1674 2SC2786
dQ2	46202901 or 46393201	2SC1674 <Z-9000X Only> 2SC2786 <Z-9000X Only>
dQ3	46202901 or 46393201	2SC1674 <Z-9000X Only> 2SC2786 <Z-9000X Only>
dQ4	46367101	2SC2603
dQ5	46367101	2SC2603
dQ7	46367101	2SC2603
dQ8	46367101	2SC2603
dQ9	46367101	2SC2603
dQ10	46367101	2SC2603
dQ11	46367101	2SC2603
dQ12	46367001	2SA1115
dQ13	46367101	2SC2603
dQ14	46367101	2SC2603
dQ15	46367101	2SC2603
dQ16	46367001	2SA1115
dQ17	46367001	2SA1115
dQ18	46367101	2SC2603
dQ19	46367101	2SC2603
dQ20	46367101	2SC2603
dQ21	46367101	2SC2603
dQ22	03059501 or 03068301 or 07194801	2SC945 2SC2320 2SC1815
<b>•IC</b>		
dIC1	03605900	TA7302P
dIC2	07196000	HA12412
dIC3	46267100	LA3390
<b>•Diode</b>		
dD1	03117600 or 46086000	1S2473D 1S1588
dD3	03117600 or 46086000	1S2473D 1S1588
dD10	03117600 or 46086000	1S2473D 1S1588
dD11	03117600 or 46086000	1S2473D 1S1588
dD12	03117600 or 46086000	1S2473D 1S1588
dD13	03117600 or 46086000	1S2473D 1S1588
dD14	03117600 or 46086000	1S2473D 1S1588
dD15	03117600 or 46086000	1S2473D 1S1588
dD16	03117600 or 46086000	1S2473D 1S1588
dD17	03117600 or 46086000	1S2473D 1S1588
dD18	03117600 or 46086000	1S2473D 1S1588

Parts No.	Stock No.	Description
dCF1~4	46393500	Ceramic Filter kit (Including dCF1~4) <Z-9000X>
dCF1~3	46393600	Ceramic Filter kit (Including dCF1~3) <Z-7000X>
dLF1	46266900	Low Pass Filter
dL1	07250300	Peaking Coil 2.2 $\mu$ H
dT1	46369500	FM IF Coil
dT2	46422500	FM RF Coil
dT3	46422600	FM RF Coil
dVR1	10351300	10k $\Omega$ (B) S.V.R., FM Signal Level Adj.
dVR2	10351500	22k $\Omega$ (B) S.V.R., FM Muting Level & Stop Level Adj.
dVR3	07241400	20k $\Omega$ (B) S.V.R., FM Separation Adj.
dVR4	07241300	10k $\Omega$ (B) S.V.R., V.C.O. Adj.
dS1	07251100	Slide SW., de-emphasis
<b>•Transistor</b>		
eQ1	46367101	2SC2603
<b>•FET</b>		
eFT1	46369900 or 46369901	2SK192A-Y 2SK192A-GR
<b>•IC</b>		
eIC1	07237200	LA1245
<b>•Diode</b>		
eD1	46254600	1SV100 (Varactor)
eD2	46254600	1SV100 (Varactor)
eD3	03117600	1S2473D
eD4	03117600 or 46086000 or 46086000	1S1588 1S2473D 1S1588
eTC1	46437500	Trimmer Capacitor 20pF
eTC2	46437500	Trimmer Capacitor 20pF
eCF1	07254000	Ceramic Filter
eCF2	07265100	Ceramic Filter
eT1	46369600	AM IF Coil
eT2	46394700	AM RF Coil
eT3	46394600	AM RF Coil
eVR1	07241500	50k $\Omega$ (B) S.V.R., AM Muting Lever Adj.
eVR2	07241200	50k $\Omega$ (B) S.V.R., AM Signal Level Adj.
<b>•Transistor</b>		
fQ10	46367101	2SC2603
mQ51	07287101	2SD1147
mQ52	46367101	2SC2603
<b>•Zener Diode</b>		
mDZ51	03177600	RD6.8E-B



3-2. F-3808 Control & Selector Switch Circuit Board (Stock No. 00751001 = Z-9000X/00752101 = Z-7000X)

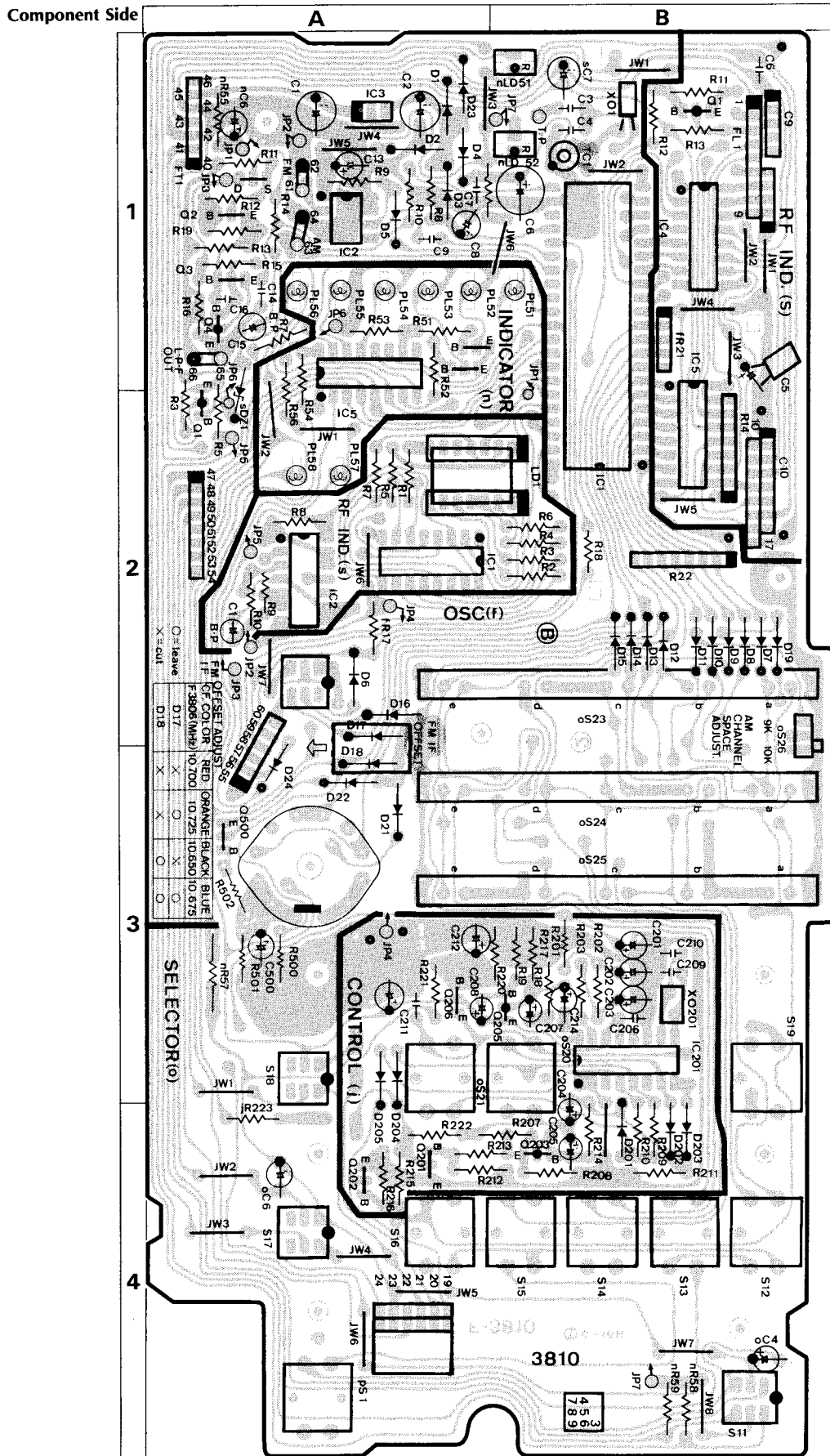


## Parts List &lt; F-3808 &gt;

Parts No.	Stock No.	Description
<b>•IC</b>		
gIC1	46288800	M5220L
gVR1	46362600	20k $\Omega$ (A) and 50k $\Omega$ (B) V.R., MIC MIXING, BALANCE
<b>•Transistor</b>		
jQ1	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
jQ51	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
jQ52	07194801 or 03059501 or 03068301	2SC1815 <Z-9000X Only> 2SC945 <Z-9000X Only> 2SC2320 <Z-9000X Only>
jQ53	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
jQ54	07194801 or 03059501 or 03068301	2SC1815 <Z-9000X Only> 2SC945 <Z-9000X Only> 2SC2320 <Z-9000X Only>
jQ55	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
jQ56	07194801 or 03059501 or 03068301	2SC1815 <Z-9000X Only> 2SC945 <Z-9000X Only> 2SC2320 <Z-9000X Only>
jQ57	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
<b>•IC</b>		
jIC1	46362000	M51133P
jIC2	46151400	NJM2043D
<b>•Diode</b>		
jD1	03111600	1S2473D
<b>•Resistor Array</b>		
jR23	46343100	100k $\Omega$ x 4
jR24	46343100	100k $\Omega$ x 4
jR25	46343100	100k $\Omega$ x 4
jR59	46341900	10k $\Omega$ x 4
jR60	46341900	10k $\Omega$ x 4
jR61	46341900	10k $\Omega$ x 4
jR62	46343100	100k $\Omega$ x 4
jR63	46343100	100k $\Omega$ x 4
jR64	46343100	100k $\Omega$ x 4
jC3	00305200	4.7 $\mu$ F 16V E.B.
jVR1	46362700	10k $\Omega$ (B) x 2 V.R., REVERB DEPTH <Z-9000X Only>
jVR51	46360500	50k $\Omega$ x 2 Slide V.R., 60 Hz/GRAPHIC EQUALIZER <Z-9000X Only>
jVR52	46360500	50k $\Omega$ x 2 Slide V.R., 150 Hz/GRAPHIC EQUALIZER <Z-9000X Only>
jVR53	46360500	50k $\Omega$ x 2 Slide V.R.; 400 Hz/GRAPHIC EQUALIZER <Z-9000X>
	46360500	50k $\Omega$ x 2 Slide V.R., BASS <Z-7000X>
jVR54	46360500	50k $\Omega$ x 2 Slide V.R., 1 kHz/GRAPHIC EQUALIZER <Z-9000X Only>
jVR55	46360500	50k $\Omega$ x 2 Slide V.R., 2.5 kHz/GRAPHIC EQUALIZER <Z-9000X>
	46360500	50k $\Omega$ x 2 Slide V.R., MIDRANGE <Z-7000X>
jVR56	46360500	50k $\Omega$ x 2 Slide V.R., 6 kHz/GRAPHIC EQUALIZER <Z-9000X Only>
jVR57	46360500	50k $\Omega$ x 2 Slide V.R., 15 kHz/GRAPHIC EQUALIZER <Z-9000X>
	46360500	50k $\Omega$ x 2 Slide V.R., TREBLE <Z-7000X>

Parts No.	Stock No.	Description
<b>•Transistor</b>		
nQ21	46086601	2SA937
nQ22	07194801 or 03059501 or 03068301	2SC1815 <Z-9000X Only> 2SC945 <Z-9000X Only> 2SC2320 <Z-9000X Only>
nQ23	07194801 or 03059501 or 03068301	2SC1815 <Z-9000X Only> 2SC945 <Z-9000X Only> 2SC2320 <Z-9000X Only>
nQ24	07194701 or 07197001 or 03012701	2SA1015 <Z-9000X Only> 2SA733A <Z-9000X Only> 2SA999 <Z-9000X Only>
nQ25	07194701 or 07197001 or 03012701	2SA1015 <Z-9000X Only> 2SA733A <Z-9000X Only> 2SA999 <Z-9000X Only>
<b>•IC</b>		
nIC21	46254700	HA12010
nIC22	46255000	LC4066BH
<b>•Diode</b>		
nD21	03103400	10D-1 <Z-9000X Only>
nD22	03103400	10D-1 <Z-9000X Only>
nFL1	46254100	FL. Display Tube FG24SJ1GR
nPL21	46422200	Pilot Lamp 6V 0.15A <Z-9000X Only>
nPL22	46422200	Pilot Lamp 6V 0.15A <Z-9000X Only>
nPL23	04006600	Pilot Lamp 8V 0.15A
nPL24	04006600	Pilot Lamp 8V 0.15A
nPL25	46359900	Pilot Lamp 8V 0.1A
nPL26	46359900	Pilot Lamp 8V 0.1A <Z-9000X Only>
nPL27	46359900	Pilot Lamp 8V 0.1A
oS1	46360000	Push SW., REVERB MODE <Z-9000X Only>
oS2	46360000	Push SW., GRAPHIC EQUALIZER <Z-9000X>, TONE <Z-7000X>
oS3	46360000	Push SW., HIGH FILTER
oS4	46360000	Push SW., SUBSONIC FILTER
oS5	46360000	Push SW., REVERB ON/OFF <Z-9000X Only>
oS6	46360000	Push SW., SPEAKERS A
oS7	46360000	Push SW., SPEAKERS B
oS8	46360000	Push SW., SPEAKERS C <Z-9000X Only>
oS9	46360000	Push SW., FM IF BAND <Z-9000X Only>
<b>•IC</b>		
sIC3	46392500	BA6125
sFL1	46253900	Fl. Display Tube FG712B1GR
<b>•Light Emitting Diode</b>		
sLD2	07251000 or 46470400	TLY-123 SEL2910A
sLD3	07251000 or 46470400	TLY-123 SEL2910A
sLD4	07251000 or 46470400	TLY-123 SEL2910A
sLD5	07251000 or 46470400	TLY-123 SEL2910A
sLD6	07251000 or 46470400	TLY-123 SEL2910A
sLD7	46176900 or 46470200	TLS-123 <Z-9000X Only> SEL2210S <Z-9000X Only>
sLD8	07250900 or 46470300	TLG-123A <Z-9000X Only> SEL2410E <Z-9000X Only>
sLD9	46176900 or 46470200	TLS-123 <Z-7000X Only> SEL2210S <Z-7000X Only>
sLD10	07250900 or 46470300	TLG-123A <Z-7000X Only> SEL2410S <Z-7000X Only>
sC51	46275600	10 $\mu$ F 16V E.C.

3-3. F-3810 Tone Control & Audio Indicator Circuit Board (Stock No. 00751601 = Z-9000X/00752801 = Z-7000X)



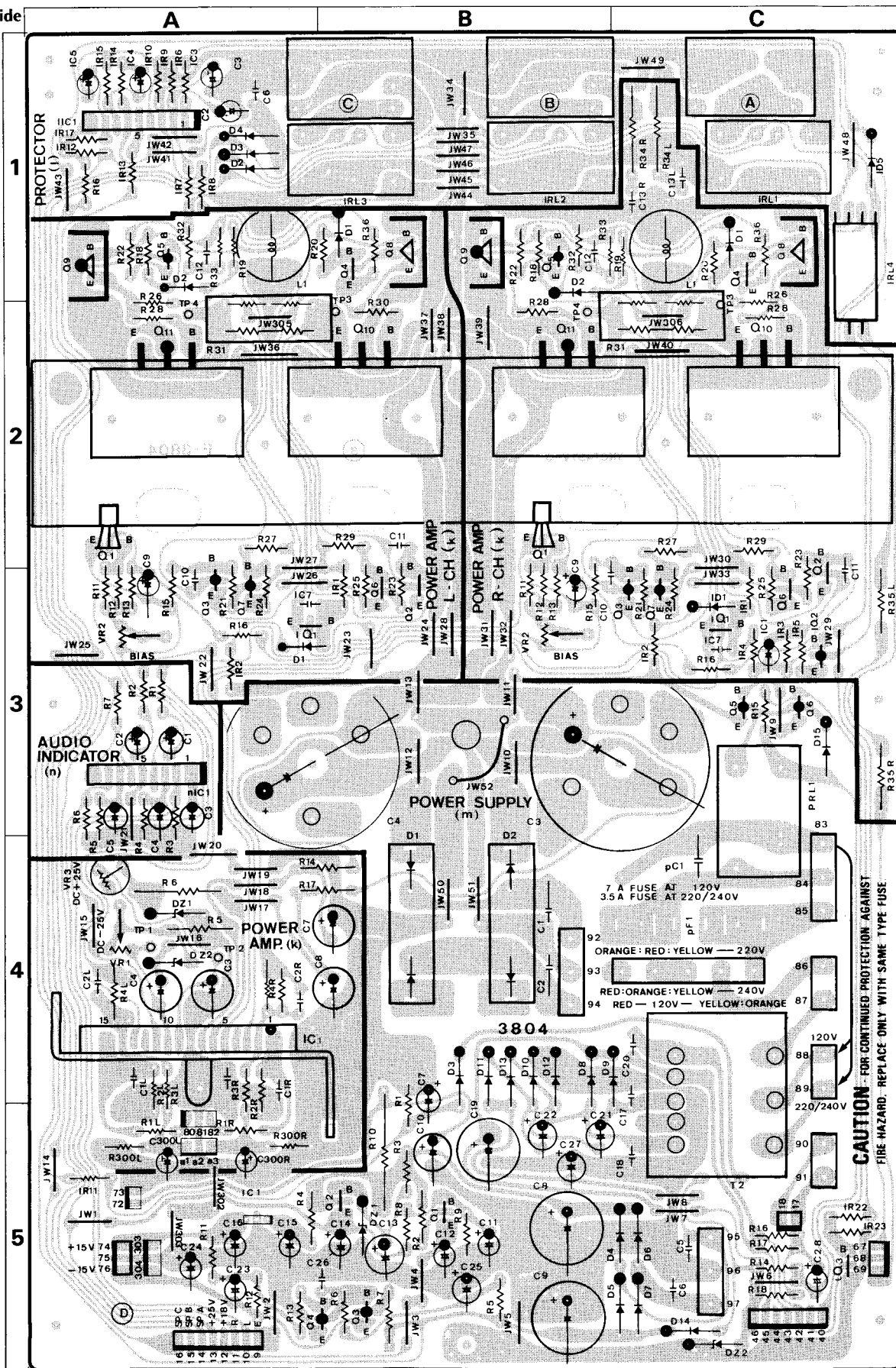
## Parts List &lt;F-3810&gt;

Parts No.	Stock No.	Description
<b>•Transistor</b>		
fQ1	07197001 or 07194701 or 03012701	2SA733A 2SA1015 2SA999
fQ2	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
fQ3	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
fQ4	07197001 or 03012701 or 07194701	2SA733A 2SA999 2SA1015
<b>•FET</b>		
fFT1	03703401 or 03703402	2SK163-K2 2SK163-L1
<b>•IC</b>		
fIC1	46253300	$\mu$ PD1704C-011
fIC2	46253400	$\mu$ PB553AC
fIC3	46361200	L78N06
fX01	46253600	Quartz Element 4.5 MHz
<b>•Diode</b>		
fD1	03111600	1S2473D
fD2	03111600	1S2473D
fD3	03111600	1S2473D
fD4	03111600	1S2473D
fD5	03111600	1S2473D
fD6	03111600	1S2473D
fD7	03111600	1S2473D
fD8	03111600	1S2473D
fD9	03111600	1S2473D
fD10	03111600	1S2473D
fD11	03111600	1S2473D
fD12	03111600	1S2473D
fD13	03111600	1S2473D
fD14	03111600	1S2473D
fD15	03111600	1S2473D
fD16	03111600	1S2473D
fD17	03111600	1S2473D
fD18	03111600	1S2473D
fD19	03111600	1S2473D
fD21	03111600	1S2473D
fD22	03111600	1S2473D
fD23	03111600	1S2473D
fD24	03111600	1S2473D
fR21	46343100	100k $\Omega$ $\times$ 4 A.R.
fR22	46392900	100k $\Omega$ $\times$ 7 A.R.
fC1	46316400	100 $\mu$ F 16V E.C.
fC2	46275900	47 $\mu$ F 16V E.C.
fC6	46422800	470 $\mu$ F 6.3V E.C.
fC8	46276800	4.7 $\mu$ F 50V E.C.
fC13	46275700	22 $\mu$ F 16V E.C.
fC15	00305800	2.2 $\mu$ F 25V E.B.
fTC1	46437500	Trimmer Capacitor 30pF
<b>•Transistor</b>		
jQ201	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
jQ202	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
jQ203	07194701 or 07197001 or 03012701	2SA1015 2SA733A 2SA999
jQ205	07194701 or 07197001 or 03012701	2SA1015 2SA733A 2SA999
jQ206	07194801 or 03059501 or 03068301	2SC1815 2SC945 2SC2320
<b>•IC</b>		
jIC201	46361900	M50601P

Parts No.	Stock No.	Description
<b>•Diode</b>		
jD201	03111600	1S2473D
jD202	03111600	1S2473D
jD203	03111600	1S2473D
jD204	03111600	1S2473D
jD205	03111600	1S2473D
jX0201	07274000	Ceramic Filter CSB550A
<b>•Transistor</b>		
nQ51	46134201	2SD1111
nQ52	46134201	2SD1111
<b>•IC</b>		
nIC51	46269600	$\mu$ PA81C
<b>•LED</b>		
nLD51	46176900 or 46470200	TLS-123 SEL2210S
nLD52	46176900 or 46470200	TLS-123 SEL2210S
nPL51	46359900	Pilot Lamp 8V 0.1A
nPL52	46359900	Pilot Lamp 8V 0.1A
nPL53	46359900	Pilot Lamp 8V 0.1A
nPL54	46359900	Pilot Lamp 8V 0.1A
nPL55	46359900	Pilot Lamp 8V 0.1A
nPL56	46359900	Pilot Lamp 8V 0.1A
nPL57	46359900	Pilot Lamp 8V 0.1A
nPL58	46359900	Pilot Lamp 8V 0.1A
<b>•Transistor</b>		
oQ500	03059501 or 03068301 or 07194801	2SC945 2SC2320 2SC1815
oC500	46275800	33 $\mu$ F 16V E.C.
oS10	46360000	Push SW., TUNING/FM MODE
oS11	46360000	Push SW., CARTRIDGE
oS12	11907000	Push SW., PHONO
oS13	11907000	Push SW., FM
oS14	11907000	Push SW., AM
oS15	11907000	Push SW., AUX
oS16	11907000	Push SW., TAPE-1
oS17	46360000	Push SW., TAPE-2
oS18	46360000	Push SW., MUTING
oS19	11907000	Push SW., VOLUME UP
oS20	11907000	Push SW., VOLUME DOWN
oS21	11907000	Push SW., VOL. PRESET
oS22	46396300	Rotary SW., PROGRAM TIMER
oS23	46365200	Push SW., control keyboard, 1/3/5/7/9
oS24	46365200	Push SW., control keyboard, 2/4/6/8/0
oS25	46365200	Push SW., TUNING/MEMORY/ PRESET SCAN/CLOCK CALL
oS26	46394000	Slide SW., AM channel step
pS1	11907000	Push SW., POWER STD-BY
<b>•Transistor</b>		
sQ1	46086601	2SA937
<b>•IC</b>		
sIC1	46257100 or 46257200	M74LS247 MB74LS247
sIC2	03610500	TC4001BP
sIC4	46253500	$\mu$ PA80C
sIC5	07197300	TC5066BP
sLD1	46166200	Light Emitting Diode SEL-510
sR14	46392900	100k $\Omega$ $\times$ 7 A.R.
sC1	00306800	1 $\mu$ F 50V E.B.
sC5	46275900	47 $\mu$ F 16V E.C.
sC7	46422700	47 $\mu$ F 35V E.C.
sC9	46261400	Capacitor Array 330pF $\times$ 4 50V
sC10	46261400	Capacitor Array 330pF $\times$ 4 50V
sC11	46263000	Capacitor Array 330pF $\times$ 7 50V
	46364700	IC Socket

3-4. F-3804 Power Amp. & Power Supply Circuit Board (Stock No. 00750801 = Z-9000X/00751901 = Z-7000X)

Component Side



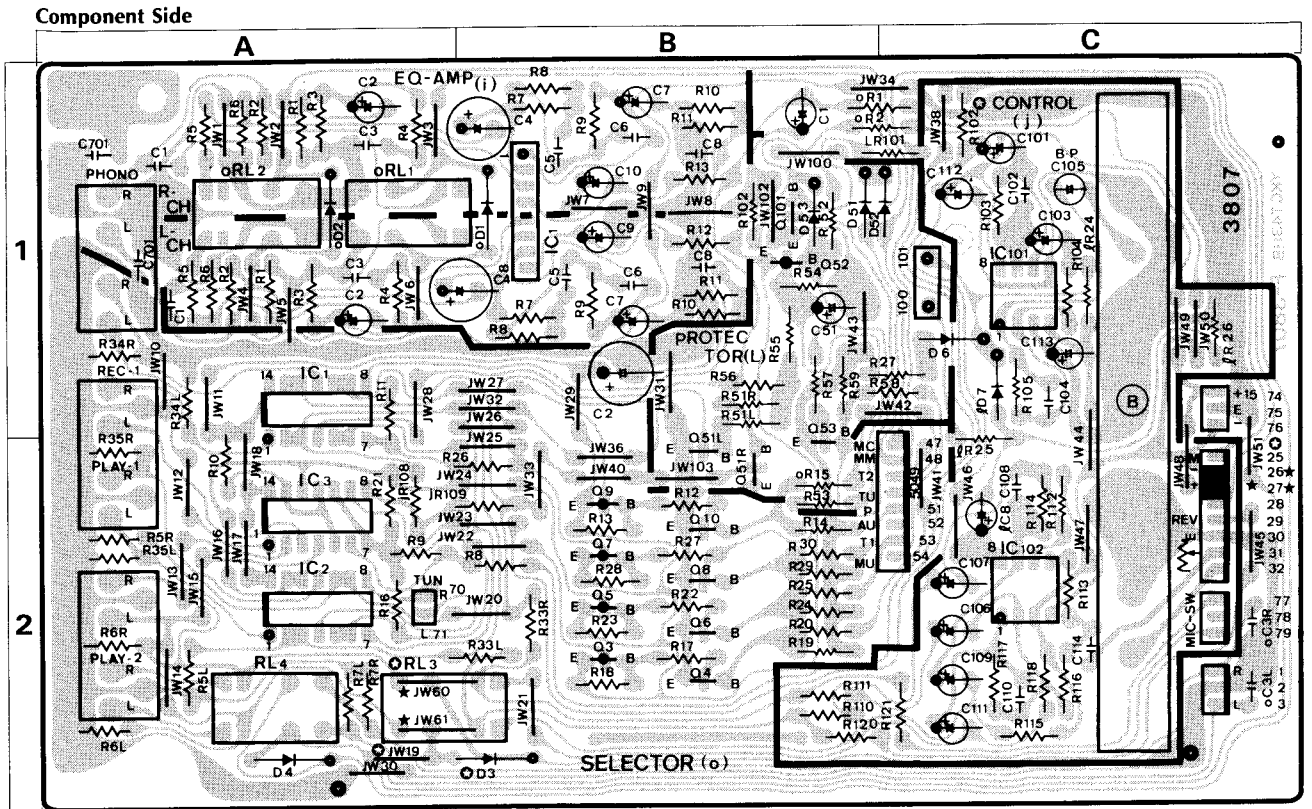


## Parts List &lt;F-3804&gt;

Parts No.	Stock No.	Description
<b>•Transistor</b>		
kQ1	07194801	2SC1815
	or 03059501	2SC945
	or 03068301	2SC2320
kQ2	03066801	2SC2071
kQ3	03010301	2SA939
kQ4	03066801	2SC2071
kQ5	03010301	2SA939
kQ6	46127701	2SC2909
kQ7	46127601	2SA1207
kQ8	03067201	2SC2238B
kQ9	03010701	2SA968B
kQ10	46440101	2SC2774LBR <Z-9000X>
	07100401	2SC2773LBR <Z-7000X>
kQ11	46440001	2SA1170LBR <Z-9000X>
	07100301	2SA1169LBR <Z-7000X>
<b>•IC</b>		
kIC1	46258300	STK3106
<b>•Diode</b>		
kD1	03117600	1S2473D
	or 46086000	1S1588
kD2	03117600	1S2473D
	or 46086000	1S1588
<b>•Zener Diode</b>		
kDZ1	46116100	05Z24-Z
kDZ2	03180400	RD27E-B
kR6	00187900	2.2k $\Omega$ 2W N.I.R.
kR31	46637800	0.33 $\Omega$ $\times$ 2 7W Ce.R.
kR34	00185500	100 $\Omega$ 2W N.I.R.
kC12	00406400	0.012 $\mu$ F 100V F.C.
kC13	00407800	0.047 $\mu$ F 100V F.C.
kL1	46027200	Inductor 1 $\mu$ H
kVR1	07241000	1k $\Omega$ (B) S.V.R., DC 0V Adj.
kVR2	07241000	1k $\Omega$ (B) S.V.R., Bias Adj.
kVR3	10350500	470 $\Omega$ (B) S.V.R., DC 0V Adj.
<b>•Transistor</b>		
IQ1	46127701	2SC2909
IQ2	03010901	2SA992
IQ3	46367101	2SC2603
<b>•IC</b>		
IIC1	46207600	TA7317P
<b>•Diode</b>		
ID1	03117600	1S2473D
	or 46086000	1S1588
ID2	03117700	10E-2
ID3	03117700	10E-2
ID4	03117700	10E-2 <Z-9000X Only>
ID5	03117700	10E-2
IRL1	07198400	Relay (RL3 2M)
IRL2	07198400	Relay (RL3 2M)
IRL3	07198400	Relay (RL3 2M) <Z-9000X Only>
IRL4	11504300	Relay (RL5 2M)

Parts No.	Stock No.	Description
<b>•Transistor</b>		
mQ1	03085201	2SD438
mQ2	03084801	2SD358
mQ3	03033101	2SB528
mQ4	46367001	2SA1115
mQ5	46367001	2SA1115
mQ6	46367001	2SA1115
<b>•IC</b>		
mIC1	46361600	L78N15
<b>•Diode</b>		
mD1	03113200	SS-5R
mD2	03113100	SS-5
mD3	03117700	10E-2
mD4	03117700	10E-2
mD5	03117700	10E-2
mD6	03117700	10E-2
mD7	03117700	10E-2
mD8	03117700	10E-2
mD9	03117700	10E-2
mD10	03117700	10E-2
mD11	03117700	10E-2
mD12	03117700	10E-2
mD13	03117700	10E-2
mD14	03117700	10E-2
mD15	03117700	10E-2
<b>•Zener Diode</b>		
mDZ1	03180200	RD24E-B
mDZ2	03171900	RD27F-B
mC1	08680400	10000pF 500V C.C.
mC2	08680400	10000pF 500V C.C.
mC3	46223000	10000 $\mu$ F 80V E.C. <Z-9000X >
	46223200	10000 $\mu$ F 71V E.C. <Z-7000X>
mC4	46223000	10000 $\mu$ F 80V E.C. <Z-9000X>
	46223200	10000 $\mu$ F 71V E.C. <Z-7000X>
mT2	15008511	Power Transformer
<b>•IC</b>		
nIC1	03610000	TA7318P
	22902400	Terminal Board 4P, SPEAKERS
pC1	46425800	0.01 $\mu$ F 400V C.C.
<b>•AC Fuse</b>		
<Z-9000X>		
pF1	07189500	10A 250V (120V)
	07189100	5A 250V (220/240V)
<Z-7000X>		
pF1	07189300	7A 250V (120V)
	07188900	3.5A 250V (220/240V)
pRL1	46222200	Relay (RL1 1M)

3-5. F-3807 EQ. Amp. Circuit Board (Stock No. 00751301 = Z-9000X/00752501 = Z-7000X)



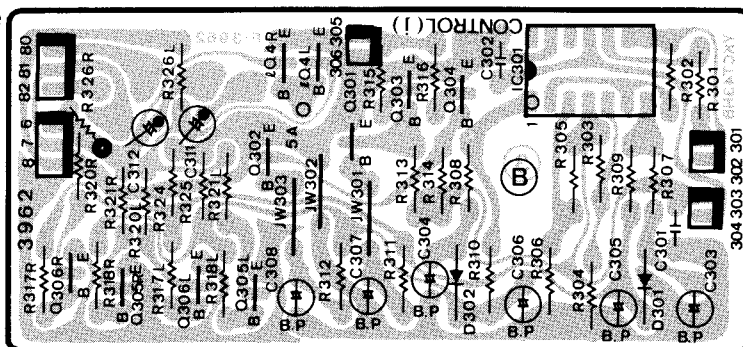
Parts List

Parts No.	Stock No.	Description
•IC		
iIC1	46288800	M5220L
•IC		
jiC101	07208900	NJM4558D-X <Z-9000X Only>
jiC102	07208900	NJM4558D-X <Z-9000X Only>
	46222100	Reverberation Unit HDR5103 <Z-9000X Only>
•Transistor		
IQ51	07194801	2SC1815
	or 03059501	2SC945
	or 03068301	2SC2320
IQ52	46367001	2SA1115
IQ53	46367101	2SC2603
IQ101	07194801	2SC1815
	or 03059501	2SC945
	or 03068301	2SC2320
•Diode		
ID6	03117600	1S2473D
	or 46086000	1S1588
ID7	03117600	1S2473D
	or 46086000	1S1588
ID51	03117600	1S2473D
	or 46086000	1S1588
ID52	03117600	1S2473D
	or 46086000	1S1588
ID53	03117600	1S2473D
	or 46086000	1S1588

Parts No.	Stock No.	Description
•Transistor		
oQ3	46367001	2SA1115
oQ4	46367101	2SC2603
oQ5	46367001	2SA1115
oQ6	46367101	2SC2603
oQ7	46367001	2SA1115
oQ8	46367101	2SC2603
oQ9	46367001	2SA1115
oQ10	46367101	2SC2603
•IC		
oIC1	46255000	LC4066BH
oIC2	46255000	LC4066BH
oIC3	46255000	LC4066BH
•Diode		
oD1	03117700	10E-2
oD2	03117700	10E-2
oD3	03117700	10E-2 <Z-9000X Only>
oD4	03117700	10E-2
oRL1	11506200	Relay
oRL2	11506200	Relay
oRL3	11506200	Relay <Z-9000X Only>
oRL4	11506200	Relay
	46363800	4P Input Terminal Board, PHONO/AUX/TAPE-1/TAPE-2

### 3-6. F-3962 Volume Control Circuit Board (Stock No. 00758001 = Z-9000X/00751801 = Z-7000X)

Component Side



Parts List

Parts No.	Stock No.	Description
•Transistor		
jQ301	46367101	2SC2603
jQ302	46367101	2SC2603
jQ303	46367101	2SC2603
jQ304	46367101	2SC2603
jQ305	46367101	2SC2603
jQ306	46367101	2SC2603
•IC		
jIC301	46500800	NJM2058D
•Diode		
jD301	03117600	1S2473D
	or 46086000	1S1588
jD302	03117600	1S2473D
	or 46086000	1S1588

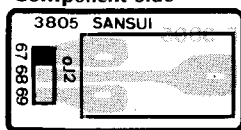
Parts No.	Stock No.	Description
jC303	08451700	1μF 50V E.B.
jC304	08451700	1μF 50V E.B.
jC305	08451000	10μF 16V E.B.
jC306	08451000	10μF 16V E.B.
jC307	08451200	2.2μF 25V E.B.
jC308	08451200	2.2μF 25V E.B.
•Transistor		
IQ4	03059501	2SC945
	or 07194801	2SC1815
	46363800	4P Input Terminal Board, PRE AMP OUT/POWER AMP IN

•Note: The circuit boards, F-3805 & F-3809 are not supplied as the assembled. However, the individual parts on the circuit boards are provided by orders.

### 3-7. F3805 PHONES Jack Circuit Board

<Z-9000X/Z-7000X>

Component Side



Parts List

Parts No.	Stock No.	Description
oJ2	46289200	Jack

### 3-8. F-3809 MIC Jack Circuit Board

<Z-9000X/Z-7000X>

Parts List

Parts No.	Stock No.	Description
oJ1	46133900	Jack

•Note: Concerning Printed Resistor and Printed Silver Pattern

In this model, printed circuit board is used on which carbon resin resistance and silver foil pattern are coated. And it is impossible to replace those parts. Therefore, please keep following procedures when repairing or ordering the parts.

1. When repairing the printed resistor, cut off center position of the resistor to make complete open circuit. Then solder 1/3 W type carbon resistor to conductor side of the PCB.
2. When repairing the printed silver pattern, solder lead wire to conductor side of the PCB.
3. When ordering the 1/3 W type carbon resistor, read the resistance value from the schematic diagram, and refer to "Common Parts List for Resistors and Capacitors".

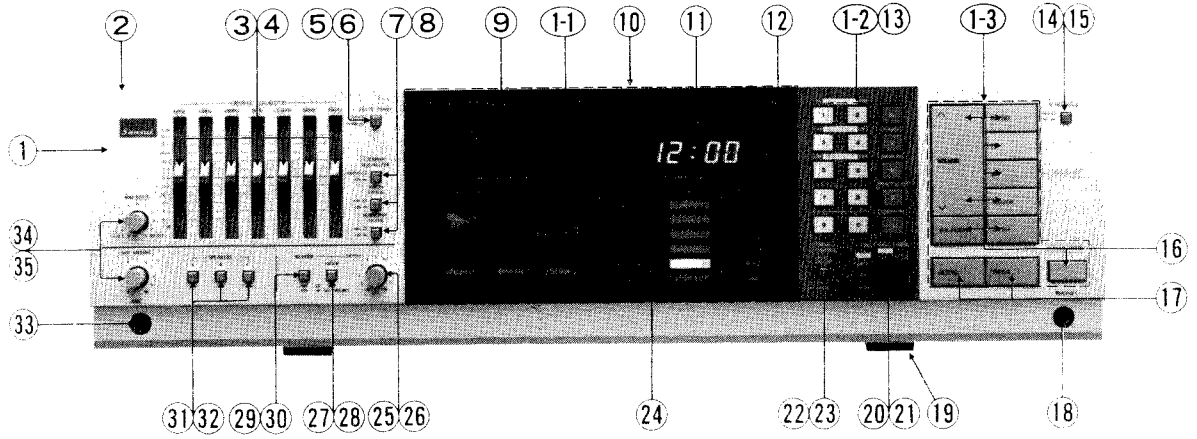
•Abbreviations

C.R. : Carbon Resistor	E.B. : Bi-Polar Electrolytic Capacitor
S.R. : Solid Resistor	E.B.L. : Low Leak Bi-Polar Electrolytic Capacitor
Ce.R. : Cement Resistor	
M.R. : Metal Film Resistor	Ta.C. : Tantalum Capacitor
F.R. : Fusing Resistor	F.C. : Film Capacitor
N.I.R. : Non-Inflammable Resistor	M.P. : Metalized Paper Capacitor
A.R. : Array Resistor	P.C. : Polystyrene Capacitor
C.C. : Ceramic Capacitor	G.C. : Gimmic Capacitor
C.T. : Ceramic Capacitor, Temperature Compensation	A.C. : Array Capacitor
E.C. : Electrolytic Capacitor	V.R. : Variable Resistor
E.L. : Low Leak Electrolytic Capacitor	S.V.R. : Semi Variable Resistor
	SW. : Switch

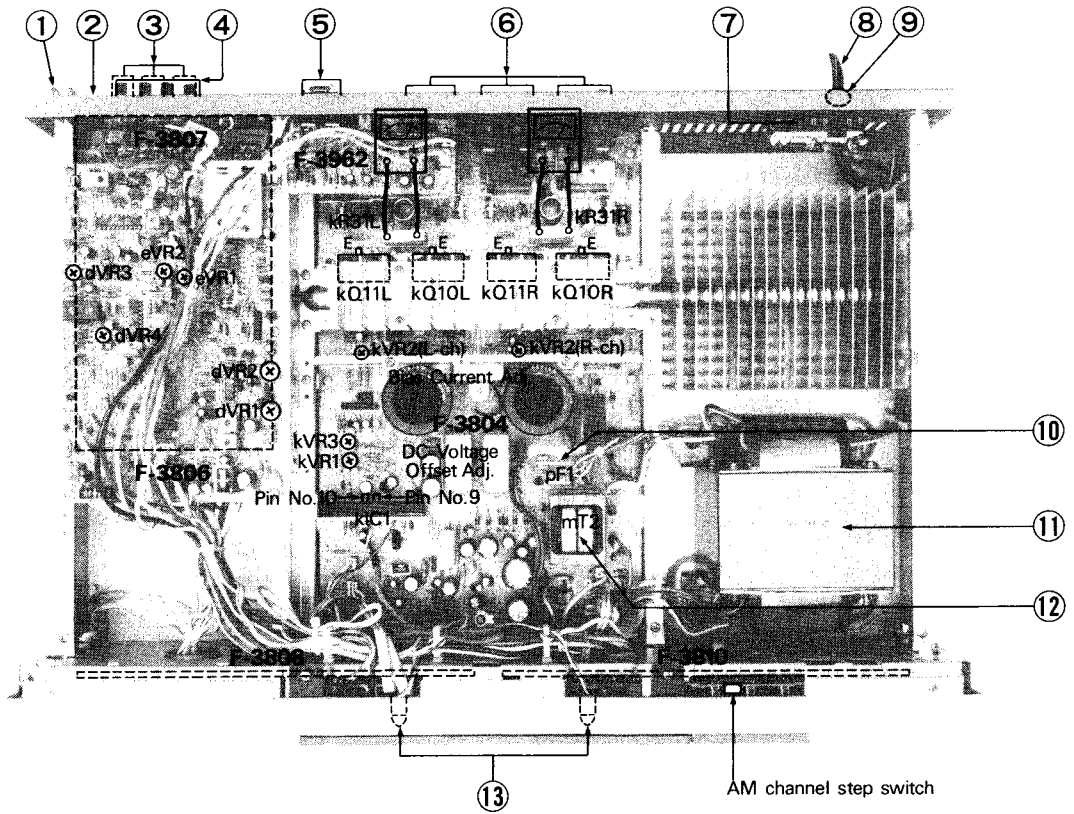
# 4. OTHER PARTS

## 4-1. Z-9000X

### A) Front View

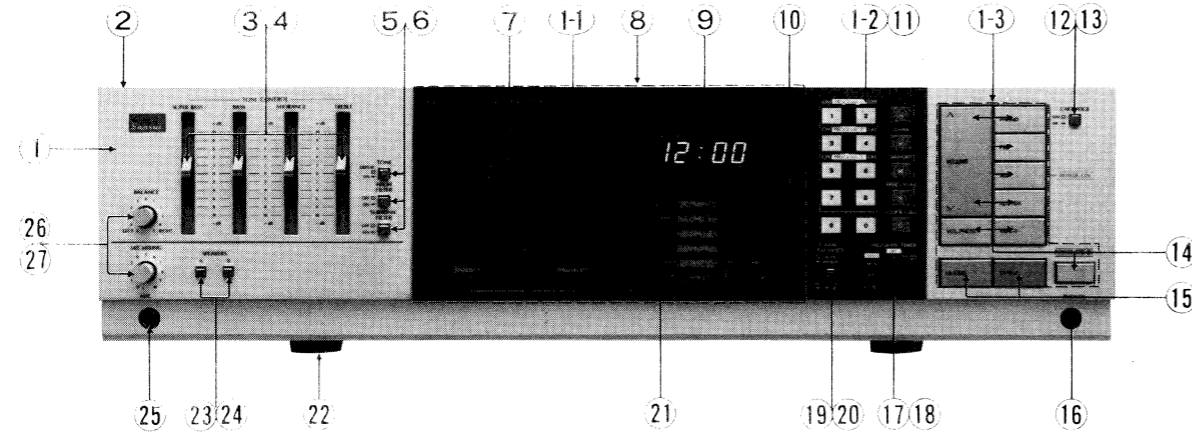


### B) Top View

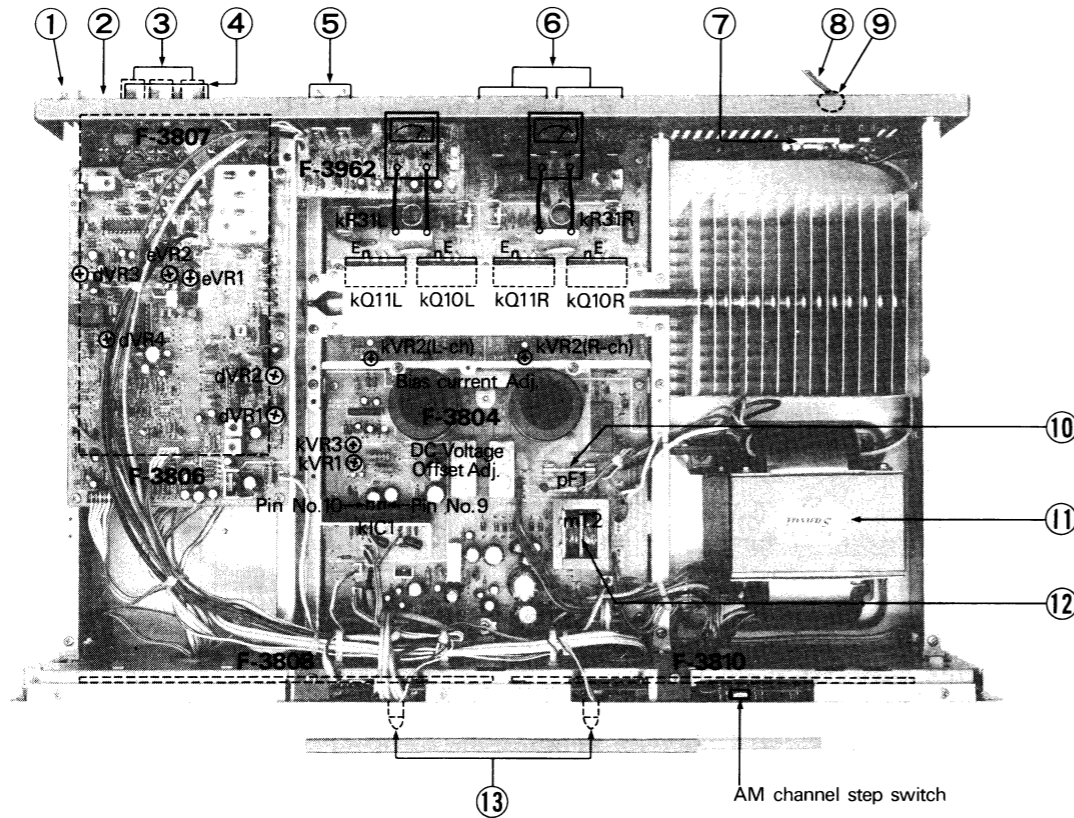


4-2. Z-7000X

A) Front View



B) Top View



●Parts List <Z-9000X>

<Front View>

Parts No.	Stock No.	Description
1	47245700	Front Panel Ass'y
1-1	47246800	Smoked Plate
1-2	47248000	15-Key Push Knob Ass'y
1-3	47248100	Selector Push Knob Ass'y
2	47246100	Bonnet Ass'y
3	07930100	Slide Knob, GRAPHIC EQUALIZER
4	46360500	50kΩ×2 Slide VR, GRAPHIC EQUALIZER
5	07977500	Push Knob Ass'y, FM IF BAND
6	46360000	Push SW., FM IF BAND
7	07977500	Push Knob Ass'y, GRAPHIC EQUALIZER, HIGH FILTER, SUBSONIC FILTER
8	46360000	Push SW., GRAPHIC EQUALIZER, HIGH FILTER, SUBSONIC FILTER
9	46254100	FL Display Tube, VOLUME/PEAK POWER
10	47245900	Sub Panel Ass'y
11	46253900	FL Display Tube, FREQUENCY/QUARTZ CLOCK
12	46166200	7-seg. LED, CHANNEL
13	46365200	Push SW., keyboard
14	07977500	Push Knob Ass'y, CARTRIDGE
15	46360000	Push SW., CARTRIDGE
16	11907000	Push SW., VOLUME, PHONO, POWER STD-BY etc.
17	46360000	Push SW., MUTING/TAPE-2
18	46289200	Jack, PHONES
19	07964100	Knob, PROGRAM TIMER
20	07964100	Rotary SW., PROGRAM TIMER
21	46364600	Rotary SW., PROGRAM TIMER
22	07977500	Push Knob Ass'y, TUNING/FM MODE
23	46360000	Push SW., TUNING/FM MODE
24	46359900	8V 0.1A Pilot Lamp
25	07964000	Knob, DEPTH
26	46362700	10kΩ (B)×2 V.R., DEPTH
27	07977500	Push Knob Ass'y, MODE MIC/SOURCE
28	46360000	Push SW., MODE MIC/SOURCE
29	07966500	Push Knob Ass'y, MIC/SOURCE
30	46360000	Push SW., REVERB ON/OFF
31	07977500	Push Knob Ass'y, SPEAKERS
32	46360000	Push SW., SPEAKERS
33	46133900	Jack, MIC
34	07964000	Knob, MIC MIXING, BALANCE
35	46362600	20kΩ and 50kΩ VR, MIC MIXING, BALANCE

<Top View>

Parts No.	Stock No.	Description
1	07193200	Antenna Holder
2	22301500	Ground Terminal
3	46363800	4P Input Terminal, PHONO, AUX, TAPE-1/-2
4	46364500	Antenna Terminal
5	46363800	4P Input Terminal, PREAMP OUT/POWER AMP IN
6	22902400	4P Speaker Terminal, SYSTEM-A, -B, -C
7	46360200	AC Outlet
8	38004900	Power Supply Cord
9	39104900	Strain Relief
10	07189500	10A 250V (120V) AC Fuse
11	07189100	5A 250V (220/240V) AC Fuse
12	15013501	Power Transformer
13	15008511	Power Transformer
14	04006600	8V 150mA Pilot Lamp

●Parts List <Z-7000X>

<Front View>

Parts No.	Stock No.	Description
1	47245800	Front Panel Ass'y
1-1	47246900	Smoked Plate
1-2	47248000	15-Key Push Knob Ass'y
1-3	47248100	Selector Push Knob Ass'y
2	47246100	Bonnet Ass'y
3	07930100	Slide Knob, TONE CONTROL
4	46360500	50kΩ×2 Slide VR, TONE CONTROL
5	07977500	Push Knob Ass'y, TONE, HIGH FILTER, SUBSONIC FILTER
6	46360000	Push SW., TONE, HIGH FILTER, SUBSONIC FILTER
7	46254100	FL Display Tube, VOLUME/PEAK POWER
8	47246000	Sub Panel Ass'y
9	46253900	FL Display Tube, FREQUENCY/QUARTZ CLOCK
10	46166200	7-seg. LED, CHANNEL
11	46365200	Push SW., Keyboard
12	07977500	Push Knob Ass'y, CARTRIDGE
13	46360000	Push SW., CARTRIDGE
14	11907000	Push SW., VOLUME, PHONO, POWER STD-BY etc.
15	46360000	Push SW., MUTING/TAPE-2
16	46289200	Jack, PHONES
17	07964100	Knob, PROGRAM TIMER
18	46364600	Rotary SW., PROGRAM TIMER
19	07977500	Push Knob Ass'y, TUNING/FM MODE
20	46360000	Push SW., TUNING/FM MODE
21	46359900	8V 0.1A Pilot Lamp
22	07841700	Leg
23	07977500	Push Knob Ass'y, SPEAKERS
24	46360000	Push SW., SPEAKERS
25	46133900	Jack, MIC
26	07964000	Knob, MIC MIXING/BALANCE
27	46362600	20kΩ and 50kΩ (B) VR, MIC MIXING/BALANCE

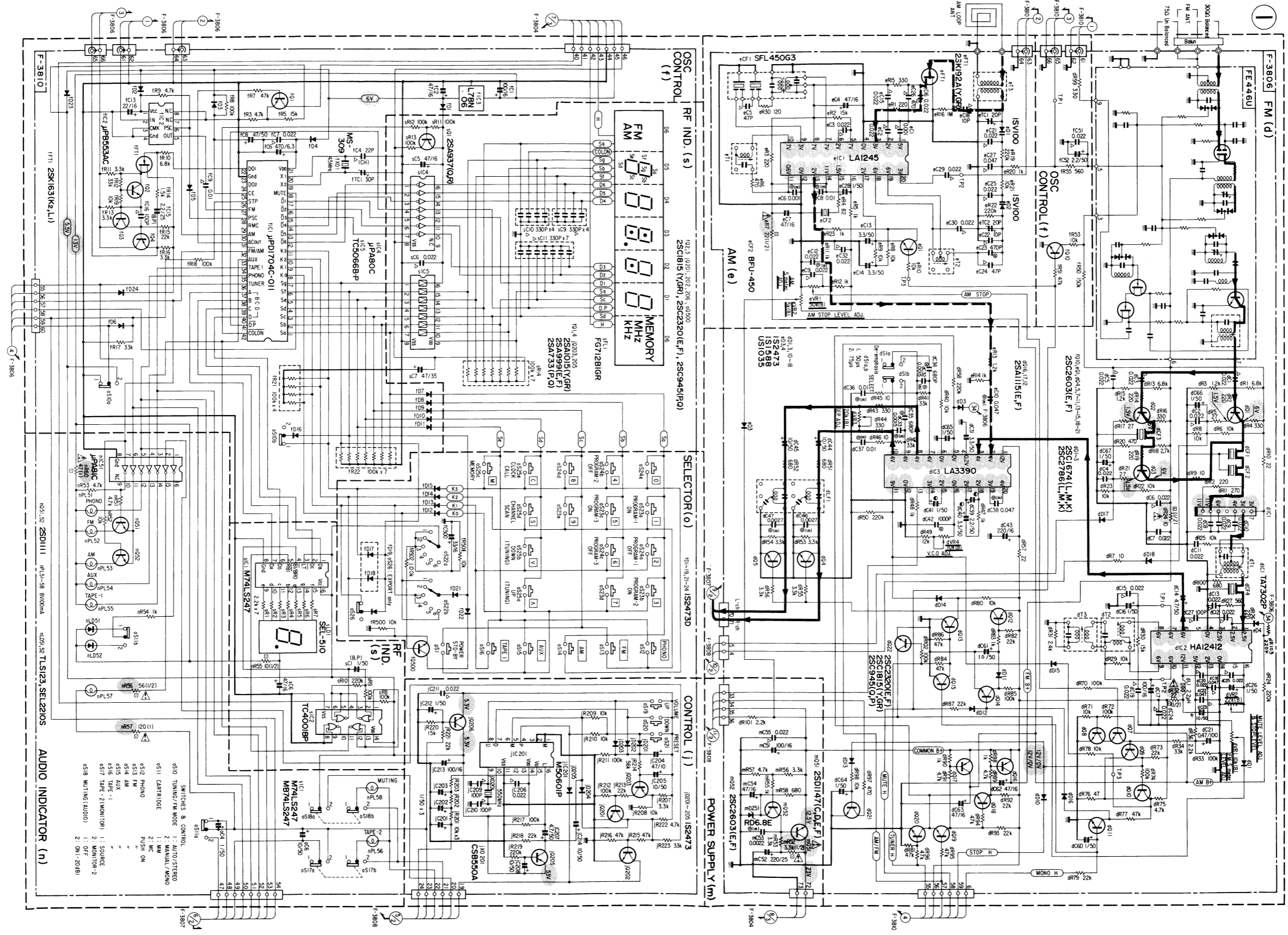
<Top View>

Parts No.	Stock No.	Description
1	07193200	Antenna Holder
2	22301500	Ground Terminal
3	46363800	4P Input Terminal, PHONO, AUX, TAPE-1, -2
4	46364500	Antenna Terminal
5	46363800	4P Input Terminal, PREOUT/POWER AMP IN
6	22902400	4P Speaker Terminals, SYSTEM-A, -B
7	46360200	AC Outlet
8	38004700	Power Supply Cord
9	39106000	Strain Relief
10	07189300	7A 250V (120V) AC Fuse
11	07188900	3.5A 250V (220/240V) AC Fuse
12	15013501	Power Transformer
13	15008511	Power Transformer
14	04006600	8V 150mV Pilot Lamp



**5. SCHEMATIC DIAGRAM 5-1. Z-9000X Tuner & Control Section**

\*Design and specifications subject to change without notice for improvement.  
 \*La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.  
 \*Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

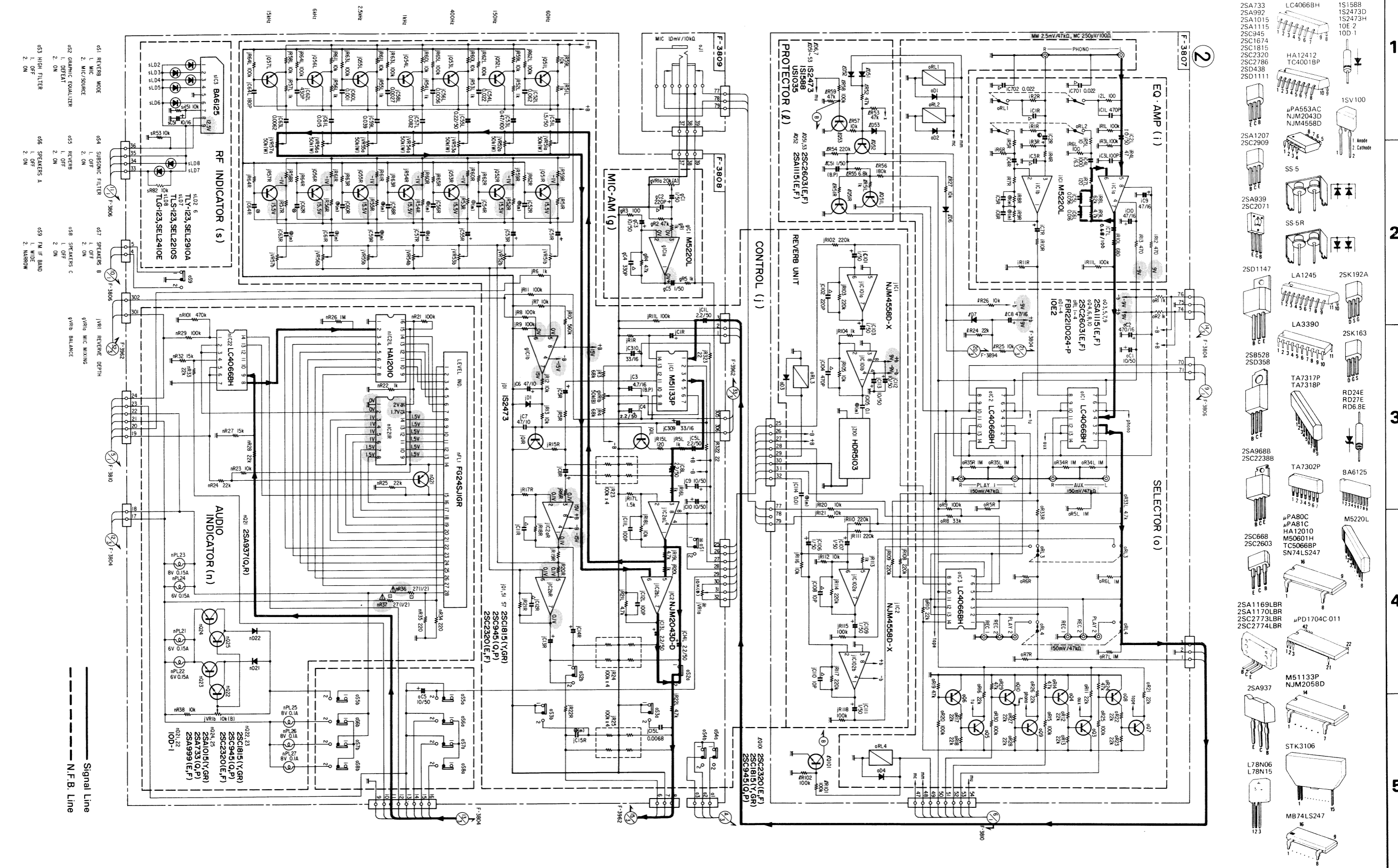


- 2SA733 LC4066BH 1S1588
- 2SA992 1S2473D
- 2SA1015 1S2473H
- 2SA1115 10E 2
- 2SC945 10D-1
- 2SC1674 HA12412
- 2SC1815 TC4001BP
- 2SC2320
- 2SC2786
- 2SD438
- 2SD1111
- 1S1500
- 1 Anode
- 2 Cathode
- 2SA1207 SS 5
- 2SC2909 SS 5R
- 2SA939 SS 5R
- 2SC2071
- 2SD1147 LA1245 2SK192A
- LA3390 2SK163
- 2SB528 2SD358 TA7317P 2SK163
- 2SD358 TA7318P
- 2SA968B TA7302P 8A6125
- 2SC2388 M5220L
- 2SA1169LBR M51133P
- 2SA1170LBR NJM2058D
- 2SC2773LBR STK3106
- 2SC2774LBR MB74LS247
- 2SA937 L78N06
- L78N15
- MB74LS247

— FM Signal Line  
 - - - - - AM Signal Line

5-2. Z-9000X EQ. Amp. & Tone Control Section

\*Design and specifications subject to change without notice for improvement.  
 \*La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.  
 \*Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



- 651 REVERSE MODE  
1. MIC  
2. MIC/SOURCE
- 652 GRAPHIC EQUALIZER  
1. TREAT  
2. ON
- 653 HIGH FILTER  
1. OFF  
2. ON
- 654 SUBSONIC FILTER  
1. OFF  
2. ON
- 655 REVERSE  
1. OFF  
2. ON
- 656 SPEAKERS A  
1. OFF  
2. ON
- 657 SPEAKERS B  
1. OFF  
2. ON
- 658 REVERSE C  
1. OFF  
2. ON
- 659 FM F. BAND  
1. OFF  
2. WIDE

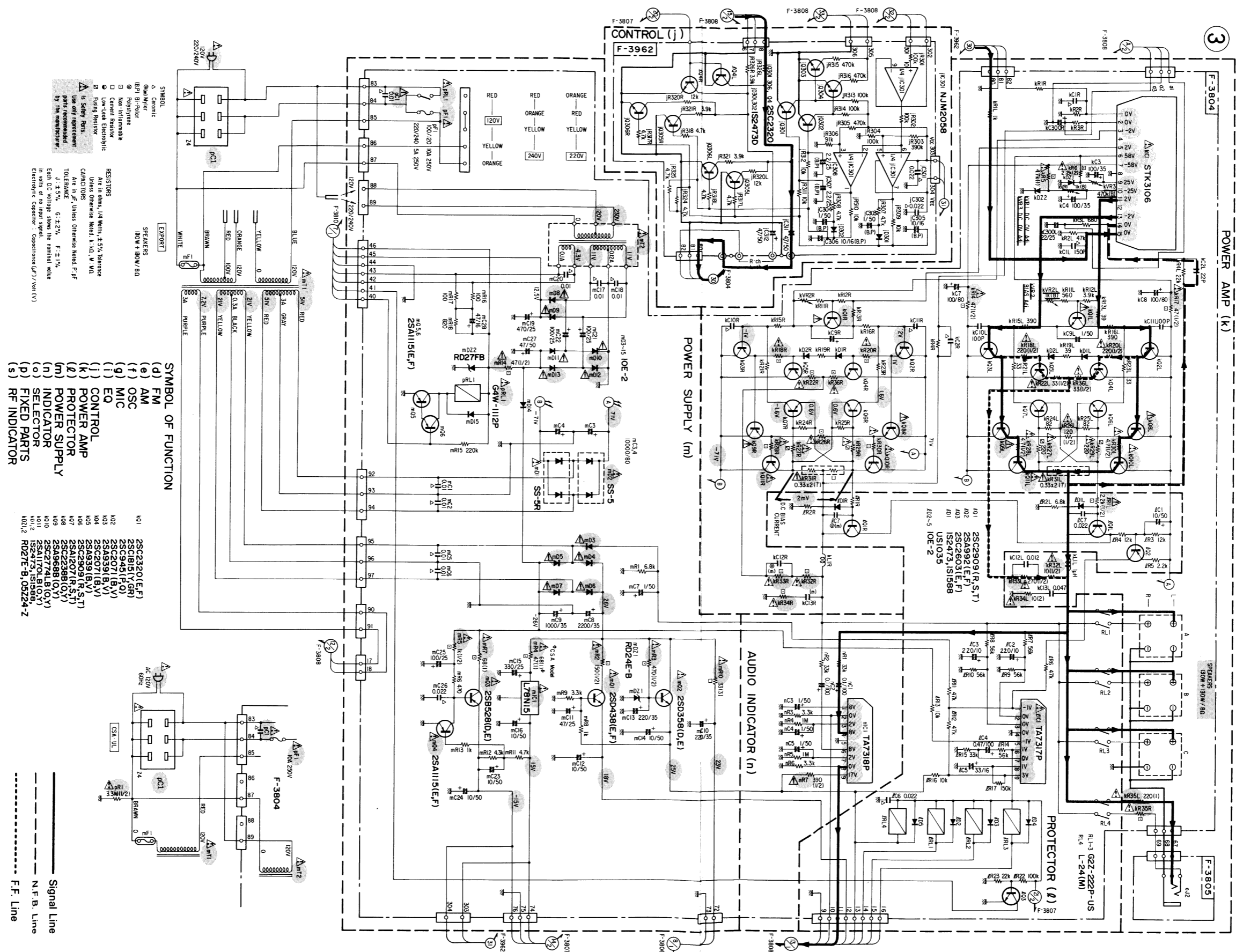
Signal Line  
 --- N.F.B. Line

- 25A733 LC4066BH 1S1588
- 25A992 1S2473D
- 25A1015 1S2473H
- 25A1115 10E 2
- 25C945 10D-1
- 25C1674 HA12412
- 25C1815 TC4001BP
- 25C2320
- 25C2786
- 25D438
- 25D1111
- 15V100
- µPA553AC
- NJM2043D
- NJM4558D
- 25A1207
- 25C2909
- 25A939
- 25C2071
- SS 5
- SS-5R
- 25D1147
- LA1245
- 2SK192A
- LA3390
- 2SK163
- 25B528
- 25D358
- TA7317P
- TA7318P
- RD24E
- RD27E
- RD6.8E
- 25A968B
- 25C2238B
- TA7302P
- BA6125
- 25C668
- 25C2603
- µPA80C
- µPA81C
- HA12010
- M50601H
- TC5066BH
- SN74LS247
- 25A1169LBR
- 25A1170LBR
- 25C2773LBR
- 25C2774LBR
- µPD1704C-011
- 25A937
- NM51133P
- NJM2058D
- STK3106
- L78N06
- L78N15
- MB74LS247

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5-3. Z-9000X Power Amp. & Power Supply Section

\*Design and specifications subject to change without notice for improvement.  
 \*La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.  
 \*Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



- SYMBOL**
- △ Ceramic
  - Resistor
  - Polystyrene
  - ⊖ Non-inductance
  - Cement Resistor
  - Low-Leak Electronic
  - Fusing Resistor
  - △ Safety Parts
- Use only replacement parts recommended by the manufacturer.
- RESISTORS**
- Are in ohms, 1/4 W or 1/2 W, ±5%, tolerance
  - Unless otherwise noted, K, M, M, M, M
  - Are in Ω, unless otherwise noted, P, P, P
- TOLERANCE**
- J: ±5%, G: ±2%, F: ±1%
  - Each DC Voltage shows the nominal value
  - Electronic Capacitor: Capacitance (pF)/V or (V)
- SPEAKERS**
- 30W + 80W/8Ω
  - 30W + 160W/8Ω

- SYMBOL OF FUNCTION**
- (d) FM
  - (e) AM
  - (f) OSC
  - (g) MIC
  - (i) EO
  - (j) CONTROL
  - (k) POWER AMP
  - (l) PROTECTOR
  - (m) POWER SUPPLY
  - (n) INDICATOR
  - (o) SELECTOR
  - (p) FIXED PARTS
  - (s) RF INDICATOR

- K01 2SC2320(E,F)
- K02 2SC1815(Y,G,R)
- K03 2SC945(P,Q)
- K04 2SC2071(B,V)
- K05 2SC9391(B,V)
- K06 2SC2071(B,V)
- K07 2SC2320(E,F)
- K08 2SC2320(E,F)
- K09 2SC2320(E,F)
- K10 2SC2320(E,F)
- K11 2SC2320(E,F)
- K12 2SC2320(E,F)

— Signal Line  
 - - - N.F. B. Line  
 ····· F.F. Line

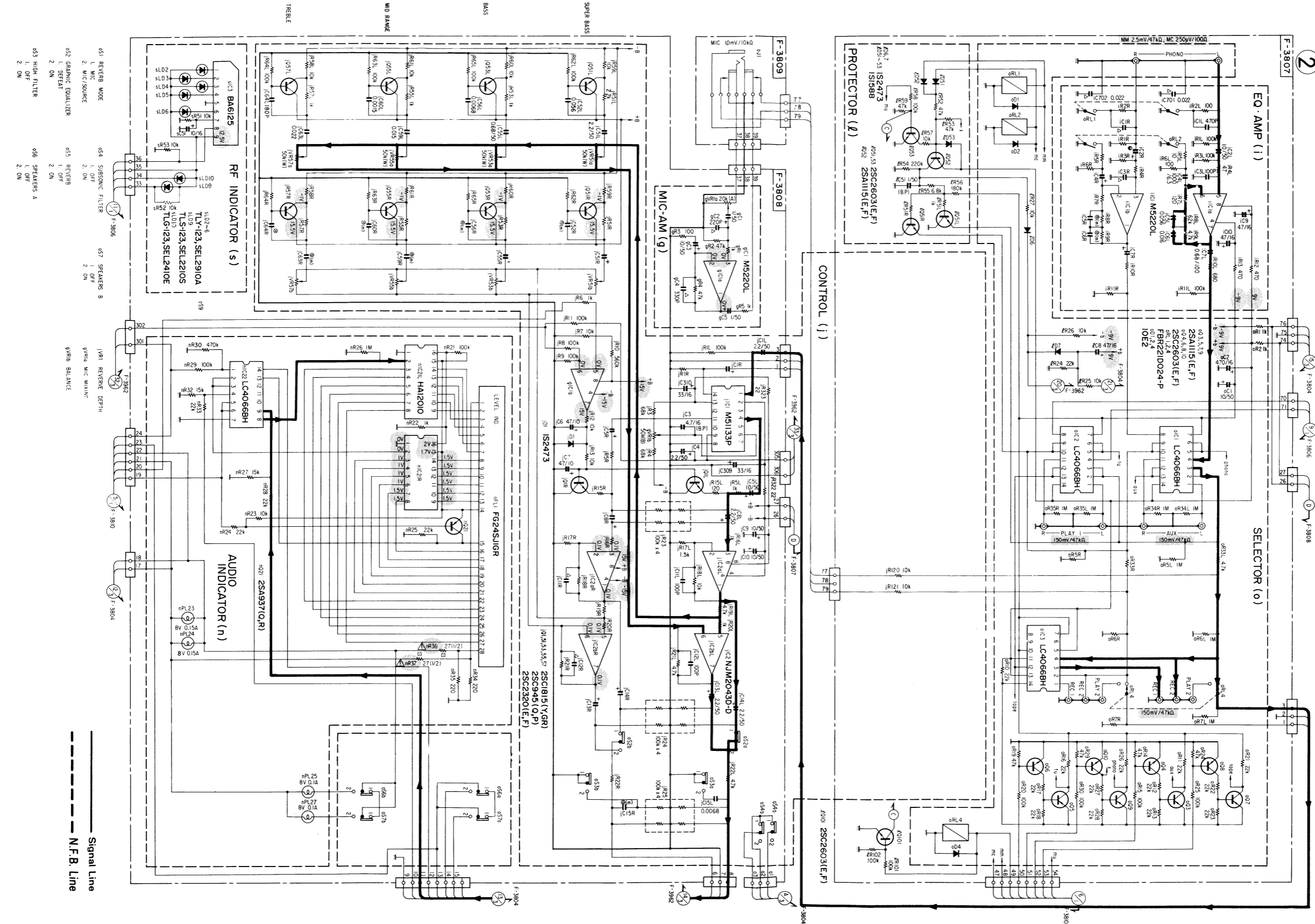
- 2SA733
- 2SA932
- 2SA1015
- 2SA1115
- 2SC945
- 2SC1674
- 2SC1815
- 2SC2320
- 2SC2786
- 2SD438
- 2SD1111
- LC4066BH
- 1S1588
- 1S2473D
- 1S2473H
- 10E-2
- 10D-1
- HA12412
- TC4001BP
- 1S100
- 15V100
- μPA553AC
- NJM2043D
- NJM4558D
- 2SA1207
- 2SC2909
- SS-5
- SS-5R
- SS-5R
- 2SA939
- 2SC2071
- 2SD1147
- LA1245
- 2SK192A
- LA3390
- 2SK163
- 2SB528
- 2SD358
- TA7317P
- TA7318P
- RD24E
- RD27E
- RD6.8E
- 2SA968B
- 2SC2238B
- TA7302P
- BA6125
- μPA80C
- μPA81C
- HA12010
- M50601H
- TC5066BP
- SN74LS247
- 2SA1169LBR
- 2SA1170LBR
- 2SC2773LBR
- 2SC2774LBR
- μPD1704C-011
- M51133P
- NJM2058D
- 2SA937
- L78N06
- L78N15
- STK3106
- MB74LS247





5-5. Z-7000X EQ. Amp. & Control Section

\*Design and specifications subject to change without notice for improvement.  
 \*La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.  
 \*Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



- 651 REVERB MODE  
1. MIC  
2. MIC/SOURCE
- 652 GAINIC EQUALIZER  
1. OFF  
2. ON
- 653 HIGH FILTER  
1. OFF  
2. ON
- 654 SUBSONIC FILTER  
1. OFF  
2. ON
- 655 REFLEERS  
1. OFF  
2. ON
- 656 SPEAKERS A  
1. OFF  
2. ON
- 657 SPEAKERS B  
1. OFF  
2. ON
- 658 SPEAKERS C  
1. OFF  
2. ON
- 659 SPEAKERS D  
1. OFF  
2. ON
- 660 SPEAKERS E  
1. OFF  
2. ON
- 661 SPEAKERS F  
1. OFF  
2. ON
- 662 SPEAKERS G  
1. OFF  
2. ON
- 663 SPEAKERS H  
1. OFF  
2. ON
- 664 SPEAKERS I  
1. OFF  
2. ON
- 665 SPEAKERS J  
1. OFF  
2. ON
- 666 SPEAKERS K  
1. OFF  
2. ON
- 667 SPEAKERS L  
1. OFF  
2. ON
- 668 SPEAKERS M  
1. OFF  
2. ON
- 669 SPEAKERS N  
1. OFF  
2. ON
- 670 SPEAKERS O  
1. OFF  
2. ON
- 671 SPEAKERS P  
1. OFF  
2. ON
- 672 SPEAKERS Q  
1. OFF  
2. ON
- 673 SPEAKERS R  
1. OFF  
2. ON
- 674 SPEAKERS S  
1. OFF  
2. ON
- 675 SPEAKERS T  
1. OFF  
2. ON
- 676 SPEAKERS U  
1. OFF  
2. ON
- 677 SPEAKERS V  
1. OFF  
2. ON
- 678 SPEAKERS W  
1. OFF  
2. ON
- 679 SPEAKERS X  
1. OFF  
2. ON
- 680 SPEAKERS Y  
1. OFF  
2. ON
- 681 SPEAKERS Z  
1. OFF  
2. ON

Signal Line  
 N.F.B. Line

- 2SA733
- 2SA992
- 2SA1015
- 2SA1115
- 2SC945
- 2SC1674
- 2SC1815
- 2SC2320
- 2SC2786
- 2SD438
- 2SD1111
- LC4066BH
- 1S1588
- 1S2473D
- 1S2473H
- 10E 2
- 10D 1
- HA12412
- TC4001BP
- 1SV100
- 1 Anode
- 2 Cathode
- μPA553AC
- NJM2043D
- NJM4558D
- 2SA1207
- 2SC2909
- SS 5
- 2SA939
- 2SC2071
- SS 5R
- 2SD1147
- LA1245
- 2SK192A
- LA3390
- 2SK163
- 2SB528
- 2SD358
- TA7317P
- TA7318P
- RD24E
- RD27E
- RD6.8E
- 2SA9688
- 2SC2238B
- TA7302P
- 9A6125
- μP80C
- μP81C
- HA12010
- M50601H
- TC5066BP
- SN74LS247
- 2SA1169LBR
- 2SA1170LBR
- 2SC2773LBR
- 2SC2774LBR
- μPD1704C 011
- M51133P
- NJM2058D
- 2SA937
- STK3106
- L78N06
- L78N15
- MB74LS247

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5-6. Z-7000X Power Amp. & Power Supply Section

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 \*Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

**SYMBOL**  
 A. Circuit  
 @. Wiper  
 (B/F). Bi-Factor  
 @. Polystyrene  
 □. Non-inductable  
 □. Low-leak Electrolytic  
 □. Fusing Resistor  
 □. Safety Part  
 □. Part not recommended  
 □. Part not available  
 □. Part not used  
 □. Part not tested  
 □. Part not specified  
 □. Part not shown

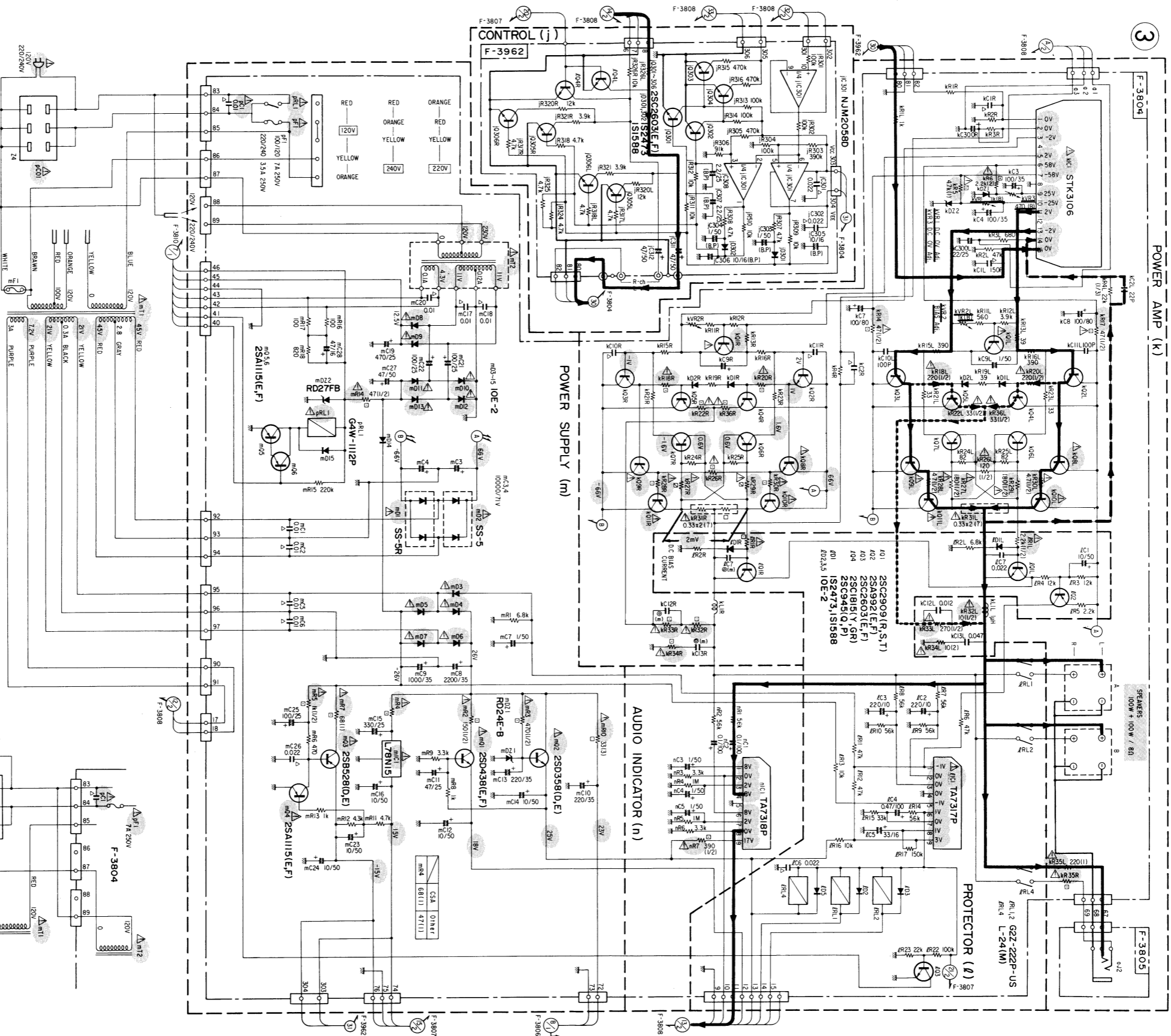
**RESISTORS**  
 All in ohms, 1/4 Watt, ±5% tolerance  
 Unless otherwise noted: K, M, W, Ω  
 TOLERANCE:  
 J, ±5%, G, ±2%, F, ±1%,  
 Each DC Voltage shows the nominal value  
 Electrolytic Capacitor: Capacitance (μF) / Volt (V)

**EXPORT**  
 SPEAKERS  
 100W + 100W / 8Ω

**SYMBOL OF FUNCTION**

(d)	FM
(e)	AM
(f)	OSC
(g)	MIC
(h)	EQ
(i)	CONTROL
(j)	POWER AMP
(k)	PROTECTOR
(l)	POWER SUPPLY
(m)	INDICATOR
(n)	SELECTOR
(o)	FIXED PARTS
(p)	RF INDICATOR

Signal Line  
 N.F.B. Line  
 F.F. Line

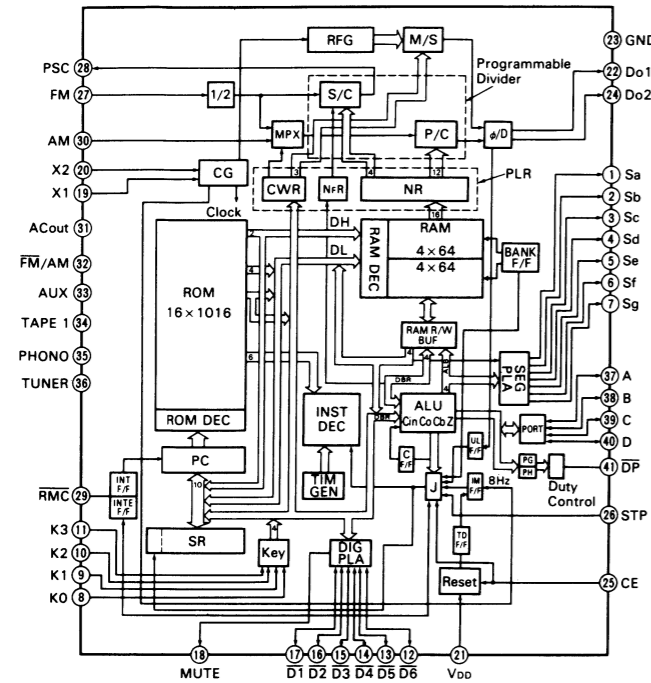


- |            |              |         |
|------------|--------------|---------|
| 25A733     | LC40668H     | 1S1588  |
| 25A992     |              | 1S2473D |
| 25A1015    |              | 1S2473H |
| 25A1115    |              | 10E-2   |
| 25C345     |              | 10D-1   |
| 25C1674    | HA12412      |         |
| 25C1815    | TC40018P     |         |
| 25C2320    |              | 15V100  |
| 25C2786    |              | Anode   |
| 25D438     |              | Cathode |
| 25D1111    |              |         |
|            | μPA553AC     |         |
|            | NJM2043D     |         |
|            | NJM4558D     |         |
| 25A1207    |              |         |
| 25C2909    |              |         |
|            | SS-5         |         |
| 25A939     |              |         |
| 25C2071    |              |         |
|            | SS-5R        |         |
| 25D1147    |              |         |
|            | LA1245       | 25K192A |
|            |              |         |
|            | LA3390       | 25K163  |
|            |              |         |
| 25B528     |              |         |
| 25D358     |              |         |
|            | TA7317P      |         |
|            | TA7318P      |         |
|            |              | RD24E   |
|            |              | RD27E   |
|            |              | RD8.5E  |
| 25A9688    |              |         |
| 25C2388    |              |         |
|            | TA7302P      | 8A6125  |
|            |              |         |
|            | μPA80C       | M5220L  |
|            | μPA81C       |         |
|            | HA12010      |         |
|            | M50601H      |         |
| 25C668     |              |         |
| 25C2603    |              |         |
|            | TC5066BP     |         |
|            | SN74LS247    |         |
| 25A1169LBR |              |         |
| 25A1170LBR |              |         |
| 25C2773LBR |              |         |
| 25C2774LBR |              |         |
|            | μPD1704C.011 |         |
|            |              |         |
|            | M51133P      |         |
|            | NJM2058D     |         |
| 25A937     |              |         |
|            | STK3106      |         |
| L78N06     |              |         |
| L78N15     |              |         |
|            | MB74LS247    |         |

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## 6. INTERIOR BLOCK DIAGRAM OF IC & TERMINAL FUNCTION OF $\mu$ PD1704C-011

### • $\mu$ PD1704C-011 (FM/AM PLL Synthesizer & Control IC)



\*The description of IC/ $\mu$ PD1704C-011 are omitted from this manual expect terminal function, therefore please refer to the service manual Z-9000/7000.

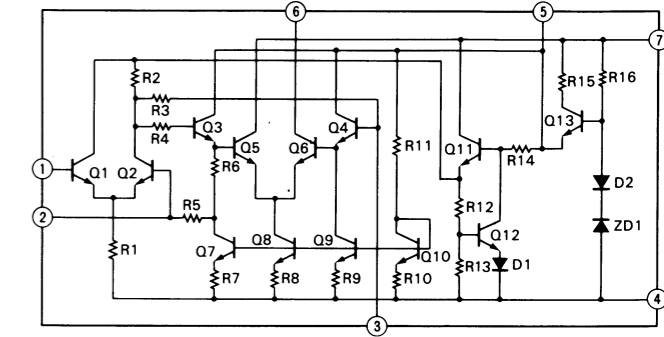
### • Terminal Function of $\mu$ PD1704C-011

Terminal Nos.	Terminal Symbols	Terminal Name	Description
1~7	Sa~Sg	Segment Output	Terminals for outputting indicator digit segment signals and a key return signal source. High level when active.
8~11	K <sub>0</sub> ~K <sub>3</sub>	Key Return Signal	Terminals for inputting a key return signal from externally connected key matrix. The key return signal source is an ANDed signal of segment terminals Sa to Sg and tuner and phono terminals.
12~17	D <sub>1</sub> ~D <sub>6</sub>	Digit Outputs	Terminals for outputting indicator digit signals. Low level when active.

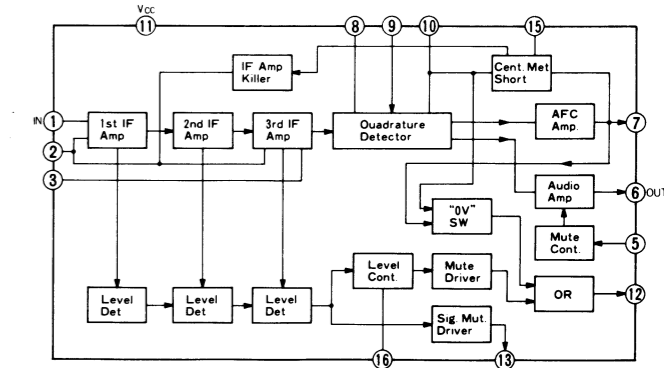
Terminal Nos.	Terminal Symbols	Terminal Name	Description
18	MUTE	Mute	Terminal for outputting a muting signal to eliminate shock noise generated when PLL is unlocked. High level when active. This muting signal is kept outputted for 55 ms before and after PLL data (contents in the programmable counter) change. The muting signal is outputted in the following modes: * In AM/FM and selector switching * In MANUAL UP/DOWN * In AUTO UP/DOWN * In preset memory access (including preset scanning) * In switching from CLOCK set to OFF mode
19, 20	X <sub>1</sub> , X <sub>2</sub>	X'tal	Terminals for connecting a 4.5 MHz quartz oscillator.
21	VDD	VDD	Terminal for a power supply for a device.
22, 24	DO <sub>1</sub> , DO <sub>2</sub>	Error Out	Terminals for outputting signals from a phase detector which configures PLL. High level when the divided oscillator frequency is higher than the reference frequency. Low level when the divided one is lower than the reference one.
23	GND	Ground	Terminal connected to ground.
25	CE	Chip Enable	Terminal for inputting a device is used for the ordinary operations. Low level when no device is used. (1) When NONCLOCK is preset by an initializing diode matrix: CE = High . Ordinary operations Indicator is off. PLL is inoperative. Internal clock generator is inoperative. (2) When NONCLOCK is not preset by an initializing diode matrix: CE = High . Ordinary operations CE = Low . Indicator is off. PLL is inoperative.
26	SD	Station Detector	Terminal for inputting a signal to detect whether or not a station is received in automatic tuning (AUTO UP/DOWN). Automatic tuning stops when at high-level. However, it is necessary to input a High level signal within 50 ms after PLL has been locked.

Terminal Nos.	Terminal Symbols	Terminal Name	Description																																																		
27	FM	FM Local Oscillator Signal Inputs	Terminal for input a signal from FM programmable counter. The inputted signal is obtained by dividing an output signal from FM local oscillator (VCO) into 1/16 or 1/17 through prescaler $\mu$ PB553AC.																																																		
28	PSC	Prescaler Control	Terminal for outputting a signal to change the division ratio of prescaler in FM. This terminal is connected to PSC terminal of prescaler $\mu$ PB553AC. Selectable division ratios are 1/16 and 1/17 in $\mu$ PB553AC.																																																		
29	RMC	Remote Control Inputs	Terminal for inputting a remote control signal. Not now in use.																																																		
30	AM	AM Local Oscillator Signal Inputs	Terminal for inputting a signal from AM programmable counter. The inputted signal is one outputted from AM local oscillator (VCO).																																																		
31	AC OUT	AC Outlet Control	Terminal for AC outlet. The AC outlet is used for energizing a relay to break the main power supply for the set. High level when any of selection terminals (TUNER, PHONO, TAPE-1, and AUX) is on. Low level when STD-BY key is depressed.																																																		
32	FM/AM	FM/AM Power Supply Control	Terminal for switching the power supply for FM section to that for AM section or vice versa in tuner. Low level in FM. High level in AM.																																																		
33, 34, 35, 36	AUX TAPE-1 PHONO TUNER	AUX TAPE-1 PHONO TUNER	Terminals for selecting TUNER, PHONO, TAPE-1 and AUX. TUNER terminal is at a High level when FM/AM key or preset key is depressed; PHONO, TAPE-1, AUX terminals are at a High level when PHONO key, TAPE-1 key or AUX key is depressed respectively. Further, all terminals change to a Low level when STD-BY key is depressed.																																																		
37~40	A~D	Preset Station Indicator Outputs	Terminals for outputting preset station indicator BCD signals. The output BCD signals corresponding to the preset stations are listed below: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>PRESET STATION</th> <th>D</th> <th>C</th> <th>B</th> <th>A</th> </tr> </thead> <tbody> <tr> <td>No channel designation</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>P1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>P2</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>P3</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>P4</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>P5</td> <td>0</td> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>P6</td> <td>0</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>P7</td> <td>0</td> <td>1</td> <td>1</td> <td>1</td> </tr> <tr> <td>P8</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	PRESET STATION	D	C	B	A	No channel designation	0	0	0	0	P1	0	0	0	1	P2	0	0	1	0	P3	0	0	1	1	P4	0	1	0	0	P5	0	1	0	1	P6	0	1	1	0	P7	0	1	1	1	P8	1	0	0	0
PRESET STATION	D	C	B	A																																																	
No channel designation	0	0	0	0																																																	
P1	0	0	0	1																																																	
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P4	0	1	0	0																																																	
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P6	0	1	1	0																																																	
P7	0	1	1	1																																																	
P8	1	0	0	0																																																	
41	DP	DECIMAL POINT	Terminal for outputting a decimal point indication signal in FM frequency indication. Low level when active.																																																		
42	COLON	COLON	Terminal for outputting a COLON indication signal in CLOCK indication. Low level when active.																																																		

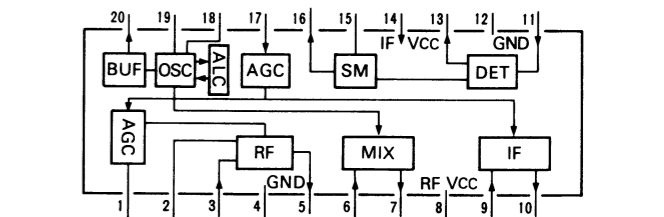
### •TA7302P (FM IF Amp. IC)



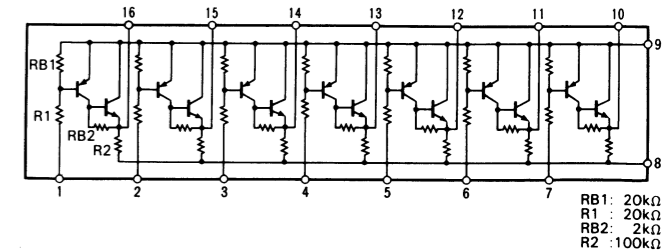
### •HA12412 (FM Detector IC)



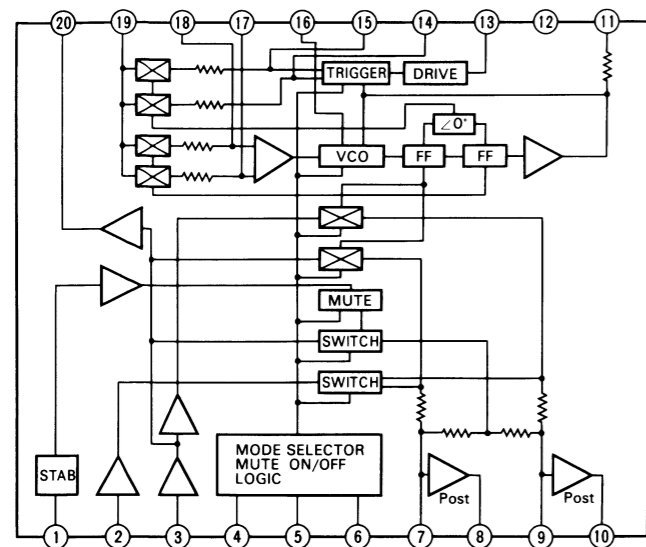
### •LA1245 (AM Tuner IC)



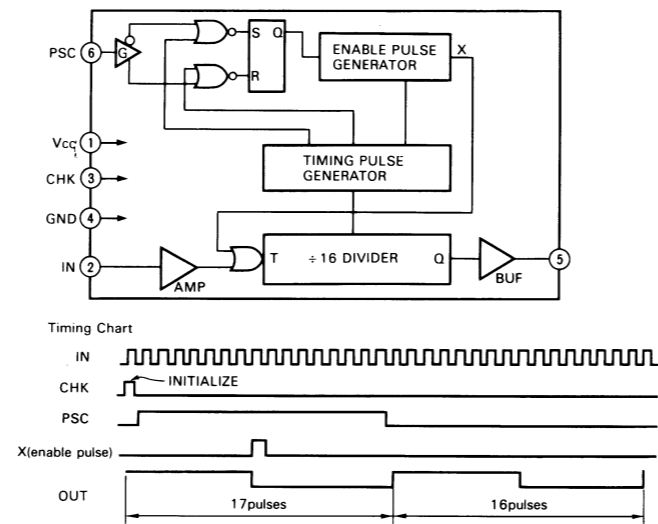
### • $\mu$ PA80C (FL Display Drive IC)



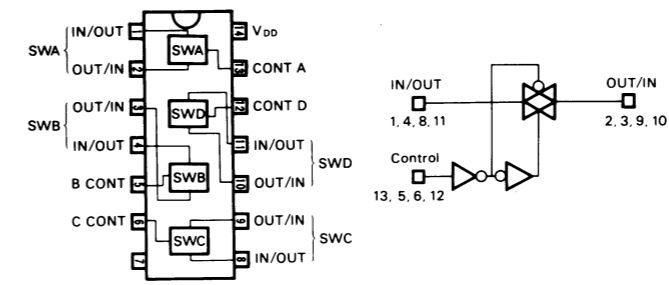
●LA3390 (MPX Decoder IC)



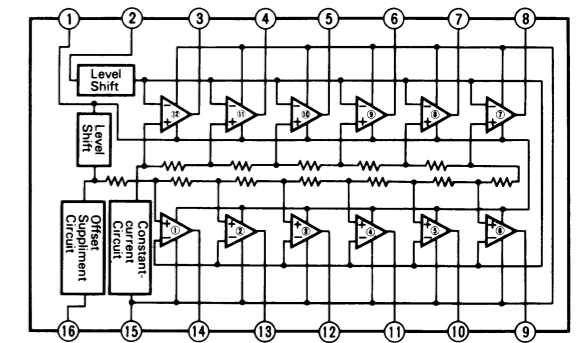
●μPB553AC (Prescaler IC)



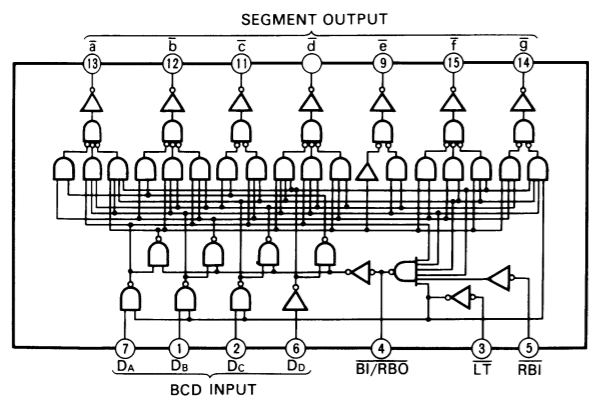
●LC4066BH (Quad Bi-lateral Switch IC)



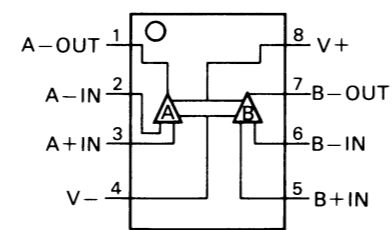
●HA12010 (FL Display Tube Drive IC)



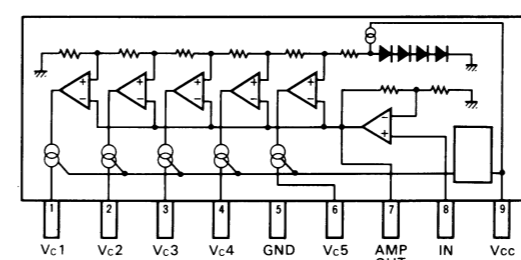
●M74LS247/MB74LS247 (BCD-TO-SEVEN SEGMENT DECODER/DRIVER IC)



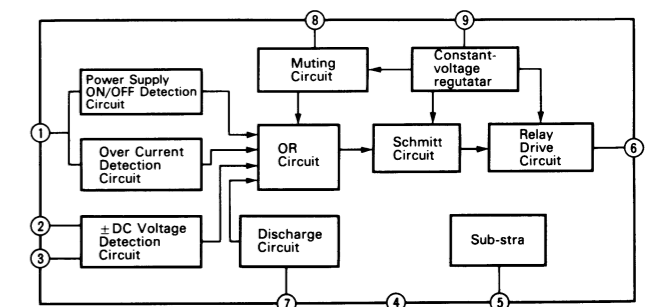
●NJM4558D-X/NJM2043D (Operational Amp. IC)



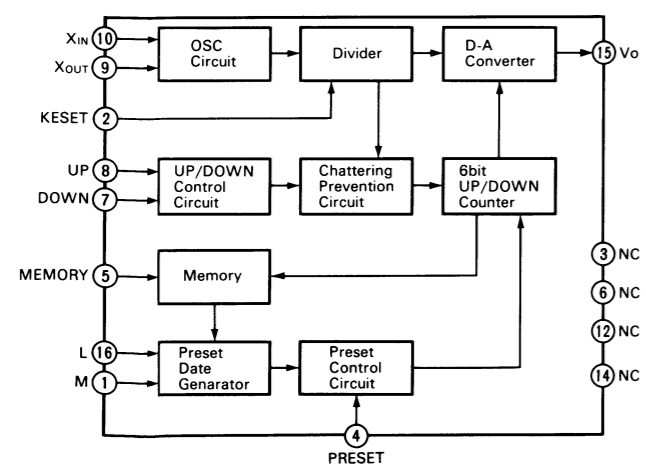
●BA6125 (L.E.D. Drive IC)



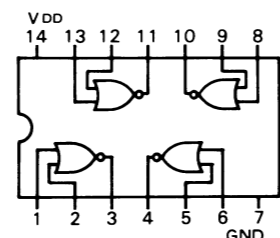
●TA7317P (Speaker Protector IC)



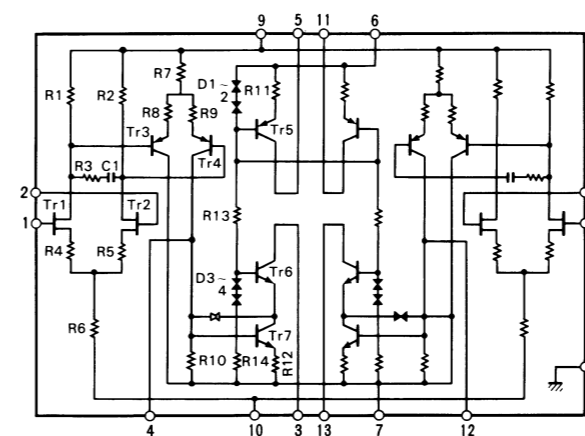
●M50601P (D-A Converter IC)



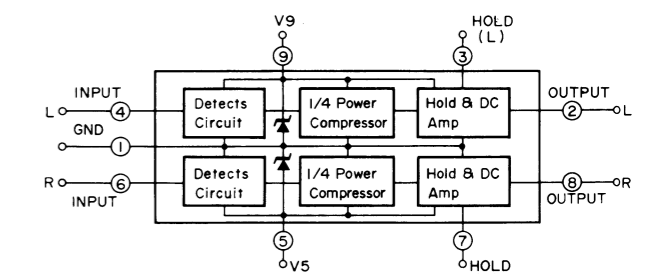
●TC4001BP (Quad NOR1~4IC)



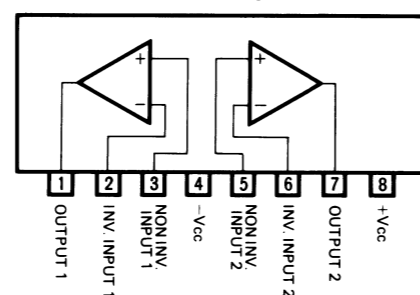
●STK3106 (Pre Drive IC)



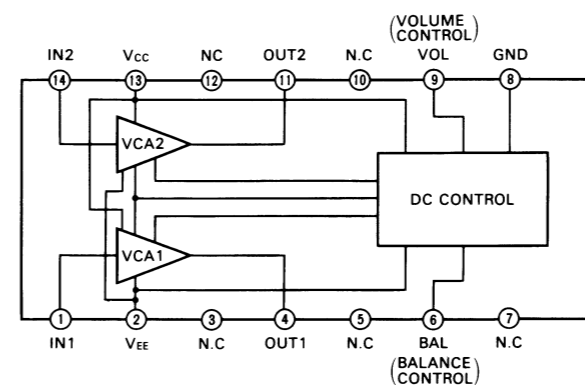
●TA7318P (Meter Drive IC)



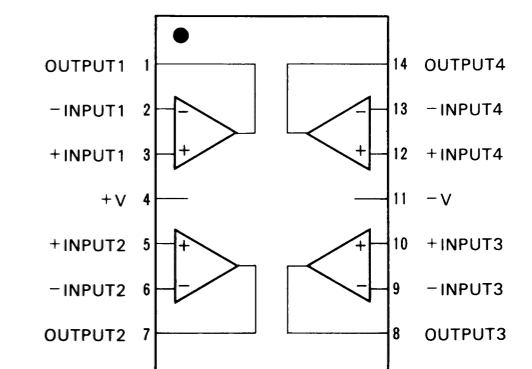
●M5220L (Audio Pre Amp. IC)



●M51133P (Electronic Volume IC)



●NJM2058D (Operational Amp. IC)



## 7. NOTES

### 7-1. Notice when the user moves from 9 kHz to 10 kHz step area, or vice versa, in AM broadcasting frequency

- AM programs are being broadcast under channel plans which, depending on the broadcasting area in the world, are characterized by different channels (frequency intervals) between broadcasting stations. In North, South, and Central America, this channel is 10 kHz whereas in the rest of these areas, it is 9 kHz. This unit is synthesizer tuner which varies the reception frequency at each 9 kHz or 10 kHz channel (frequency interval) during auto search reception. If the client uses the unit in an area with a different channel plan, he may not be able to receive AM stations. The unit he has purchased has been originally adjusted to the channel in his area. It is therefore necessary to change over the channel setting if he moves to an area with a different channel plan. It is impossible to receive AM broadcasting in Automatic Tuning operation. In this case, use the AM 9/10 kHz channel step switch (oS26, see Fig. 2-1 on page 3) installed on the circuit board F-3810.

### 7-2 Notice when the user moves from 200 kHz to 50 kHz step area, or vice versa, in FM broadcasting frequency.

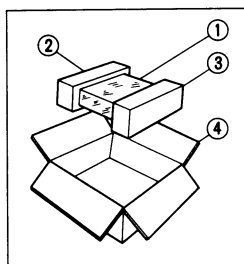
- When the frequency-step of AM broadcasting is set to 10 kHz or 9 kHz (in EUROPE) by sliding the AM 9/10 kHz channel step switch (oS26) installed on the circuit board F-3810, the frequency-step of FM broadcasting is also switched automatically to 200 kHz or 50 kHz (in EUROPE).

Switch (oS26)	AM	FM
Set 10 kHz	10 kHz Frequency Step	200 kHz Frequency Step
Set 9 kHz	9 kHz Frequency Step	50 kHz Frequency Step

- Disconnect the AC power plug from the AC outlet, when AM 9/10 kHz channel step switch (oS26) is set 9 kHz or 10 kHz.

## 8. PACKING LIST

Parts No.	Stock No.	Description
1	91167430	Vinyl Cover
2	07973800	Styrofoam Packing (L)
3	07973900	Styrofoam Packing (R)
4	47247400	Carton Case <Z-9000X>
	47247500	Carton Case <Z-7000X>



## 9. ACCESSORY LIST

Stock No.	Description
46051700	FM Antenna
07272400	AM Loop Antenna
07563000	AM Antenna Holder
46686800	Operating Sheet
46607000	Operating Instruction <Z-9000X>
46607100	Operating Instruction <Z-7000X>