

# SERVICE MANUAL

AM/FM STEREO RECEIVER  
**SANSUI 221/331/331L/331SS**



*Sansui*

SANSUI ELECTRIC CO., LTD.

This service manual is designed for service engineers to repair, adjust, maintain and order the replacement parts of the 331, 331L, 331SS, 221 correctly.

When ordering the parts, use the stock number and parts name specifically referring to the Parts Locations & Parts Lists.

For general usage and maintenance of the unit, please refer to the Operating Instructions attached with the unit.

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# 1. SPECIFICATIONS

## POWER OUTPUT

Min. RMS, both channels driven, from 40 to 20,000Hz, with no more than 1.0% total harmonic distortion.

12 watts per channel into 4 ohms \*8 watts (221 only)

12 watts per channel into 8 ohms \*8 watts (221 only)

Min. RMS, both channels driven, at 1kHz, with no more than 1.0% total harmonic distortion.

14 watts per channel into 4 ohms \*10 watts (221 only)

13 watts per channel into 8 ohms \*9 watts (221 only)

LOAD IMPEDANCE..... 4 ohms and 8 ohms

POWER BANDWIDTH ..... 40 to 20,000Hz  
at or below rated min. RMS power output and total harmonic distortion

## TOTAL HARMONIC DISTORTION

OVERALL (from AUX)..... less than 1.0%  
at or below rated min. RMS power output

INTERMODULATION DISTORTION (70Hz: 7,000Hz=4: 1 SMPTE method)

OVERALL (from AUX)..... less than 1.0%  
at rated min. RMS power output

FREQUENCY RESPONSE (at 1 Watt power output)

OVERALL (from AUX)..... 25 to 30,000Hz  $\pm 2.0$ dB /  $-3.0$ dB

EQUALIZATION (at TAPE REC output)

..... RIAA Curve  
(30 to 15,000Hz  $\pm 1.5$ dB)

DAMPING FACTOR ..... 30 (8 $\Omega$ )

CHANNEL SEPARATION (1,000Hz, at rated power output)

PHONO ..... better than 45dB

AUX..... better than 45dB

HUM AND NOISE (IHF)

PHONO ..... better than 70dB

AUX..... better than 80dB

INPUT SENSITIVITY AND IMPEDANCE (1,000Hz, for rated power output)

PHONO ..... 2.5mV 50k $\Omega$   
(Max. input capability: 120mV at 0.5% distortion)

AUX..... 150mV 50k $\Omega$

TAPE

PLAY Pin Jacks ..... 150mV 50k $\Omega$

REC/PLAY DIN Socket..... 150mV 50k $\Omega$

RECORDING OUTPUT

TAPE

REC Pin jacks..... 150mV

REC/PLAY DIN Socket..... 30mV

SWITCHES AND CONTROLS

BASS ..... +12dB, -12dB at 50Hz

TREBLE..... +10dB, -10dB at 10,000Hz

LOUDNESS ..... +10dB at 50Hz  
+8dB at 10,000Hz

## TUNER SECTION

[FM]

TUNING RANGE ..... 88 to 108MHz

SENSITIVITY ..... 2.5 $\mu$ V (IHF)

1.3 $\mu$ V (DIN)

TOTAL HARMONIC DISTORTION

MONO ..... 0.8%

STEREO ..... 1.0%

SIGNAL TO NOISE RATIO..... better than 65dB

SELECTIVITY ..... better than 60dB

CAPTURE RATIO ..... 1.5dB

IMAGE REJECTION ..... better than 50dB at 98MHz

IF REJECTION ..... better than 70dB at 98MHz

SPURIOUS RESPONSE REJECTION better than 70dB at 98MHz

SPURIOUS RADIATION..... less than 34dB

STEREO SEPARATION..... better than 35dB at 1kHz

FREQUENCY RESPONSE..... 30 to 12,000Hz

ANTENNA INPUT IMPEDANCE .. 300 $\Omega$  balanced  
75 $\Omega$  unbalanced

[AM]

<MW> \* Not Included in 331SS

TUNING RANGE ..... 535 to 1,605kHz

SENSITIVITY (bar antenna) ..... 50dB/m at 1MHz 54dB (331L)

SELECTIVITY ..... better than 40dB at 1MHz

IMAGE FREQUENCY REJECTION.. better than 80dB/m at 1MHz

IF REJECTION ..... better than 80dB/m at 1MHz

<SW1> \* 331SS ONLY

TUNING RANGE ..... 2.3 to 6.5MHz

SENSITIVITY ..... 20 $\mu$ V at 4MHz

SELECTIVITY ..... better than 40dB at 4MHz

IMAGE FREQUENCY REJECTION.. better than 40dB at 12MHz

IF REJECTION ..... better than 80dB at 12MHz

<SW2> \* 331SS ONLY

TUNING RANGE ..... 6.5 to 18MHz

SENSITIVITY ..... 30 $\mu$ V at 12MHz

SELECTIVITY ..... better than 40dB at 4MHz

IMAGE FREQUENCY REJECTION.. better than 40dB at 12MHz

IF REJECTION ..... better than 80dB at 12MHz

<LW> \* 331L ONLY

TUNING RANGE ..... 150 to 350kHz

SENSITIVITY ..... {60dB/m at 250kHz(Bar Antenna)  
300 $\mu$ V at 250kHz (EXT)

SELECTIVITY ( $\pm 10$ kHz) ..... better than 40dB at 1,000kHz

IMAGE REJECTION ..... better than 90dB/m

at 250kHz

IF REJECTION ..... better than 90dB at 250kHz

## OTHERS

POWER REQUIREMENTS

VOLTAGE ..... 120, 220, 240V, 50/60Hz

CONSUMPTION (331, SS, L) .. 50W (rated), 90W (max.)

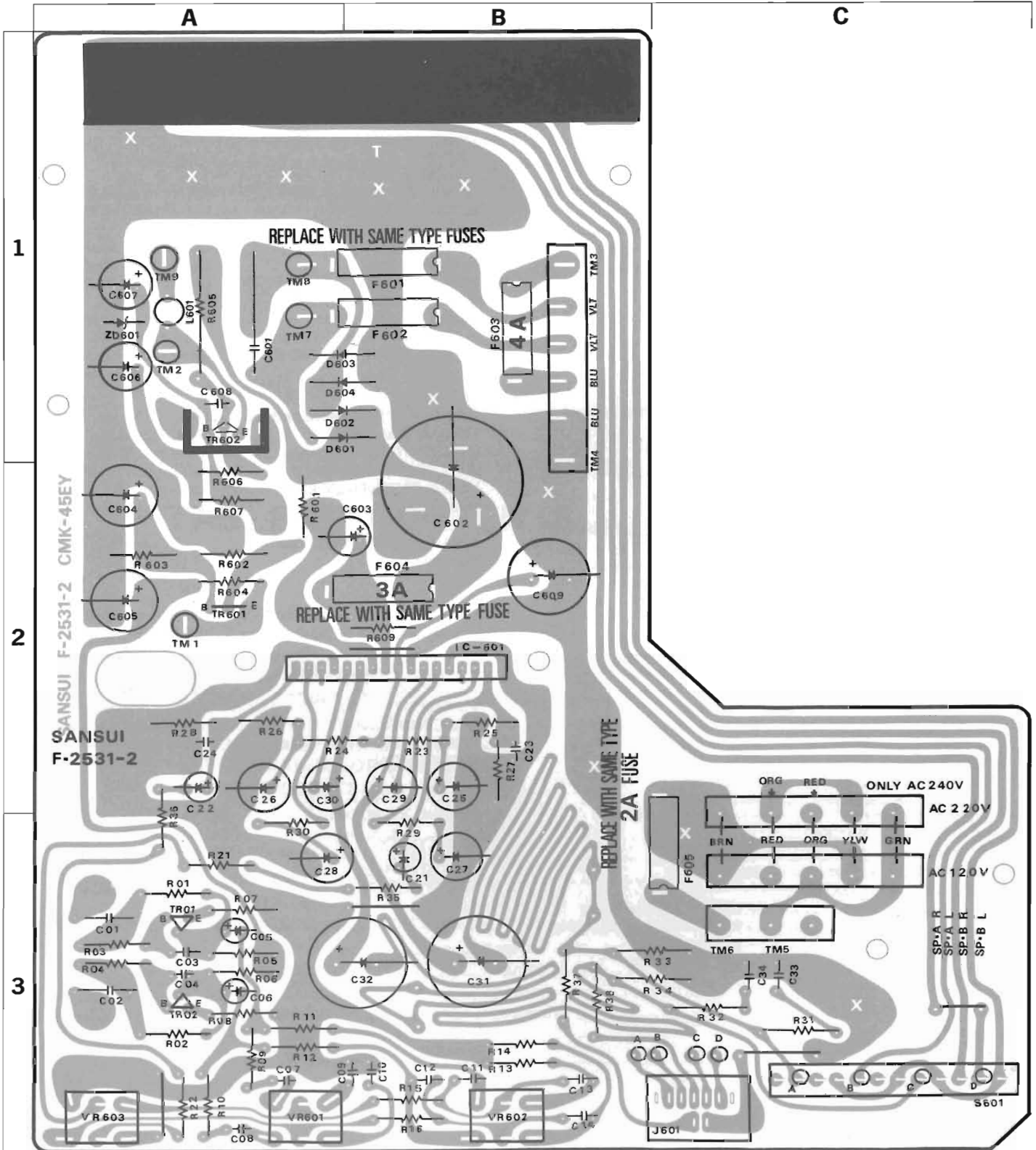
CONSUMPTION (221)..... 45W (rated), 75W (max.)

\* Design and specifications subject to change without notice for improvement.

## 2. PARTS LOCATION AND PARTS LIST

**2-1. F-2531 Main Circuit Board (Complete Circuit Board) MODEL:** 331 (Stock No. 7592391)  
 331L (Stock No. 7592693)  
 331SS (Stock No. 7592686)  
 221 (Stock No. 7592481)

Conductor Side



# Parts List

Parts No.	Stock No.	Description	Position	Parts No.	Stock No.	Description	Position	Parts No.	Stock No.	Description	Position	
TR01, 02	{ 0306011, 2 0306070, 1	25C1222 (E, F) 25C1313 (F, G)	Transistor	R27, 28	0107224	220kΩ 1/4W C.R.	2 B . 2 A	R602	0210153	15kΩ	2 A	
TR601	0306131, 2	25C1364 (6, 7)		2 A	R31, 32	0111689	6.8Ω 1 1/2W S.R.	3 C	R603	0210104	100kΩ 1/2W Ce.R.	2 A
TR602	0308361, 2	25D330 (D, E)		1 A	R33, 34	0111471	470Ω 1 1/2W S.R.	3 B C	R604	0210121	120Ω	2 A
D601	0310340	10D1	1 A, B	R35, 36	0107102	1kΩ 1/4W C.R.	3 B . 2,3A	R605	0133181	180Ω 3W Ce.R.	1 A	
D602	0310340	10D1	1 A, B	R37, 38	0111331	330Ω 1 1/2W S.R.	3 B	R606	0210332	3.3kΩ	2 A	
D603	0310340	10D1	1 A, B	R601	0111471	470Ω	2 A	R607	0210332	3.3kΩ 1/2W Ce.R.	2 A	
D604	0310340	10D1	1 A, B	R604	0107121	120Ω	2 A	R609	0210101	100Ω	2 A, B	
ZD601	{ 0315980 0316320	EQA01-14R RD-13E C	Zener Diode	R606	0107332	3.3kΩ 1/4W C.R.	2 A	S601	1101660	N-1-2-5 Rotary Switch	3 C	
C01, 02	0601228	0.22μF 50V M.C.	3 A	R607	0107332	3.3kΩ 1/4W C.R.	2 A	F601	0435160	4A 250V	1 B	
C03, 04	0660100	10pF 50V C.C.	3 A	R609	0107101	100Ω	2 B	F602	0435160	4A 250V	Time Lag Fuse	1 B
C05, 06	0519101	1μF 50V E.C.	3 A	L601	4900110	100μH Inductor	1 A	F603	0435160	4A 250V	1 B	
C07, 08	0601276	0.0027μF	3 A	VR601	1015140, 1	100kΩ A × 2	3 A	F604	0433630	4A 250V	Q.A. Fuse	2 A, B
C09, 10	0601187	0.018μF	3 B	VR602	1015140, 1	100kΩ A × 2	3 B	F605	0435120	1.6A 250V	Time Lag Fuse	2, 3 C
C11, 12	0601227	0.022μF	3 B	VR603	1015130, 1	100kΩ MN	3 A	<b>331SS ONLY</b>				
C13, 14	0601188	0.18μF	3 B	J601	2430240	JACK	3 C	IC601	0360240	STK-014C IC		
C21, 22	0519103	0.47μF	3 B . 2 A	2230110	Push Terminal (Red)			C23, 24	0660101	100pF 50V C.C.	2 B . 2 A	
C25, 26	0515100	10μF	2 B . 2 A	2230120	Push Terminal (Black)			C601	0659012	22000pF 500V C.C.	1 A	
C27, 28	0512221	220μF 16V E.C.	3 B . 3A, B	2310051	F Type Fuse Holder			R29, 30	0107151	150Ω 1/4W C.R.	3 B . 3 A	
C29, 30	0513101	100μF 25V E.C.	2 B . 2A, B	2410610	3P Connector			R602	0107153	15kΩ 1/4W C.R.	2 A	
C31, 32	0514222	2200μF 35V E.C.	3 B . 3A, B	2410630	5P Connector			R603	0107104	100kΩ	2 A	
C33, 34	0601108	0.1μF 50V M.C.	3 C	<b>331 ONLY</b>				R605	0133181	180Ω 3W Ce.R.	1 A	
C602	0549109	2200μF	1, 2 B	IC601	0360240	STK-014 IC	2 A, B	S601	1101660	N-1-2-5 Rotary Switch	3 C	
C603	0515100	10μF	2 A, B	C23, 24	0660101	100pF 50V C.C.	2 B . 2 A	F603	0431270	4A 250V AC Fuse	2 A	
C604	0515221	220μF	2 A	C601	0659012	22000pF 500V C.C.	1 A	F604	0431270	4A 250V Q.A. Fuse	2 A	
C605	0515101	100μF	2 A	R29, 30	0107151	150Ω	3 B . 3 A	F604	0433270	4A 250V Q.A. Fuse	2 A, B	
C606	0514101	100μF 35V E.C.	1 A	R602	0107153	15kΩ 1/4W C.R.	2 A	F605	{ 0431220 0431230	1.5A 250V 2A 250V	AC Fuse	3 C
C607	0512221	220μF 16V E.C.	1 A	R603	0107104	100kΩ	2 A	<b>221 ONLY</b>				
C608	0657222	2200pF 50V C.C.	1 A	R605	0133181	180Ω 3W Ce.R.	1 A	IC601	0360230	STK-013 IC		
C609	0515221	220μF 50V E.C.	2 B	S601	1101660	N-1-2-5 Rotary Switch	3 C	C23, 24	0660101	100pF 50V C.C.	2 B . 2 A	
R01, 02	0107105	1MΩ	3 A	F603	0431270	4A 250V AC Fuse	2 A	C601	0659012	22000pF 500V C.C.	1 A	
R03, 04	0107561	560Ω	3 A	F604	0431270	4A 250V Q.A. Fuse	2 A	R29, 30	0107271	270Ω 1/4W C.R.	3 B . 3 A	
R05, 06	0107562	5.6kΩ	3 A	F605	{ 0431220 0432230	1A 250V 1.5A 250V	AC Fuse	1 A	R605	0163221	220Ω 3W Ce.R.	1 A
R07, 08	0107271	270Ω	3 A	<b>331 ONLY</b>				F603	0431270	4A 250V AC Fuse	1 B	
R09, 10	0107561	560Ω	3 A	IC601	0360240	STK-014 IC	2 A B	F604	0433270	4A 250V Q.A. Fuse	2 A, B	
R11, 12	0107123	12kΩ 1/4W C.R.	3 A	C23, 24	0660331	330pF 50V C.C.	2 A	F605	{ 0431210 0431220	0.5A 250V 1A 250V	AC Fuse	2, 3 C
R13, 14	0107182	1.8kΩ	3 B	C601	0606109	1μF 250V M.C.	1 A	<b>Abbreviations</b>				
R15, 16	0107272	2.7kΩ	3 B	R29, 30	0107151	150Ω 1/4W C.R.	3 B . 3 A	C.R.	: Carbon Resistor	BP.E.C.:	Bi-Polar Electrolytic Capacitor	
R21, 22	0107122	1.2kΩ	3 A	R601	0210471	470Ω 1/2W Ce.R.	2 A	S.R.	: Solid Resistor	C.C.:	Ceramic capacitor	
R23, 24	0107224	220kΩ	2 B . 2A, B									
R25, 26	0107394	390kΩ	2 B . 2 A									

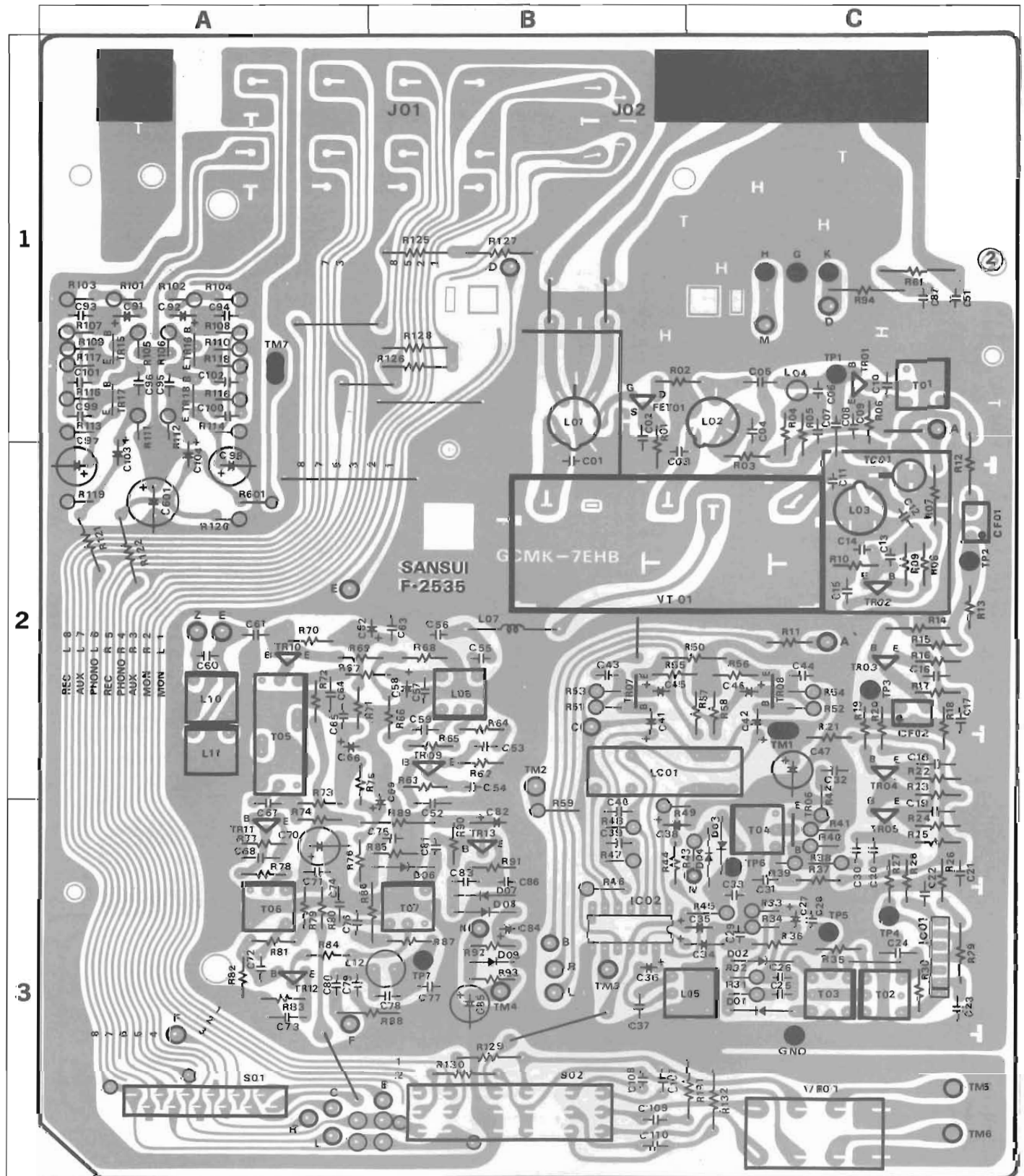
## Figures

SEMICONDUCTORS	COMPLETE CIRCUIT BOARD	SEMICONDUCTORS	COMPLETE CIRCUIT BOARD	SEMICONDUCTORS	COMPLETE CIRCUIT BOARD	SEMICONDUCTORS	COMPLETE CIRCUIT BOARD
2SC1047 2SC1222 2SC1675 2SC1364	 F-2540 F-2535 F-2531	μpc555H	 F-2540 F-2535		F-2540 F-2535	1S2473D	 F-2540 F-2535
2SC738 2SC1313	 F-2540 F-2535	μpc554C	 F-2540 F-2535	10D-1	F-2531	RD-13EC	 F-2531
2SC930	 F-2540 F-2535	2SK49 2SK83	 F-2540 F-2535	<b>Abbreviations</b> C.R. : Carbon Resistor      BP.E.C.: Bi-Polar Electrolytic Capacitor S.R. : Solid Resistor      C.C. : Ceramic capacitor Ce.R. : Cement Resistor      Mi.C. : Mica Capacitor M.R. : Metallized Film Resistor      O.C. : Oil Capacitor M.C. : Mylar Capacitor      P.C. : Polystyrene Capacitor E.C. : Electrolytic Capacitor      T.C. : Tantalum Capacitor			
2SB330	 F-2531	STK014 STK013	 F-2531				

## 2-2. F-2535 Tuner & Equalizer Circuit Board (Complete Circuit Board)

MODEL: 331 (Stock No. 7521071)  
 221 (Stock No. 7521081)

Conductor Side

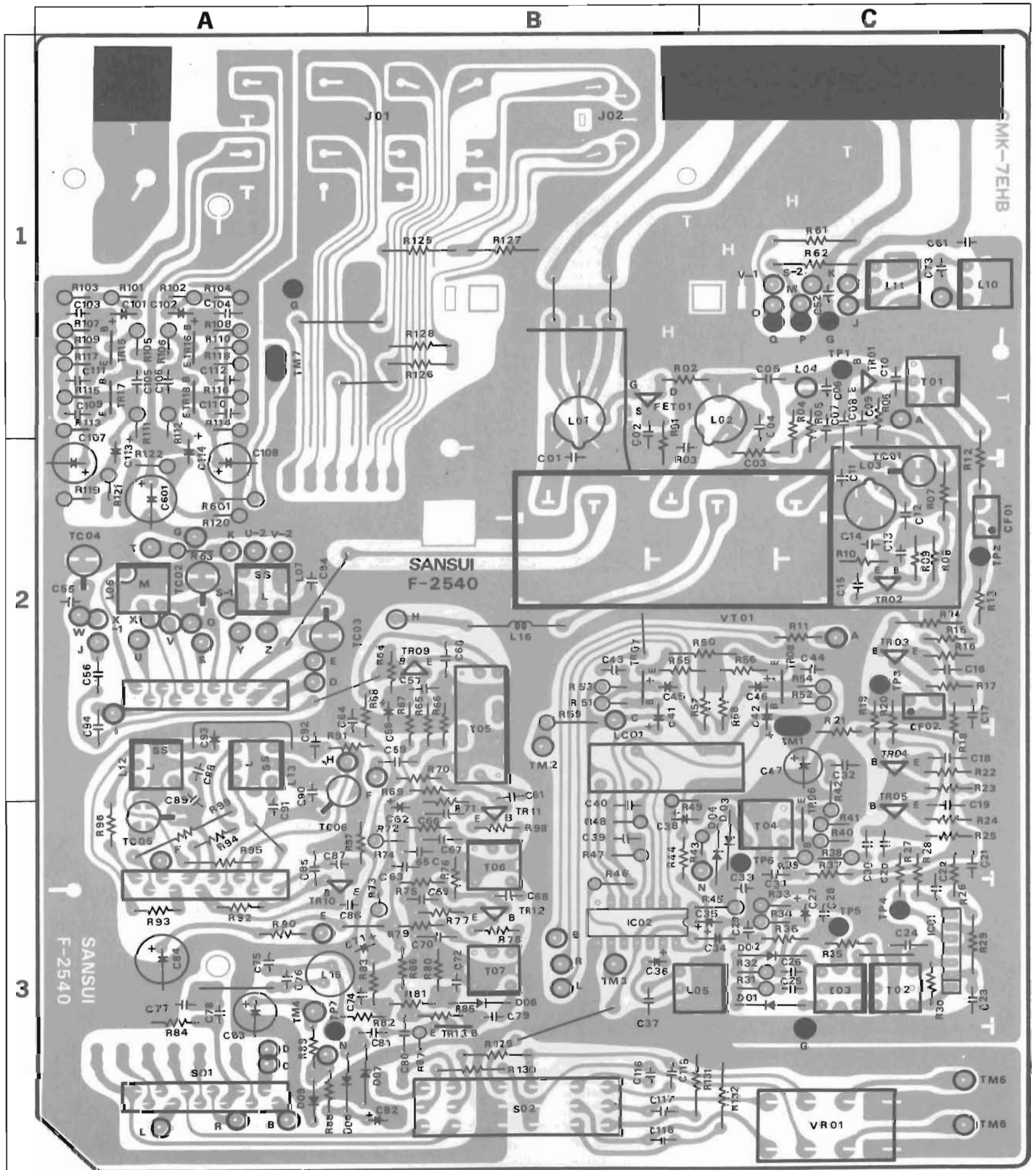




### 2-3. F-2540 Tuner & Equalizer Circuit Board (Complete Circuit Board)

MODEL: 331L (Stock No. 7521103)  
331SS (Stock No. 7521096)

Conductor Side

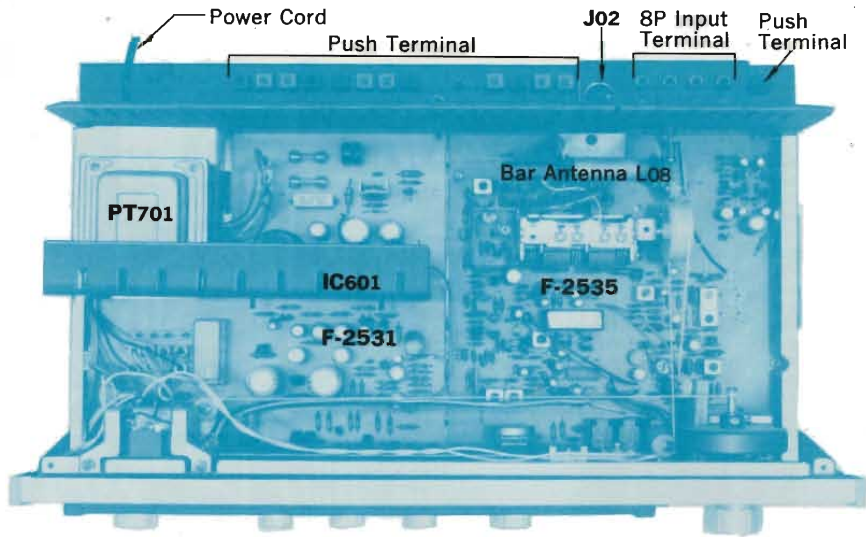






## 2-4. Other Parts (Top Side)

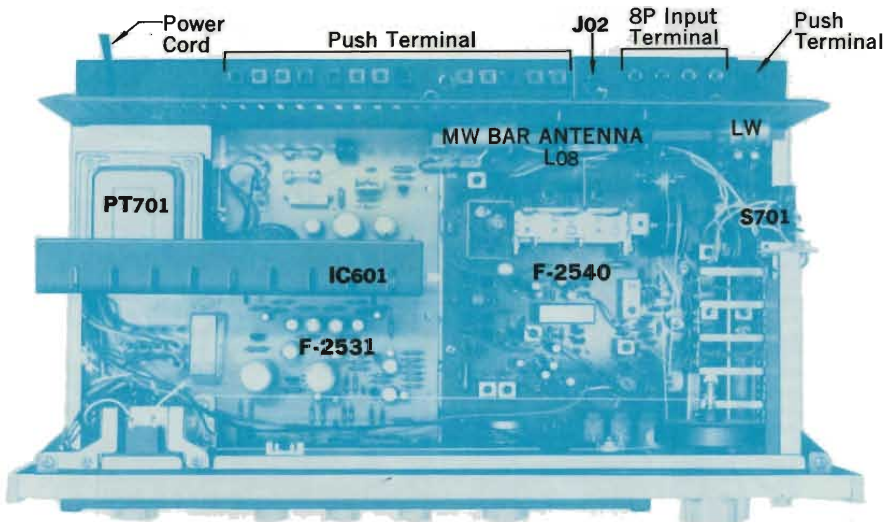
331  
221



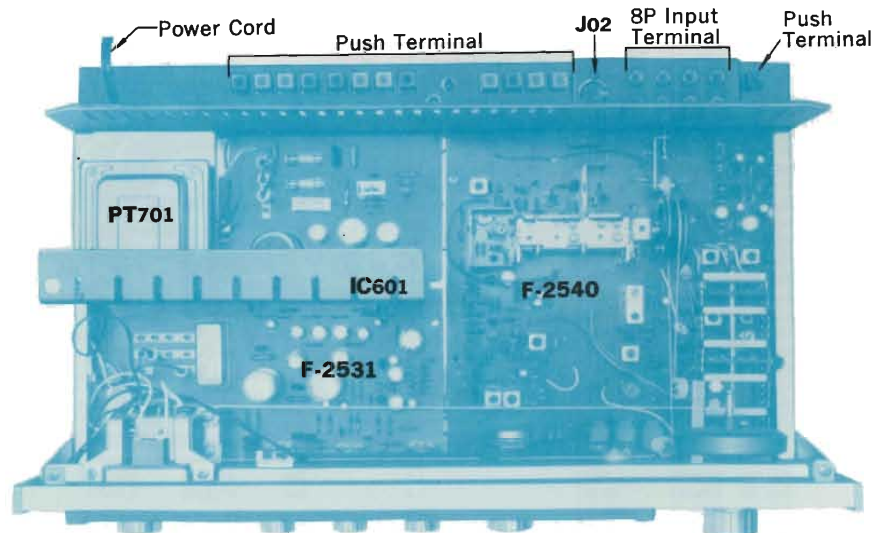
### Parts List

Parts No.	Stock No.	Description
PT701	4002230	Power Transformer (331, 331SS)
	4002234	Power Transformer (331L)
	4002220	Power Transformer (221)
CO701	2450060	AC Outlet (331, 331SS, 221)
	3800190	Power Cord (331L)
	3800010	Power Cord (331SS)
	3800261	Power Cord (221, 331)
IC601	0360240	Power IC STK014 (331, 331L, 331SS)
	0360230	Power IC STK013 (221)
L08	4200750	Bar Antenna (331, 221)
	4200740	Bar Antenna (331L)
S701	1131050	LW Antenna Switch (331L)
J01	2200410	8P Input Terminal
J02	2090030	5P Connector Socket
	2230110	Push Terminal (Red)
	2230120	Push Terminal (Black)

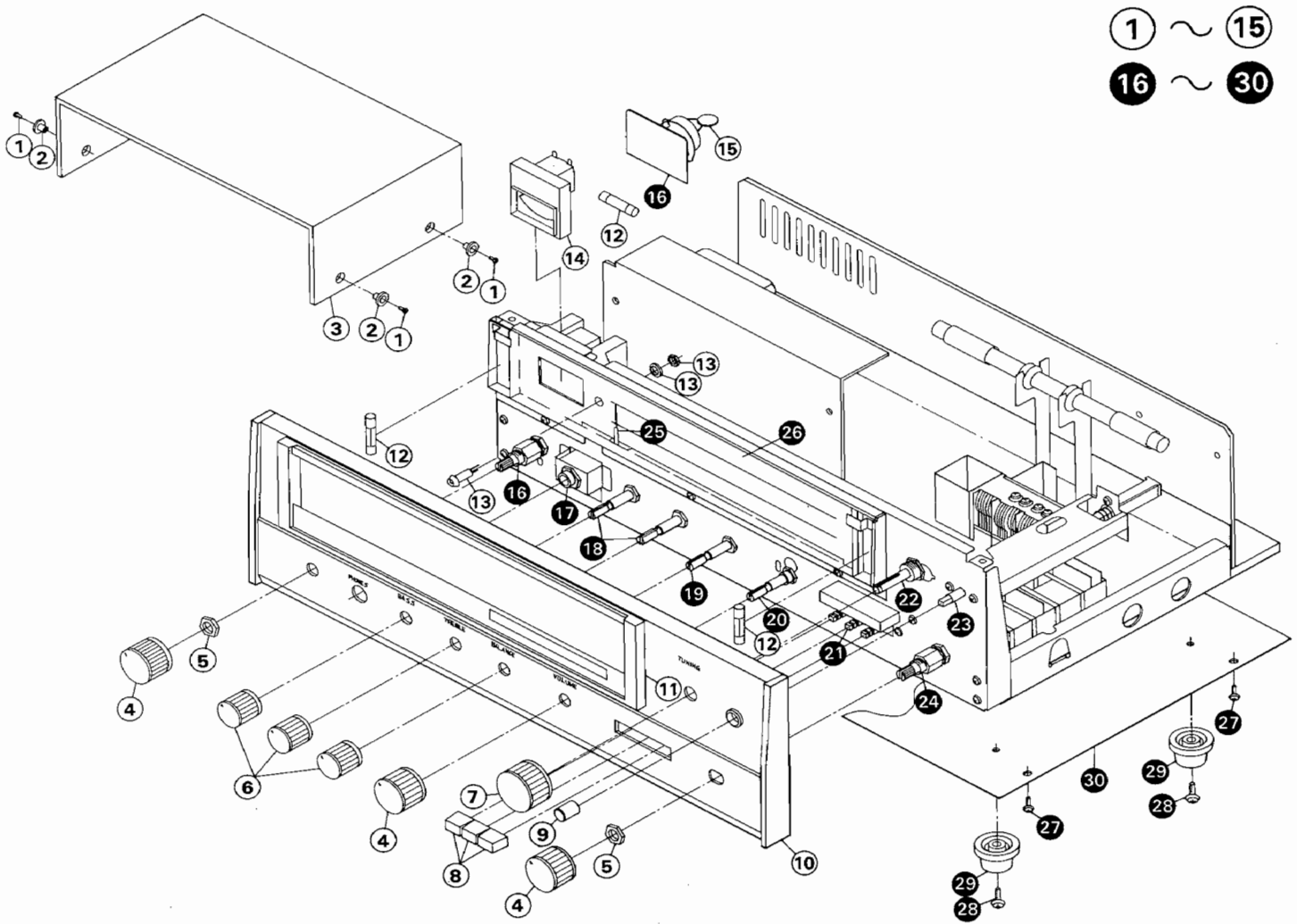
331L



331SS



## 2-5. Other Parts (Front Side)



1 ~ 15  
16 ~ 30

### Parts List

Parts No.	Stock No.	Description
1	5166470	Washer Head Tapping Screw, M3×8
2	5236560	Bushing
3	5726912	Wood Bonnet
4	5318220	M-6 Type Knob
5	5110781	Hex. Nut, M9
6	5318210	S-9 Type Knob
7	5318200	T-11 Type Knob
8	5326420	Push Button
9	5326430	Push Button, LM ANT switch (331L only)
10	7007060	Front Panel Ass'y (331)
	7007100	Front Panel Ass'y (221)
	7007111	Front Panel Ass'y (331SS)
	7007120	Front Panel Ass'y (331L)
	5336540	Name Plate (331)
	5336550	Name Plate (331L)
	5336560	Name Plate (331SS)
	5336570	Name Plate (221)
11	5309600	Frame, dial scale
12	0420040	7V, 320mA Fuse Type Lamp
13	7726080	Light Emitted Diode Ass'y (A)
14	4300820	Signal Meter
15	0659802	Ceramic Capacitor 0.0047μF (Not Included in 331L)

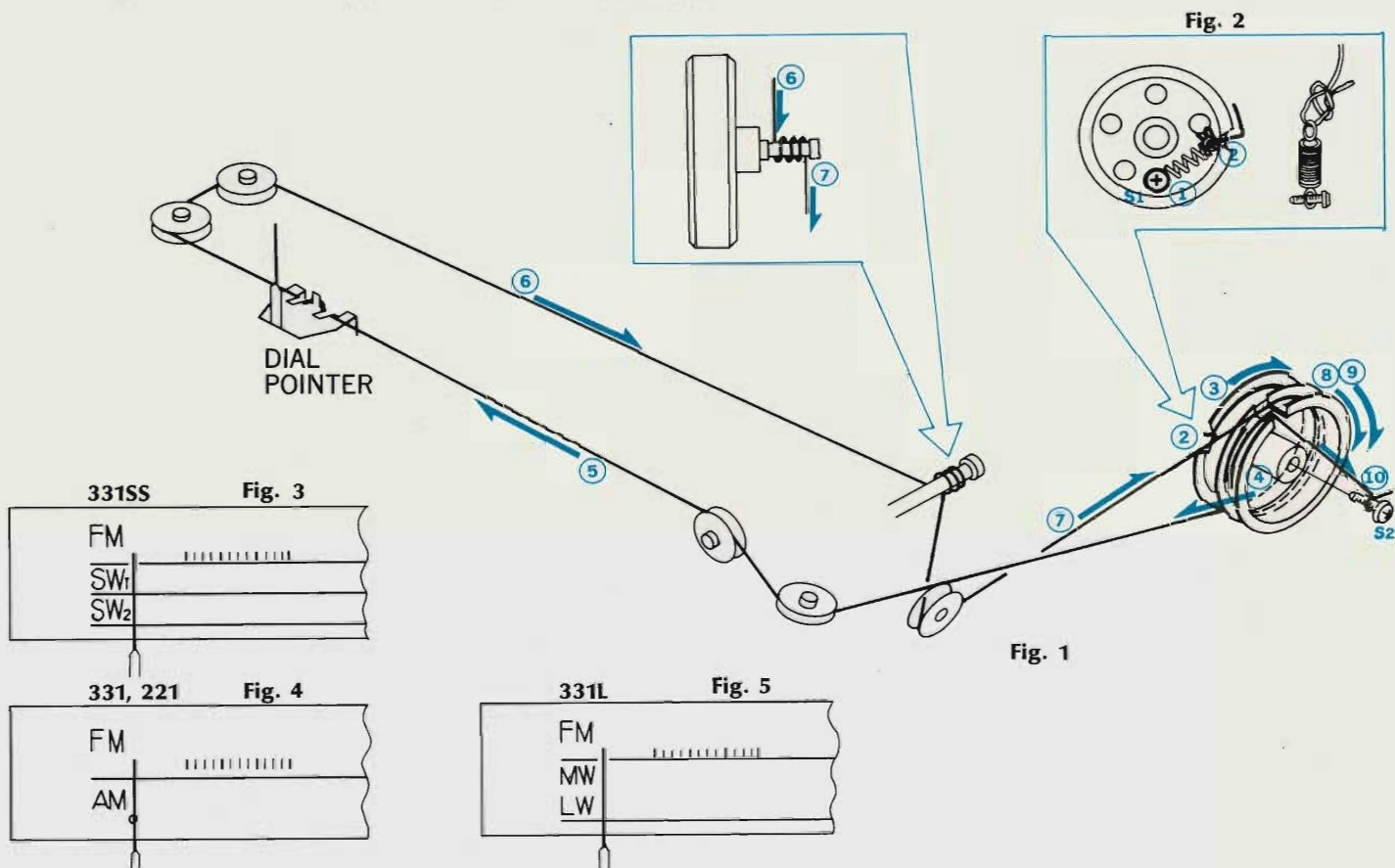
Parts No.	Stock No.	Description
16	1101660	Rotary Switch, POWER (331, 331SS)
	1101710	Rotary Switch, POWER (331L)
	1190210	Rotary Switch, POWER (221)
17	2430240	Headphone Jack
18	1015140, 1	100kΩ (A) × 2 BASS, TREBLE Volume
19	1015130, 1	100kΩ (MN) × 2 BALANCE Volume
20	1011020, 1	250kΩ (B) × 2 VOLUME
21	1131060, 1	Push Switch (3 Stage)
22	7036440	Tuning Ass'y
23	1131050	Push Switch, LW ANT (331L only)
24	1103530	Rotary Switch, SELECTOR (331SS, 331L)
	1101670	Rotary Switch, SELECTOR (331, 221)
25	5416400	Dial Pointer
	5407871	Dial Scale (331, 221)
	5407881	Dial Scale (331SS)
	5407891	Dial Scale (331L)
26	5407891	Dial Scale (331L)
27	5109122	Binding Head Tapping Screw, M3×8
28	5166520	Washer Head Tapping Screw, M3×8
29	5516911	Foot
30	5058370	Bottom Plate

### 3. THREADING OF DIAL CORD

\*If a dial cord is cut off or slips, replace it by following procedures.

These units use 0.6mmφ cord, please replace it with the same type certainly.

\*The length of dial cord is approximately 170cm (66 inch).



#### 3-1. Threading of Dial Cord

Thread the dial cord in numerical order from ① to ⑩ as Fig. 1.

- 1) Close the variable capacitor completely (Max. capacitance).
- 2) Tie dial cord to the dial spring (Fig. 2).
- 3) Fix the dial spring with screw to S1 of the dial pulley (Fig. 2).
- 4) Thread cord in the direction of arrow from ① to ⑩ (Fig. 1).
- 5) After ⑩, tie the cord to the screw S2 of the dial pulley (Fig. 1)

\*To strengthen the dial cord's tension, hold the end of cord, then pull it toward the front panel.

Turn tuning shaft counterclockwise so that the cord's tension will be more obtained.

\*After procedure 5), lock the knots of the cord and the screws, S1, S2 with paint.

#### 3-2. Attachment of Dial Pointer

- 1) Close the variable capacitor completely.
- 2) Set the dial pointer to the position on dial scale as shown in Fig. 3~5.

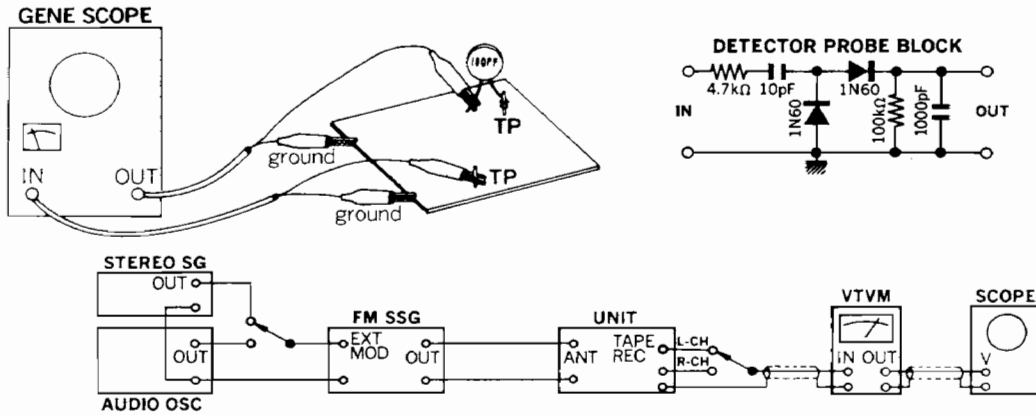
\*Confirm that the dial pointer runs smoothly on the dial scale by turning the tuning shaft.

Stock No.	Description
6036050	Dial cord (0.6mmφ)
6906461	Spring
6146700	Dial pulley (D-35)

# 4. ALIGNMENTS

## 4-1. FM Alignment

Note: IF alignment .....Connect the output of genescoper to TP01 through 100pF ceramic capacitor



STEP	SUBJECT	STEP	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR	
			FROM	TO				
1.	FM IF Alignment F-2535....Fig. 4-4 F-2540....Fig. 4-5	1. IF Coil	Output 100dB Genescoper	TP01 F-2540 or F-2535	TP03 F-2540 or F-2535 Use Detector probe	T01 F-2540 or F-2535	MAX. IF Waveform 1 as Fig. 4-3	
		2. Meter Coil	Output 70dB Genescoper	Same as above	TP06 F-2540 or F-2535	T04 F-2540 or F-2535	MAX. IF Waveform 2 as Fig. 4-3	
		3. Discrimi- nator Coil	Same as above	Same as above	TP05 F-2540 or F-2535	T03 F-2540 or F-2535	MAX. linearity of S curve (Fig. 4-3)	
2.	FM Dial Calibration and RF Alignment F-2535....Fig. 4-4 F-2540....Fig. 4-5	1. Dial Caribration	90MHz	ANT Input 400Hz (100% MOD) 60dB FM SSG 90 or 106MHz	ANT Terminal 300Ω	REC OUT L or R-CH VTVM & SCOPE	L03 F-2540 or F-2535	MAX. Output
			106MHz				TC01 F-2540 or F-2535	
		2. RF Adj	90MHz	ANT Input 400Hz (100% MOD) 50dB FM SSG 90 or 106MHz	ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	L01, L02 F-2540 or F-2535	MAX. Output
			106MHz				VT01 f, VT01 h F-2540 or F-2535	
3.	MPX Alignment F-2535....Fig. 4-4 F-2540....Fig. 4-5		98MHz ANT Input 60dB FM SSG Pilot 19kHz (10% MOD) L-CH 1kHz (40% MOD) R-CH (0% MOD) Stereo SG	ANT Terminal 300Ω	REC OUT R-CH VTVM & SCOPE	L05 F-2540 or F-2535	Separation: Over than 27dB Confirm Separation: R→L Over than 27dB	

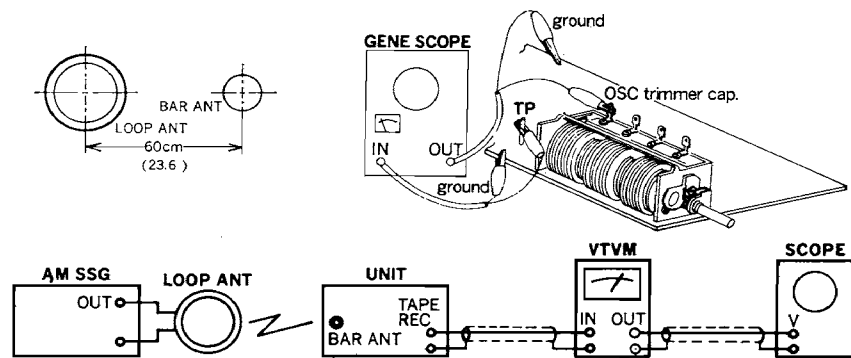
\* Signal Meter..... 4.3 on Meter (98MHz ANTENNA  
Input 60dB 400Hz 100% MOD)  
Indicator level..... 25dB

### Abbreviation

AM Standard Signal Generator.....AM SSG  
FM Stereo Generator .....Stereo SG  
Audio Oscillator .....Audio OSC  
AM FM Generator Oscilloscope.....Genescoper  
FM Standard Signal Generator .....FM SSG  
Oscilloscope .....Scope

## 4-2. AM Alignment

- Note:** 1. Selector.....AM (MW, SW, or LW)  
 2. Confirm start point of dial pointer before alignment.  
 3. In case of using loop antenna, increase output of AM SSG for 26dB than bar antenna's direct input as it attenuates input sensitivity for 26dB



STEP	SUBJECT	STEP	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR		
			FROM	TO					
1.	MW IF, Dial Calibration and RF F-2535....Fig. 4-4 F-2540....Fig. 4-5  MODEL 331 331L 221	1. IF Coil	Output 70dB Genescope	OSC Trimmer Cap VT01i F-2535 VC01 F-2540	TP7 F-2535 or F-2540	T05 F-2535 or F-2540	MAX. IF Waveform (Fig. 4-1)		
			Output 60dB Genescope			T06, T07 F-2535 or F-2540	MAX. IF Waveform (Fig. 4-2)		
		2. Dial Calibration 600kHz	ANT Input 60dB 400Hz (30% MOD) AM SSG 600 or 1400kHz	MW ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	L06 F-2535 L12 F-2540	MAX Output		
			1400kHz			VT01i F-2535 TC05 F-2540			
		3. RF Adj 600kHz	ANT Input 60dB 400Hz (30% MOD) AM SSG 600 or 1400kHz	MW ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	Bar Antenna	MAX Output		
			1400kHz			VT01g F-2535 TC02 F-2540			
2.	SW IF, Dial Calibration and RF F-2535....Fig. 4-4 F-2450....Fig. 4-5  MODEL 331SS	1. IF Coil (Selector Switch SW1)	Output 95dB Genescope	OSC Trimmer Cap VC01 F-2540	TP7 F-2540	T05 F-2540	MAX. IF Waveform (Fig. 4-1)		
			Output 80dB Genescope			T06 F-2540	MAX. IF Waveform (Fig. 4-2)		
			Output 70dB Genescope			T07 F-2540			
		2. Dial Calibra- tion	SW1 { 2.5MHz 6.5MHz	ANT Input 60dB 400Hz (30% MOD) AM SSG 2.5 or 6.5MHz	AM ANT Terminal	REC Out L or R-CH VTVM & SCOPE	L12 F-2540	MAX Output	
				SW2 { 7MHz 16MHz			ANT Input 60dB 400Hz (30% MOD) AM SSG 7 or 16MHz		TC05 F-2540
		3. RF Adj	SW1 { 2.5MHz 6MHz		ANT Input 50dB 400Hz (30% MOD) AM SSG 2.5 or 6MHz	AM ANT Terminal	REC Out L or R-CH VTVM & SCOPE		L06 F-2540
				SW2 { 7MHz 16MHz	ANT Input 50dB 400Hz (30% MOD) AM SSG 7 or 16MHz				TC02 F-2540
								L07 F-2540	
							TC03 F-2540		

STEP	SUBJECT	STEP	FEED SIGNAL		MEASURE OUTPUT	ADJUST	ADJUST FOR
			FROM	TO			
3.	LW IF, Dial Calibration and RF F-2535....Fig. 4-4 F-2540....Fig. 4-5  MODEL 331L	1. IF Coil	Output 70dB Genescope	OSC Trimmer Cap VC01 F-2540	TP7 F-2540 or F-2535	TC05 F-2540	MAX. IF Waveform (Fig. 4-1)
			Output 60dB Genescope			T06, T07 F-2540	MAX. IF Waveform (Fig. 4-2)
		2. Dial Calibration 170kHz	ANT Input 70dB 400Hz (30% MOD) AM SSG 170 or 320kHz	LM/MW EXT Bar ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	L13 F-2540	MAX. Output
						TC06 F-2540	
		3. RF Adj 170kHz	ANT Input 65dB 400Hz (30% MOD) AM SSG 170 or 320kHz	LM/MW EXT Bar ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	LW Bar Antenna	MAX. Output
						TC04 F-2540	
		170kHz	ANT Input 65dB 400Hz (30% MOD) AM SSG 170 or 320kHz	LM EXT ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	L07 F-2540	MAX. Output
						TC03 F-2540	
		320kHz	ANT Input 65dB 400Hz (30% MOD) AM SSG 170 or 320kHz	LM/MW EXT Bar ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	L10, L11 F-2540	MIN. Output
		4. 460kHz Dip Filter (Selector MW)	ANT Input 400Hz (30% MOD) AM SSG 100dB 460kHz Dial pointer 1000kHz..MW				

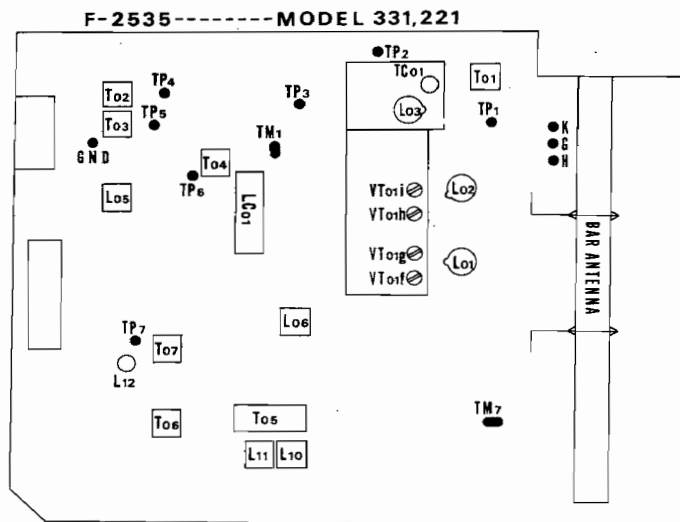
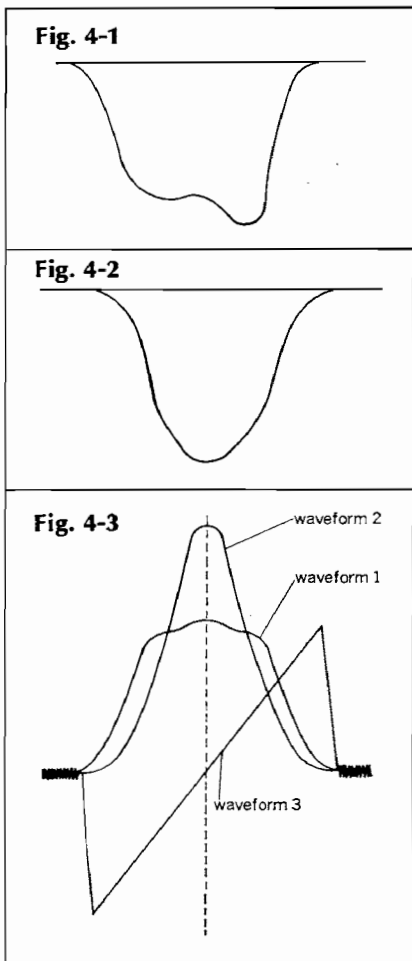


Fig. 4-4

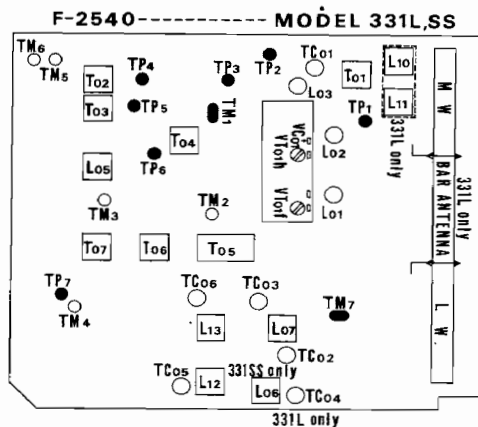


Fig. 4-5

## 5. TROUBLESHOOTING CHART

### 5-1. Troubleshooting on Audio Section

#### 1. Trouble on Power Amplifier

Symptom	Cause
1-1. Power supply section inoperative	1. Defective power switch, S601 2. Power fuse, F-605 opens 3. Defective Diode, D601~D604 4. Quick acting fuse F-604, opens
1-2. Power amplifier section inoperative	5. Shorted speaker terminals by speaker wires 6. Imperfect contact of speaker selector switch, S601 7. Defective IC601 or IC602
2. Trouble on Tone Control Section	8. Shorted C601 on F-2531 9. Opens TR601 on F-2531 10. Defective TR01 or TR02 on F-2531
3. Trouble on Phono Circuit Section	11. Imperfect contact of mode switch, tape monitor switch or selector switch 12. Defective TR15~TR18 on Equalizer circuit 13. Defective input capacitor C101 or C102 on Equalizer circuit

### 5-2. Troubleshooting on Tuner Section

#### 1. FM and AM inoperative

1-1. No voltage supplied to each section	1. Defective TR602 on F-2531 2. Imperfect contact of selector switch
1-2. Imperfect contact of selector switch	3. AM and FM output signal not supplied to audio section

#### 2. Inoperative FM section

F-2535 (Tuner & Equalizer circuit board).....MODEL 331, 221

F-2540 (Tuner & Equalizer circuit board).....MODEL 331L, 331SS

2-1. FM tuner inoperative	
1) signal meter inoperative (No output signal at checkpoint, TP4)	4. IF or RF out of adjustment 5. Defective FET01 or TR01~TR05 6. Antenna coil, osc coil or IF coil open 7. Weak input signal at FM antenna terminal
2) Signal meter operative (No output signal at checkpoint TP5)	8. Defective IC01 9. T02 or T03 out of adjustment 10. T02 or T03 open 11. Defective D01 or D02
2-2. MPX inoperative	12. Defective IC02 13. Defective TR07, TR08
2-3. No channel separation on FM Stereo broadcasting	14. 19kHz coil, L05 open 15. 19kHz coil, L05 out of adjustment 16. Low input MPX signal 17. Defective IC02
2-4. Stereo indicator lamp not lighted	18. Defective MPX indicator, LED. D01 19. Defective IC02
2-5. Signal meter inoperative (FM broadcasting sound can be heard)	20. Defective TR06 21. T04 out of adjustment or open 22. Defective D03, D04 or D09 23. Defective signal meter

### 5-3. Inoperative AM Section

#### 1. MW, SW, or LW circuit section inoperative

1-1. Signal meter inoperative (Signal meter circuit operative)	1. IF or RF out of adjustment 2. Defective TR09~TR12 3. Antenna coil, OSC coil or IF coil open 4. Weak input signal at each antenna terminal 5. Imperfect contact of selector switch
1-2. Signal meter circuit inoperative	6. Defective TR13 7. Defective D08 or D09 8. Defective signal meter



## 5-4. Operation Block Diagram

### 1) Audio Section

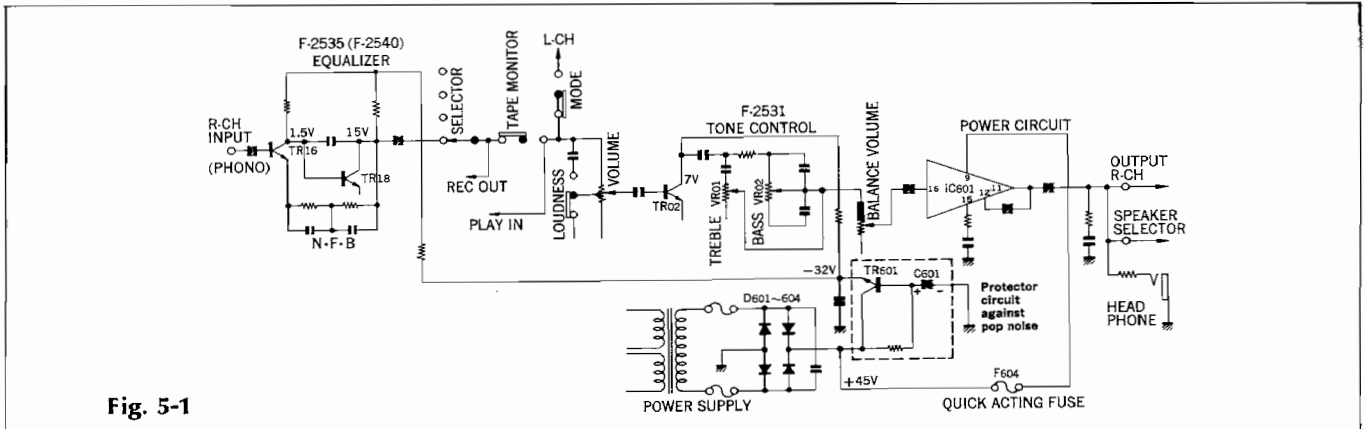


Fig. 5-1

### 2) Tuner Section AM-FM Block Diagram

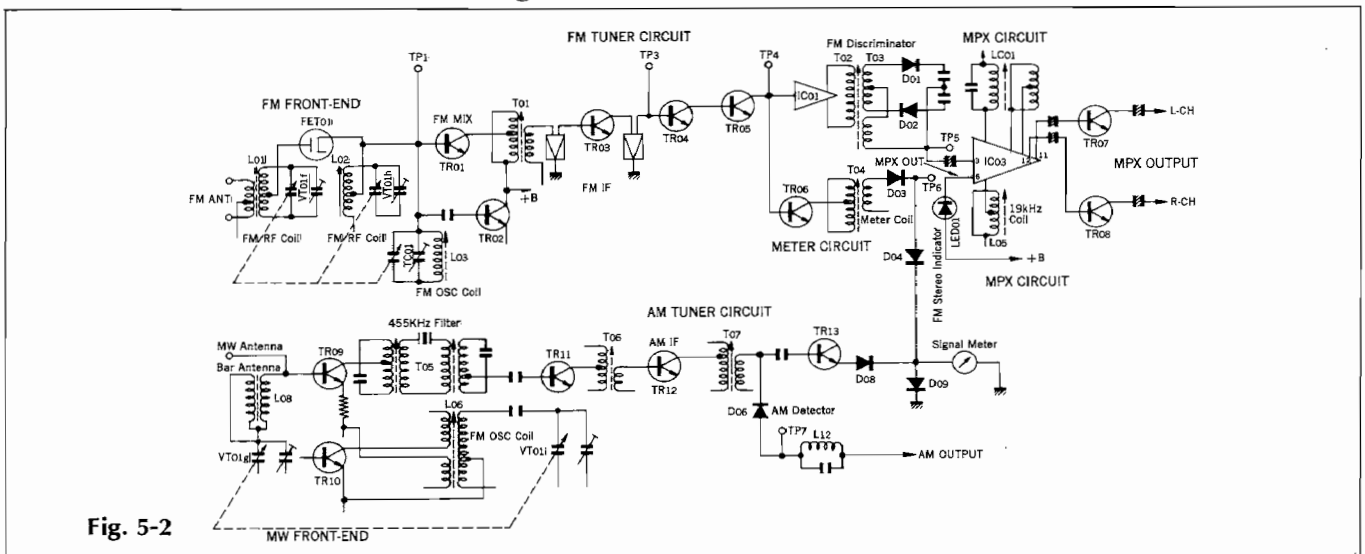
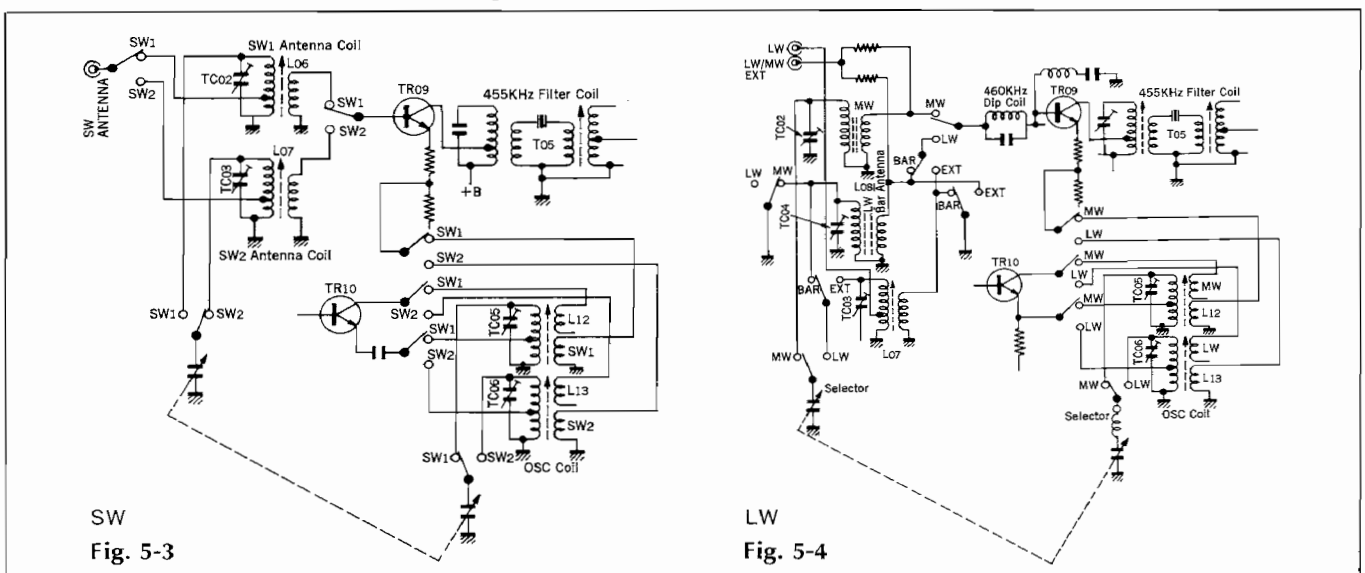


Fig. 5-2

### 3) SW & LW Front-end Block Diagram

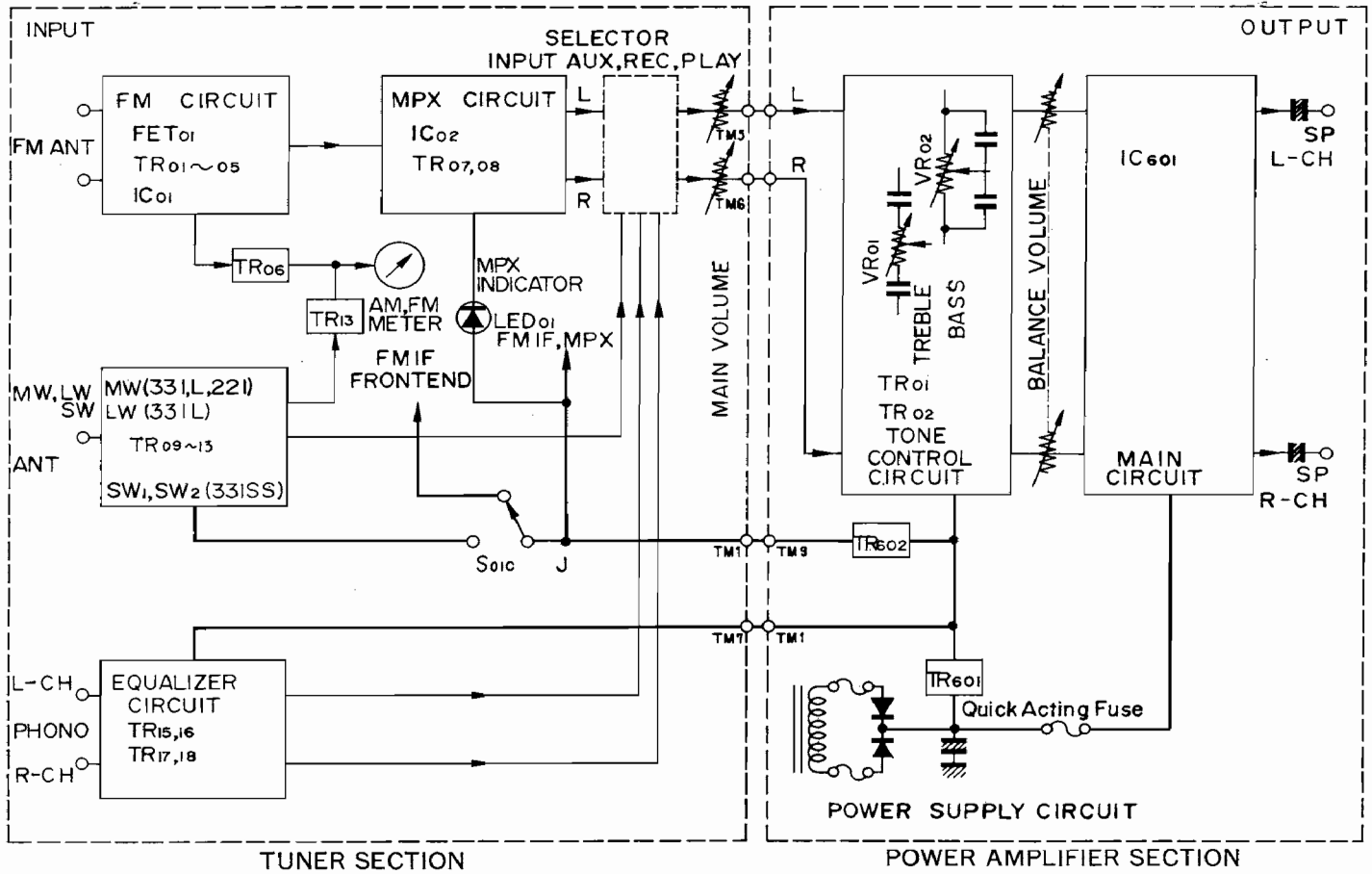


SW  
Fig. 5-3

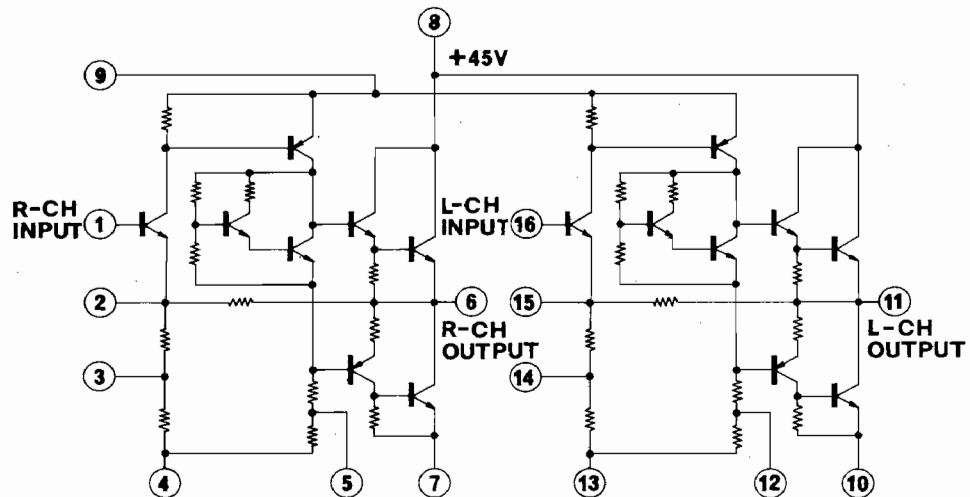
LW  
Fig. 5-4

# 6. BLOCK DIAGRAM

F-2535 (M: 331, 221) F-2540 (M: 331, 331SS, 331L) F-2531 (M: 331, 331SS, 331L, 221)



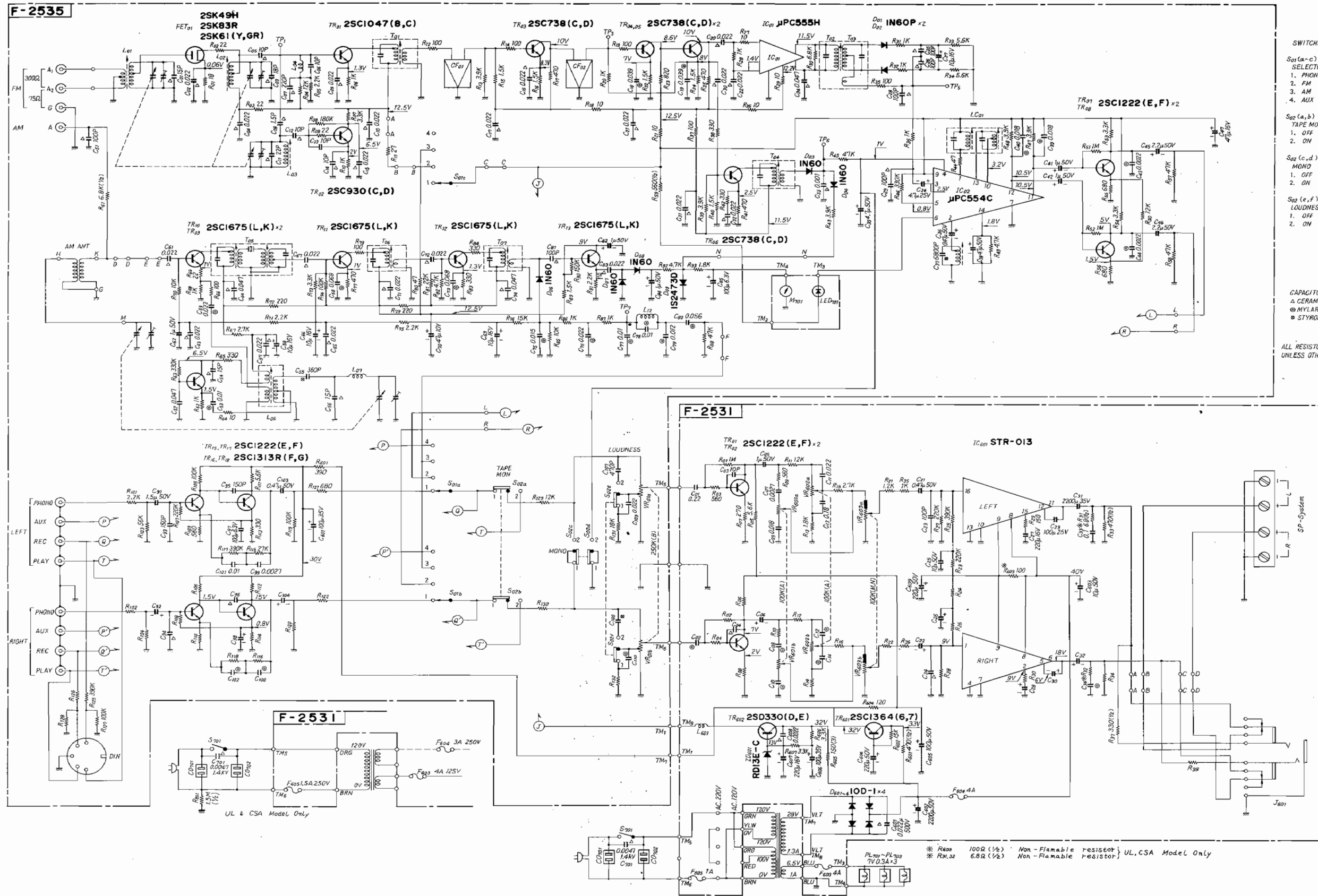
## IC STK-014 STK-013 BLOCK DIAGRAM



# 7. SCHEMATIC DIAGRAM

## 7-1. SANSUI 221 Schematic Diagram

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



SWITCHES  
S<sub>01</sub>(a-c) SELECTOR  
1. PHONO  
2. FM  
3. AM  
4. AUX  
S<sub>02</sub>(a,b) TAPE MON  
1. OFF  
2. ON  
S<sub>03</sub>(c,d) MONO  
1. OFF  
2. ON  
S<sub>04</sub>(e,f) LOUDNESS  
1. OFF  
2. ON

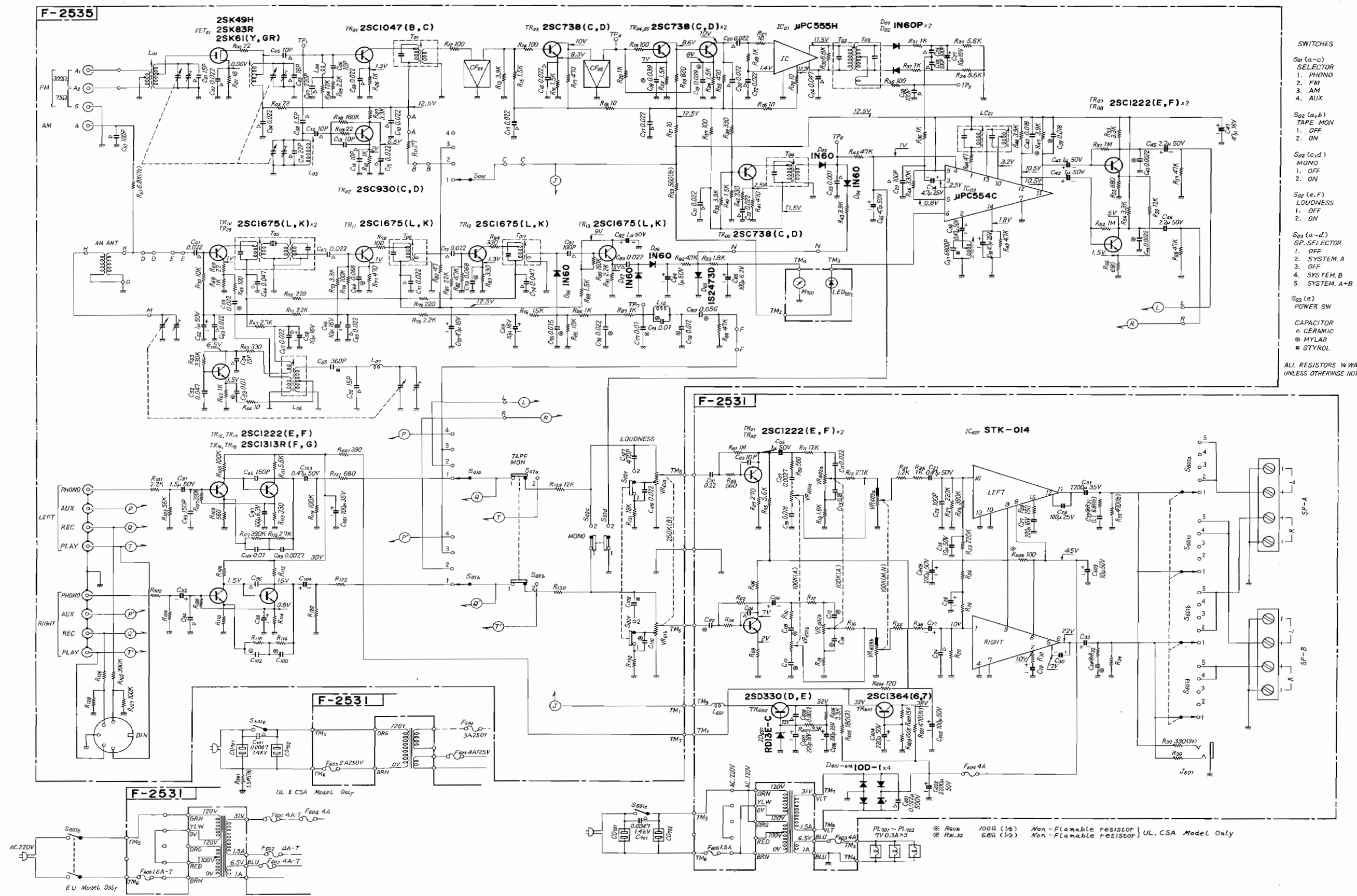
CAPACITOR  
△ CERAMIC  
● MYLAR  
■ STYROL

ALL RESISTORS 1/4 WATT UNLESS OTHERWISE NOTED

\* R<sub>01</sub> 100 $\Omega$  (1/2) Non-Flammable resistor  
\* R<sub>01,02</sub> 6.8 $\Omega$  (1/2) Non-Flammable resistor  
UL, CSA Model Only

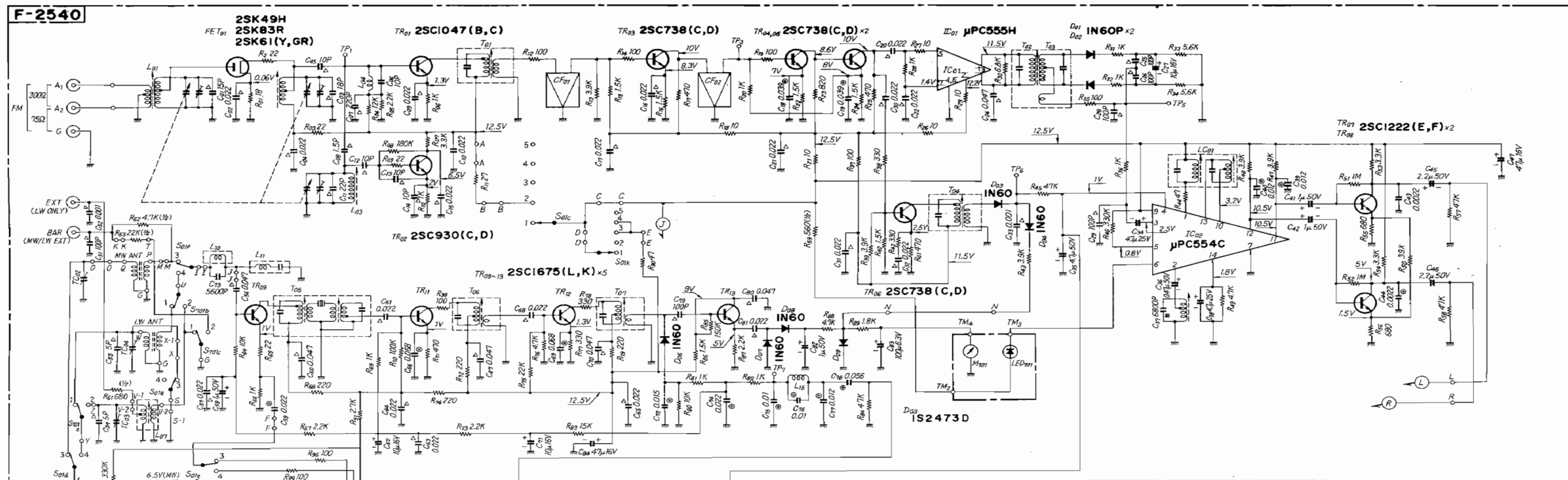
7-2. SANSUI 331 Schematic Diagram

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

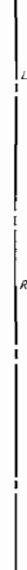
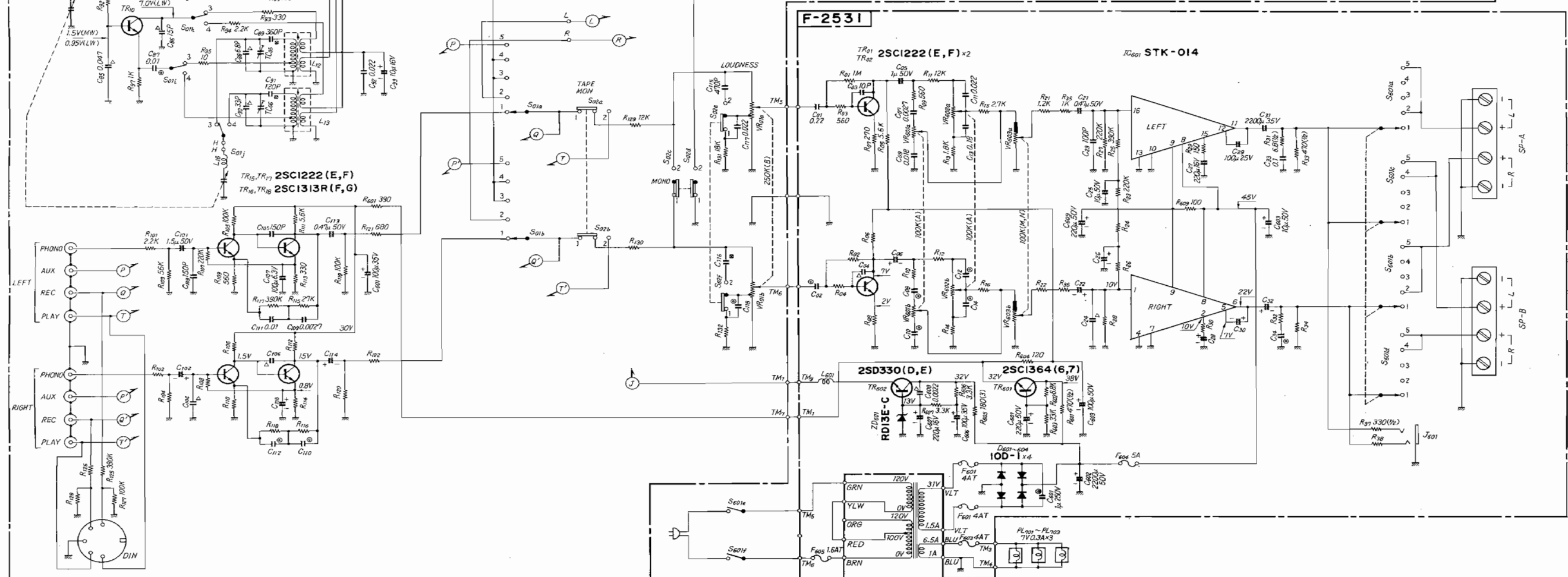


7-3. SANSUI 331L Schematic Diagram

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

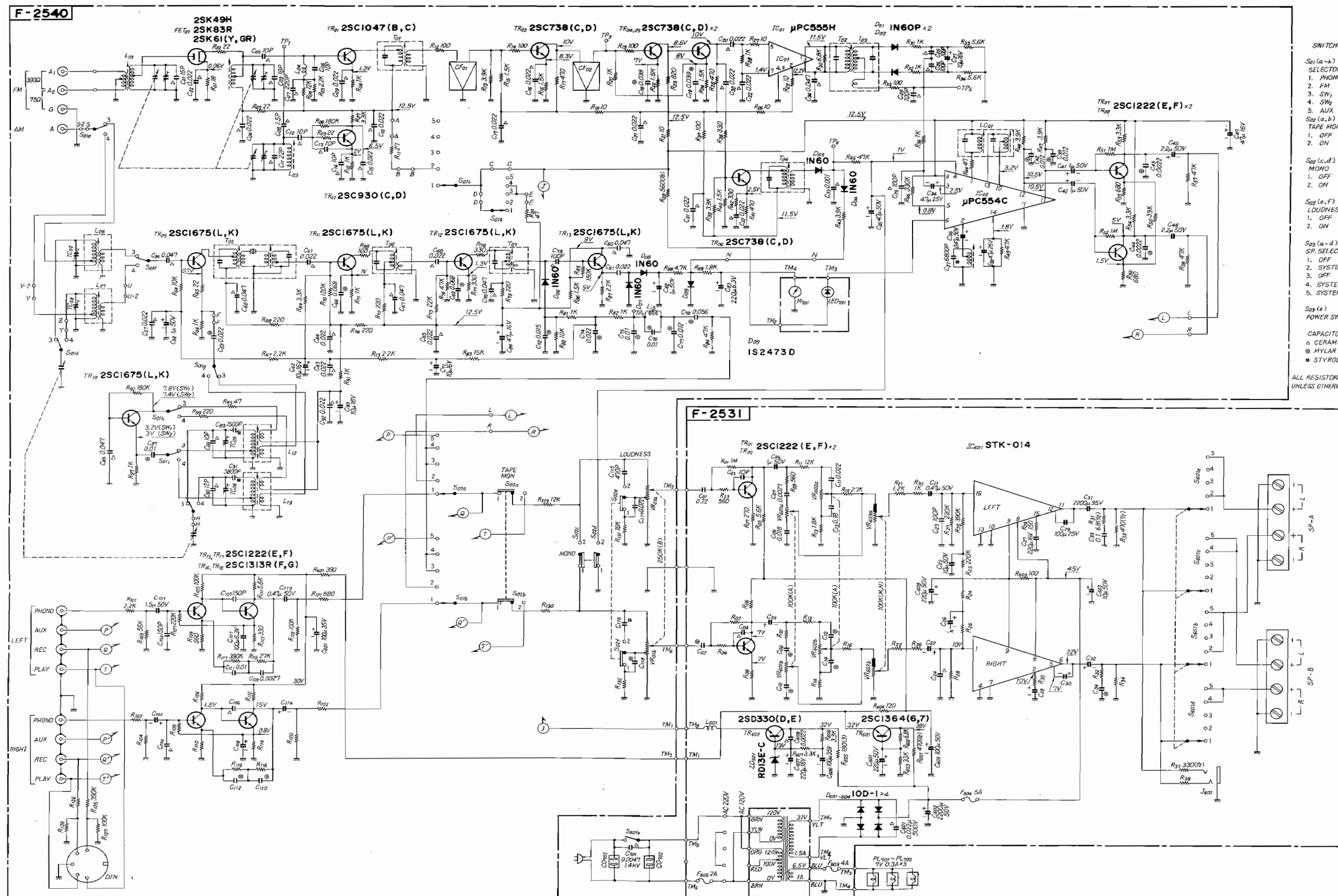


- SWITCHES**
- S<sub>01</sub> (a~c) SELECTOR
  - S<sub>02</sub> (a,b) TAPE MON
  - S<sub>03</sub> (a,b) LOUDNESS
  - S<sub>04</sub> (a~d) SP. SELECTOR
  - S<sub>05</sub> (a,f) POWER SW
- MONO**
- 1. OFF
  - 2. ON
- LOUDNESS**
- 1. OFF
  - 2. ON
- SP. SELECTOR**
- 1. SYSTEM.A
  - 2. SYSTEM.B
  - 3. OFF
  - 4. SYSTEM.A+B
- POWER SW**
- 1. OFF
  - 2. ON
- CAPACITOR**
- △ CERAMIC
  - MYLAR
  - STYROL
- ALL RESISTORS IN WATT UNLESS OTHERWISE NOTED**



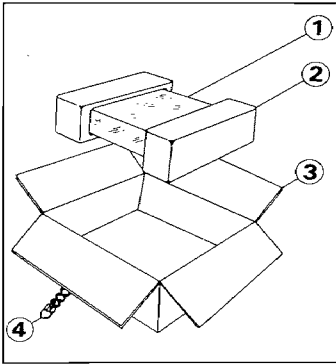
### 7-4. SANSUI 331SS Schematic Diagram

\* Design and specifications subject to change without notice for improvement.



## 8. PACKING LIST

Parts No.	Stock No.	Description
1	9116640	Vinyl Cover
2	9027870	Stylofoam Packing
3	9008260	Carton Case (331L)
	9008270	Carton Case (331SS)
	9008280	Carton Case (331L)
	9008290	Carton Case (221)
4	5996080	Curl Stopper



## 9. ACCESSORY PARTS LIST

Parts No.	Stock No.	Description	Position
	3820090, 1	FM Antenna	
	3820110	SW Antenna (331SS only)	
	9208820	Operating Instruction (331)	
	9208830	Operating Instruction (331SS)	
	9208840	Operating Instruction (331)	
	9208850	Operating Instruction (221)	



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