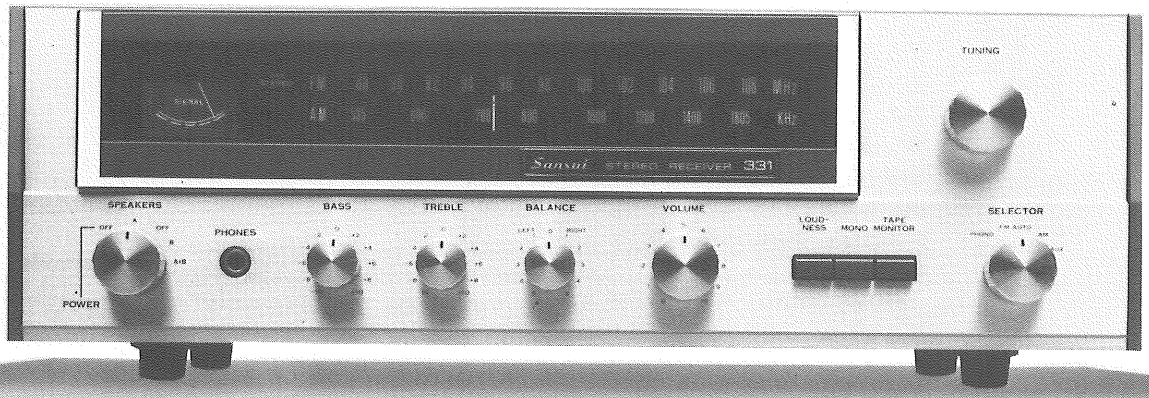
SERVICE MANUAL

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.

TABLE OF CONTENTS

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 $^{+2.0}_{-3.0}$dB
EQUALIZATION (at TAPE REC output)
..... RIAA Curve
(30 to 15,000Hz ±1.5dB)
DAMPING FACTOR 30 (8Ω)
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 50kΩ
(Max. input capability: 120mV at 0.5% distortion)
AUX 150mV 50kΩ
TAPE
PLAY Pin Jacks 150mV 50kΩ
REC/PLAY DIN Socket 150mV 50kΩ
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 ..... 2.5μV (IHF)
1.3μV (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 ..300Ω balanced
75Ω 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 ..... 20μV 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 ..... 30μV 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
SENSITYVITY ..... 60dB/m at 250kz(Bar Antenna)
300μV at 250kHz (EXT)
SELECTIVITY (±10kHz) ..... better than 40dB at 1,000kHz
IMAGE REJECTION ..... better than 90dB/m at 250kHz
IF REJECTION ..... better than 90dB at 250kHz

OTHERS

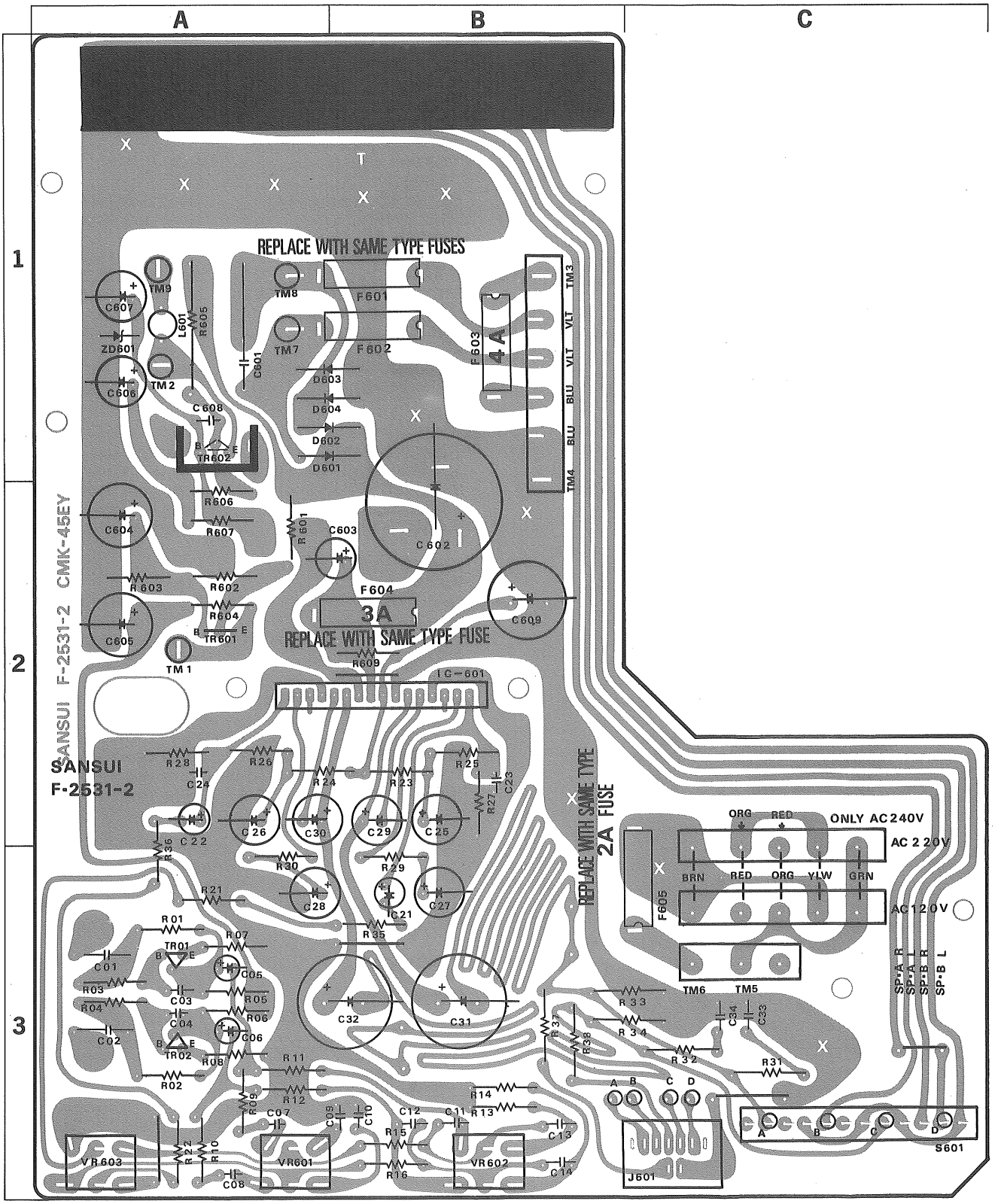
POWER REQUIREMENTS
VOLTAGE 120, 220, 240V, 50/60Hz
CONSUMTION (331, SS, L) ..50W (rated), 90W (max.)
CONSUMPTION (221) ..... 45W (rated), 75W (max.)

* 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



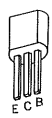
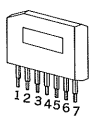
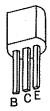
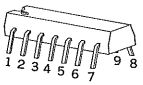
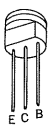
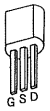
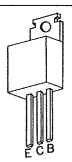
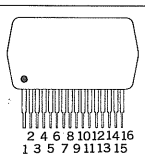
Parts List

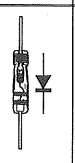
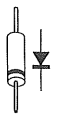
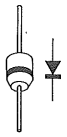
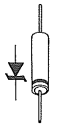
Parts No.	Stock No.	Description	Position
TR01, 02	0306011, 2	2SC1222 (E, F) Transistor	3 A
	0306070, 1	2SC1313 (F, G) Transistor	
TR601	0306131, 2	2SC1364 (6, 7) Transistor	2 A
TR602	0308361, 2	2SD330 (D, E) Transistor	1 A
D601	0310340	10D1 Diode	1 A, B
D602	0310340	10D1 Diode	1 A, B
D603	0310340	10D1 Diode	1 A, B
D604	0310340	10D1 Diode	1 A, B
ZD601	0315980	EQA01-14R Zener Diode	1 A
	0316320	RD-13E C Zener Diode	
C01, 02	0601228	0.22μF 50V M.C.	3 A
C03, 04	0660100	10pF 50V C.C.	3 A
C05, 06	0519101	1μF 50V E.C.	3 A
C07, 08	0601276	0.0027μF 50V M.C.	3 A
C09, 10	0601187	0.018μF 50V M.C.	3 B
C11, 12	0601227	0.022μF 50V M.C.	3 B
C13, 14	0601188	0.18μF 50V M.C.	3 B
C21, 22	0519103	0.47μF 50V E.C.	3 B, 2 A
C25, 26	0515100	10μF 50V E.C.	2 B, 2 A
C27, 28	0512221	220μF 16V E.C.	3 B, 3A, B
C29, 30	0513101	100μF 25V E.C.	2 B, 2A, B
C31, 32	0514222	2200μF 35V E.C.	3 B, 3A, B
C33, 34	0601108	0.1μF 50V M.C.	3 C
C602	0549109	2200μF 50V E.C.	1, 2 B
C603	0515100	10μF 50V E.C.	2 A, B
C604	0515221	220μF 50V E.C.	2 A
C605	0515101	100μF 50V E.C.	2 A
C606	0514101	100μF 35V E.C.	1 A
C607	0512221	220μF 16V E.C.	1 A
C608	0657222	2200pF 50V C.C.	1 A
C609	0515221	220μF 50V E.C.	2 B
R01, 02	0107105	1MΩ ¼W C.R.	3 A
R03, 04	0107561	560Ω ¼W C.R.	3 A
R05, 06	0107562	5.6kΩ ¼W C.R.	3 A
R07, 08	0107271	270Ω ¼W C.R.	3 A
R09, 10	0107561	560Ω ¼W C.R.	3 A
R11, 12	0107123	12kΩ ¼W C.R.	3 A
R13, 14	0107182	1.8kΩ ¼W C.R.	3 B
R15, 16	0107272	2.7kΩ ¼W C.R.	3 B
R21, 22	0107122	1.2kΩ ¼W C.R.	3 A
R23, 24	0107224	220kΩ ¼W C.R.	2 B, 2A, B
R25, 26	0107394	390kΩ ¼W C.R.	2 B, 2 A

Parts No.	Stock No.	Description	Position
R27, 28	0107224	220kΩ ¼W C.R.	2 B, 2 A
R31, 32	0111689	6.8Ω ½W S.R.	3 C
R33, 34	0111471	470Ω ½W S.R.	3 B C
R35, 36	0107102	1kΩ ¼W C.R.	3 B, 2,3A
R37, 38	0111331	330Ω ½W S.R.	3 B
R601	0111471	470Ω ½W S.R.	2 A
R604	0107121	120Ω ¼W C.R.	2 A
R606	0107332	3.3kΩ ¼W C.R.	2 A
R607	0107332	3.3kΩ ¼W C.R.	2 A
R609	0107101	100Ω ¼W C.R.	2 B
L601	4900110	100μH Inductor	1 A
VR601	1015140, 1	100kΩ A×2 Volume	3 A
VR602	1015140, 1	100kΩ A×2 Volume	3 B
VR603	1015130, 1	100kΩ MN Volume	3 A
J601	2430240	JACK	3 C
	2230110	Push Terminal (Red)	
	2230120	Push Terminal (Black)	
	2310051	P Type Fuse Holder	
	2410610	3P Connector	
	2410630	5P Connector	
331 ONLY			
IC601	0360240	STK-014 IC	2 A, B
C23, 24	0660101	100pF 50V C.C.	2 B, 2 A
C601	0659012	22000pF 500V C.C.	1 A
R29, 30	0107151	150Ω ¼W C.R.	3 B, 3 A
R602	0107153	15kΩ ¼W C.R.	2 A
R603	0107104	100kΩ ¼W C.R.	2 A
R605	0133181	180Ω 3 W Ce.R.	1 A
S601	1101660	N-1-2-5 Rotary Switch	3 C
F603	0431270	4A 250V AC Fuse	2 A
F604	0431270	4A 250V Q.A. Fuse	2 A
F605	0431220	1A 250V AC Fuse	1 A
	0432230	1.5A 250V AC Fuse	
331L ONLY			
IC601	0360240	STK-014 IC	2 A B
C23, 24	0660331	330pF 50V C.C.	2 A
C601	0606109	1μF 250V M.C.	1 A
R29, 30	0107151	150Ω ¼W C.R.	3 B, 3 A
R601	0210471	470Ω ½W Ce.R.	2 A

Parts No.	Stock No.	Description	Position
R602	0210153	15kΩ ½W Ce.R.	2 A
R603	0210104	100kΩ ½W Ce.R.	2 A
R604	0210121	120Ω ½W Ce.R.	2 A
R605	0133181	180Ω 3 W Ce.R.	1 A
R606	0210332	3.3kΩ ½W Ce.R.	2 A
R607	0210332	3.3kΩ ½W Ce.R.	2 A
R609	0210101	100Ω ½W Ce.R.	2 A, B
S601	1101660	N-1-2-5 Rotary Switch	3 C
F601	0435160	4A 250V Time Lag Fuse	1 B
F602	0435160	4A 250V Time Lag Fuse	1 B
F603	0435160	4A 250V Time Lag Fuse	1 B
F604	0433630	4A 250V Q.A. Fuse	2 A, B
F605	0435120	1.6A 250V Time Lag Fuse	2, 3 C
331SS ONLY			
IC601	0360240	STK-014C IC	
C23, 24	0660101	100pF 50V C.C.	2 B, 2 A
C601	0659012	22000pF 500V C.C.	1 A
R29, 30	0107151	150Ω ¼W C.R.	3 B, 3 A
R602	0107153	15kΩ ¼W C.R.	2 A
R603	0107104	100kΩ ¼W C.R.	2 A
R605	0133181	180Ω 3 W Ce.R.	1 A
S601	1101660	N-1-2-5 Rotary Switch	3 C
F603	0431270	4A 250V AC Fuse	1 B
F604	0433270	4A 250V Q.A. Fuse	2 A, B
F605	0431220	1.5A 250V AC Fuse	3 C
	0431230	2A 250V AC Fuse	
221 ONLY			
IC601	0360230	STK-013 IC	
C23, 24	0660101	100pF 50V C.C.	2 B, 2 A
C601	0659012	22000pF 500V C.C.	1 A
R29, 30	0107271	270Ω ¼W C.R.	3 B, 3 A
R605	0163221	220Ω 3 W Ce.R.	1 A
F603	0431270	4A 250V AC Fuse	1 B
F604	0433270	4A 250V Q.A. Fuse	2 A, B
F605	0431210	0.5A 250V AC Fuse	2, 3 C
	0431220	1A 250V AC Fuse	

Figures

SEMICONDUCTORS	COMPLETE CIRCUIT BOARD	SEMICONDUCTORS	COMPLETE CIRCUIT BOARD
2SC1047 2SC1222 2SC1675 2SC1364 	F-2540 F-2535 F-2531	μpc555H 	F-2540 F-2535
2SC738 2SC1313 	F-2540 F-2535	μpc554C 	F-2540 F-2535
2SC930 	F-2540 F-2535	2SK49 2SK83 	F-2540 F-2535
2SB330 	F-2531	STK014 STK013 	F-2531

SEMICONDUCTORS	COMPLETE CIRCUIT BOARD	SEMICONDUCTORS	COMPLETE CIRCUIT BOARD
	F-2540 F-2535	1S2473D 	F-2540 F-2535
10D-1 	F-2531	RD-13EC 	F-2531

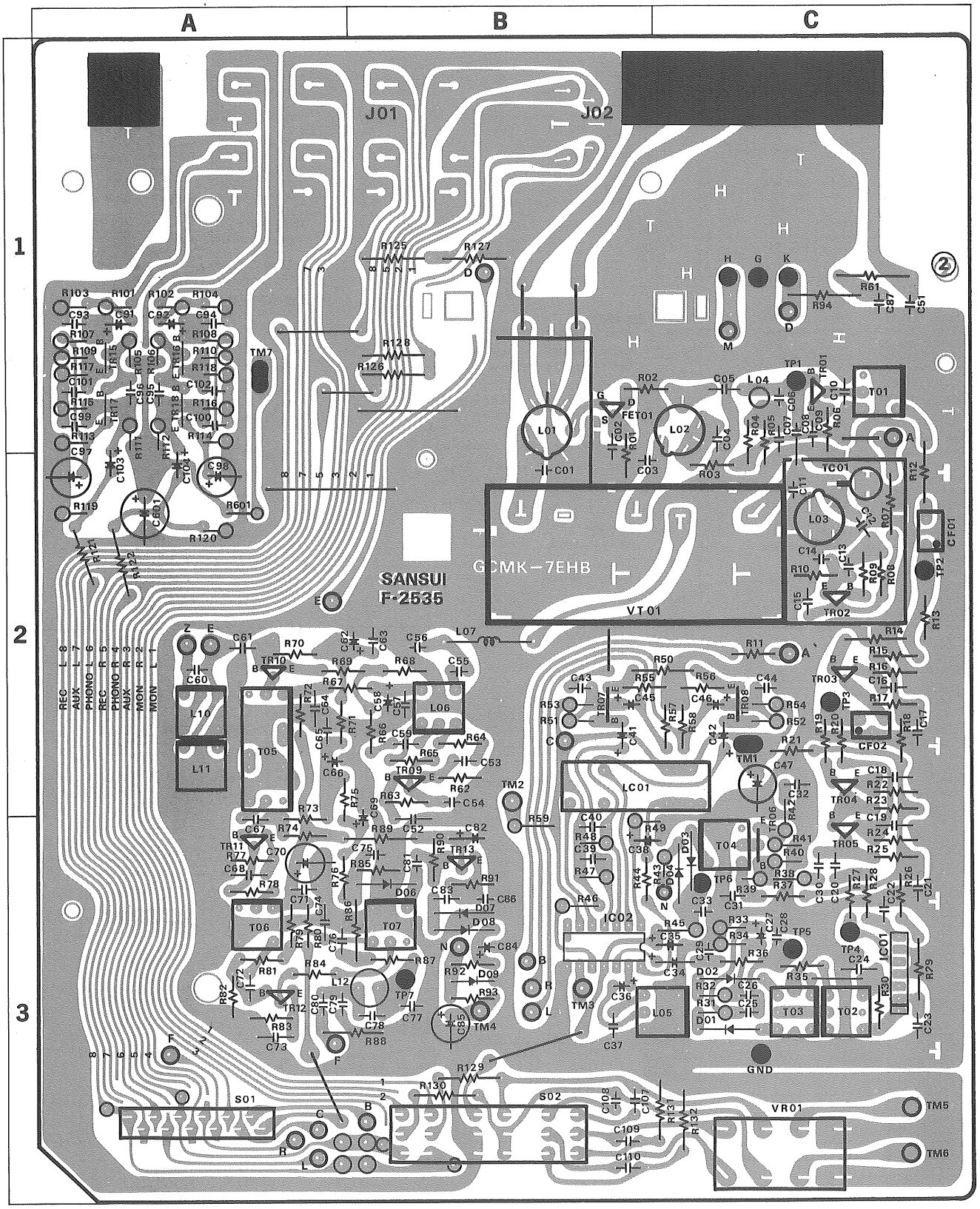
Abbreviations

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

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

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

Conductor Side



Parts List

Parts No.	Stock No.	Description	Position
TR01	0305801, 2	2SC1047 (B, C)	1 C
TR02	0305790, 1	2SC930 (C, D)	2 C
TR03	0306112, 3	2SC738 (C, D)	2 C
TR04	0306112, 3	2SC738 (C, D)	2 C
TR05	0306112, 3	2SC738 (C, D)	3 C
TR06	0306112, 3	2SC738 (C, D)	3 C
TR07	0306011, 2	2SC1222 (E, F)	2 B
	0306070, 1	2SC1313 (F, G)	
TR08	0306011, 2	2SC1222 (E, F)	2 C
	0306070, 1	2SC1313 (F, G)	
TR09	0306241, 2	2SC1675 (L, K)	2 B
TR10	0306241, 2	2SC1675 (L, K)	2 B
TR11	0306241, 2	2SC1675 (L, K)	3 A
TR12	0306241, 2	2SC1675 (L, K)	3 A
TR13	0306241, 2	2SC1675 (L, K)	3 B
TR15, 16	0306011, 2	2SC1222 (E, F)	1 A
	0306070, 1	2SC1313 (F, G)	
TR17, 18	0306011, 2	2SC1222 (E, F)	1 A
	0306070, 1	2SC1313 (F, G)	
IC01	0360120	μPC555H IC	3 C
IC02	0360250	μPC554H	3 B
FET01	0370172	FET 2SK49 H	1 B
	0370182	FET 2SK83 R	
	0370191, 2	FET 2SK61 (Y, G, R)	
D01	0311060	1N60-P	3 C
D02	0311060	1N60-P	3 C
D03	0310330, 1	1N60	3 C
D04	0311160	1S2473D	3 C
D06	0310330, 1	1N60	3 B
D07	0310330, 1	1N60	3 B
D08	0310330, 1	1N60	3 B
D09	0311160	12S473D	3 B
C01	0669350	15pF	2 B
C02	0657223	22000pF	1, 2 B
C03	0669353	18pF	2 B, C
C04	0657223	22000pF	1 C
C05	0661100	10pF	1 C
C06	0661100	10pF	1 C
C07	0660221	220pF	1 C
C08	0669021	1.5pF	1, 2 C
C09	0657223	22000pF 50V C.C.	1 C
C10	0657223	22000pF	1 C
C11	0669356	22pF	2 C
C12	0669345	10pF	2 C
C13	0669345	10pF	2 C
C14	0669345	10pF	2 C
C15	0657223	22000pF	2 C
C16	0657223	22000pF	2 C
C17	0657223	22000pF	2 C
C18	0601397	0.039μF 50V M.C.	2 C
C19	0601397	0.039μF	2 C
C20	0657223	22000pF	3 C
C21	0657223	22000pF	3 C
C22	0657223	22000pF	3 C
C24	0657473	47000pF 50V C.C.	3 C
C25	0660101	100pF	3 C
C26	0660101	100pF	3 C
C27	0512100	10μF 16V E.C.	3 C
C28	0660101	100pF	3 C
C29	0660101	100pF	3 C
C30	0657223	22000pF	3 C
C31	0657223	22000pF 50V C.C.	3 C
C32	0657223	22000pF	2 C
C33	0657102	1000pF	3 C
C34	0513479	4.7μF 25V E.C.	3 C
C35	0519103	0.47μF 50V E.C.	3 C
C36	0519103	0.47μF	3 B
C37	0629001	6800pF 50V P.C.	3 B
C38	0513479	4.7μF 25V E.C.	3 B, C
C39	0601187	0.018μF 50V M.C.	3 B
C40	0601187	0.018μF	3 B
C41	0515109	1μF 50V E.C.	2 B
C42	0515109	1μF	2 C
C43	0601226	0.0022μF 50V M.C.	2 B
C44	0601226	0.0022μF	2 C
C45	0519105	2.2μF 50V E.C.	2 B
C46	0519105	2.2μF	2 C
C47	0512470	47μF 16V E.C.	2 C
C51	0660101	100pF 50V C.C.	1 C
C52	0657473	47000pF	3 B
C53	0601107	0.01μF 50V M.C.	2 B
C54	0660150	15pF 50V C.C.	2 B
C55	0620361	360pF 50V P.C.	2 B
C56	0669400	15pF 50V C.C.	2 B
C57	0657223	22000pF	2 B
C58	0512100	10μF 16V E.C.	2 B
C59	0601227	0.022μF 50V M.C.	2 B

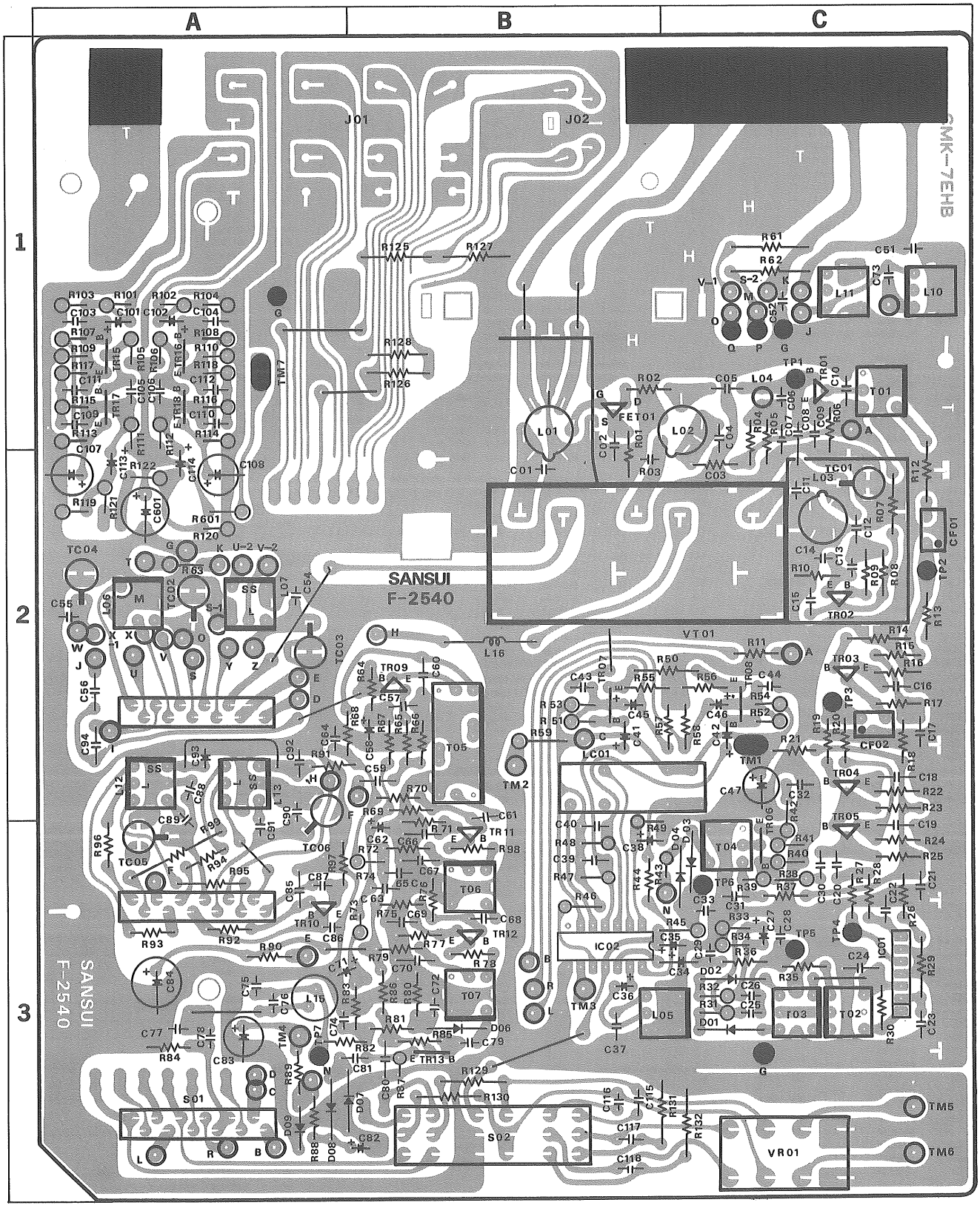
Parts No.	Stock No.	Description	Position
C61	0657223	22000pF 50V C.C.	2 A
C62	0515109	1μF 50V E.C.	2 A, B
C63	0657223	22000pF	2 B
C64	0657473	42000pF 50V C.C.	2 A
C65	0657223	22000pF	2 A
C66	0512100	10μF 16V E.C.	2 A
C67	0657223	22000pF 50V C.C.	2, 3 A
C68	0601687	0.068μF 50V M.C.	3 A
C69	0512100	10μF 16V E.C.	2, 3 B
C70	0512470	47μF	3 A
C71	0657223	22000pF 50V C.C.	3 A
C72	0657223	22000pF	3 A
C73	0601687	0.068μF 50V M.C.	3 A
C74	0657473	47000pF 50V C.C.	3 A
C75	0601157	0.015μF	3 B
C76	0601227	0.022μF	3 A
C77	0601107	0.01μF 50V M.C.	3 B
C78	0601107	0.01μF	3 B
C79	0601127	0.012μF	3 A
C80	0601567	0.056μF	3 A
C81	0660101	100pF 50V C.C.	3 B
C82	0515109	1μF 50V E.C.	3 B
C83	0657223	22000pF 50V C.C.	3 B
C84	0515109	1μF 50V E.C.	3 B
C85	0510101	100μF 6.3V E.C.	3 B
C91, 92	0519104	1.5μF 50V E.C.	1 A
C93, 94	0660151	150pF 50V C.C.	1 A
C95, 96	0660151	150pF	1 A
C97, 98	0510101	100μF 6.3V E.C.	7 A
C99, 100	0601276	0.0027μF 50V M.C.	1 A
C101, 102	0601107	0.01μF	1 A
C103, 104	0519103	0.47μF 50V E.C.	1, 2 A
C107, 108	0620471	470pF 50V P.C.	3 B
C109, 110	0601227	0.022μF 50V M.C.	3 B
C601	0514101	100μF 35V E.C.	2 A
R01	0113101	(FET01→2SK61 GY) 100Ω ¼W	1, 2 B
	0113180	(FET01→2SK49, 2SK61. Y 2SK56) 18Ω S.R.	
R02	0113220	22Ω	1 B, C
R03	0113220	22Ω	2 C
R04	0113123	12kΩ ¼W S.R.	1, 2 C
R05	0113222	2.2kΩ	1, 2 C
R06	0113102	1.0kΩ	1 C
R07	0107332	3.3kΩ ¼W C.R.	2 C
R08	0113184	180kΩ	2 C
R09	0113220	22Ω ¼W S.R.	2 C
R10	0113102	1.0kΩ	2 C
R11	0113270	27Ω	2 C
R12	0107101	100Ω ¼W C.R.	1, 2 C
R13	0113392	3.9kΩ ¼W S.R.	2 C
R14	0107101	100Ω ¼W C.R.	2 C
R15	0113152	1.5kΩ	2 C
R16	0113152	1.5kΩ	2 C
R17	0113471	470Ω	2 C
R18	0113100	10Ω	2 C
R19	0113101	100Ω	2 C
R20	0113102	1.0kΩ	2 C
R21	0113100	10Ω ¼W S.R.	2 C
R22	0113152	1.5kΩ	2 C
R23	0113821	820Ω	2 C
R24	0113152	1.5kΩ	3 C
R25	0113471	470Ω	3 C
R26	0113100	10Ω	3 C
R27	0113100	10Ω	3 C
R28	0113102	1.0kΩ ¼W S.R.	3 C
R29	0107100	10Ω ¼W C.R.	3 C
R30	0113682	6.8kΩ ¼W S.R.	3 C
R31	0106102	1kΩ	3 C
R32	0106102	1kΩ ¼W C.R.	3 C
R33	0106562	5.6kΩ	3 C
R34	0106562	5.6kΩ	3 C
R35	0113101	100Ω	3 C
R36	0113102	1.0kΩ ¼W S.R.	3 C
R37	0113101	100Ω	3 C
R38	0106331	330Ω	3 C
R39	0106392	3.9kΩ	3 C
R40	0106152	1.5kΩ	3 C
R41	0106471	470Ω ¼W C.R.	3 C
R42	0106331	330Ω	2, 3 C
R43	0106392	3.9kΩ	3 C
R44	0113470	47Ω ¼W S.R.	3 B
R45	0106473	47kΩ	3 C
R46	0106334	330kΩ	3 B
R47	0106392	3.9kΩ	3 B
R48	0106392	3.9kΩ	3 B
R49	0106472	4.7kΩ ¼W C.R.	2, 3 B C
R50	0107393	39Ω	2 B, C
R51	0106105	1MΩ	2 B
R52	0106105	1MΩ	2 C
R53	0106332	3.3kΩ	2 B

Parts No.	Stock No.	Description	Position
R54	0106332	3.3kΩ ¼W C.R.	2 C
R55	0113681	680Ω	2 B, C
R56	0113681	680Ω ¼W S.R.	2 C
R57	0113473	47kΩ	2 C
R58	0113473	47kΩ	2 C
R59	0111561	560Ω ½W S.R.	3 B
R61	0111682	6.8kΩ ½W M.R.	1 C
R62	0113102	1.0kΩ	2 B
R63	0113334	330kΩ	2 B
R64	0113100	10Ω	2 B
R65	0113331	330Ω	2 B
R66	0113101	100Ω	2 B
R67	0113272	2.7kΩ	2 A, B
R68	0113102	1.0kΩ	2 B
R69	0113220	22Ω	2 A, B
R70	0113103	10kΩ	2 A
R71	0113222	2.2kΩ	2 A
R72	0113221	220Ω	2 A
R73	0113102	1kΩ	2, 3 A
R74	0113104	100kΩ ¼W S.R.	3 A
R75	0113222	2.2kΩ	2, 3 A
R76	0113153	15kΩ	3 A
R77	0113471	470Ω	3 A
R78	0113101	100Ω	3 A
R79	0113221	220Ω	3 A
R80	0113470	47Ω	3 A
R81	0113223	22kΩ	3 A
R82	0113472	4.7kΩ	3 A
R83	0113331	330Ω	3 A
R84	0113331	330Ω	3 A
R85	0113103	10kΩ	3 B
R86	0107102	1kΩ ¼W C.R.	3 A, B
R87	0113102	1.0kΩ ¼W S.R.	3 B
R88	0107473	47kΩ ¼W C.R.	3 A, B
R89	0107152	1.5kΩ	3 A, B
R90	0113154	150kΩ	3 B
R91	0113222	2.2kΩ ¼W S.R.	3 B
R92	0113472	4.7kΩ	3 B
R93	0113182	1.8kΩ	3 B
R101, 102	0106222	2.2kΩ	1 A
R103, 104	0106563	56kΩ	1 A
R105, 106	0106104	100kΩ	1 A
R107, 108	0106224	220kΩ	1 A
R109, 110	0106561	560Ω	1 A
R111, 112	0106562	5.6kΩ	1 A
R113, 114	0106331	330Ω	1 A
R115, 116	0106273	27kΩ ¼W C.R.	1 A
R117, 118	0106394	390kΩ	1 A
R119, 120	0106104	100kΩ	2 A
R121, 122	0107681	680Ω	2 A
R125, 126	0107394	390kΩ	1 B
R127, 128	0107104	100kΩ	1 B
R129, 130	0107123	12kΩ	3 B
R131, 132	0107183	18kΩ	3BC. 3C
R601	0106391	220Ω	2 A
L01	4200720	Antenna Coil	1, 2 B
L02	4210340	RF Coil	1, 2 C
L03	4220400	OSC Coil	2 C
L04	4900140	Inductor	1 C
L05	4240720, 1	MPX Coil	3 B, C
L06	4220630	OSC Coil	2 B
L07	4290011	Choke Coil	2 B
L08	4200750	Antenna Coil	2 B
L12	4900220	Inductor	3 B
T01	4235930		1 C
T02	4235750		3 C
T03	4235760		3 C
T04	4235940	IF Coil	3 C
T05	4230550		2 A
T06	4230610		3 A
T07	4230500		3 B
CF01	0910150	Ceramic Filter	2 C
CF02	0910150		2 C
LC01	4240710, 1	MPX Unit	2 B
VR01	1011020, 1	250kΩB×2 Volume	3 C
S01	1101670	Rotary Switch	3 A
S02	1131060, 1	Push Switch	3 B
VT01	1220210	AM-FM VARIABLE CAPACITOR	2 C
TC01	1230090	6pF Trimmer	
J01	2200410	Push (PIN)	1 B
J02	2090030	5P Connector Socket	1 B
	2230120	Push Terminal (Black)	

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

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

Conductor Side



Parts No.	Stock No.	Description	Position
TR01	0305801, 2	2SC1047 (B, C)	1C
TR02	0305790, 1	2SC930 (C, D)	2C
TR03	0306112, 3	2SC738 (C, D)	2C
TR04	0306112, 3	2SC738 (C, D)	2C
TR05	0306112, 3	2SC738 (C, D)	3C
TR06	0306112, 3	2SC738 (C, D)	3C
TR07	0306011, 2	2SC1222 (E, F)	2B
	0306070, 1	2SC1313 (F, G)	
TR08	0306011, 2	2SC1222 (E, F)	2C
	0306070, 1	2SC1313 (F, G)	
TR09	0306241, 2	2SC1675 (L, K)	2B
TR10	0306241, 2	2SC1675 (L, K)	3A
TR11	0306241, 2	2SC1675 (L, K)	3B
TR12	0306241, 2	2SC1675 (L, K)	3B
TR13	0306241, 2	2SC1675 (L, K)	2B
TR15, 16	0306011, 2	2SC1222 (E, F)	1A
	0306070, 1	2SC1313 (F, G)	
TR17, 18	0306011, 2	2SC1222 (E, F)	1A
	0306070, 1	2SC1313 (F, G)	
		Transistor	
IC01	0360120	μpc555H	3C
IC02	0360250	μpc554C	3B
		IC	
FET01	0370171, 2	2SK49 H	1B
	0370182	2SK83 R	
	0370191, 2	2SK61 Y, GR	
		FET	
D01	0311060	1N60-P	3C
D02	0311060	1N60-P	3C
D03	0310330, 1	1N60	3C
D04	0311160	1S2473D	3C
D06	0310330, 1	1N60	3B
D07	0310330, 1	1N60	3A, B
D08	0310330, 1	1N60	3A
D09	0311160	1S2473D	3A
		Diode	
C01	0669350	15pF	2B
C02	0657223	22000pF	1, 2B
C03	0669353	18pF	2C
C04	0657223	22000pF	1, 2C
C05	0661100	10pF	1C
C06	0661100	10pF	1C
C07	0660221	220pF	1, 2C
C08	0669021	1.5pF	1, 2C
C09	0657223	22000pF 50V C.C.	2C
C10	0657223	22000pF	2C
C12	0669345	10pF	2C
C13	0669345	10pF	2C
C14	0669345	10pF	2C
C15	0657223	22000pF	2C
C16	0657223	22000pF	2C
C17	0657223	22000pF	2C
C18	0601397	0.039μF 50V M.C.	2C
C19	0601397	0.039μF	3C
C20	0657223	22000pF	3C
C21	0657223	22000pF	3C
C22	0657223	22000pF	3C
C24	0657473	47000pF 50V C.C.	3C
C25	0660101	100pF	3C
C26	0660101	100pF	3C
C27	0512100	10μF 16V E.C.	3C
C28	0660101	100pF	3C
C29	0660101	100pF	3C
C30	0657223	22000pF	3C
C31	0657223	22000pF 50V C.C.	3C
C32	0657223	22000pF	2C
C33	0657102	1000pF	3C
C34	0513479	4.7μF 25V E.C.	3B, C
C35	0519103	0.47μF 50V E.C.	3B, C
C36	0519103	0.47μF	3B
C37	0629001	6800pF 50V P.C.	3B
C38	0513479	4.7μF 25V E.C.	3B
C39	0601127	0.012μF 50V M.C.	3B
C40	0601127	0.012μF	3B
C41	0515109	1μF 50V E.C.	2B
C42	0515109	1μF	2C
C43	0601226	0.0022μF 50V M.C.	2B
C44	0601226	0.0022μF	2C
C45	0519105	2.2μF 50V E.C.	2B
C46	0519105	2.2μF	2C
C47	0512470	47μF 16V E.C.	2C
C57	0657223	22000pF 50V C.C.	2B
C58	0515109	1μF 50V E.C.	2B
C59	0601227	0.022μF 50V M.C.	2B
C60	0657473	47000pF 50V C.C.	2B
C61	0657223	22000pF	2, 3B
C62	0512100	10μF 16V E.C.	3B
C63	6657223	22000pF	3B
C64	0657223	22000pF 50V C.C.	2A
C65	0657223	22000pF	3B
C66	0601687	0.068μF 50V M.C.	3B
C67	0657473	47000pF 50V C.C.	3B
C68	0657223	22000pF	3B
C69	0601687	0.068μF 50V M.C.	3B
C70	0657473	47000pF 50V C.C.	3B
C71	0512100	10μF 16V E.C.	3A, B
C72	0601157	0.015μF 50V M.C.	3B
C74	0601227	0.022μF	3A
C75	0601107	0.01μF	3A
C76	0601107	0.01μF 50V M.C.	3A
C77	0601127	0.012μF	3A
C78	0601567	0.056μF	3A
C79	0660101	100pF	3B
C80	0657473	47000pF 50V C.C.	3B
C81	0657223	22000pF	3A, B
C82	0515109	1μF 50V E.C.	3A, B
C85	0657473	47000pF 50V C.C.	3A
C87	0601107	0.01μF 50V M.C.	3A
C92	0657223	22000pF 50V C.C.	2A

Parts No.	Stock No.	Description	Position
C93	0512100	10μF 16V E.C.	2A
C101~102	0519104	1.5μF 50V E.C.	1A
C103~104	0660151	150pF 50V C.C.	1A
C105~106	0660151	150pF	1A
C107~108	0510101	100μF 6.3V E.C.	2A
C109~110	0601276	0.0027μF 50V M.C.	1A
C111~112	0601107	0.01μF 50V M.C.	1A
C113~114	0519103	0.47μF 50V E.C.	2A
C115~116	0620471	470pF 50V P.C.	3B
C117~118	0601227	0.022μF 50V M.C.	3B
C601	0514101	100μF 35V E.C.	2A
R01	0113101	100Ω (FET01→2SK61, GR)	1, 2B
	0113180	10Ω (FET01→2SK49, 2SK56, 2SKG1, Y)	
		¼W S.R.	
R02	0113220	22Ω	1B, C
R03	0113220	22Ω	2B
R04	0113123	12kΩ	1, 2C
R05	0113222	2.2kΩ	1, 2C
R06	0113102	1.0kΩ	1, 2C
R07	0107332	3.3kΩ ¼W C.R.	2C
R08	0113184	180kΩ	2C
R09	0113220	22Ω	2C
R10	0113102	1kΩ ¼W S.R.	2C
R11	0113270	27Ω	2C
R12	0107101	100Ω ¼W C.R.	2C
R13	0113392	3.9kΩ ¼W S.R.	2C
R14	0107101	100Ω ¼W C.R.	2C
R15	0113152	1.5kΩ	2C
R16	0113152	1.5kΩ	2C
R17	0113471	470Ω	2C
R18	0113100	10Ω	2C
R19	0113101	100Ω	2C
R20	0113102	1.0kΩ	2C
R21	0113100	10Ω	2C
R22	0113152	1.5kΩ ¼W S.R.	2C
R23	0113821	820Ω	2C
R24	0113152	1.5kΩ	3C
R25	0113471	470Ω	3C
R26	0113100	10Ω	3C
R27	0113100	10Ω	3C
R28	0113102	1.0kΩ	3C
R29	0107100	10Ω ¼W C.R.	3C
R30	0113682	6.8kΩ ¼W S.R.	3C
R31	0106102	1kΩ	3C
R32	0106102	1kΩ ¼W C.R.	3C
R33	0106562	5.6kΩ	3C
R34	0106562	5.6kΩ	3C
R35	0113101	100Ω	3C
R36	0113102	1.0kΩ ¼W S.R.	3C
R37	0113101	100Ω	3C
R38	0106331	330Ω	3C
R39	0106392	3.9kΩ	3C
R40	0106152	1.5kΩ ¼W C.R.	3C
R41	0106471	470Ω	3C
R42	0106331	330Ω	2, 3C
R43	0106392	3.9kΩ	3B
R44	0113470	47Ω ¼W S.R.	3B
R45	0106473	47kΩ	3B, C
R46	0106334	330kΩ	3B
R47	0106392	3.9kΩ	3B
R48	0106392	3.9kΩ	3B
R49	0106472	4.7kΩ ¼W C.R.	2, 3B C
R50	0107393	39kΩ	2B C
R51	0106105	1MΩ	2B
R52	0106105	1MΩ	2C
R53	0106332	3.3kΩ	2B
R54	0106332	3.3kΩ	2C
R55	0113681	680Ω	2B, C
R56	0113681	680Ω ¼W S.R.	2C
R57	0113473	47kΩ	2C
R58	0113473	47kΩ	2C
R64	0113103	10kΩ	2B
R65	0113220	22Ω	2B
R66	0113102	1.0kΩ ¼W S.R.	2B
R67	0113222	2.2kΩ	2B
R68	0113221	220Ω	2A, B
R72	0113221	220Ω	3B
R73	0106222	2.2kΩ ¼W C.R.	3B
R74	0106221	220Ω	3B
R75	0113223	22kΩ	3B
R76	0113472	4.7kΩ ¼W S.R.	3B
R77	0113331	330Ω	3B
R78	0113331	330Ω	3B
R79	0113221	220Ω	3B
R80	0113103	10kΩ	3B
R81	0113102	1.0kΩ	3B
R82	0113102	1.0kΩ	3A, B
R83	0113153	15kΩ	3B
R84	0113473	47kΩ ¼W S.R.	3A
R85	0113154	150kΩ	3B
R86	0113152	1.5kΩ	3B
R87	0113222	2.2kΩ	3B
R88	0113472	4.7kΩ	3A
R89	0113182	1.8kΩ	3A
R90	0113470	47Ω	3A
R97	0113102	1.0kΩ ¼W S.R.	3A
R98	0113101	100Ω	3B
R101, 102	0106222	2.2kΩ	1A
R103, 104	0106563	56kΩ	1A
R105, 106	0106104	100kΩ	1A
R107, 108	0106224	220kΩ ¼W C.R.	1A
R109, 110	0106561	560Ω	1A
R111, 112	0106562	5.6kΩ	1, 2A, 1A
R113, 114	0106331	330Ω	1A
R115, 116	0106273	27kΩ	1A

Parts No.	Stock No.	Description	Position
R117, 118	0106394	390kΩ	1A
R119, 120	0106104	100kΩ	2B, 2A
R121, 122	0106681	680Ω	2A
R125, 126	0107394	390kΩ ¼W C.R.	1B
R127, 128	0107104	100kΩ	1B
R129, 130	0107123	12kΩ	3B
R131, 132	0107183	18kΩ	3B, C, 3C
R601	0106391	390Ω	2A
L01	4200720	Antenna Coil	1, 2B
L02	4210340	RF Coil	1, 2C
L04	4900140	1μF Inductor	1C
L05	4240720, 1	MPX Coil	3B, C
L15	4900220	100μF Inductor	3A
L16	4290011	Choke Coil	2B
T01	4235930	10.7MHz IF Coil	1C
T02	4235750	IF Coil (FM)	3C
T03	4235760	IF Coil (FM)	3C
T04	4235940	10.7MHz IF Coil	3C
T05	4230550	455kHz IF Coil	2B
T06	4230610	455kHz IF Coil	3B
T07	4230500	455kHz IF Coil	3B
CF01	0910150	10.7μHz Ceramic Filter	2C
CF02	0910150		2C
LC01	4240710, 1	MPX Coil	2B, C
VR01	1011020, 1	250kB Volume	3C
S01	1103530	Rotary Switch	3A
S02	1131060, 1	Push Switch	3B
VT01	1220220	AM FM Variable Capacitor	2B, C
TC01	1230090	Trimmer Capatitor	2C
TC02	1230060	Trimmer Capacitor	2A
TC03	1230060		2A
TC05	1230060	Trimmer Capacitor	3A
TC06	1230060		2, 2A
J01	2200410	Pin Terminal	1A, B
J02	2090030	5P Connector Socket	1B
	2230126	Push Terminal (Black)	

331L ONLY

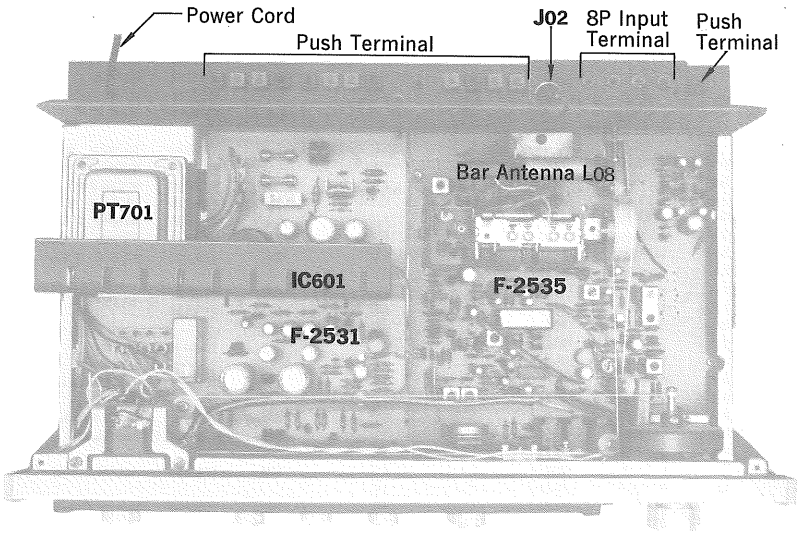
C11	0669356	22pF	2C
C51	0660101	100pF	2C
C52	0657102	1000pF 50V C.C.	2C
C54	0660509	5pF	2A
C55	0660509	5pF	2A
C56	0657473	47000pF	2A
C73	0620562	5600pF 50V P.C.	
C83	0510101	100μF 6.3V E.C.	3A
C84	2512470	47μF 16V E.C.	3A
C86	0660150	10pF 50V C.C.	3A
C88	0669437	6.8pF	2A
C89	0620361	360pF 50V P.C.	2, 3A
C90	0669408	33pF 50V C.C.	2, 3A
C91	0620121	120pF	2, 3A
R59	0200561	560Ω ½W M.R.	2B
R61	0111681	680Ω ½W S.R.	1C
R62	0111472	4.7kΩ ½W C.R.	1C
R63	0103223	22kΩ	2A
R69	0113102	1kΩ	2B
R70	0113104	100kΩ ¼W S.R.	2B
R71	0113471	470Ω	2, 3B
R91	0113272	2.7kΩ	2A, B
R92	0113334	330kΩ	3A
R93	0113331	330Ω ¼W S.R.	3A
R94	0113222	2.2kΩ	3A
R95	0107100	10Ω ¼W C.R.	3A
R96	0113101	100Ω ¼W S.R.	3A
R99	0107101	100Ω ¼W C.R.	3A
L03	4220400	OSC Coil	2C
L07	4200730	Antenna Coil	2A
L08	4200740	Antenna Coil	
L10	4290250	Choke Coil	1C
L11	4230620	455kHz IF Coil	1C
L12	4220630	OSC Coil	2A
L13	4220600	OSC Coil	2A
TC04	1230060	Trimmer Capacitor	2A

331SS ONLY

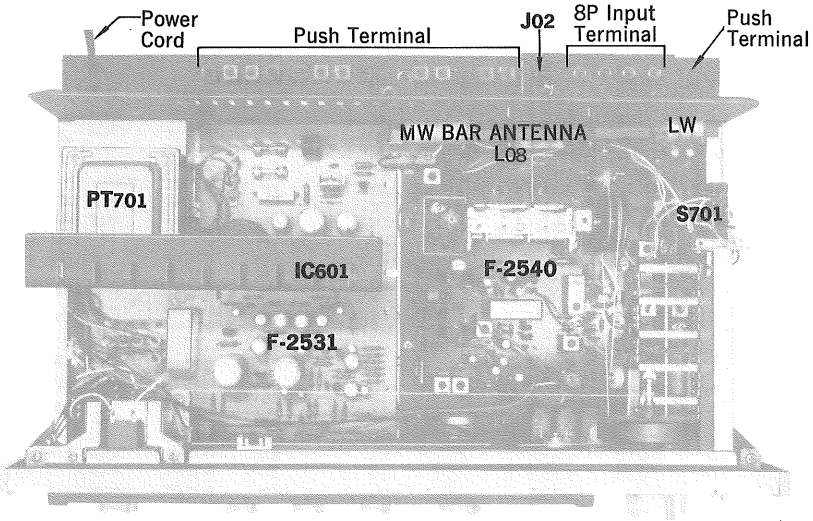
C11	0669350	15pF 50V C.C.	2C
C88	0669425	10pF	2A
C89	0620152	1500pF 50V P.C.	2, 3A
C90	0669472	12pF 50V C.C.	2, 3A
C91	0620332	3300pF 50V P.C.	2, 3A
C94	0657473	47000pF 50V C.C.	2A
R59	0111561	560Ω ½W S.R.	2B
R69	0113122	1.2kΩ	2B
R70	0113124	120kΩ	2B
R71	0113102	1kΩ	2, 3B
R91	0113102	1kΩ ¼W S.R.	2A, B
R92	0113184	180kΩ	3A
R94	0113222	2.2kΩ	3A
L03	4220420	OSC Coil	2C
L06	4200620	Antenna Coil	2A
L07	4200630	Antenna Coil	2A
L12	4220620	OSC Coil	2A
L13	4220610	OSC Coil (SW2)	2A

2-4. Other Parts (Top Side)

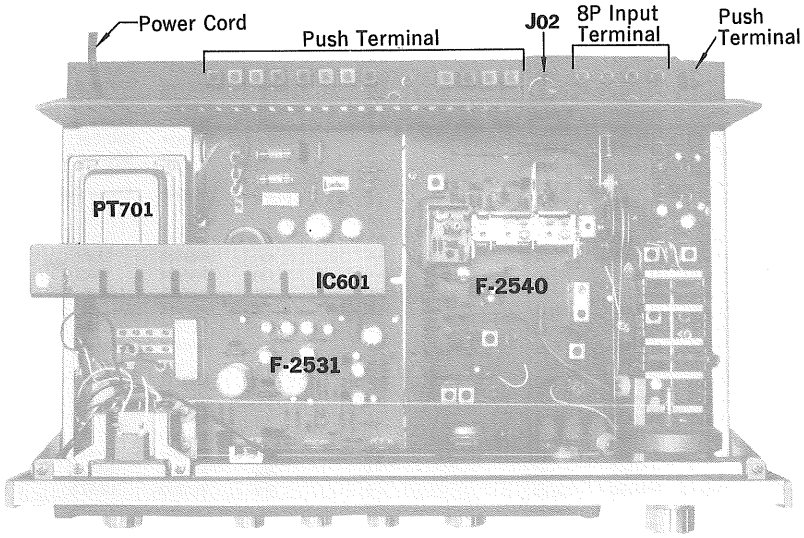
331
221



331L



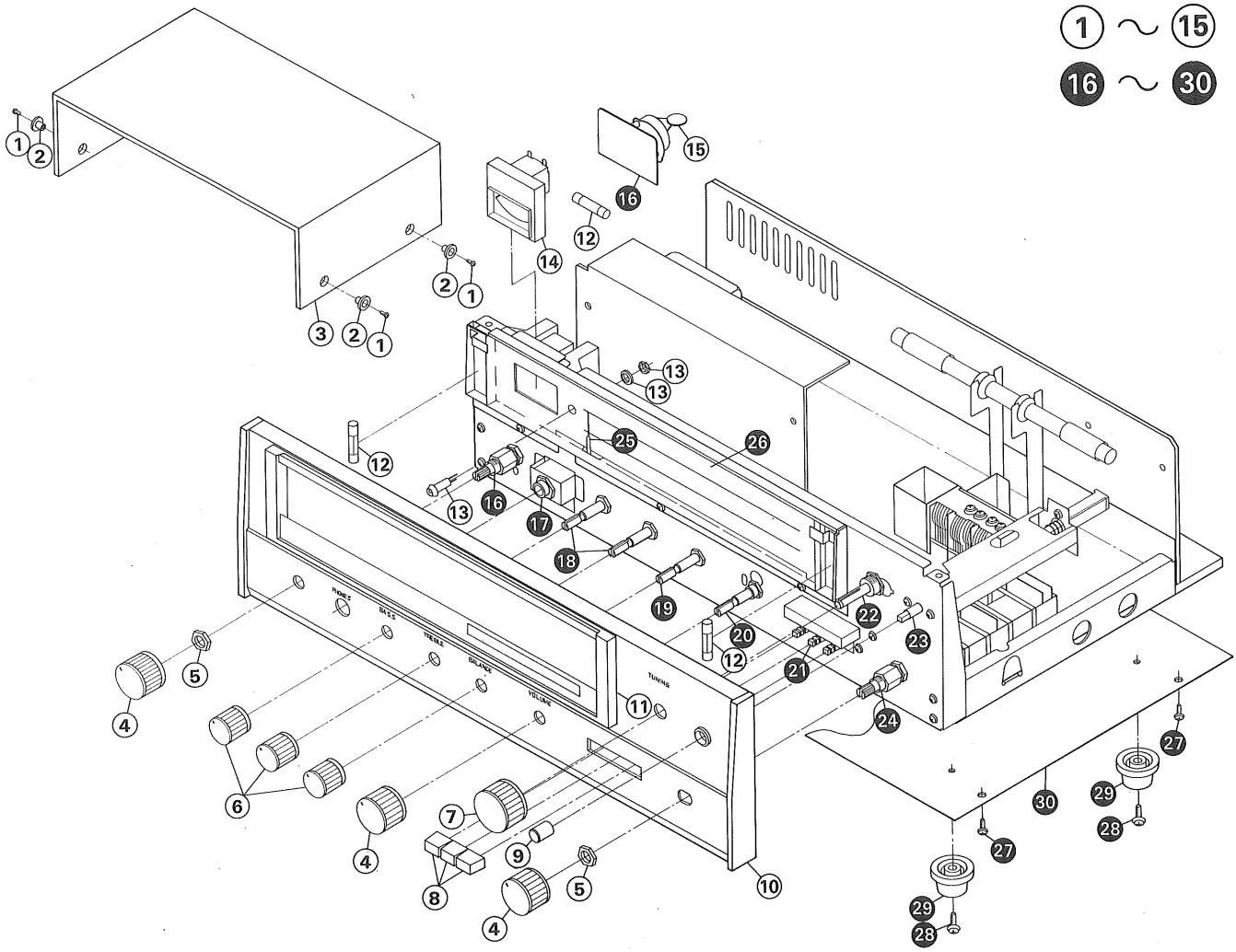
331SS



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)

2-5. Other Parts (Front Side)



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. Net, 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
26	5407871	Dial Scale (331, 221)
	5407881	Dial Scale (331SS)
	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).

Fig. 2

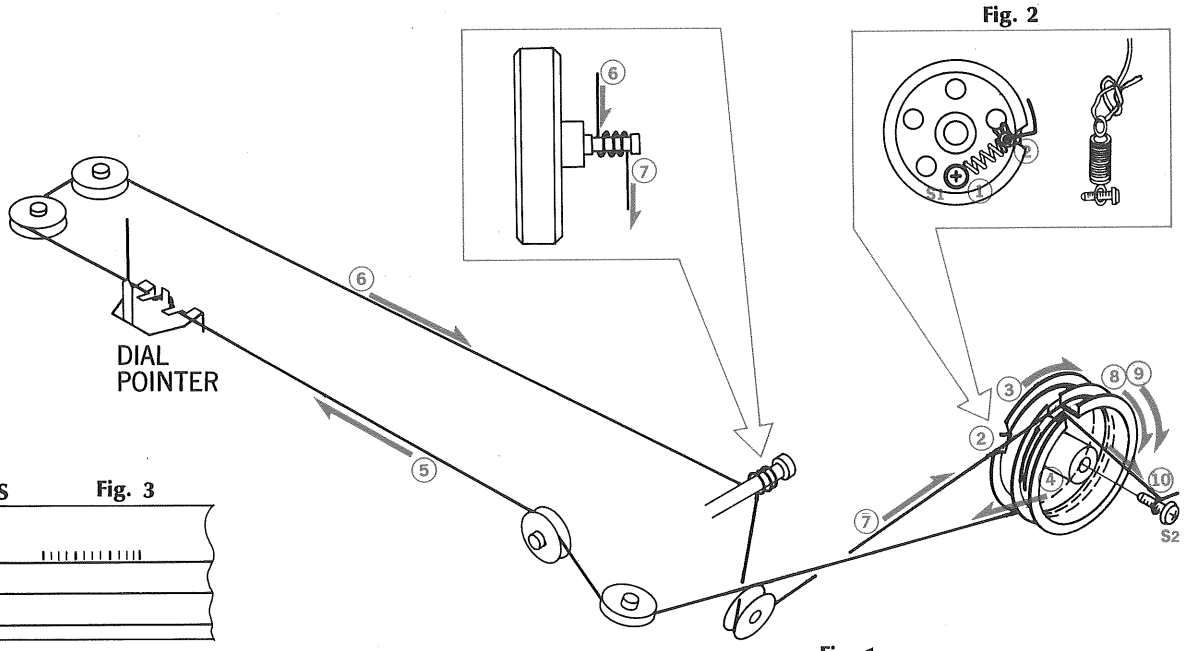
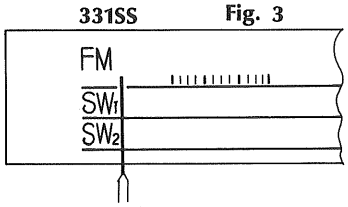
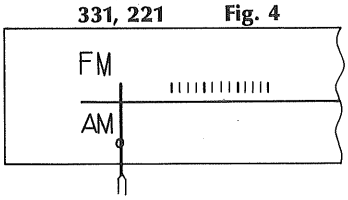


Fig. 1

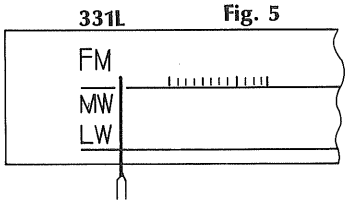
331SS Fig. 3



331, 221 Fig. 4



331L Fig. 5



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 counterclockwies 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.

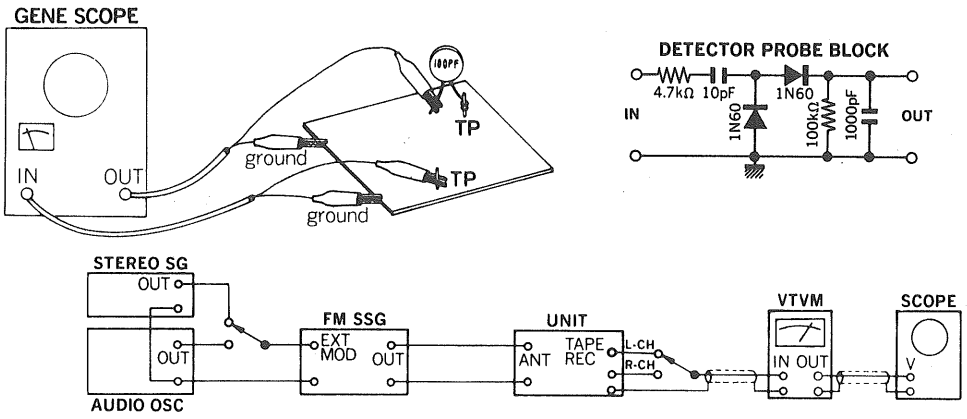
*Confirm that the dial pointer runs smoothly on the dial scale by turning the tuning shaft.

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 genescope to TP01 through 100pF ceramic capacitor



STEP	SUBJECT	STEP	FEED SIGNAL FROM	FEED SIGNAL TO	MEASURE OUTPUT	ADJUST	ADJUST FOR
1.	FM IF Alignment F-2535....Fig. 4-4 F-2540....Fig. 4-5	1. IF Coil	Output 100dB Genescope	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 Genescope	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				VT01f, VT01h 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

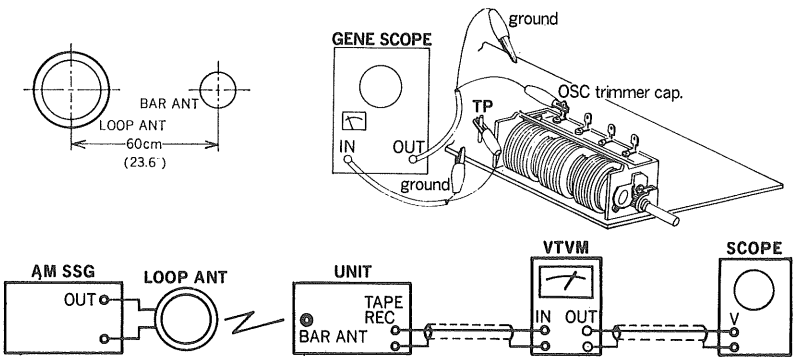
* Signal Meter.....4.3 on Meter (98MHz ANTENNA Input 60dB 400Hz 100% MOD)
Indicator level.....25dB

Abbrebiation

AM Standard Signal Generator	AM SSG
FM Stereo Generator	Stereo SG
Audio Oscillator	Audio OSC
AM FM Generator Oscilloscope	Genescope
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 FROM	FEED SIGNAL TO	MEASURE OUTPUT	ADJUST	ADJUST FOR
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 Calibration SW1 2.5MHz	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
		SW1 6.5MHz				TC05 F-2540	
		SW2 7MHz	ANT Input 60dB 400Hz (30% MOD) AM SSG 7 or 16MHz			L13 F-2540	
		SW2 16 MHz				TC06 F-2540	
		3. RF Adj SW1 2.5MHz	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	MAX
		SW1 6MHz				TC02 F-2540	
		SW2 7MHz	ANT Input 50dB 400Hz (30% MOD) AM SSG 7 or 16MHz			L07 F-2540	
		SW2 16 MHz				TC03 F-2540	

STEP	SUBJECT	STEP	FEED SIGNAL FROM	FEED SIGNAL TO	MEASURE OUTPUT	ADJUST	ADJUST FOR
3.	LW IF, Dial Calibrotion 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
		320kHz				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
		320kHz				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
		320kHz				TC03 F-2540	
		4. 460kHz Dip Filter (Selector MW)	ANT Input 400Hz (30% MOD) AM SSG 100dB 460kHz Dial pointer 1000kHz..MW	LM/MW EXT Bar ANT Terminal	REC OUT L or R-CH VTVM & SCOPE	L10, L11 F-2540	MIN. Output

Fig. 4-1

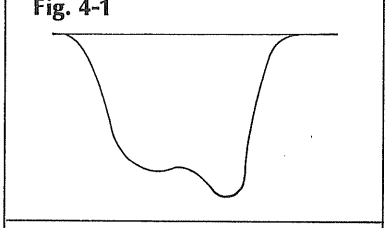


Fig. 4-2

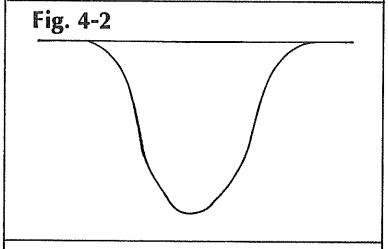
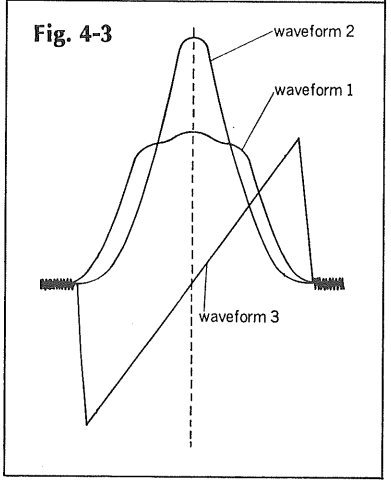


Fig. 4-3



F-2535--------MODEL 331,221

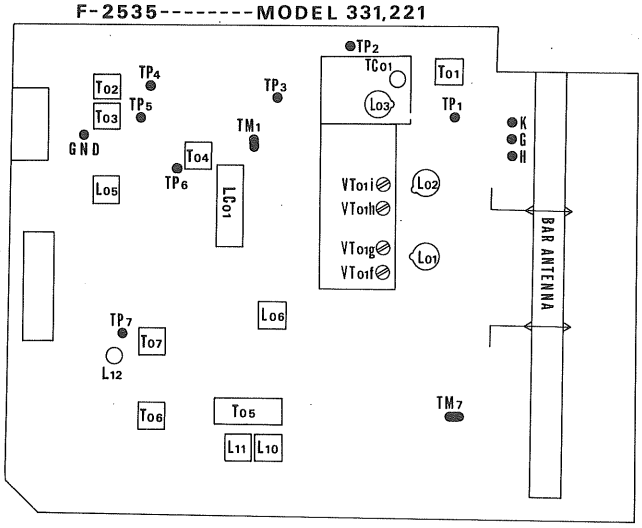


Fig. 4-4

F-2540---------- MODEL 331L,SS

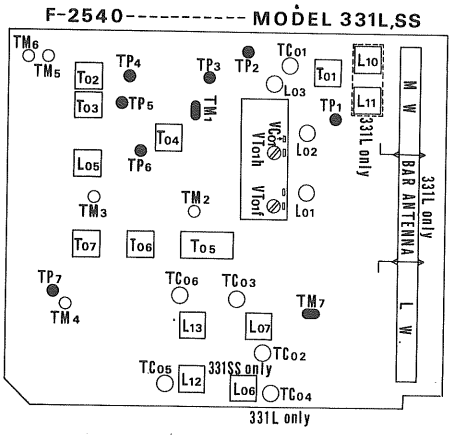


Fig. 4-5

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 Steteo broadcasting	14. 19kHz coll, 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 broadcating 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

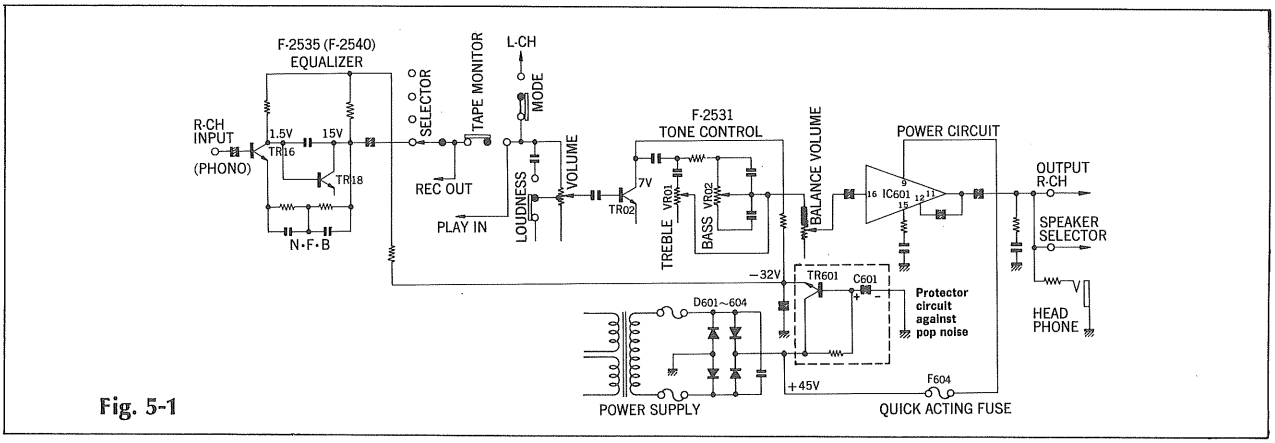


Fig. 5-1

2) Tuner Section AM-FM Block Diagram

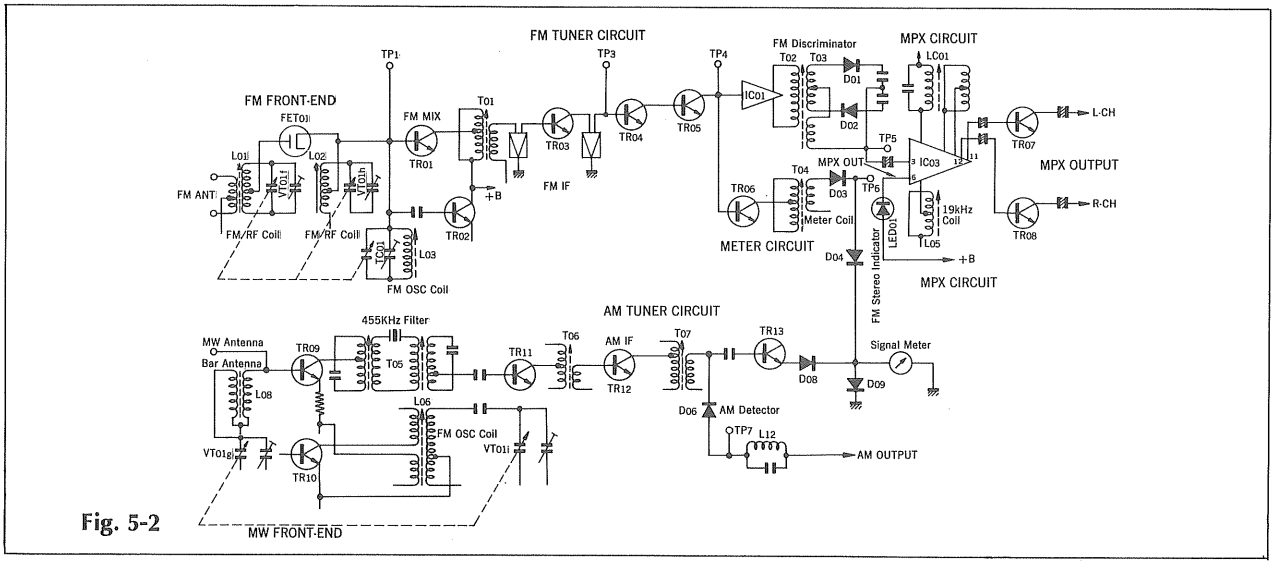
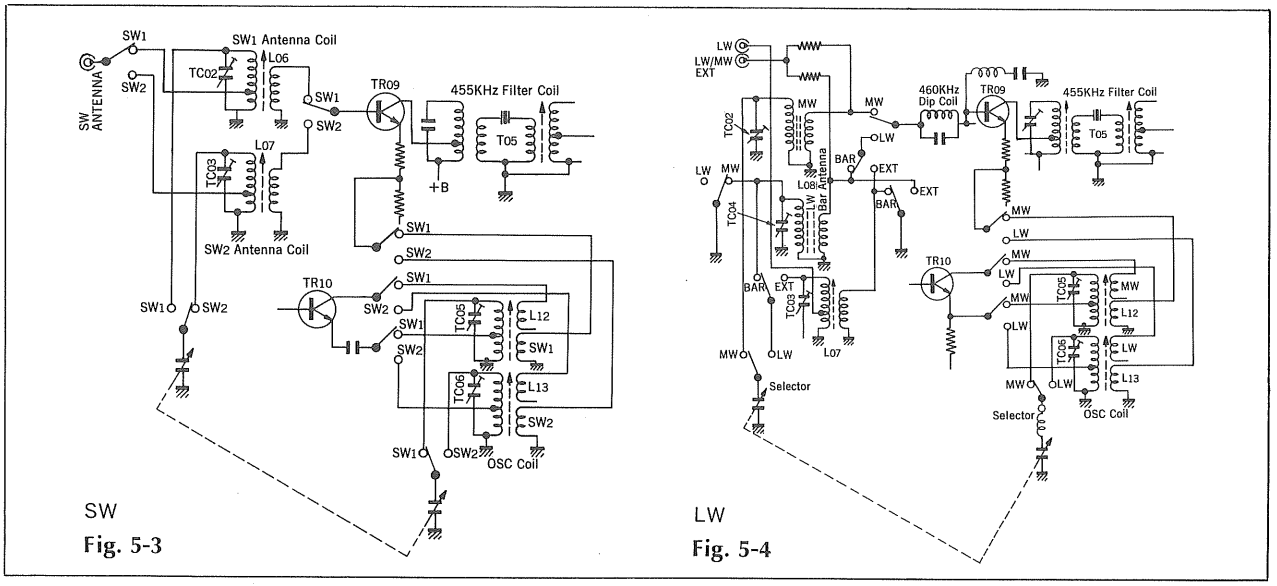


Fig. 5-2

3) SW & LW Front-end Block Diagram



SW

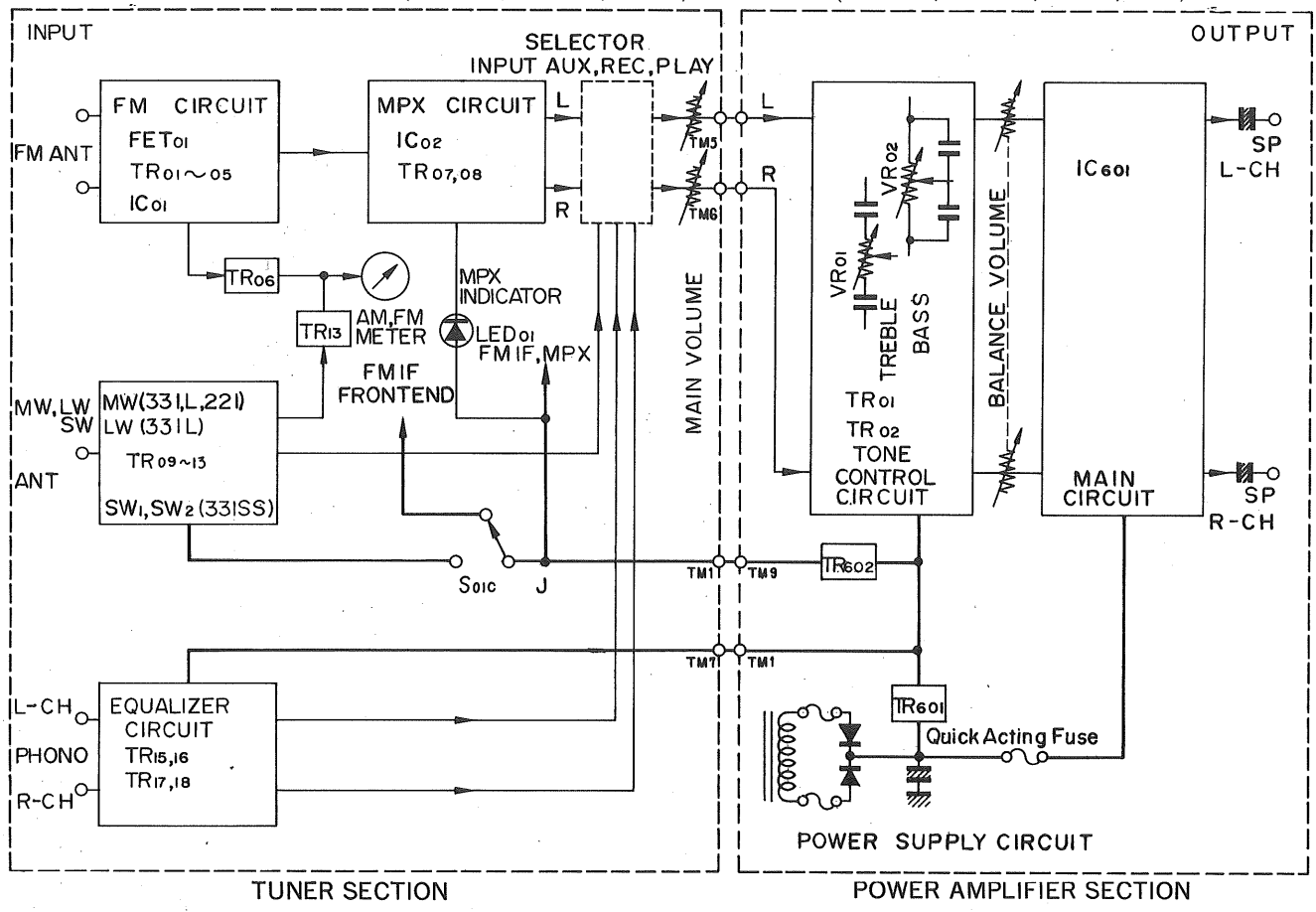
Fig. 5-3

LW

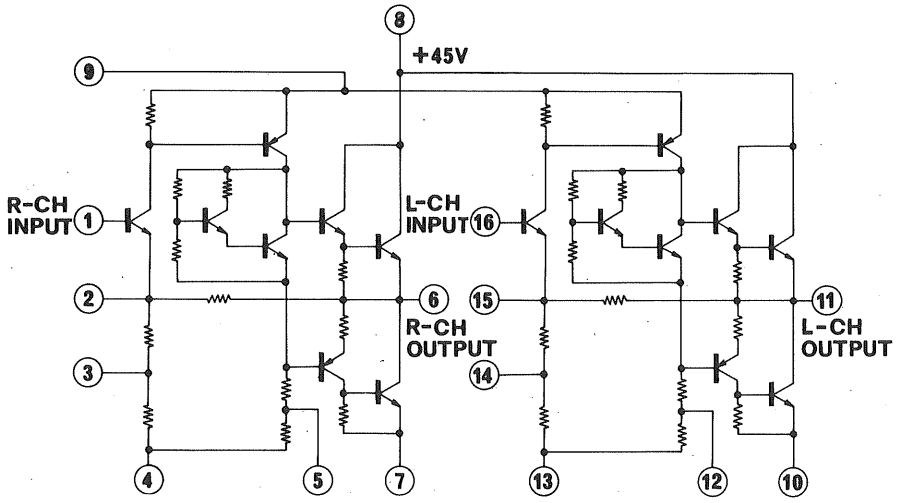
Fig. 5-4

6. BLOCK DIAGRAM

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

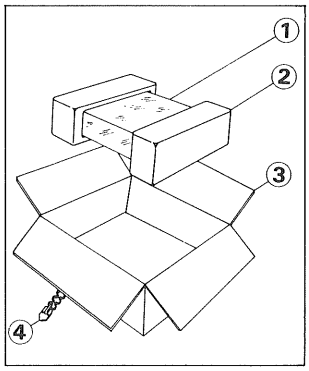


IC STK-014 STK-013 BLOCK DIAGRAM



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)	

Sansui

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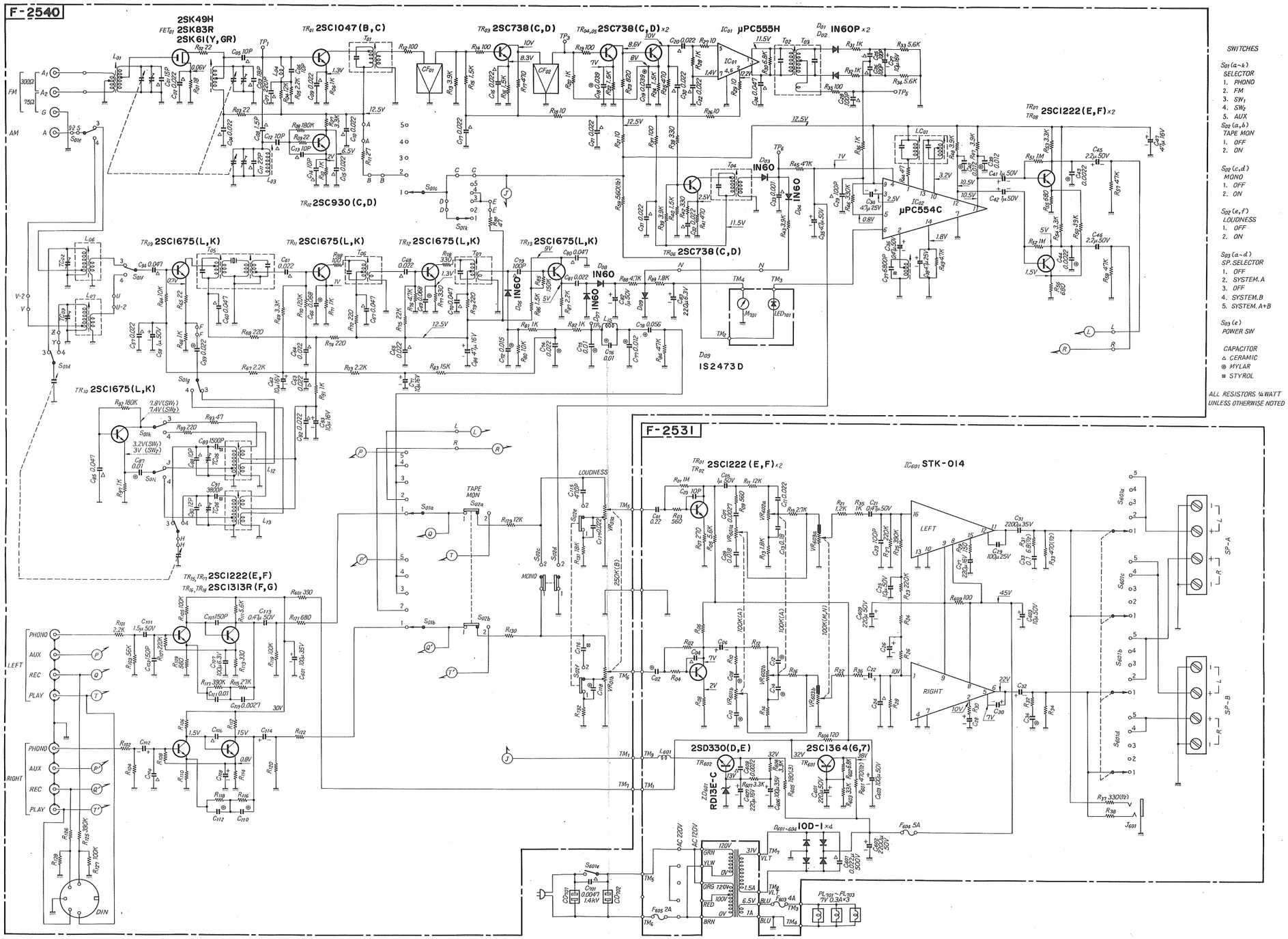
SM043

Printed in Japan (85520M)

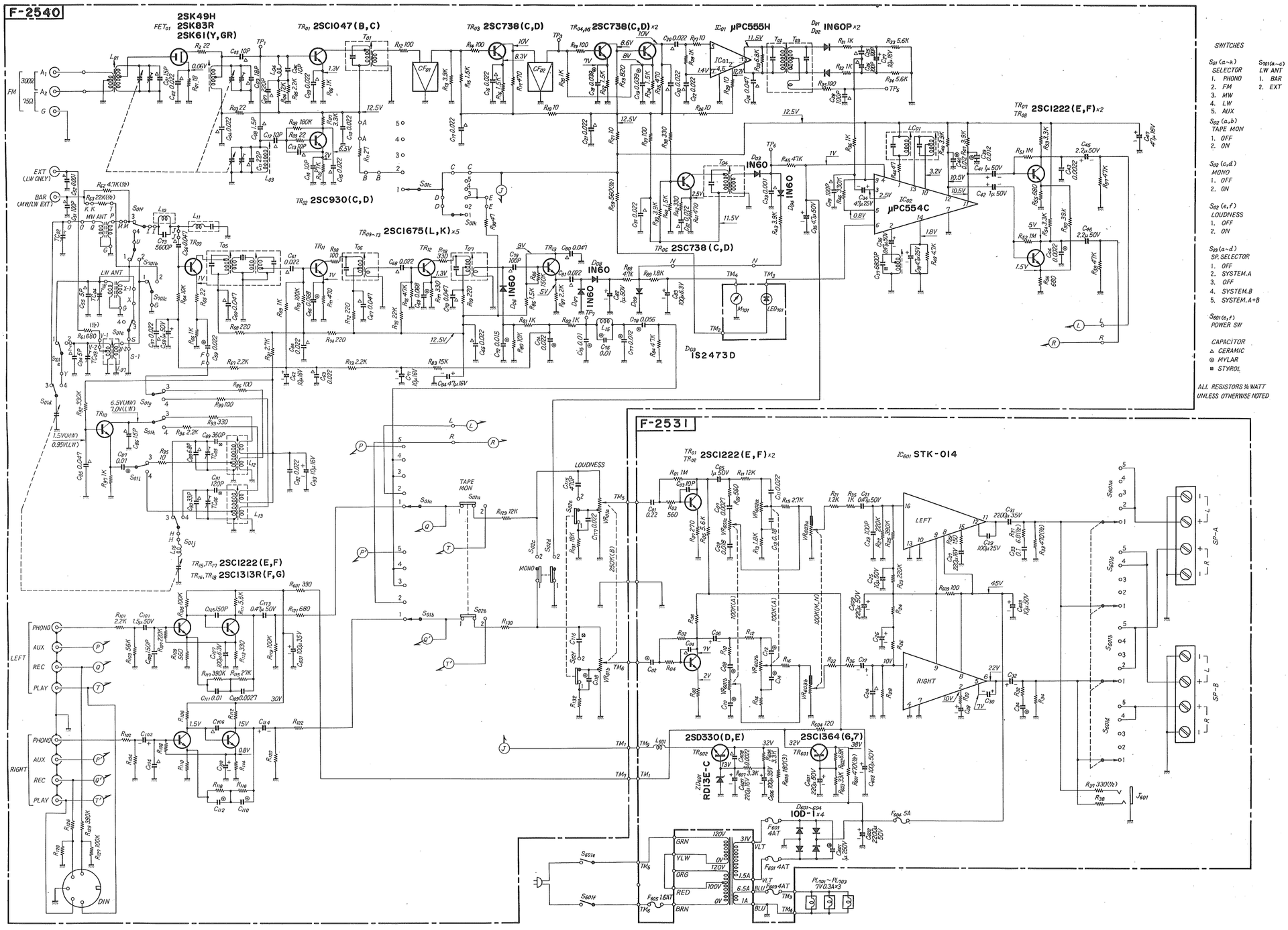
7-4. SANSUI 331SS Schematic Diagram

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



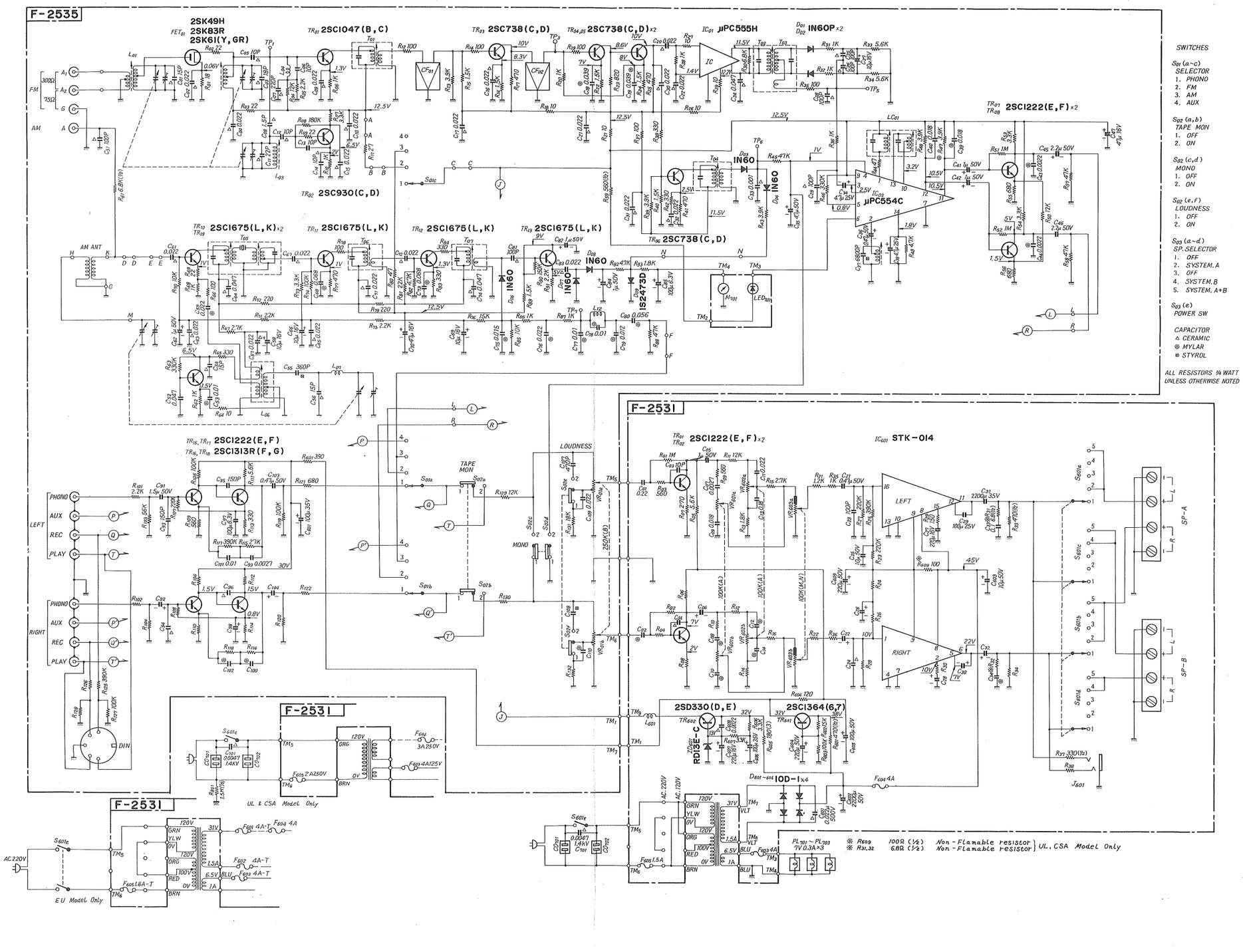
7-3. SANSUI 331L Schematic Diagram

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



7-2. SANSUI 331 Schematic Diagram

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



7. SCHEMATIC DIAGRAM

7-1. SANSUI 221 Schematic Diagram

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