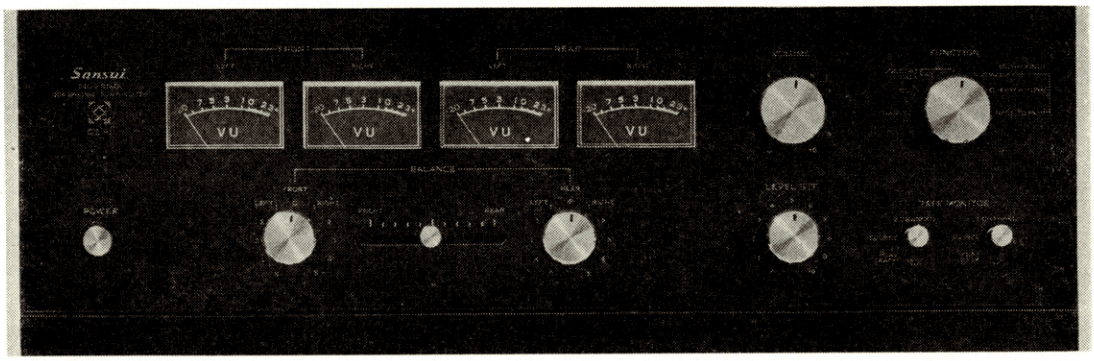
SANSUI ELECTRIC COMPANY LIMITED/14-1, 2-CHOME, IZUMI, SUGINAMI-KU, TOKYO, JAPAN/TELEPHONE: 323-1111/CABLE: SANSUIELEC TOKYO/TELEX: 232-2076

Sansui SERVICE BULLETIN

July 25, 1972
Ref. AN-033

SOLID-STATE QUADPHONIC SYNTHESIZER

SANSUI QS-1



FILE NO. AN-033

This Service Bulletin is designed for service engineers to repair, adjust, and order the replacement parts of the QS-1 correctly.
When ordering the parts, use the stock number and parts name specifically referring to the parts lists.
For general usage and maintenance of the unit, please refer to the Operating Instructions.

CONTENTS

1. SPECIFICATIONS

QS-1

INPUT LEVEL
- RATED INPUT: 2-Channel 130mV (50kΩ)
- MINIMUM INPUT: 2-Channel 90mV
- TAPE MONITOR: 2-Channel 130mV (50kΩ)
  4-Channel 775mV (50kΩ)

OUTPUT LEVEL
- RATED OUTPUT (OVU): 4-Channel 130mV (LOW OUTPUT)
  4-Channel 430mV (HIGH OUTPUT)
- MAXIMUM OUTPUT: 4-Channel 1V (LOW OUTPUT)
  4-Channel 3.5V (HIGH OUTPUT)
- RECORDING OUTPUT: 2-Channel 130mV
  4-Channel 775mV

FREQUENCY RESPONSE
- FRONT-CHANNEL: 20 to 20,000Hz±1dB
- REAR-CHANNEL
  - SOLO: −10dB at 10,000Hz
  - CONCERT HALL-1: 20 to 20,000Hz+1dB, −2dB
  - CONCERT HALL-2 (left): +6dB at 10,000Hz
    (right): +6dB at 50Hz
  - SURROUND: +6dB at 50Hz

SYNTHESIS OF REAR-CHANNEL SIGNALS:
1. SANSUI'S NEW MATRIX SYSTEM
2. PHASE MODULATION SYSTEM

REAR-CHANNEL PHASE MODULATION RANGE:
Max. 180 degrees at 10,000Hz

CONTROLS: VOLUME, LEVEL SET, FRONT BALANCE REAR BALANCE, FRONT AND REAR BALANCE

SWITCHES
- FUNCTION: 2-CHANNEL, SOLO, CONCERT HALL-1, CONCERT HALL-2, SURROUND-NORMAL, SURROUND-QUARTER TURN, SURROUND-HALF TURN
- TAPE MONITOR: 2-Channel SOURCE, PLAY BACK
  4-Channel SOURCE, PLAY BACK

SEMICONDUCTORS:
Transistors: 22 IC: 8 Diodes: 12 Zener Diode: 2

POWER REQUIREMENTS
- POWER VOLTAGE: 100, 117, 220, 240V 50/60Hz
- POWER CONSUMPTION: 12VA

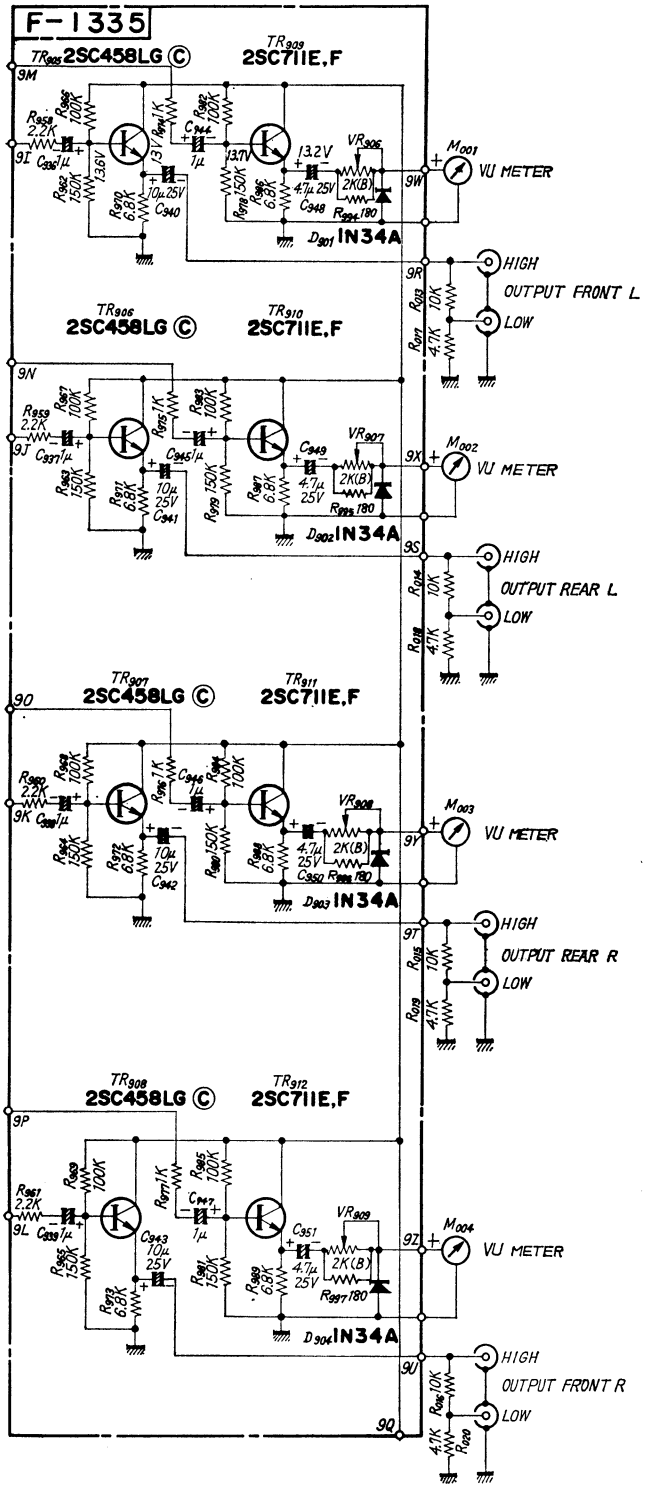
DIMENSIONS: 395mm(15 9/16″)W, 127mm(5″)H, 278mm(10 15/16″)D

WEIGHT: 5.5kg (12.1 lbs.)

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

2. F-1335 Stock No. 7590580 Complete Circuit Board F-1335

2-1. SCHEMATIC DIAGRAM (F-1335)



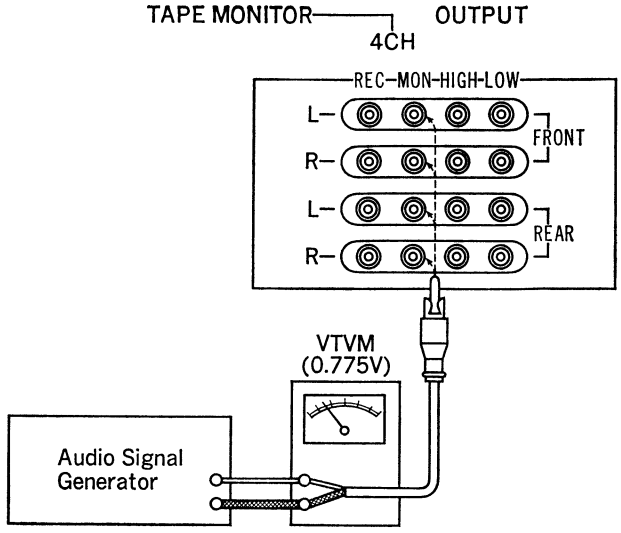
2-2. PARTS LIST (F-1335)

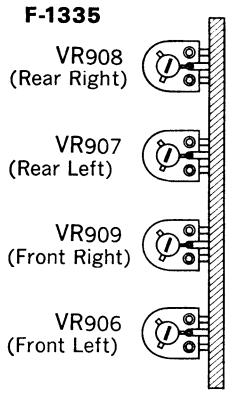
Parts No.	Stock No.	Description
R958	0101222	2.2kΩ ¼W C. Resistor
R959	0101222	2.2kΩ ¼W C. Resistor
R960	0101222	2.2kΩ ¼W C. Resistor
R961	0101222	2.2kΩ ¼W C. Resistor
R962	0101154	150kΩ ¼W C. Resistor
R963	0101154	150kΩ ¼W C. Resistor
R964	0101154	150kΩ ¼W C. Resistor
R965	0101154	150kΩ ¼W C. Resistor
R966	0101104	100kΩ ¼W C. Resistor
R967	0101104	100kΩ ¼W C. Resistor
R968	0101104	100kΩ ¼W C. Resistor
R969	0101104	100kΩ ¼W C. Resistor
R970	0101682	6.8kΩ ¼W C. Resistor
R971	0101682	6.8kΩ ¼W C. Resistor
R972	0101682	6.8kΩ ¼W C. Resistor
R973	0101682	6.8kΩ ¼W C. Resistor
R974	0101102	1kΩ ¼W C. Resistor
R975	0101102	1kΩ ¼W C. Resistor
R976	0101102	1kΩ ¼W C. Resistor
R977	0101102	1kΩ ¼W C. Resistor
R978	0101154	150kΩ ¼W C. Resistor
R979	0101154	150kΩ ¼W C. Resistor
R980	0101154	150kΩ ¼W C. Resistor
R981	0101154	150kΩ ¼W C. Resistor
R982	0101104	100kΩ ¼W C. Resistor
R983	0101104	100kΩ ¼W C. Resistor
R984	0101104	100kΩ ¼W C. Resistor
R985	0101104	100kΩ ¼W C. Resistor
R986	0101682	6.8kΩ ¼W C. Resistor
R987	0101682	6.8kΩ ¼W C. Resistor
R988	0101682	6.8kΩ ¼W C. Resistor
R989	0101682	6.8kΩ ¼W C. Resistor
R994	0101181	180Ω ¼W C. Resistor
R995	0101181	180Ω ¼W C. Resistor
R996	0101181	180Ω ¼W C. Resistor
R997	0101181	180Ω ¼W C. Resistor
C936	0515109	1μF 50V El. Capacitor
C937	0515109	1μF 50V El. Capacitor
C938	0515109	1μF 50V El. Capacitor
C939	0515109	1μF 50V El. Capacitor
C940	0513100	10μF 25V El. Capacitor
C941	0513100	10μF 25V El. Capacitor
C942	0513100	10μF 25V El. Capacitor
C943	0513100	10μF 25V El. Capacitor
C944	0515109	1μF 50V El. Capacitor
C945	0515109	1μF 50V El. Capacitor
C946	0515109	1μF 50V El. Capacitor
C947	0515109	1μF 50V El. Capacitor
C948	0513479	4.7μF 25V El. Capacitor
C949	0513479	4.7μF 25V El. Capacitor
C950	0513479	4.7μF 25V El. Capacitor
C951	0513479	4.7μF 25V El. Capacitor
D901	031040	IN34A
D902	031040	IN34A
D903	031040	IN34A
D904	031040	IN34A
TR905	0305311	2SC458 LG ©
TR906	0305311	2SC458 LG ©
TR907	0305311	2SC458 LG ©
TR908	0305311	2SC458 LG ©

Resistor: Carbon Resistor ⟶ C. Resistor
Capacitor: Electrolytic Capacitor ⟶ El. Capacitor

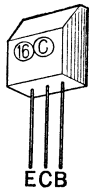
Parts No.	Stock No.	Description
TR909	030573-1 030573-2	2SC711E, F
TR910	030573-1 030573-2	2SC711E, F
TR911	030573-1 030573-2	2SC711E, F
TR912	030573-1 030573-2	2SC711E, F
VR906	1031070	2kΩ (B) Semi-Variable Resistor
VR907	1031070	2kΩ (B) Semi-Variable Resistor
VR908	1031070	2kΩ (B) Semi-Variable Resistor
VR909	1031070	2kΩ (B) Semi-Variable Resistor

VU METER CIRCUIT ADJUSTMENT

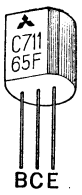




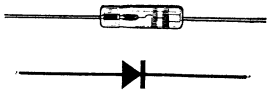
2SC458LG



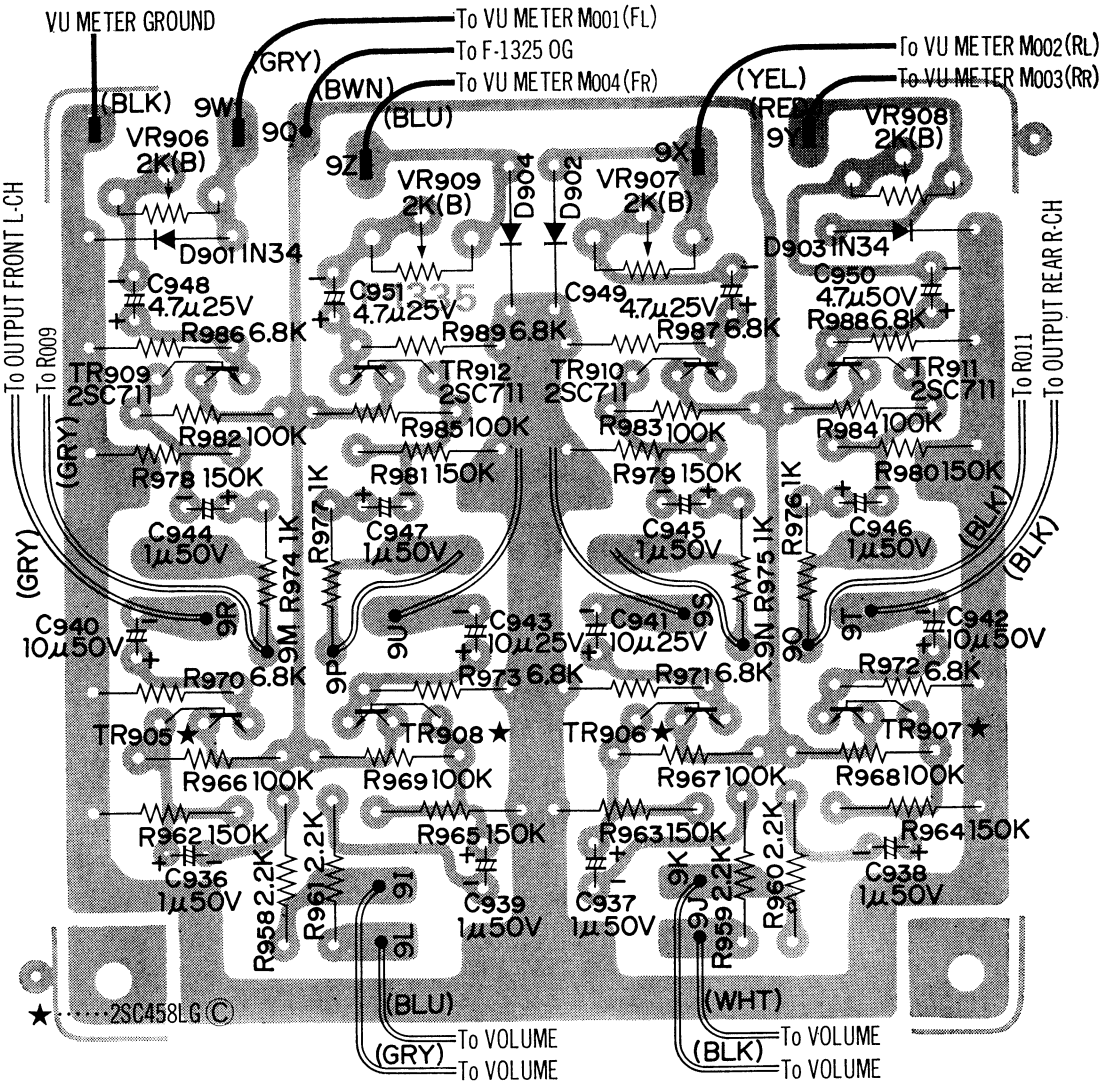
2SC711



IN60, IN34A



2-3. PARTS LOCATION (F-1335 Conductor Side)



9P	BUL	TO R_{012}
9U	BUL	TO OUTPUT FRONT R-CH
9S	WHT	TO OUTPUT REAR L-CH
9N	WHT	TO R_{010}

2-4. ADJUSTMENT PROCEDURE FOR VU METER CIRCUIT

Set QS-1 as follows prior to starting adjustment.

1. 4-CH. TAPE MONITOR.....PLAY BACK
2. VOLUME .....MAXIMUM
3. MAIN BALANCE .....CENTER
4. FRONT BALANCE.....CENTER
5. REAR BALANCE .....CENTER

1) Connect the output of an audio signal generator with terminal FRONT L-CH of 4-CH Tape Monitor and VTVM.

2) Adjust the output of the audio signal generator (sine wave, 1KHz) in such a way that the indicated value of VTVM is 0.775V (0 dB).

3) Adjust VR_{906} of F-1335 in such a way that the indicated value of VU Meter (FRONT, LEFT) is 0 VU.

4) Adjust other 3 VU meters in the same manner as described hereabove.

Audio Signal Input (0.775V)	Adjusting Point	VU METER
4-CH. TAPE MONITOR FRONT-R.	F-1335 VR_{909}	FRONT, RIGHT
4-CH. TAPE MONITOR REAR-L.	F-1335 VR_{907}	REAR, LEFT
4-CH. TAPE MONITOR REAR-R.	F-1335 VR_{903}	REAR, RIGHT

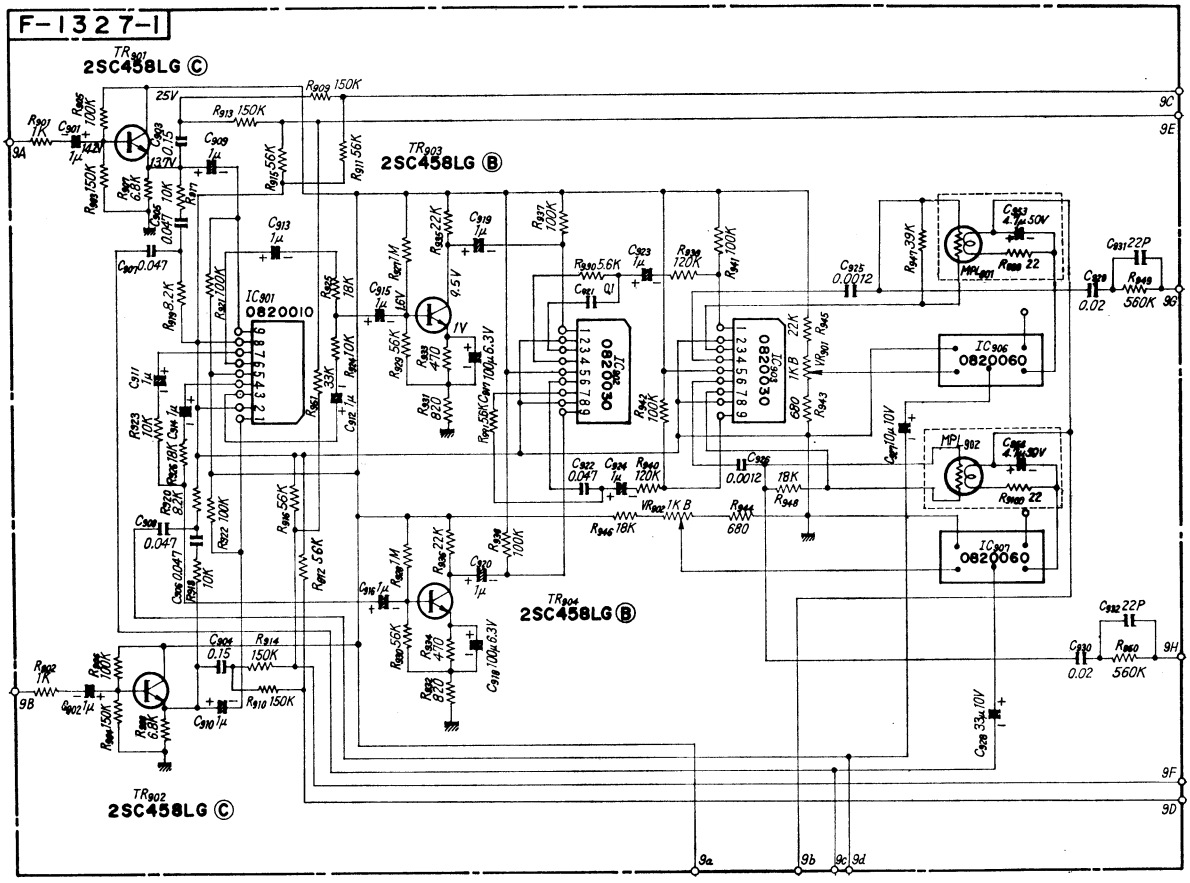
3. F-1327-1 (F-1327)

Stock No. 7590610 Complete Circuit Board F-1327-1
Stock No. 7591130 Complete Circuit Board F-1327

QS-1

1. IC (0820050) is adopted within ⬚ in case of F-1327. Incidentally, STOCK NO. of IC is 0820050.
2. In case of the board is F-1327-1, as IC (0820050) can not be mounted in board, it can not be used.
3. In case of the board is F-1327, as CdS lamp MCL-706 (MPL_{901}, MPL_{902}), 4.7μF 50V (C_{953}, C_{954}) and 22Ω (R_{999}, R_{9100}) can not be mounted in the board, it can not be used.
4. Mounted F-1327 and F-1327-1 can be interchanged completely.

3-1. SCHEMATIC DIAGRAM (F-1327-1)



3-2. PARTS LIST(F-1327-1)

This is the parts list for F-1327-1. IC (0820050) has been adopted within ⬚ in the circuit diagram in case of F-1327.

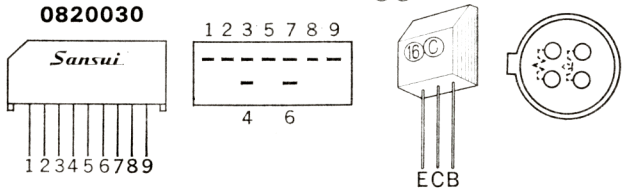
Parts No.	Stock No.	Description
R901	0101102	1kΩ ¼W C. Resistor
R902	0101102	1kΩ ¼W C. Resistor
R903	0101154	150kΩ ¼W C. Resistor
R904	0101154	150kΩ ¼W C. Resistor
R905	0101104	100kΩ ¼W C. Resistor
R906	0101104	100kΩ ¼W C. Resistor
R907	0101682	6.8kΩ ¼W C. Resistor
R908	0101682	6.8kΩ ¼W C. Resistor
R909	0101154	150kΩ ¼W C. Resistor
R910	0101154	150kΩ ¼W C. Resistor
R911	0101563	56kΩ ¼W C. Resistor
R912	0101563	56kΩ ¼W C. Resistor
R913	0101154	150kΩ ¼W C. Resistor
R914	0101154	150kΩ ¼W C. Resistor
R915	0101563	56kΩ ¼W C. Resistor
R916	0101563	56kΩ ¼W C. Resistor
R917	0101103	10kΩ ¼W C. Resistor
R918	0101103	10kΩ ¼W C. Resistor
R919	0101822	8.2kΩ ¼W C. Resistor

Parts No.	Stock No.	Description
R920	0101822	8.2kΩ ¼W C. Resistor
R921	0101104	100kΩ ¼W C. Resistor
R922	0101104	100kΩ ¼W C. Resistor
R923	0101103	10kΩ ¼W C. Resistor
R924	0101333	33kΩ ¼W C. Resistor
R925	0101183	18kΩ ¼W C. Resistor
R926	0101183	18kΩ ¼W C. Resistor
R927	0101105	1MΩ ¼W C. Resistor
R928	0101105	1MΩ ¼W C. Resistor
R929	0101563	56kΩ ¼W C. Resistor
R930	0101563	56kΩ ¼W C. Resistor
R931	0101821	820Ω ¼W C. Resistor
R932	0101821	820Ω ¼W C. Resistor
R933	0101471	470Ω ¼W C. Resistor
R934	0101471	470Ω ¼W C. Resistor
R935	0101223	22kΩ ¼W C. Resistor
R936	0101223	22kΩ ¼W C. Resistor
R937	0101104	100kΩ ¼W C. Resistor
R938	0101104	100kΩ ¼W C. Resistor

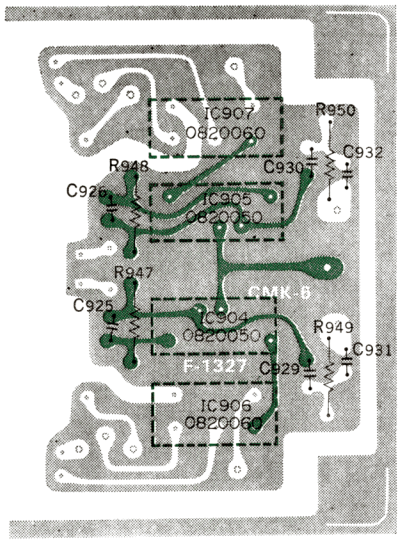
Resistor: Carbon Resistor ⟶ C. Resistor
Capacitor: Electrolytic Capacitor ⟶ El. Capacitor

Parts No.	Stock No.	Description
R939	0101124	120kΩ ¼W C. Resistor
R940	0101124	120kΩ ¼W C. Resistor
R941	0101104	100kΩ ¼W C. Resistor
R942	0101104	100kΩ ¼W C. Resistor
R943	0101391	390Ω ¼W C. Resistor
R944	0101681	680Ω ¼W C. Resistor
R945	0101223	22kΩ ¼W C. Resistor
R946	0101183	18kΩ ¼W C. Resistor
R947	0101393	39kΩ ¼W C. Resistor
R948	0101393	39kΩ ¼W C. Resistor
R949	0101564	560kΩ ¼W C. Resistor
R950	0101564	560kΩ ¼W C. Resistor
R990	0101562	5.6kΩ ¼W C. Resistor
R991	0101562	5.6kΩ ¼W C. Resistor
R999	0101220	22Ω ¼W C. Resistor
R9100	0101220	22Ω ¼W C. Resistor
C901	0515109	1μF 50V El. Capasitor
C902	0515109	1μF 50V El. Capasitor
C903	0601158	0.15μF 50V Mylar Capacitor
C904	0601158	0.15μF 50V Mylar Capacitor
C905	0601477	0.047μF 50V Mylar Capacitor
C906	0601477	0.047μF 50V Mylar Capacitor
C907	0601477	0.047μF 50V Mylar Capacitor
C908	0601477	0.047μF 50V Mylar Capacitor
C909	0515109	1μF 50V El. Capasitor
C910	0515109	1μF 50V El. Capasitor
C911	0515109	1μF 50V El. Capasitor
C912	0515109	1μF 50V El. Capasitor
C913	0515109	1μF 50V El. Capasitor
C914	0515109	1μF 50V El. Capasitor
C915	0515109	1μF 50V El. Capasitor
C916	0515109	1μF 50V El. Capasitor
C917	0510101	100μF 6.3V El. Capasitor
C918	0510101	100μF 6.3V El. Capasitor
C919	0515109	1μF 50V El. Capasitor
C920	0515109	1μF 50V El. Capacitor
C921	0601108	0.1μF 50V Mylar Capacitor
C922	0601477	0.047μF 50V Mylar Capacitor
C923	0515109	1μF 50V El. Capasitor
C924	0515109	1μF 50V El. Capasitor
C925	0601306	0.03μF 50V Mylar Capacitor
C926	0601306	0.03μF 50V Mylar Capacitor
C927	0511100	10μF 10V El. Capasitor
C928	0511330	33μF 10V El. Capasitor
C929	0601207	0.02μF 50V Mylar Capacitor
C930	0601207	0.02μF 50V Mylar Capacitor
C931	0660220	22pF 50V Ceramic Capacitor
C932	0660220	22pF 50V Ceramic Capacitor
C953	0515479	4.7μF 50V El. Capasitor
C954	0515479	4.7μF 50V El. Capasitor
MPL901	0920021	MCL-706
MPL902	0920021	MCL-706
TR901	0305311	2SC458LG©
TR902	0305311	2SC458LG©
TR903	0505310	2SC458LGⒷ
TR904	0305310	2SC458LGⒷ
IC901	0820010	0820010
IC902	0820030	0820030
IC903	0820030	0820030
IC906	0820060	0820060
IC907	0820060	0820060
VR901	1031050	1kΩ(B) Semi-Variable Resistor
VR902	1031050	1kΩ(B) Semi-Variable Resistor

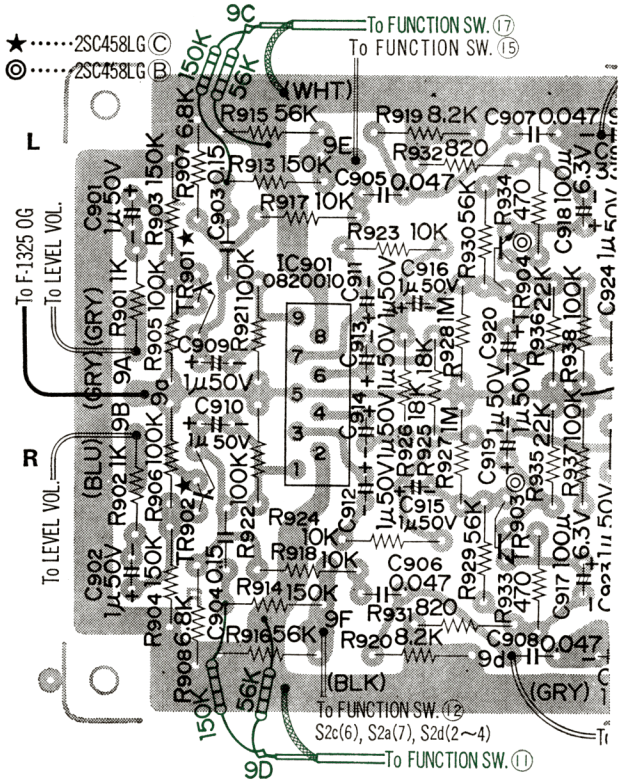
0820020 0820010 0820030 | **0820011 0820031** | **2SC458LG** Ⓑ© | **MCL-706**



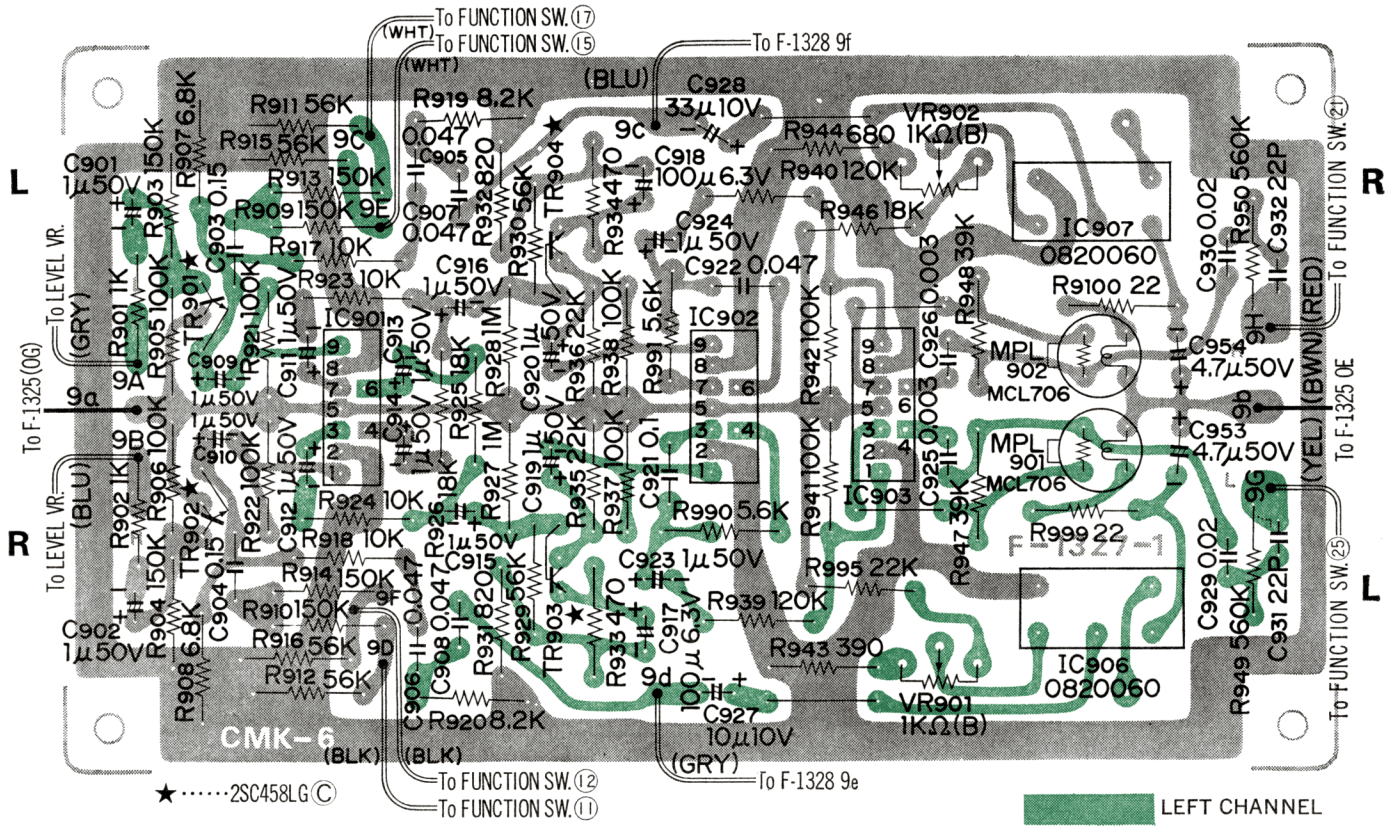
As for the difference between F-1327 and F-1327-1, as IC (0820050) is adopted for the parts within ▭ in the circuit diagram of F-1327-1, the pattern will be as follows.



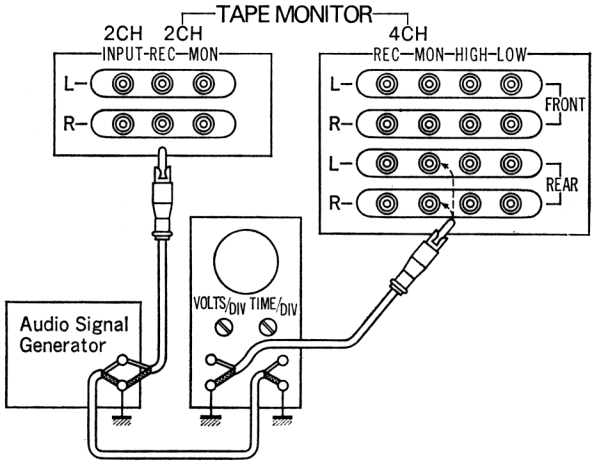
In case of F-1327-1 (F-1327) is not in stock, F-1331 can be used in the following manner.



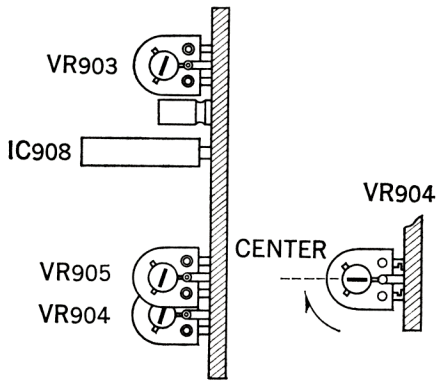
3-3. PARTS LOCATION (F-1327-1 Conductor Side)



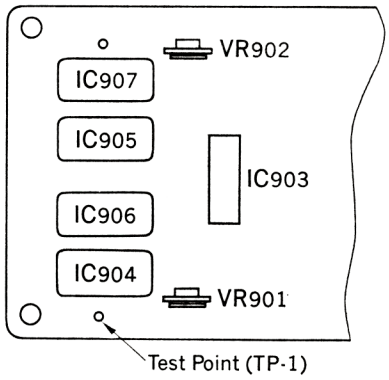
PHASE MODULATOR CIRCUIT ADJUSTMENT



F-1328 (Refer to page 15 for the details of F-1328



F-1327



3-4. ADJUSTMENT PROCEDURE FOR PHASE MODULATOR CIRCUIT

Be sure to carry out the aging operation continuously for more than 5 minutes before adjustment. (The purpose of this aging operation lies in correct adjustment of the phase modulator circuit.)

Set QS-1 as follows prior to starting adjustment.

1. FUNCTION .....CONCERT HALL 1
2. 4-CH. TAPE MONITOR .....SOURCE
3. 2-CH. TAPE MONITOR .....SOURCE
4. MAIN BALANCE .....CENTER
5. REAR BALANCE .....CENTER
6. Turn VR_{901} and VR_{902} on F-1327-1 (F-1327, F-1331), also VR_{903}, VR_{904} and VR_{905} on F-1328 counterclockwise.

1. Adjustment of REAR L-CH

1) Connect a DC voltmeter with the test point TP-1 of F-1327-1 (F-1327, F-1331) and adjust VR_{901} of F-1327-1 (F-1327, F-1331) in such a way that the indicated value of the DC voltmeter is 60mV to 100mV.

2) Add the output of the audio signal generator (sine wave, 12KHz) to the L-CH of 2-CH INPUT and horizontal axis of an oscilloscope.

3) Change over the TIME/DIV of the oscilloscope to "EXT".

4) Connect the terminal REAR L-CH (OUTPUT, HIGH) of QS-1 with the vertical axis of the oscilloscope.

5) Adjust the VOLTS/DIV of the oscilloscope, VOLUME and LEVEL SET of QS-1 in such a way that such a waveform as shown in Fig. 3-1 appears in the oscilloscope.

6) Adjust VR_{903} (8Hz output adjustment) of F-1328 (8Hz oscillator) in such a way that such a symmetrical waveform as shown in Fig. 3-2 can be obtained.

2. Adjustment of REAR R-CH

1) Add the output of the audio signal generator (sine wave, 18KHz) to R-CH of 2-CH INPUT and the horizontal axis of the oscilloscope.

2) Change over the TIME/DIV of the oscilloscope to "EXT".

3) Connect the REAR R-CH (OUTPUT, HIGH) terminal of QS-1 with the vertical axis of the oscilloscope.

4) Adjust the VOLTS/DIV of the oscilloscope, VOLUME and LEVEL SET of QS-1 in such a way that such a waveform as shown in Fig. 3-3 appears in the oscilloscope.

5) As VR_{902} of F-1327-1 (F-1327, F-1331) is turned, the waveform in Fig. 3-4 is changed as indicated with an arrow mark ⟶ e.g. 1, 2, 3, 4, 5 and 6.

Adjust VR_{902} to such a position that the waveform in 3 is maintained before turning to waveform in 4. ($B/A \simeq 1/5$)

6) Turn VR_{904} (for variation of frequency) of F-1328 up to its central position.

7) Turn VR_{905} (for adjustment of beat output) of F-1328 gradually and adjust it in such a way that such a waveform as shown in Fig. 3-5 can be obtained.

8) Turn VR_{904} of F-1328 slightly and adjust it in such a way that the cycle in change of waveform of ① and ② as shown in Fig. 3-5 is one second.

Fig. 3-1 Fig. 3-2 Fig. 3-3 Fig. 3-5

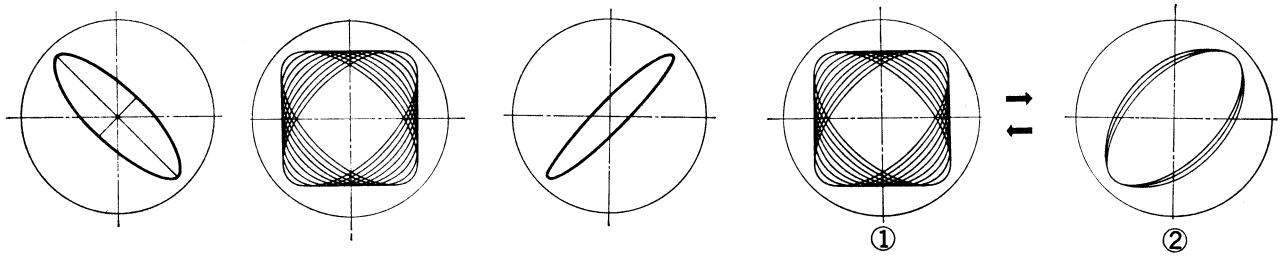
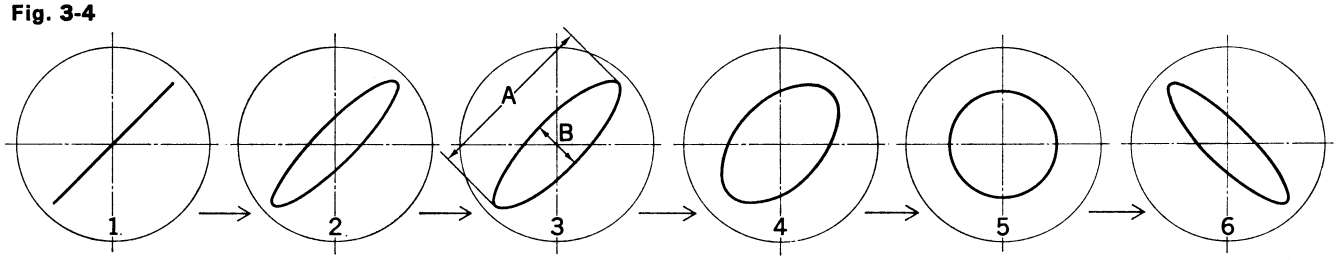
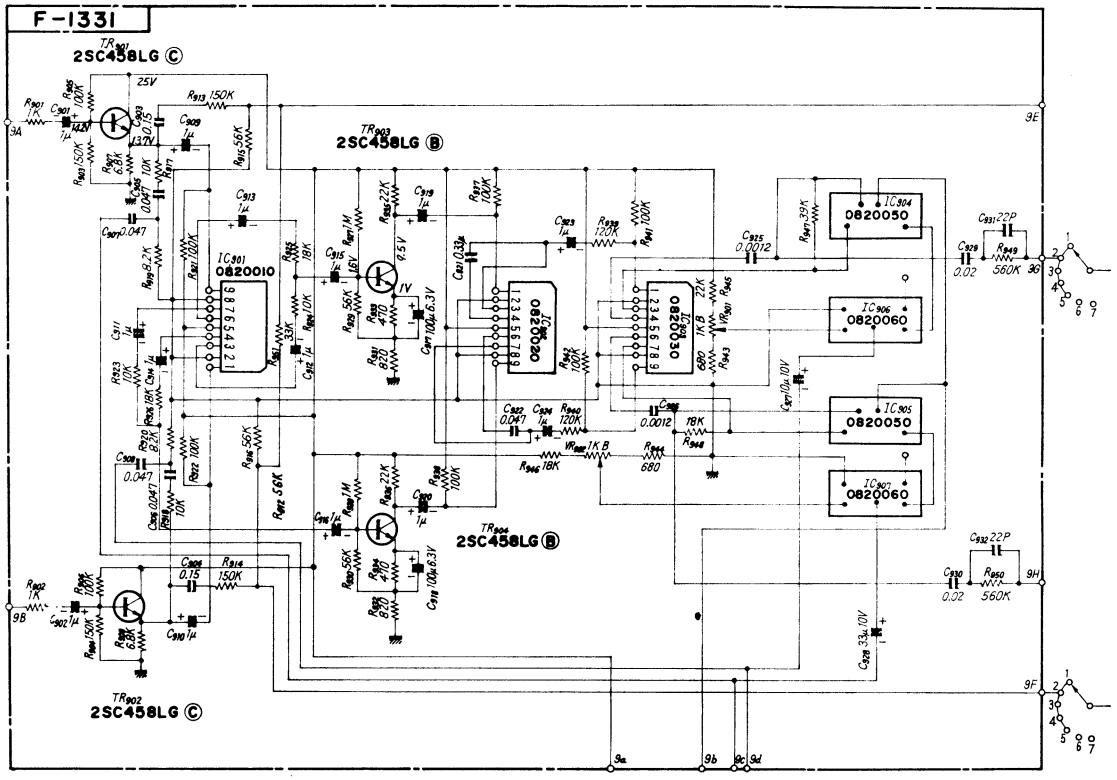


Fig. 3-4



4. F-1331 Stock No. 7590570 Complete Circuit Board F-1331 QS-1

4-1. SCHEMATIC DIAGRAM (F-1331)

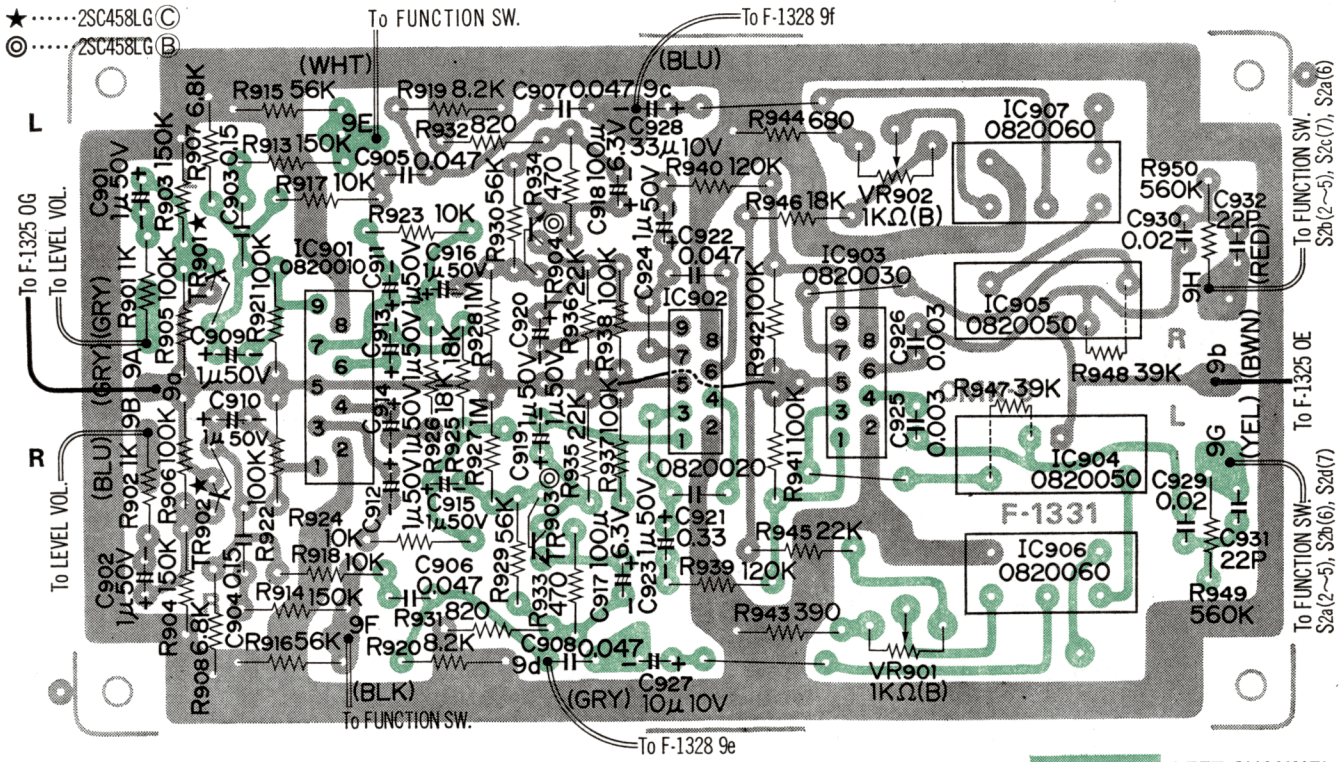


4-2. PARTS LIST (F-1331)

Resistor: Carbon Resistor → C. Resistor
Capacitor: Electrolytic Capacitor → El. Capacitor

Parts No.	Stock No.	Description
R901	0101102	1kΩ ¼W C. Resistor
R902	0101102	1kΩ ¼W C. Resistor
R903	0101154	150kΩ ¼W C. Resistor
R904	0101154	150kΩ ¼W C. Resistor
R905	0101104	100kΩ ¼W C. Resistor
R906	0101104	100kΩ ¼W C. Resistor
R907	0101682	6.8kΩ ¼W C. Resistor
R908	0101682	6.8kΩ ¼W C. Resistor
R913	0101154	150kΩ ¼W C. Resistor
R914	0101154	150kΩ ¼W C. Resistor
R915	0101563	56kΩ ¼W C. Resistor
R916	0101563	56kΩ ¼W C. Resistor
R917	0101103	10kΩ ¼W C. Resistor
R918	0101103	10kΩ ¼W C. Resistor
R919	0101822	8.2kΩ ¼W C. Resistor
R920	0101822	8.2kΩ ¼W C. Resistor
R921	0101104	100kΩ ¼W C. Resistor
R922	0101104	100kΩ ¼W C. Resistor
R923	0101103	10kΩ ¼W C. Resistor
R924	0101333	33kΩ ¼W C. Resistor
R925	0101183	18kΩ ¼W C. Resistor
R926	0101183	18kΩ ¼W C. Resistor
R927	0101105	1MΩ ¼W C. Resistor
R928	0101105	1MΩ ¼W C. Resistor
R929	0101563	56kΩ ¼W C. Resistor
R930	0101563	56kΩ ¼W C. Resistor
R931	0101821	820Ω ¼W C. Resistor
R932	0101821	820Ω ¼W C. Resistor
R933	0101471	470Ω ¼W C. Resistor
R934	0101471	470Ω ¼W C. Resistor
R935	0101223	22kΩ ¼W C. Resistor
R936	0101223	22kΩ ¼W C. Resistor
R937	0101104	100kΩ ¼W C. Resistor
R938	0101104	100kΩ ¼W C. Resistor
R939	0101124	120kΩ ¼W C. Resistor
R940	0101124	120kΩ ¼W C. Resistor
R941	0101104	100kΩ ¼W C. Resistor
R942	0101104	100kΩ ¼W C. Resistor
R943	0101391	390Ω ¼W C. Resistor
R944	0101681	680Ω ¼W C. Resistor
R945	0101223	22kΩ ¼W C. Resistor
R946	0101183	18kΩ ¼W C. Resistor
R947	0101393	39kΩ ¼W C. Resistor
R948	0101393	39kΩ ¼W C. Resistor
R949	0101564	560kΩ ¼W C. Resistor
R950	0101564	560kΩ ¼W C. Resistor
C901	0515109	1μF 50V El. Capacitor
C902	0515109	1μF 50V El. Capacitor
C903	0601158	0.15μF 50V Mylar Capacitor
C904	0601158	0.15μF 50V Mylar Capacitor
C905	0601477	0.047μF 50V Mylar Capacitor
C906	0601477	0.047μF 50V Mylar Capacitor
C907	0601477	0.047μF 50V Mylar Capacitor
C908	0601477	0.047μF 50V Mylar Capacitor
C909	0515109	1μF 50V El. Capacitor
C910	0515109	1μF 50V El. Capacitor
C911	0515109	1μF 50V El. Capacitor
C912	0515109	1μF 50V El. Capacitor
C913	0515109	1μF 50V El. Capacitor
C914	0515109	1μF 50V El. Capacitor
C915	0515109	1μF 50V El. Capacitor
C916	0515109	1μF 50V El. Capacitor
C917	0510101	100μF 6.3V El. Capacitor

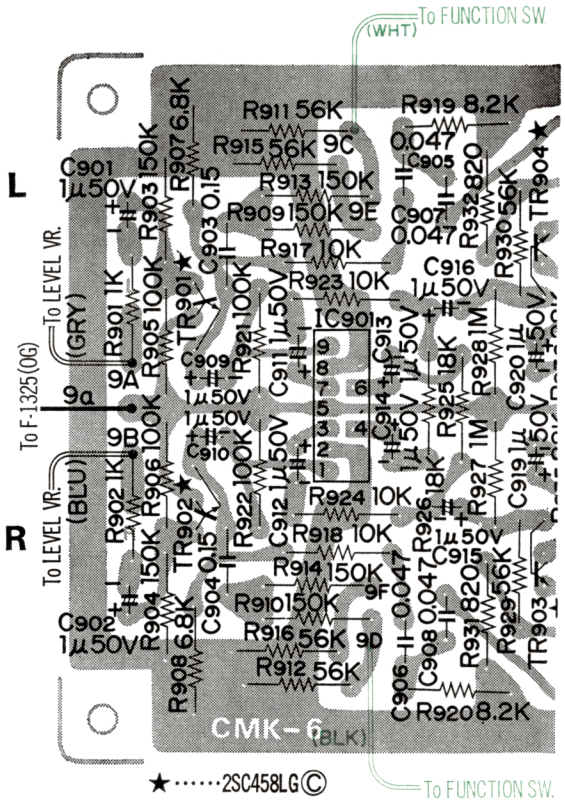
4-3. PARTS LOCATION (F-1331 Conductor Side)



Note: Refer to 3-4 in page 10 for the details of the adjustment procedure.

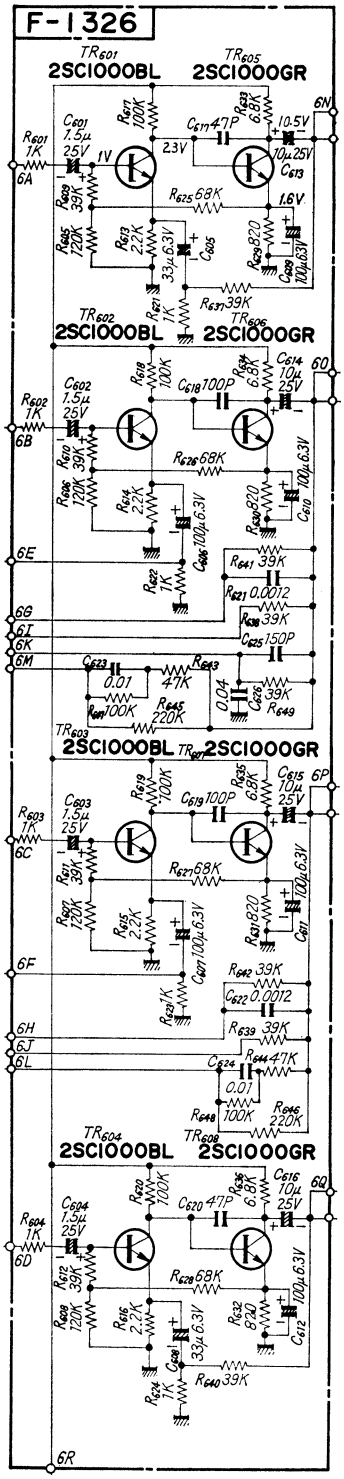
Parts No.	Stock No.	Description
C918	0510101	100μF 6.3V El. Capacitor
C919	0515109	1μF 50V El. Capacitor
C920	0515109	1μF 50V El. Capacitor
C921	0601338	0.33μF 50V Mylar Capacitor
C922	0601477	0.047μF 50V Mylar Capacitor
C923	0515109	1μF 50V El. Capacitor
C924	0515109	1μF 50V El. Capacitor
C925	0601306	0.03μF 50V Mylar Capacitor
C926	0601306	0.03μF 50V Mylar Capacitor
C927	0511100	10μF 10V El. Capacitor
C928	0511330	33μF 10V El. Capacitor
C929	0601207	0.02μF 50V Mylar Capacitor
C930	0601207	0.02μF 50V Mylar Capacitor
C931	0660220	22pF 50V Ceramic Capacitor
C932	0660220	22pF 50V Ceramic Capacitor
TR901	0305311	2SC458LG©
TR902	0305311	2SC458LG©
TR903	0305310	2SC458LG®
TR904	0305310	2SC458LG®
IC901	0820010	0820010
IC902	0820020	0820020
IC903	0820030	0820030
IC904	0820050	0820050
IC905	0820050	0820050
IC906	0820060	0820060
IC907	0820060	0820060
VR901	1031050	1kΩ(B) Semi-Variable Resistor
VR902	1031050	1kΩ(B) Semi-Variable Resistor

In case of F-1331 is not in stock, F-1327-1 (F-1327) can be used in the following manner.



5. F-1326 Stock No. 7550210 Complete Circuit Board F-1326

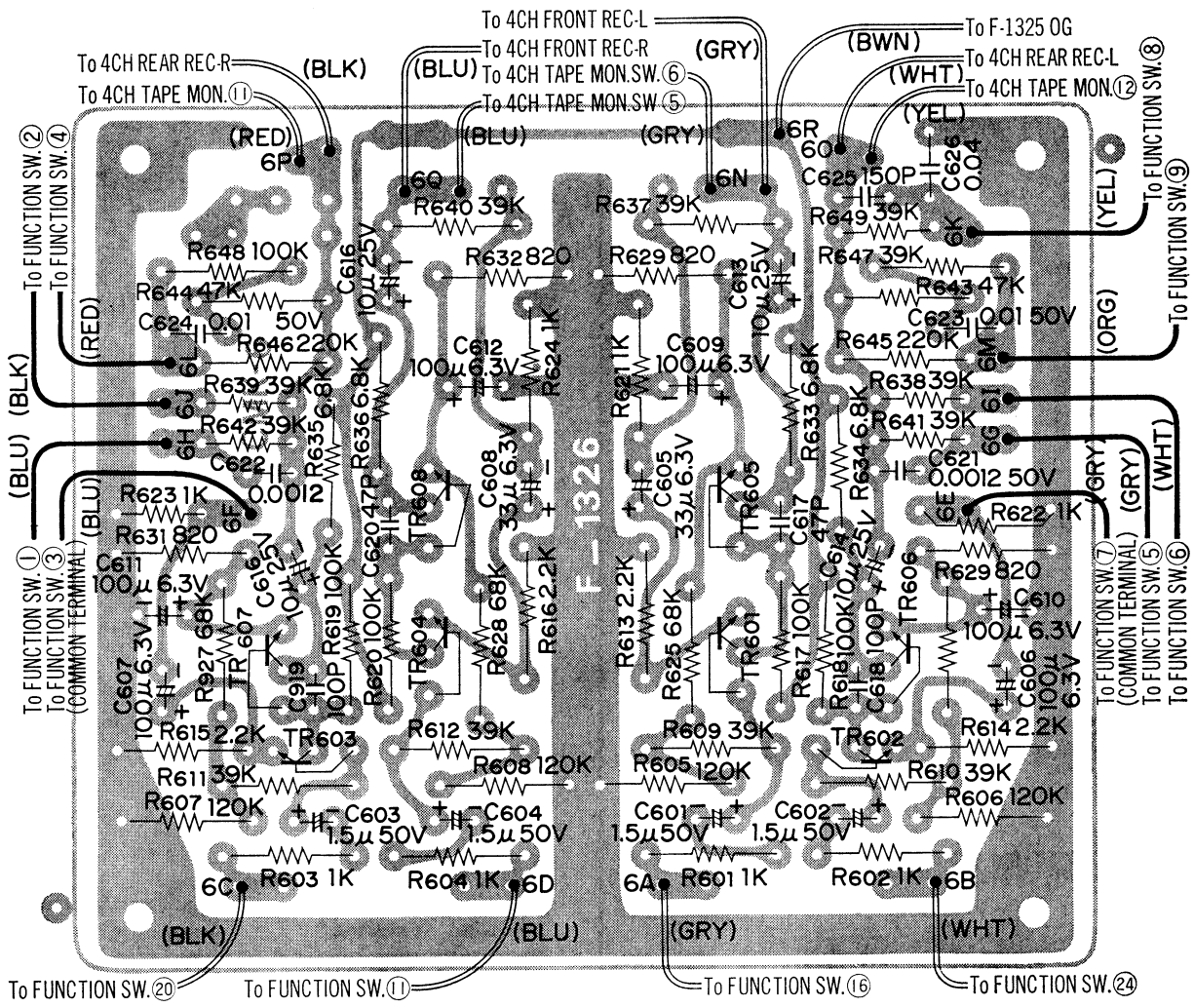
5-1. SCHEMATIC DIAGRAM (F-1326)



5-2. PARTS LIST (F-1326)

Parts No.	Stock No.	Description
R601	0101102	1kΩ ¼W C. Resistor
R602	0101102	1kΩ ¼W C. Resistor
R603	0101102	1kΩ ¼W C. Resistor
R604	0101102	1kΩ ¼W C. Resistor
R605	0101124	120kΩ ¼W C. Resistor
R606	0101124	120kΩ ¼W C. Resistor
R607	0101124	120kΩ ¼W C. Resistor
R608	0101124	120kΩ ¼W C. Resistor
R609	0101393	39kΩ ¼W C. Resistor
R610	0101393	39kΩ ¼W C. Resistor
R611	0101393	39kΩ ¼W C. Resistor
R612	0101393	39kΩ ¼W C. Resistor
R613	0101222	2.2kΩ ¼W C. Resistor
R614	0101222	2.2kΩ ¼W C. Resistor
R615	0101222	2.2kΩ ¼W C. Resistor
R616	0101222	2.2kΩ ¼W C. Resistor
R617	0101104	100kΩ ¼W C. Resistor
R618	0101104	100kΩ ¼W C. Resistor
R619	0101104	100kΩ ¼W C. Resistor
R620	0101104	100kΩ ¼W C. Resistor
R621	0101102	1kΩ ¼W C. Resistor
R622	0101102	1kΩ ¼W C. Resistor
R623	0101102	1kΩ ¼W C. Resistor
R624	0101102	1kΩ ¼W C. Resistor
R625	0101683	68kΩ ¼W C. Resistor
R626	0101683	68kΩ ¼W C. Resistor
R627	0101683	68kΩ ¼W C. Resistor
R628	0101683	68kΩ ¼W C. Resistor
R629	0101821	820Ω ¼W C. Resistor
R630	0101821	820Ω ¼W C. Resistor
R631	0101821	820Ω ¼W C. Resistor
R632	0101821	820Ω ¼W C. Resistor
R633	0101682	6.8kΩ ¼W C. Resistor
R634	0101682	6.8kΩ ¼W C. Resistor
R635	0101682	6.8kΩ ¼W C. Resistor
R636	0101682	6.8kΩ ¼W C. Resistor
R637	0101393	39kΩ ¼W C. Resistor
R638	0101393	39kΩ ¼W C. Resistor
R639	0101393	39kΩ ¼W C. Resistor
R640	0101393	39kΩ ¼W C. Resistor
R641	0101393	39kΩ ¼W C. Resistor
R642	0101393	39kΩ ¼W C. Resistor
R643	0101473	47kΩ ¼W C. Resistor
R644	0101473	47kΩ ¼W C. Resistor
R645	0101224	220kΩ ¼W C. Resistor
R646	0101224	220kΩ ¼W C. Resistor
R647	0101104	100kΩ ¼W C. Resistor
R648	0101104	100kΩ ¼W C. Resistor
R649	0101393	39kΩ ¼W C. Resistor
C601	0573159	1.5μF 25V Tantalum Capacitor
C602	0573159	1.5μF 25V Tantalum Capacitot
C603	0573159	1.5μF 25V Tantalum Capacitot
C604	0573159	1.5μF 25V Tantalum Capacitot
C605	0510330	33μF 6.3V El. Capacitor
C606	0510330	33μF 6.3V El. Capacitor
C607	0510330	33μF 6.3V El. Capacitor
C608	0510330	33μF 6.3V El. Capacitor
C609	0510101	100μF 6.3V El. Capacitor
C610	0510101	100μF 6.3V El. Capacitor
C611	0510101	100μF 6.3V El. Capacitor
C612	0510101	100μF 6.3V El. Capacitor
C613	0513100	10μF 25V El. Capacitor
C614	0513100	10μF 25V El. Capacitor

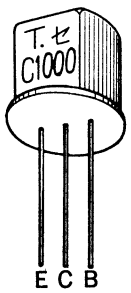
5-3. PARTS LOCATION (F-1326 Conductor Side)



Resistor: Carbon Resistor → C. Resistor
Capacitor: Electrolytic Capacitor → El. Capacitor

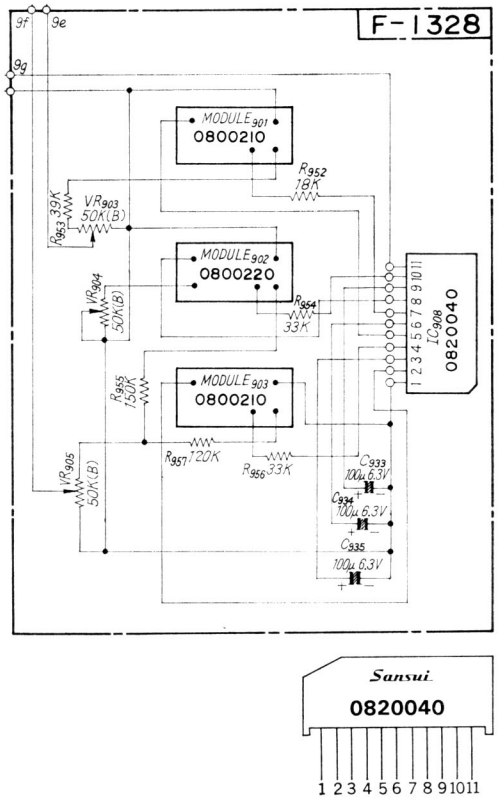
Parts No.	Stock No.	Description
C615	0513100	10μF 25V El. Capacitor
C616	0513100	10μF 25V El. Capacitor
C617	0660470	47 pF 50V Ceramic Capacitor
C618	0660101	100 pF 50V Ceramic Capacitor
C619	0660101	100 pF 50V Ceramic Capacitor
C620	0660470	47 pF 50V El. Capacitor
C621	0601126	0.0012μF 50V Mylar Capacitor
C622	0601126	0.0012μF 50V Mylar Capacitor
C623	0601107	0.01μF 50V Mylar Capacitor
C624	0601107	0.01μF 50V Mylar Capacitor
C625	0660151	150 pF 50V Ceramic Capacitor
C626	0601407	0.04μF 50V Mylar Capacitor
TR601	0305881	2SC1000BL
TR602	0305881	2SC1000BL
TR603	0305881	2SC1000BL
TR604	0305881	2SC1000BL
TR605	0305880	2SC1000GR
TR606	0305880	2SC1000GR
TR607	0305880	2SC1000GR
TR608	0305880	2SC1000GR

2SC1000BL, GR



6. F-1328 Stock No. 7590590 Complete Circuit Board F-1328 QS-1

6-1. SCHEMATIC DIAGRAM (F-1328)

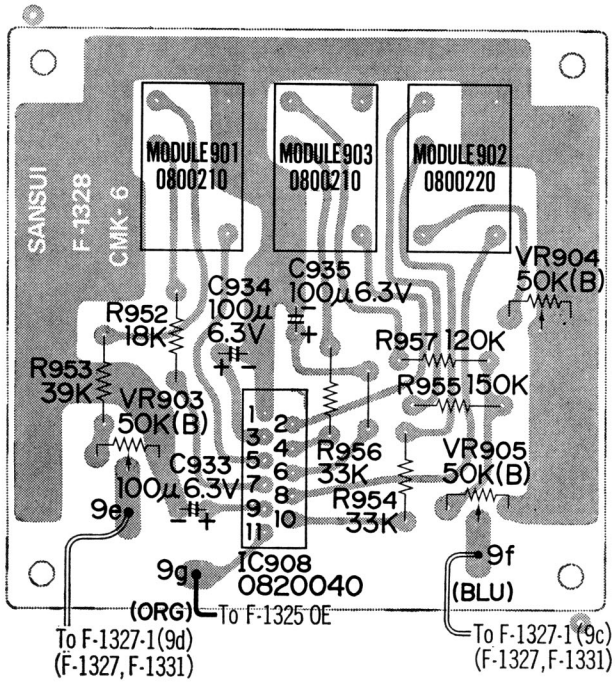


6-2. PARTS LIST (F-1328)

Parts No.	Stock No.	Description
R952	0101183	18kΩ ¼W C. Resistor
R953	0101393	39kΩ ¼W C. Resistor
R954	0101333	33kΩ ¼W C. Resistor
R955	0101154	150kΩ ¼W C. Resistor
R956	0101333	33kΩ ¼W C. Resistor
C933	0510101	100μF 6.3V El. Capacitor
C934	0510101	100μF 6.3V El. Capacitor
C935	0510101	100μF 6.3V El. Capacitor
Module901	0800210	0800210
Module902	0800220	0800220
Module903	0800210	0800210
IC908	0820040	0820040
VR903	1031130	50kΩ(B) Semi-Variable Resistor
VR904	1031130	50kΩ(B) Semi-Variable Resistor
VR905	1031130	50kΩ(B) Semi-Variable Resistor

Resistor: Carbon Resistor ⟶ C. Resistor
Capacitor: Electrolytic Capacitor ⟶ El. Capacitor

6-3. PARTS LOCATION (F-1328 Conductor Side)



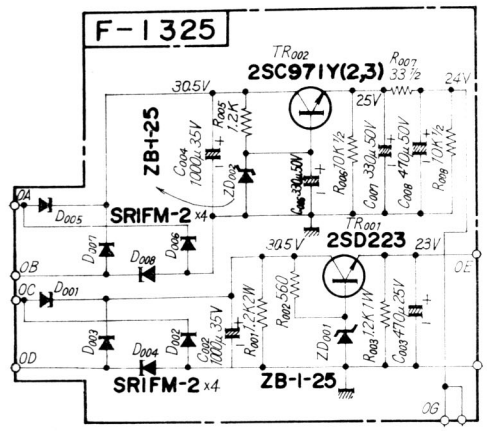
7-2. PARTS LIST (F-1325)

Parts No.	Stock No.	Description
R001	0105122	1.2kΩ 2W C. Resistor
R002	0101561	560Ω ¼W C. Resistor
R003	0104122	1.2kΩ 1W C. Resistor
R005	0101681	680Ω ¼W C. Resistor
R006	0111103	10kΩ ½W Solid Resistor
R007	0111333	33Ω ½W Solid Resistor
R008	0111103	10kΩ ½W Solid Resistor
C002	0549004	1000μF 35V El. Capacitor
C003	0513471	470μF 25V El. Capacitor
C004	0549004	1000μF 35V El. Capacitor
C006	0515471	470μF 50V El. Capacitor
C007	0515331	330μF 50V El. Capacitor
C008	0515331	330μF 50V El. Capacitor
D001	0310870	SR1FM-2
D002	0310870	SR1FM-2
D003	0310870	SR1FM-2
D004	0310870	SR1FM-2
D005	0310870	SR1FM-2
D006	0310870	SR1FM-2
D007	0310870	SR1FM-2
D008	0310870	SR1FM-2
ZD001	0310710	ZB-1-25
ZD002	0310710	ZB-1-25
TR001	0308230	2SD223
TR002	0305860 (or 0305861)	2SC509 O, Y

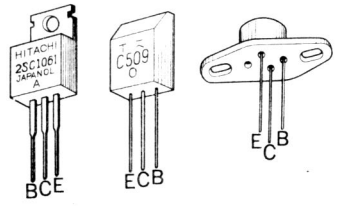
7. F-1325

Stock No. 7500380
Complete Circuit Board F-1325

7-1. SCHEMATIC DIAGRAM (F-1325)

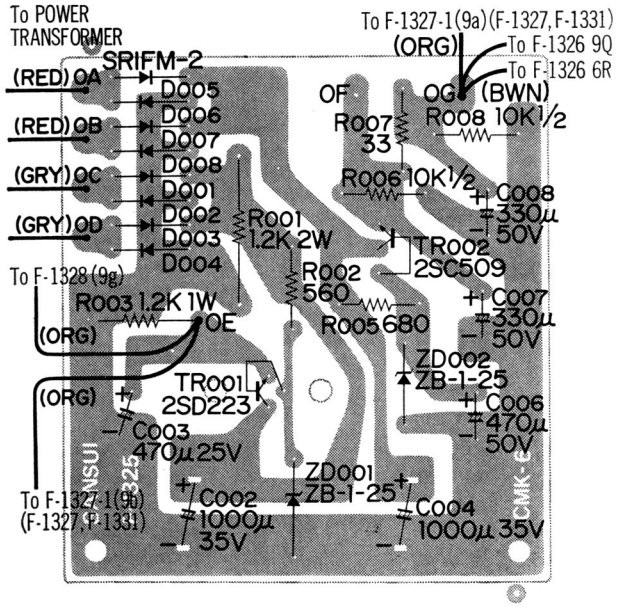


2SC1061 2SC509 2SD224 2SD223



ZB-I-25

7-3. PARTS LOCATION (F-1325 Conductor Side)

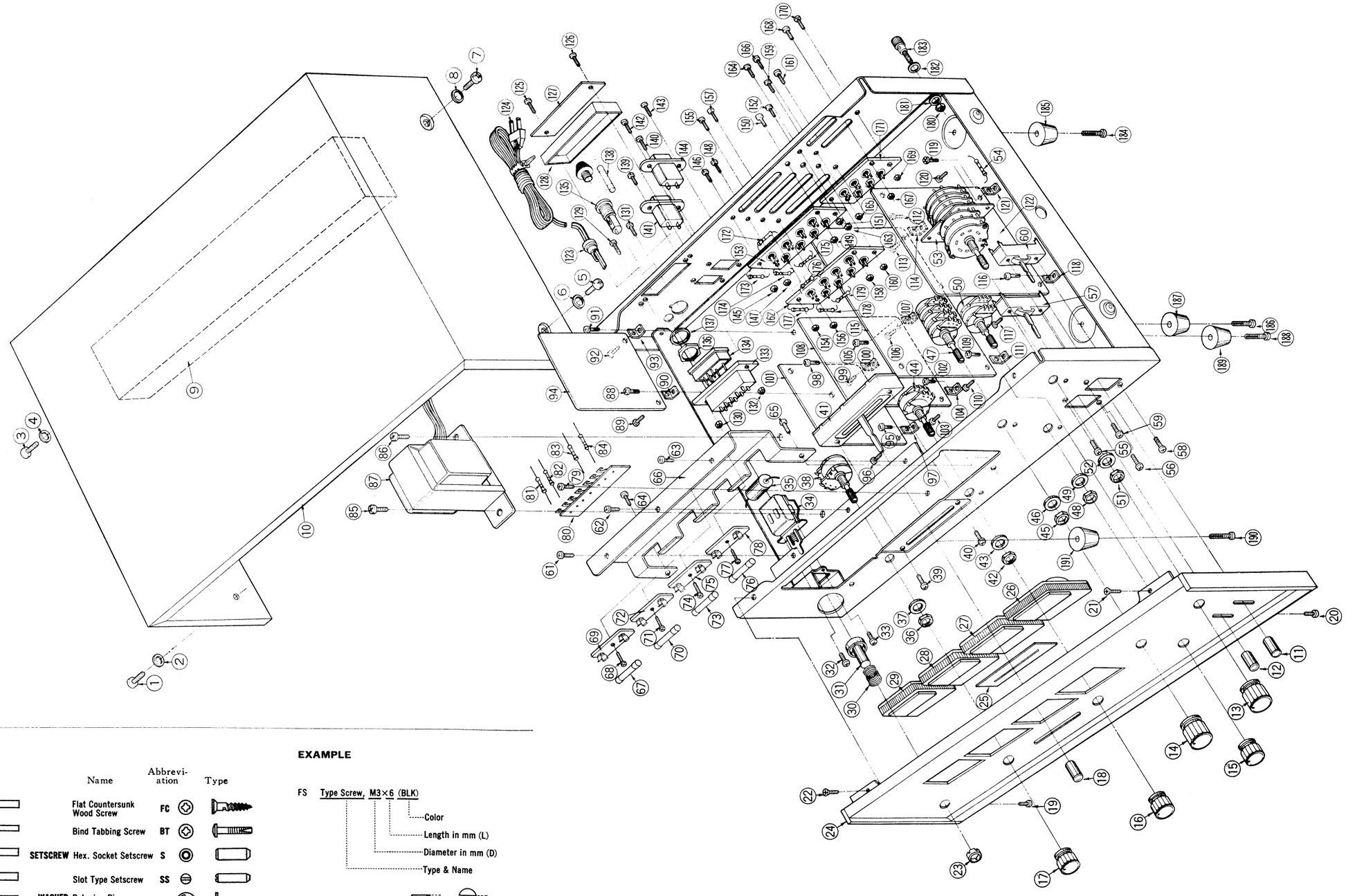


8-1. PARTS LIST (Section 8)

Parts No.	Stock No.	Description
1	5100165	B Type Screw, M4×14 Black
2	5186110	P Type Washer, 4×12×1.6
3	5100165	B Type Screw, M4×14 Black
4	5186110	P Type Washer, 4×12×1.6
5	5100165	B Type Screw, M4×14 Black
6	5186110	P Type Washer, 4×12×1.6
7	5100165	B Type Screw, M4×14 Black
8	5186110	P Type Washer, 4×12×1.6
9	5516612	Sponge Cushion
10	5726051	Wood Bonnet
11	7106070	Knob, 2-ch tape monitor
12	7106070	Knob, 4-ch tape monitor
13	5316120	Knob, function (R-2)
14	5316120	Knob, volume (R-2)
15	5316110	Knob, level set (Q-2)
16	5316110	Knob, rear balance (Q-2)
17	5316110	Knob, front balance (Q-2)
18	7106100	Knob, main balance
19	5100043	B Type Screw, M3×6
20	5100043	B Type Screw, M3×6
21	5102543	F Type Screw, M3×6
22	5102543	F Type Screw, M3×6
23	5066040	Ring, power switch
24	7006730	Panel Ass'y
25	5046180	Masking, balance volume
26	4300370	VU Meter
27	4300370	VU Meter
28	4300370	VU Meter
29	4300370	VU Meter
30	6906020	Spring, power switch
31	7106080	Button, power switch
32	5100043	B Type Screw, M3×6
33	5100043	B Type Screw, M3×6
34	1130160	Power Switch
35	0591227	0.022μF 600V Oil Capacitor
36	5110380	Hex. Nut, M8
37	5120183	P Type Washer, 8φ
38	1010690	100kΩ MN×2 Front Balance Volume
39	5100043	B Type Screw, M3×6
40	5100043	B Type Screw, M3×6
41	1040040	250KΩW×2 Main Balance Volume
42	5110380	Hex. Nut, M8
43	5120183	P Type Washer, 8φ
44	1010690	100KΩ MN×2 Rear Balance Volume
45	5110380	Hex. Nut, M8
46	5120183	P Type Washer, 8φ
47	1060010	100KΩB (A)×4 Volume
48	5110380	Hex. Nut M8
49	5120183	P Type Washer, 8φ
50	1010710	250KΩB (A)×2 Level Set
51	5110382	Hex. Nut, M9
52	5120184	P Type Washer, 9φ
53	1106050	Function (F-1331)
	1106070	Function (F-1327 or F-1327-1)
54	0101333	33KΩ ¼W Carbon Resistor
55	5100043	B Type Screw, M3×6
56	5100043	B Type Screw, M3×6
57	1170210	Lever Switch, 4ch tape monitor
58	5100043	B Type Screw, M3×6
59	5100043	B Type Screw, M3×6
60	1170210	Lever Switch, 2ch tape monitor
61	5100043	B Type Screw, M3×6
62	5100043	B Type Screw, M3×6
63	5100043	B Type Screw, M3×6
64	5100043	B Type Screw, M3×6
65	5100043	B Type Screw, M3×6
66	5266121	Meter Bracket
67	0420020	Lamp, fuse type (6.3V 0.25A)
68	5100542	BT Type Screw, M3×8
69	2310031	Fuse Holder (P Type)
70	0420020	Lamp, fuse type (6.3V 0.25A)
71	5100542	BT Type Screw, M3×8
72	2310031	Fuse Holder (P Type)
73	0420020	Lamp, fuse type (6.3V 0.25A)
74	5100542	BT Type Screw, M3×8
75	2310031	Fuse Holder (P Type)
76	0420020	Lamp, fuse type (6.3V 0.25A)
77	5100542	BT Type Screw, M3×8
78	2310031	Fuse Holder (P Type)
79	5100043	B Type Screw, M3×6
80	2110031	Terminal, 1L6P
81	0101123	12KΩ ¼W Carbon Resistor
82	0101123	12KΩ ¼W Carbon Resistor
83	0101123	12KΩ ¼W Carbon Resistor
84	0101123	12KΩ ¼W Carbon Resistor
85	5100061	B Type Screw, M4×6
86	5100061	B Type Screw, M4×6
87	4000900	Power Transformer
88	5100043	B Type Screw, M3×6
89	5100041	B Type Screw, M3×4
90	5246420	P.C.B. Angle
91	5100043	B Type Screw, M3×6
92	5100041	B Type Screw, M3×4
93	5246420	P.C.B. Angle
94	7500380	Complete P.C.B. F-1325
95	5100043	B Type Screw, M3×6
96	5100041	B Type Screw, M3×4
97	5246420	P.C.B. Angle
98	5100043	B Type Screw, M3×6
99	5100041	B Type Screw, M3×4
100	5246420	P.C.B. Angle
101	7590590	Complete P.C.B. F-1328
102	5100043	B Type Screw, M3×6
103	5100041	B Type Screw, M3×4
104	5246420	P.C.B. Angle
105	5100043	B Type Screw, M3×6
106	5100041	B Type Screw, M3×4
107	5246420	P.C.B. Angle
108	7590580	Complete P.C.B. F-1335
109	5100043	B Type Screw, M3×6
110	5100041	B Type Screw, M3×4
111	5246420	P.C.B. Angle
112	5100043	B Type Screw, M3×6
113	5100041	B Type Screw, M3×4
114	5246420	P.C.B. Angle
115	7590570	Complete P.C.B. F-1331
	7591130	Complete P.C.B. F-1327
	7590610	Complete P.C.B. F-1327-1
116	5100043	B Type Screw, M3×6
117	5100041	B Type Screw, M3×4
118	5246420	P.C.B. Angle
119	5100043	B Type Screw, M3×6
120	5100041	B Type Screw, M3×4
121	5246420	P.C.B. Angle
122	7550210	Complete P.C.B. F-1326
123	2450040	Line Cord Strain Relief
124	3800020	Power Cord
125	5100149	B Type Screw, M3×16 Black
126	5100149	B Type Screw, M3×16 Black
127	5369280	Name Plate
128	5056110	Cover, voltage selector
129	5100145	B Type Screw, M3×10 Black
130	5110340	Hex. Nut, M3
131	5100145	B Type Screw, M3×10 Black
132	5110340	Hex. Nut, M3
133	2410080	Voltage Selector (Socket)
134	2410090	Voltage Selector (Plug)
135	2310030	
136	2310030	Fuse Holder
137	2310030	
138	0430012	Fuse 0.5A 250V (100~117V)
	0430450	Fuse 0.3A 250V (220~240V)
139	5100144	B Type Screw, M3×8 Black
140	5100144	B Type Screw, M3×8 Black

8. DISASSEMBLY AND PARTS LIST

Parts No.	Stock No.	Description
141	2450010	Receptacle, power
142	5100144	B Type Screw, M3×8 Black
143	5100144	B Type Screw, M3×8 Black
144	2450010	Receptacle, Power
145	5110340	Hex. Nut, M3
146	5100144	B Type Screw, M3×8 Black
147	5110340	Hex. Nut, M3
148	5100144	B Type Screw, M3×8 Black
149	5110340	Hex. Nut, M3
150	5100144	B Type Screw, M3×8 Black
151	5110340	Hex. Nut, M3
152	5100144	B Type Screw, M3×8 Black
153	2200020	Terminal, 8P output
154	5110340	Hex. Nut, M3
155	5100144	B Type Screw, M3×8 Black
156	5110340	Hex. Nut, M3
157	5100144	B Type Screw, M3×8 Black
158	5110340	Hex. Nut, M3
159	5100144	B Type Screw, M3×8 Black
160	5110340	Hex. Nut, M3
161	5100144	B Type Screw, M3×8 Black
162	2200020	Terminal, 8P output
163	5110340	Hex. Nut, M3
164	5100144	B Type Screw, M3×8 Black
165	5110340	Hex. Nut, M3
166	5100144	B Type Screw, M3×8 Black
167	5110340	Hex. Nut, M3
168	5100144	B Type Screw, M3×8 Black
169	5110340	Hex. Nut, M3
170	5100144	B Type Screw, M3×8 Black
171	2200030	Terminal, 6P input
172	0101103	10kΩ ¼W Carbon Resistor
173	0101472	4.7KΩ ¼W Carbon Resistor
174	0101472	4.7KΩ ¼W Carbon Resistor
175	0101103	10KΩ ¼W Carbon Resistor
176	0101103	10KΩ ¼W Carbon Resistor
177	0101472	4.7KΩ ¼W Carbon Resistor
178	0101472	4.7KΩ ¼W Carbon Resistor
179	0101103	10KΩ ¼W Carbon Resistor
180	5110340	Hex. Nut, M3
181	5121040	S Type Washer, 3×1.1×0.7
182	5120341	P Type Washer, 3×8×0.5
183	2230010	Terminal, metal
184	5100565	BT Type Screw, M4×16
185	5506360	Rubber Feet
186	5100565	BT Type Screw, M4×16
187	5506360	Rubber Feet
188	5100565	BT Type Screw, M4×16
189	5506360	Rubber Feet
190	5100565	BT Type Screw, M4×16
191	5506360	Rubber Feet



Hardware Nomenclature

	Name	Abbreviation	Type
SCREW	Pan Head Screw	P	
	Binding Head Screw	B	
	Round Head Screw	R	
	Flat Countersunk Head Screw	F	
	Oval Countersunk Head Screw	O	
	Truss Head Screw	T	
	Flat Fillister Screw	FS	
	Oval Countersunk Wood Screw	OC	
	Flat Countersunk Wood Screw	FC	
	Bind Tabbing Screw	BT	
SETSCREW	Hex. Socket Setscrew	S	
	Slot Type Setscrew	SS	
WASHER	Retaning Ring (E washer)	E	
	Plane Washer	P	
	Spring Washer	S	
	Corrugated Washer	C	

EXAMPLE

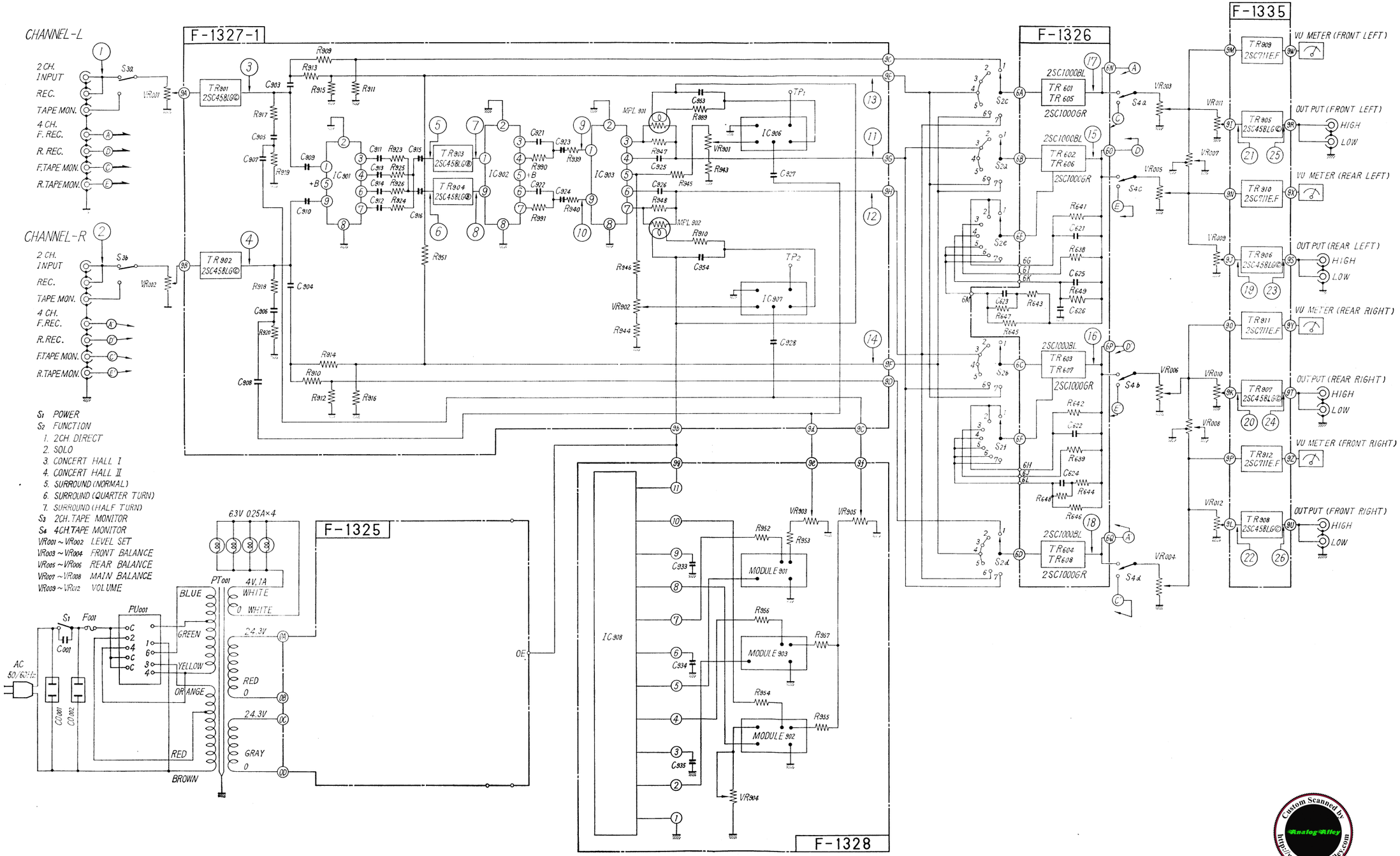
FS Type Screw, M3×6 (BLK)

- Color
- Length in mm (L)
- Diameter in mm (D)
- Type & Name

All screws conform to ISO standards, unless otherwise noted.

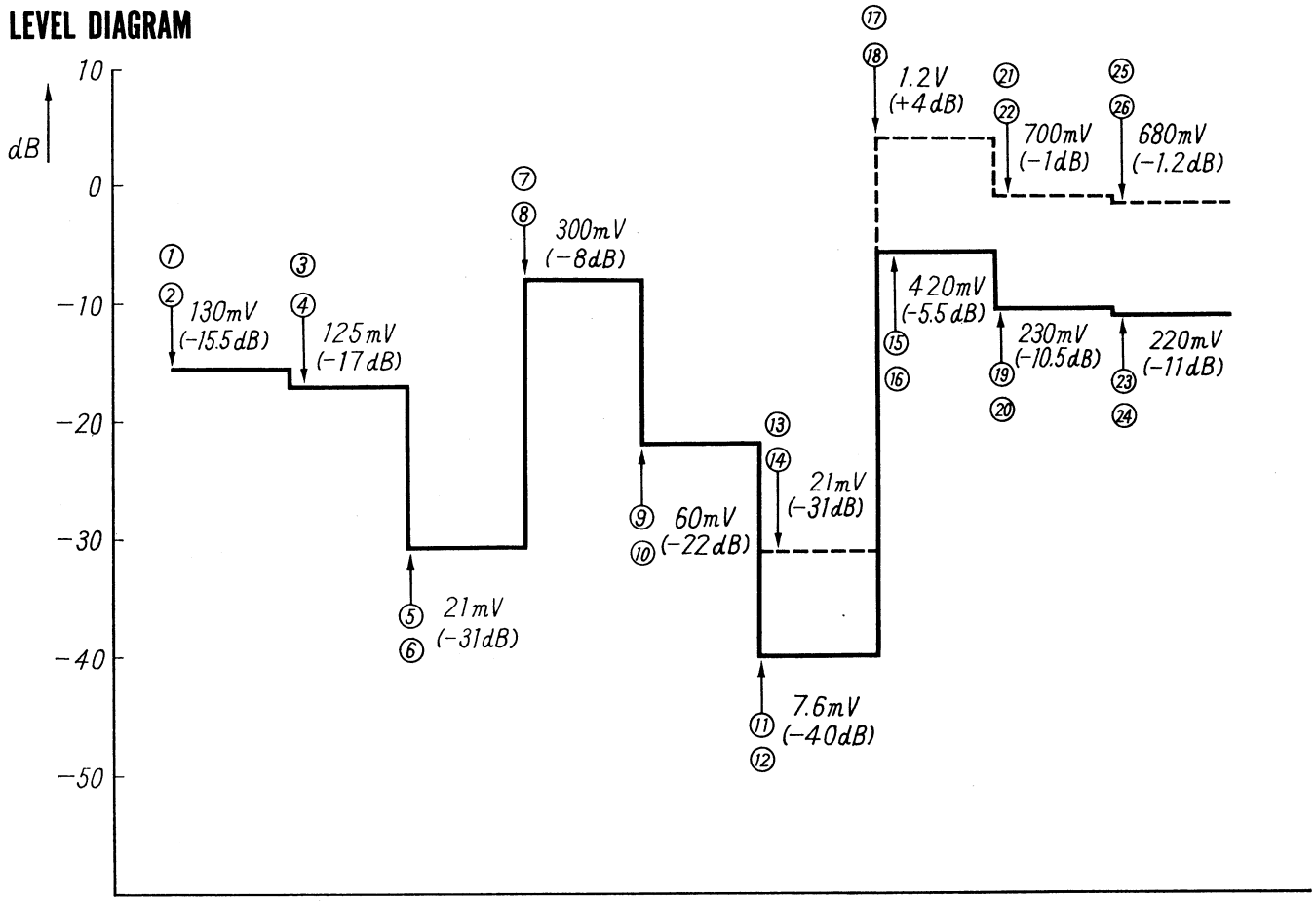
9. BLOCK DIAGRAM AND LEVEL DIAGRAM

QS-1



S1 POWER
S2 FUNCTION
1. 2CH DIRECT
2. SOLO
3. CONCERT HALL I
4. CONCERT HALL II
5. SURROUND (NORMAL)
6. SURROUND (QUARTER TURN)
7. SURROUND (HALF TURN)
S3 2CH. TAPE MONITOR
S4 4CH. TAPE MONITOR
VR001 ~ VR002 LEVEL SET
VR003 ~ VR004 FRONT BALANCE
VR005 ~ VR006 REAR BALANCE
VR007 ~ VR008 MAIN BALANCE
VR009 ~ VR012 VOLUME

LEVEL DIAGRAM



Note: Each voltage value is for reference and measured by a VTVM. In some recorders, the actual voltage value is in minor difference from the reference value.

1. FUNCTION .....CONCERT HALL 1
2. VOLUME .....MAXIMUM
3. LEVEL SET .....MAXIMUM
4. MAIN BALANCE .....CENTER
5. FRONT BALANCE .....CENTER
6. REAR BALANCE .....CENTER
7. 2-CH TAPE MONITOR.....SOURCE
8. 4-CH TAPE MONITOR.....SOURCE

Input .....1KHz, 130mV, sine wave (output impedance of 600Ω at an audio signal generator)

After connecting INPUT and output of the audio signal generator (sine wave, 1KHz) with L-CH and R-CH terminals of 2-CH INPUT, set the output level of the audio signal generator at 130mV.

A change takes place in the level for the reason of impedance before and after connection of output of the audio signal generator with QS-1.

Therefore, after connecting the audio signal generator with QS-1, set the level of the audio signal generator at 130mV.

10. TROUBLESHOOTING

Some of the symptoms which seem attributable to the trouble of the set itself are disordered for the reason of wrong operational procedure or due to poor functions of other machines sometimes.
Therefore, if the trouble seems attributable to the trouble of set after checking whether or not connection and operation are made correctly, correct the trouble, referring to the following troubleshooting guide.

10-1. TROUBLE OF POWER SUPPLY

10-1-1. No voltage is supplied to OE (DC 23V) and OG (24V) in F-1325

- 1) Defective plug of power cord
- 2) Breakage of power cord
- 3) Imperfect contact of POWER switch S_1
- 4) Power fuse F_{001} blown
- 5) Imperfect contact of power fuse and fuse holder
- 6) Defective voltage selector PU_{001}
- 7) Defective power transformer PT_{001}

10-1-2. No DC 23V is supplied to OE terminal of F-1325

- 8) Defective D_{001}~D_{004} on F-1325
- 9) TR_{001} on F-1325 open
- 10) ZD_{001} on F-1325 shortcircuited
- 11) Breakage of R_{002} on F-1325

10-1-3. No DC 24V is supplied to OG terminal of F-1325

- 12) Defective D_{005}~D_{008} on F-1325
- 13) TR_{002} (2SC509) on F-1325 open
  When 2SC509 is defective, replace it with 2SD224 (2SD223) or 2SC1061.
- 14) Breakage of R_{007} on F-1325
- 15) ZD_{002} on F-1325 shortcircuited
- 16) Breakage of R_{005} on F-1325

10-1-4. The voltage at OE terminal on F-1325 is not normal

- 17) ZD_{001} on F-1325 open
- 18) TR_{001} on F-1325 shortcircuited

10-1-5. The voltage at OG terminal of F-1325 is not normal

- 19) ZD_{002} on F-1325 open
- 20) TR_{002} (2SC509) on F-1325 shortcircuited
  When 2SC509 is defective, replace it with 2SD224 (2SD223) or 2SC1061.

10-2. NO OUTPUT FROM OUTPUT TERMINALS

10.2-1. No output from OUTPUT both FRONT and REAR

- 21) Defective power supply
  Refer to Trouble of Power Supply.

10-2-2. No output from OUTPUT of FRONT, LEFT (FRONT, RIGHT)

- 22) Imperfect contact of 2-CH, TAPE MONITOR switch S_3a (S_3b)
- 23) Imperfect contact of LEVEL SET volume VR_{001} (VR_{002})
- 24) C_{901} (C_{902}) on F-1327-1 (F-1327, F-1331) open
- 25) Imperfect contact of FUNCTION switch S2c (S2d)
- 26) C_{601} (C_{602}) on F-1326 open
- 27) Defective TR_{601}, TR_{605} (TR_{604}, TR_{608}) on F-1326
- 28) Imperfect contact of 4-CH, TAPE MONITOR switch S_4a (S_4b)
- 29) The MAIN BALANCE volume is not located at the center (located at position of REAR)
- 30) Imperfect contact of VOLUME VR_{011} (VR_{012})
- 31) C_{936} (C_{939}) on F-1335 open
- 32) Defective TR_{905} (TR_{908})

10-2-3. No output from OUTPUT of REAR, LEFT (REAR, RIGHT) (Normal output is produced both at LEFT and RIGHT in the FRONT.)

—33) C_{909} (C_{910}) on F-1327-1 (F-1327, F-1331) open
—34) Defective IC_{901} on F-1327-1 (F-1327, F-1331)
—35) Defective C_{912}, C_{913} (C_{911}, C_{914}) on F-1327-1 (F-1327, F-1331)
—36) C_{915} (C_{916}) on F-1327-1 (F-1327, F-1331) open
—37) Defective TR_{903} (TR_{904}) on F-1327-1 (F-1327, F-1331)
—38) C_{919} (C_{920}) on F-1327-1 (F-1327, F-1331) open
—39) Defective IC_{902} on F-1327-1 (F-1327, F-1331)
—40) C_{923} (C_{924}) on F-1327-1 (F-1327, F-1331) open
—41) Defective IC_{903} on F-1327-1 (F-1327, F-1331)
—42) Imperfect contact of FUNCTION switch S_4c (S_4d)
—43) C_{602} (C_{603}) on F-1326 open
—44) Defective TR_{602}, TR_{606} (TR_{603}, TR_{607}) on F-1326
—45) Imperfect contact of 4-CH, TAPE MONITOR switch S_4c (S_4d)
—46) Imperfect contact of REAR BALANCE volume VR_{005} (VR_{006})
—47) The MAIN BALANCE volume is not located at the position of CENTER (located at position of FRONT)
—48) Imperfect contact of VOLUME VR_{009} (VR_{008})
—49) C_{937} (C_{938}) on F-1335 open
—50) Defective TR_{906} (TR_{907}) on F-1335

10-3. TROUBLE OF PHASE MODULATOR CIRCUIT

As the operation of phase modulator circuit is very complicated, check whether or not the operation of the phase modulator circuit is correct by observing the waveform, employing the audio signal generator and oscilloscope.

Before checking, be sure to set QS-1 as follows:

1. FUNCTION.....CONCERT HALL 1
2. 4-CH TAPE MONITOR...SOURCE
3. 2-CH TAPE MONITOR...SOURCE
4. MAIN BALANCE .....CENTER
5. REAR BALANCE .....CENTER

10-3-1. Judgement for operation of REAR L-CH

1) Add the output of the audio signal generator (sine wave, 12KHz) to L-CH of 2-CH INPUT and the horizontal axis of the oscilloscope.
2) Set the TIME/DIV of the oscilloscope at position "EXT".
3) Connect REAR L-CH (OUTPUT, HIGH) of QS-1 with the vertical axis of the oscilloscope.
4) Adjust the LEVEL SET and VOLUME of QS-1, and VOLTS/DIV of the oscilloscope. If such a waveform as shown in Fig. 3-2 appears in the oscilloscope, the phase modulator circuit of REAR L-CH will be operated correctly.

10. TROUBLESHOOTING

10-3-2. Judgement for operation of REAR R-CH

1) Add the output of audio signal generator (sine wave, 18KHz) to R-CH of 2-CH INPUT and horizontal axis of the oscilloscope.
2) Set the TIME/DIV of the oscilloscope to "EXT".
3) Connect REAR R-CH (OUTPUT, HIGH) of QS-1 with the vertical axis of the oscilloscope.
4) Adjust the VOLTS/DIV of the oscilloscope, VOLUME and LEVEL SET of QS-1. If such a waveform as Fig. 3-5 appears in the oscilloscope, the phase modulator circuit of REAR R-CH will be operated correctly.
   The cycle in change of waveforms of ① and ② is one second.
   If the phase modulator circuit is judged defective by this method, correct the trouble, referring to the next troubleshooting guide.

10-3-3. When the phase modulator circuit is not operated both of L-CH and R-CH

—51) No DC 23V is added to 9g terminal of F-1328 (Refer to Trouble of Power Supply in page 22)
—52) Defective IC_{908} on F-1328

10-3-4. When only phase modulator circuit L-CH (R-CH) is not operated

—53) Defective IC_{908} on F-1328
—54) Defective MODULE 901 (MODULE 902, 903) on F-1328
—55) Defective VR_{903} (VR_{904}, VR_{905}) on F-1328 or loose adjustment
—56) Defective IC_{906} (IC_{907}) on F-1327-1
—57) Defective IC_{904} (IC_{905}) on F-1327
—58) Defective MPL_{901} (MPL_{902}) in case of F-1327-1
—59) Defective VR_{901} (VR_{902}) on F-1327-1 (F-1327, F-1331) or loose adjustment.

The cause for poor condition of R-CH is shown within ( ). When you feel that continuity of sound is unnatural and low-pitched tone seems short:

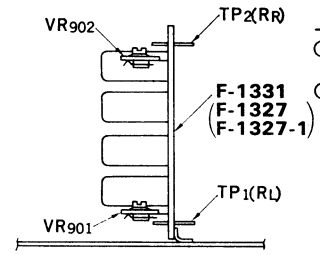
10-4. OTHERS

10-4-1. AC Hum

1) After power is switched ON (more than 5 minutes later), check and record the voltages at the test points TP_1 (R_L) and TP_2 (R_R) correctly as Fig. 1. Use the maximum value for TP_2.
2) Change the orange lead as shown in Fig. 2.
3) Add a 470μF 50V capacitor between Ⓐ and the grounding point of the chassis from the conductor side as shown in Fig. 2.
4) After change, put the voltages at TP_1 and TP_2 back to the previously measured ones with the VR_{901} and VR_{902} as shown in Fig. 1.

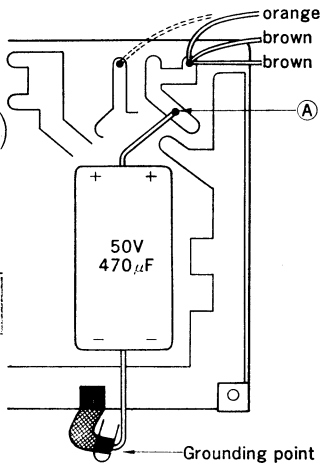
Note: * Use a DC voltmeter (1~2.5V range) which can indicate under 0.1V correctly.
* Approximate voltage at TP_1 is between 0.15 and 0.20V, and at TP_2 is about 0.25V.
* Turn the VR_{901} and VR_{902} as slow as possible for a correct reading of the meter.

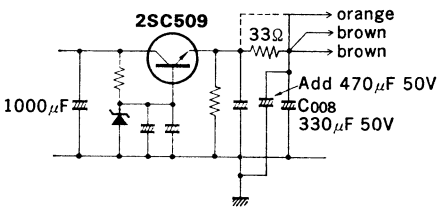
Fig. 1 F-1331 (F-1327, F-1327-1)



STOCK NO.	DESCRIPTION
0505471	470μF 50V

Fig. 2 F-1325

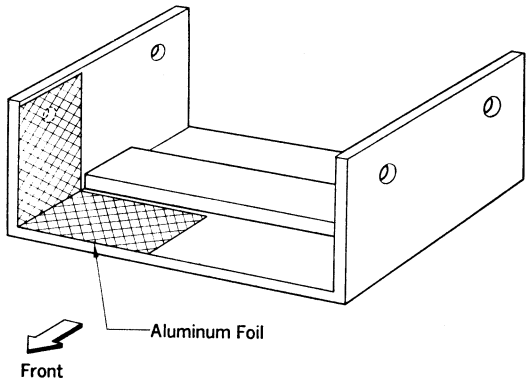


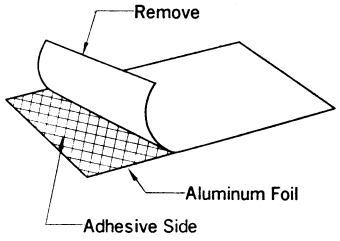


10-4-2. Induced Hum

1) Stick the aluminum foil inside of the wood case as shown in Fig. 3 so that the selector switch section of the unit will be shielded.

Fig. 3





STOCK NO.	DESCRIPTION
	Aluminum Foil

10. TROUBLESHOOTING

10-4-3. Reduction of Poping Noise (Tentative)

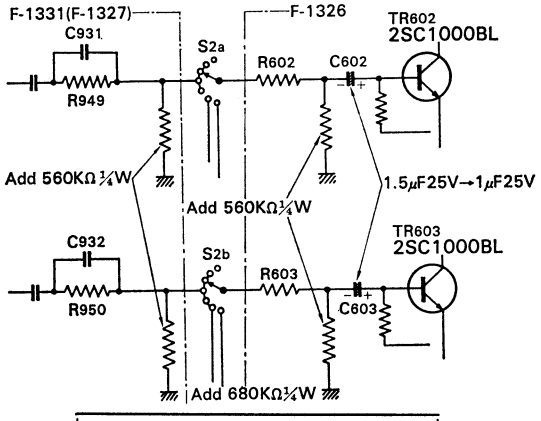
The poping noise while operating the function switch will be reduced by the following steps.

1) Add 560K ohms resistors on the F-1331 (F-1327-1) circuit board. See Fig. 1 & 2.

2) Add 560K ohms resistors on the F-1326 circuit board. See Fig. 1 & 3.

3) Change 1.5μF capacitors (C_{602}, C_{603}) with 1μF on the F-1326 circuit board. See Fig. 1 & 3.

Fig. 1 F-1331 (F-1327-1, F-1327)



STOCK NO.	DESCRIPTION
0573109	1μF 25V (Tantalum)
0101564	560kΩ R¼W

Fig. 2 F-1331 (F-1327, F-1327-1)

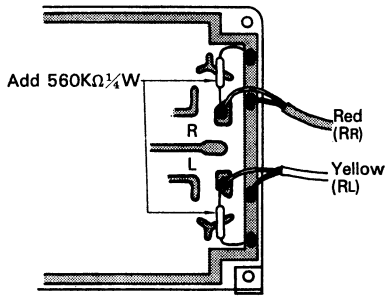
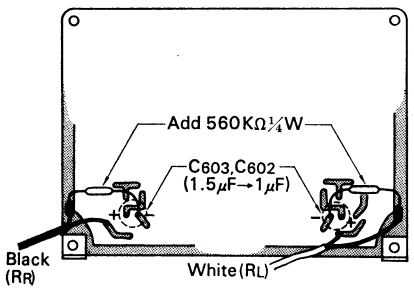


Fig. 3 F-1326



10-4-4. Improvement of Separation in 2-Channel Mode

1) Solder a lead and a resistor (33KΩ ¼W) to an additional wafer as Fig. 1.

2) Change the metal plate with this wafer as Fig. 2. (Altogether seven wafers and no metal plate.)

3) Solder the lead and resistor from the wafer as Fig. 2.

4) Remove the resistor (33KΩ ¼W) as Fig. 3.

Note:

1. Ones using the same wafer at the Section 3, 4, 5 and 6 have already been improved.
2. Write "An additional wafer for QS-1" when ordering the above wafer.

Fig. 2

Fig. 1

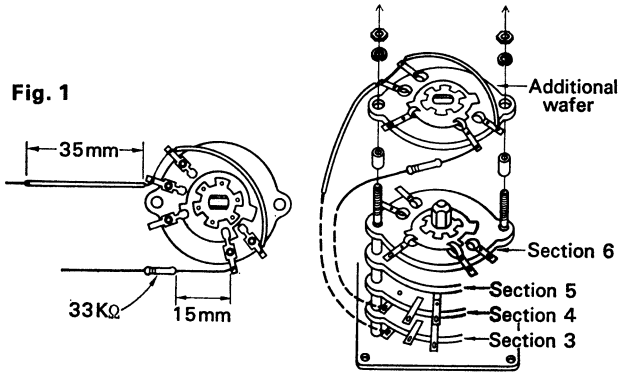
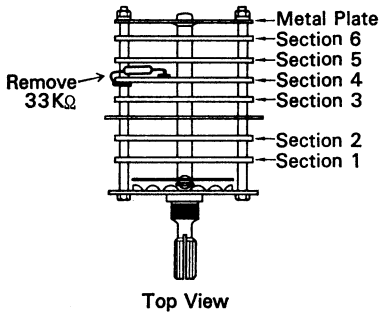


Fig. 3 Original



10-4-5. Improvement of VU Meter Circuits

If the VU meters or diodes (IN34A or IN60) were damaged during operation, the following steps should be proceeded for prevention.

1) Change the diode polarity as Fig. 2.
2) Change the leads to the meters as Fig. 3.

Note: These changes for all of the four meter circuits must be applied at the same time.

Fig. 1 Original F-1335

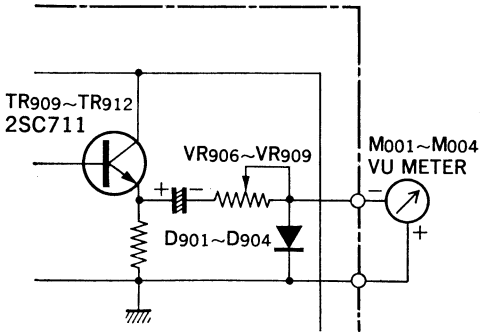


Fig. 2 F-1335

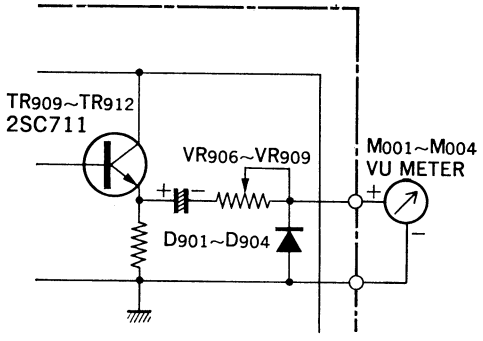
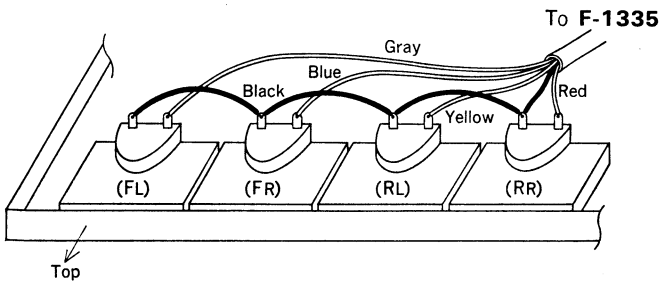


Fig. 3



10-4-6. Improvement of Output Balance on Rear Channels (2-CH)

Among the unbalance troubles of output level on rear channels, the trouble caused from gang-error of the LEVEL SET volume will be improved by replacement of the same if the trouble is dissolved by minimizing output level of an audio signal generator connected to the input terminal of QS-1 just before the output signal of rear channels start to distort while making the LEVEL SET volume maximum.

STOCK NO.	DESCRIPTION
1010710	250kΩB×2

10. TROUBLESHOOTING

10-4-7. If the Rear Channel Sound is Shaky

You may sometimes notice the sound from the rear speaker systems is shaky when that from the front speaker systems is not. This usually happens because the indirect sound components that the QS-1 extracts are distorted to begin with, for one of the following reasons:

1) The record is damaged or worn out.
2) The cartridge stylus is damaged or has dust on it.
3) The tracking force of the cartridge is either too light or heavy.
4) The cartridge itself is faulty.
5) The level of the input signals fed to the QS-1 is too high, causing the VU meter pointers to swing to the right end.
6) The sound in the record or tape is already distorted.
7) The stereo separation of the FM tuner is poor, or the FM antenna input is insufficient and the broadcast signal contains much noise.

10-4-8. If the Separation of the Front and Rear, Left and Right Channels is Poor

While the QS-1 is designed so that the sounds from the four speaker systems blend with one another to form an integrated sound field, the separation of the four channels may be noticeably poor sometimes, for one of the following reasons:

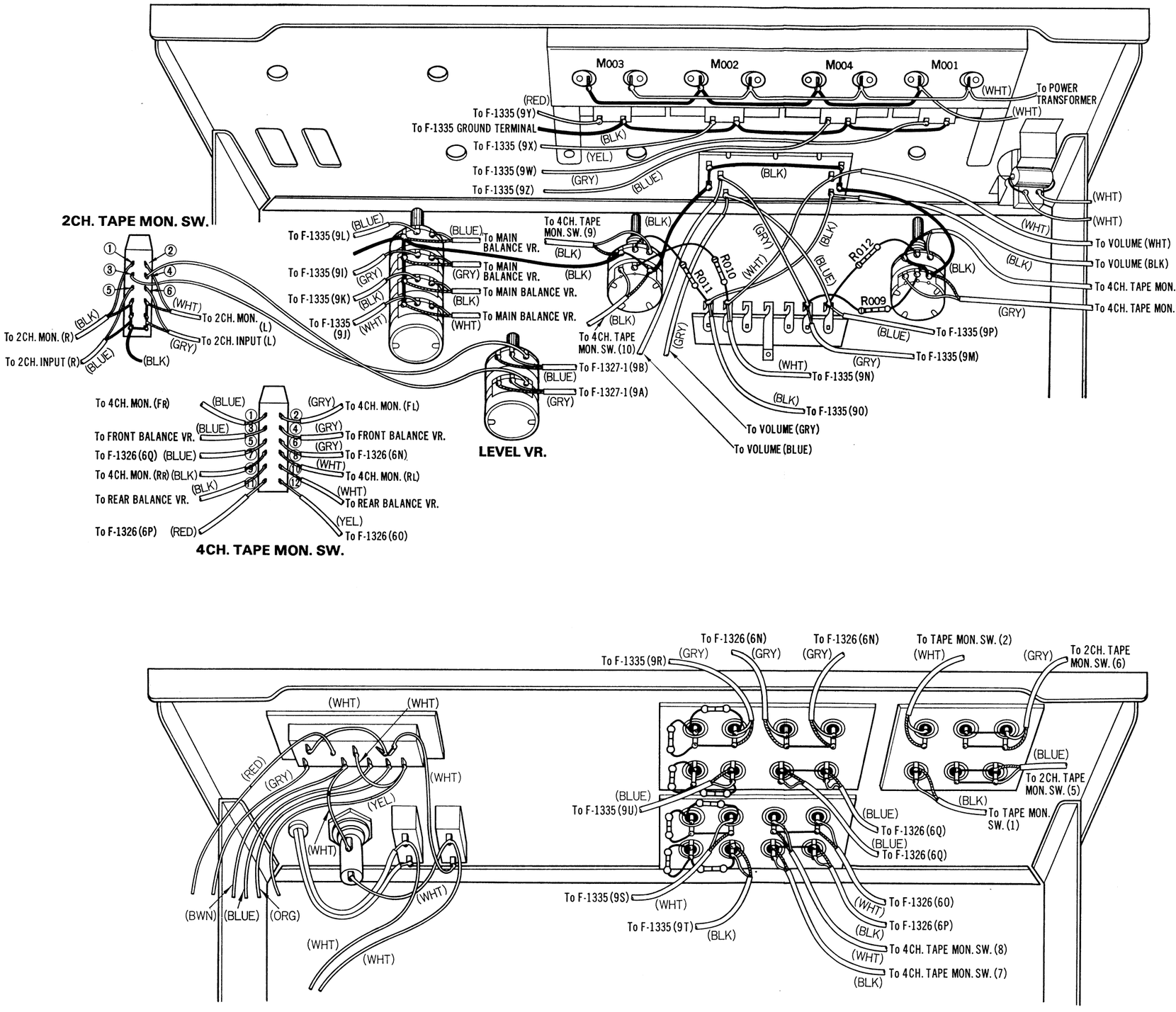
1) The separation by the cartridge is poor.
2) The left and right channels of the cartridge are not in phase.
3) The left and right output voltages of the cartridge are way out of proportion.
4) The left and right channels of the playback head of the tape deck are not in phase.
5) The left and right output voltages of the tape deck are way out of proportion.
6) The left and right output voltages of the FM tuner are way out of proportion.
7) The separation by the FM tuner is poor.
8) The program source itself is faulty.

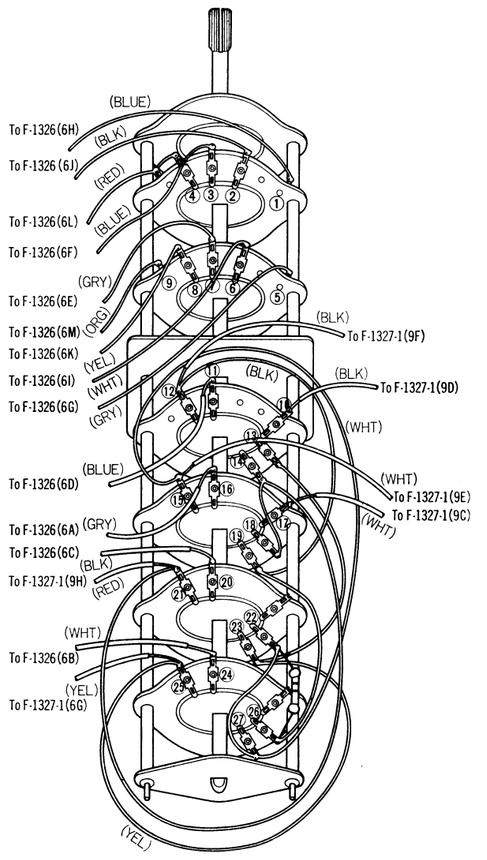
10-4-9. About Speaker Polarities

If the polarities (plus and minus) of the front left and right speaker systems are not identical, sound from them will lack a sense of natural connection, and also be weak in the bass range. The same applies to the polarities of the rear left and right speaker systems. Further, if the polarities of the front left and right and the rear left and right speaker systems are not identical, sound from the four speaker systems will lack a sense of natural connection, and especially show a weakness in the bass range.

Should you be using amplifiers of different makes for the front and rear channels, matching the polarities between the rear channel amplifiers and speaker systems alone may sometimes fail to achieve correct matching with those of the front channel amplifiers and speaker systems. To prevent this, try reversing the amplifier-speaker connections once (i.e., connecting the plus side of the amplifier output terminal to the minus side of the speaker input terminal, and the minus side of the amplifier output terminal to the plus side of the speaker input terminal, without reversing the left and right channels) and see if better 4-channel stereo effect can be obtained.

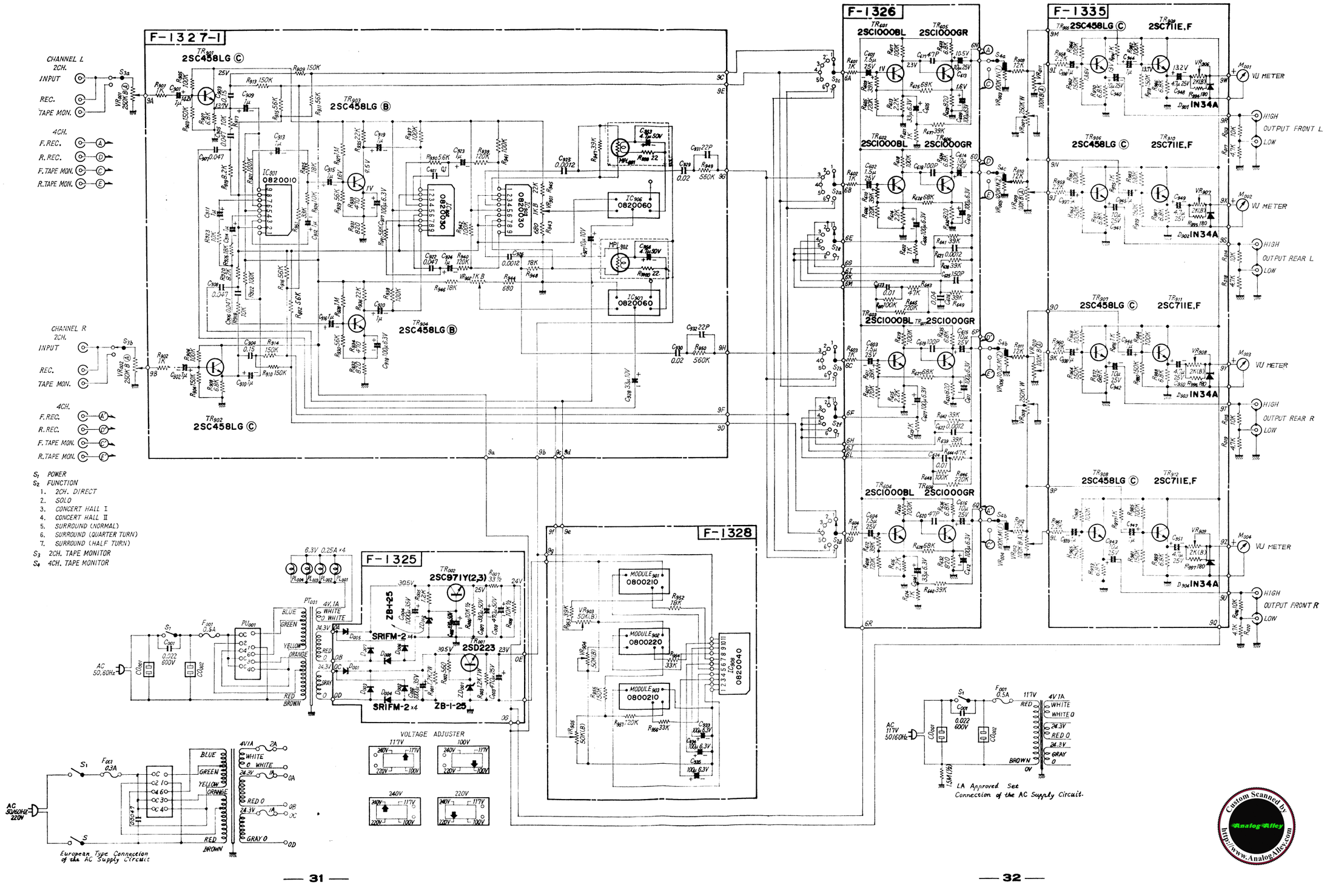
11. WIRING DIAGRAM



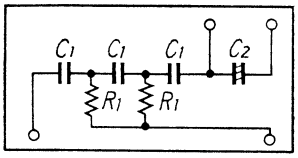


12. SCHEMATIC DIAGRAM

QS-1

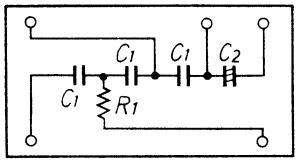


0800210

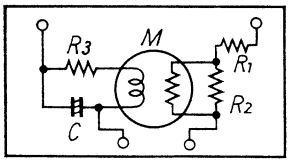


R1: 39K
C1: 0.22μ
C2: 1μ 50WV

0800220

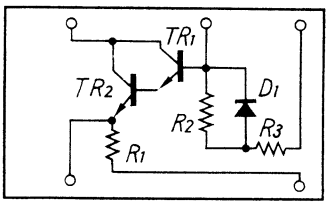


0820050



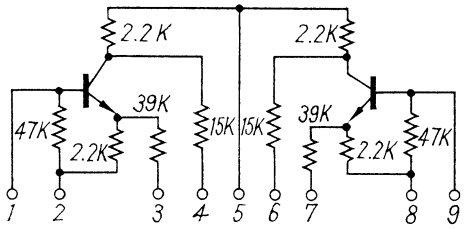
R1: 270Ω
R2: 180K
R3: 22Ω
C : 4.7μ
M : MPL-3051

0820060

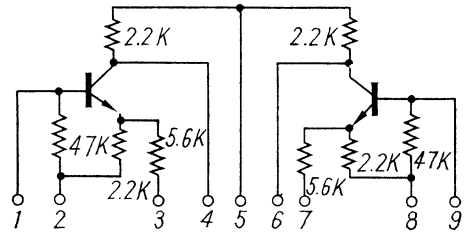


R1 : 33Ω
R2 : 56K
R3 : 100K
D1 : IN60
TR1: 2SC458
TR2: 2SC506

0820010



0820020



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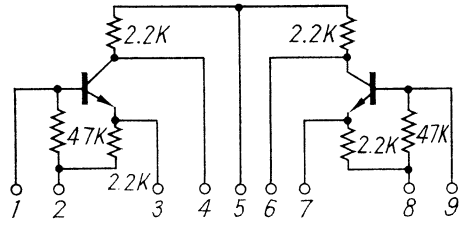

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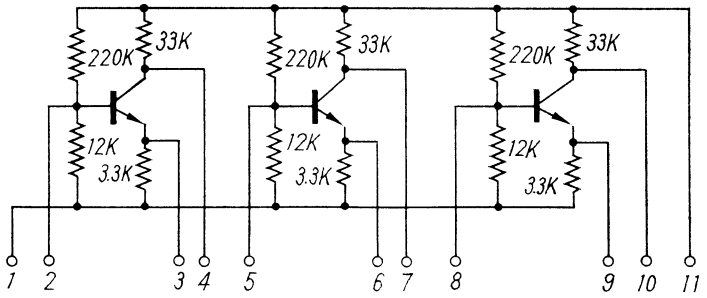

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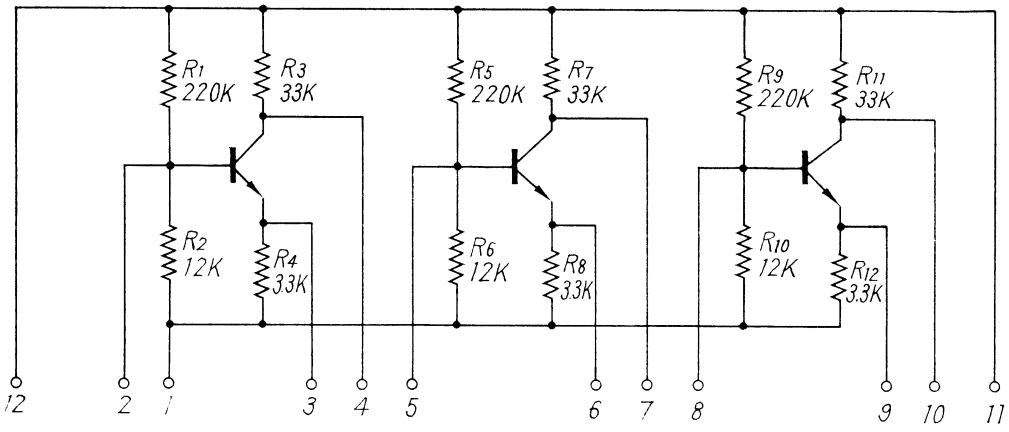
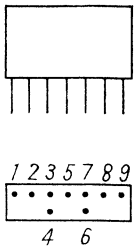


0820011
0820021
0820031



0820010
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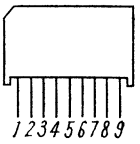

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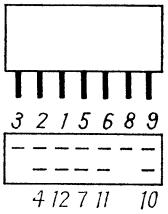

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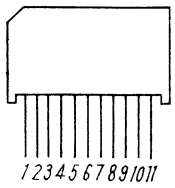


Printed in Japan (82020M2)

SANSUI ELECTRIC COMPANY LIMITED/14-1, 2-CHOME, IZUMI, SUGINAMI-KU, TOKYO, JAPAN/TELEPHONE: 323-1111/CABLE: SANSUIELEC TOKYO/TELEX: 2

SERVICE BULLETIN

April 28, 1971
Ref. CE-029

Subject: REDUCTION OF POPING NOISE (TENTATIVE)
Model: QS-1

The poping noise while operating the function switch will be reduced by the following steps.

1. Add 560 K ohms resistors on the F-1331 (F-1327) circuit board. See Fig. 1 & 2.
2. Add 560 K ohms resistors on the F-1326 cicuit board. See Fig. 1 & 3.
3. Change 1.5μF capacitors (C602, C603) with 1μF on the F-1326 circuit board. See Fig. 1 & 3.

Fig. 1

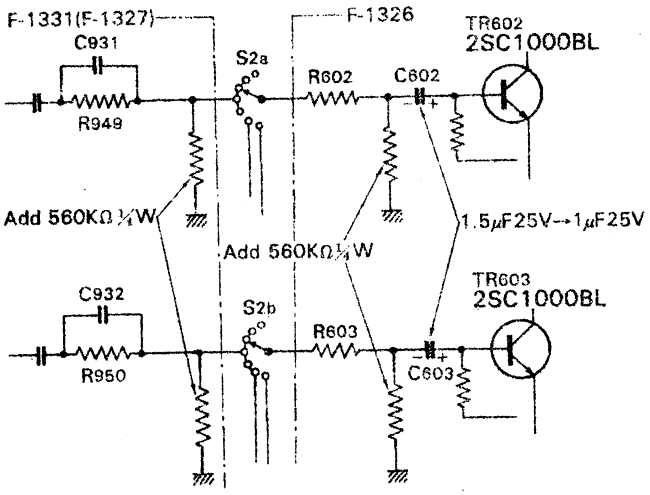


Fig. 2 F-1331 (F-1327)

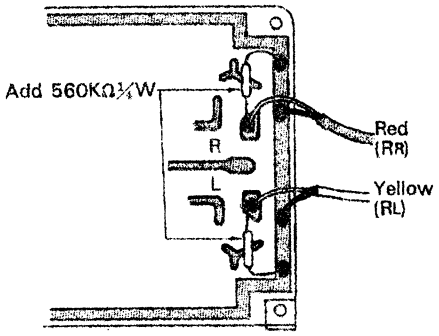
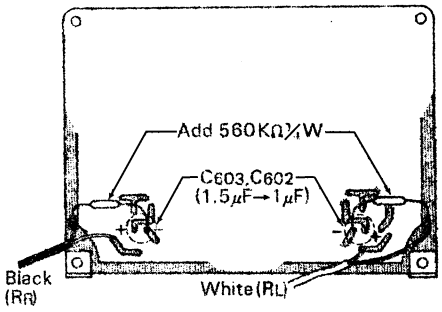


Fig. 3 F-1326



STOCK NO.	DESCRIPTION
0573109	1μF 25V (Tantalum)
0101564	560 kΩ R¼W

FILE NO.

SANSUI ELECTRIC COMPANY LIMITED/14-1, 2-CHOME, IZUMI, SUGINAMI-KU, TOKYO, JAPAN/TELEPHONE: 323-1111/CABLE: SANSUIELEC TOKYO/TELEX:

SERVICE BULLETIN

December 20, 1971
Ref. CE-033A

Subject: ELIMINATION OF HUM
Model: QS-1

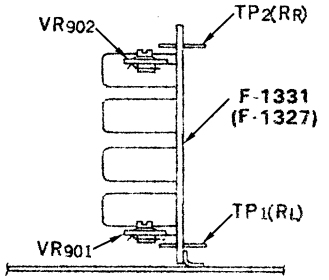
In a 4-channel stereo system using a QS-1, if hum is noticeable, it will be eliminated with the following steps.

1. AC Hum

1) After power is switched ON (more than 5 minutes later), check and record the voltages at the test points TP_1 (R_L) and TP_2 (R_R) correctly as Fig. 1. Use the maximum value for TP_2.
2) Change the orange lead as shown in Fig. 2.
3) Add a 470μF 50V capacitor between Ⓐ and the grounding point of the chassis from the conductor side as shown in Fig. 2.
4) After change, put the voltages at TP_1 and TP_2 back to the previously measured ones with the VR_{901} and VR_{902} as shown in Fig. 1.

Note: * Use a DC voltmeter (1~2.5V range) which can indicate under 0.1V correctly.
* Approximate voltage at TP_1 is between 0.15 and 0.20V, and at TP_2 is about 0.25V.
* Turn the VR_{901} and VR_{902} as slow as possible for a correct reading of the meter.

Fig. 1 F-1331 (F-1327)



STOCK NO.	DESCRIPTION
0505471	470μF 50V

Fig. 2 F-1325