

SERVICE MANUAL

POWER AMPLIFIER

SANSUI BA-2000



Sansui
SANSUI ELECTRIC CO., LTD.



1. SPECIFICATIONS

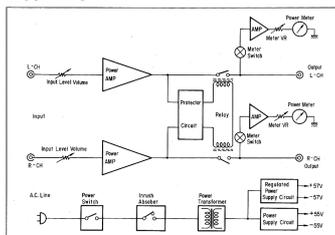
POWER OUTPUT Min. RMS, both channels driven, from 50 to 20,000Hz, with no more than 0.5% total harmonic distortion. 150 watts per channel into 8 ohms See note on harmonic distortion, channel separation, and channel crosstalk in the Introduction section.	DAMPING FACTOR approximately 70 at 8 ohms load
LOAD IMPEDANCE 8 ohms	CHANNEL SEPARATION (at rated output, 10kHz) better than 75dB
POWER BANDWIDTH 10 to 20,000Hz at or below rated min. RMS power output and total harmonic distortion	HEM AND NOISE DNF better than 115dB (SPL for rated power output)
TOTAL HARMONIC DISTORTION less than 0.5% at or below rated min. RMS power output	INPUT SENSITIVITY AND IMPEDANCE 5,000V 50k Ω
INTERMODULATION DISTORTION (IMD) (200Hz-4.5 kHz, 50V μ sec method) less than 0.5%	GENERAL POWER VOLTAGE 100, 120, 240V 50/60Hz (U.S.A. & Canada) 230V (Canada/100/200/240V)
FREQUENCY RESPONSE (A-weighted) 5Hz to 100kHz \pm 5dB	POWER CONSUMPTION 400 watts (SPL) (rated)
	DIMENSIONS 460 mm (18 1/8") W 360 mm (14 1/8") H 35 mm (1 3/8") D
	WEIGHT 33.3 kg (74.3 lbs) net 30.8 kg (68.0 lbs) packed

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

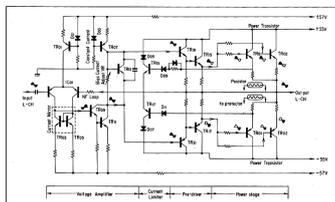
TABLE OF CONTENTS

Section	Title	Page
1.	SPECIFICATIONS	1
2.	BLOCK DIAGRAM	2
3.	OPERATING DIAGRAM	2
4.	OPERATION OF NEW CIRCUIT	3
4.1.	Current Meter Circuit	3
5.	ADJUSTMENTS	4
5.1.	Rin Current Adjustment	4
5.2.	Power Meter Adjustment	4
6.	PARTS LISTS & PARTS LOCATION	5
6.1.	F-3601 Driver Circuit Board	5
6.2.	F-3630 Power Supply Circuit Board for Driver Stage	6
6.3.	F-3620 Power Supply Circuit Board	7
6.4.	F-3631 Level Volume & Meter Circuit Board	7
6.5.	F-3614 Meter Lamp Circuit Board	7
6.6.	F-3632 Final Stage Circuit Board	8
6.7.	F-3630 Top Terminal Circuit Board	8
7.	OTHER PARTS	9
7.1.	Top & Bottom View	9
7.2.	Front View	10
7.3.	Figures	10
8.	SCHEMATIC DIAGRAM	11
9.	PACKING LIST	BACK COVER
10.	ACCESSORY PARTS LIST	BACK COVER

2. BLOCK DIAGRAM



3. OPERATING DIAGRAM



4. OPERATION OF NEW CIRCUIT

4-1. Current Mirror Circuit

o Purpose of use is § 2.4.2.009
By adding current mirror section to balanced-type signal amplifier as Fig. the current mirror circuit is effective to improve signal to noise ratio, distortion factor and direct current stability.

o Advantages

1. By operation of differential amplification in this divider stage, the current mirror circuit is effective to reduce the influence of the power line voltage deviation and "Common Mode Rejection Ratio (C.M.R.R.) differential gain".
2. By basic functions of push-pull amplifier in this circuit, lower distortion factor is obtained.
3. Since the output impedance of this circuit can be kept extremely high, considerable high gain is obtained.

o Operation

This Current Mirror Circuit is composed of two transistors, TR03 & TR05 as the current mirror section and a R201 as the balanced-type signal amplifier as shown in Fig. The transistor, TR03, and transistor A, of first stage built in the IC operate as a push-pull amplifier.

o Phase Characteristics

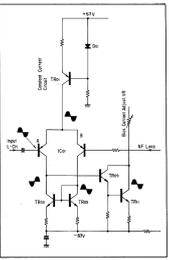
When input signal shown in Fig. is supplied to the base of the transistor A in the IC,

1. Out-of phase signal against the input signal appears at the collector of transistor A.
2. In-phase signal against the input one appears at the emitter of transistor B.
3. Since the base of transistor B built in the IC is grounded in AC equivalent circuit, transistor B operates as the function of common-base circuit; therefore, the signal at collector of transistor B is in-phase signal against signal appeared at emitter of transistor B.
4. The signal appeared at collector of transistor B is given to the base of TR03. The signal appeared at collector of TR03 is out-of phase to the signal at collector of transistor B and is in-phase signal at collector of transistor A.

Thus, the combination of transistor A and TR03 is used as operation of push-pull amplifier.

o Open Loop Gain

The open loop gain of conventional differential amplifier itself is approximately 30dB to 35dB in normal operation; furthermore, by adding the current mirror circuit in series to conventional differential amplifier, it is possible to obtain high open loop gain, approximately 200dB to 300dB. Consequently, the gain-rolls to 30dB, it is able to add to negative feedback loop by using the current mirror circuit in order to improve distortion factor.



5. ADJUSTMENTS

5-1. Bias Current Adjustment (See Fig. 5-1, 5-2)

Condition:

- Room Temperature 18°C-28°C (65°F-83°F) minimum (counterclockwise)
- Output Load Connected 2 ohms 5. Level Volume Maximum
- A.C. Supply Voltage Rated Voltage ±2% 6. For this adjustment, run this unit for more than 3 minutes after turning on the power switch.
- Turn down the volume, VRO1, VRO2 on F-2611 to minimum (counterclockwise)

STEP	SUBJECTS	AUDIO OSCILLATOR OUTPUT	CONNECTING POINT	OUTPUT TERMINAL	ADJUST	ADJUST FOR	REMARKS
1	Distortion Factor & Harmonic Distortion Adjustment	An audio signal generator connected to the input of the amplifier. Adjusting distortion adjustment by adjusting D.S.C.-output level.	Input amplifier	Speaker Terminal B1 (Output) Distortion Meter	VRO1 (Q-CH) on F-2611	Minimum point of distortion factor & distortion	To avoid over-temperature, adjustment in a short time.
2	Bias Current (no input signal)	VRO1 (Q-CH input signal)		D.C. Milliammeter VRO1 (Q-CH) on F-2611		Confirm bias current is over 100mA, Set it to 100mA.	Only being it over 100mA, Set it to 100mA.

Note: After proceeding with Step 1, have a cooling off period, 5 to 10 minutes, to confirm the bias current. In case of not having a distortion meter, complete the adjustment by Step 2 to obtain bias current 100mA.

Fig. 5-1

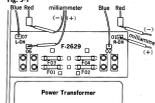
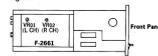


Fig. 5-2



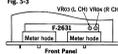
5-2. Power Meter Adjustments (See Fig. 5-3)

Condition:

- Level Volume Maximum
- For this adjustment, run the unit for more than 2 minutes after turning on the power switch.

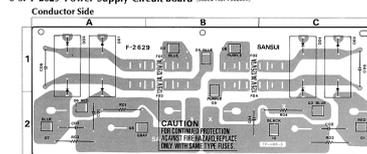
OUTPUT	AUDIO OSCILLATOR	CONNECTING POINT	OUTPUT TERMINAL	ADJUST	ADJUST FOR
VRO1 (Q-CH) VRO2 (Q-CH)	Input terminal of Amplifier	Input terminal of VTM Oscilloscope	VRO1 (Q-CH) VRO2 (Q-CH) on F-2611		Set the pointer of power meter (M11190) on both channels

Fig. 5-3





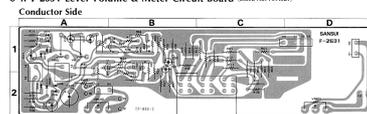
6-3. F-2629 Power Supply Circuit Board (Stock No. 7592881)



Parts List

Parts No.	Stock No.	Description	Position	Parts No.	Stock No.	Description	Position
Dis	0211010	SS-5		Chl. Co	060100	1.0μF	100V V.C. 1A, 1C
Dis	0211048	60141	1A	Chl. Co	060100	1.0μF	2A, 2B
Dis	0211010	SS-5	1C	Chl. Co	065547	0.847μF	250V V.C. 1A, 1C
Dis	0211048	SS-51	1A	Res. Co	020300	2.2kΩ	1A, 1C
Dis	0211028	SS-38	1A	Res. Co	020300	2.2kΩ	2W 1/2W 1A, 1C
Dis	0211028	SS-38	1A	Ph. Co	043300	AC Fuse	1, 2B
Dis	0211028	SS-38	1C				

6-4. F-2631 Level Volume & Meter Circuit Board (Stock No. 7592821)



Parts List

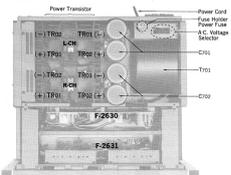
Parts No.	Stock No.	Description	Position	Parts No.	Stock No.	Description	Position
Trf. Co	020407-1	2SC1313 (J, G)	1A	Res	021000	1.0kΩ	1/2W V.C. 2A
Trf. Co	020407-2	2SC1313 (J, G)	1A, 1B	V.M. Co	100000	100kΩ (10)	1A
Dis	0211048	124K20	1A, 2A	V.M. Co	102400	200kΩ (10)	Volume
Dis	0211048	124K20	1A, 2A	Slr	110300	Push Switch	
Dis	0211048	124K20	1A, 2A				
Dis	0211048	124K20	1A, 2A				



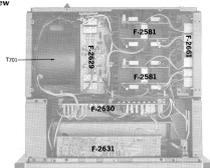
7. OTHER PARTS

7-1. Top & Bottom View

Top View



Bottom View



Parts List

Parts No.	Stock No.	Description	Parts No.	Stock No.	Description
C101	884919	E.C. 1000µF 63V	F10	041460	Fuse 10A (100V 120V)
C102	884919	E.C. 8.2µF 160V	F10	041170	Fuse 5A (100V 120V)
R01	820101	1/4W 100Ω	F10	020360	Fuse Holder
R02	820102	1/4W 10kΩ	F10	241091	AC Voltage Selector Plug
T01	402208	Power Transistor	F10	241800	10P AC Voltage Selector Socket
			F10	638400	AC Voltage Selector Cover
			F10	388210	A.C. Power Cord

9. PACKING LIST

Parts No.	Stock No.	Description
1	P20900	Carton Case
2	P02791	Explosion Proofing
3	P11605	Wet Cover

10. ACCESSORY PARTS LIST

Stock No.	Description
P20240	Clearing Instruction
P201420	Clearing Diagram

