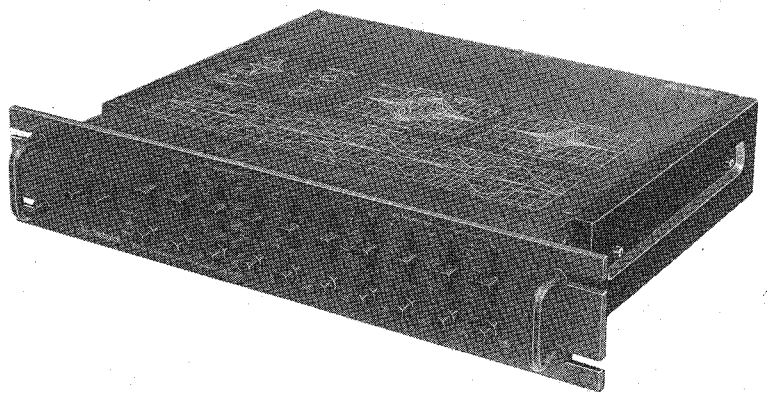
ORDER NO. SD7701-1174

Service Manual

Stereo Universal Frequency Equalizer

SH-9010

(X), (XG), (XGH), (XE), (XSD), (XSW)



- The model SH-9010 (X) is available in Asia, Latin America, Oceania, Middle East and Afirica.
- The model SH-9010 (XG) is available in European only.
- The model SH-9010 (XGH) is available in Holland only.
- The model SH-9010 (XE) is available in England only.
- The model SH-9010 (XSD) is available in Scandinavia only.
- The model SH-9010 (XSW) is available in Swiss only.

TECHNICAL SPECIFICATIONS

Specifications are subject to change without notice for further improvement.

Output voltage and impedance:
Rated 1V/300Ω
Maximum 5V/300Ω
(Band-level controls: 0dB)
Total harmonic distortion: 0.02% (rated output)
Input sensitivity and impedance: 1V/47kΩ (1kHz)
Frequency response (All band-level controls: 0dB):
10Hz ~ 20kHz, $^{+0}_{-0.2}$ dB
10Hz ~ 70kHz, $^{+0}_{-3}$ dB
Gain: 0 ± 1dB
S/N (IHF, A Signal = 1V): 90dB
S/N (DIN 45 500): 87dB (rated output)
Band-level controls: +12dB ~ −12dB
(5 elements, continuously variable)
Center-frequency controls: From 1.6 octave above to 1.6 octave below the standard frequency
(5 elements, continuously variable)
Bandwidth control [Q]: 0.7 ~ 7
(5 elements, continuously variable)
Center frequencies:
60Hz (20Hz ~ 180Hz)
240Hz (80Hz ~ 720Hz)
1kHz (333Hz ~ 3kHz)
4kHz (1.33kHz ~ 12kHz)
16kHz (5.3kHz ~ 48kHz)

GENERAL

Power consumption: 8W
Power supply: 110/120/220/240V
Dimensions (W x H x D): 450 x 92 x 364mm (17$^{23}/_{32}$" x 3$^{5}/_{8}$" x 14$^{11}/_{32}$")
Weight: 6.0kg (13.2 lb.)

TECHNISCHE DATEN

Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

Ausgangsspannungen & Impedanz:
Nominal 1V/300Ω
Maximal: 5V/300Ω
(Bandpegelregler 0dB)
Harmonische Verzerrungen: 0.02% (Solleistung)
Eingangsempfindlichkeit & Impedanz: 1V/47kΩ (1kHz)
Frequenzgang (Bandpegelregler: 0dB):
10Hz ~ 20kHz, $^{+0}_{-0,2}$ dB
10Hz ~ 70kHz, $^{+0}_{-3}$ dB
Verstärkung: 0 ± 1 dB
Rauschabstand (nach IHF, A Signal = 1V); 90dB
Rauschabstand (nach DIN 45 500): 87 dB (Solleistung)
Bandpegelregler: +12dB ~ −12dB
(5 Elemente, kontinuierlich einstellbar)
Mittenfrequenzregler: Von 1,6 Oktaven über, bis 1,6 Oktaven unter der Standard frequenz
(5 Elemente, kontinuierlich einstellbar)
Bandbreiteregler [Q]: 0.7 ~ 7
(5 Elemente, kontinuierlich einstellbar)
Mittenfrequenzen:
60Hz (20Hz ~ 280Hz)
240Hz (80Hz ~ 720Hz)
1kHz (333Hz ~ 3kHz)
4 kHz (1,33kHz ~ 12kHz)
16kHz (5,3kHz ~ 48kHz)

ALLGEMEINE DATEN

Leistungsaufnahme: 8W
Netzspannung umschaltbar: 110/120/220/240V
Abmessungen (B x H x T): 450 x 92 x 364mm
Gewicht: 6.0kg

CARACTERISTIQUES TECHNIQUES

Sujet à changement sans préaris.

Tension de sortie & impédance de sortie:
Nominale: 1V/300Ω
Maximale: 5V/300Ω
(Commandes de niveau des bandes: 0dB)
Distorsion harmonique totale: 0.02% (à la puissance nom.)
Sensibilité & impédance d'entrée: 1V/47kΩ (1kHz)
Courbe de réponse (Toules les commandes de niveau des bandes: 0 dB):
10Hz ~ 20kHz, $^{+0}_{-0,2}$ dB
10Hz ~ 70kHz, $^{+0}_{-3}$ dB
Gain: 0 ±1dB
Rapport S/B (IHF, A Signal = 1V): 90dB
Rapport S/B (DIN 45 500): 87dB (à la puissance nom.)
Commandes de niveau des bandes: +12dB à −12dB
(5 éléments: continuellement variable)
Commande de la fréquence médiane:
(5 divisions de 1,6 octave au-dessus à 1,6 octave au-dessous de la fréquence normale)
Commande de largeur bande [Q]: 0,7 à 7
(5 éléments: continuellement variable)
Fréquence médiane:
60Hz (20Hz ~ 180Hz)
240Hz (80Hz ~ 720Hz)
1kHz (333Hz ~ 3kHz)
4kHz (1.33Hz ~ 12kHz)
16kHz (5.3kHz ~ 48kHz)

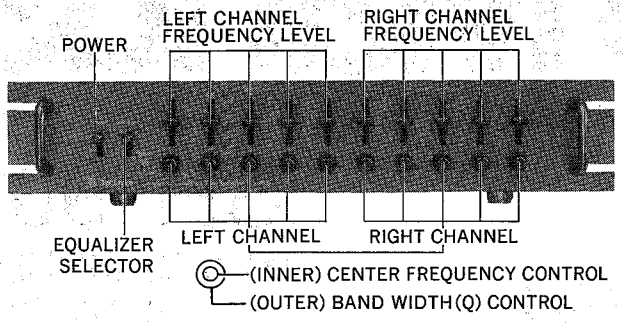
GENERALITES

Consommation: 8W
Alimentation: 110/120/220/240V
Dimensions (L x H x P): 450 x 92 x 364 mm
Poids: 6.0kg

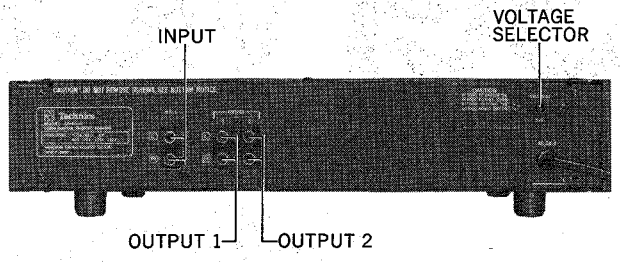
Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

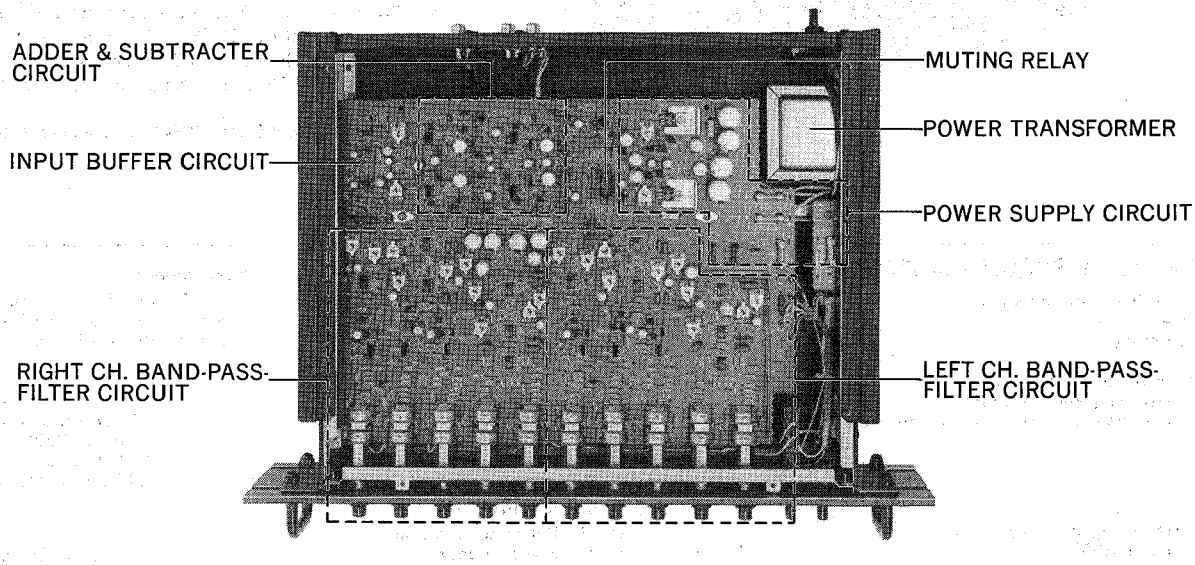
■ LOCATION OF CONTROLS



FRONT VIEW

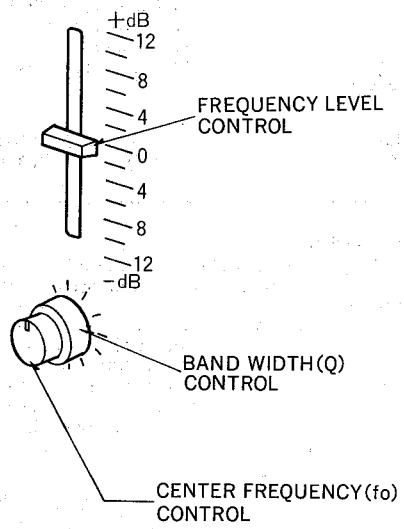


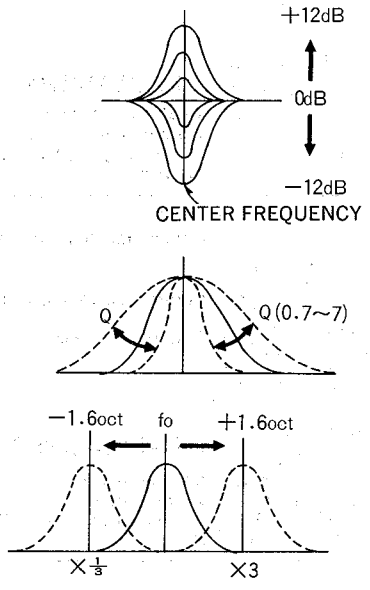
REAR VIEW



INSIDE VIEW

■ CONTROL OF THE FREQUENCY RESPONSE





Frequency response can be adjusted by using the 5 bandlevel controls, one for each band, the 5 center-frequency controls, and the 5 bandwidth controls. The maximum adjustment is from 20 Hz to 48 kHz (corresponding to a range of ± 12dB in which the band level is variable).

The standard frequency for each of the 5 divisions is: 60 Hz, 240 Hz, 1 kHz, 4 kHz and 16 kHz. One band-level control, one center-frequency control, and one bandwidth control are assigned to each division, and variations are possible within a range of + 12dB to −12 dB (for each band-level control), 1.6 octave above and below the standard frequency (for each center-frequency control), and, of "Q", from 0.7 to 7 (the sharpness of the peak and dip).

The function of each control is explained below. Although the frequency range differs for each division, the actual operation of the controls for all 5 divisions is the same.

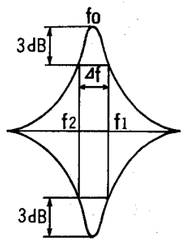
- **Frequency level controls**

These controls can be used for continuously varying the level of each frequency response from + 12dB to −12 dB.

- **Bandwidth controls [bandwidth "Q"]**

These controls can be used for continuously varying the sharpness of the peak and the dip of the frequency response The "Q" is one of the measuring methods used for expressing the sharpness of the peak and the dip.

Definition of "Q"



"Q" expresses the sharpness of the peak and the dip, and its value is expressed as the value obtained when the center frequency (fo) is decreased by 3 dB less than the peak point (the dip point is increased by 3 dB), and is divided by the frequency range ($\Delta f = f_1 - f_2$).

$$Q = \frac{f_0}{\Delta f}$$

- **Center-frequency controls**

These controls can be used for continuously varying the center frequency of the peak and dip frequency response 1.6 octave upward and 1.6 octave downward with respect to the indicated standard frequency.
A variable range of 1.6 octave upward and downward means a range of 1/3 to 3 times the indicated standard frequency. For example, for the 60 Hz center-frequency control, continuous variation is possible within a range of 20 Hz to 180 Hz. The center frequency becomes lower when this control is turned to the left, and the center frequency becomes 1/3 of the indicated standard frequency by turning it completely to the left.
The center frequency becomes higher when this control is turned to the right, and becomes 3 times the indicated standard frequency by turning it all the way to the right.
(The indicated standard frequencies are 60 Hz, 240 Hz, 1 kHz, 4 kHz and 16 kHz, as indicated on the front panel.)

■ SERVICE AID

The equalizer section of this unit is mainly divided into two parts: the band-pass filter section and the operational section

1. Band-Pass Filter Section

There are 5 band-pass filters, each filter consisting of three operational amplifiers (OP amplifier) (figure 1). The three operational amplifiers are: two integrators and one adder.
Because the center frequency of the band-pass filter is determined by the time constant relative to **R** and **C**, it is operated by a 2-gang volume control (VR201-3, VR201-4 [Lch.] at 60 Hz in the circuit diagram).
In addition, the "Q" of the resonance peak characteristic (bandwidth) of the band-pass filter is to be varied with the 2-gang volume "**r**" VR201-1, VR201-2 [Lch.] at 60 Hz in the circuit diagram).

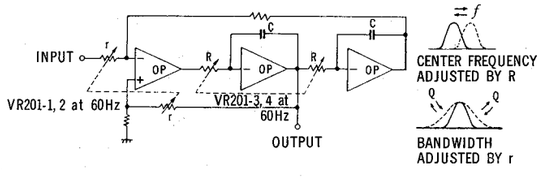


Fig. 1

2. Operational Section

This "block" functions to form the peak and dip frequency response; figure 2 shows this circuit construction. When the level volume VR (VR1 [Lch.] at 60 Hz in the circuit diagram) is located at the center position, the band-pass filter is disengaged from the circuit, so that the gain of both input and output is:

$$G = \frac{R_2}{R_1} \times \frac{R_4}{R_3}$$

When the sliding VR is located at position ① , the output becomes the total of the input from R_3 added to the output of the band-pass filter.

That is, $G = \frac{R_2}{R_1} \times \left(\frac{R_4}{R_3} + \frac{R_4}{R_5} T_B\right)$

T_B: gain characteristic of the band-pass filter.

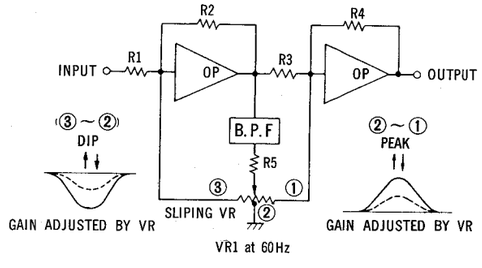
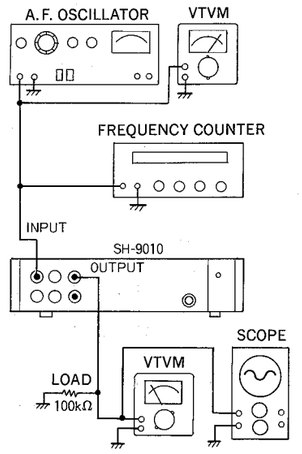


Fig. 2

In this way, as the overall response, a frequency response which has a peak is producted.
When the sliding VR is located at position ③ , the band-pass filter enters the NF circuit of the first-stage amplifier so that negative feedback, which is the synthesis of a band-pass filter which has a peak and of **R2**, will be applied. The result is a frequency response which has a dip.
There are 5 band-pass filters and sliding volume controls in parallel (each channel), making it possible to form the desired frequency response for each frequency.

■ ALIGNMENT INSTRUCTIONS



- This unit should be re-adjusted when capacitors or resistors (especially the volume control) are replaced.
- A complete and very precise measuring instrument is required for adjustment of this unit; It is especially necessary to use a frequency oscillator which oscillates a stable signal for individual frequency bands.
- For adjustment of this unit, turn the power switch "on" and the equalizer selector switch to the "in" position.
- Refer to right figure for information concerning connections of measuring instruments.
- Follow the steps described below before beginning adjustments.
  * Set individual frequency band level control to 0dB.
  * Set center frequency control to middle position.
  * Set bandwidth control to right turned position (Narrow band).
  * Set standard input voltage (each frequency) to 0dB in the 1V range (0.775V).

Adjustment of Voltage Regulation Circuit

DC VOLTMETER CONNECTION	ADJUSTMENT POINTS	VOLTAGE
Connect a DC voltmeter between terminal [111] and terminal [716] of the p.c.b.	VR701	+17V
Connect a DC voltmeter between terminal [111] and terminal [717] of the p.c.b.	VR702	−17V

Adjustment of DC Unbalanced Voltage

DC VOLTMETER CONNECTION	ADJUSTMENT POINTS	VOLTAGE
Connect a DC voltmeter between terminal [118] and testpoint TP1 of printed circuit board.	VR101	0mV
Connect a DC voltmeter between terminal [118] and testpoint TP2 of printed circuit board.	VR102	0mV

Adjustment of Individual Frequency Gain (When adjusting 1kHz gain)

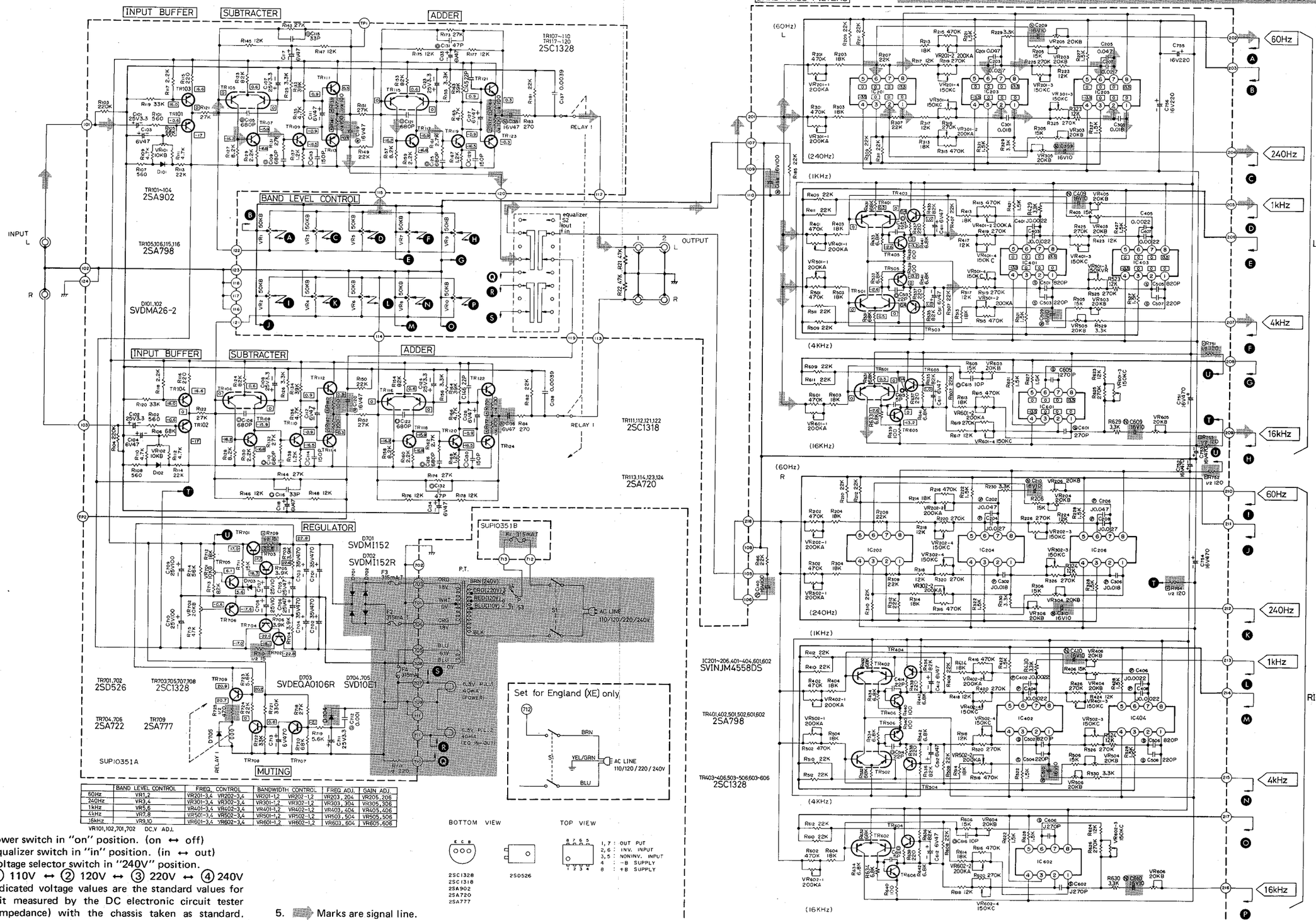
Input Frequency	Output Voltage	Adjustment Points	Procedure of Adjustment
1kHz	1V range 0 dB	Input Level of this unit	Vary input level to make output power 0dB (0.775V) in the 1V range at 1kHz input.
	Maximum	Left channel VR403	Set the 1kHz level control to +12dB and adjust VR403 to obtain maximum output.
		Right channel VR404	Set the 1kHz level control to +12dB and adjust VR404 to obtain maximum output.
	3V range +2dB	Left channel VR405	Adjust VR405 to +2dB in the 3V range of output at this time.
		Right channel VR406	Adjust VR406 to +2dB in the 3V range of output at this time.

* Concerning other frequencies, adjust them by the same procedure as described in Adjustment of 1kHz gain.

FREQUENCIES		60Hz	240Hz	1kHz	4kHz	16 kHz
TO MAXIMUM OUTPUT	Left channel	VR203	VR303	VR403	VR503	VR603
	Right channel	VR204	VR304	VR404	VR504	VR604
TO +2dB IN THE 3V RANGE OF OUTPUT	Left channel	VR205	VR305	VR405	VR505	VR605
	Right channel	VR206	VR306	VR406	VR506	VR606

Schematic Diagram — Model SH-9010

IMPORTANT SAFETY NOTICE
THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR SAFETY.
WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTUR'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

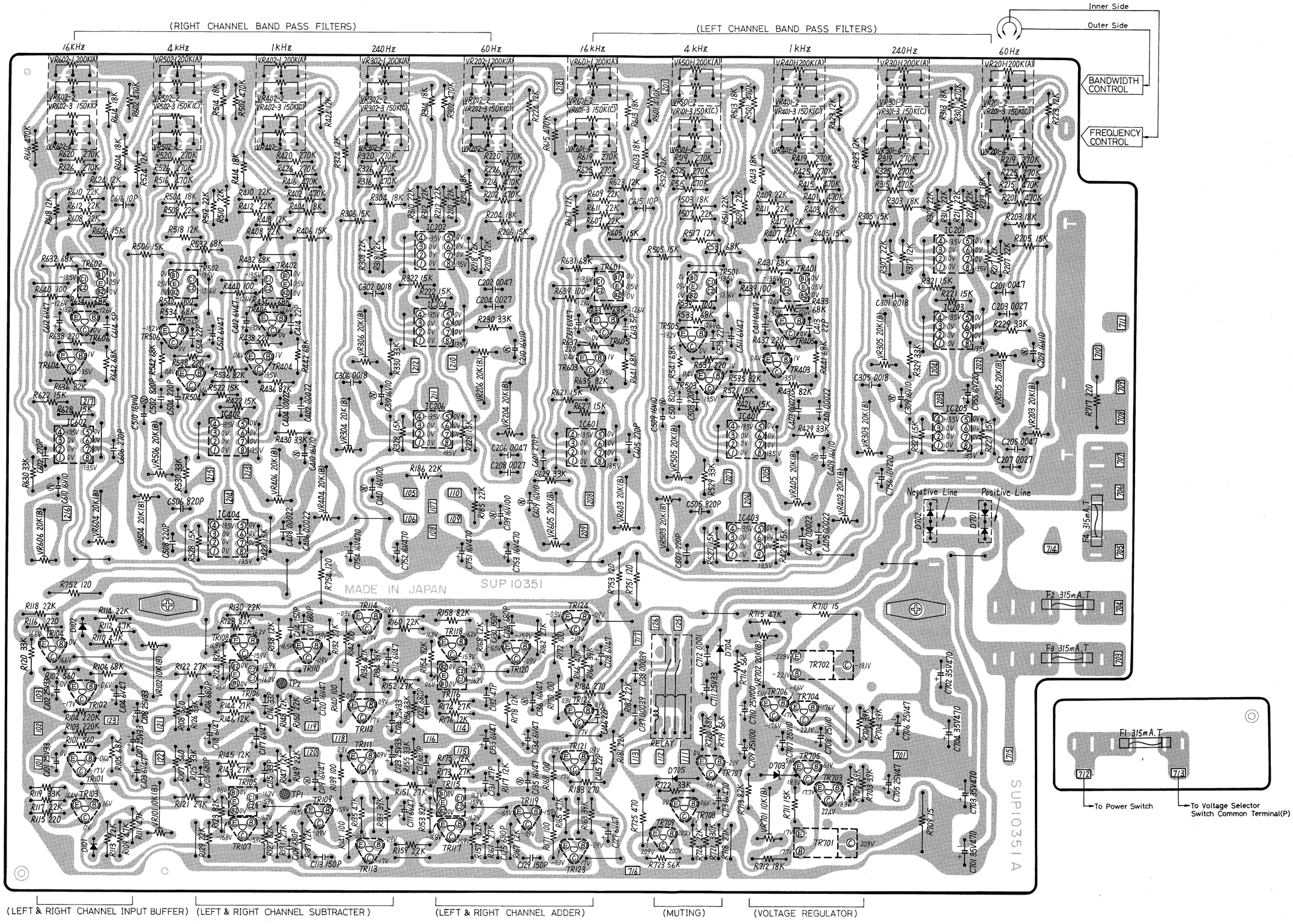


	BAND LEVEL CONTROL	FREQ. CONTROL	BANDWIDTH CONTROL	FREQ ADJ.	GAIN ADJ.
60Hz	VR1,2	VR201-3,4	VR201-1,2	VR203, 204	VR205, 206
240Hz	VR3,4	VR301-3,4	VR301-1,2	VR303, 304	VR305, 306
1kHz	VR5,6	VR401-3,4	VR401-1,2	VR403, 404	VR405, 406
4kHz	VR7,8	VR501-3,4	VR501-1,2	VR503, 504	VR505, 506
16kHz	VR9,10	VR601-3,4	VR601-1,2	VR603, 604	VR605, 606

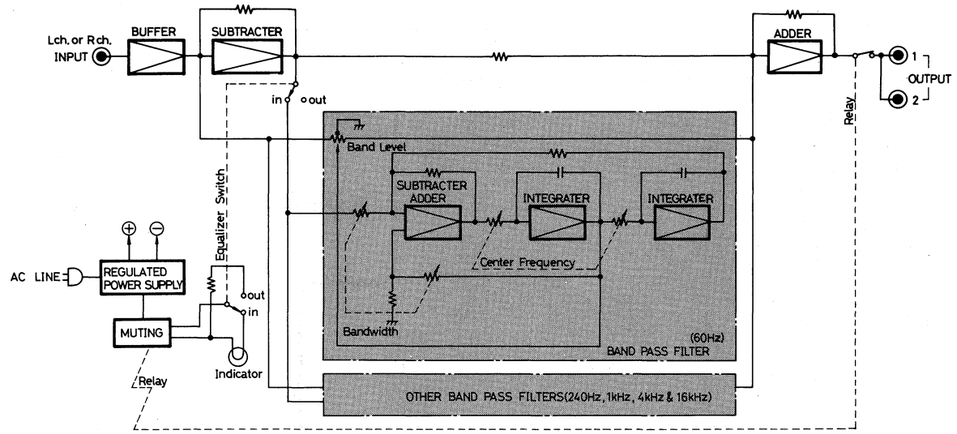
VR101,102,701,702 DC.V ADJ.

Notes:
1. S1: Power switch in "on" position. (on ↔ off)
2. S2: Equalizer switch in "in" position. (in ↔ out)
3. S3: Voltage selector switch in "240V" position.
   ① 110V ↔ ② 120V ↔ ③ 220V ↔ ④ 240V
4. ▭ Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
5. ▰ Marks are signal line.
6. This schematic diagram may be modified at any time with the development of new technology.

Printed Circuit Board

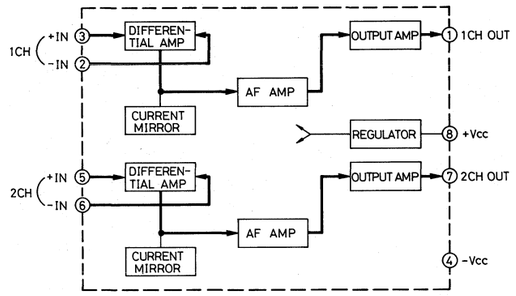


■ BLOCK DIAGRAM (each channel)

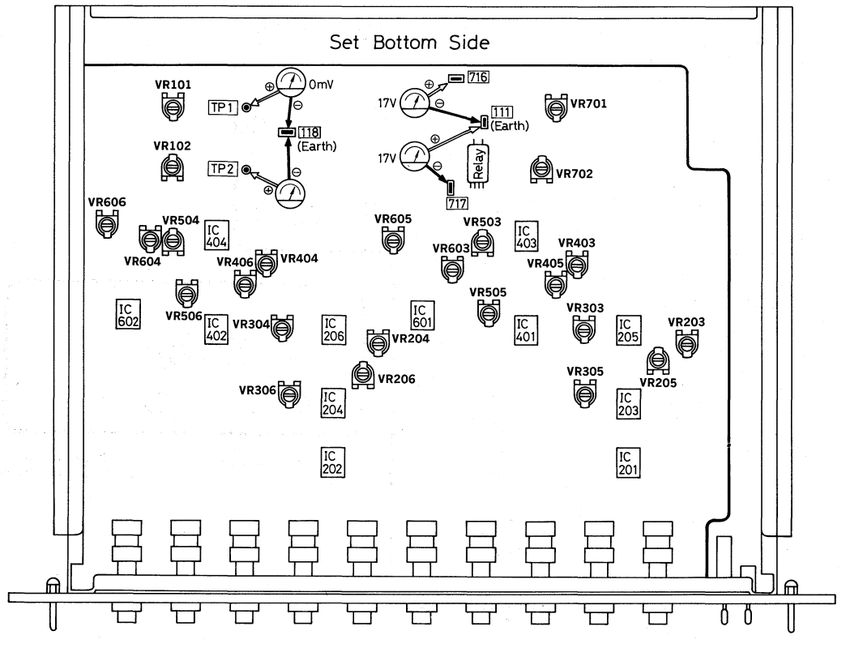


■ BLOCK DIAGRAM OF I.C.

Part No. (SVINJM4558DS)
Built-in two channel amplifier



■ ALIGNMENT POINTS



■ ANLEITUNGEN ZUM ABSTIMMEN

- Dieses Gerät sollte neu abgestimmt werden, wenn Kondensatoren oder Resistoren (im besonderen der Lautstärkeregler) ausgewechselt worden sind.
- Zum Abstimmen dieses Gerätes wird ein vollständiges und sehr präzises Meßinstrument benötigt. Es ist besonders wichtig, daß ein Frequenzoszilloskop verwendet wird, welches ein gleichmäßiges Signal für die einzelnen Frequenzbänder ausstrahlt.
- Schalten Sie zum Abstimmen dieses Gerätes den Netzschalter auf "ON" und den Entzerrungswählschalter in die "IN"-Position.
- Folgen Sie den nachstehenden Anleitungen, bevor Sie mit dem Abstimmen beginnen.
  * Stellen Sie den Frequenzbandpegelregler auf 0 dB.
  * Stellen Sie den Mittelfrequenzregler in die Mittelstellung.
  * Stellen Sie den Bandbreiteregler in die rechte Position (schmales Band) .
  * Stellen Sie die Standard-Eingangsspannung (jede Frequenz) auf 0 dB im Bereich von 1 V (0,775 V) .

Abstimmen der Spannungsausgleich-Schaltung

	ANSCHLUSS DES GLEICHSTROM-VOLTMETERS	ABSTIMMUNGSSTELLE	SPANNUNG
1	Schließen Sie einen Gleichstrom-Voltmeter zwischen Anschluß [111] und Anschluß [716] auf der gedruckten Schaltung an.	VR701	+17V
2	Schließen Sie einen Gleichstrom-Voltmeter zwischen Anschluß [111] und Anschluß [717] auf der gedruckten Schaltung an.	VR702	–17V

Abstimmen der unausgeglichenen Spannung

	ANSCHLUSS DES GLEICHSTROM-VOLTMETERS	ABSTIMMUNGSSTELLE	SPANNUNG
1	Schließen Sie einen Gleichstrom-Voltmeter zwischen Anschluß [118] und Prüfstelle TP1 auf der gedruckten Schaltung an.	VR101	0 mV
2	Schließen Sie einen Gleichstrom-Voltmeter zwischen Anschluß [118] und Prüfstelle TP2 auf der gedruckten Schaltung an.	VR102	0 mV

Abstimmen der individuellen Frequenzverstärkung (beim Abstimmen der 1 kHz Verstärkung)

	Eingangs-frequenz	Ausgangsspannung	Abstimmungsstelle	Abstimmungsmethode
1	1 kHz	1V Bereich 0 dB	Eingangspegel dieses Gerätes	Den Eingangspegel verändern, um die Ausgangsleistung auf 0 dB (0,775V) im 1V Bereich bei 1 kHz Eingangsfrequenz zu bringen.
2		Maximum	L Kanal VR403	Den 1 kHz Pegelregler auf +12 dB stellen und VR403 abgleichen, um maximale Ausgangsleistung zu erzielen.
			R Kanal VR404	Den 1 kHz Pegelregler auf +12 dB stellen und VR404 abgleichen, um maximale Ausgangsleistung zu erzielen.
3		3V Bereich +2 dB	L Kanal VR405	VR405 auf +2 dB im 3V Bereich der Ausgangsleistung zu dieser Zeit justieren.
			R Kanal VR406	VR406 auf +2 dB im 3V Bereich der Ausgangsleistung zu dieser Zeit justieren.

* Zum Abstimmen anderer Frequenzen, verwenden Sie dieselbe Methode, wie im Abschnitt "Abstimmen der 1 kHz Verstärkung" beschrieben.

FREQUENZEN		60 Hz	240 Hz	1 kHz	4 kHz	16 kHz
AUF MAXIMUM-AUSGANGSLEISTUNG	L Kanal	VR203	VR303	VR403	VR503	VR603
	R Kanal	VR204	VR304	VR404	VR504	VR604
AUF +2 dB IM 3V BEREICH DER AUSGANGSLEISTUNG	L Kanal	VR205	VR305	VR405	VR505	VR605
	R Kanal	VR206	VR306	VR406	VR506	VR606

■ DIRECTIVES POUR LE SYNCHRONISME

- Cet appareil devra être réglé à nouveau lorsque les condensateurs et les résistances (particulièrement le réglage de volume) sont remplacés ou remis en place.
- Un appareil de mesure complet et très précis est nécessaire pour la mise au point de cet ensemble. Il est particulièrement nécessaire d'utiliser un oscillateur de fréquences qui puisse osciller à un signal stable pour les bandes de fréquences individuelles.
- Pour la mise au point de cet appareil tourner l'interrupteur d'alimentation sur "ON" et l'interrupteur sélecteur de compensation sur la position "IN".
- Suivre les étapes décrites ci-dessous, avant de commencer les réglages.
  * Régler le régulateur de niveau de bandes de fréquences individuelles sur 0 dB.
  * Régler le réglage de fréquences central sur une position médiane.
  * Régler le réglage de la bande passante sur une position dirigée vers la droite, (Bande étroite).
  * Régler la tension d'entrée nominale (pour chaque fréquence) sur 0 dB dans la gamme de 1V (0,775V).

Mise au point du circuit de régulation de tension

	BRANCHEMENTS DU VOLTMETRE A C.C.	POINTS DE REGLAGE	TENSION
1	Brancher un voltmètre à C.C. entre la borne [111] et la borne [716] de la plaquette à circuits imprimés.	VR701	+17V
2	Brancher un voltmètre à C.C. entre la borne [111] et la borne [717] de la plaquette à circuits imprimés.	VR702	–17V

Mise au point de la tension asymétrique à C.C.

	BRANCHEMENTS DU VOLTMETRE A C.C.	POINTS DE REGLAGE	TENSION
1	Brancher un voltmètre à C.C. entre la borne [118] et le point de mesure TP1 de la plaquette à circuits imprimés.	VR101	0 mV
2	Brancher un voltmètre à C.C. entre la borne [118] et le point de mesure TP2 de la plaquette à circuits imprimés.	VR102	0 mV

Mise au point de l'amplification de fréquence individuelle (Lors d'un réglage d'amplification de 1 kHz.)

	Fréquence d'entrée	Tension de sortie	Points de réglage	Procédure de mise au point
1	1 kHz	Gamme de 1V 0dB	Niveau d'entrée de cet appareil	Modifier le niveau d'entrée pour amener 0 dB de la puissance de sortie (0,775V) dans la gamme IV à une entrée de 1 kHz.
2		Maximum	Canal de gauche VR403	Régler le régulateur de niveau de 1 kHz sur +12dB et ajuster VR403 pour obtenir une sortie maximum.
			Canal de droite VR404	Régler le régulateur de niveau de 1 kHz sur +12dB et ajuster VR404 pour obtenir une sortie maximum.
3		Gamme de 3V +2dB	Canal de gauche VR405	Régler VR405 sur +2dB dans la gamme de 3V à la sortie de cette période.
			Canal de droite VR406	Régler VR406 sur +2dB dans la gamme de 3V à la sortie de cette période.

* Au sujet des autres fréquences, les régler en utilisant la même procédure que celle décrite dans le "Réglage d'amplification de 1 kHz".

	FREQUENCES		60Hz	240Hz	1 kHz	4 kHz	16 kHz
1	A UNE SORTIE MAXIMUM	Canal de gauche	VR203	VR303	VR403	VR503	VR603
		Canal de droite	VR204	VR304	VR404	VR504	VR604
2	A +2dB DANS LA GAMME DE 3V DE SORTIE	Canal de gauche	VR205	VR305	VR405	VR505	VR605
		Canal de droite	VR206	VR306	VR406	VR506	VR606

■ REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by shaded area have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

NOTE: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
INTEGRATED CIRCUITS				
IC201,202,203, 204,205,206, 401,402,403, 404,601,602	SVINJM4558DS	Band Pass Filter Circuit	12	O
TRANSISTORS				
TR101,102,103, 104,704,706	**2SA902-F**	Input Buffer Amplifier & Voltage Regulator	6	
TR105,106,115, 116,401,402, 501,502,601, 602	2SA798-F	Differential Amplifier (Use in ranks F or G2)	10	
TR107,108,109, 110,117,118, 119,120,403, 404,405,406, 503,504,505, 506,603,604, 605,606,703, 705,707,708	**2SC1328-T**	Adder & Subtracter Amplifier, Band Pass Filter, Voltage Regulator Circuit & Muting Switching (Use in ranks T,U or S)	24	
TR111,112,121, 122	**2SC1318-R**	Adder & Subtracter Amplifier (Use in ranks Q or R)	4	
TR113,114,123, 124	**2SA720-R**	Adder & Subtracter Amplifier (Use in ranks Q or R)	4	
TR701,702	2SD526-O	Voltage Stabilizer (Use in ranks R, O or Y2)	2	
TR709	**2SA777-Q**	Relay Driver (Use in ranks Q or R)	1	
DIODES				
D101,102	SVDMA26-2	Buffer Amplifier Bias Supply	2	
D701	**RVD10DC2**	Rectifier	1	
D702	**RVD10DC2R**	Rectifier	1	
D703	SVDEQA0106R	6V Zener, Voltage Stabilizer	1	
D704,705	SVD10E1	Rectifier	2	
TRANSFORMER				
T1	SLT5M65-W	Power Transformer	1	O
RESISTORS				
R21	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ±5%	1	
R22	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ±5%	1	
R101	**ERD25TJ561**	Carbon, 560Ω, 1/4W, ±5%	1	
R102	**ERD25TJ561**	Carbon, 560Ω, 1/4W, ±5%	1	
R103	**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ±5%	1	
R104	**ERD25TJ224**	Carbon, 220kΩ, 1/4W, ±5%	1	
R105	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R106	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R107	**ERD25TJ561**	Carbon, 560Ω, 1/4W, ±5%	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R108	**ERD25TJ561**	Carbon, 560Ω, 1/4W, ±5%	1	
R109	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R110	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R111	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R112	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R113	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R114	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R115	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R116	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R117	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ±5%	1	
R118	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ±5%	1	
R119	**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ±5%	1	
R120	**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ±5%	1	
R121	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R122	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R123	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R124	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R125	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R126	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R127	**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ±5%	1	
R128	**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ±5%	1	
R129	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ±5%	1	
R130	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ±5%	1	
R131	**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ±5%	1	
R132	**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ±5%	1	
R133	**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ±5%	1	
R134	**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ±5%	1	
R135	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R136	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R137	**ERD25TJ122**	Carbon, 1.2kΩ, 1/4W, ±5%	1	
R138	**ERD25TJ122**	Carbon, 1.2kΩ, 1/4W, ±5%	1	
R139	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R140	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R141	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R142	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R143	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R144	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R145	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R146	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R147	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R148	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R149	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R150	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R151	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R152	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R153	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R154	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R155	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R156	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R157	**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ±5%	1	
R158	**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ±5%	1	
R159	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ±5%	1	
R160	**ERD25TJ222**	Carbon, 2.2kΩ, 1/4W, ±5%	1	
R161	**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ±5%	1	
R162	**ERD25TJ272**	Carbon, 2.7kΩ, 1/4W, ±5%	1	
R163	**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ±5%	1	
R164	**ERD25TJ393**	Carbon, 39kΩ, 1/4W, ±5%	1	
R165	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R166	**ERD25TJ472**	Carbon, 4.7kΩ, 1/4W, ±5%	1	
R167	**ERD25TJ122**	Carbon, 1.2kΩ, 1/4W, ±5%	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R168	**ERD25TJ122**	Carbon, 1.2kΩ, 1/4W, ±5%	1	
R169	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R170	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R171	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R172	**ERD14FJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R173	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R174	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R175	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R176	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R177	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R178	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R181	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R182	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R183	**ERD25TJ271**	Carbon, 270Ω, 1/4W, ±5%	1	
R184	**ERD25TJ271**	Carbon, 270Ω, 1/4W, ±5%	1	
R185	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R186	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R201	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R202	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R203	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R204	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R205	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R206	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R207	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R208	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R209	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R210	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R211	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R212	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R213	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R214	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R215	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R216	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R217	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R218	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R219	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R220	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R221	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R222	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R223	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R224	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R225	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R226	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R227	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R228	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R229	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R330	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R301	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R302	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R303	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R304	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R305	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R306	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R307	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R308	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R309	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R310	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R311	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R312	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R313	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R314	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R315	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R316	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R317	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R318	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R319	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R320	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R321	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R322	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R323	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R324	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R325	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R326	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R327	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R328	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R329	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R330	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R401	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R402	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R403	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R404	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R405	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R406	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R407	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R408	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R409	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R410	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R411	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R412	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R413	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R414	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R415	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R416	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R417	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R418	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R419	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R420	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R421	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R422	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R423	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R424	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R425	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R426	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R427	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R428	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R429	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R430	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R431	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R432	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R433	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R434	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R435	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R436	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R437	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R438	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R439	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R440	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R441	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R442	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R501	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R502	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R503	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R504	**ERD25TJ183**	Carobn, 18kΩ, 1/4W, ±5%	1	
R505	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R506	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R507	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R508	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R509	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R510	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R511	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R512	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R513	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R514	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R515	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R516	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R517	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R518	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R519	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R520	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R521	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R522	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R523	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R524	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R525	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R526	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R527	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R528	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R529	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R530	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R531	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R532	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R533	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R534	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R535	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R536	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R537	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R538	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R539	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R540	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R541	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R542	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R601	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R602	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R603	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R604	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R605	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R606	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R607	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R608	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R609	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R610	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R611	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R612	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R613	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R614	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R615	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R616	**ERD25TJ474**	Carbon, 470kΩ, 1/4W, ±5%	1	
R617	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R618	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R619	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R620	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R621	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R622	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R623	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R624	**ERD25TJ123**	Carbon, 12kΩ, 1/4W, ±5%	1	
R625	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R626	**ERD25TJ274**	Carbon, 270kΩ, 1/4W, ±5%	1	
R627	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R628	**ERD25TJ152**	Carbon, 1.5kΩ, 1/4W, ±5%	1	
R629	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R630	**ERD25TJ332**	Carbon, 3.3kΩ, 1/4W, ±5%	1	
R631	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R632	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R633	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R634	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R635	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R636	**ERD25TJ823**	Carbon, 82kΩ, 1/4W, ±5%	1	
R637	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R638	**ERD25TJ221**	Carbon, 220Ω, 1/4W, ±5%	1	
R639	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R640	**ERD25TJ101**	Carbon, 100Ω, 1/4W, ±5%	1	
R641	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R642	**ERD25TJ682**	Carbon, 6.8kΩ, 1/4W, ±5%	1	
R703	**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ±5%	1	
R704	**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ±5%	1	
R705	**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ±5%	1	
R706	**ERD25TJ392**	Carbon, 3.9kΩ, 1/4W, ±5%	1	
R709	ERQ12HJ150	Fuse Type Metallic, 15Ω, 1/2W, ±5%	1	
R710	ERQ12HJ150	Fuse Type Metallic, 15Ω, 1/2W, ±5%	1	
R711	**ERD25TJ153**	Carbon, 15kΩ, 1/4W, ±5%	1	
R712	**ERD25TJ183**	Carbon, 18kΩ, 1/4W, ±5%	1	
R713	**ERD25TJ822**	Carbon, 8.2kΩ, 1/4W, ±5%	1	
R714	**ERD25TJ563**	Carbon, 56kΩ, 1/4W, ±5%	1	
R715	**ERD25TJ473**	Carbon, 47kΩ, 1/4W, ±5%	1	
R717	ERD12FJ221	Carbon, 220Ω, 1/2W, ±5%	1	
R718	**ERD25TJ273**	Carbon, 27kΩ, 1/4W, ±5%	1	
R719	**ERD25TJ562**	Carbon, 5.6kΩ, 1/4W, ±5%	1	
R720	**ERD25TJ683**	Carbon, 68kΩ, 1/4W, ±5%	1	
R721	**ERD25TJ334**	Carbon, 330kΩ, 1/4W, ±5%	1	
R722	**ERD25TJ333**	Carbon, 33kΩ, 1/4W, ±5%	1	
R723	**ERD25TJ562**	Carbon, 5.6kΩ, 1/4W, ±5%	1	
R724	**ERD25TJ223**	Carbon, 22kΩ, 1/4W, ±5%	1	
R725	ERD12FJ471	Carbon, 470Ω, 1/2W, ±5%	1	
R751	ERD12FJ121	Carbon, 120Ω, 1/2W, ±5%	1	
R752	ERD12FJ121	Carbon, 120Ω, 1/2W, ±5%	1	
R753	ERD12FJ121	Carbon, 120Ω, 1/2W, ±5%	1	
R754	ERD12FJ121	Carbon, 120Ω, 1/2W, ±5%	1	

VARIABLE RESISTORS

VR1,2,3,4,5,6,7, 8,9,10	EVAV11D25B54	Band Level Control, 50kΩ (B)	10	○
VR101,102,701	**EVLS3AA00B14**	Bias & Voltage Adjustment, 10kΩ (B)	3	
VR201,202 301, 302,401,402, 501,502,601, 602	EWK2PAS31848	Double Variable Resistors, Band Width & Frequency Control 200kΩ (A) & 150kΩ (C)	10	⊙

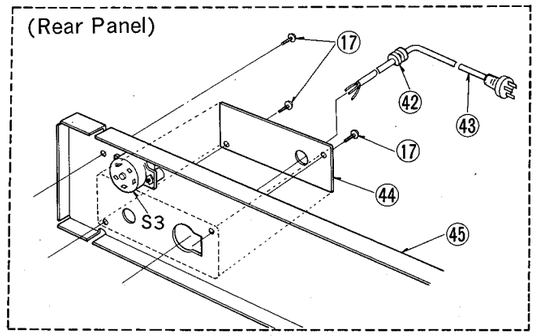
Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
VR203,204,205, 206,303,304, 305,306,403, 404,405,406, 503,504,505, 506,603,604, 605,606,702	**EVLS3AA00B24**	Frequency & Gain Adjustment, 20kΩ (B)	21	

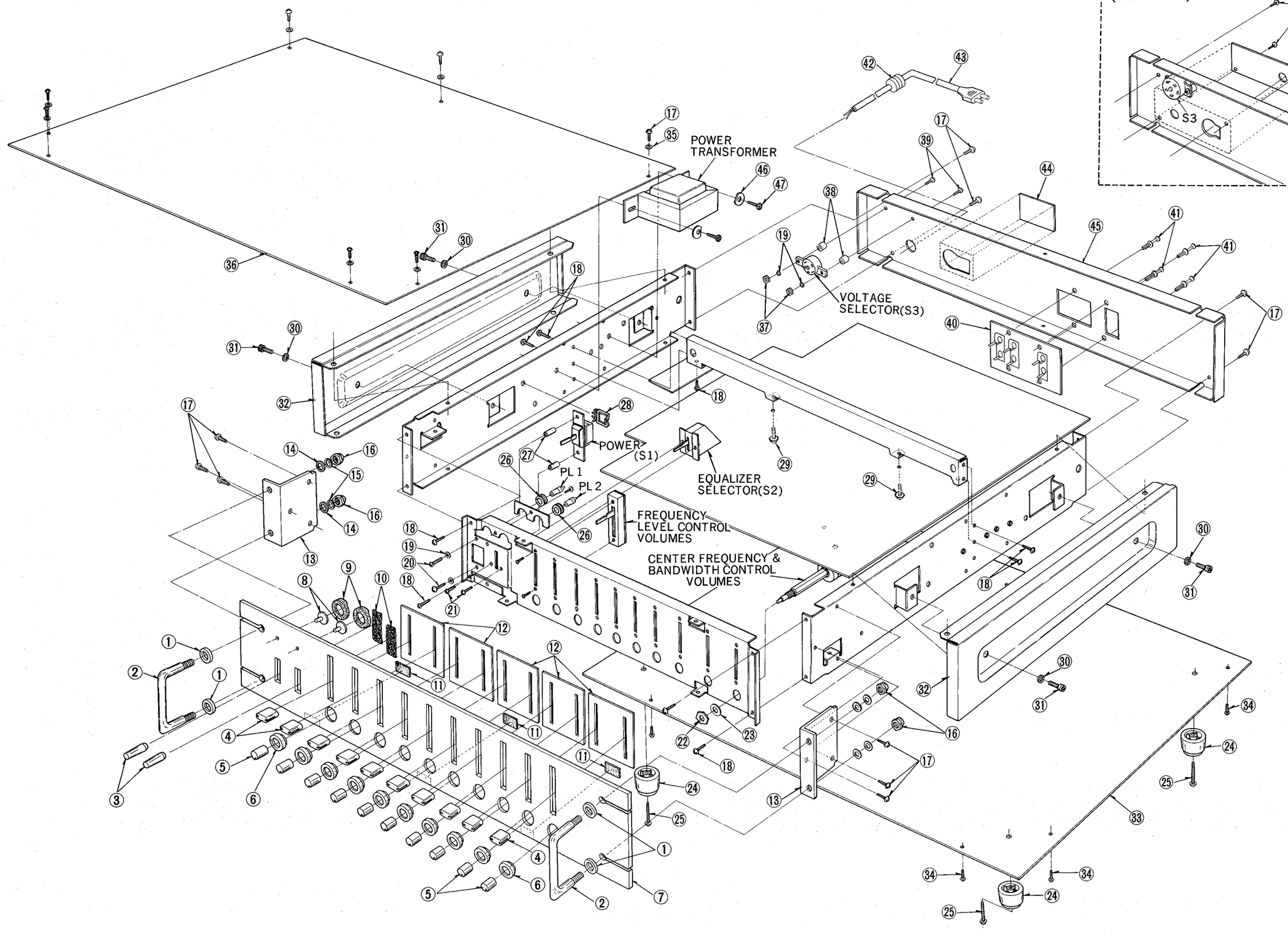
CAPACITORS

C101	ECEA25M3R3R	Electrolytic, 3.3μF, 25WV	1	
C102	ECEA25M3R3R	Electrolytic, 3.3μF, 25WV	1	
C103	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C104	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C105	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C106	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C107	ECEA25V3R3	Electrolytic, 3.3μF, 25WV	1	
C108	ECEA25V3R3	Electrolytic, 3.3μF, 25WV	1	
C109	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C110	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C111	ECEA6V47	Electrolytic, 47μF, 6.3WV,	1	
C112	ECEA6V47	Electrolytic, 47μF, 6.3WV,	1	
C113	ECCD1H151K	Ceramic, 150pF, 50WV, ±10%	1	
C114	ECCD1H151K	Ceramic, 150pF, 50WV, ±10%	1	
C115	ECCD1H330K	Ceramic, 33pF, 50WV, ±10%	1	
C116	ECCD1H330K	Ceramic, 33pF, 50WV, ±10%	1	
C117	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C118	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C119	ECEA16N47	Non-Polar Electrolytic, 47μF, 16WV	1	
C120	ECEA16N47	Non-Polar Electrolytic, 47μF, 16WV	1	
C121	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C122	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C123	ECEA25V3R3	Electrolytic, 3.3μF, 25WV	1	
C124	ECEA25V3R3	Electrolytic, 3.3μF, 25WV	1	
C125	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C126	ECKD2H681KB	Ceramic, 680pF, 500WV, ±10%	1	
C127	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C128	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C129	ECCD1H151K	Ceramic, 150pF, 50WV, ±10%	1	
C130	ECCD1H151K	Ceramic, 150pF, 50WV, ±10%	1	
C131	ECCD1H470K	Ceramic, 47pF, 50WV, ±10%	1	
C132	ECCD1H470K	Ceramic, 47pF, 50WV, ±10%	1	
C133	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C134	ECEA6V47	Electrolytic, 47μF, 6.3WV	1	
C135	ECEA16N47	Non-Polar Electrolytic, 47μF, 16WV	1	
C136	ECEA16N47	Non-Polar Electrolytic, 47μF, 16WV	1	
C137	ECQM05392JZ	Polyester, 0.0039μF, 50WV, ±5%	1	
C138	ECQM05392JZ	Polyester, 0.0039μF, 50WV, ±5%	1	
C139	ECEA16N100	Non-Polar Electrolytic, 100μF, 16WV	1	
C140	ECEA16N100	Non-Polar Electrolytic, 100μF, 16WV	1	
C145	ECCD1H220K	Ceramic, 22pF, 50WV, ±10%	1	
C146	ECCD1H220K	Ceramic, 22pF, 50WV, ±10%	1	
C201	ECQM05473JZ	Polyester, 0.047μF, 50WV, ±5%	1	
C202	ECQM05473JZ	Polyester, 0.047μF, 50WV, ±5%	1	
C203	ECQM05273JZ	Polyester, 0.027μF, 50WV, ±5%	1	
C204	ECQM05273JZ	Polyester, 0.027μF, 50WV, ±5%	1	
C205	ECQM05473JZ	Polyester, 0.047μF, 50WV, ±5%	1	
C206	ECQM05473JZ	Polyerter, 0.047μF, 50WV, ±5%	1	
C207	ECQM05273JZ	Polyester, 0.027μF, 50WV, ±5%	1	
C208	ECQM05273JZ	Polyester, 0.027μF, 50WV, ±5%	1	

■ EXPLODED VIEWS

Available in England (XE) only





15 SH-9010

16 SH-9010

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C209	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C210	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C301	ECQM05183JZ	Polyester, 0.018μF, 50WV, ±5%	1		
C302	ECQM05183JZ	Polyester, 0.018μF, 50WV, ±5%	1		
C305	ECQM05183JZ	Polyester, 0.018μF, 50WV, ±5%	1		
C306	ECQM05183JZ	Polyester, 0.018μF, 50WV, ±5%	1		
C309	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C310	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C401	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C402	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C403	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C404	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C405	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C406	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C407	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C408	ECQM05222JZ	Polyester, 0.0022μF, 50WV, ±5%	1		
C409	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C410	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C411	ECEA6V47	Electrolytic, 47μF, 6.3WV	1		
C412	ECEA6V47	Electrolytic, 47μF, 6.3WV	1		
C413	ECCD1H220K	Ceramic, 22pF, 50WV, ±10%	1		
C414	ECCD1H220K	Ceramic, 22pF, 50WV, ±10%	1		
C501	ECQS1821JZ	Styrol, 820pF, 125WV, ±5%	1		
C502	ECQS1821JZ	Styrol, 820pF, 125WV, ±5%	1		
C503	ECQS1221JZ	Styrol, 220pF, 125WV, ±5%	1		
C504	ECQS1221JZ	Styrol, 220pF, 125WV, ±5%	1		
C505	ECQS1821JZ	Styrol, 820pF, 125WV, ±5%	1		
C506	ECQS1821JZ	Styrol, 820pF, 125WV, ±5%	1		
C507	ECQS1221JZ	Styrol, 220pF, 125WV, ±5%	1		
C508	ECQS1221JZ	Styrol, 220pF, 125WV, ±5%	1		
C509	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C510	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C511	ECEA6V47	Electrolytic, 47μF, 6.3WV	1		
C512	ECEA6V47	Electrolytic, 47μF, 6.3WV	1		
C513	ECCD1H220K	Ceramic, 22pF 50WV, ±10%	1		
C514	ECCD1H220K	Ceramic, 22pF, 50WV, ±10%	1		
C601	ECQS1271JZ	Styrol, 270pF, 125WV, ±5%	1		
C602	ECQS1271JZ	Styrol, 270pF, 125WV, ±5%	1		
C605	ECQS1271JZ	Styrol, 270pF, 125WV, ±5%	1		
C606	ECQS1271JZ	Styrol, 270pF, 125WV, ±5%	1		
C609	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C610	ECEA16N10	Non-Polar Electrolytic, 10μF, 16WV	1		
C611	ECEA6V47	Electrolytic, 47μF, 6.3WV	1		
C612	ECEA6V47	Electrolytic, 47μF, 6.3WV	1		
C613	ECCD1H050C	Ceramic, 5pF, 50WV, ±0.25pF	1		
C614	ECCD1H050C	Ceramic, 5pF, 50WV, ±0.25pF	1		
C615	ECCD1H100K	Ceramic, 10pF, 50WV, ±10%	1		
C616	ECCD1H100K	Ceramic, 10pF, 50WV, ±10%	1		
C701	**ECEA35V470V**	Electrolytic, 470μF, 35WV	1		
C702	**ECEA35V470V**	Electrolytic, 470μF, 35WV	1		
C703	**ECEA35V470V**	Electrolytic, 470μF, 35WV	1		
C704	**ECEA35V470V**	Electrolytic, 470μF, 35WV	1		
C705	**ECEA25V47V**	Electrolytic, 47μF, 25WV	1		
C706	**ECEA25V47V**	Electrolytic, 47μF, 25WV	1		
C707	ECEA25V10L	Electrolytic, 10μF, 25WV	1		
C708	ECEA25V10L	Electrolytic, 10μF, 25WV	1		

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C709	**ECEA25V100V**	Electrolytic, 100μF, 25WV	1		
C710	**ECEA25V100V**	Electrolytic, 100μF, 25WV	1		
C711	ECEA25V3R3	Electrolytic, 3.3μF, 25WV	1		
C712	ECKD2H102PF	Ceramic, 0.001μF, 500WV, $^{+100}_{-0}$%	1		
C713	**ECEA6V470V**	Electrolytic, 470μF, 6.3WV	1		
C751	**ECEA16V470V**	Electrolytic, 470μF, 16WV	1		
C752	**ECEA16V470V**	Electrolytic, 470μF, 16WV	1		
C753	**ECEA16V470V**	Electrolytic, 470μF, 16WV	1		
C754	**ECEA16V470V**	Electrolytic, 470μF, 16WV	1		
C755	**ECEA16V220V**	Electrolytic, 220μF, 16WV	1		
C756	**ECEA16V220V**	Electrolytic, 220μF, 16WV	1		
		LAMPS			
PL1,2	**XAMR38S200**	Pilot Lamp, Indicator, 6.3V 40mA	2		
		FUSES			
F1,2,3,4	XBA2C03TR0	Fuse, 315mAT [250V]	4		
		SWITCHES			
S1	SSL5S	Switch, Power Source	1		
S2	SSLA35S	Switch, Equalizer Selector	1		
S3	ESE372	Switch, Voltage Selector	1		
		RELAY			
RELAY 1	SSY9	Relay, Muting	1		
		CABINET and CHASSIS PARTS			
1	SGXA64	Sleeve, Handle	4		
2	SKH47	Handle, Front Panel	2		
3	SBLA4-3	Knob, Power & Equalizer Switch	2		
4	SBD5-1	Knob, Slide Volume	10		○
5	SBN613	Knob, Rotary Volume, Inside	10		○
6	SBN619	Knob, Rotary Volume, Outside	10		○
7	SGW8110	Panel, Front	1		○
8	SGLA9	Panel Light, Orange	2		
9	SHRA601	Bracket, Lamps	2		
10	SHSA22	Shading Cloth, Lever Switch	2		
11	SHSA921	Paper Cloth	3		
12	SHG1359	Shading Rubber, Slide Volume	5		○
13	SKT3	Bracket, Handle	2		○
14	XWE6EFZ	Washer, Handle	4		
15	XWAR6BFZ	Washer, Spring	4		
16	XNA6FFZ	Nut, Handle M'tg	4		
17	XTB3+8BFZ	Screw,Top Board, Rear Panel & Handle Bracket M'tg	17		
18	XTV3+8C	Screw, Chassis M'tg	9		
19	XWA3B	Washer, Spring	4		
20	XSN3+12S	Screw, Power Switch M'tg	2		
21	XYN3+C6S	Screw, Equalizer Switch M'tg	2		
22	XNS9	Nut, Rotary Volume M'tg	10		
23	XWV9	Washer, Rotary Volume	10		
24	SKL151	Foot, Bottom Board	4		○
25	XTV3+16C	Screw, Foot M'tg	4		
26	SHGA204	Bracket, Pilot Lamp	2		

■ PACKINGS

■ ACCESSORIES

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
27	SUD171	Sleeve, Power Switch M'tg Screw	2	* O
28	SHRA306	Clamp, Lead Wire	1	
29	XYA3+EB8FZ	Screw, Printed Circuit Board M'tg	2	
30	XWE4FZ	Washer, Side Board	4	
31	XVE4B8FZS	Bolt, Side Board M'tg	4	
32	SKS1	Side Board	2	*
33	SKU5350-1	Bottom Board	1	*
34	XTB3+8BFYR	Screw, Red, Bottom Board M'tg	7	
35	SNW329	Washer, Top Board	7	
36	SKP25	Top Board	1	O
37	XNG3BS	Nut, Voltage Selector Switch M'tg	2	
38	SUDA41	Sleeve, Voltage Selector Switch Screw	2	*
39	XSB3+14FZS	Screw, Voltage Selector Switch M'tg	2	
40	SJF3803-2	Terminal, Input & Output	1	O
41	SHR401-1	Latch, Terminal M'tg	4	
42	SHR127	Bushing, AC Cord (Except Set for [XE])	1	
42 [XE] only	SHR131	Bushing, AC Cord	1	
43 [X,XG] only	SJA95	AC Cord	1	
43 [XSD,XGH] only	SJA81	AC Cord	1	
43 [XSW] only	SJA68	AC Cord	1	
43 [XE] only	SJA73	AC Cord	1	
44	SUE7	Plate, Hole Cover (Except Set for [XE])	1	
44 [XE] only	SGE411	Bracket, AC Cord Bushing	1	O
45	SGP91-1A	Rear Panel (Except Set for [XSD] & [XSW])	1	O
45[XSD,XSW]only	SGPH9010D	Rear Panel (SGP91-1A) with Name Plate (SGT13430)	1	O
46	XWT4	Washer, Power Transformer	2	
47	XTB4+12FFZ	Screw, Power Transformer M'tg	2	
		ACCESSORIES		
A1	SJP2129-5	Cord, Connection Shield	2	
A2 [X] only	SJP5213	Plug Adapter, Power (only set for [X])	1	
		PACKING PARTS		
P1	SPP461	Soft Cover	1	
P2	SPP163	Polyethylene Bag	1	
P3	SPS1009	Pad, Outer Side (Right and Left Side)	2	O
P4	SPS109-1	Pad, Inner Side (Right and Left Side)	2	O
P5	SPS1011	Pad, Front Side	1	O
P6	SPS1007	Pad, Bottom Side	1	O
P7 [X] only	SPN5195	Carton, Inside, Use only for [X]	1	O
P8 [X] only	SPG905	Carton, Outside	1	O
P8	SPG907	Carton, Except Set for [X]	1	O
P9	SQF1451	Printed Matter Except set for [XE]	1	O
P9 [XE] only	SQF1453	Printed Matter	1	O

NOTES:

The model SH-9010 **[X]** is available in Asia, Latin America, Oceania, Middle East and Africa.
The model SH-9010 **[XGH]** is available in Holland only.
The model SH-9010 **[XSD]** is available in Scandinavia only.
The model SH-9010 **[XSW]** is available in Swiss only.
The model SH-9010 **[XE]** is available in England only.
The model SH-9010 **[XG]** is available in European only.

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