



Set using ISO screws

TA-4300F TAD-43F



**TA-4300F: CHANNEL DIVIDING STEREO
PRE-AMPLIFIER
TAD-43F: 4-CHANNEL ADAPTOR**

**SONY®
SERVICE MANUAL**

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SECTION 1

TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TA-4300F are given in Table 1-1.

TABLE 1-1. TECHNICAL SPECIFICATIONS

Frequency response :	10 Hz to 100 kHz $\pm 1^0$ dB
Crossover frequency :	LOW : 150, 250, 400, 600, 800, 1000 Hz HIGH : 1.5k, 2.5k, 3.5k, 4.5k, 6k, 8k Hz
Input impedance :	90 k ohms
Output impedance :	Less than 5 k ohms
Harmonic distortion :	0.03% at 1 V output 0.1 % at 4 V output (at each frequency passband) 0.05% at 1 V output 0.1 % at 2.5 V output (at crossover frequency)
Signal-to-Noise Ratio :	85 dB shorted circuit (1 V input)
Maximum input signal :	4.5 V
Bass boost control :	0, 3, 6, 12, 18, dB at 20 Hz
Power consumption :	Approx. 5 watts
Power requirement :	100, 120, 220, or 240 volts ac
Dimensions :	200mm (width) X 149mm (height) X 316mm (depth) 77/8" (width) X 57/8" (height) X 127/16" (depth)
Net weight :	3.8 kg (8 lb 6 oz)
Shipping weight :	5.5 kg (12 lb 2 oz)

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the functions of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at left margin; major components are also listed in a similar manner. Refer to the block diagram on page 4 and schematic diagram on pages 19 and 20.

Stage/Control

Buffer amplifier
Q101, Q102

Function

Presents the input signal with a high input impedance and drives the following filters. Q101 and Q102 form a modified source follower circuit in which Q102 acts not only as constant-current source, but also as a drive amplifier for the negative-going half cycle.

This FET-PNP combination amplifier has the advantage of low harmonic distortion and wide dynamic range. In addition, the FET generates less noise than conventional silicon transistors. Therefore, this combination amplifier is employed in all of the filter circuits. The FETs used in this type of circuit are selected according to their Idss rank, and care should be taken to use replacement FETs with the exact same Idss rank.

Idss rank is indicated by the identification number, as illustrated in Fig. 1-1.

Before studying the following circuit, note that the filter circuits consist of two pairs of high- and low-pass filters having variable crossover frequencies. The high crossover frequency (fH) can be 1.5 kHz, 2.5 kHz, 3.5 kHz, 4.5 kHz, 6 kHz, or 8 kHz, and the low crossover frequency (fL) can be 150 Hz, 250 Hz, 400 Hz, 600 Hz, 800 Hz, or 1 kHz, as shown in Fig. 1-2. By combining these filters, the TA-4300F provides various kinds of filter characteristics, such as two-channel or three-channel filtering having a crossover frequency of fL or fH, or both. See Fig. 1-2.

2SK23-23
↑
Idss rank

Fig. 1-1 Example of Idss rank

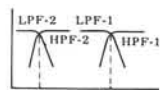
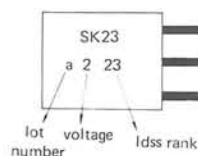
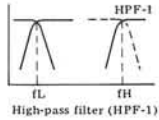


Fig. 1-2 Output of each of the three sections

Stage/Control

Function

High-pass filter
HPF-1



Three RC filters and two FET-PNP buffer amplifiers (Q103, Q104, Q105 and Q106) comprise a high-pass filter having six possible crossover frequencies. The RC network for the high-pass filter (HPF-1) is composed of C102, C103, C105 and the resistors connected to switches S3-1, S3-3 and S3-5.

FET-PNP buffer amplifiers are inserted between each RC filter to prevent interaction between filters. The positive feedback applied from the source of Q103 to C103 through R106 and R107 provides a sharp knee characteristic at the crossover frequency. To obtain a sharp rolloff of approximately 18 dB/octave, the design crossover frequencies of three RC filters are the 1/2 crossover, twice the crossover, and the crossover frequency respectively as shown in Fig. 1-3. The same is true for the other filters used in the TA-4300F.

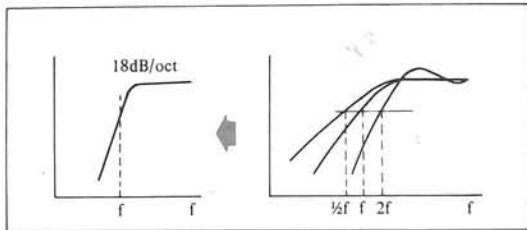
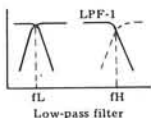


Fig. 1-3 Design of the sharp-cutoff RC filter

CROSSOVER
FREQUENCY
selector
switch S3

Switch S3 selects one of the six crossover frequencies for the low-and-high pass filters at f_H (1.5 kHz, 2.5 kHz, 3.5 kHz, 4.5 kHz, 6 kHz or 8 kHz).

Low-pass filter
LPF-1



Three RC filters and two FET-FET buffer amplifiers (Q301, Q302, Q303 and Q304) comprise a low-pass filter (LPF-1) having six crossover frequencies.

Stage/Control

Function

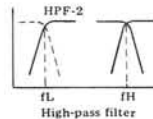
The RC networks for the low-pass filter (LPF-1) are composed of C301, C302, C303 and the resistors connected to switch wafers S3-7, S3-9 and S3-11. These switch wafers are mechanically connected with switch wafers S3-1, S3-3 and S3-5. This low-pass filter provides a crossover frequency " f_H " and rolloff of about 18 dB/octave. Direct coupling is employed in this circuit to eliminate popping noise when changing the crossover frequency.

CHANNEL
SELECT switch S5

The output is fed to switch S5 and then routed to the low-boost amplifier when S5 is set to 2 CH HIGH.

When S5 is set to 2, CH LOW, the output is disconnected from the signal path. When S5 is set to 3 CH the low-pass filter (LPF-1) output is fed to the following high-pass filter (HPF-2).

High-pass filter
HPF-2



Same as the high-pass filter (HPF-1) previously described, except for its crossover frequencies. Major components are the FET-PNP buffer amplifier (Q305, Q306, Q307, Q308) and the RC network consisting of C305, C306, C307 and the resistors connected to switch wafers S4-1, S4-3 and S4-5. These switch wafers are mechanically connected with S4-7, S4-9 and S4-11, those switch wafers which determine the crossover frequency of the low-pass filter (LPF-2). The output is supplied to the MID RANGE output jack through R323 (LEVEL control).

As the input signal of this filter is routed through the Channel Selector switch (S5), the output

Stage/Control

Function

characteristic is changed according to S5's setting.

At the 2 CH LOW position of S5, the input is a full range signal. Only the high-frequency component having the crossover frequency of "fL" appear at the MID-RANGE output jack.

At the 2 CH HIGH position, no signal is supplied to this filter, therefore no signal appears at the MID-RANGE output jack. At the 3 CH or 4 CH positions, S5 supplies the LPF-1 output signal to this filter. Therefore, the overall frequency response obtained by combining the low and high-pass filters is that of a bandpass filter having a frequency characteristic between fL and fH as shown in Fig. 1-4.

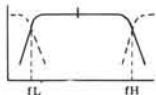
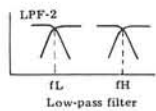


Fig. 1-4 Bandpass filter

Low-pass filter
LPF-2



Low-pass filter

FET-FET buffer amplifier (Q501, Q502) and the RC network consisting of C501, C502, C503, C511 and the resistors connected to switch wafers S4-7, S4-9 and S4-11, comprise a lowpass filter having a crossover frequency of "fL" and a rolloff of about 18 dB/octave. Input signal is fed through the first buffer amplifier (Q101, Q102), and the output is routed to the low-boost amplifier through Channel Selector switch S5.

LOW CHANNEL
FREQUENCY
SHIFT
control

Switches S1-1, S1-3 and S1-5 are paralleled across S4-7, S4-9 and S4-11 respectively, to change the rolloff frequency of low-pass filter LPF-2 slightly to match the characteristics of the low-frequency speaker.

Bass-boost ampli-
fier Q503, Q504

This direct-coupled three-stage amplifier boosts the output signal of low-pass filter LPF-1 or LPF-2 to the level required at the LOW outputs.

Stage/Control

Function

This amplifier also controls the low-frequency characteristics by using frequency-selective negative feedback techniques. The resistances connected at S2 change the feedback voltage, thus controlling the low boost value from zero to +18 dB at 20 Hz. The low-boost frequency response is shown in Fig. 1-5.

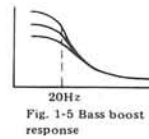


Fig. 1-5 Bass boost response

Negative feedback is provided from the emitter circuit of Q505 to the source of Q503 through BASS BOOST switch S2. Potentiometer R566 in the source circuit of Q503 determines the bias current in Q503. This in turn sets the bias current in Q504 and Q505, ensuring the distortionless boost operation at low frequencies. The output is fed to the LOW-FREQUENCY output jack through LEVEL control R517. It also supplied to the CENTER CHANNEL output jack through R508 or R608 for use in center-woofer systems. Note that the left and right channel low-frequency components are mixed at this jack.

CENTER
CHANNEL
Output jack J701

4 CH
CONNECTOR

This socket is provided for connecting optional accessory TAD-43F, (4-channel adaptor). It delivers dc power and the high-pass filter's output to the TAD-43F.

Power Supply

Rectifier
circuit

Line input is supplied to the transformer through POWER switch S6. The output from the power transformer is rectified by bridge rectifier D701 to produce about +42 volts dc.

TA-4300F TAD-43F

Stage/Control

Voltage regulator
Q701, Q702

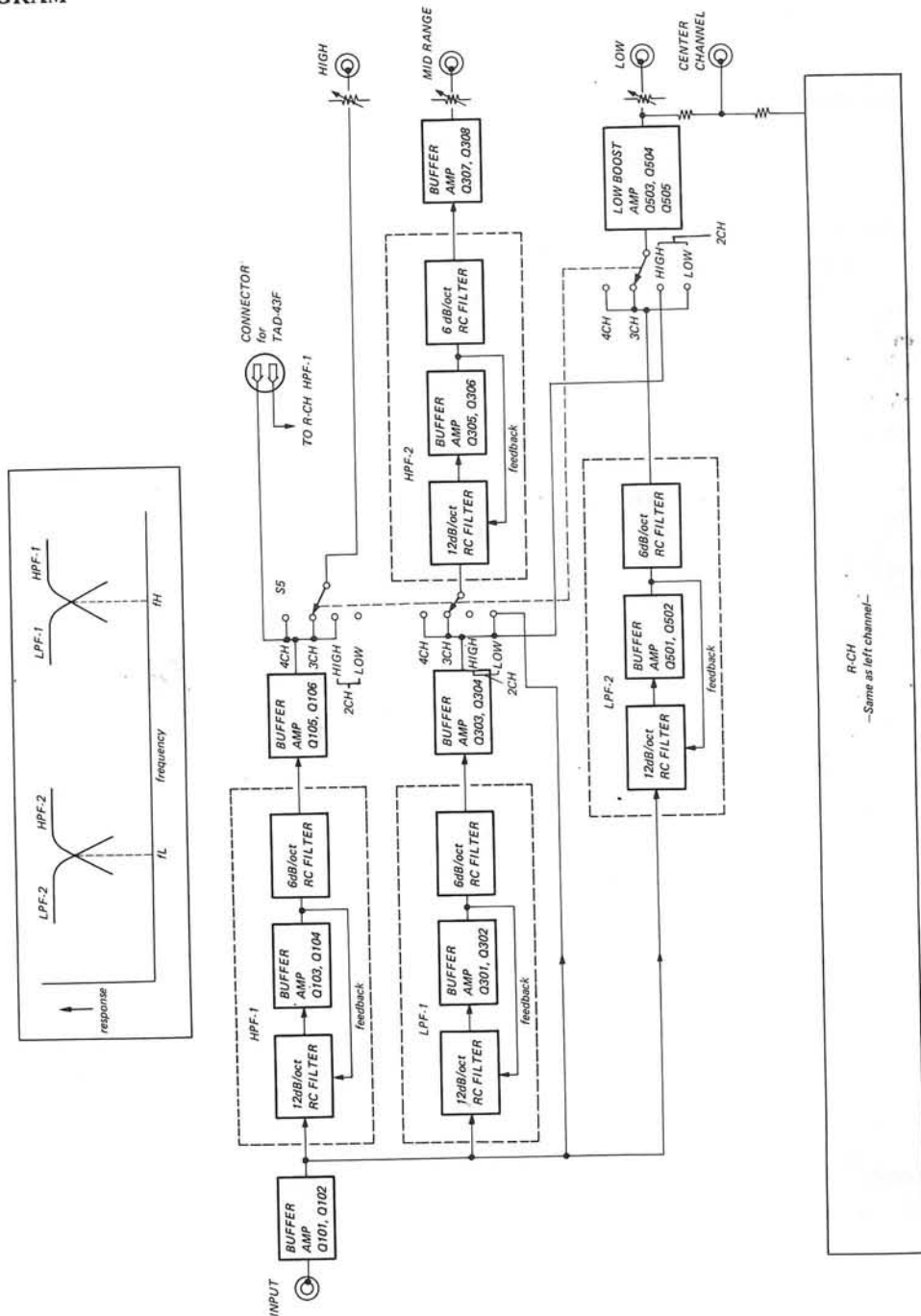
Function

Dc output from the rectifier is filtered by C706 and applied to series regulator transistor Q701. Transistor Q702 compares a sample of the output voltage, picked off the junction of R704 and R705, with a reference

Stage/Control

voltage supplied by zener diode D703. A change in output voltage, is detected by Q702, amplified and applied to Q701 in a manner that offsets the original voltage shift.

1-3. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING

Unplug the ac power cord before starting any disassembly or replacement procedures.

2-1. TOOLS REQUIRED

The following tools and materials are required to perform disassembly and replacement procedures on the TA-4300F.

1. Screwdriver
2. Phillips head screwdriver
3. Soldering iron, 30 to 50 watts, equipped with solder sucker
4. Wrench
5. Long-nose pliers
6. Electric drill and drill bit
7. Solder, rosin core

2-2. HARDWARE IDENTIFICATION GUIDE

The following chart will help you to decipher the hardware codes given in the service manual.

Note: All screws in the TA-4300F are manufactured to the specifications of the International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable. ISO screws have a different number of threads per mm compared to the old ones.

The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

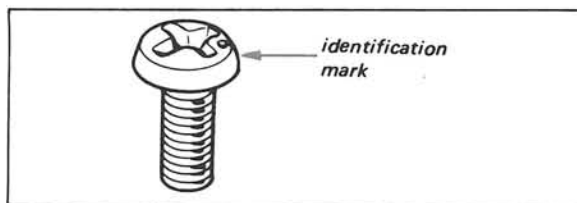


Fig. 2-1 ISO screw

Hardware Nomenclature

P	Pan Head Screw	⊕	
PS	Pan Head Screw with Spring Washer	⊕	
K	Flat Countersunk Head Screw	⊕	
B	Binding Head Screw	⊕	
RK	Oval Countersunk Head Screw	⊕	
T	Truss Head Screw	⊕	
R	Round Head Screw	⊕	
F	Flat Fillister Head Screw	⊕	
SC	Set Screw	⊕	
E	Retaining Ring (E Washer)	⊕	
	W		Washer
	SW		Spring Washer
	LW		Lock Washer
	N		Nut

- Example -

⊕ P 3x10

└─ Length in mm (L)

└─ Diameter in mm (D)

└─ Type of Head

2-3. TOP COVER AND FRONT PANEL REMOVAL

1. Remove the two machine screws at each side of the case, and lift off the top cover.
2. Remove all control knobs except the POWER switch knob by loosening the set screws, and pull off the POWER switch knob.
3. Remove the two screws (+P 4 X 6) securing the front panel from the back of the front subchassis as shown in Fig. 2-2.
4. Remove the two self-tapping screws (+B 3 X 6) securing the panel at the front edge of the bottom plate as shown in Fig. 2-3. This frees the front panel.

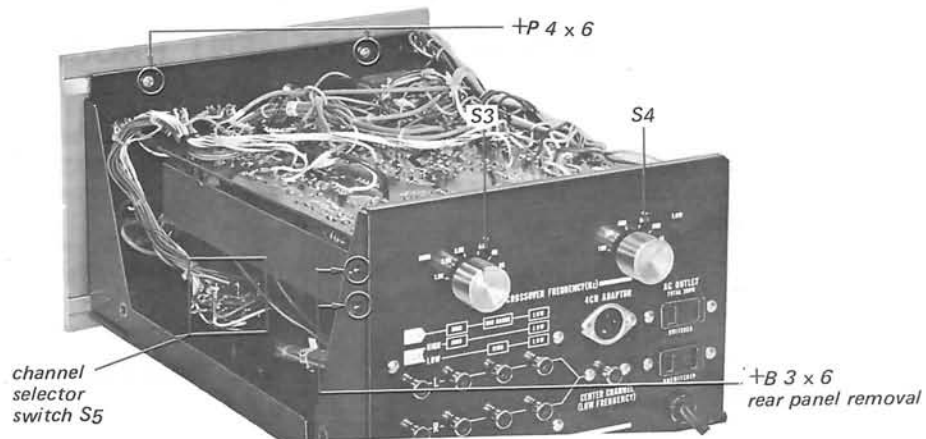


Fig. 2-2 Front panel removal

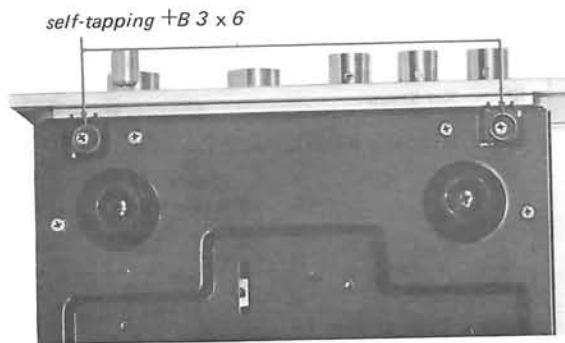


Fig. 2-3 Bottom view

2-4. PILOT LAMP REPLACEMENT

1. Remove the top cover as described in Procedure 2-3.
2. Straighten the tab of the meter-lamp holder to permit the removal of the meter-lamp socket.
3. Pull out the meter-lamp socket, and then unscrew the lamp from the socket and install the new lamp.

2-5. FILTER AMPLIFIER BOARD REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the control knob at the rear panel by loosening the set screw, and then remove the hex nut securing the CROSSOVER FREQUENCY switch to the rear panel.
3. Remove the two screws (+B 3 X 6) securing the filter amplifier board to the mounting bracket. This frees the filter amplifier board.

2-6. CONTROL AND SWITCH REPLACEMENT

Prepare for replacing any of the controls by removing the top cover or front panel as described in Procedure 2-3.

POWER Switch

1. Remove the two screws (+PS 3 X 6) securing the switch to the front subchassis as shown in Fig. 2-4.
2. Remove the defective switch, and then resolder the lead wires to the new switch's lugs one by one.
3. Install the replacement switch.

LOW CHANNEL FREQUENCY SHIFT Switch (S1)

1. Remove the hex nut securing the LOW CHANNEL FREQUENCY SHIFT switch to the front subchassis as shown in Fig. 2-4.
2. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the defective switch and the printed board. This frees the switch.
3. Install the replacement switch.

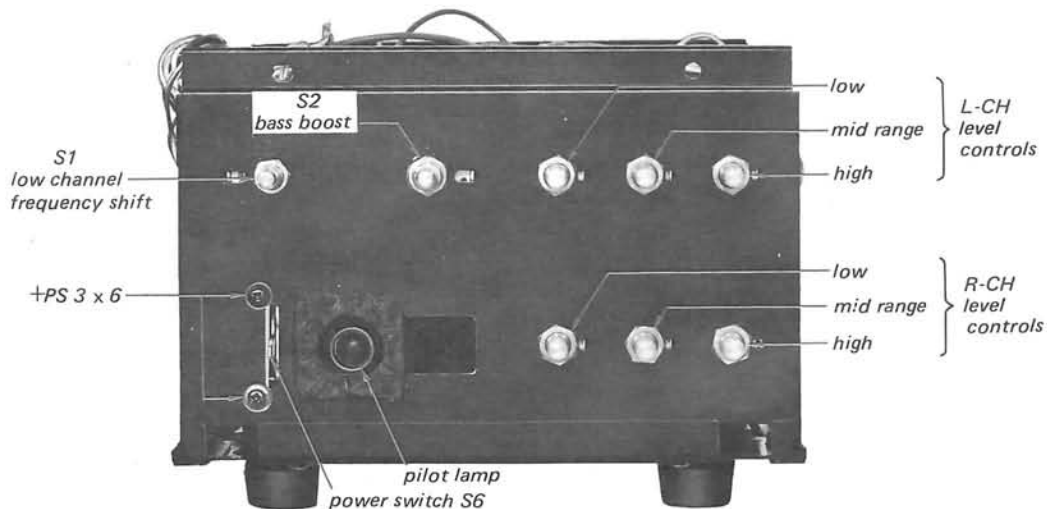


Fig. 2-4 Switch and control replacement

BASS BOOST Switch (S2)

1. Remove the hex nut securing the defective switch to the front subchassis. See Fig. 2-4.
2. Unsolder the lead wires and resistors from the defective switch, and then install the replacement switch.

LEVEL Control

1. Remove the hex nut securing each control to the front subchassis. See Fig. 2-4.
2. Unsolder the lead wires from the defective control, and then install the replacement control.

CROSSOVER FREQUENCY Switches (S3, S4)

1. Remove the filter amplifier board as described in Procedure 2-5.
2. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the defective switch and the printed board. This frees the switch.
3. Install the replacement switch.

Channel Selector Switch (S5)

1. Remove the two screws (+B 3 X 6) securing the switch mounting bracket to the bottom plate as shown in Fig. 2-5.
2. Remove the hex nut securing the defective switch to the bracket.
3. Unsolder the lead wires from the defective switch, and then install the replacement switch.

2-7. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the filter amplifier board as described in Procedure 2-5.

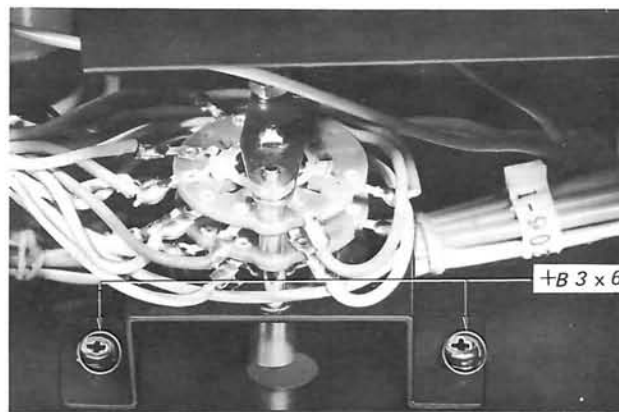


Fig. 2-5 Channel Selector switch removal

3. Remove the two screws (+B 3 X 6) at each side of the rear panel as shown in Fig. 2-2.
4. Remove the four self-tapping screws (+B 3 X 6) from the bottom edge of the chassis as shown in Fig. 2-6. This frees the rear panel.

2-8. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY RIVETS

1. Remove the rear panel as described in Procedure 2-7.
2. Bore out the rivets using a drill bit slightly larger in diameter than the rivet. See Fig. 2-7.

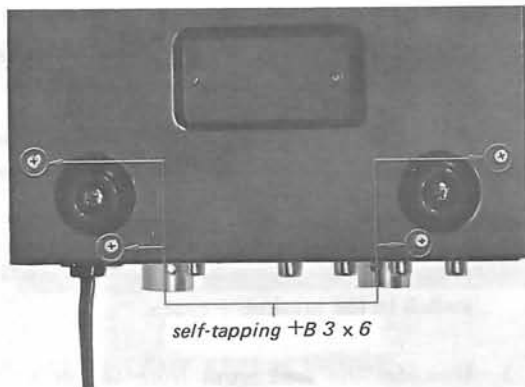


Fig. 2-6 Rear panel removal

3. Punch out the remainder of the rivets with a nail set or prick punch.
4. Remove the defective component, and then install a new one.
5. Secure the new component with suitable screws and nuts or repair rivet screws (part number 3-701-402).

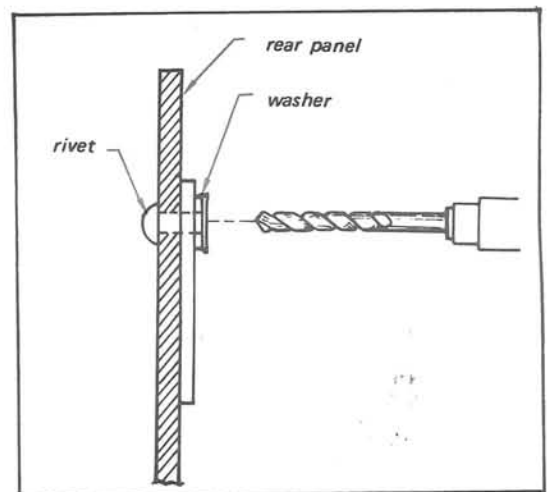


Fig. 2-7 Rivet replacement

SECTION 3

OVERALL CHECKS AND MEASUREMENTS

3-1. TEST EQUIPMENT REQUIRED

1. Audio Oscillator

Frequency range 10 Hz to 100 kHz
Distortion 0.03% or less at
1 kHz

2. Distortion Meter

Capable of measuring of 0.015% distortion or less at 1 kHz.
Frequency range 20 Hz to 100 kHz
Input impedance 1 megohm or more

3. Ac VTVM

Capable of measuring rms voltage of 0.5 mV or less within a frequency range from 10 Hz to 100 kHz.
Input impedance 500 k ohms or more

4. Attenuator

Capable of attenuating signals 60 dB or more.
Characteristic impedance 600 ohms unbalanced.

5. Oscilloscope

Bandwidth 1 MHz or more

Note: 0 dB= 0.775 V (rms)

3-2. LEVEL CHECK WITHIN PASSBAND

Preparation

Set the controls and switches as follows:

LOW CHANNEL FREQUENCY

SHIFT switch (S1) NORMAL

BASS BOOST switch (S2) 0 dB

CHANNEL SELECT switch (S5) 3 CH

LEVEL control maximum

Procedure

With the equipment connected as shown in Fig. 3-1, follow the procedures given in Table 3-1.

TABLE 3-1 LEVEL CHECK WITHIN PASSBAND

OUTPUT Jack	CROSSOVER FRE- QUENCY Selector Switch		Input Signal Level and Frequency	Output Level
	S3(HIGH)	S4(LOW)		
LOW	8 kHz	1 kHz	10 Hz, 0 dB 100 Hz, 0 dB	-1.3 ±1 dB -0.5 ±0.5dB
MID	8 kHz	150 HZ	1 kHz, 0 dB	0.5 ±0.5 dB
HIGH	1.5 kHz	150 Hz	10 kHz, 0 dB 100 kHz, 0 dB	-0.5 ±0.5 dB 0~1.5 dB
4P Socket for 4 CH ADAPTOR ② or ④ to ground See Fig. 3-2.	1.5 kHz	150 Hz	10 kHz, 0 dB	-0.5 ±0.5 dB

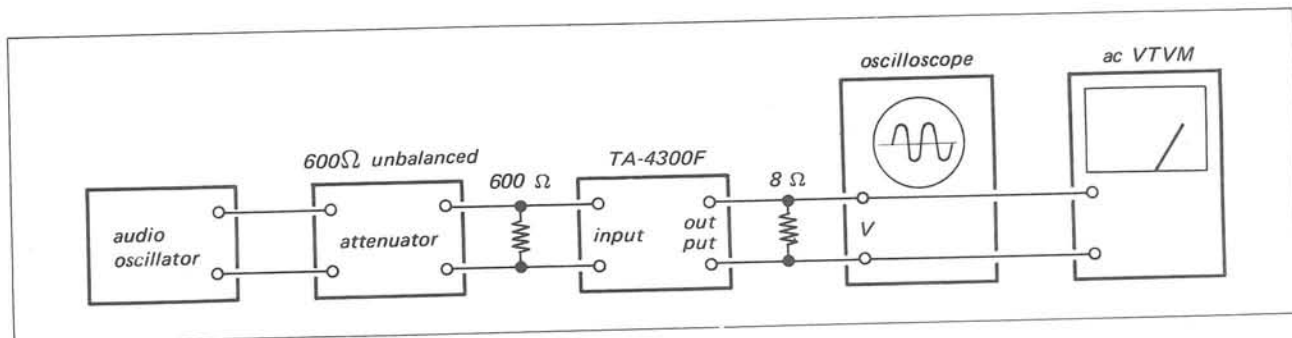


Fig. 3-1 Level check test setup

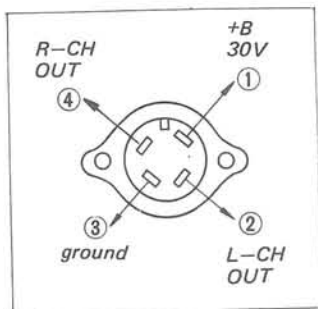


Fig. 3-2 Detail of 4 CH connector

3-3. LEVEL CHECK AT CROSSOVER FREQUENCY

Preparation

Connect the equipment as shown in Fig. 3-1. Then, set the controls and switches as follows:

Description	Position
LOW CHANNEL FREQUENCY	
SHIFT switch	NORMAL
BASS BOOST switch	0 dB
Channel Selector switch	3 CH

High-Frequency Output Level Adjustment

Set CROSSOVER FREQUENCY selector switch S3(HIGH) to 1.5 kHz, and S4 (LOW) to 150 Hz. Feed a 10 kHz 2 dB signal to the INPUT jacks, and then adjust the "HIGH" LEVEL controls to obtain 0 dB readings at the HIGH OUTPUT jacks.

Mid-Frequency Output Level Adjustment

Set CROSSOVER FREQUENCY selector switch S3 (HIGH) to 8 kHz, and S4 (LOW) to 150 Hz. Feed a 1 kHz, 2 dB signal to the INPUT jack, and then adjust the "MID" LEVEL controls to obtain 0 dB readings at the MID RANGE OUTPUT jacks.

Low-Frequency Output Level Adjustment

Set CROSSOVER FREQUENCY selector switch S3 (HIGH) to 8 kHz, and S4 (LOW) to 1 kHz. Feed a 50 Hz, 2 dB signal to the INPUT jacks and then adjust the "LOW" LEVEL controls to obtain 0 dB readings at the LOW OUTPUT jacks.

Procedure

1. With the equipment connected as shown in Fig. 3-1, feed a 1 kHz, 2 dB signal to the INPUT connectors.
2. Set CROSSOVER FREQUENCY selector switch S4 (LOW) to 150 Hz.
3. Measure the output levels of the HIGH and MID RANGE outputs, while simultaneously changing the crossover frequency and input signal frequency from 1.5 kHz to 8 kHz. The outputs should be within the limit of -3.2 ± 0.8 dB.
4. Set CROSSOVER FREQUENCY selector switch S3 (HIGH) to 8 kHz.
5. Measure the output levels of the MID RANGE and LOW outputs while simultaneously changing the crossover frequency and input signal frequency from 150 Hz to 1 kHz. The outputs should be within the limit of -3.2 ± 0.8 dB.

3-4. BASS BOOST CHECK

Preparation

Set the controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY	
SHIFT switch (S1)	NORMAL
CROSSOVER FREQUENCY	
selector switch-HIGH (S3)	8 kHz
CROSSOVER FREQUENCY	
selector switch-LOW (S4)1 kHz
Channel Selector switch (S5) . . .	3 CH

Procedure

1. With the equipment connected as shown in Fig. 3-1, adjust the LOW LEVEL control to obtain a 0 dB output signal level when supplying a 20 Hz, +2 dB signal and the BASS BOOST switch (S2) is set to 0 dB.
2. Change the BASS BOOST switch (S2) setting as indicated in Table 3-2, and then increase the attenuation to obtain a 0 dB level at the LOW OUTPUT jack. The attenuation required indicates the bass boost value, and should be within the limits given in Table 3-2.

TABLE 3-2 BASS BOOST CHECK

S2 Position	3	6	12	18
Bass boost	3 ±1 dB	6 ±1.5 dB	12 ±2 dB	18 ±2 dB

3-5. CROSSTALK MEASUREMENT

Preparation

Set the controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY	
SHIF switch (S1)	NORMAL
BASS BOOST switch (S2)	0 dB
Channel Selector switch (S5) . . .	3 CH
LEVEL controls	maximum

Procedure

1. With the equipment connected as shown in Fig. 3-3, feed a signal to the left channel INPUT jack as specified in Table 3-3 to obtain a 0 dB output.
2. Switch the signal to the right channel INPUT and read the residual signal level in the left channel output.
3. The 0 dB output-level to residual-level ratio represents the channel crosstalk. Check the crosstalk according to the procedures given in Table 3-3.

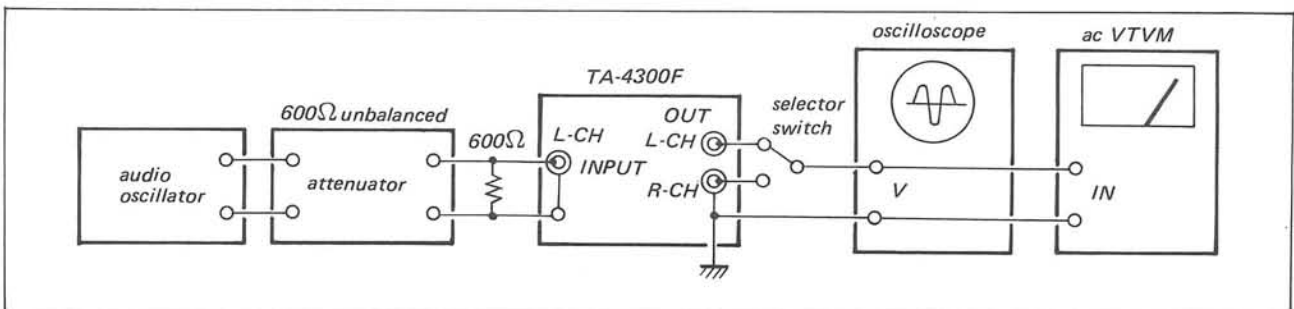


Fig. 3-3 Crosstalk measurement test setup

3-6. NOISE LEVEL MEASUREMENT

Preparation

Set the each controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY	
SHIFT switch (S1)	NORMAL
BASS BOOST switch (S2)	0 dB
Channel Selector switch (S5)	3 CH
Level control	maximum

Procedure

1. With the equipment connected as shown in Fig. 3-4, measure each OUTPUT jack's noise level with a VTVM as directed in the Table 3-4.

3-7. HARMONIC-DISTORTION MEASUREMENT AND CLIPPING-POINT ADJUSTMENT

Preparation

Set the controls and switches as follows:

TABLE 3-3 CROSSTALK MEASUREMENT

OUTPUT Jack	CROSSOVER FRE- QUENCY Selector Switch		Input Signal Frequency	Channel Crosstalk
	S3(HIGH)	S4(LOW)		
LOW	8 kHz	1 kHz	100 Hz	40 dB or more
MID	8 kHz	150 kHz	1 kHz	57 dB or more
HIGH	1.5 kHz	150 Hz	10kHz	42 dB or more

TABLE 3-4 NOISE LEVEL MEASUREMENT

OUTPUT Jack	CROSSOVER FRE- QUENCY Selector Switch		Noise Level	
	S3(HIGH)	S4(LOW)	Input Open	Input shorted
LOW	8 kHz	1 kHz	-75 dB or less	-80 dB or less
MID	8 kHz	150 Hz	-75 dB or less	-80 dB or less
HIGH	1.5 kHz	150 Hz	-75 dB or less	-80 dB or less

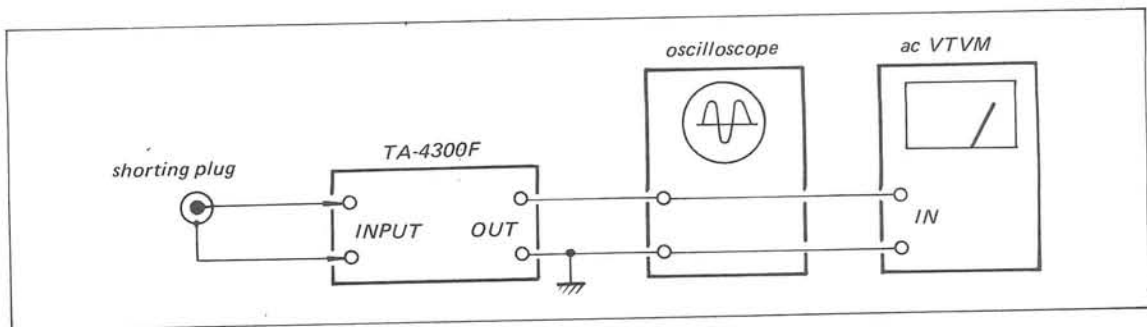


Fig. 3-4 Noise level check test setup

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY	
SHIFT switch (S1)	NORMAL
BASS BOOST switch (S2)	0 dB
Channel selector switch (S5)	3 CH
LEVEL control	maximum

Procedure

1. With the equipment connected as shown in Fig. 3-5, feed a signal as specified in Table 3-5, to obtain a 15.2 dB (4.5 V rms) output.
2. Measure the harmonic distortion.

Clipping Point Adjustment for LOW Channel

Preparation

Same as harmonic distortion measurement.

Procedure

1. Feed in a 100 Hz signal to obtain a 19 dB (7.0 V) output level at the LOW output jack.

2. Adjust potentiometer R566 (R666) (semifixed resistor) See Fig. 3-6, so that the positive and negative peaks of the output waveform are simultaneously clipped.
3. After completing this adjustment, apply a drop of lock paint to R566.

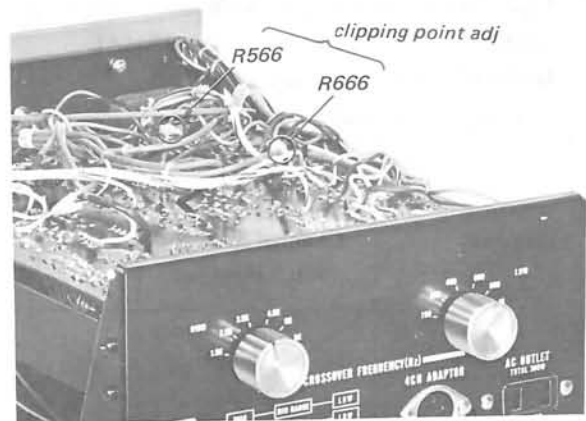


Fig. 3-6 Parts location

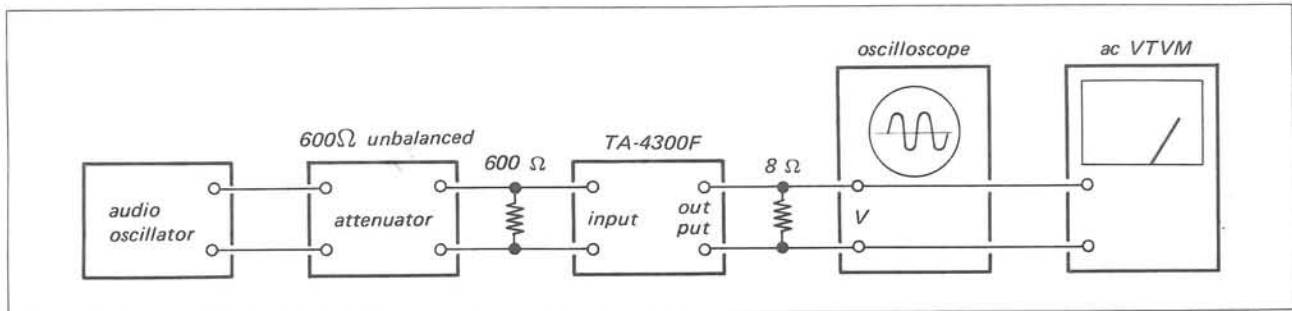


Fig. 3-5 Harmonic distortion test setup

TABLE 3-5 HARMONIC DISTORTION MEASUREMENT

OUTPUT Jack	CROSSOVER FRE- QUENCY Selector Switch		Input Signal Frequency	Harmonic Distortion
	S3(HIGH)	S4(LOW)		
LOW	8 kHz	1 kHz	100 Hz	0.1% or less
MID	8 kHz	150 Hz	1 kHz	0.1% or less
HIGH	1.5 kHz	150 Hz	10 Hz	0.1% or less

3-8. CHANNEL SELECTOR SWITCH OPERATIONAL CHECK

CROSSOVER FREQUENCY

Selector switch
S3 (HIGH) 8 kHz
S4 (LOW) 150 Hz
Level controls maximum

Preparation

Set the controls and switches as follows:

<u>Description</u>	<u>Position</u>
LOW CHANNEL FREQUENCY	
SHIFT switch (S1)	NORMAL
BASS BOOST switch	0 dB

Procedure

1. With the equipment oconnected as shown in Fig. 3-1, check the output level while changing the input signal frequency as directed in the Table 3-6.

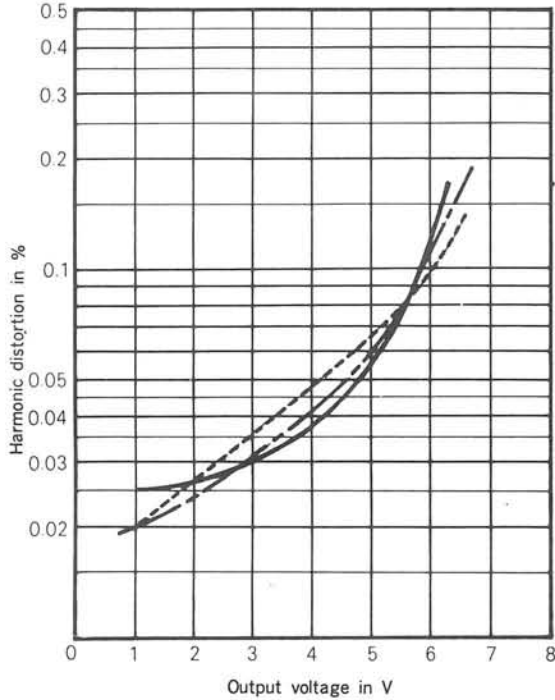
TABLE 3-6 CHANNEL SELECTOR SWITCH OPERATIONAL CHECK

Channel Selector Switch Position	2 CH LOW	2 CH HIGH	4 CH	
	150 Hz 0 dB	8 kHz 0 dB	150 Hz 0 dB	8 kHz 0 dB
LOW	-3.0 ± 1 dB	-3.0 ± 1 dB	-3.0 ± 1 dB	/
MID	-3.0 ± 1 dB	/	-3.0 ± 1 dB	-3.0 ± 1 dB
HIGH	/	-3.0 ± 1 dB	/	/

SECTION 4

PERFORMANCE CURVES

HARMONIC DISTORTION vs OUTPUT VOLTAGE CURVES (within the passband)



LOW CHANNEL FREQUENCY

SHIFT switch NORMAL

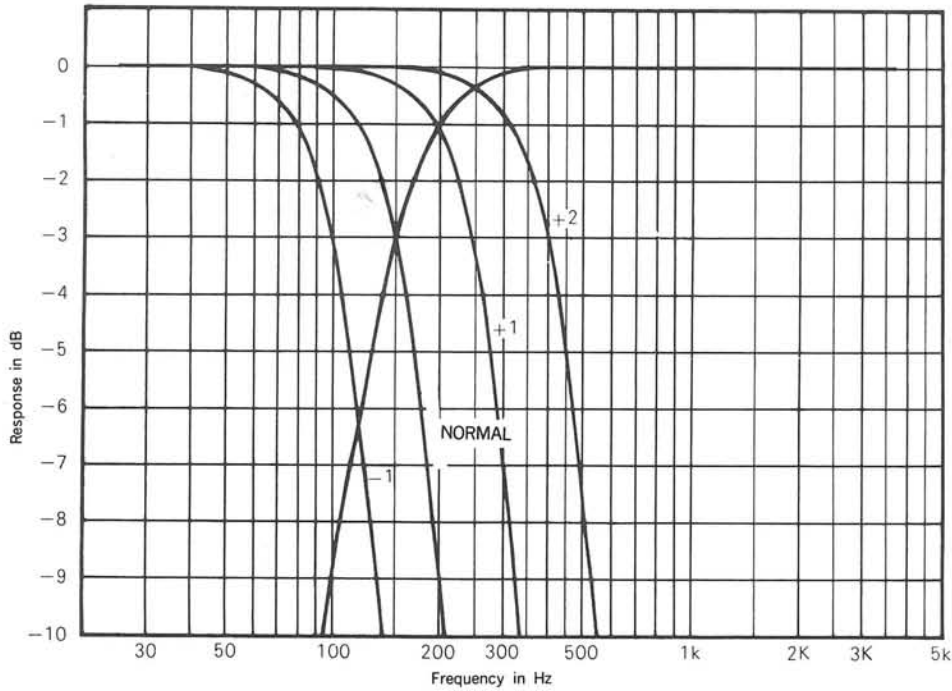
BASS BOOST switch 0 dB

— 10kHz
- - - 1kHz
- · - 100Hz

Channel Selector Switch 3 CH

LEVEL controls Maximum

LOW CHANNEL FREQUENCY SHIFT RESPONSE



CROSSOVER FREQUENCY switch (LOW) 150 Hz

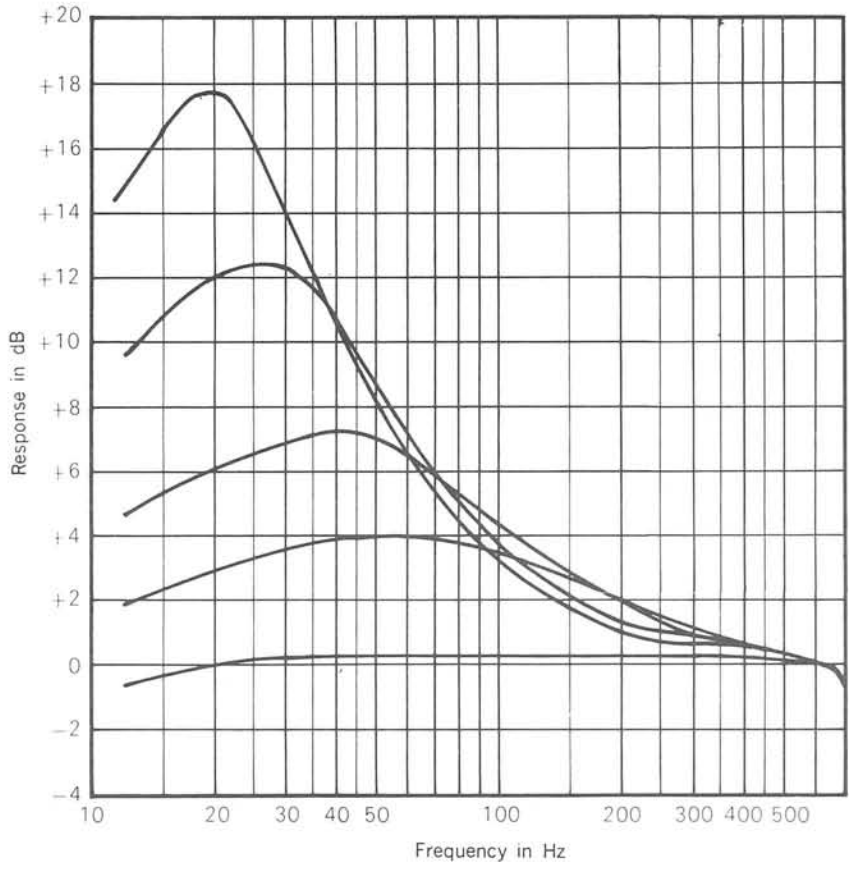
CROSSOVER FREQUENCY switch (HIGH) 8 kHz

BASS BOOST switch 0 dB

Channel Selector switch 3 CH

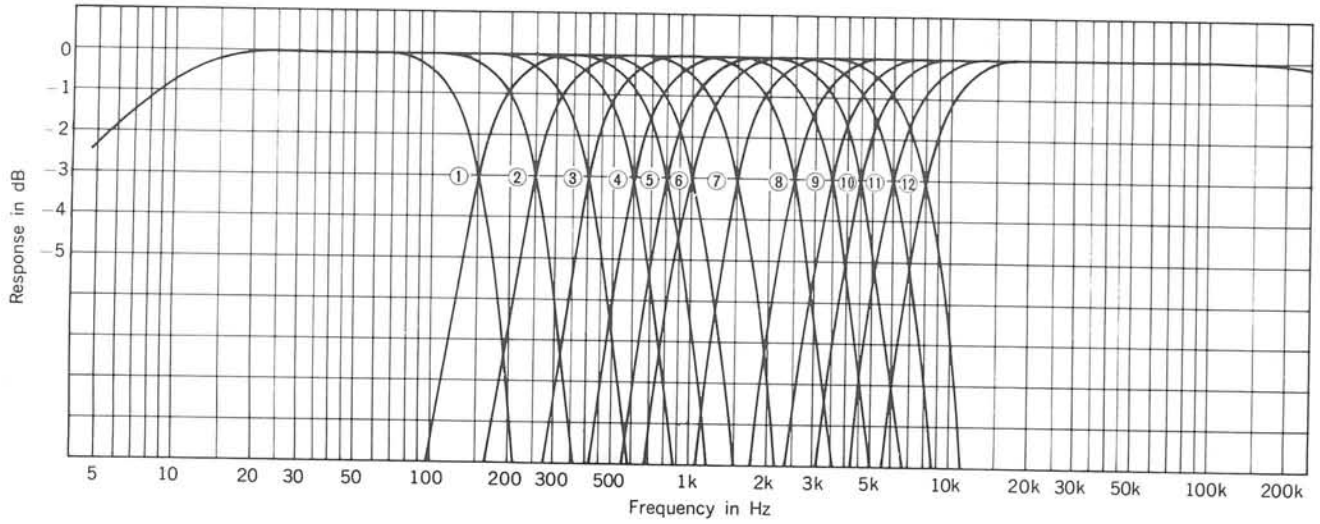
LEVEL controls Maximum

BASS BOOST RESPONSE .



LOW CHANNEL FREQUENCY SHIFT switch NORMAL
 CROSSOVER FREQUENCY switch (LOW) 1 kHz

FREQUENCY RESPONSE



Note:

CROSSOVER FREQUENCY (LOW)

- 1 150Hz
- 2 250Hz
- 3 400Hz
- 4 600Hz
- 5 800Hz
- 6 1kHz

(Set the CROSSOVER FREQUENCY
switch-HIGH to 8 kHz)

CROSSOVER FREQUENCY (HIGH)

- 7 1.5kHz
- 8 2.5kHz
- 9 3.5kHz
- 10 4.5kHz
- 11 6 kHz
- 12 8 kHz

(Set the CROSSOVER FREQUENCY
switch-LOW to 150 Hz)

- LOW CHANNEL FREQUENCY SHIFT switch NORMAL
- BASS BOOST switch 0 dB
- Channel Selector switch 3 CH
- LEVEL controls Maximum

SECTION 5
REPACKING

The TA-4300F's original shipping carton and packing material are the ideal containers for shipping the unit. However, to secure the maximum protection the

TA-4300F must be repacked in these materials precisely as before. The proper repacking procedure is shown in Fig. 5-1.

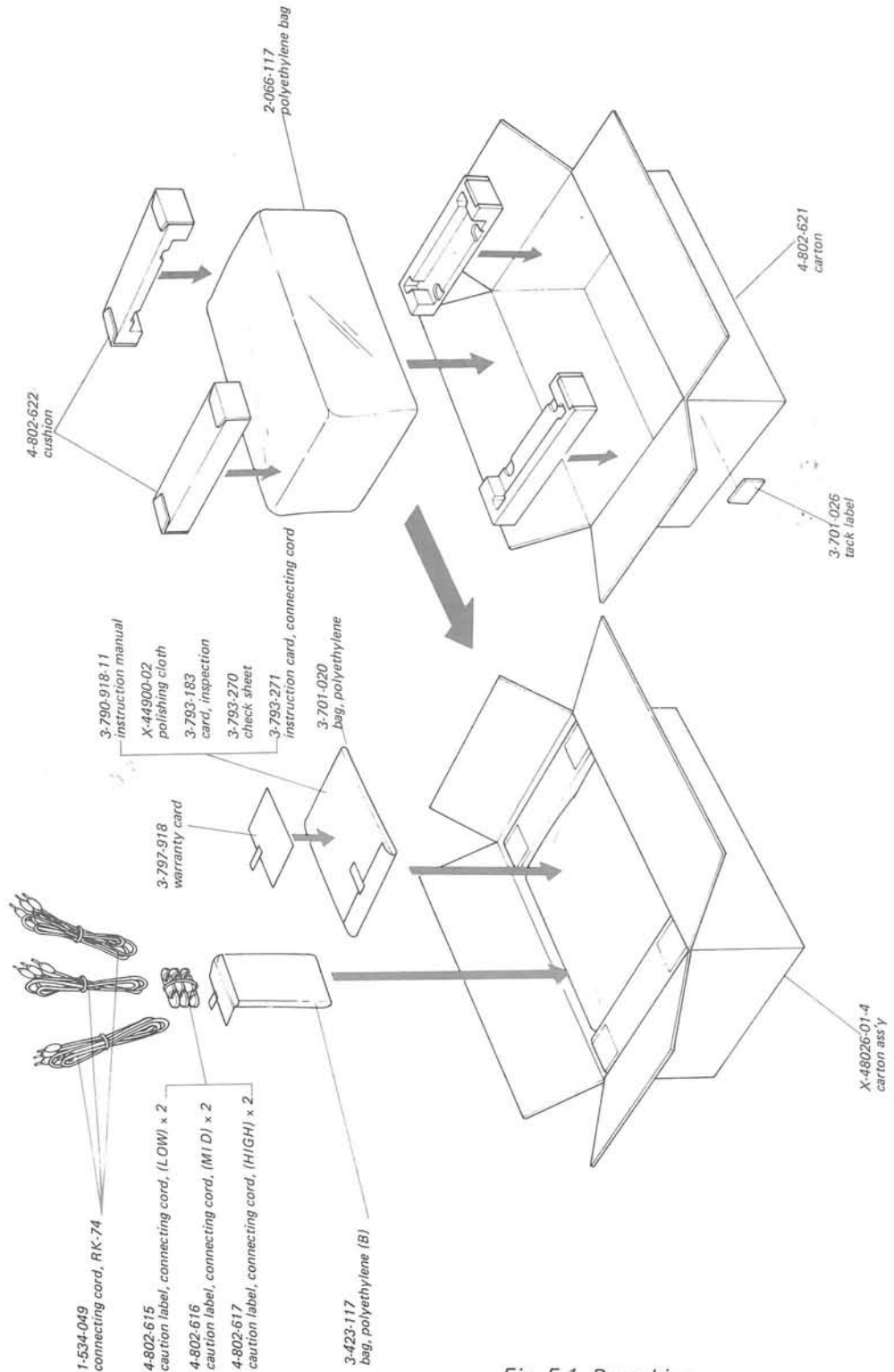
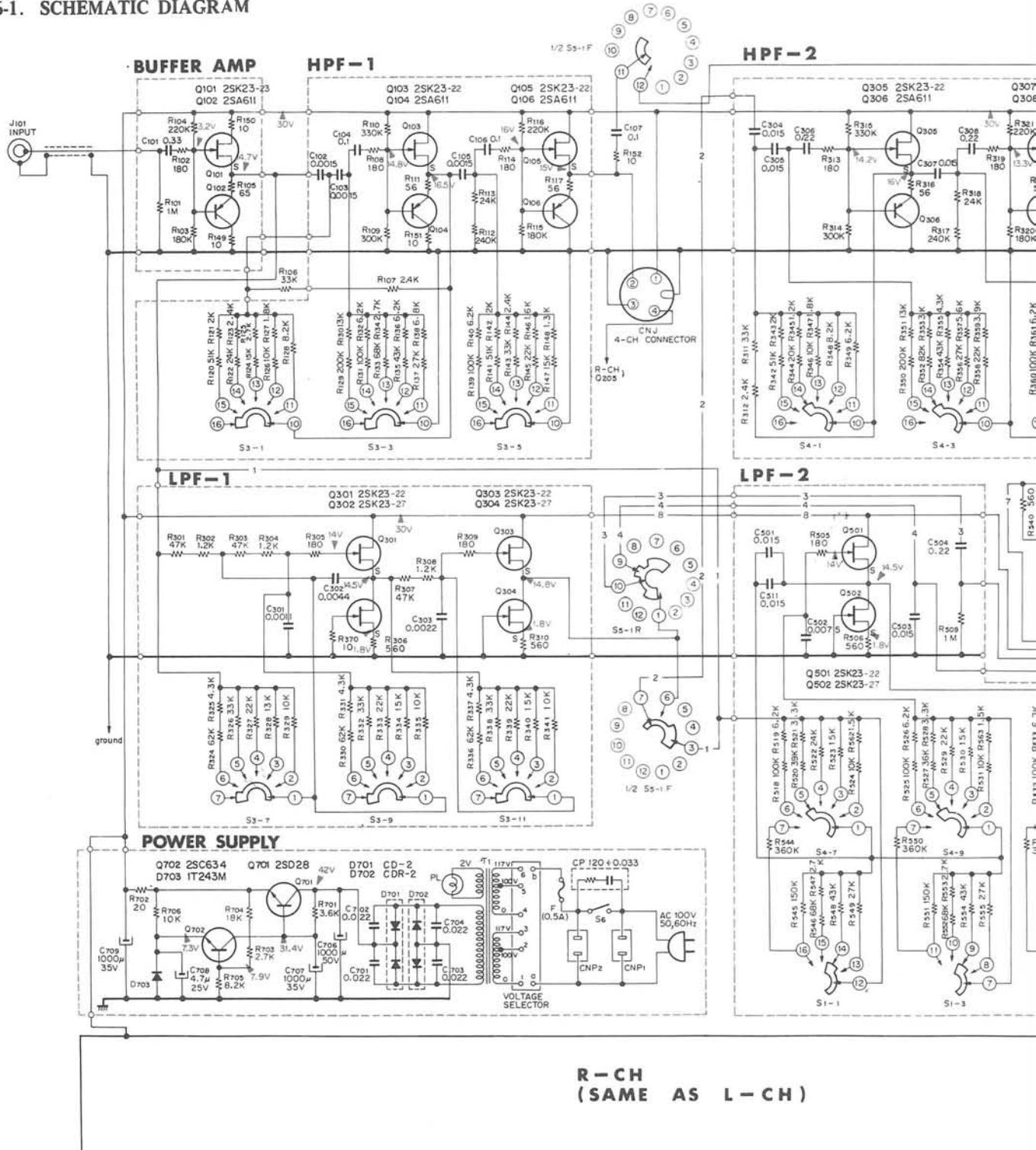


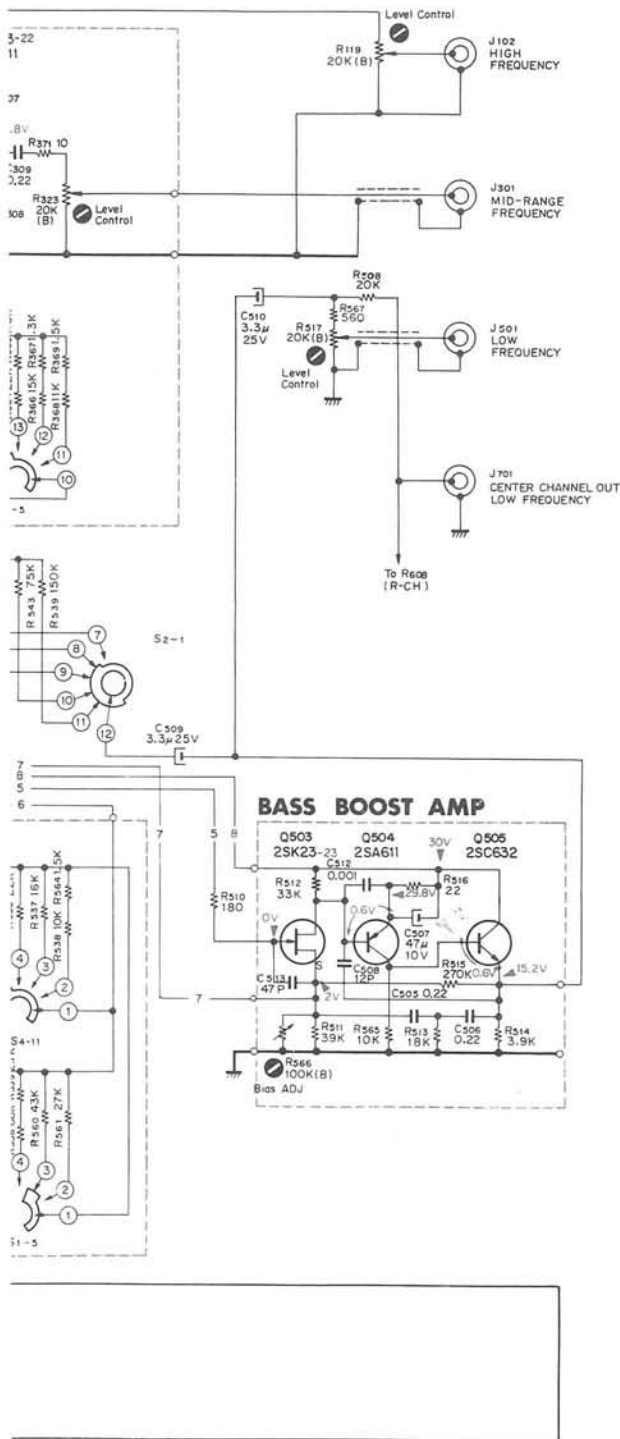
Fig. 5-1 Repacking

SECTION 6
DIAGRAMS

6-1. SCHEMATIC DIAGRAM



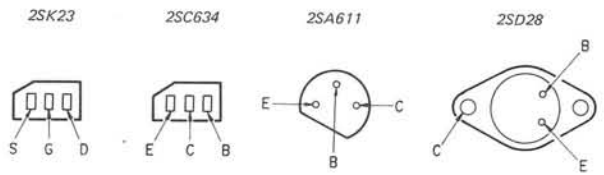
TA-4300F TAD-43F



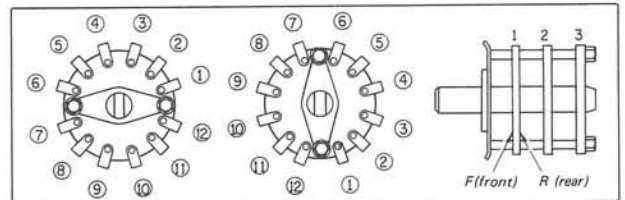
Ref. No.	Description	Position
S1	LOW CHANNEL FREQ. SHIFT sw. (-1, NORMAL +1 +2)	+1
S2	BASS BOOST sw. (0, 3, 6, 12, 18 dB)	3 dB
S3	CROSSOVER FREQ. selector sw (HIGH) (1.5 kHz, 2.5 kHz, 3.5 kHz, 4.5 kHz, 6 kHz, 8 kHz)	1.5 kHz
S4	CROSSOVER FREQ. (150 Hz, 250 Hz, 400 Hz, 600 Hz, 800 Hz, 1 kHz)	400 Hz
S5	Channel Selector sw (2 CH (LOW), 2 CH (HIGH), 3 CH, 4 CH)	2 CH. LOW

Note:

All resistance values are in ohms, k=1000, M=1000 k
 All capacitance values are in μF except as indicated with p, which means $\mu\mu\text{F}$.
 All voltages represent an average value and should hold within $\pm 20\%$.
 All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.



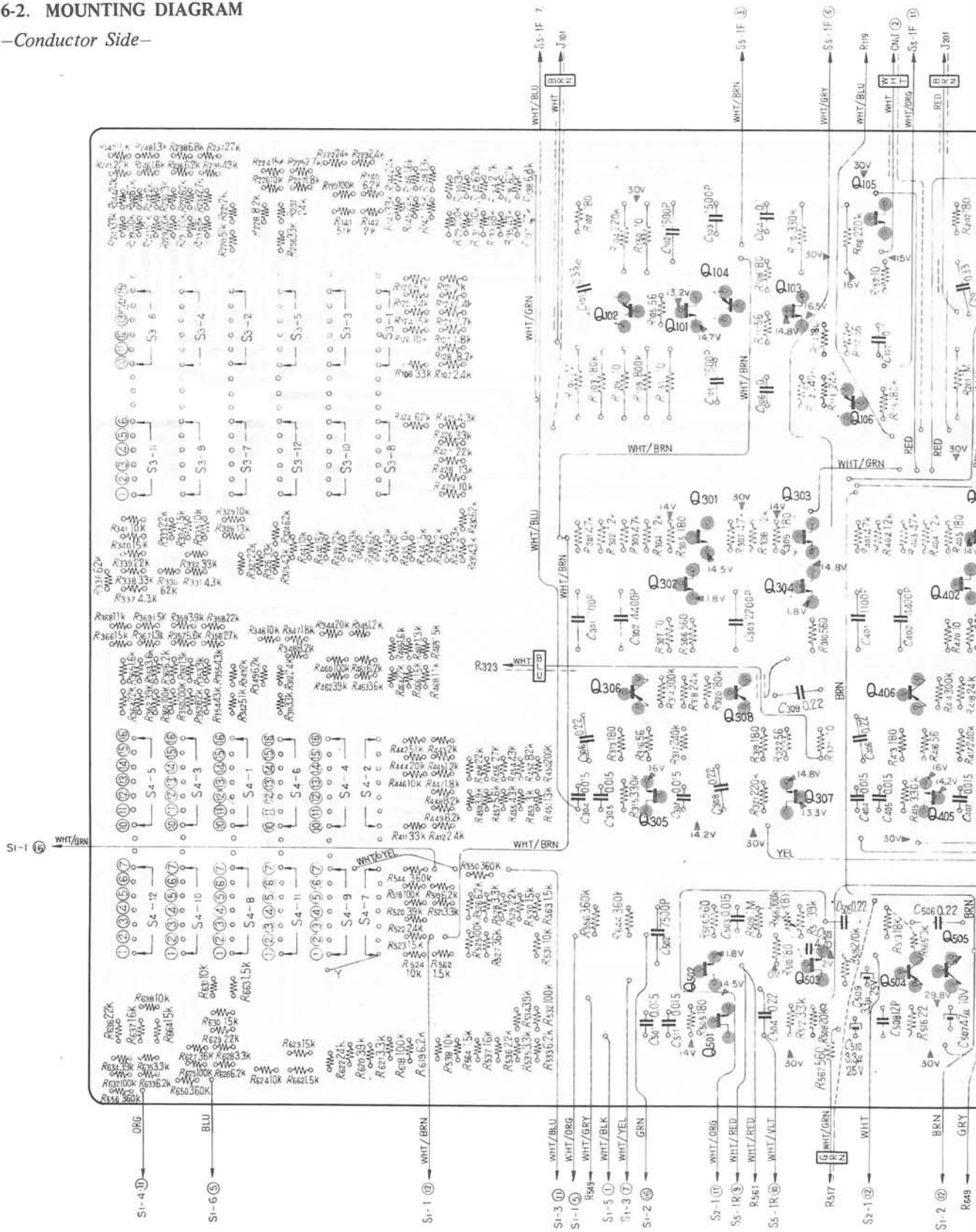
ROTARY SWITCH INDEX (S2, S5)



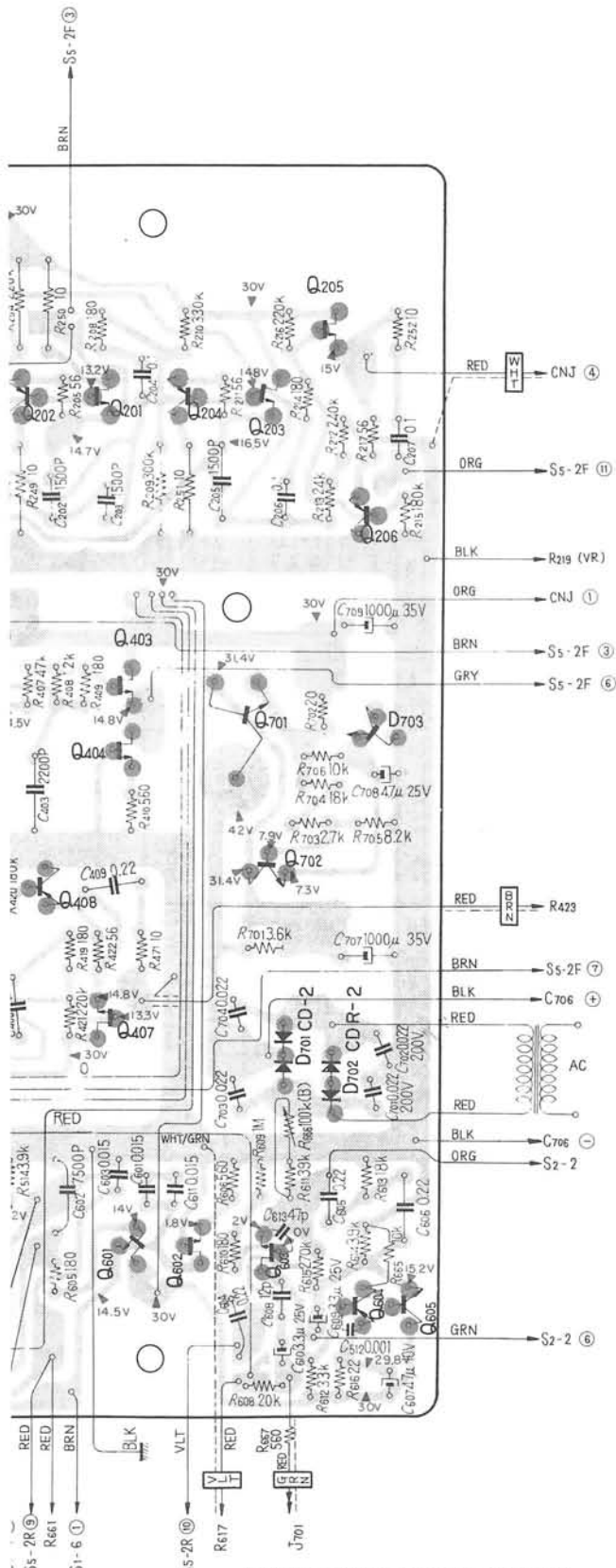
SONY®
TA-4300F
 © 1970

6-2. MOUNTING DIAGRAM

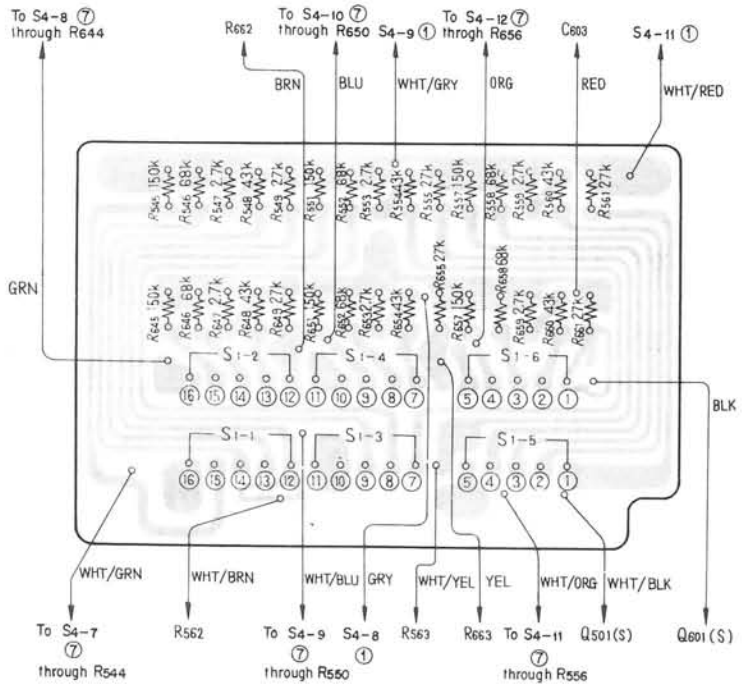
-Conductor Side-



TA-4300F TAD-43F

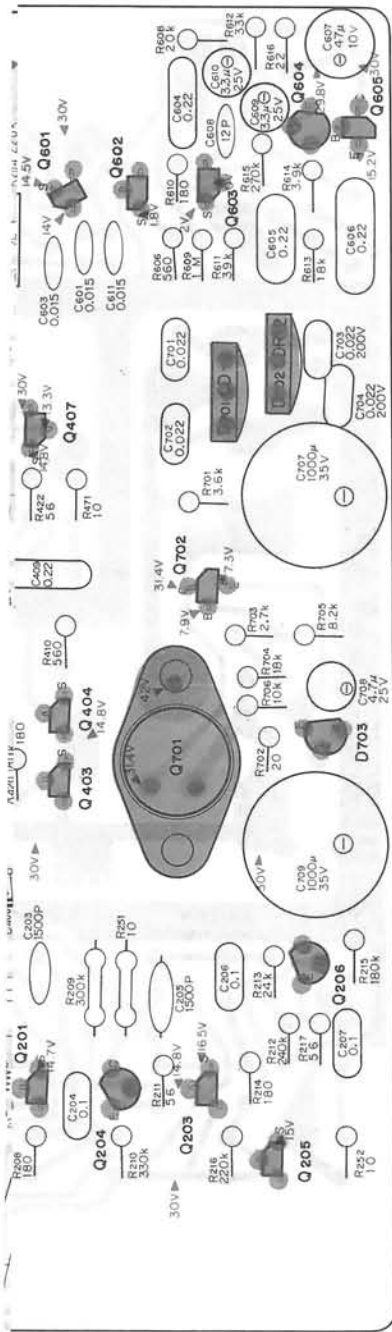


C513 and C613 are mounted on conductor side.

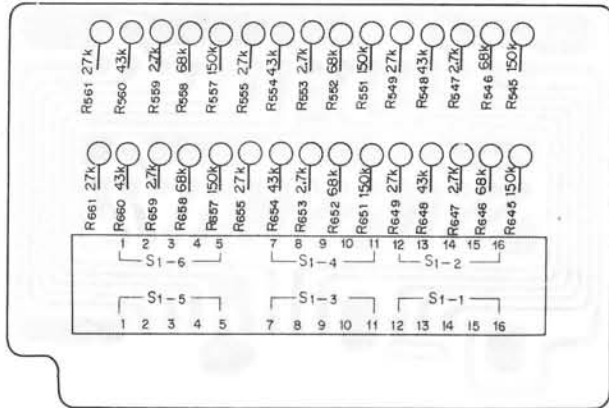


- | | |
|-------------|----------|
| Q101(Q201), | 2SK23-23 |
| Q102(Q202), | 2SA611 |
| Q103(Q203), | 2SK23-22 |
| Q104(Q204), | 2SA611 |
| Q105(Q205), | 2SK23-22 |
| Q106(Q206), | 2SA611 |
| Q301(Q401), | 2SK23-22 |
| Q302(Q402), | 2SK23-27 |
| Q303(Q403), | 2SK23-22 |
| Q304(Q404), | 2SK23-27 |
| Q305(Q405), | 2SK23-22 |
| Q306(Q406), | 2SA611 |
| Q307(Q407), | 2SK23-22 |
| Q308(Q408), | 2SA611 |
| Q501(Q601), | 2SK23-22 |
| Q502(Q602), | 2SK23-27 |
| Q503(Q603), | 2SK23-23 |
| Q504(Q604), | 2SA611 |
| Q505(Q605), | 2SC632 |
| Q701 | 2SD-28 |
| Q702 | 2SC634 |

TA-4300F TAD-43F

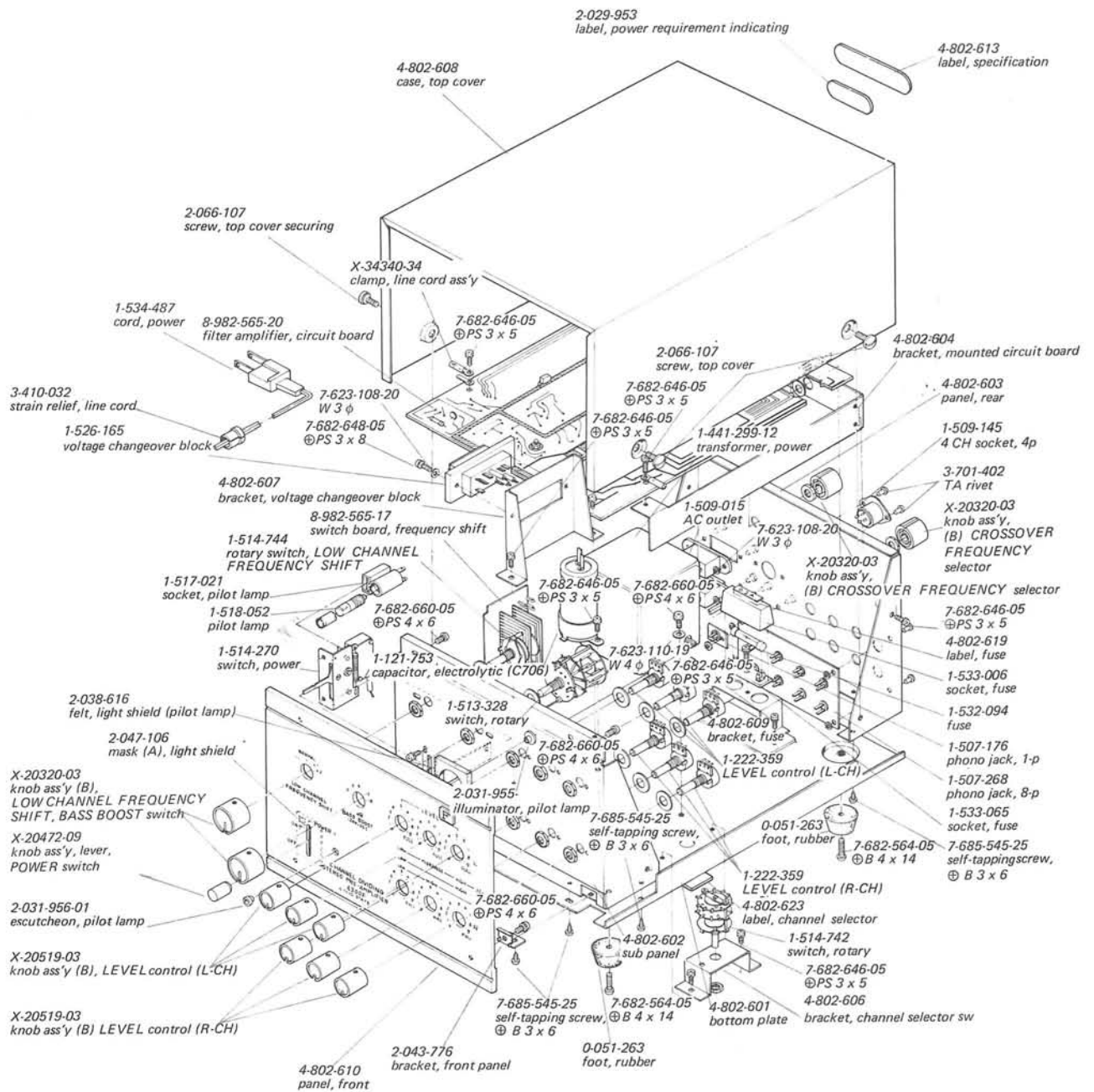


C513 and C613 are mounted on conductor side.



- Q101(Q201), 2SK23-23
- Q102(Q202), 2SA611
- Q103(Q203), 2SK23-22
- Q104(Q204), 2SA611
- Q105(Q205), 2SK23-22
- Q106(Q206), 2SA611
- Q301(Q401), 2SK23-22
- Q302(Q402), 2SK23-27
- Q303(Q403), 2SK23-22
- Q304(Q404), 2SK23-27
- Q305(Q405), 2SK23-22
- Q306(Q406), 2SA611
- Q307(Q407), 2SK23-22
- Q308(Q408), 2SA611
- Q501(Q601), 2SK23-22
- Q502(Q602), 2SK23-27
- Q503(Q603), 2SK23-23
- Q504(Q604), 2SA611
- Q505(Q605), 2SC632
- Q701 2SD-28
- Q702 2SC634

SECTION 7
EXPLODED VIEW



SECTION 8

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
Mounted Circuit Boards			C301(C401)	1-109-213	1100p ±5% 100V mica
			C302(C402)	1-109-215	4400p ±5% 100V mica
	8-982-565-20	filter amplifier circuit board	C303(C403)	1-109-214	2200p ±5% 100V mica
	8-982-565-17	switch board, frequency shift	C304(C404)	1-106-029-12	0.015 ±5% 50V mylar
			C305(C405)	1-106-029-12	0.015 ±5% 50V mylar
			C306(C406)	1-105-689-12	0.22 ±10% 50V mylar
			C307(C407)	1-106-029-12	0.015 ±5% 50V mylar
			C308(C408)	1-105-689-12	0.22 ±10% 50V mylar
			C309(C409)	1-105-689-12	0.22 ±10% 50V mylar
			C501(C601)	1-106-029-12	0.015 ±5% 50V mylar
			C502(C602)	1-109-216	7500p ±5% 100V mica
			C503(C603)	1-106-029-12	0.015 ±5% 50V mylar
			C504(C604)	1-105-689-12	0.22 ±10% 50V mylar
			C505(C605)	1-106-057-12	0.22 ±5% 50V mylar
			C506(C606)	1-106-057-12	0.22 ±5% 50V mylar
			C507(C607)	1-121-408	47 +150-10% 10V electrolytic
			C508(C608)	1-107-109	12p ±10% 50V silvered mica
			C509(C609)	1-121-344	3.3 +150-10% 25V electrolytic
			C510(C610)	1-121-344	3.3 +150-10% 25V electrolytic
			C511(C611)	1-106-029-12	0.015 ±5% 50V mylar
			C512(C612)	1-105-661-12	0.001 ±10% 50V mylar
			C513(C613)	1-107-123	47p ±10% 50V silvered mica
			C701	1-105-917-12	0.022 ±20% 200V mylar
			C702	1-105-917-12	0.022 ±20% 200V mylar
			C703	1-105-917-12	0.022 ±20% 200V mylar
			C704	1-105-917-12	0.022 ±20% 200V mylar
			C706	1-121-753	1000 50V electrolytic
			C707	1-121-388	1000 +150-10% 35V electrolytic
			C708	1-121-395	4.7 +150-10% 25V electrolytic
			C709	1-121-388	1000 +150-10% 35V electrolytic
					Resistors
					All resistance values are in Ω, ±5%, 1/4 W and carbon type unless otherwise indicated
					Transformer
T	1-441-299	transformer, power	R101(R201)	1-244-745	1M
			R102(R202)	1-242-655	180
			R103(R203)	1-244-727	180K
			R104(R204)	1-244-729	220K
			R105(R205)	1-242-643	56
			R106(R206)	1-242-709	33K
			R107(R207)	1-242-682	2.4K
			R108(R208)	1-242-655	180
			R109(R209)	1-244-732	300K
			R110(R210)	1-242-733	330K
			R111(R211)	1-242-643	56
			R112(R212)	1-242-730	240K
			R113(R213)	1-242-706	24K
			R114(R214)	1-242-655	180
					Capacitors
					All capacitance values are in μF, except as indicated with p, which means pμF.
C101(C201)	1-105-691-12	0.33 ±10% 200V mylar			
C102(C202)	1-106-005-12	1500p ±5% 50V mylar			
C103(C203)	1-106-005-12	1500p ±5% 50V mylar			
C104(C204)	1-105-685-12	0.1 ±10% 50V mylar			
C105(C205)	1-106-005-12	1500p ±5% 50V mylar			
C106(C206)	1-105-685-12	0.1 ±10% 50V mylar			
C107(C207)	1-105-685-12	0.1 ±10% 50V mylar			

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R115(R215)	1-242-727	180K	R315(R415)	1-242-733	330K
R116(R216)	1-244-729	220K	R316(R416)	1-242-643	56
R117(R217)	1-244-643	56	R317(R417)	1-242-730	240K
R119(R219)	1-222-359	20K (B), variable	R318(R418)	1-242-706	24K
R120(R220)	1-242-714	51K	R319(R419)	1-242-655	180
R121(R221)	1-242-680	2K	R320(R420)	1-242-727	180K
R122(R222)	1-242-706	24K	R321(R421)	1-242-729	220K
R123(R223)	1-242-682	2.4K	R322(R422)	1-242-643	56
R124(R224)	1-242-701	15K	R323(R423)	1-222-359	20K (B), variable
R125(R225)	1-242-683	2.7K	R324(R424)	1-242-716	62K
R126(R226)	1-242-697	10K	R325(R425)	1-242-688	4.3K
R127(R227)	1-242-679	1.8K	R326(R426)	1-242-709	33K
R128(R228)	1-242-695	8.2K	R327(R427)	1-242-705	22K
R129(R229)	1-242-728	200K	R328(R428)	1-242-700	13K
R130(R230)	1-242-700	13K	R329(R429)	1-242-697	10K
R131(R231)	1-242-721	100K	R330(R430)	1-242-716	62K
R132(R232)	1-242-692	6.2K	R331(R431)	1-242-688	4.3K
R133(R233)	1-242-717	68K	R332(R432)	1-242-709	33K
R134(R234)	1-242-683	2.7K	R333(R433)	1-242-705	22K
R135(R235)	1-242-712	43K	R334(R433)	1-242-701	15K
R136(R236)	1-242-692	6.2K	R335(R435)	1-242-697	10K
R137(R237)	1-242-707	27K	R336(R436)	1-242-716	62K
R138(R238)	1-242-693	6.8K	R337(R437)	1-242-688	4.3K
R139(R239)	1-242-721	100K	R338(R438)	1-242-709	33K
R140(R240)	1-242-692	6.2K	R339(R439)	1-242-705	22K
R141(R241)	1-242-714	51K	R340(R440)	1-242-701	15k
R142(R242)	1-242-680	2.0K	R341(R441)	1-242-697	10K
R143(R243)	1-242-709	33K	R342(R442)	1-242-714	51K
R144(R244)	1-242-682	2.4K	R343(R443)	1-242-680	2K
R145(R245)	1-242-705	22K	R344(R444)	1-242-704	20K
R146(R246)	1-242-678	1.6K	R345(R445)	1-242-675	1.2K
R147(R247)	1-242-701	15K	R346(R446)	1-242-697	10K
R148(R248)	1-242-676	1.3K	R347(R447)	1-242-679	1.8K
R149(R249)	1-244-625	10	R348(R448)	1-242-695	8.2K
R150(R250)	1-244-625	10	R349(R449)	1-242-692	6.2K
R151(R251)	1-244-625	10	R350(R450)	1-242-728	200K
R152(R252)	1-242-625	10	R351(R451)	1-242-700	13K
R301(R401)	1-242-713	47K	R352(R452)	1-242-719	82K
R302(R402)	1-242-675	1.2K	R353(R453)	1-242-684	3.0K
R303(R403)	1-242-713	47K	R354(R454)	1-242-712	43K
R304(R404)	1-242-675	1.2K	R355(R455)	1-242-688	4.3K
R305(R405)	1-242-655	180	R356(R456)	1-242-707	27K
R306(R406)	1-242-667	560	R357(R457)	1-242-691	5.6K
R307(R407)	1-242-713	47K	R358(R458)	1-242-705	22K
R308(R408)	1-242-675	1.2K	R359(R459)	1-242-687	3.9K
R309(R409)	1-242-655	180	R360(R460)	1-242-721	100K
R310(R410)	1-242-667	560	R361(R461)	1-242-692	6.2K
R311(R411)	1-242-709	33K	R362(R462)	1-242-711	39K
R312(R412)	1-242-682	2.4K	R363(R463)	1-242-686	3.6K
R313(R413)	1-242-655	180	R364(R464)	1-242-705	22K
R314(R413)	1-242-732	300K	R365(R465)	1-242-678	1.6K
			R366(R466)	1-242-701	15K

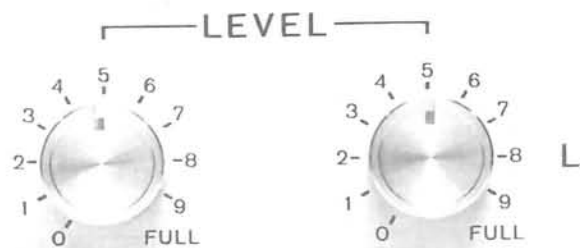
TA-4300F

TAD-43F

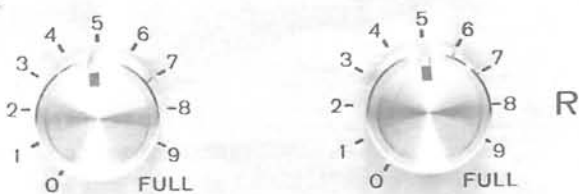
<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R367(R467)	1-242-676	1.3K	R552(R652)	1-242-717	68K
R368(R468)	1-242-698	11K	R553(R653)	1-242-683	2.7K
R369(R469)	1-242-677	1.5K	R554(R654)	1-242-712	43K
R370(R470)	1-242-625	10	R555(R655)	1-242-707	27K
R371(R471)	1-242-625	10	R556(R656)	1-242-734	360K
R505(R605)	1-242-655	180	R557(R657)	1-242-725	150K
R506(R606)	1-242-667	560	R558(R658)	1-242-717	68K
R508(R608)	1-242-704	20K	R559(R659)	1-242-683	2.7K
R509(R609)	1-242-745	1M	R560(R660)	1-242-712	43K
R510(R610)	1-242-655	180	R561(R661)	1-242-707	27K
R511(R611)	1-242-711	39K	R562(R662)	1-242-677	1.5K
R512(R612)	1-242-709	33K	R563(R663)	1-242-677	1.5K
R513(R613)	1-242-703	18K	R564(R664)	1-242-677	1.5K
R514(R614)	1-242-687	3.9K	R565(R665)	1-242-697	10K
R515(R615)	1-242-731	270K	R566(R666)	1-221-638	100K (B) semi-fixed
R516(R616)	1-242-633	22	R567(R667)	1-244-667	560
R517(R617)	1-222-359	20K (B), variable	R701	1-242-686	3.6K
R518(R618)	1-242-721	100K	R702	1-242-632	20
R519(R619)	1-242-692	6.2K	R703	1-242-683	2.7K
R520(R620)	1-242-711	39K	R704	1-242-703	18K
R521(R621)	1-242-685	3.3K	R705	1-242-693	6.8K
R522(R622)	1-242-706	24K	R706	1-242-697	10K
R523(R623)	1-242-701	15K			
R524(R624)	1-242-697	10K			Switches
R525(R625)	1-242-721	100K	S1	1-514-744	switch, LOW CHANNEL
R526(R626)	1-242-692	6.2K	S2	1-513-328	FREQUENCY SHIFT
R527(R627)	1-242-710	36K	S3	1-514-743	switch, BASS BOOST
R528(R628)	1-242-685	3.3K	S4	1-514-743	switch, CROSSOVER
R529(R629)	1-242-705	22K	S5	1-514-742	FREQUENCY SELECTOR
R530(R630)	1-242-701	15K	S6	1-514-270	(HIGH)
R531(R631)	1-242-697	10K			switch, CROSSOVER
R532(R632)	1-242-721	100K			FREQUENCY SELECTOR
R533(R633)	1-242-692	6.2K			(MID-RANGE)
R534(R634)	1-242-711	39K			switch, CHANNEL SELECTOR
R535(R635)	1-242-685	3.3K			switch, POWER
R536(R636)	1-242-705	22K			
R537(R637)	1-242-702	16K			Miscellaneous
R538(R638)	1-242-697	10K			1-509-145
R539(R639)	1-244-725	150K			connector, 7-p
R540(R640)	1-244-667	560			1-509-015
R541(R641)	1-244-701	15K			AC outlet
R542(R642)	1-244-707	27K			1-231-057
R543(R643)	1-244-718	75K			encapsulated component
R544(R644)	1-242-734	360K			($120\Omega + 0.033\mu\text{F}$)
R545(R645)	1-242-725	150K			1-507-268
R546(R646)	1-242-717	68K			phono jack, 4-p
R547(R647)	1-242-683	2.7K			1-518-052
R548(R648)	1-242-712	43K			lamp, pilot
R549(R649)	1-242-707	27K			1-526-165
R550(R650)	1-242-734	360K			voltage changeover block
R551(R651)	1-242-725	150K			1-517-021
					socket, pilot lamp
					1-533-066
					socket, fuse
					1-534-487
					cord, power
					1-507-176
					phono jack, 1-p
					1-532-091
					fuse 0.2A

4-CHANNEL ADAPTOR TAD-43F

SONY



LOWER HIGH ——— UPPER HIGH — 4 CH



4 CHANNEL ADAPTOR
TAD-43F
SOLID STATE

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SECTION 1

TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the TAD-43F are given in Table 1-1.

TABLE 1-1. TECHNICAL SPECIFICATIONS

Frequency response :	f_c to 100 kHz ± 0 dB
	f_c : crossover frequency
Crossover frequency :	3k, 4.5k, 6k, 8k, 10k, 12kHz
Output impedance :	Less than 5k ohms
Harmonic distortion :	0.03% at 1 V output
	0.1 % at 4 V output
	(each passband frequency)
	0.05% at 1 V output
	0.1 % at 2.5 V output
	(at crossover frequency)
Signal-to-noise ratio :	85 dB, shorted circuit (1 V input)
Maximum input signal level :	4.5 V
Power consumption :	Approx. 1 watt
Power requirement :	30 volts dc (from TA-4300F)
Dimensions :	100mm (width) X 149mm (height) X 316mm depth
	$3^{15}/16$ " (width) X $5^{7}/8$ " (height) X $12^{7}/16$ " (depth)
Net weight :	1.85 kg (4 lb)
Shipping weight :	2.35 kg (5 lb 1 oz)

1-2. DETAILED CIRCUIT ANALYSIS

The following describes the functions of all stages and controls. The text sequence follows signal paths. Stages are listed by transistor reference designation at left margin; major components are also listed in a similar manner. Refer to the block diagram on page 33 and schematic diagram on page 41.

Stage/Control

Input connector
CNP

Function

This socket is provided for connecting the TAD-43F to the TA-4300F. This socket accepts the dc power and the output of the high-pass filter (HPF-1) in the TA-4300F. Before describing the following circuit, note that following filter circuit consists of a pair of high-and-low pass filters having a variable crossover frequency fH' (3 kHz, 4.5 kHz, 6 kHz, 8 kHz, 10 kHz, or 12 kHz). Combining these filters and those in the TA-4300F, various kinds of 4-channel filters, having the crossover frequencies fL , fH , and fH' are obtained. See Fig. 1-1.

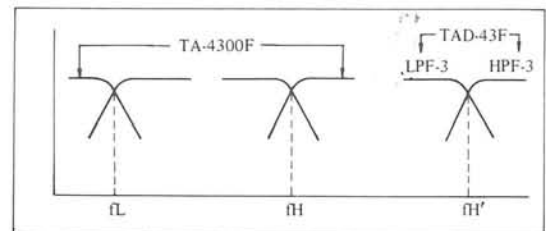


Fig. 1-1 Outputs of each of the four sections

High-pass filter HPF-3

Three RC filters and two FET-PNP buffer amplifiers (Q101, Q102, Q103 and Q104) comprise a high-pass filter having six possible crossover frequencies. The RC networks for the high-pass filter (HPF-3) are composed of C101, C102 and C104 and the resistors connected to switch wafers S1-1, S1-3 and S1-5. FET-PNP buffer amplifiers are inserted between each RC filter to eliminate interaction between each RC filter. The positive feedback applied from the source of Q101 to C102 through R101 provides a sharp knee characteristic at the crossover frequency. To obtain a sharp rolloff of approximately 18 dB/octave, the design crossover frequencies of

Stage/Control

Function

three RC filters are 1/2 the crossover, twice the crossover, and the crossover frequency respectively as shown in Fig. 1-2. The same is true for the other filters used in the TAD-43F.

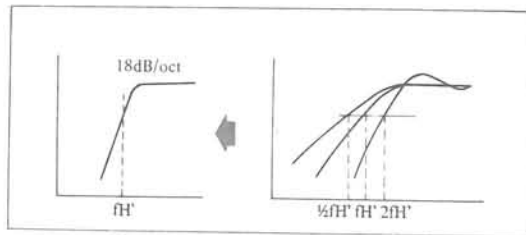


Fig. 1-2 Design of the sharp-cutoff RC filter

FET-PNP buffer amplifier
Q101, Q102

Presents the input signal with a high input impedance and drives the following filters. Q101 and Q102 form a modified source follower circuit in which Q102 acts not only as a constant-current source but also as a negative-going half-cycle drive amplifier. This combination amplifier has the advantage of low harmonic distortion and wide dynamic range. In addition, the FET generates less noise than conventional silicon transistors.

The FETs used in this type of circuit are selected according to their I_{dss} rank, and care should be taken to use replacement components with the same I_{dss} . I_{dss} rank is indicated by the identification number as illustrated in Fig. 1-3.

The output of the high-pass filter containing highest frequency component is fed to the UPPER HIGH connector through R113 (LEVEL control).

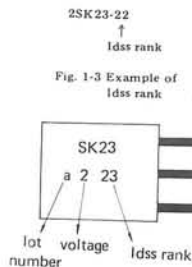


Fig. 1-3 Example of I_{dss} rank

Stage/Control

Function

Low-pass filter
LPF-3

Three RC filters and two FET-FET buffer amplifiers (Q301, Q302, Q303 and Q304) comprise a low-pass filter (LPF-3) having six crossover frequencies.

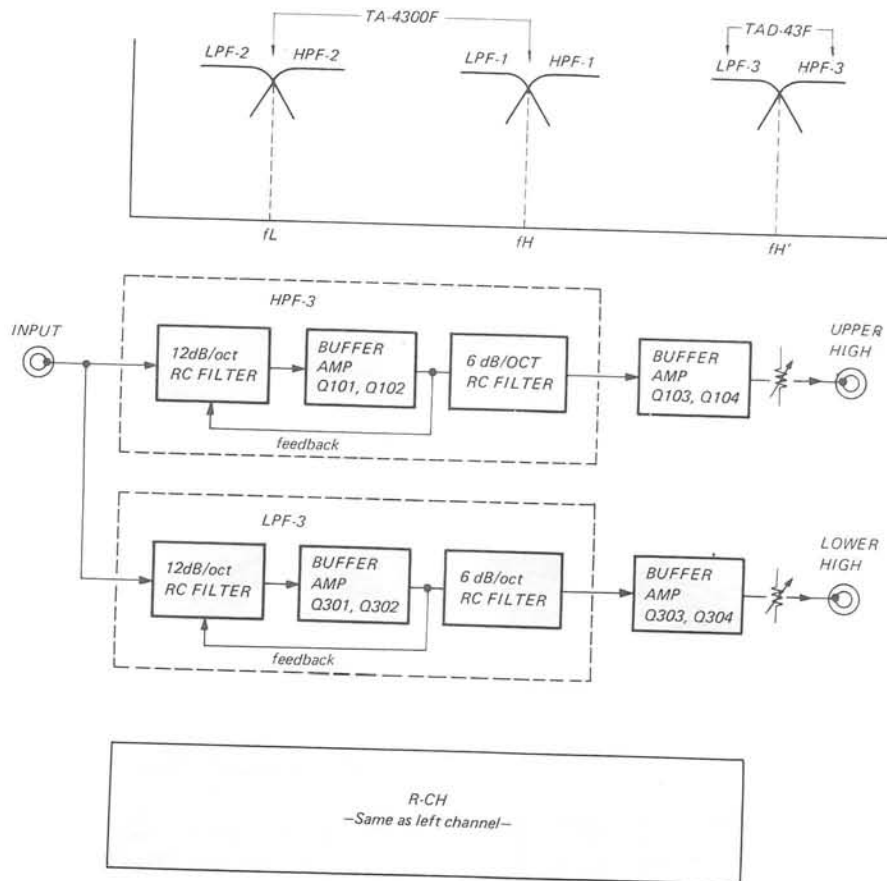
The RC network for the low-pass filter consists of C301, C302, C303 and C304 and the resistors connected to switch wafers S1-7, S1-9 and S1-11 (CROSSOVER FREQUENCY selector switch). This low-pass filter provides a crossover frequency of " fH' " and rolloff of about 18 dB/octave. Direct coupling is employed in this circuit to eliminate popping noise when changing the crossover frequency.

FET-FET buffer amplifier
Q301, Q302

Presents the input signal with a high-impedance and drives the following filters. Q301 and Q302 form a modified source follower circuit in which Q302 acts as a constant current source. This increases the dynamic range. In addition, the FET generates less noise than conventional silicon transistors. The output of the low-pass filter is fed to the LOWER HIGH connector through R313 (LEVEL control).

As the input signal is supplied through high-pass filter HPF-1 in the TA-4300F, the overall frequency characteristic obtained by combining this low-pass filter HPF-1 becomes that of a band-pass filter having a frequency characteristic between fH and fH' as shown in Fig. 1-1.

1-3. BLOCK DIAGRAM



SECTION 2

DISASSEMBLY AND REPLACEMENT PROCEDURES

WARNING













Unplug the ac power cord before starting any disassembly or replacement procedures.

2-1. TOOLS REQUIRED

The following tools and materials are required to perform disassembly and replacement procedures on the TAD-43F.

1. Screwdriver
2. Phillips head screwdriver
3. Soldering iron, 30 to 50 watts.
4. Wrench
5. Electric drill and drill bit
6. Solder, rosin core

— Hardware Nomenclature —

P	Pan Head Screw	⊕	
PS	Pan Head Screw with Spring Washer	⊕	
K	Flat Countersunk Head Screw	⊕	
B	Binding Head Screw	⊕	
RK	Oval Countersunk Head Screw	⊕	
T	Truss Head Screw	⊕	
R	Round Head Screw	⊕	
F	Flat Fillister Head Screw	⊕	
SC	Set Screw	⊖	
E	Retaining Ring (E Washer)	⊖	
	W	Washer	
	SW	Spring Washer	
	LW	Lock Washer	
	N	Nut	
— Example —			
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <p>⊕ P 3x10</p> <p>└─ Type of Slot</p> <p>└─ Length in mm (L)</p> <p>└─ Diameter in mm (D)</p> <p>└─ Type of Head</p> </div> <div style="margin-right: 10px;">  </div> <div>  </div> </div>			

2-2. HARDWARE IDENTIFICATION GUIDE

The following chart will help you to decipher the hardware codes given in this service manual.

Note: All screws in the TAD-43F are manufactured to the specifications of the International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable. ISO screws have a different number of threads per mm compared to the old ones. The ISO screws have an identification mark on their heads as shown in Fig. 2-1.

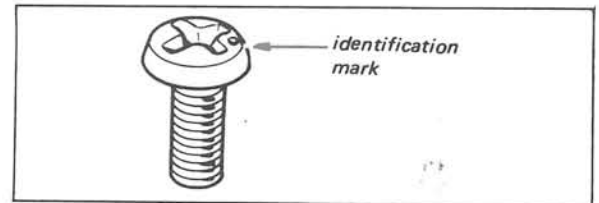


Fig. 2-1 ISO screw

2-3. TOP COVER AND FRONT PANEL REMOVAL

1. Remove the two machine screws at each side of the case, and lift off the top cover.
2. Remove all the LEVEL control knobs by loosening their set screws.
3. Remove the two screws (+PS 4 X 6) securing the front panel from the back of the front subchassis as shown in Fig. 2-2.

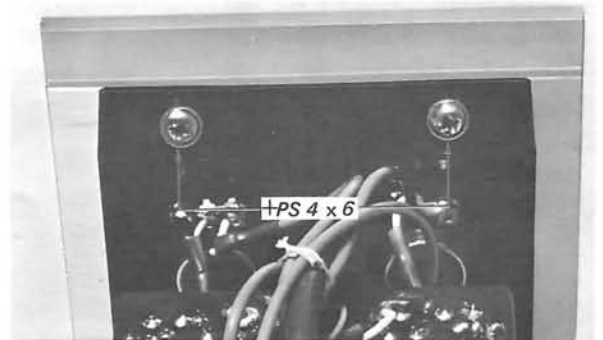


Fig. 2-2 Front panel removal

4. Remove the two self-tapping screws (+B 3 X 6) at each side of the chassis as shown in Fig. 2-3. Now the front subchassis can be tilted forward and down with front panel as shown in Fig. 2-4.
5. Remove the two screws (+PS 4 X 6) securing the front subchassis to the front panel as shown in Fig. 2-4. This frees the front panel.

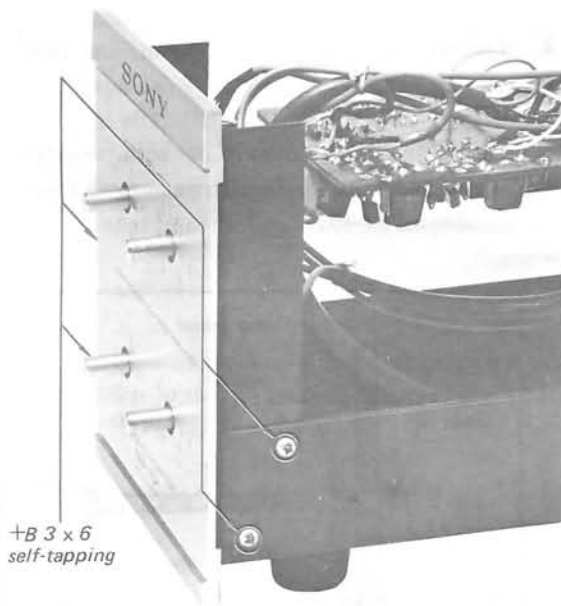


Fig. 2-3 Front subchassis removal

2-4. FILTER AMPLIFIER BOARD REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the control knob at the rear panel by loosening the set screw, and then remove the hex nut securing the CROSSOVER FREQUENCY switch to the rear panel. See Fig. 2-5.
3. Remove the two screws (+PS 3 X 5) securing the filter amplifier board to the mounting bracket. This frees the filter amplifier board. See Fig. 2-5.

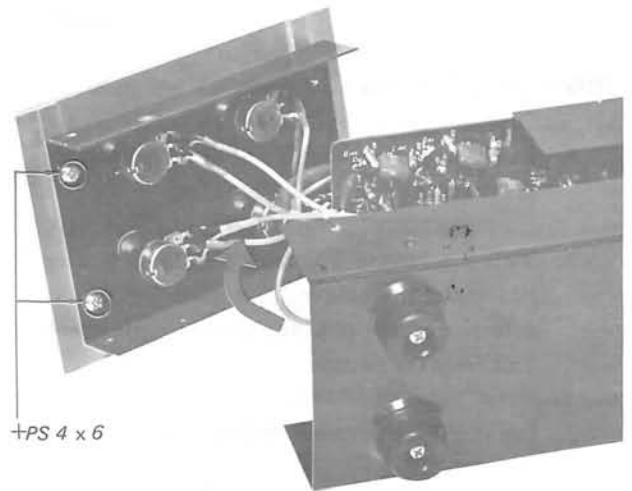


Fig. 2-4 Front panel removal

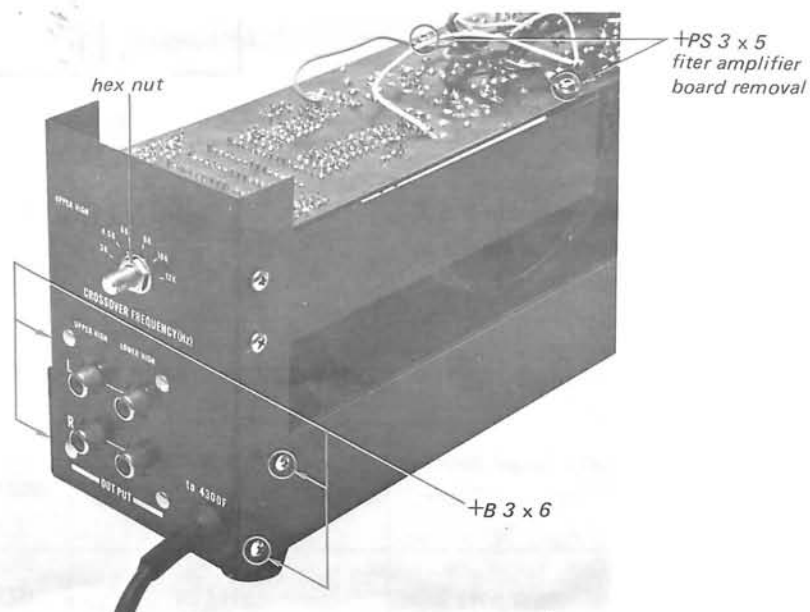


Fig. 2-5 Filter amplifier board and rear panel removal

2-5. CONTROL AND SWITCH REPLACEMENT

Prepare for replacing any of the controls by removing the top cover

LEVEL Controls

1. Remove the front panel as described in Procedure 2-3.
2. Remove the hex nut securing the defective controls to the front subchassis.
3. Unsolder the lead wires from the defective control, and then install the replacement control.

CROSSOVER FREQUENCY Switch

1. Remove the filter amplifier board as described in Procedure 2-4.
2. With a soldering-iron having a solder-sucking tip, clean the solder from each lug of the defective switch and the printed circuit board. This frees the switch.
3. Install the replacement switch.

2-6. REAR PANEL REMOVAL

1. Remove the top cover as described in Procedure 2-3.
2. Remove the filter amplifier board as described in Procedure 2-4.
3. Remove the two self-tapping screws (+B 3 X 6) at each side of the rear panel as shown in Fig. 2-5. This frees the rear panel.

2-7. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY RIVETS

1. Remove the rear panel as described in Procedure 2-6.
2. Bore out the rivets using a drill bit slightly larger in diameter than the rivet. See Fig. 2-6.
3. Punch out the remainder of the rivets with a nail set-or prick punch.
4. Remove the defective component, and then install a new one.
5. Secure the new component with suitable screws and nuts, or repair rivet screws (part number 3-701-402).

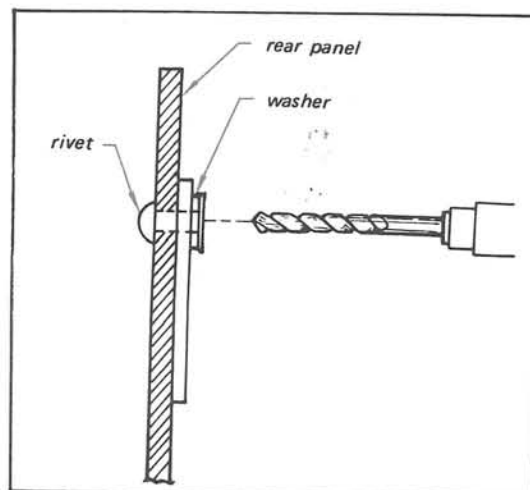


Fig. 2-6 Rivet replacement

SECTION 3

OVERALL CHECKS AND MEASUREMENTS

3-1. TEST EQUIPMENT REQUIRED

1. Audio Oscillator

Frequency range 10 Hz to 100 kHz
Distortion 0.03% or less at
1 kHz

2. Distortion Meter

Capable of measuring of 0.015% distortion or less at 1 kHz.

Frequency range 20 Hz to 100 kHz
Input impedance 1 megohm or more

3. Ac VTVM

Capable of measuring rms voltage of 0.5 mV or less within a frequency range from 10 Hz to 100 kHz.

Input impedance 500 k ohms or more

4. Attenuator

Capable of attenuating signals 60 dB or more.

Characteristic impedance . . . 600 ohms
unbalanced

5. Oscilloscope

Bandwidth 1 MHz or more

Note: 0 dB = 0.775 V (rms)

6. TA-4300F

3-2. LEVEL CHECK WITHIN PASSBAND

Preparation

Set the TA-4300F's controls and switches as follows:

Channel Selector switch 4 CH
CROSSOVER FREQUENCY switch
HIGH S3 1.5 kHz
LOW S4 150 Hz

Procedure

With the equipment connected as shown in Fig. 3-1, check the output level according to the procedures given in Table 3-1.

3-3. LEVEL CHECK AT CROSSOVER FREQUENCY

Preparation

1. Set the TA-4300F's switches and controls as described in Procedure 3-2.

2. Calibrate the upper and lower output levels as follows:

(a) With the equipment connected as shown in Fig. 3-1, set the CROSSOVER FREQUENCY selector switch to 12 kHz. Feed a 5 kHz, 2 dB signal to the INPUT jacks of the TA-4300F, and then adjust the LOWER HIGH LEVEL controls to obtain 0 dB readings at the LOWER HIGH OUTPUT jacks.

TABLE 3-1. LEVEL CHECK WITHIN PASSBAND

OUTPUT Jacks	CROSSOVER FREQUENCY Selector Switch S1	Input Signal Level and Frequency	Output Level
LOWER HIGH	12 kHz	5 kHz, 0 dB	-1 ±0.5 dB
UPPER HIGH	3 kHz	20 kHz, 0 dB	-1 ±0.5 dB

Note: Set the TAD-43F's LEVEL control fully clockwise.

- (b) With the equipment connected as shown in Fig. 3-1, set the CROSSTALK FREQUENCY selector switch to 3 kHz. Feed a 20 kHz, 2 dB signal to the INPUT jacks, and then adjust the UPPER HIGH LEVEL controls to obtain, 0 dB readings at the UPPER HIGH OUTPUT jacks.

Procedure

1. With the equipment connected as shown in Fig. 3-1, feed a 3 kHz, 2 dB signal to the INPUT terminals of the TA-4300F.
2. Measure the level at the UPPER and LOWER OUTPUT jacks while simultaneously changing the crossover frequency and input signal frequency from 3 kHz to 12 kHz. The output should be within the limit of -3.2 ± 0.8 dB.

3-4. CROSSTALK MEASUREMENT

Preparation

1. Set the TA-4300F's switches as described in Procedure 3-2.
2. Set the TAD-43F's LEVEL controls fully clockwise.

Procedure

1. With the equipment connected as shown in Fig. 3-2, feed a signal to the left channel INPUT jack as specified in Table 3-2 to obtain a 0 dB output.
2. Switch the signal to the right channel INPUT and read the residual signal level in the left channel. The 0 dB output level to residual-level ratio represents the channel crosstalk.
3. Check the crosstalk according to the procedures given in Table 3-2.

3-5. NOISE LEVEL MEASUREMENT

Preparation

1. Set the TA-4300F's switches as described in Procedure 3-2.
2. Set the TAD-43F's LEVEL controls fully clockwise.

Procedure

1. With the equipment connected as shown in Fig. 3-3, follow the procedures given in the Table 3-3.

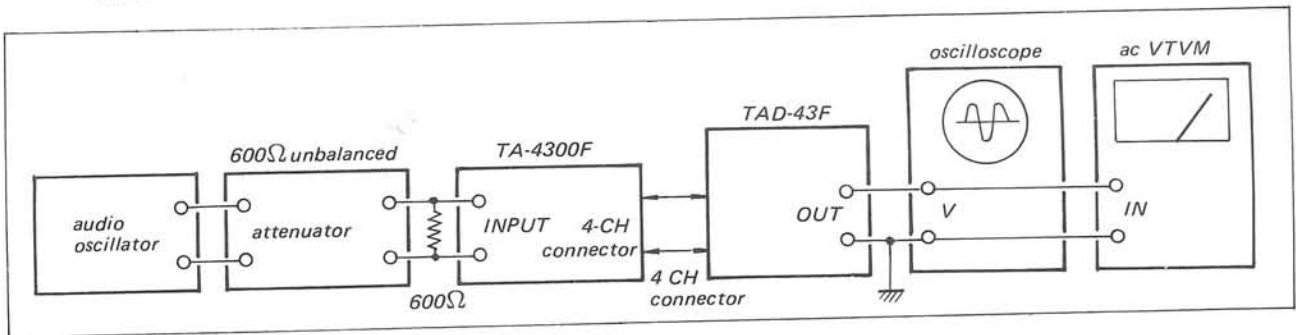


Fig. 3-1 Level check test setup

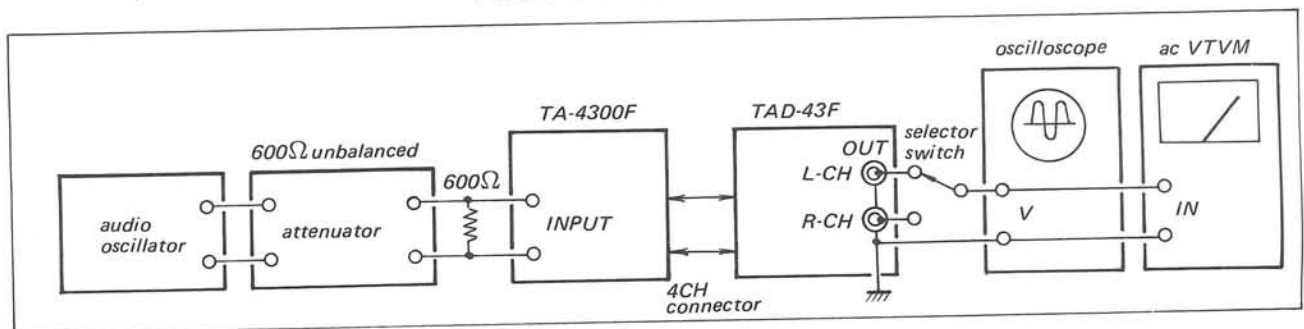


Fig. 3-2 Crosstalk measurement test setup

3-6. HARMONIC DISTORTION MEASUREMENT

Preparation

1. Set the TA-4300F's crossover frequency as described in Procedure 3-2.
2. Set the TAD-43F's LEVEL controls fully clockwise.

Procedure

1. With the equipment connected as shown in Fig. 3-4, feed a signal as specified in Table 3-4, to obtain a 14.2 dB (4.0 V rms) output.
2. Follow the procedures given in Table 3-4.

TABLE 3-2 CROSSTALK MEASUREMENT

OUTPUT Jack	CROSSOVER FREQUENCY selector Switch	Input Signal Frequency	Channel Crosstalk
LOWER HIGH	12 kHz	5 kHz	43 dB or more
UPPER HIGH	3 kHz	20 kHz	40 dB or more

TABLE 3-3 NOISE LEVEL MEASUREMENT

OUTPUT Jack	CROSSOVER FREQUENCY Selector Switch	Noise Level (With the TA-4300F's INPUT Jacks shorted)
LOWER HIGH	12 kHz	-80 dB or less
UPPER HIGH	3 kHz	-80 dB or less

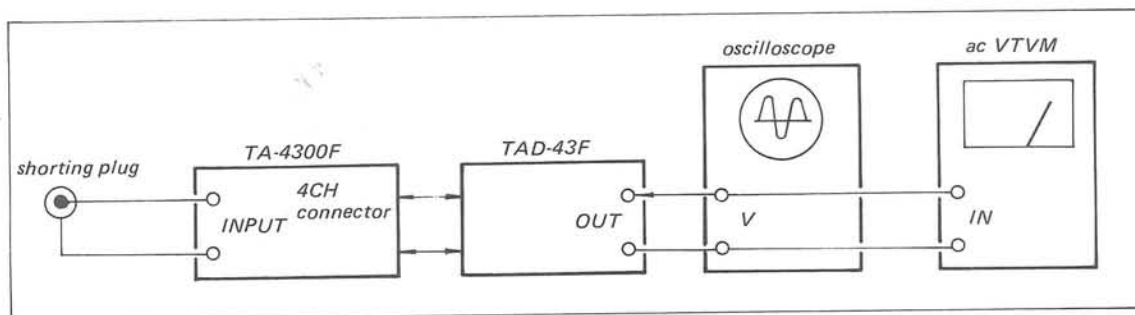


Fig. 3-3 Noise level check test setup

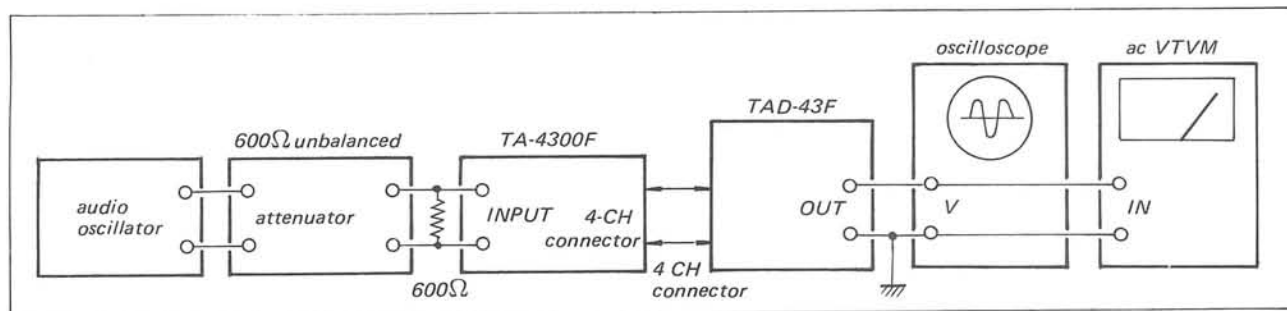


Fig. 3-4 Harmonic distortion test setup

TABLE 3-4 HARMONIC DISTORTION MEASUREMENT

OUTPUT Jacks	CROSSOVER FRE- QUENCY Selector Switch	Input Signal Frequency	Harmonic Distortion
LOWER HIGH	12 kHz	5 kHz	0.1% or less
UPPER HIGH	3 kHz	20 kHz	0.1% or less

SECTION 4 REPACKING

The TAD-43F's original shipping carton and packing material are the ideal containers for shipping the unit. However, to secure the maximum protection the

TAD-43F must be repacked in these materials precisely as before. The proper repacking procedure is shown in Fig. 4-1.

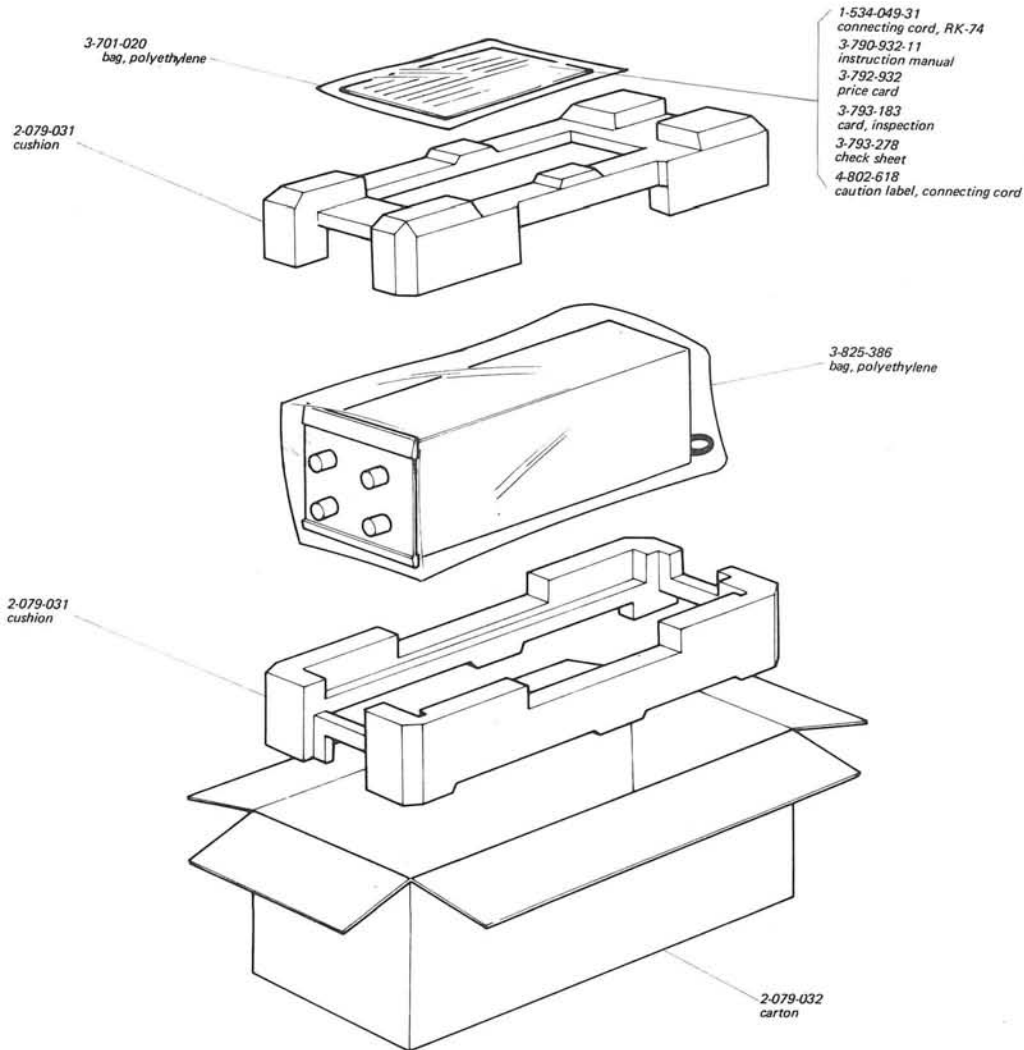
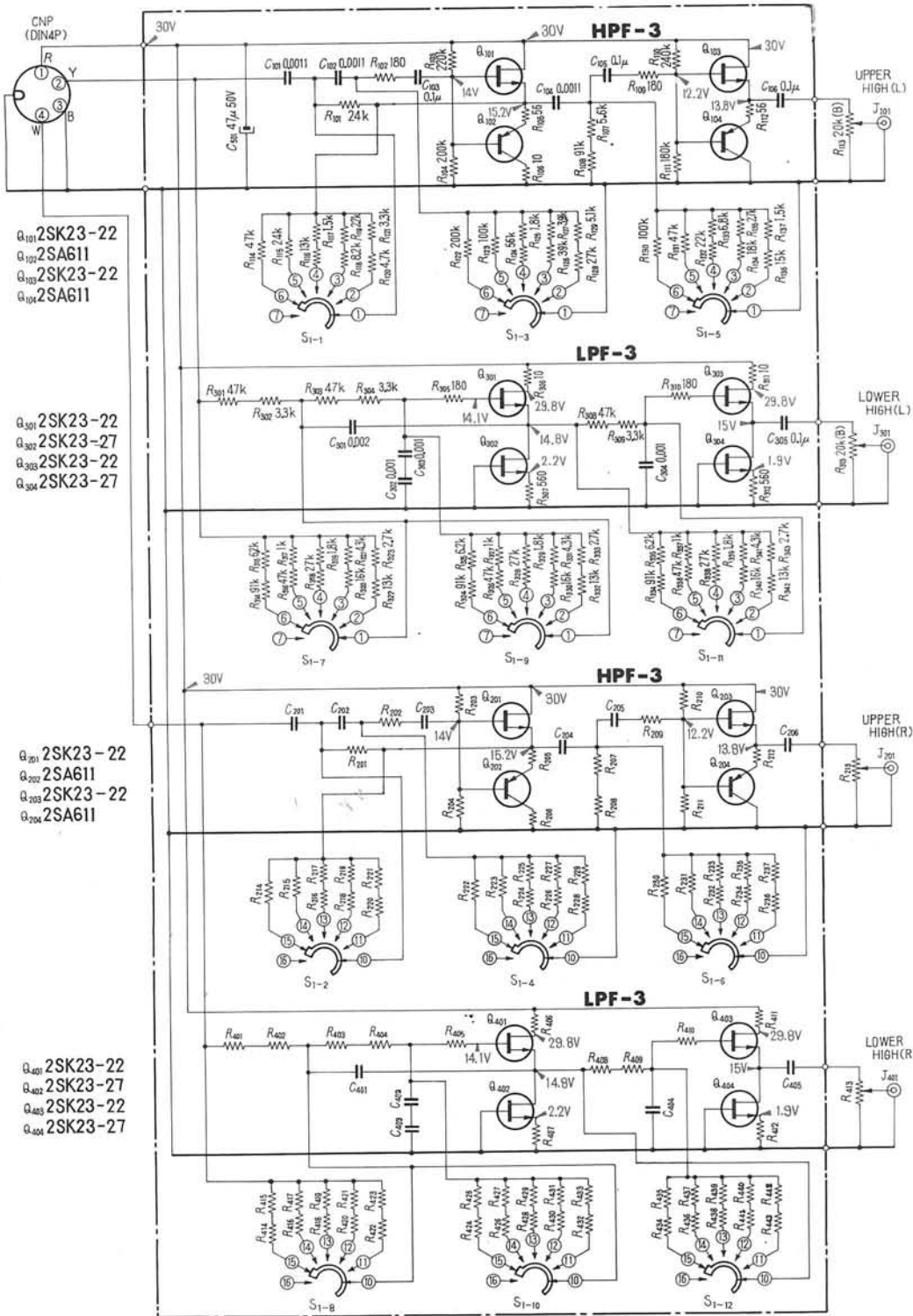


Fig. 4-1 Repacking

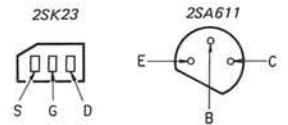
SECTION 5
DIAGRAMS

5-1. SCHEMATIC DIAGRAM



Ref. No.	Description	Position
S1	CROSSOVER FREQ selector sw	10 kHz
		(3 kHz, 4.5 kHz, 6 kHz, 8 kHz, 10 kHz, 12 kHz)

Note:
All resistance values are in ohms, k=1000, M=1000 k
All capacitance values are in µF except as indicated with p, which means pF.
All voltages represent an average value and should hold within ±20%.
All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.



Q₁₀₁ 2SK23-22
Q₁₀₂ 2SA611
Q₁₀₃ 2SK23-22
Q₁₀₄ 2SA611

Q₃₀₁ 2SK23-22
Q₃₀₂ 2SK23-27
Q₃₀₃ 2SK23-22
Q₃₀₄ 2SK23-27

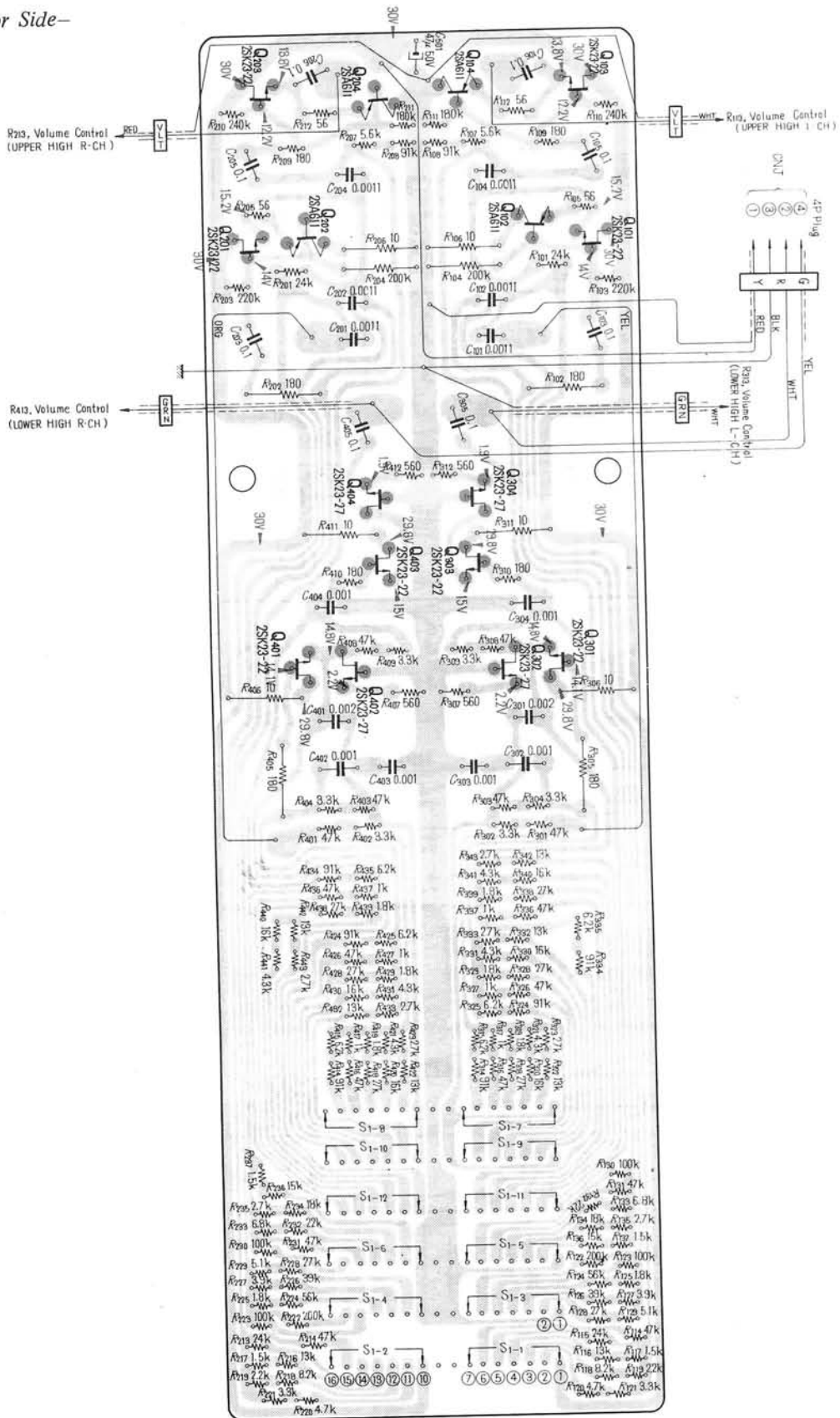
Q₂₀₁ 2SK23-22
Q₂₀₂ 2SA611
Q₂₀₃ 2SK23-22
Q₂₀₄ 2SA611

Q₄₀₁ 2SK23-22
Q₄₀₂ 2SK23-27
Q₄₀₃ 2SK23-22
Q₄₀₄ 2SK23-27

SONY
TAD-43F
© 1970

5-2. MOUNTING DIAGRAM.

—Conductor Side—



5-2. MOUNTING DIAGRAM
—Component Side—

