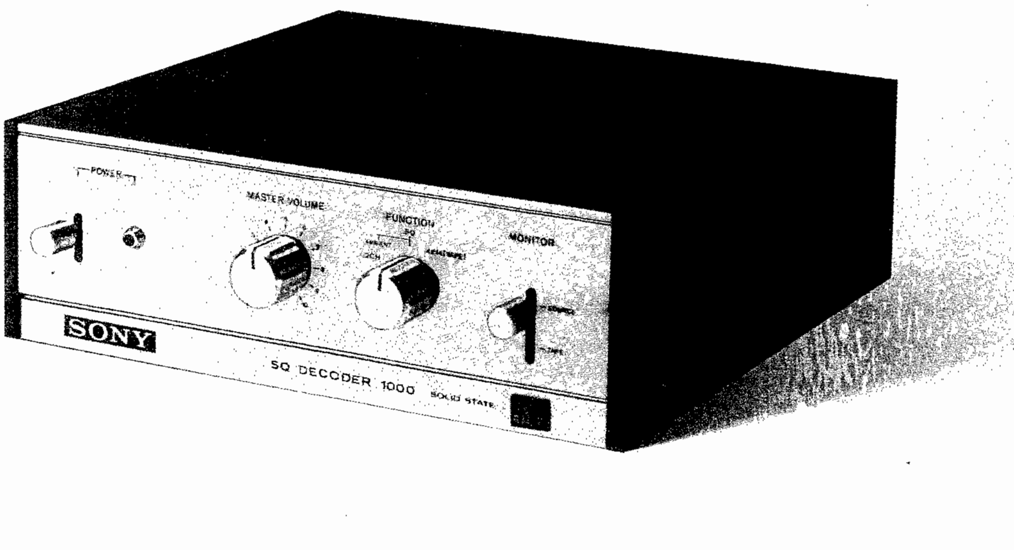
1737
AEP Model



SERVICE MANUAL

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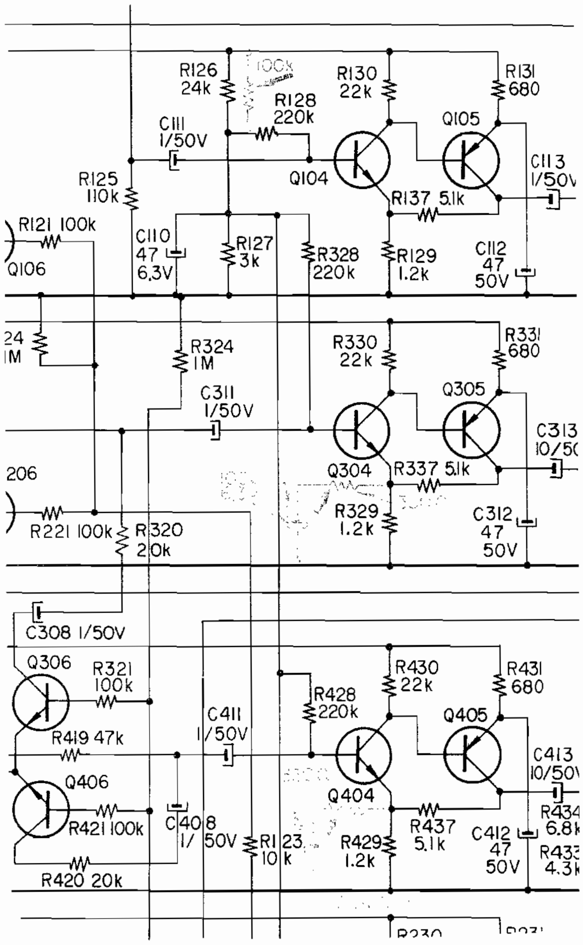
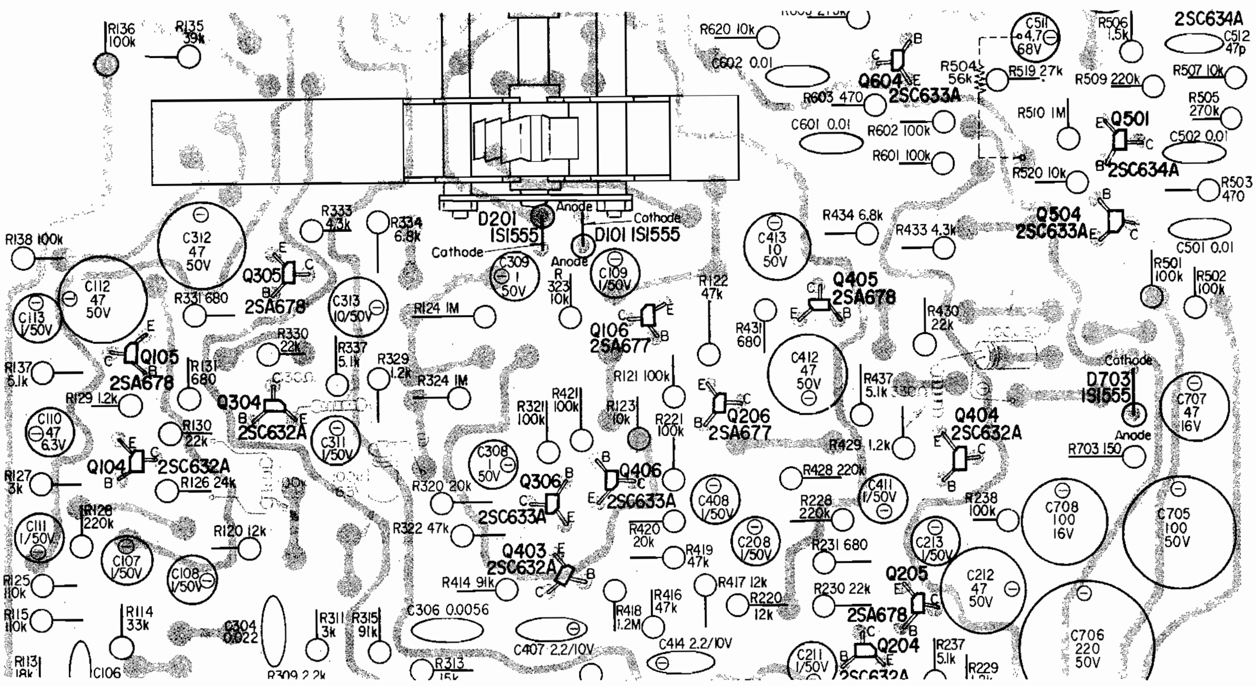
SERVICING NOTES

Instruction for Increasing Back Channel Output Signal Level on SQD-1000

As explained in the owner's instruction manual, the SQD-1000 normally requires two stereo integrated amplifiers (with preamplification and independent level control) for best 4-channel balance. For this reason, the maximum output level of the SQD-1000 is relatively low. However, when a power amplifier is used for the back channels, it will probably be necessary to increase the back-channel output level of the SQD-1000 by approximately 12 dB. To achieve this, modify the circuit as illustrated.





SECTION 1
TECHNICAL DESCRIPTION

1-1. TECHNICAL SPECIFICATIONS

Technical specifications for the SQD-1000 are listed in Table 1-1.

TABLE 1-1. SQD-1000 TECHNICAL SPECIFICATIONS

Frequency response:	10 Hz to 100 kHz		
Input sensitivity and impedance:	INPUT	250 mV	50 k
	2CH TAPE	250 mV	50 k
	REC/PB	250 mV	50 k
	4CH INPUT	accept any 4ch tape deck	50 k
Maximum input capability:	INPUT	2 V	
	2CH TAPE	2 V	
	REC/PB	2 V	
	4CH INPUT	————	
Signal output level and Impedance:	OUTPUT	250 mV	15 k
	REC OUT	250 mV	15 k
	REC/PB	30 mV	82 k
Signal-to-noise ratio:	greater than 80 dB (weighting network "A")		
Harmonic distortion:	0.2% or less		
Crosstalk:	Left front .... Right front 30 dB at 2 kHz		
	Left back .... Right back 30 dB at 2 kHz		
Phase shifter response:	90° ±10% through 30 Hz to 20 kHz		
	90° ±3% at 2 kHz		
Power consumption:	5 watts		
Power requirement:	110, 130, 220, 240 V 50/60 Hz		
Dimensions:	9" (width) x 3³⁄₁₆" (height) x 9⅞" (depth)		
	230 mm (width) x 80 mm (height) x 250 mm (depth)		
Net weight:	4 lb 7 oz (2 kg)		
Shipping weight:	6 lb 13 oz (3.1 kg)		

1-2. CIRCUIT ANALYSIS

Introduction

Fig. 1-1 shows the overall SQ chain. SQD-1000 decodes the encoded signals (Lt, Rt) to the four signals (Lf', Rf', Lb', Rb') which will provide quadraphonic-stereophonic sound having a close relationship to the original four-channel sound. Note that decoded Lf', Rf', Lb' and Rb' signals can be expressed by the original signal phasors as shown in Fig. 1-2.

Stage/Control	*Function*
Phase Shifter/Splitter Section	
($\phi - 0°$) network Q101, Q102 Q201, Q202 ($\phi - 90°$) Q301, Q302 Q401, Q402	The encoded signals (Rt, Lt) are applied to the corresponding input terminals, and then fed to the phase shifter/splitters ($\phi - 0°$) and ($\phi - 90°$). These networks are so designed that they will pass all audio frequencies (30 Hz to 20 kHz) unattenuated (referred to 1 kHz), and at the same time maintaining their relative phase angles at 90° to each other as shown in Fig. 1-3.

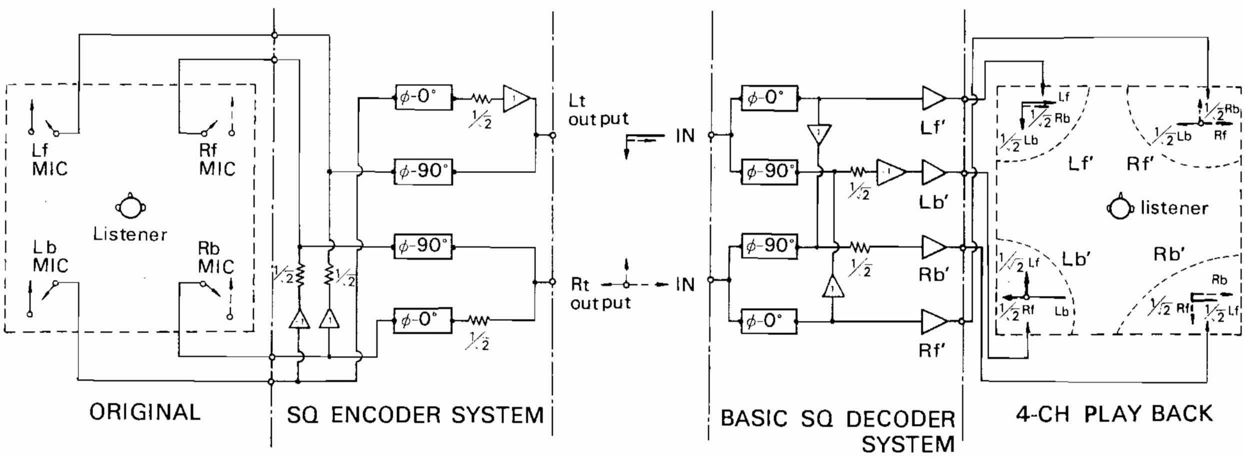


Fig. 1-1. Overall SQ chain

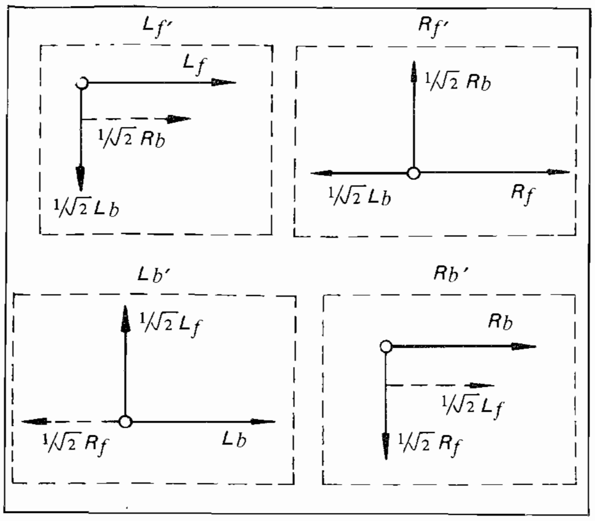


Fig. 1-2. Phasor components in SQ decoding

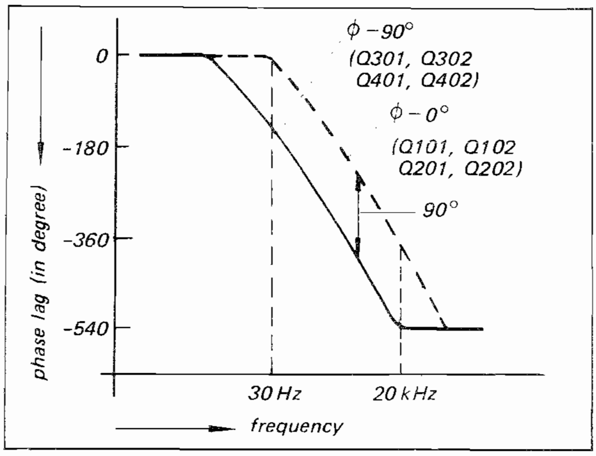


Fig. 1-3. Phase shifter response

Stage/Control	*Function*
Matrix Section	
R414, R415 R314, R315	The outputs of the phase shifter network are mixed through these resistor matrix circuits to produce back signals (Rb′ or Lb′). This matrix has an insertion loss of 6 dB. To compensate for this insertion loss, front signals are attenuated by R114 and paralleled R115 and R125 (R214 and paralleled R215 and R225) to maintain the 3 dB level difference between front and back signals.
Phase inverter Q403	This inverts the Lb′ signal to obtain a proper phase relationship with other decoded signals without attenuation.
Buffer amplifier Q104, Q105 Q204, Q205 Q304, Q305 Q404, Q405	These direct-coupled two stage amplifiers provide additional gain (13 dB) to compensate for the insertion loss of the matrix networks.

Front-Back Logic Section

A listener will perceive unwanted out-of-phase crosstalk components when the original signals contain in-phase monaural components. The front-back logic diminishes the out-of-phase crosstalk components by mixing decoded Lf′ and Rf′ signals or Lb′ and Rb′ signals in accordance with the condition of exsisting monaural components in the original sources. This is summarized in the Table 1-1.

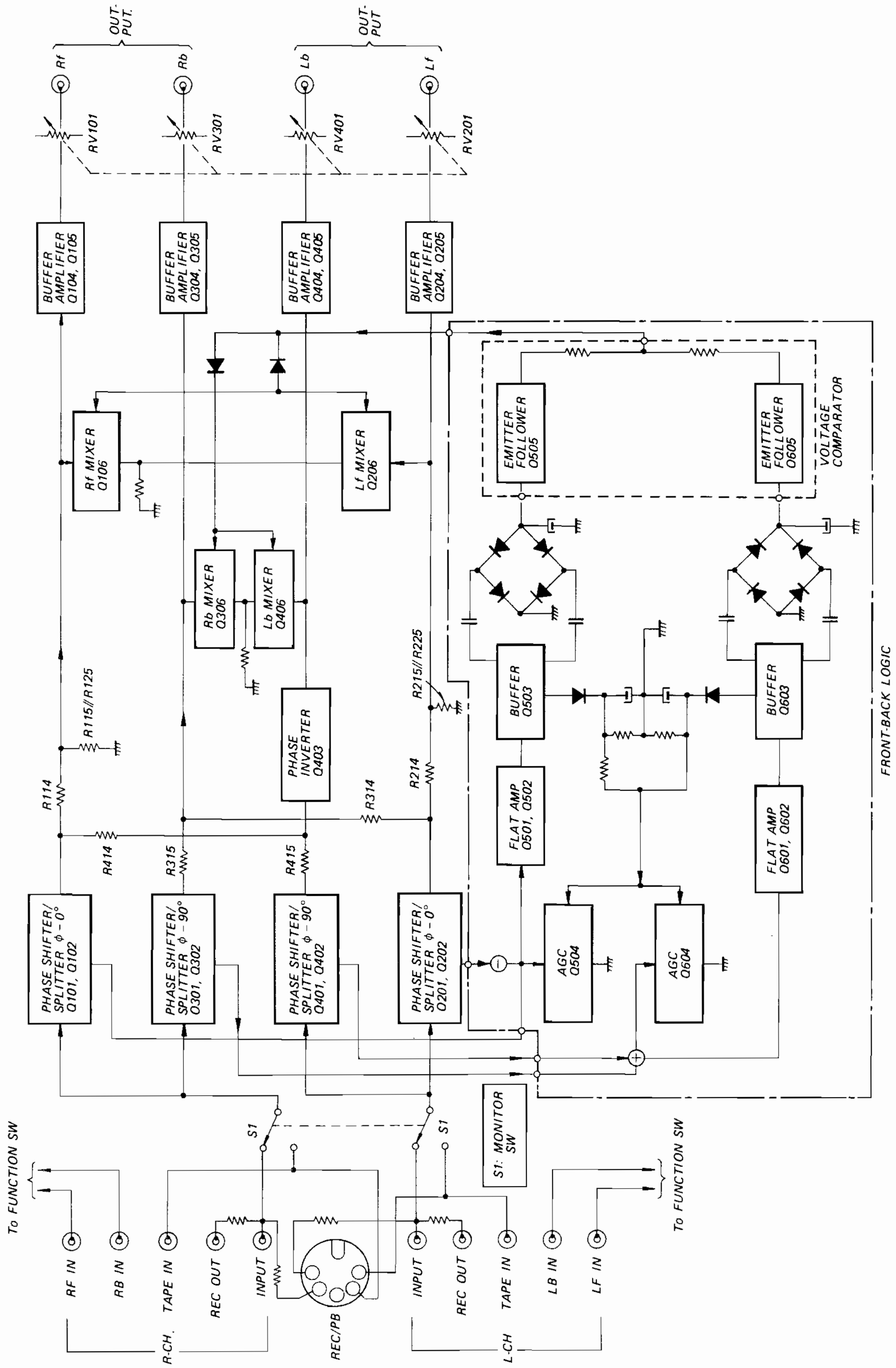
R501, R502 R601, R602	Rt and Lt signals are extracted from emitter or collector circuit of Q101, Q201, Q301 and Q401, and then added or subtracted through R501, R502 matrix and R601, R602 matrix to obtain $\lvert\vec{Rt} - \vec{Lt}\rvert$ and $\lvert\vec{Rt} + \vec{Lt}\rvert$ signals respectively.
Note $\vec{Rt}$, $\vec{Lt}$ ↑ means phasor Q501, Q502	$\lvert\vec{Rt} - \vec{Lt}\rvert$ ($\lvert\vec{Rt} + \vec{Lt}\rvert$) signal is amplified by flat amplifier Q501, Q502(Q601, Q602) to the level required by the following detector circuit.

TABLE 1-1. FRONT-BACK LOGIC OPERATION

Original signal	Decoder input	Matrix output	Detector output	Detector output comparator	Operation
front monaural	Lt, Rt in-phase	$\lvert\vec{Rt} + \vec{Lt}\rvert$ .... ∨ $\lvert\vec{Rt} - \vec{Lt}\rvert$	positive voltage ∨ negative voltage	positive	performing Lb, Rb mixing
back monaural	Lt, Rt out-of-phase	$\lvert\vec{Rt} + \vec{Lt}\rvert$ .... ∧ $\lvert\vec{Rt} - \vec{Lt}\rvert$	positive voltage ∧ negative voltage	negative	performing Lf, Rf mixing

Stage/Control	*Function*
D503, D504 D505, D506	The output of the flat amplifier is fed to the buffer amplifier Q503 (Q603) and then fed to the bridge rectifier circuit formed by D503, D504, D505 and D506 (D603, D604, D605 and D606) through the collector and emitter circuit. The output of voltage doublers are filtered by C509 (C609), and then applied to the base of Q505 (Q605) voltage comparator. Note that Q504, Q604 and pair of voltage doublers D501 and D601 form an AGC circuit eliminating front-back logic operation change due to input signal level difference. The gain control is performed by the collector-emitter impedance of Q504 (Q604) which shunts the input signals to ground. Since the base voltage determines the collector-emitter impedance, the voltage doubler's output (AGC voltage) is fed back to the base of Q504 or Q604 to maintain constant front-back logic chain gain.
Voltage comparator Q505, Q605 R518, R618 Note $\vec{Rt}$, $\vec{Lt}$ ↑ means phasor	Voltage comparator is formed by Q505 (PNP), Q605 (NPN), and the R518 and R618 matrix. Q505 delivers negative voltage while Q605 delivers positive voltage proportional to the input signal level. As a result the voltage comparator output represents the higher of the two signals: $\lvert\vec{Rt} - \vec{Lt}\rvert$ or $\lvert\vec{Rt} + \vec{Lt}\rvert$. If the $\lvert\vec{Rt} + \vec{Lt}\rvert$ signal is larger than $\lvert\vec{Rt} + \vec{Lt}\rvert$, negative output voltage will appear at the output (mixing control voltage) and vice versa.
Mixer circuit Q106, Q206 Q306, Q406	Q106, Q206 and Q306, Q406 form and Rf′ – Lf′ mixer circuit and Rb′ – Lb′ mixer circuit respectively. Negative control voltage turns on Q106 and Q206, permitting the mixing of between Rf′ and Lf′ since the collector emitter impedance of Q106 or Q206 changes in accordance with the control voltage applied to its base circuit. As a result, out-of-phase components in the Rf′ and Lf′ are cancelled out effectively. The same is true of mixer Q306, Q406 except positive voltage controls their operation.
D101, D102	Notice that D101 or D102 acts as an isolation diode, ensuring stable front-back logic operation because it discriminates between turn-on and turn-off operation of the mixer circuit. The mixer circuit has no effect on decoding operation when it is off.
FUNCTION switch S2	Selects the desired mode of operation. [2-CH] Input signals are attenuated by R135 (R235) and R136 (R236), and then amplified by buffer amplifier Q104, Q105 (Q204, Q205). Output signals appears at the Rf (Lf) output terminal. The output level is the same as the input signal level. [SQ AMBIENT] The front-back logic circuit is off but SQ decoding is performed. Notice that back channel signals are attenuated about 10 dB at the back channel buffer amplifier output circuit by R333 and R334 (R433 and R434). [SQ] SQ decoding and front-back logic operation is performed. [4-CH (TAPE)] Input signals connected to 4-CH INPUT terminal are directly routed to each OUTPUT terminal.

1-3. BLOCK DIAGRAM



SECTION 2
DISASSEMBLY

WARNING

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

2-1. TOOLS REQUIRED

The following tools are required to perform disassembly and replacement procedures on the SQD-1000.

1. Screwdriver, Phillips-head
2. Screwdriver, 1/8" blade (3 mm)
3. Pliers, long-nose
4. Diagonal cutters
5. Wrench, adjustable
6. Tweezers
7. Soldering iron, 40~150 watts
8. Solder, rosin core

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 SQD-1000 are manufactured to the specifications of the International Organization for Standardization (ISO). This means that the new and old screws are not interchangeable because 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.

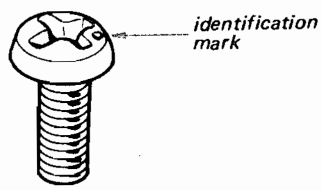


Fig. 2-1. ISO screw

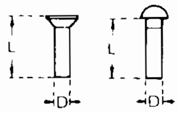
– Hardware Nomenclature –

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 3×10
- Type of Slot (⊕)
- Length in mm (L) (10)
- Diameter in mm (D) (3)
- Type of Head (P)



2-3. FRONT PANEL REMOVAL

1. Remove the four screws securing the wooden case to the chassis. This frees the wooden case.
2. Pull off all the knobs.
3. Remove the screws securing the front panel to the front subchassis as shown in Fig. 2-2 and 2-3. This frees the front panel.

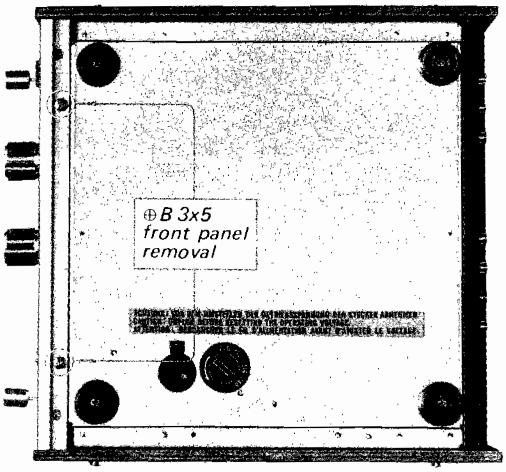


Fig. 2-2. Front panel removal

2-4. PRINTED CIRCUIT BOARD REMOVAL

1. Remove the wooden case and front panel as described in Procedure 2-3.
2. Remove the hex nut securing function switch and volume control to the front subchassis.
3. Remove the three screws securing the PCB to the chassis as shown in Fig. 2-3. This frees the printed circuit board.

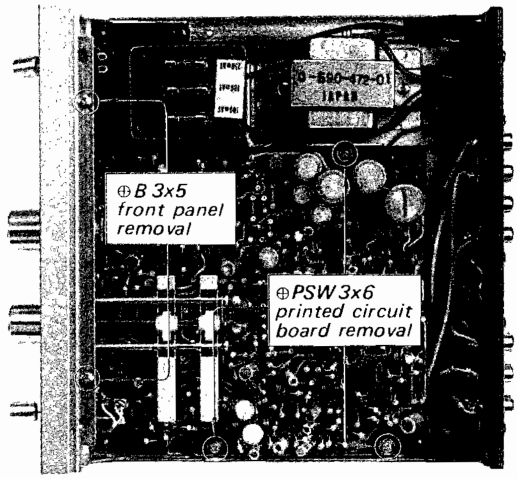


Fig. 2-3. Printed circuit board removal

2-5. SWITCH AND CONTROL REPLACEMENT

1. Remove the printed circuit 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 or control and the printed circuit board.
3. Remove the defective component and then install a new one.

2-6. REPLACEMENT OF COMPONENTS SECURED TO THE REAR PANEL BY NYLON RIVETS

1. Remove the nylon rivets securing the defective component by pushing its end with a tweezers as shown in Fig. 2-4.
2. Remove the defective component and then install a new one.

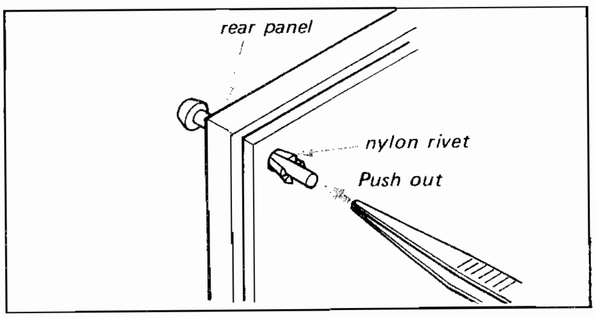


Fig. 2-4.

SECTION 3
OPERATIONAL CHECKS

The following items are for checking the performance of the SQD-1000. Always make this check after repair work.

3-1. TEST EQUIPMENT REQUIRED

1. Audio oscillator
   Frequency range .... 50 Hz to 100 kHz
   Output level .... 0 dB (0.775 V rms)
2. Ac VTVM
3. Oscilloscope

3-2. OUTPUT LEVEL CHECK

With the equipment connected as shown in Fig. 3-1, check the output level of SQD-1000 as given in the Tables listed below.

Note: Apply 1 kHz, 0 dB (0.775 V) sine wave signal to the specified input terminal.

TABLE 3-1. L-CH CHECK

Input signal connection	FUNCTION SW position		Outputs			
			L_f	L_b	R_f	R_b
L-channel INPUT	SQ	1 kHz	0±1.5 dB	-3±1.5 dB	-25 dB or less	-3±1.5 dB
		100 Hz to 10 kHz	0±1.5 dB	-3±1.5 dB	-20 dB or less	-3±1.5 dB
	SQ-AMBIENT (1 kHz)		0±1.5 dB	-12±3 dB	-25 dB or less	-12±3 dB
	2-CH (1 kHz)		0±1.5 dB	-30 dB or less	-30 dB or less	-30 dB or less

Note: When a malfunction is noted, repair the related circuitry.

TABLE 3-2. R-CH CHECK

Input signal connection	FUNCTION SW position		Outputs			
			L_f	L_b	R_f	R_b
R-channel INPUT	SQ	1 kHz	-25 dB or less	-3±1.5 dB	0±1.5 dB	-3±1.5 dB
		100 Hz to 10 kHz	-20 dB or less	-3±1.5 dB	0±1.5dB	-3±1.5 dB
	SQ-AMBIENT (1 kHz)		-25 dB or less	-12±3 dB	0±1.5 dB	-12±3 dB
	2-CH (1 kHz)		-30 dB or less	-30 dB or less	0±1.5 dB	-30 dB or less

Note: When a malfunction is noted, repair the related circuitry.

TABLE 3-3. IN-PHASE SIGNAL CHECK

Input signal connection	FUNCTION SW position	Outputs			
		Lf	Lb	Rf	Rb
Supply L-CH and R-CH INPUT simultaneously	SQ	0±2 dB	-6 to -12 dB	0±2 dB	-6 to -12 dB

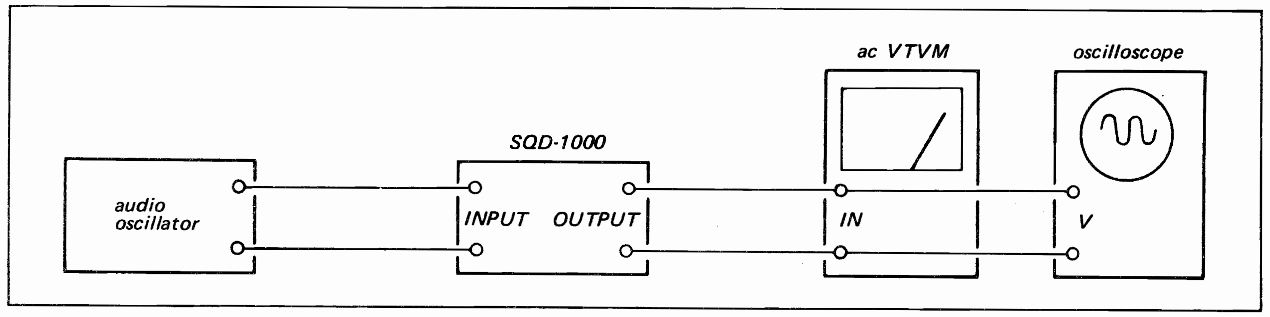


Fig. 3-1. Operational check test setup

3-3. LEVEL DIAGRAM

Note: All the signal voltages are measured with ac VTVM referred to 0.775V, 1 kHz.
FUNCTION switch .... SQ
Input signal .... 1 kHz, 0 dB (0.775V)

(1) In case that input signal is applied both Lt and Rt input terminal simultaneously.

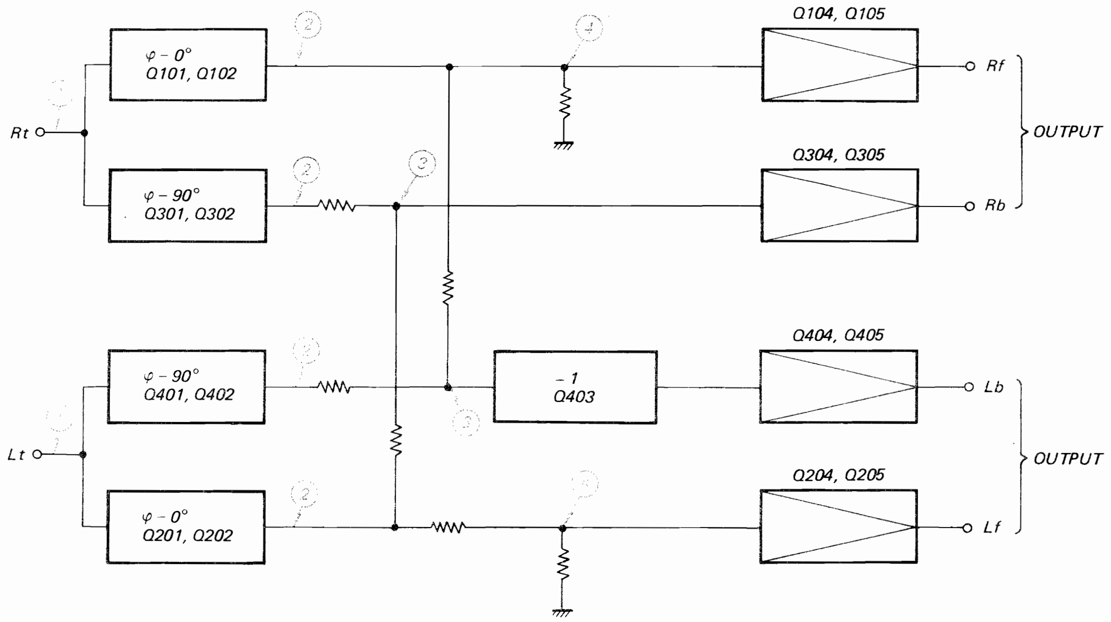
① = 0 dB, ② = −10 dB, ③ = −16 dB, ④ = −13 dB

Lf = 0 dB, Lb = −10 dB, Rf = 0 dB, Rb = −10 dB

(2) In case that input signal is applied Lt or Rt input terminal.

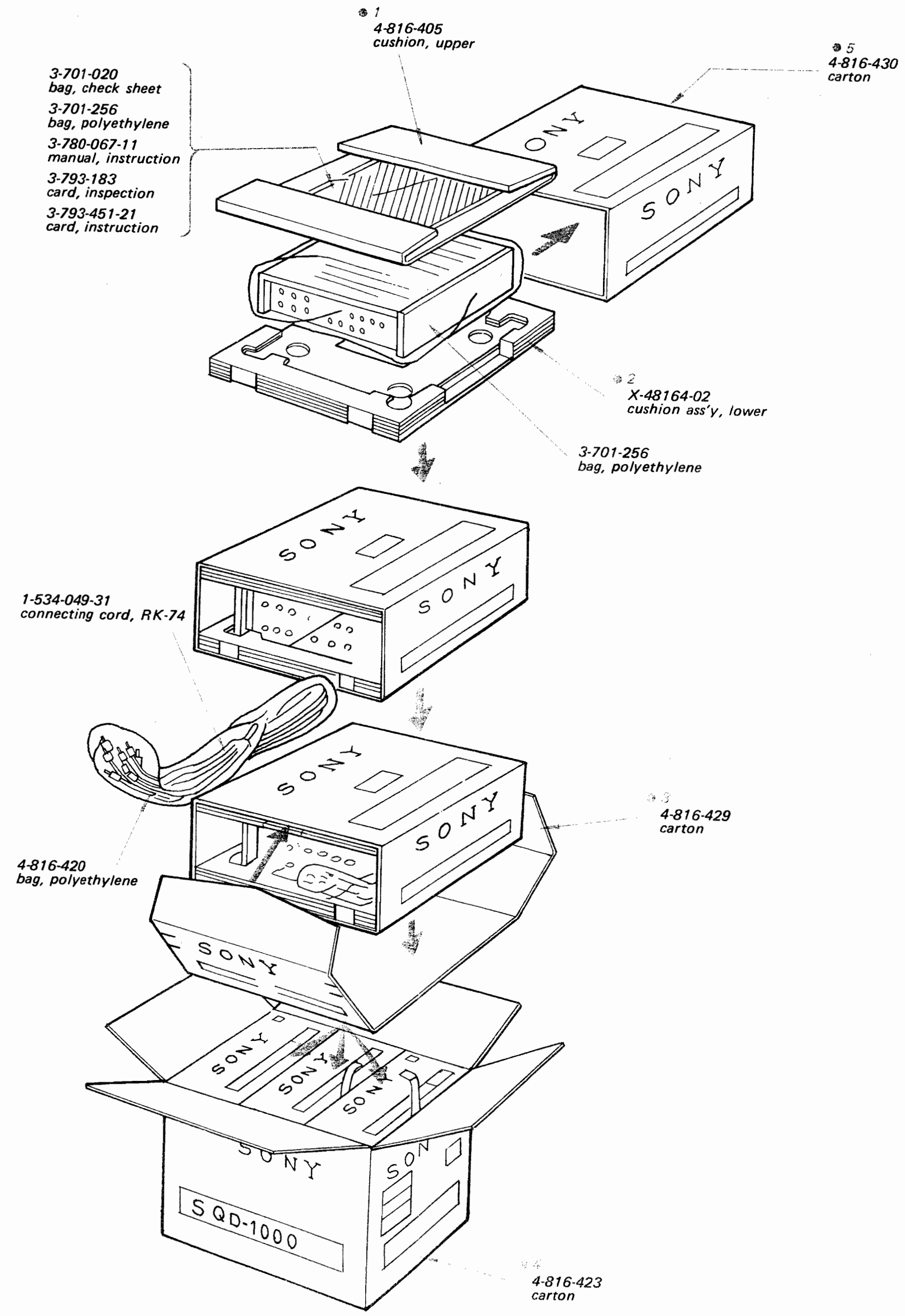
Lt (only) Lf = 0 dB, Lb = −3 dB, Rf = −25 dB or less, Rb = −3 dB

Rt (only) Lf = −25 dB, Lb = −3 dB, Rf = 0 dB or less, Rb = −3 dB



SECTION 4
REPACKING

The SQD-1000's original shipping carton and packing materials are the ideal containers for shipping the unit. However to secure the maximum protection, the SQD-1000 must be repacked in these materials precisely as before. The proper repacking procedures are shown in Fig. 4-1.

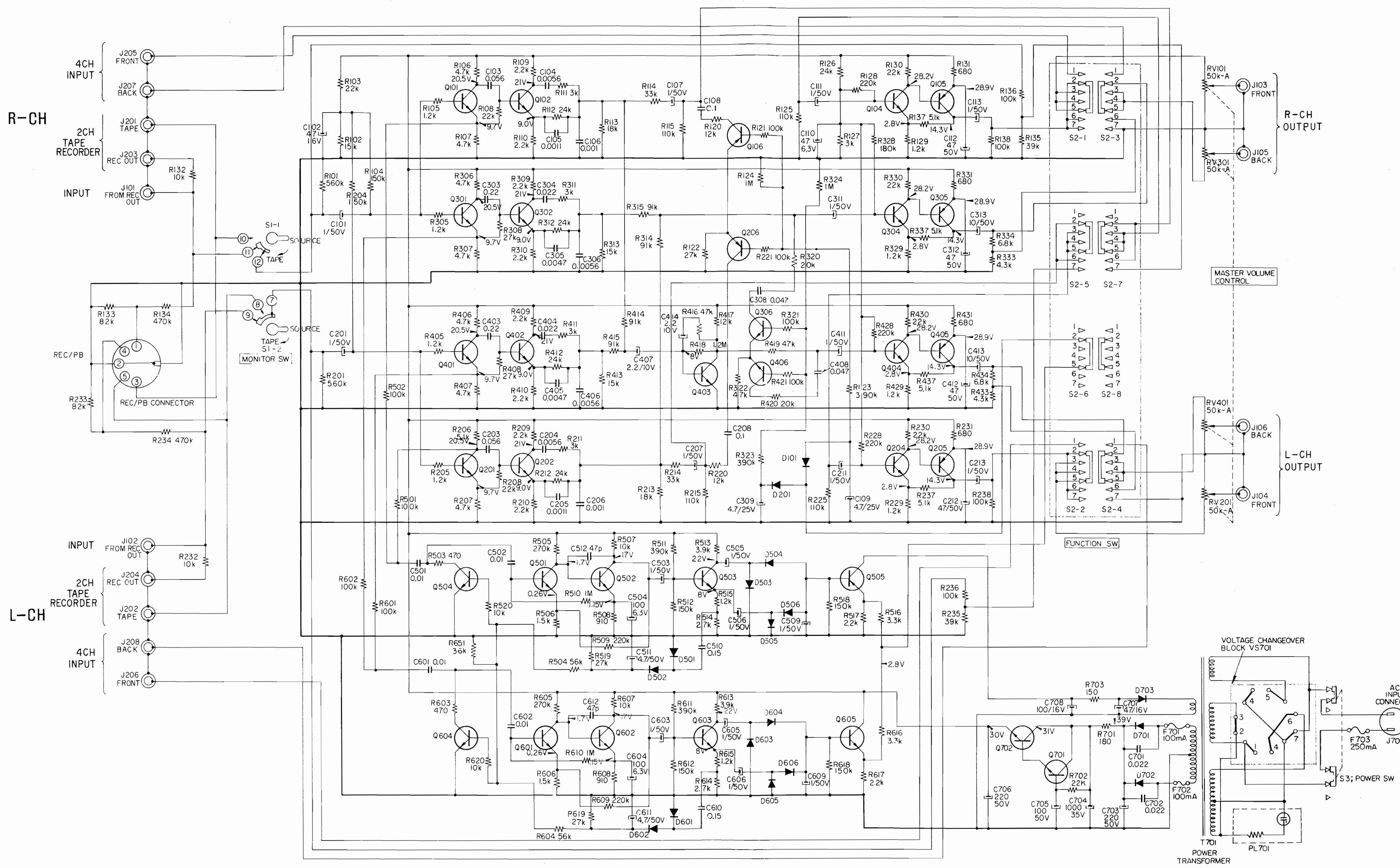


Note: Carton ass'y (X-48164-13) includes all the parts marked .

Fig. 4-1. Repacking

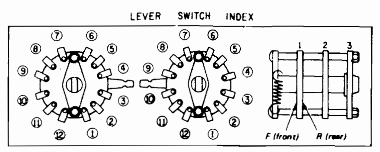
SECTION 5
DIAGRAMS

5-1. SCHEMATIC DIAGRAM



D101 (D201) D501 (D601) D502 (D602) D503 (D603) D504 (D604) D505 (D605) D506 (D606)	1S1555
D701 D702	10D-2
D703	1S1555
Q101 (Q201) Q301 (Q401) Q102 (Q202) Q302 (Q402)	2SC632A
Q105 (Q205) Q305 (Q405)	2SA678
Q106 (Q206)	2SA677
Q306 (Q406)	2SC633A
Q504 (Q604)	2SC633A
Q501 (Q601) Q502 (Q602) Q503 (Q603) Q505 (Q605) Q701 Q702	2SC634A

Ref. No.	Description	Position
S1	MONITOR SW (SOURCE-TAPE)	SOURCE
S2	FUNCTION SW (2-CH-SQ AMBIENT-SQ-4-CH (TAPE))	SQ
S3	POWER SW (ON-OFF)	ON



Note:

All resistance values are in ohms. k = 1,000, M = 1,000 k

All capacitance values are in μF except as indicated with p, which means $\mu\mu$F.

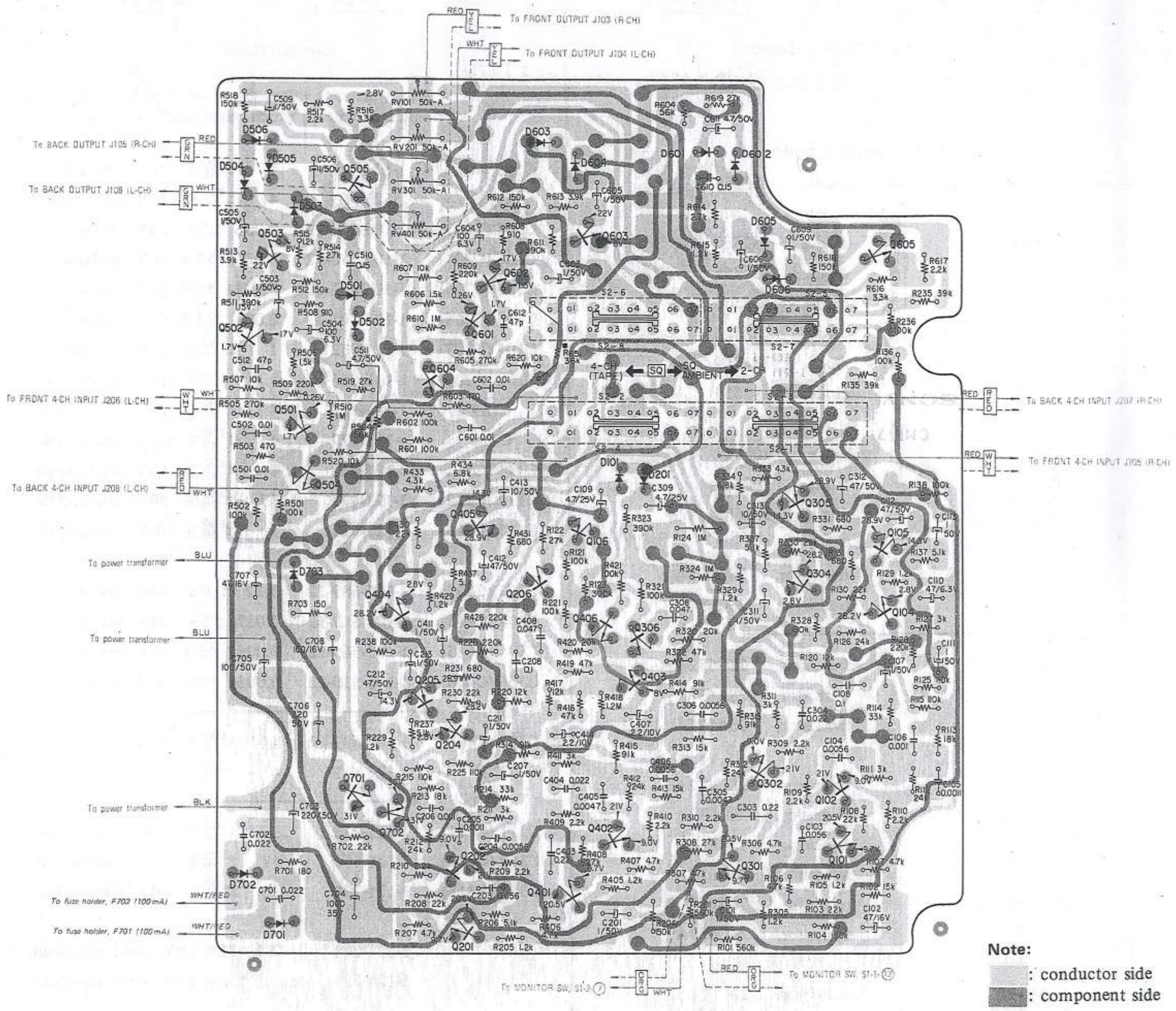
All voltages represent an average value and should hold within ±20%.

All voltages are dc measured with a VOM which has an input impedance of 20 k ohms/volt. No signal in.

SONY
SQD-1000

5-2. MOUNTING DIAGRAM

– Conductor Side –

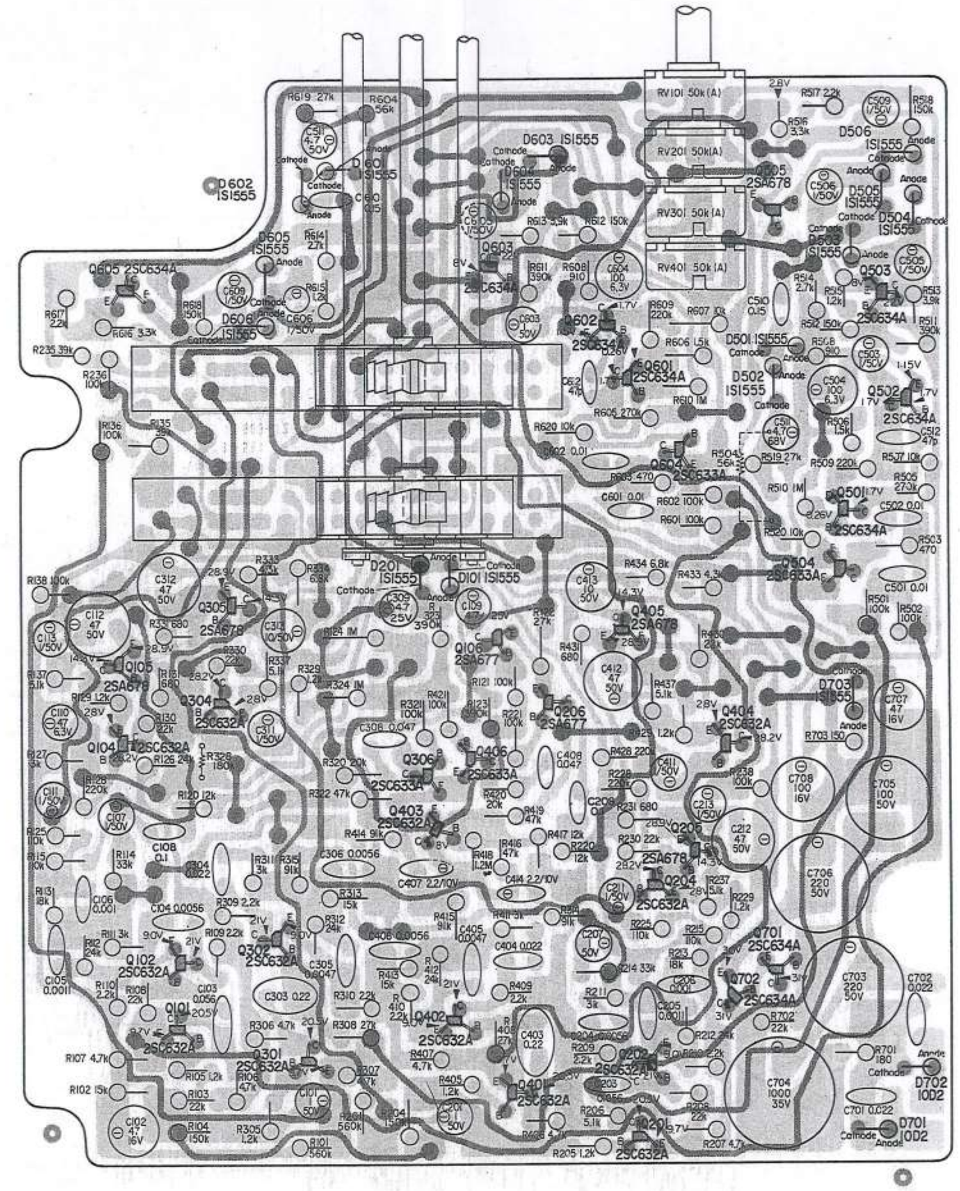


Note:
: conductor side
: component side

Note: ■ R604, R654 and R504 are mounted on conductor side.

5-3. MOUNTING DIAGRAM

– Component Side –



D101 (D201), D501 (D601), D502 (D602), D503 (D603), D504 (D604), D505 (D605), D506 (D606) } **1S1555**

D701, D702 } **10D-2**

D703 **1S1555**

Q101 (Q201), Q301 (Q401), Q102 (Q202), Q302 (Q402) } **2SC632A**

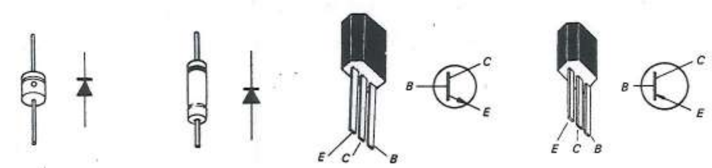
Q105 (Q205), Q305 (Q405) } **2SA678**

Q106 (Q206) **2SA677**

Q306 (Q406) **2SC633A**

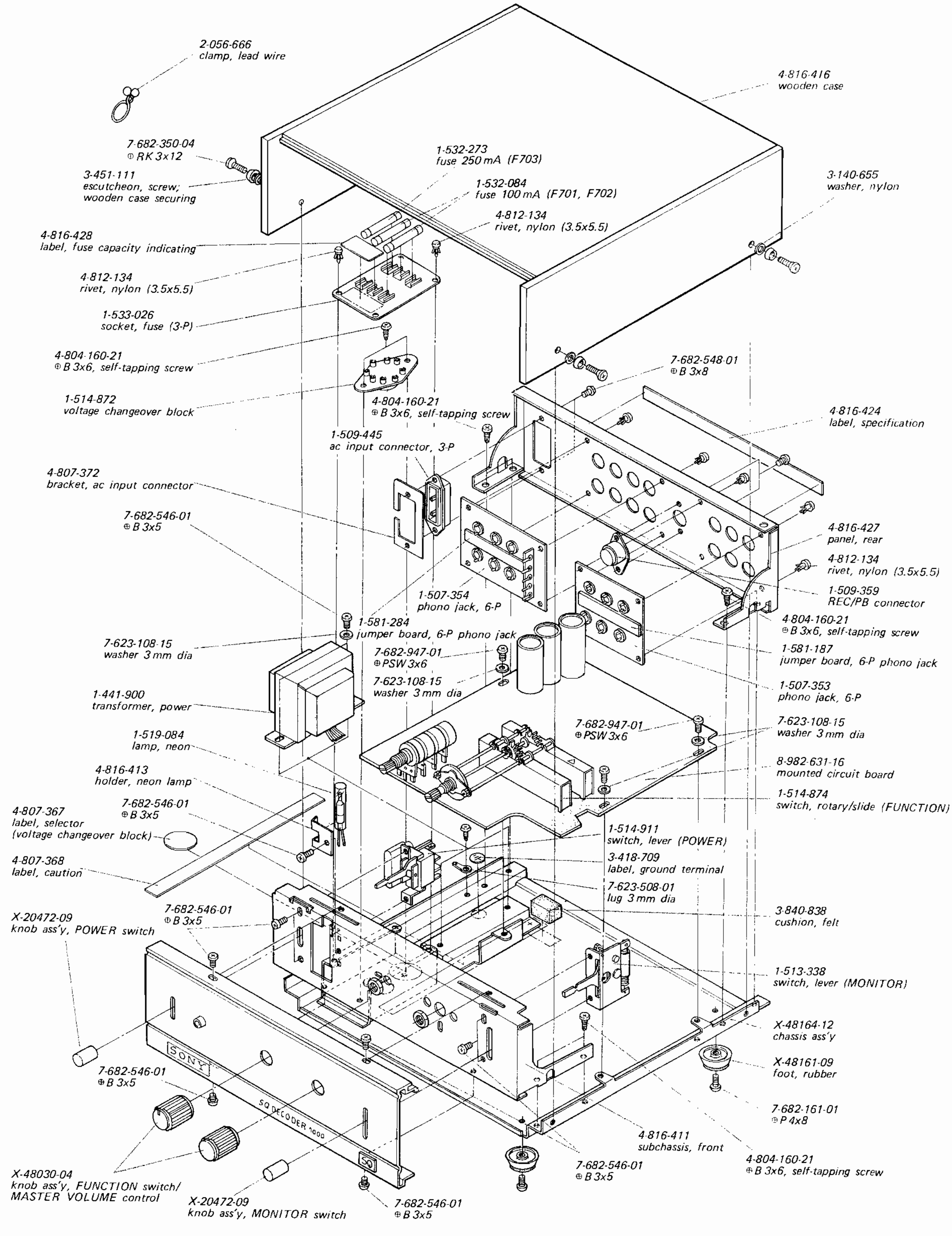
Q504 (Q604) **2SC633A**

Q501 (Q601), Q502 (Q602), Q503 (Q603), Q505 (Q605), Q701, Q702 } **2SC634A**



10D-2 **1S1555** **2SC632A 2SC633A 2SC634A** **2SA678 2SA677**

SECTION 6
EXPLODED VIEW



SECTION 7
ELECTRICAL PARTS LIST

Ref. No.	*Part No.*	*Description*
		Mounted Circuit Board
	8-982-631-16	mounted circuit board

SEMICONDUCTORS

Ref. No.	*Part No.*	*Description*
D101 (D201)		diode, 1S1555
D501 (D601)		diode, 1S1555
D502 (D602)		diode, 1S1555
D503 (D603)		diode, 1S1555
D504 (D604)		diode, 1S1555
D505 (D605)		diode, 1S1555
D506 (D606)		diode, 1S1555
D701		diode, 10D-2
D702		diode, 10D-2
D703		diode, 1S1555
Q101 (Q201)		transistor, 2SC632A
Q102 (Q202)		transistor, 2SC632A
Q103 (Q203)	———	———
Q104 (Q204)		transistor, 2SC632A
Q105 (Q205)		transistor, 2SA678
Q106 (Q206)		transistor, 2SA677
Q301 (Q401)		transistor, 2SC632A
Q302 (Q402)		transistor, 2SC632A
Q403		transistor, 2SC632A
Q304 (Q404)		transistor, 2SC632A
Q305 (Q405)		transistor, 2SA678
Q306 (Q406)		transistor, 2SC633A
Q501 (Q601)		transistor, 2SC634A
Q502 (Q602)		transistor, 2SC634A
Q503 (Q603)		transistor, 2SC634A
Q504 (Q604)		transistor, 2SC633A
Q505		transistor, 2SA678
Q605		transistor, 2SC634A
Q701		transistor, 2SC634A
Q702		transistor, 2SC634A

TRANSFORMER

Ref. No.	*Part No.*	*Description*
	1-441-900	transformer, power

CAPACITORS

All capacitance values are in μF except as indicated with p, which means μμF.

Ref. No.	*Part No.*	*Description*
C101 (C201)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C102	1-121-409	47 $\pm^{100}_{10}$% 16V electrolytic
C103 (C203)	1-105-522-12	0.056 ±5% 50V mylar
C104 (C204)	1-105-510-12	0.0056 ±5% 50V mylar
C105 (C205)	1-106-002-12	0.0011 ±5% 50V mylar
C106 (C206)	1-105-501-12	0.001 ±5% 50V mylar
C107 (C207)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C108 (C208)	1-105-685-12	0.1 ±10% 50V mylar
C109	1-121-915	4.7 $\pm^{100}_{10}$% 25V electrolytic
C110	1-121-927	47 $\pm^{100}_{10}$% 6.3V electrolytic
C111 (C211)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C112 (C212)	1-121-411	47 $\pm^{100}_{10}$% 50V electrolytic
C113 (C213)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C303 (C403)	1-105-689-12	0.22 ±10% 50V mylar
C304 (C404)	1-105-517-12	0.022 ±5% 50V mylar
C305 (C405)	1-105-509-12	0.0047 ±5% 50V mylar
C306 (C406)	1-105-510-12	0.0056 ±5% 50V mylar
C307	———	———
C308 (C408)	1-105-681-12	0.047 $\pm^{100}_{10}$% 50V mylar
C309	1-121-912	4.7 $\pm^{100}_{10}$% 25V electrolytic
C310	———	———
C311 (C411)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C312 (C412)	1-121-411	47 $\pm^{100}_{10}$% 50V electrolytic
C313 (C413)	1-121-738	10 $\pm^{100}_{10}$% 50V electrolytic
C407	1-127-024	2.2 ±20% 10V solid, aluminum
C414	1-127-024	2.2 ±20% 10V solid, aluminum
C501 (C601)	1-105-673-12	0.01 ±10% 50V mylar
C502 (C602)	1-105-673-12	0.01 ±10% 50V mylar
C503 (C603)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C504 (C604)	1-121-413	100 $\pm^{100}_{10}$% 6.3V electrolytic
C505 (C605)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C506 (C606)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C507 (C607)	———	———
C508 (C608)	———	———
C509 (C609)	1-121-912	1 $\pm^{100}_{10}$% 50V electrolytic
C510 (C610)	1-105-687-12	0.15 ±10% 50V mylar
C511 (C611)	1-121-396	4.7 $\pm^{150}_{10}$% 50V electrolytic
C512 (C612)	1-101-881	47p ±10% 50V ceramic

Ref. No.	Part No.	Description			
C701	1-105-677-12	0.022	±10%	50V	mylar
C702	1-105-677-12	0.022	±10%	50V	mylar
C703	1-121-423	220	$\pm^{100}_{10}$%	50V	electrolytic
C704	1-121-388	1,000	$\pm^{100}_{10}$%	35V	electrolytic
C705	1-121-417	100	$\pm^{100}_{10}$%	50V	electrolytic
C706	1-121-423	220	$\pm^{100}_{10}$%	50V	electrolytic
C707	1-121-409	47	$\pm^{100}_{10}$%	16V	electrolytic
C708	1-121-415	100	$\pm^{100}_{10}$%	16V	electrolytic

RESISTORS

All resistance values are in Ω, ±5%, ¼W and carbon type unless otherwise indicated.

Ref. No.	Part No.	Description
R101 (R201)	1-242-739	560 k
R102	1-242-701	15 k
R103	1-242-705	22 k
R104 (R204)	1-242-725	150 k
R105 (R205)	1-242-675	1.2 k
R106	1-242-689	4.7 k
R107 (R207)	1-242-689	4.7 k
R108 (R208)	1-242-705	22 k
R109 (R209)	1-242-681	2.2 k
R110 (R210)	1-242-681	2.2 k
R111 (R211)	1-242-684	3 k
R112 (R212)	1-242-706	24 k
R113 (R213)	1-242-703	18 k
R114 (R214)	1-242-709	33 k
R115 (R215)	1-242-722	110 k
R116	———	———
R117	———	———
R118	———	———
R119	———	———
R120 (R220)	1-242-699	12 k
R121 (R221)	1-242-721	100 k
R122	1-242-707	27 k
R123	1-242-735	390 k
R124	1-242-745	1 M
R125 (R225)	1-242-722	110 k
R126	1-242-706	24 k
R127	1-242-684	3 k
R128 (R228)	1-242-729	220 k
R129 (R229)	1-242-675	1.2 k
R130 (R230)	1-242-705	22 k
R131 (R231)	1-242-669	680
R132 (R232)	1-244-697	10 k
R133 (R233)	1-244-719	82 k
R134 (R234)	1-244-737	470 k
R135 (R235)	1-242-711	39 k
R136 (R236)	1-242-721	100 k
R137 (R237)	1-242-690	5.1 k
R138 (R238)	1-242-721	100 k
R206	1-242-690	5.1 k
R305 (R405)	1-242-675	1.2 k
R306 (R406)	1-242-689	4.7 k
R307 (R407)	1-242-689	4.7 k
R308 (R408)	1-242-707	27 k
R309 (R409)	1-242-681	2.2 k
R310 (R410)	1-242-681	2.2 k
R311 (R411)	1-242-684	3 k
R312 (R412)	1-242-706	24 k
R313 (R413)	1-242-701	15 k
R314 (R414)	1-242-720	91 k
R315 (R415)	1-242-720	91 k
R317	———	———
R318	———	———
R319	———	———
R320 (R420)	1-242-704	20 k
R321 (R421)	1-242-721	100 k
R322	1-242-713	47 k
R323	1-242-735	390 k
R324	1-242-745	1 M
R325	———	———
R326	———	———
R327	———	———
R328	1-242-727	180 k
R329 (R429)	1-242-675	1.2 k
R330 (R430)	1-242-705	22 k
R331 (R431)	1-242-669	680
R332 (R432)	———	———
R333 (R433)	1-242-688	4.3 k
R334 (R434)	1-242-693	6.8 k
R337 (R437)	1-242-690	5.1 k
R416	1-242-713	47 k
R417	1-242-699	12 k
R418	1-242-747	1.2 M
R419	1-242-713	47 k
R428	1-242-729	220 k
R501 (R601)	1-242-721	100 k
R502 (R602)	1-242-721	100 k

Ref. No.	Part No.	Description
R503 (R603)	1-242-665	470
R504 (R604)	1-244-715	56 k
R505 (R605)	1-242-731	270 k
R506 (R606)	1-242-677	1.5 k
R507 (R607)	1-242-697	10 k
R508 (R608)	1-242-672	910
R509 (R609)	1-242-729	220 k
R510 (R610)	1-242-745	1 M
R511 (R611)	1-242-735	390 k
R512 (R612)	1-242-725	150 k
R513 (R613)	1-242-687	3.9 k
R514 (R614)	1-242-683	2.7 k
R515 (R615)	1-242-675	1.2 k
R516 (R616)	1-242-685	3.3 k
R517 (R617)	1-242-681	2.2 k
R518 (R618)	1-242-725	150 k
R519	1-242-707	27 k
R520 (R620)	1-242-697	10 k
R619	1-242-707	27 k
R651	1-244-710	36 k
R701	1-206-084	180, metal-oxide
R702	1-242-705	22 k
R703	1-242-653	150

Ref. No.	Part No.	Description
RV101 (201) RV301 (401)	1-222-613	50 k (A), variable (MASTER VOLUME)

SWITCHES

Ref. No.	Part No.	Description
S1	1-513-338	switch, lever (MONITOR)
S2	1-514-874	switch, rotary/slide (FUNCTION)
S3	1-514-911	switch, seesaw (POWER)

MISCELLANEOUS

Ref. No.	Part No.	Description
J101 ~ 106	1-507-353	phono jack, 6-P
J201 ~ 208	1-507-354	phono jack, 8-P
	1-509-359	REC/PB connector
J701	1-509-445	ac input connector
	1-514-872	voltage changeover block
PL701	1-519-084	lamp, neon
F701, F702	1-532-084	fuse 100 mA
F703	1-532-273	fuse 250 mA
	1-533-026	socket, fuse (3-P)
	1-536-182	terminal strip, 2L2 (C)
	1-536-189	terminal strip, 1L1 (B)
	1-581-187	jumper board
	1-581-284	jumper board

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