

# SERVICE MANUAL



## MODEL 4VN-990

SOLID STATE 4-CHANNEL INTEGRATED AMPLIFIER

DIMENSIONS : Height 5-3/8", Width 16-5/8", Depth 15-3/8"      WEIGHT : 35.2 lbs.

### SPECIFICATIONS

#### POWER AMPLIFIER SECTION

Total Dynamic Power(IHF)	: 280W (70W+70W+70W+70W) at 4Ω
" "	264W (66W+66W+66W+66W) at 8Ω
BTL Connection	310W (155W+155W) at 8Ω
Continuous Power	:
All Ch Driven	152W (38W+38W+38W+38W) at 4Ω
" "	140W (35W+35W+35W+35W) at 8Ω
BTL Connection	
All Ch Driven	176W (88W+88W) at 8Ω
Total Harmonic Distortion	:
at Rated Power	: 0.5%
IM Distortion	:
at Rated Power	: 0.8%
Power Bandwidth	: 10Hz~30kHz (IHF)
Frequency Response	: 10Hz~50kHz ±1dB
Signal to Noise Ratio	: 96dB
Channel Separation	: 55dB at 1kHz
Input Sensitivity	:
at Rated Power	: 0.7V
Input Impedance	: 50kΩ
Load Impedance	:
4 Channel Connection	4~16Ω
BTL Connection	8~16Ω
Damping Factor	50 at 8Ω

#### PRE AMPLIFIER SECTION

Frequency Response	: 10Hz~50kHz ±1dB
Total Harmonic Distortion	: 0.03%

#### S.E.A. Controls

Center Frequency	: 40,250,1K,5K,15KHz
Control Range	: (±) 12dB
Loudness Control	: (+) 12dB at 50Hz (+) 6dB at 10kHz
Low Cut Filter	: (-) 3dB at 50Hz (12dB/oct)
High Cut Filter	: (-) 3dB at 7kHz (12dB/oct)
Signal to Noise Ratio	: Phono (Mag.1) 65dB Phono (Mag.2) 65dB Aux-1 75dB Aux-2 75dB Tape Play 75dB
Input Sensitivity for Rated Power	: Phono (Mag.1) 2.5mV Phono (Mag.2) 2.5mV Aux (2ch) 150mV Aux (4ch) 150mV Tape Mon.(Pin 2-ch) 150mV (DIN-2ch) 250mV (Pin-4ch) 150mV
Recording Out Level	: 2ch-Pin 200mV 2ch-DIN 30mV 4ch-Pin 200mV
Channel Separation	: 50dB at 1kHz
Muting	: -20dB
Equalizer	: RIAA (Mag) ±0.5dB

POWER CONSUMPTION : 310W

POWER SOURCE : AC 120V 50/60Hz

**PACKING ILLUSTRATION**

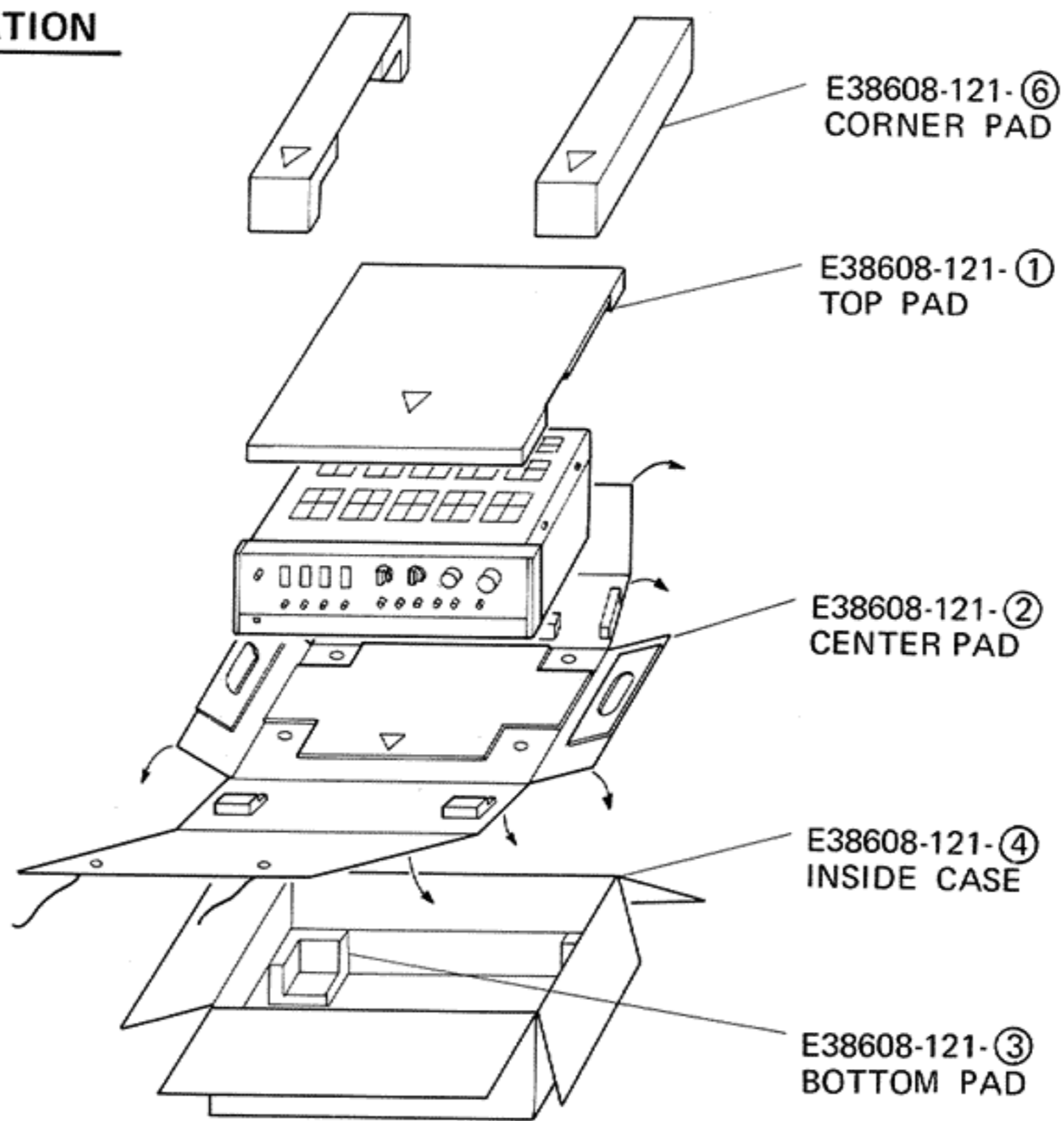


Fig. 1

Parts No.	Parts Name	Dwg. No.
4VN-990-PK	Carton Case	4
4VN-990-NZ	Packing Material	1,2,3,6
E32332-016	Envelope (for Set)	—

**EXPLODED VIEW OF MECHANICAL PARTS**

Dwg. No.	Parts No.	Parts Name
1	E21149-001	Cover
2	Q03093-108	Washer
3	SDSP4008NS	Screw
4	E21199-001	Bottom Plate
5	LPSP4008NS	Ass'y Screw
6	Q05911-1	Foot
7	SBSB3010M	Tapping Screw

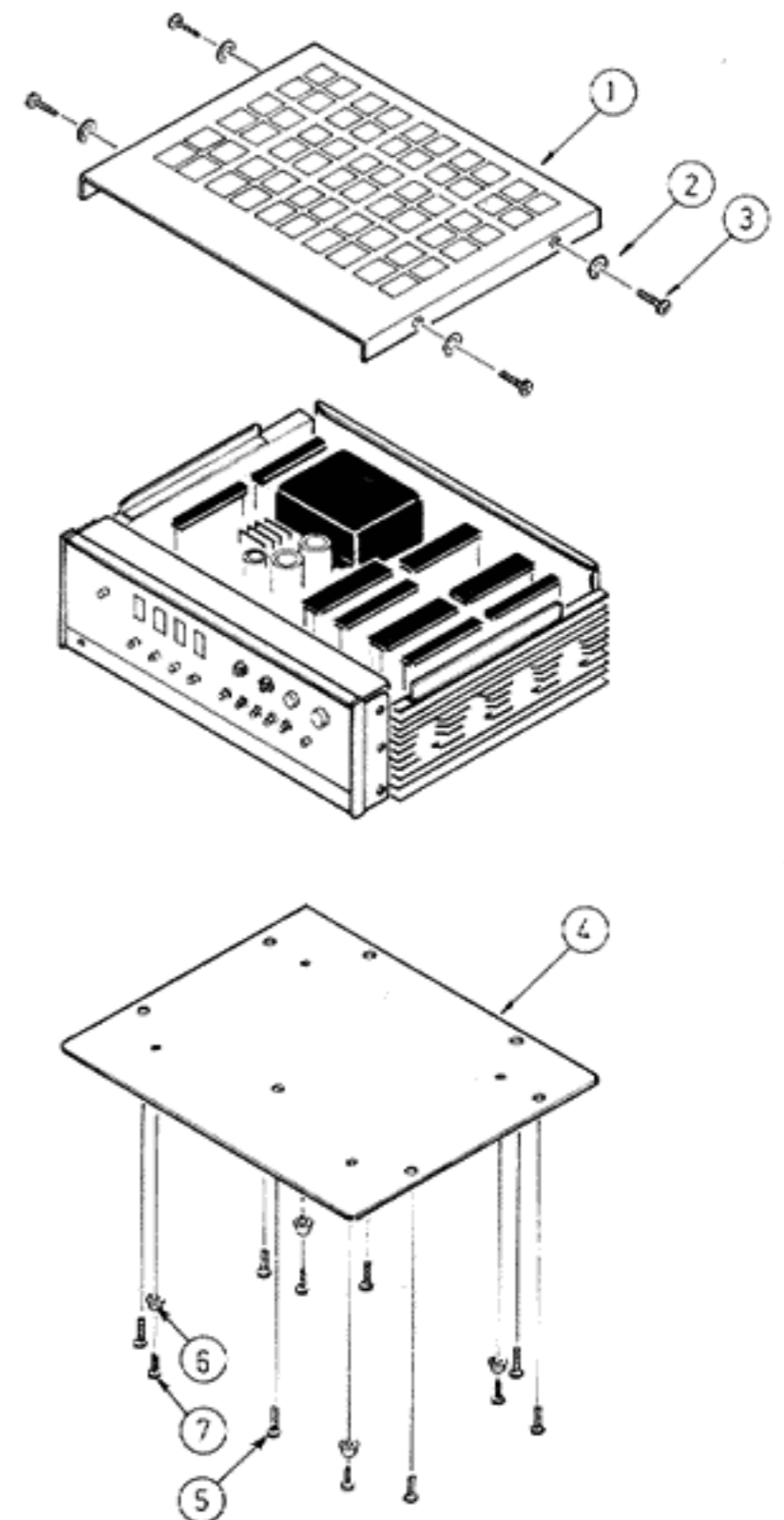


Fig. 2

# PARTS ARRANGEMENT

## 1 TOP VIEW

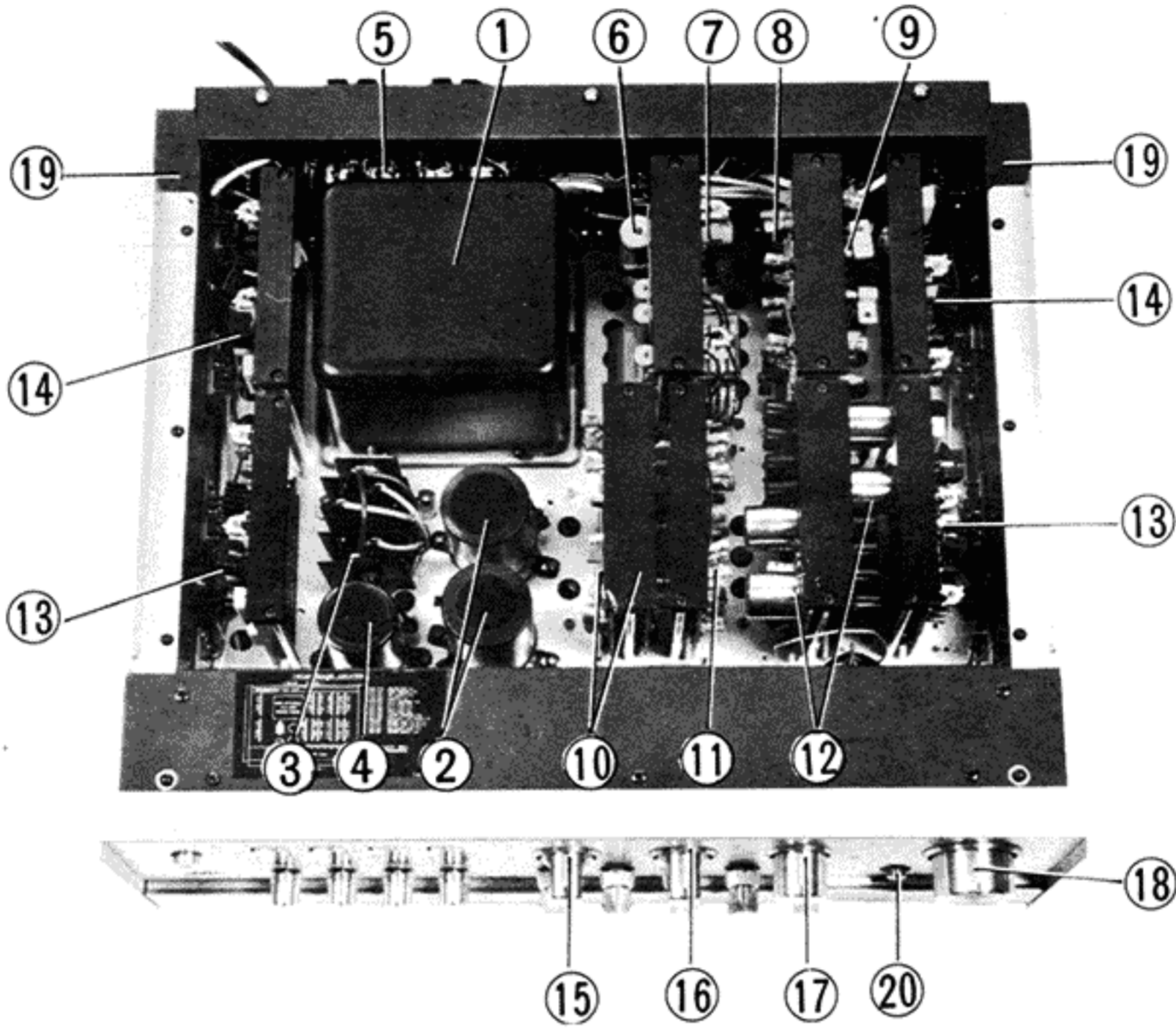


Fig. 3

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	E03164-12	Power Transformer	13	TAD-112	Driver Amp. C.B. Ass'y
2	QEY8001-121	Electrolytic Capacitor	14	TAD-113	" "
3	CD-2P	Silicon Diode	15	Q30431-1	Rotary Switch
4	QEY-5006-121	Electrolytic Capacitor	16	Q03710-4	" "
5	TAC-250	Meter Control C.B. Ass'y	17	QVC2A2C-0F5	Variable Resistor
6	TAP-173	Power Supply C.B. Ass'y	18	E03413-002	Variable Resistor
7	TAC-280	Protector C.B. Ass'y	19	E21192-001	Heat Sink
8	TAC-249	SFCS Amp. C.B. Ass'y	20	TAC-245	Muting SW C.B. Ass'y
9	TAE-37B	Equalizer Amp. C.B. Ass'y			
10	TAC-251	High Low Filter C.B. Ass'y			
11	TAC-248	SEA Amp. C.B. Ass'y			
12	TAC-247	SEA Coil C.B. Ass'y			

2 BOTTOM VIEW

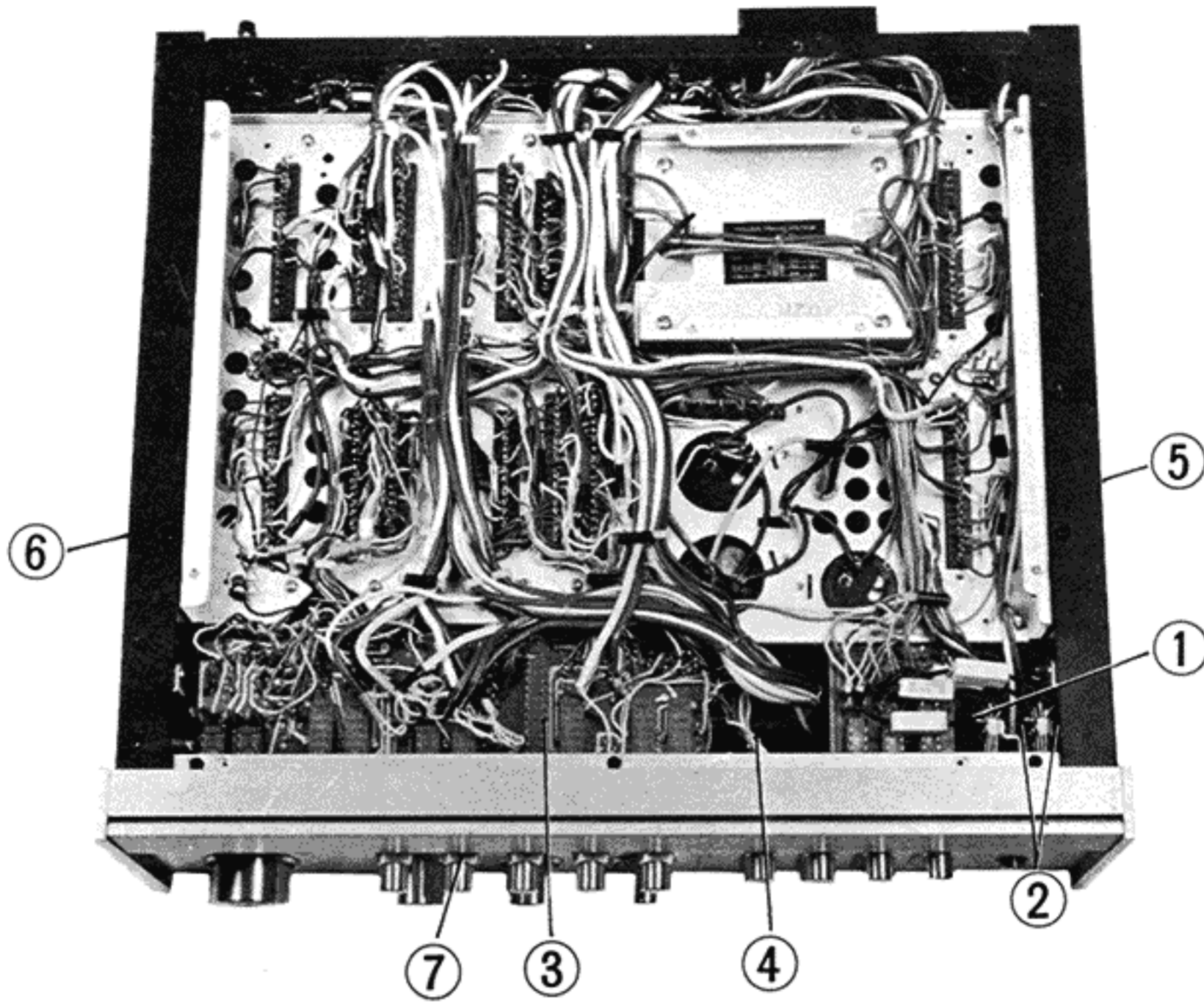


Fig. 4

Dwg. No.	Parts No.	Parts Name	Dwg. No.	Parts No.	Parts Name
1	TAC-244	SPK. Select SW. C.B. Ass'y	5	E21193-002	Transistor Cover
2	Q03963-001	Jack Ass'y	6	E21193-001	" "
3	TAC-243	Push Switch C.B. Ass'y	7	TAC-246	SEA Control C.B. Ass'y
4	E03380-001	8P Plug			

# EXPLODED VIEW OF MECHANICAL PARTS

(REAR PANEL)

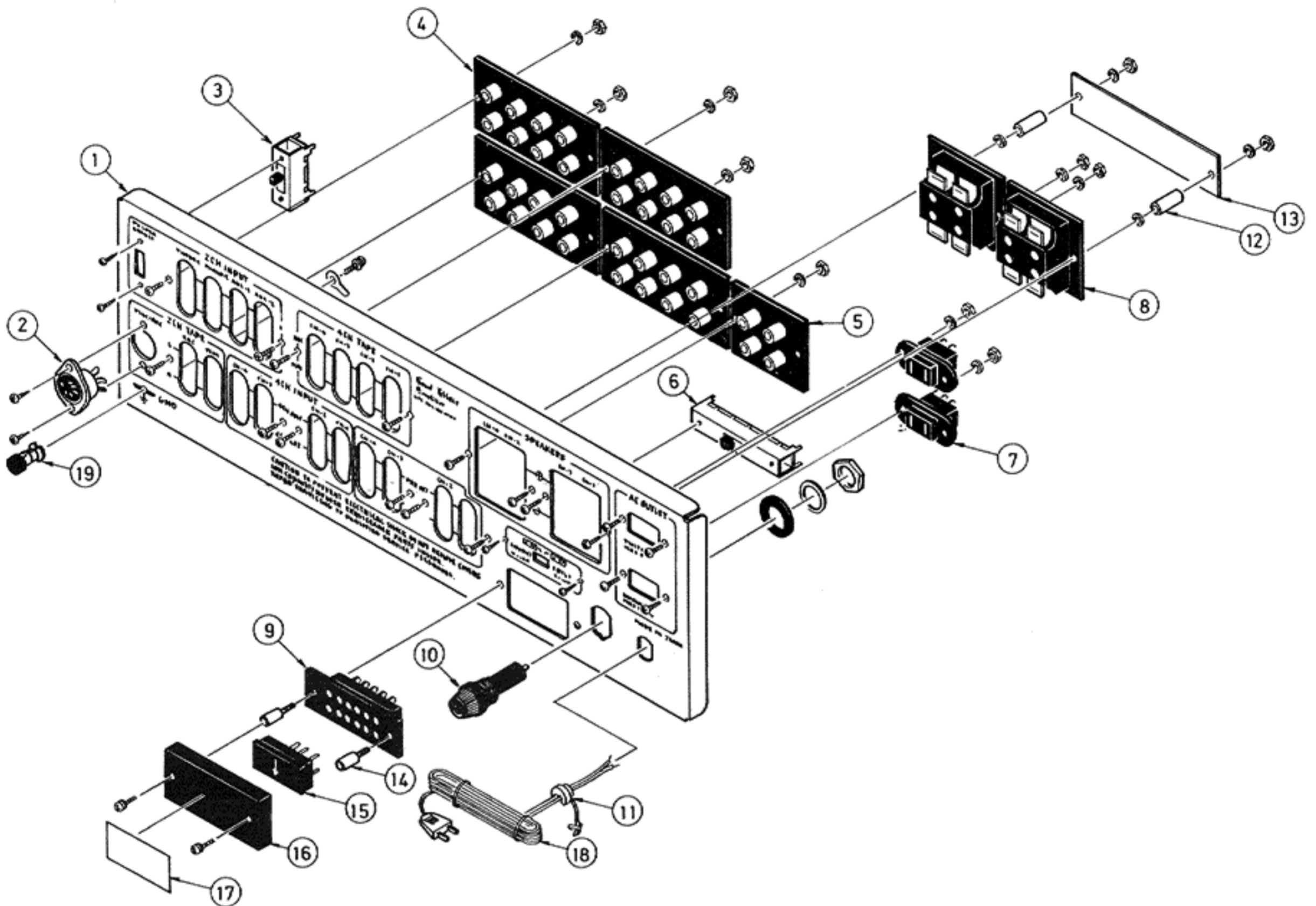


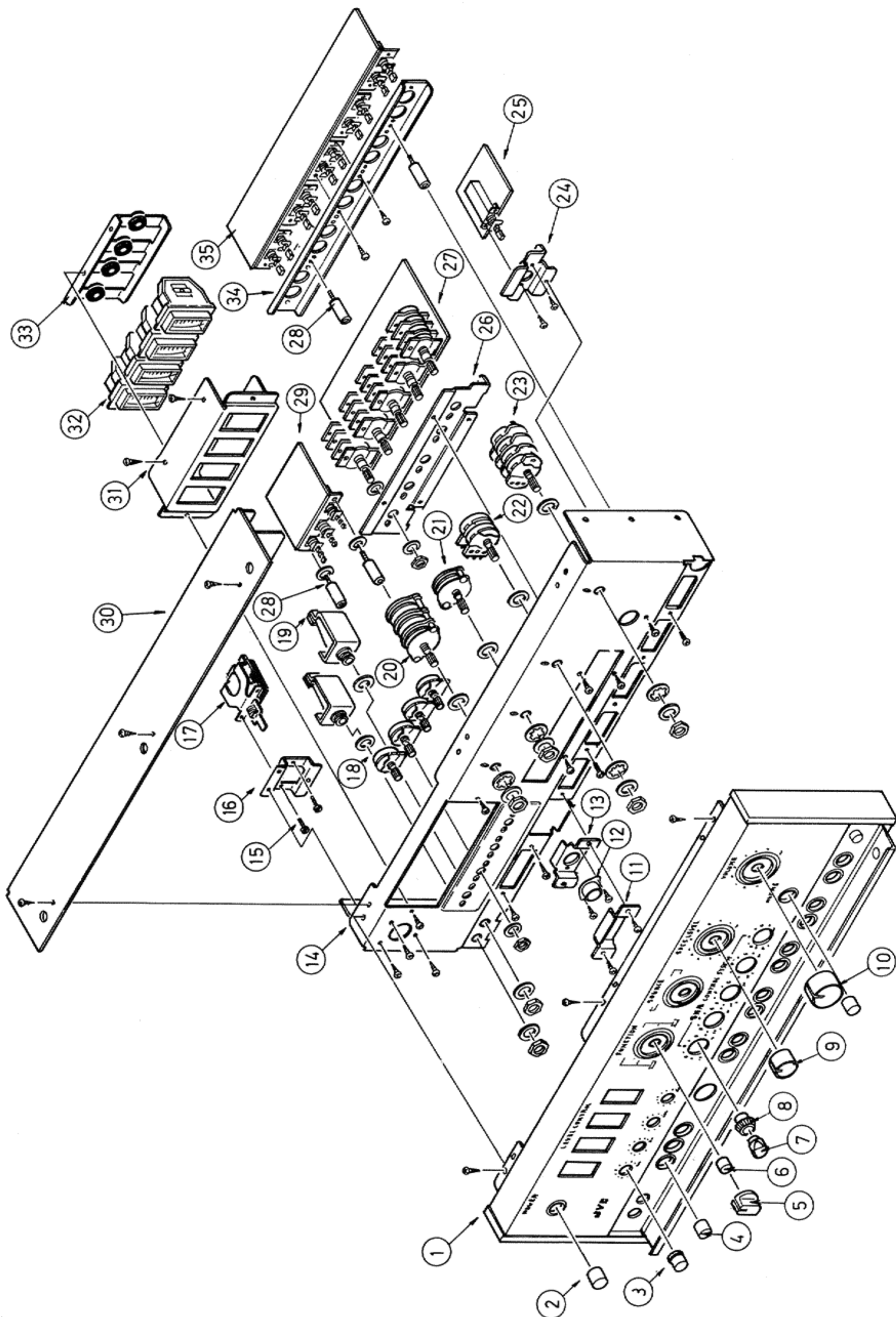
Fig. 5

## THE LIST OF REAR PANEL PARTS FOR REPLACEMENT

Dwg. No.	Parts No.	Parts Name	Description
1	E21195-001	Rear Panel	
2	Q03967	DIN Socket	
3	Q03764-002	Slide Switch	Load Impedance SW.
4	E03043-80	Pin Jack Ass'y	8 Pin
5	E03043-40	Pin Jack Ass'y	4 Pin
6	QSS8248-002	Slide Switch	BTL Select SW.
7	Q30120-001	AC Socket Ass'y	UL Type
8	E03410-001	4P Push Terminal	
9	E04084-001	Volt Select Socket	
10	Q30210-001	Fuse Socket Ass'y	UL Type
11	E31704-001	Power Cord Stopper	UL Type
12	E44182-001S	Stud	
13	TAC-250	Meter Control C.B.	
14	E44182-008S	Stud	
15	E04085	Volt Select Plug	
16	E46603-002	Cover	
17	E46789-001	Caution Label.	
18	Q03056-14	Power Cord with Plug	
19	E04069S	Push Terminal	

# EXPLODED VIEW OF MECHANICAL PARTS

(FRONT PANEL)



**THE LIST OF FRONT MECHANICAL PARTS FOR REPLACEMENT**

Dwg. No.	Parts No.	Parts Name	Description
1	E1693-001	Front Panel Ass'y	
2	E47958-001	Power SW Knob	
3	E47960-001	Knob	(Level Control)
4	E47959-001	Knob	(Push SW)
5	E48002-001	Select Knob	(Function)
6	E48003-001	Adjust Knob	( " )
7	E47961-001	SEA Knob	(Front Channel)
8	E47962-001	"	(Rear Channel)
9	E47613-001	Knob	(SFCS Level)
10	E47612-001	Volume Knob	
11	E47951-001	B. Remote Cover	
12	E03380-001	8P. Plug	(B. Remote)
13	E47950-001	B. Remote Holder	
14	E21194-001	Front Bracket	
15	E44865-001S	Screw	
16	E47948-001	Power SW Bracket	
17	QSU1130-001	Push Switch	(UL)
18	QFV1A2B-0F5	Variable Resistor	(Level Controls)
19	Q03963-001	Jack Ass'y	(Head Phones)
20	Q30431-1	Rotary Switch	(Function)
21	Q03710-4	"	(Source)
22	QVC2A2C-0F5	Variable Resistor	(SFCS)
23	E03413-002	" "	(Master Volume)
24	E47946-001	Muting SW Bracket	
25	TAC-245	Muting SW C.B. Ass'y	
26	E33231-001	SEA Vol Holder	
27	TAC-246	SEA Control C.B. Ass'y	
28	E44182-008S	Stud	
29	TAC-244	SPK Select SW C.B. Ass'y	
30	E33243-001	Cover	(Front)
31	E33230-001	Meter Bracket	
32	E03507-001	VU Meter	
33	E47947-001	Meter Holder	
34	E33229-001	Push SW Holder	
35	TAC-243	Push SW C.B. Ass'y	
36			

## EXPLODED VIEW OF MECHANICAL PARTS

(HEAT SINK & POWER TRANSISTOR)

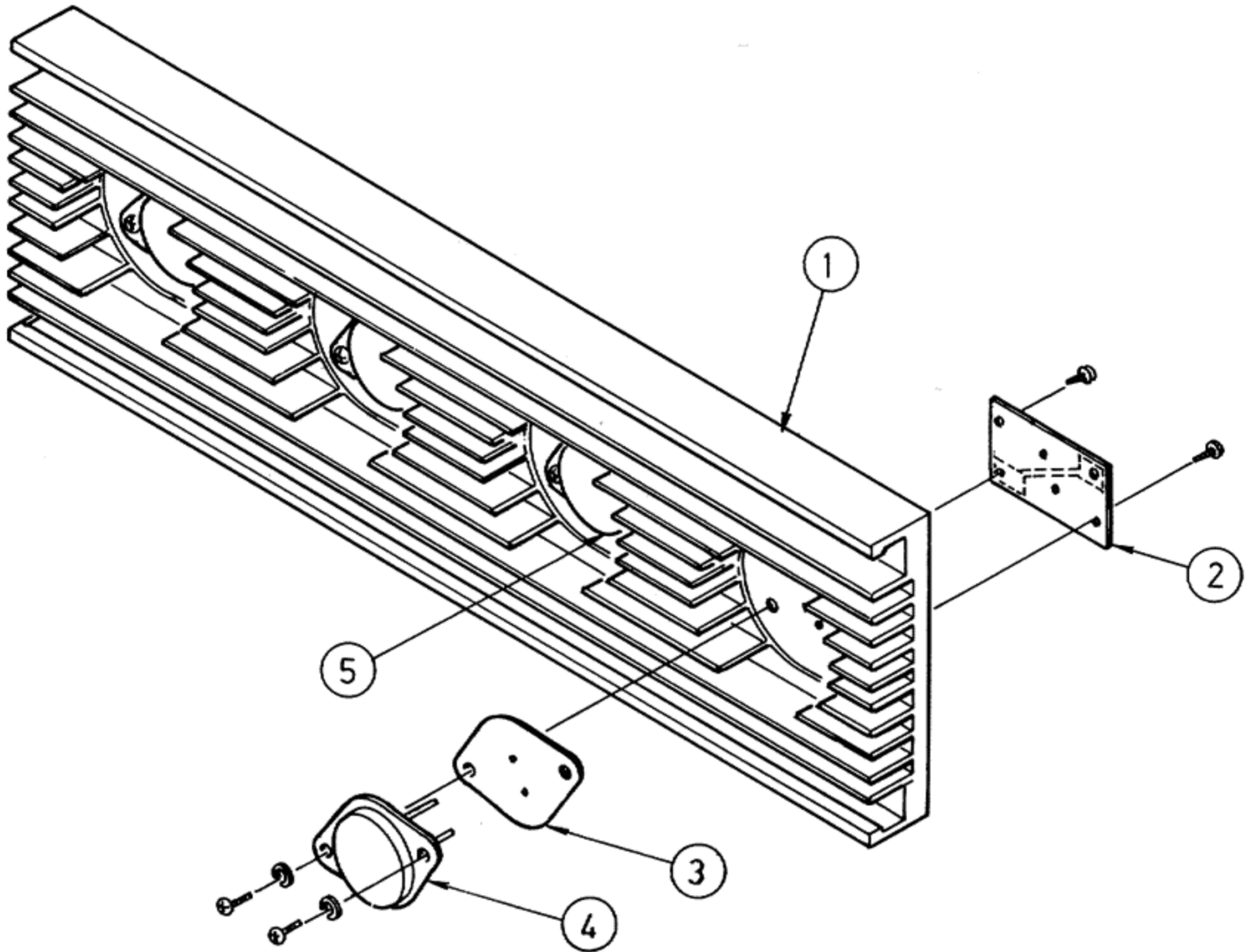


Fig. 7

## THE PARTS LIST FOR REPLACEMENT

Dwg. No.	Parts No.	Parts Name	Description
1	E21192-001	Heat Sink	
2	E04086S	TR. Socket	
3	E41542-2	Insulator Film	
4	2SA758	Power Transistor (HITACHI)	X2
5	2SC898	" (HITACHI)	X1



**TAE-37B EQUALIZER CIRCUIT BOARD ASS'Y**

(TOP VIEW)

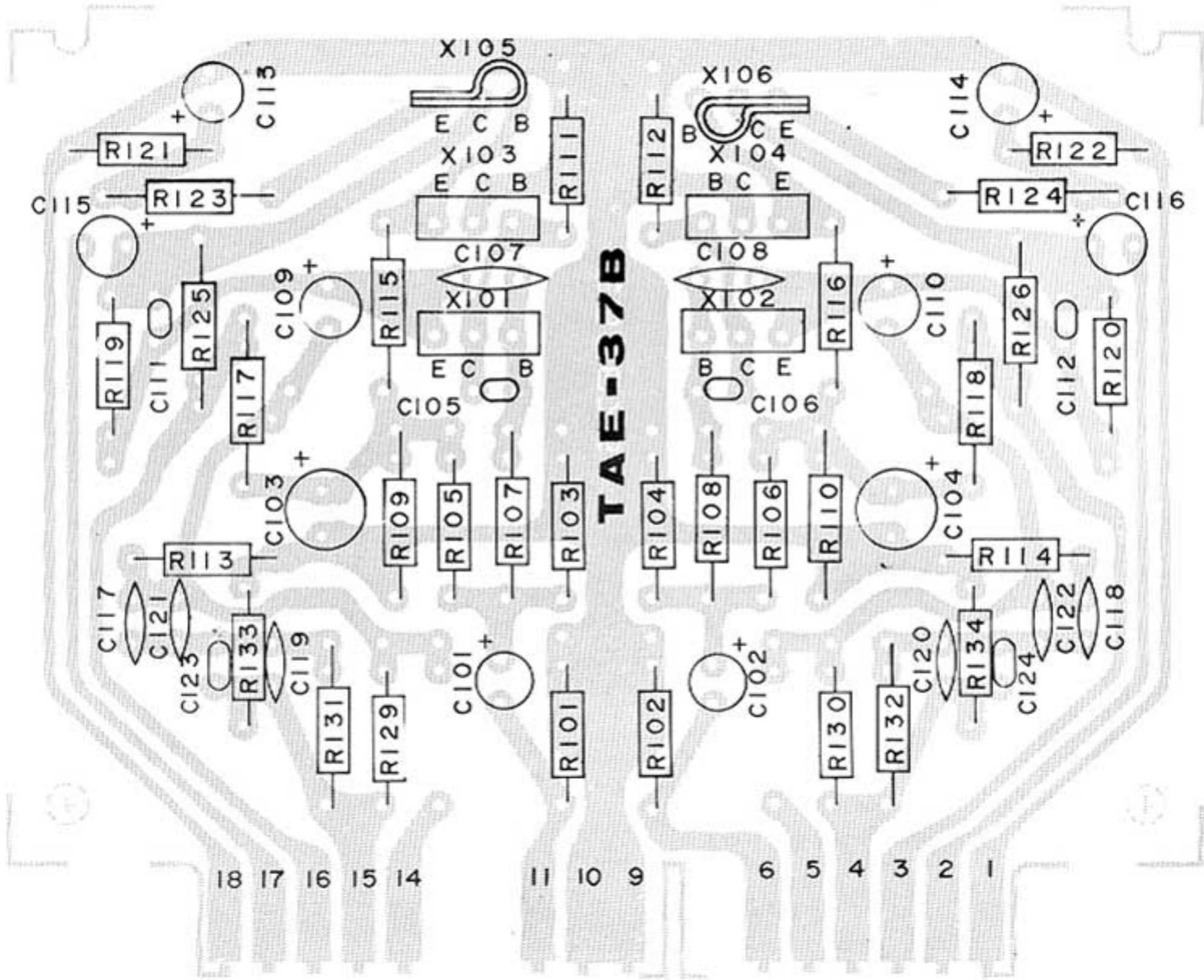


Fig. 8

**TAE-37B EQUALIZER CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

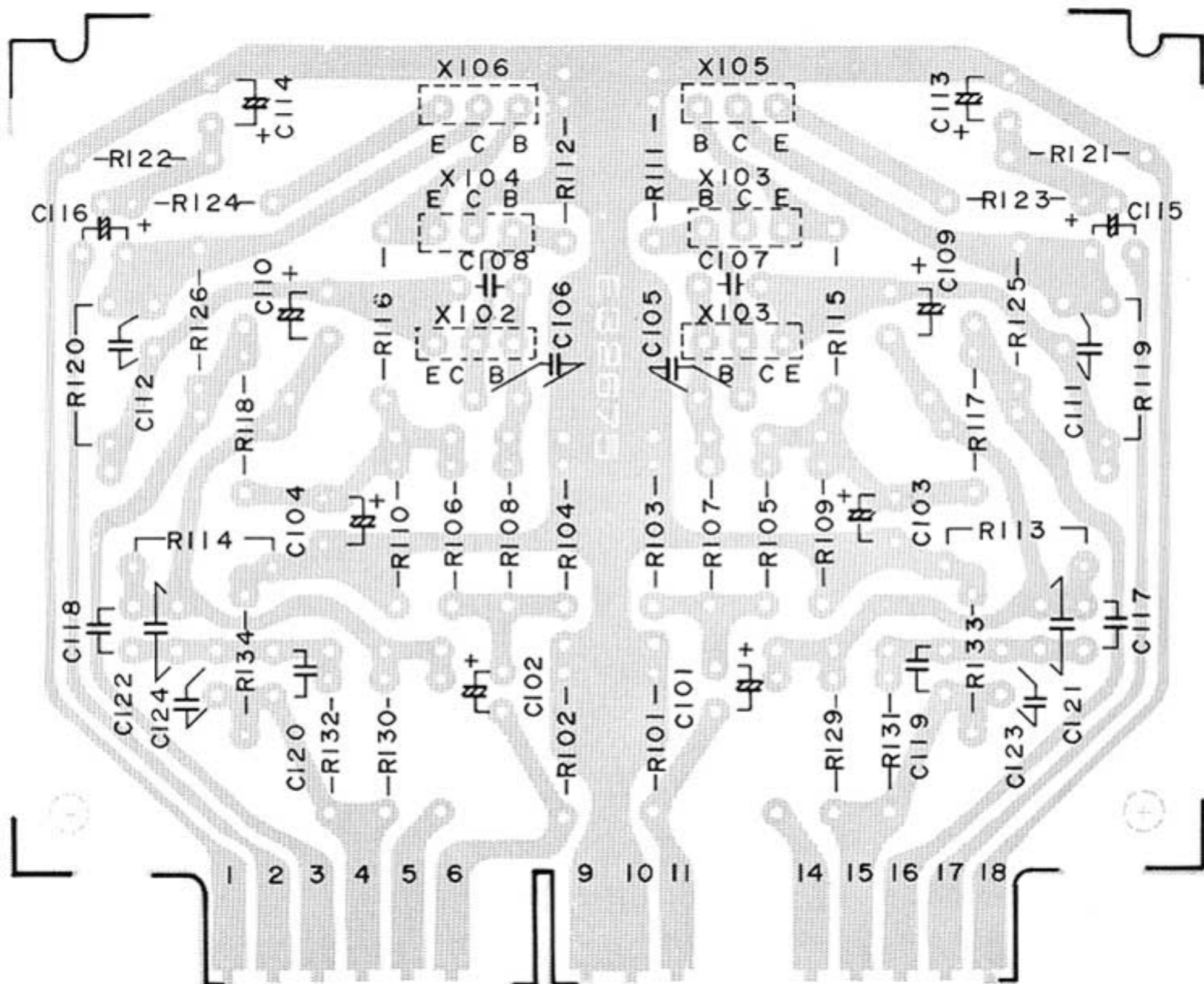


Fig. 9

**WIRE CONNECTION** (Fig. 8, 9)

Pin No.	Socket Pin Name	Connection
1	Earth	
2	Output	To Source Rotary Switch
3	B+	From TAP-173 Pin 8
4	NF Output	To TAE-37B Pin 2
5		
6	Input	From Source Rotary Switch
7		
8		
9	Earth	
10	Earth	
11	Input	From Source Rotary Switch
12		
13		
14		
15	NF Output	To TAE-37B Pin 17
16	B+	To TAE-37B Pin 3
17	Output	To Source Rotary Switch
18	Earth	

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAE-37B	Circuit Board Ass'y	
2	2SA493GR	Si Transistor (Toshiba)	X101~104
3	2SC853L	Si Transistor (Nichiden)	X105, 106

**TAC-249 S.F.C.S. AMPLIFIER CIRCUIT BOARD ASS'Y**

(TOP VIEW)

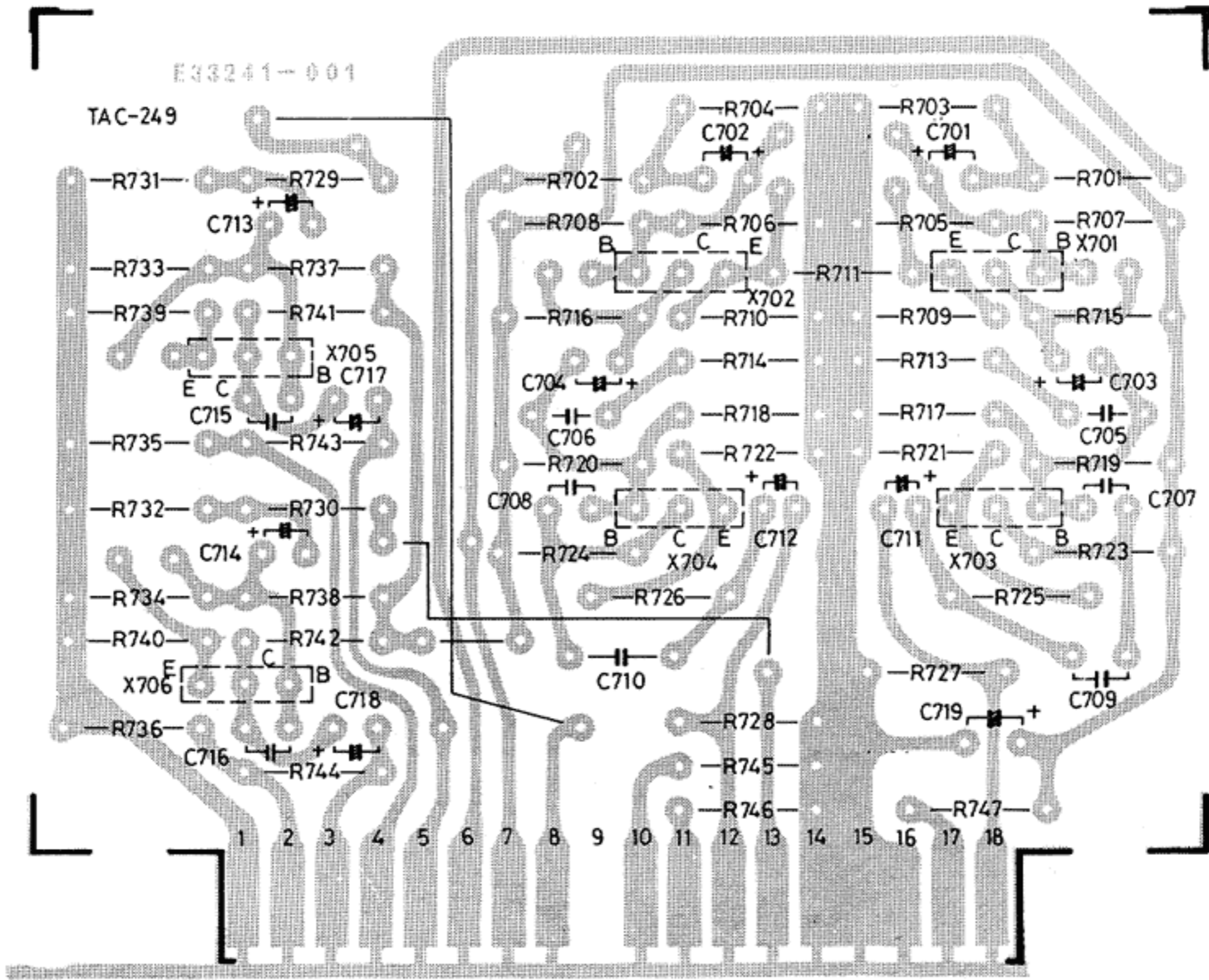


Fig. 10

**TAC-249 S.F.C.S. AMPLIFIER CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

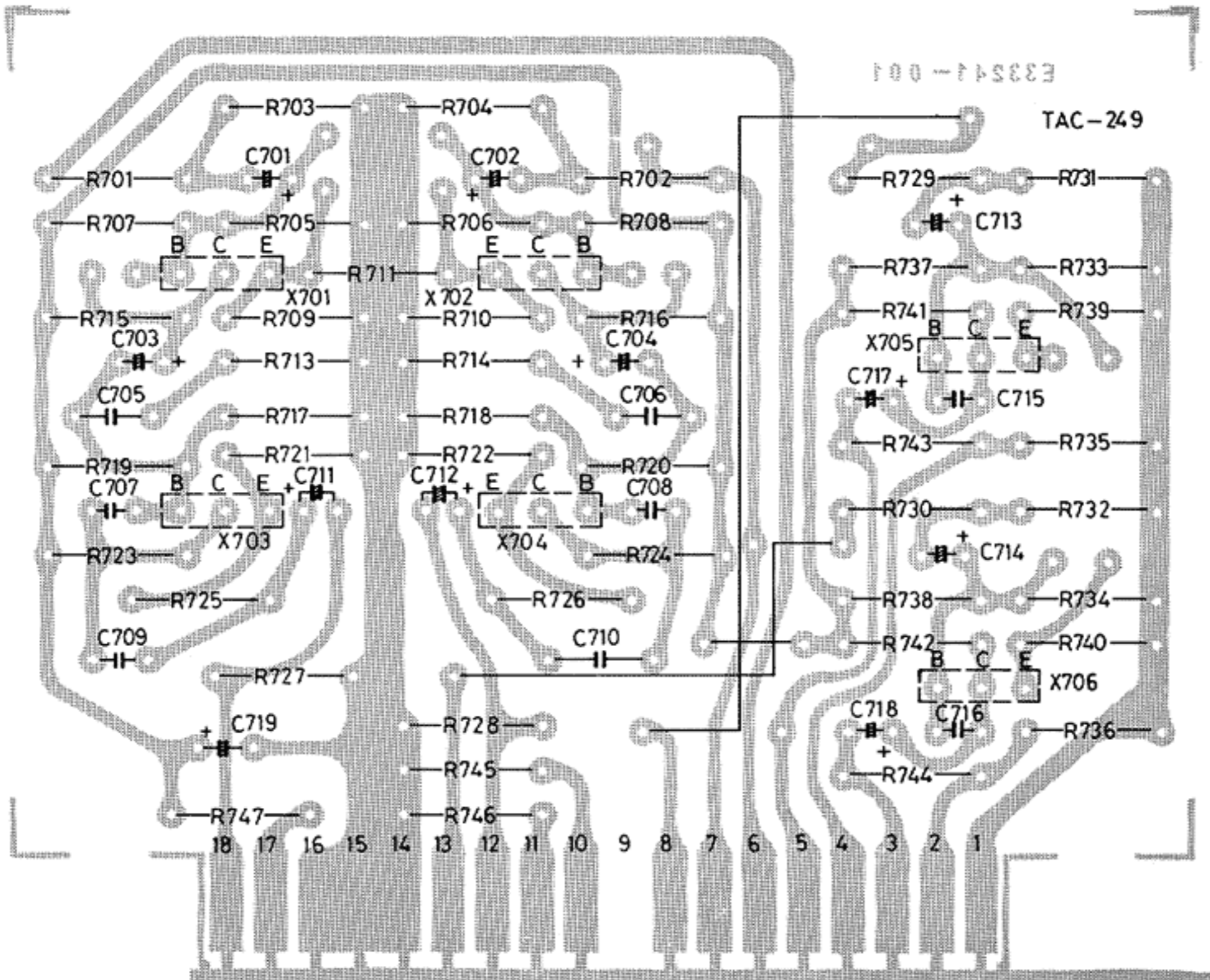


Fig. 11

**WIRE CONNECTION** (Fig. 10, 11)

Pin No.	Socket Pin Name	Connection
1	Earth	
2	Flat Amp. Output	To FUNCTION Rotary Switch (S4c)
3	"	To FUNCTION Rotary Switch (S4h)
4	"	To FUNCTION Rotary Switch (S4a)
5	"	To FUNCTION Rotary Switch (S4g)
6	SFCS Input	From SFCS Volume (R2a)
7	"	From SFCS Volume (R2b)
8	FLAT Amp. Input	From SFCS Volume (R2a)
9		
10	Level Adjust Pin	To FUNCTION Rotary Switch (S4g)
11	"	To FUNCTION Rotary Switch (S4h)
12	SFCS Output	To FUNCTION Rotary Switch (S4f)
13	FLAT Amp. Input	From SFCS Volume (R2b)
14	Earth	
15	Earth	
16	Earth	
17	B+	From TAP-173 Pin 8
18	SFCS Output	To FUNCTION Rotary Switch (S4e)

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-249	Circuit Board Ass'y	
2	2SC458ALGC	Si. Transistor (Hitachi)	X701~706

TAC-247 SEA COIL CIRCUIT BOARD ASS'Y

(TOP VIEW)

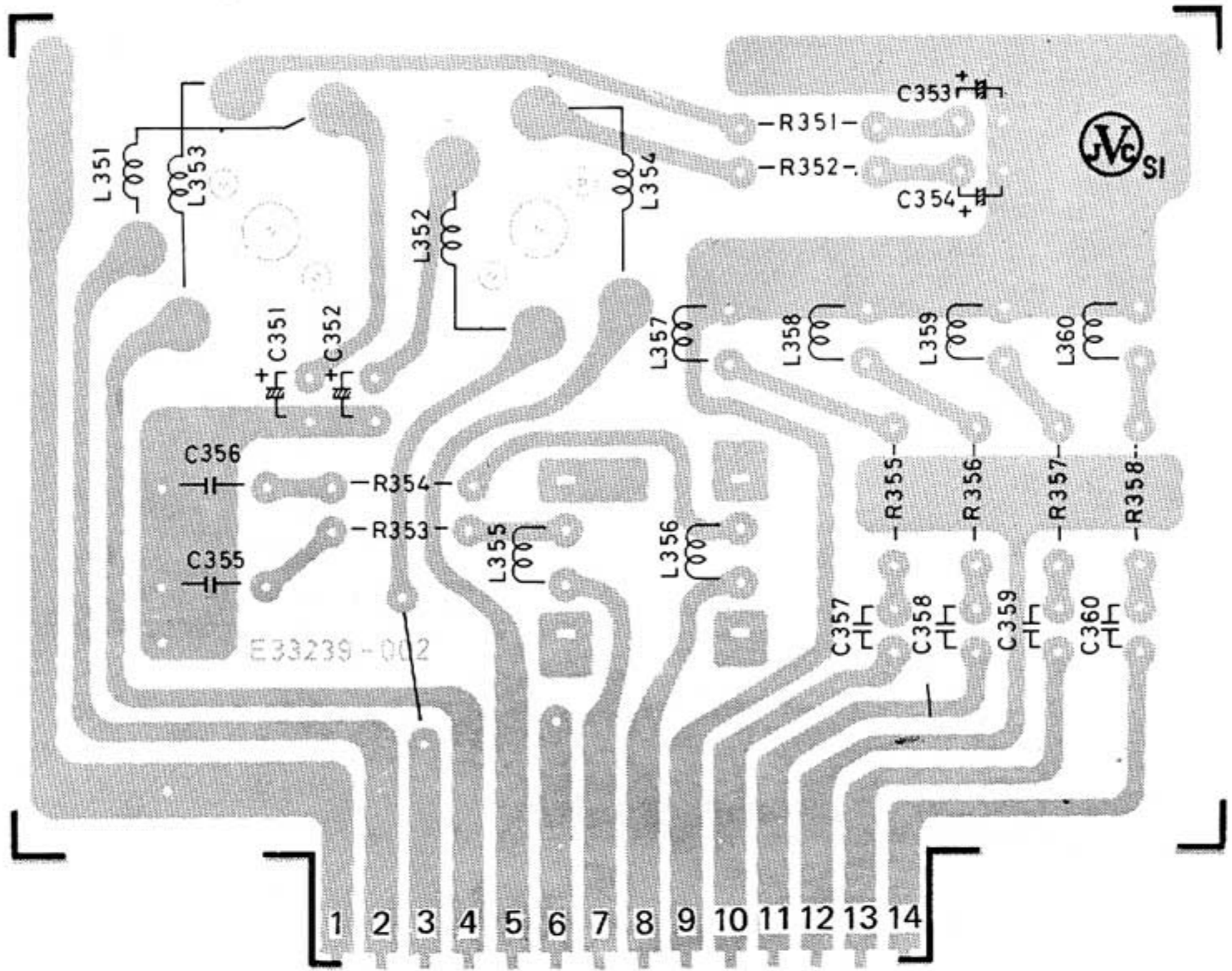


Fig. 12

TAC-247 SEA COIL CIRCUIT BOARD ASS'Y

(BOTTOM VIEW)

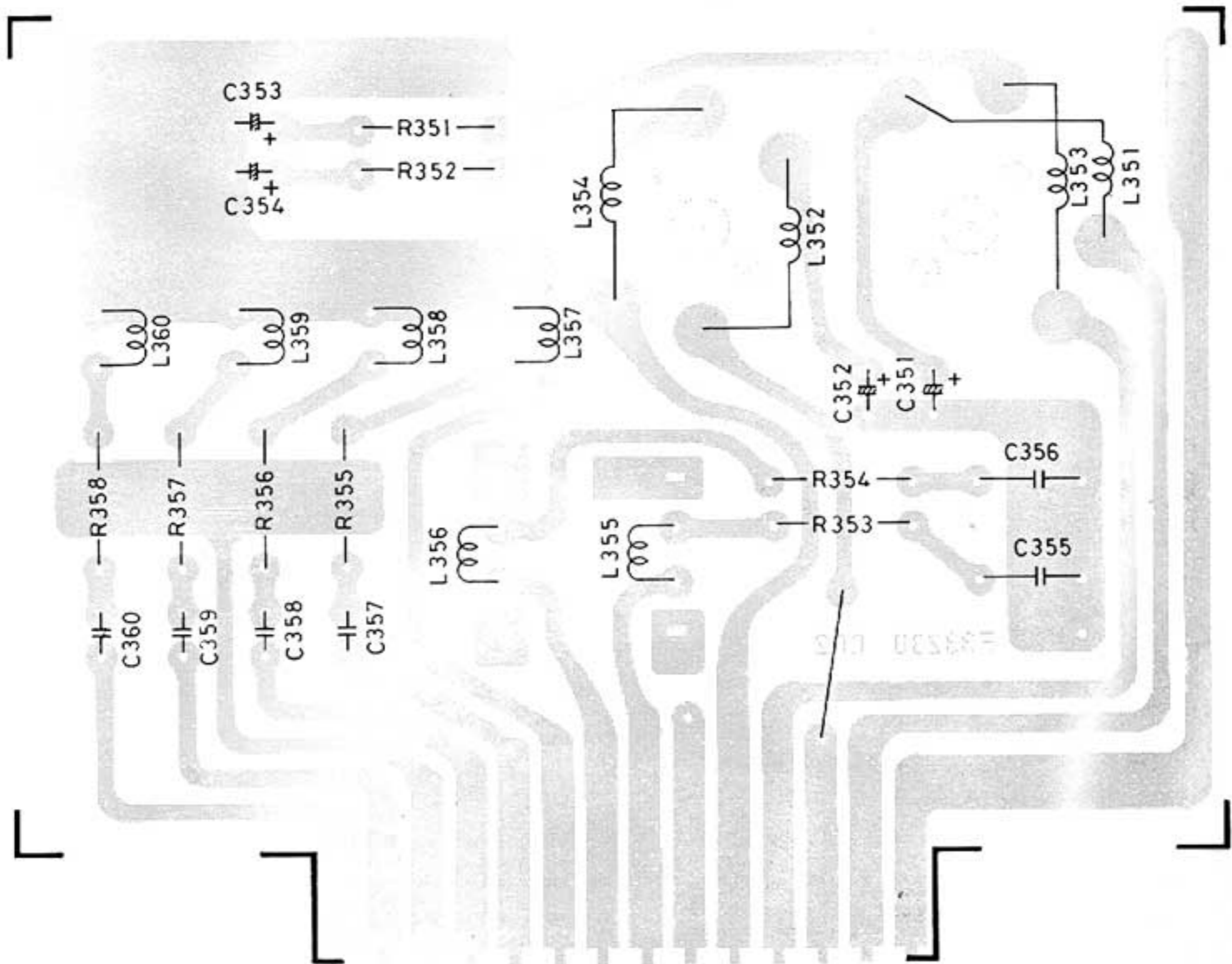


Fig. 13

WIRE CONNECTION (Fig. 12, 13)

Pin No.	Socket Pin Name	Connection
1	Earth	
2	2H Coil Output	To 40Hz Volume Control (pin 2 )
3	" "	"
4	0.6H "	To 250Hz Volume Control (pin 2)
5	" "	"
6	Earth	
7	100mH Coil Output	To 1kHz Volume Control (pin 2)
8	"	"
9	Earth	
10	22mH Coil Output	To 5kHz Volume Control (pin 2)
11	"	"
12	Earth	
13	10mH Coil Output	To 15kHz Volume Control (pin 2)
14	"	"

THE LIST OF MAIN PARTS FOR REPLACEMENT

No.	Parts No.	Parts Name	Description
1	TAC-247	Circuit Board Ass'y	
2	E03108-19A	Choke Coil	L351,352,353,354 (a & b)
3	E0747-11	Ferri Inductor	L355,356 (a & b)
4	E0747-12	"	L357,358 (a & b)
5	E0747-13	"	L359,360 (a & b)

**TAC-280 PROTECTOR CIRCUIT BOARD ASS'Y**

(TOP VIEW)

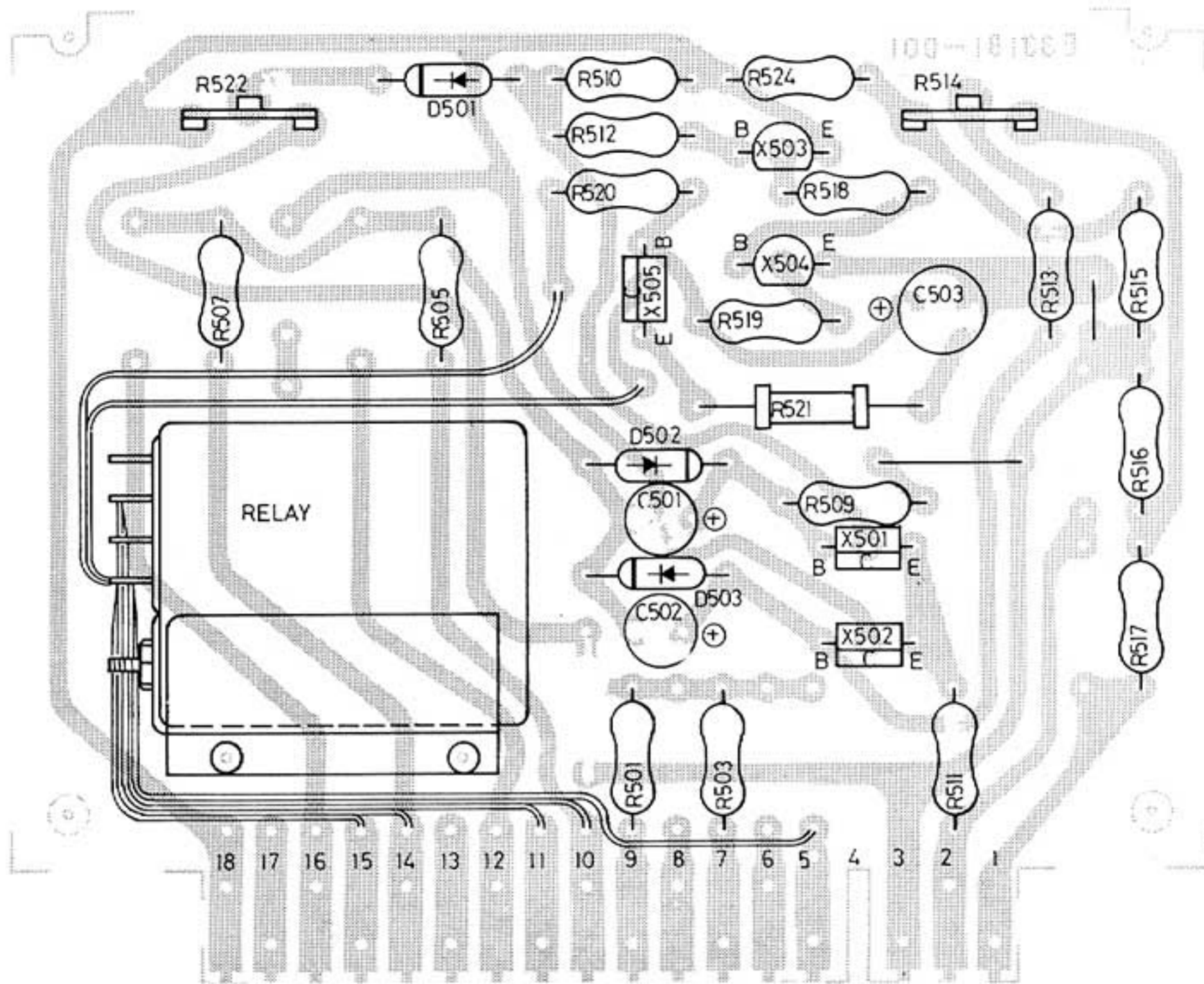


Fig. 14

**TAC-280 PROTECTOR CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

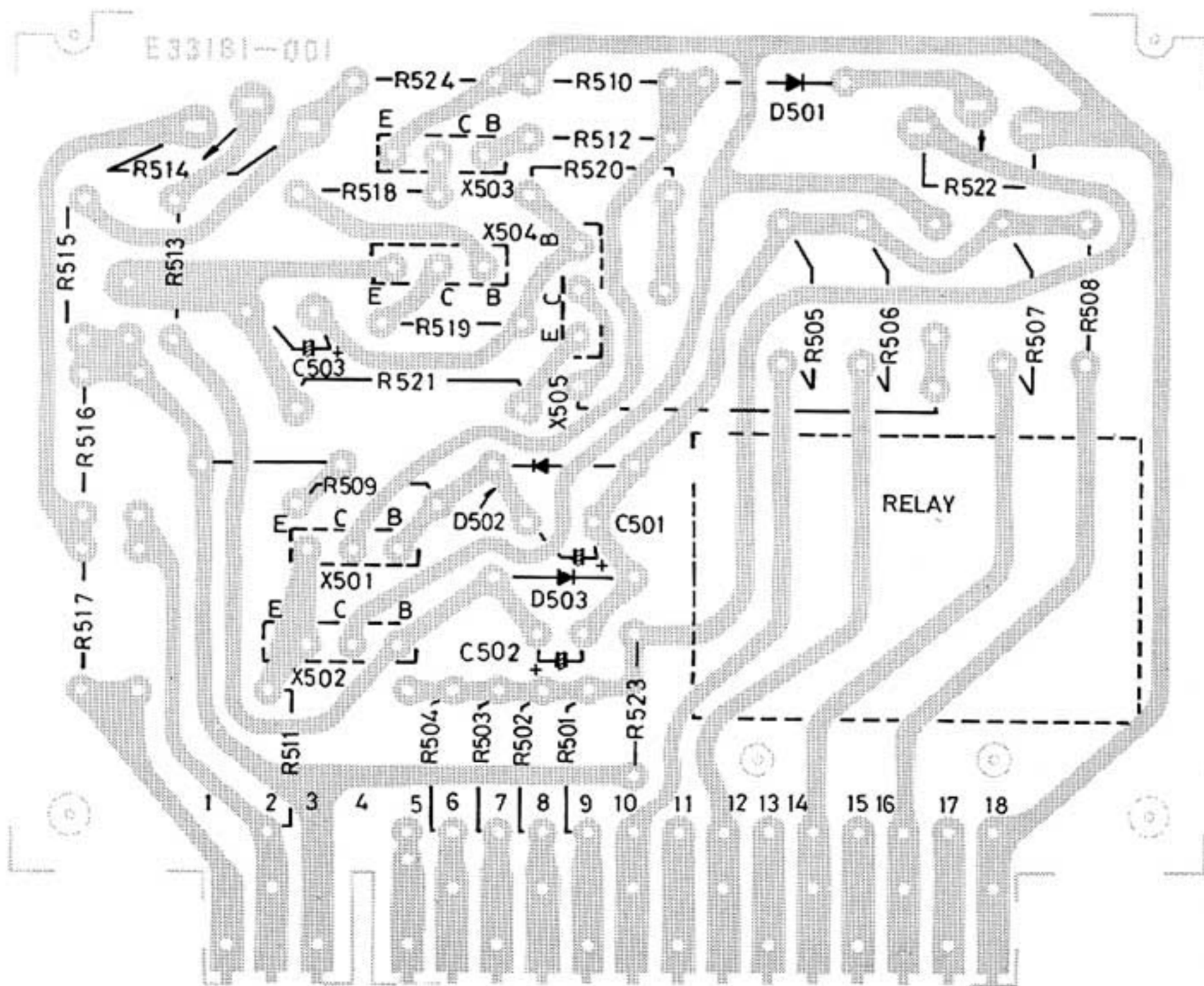


Fig. 15

**WIRE CONNECTION** (Fig. 14, 15)

Pin No.	Socket Pin Name	Connection
1	B- Input	From Power Source -38V
2	B+ Input	From TAP-173 Pin 11
3	Earth	
4		
5	Relay B+ Input	From TAP-173 Pin 10
6	Protector Input	From TAD-112,113 Pin 7
7	"	"
8	"	From TAD-112, 113 Pin 7
9	"	"
10	Protector Output	To TAC-244
11	" Input	From TAD-113 pin 8
12	" Output	To TAC-244
13	" Input	From TAD-113 Pin 8
14	" Output	To TAC-244
15	" Input	From TAD-112 Pin 8
16	" Output	To TAC-244
17	" Input	From TAC-112 Pin 8
18	B+	From Power Source +38V

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-280	Circuit Board Ass'y	
2	MY4-24	Relay (OMRON)	
3	2SC711A	Si Transistor (Mitsubishi)	X501, 502, 504
4	2SA628A	" (Mitsubishi)	X503
5	2SC1213A	" (Hitachi)	X505



TAC-243 PUSH SWITCH CIRCUIT BOARD ASS'Y

(TOP VIEW)

(BOTTOM VIEW)

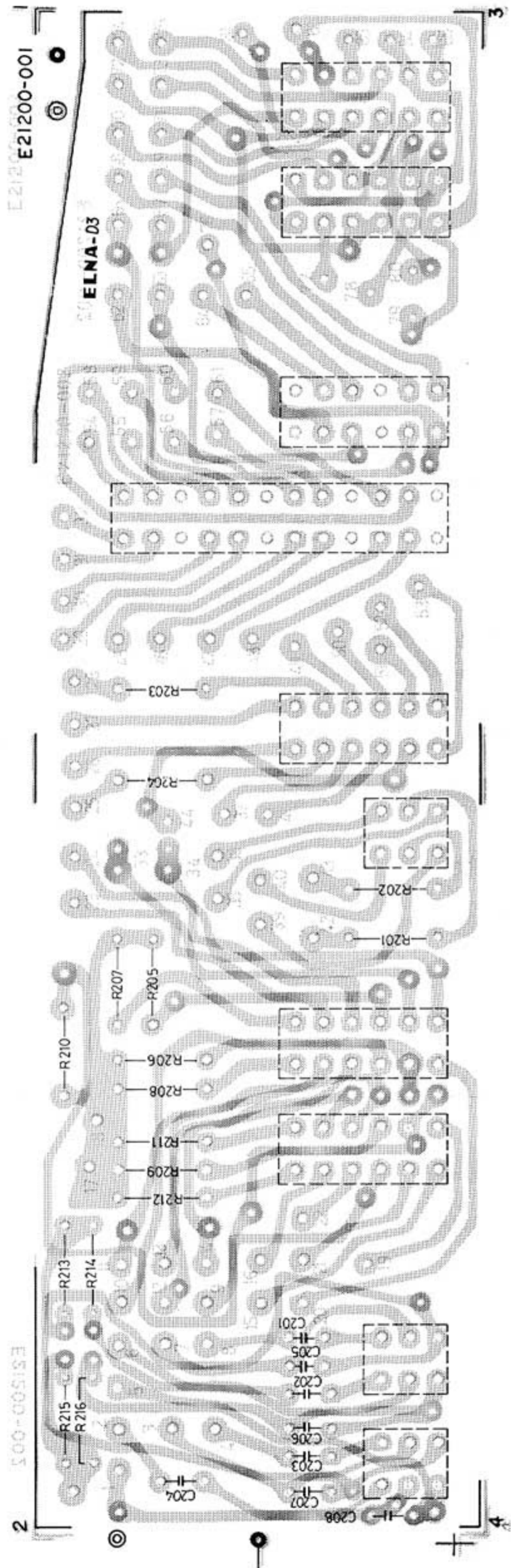


Fig. 16

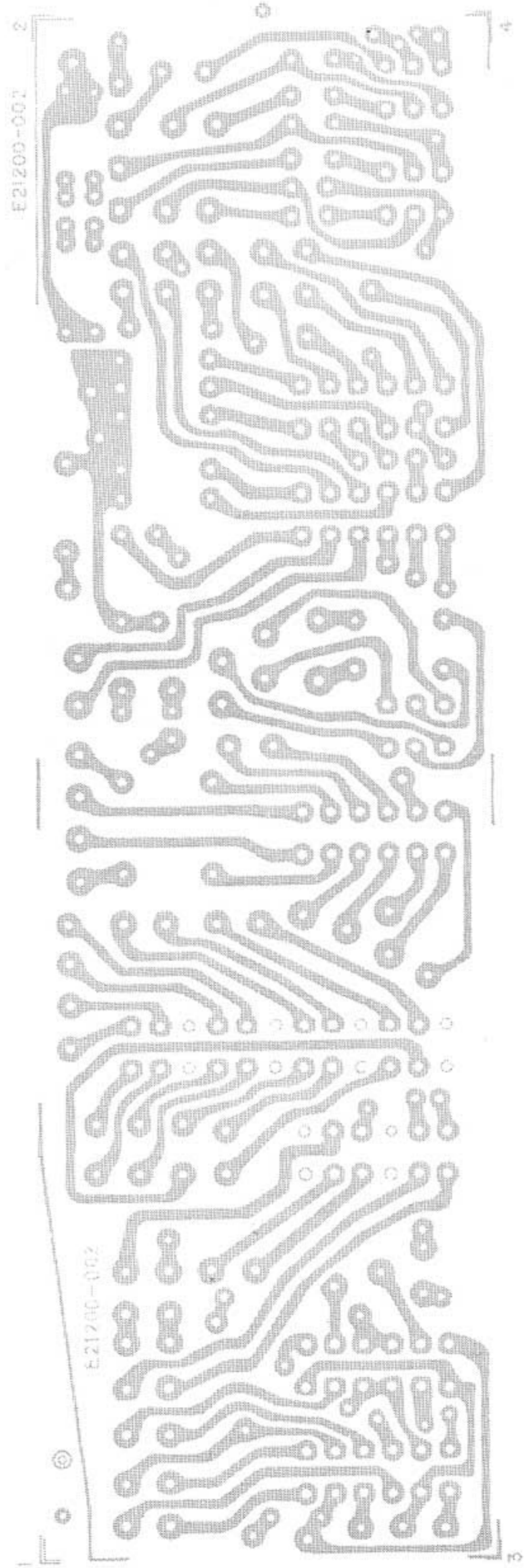


Fig. 17

**WIRE CONNECTION** (Fig. 16, 17)

Pin No.	Pin Name	Connection
1	Loudness	To Volume R20d Pin 4
2	"	To Volume R20d Pin 1
3	"	To Volume R20c Pin 4
4	"	To Volume R20c Pin 1
5	"	To Volume R20b Pin 4
6	"	To Volume R20b Pin 1
7	"	To Volume R20a Pin 4
8	"	To Volume R20a Pin 1
9	SEA Switch Pin	From TAC-248 Pin 9
10	"	" Pin 7
11	"	" Pin 8
12	"	To TAC-246 Pin 10
13	"	To TAC-246 Pin 13
14	"	From TAC-248 Pin 10
15	"	To TAC-246 Pin 27
16	"	From TAC-248 Pin 2
17		
18		
19	SEA Switch Out	To TAC-246 Pin 13
20	"	To TAC-246 Pin 20
21	"	From TAC-248 Pin 1
22	"	To TAC-246 Pin 24
23	"	From TAC-248 Pin 13
24	"	To TAC-246 Pin 1
25	4ch Tape Pin	To Volume R4 Pin 1
26	"	From 4ch Tape Terminals
27	"	"
28	"	To Volume R3 Pin 1
29	High Cut Switch Pin	To TAC-251 Pin 3
30	"	" Pin 5
31	"	" Pin 1
32	"	" Pin 4
33	SEA Switch Out	From TAC-248 Pin 14
34	"	To TAC-246 Pin 5
35	2ch Tape Switch Pin	From SOURCE Rotary Switch S3c
36	2ch Tape Pin	From 2ch Tape Terminals
37	4ch Tape Pin	To 4ch Tape Terminals
38		
39	2ch Tape Switch Pin	From SOURCE Rotary Switch S3d
40	2ch Tape Switch Pin	From 2ch Tape Terminals
41	4ch Tape Switch Pin	From Volume R6 Pin 2
42	2ch Tape Switch Pin	To FUNCTION Switch S4a
43	"	To FUNCTION Switch S4c
44	4ch Tape Switch Pin	To Volume R6 Pin 1
45	High Cut Switch Pin	To TAC-251 Pin 14
46	"	" Pin 18
47	"	" Pin 13
48	"	" Pin 15
49	4ch Tape Switch Pin	To 4ch Tape Terminals
50	"	From 4ch Tape Terminals

Pin No.	Pin Name	Connection
51	4ch Tape Switch Pin	To Volume R5 Pin 1
52	"	From FUNCTION Switch S4e
53	"	From FUNCTION Switch S4f
54	High Cut Switch Pin	To TAC-251 Pin 14
55	"	" Pin 13
56	"	" Pin 4
57	"	" Pin 5
58	"	" Pin 18
59	"	" Pin 15
60	"	" Pin 1
61	"	" Pin 3
62	Low Cut Switch Pin	" Pin 7
63	"	" Pin 6
64	"	" Pin 11
65	"	" Pin 12
66	"	" Pin 11
67		
68	Low Cut Switch Pin	To TAC-251 Pin 7
69	"	" Pin 6
70	Reverse Switch Pin	To Pre-out Terminal (Ch-2)
71	Remote Switch Pin	To 8P. Plug Pin 7
72		
73	Remote Switch Pin	To 8P. Plug Pin 1
74	"	To 8P. Plug Pin 6
75	"	To 8P. Plug Pin 3
76	Low Cut Switch Pin	To TAC-251 Pin 12
77	Reverse Switch Pin	To Pre-out Terminal CH-1
78	"	" CH-4
79	"	" CH-2
80	Remote Switch Pin	To 8P. Plug Pin 2
81	"	To 8P. Plug Pin 4
82		
83	Remote Switch Pin	To 8P. Plug Pin 5
84		
85	Remote Switch Pin	To 8P. Plug Pin 8

### THE LIST OF MAIN PARTS FOR REPLACEMENT

No.	Parts No.	Parts Name	Description
1	TAC-243	Circuit Board Ass'y	
2	QSP0221-001	Push Switch Ass'y	4-4 Circuit
3	QSP0221-002	"	4-8 "
4	QSP0221-003	"	4-2 "
5	QSP0221-004	"	2-2 "

TAC-244 SPEAKER SELECT CIRCUIT BOARD ASS'Y

(TOP VIEW)

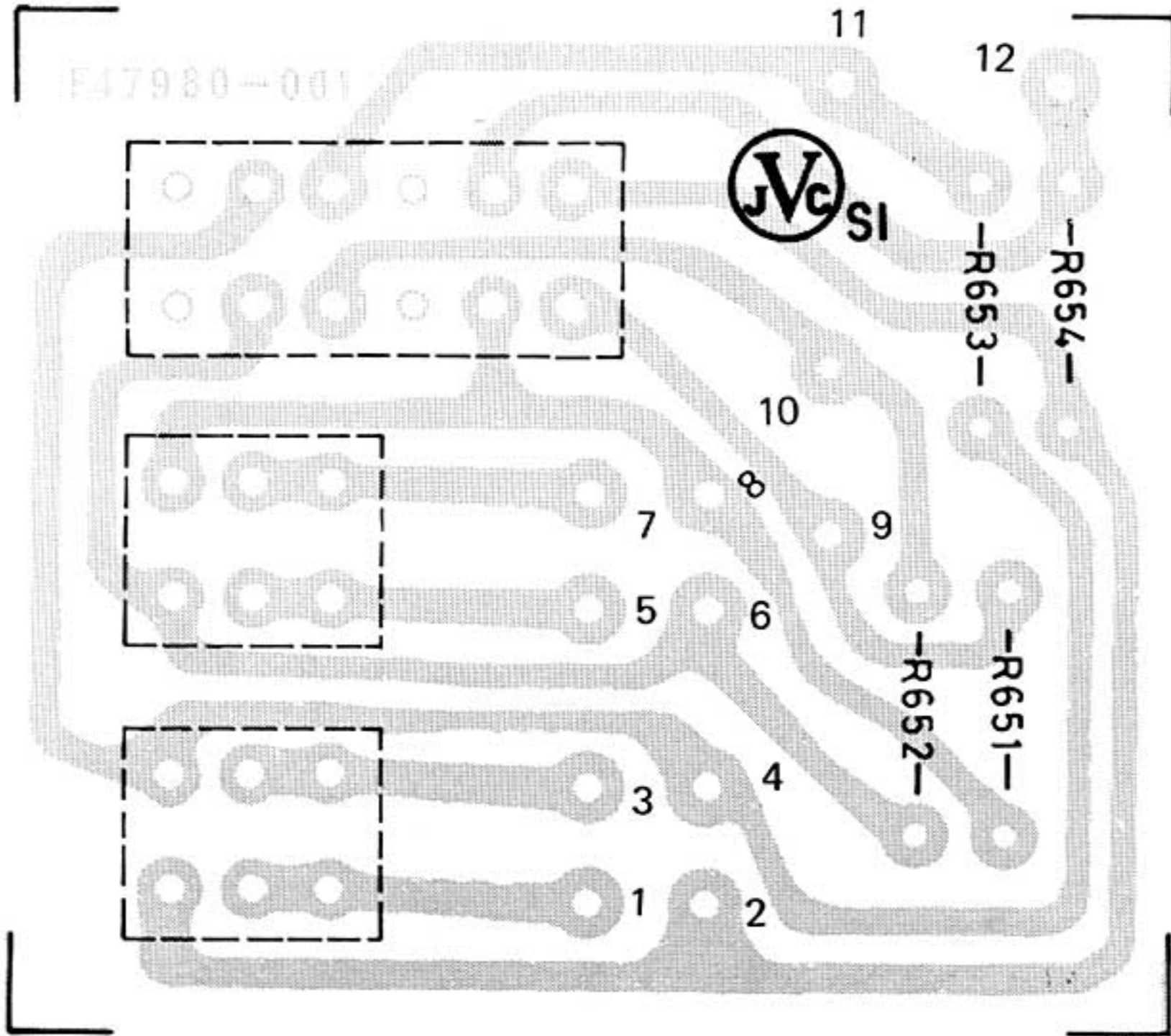


Fig. 18

TAC-244 SPEAKER SELECT CIRCUIT BOARD ASS'Y

(BOTTOM VIEW)

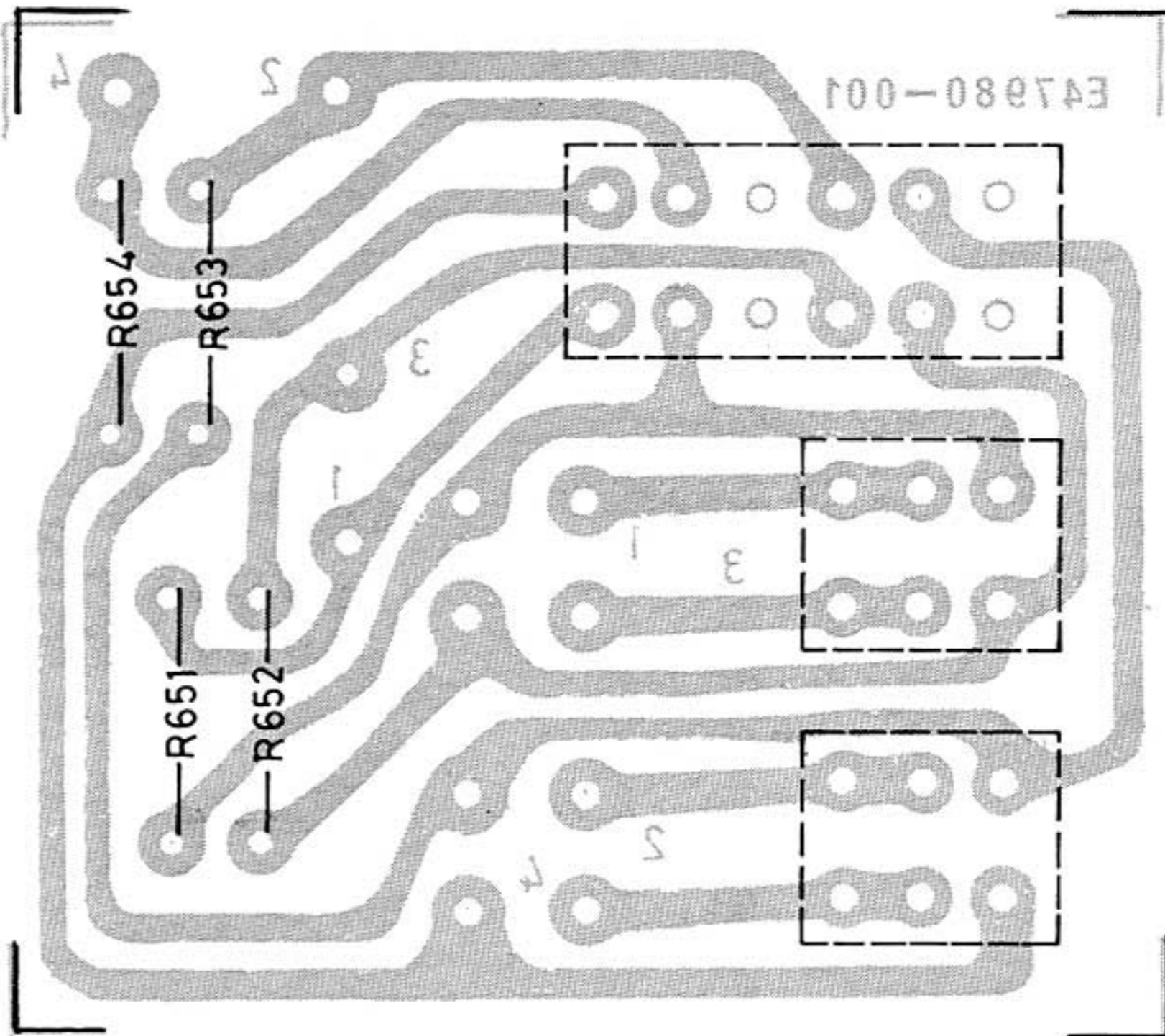


Fig. 19

**WIRE CONNECTION** (Fig. 18, 19)

Pin No.	Pin Name	Connection
1	Channel 4 Switch Out	To Speaker Terminal
2	"	From TAC-280 Pin 16
3	Channel 2 Switch Out	To Speaker Terminal
4	"	From TAC-280 Pin 14
5	Channel 3 Switch Out	To Speaker Terminal
6	"	From TAC-280 Pin 12
7	Channel 1 Switch Out	To Speaker Terminal
8	"	From TAC-280 Pin 10
9	Meter Output	To TAC-250
10	"	"
11	"	"
12	"	"

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-244	Circuit Board Ass'y	
2	QSP0233-001	Push Switch Ass'y	

TAC-245 MUTING CIRCUIT BOARD ASS'Y

(TOP VIEW)

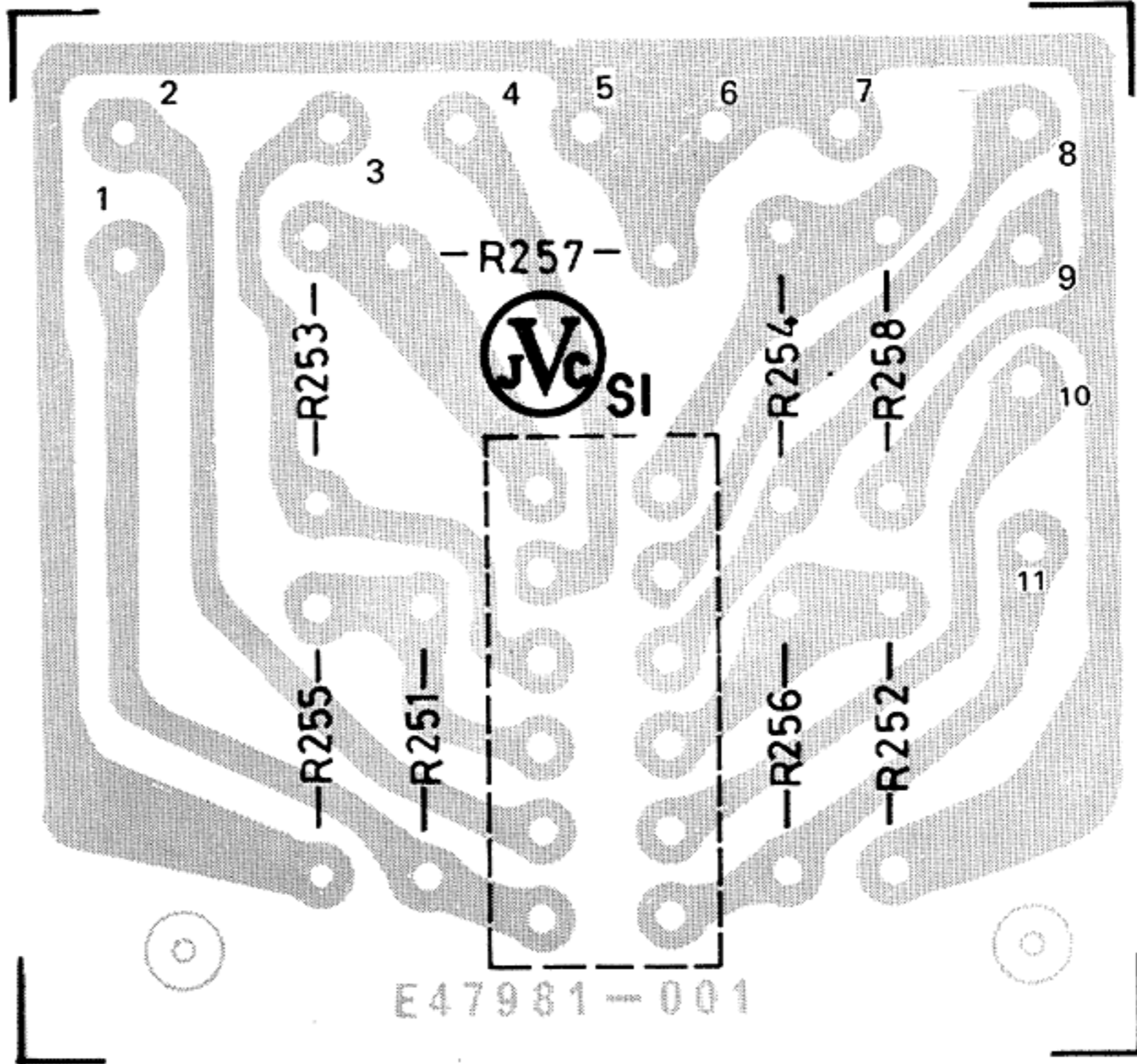


Fig. 20

TAC-245 MUTING CIRCUIT BOARD ASS'Y

(BOTTOM VIEW)

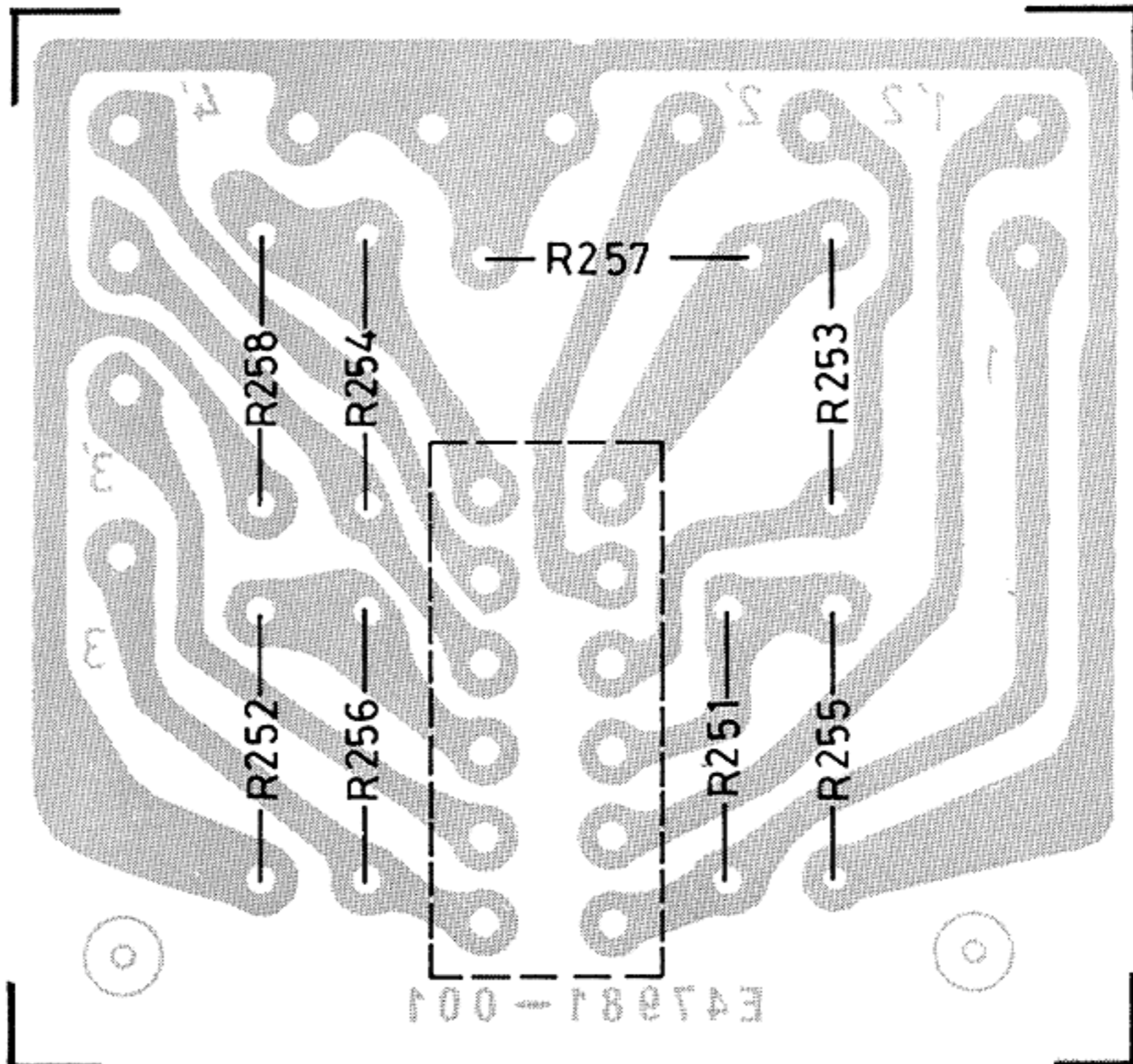


Fig. 21

**WIRE CONNECTION** (Fig. 20, 21)

No.	Pin Name	Connection
1	Muting Input	From Volume R3 Pin 2
2	Muting Output	To Volume R20a Pin 1
3	Muting Input	From Volume R5 Pin 2
4	Muting Output	To Volume R20c Pin 1
5	Earth	
6	Earth	
7	Earth	
8	Muting Output	To Volume R20d Pin 1
9	Muting Input	From Volume R6 Pin 2
10	Muting Input	From Volume R4 Pin 2
11	Muting Output	To Volume R20b Pin 1

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-245	Circuit Board Ass'y	
2	Q30510-001	Push Switch Ass'y	

**TAC-246 SEA CONTROL CIRCUIT BOARD ASS'Y**

(TOP VIEW)

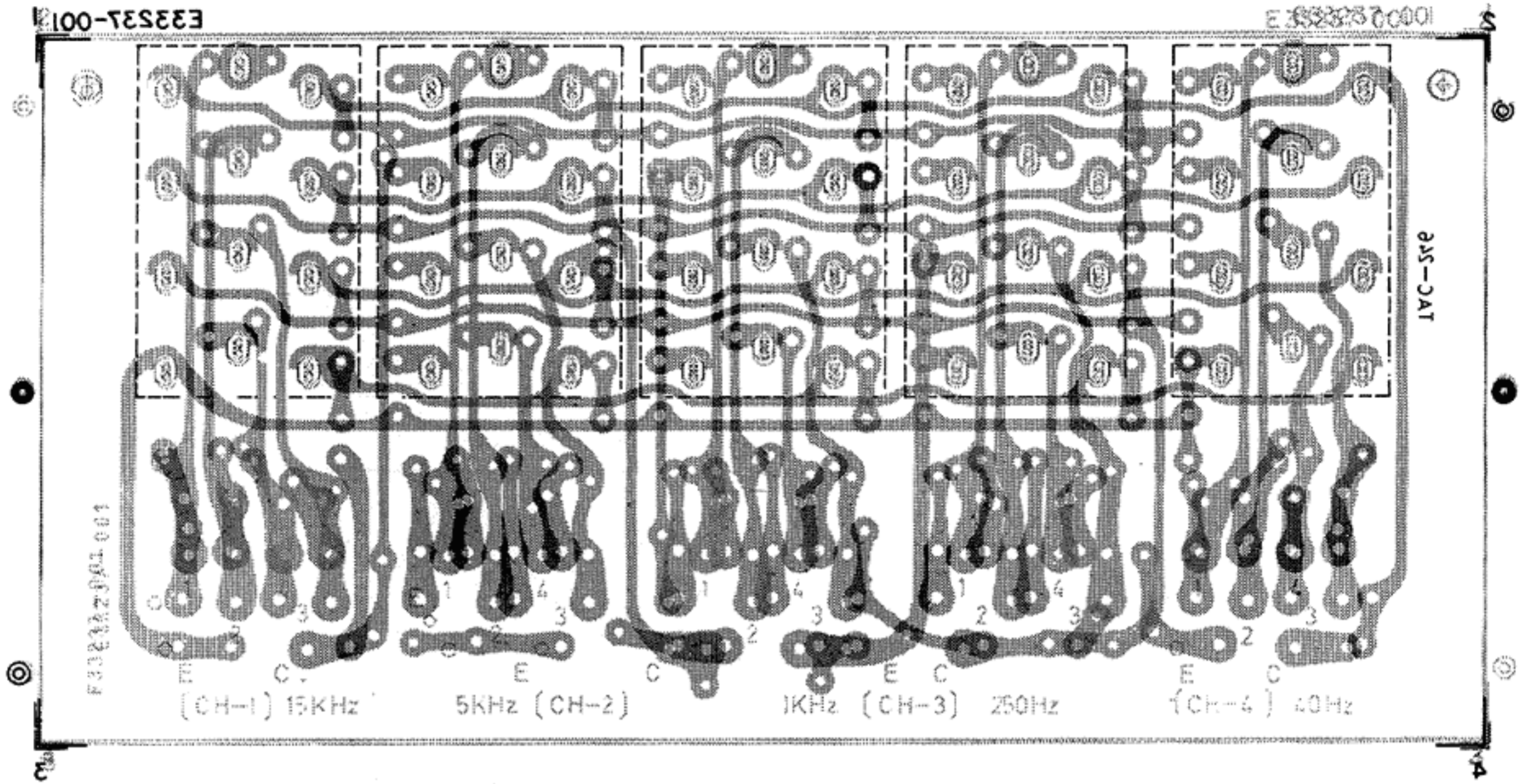


Fig. 22

**TAC-246 SEA CONTROL CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

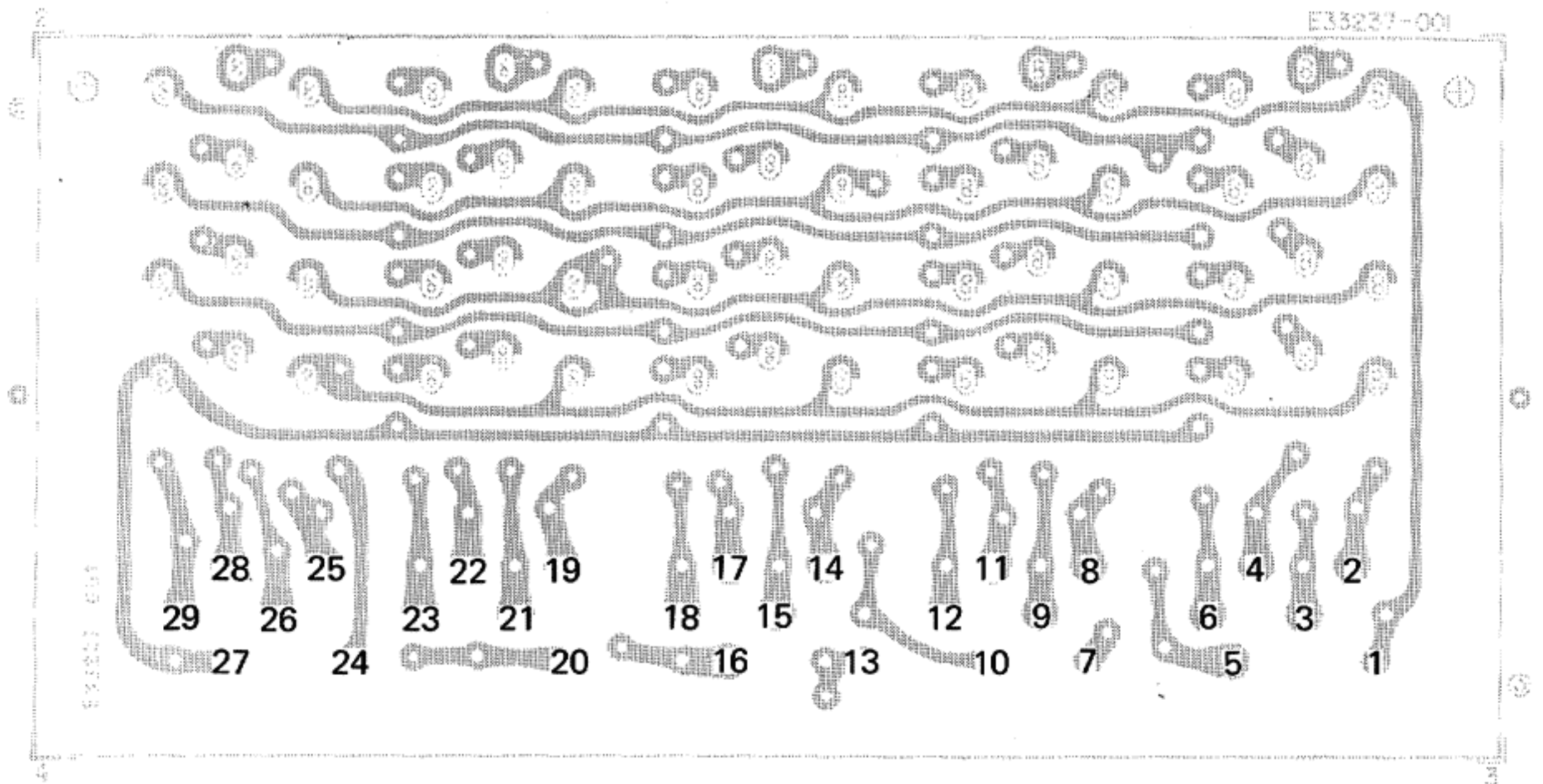


Fig. 23



**WIRE CONNECTION** (Fig. 22, 23)

Pin No.	Pin Name	Connection
1	Volume Pin-1 out	From TAC-243 S9b
2	SEA Control out	To TAC-247 Pin 13
3	"	" Pin 14
4	"	" Pin 13
5	Volume Pin-3 out	From TAC-243 S9a
6	SEA Control out	To TAC-247 Pin 14
7	Earth	
8	SEA Control out	To TAC-247 Pin 10
9	"	" Pin 11
10	Volume Pin-3 out	From TAC-243 S9J
11	SEA Control out	To TAC-247 Pin 10
12	"	" Pin 11
13	Volume Pin-1 out	From TAC-243 S9e
14	SEA Control out	To TAC-247 Pin 7
15	"	" Pin 8
16	Volume Pin-3 out	From TAC-243 S9c
17	SEA Control out	To TAC-247 Pin 7
18	"	" Pin 8
19	"	" Pin 4
20	Volume Pin-1 out	From TAC-243 S9d
21	SEA Control out	To TAC-247 Pin 5
22	"	" Pin 4
23	"	" Pin 5
24	Volume Pin-3 out	From TAC-213 S9g
25	SEA Control out	To TAC-247 Pin 2
26	"	" Pin 3
27	Volume Pin-1 out	From TAC-243 S9h
28	SEA Control out	To TAC-247 Pin 2
29	"	" Pin 3

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-246	Circuit Board Ass'y	
2	E03412-002	Variable Resistor	R301~328

TAC-248 SEA AMPLIFIER CIRCUIT BOARD ASS'Y

(TOP VIEW)

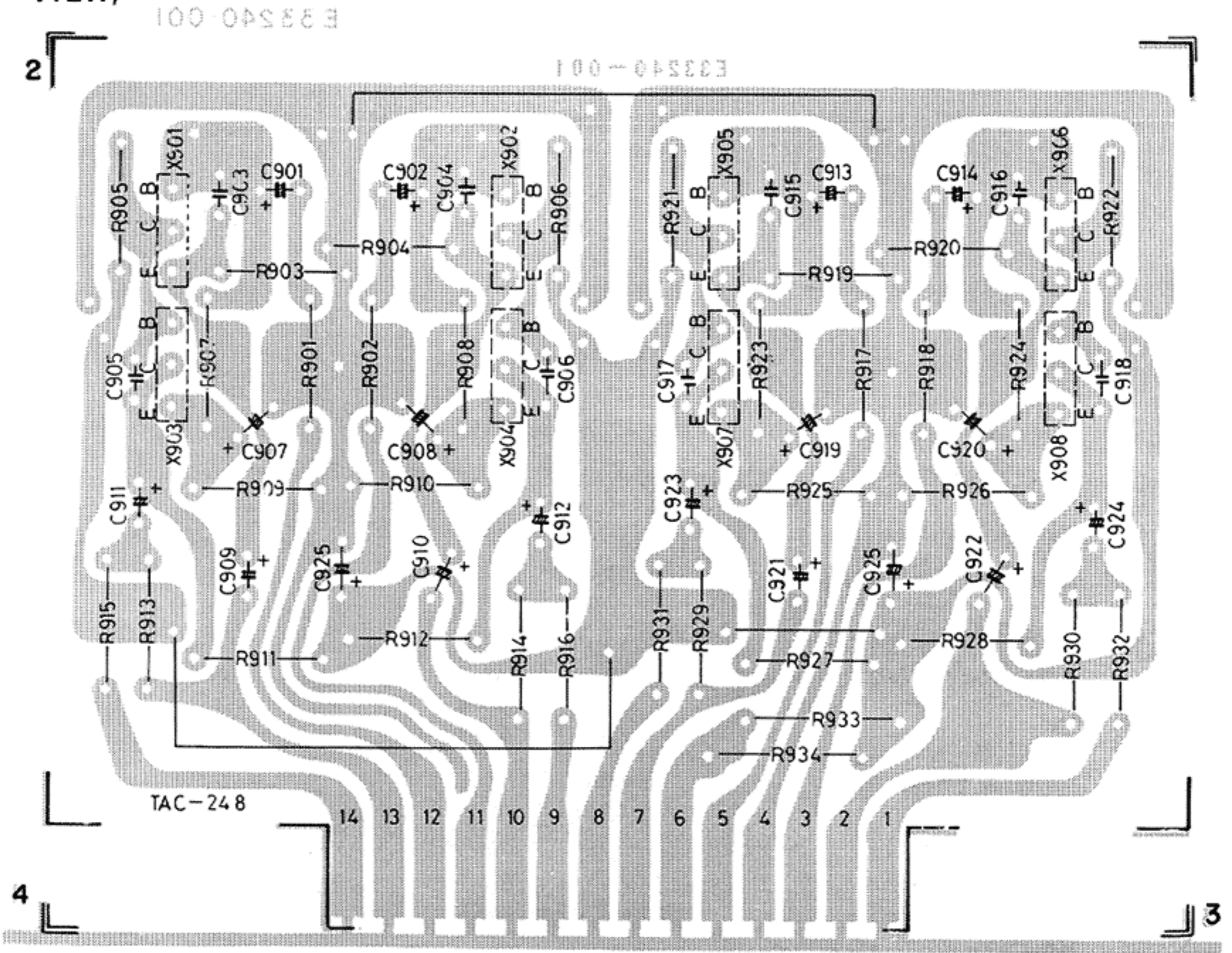


Fig. 24

TAC-248 SEA AMPLIFIER CIRCUIT BOARD ASS'Y

(BOTTOM VIEW)

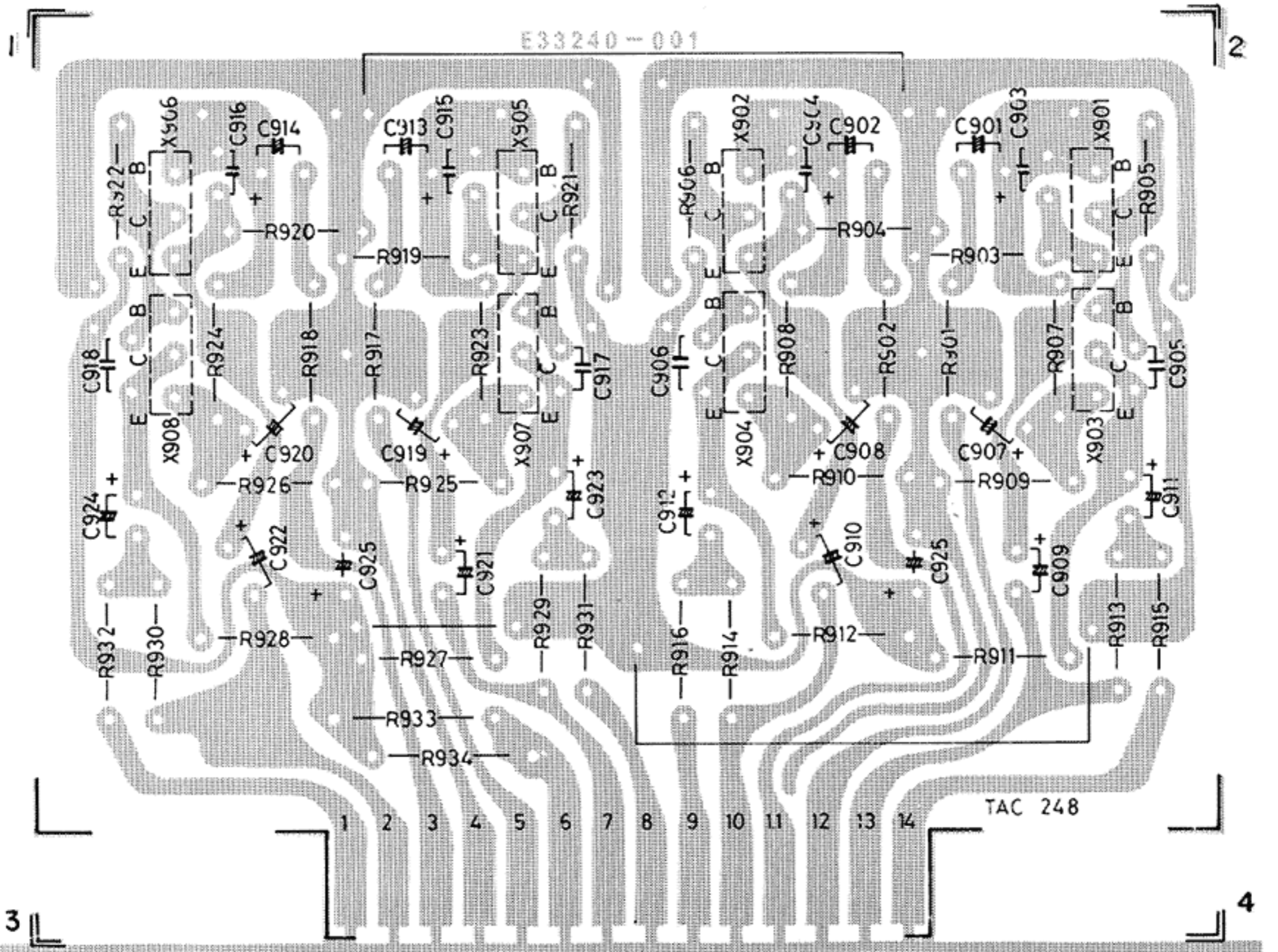


Fig. 25

WIRE CONNECTION (Fig. 24, 25)

Pin No.	Pin Name	Connection
1	Collector out Pin	To TAC-243 SEA Switch
2	Emitter	"
3	SEA Amp. Input Pin	From Volume R20d Pin 2
4	Earth	
5	SEA Amp. Input Pin	From Volume R20b Pin 2
6	B+	To TAP-173 Pin 7
7	Emitter Out Pin	To TAC-243 SEA Switch
8	Collector Out Pin	"
9	"	"
10	Emitter Out Pin	"
11	SEA Amp. Input Pin	From Volume R20c Pin 2
12	"	" R20a Pin 2
13	Emitter Out Pin	To TAC-243 SEA Switch
14	Collector Out Pin	"

THE LIST OF MAIN PARTS FOR REPLACEMENT

No.	Parts No.	Parts Name	Description
1	TAC-248	Circuit Board Ass'y	
2	2SC458ALGC	Si. Transistor (Hitachi)	X901~908

TAC-250 METER CONTROL CIRCUIT BOARD ASS'Y

(TOP VIEW)

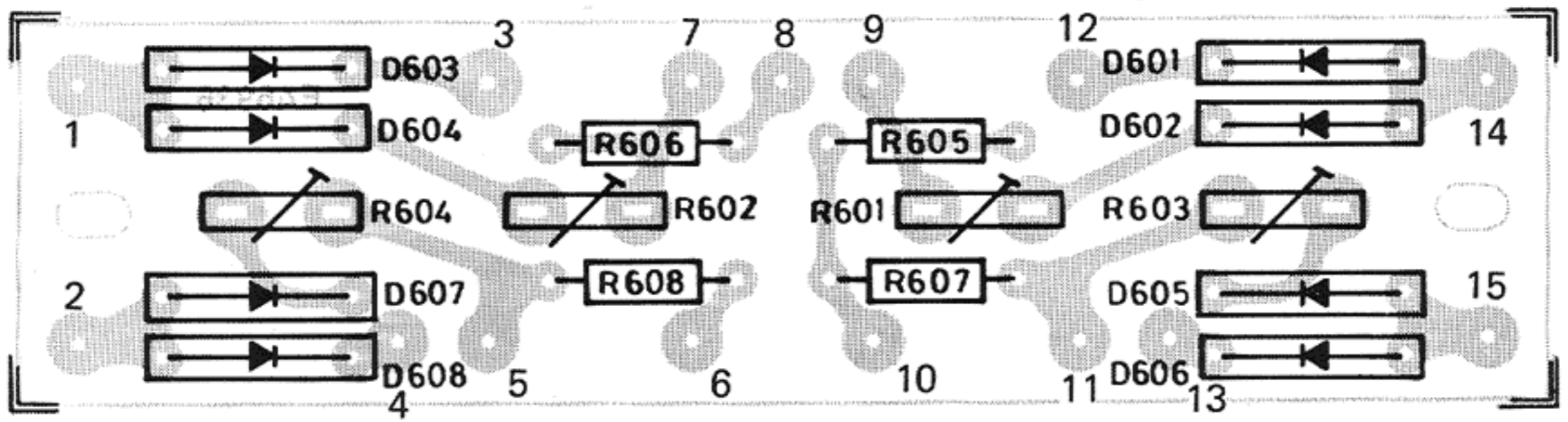


Fig. 26

TAC-250 METER CONTROL CIRCUIT BOARD ASS'Y

(BOTTOM VIEW)

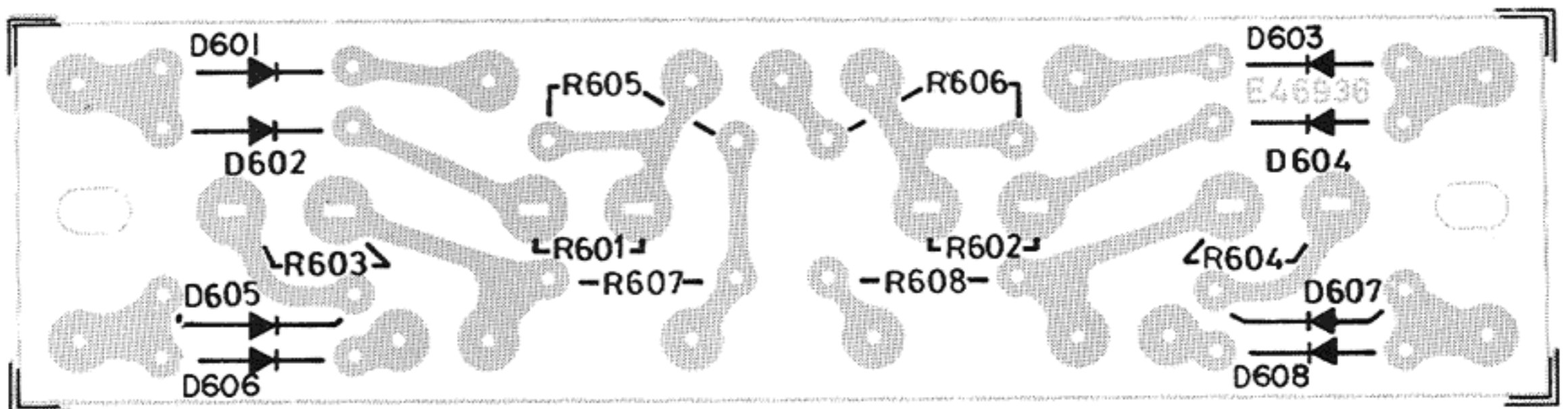


Fig. 27

**WIRE CONNECTION** (Fig. 26, 27)

Pin No.	Pin Name	Connection
1	Input Pin	From TAC-244 Select Switch
2	Input Pin	"
3	Meter Out Pin	To VU Meter (+) CH-2
4	"	" (+) CH-4
5	"	" (-) CH-4
6	Select Out Pin	To BTL Select Switch
7	Meter Out Pin	To VU Meter (-) CH-2
8	Select Out Pin	To BTL Select Switch
9	Meter Out Pin	To Meter (-) CH-1
10	Earth	
11	Meter Out Pin	To Meter (-) CH-3
12	"	To Meter (+) CH-1
13	"	To Meter (+) CH-3
14	Input Pin	From TAC-244 Select Switch
15	"	"

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-250	Circuit Board Ass'y	
2	Q04843-4	Variable Resistor	R601~604
3	1N34A	Diode (Hitachi)	D601~608

**TAD-112 DRIVER AMPLIFIER CIRCUIT BOARD ASS'Y**

(TOP VIEW)

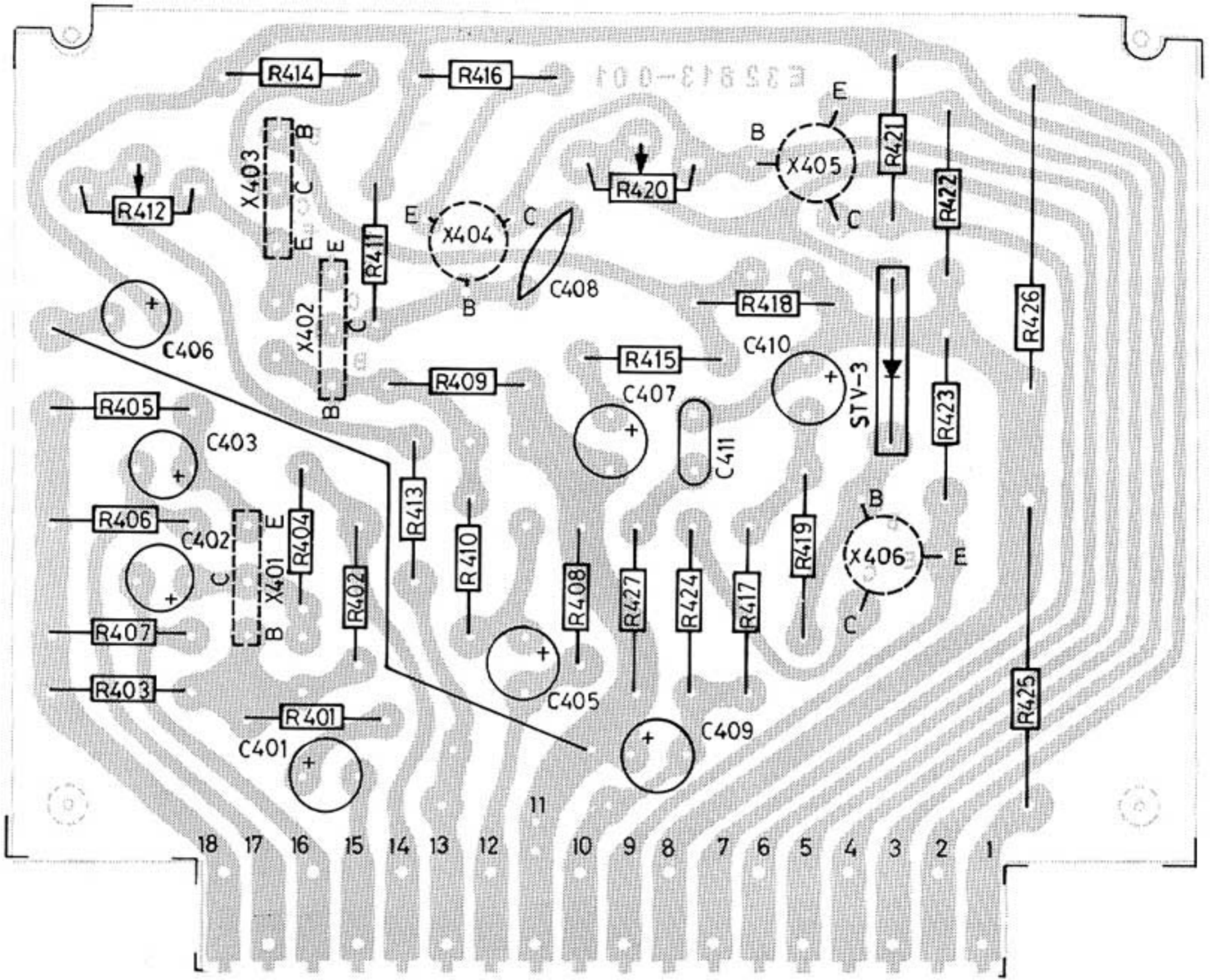


Fig. 28

**TAD-112 DRIVER AMPLIFIER CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

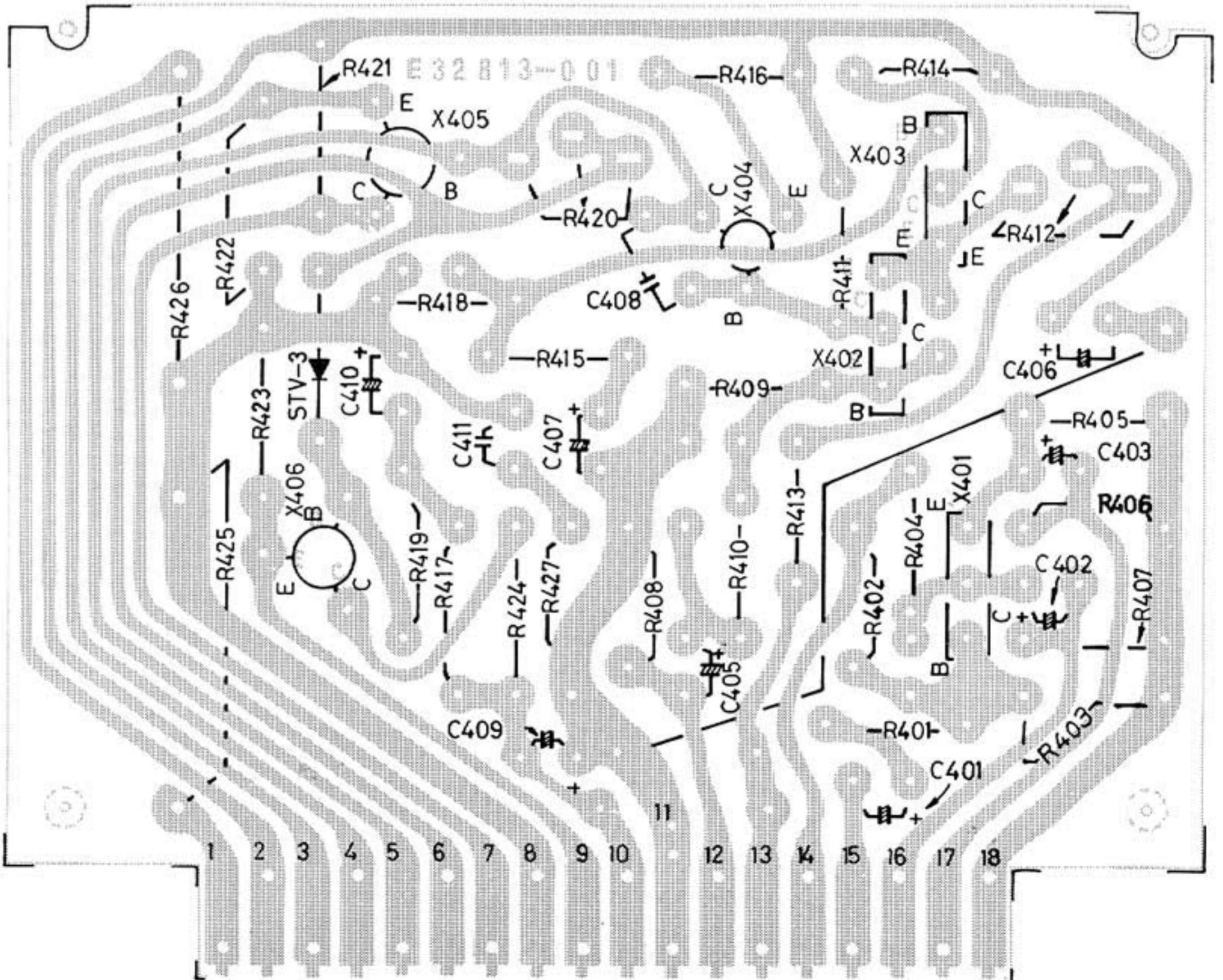


Fig. 29

**WIRE CONNECTION** (Fig. 28, 29 )

Pin No.	Socket Pin Name	Connection
1	Driver Out Pin	To Power Transistor Emitter X1
2	"	" X2
3	B+ Pin	From Power Source +38V
4	Driver Out Pin	To Power Transistor Base X1
5	Thermistor Out	To Thermistor SDT-20
6	"	"
7	Protector Out	To TAC-280
8	Output Terminal	To TAC-244
9	Driver Output	To Power Transistor Base X2
10	B- Pin	From Power Source -38V
11	Earth	
12	Driver Input	From TAD-112 Pin 17
13	Center Control Bias Pin	From TAD-173 Pin 11
14	BTL Amp; B+	" Pin 6
15	BTL Amp. Input	From TAC-251
16	Phase Select Switch Pin	To BTL Select Switch
17	BTL Output Pin	To TAC-112 Pin 12
18	Earth	

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAD-112	Circuit Board Ass'y	
2	2SC458ALGC	Si Transistor (Hitachi)	X401
3	2SC1345	" (Hitachi)	X402,403
4	2SA607	" (NEC)	X404,406
5	2SC960	" (NEC)	X405
6	STV-3	Varistor (Sanken)	D401

**TAC-251 HIGH LOW CUT FILTER CIRCUIT BOARD ASS'Y**

(TOP VIEW)

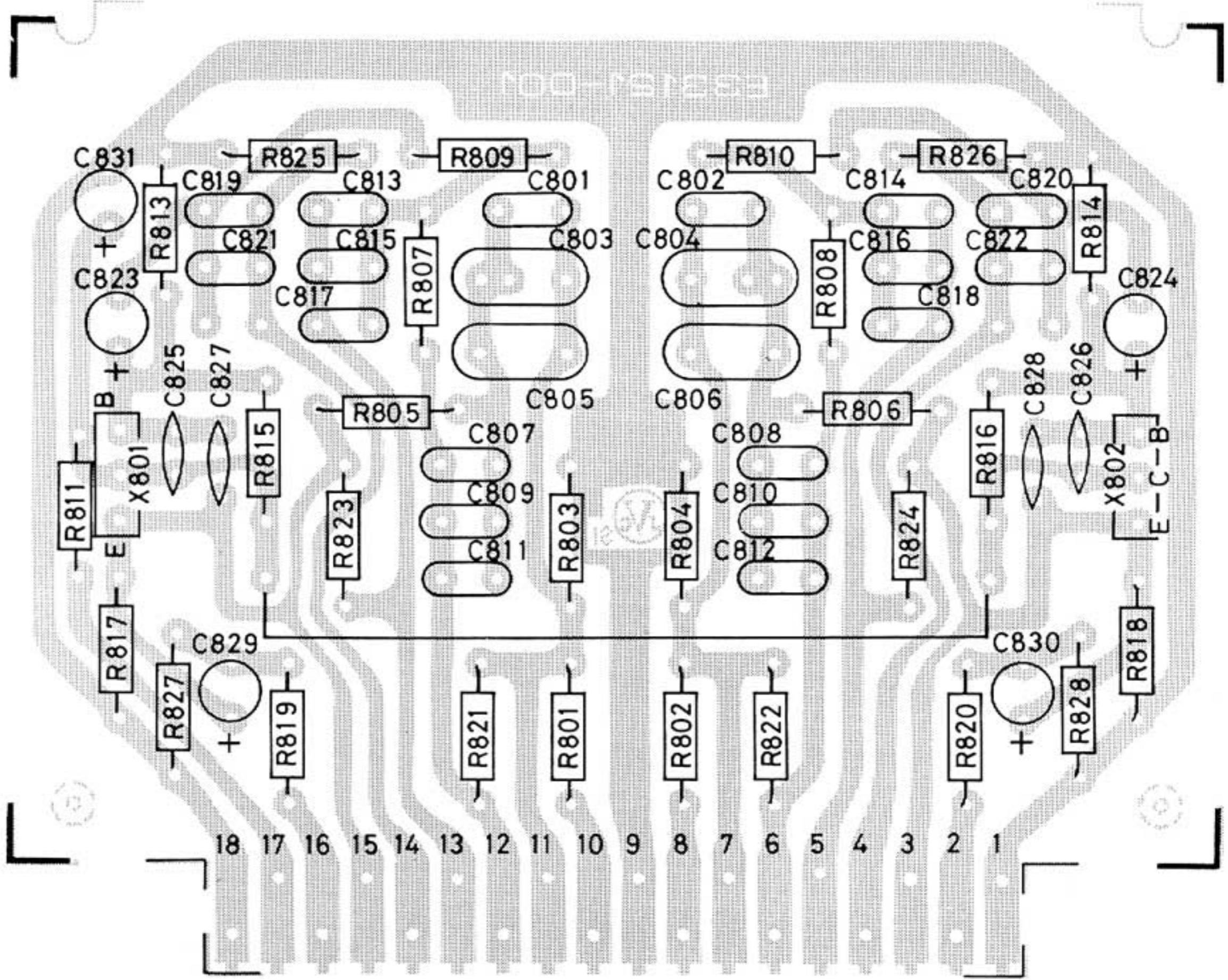


Fig. 30

**TAC-251 HIGH LOW CUT FILTER CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

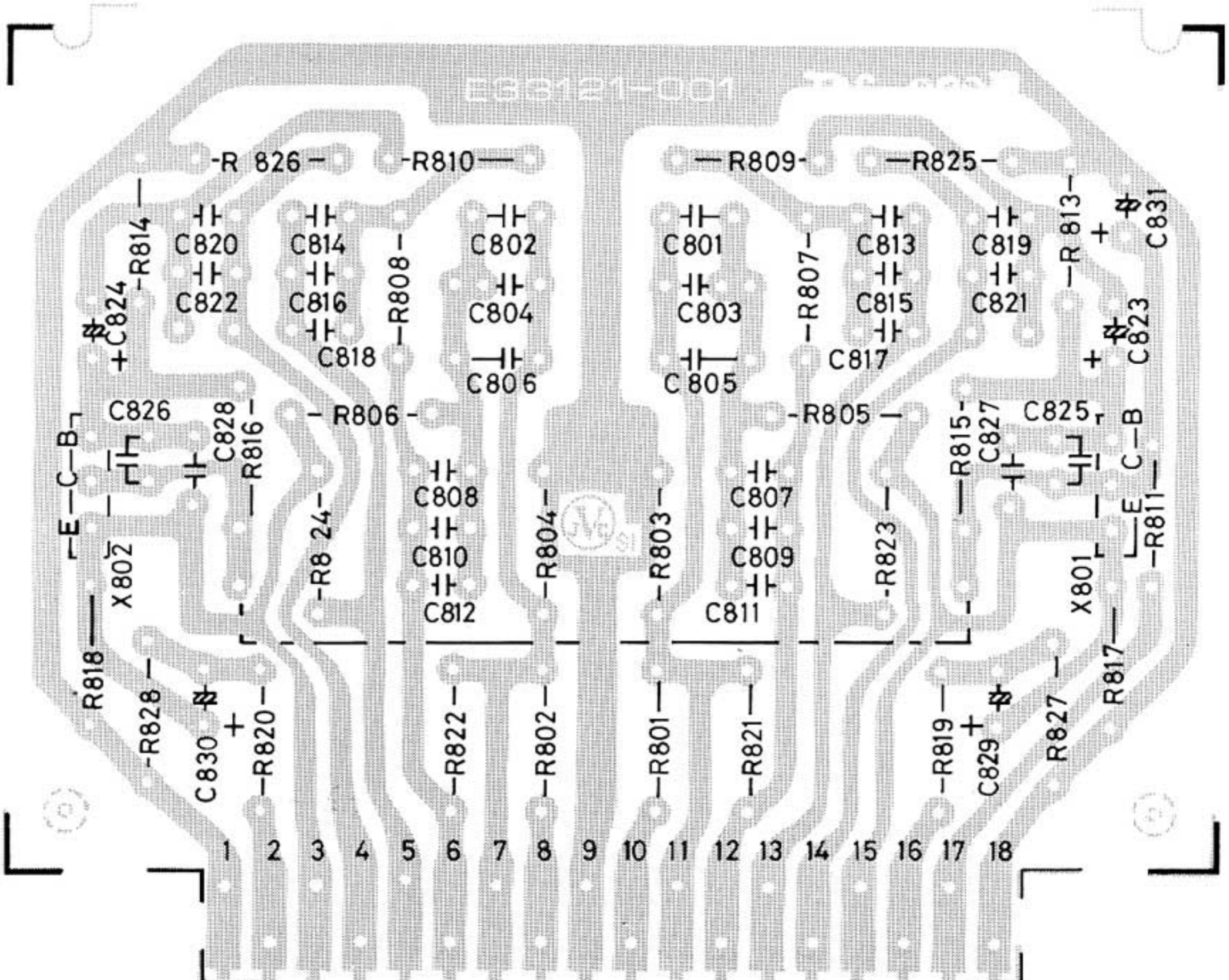


Fig. 31



**WIRE CONNECTION** (Fig. 30, 31)

Pin No.	Socket Pin Name	Connection
1	Earth	
2	Output Pin	To Driver Amp. Input
3	High Cut Switch Pin	To TAC-243 High Cut Switch
4	"	" "
5	"	" "
6	Low Cut Switch Pin	" Low Cut Switch
7	"	" "
8	Filter Amp. Input Pin	From Main-in Terminal
9	Earth	
10	Filter Amp. Input Pin	From Main-in Terminal
11	Low Cut Switch Pin	To TAC-243 Low Cut Switch
12	"	" "
13	High Cut Switch Out	" High Cut Switch
14	"	" "
15	"	" "
16	Output Pin	To Driver Amp. Input
17	B+	From TAP-173 Pin 6
18	Earth	

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAC-251	Circuit Board Ass'y	
2	2SC458ALGC	Si Transistor (Hitachi)	X801,802

**TAP-173 POWER SUPPLY CIRCUIT BOARD ASS'Y**

(TOP VIEW)

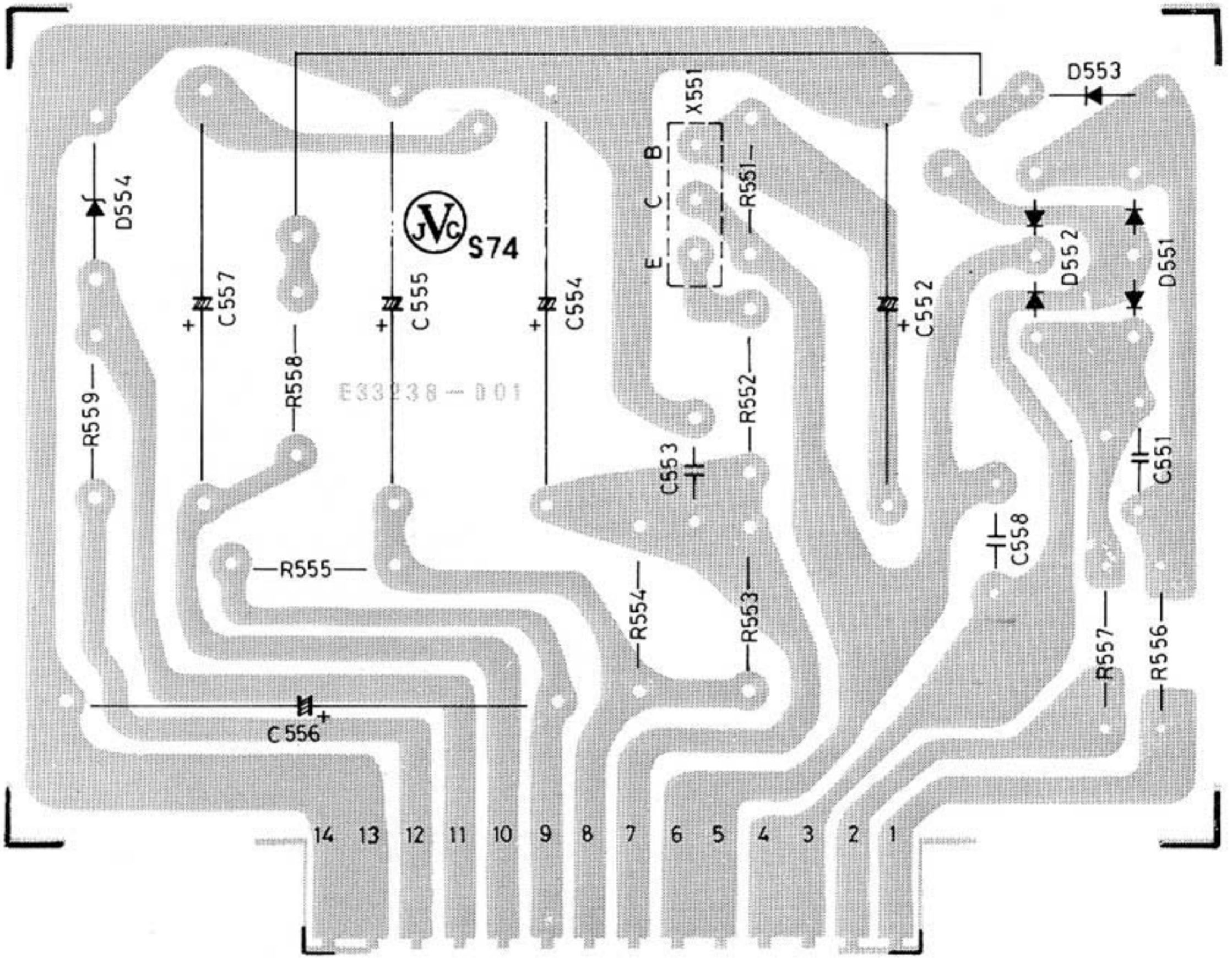


Fig. 32

**TAD-173 POWER SUPPLY CIRCUIT BOARD ASS'Y**

(BOTTOM VIEW)

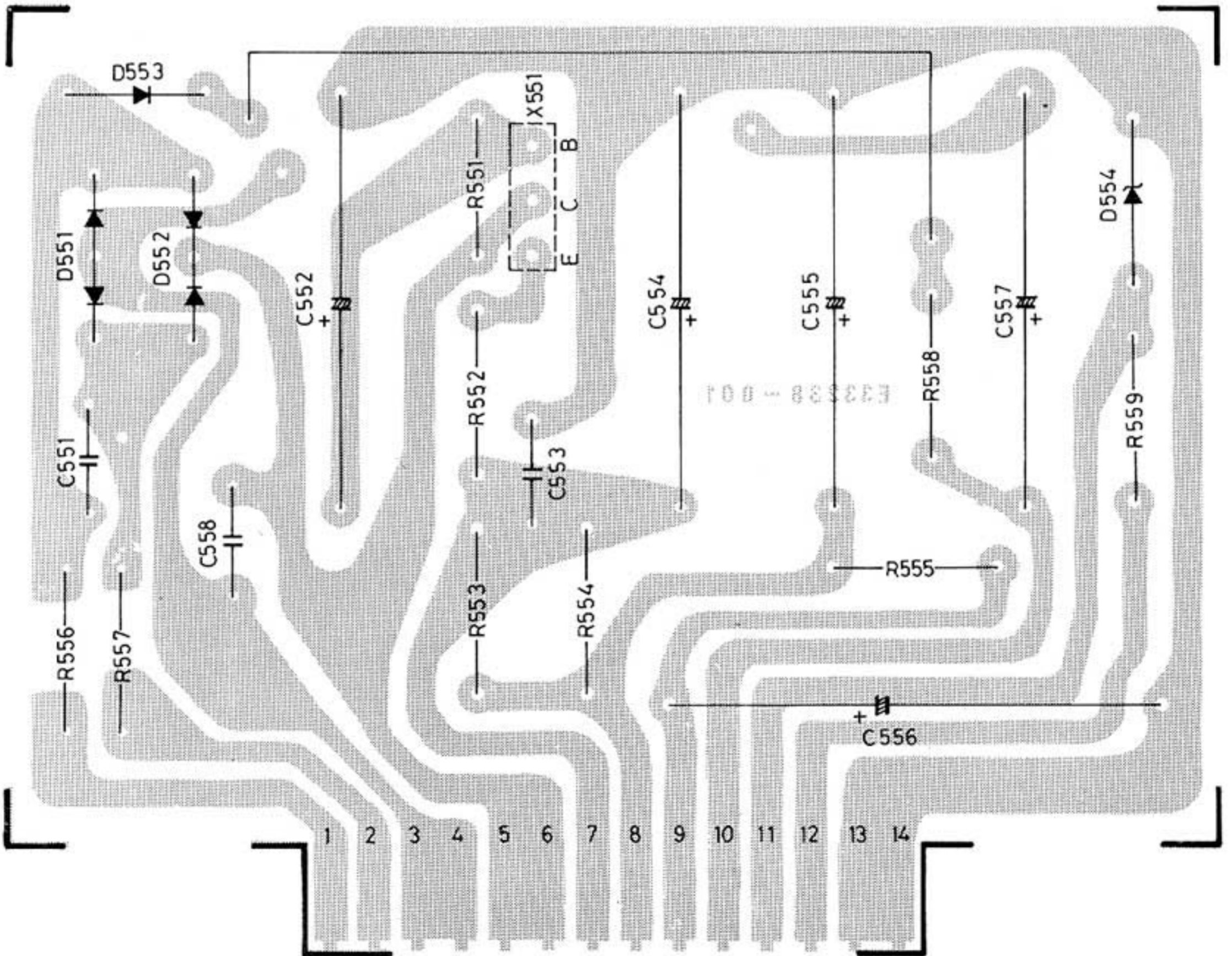


Fig. 33

**WIRE CONNECTION** (Fig. 32, 33)

Pin No.	Socket Pin Name	Connection
1	Earth	
2	"	
3	B- Input Pin	From Power Source -38V
4	Zener Output Pin	To Driver Pin 10
5	Relay B+ Out Pin	To TAC-280 Pin 5
6	B7 Out Pin	To TAC-251 Pin 17
7	B6 Out Pin	To TAC-248 Pin 6
8	B5 Out Pin	To TAE-37B Pin 3
9	B+ Out Pin	To Capacitor C5
10	"	"
11	B- (Earth)	
12	"	
13	AC Input Pin	From Power Transformer
14	"	"

**THE LIST OF MAIN PARTS FOR REPLACEMENT**

No.	Parts No.	Parts Name	Description
1	TAP-173	Circuit Board Ass'y	
2	SIB02-03C	Si Diode	(+)
3	SIB02-03CR	"	(-)
4	E0771-15	Z. Diode (JRC)	(7V)
5	2SC509Y	Si Transistor (Toshiba)	X551

## HOW TO CHECK THE CENTER VOLTAGE

## AND THE IDLING CURRENT OF POWER AMPLIFIER

NOTE : Allow the set to warm up at least to 10 minutes before you begin the following procedure.

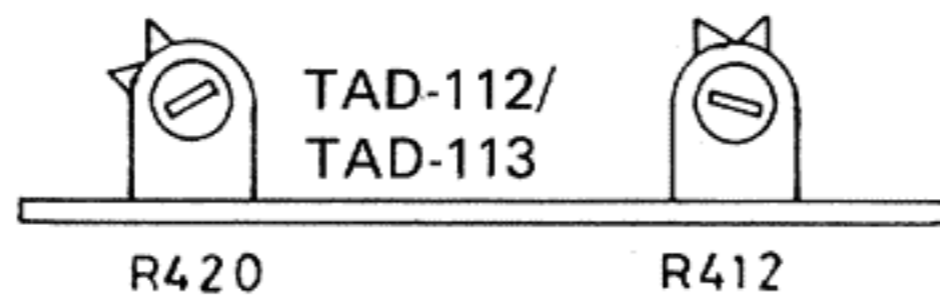


Fig. 34

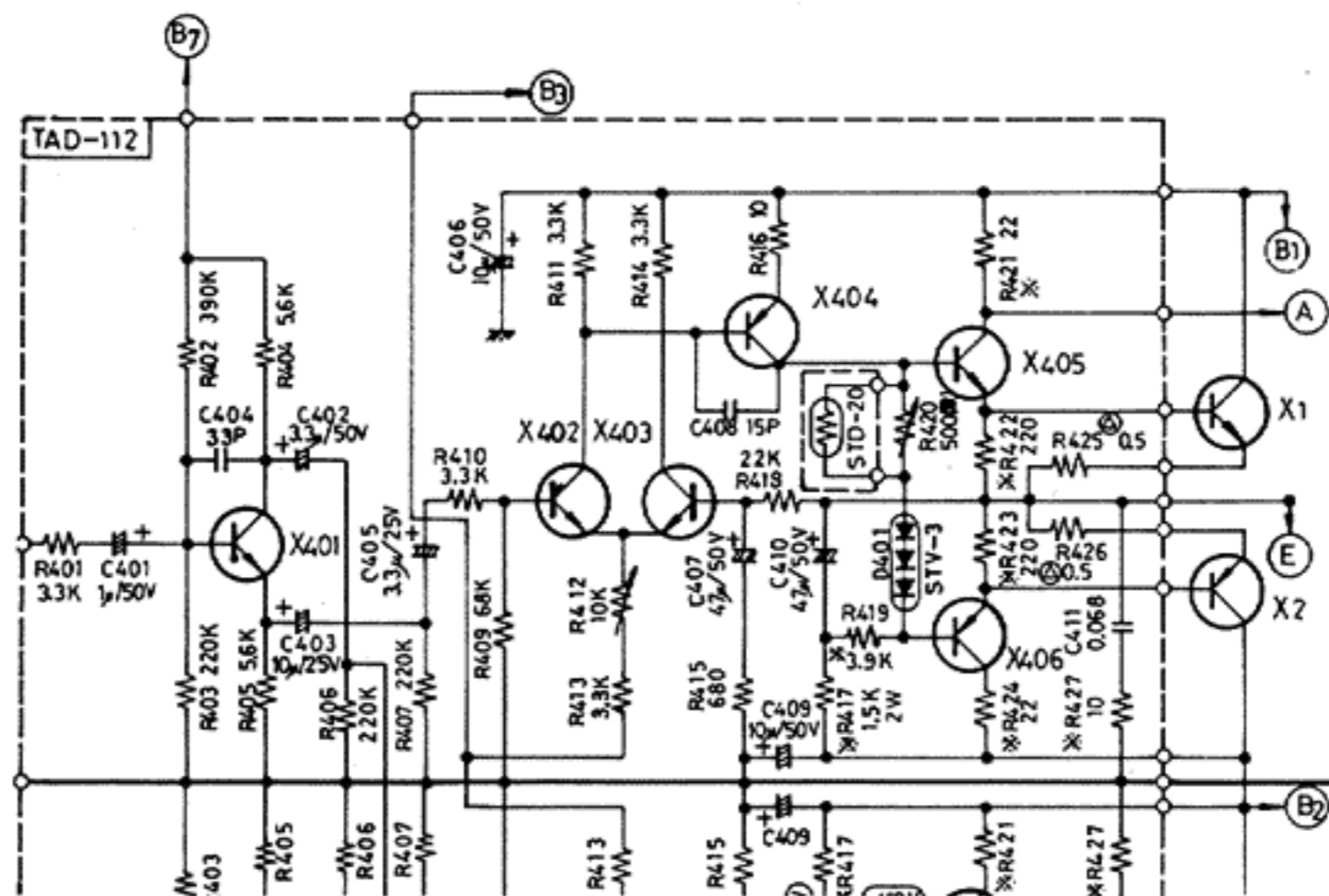


Fig. 35

Connection of a measurement instrument as shown Fig.

This circuit is the standard one of main amplifier.

\* Turn VOLUME control to minimum

- (1) Connect the probe of VTVM (D.C.) to a positive of output point. And connect the ground lead of VTVM (D.C.) to a chassis.
- (2) Insert an ammeter and a jumper wire together as shown Fig.

NOTE : After the power switch has been turned on and jumper wire has been take off, adjust the idlling current in order to protect the ammeter against being damaged by surge current.

\* Turn POWER SWITCH on

- (1) VTVM (D.C.) aught to Zero V. if VTVM (D.C.) is not Zero V adjust R412 to VTVM (D.C.) reading of zero V.
- (2) An ammeter aught to 15~20mA if an ammeter reading of volume are not 15~20mA, adjust R420 to an ammeter reading of 15~20mA.

NOTE : The adjustment of the center voltage of power amplifier should be performed before measuring the idlling current.

## USED TRANSISTORS & DIODE

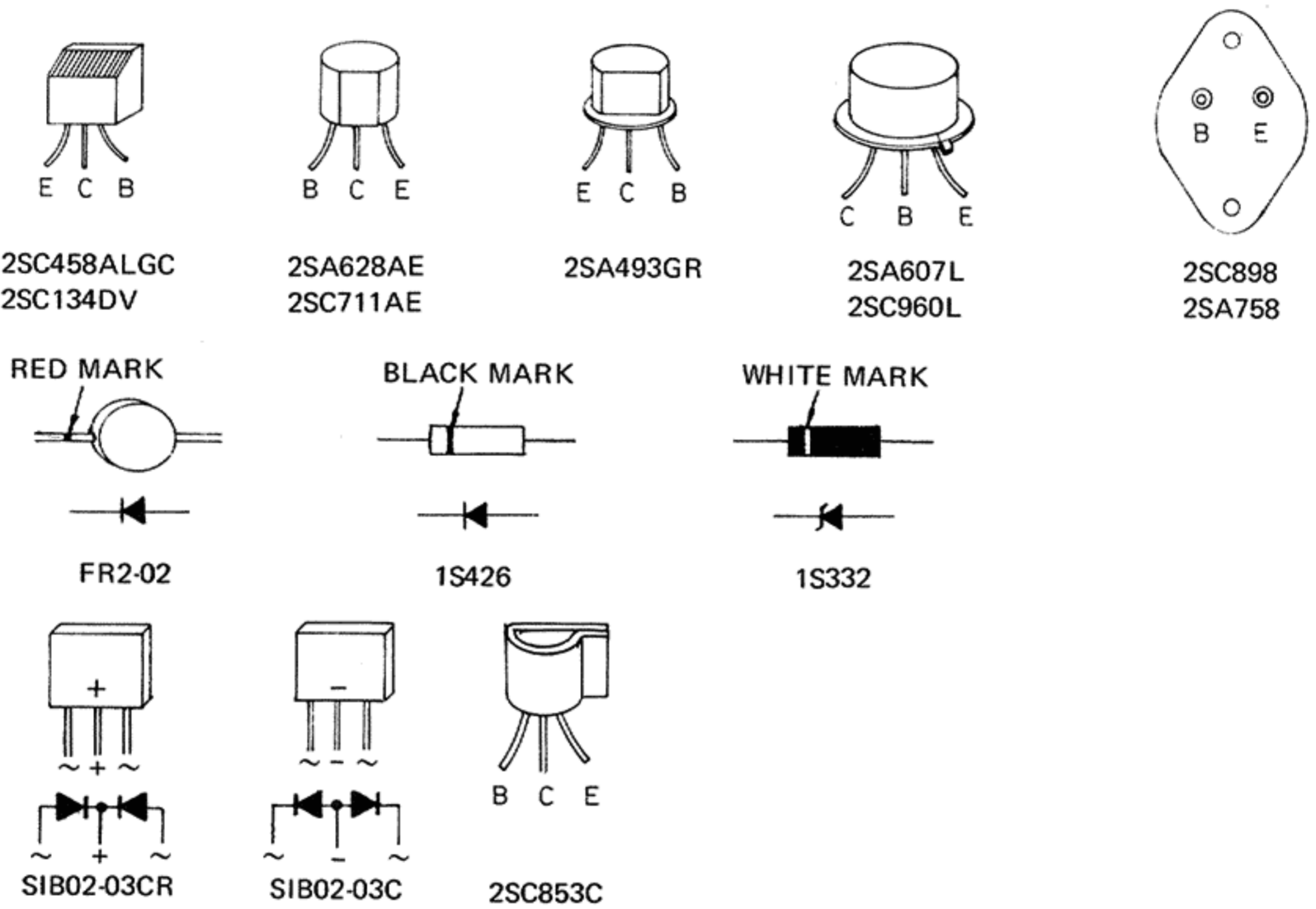


Fig. 36

## POWER TRANSFORMER VOLTAGE

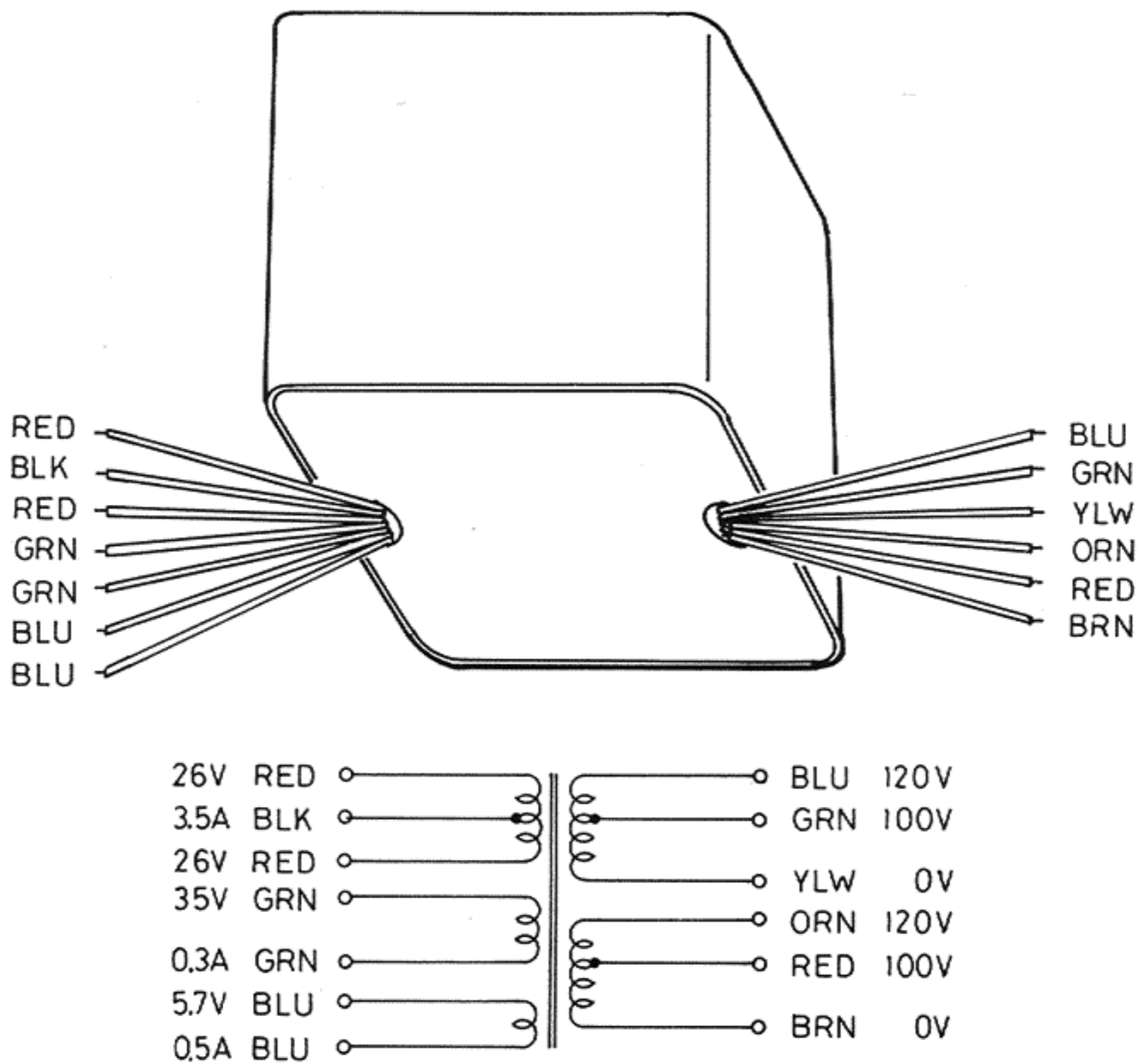


Fig. 37

## PROTECTOR ADJUSTMENT

The protector circuit doesn't operate at 4Ω load, 14V output. (All channels are driven).

Adjust the R522 in order to activate the protector circuit by grounding the speaker terminals when the output is 2 volt at 8Ω load.

And adjust R513 in order to activate the protector circuit by applying DC 0.25 volt to point "A".

## VU METER control adjustment

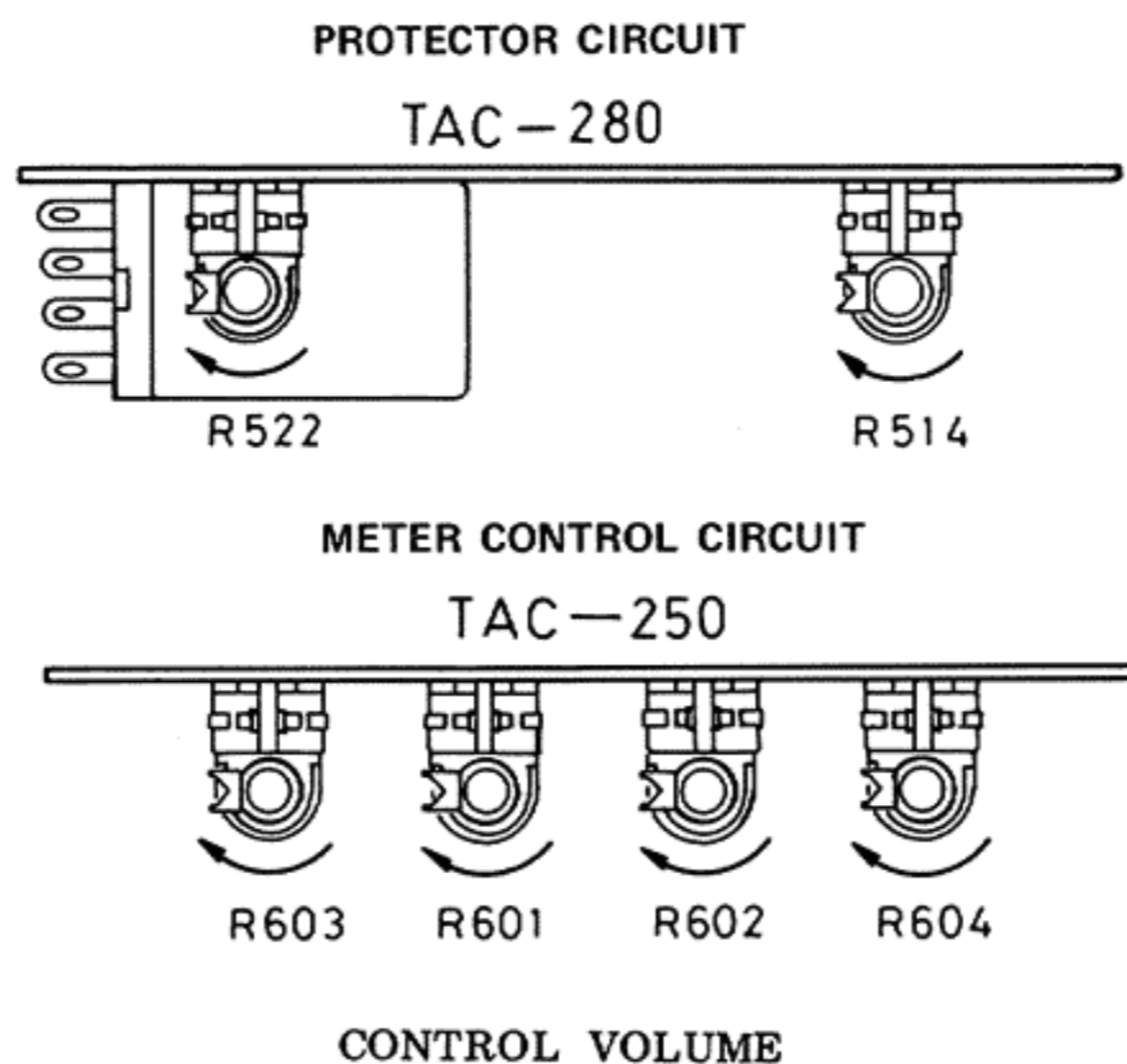


Fig. 38

1. Connect the 8Ω Dummy load to the speaker terminals.
2. Add "1kHz" to the power amplifiers terminals (Main in) Simultaneously on all channels.
3. Set the meter level switch on the "high" position.
4. Control the input signal in order to take the output of 3V at the speaker terminals and turn the "VR601~604" to the left or right so that meters should point out "0" VU.

## FUNCTION ROTARY SWITCH

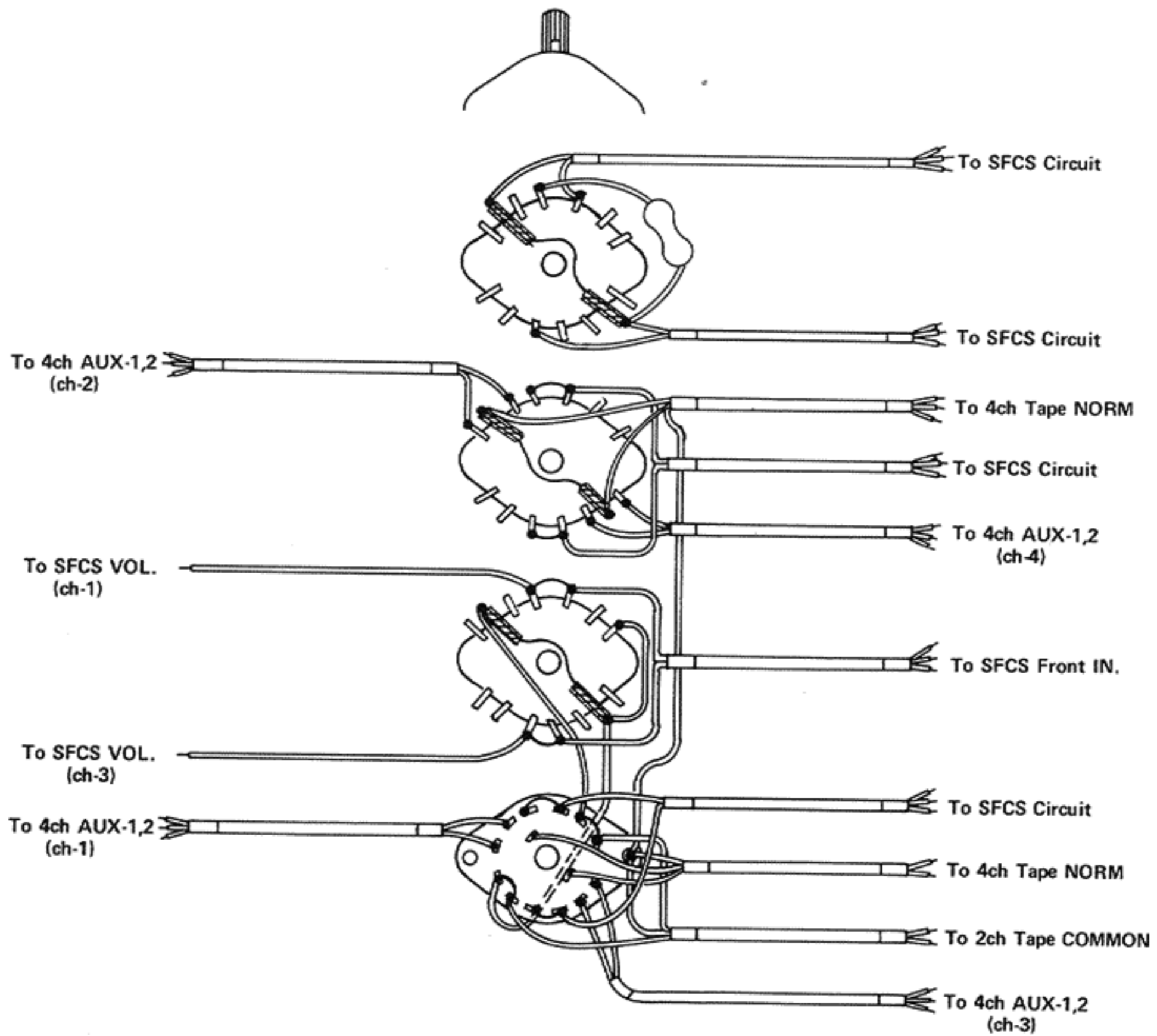


Fig. 39

## SOURCE ROTARY SWITCH

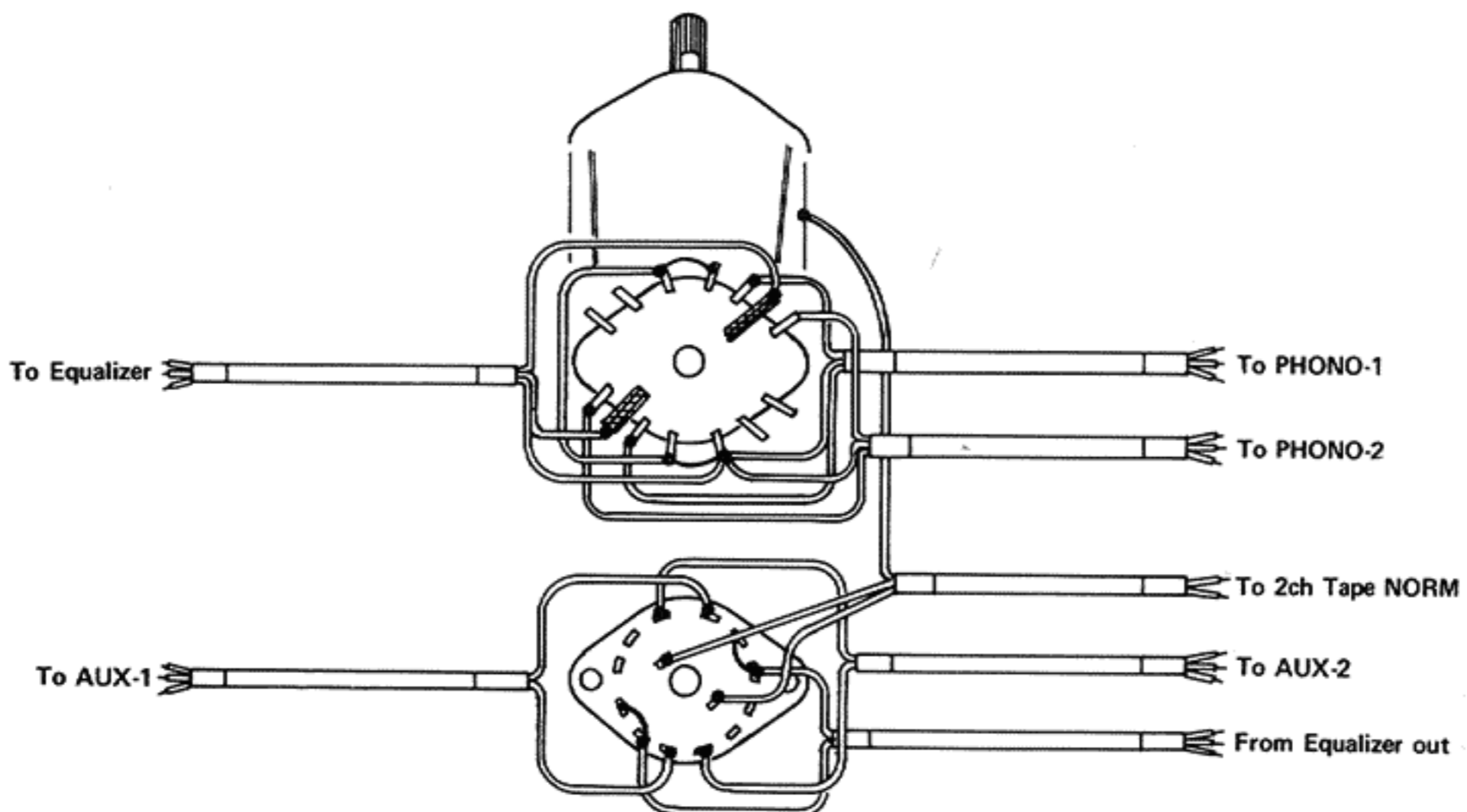


Fig. 40

## CHECK POINT AFTER REPAIR

Please make sure of the following respect when repair was completed.

1. Normal gain and output are obtained.
2. Booth high low range of audio frequency are not decreased exceptionally.
3. Normal fuse used 100~120V

## ACCESSORIES

E30580-337A	INSTRUCTION BOOK
QMF61M1-5R0	FUSE (125V, 5A)
E64208-001	ENVELOPE
E64213-002	WARRANTY CARD
E30539-339A	SCHEMATIC DIAGRAM
E64103-001	POLISHING CLOTH
BT-10001	SERVICE STATION LIST
E64207-001	ENVELOPE

**JVC AMERICA, INC.**

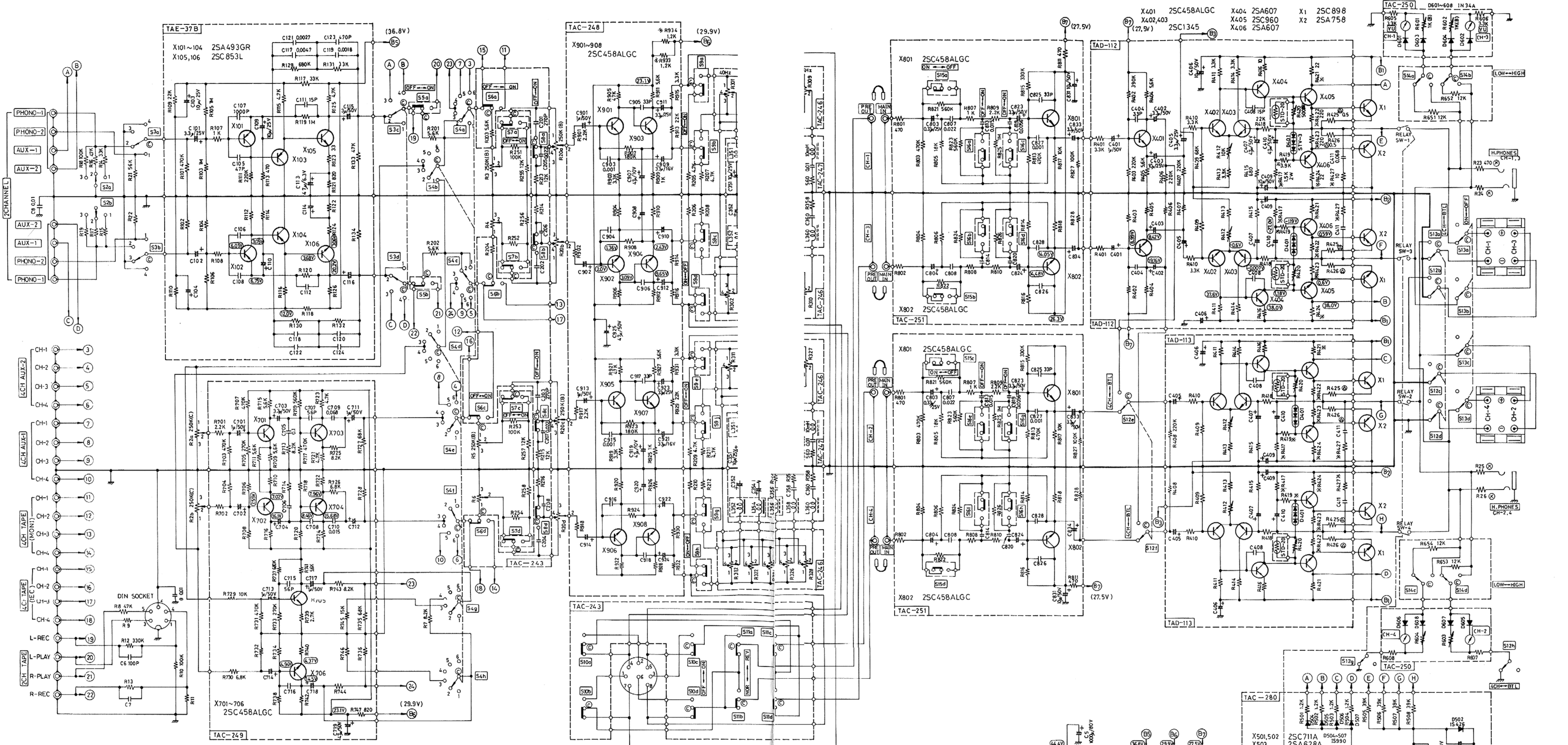
**50-35, 56th Road, Maspeth**

**New York, N. Y. 11378**

**Manufactured by**

**Victor Company of Japan, Limited**

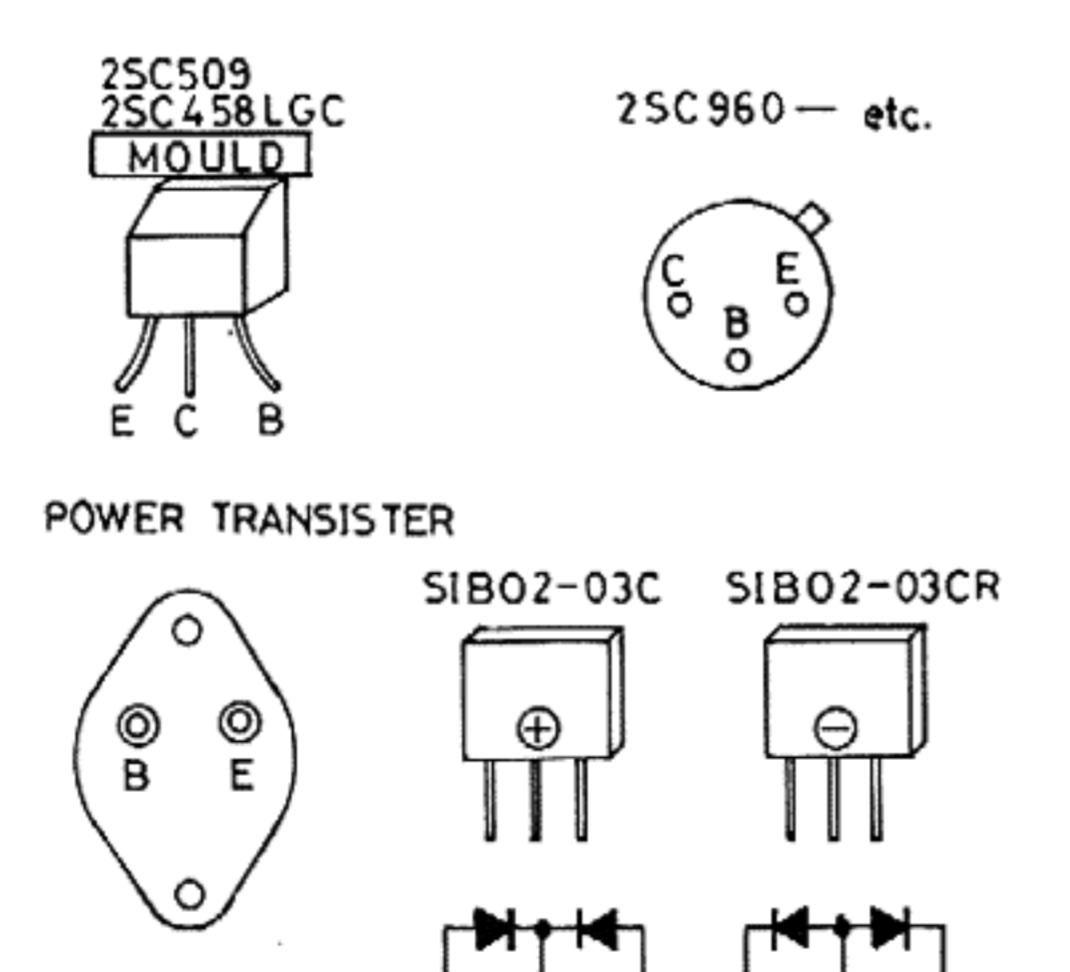




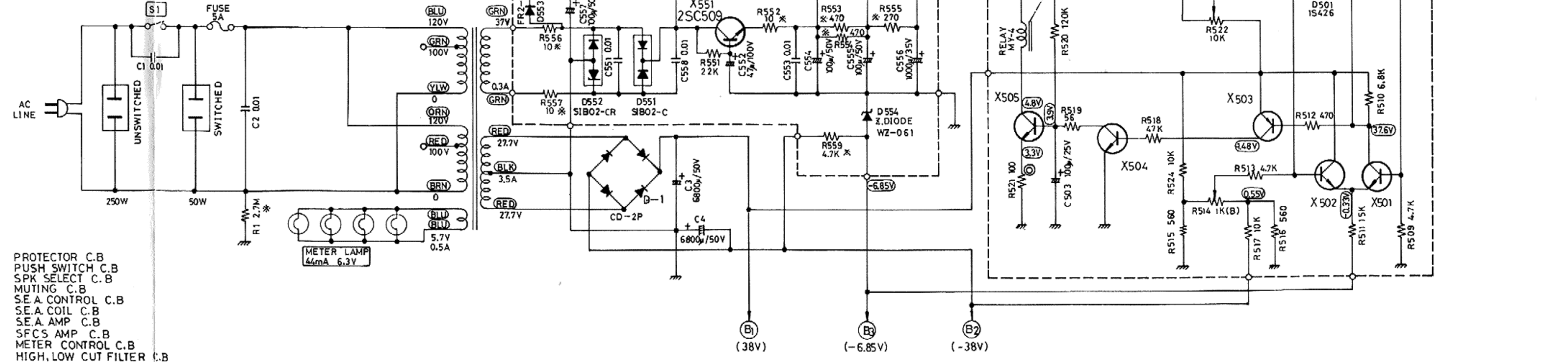
**SPEAKER LOAD IMPEDANCE**  
 4CH-NORMAL 4Ω-16Ω  
 2CH-BTL 8Ω-16Ω

**NOTICE**  
 \* VOLTAGE MEASUREMENT TAKEN WITH VTVM.  
 \* MEASURED VALUES ARE TAKEN FROM MEASUREMENT POINT TO COMMON GROUND.  
 \* ALL CONTROLS SET FOR NORMAL OPERATION NO SIGNAL APPLIED.

S1	POWER SW	① 33K ② 47K ③ 100K	S10a~d	4CH REMOTE SW	
S2a~b	PICK UP LOAD IMPEDANCE SELECTOR SW	① PHONO-2 ② PHONO-1 ③ AUX-1 ④ AUX-2	S11a~d	4CH REVERS SW	
S3a~d	SOURCE	① L+R ② STEREO ③ SFCS-1 ④ SFCS-2 ⑤ 4CH AUX-1 ⑥ 4CH AUX-2	S12a~h	BTL SW	
S4a~h	FUNCTION		S13a~d	SPK SW	a~b FRONT c~d REAR
S5a~b	2CH TAPE MONITOR		S14a~d	METER LEVEL SW	
S6a~d	4CH TAPE MONITOR		S15a~d	LOW CUT	
S7a~d	MUTING SW		S16a~h	HIGH CUT	
S8a~d	LOUDNESS	a~b FRONT c~d REAR	R2a~b	SFCS LEVEL	
S9a~h	SEA SW	a~d FRONT e~h REAR	R20a~d	MASTER VOLUME	
			R3,4,5,6	LEVEL CONTROL	



TAC-280 PROTECTOR C.B  
 TAC-243 PUSH SWITCH C.B  
 TAC-244 SPK SELECT C.B  
 TAC-245 MUTING C.B  
 TAC-246 SEA CONTROL C.B  
 TAC-247 SEA COIL C.B  
 TAC-248 SEA AMP C.B  
 TAC-249 SFCS AMP C.B  
 TAC-250 METER CONTROL C.B  
 TAC-251 HIGH, LOW CUT FILTER C.B  
 TAD-112 DRIVER AMP C.B CH-1,3  
 TAD-113 DRIVER AMP C.B CH-2,4  
 TAE-37B EQUALIZER AMP C.B  
 TAP-173 POWER SUPPLY C.B



\* : 1/2W RESISTOR  
 ⊙ : 1W RESISTOR  
 ⊗ : 3W RESISTOR  
 ⊕ : 5W RESISTOR  
 IN OHM, 10% TOLERANCE EXCEPT THE ABOVE 1/4W

**Schematic Diagram of Model 4VN-990**

Subject to change without notice.