ORDER NO. SD8004-1726

Service Manual

Stereo Integrated DC Amplifier

SU-V8

[D], [DG], [EB], [XE], [XSW], [XGH], [XGF], [XAL], [XA]

SU-V8(K)

[D], [DG], [EB], [XE], [XSW], [XGH], [XAL], [XA]

* The cabinet, front panel and knob are available in black color and silver types.
The black type model is provided with (K) in the Service Manual.

* [D] and [DG] are available in Scandinavia and European except Belgium, United Kingdom, Switzerland, Holland and France.
* [EB] is available in Belgium.
* [XE] is available in United Kingdom.
* [XSW] is available in Switzerland.
* [XGH] is available in Holland.
* [XGF] is available in France.
* [XAL] is available in Australia.
* [XA] is available in Asia, Latin America, Middle East and Africa.

■ CONTENTS

TECHNICAL SPECIFICATIONS (DIN 45 500)

Specifications are subject to change without notice for further improvement.

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 140W (4Ω)
	2 × 105W (8Ω)
40 Hz~16 kHz continuous power output	
both channels driven	2 × 140W (4Ω)
	2 × 105W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 150W (4Ω)
	2 × 115W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.008% (4Ω)
	0.005% (8Ω)
rated power at 40 Hz~16 kHz	0.008% (4Ω)
	0.005% (8Ω)
rated power at 1 kHz	0.008% (4Ω)
	0.005% (8Ω)
half power at 20 Hz~20 kHz	0.004% (8Ω)
half power at 1 kHz	0.002% (8Ω)
−26 dB power at 1 kHz	0.05% (4Ω)
50 mW power at 1 kHz	0.1% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.01%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.007%
Power bandwidth	
both channels driven, −3 dB	
(THD 0.03%)	5 Hz~70 kHz (4Ω)
(THD 0.02%)	5 Hz~70 kHz (8Ω)
Residual hum and noise (straight DC)	0.4 mV
Damping factor	30 (4Ω), 60 (8Ω)

Technics

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

■ ADJUSTING INSTRUCTIONS — ENGLISH

• Setting of controls and instruments to be used

1. Operation switch . . . .straight DC
2. Speaker switch . . . . . .main
3. Sound volume. . . . . .0 (minimum)
4. DC voltmeter (capable to measure 5mV)

No.	Adjustments	DC voltmeter Connections	Adjusting Point	Adjustment Procedure
1	Voltage regulator	Between TP402 and ground	VR401	* Turn voltage regulator semi-fixed resistor VR301 to minimum. (counter-clockwise direction) * Adjust VR401 to 17.5V
2	DC Balance	L channel Between R651 (Ⓐ) and ground	VR301	* Adjust VR301 to obtain a minimum reading, using the 30mV range on the DC voltmeter (within ± 10mV) * Cut off the jumper wire (J301) if adjustment is not posible.
3		R channel Between R652 (Ⓐ) and ground	VR302	* Adjust VR302 to obtain a minimum reading, using the 30mV range on the DC voltmeter * Cut off the jumper wire (J302) if adjustment is not possible.
4	Clamp Voltage	L channel Between TP601 and TP603 (minus probe) R channel Between TP602 and TP604 (minus probe)	VR603 (L channel) VR604 (R channel)	* Turn Icq semi-fixed resistors VR601, 602 to minimum. (counter-clockwise direction) * Adjust VR603 (L ch) and VR604 (R ch) to approx. 1mV after ten minutes warm-up time.
5	Icq (Adjustment using a DC voltmeter)	L channel Between TP601 and TP603 (minus probe) R channel between TP602 and TP604 (minus probe)	VR601 (L channel) VR602 (R channel)	* Adjust VR601 (L ch) and VR602 (R ch) to approx. 40mV after ten minutes warm-up time.

• ICQ can be adjusted with oscilloscope and the distortion analyser.

Instruments to be used

1. Oscillator (20kHz sine wave)
2. Distortion analyser
3. Oscilloscope

1st Feed 20kHz sine wave into the TUNER or AUX terminals.

2nd Volume control to maximum of this unit.

3rd Connect the distortion analyser to the speaker terminals and connect the output from the distortion analyser to the vertical input of the oscilloscope.

4th Turn the oscillator attenuater so that the output at the speaker terminal reaches 20V.

5th Adjust the ICQ semi-fixed resistors VR601 (left channel), VR602 (right channel) for minimum distortion on the oscilloscope.

■ EINSTELLUNGSANWEISUNGEN — DEUTSCH

• Einstellung der zu benutzenden Regler und Instrumente

1. Betriebsschalter. . . . . .Gleichstrom (direkt)
2. Lautsprecherschalter . . .Hauptlautsprecher ("main")
3. Lautstärke . . . . . ."0" (Minimalstellung)
4. Gleichstromvoltmeter. . 5mV Meßbereich erforderlich.

Nr	Einstellungen	Gleichstromvoltmeterverbindungen	Einstellungspunkte	Einstellungsvorgang
1	Spannungs-sregler	Zwischen TP402 und Masse.	VR401	* Die spannungsregler halbfesteingestellten Widerstände **VR301** auf Minimalstellung drehen. (Entgegen dem Uhrzeigersinn) * **VR401** auf 17.5V abstimmen.
2	Gleichstrom-balance	L-Kanal. Zwischen R651 (Ⓐ) und Masse.	VR301	* Durch Benutzung des 30mV-Bereiches (innerhalb von ±10mV) des Gleichstrom-voltmeters, den regelbaren Widerstand **VR301** auf minimalen Wert einstellen. * Wenn eine Einstellung nicht möglich ist, die Schaltader (J301) abtrennen.
3		R-Kanal. Zwischen R652 (Ⓐ) und Masse.	VR302	* Durch Benutzung des 30mV-Bereiches (innerhalb von ±10mV) des Gleichstrom-voltmeters, den regelbaren Widerstand **VR302** auf minimalen Wert einstellen. * Wenn eine Einstellung nicht möglich ist, die Schaltader (J302) abtrennen.

4	Klemmspannung	L-Kanal. Zwischen TP601 und TP603 (Minustest) R-Kanal. Zwischen TP602 und TP604 (Minustest)	VR603 (L-Kanal) VR604 (R-Kanal)	* Die Icq halbfesteingestellten Widerstände **VR601** und **VR602** auf Minimalstellung drehen. (Entgegen dem Uhrzeigersinn) * **VR603** (L-Kanal) und VR604 (R-Kanal) auf ungefähr 1mV, nach 10 Minuten Anwärmezeit, einstellen.
5	Icq (Einstellungen mit einem Gleichstrom-voltmeter	L-Kanal. Zwischen TP601 und TP603 (Minustest) R-Kanal. Zwischen TP602 und TP604 (Minustest)	VR601 (L-Kanal) VR602 (R-Kanal)	* **VR601** (L-Kanal) und **VR602** (R-Kanal) auf ungefähr 40mV, nach 10 Minuten Anwärmezeit, einstellen.

• Icq Kann mit einem Oszilloskop und dem Verzerrungsanalyser eingestellt werden.

Zu benutzende Instrumente
1. Schwingungserreger (20kHz sinus)
2. Verzerrungsanalyser
3. Oszilloskop

Erster Schritt: Die 20kHz Sinuswelle in die TUNER-oder AUX-Buchsen eingeben.

Zweiter Schritt: Den Lautstärkeregler dieses Gerätes auf Maximalstellung bringen.

Dritter Schritt: Den Verzerrungsanalyser mit den Lautsprecherklemmen verbinden, und den Ausgang des Verzerrungsanalysers mit. dem Vertikaleingang des Oszilloskops verbinden.

Vierter Schritt: Den Eichungsregler des Oszilloskops auf eine Weise regeln, daß der Ausgang der Lautsprecherklemmen auf 20 Volt kommt.

Fünfter Schritt: Den Icq halbeinstellbaren Widerstand **VR601** (L-Kanal) und **VR602** (R-Kanal), auf minimale Verzerrungsanzeige dem Oszilloskop einstellen.

■ INSTRUCTIONS DE REGLAGE——FRANÇAIS

• Réglage des commandes et instruments à utiliser

1. Commutateur de marche/arrêt . . . . . .CC direct
2. Commutateur du haut-parleur . . . . . .Principal
3. Volume du son . . . . . .0 (minimum)
4. Voltmètre CC (pouvant mesurer 5mV)

No	Réglages	Connexions du voltmetre CC	Point de réglage	Procédé de réglage
1	Régulateur de potential	Entre TP402 et la masse	VR401	* Tourner les résistances **VR301** semifixes regulateur de potentiol sur le minimum. (à gauche) * Régler les **VR401** sur 17.5V.
2	Equilibre CC	Canal gauche Entre R651 (Ⓐ) et la masse	VR301	* Régler **VR301** pour obtenir une lecture minimale, à l'aide de la gamme de 30mV sur le voltmètre CC (avec ±10mV). * Couper le fil volant (J301) si le réglage est impossible.
3		Canal droite Entre R652 (Ⓐ) et la masse	VR302	* Régler **VR302** pour obtenir une lecture minimale, à l'aide de la gamme de 30mV sur le voltmètre CC (avec ±10mV) * Couper le fil volant (J302) si le réglage est impossible.
4	Tension de blocage	Canal G. Entre TP601 et TP603 (sonde au moins) Canal D. Entre TP602 et TP604 (sonde au moins)	VR603 (Canal G) VR604 (Canal D)	* Tourner les résistances **VR601**, **VR602** semifixes Icq sur le minimum. (à gauche) * Régler **VR603** (canal gauche) et **VR604** (canal droit) sur env. 1mV après 10 minutes de temps de chauffage.
5	Icq (réglage à l'aide d'un voltmètre CC)	Canal G. Entre TP601 et TP603 (sonde au moins) Canal D. Entre TP602 et TP604 (sonde au moins).	VR601 (Canal G) VR602 (Canal D)	* Régler les **VR601** (canal gauche) et **VR602** (canal droit) sur env. 40mV après 10mn. de prèchauffage.

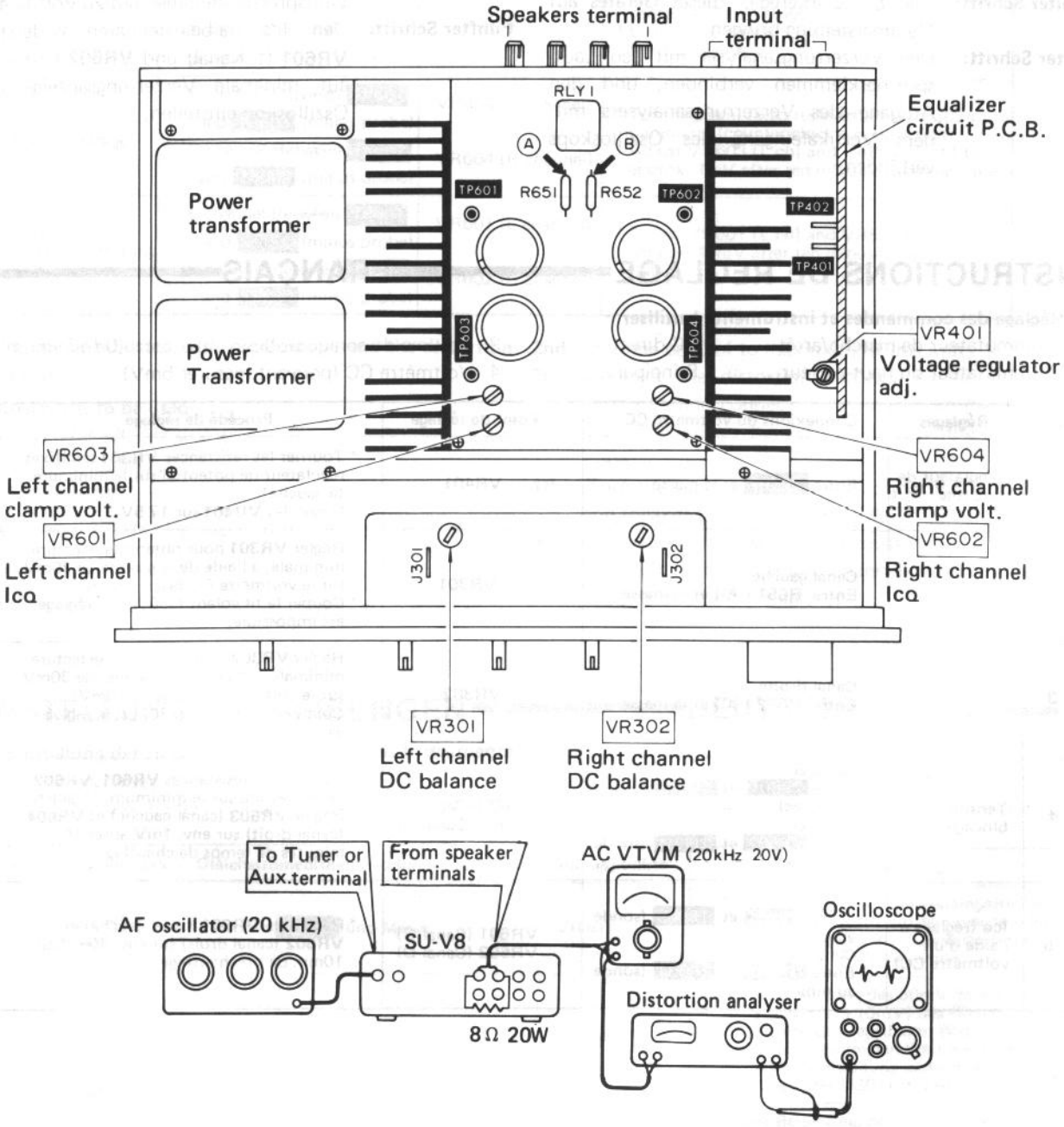
- **Icq peut être réglé à l'aide d'un oscilloscope et un analyseur de distorsion.**

Instruments à utiliser

1. Oscillateur (onde sinusoîdale de 20kHz)
2. Analyseur de distorsion
3. Oscilloscope

1. Alimenter une onde sinusoîdale de 20kHz aux bornes TUNER et AUX.
2. Placer la commande de volume, sur le maximum de cet appareil.
3. Brancher l'analyseur de distorsion aux bornes du haut-parleur et brancher la sortie de l'analyseur de distorsion à l'entrée verticale de l'oscilloscope.
4. Tourner l'atténuateur de l'oscillateur de telle sorte que la sortie à la borne du haut-parleur, atteigne 20V.
5. Régler les résistances **VR601** (canal gauche) et **VR602** (canal droit) semi-fixes Icq sur la distorsion minimale de l'oscilloscope.

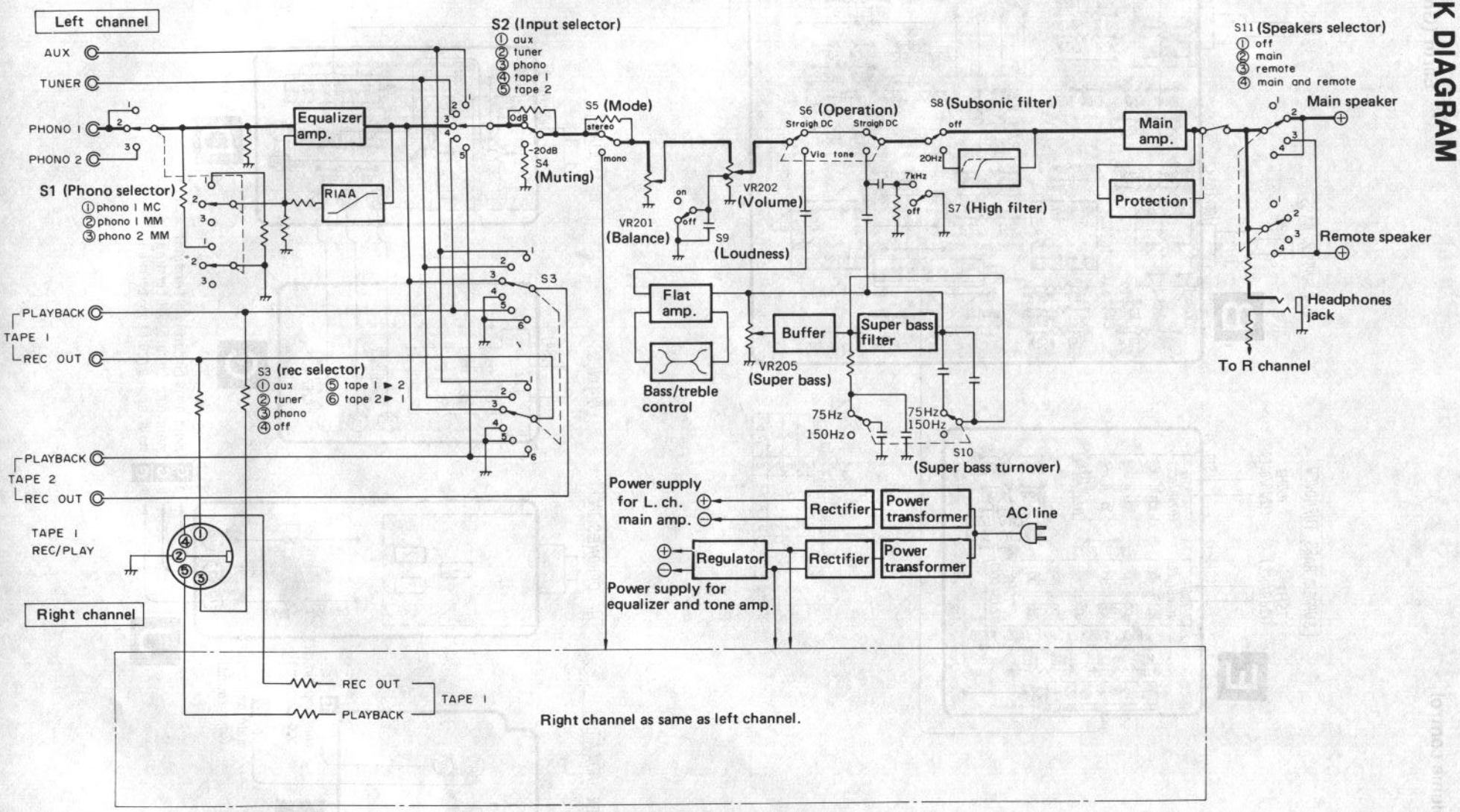
■ ADJUSTING POINTS



(I CQ adjustment with the oscilloscope and the distortion analyser)
(Icq-Einstellung mit Oszilloskop und Verzerrungsanalyser)
(Réglage de Icq à l'aide de l'oscilloscope et de l'analyseur de distorsion.)

[Fig. 13]

■ BLOCK DIAGRAM



■ REPLACEMENT PARTS LIST (Electric Parts)

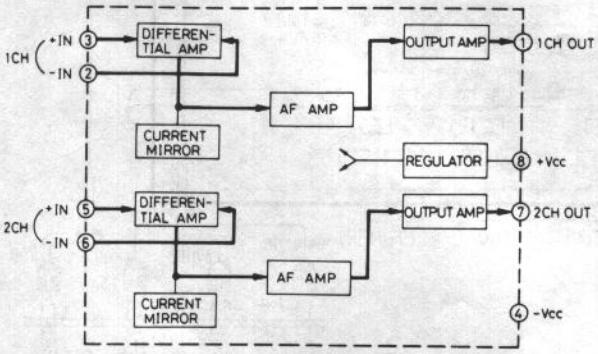
Notes: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. ⚠ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.		Part No.	Part Name & Description
INTEGRATED CIRCUITS			
IC101, 201		SVINJM4559DS	IC, Equalizer and Tone Amplifer
IC202, 203		AN6552	IC, Super Bass Buffer and Super Bass Filter
IC551		SVITA7317P	IC, Protection
TRANSISTORS			
Q101 ~ 108		2SK170–GR	Transistor, Differential Amplifier
Q301, 302		SVIUPA68H–LK	Transistor, Buffer
Q303, 304		2SA995N–F	Transistor, Current Mirror
Q305 ~ 308, 455		2SC1815–Y	Transistor, Cascade and An Error Voltage Detector
Q309, 310		SVIUPA74V–PF	Transistor, Pre Drive
Q311, 312		2SA921–S	Transistor, Emitter Follower
Q313, 314		2SA1124–R	Transistor, Pre Diode
Q315, 316		2SC2632–R	Transistor, Constant Current
Q451, 452		2SK34–D1	Transistor, Diode For Current Stabilizer
Q453		2SC1913–Q	Transistor, Regulator
Q454		2SA913–Q	Transistor, Regulator
Q456, 603, 604		2SA1015–Y	Transistor, An Error Voltage Detector and Over Load Current Limiter
Q601, 602		2SC1815–Y	Transistor, Over Load Current Limiter
Q605 ~ 608		2SD661–S	Transistor, Bias Supply
Q609 ~ 612		2SB745–S	Transistor, Bias Supply
Q613, 614		2SC2632–R	Transistor, Driver
Q615, 616		2SA1124–R	Transistor, Driver
Q617, 618		2SC1913–Q	Transistor, Driver
Q619, 620		2SA913	Transistor, Driver
Q621, 622, 625, 626		2SD845–R	Transistor, Power Amplifier
Q623, 624, 627 628		2SB755–R	Transistor, Power Amplifier
DIODES			
D101, 102 301 ~ 306, 402 551, 601 ~ 608		**MA162A**	Diode, Bias, Detector and Current Limiter
D307, 308		**MA27A1**	Diode, Bias
D401		LN831RP	Diode, Power Indicator
D403 ~ 410	⚠	**SVDS3V40**	Rectifier
D451		**RVDEQA0106S**	Diode, 6V Zener
D552		**SVDSR1K2**	Diode, Pulse Cancel
D609 ~ 616		**20A90**	Diode, Synchronous Bias Circuit

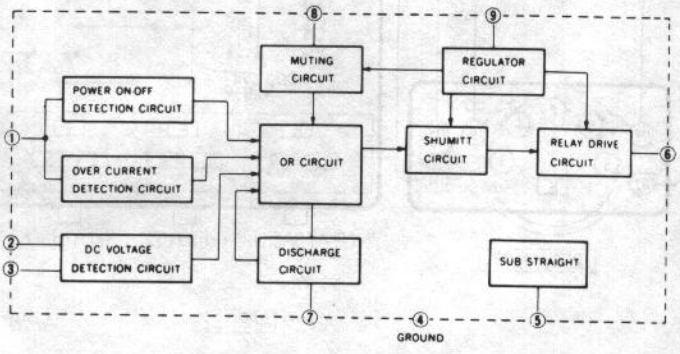
Ref. No.		Part No.	Part Name & Description
COILS and TRANSFORMERS			
L601, 602		SLQY16G–1U	Coil, Choke
T401, 402	⚠	SLT5P195	Transformer, Power Source
VARIABLE RESISTORS			
VR201		EWKK4A090252	Balance Control
VR202		EWI5PA026B15	Volume Control
VR203		EWJFG0090C15	Treble Control
VR204		EWJFBY090530	Bass Control
VR205		EWKGYA086B15	Super Bass Control
VR301, 302		EVMH9GA00B53	DC Balance Adjustment, 5kΩ (B)
VR401		**EVTS0AA00B53**	Voltage Regulator Adjustment, 5kΩ (B)
VR601 ~ 604		EVTR4SA00B13	Clamp Voltage and Icq Adjustment 1kΩ (B)
COMPONENT COMBINATIONS			
Z401, 402		EXRFS203ZS	Component Combination, 0.01μF x 2
THERMISTORS			
TH601, 602		ERTD2FHL103S	Thermister, Thermal Compensation, 10kΩ
FUSES			
F4	⚠	XBA2C05TR0	Fuse, T500mA (250V)
F5, 6, 7, 8	⚠	XBA2C20TR0	Fuse, T2A (250V)
SWITCHES			
S1		ESA26520	Switch, Phono Selector
S2, 3		ESA2682	Switch, Input and Recording Selector
S4, 5, 7, 8		SSL145–1	Switch, Muting, Mode, High Filter and Subsonic Filter
S6		SSL129–1	Switch, Operation
S9		SSH151	Switch, Loudness
S10		SSH275	Switch, Super Bass Turnover
S11		SSR145	Switch, Speakers Selector
S12	⚠	ESL21210S	Switch, Power
S13	⚠	ESE37200	Switch, Voltage Adjuster
LAMP			
PL	⚠	XAMR73S550	Lamp, New Class A Badge, 6.3V, 250mA
RELAY			
RLY1	⚠	SSY19–1	Relay, Muting & Protection

■ BLOCK DIAGRAM OF IC'S

This is the basic block diagram of the inside circuit of IC. In an actual circuit, there may be sometimes idle terminals or some different functions other than the basic circuit.



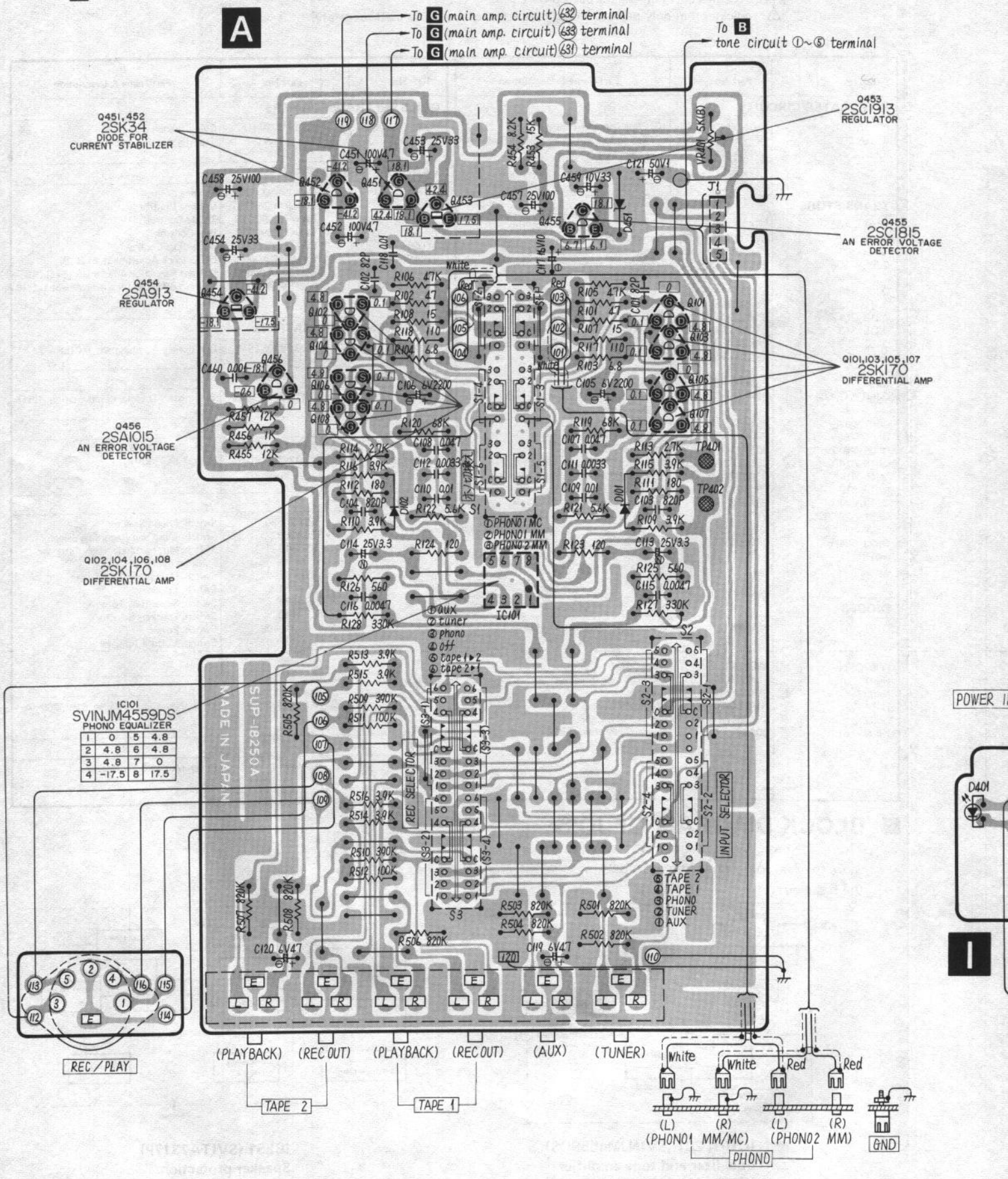
IC101, 201 (SVINJM4559DS)
Equalizer and tone amplifier
IC202, 203 (AN6552)
Super bass buffer and super bass filter



IC551 (SVITA7317P)
Speaker protection

■ PRINTED CIRCUIT BOARD

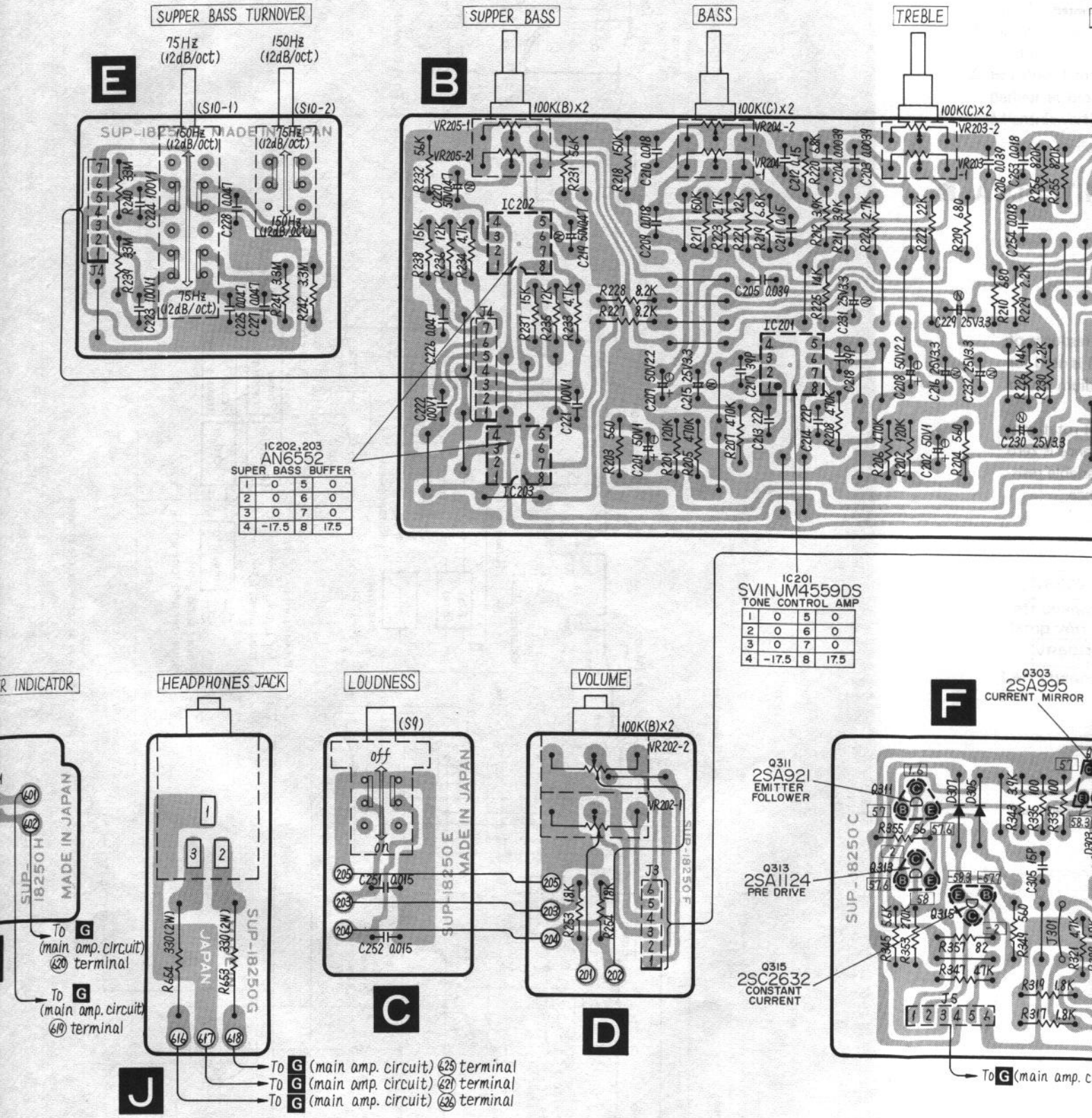
(A Equalizer/Voltage regulator, B E Tone control circuit, I Power indicator, C Loudness switch, D Volum
F Pre drive circuit)



1	0	5	4.8
2	4.8	6	4.8
3	4.8	7	0
4	-17.5	8	17.5

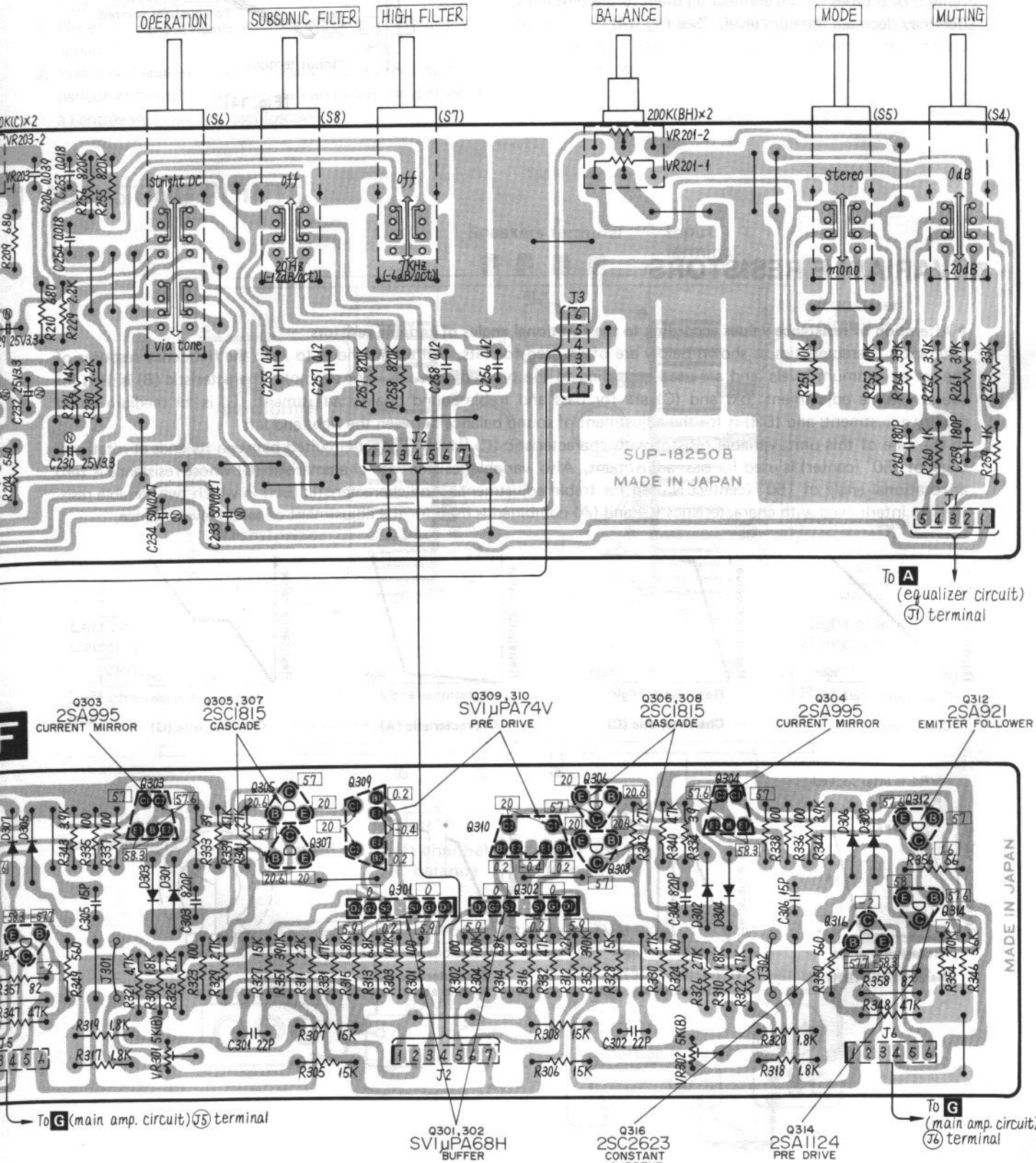
lume control

Earth (Ground) Lines



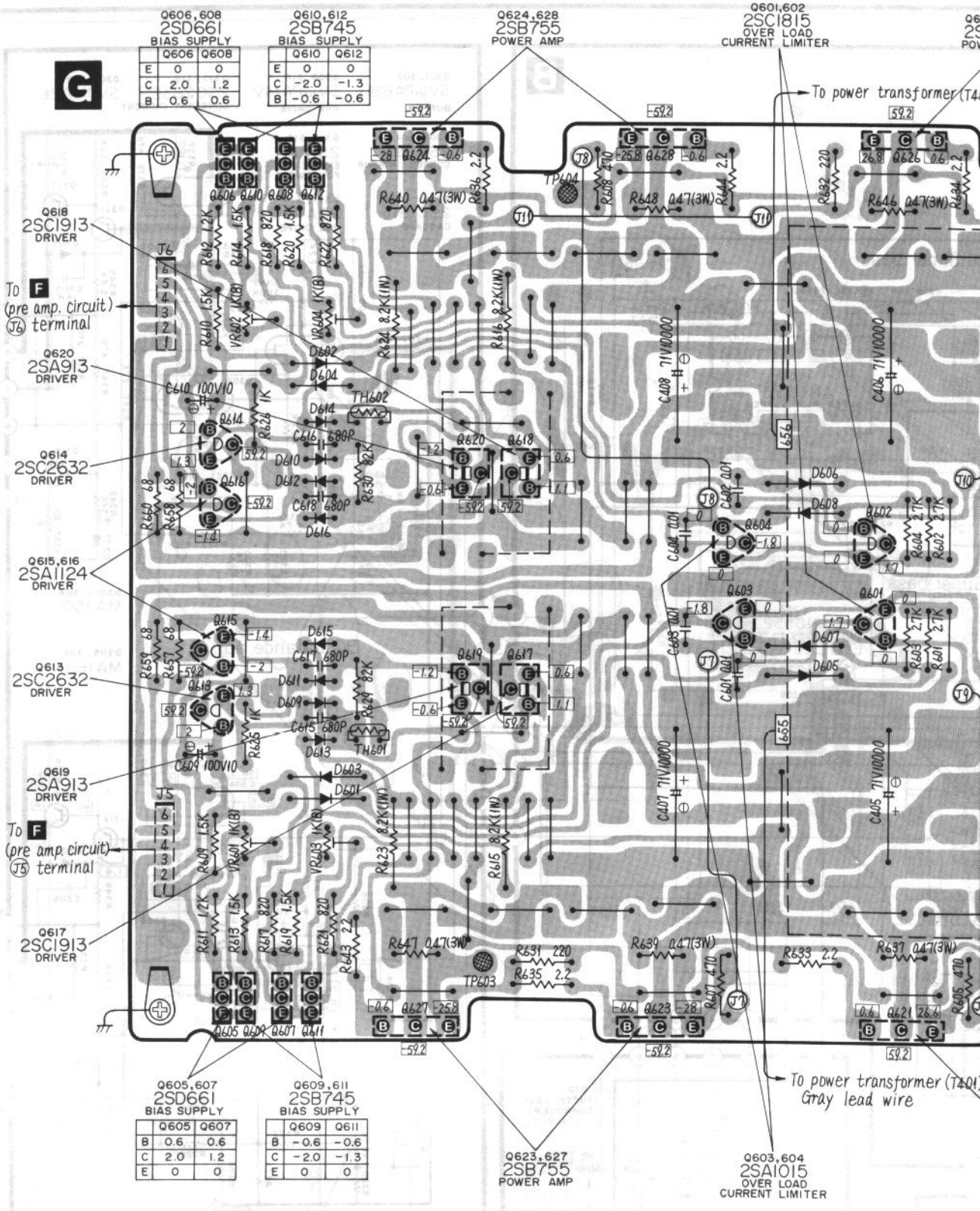
IC202,203 AN6552 SUPER BASS BUFFER			
1	0	5	0
2	0	6	0
3	0	7	0
4	-17.5	8	17.5

IC201 SVINJM4559DS TONE CONTROL AMP			
1	0	5	0
2	0	6	0
3	0	7	0
4	-17.5	8	17.5


OPERATION
SUBSONIC FILTER
HIGH FILTER
BALANCE
MODE
MUTING
(S6)
(S8)
(S7)
(S5)
(S4)
200K(BH)×2
VR201-2
VR201-1
VR203-2
stright DC
via tone
off
20Hz (-12dB/oct)
7KHz (-6dB/oct)
stereo
mono
0dB
-20dB
J3
J2
J1
SUP-18250B
MADE IN JAPAN
To A
(equalizer circuit)
(J1) terminal

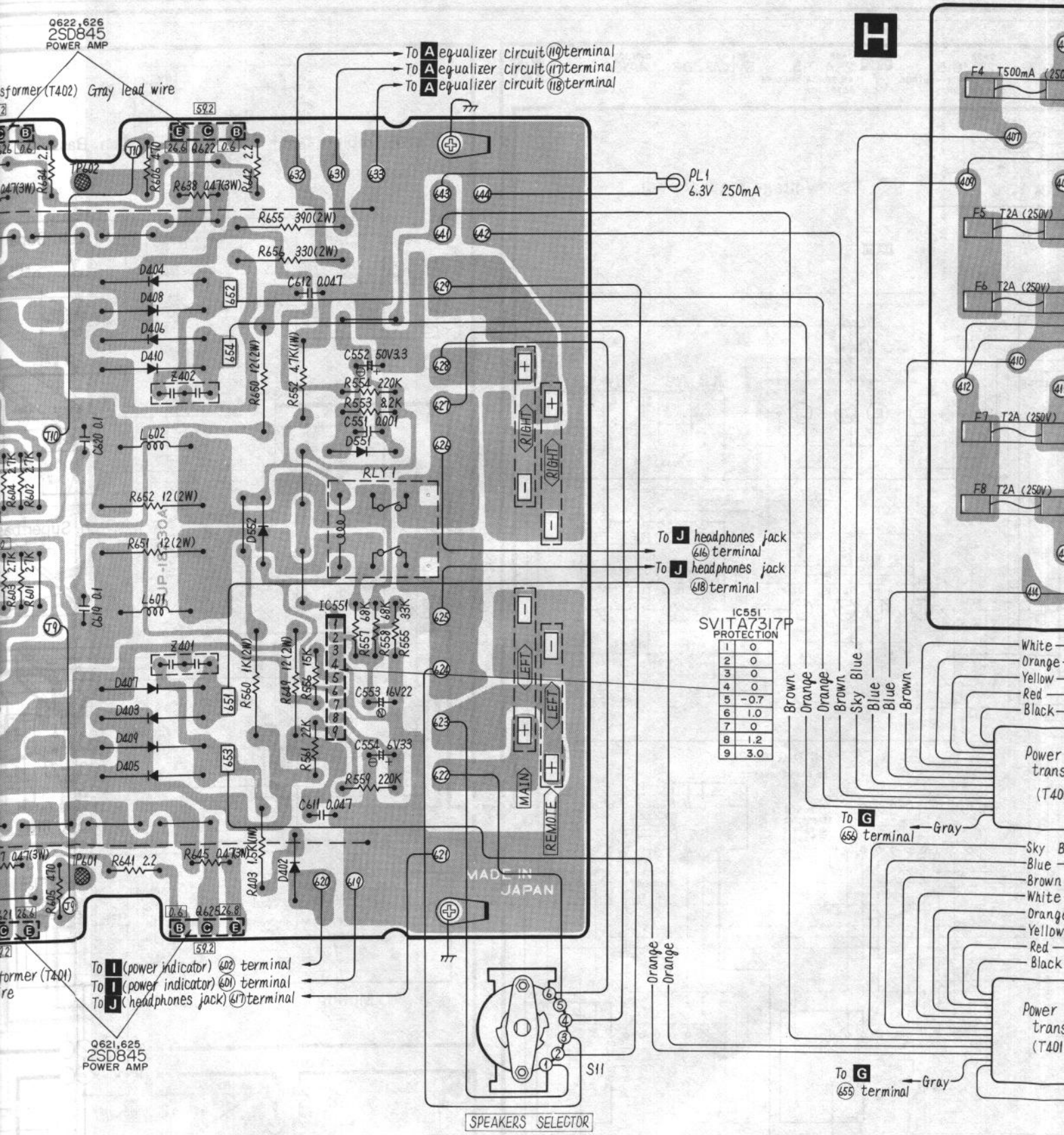
Q303
2SA995
CURRENT MIRROR
Q305,307
2SC1815
CASCADE
Q309,310
SVIμPA74V
PRE DRIVE
Q306,308
2SC1815
CASCADE
Q304
2SA995
CURRENT MIRROR
Q312
2SA921
EMITTER FOLLOWER
MADE IN JAPAN
To G (main amp. circuit) (J5) terminal
Q301,302
SVIμPA68H
BUFFER
Q316
2SC2623
CONSTANT CURRENT
Q314
2SA1124
PRE DRIVE
To G
(main amp. circuit)
(J6) terminal

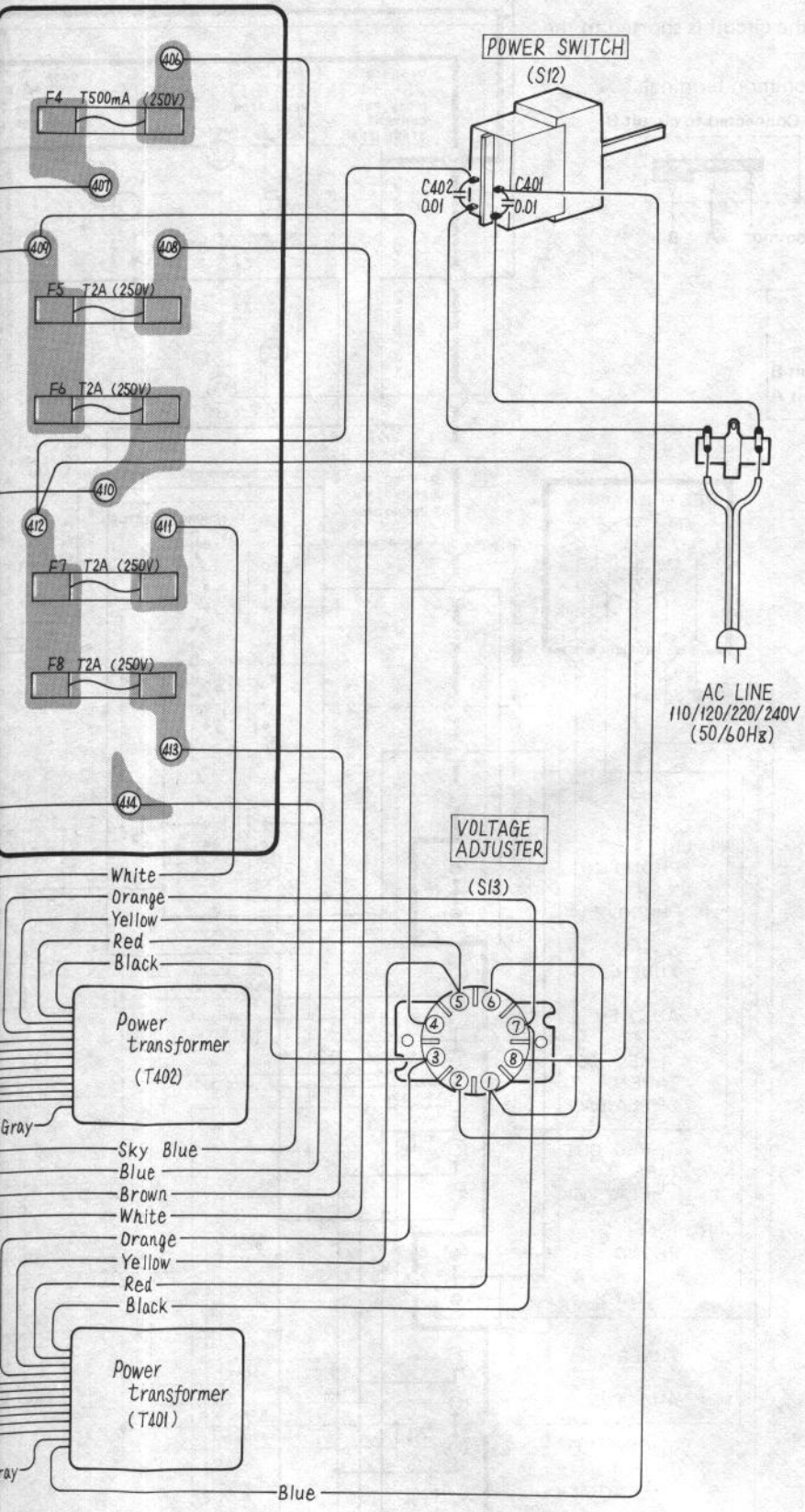
■ PRINTED CIRCUIT BOARD (G Power amplifier drive & synchronous bias circuits, H Power sou



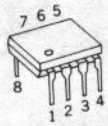
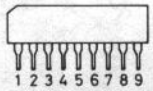
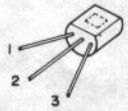
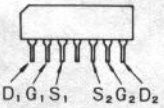
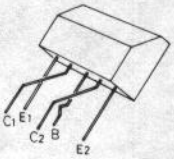
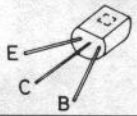
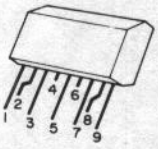
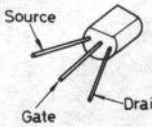
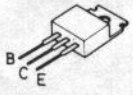
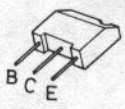
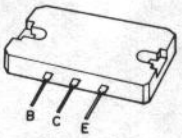
ower source fuse)

Earth (Ground) Lines





■ TERMINAL GUIDE OF TRANSISTOR AND IC'S

SVINJM4559DS	AN6552
	
SVITA7317P	2SK170
	
SVIμPA68H	2SA995N
	
2SC1815 , 2SA921 2SA1124 , 2SC2632 2SA1015 , 2SC1815 2SC2632 , 2SA1124	SVIμPA74V
	
2SK34	2SC1913 , 2SA913
	
2SD661 , 2SB745	2SD845 , 2SB755
	

■ SCHEMATIC DIAGRAM ..... MODEL SU-V8 (This schematic diagram may be modified at any time with t

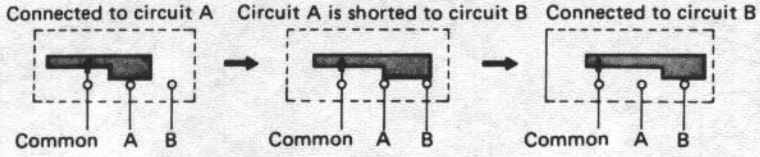
1 2 3 4 5

A B C D E F

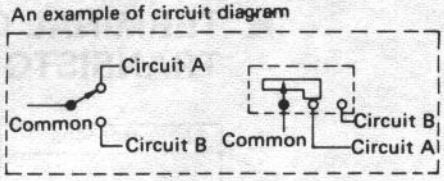
Shorting Switch

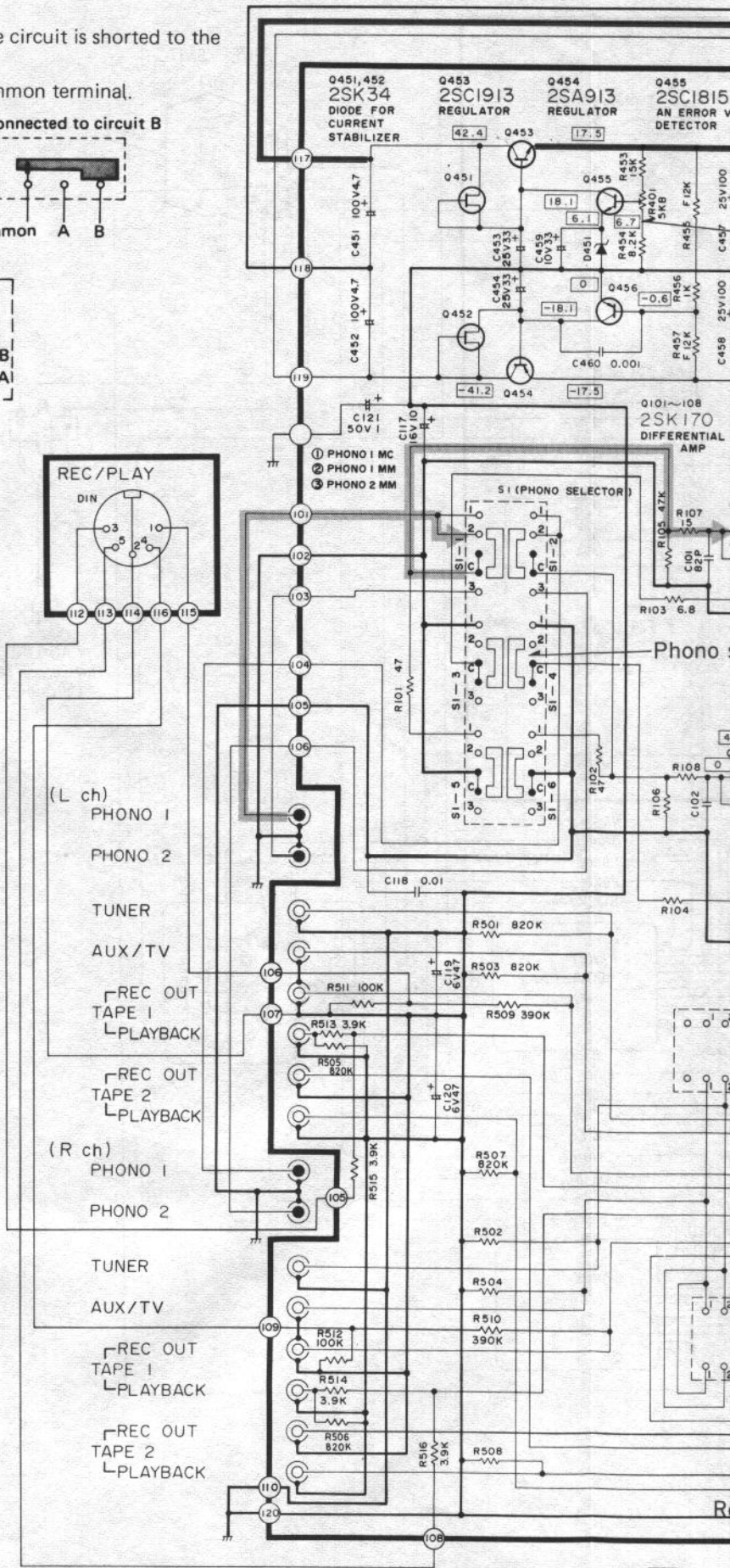
This unit uses a shorting switch. As illustrated below, the circuit is shorted to the next circuit without being opened.

In the circuit diagram, the shaded area represents the common terminal.

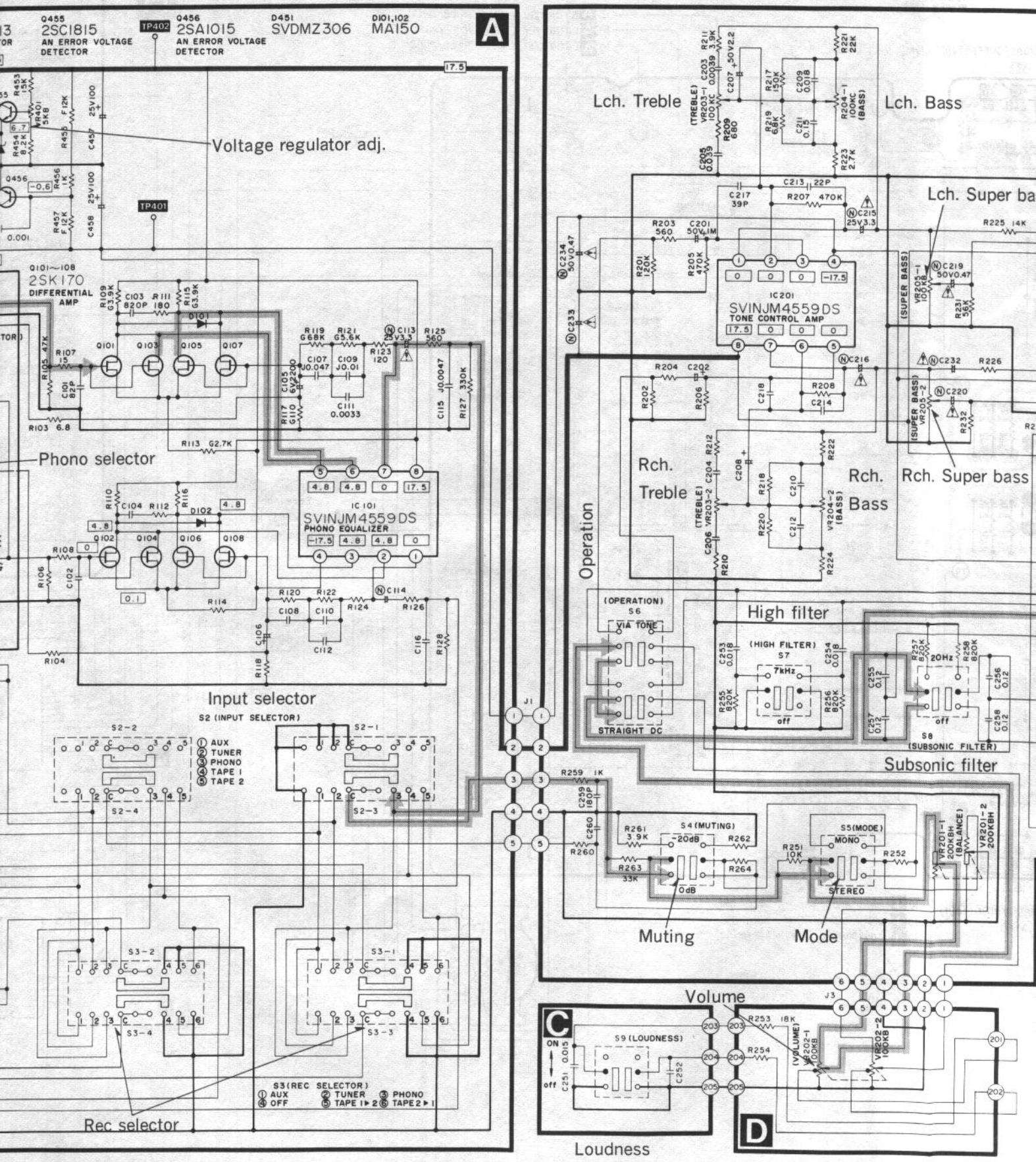


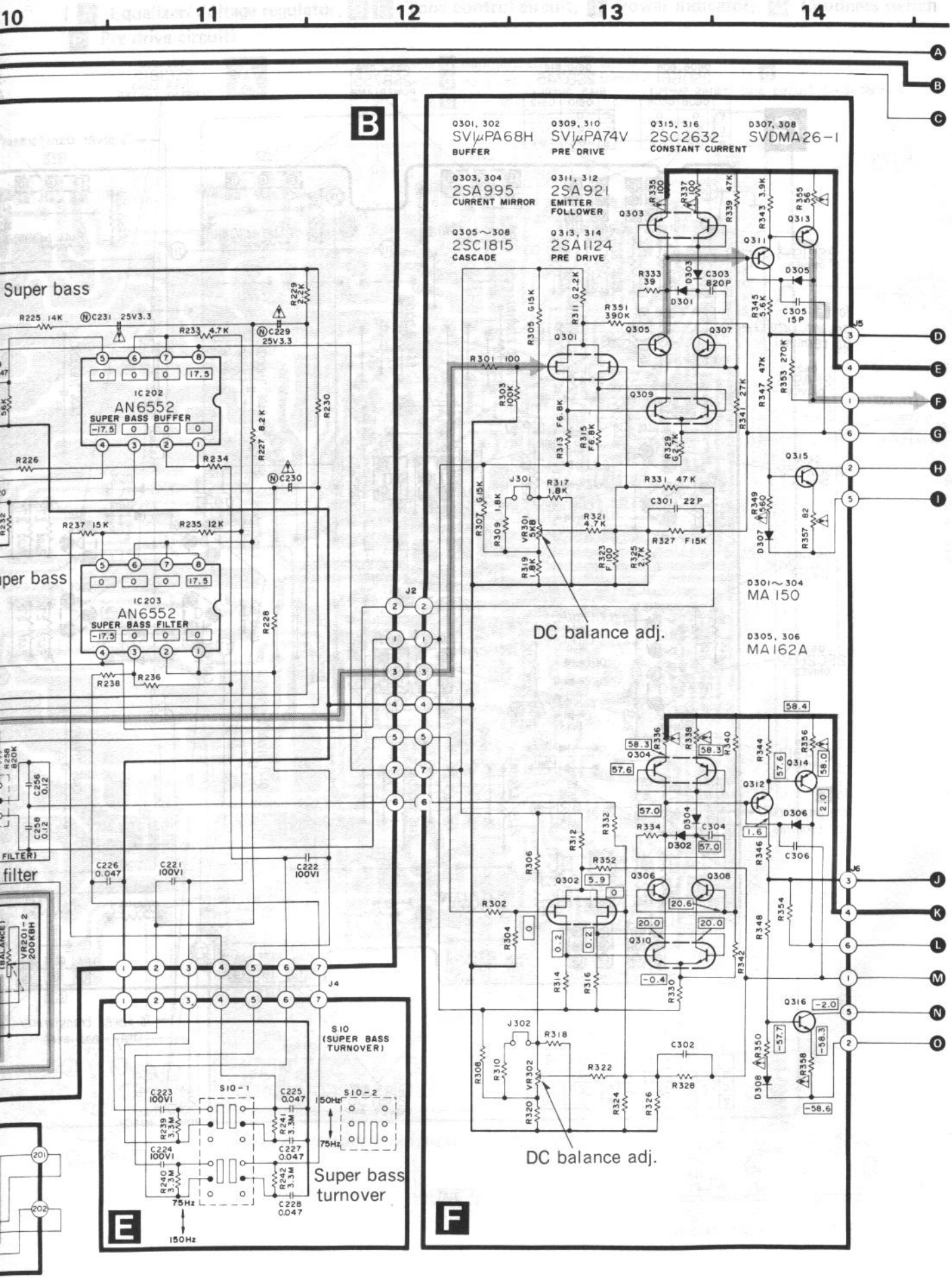
An example of circuit diagram

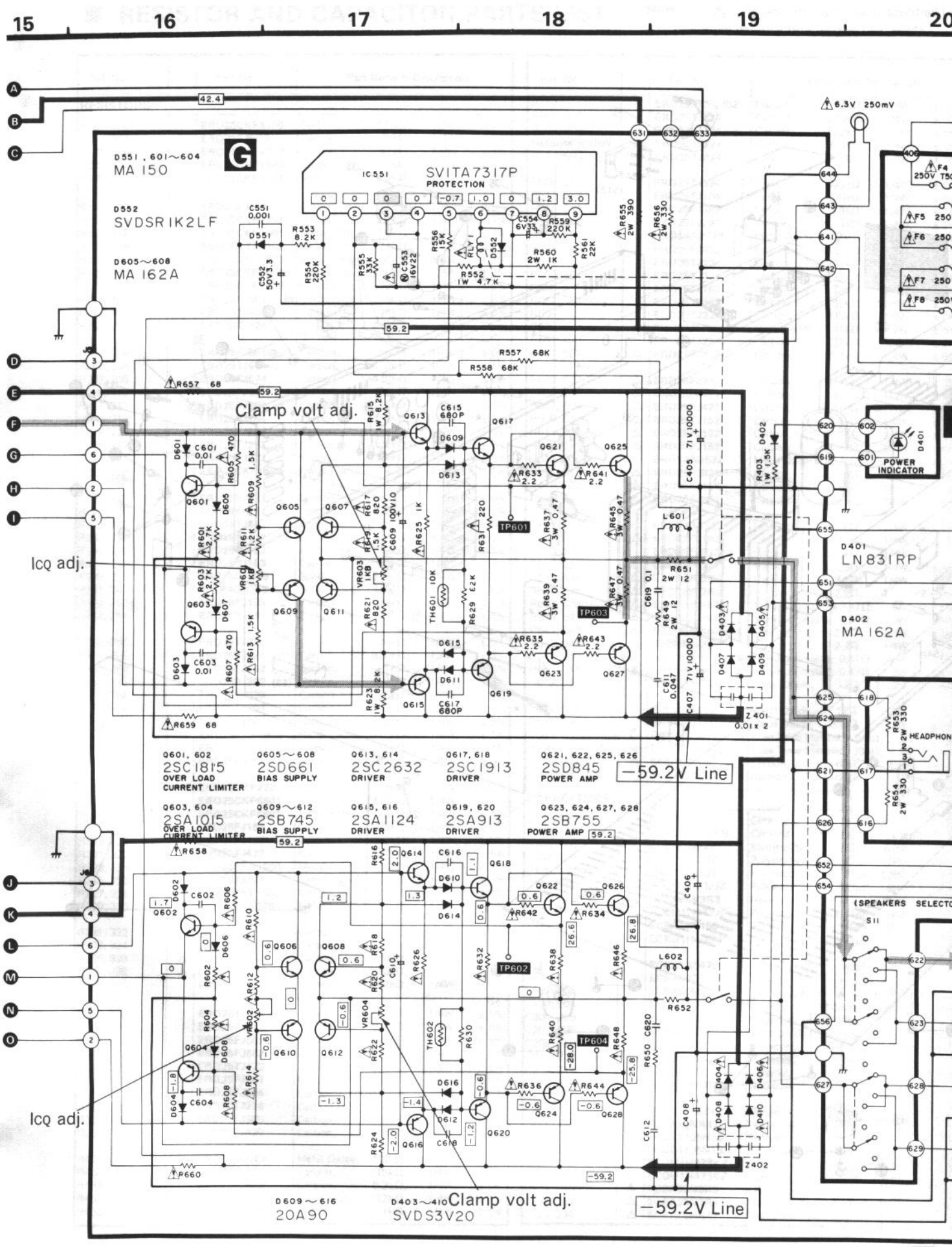


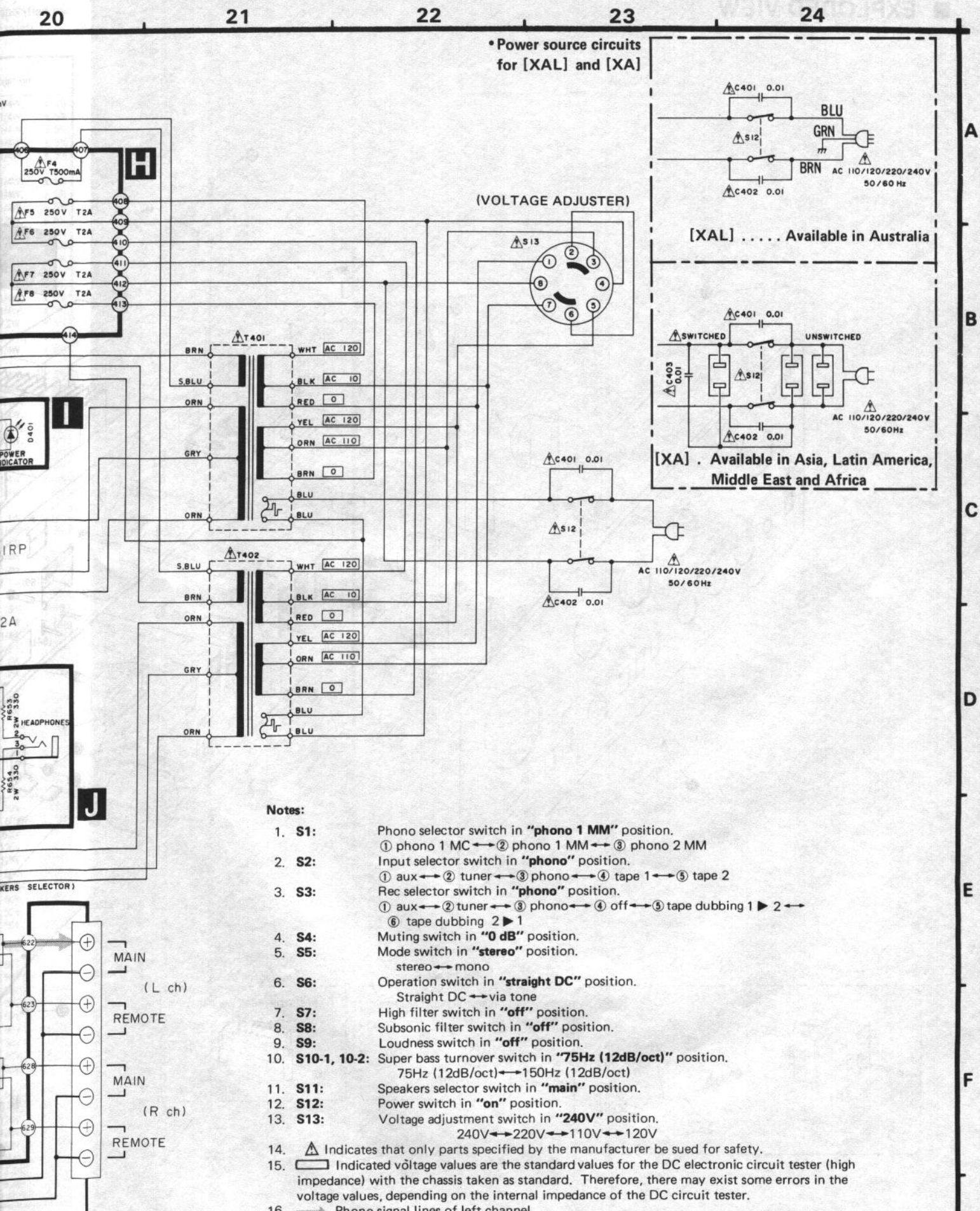


any time with the development of new technology.)




10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
B
F
E
Q301, 302
SVIμPA68H
BUFFER
Q309, 310
SVIμPA74V
PRE DRIVE
Q315, 316
2SC2632
CONSTANT CURRENT
D307, 308
SVDMA26-1
Q303, 304
2SA995
CURRENT MIRROR
Q311, 312
2SA921
EMITTER FOLLOWER
Q305~308
2SC1815
CASCADE
Q313, 314
2SA1124
PRE DRIVE
Super bass
IC202
AN6552
SUPER BASS BUFFER
IC203
AN6552
SUPER BASS FILTER
DC balance adj.
D301~304
MA150
D305, 306
MA162A
DC balance adj.
S10
(SUPER BASS TURNOVER)
S10-1
S10-2
150Hz
75Hz
Super bass turnover
J2
J4
J5
J6
J301
J302


15
16
17
18
19
20
G
D551 , 601~604
MA 150
D552
SVDSR1K2LF
D605~608
MA 162A
IC551 SVITA7317P
PROTECTION
Clamp volt adj.
Icq adj.
Icq adj.
Clamp volt adj.
-59.2V Line
-59.2V Line
POWER INDICATOR
D401
LN831RP
D402
MA 162A
Q601, 602
2SC1815
OVER LOAD CURRENT LIMITER
Q605~608
2SD661
BIAS SUPPLY
Q613, 614
2SC2632
DRIVER
Q617, 618
2SC1913
DRIVER
Q621, 622, 625, 626
2SD845
POWER AMP
Q603, 604
2SA1015
OVER LOAD CURRENT LIMITER
Q609~612
2SB745
BIAS SUPPLY
Q615, 616
2SA1124
DRIVER
Q619, 620
2SA913
DRIVER
Q623, 624, 627, 628
2SB755
POWER AMP
D609~616
20A90
D403~410
SVDS3V20
TP601
TP602
TP603
TP604
L601
L602
Z401
Z402
6.3V 250mV
HEADPHON
SPEAKERS SELECTO
S11
25



Notes:

1. **S1:** Phono selector switch in **"phono 1 MM"** position.
   ① phono 1 MC ⟷ ② phono 1 MM ⟷ ③ phono 2 MM
2. **S2:** Input selector switch in **"phono"** position.
   ① aux ⟷ ② tuner ⟷ ③ phono ⟷ ④ tape 1 ⟷ ⑤ tape 2
3. **S3:** Rec selector switch in **"phono"** position.
   ① aux ⟷ ② tuner ⟷ ③ phono ⟷ ④ off ⟷ ⑤ tape dubbing 1 ▶ 2 ⟷ ⑥ tape dubbing 2 ▶ 1
4. **S4:** Muting switch in **"0 dB"** position.
5. **S5:** Mode switch in **"stereo"** position.
   stereo ⟷ mono
6. **S6:** Operation switch in **"straight DC"** position.
   Straight DC ⟷ via tone
7. **S7:** High filter switch in **"off"** position.
8. **S8:** Subsonic filter switch in **"off"** position.
9. **S9:** Loudness switch in **"off"** position.
10. **S10-1, 10-2:** Super bass turnover switch in **"75Hz (12dB/oct)"** position.
    75Hz (12dB/oct) ⟷ 150Hz (12dB/oct)
11. **S11:** Speakers selector switch in **"main"** position.
12. **S12:** Power switch in **"on"** position.
13. **S13:** Voltage adjustment switch in **"240V"** position.
    240V ⟷ 220V ⟷ 110V ⟷ 120V
14. ⚠ Indicates that only parts specified by the manufacturer be sued for safety.
15. ▭ Indicated voltage values are the standard values for the DC electronic circuit tester (high impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
16. ⟹ Phono signal lines of left channel
17. ▬ Positive (+B) voltage lines.