

Service Manual

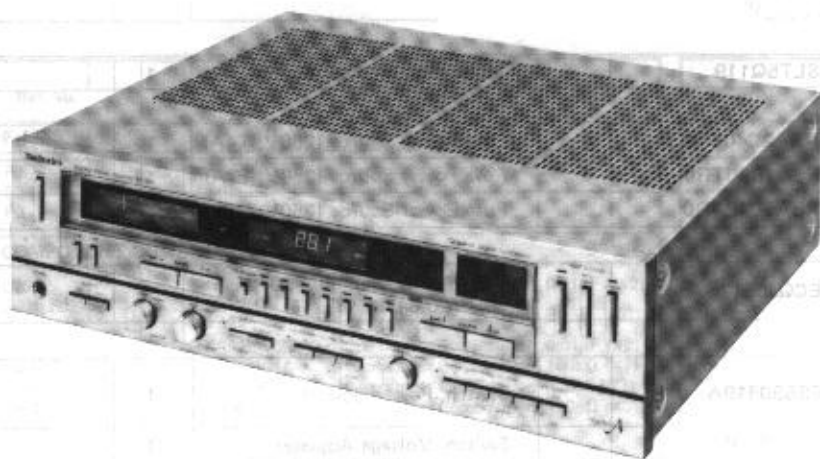
FM/AM Stereo Receiver

SA-626

[PA], [PE], [PC]

SA-626(K)

[PC]



* The colors of this model include silver and black. The black type model is provided with (K) in the Service Manual

Areas

- [PA] is available in far East PX.
- [PE] is available in European Military.
- [PC] is available in European Audio Club.

Please use this manual together with the service manual for Model No. SA-626 [M, MC] Order No. SD8101-1832.

Specification

(Specifications are subject to change without notice for further improvement.)

The following items are different from those shown in the operating instructions.

Input sensitivity

PHONO		0.35 mV (2.5 mV, IHF '66)
TAPE 1	REC/PLAY	18 mV (180 mV, IHF '66)
TAPE 2		15 mV (150 mV, IHF '66)

Input impedance

PHONO		47 kilohms
TAPE 1	REC/PLAY	27 kilohms
TAPE 2		22 kilohms

Output voltage

TAPE 1 REC/PLAY	30 mV 82 kilohms
TAPE 2 REC OUT	150 mV

Power consumption

625W

Power supply

AC 50 Hz/60 Hz
110V/120V/220V/240V

Dimensions (W × H × D)

430 × 120 × 380 mm
(16-15/16" × 4-23/32" × 14-31/32")

Weight

11.1 kg
(24.5 lb.)

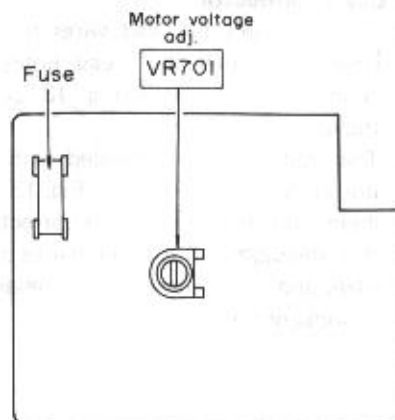
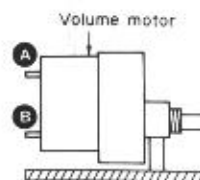
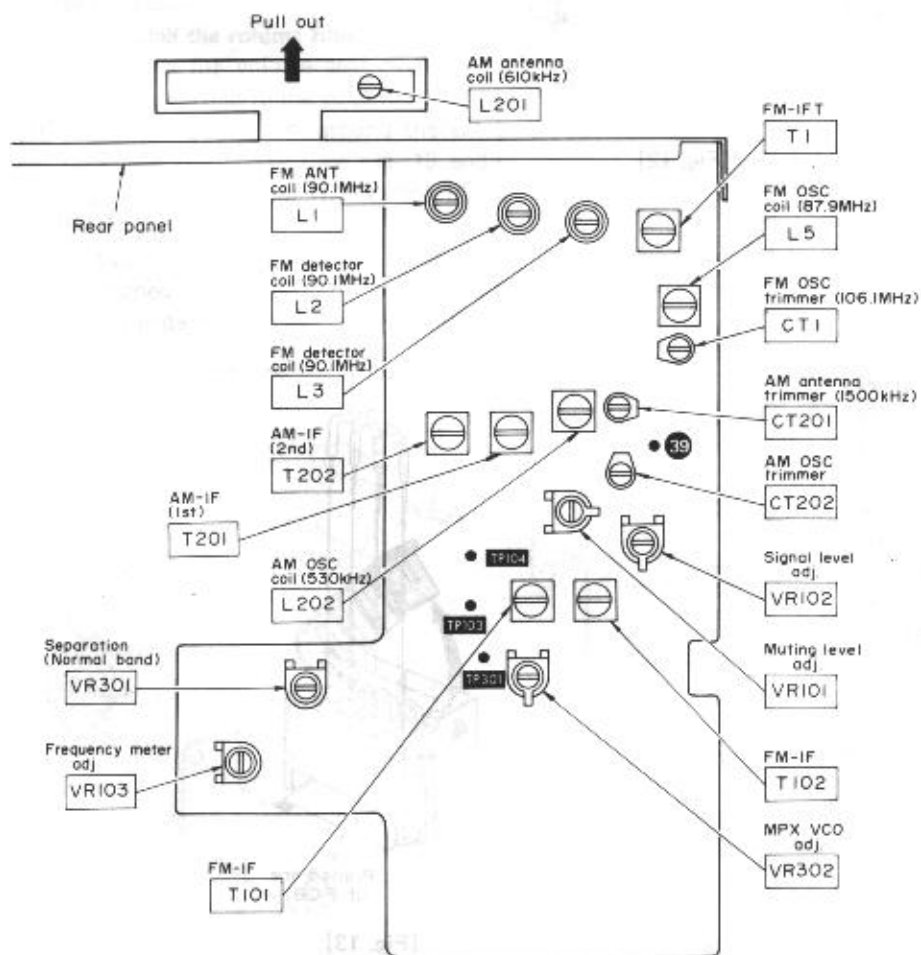
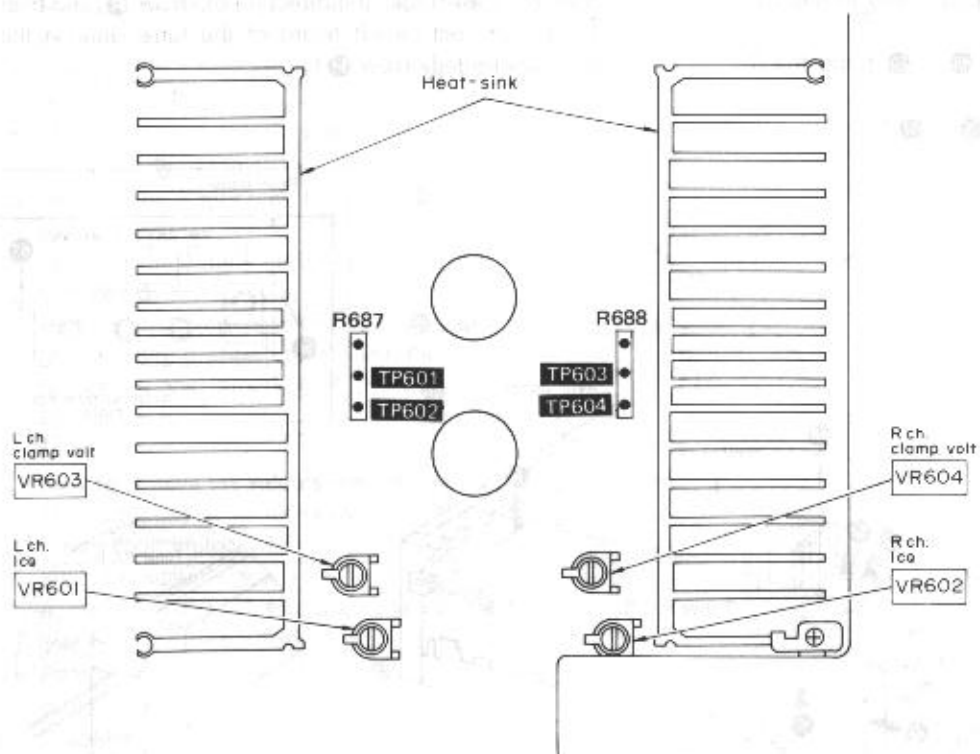
Technics

Panasonic Tokyo

Matsushita Electric Industrial Co., Ltd.
1-2, 1-chome, Shiba-koen, Minato-ku, Tokyo 105 JapanMatsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

MEASUREMENTS AND ADJUSTMENTS

• Adjustment points



● **Setting of controls and instruments to be used.**

* Before the adjustment, VR601, VR602, VR603 and VR604 should be turned to counter-clockwise direction.

1. Speaker switch Main
2. Sound volume. 0 (minimum)
3. DC voltmeter (capable to measure 5mV)

AMPLIFIER ADJUSTMENT

No.	ADJUSTMENTS	DC VOLTMETER CONNECTION	PARTS ADJUSTED	ADJUSTING PROCEDURE
1	Clamp voltage	(L channel) Between TP601 and TP602 (minus probe) (R channel) Between TP603 and TP604 (minus probe)	VR603 (L channel) VR604 (R channel)	* Turn Ica semi-fixed resistors VR601, VR602 to minimum. (counter-clockwise direction) * Adjust VR603 (L ch) and VR604 (R ch) to approx. 0.5mV after one minute warm-up time.
2	Ica	(L channel) Between TP601 and TP602 (minus probe) (R channel) Between TP603 and TP604 (minus probe)	VR602 (L channel) VR602 (R channel)	* Adjust VR601 (L ch) and VR602 (R ch) to approx. 8 ~ 12mV after one minute warm-up time.

ADJUSTMENT OF VOLTAGE APPLIED TO THE TONE VOLUME MOTOR

● **Do not apply input signal to the set.**

No.	ADJUSTMENTS	DC VOLTMETER CONNECTION	PARTS ADJUSTED	ADJUSTING PROCEDURE
1	Voltage applied to the motor	Between A and B	VR701	Make the tone volume up → down at low speed, and adjust so that the average voltage is 3.3V between A and B.

* Set FM/AM allocation selector to "FM 0.2MHz/AM 10kHz" position.

AM TUNER ADJUSTMENT

Note: AM OSC coil (L202) and AM 2nd IFT (T202) have been already adjusted, and require no adjustment.

● **Setting and Equipment used**

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. Maintain line voltage at 120 volts.
4. Output of signal generator should be no higher than necessary to obtain an output reading.
5. Pull the AM ferrite-bar antenna (L201) outward.
6. Set input selector to "tuner" position.
7. Use a non-metal screwdriver for the adjustment.
8. Set FM-AM muting/mode switch to "off/FM mono" position.
9. Set broadcast selector to "AM" position.
10. Set tape monitor and recording mode selector to "source" position.

Step No.	AM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
AM-IF ADJUSTMENT						
1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450kHz (30% Mod. with 400Hz)	Frequency of non-interference	Connect AC VTVM or scope to "Speaker" terminals of the set.	T201 (AM 1st IFT)	* Adjust the input frequency and adjustment points so that the output becomes maximum.
ANALOG FREQUENCY METER ADJUSTMENT						
2	—	No-Signal	87.9MHz	Connect DC VTVM to ③ terminal.	L5 (FM OSC Coil)	1. Adjust L5 so that voltage measured by DC voltmeter is 4.1V.
3	—	No-Signal	107.9MHz	Connect DC VTVM to ③ terminal.	CT1 (FM OSC Trimmer)	1. Adjust CT1 so that voltage measured by DC voltmeter is 16.0V.
4	—	No-Signal	100.1MHz	—	VR103 (Frequency meter)	1. Adjust VR103 so that the frequency meter indicates 100.1MHz (Refer to Fig. 15)

Step No.	AM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
AM-RF ADJUSTMENT * Set broadcast selector to "AM" position.						
5	—	No-Signal	1100kHz	Connect DC VTVM to 39 terminal.	CT202 (AM OSC Trimmer)	<ol style="list-style-type: none"> Adjust CT202 so that the frequency meter indicates 1100kHz. (Refer to Fig. 14) If it is not adjustable, set the frequency to 530kHz and adjust L202 (AM OSC Coil) so that the voltage of 39 is $1.2 \pm 0.05V$. Next, set the frequency to 1500kHz and make sure that the range is within 3 of Fig. 15. If it is not within the range, perform the adjustment of steps 1 and 3 again.
6	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	610kHz (30% Mod. with 400Hz)	610kHz	Connect AC VTVM to scope to "speaker" terminals of the set	L201 (ANT Coil)	<ol style="list-style-type: none"> Adjust for maximum output. Adjust ferrite core of L201 by screwdriver.
7		1500kHz (30% Mod. with 400Hz)	1500kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	CT201 (ANT Trimmer)	<ol style="list-style-type: none"> Adjust for maximum output. Repeat steps (6) and (7) until the frequency correctly matches the dial display.

FM TUNER ADJUSTMENT

* Equipment used

- FM signal generator (FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- AC and DC electronic voltmeters (VTVM).
- Frequency counter (19kHz and 108MHz measurable).
- FM 300Ω dummy antenna (Fig. 16).

* Preparation of FM signal generator (FM-SG)

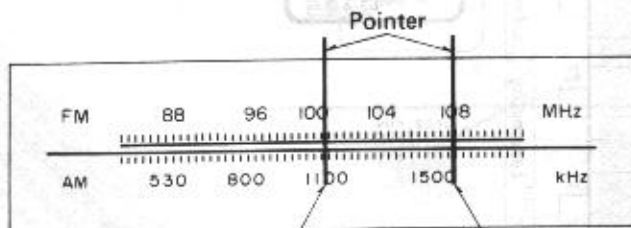
- Connect stereo modulator to FM-SG.
- Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna.
- The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of using dummy antenna, SG output must be 12dB plus (IHF). That is, when input is 60dB, SG output is to be 72dB.

* Setting of controls

- Set IF band selector to "normal" position.
- Set broadcast selector to "FM" position.
- Other setting are the same as in AM adjustment.

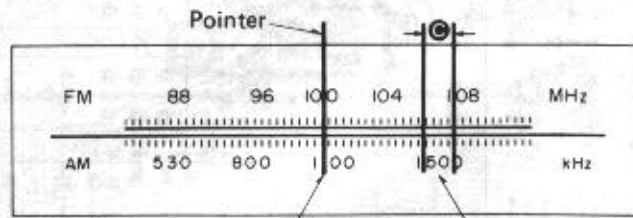
Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
FM-IF ADJUSTMENT						
8	—	No-Signal	Frequency of non-interference	Connect DC VTVM between TP103 and TP104 through choke coil. (Refer to Fig. 17)	T101 (Discr. IFT)	Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
FM-RF ADJUSTMENT						
9	—	No-Signal	87.9MHz	Connect DC VTVM to 39 terminal.	L5 (OSC Coil)	Adjust L5 (OSC Coil) to 4.1V.
10	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.	90.1MHz (100% Mod. with 400Hz) weak input	90.1MHz	Connect scope to "Speaker" terminals of the set.	L2 (RF DET Coil 1st) L3 (RF DET Coil, 2nd) L1 (ANT Coil) T1 (FM IFT)	<ol style="list-style-type: none"> Add weak input so that noise is included in the output wave form. Make the adjustment so that the output wave form is vertically symmetrical. Refer to Fig. 18. Repeat the steps (10) and (11) until the frequency correctly matches the broadcasts frequency display.
11		106.1MHz (100% Mod. with 400Hz)	106.1MHz	Connect scope to "Speaker" terminals of the set.	CT1 (OSC Trimmer)	
FM MONO DISTORTION ADJUSTMENT						
12	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 60dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T101, T102 (Discr. IFT)	<ol style="list-style-type: none"> Set the FM muting/FM mode switch to "on/auto" and then check step (8) in no signal mode. If it is deflected, readjust of T101. Adjust T102 core so that distortion of right and left channels are minimized.

Step No.	FM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
FM MUTING LEVEL ADJUSTMENT						
13	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 16dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Connect AC VTVM or scope to "Speaker" terminals of the set.	VR101 (Muting level)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "off/mono" 2. With the FM muting/FM mode switch set to "on/auto" adjust VR101 so that the output is given with muting condition released.
SIGNAL METER LED (Light Emitting diode) INDICATOR ADJUSTMENT						
14	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 45dB to antenna terminal)	100.1MHz (100% Mod. with 400Hz)	100.1MHz	Signal meter LED	VR102 (Meter level)	Adjust VR102 while observing the signal meter LED so that the indicator at 5th is about to turn on.
FM MPX PILOT (VCO) ADJUSTMENT						
15	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Monaural signal)	100.1MHz (Non-modulated)	100.1MHz	Connect frequency counter to TP301 terminal.	VR302 (VCO)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Adjust VR302 to 19kHz ± 30Hz.
STEREO DISTORTION ADJUSTMENT						
16	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 400Hz (L mode))	100.1MHz	Connect distortion analyser to "Speaker" terminals of the set.	T1 (IFT)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Re-adjust the already adjusted T1 within ± 90° from the preset core position so that the distortion of L ch is minimized. 3. Re-check the steps 8, 12 and 13.
SEPARATION ADJUSTMENT						
17	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1MHz (100% Mod. with 1kHz) (L or R mode)	100.1MHz	Connect AC VTVM to "Speaker" terminals of the set.	VR301 (Separation)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/auto". 2. Adjust VR301 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.



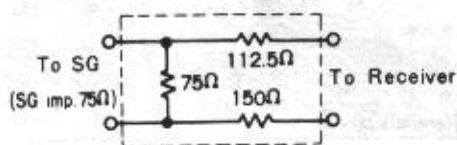
(When 1100kHz) (When 107.9MHz)

[Fig. 14]



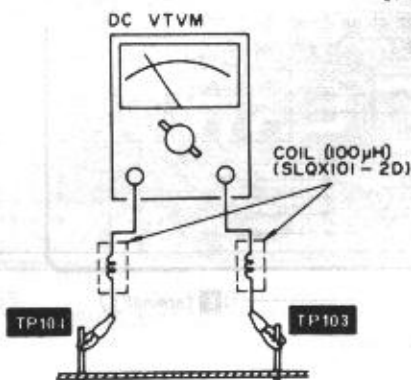
(When 100.1MHz) (When 1500kHz)

[Fig. 15]

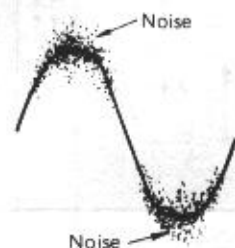


300Ω FM Dummy Antenna

[Fig. 16]



[Fig. 17]



AF output wave form

[Fig. 18]

12. **S913** : FM/AM allocation selector switch in "FM 0.2MHz/AM 10kHz" step position.
13. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
 * Figures in □ stand for DC voltage in FM signal reception mode.
 * Figures in () stand for DC voltage in AM signal reception mode.
 * □ marked terminal : 5V or 0V output.
14. Transistor and IC terminals which carry no voltage indication emit 5V pulse waveforms or are subject to change according to the frequency or input signal levels.
15. Signal lines
 □/□□□ FM signal
 ■/■ ■ ■ AM signal
 ▬ Audio frequency signal
 — Positive voltage lines

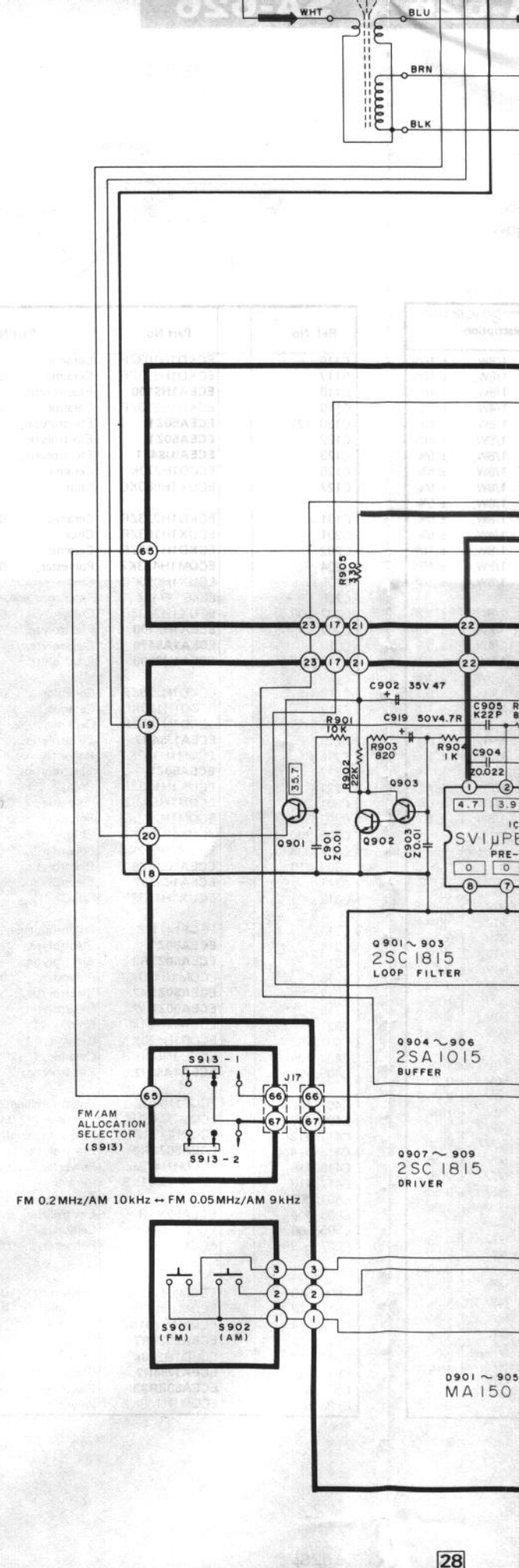
IMPORTANT SAFETY NOTICE

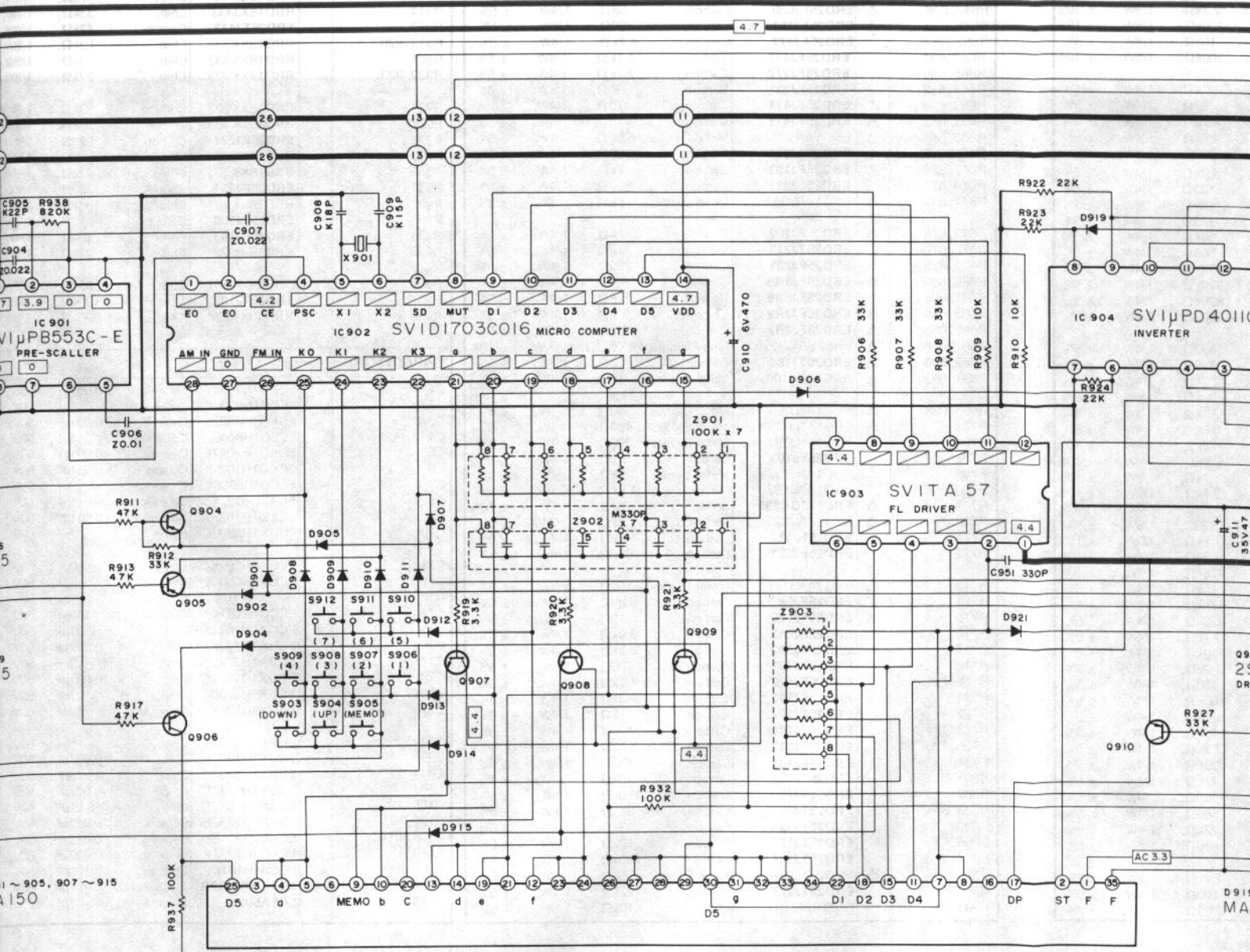
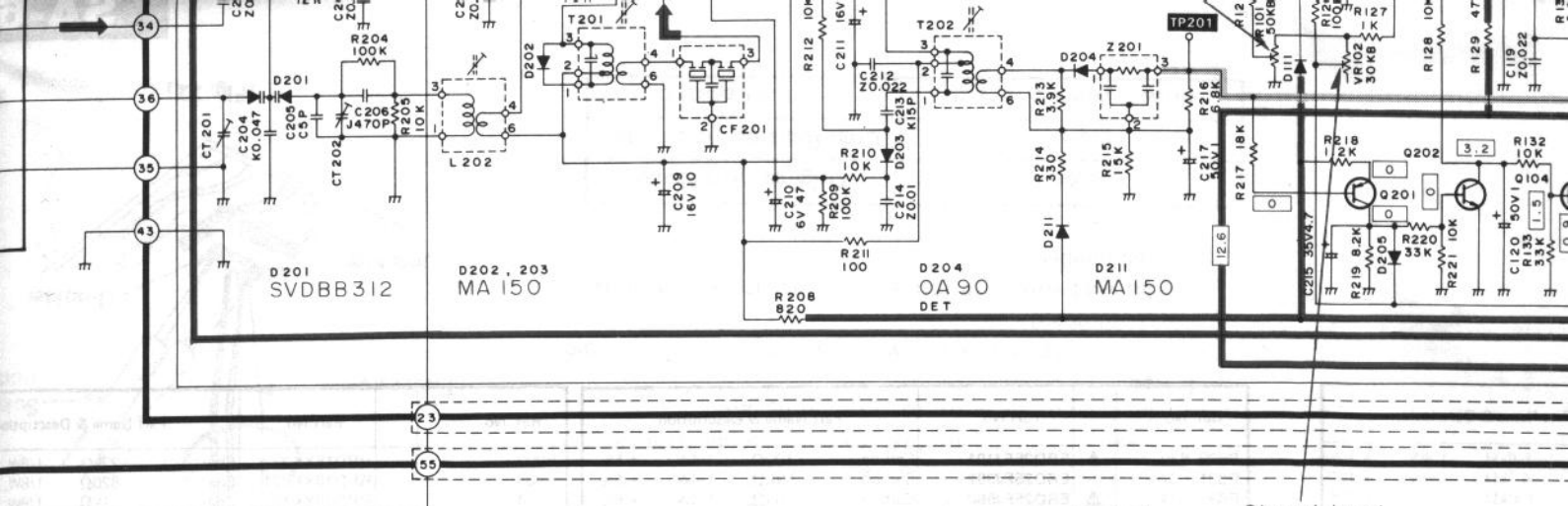
The shaded area on this schematic diagram incorporates special features important for safety. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

Terminal guide of transistors and IC's

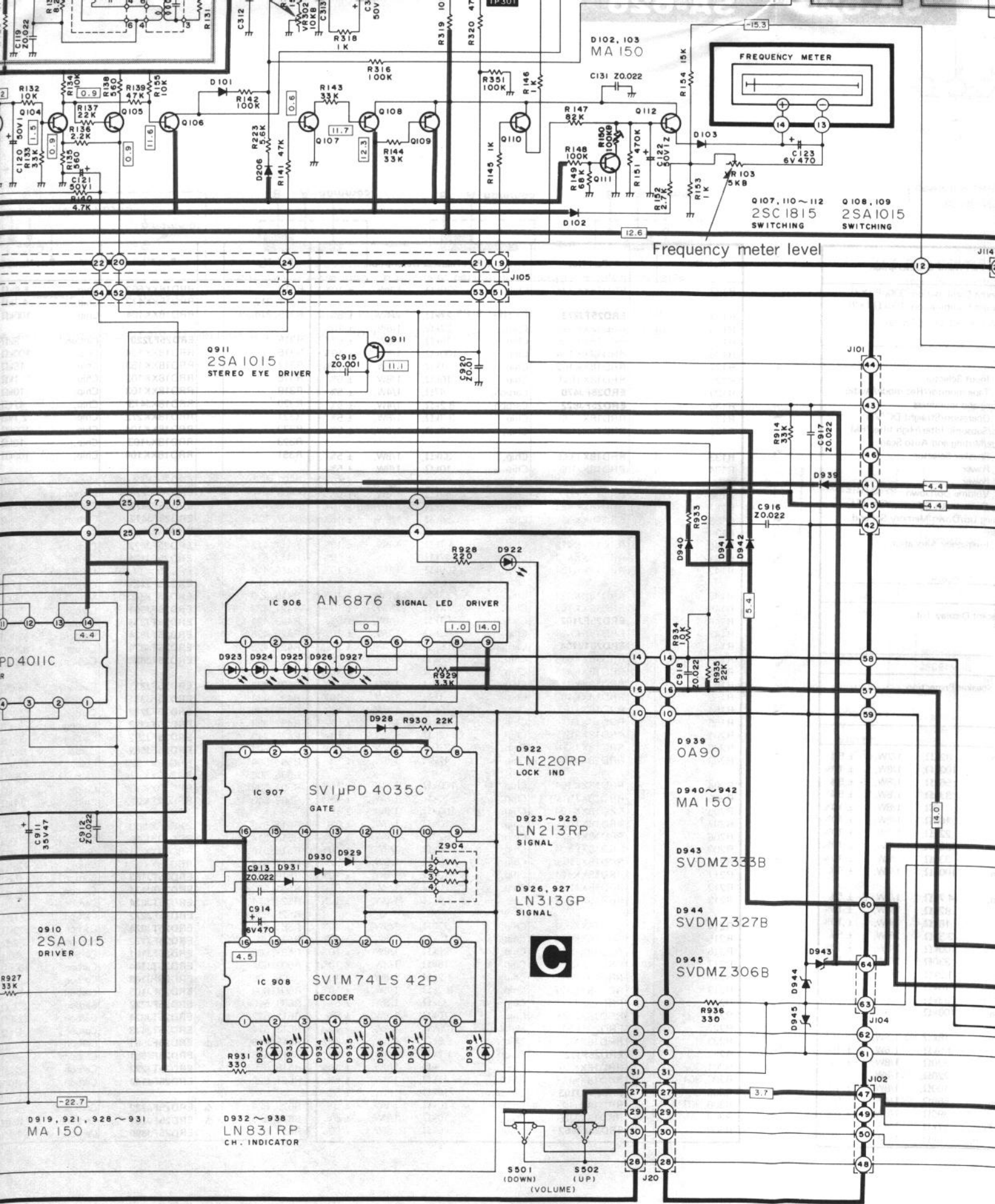
SV1μPC108C, SV1LA123NS SV1μPC1161C, SV1μPD4035C, SV1M74LS42P	SVINJM4559DS, SVINJM4558DG	AN6876
SVITA7317P	SVITA57	SVID1703C016
SV1μPB553C	SV1μPD4011C	2SC1913, 2SD880, 2SA913
2SC1674, 2SC1675 2SC945, 2SC1815 2SA1015, 2SC2320 2SA992, 2SC1815 2SC822, 2SC2631 2SA1123, 2SA921 2SC1509, 2SA777 2SC1318, 2SA720	3SK74-L1	2SD661
	2SK246	
	Source Gate Drain	
2SK170	2SB745, 2SB755 2SD845	MA320G1-N
1. Drain 2. Gate 3. Source		
SVDMZ □□□□	LN213RP, LN313GP LN220RP, LN224RP	LN831RP

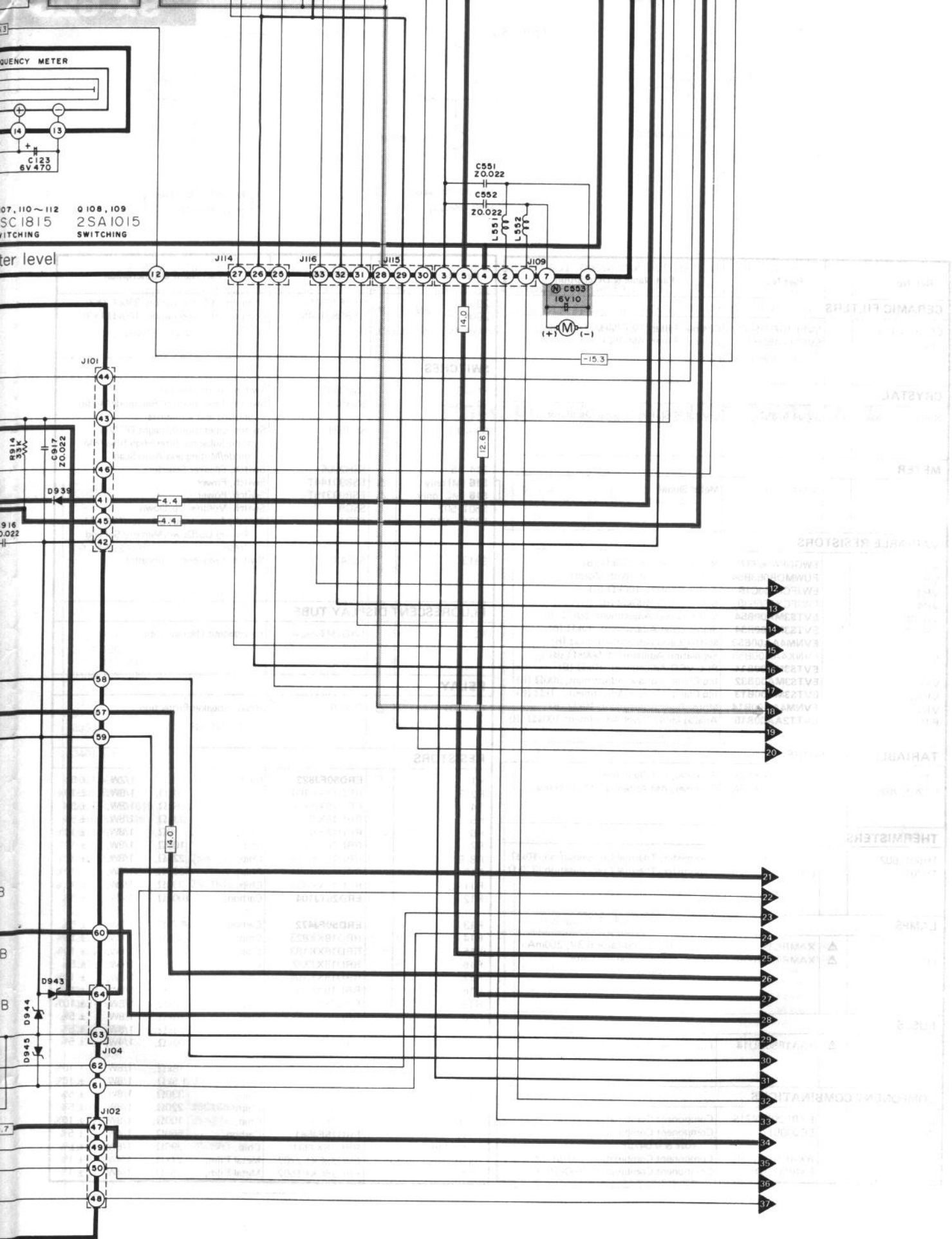
C
D
E
F
G
H
I





LOGIC, FL DISPLAY & LED DISPLAY CIRCUIT





■ SCHEMATIC DIAGRAM (A)

(A, B and C P.C.B.) ...

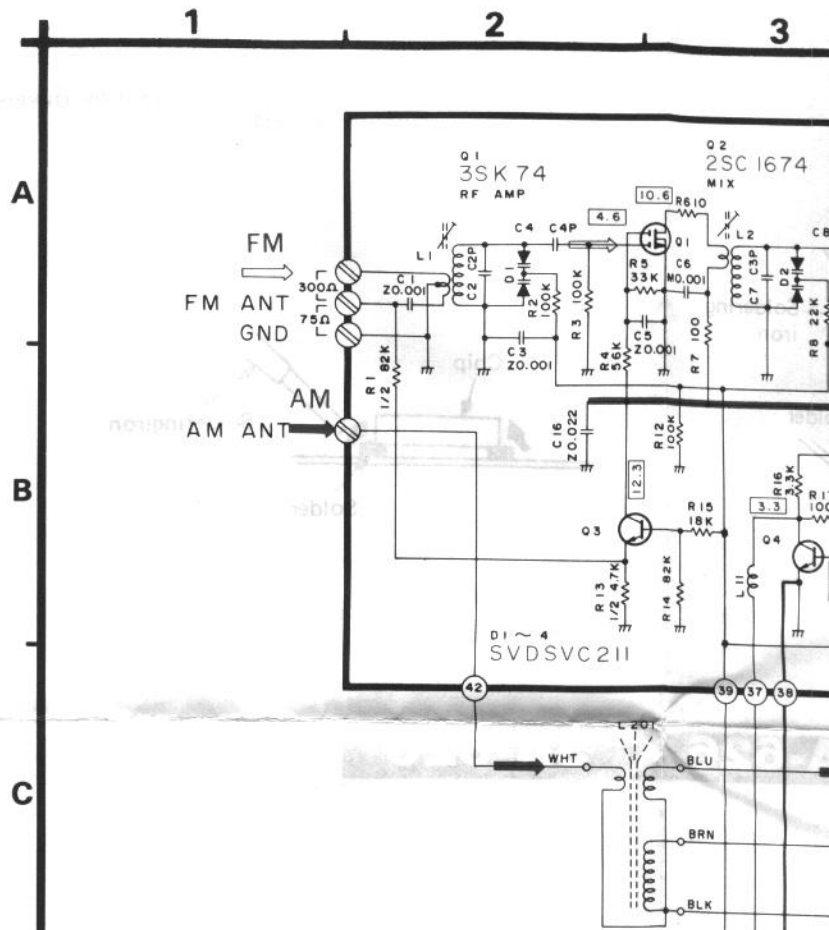
MODEL SA-626

(This schematic diagram may be modified at any time with the development of new technology.)

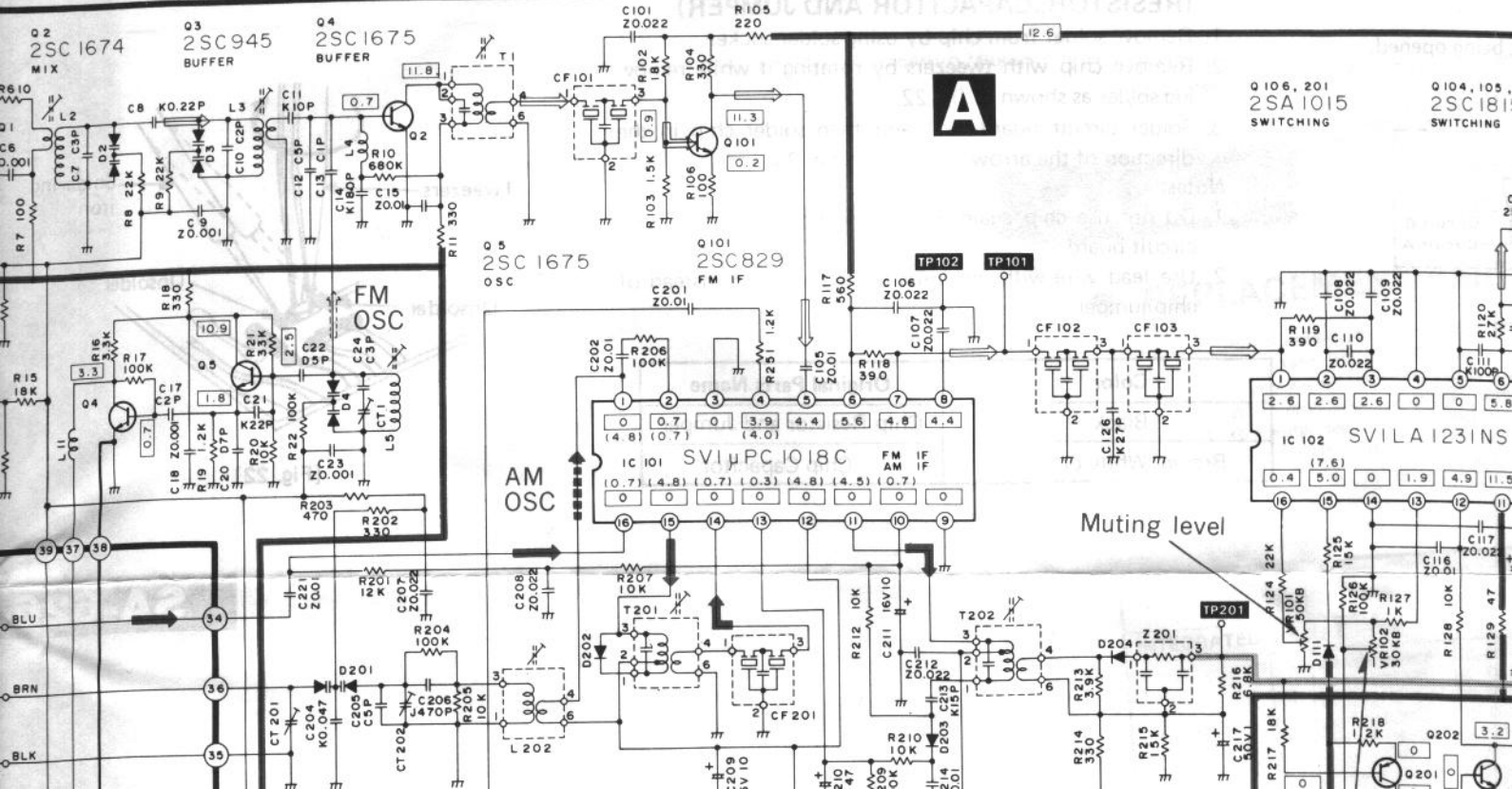
Notes 1:

- S1-1 ~ S1-3**: Phono input selector switch in "off" position.
- S2-1 ~ S2-4**: Tuner input selector switch in "on" position.
- S3-1 ~ S3-3**: Aux input selector switch in "off" position.
- S501**: Volume "down" switch.
- S502**: Volume "up" switch.
- S901**: FM tuner selector switch.
- S902**: AM tuner selector switch.
- S903**: Manual tuning "down" switch.
- S904**: Manual tuning "up" switch.
- S905**: Memory set switch.
- S906 ~ S912**: Preset tuning switch.
S906 - 1 ch, S907 - 2 ch, S908 - 3 ch
S909 - 4 ch, S910 - 5 ch, S911 - 6 ch
S912 - 7 ch
- S913**: FM/AM allocation selector switch in "FM 0.2MHz/AM 10kHz" step position.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.

Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
* Figures in □ stand for DC voltage in FM signal reception mode



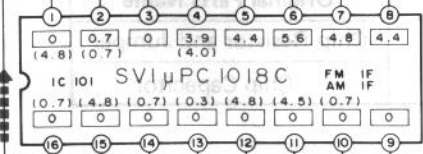
HOW TO REPLACE CHIPS



A

AM OSC

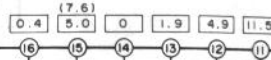
Muting level



Q106, 201
2SA1015
SWITCHING

Q104, 105,
2SC1815
SWITCHING

IC102 SVILA123INS



TUNER CIRCUIT

Q106, 201
2SA1015
SWITCHING

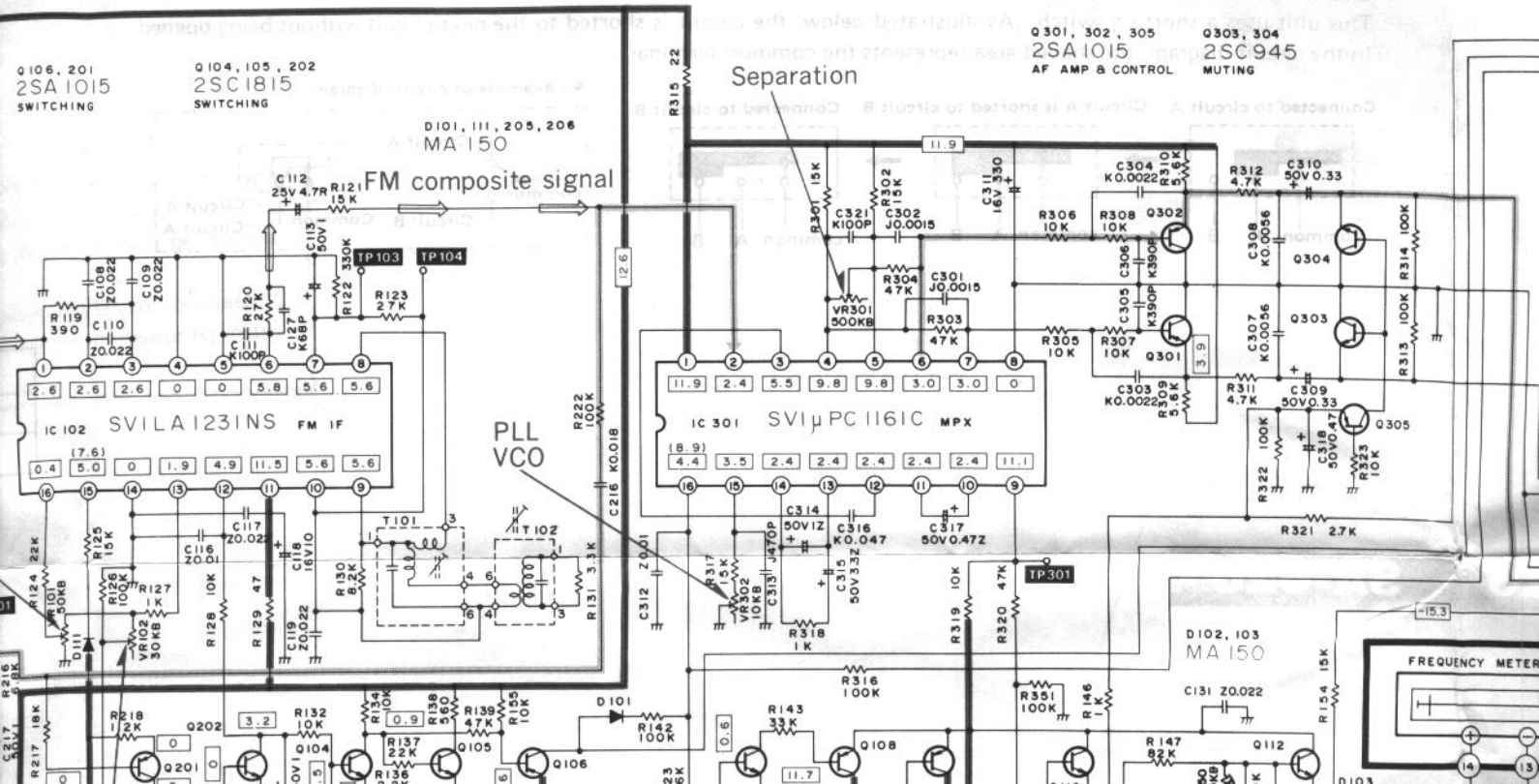
Q104, 105, 202
2SC1815
SWITCHING

D101, 111, 205, 206
MA150

Q301, 302, 305
2SA1015
AF AMP & CONTROL

Q303, 304
2SC945
MUTING

Separation



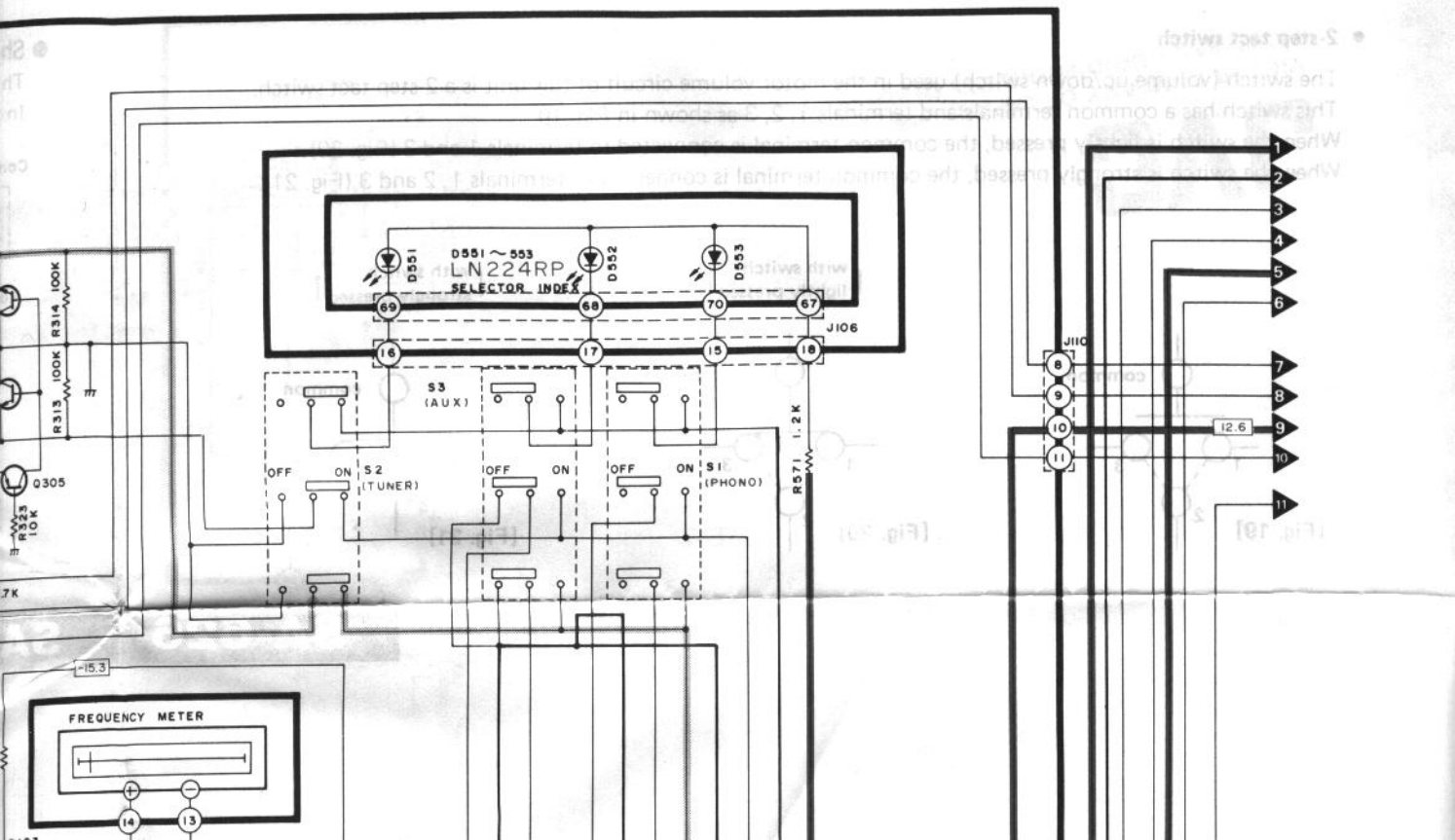
IC 102 SVILA1231NS FM IF

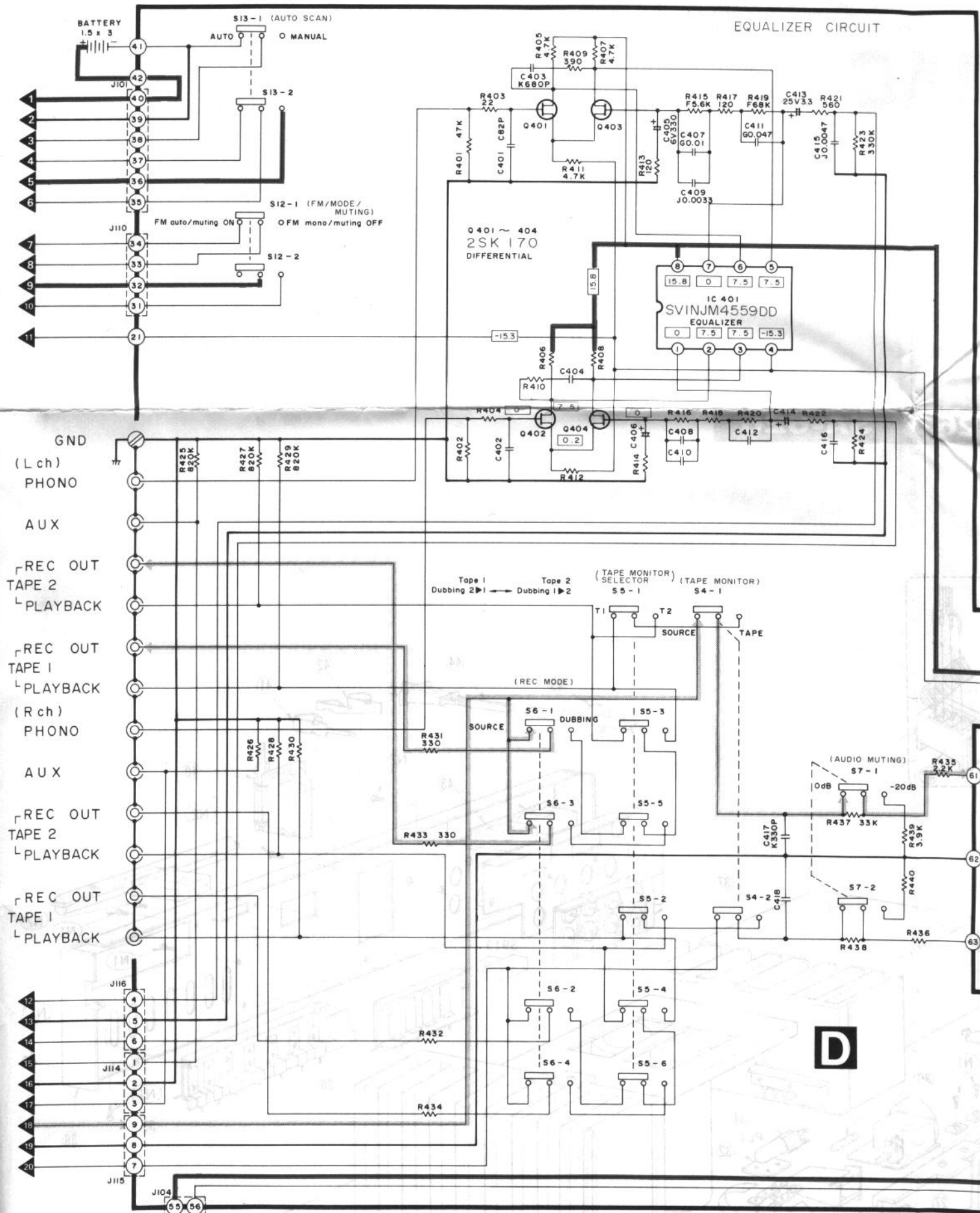
PLL VCO

IC 301 SVIµPC1161C MPX

D102, 103
MA150

FREQUENCY METER



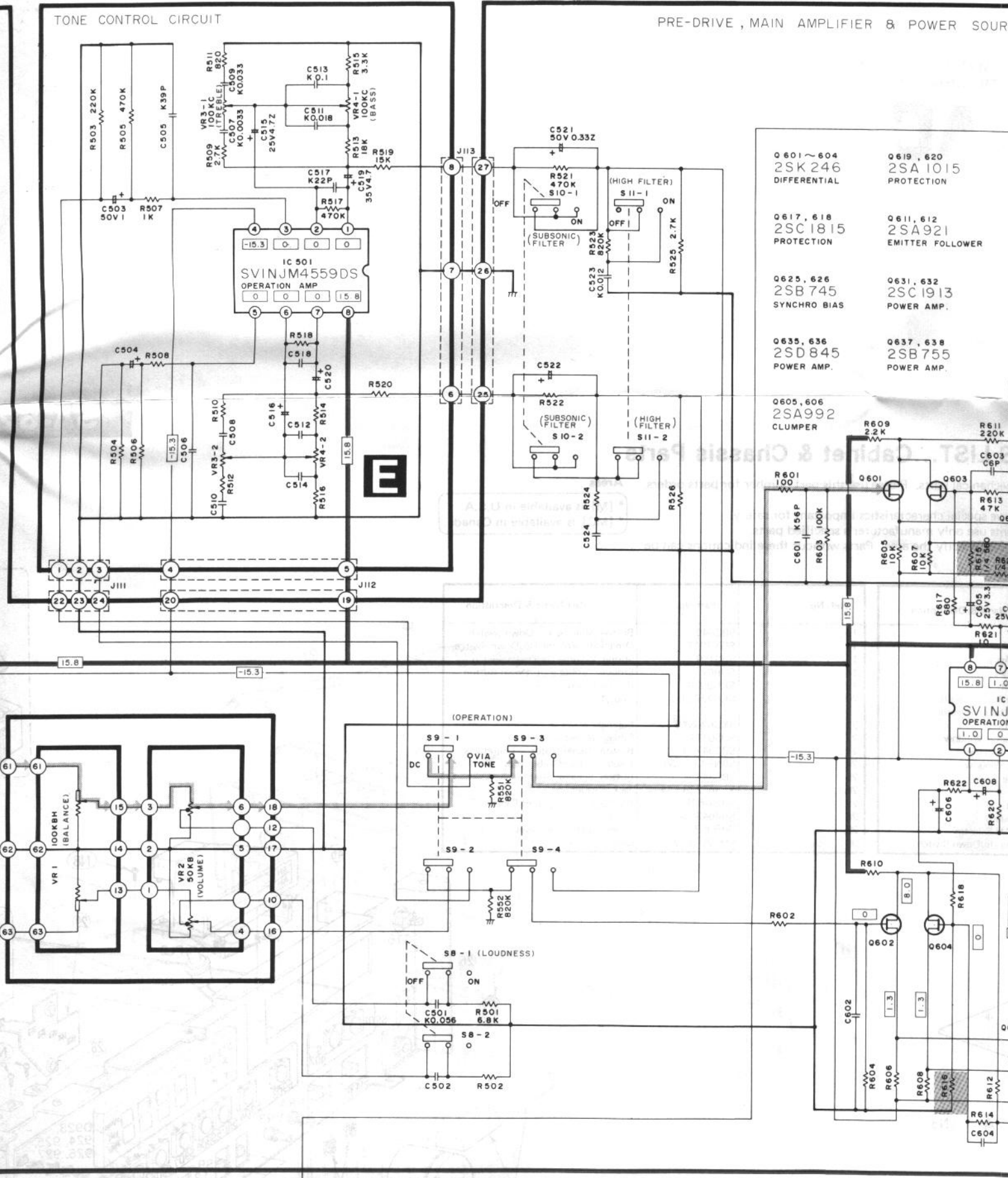


D

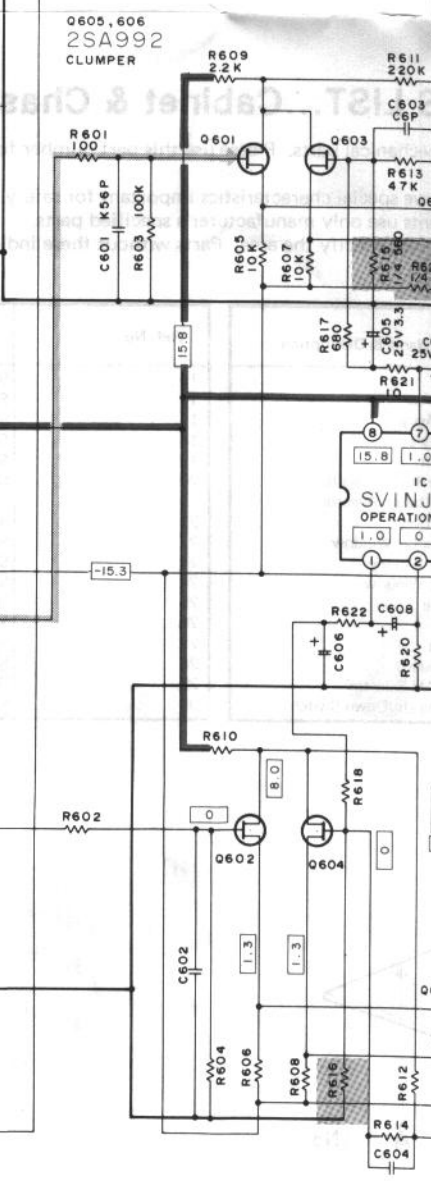
Q710, 712 2SA 720	Q703, 706 2SD880	Q704, 705, 707, 708 2SC 1815	Q709, 711 2SC 1318
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TONE CONTROL CIRCUIT

PRE-DRIVE, MAIN AMPLIFIER & POWER SOURCE



- Q 601 ~ 604
2SK 246
DIFFERENTIAL
- Q 619, 620
2SA 1015
PROTECTION
- Q 617, 618
2SC 1815
PROTECTION
- Q 611, 612
2SA 921
EMITTER FOLLOWER
- Q 625, 626
2SB 745
SYNCHRO BIAS
- Q 631, 632
2SC 1913
POWER AMP.
- Q 635, 636
2SD 845
POWER AMP.
- Q 637, 638
2SB 755
POWER AMP.



POWER SOURCE CIRCUIT

Q619, 620
2SA1015
PROTECTION

Q607 ~ 610, 615, 616, 627, 628
2SC2631
CASCADE CURRENT STABILIZER & DRIVE

Q611, 612
2SA921
EMITTER FOLLOWER

Q613, 614, 629, 630
2SA1123
PRE-DRIVE & DRIVE

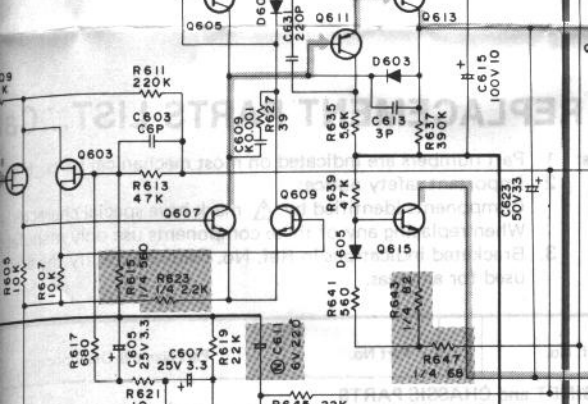
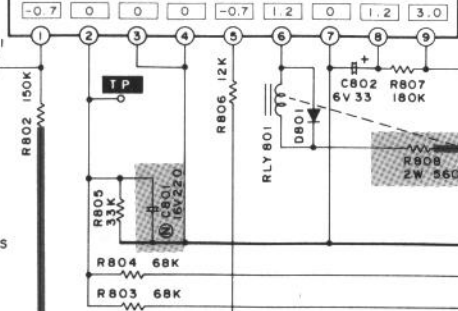
Q621 ~ 624
2SD661
ICQ & SYNCHRO BIAS

Q631, 632
2SC1913
POWER AMP.

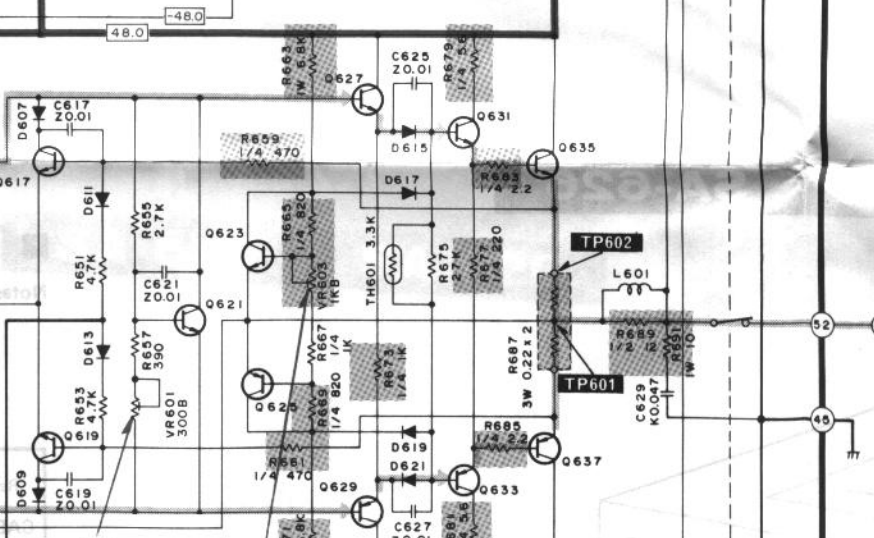
Q633, 634
2SA913
POWER AMP.

Q637, 638
2SB755
POWER AMP.

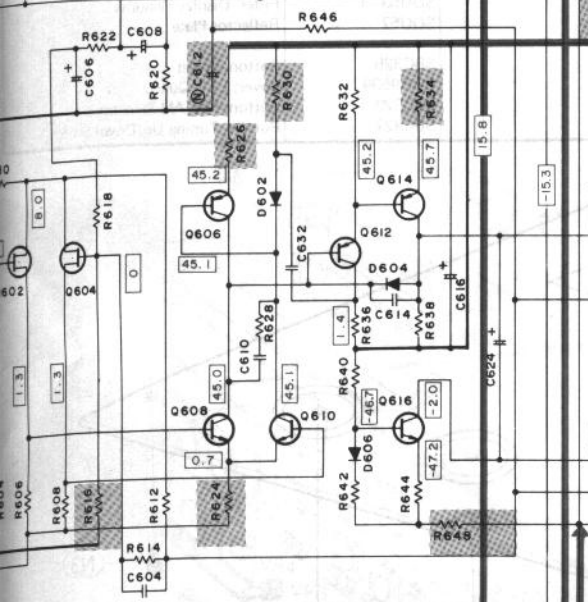
IC 801 SVITA 7317B
RELAY DRIVE



IC 601 SVINJM4558D
OPERATION AMP
1.0 0 0 -15.3



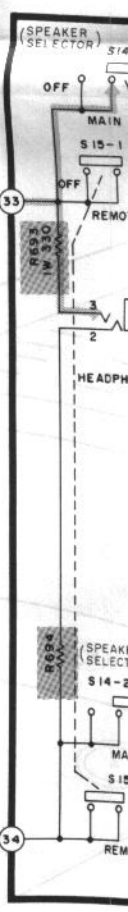
ICQ Clamp voltage



ICQ Clamp voltage

Q701 2SC1509NC REGULATOR
Q702 2SA777NC REGULATOR

D601~604
MA162A



■ SCHEMATIC DIAGRAM (B)

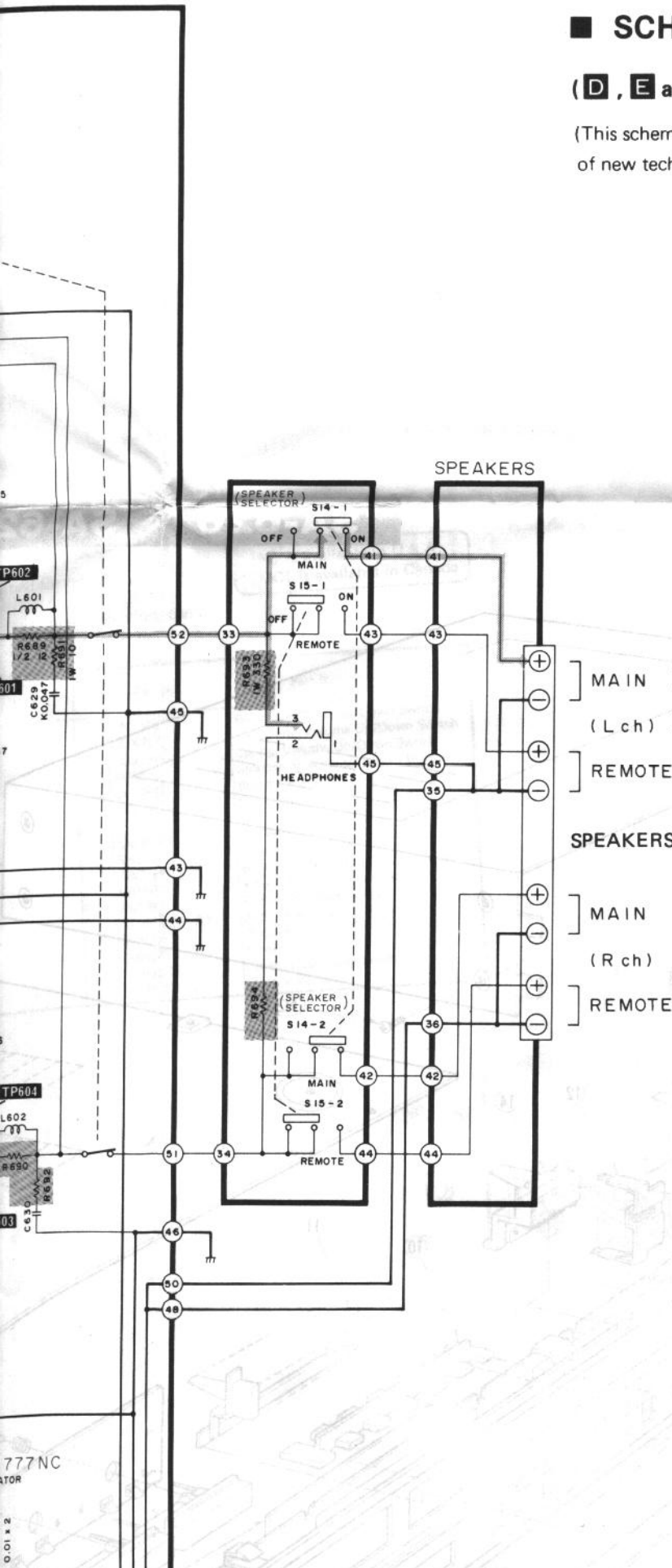
(D, E and F P.C.B.) ... MODEL

SA-626

(This schematic diagram may be modified at any time with the development of new technology.)

Notes 2:

1. **S4-1, S4-2** : Tape monitor switch in "source" position.
 source, tape
2. **S5-1 ~ S5-6** : Tape monitor and rec mode switch in "Tape 1 and dubbing 2 ▶ 1" position.
 tape 1 and dubbing 2 ▶ 1, tape 2 and dubbing 1 ▶ 2
3. **S6-1 ~ S6-4** : Rec mode switch in "source" position.
 source, dubbing
4. **S7-1, S7-2** : Audio muting switch in "0 dB" position.
 0 dB, -20 dB
5. **S8-1, S8-2** : Loudness switch in "off" position.
 off, on
6. **S9-1 ~ S9-4** : Operation switch in "straight DC" position.
 straight DC, via tone
7. **S10-1, S10-2** : Subsonic filter switch in "off" position.
 off, on
8. **S11-1, S11-2** : High filter switch in "off" position.
 off, on
9. **S12-1, S12-2** : FM/mode/muting switch in "FM auto/muting on" position.
 FM auto/muting on, FM mono/muting off
10. **S13-1, S13-2** : Auto scan switch in "on (auto)" position.
 on (auto), off (manual)
11. **S14-1, S14-2** : Main speaker switch in "on" position.
12. **S15-1, S15-2** : Remote speaker switch in "off" position.
13. **S16** : Power source switch in "on" position.
14. Signal line
 Positive voltage lines
 Audio frequency signal

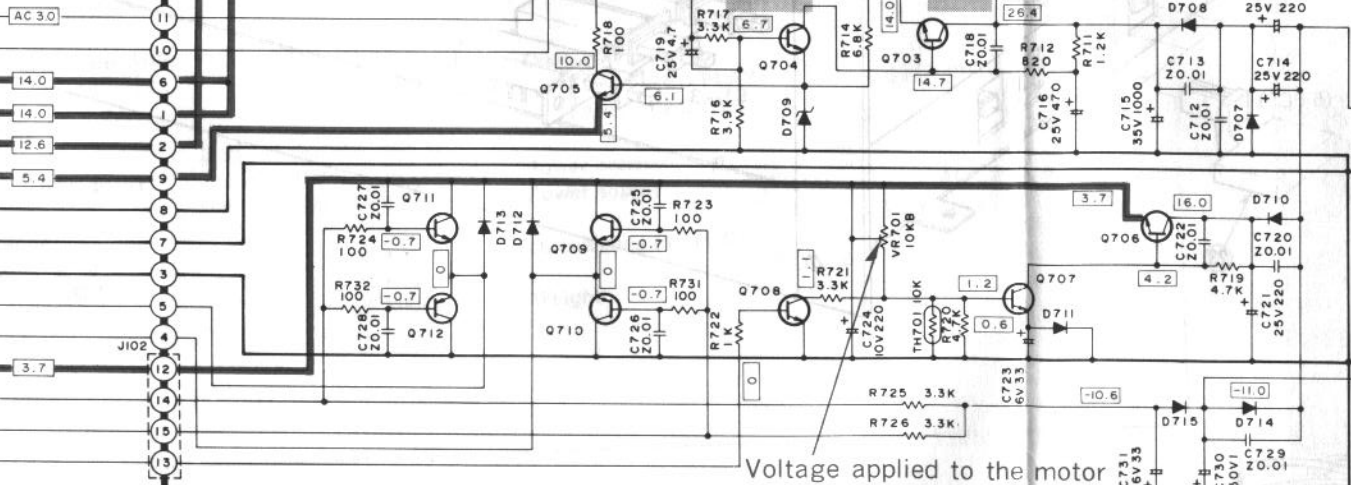


IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for safety. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

25A720 MOTOR DRIVE
 23D880 REGULATOR
 25C1815 STABILIZER & SWITCHING
 25C1518 MOTOR DRIVE

D707,708,710,712,713
 SVDSRIK 2



D709
 SVDMZ 306B

D711
 MA 27B

D714,715
 MA 150

MOTOR DRIVE & VOLTAGE REGULATOR CIRCUIT

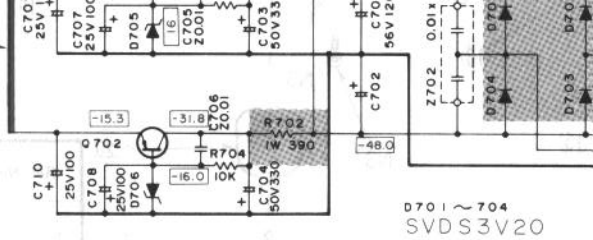
F

D 607 ~ 610, 801
MA 150

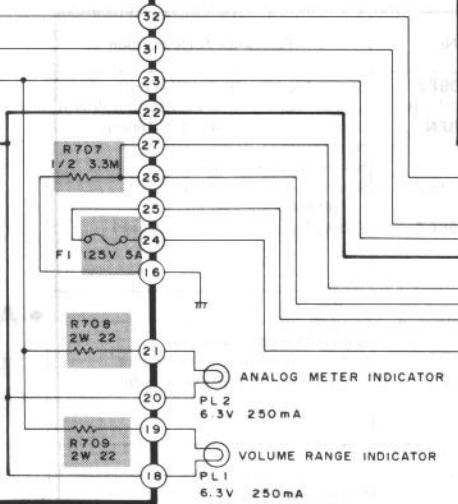
D 615 ~ 622
20A 90

D 611 ~ 614
MA 162

Negative voltage line



D701 ~ 704
SVDS3V20



AC 3.0
AC 3.0
AC 11.7

