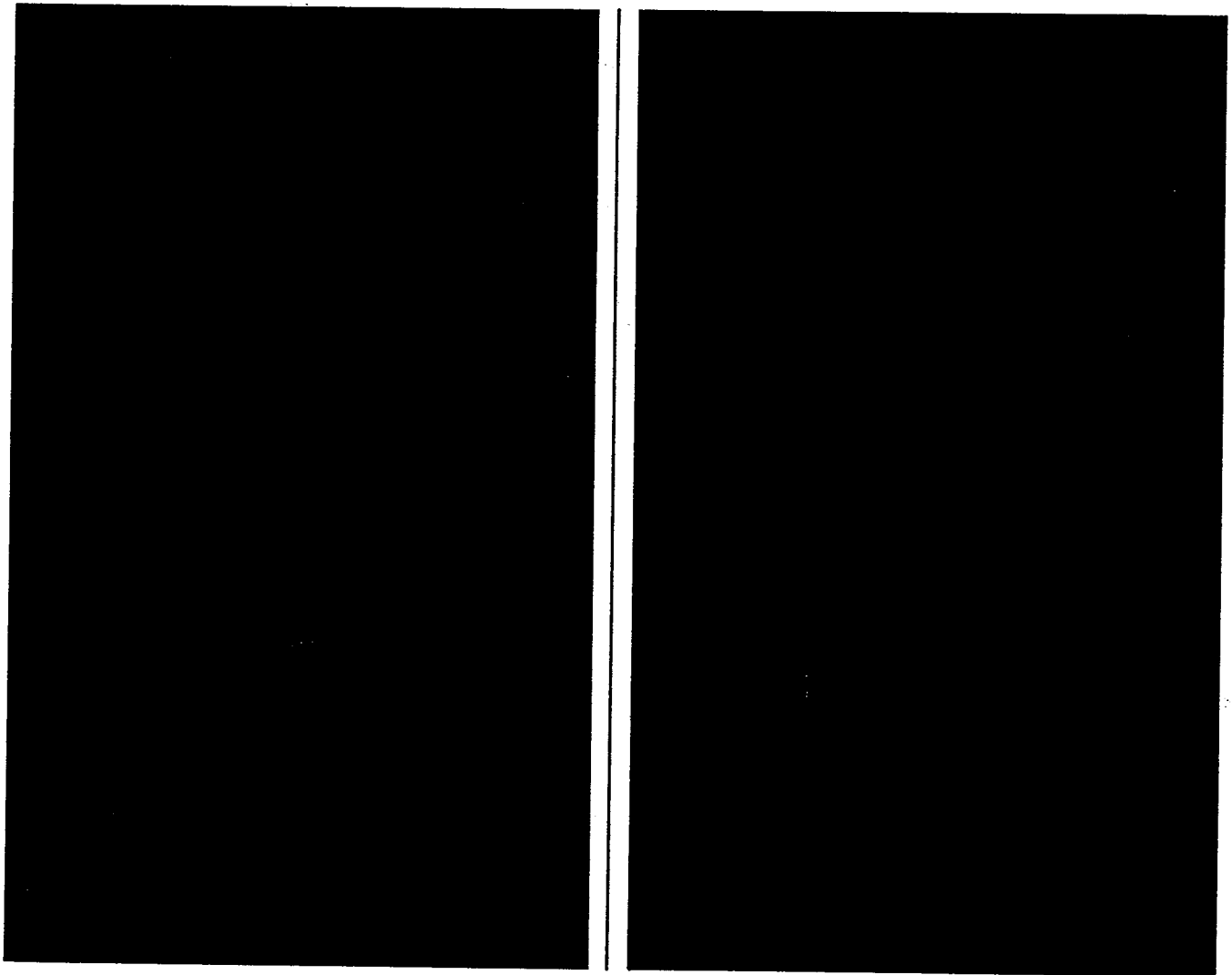


40

# Service Manual Integrated Stereo Amplifiers

# 460A/480A

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The Name to listen to.

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## CAUTION NOTICE

The following safety precautions must be followed to assure continued reliability and safety against fire and shock hazard:

1. Replacement parts used during servicing of this appliance must have identical characteristics as those offered and recommended by H. H. Scott, Inc.
2. A dielectric test is to be performed on each appliance following the re-assembly and before returning the unit to the customer.
3. The dielectric test to be performed on H. H. Scott, Inc. electric components serviced in the United States and Canada for use in these countries shall consist of not less than the following: \*
  - 1) A dielectric tester designed to supply not less than 1100 volts at 60 Hz and employing leakage current indicator(s), is to be used.
  - 2) The tester is to be connected per the instructions enclosed with the instrument, or as follows:
    - a. The tester is connected to the power line receptacle and the power switch is turned on.
    - b. Sufficient time is allowed for the tester supply to stabilize and then the output voltage is adjusted for 1080V.
    - c. Leads of the tester, usually marked GND and HV, are connected between chassis ground and both blades of the male plug of the power cord.
    - d. Switch tester to "test" and observe leakage indicator. Leakage current must not exceed 0.5 mA.

\* Dielectric tests made by service personnel in countries other than USA and Canada must use test equipment and procedures specified by the safety agency serving that country.

# SPECIFICATIONS: 460A(480A)

**Minimum Continuous RMS Output Power per channel, both channels driven into 8 Ohms from 20 Hz – 20 kHz with no more than rated THD**  
70 watts (85 watts)

**Total Harmonic Distortion [78 IHF rated, at 20 Hz – 20 kHz]**  
0.04% (0.03%)

**Intermodulation Distortion [at rated output, 60:7000 Hz; 4:1]**  
0.04% (0.03%)

**Frequency Response [at 1 watt output,  $\pm 0.5$  dB]**  
20 Hz to 20 kHz

**Power Bandwidth [at  $-3$  dB]**  
10 Hz to 40 kHz

**Damping Factor [at 1 kHz, for 8 Ohm load]**  
>100

**Input Sensitivity [for rated output]**

Phono 1: 2.5 mV

Phono 2 Hi: 2.5 mV

Phono 2 Lo: 5 mV

Aux, Tuner: 150 mV

Accessory Input: 150 mV

Tape Play Jacks 1 and 2: 150 mV

Tape 2 DIN Input: 150 mV

**Maximum Input Voltage**

Phono 1: 180 mV

Phono 2 Hi: 180 mV

Phono 2 Lo: 360 mV

Aux, Tuner: 10V

Accessory Input: 10V

Tape Play Jacks 1 and 2: 10V

Tape 2 DIN Input: 10V

**Signal-to-Noise Ratio [shorted input, IHF A network]**

Phono 1; Ref. 10 mV: 90 dB

Phono 2; Ref. 10 mV: 90 dB

Aux, Tuner: 95 dB

Tape Play Jacks 1 and 2: 95 dB

Tape 2 DIN Input: 95 dB

**Tone Control Range**

Bass (100 Hz):  $\pm 10$  dB

Mid (1 kHz):  $\pm 6$  dB

Treble (10 kHz):  $\pm 10$  dB

**Filter Attenuations [12 dB/oct.]**

High (8 kHz):  $-3$  dB

Sub-sonic (18 Hz):  $-3$  dB

**Loudness Contour Compensation [Volume Control set to  $-30$  dB]**

100 Hz:  $+7$  dB

10 kHz:  $+3.5$  dB

**Crosstalk**

1 kHz: 80 dB

**Channel Balance [maximum Volume Control]**

0.5 dB

**RIAA Tolerance [78 RIAA rated, 20 Hz to 20 kHz]**

$\pm 0.5$  dB

**Channel Separation [78 IHF rated]**

Phono 1 and 2 (1 kHz): 65 dB

Aux, Tuner, Accessory Input, Tape Play 1 and 2,

Tape 2 DIN Input (1 kHz): 75 dB

**Tape Recording Output Level [at rated input sensitivity level]**

Tape 1 Rec: 150 mV

Tape 2 Rec: 150 mV

Tape 2 DIN Output: 30 mV

**AC Power Requirement**

117V AC 60 Hz (US/Canada version)

100V/117V/220V/240V, switchable

AC 50/60 Hz (European version)

**Power Consumption**

US/Canada: 200W (240W), Europe: 530W (630W)

**Dimensions**

17"W, 5-1/4"H, 14-1/4"D

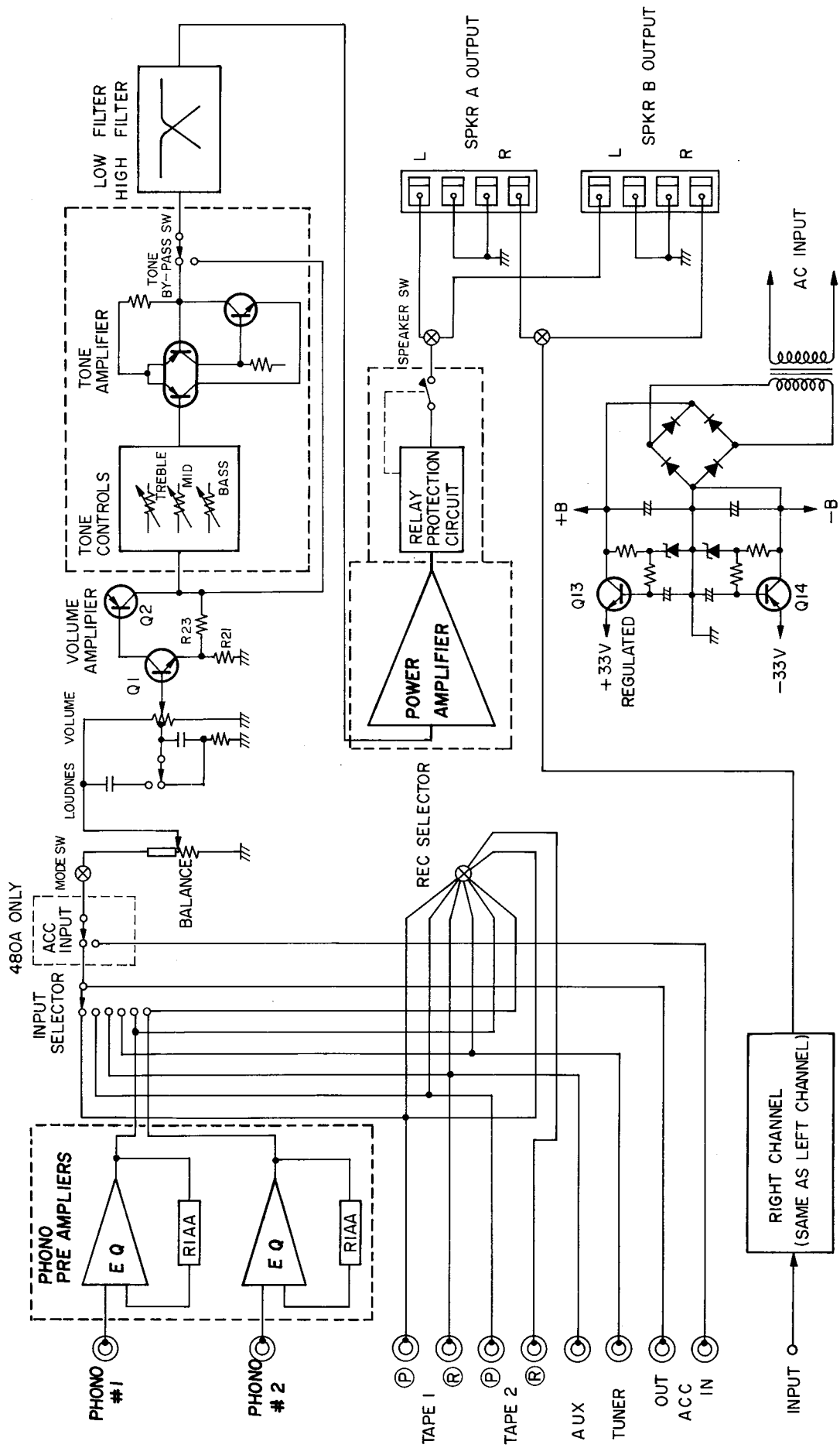
430W, 132H, 330D (mm)

**Net Weight**

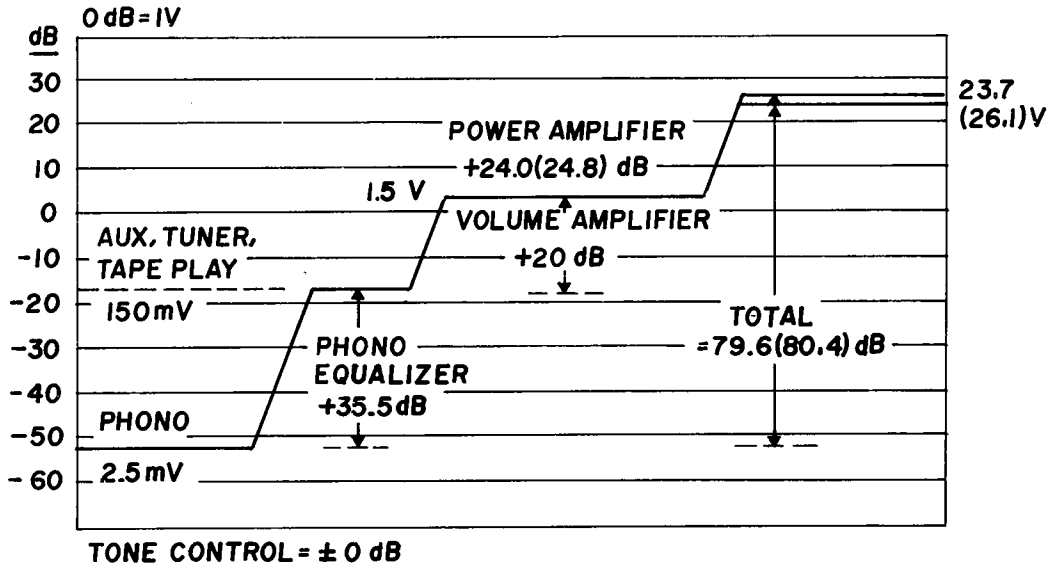
27 lbs (29 lbs)

12.3 kgs (13 kgs)

# BLOCK DIAGRAM



- DOTTED LINE AREAS ARE REPRESENTED IN CIRCUIT DESCRIPTION.



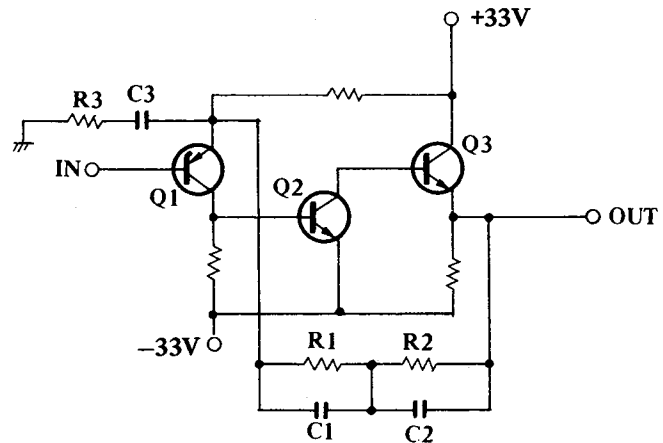
## CIRCUIT DESCRIPTION

### Phono Preamplifier

This is a negative feedback type of phono equalizer, it consists of three low noise transistors per channel. Open loop gain of the circuit is 86 dB. Negative feedback for gain adjustment and equalization is provided by resistors R1, and R2 and capacitors C1 and C2 connected between emitter of Q3 and emitter of Q1 giving a gain of 35.5 dB @ 1 kHz.

Units produced for use in Europe include circuitry to provide playback equalization conforming to IEC standards publication 98 amended September 1976 ie: +16.3 dB @ 50 Hz, -13.7 dB @ 10 kHz. Units produced for North America provide playback equalization conforming to RIAA standards ie: +16.9 dB @ 50 Hz, -13.7 dB @ 10 kHz.

Additional rolloff below 30 Hz required by IEC standard is provided by C3. The circuit is powered by a split power supply of  $\pm 33$ V to provide an over load capability of greater than 200 mV at 1.0 kHz.



### Volume Amplifier

The signal from the volume control is amplified 20 dB by the dual transistor amplifier Q1 and Q2 (refer to block dia-

gram, page 4). Gain is set by the ratio of R23 to R21.

### Tone Control

The tone control circuit is a negative feedback type which utilizes common emitter amplifier Q3 and emitter follower Q2 as the active elements. That is, the gain of Q3 is controlled by the tone control circuitry.

**Mid Tone Control:** At 1 kHz the bass and treble controls have little effect on the gain since the impedance of capacitor C1, is high which effectively removes VR1 from the circuit. Im-

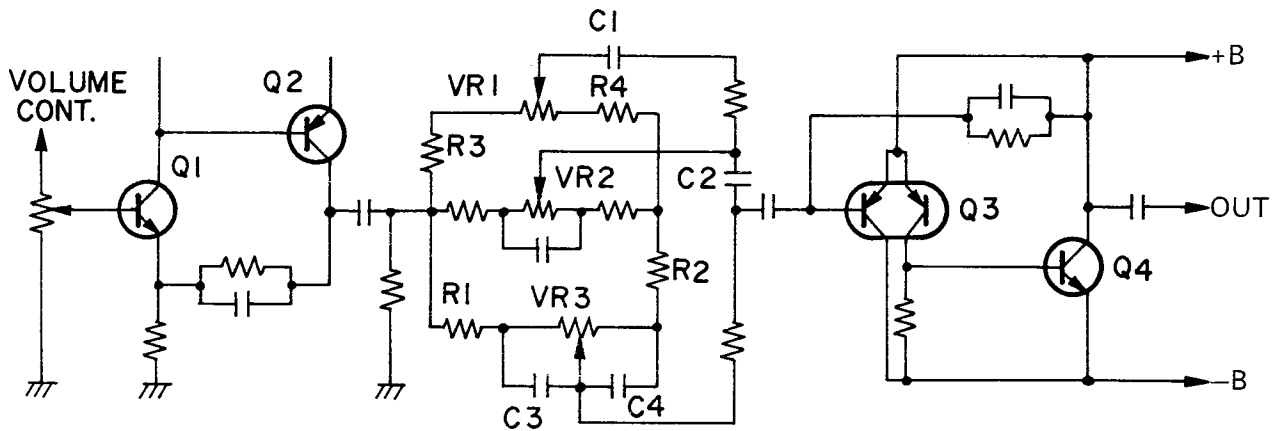
pedance of capacitors C3 and C4 is low, effectively shorting VR3 thus at midrange frequencies near 1 kHz the gain is mainly determined by the position of VR2.

**Bass Tone Control:** As the frequency decreases below 1 kHz, the impedance of C3 and C4 increases proportionally. At very low frequencies, C1 and C2 are effectively open, removing VR1 and VR2 from the circuit. Thus at low frequencies, the

gain is mainly determined by the position of the Bass tone control VR3. Rotation towards R1 will boost the low frequencies, while turning it towards R2 will cut the bass.

**Treble Tone Control:** At high frequencies, VR2 and VR3 are effectively short circuited. At these frequencies, however,

C1 impedance decreases, so that VR1 becomes the main control of the circuit gain. Rotating VR1 towards R3 will boost the treble, while turning it towards R4 cut the treble response.



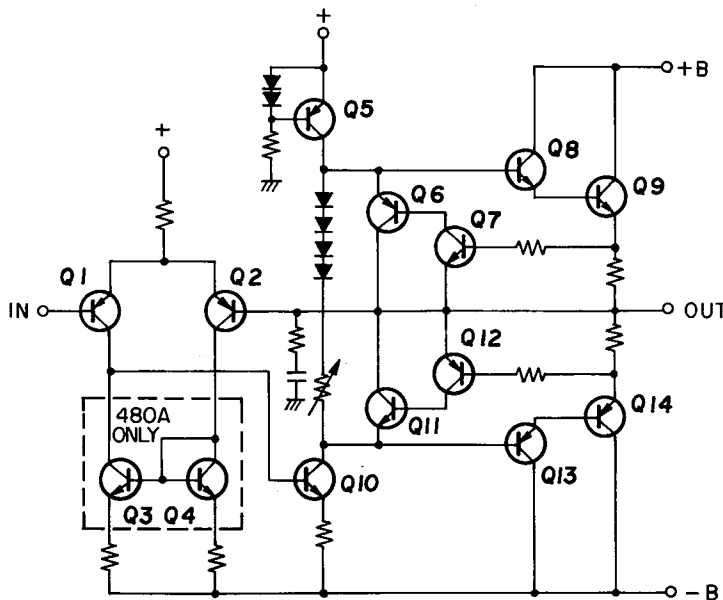
### Power Amplifier

This circuit is an OCL, fully complementary amplifier. The input stage consists of a differential amplifier (Q1 and Q2). The differential amp is a matched transistor pair in one package providing excellent common mode rejection and low DC offset. Q10 acts as the voltage amplifier providing voltage swing to nearly full plus and minus supply. Current gain is then provided by the fully complementary Darlington pairs of Q8 and Q9 for the positive swing, Q13 and Q14 for the negative swing. The output stage bias is set by the multiple diode array and variable resistor. As previously described,

amplifier gain is set by tone control circuitry.

The driver and output stage is protected from short circuit and overload by transistors Q6, Q7, Q11 and Q12, which short out the driving signal when current through the output transistors reaches an excessive level.

The model 480A is designed using a differential current mirror loaded low noise input stage, where a transistor pair (Q3 and Q4) are connected to provide an active load to the differential amplifier to further minimize distortion products.

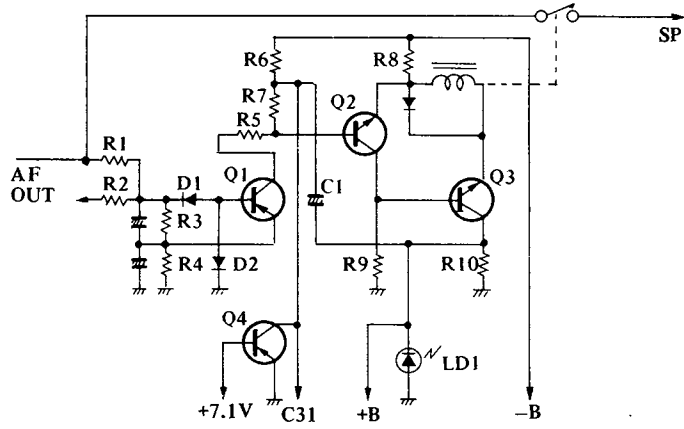


## Relay Protection Circuit

This circuit protects the speakers from the possibility of DC potential at the amplifier outputs, as well as eliminating transients during turn on or turn off.

**Turn On/Off:** When the unit is first switched on, Q2 quickly turns on, holding Q3 off. After several seconds, determined by the charging time of C1 through R6, Q2 turns off, thus turning on Q3 and activating the relay which connects the audio output to the speakers. At turn off, Q4 immediately turns on, which turns Q2 on and Q3 off, instantly opening the speaker relay.

**Center Point Potential Detect:** This circuit, composed primarily of Q1, D1 and D2, protects the loudspeakers from DC at the amplifier output. When excessive plus or minus DC appears at R1 or R2, Q1 turns on, which activates Q2 and opens the speaker relay. At the same time, LD1, the front panel protection indicator, is activated.



## Power Supply (Refer to Block Diagram)

The main power supply consists of a full wave bridge rectifier and two 10,000  $\mu$ F capacitors. The +B and -B regulators

(Q13 + Q14) supply  $\pm 33$ V for the phono preamplifiers.

## ADJUSTMENT

### Equipment Required

Audio signal generator.

DC voltmeter.

Speaker load resistors, 8 ohm, 100 watt.

Digital voltmeter or DC milliammeter.

The following adjustments are the same for both the left and the right channel.

### Bias Adjustment

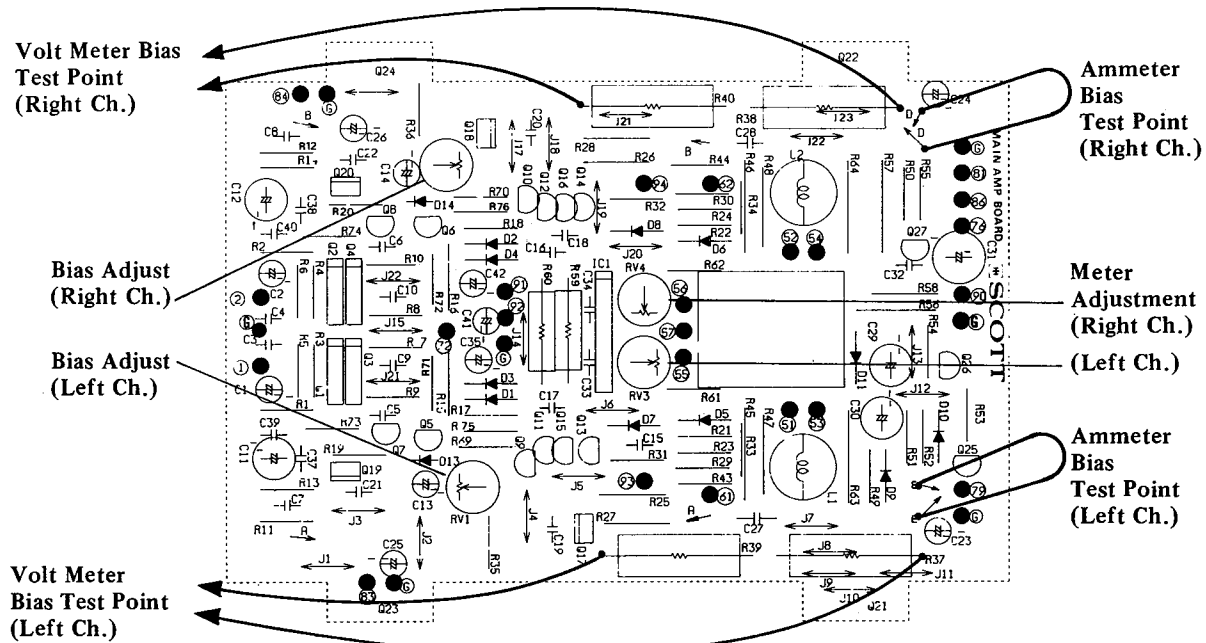
- 1) Connect 8 ohm resistors to the speaker A terminals, and set the Speaker Mode switch to A position.
- 2) Turn the Volume control fully counter-clockwise.
- 3) Turn RV1 fully counterclockwise.
- 4) Depending on available equipment, use A or B:
  - A. Set digital voltmeter to most sensitive voltage range. Connect probes across R37 and R39 (Voltmeter bias test points, L channel). Turn unit on. Let it idle for at least one minute. Adjust RV1 for 40 mV across the resistors.
  - B. With unit off, remove jumper between PC board terminals E and E, and connect ammeter, set to 100 mA range. Turn unit on and let it idle for at least one minute. Adjust RV1 for 40 mA.
- 5) Perform the same procedure for the right channel, except measure voltage across R38 and R40 (voltmeter bias test points, R channel) or replace jumper from D to D with ammeter. Adjustment is made with RV2.

- 6) Leave the amplifier on for about 30 minutes, then recheck measurement. A tolerance of  $\pm 25\%$  is acceptable. Re-adjust if necessary.

### Power Meter Calibration

- 1) Connect the audio signal generator to the amplifier and apply 1 kHz signal to Aux input, Left channel.
- 2) Connect voltmeter across the left channel load resistor.
- 3) Turn power on.
- 4) Adjust the signal generator output so as to obtain 2.83 volts on the voltmeter.
- 5) Check that the left channel meter indicates 1 watt. If not, adjust RV3.
- 6) Perform above steps on the right channel, adjusting RV4 if necessary.

### Adjustment Location







# REPLACEMENT PARTS LIST: 460A/480A

## 460A Mechanical

Exploded View No.	Description	Part Code
1	Front panel	MU972SZ003
2	Plastic relief	VF221DNN001
3	Program LED board	PSLD013COX
4	Protection LED socket	YSZ020002U
5	Control amplifier board	PSTC027COX
6	Meter, Power Output (M1, 2)	ZMD2050K01
7	Sheet, behind meters	VS227RB001
8	Meter housing	VB532AW001
9	Bulbe relief	VM165RX003
10	Meter bulbe, 14V/80 mA (PL1, 2)	ZPA148103U
11	Power switch (S1)	SL020216UB
12	Headphone jack (J7)	YJS03S016Z
13	Speaker mode switch (S2)	SR0204107T
14	Rack handle base	MC371SZ002
15	Power supply chassis	MU865SZ001
16	Power transformer (PT1)	TPAA5A002Y
17	Transformer plate	MU762SZ003
18	Electrolytic capacitor (C3, 4)	CEJ1G10304
19	Wiring bridge	MP363SS001
20	Power supply board	PSPW003COX
21	Power board stand	VX311NN001
22	Fuse (F2, 3), 6A	ZFBQ60201Z
23	Fuse (F4), 0.5A	ZFBQ50103Z
24	Chassis bridge	MB851SZ001
25	Hearsink plate	MS867SZ003
26	Hearsink	MH766AA002
27	Power amplifier board	PSMA030COX
28	Transistor (Q21, 22), 2SD745	QTD0745XAA
29	" (Q23, 24), 2SB705	QTB0705XAA
30	Chassis bridge (right)	MU851SZ004
31	Control amplifier board	PSPA038COX
32	Record/Input selector bracket	MS766SZ021
33	Shaft joint	VM460SW001
34	Remote shaft	MT865AD009
35	Rear panel	MB972SE031
36	Ground thumb screw (J9)	BWM30A08SN
37	Tape input board	PSAZ023COX
38	Shorting bar	MU132BU001
39	Speaker output terminal (J5, 6)	YTS04S007U
40	Power selector board	PSSW066COX
41	Switch bracket	ML322SZ005
42A	Voltage selector (J4)	YJZ10S001U
42B	" (plug)	YPZ06S004U
43	AC accessory outlet (J2, 3)	YJA020005U

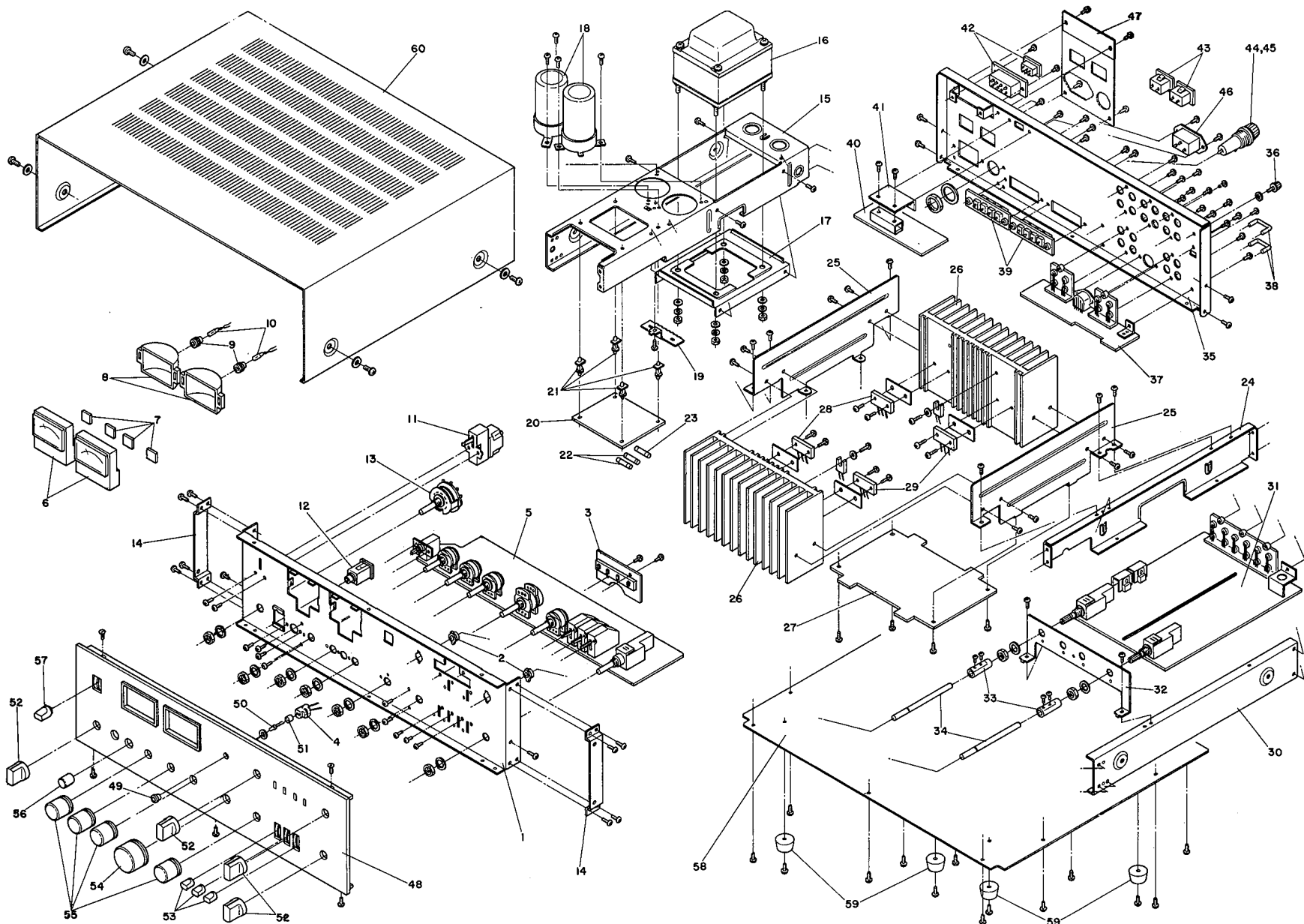
Exploded View No.	Description	Part Code
44	Fuse holder (J8)	YHF1S3001U
45	Fuse (F1), 100-117V: 5A 220-240V: 2.5A	ZFBQ50201U
46	AC power receptacle (J1)	YJA03S002U
47	Voltage identification plate US/Canada: Europe:	MS766SE011
48	Front escutcheon panel	MS636SE001
49	Protection LED bezel	AM460A**01
50	LED, Protection	MT665BC001
51	LED housing	QLAGD4505R
52	Knob, Tape Input/Mode/Speaker	VM162RX001
53	" all lever switches	MN376AA019
54	" Volume	VN360SX001
55	" Tone, Balance	MN386XA024
56	" Tone Flat	MN276XA020
57	" Power	VN265SP003
58	Bottom plate	VN370SX001
59	Foot	MS986SZ017
60	Cabinet cover	VM280EB001
		MU897SXX009

## 480A Mechanical

Exploded View No.	Description	Part Code
1	Front panel	MU972SZ002
2	Plastic relief	VF221DNN001
3	Program LED board	PSLD013COX
4	Meter, Power Output (M1, 2)	ZMD2050K01
5	Sheet, behind meters	VS227RB001
6	Meter housing	VB532AW001
7	Bulbe relief	VM165RX003
8	Bulbe, 14V/80 mA (PL1, 2)	ZPA148103U
9	Power switch (S1)	SL020216BU
10	Rotary switch (S2), Speaker Mode	SR0204107T
11	Headphone jack (J7)	YJS03S016Z
12	Control amplifier board	PSTC017COX
13	Rack handle base	MC371SZ002
14	Power supply chassis	MU865SZ001
15	Power transformer (PT1)	TPAA5A001Y
16	Transformer plate	MU762SZ003
17	Electrolytic capacitor (C3, 4), 10,000/63	CEJ1H10305
18	Wiring bridge	MP363SS001
19	Power supply board	PSPW033COX
20	Power supply board stand	VX311NN001

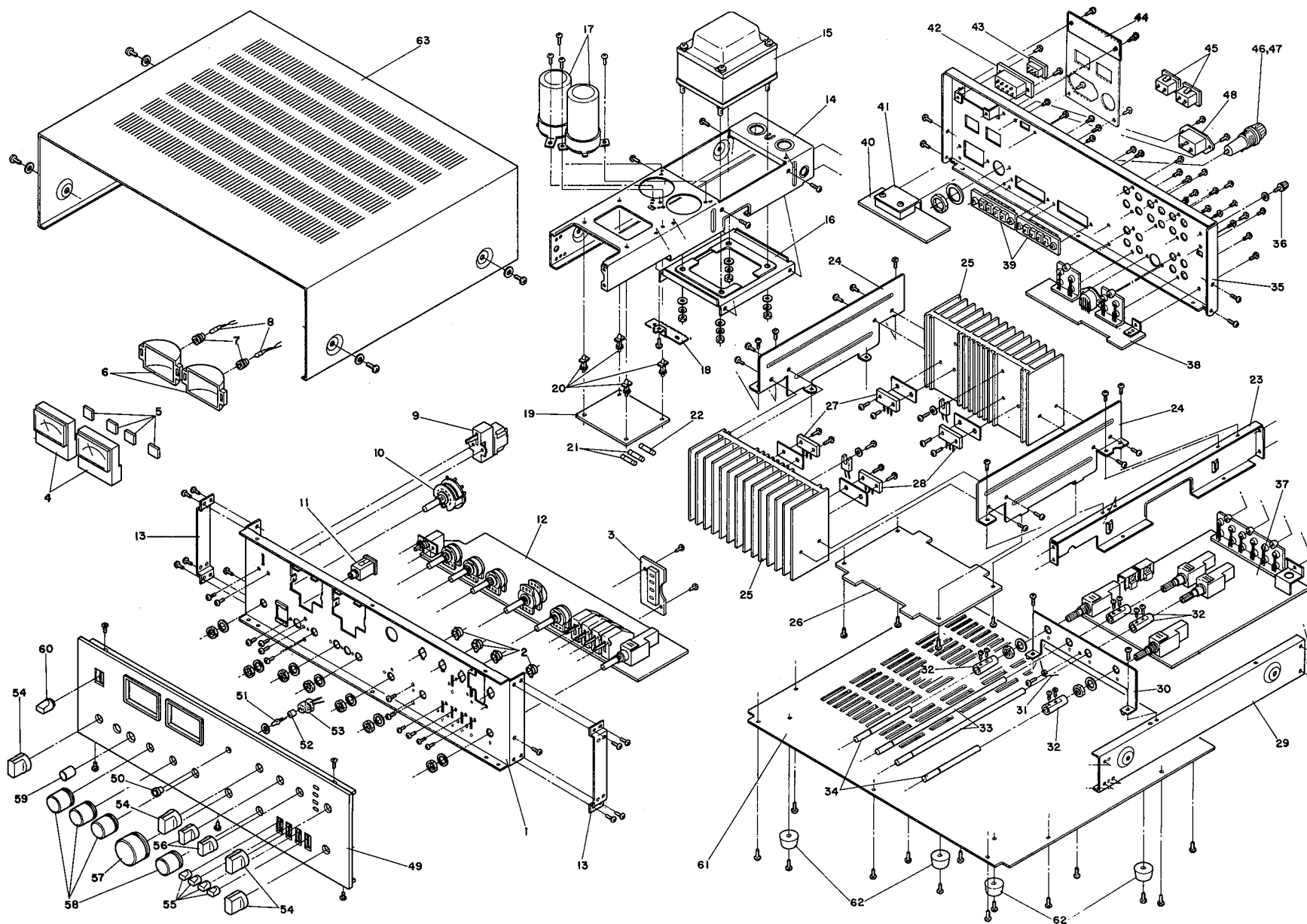
# EXPLODED VIEW

460A



Half-toned part for US/Canada

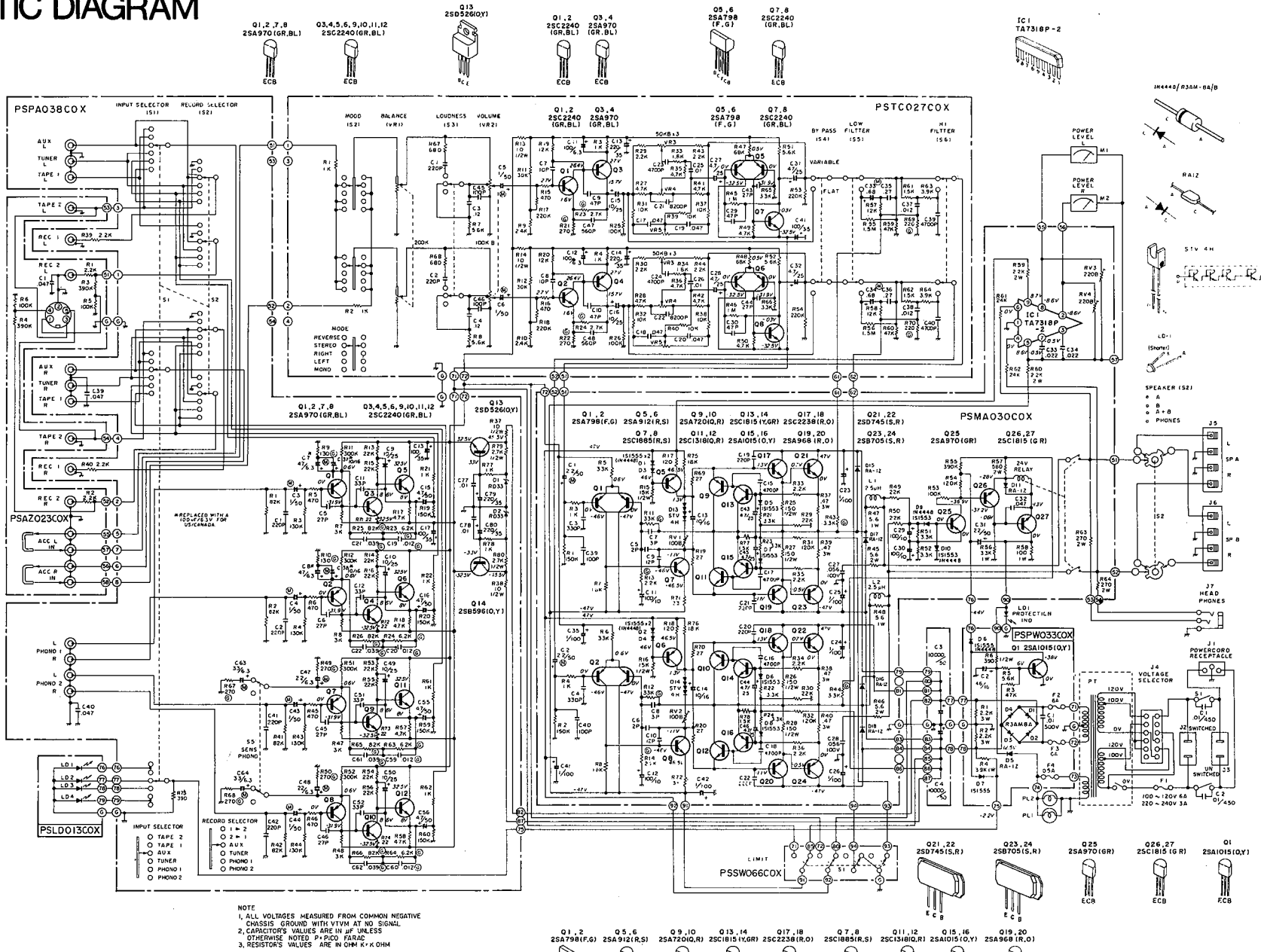
480A



Half-toned part for US/Canada

# SCHEMATIC DIAGRAM

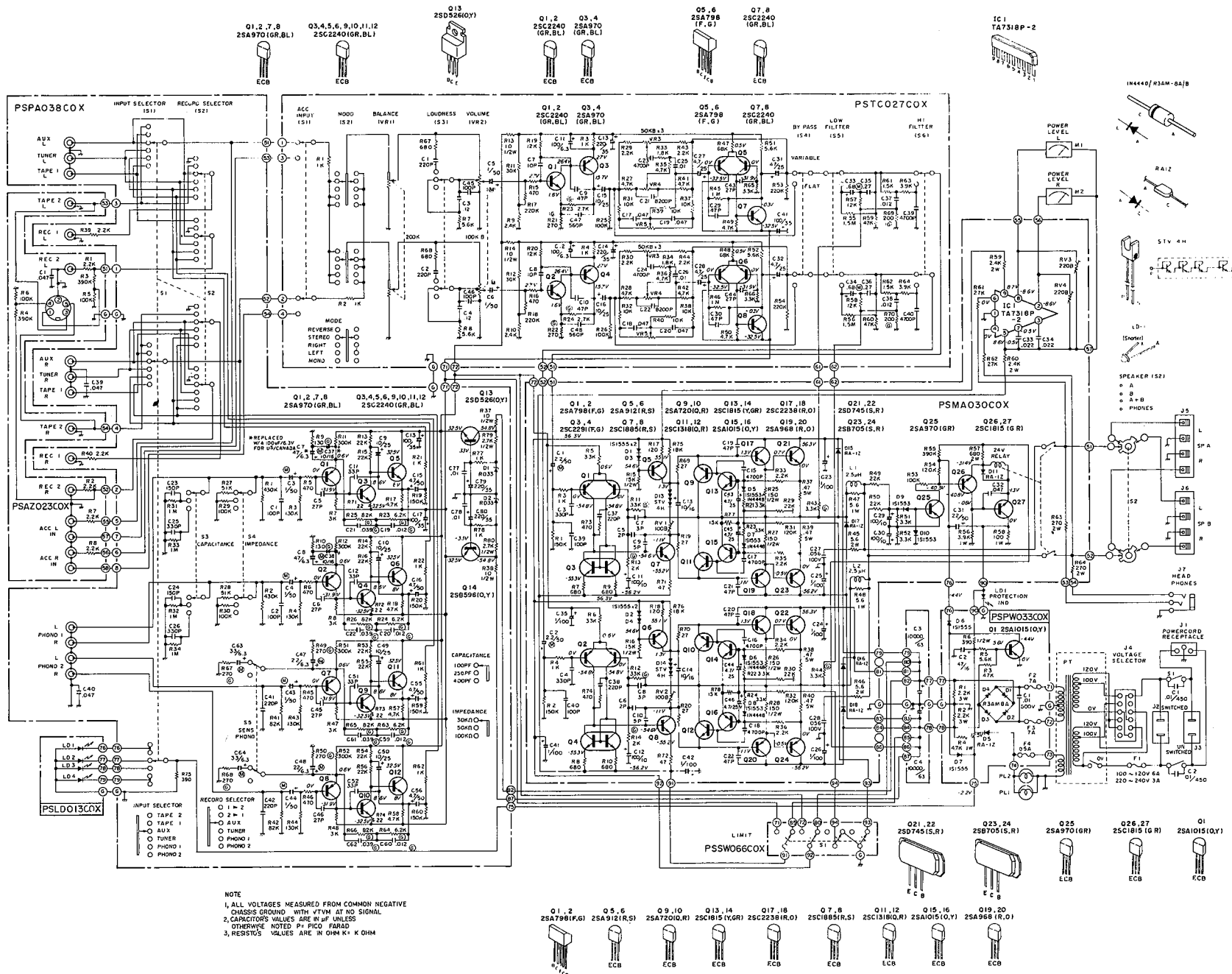
460A



\* Combination of C7/37 and C8/38 are replaced with 100  $\mu$ F/6.3V for US/Canada units.

11

480A



\* Combinations of C7/37 and C8/38 are replaced with 100  $\mu$ F/6.3V for US/Canada units.

12

Exploded View No.	Description	Part Code
21	Fuse (F2, 3), 7A	ZFBQ70201Z
22	Fuse (F4), 0.5A	ZFBQ50103Z
23	Chassis bridge	MB851SZ001
24	Heatsink plate	MS867SZ003
25	Heatsink	MH766AA001
26	Power amplifier board	PSMA030COX
27	Transistor (Q21, 22), 2SD745	QTD0745XAA
28	" (Q23, 24), 2SB705	QTB0705XAA
29	Chassis bridge (right)	MU851SZ004
30	Record/Input select bracket	MS766SZ021
31	Coil spring	MW141SD001
32	Shaft joint	VM460DN001
33	Remote shaft, long	MT865AD008
34	" short	MT865AD009
35	Rear panel	MB972SE030
36	Ground thumb screw	BWM30A08SN
37	Input circuit board	PSPA038COX
38	Tape input board	PSAZ023COX
39	Speaker output terminal (J5, 6)	YTS04S007U
40	Power selector board	PSSW066COX
41	Switch bracket	ML322SZ005
42	Voltage selector (J4)	YJZ10S001U
43	" plug	YPZ06S004U
44	Voltage identification plate, <b>US/Canada:</b>	MS766SE011
	<b>Europe:</b>	MS636SE001
45	AC accessory outlet (J2, 3)	YJA020005U
46	Fuse holder (J8)	YHF1S3001U
47	Fuse (F1) 110–117V: 6A	ZFBQ60201U
	220–240V: 3A	ZFBQ30201U
48	AC power receptacle (J1)	YJA03S002U
49	Front escutcheon panel	AM480A**01
50	Protect LED bezel	MT165BC001
51	LED, Protection (LD1)	QLAGD4505R
52	Protect LED relief	VM162RX001
53	Protect LED socket	YSZ020002U
54	Knob, <b>Tape/Input, Mode, Speaker</b>	MN376AA019
55	" all lever switches	VN360SX001
56	" <b>Capacitance/Impedance</b>	MN276AA101
57	" <b>Volume</b>	MN386XA024
58	" <b>Tone, Balance</b>	MN276XA020
59	" <b>Tone/Flat</b>	VN265SP003
60	" <b>Power</b>	VN370SX001
61	Bottom plate	MS986SZ017
62	Foot	VM280EB001

Exploded View No.	Description	Part Code
63	Cabinet cover	MU897SX009

#### Parts on Main Chassis

Symbol No.	Description	Part Code
C1, 2	US/Canada: Ceramic capacitor, 4,700p*, 125V AC Europe: Oil-paper capacitor, 0.01*/450V	CKDX472PMM CNST103MAN
D13, 14	Quadruple diode array, STV-4H	QVFSTV4HXD

#### Miscellaneous

Description	Part Code
Operation Manual, US/Canada: 460A US/Canada: 460A Europe: 480A Europe: 480A	KT460A**AX KT480A**AX KT460AE*AX KT480AE*AX
Carton, 460A: 480A :	KP460A**01 KP480A**01
Cushoning, 460A: 480A:	KN440A**03 KN480A**03

#### PSPW033COX [Power Supply]

Symbol No.	Description	Part Code
Q1	Transistor, 2SA1015	QTA1015XAT
D1-4	460A: Silicon diode, SR3AM-8B 480A: Silicon diode, SR3AM-8A	QDSR3AM8BE QDSR3AM8AE
D5	Silicon diode, RA-1Z	QDSRA1ZXXD
D6, 7	" 1N4448	QDSN4448XZ
R1, 2	460A: MOF resistor, 2.2k, 2W 480A: MOF** resistor, 2.2k***, 3W	RG2ANJ222N RG3ANJ222N
R4	460A: MOF resistor, 3.9k, 1W 480A: MOF** resistor, 4.7k, 1W	RG1ANJ392N RG1ANJ472N
R6	480A: 390, 1/2W	RGHANJ391N
C1	Ceramic capacitor, 0.01, 500V	CKDE103PEM
C2	Electrolytic capacitor, 47/16 Fuse housing	CEWD470ALX YHF0P0003Z

\* All capacitors are rated in micro-farad, and have voltage handling of 50V, both unless otherwise specified.

\*\* Metal-oxide-film (resistor).

\*\*\* All resistors are rated in Ohm, and have power handling capability of 1/4W unless otherwise specified.

PSMA030COX [Power Amplifier]

Symbol No.	Description	Part Code
IC1	IC, TA7318P-2, meter driver	QQM07318AT
Q1, 2	Transistor, 2SA798	QTA0798XEE
Q3, 4	480A only: Transistor, 2SC2291	QTC2291XAE
Q5, 6	Transistor, 2SA912	QTA0912XAN
Q7, 8	" 2SC1885	QTC1885XAN
Q9, 10	" 2SA720	QTA0720XBN
Q11, 12	" 2SC1318	QTC1318XDN
Q13, 14, 26, 27	" 2SC1815	QTC1815XAT
Q15, 16	" 2SA1015	QTA1015XAT
Q17, 18	" 2SC2238	QTC2238XBT
Q19, 20	" 2SA968	QTA1968XBT
Q25	" 2SA970	QTA0970XBT
D1-10	Silicon diode, 1N4448	QDSN4448XZ
D11-18	" RA-1Z	QDSRA1ZXXD
L1, 2	RFC, 2.5 $\mu$ H	LA3QH1323B
RY1	DC relay, type-24	ZRA444103U
RV-1, -2	Trimming resistor, 100/B	RPJNB10103
RV-3, -4	" 220/B	RPJNB22101
R15, 16	MOF resistor, 15k, 1/2W	RGHANJ153N
R25-28	" 150, 1/2W	RGHANJ151N
R37-40	460A: Cement resistor, 0.47, 3W	RF03SKR47B
	480A: Cement resistor, 0.47, 5W	RF05SKR47B
R45, 46	MOF resistor, 5.6, 2W	RX2ANJ5R6N
R47, 48	" 5.6, 1W	RX1ANJ5R6N
R56	460A: MOF resistor, 3.3k, 1W	RG1ANJ332N
	480A: " 3.9k, 1W	RG1ANJ392N
R57	460A: " 560, 2W	RG2ANJ561N
	480A: " 680, 2W	RG2ANJ681N
R58	MOF resistor, 100, 1/2W	RGHANJ101N
R59	460A: MOF resistor, 2.2k, 2W	RG2ANJ222N
	480A: " 2.4k, 2W	RG2ANJ242N
R60	460A: " 2.2k, 2W	RG2ANJ222N
	480A: " 2.4k, 2W	RG2ANJ242N
R63, 64	MOF resistor, 270, 2W	RG2ANJ271N
C1, 2	Electrolytic capacitor, 2.2	CEAG2R2ZMN
C3, 4	Ceramic capacitor, 330p	CCFB331KOT
C5, 6	" 2p	CCGB020COT
C7, 8	" 3p	CCGB030DOT
C9, 10	" 5p	CCGB050COT
C11, 12	Electrolytic capacitor, 100/10	CEWC101ALX
C13, 14	" 10/16	CEWD100ALX
C15-18	Ceramic capcitor, 4,700p	CKGB472ZFT
C19-22	460A: Ceramic capacitor, 220p	CCFB221KOT
	480A: " 47p	CCGB470KOT

Symbol No.	Description	Part Code
C23-26	Electrolytic capacitor, 1/100	CEWK010ALX
C27, 28	Mylar capacitor, 0.056/100	CQMC563KEH
C29, 30	Electrolytic capacitor, 100/10	CEWC101ALX
C31	" 22/50	CEAG220AMN
C32	Mylar capacitor, 0.047	CQMB473KTH
C33, 34	" 0.022	CQMB223KTH
C35	Electrolytic capacitor, 1/100	CEWK010ALX
C37, 38	480A only: Ceramic capacitor, 220p	CCFB221KOT
C39, 40	Ceramic capacitor, 100p	CCGB101KOT
C41, 42	Electrolytic capacitor, 1/100	CEWK010ALX
C43-46	" 4.7/25	CEAE4R7ALX

#### PSTC027COX [Tone Amplifier]

Symbol No.	Description	Part Code
S1	480A only: Lever switch, 2-2****, Acc/Input	SL020215ZB
S2	Rotary switch, 4-5, Mode	SH040503ZA
S3	Lever switch, 2-2, Loudness	SL020215ZB
S4	Push switch, Tone/By-pass	SP01AAX29A
S5, 6	Lever switch, 2-2, Lo-Fil	SL020218ZB
VR	VR, Balance, 200k/MN	RVQA204X01
VR2	460A: Volume, 100k/B 480A: " 100k	RVDA104B01 RVZA104B01
VR3-5	VR, Tone, 50k/B	RVQA503B05
Q1, 2, 7, 8	Transistor, 2SC2240	QTC2240XAT
Q3, 4	" 2SA970	QTA0970XAT
Q5, 6	" 2SA798	QTA0798XEE
R13, 14	MOF resistor, 10, 1/2W	RXHANJ100N
C1, 2	Ceramic capacitor, 220p	CCCB221KOM
C3, 4	Mylar capacitor, 0.12	CQMB124KEH
C5, 6	Electrolytic capacitor, 1	CEAG010ZMN
C7, 8	Ceramic capacitor, 10p	CCCB100DOM
C9, 10	" 47	CCCB470KOM
C11, 12	Electrolytic capacitor, 100/6.3	CEEB101ALX
C13, 14	" 220/35	CEEF221ALX
C15, 16	" 10/25	CEEE100ALX
C17-20	Mylar capacitor, 0.047	CQMB473KEH
C21, 22	" 8,200p	CQMB822KEH
C23, 24	" 4,700p	CQMB472KEH
C25, 26	" 0.01	CQMB103KEH
C27, 28	Electrolytic capacitor, 4.7/25	CEEE4R7ALX
C29, 30	Ceramic capacitor, 47p	CCCB470KOM
C31, 32	Electrolytic capacitor, 4.7/25	CEEE4R7ALX

\*\*\*\* No of pole-throw. (Ex. 2-pole/2-throw)



Symbol No.	Description	Part Code
C33, 34	Electrolytic capacitor, 0.68	CEAGR68ZMN
C35, 36	Mylar capacitor, 0.27	CQMB274KEH
C37, 38	" 0.012	CQMB123KEH
C39, 40	" 0.0047	CQMB472KEH
C41	" 100/35	CEEF101ALX
C43, 44	Ceramic capacitor, 27p	CCCB270KOT
C45, 46	" 100p	CCCB101KOT
C47, 48	" 560p	CCCB561KOT

### PSPA038COX [Preamplifier]

Symbol No.	Description	Part Code
S1, 2	Rotary switch, Selector, 4-6	SH040603ZA
S3, 4	480A only: Rotary switch, Capacitance/Impedance	SH020301ZA
S5	Slide switch, Phono Sens, 2-2	SS020233ZA
J1-3	RCA jack, 4p	YJP04S016U
Q1, 2, 7, 8	Transistor, 2SA970	QTA0970XAT
Q3-6, 9-12	" 2SC2240	QTC2240XAT
Q13	" 2SD526	QTD0526XAT
Q14	" 2SB596	QTB0596XAT
D1, 2	Zenner diode, RD-33	QDZRD33XXA
R37, 38	MOF resistor, 10, 1/2W	RXHANJ100N
R79, 80	" 2.7k, 1/2W	RGHANJ272N
C1, 2	460A: Ceramic capacitor, 220p	CCCB221KOM
	480A: ,, 100p	CCCB101KOM
C3, 4	Electrolytic capacitor, 1	CEAG010ZMN
C5, 6	Ceramic capacitor, 27p	CCCB270KOM
C7, 8	Electrolytic capacitor, 47/6.3	CEAB470ZMN
C9, 10	" 10/25	CEEE100ALX
C11, 12	Ceramic capacitor, 33p	CCCB330KOM
C13	Electrolytic capacitor, 100/35	CEEF101ALX
C15, 16	" 4.7	CEAG4R7ZMN
C17	" 100/35	CEEF101ALX
C19, 20	Mylar capacitor, 0.012 ±2%	CQMB123GEH
C21, 22	" 0.039 ±2%	CQMB393GEH
C23, 24	480A:only: Ceramic capacitor, 150p	CCCB151KOM
C25, 56	480A only: ,, 330p	CCCB331KOM
C37, 38	Electrolytic capacitor, 10/16	CEED100ZMN
C39, 40	Ceramic capacitor, 0.047	CKCB473ZFM
C41, 42	" 220p	CCCB221KOM
C43, 44	Electrolytic capacitor, 1	CEAG010ZMN
C45, 46	Ceramic capacitor, 27p	CCCB270KOM
C47, 48	Electrolytic capacitor, 22/6.3	CEAB220ZMN

Symbol No.	Description	Part Code
C49, 50	Electrolytic capacitor, 10/25	CEEE100ALX
C51, 52	Ceramic capacitor, 33p	CCCB330KOM
C55, 56	Electrolytic capacitor, 4.7	CEAG4R7ZMN
C59, 60	Mylar capacitor, 0.012 ±2%	CQMB123GEH
C61, 62	" 0.039 ±2%	CQMB393GEH
C63, 64	Electrolytic capacitor, 33/6.3	CEAB330ZMN
C65, 66	" 1	CEAG010ALX
C77, 78	Ceramic capacitor, 0.01	CKCB103PEM
C79, 80	Electrolytic capacitor, 220/35	CEEF221ALX

**PSAZ023COX [Input Terminal]**

Symbol No.	Description	Part Code
J1, 2	Accessory in/out RCA jacks, 4P	YJP04S016U
J3	Tape DIN-standardized jack, 5P	YJD05S011Z
C1	Ceramic capacitor, 0.047	CKFB473ZFT

**PSLD013COX [Program LED]**

Symbol No.	Description	Part Code
LD1-4	LED, Program	QLAPR5531R

**SSW066COX [AF Power Select]**

Symbol No.	Description	Part Code
S1	Sliding switch, 4-2	SS040204ZA