

SERVICE MANUAL

HAMMOND B-100 COMBO ORGAN



CAUTION!
see safety notice inside

H000-006146-00J



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SAFETY NOTICE

Great care has been taken in the design and manufacture of this product to assure that no shock hazard exists on any exposed metal parts. Internal service operations can expose the technician to hazardous line voltages and accidentally cause these voltages to appear on exposed metal parts during repair or reassembly of product components. To prevent this, work on these products should only be performed by those who are thoroughly familiar with the precautions necessary when working on this type of equipment.

To protect the user, it is required that all enclosure parts and safety interlocks be restored to their original condition and the following tests be performed before returning the product to the owner after any service operation.

Plug the AC line cord directly into a line voltage AC receptacle (do not use an isolation transformer for this test) and turn the product on. Connect the network (as shown below) in series with all exposed metal parts and a known earth ground such as a water pipe or conduit. Use an AC VOM of 5,000 ohms per volt or higher sensitivity to measure the voltage drop across the network. Move the network connection to each exposed metal part (metal chassis, screw heads, knobs and control shafts, escutcheon, etc.) and measure the voltage drop across the network. Reverse the line plug and repeat the measurements. Any reading of 4 volts RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the product to the user.

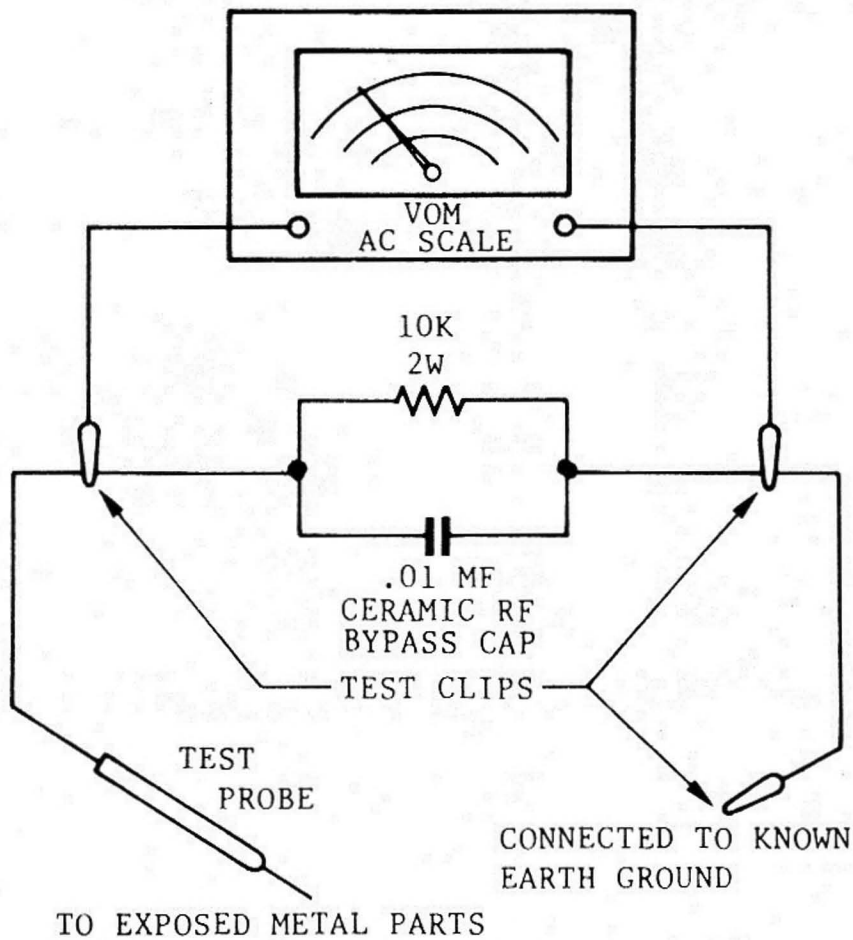


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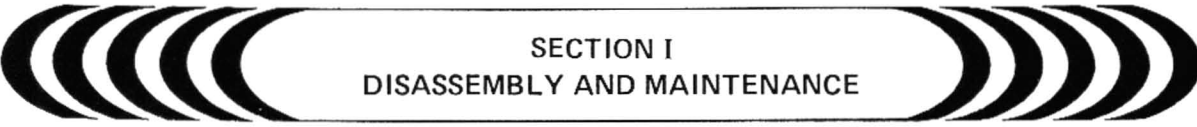
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SECTION I DISASSEMBLY AND MAINTENANCE

1-1 GENERAL

This section contains instructions for removal of specific assemblies of the organ. The removal of some sub-assemblies and unplugging connectors or unsoldering is obvious.

This procedure is laid out in a disassembly sequence, reverse procedure for reassembly.

1-2 TOP & REAR COVER

- a) Pull up Music Stand.
- b) Remove four (4) screws, retaining Top & Rear Cover to Bracket through Foot, from back (rear) side.
- c) From back side, pull slightly, then Top & Rear Cover will be removed.

1-3 FRONT PANEL

- a) Follow steps 1-2 a) ~ c).
- b) Remove two (2) screws retaining Front Panel to Tonebar Base, at both side.

1-4 TONEBAR BASE

- a) Follow Step 1-2.
- b) Remove two (2) screws retaining Tonebar Base to Hinges at both side.
- c) Raise Tonebar Base to swing up position.

1-5 MANUAL KEYBOARD ASSEMBLY

- a) Follow steps 1-2 and 1-4.
- b) Remove three (3) bronze screws from front under side of cabinet.
- c) Rise Manual Keyboard Assembly to swing up position.

1-6 TONEBAR ASSEMBLY

- a) Follow steps 1-2 and 1-3.
- b) Remove self tapping screws mounting Tonebar Assembly to Tonebar Base.

1-7 PRINTED WIRING BOARD (REMOVAL)

- a) The removal of PWB Assemblies is quite obvious and will not be necessary describe.

TEST AND ADJUSTMENT PROCEDURES

NOTE: During test procedure the following must be maintained unless otherwise stated:

- a) Without expression pedal.
- b) All switches, tonebars in the off position. Switch for Tonebar ON.
- c) Tonebars to position 8 when it is required to extend tonebars.
- d) Tuning Pot. at middle position.
Potentiometer Warmth at minimum.
Potentiometer Brilliance and Volume at maximum.

| STEP | TITLE OF TEST | SETUP PROCEDURE (TABS DEPRESSED) (TONEBARS OUT) | KEY (S) DEPRESSED | TEST POINT | POT AND BOARD | SPECIFICATION AND/OR ACCEPTABLE CONNECTION |
|------|----------------|--|---|------------------------|--------------------------------|--|
| 1 | TUNING | Tonebar 2' a) Tuning Pot. at middle Position b) Tuning Pot. at Sharp Max. c) Tuning Pot. at Flat Max. | No. 58 (A5) | Pin 1 in Leslie Socket | a) Coil (L1) (DV-14) 229-21206 | a) 7040Hz \pm 7Hz b) 7240Hz or Upper c) 6860Hz or Under |
| 2 | LESLIE CONTROL | Connect to Leslie Socket, 11 pin Leslie Box a) Leslie Sw. ON b) as a) & Fast Sw. ON c) Leslie Sw. OFF | | Ear | | a) Leslie Slow b) Leslie Fast c) Leslie Stop |
| 3 | CHORUS CONTROL | Tonebar Connect to Line Out or Leslie Socket, Amp. & Tone Box. a) CHORUS SW. ON b) as a) & CHORUS FAST SW. ON | Any Key | Ear | | a) Chorus Effect b) Chorus Slow to Fast |
| 4 | PRESET | a) PRESET 1 b) PRESET 2 c) PRESET 3 | | | | a) 888800000 b) 800000888 c) 888543788 |
| 5 | KEY CLICK | KEY CLICK ACCENT SW. ON Tonebar 8' Amp. & Tone Box | Any Key | Ear | | Key Click |
| 6 | PERCUSSION | Connect to Leslie Socket P1 Oscillo-scope a) 2nd PERCUSSION SW. ON b) 3rd PERCUSSION SW. ON c) PERCUSSION DECAY SW. ON 2nd PERCUSSION SW. ON d) PERCUSSION DECAY SW. ON 3rd PERCUSSION SW. ON e) PERCUSSION LOUD SW. ON 3rd PERCUSSION SW. ON | a) Any Key b) Any Key c) Any Key d) Any Key e) C ₃ | | | a) 0.8V \pm 20% 90mSec \pm 20% b) 0.8V \pm 20% 90mSec \pm 20% c) 300mSec \pm 20% d) 300mSec \pm 20% e) 2V Peak |
| 7 | WARMTH | a) PRESET 1 SW. ON | a) C ₃ , E ₃ , G ₃ | a) Ear | | WARMTH Volume to Max. a) Soft Distortion |

| STEP | TITLE OF TEST | SETUP PROCEDURE (TABS DEPRESSED) (TONEBARS OUT) | KEY (S) DEPRESSED | TEST POINT | POT AND BOARD | SPECIFICATION AND/OR ACCEPTABLE CONNECTION |
|------|----------------------|--|--|---------------------------|--|--|
| 8 | EXPRESSION LOSS | Connect Expression Pedal Tonebar 8' | C ₁ | Leslie Socket Pin 1 | Expression Board (EF-208) 223-40216 R2 | ± 3dB |
| 9 | EXPRESSION VARIATION | Connect Expression Pedal Tonebar 8' | a) C ₁ b) C ₅ | Leslie Socket Pin 1 | | a) 13dB ~ 18dB b) Minimum 30dB |
| 10 | HUM & NOISE | Connect to Leslie Socket Pin 1, Noise Meter thru A Net, Filter a) CHORUS SW. ON | | a) Leslie Socket Pin 1 | | a) 3mV RMS, Max. |

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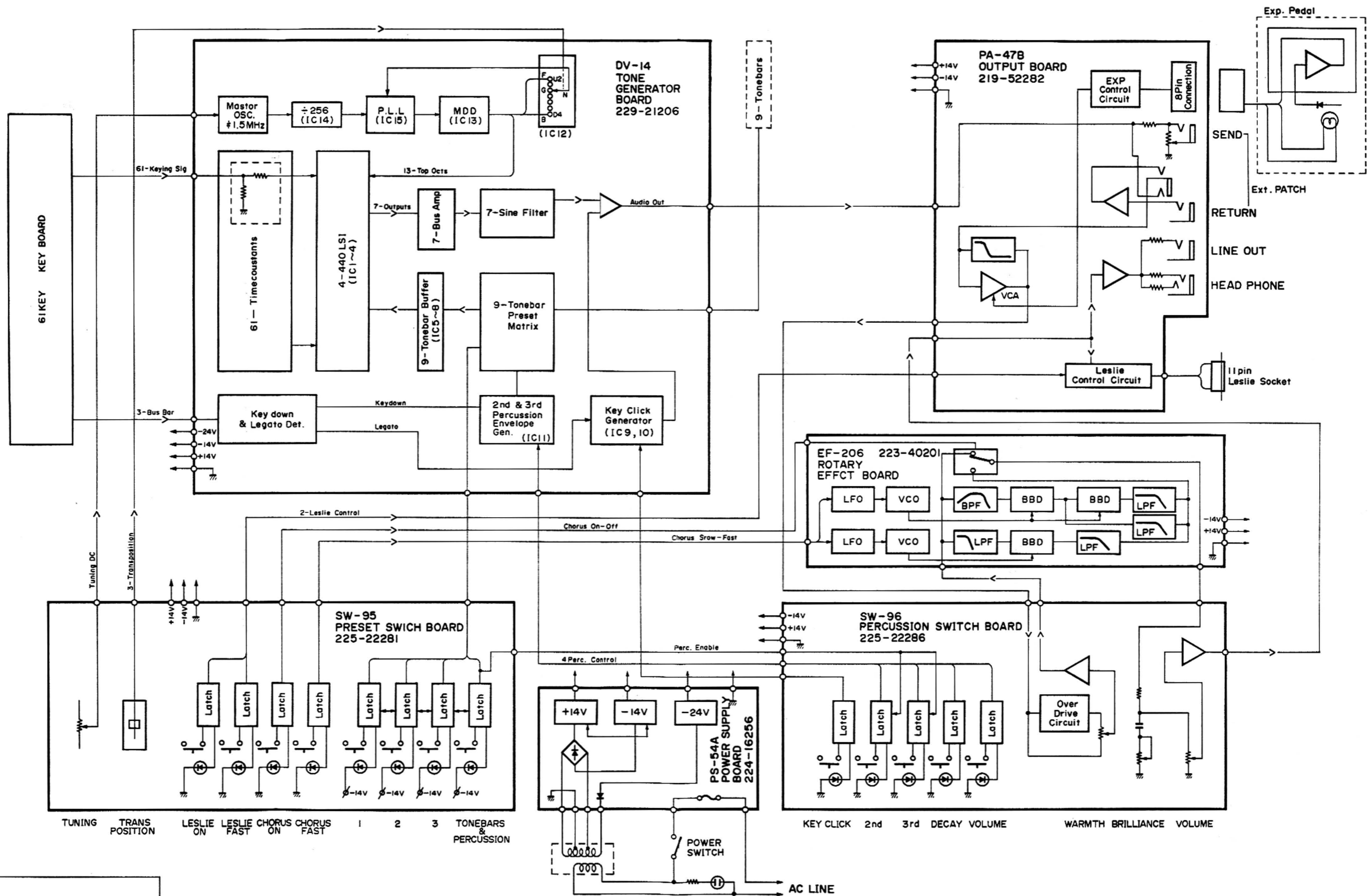


FIGURE 3-1
B-100 (18350K)
BLOCK DIAGRAM

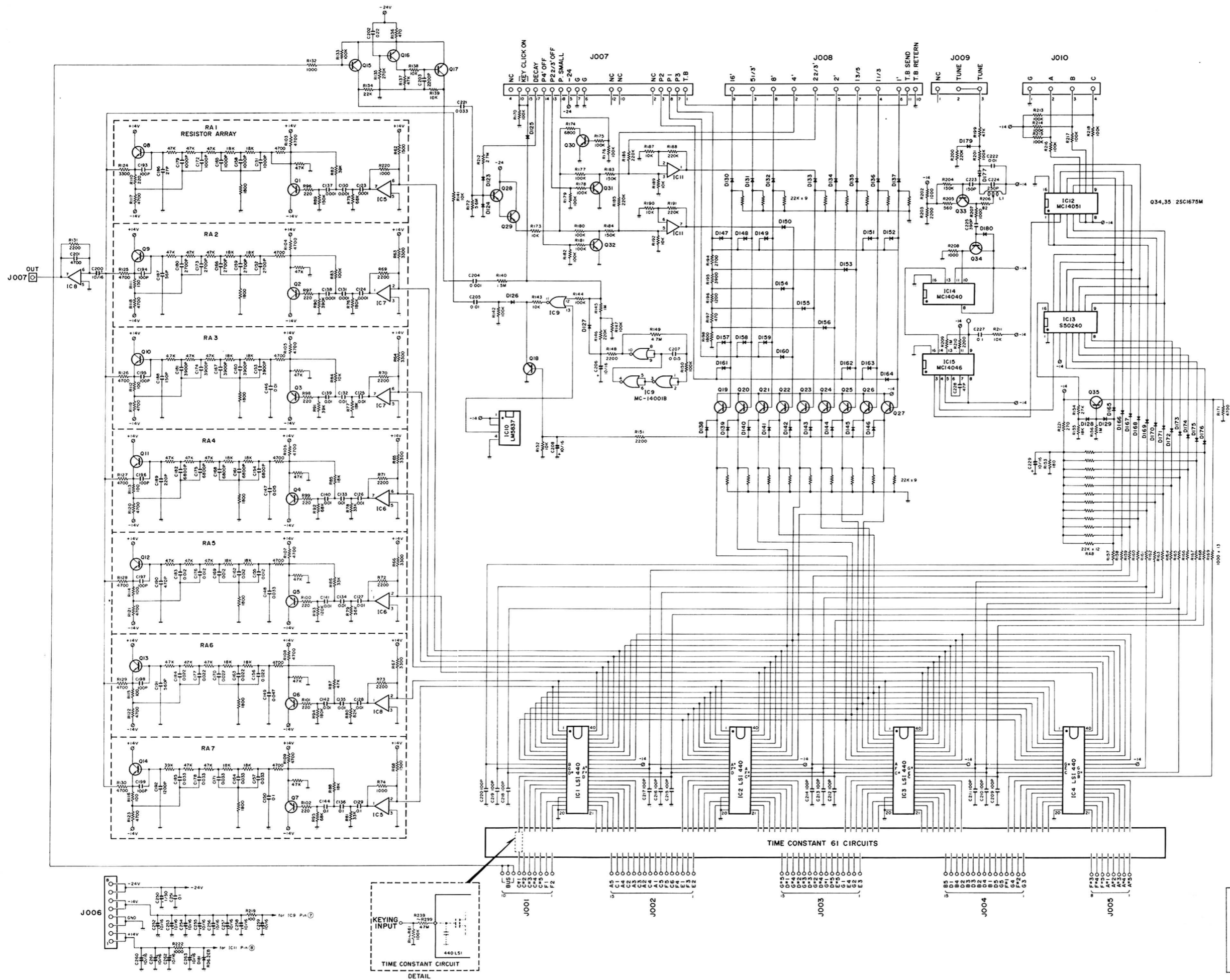


FIGURE 3-2
TONE GENERATOR BOARD
(DV-14) 229-21206
SCHEMATIC

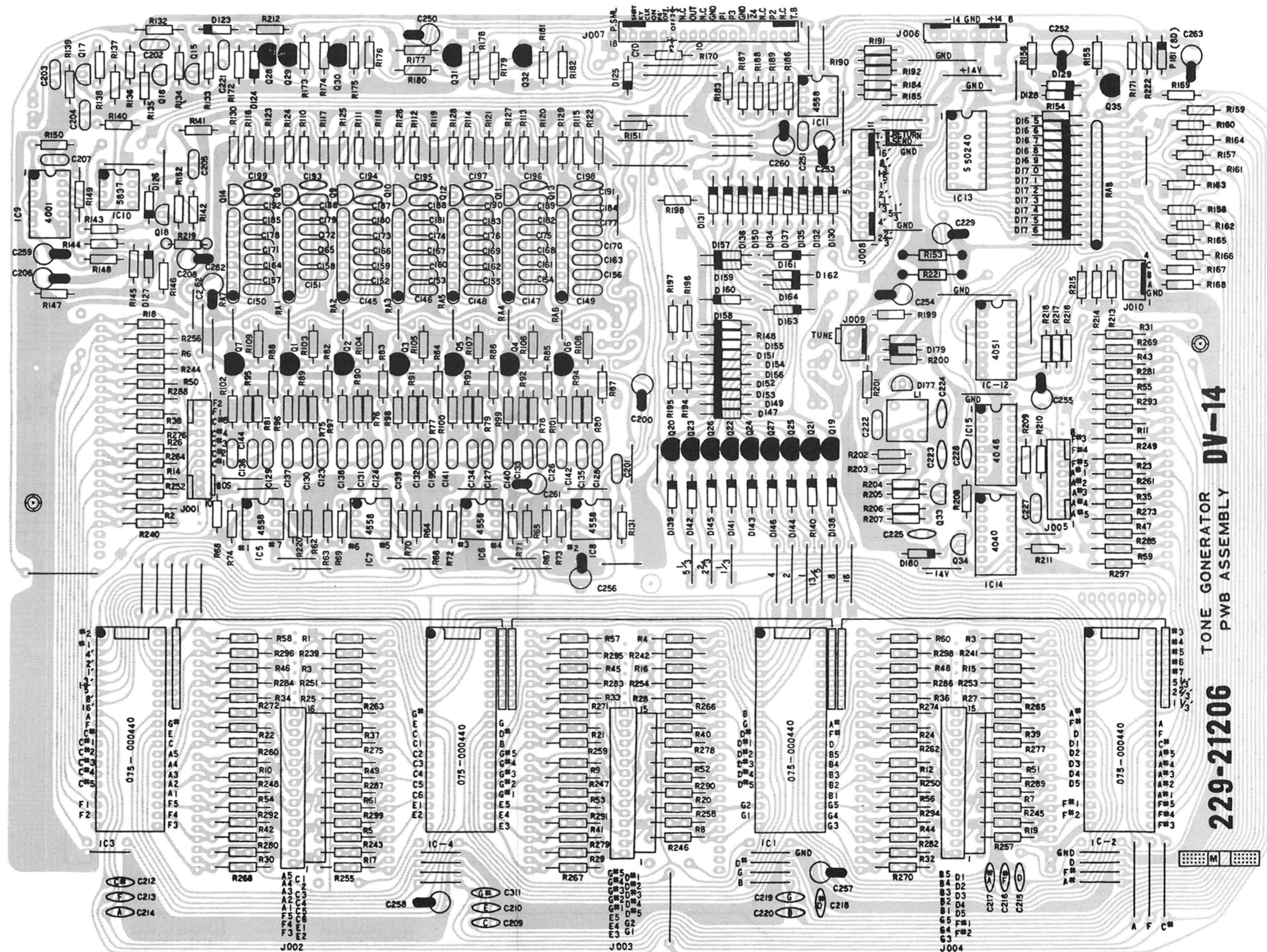


FIGURE 3-3
TONE GENERATOR BOARD
(DV-14) 229-21206
LAYOUT

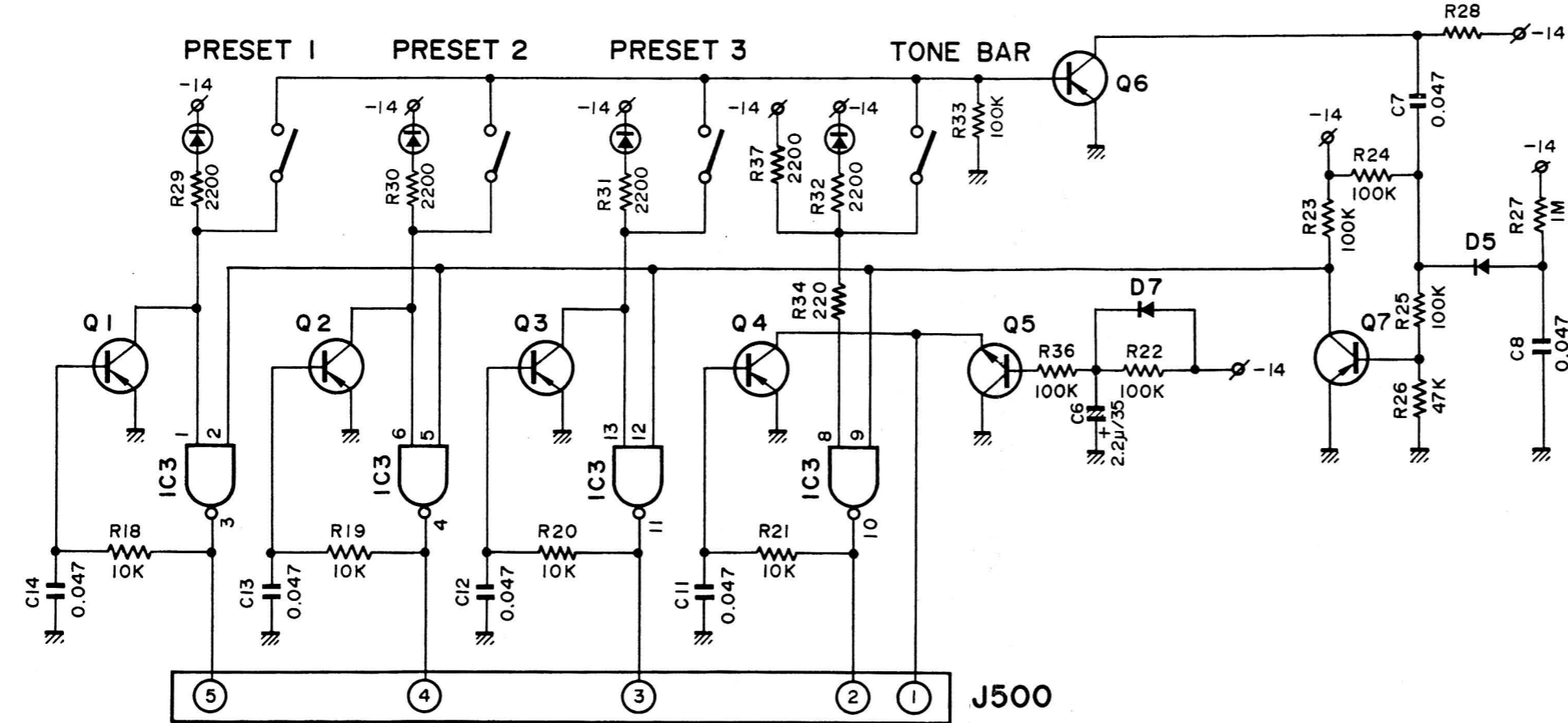
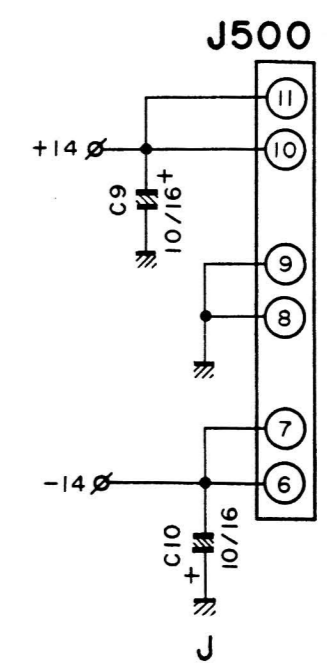
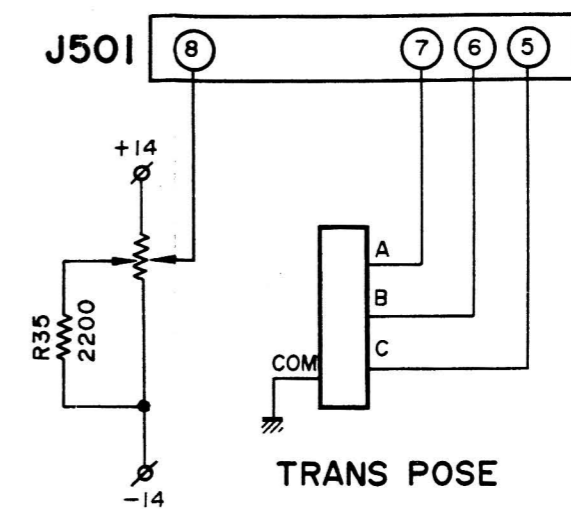
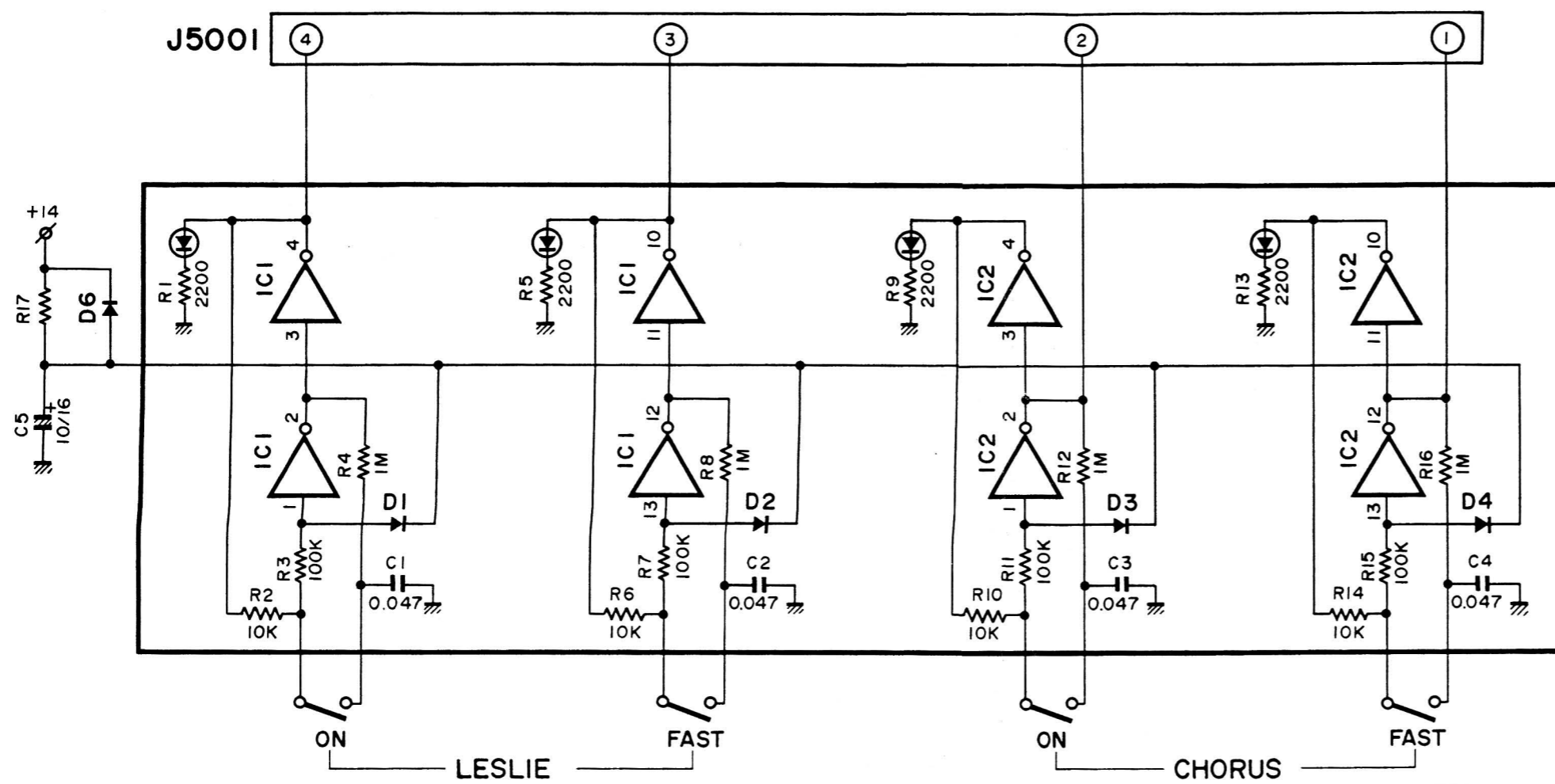


FIGURE 3-4
PRESET SWITCH BOARD
(EF-95) 225-22281
SCHEMATIC

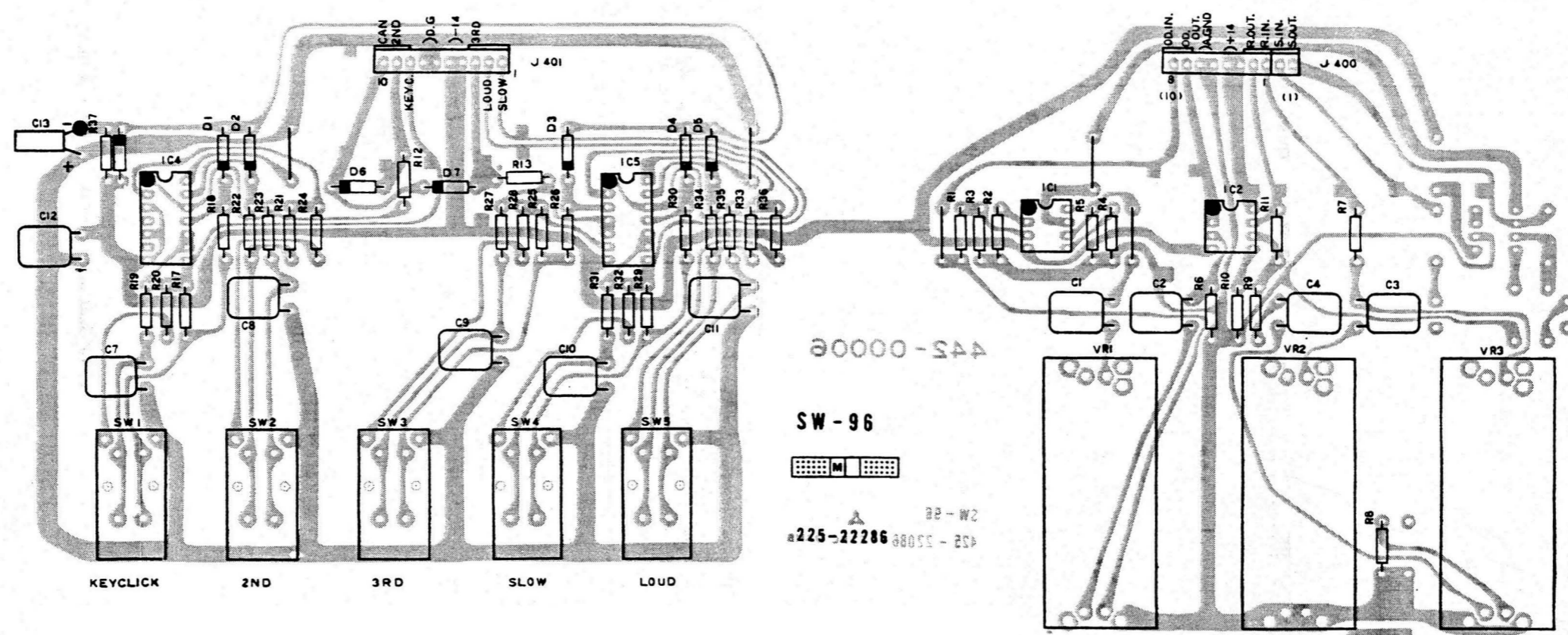
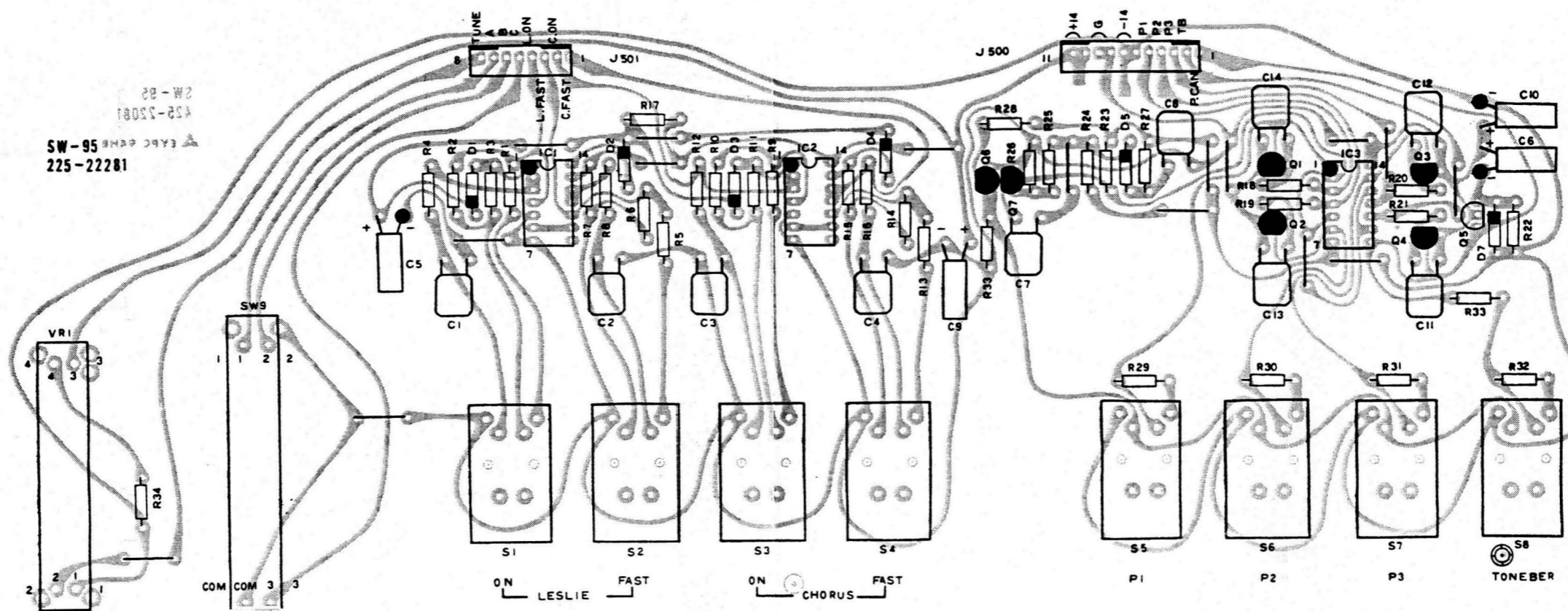


FIGURE 3-5
PRESET SWITCH BOARD
(SW-95) 225-22281
&
PERCUSSION SWITCH BOARD
(SW-96) 225-22286
LAYOUT

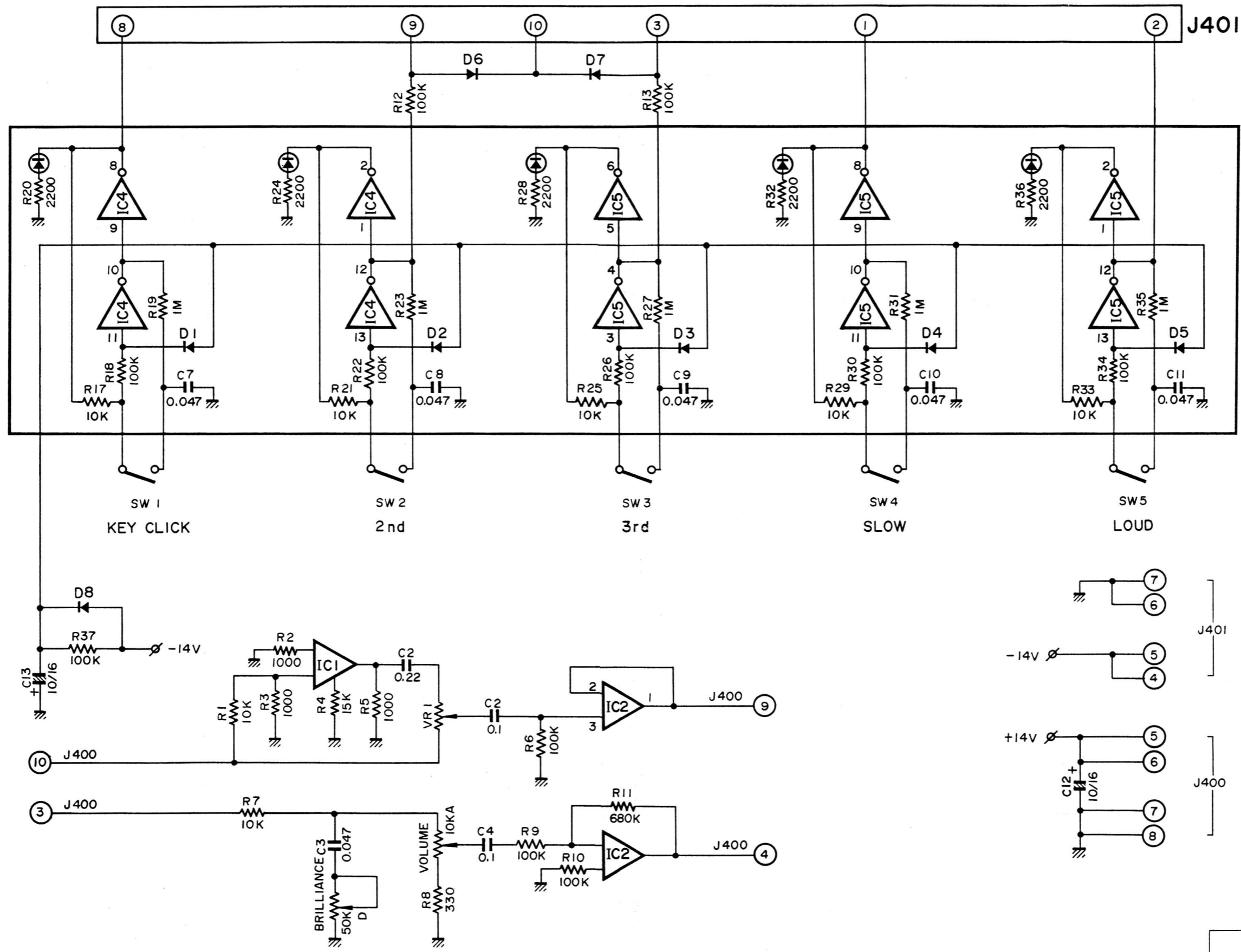
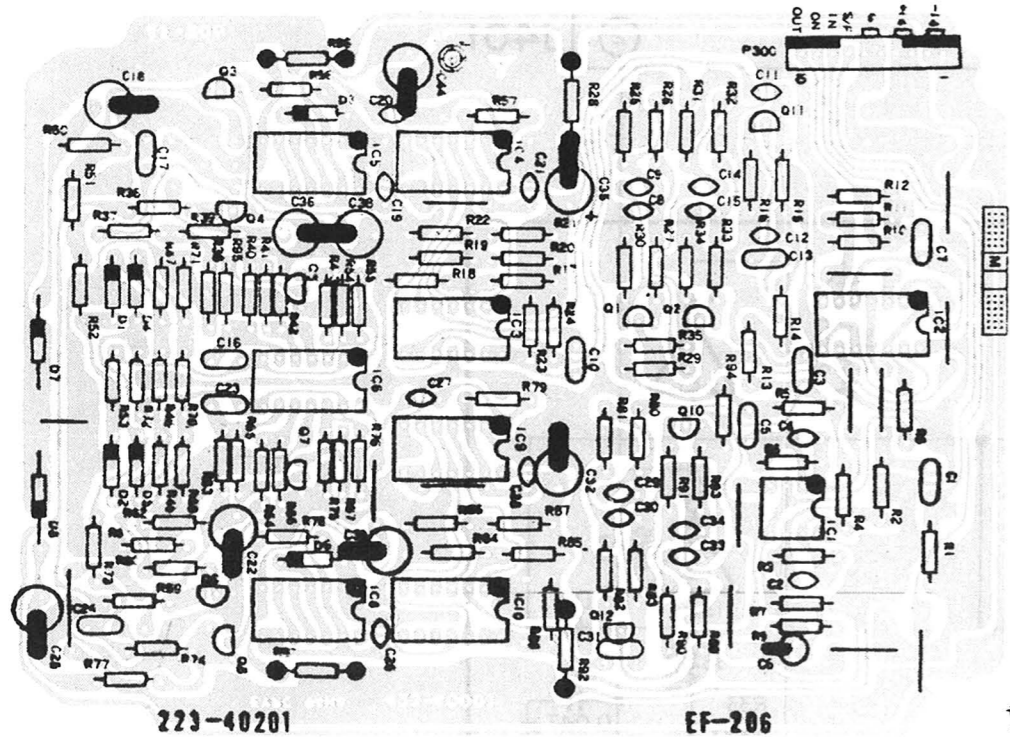


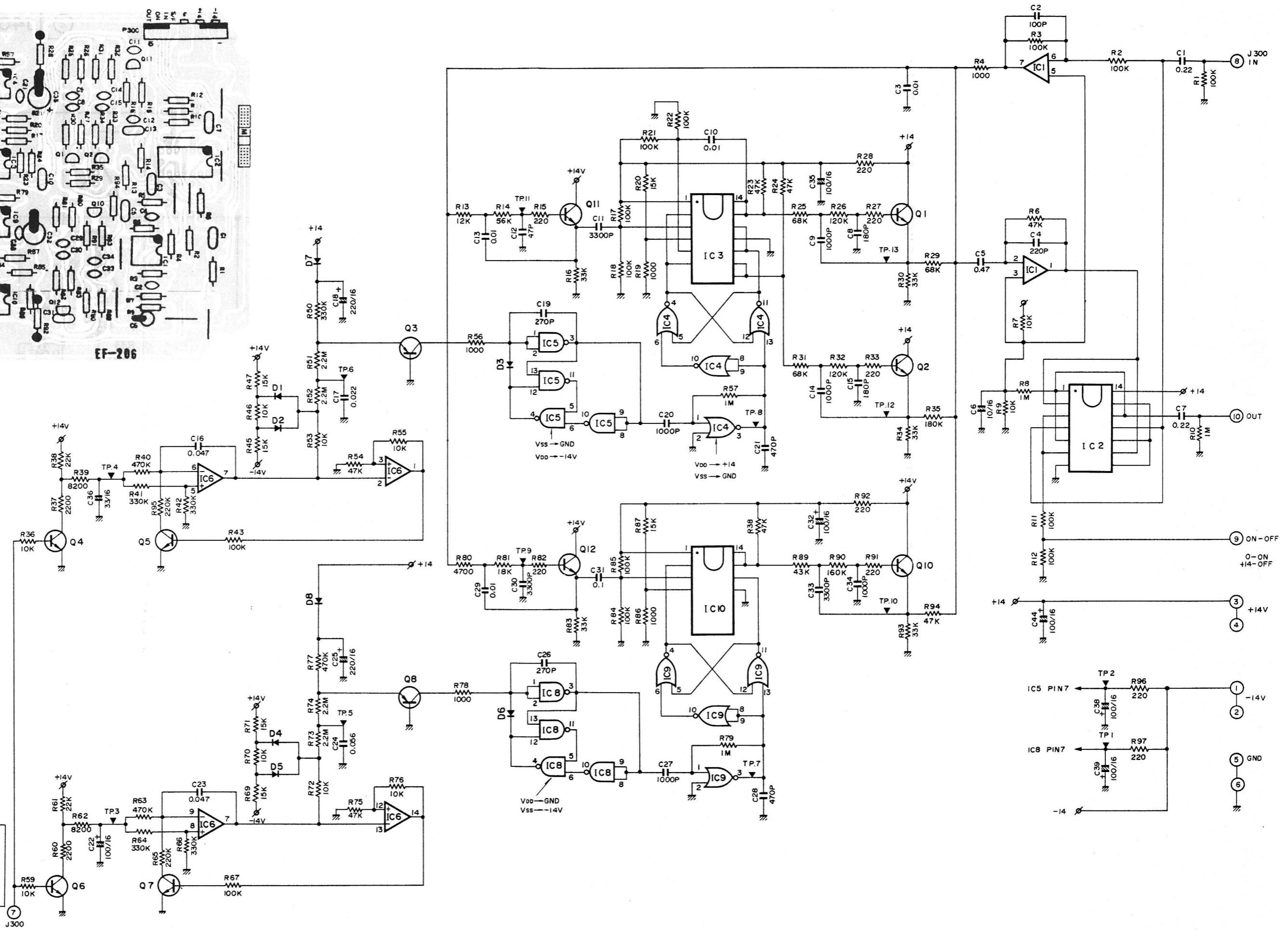
FIGURE 3-6
 PERCUSSION SWITCH BOARD
 (SW-96) 225-22286
 SCHEMATIC



223-40201

EF-206

FIGURE 3-7
ROTARY EFFECT BOARD
(EF-206) 223-40201
SCHEMATIC & LAYOUT



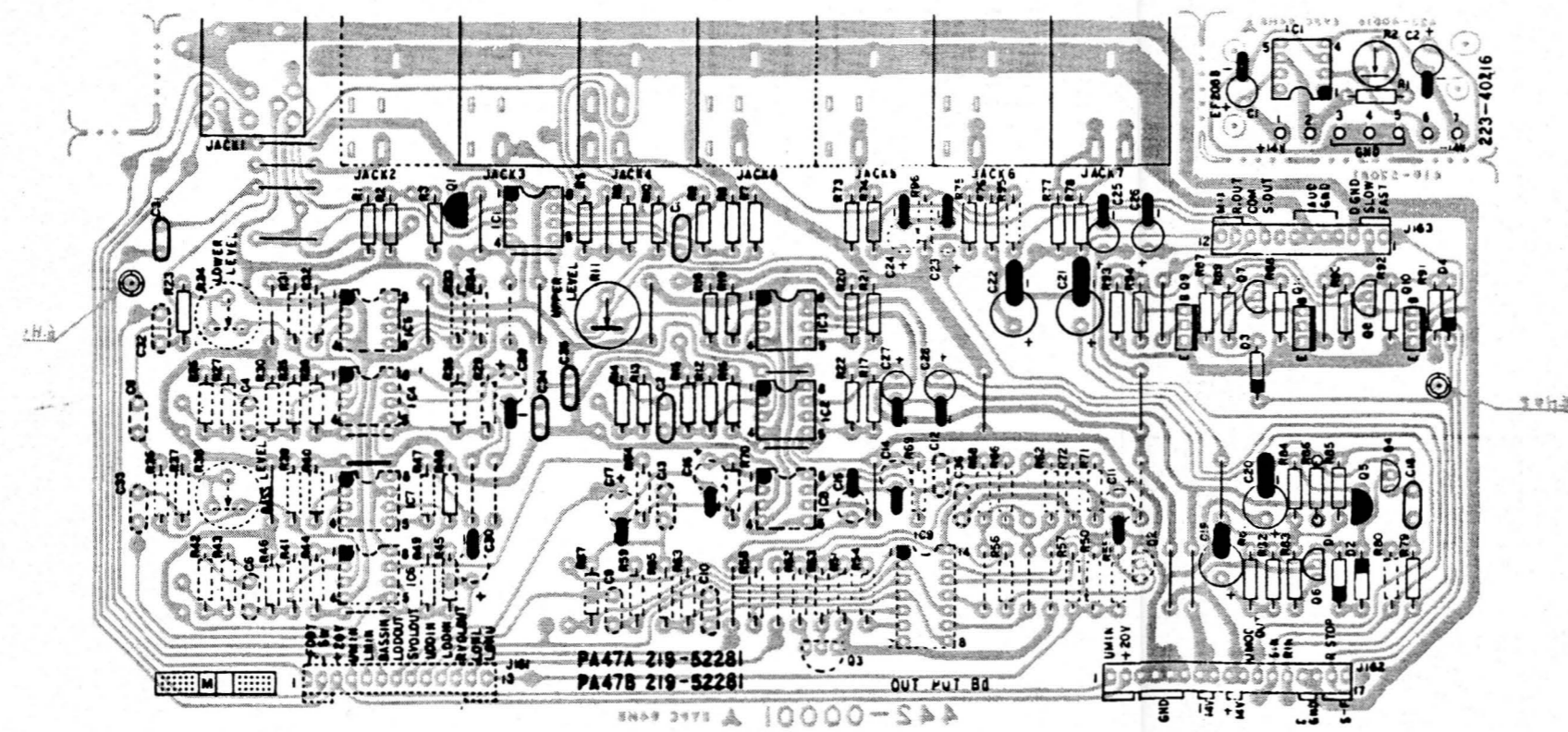
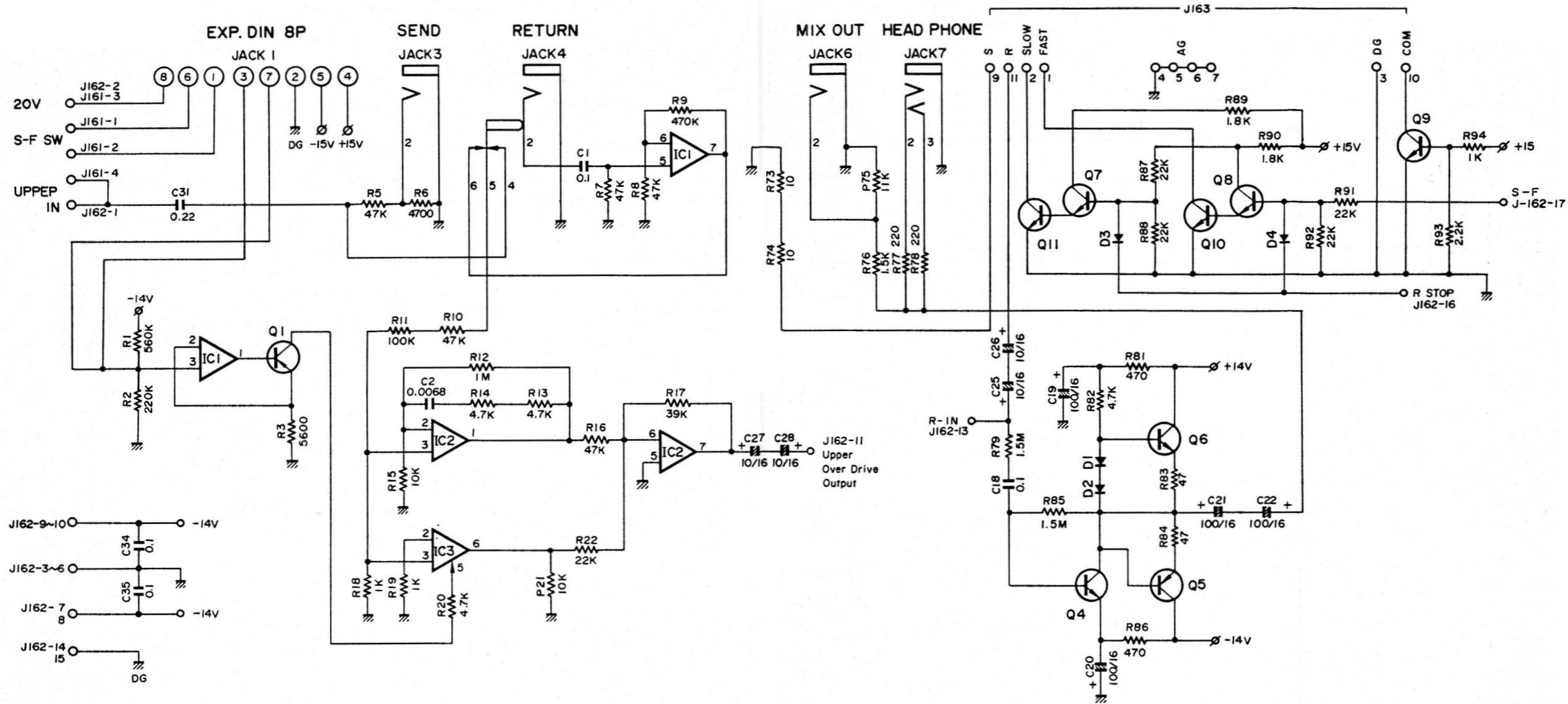


FIGURE 3-8
OUTPUT BOARD
(PA-47B) 219-52282
SCHEMATIC & LAYOUT

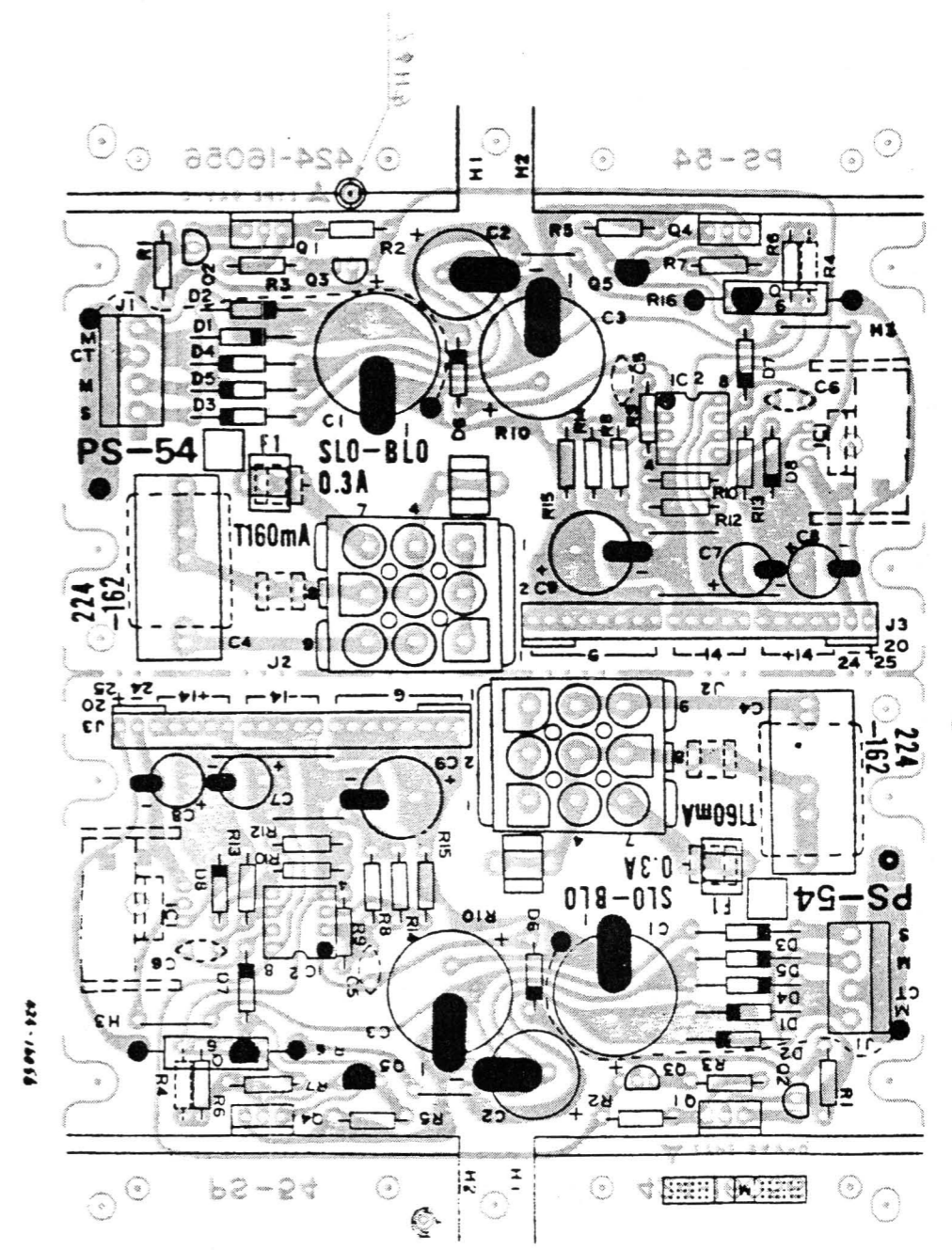
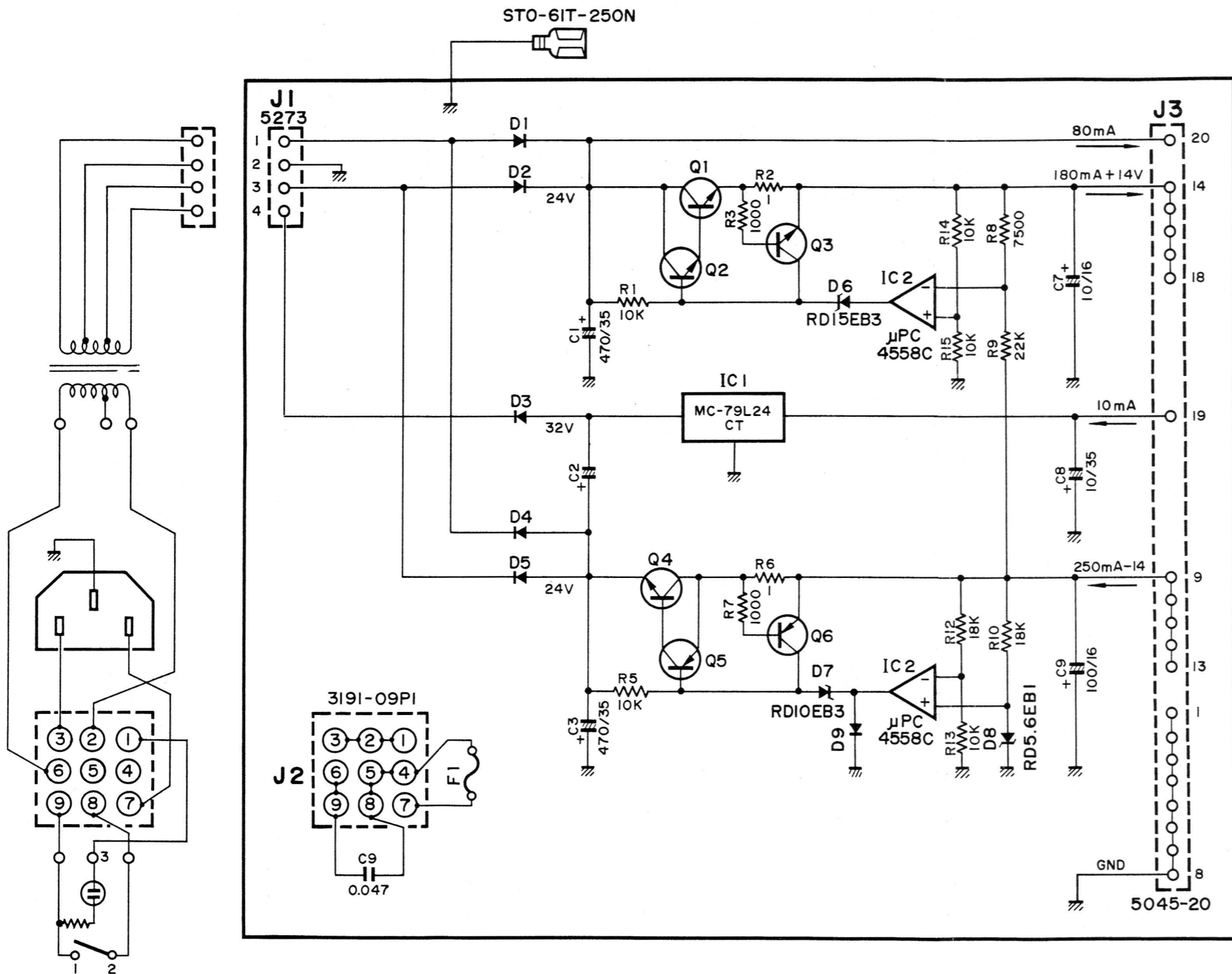
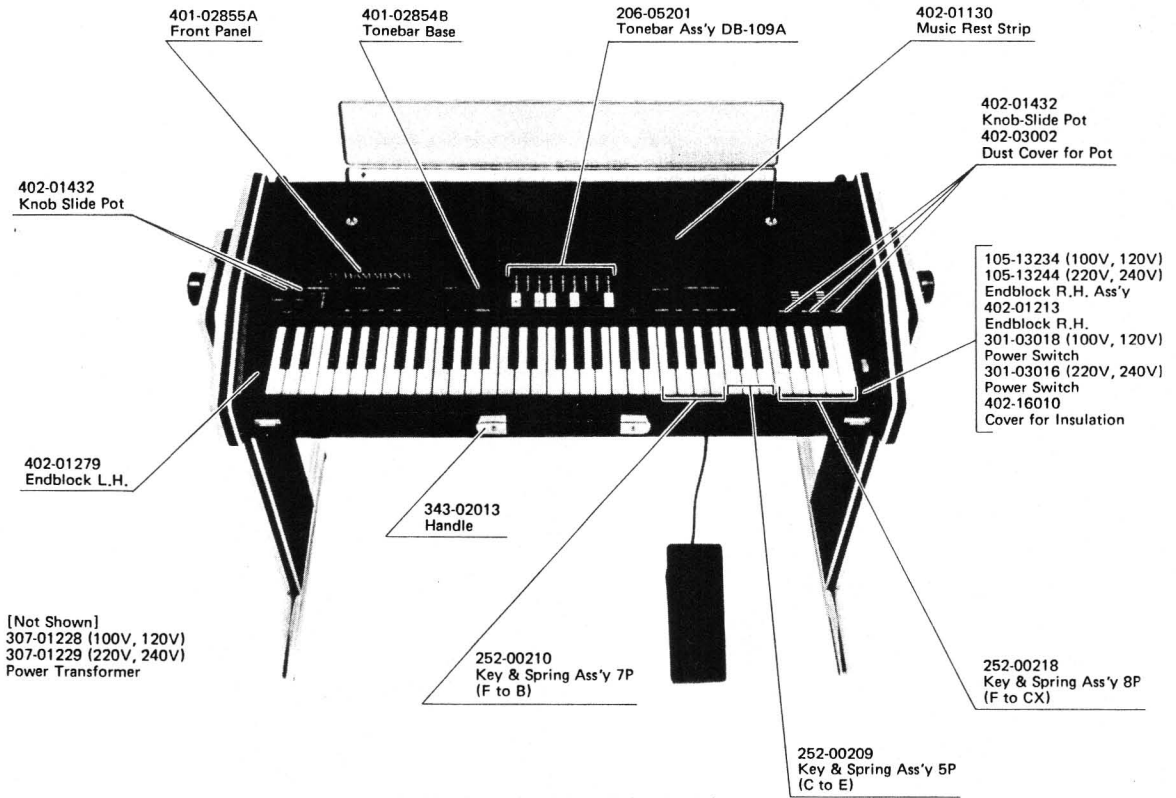


FIGURE 3-9
 POWER SUPPLY BOARD
 (PS-54A) 224-16256 (220V, 240V Area)
 SCHEMATIC & LAYOUT
 224-16259 (120V Area)
 224-16262 (100V Area)

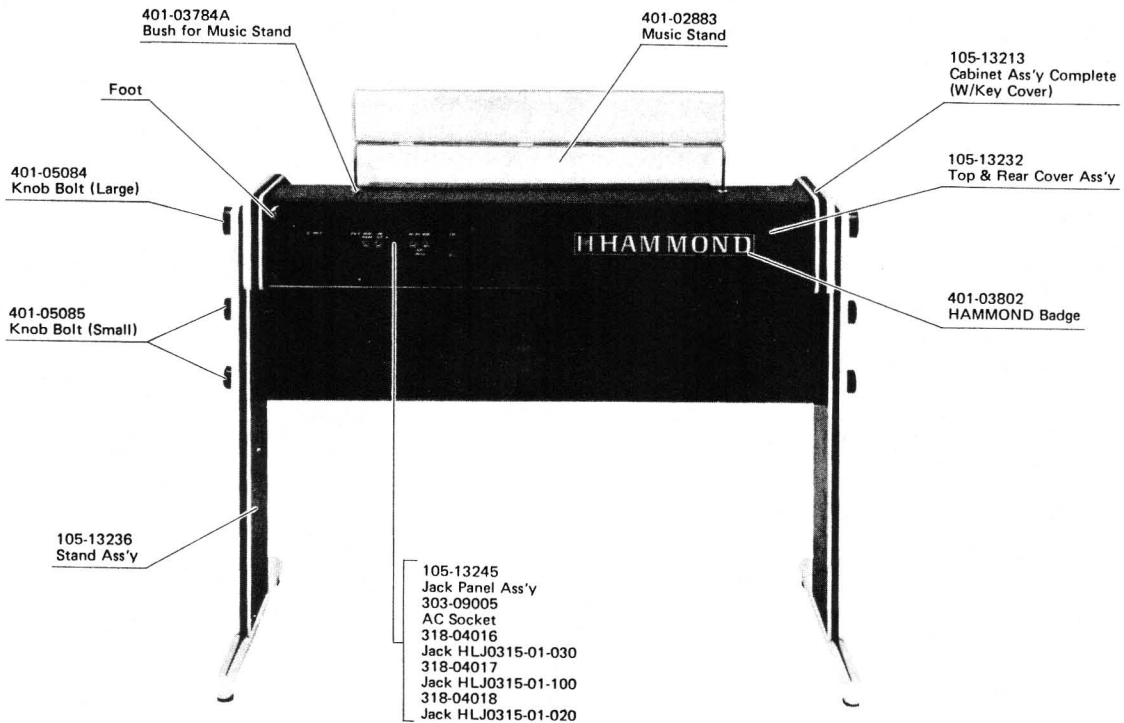
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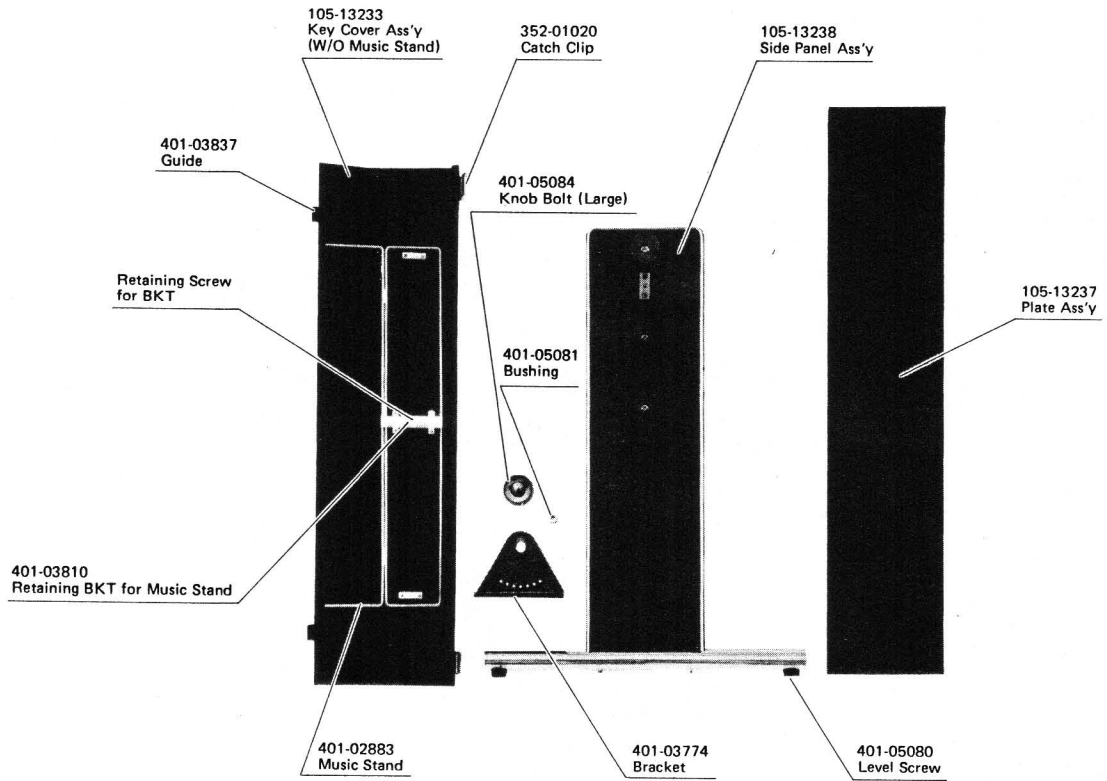
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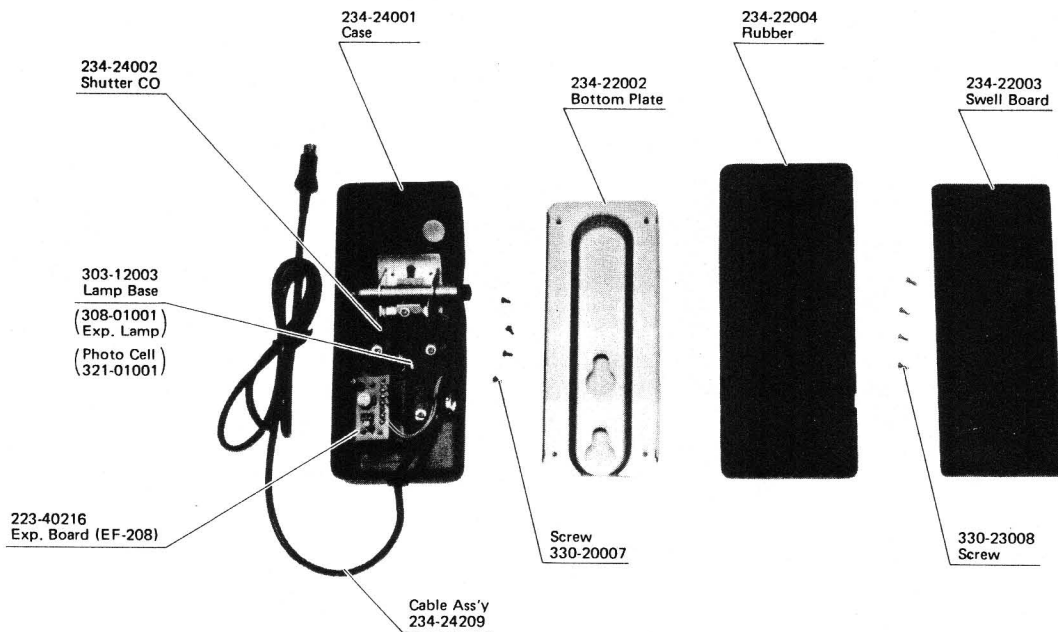
COMBO ORGAN B-100 (18350K)
FRONT UPPER VIEW



COMBO ORGAN B-100 (18350K)
REAR VIEW



KEY BOARD COVER & STAND
ILLUSTRATED PARTS



234-24204 (EXP-7B)
EXPRESSION PEDAL ASS'Y
EXPOSED VIEW

DV-14 TONE GENERATOR BOARD 229-21206

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|--|-----------------|--|--------------|
| Printed Wiring Board | No Parts | | 429-21006 |
| Integrated Circuit | 075-000440 | IC1 thru 4 | 319-07007 |
| Integrated Circuit | μ PC4558C | IC5 thru 8, 11 | 319-23020 |
| Integrated Circuit | MC14001BCP | IC9 | 319-06012 |
| Integrated Circuit | MM5837N | IC10 | 319-08001 |
| Integrated Circuit | MC14051BCP | IC12 | 319-06033 |
| Integrated Circuit | S50240 | IC13 | 319-01014 |
| Integrated Circuit | MC14040BCP | IC14 | 319-03012 |
| Integrated Circuit | MC14046BCP | IC15 | 319-25007 |
| Transistor | 2SA1015Y | Q1 thru 7, 19 thru 32, 35 | 305-01051 |
| Transistor | 2SC1675M | Q33, 34 | 305-03082 |
| Transistor | 2SC1815Y | Q15 thru 18 | 305-03087 |
| Transistor | 2SC1222E | Q8 thru 14 | 305-03101 |
| Zener Diode | RD6.2EB2 | D181 | 337-06012 |
| Diode | 1S1555 | D123 thru 176, 179, 180 | 306-01005 |
| Vari Cap. | MV104 | D177 | 306-05005 |
| Coil | 14S-080-2170 | L1 | 312-02020 |
| Printed Network | D13002110 | RA1 thru 7 | 320-97040 |
| Printed Network | 22K x 12 | RA8 | 320-97059 |
| IC Socket | DICA-40A-T1 | | 303-13004 |
| Capacitor Electrolytic | 10 μ F/16V | C200, 206, 208, 229, 252 thru 256, 259 thru 263 | 311-08034 |
| Capacitor Electrolytic | 100 μ F/16V | C257, 258 | 311-08038 |
| Capacitor Electrolytic | 1 μ F/50V | C250 | 311-08058 |
| Capacitor Ceramic (Thermal Compensator) | 220pF | C224 | 311-19026 |
| Capacitor Ceramic | 47pF | C228 | 311-01027 |
| Capacitor Ceramic | 100pF | C193 thru 199, 209 thru 220 | 311-01010 |
| Capacitor Ceramic | 150pF | C223 | 311-01011 |
| Capacitor Ceramic | 390pF | C225 | 311-01053 |
| Capacitor Ceramic | 2200pF | C203 | 311-01020 |
| Capacitor Ceramic | 4700pF | C201 | 311-01021 |
| Connector | 5045-3A | | 317-03163 |
| Connector | 5045-4A | | 317-03164 |
| Connector | 5045-8A | | 317-03168 |
| Connector | 5045-10A | | 317-03170 |
| Connector | 5045-11A | | 317-03171 |
| Connector | 5045-18A | | 317-03178 |
| Connector | 5046-15A | | 317-03263 |
| Connector | 5046-16A | | 317-03306 |

EF-206 ROTARY EFFECT BOARD 223-40201

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|------------------------|-----------------|---------------------------------|--------------|
| Printed Wiring Board | No Parts | | 423-40001 |
| Integrated Circuit | μ PC4558C | IC1 | 319-23020 |
| Integrated Circuit | MC14007BCP | IC2 | 319-06011 |
| Integrated Circuit | MN3010 | IC3 | 319-26010 |
| Integrated Circuit | MC14001BCP | IC4, 9 | 319-06005 |
| Integrated Circuit | MC14011UBCP | IC5, 8 | 319-06006 |
| Integrated Circuit | μ PC324C | IC6 | 319-23014 |
| Integrated Circuit | MN3004 | IC10 | 319-26006 |
| Transistor | 2SA1015Y | Q3, 8 | 305-01051 |
| Transistor | 2SC1815Y | Q1, 2, 4 thru 7, 10 thru 12 | 305-03087 |
| Diode | 1S1555 | D1 thru 6 | 306-01005 |
| Diode | 1S1885 | D7, 8 | 306-01020 |
| Capacitor Electrolytic | 10 μ F/16V | C6 | 311-08034 |
| Capacitor Electrolytic | 33 μ F/16V | C36 | 311-08036 |
| Capacitor Electrolytic | 100 μ F/16V | C18, 22, 25, 32, 35, 38, 39, 44 | 311-08038 |
| Capacitor Ceramic | 47pF | C12 | 311-01027 |
| Capacitor Ceramic | 100pF | C2 | 311-01010 |
| Capacitor Ceramic | 180pF | C8, 15 | 311-01069 |
| Capacitor Ceramic | 220pF | C4 | 311-01046 |
| Capacitor Ceramic | 270pF | C19, 26 | 311-01029 |
| Capacitor Ceramic | 470pF | C21, 28 | 311-01015 |
| Capacitor Ceramic | 1000pF | C9, 14, 20, 27, 34 | 311-01050 |
| Capacitor Ceramic | 3300pF | C11, 30, 33 | 311-01054 |
| Connector | 5045-10A | | 317-03170 |

PA-47B OUTPUT BOARD 219-52282

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|------------------------|------------------------------------|-------------|---------------------------|
| Printed Wiring Board | No Parts | | 419-52081 |
| Integrated Circuit | μ PC4558C | IC1, 2 | 319-23020 |
| Integrated Circuit | LM3080N | IC3 | 319-23021 |
| Transistor | 2SA1015Y | Q1 | 305-01051 |
| Transistor | 2SA1020O or 1020Y | Q5 | 305-01059 or 305-01058 |
| Transistor | 2SC1173Y | Q9, 10, 11 | 305-03081 |
| Transistor | 2SC1815Y | Q4, 7, 8 | 305-03087 |
| Transistor | 2SC2655O or 2655Y | Q6 | 305-03106 or 305-03105 |
| Diode | 1S2473 | D1 thru 4 | 306-01017 |
| Capacitor Electrolytic | 10 μ F/16V | C25 thru 28 | 311-08034 |
| Capacitor Electrolytic | 100 μ F/16V | C19 thru 22 | 311-08038 |
| Connector | 5045-12A | | 317-03172 |
| Connector | 5045-17A | | 317-03177 |
| Din Connector | Din 8P TCS5380-01A | Jack 1 | 318-04019 |
| Jack | HLJ0315-01-030 | Jack 4 | 318-04016 |
| Jack | HLJ0315-01-100 or HLJ0315-01-30 | Jack 3, 6 | 318-04017 or 318-04016 |
| Jack | HLJ0315-01-020 | Jack 7 | 318-04018 |
| Trimmer Pot | 100KB EVL-R4S-A00 | R11 | 336-01010 |

**PS-54A POWER SUPPLY BOARD 224-16256 (220V, 240V Area)
 224-16259 (120V Area)
 224-16262 (100V Area)**

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|------------------------|--|-------------------|---------------------|
| Printed Wiring Board | No Parts | | 424-16056 |
| Integrated Circuit | MC79L24CP | IC1 | 319-28031 |
| Integrated Circuit | μ PC4558C | IC2 | 319-23020 |
| Transistor | 2SA1015Y | Q5, 6 | 305-01051 |
| Transistor | 2SC1815Y | Q2, 3 | 305-03087 |
| Transistor | 2SD526Y | Q1, 4 | 305-04014 |
| Zener Diode | RD15EB3 | D6 | 337-06034 |
| Zener Diode | RD5.6EB1 | D8 | 337-06042 |
| Zener Diode | RD10EB3 | D7 | 337-06036 |
| Diode | 1S1885 | D1 thru 5 | 306-01005 |
| Diode | 1S2473 | D9 | 306-01020 |
| Capacitor Electrolytic | 10 μ F/16V | C7 | 311-08034 |
| Capacitor Electrolytic | 100 μ F/16V | C2, 9 | 311-08038 |
| Capacitor Electrolytic | 10 μ F/35V | C8 | 311-08076 |
| Capacitor Electrolytic | 470 μ F/35V | C1, 3 | 311-08083 |
| Capacitor Polyester | .047 μ F/ECQ-UF (220V-240V Area Only) | | 311-04058 |
| Capacitor Polyester | .047 μ F/ECQ-UC (120V Area Only) | | 311-06011 |
| Capacitor Polyester | .047 μ F/ECQ-F1A (100V Area Only) | | 311-04097 |
| Fuse | 160mAT NSD (220V-240V Area Only) | | 302-01077 |
| Fuse | 0.3A UL Slow Blow (120V Area Only) | | 302-01083 |
| Fuse | 315mA NSD (100V Area Only) | | 302-01063 |
| Connector | 3191-09P1 | | 317-01069 |
| Connector | 5045-20A | | 317-03180 |
| Connector | 5273-4A | | 317-03334 |

SW-95 PRESET SWITCH BOARD 225-22281

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|------------------------|-----------------|-----------------|--------------|
| Printed Wiring Board | No Parts | | 425-22081 |
| Integrated Circuit | MC14069UBCP | IC1, 2 | 319-11001 |
| Integrated Circuit | MC14011BCP | IC3 | 319-06014 |
| Transistor | 2SA1015Y | Q1 thru 4, 6, 7 | 305-01051 |
| Transistor | 2SC1815Y | Q5 | 305-03087 |
| Diode | 1S1555 | D1 thru 5, 7 | 306-01005 |
| Capacitor Electrolytic | 10 μ F/16V | C5, 9, 10 | 311-08034 |
| Capacitor Electrolytic | 2.2 μ F/50V | C6 | 311-08059 |
| L-E-D Switch | KHC11013 | S1 thru 8 | 301-02129 |
| Slide Switch | SGC1017 | SW9 | 301-09001 |
| Slide Pot | S-3015 10KB | VR1 | 358-05051 |
| Connector | 5045-08A | | 317-03168 |
| Connector | 5045-11A | | 317-03171 |

SW-96 PERCUSSION SWITCH BOARD 225-22286

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|------------------------|----------------|------------|--------------|
| Printed Wiring Board | No Parts | | 425-22086 |
| Integrated Circuit | LM3080N | IC1 | 319-23021 |
| Integrated Circuit | μ PC4558C | IC2 | 319-23020 |
| Integrated Circuit | MC14069UBCP | IC4, 5 | 319-11001 |
| Diode | 1S2473 | D1 thru 8 | 306-01017 |
| Capacitor Electrolytic | 10 μ F/16V | C12, 13 | 311-08034 |
| L-E-D Switch | KHC11013 | S1 thru 5 | 301-02129 |
| Slide Pot | S-3015 10KA | VR3 | 358-05004 |
| Slide Pot | S-3015 10KB | VR1 | 358-05014 |
| Slide Pot | S-3015 50KD | VR2 | 358-05052 |
| Connector | 5045-08A | | 317-03168 |
| Connector | 5045-10A | | 317-03170 |

EF-208B EXPRESSION BOARD 223-40216

| PARTS NAME | DESCRIPTION | RC. NUMBER | PARTS NUMBER |
|------------------------|----------------|------------|--------------|
| Printed Wiring Board | No Parts | | 423-40016 |
| Integrated Circuit | TL081 | IC1 | 319-23025 |
| Capacitor Electrolytic | 10 μ F/16V | C1, 2 | 311-08034 |