

# SERVICE MANUAL

# RHYTHM II



**HAMMOND ORGAN COMPANY**  
**DIVISION OF HAMMOND CORPORATION**

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## INTRODUCTION

This manual contains information for the servicing of the Rhythm II device which allows the user to select a number of automatic rhythm patterns described in the text in Section I.

The Rhythm II device is furnished in two basic forms; one is a "drawer" unit which can be added on to T-Series, L-100 Series, M-100 Series, and N-100, N-200 organs; the other is a built-in form which is mounted on the control panel of certain models.

The "drawer" unit is furnished as a kit, complete with installation instructions. Also, some organs were available with the "drawer" unit installed at the factory. These are Models T-200-2 and L-100-2.

While both forms are electronically almost identical, the built-ins and N-Series "drawer" installations do not require a separate power supply, and the remaining parts are contained in one assembly. For illustrations of the "drawer" unit installations, see the Appendix. The built-in control arrangement is shown in Figure 1-2. The drawer control arrangement is shown in Figure 1-1.

For servicing purposes, the Rhythm II device may be considered as a separate entity, independent of the remaining organ circuitry. Complete information is contained in this manual, and will not be repeated in manuals covering organs with the built-in or factory installed "drawer" devices.

For convenience in locating specific information this manual is divided into seven sections, as shown below.

- I. How Rhythm II Operates
- II. Theory of Operation
- III. Disassembly
- IV. Maintenance
- V. Diagrams
- VI. Parts List
- Appendix

## SECTION I HOW RHYTHM II OPERATES

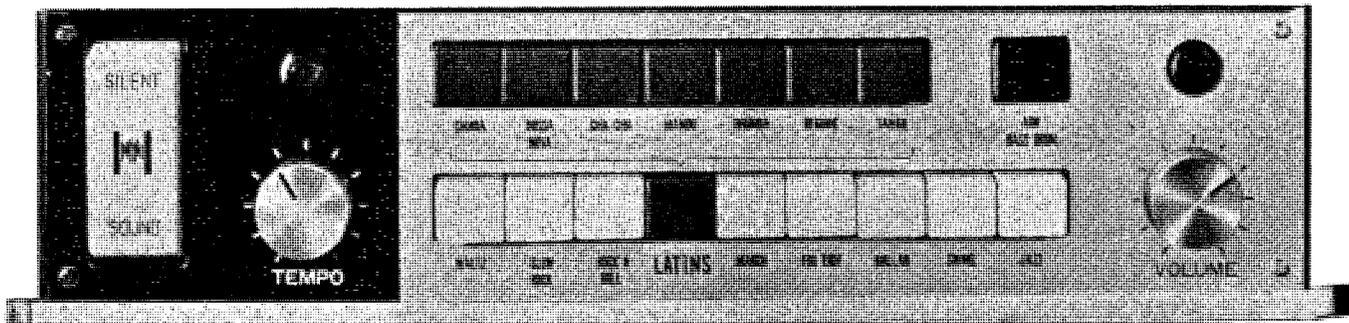


Figure 1-1 Rhythm II Control Arrangement (Drawer)

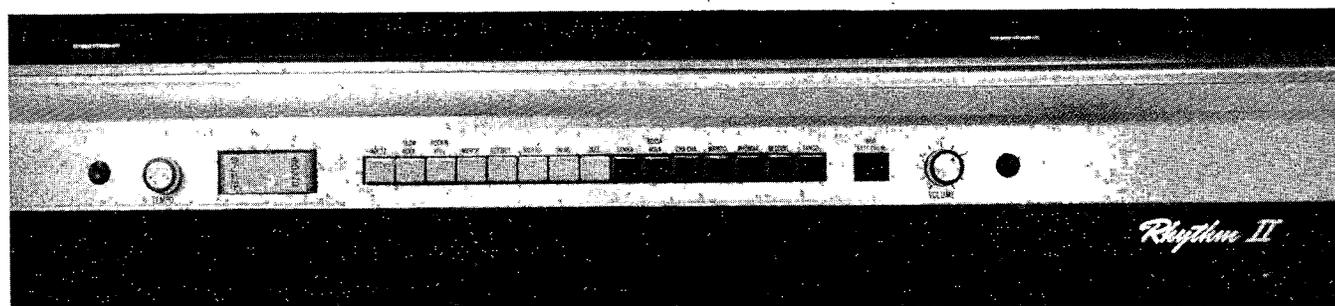


Figure 1-2 Rhythm II Control Arrangement (Inbuilt)

### RHYTHM II Drawer (125-000045) Inbuilt (125-000049)

- 1-1. **GENERAL.** – The next few paragraphs describe the controls and the effects produced by the Rhythm II Drawer and Inbuilt units. Service Diagrams and Schematics are found from 5-1 to 5-13. The 21 rhythm track patterns are the same for all rhythm units discussed in this manual. Only tracks selected and voicing will change in later models.
- 1-2. **POWER.** – Rhythm II is connected to DC voltages when the separate power switch on the control unit is “on”.
- 1-3. **SILENT-SOUND TABLET.** – With power “on”, the SILENT-SOUND tablet is moved to SOUND position to start the rhythm at the player’s option.
- 1-4. **VOLUME CONTROL.** – This control regulates the audio output of the rhythm effects, with a range of about -25 db from maximum to minimum.
- 1-5. **TEMPO.** – The TEMPO control permits the player to select any desired rhythm within the range of 72 to 460 beats per minute. A lamp associated with the TEMPO control blinks on the first beat of every measure, regardless of position of the SILENT-SOUND tab. To stop the blinking, power must be removed from the Rhythm accessory.
- 1-6. **RHYTHM PATTERNS.** – As will be seen in Figures 1-1 and 1-2, the built-in units have one row of 15 control buttons, while the “drawer” units have two rows; one of nine, the other of seven. (Exclusive of the ADD BASS DRUM button).

In the built-in unit, the mechanical action of the control buttons is such that when any button is depressed, any previously depressed button is released. The release occurs when the button being depressed is at about one-half the distance of its travel. Thus, if a button is half-depressed, then released, a condition of no buttons depressed is brought about.

In the "drawer" unit, the row of nine buttons permits selection of eight rhythm patterns, while the red LATINS button controls the row of seven buttons, allowing the selection of Latin patterns when depressed. Mechanically, the two rows of buttons are independent of each other.

Two or more buttons can be latched down at the same time if they are depressed simultaneously.

**1-7. BASS DRUM.** – The black ADD BASS DRUM pushbutton is of the push-on, push-off type. When "on" it adds bass drum to any selected rhythm pattern. The bass drum alone can be allowed to sound by achieving a no buttons depressed condition as described in paragraph 1-6, and setting the ADD BASS DRUM button to the "on" condition.

**1-8. VOICING.** – The following voices are used in combinations shown in the charts; Figures 1-3.

HIGH CONGA	(HC)
LOW CONGA	(LC)
RIM SHOT	(RS)
CLAVES	(C)
SNARE DRUM	(SD)
MARACAS	(M)
CYMBAL	(CY)
BASS DRUM	(BD)

The charts also depict the beat on which each voice is heard, and/or accented.

**1-9. VOICE GENERATOR.** – All voices produced by Rhythm II originate in the voice generator assembly, and are routed to the Rhythm II preamplifier. From the preamplifier, the voices are coupled to the organ's output through appropriate circuitry.

**1-10. POWER SUPPLY.** – A separate power supply is used to provide the voltages required by

Rhythm II "drawer" units only, except in N-Series organs.

**1-11. FOOT SWITCH.** – To silence built-in units, without removing power, a foot switch is attached to the right side of the swell pedal. The switch silences the rhythm when pressed.

For "drawer" units, a foot switch is available as an optional accessory. Its connector is a standard phone plug, which is inserted into a phone jack on the underside of the control.

The accessory foot switch is connected in series with the SILENT-SOUND tablet, and is effective only when the tablet is in SOUND Position. The switch does not control power to the Rhythm II circuitry, but acts in lieu of the SILENT-SOUND tablet. The switch is of the push-on, push-off type, and can be placed on the floor at any position convenient to the organist.

## RHYTHM II

### Inbuilt-Improved (125-000049)

**1-12. GENERAL.** – For servicing Diagrams and Schematics Figure 5-14 to 5-21 are used. The new rhythm pattern charts (Figure 5-16) will show the voicing and pattern changes. The major changes will be discussed in the following paragraphs.

### NOTE

Special note should be taken that on the board layout for the voicing board there are two capacitors with "A" designations. They do not appear on the schematics as "A" designated components. C309, for example, is shown on the schematic. On the board layout C309 and C309A are in parallel. C303 is presented in the same manner.

**1-13. BASS DRUM.** – In the early units, with the Add Bass Drum Button released, the bass drum is present in all patterns. When this button is depressed the bass drum is completely silenced.

In the later units, with the button released, the action is the same. However, with the button depressed, the bass drum is reduced in audible level approximately 6 DB.

**1-14. TEMPO LAMP.** – In the early units, the tempo lamp blinked as long as the power switch for the rhythm unit is on.

In the later units, the lamp blinks only when the Silent-Sound switch is in the “sound” position.

**1-15. SILENT-SOUND SWITCH.** – In the early units, the audio output would become audible when this switch is switched to the “sound” position. Also it was not a synchronous start. That is, it would sound at whatever point of operation the multivibrators were keying at the time the switch was turned on.

In the later units, each time the Silent-Sound switch is turned on, the multi-vibrators are reset and a resulting rhythm pattern starting on the downbeat occurs.

**1-16. TEMPO CONTROL.** – In the early units, this control varied the speed or rate of the rhythm from 72 to 460 beats per minute.

In the later units, the rate is variable from 48 to 300 beats per minute.

#### **RHYTHM II-A**

##### **Inbuilt (125-000079)**

**1-17. GENERAL.** – The Rhythm II-A unit is domestic built. All functions and voicing are the same as the Rhythm II Inbuilt-Improved.

Electrically the Rhythm II-A is an entirely new piece of electronics.

The first and major difference is the power requirement. A positive twenty-five (25) volts is used instead of a negative twenty-five (25) volts, therefore the 125-000049 and 125-000079 are not interchangeable although they are physically identical in appearance.

Rhythm voicing and pattern charts are shown in Figure 5-16.

Component layout, wiring diagrams, and schematics for service are found starting with Figure 5-22 through 5-27.

**SECTION II  
THEORY OF OPERATION**

2-1 Theory of operation not included at this time.

**SECTION III  
DISASSEMBLY**

3-1 This section not included as disassembly is obvious.

## SECTION IV MAINTENANCE

- 4-1. GENERAL.** – This section contains performance standards and practical service suggestions for Rhythm II (Drawer, Inbuilt, Inbuilt-Improved).
- 4-2. PERFORMANCE STANDARDS.** – Following is a table of performance standards for the individual voices.
- e. Apply the other end of the jumper to the desired voice trigger on voice generator board (See Figure 5-10).
- f. The pattern seen on the oscilloscope shall be an exponentially decaying voltage, as indicated in the table in paragraph 4-2.

Voice	Amplitude (Volts)	Frequency (Hertz)	Duration (Milliseconds)
Bass Drum	1.5 to 2.3	55 to 75	85 – 200
Low Conga	1.4 to 2.2	118 to 165	70 – 170
High Conga	1.3 to 2.1	210 to 284	50 – 120
Claves	1.2 to 2.0	2240 to 2600	3 – 7
Rim Shot	1.2 to 2.0	1350 to 1560	2 – 5
Snare Drum	1.2 to 2.0	---	70 – 110
Maracas	1.2 to 2.0	---	20 – 40
Cymbal	1.2 to 2.0	---	150 – 300

- 4-3. PERFORMANCE CHECK.** – In order to check performance of any individual voice, proceed according to the following:
- a. Remove phone plug and connect oscilloscope across output jack of voice generator. (Output of generator must remain disconnected from organ.)
  - b. Set rhythm selector for a no buttons depressed condition as described in paragraph 1-6.
  - c. Apply power and set SILENT/SOUND tab to SOUND position.
  - d. Connect a jumper to contact No. 16 on diode matrix board.

### NOTE

Amplitude is the peak positive voltage with respect to ground, measured with Rhythm Volume control set for maximum output.

Duration is measured from start of signal to the point where it has decayed to 10% of the amplitude.

- 4-4. MASTER OSCILLATOR FREQUENCY CHECK.** – The frequency of the master oscillator measured at 0', Figure 5-4, shall be 2.4 Hz  $\pm$  20% with TEMPO control fully counter-clockwise. With TEMPO control fully clockwise, the output shall be 15.4 Hz  $\pm$  20%.

**4-5. PRACTICAL SERVICE SUGGESTIONS. —**

**4-6. NO RHYTHM SOUND. —**

- a. If Tempo lamp blinks, check connections between control circuits and voice generator, and from voice generator to organ preamplifier. Be sure SILENT/SOUND tablet is in SOUND position.
- b. If Tempo lamp does not blink, check the following:
  1. Connection of Rhythm II power supply to AC source (T, L, & M organs only).
  2. Connection of D.C. source to voice generator chassis.
  3. Voltages of power supply output connector (T, L, & M organs only).
  4. Power switch on Rhythm II control.
  5. Be sure primary power is reaching organ.

**4-7. ONE RHYTHM VOICE MISSING. —** Perform check according to paragraph 4-3 on the missing voice.

If voice does not sound, check associated oscillator or noise source. Refer to Section V and Figure 5-9.

For voices other than Snare Drum, Cymbal, and Maracas, check preamplifier circuit, Figure 5-9, also.

For voices included in Latin patterns on Drawer units, check track gate, Figure 5-9.

**4-8. NO LATIN RHYTHMS (Drawer Units only). —** Check LATINS switch and associated interconnections.

**4-9. NO TEMPO INDICATION. —** If sound of Rhythm II is satisfactory, but lamp does not blink, lamp is probably at fault - replace. If lamp is not at fault, check Q114, Q115 and associated circuitry for defective parts. See Figure 5-4.

**4-10. ONE RHYTHM PATTERN MISSING. —** If remaining patterns are satisfactory, check individual pattern switch and associated wiring.

**RHYTHM II-A  
125-000079**

**4-11. PERFORMANCE SPECIFICATIONS. —** With the voice generator pulsed directly by the output of track #2 (J2-20), the volume control set to maximum, and the tempo control set to its mid-position (or to any convenient setting), the output wave forms shall be as described below.

The amplitude is measured in volts peak to peak with respect to ground. The output load shall be greater than 1 meg. ohm.

The duration is measured from the start of the signal to the point where it has decayed to 10% of maximum amplitude.

With the TEMPO control fully counter-clockwise, the TEMPO LAMP shall blink every 5.0 seconds  $\pm 25\%$ . With the TEMPO control fully clockwise, the TEMPO LAMP shall blink every 800 milliseconds  $\pm 20\%$ .

The rhythm generator timing chart is shown in Figure 5-1.

The rhythm patterns are shown in Figure 5-16.

Voice	Amplitude (P-P Volts)	Frequency (Hertz)	Duration (Milliseconds)
Bass Drum	3.7 to 6.3	53 to 72	120 to 280
Low Congo	3.2 to 5.4	122 to 166	100 to 225
High Congo	3.1 to 5.2	223 to 302	80 to 200
Claves	3.0 to 5.0	2130 to 2880	3.5 to 8
Rim Shot	2.2 to 3.7	1250 to 1690	5 to 12
Snare Drum	2.9 to 4.8	---	45 to 110
Maracas	2.5 to 4.2	---	25 to 60
Cymbal	2.5 to 4.2	---	150 to 300

# SECTION V DIAGRAMS

5-1. **GENERAL.** - This section contains diagrams which illustrate the foregoing text and provide information necessary to proper organ servicing.

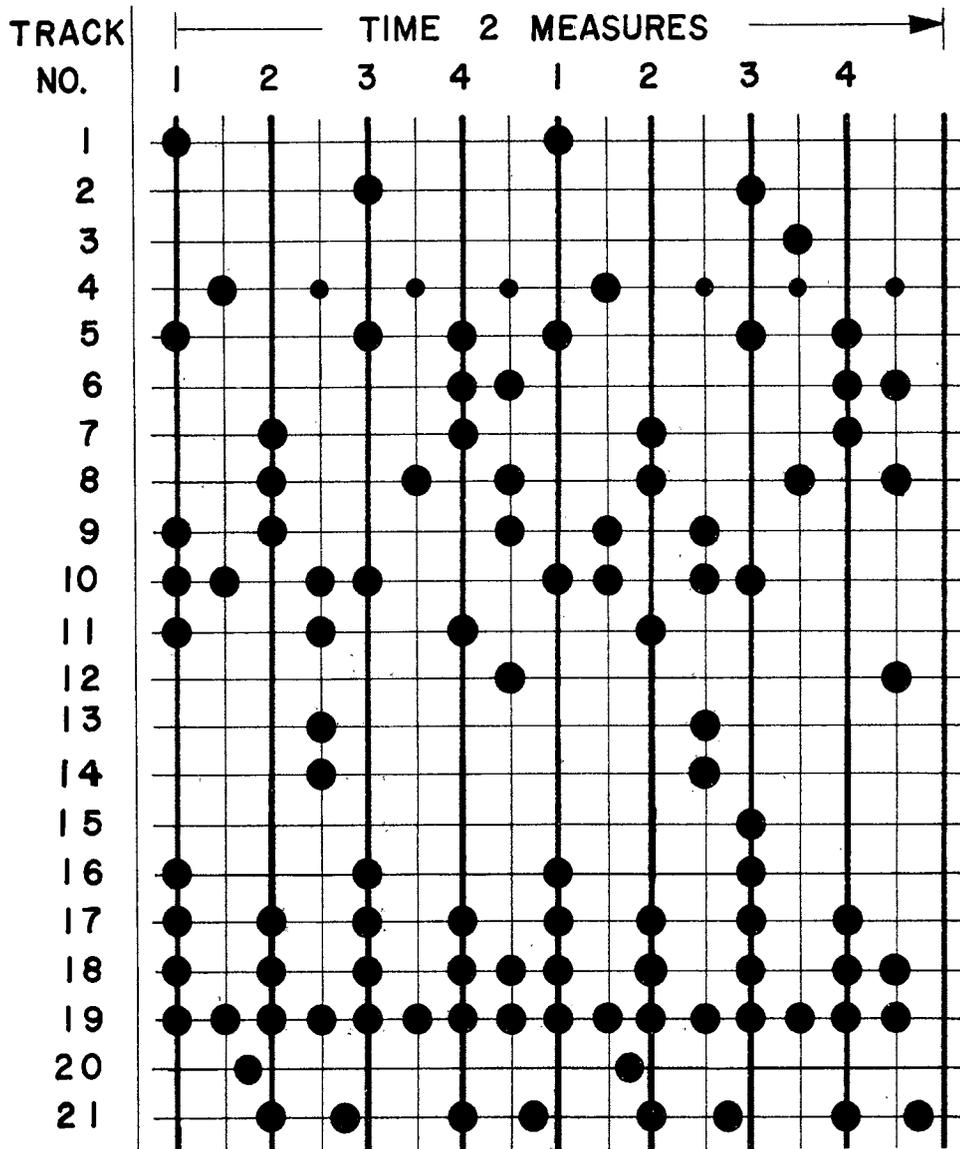
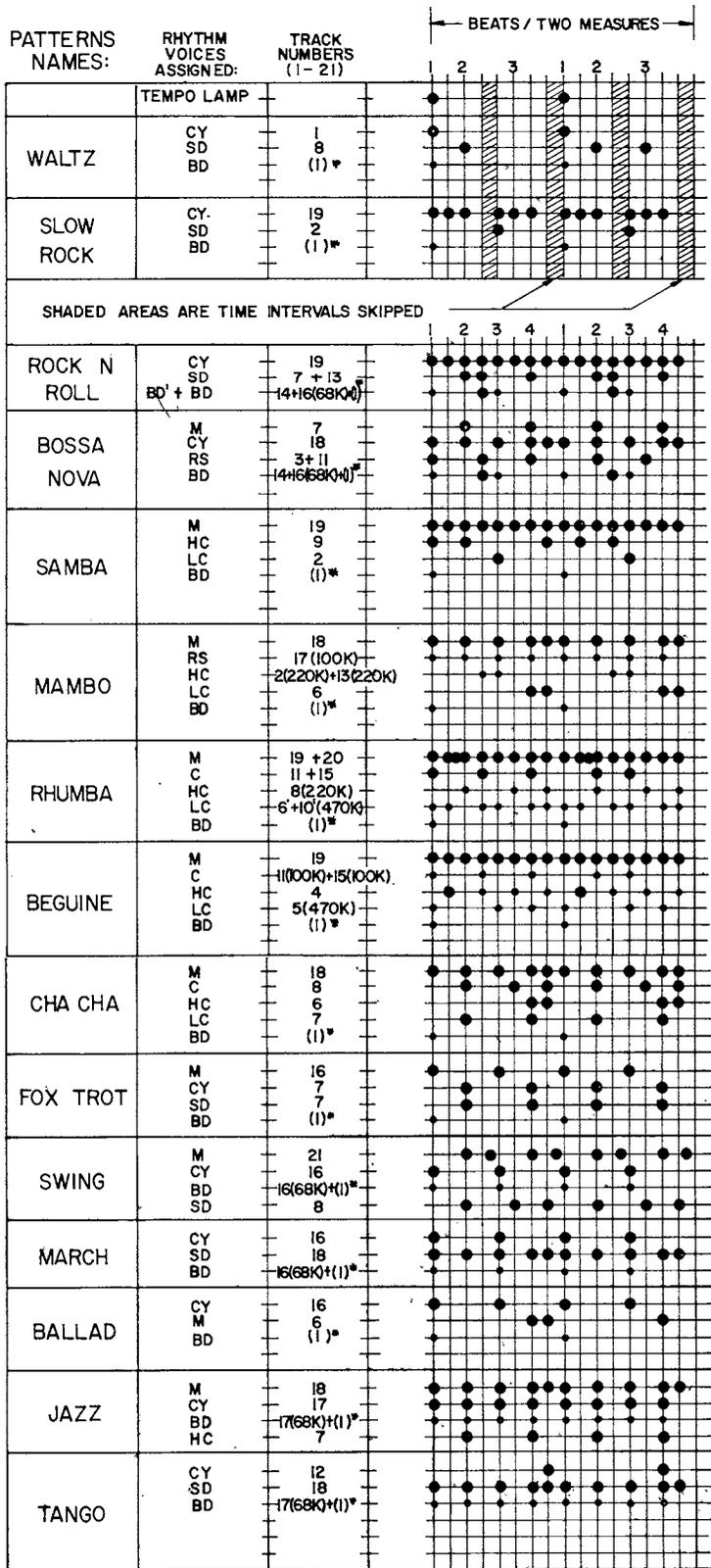


Figure 5-1  
Output Matrix Timing Chart  
(Common to all Rhythm units)

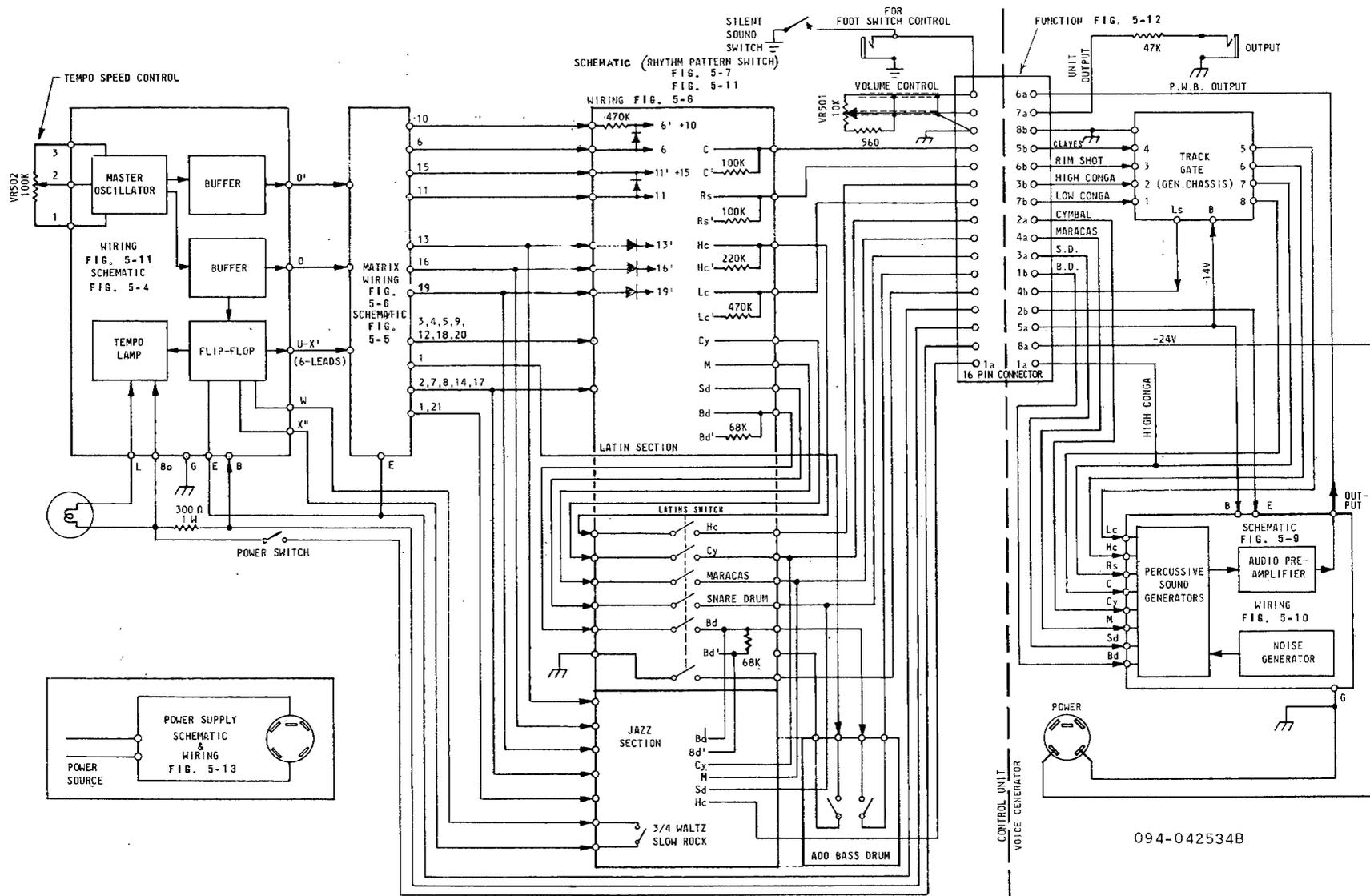


HC - HIGH CONGA  
 LC - LOW CONGA  
 RS - RIM SHOT  
 C - CLAVES  
 SD - SNARE DRUM  
 M - MARACAS  
 CY - CYMBAL  
 BD - BASS DRUM

\*(Bass Drum always connected to Track 1 through 68K)  
 (Small dots indicate attenuated loudness).

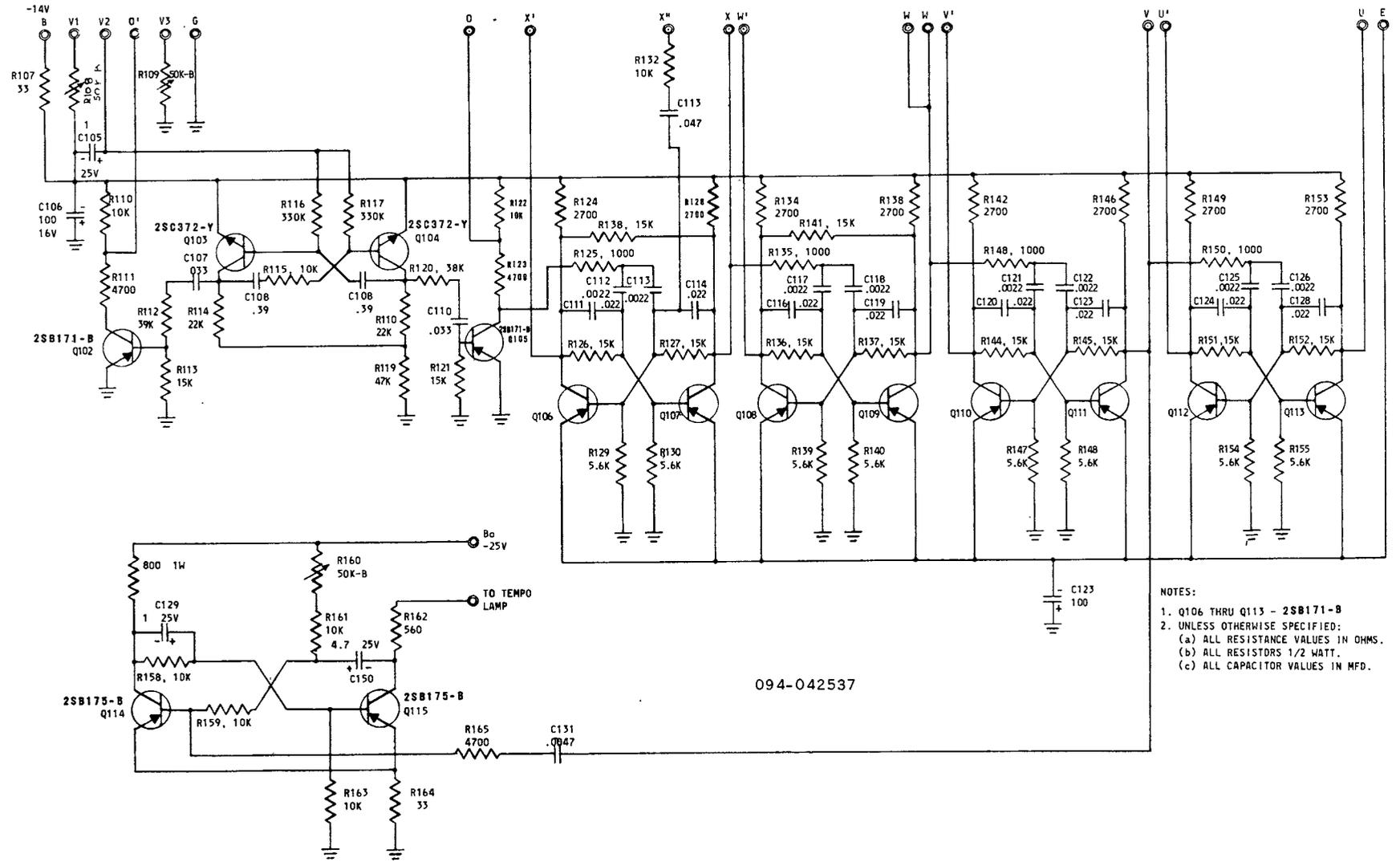
Figure 5-2  
 Rhythm Patterns Chart  
 (Drawer & Inbuilt)

Figure 5-3  
Block Diagram, Rhythm II  
(Drawer)



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Figure 5-4  
Time Base Generator and Divider  
Board (Drawer & Inbuilt),  
Schematic Diagram



- NOTES:
1. Q106 THRU Q115 - 2SB175-B
  2. UNLESS OTHERWISE SPECIFIED:  
(a) ALL RESISTANCE VALUES IN OHMS.  
(b) ALL RESISTORS 1/2 WATT.  
(c) ALL CAPACITOR VALUES IN MFD.

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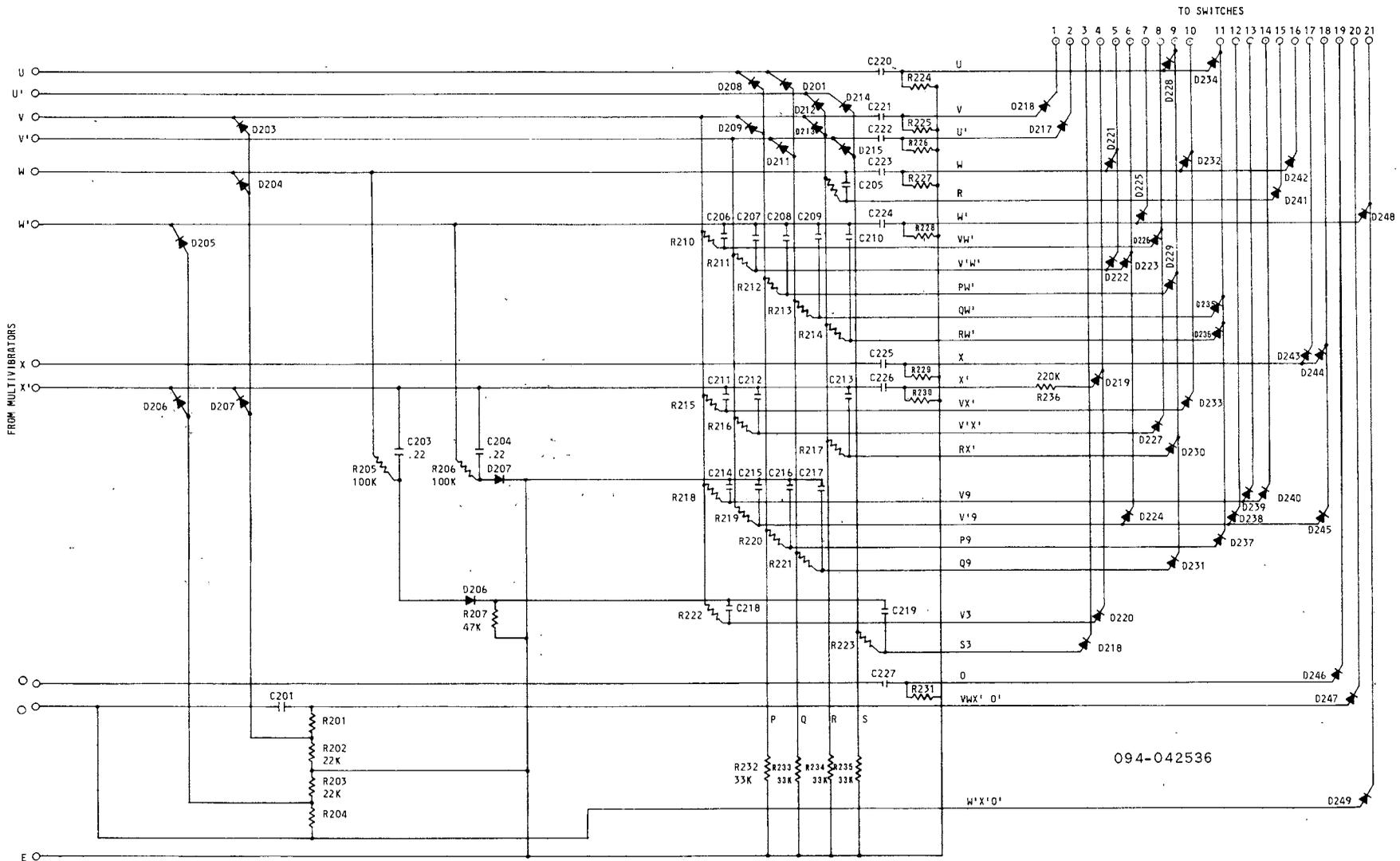
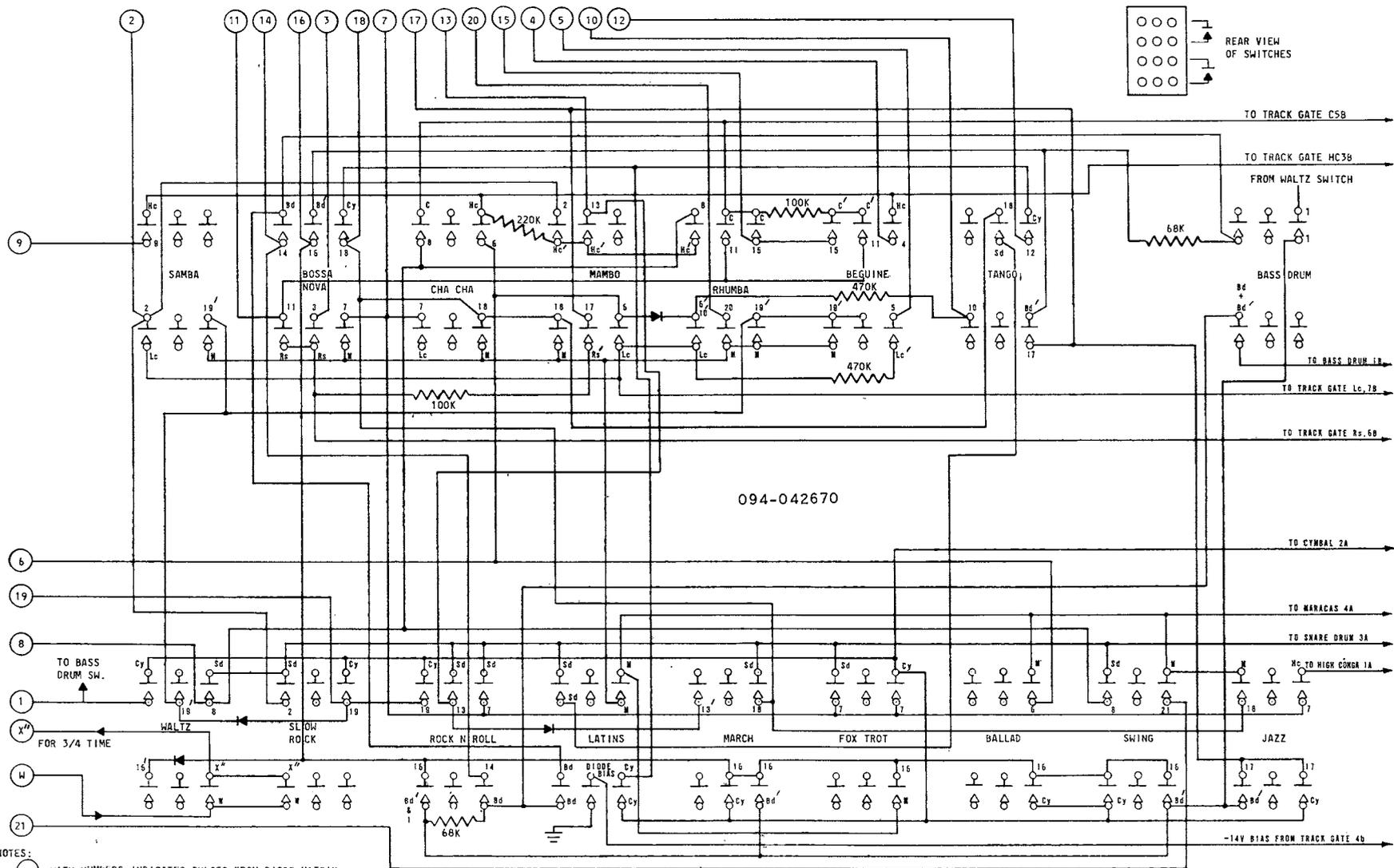


Figure 5-5  
Diode Matrix (Drawer & Inbuilt),  
Schematic Diagram

NOTES:  
ALL RESISTORS ARE 1/4 WATT & 470 OHMS UNLESS MARKED OTHERWISE.  
ALL CAPACITORS ARE MFD.  
ALL CAPACITORS ARE .037 MFD. UNLESS MARKED OTHERWISE.  
ALL DIODES ARE SILICON 1S1555



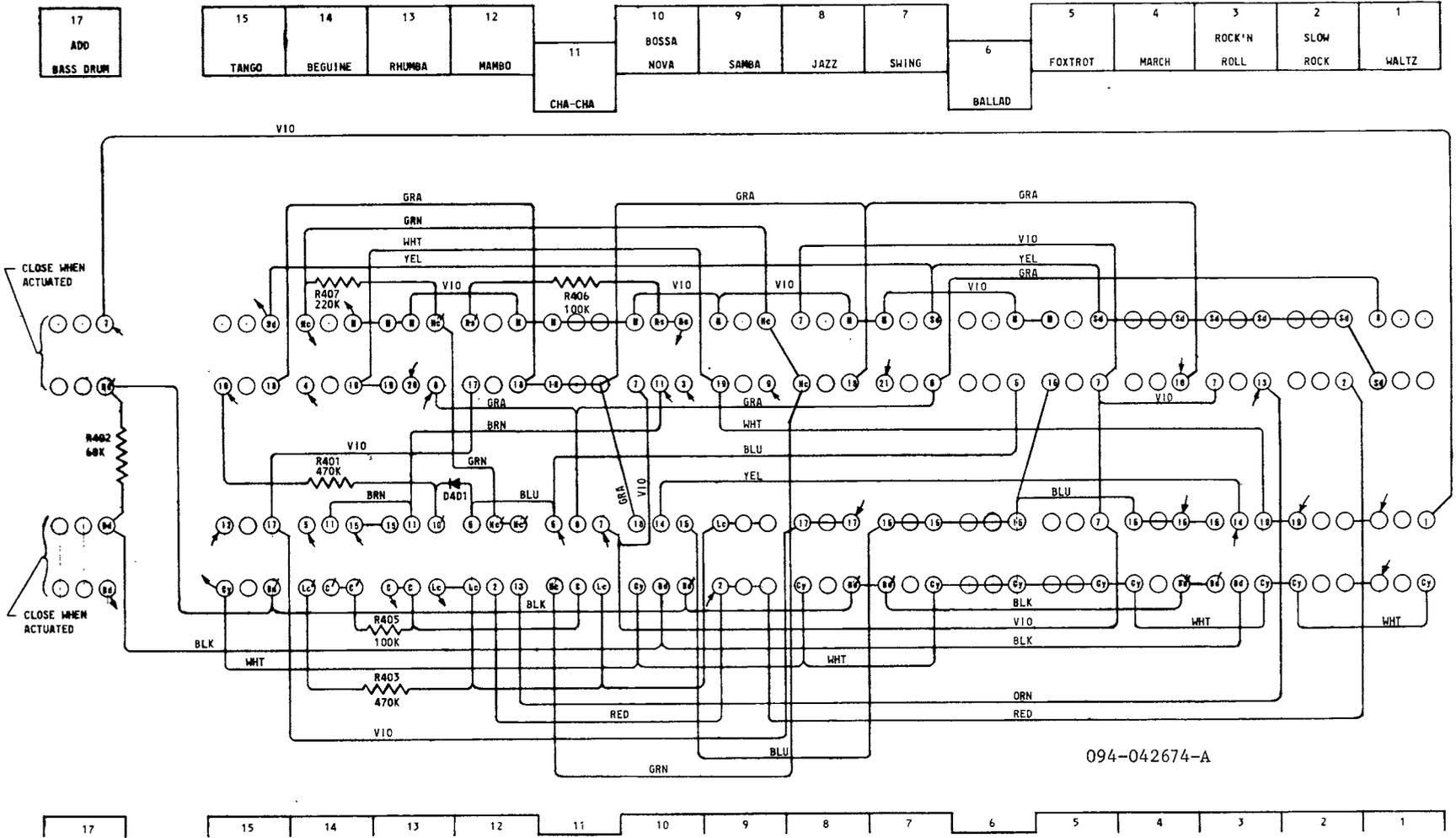


NOTES:

1. ○ WITH NUMBERS INDICATES PULSES FROM DIODE MATRIX.
2. Cy, Sd, M, ETC. DESIGNATE VOICES WHICH ARE KEYPED BY THE PARTICULAR SWITCH DEPRESSED THRU 16 P CONNECTOR.
3. 1, 2 ETC. ON SWITCH ARE DIODE MATRIX PULSES.
4. THIS DRAWING APPLICABLE TO DRAWER UNIT ONLY.

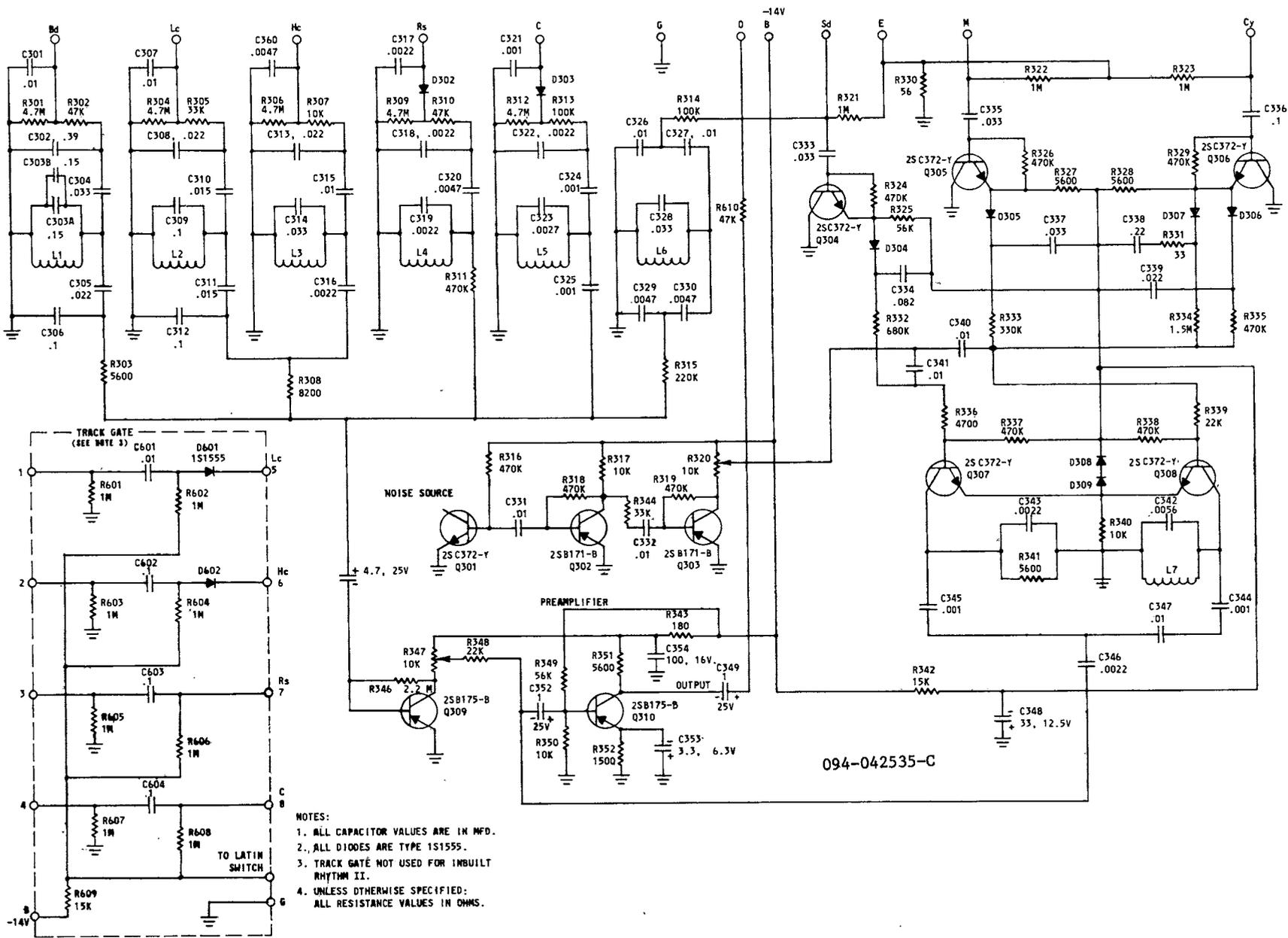
Figure 5-7  
 Selector Switch (Drawer),  
 Wiring Diagram

Figure 5-8  
Selector Switch (Inbuilt),  
Wiring Diagram



17	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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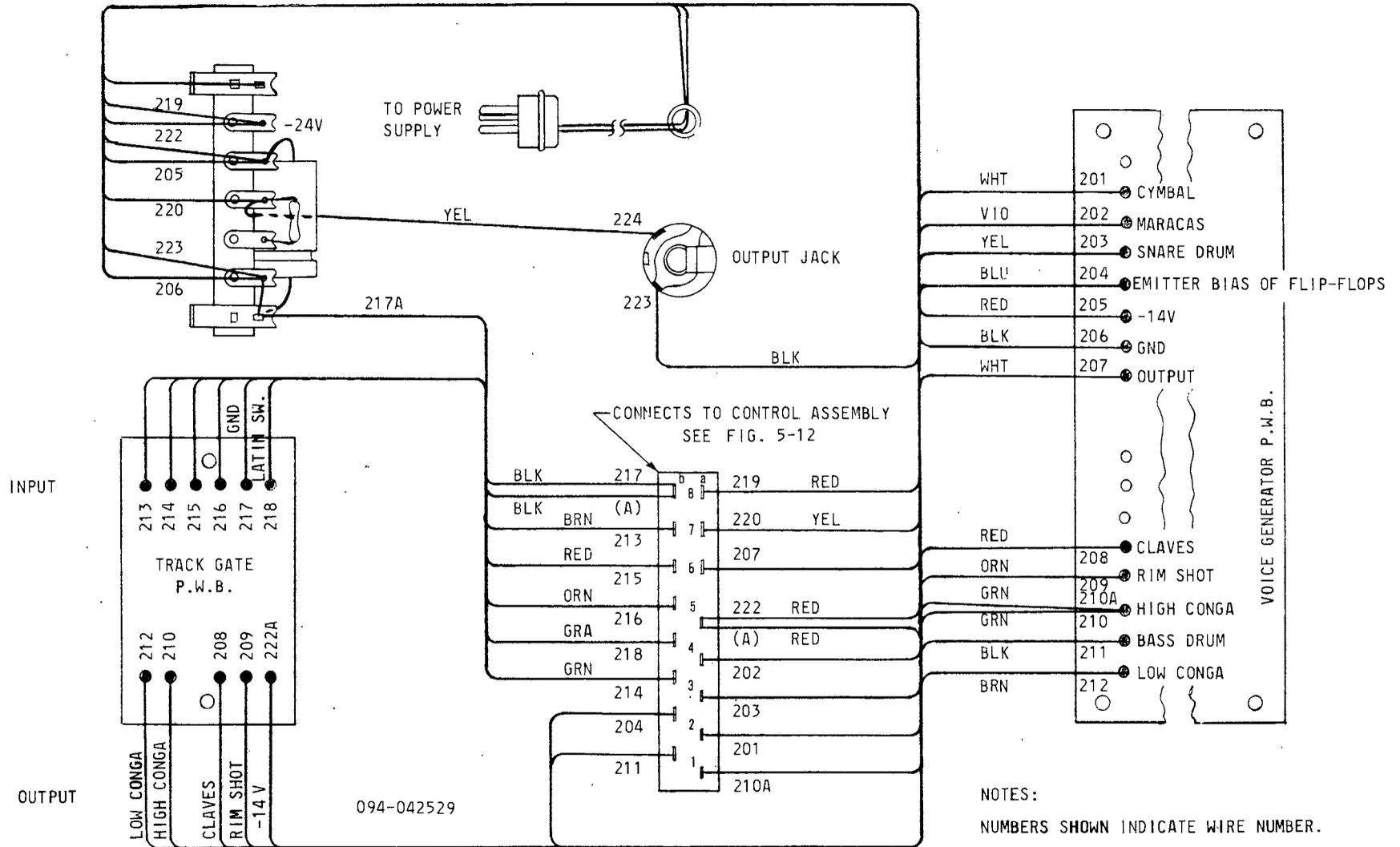
Figure 5-9  
Voice Generator and Track Gate  
(Drawer & Inbuilt), Schematic Diagram



- NOTES:
1. ALL CAPACITOR VALUES ARE IN MFD.
  2. ALL DIODES ARE TYPE 1S1555.
  3. TRACK GATE NOT USED FOR INBUILT RHYTHM II.
  4. UNLESS OTHERWISE SPECIFIED: ALL RESISTANCE VALUES IN OHMS.

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Figure 5-10  
Voice Generator Chassis,  
Wiring Diagram



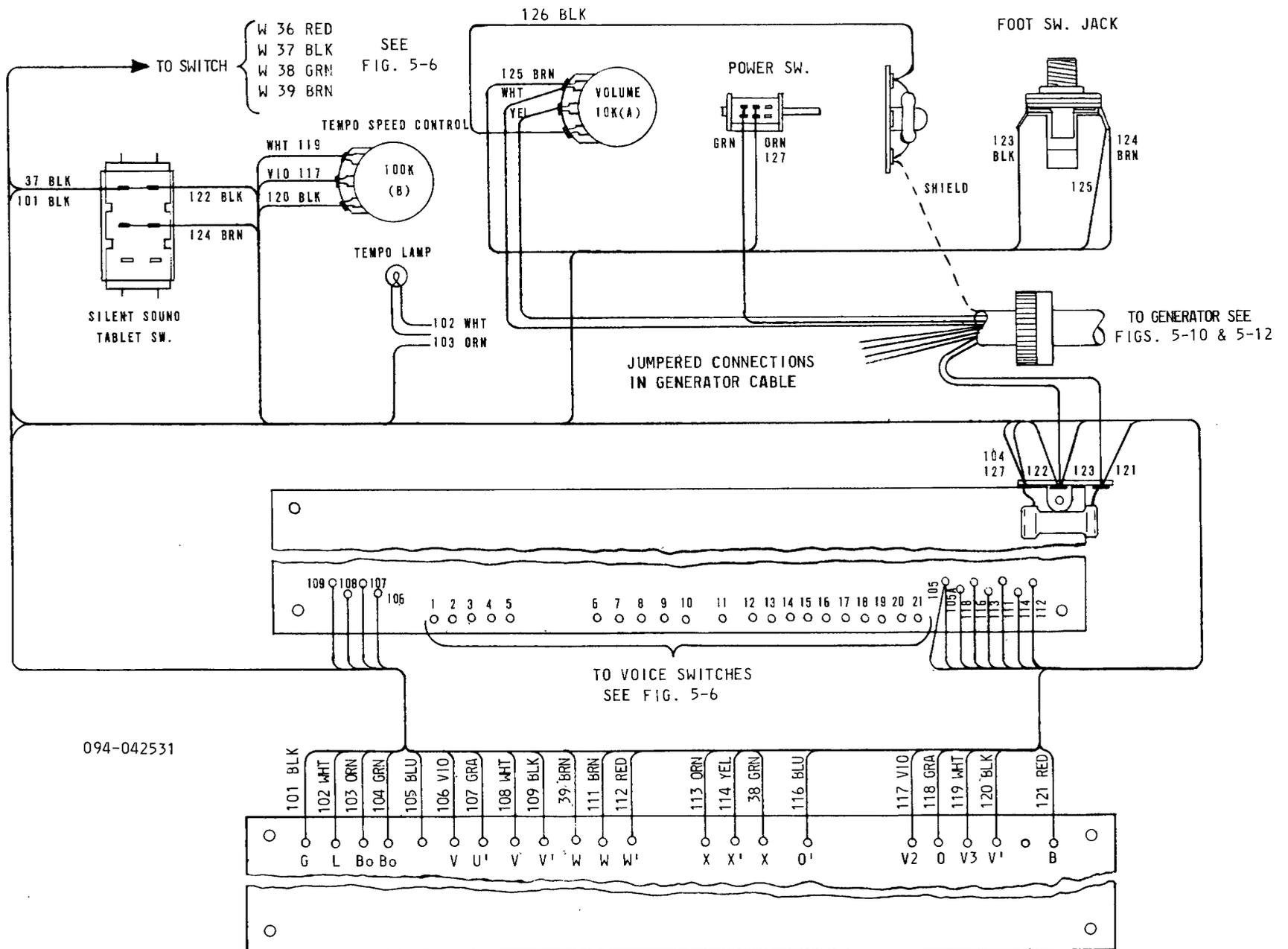


Figure 5-11  
Control Assembly (Drawer),  
Wiring Diagram

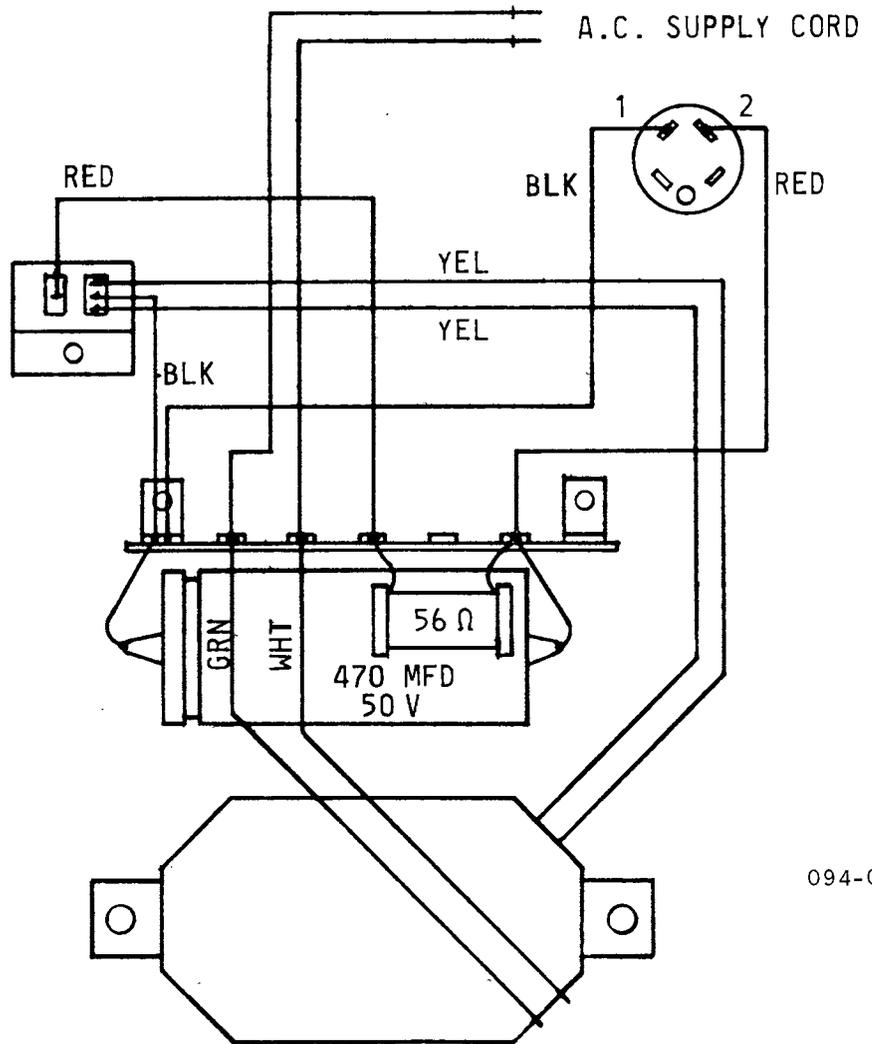
LEAD COLOR	CONTROL ASSEMBLY	16P TERMINAL CONNECTOR	FLEXIBLE CABLE LEAD COLOR	LEAD COLOR	VOICE GENERATOR ASSEMBLY
BLU	SELECTOR-JAZZ HIGH CONGA	1a	LIGHT GRN.	GRN	P.C.B. -HIGH CONGA
WHT	SELECTOR-FOX TROT CYMBAL	2a	WHT.	WHT	P.C.B. -CYMBAL
YEL	SELECTOR-SWING SNARE DRUM	3a	YEL	YEL	P.C.B. -SNARE DRUM
VIO	SELECTOR-JAZZ MARACAS	4a	VIO	VIO	P.C.B. -MARACAS
RED	TERMINAL STRIP, LEAD 121	5a	RED	RED	-14V TERMINAL STRIP TRACK GATE P.C.B.
BRN	VOLUME 10K-A TERMINAL NO. 3	6a	WHT (SHIELD)	WHT	P.C.B. -OUTPUT
	VOLUME 10K-A TERMINAL NO. 2	7a	YEL (SHIELD)	YEL	OUTPUT SERIES 47K $\Omega$
ORN	POWER SWITCH	8a	GRN (THICK)	RED	-24V TERMINAL STRIP
BLK	SELECTOR-ADD BASS DRUM	1b	BLK	BLK	P.C.B. -BASS DRUM
BLU	P.C.B. -EMITTER OF FLIP- FLOPS LEAD 105, 105A	2b	BLU	BLU	P.C.B. -EMITTER RESISTOR OF FLIP-FLOPS
GRN	SELECTOR-CHA-CHA HIGH CONGA	3b	GRN	GRN	TRACK GATE P.C.B. HIGH CONGA
RED	SELECTOR-LATINS	4b	GRA	GRA	TRACK GATE P.C.B. -LS (LATINS SWITCH)
ORN	SELECTOR-RHUMBA CLAVES	5b	ORN	ORN	TRACK GATE P.C.B. CLAVES
RED	SELECTOR-BOSSANOVA RIM SHOT	6b	SKY BLU	RED	TRACK GATE P.C.B. RIM SHOT
BRN	SELECTOR-MAMBO LOW CONGA	7b	BRN	BRN	TRACK GATE P.C.B. LOW CONGA

BLK	TERMINAL STRIP, LEAD 122 123	8b	BLK (THICK) SHIELD	BLK	GROUND
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Figure 5-12  
Cable and Connector,  
Wiring Chart

WIRING



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SCHEMATIC

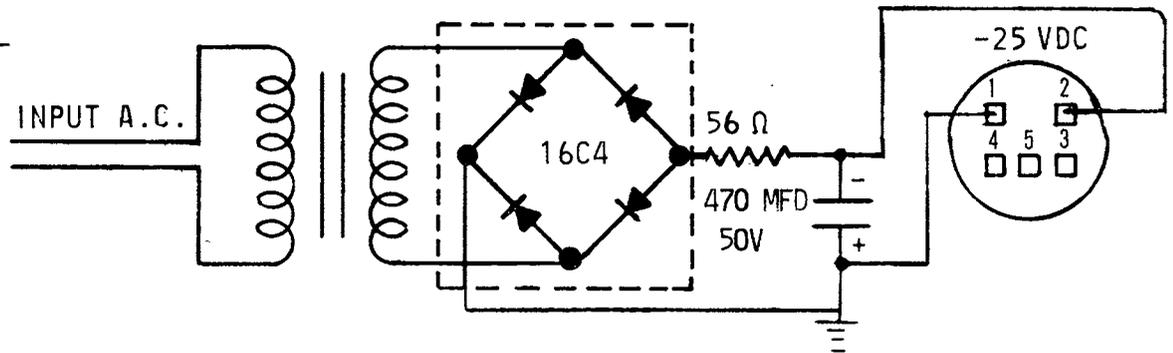


Figure 5-13  
Power Supply (Drawer),  
Schematic Diagram

Figure 5-14  
Block Diagram Rhythm II  
(Imbuil - Improved)

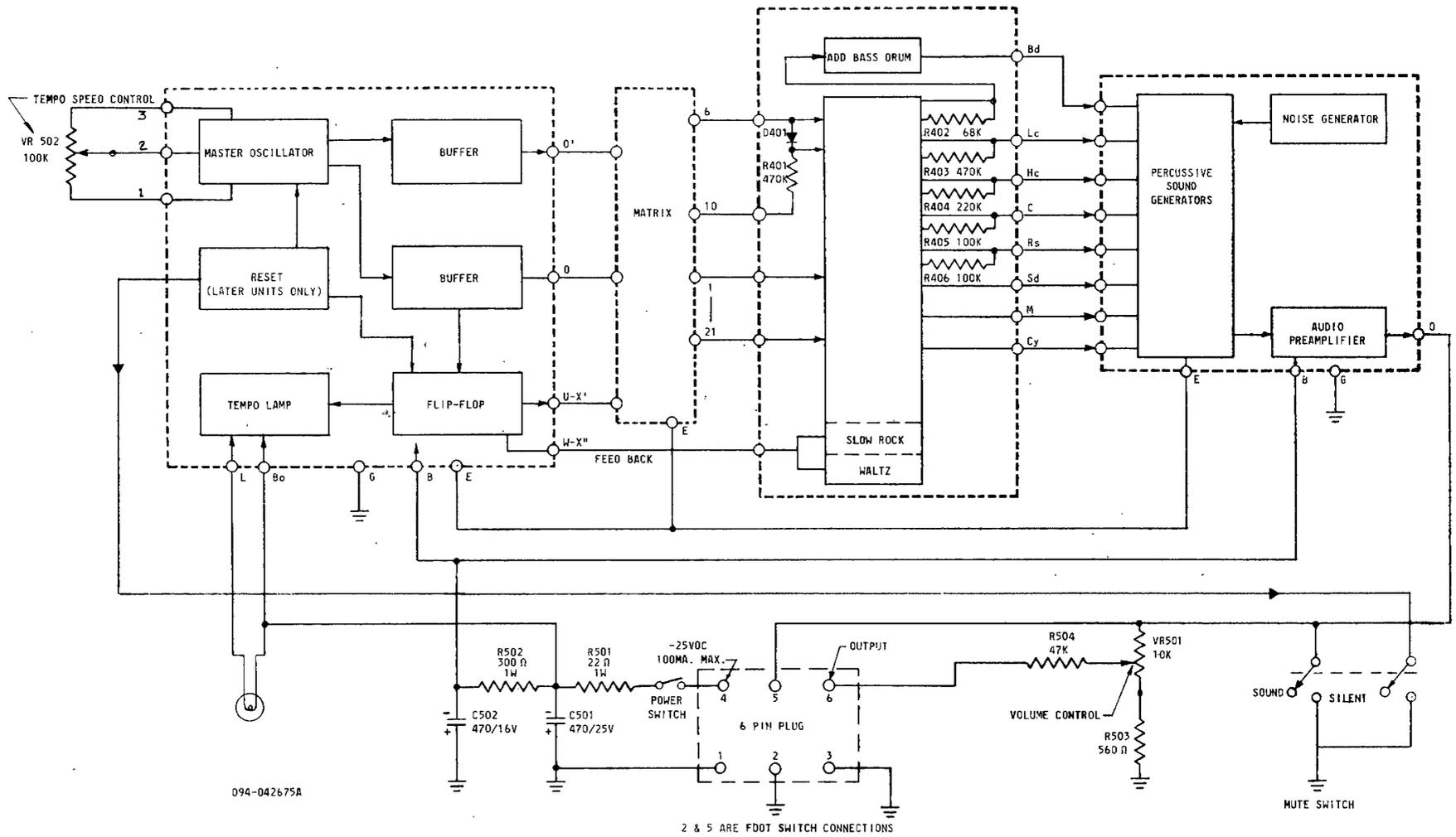
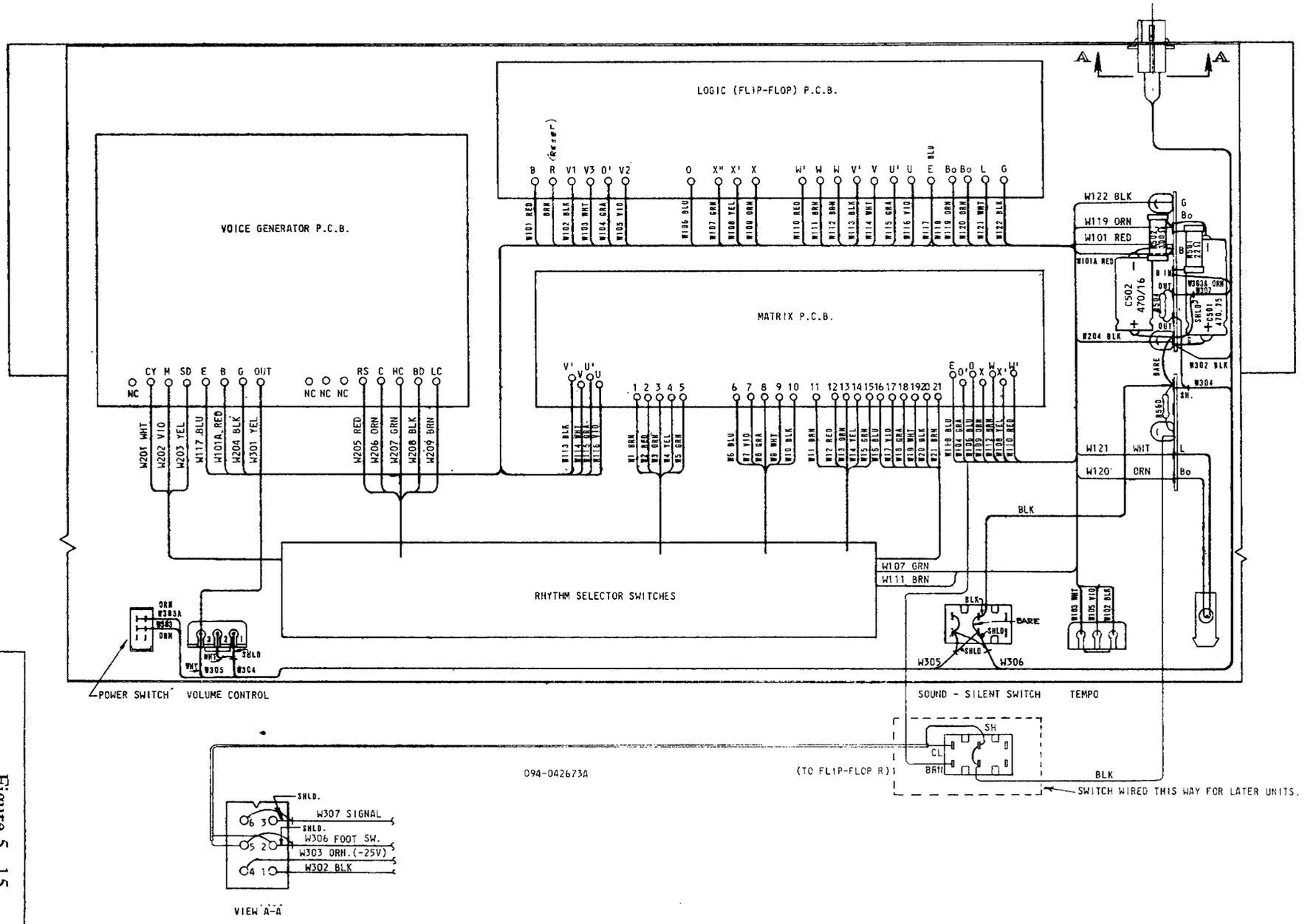
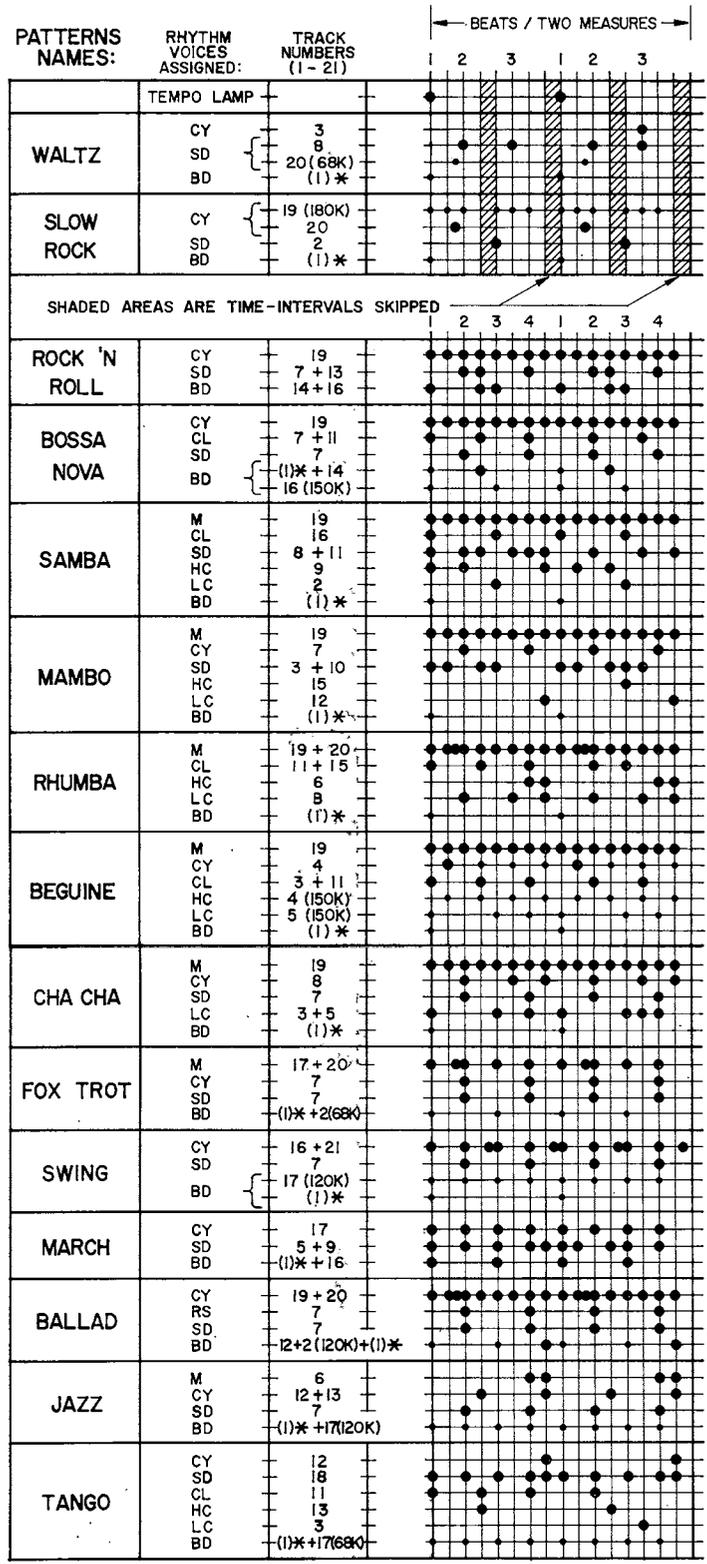


Figure 5-15  
Rhythm II (Inbuilt - Improved),  
Wiring Diagram





HC - HIGH CONGA  
 LC - LOW CONGA  
 RS - RIM SHOT \* (Bass Drum always connected to Track 1 through 68K).  
 C - CLAVES (Small dots indicate attenuated loudnesses).  
 SD - SNARE DRUM  
 M - MARACAS  
 CY - CYMBAL  
 BD - BASS DRUM

7-69

Figure 5-16  
Rhythm Patterns Chart  
(Inbuilt - Improved)

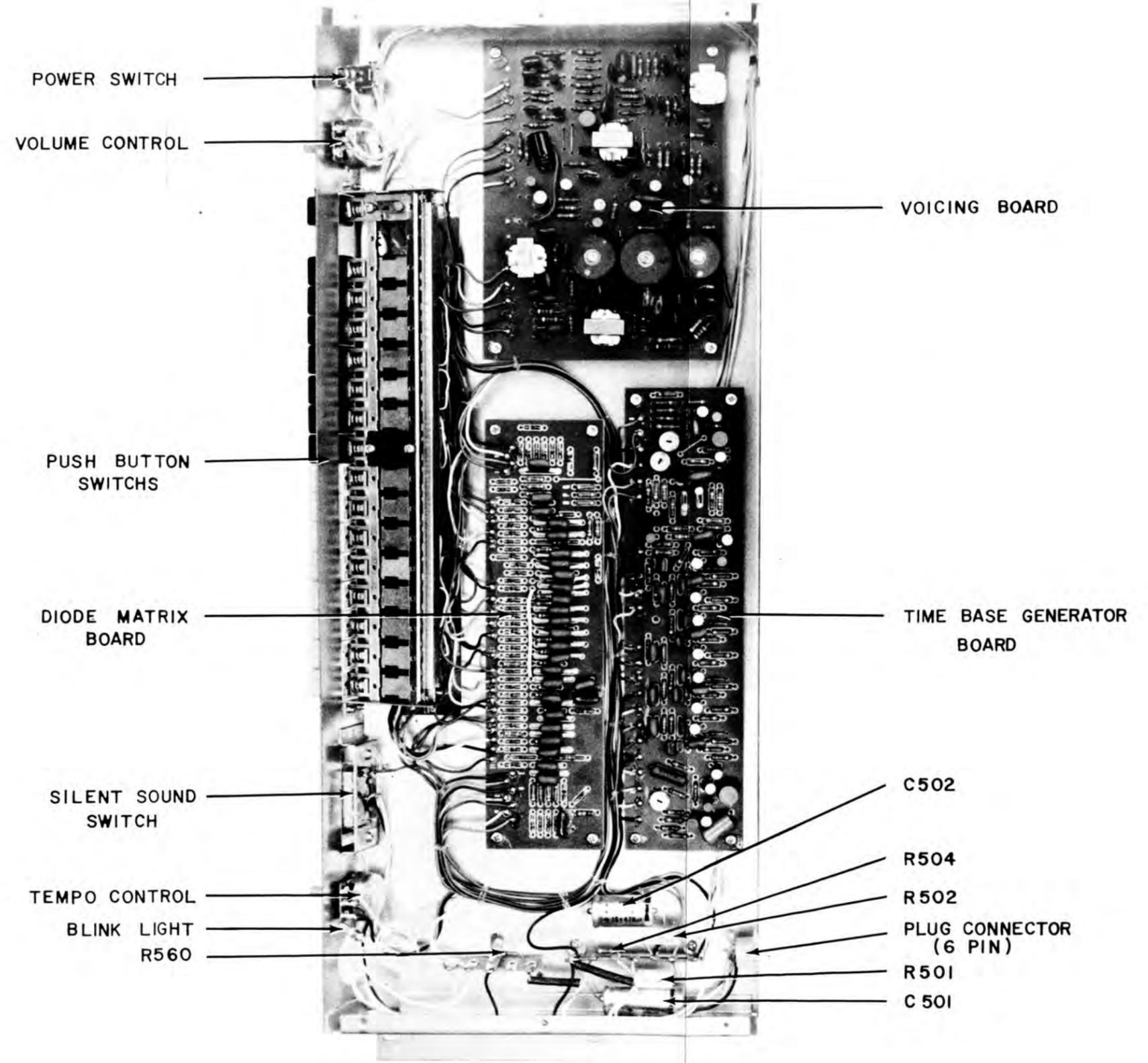
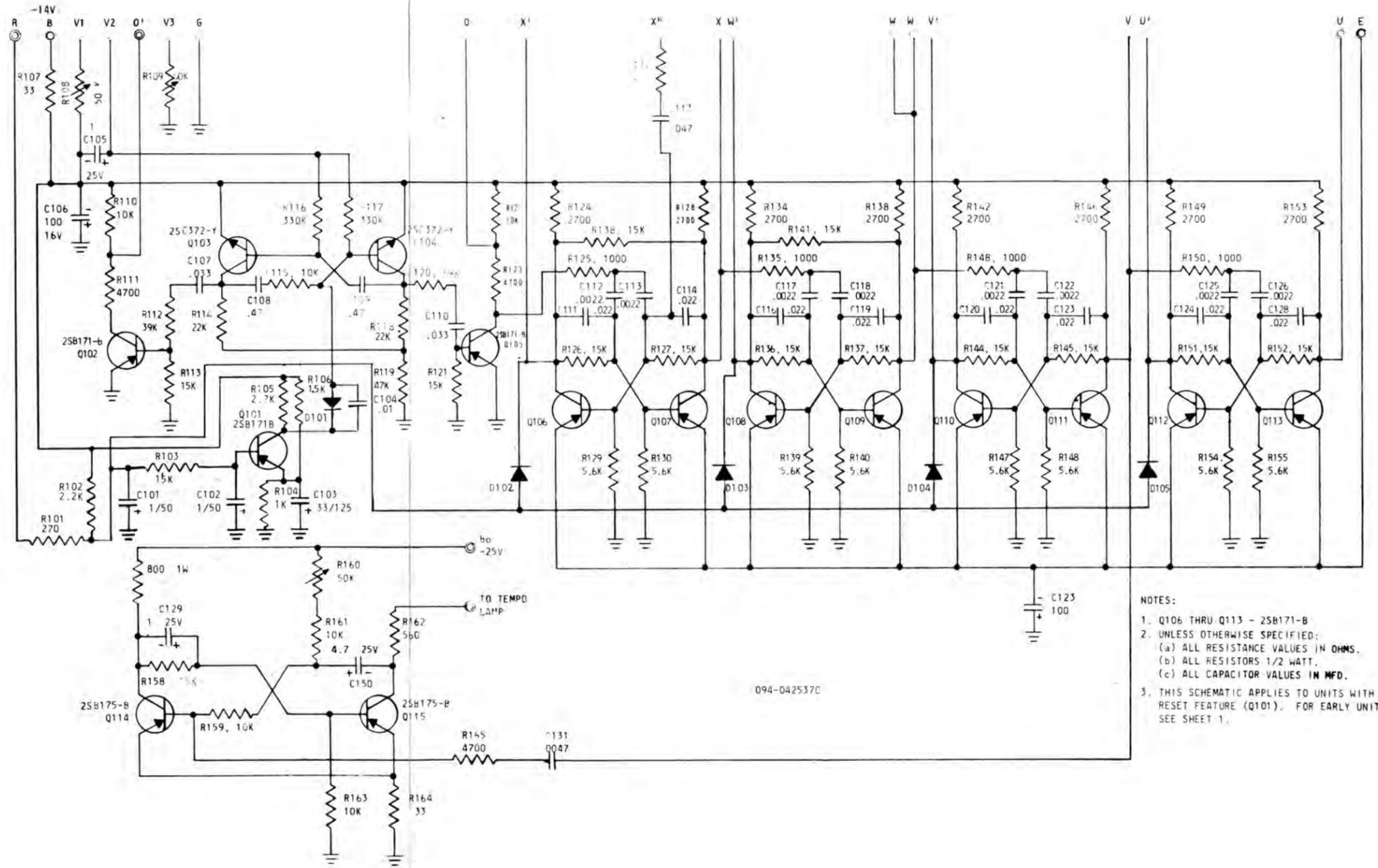
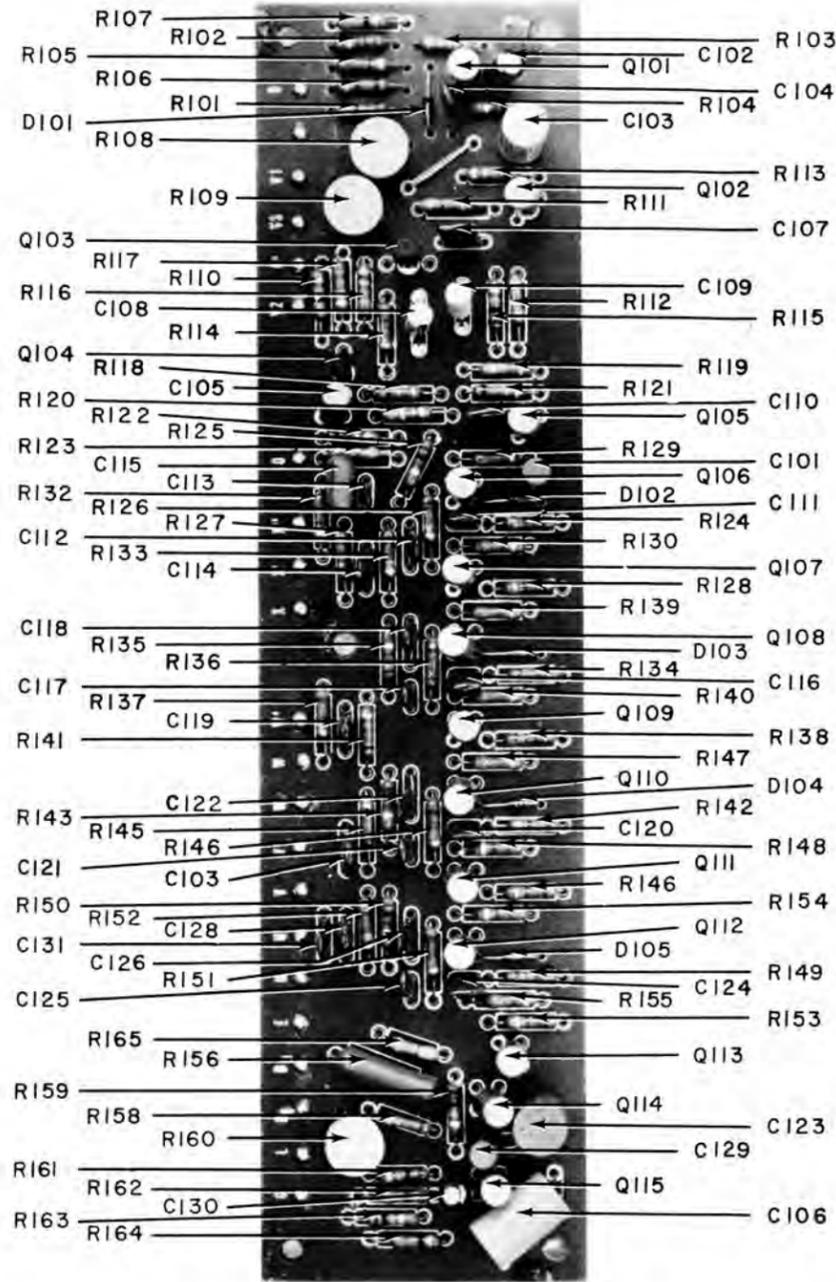
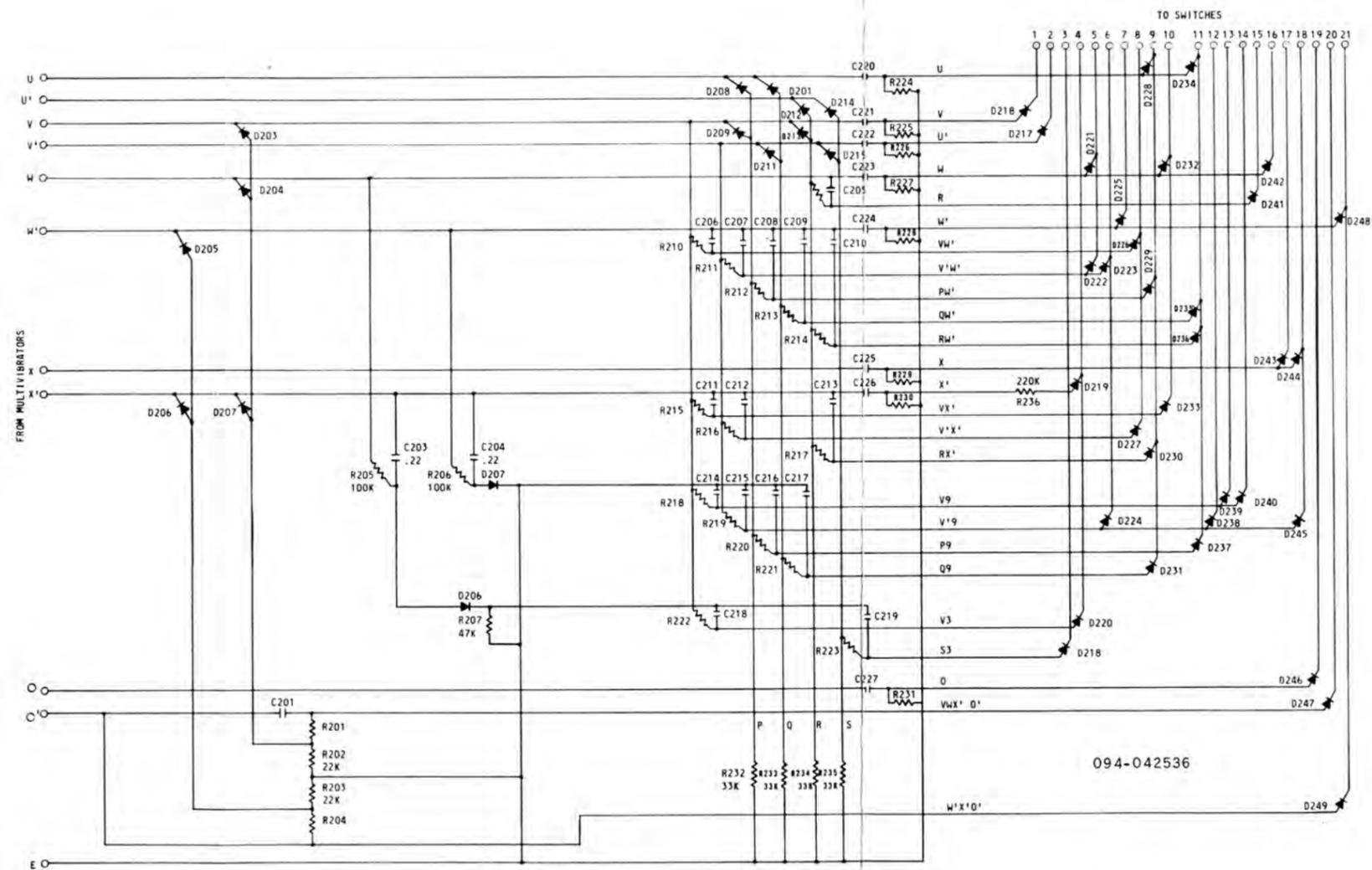
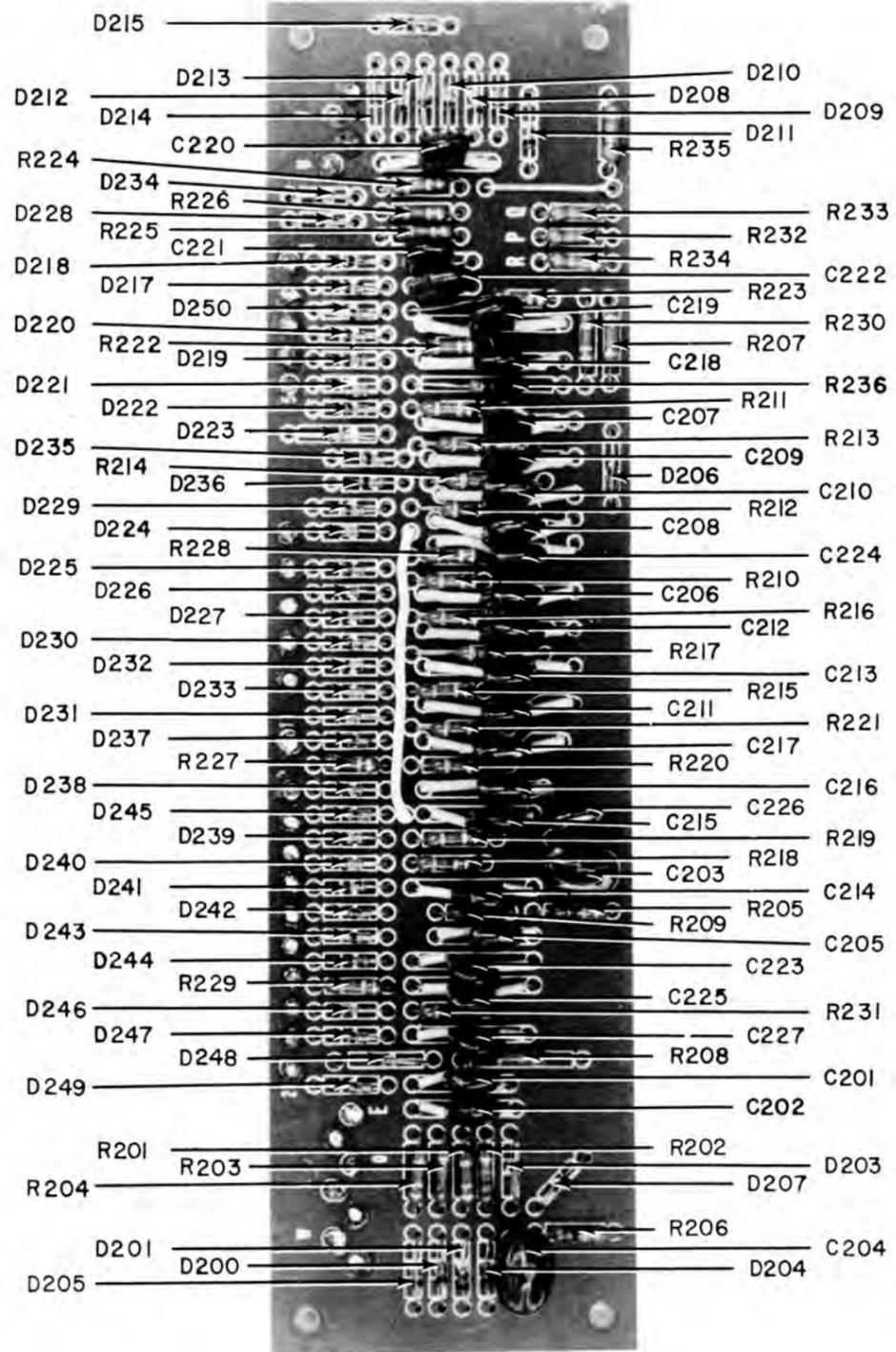


Figure 5-17  
 Rhythm II (Improved)  
 Board and Component Location



- NOTES:
1. Q106 THRU Q113 - 25B171-B
  2. UNLESS OTHERWISE SPECIFIED:
    - (a) ALL RESISTANCE VALUES IN OHMS.
    - (b) ALL RESISTORS 1/2 WATT.
    - (c) ALL CAPACITOR VALUES IN MFD.
  3. THIS SCHEMATIC APPLIES TO UNITS WITH RESET FEATURE (Q101). FOR EARLY UNITS SEE SHEET 1.

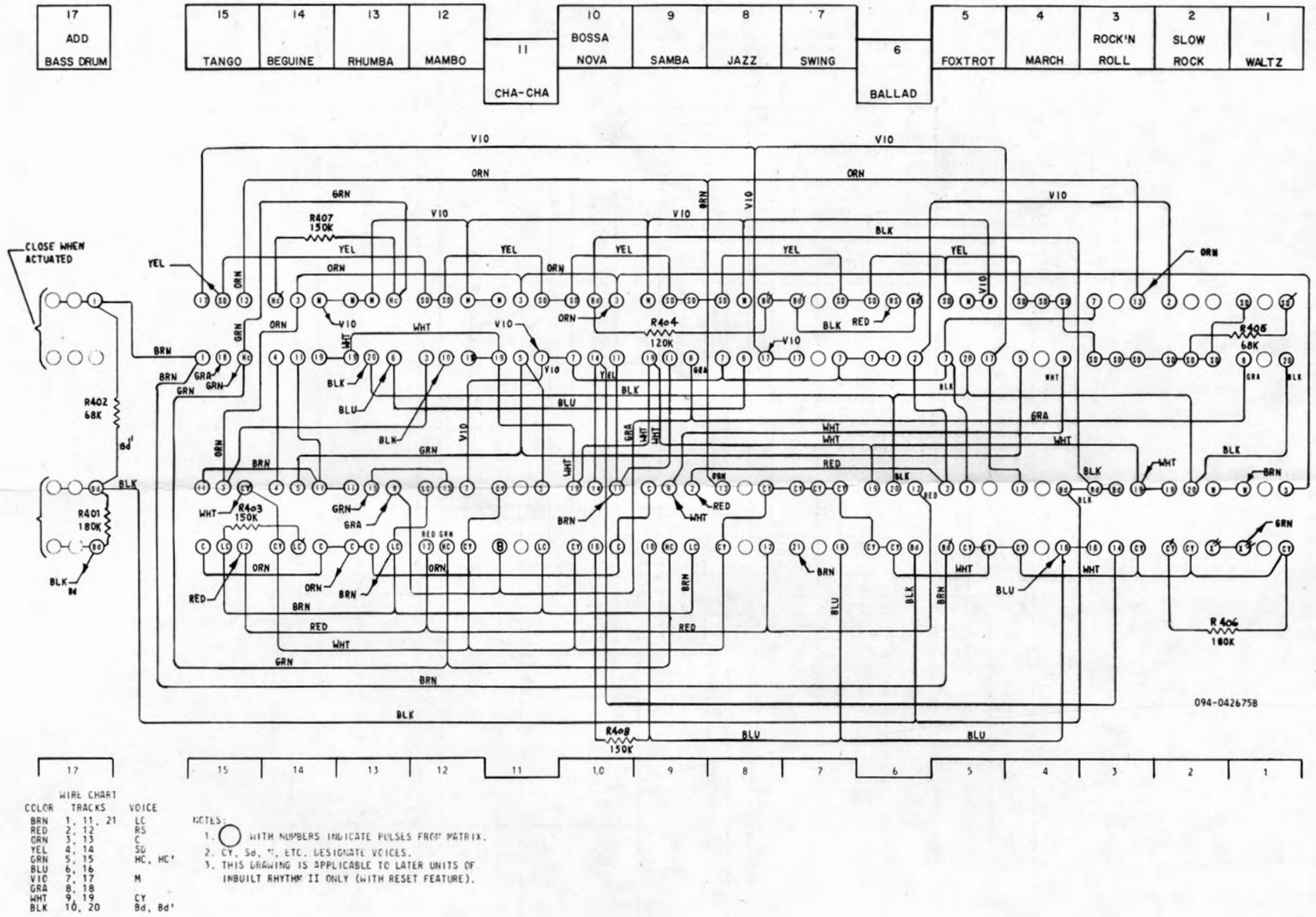
Figure 5-18  
Time Base Generator,  
Layout and Schematic



NOTES:  
 ALL RESISTORS ARE 1/4 WATT & 470 OHMS UNLESS MARKED OTHERWISE.  
 ALL CAPACITORS ARE MFD.  
 ALL CAPACITORS ARE .037 MFD. UNLESS MARKED OTHERWISE.  
 ALL DIODES ARE SILICON 1S1555

Figure 5-19  
 Diode Matrix,  
 Layout and Schematic

Figure 5-20  
Selector Switch,  
(Inbuilt - Improved)



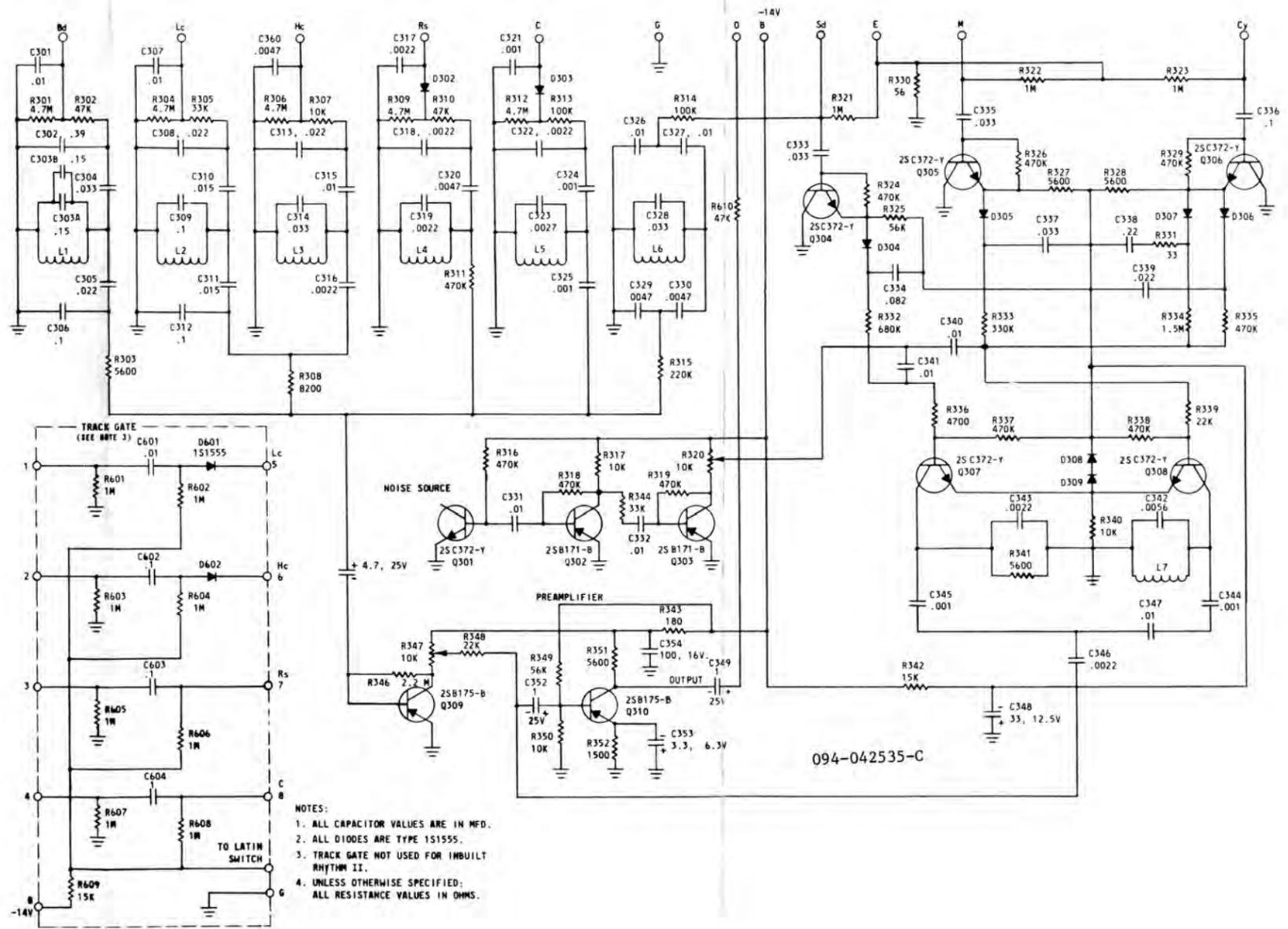
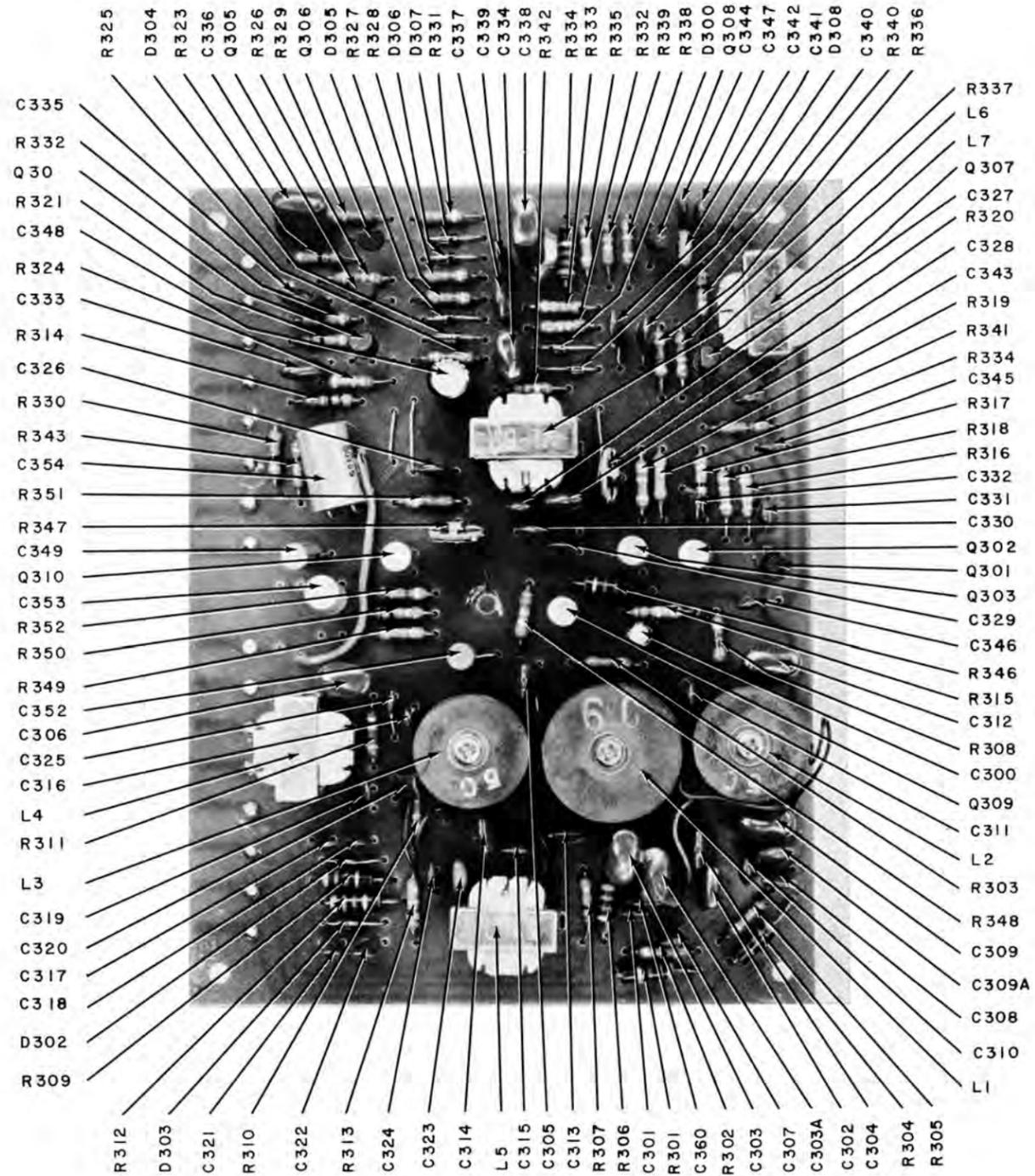


Figure 5-21  
Voicing Board,  
Layout and Schematic

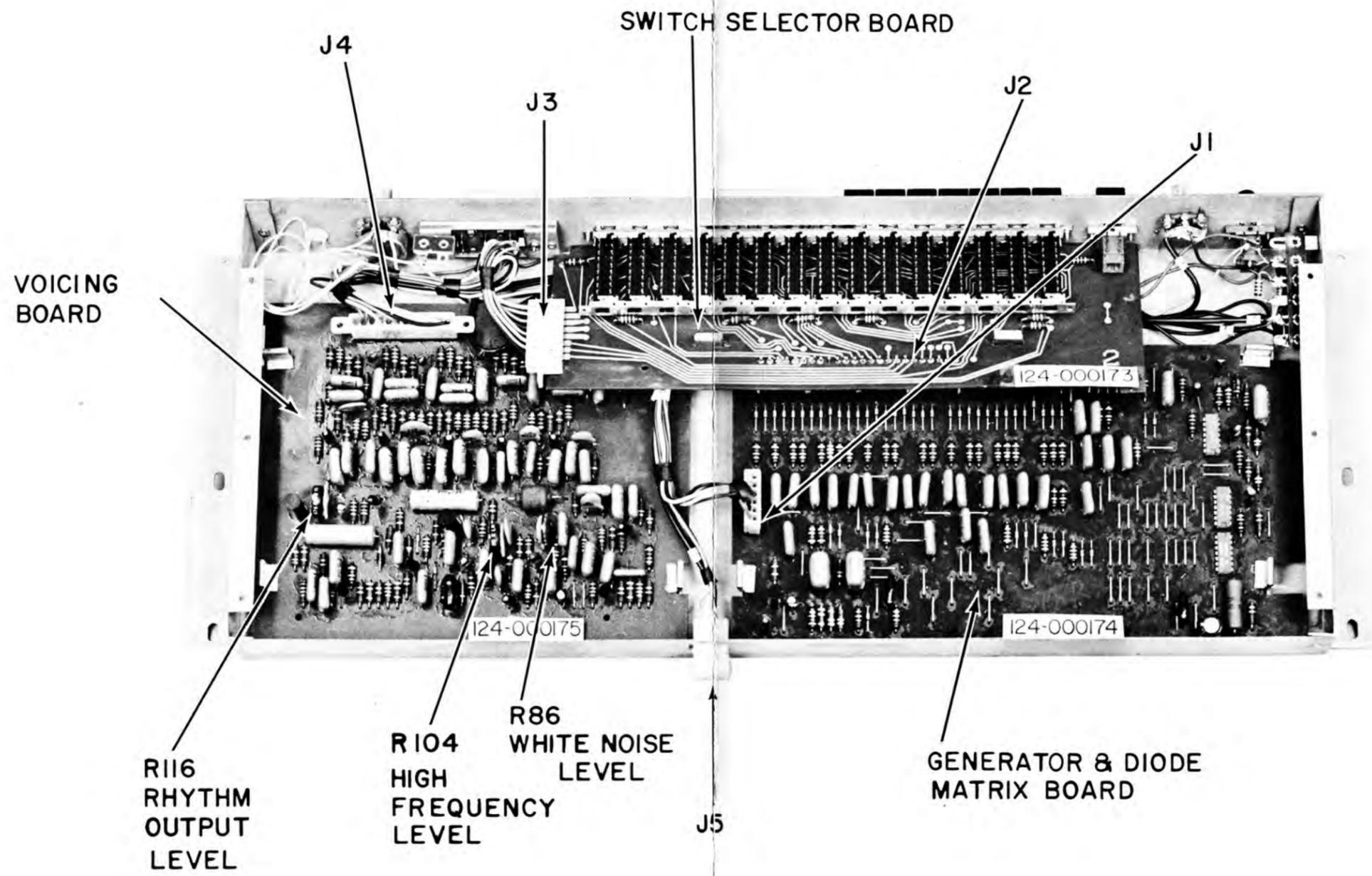


Figure 5-22  
Board and Component Location  
(Rhythm II-A)

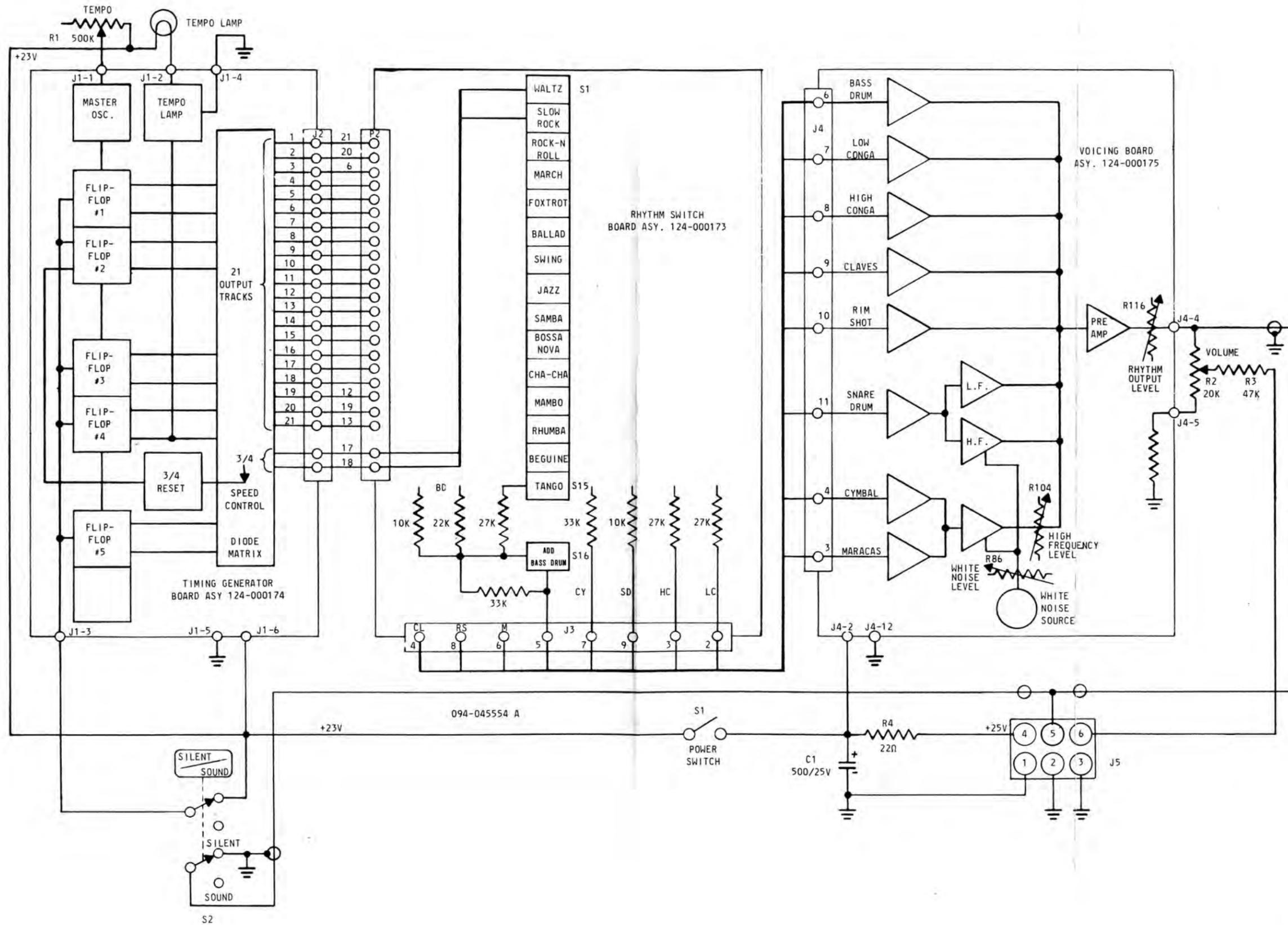
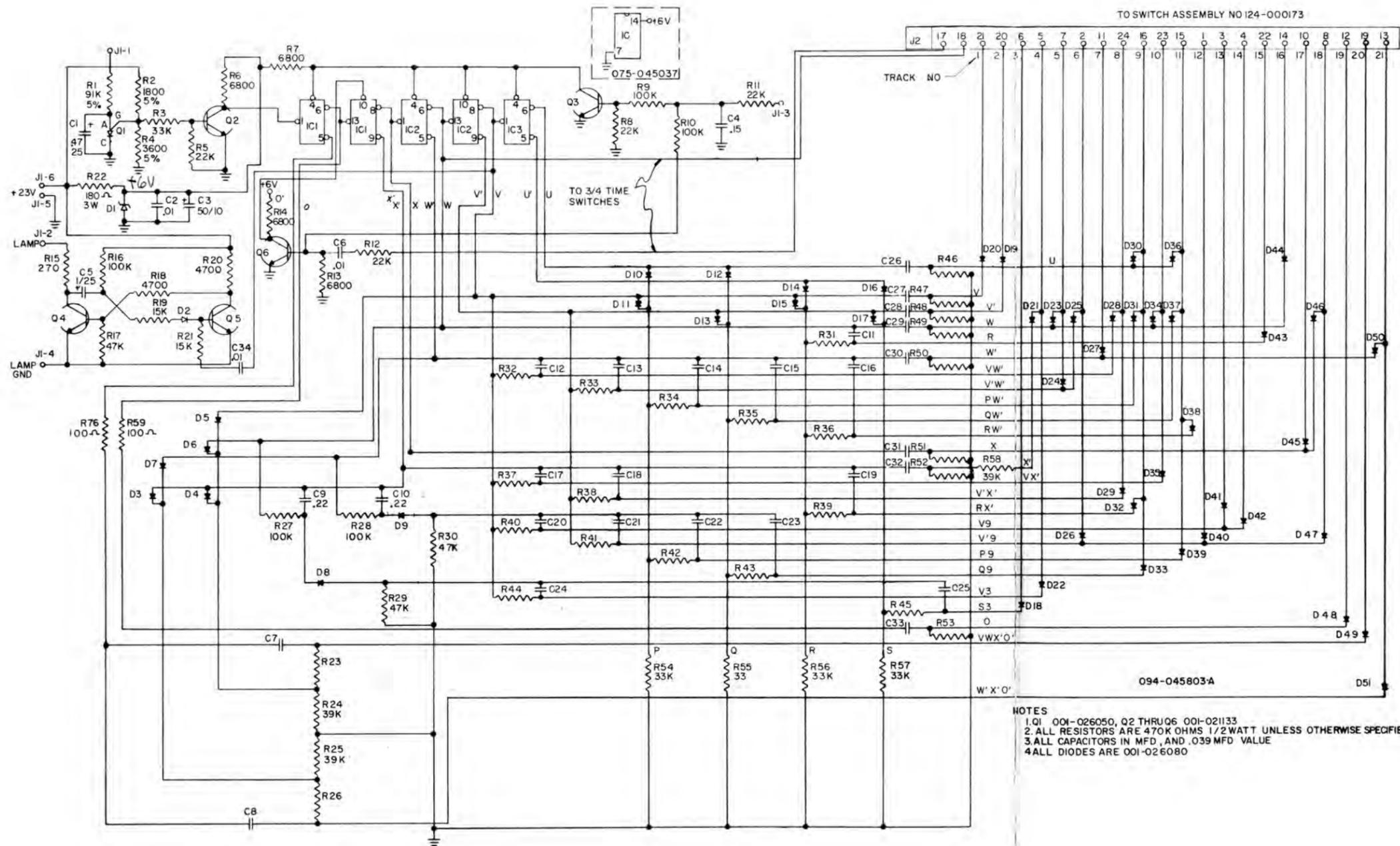


Figure 5-23  
Block Diagram  
(Rhythm II-A)



- NOTES
1. Q1-026050, Q2 THRU Q6 001-021133
  2. ALL RESISTORS ARE 470K OHMS 1/2 WATT UNLESS OTHERWISE SPECIFIED
  3. ALL CAPACITORS IN MFD, AND .039 MFD VALUE
  4. ALL DIODES ARE 001-026080

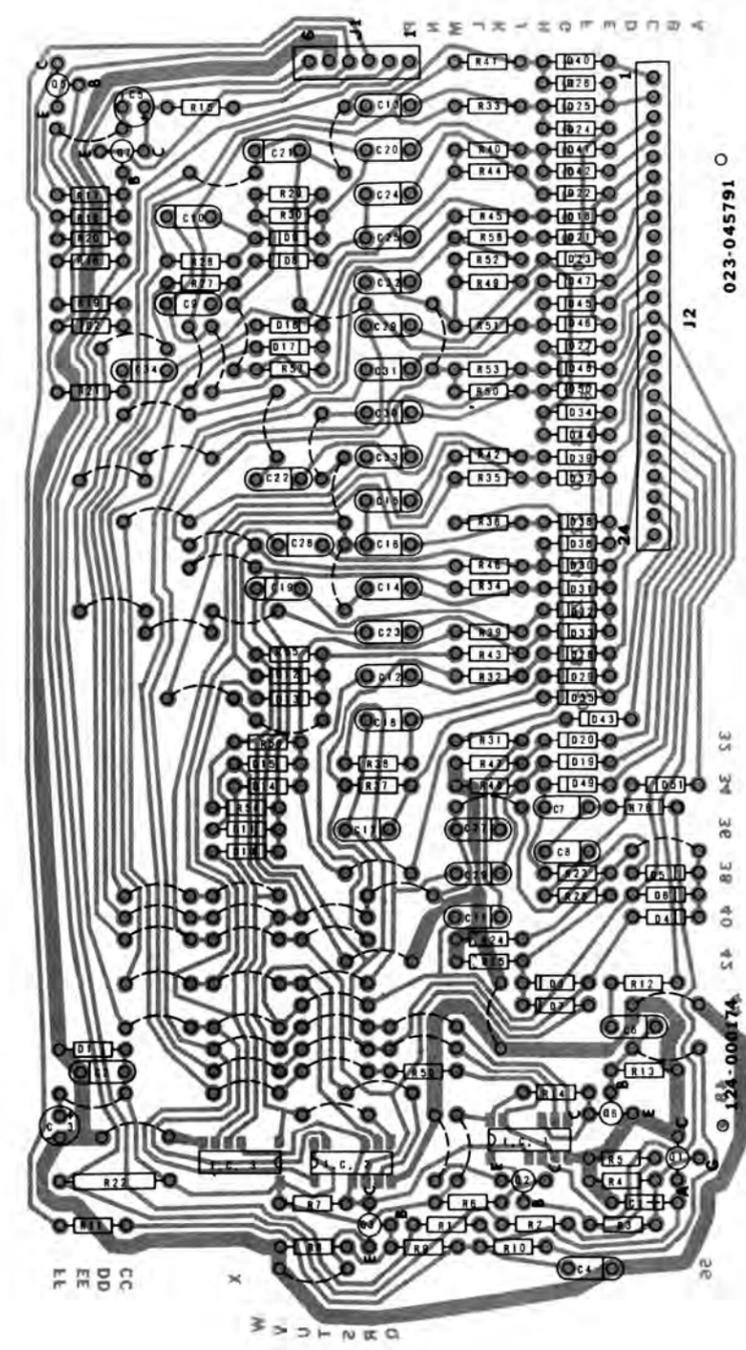
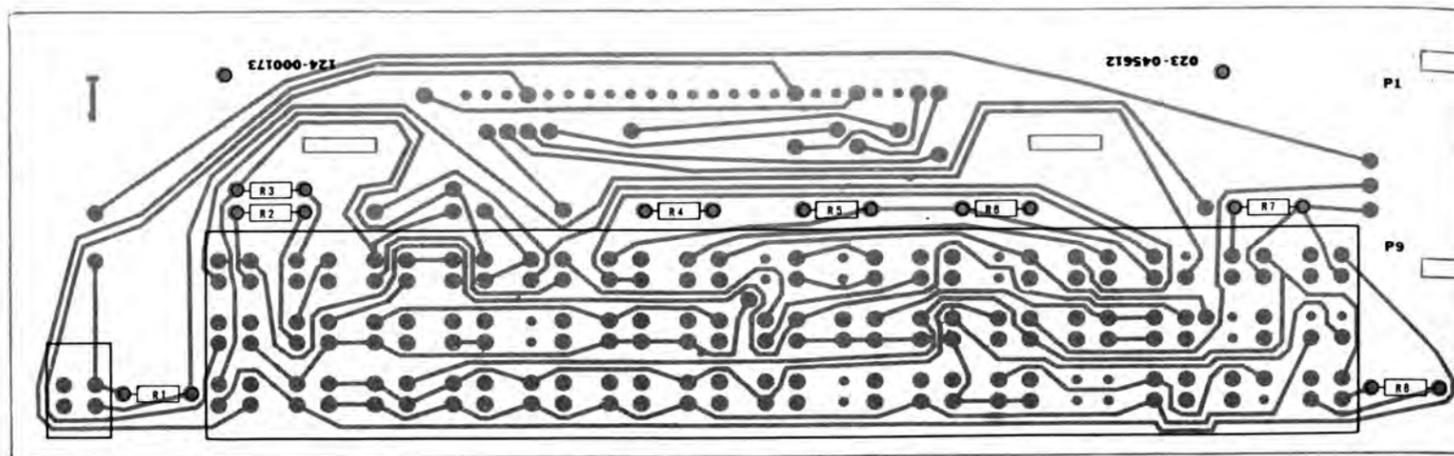
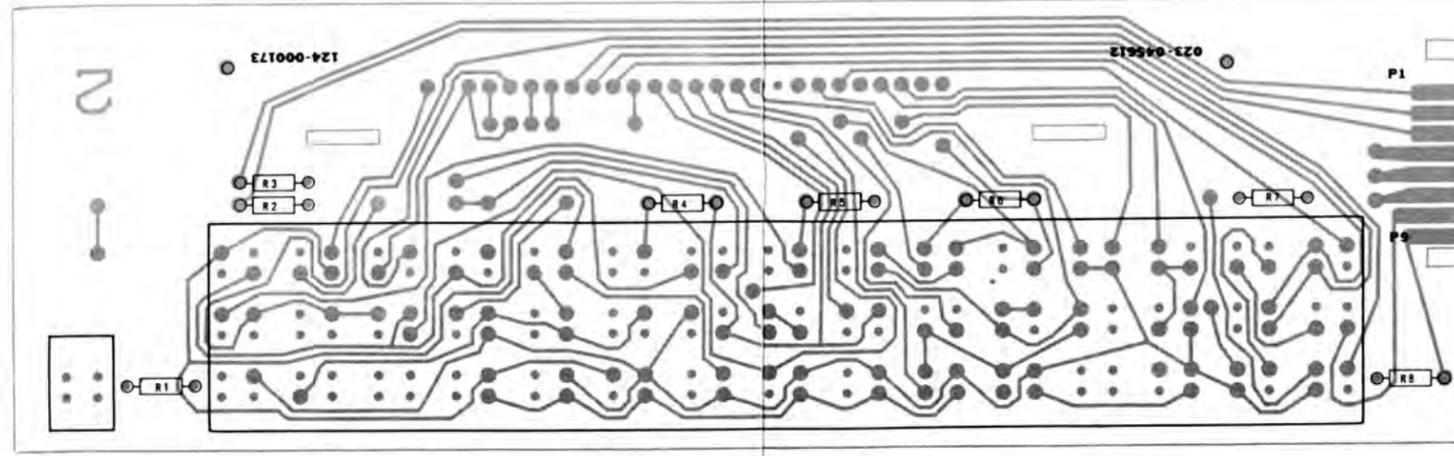


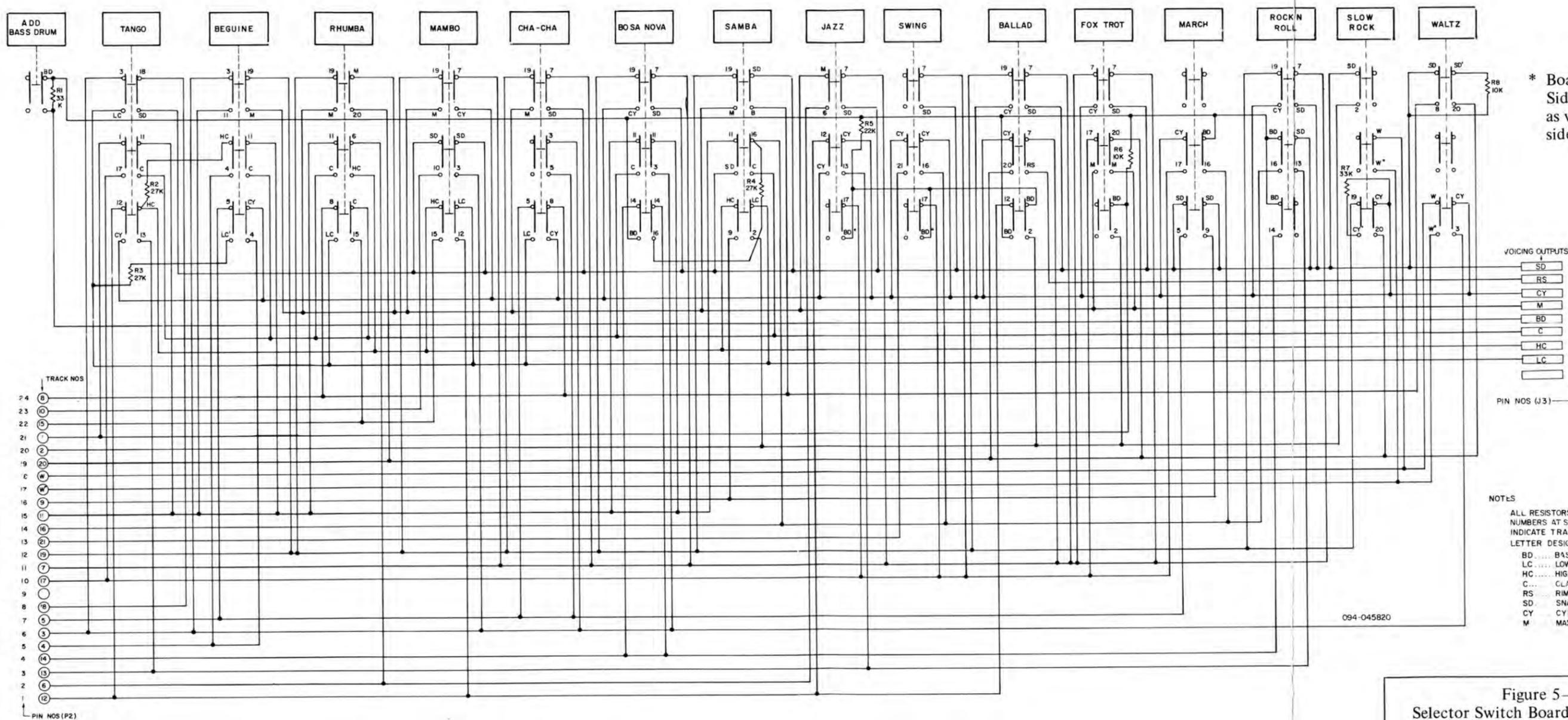
Figure 5-24  
Time Base Generator (Rhythm II-A),  
Layout and Schematic



\* Side #1



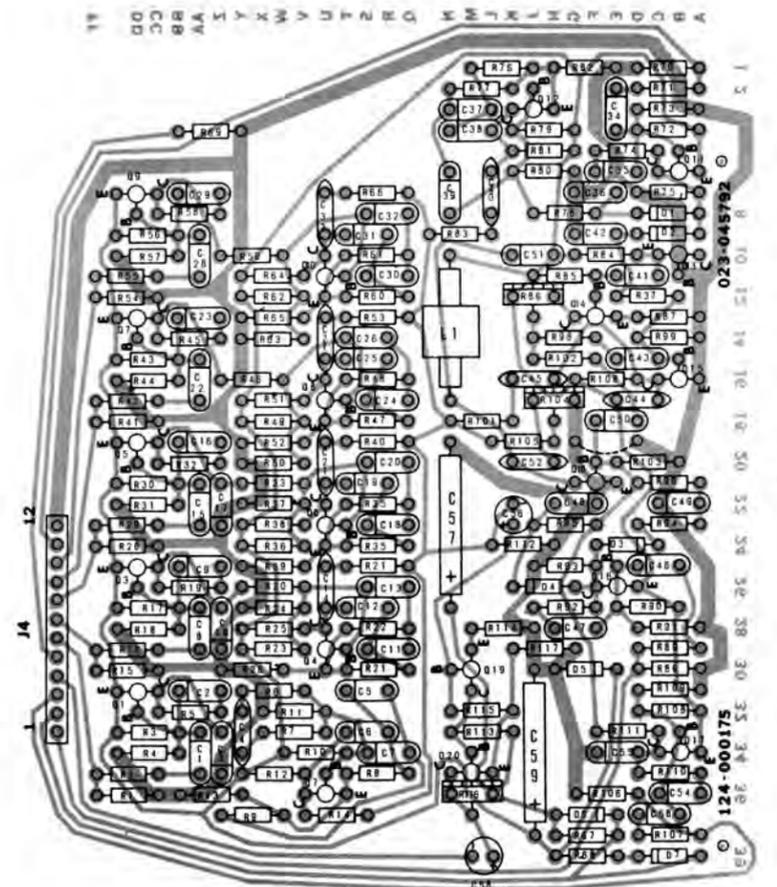
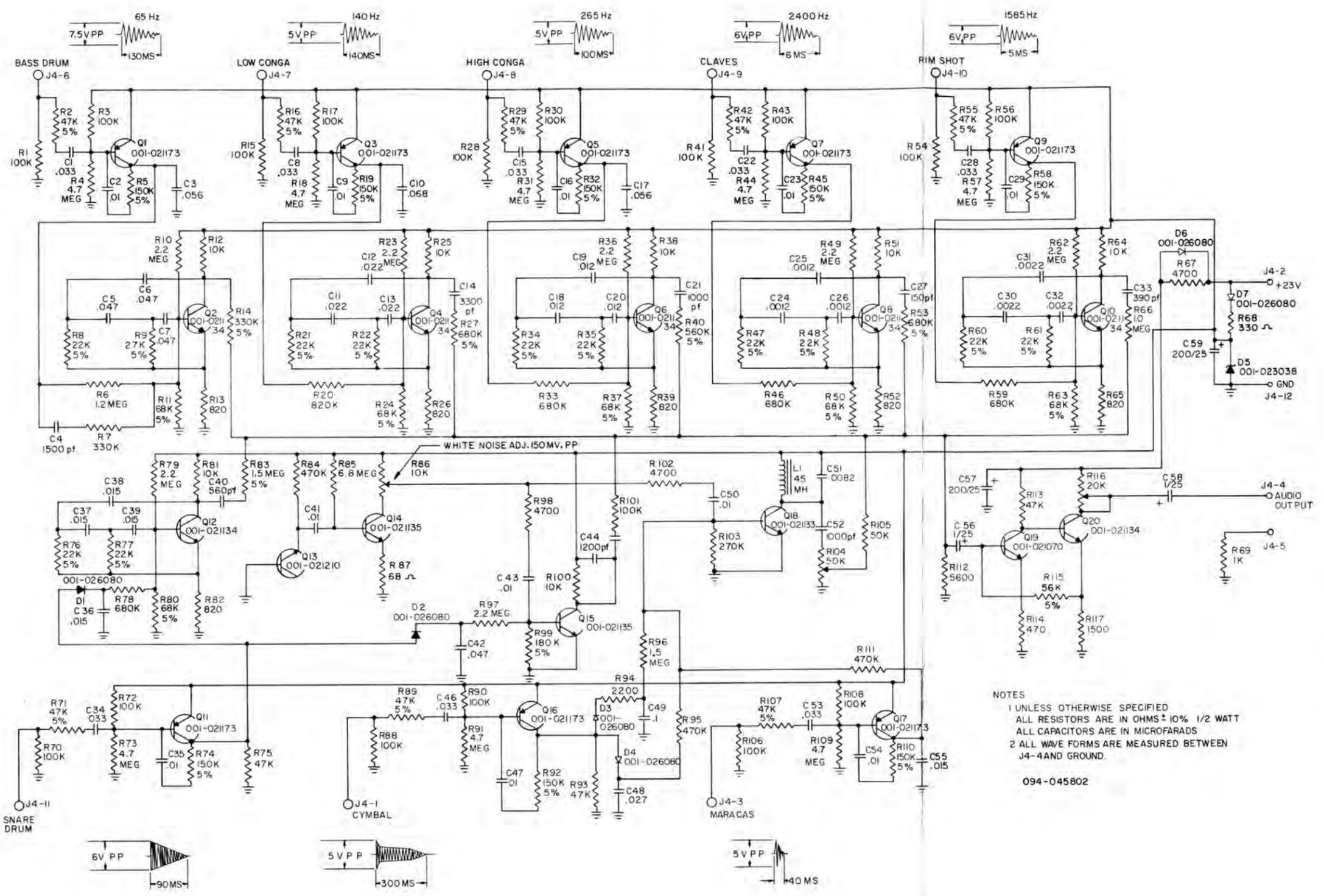
\* Side #2



\* Board plated both sides  
Side #1 & #2 are shown  
as viewed from switch  
side of board.

NOTES  
ALL RESISTORS ARE IN OHMS ± 10% 1/2W  
NUMBERS AT SWITCH CONTACTS  
INDICATE TRACK NO  
LETTER DESIGNATIONS ARE  
BD ... BASS DRUM  
LC ... LOW CONGA  
HC ... HIGH CONGA  
C ... CLAVES  
RS ... RIM SHOT  
SD ... SNARE DRUM  
CY ... CYMBAL  
M ... MARACAS

Figure 5-25  
Selector Switch Board (Rhythm II-A),  
Layout and Schematic



NOTES  
 1 UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS ARE IN OHMS ± 10% 1/2 WATT  
 ALL CAPACITORS ARE IN MICROFARADS  
 2 ALL WAVE FORMS ARE MEASURED BETWEEN  
 J4-4 AND GROUND.  
 094-045802

Figure 5-26  
 Voicing Board (Rhythm II-A),  
 Layout and Schematic

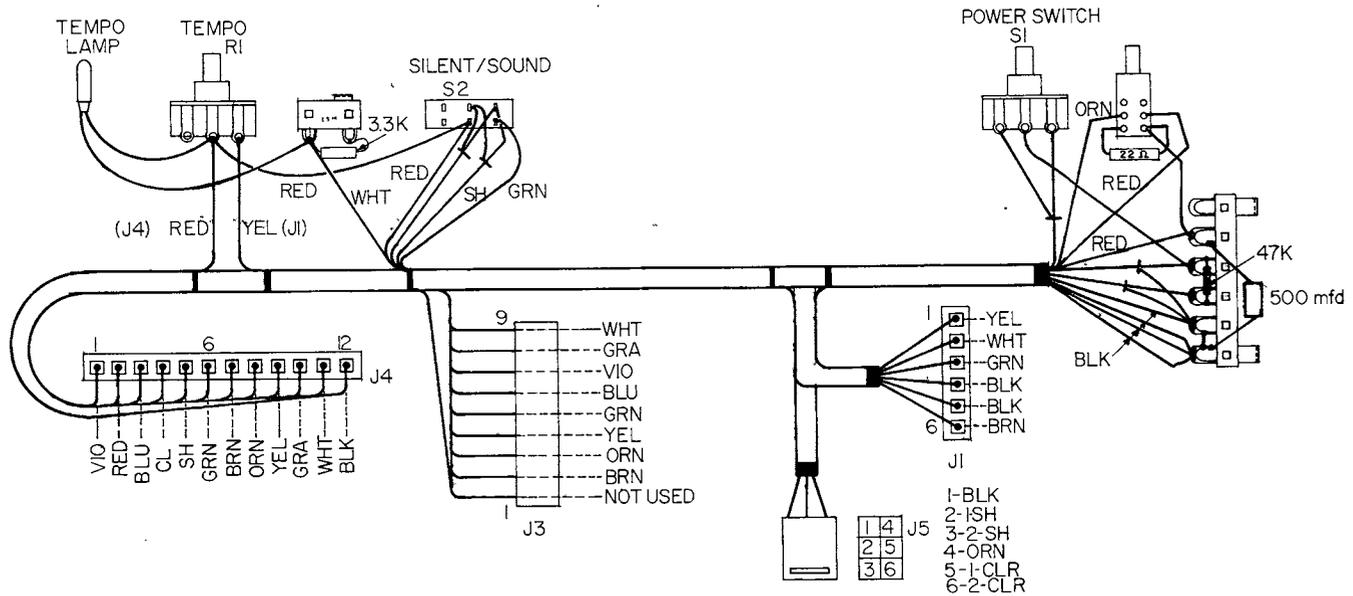


Figure 5-27  
Cable (Rhythm II-A),  
Layout and Schematic

# SECTION VI PARTS LIST

## RHYTHM II

### 6-1 RHYTHM II (Drawer, Inbuilt, & Inbuilt-Improved)

PART			HAMMOND NO.	JAP. NO.
Power Supply	120V	60 Hz	127-000028	
Power Supply	120V	50/60 Hz	127-000029	
Power Supply	220V	50/60 Hz	127-000030	
Power Transformer	120V	50 Hz		FR-3 PT } Specify
Power Transformer	120V	50/60 Hz		FR-3 PT } Voltage &
Power Transformer	220V	50/60 Hz		FR-3 PT } Frequency
Coil	L2, 3	} Refer to Figure 5-9	003-044680-001	5C
Coil	L1		003-044679-001	6C
Coil, 1H	L5			V-49
Coil, 3H	L4			V-50
Coil, 7	L6			V-67
Diode (Bridge I. C.)				
Diode			001-044676-001	IS 1555
Transistor			001-044672-001	2SB171-B
Transistor			001-044673-001	2SB175-B
Transistor			001-044677-001	2SC372-Y
Potentiometer	10K	(R320)		V101KR
Potentiometer	10K	(Volume Control)		EVC-BOAK25A14
Potentiometer	100K	(Tempo Control)		EVC-BOAK25B15
Potentiometer	47K	(Logic Assembly)	001-044675-001	SV10KR0015
Potentiometer	100K	(Level Adjustment)		BOAK20B15
Potentiometer	10K	(Level Adjustment)		BOAK20B14
Terminal Pin				1381
Terminal Strip Assembly (2LSP)	(Inbuilt)			FR-1125
Terminal Strip Assembly (1L2P)	(Inbuilt)			FR-1126
Terminal Strip (Control Unit - Drawer)				1L2P
Terminal Strip (Inbuilt)				2L5P
Push Switch (Inbuilt)				GA-176-a
Plug (Molex)				1261-R
Push Button (Power Switch)				FR-0603
Connector Assembly				FR-1127
Silent/Sound Switch (Inbuilt)				FR-1130
Power Switch				WE-A-a
Rhythm Selector Switch Assembly (Inbuilt)				FR-1113
Voice Generator PWB Assembly				FRPS31
Pilot Lamp				L-5A
Pilot Lamp Window				7314
PWB Holder				7002
Logic Circuit Assembly				FR-PS3L
Matrix Circuit Assembly				FR-PS3M
AC Line (For Power Supply)		} Order By Description		
Power Switch Button				
Knob (Variable Control)				
Push Button Switch				
Silent/Sound Switch (Drawer)				FR-0950A

## PART

JAP. NO.

Jazz Selector Switch Assembly (Drawer)	} Order by		
Latin Selector Switch Assembly (Drawer)		} Description	
Jazz Push Switch w/o Wiring (Drawer)			
Latin Push Switch w/o Wiring (Drawer)			GA-096-S58
Voice Generator & Track Gate Assembly			FR-PS3G
Connector, 16-Pin, Female			SC-1414
Jack (Voice Generator)			L-2
Plug (Voice Generator)			7060
Socket, 5-Pin (Power Supply - Drawer)			Type S

**6-2 RHYTHM II-A (Domestic) 125-000079**

HAMMOND NO.

Chassis Pan Assembly				060-045485
Cover Shield				041-045405
Rocker Switch (Silent/Sound)				008-045512
Selector Switch (Push-Push)				008-045454
Potentiometer				676-000159
Potentiometer				676-000160
Resistor	22 Ohms		½ W	600-020091
Terminal Strip Assembly				006-022173
Knob (Ivory)				025-045482
Knob (Maroon)				025-045483
Knob (Black)				025-045513
Push Button (Black)				025-045514
Lamp (Miniature)				016-045804
Foam Strip (Adhesive Backed)				048-035257
Speed Clip (PWB Retaining)				013-045215
Cable Assembly				011-045547
Plug (6 Pin -J5)				005-039920
Plug (12 Pin -J4)				005-043374
Plug (9 Pin -J3)				005-043375
Plug (6 Pin -J1)				005-043377

**RHYTHM SELECTOR BOARD 124-000173**

Switch				008-045423
Switch, Push-Push				008-045454
Wafer Assembly				005-045456
Resistor	10K	½ W	R6, 8	600-220731
Resistor	22K	1 W	R5	600-220811
Resistor	27K	½ W	R2, 3, 4	600-220831
Resistor	33K	½ W	R1, 7	600-220851

**GENERATOR BOARD 124-000174**

Connector & Terminal Assy.				005-044724
Wafer Assy				005-044742
Resistor	270 Ohms	½ W	R15	600-220351
Resistor	1800 Ohms	½ W	R2	600-220552
Resistor	3600 Ohms	½ W	R4	600-220622
Resistor	4700 Ohms	½ W	R18, 20	600-220651
Resistor	6800 Ohms	½ W	R6, 7, 13, 14	600-220691
Resistor	15K	½ W	R19, 21	600-220771
Resistor	22K	½ W	R8, 11, 12	600-220811
Resistor	33K	½ W	R54, 55, 56, 57	600-220851
Resistor	39K	½ W	R24, 25, 58	600-220871
Resistor	47K	½ W	R5, 17, 29, 30	600-220891

Resistor	68K	½ W	R3	600-220931
Resistor	100K	½ W	R9, 10, 16, 27, 28	600-220971
Resistor	91K	½ W	R1	600-220962
Resistor	470K	½ W	R23, 26, R31 thru R53	600-221131
Resistor	100 Ohms	½ W	R76, 59	600-220251
Resistor	180 Ohms	3 W	R22	602-050201
Capacitor, Electrolytic		50/15V	C3	407-040439
Capacitor, Electrolytic		1/25V	C5	407-060449
Capacitor, Mylar		.039	C7, 8, C11 thru C33	412-110652
Capacitor, Mylar		.01	C2, 6, 34	412-110462
Capacitor, Mylar		.15	C4	412-110642
Capacitor, Mylar		.22	C9, 10	412-110532
Capacitor		.47	C1	414-040052
Integrated Circuit			C1, 2, 3	075-045037
Transistor			Q2, 3, 4, 5, 6	001-021133
Transistor			Q1	001-026050
Diode, Zener			D1	001-023033
Diode			D2 thru D51	001-026080

### VOICING BOARD 124-000175

Resistor	1.5 Meg	½ W	R83, 96	900-221252
Resistor	68 Ohms	½ W	R87	600-220211
Resistor	330 Ohms	½ W	R68	600-220371
Resistor	470 Ohms	½ W	R114	600-220411
Resistor	820 Ohms	½ W	R13, 26, 39, 52, 65, 82	600-220471
Resistor	1K	½ W	R63	600-220491
Resistor	2200 Ohms	½ W	R94	600-220571
Resistor	4700	½ W	R67, 98, 102	600-220651
Resistor	5600	½ W	R112	600-220671
Resistor	10K	½ W	R12, 25, 38, 51, 64, 81, R100	600-220731
Resistor	22K	½ W	R8, 21, 22, 34, 35, 47, 48, 60, 61, 76, 77	600-220812
Resistor	27K	½ W	R9	600-220832
Resistor	39K	½ W	R105	600-220871
Resistor	47K	½ W	R2, 16, 29, 42, 55, 71 75, 89, 93, 107, 113	600-220892
Resistor	68K	½ W	R11, 24, 37, 50, 63, 80	600-220932
Resistor	100K	½ W	R1, 3, 15, 17, 28, 39, 41, 43, 54, 56, 70, 72, 88, 90, 101, 106, 108	600-220971
Resistor	150K	½ W	R5, 19, 32, 45, 58, 74, 92, 110	600-221012
Resistor	180K	½ W	R99	600-221032
Resistor	330K	½ W	R7, 14	600-221092
Resistor	470K	½ W	R84, 95, 111	600-221131
Resistor	680K	½ W	R27, 53	600-221172
Resistor	560K	½ W	R40	600-221152
Resistor	680K	½ W	R33, 46, 59, 78	600-221171
Resistor	820K	½ W	R20	600-221191
Resistor	1 Meg	½ W	R66	600-221212
Resistor	1.2 Meg	½ W	R6	600-221231
Resistor	2.2 Meg	½ W	R10, 23, 36, 49, 62, 79, 97	600-221291
Resistor	4.7 Meg	½ W	R4, 18, 31, 44, 57, 73, 91, 109	600-221371
Resistor	6.8 Meg	½ W	R85	600-221411
Resistor	1500 Ohms	½ W	R117	600-220532
Trimmer Potentiometer	20K		R116	676-000015
Trimmer Potentiometer	50K		R104	676-000019
Trimmer Potentiometer	10K		R86	676-000014
Diode			D1, 2, 3, 4, 6, 7	001-026080

Diode, Zener			D5	001-023038
Transistor			Q18	001-021133
Transistor			Q2, 4, 6, 8, 10, 12, 20	001-021134
Transistor			Q1, 3, 5, 7, 9, 11, 16, 17	001-021173
Transistor			Q13	001-021211
Transistor			Q15, 14	001-021135
Resistor	270K	½ W	Q19	001-021070
Choke	45 mH		R103	600-221071
Capacitor, Electrolytic		1/25V	L1	003-030753
Capacitor, Electrolytic		200/25V	C56, 58	407-060449
Capacitor, Mylar		.0012	C57, 59	407-060489
Capacitor, Mylar		.0022	C24, 25, 26	412-110582
Capacitor, Mylar		.0082	C30, 31, 32	412-110592
Capacitor, Mylar		.01	C51	412-110602
Capacitor, Mylar		.012	C2, 9, 16, 23, 29, 35, 36, 41, 43, 47, 50, 54	412-110462
Capacitor, Mylar		.015	C18, 19, 20	412-110612
Capacitor, Mylar		.022	C37, 38, 39, 55	412-110472
Capacitor, Mylar		.027	C11, 12, 13	412-110482
Capacitor, Mylar		.033	C48	412-110492
Capacitor, Mylar		.047	C1, 8, 15, 22, 28, 34, 46, 53	412-110502
Capacitor, Mylar		.056	C5, 6, 7, 42	412-110512
Capacitor, Mylar		.068	C3, 17	412-110622
Capacitor, Mylar		.10	C10	412-110632
Capacitor, Ceramic		68	C49	412-110522
Capacitor, Ceramic		150	C45	426-010212
Capacitor, Ceramic		390	C27	426-010292
Capacitor, Ceramic		560	C33	426-010392
Capacitor, Ceramic		1000	C40	426-010442
Capacitor, Ceramic		1200	C21, 52	426-010502
Capacitor, Ceramic		1500	C44	426-010522
Capacitor, Ceramic		3300	C4	426-010542
Wafer Assy.			C14	426-010622
Resistor	56K	½ W	R115	005-044738
				600-220912

# APPENDIX

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## INTRODUCTION

This appendix contains instructions for installing the Rhythm II accessory kit on the following organs:

T-Series  
L-100, L-100A, L-100-1  
M-100, M-100A  
N-100, N-200  
J-100, J-200, J-300

For clarity and convenience, instructions for each series are printed in a separate section: I, T-Series; II, L Models; III, M-100 & M-100A; IV, N-100 & N-200; V, J-100, J-200, J-300.

Rhythm II Drawer (125-000045)

The Kit is designated as Model A-2. Parts required for installation on any of the above listed organs are included in the kit. Carefully follow instructions for the particular organ at hand. Consult Contents of Kit list on page ii for information concerning applicability of specific parts.

### WARNING

Complete installation of this kit requires wiring to primary power source. Connections described herein are to be made by qualified service men only.

CONTENTS OF KIT

QTY	PART NO.	DESCRIPTION	USED ON						
			L-100-1	L-100 L-100A	L-100 Early	M-100	T	N	J
1	127-000028	Power Supply, 120V 60 or	X	X	X	X	X		
1	127-000029	Power Supply, 120V 50/60 or	X	X	X	X	X		
1	127-000030	Power Supply, 220V 50/60 or	X	X	X	X	X		
1	127-000203	Power Supply 120V 60	X	X	X	X	X		
1	063-042080	Voice Generator Assembly	X	X	X	X	X	X	X
1	125-000045	Control Assembly	X	X	X	X	X	X	X
1	035-042081	Mounting Rail	X	X	X	X	X	X	X
1	010-042054	Shield (power supply)	X	X	X	X	X		
1	010-042082	Shield (voice generator)	X	X	X	X	X	X	X
1	011-042083	Wire & Plug Assembly	X	X	X	X	X	X	X
9	884-050734	Screw, #6	X	X	X	X	X	X	X
3	884-050933	Screw	X	X	X	X	X	X	X
1	999-000065	Washer	X	X	X	X	X	X	X
3	013-042242	Clip	X	X	X	X	X	X	X
3	013-031744	Plastic Tie	X	X	X	X	X	X	X
1	006-033265	Terminal Strip		X	X	X	X	X	X
1	254-000032-07	22 Ga. S.C. Wire (Black) 16"		X	X				
1	200-010318	Shielded Lead		X	X	X	X	X	X
1	425-010582	Capacitor, disk, .0022 uf					X		X
1	600-020971	Resistor, 100K					X		
1	425-010412	Capacitor, disk 470 pf		X	X	X			
2	007-023410	Pin, connector		X					
1	600-021211	Resistor, 1 meg.		X	X	X			
1	254-060008-04	22 Ga. S.C. Wire (Blue) 4"		X					
3	999-000815	Washer						X	
1	042-035141	Adhesive Backed Felt	X	X	X	X	X	X	X
1	011-033223	Ground Lead Assembly					X		
1	011-042617	Ground Lead Assembly					X		
1	425-010622	Capacitor, disk, .0033 uf				X			
1	600-021131	Resistor, 470K							X
1	816-081814	Machine Screw							X
2	823-102514	Machine Screw, #10							X
1	HO-449	Installation Instructions	X	X	X	X	X	X	X

# SECTION I T-SERIES

## NOTE

Check contents of kit before starting installation. Be sure all required parts are at hand.

- 1-1. **GENERAL.** — This section contains instructions for installing the Rhythm II accessory on any T-Series organ.
- 1-2. **PREPARATION OF ORGAN.** — Disconnect organ from power source. Remove and set aside organ parts listed below.
- Back cover
  - Console top and music rack
  - Control panel cover
  - AC post cover on Tone Wheel Generator Assembly

## NOTE

The following instructions are for right-hand installation of the Rhythm II Control. The control may be mounted at the left of the organ at the owner's option on any T-Series model, except T-300, which requires the control assembly to be on the right side.

- 1-3. **INSTALLATION OF SWITCH ASSEMBLY.** — Proceed according to the following.

- Remove decorative bracket from underside of rail at right end.

## NOTE

To remove bracket from later model organs, remove two screws from underside. On early organs the bracket must be chiseled off carefully.

- Remove screw from front right end of lower manual terminal strip cover.
- Install mounting rail, 035-042081, open end toward front of organ as shown in

Figure A-1. Before fastening rail, place control unit on floor under rail. Drape control cable from right to left, (multi-pin connector toward left) over top of rail, then fasten rail into place with three screws, 884-050933, driven into pilot holes provided. Place adhesive felt 042-035141 over head of right side mounting screw.

## NOTE

On older organs not equipped with pilot holes, use rail as a template and pierce holes with an awl or other suitable tool.

- Reinsert screw removed at step A-3b; above, through slotted hole in rear lip of rail, placing a washer, 999-000065, between lip of rail and terminal strip cover.
- Back out the two small screws at either end of the mounting rail far enough to permit insertion of switch assembly, 125-000045, into rails. Slide the switch assembly into rails and retighten screws.
- Pull control cable to the left, allowing sufficient slack to permit the switch assembly to move freely in and out on its track.
- Feed connector end of control cable through large opening at left of lower manual.
- Install three adhesive-backed clips, 013-042242, at approximate locations shown in Figure A-1.

To install clips (See Figure A-2):

- Remove protective backing to expose adhesive.
- Install as shown in Figure A-2.
- Adhesive backing will anchor clip.
- Insert cable into clip. Pull clip open sufficiently to clear cable if necessary.
- Compress clip until locking lip engages.

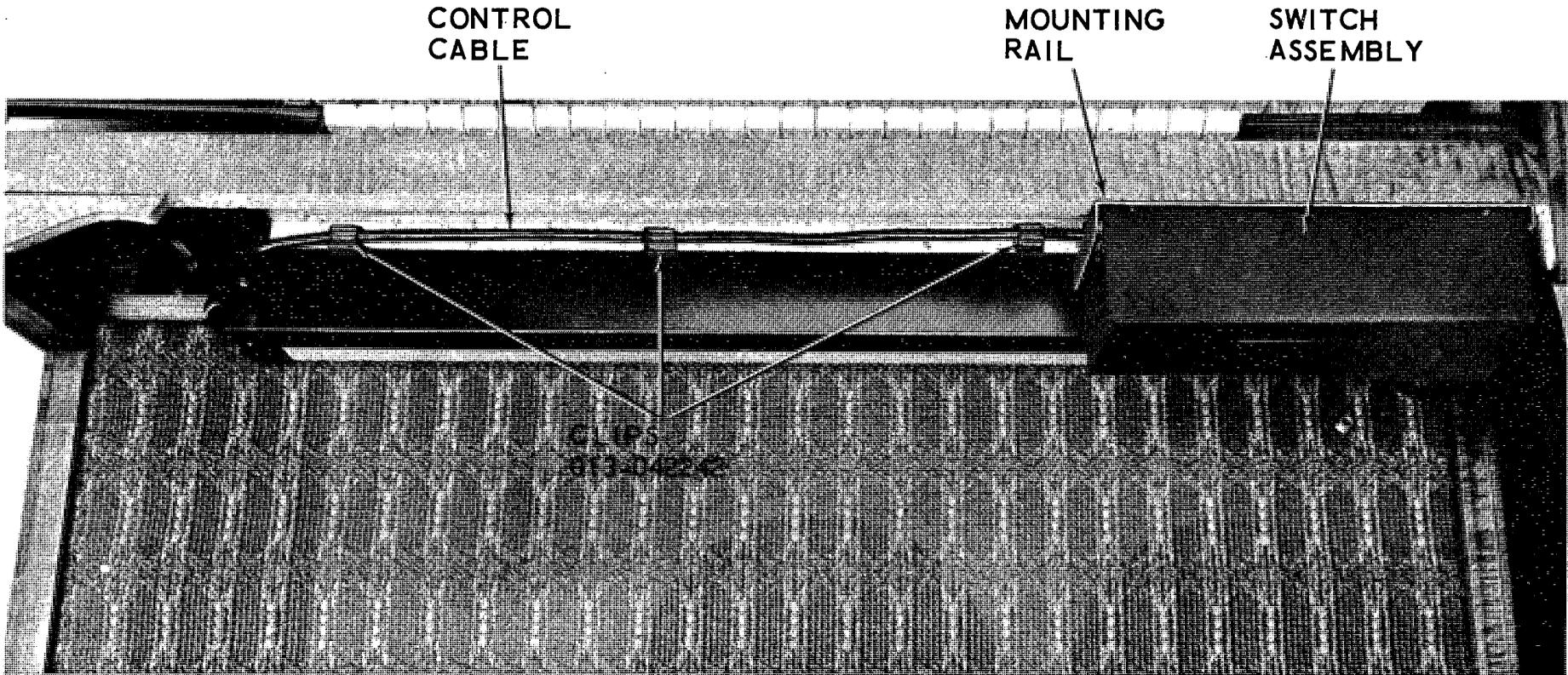


Figure A-1.  
Typical Mounting Rail and Control Installation

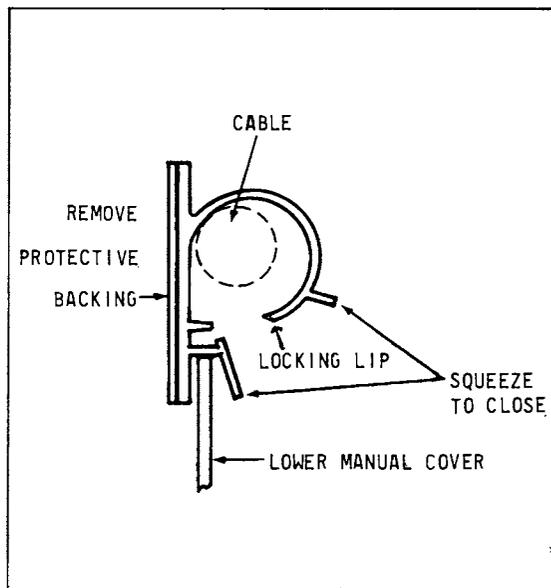


Figure A-2.  
Installation of Clips

**1-4. INSTALLATION OF POWER SUPPLY.—**

The Power Supply is to be installed in the position indicated in Figure A-3.

**NOTE**

Reference to right or left, in steps 1-4 and 1-5 is as viewed from rear of organ.

Proceed according to the following:

- a. Remove tube of oil from left end wall. Remove cable ties holding tube. Relocate ties and tube as shown in Figure A-3.
- b. Place power supply shield, 010-042054, over pilot holes in left end wall. Place power supply, 127-000028 (-30), over shield in a position such that receptacle on power supply is at lower end. Fasten power supply and shield into place with three screws, 884-050734 leaving top rear screw off temporarily.

**NOTE**

On older organs, without pilot holes, place power supply shield against end wall about 12 inches up from bottom of organ and 6 inches from rear of organ. Use shield as template to pierce holes.

**1-5. INSTALLATION OF VOICE GENERATOR. —**

Proceed according to the following:

- a. Place voice generator shield, 010-042082, over pilot holes on upper shelf of organ. Position as shown in Figure A-3.

**NOTE**

On older organs without pilot holes, use shield as a template to pierce holes,

Place voice generator over shield and fasten generator and shield to shelf with two screws, 884-050734, leaving two rear screws off temporarily. Connector on generator should be toward left of organ.

**1-6. TERMINAL STRIP ASSEMBLY.—**

Assemble terminal strip assembly as shown in Figure A-4, using .0022 uf capacitor and 100K resistor. Fasten terminal strip assembly to shelf about two inches to the right of voice generator, as shown in Figure A-3. Use one screw, 884-050734.

**1-7. INTERCONNECTIONS. —** Proceed according to the following:

- a. Mate large connector on end of control cable to receptacle on voice generator.
- b. Fasten cable to voice generator by means of plastic cable tie mounted on generator.
- c. Insert phone plug of wire and plug assembly, 011-042083, into phone jack on voice generator assembly.
- d. Solder free ends of wire and plug assembly, 011-042083, to terminal strip assembly, as shown in Figure A-4.
- e. Solder free ends of coaxial cable 200-010318, to terminal strip assembly, as shown in Figure A-4 and tablet, as shown in Figure A-5.
- f. Mate plug at end of red and black pair from voice generator to receptacle on Rhythm II power supply, 127-000028 (-30).

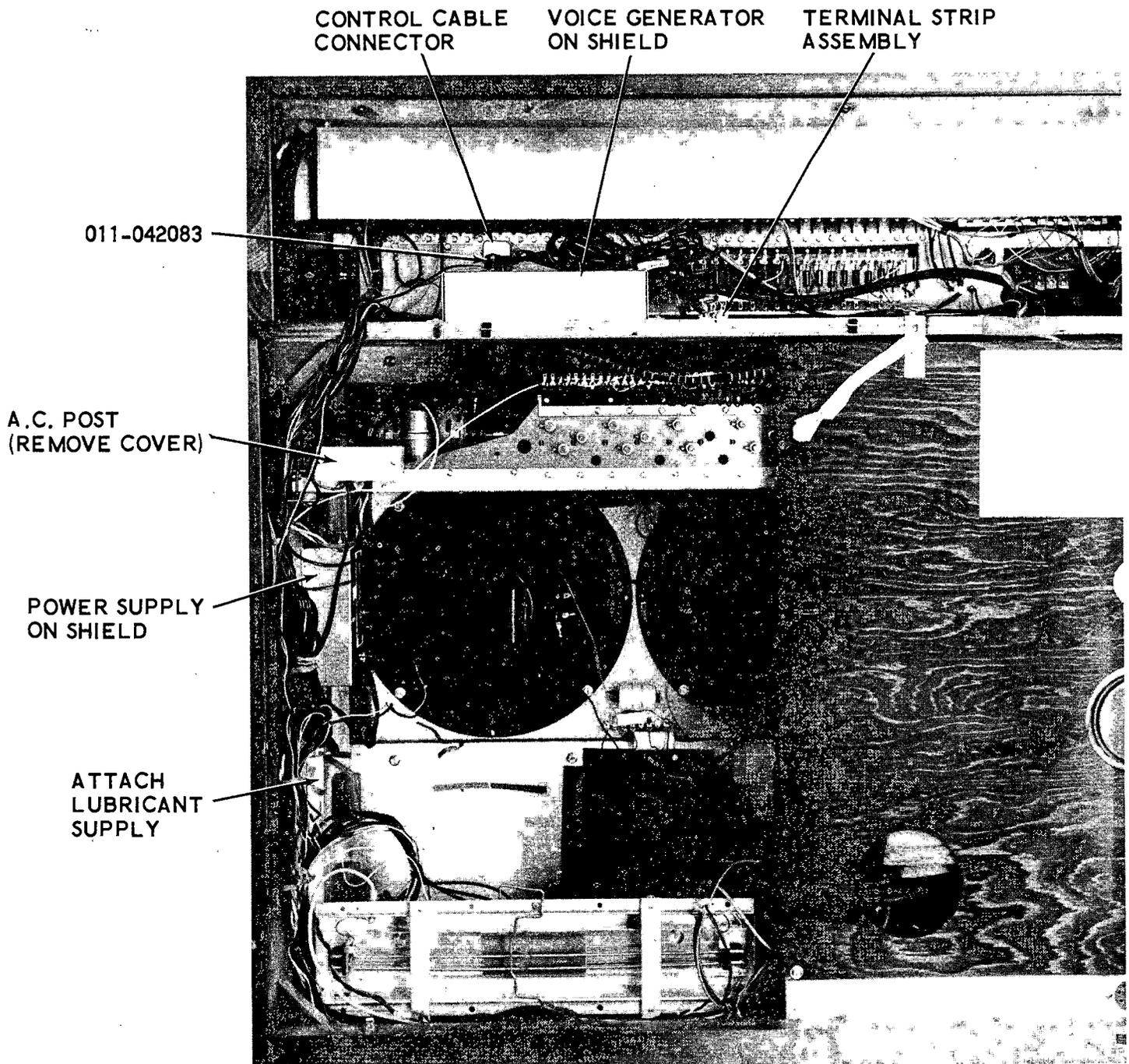


Figure A-3  
Placement of Circuit Assemblies in T Series Organ

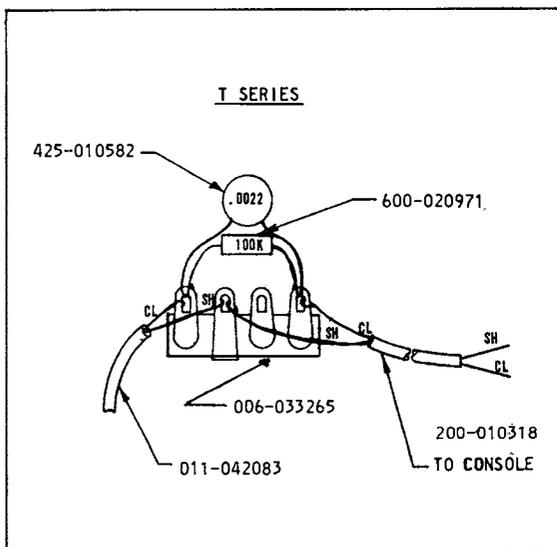


Figure A-4.  
Terminal Strip Assembly for  
T-Series

- g. Pull apart bared ends of power supply line cord about two to three inches. From underneath, insert each of the bared ends through one of the grommets on the AC post. Solder one end to terminal marked "GY", the other end to terminal marked "YEL".
- h. Fasten one end of ground lead assembly, 011-033223, to right rear of voice generator assembly with washer 999-000815 under head of mounting screw, 884-050734. Route other end of 011-033223 to ground lug on frequency generator and motor assembly, 112-000005, and solder. Be sure grounding connections are secure. Check with ohmmeter leads on housings.
- i. Fasten one end of ground lead assembly, 011-042617, to left rear of voice generator assembly with washer 999-000815 under head of mounting screw 884-050734. Fasten other end of 011-042617 to top rear mounting screw of Rhythm II Power Supply assembly, 127-000028 (-30) or 101-000203, using washer 999-000815 under head of mounting screw 884-050734. Check for secure grounding connections with ohmmeter leads on power supply and voice generator covers.

- j. Tie all newly installed cabling neatly to existing cabling using cable ties, 013-031744.
- k. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.
- l. Disconnect organ from power source and reinstall all parts set aside at step A-2. This completes installation.

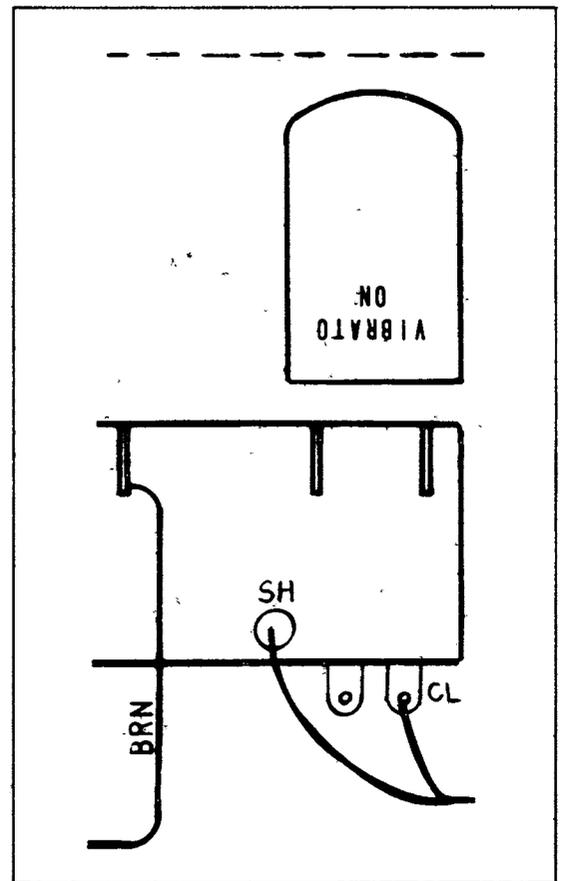
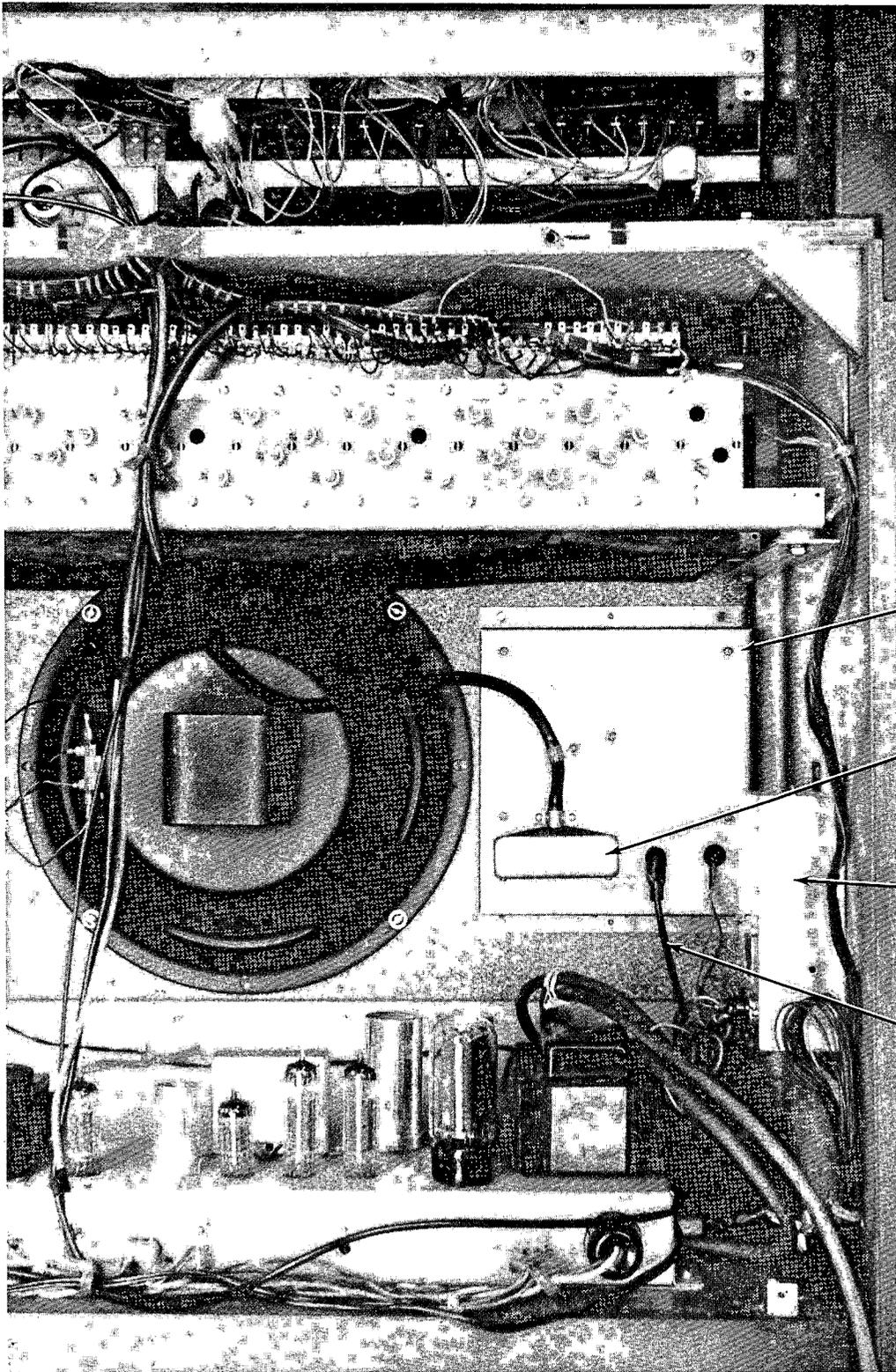


Figure A-5.  
Wiring to Vibrato on Tablet in  
T-Series



VOICE  
GENERATOR  
ON SHIELD

CONTROL CABLE  
CONNECTOR

POWER SUPPLY  
ON SHIELD

011-042083

Figure A-6.  
Power Supply & Voice Generator Installation in L-100 Series Organs

## SECTION II L-100 SERIES

### NOTE

Check contents of kit before starting installation. Be sure all required parts are at hand.

- 2-1. **GENERAL.**— This section contains instructions for installing the Rhythm II accessory on any L-100 organ.
- 2-2. **PREPARATION OF ORGAN.**— Disconnect organ from power source. Remove and set aside back cover of organ.

### NOTE

The following instructions are for right-hand installation of the Rhythm II Control. The control may be mounted at the left of the organ at the owner's option.

- 2-3. **INSTALLATION OF SWITCH ASSEMBLY.**— Proceed according to the following:

- a. Remove decorative wood block from underside of rail at right end.

### NOTE

The wood block is fastened by means of glue and two nails driven from the underside. Take care not to mar finish of front rail or console leg.

- b. Remove screw from front right end of lower manual terminal strip cover.
- c. Install mounting rail, 035-042081, open end toward front of organ as shown in Figure A-1. Before fastening rail, place control unit on floor under rail. Drape control cable from right to left (multi-pin connector toward left) over top of rail, then fasten rail into place with three screws, 884-050933, driven into pilot holes provided.

Place adhesive felt 042-035141 over head of right side mounting screw.

### NOTE

On older organs not equipped with pilot holes, use rail as a template and pierce holes with an awl or other suitable tool.

- d. Reinsert screw removed at step b., above, through slotted hole in rear lip of rail, placing a washer, 999-000065, between lip of rail and terminal strip cover.
- e. Back out the two small screws at either end of the mounting rail far enough to permit insertion of switch assembly, 125-000045, into rails. Slide the switch assembly into rails and retighten screws.
- f. Pull control cable to left to take up slack.

### NOTE

Allow sufficient slack to permit the switch assembly to move freely in and out on its track.

- g. Feed connector end of control cable around left end of lower manual to top shelf at rear of organ.
- h. Insert connector, pins upward, through the large hole above the tone generator. Move the connector carefully toward the rear of the organ until it clears the tone generator. Then pull cable to take up slack.
- i. Install three adhesive-backed clips, 013-042242, at approximate locations shown in Figure A-1.

To install clips (See Figure A-2):

1. Remove protective backing to expose adhesive.
2. Install as shown in Figure A-2.
3. Adhesive backing will anchor clip.
4. Insert cable into clip. Pull clip open sufficiently to clear cable if necessary.

5. Compress clip until locking lip engages.
6. If necessary, clip may be un-locked with the aid of a screwdriver.

#### 2-4. INSTALLATION OF POWER SUPPLY. —

The Power Supply is to be installed in the position indicated in Figure A-6.

#### NOTE

Reference to right or left, in steps 2-4, and 2-5 is as viewed from rear of organ.

Proceed according to the following:

- a. Place power supply shield, 010-042054, over pilot holes in right end wall. Place power supply, 127-000028 (-30), over shield in a position such that receptacle on power supply is at lower end. Fasten power supply and shield into place with four screws, 884-050734.

#### NOTE

On older organs, without pilot holes, place power supply shield against end wall about 4½ inches up from bottom of organ and 3 inches from rear of organ. Use shield as a template to pierce holes.

#### 2-5. INSTALLATION OF VOICE GENERATOR. —

Proceed according to the following:

- a. Place voice generator shield, 010-042082, over pilot holes immediately to right of main speakers. Position as shown in Figure A-6.

#### NOTE

On older organs without pilot holes, use shield as a template to pierce holes.

Place voice generator over shield and fasten generator and shield to front of organ with four screws, 884-050734. Connector on voice generator should be toward bottom of organ.

#### 2-6. ASSEMBLY OF TERMINAL STRIP (NOT REQUIRED FOR L-100-1). — Assemble

terminal strip as shown in Figure A-7, using 470 pf capacitors, 425-010412, and 1 meg. resistor 600-021211.

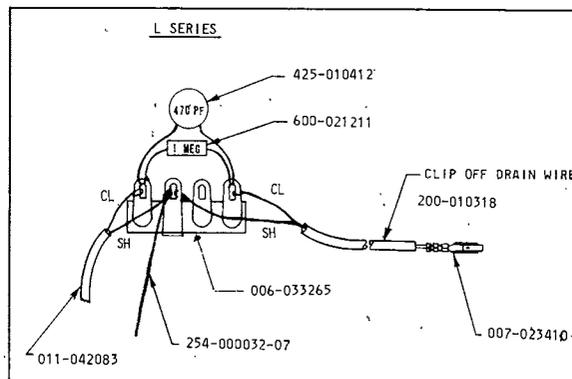


Figure A-7.  
Terminal Strip Assembly for  
L-100 & L-100A

#### 2-7. INSTALLATION OF TERMINAL STRIP ASSEMBLY (DOES NOT APPLY TO L-100-1). —

Attach terminal strip assembly to upper shelf near center of preamplifier chassis, approximately two inches from rear of shelf. Fasten with one screw, 884-050734.

#### 2-8. INTERCONNECTIONS. — Depending on age and model, one of three different sets of interconnections is used. Refer to subparagraphs A, B, and C, below.

- A. For L-100 organs Serial No. 87045 and up, proceed according to the following:
  1. Mate large connector on end of control cable to receptacle on voice generator.
  2. Fasten cable to voice generator by means of plastic cable tie mounted on generator.
  3. Insert phone plug of wire and plug assembly, 011-042083, into phone jack on voice generator.
  4. Solder free ends of wire to terminal strip assembly as shown in Figure A-7.
  5. Connect 22 ga. black wire, 254-000032-07 from terminal strip assembly, to any convenient ground lug on the organ.

6. Assemble connector pin 007-023410, to one end of shielded lead, 200-010318, as shown in Figure A-7. Solder other end of shielded lead to terminal strip as shown in Figure A-7. Connect pin into the six-pin plug located toward the right (rear view) of the organ preamplifier chassis. Correct position is the vacant one between gray and green wires.
  7. Mate plug at end of red and black pair from voice generator to receptacle on Rhythm II power supply, 127-000028 (-30).
  8. Pull apart bared ends of power supply line cord about two to three inches. From underneath, insert each of the bare ends through one of the grommets on the AC post. Solder one end to terminal marked "GY", the other end to terminal marked "YEL".
  9. Tie all newly installed cabling neatly to existing cabling using cable ties, 013-031744.
  10. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.
  11. Reattach back cover of organ. This completes installation.
- B. For L-100 organs BELOW Serial No. 87045, proceed according to the following:
1. Mate large connector on end of control cable to receptacle on voice generator.
  2. Fasten cable to voice generator by means of plastic cable tie mounted on generator.
  3. Insert phone plug of wire and plug assembly, 011-042083, into phone jack on voice generator assembly. Solder free ends of wire to terminal strip assembly as shown in Figure A-7.
  4. Connect 22 ga. black wire 254-000032-07 from terminal strip assembly to any convenient ground lug on organ. See Figure A-7.
  5. Remove all connectors mated to organ's percussion amplifier.
  6. Remove four slotted screws which attach amplifier to manual chassis and lift amplifier from organ.
  7. Remove seven slotted screws from preamplifier chassis and slip off preamplifier cover.
  8. Solder bare end of 4" length of blue wire, 254-006008-04 to pin 2 of the socket for V1 (12AX7). Attach connector pin, 007-023410 to other end of wire and insert pin into position on the six-pin connector inside the amplifier chassis. Correct position is the vacant one between the gray and violet wires.

#### NOTES

The pin can be inserted in only one orientation.

9. Reassemble cover to preamplifier; reattach amplifier to organ; reattach external connectors to amplifier from which removed.
10. Assemble connector pin 007-023410, to one end of shielded lead, 200-010318, as shown in Figure A-7. Solder other end of shielded lead to terminal strip as shown in Figure A-7. Connect pin into the six-pin plug located toward the right (rear view) of the organ preamplifier chassis. Correct position is the vacant one between gray and green wires.
11. Mate plug at end of red and black pair from voice generator to receptacle on Rhythm II power supply, 127-000028 (-30).
12. Pull apart bared ends of power supply line cord about two to three inches. From underneath, insert each of the bare ends through one of the grommets on the AC post. Solder one end to terminal marked "GY", the other end to terminal marked "YEL".
13. Tie all newly installed cabling neatly to existing cabling using cable ties, 013-031744.
14. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.

15. Reattach back cover or organ. This completes installation.
- C. For L-100-1 organs proceed according to the following:
1. Mate large connector on end of control cable to receptacle on voice generator.
  2. Fasten cable to voice generator by means of plastic cable tie mounted on generator.
  3. Insert phone plug of wire and plug assembly, 011-042083, into phone jack on voice generator assembly.
  4. Route wire to Pedal Control Board mounted on left (rear view) end wall of organ. Connect center conductor to bottom lug on right side of Pedal Control Board. Connect shield to 3-lug terminal strip mounted on end wall next to Pedal Control Board. See Figure A-8.
  5. Mate plug at end of red and black pair from voice generator to receptacle on Rhythm II power supply, 127-000028 (-30).
  6. Pull apart bared ends of power supply line cord about two to three inches. From underneath, insert each of the bare ends through one of the grommets on the AC post. Solder one end to terminal marked "GY", the other end to terminal marked "YEL".
  7. Tie all newly installed cabling neatly to existing cabling using cable ties, 013-031744.
  8. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.
  9. Reattach back cover of organ. This completes installation.

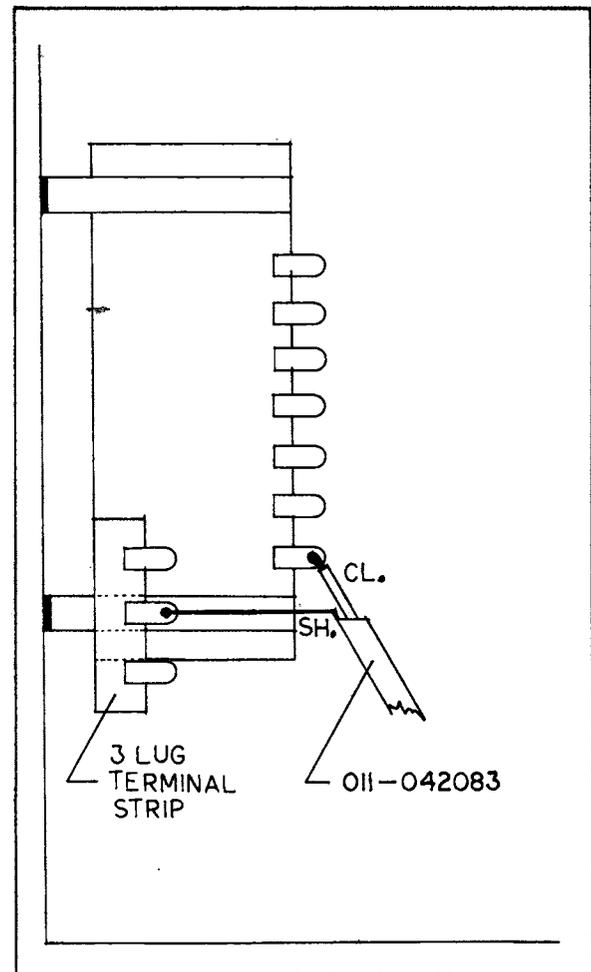


Figure A-8.  
Connections to Pedal Control  
Board & Ground

## SECTION III M-100 & M-100A

### NOTE

Check contents of kit before starting installation. Be sure all required parts are at hand.

**3-1. GENERAL.** – This section contains instructions for installing the Rhythm II accessory on M-100 and M-100A organs.

**3-2. PREPARATION OF ORGAN.** – Disconnect organ from power source.

- a. Remove and set aside back cover.
- b. Remove and set aside generator cover.
- c. Remove terminal strip metal cover on amplifier.

### NOTE

The following instructions are for right-hand installation of the Rhythm II Control. The control may be mounted at the left of the organ at the owner's option.

**3-3. INSTALLATION OF SWITCH ASSEMBLY.** – Proceed according to the following:

- a. Remove decorative wood block from underside of front rail at right end. (See Figure A-1).

### NOTE

The block is fastened by means of glue and two nails driven from the underside. Take care not to mar finish of front rail or console leg. Stain exposed wood as required.

- b. Remove and set aside screw at right end of lower manual cover.
- c. Install mounting rail, 035-042081, open end toward front of organ as shown in Figure A-1. Before fastening rail, place control unit on floor under rail. Drape control cable from right to left (multi-pin connector toward left) over top of rail, then fasten rail into place with three screws, 884-050933, driven into pilot holes provided.

Place adhesive felt 042-035141 over head of right side mounting screw.

### NOTE

On older organs not equipped with pilot holes, measure 1-3/8" to left of right leg and 5/8" toward rear from front of rail for location of first hole. Use mounting rail as a template for remaining two screw locations. Pierce pilot holes with an awl or other suitable tool.

Do not tighten mounting screws until instructed in step 3-3. f, below.

- d. Reinsert screw removed in step b, above, through slotted hole at rear of rail, placing a washer, 999-000065, between lip of rail and terminal strip cover.
- e. Back out the two small screws at either end of the mounting rail far enough to permit insertion of switch assembly, 125-000045 into rails. Slide switch assembly into rails and retighten screws.
- f. Pull control cable to left to take up slack, then tighten the three rail mounting screws.

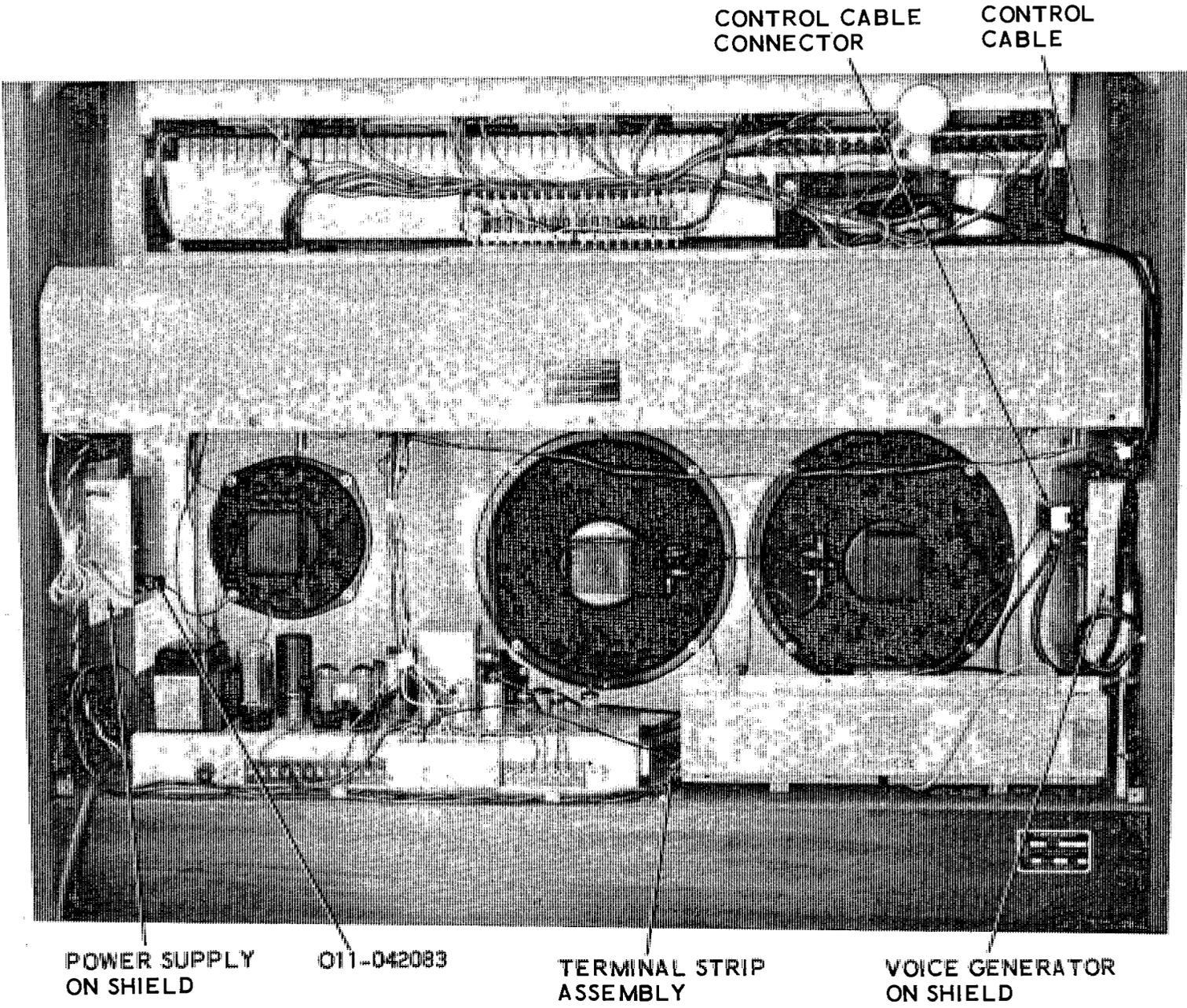
### NOTE

Allow sufficient slack in control cable to allow switch assembly to move freely in and out on its track.

- g. Feed connector end of control cable through opening under left end block (to left of lower manual) to rear of organ.
- h. Install three adhesive-backed clips, 013-042242 at approximate locations shown in Figure A-1.

To install clips (see Figure A-2):

1. Remove protective backing to expose adhesive.
2. Install as shown in Figure A-2.
3. Adhesive backing will anchor clip.
4. Insert cable into clip. Pull clip open sufficiently to clear cable if necessary.
5. Compress clip until locking lip engages.



CONTROL CABLE  
CONNECTOR

CONTROL  
CABLE

POWER SUPPLY  
ON SHIELD

O11-D42083

TERMINAL STRIP  
ASSEMBLY

VOICE GENERATOR  
ON SHIELD

Figure A-9:  
Power Supply Voice Generator & Terminal Strip Installation on M-100

### 3-4. INSTALLATION OF POWER SUPPLY. —

The power supply is to be installed in the position indicated in Figure A-9, on left panel (rear view) of organ.

Proceed according to the following:

- a. Place power supply shield, 010-042054, on panel, and use as a template to pierce 4 pilot holes, if none exist.
- b. Place power supply, 127-000028 (-30) over shield and fasten both to panel with four screws, 884-050734.

### 3-5. INSTALLATION OF VOICE GENERATOR. —

Observe position of voice generator, 063-042080, as shown in Figure A-9.

The generator is fastened to the right panel over shield, 010-042082 in a manner similar to that used for installing the power supply (Paragraph 3-4).

### 3-6. ASSEMBLY OF TERMINAL STRIP. —

Assemble terminal strip as shown in Figure A-10, using .0033 uf capacitor, 425-010622, 470 pf capacitor, 425-010412, and 1 meg resistor, 600-021211.

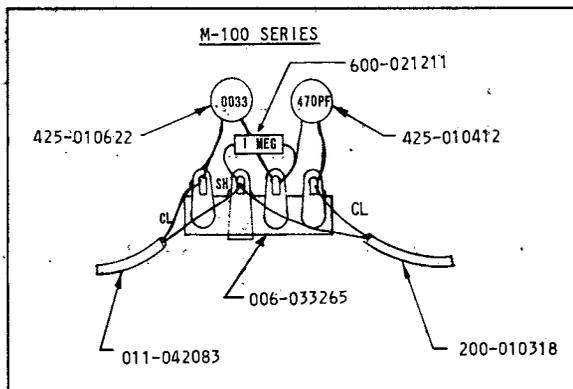


Figure A-10.  
Terminal Strip Assembly for  
M-100

### 3-7. INSTALLATION OF TERMINAL STRIP ASSEMBLY. —

Install terminal strip assembly on bottom shelf of organ as shown in Figure A-9, using the screw which holds the plastic cable clamp located to the right (rear view) of the amplifier chassis.

### NOTE

The screw will now hold both the terminal strip and the cable clamp.

### 3-8. INTERCONNECTIONS. — Proceed according to the following:

- a. Insert phone plug of wire and plug assembly, 011-042083, into phone jack on voice generator assembly.
- b. Solder free ends of wire and plug assembly to terminal strip assembly as shown in Figure A-10;
- c. Solder shield and conductor of shielded lead, 200-010318 to terminal strip assembly as shown in Figure A-10.
- d. Solder other ends of 200-010318 to amplifier terminals as shown in Figure A-11.

### NOTE

Route inner conductor through small hole on plate located directly above amplifier terminal strip. Ground shield to screw on plate. Some early models do not have hole. Drill 3/16" hole if necessary.

- e. Route AC power wires from Rhythm II power supply through hole provided in left rear (rear view) of generator shelf, and solder to terminal strip of generator as shown in Figure A-12.
- f. Route the red and black pair of wires from voice generator along existing cabling on bottom shelf of organ, and insert the plug into its mating jack on the Rhythm II power supply.
- g. Cut away a section 1/2" x 5" from the lower right side (rear view) of the fibreboard generator cover, as shown in Figure A-13. Reattach generator cover.
- h. Route control cable with 16-pin plug attached along the right panel (rear view) and down the cutaway made in the preceding step to the voice generator assembly. See Figure A-9. Mate the 16-pin plug to the socket on the voice generator.

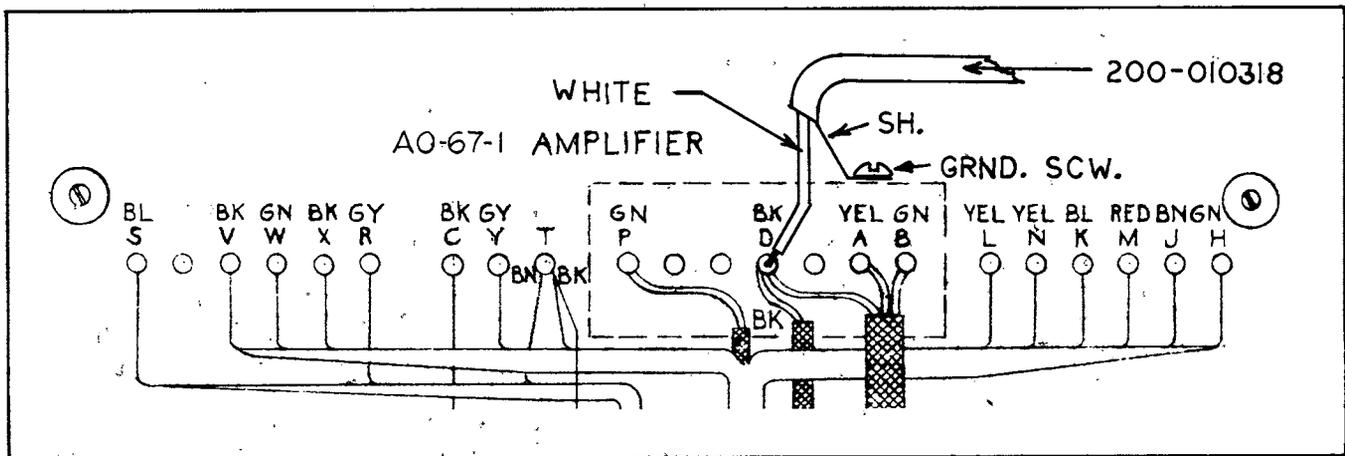


Figure A-11.  
Coaxial Connections to M-100 Amplifier

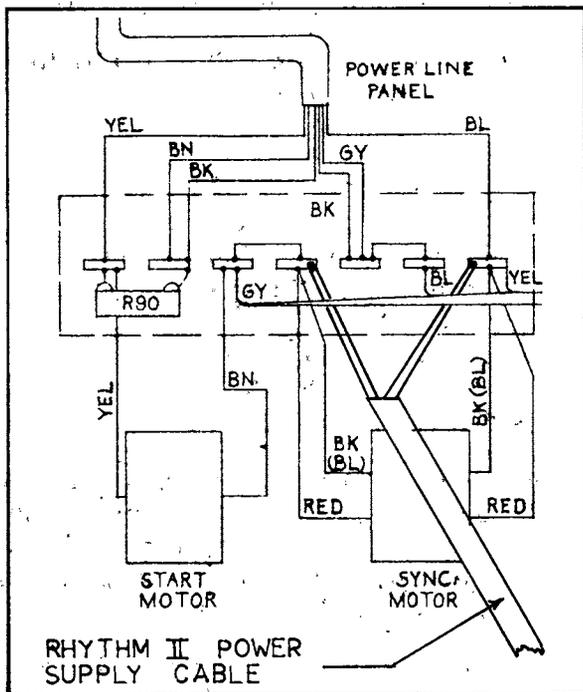


Figure A-12.  
Power Connections to  
M-100 Generator

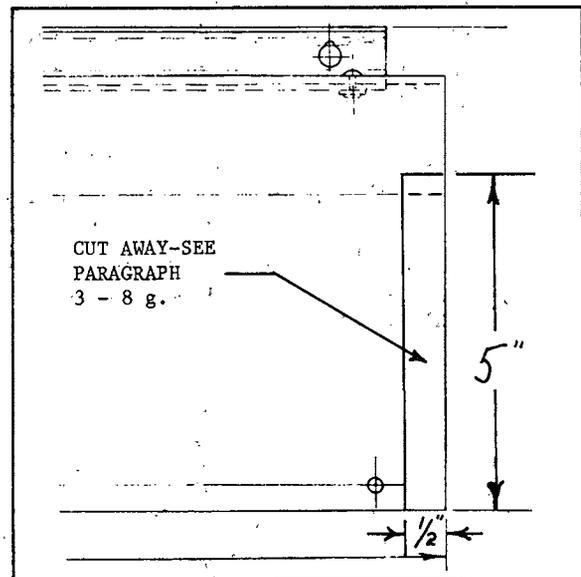


Figure A-13.  
Cutaway to Accommodate Control  
Cable in M-100

- i. Fasten control cable to voice generator by means of plastic cable tie mounted on generator.

**3-9. COMPLETION OF INSTALLATION. -**  
Proceed according to the following:

- a. Dress all leads and tie new cables to existing cables with plastic ties, 013-031744, provided.

- b. Reinstall terminal strip cover removed in step 3-2. c.
- c. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.
- d. Reattach back cover of organ, making certain that control cable is in place in cutaway (Paragraph 3-8, g. and h.). The back cover will hold the control cable in place. This completes installation.

## SECTION IV N-100, N-200

### NOTE

Check contents of kit before starting installation. Be sure all required parts are at hand.

- 4-1. GENERAL.** — This section contains instructions for installing the Rhythm II accessory on N-100 and N-200 Series organs.
- 4-2. USE OF PARTS.** — Only the following parts contained in the kit are required for N-Series installations.

- a. Remove and set aside cable ties from cabling to lower right end block to provide slack.
- b. Remove three screws which hold lower right end block and lift up end block.
- c. Position switch assembly 125-000045 on floor under right front of organ and feed 16-pin plug through large hole in the generator shelf from underneath, and toward rear of organ, then down through the large hole in the rear of the generator shelf.
- d. Reattach lower right end block with screws removed in Step 4-4a.

QTY.	PART NUMBER	DESCRIPTION
1	125-000045	Switch (Control) Assembly
1	035-042081	Mounting Rail
3	884-050933	Screws
6	884-050734	Screws #6
1	063-042080	Voice Generator
1	010-042080	Voice Generator Shield
1	011-042083	Wire and Plug Assembly
3	013-031744	Plastic Tie
1	042-035141	Adhesive Backed Felt
1	HO-449	Installation Instructions

**NOTE**

No other parts of kit are used for N-100, N-200 installation.

- 4-3. PREPARATION OF ORGAN.** — Disconnect organ from power source. Remove and set aside organ parts listed below.
- a. Back cover.
  - b. Leslie unit.

- e. Install mounting rail 035-042081, open end toward front of organ as shown in Figure A-1. Fasten with three screws 884-050933 driven into pilot holes, and two screws 884-050734 at rear.

### NOTE

The following instructions are for right-hand installation of the Rhythm II Control. The control may be mounted at the left of the organ at the owner's option.

### NOTE

If pilot holes are not provided, use mounting rail as a template to pierce holes. Locate right-hand hole in the row of three holes 1-3/4-inch to the left of the inner face of the decorative wood block.

- 4-4. INSTALLATION OF SWITCH ASSEMBLY.** — Proceed according to the following:

- Place adhesive felt 042-035141 over head of right-hand screw in the row of three.

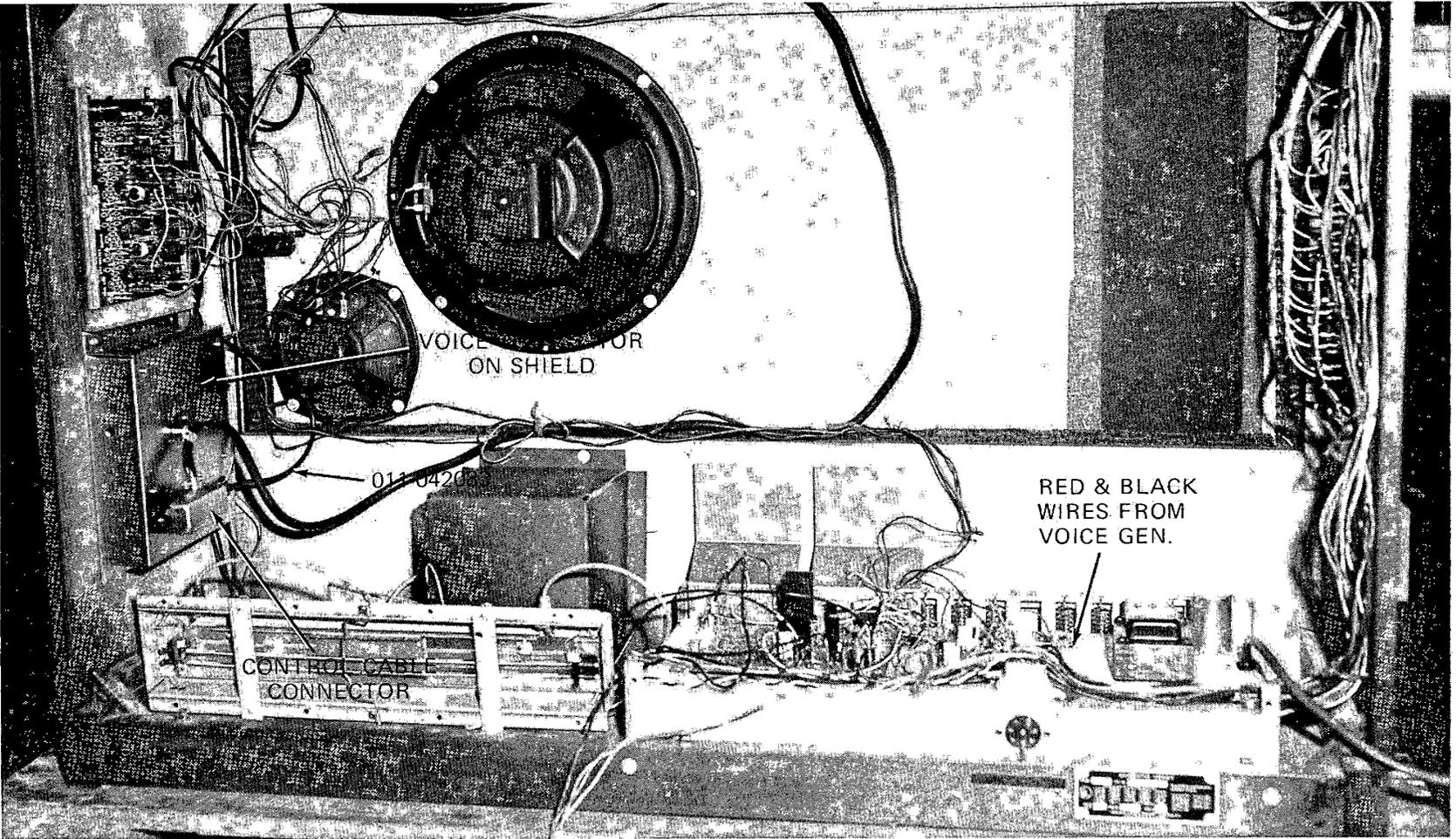


Figure A-14  
Locations of Voice Generator & Power Connections N-100, N-200



- f. Back out two small screws at either end of mounting rail far enough to permit insertion of switch assembly 125-000045 into rails. Slide switch assembly into rails, and retighten screws.
- g. Pull control cable toward rear of organ to take up slack.

**NOTE**

Allow sufficient slack in control cable to permit switch assembly to move freely on its tracks.

**4-5. INSTALLATION OF VOICE GENERATOR. —**  
Proceed according to the following:

- a. Place voice generator 063-042080 over shield 010-042082 and fasten generator on shield to inside left end wall (rear view) in the position shown in Figure A-14. Fasten with four screws 884-050734.

**NOTE**

If pilot holes do not exist, use shield as a template to pierce holes. Locate rear bottom hole  $3\frac{1}{2}$  inches up from the bottom shelf of the organ, and 3 inches in from the rear edge.

**4-6. INTERCONNECTIONS. —** Proceed according to the following:

- a. Mate 16-pin connector on control cable to its receptacle on voice generator.
- b. Fasten cable to voice generator by means of plastic tie mounted on generator.
- c. Loosen the two screws which hold the upper left end block, and lift the block (Block is held by friction fasteners at the front). Feed plug end of wire and plug assembly 011-042083 through opening toward rear of organ.
- d. Connect conductor and shield to underside of end block; N-100 according to Figure A-15; N-200 according to Figure A-16. Solder connections. Reattach end block and tighten screws.
- e. Route plug and cable along generator shelf and feed plug through large opening

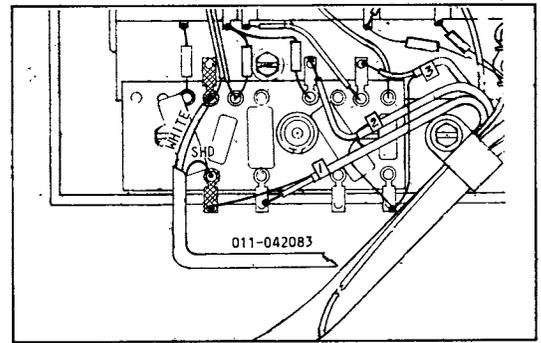


Figure A-15.  
Connections to Upper  
Left End Block, N-100

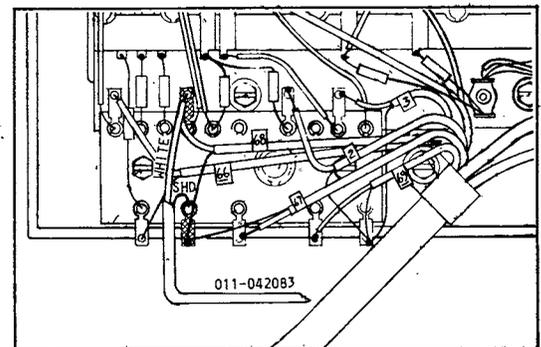


Figure A-16  
Connections to Upper  
Left End Block, N-200

at left rear of organ, (rear view). This is same opening through which control cable is routed. Mate plug with mating connector on voice generator.

- f. Cut plug from ends of red and black wires attached to voice generator. Strip ends of wires  $1/4$  inch. Connect red and black wires to organ power supply terminal strip as shown in Figure A-17. Solder.

**NOTE**

Some organs may have six-lug terminal strip. In any case, connect black wire to ground.

- g. Tie all newly installed cabling neatly to existing cabling, using cable ties 013-031744. Tie lower right end block cabling to original harness, using ties removed at Step 4-4a.

- h. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.
- i. Disconnect organ from power source and reattach parts set aside in Step 4-3. This completes installation.

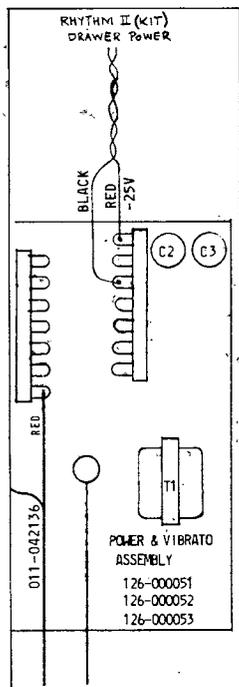


Figure A-17.  
Power Wiring,  
N-100, N-200

# SECTION V

## J-100, J-200, J-300

### NOTE

Check contents of kit before starting installation. Be sure all required parts are at hand.

- 5-1. **GENERAL.** – This section contains instructions for installing the Rhythm II Accessory on J-100, J-200, and J-300 Series organs.

- 5-4. **INSTALLATION OF SWITCH ASSEMBLY.** – Proceed according to the following:

- a. Remove three screws which hold lower right end block. Lift up end block.
- b. Elongate hole in the generator shelf (under right-hand end block) approximately  $\frac{3}{4}$ " toward front of organ. The hole must be made large enough to allow 16-pin connector to pass through. Remove 6 screws and housing from the control cable connector (16-pin plug).

QUANTITY	PART NUMBER	DESCRIPTION
1	125-000045	Switch (Control) Assembly
1	035-042081	Mounting Rail
3	884-050933	Screws
5	884-050734	Screws, #6
1	063-042080	Voice Generator
1	010-042082	Voice Generator Shield
1	011-042083	Wire & Plug Assembly
1	200-010318	Shielded Lead
1	042-035141	Adhesive Backed Felt
3	013-031744	Plastic Tie
1	600-021131	Resistor 470K ohm
1	006-033265	Terminal Strip
1	425-010582	Disk Capacitor .0022 uf
1	816-081814	Machine Screw
2	823-102514	Machine Screws, #10
1	HO-449	Installation Instructions

**NOTE**

No other parts of kit are used for this installation.

- 5-2. **USE OF PARTS.** – Only the following parts contained in the kit are required for J-Series installations.

- 5-3. **PREPARATION OF ORGAN.** – Disconnect organ from power source. Remove and set aside organ parts listed below:

- a. Back Cover
- b. Leslie Unit (J-200/J-300)
- c. Organ Top

### NOTE

The following instructions are for right-hand installation of the Rhythm II control. The control may be mounted at the left of the organ at the owner's option.

Position switch assembly 125-000045 on floor under right front of organ and feed 16-pin plug through elongated hole in the generator shelf from underneath, and toward rear of organ, then down through the large hole in the rear of the generator shelf. Reattach housing and 6 screws to 16-pin plug.

### NOTE

An alternative to enlarging the hole is to remove housing and unsolder the 16 wires from the 16-pin plug. Then feed cable through hole from underneath and toward the rear of organ, then down through the large hole in the rear of the generator shelf. Now resolder the 16 wires to

the pins and reattach the housing to the connector. Care must be taken since the same color is used more than once in the harness (only 12 different colors are used). Under these conditions the plug can be easily miswired. Label the duplicate colored wires before removing. In case of malfunctioning after rewiring, refer to this Rhythm II Service Manual, Cable & Connector Wiring Diagram Figure 5-12.

- c. 1. Reattach lower right-hand end block. Fasten with only one screw removed in step 5-a, driven into hole behind right leg of organ.
2. Remove screw holding lower manual to shelf so that the mounting rail can be put in place.
3. Install mounting rail 035-042081, open end toward front of organ as shown in Figure A-1. Fasten with 2 screws 823-102514 to the lower right-hand end block and 3 screws, 884-050933 into the 3 front pilot holes. Place adhesive felt 042-035141 over head of right-hand screw in the row of 3. Replace screw removed from lower manual with 816-081814. Discard screws previously removed but not re-used in this step.

#### NOTE

If pilot holes are not provided, use mounting rail as template to pierce holes. Locate right-hand hole of 3 holes by placing mounting rail against right leg, or on legless models, 3-1/8" from outer edge of cabinet.

- d. Back out 2 small screws at either end of mounting rail far enough to permit insertion of switch assembly 125-000045 onto rails. Slide switch assembly onto rails and retighten screws.
- e. Pull control cable toward rear of organ to take up slack.

#### NOTE

Allow sufficient slack in control cable to permit switch assembly to move freely on its tracks.

#### 5-5. INSTALLATION OF VOICE GENERATOR. — Proceed according to the following:

- a. Place voice generator 063-042080 over shield 010-042082 and fasten generator on shield to inside left end wall (rear view) in a position similar to that shown in Figure A-9 or A-14. Fasten with 4 screws 884-050734.

#### NOTE

Use shield 010-042082 as a template to pierce pilot holes. Locate rear bottom hole 8-1/2" up from bottom shelf of the organ, and 1" from the rear edge.

- 5-6. **TERMINAL STRIP ASSEMBLY.** — Assemble terminal strip assembly as shown in Figure A-18, using .0022 uf capacitor, 425-010582, and 470K resistor, 600-021131. Fasten terminal strip to right of top shelf (rear view) 5" from rear edge and 1" from inside right-hand wall. Use 1 screw 884-050734.

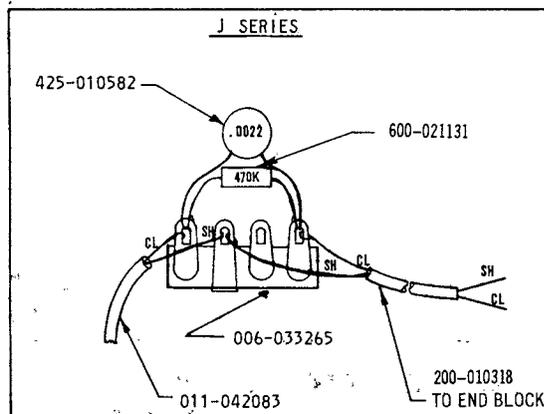


Figure A-18.  
Terminal Strip Assembly  
For J Series

#### 5-7. INTERCONNECTIONS. — Proceed according to the following:

- a. Mate large connector on end of control cable to receptacle on voice generator.
- b. Fasten cable to voice generator by means of plastic cable tie mounted on generator.
- c. Insert phone plug of wire and plug assembly, 011-042083, into phone jack on voice generator assembly.

- d. Solder free ends of wire and plug assembly, 011-042083, to terminal strip assembly, as shown in Figure A-18.
- e. Remove 5-prong plug from red and black wire leads attached to voice generator assembly and connect ends of these wires to the organ power supply terminal strip as shown in Figure A-19.

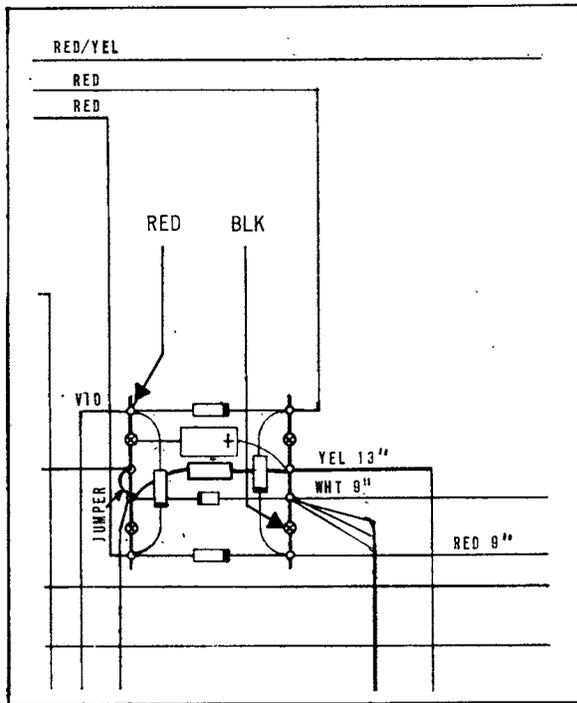


Figure A-19.  
Power Connections, J Series

- f. Solder one end of shielded lead 200-010318 to terminal strip as shown in Figure A-18. Solder other end to upper left-hand end block as shown in Figure A-20.

**5-8. COMPLETION OF INSTALLATION.** — Proceed according to the following:

- a. Tie all newly installed cabling neatly to existing cabling, using cable ties 013-031744.
- b. Connect organ to power source and check operation of Rhythm II. If foregoing instructions have been carefully followed, unit should operate properly.
- c. Reattach Leslie unit (J-200/J-300), top of organ, and back cover. This completes installation.

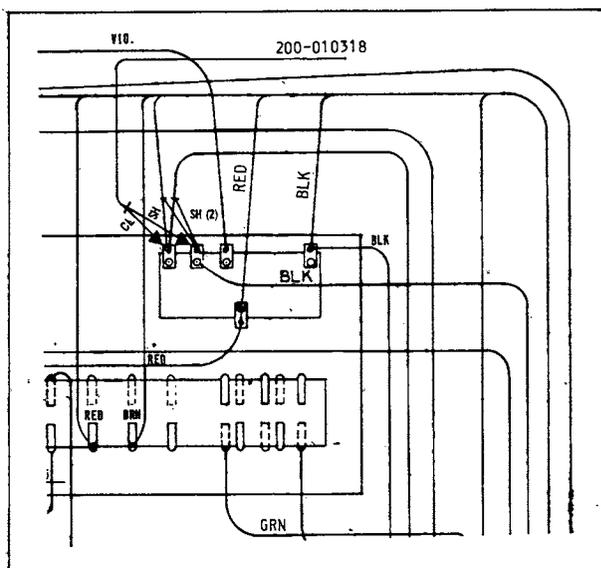


Figure A-20.  
Connections to End Block, J Series