

**ELECTRONIC RHYTHM INSTRUMENT**

**RHYTHM ACE**

**model FR-2L**

**SERVICE NOTE**

**ACE ELECTRONIC INDUSTRIES INC.**

## RHYTHM ACE FR-2L

### MAIN FEATURES

Rhythm patterns(Rhythm selectors)	16
Waltz	
Dixieland	
Western	
Rock' n Roll	
Slow Rock	
Bossanova	
Foxtrot	
Swing	
Tango	
Beguine	
Rhumba	
Samba	
Mambo	
Cha-Cha	
Shuffle	
March	
Percussive Sounds	10
Bass Drum	
Low Conga	
High Conga	
High Bongo	
Cow Bell	
Claves	
Snare Drum	
Cymbal	
Maracas	
Wirebrush	
Cancel Button Switch	3
Cymbal	
Claves	
Snare Drum	
Volume Control Knob with Switch	1
Tempo Control Knob	1
Start Push Button Switch	1
Transistor	
2SB171B	25
2SB175B	5
2SC538	8
Diode	
SM150SS	107
Power Source	
110/117volts or 220-240volts	50/60 cycles
Dimension	
600 X 300 X 83mm	
Weight	
6kg	

## General Description

The Selector Switch is consisted of 16 push-button switches. All of these switches are rhythm selectors. When any rhythm selector button is depressed, the Rhythm Ace plays the corresponding rhythm. This switch also allows the musician to depress two or more buttons simultaneously to create truly unique rhythms. When the start switch is depressed, the Rhythm Ace is turned on.

The Tempo Control Knob is used to control tempo of the selected rhythm. Tempo is variable from 22 to 75 measures per minute.

The FR-2L itself is consisted of three major sections and a power supply. The first major section is the Control Section, which consists of the Rhythm Generator and Selection system. The second major section is the Audio Preamplifier. (Refer: Figure 1.)

### How to adjust semi-fixed resistors on print circuit boards (P.C.B.) and lug terminal

#### \*Tempo Speed:

Speed is variable by adjusting VR1 and VR3.

A: Set the tempo speed control knob at 4th marking from Slow side and adjust VR1 so that tempo light brightens 30 times per minute.

B: Set the same knob at 2nd marking from Fast side, and adjust VR3 until light brightens 60 times per minutes.

Repeat same procedures until tempo speed synchronizes with number of measures at 22, 24, 27, 30, 35, 40, 50, 60, 75, times per minute. (Ref: Fig. 5.6)

#### \*Decay Time:

If the duration of each sound is not satisfactory, the decay time (length of duration) can be adjusted by the following

resistors.

Bass Drum	VR4
Low Conga	VR5
High Conga	VR6
High Bongo	VR7
Cow Bell	VR8,9
Claves	VR10

When the sound of Snare Drum, Cymbal, Maracas and Wirebrush is too loud or too small, adjust VR11.

If the sounds of Bass Drum, Low Conga, High Conga, High Bongo, Cow Bell and Claves are louder than the same of Snare Drum, Cymbal, Maracas and Wirebrush or vice versa, slight adjustment is possible by VR138. (Ref. Fig. 2, 3&4)

The brightness of tempo lamp is adjustable by VR199 on the lug terminal located near metal cover for power supply.

(Ref. Fig. 2& 6)

Note:

The manufacturer holds the right of changing such component parts as resistors, condensers and coils for improvement with or without previous notice.

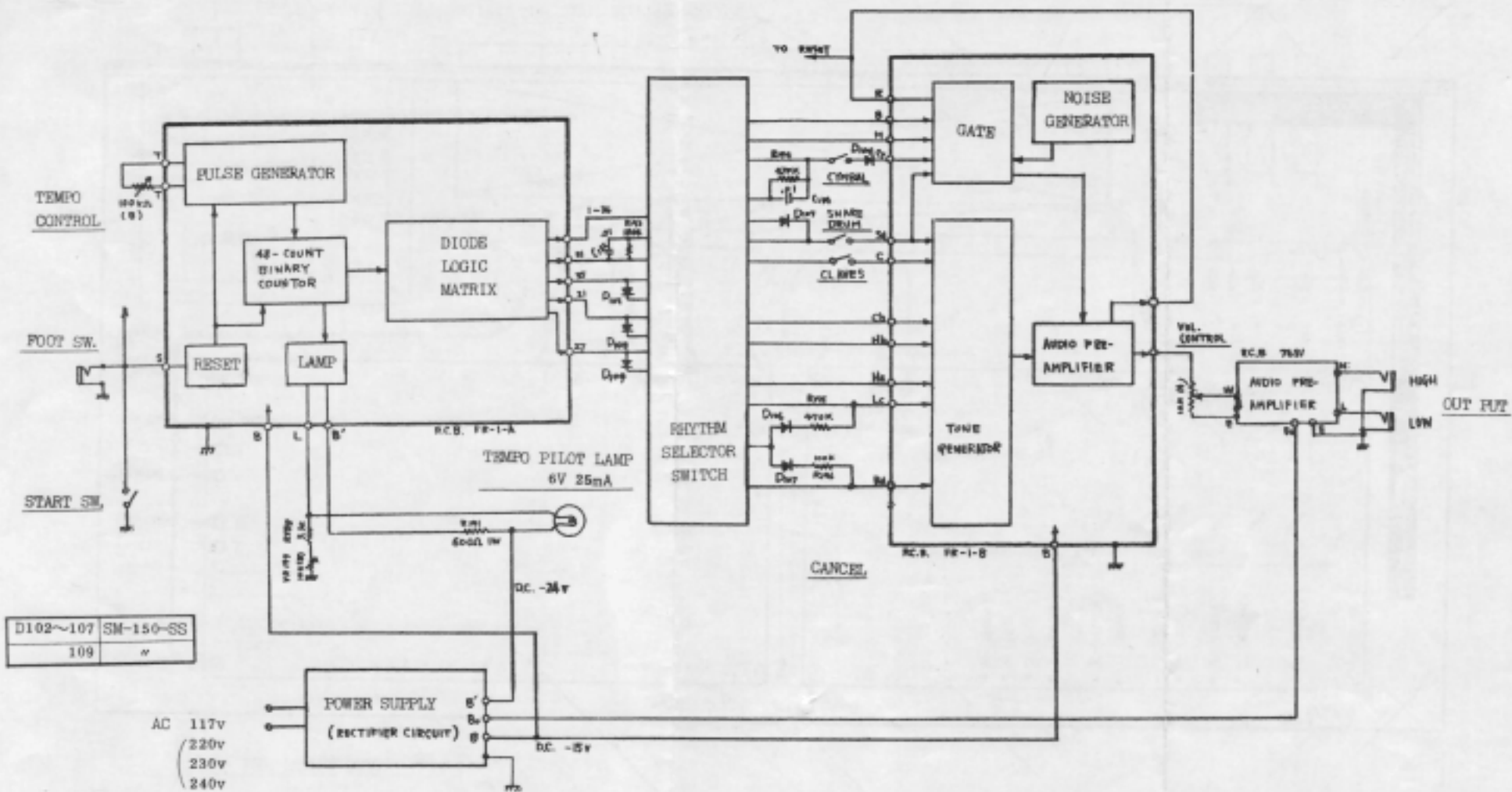


Fig 1 RHYTHM ACE FR-2L  
 Detailed Block Dia.

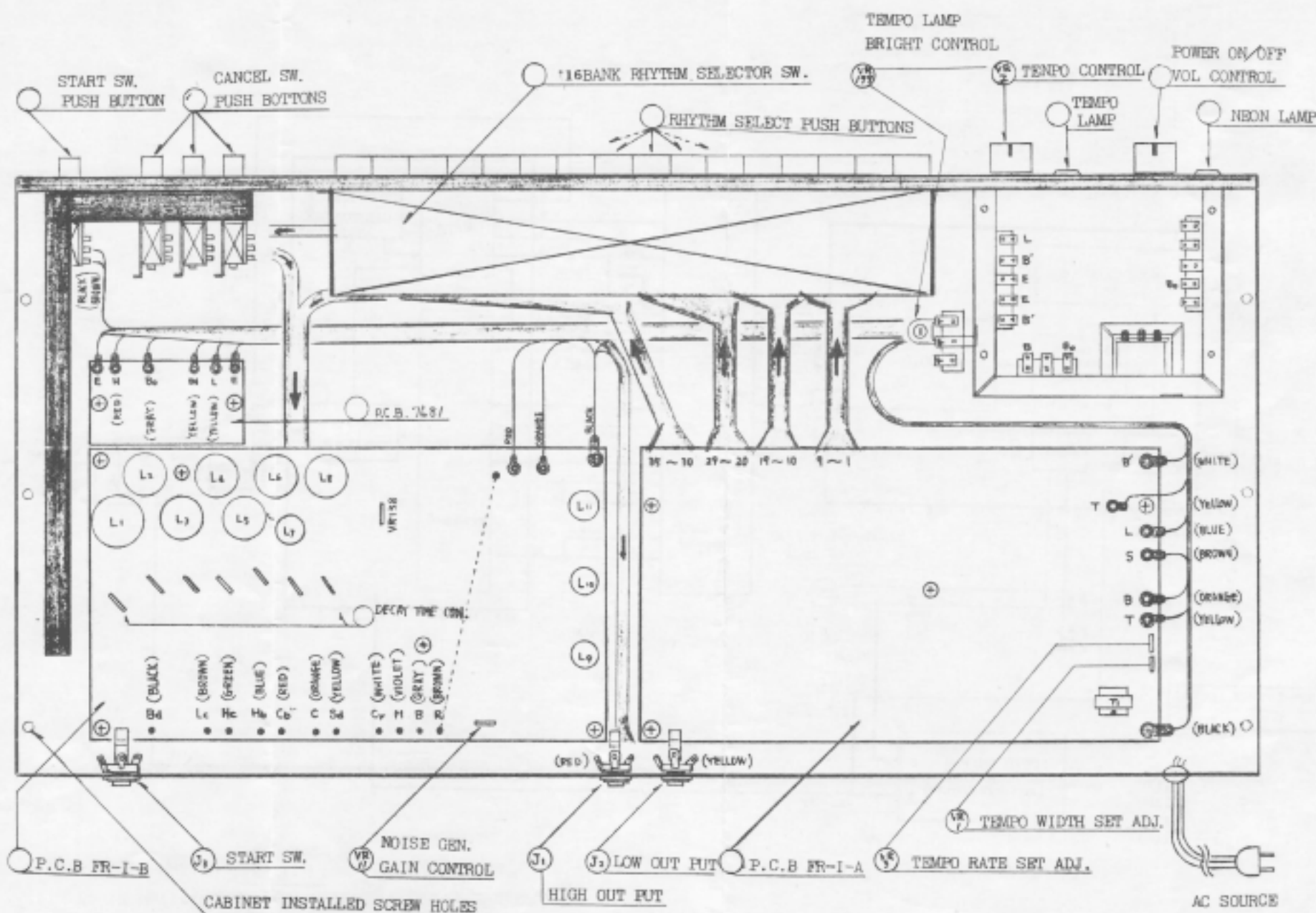
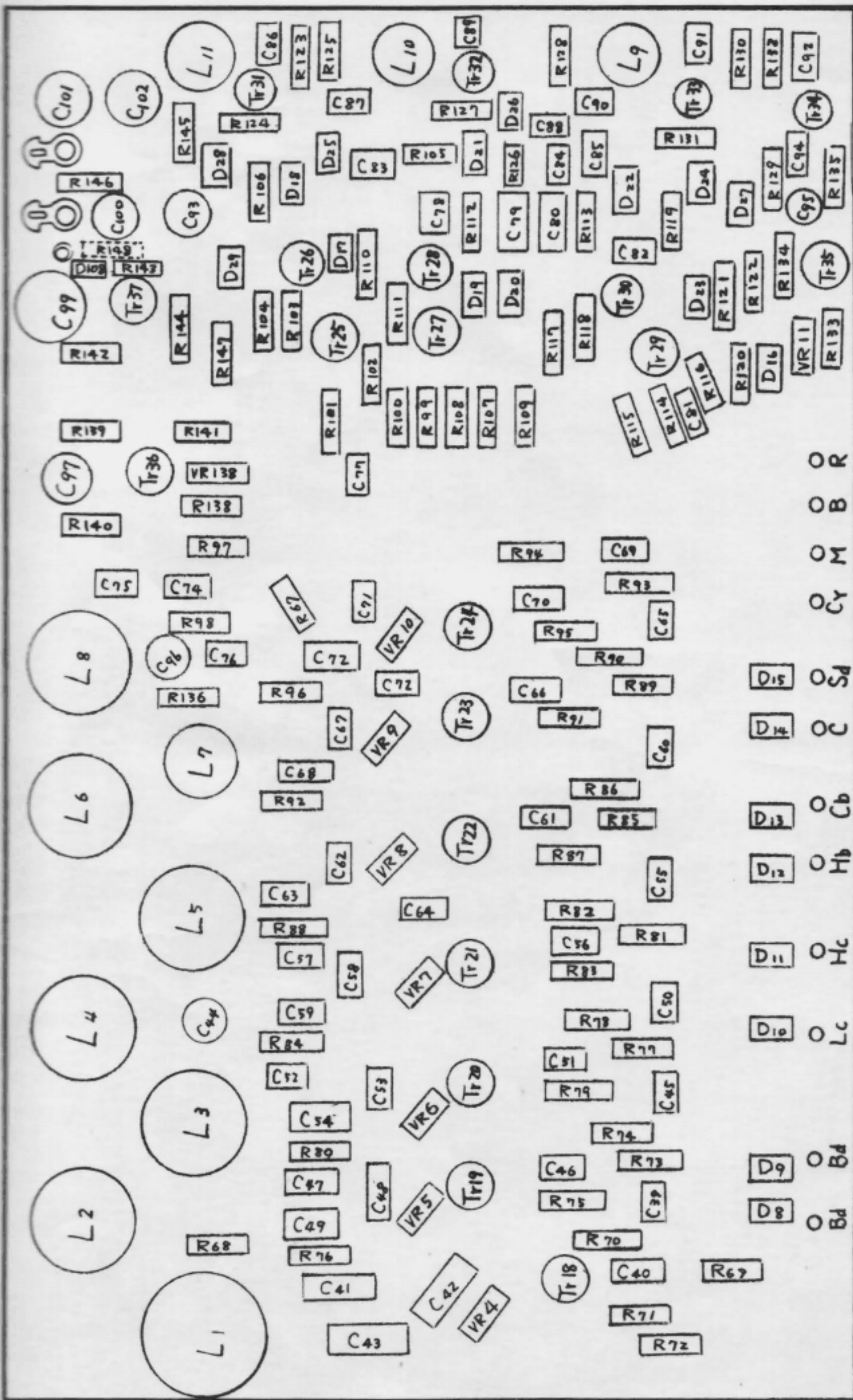


Fig 2

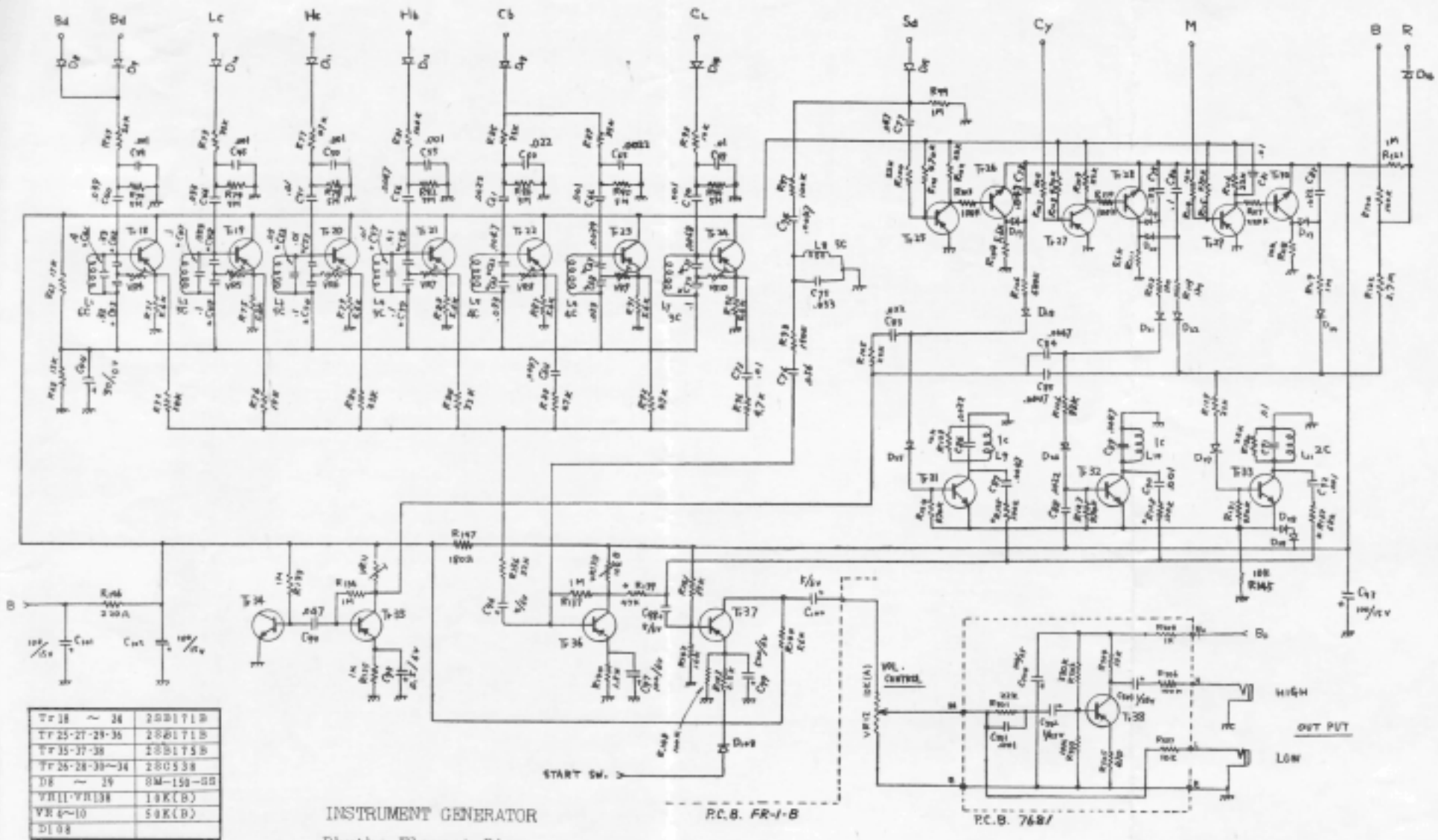


RHYTHM ACE FR-2L

Instrument Generator Assembly(P.C.B.FR-1B)

Fig 3

Elements Location Dia.



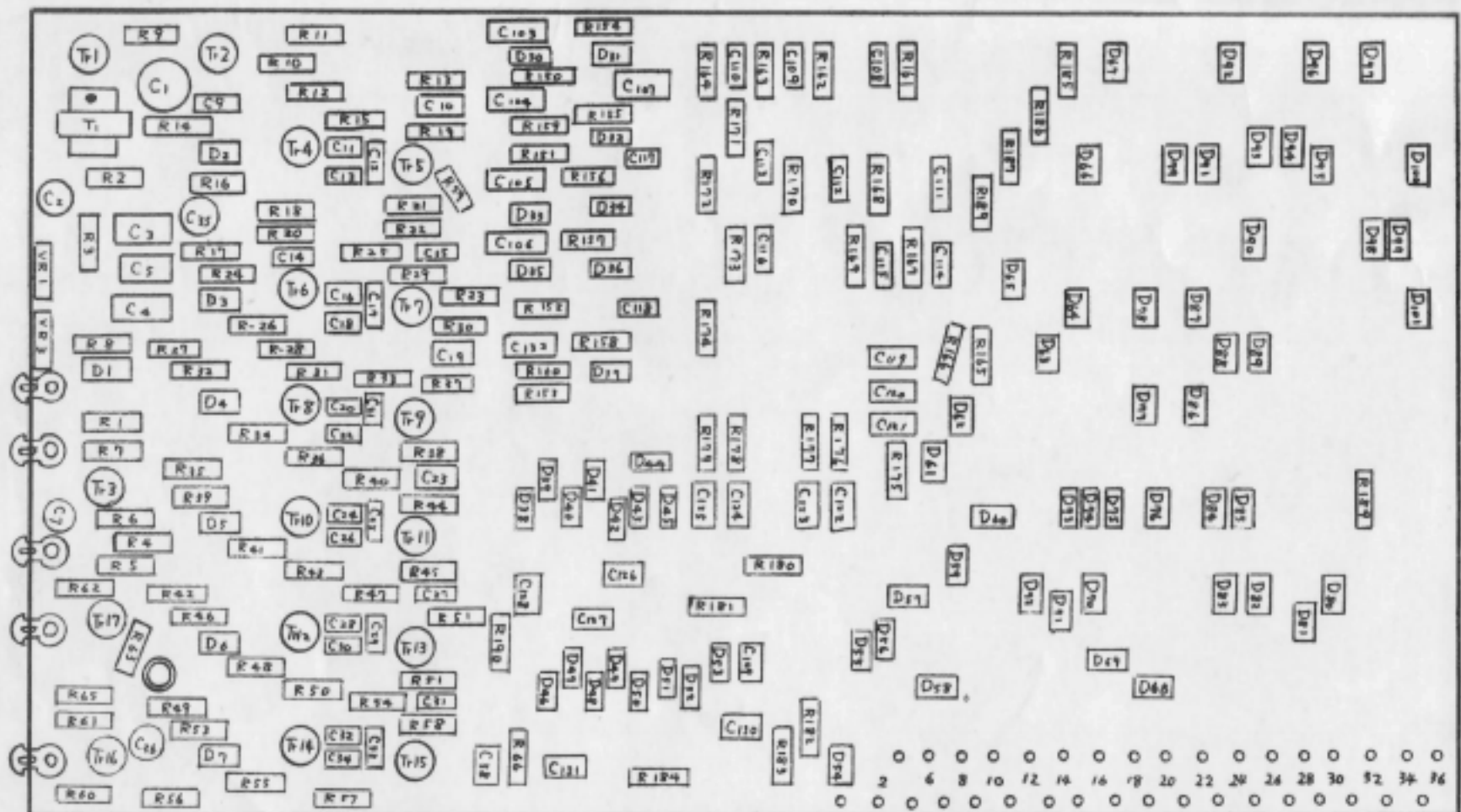
TR 18 ~ 24	200171B
TR 25-27-29-35	200171B
TR 33-37-38	100175B
TR 36-28-30-34	20055B
OR ~ 19	8M-150-00
VR11-VR18	10K(B)
VR 4-10	50K(B)
DI 08	

INSTRUMENT GENERATOR  
Rhythm Element Dia.

PREAMPLIFIER  
Schematic Dia.

Fig 4





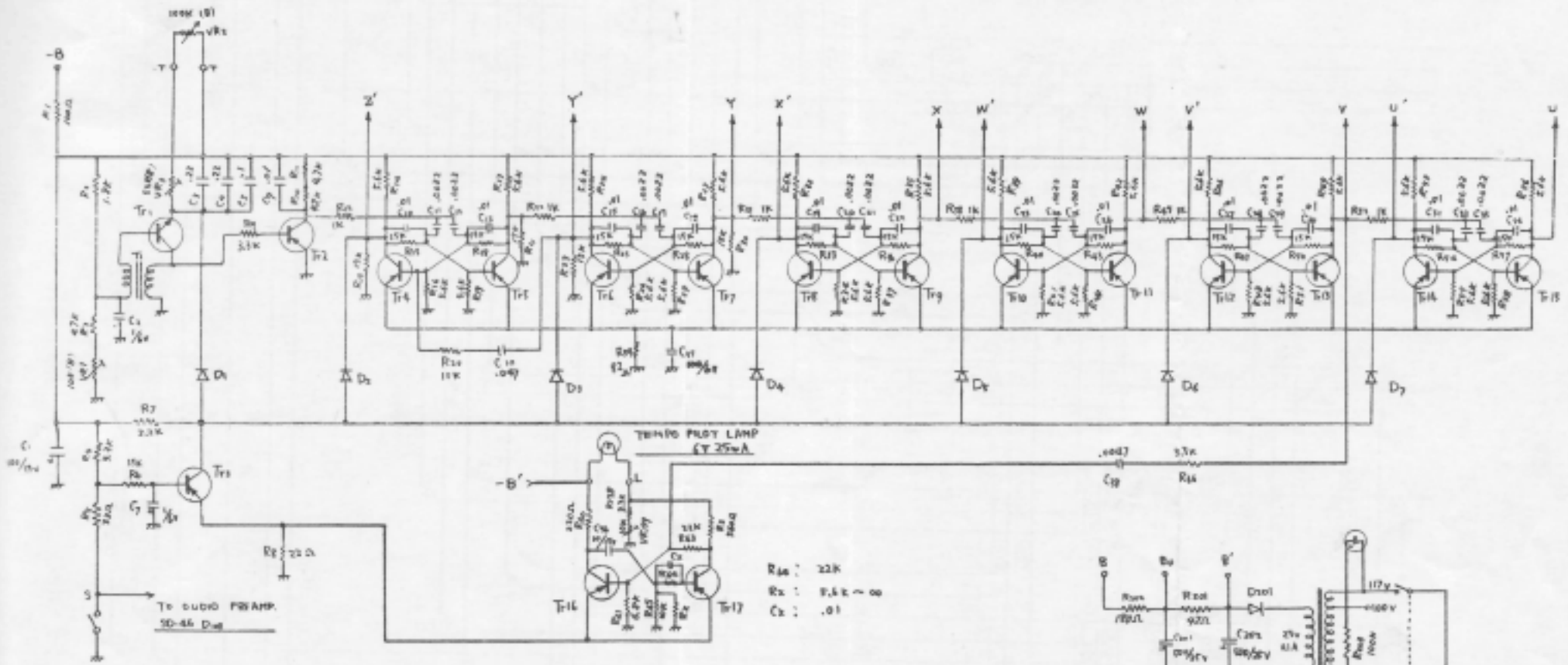
RHYTHM ACE FR-2L

Commutator and Logic Assembly(P.C.B.FR-1A)

Elements Location Dia.

Fig 5

TEMPO CONTROL



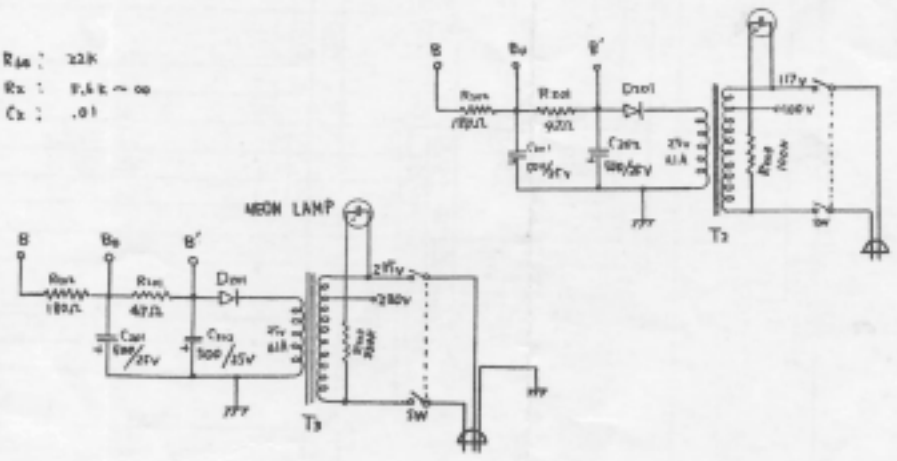
$R_{16} : 22K$   
 $R_{17} : 5.6K \sim \infty$   
 $C_{17} : .01$

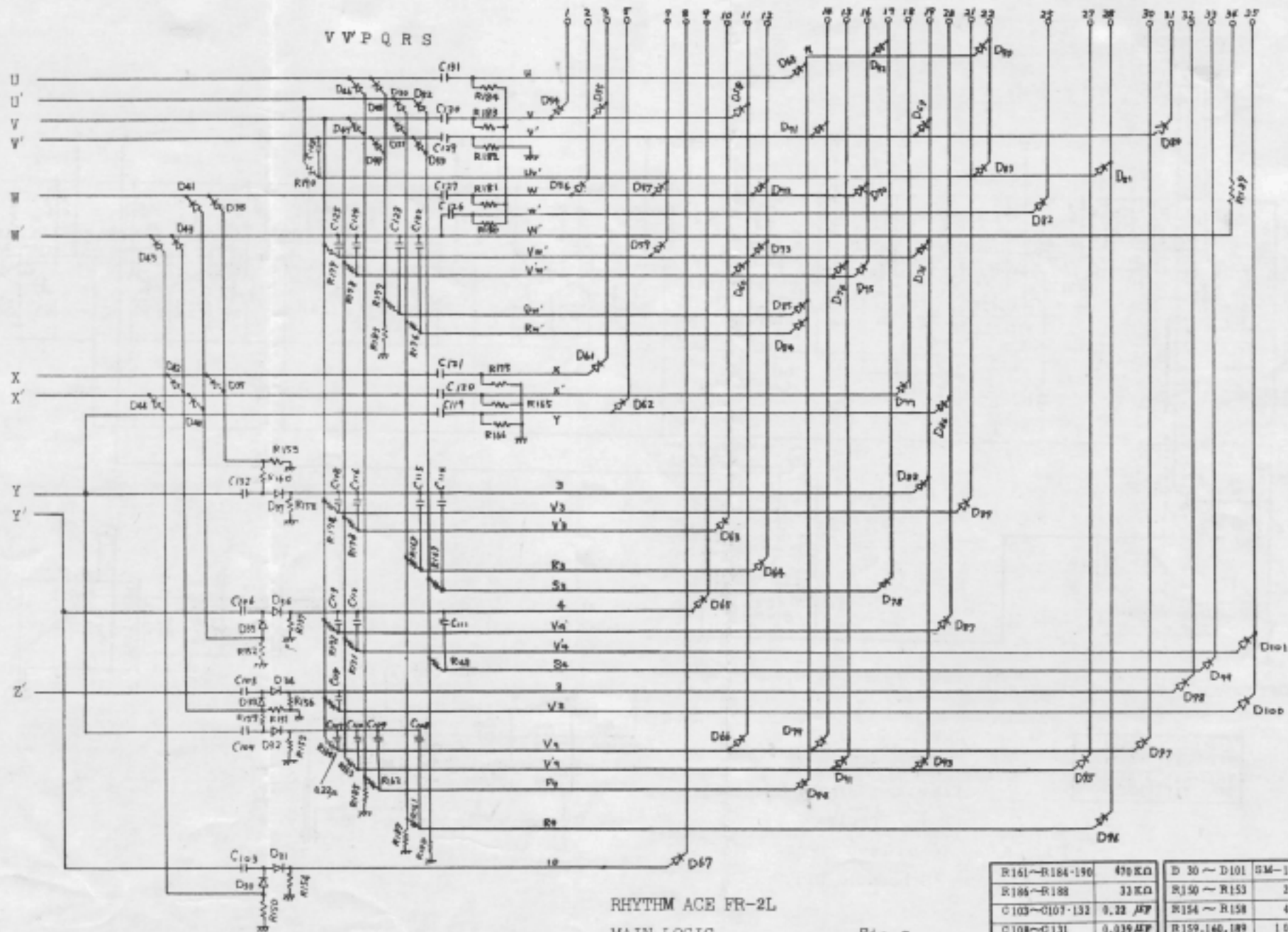
START SWITCH

T1	250538
T2 ~ 15	2001110
T16 ~ 17	2001150
D1 ~ 1, 2, 3	GM-150-88

RHYTHM ACE FR-2L  
 48-Count Binary Counter  
 Power Supply  
 Tempo Lamp  
 Schematic Dia.

Fig 6





RHYTHM ACE FR-2L  
 MAIN LOGIC  
 Schematic Dia.

Fig 7

R161~R184-190	470 KΩ	D 30 ~ D101	DM-150-05
R186~R198	33 KΩ	R150 ~ R153	22 KΩ
C103~C107-132	0.22 μF	R154 ~ R158	47 KΩ
C108~C131	0.039 μF	R159,160,189	100 KΩ

SELECTION SYSTEM  
SELECTOR SWITCH LAYOUT

CANCEL

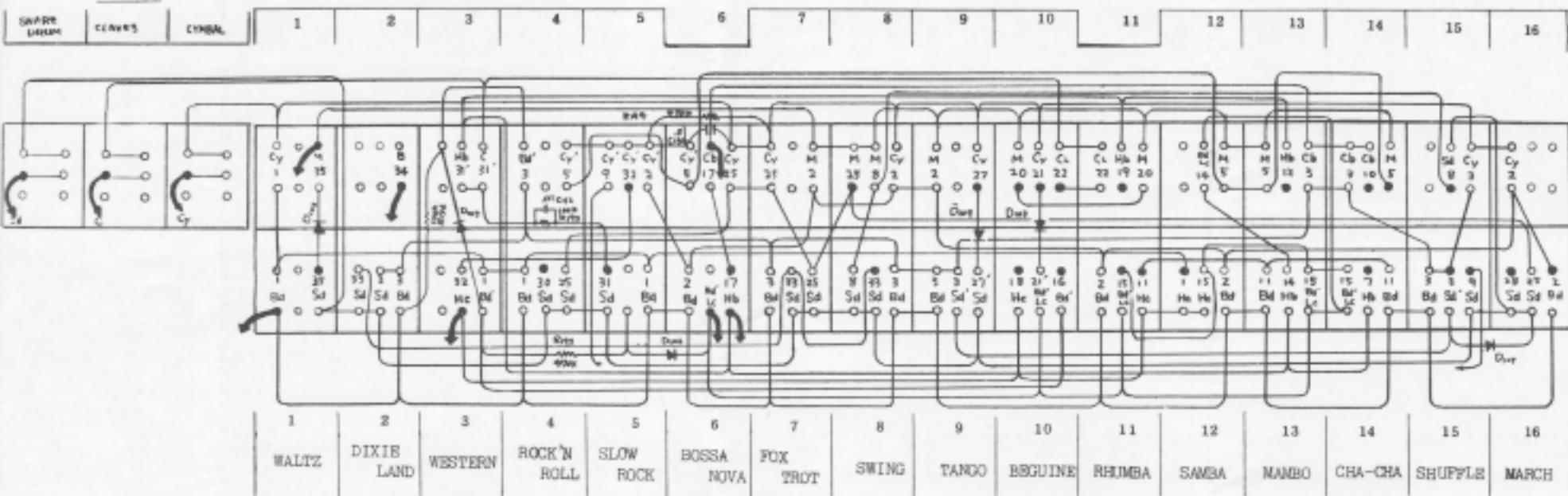
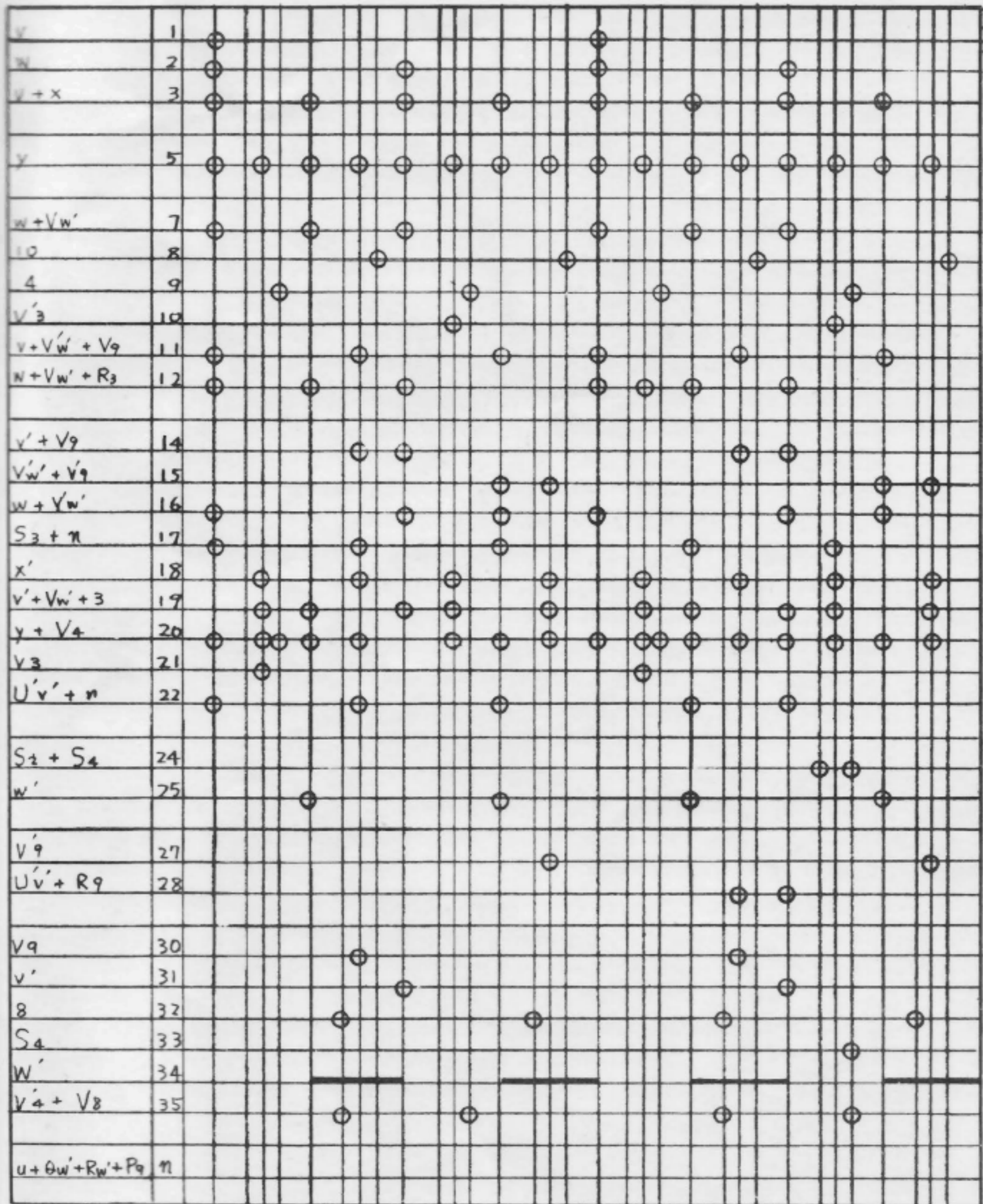


Fig 8

Time →

Code 1 2 3 4 1 2 3 4



LOGIC OUTPUT TIMING CHART

Figure 9 shows the logic outputs according to their numerical coding(1~35). Output logic is shown as positive pulses occurring at the times indicated. These times are the 48-Count Binary counter cycle time.

Fig 9

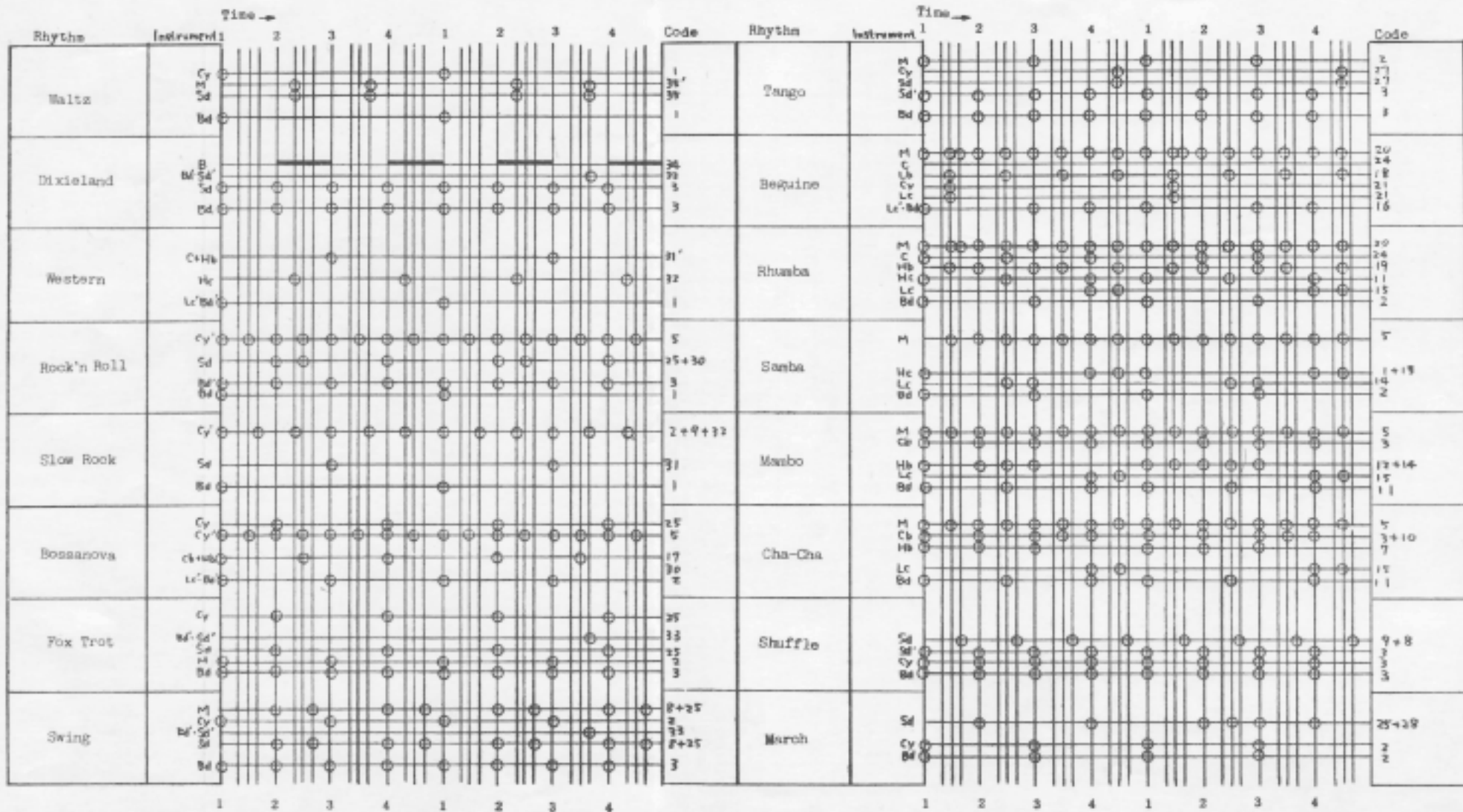


Fig 10

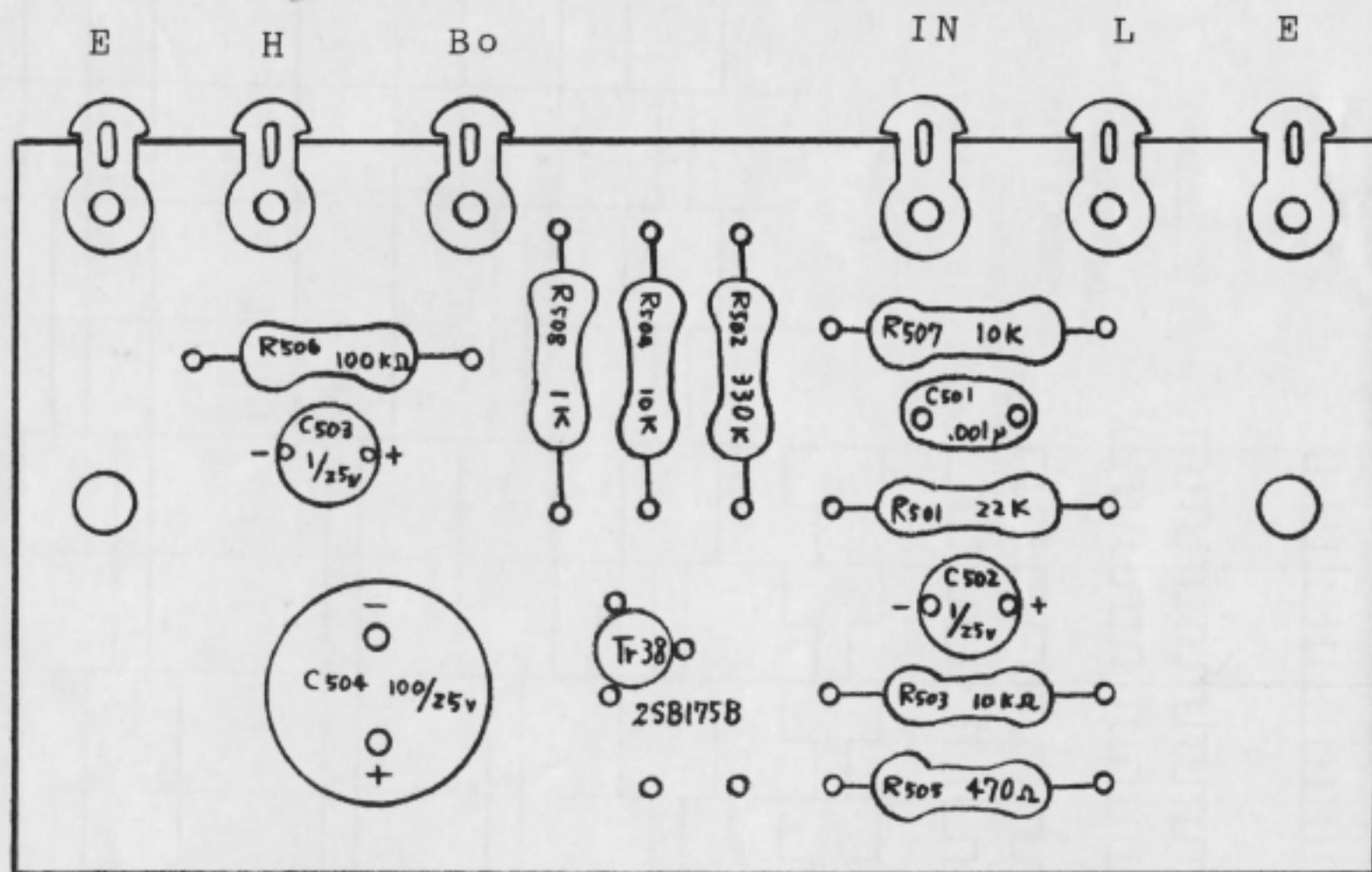


Fig 11

RHYTHM ACE FR-2L  
AUDIO PREAMPLIFIER

Elements Location Dia.

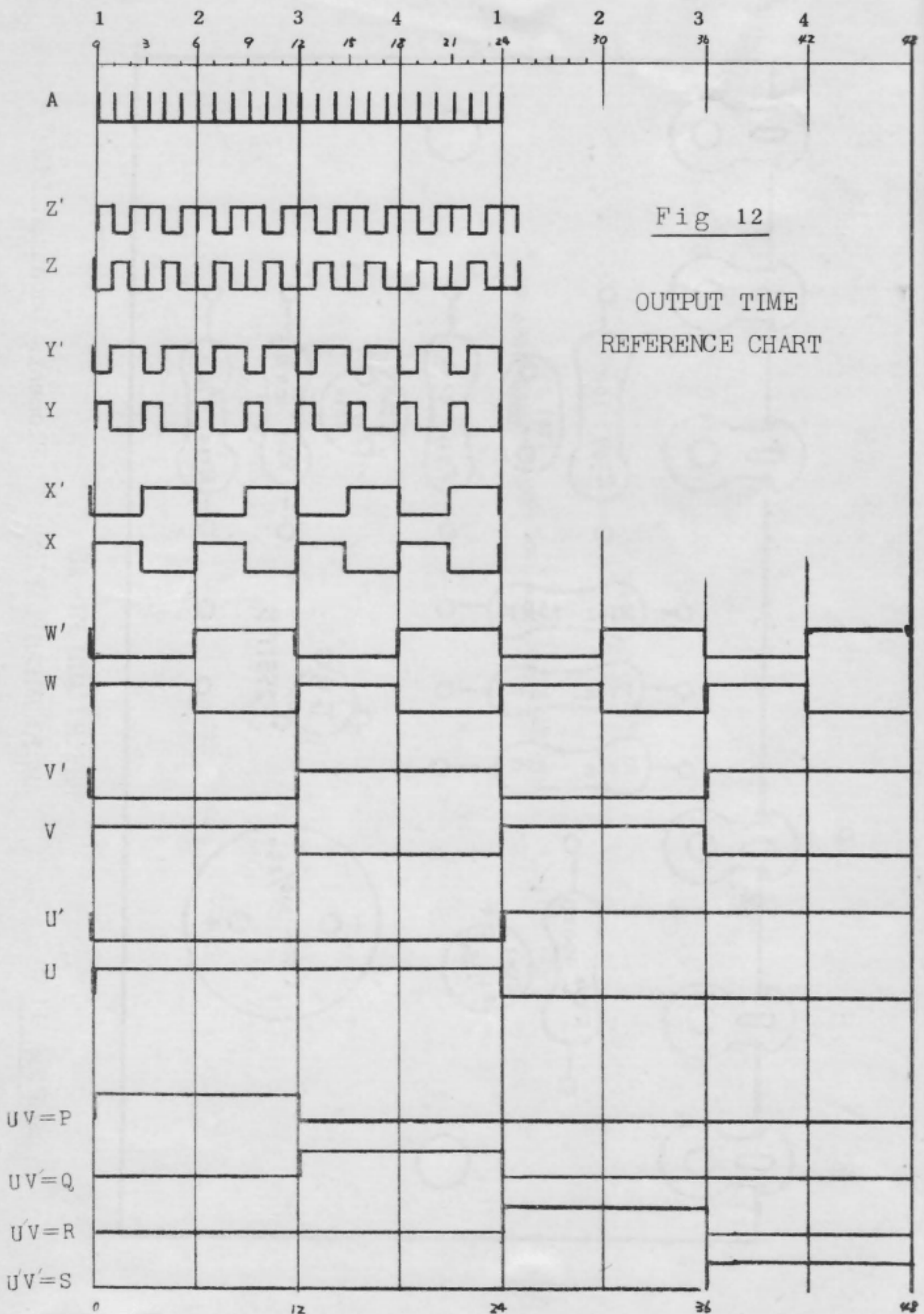


Fig 12

OUTPUT TIME  
REFERENCE CHART