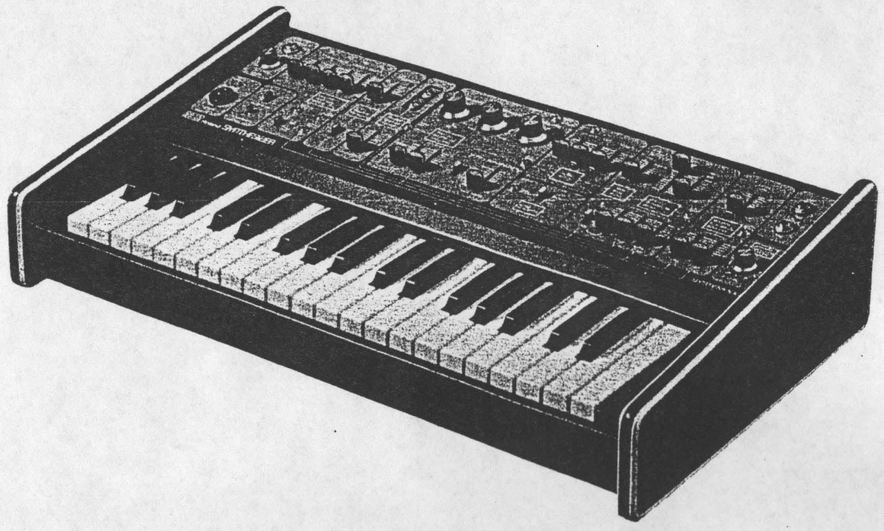
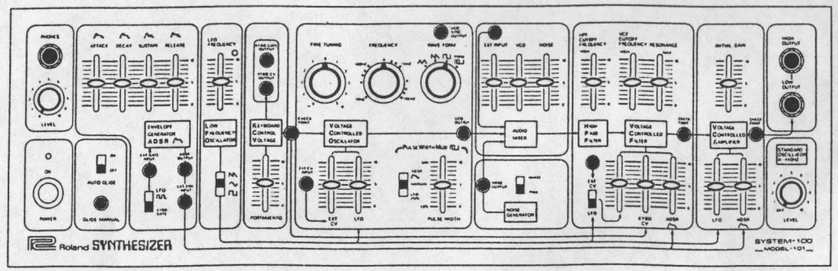
PANEL DIAGRAM





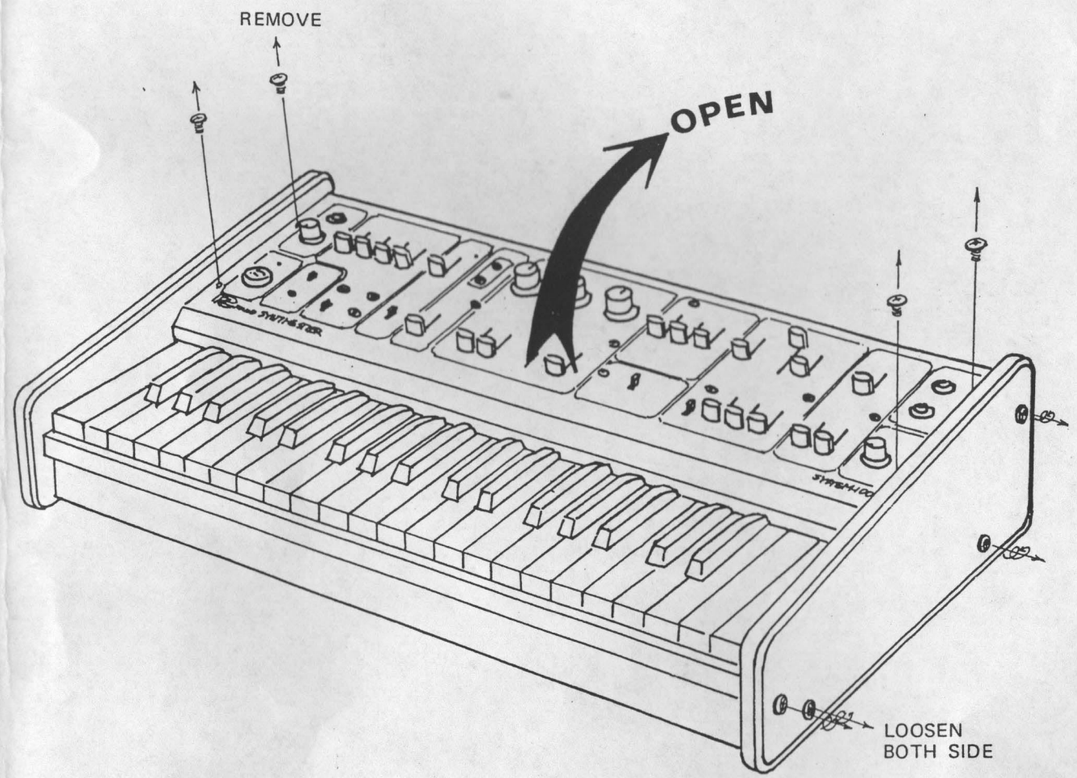
DISASSEMBLY

System-100, Model-101 can be disassembled in the following steps when necessary for checking and readjustment.

The power cord must be disconnected from the power source before proceeding with disassembly.

Remove the panel board screws (2 each on both sides of right and left) from the Control Panel, and also the side board screws (4 each on both sides) from the side board. With all done, the Panel Board can be opened by lifting upward.

Harness the Panel Board with a string or else through holes on both sides of the right and left on the reverse side of the Panel, to those holes on the side board, so as to prevent the Panel Board from falling back too far on procedures afterward.



SYSTEM-100 SPECIFICATIONS

MODEL-101

1. VCO (Voltage Controlled Oscillator)

Frequency Range:	3 Hz — 40 KHz
VCO Output:	10 Vp-p
VCO Sync. Output:	Pulse Wave

CONTROLS

Wave Form:	Triangular Wave, Sawtooth Wave, Square Wave, Pulse Wave (Pulse Width Controlled)
Frequency:	10 Hz — 10 KHz (at A2 key) continuously variable
Fine Tuning:	1 oct.
Pulse Width:	5% — 50% (Manual, ADSR, LFO)
Ext. C✓:	1V/oct.
LFO	

2. NOISE GENERATOR

Pink or White Noise Output: 10Vp-p

3. AUDIO MIXER

Ext. Input Impedance: more than 50 Kohm

CONTROLS

VCO, Noise, Ext. Input

4. HIGH PASS FILTER

HPF Cutoff Frequency: 10 Hz — 10 KHz

5. VCF (Voltage Controlled Filter)

Cutoff Frequency Range: 20 Hz — 100 KHz

CONTROLS

VCF Cutoff Frequency:	20 Hz — 20 KHz
Resonance:	0 — self oscillation
LFO/Ext. CV:	1V/oct.
Kybd. CV	
ADSR	

6. VCA (Voltage Controlled Amplifier)

CONTROLS

Initial Gain
LFO
ADSR

7. ENVELOPE GENERATOR (ADSR)

ADSR Output:	+6V (contour peak)
Ext. Env. Input:	same as above
Ext. Gate Input:	+14V
ADSR Trig.:	KYBD Gate or LFO

CONTROLS

Attack Time:	0.4 msec. —3 sec.
Decay Time:	0.8 msec. —6 sec.
Sustain Level:	0 — 100% (contour peak)
Release Time:	0.8 msec. —6 sec.

1976-7-30 SYSTEM100-101

8. LFO (Low Frequency Oscillator)

Wave Form:	Sawtooth Wave, Sine Wave, Square Wave

CONTROL

LFO Frequency:	0.15 Hz, —25 Hz

9. GLIDE

Auto Glide (Key Trig. ON/OFF):	
Glide Manual:	Semi Tone

10. KEYBOARD CONTROL VOLTAGE

KYBD CV Output:	1 V/oct.
KYBD Gate Output:	+14V

CONTROL

Portamento:	0 — 2.5 sec.

11. STANDARD OSCILLATOR

A-440 Hz

12. AUDIO SIGNAL OUTPUT

High Output:	3 Vp-p with 1 Kohm output impedance.
Low Output:	0.3 Vp-p with 1 Kohm output impedance.

13. HEAD PHONE OUTPUT

0.3V max into standard 8 ohm stereo headphones.

14. KEYBOARD

37-key

15. FOR COMPUTER

CV Input:	1 V/oct.
CV Output:	Keyboard Control Voltage 1V/oct.
Trig. Input:	+14V
Trig. Output:	+14V

16. DIMENSIONS AND WEIGHT

Overall Size:	610 m/m wide, 355 m/m deep, 145 m/m high.
Net Weight:	9 kg.

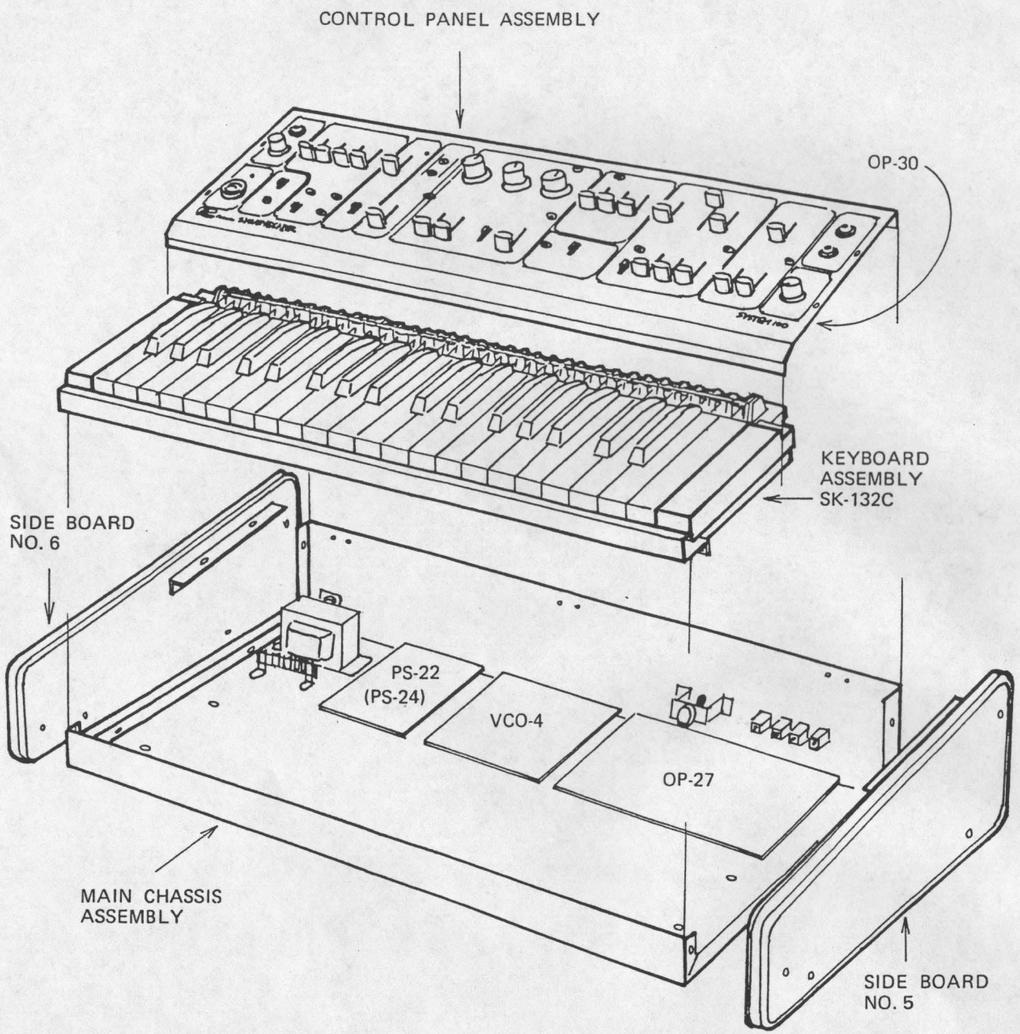
17. POWER REQUIREMENTS

100 — 120V 50 — 60Hz:
220 — 250V 50 — 60Hz:

18. POWER CONSUMPTION

10W max.

GENERAL LAYOUT



1976-7-30 SYSTEM100-101

DESCRIPTION of PCB (Printed Circuit Board) ASSEMBLY

1. VCO BOARD ASSEMBLY (VCO-4)

VCO Board Assembly is consisted of two main circuits: KEYBOARD CIRCUIT and VCO CIRCUIT.

In KEYBOARD CIRCUIT, there are Keyboard CV (Control Voltage) Circuit and Keyboard Gate Circuit.

1-1. Keyboard CV Circuit is the circuit where the constant DC current is applied from the constant current source so as to produce always certain voltage drop (1 V/Oct.) on the Keyboard resistors when the current comes across them.

The voltage therein provided then goes to S & H Circuit (Sample & Hold), where it is so designed to be held until another key is depressed on the Keyboard to have another voltage thus provided to replace the then hold one.

The output voltage from this circuit is then used, after another voltage produced on the Glide Circuit being added, as a control voltage for VCO, VCF, and for Expander (102), etc.

Keyboard Gate Circuit, on the other hand, produces the gate voltage by ON/OFF manuals of the keys and such voltage thus produced is for use as a gate voltage on Envelope Generator and on Expander (102), etc.

1-2. VCO is an oscillator having its frequencies controlled by the voltage supplied from the Keyboard or other external sources (Voltage Controlled Oscillator).

Such control voltage from Keyboard or other external sources are firstly mixed up in the Control Voltage Mixer, to be sent afterward to the exponential converter circuit where the voltages so far having a linear increasing ratio receive conversion to those having exponential increasing ratio, thereby to fit for use as a control voltage for frequency oscillator.

Since the VCO is fundamentally a sawtooth wave form oscillator, such other triangular or square wave forms are to be obtained through the Wave Form Converter.

And, on the square wave form converter circuit, the pulse width modulation is also conducted by the control voltage supplied from ADSR, LFO and the Manual, within a variable degree of 5% to 50% of its pulse width.

2. VCF-VCA BOARD ASSEMBLY (OP-27)

Included in this Assembly are: VCF, HPF, VCA, Envelope Generator, LFO, Noise Generator Head-Phone Amplifier, and Mixer Amplifier.

2-1. VCF is a voltage controlled low pass filter consisting of the ladder type networks with capacitors and transistors: connected as the diode strings and here the control voltages supplied from the Keyboard or other sources provide the variations on the cutoff frequencies through this VCF.

Also, provided here such characteristic as to have a peak at around the frequency cutoff point, varied tone colours can be made obtainable, and by further being capable of self-oscillation in a wide range of frequencies, setting of musical scale here is also possible on following manuals on Keyboard.

2-2. HPF is a high pass filter, of a differentiation circuit composed of C & R, and here the cutoff frequencies are made varied following the control variations on the resistor values.

2-3. VCA is a voltage controlled amplifier, having its gain controlled by the voltage supplied from ADSR, LFO and applied on its current source transistor.

2-4. Envelope Generator produces the ADSR triggered by the keyboard gate voltage, the positions of the four sliders in the ADSR section determine the steepness of the curves of each section and level of the envelope.

2-5. Noise Generator is using, as its sound source, white noise appearing upon the junction of the reverse biased transistor, and on use, by further amplifying such noise.

2-6. LFO is a low frequency oscillator for use of modulation, with the Sine Wave, Sawtooth and Square Waves for modulation of VCO, VCF and VCA, while Triangular Wave for Pulse Width modulation.

2-7. Head-Phone Amplifier provides A-class amplified signals through its output transformer.

2-8. Mixing Amplifier mixes the signals from VCA with that of A-440 Hz Standard Oscillator, thus providing the output of the mixed signals from here.

3. A-440 HZ OSC BOARD ASSEMBLY (OP-30)

This circuit is a very stable LC Oscillator.

4. POWER SUPPLY BOARD ASSEMBLY (OP-22, OP-24)

The assembly is a voltage regulator circuit, to provide the constant voltages of +14V and –14V, and in order to assure of such precise voltage an adjustable trimmer potentiometer is incorporated.

Note: The board PS-22 is for 100V - 200V, while PS-24 for 220V – 240V.

Fuse 0.5A, Fuse Holder TF-758, of Label No. 69, are to be used on PS-24 alone.

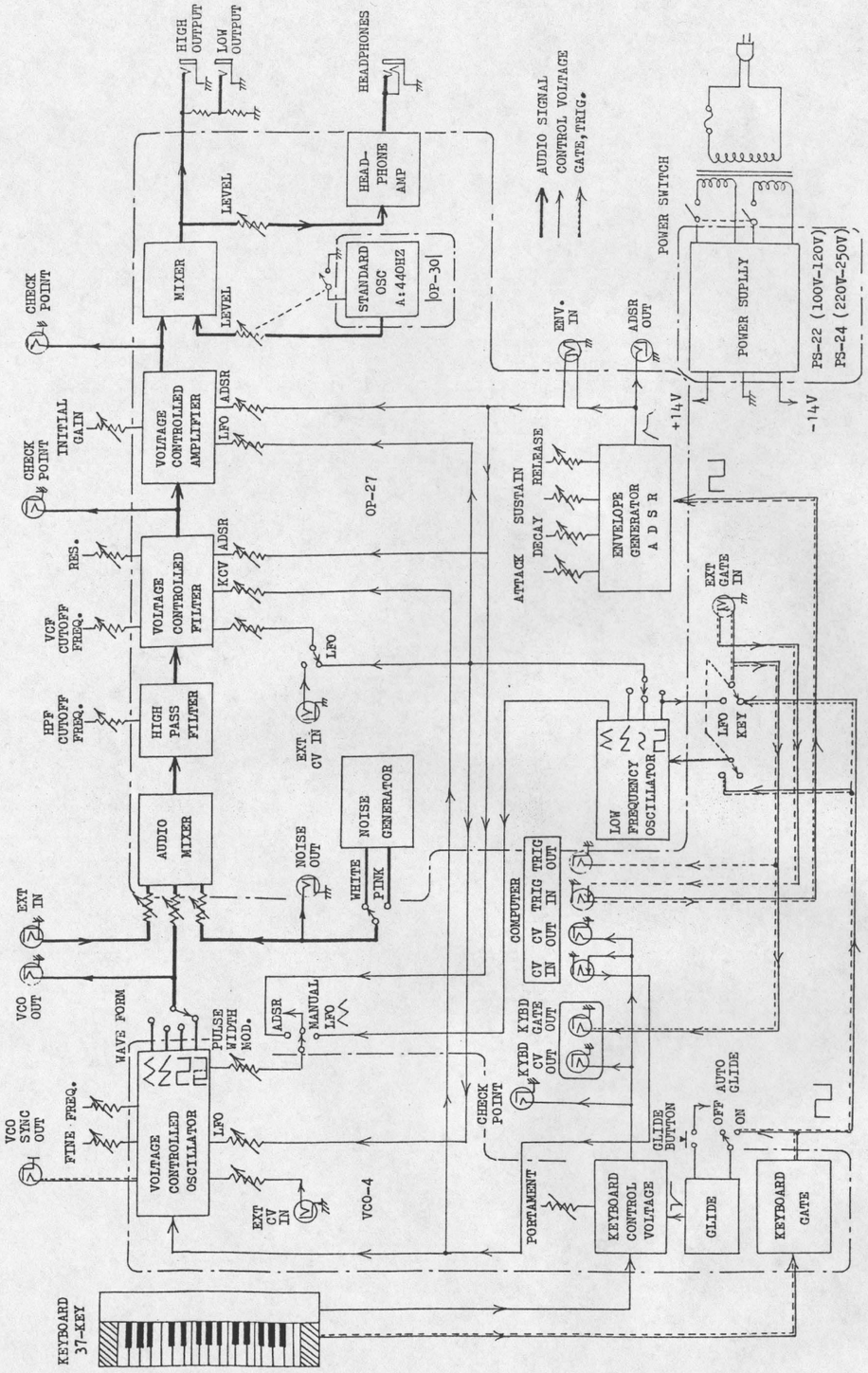
For PS-22, use such ones having jumper wire on Fuse Holder.

1976-7-30 SYSTEM100-101

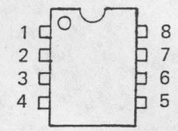
CONTENTS

1. SPECIFICATIONS 2
2. PANEL DIAGRAM 4
3. DISASSEMBLY 5
4. GENERAL LAYOUT 6
5. CIRCUIT DESCRIPTION 7
6. GENERAL BLOCK DIAGRAM 9
7. SEMICONDUCTOR ELECTRODES 9
8. PRINTED CIRCUIT BOARD ASSEMBLY PARTS LAYOUT AND CIRCUIT DIAGRAM 10
   - 8-1. VCO-4 VCO BOARD 10
   - 8-2. OP-27 VCF-VCA BOARD 12
   - 8-3. OP-30 A-440Hz OSC BOARD 14
   - 8-4. PS-22, PS-24 POWER SUPPLY BOARD 15
9. WIRING DIAGRAM 16
10. ADJUSTMENT 17
11. PARTS LIST 32
12. PARTS PICTURE 36

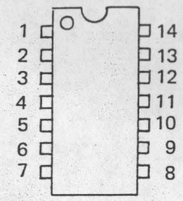
GENERAL BLOCK DIAGRAM



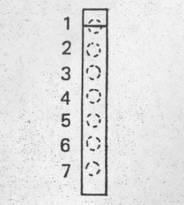
SEMICONDUCTOR ELECTRODES (TOP VIEW)



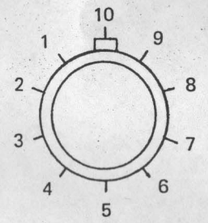
CA1458(G)



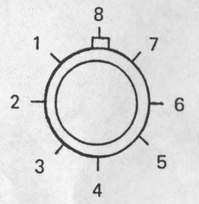
723CN



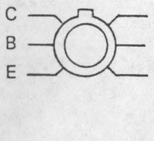
TA7136P



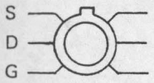
μA726



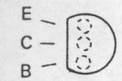
TA7504M
301AH
CA3080
CA3130



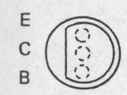
ITS1276



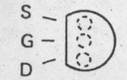
E-412
(ITS30546)



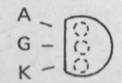
2SA733(Q)
2SC945(Q)
2SC828(R)



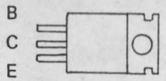
2SC1000(GR)



2SK30A(Y)
2SK30A(GR)

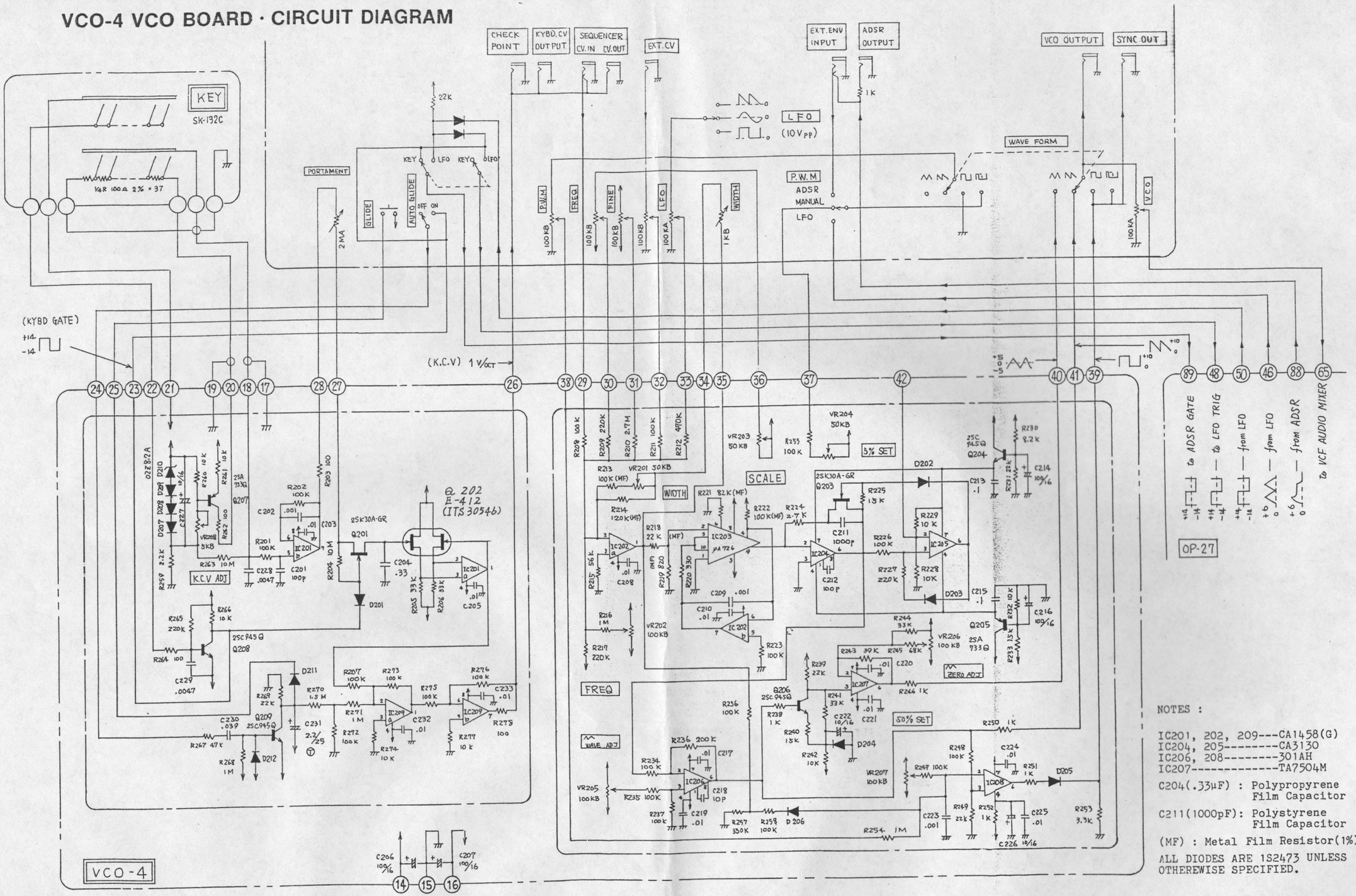


N13T1



2SD234(O)

VCO-4 VCO BOARD · CIRCUIT DIAGRAM



NOTES: IC201, 202, 209..... CA1458G
IC204, 205 ..... CA3130
IC206, 208 ..... 301AH
IC207 ..... TA7504M
(MF): Metal Oxide Film Resistor.
ALL DIODES ARE 1S2473 UNLESS OTHERWISE SPECIFIED.

NOTES :

IC201, 202, 209---CA1458(G)
IC204, 205--------CA3130
IC206, 208--------301AH
IC207------------TA7504M

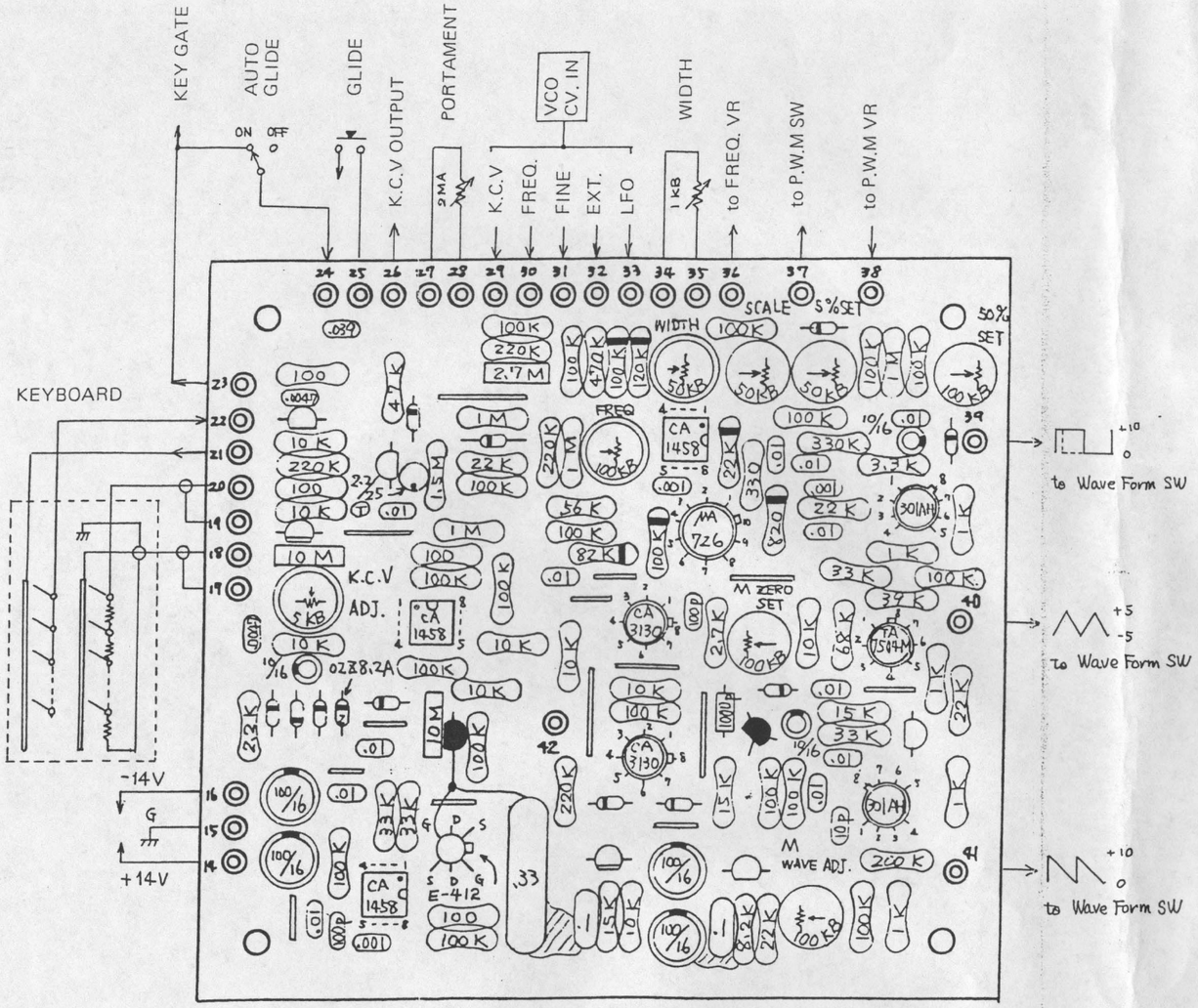
C204(.33μF) : Polypropyrene Film Capacitor

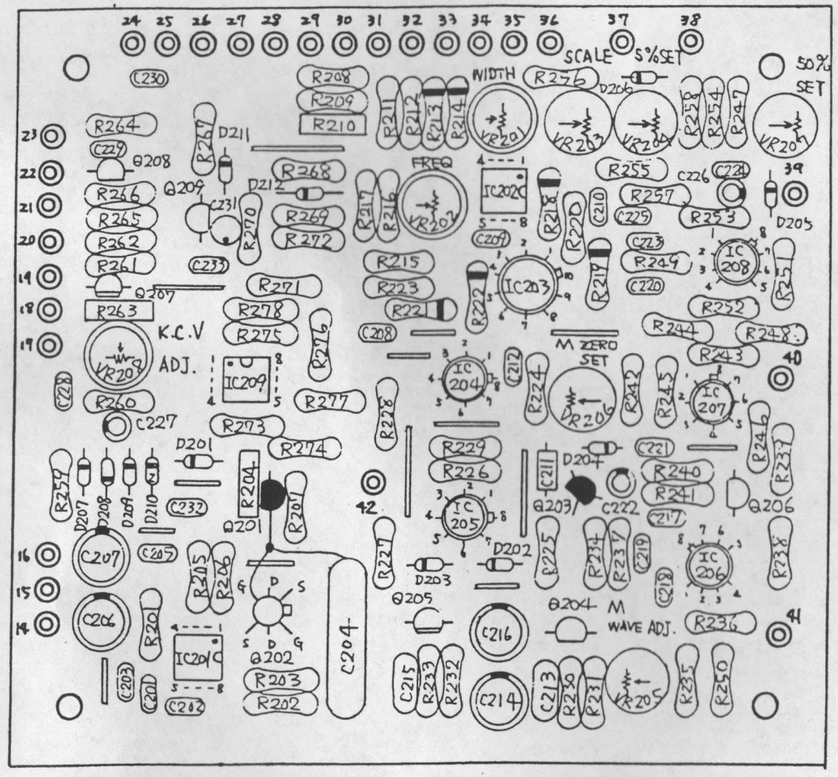
C211(1000pF): Polystyrene Film Capacitor

(MF) : Metal Film Resistor(1%)

ALL DIODES ARE 1S2473 UNLESS OTHERWISE SPECIFIED.

VCO-4 VCO BOARD ASSEMBLY PARTS LAYOUT (152-004)





: Metal Film Type

: Carbon Type

Q-F334M .33 : Polypropylene Film Capacitor

102J 1000P : Polystyrene Film Capacitor

: 2SK30A(GR)

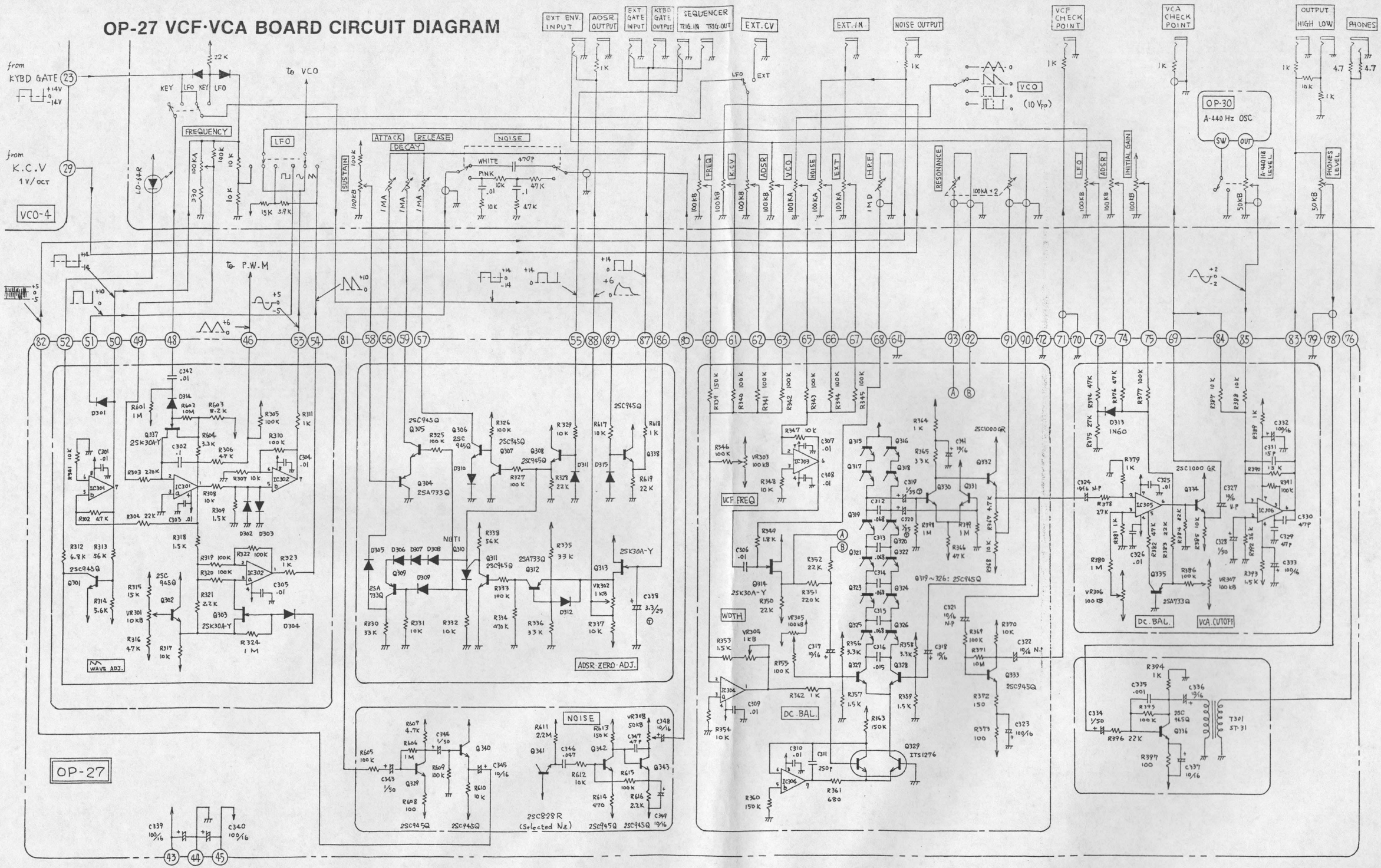
: 2SA733(Q)

: 2SC945(Q)

: 1S2473

: Metal Film Resistor (1%)

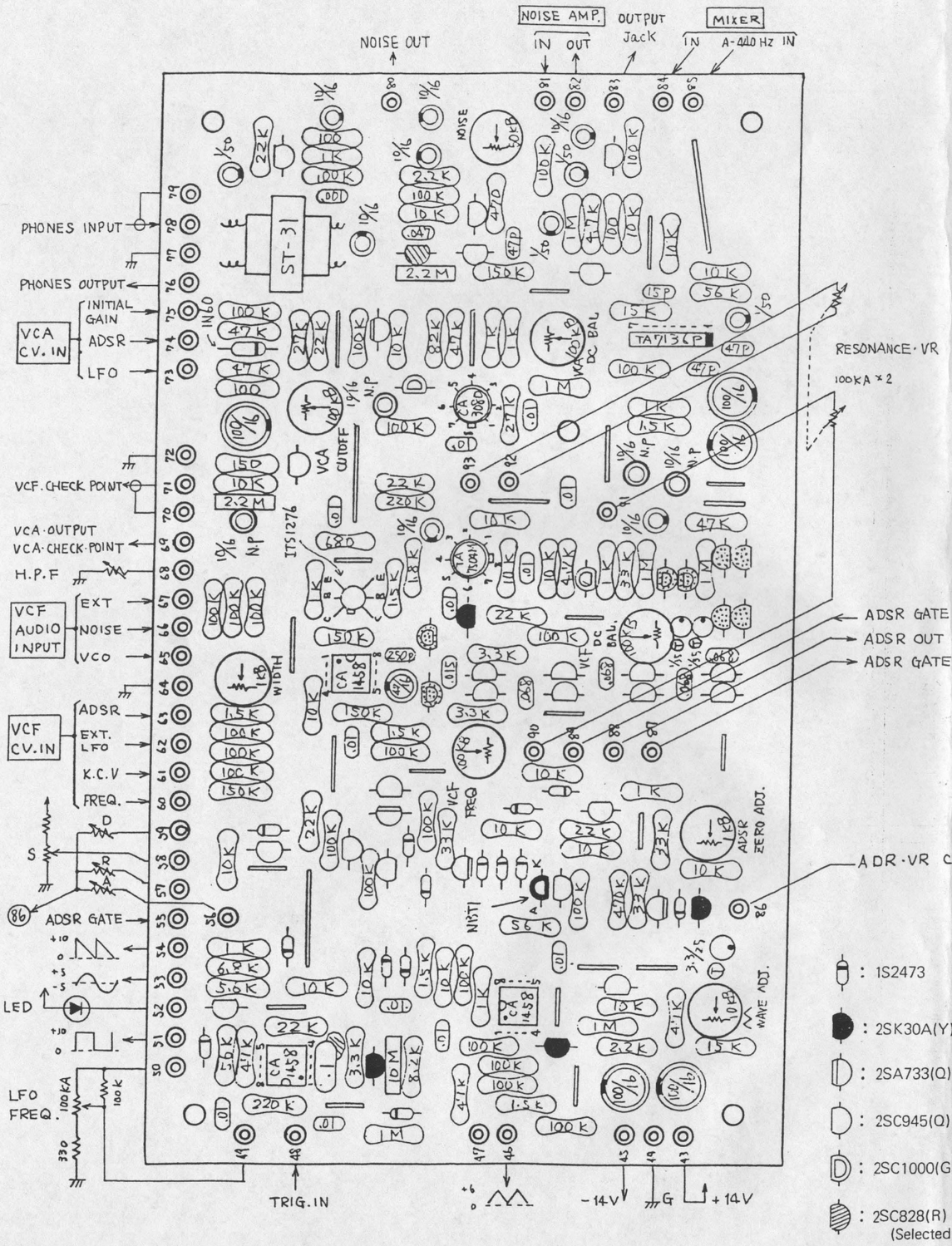
OP-27 VCF·VCA BOARD CIRCUIT DIAGRAM



NOTES:
- Q315-318 ..... 2SC945Q (SELECTED VCF)
- Q327, 328, 330, 331 .... 2SC1000GR (SELECTED hfe)
- IC301, 302, 304 ..... CA1458G
- IC303 ..... TA7504M
- IC305 ..... CA3080 (SELECTED C)
- IC306 ..... TA7136P

T : Tantalum Capacitor
ALL DIODES ARE 1S2473
UNLESS OTHERWISE SPECIFIED.

OP-27 VCF VCA BOARD ASSEMBLY PARTS LAYOUT (149-027)



: 1S2473

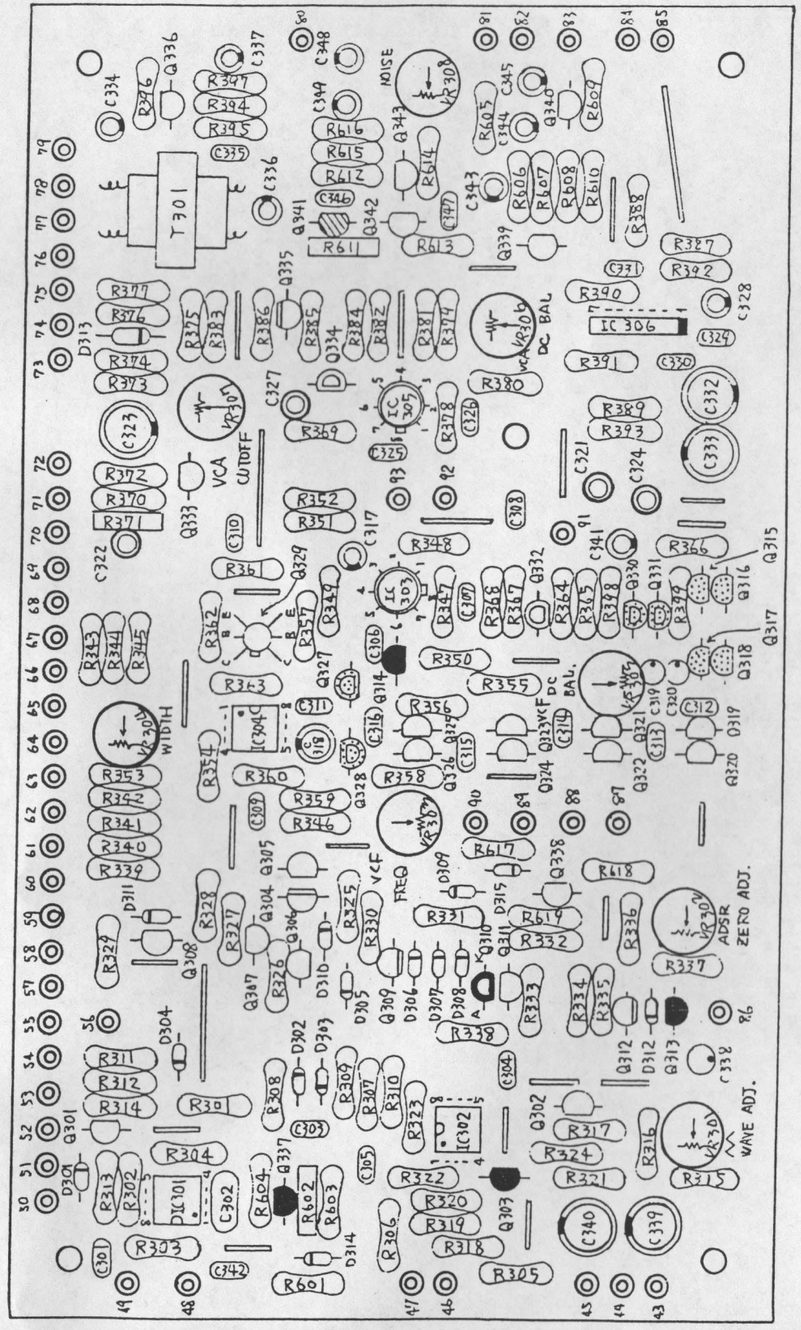
: 2SK30A(Y)

: 2SA733(Q)

: 2SC945(Q)

: 2SC1000(GR)

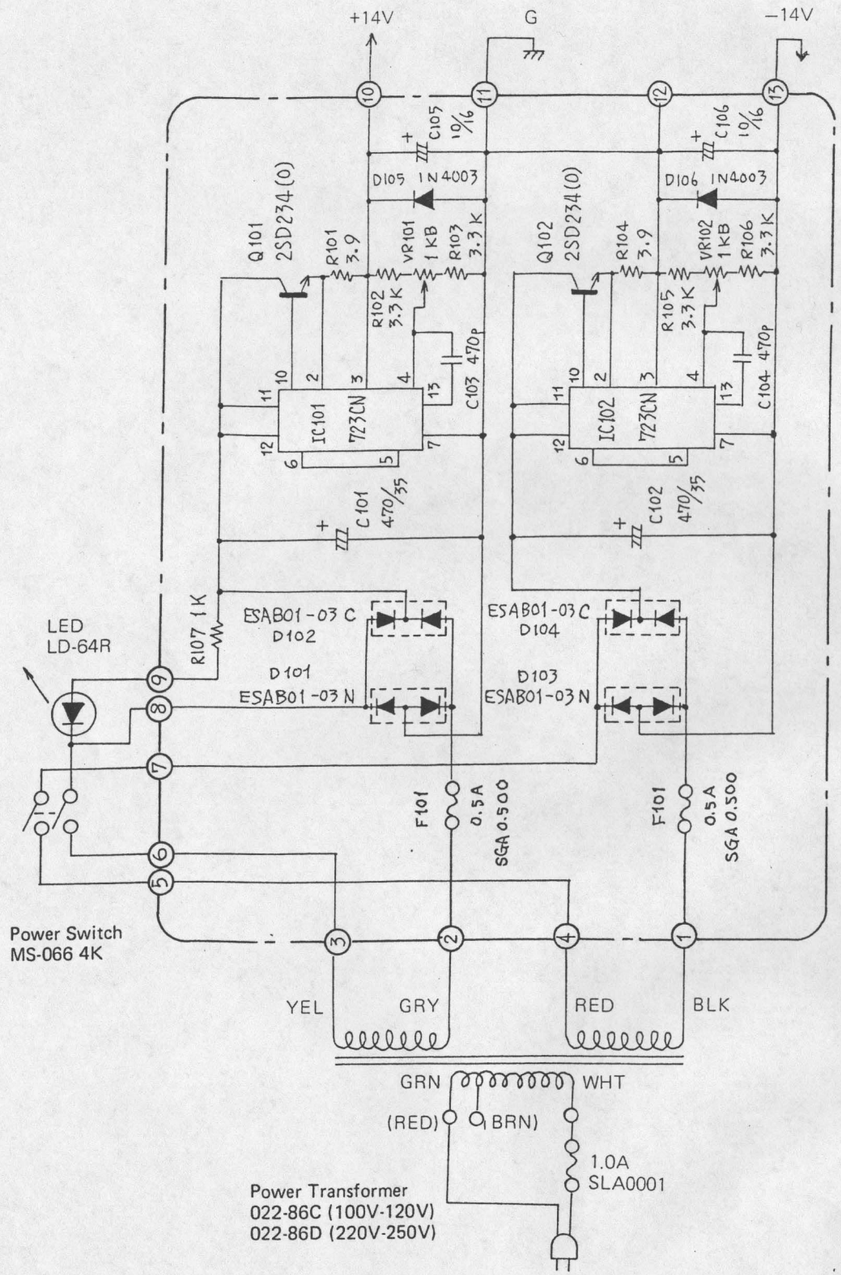
: 2SC828(R)
(Selected NZ)



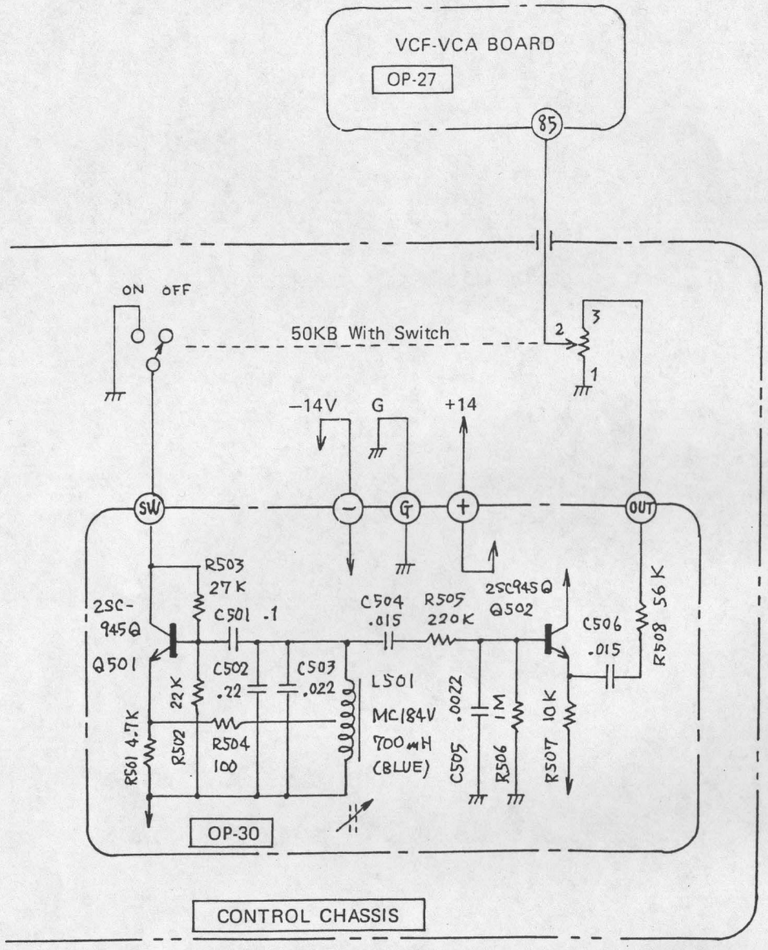
: 2SC945(Q)
(Selected VCF)

: 2SC1000(GR)
(Selected hfe)

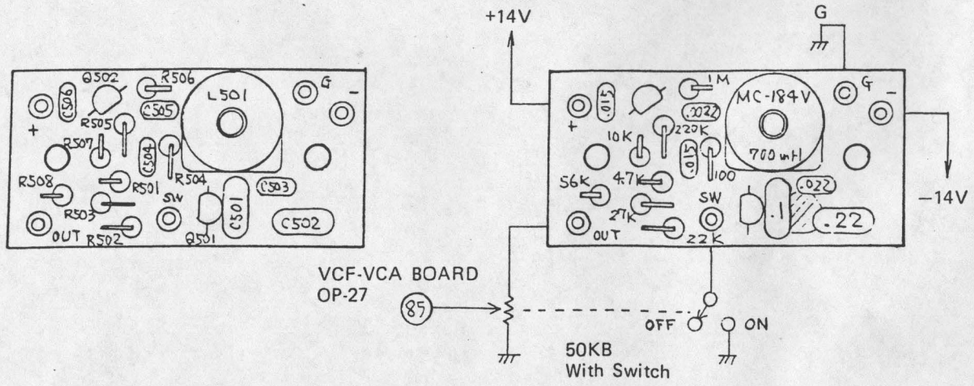
PS-22, 24 Power Supply Board Circuit Diagram



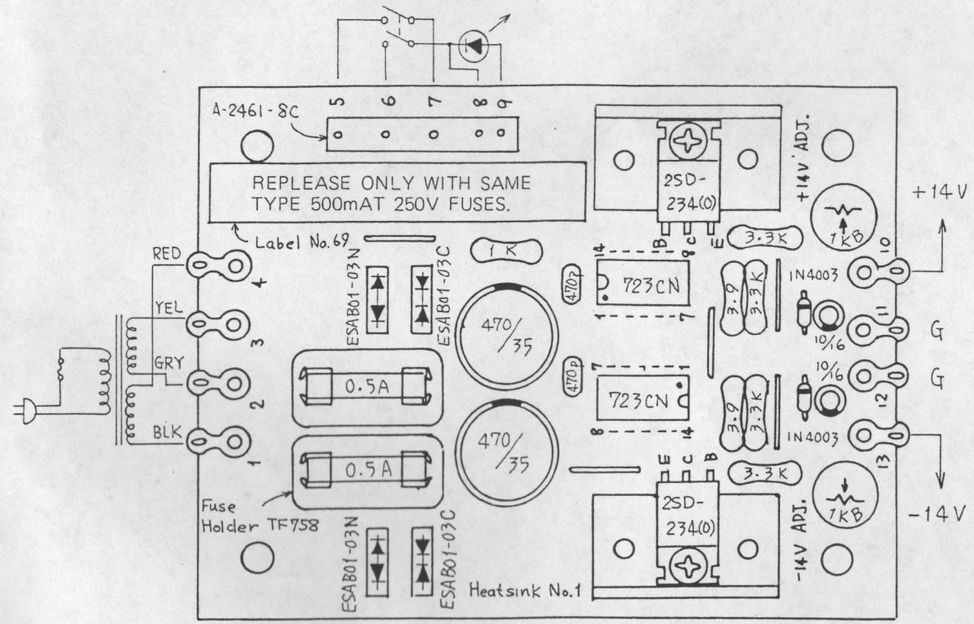
OP-30 A-440HZ OSC BOARD CIRCUIT DIAGRAM (149-30)

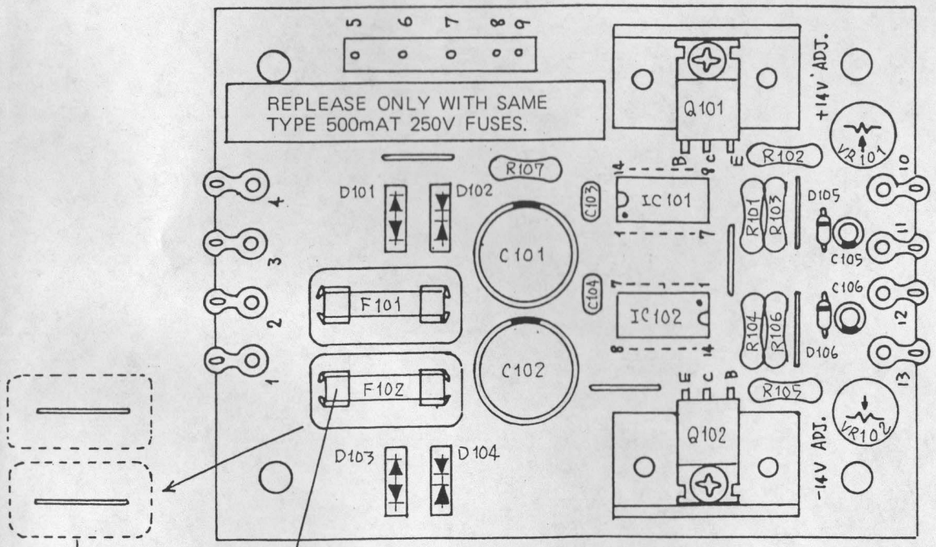


OP-30 A-440HZ OSC BOARD ASSEMBLY PARTS LAYOUT

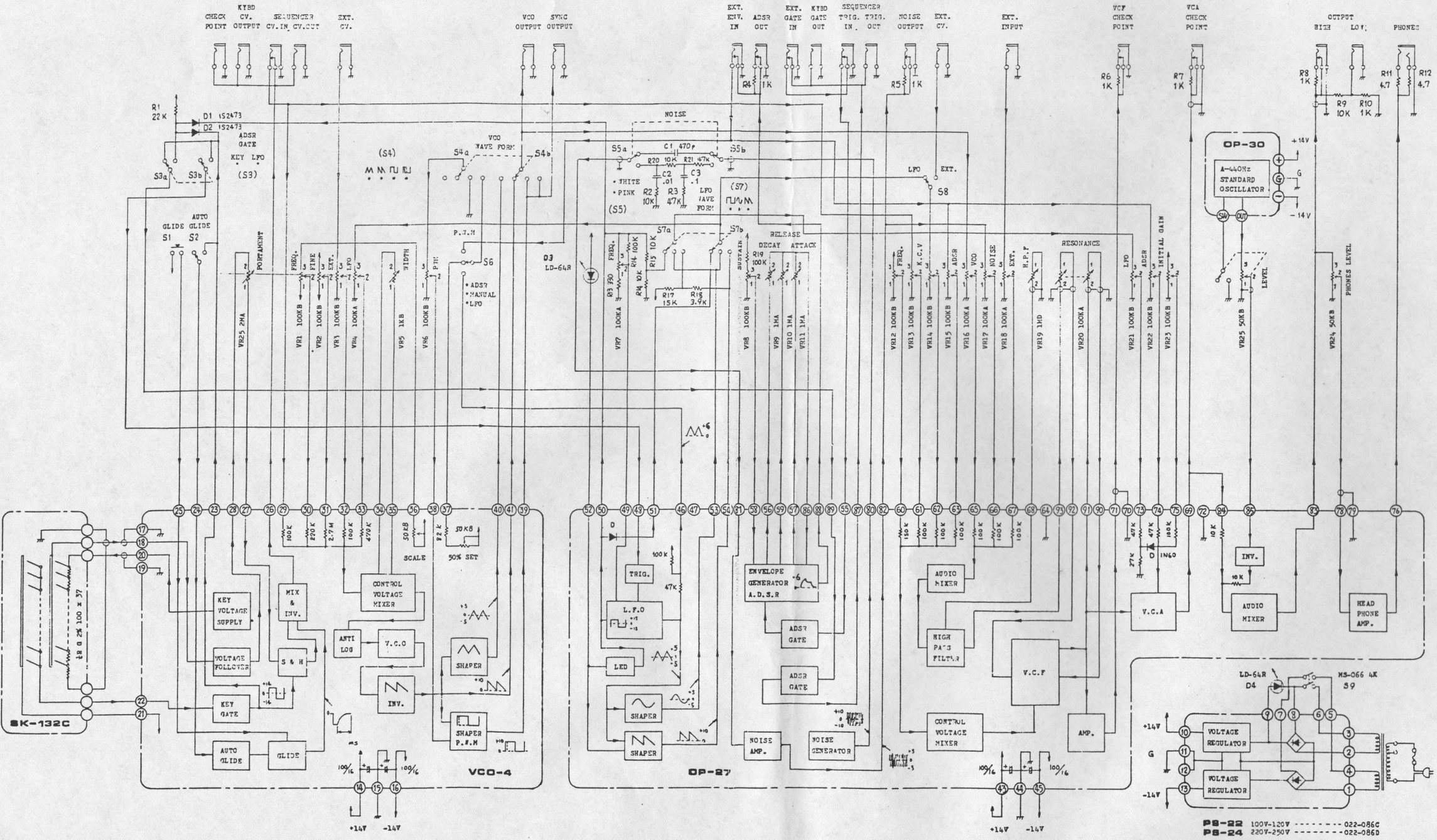


PS-22, 24 Power Supply Board Assembly Parts Layout (146-022, 024)





WIRING DIAGRAM



SYSTEM 100, MODEL 101 ADJUSTMENT PROCEDURE

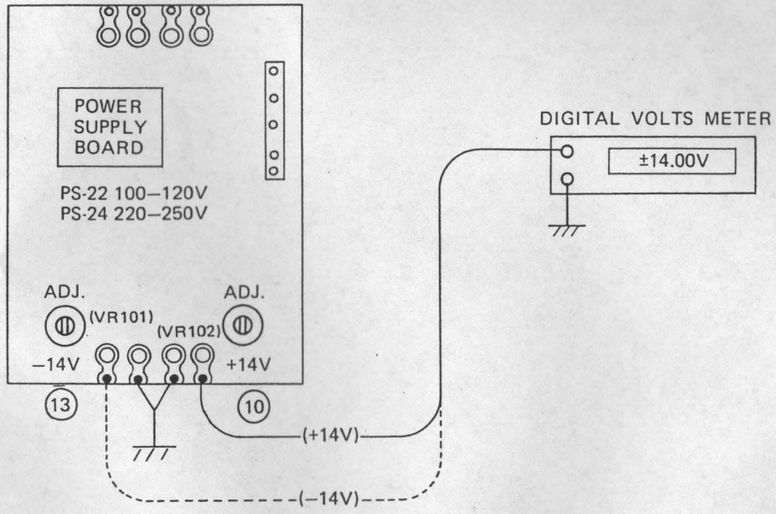
1. Power supply Voltage Adjustment:

a) Connect the Digital Voltmeter to Terminal "10" of the Power Circuit Board (PS-22, PS-24), and adjust VR101 (+14V ADJ.) for reading +14V on the voltmeter.

b) In the same manner, with connection to Terminal "13", adjust VR102 (–14V ADJ.) for reading –14V.

c) Tolerance: 14V±100 mV can be accepted here.

d) Digital Voltmeter to be used here must be in accuracy of:
Resolution voltage . . . . . down to DC 10 mV or more
Input Impedance . . . . . 1 Mohm or more



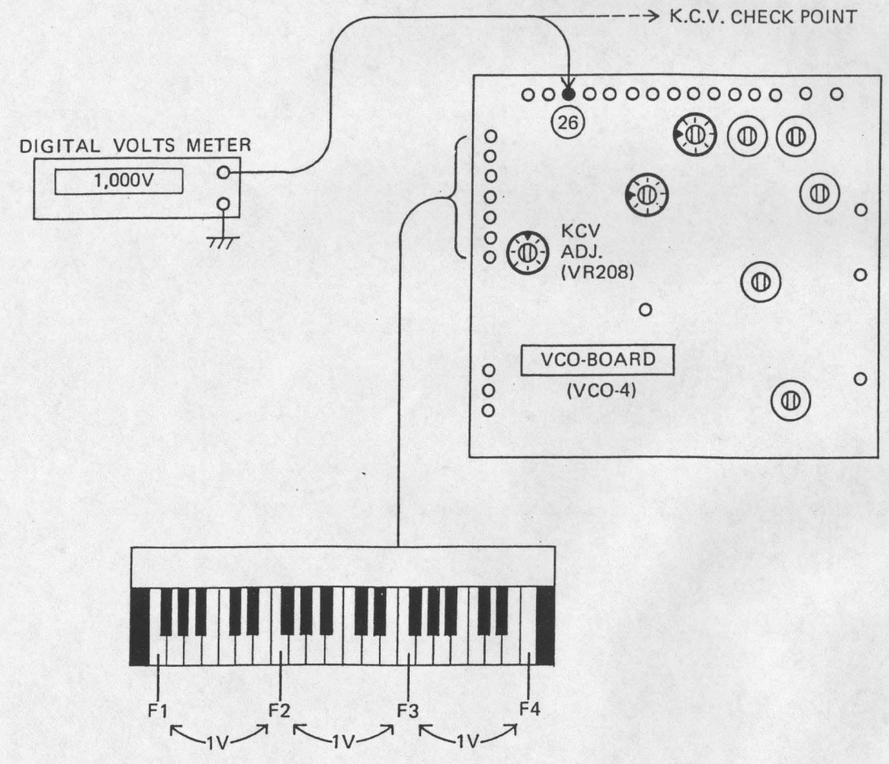
1976-7-30 SYSTEM100-101

2. Key Control Voltage Adjustment:

a) Connect the Digital Voltmeter to Terminal "26" or KCV CHECK POINT of VCO Board (VCO-4), and adjust VR208 so as to have voltage difference of 1V each in between the Keys F1 and F2, and between F2 and F3, then F3 and F4.

b) Tolerance shall be: 1V±2 mV

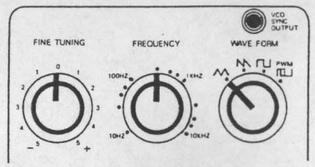
c) Digital Voltmeter must be in accuracy of:
Resolution voltage . . . . . down to DC 1 mV
Input Impedance . . . . . 1 Mohm or more



VCO ADJUSTMENT

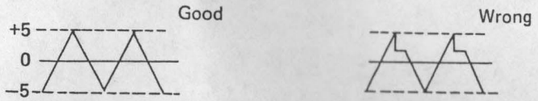
1. Triangular (⩘) Wave Form Adjustment:

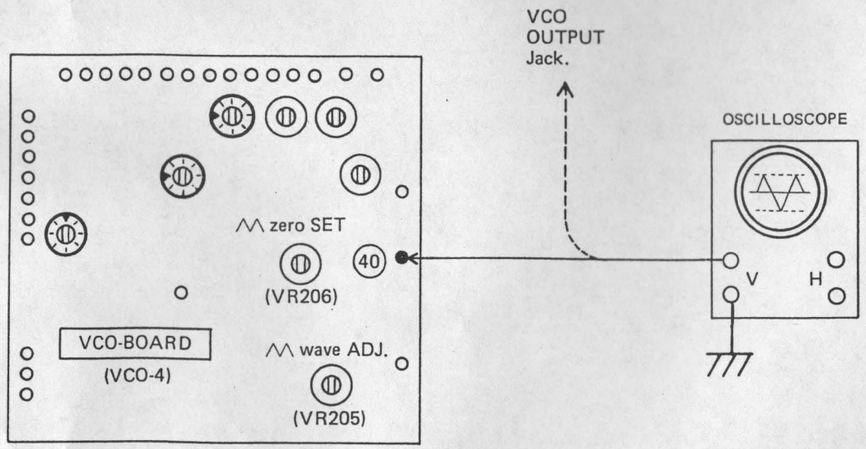
a) Set the Control Panel as shown below.



b) Connect the Oscilloscope to Terminal "40" or VCO OUTPUT JACK, and adjust VR205 (⩘ WAVE ADJ.) for the output wave form to be in triangular.

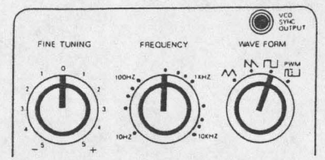
c) Then, adjust VR206 (⩘ ZERO SET) so as to have this output wave form of triangular formed across 0V±5V.





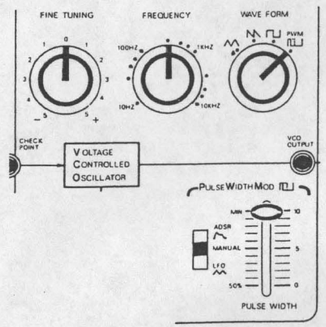
2. Square (⊓⊔) Wave Form Adjustment:

a) Set the Control Panel as shown below.



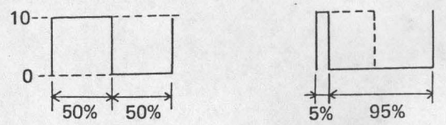
b) Connect the Oscillioscope to Terminal "39" or VCO OUTPUT JACK of VCO Board (VCO-4), and adjust VR207 (⊓⊔ 50% SET) to have the output wave form in 50% – 50% square wave.

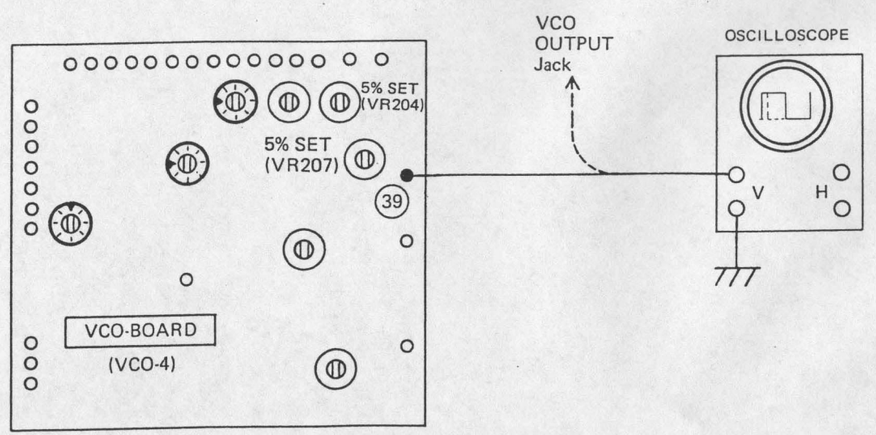
c) Re-set the Control Panel as shown below.



d) With the same connection as in b) above, adjust VR204 (⊓⊔ 5% SET) for the output now of 5% – 95% square wave.

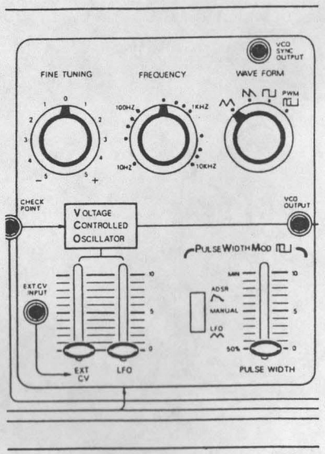
e) Check that the wave form does not disappear all the way when VCO-FREQ. on the Control Panel is being turned from 10 Hz to 10 KHz.





3. VCO WIDTH Adjustment:

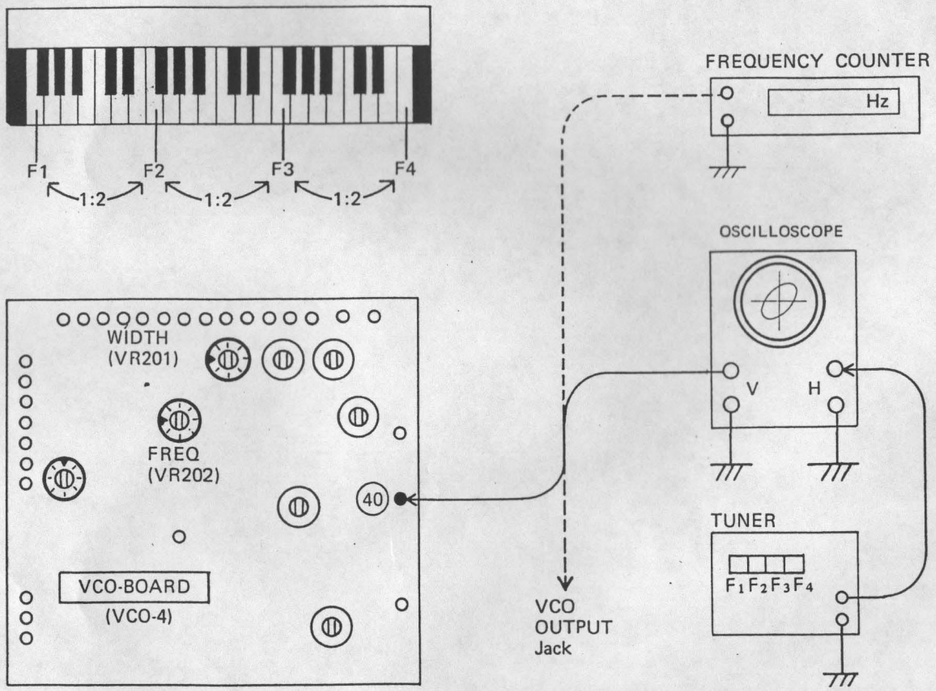
a) Set the Control Panel as shown below.



(101)

b) Connect the Oscillioscope or Frequency Counter to Terminal "40" or VCO OUTPUT JACK, and adjust VR201(WIDTH) to have the frequency generations on Keys F1, F2, F3, and F4, become all in octave relations with each other.

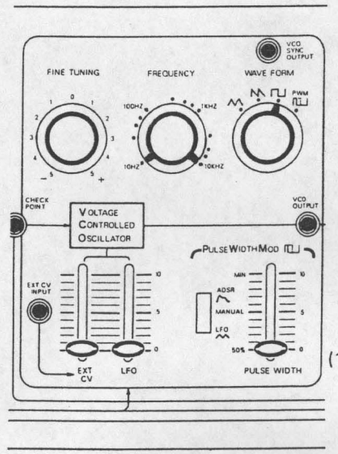
c) When tuned with a Tuner, use VR202 (FREQ.) for adjustment of the frequency of Key F1.



1976-7-30 SYSTEM100-101

4. VCO FREQ. Adjustment:

a) Set the Control Panel as shown below.

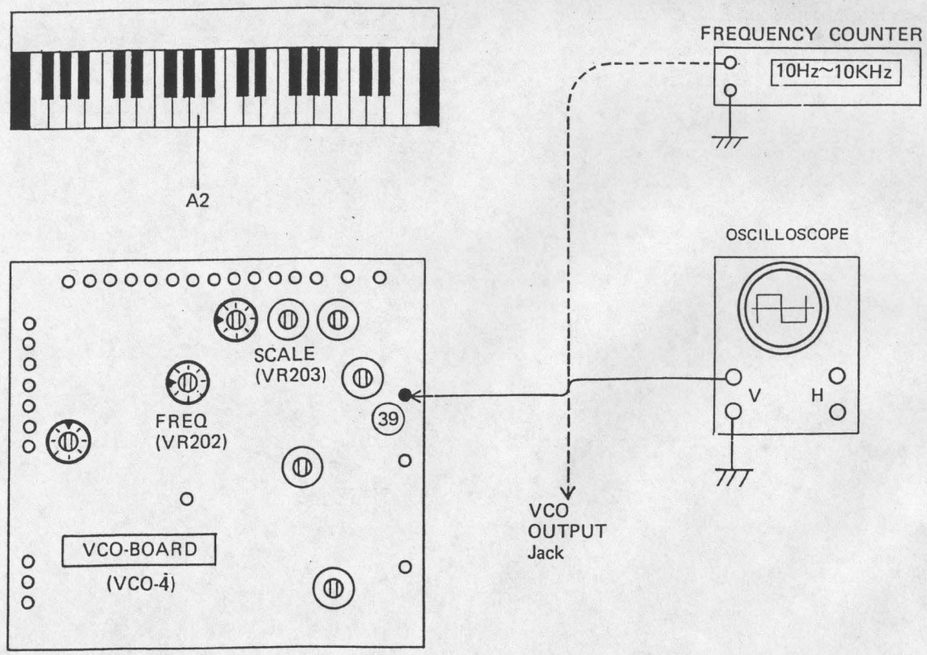


(101)

b) Connect the Oscilloscope or Frequency Counter to Terminal "39" or VCO OUTPUT JACK, and adjust VR202 (FREQ.) to have the frequency generation of Key A2 become 10 Hz (100ms) when VCO-FREQ. knob is turned to point at 10 Hz on the dial.

c) In the same manner, adjust VR203 (SCALE) so as to have 10 KHz (100 μs) when VCO-FREQ. is at 10 KHz.

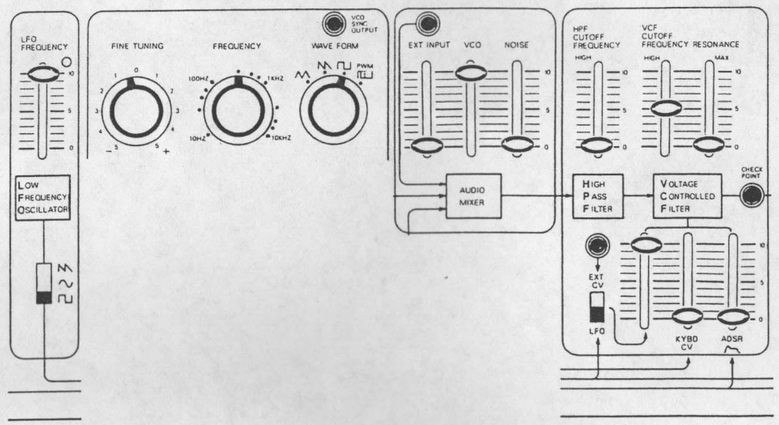
d) Repeat the above b) and c) until the matching of both 10 Hz and 10 KHz are made ascertained.



VCF ADJUSTMENT

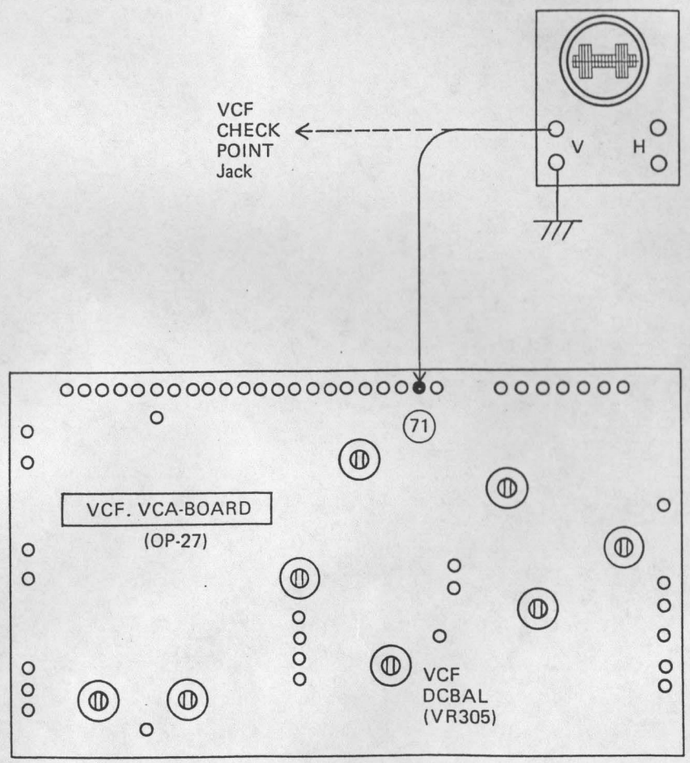
1. VCF DC BAL Adjustment:

a) Set the Control Panel as shown below.



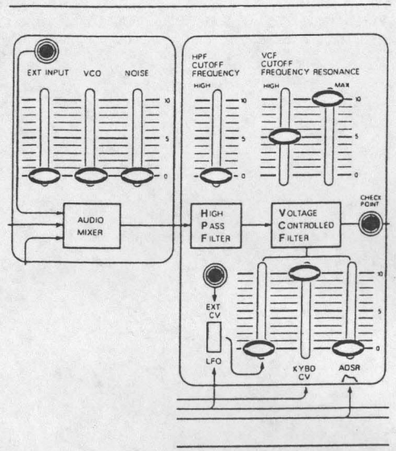
b) Connect the Oscilliscope to Terminal "71" or VCF CHECK POINT JACK on the VCF VCA Board, and adjust VR305 (VCF DC BAL) for the output wave form to be symmetrical in upper and lower sides.

c) Check that the wave form is always balanced when CUTOFF-FREQ. of the Control Panel is turned from 10 to 0.



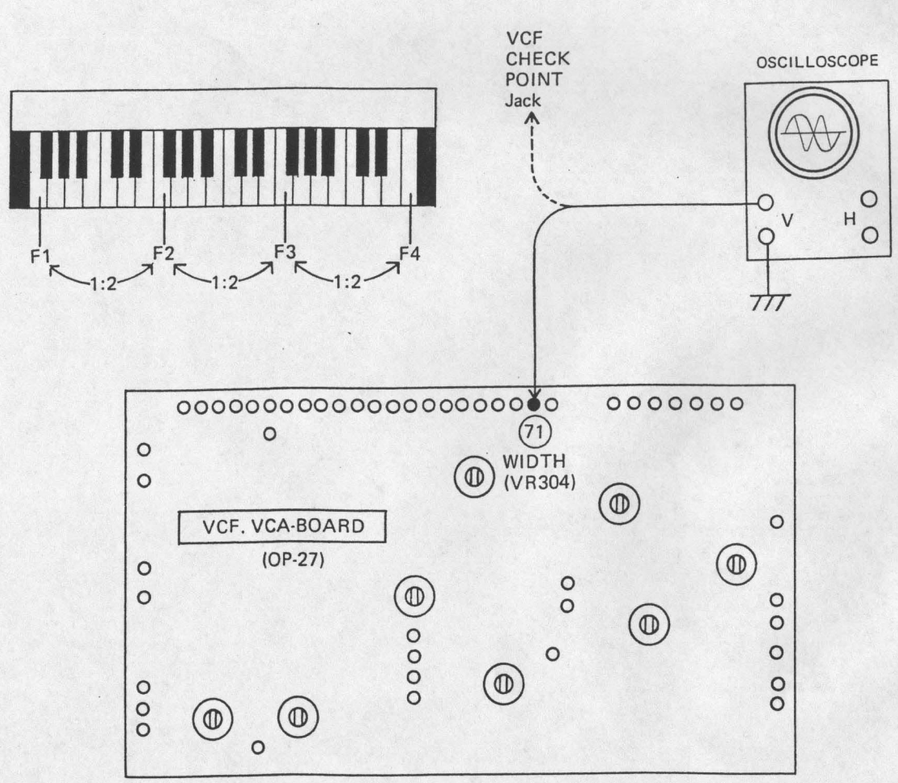
2. VCF WIDTH Adjustment:

a) Set the Control Panel as shown below.



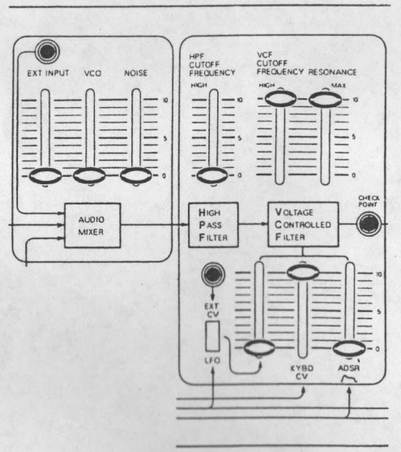
b) Connect the Oscilloscope to Terminal "71" or VCF CHECK POINT JACK, and adjust VR304 (WIDTH) to have the frequency generations of Keys F1, F2, F3, and F4, become all in octave relations with each other.

c) Check that such octave relations remain same all the way when the CUTOFF FREQ. of the Control Panel is being turned from 10 to 0.



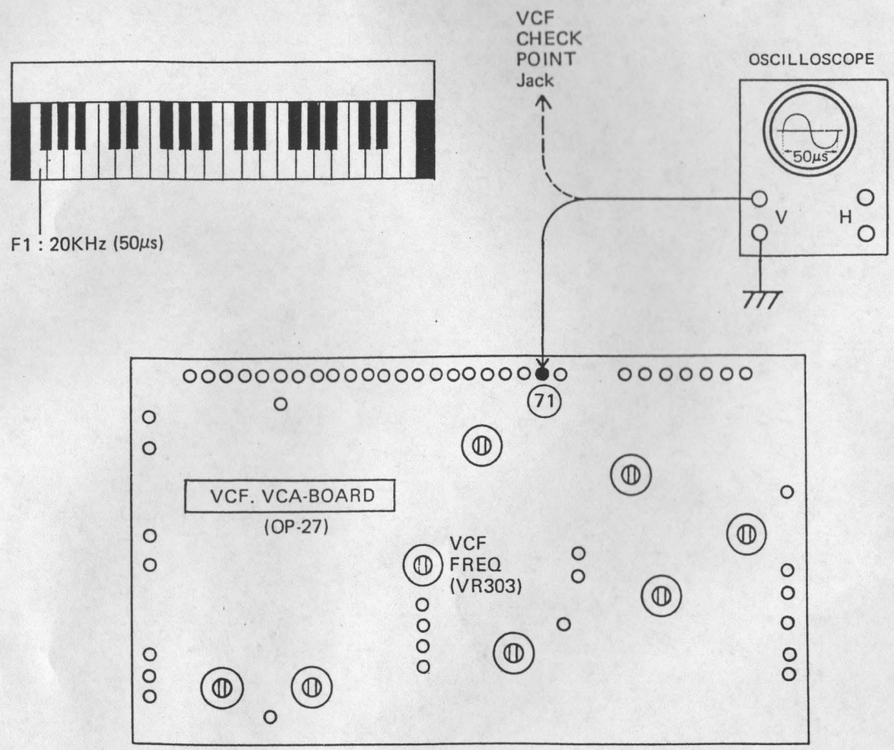
3. VCF FREQ. Adjustment:

a) Set the Control Panel as shown below.



b) Connect the Oscilloscope to Terminal "71" or VCF CHECK POINT JACK of the VCF-VCA Board (OP-27), and adjust VR303 (VCF-FREQ.) for the frequency of Key F1 to be 20 KHz (50 μs).

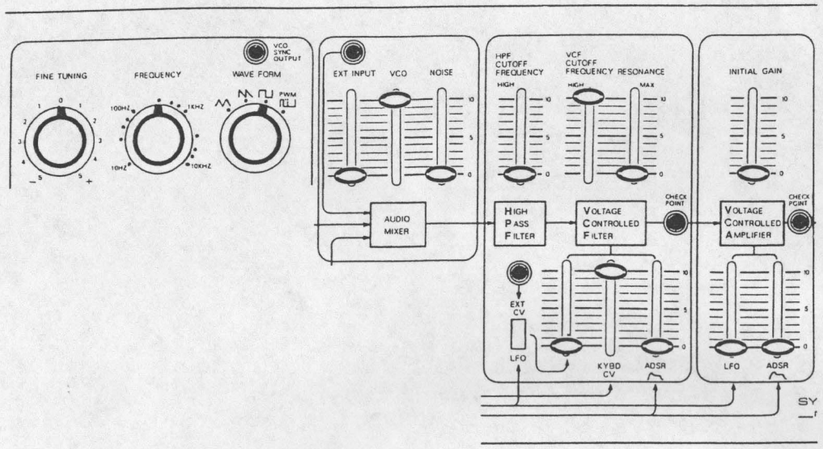
c) Adjustment as above may occasion to disturb the VCF WIDTH Adjustment as once done in (2) hereinbefore. Repeat, therefore, both adjustments of (2) and (3) until the matching of both WIDTH and FREQ. are made ascertained.



VCA ADJUSTMENT

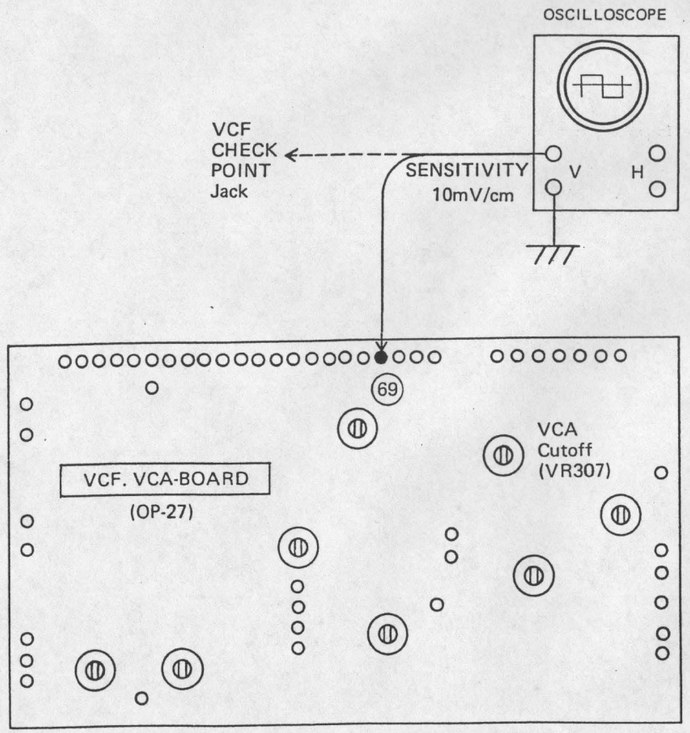
1. VCA CUTOFF Adjustment:

a) Set the Control Panel as shown below.



b) Connect the Oscilloscope to Terminal "69" or VCA CHECK POINT JACK of the VCF VCA Board (OP-27), and adjust VR307 (VCA CUTOFF) to have the cutoff point placed at the point before the output wave form appears on the oscilloscope.

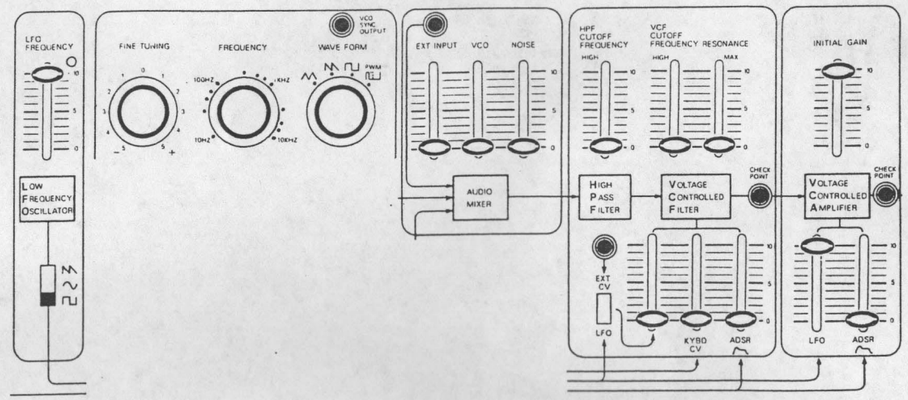
c) Check that, when the INITIAL GAIN of the Control Panel held to point at 10, the output voltage shall be within 2 Vp-p – 3 Vp-p.



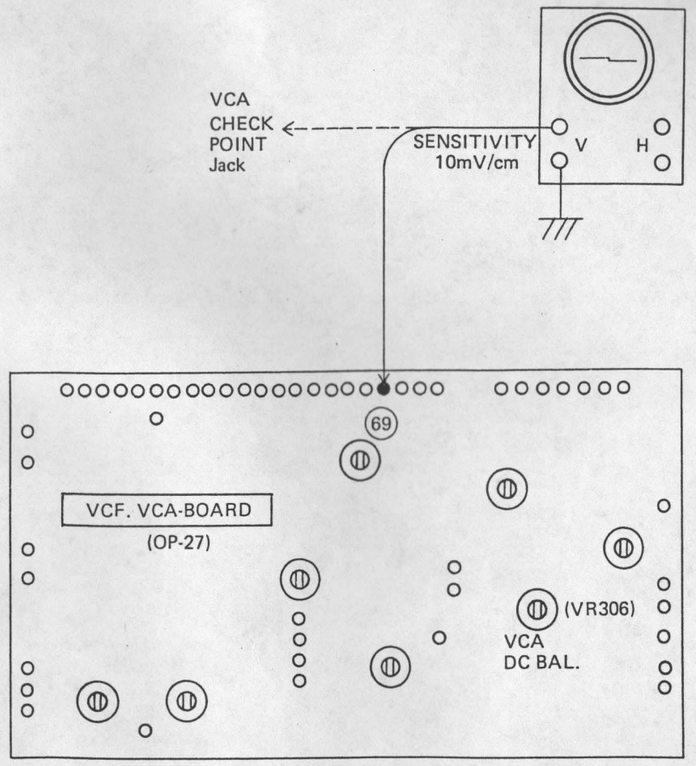
1976-7-30 SYSTEM100-101

2. VCA DC BAL Adjustment:

a) Set the Control Panel as shown below.

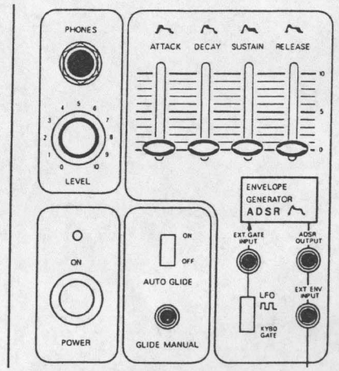


b) Connect the Oscilloscope to Terminal "69" or VCA CHECK POINT JACK of the VCF VCA Board (OP-27), and adjust VR306 (VCA DC BAL) to have the click appearing on the output as least as possible.

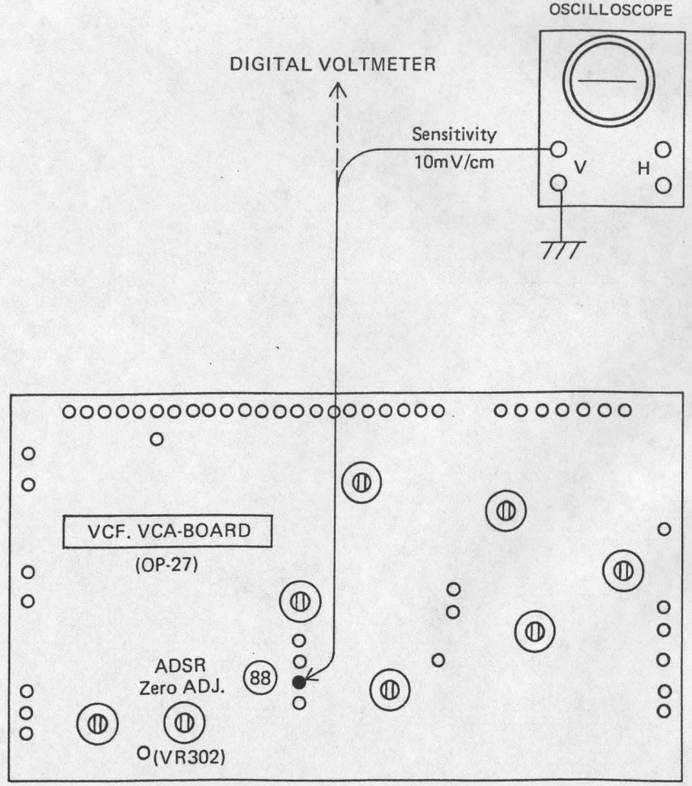


ADSR Zero Adjustment:

a) Set the controls of the Control Panel as illustrated below:

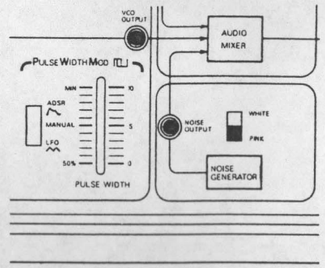


b) Connect the Oscilloscope, or Digital Voltmeter, to Terminal "88" or ADSR OUTPUT JACK, and adjust VR302 (ADSR Zero ADJ.) for reading of 0V.

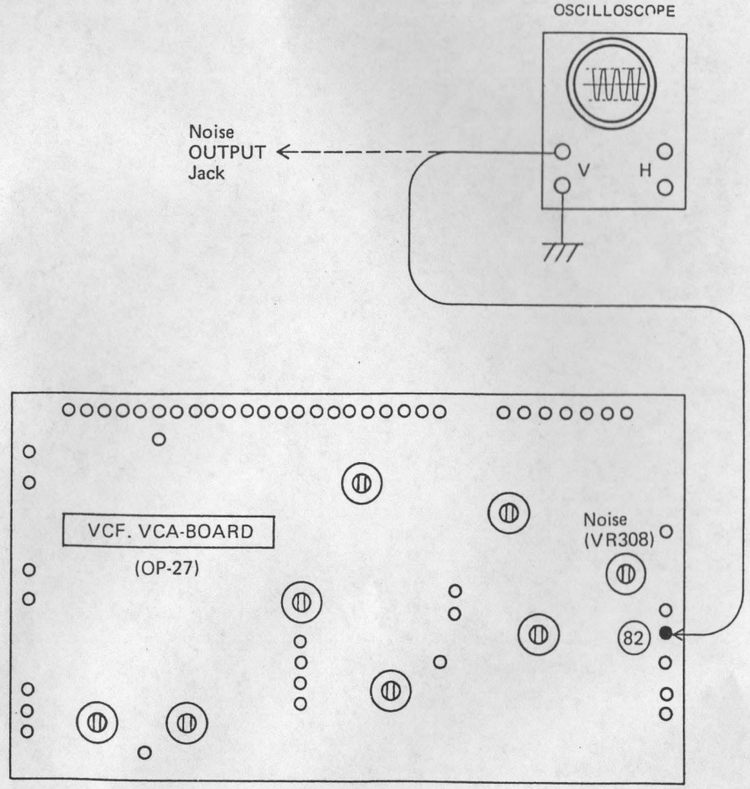


Noise Level Adjustment:

a) Turn the Noise Changeover Switch of the Control Panel to PINK as illustrated below:

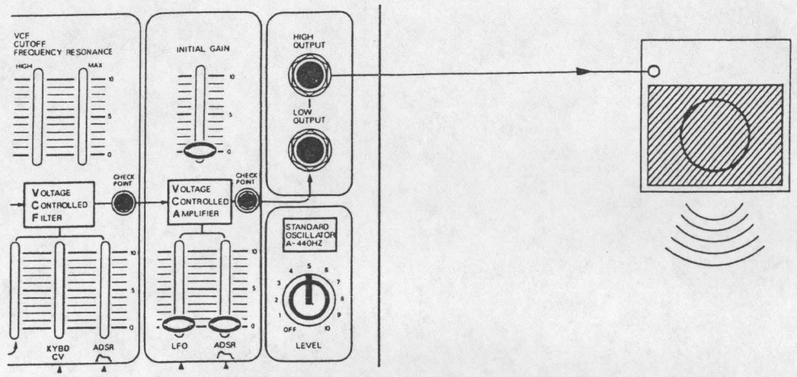


b) Connect the Oscilloscope to Terminal "82" or NOISE OUTPUT JACK of the VCF VCA Board, and adjust VR308 (NOISE) for voltage reading of 10Vp-p.



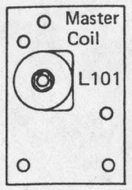
A-440 Hz Standard OSC Freq. Adjustment:

a) Set the Control Panel as shown below, and produce the sound A-440 Hz.



b) Have a Tuning Fork of A-440 Hz set along.
Then, adjust the Master Coil L101 of the 440 Hz OSC Board (OP-30) for zero heat (unison) with the tuning fork.

c) In this Coil Adjustment, use always a hexagonal core driver of nonmagnetic type.



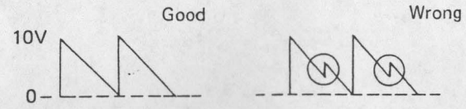


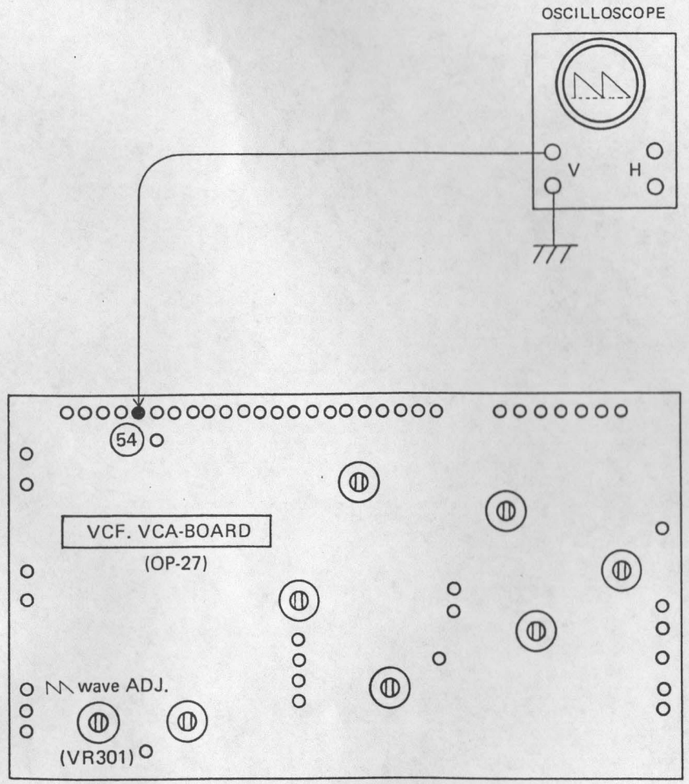
Tuning fork

A-440Hz
STANDARD
OSCILLATOR
BOARD

LFO, Wave Form Adjustment:

a) Connect the Oscilloscope to Terminal "54" of the VCF-VCA Board (OP-27), and adjust VR301 (⩘ wave ADJ.) so as to have the output wave in a form of Sawtooth.





SYSTEM-100 MODEL-101 PARTS LIST

VCO-4 VCO Board Assembly (152-004)

052-134C	Printed Circuit Board No. 134C	(less parts)			
020-025	IC	CA3130			
020-024	IC	301AH			
020-052	IC	CA1458G			
020-010	IC	TA7504M			
020-032	IC	μA726			
017-013	Transistor	2SC945 (Q)			
017-012	Transistor	2SA733 (Q)			
017-016	FET	2SK30A (GR)			
017-036	FET	E-412 (ITS30546)			
018-014	Diode	1S2473			
018-008	Diode	02Z8.2A			
028-006	Trimmer Potentiometer	50KΩ (B)	EVL-R4XA0054B		
028-007	Trimmer Potentiometer	100KΩ (B)	EVL-R4XA0015B		
029-105	Trimmer Potentiometer	5KΩ (B)	PNB-04C3A-502H		
029-108	Trimmer Potentiometer	50KΩ (B)	PNB-04C3A-503H		
029-109	Trimmer Potentiometer	100KΩ (B)	PNB-04C3A-104H		
044-025	Resistor	100Ω	1/4W	±5%	
044-031	Resistor	330Ω	1/4W	±5%	
044-037	Resistor	1KΩ	1/4W	±5%	
044-040	Resistor	2.2KΩ	1/4W	±5%	
044-041	Resistor	2.7KΩ	1/4W	±5%	
044-042	Resistor	3.3KΩ	1/4W	±5%	
044-047	Resistor	8.2KΩ	1/4W	±5%	
044-048	Resistor	10KΩ	1/4W	±5%	
044-050	Resistor	15KΩ	1/4W	±5%	
044-052	Resistor	22KΩ	1/4W	±5%	
044-054	Resistor	33KΩ	1/4W	±5%	
044-055	Resistor	39KΩ	1/4W	±5%	
044-056	Resistor	47KΩ	1/4W	±5%	
044-057	Resistor	56KΩ	1/4W	±5%	
044-058	Resistor	68KΩ	1/4W	±5%	
044-060	Resistor	100KΩ	1/4W	±5%	
044-082	Resistor	200KΩ	1/4W	±5%	
044-064	Resistor	220KΩ	1/4W	±5%	
044-066	Resistor	330KΩ	1/4W	±5%	
044-068	Resistor	470KΩ	1/4W	±5%	
044-072	Resistor	1MΩ	1/4W	±5%	
044-074	Resistor	1.5MΩ	1/4W	±5%	
044-167	Resistor	2.7MΩ	1/2W	±10%	
044-599	Resistor	10MΩ	1/2W	±10%	
044-829	Resistor	820Ω	CRB-1/4FX	±1%	
044-840	Resistor	22KΩ	CRB-1/4FX	±1%	
044-845	Resistor	82KΩ	CRB-1/4FX	±1%	
044-846	Resistor	100KΩ	CRB-1/4FX	±1%	
044-847	Resistor	120KΩ	CRB-1/4FX	±1%	
037-001	Capacitor	10pF	50V	±10%	Ceramic
037-006	Capacitor	100pF	50V	±10%	Ceramic
035-005	Capacitor	0.001μF	50V	±10%	Mylar
035-012	Capacitor	0.0047μF	50V	±10%	Mylar
035-016	Capacitor	0.01μF	50V	±10%	Mylar
035-023	Capacitor	0.039μF	50V	±10%	Mylar
035-028	Capacitor	0.1μF	50V	±10%	Mylar
035-137	Capacitor	1000pF	100V	±10%	Polystyrene
035-091	Capacitor	0.33μF	ECQ-F2334MZ		Polyporpylene
032-105	Capacitor	2.2μF	25V	±10%	Tantalum
032-033	Capacitor	10μF	16V		Electrolytic
032-037	Capacitor	100μF	16V		Electrolytic

1976-7-30 SYSTEM100-101

OP-27 VCF-VCA Board Assembly (149-027)

052-135A	Printed Circuit Board No. 135A	(less parts)			
020-052	IC	CA1458G			
020-015	IC	CA3080	Selected VCA		
020-010	IC	TA7504M			
020-027	IC	TA7136P			
020-021	IC	ITS1276			
017-013	Transistor	2SC945 (Q)			
017-047	Transistor	2SC945 (Q)	Selected VCF		
017-003	Transistor	2SC1000 (GR)			
017-048	Transistor	2SC1000 (GR)	Selected hfe		
017-046	Transistor	2SC828 (R)	Selected Nz		
017-012	Transistor	2SA733 (Q)			
017-014	FET	2SK30A (Y)			
017-018	PUT	N13T1			
018-014	Diode	1S2473			
018-027	Diode	1N60			
022-077	Output Transformer	ST-31			
028-002	Trimmer Potentiometer	1KΩ (B)	EVL-R4XA0013B		
028-004	Trimmer Potentiometer	10KΩ (B)	EVL-R4XA0014B		
028-006	Trimmer Potentiometer	50KΩ (B)	EVL-R4XA0054B		
028-007	Trimmer Potentiometer	100KΩ (B)	EVL-R4XA0015B		
044-025	Resistor	100Ω	1/4W	±5%	
044-027	Resistor	150Ω	1/4W	±5%	
044-033	Resistor	470Ω	1/4W	±5%	
044-035	Resistor	680Ω	1/4W	±5%	
044-037	Resistor	1KΩ	1/4W	±5%	
044-038	Resistor	1.5KΩ	1/4W	±5%	
044-039	Resistor	1.8KΩ	1/4W	±5%	
044-040	Resistor	2.2KΩ	1/4W	±5%	
044-042	Resistor	3.3KΩ	1/4W	±5%	
044-044	Resistor	4.7KΩ	1/4W	±5%	
044-045	Resistor	5.6KΩ	1/4W	±5%	
044-046	Resistor	6.8KΩ	1/4W	±5%	
044-047	Resistor	8.2KΩ	1/4W	±5%	
044-048	Resistor	10KΩ	1/4W	±5%	
044-050	Resistor	15KΩ	1/4W	±5%	
044-052	Resistor	22KΩ	1/4W	±5%	
044-053	Resistor	27KΩ	1/4W	±5%	
044-054	Resistor	33KΩ	1/4W	±5%	
044-056	Resistor	56KΩ	1/4W	±5%	
044-059	Resistor	82KΩ	1/4W	±5%	
044-060	Resistor	100KΩ	1/4W	±5%	
044-062	Resistor	150KΩ	1/4W	±5%	
044-064	Resistor	220KΩ	1/4W	±5%	
044-068	Resistor	470KΩ	1/4W	±5%	
044-072	Resistor	1MΩ	1/4W	±5%	
044-166	Resistor	2.2MΩ	1/2W	±10%	
044-599	Resistor	10MΩ	1/2W	±10%	
037-002	Capacitor	15pF	50V	±10%	Ceramic
037-005	Capacitor	47pF	50V	±10%	Ceramic
037-007	Capacitor	250pF	50V	±10%	Ceramic
035-001	Capacitor	0.001μF	50V	±10%	Mylar
035-016	Capacitor	0.01μF	50V	±10%	Mylar
035-018	Capacitor	0.015μF	50V	±10%	Mylar
035-024	Capacitor	0.047μF	50V	±10%	Mylar
035-026	Capacitor	0.068μF	50V	±10%	Mylar
035-028	Capacitor	0.1μF	50V	±10%	Mylar
032-099	Capacitor	1μF	35V	±10%	Tantalum

032-107	Capacitor	3.3μF	25V	±10%	Tantalum
032-071	Capacitor	1μF	50V	±10%	Electrolytic
032-033	Capacitor	10μF	16V		Electrolytic
032-036	Capacitor	47μF	16V		Electrolytic
032-037	Capacitor	100μF	16V		Electrolytic
032-191	Capacitor	10μF	16V		Non Polarized

OP-30 A-440 Hz OSC Board Assembly (149-030)

052-141	Printed Circuit Board No. 141	(less parts)			
022-056	Master Coil	700mH	MC-184V (Blue)		
017-013	Transistor	2SC945 (Q)			
044-025	Resistor	100Ω	1/4W	±5%	
044-044	Resistor	4.7KΩ	1/4W	±5%	
044-048	Resistor	10KΩ	1/4W	±5%	
044-052	Resistor	22KΩ	1/4W	±5%	
044-053	Resistor	27KΩ	1/4W	±5%	
044-057	Resistor	56KΩ	1/4W	±5%	
044-064	Resistor	220KΩ	1/4W	±5%	
044-072	Resistor	1MΩ	1/4W	±5%	
035-009	Capacitor	0.0022μF	50V	±10%	Mylar
035-018	Capacitor	0.015μF	50V	±10%	Mylar
035-020	Capacitor	0.022μF	50V	±10%	Mylar
035-028	Capacitor	0.1μF	50V	±10%	Mylar
035-032	Capacitor	0.22μF	50V	±10%	Mylar

PS-22 Power Supply Board Assembly (146-022) 100V-120V
PS-24 Power Supply Board Assembly (146-024) 220V-250V

052-133B	Printed Circuit Board No. 133B	(less parts)			
048-001	Heatsink No. 1				
020-031	IC	723CN			
017-010	Transistor	2SD234 (O)			
018-028	Diode	ESA-B01-03C			
018-029	Diode	ESA-B01-03N			
018-022	Diode	1N4003			
028-002	Trimmer Potentiometer	1KΩ (B)	EVL-R4XA0013B		
044-008	Resistor	3.9Ω	1/4W	±5%	
044-037	Resistor	1KΩ	1/4W	±5%	
044-042	Resistor	3.3KΩ	1/4W	±5%	
037-008	Capacitor	470pF	50V	±10%	Ceramic
032-033	Capacitor	10μF	16V	±10%	Electrolytic
032-068	Capacitor	470μF	35V		Electrolytic
010-038	Wafer Terminal	A-2461-8C			

PS-24 Only

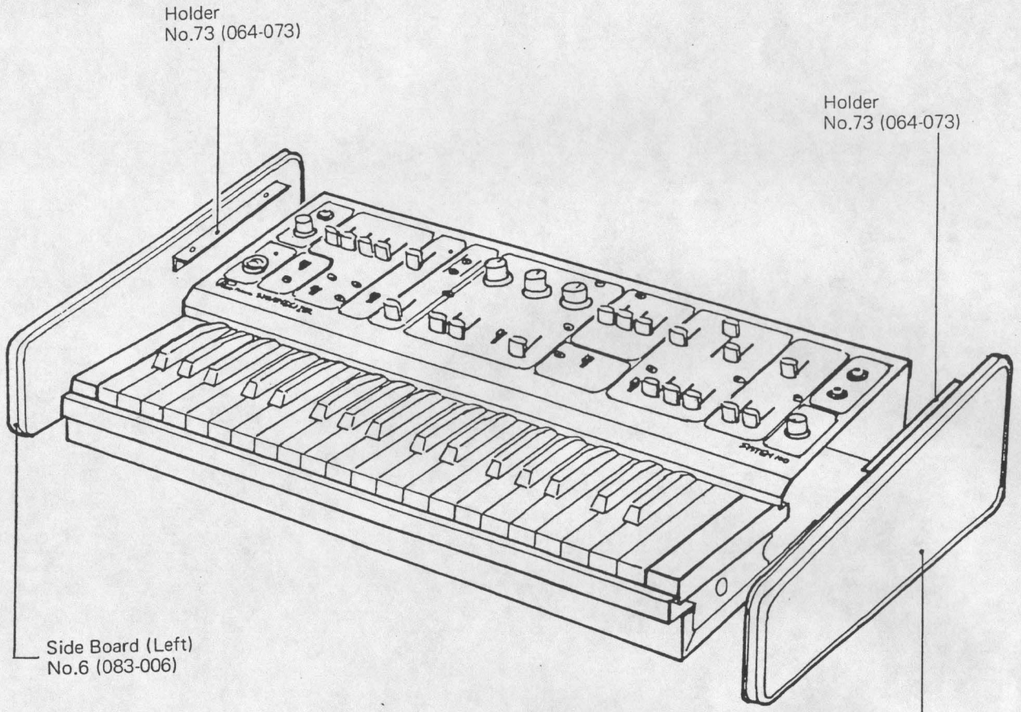
012-003	Fuse Holder	TF-758	
008-024	Fuse (Midget)	0.5A	SGA0.500
076-069	Label No. 69		

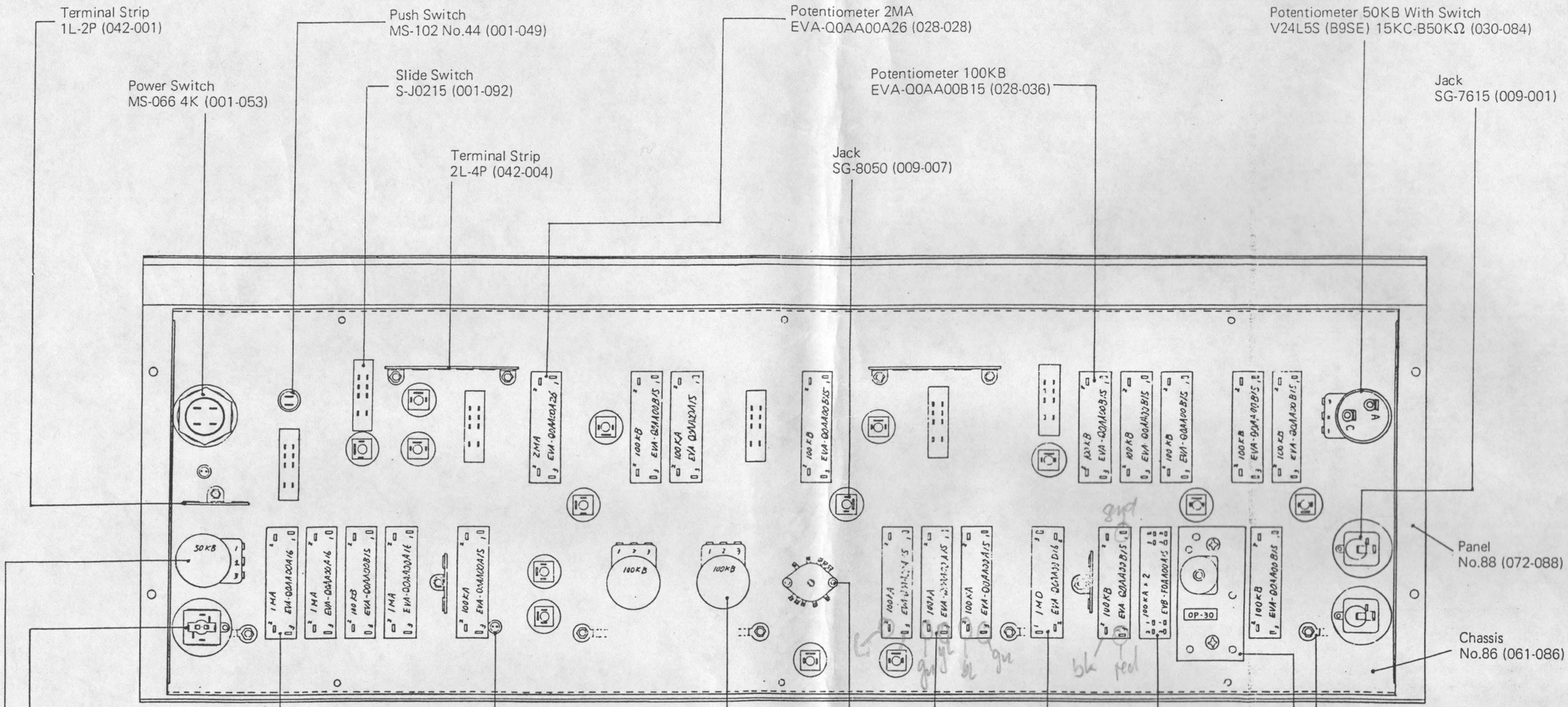
1976-7-30 SYSTEM100-101

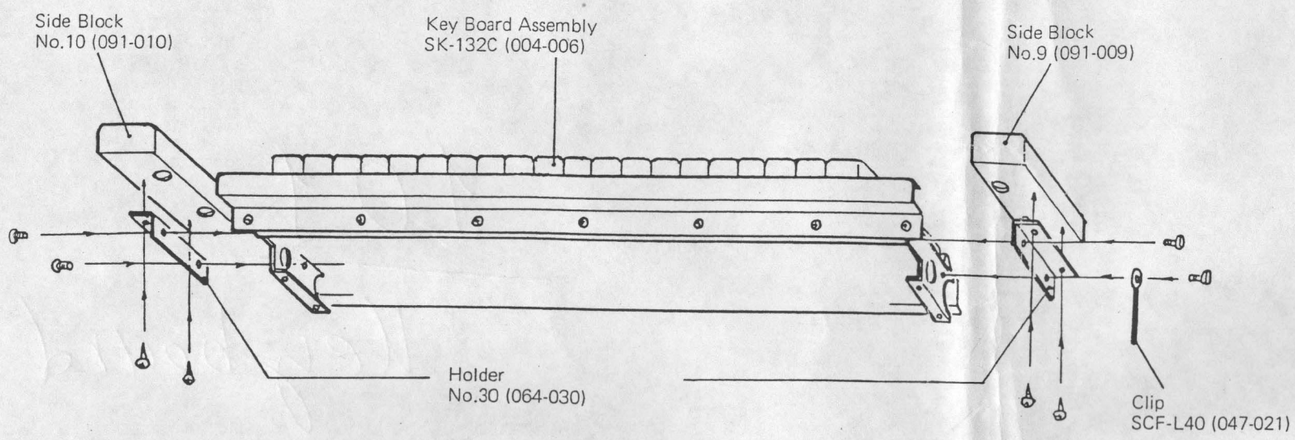
Control Panel Assembly

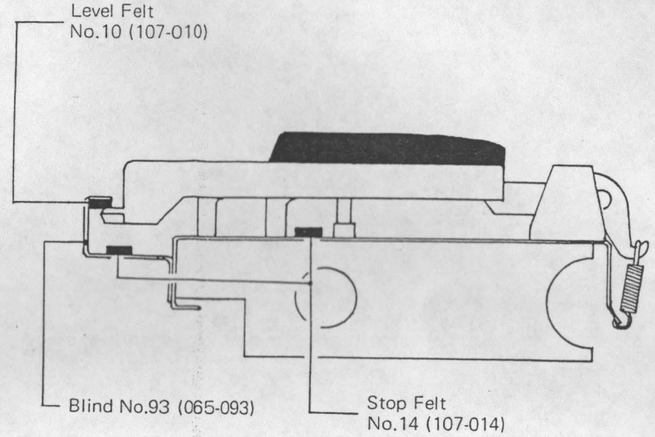
010-010	Housing Receptacle	A-2139-8			
042-015	Pin Terminal	2578T			
018-014	Diode	1S2473			
044-009	Resistor	4.7Ω	1/4W	±5%	
044-031	Resistor	330Ω	1/4W	±5%	
044-037	Resistor	1KΩ	1/4W	±5%	
044-043	Resistor	3.9KΩ	1/4W	±5%	
044-048	Resistor	10KΩ	1/4W	±5%	
044-050	Resistor	15KΩ	1/4W	±5%	
044-052	Resistor	22KΩ	1/4W	±5%	
044-056	Resistor	47KΩ	1/4W	±5%	
044-060	Resistor	100KΩ	1/4W	±5%	
037-008	Capacitor	470pF	50V	±10%	Ceramic
035-016	Capacitor	0.01μF	50V	±10%	Mylar
035-028	Capacitor	0.1μF	50V	±10%	Mylar

PARTS PICTURE

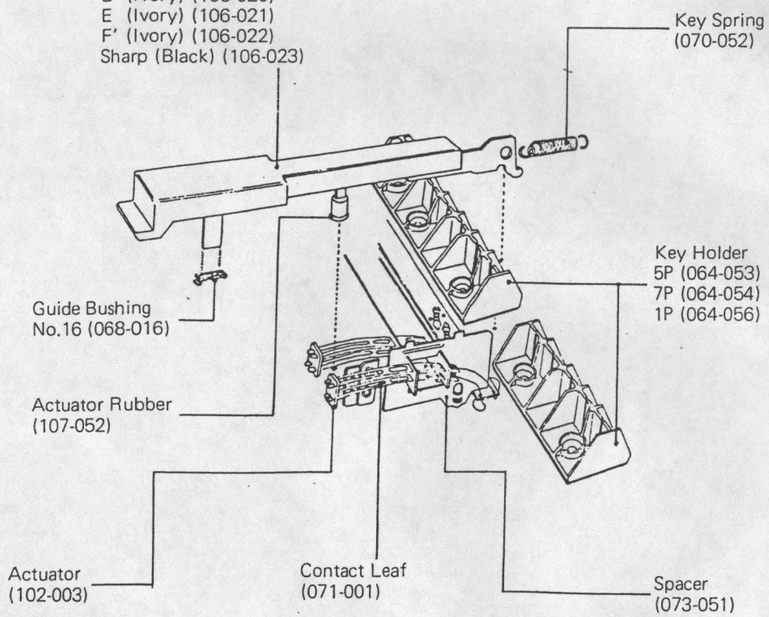


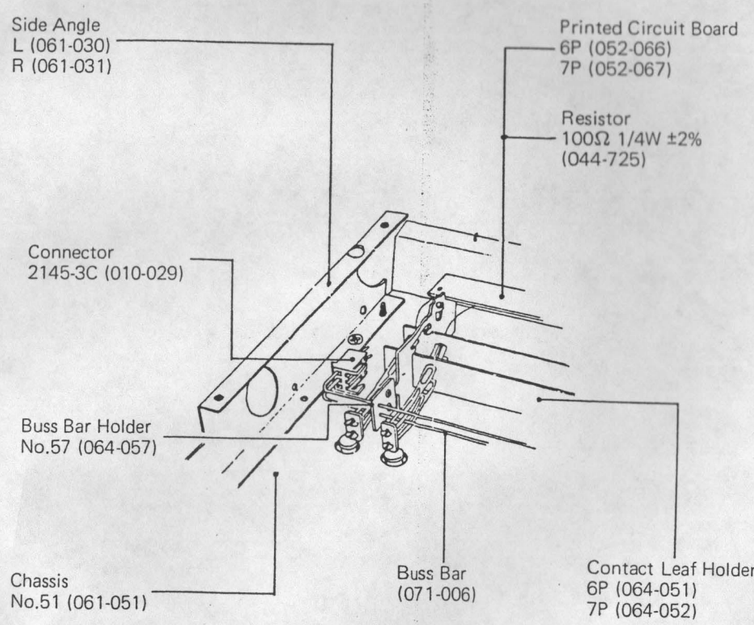

Terminal Strip
1L-2P (042-001)
Push Switch
MS-102 No.44 (001-049)
Potentiometer 2MA
EVA-Q0AA00A26 (028-028)
Potentiometer 50KB With Switch
V24L5S (B9SE) 15KC-B50KΩ (030-084)
Power Switch
MS-066 4K (001-053)
Slide Switch
S-J0215 (001-092)
Potentiometer 100KB
EVA-Q0AA00B15 (028-036)
Jack
SG-7615 (009-001)
Terminal Strip
2L-4P (042-004)
Jack
SG-8050 (009-007)
Panel
No.88 (072-088)
Chassis
No.86 (061-086)
Potentiometer 1MA
EVA-Q0AA00A16 (028-027)
Bush No.20
(068-020)
Potentiometer 1MD
EVA-Q0AA00D16 (028-097)
Clip
SCF-L40 (047-021)
Jack
LJ-039-1-6 (009-002)
Light Emitting Diode
LD-64R (019-004)
Potentiometer 100KA
EVA-Q0AA00A15 (028-025)
A-440Hz OSC Board Assembly
OP-30 (149-030)
Potentiometer 100KB
V24L5N20KC-B100KΩ (030-055)
Rotary Switch
ESR-E124K20Z (001-055)
Potentiometer 100KAx2
EVB-F0AC16A15 (029-168)
Potentiometer 50KB
V24L5N15KC-B50KΩ (030-054)

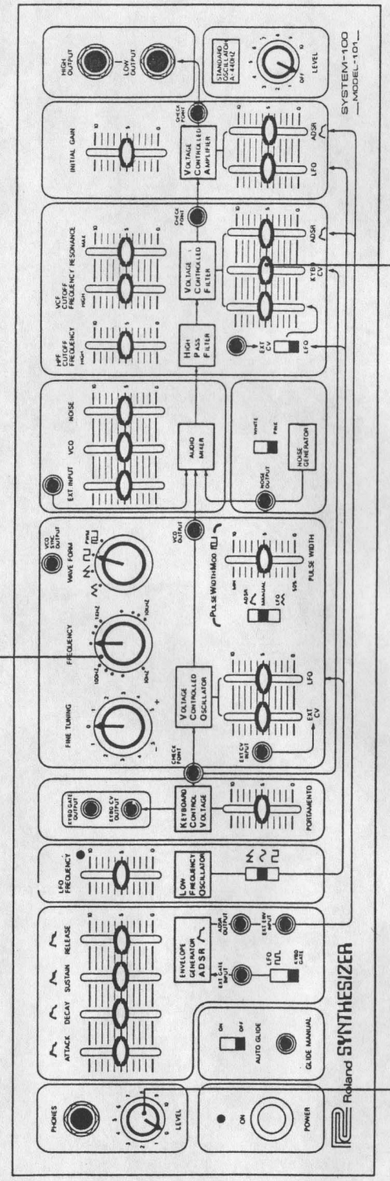




Key Assembly
F (Ivory) (106-015)
G (Ivory) (106-016)
A (Ivory) (106-017)
B (Ivory) (106-018)
C (Ivory) (106-019)
D (Ivory) (106-020)
E (Ivory) (106-021)
F' (Ivory) (106-022)
Sharp (Black) (106-023)



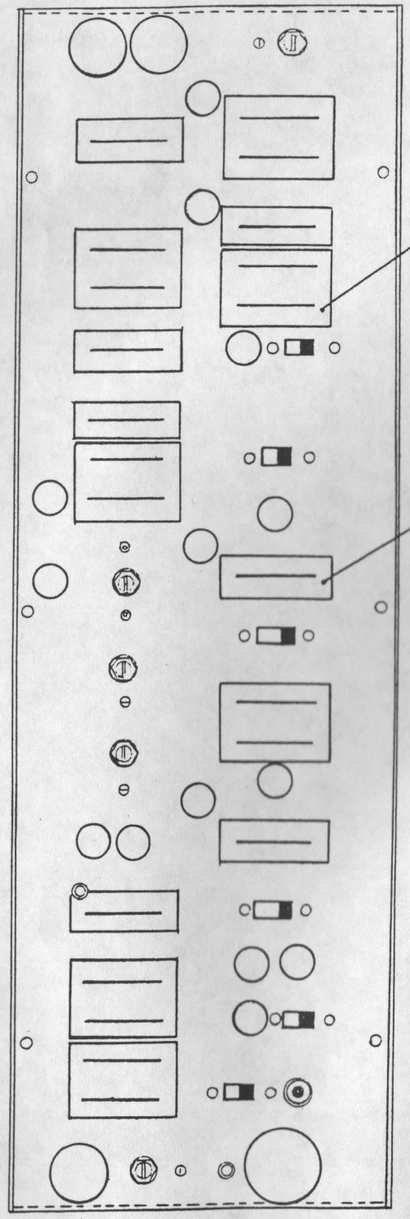




Knob No.3
(016-003)
Knob Plate No.1
(063-061)

Knob TK-1113
(016-026)

Knob TK-1114
(016-021)



Cover No.67
(065-067)

Cover No.66
(065-066)

This supplement will help you make perfect adjustment.

* *It is convenient to separate these supplement sheets into sections and attach them to corresponding parts of the first edition.*

SUPPLEMENT
TO
SYSTEM 100-101
AND
SYSTEM 100-102

SYSTEM 100-101 – page 18.

2. Key Control Voltage Adjustment:

* *Step 2-a) can be completed in the following manner:*

a) Depress F1 key and note the voltage (V_{F1} = approx. 60 – 100mV).
Next with F4 key down, turn VR208 to obtain voltage V_{F4} :

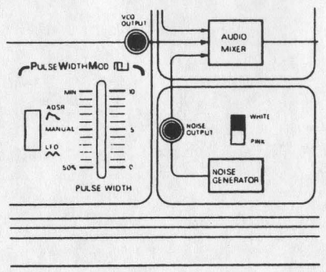
$$V_{F4} = 3V + V_{F1}$$

SYSTEM 100-101 – page 21.

Noise Level Adjustment:

* *Step a) may be amended as follows:*

a) Turn the Noise Changeover Switch of the Control Panel to *WHITE* as illustrated below:



NOTE: Allow at least five minutes for warming up.

SYSTEM 100-101 – page 23. and SYSTEM 100-102 – page 22.

VCO ADJUSTMENT

1. Triangular (/\ ) Wave Form Adjustment:

* *Step 1-b) – to be added:*

for the output wave form to be in triangular, *with C2 key down.*

* *Step 1-c) – to be added:*

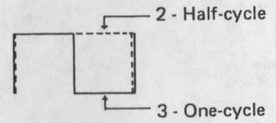
Change Vertical Input Switch from DC to AC. At this time, there should be no vertical swing of the wave form, which can be caused by possible change in 0-level.

SYSTEM 100-101 – page 24. and SYSTEM 100-102 – page 23.

2. Square (⊓⊔) Wave Form Adjustment:

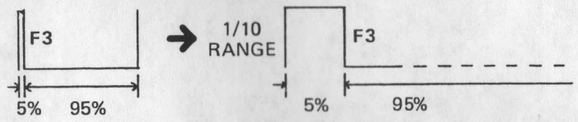
* *Step 2-b) can be completed in the following manner:*

With F3 key down, adjust the Oscilloscope so that one-cycle wave form covers the entire surface of the Oscilloscope. Next, with F2 key down, adjust VR207 to obtain half-cycle over the entire surface. This adjustment can be facilitated by quickly and alternatively depressing F3 and F2 keys, which will give the wave forms continuously on the Oscilloscope.

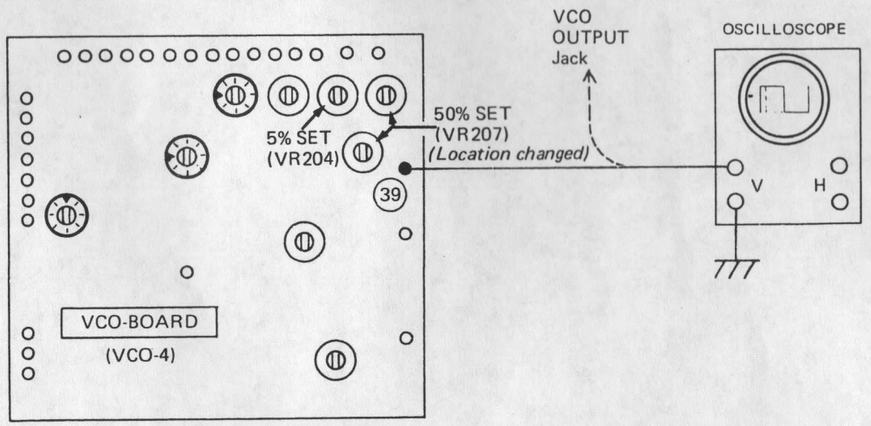


* *Step 2-d) – to be added:*

It is recommendable to set sweep range to 1/10 of the former setting for 50%-50% adjustment.



* *PCB Illustration at the bottom should be amended as follows:*



NOTE: Allow at least five minutes for warming up.

SYSTEM 100-101 – page 25. and SYSTEM 100-102 – page 24.

3. VCO WIDTH Adjustment:

* *Step 3-a) – to be added:*

Without sticking to Wave Form setting of ⋀⋀, set it to any wave form where frequency deviation appears most significantly.

* *To practise Step 3-b) do as follows:*

With F1 key down, tune F1 with FINE TUNING. Next, with F4 key down, check to see to which F4 is deviated, higher frequency (sharp) or lower frequency (flat).

If the deviation is too big that judgment is difficult, check it with F2 or F3 key down.

If to higher frequency (sharp), turn VR201 so that F4 becomes *even* higher (sharper).

If to lower frequency (flat), turn VR201 so that F4 becomes *even* lower (flatter).

CAUTION: If you try to turn VR201 to make F4 frequency closer to true F4 frequency, that is, in the direction to obtain static Lissajous' figure, tuning can never be completed.

Then tune F1 again and follow the step for F4 again. Repeat the procedures until frequencies on F1, F2, F3 and F4 keys are all in octave relations with each other.

In case F4 is deviated only slightly, tuning can be completed with VCO WIDTH on rear panel, instead of VR201.

SYSTEM 100-101 – page 27. and SYSTEM 100-102 – page 26.

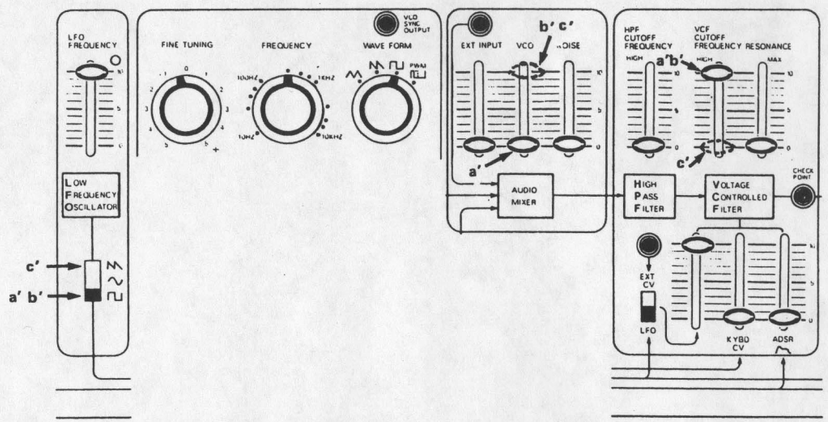
VCF ADJUSTMENT

1. VCF DC BAL Adjustment:

* *Step 1. VCF DC BAL Adjustment can also be made in the following procedures.*

a') Connect the Oscilloscope to Terminal "71" on the VCF VCA Board or VCF CHECK POINT JACK, and set the range to 0.5V/cm.

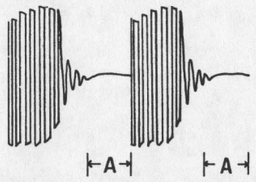
Set the Control Panel as shown below, and adjust VR305 so that leakage square wave from LFO is minimized.



b') Change VCO setting to "10" and make sure the wave form is vertically symmetrical on the whole.

c') With VCO setting to "10" as it is, change VCF CUTOFF FREQUENCY to "0" and LFO wave form to sawtooth (⋀⋀).

For perfect adjustment, fine-adjust VR305 so that inclination of A section is minimized.



NOTE: Allow at least five minutes for warming up.

SYSTEM 100-101 – page 28. and SYSTEM 100-102 – page 27.

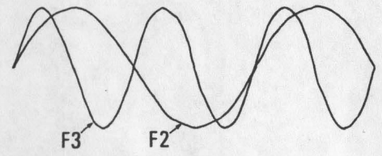
2. VCF WIDTH Adjustment:

* *To practise Step 2-b), do as follows:*

With C2 key down, adjust VCF CUTOFF FREQUENCY to obtain 1KHz oscillation on the Oscilloscope.

Then, with F3 key down, adjust the Oscilloscope to obtain 3-cycle wave form on the Oscilloscope.

Next, depress F3 and F2 keys alternatively and quickly and turn VR304 to attain octave-relation between the two keys.



NOTE: Allow at least five minutes for warming up.