

保存用

ELECTRONIC MUSIC SYNTHESIZER MODEL SH-3



ROLAND SYNTHESIZER

SERVICE NOTE

THE FIRST EDITION

 **Roland Corporation**

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1. SPECIFICATIONS

- * 44Keys(F Scale)
 - Note can be raised or lowered by one octave via Transpose switch.

- * VCO Assembly(Voltage Controlled Oscillator)
 - 5 Octave Combination(32', 16', 8', 4', 2') 5
 - Waveform Selector 5
 - Modulation Waveform Selector (\sphericalangle / \square / \sim) 1
 - Modulation Depth Control (VIBRATO) 1
 - Pitch Control 1
 - Glide Switch 1
 - Portamento Time (PORTAMENTO) 1
 - Portamento OFF Switch (OFF) 1
 - Transpose Changeover Switch (L/M/H) 1
 - 8' Chorus Speed Control/OFF (8' CHORUS)..... 1
 - Sampler
 - Sampled Waveform Selector (MODE - OFF/ \sphericalangle / \square / \sim /RANDOM) 1
 - Sampling Time (SAMPLE TIME) 1
 - Sampling Level Control (LEVEL) 1

- * VCF Assembly (Voltage Controlled Filter)
 - Filter Resonance Control
 - CUTOFF FREQ 1
 - RESONANCE 1
 - Modulation Waveform Selector (\sphericalangle / \square / \sim) 1
 - Modulation Depth Control (GROWL) 1
 - Envelope Selector (ADSR/ \sphericalangle / \sphericalangle) 1
 - Envelope Sensitivity Control (SENS) 1

- * VCA Assembly (Voltage Controlled Amplifier)
 - Modulation Waveform Selector (\sphericalangle / \square / \sim) 1
 - Modulation Depth Control (TREMOLO)..... 1
 - Envelope Selector (ADSR/ \sphericalangle / \sphericalangle / \square) 1
 - Hold Control 1
 - OUTPUT Level Control (OUT LEVEL) 1

- * Others
 - Envelope Control 4
 - Attack Time/Decay Time/Sustain Level/Release Time
 - Low Frequency Oscillator 1 Rate 1
 - Low Frequency Oscillator 2 Rate 1
 - Low Frequency Oscillator 2 Delay Time Control 1
 - Noise Generator Level Control 1
 - White/Pink Noise Changer 1
 - Noise Input Selector 1
 - Phones Level Control 1
 - Tuning (on rear Panel) 1
 - OUTPUT Jack 1
 - OUTPUT VOLTAGE CHANGEOVER SWITCH (L/M/H) 1
 - PHONES Jack 1
 - Jack for VCO CONTROL 1
 - Jack for VCF CONTROL 1

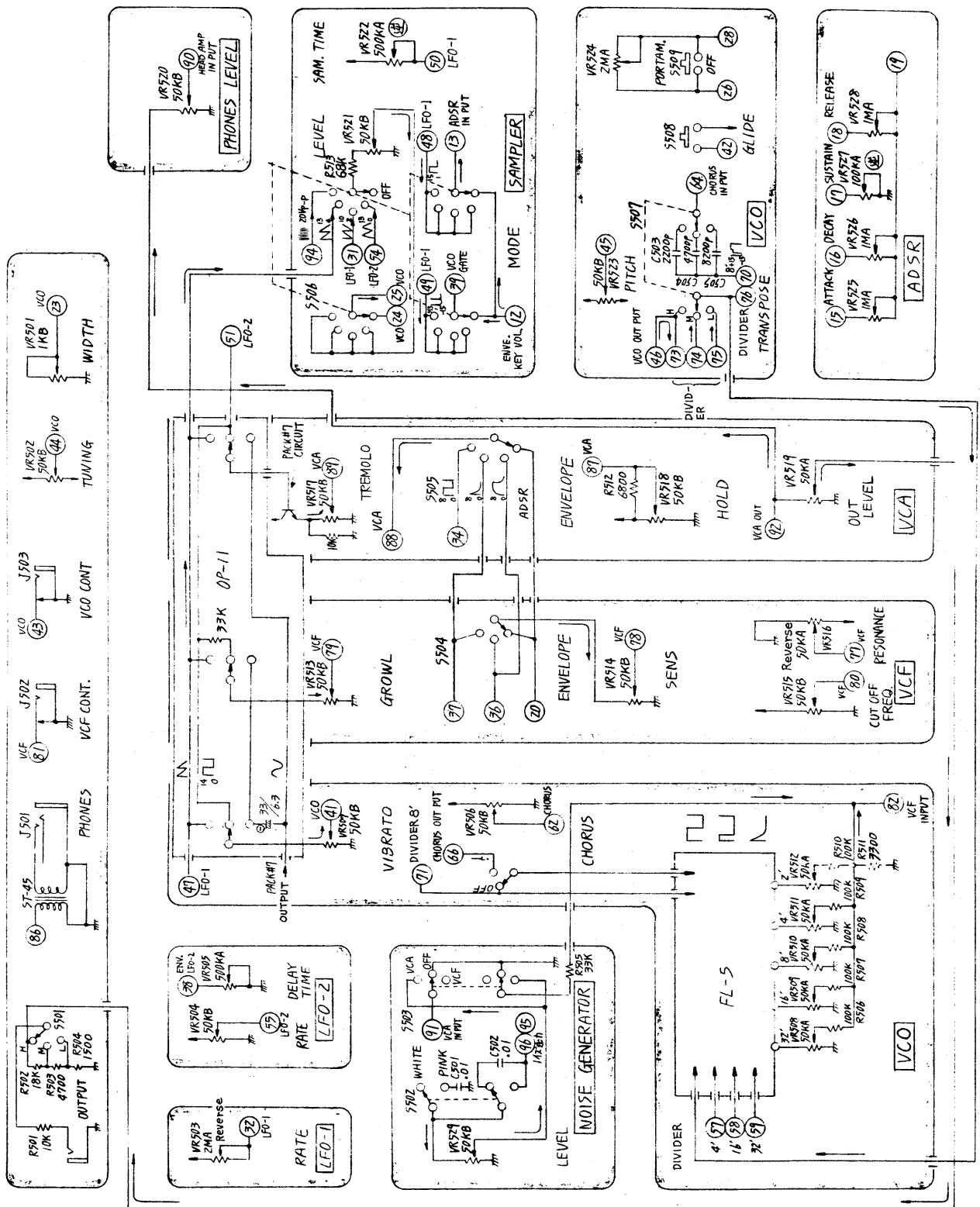
Voltage Changer (for changing AC voltage) 1

- * Power Source AC 100, 117, 220, 250V 50/60Hz
- * Power Consumption 9VA
- * Dimensions W ; 1005mm (40.2")
D ; 320mm (12.8")
H ; 150mm (6.0")
- * Weight(Net) 14.5 Kg (32 Lbs.)
- * Accessories Music Rack
Conection Cord
(2.5m with Pin-Plug Adapter)
- ** Accessories(optional)
Volume Control Pedal FV-1
(for controlling Sound Volume, VCO
GLIDE effect or VCF CUTOFF-
FREQUENCY)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

2. CONTROL CIRCUIT

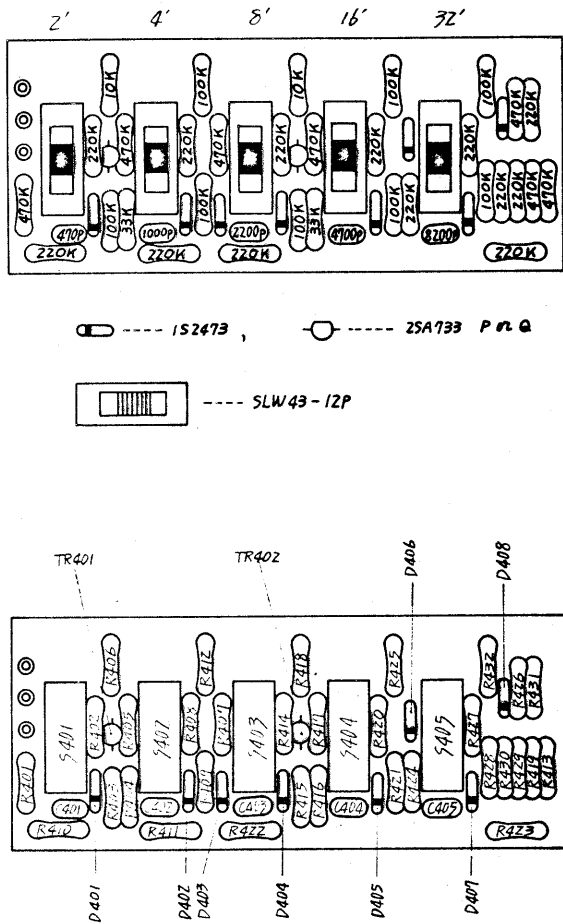
(1) Control Circuit Block Diagram



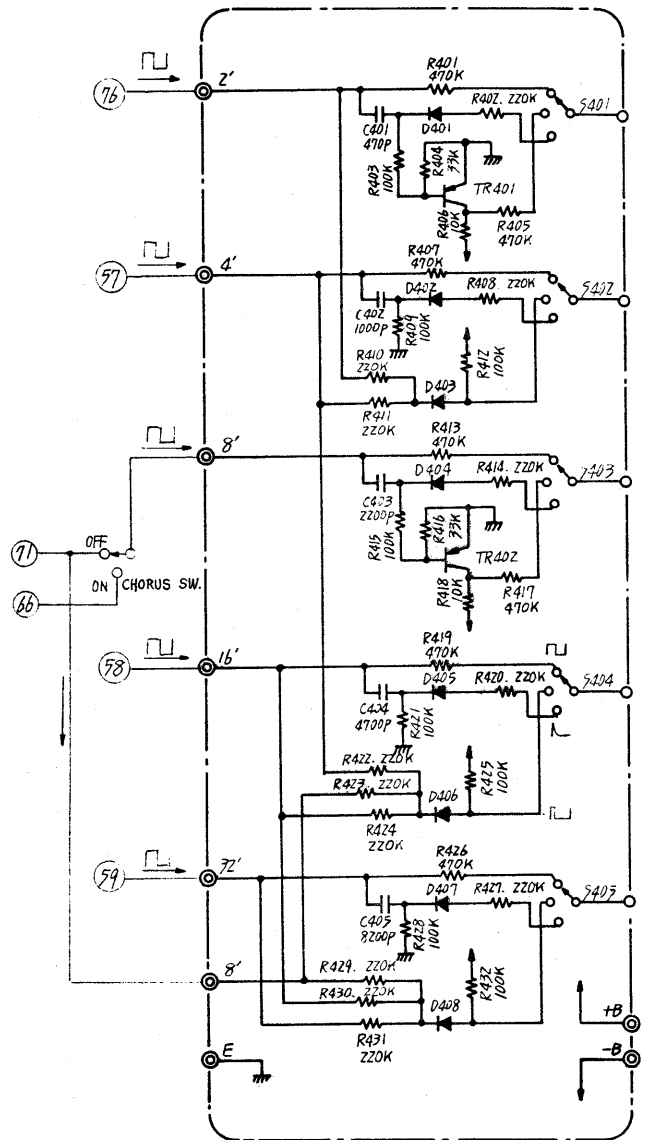
- ① ~ ③⑥ OP-9 VCO PULSE BOARD
- ⑦ ~ ⑧⑥ OP-10 VCF-VCA BOARD

(2) FILTER BOARD ASSEMBLY (FL - 5)

A. Parts Layout



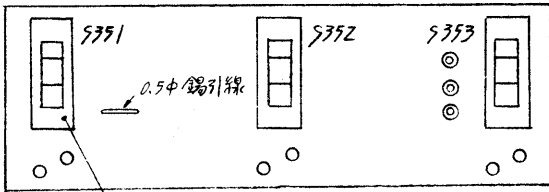
B. Circuit Diagram



- D401 - D408 Diode IS2473
- TR401, 402 Tr. 2SA733P or Q
- S401 - S405 Slide SW. SLW43-12P

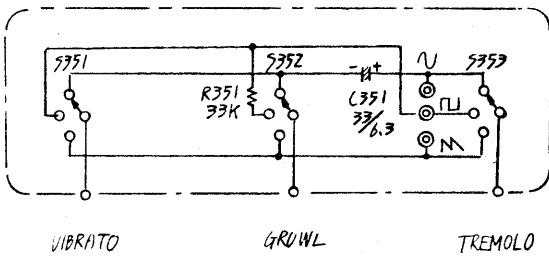
(3) MODULATION BOARD ASSEMBLY (OP -11)

A. Parts Layout

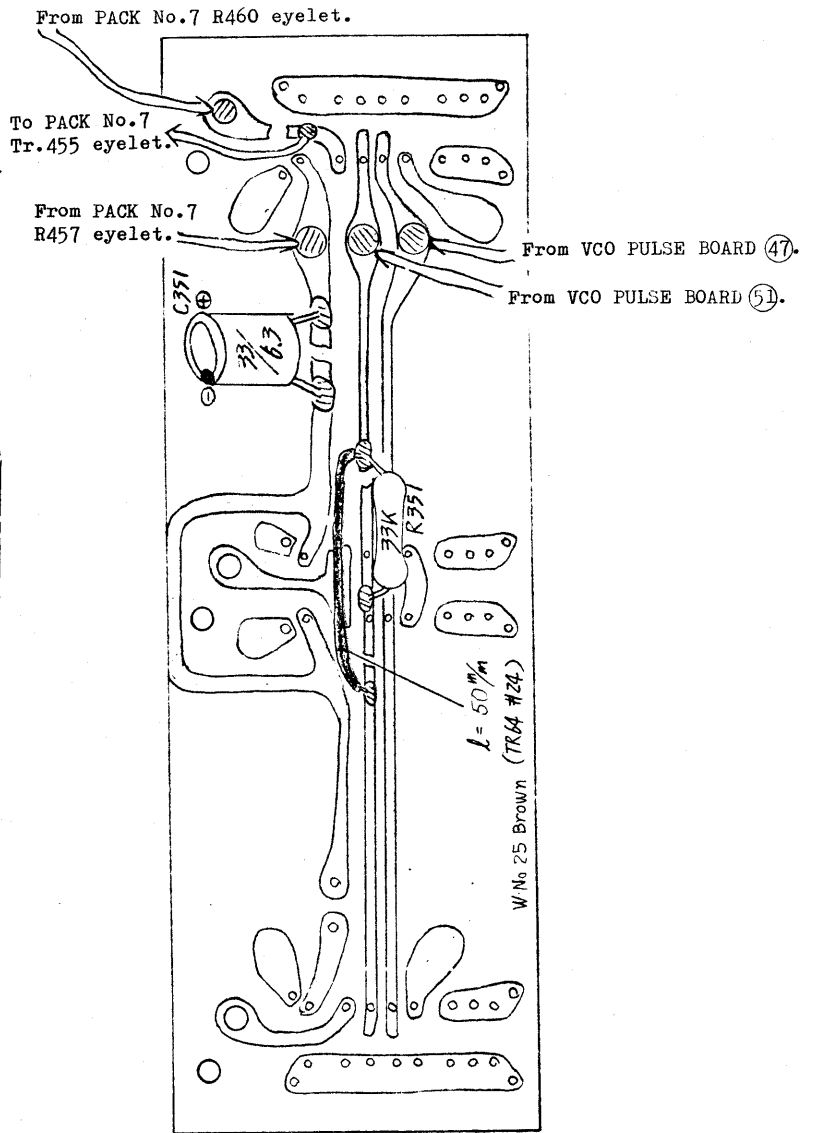


Slide SW.
SLW43-12P

C. Circuit Diagram (OP-11)

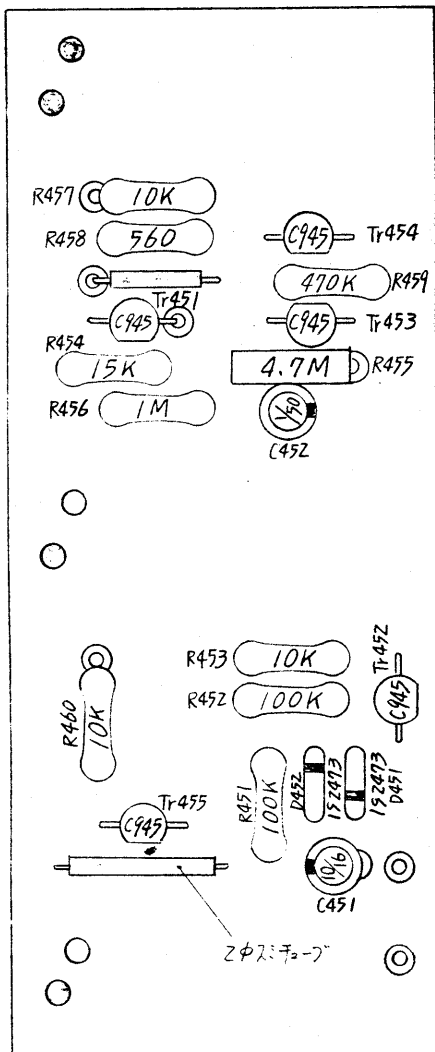


B. Rear side of OP-11.

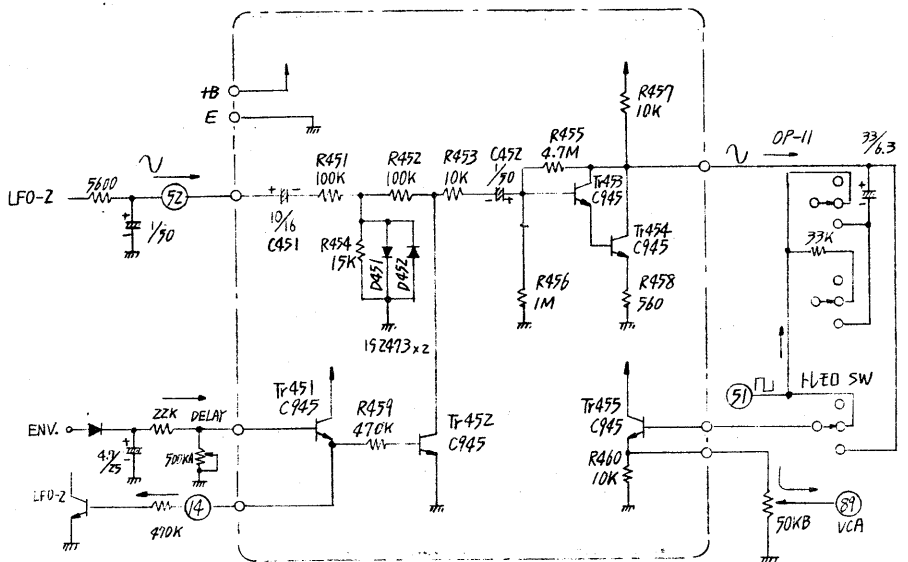


(4) VIBRATO - PACK No.7

A. Parts Layout



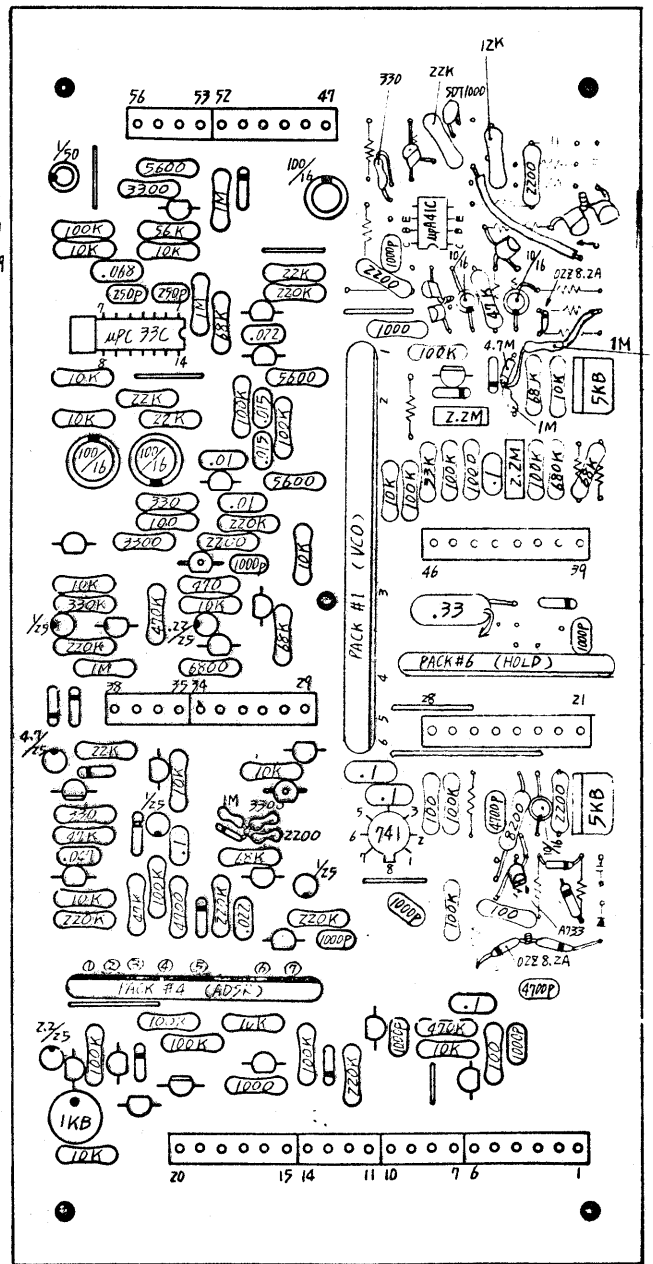
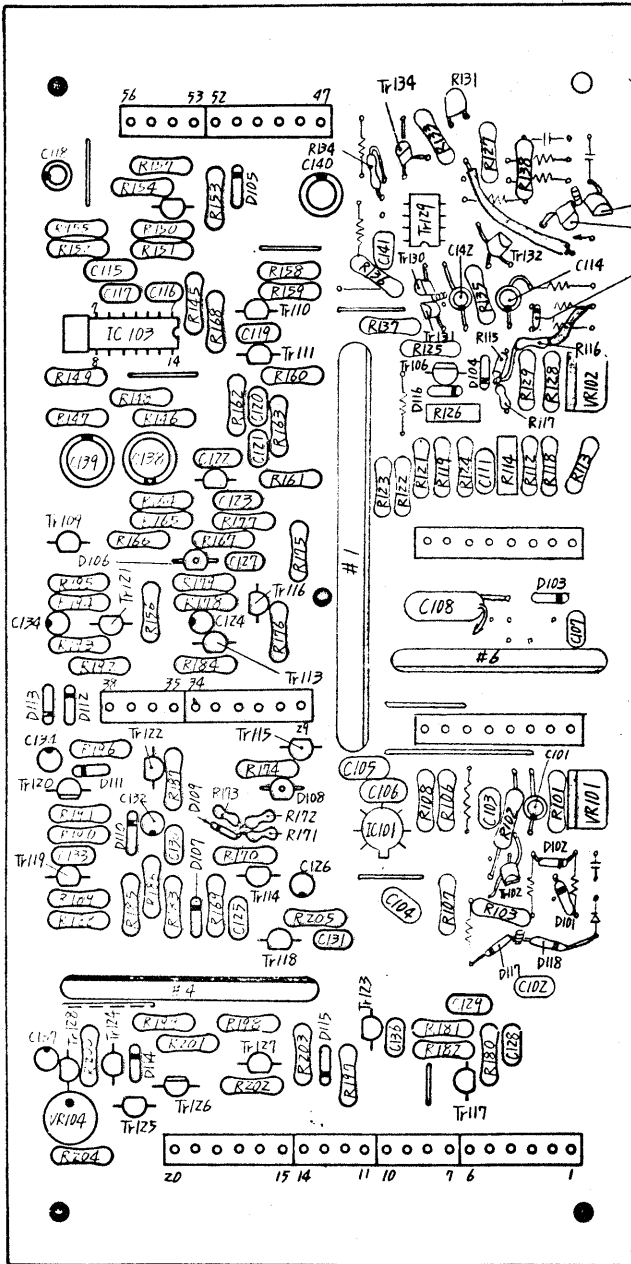
B. Circuit Diagram (PACK No.7)



3. VCO CIRCUIT

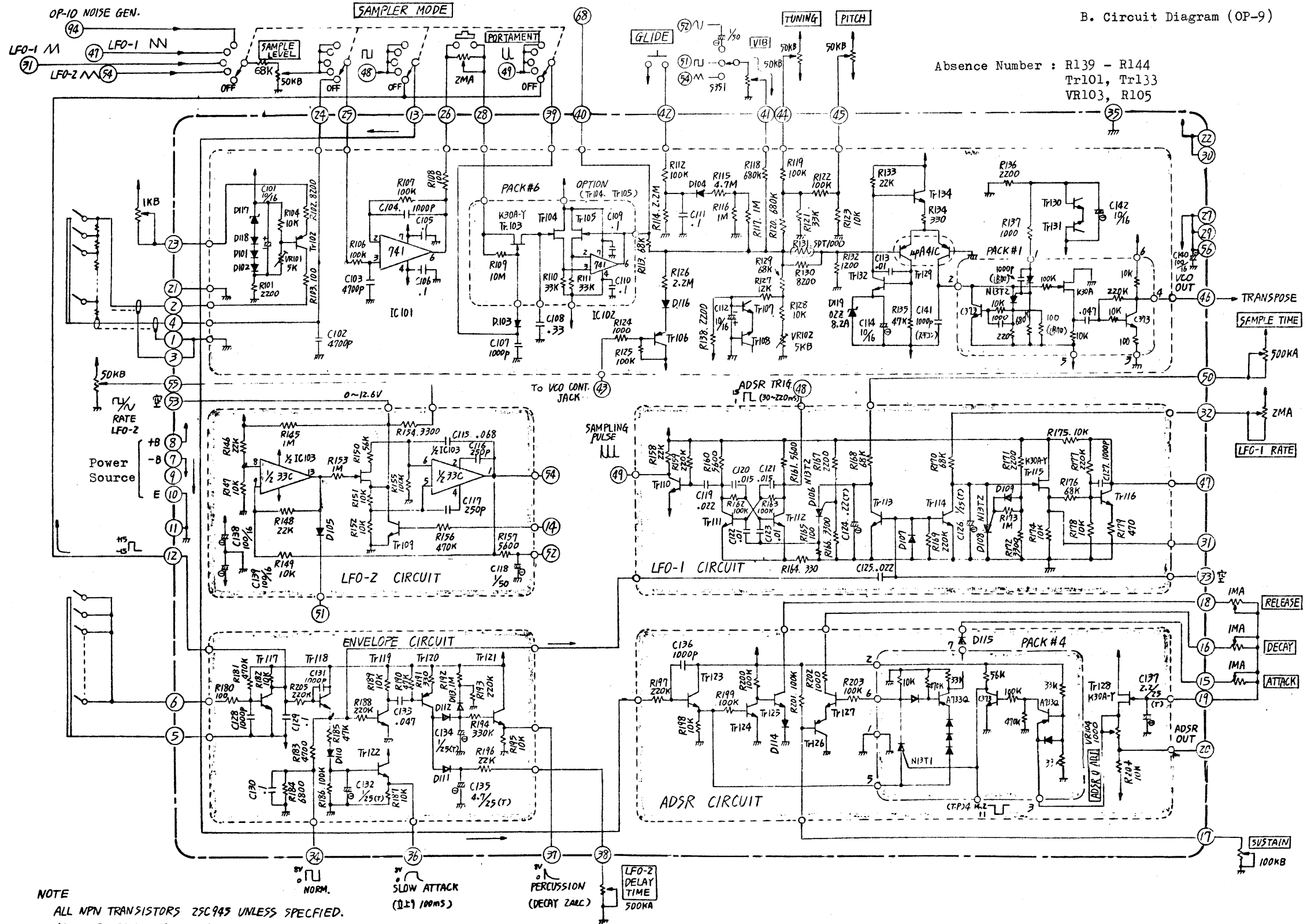
(1) VCO PULSE BOARD ASSEMBLY (OP-9)

A. Parts Layout



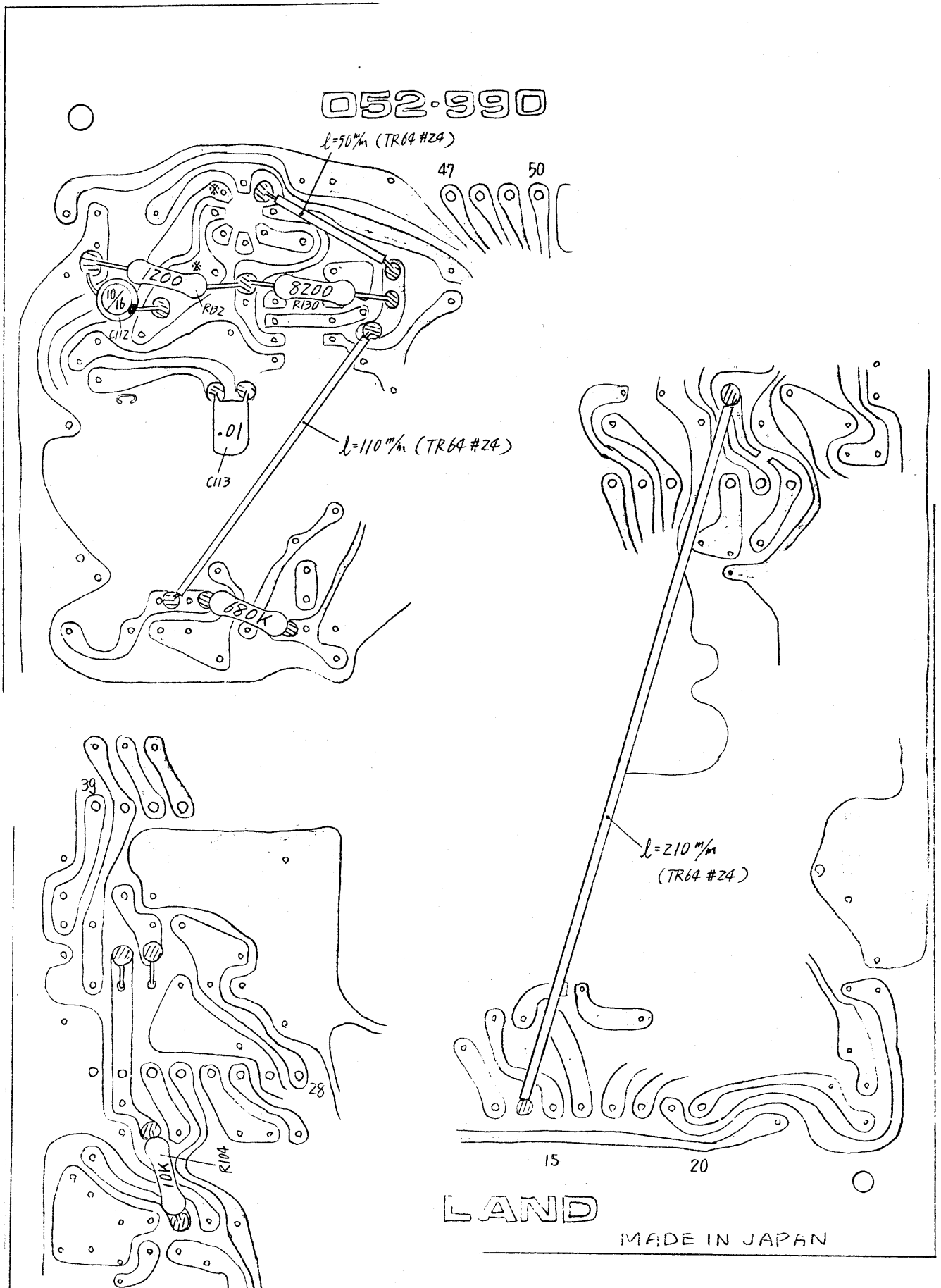
- Tantalum Capacitor
- Tr. 25A733P or Q
- Tr. 25C945P or Q
- PUT. N13TZ
- FET. 25K30A-Y
- D. 152473
- Electrolytic Capacitor

B. Circuit Diagram (OP-9)



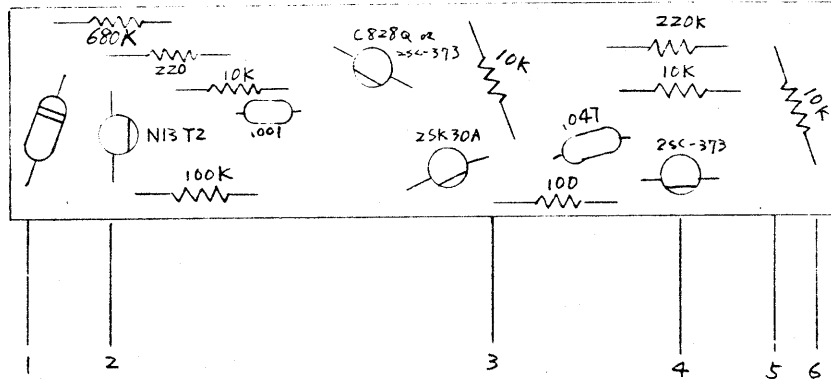
Absence Number : R139 - R144
 Tr101, Tr133
 VR103, R105

C. Rear side parts layout (OP-9)

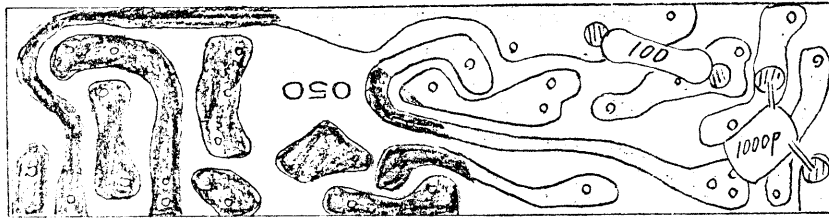


(2) PACK No.1 ASSEMBLY

A. Parts Layout



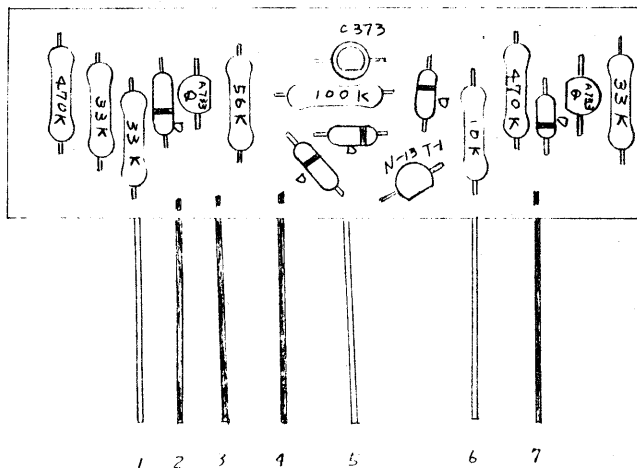
B. Rear side (PACK No.1)



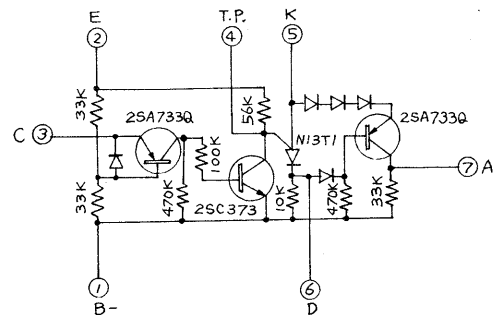
D : 1S2473

(3) PACK No.4 ASSEMBLY

A. Parts Layout



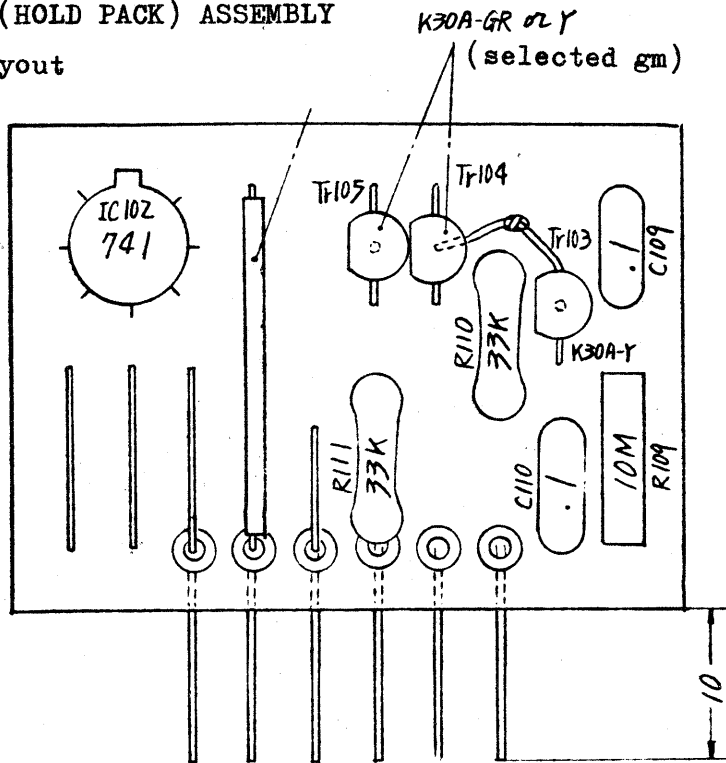
B. Circuit Diagram (PACK No.1)



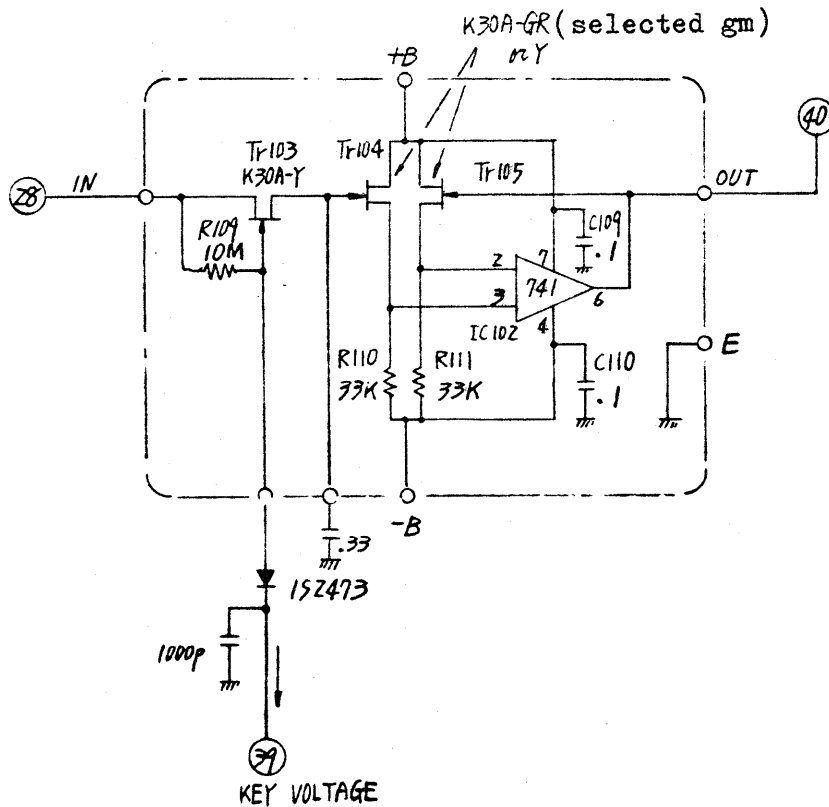
D : 1S2473

(4) PACK No.6 (HOLD PACK) ASSEMBLY

A. Parts Layout



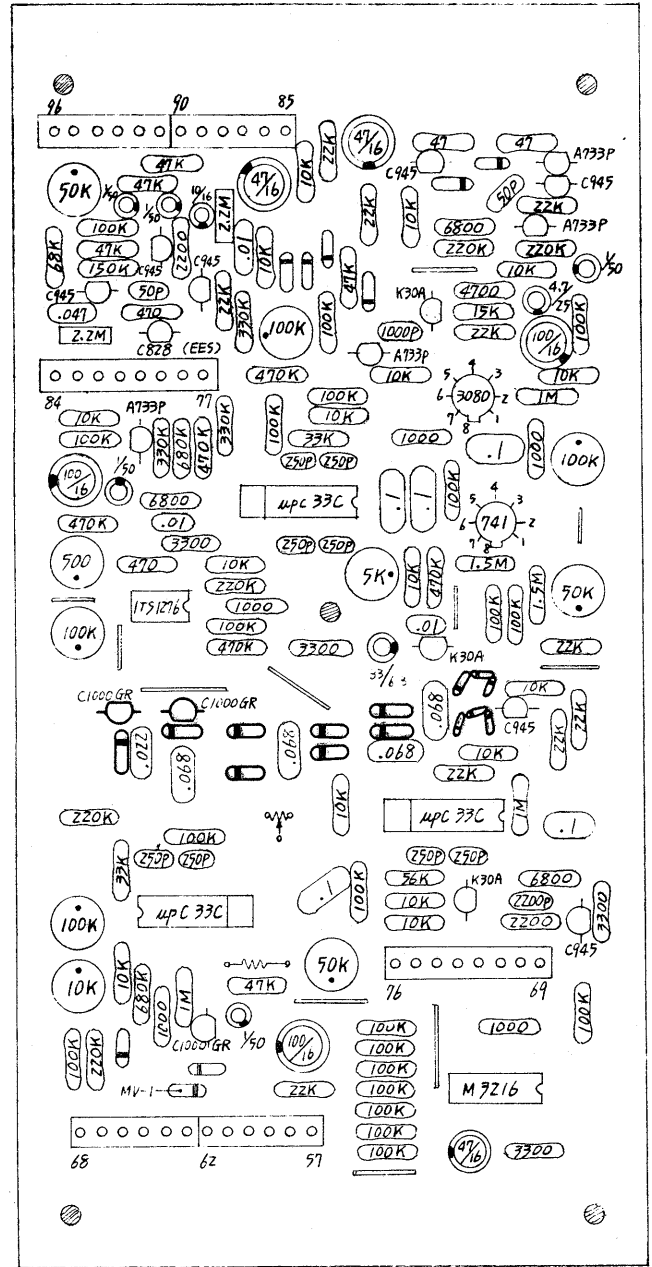
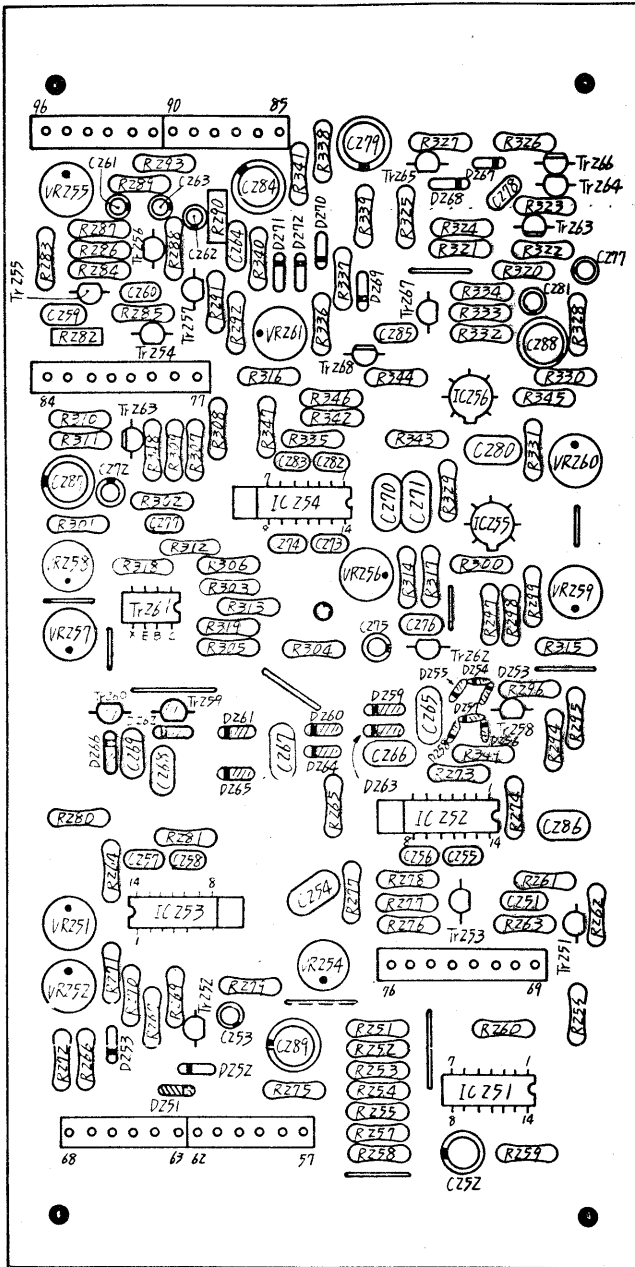
B. Circuit Diagram (PACK No.6)



4. VCF-VCA CIRCUIT

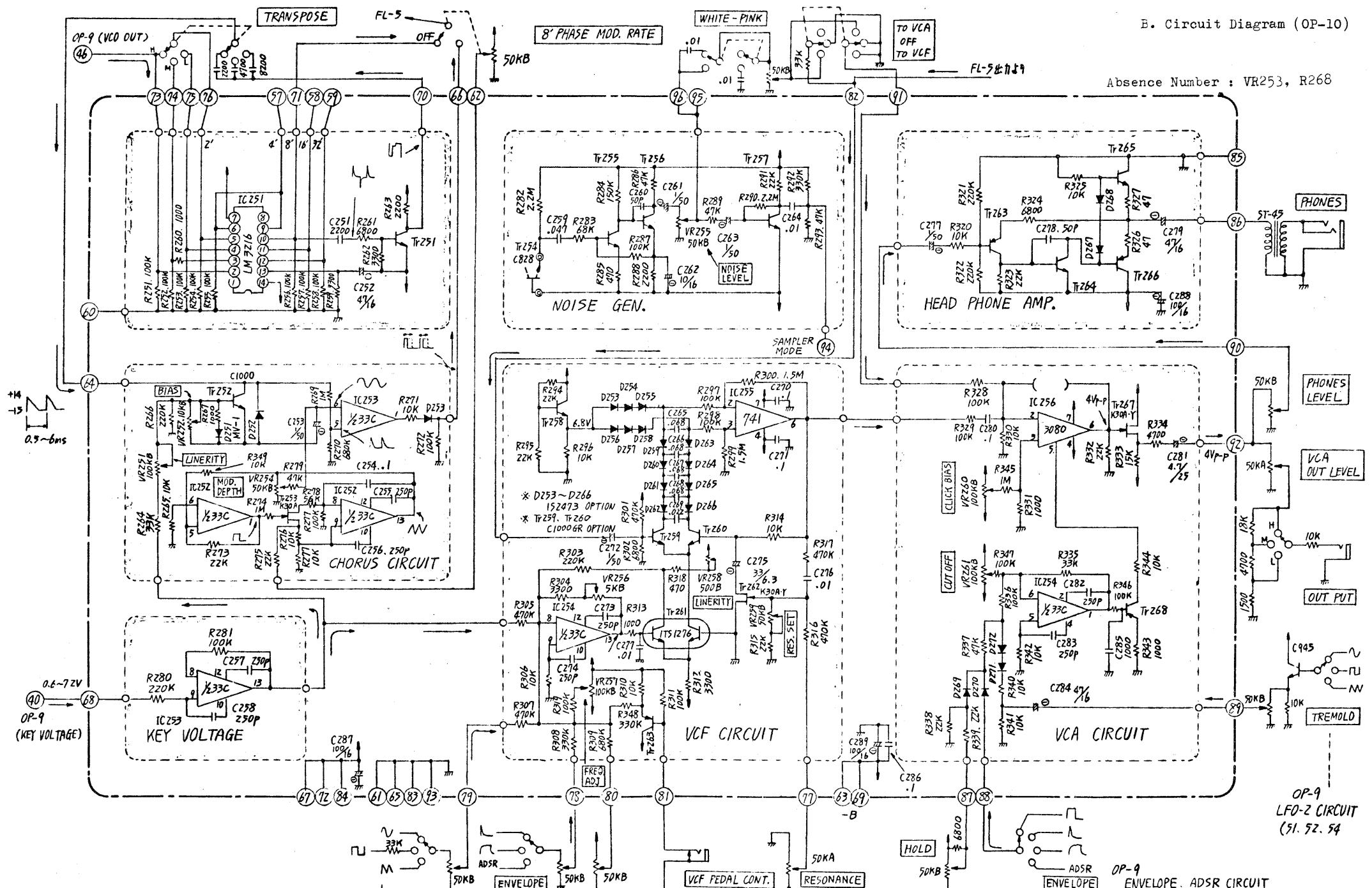
(1) VCF-VCA BOARD ASSEMBLY (OP-10)

A. Parts Layout



- 152473 ○ Z5C-1000 GR (selected)
- 152473 (selected)

B. Circuit Diagram (OP-10)



Absence Number : VR253, R268

NOTE
 ALL NPN TRANSISTORS 2SC945 UNLESS SPECIFIED.
 ALL PNP TRANSISTORS 2SA173 UNLESS SPECIFIED.
 ALL DIODES ARE 1S2473 UNLESS SPECIFIED.

OP-9 LFO-2 CIRCUIT (51. 52. 54)
 OP-9 ENVELOPE, ADSR CIRCUIT (20. 36. 37)

OP-9 ENVELOPE, ADSR CIRCUIT (20. 34. 36. 37)

6. ALIGNMENT PROCEDURE

1. Preparation (Check of Operation and Preadjustment)

(1) Setting of Controllers

VCO 8' 10 on scale

VCF Cutoff Frequency 10 on scale

VCA HOLD 10 on scale

TRANSPOSE Position M

* Other Controllers 0 on scale or OFF

(2) Adjusting Points

VCA VR261 (CUTOFF)

VCF VR257 (FREQ.)

Adjust these semi-fixed resistors so that the sounds are audible, using a headphone or an amplifier.

2. Adjustment of VCO

- (1) Connect the digital frequency counter to the 71st terminal.
- (2) Check the 0 position of PITCH on the control panel, and the center position of TUNING and WIDTH on the rear panel.
- (3) Adjust VR102 so that the frequency shown on the digital counter may come to 174Hz, depressing the lowest Key F.
- (4) Likewise, adjust VR101 so that the frequency may come to 1760Hz, depressing the highest Key A.
- (5) Repeat abovementioned procedure (3) and (4).
- (6) Check the operations of following functions.
 - a. PORTAMENTO
 - b. PORTAMENTO OFF (Push Switch)
 - c. GLIDE Button (Semitone)
 - d. PITCH, TUNING and WIDTH
 - e. GLIDE PEDAL (One note)

3. Adjustment of VCF

Return the VCO 8' to 0 position, and raise the RESONANCE control to 10 on scale so as to get the oscillation.

- (1) Adjust the CUTOFF FREQ. control and VR257 properly.
- (2) Adjust VR256 to get Octave.
- (3) Adjust VR258 to get Octave independently of the position of CUTOFF FREQ. control.
- (4) Repeat abovementioned procedure (1), (2) and (3).
- (5) Set the CUTOFF FREQ. control at 0 position, and adjust VR 257 so as

to get the oscillated frequency may come to 358Hz, depressing the highest Key C.

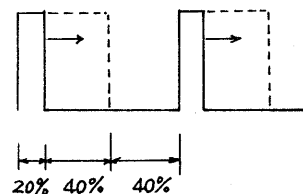
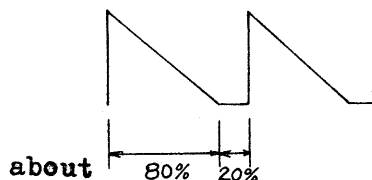
- (6) Set the RESONANCE control at 7 position on scale, and adjust VR259 so as to get the condition right before the oscillation.
- (7) Check the operation of the VCF PEDAL control.

4. Adjustment of VCA

- (1) Return the HOLD Control to 0 position.
- (2) Raise both the VCO 8' (or others feet) and the VCF CUTOFF FREQ. control to 10 on scale, and adjust VR261 so that the sounds may not be audible.

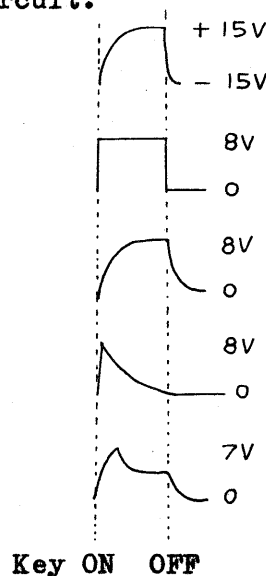
5. Adjustment of CHOROUS

- (1) Connect the synchroscope to the 64th terminal.
- (2) Adjust VR252 so that the wave-form shown on the figure may be obtained, depressing the lowest Key F.
- (3) Adjust VR264 so that the wave-form shown on the figure may be obtained, depressing the keys step by step from low to high.
- (4) Adjust VR279 so that the output from the 66th terminal may be modulated as shown on the figure.
- (5) Check the operation of 8' CHOROUS Control.
- (6) Check if the all keys' note will be modulated smoothly, changing the TRANSPOSE Changeover Switch in three stages.



6. Check the wave-form on Envelope Circuit.

- (1) at 12nd terminal
- at 34th terminal
- at 36th terminal
- at 37th terminal
- at 20th terminal

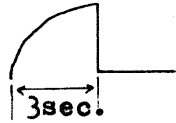


(2) 0 Adjustment of ADSR

Adjust VR104 so that the voltage of 20th terminal may reach 0V when all keys are at OFF position.

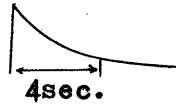
(3) Check the wave-forms via the ADSR Control at the 20th terminal.

Attack



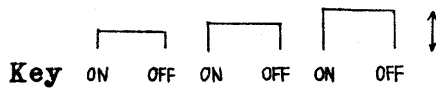
10 on scale
(D, S, R are all at 0 position)

Decay



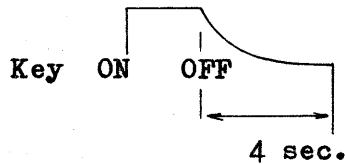
10 on scale
(A, S, R are all at 0 position)

Sustain



10 on scale
(A, D, R are all at 0 position)
Varied in accordance with the position on scale.

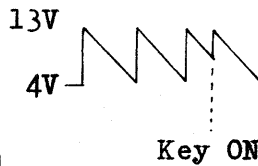
Release



10 on scale
(A, D are at 0 position, and S only at 10 on scale)

7. Check the wave-form of LFO-1.

47th terminal



Frequency range : 0.5 - 16Hz

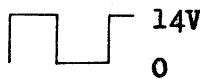
31st terminal



Frequency range : 0.5 - 16Hz

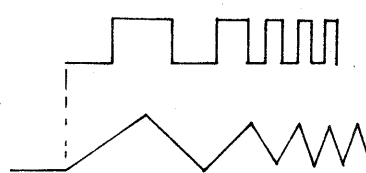
8. Check the wave-form of LFO-2. (Frequency range : 0.2 - about 36Hz)

51st terminal

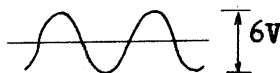


Delay

54th terminal



52nd terminal



Key ON

9. VCO MODULATION ; Check the operation of VIBRATO.
10. VCF MODULATION ; Check the operation of GROWL.
11. VCA MODULATION ; Check the operation of TREMOLO.
12. Check the operation of VCF Envelope Control.
13. Check the operation of VCA Envelope Control.

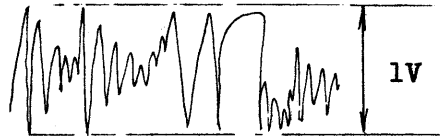
* At the dial position of wave-form \square , adjust VR260 to eliminate DC factor from the output so that the crick noises are not produced.

14. Check the operation of SAMPLER.

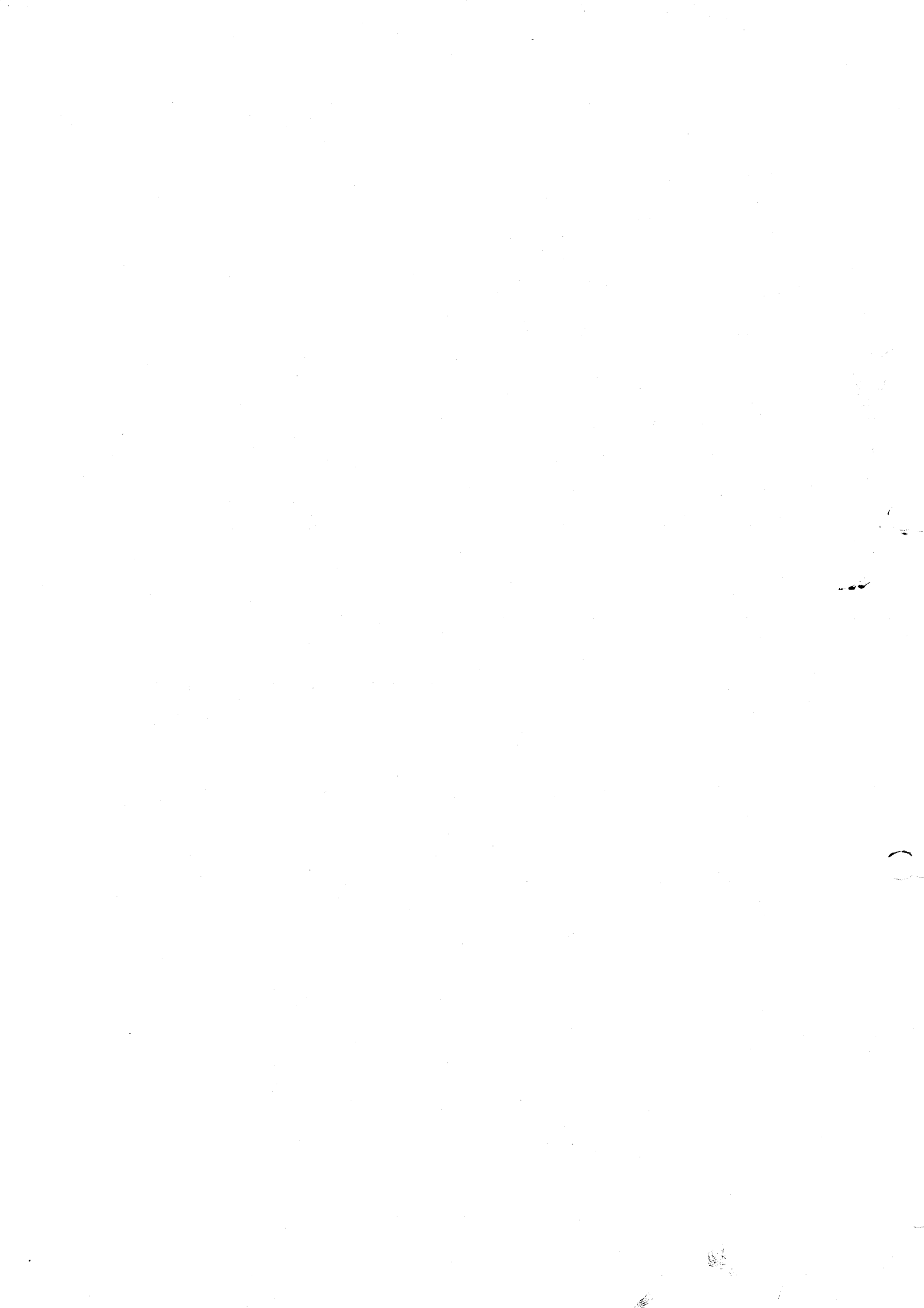
- 1) SAMPLE TIME
- 2) LEVEL

15. NOISE LEVEL

Check the output voltage of Noise signal at 95th terminal.



16. Check the operations and the wave-forms, operating controllers on the control panel.



7. PARTS LIST

GENERAL ASSEMBLY

Cabinet (Complete)		
Control Chassis Assembly		
Top Cover Assembly		
Power Supply Assembly	PC-2	162-002
Keyboard	SK-142A	004-002
Connector Housing	2145-6C	
Holder	No.30	064-030
"	No.24 (Common with EP-10)	064-024

CABINET ASSEMBLY

Cabinet		081-992
"		081-993
Lock	P-11A(Ni)	
Hooking Hinge	T-32(Cr)	
Handle	H-26(Cr)	
Foot-Rubber	G-7	
Lid	No.7	065-007
Badge	No.25	074-025
Speed Nut	M2	
Clamp	No.18	047-018
Holder	No.995	064-995
Side Block	No.997	091-997

CONTROL CHASSIS ASSEMBLY

Filter Board Assembly	FL-5	145-005
Modulation Board Assembly	OP-11	149-011
VCO Pulse Board Assembly	OP-9	149-009
VCF-VCA Board Assembly	OP-10	149-010
VIB Pack No.7	BX-7	140-007
Panel	No.60	072-060
"	No.960	072-960
Chassis	No.989 1.0t SPC-1	061-989
Holder	No.996 "	064-996
"	No.993 "	064-993
Cover	No.996 2.0t Black Sponge	065-996
"	No.994 "	065-994
"	No.49 2.0t Grey Sponge	065-049
"	No.34 " Black	065-034
Output Transformer	ST-45	
Knob	TK-1114	016-021
"	No.3	016-003
Plate	No.1	063-001
Slide Switch	SW321	001-018
Lever Switch	LE2723-18	001-044
"	LE2742-18	001-045
Push Switch	No.44 Red	001-049
Jack	No.5 SG7615	009-001
"	LJ-039-1-6	009-002
Jack Washer	BSP 1.6t Ni	121-005
Bush	No.5 Black (for insulation)	068-005
Lug	2L-6P	042-009
"	1L-3P	042-006
Long Nut	No.7 M3 x 52	120-007
Connector Housing	2145-4C	
"	2145-6C	
"	2145-8C	

Rubber Bush	No.19	068-019
Volume Washer	8ø	121-001
TOP COVER ASSEMBLY		
Top Cover	No.997	065-997
Power Switch	MS0664K Black	001-053
Light Emitting Diode	S-8119	019-002
Blaket	No.2	062-002
Speed Nut	M8	
Bush	No.11	068-011
Connector Housing	2145-8C	
POWER SUPPLY ASSEMBLY		
PC-2		162-002
Power Supply Board Assembly	PS-12	146-012
Chassis	1t SPC-1	061-988
Power Transformer		022-027A
"	No.27B-D	022-027B-D
AC Cord	SVT-2No.18(3M)	053-021
Cord Binder	No.11	047-001
" Bush	R-5	047-019
Power Switch	KW-103-1-10	001-002
Lug	1L-4P	042-002
Lead Fuse	1A	008-014
Long Nut	M3 x 10	120-001
Connector Housing	2145-4C	010-019
VCO PULSE BOARD ASSEMBLY		
OP-9		149-009
VCO Pack	No.1	
ADSR Pack	No.4	
Hold Pack	No.6	
Connector Wafer Pin	A-2402-4A	
"	" 6A	
"	" 8A	
OTHERS		
Slide-Switch	SLW43-12P	001-057
Rotary Switch	ESR-E123R20A	001-054
"	ESR-E114R20B	001-055
"	ESR-E245R20B	001-056
Midget Fuse	.5A	008-024
Midget Holder	TF-758	012-003
IC	SI3150E	020-013
"	741	
"	μPC33C	
"	μPA41C	
"	CA3080	
"	LM3216	
Silicon Transistor	2SC945 P or Q	
"	2SA733 "	
"	2SC828 EES	
"	2SC1000 GR	
"	2SC1000 (Selected)	
PUT	N13T2	
FET	2SK30A Y	
"	2SK30A GR or Y (Selected)	
ITS	1276	
Thermister	SDT1000	

Silicon Diode	1S2473		
"	02Z8.2A		
"	MV-1		
"	1850		018-003
"	1850R		018-004
Potentiometer	1K ohm(B)	EVR2OAS10B13	029-002
"	50Kohm(B)	EVCBOAS20B54	028-243
"	50Kohm(B)	EVCBOAS10B54	028-262
"	50Kohm(B)	EVCBOHS20B54	028-307
"	2 Mohm(A)	EVCBOAS20A26	028-238
Slide Potentiometer	50Kohm(A)	EVAQOAA00A54	028-035
"	50Kohm(B)	EVAQOAA00B54	028-024
"	100Kohm(A)	EVAQOAA00A15	028-036
"	500Kohm(A)	EVAQOAA00A55	028-038
"	1 Mohm(A)	EVAQOAA00A16	028-039
"	2 Mohm(A)	EVAQOAA00A26	028-040
Semi-fixed Resistor	500ohm (B)	EVL4XA00B52	
"	1 Kohm	EVL4XA00B13	
"	5 Kohm	PNB04C3A502V	
"	5 Kohm (B)	EVL4XA00B53	
"	10Kohm(B)	EVL4XA00B14	
"	50Kohm(B)	EVL4XA00B54	
"	100Kohm(B)	EVL4XA00B15	
Carbon Film Resistor	47 ohm	1/4 R J	
"	100 ohm	"	
"	330 ohm	"	
"	470 ohm	"	
"	560 ohm	"	
"	1000ohm	"	
"	1200ohm	"	
"	1500ohm	"	
"	2200ohm	"	
"	3300ohm	"	
"	4700ohm	"	
"	5600ohm	"	
"	6800ohm	"	
"	8200ohm	"	
"	10 Kohm	"	
"	12 Kohm	"	
"	15 Kohm	"	
"	18 Kohm	"	
"	22 Kohm	"	
"	33 Kohm	"	
"	47 Kohm	"	
"	56 Kohm	"	
"	68 Kohm	"	
"	100Kohm	"	
"	150Kohm	"	
"	220Kohm	"	
"	330Kohm	"	
"	470Kohm	"	
"	680Kohm	"	
"	1 Mohm	"	
Carbon Solid Resistor	4.7 ohm	ERC12GK4R7	044-098
"	1.5Mohm	1/4 R J or ERC12GK	
"	2.2Mohm	ERC12GK	
"	4.7Mohm	"	
"	10 Mohm	"	

Electrolytic Capacitor	1 mfd 50V	ECE-A50V1
"	4.7mfd 25V	ECE-A25V4.7
"	10 mfd 16V	ECE-A16V10
"	33 mfd 6.3V	ECE-A6.3V33
"	47 mfd 16V	ECE-A16V47
"	100mfd 16V	ECE-A16V100
"	1000mfd 16V	ECE-A16V1000
"	1000mfd 25V	ECE-A25V1000
Plastic Film Capacitor	470 pfd 50V V Type ($\pm 10\%$ or 20%)	
"	1000pfd "	"
"	2200pfd "	"
"	4700pfd "	"
"	8200pfd "	"
"	.01 mfd "	"
"	.015mfd "	"
"	.022mfd "	"
"	.047mfd "	"
"	.068mfd "	"
"	.1 mfd "	"
"	.33 mfd "	"
Polystyrol Film Capacitor	1000pfd	
Ceramic Capacitor	50 pfd 50V V Type ($\pm 10\%$ or 20%)	
"	250 pfd "	"
Diped Tantalume	.22 mfd 25V V Type	
"	1 mfd "	"
"	2.2 mfd "	"
"	4.7 mfd "	"

MISCELLANEOUS PARTS

Interior Packing Case	No.999	130-999
Pat	No.87	132-087
"	No.88	132-088
Music Rack		092-999
Name Plate	No.12 (Common with SH-1000)	079-012
"	No.21	075-021
"	No.23	220V
"	No.24	230V
"	No.25	240V
Caution Mark	No.9	075-009
Cover	No.35	065-035