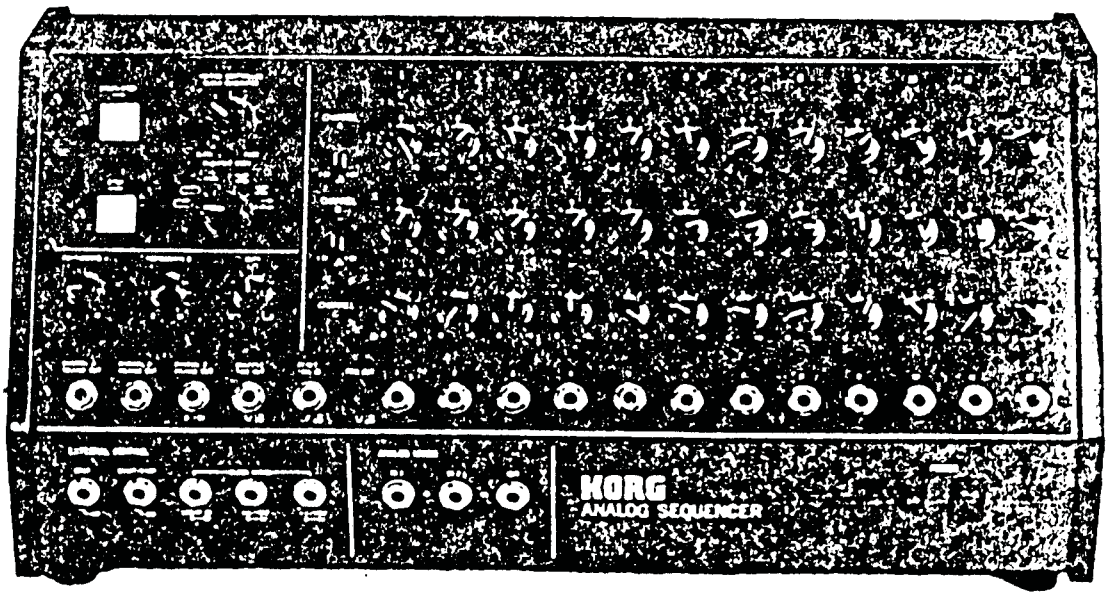
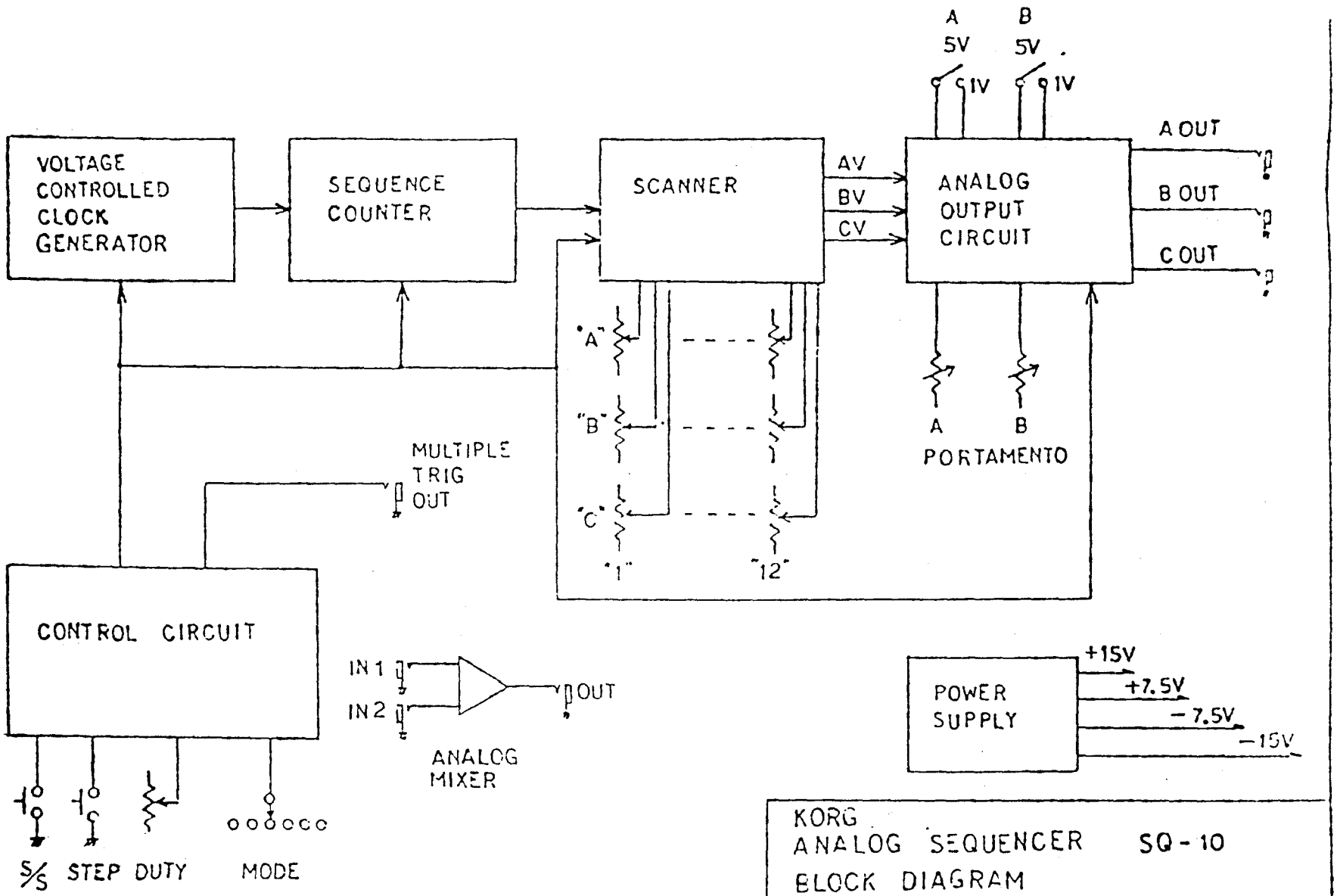
(Bad copy)

SQ-10

SERVICE MANUAL



KEIO ELECTRONIC LAB., CORP.
TOKYO, JAPAN



KORG
ANALOG SEQUENCER SQ-10
BLOCK DIAGRAM

DATE	MAY 1978	DWG	KOD-B40007

SQ-10

Checking and Adjustment

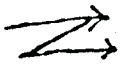
Power Check & Adjust

1. +15V; Should be 14.4V～15.6V.
2. -15V; Should be -14.4V～-15.6V.
3. +7.5V; Adjust VR46 to 7.50V.
4. -7.5V; Adjust VR47 to -7.50V.

Function Test -- Standard -- Connect MS-10 (fig 1)

Set MS-10 and SQ-10 controls (fig 2) (fig-3)

No.	Mode Rotary switch	Check
2.	＼	Clock LED flashes on and off.
3.	⟲	'12' LED turns on first. Then 1 and 2 each time step button is pressed, so the sequence goes 12 , 1 , 2. A and B LED's do not turn on in this mode.
4.	⟳	LED's 1 through 12 should be off at first. When S/S switch is pressed, sequence goes 1 , 2 .... 12 , 1 , 2 ....When S/S switch is pressed again, LED's go out. A and B do not light.
5.	→	LED's 1 through 12 should be off at first. When you turn on the S/S switch, the sequence should automatically advance 1,2,...12... and then stop after one time, If you press the S/S switch between 1 and 12, the sequence should stop. A and B do not turn on.
6.	⇄	B and 12 are on at first. A and 1 turn on when you first press the Step switch. Press it again for 2...12; again for B 1...12; and again for A 1...
7.	⤫	A and B and 1 through 12 should all be off at the beginning. When you press the S/S switch, the sequence should go A 1...12, B 1...12, A 1... automatically. Press the S/S switch again to stop.

8.  At the beginning A and B and 1 through 12 should all be off. Pressthe S/S switch and there should be a single cycle of A 1...12 and B 1...12. Then it should stop. It should also stop if you press the S/S switch while the LED's are changing.

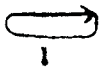
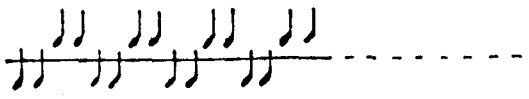
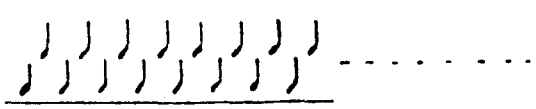
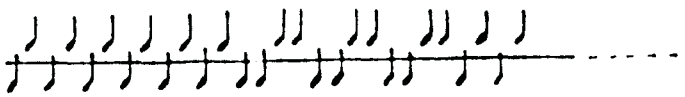
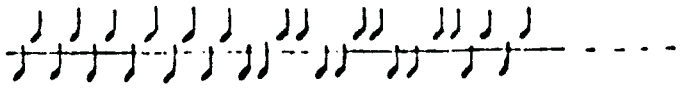
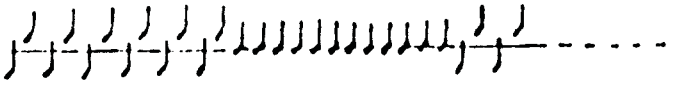
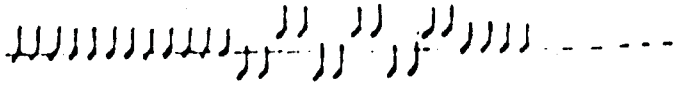
Function Test (2)

O means the phone plug connected to the MS-10 CV IN.

Ø means the phone plug connected to the opposite side (open).

SQ-10 Check 2/4

FUNCTION TEST (2)

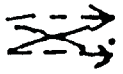
NO	MODE Rotary SW	(OUTPUT) A	B	C	musical interval
9		○			
10			○		
11				○	
12		○			
13			○		
14		○	⊗		
15		⊗	○		

OUT PUT CHECK

NO.	"1" Step VR 3	MODE	5V - 1V Sw A	5V - 1V Sw B	Digital Volt Mt A	Digital Volt Mt B	Digital Volt Mt C	measure Step	Limit
28			5V		○			"1"	+4.90 ~ +5.10 V
29			1V	5V	○			"1"	+0.95 ~ +1.05 V
30	"1" A	⊂→				○		"1"	+4.90 ~ +5.10 V
31	B			1V		○		"1"	+0.95 ~ +1.05 V
32	C						○	"1"	+4.90 ~ +5.10 V
33					○			"A" "1"	+4.85 ~ +5.15 V
34		⊂→ ×→	5V	5V	○			"B" "1"	+4.85 ~ +5.15 V
35					○			"A" "1"	-4.85 ~ -5.15 V
36	"1" A				○			"B" "1"	-4.85 ~ -5.15 V
37	B				○			"1"	-4.90 ~ -5.10 V
38	C	⊂→				○		"1"	-4.90 ~ -5.10 V
39							○	"1"	-0.10 ~ +0.10 V

○ Digital voltmeter to measure the Phone jack

Function Test (3)

No.	Item	Check
16	Portamento-A	Portamento effect should only show up in the channel A output when you turn up this knob.
17.	Portamento-B	Portamento should only show up in the B channel output.
18.	Duty	Should get shorter when knob is turned counter-clockwise. Should get longer when turned clockwise.
19.	Reset, Trig Out (1~11)	Connect RESET IN jack to each of TRIG OUT jacks 1 through 11 in turn, and see that the sequence returns to 1 after reaching the proper step. Disconnect after check.
20.	Trig Out (12)	With TRIG OUT 12 connected to the MS-10 TRIG IN jack, see that there is only a sound produced at the 12th step in a sequence. Disconnect after check.
21.	Step (jack)	Set mode to  . Connect MS-10 momentary switch to STEP jack and see that steps advance when you press the MS-10 switch. Set mode back to  and disconnect after check.
22.	Start/Stop (jack)	Connect MS-10 momentary switch to S/S jack,

and see that the MS-10 switch will turn the S/S on and off. Disconnect after check.

23. Linear In — Connect MS-10 control wheel ⌓ out to LINEAR IN jack, and see that the clock speed changes with input voltage. It should get faster toward +5V. Disconnect after check.

24. x2/V — Connect MS-10 ⌓ out to x2/V jack, and see that clock speed changes with input voltage. Speed increases towards +5V. Disconnect after check.

25. +2/V — Connect MS-10 ⌓ out to +2/V jack, and see that clock speed changes with input voltage. Speed should decrease toward +5V. Disconnect after check.

26. Clock — Turning the CLOCK knob all the way counter-clockwise should slow down the cycle 10sec ~ 40sec. Turning the knob clockwise should speed up the clock.

27. Analog Mixer — The sum of IN 1 and IN 2 voltages should appear in the OUT voltage.
For example: Connect MS-10 ⌓ out to IN 1;
Connect SQ-10 multiple trigger out to IN 2;
Connect MS-10 CV IN to OUT.

Multiple trigger signal should modulate pitch of note when keyboard is played (or momentary switch is pressed) on MS-10. Changing IN 1 input voltage (from control wheel) will vary entire pitch.

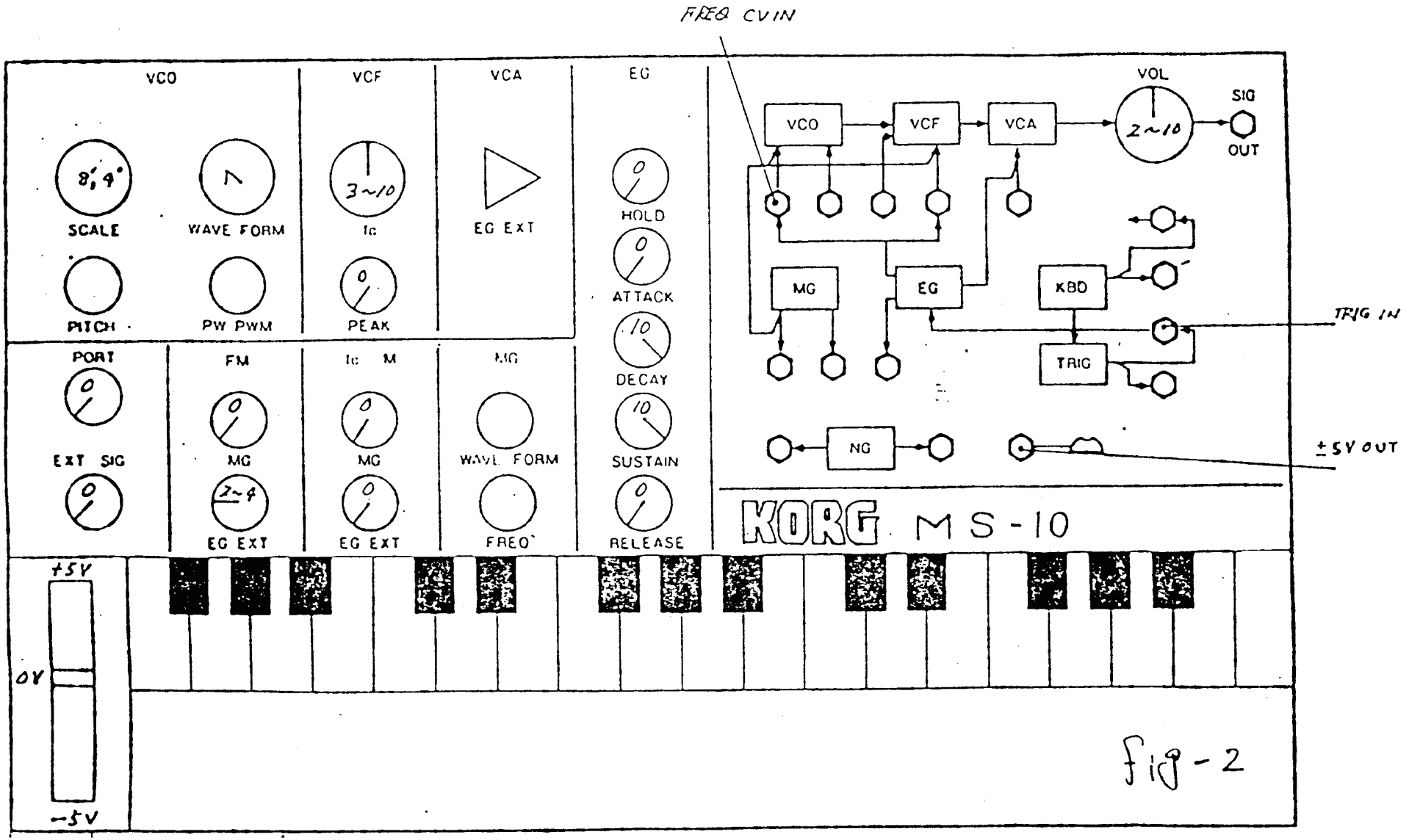

FREQ CV IN
VCO
VCF
VCA
EG
SCALE
WAVE FORM
PITCH
PW PWM
Ic
PEAK
EG EXT
HOLD
ATTACK
DECAY
SUSTAIN
RELEASE
PORT
EXT SIG
FM
MG
EG EXT
Ic M
MG
EG EXT
MG
WAVE FORM
FREQ
+5V
0V
-5V
VOL
SIG
OUT
KBD
TRIG
TRIG IN
NG
±5V OUT
KORG MS-10

fig-2

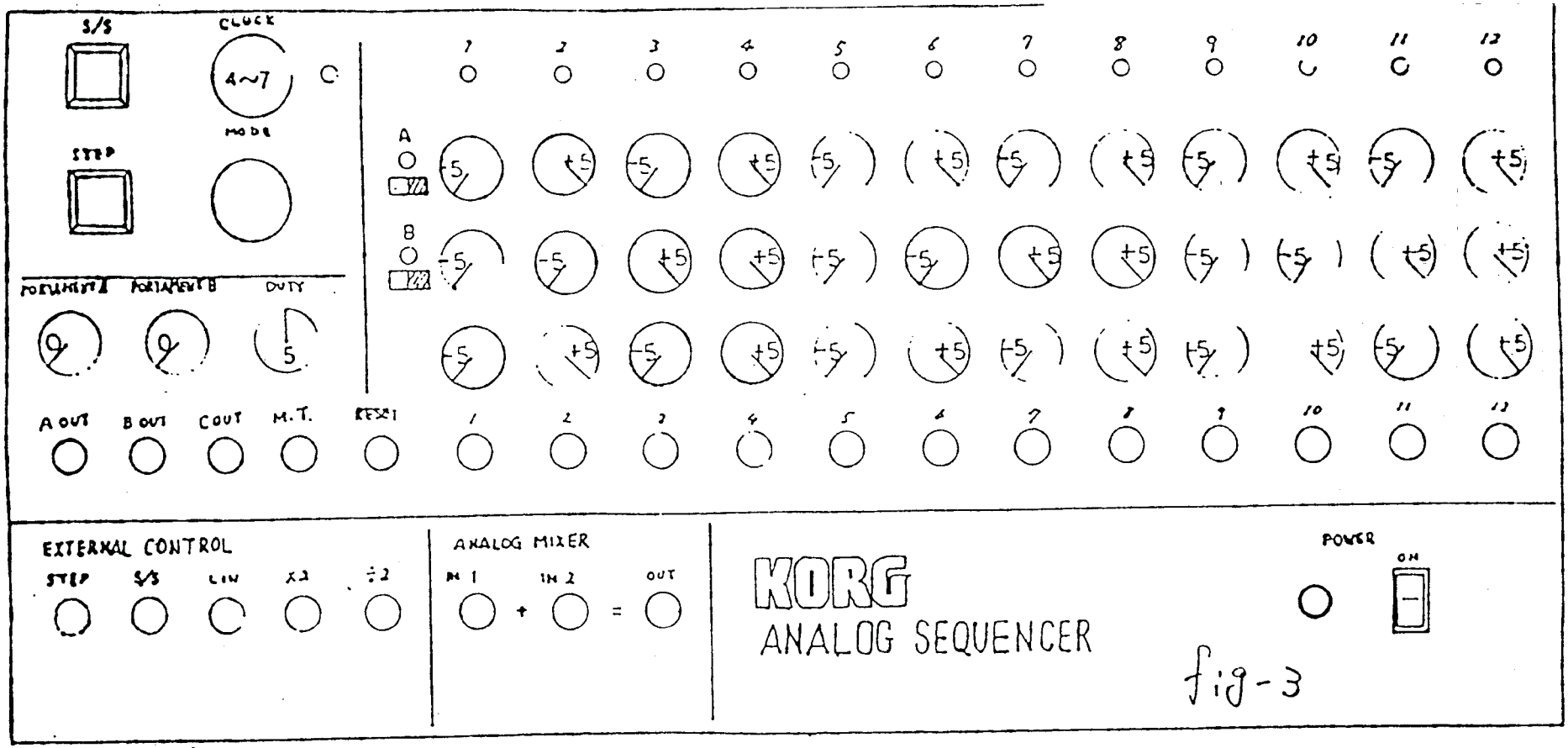
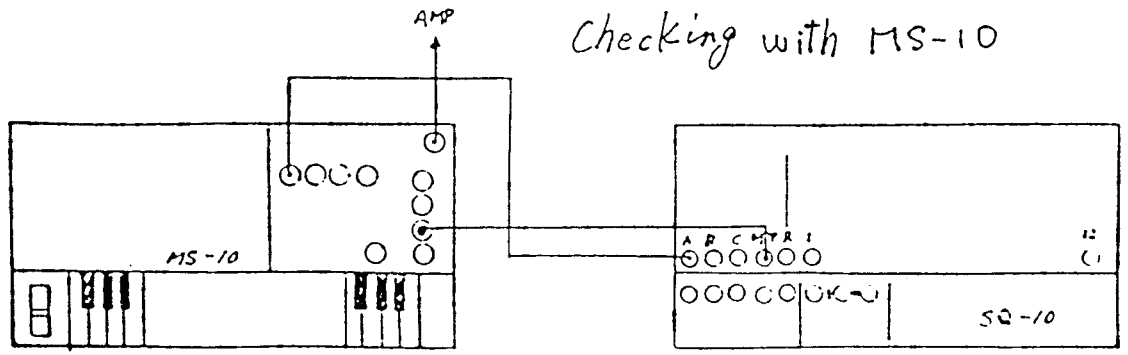


fig-3

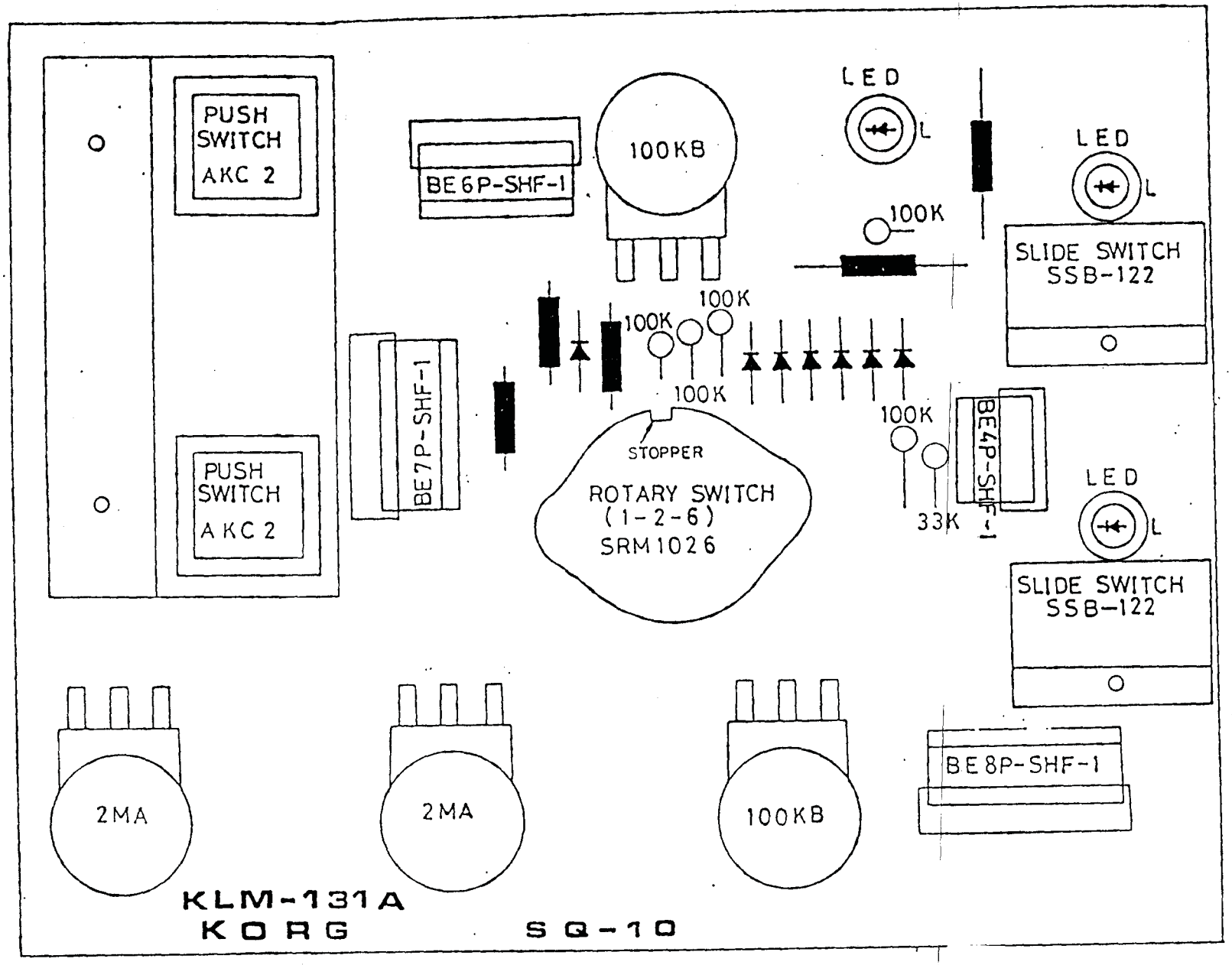


Checking with MS-10

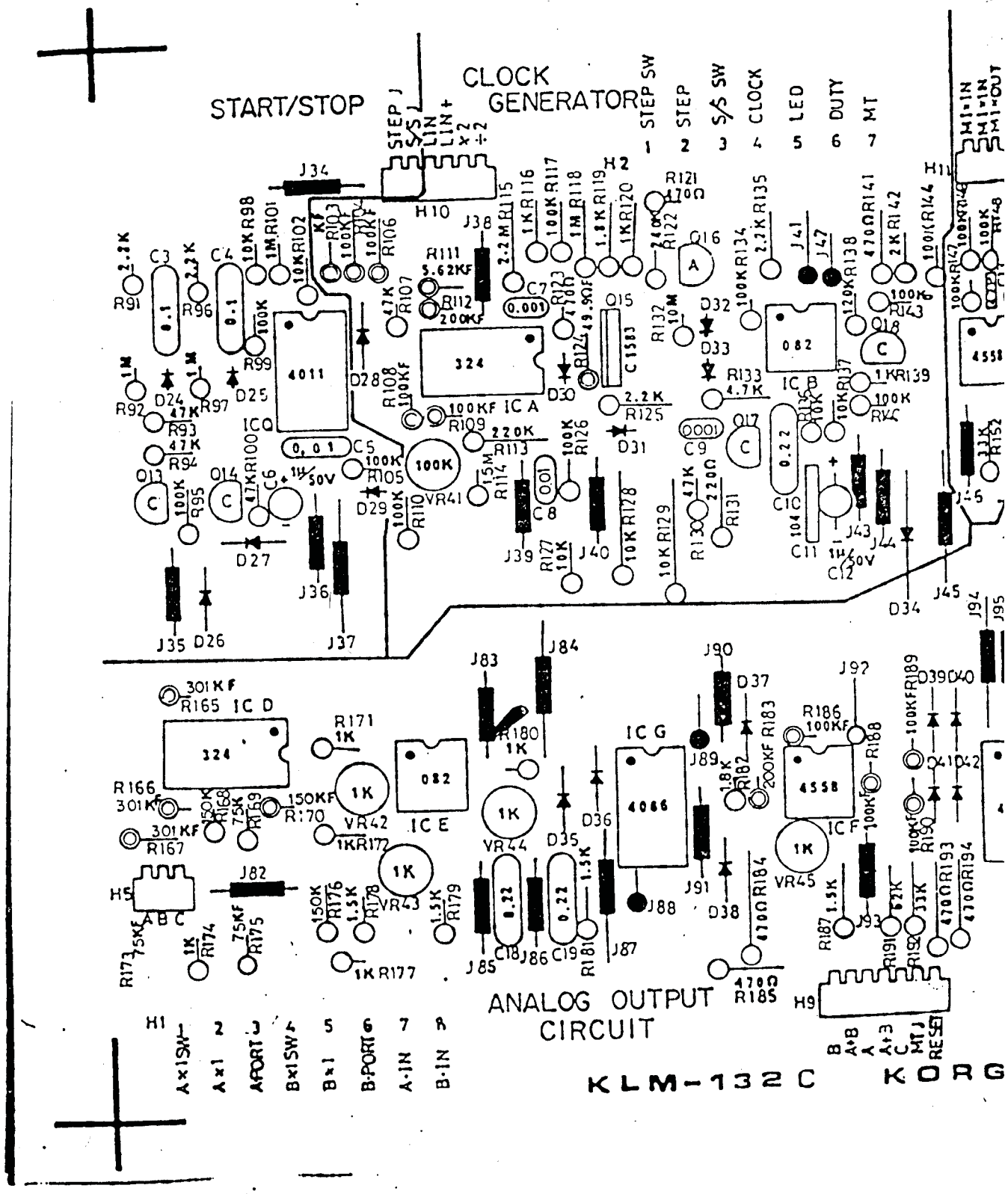
AMP	MS10	SQ-10
VCO FREQ CVIN		A OUT
TRIG IN		MULTIPLE TRIG OUT
INPUT	SIG OUT	

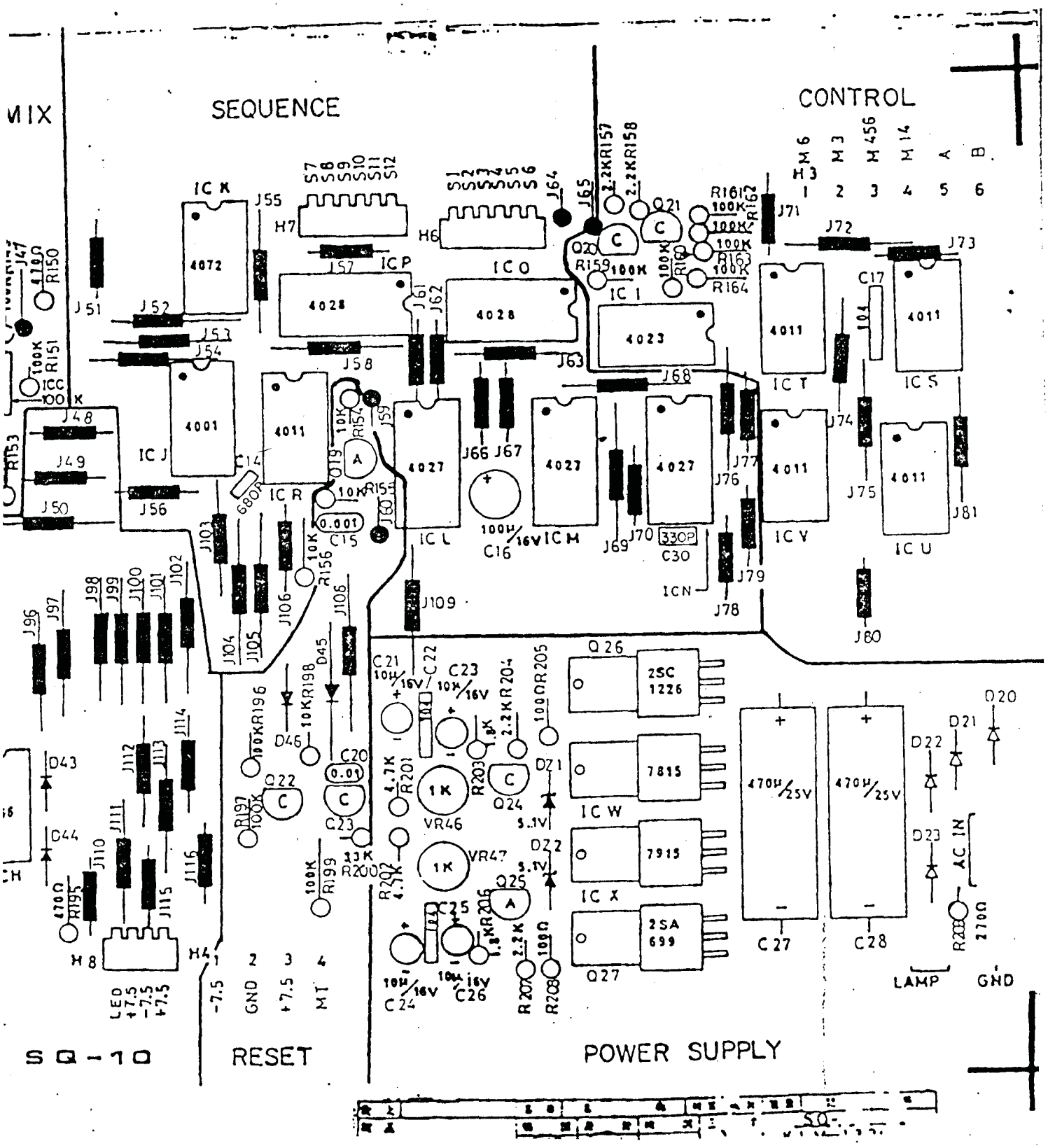
fig-1

See other chart for MS-10 control settings

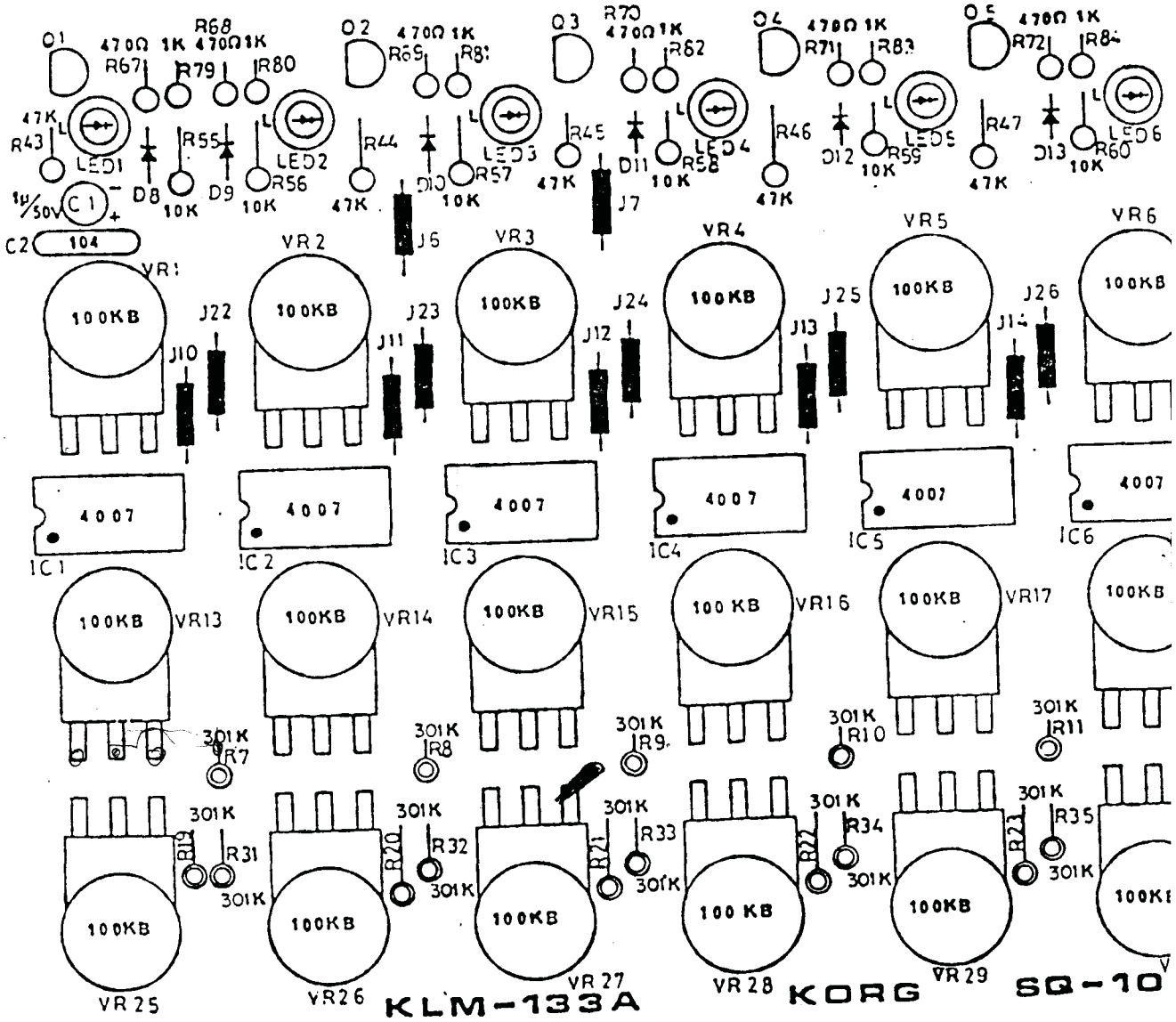

PUSH SWITCH AKC 2
PUSH SWITCH AKC 2
BE6P-SHF-1
100KB
LED
L
LED
L
100K
SLIDE SWITCH SSB-122
100K
100K
100K
100K
BE7P-SHF-1
STOPPER
ROTARY SWITCH (1-2-6) SRM1026
100K
33K
BE4P-SHF-1
LED
L
SLIDE SWITCH SSB-122
2MA
2MA
100KB
BE8P-SHF-1
KLM-131A
KORG
SQ-10

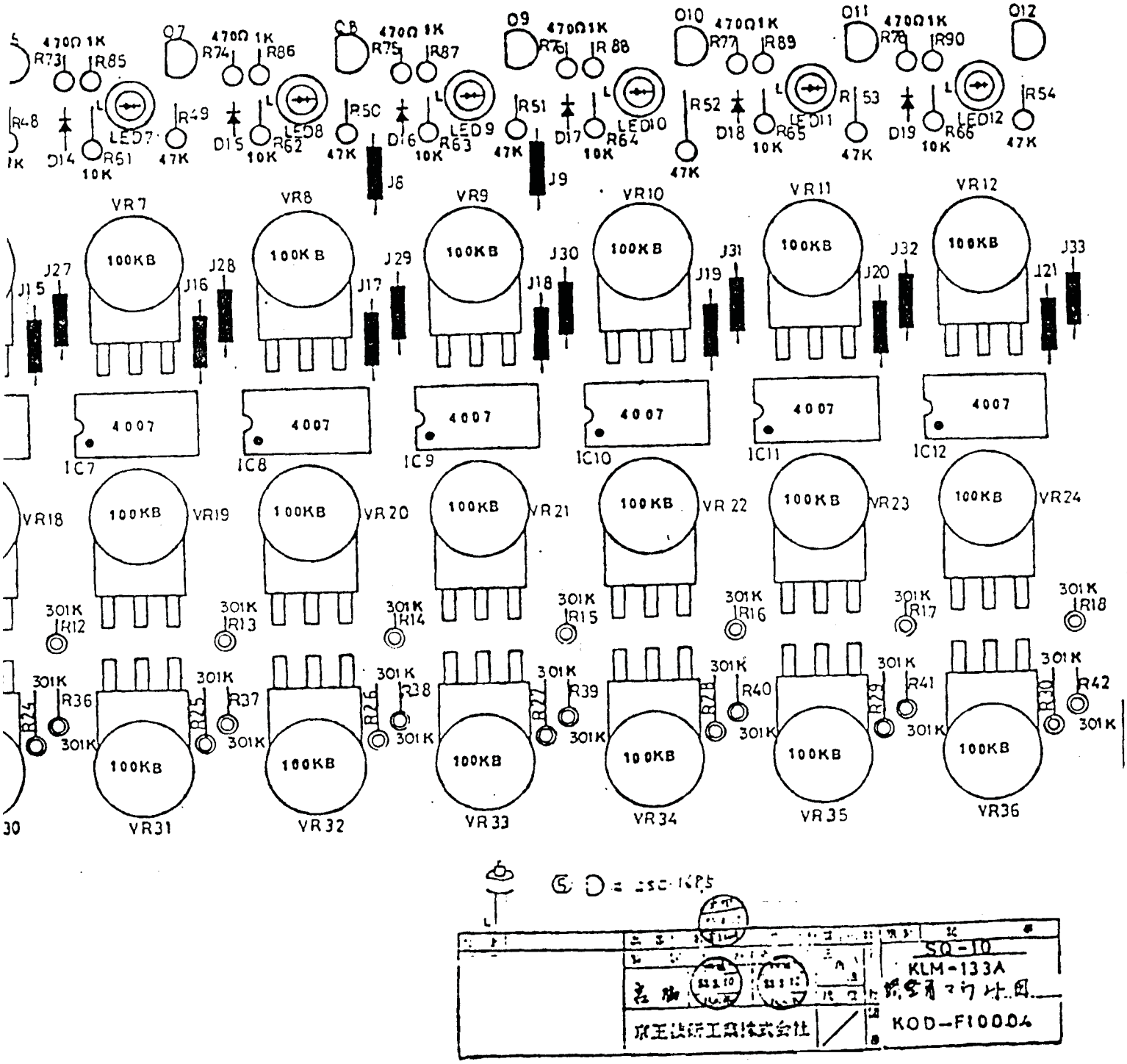
SQ10 KLM-132C

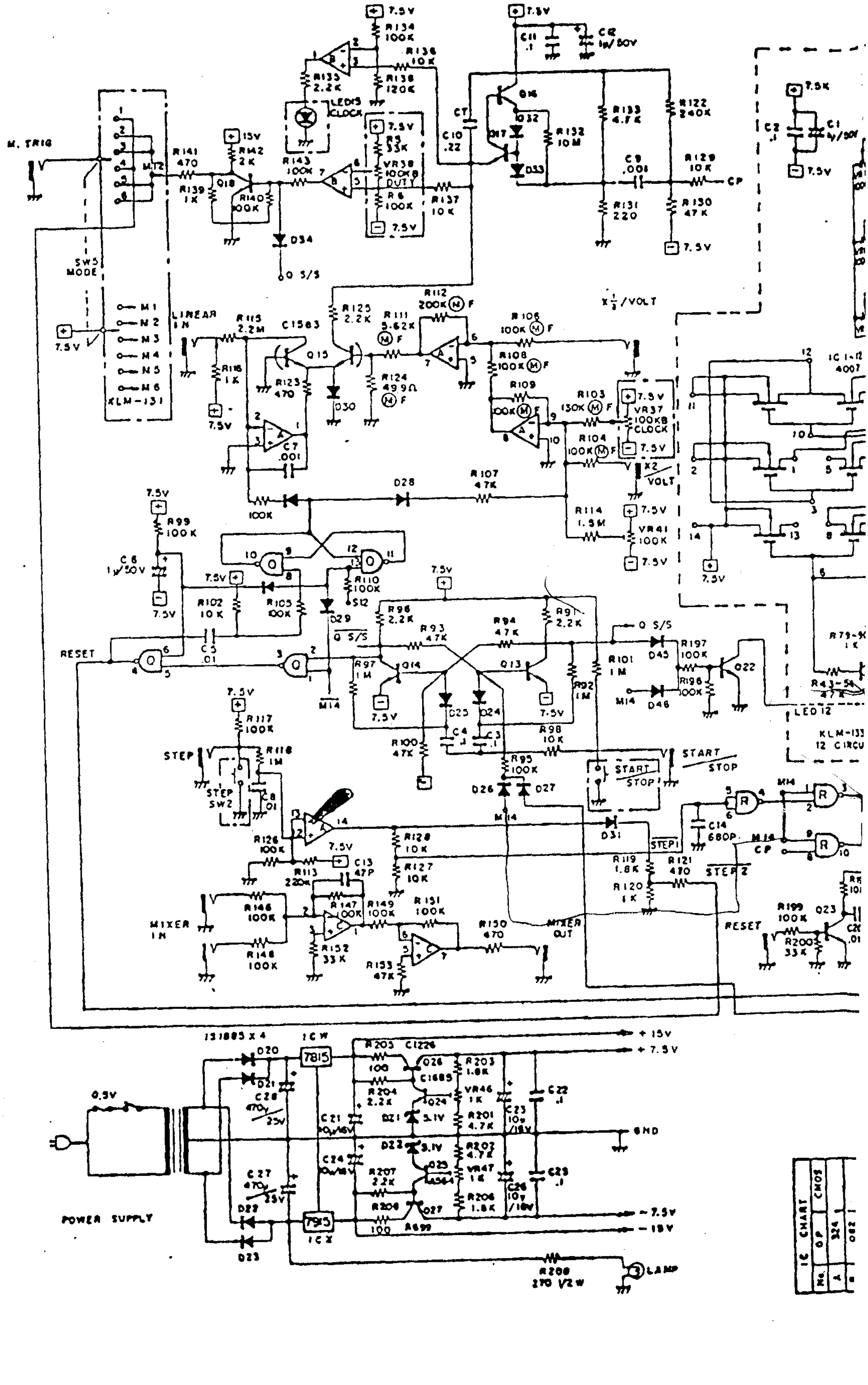



MIX
SEQUENCE
CONTROL
SQ-10
RESET
POWER SUPPLY
IC K
IC P
IC O
IC J
IC R
IC L
IC M
IC I
IC T
IC S
IC V
IC U
IC N
IC W
IC X
4072
4028
4001
4011
4027
4023
2SC 1226
7815
7915
2SA 699
470μ/25V
AC IN
LAMP
GND
LED +7.5 -7.5 +7.5
-7.5 GND +7.5 MT

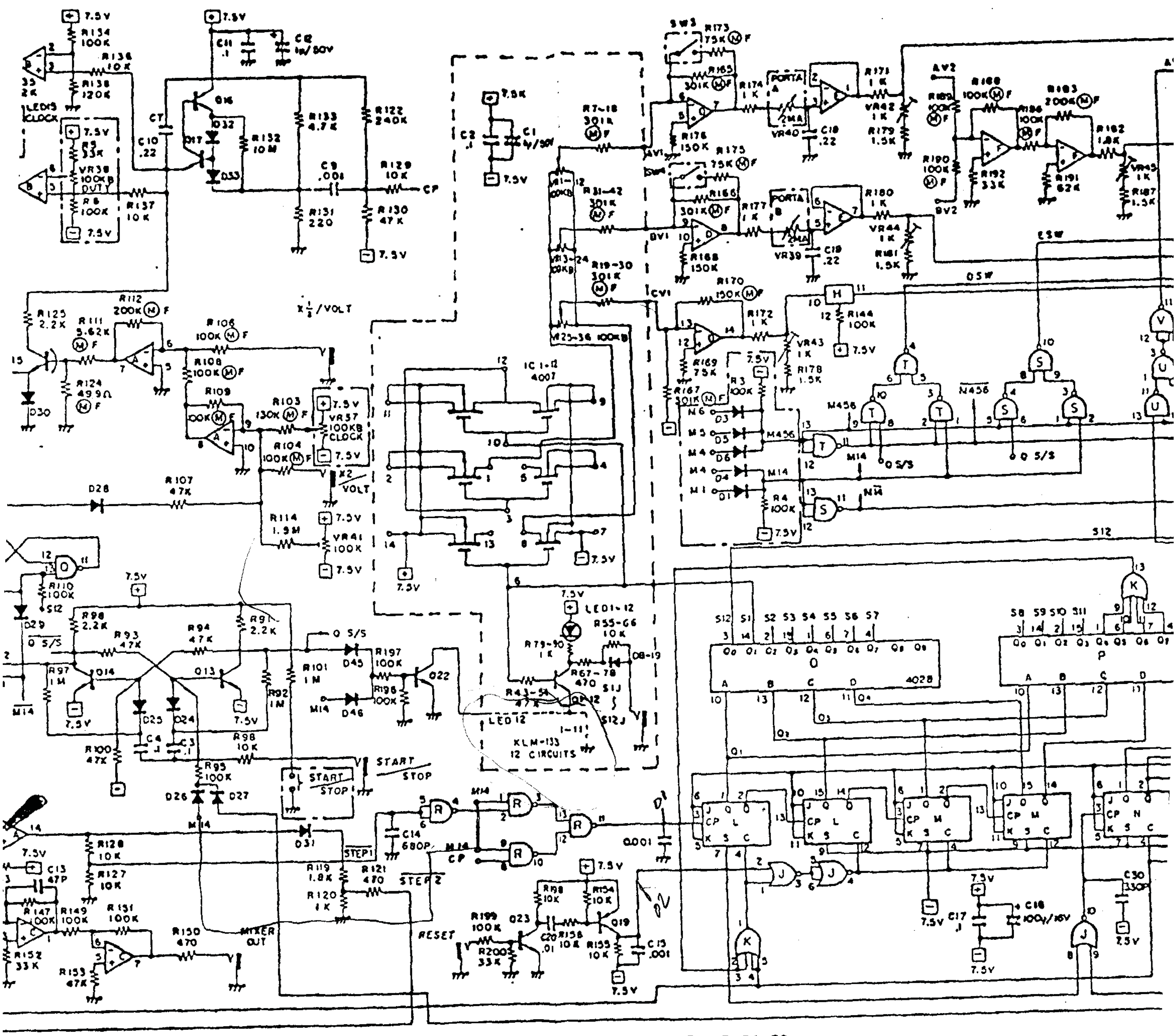
SQ10 KLM-133A

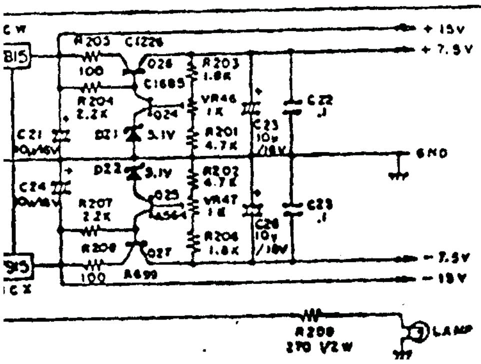



Q7
Q8
Q9
Q10
Q11
Q12
470Ω 1K
R73
R85
R74
R86
R75
R87
R76
R88
R77
R89
R78
R90
R48
D14
LED7
R61
R49
47K
D15
LED8
R62
10K
R50
D16
LED9
R63
R51
D17
LED10
R64
R52
D18
LED11
R65
R53
D19
LED12
R66
R54
J8
J9
VR7
VR8
VR9
VR10
VR11
VR12
100KB
J15
J16
J17
J18
J19
J20
J21
J27
J28
J29
J30
J31
J32
J33
4007
IC7
IC8
IC9
IC10
IC11
IC12
VR18
VR19
VR20
VR21
VR22
VR23
VR24
301K
R12
R13
R14
R15
R16
R17
R18
R24
R36
R25
R37
R26
R38
R27
R39
R28
R40
R29
R41
R30
R42
VR31
VR32
VR33
VR34
VR35
VR36
SQ-10
KLM-133A
KOD-F10004



M. TRIG
SW5 MODE
M1
M2
M3
M4
M5
M6
KLM-131
LINEAR IN
R141 470
R139 1K
Q18
R140 100K
R142 2K
15V
R143 100K
D34
0 S/S
R135 2.2K
LED15 CLOCK
R134 100K
R136 10K
R138 120K
7.5V
R3 33K
VR38 100KB DUTY
R6 100K
R137 10K
C10 .22
C7
Q16
D32
D17
D33
C11 .1
C12 1μ/50V
R133 4.7K
R132 10M
R122 240K
C9 .001
R129 10K
CP
R131 220
R130 47K
R115 2.2M
C1583
Q15
R125 2.2K
R111 5.62K
R112 200K
R106 100K
X 1/3 /VOLT
R116 1K
R123 470
D30
R124 499Ω
R108 100K
R109
R103 150K
VR37 100KB CLOCK
R104 100K
X2 VOLT
C7 .001
D28
R107 47K
R114 1.5M
VR41 100K
R99 100K
C6 1μ/50V
R102 10K
R105 100K
R110 100K
D29
Q S/S
R96 2.2K
R93 47K
R94 47K
R91 2.2K
0 S/S
R197 100K
D45
R101 1M
Q22
RESET
C5 .01
M14
R97 1M
Q14
Q13
R92 1M
R196 100K
D46
D25
D24
C4 .1
C3 .1
R98 10K
R100 47K
R95 100K
D26
D27
START STOP
STEP
R117 100K
R118 1M
STEP SW2
C8 .01
R126 100K
R113 220K
C13 47P
R128 10K
R127 10K
D31
STEP1
C14 680P
CP
R119 1.8K
R121 470
STEP2
R120 1K
MIXER IN
R146 100K
R147 100K
R149 100K
R151 100K
R150 470
MIXER OUT
R148 100K
R152 33K
R153 47K
RESET
R199 100K
Q23
R200 33K
IC 1-12 4007
KLM-133
LED 12
R79-90 1K
R43-54 47K
7.5K
C2 .1
C1 1μ/50V
15V
7.5V
GND
-7.5V
-15V
131885 X 4
ICW
7815
D20
D21
C28 470μ/25V
C27 470μ/25V
D22
D23
7915
ICX
0.5V
R205 100
C1226
Q26
C1685
R204 2.2K
Q24
DZ1 5.1V
DZ2 5.1V
Q25
A564
R207 2.2K
R206 100
A699
Q27
R203 1.8K
VR46 1K
R201 4.7K
R202 4.7K
VR47 1K
R206 1.8K
C21 10μ/16V
C24 10μ/16V
C23 10μ/16V
C26 10μ/16V
C22 .1
C25 .1
R208 270 1/2W
LAMP
POWER SUPPLY
IC CHART
No.
OP
CMOS
A
324





KLM132 : MAIN CIRCUIT BOARD
KLM133 : SEQUENCE CIRCUIT BOARD
KLM131 : CONTROL CIRCUIT BOARD

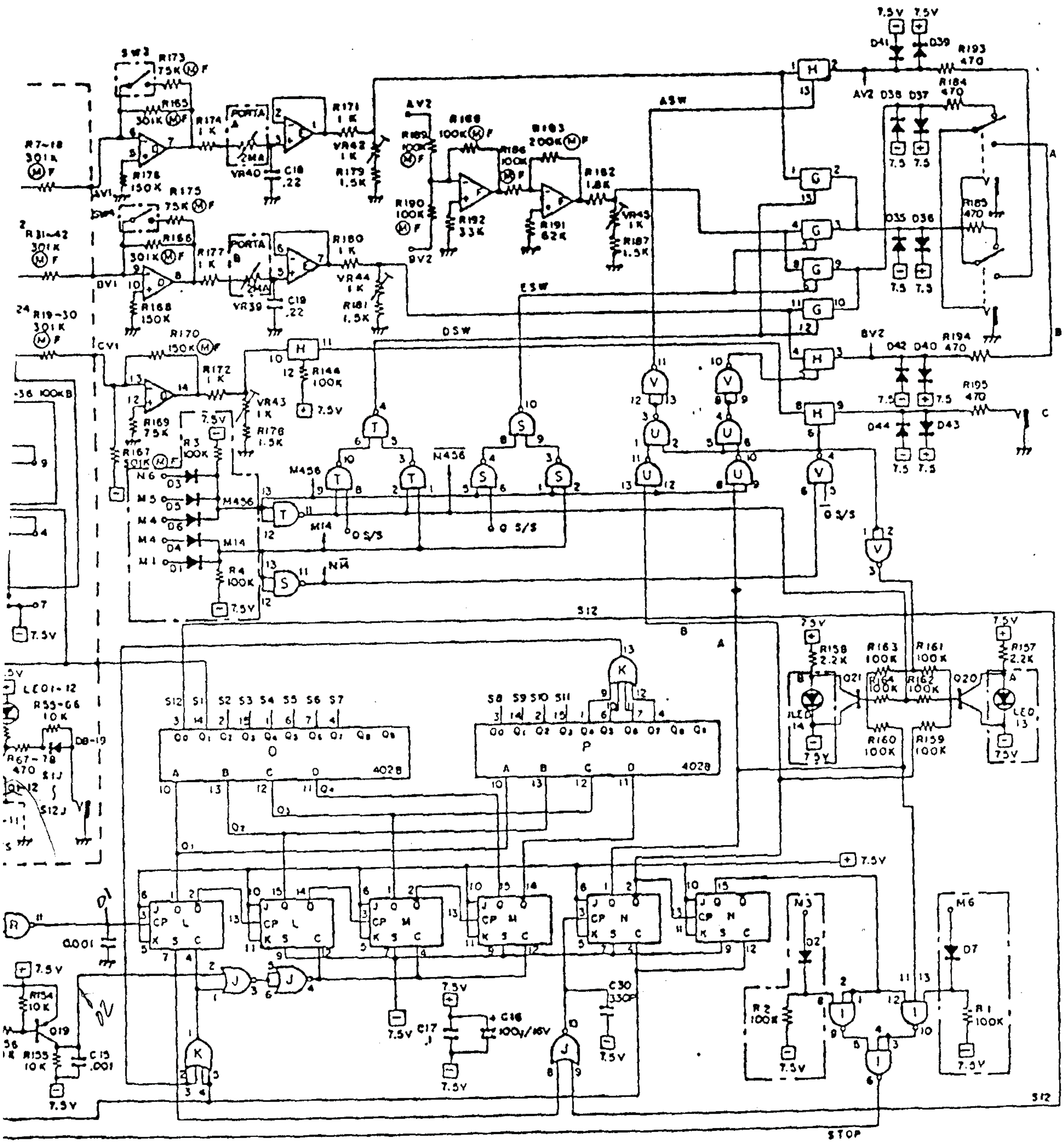
2SA564 PNP

2SC1683 NPN

OP Amp : ±15V
ANALOG SW : ±7.5V
DIGITAL IC : ±7.5V

IC CHART

No.	OP	CMOS
A	324	
B	082	
C	4558	
D	324	
E	082	
F	4558	
G		4066
H		4066
I		4023
J		4001
K		4072
L		4027
M		4027
N		4027
O		4028
P		4028
Q		4011
R		4011
S		4011
T		4011
U		4011
V		4011
1-12		4007



.M132 : MAIN CIRCUIT BOARD
.M133 : SEQUENCE CIRCUIT BOARD
.M131 : CONTROL CIRCUIT BOARD

2SA564 PNP
. 2SC1685 NPN

OP Amp : ±15V
ANALOG SW : ±7.5V
DIGITAL IC : ±7.5V

D	324
E	082
F	4558
G	4066
H	4066
I	4023
J	4001
K	4072
L	4027
M	4027
N	4027
O	4028
P	4028
Q	4011
R	4011
S	4011
T	4011
U	4011
V	4011
[illegible]	4007