

# KORG®

## EFFECTS SERIES

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## SERVICE MANUAL

KEIO ELECTRONIC LABORATORY CORPORATION  
TOKYO/JAPAN

# CHORUS CHR-1

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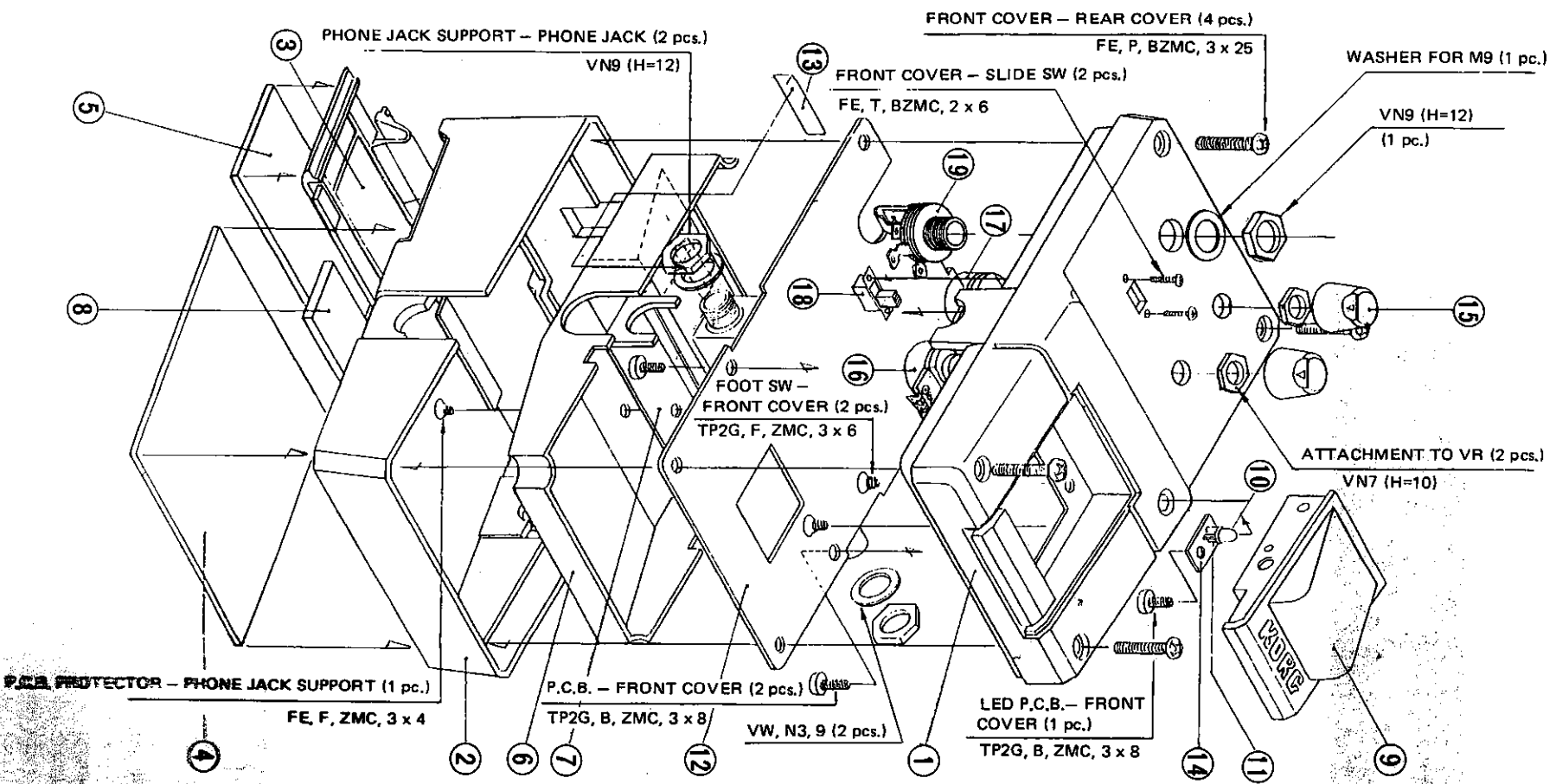
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## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
- Output impedance 1k $\Omega$  (general), 1k $\Omega$  (DIRECT OUT FOR STEREO)
- Maximum input level +3dBm (INTENSITY 0, MODE 1, at 250Hz)
- Maximum output level +3dBm (INTENSITY 0, MODE 1, at 250Hz)
- Delay time 2msec. ~ 5msec.
- Frequency response 20Hz ~ 20kHz +0/-1.5dB [EFFECT OFF]
- Residual noise level -96dBm (INTENSITY 0, MODE 1, input short-circuited, IHF-A)
- Operating voltage 10 ~ 7.5V
- Power consumption 12.8mA
- Pedal switch life Over 10,000 times of switching
- Functions SPEED, INTENSITY, MODE SW, DIRECT OUT FOR STEREO, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT
- Power supply 006P 9V battery/DC jack
- Dimensions 70(W) x 68(H) x 129(D) mm
- Weight 470 g (including battery)

(All values are typical.)

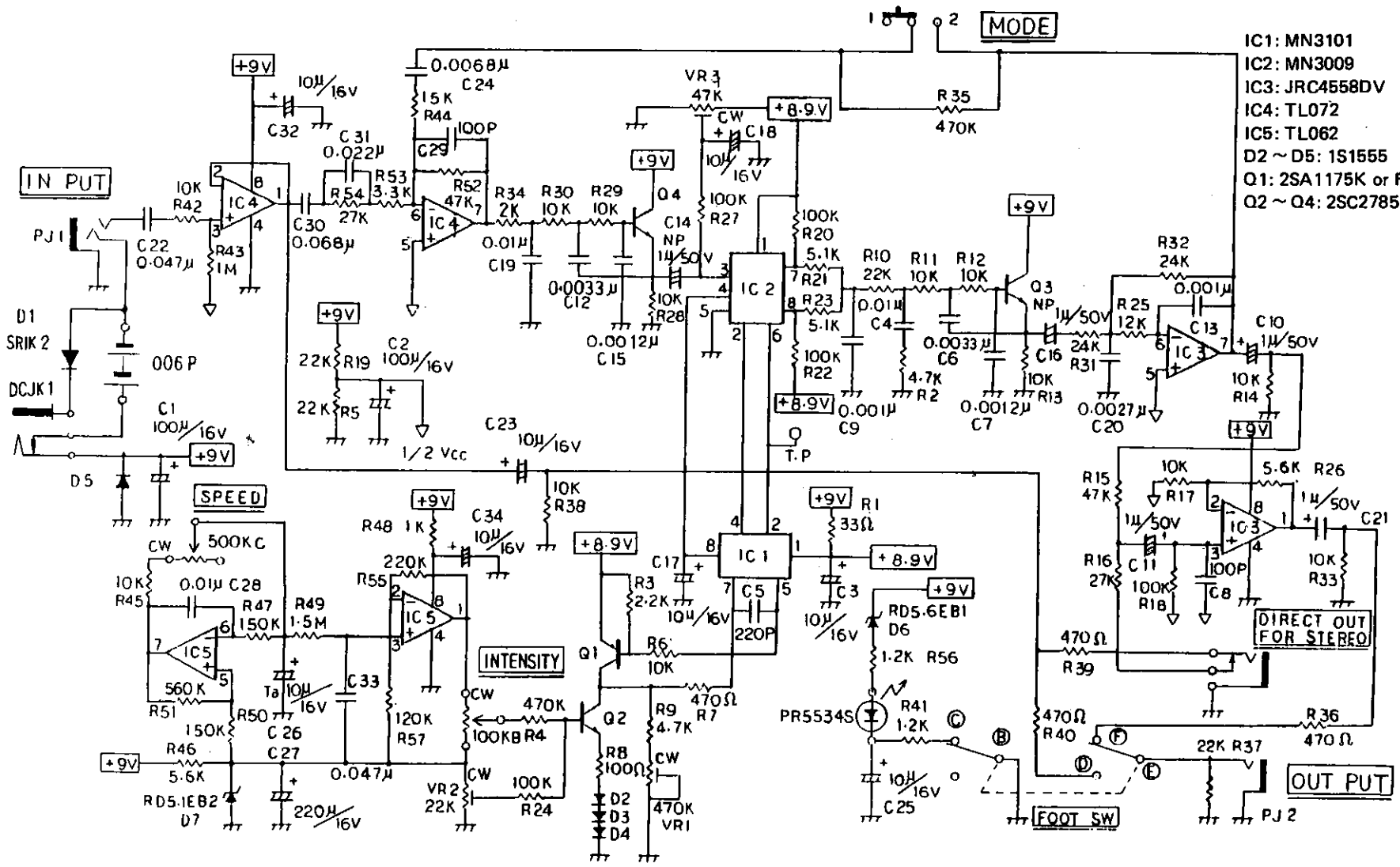
## 2. STRUCTURAL DIAGRAM



PART NO.	PART NAME	PART CODE
1	FRONT COVER	64703300
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B. PROTECTOR	64697000
7	PHONE JACK SUPPORT	64603000
8	BRONZE	50003400
9	ROOT SW (KES2)	37501100
10	LED (PFA3E8)	37280700
11	LED HOLDER X-TYPE	37504000
12	P.C.B. (KLM-88)	34088400
13	RUBBER NUMBER SEAL	34089400
14	LED P.C.B. (KLM-694)	62014300
15	EFFECTS KNOB SMALL	36012100
16	VR 100K8	36012400
17	VR 500K C	37301400
18	SLIDE SW	45000700
19	PHONE JACK	

PART CODE	30E
64703300	
64703100	
64703200	
60009300	
60009400	
64607800	
64003400	
50003400	
37501100	
31200700	
57504000	
34008400	
34008400	
52014300	
38012400	
37301400	
46007000	

3



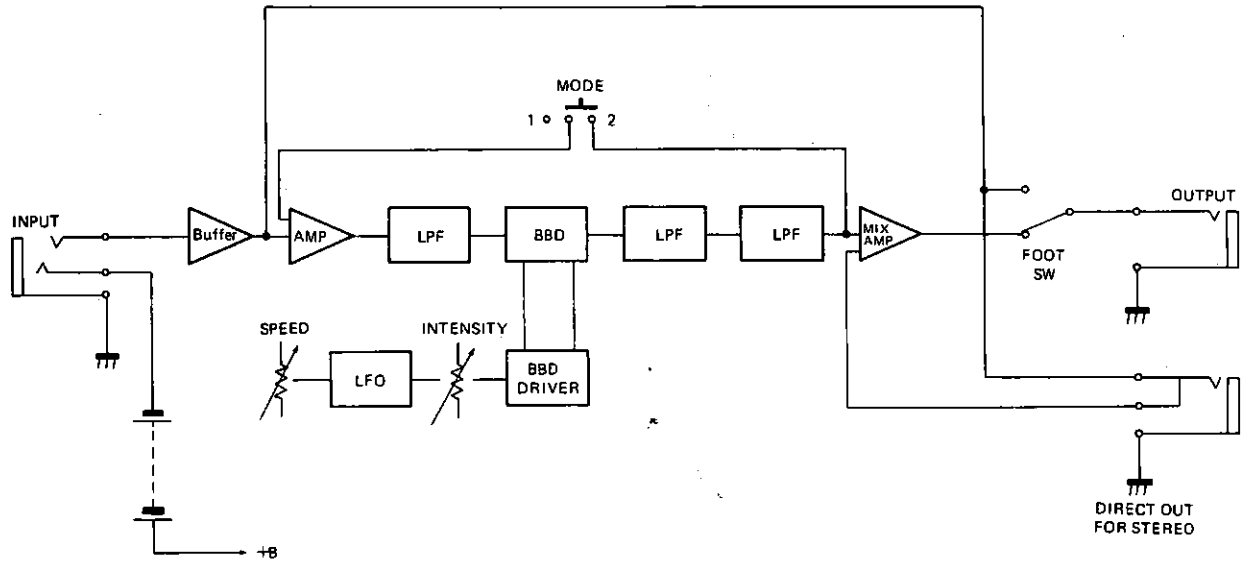
- IC1: MN3101
- IC2: MN3009
- IC3: JRC4558DV
- IC4: TL072
- IC5: TL062
- D2 ~ D5: 1S1555
- Q1: 2SA1175K or F
- Q2 ~ Q4: 2SC2785K

### 3. CIRCUIT DIAGRAM

KLM-684

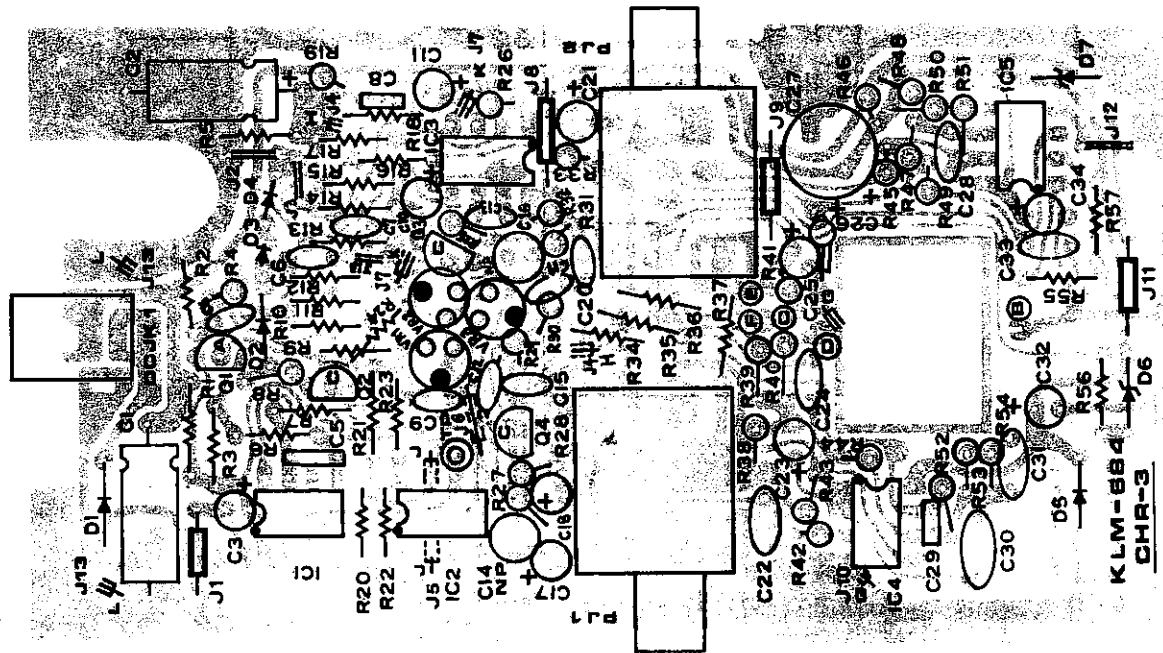
# 4. BLOCK DIAGRAM

KLM-684



# 5. P.C. BOARD

KLM-684



## 6. ADJUSTMENT PROCEDURE

### 1. BBD Clock check and adjustment

1) Connect oscilloscope to TP1 and confirm the waveform shown in Figure 1.

Set MODE switch to 1, SPEED to 0, INTENSITY to 10.

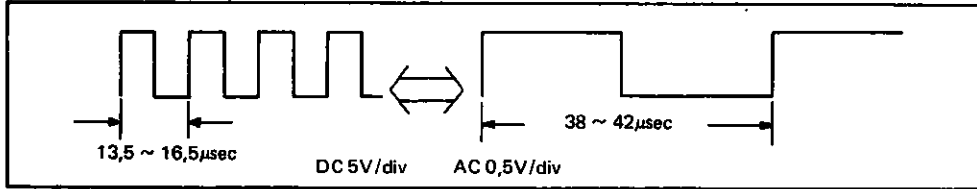


Fig-1

2) Observe cycle on oscilloscope and confirm that it is within the limits shown in figure-4. If necessary, adjust VR2 (clock maximum) to obtain  $13\mu s$   $16.5\mu s$ , VR1 (clock minimum) to obtain  $38\mu s$   $42\mu s$ . Repeat adjustments as many times as is necessary to obtain desired results.

### 2. BBD Bias check and adjustment

1) Use signal generator to apply 250 Hz sine wave at 2Vp-p to CHR-1. Set MODE to 1, SPEED to 0, INTENSITY to 0.

2) Connect oscilloscope to R10 and confirm Figure 2 waveform.

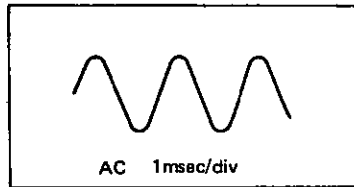
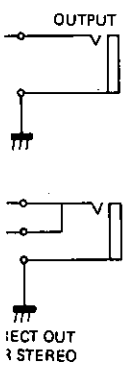


Fig-2

3) Upper and lower parts of waveform should be symmetrical and there should be little distortion. Adjust VR3 if necessary.



KLM-884  
 CHR-3  
 D6  
 R57  
 J11  
 J12

## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0Ω	KLM-684		4
10013233	S1/4JY 33Ω			1
10013347	S1/4JY 470Ω			2
10013412	S1/4JY 1.2K			1
10013420	S1/4JY 2K			1
10013422	S1/4JY 2.2K			1
10013447	S1/4JY 4.7K			2
10013451	S1/4JY 5.1K			2
10013510	S1/4JY 10K			6
10013522	S1/4JY 22K			3
10013527	S1/4JY 27K			1
10013547	S1/4JY 47K			1
10013610	S1/4JY 100K			4
10013612	S1/4JY 120K			1
10013622	S1/4JY 220K			1
10013647	S1/4JY 470K			1
10113310	S1/4JT 100Ω			1
10113347	S1/4JT 390Ω			2
10113410	S1/4JT 1K			1
10113412	S1/4JT 1.2K			1
10113433	S1/4JT 3.3K			1
10113456	S1/4JT 5.6K			2
10113510	S1/4JT 10K			7
10113512	S1/4JT 12K			1
10113515	S1/4JT 15K			1
10113522	S1/4JT 22K			1
10113524	S1/4JT 24K			2
10113527	S1/4JT 27K			1
10113547	S1/4JT 47K			1
10113610	S1/4JT 100K			1
10113615	S1/4JT 150K			2
10113647	S1/4JT 470K			1
10113656	S1/4JT 560K			1
10113710	S1/4JT 1M			1
10113715	S1/4JT 1.5M			1
<b>MYLAR CAPACITORS</b>				
20023410	50V 0.001 μF	KLM-684		2
20023412	50V 0.0012 μF			2
20023427	50V 0.0027 μF			1
20023433	50V 0.0033 μF			2
20023468	50V 0.0068 μF			1
20023510	50V 0.01 μF			3
20023522	50V 0.022 μF			1
20023547	50V 0.047 μF			2
20023568	50V 0.068 μF			2

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CERAMIC CAPACITORS</b>				
21256310	50V 100PF	KLM-684		2
21256322	50V 220PFJ			1
<b>TANTALUM CAPACITOR</b>				
22007210	16V 10UFK	KLM-684		1
<b>ELECTROLYTIC CAPACITORS</b>				
23007322	A 16V 220 μF	KLM-684		1
23107310	B 16V 100 μF			2
23207210	A 16V 10 μF			7
23215110	A 50V 1 μF			3
24515110	A 50V 1 μF (NON POLAR)			2
<b>TRANSISTORS</b>				
30001311	2SA1175 K	KLM-684		1
30202211	2SC2785 K			3
<b>DIODES</b>				
31000100	1S1555	KLM-684		4
31001500	SR1K-2			1
<b>ZENER DIODES</b>				
31101300	RD 5.1EB2	KLM-684		1
31101600	RD 5.6EB1			1
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32002013	MN-3009	KLM-684		1
32002014	MN-3101			1
32009001	NJM-4558D-V			1
32021011	TL-072			1
32021022	TL-062			1
<b>P.C.BOARD WITH PARTS</b>				
34068400	KLM-684			1
34068400	KLM-684			1

20023433	50V 0.0033 $\mu$ F			1
20023468	50V 0.0068 $\mu$ F			2
20023510	50V 0.01 $\mu$ F			1
20023522	50V 0.022 $\mu$ F			3
20023547	50V 0.047 $\mu$ F			1
20023568	50V 0.068 $\mu$ F			2
				1

32021011	TL-072			1
32021022	TL-062			1
<b>P.C.BOARD WITH PARTS</b>				
34068400	KLM-684			1
34069400	KLM-694			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SEMI FIXED VRs</b>				
35001322	H0651A 22KB	KLM-684		1
35001347	H0651A 47KB			1
35001447	H0651A 470KB			1
<b>VRs</b>				
36012100	K161100T6E 100KB VM10A-C29			1
36012400	K161100T6E 500KC VM10A-C29			1
<b>SLIDE SW</b>				
37301400	SS-003			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-684	STRUCTURAL DIAGRAM	1
45400700	S-G 2101			1
45001100	S-G 7713 #04	KLM-684		1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-684		1
<b>SPONGE</b>				
50003400	4x20x40			1
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>TEST PIN</b>				
54007100	LC-2-G-YELLOW	KLM-684		1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014300	SMALL			2
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64703300				1
<b>SCREWS</b>				
70060323	FE P BZMC 3x23			4
70130304	FE F ZMC 3x4			1
70460206	FE T BZMC 2x6			2
72130306	TP2G F ZMC 3x6			2
72530308	TP2G B ZMC 3x8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

-7-



# COMPRESSOR CMP-1

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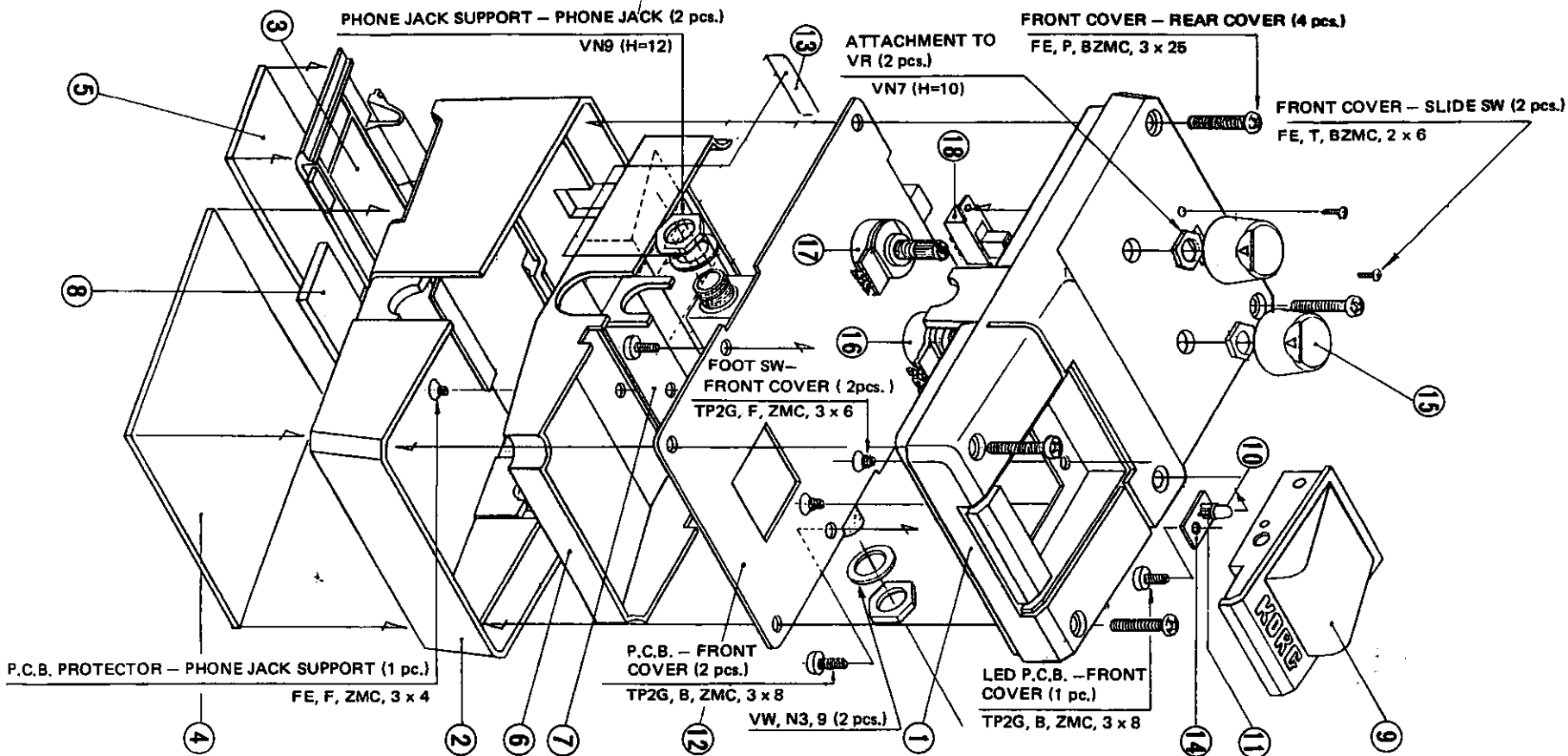
## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
- Output impedance 10k $\Omega$
- Maximum input level +3dBm (soft ATTACK, at 250Hz)
- Maximum output level -10dBm (at 250Hz)
- Maximum compression ratio 37dB (with maximum input)
- Operation characteristics INPUT (-40dBm ~ +3dBm)  
OUTPUT (-16dBm ~ 10dBm)
- Frequency response 20Hz ~ 20kHz +0/-1.5dB  
[EFFECT OFF]  
[EFFECT ON] 50Hz ~ 10kHz + 0/-3dB  
(with maximum input)
- Attack time 5msec. (soft attack), 8.3msec. (hard attack)
- Release time 1sec. (soft attack), 100msec. (hard attack)
- Noise level -90dBm (equivalent input noise, soft attack, sensitivity 10, input short-circuited, IHF-A)
- Operating voltage 10 ~ 7.5V
- Power consumption 7mA

- Pedal switch life Over 10,000 times of switching
- Functions SENSITIVITY, OUTLEVEL, ATTACK SW, EFFECT ON/OFF LED, FOOT SW, INPUT, and OUTPUT
- Power supply 006P 9V battery/DC jack
- Dimensions 70(W) x 63.5(H) x 129(D) mm
- Weight 450 g (including battery)

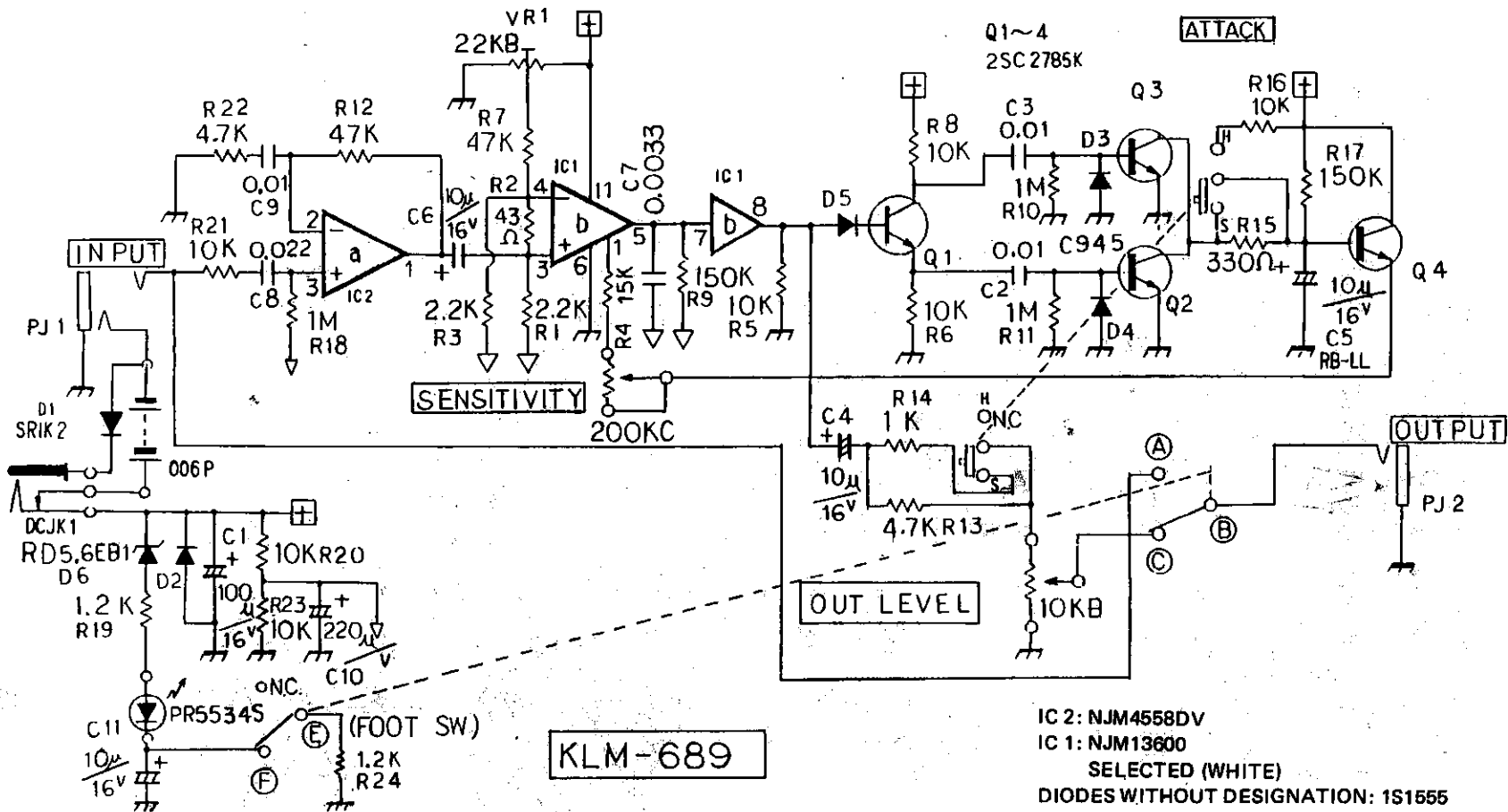
(All values are typical.)

## 2. STRUCTURAL DIAGRAM



teching  
LEVEL, AT-  
N/OFF LED,  
nd OUTPUT  
) mm

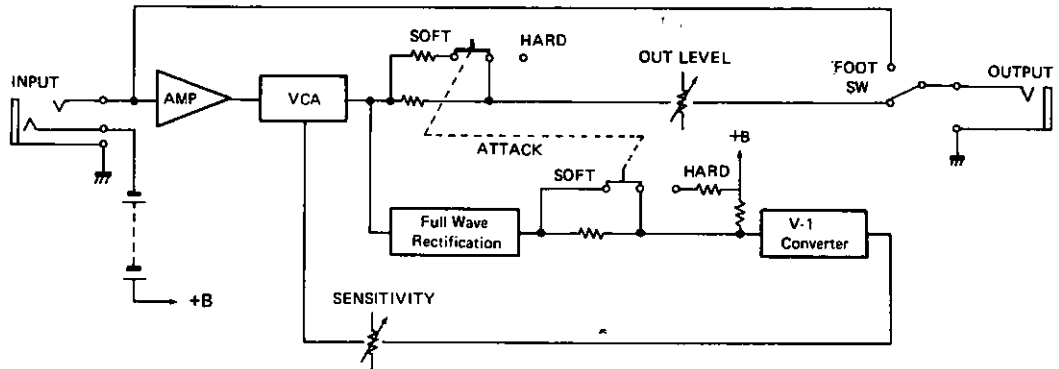
PART No.	PART NAME	PART CODE
1	FRONT COVER	64763700
2	REAR COVER	64763700
3	BATTERY COVER	64763700
4	RUBBER STOPPER LARGE	50006300
5	RUBBER STOPPER SMALL	50006400
6	P.C.B PROTECTOR	64660700
7	PHONE JACK SUPPORT	64603600
8	SPONGE	50003400
9	FOOT SW (KFS 2)	37567100
10	LED (FR-5534S)	31260700
11	LED HOLDER X: TYPE NO. 4	57562000
12	P.C.B. (K.LM-69B)	34068900
13	SERIAL NUMBER SEAL	34068900
14	LED P.C.B. (K.LM-69A)	62071200
15	EFFECT'S KNOR LARGE	62071200
16	VR 200KC	36012000
17	VR 10K8	36012000
18	SLIDE SW	37301400



KLM-689

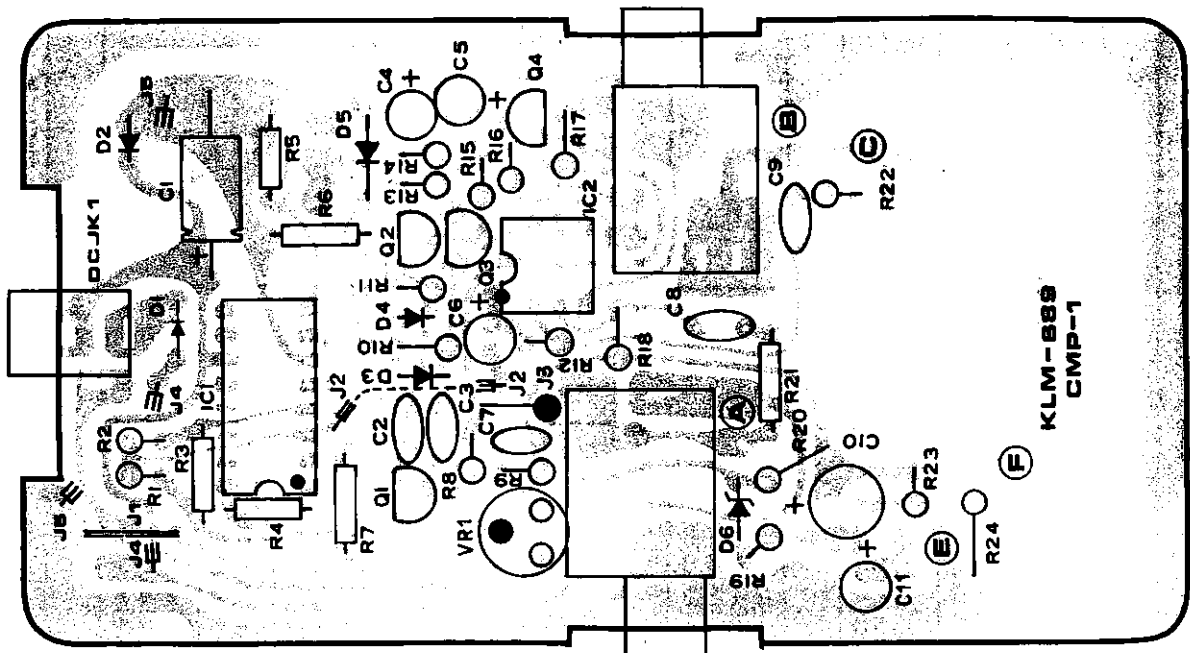
## 4. BLOCK DIAGRAM

KLM-689



## 5. P.C. BOARD

KLM-689



## 6. ADJUSTMENT PROCEDURE

### 1. OFFSET check and adjustment

- 1) Apply signal generator signal (1 kHz, sine wave, 3Vp-p) to CMP-1 input. Set ATTACK to SOFT, OUTPUT LEVEL to 10, SENSITIVITY to 10.
- 2) Observe output on oscilloscope.
- 3) Short input and confirm that DC voltage fluctuation is  $0\text{ V} \pm 5\text{ mV}$  at the instant that the short occurs. Refer to Figure 3.
- 4) Adjust VR1 if necessary.

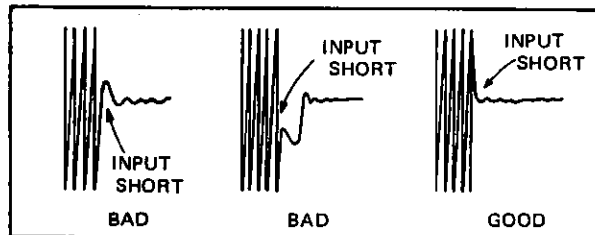


Fig-3

## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	QTY
<b>CARBON RESISTORS</b>				
10013422	S1/4JY 2.2K	KLM-689		1
10013510	S1/4JY 10K			3
10013515	S1/4JY 15K			1
10013547	S1/4JY 47K			1
10113243	S1/4JT 43Ω			1
10113333	S1/4JT 330Ω			1
10113410	S1/4JT 1K			1
10113412	S1/4JT 1.2K			2
10113422	S1/4JT 2.2K			1
10113447	S1/4JT 4.7K			2
10113510	S1/4JT 10K			4
10113547	S1/4JT 47K			1
10113615	S1/4JT 150K			2
10113710	S1/4JT 1M			3
<b>MYLAR CAPACITORS</b>				
20023433	50V 0.0033 μF	KLM-689		1
20023510	50V 0.01 μF			3
20023522	50V 0.022 μF			1
<b>ELECTROLYTIC CAPACITORS</b>				
23007210	A16V 10 μF	KLM-689		3
23007322	A16V 220 μF			1
23107310	B16V 100 μF			1
23307210	A16V 10 μF			1
<b>TRANSISTOR</b>				
30202211	2SC2785 K	KLM-689		4
<b>DIODES</b>				
31000100	1S1555	KLM-689		4
31001500	SR1K-2			1
<b>ZENER DIODE</b>				
31101600	RD 5.6EB1	KLM-689		1
<b>LED</b>				
31200700	PR-5534S			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	QTY
<b>ICs</b>				
32009001	NJM-4558D-V	KLM-689		1
32009017	NJM-13600D-A			1
<b>P.C. BOARD WITH PARTS</b>				
34068900	KLM-689	KLM-689		1
34069400	KLM-694			1
<b>SEMI FIXED VR</b>				
35201322	H1051A 22KB	KLM-689		1
<b>VRs</b>				
36012000	K161100T6E 10KB VM10A-C29E			1
36012300	K161100T6E 200KC VM10A-C29			1
<b>SLIDE SW</b>				
37301400	SS-003			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-689		1
45001100	S-G 7713 #04			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-689		1
<b>SPONGE</b>				
50003400	4x20x40			1
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>BATTERY</b>				
52000400	606PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014200	LARGE			2
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64703700				1
<b>SCREWS</b>				
70060323	FE P BZMC 3x23			4
70130304	FE F ZMC 3x4			1
70460206	FE T BZMC 2x6			2
72130306	TP2G F ZMC 3x6			2
72530308	TP2G B ZMC 3x8			3
<b>NUT</b>				
77310900	VN N-3 9			2

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0			2

# DISTORTION DST-1

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## 1. SPECIFICATIONS

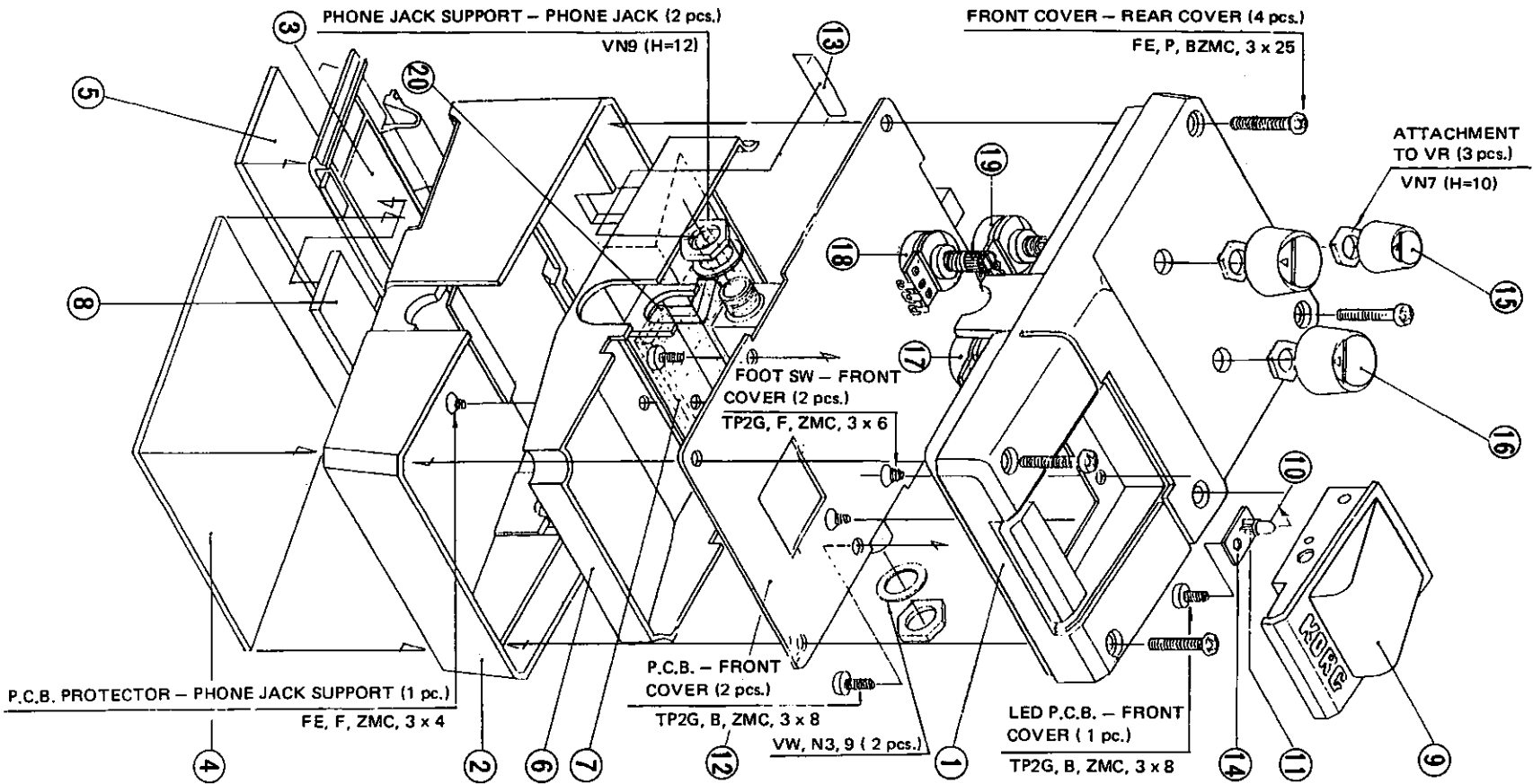
- Input impedance 1M $\Omega$
- Output impedance 10k $\Omega$
- Maximum output 1V peak to peak level
- TONE -14dB ~ +0dB (at 1kHz)
- Maximum gain 36dB
- Frequency response 20Hz ~ 20kHz  
+0/-1.5dB
- [EFFECT OFF]
- Noise level -106dBm (TONE 10, DISTORTION 10, equivalent input noise, input short-circuited, IHF-A)
- Operating voltage 10 ~ 7.5V
- Power consumption 3.5mA
- Pedal switch Over 10,000 times of switching life
- Functions DISTORTION, TONE, OUT LEVEL, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT
- Power supply 006P 9V battery/DC jack
- Dimensions 70(W) x 67(H) x 129(D) mm
- Weight 450 g (including battery)

(All values are typical.)

72130306 72530308	NUT	77310900 VN N-3-9
3	2	



## 2. STRUCTURAL DIAGRAM

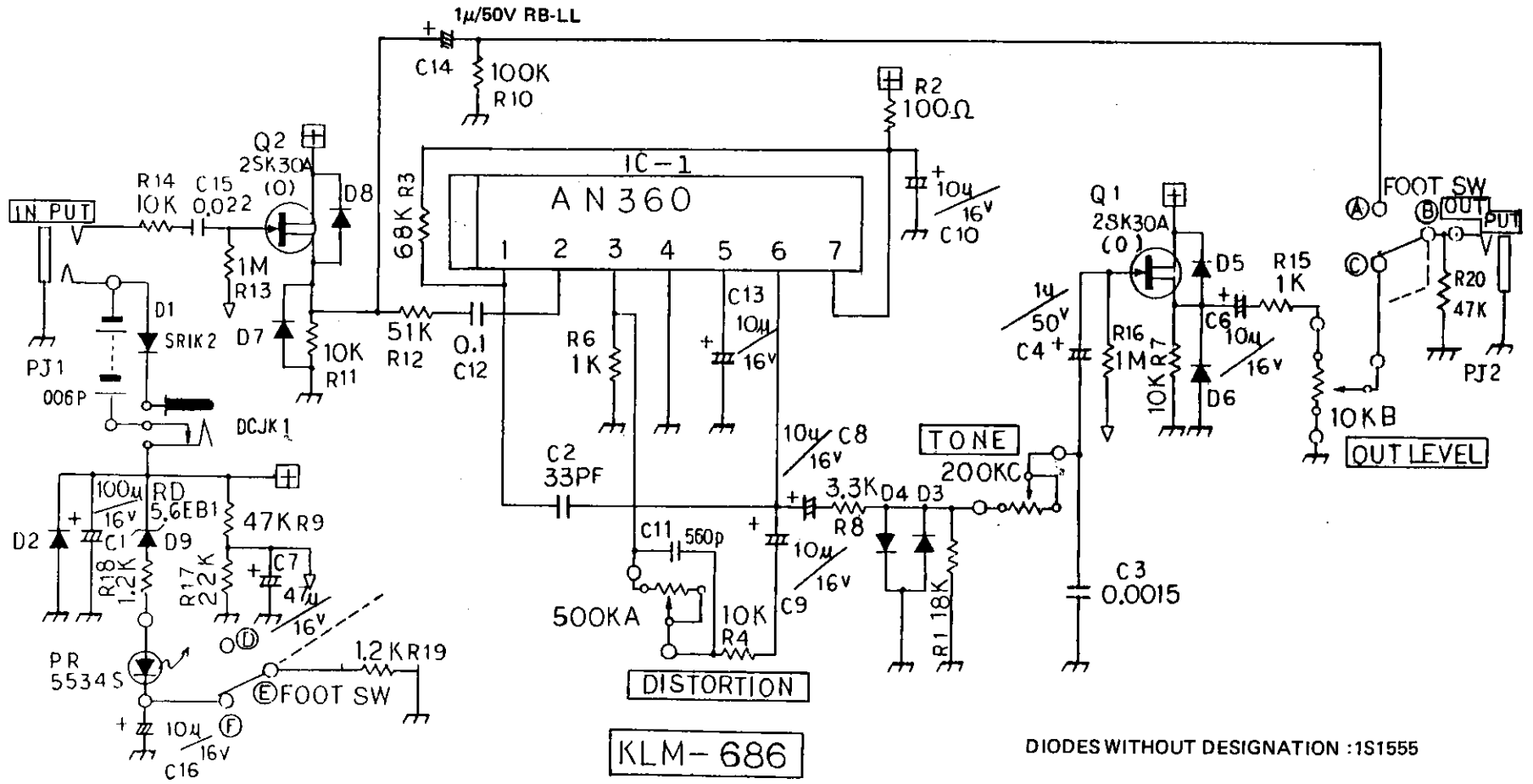


PART NO.	PART NAME	PART CODE
1	FRONT COVER	64704200
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B. PROTECTOR	64607000
7	PHONE JACK SUPPORT	64603600
8	SPONGE	50003400
9	FOOT SW (KFS-2)	37507100
10	LED (PR5534S)	31200700
11	LED HOLDER X-TYPE No. 4	57504000
12	P.C.B. (KLM-686)	34058500
13	SERIAL NUMBER SEAL	34058400
14	LED P.C.B. (KLM-694)	62014300
15	EFFECTS KNOB SMALL	62014200
16	EFFECTS KNOB LARGE	36011700
17	VR 500KA	36012000
18	VR 10KB	36012300
19	VR 200KC	50004400
20	BATTERY CUSHION	50004400

PART CODE	Q 4	L 5
64704200		
64704100		
50009300		
50009300		
50009300		
64807000		
64807000		
50003400		
37507100		
31200700		
57504000		
34088600		
34088400		
62014200		
36011700		
36012000		
36012300		
50004400		

### 3. CIRCUIT DIAGRAM

KLM-686

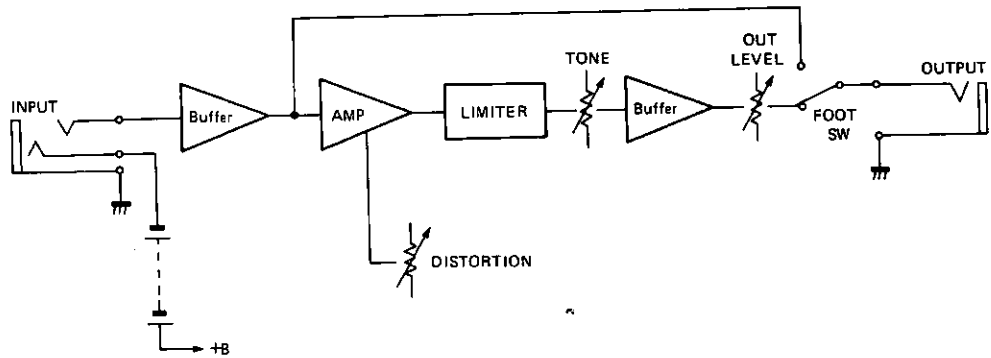


DIODES WITHOUT DESIGNATION : 1S1555

KLM-686

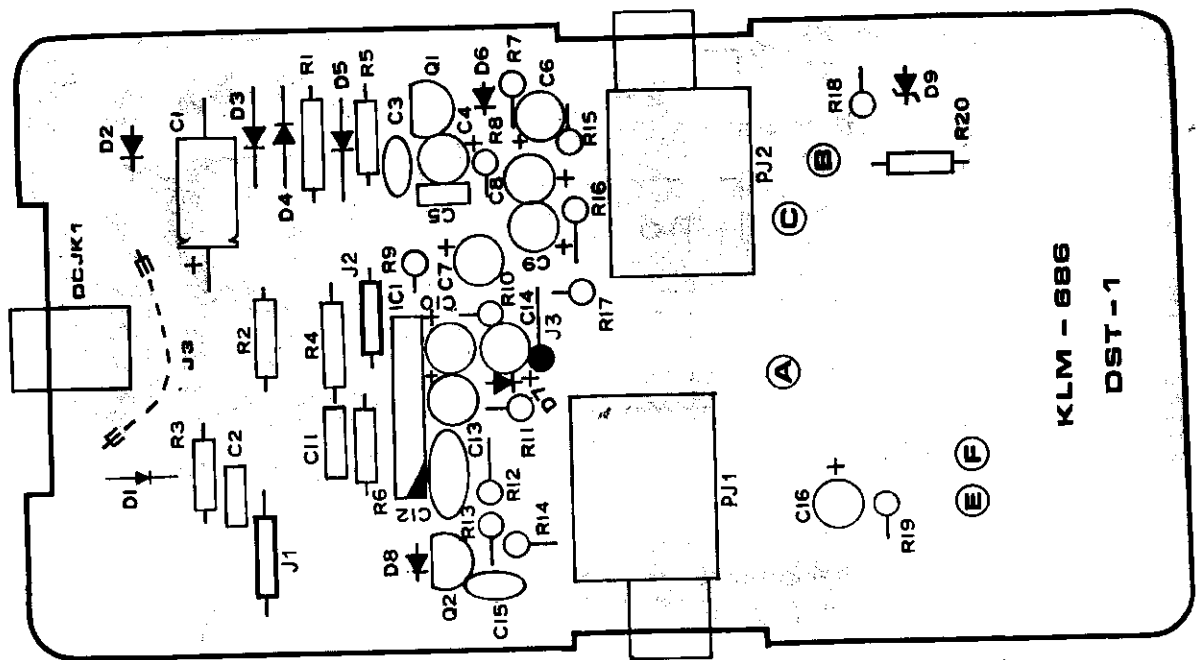
# 4. BLOCK DIAGRAM

KLM-686



# 5. PC. BOARD

KLM-686



## 6. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-686		3
10013310	S1/4JY 100 Ω		1	
10013410	S1/4JY 1K		1	
10013510	S1/4JY 10K		1	
10013518	S1/4JY 18K		1	
10013547	S1/4JY 47K		1	
10013568	S1/4JY 68K		1	
10113410	S1/4JT 1K		1	
10113412	S1/4JT 1.2K		2	
10113433	S1/4JT 3.3K		1	
10113510	S1/4JT 10K		3	
10113522	S1/4JT 22K		1	
10113547	S1/4JT 47K		1	
10113551	S1/4JT 51K		1	
10113610	S1/4JT 100K		1	
10113710	S1/4JT 1M		2	
<b>MYLAR CAPACITORS</b>				
20023415	50V 0.0015 μF	KLM-686		1
20023522	50V 0.022 μF		1	
20023610	50V 0.1 μF		1	
<b>CERAMIC CAPACITORS</b>				
21012233	50V 33PF	KLM-686		1
21012356	50V 560PF		1	
<b>ELECTROLYTIC CAPACITORS</b>				
23007210	A16V 10 μF	KLM-686		6
23007247	A16V 47 μF		1	
23107310	B16V 100 μF		1	
23215110	A50V 1 μF		1	
23315110	A50V 1 μF		1	
<b>FET</b>				
30600115	2SK 30A TM-O	KLM-686		2
<b>DIODES</b>				
31000100	1S1555	KLM-686		7
31001500	SR1K-2		1	

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>ZENER DIODE</b>				
31101600	RD 5.6EB1	KLM-686		1
<b>LED</b>				
31200700	PR-5534S			1
<b>IC</b>				
32002012	AN-360	KLM-686		1
<b>P.C. BOARD WITH PARTS</b>				
34068600	KLM-686	KLM-686		1
34069400	KLM-694		1	
<b>VRs</b>				
36011700	K161100T6E 500KA			1
36012000	K161100T6E 10KB VM10A-C29E			1
36012300	K161100T6E 200KC VM10A-C29			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-686		1
45001100	S-G 7713 #04		1	
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-686		1
<b>SPONGE</b>				
50003400	4x20x40			1
<b>BATTERY CUSHIONS</b>				
50004400				1
50005300	KOC-F40218			2

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOBS</b>				
62014200	LARGE			2
62014300	SMALL			1
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64704200				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SCREWS</b>				
70060323	FE P BZMC 3x23			4
70130304	FE F ZMC 3x4			1
72130306	TP2G F ZMC 3x6			2
72530308	TP2G B ZMC 3x8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# HARD DIST DST-3

## CONTENTS

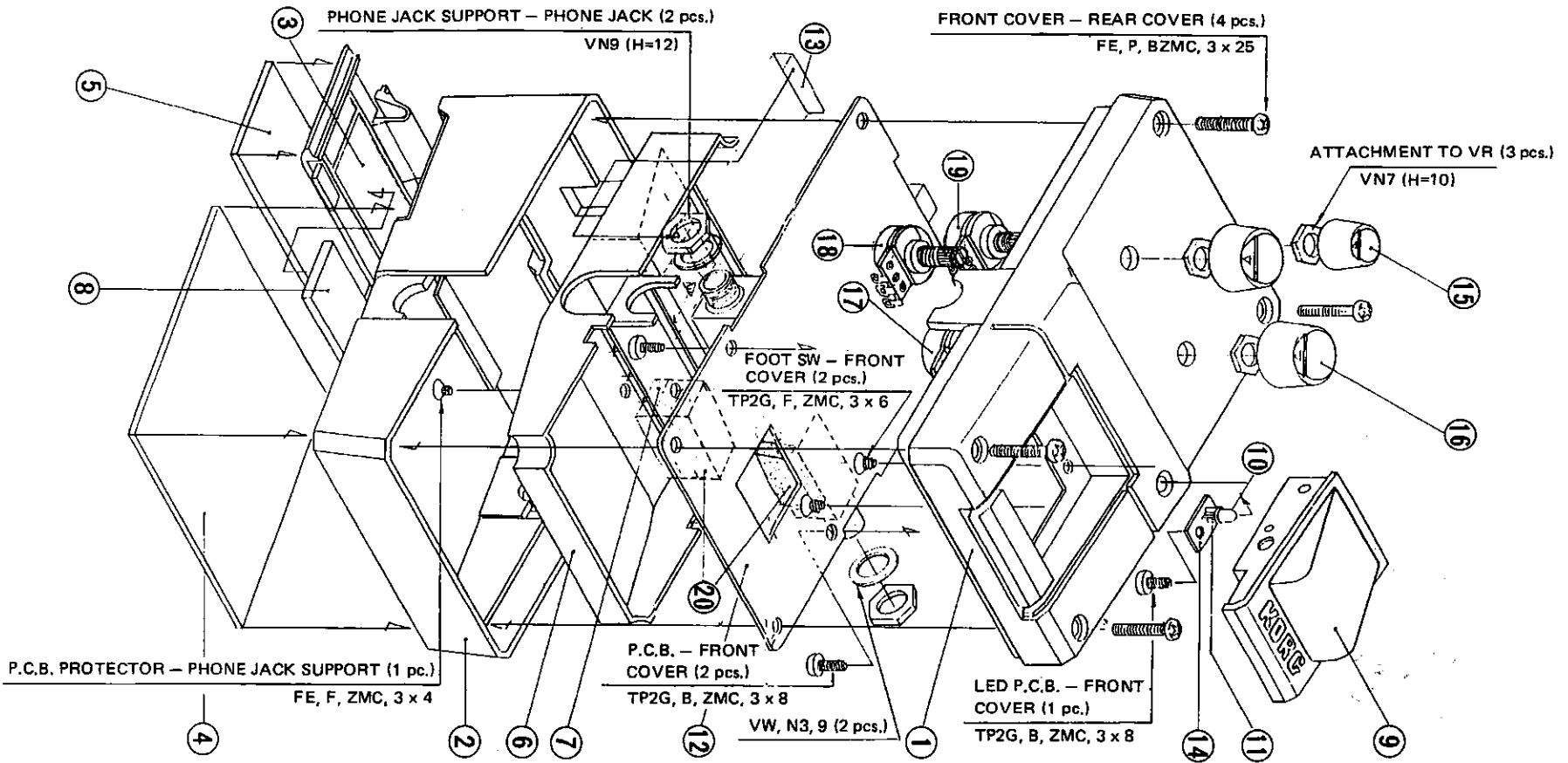
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5. PC BOARD .....	24
6. PARTS LIST .....	25

## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
- Output impedance 10k $\Omega$
- Maximum output level 1.3V<sub>p-p</sub> (TONE 10, DISTORTION 10, at 250Hz)
- TONE PEAK 1.3kHz (TONE 10, DISTORTION 10) PEAK 200Hz (TONE 0, DISTORTION 10)
- Maximum gain 46dB (TONE 10, DISTORTION 10, at 1.3kHz)
- Frequency response 20Hz ~ 20kHz  
+0/-1.5dB
- [EFFECT OFF] Noise level -110dBm (equivalent input noise, TONE 10, DISTORTION 10, input short-circuited, IHF-A)
- Operating voltage 10 ~ 7.5V
- Power consumption 5.8mA
- Pedal switch life Over 10,000 times of switching
- Functions DISTORTION, TONE, OUTPUT, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT
- Power supply 006P 9V battery/DC jack
- Dimensions 70(W) x 67(H) x 129(D) mm
- Weight 450 g (including battery)

(All values are typical.)

## 2. STRUCTURAL DIAGRAM



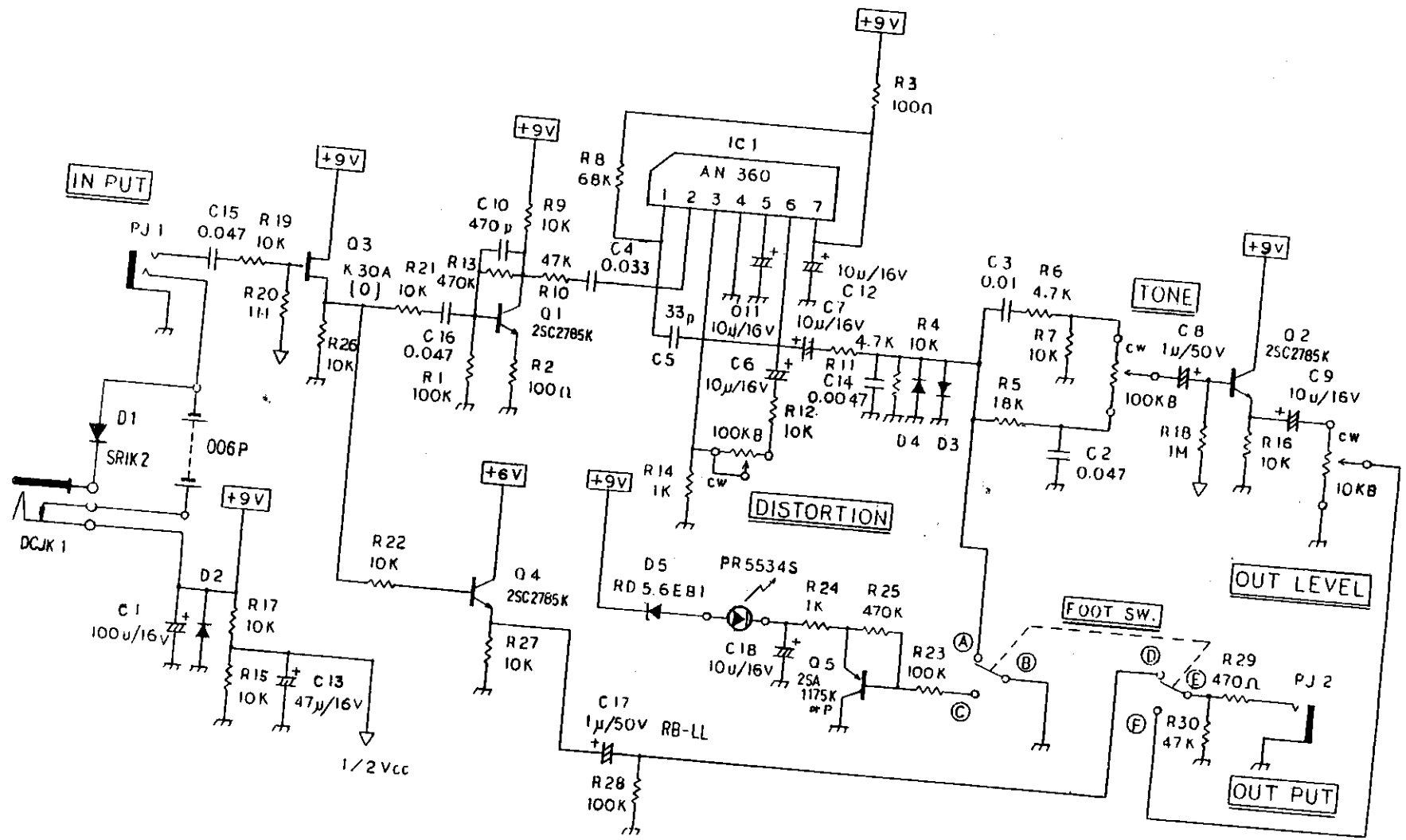
PART NO.	PART NAME	PART CODE
1	FRONT COVER	64703500
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B PROTECTOR	64607000
7	PHONE JACK SUPPORT	64003600
8	SPONGE	50003400
9	FOOT SW (KFS-2)	37507100
10	LED (PR-6534S)	31200700
11	LED HOLDER X-TYPE No. 4	57504000
12	P.C.B. (KLUASB7)	34069700
13	SERIAL NUMBER SEAL	34069400
14	LED P.C.B. (KLU-6594)	62014300
15	EFFECT'S KNOB SMALL	62014200
16	EFFECT'S KNOB LARGE	36012100
17	VR 100K B	36012000
18	VR 10K B	36012100
19	VR 100K S	50004400
20	BATTERY CUSHION	50004400

IT CODE
4703500
4703700
7103200
0069300
0069400
0070000
0305000
0034100
0070700
0400000
8870000
9840000
1430000
4200000
2100000
2000000
2100000
4400000

D2~4:1S1555

3. CIRCUIT DIAGRAM

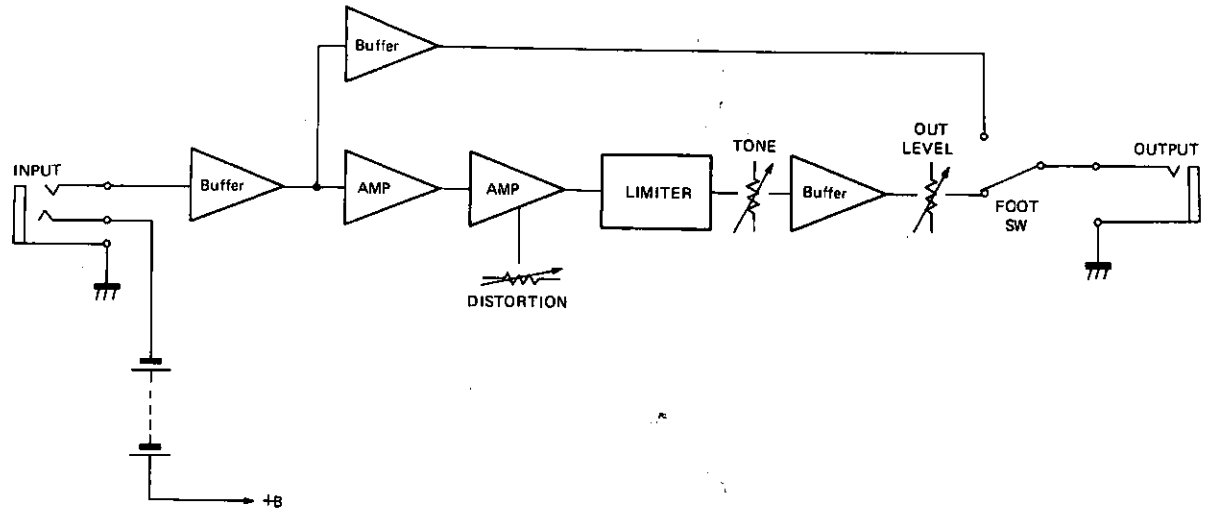
KLM-687





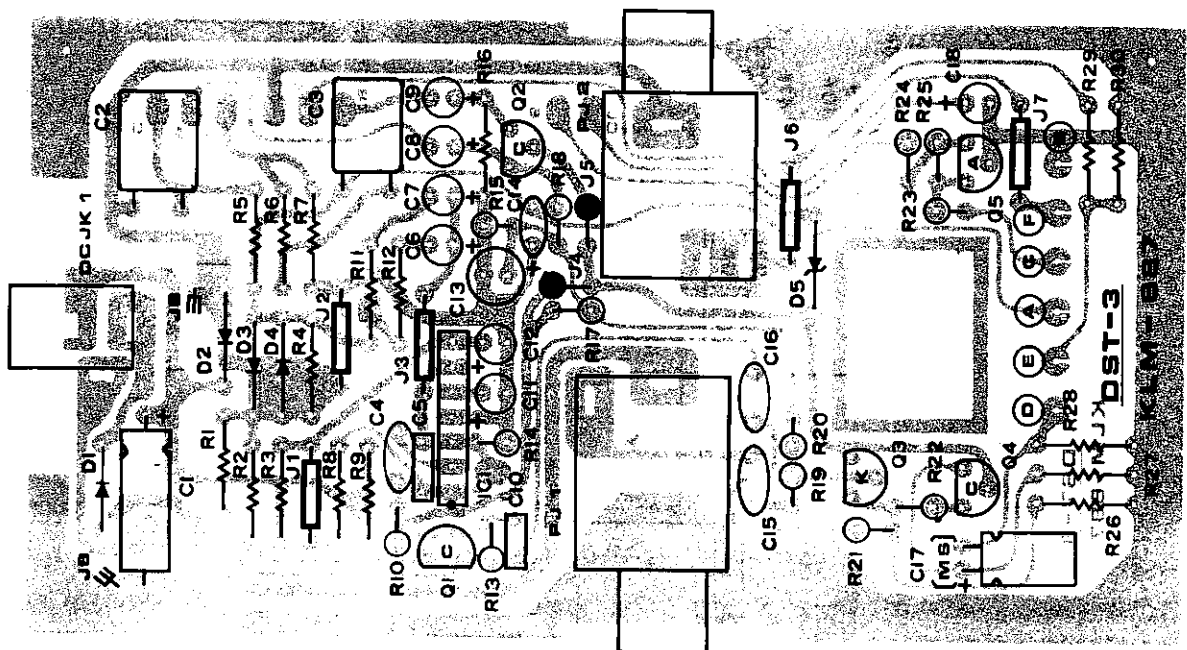
## 4. BLOCK DIAGRAM

KLM-687



## 5. P.C. BOARD

KLM-687



## 6. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-687		5
10013310	S1/4JY 100 Ω			2
10013347	S1/4JY 470 Ω			1
10013447	S1/4JY 4.7K			2
10013510	S1/4JY 10K			7
10013518	S1/4JY 18K			1
10013547	S1/4JY 47K			1
10013568	S1/4JY 68K			1
10013610	S1/4JY 100K			2
10109000	T 0 Ω			2
10113410	S1/4JT 1K			2
10113510	S1/4JT 10K			5
10113547	S1/4JT 47K			1
10113610	S1/4JT 100K			1
10113647	S1/4JT 470K			2
10113710	S1/4JT 1M			2
<b>MYLAR CAPACITORS</b>				
20023447	50V 0.0047μF	KLM-687		1
20023510	50V 0.01μF			1
20023533	50V 0.033μF			1
20023547	50V 0.047μF			3
<b>CERAMIC CAPACITORS</b>				
21352331	50V 33PF	KLM-687		1
21353471	50V 470PF			1
<b>ELECTROLYTIC CAPACITORS</b>				
23007247	A16V 47μF	KLM-687		1
23107310	B16V 100μF			1
23207210	A16V 10μF			6
23215110	A50V 1μF			1
23315110	A50V 1μF			1
<b>TRANSISTORS</b>				
30001311	2SA1175 K	KLM-687		1
30202211	2SC2785 K			3
<b>FET</b>				
30600115	2SK 30A TM-0	KLM-687		1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>DIODES</b>				
31000100	1S1555	KLM-687		3
31001500	SR1K-2			1
<b>ZENER DIODE</b>				
31101600	RD 5.6EB1	KLM-687		1
<b>LED</b>				
31200700	PR-5534S			1
<b>IC</b>				
32002012	AN-360	KLM-687		1
<b>P.C. BOARD WITH PARTS</b>				
34068700	KLM-687			1
34069400	KLM-694			1
<b>VRs</b>				
36012000	K161100T6E 10KB <sub>3</sub> VM10A-C29E			1
36012100	K161100T6E 100KB VM10A-C29			2
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACK</b>				
45000600	S-G 7622 #06	KLM-687		1
45001100	S-G 7713 #04			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-687		1
<b>SPONGE</b>				
50003400	4 x 20 x 40			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>BATTERY CUSHION</b>				
50004400				1
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOBS</b>				
62014200	LARGE			2
62014300	SMALL			1
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64703500				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SCREWS</b>				
70060323	FE P BZMC 3 x 23			4
70130304	FE F ZMC 3 x 4			1
72130306	TP2G F ZMC 3 x 6			2
72530308	TP2G B ZMC 3 x 8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# FLANGER FLG-1

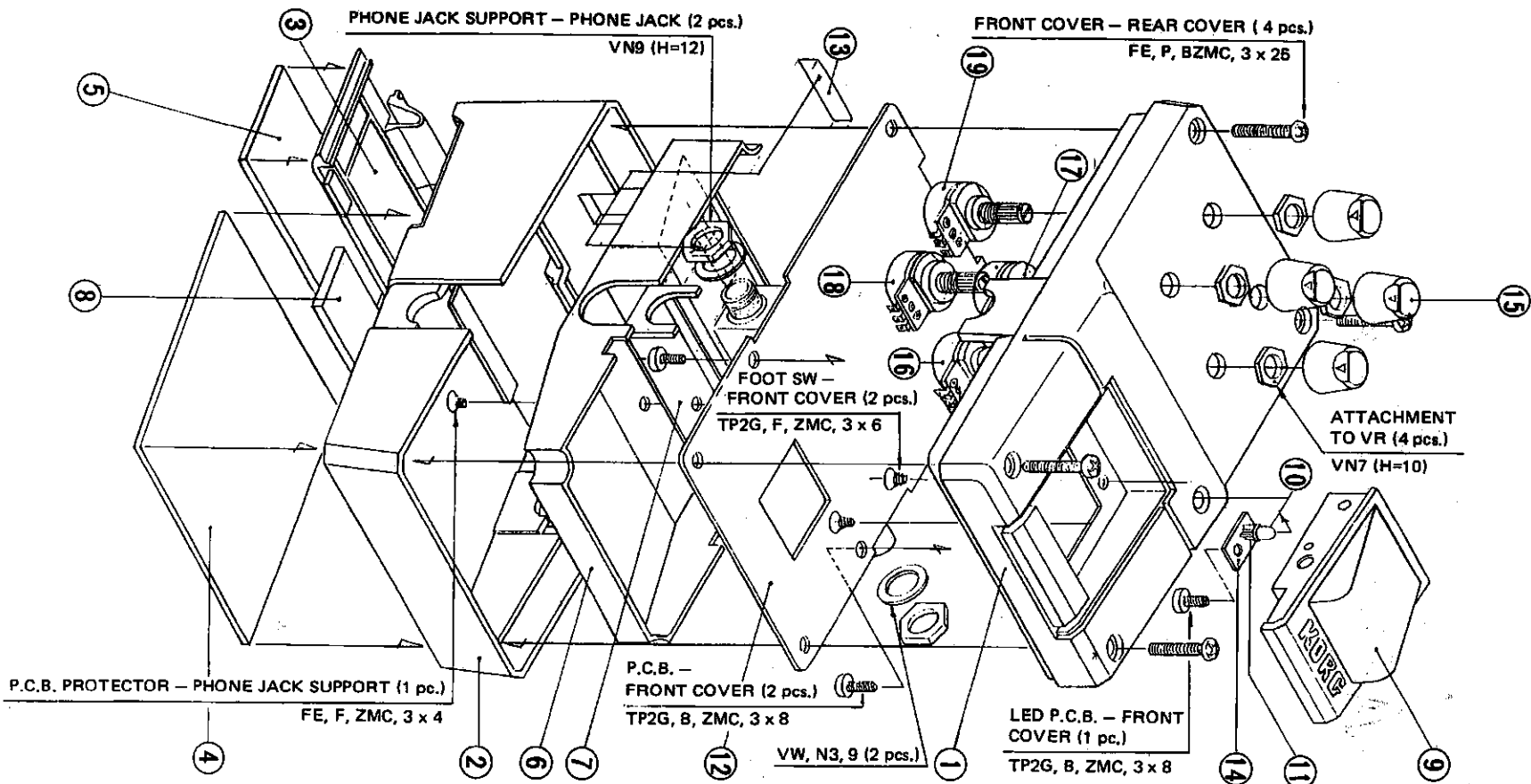
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## 1. SPECIFICATIONS

- |                        |   |                |                           |
|------------------------|---|----------------|---------------------------|
| ● Input impedance      | 1M $\Omega$   | ● Power supply | 006P 9V battery/DC jack   |
| ● Output impedance     | 1k $\Omega$   | ● Dimensions   | 70(W) x 68(H) x 129(D) mm |
| ● Maximum input level  | +3dBm (INTENSITY 0, MANUAL 0, FEEDBACK 0, at 250Hz)                           | ● Weight       | 470 g (including battery) |
| ● Maximum output level | +3dBm (INTENSITY 0, MANUAL 0, FEEDBACK 0, at 250Hz)                           |                | (All values are typical.) |
| ● Delay time           | 12msec. ~ 1msec.  |                |                           |
| ● Modulation speed     | 0.1Hz ~ 10Hz  |                |                           |
| ● Feedback             | 0 ~ 100%  |                |                           |
| ● Frequency response   | 20Hz ~ 20kHz<br>+0/-1.5dB   |                |                           |
| ● Residual noise level | -90dBm (MANUAL 10, INTENSITY 0, FEEDBACK 0, input short-circuited, IHF-A)     |                |                           |
| ● Operating voltage    | 10 ~ 7.5V   |                |                           |
| ● Power consumption    | 12.8mA  |                |                           |
| ● Pedal switch life    | Over 10,000 times of switching  |                |                           |
| ● Functions            | SPEED, INTENSITY, MANUAL, FEEDBACK, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT |                |                           |

## 2. STRUCTURAL DIAGRAM



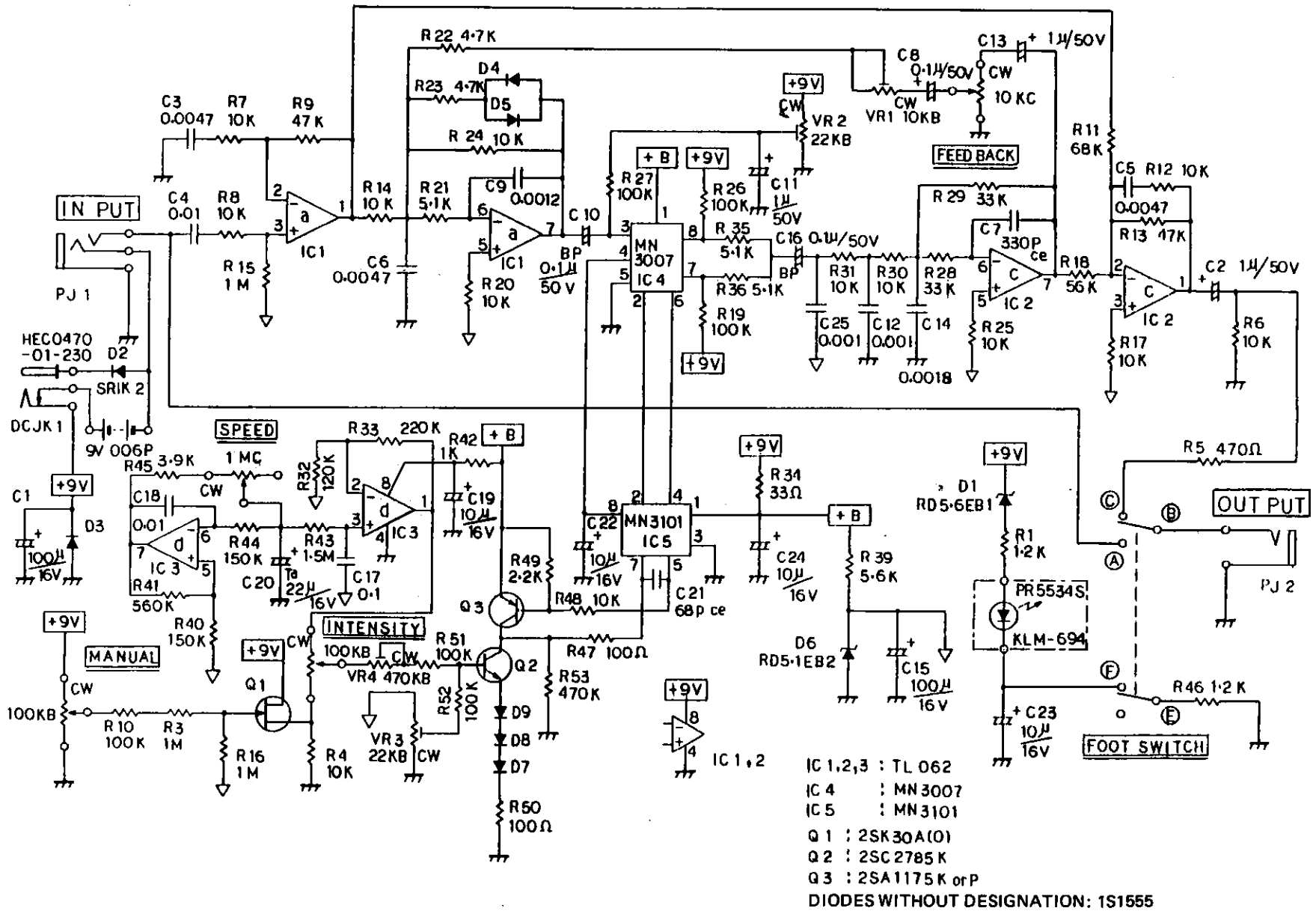
PART NO.	PART NAME	PART CODE
1	FRONT COVER	64703400
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B. PROTECTOR	64607000
7	PHONE JACK SUPPORT	64400600
8	SPONGE	500003400
9	FOOT SW (KFS2)	37507100
10	LED (PH-65348)	31200700
11	LED HOLDER X-TYPE	57504000
12	P.C. BOARD (K.LA68)	34089300
13	SERIAL NUMBER SEAL	34089400
14	LED P.C. BOARD (K.LW-894)	62014300
15	EFFECTS KNOB SMALL	35013100
16	VR 10KC	35012500
17	VR 100KB	35012100
18	VR 100KB	35012100
19	VR 100KB	35012100

1068400	1068400
7034100	7034100
7035100	7035100
7036100	7036100
7037100	7037100
7038100	7038100
7039100	7039100
7040100	7040100
7041100	7041100
7042100	7042100
7043100	7043100
7044100	7044100
7045100	7045100
7046100	7046100
7047100	7047100
7048100	7048100
7049100	7049100
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7051100	7051100
7052100	7052100
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7100100	7100100

### 3. CIRCUIT DIAGRAM

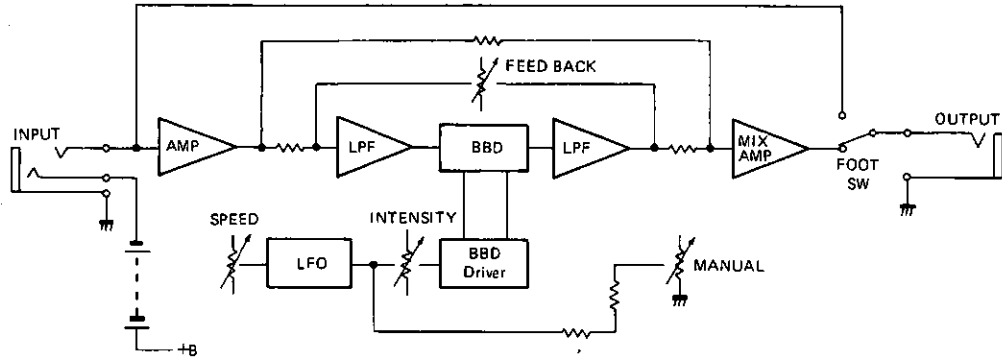
KLM-683

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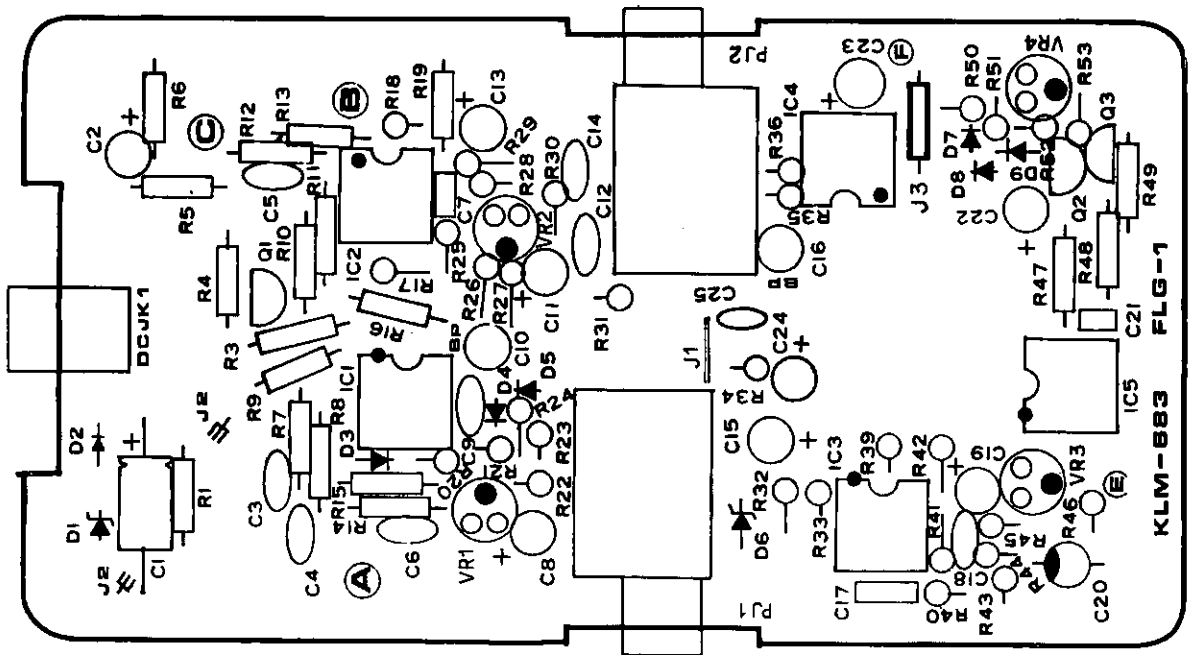
# 4. BLOCK DIAGRAM

KLM-683



# 5. PC. BOARD

KLM-683



## 6. ADJUSTMENT PROCEDURE

### 1. BBD Clock check and adjustment

- 1) Insert a plug in the input jack and turn on the FLG-1 power supply. Set SPEED to 0, FEEDBACK to 0, MANUAL to 10.
- 2) Connect oscilloscope to KLM-683 J3 (0 ohm) and check the clock cycle. Refer to Figure 4.

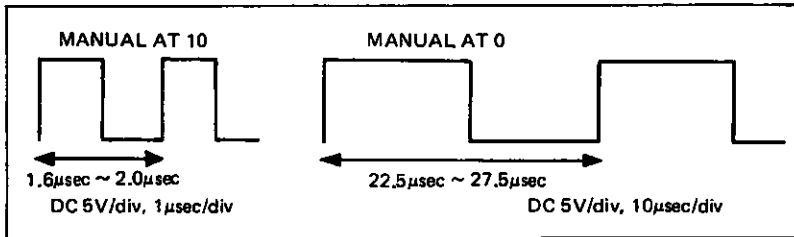


Fig-4

- 3) The cycle should be  $1.8 \mu\text{s} \pm 0.2 \mu\text{s}$ .
- 4) Adjust VR4 if necessary.
- 5) Set MANUAL to 0 and confirm a cycle of  $25 \mu\text{s} \pm 2.5 \mu\text{s}$ . Refer to figure 4.
- 6) Adjust VR3 if necessary.

### 2. BBD bias check and adjustment

- 1) Apply signal generator signal (250 Hz, sine wave 3 Vp-p) to FLG-1 input.
- 2) Connect oscilloscope (0.5 V/div, 1 ms/div, AC) to KLM-683 IC4 (MN3007) 8-pin and observe the waveform.
- 3) The waveform's upper and lower portions should be symmetrical and it should be of maximum amplitude.
- 4) Adjust VR2 if necessary.

### 3. Feedback check and adjustment

- 1) Apply signal generator signal (250 Hz, sine wave, 3 Vp-p) to FLG-1 input.
- 2) Connect oscilloscope to output and short input to ground.
- 3) Confirm that the waveform observable on the oscilloscope is oscillating.
- 4) Adjust VR1 if necessary.

**NOTE:** Oscillation occurs if the feedback knob is set to 7 or higher. Oscillation should not occur if set between 0 and 6.9.



## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-683		1
10013310	S1/4JY 100 Ω			1
10013347	S1/4JY 470 Ω			1
10013412	S1/4JY 1.2K			1
10013422	S1/4JY 2.2K			1
10013510	S1/4JY 10K			7
10013547	S1/4JY 47K			2
10013568	S1/4JY 68K			1
10013610	S1/4JY 100K			2
10013710	S1/4JY 1M			3
10113233	S1/4JT 33 Ω			1
10113310	S1/4JT 100 Ω			1
10113410	S1/4JT 1K			1
10113412	S1/4JT 1.2K			1
10113439	S1/4JT 3.9K			1
10113447	S1/4JT 4.7K			2
10113451	S1/4JT 5.1K			3
10113456	S1/4JT 5.6K			1
10113510	S1/4JT 10K			6
10113533	S1/4JT 33K			2
10113556	S1/4JT 56K			1
10113610	S1/4JT 100K			4
10113612	S1/4JT 120K			1
10113615	S1/4JT 150K			2
10113622	S1/4JT 220K			1
10113647	S1/4JT 470K			1
10113656	S1/4JT 560K			1
10113715	S1/4JT 1.5M			1
<b>MYLAR CAPACITORS</b>				
20023410	50V 0.001 μF	KLM-683		2
20023412	50V 0.0012 μF			1
20023418	50V 0.0018 μF			1
20023447	50V 0.0047 μF			3
20023510	50V 0.01 μF			2
<b>CERAMIC CAPACITORS</b>				
21012268	50V 68PF	KLM-683		1
21012333	50V 330PF			1
21238610	25V 0.1 μF			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>TANTALUM CAPACITOR</b>				
22007222	16V 22UFK	KLM-683		1
<b>ELECTROLYTIC CAPACITORS</b>				
23007310	A16V 100 μF	KLM-683		1
23107310	B16V 100 μF			1
23207210	A16V 10 μF			4
23215110	A50V 1 μF			3
23315010	A50V 0.1 μF			1
24515010	50V 0.1 μF			2
<b>TRANSISTORS</b>				
30000727	2SA733 AK	KLM-683		1
30202211	2SC2785 K			1
<b>FET</b>				
30600115	2SK 30A TM-0	KLM-683		1
<b>DIODES</b>				
31000100	1S1555	KLM-683		6
31001500	SR1K-2			1
<b>ZENER DIODES</b>				
31101300	RD 5.1EB2	KLM-683		1
31101600	RD 5.6EB1			1
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32002011	MN-3007	KLM-683		1
32002014	MN-3101			1
32021022	TL-062			3
<b>P.C. BOARD WITH PARTS</b>				
34068300	KLM-683			1
34069400	KLM-694			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SEMI FIXED VRs</b>				
35001310	H0651A 10KB	KLM-683		1
35001322	H0651A 22KB			2
35001447	H0651A 470KB			1
<b>VRs</b>				
36012100	K161100T6E 100KB VM10A-C29			2
36012500	K161100T6E 1MC VM10A-C29E			1
36013100	K161100T6E 10KC VM10A-C29E			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-683		1
45001100	S-G 7713 #04			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-683		1
<b>SPONGE</b>				
50003400	4 x 20 x 40			1
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>LED HOLDER</b>				
57504000	X-TYPE No. 4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014300	SMALL			4
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64703400				1
<b>SCREWS</b>				
70060323	FE P BZMC 3 x 23			4
70130304	FE F ZMC 3 x 4			1
72130306	TP2G F ZMC 3 x 6			2
72530308	TP2G B ZMC 3 x 8			3
<b>NUT</b>				
77310900	VN N-39			2
<b>PHONE JACK WASHER</b>				
79040914	N-39 x 14 x 0.			2

# LIMITER LIM-1

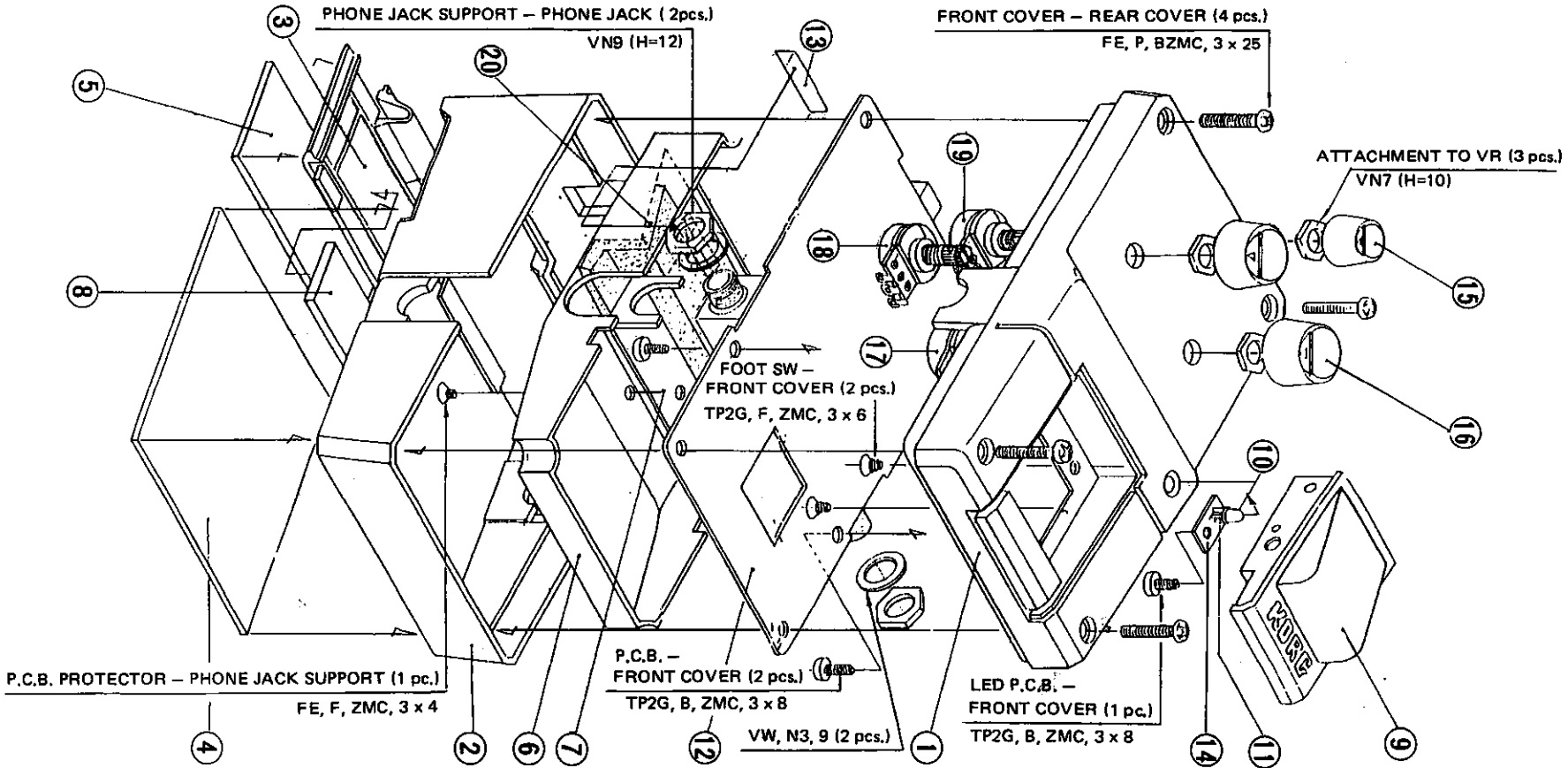
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## 1. SPECIFICATIONS

- |                                   |  |                     |   |
|-----------------------------------|--|---------------------|---|
| ● Input impedance                 | 1M $\Omega$  | ● Noise level       | -95dBm (THRESHOLD 0, equivalent input noise, input short-circuited, IHF-A)    |
| ● Output impedance                | 10k $\Omega$   | ● Operating voltage | 10 ~ 7.5V   |
| ● Maximum input level             | +5dBm (THRESHOLD 0), at 250Hz  | ● Power consumption | 6.5mA   |
| ● Maximum output level            | +1dBm (THRESHOLD 0), at 250Hz  | ● Pedal switch life | Over 10,000 times of switching  |
| ● Minimum input for compression   | -13.5dBm ~ +5dBm (THRESHOLD 10 ~ 0, at 250Hz, 3dB compression)             | ● Functions         | THRESHOLD, RELEASE TIME, OUT LEVEL, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT |
| ● Operation characteristics       | -20dBm ~ 0dBm (INPUT),<br>-12dBm ~ -8dBm (OUTPUT) (THRESHOLD 10, at 250Hz) | ● Power supply      | 006P 9V battery/DC jack   |
| ● Maximum compression ratio       | 13dB (maximum input, at 250Hz)   | ● Dimensions        | 70(W) x 67(H) x 129(D) mm   |
| ● Release time                    | 0.5 ~ 10 sec. (RELEASE TIME 0 ~ 10)  | ● Weight            | 450 g (including battery)   |
| ● Frequency response [EFFECT OFF] | 20Hz ~ 20kHz<br>+0/-1.5dB  |                     |   |
| ● Frequency response [EFFECT ON]  | 20Hz ~ 7.5kHz<br>+0/-3dB (THRESHOLD 10, RELEASE TIME 10, -30dBm input)     |                     |   |
| ● Frequency response [EFFECT ON]  | 20Hz ~ 7.5kHz +0/-6dB (THRESHOLD 10, RELEASE TIME 10, -10dBm input)        |                     |   |
- (All values are typical.)

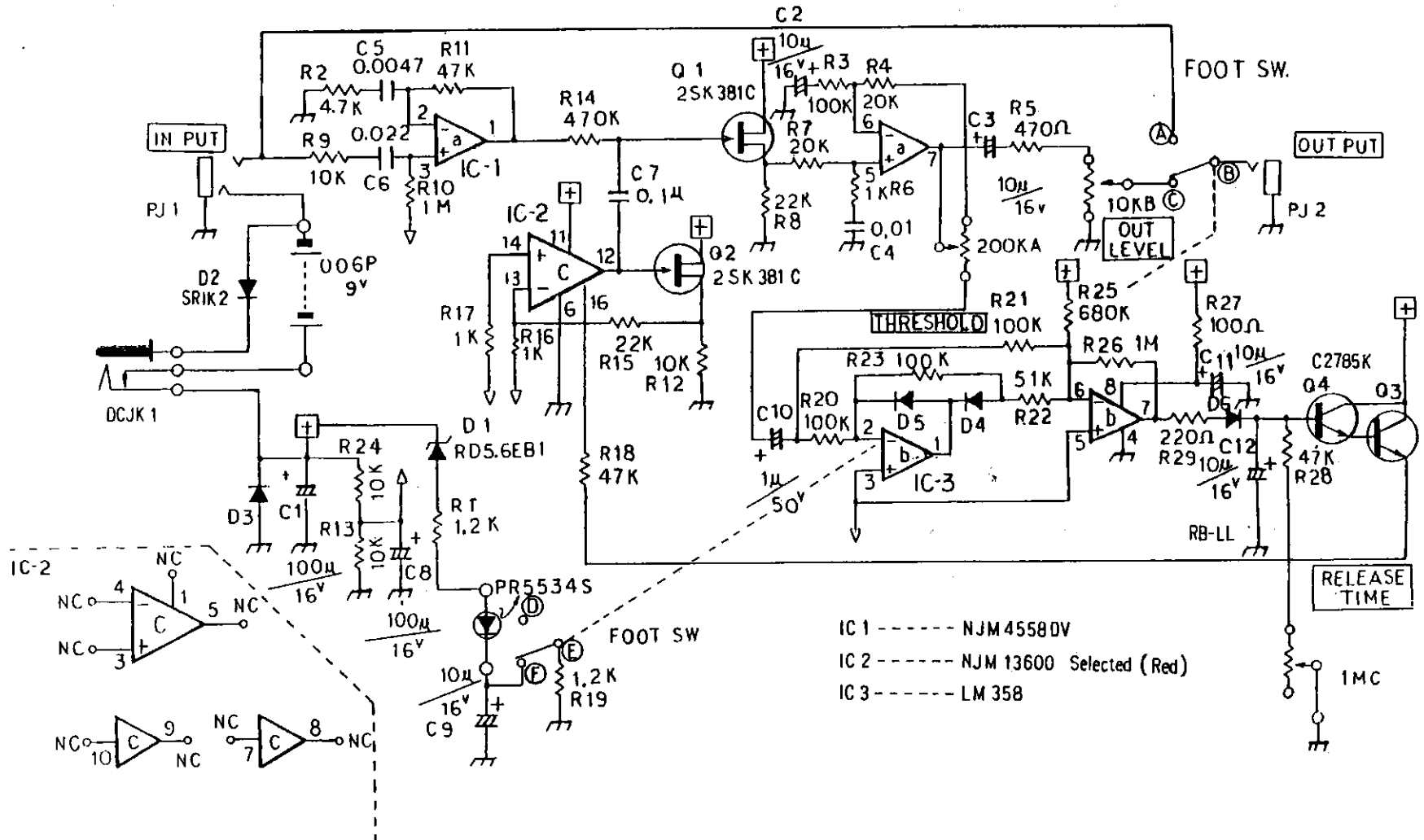
## 2. STRUCTURAL DIAGRAM



PART NO.	PART NAME	PART CODE
1	FRONT COVER	64704300
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	60008300
5	RUBBER STOPPER SMALL	60008400
6	P.C.B PROTECTOR	64607000
7	PHONE JACK SUPPORT	64030600
8	SPONGE	50003400
9	FOOT SW (KFS-2)	37607100
10	LED (PR 85345)	31200700
11	LED HOLDER X-TYPE No. 4	57504000
12	P.C.B (KLM4593)	34069300
13	SERIAL NUMBER SEAL	34069400
14	LED P.C.B (KLM4594)	62014300
15	EFFECTS KNOB SMALL	62014200
16	EFFECTS KNOB LARGE	36011800
17	VR 200K/A	36012000
18	VR 10K/B	36012500
19	VR 1 MC	50004400
20	BATTERY CUSHION	50004400

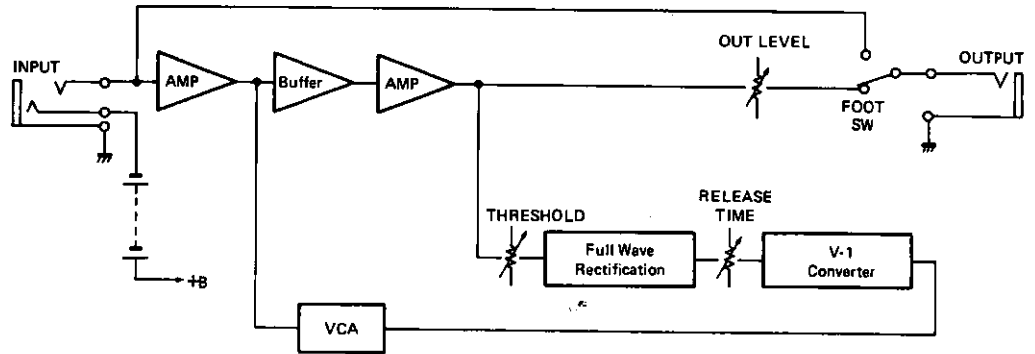
### 3. CIRCUIT DIAGRAM

KLM-693



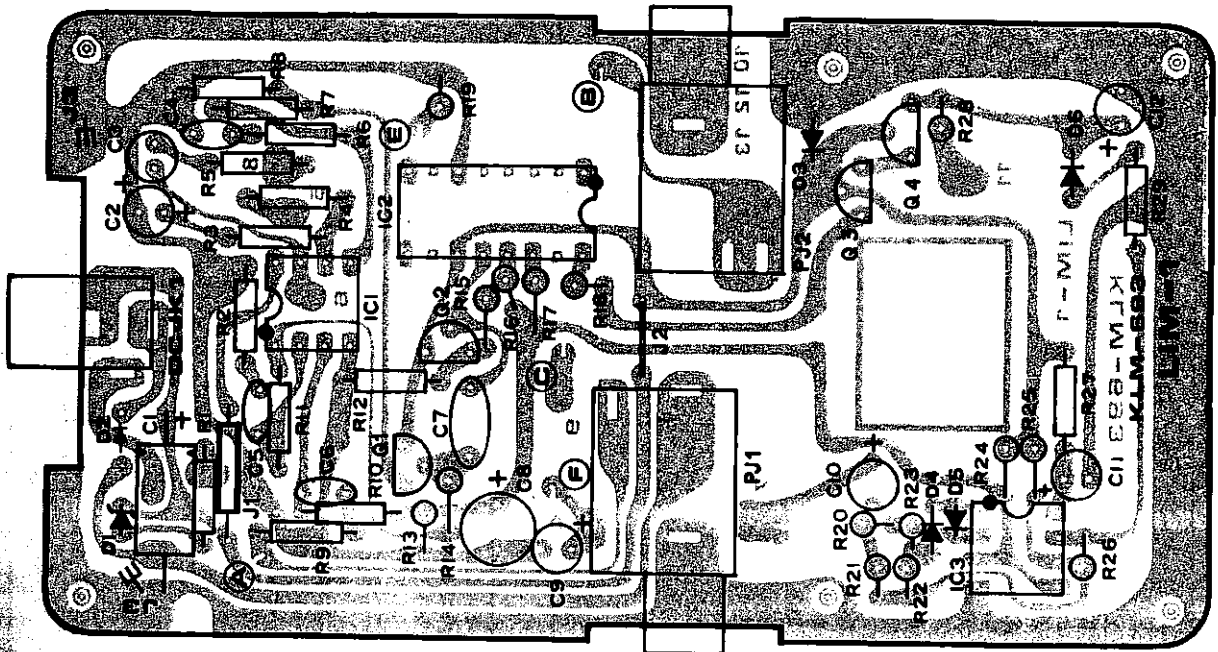
## 4. BLOCK DIAGRAM

KLM-693



## 5. P.C. BOARD

KLM-693



## 6. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-693		1
10013310	S1/4JY 100 Ω			1
10013322	S1/4JY 220 Ω			1
10013347	S1/4JY 470 Ω			1
10013410	S1/4JY 1K			1
10013412	S1/4JY 1.2K			1
10013447	S1/4JY 4.7K			1
10013510	S1/4JY 10K			2
10013520	S1/4JY 20K			2
10013522	S1/4JY 22K			1
10013547	S1/4JY 47K			1
10013610	S1/4JY 100K			1
10013710	S1/4JY 1M			1
10113410	S1/4JT 1K			2
10113412	S1/4JT 1.2K			1
10113510	S1/4JT 10K			2
10113522	S1/4JT 22K			1
10113547	S1/4JT 47K			2
10113551	S1/4JT 51K			1
10113610	S1/4JT 100K			3
10113647	S1/4JT 470K		1	
10113668	S1/4JT 680K		1	
10113710	S1/4JT 1M		1	
<b>MYLAR CAPACITORS</b>				
20023447	50V 0.0047μF	KLM-693		1
20023510	50V 0.01μF			1
20023522	50V 0.022μF			1
20023610	50V 0.1μF			1
<b>ELECTROLYTIC CAPACITORS</b>				
23007210	A16V 10μF	KLM-693		1
23007310	A16V 100μF			1
23107310	B16V 100μF			1
23207210	A16V 10μF			4
23215110	A50V 1μF			1
23307210	A16V 10μF			1
<b>TRANSISTOR</b>				
30202211	2SC2785 K	KLM-693		2

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>FET</b>				
30600303	2SK 381-C	KLM-693		2
<b>DIODES</b>				
31000100	1S1555	KLM-693		4
31001500	SR1K-2			1
<b>ZENER DIODE</b>				
31101600	RD 5.6EB1	KLM-693		1
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32009001	NJM-4558D-V	KLM-693		1
32009017	NJM-13600D-A			1
32021025	LM-358			1
<b>P.C. BOARD WITH PARTS</b>				
34069300	KLM-693			1
34069400	KLM-694			1
<b>VRs</b>				
36011900	K161100T6E			1
36012000	200KA VM10A-C29			1
	K161100T6E			
36012500	10KB VM10A-C29E			1
	K161100T6E			
	1MC VM10A-C29E			
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-693		1
45001100	S-G 7713 #04			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-693		1
<b>SPONGE</b>				
50003400	4x20x40			1
<b>BATTERY CUSHION</b>				
50004400				1
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No. 4 5.8MM			1
<b>EFFECTS KNOBS</b>				
62014200	LARGE			2
62014300	SMALL			1
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64704300				1
<b>SCREWS</b>				
70060323	FE P BZMC 3x23			4
70160304	FE F BZMC 3x4			1
72130306	TP2G F ZMC 3x6			2
72560308	TP2G B BZMC 3x8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2



# NOISE GATE NGT-1

## CONTENTS

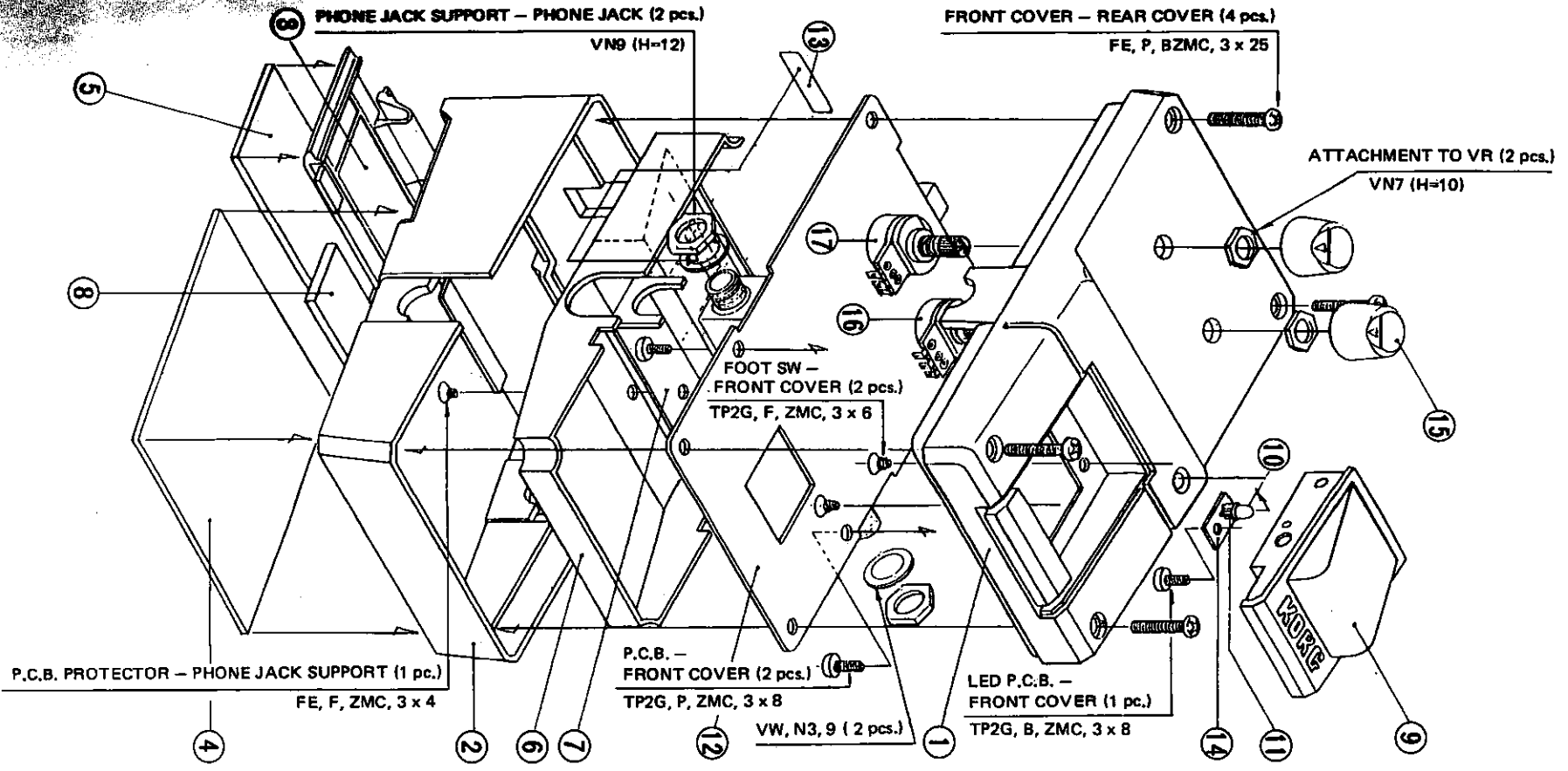
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## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
- Output impedance 20k $\Omega$
- Maximum input level +3dBm (at 250Hz)
- Maximum output level +3dBm (at 250Hz)
- Gate operation level 0~6mVrms (-42dBm)(at 250Hz)
- Release time 34msec. ~ 2sec. (RELEASE TIME 0 ~ 10)
- Frequency response [EFFECT OFF] 20Hz ~ 20kHz +0/1.5dB
- Frequency response [EFFECT ON] 20Hz ~ 10kHz +0/-4dB (-20dBm input)
- Residual noise level -100dBm (input short-circuited, IHF-A)
- Operating voltage 10V ~ 7.5V
- Power consumption 7.5mA
- Pedal switch life Over 10,000 times of switching
- Functions THRESHOLD, RELEASE TIME, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT
- Power supply 006P 9V battery/DC jack
- Dimensions 70(W) x 64.5(H) x 129(D) mm
- Weight 450 g (including battery)

(All values are typical.)

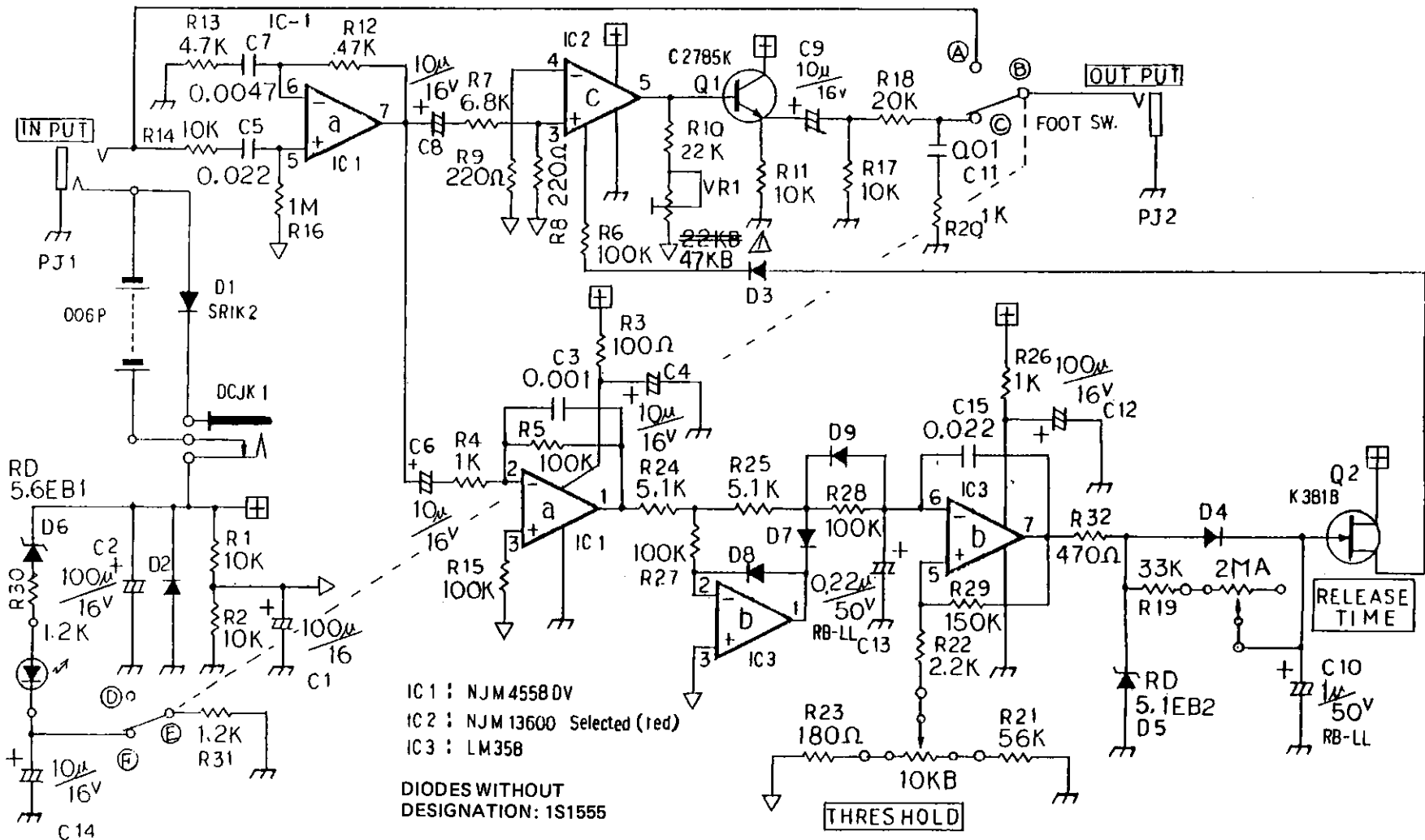
# 2. STRUCTURAL DIAGRAM



PART No.	PART NAME	PART CODE
1	FRONT COVER	64703900
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B PROTECTOR	64480700
7	PHONE JACK SUPPORT	64030500
8	SPONGE	50003400
9	FOOT SW (KES.21)	37507100
10	LED (IPR-592AS)	31700700
11	LED HOLDER X-TYPE	57509000
12	LED (KLM-991)	34089100
13	SERIAL NUMBER SEAL	34089400
14	LED P.C.B (KLM-994)	62014200
15	EFFECTS KNOB LARGE	36012000
16	VR 10KB	36011800
17	VR 2MA	

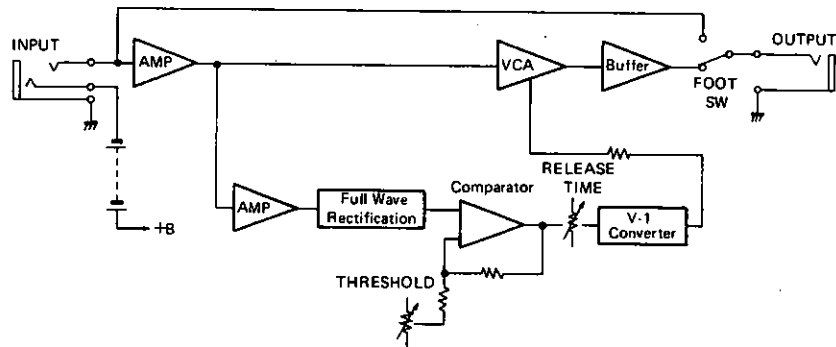
### 3. CIRCUIT DIAGRAM

KLM-691



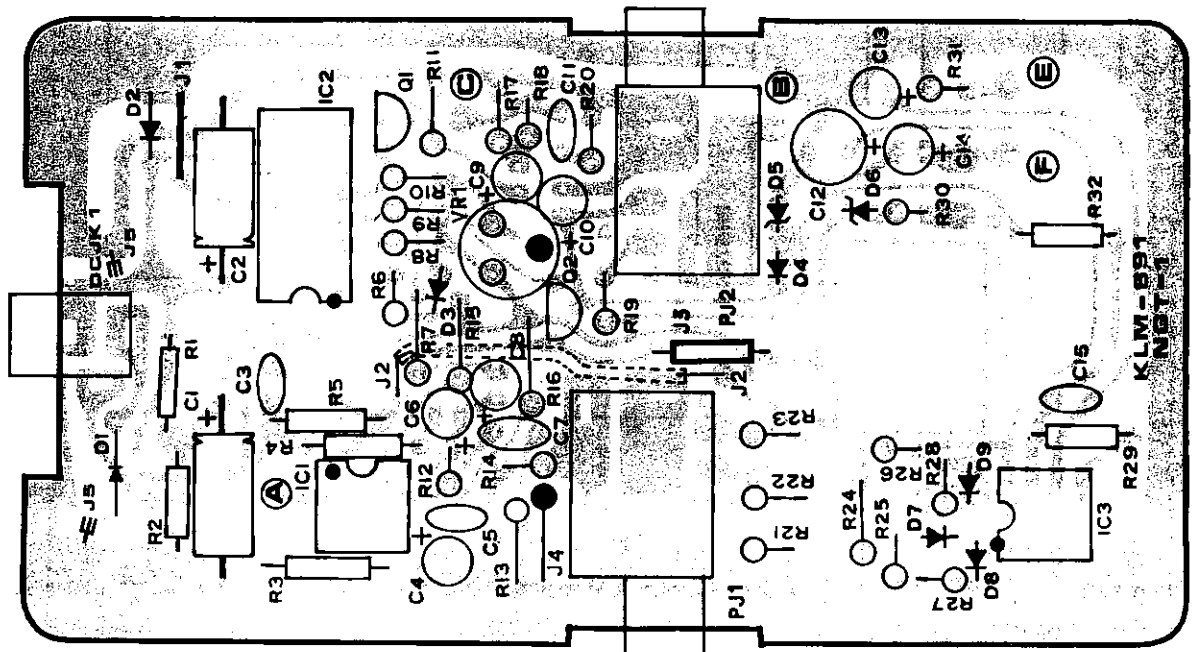
## 4. BLOCK DIAGRAM

KLM-691



## 5. P.C. BOARD

KLM-691



## 6. ADJUSTMENT PROCEDURE

### 1. NORMAL/EFFECT LEVEL check and adjustment

- 1) Connect a standard signal generator to the NGT-1 and apply a 250 Hz sine wave at 2Vp-p. NGT-1 settings may be as you like.
- 2) Connect an oscilloscope to the output jack and confirm the Figure 5 waveform.

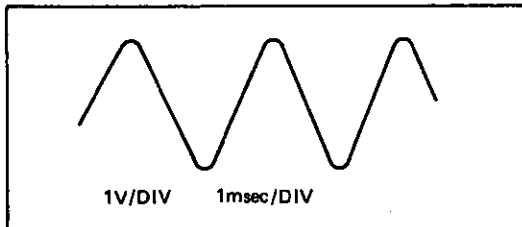


Fig-5

- 3) Switch the foot switch on and off and confirm that there is no significant volume difference between the direct sound and the effect sound. (Within 10%.)
- 4) Adjust VR1 if necessary.

## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	QTY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-691		1
10013310	S1/4JY 100 Ω			1
10013347	S1/4JY 470 Ω			1
10013410	S1/4JY 1K			1
10013510	S1/4JY 10K			2
10013610	S1/4JY 100K			1
10013615	S1/4JY 150K			1
10113318	S1/4JT 180 Ω			1
10113322	S1/4JT 220 Ω			2
10113410	S1/4JT 1K			2
10113412	S1/4JT 1.2K			2
10113422	S1/4JT 2.2K			1
10113447	S1/4JT 4.7K			1
10113451	S1/4JT 5.1K			2
10113468	S1/4JT 6.8K			1
10113510	S1/4JT 10K			3
10113520	S1/4JT 20K			1
10113522	S1/4JT 22K			1
10113533	S1/4JT 33K			1
10113547	S1/4JT 47K			1
10113556	S1/4JT 56K		1	
10113610	S1/4JT 100K		4	
10113710	S1/4JT 1M		1	
<b>MYLAR CAPACITORS</b>				
20023410	50V 0.001μF	KLM-691		1
20023447	50V 0.0047μF			1
20023510	50V 0.01μF			1
20023522	50V 0.022μF			2
<b>ELECTROLYTIC CAPACITORS</b>				
23007310	A16V 100μF	KLM-691		1
23107310	B16V 10μF			2
23207210	A16V 10μF			5
23315022	A50V 0.22μF			1
23315110	A50V 1μF			1
<b>TRANSISTORS</b>				
30202211	2SC2785 K	KLM-691		1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	QTY
<b>FET</b>				
30600302	2SK381-B	KLM-691		1
<b>DIODES</b>				
31000100	1S1555	KLM-691		6
31001500	SR1K-2			1
<b>ZENER DIODES</b>				
31101300	RD 5.1EB2	KLM-691		1
31101600	RD 5.6EB1			1
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32009001	NJM-4558D-V	KLM-691		1
32009017	NJM-13600D-A			1
32021025	LM-358			1
<b>P.C. BOARD WITH PARTS</b>				
34069100	KLM-691			1
34069400	KLM-694			1
<b>SEMI FIXED VR</b>				
35201347	H1051A 47KB	KLM-691		1
<b>VRs</b>				
36011800	K161100T6E 2MA			1
36012000	K161100T6E			1
	10KB VM10A-C29E			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-691		1
45001100	S-G 7713 #04			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-691		1
<b>SPONGE</b>				
50003400	4X20X40			1
<b>RUBBER STOPPERS</b>				
50009300	NO. 1 LARGE			1
50009400	NO. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014200	LARGE			2
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>FRONT COVER</b>				
64703900				1
<b>SCREWS</b>				
70060323	FE P BZMC 3X23			4
70130304	FE F ZMC 3X4			1
72130306	TP2G F ZMC 3X6			2
72560308	TP2G B BZMC 3X8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# OCTAVER OCT-1

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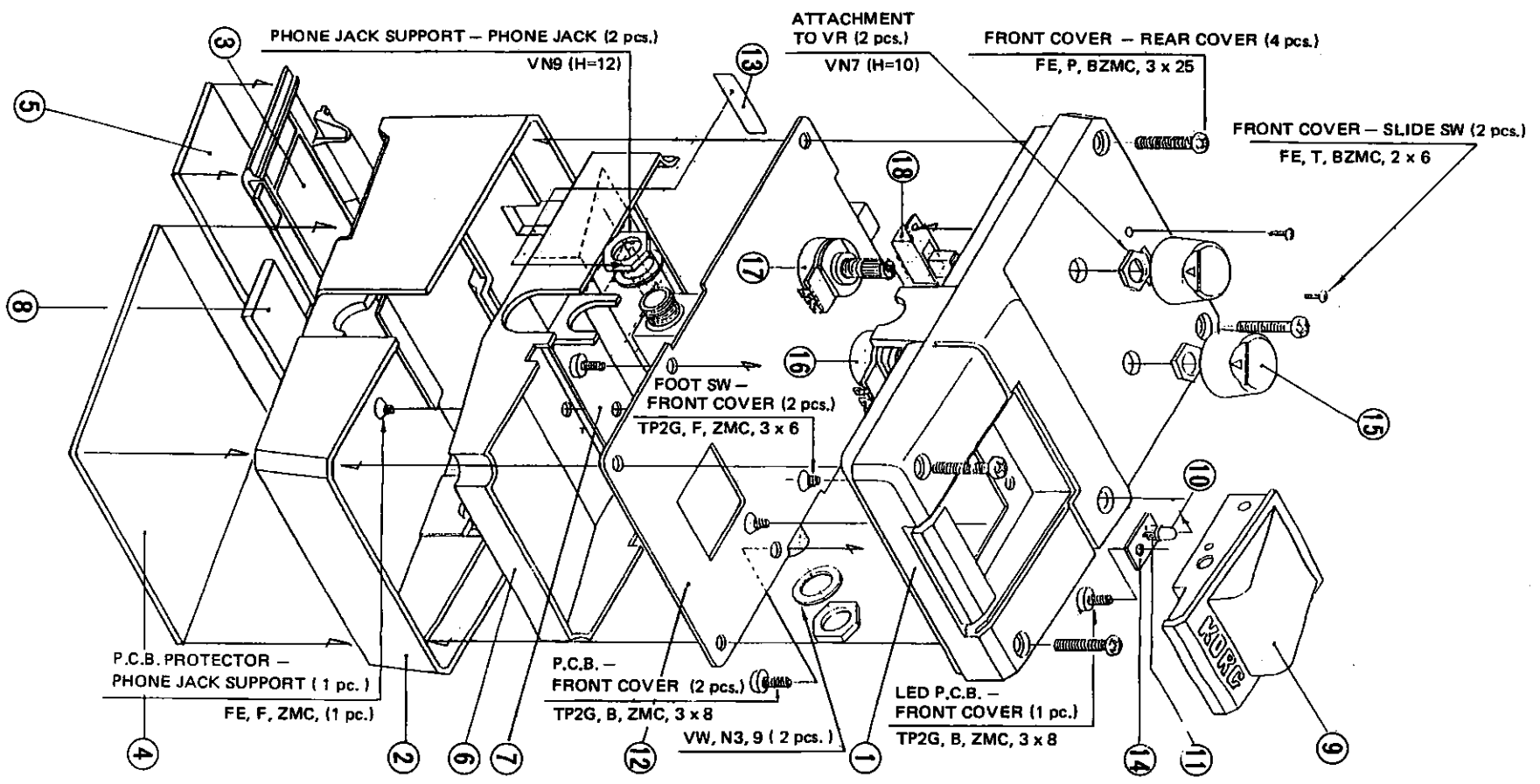
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## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
  - Output impedance 1k $\Omega$
  - Maximum input level -6dBm (at 250Hz)
  - Maximum output level +5dBm (at 250Hz)
  - Operation frequency range 40Hz ~ 1500Hz (-20dBm input)
  - Minimum input for operation -45dBm (at 250Hz)
  - Frequency response 20Hz ~ 10kHz  
+0/-3dB  
[EFFECT OFF]
  - Noise level -95dBm (equivalent input noise, input short-circuited, IHF-A)
  - Operating voltage 10 ~ 7.5V
  - Power consumption 10mA
  - Pedal switch life Over 10,000 times of operation
  - Functions DIRECT LEVEL, EFFECT LEVEL, POLARITY SW, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT
  - Power supply 006P 9V battery/DC jack
  - Dimensions 70(W) x 63.5(H) x 129(D) mm
  - Weight 450 g (including battery)
- (All values are typical.)



## 2. STRUCTURAL DIAGRAM

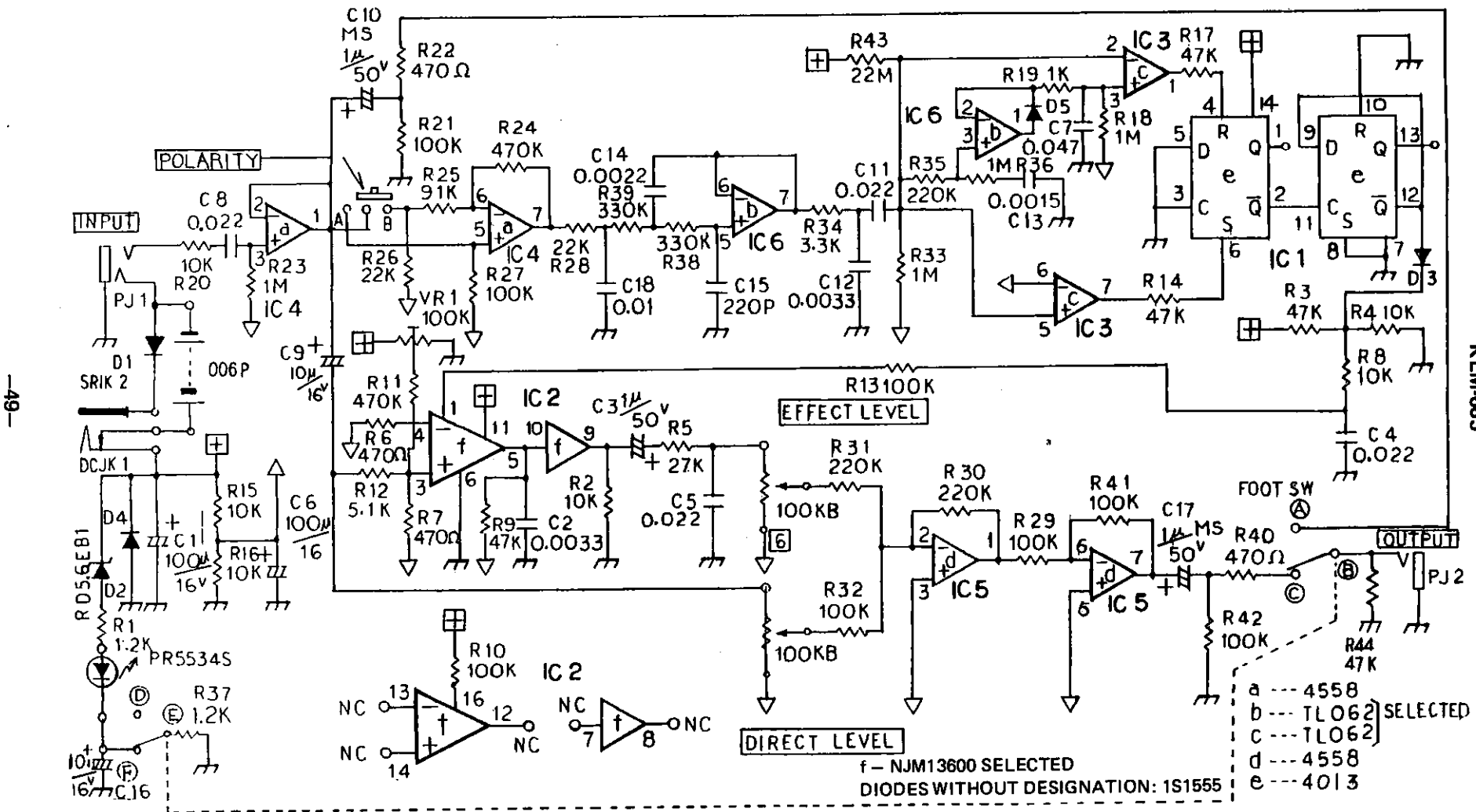


PART NO.	PART NAME	PART CODE
1	FRONT COVER	64703600
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B. PROTECTOR	64807000
7	PHONE JACK SUPPORT	64030600
8	SPONGE	50003400
9	FOOT SW (KFS-2)	37507100
10	LED (PR-55343)	50003400
11	LED HOLDER X-TYPE No. 4	31200700
12	P.C.B. (K.LM-885)	57504000
13	SERIAL NUMBER SEAL	34068500
14	LED P.C.B. (K.LM-694)	34089400
15	EFFECTS KNOB LARGE	62014200
16	VR 100KB	36012100
17	VR 100KB	36012100
18	SLIDE SW	37301400

PART CODE	DESCRIPTION
64703800	
64703100	
64703200	
50009300	
50009400	
64607000	
64030500	
50003400	
37507100	
37507200	
37507300	
34068500	
34069400	
62014200	
38012100	
38012100	
37301400	

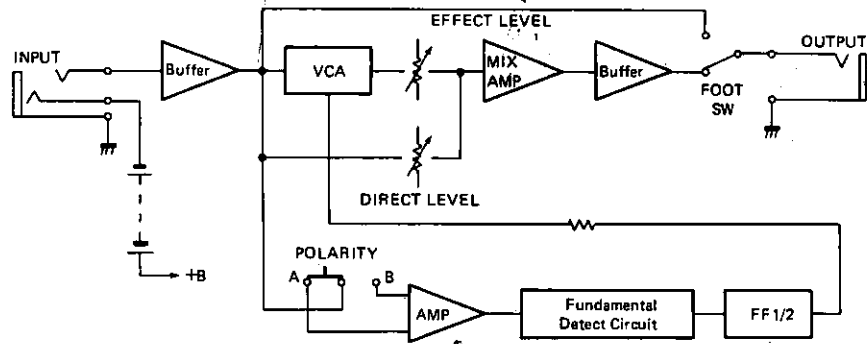
### 3. CIRCUIT DIAGRAM

KLM-685



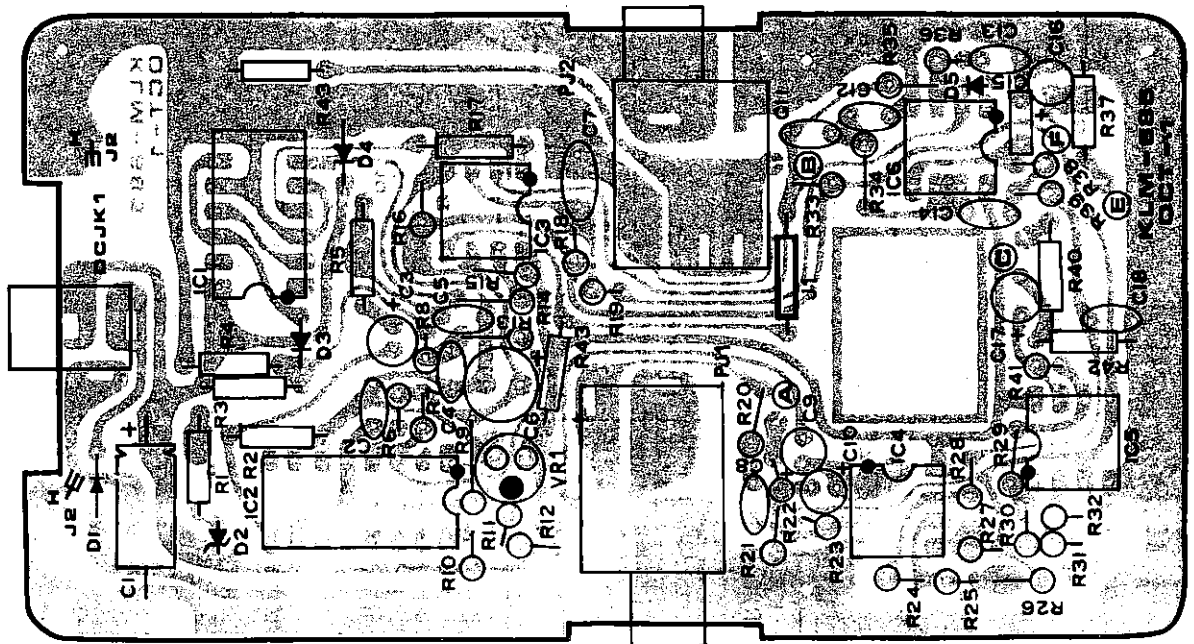
## 4. BLOCK DIAGRAM

KLM-685



## 5. P.C. BOARD

KLM-685



## 6. ADJUSTMENT PROCEDURE

### 1. EFFECT LEVEL check and adjustment

- 1) Apply signal generator signal (250 Hz, sine wave, 20 mVp-p) to OCT-1 input. Set DIRECT to 0, EFFECT to 10, POLARITY to A.
- 2) Connect an oscilloscope to the output and confirm the Figure 6 waveform.

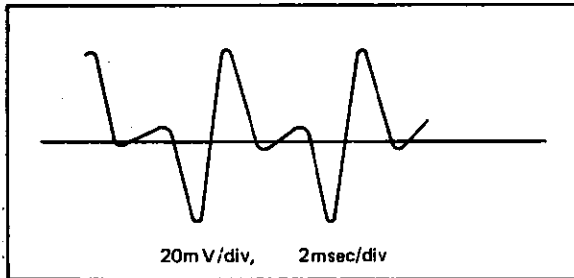


Fig-6

- 3) The upper and lower portions of the waveform should be symmetrical. Adjust VR1 if necessary.

1CS 270 CIS KLM-008 OCT-1

## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-685		1
10013347	S1/4JY 470 Ω		1	
10013412	S1/4JY 1.2K		2	
10013510	S1/4JY 10K		2	
10013527	S1/4JY 27K		1	
10013547	S1/4JY 47K		3	
10013610	S1/4JY 100K		1	
10113347	S1/4JT 390 Ω		3	
10113410	S1/4JT 1K		1	
10113433	S1/4JT 3.3K		1	
10113451	S1/4JT 5.1K		1	
10113510	S1/4JT 10K		4	
10113522	S1/4JT 22K		2	
10113547	S1/4JT 47K		2	
10113591	S1/4JT 91K		1	
10113610	S1/4JT 100K		7	
10113622	S1/4JT 220K		3	
10113633	S1/4JT 330K		2	
10113647	S1/4JT 470K	2		
10113710	S1/4JT 1M	4		
<b>SOLID RESISTOR</b>				
11013822	1/4KY 22M	KLM-685		1
<b>MYLAR CAPACITORS</b>				
20023415	50V 0.0015μF	KLM-685		1
20023422	50V 0.0022μF		1	
20023433	50V 0.0033μF		2	
20023510	50V 0.01μF		1	
20023522	50V 0.022μF		4	
20023547	50V 0.047μF		1	
<b>CERAMIC CAPACITOR</b>				
21012322	50V 220PF	KLM-685		1
<b>ELECTROLYTIC CAPACITORS</b>				
23007310	A16V 100μF	KLM-685		1
23107310	B16V 100μF		1	
23207210	A16V 10μF		2	
23215110	A50V 1μF		1	
23315110	A50V 1μF (NON POLAR)		2	

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>DIODES</b>				
31000100	1S1555	KLM-685		3
31001500	SR1K-2		1	
<b>ZENER DIODE</b>				
31101600	RD 5.6EB1	KLM-685		1
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32001020	μPD-4013 BC	KLM-685		1
32009001	NJM-4558D-V		2	
32009017	NJM-13600D-A		1	
32021099	TL-062 SELECTED		2	
<b>P.C. BOARD WITH PARTS</b>				
34068500	KLM-685			1
34069400	KLM-694			1
<b>SEMI FIXED VR</b>				
35001410	H0651A 100KB	KLM-685		1
<b>VR</b>				
36012100	K161100T6E 100KB VM10A-C29			2
<b>SLIDE SW</b>				
37301400	SS-003			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-685		1
45001100	S-G 7713 #04		1	

23007310	A16V 100 $\mu$ F	KLM-685	1
23107310	B16V 100 $\mu$ F		2
23207210	A16V 10 $\mu$ F		1
23215110	A50V 1 $\mu$ F		1
23315110	A50V 1 $\mu$ F (NON POLAR)		2

PHONE JACKS				
45000600	S-G 7622 #06	KLM-685		1
45001100	S-G 7713 #04			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	QTY
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-685		1
<b>SPONGE</b>				
50003400	4X20X40			1
<b>RUBBER STOPPERS</b>				
50009300	NO. 1 LARGE			1
50009400	NO. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014200	LARGE			2
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	QTY
<b>FRONT COVER</b>				
64703600				1
<b>SCREWS</b>				
70060323	FE P BZMC 3X23			4
70130304	FE F ZMC 3X4			1
70460206	FE T BZMC 2X6			2
72130306	TP2G F ZMC 3X6			2
72530308	TP2G B ZMC 3X8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# OVER DRIVE OVD-1

## CONTENTS

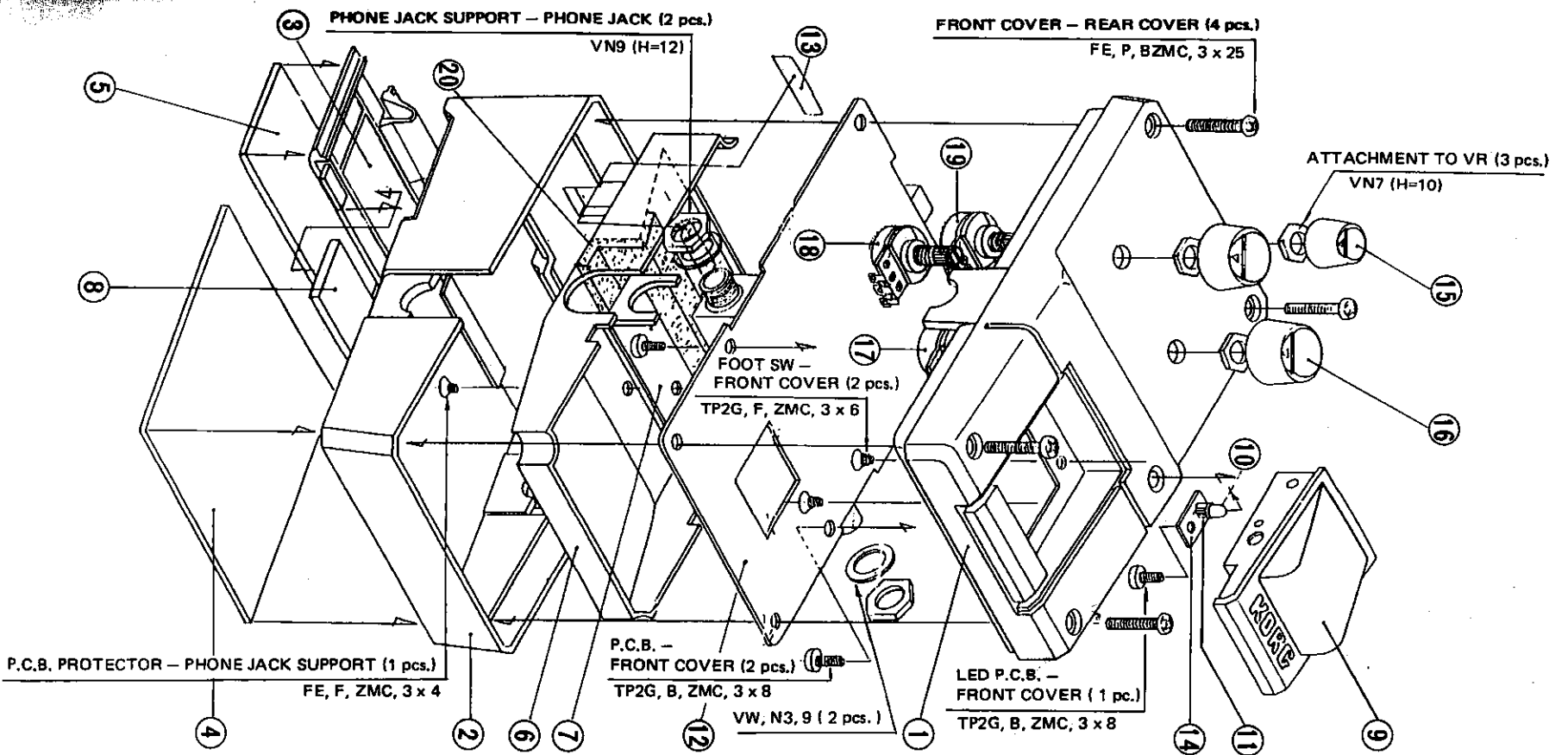
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6. PARTS LIST .....	58

## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
- Output impedance 10k $\Omega$
- Maximum output 2.5V<sub>p-p</sub> (at 250Hz) level
- TONE  $\pm$ 4dB (DRIVE 10, at 1.4kHz)
- Maximum gain 32dB (at 1kHz)
- Frequency response 20Hz ~ 20kHz  
+0/-1.5dB
- [EFFECT OFF]
- Noise level -110dBm (TONE 10, DRIVE 10, equivalent input noise, input short-circuited, IHF-A)
- Operating voltage 10 ~ 7.5V
- Power consumption 6.8mA
- Pedal switch life Over 10,000 times of switching
- Functions DRIVE, TONE, EFFECT OFF, EFFECT ON/OFF, EFFECT ON/OFF, INPUT, OUTPUT
- Power supply 006P 9V battery, DC 9V
- Dimensions 70(W) x 67(H) x 12.9(D) mm
- Weight 45.0 g (including battery)

(All values are typical.)

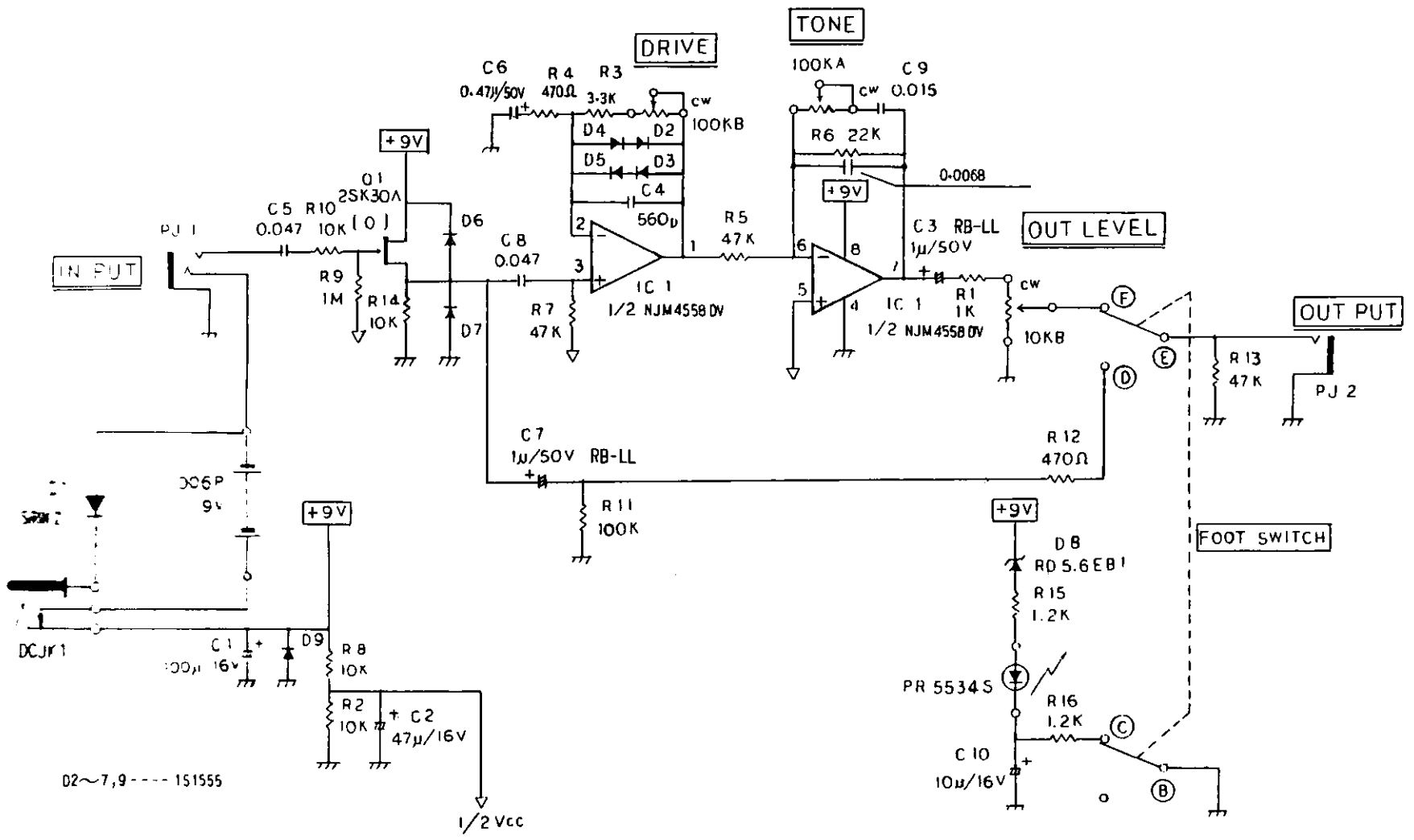
## 2. STRUCTURAL DIAGRAM



PART NO.	PART NAME	PART CODE
1	FRONT COVER	64704100
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER COVER LARGE	50009300
5	RUBBER STOPPER LARGE	50009400
6	P.C.B PROTECTOR	64607000
7	PHONE JACK SUPPORT	64030500
8	SPONGE	60003400
9	FOOT SW (KFS-2)	37507100
10	LED (PRAS2A5)	37200700
11	LED HOLDER X-TYPE No. 4	57604000
12	P.C.S (KLM-581)	34058800
13	SERIAL NUMBER SEAL	34059400
14	LED P.C.B (KLM-584)	62014300
15	EFFECT'S KNOB SMALL	62014200
16	EFFECT'S KNOB LARGE	36011600
17	VR 100K-A	36012000
18	VR 100K-B	36012100
19	BATTERY CUSHION	50004400
20		



### 3. CIRCUIT DIAGRAM



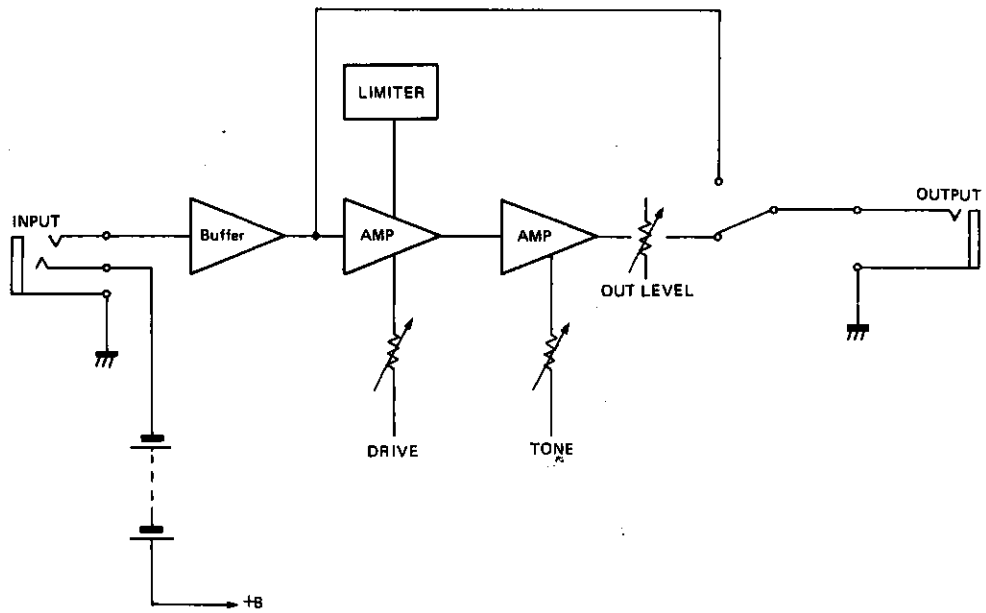
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D2~7,9----- 151555

KLM-688

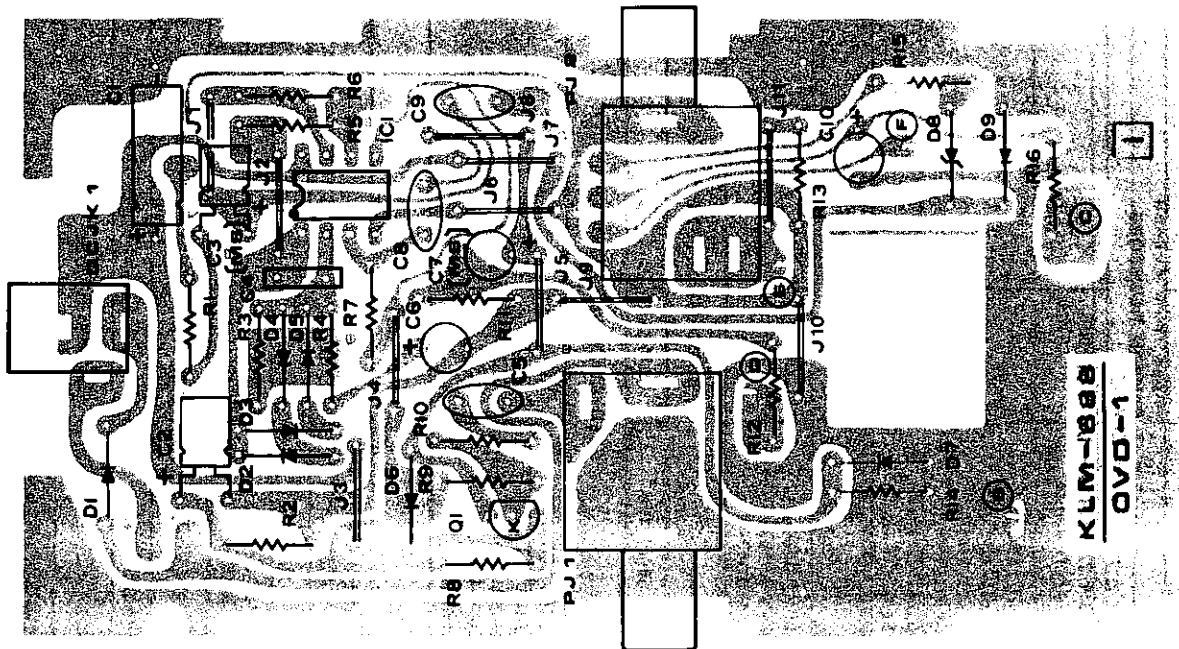
## 4. BLOCK DIAGRAM

KLM-688



## 5. P.C. BOARD

KLM-688



## 6. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10016522	1/6JY 22K	KLM-688		1
10413347	S1/4JYTP 470 Ω			2
10413410	S1/4JYTP 1K			1
10413412	S1/4JYTP 1.2K			2
10413433	S1/4JYTP 3.3K			1
10413510	S1/4JYTP 10K			4
10413547	S1/4JYTP 47K			3
10413610	S1/4JYTP 100K			1
10413710	S1/4JYTP 1M			1
<b>MYLAR CAPACITORS</b>				
20023468	50V 0.0068μF	KLM-688		1
20402515	50V 0.015μF			1
20402547	50V 0.047μF			2
<b>CERAMIC CAPACITOR</b>				
21453560	50V 560PF TP	KLM-688		1
<b>ELECTROLYTIC CAPACITORS</b>				
23107310	B16V 100μF	KLM-688		1
23315047	A50V 0.47μF			1
23315110	A50V 1μF			2
25003210	16V 10μF			1
25043247	16V 47μF			1
<b>FET</b>				
30460010	2SK30A TM-O	KLM-688		1
<b>DIODES</b>				
31001500	SR1K-2	KLM-688		1
31400100	1S1555			7
<b>LED</b>				
31200700	PR-5534S			1
<b>ZENER DIODE</b>				
31420300	RD-5.6EB-TN-B1	KLM-688		1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>IC</b>				
32009001	NJM-4558D-V	KLM-688		1
<b>P.C. BOARD WITH PARTS</b>				
34068800	KLM-688			1
34069400	KLM-694			1
<b>VRs</b>				
36011600	K161100T6E 100KA			1
36012000	K161100T6E 10KB VM10A-C29E			1
36012100	K161100T6E 100KB VM10A-C29			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-688		1
45001100	S-G 7713 #04			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-688		1
<b>SPONGE</b>				
50003400	4x20x40			1
<b>BATTERY CUSHION</b>				
50004400				1
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1

ZENER DIODE			
31420300	RD-5.6EB-TN-B1	KLM-688	1

50009400	No. 2 SMALL		1
BATTERY			
52000400	006PUE 9V		1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No. 4 5.8MM			1
<b>EFFECTS KNOBS</b>				
62014200	LARGE			2
62014300	SMALL			1
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64704100				1
<b>SCREWS</b>				
70060323	FE P BZMC 3x23			4
70130304	FE F ZMC 3x4			1
72130306	TP2G F ZMC 3x6			2
72530308	TP2G B ZMC 3x8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# PARAMETRIC EQ PEQ-1

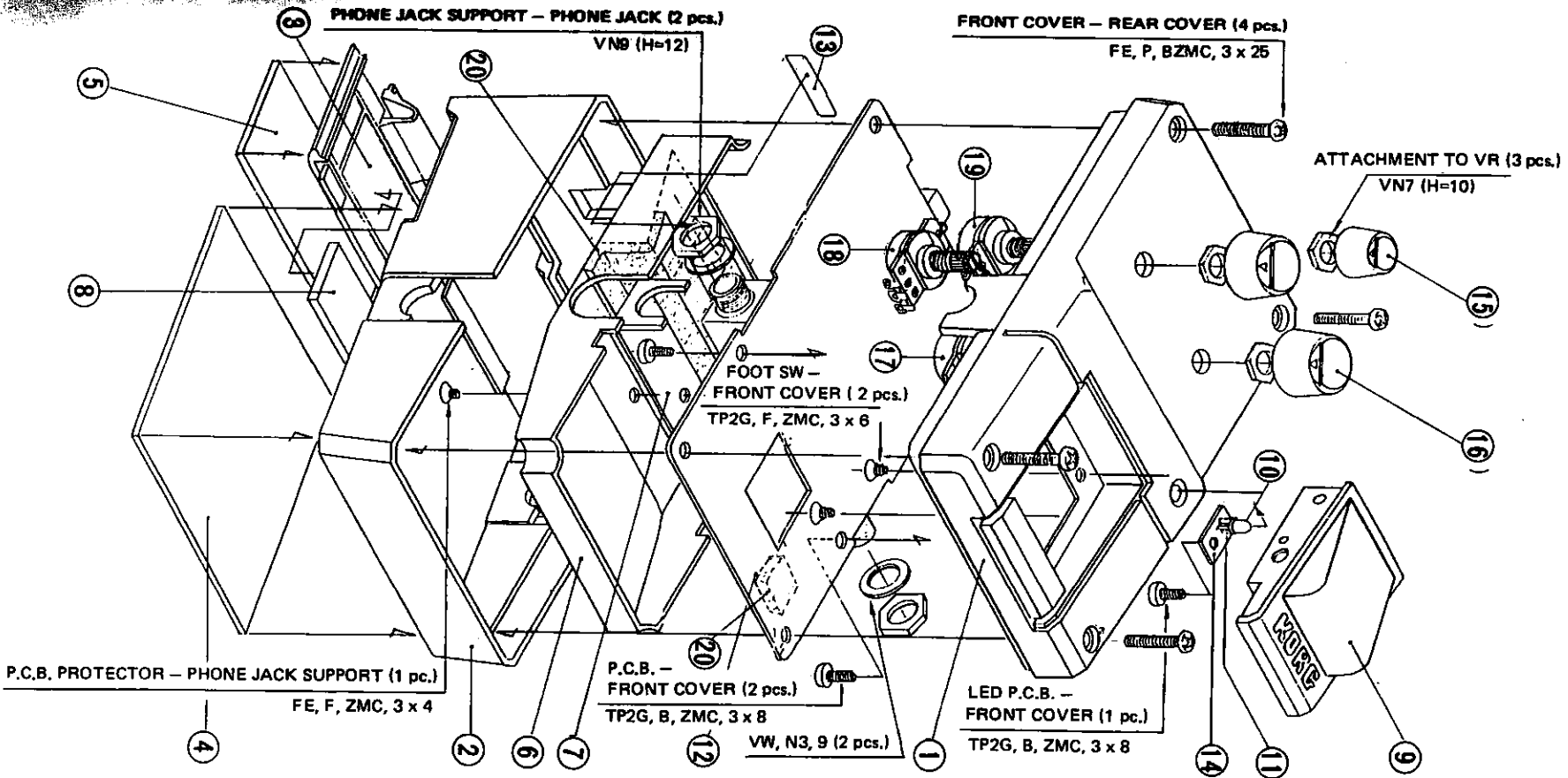
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## 1. SPECIFICATIONS

- |                        |   |                |  |
|------------------------|---|----------------|--|
| ● Input impedance      | 1M $\Omega$   | ● Functions    | FREQUENCY, GAIN, BAND WIDTH, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT |
| ● Output impedance     | 20k $\Omega$  | ● Power supply | 006P 9V battery /DC jack   |
| ● Maximum input level  | 0dBm (GAIN 0, at 250Hz)   | ● Dimensions   | 70(W) x 67(H) x 129(D) mm  |
| ● Maximum output level | +6dBm (GAIN +5, FREQUENCY ADJ, at 250Hz)                              | ● Weight       | 460 g (including battery)  |
| ● Gain control         | $\pm 18$ dB (BAND WIDTH 0, FREQUENCY ADJ, -30dBm input, at 1kHz)      |                |  |
| ● Frequency control    | 100Hz ~ 3.8kHz (BAND WIDTH 10, GAIN +5, -30dBm input)                 |                |  |
| ● BAND WIDTH           | 7 ~ 1.5 octaves (GAIN +5, +3dB point width)                           |                |  |
| ● Frequency response   | 20Hz ~ 20kHz<br>+0/-1.5dB   |                |  |
| ● Noise level          | -86dBm (GAIN 0, input short-circuited, equivalent input noise, 1HF-A) |                |  |
| ● Operating voltage    | 10 ~ 7.5V   |                |  |
| ● Power consumption    | 15mA  |                |  |
| ● Pedal switch life    | Over 10,000 times of switching  |                |  |
- (All values are typical.)

## 2. STRUCTURAL DIAGRAM

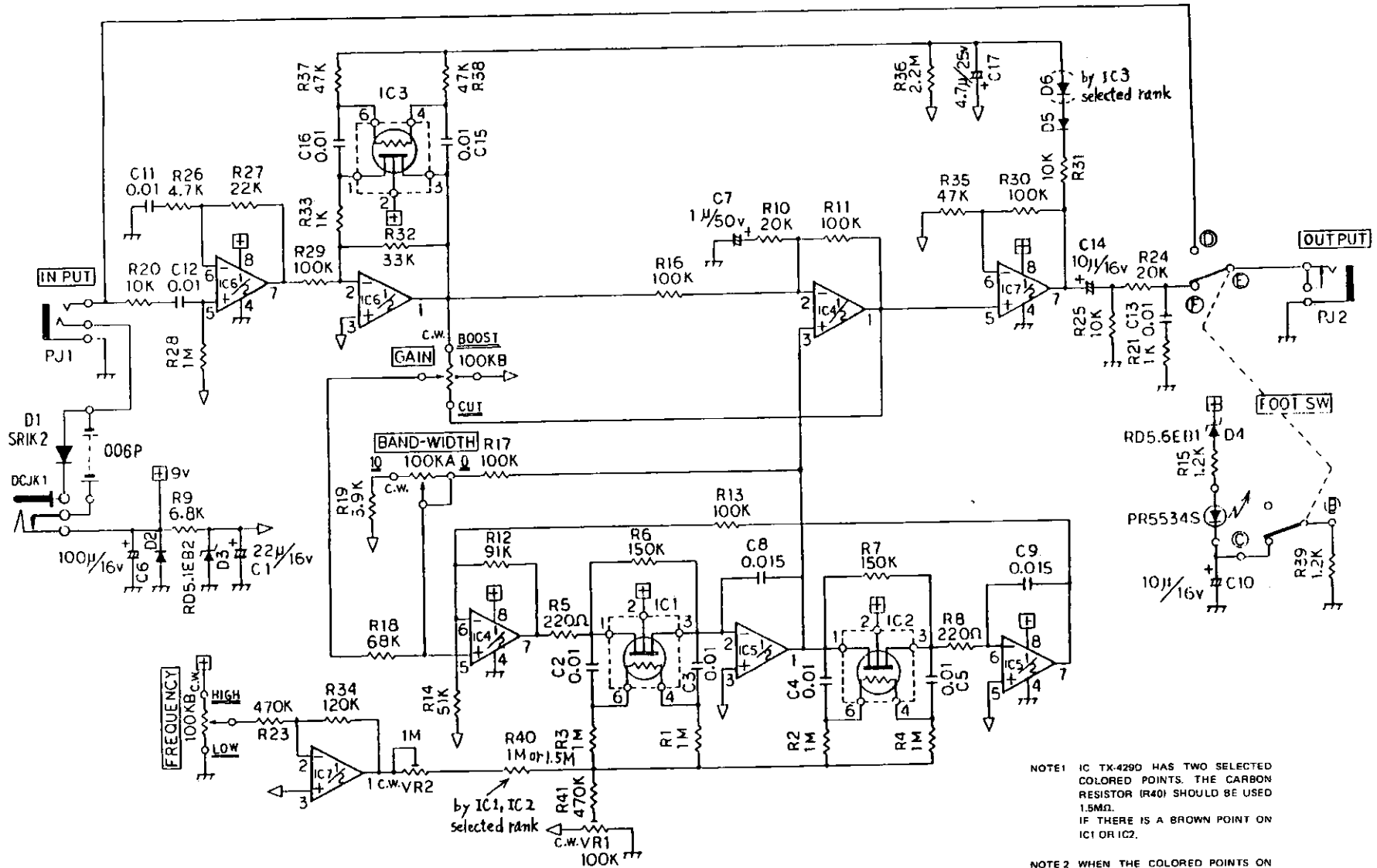


PART NO.	PART NAME	PART CODE
1	FRONT COVER	64703800
2	REAR COVER	64703100
3	BATTERY COVER	64703200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B PROTECTOR	64807000
7	PHONE JACK SUPPORT	64803600
8	SPONGE	50003400
9	FOOT SW (KFS2)	37807100
10	LED	31200700
11	LED HOLDER X-TYPE	57504000
12	P.C. BOARD (KLM692)	34069200
13	SERIAL NUMBER SEAL	34069400
14	P.C. BOARD (KLM694)	62014300
15	EFFECTS KNOB SMALL	64014200
16	EFFECTS KNOB LARGE	36017100
17	VR 100K6	36012600
18	VR 100K8	36011600
19	VR 100KA	50004400
20	BATTERY CUSHION	

ND WIDTH,  
FOOT SW,  
mm

3. CIRCUIT DIAGRAM

KLM-692



IC1, 2, 3 : TX-429D (selected)  
 IC4, 5, 6, 7 : NJM4558DV

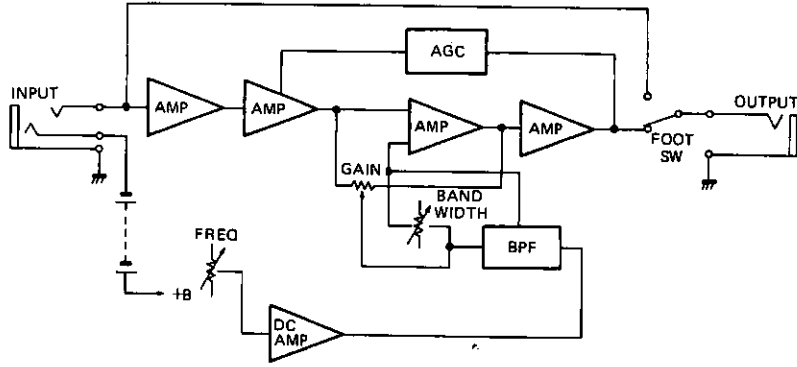
DI. 5, 6 : 1S1555

NOTE 1 IC TX-429D HAS TWO SELECTED COLORED POINTS. THE CARBON RESISTOR (R40) SHOULD BE USED 1.5MΩ. IF THERE IS A BROWN POINT ON IC1 OR IC2.

NOTE 2 WHEN THE COLORED POINTS ON THE IC3 ARE ORANGE/BROWN OR GREEN/BROWN OR BLUE/BROWN, THE DIODE (D6) WOULD BE USED.

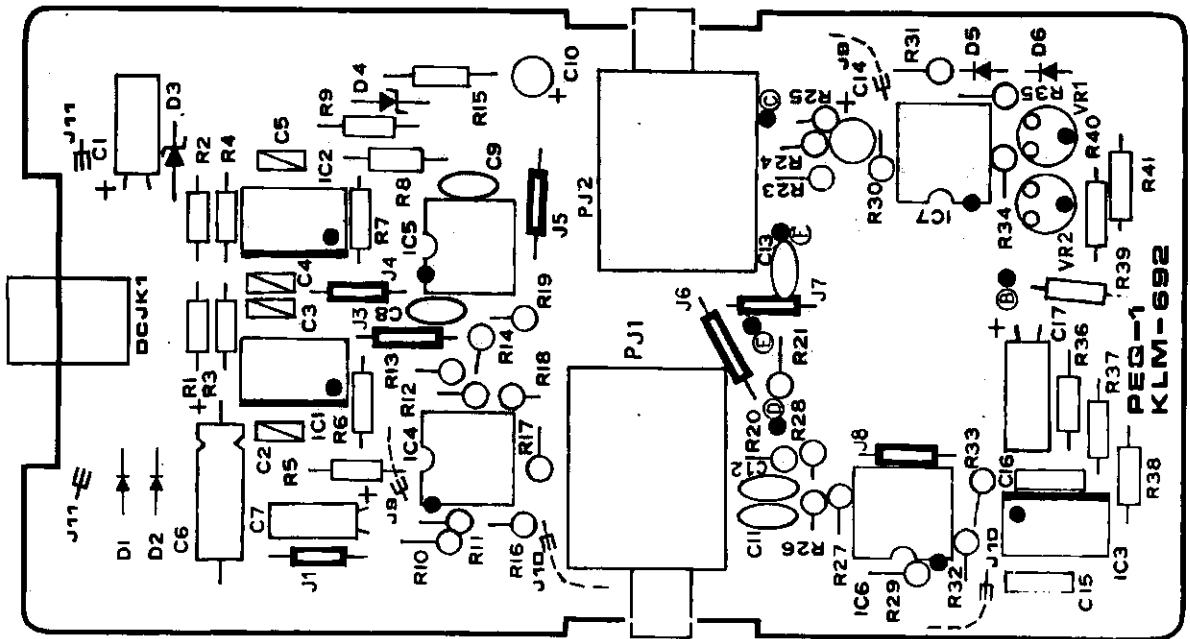
# 4. BLOCK DIAGRAM

KLM-692



# 5. P.C. BOARD

KLM-692



NOTE: WHEN THE VALUES GIVEN IN THE IC3 ARE ORANGE/BROWN OR GREEN/BROWN OR BLUE/BROWN, THE DIODE (D6) WOULD BE USED.

IC1, 2, 3 : TX-429D (selected)  
 IC4, 5, 6, 7 : NJM4558DV  
 D2, 5, 6 : 1S1555

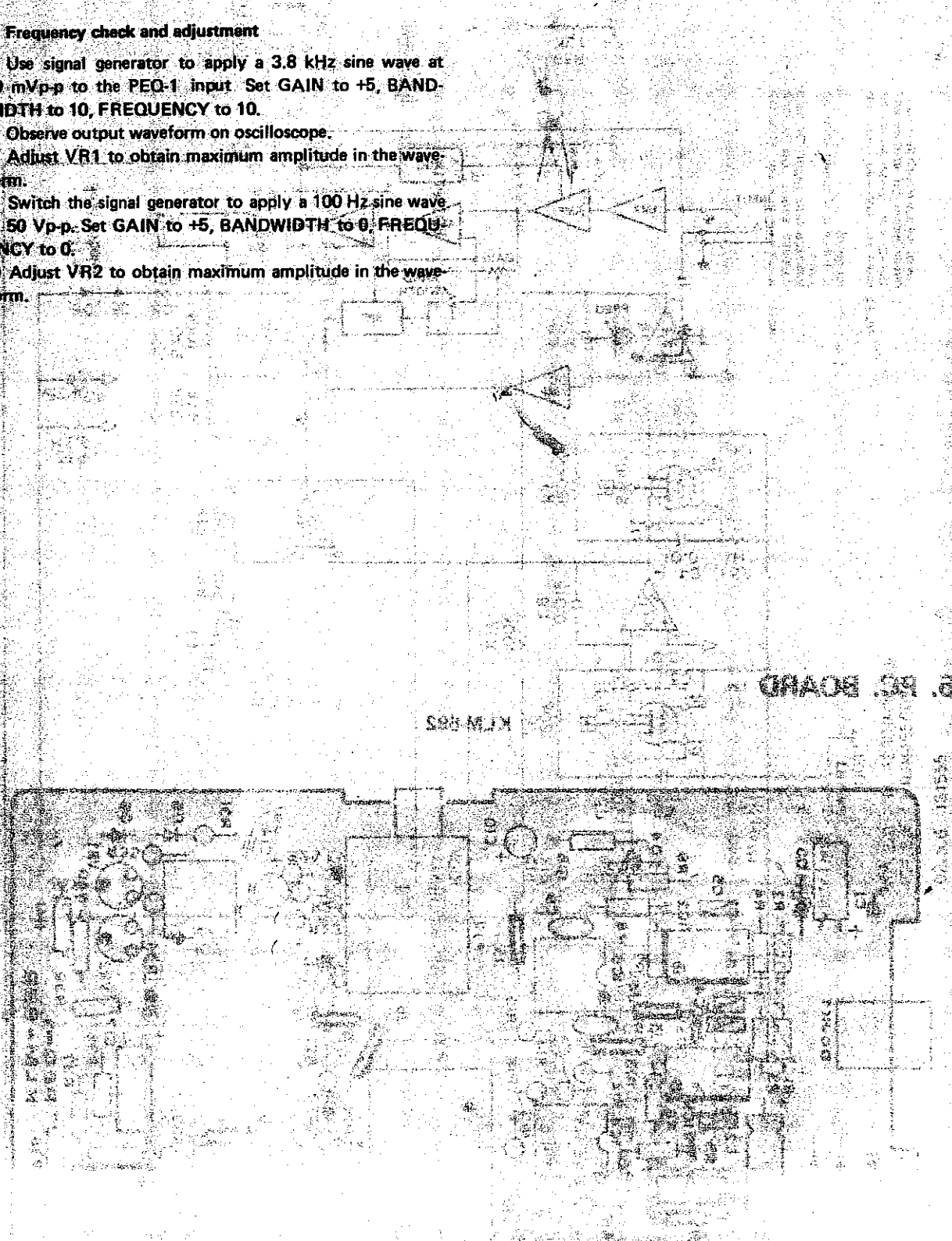


## 6. ADJUSTMENT PROCEDURE

BLOCK DIAGRAM

### 1. Frequency check and adjustment

- 1) Use signal generator to apply a 3.8 kHz sine wave at 50 mVp-p to the PEQ-1 input. Set GAIN to +5, BANDWIDTH to 10, FREQUENCY to 10.
- 2) Observe output waveform on oscilloscope.
- 3) Adjust VR1 to obtain maximum amplitude in the waveform.
- 4) Switch the signal generator to apply a 100 Hz sine wave at 50 Vp-p. Set GAIN to +5, BANDWIDTH to 0, FREQUENCY to 0.
- 5) Adjust VR2 to obtain maximum amplitude in the waveform.



## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-692		8
10013322	S1/4JY 220 Ω			2
10013412	S1/4JY 1.2K			2
10013468	S1/4JY 6.8K			1
10013547	S1/4JY 47K			2
10013615	S1/4JY 150K			2
10013647	S1/4JY 470K			1
10013710	S1/4JY 1M			4(5)
10013715	S1/4JY 1.5M			1(0)
10013722	S1/4JY 2.2M			1
10113410	S1/4JT 1K			2
10113439	S1/4JT 3.9K			1
10113447	S1/4JT 4.7K			1
10113510	S1/4JT 10K			3
10113520	S1/4JT 20K			2
10113522	S1/4JT 22K			1
10113533	S1/4JT 33K			1
10113547	S1/4JT 47K			1
10113551	S1/4JT 51K			1
10113568	S1/4JT 68K			1
10113591	S1/4JT 91K		1	
10113610	S1/4JT 100K		6	
10113612	S1/4JT 120K		1	
10113647	S1/4JT 470K		1	
10113710	S1/4JT 1M		1	
<b>MYLAR CAPACITORS</b>				
20023510	50V 0.01μF	KLM-692		3
20023515	50V 0.015μF			2
<b>CERAMIC CAPACITORS</b>				
21289510	50V 0.01μF	KLM-692		2
21612510	C50V 10000PF			4
<b>ELECTROLYTIC CAPACITORS</b>				
23007222	A16V 22μF	KLM-692		1
23107310	B16V 100μF			1
23207210	A16V 10μF			2
23211147	A25V 4.7μF			1
23215110	A50V 1μF			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>DIODES</b>				
31000100	1S1555	KLM-692		2(3)
31001500	SR1K-2			1
<b>ZENER DIODES</b>				
31101300	RD 5.1EB2	KLM-692		1
31101600	RD 5.6EB1			1
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32009001	NJM-4558D-V	KLM-692		4
32010098	TX-429D SELECTED (GREEN OR BLUE POINT)			1
32010099	TX-429D SELECTED (SAME COLOR)			2
<b>P.C. BOARD WITH PARTS</b>				
34069200	KLM-692			1
34069400	KLM-694			1
<b>SEMI FIXED VRs</b>				
35001410	H0651A 100KB	KLM-692		1
35001510	H0651A 1MB			1
<b>VRs</b>				
36011600	K161100T6E 100KA			1
36012100	K161100T6E 100KB VM10A-C29			1
36012600	VM10E-100KB			1
<b>FOOT SW</b>				
37507100	KFS-2			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-692		1
45001100	S-G 7713 #04			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-692		1
<b>SPONGE</b>				
50003400	4 x 20 x 40			1
<b>BATTERY CUSHION</b>				
50004400				1.07
<b>RUBBER STOPPERS</b>				
50009300	No. 1 LARGE			1
50009400	No. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014200	LARGE			2
62014300	SMALL			1
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64703800				1
<b>SCREWS</b>				
70060323	FE P ZMBC 3 x 23			4
70130304	FE F ZMC 3 x 4			1
72130306	TP2G F ZMC 3 x 6			2
72530308	TP2G B ZMC 3 x 8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# PHASER PHS-1

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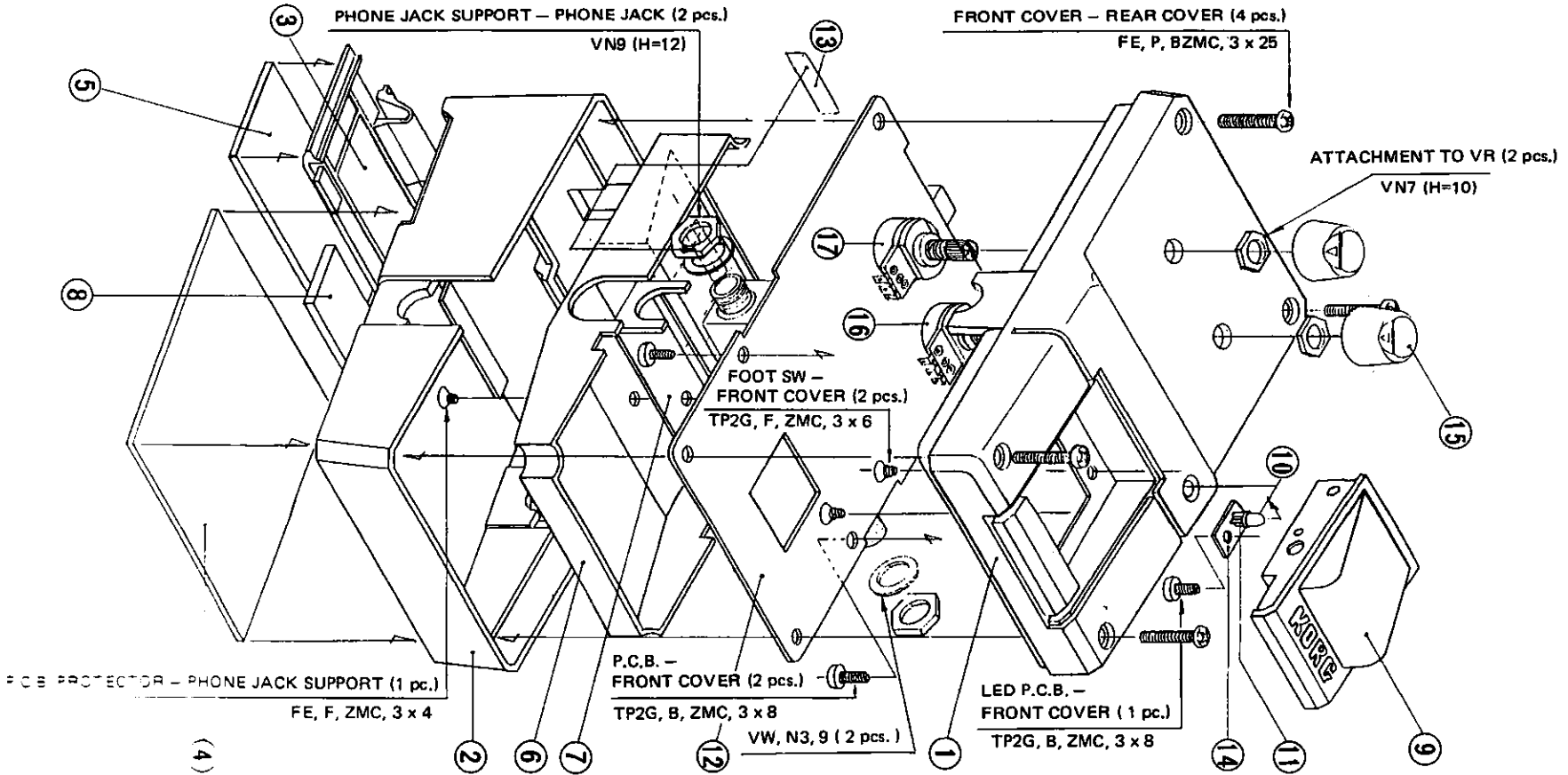
## 1. SPECIFICATIONS

- Input impedance 1M $\Omega$
  - Output impedance 1k $\Omega$
  - Maximum input level 0dBm (at 250Hz)
  - Maximum output level +5dBm (at 250Hz)
  - Phase shift 720 $^{\circ}$
  - Modulation speed 0.2Hz ~ 10Hz
  - Frequency response 20Hz ~ 20kHz  
+0/-1.5dB
  - Residual noise level [EFFECT OFF] -100dBm (input short-circuited, IHF-A)
  - Operating voltage 10 ~ 7.5V
  - Power consumption 12.5mA
  - Pedal switch life Over 10,000 times of switching
  - Functions SPEED, INTENSITY, EFFECT ON/OFF LED, FOOT SW, INPUT, OUTPUT
  - Power supply 006P 9V battery/DC jack
  - Dimensions 70(W) x 64.5(H) x 129(D) mm
  - Weight 450 g (including battery)
- (All values are typical.)

P.C.B PROTECTOR

64607000

## 2. STRUCTURAL DIAGRAM

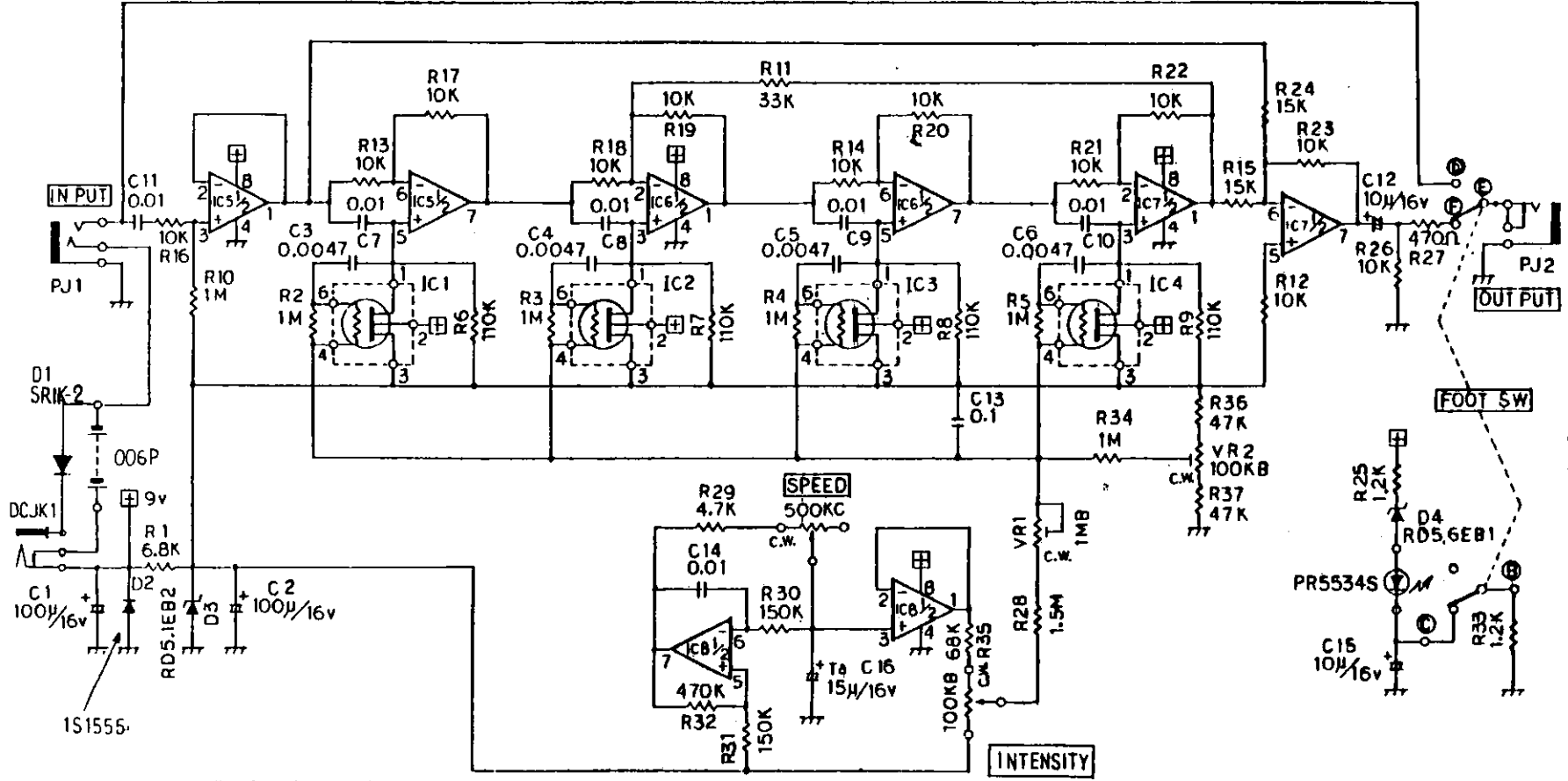


PART NO	PART NAME	PART CODE
1	FRONT COVER	64703000
2	HEAR COVER	64703100
3	BATTERY COVER	64703200
4	HUBBER STOPPER LARGE	50009300
5	HUBBER STOPPER SMALL	50009400
6	P.C.B. PROTECTOR	64607000
7	PHONE JACK SUPPORT	64030500
8	SPONGE	50005400
9	FOOT SW (KES-2)	31200700
10	LED (PR 554S)	64030600
11	LED HOLDER X-TYPE No. 4	87504000
12	P.C.B. (KLM-92)	34068200
13	SERIAL NUMBER SEAL	34068400
14	LED P.C.B. (KLM-694)	62014200
15	EFFECTS KNOB LARGE	36012400
16	VR 500KC	36012100
17	VR 100KB	36012100

PART CODE	QTY	DESCRIPTION
6A703000	1	6A703000
6A703100	1	6A703100
6A703200	1	6A703200
50069300	1	50069300
50069400	1	50069400
6A607000	1	6A607000
50030500	1	50030500
50030400	1	50030400
37507100	1	37507100
31200700	1	31200700
57504000	1	57504000
3A068200	1	3A068200
3A068400	1	3A068400
52014200	1	52014200
36012400	1	36012400
36012100	1	36012100

### 3. CIRCUIT DIAGRAM

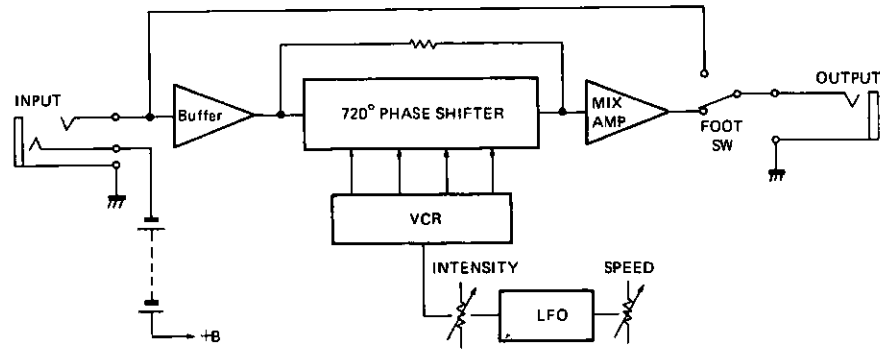
KLM-682



- IC 1, 2, 3, 4: TX-429D (selected)
- IC 5, 6, 7: NJM4558DV
- IC 8: TL062

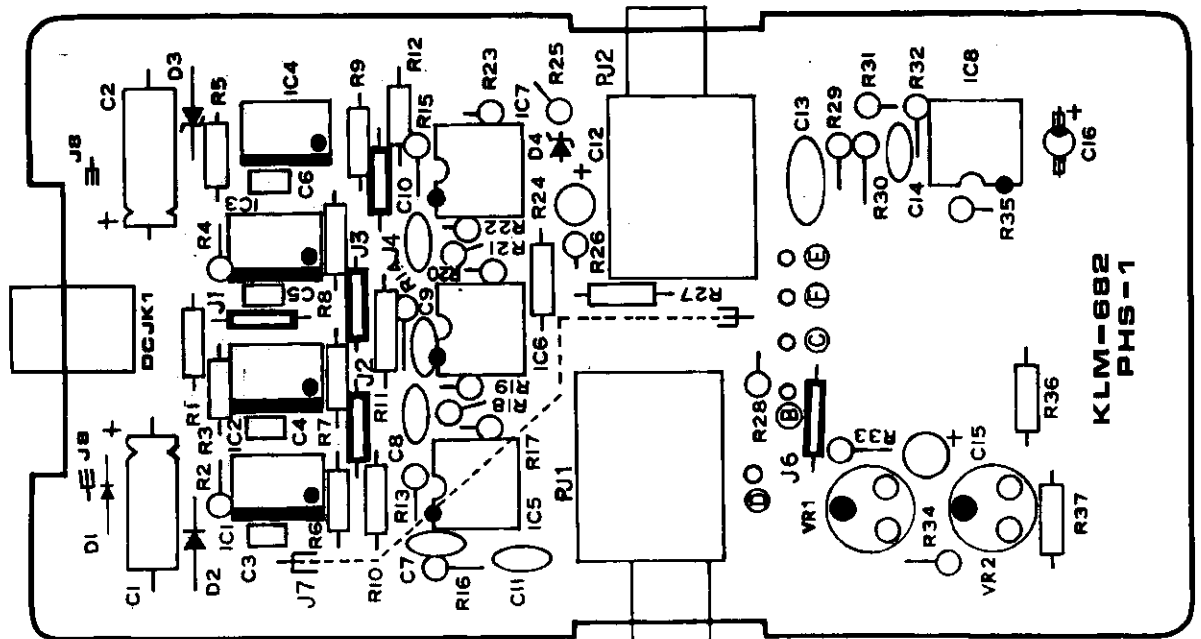
## 4. BLOCK DIAGRAM

KLM-682



## 5. P.C. BOARD

KLM-682



## 6. ADJUSTMENT PROCEDURE

### 1. Phase check and adjustment

- 1) Apply signal generator signal (1 kHz, square wave 1Vp-p) to PHS-1 input. Set SPEED to 0, INTENSITY to 8.
- 2) Connect an oscilloscope to the output jack and confirm the Figure 7 waveform.

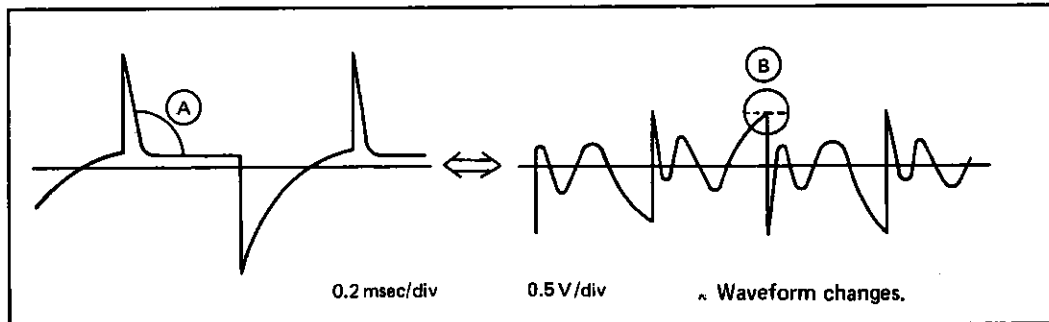


Fig-7

3) If necessary, adjust VR1 (depth) and/or VR2 (phase balance). Refer to Figure 7.

(A) Adjust so that the angle here is 90 degrees.

(B) Adjust so that the tangent (indicated by the broken line) to the end of the curve within the circle will be parallel to the horizontal axis.



## 7. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-682		6
10013347	S1/4JY 470 Ω		1	
10013468	S1/4JY 6.8K		1	
10013510	S1/4JY 10K		1	
10013515	S1/4JY 15K		1	
10013533	S1/4JY 33K		1	
10013547	S1/4JY 47K		2	
10013611	S1/4JY 110K		4	
10013710	S1/4JY 1M		3	
10113412	S1/4JT 1.2K		2	
10113447	S1/4JT 4.7K		1	
10113510	S1/4JT 10K		11	
10113515	S1/4JT 15K		1	
10113568	S1/4JT 68K		1	
10113615	S1/4JT 150K		2	
10113647	S1/4JT 470K		1	
10113710	S1/4JT 1M		3	
10113715	S1/4JT 1.5M	1		
<b>MYLAR CAPACITORS</b>				
20023510	50V 0.01μF	KLM-682		6
20023610	50V 0.1μF		1	
<b>CERAMIC CAPACITOR</b>				
21612447	50V 4700PF	KLM-682		4
<b>TANTALUM CAPACITOR</b>				
22007215	16V 15μFK	KLM-682		1
<b>ELECTROLYTIC CAPACITORS</b>				
23107310	B16V 100μF	KLM-682		2
23207210	A16V 10μF		2	
<b>DIODES</b>				
31000100	1S1555	KLM-682		1
31001500	SR1K-2		1	

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>ZENER DIODES</b>				
31101300	RD 5.1EB2	KLM-682		1
31101600	RD 5.6EB1		1	
<b>LED</b>				
31200700	PR-5534S			1
<b>ICs</b>				
32009001	NJM-4558D-V	KLM-682		3
32010099	TX-429D SELECTED (SAME COLOR POINTS)		4	
32021022	TL-062		1	
<b>P.C. BOARD WITH PARTS</b>				
34068200	KLM-682			1
34069400	KLM-694			1
<b>SEMI FIXED VRs</b>				
35201410	H1051A 100KB	KLM-682		1
35201510	H1051A 1MB		1	
<b>VRs</b>				
36012100	K161100T6E			1
36012400	100KB VM10A-C29			
	K161100T6E 500KC VM10A-C29		1	
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-682		1
45001100	S-G 7713 #04		1	
<b>POWER JACK</b>				
45400300	HEC-0470-01-230	KLM-682		1

45400300	HEC-0470-01-230	KLM-682	1
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PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SPONGE</b>				
50003400	4X20X40			1
<b>RUBBER STOPPERS</b>				
50009300	NO. 1 LARGE			1
50009400	NO. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE No.4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014200	LARGE			2
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>FRONT COVER</b>				
64703000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SCREWS</b>				
70060323	FE P BZMC 3X23			4
70130304	FE F ZMC 3X4			1
72130306	TP2G F ZMC 3X6			2
72530308	TP2G B ZMC 3X8			3
<b>NUT</b>				
77310900	VN N-3 9			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9x14x0.			2

# tone booster TNB-1

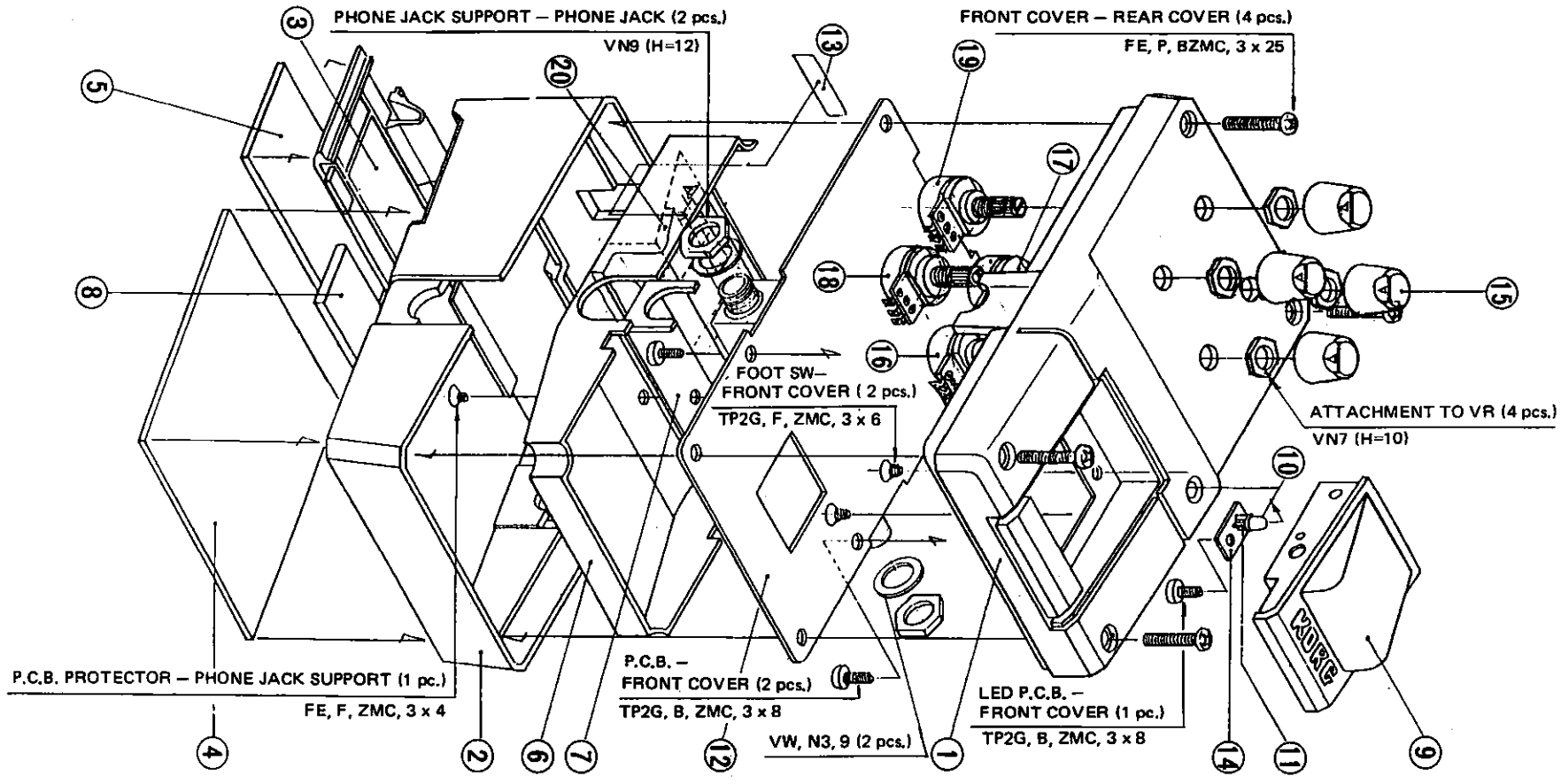
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6. PARTS LIST .....	78

## 1. SPECIFICATIONS

● Input impedance	1M $\Omega$	● Power supply	006P 9V battery/DC jack
● Output impedance	10k $\Omega$	● Dimensions	70(W) x 68(H) x 129(D) mm
● Maximum input level	+6dBm (GAIN MIN, at 250Hz)	● Weight	460 g (including battery)
● Maximum output level	+6dBm (GAIN MIN, at 250Hz)		(All values are typical.)
● GAIN CONTROL	41dB		
● TONE CONTROL	TREBLE +5/-7dB at 2kHz BASS +5/-8dB at 100Hz		
● Frequency response	20Hz ~ 20kHz +0/-1.5dB		
● Noise level	[EFFECT OFF] -103dBm (GAIN MAX, BASS 5, TREBLE 5, equivalent input noise, input short-circuited, IHF-A)		
● Operating voltage	10V ~ 7.5V		
● Power consumption	5mA		
● Pedal switch life	Over 10,000 times switching		
● Functions	GAIN, TREBLE, BASS, OUT LEVEL, EFFECT ON/OFF, LED, FOOT SW, INPUT, OUTPUT		

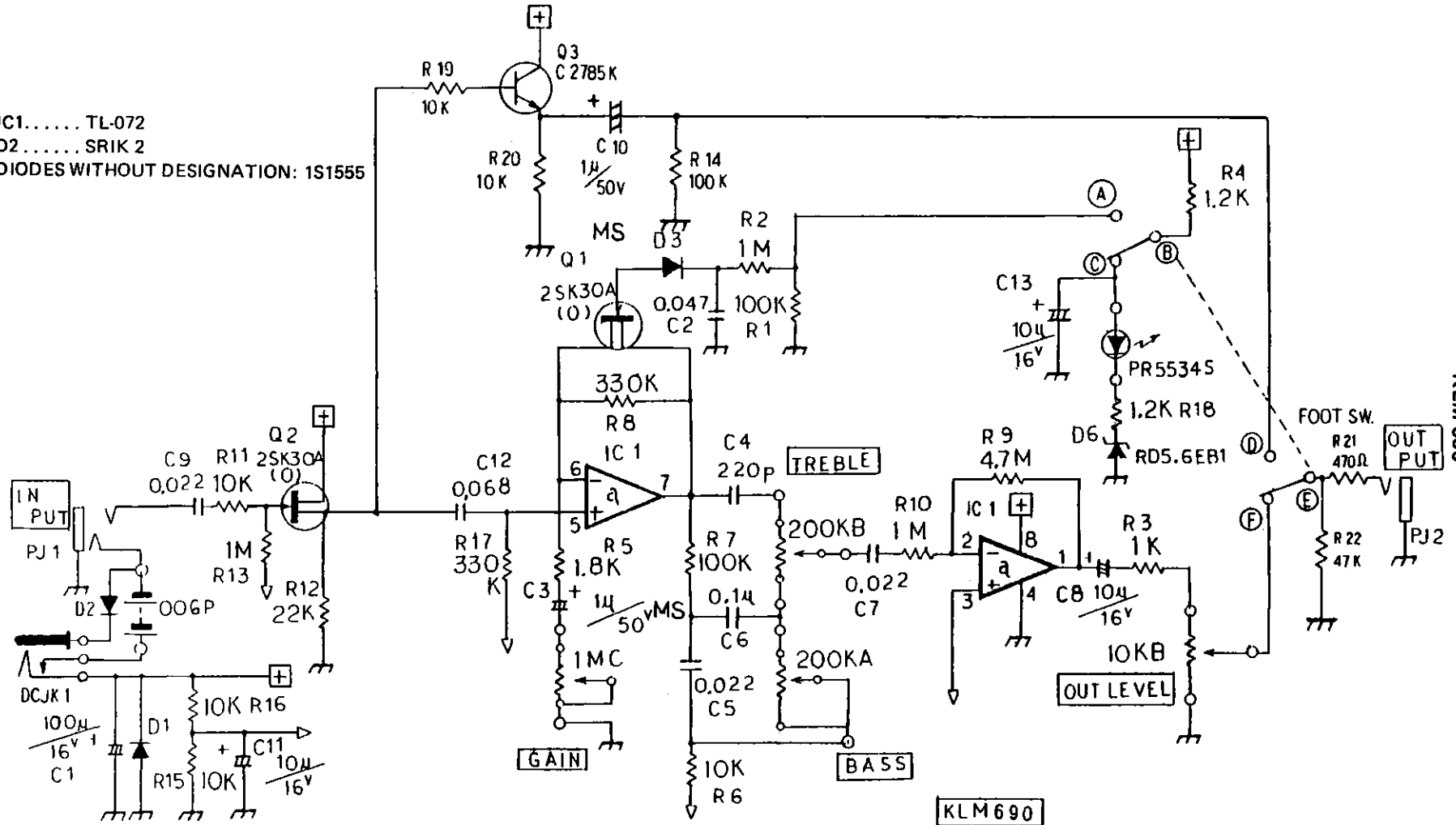
## 2. STRUCTURAL DIAGRAM



PART NO.	PART NAME	PART CODE
1	FRONT COVER	64704000
2	REAR COVER	64721100
3	BATTERY COVER	64723200
4	RUBBER STOPPER LARGE	50009300
5	RUBBER STOPPER SMALL	50009400
6	P.C.B. PROTECTOR	64697900
7	PHONE JACK SUPPORT	64032800
8	SPRING	50009400
9	FOOT SW (KFS-2)	37507100
10	LED	31200700
11	LED HOLDER	57504000
12	P.C. BOARD (KLM-890)	34069000
13	SERIAL NUMBER SEAL	34069400
14	P.C. BOARD (KLM-891)	62014300
15	EFFECT KNOB SMALL	38012500
16	VR 1MC	38012200
17	VR 200KB	38012000
18	VR 10KB	38011900
19	VR 200KA	50009400
20	BATTERY CUSHION	50009400

### 3. CIRCUIT DIAGRAM

IC1..... TL-072  
 D2..... SRIK 2  
 DIODES WITHOUT DESIGNATION: 1S1555



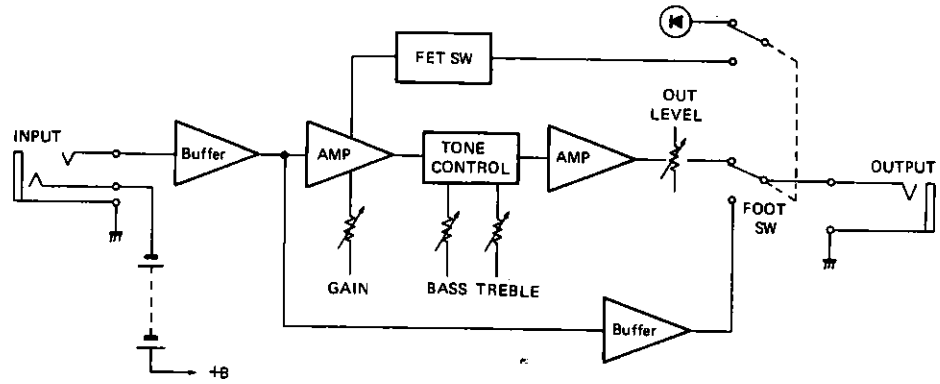
-76-

KLM-690

KLM690

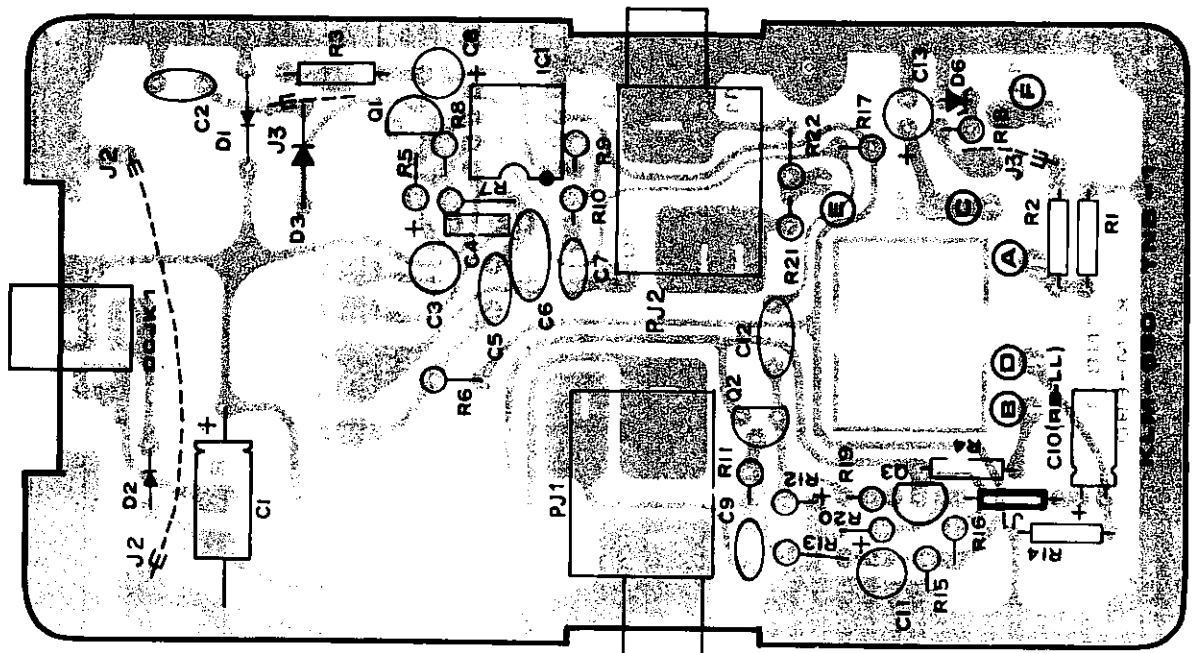
## 4. BLOCK DIAGRAM

KLM-690



## 5. P.C. BOARD

KLM-690



## 6. PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y 0 Ω	KLM-690		1
10013410	S1/4JY 1K			1
10013412	S1/4JY 1.2K			1
10013610	S1/4JY 100K			2
10013710	S1/4JY 1M			1
10113347	S1/4JT 390 Ω			1
10113412	S1/4JT 1.2K			1
10113418	S1/4JT 1.8K			1
10113510	S1/4JT 10K			6
10113522	S1/4JT 22K			1
10113547	S1/4JT 47K			1
10113610	S1/4JT 100K			1
10113633	S1/4JT 330K			2
10113710	S1/4JT 1M			2
10113747	S1/4JT 4.7M			1
<b>MYLAR CAPACITORS</b>				
20023522	50V 0.022μF			3
20023547	50V 0.047μF			1
20023568	50V 0.068μF			1
20023610	50V 0.1μF			1
<b>CERAMIC CAPACITOR</b>				
21012322	50V 220PF			1
<b>ELECTROLYTIC CAPACITORS</b>				
23107310	B16V 100μF			1
23207210	A16V 10μF			3
23315110	A50V 1μF			2
<b>TRANSISTOR</b>				
30202211	TR 2SC2785 K			1
<b>FET</b>				
30600115	2SK 30A TM-O			2
<b>DIODES</b>				
31000100	1S1555			2
31001500	SR1K-2			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>ZENER DIODE</b>				
31101600	RD 5.6EB1			1
<b>LED</b>				
31200700	PR-5534S			1
<b>IC</b>				
32021011	TL-072	KLM-690		1
<b>P.C. BOARD WITH PARTS</b>				
34069000	KLM-690			1
34069400	KLM-694			1
<b>VRs</b>				
36011900	VR K161100T6E 200KA VM10A-C29			1
36012000	VR K161100T6E 10KB VM10A-C29E			1
36012200	VR K161100T6E 200KB VM10A-C29 <sup>7</sup>			1
36012500	VR K161100T6E 1MC VM10A-C29E			1
<b>FOOT SW</b>				
37507100	KFS-2			1
<b>PHONE JACKS</b>				
45000600	S-G 7622 #06	KLM-690		1
45001100	S-G 7713 #04			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230			1
<b>SPONGE</b>				
50003400	4X20X40			1

DIODES				
PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
31000100	1S1555			2
31001500	SR1K-2			1

50003400	4X20X40			1
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PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>BATTERY CUSHION</b>				
50004400				1
<b>RUBBER STOPPERS</b>				
50009300	NO. 1 LARGE			1
50009400	NO. 2 SMALL			1
<b>BATTERY</b>				
52000400	006PUE 9V			1
<b>BATTERY SNAP</b>				
54005100	I-TYPE 80MM			1
<b>LED HOLDER</b>				
57504000	X-TYPE NO. 4 5.8MM			1
<b>EFFECTS KNOB</b>				
62014300	SMALL			4
<b>PHONE JACK SUPPORT</b>				
64030500				1
<b>P.C.B PROTECTOR</b>				
64607000				1
<b>REAR COVER</b>				
64703100				1
<b>BATTERY COVER</b>				
64703200				1
<b>FRONT COVER</b>				
64704000				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>SCREWS</b>				
70060323	FE P BZMC 3X23			4
70130304	FE F ZMC 3X4			1
72130306	TP2G F ZMC 3X6			2
72530308	TP2G B ZMC 3X8			3
<b>NUT</b>				
77310900	VN N-39			2
<b>PHONE JACK WASHER</b>				
79040914	N-3 9X14X0.			2



**MEMO**

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