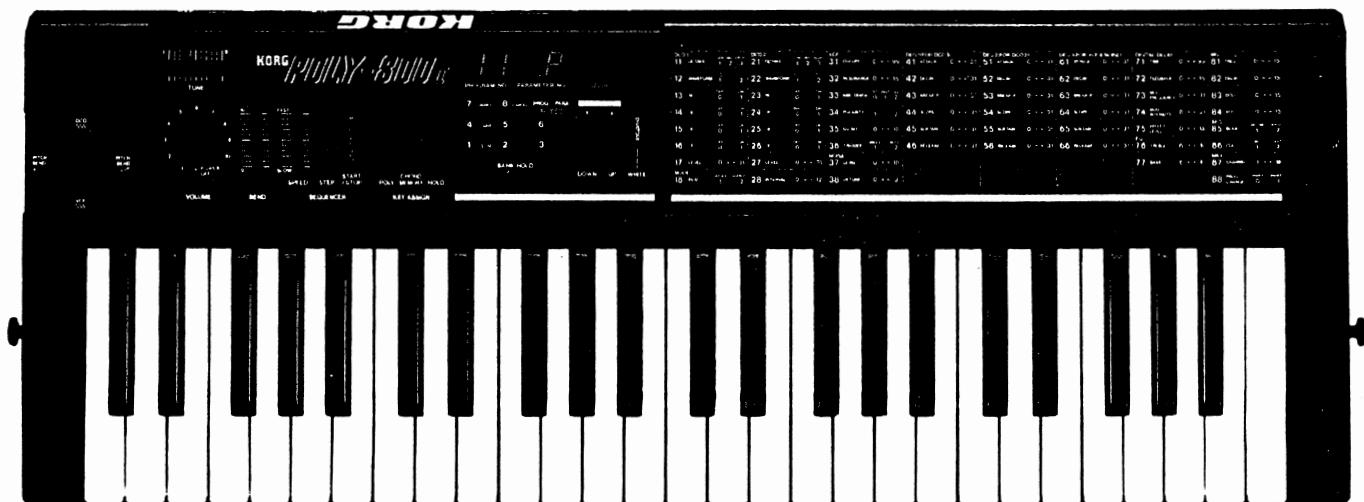


PROGRAMMABLE POLYPHONIC SYNTHESIZER

# POLY-800 II

## SERVICE MANUAL



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**KORG®**

# 1 TECHNICAL SPECIFICATIONS

## 1. KEY

C-C 49 Keys

## 2. MASTER OSC

After power ON

Variation after 0~10 min.: within ±5 cents

Variation after 10 min.~1 hr.: within ±5 cents

Temperature characteristics 0~40°C within ±10 cents

## 3. MASTER TUNE

# MAX +40~70 cents  
bMAX -40~70 cents

## 4. DCO

OCTAVE: LOW, MID, HIGH

WAVE FORM:

LEVEL: 0~31 32 steps

DCO 2 INTERVAL: 0~12 half-steps 13 steps

DETUNE: 0~3

0, 6.5, 13, 26 cents 4 steps

## 5. VCF

24 dB/OCT LPF

CUT OFF: 0~99 half-steps 100 steps

RESONANCE: 0~15 (Q=0~10) 16 steps

KBD TRACK: 0, 50, 100%

POLARITY:

EG INT: 0~15 16 steps

CUT OFF = 0~±10 OCT (±20%)

TRIGGER: SINGLE/MULTI

## 6. NOISE

0~15 16 steps

## 7. EG

0~31 32 steps

## 8. MG

0~15 16 steps

## 9. DCO MOD

BEND : 0~±730 cents (±30 cents)

MG : 0~±160 cents (±40 cents)

MG (JOYSTICK): 0~±160 cents (±40 cents)

## 10. VCF MOD

MG: 0~±10 2/3 OCT (±10%)

MG (JOYSTICK): 0~±10 2/3 OCT (±10%)

## 11. EQUALIZER

TREBLE: -6~0~+6 (13 STEP) ±10 dB (±20%)

±3 dB POINT:

2 kHz (±10%)

BASS: -6~0~+6 (13 STEP) ±10 dB (±20%)

±3 dB POINT:

300Hz (±10%)

## 12. DIGITAL DELAY (DDL)

DELAY TIME: 0~99 (100 STEP) 4 msec~1024 msec

FEED BACK: 0~15 (16 STEP) 0~100%

(until oscillation ceases)

MOD FREQUENCY: 0~31 (32 STEP) 0.1 Hz~10 Hz

(±20%)

MOD INTENSITY: 0~31 (32 STEP) 1 = 5 TYP

(1 = 8 MAX)

EFFECT LEVEL: 0~15 (16 STEP) 1 = 1 max.

Effect sound produced

## 13. SEQUENCER

1 note, rest or tie regarded as 1 step

maximum of 1,000 steps

SPEED: 1 step regarded as "J"

"J" = 25~250 ±20%

MODE: ONE TIME/REPEAT

## 14. TAPE INTERFACE

DATA TRANSMISSION SPEED: approx. 2,000 (bit/sec)

OUTPUT LEVEL: 4.5 mVp-p

INPUT LEVEL: HIGH 3 Vp-p

LOW 1 Vp-p

## 15. MIDI

CHANNEL: 1~16 CH

PROGRAM CHANGE: DISABLE/ENABLE

SEQUENCER CLOCK: INT/EXT

SOCKET: IN/OUT

## 16. DIMENSIONS

780(W)×286(P)×87.6(H) mm

## 17. WEIGHT

4.4 kg (including dry-cell batteries)

## 18. ACCESSORIES

Pre-load data tape

Batteries (UM-2×6)

Shielded cord (2.5m×1)

## 19. POWER CONSUMPTION

7 W (when using AC adapter)

SUM-2×6 9 V 330 mA ±10%

## 20. BATTERY LIFE

3.5 hrs. or over (National Hi-Top SUM-2×6, continuous usage, 20°C)

## 21. EXTERNAL DC POWER RANGE

+7.0V ~ +11.0V

## 22. ENVIRONMENTAL CONDITIONS

Temperature: 0°C~40°C

Humidity: Below dew point

## 23. TIME TO STABLE OPERATION AFTER POWER ON:

300 sec.

## 24. PERMISSIBLE LINE NOISE VOLUME

(with AC adapter)

5 min. marked without malfunction at positive polarity

90°, 350 ns, 500 V pulse

## 25. ELECTROSTATIC TEST

Normal function at 10 kV of static electricity

## 26. ENCLOSURE HEAT BUILD-UP

15 or less

## 27. AT POWER ON/OFF

spike noise — less than 300 mVp-p

## 28. OUTPUT LEVEL (Line Out)

C4~C5 8 notes output simultaneously, VOL MAX, -6dBm (±3dB)

## 29. NOISE LEVEL

JIS-A AVERAGE

	GATE ON	GATE OFF
DDL ON	-76 dBm TYP (-70 dBm MAX)	-90 dBm TYP (-84 dBm MAX)
DDL OFF	-80 dBm TYP (-74 dBm MAX)	-90 dBm TYP (-84 dBm MAX)

## 30. ELECTRICAL WAVE INTERFERENCE

FCC (U.S.A.)

VDE (W. Germany)

Certification for each under review.

## 2. MIDI IMPLEMENTATION

### 1. TRANSMITTED DATA

#### 1 CHANNEL MESSAGES

1 0 0 0 nnnn	0 k k k k k k k	0 1 0 0 0 0 0 0	Note Off k k k k k k k = 36~84
1 0 0 1 nnnn	0 k k k k k k k	0 1 0 0 0 0 0 0	Note On k k k k k k k = 36~84
1 0 1 1 nnnn	0 0 0 0 0 0 0 1	0 v v v v 0 0 0	DCO Modulation (4bit resolution)
1 0 1 1 nnnn	0 0 0 0 0 0 1 0	0 v v v v 0 0 0	VCF Modulation (4bit resolution)
1 1 0 0 nnnn	0 p p p p p p p	—	Program Change p p p p p p p = 0~63 (NOTE 1)
1 1 1 0 nnnn	0 0 0 0 0 0 0 0	0 v v v v v v v	Pitch Bender Change (7bit resolution) v v v v v v v = 64 : Center LSB is not used

★ nnnn=0~15: The channel number set in parameter 87. But sequencer data is fixed at channel 2.

#### NOTE

1. The relationship between MIDI program numbers (0pppppp) and display program numbers is shown here.

Display number	MIDI Program number
#11	0
#12	1
:	:
#87	62
#88	63

#### 2 SYSTEM REAL TIME MESSAGES

1 1 1 1 1 0 0 0	Timing Clock
1 1 1 1 1 0 1 0	Start
1 1 1 1 1 1 0 0	Stop

\* Sent only during sequencer operation.

### ③ SYSTEM EXCLUSIVE MESSAGES

#### ① DATA DUMP

1 1 1 1 0 0 0 0 0 1 0 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 1 1 0 0 0 0 0 0 d d d d 0 0 0 0 d d d d ⋮ 0 0 0 0 s s s s 0 0 0 0 s s s s 1 1 1 1 0 1 1 1	Exclusive Status KORG ID 42H Format ID 21H POLY-800II ID 0CH LSB 4bit } RAM data 1 word MSB 4bit } (5376 Byte) ⋮ LSB 4bit } Check Sum data (NOTE 2 ) MSB 4bit } EOX
--	--

★ DATA DUMP is sent only when a DATA DUMP request is received.

#### NOTE

2. The  $\sum_{n=1}^{2688}$  (RAM data 1 word), least significant 8 bits are check sum data.

#### ② DATA ERROR

1 1 1 1 0 0 0 0 0 1 0 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 1 1 0 0 0 0 1 0 0 0 0 0 1 1 1 1 0 1 1 1	Exclusive status KORG ID 42H Format ID 21H POLY-800II ID 0CH Data Error 20H EOX
--	--

★ Sent only when a check sum error occurs during a data dump.

## 2. RECOGNIZED RECEIVE DATA

### 1 CHANNEL MESSAGES

1 0 0 0 nnnn	0 k k k k k k k k	0 x x x x x x x x	Note Off (NOTE 1) Velocity will be ignored
1 0 0 1 nnnn	0 k k k k k k k k	0 v v v v v v v v	Note On (NOTE 1) Velocity will be ignored (v v v v v v > 0)
1 0 0 1 nnnn	0 k k k k k k k k	0 0 0 0 0 0 0 0	Note Off
1 0 1 1 nnnn	0 0 0 0 0 0 0 1	0 v v v v x x x x	DCO Modulation (4 bit resolution)
1 0 1 1 nnnn	0 0 0 0 0 0 1 0	0 v v v v x x x x	VCF Modulation (4 bit resolution)
1 0 1 1 nnnn	0 1 1 1 1 1 0 0	0 0 0 0 0 0 0 0	OMNI Mode Off
	0 1 1 1 1 1 0 1	0 0 0 0 0 0 0 0	OMNI Mode On
1 1 0 0 nnnn	0 p p p p p p p p	—————	Program Change (NOTE 2)
1 1 1 0 nnnn	0 x x x x x x x x	0 v v v v v v v v	Pitch Bender Change LSB will be ignored MSB will be recognized v v v v v v v = 64:center

\* nnnn=0~15: Channel number set in parameter 87. When OMNI mode is ON, all messages are received, regardless of channel number setting.

When OMNI mode is OFF, the synthesizer responds only to messages received on the currently selected channel number.

The "power on" default is OMNI ON.

### NOTE

1. Note number (0kkk kkkk)=36~84. Received data beyond this range is voiced as the same note in the nearest octave within the range.
2. Program number (0ppp pppp)=0~63. Data higher than 63 is interpreted as the difference obtained by subtracting 64 from the data.

### 2 SYSTEM REAL TIME MESSAGES

1 1 1 1 1 0 0 0	Timing Clock (NOTE 3)
1 1 1 1 1 0 1 0	Start
1 1 1 1 1 1 0 0	Stop

### NOTE

3. Timing clock data can be received only in the period between reception of start and stop data.

### ③ SYSTEM EXCLUSIVE MESSAGES

#### ① DATA DUMP

Exclusive status	
1 1 1 1 0 0 0 0	KORG ID 42 H
0 1 0 0 0 0 1 0	Format ID 21 H
0 0 1 0 0 0 0 1	POLY-800II ID 0CH
0 0 0 0 1 1 0 0	LSB 4bit } RAM data 1 word MSB 4bit } (5376 Byte)
0 0 0 0 d d d d	⋮
0 0 0 0 d d d d	⋮
⋮	⋮
0 0 0 0 s s s s	LSB 4bit } Check Sum data (NOTE 4 )
0 0 0 0 s s s s	MSB 4bit }
1 1.1 1 0 1 1 1	EOX

#### NOTE

4. The  $\sum_{n=1}^{2688}$  (RAM data 1 word)<sub>n</sub> least significant 8 bits are check sum data.

#### ② DATA DUMP REQUEST

Exclusive status	
1 1 1 1 0 0 0 0	KORG ID 42 H
0 1 0 0 0 0 1 0	Format ID 21 H
0 0 1 0 0 0 0 1	POLY-800II ID 0CH
0 0 0 0 1 1 0 0	Data Dump Request 10 H
0 0 0 1 0 0 0 0	EOX
1 1 1 1 0 1 1 1	

★ After receiving a DATA DUMP REQUEST, there is a delay of about 300ms before the POLY-800II begins DATA DUMP transmission.

### 3. USING SYSTEM EXCLUSIVE MESSAGES

#### ■ Communication between the POLY-800II and a computer.

■ The POLY 800II can send and receive the following kinds of information via system exclusive messages. This enables sequencer and other data exchange with a computer equipped with a MIDI interface and suitable software.

##### Sending

**DATA DUMP:** This includes the sound data stored in the 64 programs in memory, sequencer data, settings of parameters 85, 86, 87, and 88, and chord memory data. This is sent in response to a DATA DUMP REQUEST.

**DUMP ERROR:** Sent when a check sum error occurs during reception of DATA DUMP data.

##### Receiving

**DATA DUMP:** The program data loaded to the POLY-800II. The contents of this data replace the sound data stored in the 64 programs in memory, sequencer data, settings of parameters 85, 86, 87, and 88, and chord memory data.

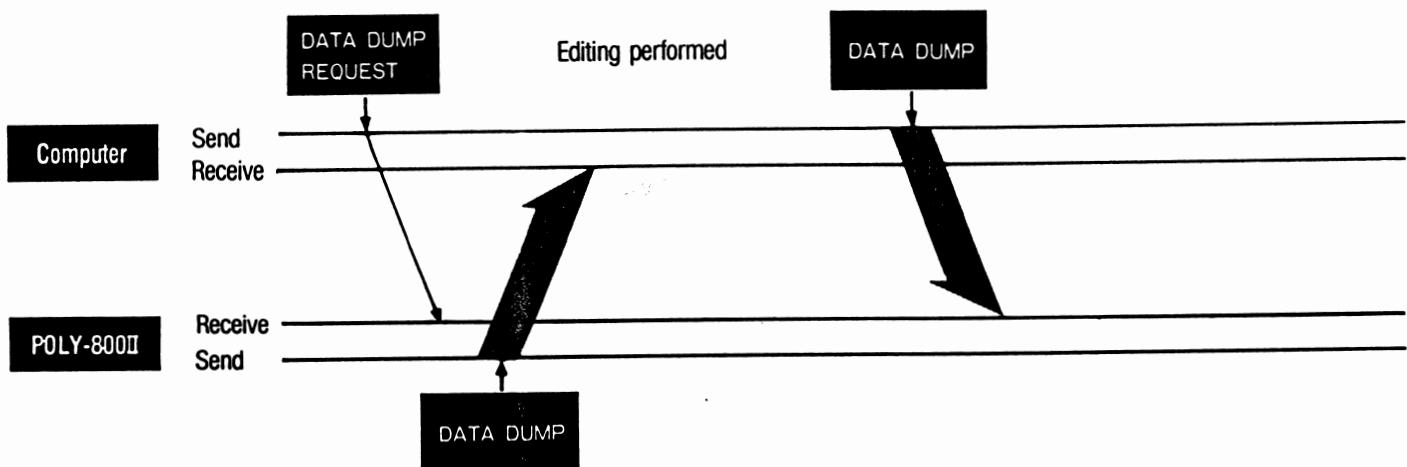
**DATA DUMP REQUEST:** A command to transmit program data. When this request is received, the POLY-800II begins DATA DUMP transmission after a 300ms delay.

#### ■ Setup is shown here:

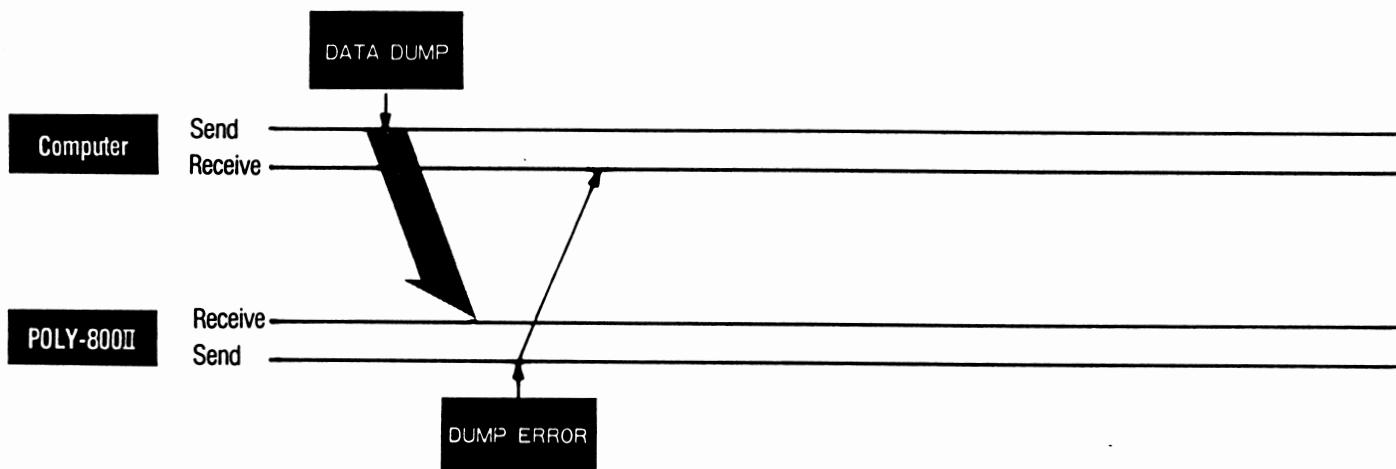


#### ■ Communications Examples

① First the computer obtains sound program and sequencer data from the synthesizer for editing. After editing, the data is sent back to the synthesizer.



- ② If an irregularity is detected in the data loaded from the computer.



## 2 RAM data structure

- The RAM data portion of DATA DUMP data is organized as shown here.

MIDI CHANNEL	0 0 0 H	1
SEQ DATA (UNDEFINED)	0 0 1 H ~ 3 E 8 H	1000
CHORD MEMORY	3 E 9 H ~ 3 F 0 H	8
SEQ MODE	3 F 1 H ~ 3 F 8 H	8
SEQ CLK	3 F 9 H	1
PROG CHANGE DIS/ENA (UNDEFINED)	3 F A H	1
PROG DATA	3 F B H	1
	3 F C H ~ 3 F F H	4
	4 0 0 H ~ A 7 F H	1664

- Actually, when this data is transmitted on MIDI, each byte is split at its least significant four bits and sent starting from relative address 000H.  
(UNDEFINED data does not affect internal operation; it is only used in the check sum.)

### ③ RAM data organization

#### ■ Bit map for MIDI CHANNEL, SEQ MODE, SEQ CLK, and PROG CHANGE.

	MSB	7	6	5	4	3	2	1	0	LSB
0 0 0 H		0	0	0	0	0	0	0	0	MIDI CHANNEL
3 F 9 H		0	0	0	0	0	0	0	0	SEQ MODE
3 E A H		0	0	0	0	0	0	0	0	SEQ CLK
3 F B H		0	0	0	0	0	0	0	0	PROG CHANGE

#### ★ Bit map relationship with parameter values on front panel.

MIDI CHANNEL	0 0 0 H	b 3—b 0	0 0 0 0 - I I I I = I - I 6	87
SEQ MODE	3 F 9 H	b 0	0 = 1 (ONE TIME), I = 2 (REPEAT)	85
SEQ CLK	3 F A H	b 0	0 = 1 (INT), I = 2 (EXT)	86
PROG CHANCE D/E	3 F B H	b 0	0 = 0 (DISABLE), I = 1 (ENABLE)	88

#### ■ Sequencer data has the following structure.

	00H	End
	01H	Rest
	02H	Tie
	I k <sub>1</sub> k <sub>2</sub> k <sub>3</sub> k <sub>4</sub> k <sub>5</sub> k <sub>6</sub> k <sub>7</sub>	If most significant bit is 0: Other notes exist at same time. If most significant bit is 1: Block end at that point in time. 0k <sub>n</sub> k <sub>n</sub> k <sub>n</sub> k <sub>n</sub> k <sub>n</sub> k <sub>n</sub> k <sub>n</sub> : Same as MIDI note number. (24 H — 54 H.) (n = I — 8)
	0 k <sub>1</sub> k <sub>2</sub> k <sub>3</sub> k <sub>4</sub> k <sub>5</sub> k <sub>6</sub> k <sub>7</sub> 0 k <sub>2</sub> k <sub>2</sub> I k <sub>3</sub>	

Example:



#### ■ CHORD MEMORY has the following structure.

0k<sub>n</sub>k<sub>n</sub>k<sub>n</sub>k<sub>n</sub>k<sub>n</sub>k<sub>n</sub>k<sub>n</sub>: Same as MIDI note number.  
00000000: End

Data: B4H, 02H, B5H, 02H, 01H, 01H, B7H, B9H, 34H, 37H,  
BCH, 02H, 02H, 02H, 02H, 01H, 01H, 00H.

■ Bit map for each program.

0	←DCO2 WAVEFORM→	←DCO1 WAVEFORM→	←DCO2 OCTAVE→	←DCO1 OCTAVE→
1	←DCO2 16'~2'		←DCO1 16'~2'	
2	UNDEFINED	←DCO MODE→	UNDEFINED	←DCO DETUNE→
3	←NOISE LEVEL→		←DCO INTERVAL→	
4	←DCO1 LEVEL*	←VCF EG POLARITY→	←VCF EG INT→	
5	UNDEFINED	←DCO2 LEVEL→	→*	→
6	←VCF TRIG MODE→	←VCF CUTOFF→		
7	←MG DELAY→	←MG FREQ→		
8	←MG VCF INT→	←MG DCO INT→		
9	*DEGI DECAY	←DEGI ATTACK→		
10	*→	←DEGI BREAK P.	→	→*
11	*—DEGI SUSTAIN→	←DEGI SLOPE→		*
12	*→	←DEGI RELEASE→		→*
13	←DEG2 DECAY→	←DEG2 ATTACK→		*
14	*DEG2 SLOPE	←DEG2 BREAK P.		
15	*→	←DEG2 SUSTAIN→	→	→*
16	*—DEG3 ATTACK→	← DEG2 RELEASE→		*
17	*→	←DEG3 DECAY→	→	→*
18	←DEG3 SLOPE→	←DEG3 BREAK P.—*		
19	*DEG3 RELEASE	←DEG3 SUSTAIN→		
20	←VCF KBD TRACK→	←VCF RESONANCE→	→	→*
21	UNDEFINED	←DDL TIME→		
22	←DDL EFFECT LEVEL→	←DDL FEEDBACK→		
23	UNDEFINED	←DDL MOD FREQ→		
24	UNDEFINED	←DDL MOD INT→		
25	←EQ BASS→	←EQ TREBLE→		

"\*" Exceeds byte unit.

UNDEFINED data can have any value; it is only used in the check sum.

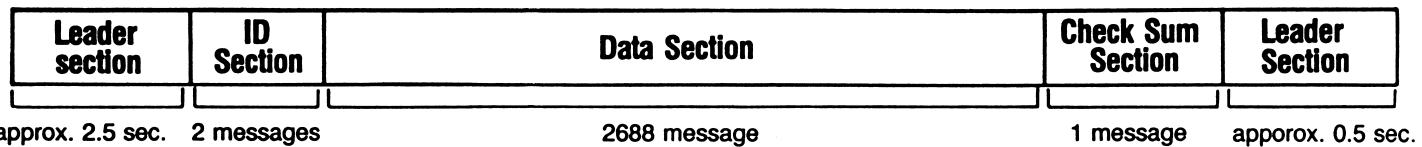
★ Relationships between bit map and parameter values listed on the front panel (per program).

Bit Map Relationships				
DCO1 OCTAVE	0	b1—b0	00=1(LOW)、01=2(MID)、10=3(HIGH)、11=INHIBIT	11
DCO2 OCTAVE	0	b3—b2	00=1(LOW)、01=2(MID)、10=3(HIGH)、11=INHIBIT	21
DCO1 WAVE FORM	0	b5—b4	00=1(□)、01=2(△)、10—11=INHIBIT	12
DCO2 WAVE FORM	0	b7—b6	00=1(□)、01=2(△)、10—11=INHIBIT	22
DCO1 16'	1	b0	0=0(OFF)、1=1(ON)	13
DCO1 8'	1	b1	0=0(OFF)、1=1(ON)	14
DCO1 4'	1	b2	0=0(OFF)、1=1(ON)	15
DCO1 2'	1	b3	0=0(OFF)、1=1(ON)	16
DCO2 16'	1	b4	0=0(OFF)、1=1(ON)	23
DCO2 8'	1	b5	0=0(OFF)、1=1(ON)	24
DCO2 4'	1	b6	0=0(OFF)、1=1(ON)	25
DCO2 2'	1	b7	0=0(OFF)、1=1(ON)	26
DCO DETUNE	2	b1—b0	00—11=0—3	38
DCO MODE	2	b6	0=1(WHOLE)、1=2(DOUBLE)	18
DCO INTERVAL	3	b3—b0	0000—1100=0—12、1101—1111=INHIBIT	28
NOISE LEVEL	3	b7—b4	0000—1111=0—15	37
VCF EG INT	4	b3—b0	0000—1111=0—15	35
VCF EG POLARITY	4	b4	0=1(↙)、1=2(↖)	34
DCO1 LEVEL	4—5	b7—b5、b1—b0	00000—11111=0—31	17
DCO2 LEVEL	5	b6—b2	00000—11111=0—31	27
VCF CUTOFF	6	b6—b0	000000—1100011=0—99、1100100—111111=INHIBIT	31
VCF TRIG MODE	6	b7	0=1(SINGLE)、1=2(MULTI)	36
MG FREQ	7	b3—b0	0000—1111=0—15	81
MG DELAY	7	b7—b4	0000—1111=0—15	82
MG DCO INT	8	b3—b0	0000—1111=0—15	83
MG VCF INT	8	b7—b4	0000—1111=0—15	84
DEG1 ATTACK	9	b4—b0	00000—11111=0—31	41
DEG1 DECAY	10—9	b1—b0、b7—b5	00000—11111=0—31	42

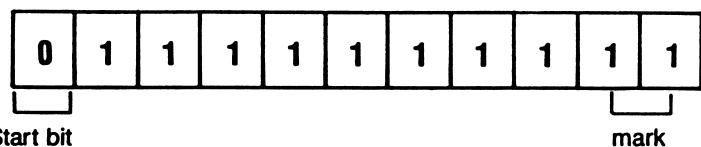
DEG1 BREAK P.	I0	b6—b2	00000—11111=0—31	43
DEG1 SLOPE	I1—I0	b3—b0, b7	00000—11111=0—31	44
DEG1 SUSTAIN	I2—I1	b0, b7—b4	00000—11111=0—31	45
DEG1 RELEASE	I2	b5—b1	00000—11111=0—31	46
DEG2 ATTACK	I3—I2	b2—b0, b7—b6	00000—11111=0—31	51
DEG2 DECAY	I3	b7—b3	00000—11111=0—31	52
DEG2 BREAK P.	I4	b4—b0	00000—11111=0—31	53
DEG2 SLOPE	I5—I4	b1—b0, b7—b5	00000—11111=0—31	54
DEG2 SUSTAIN	I5	b6—b2	00000—11111=0—31	55
DEG2 RELEASE	I6—I5	b3—b0, b7	00000—11111=0—31	56
DEG3 ATTACK	I7—I6	b0, b7—b4	00000—11111=0—31	61
DEG3 DECAY	I7	b5—b1	00000—11111=0—31	62
DEG3 BREAK P.	I8—I7	b2—b1, b7—b6	00000—11111=0—31	63
DEG3 SLOPE	I8	b7—b3	00000—11111=0—31	64
DEG3 SUSTAIN	I9	b4—b0	00000—11111=0—31	65
DEG3 RELEASE	I20—I9	b1—b0, b7—b5	00000—11111=0—31	66
VCF RESONANCE	I20	b5—b2	0000—1111=0—15	32
VCF KBD TRACK	I20	b7—b6	00=0(OFF), 01=1(HALF), I0=2(FULL), I1=INHIBIT	33
DDL TIME	I21	b6—b0	0000000—1100011=0—99, 1100100—1111111=INHIBIT	71
DDL FEEDBACK	I22	b3—b0	0000—1111=0—15	72
DDL EFFECT LEVEL	I22	b7—b4	0000—1111—0—15	75
DDL MOD FREQ	I23	b4—b0	00000—11111=0—31	73
DDL MOD INT	I24	b4—b0	00000—11111=0—31	74
EQ TREBLE	I25	b3—b0	0000—0110—1100=(-6)—0—6, 1101—1111=INHIBIT	76
EQ BASS	I25	b7—b4	0000—0110—1100=(-6)—0—6, 1101—1111=INHIBIT	77

## **4. TAPE FORMAT**

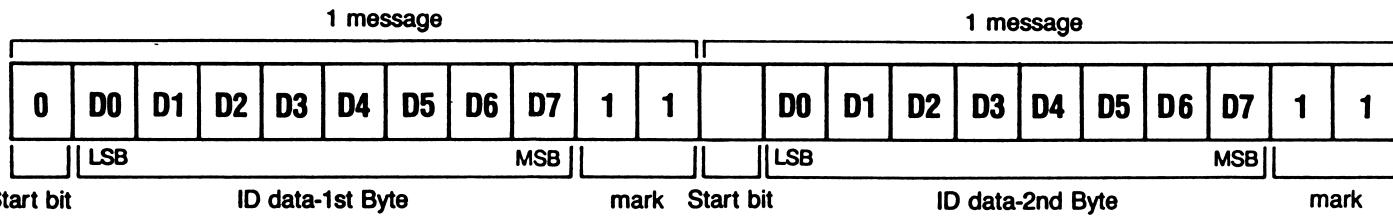
### **(a) Overall Composition**



**(b) Composition of 1 message in Leader Section**



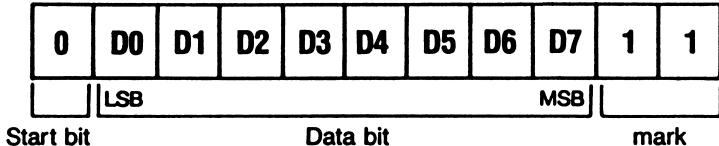
**(c) Composition of ID section**



ID data-1st byte—42H (KORG's MIDI ID code)

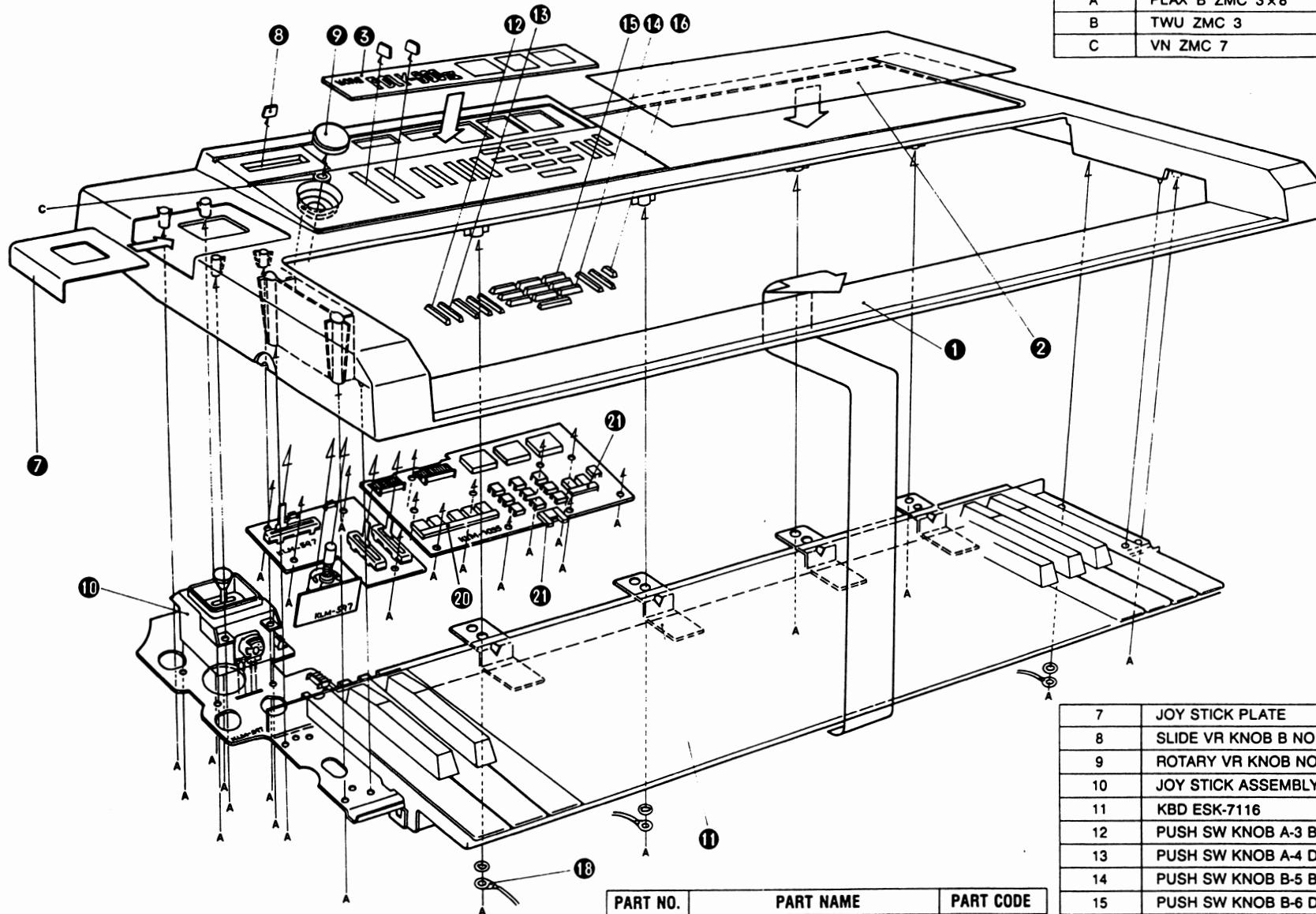
#### ID data-2nd byte—OH (Poly-800II's MIDI ID code)

**(d) Composition of 1 message in Data Section and Check Sum Section**



- Data moves in order from LSB, with one "0" inserted before 8 data bits as the start bit.
  - Check sum uses 8 bit calculation, without regard to decimal point.

# 3. STRUCTURAL DIAGRAM



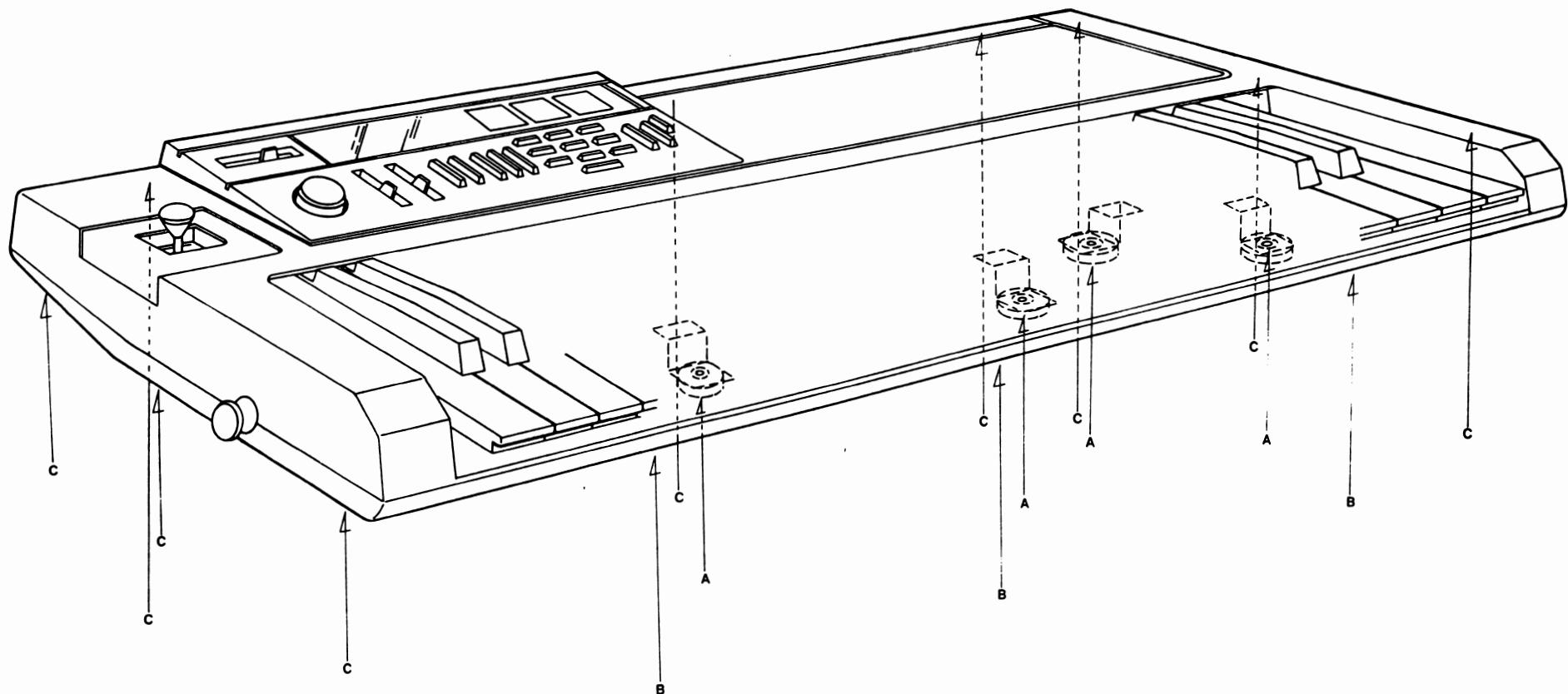
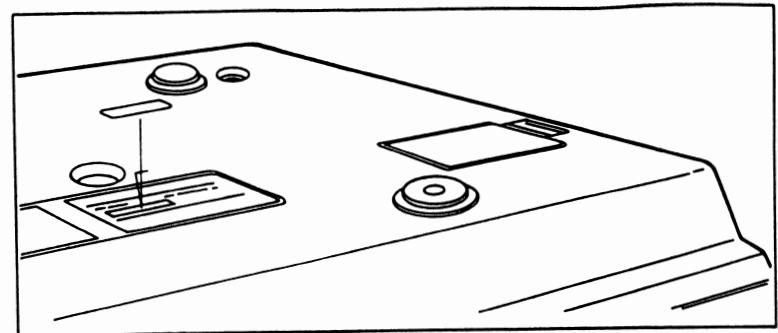
PART NO.	SCREWS, NUT	Q'TY
A	PLAX B ZMC 3x8	29
B	TWU ZMC 3	3
C	VN ZMC 7	1

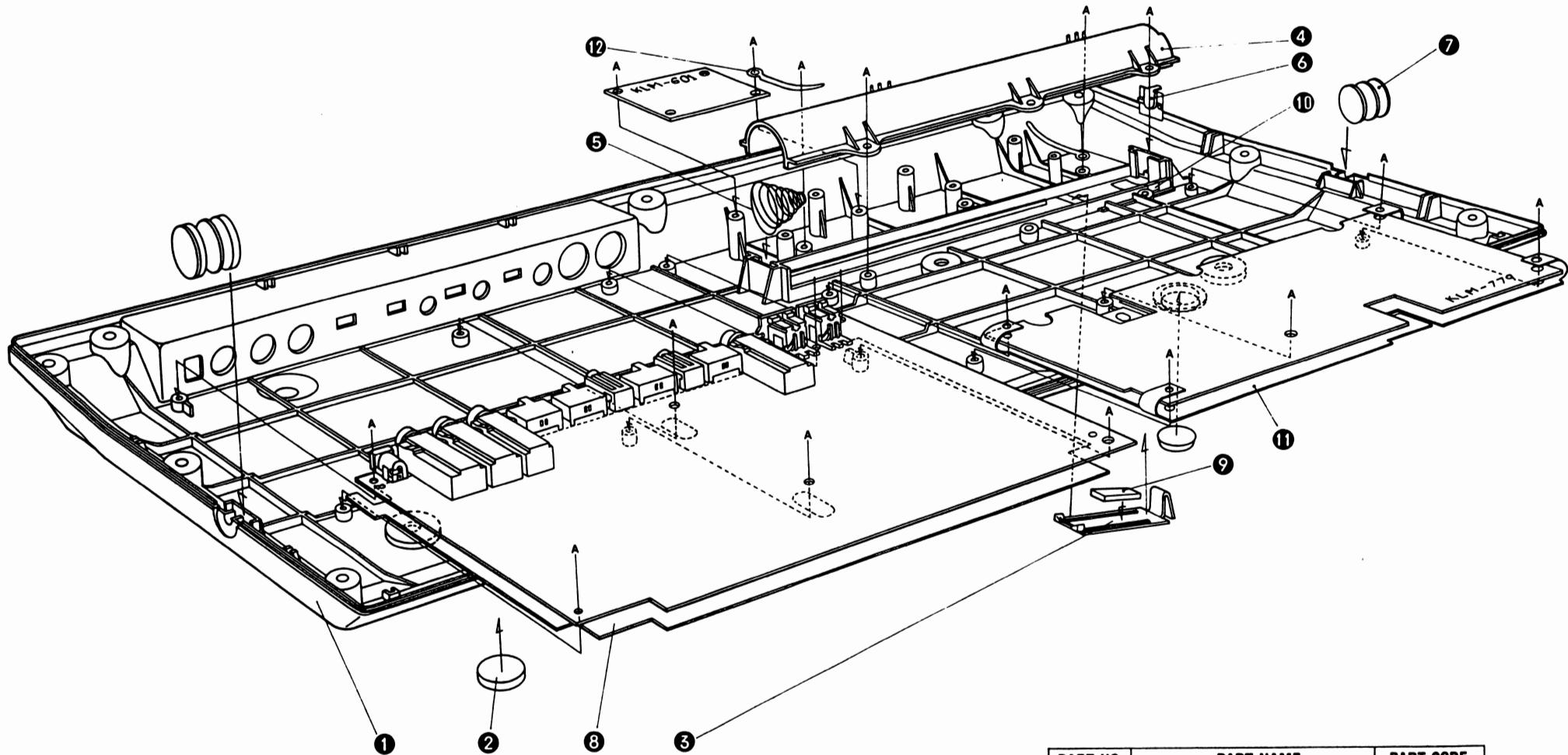
PART NO.	PART NAME	PART CODE
1	UPPER CASE	64620900
2	PARAMETER INDEX SHEET	63002400
3	LED DISPLAY COVER	63002300
4		
5		
6		

7	JOY STICK PLATE	64062600
8	SLIDE VR KNOB B NO.2 BLK	62015600
9	ROTARY VR KNOB NO.2 BLK	62015700
10	JOY STICK ASSEMBLY	
11	KBD ESK-7116	42003100
12	PUSH SW KNOB A-3 BLK	62015900
13	PUSH SW KNOB A-4 DARK GRY	62015901
14	PUSH SW KNOB B-5 BLK	62016000
15	PUSH SW KNOB B-6 DARK GRY	62016002
16	PUSH SW KNOB B-3 RED	62012402
17		
18	LUG 3 N-3	67201200
19		
20	PUSH SW CUSHION A	50008900
21	PUSH SW CUSHION B	50009000

PART NO.	SCREWS	Q'TY
A	FE B BZMC 5x8	4
B	PLAX B BZMC 4x8	3
C	PLAX B BZMC 4x12	9

PART NO.	PART NAME	PART CODE
1	SERIAL NO. SEAL	

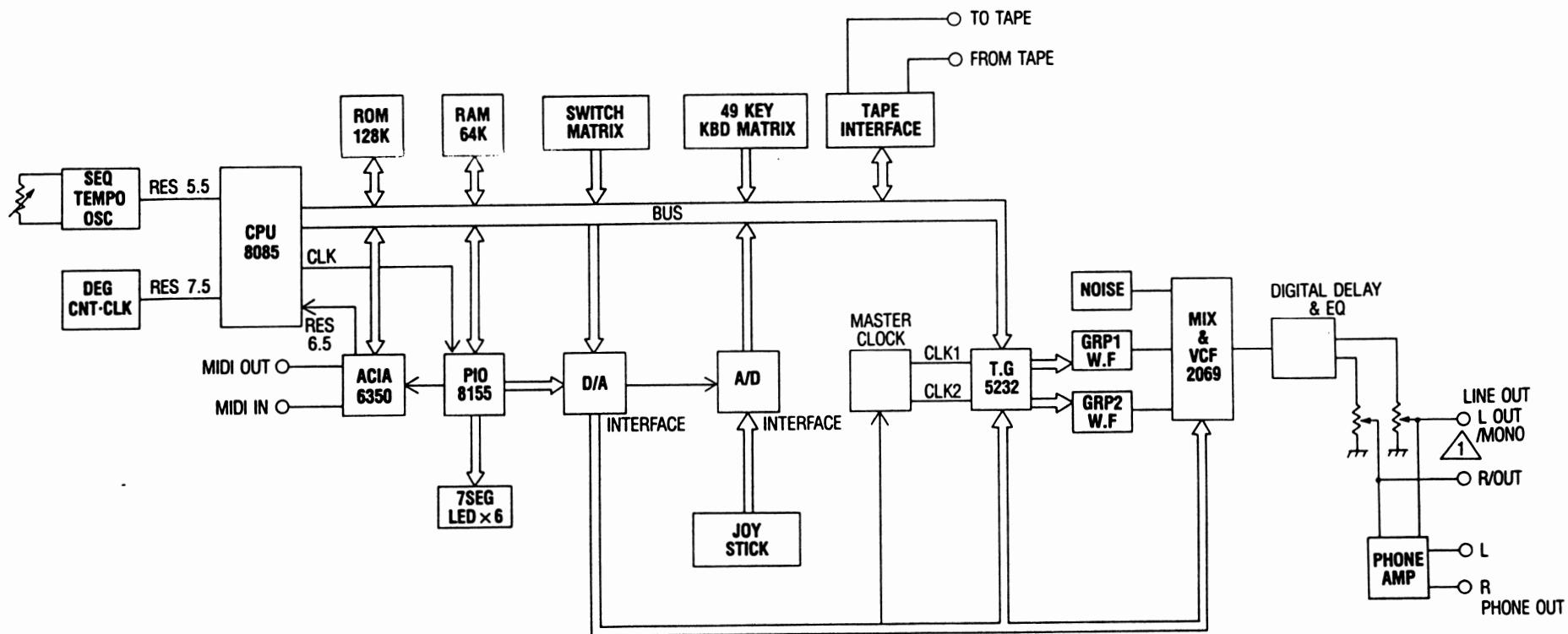


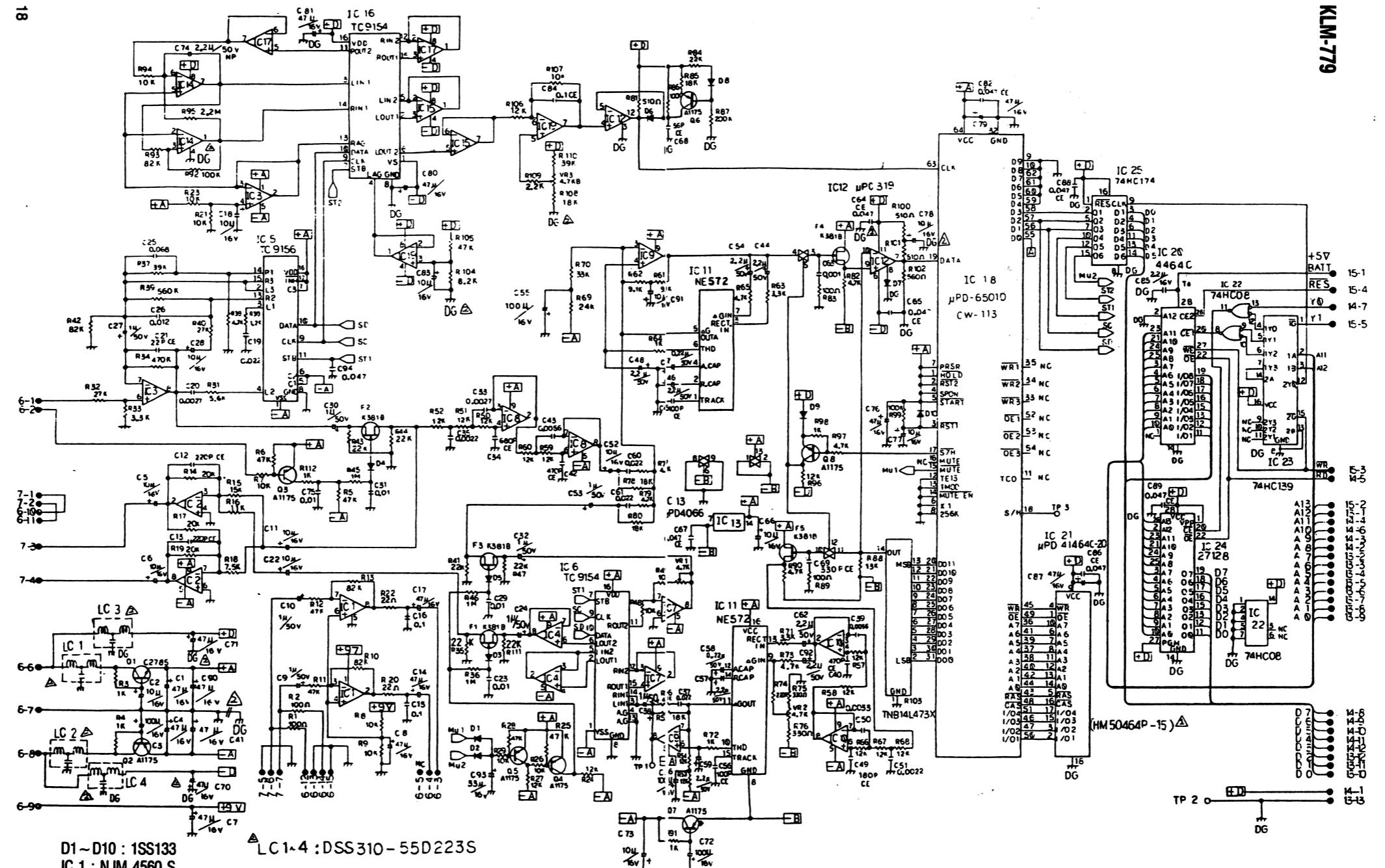


PART NO.	SCREWS	Q'TY
A	PLAX B ZMC 3×8	18

PART NO.	PART NAME	PART CODE
1	LOWER CASE	6462100
2	RUBBER FEET	50008700
3	BATTERY COVER	64621100
4	BATTERY HOLDER	64621200
5	BATTERY TERMINAL (-)	64058100
6	BATTERY TERMINAL (+)	64058101
7	STRAP PEG	64402200
8	SHIELDING SHEET	58018004
9	BATTERY CUSHION 16×30×4	50008800
10	RIBBON	54008100
11	SHIELDING SHEET	63002500
12	SPIRAL CLIP CS-8	54008600

## 4. BLOCK DIAGRAM





D1~D10 : 1SS133

IC 1 : NJM 4560 S

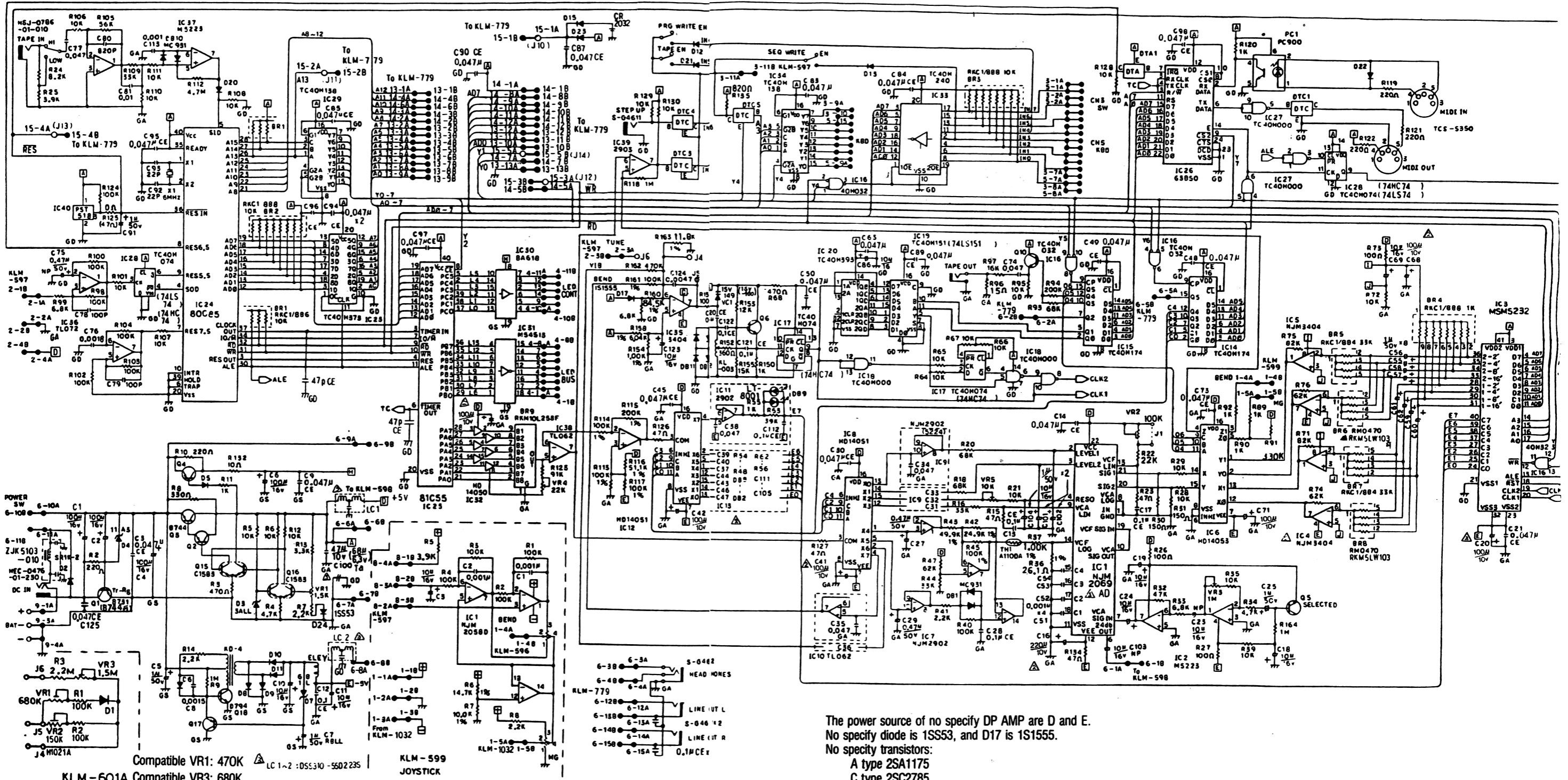
IC 14, 15, 17, 19 : M5223L

IC NOT SPECIFIED: NJM4558S

LC 1~4 : DSS 310-55D223S

# J. CHART DIAGRAM

**KLM-1032-599-601**



The power source of no specify DP AMP are D and E.  
No specify diode is 1SS53, and D17 is 1S1555.

No specificity diodes or  
No specificity transistors:

NO specify transistors.  
A type 2SA1175

A type 2SA1175  
C type 2SC2785

C type ZSL2785  
DB2 0 LT 8001 used

DBZ-9 LT-0001 used

6.8K has not silk between

6.8K has not stuck, between  
1SSE3 can be replaced

1SS53 can be replaced  
1QH174 can be replaced

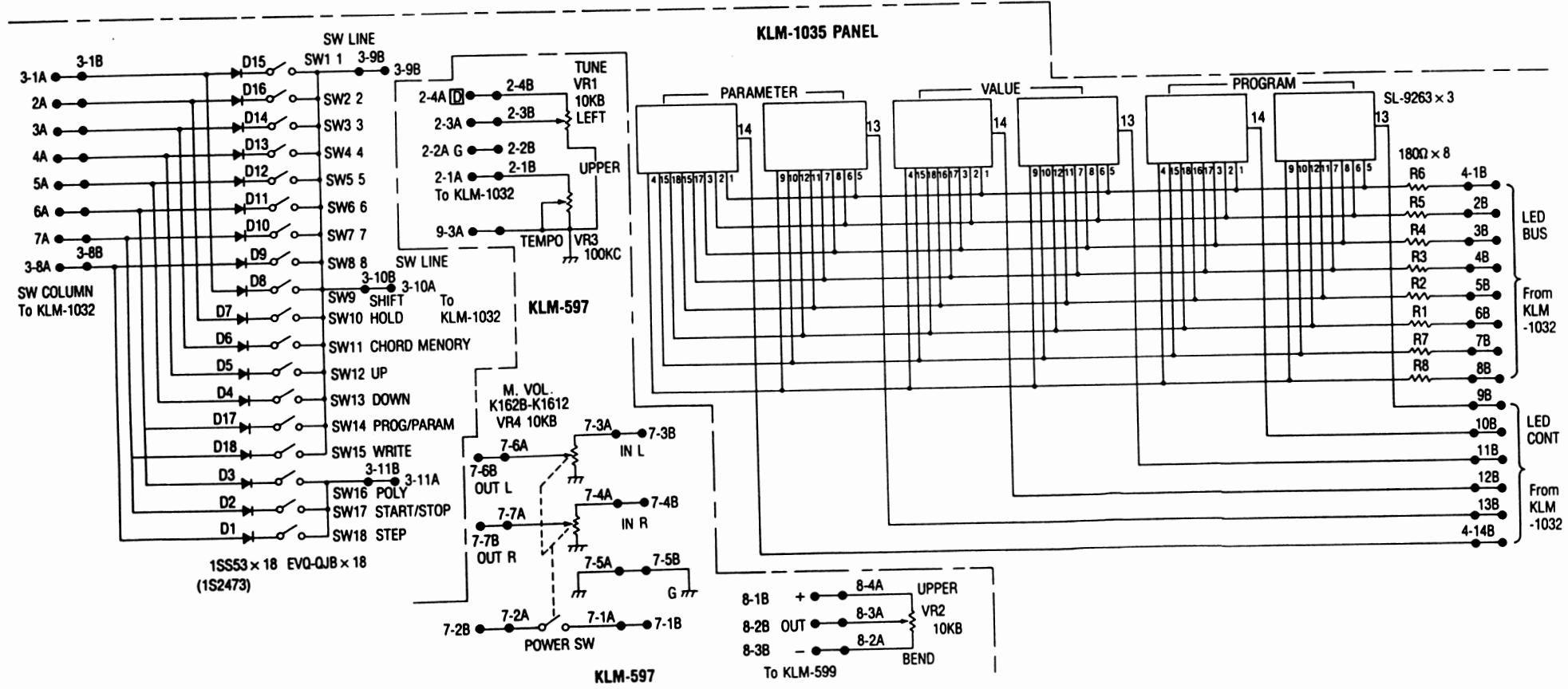
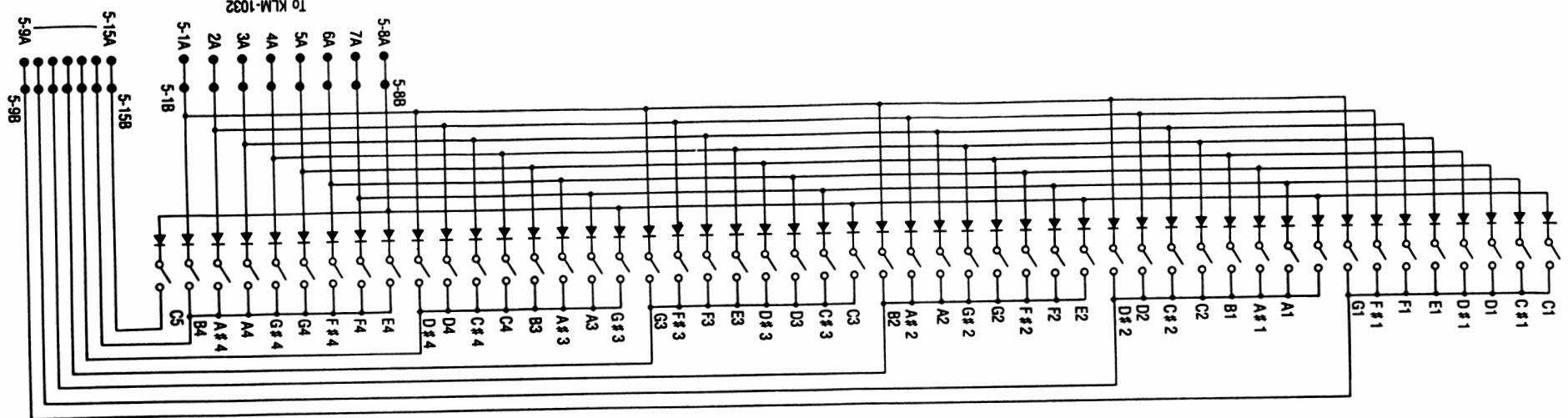
40H174 can be replaced

◆ In NIM 2020 AD 12

△ Is NJM 2069 AD '85  
△ 1-12M4

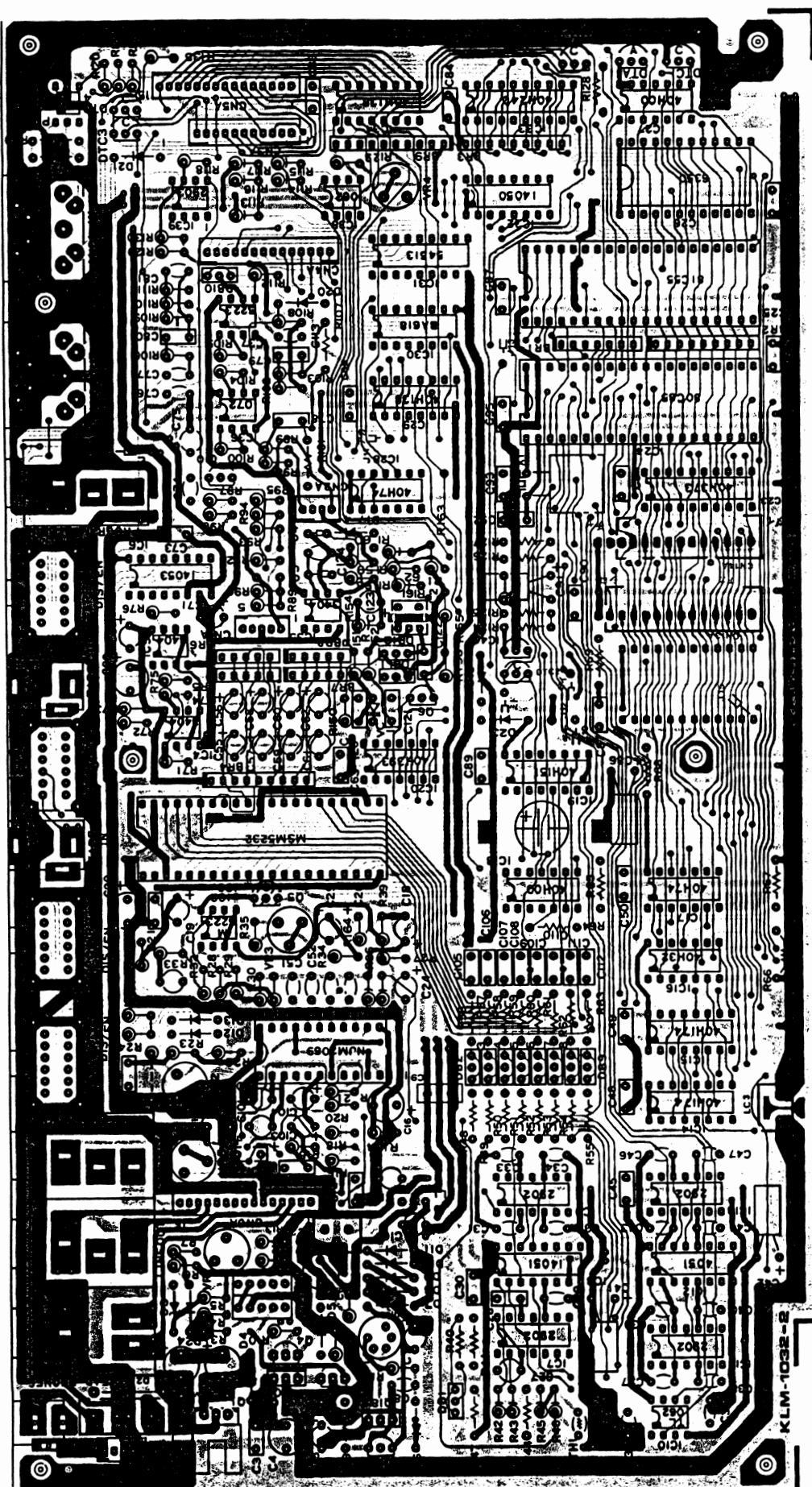
**⚠ replaced 10V type of**

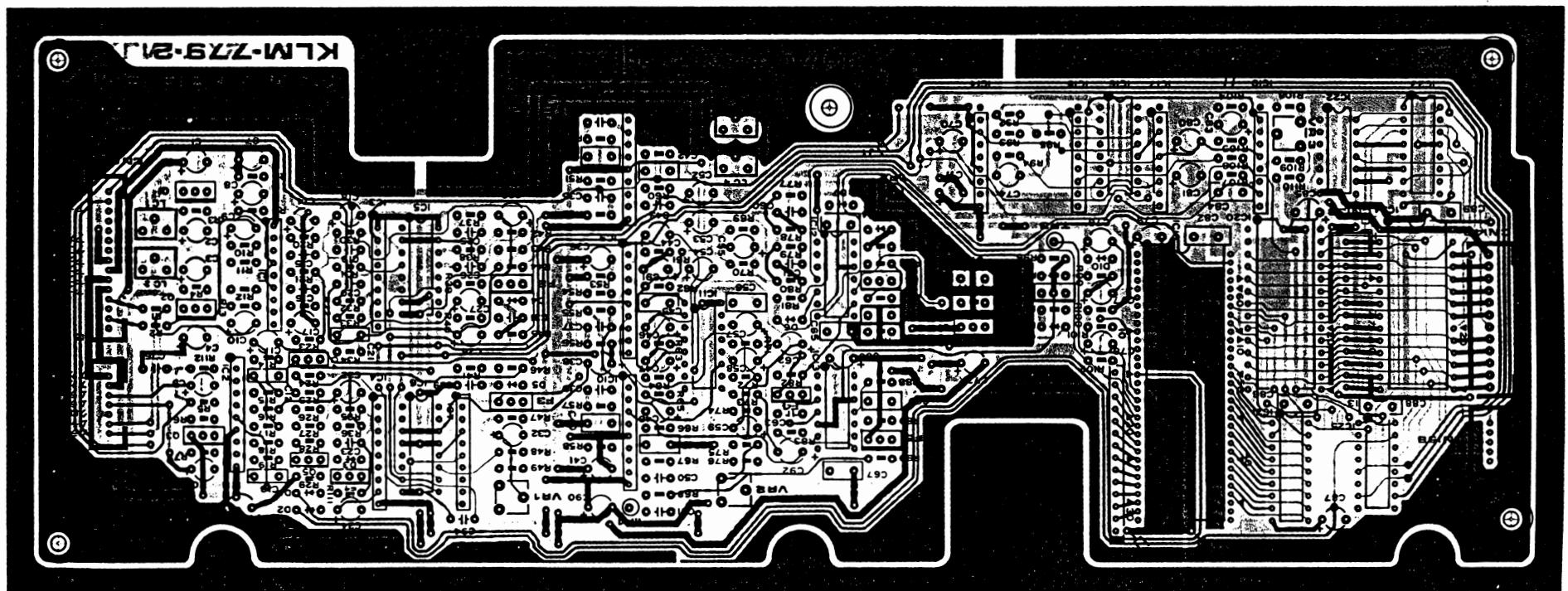
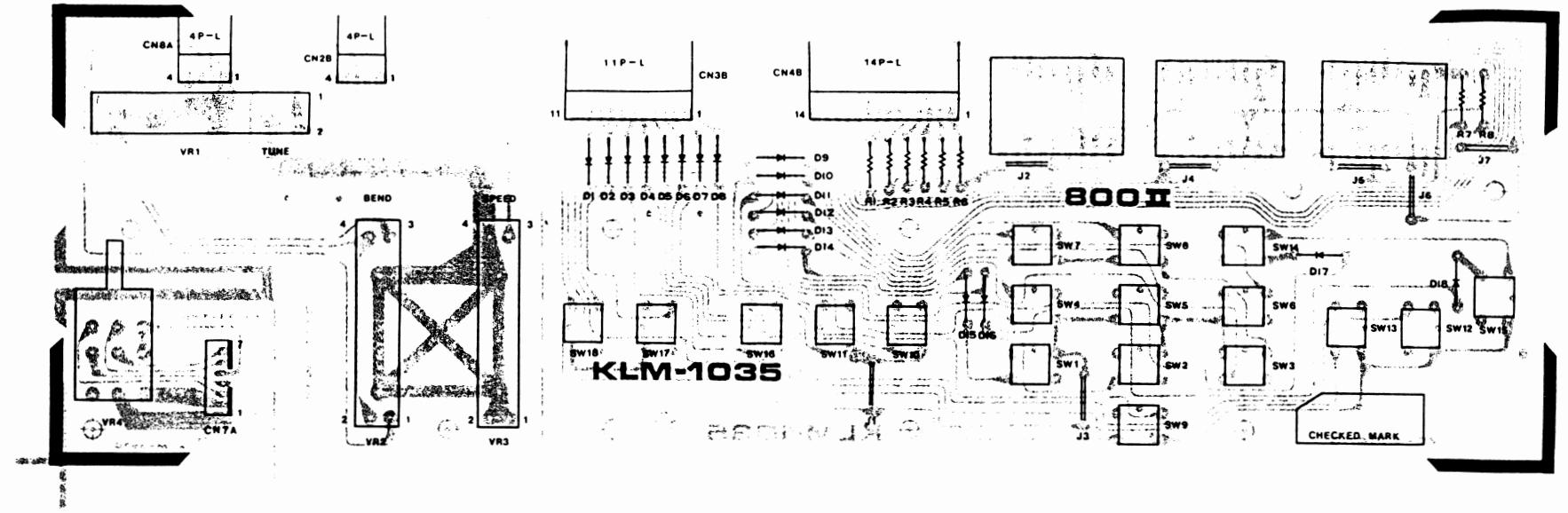
 changed some part



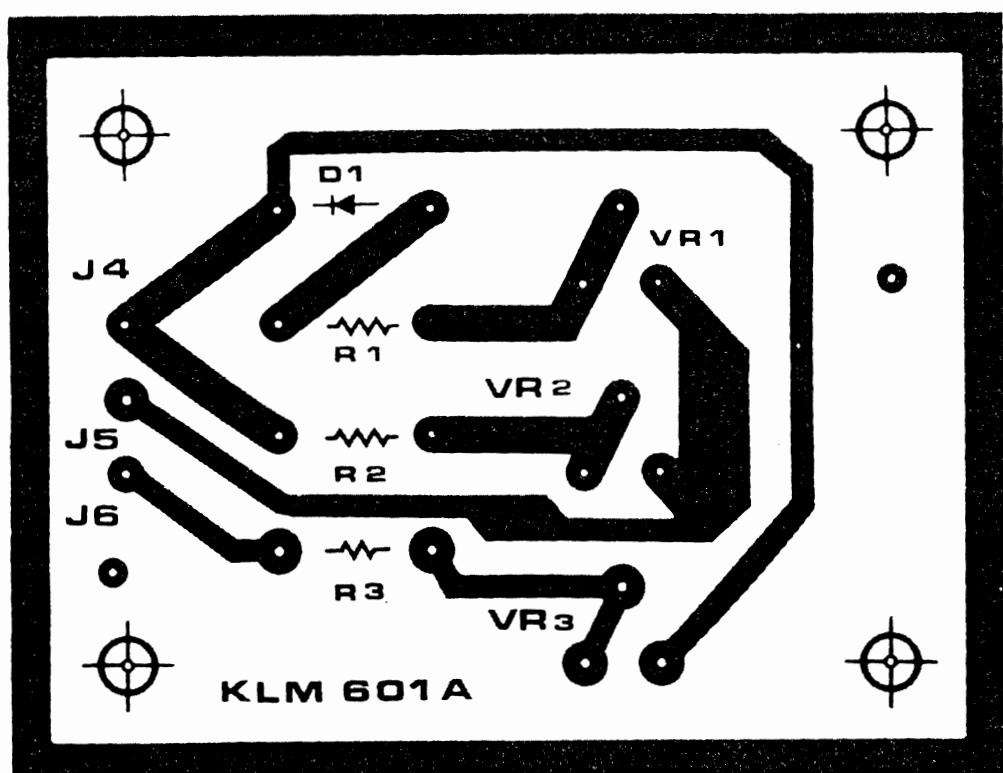
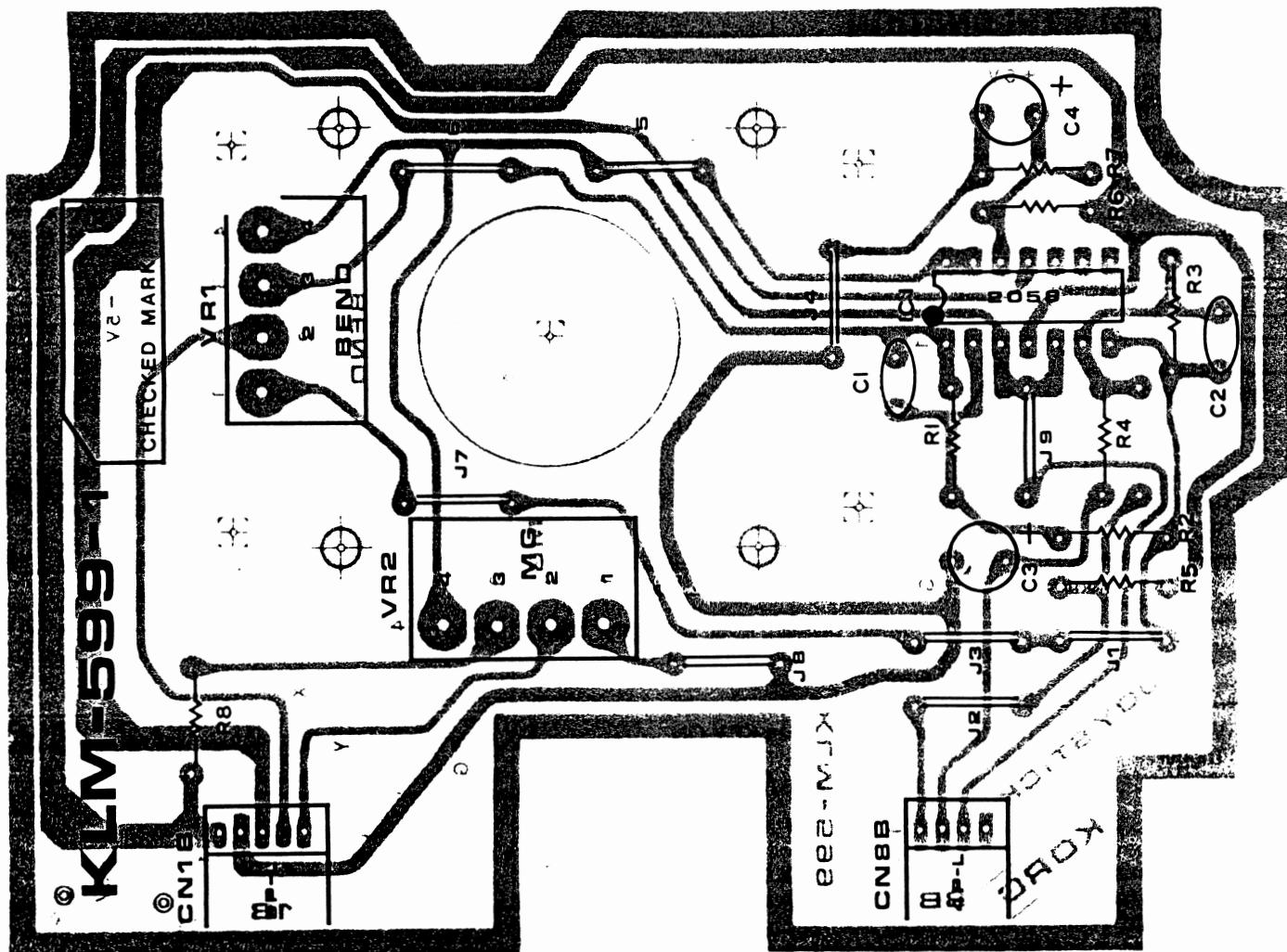
# 6. P.C. BOARD

KLM-1032





KLM-599-601



# 7. CIRCUIT DESCRIPTIONS

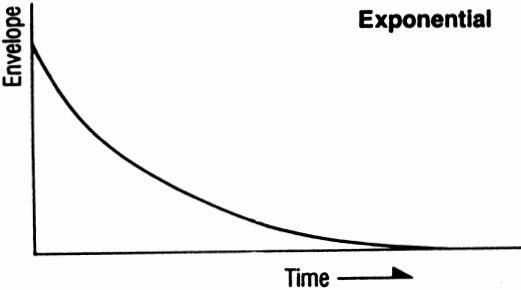
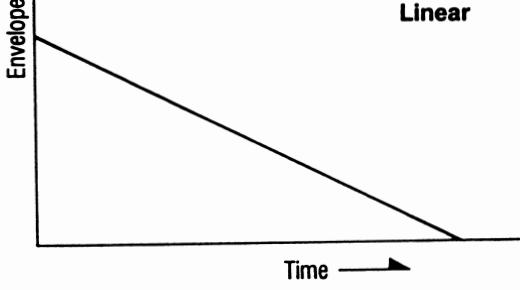
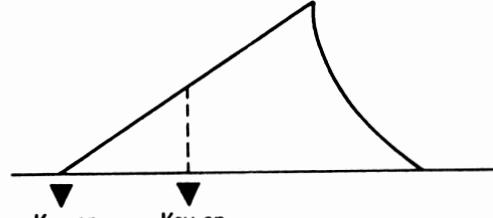
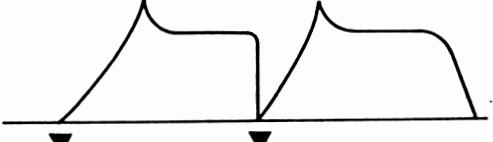
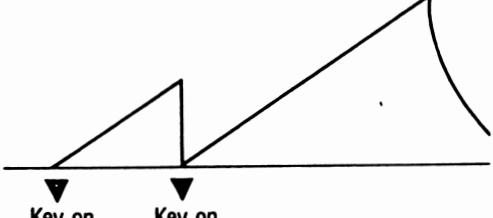
## 1. SYSTEM EXPLANATION

The Poly-800II system does not contain the KLM-598 Chorus circuit board used in the Poly-800, but replaces it with a new KLM-779 circuit board which contains the following new circuits; Digital Delay circuitry (DDL), Programmable Equalizer circuitry, 128Kbit EPROM for the System Program, 64Kbit STATIC RAM for timbre data storage, etc.

Other circuit boards have revised numbers, and some minor changes have been made.

Differences in specifications between the POLY-800II and the POLY-800 are described on the following chart.

**POLY-800II/POLY-800 COMPARISON CHART**

ITEM	POLY-800II	POLY-800
1 EG DEG 1-3 Decay Slope Release	 <p>Exponential</p> <p>Envelope</p> <p>Time →</p> <p>However, when Sustain level is greater than Break point level (slope envelope rises), then slope of envelope is linear.</p>	 <p>Linear</p> <p>Envelope</p> <p>Time →</p> <p>Ratio of change is always equal</p>
2 VCF Multiple Trigger	<p>Trigger takes effect when KEY ON.</p>  <p>Key on      Key on</p>  <p>Key on      Key on</p>	<p>Trigger takes effect from any point when Key ON.</p>  <p>Key on      Key on</p>  <p>Key on      Key on</p>
3 EFFECT	<p>Built-in Digital Delay</p> <p>Delay, Chorus, Flanging, Dubbing &amp; other effects available according to setting of Digital Delay value.</p> <p>(programmable)</p>	<p>Built-in BBD Chorus</p> <p>Chorus ON/OFF only</p> <p>(programmable)</p>
	<p>Built-in Equalizer</p> <p>Treble ± 10dB, 2kHz</p> <p>Bass ± 10dB, 300kHz</p> <p>(programmable)</p>	<p>Not available</p>
4 SEQUENCER	<p>Max. no. of steps (1 step equal to 1 note, rest or tie)</p> <p>1,000 steps</p>	<p>256 steps</p>

	ITEM	POLY-800II	POLY-800
<b>DATA BACKUP</b>			
5	SEQ MODE	One-time repeat	Back up
	SEQ CLOCK INT/EXT		Back up
	MIDI CHANNEL		Back up
	PROG CHANGE		Back up
<b>MIDI SPECIFICATIONS</b>			
6	CHANNEL	Channel selection available in SEND or RECEIVE, however SEQ data fixed at CH 2. OMNI ON until parameter 87 is called.	Channel selection available only at RECEIVE. Note data fixed at CH 1, SEQ data at CH 2. OMNI ON until parameter 86 is called.
	MODE MESSAGES	Reception only OMNI ON/OFF	Sends OMNI OFF, POLY ON at SEQ START Sends OMNI ON, POLY ON at SEQ STOP
	DATA DUMP	SEND/RECEIVE OF DATA DUMP	Not available with POLY-800 alone.

## 2. MAIN CIRCUIT EXPLANATION

### KEYBOARD DATA PROCESSING AND PANEL SWITCH OPERATION

There are six 8-tone keyboard buses (plus 1 tone for high C). IC34 decodes addresses for CPU bus line supply.

Key on/off data is read by the CPU via the IC33 buffer.

When the CPU receives key data, it instantly outputs pitch data to the TG. (Tone Generator)

Note: If IC34 (TC40H138) fails, then there will be no sound for some of all groups of eight notes. If IC33 (TC40H240) fails then sound will not be heard for every eighth note.

Switch operation is exactly the same as the keyboard.

DC01 and DC02 octave switching is read by the CPU via matrix circuit and performed by IC3 (MSM5232) itself. The MSM5232 output goes through waveform synthesis circuit (which includes IC's 4, 5, and 6) and is input to filter chip IC1 (NJM2069).

Likewise, EG (DEG1, DEG2, DEG3), LEVEL1, LEVEL2, CUTOFF, and other switching is read by the CPU via the same matrix. The CPU processes the data and controls IC2069 via a D/A converter and time sharing CV circuit.

Data of sounds created by the user is stored in static RAM KLM-779 IC20 (MPD4464). Therefore, to maintain all program data when the unit is turned off, it is necessary for this type of memory to have a battery have a battery backup. Although the system does contain a built-in lithium battery to protect the memory, it is housed in the main circuit board KLM-1032 — not in KLM-779 which contains the RAM. Consequently, if the KLM-779 is disconnected, timbre data will be erased.

As for the delay circuitry, a Gate Array (MPD65010 CW-113), such as is used in the DW-8000 is used for digital delay, providing delay according to signal specified time (max. of 1024 seconds).

The DRAM for external connection is 256Kbit.

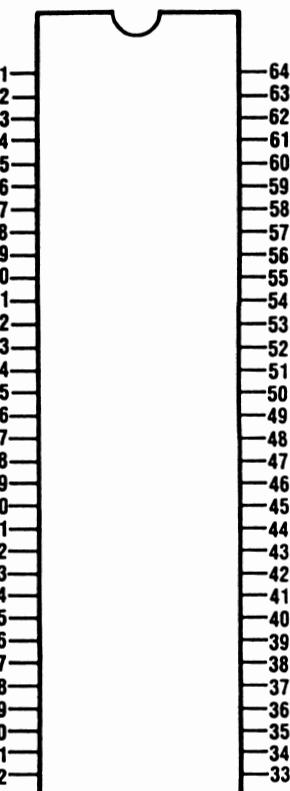
The Digital Delay and Equalizer circuitry are controlled by latched data of IC25 (74HC174) which is connected to the DATA BUS from the main circuit board KLM-1032 CPU. This control is carried out via FET switches F1 and F3 ON/OFF control of Digital Delay parameter settings, EQ parameter setting and Digital Delay circuitry.

# 3. $\mu$ PD 65010 CW-113 SPECIFICATIONS

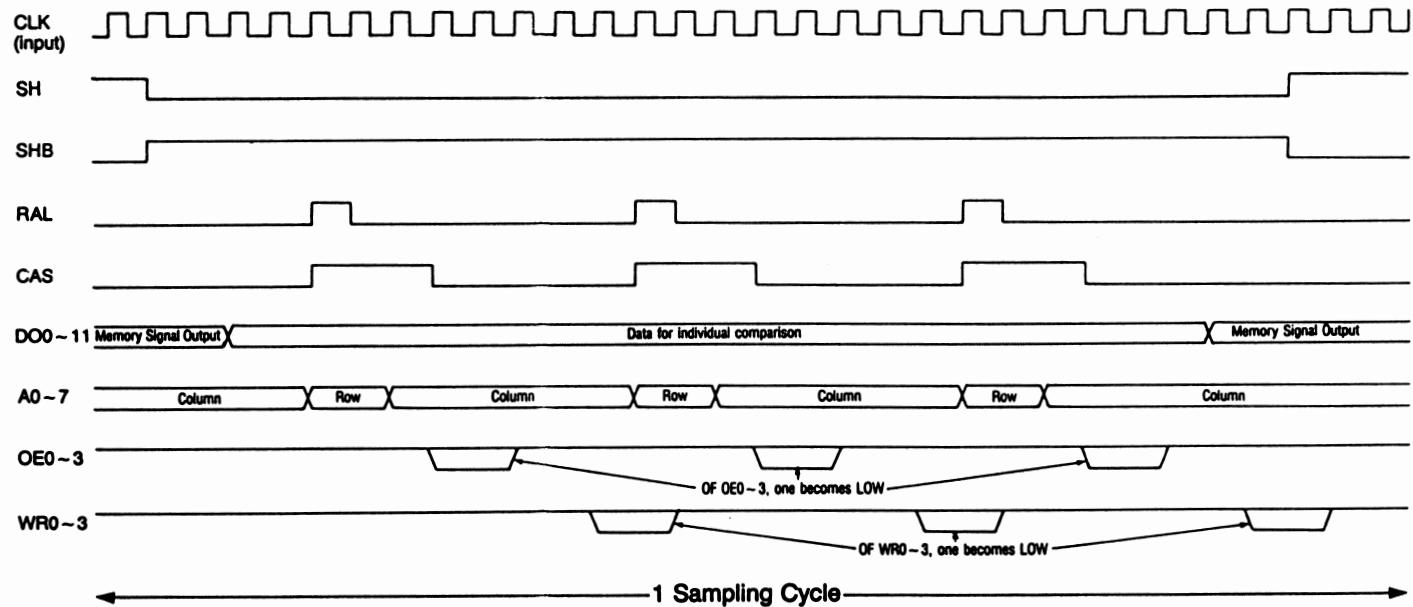
## TERMINAL NAMES

Pin No.	Pin Name	I/O	Pin No.	Pin Name	I/O	Pin No.	Pin Name	I/O
1	HOLD	I	23	DO8	O	44	A0	O
2	RST1	I	24	DO7	O	45	WR0	O
3	RST2	I	25	DO6	O	46	IO3	I/O
4	SPON	I	26	DO5	O	47	IO2	I/O
5	STRT	I	27	DO4	O	48	CAS	O
6	X1	I	28	CO3	O	49	OE0	O
7	PRSR	I	29	DO2	O	50	IO1	I/O
8	256K	I	30	DO1	O	51	IO4	I/O
9	D9	I	31	DO0	O	52	OE1	O
10	D8	I	32	GND	0V	53	OE2	O
11	TCO	O	33	WR3	O	54	OE3	O
12	TE13	I	34	WR2	O	55	D0	I
13	TMOD	I	35	WR1	O	56	D1	I
14	MTEN	I	36	A7	O	57	D2	I
15	MUTB	O	37	A4	O	58	D3	I
16	MUTE	O	38	A3	O	59	D4	I
17	SHB	O	39	A5	O	60	D5	I
18	SH	O	40	A2	O	61	D6	I
19	DATA	I	41	A6	O	62	D7	I
20	DO11	O	42	A1	O	63	CLK	I
21	DO10	O	43	RAS	O	64	VDD	+5V
22	DO9	O						

## PIN CONFIGURATION



## OUTPUT TERMINAL TIMING CHART



NOTE: The timing shown is for normal operation, with  $\times 1$  input being low.

# 8. CHECK AND ADJUSTMENT PROCEDURE

## ADJUSTMENT PROCEDURE

### Caution:

This product has been thoroughly adjusted at the factory before shipment. Therefore do not adjust anything other than those VRs required for servicing.  
BEFORE making any calibration adjustments, Be sure

that test data is loaded into POLY-800.

The following setting chart shows the program data used for service testing. After inputting the data, save it on tape for future time saving convenience.

### PROGRAM no. 11 (noise level):

Parameter:	17 18 31 32 33 35 37 61 62 63 64 65 66 83 84
Value:	0 1 99 0 0 0 15 0 0 31 0 31 0 0 0

### PROGRAM no. 21 (master oscillator):

Parameter:	11 12 13 14 15 16 17 18 31 32 33 35 38 41 42 43 44 45 46 83 84
Value:	2 2 1 0 0 0 30 1 60 0 0 0 0 0 31 0 31 0 0 0

### PROGRAM no. 13 (cut off):

Parameter:	11 12 13 14 15 16 17 18 31 32 33 35 37 41 42 43 44 45 46 83 84
Value:	2 2 1 0 0 0 31 1 12 12 2 0 0 0 0 31 0 31 0 0 0

### PROGRAM no. 14 (resonance):

Parameter:	11 12 13 14 15 16 17 18 31 32 33 35 37 41 42 43 44 45 46 81 82 83 84
Value:	2 2 1 0 0 0 31 1 99 15 0 0 0 0 0 31 0 31 0 15 0 0 0

### PROGRAM no. 15 (delay 1):

Parameter:	11 12 13 14 15 16 17 18 31 32 33 35 37 41 42 43 44 45 46 61 71 72 73 74 75 76 77 81 82 83 84 85 86 81 88
Value:	1 1 1 1 1 1 31 1 99 0 0 1 0 0 0 7 0 0 0 0 0 50 15 0 0 15 0 0 0 0 0 0 2 1 1 0

### PROGRAM no. 16 (delay 2):

Parameter:	11 12 13 14 15 16 17 18 31 32 33 35 37 41 42 43 44 45 46 61 71 72 73 74 75 76 77 81 82 83 84 85 86 81 88
Value:	1 1 1 1 1 1 31 1 99 0 0 1 0 0 0 7 0 0 0 0 0 0 0 15 0 0 0 0 0 0 0 0 2 1 1 0

#### 1. Power supply circuit (KLM-1032)

Be sure that the specified AC adapter is used: 9V, 300mA,

##### 1) +5V check and adjustment:

Use a DVM (digital voltmeter) to check KLM-596 connector CN6 Pin 6 and confirm +5V ( $\pm 0.005V$ ). Adjust VR1 if necessary.

##### 2) -5V check:

Use a DVM to check KLM-596 connector CN6 Pin 8 and confirm -5V (within -4.7V ~ -5.7V)

#### 2. D/A converter check and adjustment (KLM-1032)

With joystick bend control at center position: (BEND INT MAX) connect DVM to KLM-596 IC10 (TL062) Pin 7 and confirm 1.986V  $\pm 0.005V$ . Adjust VR4 if necessary.

##### Reference data:

3.990V for an upward pitch bend and  
0.020V for a downward pitch bend.

#### Note:

Adjustment is easiest in the joystick circuit although the idea is to obtain a 4V  $\pm 0.004V$  output from IC 38 (TL062) by adjusting the D/A converter when IC 81C55 port A output is all high.

#### 3. Noise level check and adjustment: (KLM-1032)

1) Select program no. 11.

2) Depress C3 key and set to HOLD.

3) Connect on oscilloscope to KLM-596 CN6A 3 pin and confirm noise level of 0.3Vp-p ( $\pm 20\%$ ).

4) Adjust VR3 if necessary.

#### 4. Master oscillator check and adjustment: (KLM-1032)

Set tune knob to center and bend intensity to maximum. Connect AT-12 to line out jack.

- 1) Select program no. 12.
  - 2) Play C3 key and set to HOLD.
  - 3) Confirm AT-12 indication of — 1 OCT, C, 0 cent. If necessary, adjust coil KL-003.
  - 4) Next, move joystick to maximum upward pitch bend position and confirm AT-12 reading of — 1 OCT, G, +35 cents. Adjust KLM-601 VR2 if necessary.
  - 5) At maximum joystick downward pitch bend, AT-12 indication should be — 2 OCT, —35 cents. Adjust KLM-601 VR1 if necessary.
- VR3 is a semi-fixed resistor to fix range of tune VR on front panel.  
Confirm +40 ~ +70 cents when tune VR is at # max position.  
● Confirm —40 ~ —70 cents when tune VR is at b max position.  
If necessary, Adjust VR3.

#### 5. Cutoff check and adjustment: (KLM-1032)

- 1) Select program no. 13.
- 2) Play C3 and set to HOLD.
- 3) Connect on oscilloscope to CN6A pin 3 and observe waveform as in figure 1.
- 4) Adjust VR2 to obtain maximum waveform amplitude.

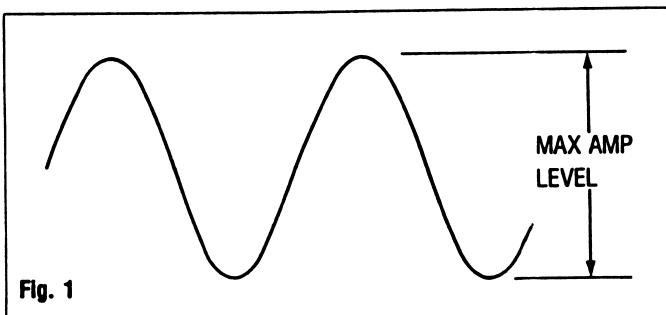
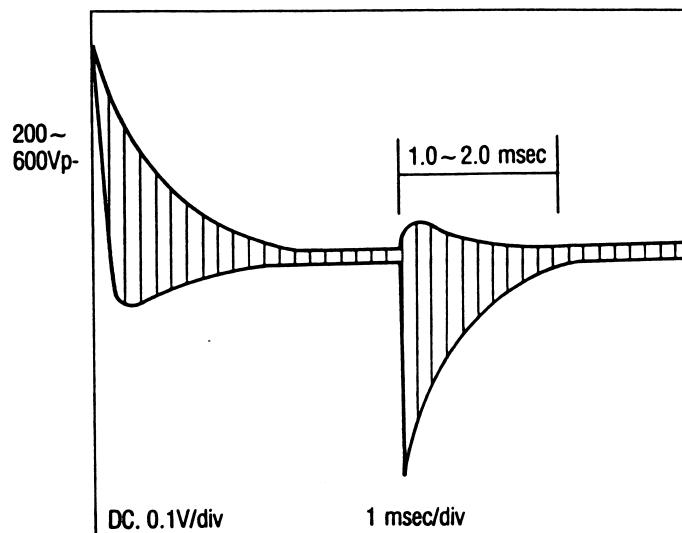


Fig. 1

#### 6. Resonance check and adjustment: (KLM-1032)

- 1) Select program no. 14.
- 2) Play C3 and set to HOLD.
- 3) Confirm to oscillation and confirm that waveform is as shown in figure 2.
- 4) Adjust VR5 if necessary to prevent oscillation or to correct waveform deviation from figure 2 example.



#### 7. S/H CLOCK check and adjustment

##### 1. S/H CLOCK Verification, Adjustment

- 1) Connect a frequency counter to TEST POINT 3 (TP3).
- 2) Check that the frequency counter displays 20kHz ± 0.5kHz.
- 3) Adjust VR3 if necessary.

**NOTE:**  
Waveforms on the oscilloscope are as follows; (Fig-1)

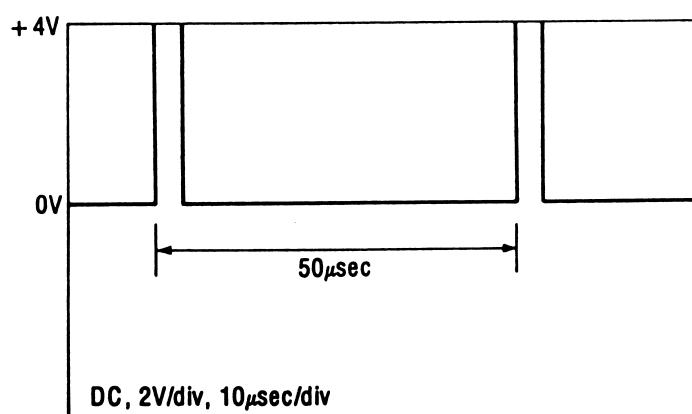
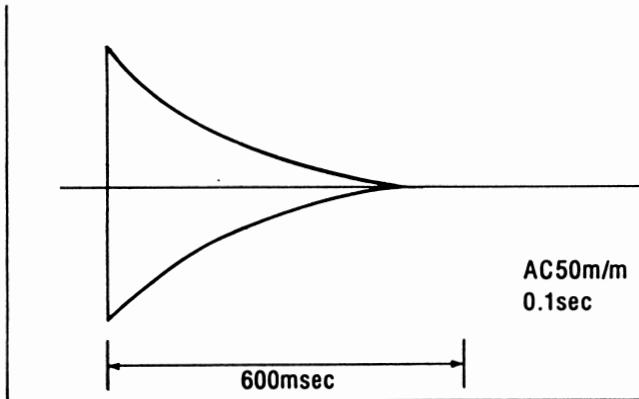


Fig-1

## **2. FEEDBACK TIME Verification, Adjustment**

- 1) Select program No. 15.
- 2) Connect on oscilloscope (AC, 50mV/div, 0.1 sec/div) to TP1.
- 3) Play C3 key, and check that the envelope of the waveform (from peak of waveform to decay) is 600msec  $\pm$  50msec. (Fig-2)
- 4) Adjust VR 1 if necessary



**Fig-2**

## **3. ANALOG COMPANDER NE572 Verification, Adjustment**

- 1) Select program No. 16.
- 2) Connect on oscilloscope (AC 50mV/div, 0.1 sec/div) to TP1. (Connect ground to TP2)
- 3) Play C3 key, and check on the oscilloscope that visible waveforms are formed which are uniform in size and shape.

**Note:**

Although this can be adjusted via VR2, because it is fixed at a fully counterclockwise position, so it should not be turned.

# 9. PARTS LIST

## PARTS LIST

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>CARBON RESISTORS</b>				
10009000	Y O OHM	KLM-1032		2
10013710	S1/4JY 1M			1
10016610	1/6JY 100K	KLM-601		2
10016722	1/6JY 2.2M			1
10113747	S1/4JT 4.7M	KLM-1032		1
10413247	S1/4JYTP 47 OHM			3
10413318	S1/4JYTP 180 OHM	KLM-1035		8
10413322	S1/4JYTP 220 OHM	KLM-1032		2
10413327	S1/4JYTP 270 OHM			1
10413347	S1/4JYTP 470 OHM			1
10413410	S1/4JYTP 1K			8
10413422	S1/4JYTP 2.2K	KLM-599		1
		KLM-1032		1
10413439	S1/4JYTP 3.9K	KLM-599		1
10413510	S1/4JYTP 10K	KLM-1032		3
10413533	S1/4JYTP 33K			1
10413539	S1/4JYTP 39K			8
10413562	S1/4JYTP 62K	KLM-599		1
10413610	S1/4JYTP 100K	KLM-1032		4
				2
10413710	S1/4JYTP 1M			1
10416210	1/6JTP 10 OHM			1
10416215	1/6JTP 15 OHM			1
10416222	1/6JTP 22 OHM	KLM-779		2
10416247	1/6JTP 47 OHM	KLM-1032		2
10416310	1/6JTP 100 OHM	KLM-779		4
		KLM-1032		3
10416315	1/6JTP 150 OHM			2
10416322	1/6JTP 220 OHM			3
10416333	1/6JTP 330 OHM	KLM-779		2
10416336	1/6JTP 360 OHM	KLM-1032		1
10416347	1/6JTP 470 OHM			1
10416351	1/6JTP 510 OHM	KLM-779		3
10416356	1/6JTP 560 OHM			1
10416382	1/6JTP 820 OHM	KLM-1032		1
10416410	1/6JTP 1.0K	KLM-779		7
		KLM-1032		6
10416412	1/6JTP 1.2K	KLM-779		1
10416422	1/6JTP 2.2K			1
10416433	1/6JTP 3.3K	KLM-1032		2
		KLM-779		3
10416439	1/6JTP 3.9K	KLM-1032		1
				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
10416447	1/6JTP 4.7K		KLM-779	9
			KLM-1032	2
10416456	1/6JTP 5.6K		KLM-779	1
10416468	1/6JTP 6.8K		KLM-1032	3
10416475	1/6JTP 7.5K		KLM-779	1
10416482	1/6JTP 8.2K		KLM-1032	1
10416491	1/6JTP 9.1K		KLM-779	2
10416510	1/6JTP 10K		KLM-1032	11
			KLM-779	15
10416511	1/6JTP 11K		KLM-779	1
10416512	1/6JTP 12K		KLM-1032	16
10416513	1/6JTP 13K		KLM-779	1
10416515	1/6JTP 15K		KLM-1032	1
10416516	1/6JTP 16K		KLM-779	1
10416518	1/6JTP 18K		KLM-779	5
10416520	1/6JTP 20K		KLM-779	3
10416522	1/6JTP 22K		KLM-1032	7
10416524	1/6JTP 24K		KLM-779	1
10416527	1/6JTP 27K		KLM-779	2
10416533	1/6JTP 33K		KLM-1032	1
10416539	1/6JTP 39K		KLM-779	2
10416547	1/6JTP 47K		KLM-1032	7
10416556	1/6JTP 56K		KLM-779	1
10416562	1/6JTP 62K		KLM-1032	2
10416568	1/6JTP 68K		KLM-779	3
10416582	1/6JTP 82K		KLM-1032	2
10416591	1/6JTP 91K		KLM-779	1
10416610	1/6JTP 100K		KLM-1032	3
10416620	1/6JTP 200K		KLM-779	8
10416622	1/6JTP 220K		KLM-779	1
10416633	1/6JTP 330K		KLM-1032	1
10416647	1/6JTP 470K		KLM-779	1
10416656	1/6JTP 560K		KLM-1032	1
10416710	1/6JTP 1.0M		KLM-779	3

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
10416710	1/6JTP 1.0M	KLM-1032		2
10416722	1/6JTP 2.2M	KLM-779		1
<b>METAL FILM RESISTORS</b>				
12512261	1/6TP 26.1OHM	KLM-1032		1
12514100	1/6TP 1.00K			2
12514604	1/6TP 6.04K			1
12515100	1/6TP 10.0K	KLM-599		1
12515118	1/6TP 11.8K	KLM-1032		1
12515147	1/6TP 14.7K	KLM-599		1
12515249	1/6TP 24.9K	KLM-1032		1
12515499	1/6TP 49.9K			1
12515511	1/6TP 51.5K			1
12515845	1/6TP 84.5K			1
12516100	1/6TP 100K			5
12516200	1/6TP 200K			1
<b>BLOCK RESISTORS</b>				
13504533	RKC1/8B4J 33K	KLM-1032		2
13506510	RKC1/8B6J 10K			1
13508410	RKC1/8B8J 1K			1
13508510	RKC1/8B8J 10K			2
13807002	RN3QEL472Z01	KLM-779		1
13810525	RKM10L253F 25K	KLM-1032		1
13890470	RKM 5LW103			2
<b>THERMISTOR</b>				
18032310	TD5-A110DA	KLM-1032		1
<b>MYLAR CAPACITORS</b>				
20402410	50V 0.001UF	KLM-599 KLM-779 KLM-1032		2 1 5
20402415	50V 0.0015UF			1
20402418	50V 0.0018UF			1
20402422	50V 0.0022UF	KLM-779		2
20402427	50V 0.0027UF			2
20402433	50V 0.0033UF	KLM-779		1
20402447	50V 0.0047UF	KLM-1032		1
20402456	50V 0.0056UF	KLM-779		2
20402510	50V 0.01UF	KLM-1032		4
20402512	50V 0.012UF	KLM-779		1
20402522	50V 0.022UF			4
20402547	50V 0.047UF			1
20402568	50V 0.068UF	KLM-1032 KLM-779		16 1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
20402610	50V 0.1UF	KLM-779		2
<b>CERAMIC CAPACITORS</b>				
21352471	50V 47PF	KLM-1032		2
21356101	25V 0.1UF	KLM-779		2
21452220	50V 22PF TP	KLM-1032		1
21452560	50V 56PFTP	KLM-779		2
21453100	50V 100PF TP	KLM-1032		1
21453180	50V 180PF	KLM-779		2
21453220	50V 220PF TP			1
21453330	50V 330PF TP			2
21453470	50V 470PF TP			1
21453680	50V 680PF TP			1
21453820	50V 820PF TP	KLM-1032		1
21455470	50V 0.047UFTP	KLM-779		7
21456100	25V 0.1UF TP	KLM-1032		22
		KLM-779		1
		KLM-1032		16
<b>NOISE FILTER</b>				
2180050	ZJK-5103-00	KLM-1032		1
<b>EMI FILTER</b>				
21950100	DSS310-55D223S	KLM-779 KLM-1032		4 2
<b>TANTALUM CAPACITORS</b>				
22005247	10V 47UFM	KLM-1032		1
22407122	16V 2.2UF	KLM-779		1
<b>ELECTROLYTIC CAPACITORS</b>				
25402310	10V 100UF	KLM-1032		6
25402322	10V 220UF	KLM-599		1
25403210	16V 10UF	KLM-779		1
		KLM-1032		14
25403233	16V 33UF	KLM-779		9
25403247	16V 47UF			1
25403310	16V 100UF			15
		KLM-1032		4
25406022	50V 0.22UF	KLM-779		4
25406047	50V 0.47UF	KLM-1032		2
25406110	50V 1UF	KLM-779		2
		KLM-1032		8
25406122	50V 2.2UF	KLM-779		13
		KLM-1032		8
25426110	50V 1UF	KLM-1032		1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
25463210	16V 10UF	KLM-1032		2
25466047	50V 0.47UF			1
25466122	50V 2.2UF	KLM-779		1
<b>TRANSISTORS</b>				
30100328	2SB744 A P/Q	KLM-1032		2
30201107	2SC1583 G			2
30202299	2SC2785 K SELECTED (SILVER)			1
30300528	2SD794A P/Q			1
30400050	2SA1175	KLM-779		7
		KLM-1032		3
30420070	2SC2785	KLM-779		1
		KLM-1032		2
<b>DIGITAL TRANSISTORS</b>				
30430010	DTA-114N	KLM-1032		1
30430020	DTC-114N			4
<b>FET</b>				
30460022	2SK381-34-B/C	KLM-779		5
<b>DIODES</b>				
3100800	1S2473	KLM-601		1
31001100	1SS-53	KLM-1032		1
31001500	SR1K-2			1
<b>VARACTOR</b>				
31020300	1SV-100	KLM-1032		1
<b>LED</b>				
31201500	LT-8001P	KLM-1032		16
31206200	SL9263	KLM-1035		3
<b>DIODES</b>				
31400100	1S1555	KLM-1032		1
31400300	1S-2473			13
		KLM-1035		18
31401300	1SS-133	KLM-779		10
<b>ZENER DIODES</b>				
31422300	HZ-6B1L-TD	KLM-1032		1
31422400	HZ-3ALL-TD			1
31422700	HZ-11A3-TD			1
<b>DOUBLE DIODES</b>				
31500100	MC931	KLM-1032		4
<b>ICs</b>				
32001023	UPD-4066 BC	KLM-779		1
32001085	UPD65010CW-113			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
32001087	UPC319C	KLM-779		1
32001094	74HC139C			1
32001095	74HC174C			1
32001101	74HC08C			1
32001102	UPD4464C-15			1
32003011	74HC(40H)000 P	KLM-1032		2
32003021	74HC(40H)074 P			2
32003026	74HC(40H)138 P			2
32003030	74HC(40H)151 P			1
32003041	74HC(40H)174 P			2
32003043	74HC(40H)032 P			1
32003047	74HC(40H)240 P			1
32003058	74HC(40H)373 P			1
32003063	74HC(40H)393 P			1
32003070	TC9154P	KLM-779		2
32003071	TC9156AP			1
32004016	HD-14050 BP	KLM-1032		1
32004017	HD-14051 BP			2
32004039	HD-14053BP			1
32004063	HD-63B50P			1
32004095	HN4827128G-25	KLM-779		1
32004105	HM50464P-15			1
32006009	MSM-5232RS	KLM-1032		1
32006010	MSM-80C85ARS			1
32006011	MSM-81C554RS			1
32007003	BA-618			1
32009005	NJM-4558 S	KLM-779		7
32009007	NJM-2902 N	KLM-1032		4
32009015	NJM-2903 D			1
32009028	NJM-3404AD			3
32009029	NJM-2058 D	KLM-599		1
32009036	NJM2069A-D	KLM-1032		1
32009044	NJM4560S	KLM-779		1
32011024	M-5223	KLM-1032		2
32011025	M-54513P			1
32011065	M5223L	KLM-779		4
32013001	PST-518	KLM-1032		1
32021011	TL-072			1
32021022	TL-062			2
32025003	NE572N	KLM-779		1
<b>PHOTO COUPLER</b>				
33000900	PC-900	KLM-1032		1
<b>CERAMIC OSCILATOR</b>				
33500900	EFO-A6ROM01	KLM-1032		1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>P.C. BOARDS (without parts)</b>				
34059900	PARTS KLM-599	KLM-599		1
34060100	PARTS KLM-601	KLM-601		1
<b>P.C. BOARDS</b>				
34077900	KLM-779	KLM-779		1
34310320	KLM-1032	KLM-1032		1
34310350	KLM-1035	KLM-1035		1
<b>SEMI FIXED VRs</b>				
35002215	RH0615C 1.5K	KLM-1032		1
35002247	RH0615C 4.7K	KLM-779		3
35002310	RH0615C 10K	KLM-1032		1
35002322	RH0615C 22K			1
35002410	RH0615C 100K			1
35002468	RH0615C 680K	KLM-601		1
35002510	RH0615C 1M	KLM-1032		1
35002515	RH0615C 1.5M	KLM-601		1
35202415	H1021A 150KB			1
<b>VRs</b>				
36016900	RK16Y1110A11A 10KB			2
36204300	RK16112A1A0MA-10KB	KLM-1035		1
<b>SLIDE VRs</b>				
36504000	RS30111A6013A-10KB	KLM-1035		2
36504100	RS30111A6011A-100KC			1
<b>SLIDE SW</b>				
37303900	R-S47836	KLM-1032		4
<b>PUSH SW</b>				
37505700	EVQQJB04K	KLM-1035		18
<b>COILS</b>				
40201200	KD-4	KLM-1032		1
40201300	ELEY-471KA			1
40201400	KL-003			1
<b>AC ADAPTORS</b>				
40502700	KAC-302 UNI/117V		117 US	1
			117 2P	1
40502800	KAC-303 JAM/CSA		JAM	1
40503000	KAC-305 240AU		240 AU	1
40503100	KAC-306 240GE		240 GE	1
			240 RME	1
40503200	KAC-307 240AF		240 AF	1
40503300	KAC-308 220GE		220 GE	1
			220 SE	1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
40503300	KAC-308 220GE		DEMKO SEMKO MEMKO GAF FIMKO VDE	1 1 1 1 1 1
<b>KEYBOARD</b>				
42003100	ESK-7116			1
<b>POWER JACK</b>				
45400300	HEC-0470-01-230		KLM-1032	1
<b>MINI PHONE JACK</b>				
45400900	HSJ0786-01-010		KLM-1032	2
<b>PHONE JACKS</b>				
45404300	YKB21-5012		KLM-1032	3
45404400	YKB21-5010			1
<b>DIN JACK</b>				
45405400	YKF51-5008		KLM-1032	2
<b>HARNESSES</b>				
47040120	HNS-301			1
47040220	HNS-302			1
47040320	HNS-303			1
47040420	HNS-304			1
47040820	HNS-308			1
47040920	HNS-309			1
47057300	HNS-473			1
47057400	HNS-474			1
47057800	HNS-478			1
47057900	HNS-479			1
47058000	HNS-480	KLM-1032		1
47060400	HNS-504			1
47060500	HNS-505			1
47060600	HNS-506			1
<b>CONNECTORS</b>				
47181200	W-P 9012 #51		KLM-779 KLM-1032	1 1
47181300	W-P 9013 #51		KLM-779 KLM-1032	1 1
<b>MP CONNECTORS</b>				
47408804	S4P W-P2604 #51		KLM-1032	2
47408805	S5P W-P2605		KLM-779 KLM-1032	1 1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
47408807	S7P W-P2607	KLM-779 KLM-1035		1 1
47408811	S11P W-P2611	KLM-1032		1
47408814	S14P W-P2614			1
47408815	S15P W-P2615	KLM-779 KLM-1032		1 2
47408904	L4P W-P2804	KLM-599 KLM-1035		1 2
47408905	L5P W-P2805	KLM-599		1
47408911	L11P W-P2811	KLM-1035		1
47408914	L14P W-P2814			1
<b>IC SOCKET</b>				
48001282	28P DICA-28CTI	KLM-779		1
<b>RUBBER FEET</b>				
50008700				1
<b>BATTERY CUSHION</b>				
50008800	16×30×4			1
<b>PUSH SW.</b>				
50008900	CUSHION A			1
50009000	CUSHION B			2
<b>BATTERY</b>				
52001100	SUM2DGB			6
<b>LITHIC BATTERY</b>				
52001200	CR2032 T-4			1
<b>TEST PIN</b>				
54007100	LC-2-G-YELLOW	KLM-779 KLM-1032		3 1
<b>WIRE BAND</b>				
54007200	PLT-1M			3
<b>RIBBON</b>				
54008100				1
<b>SPIRAL CLIP</b>				
54008600	CS-8			2
<b>SHIELDING SHEET</b>				
58018004				1
<b>CAUTION LABEL</b>				
58019400		100V		1
<b>SHIELDING SHEET</b>				
58020600	NO.2			1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>FCC LABEL</b>				
58021000			117 US	1
<b>FTZ LABEL</b>				
58021700			VDE	1
<b>SHIELDING SHEET</b>				
58023300				1
<b>CONNECTION CORD</b>				
60201302	6.3PHYPLUG2.5			1
<b>SLIDE VR KNOB</b>				
62015600	B NO.2 BLK			3
<b>ROTARY VR KNOB</b>				
62015700	NO.2 BLK			1
<b>JOYSTICK LEVER KNOB</b>				
62015800	NO.2 BLK			1
<b>PUSH SW KNOBS</b>				
62012402	B-3 RED			1
62015900	A-3 BLK			7
62015901	A-4 DARK GRY			1
62016000	B-5 BLK			8
62016002	B-6 DARK GRY			1
<b>LED DISPLAY COVER</b>				
63002300				1
<b>PARAMETER INDEX SHEET</b>				
63002400				1
<b>SHIELDING SHEET</b>				
63002500				1
<b>BATTERY TERMINAL (-)</b>				
64058100				1
<b>BATTERY TERMINAL (+)</b>				
64058101				1
<b>JOY STICK Y-SUPPORT</b>				
64058400				1
<b>JOY STICK LEVER FIX PIN</b>				
64058402				2
<b>JOY STICK PLATE</b>				
64062600				1

PARTS CODE	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
<b>STRAP PEG</b>				
64402200				2
<b>JOY STICK BOX</b>				
64610101				1
<b>JOY STICK X-SUPPORT</b>				
64610101				1
<b>JOY STICK LEVER</b>				
64616100				1
<b>UPPER CASE</b>				
64620900				1
<b>LOWER CASE</b>				
64621000				1
<b>BATTERY COVER</b>				
64621100				1
<b>BATTERY HOLDER</b>				
64621200				1
<b>LUG</b>				
67201200	3 N-3			6
<b>SCREWS</b>				
70560508	FE B BZMC 5×8			4
74530308	PLAX B ZMC 3×8			45
74560408	PLAX B BZMC 4×8			3
74560412	PLAX B BZMC 4×12			9
<b>WASHERS</b>				
78430300	TWU ZMC 3		100V	3
			117 US	3
			JAM	3
			117 2P	3
			220 GE	3
			220 SE	3
			240 AF	3
			240 AU	3
			DEMKO	3
			SEMKO	3
			NEMKO	3

PARTS CORD	PARTS NAME SPECIFICATIONS	P.C. BOARD	IDENTIFICATION NO. FUNCTION	Q'TY
			240 GE GAF FIMKO 240 RME VDE	3 3 3 3 3
78690300	PSW 3			1
78690500	PSW 5			

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