DIGITAL PIANO

KSP30/20/10

Service Manual

KAWAI Kawai Musical Instruments Manufacturing Co., Ltd.

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1. P.W.B. INFORMATION

P.W.B. Name	Code No.	
HEP-001(1)	236497	Main P.W.B.(For KSP10)
〃 (2)	236519	〃 (For KSP20)
HEP-009(1):D	236509	Main P.W.B.(For KSP30)
〃 (2):except D	236532	〃 (〃)
HEP-010～013(1)	236499	Panel P.W.B.(For KSP10)
〃 010～014(2)	236515	〃 (For KSP30)
〃 010～014(3)	236518	〃 (For KSP20)
HEP-006,007(1):D	236498	Main Amp. Power Supply (For KSP20)
〃 (2):US,CA	236500	〃 (For KSP10)
〃 (3):NE	236501	〃 (〃)
〃 (4):GE110V	236502	〃 (〃)
〃 (5):AU	236503	〃 (〃)
〃 (6):D	236510	〃 (For KSP30)
〃 (7):US,CA	236511	〃 (〃)
〃 (8):NE	236512	〃 (〃)
〃 (9):GE110V	236513	〃 (〃)
〃 (10):AU	236514	〃 (〃)

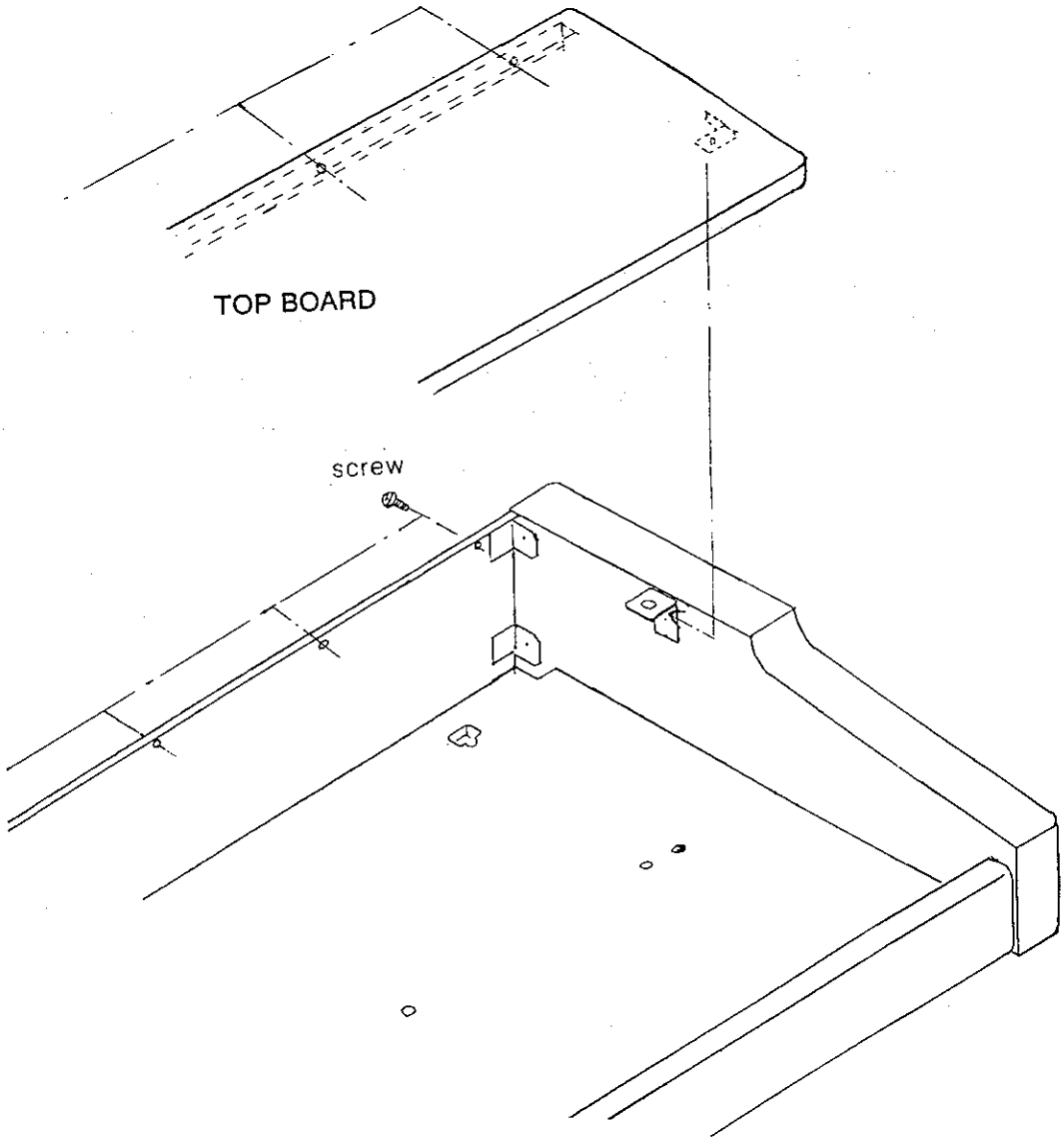
2. SEMICONDUCTORS LIST

	Code No.	Part Name	Pieces			Description
			KSP10	KSP20	KSP30	
IC	804050	74HC04FP	1	1	1	Inverter
	804055	HD74HC541	1	1	1	Buffer/Driver/Receiver
	805154	74HC74	1	1	1	Flip/Flop(Dual D-Type)
	805758	K005FP(QFP64P)	1	1	1	Key Touch Controller
	806448	74HC03	1	1	1	NAND Gate
	806449	74HC08	1	1	2	AND Gate
	806520	74HC139			1	Decoder/Demultiplexer
	806962	MN19411(QFP64P)	1	1	1	ASP
	807020	HD63266F(QFP64P)			1	Floppy Disk Controller
	807657	K015FP(QFP160P)	1	1	2	Sound Source
	808376	HD64180R1F10(QFP80P)			1	CPU
	808476	MT4C4256Z-8	2	2	2	DRAM
	808618	K016FP(QFP80P)	1	1	1	Filter
	808923	TMP96C141F(QFP80P)	1	1	1	CPU
	808924	MN64761M(QFP42P)	1	1	1	DA CONVERTER

	Code No.	Part Name	Pieces			Description
			KSP10	KSP20	KSP30	
	808925	PD431000AGW-10LL	1	1	1	S.RAM
	808926	PD43256AGU-10L	1	1	1	〃
	808927	74F138SJ	1	1	2	Decoder
	808928	74AC139	1	1	1	Decoder
	808929	74BC573	2	2	2	Latch
	808930	MB3771PF	1	1	1	Reset IC
	808931	BA15532F	3	3	3	OP Amp
	808932	PC400T	1	1	1	Photo coupler
	809270	HM658128ADFP-10			2	PS.RAM
	809271	M66220FP			1	Dual Port RAM
	809272	HD74UH04			1	INVERTER
	809279	74HC157			1	Data Selector
	926595	KP069A(SOP44P)	1	1	1	M.ROM
	926600	KP070 (〃)	1	1	1	〃
	926605	KP071 (〃)	1	1	1	〃
	926610	HP040 (〃)	1	1	1	〃
	926620	HP042(MBM27C2048-12Z)	1	1	1	EP.ROM
	927155	MP090(SOP44P)			1	M.ROM
	927160	MP091(〃)			1	〃
	927165	MP092(〃)			1	〃
	927175	HP044(HN27C256AG-10)			1	EP.ROM
	926615	HP041(TMS27C240-10JL)	1			〃
	927855	HP059(〃)		1		〃
	927170	HP043(〃)			1	〃 (Japan)
	929365	HP063(〃)			1	〃 (except Japan)
	808457	74HC595	8	8	8	Shift Register
	808972	74HC165	8	8	8	Shift Register
	802889	AN7815F	1	1	1	Regulator
	802890	AN7915F	1	1	1	〃
	804920	M5F7805	1	1		〃
	808947	STK4152-MK2	1	1	1	Amp IC
	808948	M5229P	2	2	2	Equalizer
	808949	BA15532N(SIP8P)	2	2	2	OP Amp
	809274	STK720B			1	Regulator
	809275	M5283P			1	VCA
	809276	M5238AL			1	OP Amp

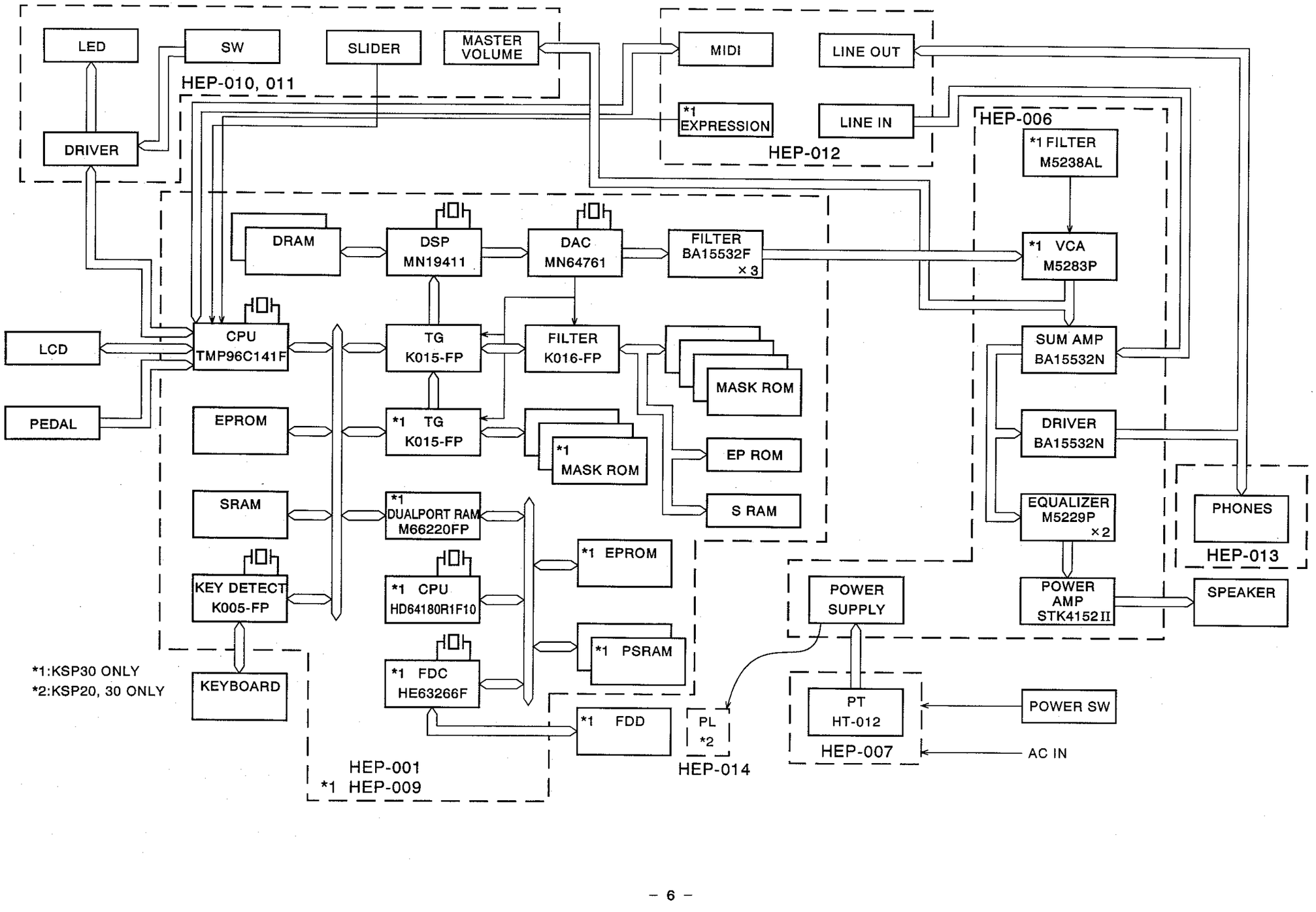
	Code No.	Part Name	Pieces			Description
			KSP10	KSP20	KSP30	
Transistor	808933	2SB1295-6	1	1	1	
	805984	2SD1468SR	3	3	3	
	808950	2SB1322AR	2	2	2	
	808973	DTA114ES	1	1	1	
	808951	2SD1994AR	2	2	2	
Diode	808934	MA741	1	1	1	
	805852	1SR139-100	3	3	3	
	808952	DBF40B	2	2	2	
Zener Diode	809243	GZB6.2C			1	
Oscillator	808935	SMD-49 16.0000MHZ	1	1	1	
	808936	// 20.0000MHZ	1	1	1	
	808937	// 24.0000MHZ	1	1	1	
	808938	// 33.8688MHZ	1	1	1	

3. TOP BOARD OPENING PROCEDURE



1. Remove the 5 (five) back screws.
2. Slide TOP BOARD forward. (Keyboard side)
3. Lift TOP BOARD up and away from the piano.

4. BLOCK DIAGRAM

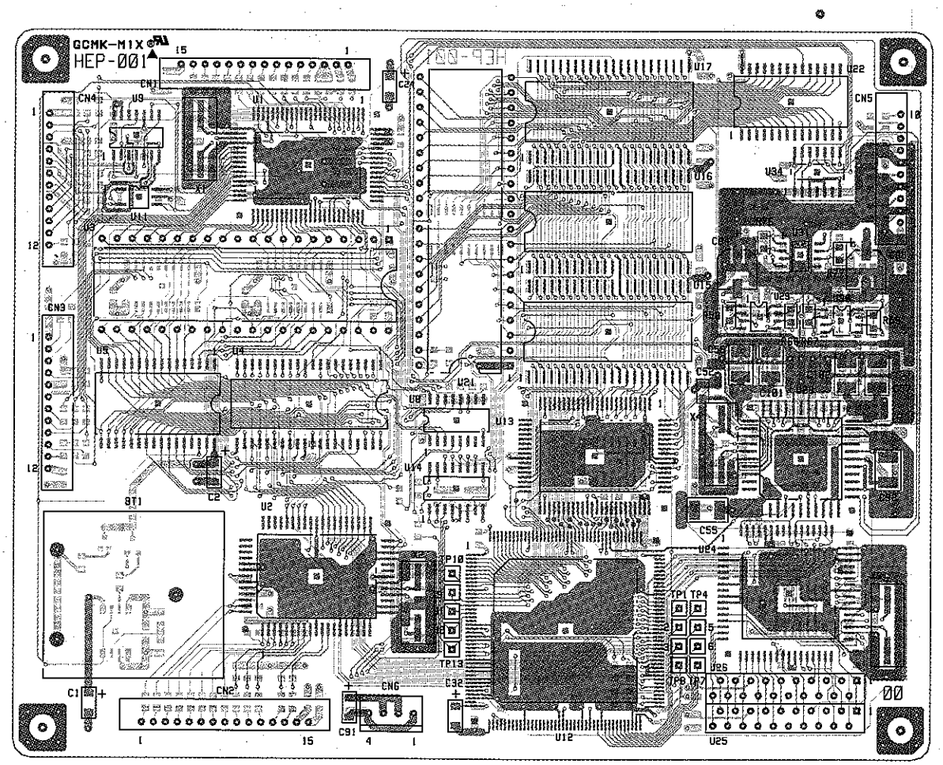


5. HEP-001 PRINTED WIRING BOARD

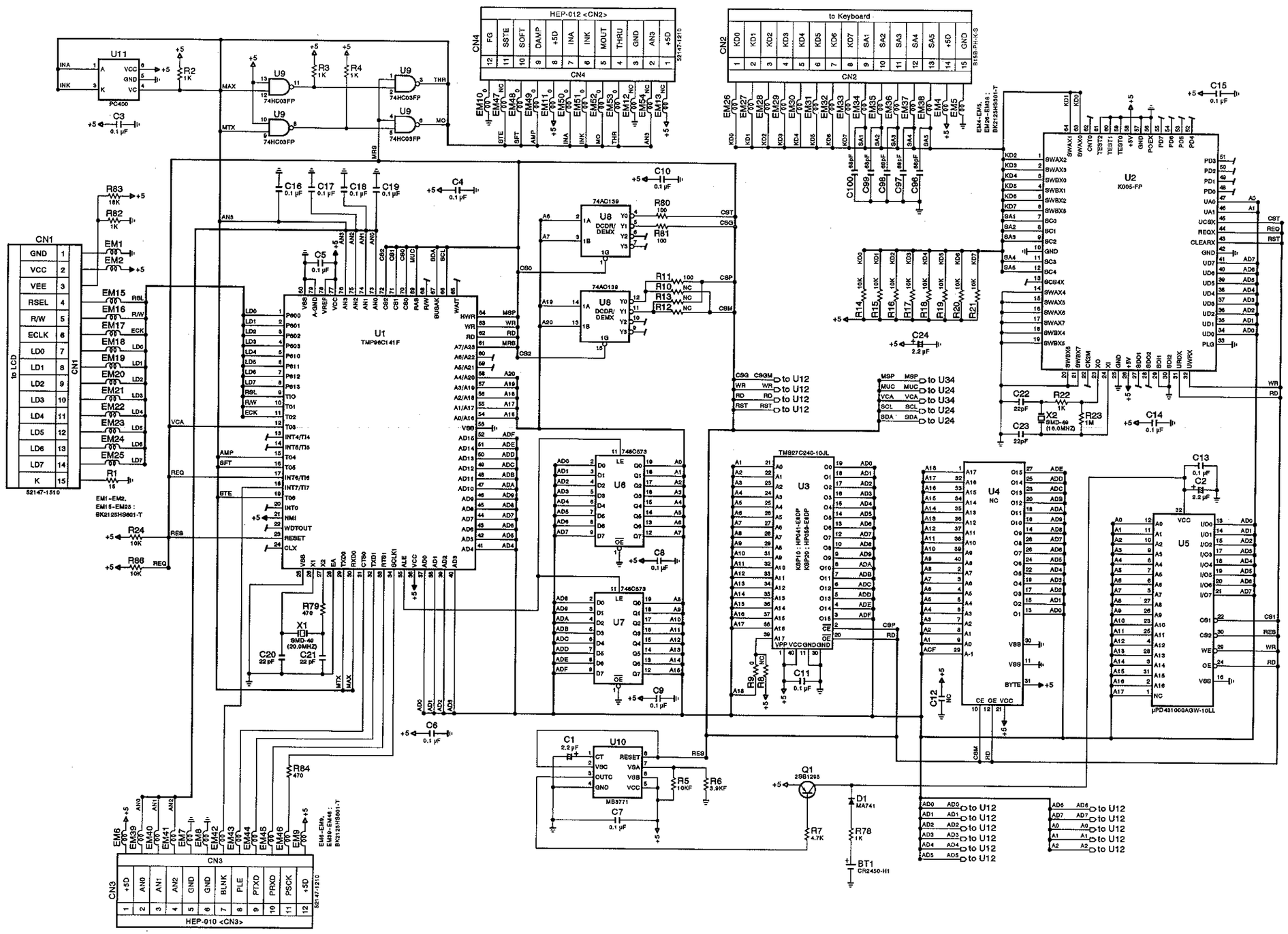
to LCD														
	K	LD7	LD6	LD5	LD4	LD3	LD2	LD1	LD0	ECLK	R/W	RSEL	VEE	VCC	GND
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CN1															

HEP-012 <CN2>			CN4
	+5D	1	
	AN3	2	
	GND	3	
	THRU	4	
	MOUT	5	
	INK	6	
	INA	7	
	+5D	8	
	DAMP	9	
	SOFT	10	
	SSTE	11	
	FG	12	

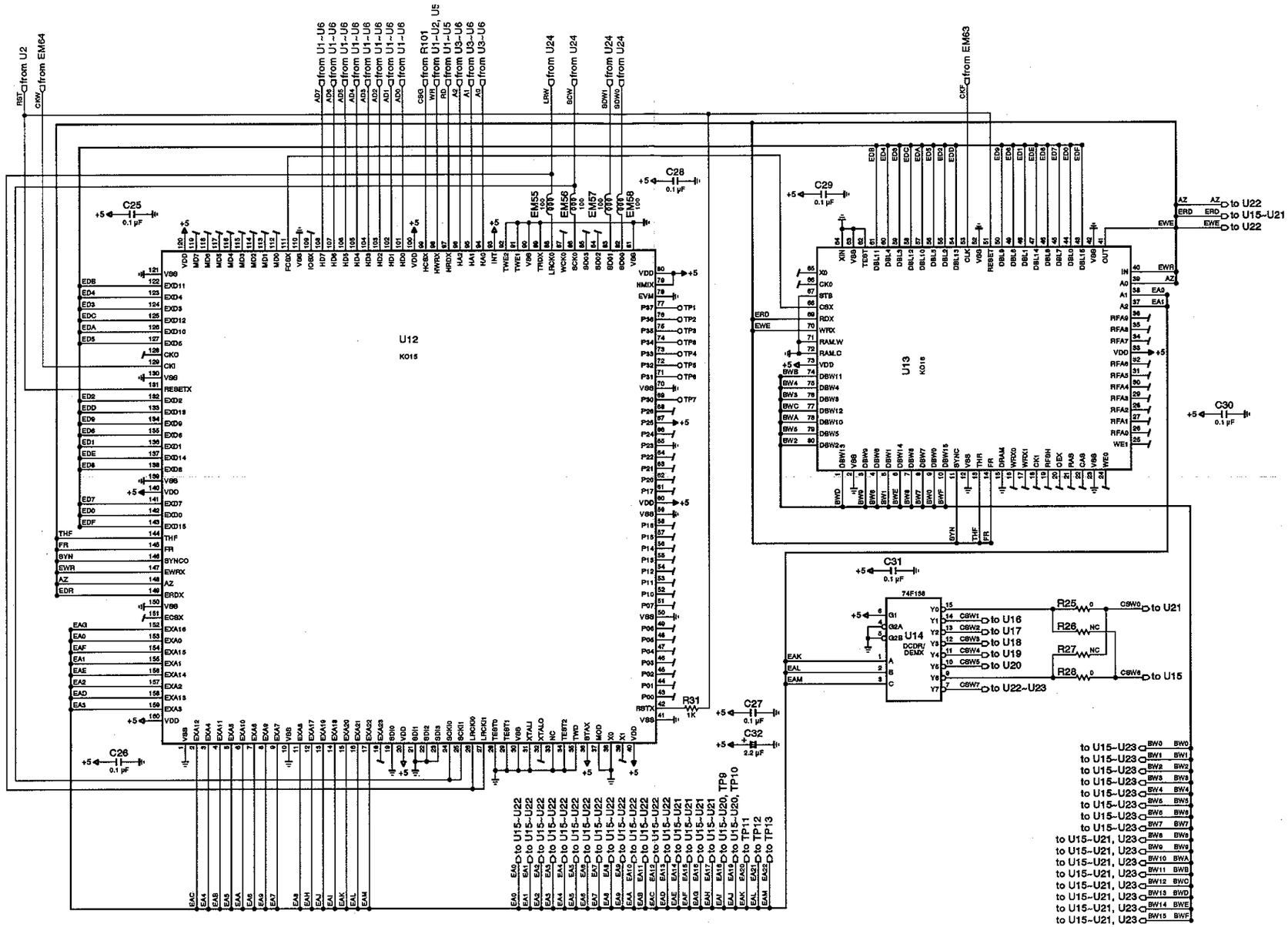
HEP-010 <CN3>			CN3
	+5D	1	
	AN0	2	
	AN1	3	
	AN2	4	
	GND	5	
	GND	6	
	BLNK	7	
	PLE	8	
	PTXD	9	
	PRXD	10	
	PSCK	11	
	+5D	12	



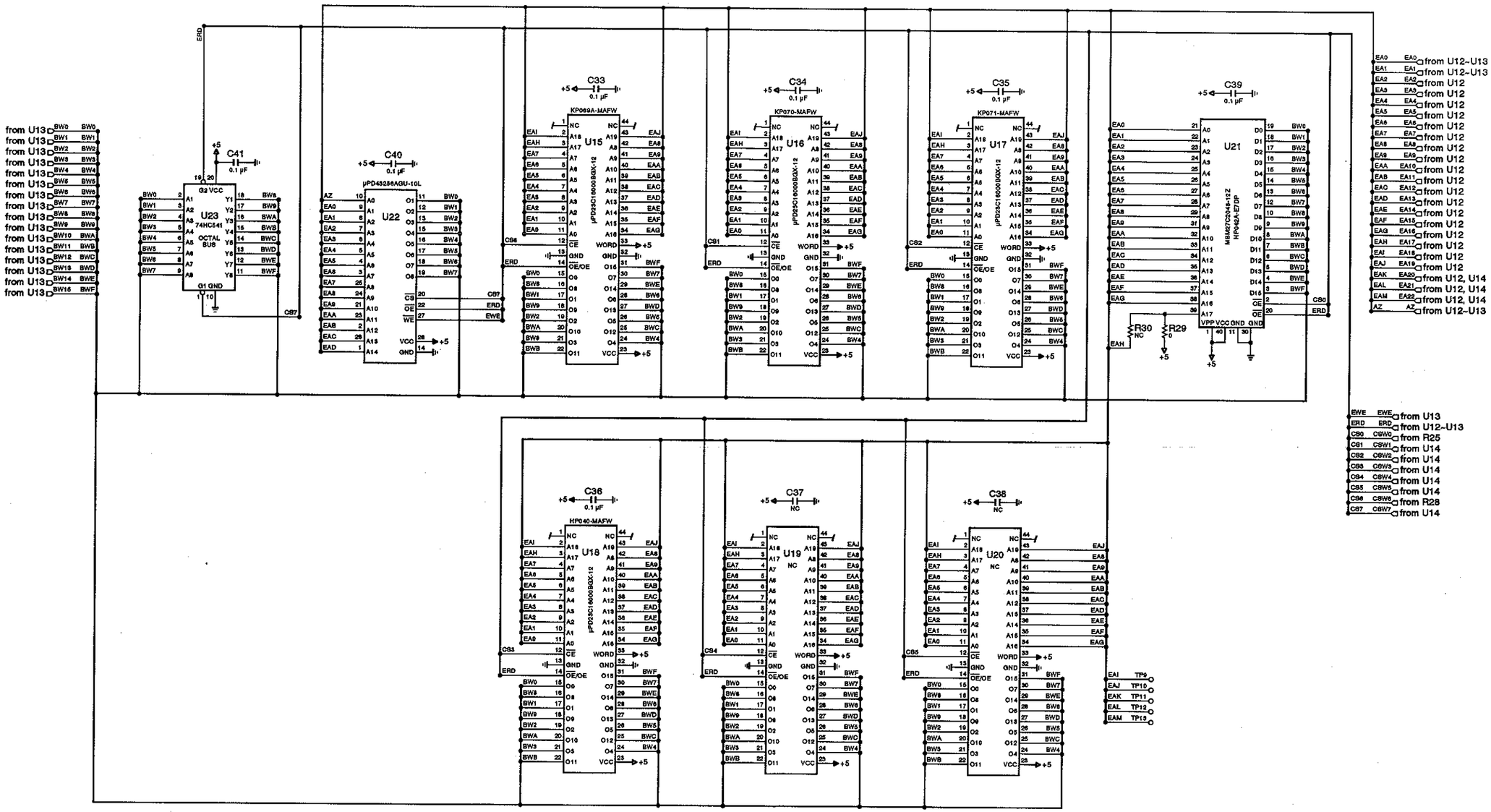
6. HEP-001 CIRCUIT(1/4)



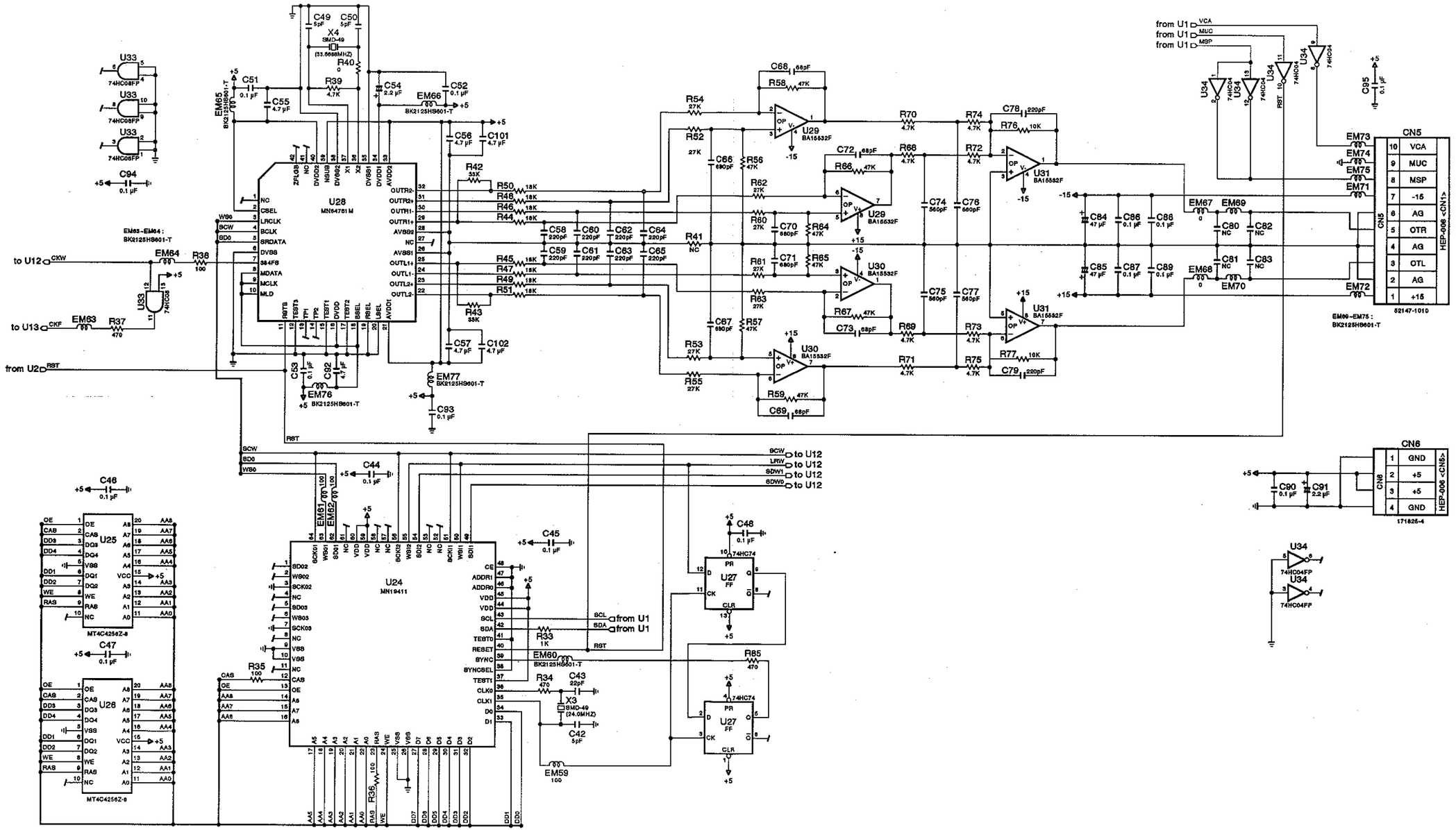
7. HEP-001 CIRCUIT(2/4)



8. HEP-001 CIRCUIT(3/4)



9. HEP-001 CIRCUIT(4/4)

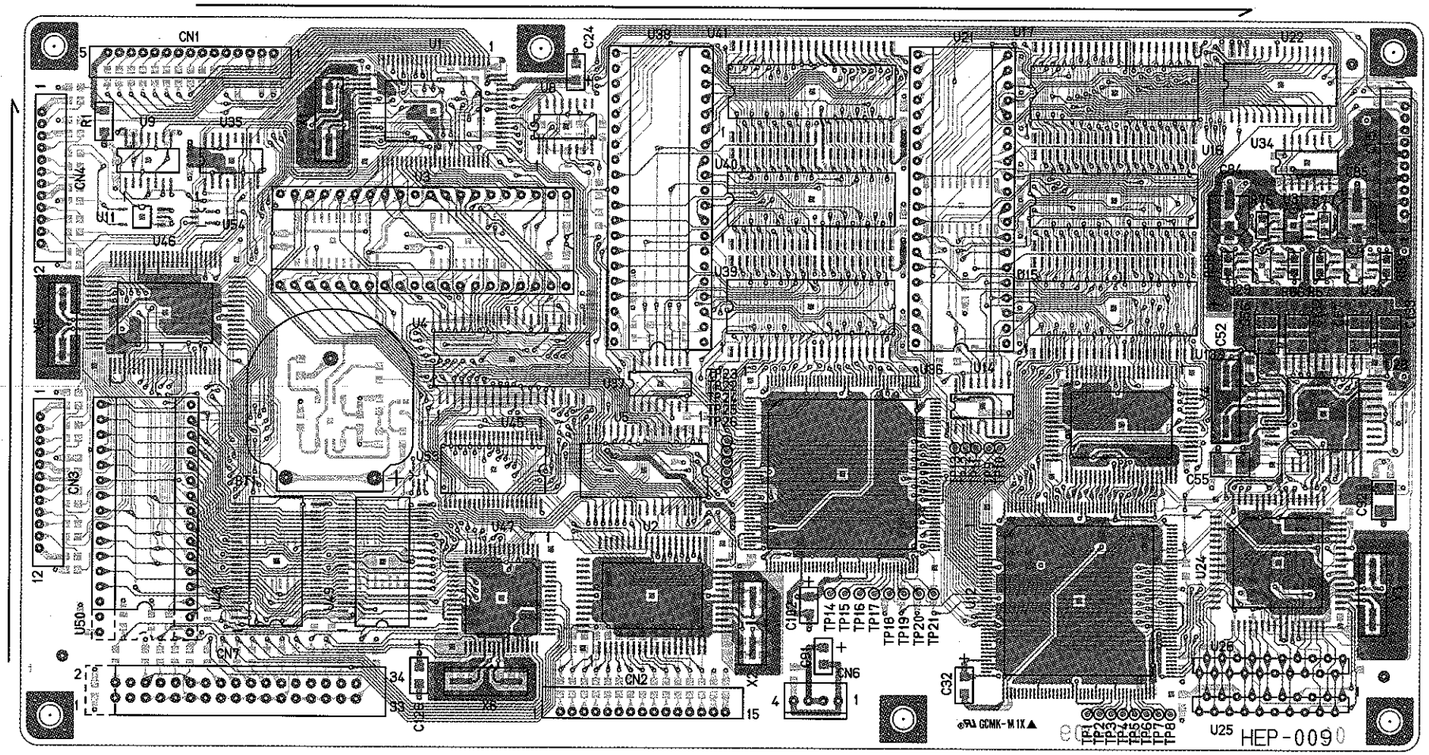


10. HEP-009 PRINTED WIRING BOARD(1/2)

to LCD														
	K	LD7	LD6	LD5	LD4	LD3	LD2	LD1	LD0	ECLK	R/W	RSEL	VEE	VCC	GND
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CN1															

HEP-012 <CN2>			CN4
	+5D	1	
	AN3	2	
	GND	3	
	THRU	4	
	MOUT	5	
	INK	6	
	INA	7	
	+5D	8	
	DAMP	9	
	SOFT	10	
	SSTE	11	
	FG	12	

HEP-010 <CN3>			CN3
	+5D	1	
	AN0	2	
	AN1	3	
	AN2	4	
	GND	5	
	GND	6	
	BLNK	7	
	PLE	8	
	PTXD	9	
	PRXD	10	
	PSCK	11	
	+5D	12	



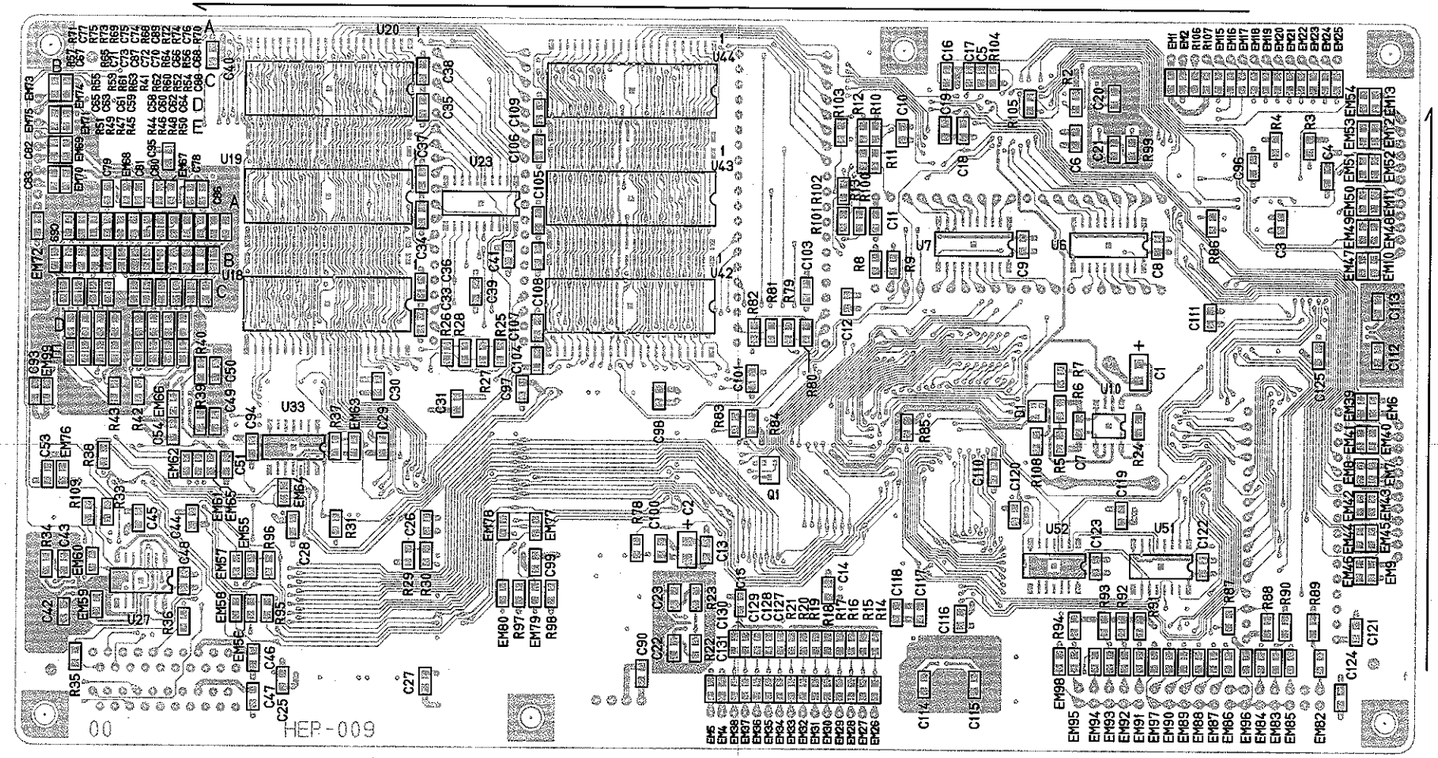
CN5			HEP-006 <CN1>
	10	VCA	
	9	MUC	
	8	MSP	
	7	-15	
	6	AG	
	5	OTR	
	4	AG	
	3	OTL	
	2	AG	
	1	+15	

CN7																																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
	NC	INP	NC	NC	GND	+5	GND	IDX	GND	DSL	GND	+5	GND	+5	GND	MON	GND	HDR	GND	STP	GND	WDT	GND	WGT	GND	TRK	GND	WPT	GND	RDT	GND	HSL	GND	RDY
to FDD																																	

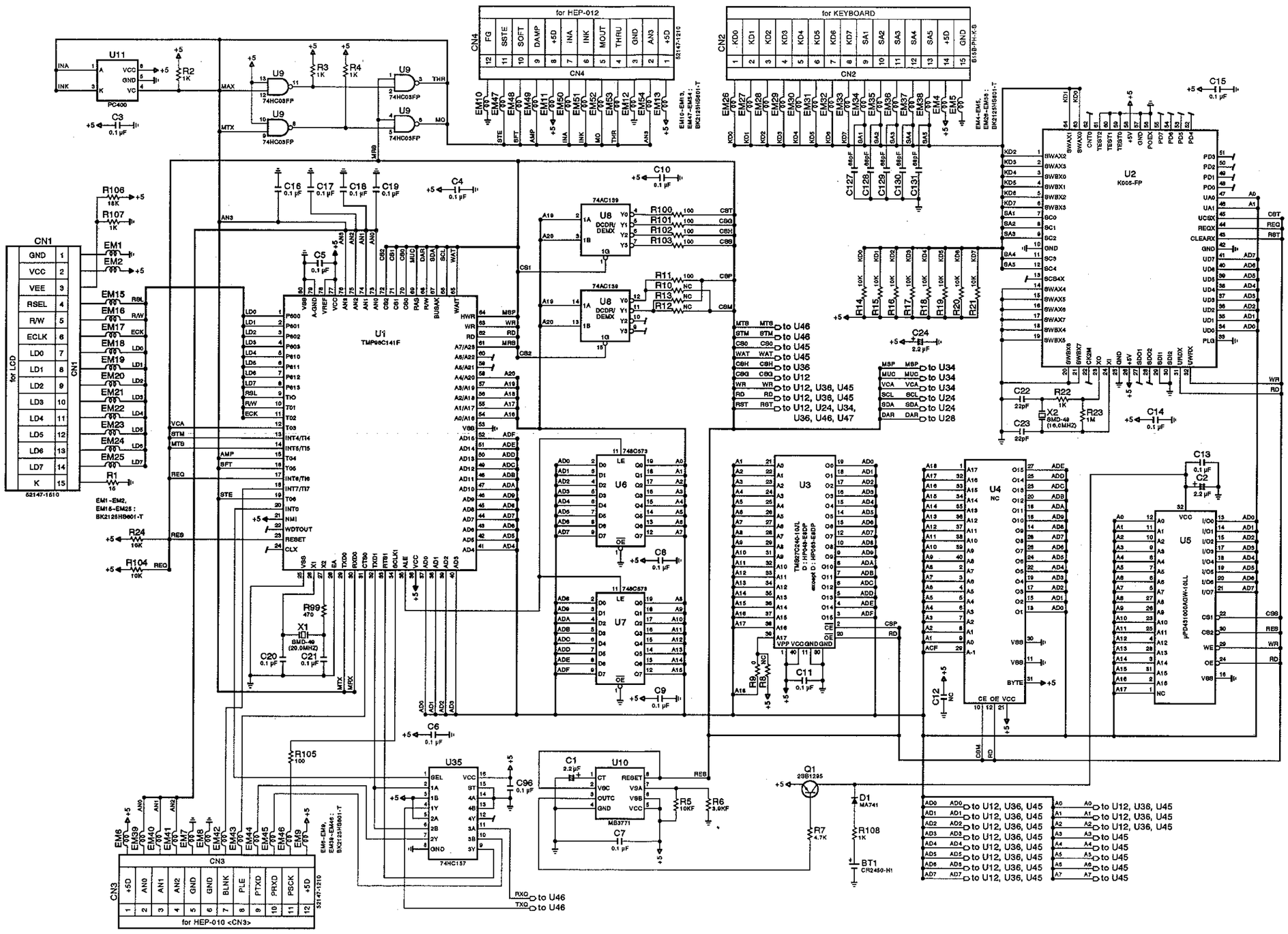
CN2															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	KD0	KD1	KD2	KD3	KD4	KD5	KD6	KD7	SA1	SA2	SA3	SA4	SA5	+5D	GND
to Keyboard															

CN6				
	4	3	2	1
	GND	+5	+5	GND
HEP-006 <CN5>				

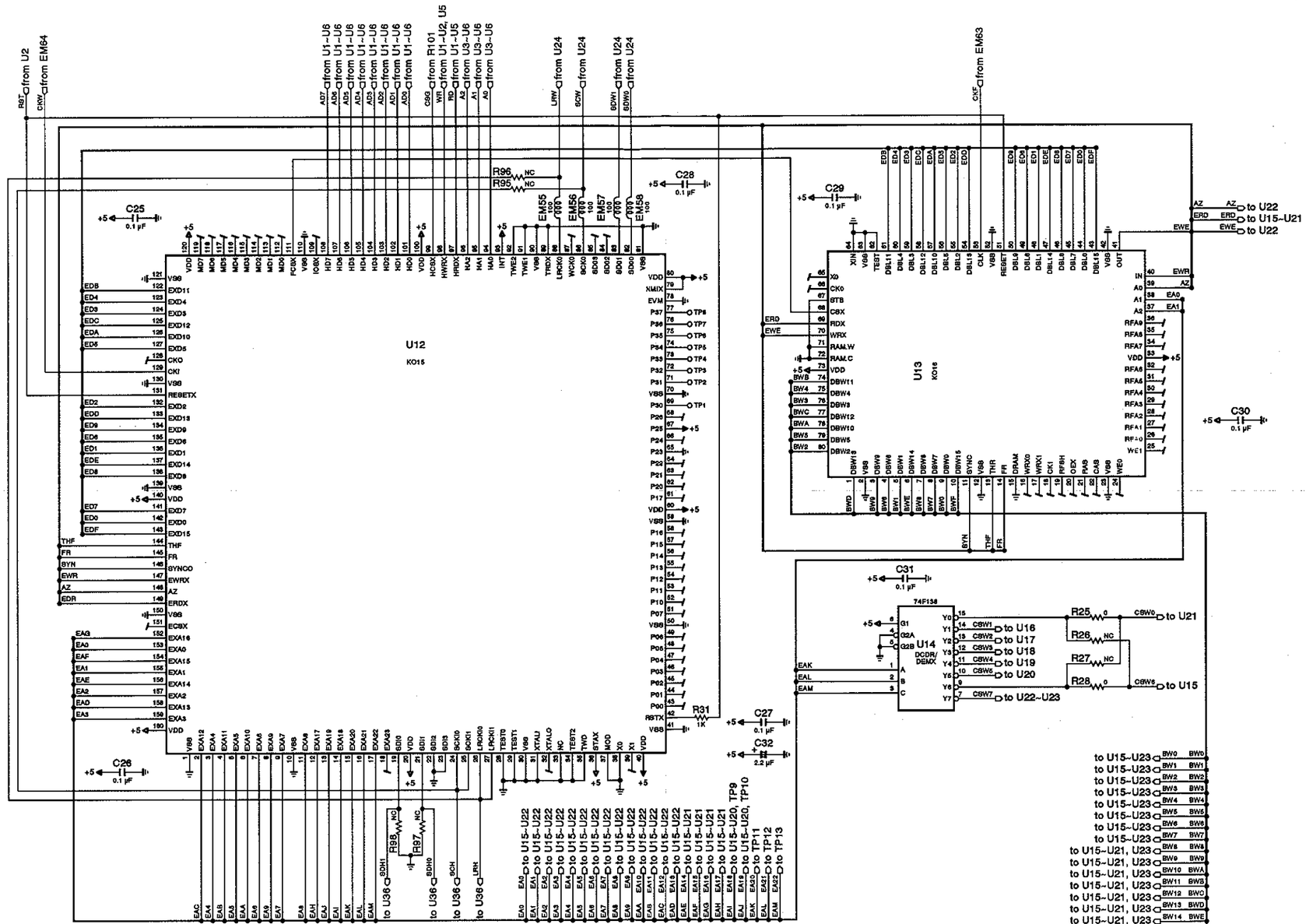
11. HEP-009 PRINTED WIRING BOARD(2/2)(SILKSCREEN SOLDER)



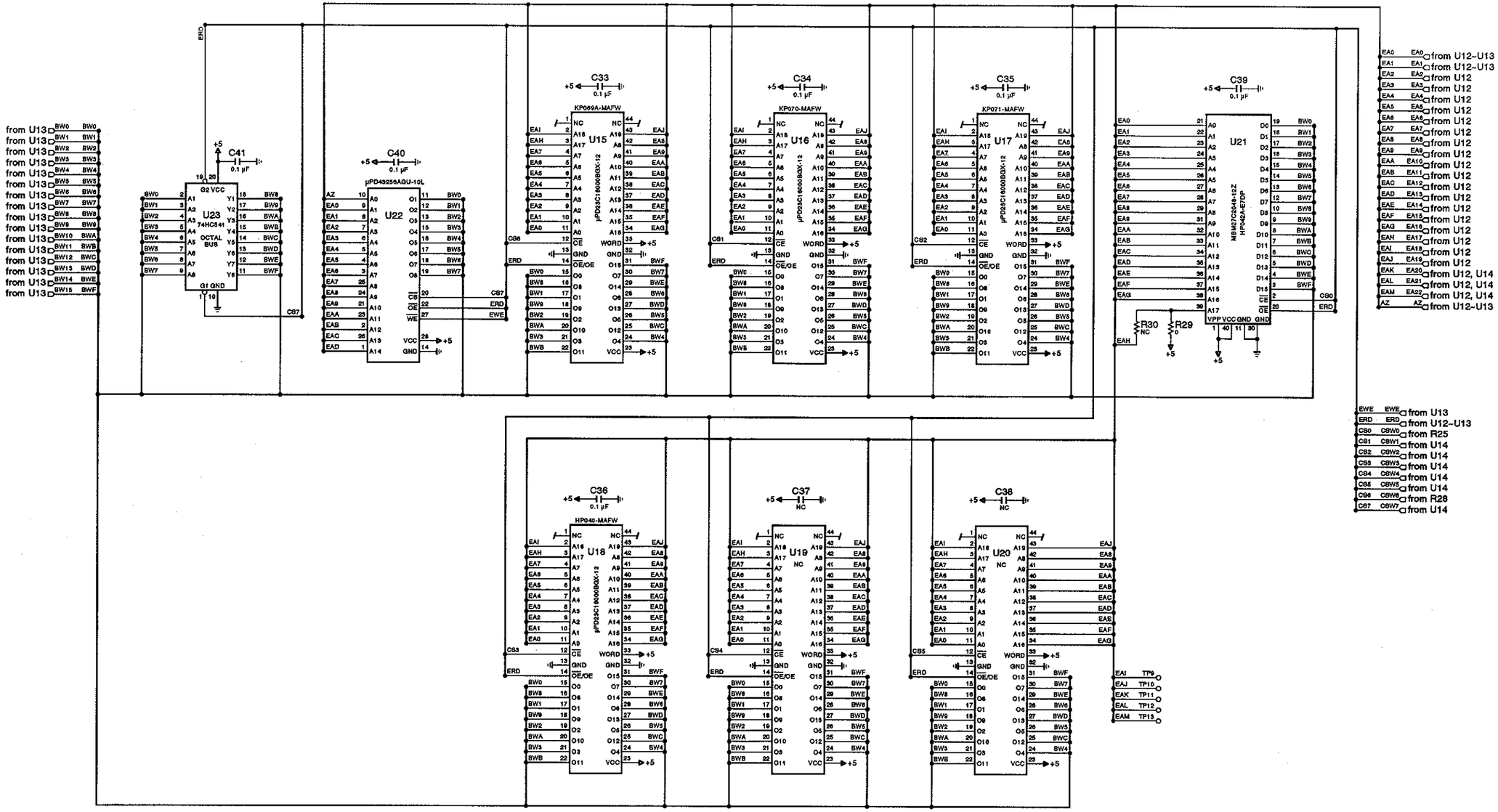
12. HEP-009 CIRCUIT(1/7)



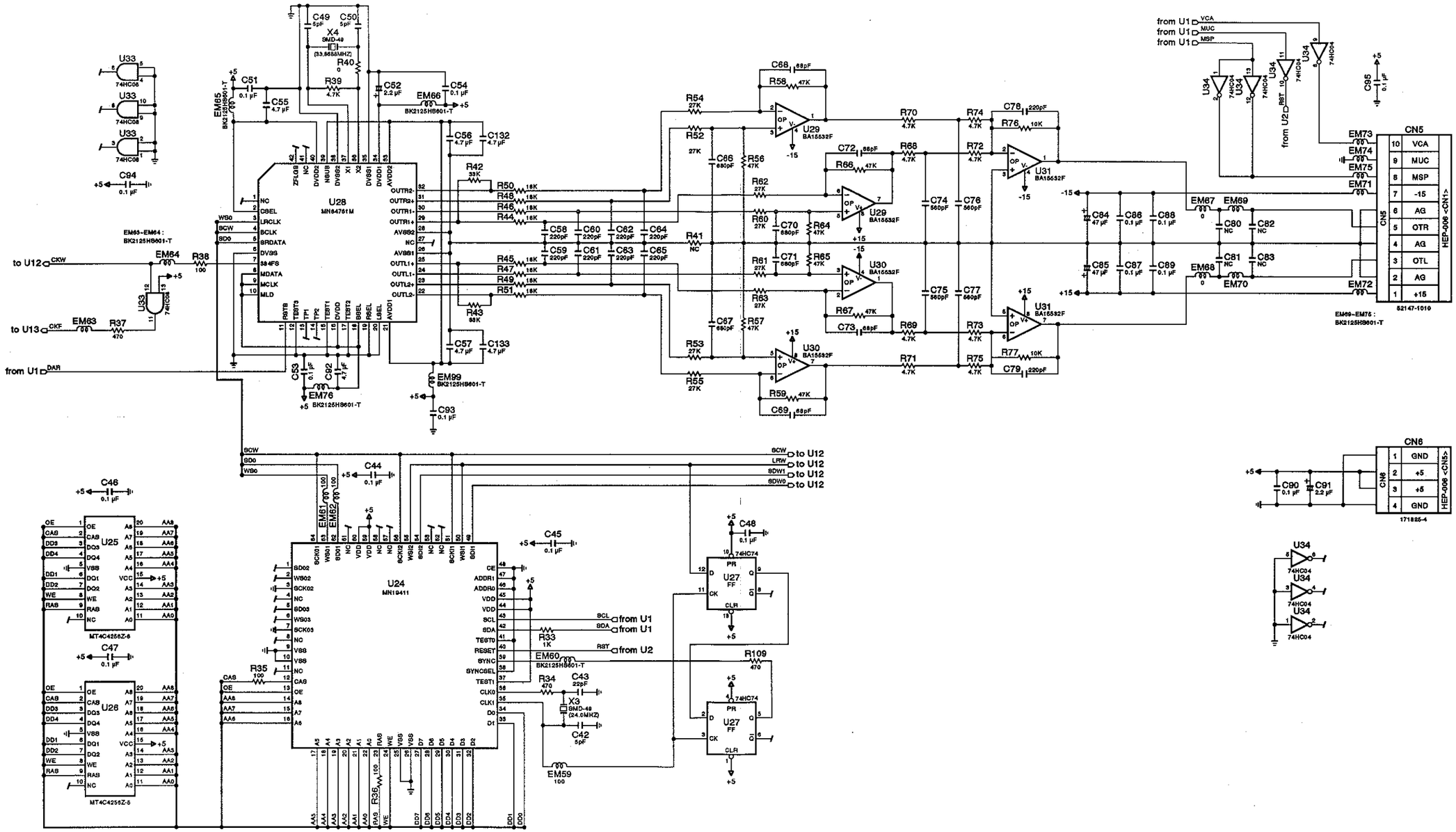
13. HEP-009 CIRCUIT(2/7)



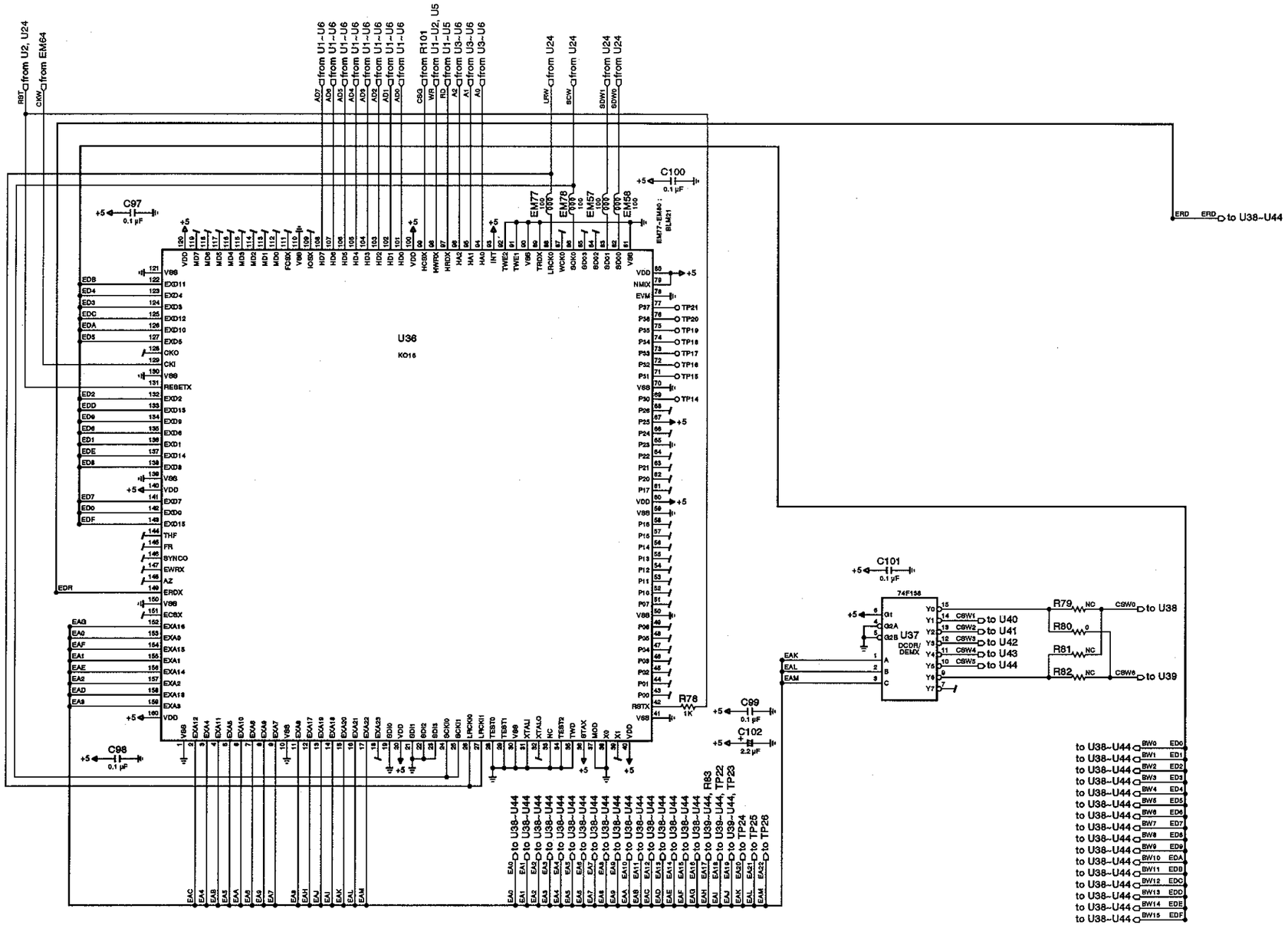
14. HEP-009 CIRCUIT(3/7)



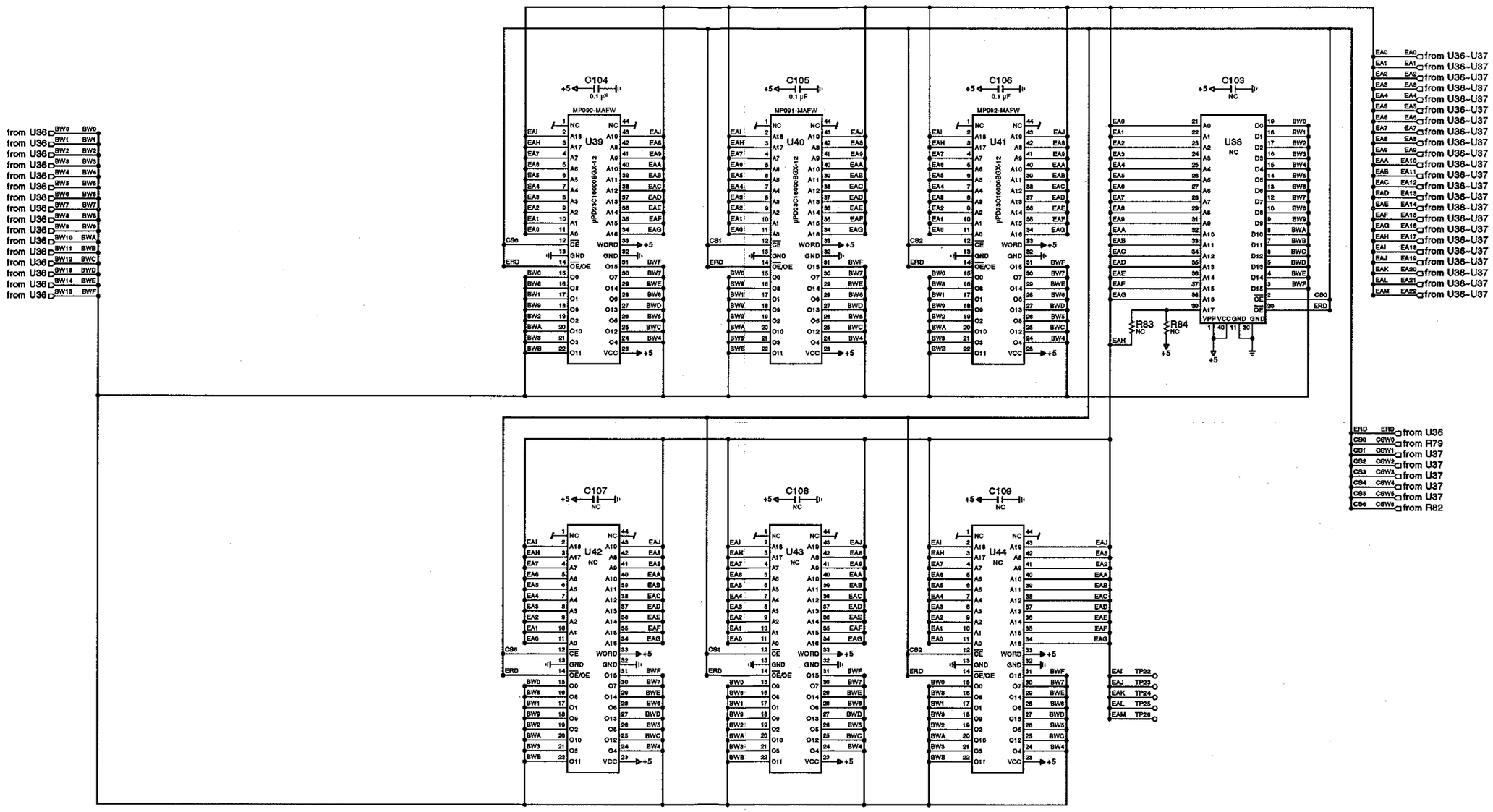
15. HEP-009 CIRCUIT(4/7)



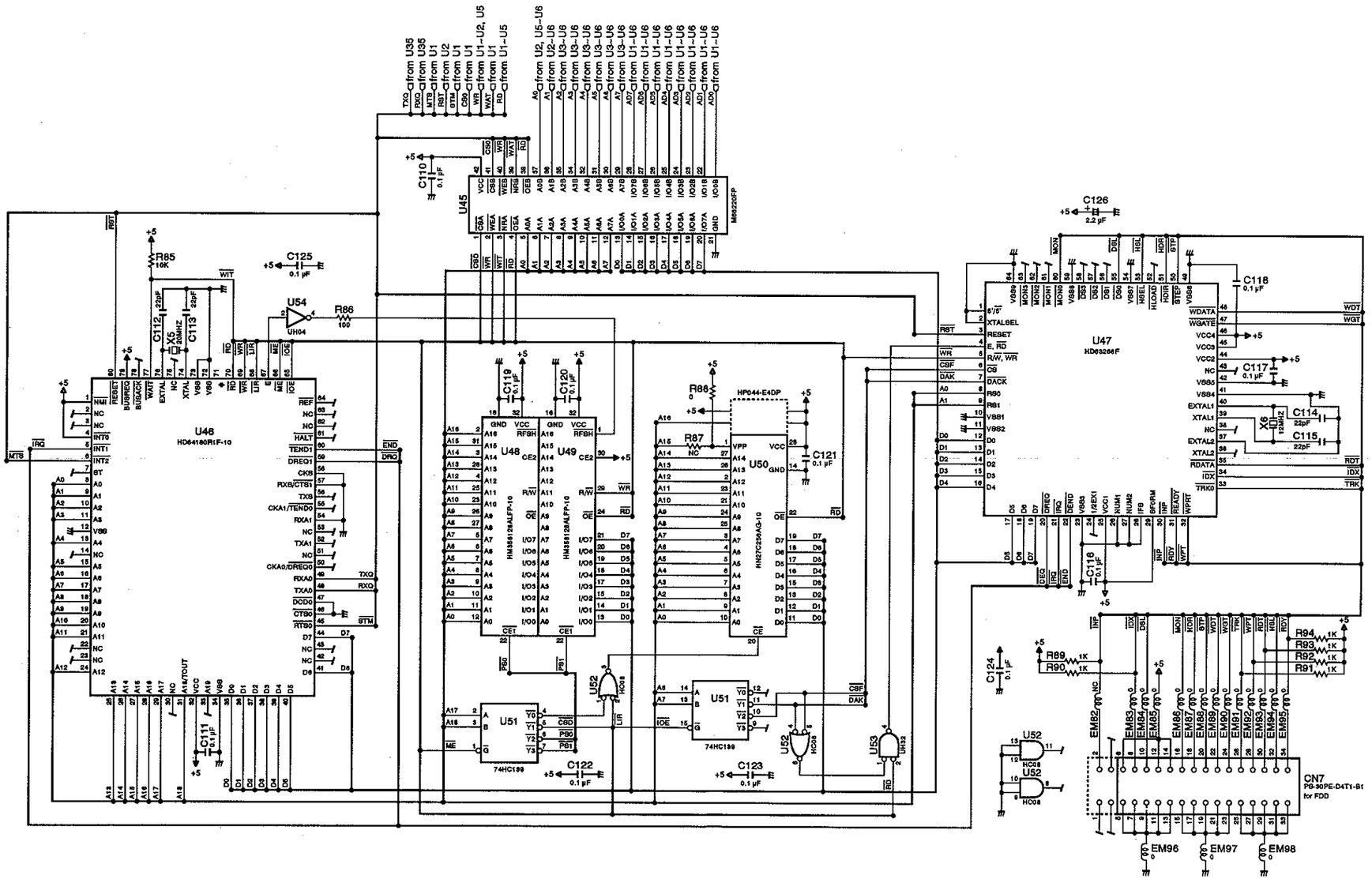
16. HEP-009 CIRCUIT(5/7)



17. HEP-009 CIRCUIT(6/7)



18. HEP-009 CIRCUIT(7/7)



19. HEP-010,011,012,013,014 PRINTED WIRING BOARDS

(HEP-010)
51048-0800

HEP-011 <CN1>							
+5D	PSCK	S/L	PRXD	PTXD	PLE	BLNK	GND
1	2	3	4	5	6	7	8
CN4							

(HEP-010)
51048-1200

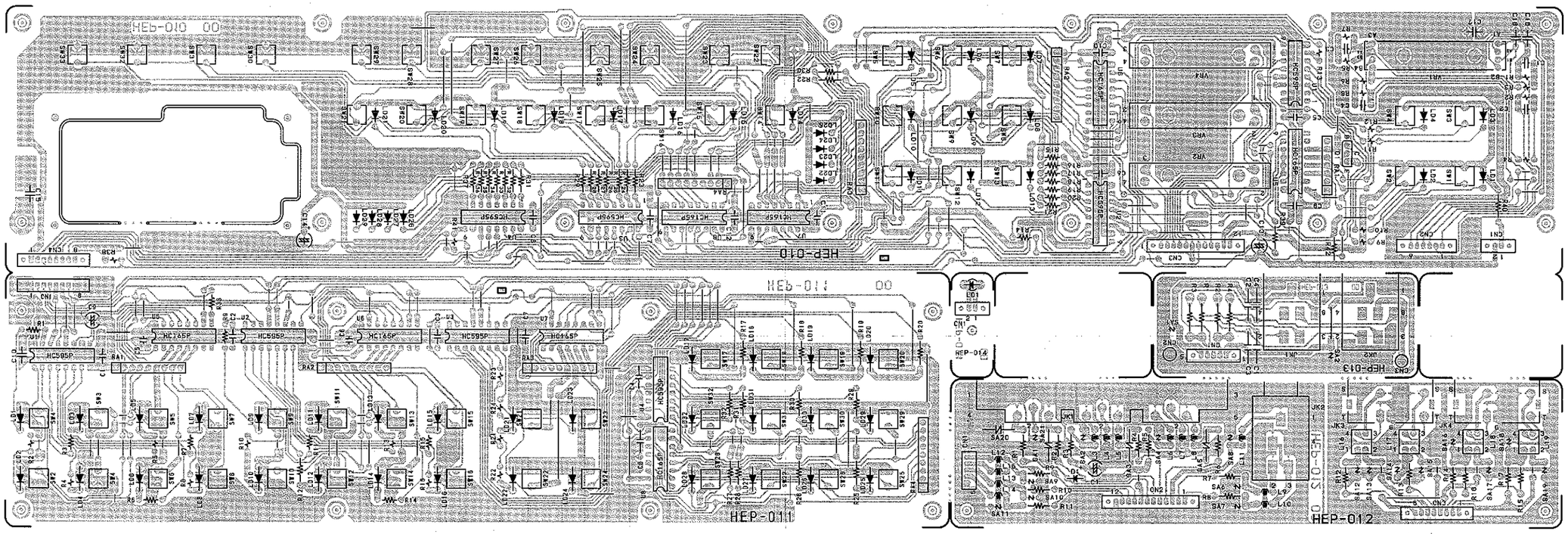
HEP-001 <CN3>, HEP-009 <CN3>												
+5D	PSCK	PRXD	PTXD	PLE	BLNK	GND	GND	AN2	AN1	AN0	+5D	
12	11	10	9	8	7	6	5	4	3	2	1	
CN3												

(HEP-010)
51048-0600

HEP-006 <CN2>						
AG	RR	SR	SL	RL	AG	
6	5	4	3	2	1	
CN2						

(HEP-010)
NC

LDA	LDK
2	1
CN1	



CN1							
GND	BLNK	PLE	PTXD	PRXD	S/L	PSCK	+5D
1	2	3	4	5	6	7	8
HEP-010 <CN4>							

51048-0800
(HEP-011)

PEDAL		
	DAMP	1
	GND	2
	SOFT	3
	SSTE	4
	FG	5
	CN1	

B5B-PH-K-S
(HEP-012)

CN2												
FG	SSTE	SOFT	DAMP	+5D	INA	INK	MOUT	THRU	GND	AN3	+5D	
12	11	10	9	8	7	6	5	4	3	2	1	
HEP-001 <CN4>, HEP-009 <CN4>												

51048-1200
(HEP-012)

CN3							
AG	INL	AG	INR	AG	OLL	OLR	AG
8	7	6	5	4	3	2	1
HEP-006 <CN3>							

51048-0800
(HEP-012)

CN1		
	2	1
LDV		DG
HEP-006 <CN10>		

51048-0200
(HEP-014)

CN2	
	1
FG	
FG	

SIN-21T-1.8S
(HEP-013)

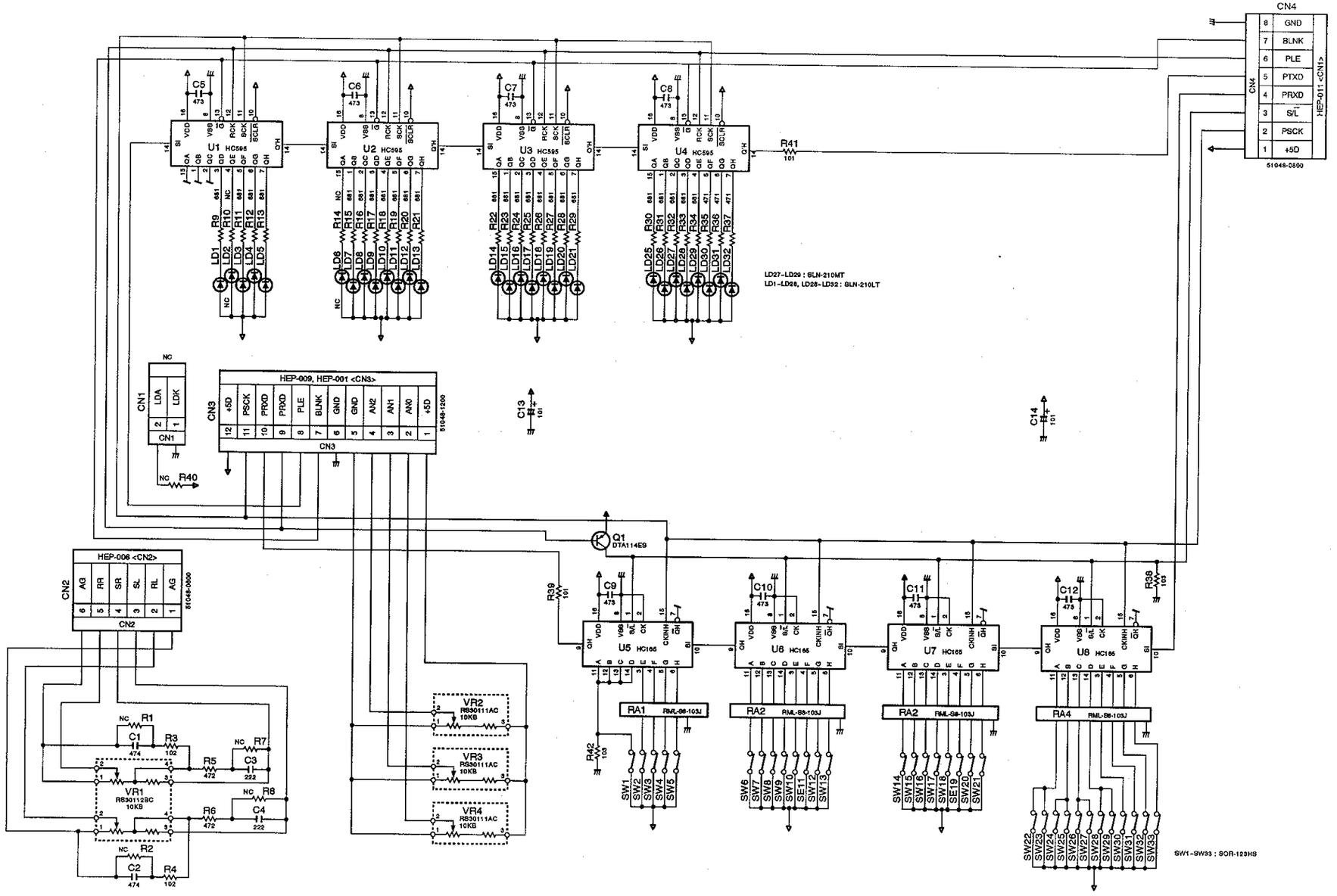
CN1					
	5	4	3	2	1
AG	HPL		PSN	HPR	AG
HEP-006 <CN4>					

51048-0500
(HEP-013)

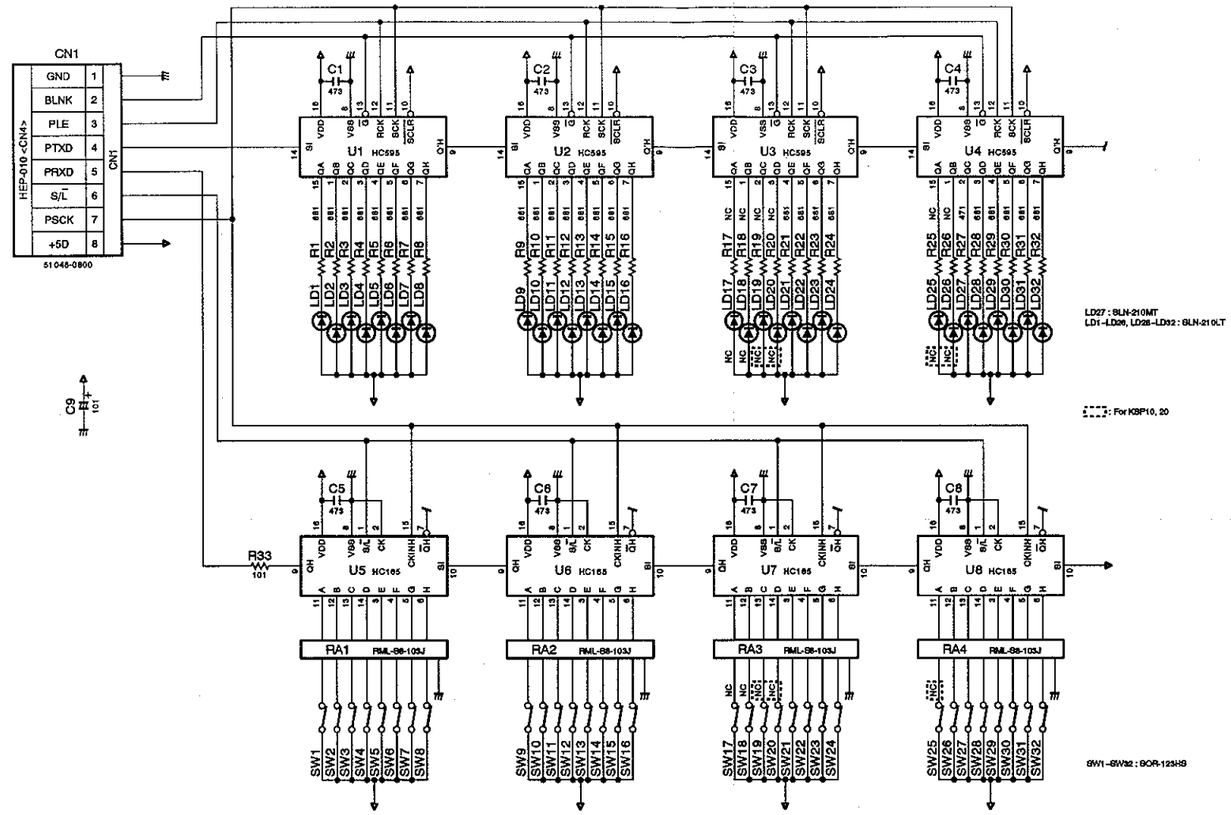
CN3	
	1
FG	
FG	

SIN-21T-1.8S
(HEP-013)

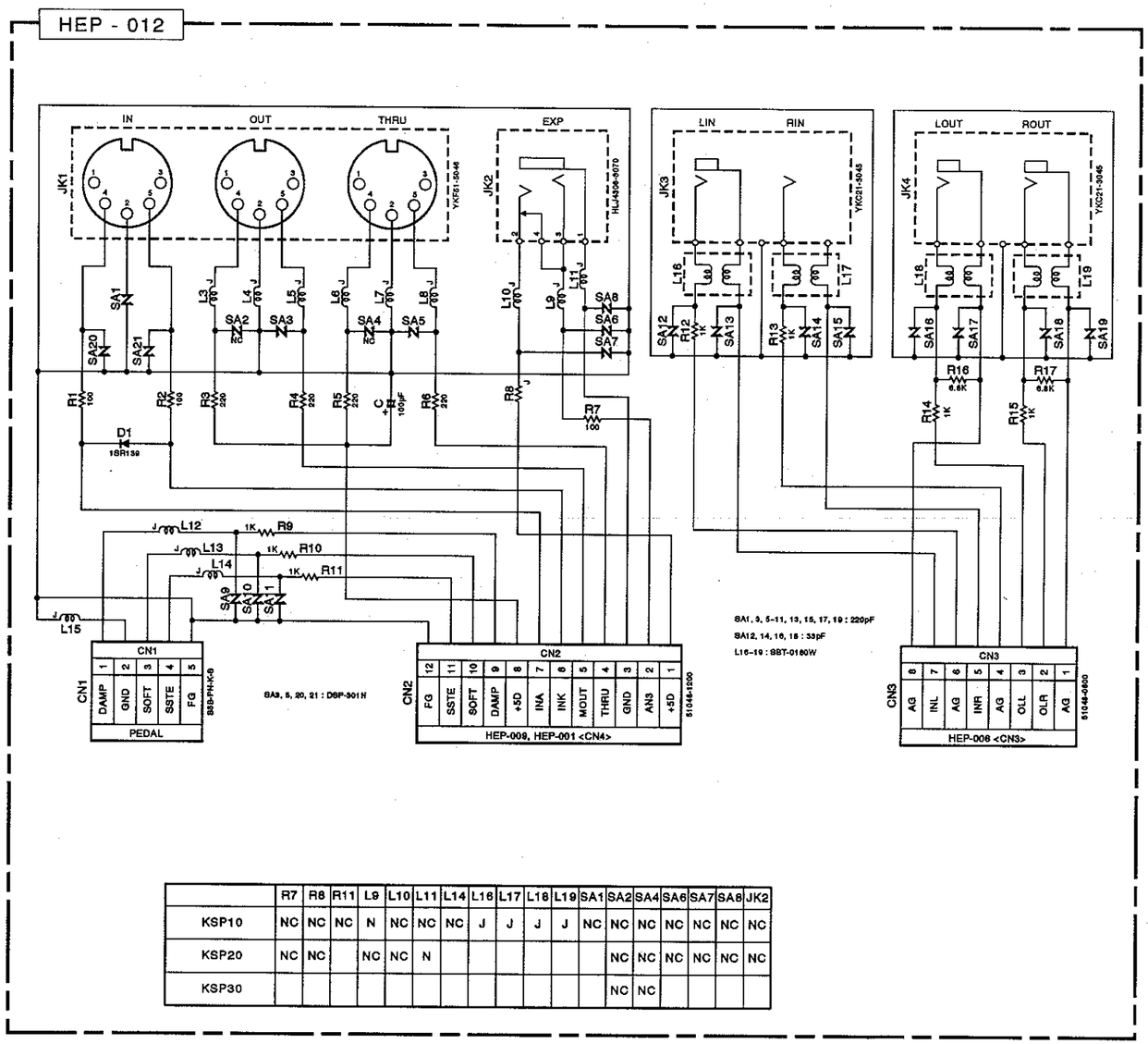
20. HEP-010 CIRCUIT



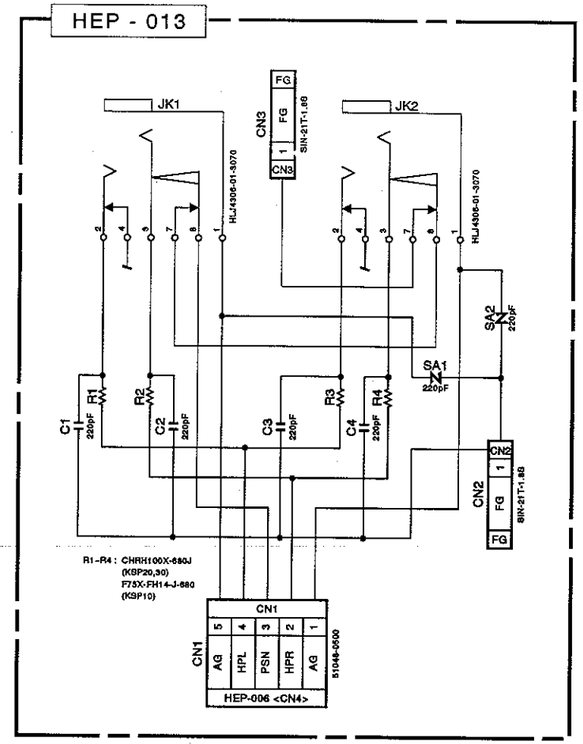
21. HEP-011 CIRCUIT

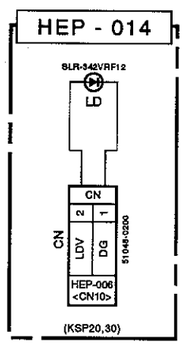


22. HEP-012,013,014 CIRCUITS

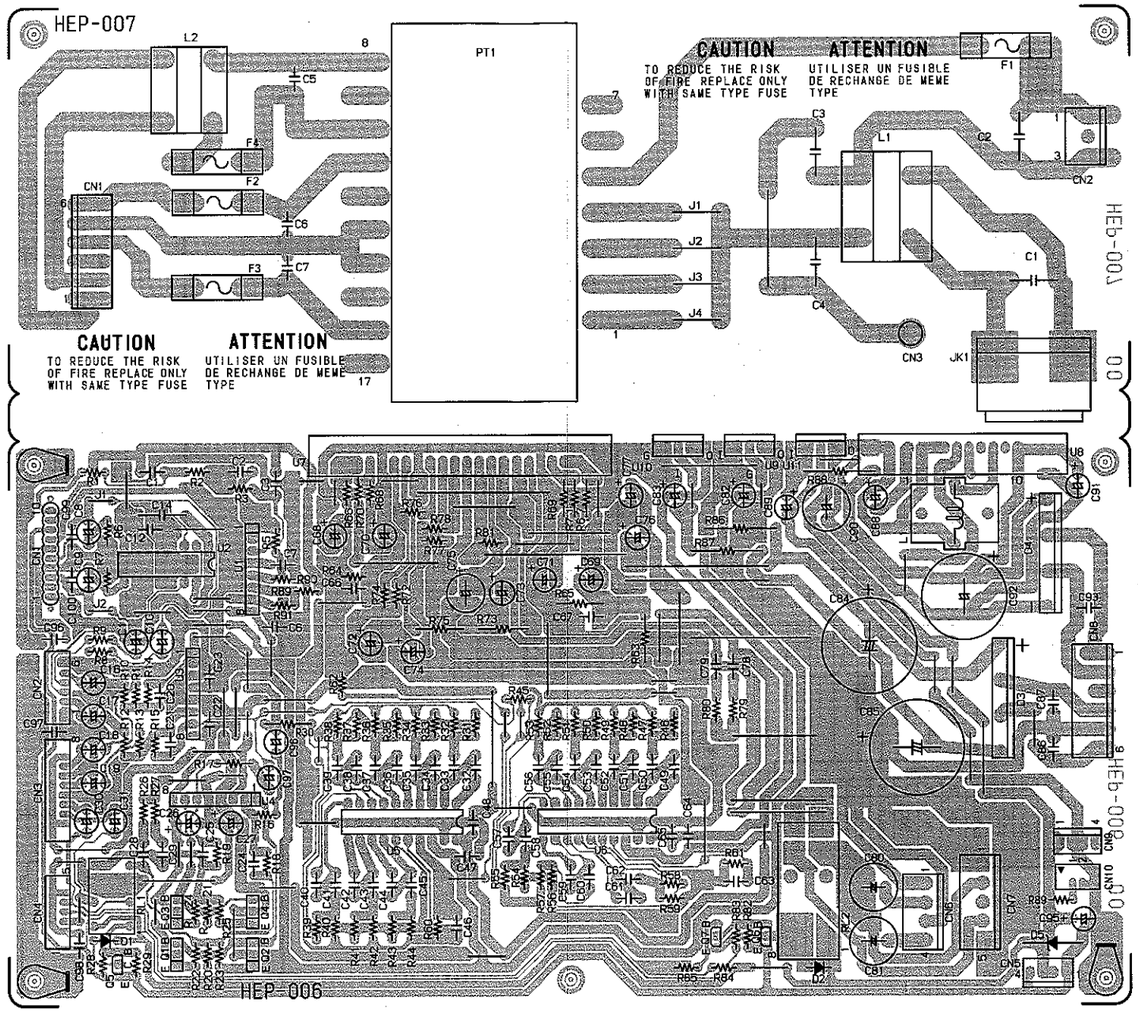


	R7	R8	R11	L9	L10	L11	L14	L16	L17	L18	L19	SA1	SA2	SA4	SA6	SA7	SA8	JK2
KSP10	NC	NC	NC	N	NC	NC	NC	J	J	J	J	NC	NC	NC	NC	NC	NC	NC
KSP20	NC	NC		NC	NC	N							NC	NC	NC	NC	NC	NC
KSP30													NC	NC				





23. HEP-006,007 PRINTED WIRING BOARDS



B6P-VH HEP-006 <CN8>		
AH30	6	CN1
AG	5	
AL30	4	
NC	3	
AH12	2	
AL12	1	

CN2		
1	SWC	to P.SW B3P-VH
2	NC	
3	SWH	

CN8		
FG	FG	SIN-21T-1.8S

51048-1000 HEP-009 <CN5> / HEP-001 <CN5>		
VCA	10	CN1
DG	9	
MSP	8	
-15A	7	
AG	6	
OTR	5	
AG	4	
OTL	3	
AG	2	
+15A	1	

52147-0610 HEP-010 <CN2>		
AG	6	CN2
RL	5	
SL	4	
SR	3	
RR	2	
AG	1	

52147-0810 HEP-012 <CN3>		
AG	8	CN3
INL	7	
AG	6	
INR	5	
AG	4	
OLL	3	
OLR	2	
AG	1	

52147-0510 HEP-013 <CN1>		
AG	5	CN4
HPL	4	
PSN	3	
HPR	2	
AG	1	

CN8		
1	AL12	HEP-007 <CN1> B6P-VH
2	AH12	
3	NC	
4	AL30	
5	AG	
6	AH30	

CN9				
1	2	3	4	
+5D	DG	DG	——	FDD 171825-4

CN10		
1	2	
LDV	DG	HEP-014 <CN1> 52147-0210

CN6				
4	3	2	1	
TWR	AG	TWL	AG	to Tweeter B4P-VH

CN7					
5	4	3	2	1	
AG	SPR	——	SPL	AG	to SP BOX B5P-VH

CN5				
4	3	2	1	
DG	+5D	+5D	DG	HEP-001 <CN6> / HEP-009 <CN6> 171825-4

24. HEP-006,007 CIRCUITS

HEP - 006

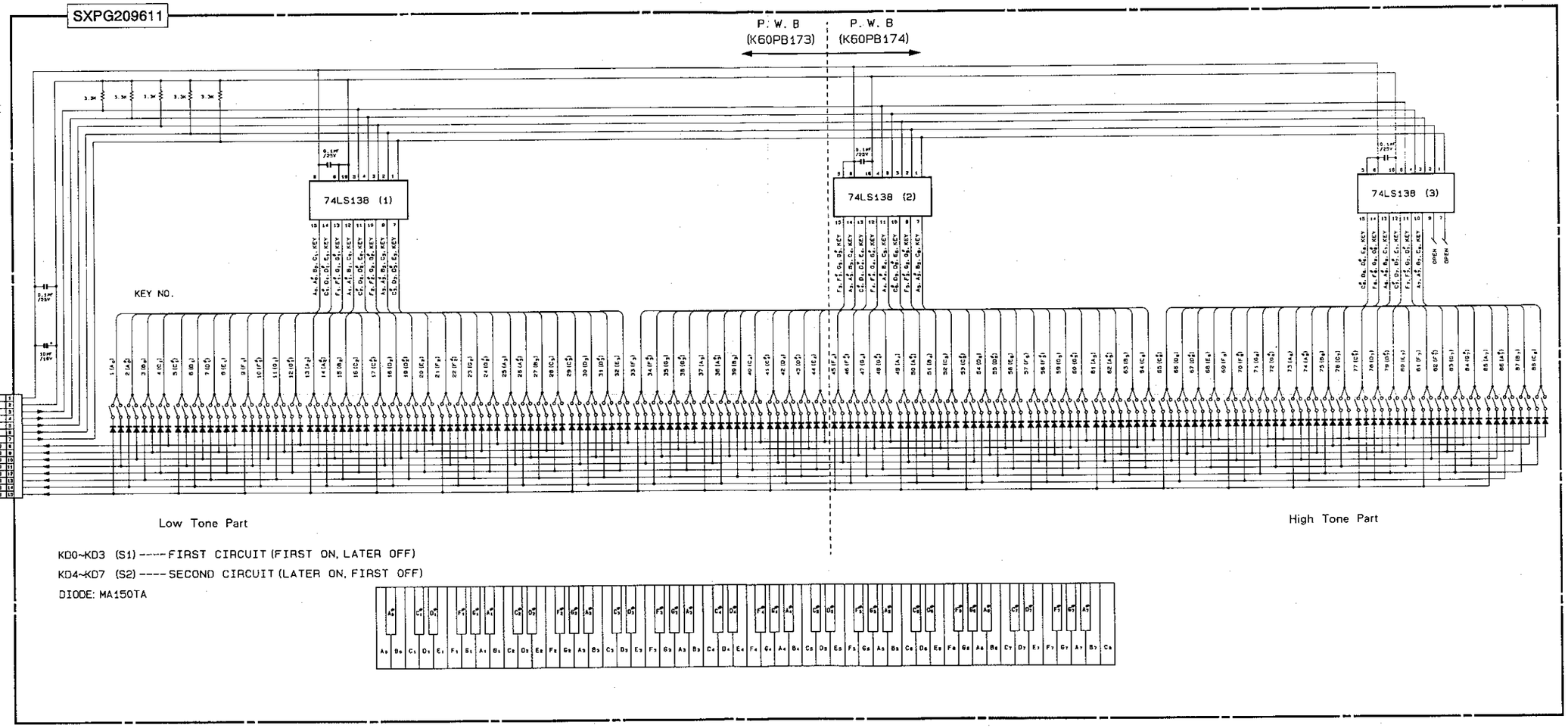
	KSP10	KSP20	KSP30
U1 ~ U2	NC	NC	
U8	NC	NC	
U11			NC
R1 ~ R3	NC	NC	
R5 ~ R7	NC	NC	
R8 ~ R9	J	J	
R88	J	J	NC
R89 ~ R91	NC	NC	
C1 ~ C3	NC	NC	
C6 ~ C9	NC	NC	
C12	NC	NC	
C15	NC	NC	
C86 ~ C87		NC	NC
C88	NC	NC	
C89			NC
C91 ~ C92	NC	NC	
C93		NC	NC
L1	NC	NC	
D5	NC	NC	
J1 ~ J2			NC

HEP - 007

	F1	F2, F3	F4
Japan 110 V	@TSC 250 V 2.5 A	@TSC 250 V 4 A	@TSC 250 V 2.5 A
UL CSA	MT4 250 V 2.5 A	(UL)TSC 125 V 4 A	MT4 250 V 2.5 A
IEE, SAA BS 220V 240V	SET 250 V 1 A	SET 250 V 4 A	SET 250 V 2 A

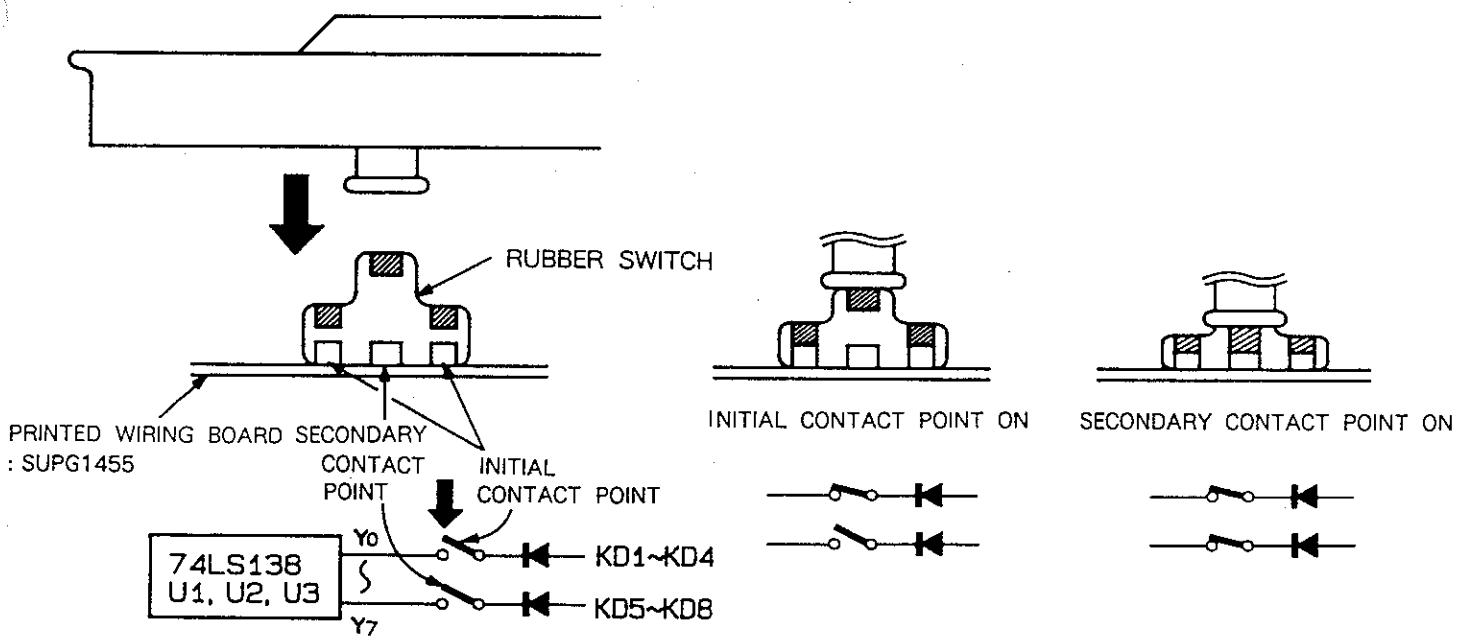
C1,C2 --- CS17-FZ2GA103Z
C3,C4 --- CD-B2GA471MYAS

25. KEYBOARD CIRCUIT



26. KEY MATRIX

		S1				S2			
		KD1	KD2	KD3	KD4	KD5	KD6	KD7	KD8
LS138 (BASS) U1	Y0 (15pin)	A0	A # 0	B0	C1	A0	A # 0	B0	C1
	Y1 (14pin)	C # 1	D1	D # 1	E1	C # 1	D1	D # 1	E1
	Y2 (13pin)	F1	F # 1	G1	G # 1	F1	F # 1	G1	G # 1
	Y3 (12pin)	A1	A # 1	B1	C2	A1	A # 1	B1	C2
	Y4 (11pin)	C # 2	D2	D # 2	E2	C # 2	D2	D # 2	E2
	Y5 (10pin)	F2	F # 2	G2	G # 2	F2	F # 2	G2	G # 2
	Y6 (9pin)	A2	A # 2	B2	C3	A2	A # 2	B2	C3
	Y7 (7pin)	C # 3	D3	D # 3	E3	C # 3	D3	D # 3	E3
LS138 (MID) U2	Y0	F3	F # 3	G3	G # 3	F3	F # 3	G3	G # 3
	Y1	A3	A # 3	B3	C4	A3	A # 3	B3	C4
	Y2	C # 4	D4	D # 4	E4	C # 4	D4	D # 4	E4
	Y3	F4	F # 4	G4	G # 4	F4	F # 4	G4	G # 4
	Y4	A4	A # 4	B4	C5	A4	A # 4	B4	C5
	Y5	C # 5	D5	D # 5	E5	C # 5	D5	D # 5	E5
	Y6	F5	F # 5	G5	G # 5	F5	F # 5	G5	G # 5
	Y7	A5	A # 5	B5	C6	A5	A # 5	B5	C6
LS138 (HIGH) U3	Y0	C # 6	D6	D # 6	E6	C # 6	D6	D # 6	E6
	Y1	F6	F # 6	G6	G # 6	F6	F # 6	G6	G # 6
	Y2	A6	A # 6	B6	C7	A6	A # 6	B6	C7
	Y3	C # 7	D7	D # 7	E7	C # 7	D7	D # 7	E7
	Y4	F7	F # 7	G7	G # 7	F7	F # 7	G7	G # 7
	Y5	A7	A # 7	B7	C8	A7	A # 7	B7	C8



27. TROUBLE SHOOTING

(1) Nothing appears on LCD display and backlight.

↓

AC IN check (HEP-007)

↓

Fuse check (HEP-007)

Digital 5V power check

(2) Backlight on but display is abnormal.

↓

Connector check

↓

LCD check

* : ONLY KSP30

↓

Check around CPU (HEP-001, *HEP-009)

↓

Check around TG Tone Generater HEP-001, *HEP-009)

(3) Sound is abnormal.

↓

Check around TG (HEP-001, *HEP-009)

↓

Check around D/A (HEP-001, *HEP-009)

↓

Check around amplifier (HEP-006)

(4) No sound produced.

↓

Is volume set to MIN?

- (Keyboard does not produce sound)
  - ↓ Connector check
  - ↓ Check around key detector (HEP-001, *HEP-009)
- (MIDI does not produce sound)
  - ↓ Check MIDI connections and settings
  - ↓ Check around MIDI connector (HEP-012)
  - ↓ Check around CPU (HEP-001, *HEP-009)
- (Keyboard and MIDI do not produce sound)
  - ↓ Connector check
  - ↓ Check around Tone Generatar (HEP-001, *HEP-009)
  - ↓ Check around D/A (HEP-001, *HEP-009)
  - ↓ Check around amplifier (HEP-006)

28. PARTS LIST

MAIN FRAME CASE

No.	Code No.	Part Name	Description	Pieces
1	926635	Arm board (left)	HPFC-0001(For KSP10)	1
	927080	Arm board (left)	HPBE-0005(For KSP20,30)	1
2	926640	Arm board (right)	HPFC-001(For KSP10)	1
	927075	Arm board (right)	HPBE-0005(For KSP20,30)	1
3	926785	Cheek block (L)	HPFC-0019(For KSP10)	1
	927035	Cheek block (L)	HPFC-0028(For KSP20,30)	1
4	926790	Cheek block (R)	HPFC-0020(For KSP10)	1
	927040	Cheek block (R)	HPFC-0029(For KSP20,30)	1
5	266124	Panel ass'y	(For KSP10)	1
	266129	Panel ass'y	(For KSP20)	1
	266125	Panel ass'y	(For KSP30)	1
6	808992	S Vol cover	MPFD-0047 (Black)	4
7	808994	S Vol Knob	MPFD-0048 (Black)	4
8	802715	Knob	AFZ-0512 (Black)	1
9	926705	Music rack	HPFC-0018	1
10	926710	Music rack hinge	MPFB-0192	1
11	807755	Score stopper	MPFD-0087	1
12	926660	Top board	HPFC-0003 (For KSP10)	1
	927105	Top board	HPFC-0025 (For KSP20,30)	1
13	808995	LCD cover	HPFD-0005	1
14	808996	LED lens	HPFD-0002	2
15	808990	Tone S.W Knob	MPFD-0046 (Black)	2
	808991	〃	〃 (Gray)	2
16	808988	〃	MPFD-0045 (Black)	6
	808989	〃	〃 (Gray)	1
17	808983	Tone S.W Knob (Dual unit)	HPFD-0001 (Black)	14
	808985	〃	〃 (Gray)	3
	808984	〃 (unit)	〃 (Black)	4
	808986	〃	〃 (Gray)	3
	808987	〃	〃 (Red)	4
19	926695	Fixing metal for panel (left)	HPFB-0007	1
20	926700	Fixing metal for panel (right)	HPFB-0007	1
21	809163	LCD	DMC16204-LY-9	1
22	809172	Keyboard unit ass'y	SK38809A(88Key)	1
23	809164	Power transformer	HT-012	1
24	926735	Panel stopper	HPFB-0009	2
25	926760	Fixing metal for P.W.B. (left)	HPFB-0011	1
26	926765	〃 (right)	HPFB-0011	1

No.	Code No.	Part Name	Description	Pieces
27	928215	Housing stopper	HPFB-0030	1
28	926720	Connector panel	EPFB-1234	1
29	926685	Rear Panel ass'y	HPBG-0001 (KSP10)	1
	927125	Rear Panel ass'y	MPBG-0003 (KSP30)	1
	927850	Rear Panel ass'y	MPBG-0006 (KSP20)	1
30	808999	Front Panel	HPFD-0004	1
31	926715	Shelf board	HPFC-0005 (For KSP10)	1
	927140	Shelf board	HPFC-0027 (For KSP20,30)	1
32	926725	Key slip ass'y	HPFC-0006 (For KSP10)	1
	927115	Key slip ass'y	HPFC-0026 (For KSP20,30)	1
33	926750	Speaker box ass'y	HPBE-0002	1
34	926675	Hook (left)	MPFB-0094	1
	926680	Hook (right)	//	1

STAND

No.	Code No.	Part Name	Description	Pieces
72	926985	Side board ass'y (left)	HPBE-0003	1
35	926990	Side board ass'y (right)	HPBE-0003	1
36	809153	Toe block (left)	MPFD-0082	1
37	809154	Toe block (right)	MPFD-0082	1
38	926805	Pedal block metal fix	EPFB-1244	2
39	926810	Stand fix (left)	HPFB-0016	1
40	926815	Stand fix (right)	HPFB-0016	1
41	926820	SP BOX fix	HPFB-0017	2
42	809155	Cord clamp	NK-2N (Black)	1
43	809156	Cord clamp	DKN-5 (Black)	2
44	927000	Back board	MPFC-0214	1
45	926995	Pedal block ass'y	HPBE-0004	1
46	926875	Pedal cable	HPBB-0007	1
47	926835	Back board Mount	MPFB-0195	2

PEDAL

No.	Code No.	Part Name	Description	Pieces		
				KSP10	KSP20	KSP30
48	926980	Pedal adjuster	EPFB-1254	1	1	1
49		Pedal chassis		1	1	1
50		Pedal		2	2	3
51		Pedal spring		2	2	3
52		Rubber switch		2	2	3
53		Cloth		2	2	3
54		Pedal holder		2	2	3
55		Pedal stopper		2	2	3
56		Pedal P.W.B.		1	1	1

ELECTRIC PARTS

No.	Code No.	Part Name	Description	Pieces		
				KSP10	KSP20	KSP30
18	802769	Power switch	SDDLD1	1	1	1
21	809163	LCD	DMC16204-LY-9	1	1	1
57	809164	Transformer	HT-012 (All markets)	1	1	1
58	926845	Power switch housing	HPBB-0001	1		
	927005	//	HPBB-0017		1	1
59	926850	AC housing	HPBB-0002	1	1	1
60	926856	SP housing (Sp BOX)	HPBB-0003A	1	1	1
61	926860	// (tweeter)	HPBB-0004	1	1	1
62	926865	DC housing	HPBB-0005	1		
63	927010	//	HPBB-0018		1	1
64	926870	Keyboard housing	HPBB-0006	1		
65	927021	//	HPBB-0020A		1	1
66	926875	Pedal housing	HPBB-0007	1	1	1
67	809165	Speaker (tweeter)	HS07-002	2	2	2
68	808126	Speaker (woofer)	985-039834-002	2	2	2
	808702	Lithium Battery	CR2450	1	1	1
69	808388	FDD	FD-235HF-3284			1
70	809255	FDD housing	HPBB-0028			1
71	927015	FDD DC housing	HPBB-0019			1

HEP-001(1), (2)ASS'Y

No.	Code No.	Part Name	Description	Pieces	
				KSP10	KSP20
	711086	Pin housing	171825-4	1	1
	803033	IC socket	DICF-40CE	2	2
	803426	Connector	B15B-PH-K-S	1	1
	806000	Wire trap	52147-1210	2	2
	806001	//	52147-1510	1	1
	807036	//	52147-1010	1	1
	808939	Battery holder	24H-1	1	1
	808941	Capacitor	MV16VC47(M)F55	2	2
	808942	Chip resister	MCR18EZHJ150	1	1
	808943	//	RK73H2ATD1002F	1	1
	808944	//	RK73H2ATD3901F	1	1
	809000	//	MCR10EZHJ0R0	16	16
	809025	//	MCR10EZHJ101	14	14
	809033	//	MCR10EZHJ471	4	4
	809037	//	MCR10EZHJ102	8	8
	809045	//	MCR10EZHJ472	10	10
	809049	//	MCR10EZHJ103	12	12
	809052	//	MCR10EZHJ183	9	9
	809054	//	MCR10EZHJ273	8	8

No.	Code No.	Part Name	Description	Pieces	
				KSP10	KSP20
	809055	Chip resister	MCR10EZHJ333	2	2
	809057	〃	MCR10EZHJ473	8	8
	809073	〃	MCR10EZHJ105	1	1
	808946	Chip ceramic capacitor	TMK432F475Z	6	6
	809074	〃	MCH215SL050JK	3	3
	809079	〃	〃 220JK	5	5
	809085	〃	〃 680JK	13	13
	809091	〃	〃 221JK	10	10
	809096	〃	〃 561JK	4	4
	809099	〃	MCH212F104ZK	47	47
	809100	〃	EMK316F225Z	6	6
	808945	Chip Bead	BK2125HS601-T	52	52

HEP-009(1), (2)ASS'Y

No.	Code No.	Part Name	Description	Pieces
				KSP30
	711086	Pin housing	171825-4	1
	800224	IC socket	DICF-28C	1
	803033	〃	DICF-40CE	2
	803426	Connector	B15B-PH-K-S	1
	803601	〃	PS-34PE-D4T1-B1	1
	806000	Wire trap	52147-1210	2
	806001	〃	52147-1510	1
	807036	〃	52147-1010	1
	808939	Battery holder	24H-1	1
	808941	Capacitor	MV16VC47(M)F55	1
	808942	Chip resistor	MCR18EZHJ150	1
	808943	〃	RK73H2ATD1002F	1
	808944	〃	RK73H2ATD3901F	1
	809000	〃	MCR10EZHJ0R0	25
	809025	〃	MCR10EZHJ101	21
	809033	〃	MCR10EZHJ471	5
	809037	〃	MCR10EZHJ102	15
	809045	〃	MCR10EZHJ472	10
	809049	〃	MCR10EZHJ103	13
	809052	〃	MCR10EZHJ183	9
	809054	〃	MCR10EZHJ273	8
	809055	〃	MCR10EZHJ333	2
	809057	〃	MCR10EZHJ473	8
	809073	〃	MCR10EZHJ105	1
	808946	Chip ceramic capacitor	TMK432F475Z	6
	809074	〃	MCH215SL050JK	3

No.	Code No.	Part Name	Description	Pieces KSP30
	809079	Chip ceramic capacitor	MCH215SL220JK	9
	809085	//	// 680JK	13
	809091	//	// 221JK	10
	809096	//	// 561JK	4
	809099	//	MCH212F104ZK	66
	809100	//	EMK316F225Z	8
	808945	Chip Bead	BK2125HS601-T	65

HEP-010~013(1), 010~014(2), 010~014(3) ASS'Y

No.	Code No.	Part Name	Description	Pieces		
				KSP10	KSP20	KSP30
	802050	Module resistor	RML S8-103J	7	7	7
	808978	//	RML S6-103J	1	1	1
	802905	Surge protector	DSP-301N	4	4	4
	804572	Connector	B5B-PH-K-S	1	1	1
	804643	Slide VR	RS30111AC 10KB	3	3	3
	805736	MIDI connector	YKF51-5046	1	1	1
	805764	Coil	SBT-0160W			4
	806005	Cable holder	51048-1200	2	2	2
	806241	//	51048-0600	1	1	1
	806242	//	51048-0800	3	3	3
	808981	//	51048-0500	1	1	1
	809278	//	51048-0200		1	1
	808976	Slide VR	RS30112BC 10KB	1	1	1
	808979	Pin Jack	YKC21-3045	2	2	2
	808980	Jack	HLJ4306-01-3070	2	2	3
	808982	Metal oxide film resistor	1W 680 CRH100X	4	4	4
	809177	J Read SMV2J-C	8X180P2.0-S5	1	1	1
	808583	//	8X100P2.0-S5	1	1	
	809299	//	12X190P2.0-S5			1
	806988	//	12X130P2.0-S5	1		
	809301	//	12X350P2.0-S5	1		1
	809180	//	12X390P2.0-S5	1		
	809302	//	6X760P2.0-S5		1	1
	909182	//	6X710P2.0-S5	1		
	809303	//	5X850P2.0-S5		1	1
	809183	//	5X820P2.0-S5	1		
	809304	//	2X640P2.0-S5		1	1
	809333	//	12X470P2.0-S5		1	
	708825	Carbon film resistor	AT1/4WJ101	2	2	3
	708829	//	AT1/4WJ221	4	4	4
	708837	//	AT1/4WJ102	6	6	7

No.	Code No.	Part Name	Description	Pieces		
				KSP10	KSP20	KSP30
	708847	Carbon film resistor	AT/4WJ682	2	2	2
	801037	//	ATR20J101	3	3	3
	801045	//	ATR20J471	4	4	4
	801047	//	ATR20J681	49	49	51
	801049	//	ATR20J102	2	2	2
	801057	//	ATR20J472	2	2	2
	801061	//	ATR20J103	2	2	2
	806002	Tact switch	SOR-123HS	60	60	63
	808493	LED	SLN-210LTT12(P, N)	49	49	51
	808975	//	SLN-210MT	4	4	4
	809277	//	SLR-342VRF12		1	1
	808955	Ceramic capacitor	ATUP050SL330J	4	4	4
	808956	//	ATUP050B221K	14	14	19
	808958	//	ATEP050F473Z	16	16	16
	808977	Electrolytic capacitor	RC2 6.3V 100μF	4	4	4
	809105	Film capacitor	ECQ-B1H 222JF	2	2	2
	809133	//	ECQ-V1H 474JM	2	2	2

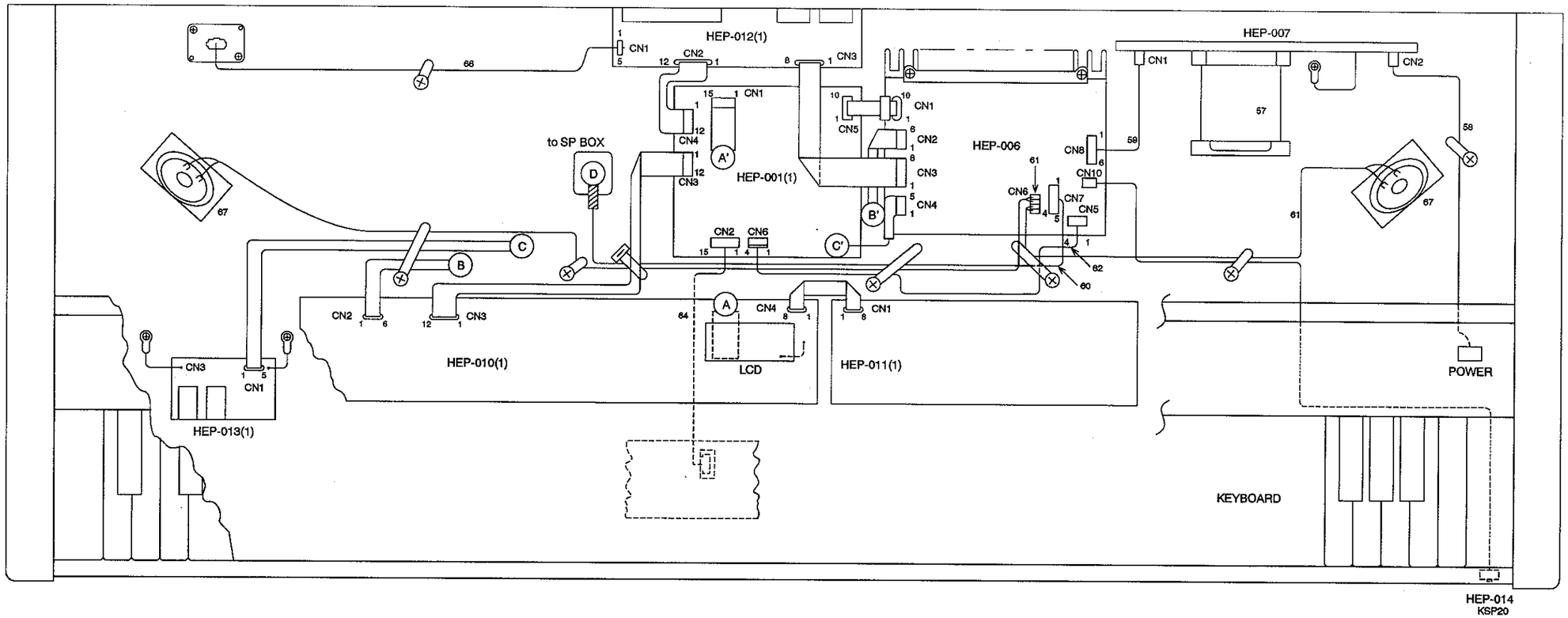
HEP-006, 007(1)~(10)ASS'Y

No.	Code No.	Part Name	Description	Pieces									
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	711086	Pin housing	171825-4	1	1	1	1	1	2	2	2	2	2
	802906	Connector base pin	B4P-VH	1	1	1	1	1	1	1	1	1	1
	802907	//	B5P-VH	1	1	1	1	1	1	1	1	1	1
	802908	//	B6P-VH	2	2	2	2	2	2	2	2	2	2
	803428	//	B3P-VH	1	1	1	1	1	1	1	1	1	1
	804134	Ceramic	CS17FZ2GA103ZYAS	2	2	2	2	1	2	2	2	2	2
	808953	Relay	AJW5219	1	1	1	1	1	1	1	1	1	1
	805829	Relay	FBR46ND005-P	1	1	1	1	1	1	1	1	1	1
	806658	Metal oxide film resistor	2W 470 CRH200FH24	2	2	2	2	2	2	2	2	2	2
	806664	Wire trap	52147-0810	1	1	1	1	1	1	1	1	1	1
	807645	//	52147-0610	1	1	1	1	1	1	1	1	1	1
	808966	//	52147-0510	1	1	1	1	1	1	1	1	1	1
	809280	//	52147-0210	1					1	1	1	1	1
	806774	Cable holder	51048-1000	1	1	1	1	1	1	1	1	1	1
	808008	Earth pin	SNE75	3	3	3	3	3	3	3	3	3	3
	808971	Fuse	(A)TSC 250V 2.5A	2					2			2	
	808500	Fuse	(A)TSC 4A	2			2		2			2	
	804604	//	UL/CS MT4 2A 250V		1		2			1			
	808660	//	(UL) TSC 4A 125V		2					2			
	809174	//	UL/CS MT4 2.5A 250V		1					1			
	803628	//	NE SET 1A 250V			1		1			1		1

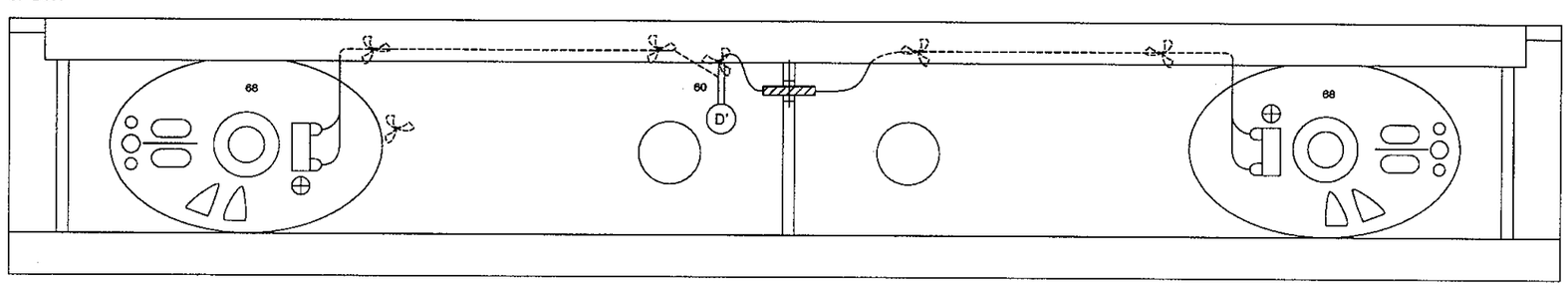
No.	Code No.	Part Name	Description	Pieces									
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	804605	Fuse	NE SET 2A 250V			1		1			1		1
	809175	〃	NE SET 4A 250V			1		1			1		1
	808965	AC inlet	M17 70-A(INL-3)	1	1	1	1	1	1	1	1	1	1
	809145	Heat sink	HPFB-0015	1	1	1	1	1	1	1	1	1	1
	809281	Insulation sheet	HPFZ-0014	1	1	1	1	1	1	1	1	1	1
	809305	Coil	SKP2-50						1	1	1	1	1
	808968	Electrolytic capacitor	35V4700MF	2	2	2	2	2	2	2	2	2	2
	808967	〃	16V6800MF	1	1	1	1	1					
	809173	〃	BP50V1R5M	2	2	2	2	1	2	2	2	2	2
	809246	〃	16V10000MF						1	1	1	1	1
	707439	〃	50V 1MF(RT)						1	1	1	1	1
	707415	〃	16V 10MF(〃)	1	1	1	1	1					
	800660	〃	50V 10MF(〃)	5	5	5	5	5	5	5	5	5	5
	800661	〃	50V 47MF(〃)	2	2	2	2	2	2	2	2	2	2
	802799	〃	16V 10MF(BP)	12	12	12	12	12	14	14	14		14
	804991	〃	10V 100 RE210V101	3	3	3	3	3	3	3	3		3
	805992	〃	6.3V 1000MF(RT)						1	1	1	1	1
	808969	〃	50V 100MF	1	1	1	1	1	1	1	1	1	1
	808970	〃	16V 100MF	2	2	2	2	2	3	3	3	3	3
	801045	Carbon resistor	ATR20J471	2	2	2	2	2	2	2	2	2	2
	801046	〃	ATR20J561	2	4	4	4	4	2	2	2	2	2
	801047	〃	ATR20J681	3	2	2	2	2	3	3	3	3	3
	801049	〃	ATR20J102	4	2	2	2	2	4	4	4	4	4
	801050	〃	ATR20J122	4	2	2	2	2	4	4	4	4	4
	801052	〃	ATR20J182		4	4	4	4					
	801053	〃	ATR20J222	2	2	2	2	2	2	2	2	2	2
	801054	〃	ATR20J272	4					2	2	2	2	2
	801055	〃	ATR20J332	6	6	6	6	6	6	6	6	6	6
	801057	〃	ATR20J472	2	2	2	2	2	2	2	2	2	2
	801061	〃	ATR20J103	10	10	10	10	10	14	14	14	14	14
	801064	〃	ATR20J183	14	14	14	14	14	14	14	14	14	14
	801066	〃	ATR20J273	4	4	4	4	4	4	4	4	4	4
	801067	〃	ATR20J333	2	2	2	2	2	2	2	2	2	2
	801071	〃	ATR20J683	2	2	2	2	2	4	4	4	4	4
	801073	〃	ATR20J104						1	1	1	1	1
	801077	〃	ATR20J224						2	2	2	2	2
	808954	Ceramic capacitor	ATUP050SL4R7K	2	2	2	2	2	2	2	2	2	2
	808955	〃	ATUP050SL330J	2	2	2	2	2	2	2	2	2	2
	808956	〃	ATUP050B221K	6	6	6	6	6	6	6	6	6	6
	808957	〃	ATUP050B471K	2	2	2	2	2	2	2	2	2	2
	808958	〃	ATEP050F473Z	6	6	6	6	6	10	10	10	10	10

No.	Code No.	Part Name	Description	Pieces									
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	808963	Ceramic capacitor	CD11-B2GA471MYAS	2	2	2	2	2	2	2	2	2	2
	808959	Noncombustible resistor	F20-4R7J	6	6	6	6	6	6	6	6	6	6
	808960	//	F20-101J	6	6	6	6	6	8	8	8	8	8
	808961	//	F20-102J	2	2	2	2	2	2	2	2	2	2
	808962	//	F20-222J	4	4	4	4	4	4	4	4	4	4
	809101	Film capacitor	ECQ-B1H 102JF	2	2	2	2	2	2	2	2	2	2
	809103	//	ECQ-B1H 152JF		2	2	2	2					
	809105	//	ECQ-B1H 222JF	2					2	2	2	2	2
	809113	//	ECQ-B1H 103JF	2	2	2	2	2	2	2	2	2	2
	809116	//	ECQ-B1H 183JF	4	4	4	4	4	4	4	4	4	4
	809118	//	ECQ-V1H 273JM	2	2	2	2	2	2	2	2	2	2
	809121	//	ECQ-V1H 473JM						2	2	2	2	2
	809123	//	ECQ-V1H 683JM	2	2	2	2	2	2	2	2	2	2
	809124	//	ECQ-V1H 823JM	4	4	4	4	4	4	4	4	4	4
	809125	//	ECQ-V1H 104JM	6	6	6	6	6	7	7	7	7	7
	809127	//	ECQ-V1H 154JM	2	2	2	2	2	2	2	2	2	2
	809129	//	ECQ-V1H 224JM	2	2	2	2	2	2	2	2	2	2
	809130	//	ECQ-V1H 274JM	2	2	2	2	2	2	2	2	2	2
	809136	//	ECQ-V1H 824JM	2	2	2	2	2	2	2	2	2	2
	808964	Fuse clip	H-0060	8	8	8	8	8	8	8	8	8	8

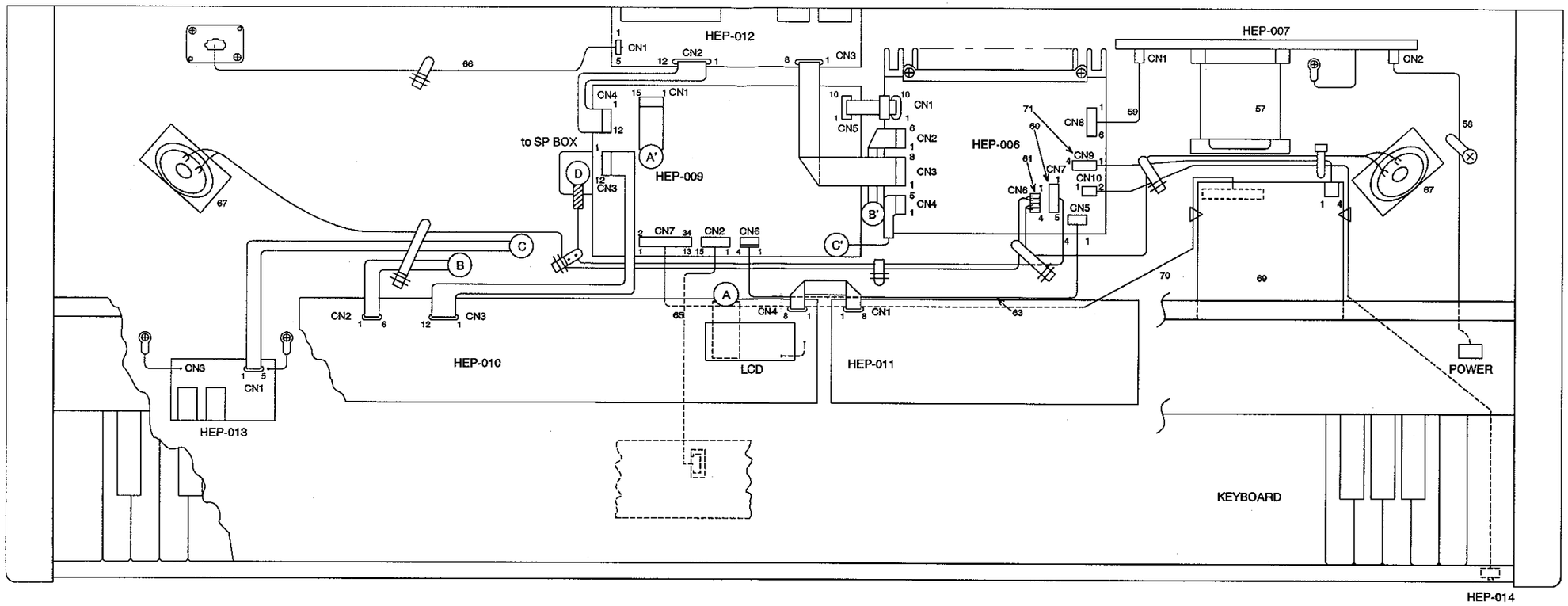
29. WIRING CONNECTION for KSP10,20



SP BOX



30. WIRING CONNECTION for KSP30



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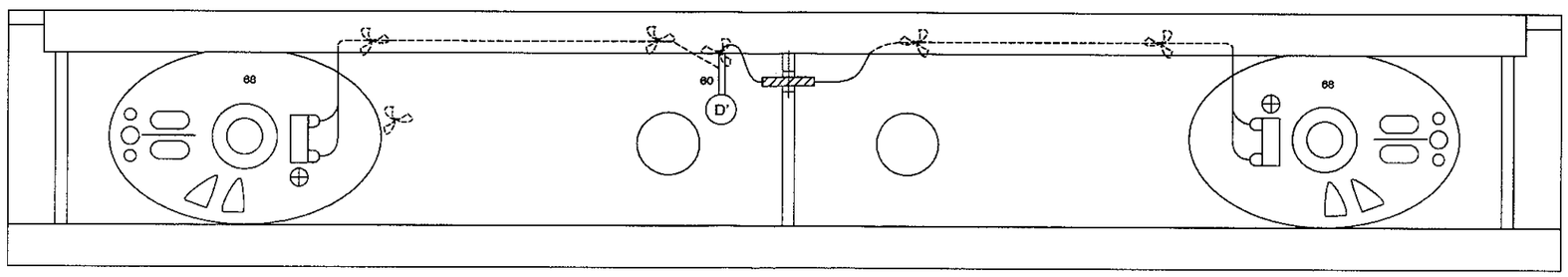
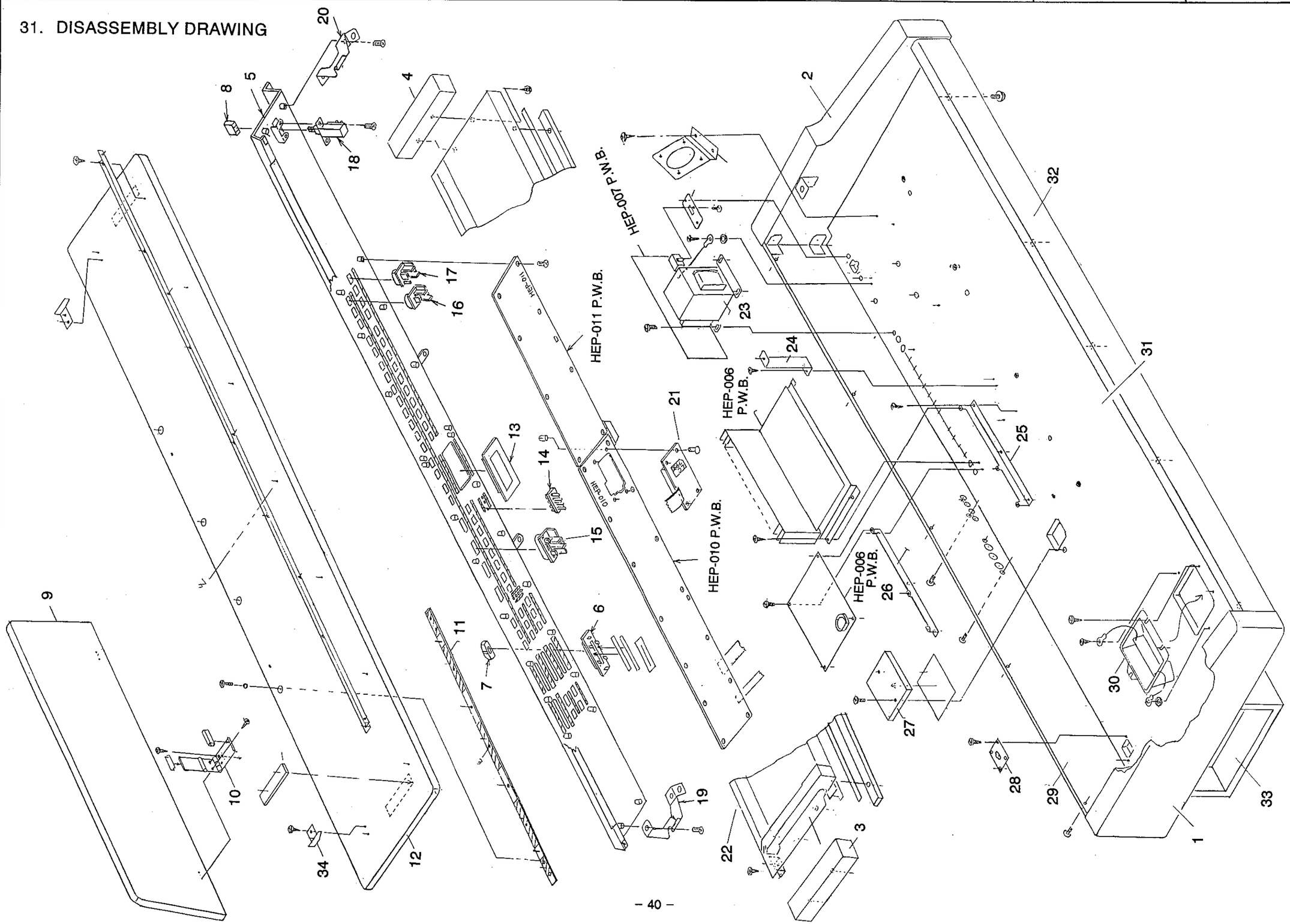
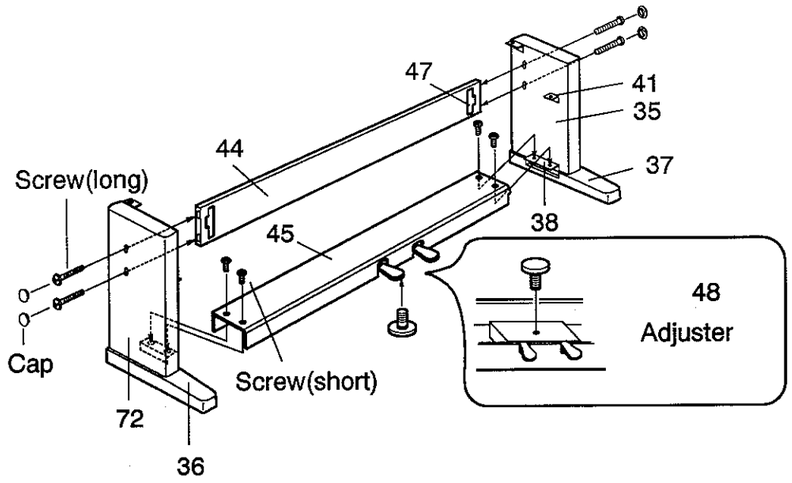
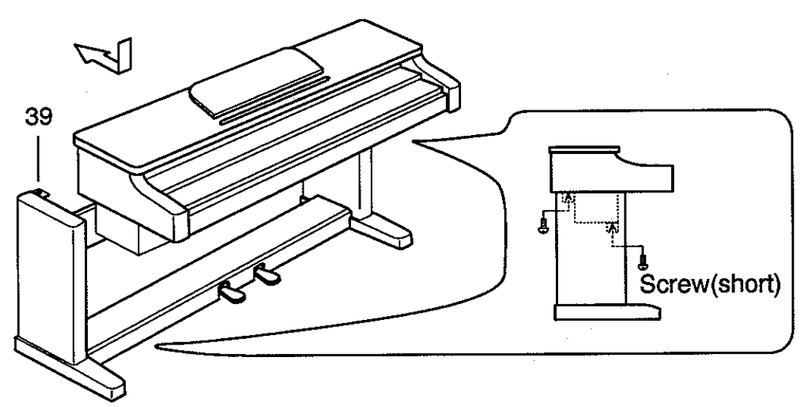


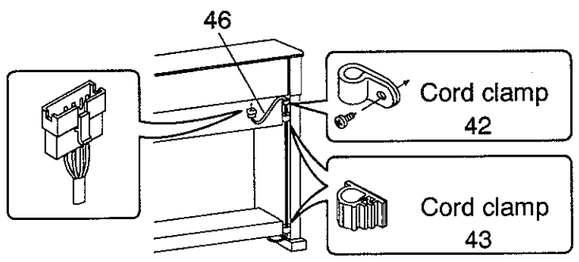
31. DISASSEMBLY DRAWING



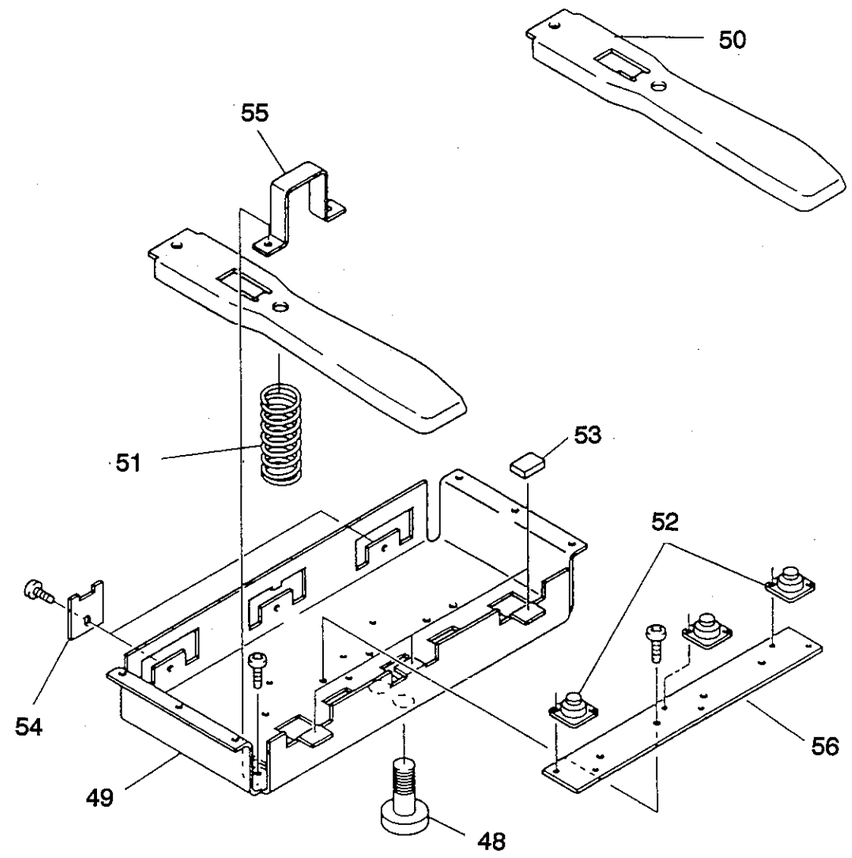
STAND


47
41
35
44
37
Screw(long)
38
45
48
Adjuster
Cap
Screw(short)
72
36


39
Screw(short)


46
Cord clamp
42
Cord clamp
43

PEDAL


50
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51
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52
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56
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48