

# KENWOOD

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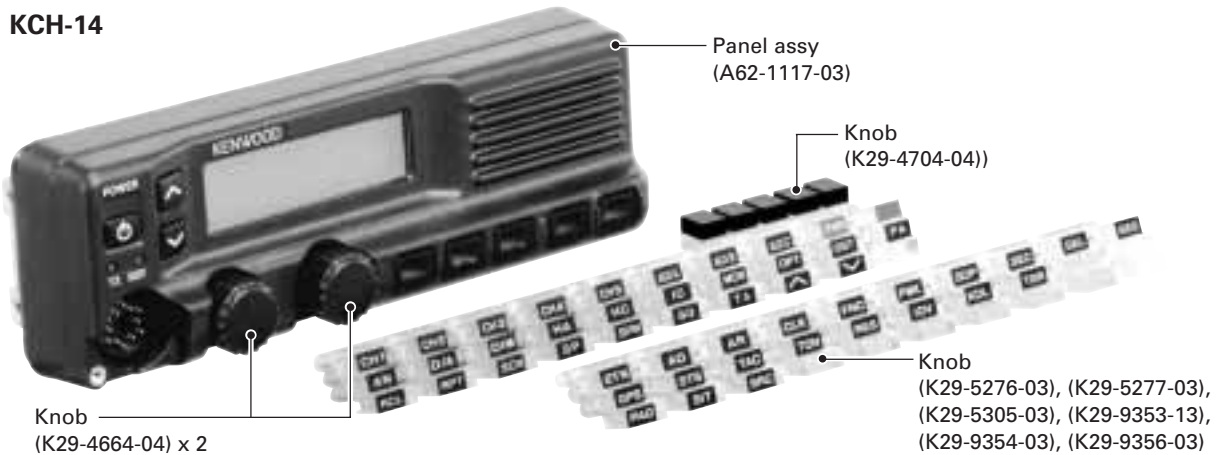
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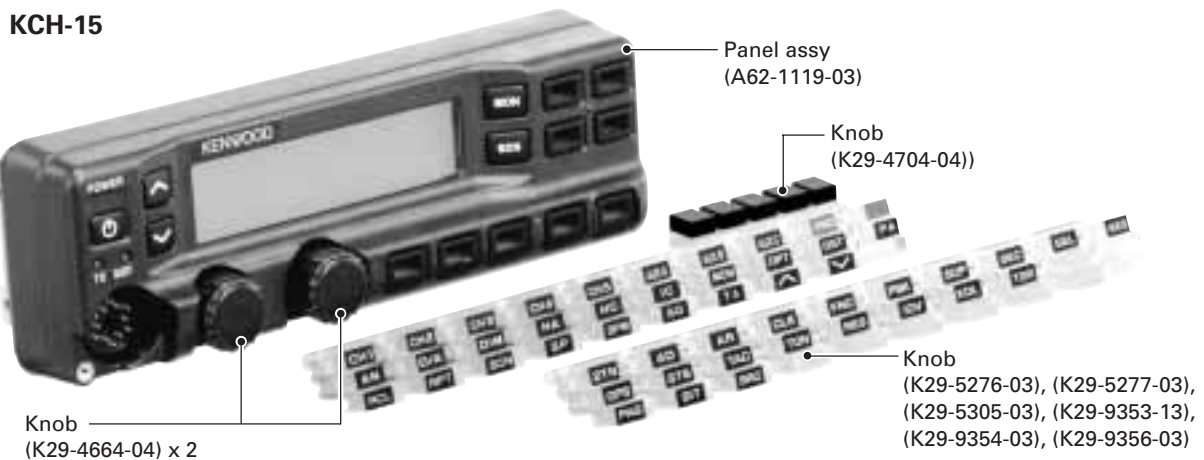
# KCH-14/15

## SERVICE MANUAL

### KCH-14



### KCH-15



## CONTENTS

DISASSEMBLY FOR REPAIR .....	2	TERMINAL FUNCTION .....	16
CIRCUIT DESCRIPTION .....	5	PC BOARD	
SEMICONDUCTOR DATA .....	7	DISPLAY UNIT (X54-3490-20) : KCH-14 .....	18
COMPONENTS DESCRIPTION .....	8	DISPLAY UNIT (X54-3500-20) : KCH-15 .....	20
PARTS LIST .....	9	SCHEMATIC DIAGRAM	
EXPLODED VIEW .....	13	DISPLAY UNIT (X54-3490-20) : KCH-14 .....	22
PACKING .....	15	DISPLAY UNIT (X54-3500-20) : KCH-15 .....	24

# KCH-14/15

## DISASSEMBLY FOR REPAIR

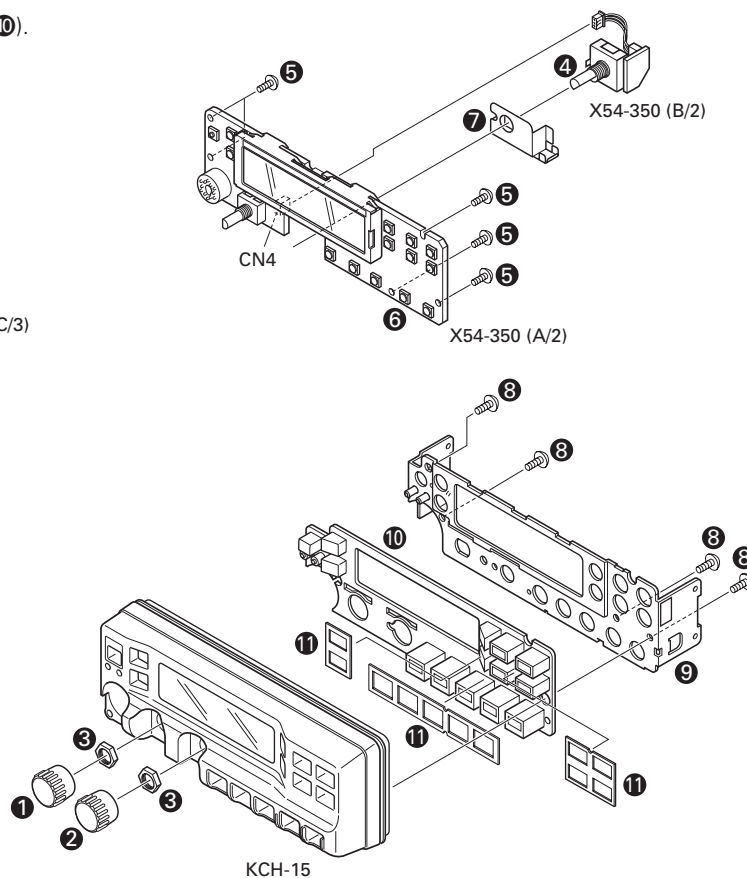
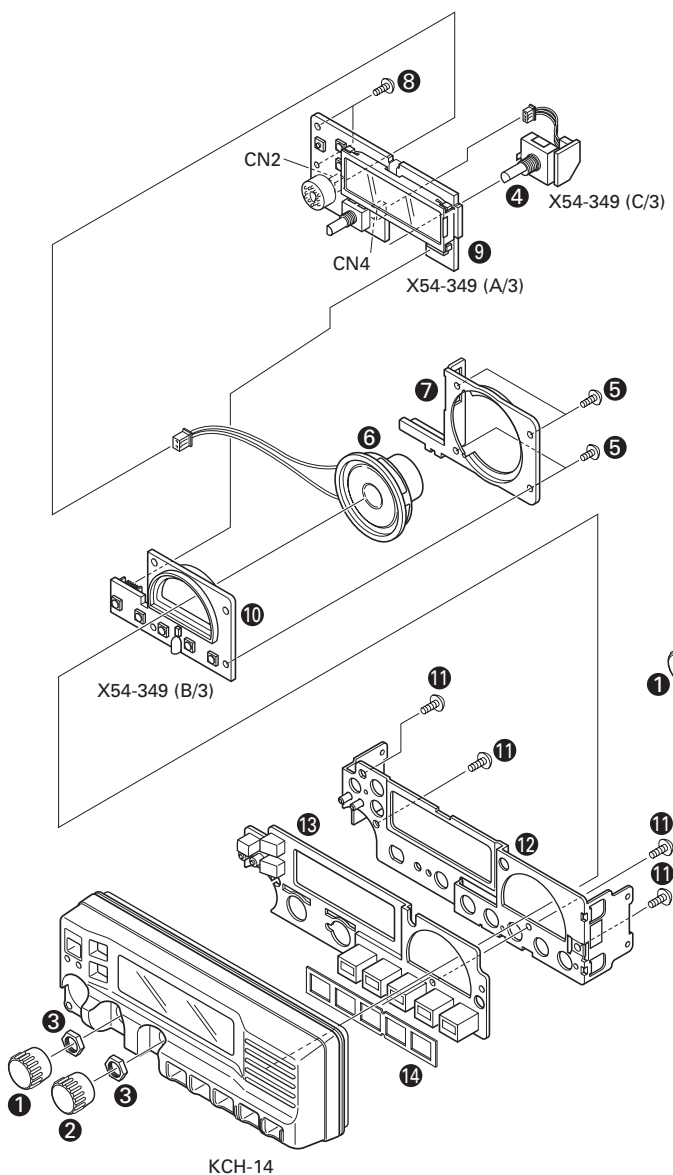
### Disassembly Procedure

#### ■ Disassembly of the Display unit (X54-349):KCH-14

1. Remove the volume knob ① and selector knob ②.
2. Remove the 2 hexagon nuts ③.
3. Remove the cable from the display unit (X54-349 A/3) connector (CN4), and remove the channel encoder ④.
4. Remove the 4 screws ⑤ holding the speaker.
5. Remove the cable from the display unit (X54-349 A/3) connector (CN2).
6. Remove the speaker ⑥ and mounting fixture ⑦.
7. Remove the 2 screws ⑧ holding the display unit (X54-349 A/3).
8. Remove the display unit (X54-349 A/3 ⑨, X54-349 B/3 ⑩).
9. Remove the 4 screws ⑪ holding the sub-panel.
10. Remove the sub-panel ⑫, keytop ⑬ and cushion ⑭.

#### ■ Disassembly of the Display unit (X54-350):KCH-15

1. Remove the volume knob ① and selector knob ②.
2. Remove the 2 hexagon nuts ③.
3. Remove the cable from the display unit (X54-350 A/3) connector (CN4), and remove the channel encoder ④.
4. Remove the 5 screws ⑤ holding the display unit (X54-350 A/3).
5. Remove the display unit (X54-350 A/3) ⑥ and channel encoder fixture ⑦.
6. Remove the 4 screws ⑧ holding the sub-panel.
7. Remove the sub-panel ⑨, keytop ⑩ and 3 cushions ⑪.



## DISASSEMBLY FOR REPAIR

### Precautions for Reassembly

#### ■ Procedure when the packing (G53-0838-13) is removed from the Panel ASSY

When the packing is removed from panel ASSY, affix new sheet (G11-4376-04) to the panel ASSY by following procedures.

1. Remove the white covering paper from the short side of the sheet ①.
2. Place the sheet on the edge of the panel ASSY ②, then affix it to one side of panel ASSY while pulling the right and left sides of the transparent covering paper to make a smooth contact (with no wrinkles) ③.
3. Remove the white covering paper from the other side of the sheet ④, then affix it to the other side of panel ASSY ⑤.

#### Note:

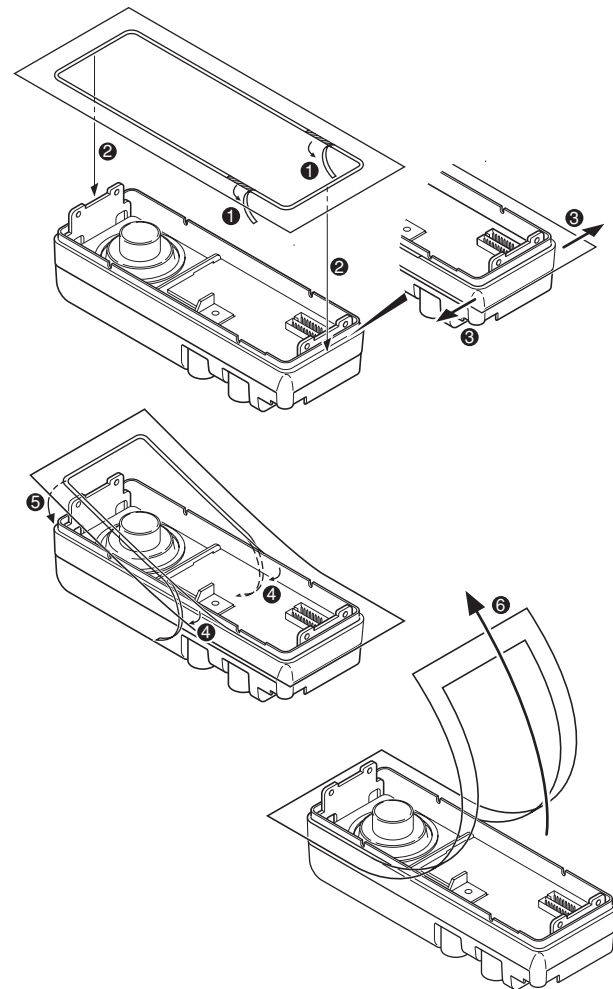
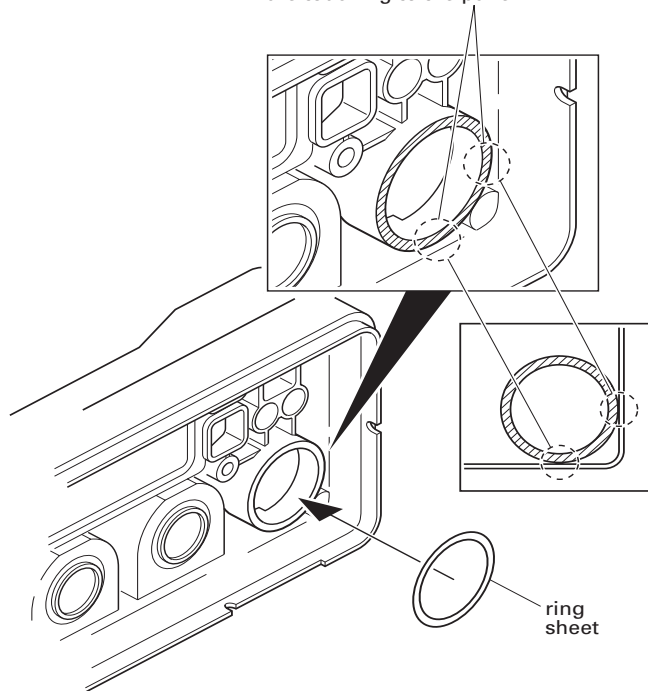
Affix it while pulling the right and left sides of the transparent covering paper to make a smooth contact (with no wrinkles).  
Firmly affix the sheet to the panel ASSY by pushing the double-coated tape with your fingers.

4. Remove the transparent covering paper from the panel ASSY ⑥.

#### ■ Affixing the ring sheet (G11-4380-14)

Affix it to the backside of the microphone jack on the panel ASSY so that the ring sheet fits to the position as shown in figure.

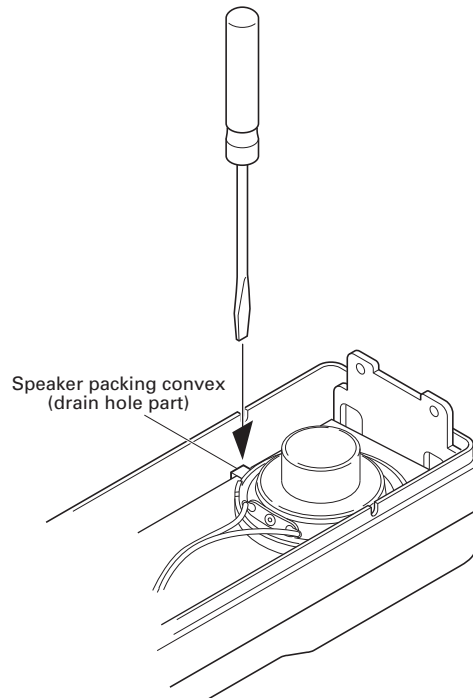
Affix the ring sheet while two positions of the ring sheet are touching to the panel.



## DISASSEMBLY FOR REPAIR

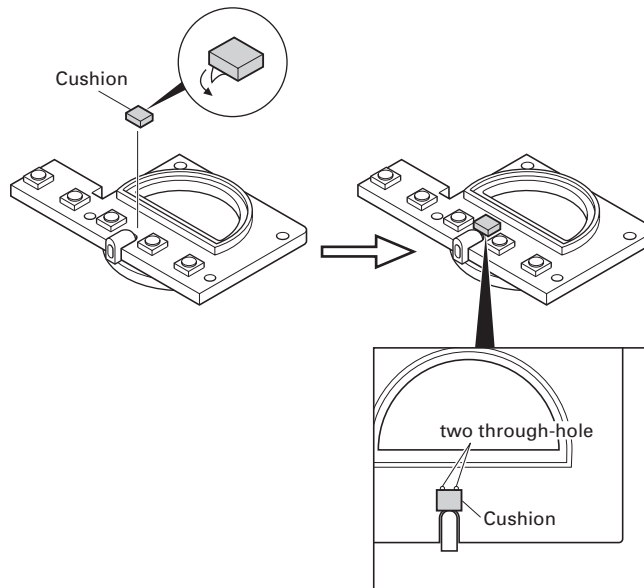
### ■ Fitting the convex (drain hole part) of the speaker packing to the hollow (drain hole part) of the panel ASSY: KCH-14 only

Push the convex (drain hole part) of the speaker packing with a flat-head screwdriver as shown in figure until drain hole of the speaker fit to the drain hole of the panel.



### ■ Affixing the cushion (G13-2129-14): KCH-14 only

Affix the cushion to the PC board along two through-hole on the display unit (X54-349 B/3).



## CIRCUIT DESCRIPTION

### 1. Display Unit

The optional display unit (front panel unit) for the TK-5710(B)/5710H(B) comes in two models : KCH-14 and KCH-15

#### 1-1. KCH-14

This display unit consists of the CPU (IC3), 5V AVR (IC1) and other components.

#### • Encoder

Channels are changed by the rotary encoder (ENC). The up/down pulses from the rotary encoder enter the CPU (IC3), and converted to a serial data signal, and are sent to the control unit.

#### • Power supply

Power is supplied to the CPU by converting SB from the control unit to 5V by IC1. And SB is supplied to the LED for backlight.

#### • CPU

The on/off signals of keys other than the power switch, and the PTT and HOOK signals, are converted to serial data and sent to the control unit. Data is displayed on the 12-digit and 3-digit dot matrix alphanumeric display.

#### • LCD brightness function

From the control of the CPU's DM1/DM2 port, you can switch the LCD/KEY backlight or the optional KMC-28 key backlight as shown in the following table.

LCD brightness setting	LCD	KEY	KMC-28
H	H	ON	ON
M	M	ON	ON
L	L	ON	ON
OFF	OFF	OFF	OFF

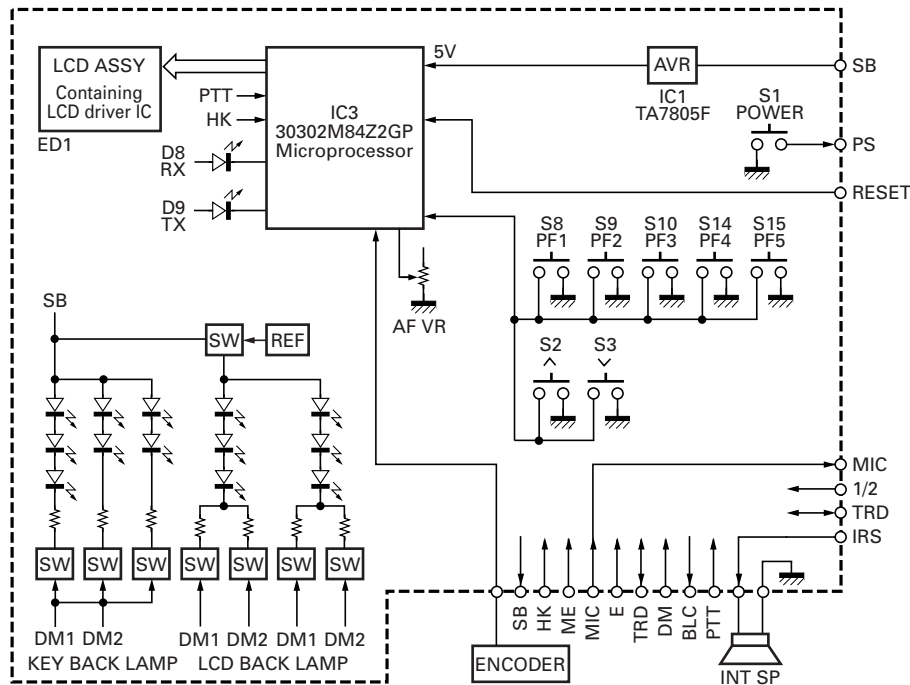


Fig. 1 KCH-14 block diagram

# KCH-14/15

## CIRCUIT DESCRIPTION

### 1-2. KCH-15

This display unit consists of the CPU (IC3), 5V AVR (IC1) and other components.

#### • Encoder

Channels are changed by the rotary encoder (ENC). The up/down pulses from the rotary encoder enter the CPU (IC3), and converted to a serial data signal, and are sent to the control unit.

#### • Power supply

Power is supplied to the CPU by converting SB from the control unit to 5V by IC1. And SB is supplied for the LED of backlight.

#### • CPU

The on/off signals of keys other than the power switch, and the PTT and HOOK signals, are converted to serial data and sent to the control unit. Data is displayed on the 14-digit and 3-digit dot matrix alphanumeric display.

#### • LCD brightness function

From the control of the CPU's DM1/DM2 port, you can switch the LCD/KEY backlight or the optional KMC-28 key backlight as shown in the following table.

LCD brightness setting	LCD	KEY	KMC-28
H	H	ON	ON
M	M	ON	ON
L	L	ON	ON
OFF	OFF	OFF	OFF

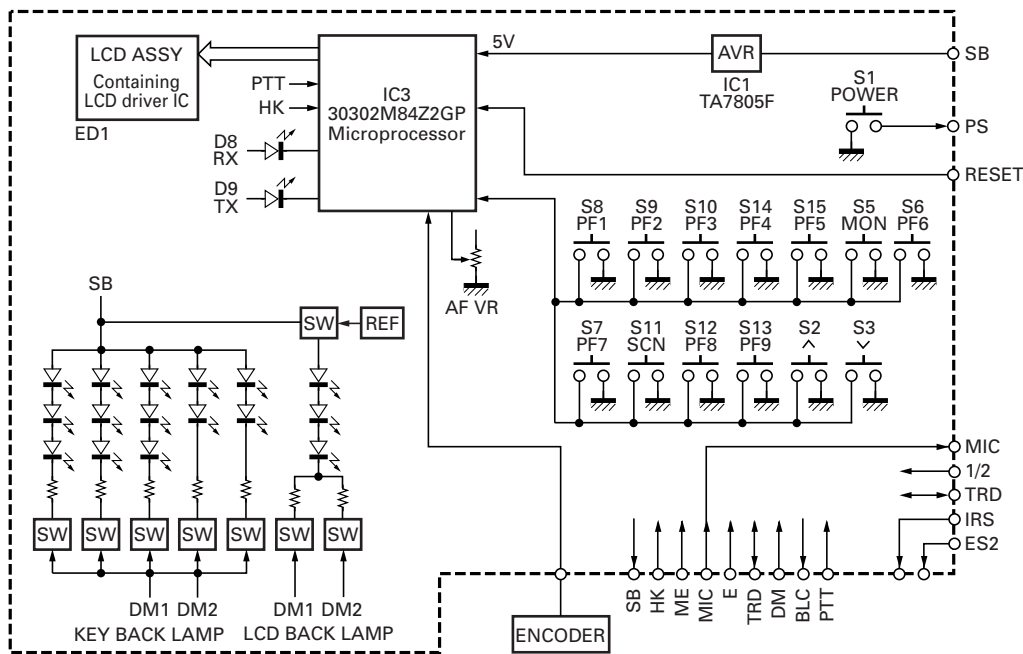


Fig. 2 KCH-15 block diagram

## SEMICONDUCTOR DATA

## CPU:30302M84Z2GP(Display unit IC3)

Pin No.	Port Name	I/O	Function
1~5	NC	-	No connection
6	BYTE	-	GND
7	CNVSS	-	GND
8	NC	-	No connection
9	SFT	O	Beat Shift (L:Shift off, H:Shift on)
10	RESET	I	CPU reset
11	XOUT	O	14.7456MHz clock output
12	VSS	-	GND
13	XIN	I	14.7456MHz clock input
14	VCC	-	+5V
15	NMI	I	NC
16	NC	-	No connection
17	INT1	I	Encoder interrupt
18	INT0	I	RXD interrupt
19	PTT	I	PTT (L:On, H:Off)
20	HOOK	I	HOOK (L:On, H:Off)
21	END	I	Encoder data
22	KVL	I	KVL3000 (L:Connect, H:Disconnect)
23	DM	I/O	MIC keypad data
24	NC	-	No connection
25	BLC	O	MIC keypad backlight control (L:Off,H:On)
26	NC	-	No connection
27	RXD2	I	Serial interface from Deck (Nch open drain output)
28	TXD2	O	Serial interface to Deck (Nch open drain output)
29	TXD	-	No connection
30	RXD	-	No connection
31	SCLK	-	No connection
32	BUSY	-	No connection
33	AI2	I	Auxiliary input 2 (L:Active, H:Inactive)
34	AI1	I	Auxiliary input 1 (L:Active, H:Inactive)
35	AO2	O	Auxiliary output 2 (L:Active, H:Inactive)
36	AO1	O	Auxiliary output 1 (L:Active, H:Inactive)
37,38	NC	-	No connection
39	EPM	-	No connection
40~55	NC	-	No connection
56	BUSYR	O	BUSY LED OFF (BUSY:Low, BUSYR:Low) GREEN (BUSY:Low, BUSYR:High) RED (BUSY:High, BUSYR:Low) ORANGE (BUSY:High, BUSYR:High)
57	BUSY	O	
58	TX	O	TX LED (TX, TXG) Low Low :TX LED OFF Low Hi :TX LED GREEN ON
59	TXG	O	Hi Low :TX LED RED ON Hi Hi :TX LED ORANGE ON
60	VCC	-	+5V
61	NC	-	No connection
62	VSS	-	GND
63~65	NC	-	No connection

Pin No.	Port Name	I/O	Function
66	PF9	I	No connection (KCH-14), [PF9] Key (KCH-15)
67	PF8	I	No connection (KCH-14), [PF8] Key (KCH-15)
68	PF7	I	No connection (KCH-14), [PF7] Key (KCH-15)
69	PF6	I	No connection (KCH-14), [PF6] Key (KCH-15)
70	PF5	I	[PF5] Key (KCH-14/15)
71	PF4	I	[PF4] Key (KCH-14/15)
72	PF3	I	[PF3] Key (KCH-14/15)
73	PF2	I	[PF2] Key (KCH-14/15)
74	PF1	I	[PF1] Key (KCH-14/15)
75	SCN	I	No connection (KCH-14), [SCN] Key (KCH-15)
76	MON	I	No connection (KCH-14), [MON]Key (KCH-15)
77	ZDN	I	[Zone down] Key (KCH-14/15)
78	ZUP	I	[Zone up] Key (KCH-14/15)
79	NC	-	No connection
80	DISP	O	LCD driver DISP (L:LCD inactive, H:LCD active)
81	DM2	O	Display backlight control 2
82	DM1	O	Display backlight control 1
83	DO	O	LCD driver data output
84	DI	I	LCD driver data input
85	CL	O	LCD driver clock
86	CE	O	LCD driver CS
87~92	NC	-	No connection
93	VOL	I	Volume control
94	AVSS	-	GND
95	NC	-	No connection
96	VREF	-	+5V
97	AVCC	-	+5V
98	TEST	I	LCD check mode (L:LCD check mode, H:Normal mode)
99	1/2	I	Head 1/2 check (L:Head 1, H:Head 2)
100	B/F	I	Basic/Full panel check (L:Basic panel, H:Full panel)



# KCH-14/15

## COMPONENTS DESCRIPTION

### Display unit (X54-3490-20):KCH-14

Ref. No.	Part name	Description
IC1	IC	AVR
IC3	IC	CPU
Q1~3	Transistor	DC switch
Q4	FET	DC switch
Q5~9	Transistor	9V AVR
Q11	Transistor	9V AVR
Q13~20	Transistor	9V AVR
D1,2	Diode	Voltage protection
D5,6	Diode	Surge absorption
D8	LED	BUSY LED
D9	LED	TX LED
D10	Zener diode	Voltage reference
D11	Varistor	Surge absorption
D16	Diode	DC switch
D18~22	Varistor	Surge absorption
D23	Zener diode	Surge absorption
D24~26	Varistor	Surge absorption

### Display unit (X54-3500-20):KCH-15

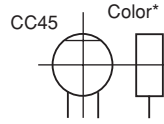
Ref. No.	Part name	Description
IC1	IC	AVR
IC3	IC	CPU
Q1~3	Transistor	DC switch
Q4	FET	DC switch
Q5-20	Transistor	9V AVR
D1,2	Diode	Voltage protection
D5,6	Diode	Surge absorption
D8	LED	BUSY LED
D9	LED	TX LED
D10	Zener diode	Voltage reference
D11	Varistor	Surge absorption
D16	Diode	DC switch
D18~22	Varistor	Surge absorption
D23	Zener diode	Surge absorption
D24~26	Varistor	Surge absorption

## PARTS LIST

### CAPACITORS

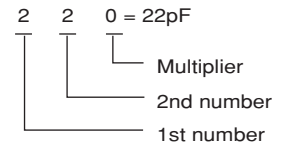
CC 45 TH 1H 220 J  
 1 2 3 4 5 6

- 1 = Type ... ceramic, electrolytic, etc.
- 2 = Shape ... round, square, ect.
- 3 = Temp. coefficient
- 4 = Voltage rating
- 5 = Value
- 6 = Tolerance



#### Capacitor value

- 010 = 1pF
- 100 = 10pF
- 101 = 100pF
- 102 = 1000pF = 0.001μF
- 103 = 0.01μF



#### Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

#### Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -40	+80 -20	+100 -0	More than 10μF -10 ~ +50 Less than 4.7μF -10 ~ +75

#### (Less than 10pF)

Gode	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

#### Voltage rating

2nd word 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

#### Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J  
 1 2 3 4 5 6 7

(Chip)(CH,RH<UJ,SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z  
 1 2 3 4 5 6 7

(Chip)(B,F)

Refer to the table above.

- 1 = Type
- 2 = Shape
- 3 = Dimension
- 4 = Temp. coefficient
- 5 = Voltage rating
- 6 = Value
- 7 = Tolerance

#### Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.0 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0
H	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05

### RESISTORS

#### Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J  
 1 2 3 4 5 6 7

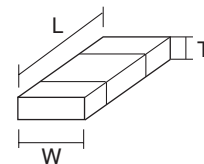
(Chip)(B,F)

#### Carbon resistor (Nomal type)

(EX) R D 1 4 B B 2 C 0 0 0 J  
 1 2 3 4 5 6 7

- 1 = Type
- 2 = Shape
- 3 = Dimension
- 4 = Temp. coefficient
- 5 = Rating wattage
- 6 = Value
- 7 = Tolerance

#### Dimension



#### Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1
H	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05

#### Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

# KCH-14/15

## PARTS LIST

\* New Parts.  $\Delta$  indicates safety critical components.  
 Parts without **Parts No.** are not supplied.  
 Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.  
 Teile ohne **Parts No.** werden nicht geliefert.

L: Scandinavia      K: USA      P: Canada  
 Y: PX (Far East, Hawaii)      T: England      E: Europe  
 Y: AAFES (Europe)      X: Australia      M: Other Areas

### KCH-14 (Y60-4050-20) DISPLAY UNIT (X54-3490-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>KCH-14</b>						C23			CK73GB1H102K	CHIP C 1000PF K	
3	3A	*	A62-1117-03	PANEL ASSY(BASIC)		C27 -29			CC73GCH1H101J	CHIP C 100PF J	
5	3A	*	B41-1852-14	CAUTION STICKER		C30			CK73GB1H102K	CHIP C 1000PF K	
6	2A		E37-0787-05	LEAD WIRE WITH CONNECTOR(SP)		C32			CK73GB1H102K	CHIP C 1000PF K	
7	2B		G10-0755-04	FIBROUS SHEET(SP LEAD)		C36 ,37			CC73GCH1H101J	CHIP C 100PF J	
10	1A		G11-2663-04	SHEET(MIC JACK)		C39 -44			CK73GB1H102K	CHIP C 1000PF K	
11	3A	*	G11-4376-04	SHEET(PANEL ASSY)		C45			CC73GCH1H101J	CHIP C 100PF J	
12	3A	*	G11-4380-14	SHEET		C46			CK73GB1C104K	CHIP C 0.10UF K	
16	3B	*	G13-2124-04	CUSHION(KEYTOP 5KEY)		C47			CK73GB1H102K	CHIP C 1000PF K	
17	2A	*	G13-2129-14	CUSHION		C48			C92-0836-05	ELECTRO 330UF 16WV	
20	3A		G53-0838-13	PACKING(PANEL ASSY)		C49			CK73GB1C104K	CHIP C 0.10UF K	
21	2A		G53-0839-14	PACKING(SP)		C50			CK73GB1H102K	CHIP C 1000PF K	
23	3A		G53-1523-04	PACKING(VOL, CH KNOB)		C51			CK73GB1C104K	CHIP C 0.10UF K	
24	3B	*	G53-1670-04	PACKING(MIC JACK)		C52			CK73GB1H102K	CHIP C 1000PF K	
26	2F	*	H12-3182-02	PACKING FIXTURE		C53			C92-0628-05	CHIP-TAN 10UF 10WV	
31	3F	*	H52-2109-02	ITEM CARTON CASE		C55			CC73GCH1H101J	CHIP C 100PF J	
33	2B		J21-8345-14	MOUNTING HARDWARE(SP)		C57			CK73GB1H102K	CHIP C 1000PF K	
36	2B		J39-0625-04	SPACER(TX-BUSY)		C58			CK73GB1E103K	CHIP C 0.010UF K	
40	3A		K29-4664-04	KNOB(VOL,CH)		C59			CC73GCH1H101J	CHIP C 100PF J	
41	1E		K29-4704-04	KNOB ACCESSORY		-			E37-0781-05	PROCESSED LEAD WIRE(ENCODER)	
42	1E		K29-5276-03	KNOB ACCESSORY		CN1			E40-5953-05	PIN ASSY	
43	1E		K29-5277-03	KNOB ACCESSORY		CN2			E40-5704-05	PIN ASSY	
44	1E		K29-5305-03	KNOB ACCESSORY		CN3			E40-5952-05	PIN ASSY	
45	3B	*	K29-9347-02	KEY TOP(BASIC)		CN4			E40-5738-05	PIN ASSY	
47	1E	*	K29-9353-13	KNOB ACCESSORY		CN5			E40-5823-05	FLAT CABLE CONNECTOR	
48	1E	*	K29-9354-03	KNOB ACCESSORY		CN12			E40-6202-05	FLAT CABLE CONNECTOR	
49	1E	*	K29-9356-03	KNOB ACCESSORY		CN13			E40-5957-05	SOCKET FOR PIN ASSY	
A	2B		N82-2005-45	BINDING HEAD TAPTITE SCREW		CN14			E40-5958-05	PIN ASSY	
B	2B,3B		N82-3006-46	BINDING HEAD TAPTITE SCREW(SUB PANEL)		J1	1B		E56-0410-15	CYLINDRICAL RECEPTACLE(MIC JACK)	
C	2B		N87-2605-46	BRAZIER HEAD TAPTITE SCREW(TX-BUSY)		W1	1B		E37-0703-05	LEAD WIRE WITH CONNECTOR	
D	2B		N87-2606-45	BRAZIER HEAD TAPTITE SCREW(SP)		L1		*	L92-0155-05	CHIP FERRITE	
E	1B,2B		N87-2608-46	BRAZIER HEAD TAPTITE SCREW(PCB,SP)		L2		*	L92-0451-05	CHIP FERRITE	
50	1E		N99-0364-05	SCREW SET ACCESSORY		L3		*	L92-0140-05	CHIP FERRITE	
51	2B		T07-0265-05	SPEAKER		X1		*	L77-1956-05	CRYSTAL RESONATOR(14.7456MHZ)	
<b>DISPLAY UNIT (X54-3490-20) : KCH-14</b>						R1		*	R92-1252-05	CHIP R 0 OHM J 1/16W	
D8 ,9	1A	*	B30-2019-05	LED(RE/GR)		R2 ,3		*	RK73GB1J102J	CHIP R 1.0K J 1/16W	
ED1			B38-0904-05	LCD ASSY		R4		*	R92-1252-05	CHIP R 0 OHM J 1/16W	
C1 -3			CC73GCH1H101J	CHIP C 100PF J		R5		*	RK73PB2H821J	CHIP R 820 J 1/2W	
C4 ,5			CK73GB1H102K	CHIP C 1000PF K		R7		*	RK73GB1J473J	CHIP R 47K J 1/16W	
C6			CK73GB1E105K	CHIP C 1.0UF K		R8 ,9		*	RK73GB1J102J	CHIP R 1.0K J 1/16W	
C7			CK73GB1C104K	CHIP C 0.10UF K		R10		*	RK73GB1J474J	CHIP R 470K J 1/16W	
C8			CK73GB1E103K	CHIP C 0.010UF K		R11		*	RK73GB1J102J	CHIP R 1.0K J 1/16W	
C9 ,10			CC73GCH1H101J	CHIP C 100PF J		R12		*	RK73FB2A151J	CHIP R 150 J 1/10W	
C11			CK73GB1E103K	CHIP C 0.010UF K		R13		*	RK73GB1J472J	CHIP R 4.7K J 1/16W	
C12			CK73GB1H102K	CHIP C 1000PF K		R14 ,15		*	RK73GB1J473J	CHIP R 47K J 1/16W	
C13			CK73GB1E223K	CHIP C 0.022UF K		R16		*	RK73GB1J561J	CHIP R 560 J 1/16W	
C14			CC73GCH1H471J	CHIP C 470PF J		R17		*	RK73FB2A391J	CHIP R 390 J 1/10W	
C15			CK73GB1H102K	CHIP C 1000PF K		R18		*	RK73GB1J102J	CHIP R 1.0K J 1/16W	
C16			CC73GCH1H101J	CHIP C 100PF J		R19		*	RK73GB1J472J	CHIP R 4.7K J 1/16W	
C19			CC73GCH1H030C	CHIP C 3.0PF C		R21		*	R92-0670-05	CHIP R 0 OHM	
C20 ,21			CC73GCH1H150J	CHIP C 15PF J		R23		*	RK73GB1J474J	CHIP R 470K J 1/16W	
						R24		*	RK73GB1J220J	CHIP R 22 J 1/16W	
						R25		*	R92-0670-05	CHIP R 0 OHM	
						R26		*	RK73GB1J103J	CHIP R 10K J 1/16W	
						R27		*	RK73FB2A102J	CHIP R 1.0K J 1/10W	

## PARTS LIST

DISPLAY UNIT (X54-3490-20)  
KCH-15 (Y60-4060-20)  
DISPLAY UNIT (X54-3500-20)

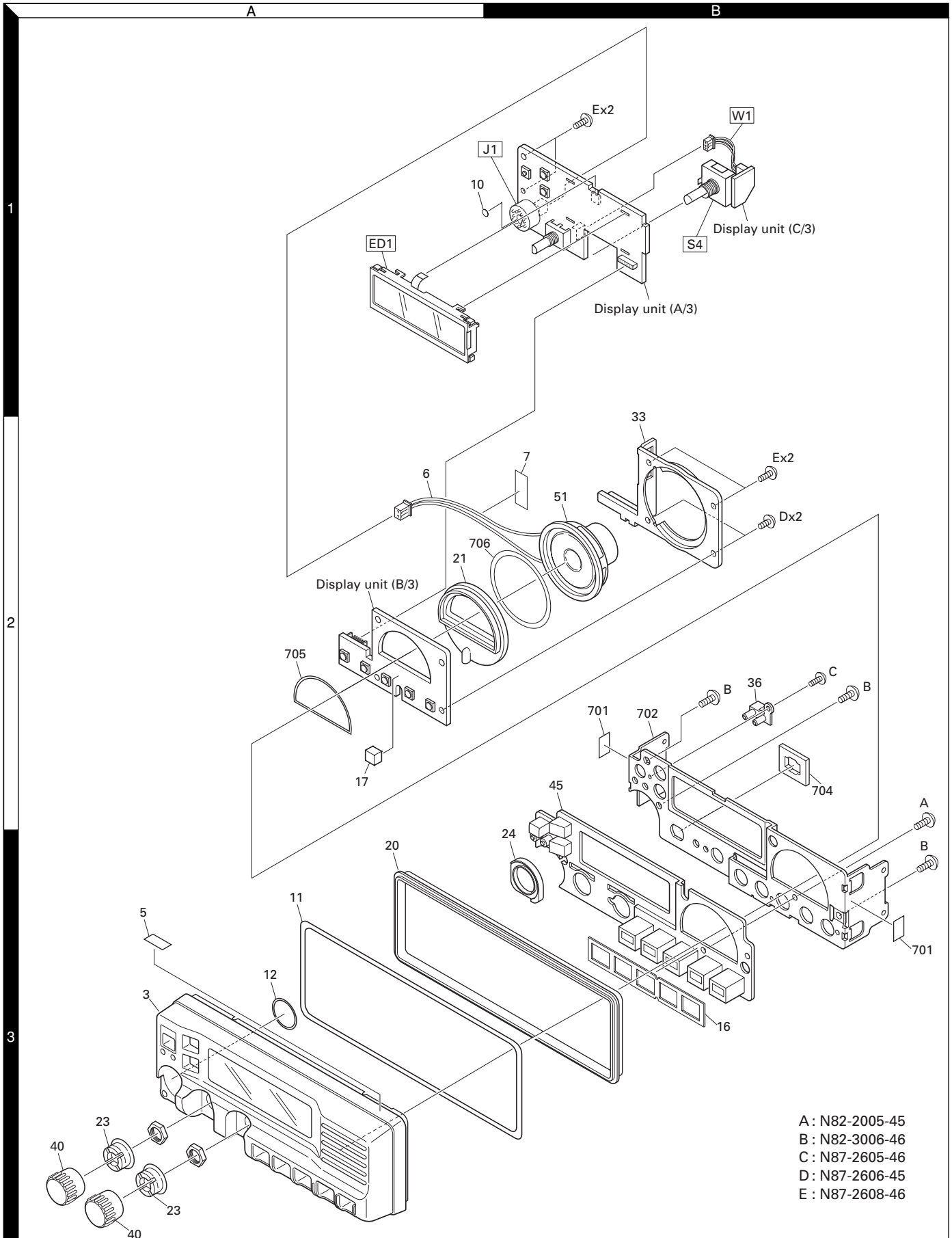
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R28 -30			R92-0670-05	CHIP R 0 OHM		12	2C	*	G11-4380-14	SHEET	
R32 -34			RK73GB1J473J	CHIP R 47K J 1/16W		13	2D	*	G11-4383-04	SHEET(SUB PANEL)	
R35			RK73GB1J682J	CHIP R 6.8K J 1/16W		14	2D	*	G11-4387-04	SHEET(CYLINDRICAL BOSS)	
R36			RK73GB1J474J	CHIP R 470K J 1/16W		15	2C,2D		G13-1713-04	CUSHION(LCD ASSY)	
R37			RK73GB1J331J	CHIP R 330 J 1/16W		16	2D	*	G13-2124-04	CUSHION(KEYTOP 5KEY)	
R38			RK73GB1J181J	CHIP R 180 J 1/16W		18	3D	*	G13-2125-14	CUSHION(KEYTOP 2KEY)	
R40		*	RK73PB2H681J	CHIP R 680 J 1/2W		19	2D	*	G13-2126-04	CUSHION(KEYTOP 2KEY)	
R42		*	RK73PB2H821J	CHIP R 820 J 1/2W		20	2C		G53-0838-13	PACKING(PANEL ASSY)	
R43 ,44			RK73GB1J473J	CHIP R 47K J 1/16W		23	3C		G53-1523-04	PACKING(VOL.CH KNOB)	
R46 -49			RK73GB1J473J	CHIP R 47K J 1/16W		24	2D	*	G53-1670-04	PACKING(MIC JACK)	
R56 -60			RK73GB1J473J	CHIP R 47K J 1/16W		26	2F	*	H12-3182-02	PACKING FIXTURE	
R61 -65			RK73GB1J102J	CHIP R 1.0K J 1/16W		31	3F	*	H52-2109-02	ITEM CARTON CASE	
R66 ,67			RK73GB1J473J	CHIP R 47K J 1/16W		35	2D		J32-0942-04	CYLINDRICAL BOSS	
R69 ,70			RK73GB1J333J	CHIP R 33K J 1/16W		36	2D		J39-0625-04	SPACER(TX-BUSY)	
R71			RK73FB2A391J	CHIP R 390 J 1/10W		40	3C		K29-4664-04	KNOB(VOL,CH)	
R72			RK73FB2A151J	CHIP R 150 J 1/10W		41	1E		K29-4704-04	KNOB ACCESSORY	
R74			R92-0670-05	CHIP R 0 OHM		42	1E		K29-5276-03	KNOB ACCESSORY	
R75			RK73GB1J220J	CHIP R 22 J 1/16W		43	1E		K29-5277-03	KNOB ACCESSORY	
R76 ,77			RK73GB1J102J	CHIP R 1.0K J 1/16W		44	1E		K29-5305-03	KNOB ACCESSORY	
R78			R92-1252-05	CHIP R 0 OHM J 1/16W		46	2D	*	K29-9348-02	KEY TOP(FULL)	
R79			RK73GB1J102J	CHIP R 1.0K J 1/16W		47	1E	*	K29-9353-13	KNOB ACCESSORY	
R80			RS14DB3D2R2J	FL-PROOF RS 2.2 J 2W		48	1E	*	K29-9354-03	KNOB ACCESSORY	
R81			RK73GB1J222J	CHIP R 2.2K J 1/16W		49	1E	*	K29-9356-03	KNOB ACCESSORY	
R82 ,83			RK73GB1J102J	CHIP R 1.0K J 1/16W		B	2D		N82-3006-46	BINDING HEAD TAPTITE SCREW(SUB PANEL)	
VR1			R31-0607-05	VARIABLE RESISTOR(10K)		C	2D		N87-2605-46	BRAZIER HEAD TAPTITE SCREW(TX-BUSY)	
S1			S40-1420-05	TACT SWITCH		E	1D		N87-2608-46	BRAZIER HEAD TAPTITE SCREW(PCB)	
S2 ,3		*	S70-0502-05	TACT SWITCH		50	1E		N99-0364-05	SCREW SET ACCESSORY	
S8 -10		*	S70-0502-05	TACT SWITCH		<b>DISPLAY UNIT (X54-3500-20) : KCH-15</b>					
S14 ,15		*	S70-0502-05	TACT SWITCH		D8 ,9			B30-2019-05	LED(RE/GR)	
D1 ,2		*	1SS355	DIODE		ED1	2C	*	B38-0910-05	LCD ASSY	
D5 ,6			DA204U	DIODE		C1 -3			CC73GCH1H101J	CHIP C 100PF J	
D10			02C29.1(X,Y)	ZENER DIODE		C4 ,5			CK73GB1H102K	CHIP C 1000PF K	
D11			AVRM1608270MAB	VARISTOR		C6			CK73GB1E105K	CHIP C 1.0UF K	
D16			1SS301	DIODE		C7			CK73GB1C104K	CHIP C 0.10UF K	
D18			MINISMD020	VARISTOR		C8			CK73GB1E103K	CHIP C 0.010UF K	
D19 -22			AVRM1608270MAB	VARISTOR		C9 ,10			CC73GCH1H101J	CHIP C 100PF J	
D23			MAYS062	ZENER DIODE		C11			CK73GB1E103K	CHIP C 0.010UF K	
D24 -26			AVRM1608270MAB	VARISTOR		C12			CK73GB1H102K	CHIP C 1000PF K	
IC1			TA7805F	MOS-IC		C13			CK73GB1E223K	CHIP C 0.022UF K	
IC3		*	30302M84Z2GP	MICROPROCESSOR IC		C14			CC73GCH1H471J	CHIP C 470PF J	
Q1 ,2			2SD2114(KW)	TRANSISTOR		C15			CK73GB1H102K	CHIP C 1000PF K	
Q3			DTC144EUA	DIGITAL TRANSISTOR		C16			CC73GCH1H101J	CHIP C 100PF J	
Q4			2SK1824	FET		C19			CC73GCH1H030C	CHIP C 3.0PF C	
Q5			2SC2873(Y)	TRANSISTOR		C20 ,21			CC73GCH1H150J	CHIP C 15PF J	
Q6 ,7			DTC114TE	DIGITAL TRANSISTOR		C23			CK73GB1H102K	CHIP C 1000PF K	
Q8 ,9			DTC144EUA	DIGITAL TRANSISTOR		C24 -29			CC73GCH1H101J	CHIP C 100PF J	
Q11			DTC144EUA	DIGITAL TRANSISTOR		C30 -32			CK73GB1H102K	CHIP C 1000PF K	
Q13			DTC144EUA	DIGITAL TRANSISTOR		C33 -37			CC73GCH1H101J	CHIP C 100PF J	
Q14 -16			DTC144EE	DIGITAL TRANSISTOR		C38 -44			CK73GB1H102K	CHIP C 1000PF K	
Q17 -20			DTC144EE	DIGITAL TRANSISTOR		C45			CC73GCH1H101J	CHIP C 100PF J	
S4	1B		W02-0393-05	ENCODER		C46			CK73GB1C104K	CHIP C 0.10UF K	
-			490-0160-05	ADHESIVE TAPE		C47			CK73GB1H102K	CHIP C 1000PF K	
<b>KCH-15</b>						C49			CK73GB1C104K	CHIP C 0.10UF K	
4	3C	*	A62-1119-03	PANEL ASSY(FULL)		C50			CK73GB1H102K	CHIP C 1000PF K	
5	2C	*	B41-1852-14	CAUTION STICKER		C51			CK73GB1C104K	CHIP C 0.10UF K	
8	2C		G10-0775-04	FIBROUS SHEET(LCD ASSY)		C52			CK73GB1H102K	CHIP C 1000PF K	
10	1D		G11-2663-04	SHEET(MIC JACK)		C53			C92-0628-05	CHIP-TAN 10UF 10WV	
11	3C	*	G11-4376-04	SHEET(PANEL ASSY)							

## PARTS LIST

### DISPLAY UNIT (X54-3500-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C55			CC73GCH1H101J	CHIP C 100PF J		S2 ,3		*	S70-0502-05	TACT SWITCH	
C57			CK73GB1H102K	CHIP C 1000PF K		S5 -15		*	S70-0502-05	TACT SWITCH	
C58			CK73GB1E103K	CHIP C 0.010UF K		D1 ,2			1SS355	DIODE	
C59			CC73GCH1H101J	CHIP C 100PF J		D5 ,6			DA204U	DIODE	
-			E37-0781-05	PROCESSED LEAD WIRE(ENCODER)		D10			02CZ9.1(X,Y)	ZENER DIODE	
CN1			E40-5953-05	PIN ASSY		D11			AVRM1608270MAB	VARISTOR	
CN2			E40-5704-05	PIN ASSY		D16			1SS301	DIODE	
CN3			E40-5952-05	PIN ASSY		D18			MINISMDCO20	VARISTOR	
CN4			E40-5738-05	PIN ASSY		D19 -22			AVRM1608270MAB	VARISTOR	
CN5			E40-5823-05	FLAT CABLE CONNECTOR		D23			MAYS062	ZENER DIODE	
CN12			E40-6202-05	FLAT CABLE CONNECTOR		D24 -26			AVRM1608270MAB	VARISTOR	
J1	1D		E56-0410-15	CYLINDRICAL RECEPTACLE(MIC JACK)		IC1			TA7805F	MOS-IC	
W1	1D		E37-0703-05	LEAD WIRE WITH CONNECTOR		IC3		*	30302M84Z2GP	MICROPROCESSOR IC	
L1			L92-0155-05	CHIP FERRITE		Q1 ,2			2SD2114K(W)	TRANSISTOR	
L2		*	L92-0451-05	CHIP FERRITE		Q3			DTC144EUA	DIGITAL TRANSISTOR	
L3			L92-0140-05	CHIP FERRITE		Q4			2SK1824	FET	
X1			L77-1956-05	CRYSTAL RESONATOR(14.7456MHZ)		Q5			2SC2873(Y)	TRANSISTOR	
R1			R92-1252-05	CHIP R 0 OHM J 1/16W		Q6 ,7			DTC114TE	DIGITAL TRANSISTOR	
R2 ,3			RK73GB1J102J	CHIP R 1.0K J 1/16W		Q8 -13			DTC144EUA	DIGITAL TRANSISTOR	
R4			R92-1252-05	CHIP R 0 OHM J 1/16W		Q14 -16			DTC144EE	DIGITAL TRANSISTOR	
R5		*	RK73PB2H821J	CHIP R 820 J 1/2W		Q17 -20			DTC114EE	DIGITAL TRANSISTOR	
R7			RK73GB1J473J	CHIP R 47K J 1/16W		S4	1D		W02-0393-05	ENCODER	
R8 ,9			RK73GB1J102J	CHIP R 1.0K J 1/16W		-			490-0160-05	ADHESIVE TAPE	
R10			RK73GB1J474J	CHIP R 470K J 1/16W							
R11			RK73GB1J102J	CHIP R 1.0K J 1/16W							
R12			RK73FB2A151J	CHIP R 150 J 1/10W							
R13			RK73GB1J472J	CHIP R 4.7K J 1/16W							
R14 ,15			RK73GB1J473J	CHIP R 47K J 1/16W							
R16			RK73GB1J561J	CHIP R 560 J 1/16W							
R17			RK73FB2A391J	CHIP R 390 J 1/10W							
R18			RK73GB1J102J	CHIP R 1.0K J 1/16W							
R19			RK73GB1J472J	CHIP R 4.7K J 1/16W							
R21			R92-0670-05	CHIP R 0 OHM							
R23			RK73GB1J474J	CHIP R 470K J 1/16W							
R24			RK73GB1J220J	CHIP R 22 J 1/16W							
R25			R92-0670-05	CHIP R 0 OHM							
R26			RK73GB1J103J	CHIP R 10K J 1/16W							
R27			RK73FB2A102J	CHIP R 1.0K J 1/10W							
R28 ,29			R92-0670-05	CHIP R 0 OHM							
R32 -34			RK73GB1J473J	CHIP R 47K J 1/16W							
R35			RK73GB1J682J	CHIP R 6.8K J 1/16W							
R36			RK73GB1J474J	CHIP R 470K J 1/16W							
R37			RK73GB1J331J	CHIP R 330 J 1/16W							
R38			RK73GB1J181J	CHIP R 180 J 1/16W							
R39 ,40		*	RK73PB2H681J	CHIP R 680 J 1/2W							
R41 ,42		*	RK73PB2H821J	CHIP R 820 J 1/2W							
R43 ,44			RK73GB1J473J	CHIP R 47K J 1/16W							
R46 -60			RK73GB1J473J	CHIP R 47K J 1/16W							
R66 -68			RK73GB1J473J	CHIP R 47K J 1/16W							
R69 ,70			RK73GB1J333J	CHIP R 33K J 1/16W							
R71			RK73FB2A391J	CHIP R 390 J 1/10W							
R72			RK73FB2A151J	CHIP R 150 J 1/10W							
R75			RK73GB1J220J	CHIP R 22 J 1/16W							
R76 ,77			RK73GB1J102J	CHIP R 1.0K J 1/16W							
R78			R92-1252-05	CHIP R 0 OHM J 1/16W							
R79			RK73GB1J102J	CHIP R 1.0K J 1/16W							
R80			RK73GB1J222J	CHIP R 2.2K J 1/16W							
R82 ,83			RK73GB1J102J	CHIP R 1.0K J 1/16W							
VR1			R31-0607-05	VARIABLE RESISTOR(10K)							
S1			S40-1420-05	TACT SWITCH							

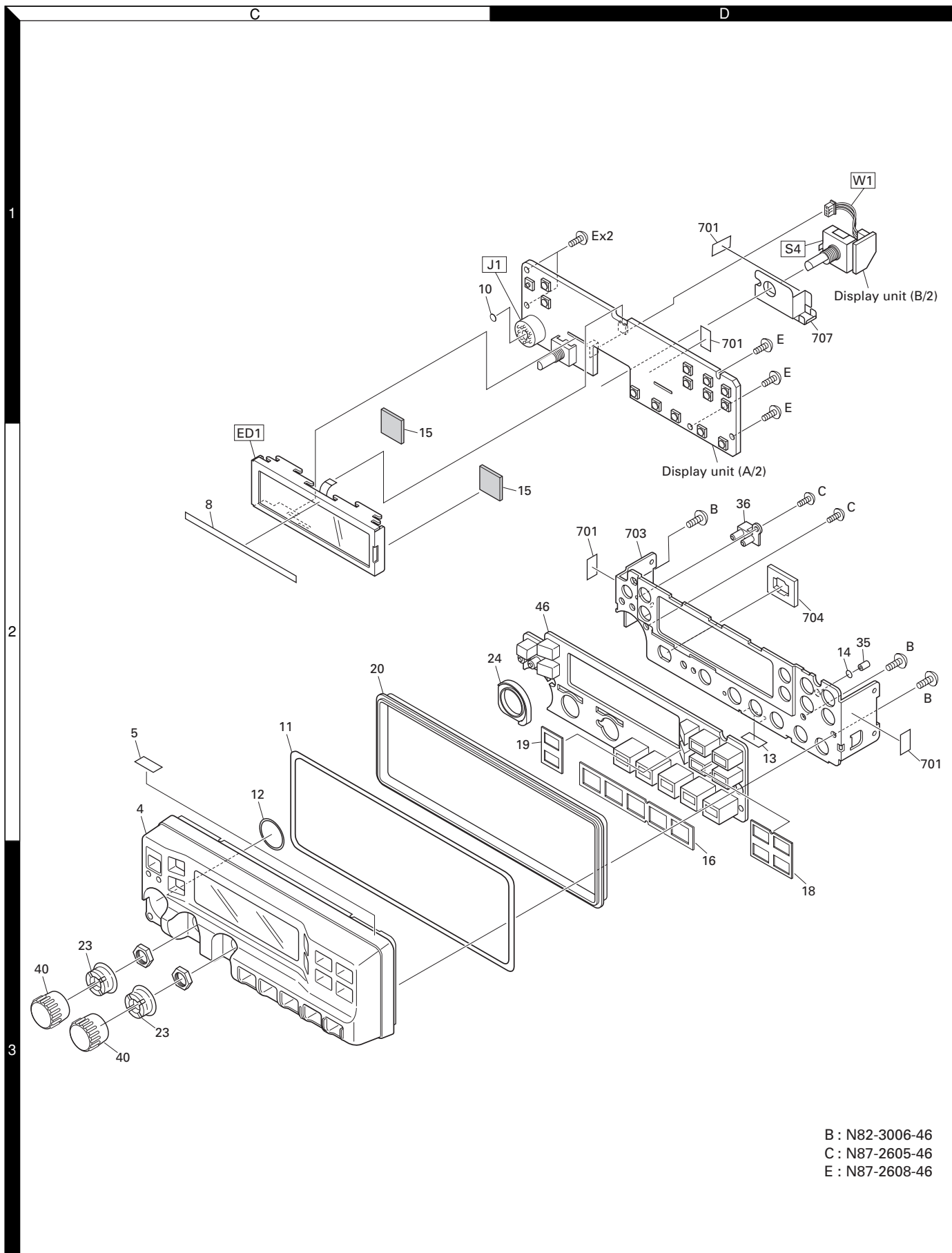
## EXPLODED VIEW (KCH-14)



- A : N82-2005-45
- B : N82-3006-46
- C : N87-2605-46
- D : N87-2606-45
- E : N87-2608-46

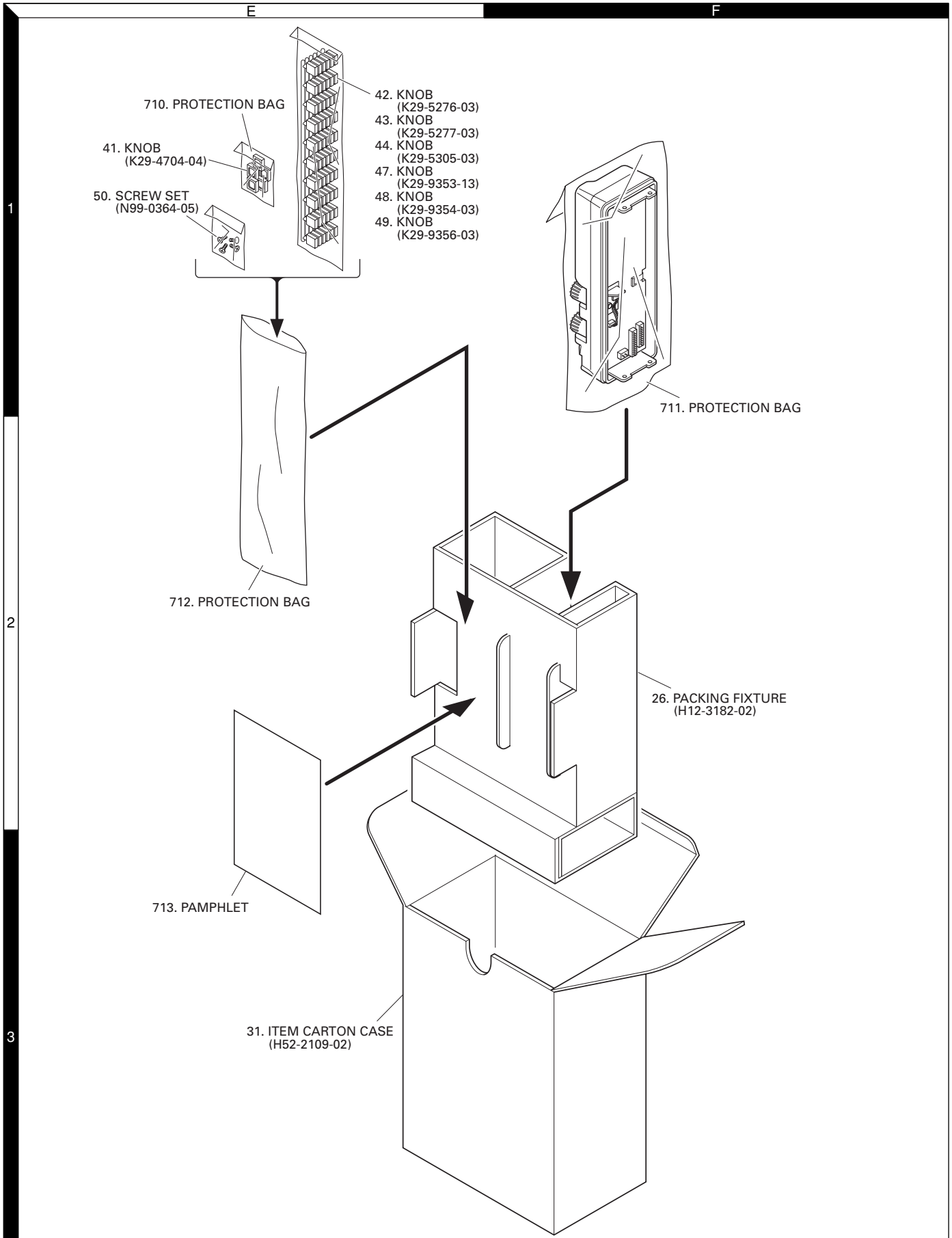
# KCH-14/15

## EXPLODED VIEW (KCH-15)



B : N82-3006-46  
C : N87-2605-46  
E : N87-2608-46

## PACKING





## TERMINAL FUNCTION

### Display unit (X54-3490-20): KCH-14

Pin No.	Name	I/O	Description
<b>CN1 (to Control unit W700 of the TK-5710(B)/TK-5710H(B))</b>			
1	ME	-	MIC GND
2	MIC	O	MIC signal output
3	E	-	GND
4	RESET	I	Reset signal input
5	1/2	I	Remote head 1 or head 2 signal input
6	TRD	I/O	TX data input / RX data output
7	PSW	O	Power switch control signal output
8	IGN	O	Ignition sense output
9	SB	I	Switched B (TK-5710(B):13.6V / TK-5710H(B):13.4V)
10	IRS	I	Remote speaker input
11	ES2	I	Remote speaker input
<b>CN2 (to Internal speaker)</b>			
1	IRS	O	Remote speaker output
2	E	-	GND
<b>CN3 (to KRK-5/6DH)</b>			
1	IGN	I	Ignition sense input
2	SB	O	Switched B (TK-5710(B):13.6V / TK-5710H(B):13.4V)
3	E	-	GND
4	MIC	I	MIC signal input
5	ME	-	MIC GND
6	AI1	I	Auxiliary input 1
7	AI2	I	Auxiliary input 2
8	AO1	O	Auxiliary output 1
9	AO2	O	Auxiliary output 2
<b>CN4 (to Display unit C/3 W1)</b>			
1	INT1	I	Encoder interrupt
2	E	-	GND
3	END	I	Encoder data
<b>CN5 (to LCD ASSY)</b>			
1	E	-	GND
2	VCC	-	5V
3	CE	O	Enable output for LCD driver
4	CL	O	Clock output for LCD driver
5	DI	O	Data output for LCD driver
6	DO	-	Not used
7	DISP	O	Display control signal output (L:Display off)
8	LEDA	O	Power output for LCD backlight
9	LEDK	O	GND for LCD backlight (L:Backlight on)
10	NC	-	No connection
<b>CN13 (to Display unit B/3 CN14)</b>			
1	PF1	I	PF1 switch signal input
2	PF2	I	PF2 switch signal input
3	PF3	I	PF3 switch signal input
4	PF4	I	PF4 switch signal input
5	PF5	I	PF5 switch signal input
6	SB	O	Switched B (TK-5710(B):13.6V / TK-5710H(B):13.4V)

Pin No.	Name	I/O	Description
7	E	-	GND
8	DIM	O	LCD brightness
<b>CN14 (to Display unit A/3 CN13)</b>			
1	PF1	O	PF1 switch signal output
2	PF2	O	PF2 switch signal output
3	PF3	O	PF3 switch signal output
4	PF4	O	PF4 switch signal output
5	PF5	O	PF5 switch signal output
6	SB	I	Switched B (TK-5710(B):13.6V / TK-5710H(B):13.4V)
7	E	-	GND
8	DIM	I	LCD brightness
<b>J1 (MIC jack)</b>			
1	SB	O	Switched B (TK-5710(B):13.6V / TK-5710H(B):13.4V)
2	HK	I	Hook signal input (L:On hook, H:Off hook)
3	ME	-	MIC GND
4	MIC	I	MIC signal input / 60% deviation at 1kHz/5mV±2mV input
5	E	-	GND
6	TRD	I/O	TX data output / RX data input
7	KVL	I	KVL3000 signal input (L:Connect, H:Disconnect)
8	DM	I/O	Serial data input/output for keypad MIC
9	BLC	O	MIC backlight control signal output (L:Off, H:On)
10	PTT	I	PTT signal input
11	NC	-	No connection
12	ES2	O	Audio output for Handset/Headset >2Ω load 3W/4Ω
<b>W1 (to Display unit A/3 CN4)</b>			
1	INT1	O	Encoder interrupt
2	E	-	GND
3	END	O	Encoder data

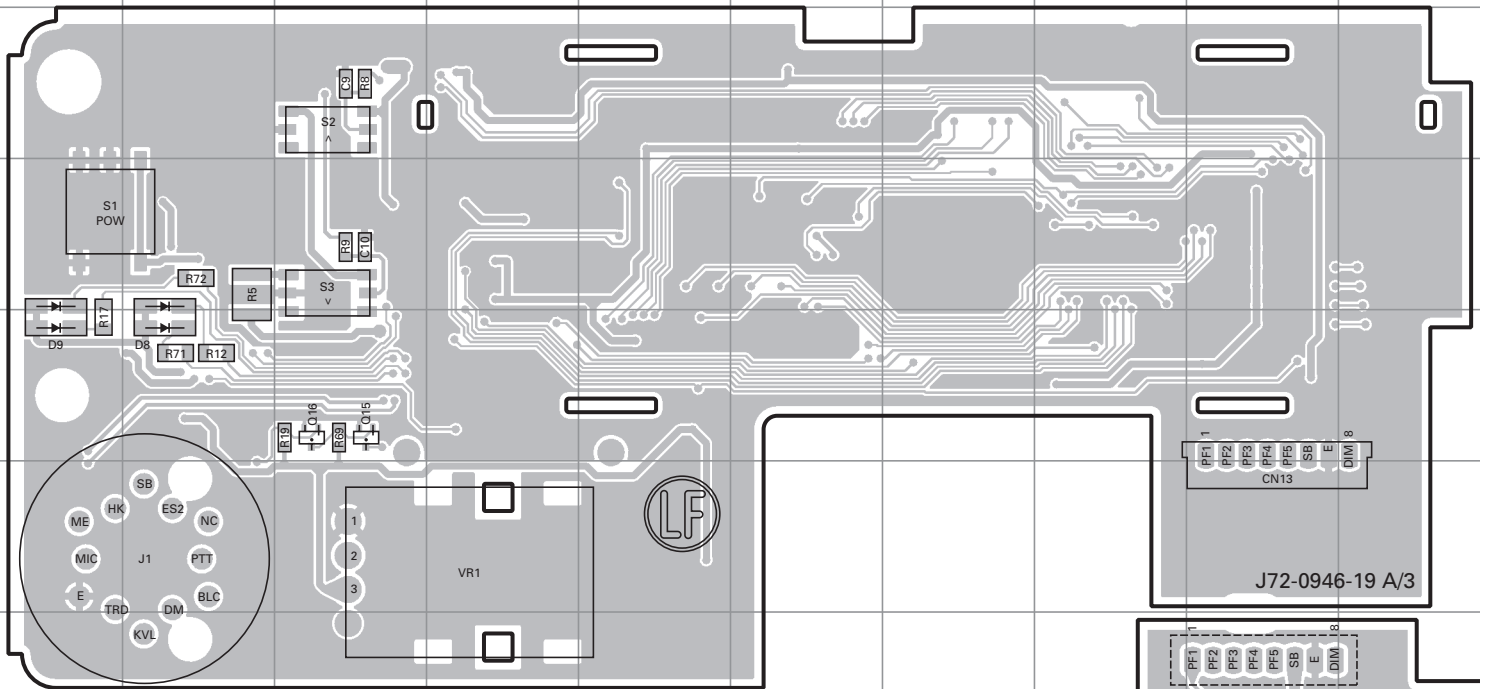
# TERMINAL FUNCTION

## Display unit (X54-3500-20): KCH-15

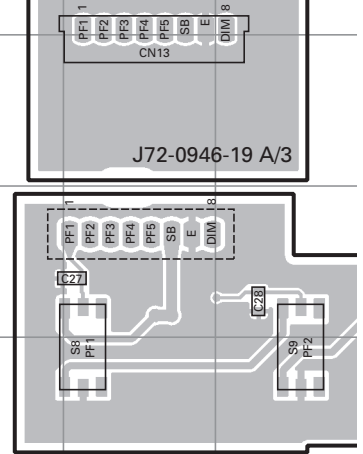
Pin No.	Name	I/O	Description
<b>CN1 (to Control unit W700 of the TK-5710(B)/TK-5710H(B))</b>			
1	ME	–	MIC GND
2	MIC	O	MIC signal output
3	E	–	GND
4	RESET	I	Reset signal input
5	1/2	I	Remote head 1 or head 2 signal input
6	TRD	I/O	TX data input / RX data output
7	PSW	O	Power switch control signal output
8	IGN	O	Ignition sense output
9	SB	I	Switched B
10	IRS	I	Remote speaker input
11	ES2	I	Remote speaker input
<b>CN2</b>			
1	IRS	O	Remote speaker output
2	ES2	O	Remote speaker output
<b>CN3 (to KRK-5/6DH)</b>			
1	IGN	I	Ignition sense input
2	SB	O	Switched B
3	E	–	GND
4	MIC	I	MIC signal input
5	ME	–	MIC GND
6	AI1	I	Auxiliary input 1
7	AI2	I	Auxiliary input 2
8	AO1	O	Auxiliary output 1
9	AO2	O	Auxiliary output 2
<b>CN4 (to Display unit C/3 W1)</b>			
1	INT1	I	Encoder interrupt
2	E	–	GND
3	END	I	Encoder data
<b>CN5 (to LCD ASSY)</b>			
1	E	–	GND
2	VCC	–	5V
3	CE	O	Enable output for LCD driver
4	CL	O	Clock output for LCD driver
5	DI	O	Data output for LCD driver
6	DO	–	Not used
7	DISP	–	Not used
8	LEDA	O	Power output for LCD backlight
9	LEDK	O	GND for LCD backlight (L:Backlight on)
10	NC	–	No connection
<b>J1 (MIC jack)</b>			
1	SB	O	Switched B (TK-5710(B) : 13.6V±15% / TK-5710H(B) : 13.4V±15%)
2	HK	I	Hook signal input (L:On hook, H:Off hook)
3	ME	–	MIC GND
4	MIC	I	MIC signal input / 60% deviation at 1kHz/5mV±2mV input
5	E	–	GND
6	TRD	I/O	TX data output / RX data input

Pin No.	Name	I/O	Description
7	KVL	I	KVL3000 signal input (L:Connect, H:Disconnect)
8	DM	I/O	Serial data input/output for keypad MIC
9	BLC	O	MIC backlight control signal output (L:Off, H:On)
10	PTT	I	PTT signal input
11	NC	–	No connection
12	ES2	O	Audio output for Handset/Headset >2Ω load 3W/4Ω
<b>W1 (to Display unit A/3 CN4)</b>			
1	INT1	O	Encoder interrupt
2	E	–	GND
3	END	O	Encoder data

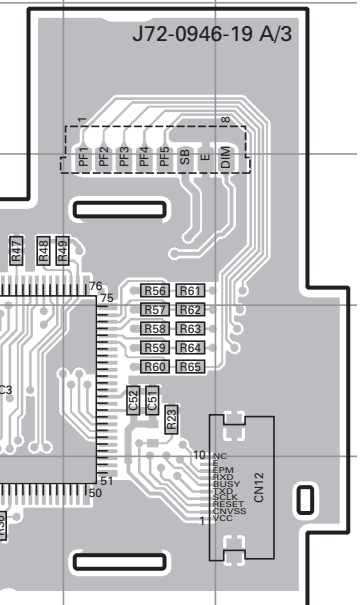
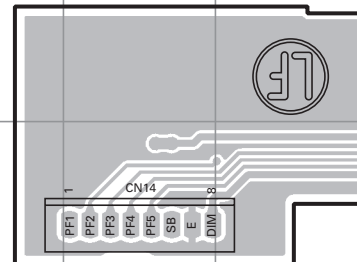
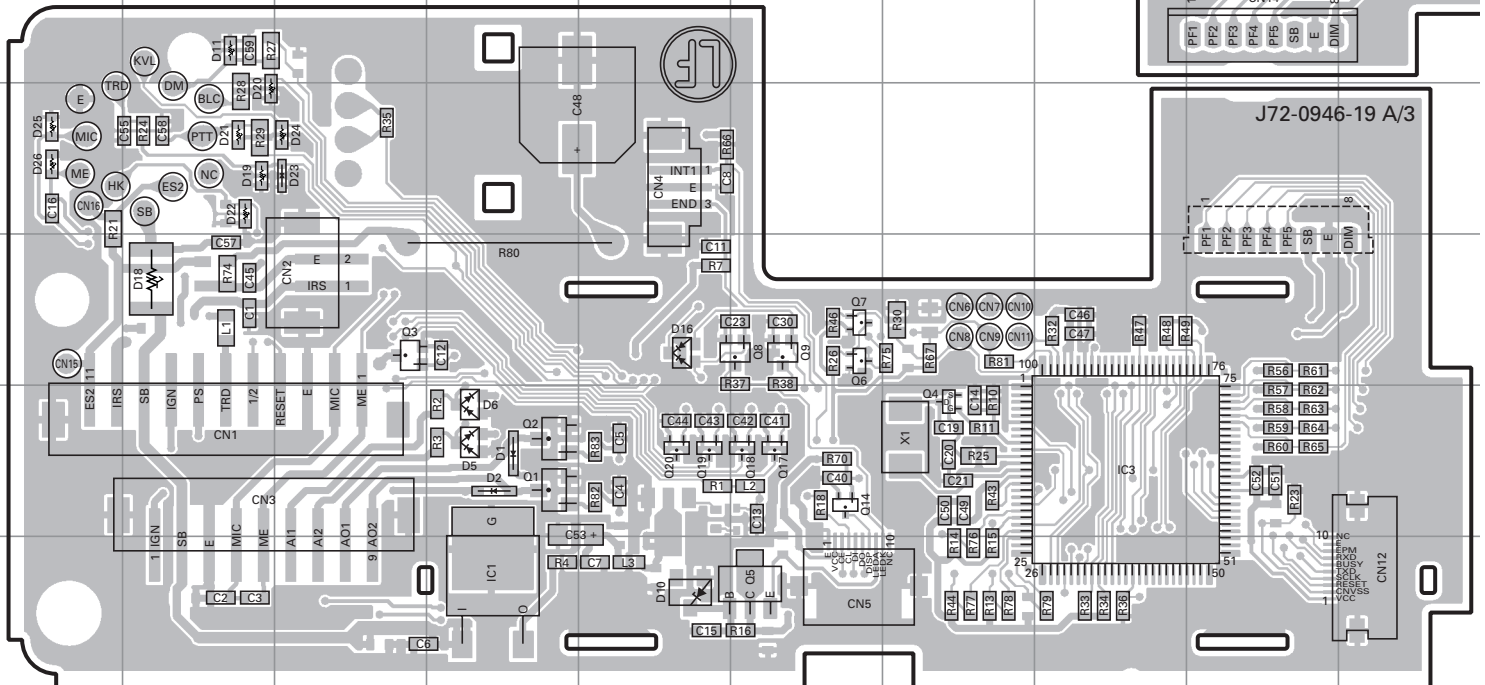
# KCH-14/15 PC BOARD



**DISPLAY UNIT (X54-3490-20) : KCH-14**  
**Component side view (J72-0946-19)**

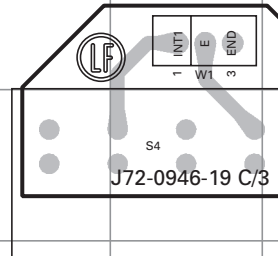
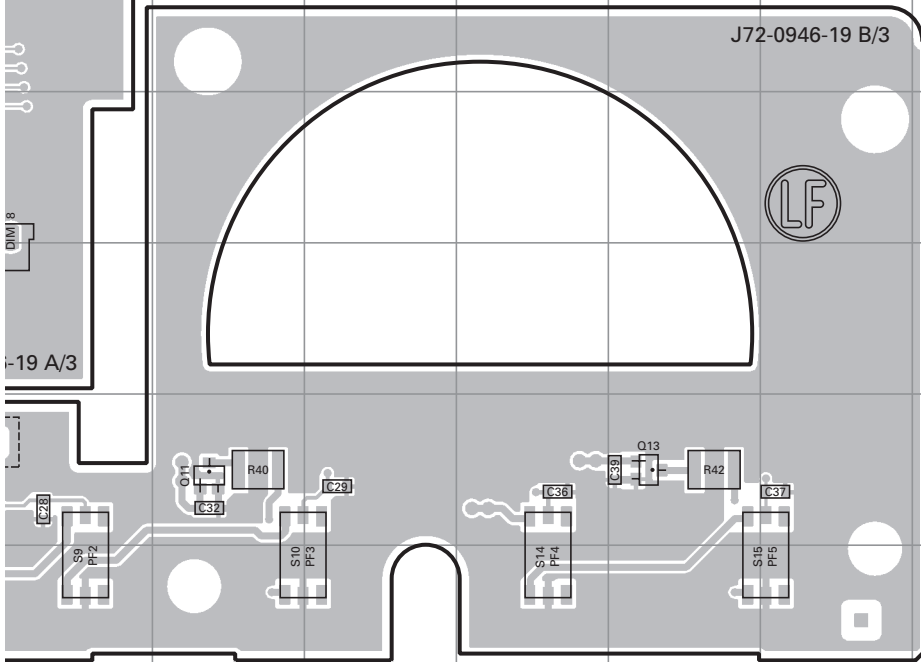


**DISPLAY UNIT (X54-3490-20) : KCH-14**  
**Foil side view (J72-0946-19)**

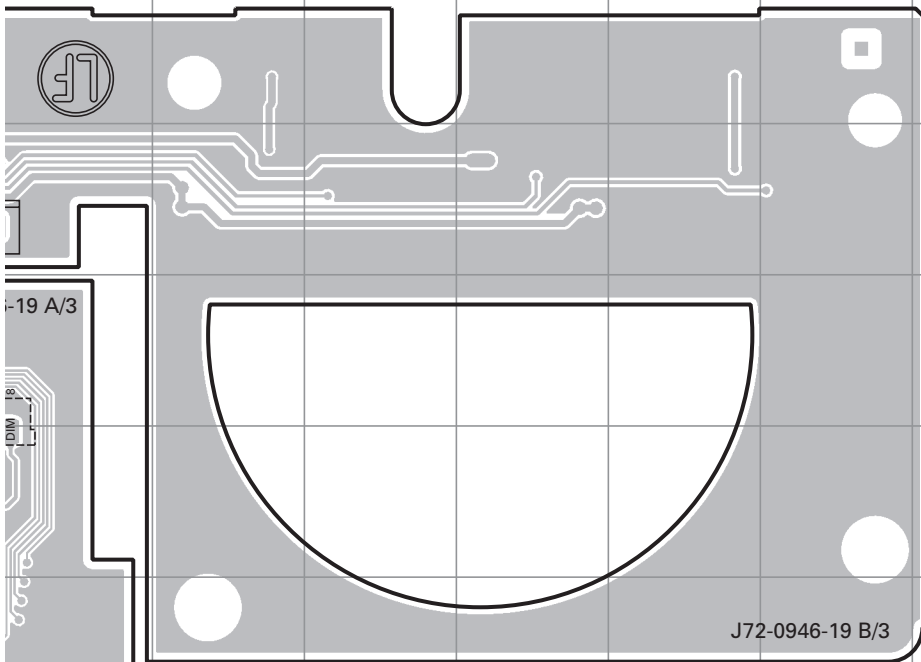
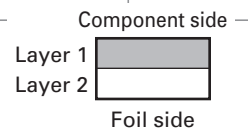


# PC BOARD KCH-14/15

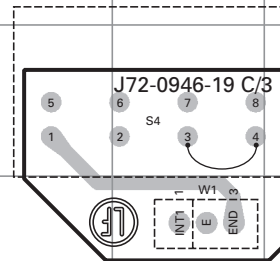
**DISPLAY UNIT (X54-3490-20) : KCH-14**  
**Component side view (J72-0946-19)**



Ref. No.	Address
Q11	6K
Q13	6N
Q15	4C
Q16	4C
D8	4B
D9	4A

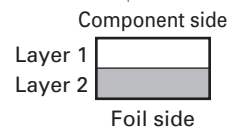


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	13D	Q7	11F	D1	12D
IC3	12H	Q8	11F	D2	12D
Q1	12D	Q9	11F	D5	12D
Q2	12D	Q14	12F	D6	12D
Q3	11C	Q17	12F	D10	13E
Q4	12G	Q18	12F	D11	9B
Q5	13F	Q19	12E	D16	11E
Q6	11F	Q20	12E	D18	11B



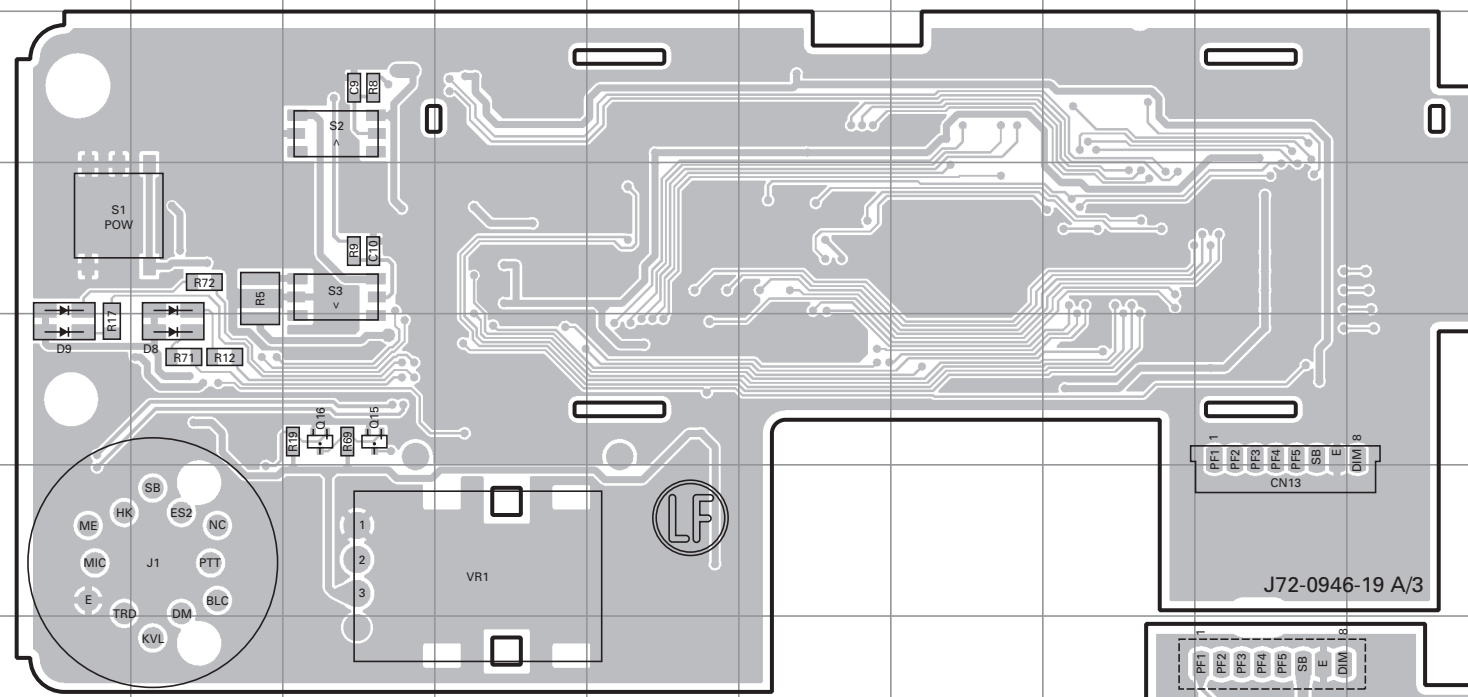
D19	10B
D20	10B
D21	10B
D22	10B
D23	10C
D24	10C
D25	10A
D26	10A

**DISPLAY UNIT (X54-3490-20) : KCH-14**  
**Foil side view (J72-0946-19)**



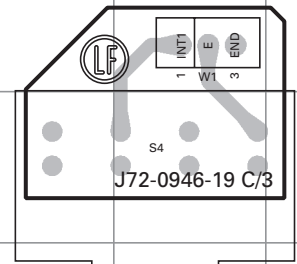
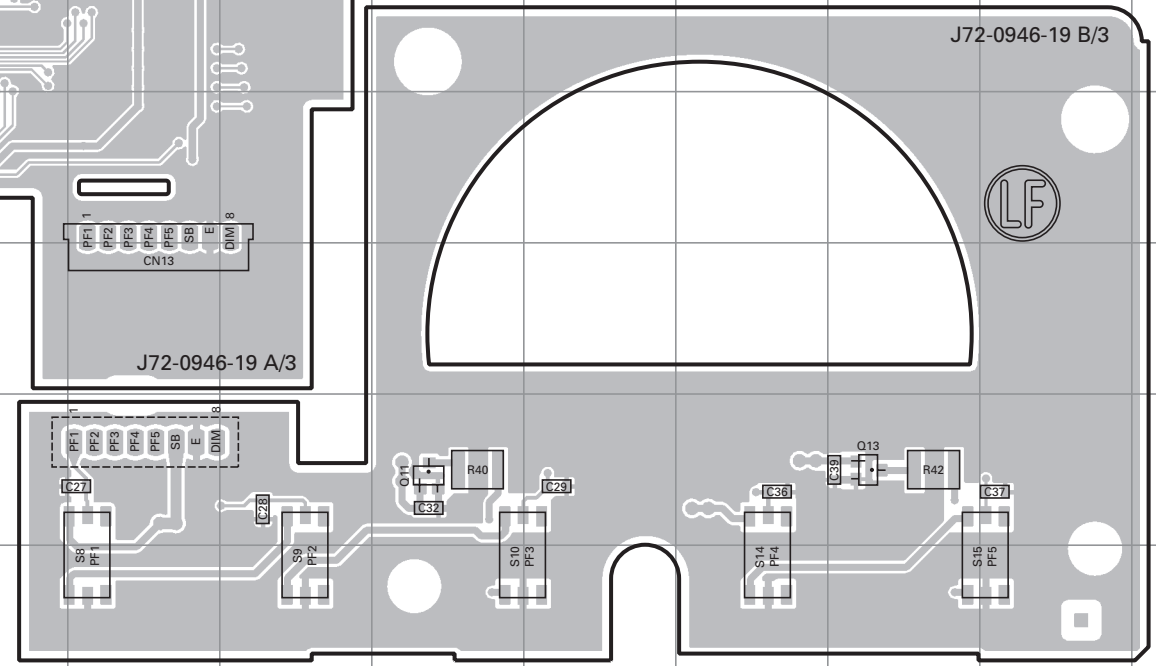
# KCH-14/15 PC BOARD

# PC BOARD KCH-14/15

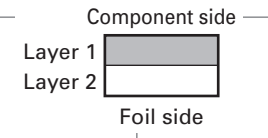


**DISPLAY UNIT (X54-3490-20) : KCH-14  
Component side view (J72-0946-19)**

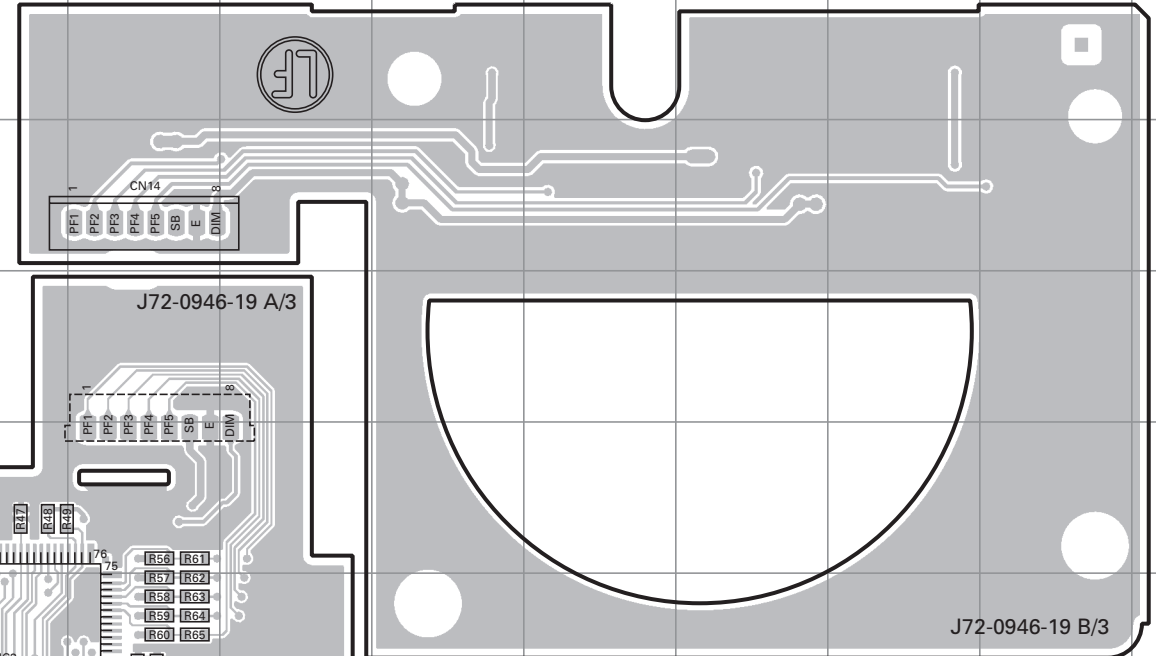
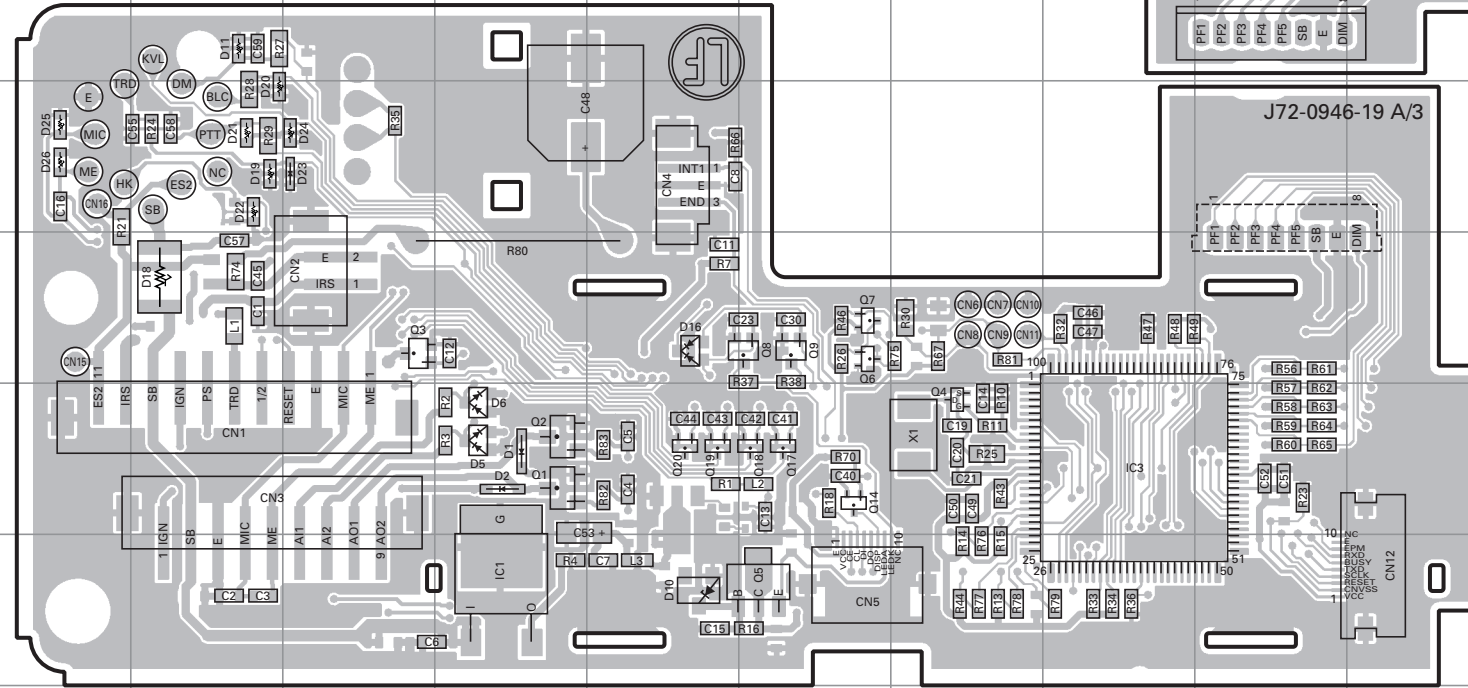
**DISPLAY UNIT (X54-3490-20) : KCH-14  
Component side view (J72-0946-19)**



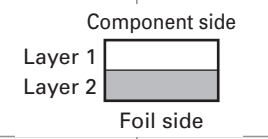
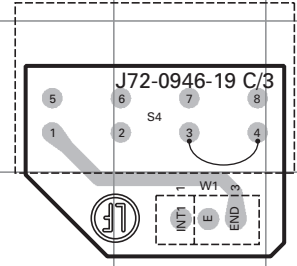
Ref. No.	Address
Q11	6K
Q13	6N
Q15	4C
Q16	4C
D8	4B
D9	4A



**DISPLAY UNIT (X54-3490-20) : KCH-14  
Foil side view (J72-0946-19)**

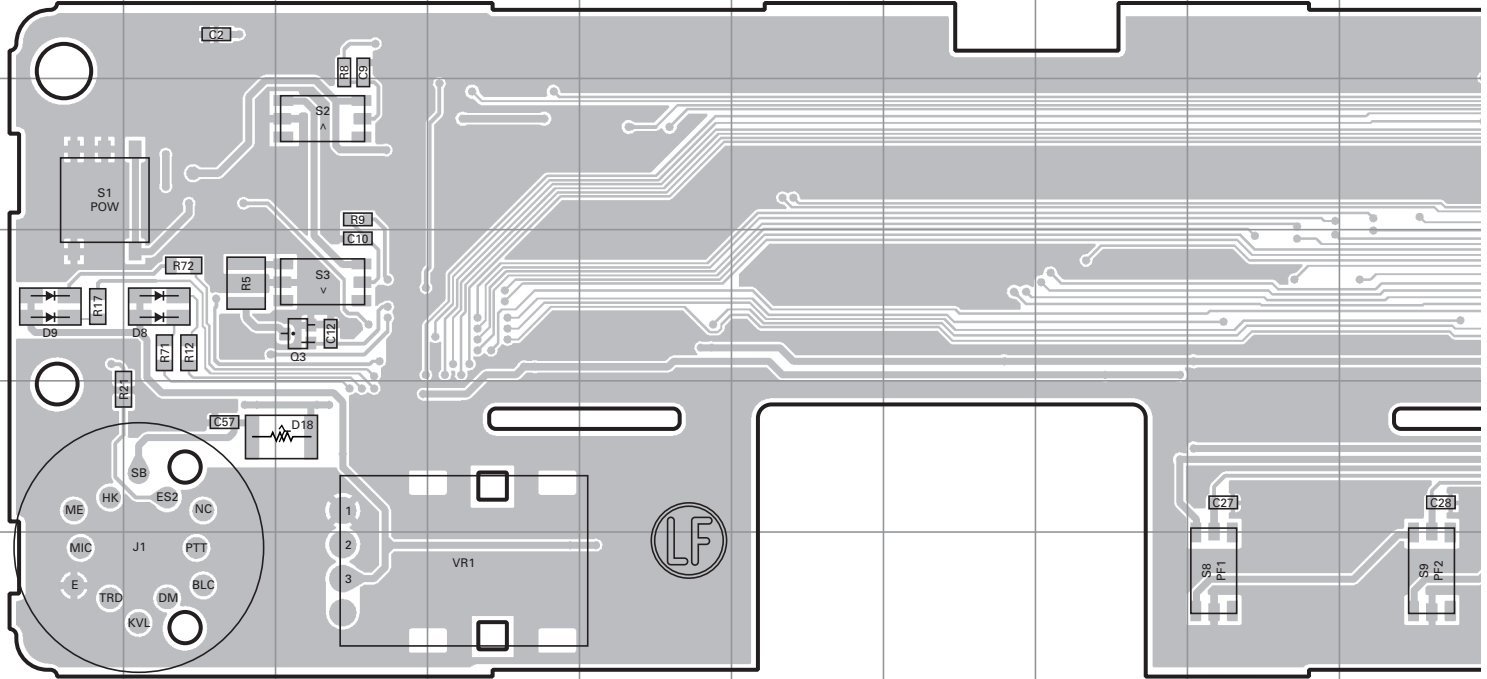


Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	13D	Q7	11F	D1	12D
IC3	12H	Q8	11F	D2	12D
Q1	12D	Q9	11F	D5	12D
Q2	12D	Q14	12F	D6	12D
Q3	11C	Q17	12F	D10	13E
Q4	12G	Q18	12F	D11	9B
Q5	13F	Q19	12E	D16	11E
Q6	11F	Q20	12E	D18	11B
				D19	10B
				D20	10B
				D21	10B
				D22	10B
				D23	10C
				D24	10C
				D25	10A
				D26	10A

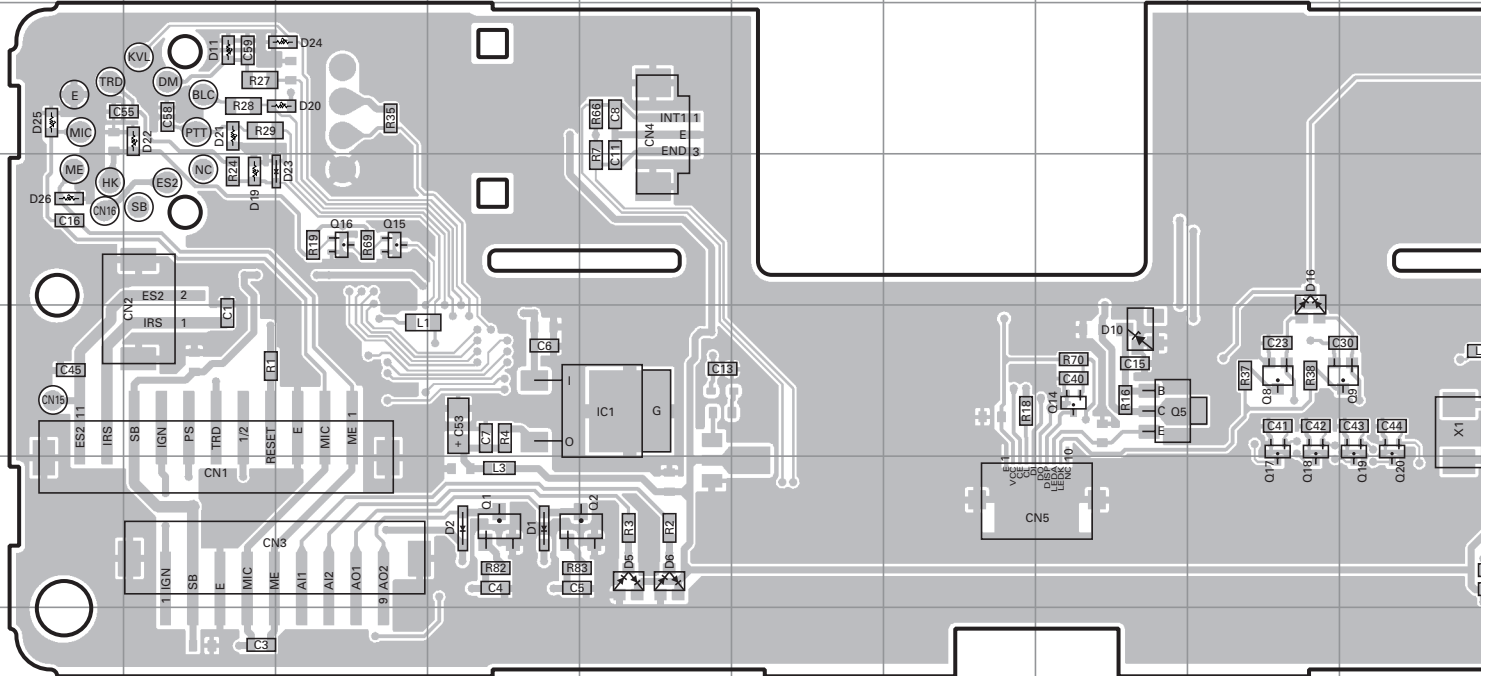


# KCH-14/15 PC BOARD

**DISPLAY UNIT (X54-3500-20) : KCH-15**  
**Component side view (J72-0947-19)**



**DISPLAY UNIT (X54-3500-20) : KCH-15**  
**Foil side view (J72-0947-19)**





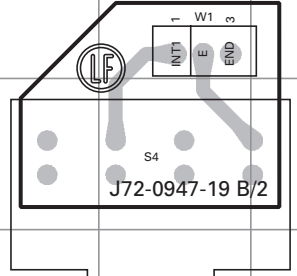
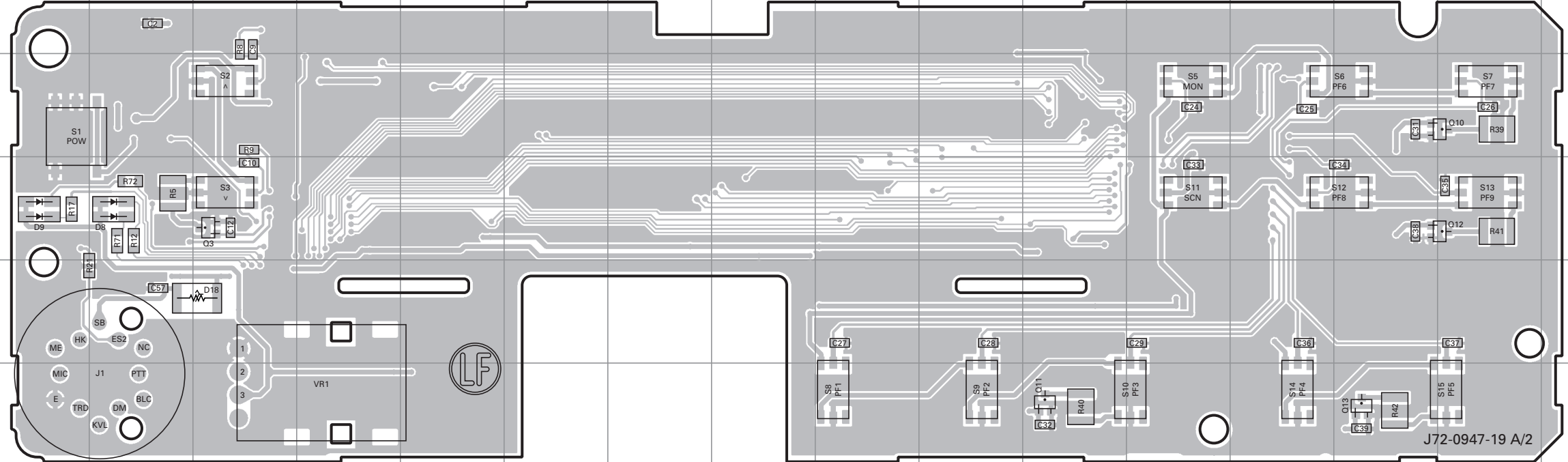


# KCH-14/15 PC BOARD

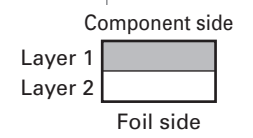
# PC BOARD KCH-14/15

**DISPLAY UNIT (X54-3500-20) : KCH-15**  
**Component side view (J72-0947-19)**

**DISPLAY UNIT (X54-3500-20) : KCH-15**  
**Component side view (J72-0947-19)**

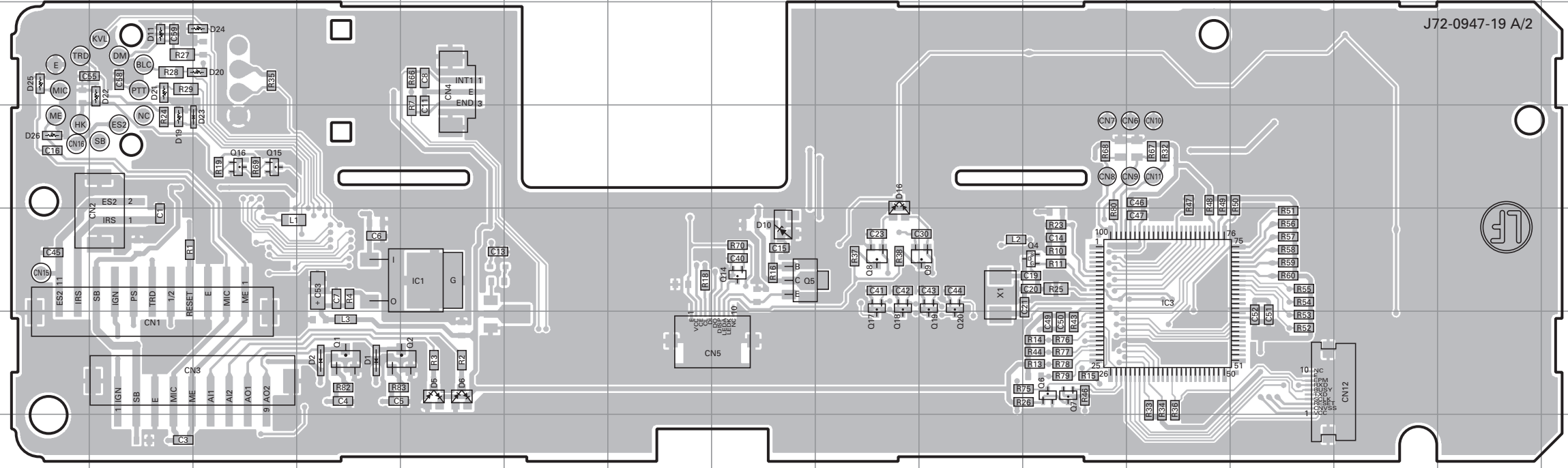


Ref. No.	Address
Q3	4C
Q10	3O
Q11	6K
Q12	4O
Q13	6N
D8	4B
D9	4A
D18	5C

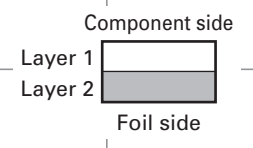
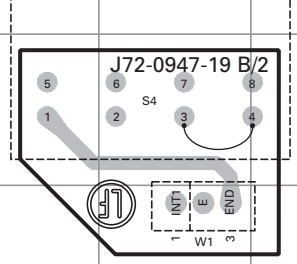


**DISPLAY UNIT (X54-3500-20) : KCH-15**  
**Foil side view (J72-0947-19)**

**DISPLAY UNIT (X54-3500-20) : KCH-15**  
**Foil side view (J72-0947-19)**



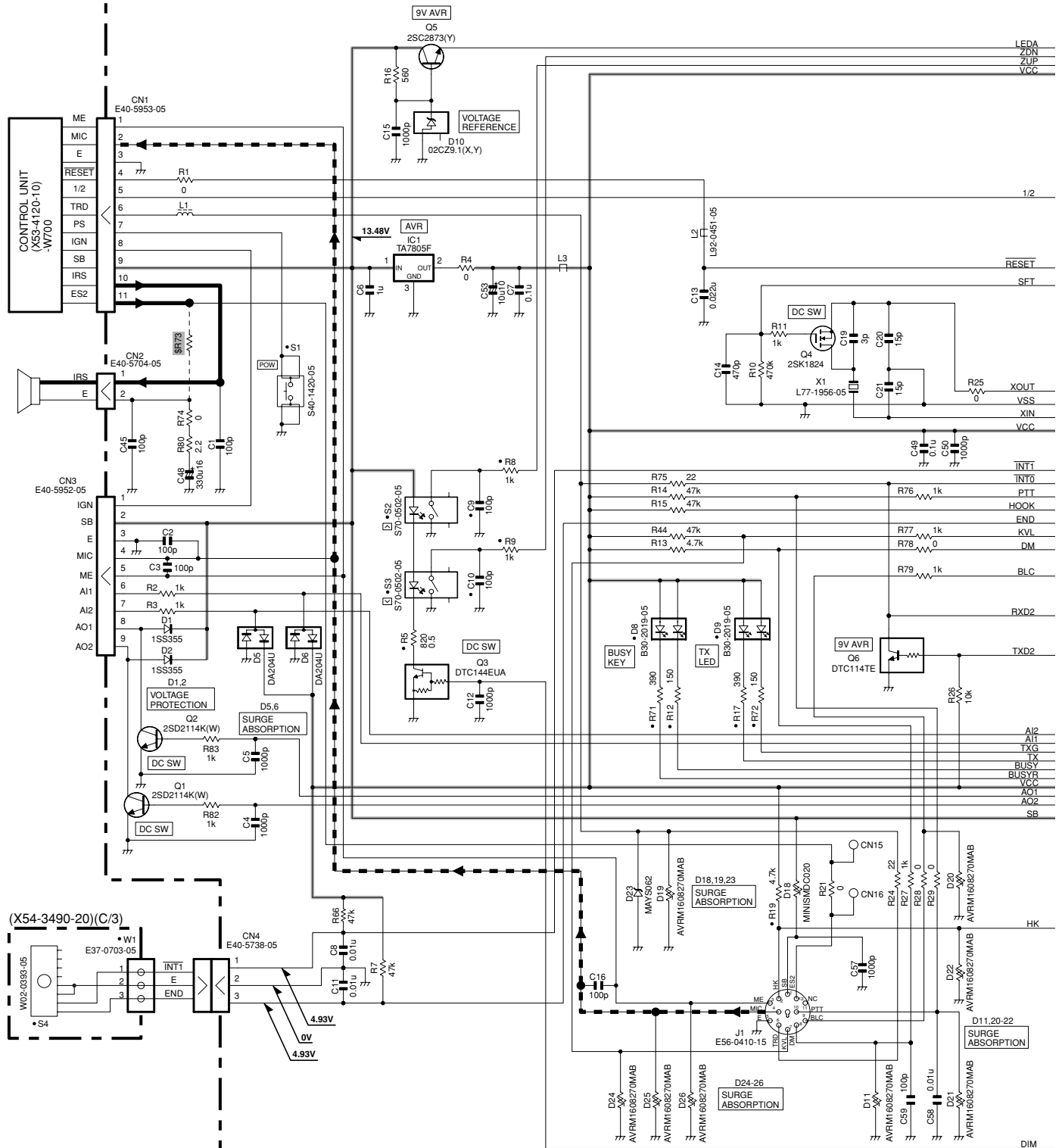
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	11E	Q14	11H	D6	12E
IC3	11L	Q15	10C	D10	11H
Q1	12D	Q16	10C	D11	9B
Q2	12E	Q17	11I	D16	10I
Q4	11K	Q18	11I	D19	10B
Q5	11H	Q19	11J	D20	9C
Q6	12K	Q20	11J	D21	9B
Q7	12K	D1	12D	D22	9B
Q8	11I	D2	12D	D23	10C
Q9	11J	D5	12E	D24	9C
				D25	9A
				D26	10A



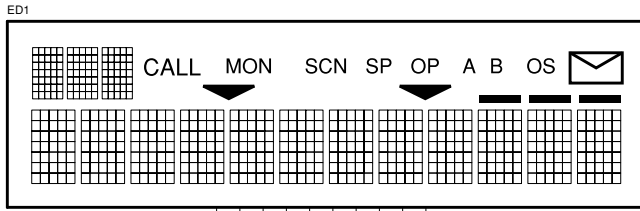


# KCH-14/15 SCHEMATIC DIAGRAM

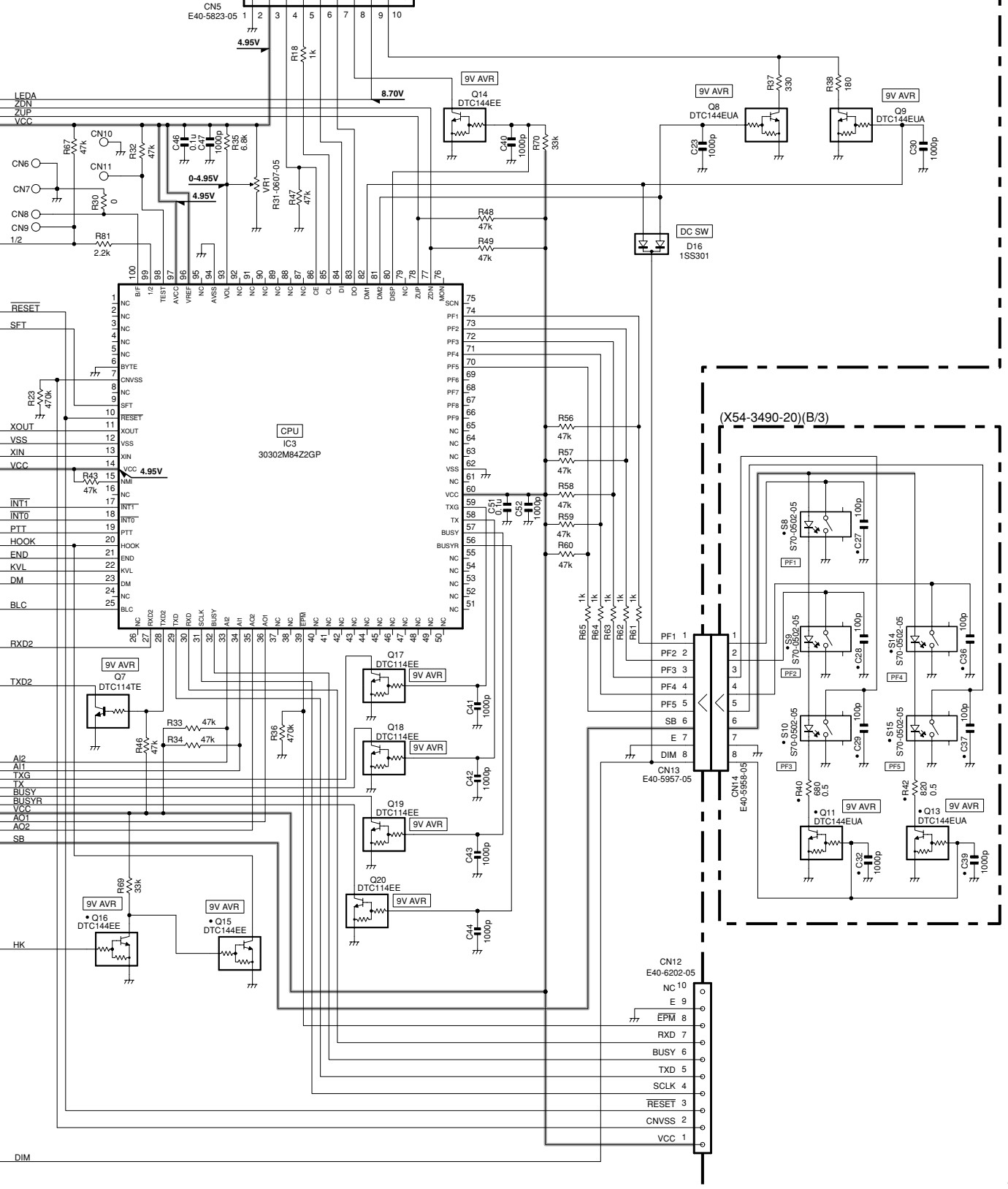
KCH-14 DISPLAY UNIT (X54-3490-20)(A/3)



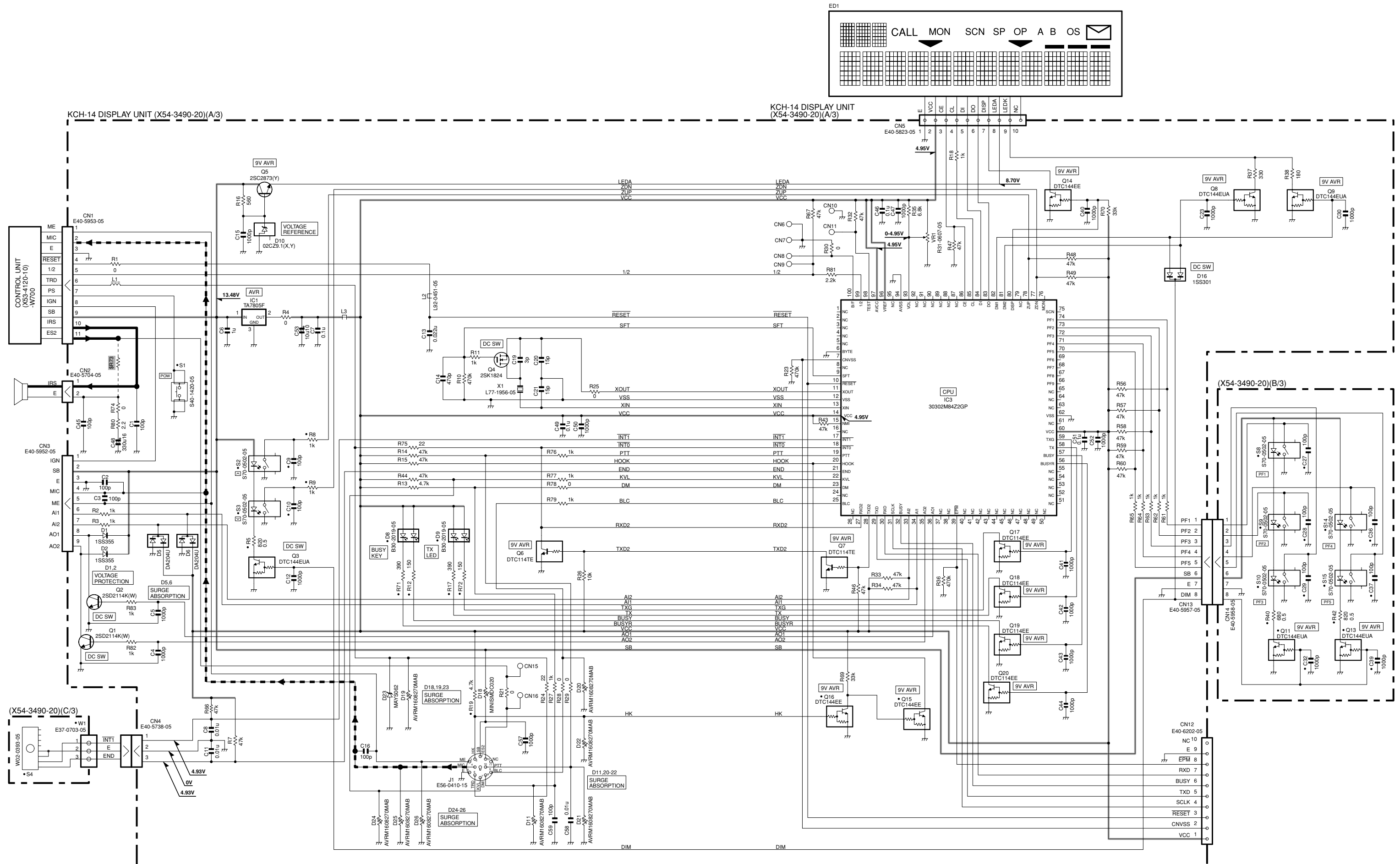
# SCHEMATIC DIAGRAM KCH-14/15



KCH-14 DISPLAY UNIT (X54-3490-20)(A/3)

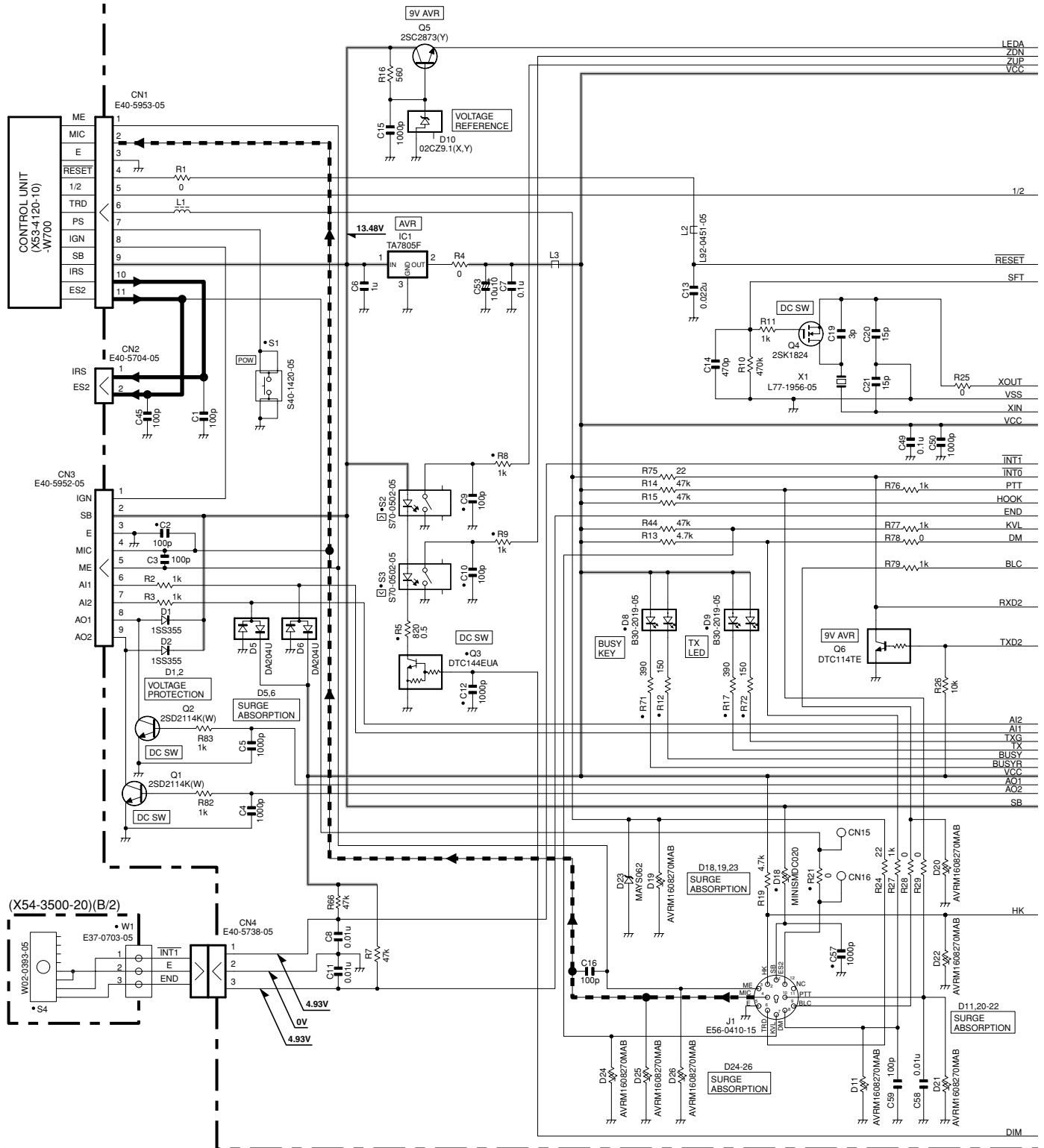


# KCH-14/15 SCHEMATIC DIAGRAM

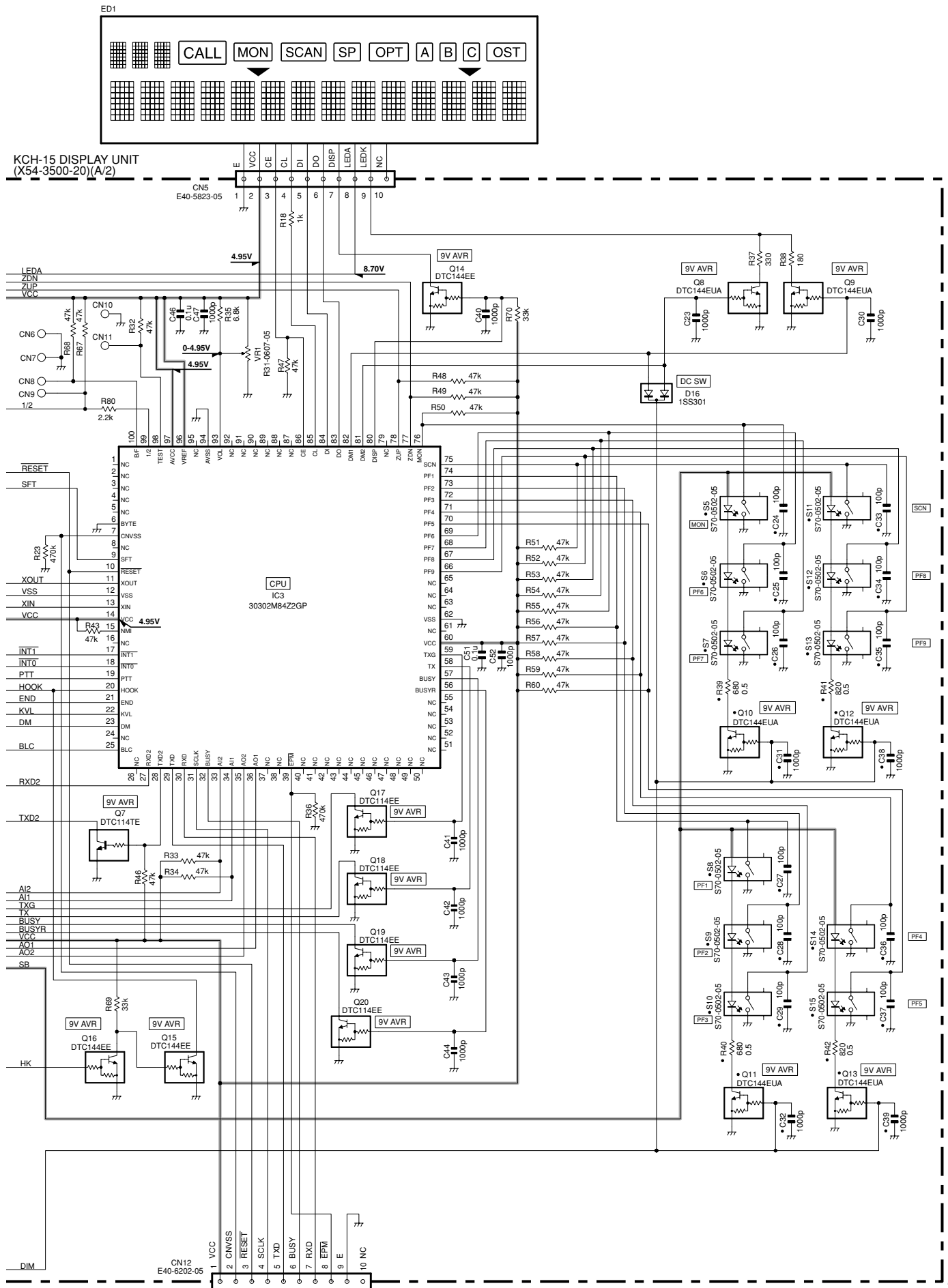


# KCH-14/15 SCHEMATIC DIAGRAM

KCH-15 DISPLAY UNIT (X54-3500-20)(A/2)



# SCHEMATIC DIAGRAM KCH-14/15



1  
2  
3  
4  
5  
6  
7



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