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SPECIFICATIONS

General

Operating temperature range
.....-30°C ~ +60°C (-22°F ~ +140°F)

Microphone

Impedance600Ω (MAX)
Sensitivity-39dB ±3.5dB at 1kHz

Speaker

Impedance16Ω ±15% at 1.2kHz
Rating input 0.8W
Maximum input 1.6W
Dimensions (W x H x D)
..... 67.8 x 91.5 x 43.3 mm (2.67 x 3.60 x 1.70 in)
Weight Approx. 260g/9.2oz

KMC-51D

DISASSEMBLY FOR REPAIR

1. Removing the cable ASSY

- 1) Pull out the holder that is set into the fixing bracket of the cable ASSY, using a pair of pliers.

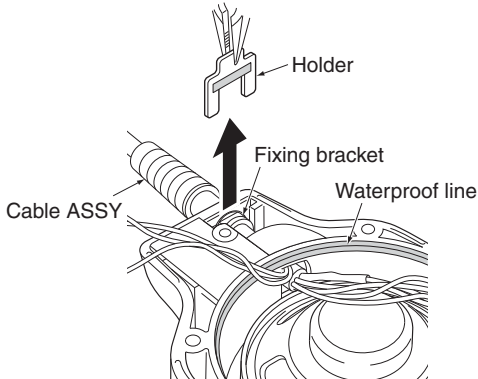


Fig. 1

- 2) Completely peel off the bond (*1) glued to the cable ASSY, using a set of diagonal cutters.

Note: Please be careful not to damage the coating of the cable ASSY and the waterproofing line of the front case.

*1: Use the following bond:

- Manufacture name: Shin-Etsu Chemical Co., Ltd.
- Bond name: Shin-Etsu silicone One-component RTV silicone rubbers Alcohol type KE-4898-T

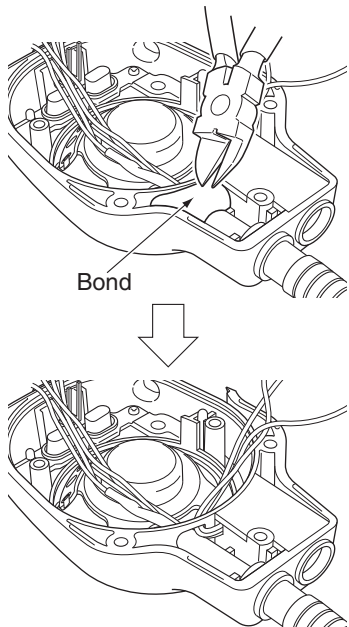


Fig. 2

- 3) Following the procedure below, pass through the connector part of the cable ASSY into the hole of the front case (waterproof line part).

- (1) Move the three lead wires soldered onto the PCB to the upper corner of the hole.
- (2) The yellow lead wire side of the connector comes in the inside of the front case.

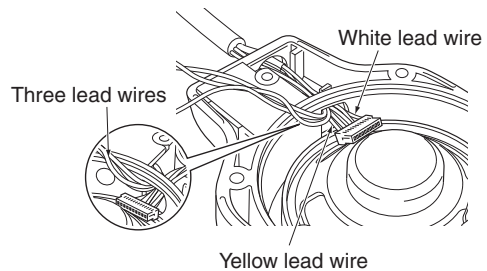


Fig. 3

- (3) Push the cable ASSY to the earphone jack side with the connector part bent as shown in the figure, then hook the end of the connector (white lead wire side) into the outside corner of the hole, using your finger.
- (4) Pass the connector through the hole, pushing the connector (yellow lead wire side) using a pair of tweezers or similar tool.

Note: Attach adhesive tape or rubber to the end of the tweezers so as not to damage the connector of the cable ASSY.

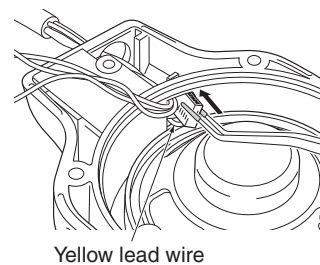


Fig. 4

- 4) Pull the cable ASSY, then remove the cable ASSY from the front case by passing the connector part through the hole of the front case.

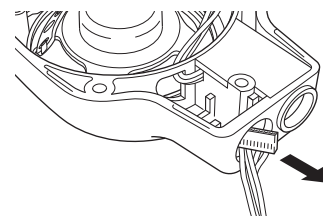


Fig. 5

DISASSEMBLY FOR REPAIR

2. Installing the cable ASSY

- 1) Pass the connector part of cable ASSY through the hole of the front case.
- 2) Move the three lead wires soldered onto the PCB to the upper corner of the hole.

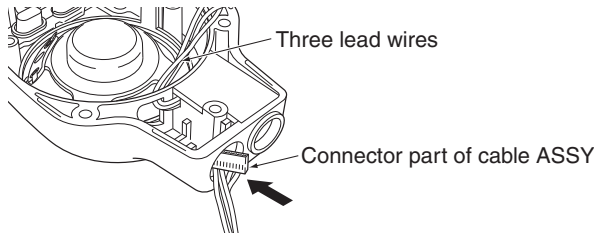


Fig. 6

- 3) Make sure the yellow lead wire side of the connector is in the inside of the front case.

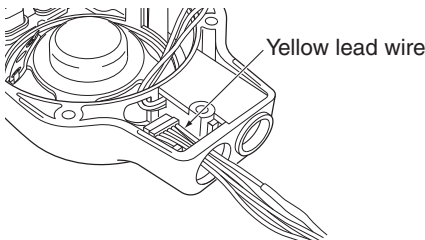


Fig. 7

- 4) Push the connector (yellow lead wire side) to the lower corner of the hole using a pair of tweezers.
Note: Attach adhesive tape or rubber to the end of the tweezers so as not to damage the connector of the cable ASSY.
- 5) Pass the connector through the hole by pushing the connector (white lead wire side) using a pair of tweezers or similar tool.

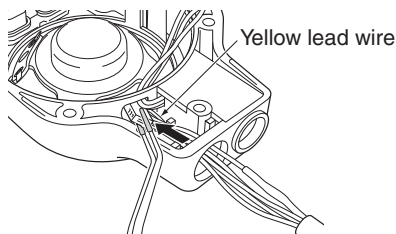


Fig. 8

- 6) Push the cable ASSY to the inside of the case, then insert the fixing bracket of the cable ASSY to the hole of the front case.
- 7) Fit the holder to the fixing bracket of the cable ASSY.

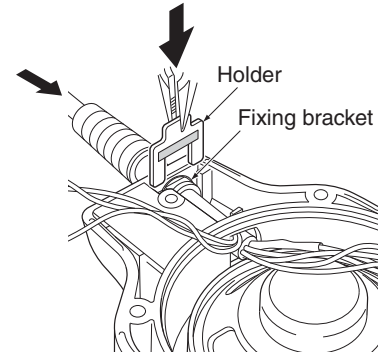


Fig. 9

- 8) Insert the cap in the earphone jack hole of the front case.
- 9) Apply the bond (*1) at the position shown in the figure, then firmly attach the cable ASSY and case.

Note: Take care not to apply the bond to the waterproofing line of the front case.

*1: Use the following bond :

- Manufacture name: Shin-Etsu Chemical Co., Ltd.
- Bond name: Shin-Etsu silicone One-component RTV silicone rubbers Alcohol type KE-4898-T

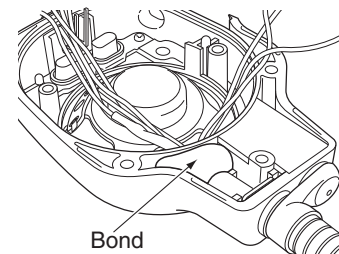


Fig. 10

3. Attach the lead wires of the earphone jack and connector of the cable ASSY to the PCB

- 1) Solder the three lead wires (red, white, black) of the earphone jack to the three solder pads (RED, WHT, BLK) of the PCB, respectively.
Note: When you solder the three lead wires to the PCB, be careful that the soldering iron does not touch the lead wires of the cable ASSY.
- 2) Insert the connector of the cable ASSY into the connector (CN1) of the PCB.

KMC-51D

DISASSEMBLY FOR REPAIR

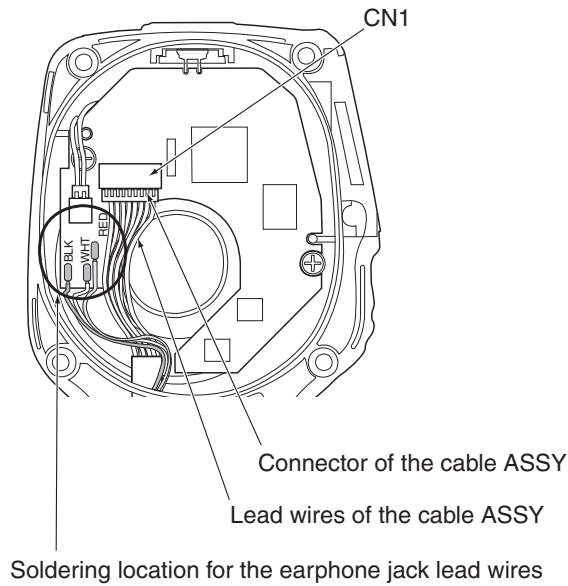


Fig. 11

5. Assemble the main microphone circumference

- 1) Insert the keytop into the front case.
- 2) Insert the main microphone into the keytop.
- 3) Pass the lead wires of the microphone through the hole of the holder.

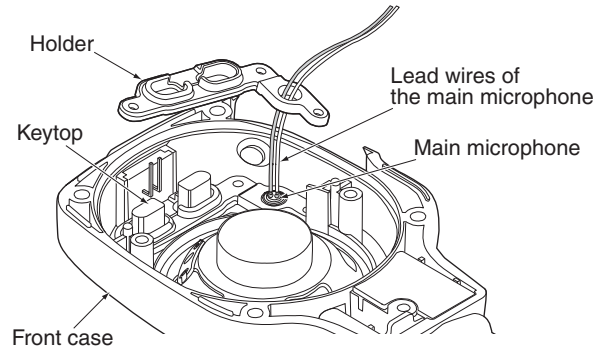


Fig. 13

4. Forming the lead wires of the sub microphone

- 1) Pass the lead wires of the sub microphone between boss A and boss B of the holder.
- 2) Push the lead wires into the spaces between the triangle shape of the holder and the packing.
- 3) Insert the connector (CN4) of the PCB without strongly pulling the lead wires.

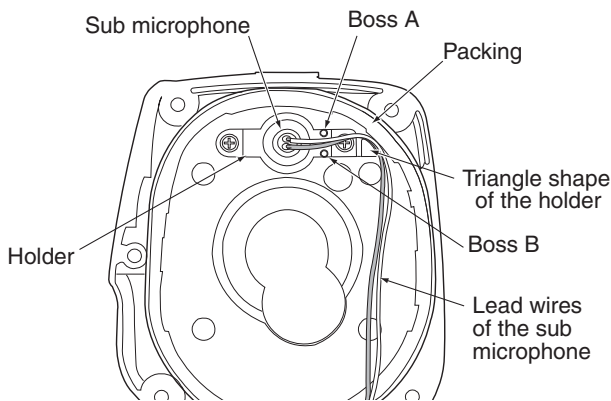


Fig. 12

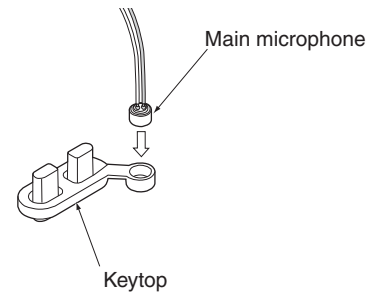


Fig. 14

- 4) Fit the holder to the front case, avoiding the leg of LED.

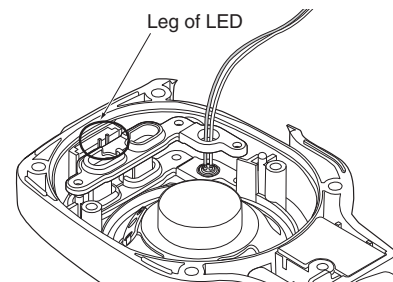


Fig. 15

DISASSEMBLY FOR REPAIR

5) Attach the three screws to the holder.

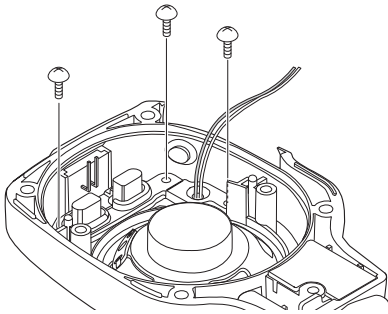


Fig. 16

6. Precautions for the soldering work of the ECM (microphone)

A FET is contained in the ECM.

This FET can be easily damaged from excessive heat and electrical shock.

Frequency characteristics and sensitivity will degrade when applying exterior power to the ECM.

Be sure to adhere to the following points.

- We recommend you use a soldering iron and apply a temperature of 345°C (653°F) or less.
- Soldering should be accomplished within 2 seconds at each terminal so as not to overheat the ECM.
- Do not hold the ECM with a pair of pliers.
- Do not drop the ECM from a high place.

NOISE CANCELLATION OPERATION CHECK METHOD

Check the noise cancellation operation according to the following procedures.

■ Preparation

Procedure 1. Prepare the two transceivers (transmitting side and receiving side) and one microphone. (The receiving side can also use the radio communication tester, etc..)

Procedure 2. Set the two transceivers so that they can communicate.

Procedure 3. Connect the microphone to the universal connector on the transmitting transceiver.

Procedure 4. Press the PTT switch of the microphone (the transceiver will transmit if the LED lights up).

■ Checking the main microphone

Procedure 5. Blow into the front side microphone hole, from a distance of 3 to 4 cm (1.18 to 1.57 inches).

[Expected Result]

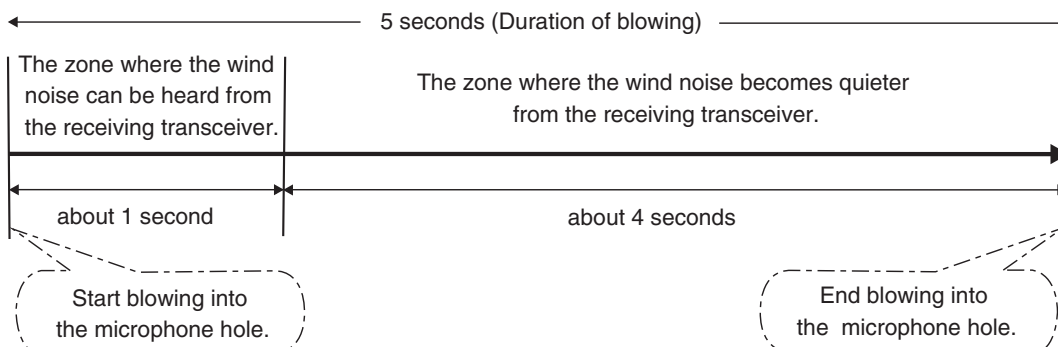
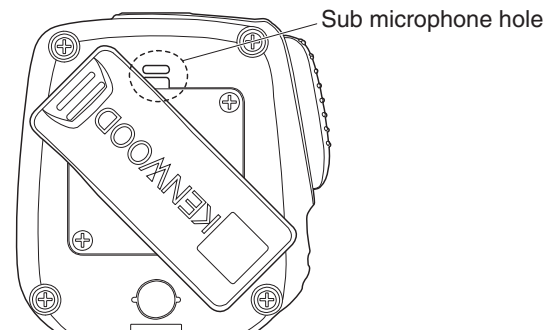
It is OK if you can hear a wind noise from the speaker of the receiving transceiver.

■ Checking the sub microphone

Procedure 6. Blow into the rear side microphone hole for 5 seconds, from a distance of 3 to 4 cm (1.18 to 1.57 inches).

[Expected Result]

You can hear a wind noise from the speaker of the receiving transceiver for about 1 second. Then, it is OK if the wind noise level becomes quieter.



TROUBLE SHOOTING

Fault Diagnosis of the BGA (Ball Grid Array) IC

■ Overview:

The following flowchart is used to determine whether or not the problem is with the BGA parts when the microphone (which satisfies the following conditions) does not turn on.

■ Conditions for the microphone which does not turn on

When the transceiver does not transmit (the LED does not light up) even if the microphone PTT switch is pressed while the microphone is connected to the transceiver.

● Checking the power supply voltage

Order	Points to be checked	Normal voltage
1	5.0V	CN1 (7 pin) 5.0V
2	3.3V (Analog)	IC15 (5 pin) 3.3V
3	3.3V (Digital)	IC1 (5 pin) 3.3V
4	1.3V (Core)	IC20 (4 pin) 1.3V

When an abnormal value is confirmed.

When a normal value is confirmed.

● Checking the clock

Points to be checked	Normal frequency
32.768kHz Pad of X2 side of C105	32.768kHz

Note:
When you check the frequency, check GND by the GND side pad of C105.

When an abnormal value is confirmed.

When a normal value is confirmed.

● Checking the reset signal

Points to be checked	Normal voltage
RESET IC10 (1 pin)	3.3V

When an abnormal value is confirmed.

When a normal value is confirmed.

● Checking the output signal from the DSP

Points to be checked	Normal voltage
13M_PLL C61 IC8 side	1.3V

When an abnormal value is confirmed.

When a normal value is confirmed.

Points to be checked	Normal voltage during access
/CS2_0 R68 IC8 side	3.3V→0V→3.3V
/oE_0 R65 IC8 side	3.3V→0V→3.3V

Note:
For several milliseconds after turning the power supply on, you can check normal voltages during access.

When an abnormal value is confirmed.

When a normal value is confirmed.

Checking for an abnormal point

[When 5.0V has an abnormal voltage]
Power supply IC (IC1, IC15, IC20) is broken.

[When 3.3V (Analog) has an abnormal voltage]
Procedure 1. Remove R7.
When an abnormal voltage is confirmed, IC15 is broken.
When a normal voltage is confirmed, the audio circuits is broken.
Perform procedure 2 after mounting R7 again.
Procedure 2. Remove L16.
When a normal voltage is confirmed, the audio circuits (IC7) is broken.
When an abnormal voltage is confirmed, the audio circuits (IC2 or IC3) is broken.

[When 3.3V (Digital) has an abnormal voltage]
Procedure 1. Remove R6.
When an abnormal voltage is confirmed, IC1 is broken.
When a normal voltage is confirmed, perform procedure 2 after mounting R6 again.
Procedure 2. Remove L22.
When a normal voltage is confirmed, IC17 is broken.
When an abnormal voltage is confirmed, perform procedure 3 after mounting L22 again.
Procedure 3. Remove L27.
When a normal voltage is confirmed, IC18 is broken.
When an abnormal voltage is confirmed, the BGA parts are broken.

[When 1.3V (Core) has an abnormal voltage]
Procedure 1. Remove R86.
When an abnormal voltage is confirmed, IC20 is broken.
When a normal voltage is confirmed, IC8 is broken.

[When the oscillation of 32.768kHz cannot be confirmed]
Procedure 1. Replace X2.
When an abnormal value is still confirmed, IC8 is broken.

[When an abnormal voltage is confirmed]
Procedure 1. Remove R97.
When a normal voltage is confirmed, IC12 is broken.
When an abnormal voltage is confirmed, perform procedure 2 after mounting R97 again.
Procedure 2. Remove R61.
When a normal voltage is confirmed, IC8 is broken.
When an abnormal voltage is confirmed, IC10 is broken.

[When an abnormal voltage is confirmed]
IC8 is broken.

[When an abnormal voltage is confirmed while "/CS2_0" or "/oE_0" is accessing]
The BGA parts are broken.

It is unlikely that the BGA parts are broken.

PARTS LIST

△ 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

Y : PX (Far East, Hawaii)

C : China

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

KMC-51D

MICROPHONE/EARPHONE JACK UNIT

Ref. No.	Address	Parts No.	Description	Desti- nation	Ref. No.	Address	Parts No.	Description	Desti- nation
KMC-51D									
1		A02-4190-08	PLASTIC CABINET ASSY		C17 ,18		CK73HB1A104K	CHIP C 0.10UF K	
2		A82-0086-08	REAR PANEL		C19		CK73HB1E103K	CHIP C 0.010UF K	
4		B4C-0007-00	BADGE(KMC-51D)		C24		CK73HB0J105K	CHIP C 1.0UF K	
5		B43-1681-08	BADGE(KENWOOD)		C25 ,26		CC73HCH1H271J	CHIP C 270PF J	
7		D10-0654-18	LEVER(PTT)		C27		CK73HB1E103K	CHIP C 0.010UF K	
10		E30-7752-08	CORD WITH PLUG		C28		CK73HB1A104K	CHIP C 0.10UF K	
11		G10-1386-08	FIBROUS SHEET(PHONE JACK)		C37		CK73HB1A104K	CHIP C 0.10UF K	
12		G10-1389-08	FIBROUS SHEET(MAIN/SUB ECM)		C38 ,39		CK73HB0J105K	CHIP C 1.0UF K	
13		G11-4450-08	SHEET(LEAK TEST)		C40		CK73HB1A104K	CHIP C 0.10UF K	
14		G11-4452-08	SHEET(PHONE JACK)		C41		CK73GB0J106K	CHIP C 10UF K	
15		G11-4505-08	SHEET(LEAK HOLE)		C44		CK73HB1H102K	CHIP C 1000PF K	
16		G13-2241-08	CUSHION(PTT)		C45		CK73HB0J105K	CHIP C 1.0UF K	
17		G53-1779-08	PACKING(PTT)		C46 ,47		CK73HB1A104K	CHIP C 0.10UF K	
18		G53-1814-08	PACKING(BOTTOM CAP)		C48		CK73GB0J475K	CHIP C 4.7UF K	
20		J19-5515-08	HOLDER(PTT)		C49		CK73HB1H102K	CHIP C 1000PF K	
22		J29-0740-08	BELT HOOK ASSY		C51		CK73GB0J106K	CHIP C 10UF K	
23		J99-0729-08	ADHESIVE SHEET(JACK COVER)		C52		CK73HB1H102K	CHIP C 1000PF K	
A		N08-0566-08	DRESSED SCREW(UNIVERSAL)		C59		CK73HB0J105K	CHIP C 1.0UF K	
28		T07-0359-18	SPEAKER		C60		CK73HB1E103K	CHIP C 0.010UF K	
29		T91-0584-08	MIC ELEMENT(MAIN/SUB)		C61 -78		CK73HB1A104K	CHIP C 0.10UF K	
MICROPHONE/EARPHONE JACK UNIT									
C1		CK73HB0J105K	CHIP C 1.0UF K		C80		CK73HB0J105K	CHIP C 1.0UF K	
C2		CC73HCH1H470J	CHIP C 47PF J		C81		CK73HB1E103K	CHIP C 0.010UF K	
C5 ,6		CC73GCH1H102J	CHIP C 1000PF J		C82		CK73HB1A104K	CHIP C 0.10UF K	
C7		CC73GCH1H471J	CHIP C 470PF J		C83		CK73HB0J105K	CHIP C 1.0UF K	
C8		CK73HB1H102K	CHIP C 1000PF K		C84		CK73HB1E103K	CHIP C 0.010UF K	
C9		CK73HB1A104K	CHIP C 0.10UF K		C85		CK73HB1A104K	CHIP C 0.10UF K	
C12		CK73HB0J105K	CHIP C 1.0UF K		C86		CK73HB0J105K	CHIP C 1.0UF K	
C14		CK73HB1H102K	CHIP C 1000PF K		C87		CK73HB1E103K	CHIP C 0.010UF K	
C15		CK73GB0J106K	CHIP C 10UF K		C89		CK73HB0J105K	CHIP C 1.0UF K	
C16		CK73HB0J105K	CHIP C 1.0UF K		C90		CK73HB1E103K	CHIP C 0.010UF K	
					C92		CK73GB1A684K	CHIP C 0.68UF K	
					C93		CK73HB1A104K	CHIP C 0.10UF K	
					C95		CK73HB1H102K	CHIP C 1000PF K	
					C98		CK73HB1H102K	CHIP C 1000PF K	
					C100		CK73HB0J105K	CHIP C 1.0UF K	
					C101		CK73HB1A104K	CHIP C 0.10UF K	
					C102		CK73HB0J105K	CHIP C 1.0UF K	
					C104		CK73HB1A104K	CHIP C 0.10UF K	
					C105,106		CC73HCH1H120J	CHIP C 12PF J	
					C108		CK73HB1H102K	CHIP C 1000PF K	
					C109		CK73HB1A104K	CHIP C 0.10UF K	
					C110		CK73HB1H102K	CHIP C 1000PF K	
					C111		CK73HB0J105K	CHIP C 1.0UF K	
					C112		CC73HCH1H100D	CHIP C 10PF D	
					C113		CK73HB0J105K	CHIP C 1.0UF K	
					C114		C90-4161-05	ELECTRO 100UF 25WV	
					C115,116		CK73HB1A104K	CHIP C 0.10UF K	
					C117		CK73HB0J105K	CHIP C 1.0UF K	
					C118,119		CK73HB1H102K	CHIP C 1000PF K	
					CN1		E41-1492-05	PIN ASSY(9P)	
					CN2 -4		E41-1486-05	PIN ASSY(2P)	
					J1		E11-0712-08	EARPHONE JACK(3.5D)	
					L1		L92-0138-05	CHIP FERRITE	
					L2 ,3		L92-0408-05	CHIP FERRITE	
					L4		L92-0138-05	CHIP FERRITE	

PARTS LIST

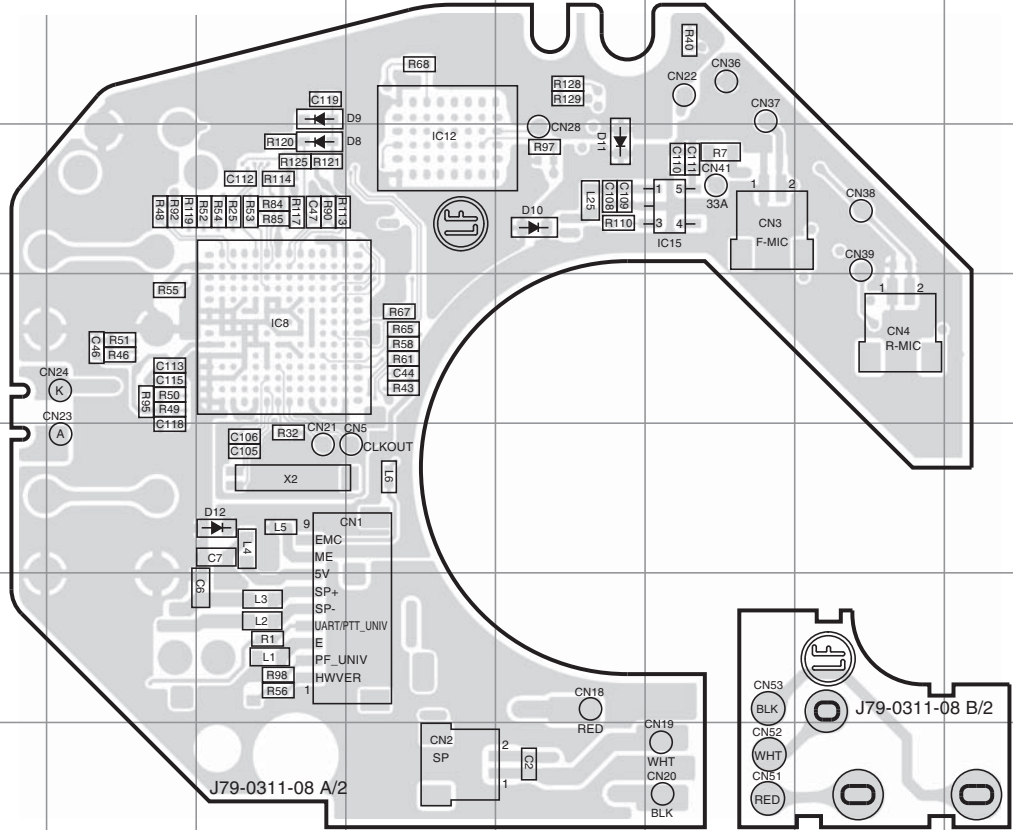
MICROPHONE/EARPHONE JACK UNIT

Ref. No.	Address	Parts No.	Description	Destination	Ref. No.	Address	Parts No.	Description	Destination
L5		L92-0162-05	BEADS CORE		R126		RK73HB1J472J	CHIP R 4.7K J 1/16W	
L6		L92-0670-05	BEADS CORE		R127		RK73HB1J222J	CHIP R 2.2K J 1/16W	
L16		L92-0467-05	CHIP FERRITE		R128-131		RK73HB1J104J	CHIP R 100K J 1/16W	
L20 -25		L92-0467-05	CHIP FERRITE						
L26		L33-1494-05	SMALL FIXED INDUCTOR(4.7UH)		S3		S70-0511-08	TACT SWITCH(PTT)	
					S4 ,5		S70-0471-08	TACT SWITCH(PF1/PF2)	
L27		L92-0467-05	CHIP FERRITE		D3		1SS388F	DIODE	
X2		L77-1802-05	CRYSTAL RESONATOR(32.768KHZ)		D5		AVRM16080MAAB	VARISTOR	
R1		RK73HB1J000J	CHIP R 0 J 1/16W		D6 -9		1SS388F	DIODE	
R3		RK73HB1J182J	CHIP R 1.8K J 1/16W		D10 -12		AVRM16080MAAB	VARISTOR	
R4		RK73HB1J471J	CHIP R 470 J 1/16W		IC1		XC6223H331M-G	ANALOGUE IC	
R5		RK73HB1J182J	CHIP R 1.8K J 1/16W						
R6 ,7		RK73GB2A000J	CHIP R 0 J 1/10W		IC2 ,3		TC75W51FK(F)	MOS-IC	
R10		RK73HH1J103D	CHIP R 10K D 1/16W		IC7		AK4555VT	MOS-IC	
R11 ,12		RK73HH1J473D	CHIP R 47K D 1/16W		IC8		Note 1	MICROPROCESSOR IC	
R17		RK73HH1J273D	CHIP R 27K D 1/16W		IC10		XC6118N38BM-G	ANALOGUE IC	
R18		RK73HH1J473D	CHIP R 47K D 1/16W		IC12		Note 1	ROM IC	
R20 ,21		RK73HH1J473D	CHIP R 47K D 1/16W		IC15		XC6223H331M-G	ANALOGUE IC	
R24		RK73HH1J473D	CHIP R 47K D 1/16W		IC17		TC7SH17FU-F	MOS-IC	
R25		RK73HB1J220J	CHIP R 220 J 1/16W		IC18		TC7SZ125FU-F	MOS-IC	
R32		RK73HB1J000J	CHIP R 0 J 1/16W		IC20		XC9235A13CM-G	MOS-IC	
R37		RK73HB1J220J	CHIP R 220 J 1/16W		Q3		SSM6N16FE-F	FET	
R40		RK73HB1J104J	CHIP R 100K J 1/16W		Q5 ,6		DTC144EUA	TRANSISTOR	
R43		RK73HB1J000J	CHIP R 0 J 1/16W		Q10		UMX2N	TRANSISTOR	
R46		RK73HB1J103J	CHIP R 10K J 1/16W						
R48 -50		RK73HB1J104J	CHIP R 100K J 1/16W						
R51		RK73HB1J103J	CHIP R 10K J 1/16W						
R52 -54		RK73HB1J220J	CHIP R 220 J 1/16W						
R55		RK73HB1J104J	CHIP R 100K J 1/16W						
R56		RK73HB1J221J	CHIP R 220 J 1/16W						
R58		RK73HB1J472J	CHIP R 4.7K J 1/16W						
R61		RK73HB1J000J	CHIP R 0 J 1/16W						
R63		RK73HB1J104J	CHIP R 100K J 1/16W						
R65		RK73HB1J220J	CHIP R 220 J 1/16W						
R66		RK73HB1J104J	CHIP R 100K J 1/16W						
R67 ,68		RK73HB1J220J	CHIP R 220 J 1/16W						
R74		RK73HB1J000J	CHIP R 0 J 1/16W						
R75		RK73HB1J472J	CHIP R 4.7K J 1/16W						
R76		RK73HB1J103J	CHIP R 10K J 1/16W						
R77		RK73HB1J472J	CHIP R 4.7K J 1/16W						
R79		RK73HB1J103J	CHIP R 10K J 1/16W						
R81		RK73HB1J104J	CHIP R 100K J 1/16W						
R84 ,85		RK73HB1J473J	CHIP R 47K J 1/16W						
R86		RK73GB2A000J	CHIP R 0 J 1/10W						
R87		RK73HB1J271J	CHIP R 270 J 1/16W						
R88		RK73HB1J104J	CHIP R 100K J 1/16W						
R90		RK73HB1J104J	CHIP R 100K J 1/16W						
R92		RK73HB1J104J	CHIP R 100K J 1/16W						
R95		RK73HB1J102J	CHIP R 1.0K J 1/16W						
R97 ,98		RK73HB1J000J	CHIP R 0 J 1/16W						
R109-111		RK73HB1J000J	CHIP R 0 J 1/16W						
R112		RK73GB2A000J	CHIP R 0 J 1/10W						
R113-117		RK73HB1J104J	CHIP R 100K J 1/16W						
R119		RK73HB1J220J	CHIP R 220 J 1/16W						
R120		RK73HB1J222J	CHIP R 2.2K J 1/16W						
R121		RK73HB1J104J	CHIP R 100K J 1/16W						
R122		RK73HB1J105J	CHIP R 1.0M J 1/16W						
R123		RK73HB1J103J	CHIP R 10K J 1/16W						
R124		RK73HB1J222J	CHIP R 2.2K J 1/16W						
R125		RK73HB1J473J	CHIP R 47K J 1/16W						

KMC-51D PC BOARD

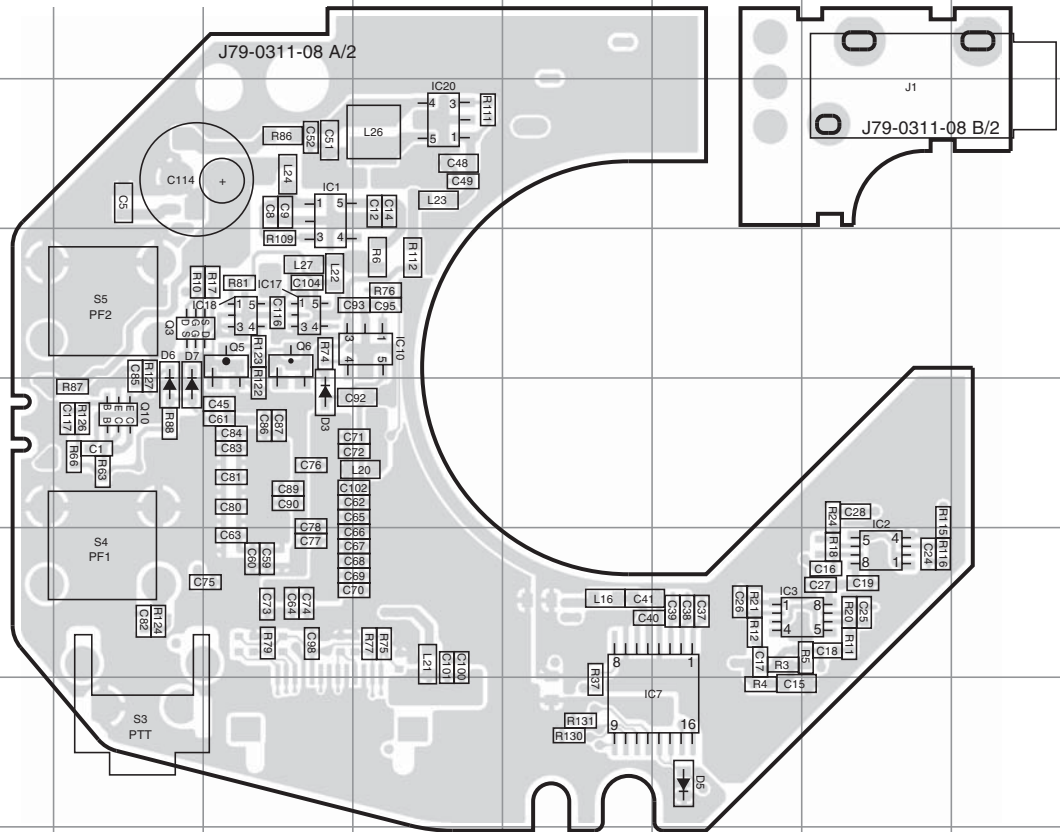
MICROPHONE UNIT, EARPHONE JACK UNIT Component side view

Ref. No.	Address
IC8	4E
IC12	3F
IC15	3H
D8	3E
D9	2E
D10	3G
D11	3G
D12	5E

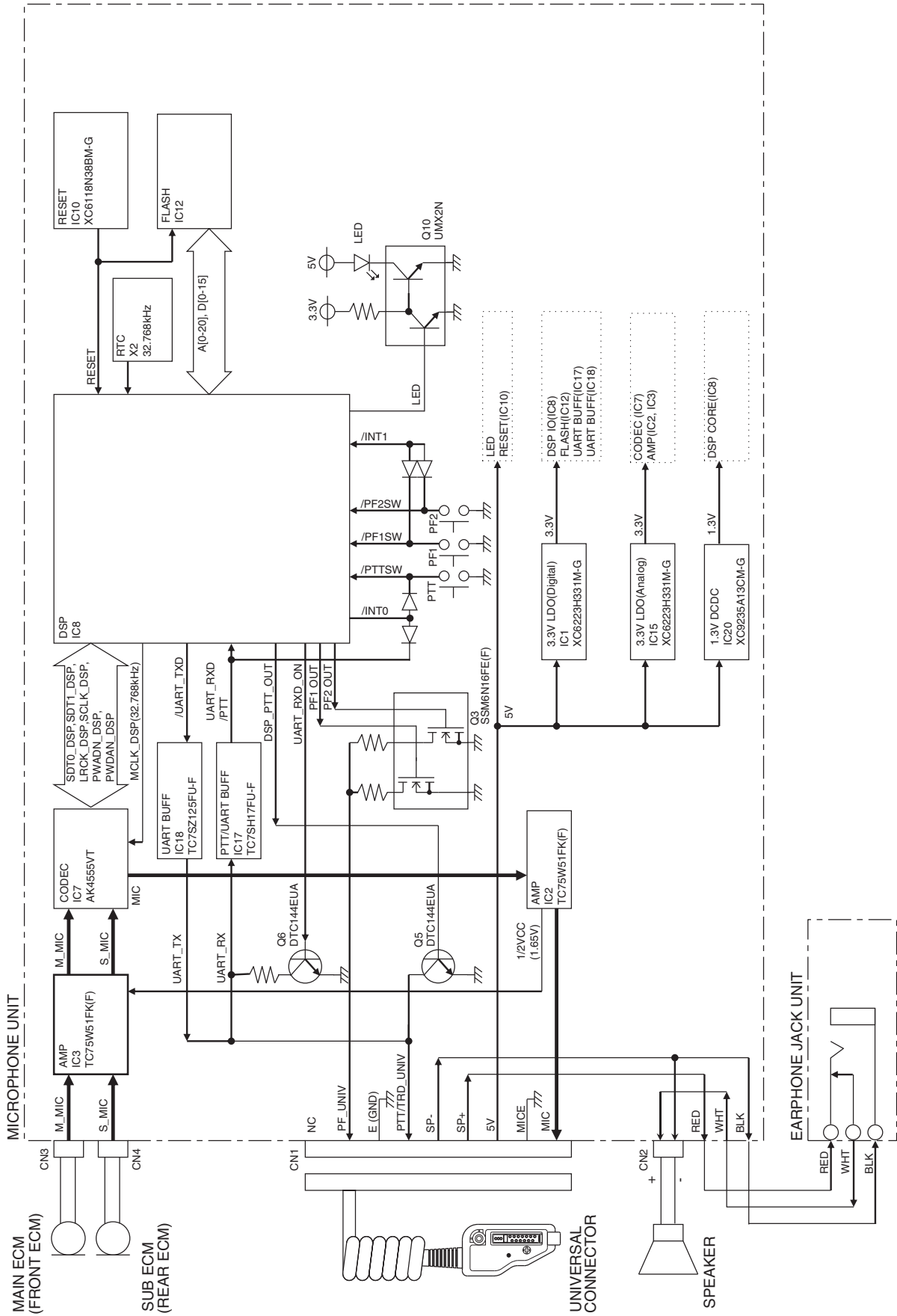


MICROPHONE UNIT, EARPHONE JACK UNIT Foil side view

Ref. No.	Address
IC1	9E
IC2	12I
IC3	12H
IC7	13G
IC10	10F
IC17	10E
IC18	10E
IC20	9F
Q3	10D
Q5	10E
Q6	10E
Q10	11D
D3	11E
D6	11D
D7	11D



BLOCK DIAGRAM



KMC-51D

MEMO

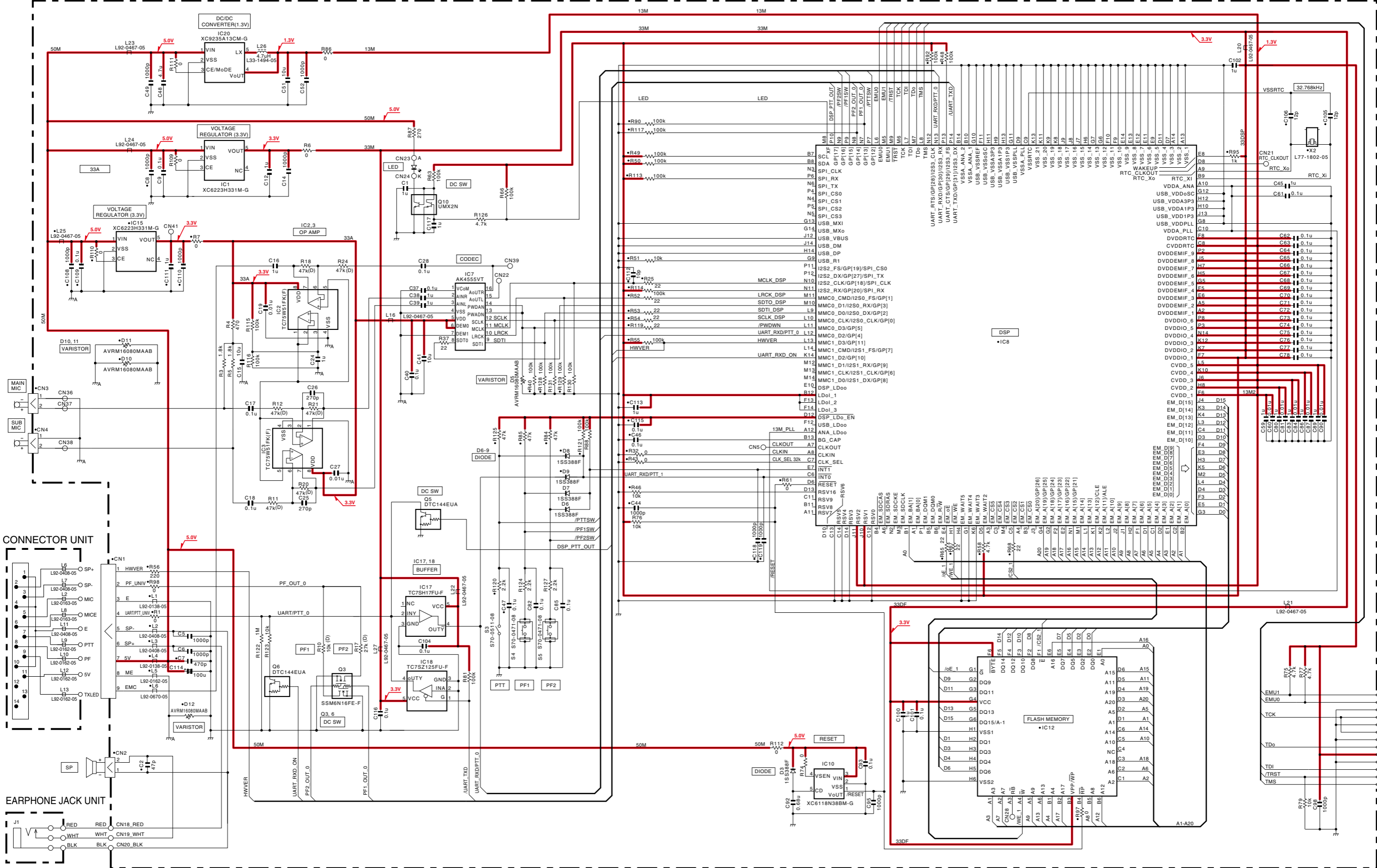
MEMO

KMC-51D

KENWOOD

JVC KENWOOD Corporation
Communications Equipment Div

MICROPHONE UNIT



CONNECTOR UNIT

EARPHONE JACK UNIT

