

# KENWOOD

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This TK-8180 service manual contains a number of sections which differ from the service manual (B51-8692-00) for the TK-8180.  
For items other than those in this TK-8180 service manual please refer to the service manual (B51-8692-00) for the TK-8180.



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### Service Manual List

Title	Part number	Remarks	Destination
TK-8180	B51-8692-00		K
TK-8180	B51-8702-00 (This service manual)	SUPPLEMENT	K2

## GENERAL

### INTRODUCTION

#### SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as of this publication date. Changes which may occur after publication are covered by either Service Bulletins or Manual Revisions, which are issued as required.

### ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts : components, kits, and chassis. If the part number is not known, include the chassis or kit number of which it is a part and a sufficient description of the required component for proper identification.

### PERSONAL SAFETY

The following precautions are recommended for personal safety :

- DO NOT transmit if someone is within two feet (0.6 meter) of the antenna.
- DO NOT transmit until all RF connectors are secure and any open connectors are properly terminated.
- SHUT OFF this equipment when near electrical blasting caps or while in an explosive atmosphere.
- All equipment should be properly grounded before power-up for safe operation.
- This equipment should be serviced by only qualified technicians.

### PRE-INSTALLATION CONSIDERATIONS

#### 1. UNPACKING

Unpack the radio from its shipping container and check for accessory items. If any item is missing, please contact KENWOOD immediately.

#### 2. LICENSING REQUIREMENTS

Federal regulations require a station license for each radio installation (mobile or base) be obtained by the equipment owner. The licensee is responsible for ensuring transmitter power, frequency, and deviation are within the limits permitted by the station license.

Transmitter adjustments may be performed only by a licensed technician holding an FCC first, second or general class commercial radiotelephone operator's license. There is no license required to install or operate the radio.

### 3. PRE-INSTALLATION CHECKOUT

#### 3-1. Introduction

Each radio is adjusted and tested before shipment. However, it is recommended that receiver and transmitter operation be checked for proper operation before installation.

#### 3-2. Testing

The radio should be tested complete with all cabling and accessories as they will be connected in the final installation. Transmitter frequency, deviation, and power output should be checked, as should receiver sensitivity, squelch operation, and audio output. Signaling equipment operation should be verified.

### 4. PLANNING THE INSTALLATION

#### 4-1. General

Inspect the vehicle and determine how and where the radio antenna and accessories will be mounted.

Plan cable runs for protection against pinching or crushing wiring, and radio installation to prevent overheating.

#### 4-2. Antenna

The favored location for an antenna is in the center of a large, flat conductive area, usually at the roof center. The trunk lid is preferred, bond the trunk lid and vehicle chassis using ground straps to ensure the lid is at chassis ground.

#### 4-3. Radio

The universal mount bracket allows the radio to be mounted in a variety of ways. Be sure the mounting surface is adequate to support the radio's weight. Allow sufficient space around the radio for air cooling. Position the radio close enough to the vehicle operator to permit easy access to the controls when driving.

#### 4-4. DC Power and wiring

1. This radio may be installed in negative ground electrical systems only. Reverse polarity will cause the cable fuse to blow. Check the vehicle ground polarity before installation to prevent wasted time and effort.
2. Connect the positive power lead directly to the vehicle battery positive terminal. Connecting the Positive lead to any other positive voltage source in the vehicle is not recommended.
3. Connect the ground lead directly to the battery negative terminal.
4. The cable provided with the radio is sufficient to handle the maximum radio current demand. If the cable must be extended, be sure the additional wire is sufficient for the current to be carried and length of the added lead.

## GENERAL

### 5. INSTALLATION PLANNING – CONTROL STATIONS

#### 5-1. Antenna system

Control station. The antenna system selection depends on many factors and is beyond the scope of this manual. Your KENWOOD dealer can help you select an antenna system that will best serve your particular needs.

#### 5-2. Radio location

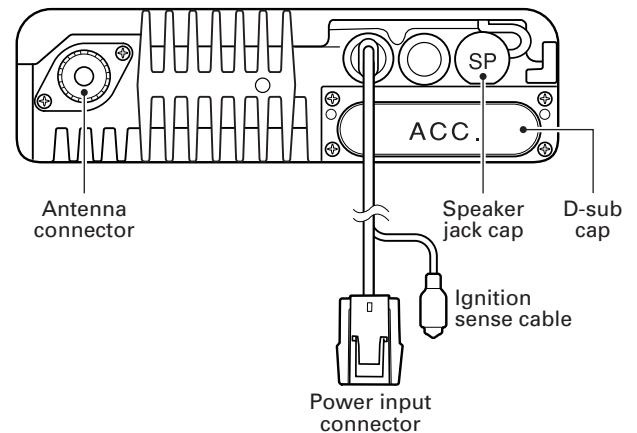
Select a convenient location for your control station radio which is as close as practical to the antenna cable entry point. Secondly, use your system's power supply (which supplies the voltage and current required for your system). Make sure sufficient air can flow around the radio and power supply to allow adequate cooling.

### SERVICE

This radio is designed for easy servicing. Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained in this manual.

### NOTE

- If you do not intend to use the speaker 3.5-mm jack and the D-sub 25-pin connector, fit the supplied speaker-jack cap and D-sub cap to stop dust and sand from getting in.
- If the transceiver is turned ON or OFF when the power-on/off status message is enabled, the transceiver sends the status.



# TK-8180

## 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

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

### TK-8180 (Y51-5030-XX)

#### DISPLAY UNIT (X54-3480-10)

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>TK-8180</b>					
1	1B		A01-2194-11	METALLIC CABINET	
2	3A		A62-1094-23	PANEL ASSY	
4	2A		B09-0681-03	CAP (KAP-2)	
5	1D		B62-1766-10	INSTRUCTION MANUAL	
7	2B		E04-0167-05	RF COAXIAL RECEPTACLE (M)	
8	2B		E30-7520-05	DC CORD (PIG TAIL)	
9	2C		E30-7523-05	DC CORD ASSY (WATER-PROOF)	
10	2A		E37-1110-05	FLAT CABLE (30P/D-SUB)	
11	1A		E37-1118-05	LEAD WIRE WITH CONNECTOR (SHORT CABLE)	
12	2A		E37-1120-05	FLAT CABLE (30P/TX-RX)	
13	3B		E37-1124-05	LEAD WIRE WITH CONNECTOR (2P/SP)	
15	2B		F10-2488-02	SHIELDING PLATE (CHASSIS)	
16	1A		F10-2489-03	SHIELDING CASE (FINAL)	
17	1A		F10-2490-03	SHIELDING CASE (VCO)	
18	1C		F52-0024-05	FUSE (BLADE TYPE) 15A/32V	
20	3B		G10-1342-04	FIBROUS SHEET (BIRITSUKI)	
21	2A		G11-4290-04	RUBBER SHEET (CHASSIS)	
22	1B		G11-4343-04	SHEET	
23	1A		G13-2018-04	CUSHION	
24	2B		G13-2047-04	CUSHION (DC SCREW)	
25	1B		G53-1613-01	PACKING (SHIELD PLATE)	
26	3A		G53-1614-23	PACKING (CHASSIS)	
27	1A		G53-1616-03	PACKING (PHONE JACK)	
28	2B		G53-1626-03	PACKING (D-SUB OUTER)	
29	3B		G53-1643-04	PACKING (DC CORD)	
30	3B		G53-1645-03	PACKING (D-SUB INNER)	
31	2A		G53-1662-04	PACKING (O RING)	
32	2C		H02-0624-03	INNER CARTON CASE	
33	2D		H12-3170-01	PACKING FIXTURE (LOWER)	
34	1D		H12-3171-03	PACKING FIXTURE (UPPER)	
36	2D		H25-2352-04	PROTECTION BAG (250/350/0.07)	
37	3D		H52-2069-02	ITEM CARTON CASE	
39	1C		J19-1584-05	HOLDER (ACCESSORY)	
40	3B		J19-5464-13	HOLDER (SP)	
41	3B		J19-5468-02	HOLDER (PANEL)	
42	2B		J21-8479-02	MOUNTING HARDWARE (D-SUB)	
43	3B		J21-8481-03	MOUNTING HARDWARE (SP)	
44	2C		J29-0662-03	BRACKET (ACCESSORY)	
45	3B		J30-1289-04	SPACER (SP)	
47	3A	*	K29-9312-31	KEY TOP	
A	2B		N09-2409-05	HEXAGON HEAD SCREW (D-SUB)	
B	1A,2A		N67-3008-48	PAN HEAD SEMS SCREW (FINAL IC)	
C	1A,2A,2B		N87-2606-48	BRAZIER HEAD TAPTITE SCREW (ANT, PCB)	
D	1A		N87-2608-46	BRAZIER HEAD TAPTITE SCREW (AUDIO IC)	
49	2C		N99-2039-05	SCREW SET (ACCESSORY)	
51	3B		T07-0757-05	SPEAKER	
52	1C		T91-0639-05	MICROPHONE (ACCESSORY)	
54	2A		W09-0971-05	LITHIUM CELL	

Ref. No.	Address	New parts	Parts No.	Description	Destination
<b>DISPLAY UNIT (X54-3480-10)</b>					
101	3B		B11-1825-04	FILTER (LCD)	
102	3B		B38-0888-05	LCD	
D907			B30-2151-05	LED (R/G)	
D909-920			B30-2281-05	LED (Y)	
D921-930			B30-2282-05	LED (Y)	
C904			CC73GCH1H101J	CHIP C 100PF J	
C906			CK73GB1H103K	CHIP C 0.010UF K	
C907,908			CK73HB1H102K	CHIP C 1000PF K	
C909-911			CC73GCH1H101J	CHIP C 100PF J	
C912,913			CK73GB1H102K	CHIP C 1000PF K	
C914			CC73GCH1H101J	CHIP C 100PF J	
C915			CK73GB1H102K	CHIP C 1000PF K	
C916,917			CK73GB1C104K	CHIP C 0.10UF K	
C918			C92-0628-05	CHIP-TAN 10UF 10WV	
C920			CC73GCH1H101J	CHIP C 100PF J	
C921			CK73GB1H102K	CHIP C 1000PF K	
C922			CK73GB1H103K	CHIP C 0.010UF K	
C924,925			CC73GCH1H100D	CHIP C 10PF D	
C926-928			CK73GB1H102K	CHIP C 1000PF K	
C930			CK73GB1H103K	CHIP C 0.010UF K	
C931			C92-0784-05	CHIP-TAN 4.7UF 10WV	
C932-934			CK73GB1H103K	CHIP C 0.010UF K	
C935			CK73GB1H471K	CHIP C 470PF K	
C936			CK73GB1C104K	CHIP C 0.10UF K	
C937			CK73GB1H103K	CHIP C 0.010UF K	
C938			CK73GB1H102K	CHIP C 1000PF K	
103	3B		E29-1202-04	INTER CONNECTOR (LCD)	
CN901			E40-5704-05	PIN ASSY	
CN902			E40-6372-05	FLAT CABLE CONNECTOR	
J901	3B		E08-0877-05	MODULAR JACK	
104	3B		G11-4342-04	SHEET	
105	3B		J19-5467-03	HOLDER (LCD)	
106	3B		J21-8470-03	MOUNTING HARDWARE (LCD)	
-			J31-0551-05	COLLAR	
L901,902			L40-1095-85	SMALL FIXED INDUCTOR (1.0UH)	
L903-907			L92-0140-05	CHIP FERRITE	
L908,909			L92-0163-05	BEADS CORE	
X901			L77-1956-05	CRYSTAL RESONATOR (14.7456MHZ)	
CP901-911			RK75HA1J101J	CHIP-COM 100 J 1/16W	
R901			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R903			RK73GB1J471J	CHIP R 470 J 1/16W	
R904			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R905			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R907			RK73GB1J333J	CHIP R 33K J 1/16W	
R909-911			RK73GB1J473J	CHIP R 47K J 1/16W	
R913-916			RK73HB1J474J	CHIP R 470K J 1/16W	
R917			RK73FB2A471J	CHIP R 470 J 1/10W	
R918			RK73FB2A271J	CHIP R 270 J 1/10W	
R919			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R920			R92-1368-05	CHIP R 0 OHM	
R925			RK73HB1J471J	CHIP R 470 J 1/16W	
R926			RK73HB1J473J	CHIP R 47K J 1/16W	

## PARTS LIST

DISPLAY UNIT (X54-3480-10)

TX-RX UNIT (X57-6990-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R927-935			RK73HB1J102J	CHIP R 1.0K J 1/16W		C42			C93-0555-05	CHIP C 5.0PF C	
R936			RK73HB1J103J	CHIP R 10K J 1/16W		C43			CC73FCH1H030C	CHIP C 3.0PF C	K
R939			RK73GB1J472J	CHIP R 4.7K J 1/16W		C43			CC73FCH1H050C	CHIP C 5.0PF C	K2
R940			RK73HB1J101J	CHIP R 100 J 1/16W		C44			C93-0573-05	CHIP C 120PF J	
R941			RK73HB1J102J	CHIP R 1.0K J 1/16W		C45			C93-0552-05	CHIP C 2.0PF C	K2
R942			RK73EB2B470J	CHIP R 47 J 1/8W		C45			C93-0553-05	CHIP C 3.0PF C	K
R943			RK73EB2B101J	CHIP R 100 J 1/8W		C47			CC73GCH1H0R5B	CHIP C 0.5PF B	
R944			R92-1368-05	CHIP R 0 OHM		C48			CC73GCH1H020B	CHIP C 2.0PF B	K2
R945			RK73GB1J103J	CHIP R 10K J 1/16W		C48			CC73GCH1H030B	CHIP C 3.0PF B	K
R947-950			RK73FB2A101J	CHIP R 100 J 1/10W		C49			CC73GCH1H101J	CHIP C 100PF J	
R951,952			RK73FB2A391J	CHIP R 390 J 1/10W		C50			C93-0557-05	CHIP C 7.0PF D	K2
R953,954			RK73FB2A821J	CHIP R 820 J 1/10W		C50			C93-0558-05	CHIP C 8.0PF D	K
R955-958			RK73HB1J472J	CHIP R 4.7K J 1/16W		C51			CC73GCH1H101J	CHIP C 100PF J	
R959			RK73HB1J103J	CHIP R 10K J 1/16W		C52			CC73GCH1H0R5B	CHIP C 0.5PF B	
R962,963			RK73GB1J103J	CHIP R 10K J 1/16W		C53			C93-0559-05	CHIP C 9.0PF D	K2
R967			RK73HB1J271J	CHIP R 270 J 1/16W		C53			C93-0560-05	CHIP C 10PF D	K
R969			R92-1368-05	CHIP R 0 OHM		C54			C93-0554-05	CHIP C 4.0PF C	K2
R970			RK73GB1J103J	CHIP R 10K J 1/16W		C55			CC73GCH1H020B	CHIP C 2.0PF B	
R971			RK73HB1J102J	CHIP R 1.0K J 1/16W		C56			CC73GCH1H101J	CHIP C 100PF J	
D901,902			02DZ18(X,Y)	ZENER DIODE		C57			CC73GCH1H0R5B	CHIP C 0.5PF B	
D903			MINISMDC020	VARIATOR		C58			CC73GCH1H020B	CHIP C 2.0PF B	
D904-906			DA204U	DIODE		C59			CC73GCH1H101J	CHIP C 100PF J	
IC901			TA78L05F	MOS-IC		C60			C93-0556-05	CHIP C 6.0PF D	K
IC902			30302M8-8Z7GP	MICROCONTROLLER IC		C60			C93-0558-05	CHIP C 8.0PF D	K2
IC903			LC75810T-8726	MOS-IC		C61,62			CC73GCH1H101J	CHIP C 100PF J	
Q901,902			DTC144EE	DIGITAL TRANSISTOR		C63			CC73GCH1H050C	CHIP C 5.0PF C	K2
Q904-906			DTC114EE	DIGITAL TRANSISTOR		C64			CC73GCH1H080D	CHIP C 8.0PF D	K2
Q907			2SC2873(Y)	TRANSISTOR		C65			CC73GCH1H060D	CHIP C 6.0PF D	K2
Q909,910			12A02CH	TRANSISTOR		C74			CC73GCH1H101J	CHIP C 100PF J	
Q911			DTC114EE	DIGITAL TRANSISTOR		C76,77			CK73GB1H471K	CHIP C 470PF K	
Q913			DTC114EE	DIGITAL TRANSISTOR		C79,80			CK73GB1H471K	CHIP C 470PF K	
TH901			S1R103J440H	THERMISTOR		C83			C93-0554-05	CHIP C 4.0PF C	K2
<b>TX-RX UNIT (X57-6990-XX) -10 : K -11 : K2</b>						C119			CC73GCH1H050B	CHIP C 5.0PF B	K
C1			CK73GB1H102K	CHIP C 1000PF K		C119			CC73GCH1H100D	CHIP C 10PF D	K2
C2-5			CC73GCH1H101J	CHIP C 100PF J		C121			CK73GB1H471K	CHIP C 470PF K	
C6			C92-0585-05	CHIP-TAN 4.7UF 16WV		C124			CC73GCH1H060B	CHIP C 6.0PF B	K2
C7,8			CC73GCH1H101J	CHIP C 100PF J		C124			CC73GCH1H100D	CHIP C 10PF D	K
C9			CC73GCH1H060D	CHIP C 6.0PF D		C125			CK73GB1H471K	CHIP C 470PF K	
C10			CC73GCH1H101J	CHIP C 100PF J		C127			CC73GCH1H220J	CHIP C 22PF J	K
C13-15			CC73GCH1H101J	CHIP C 100PF J		C127			CC73GCH1H270J	CHIP C 27PF J	K2
C16			CC73GCH1H060D	CHIP C 6.0PF D	K	C128			CC73GCH1H070B	CHIP C 7.0PF B	K2
C16			CC73GCH1H080D	CHIP C 8.0PF D	K2	C128			CC73GCH1H090B	CHIP C 9.0PF B	K
C17			CC73GCH1H220J	CHIP C 22PF J		C129			CK73GB1H471K	CHIP C 470PF K	
C18			CK73GB1H471K	CHIP C 470PF K		C130			CC73GCH1H050B	CHIP C 5.0PF B	
C19			CC73GCH1H470J	CHIP C 47PF J		C131			CK73GB1H471K	CHIP C 470PF K	
C20			CC73GCH1H101J	CHIP C 100PF J		C132			CC73GCH1H220J	CHIP C 22PF J	K
C21			CK73FB1H471K	CHIP C 470PF K		C132			CC73GCH1H270J	CHIP C 27PF J	K2
C22			CK73GB1H471K	CHIP C 470PF K		C133			CC73GCH1H060B	CHIP C 6.0PF B	K
C24			C92-0606-05	CHIP-TAN 4.7UF 10WV		C133			CC73GCH1H070B	CHIP C 7.0PF B	K2
C25			C93-0550-05	CHIP C 1.0PF C	K	C134			CC73GCH1H030B	CHIP C 3.0PF B	
C25			C93-0552-05	CHIP C 2.0PF C	K2	C135			CC73GCH1H220J	CHIP C 22PF J	K
C26			CC73GCH1H220J	CHIP C 22PF J		C135			CC73GCH1H270J	CHIP C 27PF J	K2
C27			CC73GCH1H470J	CHIP C 47PF J		C136			CC73GCH1H040B	CHIP C 4.0PF B	K
C28			CC73GCH1H101J	CHIP C 100PF J		C136			CC73GCH1H060B	CHIP C 6.0PF B	K2
C29-31			CK73GB1H471K	CHIP C 470PF K		C137			CK73GB1H471K	CHIP C 470PF K	
C32			C92-0834-05	ELECTRO 47UF 25WV		C138			CC73GCH1H050B	CHIP C 5.0PF B	
C33-35			CC73GCH1H101J	CHIP C 100PF J		C139			CK73GB1H471K	CHIP C 470PF K	
C38-40			CC73GCH1H220J	CHIP C 22PF J		C140			CC73GCH1H220J	CHIP C 22PF J	K
						C140			CC73GCH1H270J	CHIP C 27PF J	K2
						C141			CC73GCH1H090B	CHIP C 9.0PF B	K

## PARTS LIST

### TX-RX UNIT (X57-6990-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C141			CC73GCH1H100D	CHIP C 10PF D	K2	C226,227			CK73GB1H102K	CHIP C 1000PF K	
C142			CK73GB1H471K	CHIP C 470PF K		C228			CK73GB1C104K	CHIP C 0.10UF K	
C143			CK73GB1H103K	CHIP C 0.010UF K		C229			CK73GB1C333K	CHIP C 0.033UF K	
C144			CC73GCH1H070B	CHIP C 7.0PF B	K	C230			CK73GB1H103K	CHIP C 0.010UF K	
C144			CC73GCH1H080B	CHIP C 8.0PF B	K2	C231			CC73GCH1H820J	CHIP C 82PF J	
C145			CC73GCH1H020B	CHIP C 2.0PF B	K2	C232,233			CK73GB1H102K	CHIP C 1000PF K	
C145			CC73GCH1H1R5B	CHIP C 1.5PF B	K	C234			CK73FB1C224K	CHIP C 0.22UF K	
C146			CK73GB1H471K	CHIP C 470PF K		C235			CK73GB1C104K	CHIP C 0.10UF K	
C147			CC73GCH1H050B	CHIP C 5.0PF B	K	C236			CK73GB1H103K	CHIP C 0.010UF K	
C147			CC73GCH1H080B	CHIP C 8.0PF B	K2	C237			C92-0712-05	CHIP-TAN 22UF 6.3WV	
C148			CC73GCH1H010B	CHIP C 1.0PF B		C238			CK73GB1H103K	CHIP C 0.010UF K	
C149			CK73GB1H471K	CHIP C 470PF K		C239,240			CK73GB1C104K	CHIP C 0.10UF K	
C150			CC73GCH1H050B	CHIP C 5.0PF B	K	C241			CK73GB1H102K	CHIP C 1000PF K	
C150			CC73GCH1H080B	CHIP C 8.0PF B	K2	C251,252			CK73GB1H471K	CHIP C 470PF K	
C151			CC73GCH1H010B	CHIP C 1.0PF B		C253			CK73GB1H103K	CHIP C 0.010UF K	
C152			CK73GB1H471K	CHIP C 470PF K		C255			C92-0694-05	CHIP-TAN 10UF 16WV	
C153			CC73GCH1H050B	CHIP C 5.0PF B	K	C256			CK73GB1H103K	CHIP C 0.010UF K	
C153			CC73GCH1H080B	CHIP C 8.0PF B	K2	C257			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C154			CC73GCH1H020B	CHIP C 2.0PF B	K2	C258			C92-0516-05	CHIP-TAN 4.7UF 16WV	
C154			CC73GCH1H1R5B	CHIP C 1.5PF B	K	C259			C92-0628-05	CHIP-TAN 10UF 10WV	
C155,156			CK73GB1H471K	CHIP C 470PF K		C260-262			CC73GCH1H101J	CHIP C 100PF J	
C171			CC73GCH1H060B	CHIP C 6.0PF B	K	C299			CC73GCH1H0R5B	CHIP C 0.5PF B	
C171			CC73GCH1H100D	CHIP C 10PF D	K2	C302			CC73GCH1H0R5B	CHIP C 0.5PF B	K
C173			CC73GCH1H120J	CHIP C 12PF J	K	C302			CC73GCH1H1R5B	CHIP C 1.5PF B	K2
C173			CC73GCH1H180J	CHIP C 18PF J	K2	C306			CC73GCH1H100D	CHIP C 10PF D	
C175			CC73GCH1H060B	CHIP C 6.0PF B	K	C307			CK73GB1H471K	CHIP C 470PF K	
C175			CC73GCH1H100D	CHIP C 10PF D	K2	C308			CC73GCH1H100D	CHIP C 10PF D	K
C176-178			CK73GB1H471K	CHIP C 470PF K		C308,309			CC73GCH1H101J	CHIP C 100PF J	K2
C181			CK73GB1H471K	CHIP C 470PF K		C309			CC73GCH1H101J	CHIP C 100PF J	K
C182,183			CK73GB1H103K	CHIP C 0.010UF K		C311			CC73GCH1H101J	CHIP C 100PF J	K2
C184			CK73GB1H471K	CHIP C 470PF K		C311			CC73GCH1H390J	CHIP C 39PF J	K
C185			CK73GB1H103K	CHIP C 0.010UF K		C312			C92-0555-05	CHIP-TAN 0.047UF 35WV	
C186			CC73GCH1H330J	CHIP C 33PF J		C314			CK73FB1E104K	CHIP C 0.10UF K	
C187			CC73GCH1H390J	CHIP C 39PF J		C316			CC73GCH1H080D	CHIP C 8.0PF D	K
C188,189			CC73GCH1H040B	CHIP C 4.0PF B		C316,317			CC73GCH1H101J	CHIP C 100PF J	K2
C190			CC73GCH1H390J	CHIP C 39PF J		C317			CC73GCH1H101J	CHIP C 100PF J	K
C192-194			CK73GB1H103K	CHIP C 0.010UF K		C318			C92-0657-05	CHIP-TAN 2.2UF 20WV	
C195			CK73GB1H471K	CHIP C 470PF K		C320			C92-0657-05	CHIP-TAN 2.2UF 20WV	
C196,197			CK73GB1H103K	CHIP C 0.010UF K		C322			CK73GB1E473J	CHIP C 0.047UF J	K
C198			CC73GCH1H680J	CHIP C 68PF J		C322,323			CK73GB1H471K	CHIP C 470PF K	K2
C199			CC73GCH1H390J	CHIP C 39PF J		C323			CK73GB1H471K	CHIP C 470PF K	K
C200,201			CC73GCH1H040B	CHIP C 4.0PF B		C324			CK73GB1C104K	CHIP C 0.10UF K	
C202			CC73GCH1H390J	CHIP C 39PF J		C325			CK73GB1H102K	CHIP C 1000PF K	
C204-206			CK73GB1H103K	CHIP C 0.010UF K		C327			CK73FB1E224K	CHIP C 0.22UF K	
C207			CK73GB1H471K	CHIP C 470PF K		C331			CK73GB1H103K	CHIP C 0.010UF K	
C208,209			CK73GB1H103K	CHIP C 0.010UF K		C333			CC73GCH1H040B	CHIP C 4.0PF B	K2
C210			CC73GCH1H680J	CHIP C 68PF J		C333			CC73GCH1H050B	CHIP C 5.0PF B	K
C211			CC73GCH1H100D	CHIP C 10PF D		C334			CK73GB1H102K	CHIP C 1000PF K	
C212			CK73GB1H471K	CHIP C 470PF K		C335			CK73GB1C223K	CHIP C 0.022UF K	
C213			CK73GB1H103K	CHIP C 0.010UF K		C338			C92-0502-05	CHIP-TAN 0.33UF 35WV	
C214			CK73GB1C104K	CHIP C 0.10UF K		C339			CK73GB1H471K	CHIP C 470PF K	
C215			CC73GCH1H180J	CHIP C 18PF J		C342			CK73GB1H102K	CHIP C 1000PF K	
C216			CC73GCH1H150J	CHIP C 15PF J		C343			C92-0628-05	CHIP-TAN 10UF 10WV	
C217			CK73GB1H102K	CHIP C 1000PF K		C346,347			CC73GCH1H220G	CHIP C 22PF G	K
C218			CK73GB1H103K	CHIP C 0.010UF K		C346,347			CC73GCH1H390J	CHIP C 39PF J	K2
C219			CK73FB1C105K	CHIP C 1.0UF K		C350			CC73GCH1H080D	CHIP C 8.0PF D	K
C220,221			CK73GB1C104K	CHIP C 0.10UF K		C350			CC73GCH1H110J	CHIP C 11PF J	K2
C222			CK73GB1H102K	CHIP C 1000PF K		C351			CC73GCH1H0R5B	CHIP C 0.5PF B	K
C223			CK73GB1C104K	CHIP C 0.10UF K		C351			CC73GCH1H1R5B	CHIP C 1.5PF B	K2
C224,225			CC73GCH1H271J	CHIP C 270PF J		C352			CC73GCH1H120J	CHIP C 12PF J	

## PARTS LIST

TX-RX UNIT (X57-6990-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C353			CC73GCH1H471J	CHIP C 470PF J		C422			CK73GB1H102K	CHIP C 1000PF K	
C354			CC73GCH1H040B	CHIP C 4.0PF B	K	C423			CK73FF1C105Z	CHIP C 1.0UF Z	
C354,355			CC73GCH1H050B	CHIP C 5.0PF B	K2	C424			CK73GB1H102K	CHIP C 1000PF K	
C355			CC73GCH1H050B	CHIP C 5.0PF B	K	C425-428			CC73GCH1H101J	CHIP C 100PF J	
C356			CC73GCH1H0R5B	CHIP C 0.5PF B		C429			CK73GB1A105K	CHIP C 1.0UF K	
C357			CC73GCH1H060B	CHIP C 6.0PF B	K	C430,431			CC73GCH1H101J	CHIP C 100PF J	
C357,358			CC73GCH1H060B	CHIP C 6.0PF B	K2	C432			CK73GB1H102K	CHIP C 1000PF K	
C358			CC73GCH1H050B	CHIP C 5.0PF B	K	C433			CK73GB1C104K	CHIP C 0.10UF K	
C359,360			CC73GCH1H070B	CHIP C 7.0PF B		C434			CK73GB1H561K	CHIP C 560PF K	
C361-363			CC73GCH1H471J	CHIP C 470PF J		C435			CK73GB1H102K	CHIP C 1000PF K	
C364			CC73GCH1H0R5B	CHIP C 0.5PF B	K	C436,437			CC73GCH1H101J	CHIP C 100PF J	
C364,365			CC73GCH1H0R5B	CHIP C 0.5PF B	K2	C438			CK73GB1E103K	CHIP C 0.010UF K	
C365			CC73GCH1H0R3B	CHIP C 0.3PF B	K	C439			CK73GB1H102K	CHIP C 1000PF K	
C367			CK73GB1H102K	CHIP C 1000PF K		C440			CK73GB1C104K	CHIP C 0.10UF K	
C368			CC73GCH1H471J	CHIP C 470PF J		C441			CK73FB0J106K	CHIP C 10UF K	
C369,370			CK73GB1H471K	CHIP C 470PF K		C442			CK73GB1C104K	CHIP C 0.10UF K	
C371			C92-0560-05	CHIP-TAN 10UF 6.3WV		C443			CK73GB1H103K	CHIP C 0.010UF K	
C372			CC73GCH1H180J	CHIP C 18PF J	K2	C444			CC73GCH1H390J	CHIP C 39PF J	
C372			CC73GCH1H220J	CHIP C 22PF J	K	C445			CC73GCH1H150J	CHIP C 15PF J	
C373			CC73GCH1H471J	CHIP C 470PF J		C446			CK73GB1H103K	CHIP C 0.010UF K	
C374			CK73GB1H102K	CHIP C 1000PF K		C447			CK73HB1A333K	CHIP C 0.033UF K	
C375			CC73GCH1H120J	CHIP C 12PF J	K2	C448			CC73GCH1H101J	CHIP C 100PF J	
C375			CC73GCH1H270J	CHIP C 27PF J	K	C450			CK73FB0J106K	CHIP C 10UF K	
C376-378			CK73GB1H471K	CHIP C 470PF K		C451			CK73GB1H103K	CHIP C 0.010UF K	
C379			CC73GCH1H050C	CHIP C 5.0PF C	K2	C452			CC73GCH1H101J	CHIP C 100PF J	
C379			CC73GCH1H060D	CHIP C 6.0PF D	K	C453			CK73GB1C104K	CHIP C 0.10UF K	
C380,381			CK73GB1H471K	CHIP C 470PF K		C454			CK73GB1H103K	CHIP C 0.010UF K	
C382			CK73GB1H103K	CHIP C 0.010UF K		C455			C92-0589-05	CHIP-TAN 47UF 6.3WV	
C383			CK73GB1H102K	CHIP C 1000PF K		C457			CK73GB1H471K	CHIP C 470PF K	
C384			CK73GB1H103K	CHIP C 0.010UF K		C459			C92-0628-05	CHIP-TAN 10UF 10WV	
C385			CK73GB1H471K	CHIP C 470PF K		C460-463			CK73GB1H103K	CHIP C 0.010UF K	
C386			C92-0713-05	CHIP-TAN 10UF 6.3WV		C464			CK73HB1A333K	CHIP C 0.033UF K	
C387,388			CC73GCH1H050C	CHIP C 5.0PF C	K	C465			CC73GCH1H220J	CHIP C 22PF J	
C387,388			CC73GCH1H080D	CHIP C 8.0PF D	K2	C467,468			CK73GB1H103K	CHIP C 0.010UF K	
C389			CC73GCH1H020B	CHIP C 2.0PF B	K2	C469			CK73GB1C104K	CHIP C 0.10UF K	
C389			CC73GCH1H060B	CHIP C 6.0PF B	K	C470			CK73GB1H103K	CHIP C 0.010UF K	
C390			CC73GCH1H080B	CHIP C 8.0PF B	K2	C472			CK73GB1C104K	CHIP C 0.10UF K	
C390			CC73GCH1H120J	CHIP C 12PF J	K	C475			CC73GCH1H101J	CHIP C 100PF J	
C391			CC73GCH1H020B	CHIP C 2.0PF B	K	C476			CK73GB1C104K	CHIP C 0.10UF K	
C391			CC73GCH1H1R5B	CHIP C 1.5PF B	K2	C477			CK73GB1H102K	CHIP C 1000PF K	
C392			CC73GCH1H120J	CHIP C 12PF J	K	C478			CC73HCH1H101J	CHIP C 100PF J	
C392			CC73GCH1H220J	CHIP C 22PF J	K2	C479,480			CK73GB1H102K	CHIP C 1000PF K	
C393			CC73GCH1H050B	CHIP C 5.0PF B	K2	C481			CK73HB1H102K	CHIP C 1000PF K	
C393			CC73GCH1H060B	CHIP C 6.0PF B	K	C482			CK73FB1A475K	CHIP C 4.7UF K	
C394			CC73GCH1H020B	CHIP C 2.0PF B	K2	C483			CK73GB1H103K	CHIP C 0.010UF K	
C394			CC73GCH1H040B	CHIP C 4.0PF B	K	C484			CK73FB1A475K	CHIP C 4.7UF K	
C395			CC73GCH1H020B	CHIP C 2.0PF B	K	C485			CK73FB1A105K	CHIP C 1.0UF K	
C395			CC73GCH1H2R5B	CHIP C 2.5PF B	K2	C487			CK73HB1H102K	CHIP C 1000PF K	
C396			CK73GB1H103K	CHIP C 0.010UF K		C488			CC73GCH1H120J	CHIP C 12PF J	
C397			CC73GCH1H120J	CHIP C 12PF J		C489			CK73GB1C104K	CHIP C 0.10UF K	
C398			CC73GCH1H010B	CHIP C 1.0PF B	K	C490			CK73HB1H102K	CHIP C 1000PF K	
C398			CC73GCH1H070B	CHIP C 7.0PF B	K2	C491,492			CK73GB1C104K	CHIP C 0.10UF K	
C400			CK73FB1A105K	CHIP C 1.0UF K		C493			CK73FB1A475K	CHIP C 4.7UF K	
C403			CK73HB1A104K	CHIP C 0.10UF K		C495			CC73GCH1H181J	CHIP C 180PF J	
C404			CC73HCH1H050C	CHIP C 5.0PF C		C496			CK73GB1C104K	CHIP C 0.10UF K	
C406			CC73GCH1H0R3B	CHIP C 0.3PF B		C497			CK73GB1H102K	CHIP C 1000PF K	
C407			CK73GB1H103K	CHIP C 0.010UF K		C498			CC73HCH1H101J	CHIP C 100PF J	
C408,409			CC73HCH1H150G	CHIP C 15PF G		C499			CK73GB1H821K	CHIP C 820PF K	
C410-412			CK73GB1C104K	CHIP C 0.10UF K		C500			CC73HCH1H101J	CHIP C 100PF J	
C420,421			CC73GCH1H101J	CHIP C 100PF J		C501			CC73GCH1H220J	CHIP C 22PF J	



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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C502			CK73HB1H102K	CHIP C 1000PF K		C701			CK73GB1H102K	CHIP C 1000PF K	
C503			CC73GCH1H680J	CHIP C 68PF J		C702-704			CC73GCH1H101J	CHIP C 100PF J	
C504			CK73HB1H102K	CHIP C 1000PF K		C705-711			CK73GB1H102K	CHIP C 1000PF K	
C505,506			CK73GB1A105K	CHIP C 1.0UF K		C712			CC73GCH1H101J	CHIP C 100PF J	
C507			CK73GB1C104K	CHIP C 0.10UF K		C713			CK73GB1H102K	CHIP C 1000PF K	
C511			CK73GB1C104K	CHIP C 0.10UF K		C714,715			CC73GCH1H101J	CHIP C 100PF J	
C512,513			CK73GB1H102K	CHIP C 1000PF K		C716,717			CK73GB1H102K	CHIP C 1000PF K	
C514			CC73GCH1H820J	CHIP C 82PF J		C718-720			CC73GCH1H101J	CHIP C 100PF J	
C515,516			CK73HB1H102K	CHIP C 1000PF K		C721			CK73GB1H102K	CHIP C 1000PF K	
C517			CK73GB1H103K	CHIP C 0.010UF K		C722,723			CC73GCH1H101J	CHIP C 100PF J	
C518			CK73GB1C104K	CHIP C 0.10UF K		C801			C92-0777-05	ELECTRO 1000UF 25WV	
C519,520			CK73GB1H102K	CHIP C 1000PF K		C802			CK73GB1H102K	CHIP C 1000PF K	
C524			CK73GB1H102K	CHIP C 1000PF K		C803			CK73GB1E473J	CHIP C 0.047UF J	
C525,526			CK73GB1C104K	CHIP C 0.10UF K		C804			CC73GCH1H471J	CHIP C 470PF J	
C528			CK73GB1H222K	CHIP C 2200PF K		C805			CK73GB1H102K	CHIP C 1000PF K	
C529			CC73GCH1H470J	CHIP C 47PF J		C806			CC73GCH1H101J	CHIP C 100PF J	
C530			CK73FB0J106K	CHIP C 10UF K		C807			CK73GB1E473J	CHIP C 0.047UF J	
C531			CK73GB1H102K	CHIP C 1000PF K		C808			CK73GB1C104K	CHIP C 0.10UF K	
C532			CK73GB1E123K	CHIP C 0.012UF K		C809			CC73GCH1H471J	CHIP C 470PF J	
C533			CK73GB1E153K	CHIP C 0.015UF K		C810			CK73GB1E473J	CHIP C 0.047UF J	
C534			CK73GB1H102K	CHIP C 1000PF K		C811,812			CK73GB1C104K	CHIP C 0.10UF K	
C535			CK73GB1C683K	CHIP C 0.068UF K		C813,814			CC73GCH1H471J	CHIP C 470PF J	
C536,537			CK73GB1C104K	CHIP C 0.10UF K		C815			C92-0585-05	CHIP-TAN 4.7UF 16WV	
C538			CK73GB1H102K	CHIP C 1000PF K		C816			C92-0628-05	CHIP-TAN 10UF 10WV	
C539,540			C92-0628-05	CHIP-TAN 10UF 10WV		C817			CC73GCH1H471J	CHIP C 470PF J	
C541			CK73GB1C104K	CHIP C 0.10UF K		C818			CK73GB1H472K	CHIP C 4700PF K	
C542			CK73GB1H102K	CHIP C 1000PF K		C819,820			CK73GB1C104K	CHIP C 0.10UF K	
C543,544			C92-0628-05	CHIP-TAN 10UF 10WV		C821			C92-0585-05	CHIP-TAN 4.7UF 16WV	
C545			CK73HB1H102K	CHIP C 1000PF K		C822			CC73GCH1H471J	CHIP C 470PF J	
C546			CK73GB1H103K	CHIP C 0.010UF K		C823			CK73GB1H102K	CHIP C 1000PF K	
C547-549			CK73HB1H102K	CHIP C 1000PF K		C824			CK73GB1H103K	CHIP C 0.010UF K	
C550			CC73HCH1H101J	CHIP C 100PF J		C825			CK73HB1H102K	CHIP C 1000PF K	
C551-553			CK73HB1H102K	CHIP C 1000PF K		C826			CK73GB1H471K	CHIP C 470PF K	
C554			CC73HCH1H101J	CHIP C 100PF J		C831,832			C92-0585-05	CHIP-TAN 4.7UF 16WV	
C555-557			CK73HB1H102K	CHIP C 1000PF K		TC301,302			C05-0396-05	CERAMIC TRIMMER CAPACITOR (8PF)	
C558			CC73HCH1H101J	CHIP C 100PF J		CN1-3			E23-1081-05	TERMINAL	
C559			CK73HB1H102K	CHIP C 1000PF K		CN13			E23-1081-05	TERMINAL	
C560,561			CK73GB1C104K	CHIP C 0.10UF K		CN100-102			E23-1081-05	TERMINAL	
C562-565			C92-0519-05	CHIP-TAN 1.0UF 25WV		CN202,203			E23-1081-05	TERMINAL	
C566			CK73FB1C105K	CHIP C 1.0UF K		CN301,302			E40-6404-05	PIN ASSY	
C567			CC73HCH1H101J	CHIP C 100PF J		CN322,323			E23-1081-05	TERMINAL	
C568			CK73HB1H102K	CHIP C 1000PF K		CN326			E23-1081-05	TERMINAL	
C570			CK73FB1C105K	CHIP C 1.0UF K		CN329			E23-1081-05	TERMINAL	
C572,573			CK73GB1H102K	CHIP C 1000PF K		CN403			E40-6361-05	PIN ASSY	
C574			C92-0672-05	ELECTRO 22UF 16WV		CN427			E40-6371-05	FLAT CABLE CONNECTOR	
C575			C92-0834-05	ELECTRO 47UF 25WV		CN428			E40-6373-05	PIN ASSY	
C576			C92-0836-05	ELECTRO 330UF 16WV		CN429			E40-6412-05	FLAT CABLE CONNECTOR	
C577			CK73GB1C104K	CHIP C 0.10UF K		CN701			E40-6371-05	FLAT CABLE CONNECTOR	
C578			C92-0834-05	ELECTRO 47UF 25WV		CN802,803			E23-1260-04	TERMINAL	
C579			CK73GB1H102K	CHIP C 1000PF K		CN804			E40-3246-05	PIN ASSY	
C580			C92-0834-05	ELECTRO 47UF 25WV		CN815			E23-1081-05	TERMINAL	
C581,582			CK73GB1H102K	CHIP C 1000PF K		J401			E11-0425-05	3.5D PHONE JACK (3P)	
C583			CK73GB1H471K	CHIP C 470PF K		J701			E58-0494-05	SUB SOCKET (D)	
C584			CC73GCH1H220J	CHIP C 22PF J		F401			F53-0352-05	FUSE (2A)	
C585-587			CC73GCH1H101J	CHIP C 100PF J		F801			F53-0278-05	FUSE (5A)	
C588			CK73GB1H102K	CHIP C 1000PF K		CN401			J19-5386-05	HOLDER	
C591			CK73GB1C104K	CHIP C 0.10UF K		CD171			L79-1701-05	TUNING COIL	
C592,593			CC73GCH1H070D	CHIP C 7.0PF D		CF171			L72-0376-05	CERAMIC FILTER	
C594			CK73GB1H471K	CHIP C 470PF K							
C595			CC73GCH1H101J	CHIP C 100PF J							

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Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
CF172			L72-0998-05	CERAMIC FILTER		L325			L34-4645-05	AIR-CORE COIL	K2
L1			L40-1875-92	SMALL FIXED INDUCTOR (18NH)		L326			L41-1098-08	SMALL FIXED INDUCTOR	K
L2			L92-0140-05	CHIP FERRITE		L326			L41-4785-08	SMALL FIXED INDUCTOR	K2
L3			L40-2275-92	SMALL FIXED INDUCTOR (22NH)		L327			L40-3375-92	SMALL FIXED INDUCTOR (33NH)	K
L4			L92-0140-05	CHIP FERRITE		L327,328			L40-1875-92	SMALL FIXED INDUCTOR (18NH)	K2
L5,6			L92-0179-05	CHIP FERRITE		L328			L40-2275-92	SMALL FIXED INDUCTOR (22NH)	K
L7			L34-4638-05	AIR-CORE COIL		L401,402			L92-0138-05	CHIP FERRITE	
L8			L34-4758-05	AIR-CORE COIL		L403-407			L92-0140-05	CHIP FERRITE	
L9,10			L34-4743-05	AIR-CORE COIL		L408			L92-0138-05	CHIP FERRITE	
L12			L34-4743-05	AIR-CORE COIL		L409			L92-0140-05	CHIP FERRITE	
L13			L34-4482-05	AIR-CORE COIL		L410,411			L92-0179-05	CHIP FERRITE	
L14			L40-4763-92	SMALL FIXED INDUCTOR (4.7NH)	K2	L701,702			L92-0140-05	CHIP FERRITE	
L101			L41-1078-14	SMALL FIXED INDUCTOR	K2	X171			L77-1762-05	CRYSTAL RESONATOR (44.395MHZ)	
L101			L41-8268-14	SMALL FIXED INDUCTOR	K	X301			L77-1952-05	TCXD (16.8MHZ)	
L108			L92-0140-05	CHIP FERRITE		X401			L77-1802-05	CRYSTAL RESONATOR (32768HZ)	
L109			L41-1278-14	SMALL FIXED INDUCTOR	K2	X403			L77-1965-05	CRYSTAL RESONATOR (3.6864MHZ)	
L109			L41-1878-14	SMALL FIXED INDUCTOR	K	X404			L77-1950-05	CRYSTAL RESONATOR (11.0592MHZ)	
L110-113			L34-4565-05	AIR-CORE COIL	K	XF171			L71-0618-05	MCF (44.85M)	
L110-113			L34-4566-05	AIR-CORE COIL	K2						
L114-117			L41-1078-14	SMALL FIXED INDUCTOR	K2	CP401			R90-0740-05	MULTIPLE RESISTOR	
L114-117			L41-8268-14	SMALL FIXED INDUCTOR	K	CP402-417			RK75HA1J102J	CHIP-COM 1.0K J 1/16W	
L119			L41-2263-14	SMALL FIXED INDUCTOR	K2	R1			RK73GB1J821J	CHIP R 820 J 1/16W	
L119			L41-3378-14	SMALL FIXED INDUCTOR	K	R2			RK73GB1J5R6J	CHIP R 5.6 J 1/16W	
L171,172			L41-1578-14	SMALL FIXED INDUCTOR	K	R3			RK73GB1J821J	CHIP R 820 J 1/16W	
L171,172			L41-1878-14	SMALL FIXED INDUCTOR	K2	R4			RK73GB1J333J	CHIP R 33K J 1/16W	
L173,174			L39-1421-05	TOROIDAL COIL		R5			RK73GB1J682J	CHIP R 6.8K J 1/16W	
L175			L92-0140-05	CHIP FERRITE		R6			RK73GB1J221J	CHIP R 220 J 1/16W	
L176			L39-1421-05	TOROIDAL COIL		R7			RK73GB1J100J	CHIP R 10 J 1/16W	
L177			L41-2785-14	SMALL FIXED INDUCTOR		R8			RK73GB1J471J	CHIP R 470 J 1/16W	
L178,179			L41-3988-14	SMALL FIXED INDUCTOR		R9			RK73GB1J220J	CHIP R 22 J 1/16W	
L180			L40-6875-92	SMALL FIXED INDUCTOR (68NH)		R10			RK73GB1J561J	CHIP R 560 J 1/16W	
L181			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		R11			RK73GB1J272J	CHIP R 2.7K J 1/16W	
L182			L40-1085-92	SMALL FIXED INDUCTOR (100NH)		R12			RK73GB1J100J	CHIP R 10 J 1/16W	
L183,184			L41-3988-14	SMALL FIXED INDUCTOR		R13			RK73GB1J331J	CHIP R 330 J 1/16W	
L185			L40-6875-92	SMALL FIXED INDUCTOR (68NH)		R14			R92-1252-05	CHIP R 0 OHM J 1/16W	
L186			L40-1001-86	SMALL FIXED INDUCTOR (10UH)		R15			RK73FB2A221J	CHIP R 220 J 1/10W	
L187			L40-1085-92	SMALL FIXED INDUCTOR (100NH)		R16,17			RK73FB2A470J	CHIP R 47 J 1/10W	
L188			L40-8281-86	SMALL FIXED INDUCTOR (0.82UH)		R18			RK73FB2A221J	CHIP R 220 J 1/10W	
L189			L40-1091-86	SMALL FIXED INDUCTOR (1.0UH)		R19			RK73GB1J151J	CHIP R 150 J 1/16W	
L251			L33-1468-05	SMALL FIXED INDUCTOR		R21			RK73GB1J331J	CHIP R 330 J 1/16W	K
L301			L40-2295-85	SMALL FIXED INDUCTOR (2.2UH)		R21			RK73GB1J471J	CHIP R 470 J 1/16W	K2
L302			L92-0140-05	CHIP FERRITE		R22			RK73GB1J102J	CHIP R 1.0K J 1/16W	
L304-306			L92-0140-05	CHIP FERRITE		R23			RK73GB1J682J	CHIP R 6.8K J 1/16W	
L309,310			L40-1095-85	SMALL FIXED INDUCTOR (1.0UH)		R24			RK73GB1J104J	CHIP R 100K J 1/16W	
L311,312			L41-1098-08	SMALL FIXED INDUCTOR		R25			R92-1261-05	CHIP R 150 J 1/2W	
L314			L34-4607-05	AIR-CORE COIL	K	R26			RK73GB1J103J	CHIP R 10K J 1/16W	K
L314			L34-4608-05	AIR-CORE COIL	K2	R26			RK73GB1J822J	CHIP R 8.2K J 1/16W	K2
L315-317			L41-1098-08	SMALL FIXED INDUCTOR		R27			RK73GB1J104J	CHIP R 100K J 1/16W	
L318			L40-2775-92	SMALL FIXED INDUCTOR (27NH)	K2	R28			R92-1252-05	CHIP R 0 OHM J 1/16W	K
L318,319			L40-2275-92	SMALL FIXED INDUCTOR (22NH)	K	R29			RK73GB1J104J	CHIP R 100K J 1/16W	K2
L319			L40-3375-92	SMALL FIXED INDUCTOR (33NH)	K2	R29			RK73GB1J823J	CHIP R 82K J 1/16W	K
L320			L40-1075-92	SMALL FIXED INDUCTOR (10NH)	K	R30			R92-1061-05	JUMPER REST 0 OHM	
L320,321			L40-1575-92	SMALL FIXED INDUCTOR (15NH)	K2	R31			RK73GB1J332J	CHIP R 3.3K J 1/16W	
L321			L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)	K	R33			R92-1252-05	CHIP R 0 OHM J 1/16W	
L322			L41-5668-14	SMALL FIXED INDUCTOR	K	R38			R92-1252-05	CHIP R 0 OHM J 1/16W	
L322,323			L41-5668-14	SMALL FIXED INDUCTOR	K2	R71			RK73GB1J563J	CHIP R 56K J 1/16W	
L323			L41-4763-14	SMALL FIXED INDUCTOR	K	R72			RK73GB1J333J	CHIP R 33K J 1/16W	
L324			L41-2263-14	SMALL FIXED INDUCTOR	K	R75			RK73GB1J473J	CHIP R 47K J 1/16W	
L324			L41-3363-14	SMALL FIXED INDUCTOR	K2	R76-78			RK73GB1J104J	CHIP R 100K J 1/16W	
L325			L34-4605-05	AIR-CORE COIL	K	R79			RK73GB1J124J	CHIP R 120K J 1/16W	K2

## PARTS LIST

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Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R79			RK73GB1J224J	CHIP R 220K J 1/16W	K	R254,255			R92-1252-05	CHIP R 0 OHM J 1/16W	
R81,82			RK73GB1J104J	CHIP R 100K J 1/16W		R256			RK73GB1J124J	CHIP R 120K J 1/16W	
R84			RK73GB1J124J	CHIP R 120K J 1/16W	K	R257			RK73GB1J153J	CHIP R 15K J 1/16W	
R84			RK73GB1J823J	CHIP R 82K J 1/16W	K2	R258			RK73GB1J220J	CHIP R 22 J 1/16W	
R85			RK73GB1J104J	CHIP R 100K J 1/16W		R295			R92-1252-05	CHIP R 0 OHM J 1/16W	
R86			RK73GB1J824J	CHIP R 820K J 1/16W		R298			R92-1368-05	CHIP R 0 OHM	
R87			RK73GB1J823J	CHIP R 82K J 1/16W		R301			R92-1252-05	CHIP R 0 OHM J 1/16W	
R88,89			RK73GB1J104J	CHIP R 100K J 1/16W		R302			RK73GB1J100J	CHIP R 10 J 1/16W	
R90			RK73GB1J334J	CHIP R 330K J 1/16W		R303			RK73GB1J561J	CHIP R 560 J 1/16W	
R108			R92-1252-05	CHIP R 0 OHM J 1/16W		R305			RK73GB1J560J	CHIP R 56 J 1/16W	
R109			RK73GB1J102J	CHIP R 1.0K J 1/16W		R306			RK73GB1J183J	CHIP R 18K J 1/16W	
R115,116			RK73GB1J183J	CHIP R 18K J 1/16W		R307			R92-1252-05	CHIP R 0 OHM J 1/16W	
R119			R92-1252-05	CHIP R 0 OHM J 1/16W		R308			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R120			RK73GB1J221J	CHIP R 220 J 1/16W		R309,310			RK73GB1J101J	CHIP R 100 J 1/16W	
R121-124			RK73GB1J104J	CHIP R 100K J 1/16W		R311			RK73GB1J182J	CHIP R 1.8K J 1/16W	K
R126			R92-1252-05	CHIP R 0 OHM J 1/16W		R311,312			RK73GB1J102J	CHIP R 1.0K J 1/16W	K2
R129-133			RK73GB1J104J	CHIP R 100K J 1/16W		R312			RK73GB1J102J	CHIP R 1.0K J 1/16W	K
R134			R92-1252-05	CHIP R 0 OHM J 1/16W		R315			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R171			RK73GB1J271J	CHIP R 270 J 1/16W		R316			RK73GB1J104J	CHIP R 100K J 1/16W	K
R172			RK73GB1J180J	CHIP R 18 J 1/16W		R316			RK73GB1J823J	CHIP R 82K J 1/16W	K2
R173			RK73GB1J271J	CHIP R 270 J 1/16W		R317			R92-1252-05	CHIP R 0 OHM J 1/16W	
R174			RK73GB1J680J	CHIP R 68 J 1/16W		R318			R92-1301-05	CHIP R 4.7K J 1/4W	K2
R175			RK73GB1J222J	CHIP R 2.2K J 1/16W		R318			R92-2577-05	METAL-R 1.8K J 1/4W	K
R176			RK73GB1J470J	CHIP R 47 J 1/16W		R319			RK73GB1J100J	CHIP R 10 J 1/16W	
R177			RK73GB1J102J	CHIP R 1.0K J 1/16W		R320			RK73GB1J180J	CHIP R 18 J 1/16W	
R178			R92-1252-05	CHIP R 0 OHM J 1/16W		R321			RK73GB1J103J	CHIP R 10K J 1/16W	
R179			RK73GB1J102J	CHIP R 1.0K J 1/16W		R322			R92-1252-05	CHIP R 0 OHM J 1/16W	
R180			RK73GB1J821J	CHIP R 820 J 1/16W		R323			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R181			RK73GB1J331J	CHIP R 330 J 1/16W		R325			RK73GB1J154J	CHIP R 150K J 1/16W	
R182			RK73GB1J332J	CHIP R 3.3K J 1/16W		R326			RK73GB1J271J	CHIP R 270 J 1/16W	K
R183			RK73GB1J680J	CHIP R 68 J 1/16W		R326			RK73GB1J331J	CHIP R 330 J 1/16W	K2
R184			RK73GB1J100J	CHIP R 10 J 1/16W		R327			RK73GB1J100J	CHIP R 10 J 1/16W	
R185			RK73GB1J821J	CHIP R 820 J 1/16W		R330			RK73GB1J100J	CHIP R 10 J 1/16W	
R186			RK73GB1J331J	CHIP R 330 J 1/16W		R332			RK73GB1J100J	CHIP R 10 J 1/16W	
R187			RK73GB1J332J	CHIP R 3.3K J 1/16W		R333-335			R92-1252-05	CHIP R 0 OHM J 1/16W	
R188			RK73GB1J680J	CHIP R 68 J 1/16W		R336			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R189			RK73GB1J100J	CHIP R 10 J 1/16W		R337			RK73GB1J103J	CHIP R 10K J 1/16W	
R190			RK73GB1J153J	CHIP R 15K J 1/16W		R339			RK73GB1J104J	CHIP R 100K J 1/16W	
R191,192			RK73GB1J223J	CHIP R 22K J 1/16W		R340			RK73GB1J101J	CHIP R 100 J 1/16W	
R193			RK73GB1J473J	CHIP R 47K J 1/16W		R341,342			RK73GB1J181J	CHIP R 180 J 1/16W	
R194,195			RK73GB1J223J	CHIP R 22K J 1/16W		R343			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R196			RK73GB1J153J	CHIP R 15K J 1/16W		R344			RK73GB1J180J	CHIP R 18 J 1/16W	K2
R197,198			RK73GB1J334J	CHIP R 330K J 1/16W		R344			RK73GB1J470J	CHIP R 47 J 1/16W	K
R199			RK73GB1J560J	CHIP R 56 J 1/16W		R345			RK73GB1J221J	CHIP R 220 J 1/16W	K2
R200			RK73GB1J332J	CHIP R 3.3K J 1/16W		R345			R92-1252-05	CHIP R 0 OHM J 1/16W	K
R202			RK73GB1J472J	CHIP R 4.7K J 1/16W		R347			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R203			RK73GB1J332J	CHIP R 3.3K J 1/16W		R348			RK73GB1J103J	CHIP R 10K J 1/16W	
R204			RK73GB1J222J	CHIP R 2.2K J 1/16W		R349			RK73GB1J183J	CHIP R 18K J 1/16W	K2
R205			RK73GB1J332J	CHIP R 3.3K J 1/16W		R349,350			RK73GB1J333J	CHIP R 33K J 1/16W	K
R206			RK73GB1J102J	CHIP R 1.0K J 1/16W		R350			RK73GB1J393J	CHIP R 39K J 1/16W	K2
R207			RK73GB1J473J	CHIP R 47K J 1/16W		R351			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R208			RK73GB1J392J	CHIP R 3.9K J 1/16W		R352			RK73GB1J100J	CHIP R 10 J 1/16W	K
R209			RK73GB1J100J	CHIP R 10 J 1/16W		R352			RK73GB1J101J	CHIP R 100 J 1/16W	K2
R210			RK73GB1J272J	CHIP R 2.7K J 1/16W		R353			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R212			RK73GB1J104J	CHIP R 100K J 1/16W		R354			RK73GB1J121J	CHIP R 120 J 1/16W	K2
R217			R92-1252-05	CHIP R 0 OHM J 1/16W		R355			RK73GB1J101J	CHIP R 100 J 1/16W	K2
R221			RK73GB1J473J	CHIP R 47K J 1/16W		R355			RK73GB1J560J	CHIP R 56 J 1/16W	K
R251			RK73GB1J102J	CHIP R 1.0K J 1/16W		R356			RK73GB1J103J	CHIP R 10K J 1/16W	K2
R252			RK73GB1J472J	CHIP R 4.7K J 1/16W		R356,357			RK73GB1J103J	CHIP R 10K J 1/16W	K
R253			RK73GB1J103J	CHIP R 10K J 1/16W		R357,358			RK73GB1J223J	CHIP R 22K J 1/16W	K2

## PARTS LIST

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Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R358			RK73GB1J822J	CHIP R 8.2K J 1/16W	K	R469			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R359			RK73GB1J101J	CHIP R 100 J 1/16W	K	R470			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R359,360			RK73GB1J101J	CHIP R 100 J 1/16W	K2	R471,472			RK73HB1J102J	CHIP R 1.0K J 1/16W	
R360			RK73GB1J121J	CHIP R 120 J 1/16W	K	R473,474			R92-1252-05	CHIP R 0 OHM J 1/16W	
R361			RK73GB1J221J	CHIP R 220 J 1/16W		R475			RK73GB1J101J	CHIP R 100 J 1/16W	
R362			R92-1252-05	CHIP R 0 OHM J 1/16W		R476			RK73HB1J473J	CHIP R 47K J 1/16W	
R365,366			RK73GB1J222J	CHIP R 2.2K J 1/16W		R477,478			RK73HB1J474J	CHIP R 470K J 1/16W	
R367			RK73GB1J332J	CHIP R 3.3K J 1/16W		R481			RK73HB1J474J	CHIP R 470K J 1/16W	
R369			R92-1252-05	CHIP R 0 OHM J 1/16W		R482			RK73HB1J473J	CHIP R 47K J 1/16W	
R370			RK73GB1J103J	CHIP R 10K J 1/16W	K	R483-486			R92-1252-05	CHIP R 0 OHM J 1/16W	
R370			RK73GB1J183J	CHIP R 18K J 1/16W	K2	R487			RK73GB1J185J	CHIP R 1.8M J 1/16W	
R371			R92-1252-05	CHIP R 0 OHM J 1/16W		R488,489			R92-1252-05	CHIP R 0 OHM J 1/16W	
R373			RK73GB1J100J	CHIP R 10 J 1/16W	K	R490			RK73GB1J184J	CHIP R 180K J 1/16W	
R373			R92-1252-05	CHIP R 0 OHM J 1/16W	K2	R491			R92-1252-05	CHIP R 0 OHM J 1/16W	
R375			RK73GB1J331J	CHIP R 330 J 1/16W	K	R492			RK73GB1J684J	CHIP R 680K J 1/16W	
R375			RK73GB1J821J	CHIP R 820 J 1/16W	K2	R493			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R376,377			R92-1252-05	CHIP R 0 OHM J 1/16W		R494,495			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R378			RK73GB1J103J	CHIP R 10K J 1/16W		R496			RK73GB1J104J	CHIP R 100K J 1/16W	
R400			RK73HH1J105D	CHIP R 1.0M D 1/16W		R497			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R401			RK73HH1J362D	CHIP R 3.6K D 1/16W		R498			RK73GB1J274J	CHIP R 270K J 1/16W	
R402			RK73HH1J512D	CHIP R 5.1K D 1/16W		R499			RK73GB1J104J	CHIP R 100K J 1/16W	
R403			RK73HH1J105D	CHIP R 1.0M D 1/16W		R500			R92-1252-05	CHIP R 0 OHM J 1/16W	
R405,406			RK73HB1J474J	CHIP R 470K J 1/16W		R501			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R407			RK73HB1J103J	CHIP R 10K J 1/16W		R502			RK73GB1J103J	CHIP R 10K J 1/16W	
R410			RK73HB1J103J	CHIP R 10K J 1/16W		R503			RK73GB1J104J	CHIP R 100K J 1/16W	
R411,412			RK73HB1J474J	CHIP R 470K J 1/16W		R504			RK73GB1J103J	CHIP R 10K J 1/16W	
R414			RK73HB1J103J	CHIP R 10K J 1/16W		R505			RK73GB1J683J	CHIP R 68K J 1/16W	
R415			RK73HB1J474J	CHIP R 470K J 1/16W		R506,507			RK73GB1J224J	CHIP R 220K J 1/16W	
R416			R92-1368-05	CHIP R 0 OHM		R508			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R418,419			RK73HB1J473J	CHIP R 47K J 1/16W		R509			RK73GB1J333J	CHIP R 33K J 1/16W	
R420			RK73HB1J334J	CHIP R 330K J 1/16W		R511			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R421,422			RK73HB1J473J	CHIP R 47K J 1/16W		R512			RK73GB1J153J	CHIP R 15K J 1/16W	
R423			R92-1368-05	CHIP R 0 OHM		R513			RK73GB1J564J	CHIP R 560K J 1/16W	
R424-427			RK73HB1J102J	CHIP R 1.0K J 1/16W		R514			RK73GB1J183J	CHIP R 18K J 1/16W	
R428			R92-1368-05	CHIP R 0 OHM		R515			RK73GB1J104J	CHIP R 100K J 1/16W	
R429,430			RK73HB1J471J	CHIP R 470 J 1/16W		R517			RK73GB1J223J	CHIP R 22K J 1/16W	
R431			R92-1368-05	CHIP R 0 OHM		R519			RK73GB1J104J	CHIP R 100K J 1/16W	
R432			RK73HB1J102J	CHIP R 1.0K J 1/16W		R520			R92-1252-05	CHIP R 0 OHM J 1/16W	
R434			RK73HB1J473J	CHIP R 47K J 1/16W		R521			RK73GB1J473J	CHIP R 47K J 1/16W	
R435			RK73HB1J102J	CHIP R 1.0K J 1/16W		R522			RK73GB1J104J	CHIP R 100K J 1/16W	
R437			R92-1368-05	CHIP R 0 OHM		R523			RK73GB1J564J	CHIP R 560K J 1/16W	
R439			R92-1368-05	CHIP R 0 OHM		R524			RK73GB1J103J	CHIP R 10K J 1/16W	
R440-444			RK73HB1J102J	CHIP R 1.0K J 1/16W		R525			RK73HB1J152J	CHIP R 1.5K J 1/16W	
R445,446			RK73GB1J103J	CHIP R 10K J 1/16W		R526			RK73GB1J274J	CHIP R 270K J 1/16W	
R447			RK73HB1J474J	CHIP R 470K J 1/16W		R527			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R448			RK73HB1J102J	CHIP R 1.0K J 1/16W		R528			RK73GB1J473J	CHIP R 47K J 1/16W	
R449			RK73HB1J474J	CHIP R 470K J 1/16W		R529			RK73GB1J684J	CHIP R 680K J 1/16W	
R450			RK73HB1J102J	CHIP R 1.0K J 1/16W		R530			RK73GB1J334J	CHIP R 330K J 1/16W	
R451			RK73HB1J474J	CHIP R 470K J 1/16W		R531			RK73GB1J103J	CHIP R 10K J 1/16W	
R452			RK73HB1J102J	CHIP R 1.0K J 1/16W		R532			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R453			RK73HB1J474J	CHIP R 470K J 1/16W		R533			RK73GB1J104J	CHIP R 100K J 1/16W	
R454			RK73HB1J102J	CHIP R 1.0K J 1/16W		R534			RK73GB1J273J	CHIP R 27K J 1/16W	
R455,456			RK73HB1J471J	CHIP R 470 J 1/16W		R535			RK73GB1J394J	CHIP R 390K J 1/16W	
R457			RK73HB1J473J	CHIP R 47K J 1/16W		R536			RK73GB1J153J	CHIP R 15K J 1/16W	
R458,459			RK73HB1J474J	CHIP R 470K J 1/16W		R539			RK73GB1J393J	CHIP R 39K J 1/16W	
R461			RK73HB1J474J	CHIP R 470K J 1/16W		R540			RK73GB1J473J	CHIP R 47K J 1/16W	
R465			RK73GB1J473J	CHIP R 47K J 1/16W		R541,542			R92-1252-05	CHIP R 0 OHM J 1/16W	
R466			RK73HB1J473J	CHIP R 47K J 1/16W		R545			RK73GB1J103J	CHIP R 10K J 1/16W	
R467			R92-1368-05	CHIP R 0 OHM		R546			R92-1252-05	CHIP R 0 OHM J 1/16W	
R468			RK73HB1J473J	CHIP R 47K J 1/16W		R548			RK73GB1J823J	CHIP R 82K J 1/16W	

## PARTS LIST

### TX-RX UNIT (X57-6990-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R549			RK73GB1J473J	CHIP R 47K J 1/16W		R625			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R550			RK73GB1J472J	CHIP R 4.7K J 1/16W		R629,630			R92-0670-05	CHIP R 0 OHM	
R552			RK73GB1J103J	CHIP R 10K J 1/16W		R632			RK73GB1J473J	CHIP R 47K J 1/16W	
R553			RK73GB1J472J	CHIP R 4.7K J 1/16W		R633			R92-0670-05	CHIP R 0 OHM	
R554			RK73GB1J563J	CHIP R 56K J 1/16W		R636			R92-0670-05	CHIP R 0 OHM	
R555			RK73GB1J123J	CHIP R 12K J 1/16W		R641,642			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R556			RK73GB1J563J	CHIP R 56K J 1/16W		R643			RK73GB1J471J	CHIP R 470 J 1/16W	
R557			RK73GB1J472J	CHIP R 4.7K J 1/16W		R644			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R558			RK73GB1J394J	CHIP R 390K J 1/16W		R645			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R559			RK73GB1J124J	CHIP R 120K J 1/16W		R646			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R560			RK73GB1J394J	CHIP R 390K J 1/16W		R647			RK73GB1J104J	CHIP R 100K J 1/16W	
R563			RK73GB1J394J	CHIP R 390K J 1/16W		R648			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R565			R92-1252-05	CHIP R 0 OHM J 1/16W		R651			R92-1252-05	CHIP R 0 OHM J 1/16W	
R566			RK73GB1J105J	CHIP R 1.0M J 1/16W		R652			RK73GB1J561J	CHIP R 560 J 1/16W	
R567			RK73GB1J394J	CHIP R 390K J 1/16W		R653			RK73GB1J2R2J	CHIP R 2.2 J 1/16W	
R568			RK73GB1J124J	CHIP R 120K J 1/16W		R654			R92-0670-05	CHIP R 0 OHM	
R569			RK73GB1J104J	CHIP R 100K J 1/16W		R655			R92-1252-05	CHIP R 0 OHM J 1/16W	
R570			RK73GB1J154J	CHIP R 150K J 1/16W		R657			RK73HB1J472J	CHIP R 4.7K J 1/16W	
R571			RK73GB1J124J	CHIP R 120K J 1/16W		R658			R92-1368-05	CHIP R 0 OHM	
R572			R92-1368-05	CHIP R 0 OHM		R659			RK73GB1J333J	CHIP R 33K J 1/16W	
R573			RK73GB1J682J	CHIP R 6.8K J 1/16W		R661			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R574,575			R92-1368-05	CHIP R 0 OHM		R663,664			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R576			RK73GB1J224J	CHIP R 220K J 1/16W		R701-705			RK73GB1J473J	CHIP R 47K J 1/16W	
R578			R92-1368-05	CHIP R 0 OHM		R706-710			RK73GB1J471J	CHIP R 470 J 1/16W	
R579			RK73GB1J223J	CHIP R 22K J 1/16W		R711-713			RK73GB1J473J	CHIP R 47K J 1/16W	
R580,581			RK73GB1J151J	CHIP R 150 J 1/16W		R714-720			RK73GB1J471J	CHIP R 470 J 1/16W	
R582			RK73GB1J105J	CHIP R 1.0M J 1/16W		R800			RK73HH1J105D	CHIP R 1.0M D 1/16W	
R583,584			R92-1252-05	CHIP R 0 OHM J 1/16W		R801			RK73GB1J224J	CHIP R 220K J 1/16W	
R585			RK73GB1J184J	CHIP R 180K J 1/16W		R802			RK73GB1J334J	CHIP R 330K J 1/16W	
R586			RK73GB1J102J	CHIP R 1.0K J 1/16W		R803			RK73GB1J103J	CHIP R 10K J 1/16W	
R587			RK73GB1J154J	CHIP R 150K J 1/16W		R804			RK73HH1J104D	CHIP R 100K D 1/16W	
R588			RK73GB1J472J	CHIP R 4.7K J 1/16W		R805			RK73GB1J471J	CHIP R 470 J 1/16W	
R589,590			R92-1252-05	CHIP R 0 OHM J 1/16W		R806,807			RK73GB1J103J	CHIP R 10K J 1/16W	
R591			R92-1368-05	CHIP R 0 OHM		R808,809			RK73GB1J473J	CHIP R 47K J 1/16W	
R592			R92-1252-05	CHIP R 0 OHM J 1/16W		R811,812			RK73GB1J103J	CHIP R 10K J 1/16W	
R594			RK73GB1J681J	CHIP R 680 J 1/16W		R813			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R595			RK73GB1J274J	CHIP R 270K J 1/16W		R814			RK73GB1J473J	CHIP R 47K J 1/16W	
R596			R92-1252-05	CHIP R 0 OHM J 1/16W		R815			RK73GB1J683J	CHIP R 68K J 1/16W	
R597			RK73GB1J105J	CHIP R 1.0M J 1/16W		R818			RK73GB1J473J	CHIP R 47K J 1/16W	
R598			RK73GB1J472J	CHIP R 4.7K J 1/16W		R900-903			R92-1368-05	CHIP R 0 OHM	
R599			RK73GB1J184J	CHIP R 180K J 1/16W		D1			02DZ5.6(X,Y)	ZENER DIODE	
R600			RK73GB1J472J	CHIP R 4.7K J 1/16W		D2			XB15A709	DIODE	
R601			RK73GB1J474J	CHIP R 470K J 1/16W		D3			XB15A407A2GB	DIODE	
R602			RK73GB1J105J	CHIP R 1.0M J 1/16W		D3,4			XB15A407A2GB	DIODE	
R603,604			R92-1252-05	CHIP R 0 OHM J 1/16W		D6-8			HSM88AS	DIODE	
R606			R92-1252-05	CHIP R 0 OHM J 1/16W		D103-106			1SV286	VARIABLE CAPACITANCE DIODE	
R607			RK73GB1J274J	CHIP R 270K J 1/16W		D107-110			1SV291	VARIABLE CAPACITANCE DIODE	
R608			RK73GB1J184J	CHIP R 180K J 1/16W		D111			HVC131	DIODE	
R609			RK73GB1J223J	CHIP R 22K J 1/16W		D171,172			DAN235E	DIODE	
R610			RK73GB1J154J	CHIP R 150K J 1/16W		D173			RB706F-40	DIODE	
R611			RK73GB1J103J	CHIP R 10K J 1/16W		D174			MA2S111	DIODE	
R612,613			RK73GB1J104J	CHIP R 100K J 1/16W		D251			1SS388	DIODE	
R614			R92-1368-05	CHIP R 0 OHM		D308,309			BB664	VARIABLE CAPACITANCE DIODE	
R615,616			RK73GB1J472J	CHIP R 4.7K J 1/16W		D311			BB664	VARIABLE CAPACITANCE DIODE	
R617			RK73GB1J104J	CHIP R 100K J 1/16W		D313			BB664	VARIABLE CAPACITANCE DIODE	
R618			RK73GB1J224J	CHIP R 220K J 1/16W		D314			1SV278	VARIABLE CAPACITANCE DIODE	
R619			RK73GB1J104J	CHIP R 100K J 1/16W		D315,316			HVC131	DIODE	
R620			RK73GB1J224J	CHIP R 220K J 1/16W		D402-404			1SS388	DIODE	
R621,622			R92-0670-05	CHIP R 0 OHM		D405			EMZ6.8N	ZENER DIODE	
R623,624			RK73GB1J473J	CHIP R 47K J 1/16W		D406			02DZ5.1(Y)	ZENER DIODE	

K  
K2

## PARTS LIST

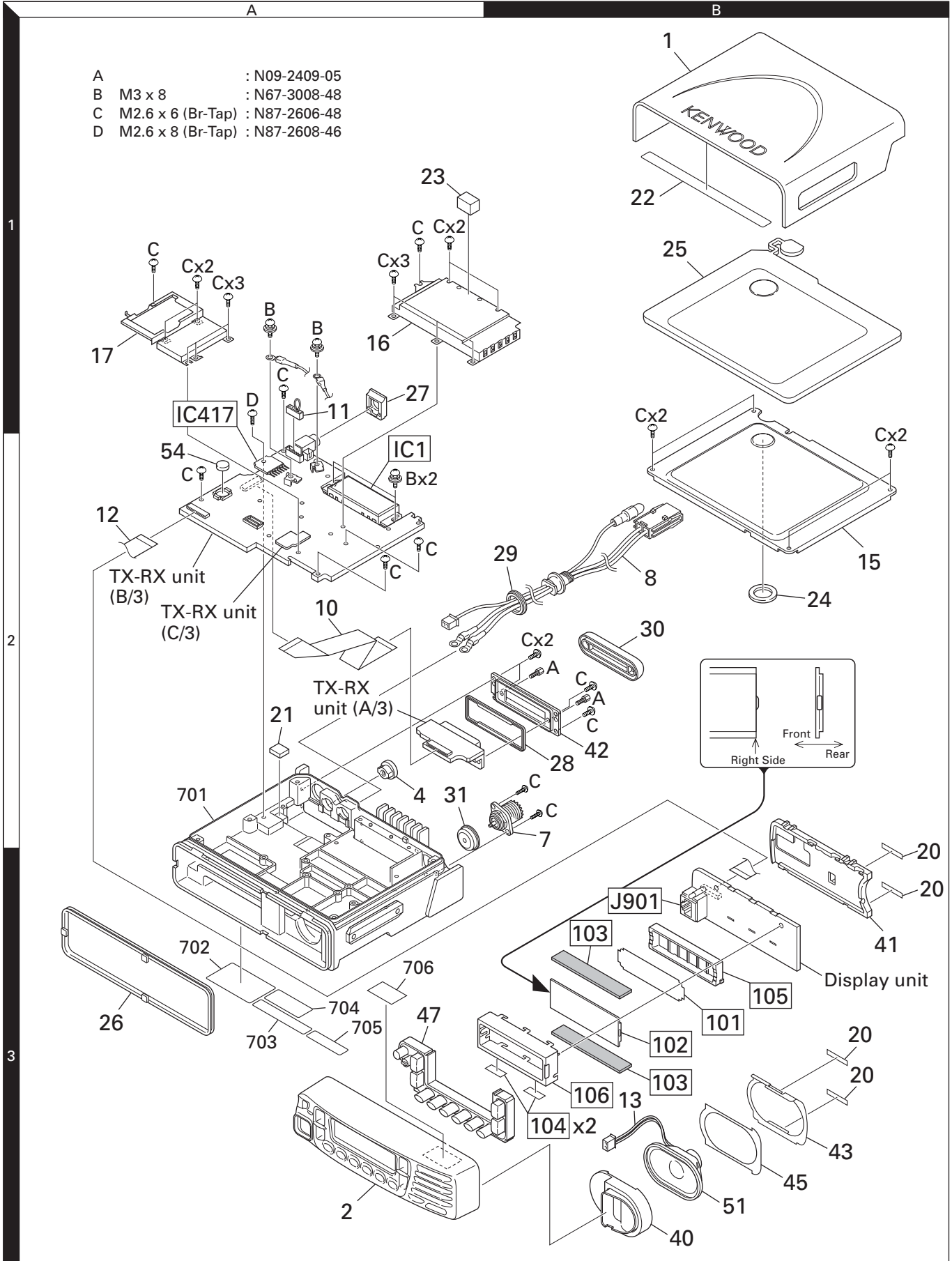
TX-RX UNIT (X57-6990-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
D407			RB706F-40	DIODE		Q301			2SC5108(Y)	TRANSISTOR	
D408,409			MA742	DIODE		Q302,303			2SC4116(BL)	TRANSISTOR	
D412-414			DA204U	DIODE		Q306,307			2SK508NV(K52)	FET	
D416			DAN202U	DIODE		Q308,309			2SC4116(GR)	TRANSISTOR	
D417,418			1SS388	DIODE		Q310			DTC114EE	DIGITAL TRANSISTOR	
D421-423			1SS388	DIODE		Q311			2SC5108(Y)	TRANSISTOR	
D600,601			1SS388	DIODE		Q312			2SC4617(S)	TRANSISTOR	
D701			02DZ18(X,Y)	ZENER DIODE		Q313			2SC5108(Y)	TRANSISTOR	
D702,703			1SS355	DIODE		Q402			DTC114YE	DIGITAL TRANSISTOR	
D704-708			DA204U	DIODE		Q405			DTA114EE	DIGITAL TRANSISTOR	
D709,710			02DZ18(X,Y)	ZENER DIODE		Q406			HN1J02FU	FET	
D711-713			DA204U	DIODE		Q409			DTC363EU	DIGITAL TRANSISTOR	
D714			02DZ18(X,Y)	ZENER DIODE		Q410			2SC4116(Y)	TRANSISTOR	
D801			22ZR-10D	SURGE ABSORBER		Q411			2SA1586(Y,GR)	TRANSISTOR	
D802			DSA3A1	DIODE		Q412			2SK1824	FET	
D804			02DZ18(X,Y)	ZENER DIODE		Q413,414			2SJ243	FET	
D805			02CZ9.1(X,Y)	ZENER DIODE		Q415			HN1L02FU	FET	
IC1	2A	*	RA30H4047M-23	MOS-IC	K2	Q416,417			2SJ243	FET	
IC1	2A		RA30H4452M-23	MOS-IC	K	Q418			DTC114EE	DIGITAL TRANSISTOR	
IC71,72			TA75W01FU	MOS-IC		Q419			DTC363EU	DIGITAL TRANSISTOR	
IC171			SPM5001	MOS-IC		Q600			DTA144EE	DIGITAL TRANSISTOR	
IC172			TA31136FN	MOS-IC		Q701,702			2SD2114K(W)	TRANSISTOR	
IC251			MAX5026EUT+T	MOS-IC		Q801			2SC2873(Y)	TRANSISTOR	
IC301			ADF4111BCP7	MOS-IC		Q802			DTC114EE	DIGITAL TRANSISTOR	
IC302			TC7S66FU	MOS-IC		Q803-805			12A02CH	TRANSISTOR	
IC401			AT24256N10SI27	ROM IC		Q806-809			DTC114EE	DIGITAL TRANSISTOR	
IC402			RV5C386A	MOS-IC		Q810			2SJ645	FET	
IC403			BU4094BCFV	MOS-IC		Q811			DTC114TE	DIGITAL TRANSISTOR	
IC404			30625MGP-169GP	MICROPROCESSOR IC		Q812			DTC114EE	DIGITAL TRANSISTOR	
IC405			AT29C040A-90TI	ROM IC		TH1			S1R104J475H	THERMISTOR	
IC406-409			TC75W51FU	MOS-IC		TH171			S1R473J475H	THERMISTOR	
IC410			M62364FP	MOS-IC							
IC411			LMC7101BIM5	MOS-IC							
IC412			TC75W51FU	MOS-IC							
IC413			TC7MZ4053FK	MOS-IC							
IC414			TC75W51FU	MOS-IC							
IC415			AQUA-L	MOS-IC							
IC416			ADM202EARN	MOS-IC							
IC417	2A		TA7252AP	ANALOGUE IC							
IC801			S-80942CNNBG9C	MOS-IC							
IC802			XC61CN5002NR	MOS-IC							
IC803			TA7808F	ANALOGUE IC							
IC804			TA7805F	MOS-IC							
IC805			NJM78L05UA	BI-POLAR IC							
IC807			XC6201P502PR	MOS-IC							
Q1			2SC5108(Y)	TRANSISTOR							
Q2			2SC5192	TRANSISTOR							
Q3			DTC114EE	DIGITAL TRANSISTOR							
Q70			DTC114EE	DIGITAL TRANSISTOR							
Q72			2SK1824	FET							
Q103			2SC3357	TRANSISTOR							
Q171,172			2SC5108(Y)	TRANSISTOR							
Q173			DTA114EE	DIGITAL TRANSISTOR							
Q174			DTC144EE	DIGITAL TRANSISTOR							
Q175			2SC4617(Q)	TRANSISTOR							
Q176			2SK1824	FET							
Q177			DTC144EE	DIGITAL TRANSISTOR							
Q178			DTA144EE	DIGITAL TRANSISTOR							
Q179			DTC144EE	DIGITAL TRANSISTOR							
Q251			2SC4617(S)	TRANSISTOR							

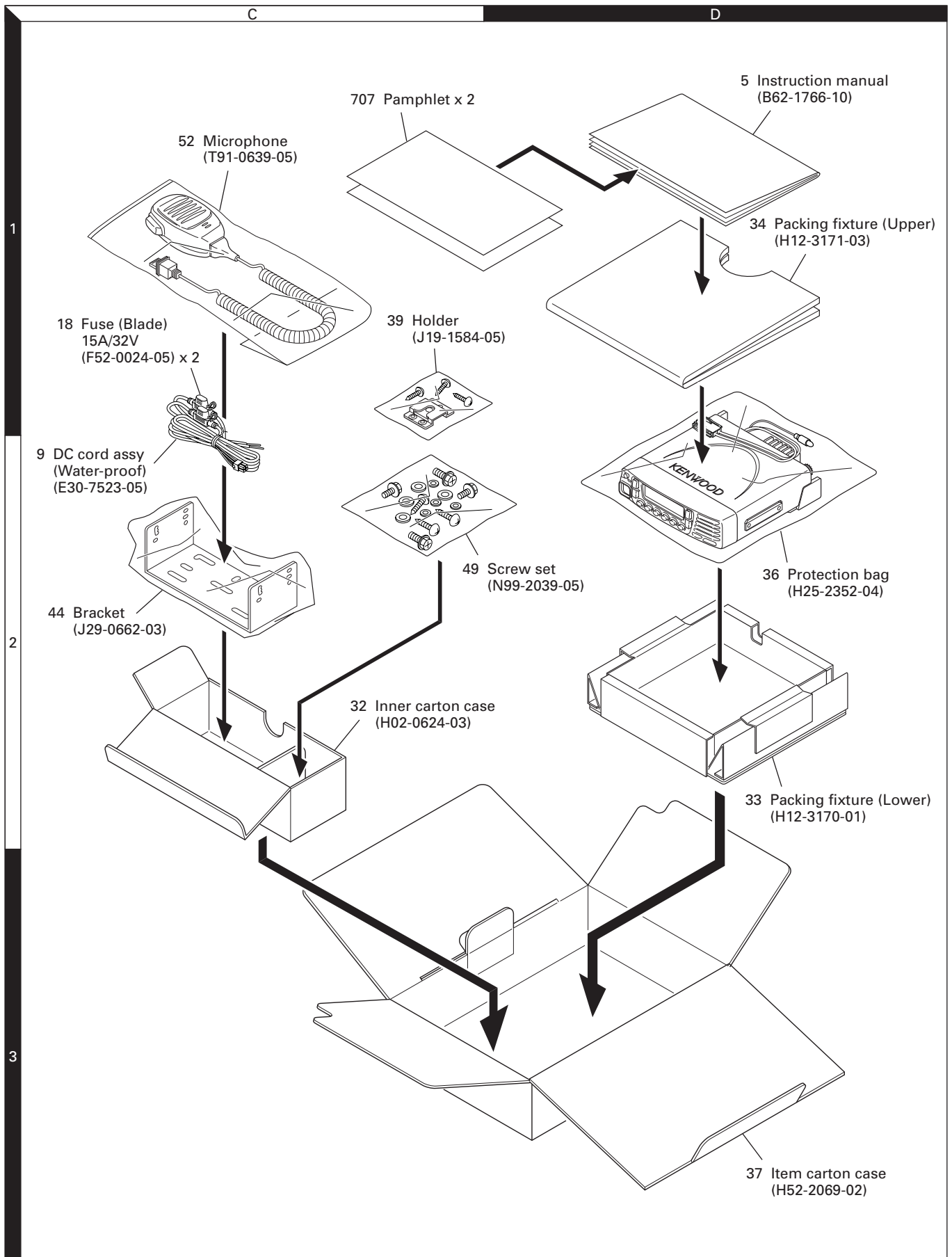
# TK-8180

## EXPLODED VIEW

- A : N09-2409-05
- B M3 x 8 : N67-3008-48
- C M2.6 x 6 (Br-Tap) : N87-2606-48
- D M2.6 x 8 (Br-Tap) : N87-2608-46



## PACKING

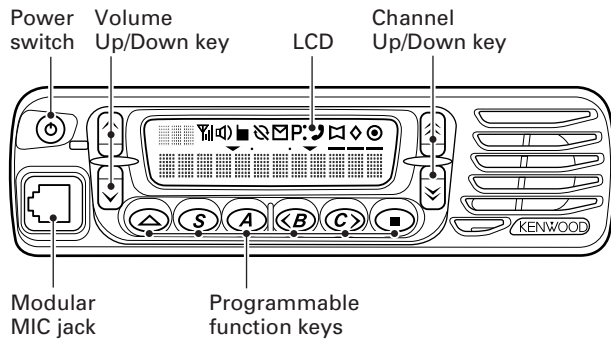


Parts with the exploded numbers larger than 700 are not supplied.



## ADJUSTMENT

### Controls



### Panel Test Mode

#### ■ Test mode operation features

This transceiver has a test mode. **To enter test mode, press [A] key and turn power on. Hold [A] key until frequency version appears on LCD.** Test mode can be inhibited by programming. To exit test mode, switch the power on again. The following functions are available in test mode.

#### ■ Key operation

Key	"FNC" not appears	
	Function	Display
[S]	Shifts to Panel tuning mode	-
[A]	Function on	"FNC" appears
[B]	MSK 1200bps and 2400bps	2400bps :  icon appears
[C]	Test signaling CH up	Signaling No.
[^]/[v]	Test frequency CH up/down	Channel No.
[^]/[v]	Volume up/down	-
[△]	Squelch on/off	
[■]	Narrow/Wide 4k/Wide 5k	Narrow : "n", Wide 4k : "s", Wide 5k : "w"
<b>Microphone key</b>		
[PTT]	Transmit	-
[0] to [9] and [A], [B], [C], [D], [#], [*]	Use as the DTMF keypad. If a key is pressed during transmission, the DTMF corresponding to the key that was presses is sent.	-

Key	"FNC" appears	
	Function	Display
[S]	High power / Low power	Low :  icon appears
[A]	Function off	-
[B]	Compander on/off	On :  icon appears
[C]	Beat shift on/off	On :  icon appears
[^]/[v]	Function off	-
[^]/[v]	Function off	-
[△]	Squelch level 0	On : <b>P</b> icon appears
[■]	LCD all lights	LCD all point appears
<b>Microphone key</b>		
[PTT]	Transmit	-
[0] to [9] and [A], [B], [C], [D], [#], [*]	Function off	-

#### Notes :

- If a [S], [A], [B], [C] key is pressed during transmission, the DTMF corresponding to the key that was pressed is sent.
- The "Wide 4k" can not use, please skip it.

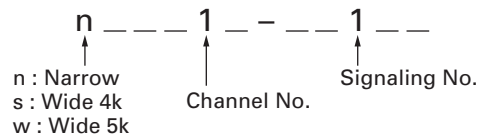
#### • LED indicator

Red LED Lights during transmission.  
Green LED Lights when there is carrier.

#### • Sub LCD indicator

"FNC" Appears at function on.

#### • LCD display in panel test mode



## ADJUSTMENT

### ■ Frequency and Signaling

The set has been adjusted for the frequencies shown in the following table. When required, readjust them following the adjustment procedure to obtain the frequencies you want in actual operation.

#### • Test frequency

CH	K		K2	
	RX (MHz)	TX (MHz)	RX (MHz)	TX (MHz)
1	485.05000	485.10000	435.05000	435.10000
2	450.05000	450.10000	400.05000	400.10000
3	519.95000	519.90000	469.95000	469.90000
4	485.00000	485.00000	435.00000	435.00000
5	485.20000	485.20000	435.20000	435.20000
6	485.40000	485.40000	435.40000	435.40000
7~16	-	-	-	-

#### • Test signaling

No.	RX	TX
1	None	None
2	None	100Hz Square Wave
3	LTR Data : AREA=0, GOTO=12 HOME=12 ID=47, FREE=25	LTR Data : AREA=0, GOTO=12 HOME=12 ID=47, FREE=25
4	QT : 67.0Hz	QT : 67.0Hz
5	QT : 151.4Hz	QT : 151.4Hz
6	QT : 210.7Hz	QT : 210.7Hz
7	QT : 254.1Hz	QT : 254.1Hz
8	DQT : D023N	DQT : D023N
9	DQT : D754I	DQT : D754I
10	DTMF : 159D	DTMF : 159D
11	None	DTMF Code 9
12	2-tone : A : 304.7Hz B : 3106.0Hz	2-tone : A : 304.7Hz B : 3106.0Hz

No.	RX	TX
13	Single Tone : 979.9Hz	Single Tone : 979.9Hz
14	None	Single Tone : 1000Hz
15	5-tone (CCIR 12345)	5-tone (CCIR 12345)
16	None	MSK
17	MSK : Preamble : 0xAAAA Sync : 0x23EB Data : 0x230960C6AAAA CRC : 0xC4D7	MSK : Preamble : 0xAAAA Sync : 0x23EB Data : 0x230960C6AAAA CRC : 0xC4D7

**Note :** The "5-tone signaling" can not use, please skip it.

### Panel Tuning Mode

#### ■ Preparations for tuning the transceiver

Before attempting to tune the transceiver, connect the unit to a suitable power supply.

Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter).

The speaker output connector must be terminated with a 4Ω dummy load and connected to an AC voltmeter and an audio distortion meter or a SINAD measurement meter at all times during tuning.

#### ■ Transceiver tuning

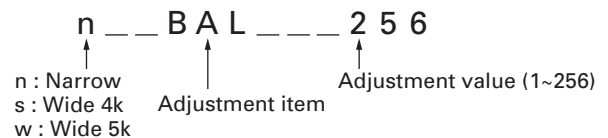
##### (To place transceiver in tuning mode)

Press [S] key, now in tuning mode. Use [B] key to write tuning data through tuning modes, and [↗]/[↘] to adjust tuning requirements (1 to 256 appears on LCD).

Use [C] key to select the adjustment item through tuning modes. Use [A] key to adjust 3 or 5 reference level adjustments, and use [■] key to switch between Wide 5k/Wide 4k/Narrow.

Channel appears on LCD. Set channel according to tuning requirements.

#### • LCD display in panel tuning mode



## ADJUSTMENT

### ■ Key operation

Key	Function	
	Push	Hold (1 second)
[S]	End of panel tuning mode	-
[A]	To enter 3 or 5 reference level adjustments	-
[B]	Writes the adjustment value	-
[C]	Go to next adjustment item	Back to last adjustment item
[↗]/[↘]	Adjustment value up/down	Continuation up/down
[↖]/[↙]	Volume level up/down	Continuation up/down
[△]	Squelch on/off	-
[■]	Selects Narrow, Wide 4k, Wide 5k	-

### ■ 3 or 5 reference level adjustments frequency

Tuning point	K		K2	
	RX (MHz)	TX (MHz)	RX (MHz)	TX (MHz)
Low	450.05000	450.10000	400.05000	400.10000
Low'	467.55000	467.60000	417.55000	417.60000
Center	485.05000	485.10000	435.05000	435.10000
High'	502.55000	502.60000	452.55000	452.60000
High	519.95000	519.90000	469.95000	469.90000

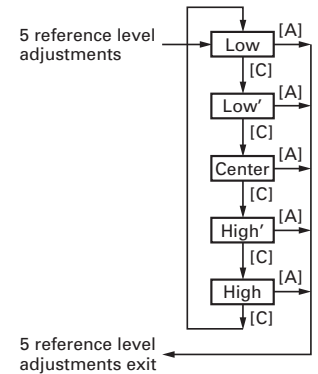
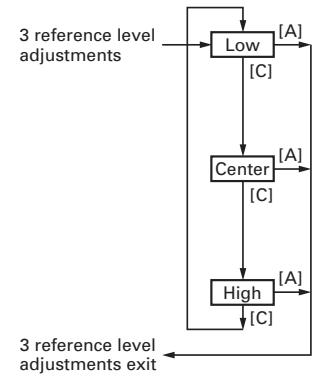
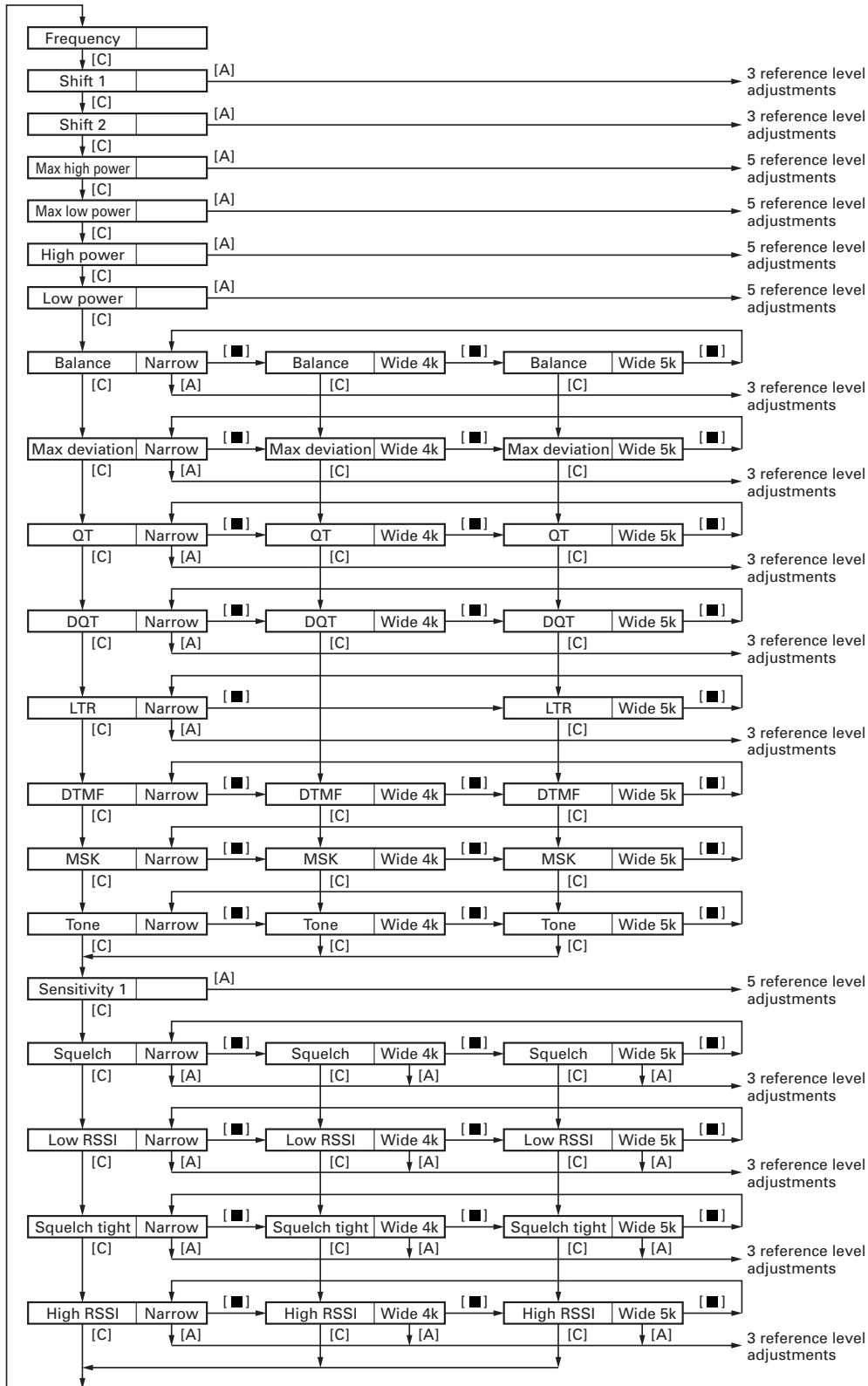
### ■ Adjustment item and Display (\*\*\*) : 1~256)

Order	Adjustment item	Display
1	Frequency	FREQ ***
2	Shift 1	SHFT1 ***
3	Shift 2	SHFT2 ***
4	Max high power	MHPWR ***
5	Max low power	MLPWR ***
6	High power	HPWR ***
7	Low power	LPWR ***
8	Balance	BAL ***
9	Max deviation	DEV ***
10	QT	QT ***
11	DQT	DQT ***
12	LTR	LTR ***
13	DTMF	DTMF ***
14	MSK	MSK ***
15	Tone	TONE ***
16	Sensitivity 1	SENS1 ***
17	Squelch	SQL ***
18	Low RSSI	LRSSI ***
19	Squelch tight	SQLT ***
20	High RSSI	HRSSI ***

## ADJUSTMENT

### ■ Flow chart

**Note :** The "Wide 4k" can not use, please skip it.

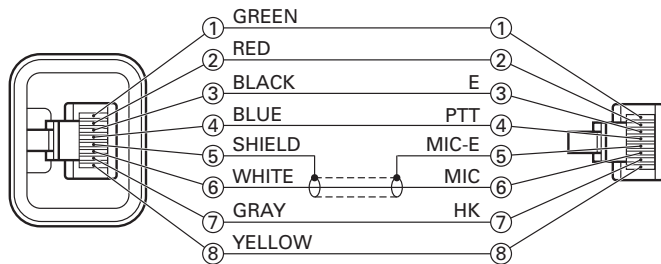


## ADJUSTMENT

### Test Equipment Required for Alignment

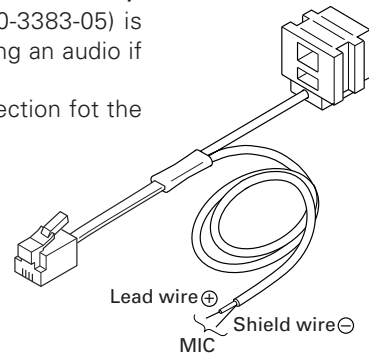
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range	400 to 520MHz
	Modulation	Frequency modulation and external modulation
	Output	0.1μV to greater than 1mV
2. Power Meter	Input Impedance	50Ω
	Operation Frequency	400 to 520MHz or more
	Measurement Capability	Vicinity of 50W
3. Deviation Meter	Frequency Range	400 to 520MHz
4. Digital Volt Meter (DVM)	Measuring Range	1 to 20V DC
	Accuracy	High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range	10Hz to 600MHz
	Frequency Stability	0.2ppm or less
7. Ammeter		13A or more
8. AF Volt Meter (AF VTVM)	Frequency Range	50Hz to 10kHz
	Voltage Range	3mV to 3V
9. Audio Generator (AG)	Frequency Range	50Hz to 5kHz
	Output	0 to 1V
10. Distortion Meter	Capability	3% or less at 1kHz
	Input Level	50mV to 10Vrms
11. Voltmeter	Measuring Range	10 to 1.5V DC or less
	Input Impedance	50kΩ/V or greater
12. 4Ω Dummy Load		Approx. 4Ω, 20W
13. Regulated Power Supply		13.6V, approx. 20A (adjustable from 9 to 20V) Useful if ammeter equipped

### Test cable for microphone input (E30-3360-08)

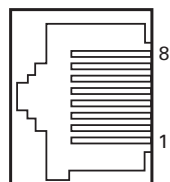


### Tuning cable (E30-3383-05)

Adapter cable (E30-3383-05) is required for injecting an audio if PC tuning is used. See "PC Mode" section for the connection.



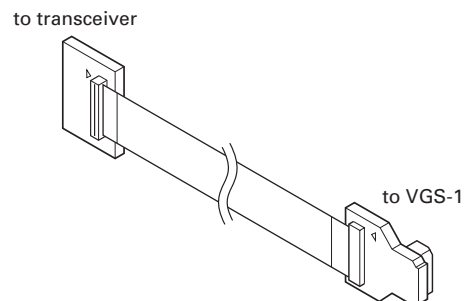
### MIC connector (Front panel view)



- 1 : BLC
- 2 : +B
- 3 : GND
- 4 : PTT/TXD  
(PC serial data from radio)
- 5 : MICE
- 6 : MIC
- 7 : HOOK/RXD  
(PC serial data to radio)
- 8 : DM

### Check Jig for the VGS-1

KENWOOD part : W05-1127-00



## ADJUSTMENT

## Common Section


Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Power supply voltage DC power supply terminal : 13.6V 2) SSG standard modulation [Wide 5k] MOD : 1kHz, DEV : 3kHz [Wide 4k] MOD : 1kHz, DEV : 2.4kHz [Narrow] MOD : 1kHz, DEV : 1.5kHz							
2. VCO lock voltage • RX	<b>[Panel test mode]</b> 1) CH-Sig : 3-1	Power meter	Rear panel	ANT	TX-RX (B/3)	TC301	8.1V	±0.1V
	2) CH-Sig : 2-1	DVM	TX-RX (B/3)	CV			Check	1.5V±0.5V
	<b>[Panel tuning mode] LPWR*</b> • TX 3) CH-Sig : 3-1 PTT : ON				TX-RX (B/3)	TC302	8.1V	±0.1V
	4) CH-Sig : 2-1 PTT : ON						Check	1.5V±0.5V

\* TX can be continued on unlock condition in panel tuning mode.

## Transmitter Section (K market model skips adjustment of Wide 4k)

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency adjust	1) Adj item : [FREQ] Adjust : [***] PTT : ON	f. counter	Rear panel	ANT	Front panel	[↗],[↘]	Center frequency ±100Hz	Note : After replacing the VCXO (X301) align frequency.
2. Frequency shift 1 adjust	1) Adj item : [SHFT1] Adjust : [***] 2) Adj item : [L SHFT1] → [C SHFT1] → [H SHFT1] Adjust : [***] PTT : ON						[L SHFT1] Low frequency+5.00kHz [C SHFT1] Center frequency+5.00kHz [H SHFT1] High frequency+5.00kHz	±100Hz
3. Frequency shift 2 adjust	1) Adj item : [SHFT2] Adjust : [***] 2) Adj item : [L SHFT2] → [C SHFT2] → [H SHFT2] Adjust : [***] PTT : ON						[L SHFT2] Low frequency+6.25kHz [C SHFT2] Center frequency+6.25kHz [H SHFT2] High frequency+6.25kHz	±100Hz
4. Max high power adjust	1) Adj item : [MHPWR] Adjust : [***] 2) Adj item : [L MHPWR] → [L' MHPWR] → [C MHPWR] → [H' MHPWR] → [H MHPWR] Adjust : [***] PTT : ON	Power meter					[L MHPWR], [L' MHPWR], [C MHPWR] : 33W [H' MHPWR], [H MHPWR] : 28W <b>K</b> : 33W <b>K2</b>	±3W  <b>CAUTION!</b> Do not attempt to adjust the transceiver's transmit output power beyond its specifications. If the transceiver is adjusted beyond the specifications, it may cause deterioration of the parts reliability and the output power may be lowered suddenly and unstable. The transceiver may be also extremely hot.

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Max low power adjust	1) Adj item : [MLPWR] Adjust : [***] 2) Adj item : [L MLPWR] → [L' MLPWR] → [C MLPWR] → [H' MLPWR] → [H MLPWR] Adjust : [***] PTT : ON	Power meter	Rear panel	ANT	Front panel	[↗],[↘]	15W	±1W  <b>CAUTION!</b> Do not attempt to adjust the transceiver's transmit output power beyond its specifications. If the transceiver is adjusted beyond the specifications, it may cause deterioration of the parts reliability and the output power may be lowered suddenly and unstable. The transceiver may be also extremely hot.
6. High power adjust	1) Adj item : [HPWR] Adjust : [***] 2) Adj item : [L HPWR] → [L' HPWR] → [C HPWR] → [H' HPWR] → [H HPWR] Adjust : [***] PTT : ON	Power meter Ammeter					[L HPWR], [L' HPWR], [C HPWR] : 30W  [H' HPWR],[H HPWR] : 25W <b>K</b> : 30W <b>K2</b>	±1W 9A or less
7. High power check	<b>[Panel test mode]</b> 1) CH-Sig : 1-1 PTT : ON 2) CH-Sig : 2-1 PTT : ON 3) CH-Sig : 3-1 PTT : ON						Check	25~35W 9A or less  21~29W 9A or less
8. Low power adjust	1) Adj item : [LPWR] Adjust : [***] 2) Adj item : [L LPWR] → [L' LPWR] → [C LPWR] → [H' LPWR] → [H LPWR] Adjust : [***] PTT : ON				Front panel	[↗],[↘]	5.0W	±0.5W 5A or less
9. Low power check	<b>[Panel test mode]</b> 1) CH-Sig : 1-1 Set low power (Push [S]) PTT : ON 2) CH-Sig : 2-1 PTT : ON 3) CH-Sig : 3-1 PTT : ON						Check	3.5~6.5W 5A or less
10. DQT balance adjust	1) Adj item : [n BAL] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF • Narrow 2) Adj item : [nL BAL] → [nC BAL] → [nH BAL] Adjust : [***] PTT : ON • Wide 4k 3) Adj item : [s BAL] Adjust : [***] PTT : ON • Wide 5k 4) Adj item : [w BAL] Adjust : [***] PTT : ON	Power meter  Deviation meter Oscilloscope AG AF VTVM	Rear panel  Front panel	ANT  Modular MIC jack	Front panel	[↗],[↘]	Make the demodulation waves into square waves.	

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks	
		Test-equipment	Unit	Terminal	Unit	Parts	Method		
11. Max DEV adjust  • Narrow	1) Adj item : [n DEV] Adjust : [***] AG : 1kHz/50mV at MIC terminal Deviation meter filter LPF : 15kHz HPF : OFF	Power meter	Rear panel	ANT	Front panel	[∧],[∨]	2.10kHz (According to the larger +, -)	±0.10kHz	
	2) Adj item : [nL DEV] → [nC DEV] → [nH DEV] Adjust : [***] PTT : ON	Deviation meter Oscilloscope AG AF VTVM	Front panel	Modular MIC jack					
	• Wide 4k	3) Adj item : [s DEV] Adjust : [***] PTT : ON						3.30kHz (According to the larger +, -)	±0.10kHz
• Wide 5k	4) Adj item : [w DEV] Adjust : [***] PTT : ON						4.20kHz (According to the larger +, -)	±0.10kHz	
12. MIC sensitivity check (Wide 5k only)	<b>[Panel test mode]</b> 1) CH-Sig : 1-1 AG : 1kHz/5mV at MIC terminal PTT : ON						Check	2.5~3.5kHz	
13. QT deviation adjust  • Narrow	1) Adj item : [n QT] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF				Front panel	[∧],[∨]	0.35kHz	±0.05kHz	
	2) Adj item : [nL QT] → [nC QT] → [nH QT] Adjust : [***] PTT : ON								
	• Wide 4k	3) Adj item : [s QT] Adjust : [***] PTT : ON						0.60kHz	±0.10kHz
• Wide 5k	4) Adj item : [w QT] Adjust : [***] PTT : ON						0.75kHz	±0.10kHz	
14. DQT deviation adjust  • Narrow	1) Adj item : [n DQT] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF					[∧],[∨]	0.35kHz	±0.05kHz	
	2) Adj item : [nL DQT] → [nC DQT] → [nH DQT] Adjust : [***] PTT : ON								
	• Wide 4k	3) Adj item : [s DQT] Adjust : [***] PTT : ON						0.60kHz	±0.10kHz
• Wide 5k	4) Adj item : [w DQT] Adjust : [***] PTT : ON						0.75kHz	±0.10kHz	



## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
15. LTR deviation adjust  • Narrow	1) Adj item : [n LTR] Adjust : [***] Deviation meter filter LPF : 3kHz HPF : OFF	Power meter  Deviation meter Oscilloscope AG AF VTVM	Rear panel	ANT	Front panel	[↗],[↘]	0.75kHz	±0.10kHz
	2) Adj item : [nL LTR] → [nC LTR] → [nH LTR] Adjust : [***] PTT : ON		Front panel	Modular MIC jack				
	• Wide		3) Adj item : [w LTR] Adjust : [***] PTT : ON					
16. DTMF deviation adjust  • Narrow	1) Adj item : [n DTMF] Adjust : [***] Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						1.5kHz	±0.1kHz
	• Wide 4k	2) Adj item : [s DTMF] Adjust : [***] PTT : ON					2.4kHz	±0.1kHz
	• Wide 5k	3) Adj item : [w DTMF] Adjust : [***] PTT : ON					3.0kHz	±0.1kHz
17. MSK deviation adjust  • Narrow	1) Adj item : [n MSK] Adjust : [***] Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						1.5kHz	±0.1kHz
	• Wide 4k	2) Adj item : [s MSK] Adjust : [***] PTT : ON					2.4kHz	±0.1kHz
	• Wide 5k	3) Adj item : [w MSK] Adjust : [***] PTT : ON					3.0kHz	±0.1kHz
18. TONE deviation adjust  • Narrow	1) Adj item : [n TONE] Adjust : [***] Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON						1.5kHz	±0.1kHz
	• Wide 4k	2) Adj item : [s TONE] Adjust : [***] PTT : ON					2.4kHz	±0.1kHz
	• Wide 5k	3) Adj item : [w TONE] Adjust : [***] PTT : ON					3.0kHz	±0.1kHz

## ADJUSTMENT

## Receiver Section (K market model skips adjustment of Wide 4k)

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Sensitivity adjust	1) Adj item : [SENS1] Adjust : [***] 2) Adj item : [L SENS1] → [L' SENS1] → [C SENS1] → [H' SENS1] → [H SENS1] Adjust : [***]	SSG  AF VTVM Oscilloscope	Rear panel	ANT  EXT. SP	Front panel	[↗],[↘]	Enter the following adjustment values to the transceiver by pressing [↗] and [↘] keys. [L SENS1] : 70 <b>K</b> 95 <b>K2</b> [L' SENS1] : 90 <b>K</b> 123 <b>K2</b> [C SENS1] : 115 <b>K</b> 151 <b>K2</b> [H' SENS1] : 138 <b>K</b> 173 <b>K2</b> [H SENS1] : 164 <b>K</b> 195 <b>K2</b> After setting the adjustment value, press [B] key. The adjustment value will be stored in memory.	Note : After replacing the EEPROM (IC401) align sensitivity.
2. Sensitivity check	<b>[Panel test mode]</b> 1) CH-Sig : 1-1 SSG output Wide 5k : -117dBm (0.32μV) (MOD : 1kHz±3kHz) Narrow : -116dBm (0.35μV) (MOD : 1kHz±1.5kHz)						Check	12dB SINAD or more
3. Squelch (Preset) adjust • Narrow	1) Adj item : [n SQL] Adjust : [***] SSG output : 12dB SINAD level (MOD : 1kHz±1.5kHz)						After input signal from SSG, press [B] key. That numeric will be stored in memory.	After adjusting SQL, check SQL open/close. SSG 12dB SINAD level + 4dB : Open SSG 12dB SINAD level - 6dB : Close [nC SQL] MOD 1kHz±1.5kHz [sC SQL] MOD 1kHz±2.4kHz [wC SQL] MOD 1kHz±3.0kHz
	2) Adj item : [nL SQL] → [nC SQL] → [nH SQL] Adjust : [***]							
• Wide 4k	3) Adj item : [s SQL] Adjust : [***] SSG output : 12dB SINAD level (MOD : 1kHz±2.4kHz)							
	4) Adj item : [sL SQL] → [sC SQL] → [sH SQL] Adjust : [***]							
• Wide 5k	5) Adj item : [w SQL] Adjust : [***] SSG output : 12dB SINAD level (MOD : 1kHz±3.0kHz)							
	6) Adj item : [wL SQL] → [wC SQL] → [wH SQL] Adjust : [***]							

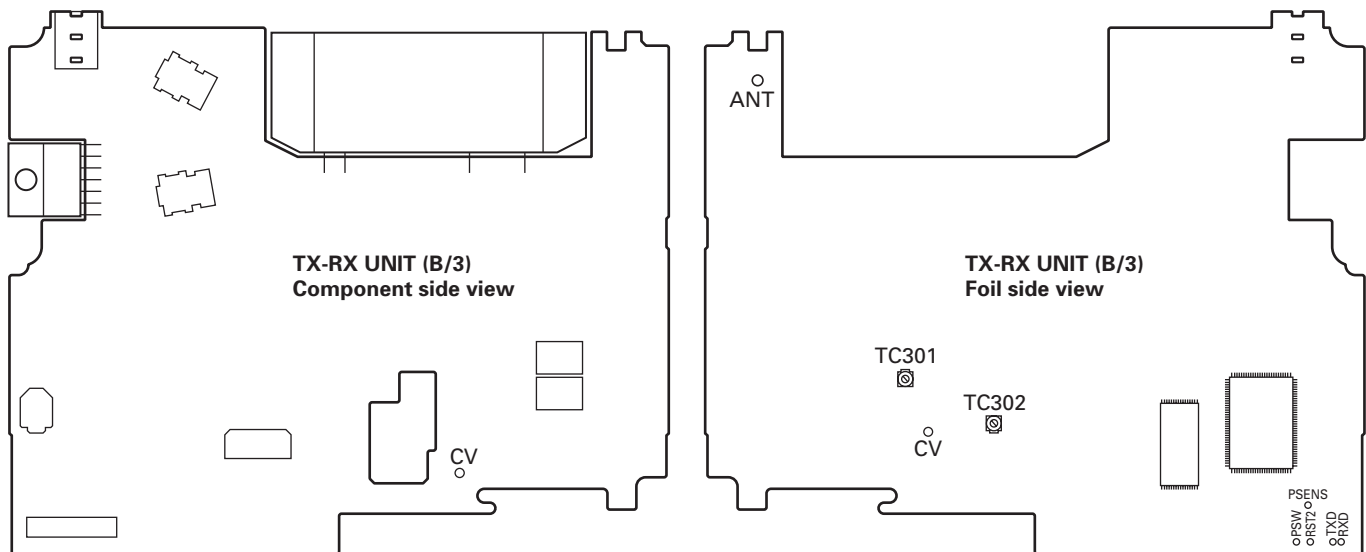
## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks	
		Test-equipment	Unit	Terminal	Unit	Parts	Method		
4. Low RSSI adjust • Narrow	1) Adj item : [n LRSSI] Adjust : [***] SSG output : 12dB SINAD level (MOD : 1kHz±1.5kHz)	SSG  AF VTVM Oscilloscope	Rear panel	ANT			After input signal from SSG, press [B] key. That numeric will be stored in memory.	The following erroneous performance may occur if any irregular RSSI adjustment, such as pressing the [B] key assigned for determination when it is the ANT OPEN state, is performed. • The antenna bar (▼) cannot appear correctly. • Scan does not stop.	
	2) Adj item : [nL LRSSI] → [nC LRSSI] → [nH LRSSI] Adjust : [***]			EXT. SP					
	• Wide 4k			3) Adj item : [s LRSSI] Adjust : [***] SSG output : 12dB SINAD level (MOD : 1kHz±2.4kHz)					
	4) Adj item : [sL LRSSI] → [sC LRSSI] → [sH LRSSI] Adjust : [***]								
	• Wide 5k			5) Adj item : [w LRSSI] Adjust : [***] SSG output : 12dB SINAD level (MOD : 1kHz±3.0kHz)					
	6) Adj item : [wL LRSSI] → [wC LRSSI] → [wH LRSSI] Adjust : [***]								
5. Squelch (Tight) adjust • Narrow	1) Adj item : [n SQLT] Adjust : [***] SSG output : 12dB SINAD+5dB level (MOD : 1kHz±1.5kHz)						After input signal from SSG, press [B] key. That numeric will be stored in memory.	After adjusting SQL, check SQL open/close. SSG 12dB SINAD level +10dB : Open SSG 12dB SINAD level : Close [nC SQLT] MOD 1kHz±1.5kHz [sC SQLT] MOD 1kHz±2.4kHz [wC SQLT] MOD 1kHz±3.0kHz	
	2) Adj item : [nL SQLT] → [nC SQLT] → [nH SQLT] Adjust : [***]								
	• Wide 4k								3) Adj item : [s SQLT] Adjust : [***] SSG output : 12dB SINAD+5dB level (MOD : 1kHz±2.4kHz)
	4) Adj item : [sL SQLT] → [sC SQLT] → [sH SQLT] Adjust : [***]								
	• Wide 5k								5) Adj item : [w SQLT] Adjust : [***] SSG output : 12dB SINAD+5dB level (MOD : 1kHz±3.0kHz)
	6) Adj item : [wL SQLT] → [wC SQLT] → [wH SQLT] Adjust : [***]								

## ADJUSTMENT

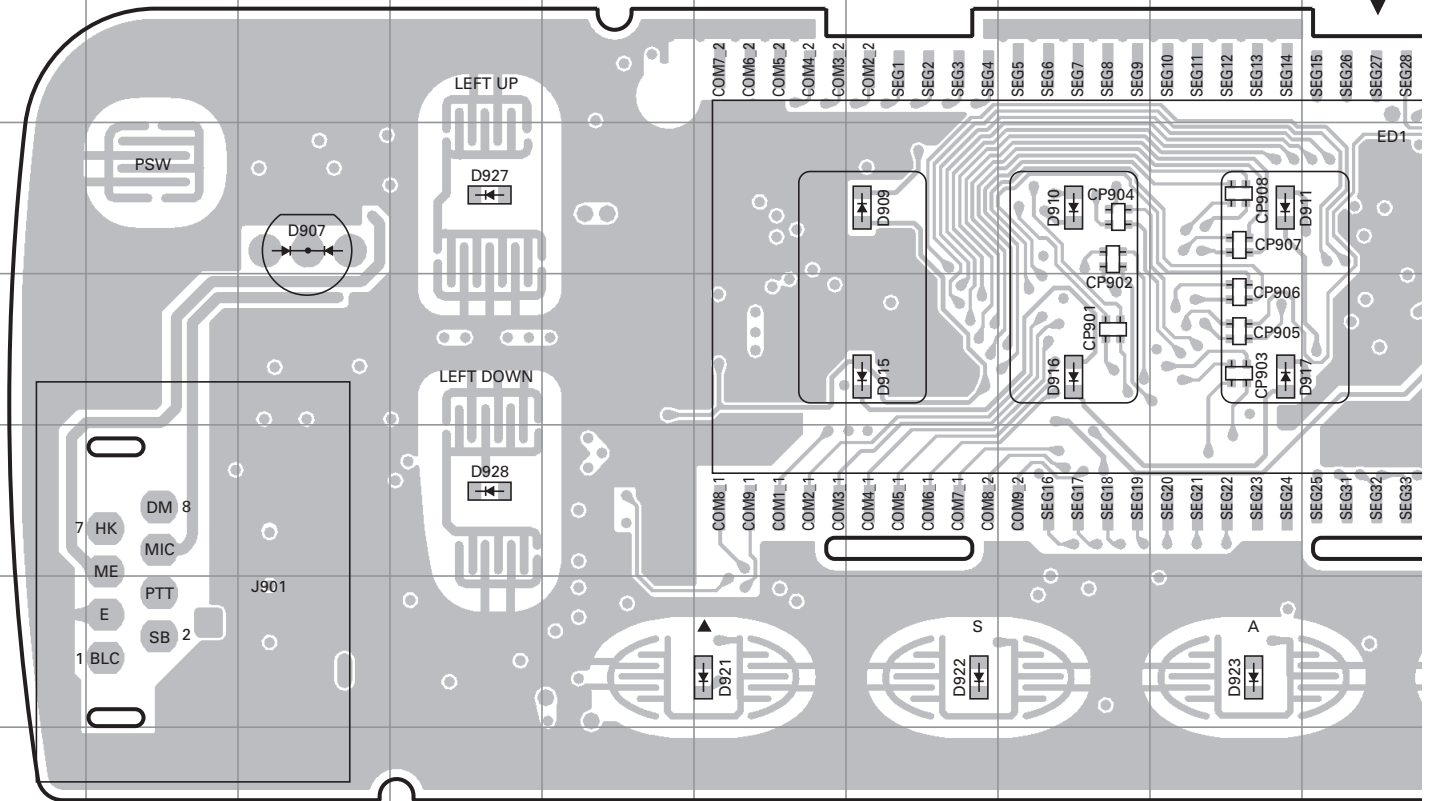
Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. High RSSI adjust • Narrow	1) Adj item : [n HRSSI] Adjust : [***] SSG output : -70dBm (MOD : 1kHz±1.5kHz)	SSG  AF VTVM Oscilloscope	Rear panel	ANT			After input signal from SSG, press [B] key. That numeric will be stored in memory.	The following erroneous performance may occur if any irregular RSSI adjustment, such as pressing the [B] key assigned for determination when it is the ANT OPEN state, is performed. • The antenna bar (▼) cannot appear correctly. • Scan does not stop.
	2) Adj item : [nL HRSSI] → [nC HRSSI] → [nH HRSSI] Adjust : [***]			EXT. SP				
	• Wide 4k			3) Adj item : [s HRSSI] Adjust : [***] SSG output : -70dBm (MOD : 1kHz±2.4kHz)				
	4) Adj item : [sL HRSSI] → [sC HRSSI] → [sH HRSSI] Adjust : [***]							
	• Wide 5k			5) Adj item : [w HRSSI] Adjust : [***] SSG output : -70dBm (MOD : 1kHz±3.0kHz)				
	6) Adj item : [wL HRSSI] → [wC HRSSI] → [wH HRSSI] Adjust : [***]							

### Adjustment Points

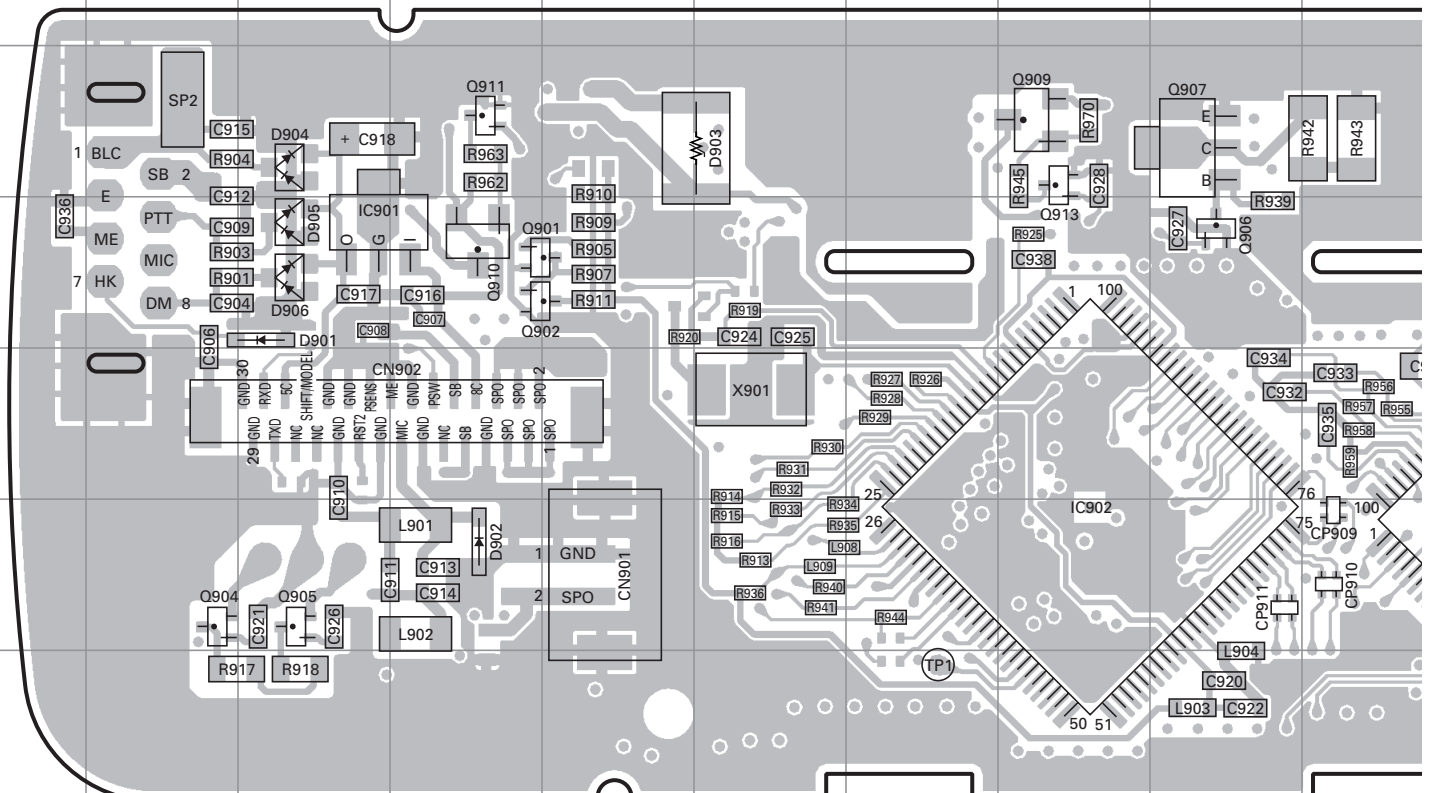


# TK-8180 PC BOARD

## DISPLAY UNIT (X54-3480-10) Component side view (J72-0932-09)

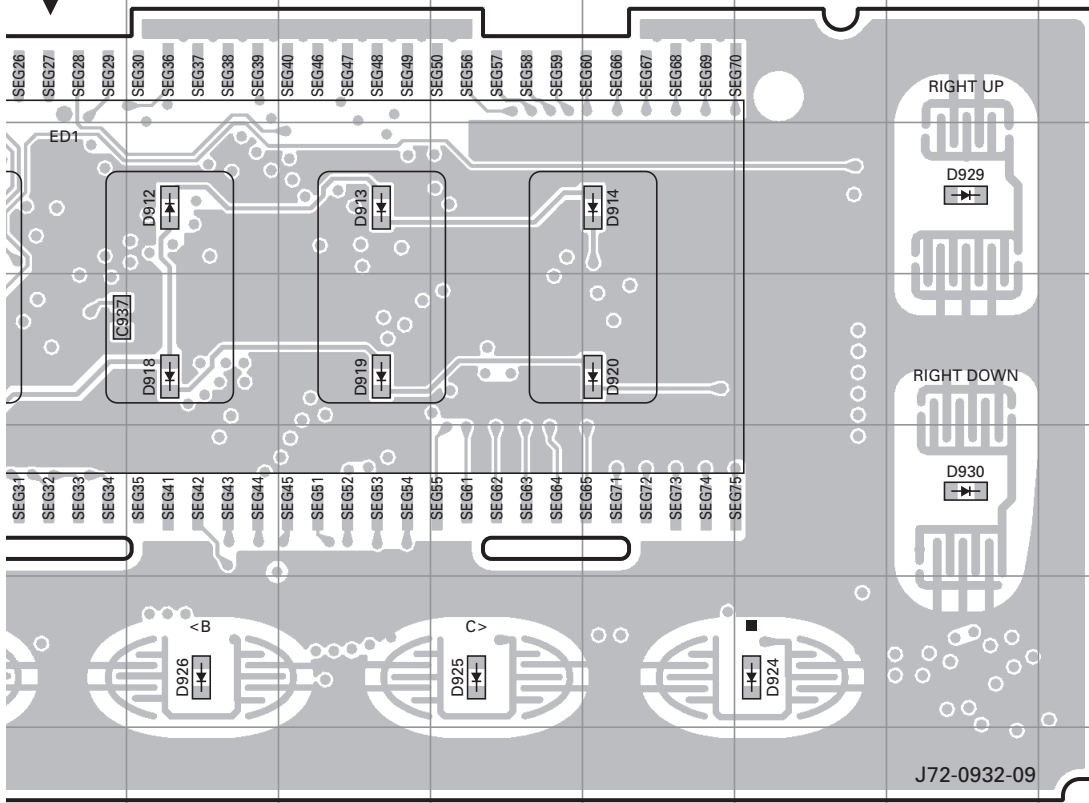


## DISPLAY UNIT (X54-3480-10) Foil side view (J72-0932-09)

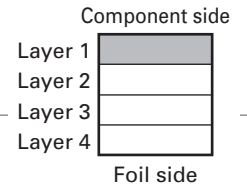


# PC BOARD TK-8180

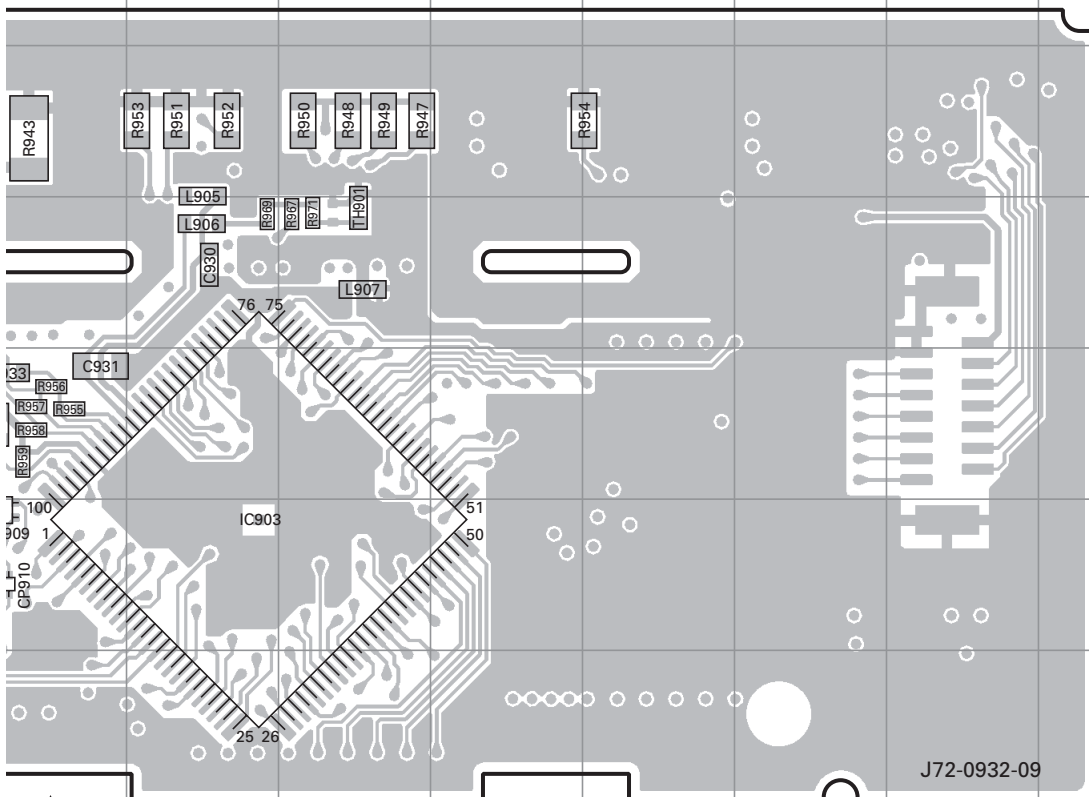
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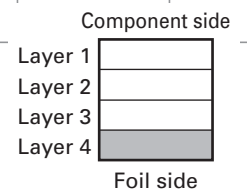
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D909	3G	D921	6F
D910	3H	D922	6G
D911	3I	D923	6I
D912	3K	D924	6O
D913	3L	D925	6M
D914	3N	D926	6K
D915	4G	D927	3D
D916	4H	D928	5D
D917	4I	D929	3P
D918	4K	D930	5P
D919	4L		



## DISPLAY UNIT (X54-3480-10) Foil side view (J72-0932-09)



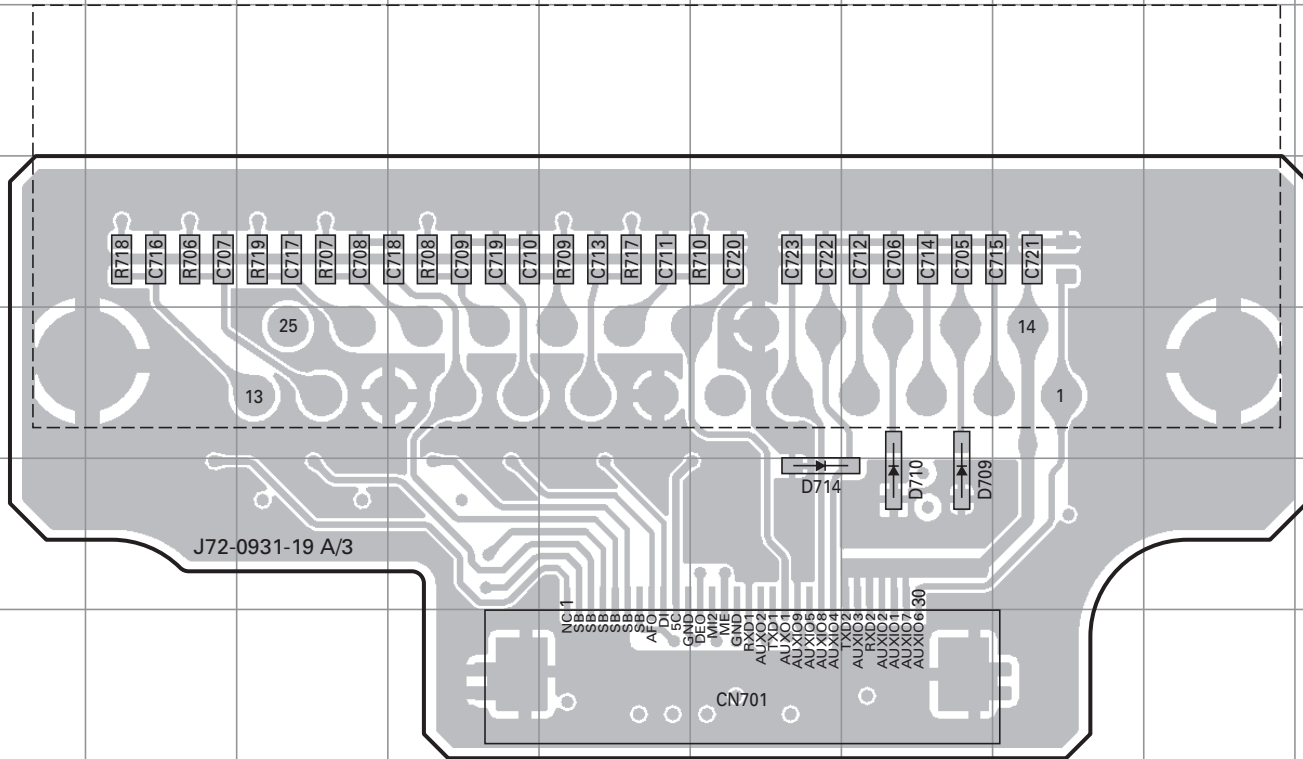
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IC902	12H	Q911	9D
IC903	12K	Q913	9H
Q901	10D	D901	10C
Q902	10D	D902	12D
Q904	12B	D903	9F
Q905	12C	D904	9C
Q906	10I	D905	10C
Q907	9I	D906	10C
Q909	9H		



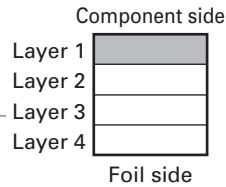


# TK-8180 PC BOARD

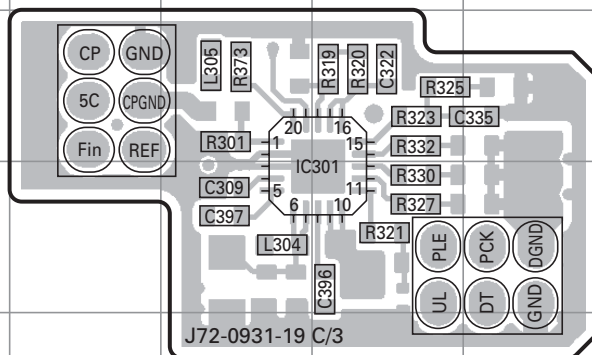
## TX-RX UNIT (X57-6990-XX) (A/3) -10 : K -11 : K2 Component side view (J72-0931-19 A/3)



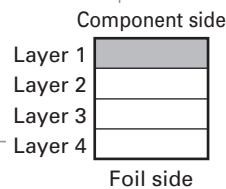
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D710	6G
D714	6F



## TX-RX UNIT (X57-6990-XX) (C/3) -10 : K -11 : K2 Component side view (J72-0931-19 C/3)



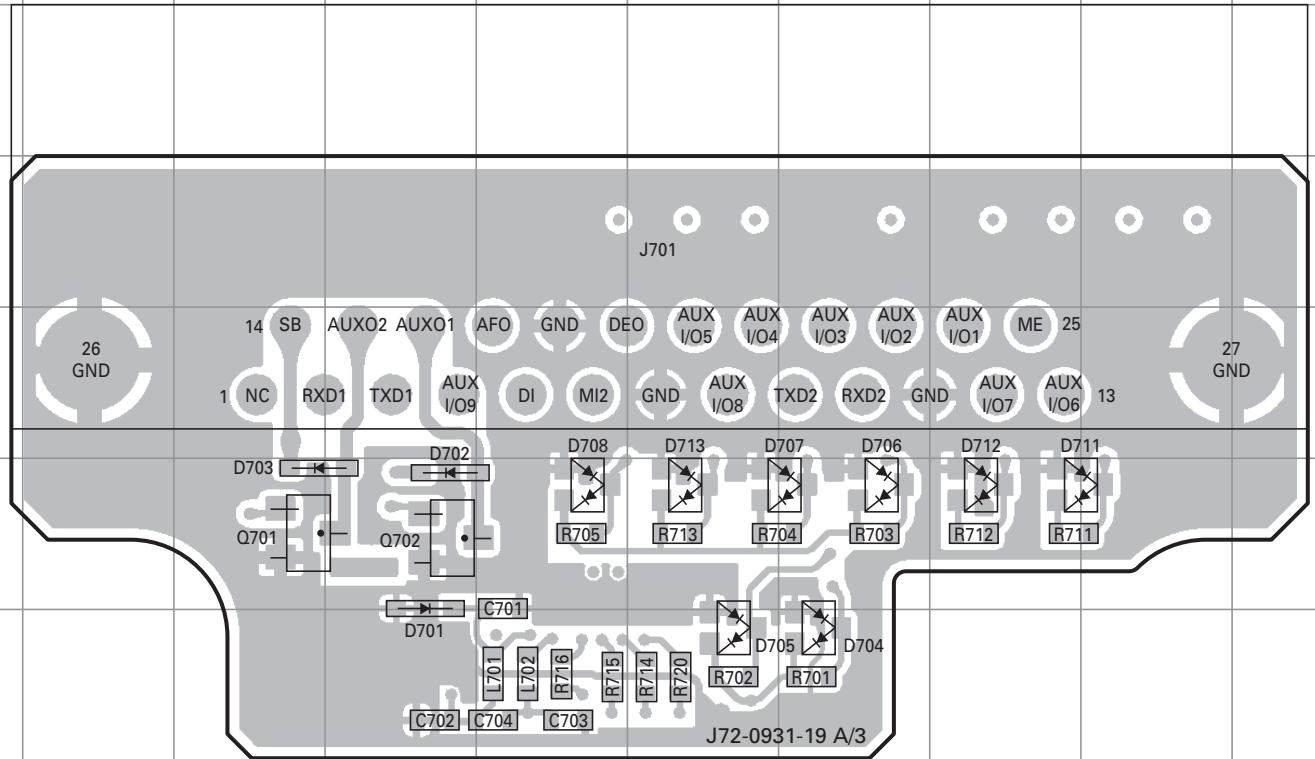
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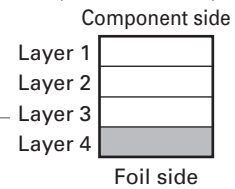


# PC BOARD TK-8180

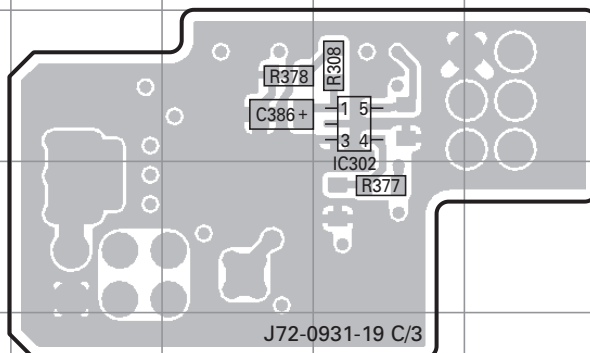
## TX-RX UNIT (X57-6990-XX) (A/3) -10 : K -11 : K2 Foil side view (J72-0931-19 A/3)



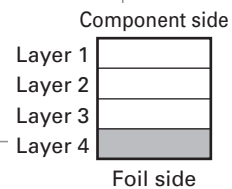
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
Q701	6C	D704	7G	D711	6H
Q702	6D	D705	7F	D712	6H
D701	7D	D706	6G	D713	6F
D702	6D	D707	6G		
D703	6C	D708	6E		



## TX-RX UNIT (X57-6990-XX) (C/3) -10 : K -11 : K2 Foil side view (J72-0931-19 C/3)



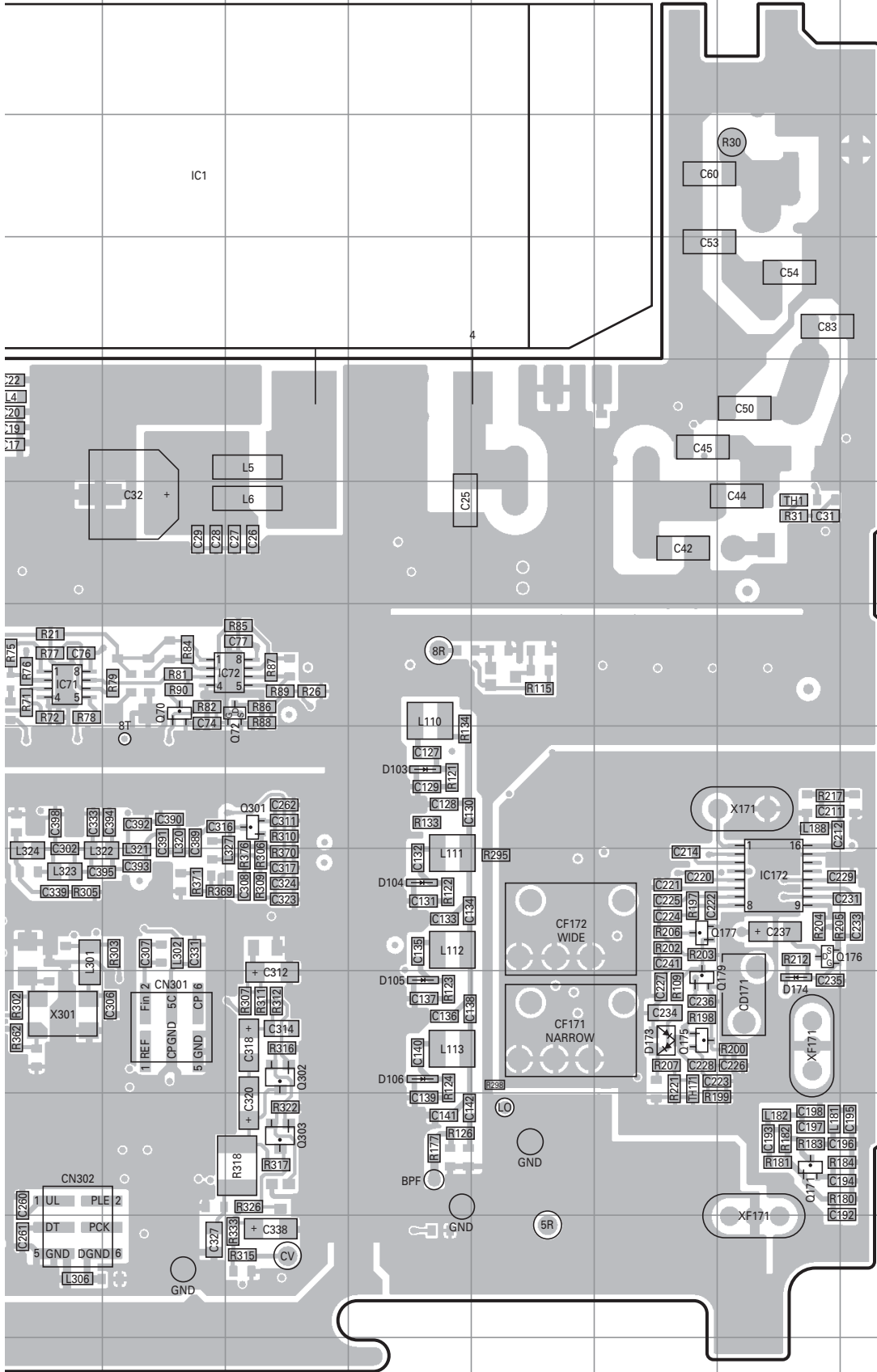
Ref. No.	Address
IC302	11E





**TX-RX UNIT (X57-6990-XX) (B/3)**  
**-10 : K -11 : K2**  
**Component side view (J72-0931-19 B/3)**

**PC BOARD TK-8180**

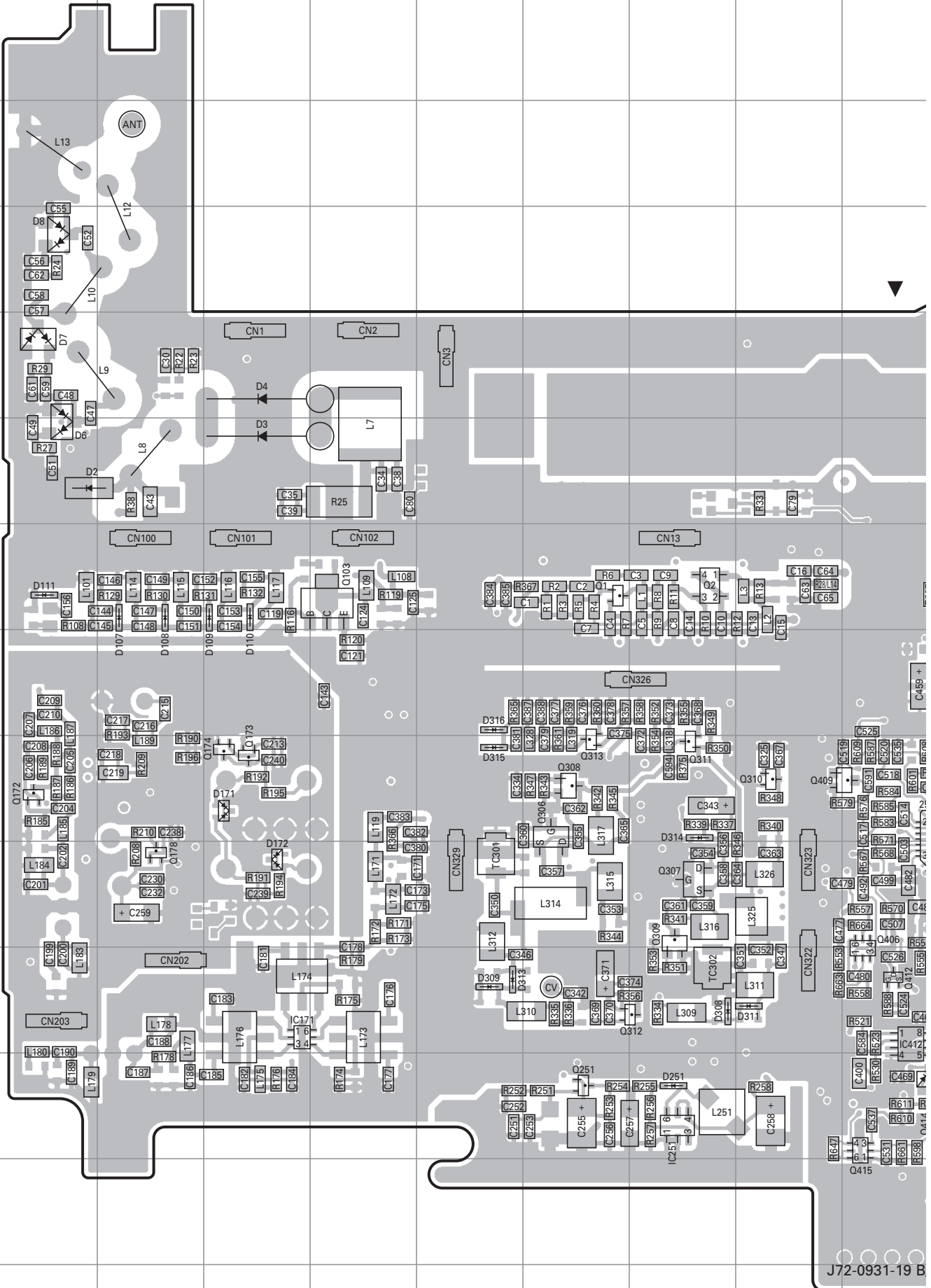


Ref. No.	Address	Ref. No.	Address
IC1	3K	Q600	11C
IC71	7J	Q803	2E
IC72	7L	Q804	2D
IC172	9P	Q806	2E
IC407	7G	Q808	3D
IC410	8F	Q811	2F



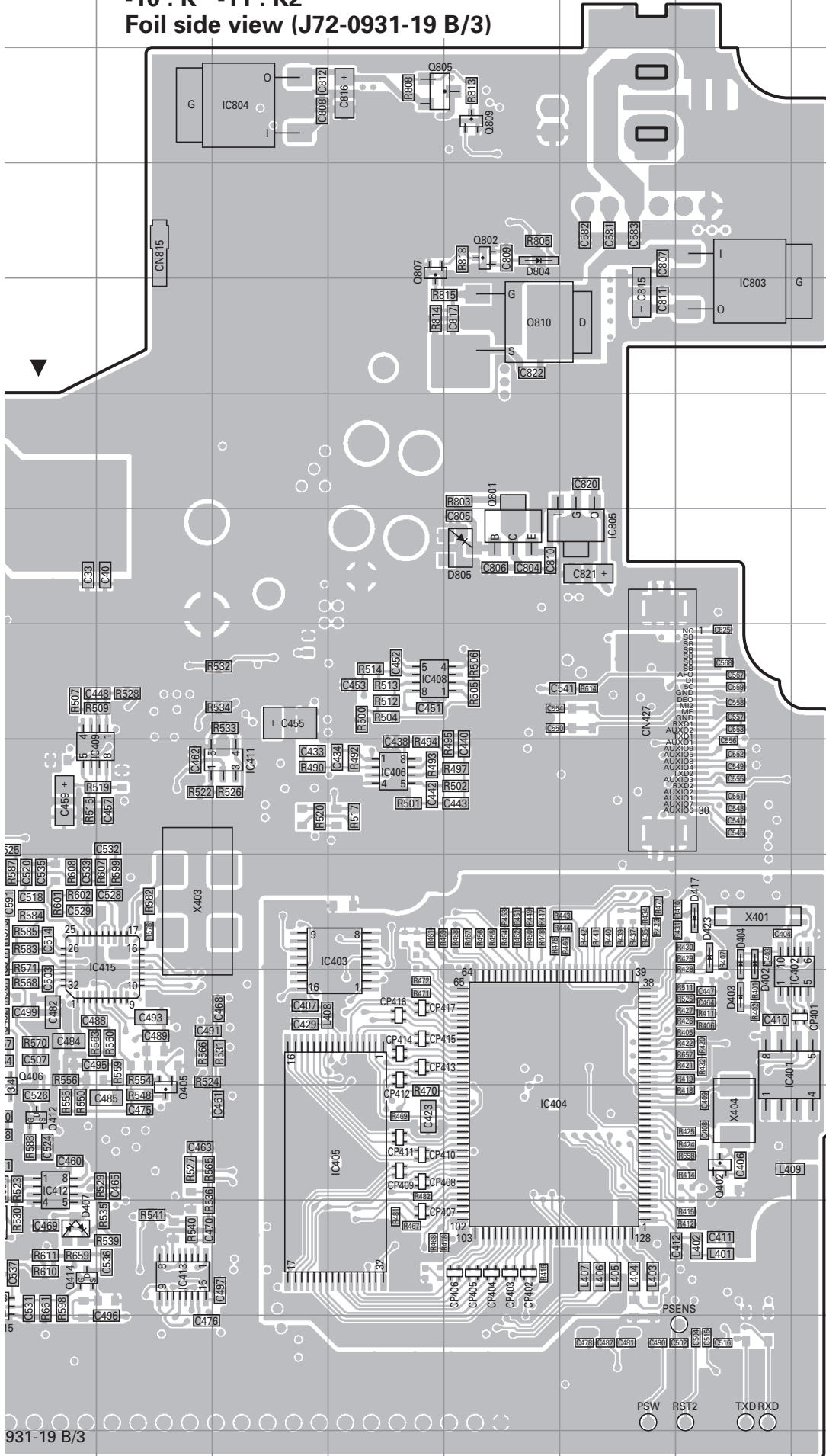
# TK-8180 PC BOARD

TX-RX UNIT (X57-6990-XX) (B/3)  
-10 : K -11 : K2  
Foil side view (J72-0931-19 B/3)

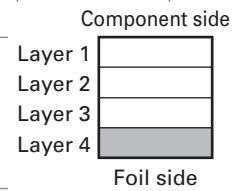


**TX-RX UNIT (X57-6990-XX) (B/3)**  
**-10 : K -11 : K2**  
**Foil side view (J72-0931-19 B/3)**

**PC BOARD TK-8180**



Ref. No.	Address	Ref. No.	Address
IC171	11D	Q414	12J
IC251	12H	Q415	12J
IC401	10P	Q801	6N
IC402	10Q	Q802	3N
IC403	9M	Q805	2M
IC404	11N	Q807	3M
IC405	11M	Q809	2N
IC406	8M	Q810	4N
IC408	7M	D2	6B
IC409	8J	D3	6D
IC411	8L	D4	5D
IC412	11J	D6	6B
IC413	12K	D7	5B
IC415	9K	D8	4B
IC803	4P	D107	7C
IC804	2L	D108	7C
IC805	6O	D109	7D
Q1	7G	D110	7D
Q2	7H	D111	7B
Q103	7E	D171	9D
Q172	9B	D172	10D
Q173	9D	D251	12H
Q174	9D	D308	11H
Q178	10C	D309	11F
Q251	12G	D311	11I
Q306	9G	D313	11F
Q307	10H	D314	9H
Q308	9G	D315	9F
Q309	10H	D316	8F
Q310	9I	D402	9P
Q311	9H	D403	10P
Q312	11H	D404	9P
Q313	9G	D407	12J
Q402	11P	D417	9P
Q405	11K	D423	9P
Q406	11J	D804	3N
Q409	9J	D805	6N
Q412	11J		



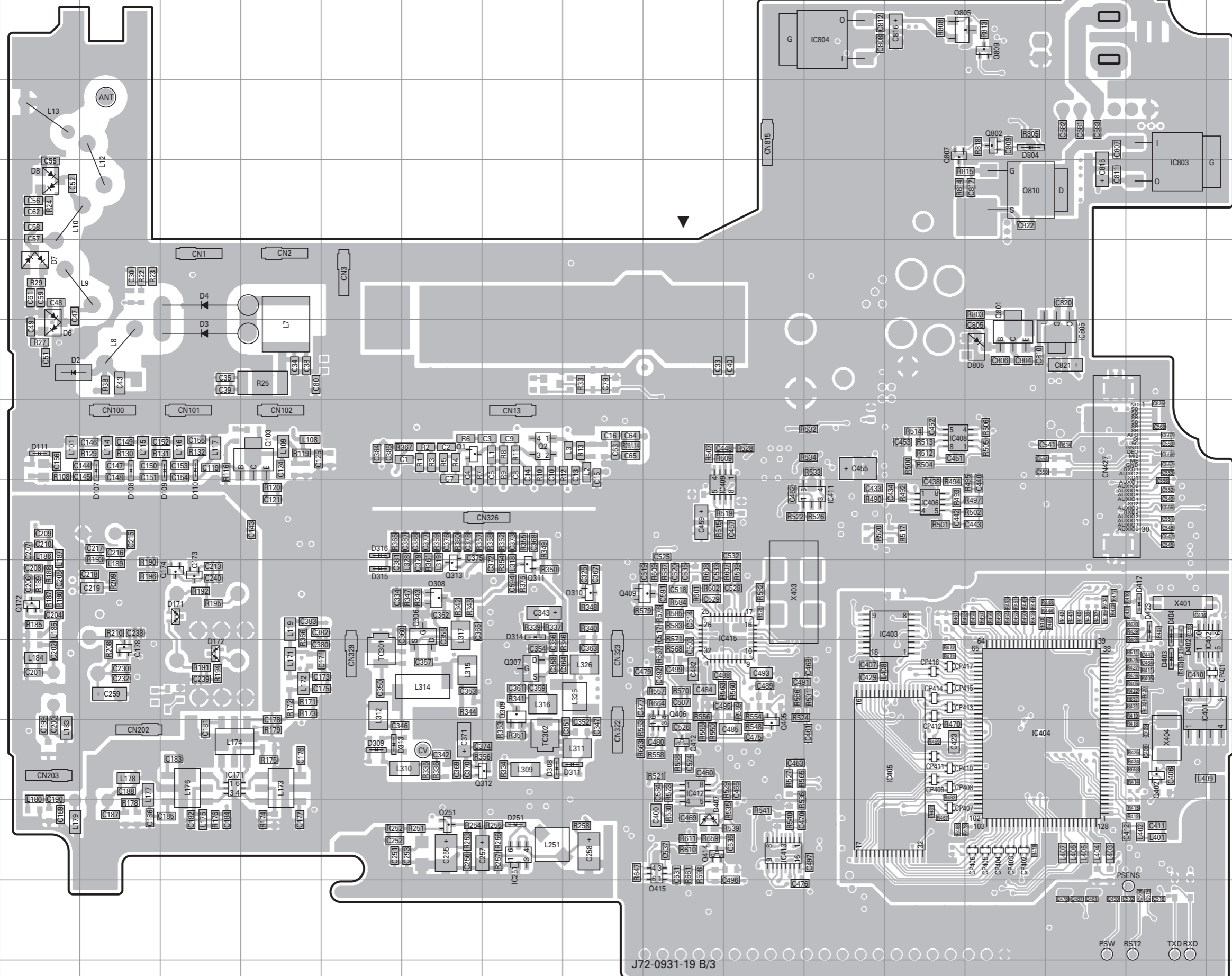
931-19 B/3

# TK-8180 PC BOARD

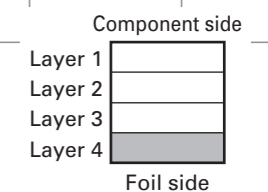
**TX-RX UNIT (X57-6990-XX) (B/3)**  
 -10 : K -11 : K2  
 Foil side view (J72-0931-19 B/3)

**TX-RX UNIT (X57-6990-XX) (B/3)**  
 -10 : K -11 : K2  
 Foil side view (J72-0931-19 B/3)

# PC BOARD TK-8180



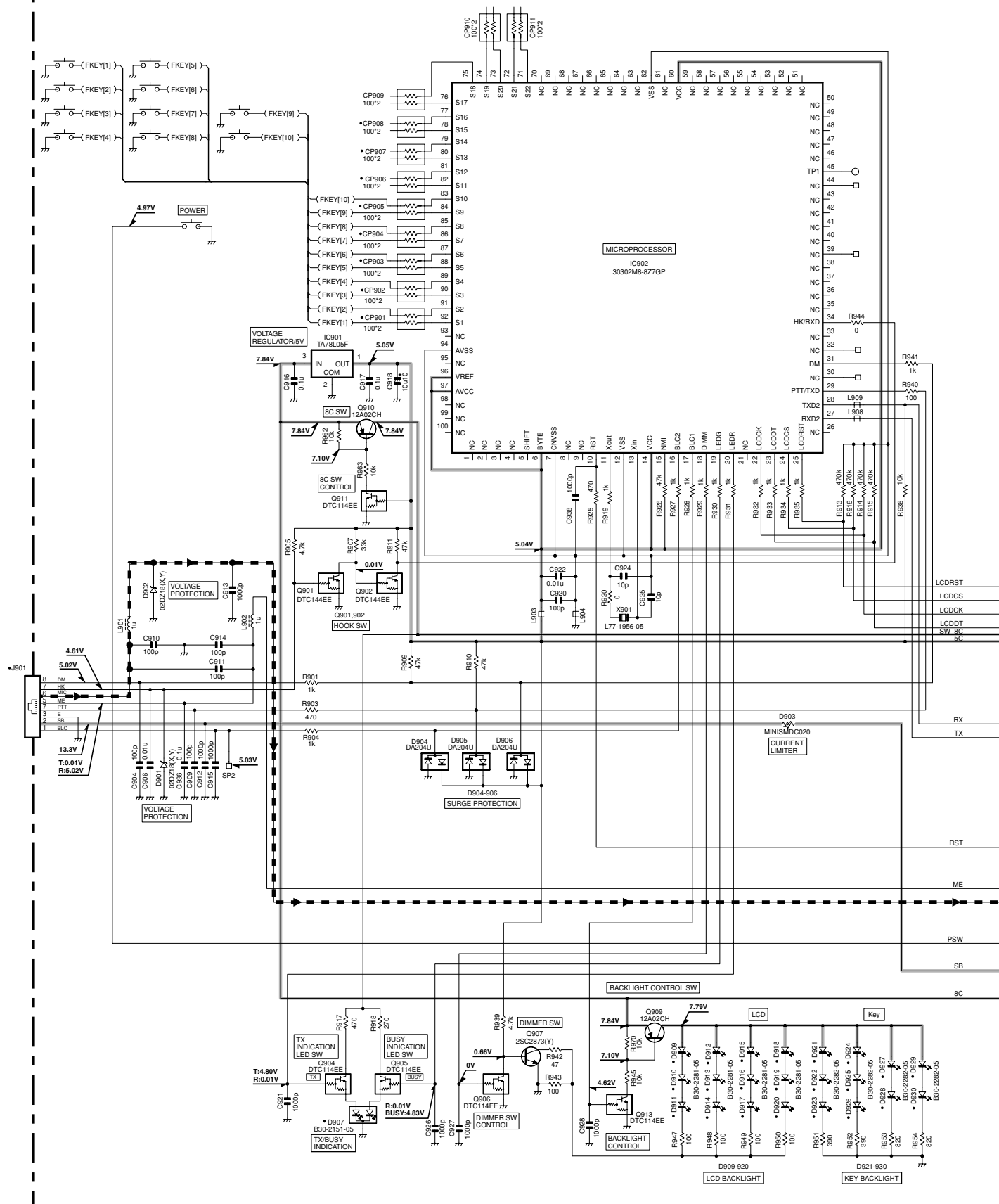
Ref. No.	Address	Ref. No.	Address
IC171	11D	Q414	12J
IC251	12H	Q415	12J
IC401	10P	Q801	6N
IC402	10Q	Q802	3N
IC403	9M	Q805	2M
IC404	11N	Q807	3M
IC405	11M	Q809	2N
IC406	8M	Q810	4N
IC408	7M	D2	6B
IC409	8J	D3	6D
IC411	8L	D4	5D
IC412	11J	D6	6B
IC413	12K	D7	5B
IC415	9K	D8	4B
IC803	4P	D107	7C
IC804	2L	D108	7C
IC805	6O	D109	7D
Q1	7G	D110	7D
Q2	7H	D111	7B
Q103	7E	D171	9D
Q172	9B	D172	10D
Q173	9D	D251	12H
Q174	9D	D308	11H
Q178	10C	D309	11F
Q251	12G	D311	11I
Q306	9G	D313	11F
Q307	10H	D314	9H
Q308	9G	D315	9F
Q309	10H	D316	8F
Q310	9I	D402	9P
Q311	9H	D403	10P
Q312	11H	D404	9P
Q313	9G	D407	12J
Q402	11P	D417	9P
Q405	11K	D423	9P
Q406	11J	D804	3N
Q409	9J	D805	6N
Q412	11J		



J72-0931-19 B/3

# TK-8180 SCHEMATIC DIAGRAM

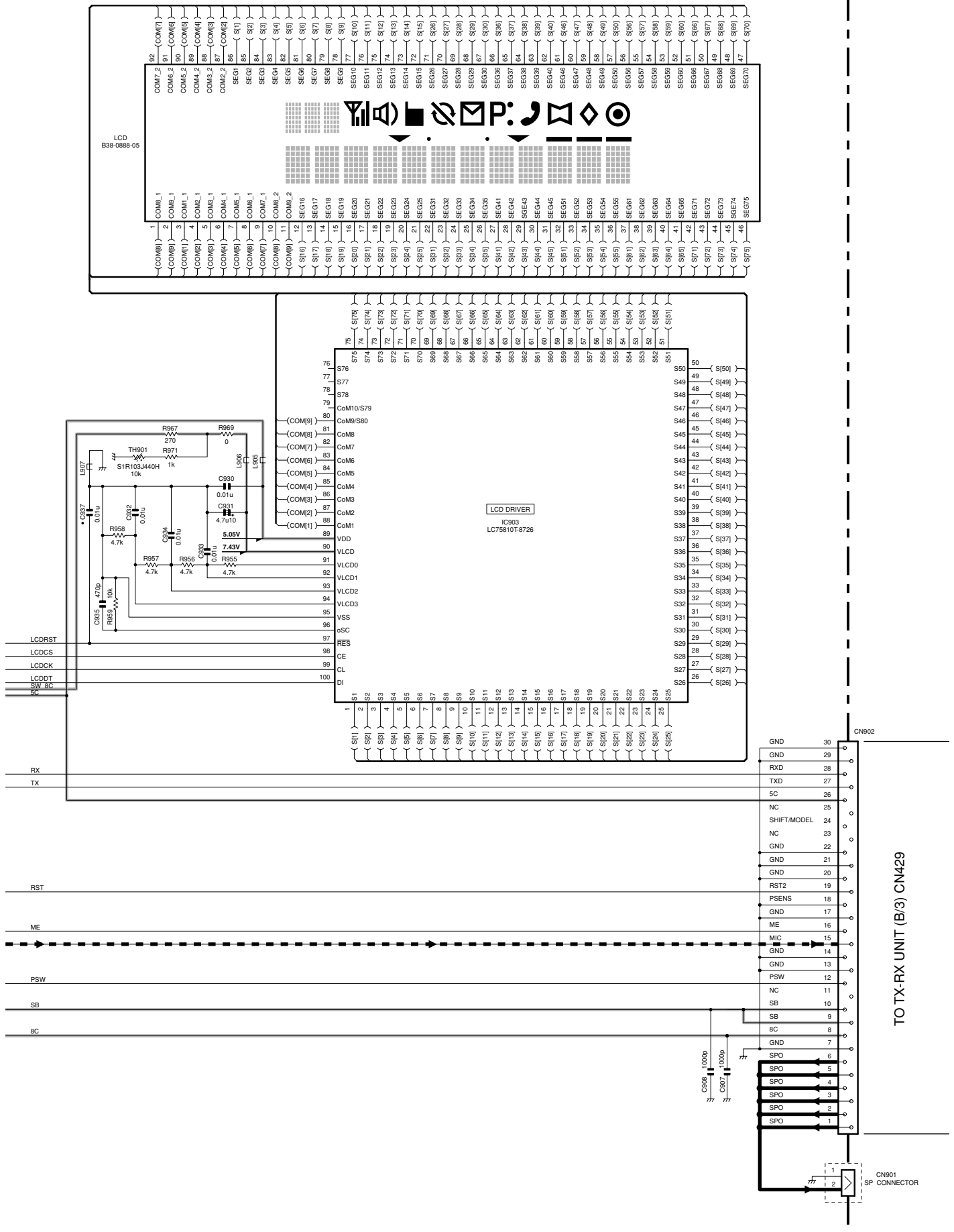
DISPLAY UNIT (X54-3480-10)





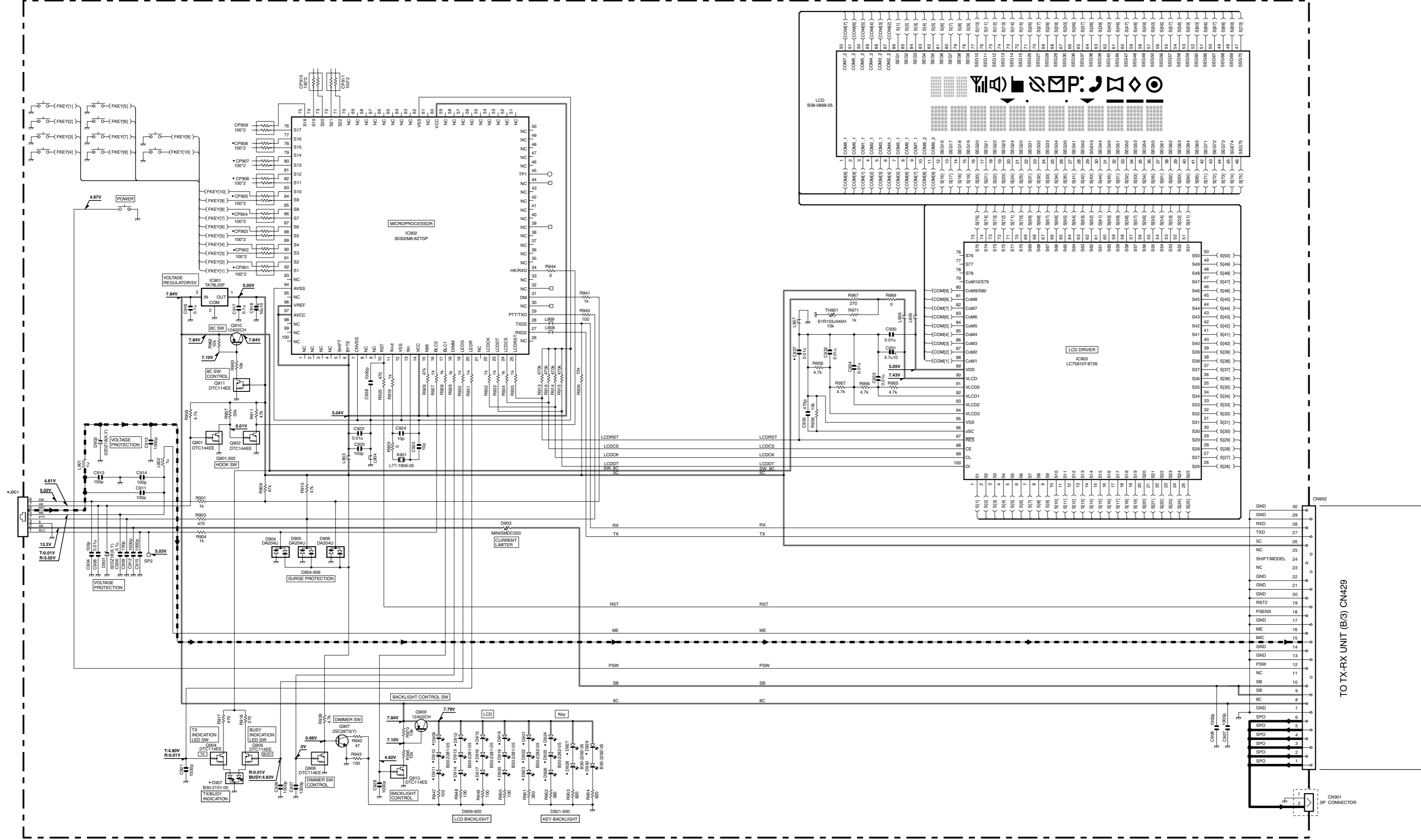
# SCHEMATIC DIAGRAM TK-8180

DISPLAY UNIT (X54-3480-10)



Note : The components marked with a dot (•) are parts of layer 1.

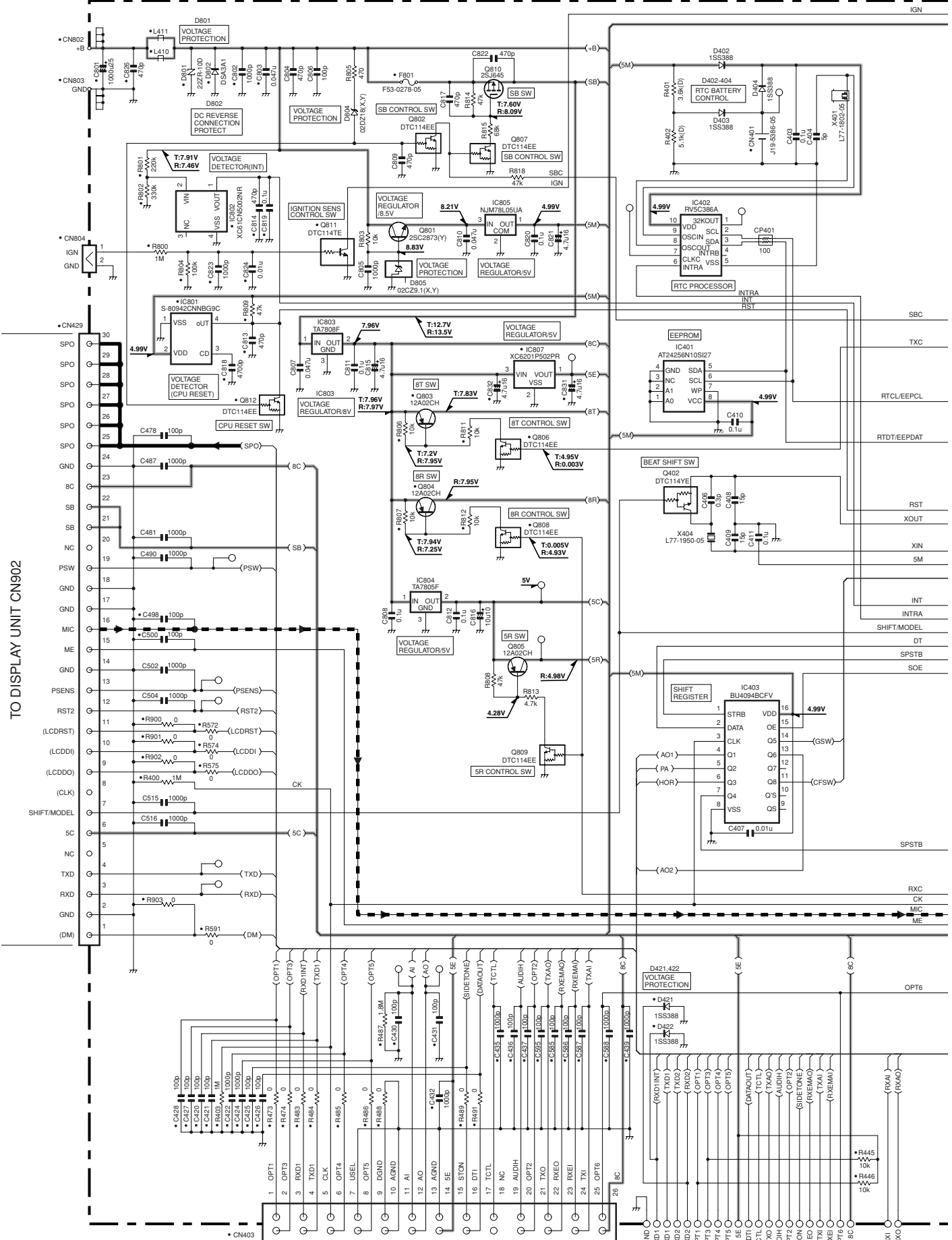
DISPLAY UNIT (X54-3480-10)



TO TX-RX UNIT (B/3) CN429

# TK-8180 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6990-XX) (B/3)

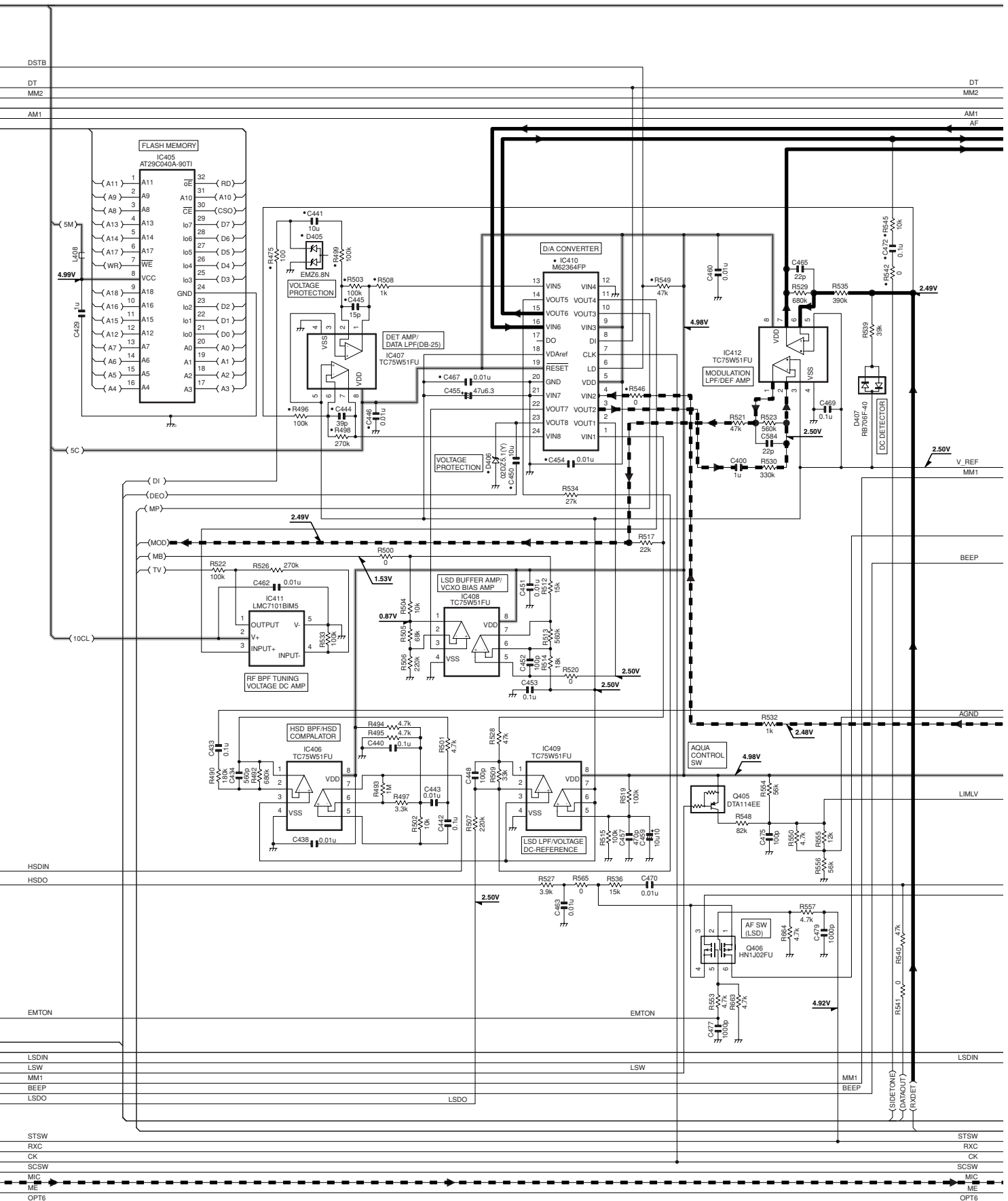


TO DISPLAY UNIT CN902



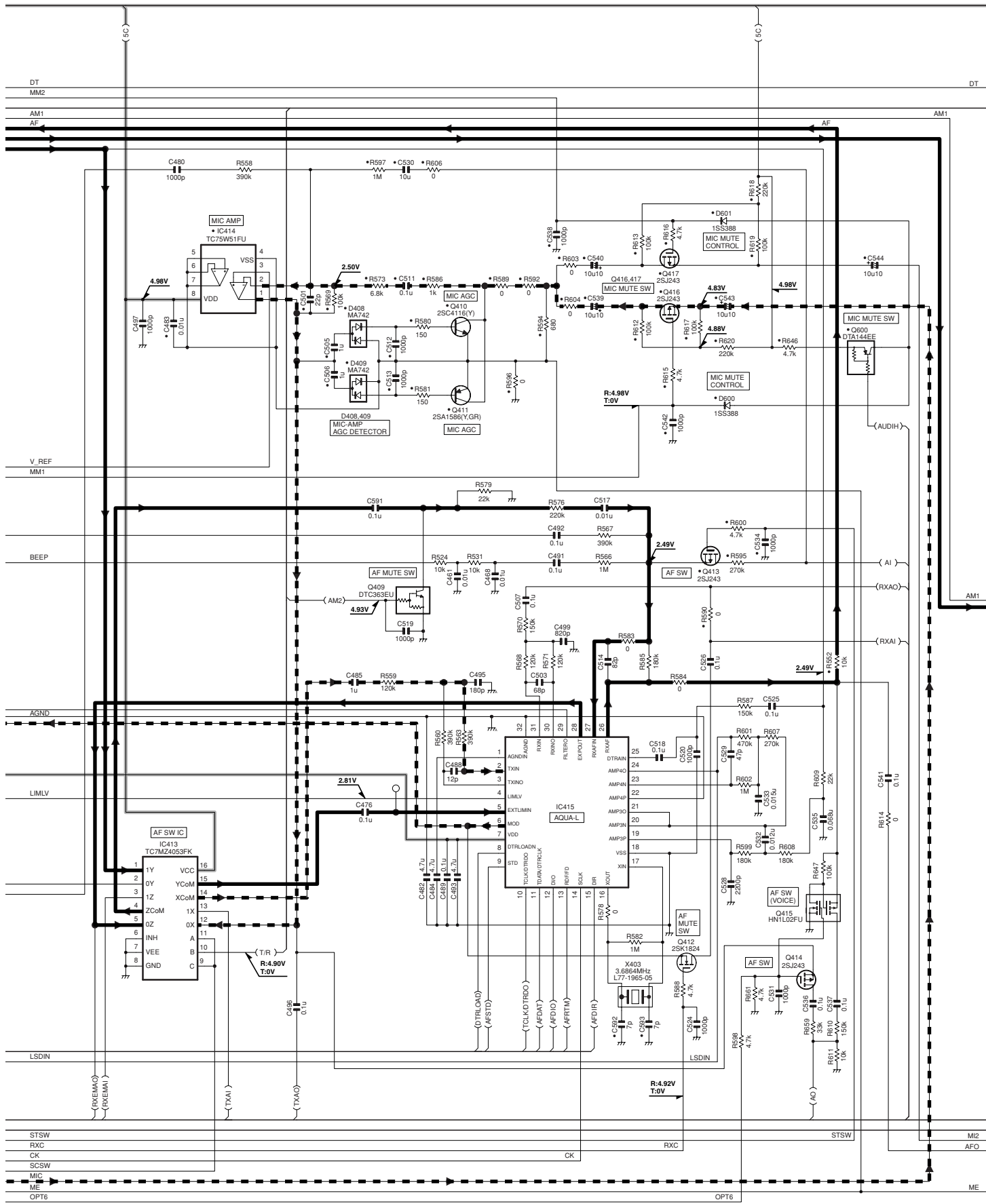
# TK-8180 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6990-XX) (B/3)



# SCHEMATIC DIAGRAM TK-8180

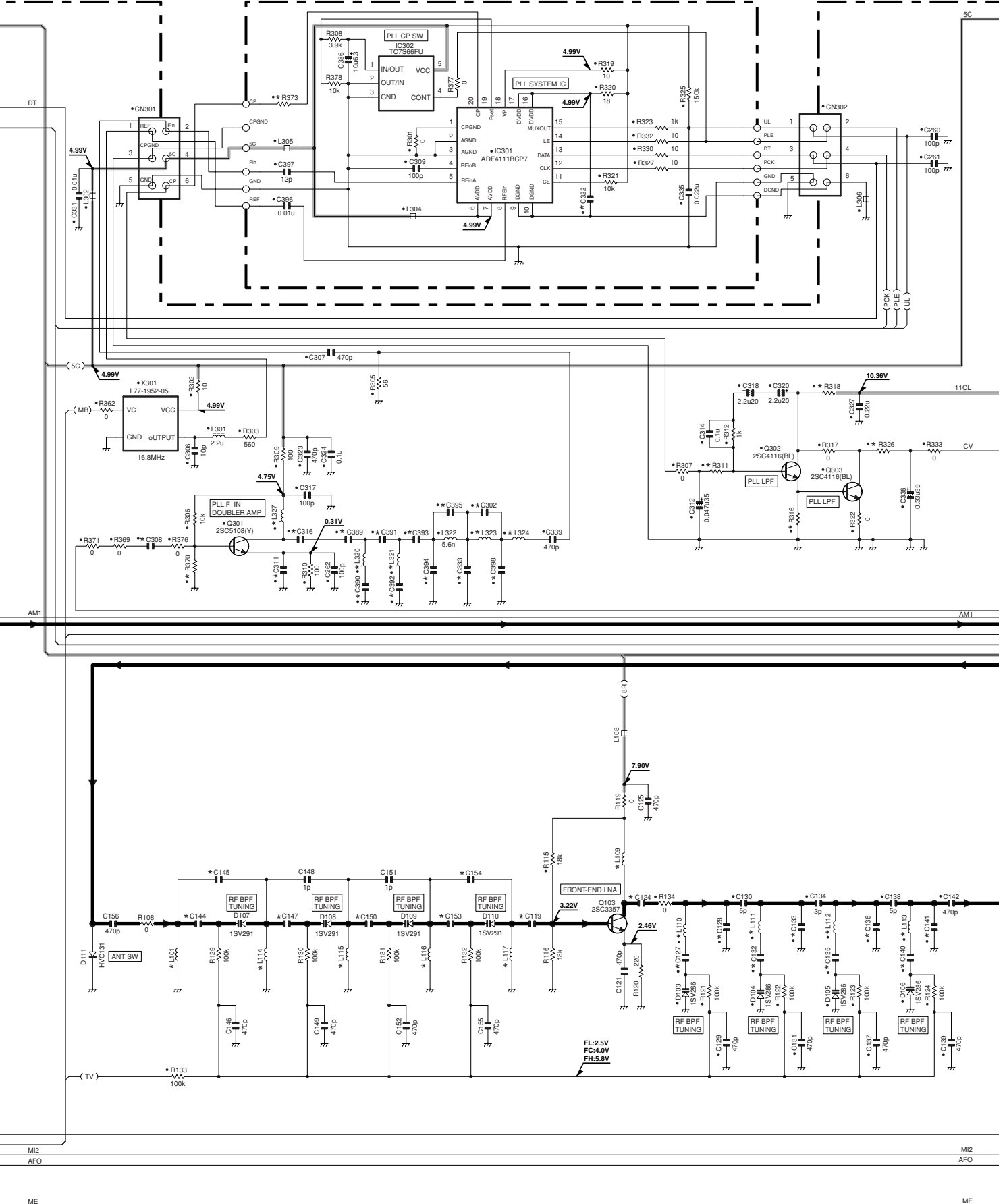
TX-RX UNIT (X57-6990-XX) (B/3)



# TK-8180 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6990-XX) (C/3)

TX-RX UNIT (X57-6990-XX) (B/3)

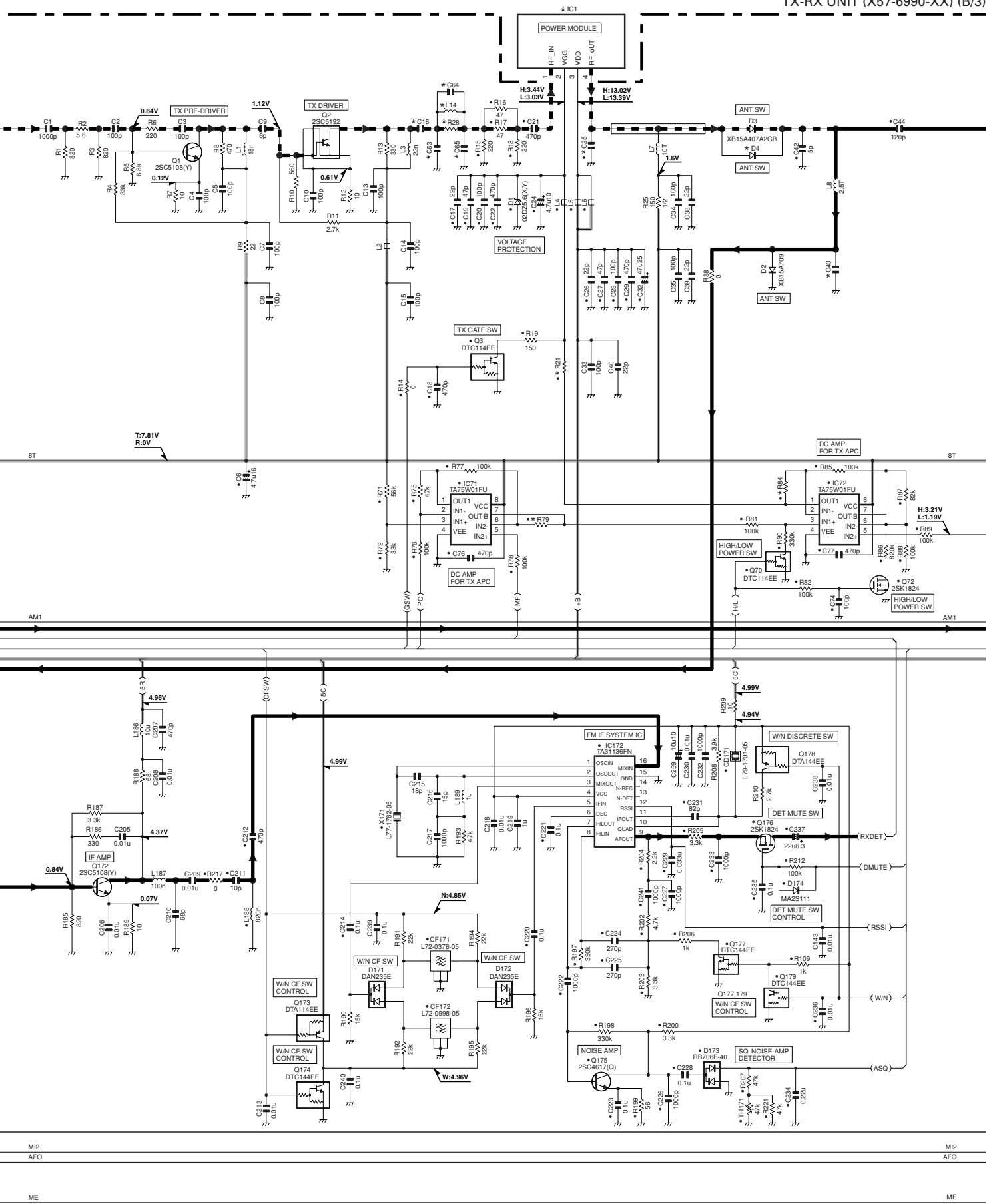






# TK-8180 SCHEMATIC DIAGRAM

TX-RX UNIT (X57-6990-XX) (B/3)



M12

AFO

M12

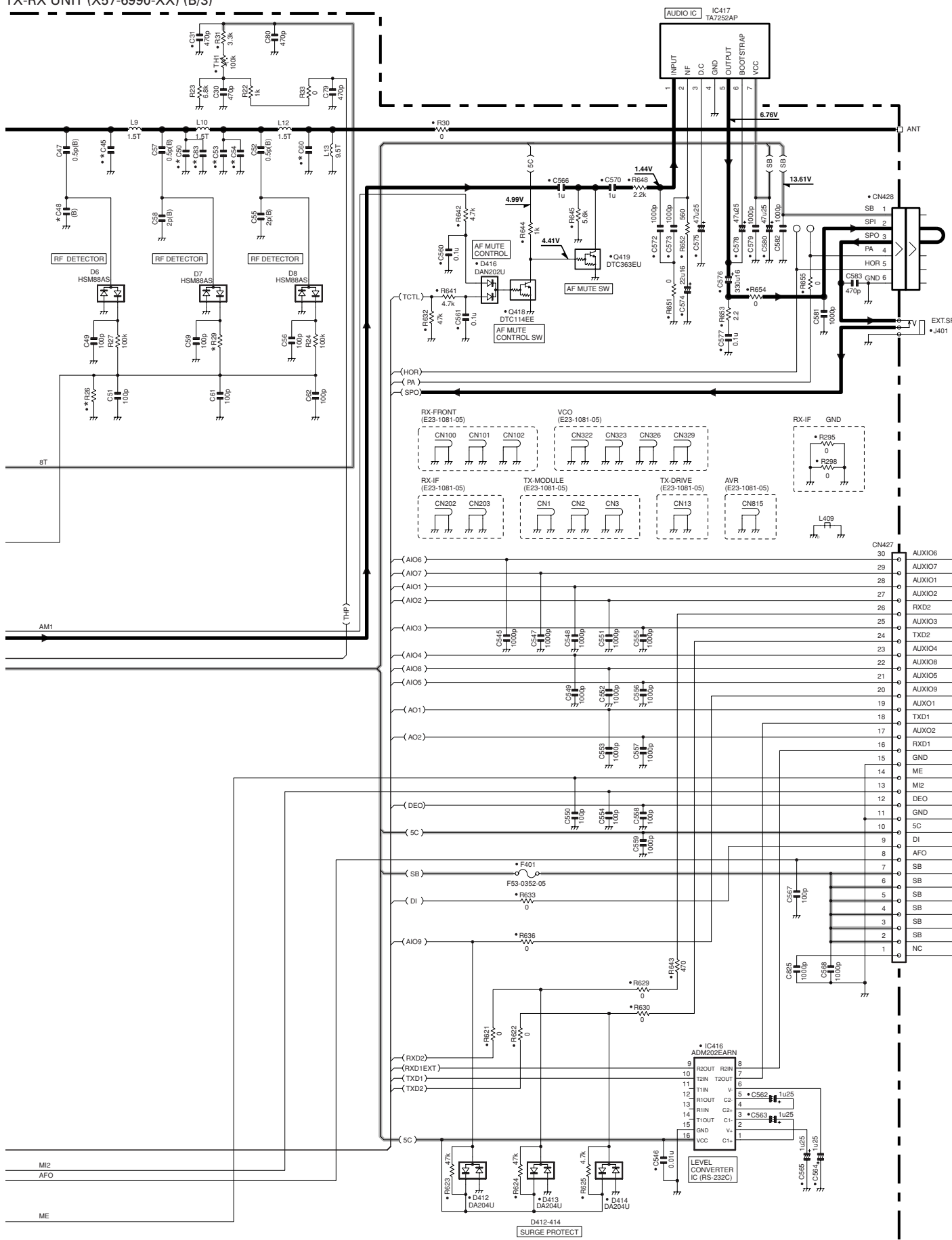
AFO

ME

ME

# SCHEMATIC DIAGRAM TK-8180

TX-RX UNIT (X57-6990-XX) (B/3)



# TK-8180 SCHEMATIC DIAGRAM

X57-6990-XX	C16	C25	C43	C45	C48	C50	C53	C54	C60	C63	C64	C65	C83	C119	C124	C127	C128	C132	C133	C135	C136	
-10	K	6p	1p	3p	3p	8p	NO	NO	6p	NO	NO	NO	NO	5p	10p	22p	9p	22p	6p	22p	4p	
-11	K2	8p	2p	5p	2p	2p	7p	9p	4p	8p	5p	8p	6p	4p	10p	6p	27p	7p	27p	7p	27p	6p

X57-6990-XX	C140	C141	C144	C145	C147	C150	C153	C154	C171	C173	C175	C302	C308	C311	C316	C322	C333	C346	C347	C350	C351
-10	K	22p	9p	7p	1.5p	5p	5p	1.5p	6p	12p	6p	0.5p	10p	39p	8p	0.047u	5p	22p	22p	8p	0.5p
-11	K2	27p	10p	8p	2p	8p	8p	2p	10p	18p	10p	1.5p	100p	100p	100p	470p	4p	39p	39p	11p	1.5p

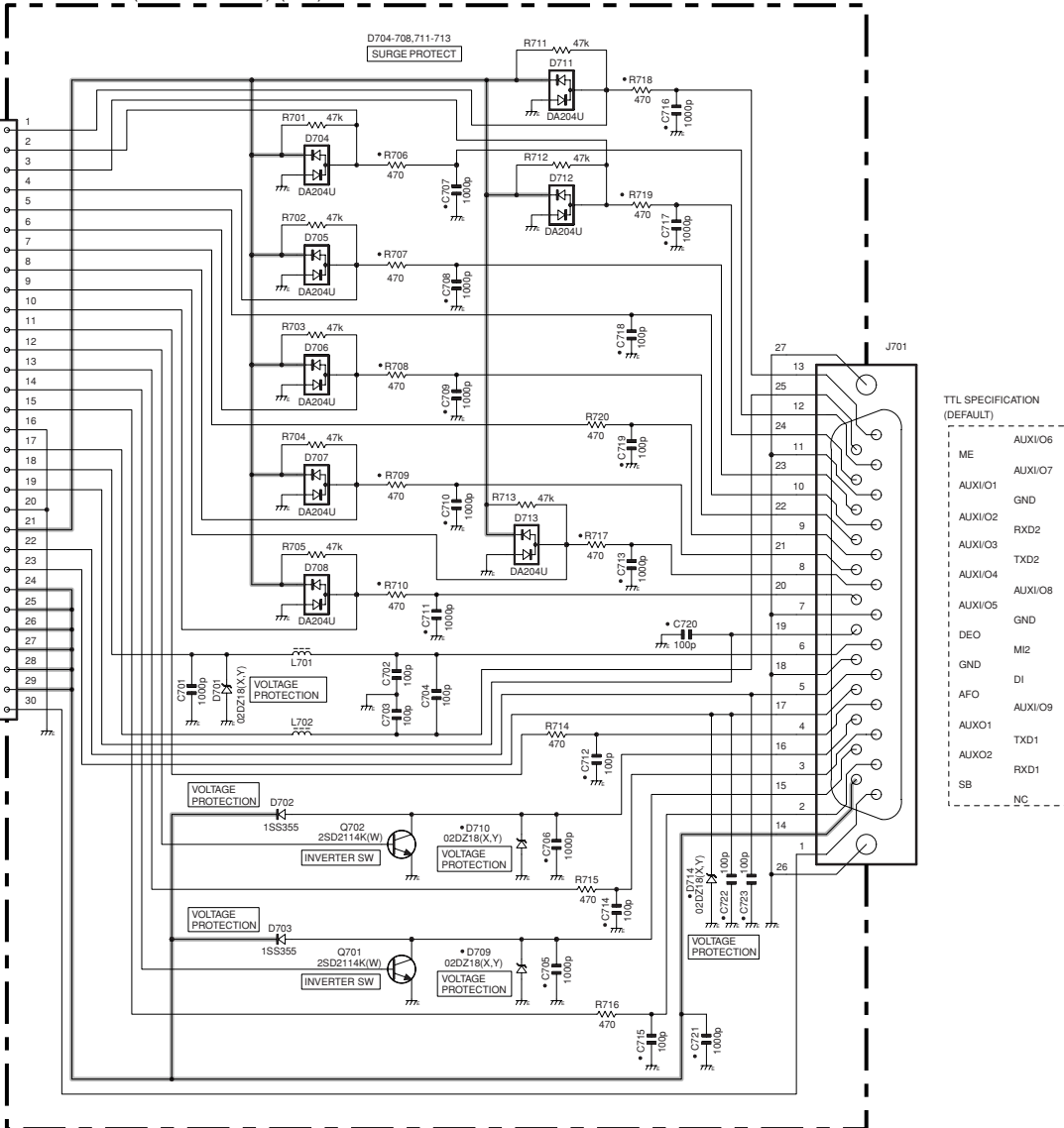
X57-6990-XX	C354	C358	C365	C372	C375	C379	C387	C388	C389	C390	C391	C392	C393	C394	C395	C398	R21	R26	R28	R29	R79	
-10	K	4p	5p	0.3p	22p	27p	6p	5p	5p	6p	12p	2p	12p	6p	4p	2p	1p	330	10k	0	82k	220k
-11	K2	5p	6p	0.5p	18p	12p	5p	8p	8p	2p	8p	1.5p	22p	5p	2p	2.5p	7p	470	8.2k	NO	100k	120k

X57-6990-XX	R84	R311	R316	R318	R326	R344	R345	R349	R350	R352	R354	R355	R357	R358	R360	R370	R373	R375	L14	L101	L109	
-10	K	120k	1.8k	100k	1.8k	270	47	0	33k	33k	10	NO	56	10k	8.2k	120	10k	10	330	NO	8.2n	18n
-11	K2	82k	1k	82k	4.7k	330	18	220	18k	39k	100	120	100	22k	22k	100	18k	0	820	4.7n	10n	12n

X57-6990-XX	L110	L111	L112	L113	L114	L115	L116	L117	L119	L171	L172	L314	L318	L319	L320	L321	L323	L324	
-10	K	L34-4565-05	L34-4565-05	L34-4565-05	L34-4565-05	8.2n	8.2n	8.2n	8.2n	33n	15n	15n	L34-4607-05	22n	22n	10n	8.2n	4.7n	2.2n
-11	K2	L34-4566-05	L34-4566-05	L34-4566-05	L34-4566-05	10n	10n	10n	10n	2.2n	18n	18n	L34-4608-05	27n	33n	15n	15n	5.6n	3.3n

X57-6990-XX	L325	L326	L327	L328	D4	IC1	
-10	K	L34-4605-05	1.0u	33n	22n	NO	RA30H4452M-23
-11	K2	L34-4645-05	470n	18n	18n	XB15A407A2GB	RA30H4047M-23

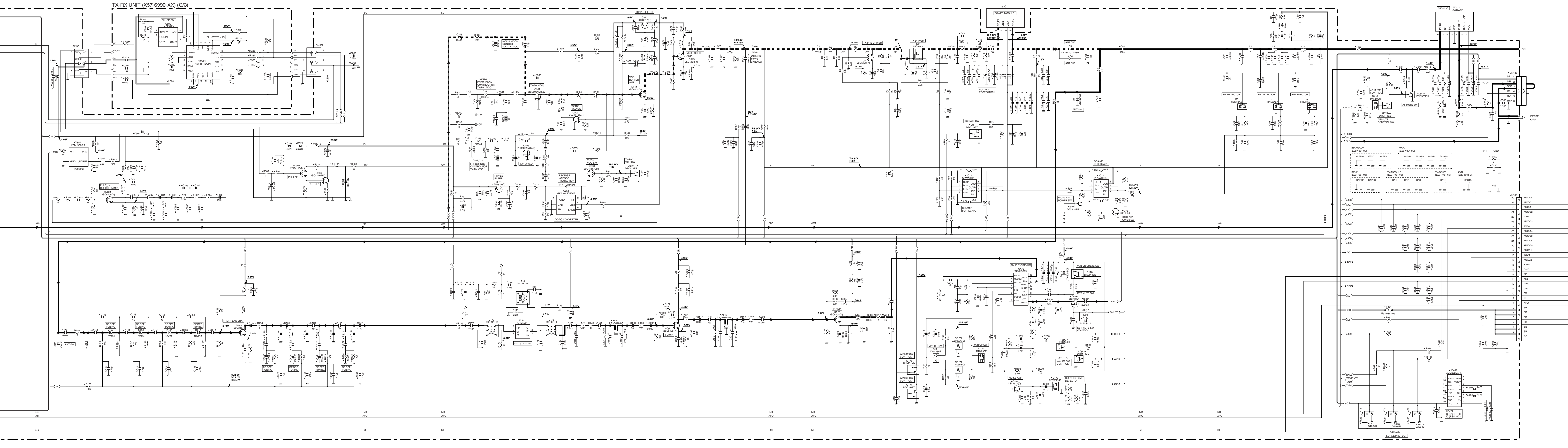
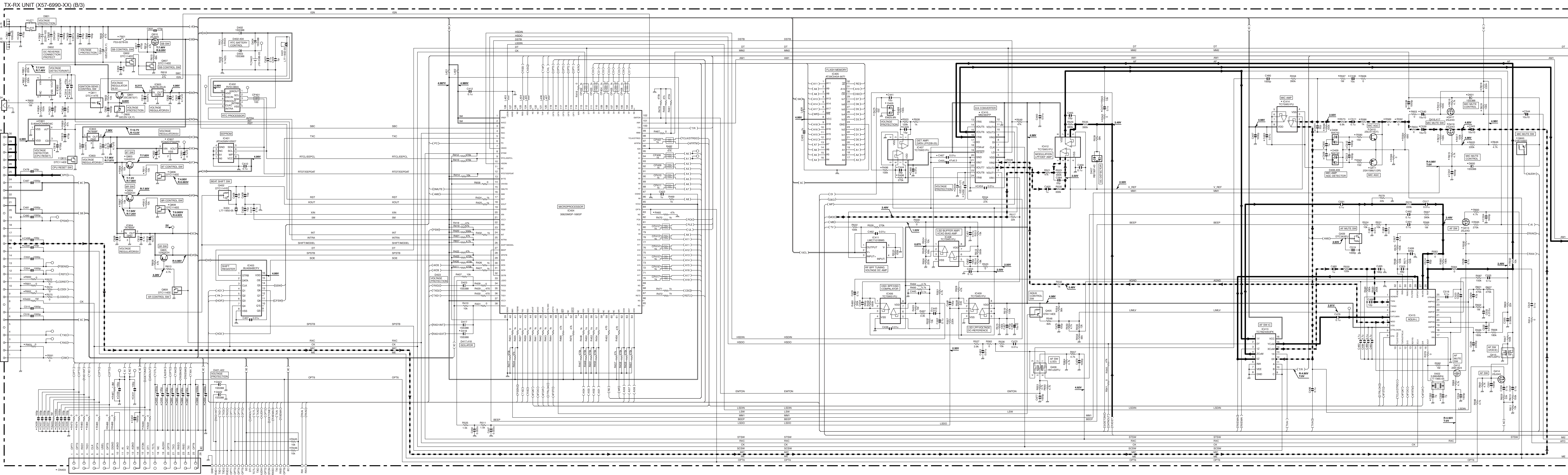
TX-RX UNIT (X57-6990-XX) (A/3)



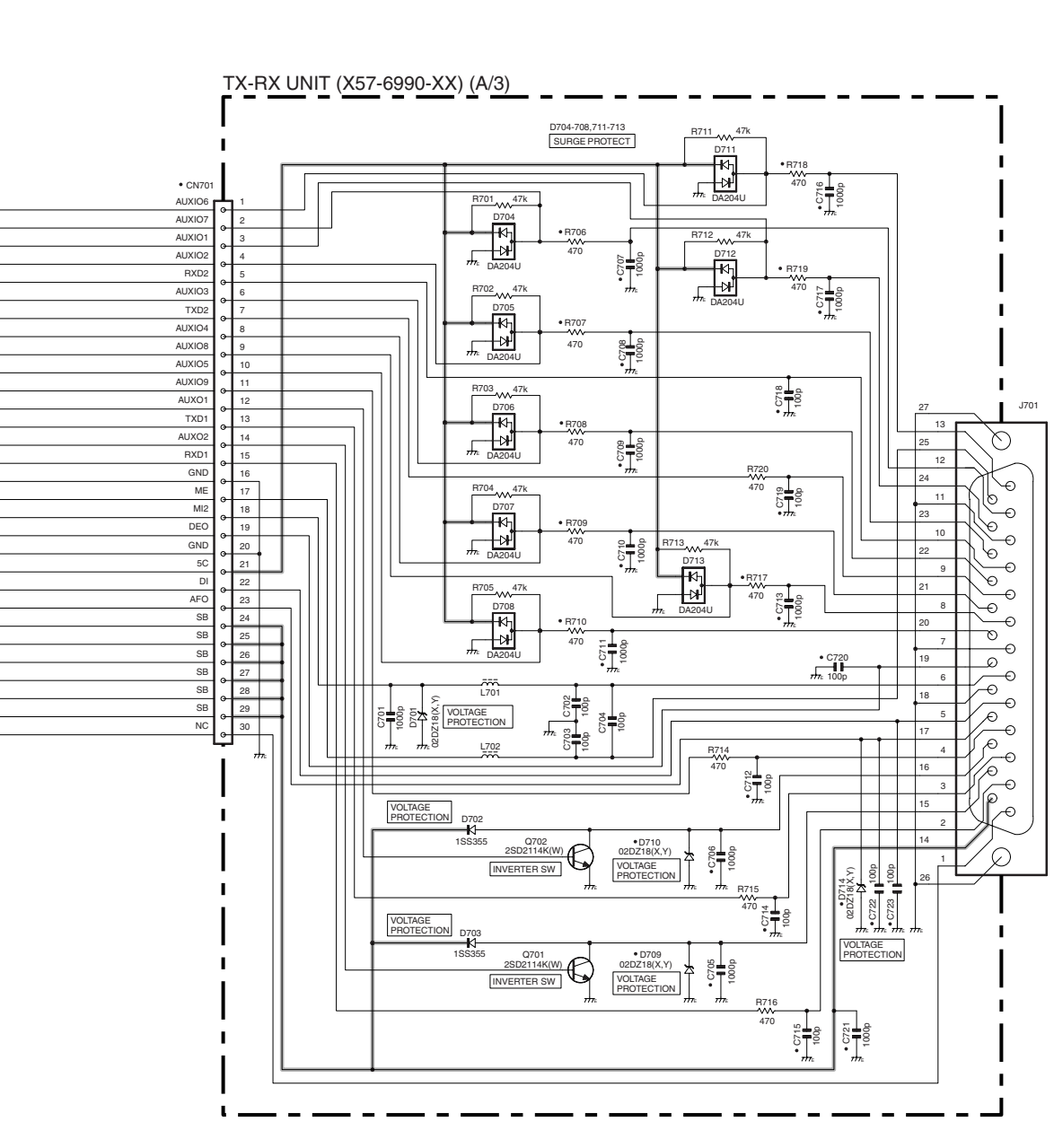
TTL SPECIFICATION (DEFAULT)

AUXIO6	AUXIO6
AUXIO7	AUXIO7
AUXIO1	GND
AUXIO2	RXD2
AUXIO3	TXD2
AUXIO4	AUXIO8
AUXIO5	GND
DEO	Mi2
GND	DI
AFO	AUXIO9
AUXO1	TXD1
AUXO2	RXD1
SB	NC

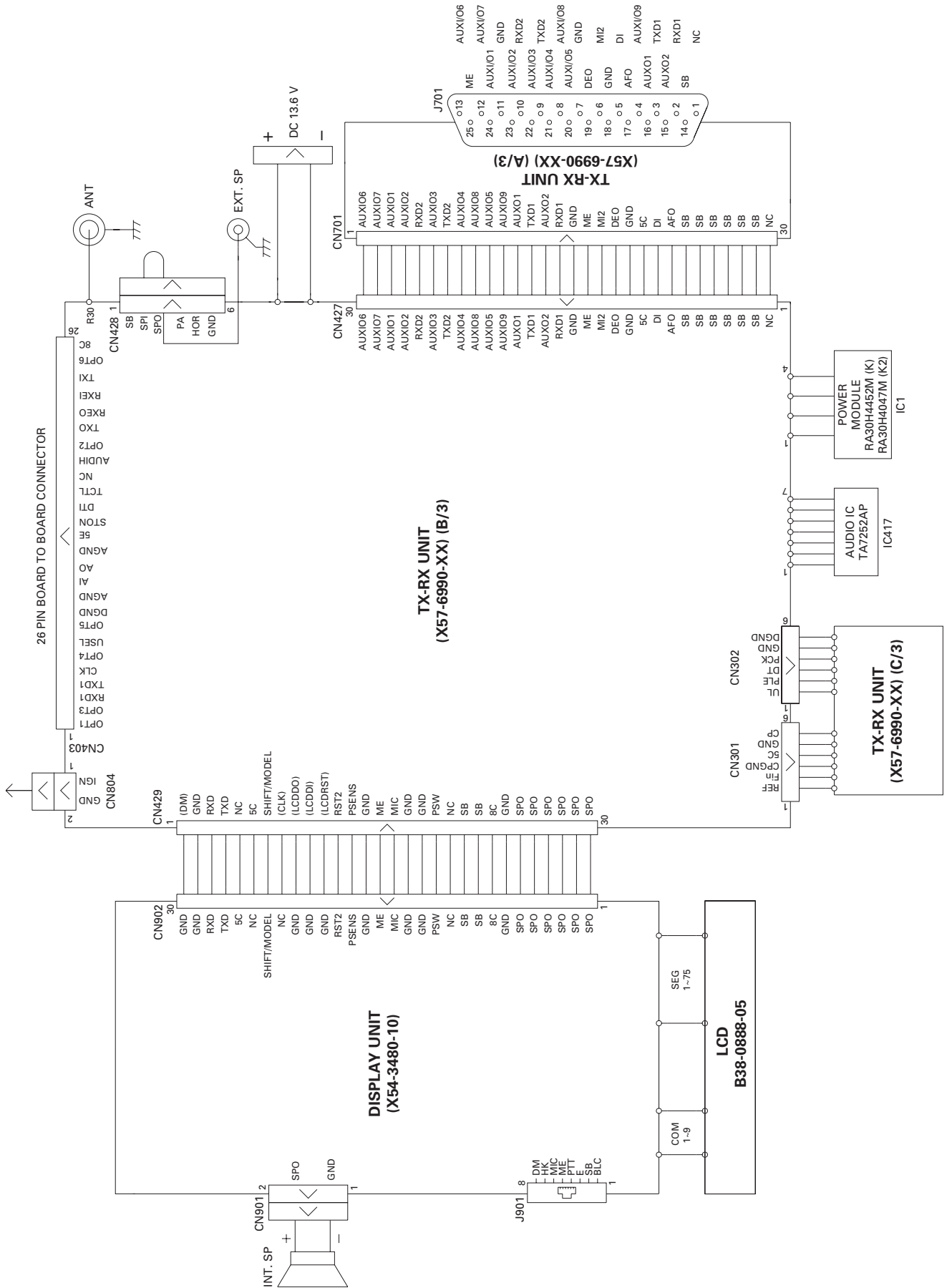
Note : The components marked with a dot (•) are parts of layer 1.



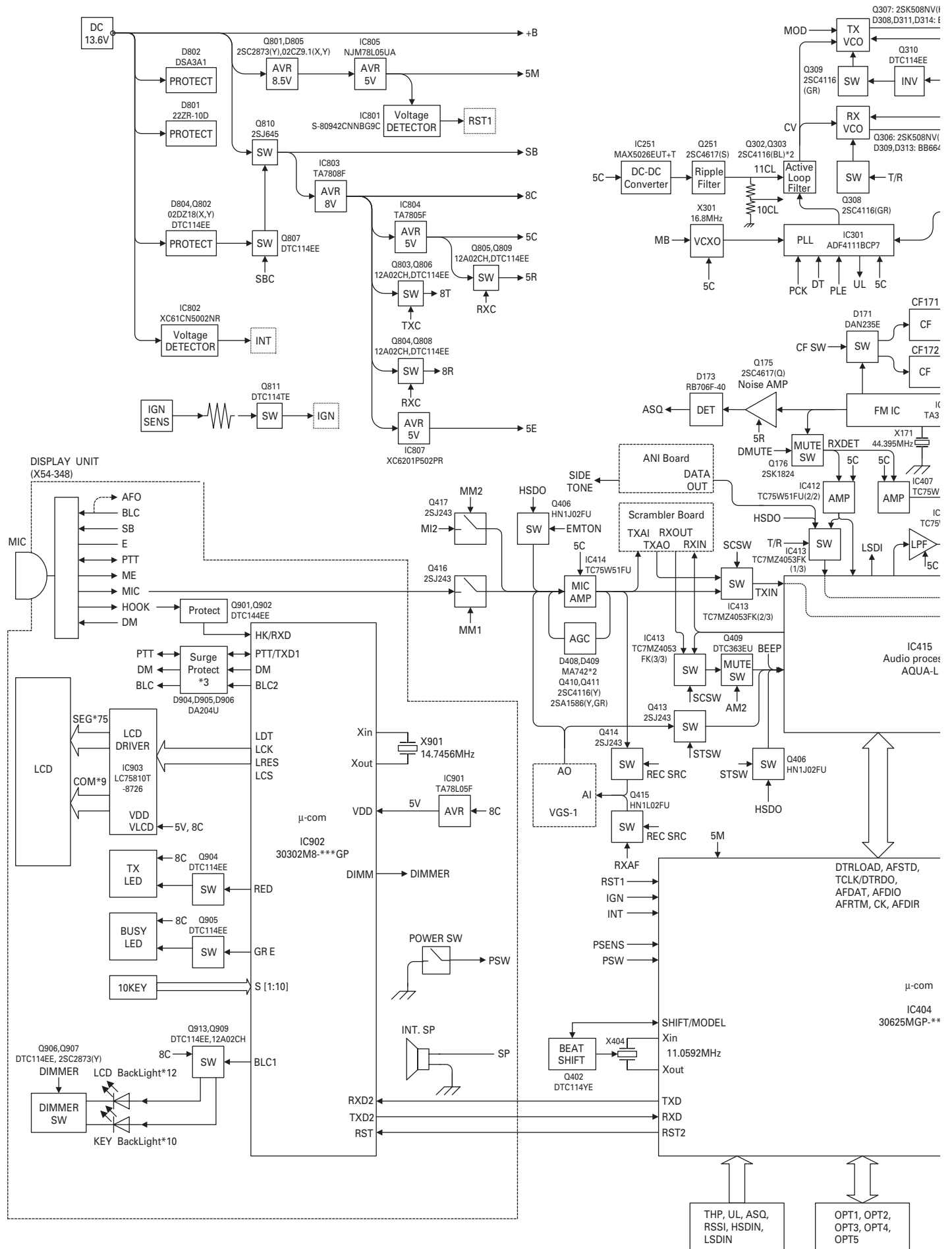
REF ID	QTY	DESCRIPTION	MANUFACTURER
X57-6990-XX	1	TX-RX UNIT (X57-6990-XX) (B/3)	
X57-6990-XX	1	TX-RX UNIT (X57-6990-XX) (C/3)	
X57-6990-XX	1	TX-RX UNIT (X57-6990-XX) (A/3)	



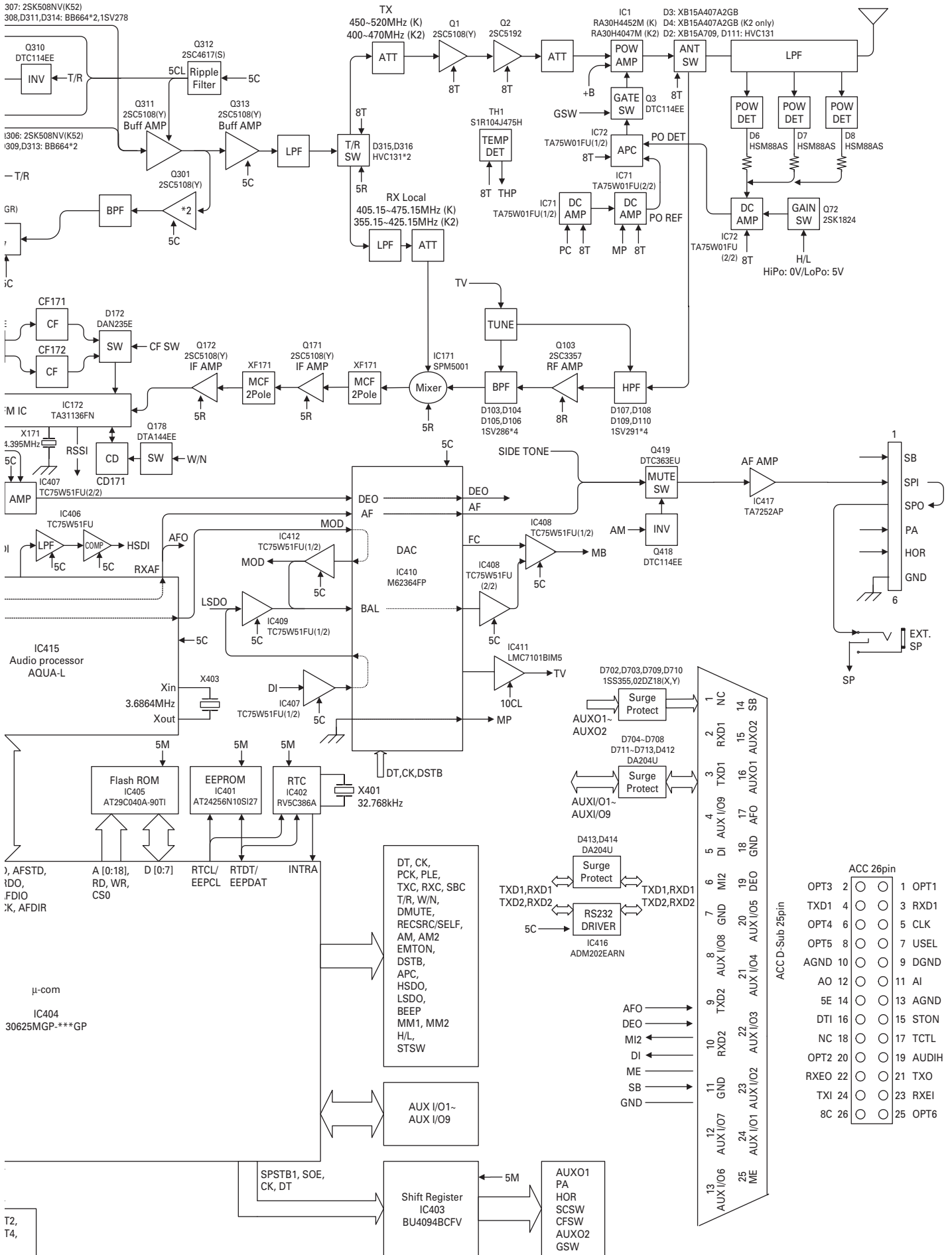
## INTERCONNECTION DIAGRAM



# TK-8180 BLOCK DIAGRAM

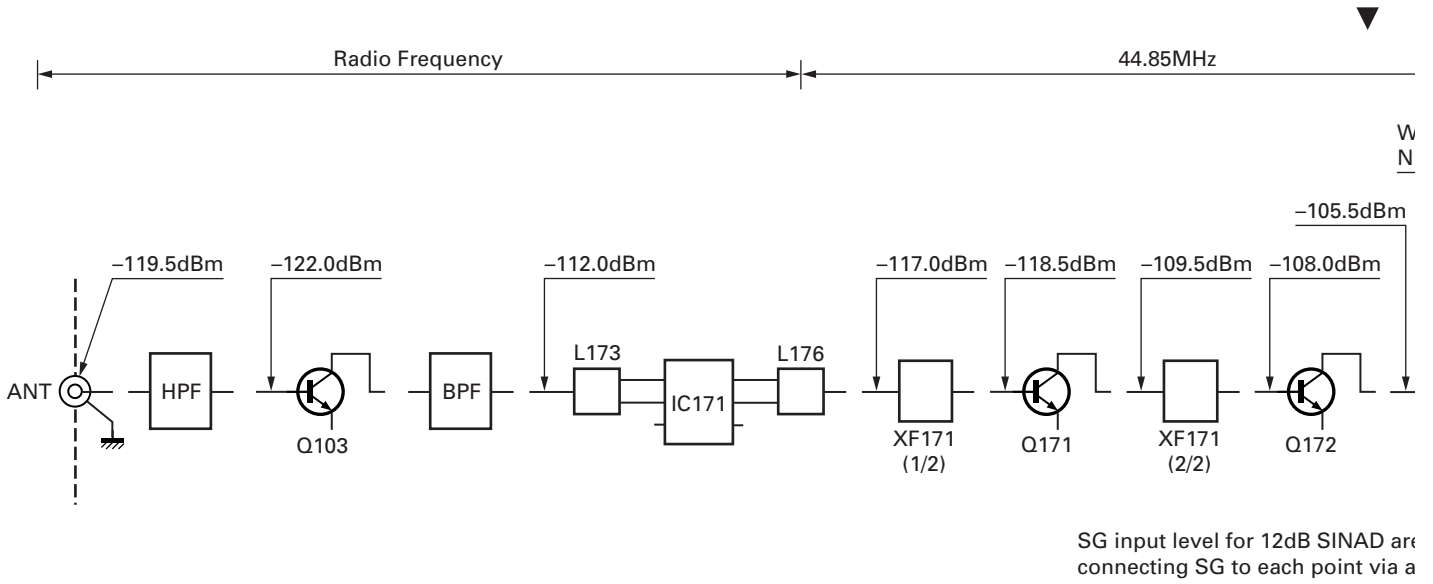


# BLOCK DIAGRAM TK-8180

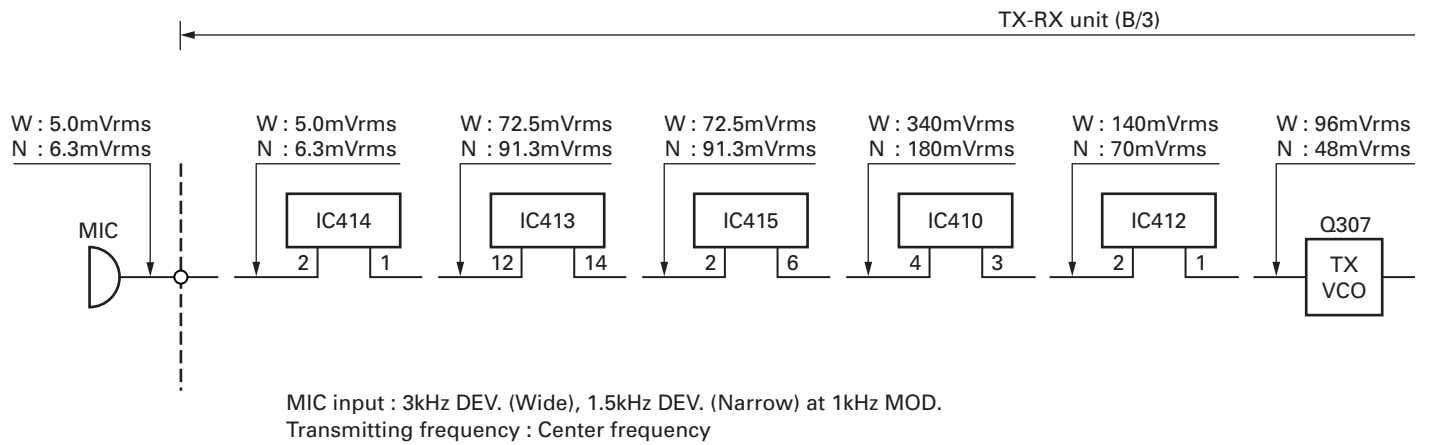


## LEVEL DIAGRAM

### Receiver Section

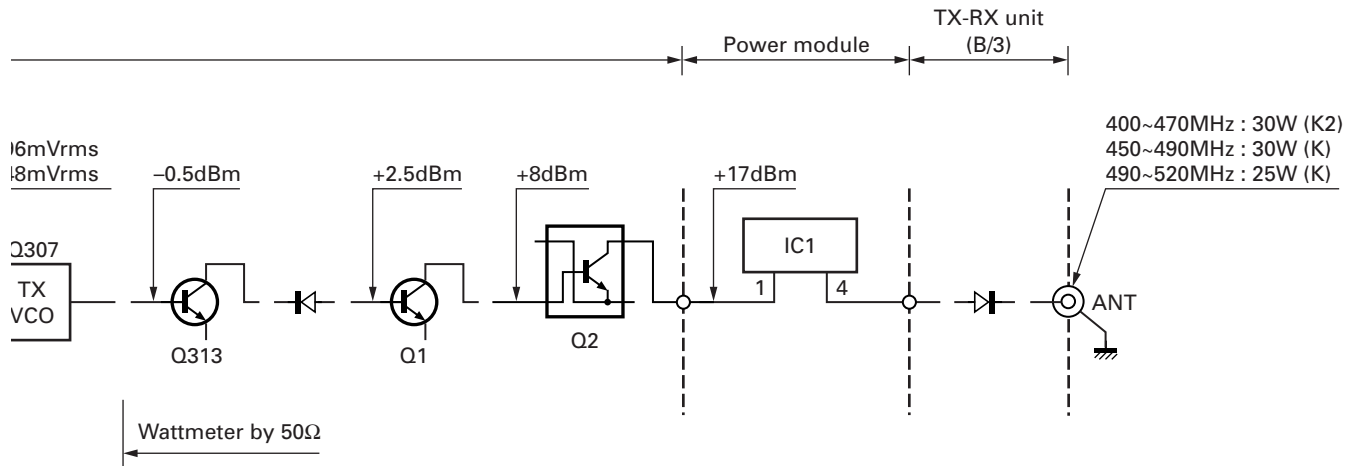
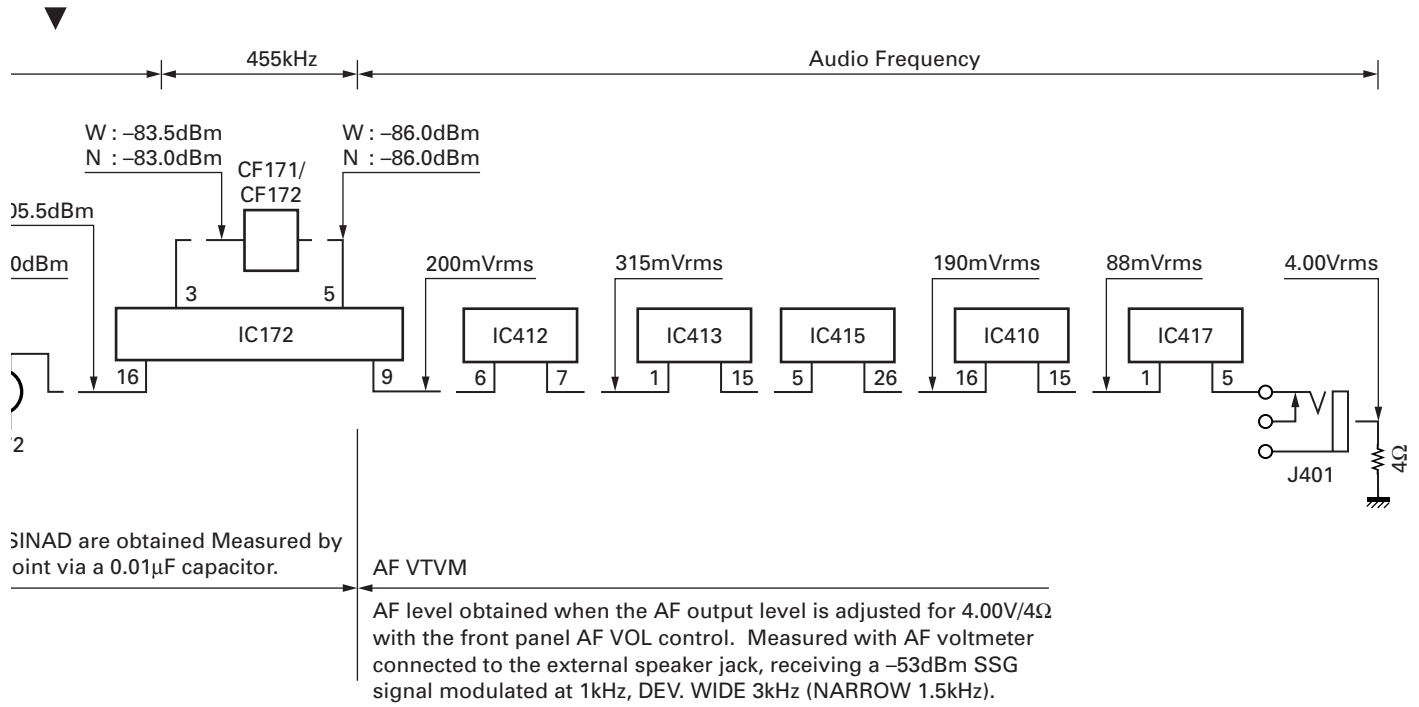


### Transmitter Section





## LEVEL DIAGRAM



## SPECIFICATIONS

### GENERAL

Frequency range .....	K : 450~520MHz	K2 : 400~470MHz
Number of channels .....	Zone : Max. 128 per radio	Ch/GID : Max. 250 per zone (Max. 512 [Conv. Ch's + GID's] total per radio)
Channel spacing .....	Wide : 25kHz	Narrow : 12.5kHz
Operating voltage .....	13.6V DC $\pm$ 15%	
Current drain		
Standby .....	0.4A	
Receive .....	1.0A	
Transmit .....	9.0A	
Duty cycle .....	Transmit : 20%	
Operating temperature range .....	-22°F~+140°F (-30°C~+60°C)	
Frequency stability .....	$\pm$ 0.00025% (-22°F~+140°F)	
Antenna impedance .....	50 $\Omega$	
Channel frequency spread .....	70MHz	
Dimensions (W x H x D) .....	6-5/16 x 1-3/4 x 6-3/16 in. (160 x 45 x 157 mm) (Projections not included)	
Weight (net) .....	3.31lbs. (1.5kg)	

### RECEIVER (Measurements made per EIA/TIA-603)

Sensitivity (12dB SINAD) .....	Wide : 0.25 $\mu$ V	Narrow : 0.28 $\mu$ V
Selectivity .....	Wide : 80dB	Narrow : 67dB
Intermodulation distortion .....	W/N : 75dB ( $\pm$ 50, 100kHz)	
Spurious response .....	85dB	
Audio output (4 $\Omega$ impedance) .....	4W with less than 5% distortion	

### TRANSMITTER (Measurements made per EIA/TIA-603)

RF power output .....	K : 30 to 1W (490~520MHz : 25 to 1W)	K2 : 30 to 1W
Spurious response .....	70dB	
Type of emission .....	Wide : 16K0F3E	Narrow : 11K0F3E
FM hum & noise .....	Wide : 50dB	Narrow : 45dB
Audio distortion .....	W/N : 3%	
Microphone impedance .....	600 $\Omega$	

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