

UHF FM TRANSCEIVER

TK-860G/862G

SERVICE MANUAL

SUPPLEMENT

KENWOOD

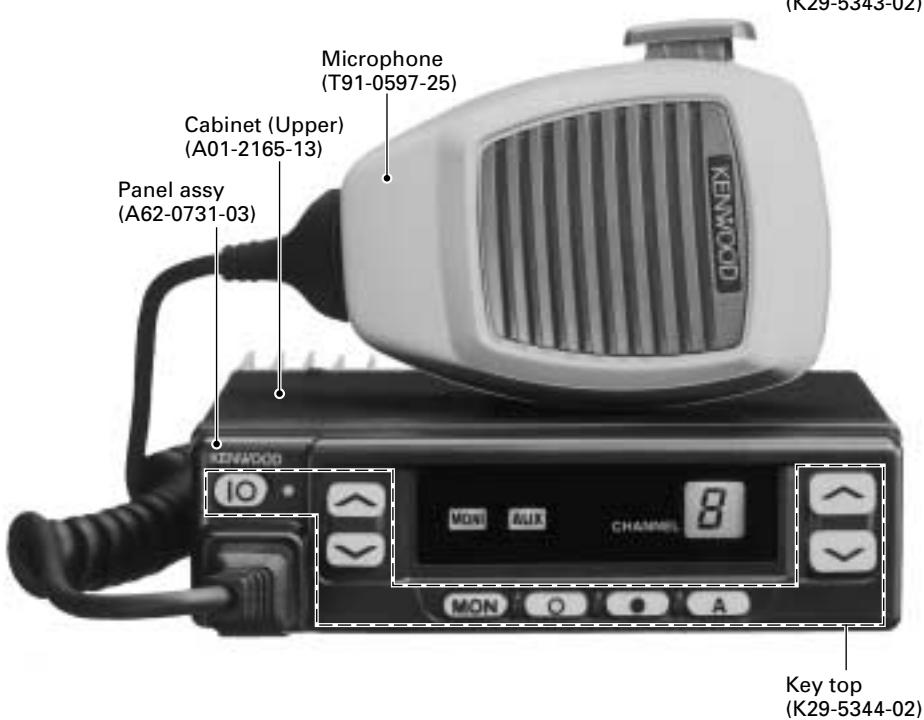
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This service manual mainly covers TK-860G K2, M2 and TK-862G K2.
If information you require is missing from this service manual.
Please refer to the B51-8498-10 service manual.

TK-860G (K)



TK-862G (K)



TK-860G/862G

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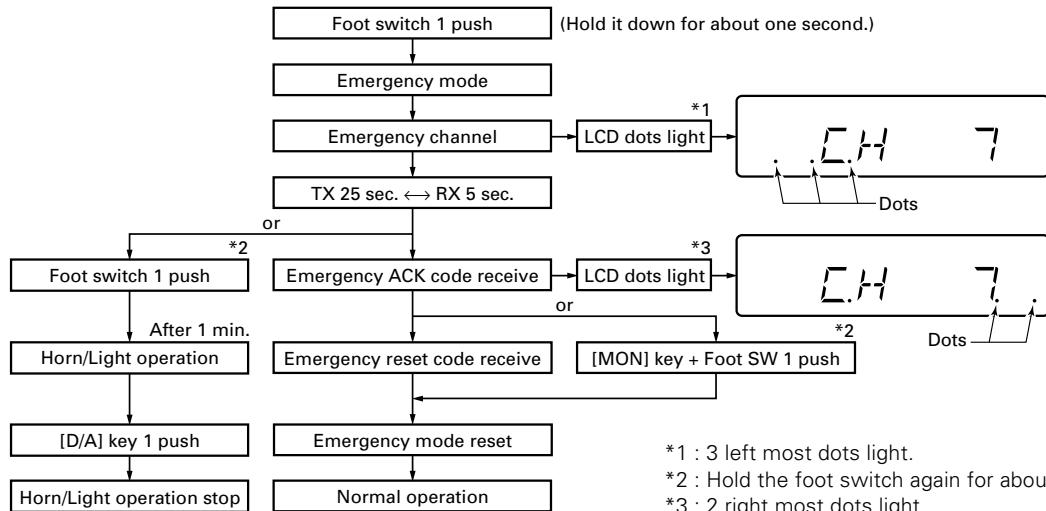
OPERATING FEATURES

Emergency

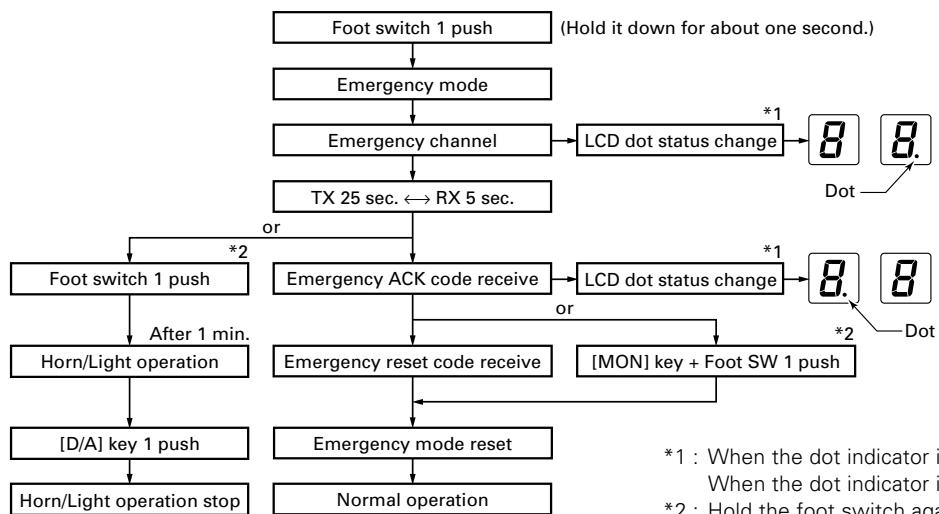
Pressing this key for longer than 1 second causes the transceiver to enter the emergency mode. The transceiver jumps to the programmed "Emergency the group and channel" and transmits for 25 seconds.

The transceiver disables mic mute while transmitting. After finishing transmission, the transceiver receives for 5 seconds. The transceiver mutes the speaker while receiving. Following the above sequence, the transceiver continues to transmit and receive.

■ Emergency mode system chart (TK-860G)



■ Emergency mode system chart (TK-862G)



TK-860G/862G

REALIGNMENT

Clone Mode

Programming data can be transferred from one radio to another by connecting them via their modular microphone jacks. The operation is as follows (the transmit radio is the master and the receive radio is the slave).

1. Turn the master TK-860G power ON with the [\blacktriangledown] key held down. If the password is set to the TK-860G, the TK-860G displays "CLN LOCK". If the password is not set, the TK-860G displays "CLONE".
2. When "CLN LOCK" is displayed, only the [CH \blacktriangleleft / \blacktriangleright] key and [SCN], and [0] to [9] keys can be accepted. When you enter the correct password, and "CLONE" is displayed, the TK-860G can be used as the cloning master. The following describes how to enter the password.
3. How to enter the password with the microphone keypad; If you press a key while "CLN LOCK" is displayed, the number that was pressed is displayed on the TK-860G. Each press of the key shifts the display in order to the left. When you enter the password and press the [SCN] key, "CLONE" is displayed if the entered password is correct. If the password is incorrect, "CLN LOCK" is redisplayed.
How to enter the password with the [CH \blacktriangleleft / \blacktriangleright] key;
If the [CH \blacktriangleleft / \blacktriangleright] key is pressed while "CLN LOCK" is displayed, numbers (0 to 9) are displayed flashing. When you press the [SCN] key, the correctly selected number is determined, and the display shifts to the left. If you press the [SCN] key after entering the password in this procedure, "CLONE" is displayed if the entered password is correct. If the password is incorrect, "CLN LOCK" is redisplayed.
4. Power on the slave TK-860G/862G.
5. Connect the cloning cable (No. E30-3382-05) to the modular microphone jacks on the master and slave.
6. Press the [SCN] key on the master while the master displays "CLONE". The data of the master is sent to the slave. While the slave is receiving the data, "-PC-" is displayed. When cloning of data is completed, the master displays "END", and the slave automatically operates in the User mode. The slave can then be operated by the same program as the master.
7. The other slave can be continuously cloned. When the [SCN] key on the master is pressed while the master displays "END", the master displays "CLONE". Carry out the operation in step 4 to 6.

Note :

You can clone the programmed data between the transceiver frequency version must be same.

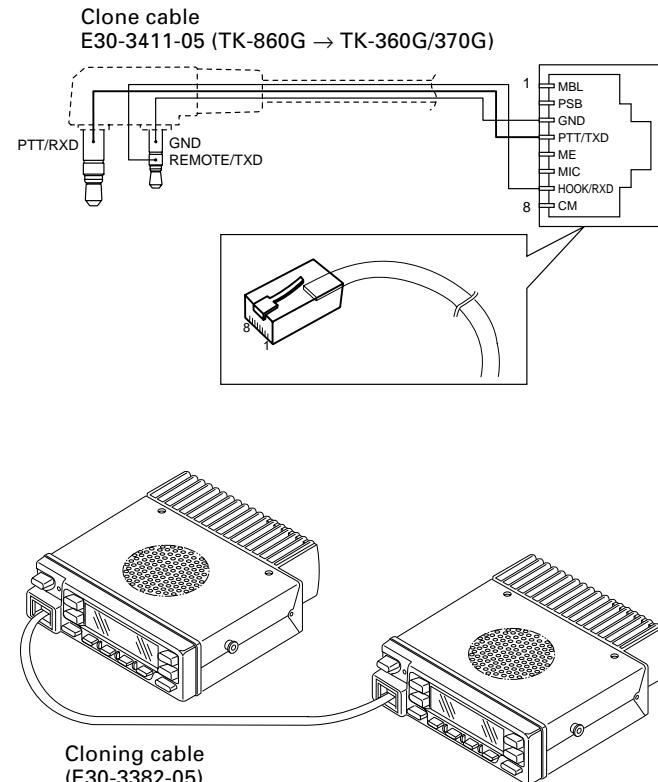


Fig. 1

INSTALLATION

Ignition Sense Cable (KCT-18 : Option)

The KCT-18 is an optional cable for enabling the ignition function. The ignition function lets you turn the power to the transceiver on and off with the car ignition key.

If you use the Horn Alert function or the Manual Relay function, you can turn the function off while driving with the ignition key.

■ Connecting the KCT-18 to the Transceiver

1. Install the KCT-19 in the transceiver.
2. Insert the KCT-18 lead terminal (②) into pin 3 of the square plug (①) supplied with the KCT-19, then insert the square plug into the KCT-19 connector (③).

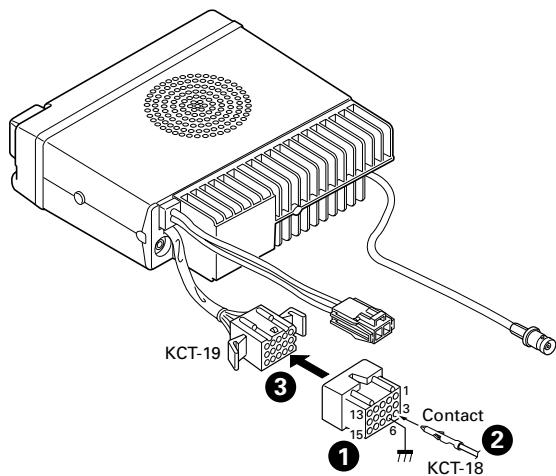


Fig. 1

■ Modifying the Transceiver

Modify the transceiver as follows to turn the power or the Horn Alert or Manual Relay function on and off with the ignition key.

1. Remove the lower half of the transceiver case.
2. Set jumper resistors (0Ω) R134 and R135 of the TX-RX unit (A/2) as shown in Table 1.

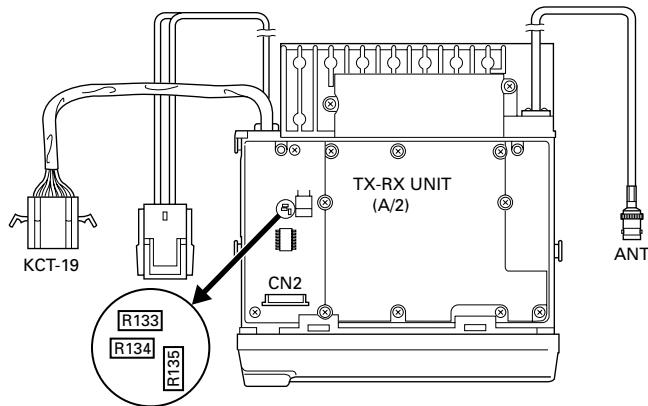


Fig. 2

Operation when KCT-18 is connected	R134	R135	
	Enable	Enable	← KCT-18 cannot be connected
Power on/off and Horn Alert or AUX-A on/off	Disable	Enable	
Horn Alert or AUX-A on/off	Enable	Disable	
	Disable	Disable	← Power cannot be turned on

Table 1 R134 and R135 setup chart

PA/HA Unit (KAP-1 : Option)

■ Installing the KAP-1 in the Transceiver

The Horn Alert (max. 2A drive) and Public Address functions are enabled by inserting the KAP-1 W1 (3P; white/black/red) into CN3 on the TX-RX unit, inserting W2 (3P; green) into CN7 on the TX-RX unit, and connecting the KCT-19 (option) to CN2 and CN3 of the KAP-1.

• Installation procedure

1. Open the upper case of the transceiver.
2. Insert the two cables (①) with connectors from the KAP-1 switch unit into the connectors on the transceiver.
3. Secure the switch unit board to the chassis with a screw (③). The notch (②) in the board must be placed at the front left side.
4. Attach the cushion on the top of the KAP-1 switch unit.

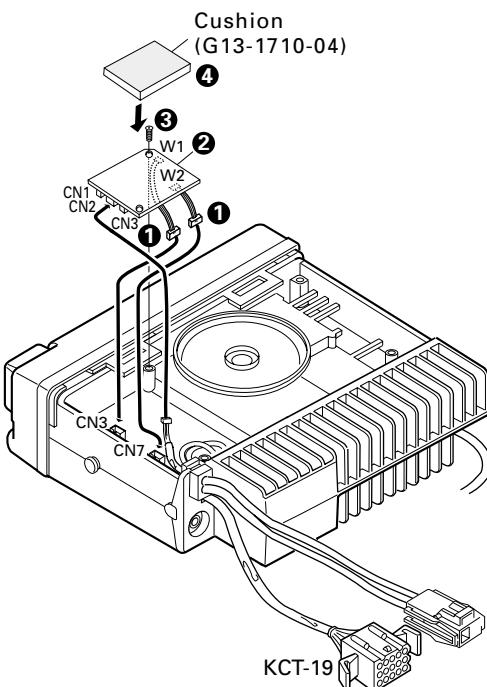


Fig. 3

TK-860G/862G

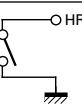
INSTALLATION

■ Modifying the Transceiver

• Horn alert

The signal from pin 4 of IC9 on the TX-RX unit turns Q5 and Q1 on and off and drives KAP-1 HA relay K2 to drive the horn with a maximum of 2A.

The default output is HR1. The relay open output can be obtained between HR1 and HR2 by removing R1 in the KAP-1.

	R1	Output form
HR1 (Default)	Enable	
HR2	Disable	

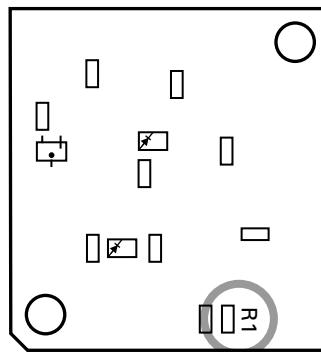


Fig. 4 KAP-1 foil side view

• Public address

The signal from pin 13 of IC9 on the TX-RX unit drives PA relay K1 in the KAP-1 and switches the audio power amplifier output between the external PA system (through KCT-19) and internal and external speakers.

To use the PA function, R153 on the TX-RX unit must be removed.

	R153
Use the PA function	Disable
Do not use the PA function	Enable

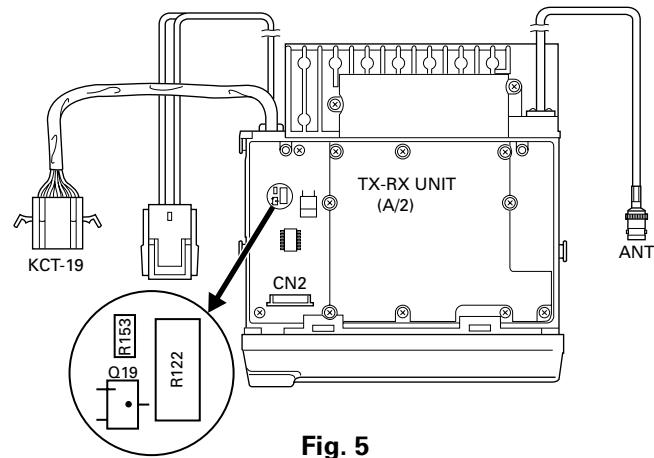


Fig. 5

■ Others

If the PA and HR2 are not necessary and the speaker output is output to an external unit through the KCT-19, connect the KCT-19 C connector to CN8 on the TX-RX unit.

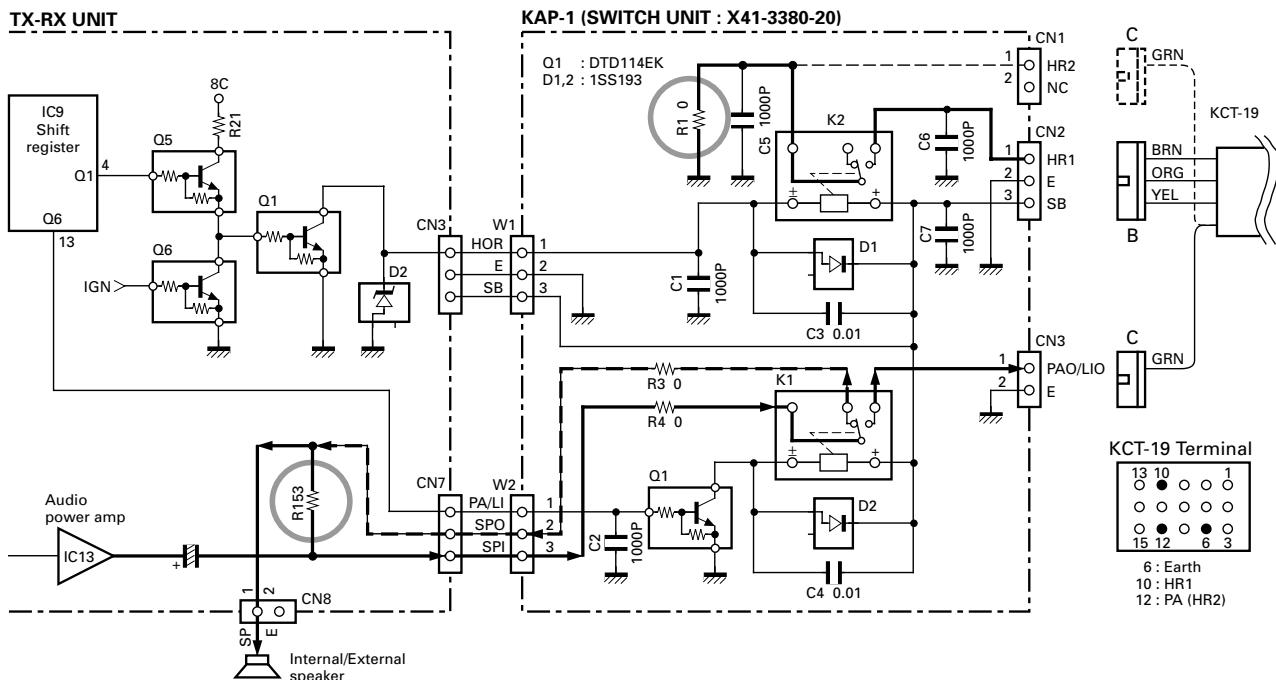


Fig. 6

INSTALLATION

Emergency Mode**■ Transceiver Modification Procedure****• Install the foot switch**

Install the foot switch through the KCT-19 and KCT-18. When the switch is treaded on, the radio enters the emergency mode.

• Change the power switch circuit

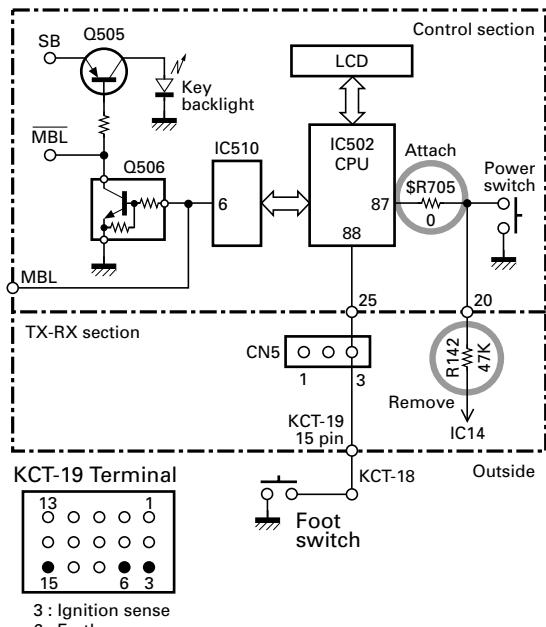
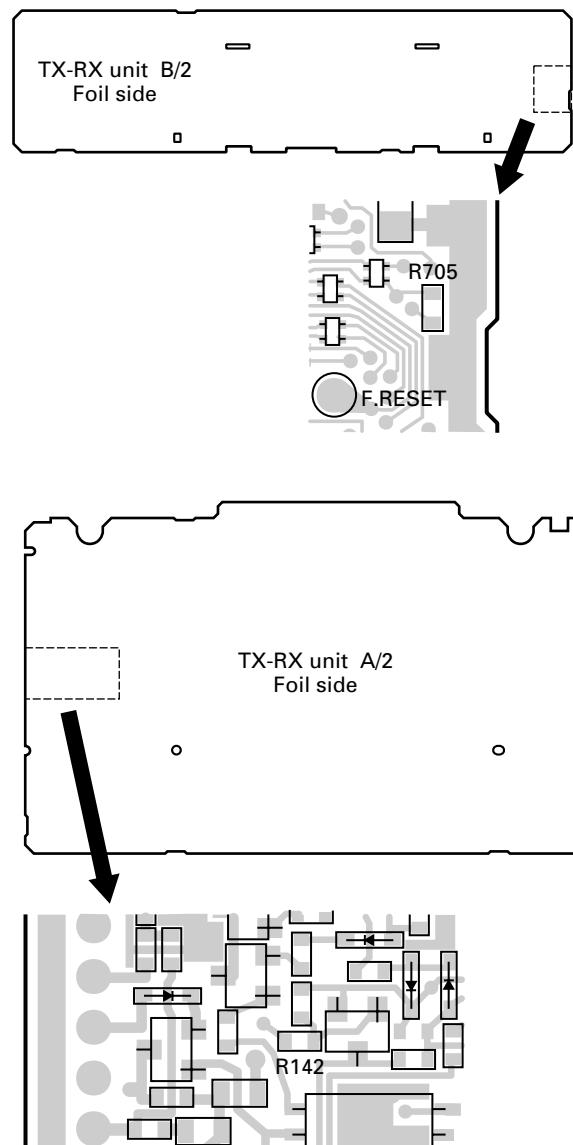
TX-RX unit (B/2) : Control section

\$R705 : Attach (R92-1252-05, 0Ω)

TX-RX unit (A/2) : RF section

R142 : Remove (RK73GB1J473J, 47kΩ)

Once the transceiver is modified, it cannot be turned on and off with the power switch. The power switch turns the LCD backlight and display on and off. (The power is switched on and off by IGNITION SENSE.)

**Fig. 7****Fig. 8**

TK-860G/862G

PARTS LIST

PLL/VCO (X58-4670-XX)

Ref. No.	Address	New parts	Parts No.	Description			Desti- nation
L112			L34-4548-05	AIR-CORE COIL			K,M
L112			L34-4549-05	AIR-CORE COIL			K3
L115			L34-4546-05	AIR-CORE COIL			K2,M2
L115			L34-4547-05	AIR-CORE COIL			K,M
L116			L34-4548-05	AIR-CORE COIL			K3
R101,102			RK73GB1J101J	CHIP R	100	J	1/16W
R103			RK73GB1J102J	CHIP R	1.0K	J	1/16W
R104			RK73GB1J101J	CHIP R	100	J	1/16W
R105			RK73GB1J154J	CHIP R	150K	J	1/16W
R106			RK73GB1J470J	CHIP R	47	J	1/16W
R107-110			RK73GB1J103J	CHIP R	10K	J	1/16W
R111			RK73GB1J331J	CHIP R	330	J	1/16W
R112			RK73GB1J181J	CHIP R	180	J	1/16W
R112,113			RK73GB1J221J	CHIP R	220	J	1/16W
R112,113			RK73GB1J221J	CHIP R	220	J	1/16W
R113			RK73GB1J221J	CHIP R	220	J	1/16W
R114			RK73GB1J470J	CHIP R	47	J	1/16W
R115			RK73GB1J103J	CHIP R	10K	J	1/16W
R116			RK73GB1J392J	CHIP R	3.9K	J	1/16W
R117			RK73GB1J101J	CHIP R	100	J	1/16W
D101-104			1SV283	VARIABLE CAPACITANCE DIODE			
D105			1SV214	VARIABLE CAPACITANCE DIODE			
Q101			2SK508NV(K52)	FET			
Q102			DTC114EUA	DIGITAL TRANSISTOR			
Q103			2SK508NV(K52)	FET			
Q104,105			2SC4081	TRANSISTOR			
Q106			2SC4226(R24)	TRANSISTOR			

Ref. No.	Address	New parts	Parts No.	Description			Desti- nation

ADJUSTMENT

Test Mode (TK-860G Only)**■ Test Mode Operating Features**

This transceiver has a test mode. **To enter test mode, press [SCN] key and turn power on. Hold [SCN] key until test channel No. and test signalling No. 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.

• Controls

[PTT]	Used when making a transmission.
[MON]	Monitor on and off.
[SCN]	Sets to the tuning mode.
[A]	Function on.
[D/A]	RF power high and low.
[▼]	Changes signalling.
[▲]	Changes wide and narrow
[CH▲/▼]	Changes channel.
[Volume▲/▼]	Volume up/down.

• LCD indicator

"SCN"	Unused.
"AUX"	Lights at RF power low.
"MON"	Lights at monitor on.
"Right side dot"	Lights at narrow.

• LED indicator

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

■ Frequency and Signalling

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

• Frequency (MHz)

Channel No.	TK-860G/862G (K2)		Tk-860G (M2)	
	RX	TX	RX	TX
1 (Center)	498.55000	498.60000	502.55000	502.60000
2 (Low)	485.05000	485.10000	485.05000	485.10000
3 (High)	511.95000	511.90000	519.95000	519.90000
4	498.50000	498.50000	502.00000	502.00000
5	498.70000	498.70000	502.20000	502.20000
6	498.90000	498.90000	502.40000	502.40000
7~16	-	-	-	-

• Signalling

Signalling No.	RX	TX
1	None	None
2	None	100Hz square
3	QT 67.0Hz	QT 67.0Hz
4	QT 151.4Hz	QT 151.4Hz
5	QT 210.7Hz	QT 210.7Hz
6	QT 250.3Hz	QT 250.3Hz
7	DQT D023N	DQT D023N
8	DQT D754I	DQT D754I
9	DTMF DEC, (159D)	DTMF ENC, (159D)
10	None	DTMF tone (9)
11	2-tone 321.7/928.1Hz	2-tone 321.7/928.1Hz
12	Single tone 1200Hz	Single tone 1200Hz

• Preparations for tuning the transceiver

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

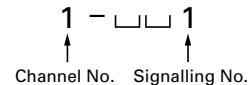
Whenever the transmitter is turned, the unit must be connected to a suitable dummy load (i.e. power meter).

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)**

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

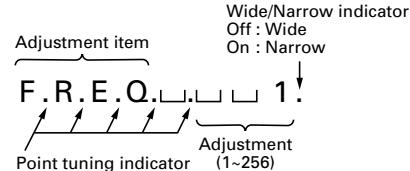
LCD display (Test mode)



Press [SCN], now in tuning mode. Use [D/A] button to write tuning data through tuning modes, and [CH▲/▼] to adjust tuning requirements (1 to 256 appears on LCD).

Use [▼] button to select the adjustment item through tuning modes. Use [A] button to adjust 3-point or 5-point tuning, and use [▲] button to switch between wide/narrow.

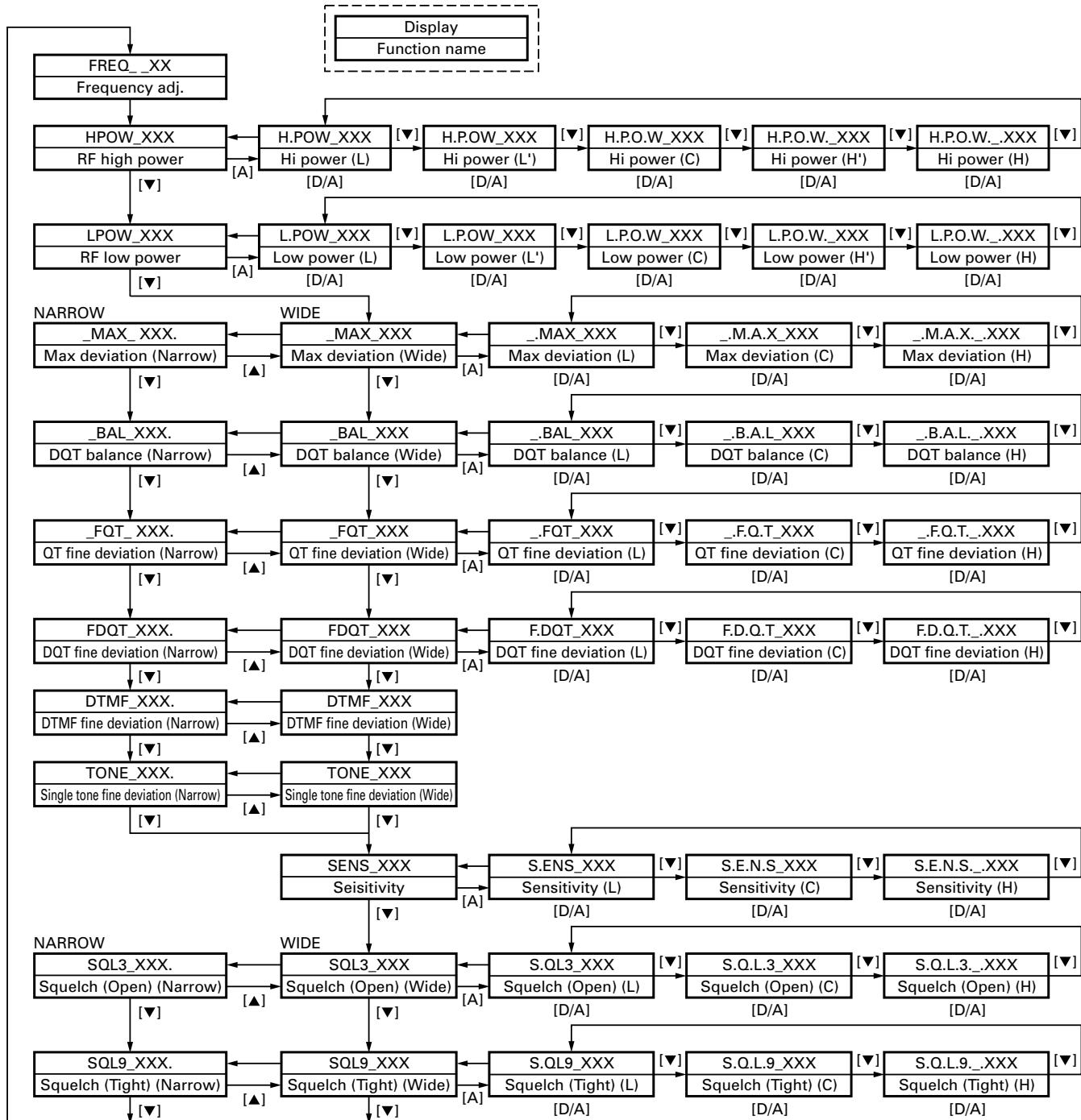
LCD display (Tuning mode)



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ADJUSTMENT

■ Tuning Mode

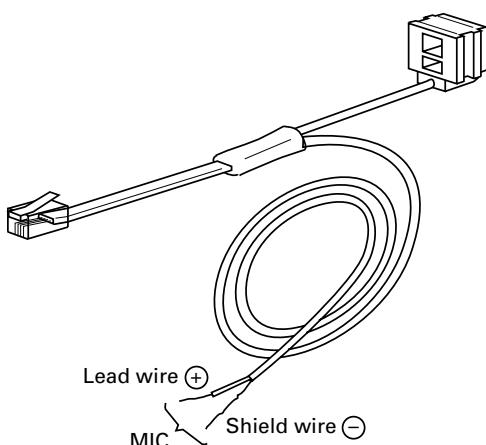
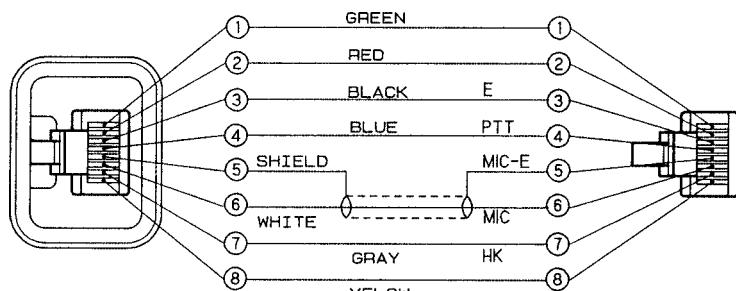


ADJUSTMENT**Test Equipment Required for Alignment**

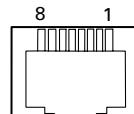
Test Equipment	Major Specifications	
1. Standard Signal Generator (SSG)	Frequency Range Modulation Output	400 to 520MHz Frequency modulation and external modulation -127dBm/0.1μV to greater than -7dBm/100mV
2. Power Meter	Input Impedance Operation Frequency Measurement Capability	50Ω 400 to 520MHz or more Vicinity of 100W
3. Deviation Meter	Frequency Range	400 to 520MHz
4. Digital Volt Meter (DVM)	Measuring Range Accuracy	1 to 20V DC High input impedance for minimum circuit loading
5. Oscilloscope		DC through 30MHz
6. High Sensitivity Frequency Counter	Frequency Range Frequency Stability	10Hz to 1000MHz 0.2ppm or less
7. Ammeter		20A
8. AF Volt Meter (AF VTVM)	Frequency Range Voltage Range	50Hz to 10kHz 1mV to 3V
9. Audio Generator (AG)	Frequency Range Output	20Hz to 20kHz or more 0 to 1V
10. Distortion Meter	Capability Input Level	3% or less at 1kHz 50mV to 10Vrms
11. 4Ω Dummy Load		Approx. 4Ω, 10W or more
12. Regulated Power Supply		13.6V, approx. 20A (adjustable from 9 to 17V) Useful if ammeter equipped

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.

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

**MIC connector
(Front view)**



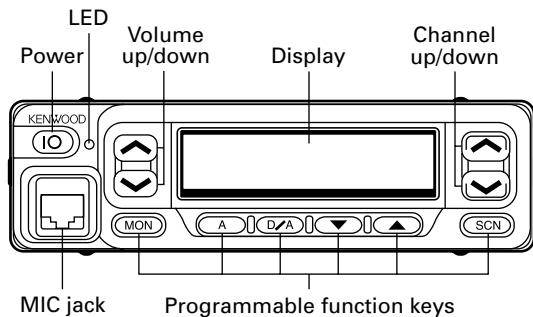
- 1 : BLC
- 2 : PSB
- 3 : E
- 4 : PTT
- 5 : ME
- 6 : MIC
- 7 : HOOK
- 8 : CM

TK-860G/862G

ADJUSTMENT

Adjustment Location

■ Switch (TK-860G)



■ Note

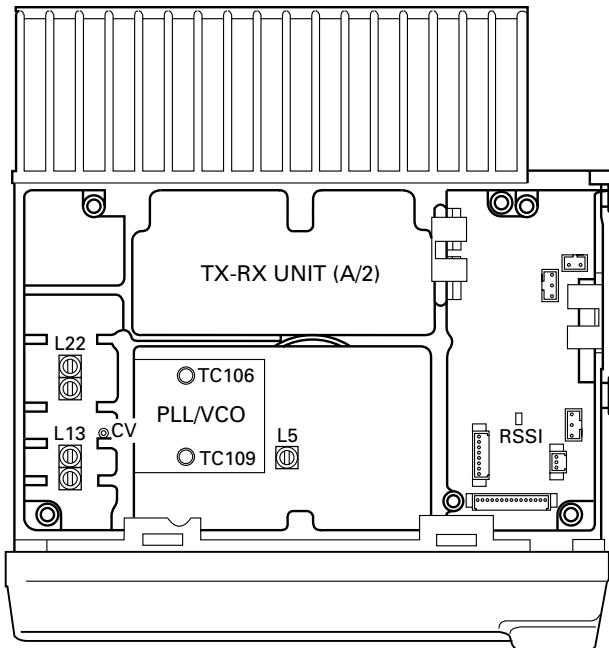
• Flash memory

The firmware program (User mode, Test mode, Tuning mode, etc.) and the data programmed by the FPU (KPG-56D) for the flash memory, is stored in memory. When parts are changed, program the data again.

• EEPROM

The tuning data (Deviation, Squelch, etc.) for the EEPROM, is stored in memory. When parts are changed, readjust the transceiver.

■ Adjustment Point



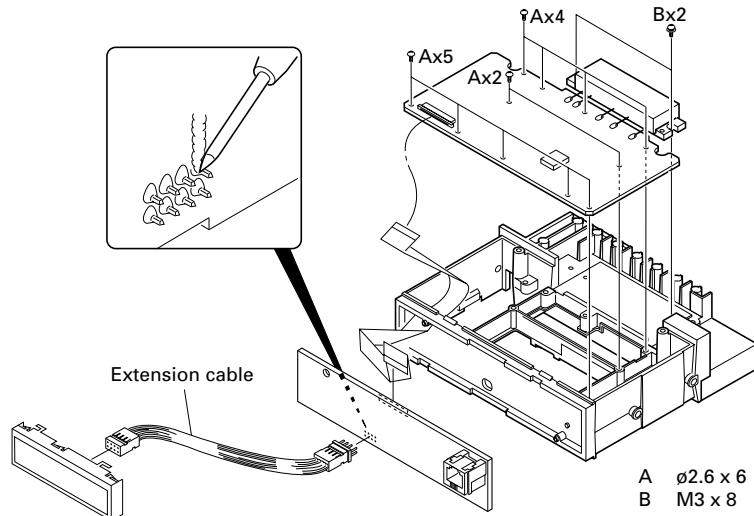
■ Repair Jig

• Chassis

Use jig (Part No. : A10-4010-02) for repairing the TK-860G/862G. The jig facilitates the voltage check when the voltage on the component side TX-RX unit is checked during repairs.

• Extension cable

Part No. : E30-3404-05



ADJUSTMENT

Common Section

To adjust TK-862G, use KPG-56D, otherwise you cannot tune this transceiver from the front panel.

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. PLL lock voltage	RX 1) Set test mode CH : CH3 - Sig1	DVM Power meter F. conter	TX-RX (A/2)	CV	PLL	TC106	6.5V	±0.1V
	TX 2) PTT : ON (Transmit)				TC109	6.5V		
	RX 3) CH : CH2 - Sig1						Check	0.9V or more
	TX 4) PTT : ON (Transmit)							0.9V or more

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Discriminator • Wide	1) Set test mode CH : CH1 - Sig1 SSG output : -53dBm/501μV SSG MOD : 3kHz AF : 1.4V/4Ω	SSG AF VTVM Oscilloscope	Rear panel	ANT ACC (EXT.SP)	TX-RX (A/2)	L5	AF output maximum.	
2. Sensitivity • Wide	1) Set test mode Select "SENS" in tuning mode. "S.E.N.S" Adjust [250] SSG freq' : 511.950MHz K2 : 519.950MHz M2 SSG output : -116dBm/0.35μV SSG MOD : 3kHz AF output : 1V/4Ω	SSG AF VTVM Distortion meter Oscilloscope AG DVM	Rear panel	ANT ACC (EXT.SP)	TX-RX (A/2)	L13 L22	RSSI voltage maximum.	
	2) "S.ENS" Adjust [***] SSG freq' : 485.050MHz					Front panel	CH \wedge/\sim	RSSI voltage maximum.
	3) "S.E.N.S._." Adjust [***] SSG freq' : 498.550MHz K2 : 502.550MHz M2							
3. Squelch 3 • Wide	1) Set test mode Select "SQL3" in tuning mode. "S.QL3" Adjust [***] SSG freq' : 485.050MHz SSG output : -127dBm/0.1μV SSG MOD : 3kHz (Wide) 1.5kHz (Narrow)	SSG AF VTVM Distortion meter Oscilloscope AG	Rear panel	ANT ACC (EXT.SP)	Front panel	CH \wedge/\sim	Adjust to the squelch threshold point.	

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ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
	2) "S.Q.L.3" Adjust [***] SSG freq' : 498.550MHz K2 : 502.550MHz M2	SSG AF VTVM Distortion meter	Rear panel	ANT ACC (EXT.SP)	Front panel	CH \wedge/\vee	Adjust to the squelch threshold point.	
	3) "S.Q.L.3._." Adjust [***] SSG freq' : 511.950MHz K2 : 519.950MHz M2	Oscilloscope AG						
• Narrow	4) "SQL3***." Adjust [***] SSG freq' : 498.550MHz K2 : 502.550MHz M2							
4. Squelch 9 • Wide	1) Set test mode Select "SQL9" in tuning mode. "S.QL9" Adjust [***] SSG freq': 485.050MHz SSG output : -115dBm/0.4μV SSG MOD : 3kHz (Wide) 1.5kHz (Narrow)							
	2) "S.Q.L.9" Adjust [***] SSG freq' : 498.550MHz K2 : 502.550MHz M2							
	3) "S.Q.L.9._." Adjust [***] SSG freq' : 511.950MHz K2 : 519.950MHz M2							
• Narrow	4) "SQL9***." Adjust [***] SSG freq' : 498.550MHz K2 : 502.550MHz M2							
5. Squelch check	1) Set test mode CH : CH1 - Sig1~CH3 - Sig1 SSG output : -116dBm/0.35μV					Check	Squelch must be opened. (Wide/Narrow)	
	2) SSG output : OFF						Squelch must be closed. (Wide/Narrow)	
6. QT check	1) Set test mode CH : CH1 - Sig4 SSG MOD INT : 3kHz (Wide) 1.5kHz (Narrow) EXT : 151.4Hz SSG system MOD DEV : ±3.75kHz (Wide) : ±1.85kHz (Narrow) SSG output : 10dB SINAD level							
	2) CH : CH1 - Sig3 CH1 - Sig5 CH1 - Sig6					Check	Squelch must be opened.	

ADJUSTMENT

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency	1) Set test mode Select "FREQ" in tuning mode. PTT : ON Adjust [<u>_*</u>]	Power meter F. counter	Rear panel	ANT	Front panel	CH \wedge/\vee	Check	498.600MHz±100Hz K2 502.600MHz±100Hz M2
2. Power output	1) Maximum power Set test mode Select "HPOW" in tuning mode. "H.POW" Adjust [256] PTT : ON						Check	More than 26.0W
3. High power	1) Set test mode Select "HPOW" in tuning mode. "H.POW" PTT : ON Adjust [<u>***</u>] 2) "H.P.O.W." PTT : ON Adjust [<u>***</u>] 3) "H.P.O.W." PTT : ON Adjust [<u>***</u>] 4) "H.P.O.W." PTT : ON Adjust [<u>***</u>] 5) "H.P.O.W._." PTT : ON Adjust [<u>***</u>]						25.0W	±1.0W
4. Low power	1) Set test mode Select "LPOW" in tuning mode. "L.POW" PTT : ON Adjust [<u>***</u>] 2) "L.P.O.W." PTT : ON Adjust [<u>***</u>] 3) "L.P.O.W." PTT : ON Adjust [<u>***</u>] 4) "L.P.O.W." PTT : ON Adjust [<u>***</u>] 5) "L.P.O.W._." PTT : ON Adjust [<u>***</u>]	Power meter					25W K2 22W M2	±1.0W
5. Power check	1) Set test mode CH : CH1 - Sig1 CH2 - Sig1 CH3 - Sig1 PTT : ON	Power meter Ammeter	Rear panel	ANT DC IN			Check	25W±1W, 8A or less

TK-860G/862G

ADJUSTMENT

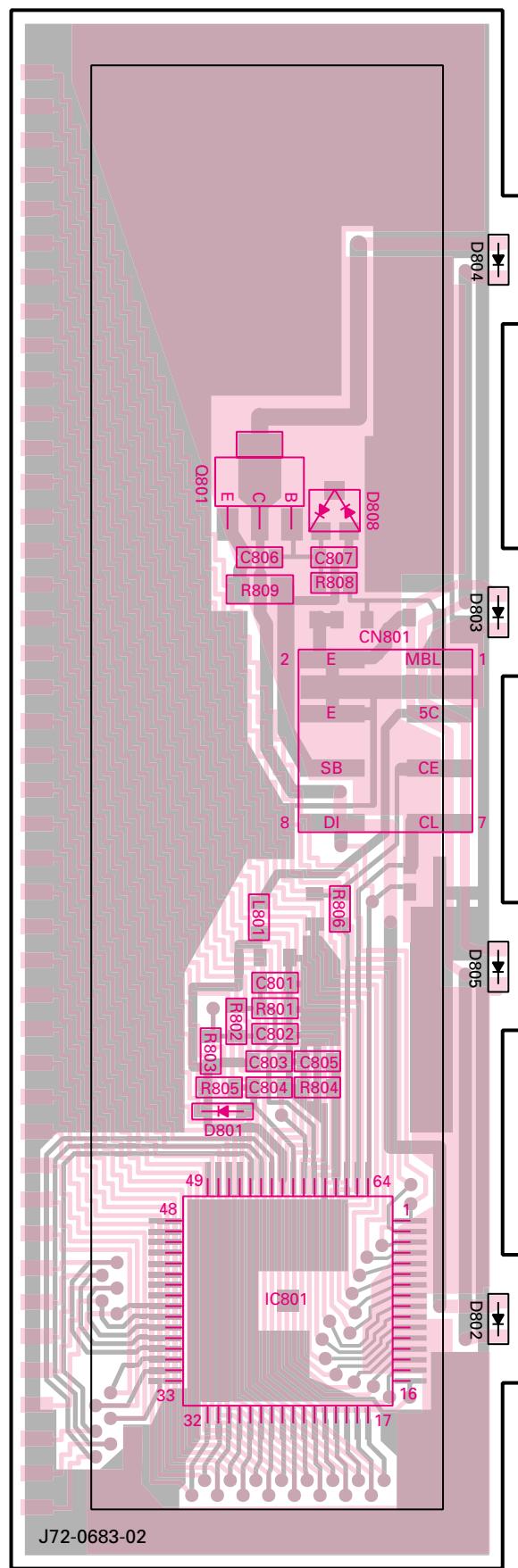
Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. Modulation balanced • Wide	1) Set test mode MIC input : OFF Select "BAL" in tuning mode. "_.BAL" Deviation meter filter LPF : 3kHz HPF : OFF De-emphasis : OFF PTT : ON Adjust [***]	Power meter Deviation meter Oscilloscope AF VTVM AG	Rear panel Front panel Front panel	ANT MIC	Front panel	CH \wedge/\vee	Make the de-modulation waveform neat.	(Wide/Narrow) 
	2) "_.B.A.L." PTT : ON Adjust [***]							
	3) "_.B.A.L._." PTT : ON Adjust [***]							
	4) "_BAL***." PTT : ON Adjust [***]							
7. Maximum deviation • Wide	1) Set test mode Connect AG to the MIC terminal. Select "MAX" in tuning mode. "_.MAX" AG : 1kHz/50mV Deviation meter filter LPF : 15kHz HPF : OFF De-emphasis : OFF PTT : ON Adjust [***]					3.95kHz (Wide) 1.75kHz (Narrow) (According to the larger +, -)	$\pm 50\text{Hz}$ (Wide/Narrow)	
	2) "_.M.A.X." PTT : ON Adjust [***]							
	3) "_.M.A.X._." PTT : ON Adjust [***]							
	4) "_MAX***." PTT : ON Adjust [***]							
8. MIC sensitivity check	1) Set test mode CH : CH1 - Sig1 AG : 1kHz/5mV PTT : ON Adjust [***]					Check		$\pm 3\text{kHz} \pm 0.2\text{kHz}$ (Wide) $\pm 1.5\text{kHz} \pm 0.05\text{kHz}$ (Narrow)

ADJUSTMENT

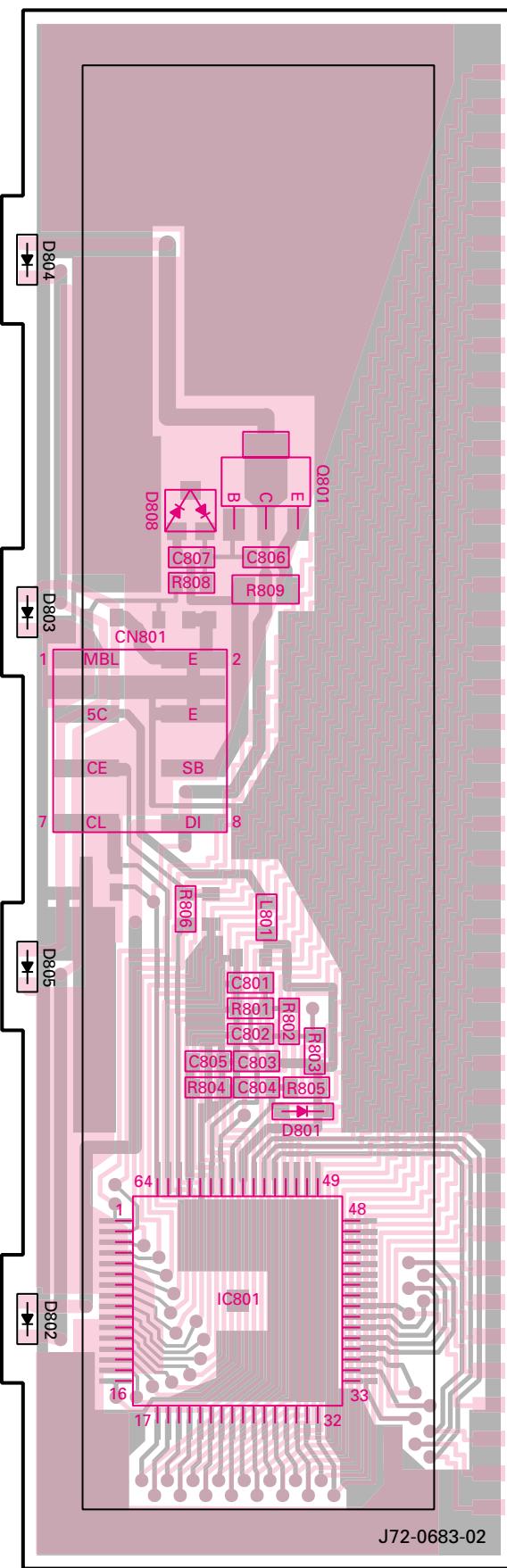
Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
9. QT deviation • Wide	1) Set test mode Select "FQT" in tuning mode. "_.FQT" Deviation meter filter LPF : 3kHz HPF : OFF PTT : ON Adjust [***]	Power meter Deviation meter Oscilloscope AF VTVM AG	Rear panel Front panel	ANT MIC	Front panel	CH \wedge/\vee	0.75kHz 0.35kHz	$\pm 50\text{Hz}$ (Wide/Narrow)
	2) "_F.Q.T" PTT : ON Adjust [***]							
	3) "_F.Q.T._." PTT : ON Adjust [***]							
	4) "_FQT***." PTT : ON Adjust [***]							
10. DQT deviation • Wide	1) Set test mode Select "FDQT" in tuning mode. "F.DQT" Deviation meter filter LPF : 3kHz HPF : OFF PTT : ON Adjust [***]	Front panel	Front panel	CH \wedge/\vee	0.75kHz 0.35kHz	$\pm 50\text{Hz}$ (Wide/Narrow)		
	2) "F.D.Q.T" PTT : ON Adjust [***]							
	3) "F.D.Q.T._." PTT : ON Adjust [***]							
	4) "FDQT***." PTT : ON Adjust [***]							
11. DTMF deviation • Wide	1) Set test mode Select "DTMF" in tuning mode. Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON Adjust [***]	Front panel	Front panel	CH \wedge/\vee	3.0kHz 1.5kHz	$\pm 0.2\text{kHz}$ $\pm 0.1\text{kHz}$		
	2) "DTMF***." PTT : ON Adjust [***]							
12. TONE deviation • Wide	1) Set test mode Select "TONE" in tuning mode. Deviation meter filter LPF : 15kHz HPF : OFF PTT : ON Adjust [***]	Front panel	Front panel	CH \wedge/\vee	3.0kHz 1.5kHz	$\pm 0.1\text{kHz}$ (Wide/Narrow)		
	2) "TONE***." PTT : ON Adjust [***]							
• Narrow								

TK-860G/862G PC BOARD VIEWS

DISPLAY UNIT (X54-3270-10) : TK-860G
Component side view



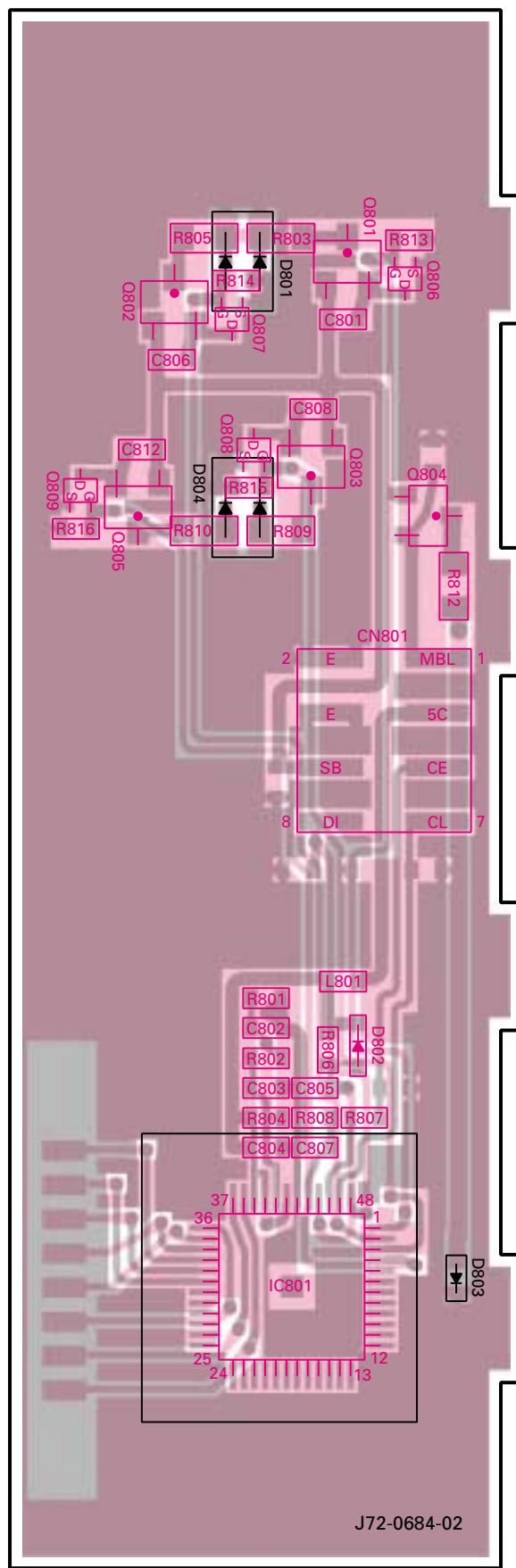
DISPLAY UNIT (X54-3270-10) : TK-860G
Foil side view



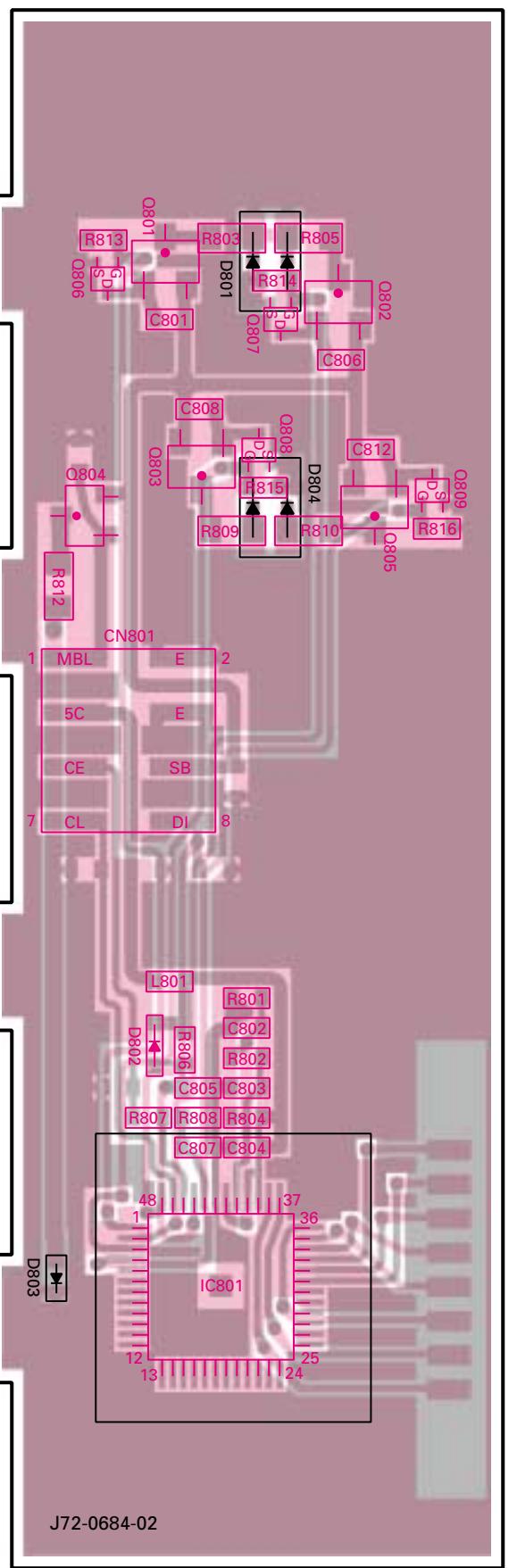
Component side Foil side

PC BOARD VIEWS TK-860G/862G

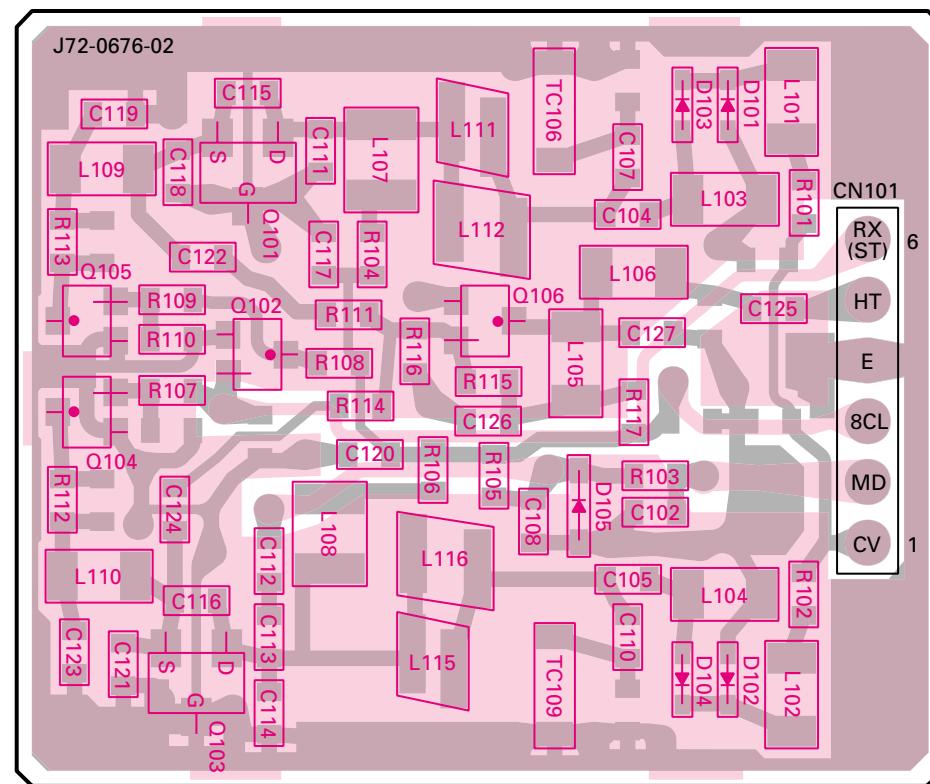
DISPLAY UNIT (X54-3280-10) : TK-862G
Component side view



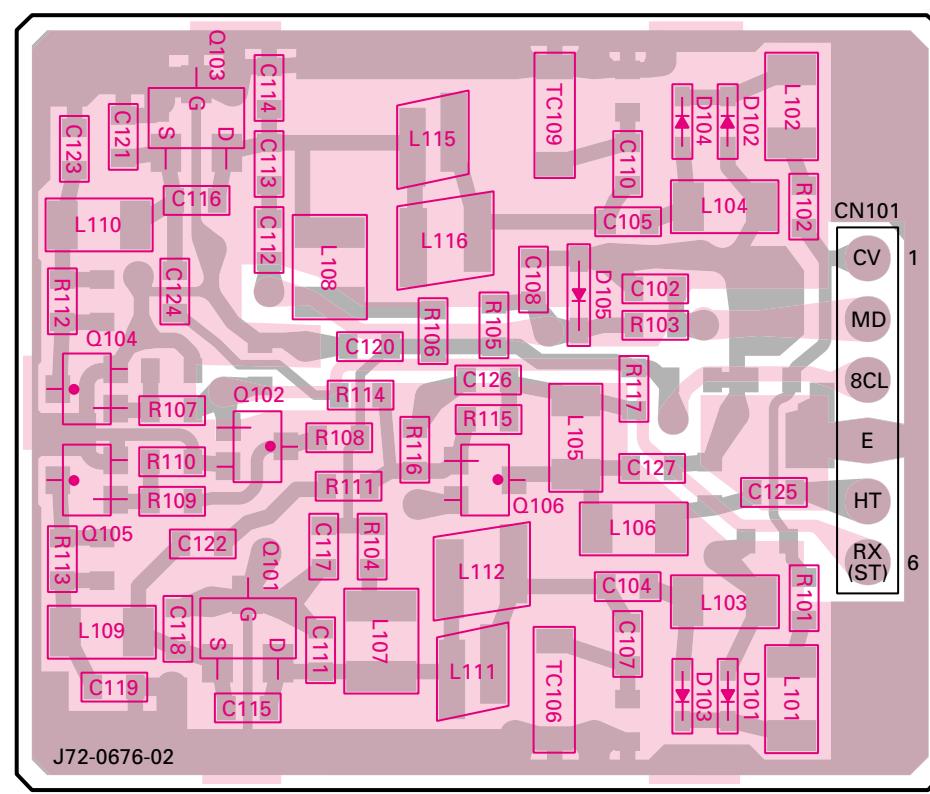
DISPLAY UNIT (X54-3280-10) : TK-862G
Foil side view



PLL/VCO (X58-4670-XX) -12 : K,M -13 : K2,M2 -14 : K3
Component side view



PLL/VCO (X58-4670-XX) -12 : K,M -13 : K2,M2 -14 : K3
Foil side view



■ Component side ■ Foil side

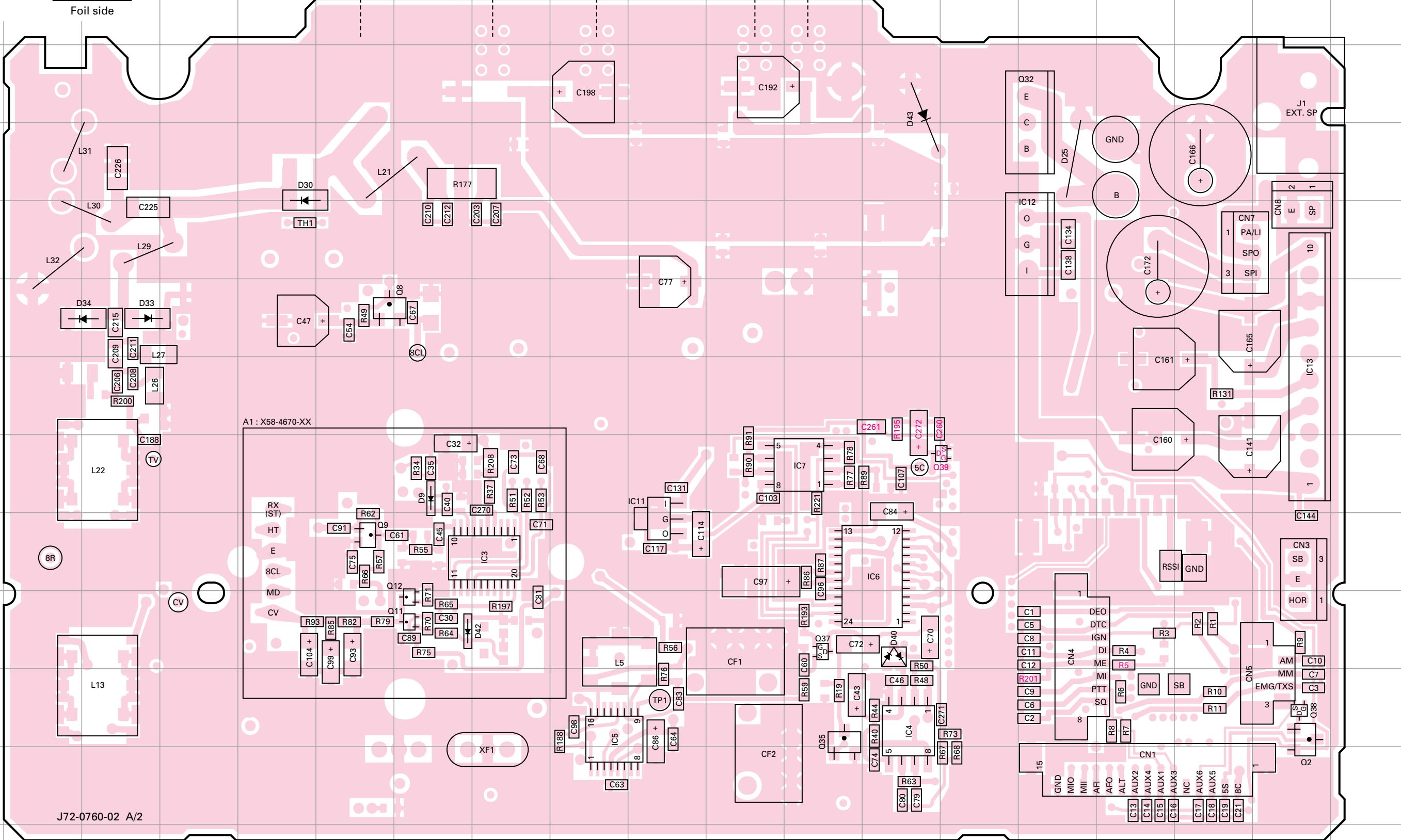
TK-860G/862G PC BOARD VIEW

TX-RX UNIT (X57-5960-XX) (A/2) Component side view

-10 : TK-860G K,M -11 : TK-862G K -12 : TK-860G K2,M2 -13 : TK-862G K2 -14 : TK-860G K3

Component side
Pattern 1
Pattern 2
Pattern 3
Pattern 4

Foil side



Ref. No.	Address						
IC3	10H	IC13	8R	Q32	4O	D30	5E
IC4	12M	IC400	2I	Q35	12L	D33	7C
IC5	12I	Q2	12R	Q37	11L	D34	7C
IC6	10M	Q8	7F	Q38	12R	D40	11M
IC7	9L	Q9	10F	Q39	9N	D42	11G
IC11	10J	Q11	11G	D9	9G		
IC12	6O	Q12	11G	D25	5O		

PC BOARD VIEW TK-860G/862G

TX-RX UNIT (X57-5960-XX) (A/2) Foil side view

-10 : TK-860G K,M -11 : TK-862G K -12 : TK-860G K2,M2 -13 : TK-862G K2 -14 : TK-860G K3

Ref. No.	Address										
IC1	11E	Q4	12H	Q17	9B	Q26	8C	D2	12B	D16	11N
IC2	9J	Q5	11B	Q18	13N	Q27	6I	D3	13C	D17	7J
IC9	9G	Q6	11B	Q19	7C	Q28	7I	D4	13C	D18	12Q
IC10	8E	Q7	11K	Q20	8C	Q29	7H	D5	13D	D19	8B
IC14	9D	Q10	13G	Q21	7C	Q31	6H	D8	11J	D20	8D
IC15	7O	Q13	13K	Q22	7L	Q33	7N	D10	12I	D21	7C
IC400	2K	Q14	10N	Q23	7E	Q34	10Q	D11	12G	D23	12R
Q1	11B	Q15	12O	Q24	8B	Q36	9K	D14	10H	D24	8D
Q3	12H	Q16	13M	Q25	7K	D1	13D	D15	10B	D27	8D



J72-0760-02 A/2

32

14

Component side
Pattern 1
Pattern 2
Pattern 3
Pattern 4

Foil side

TK-860G/862G PC BOARD VIEW

TX-RX UNIT (X57-5960-XX) (A/2) Component side view + Foil side

-10 : TK-860G K,M -11 : TK-862G K -12 : TK-860G K2,M2 -13 : TK-862G K2 -14 : TK-860G K3

Component side

Pattern 1

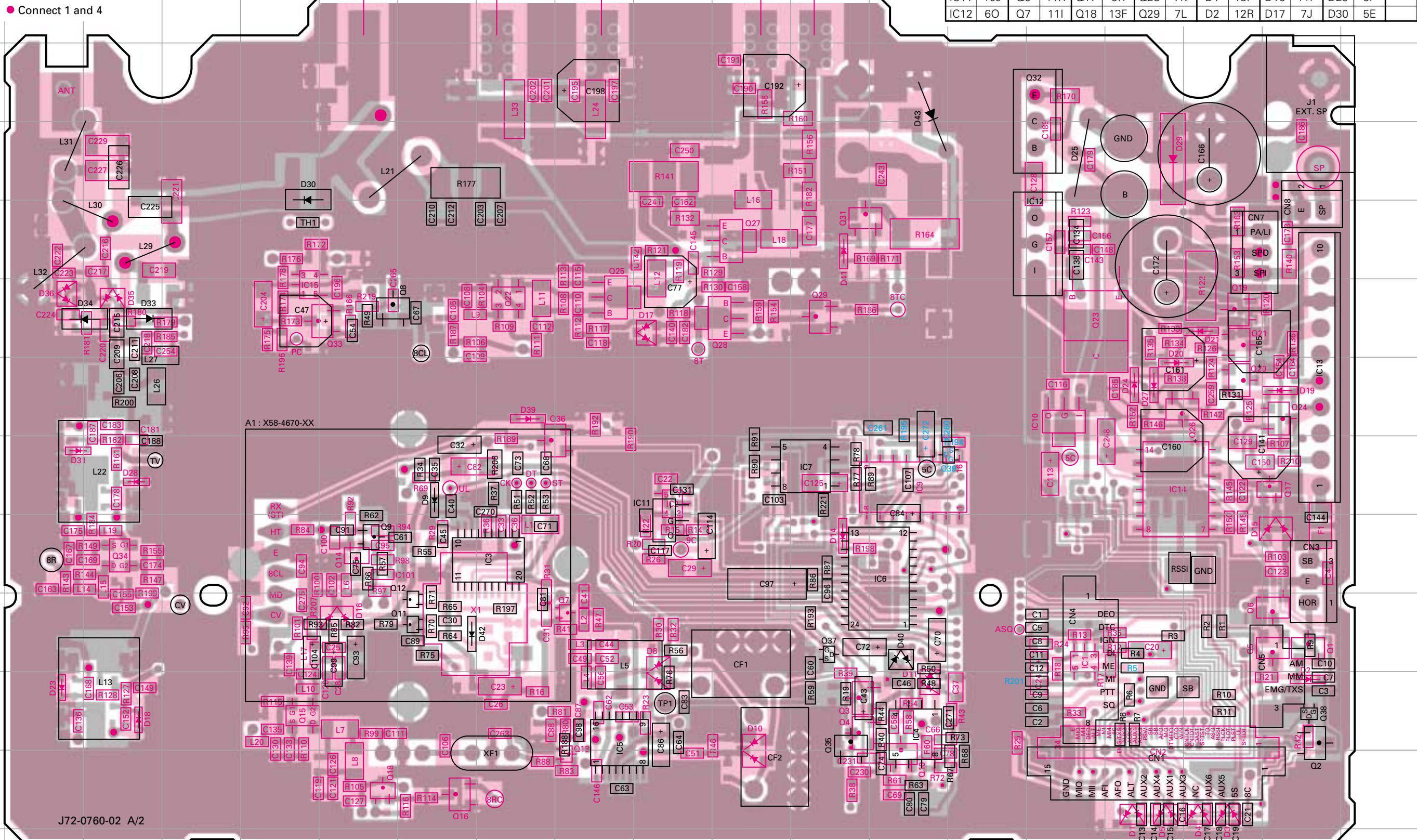
Pattern 2

Pattern 3

Pattern 4

Foil side

• Connect 1 and 4

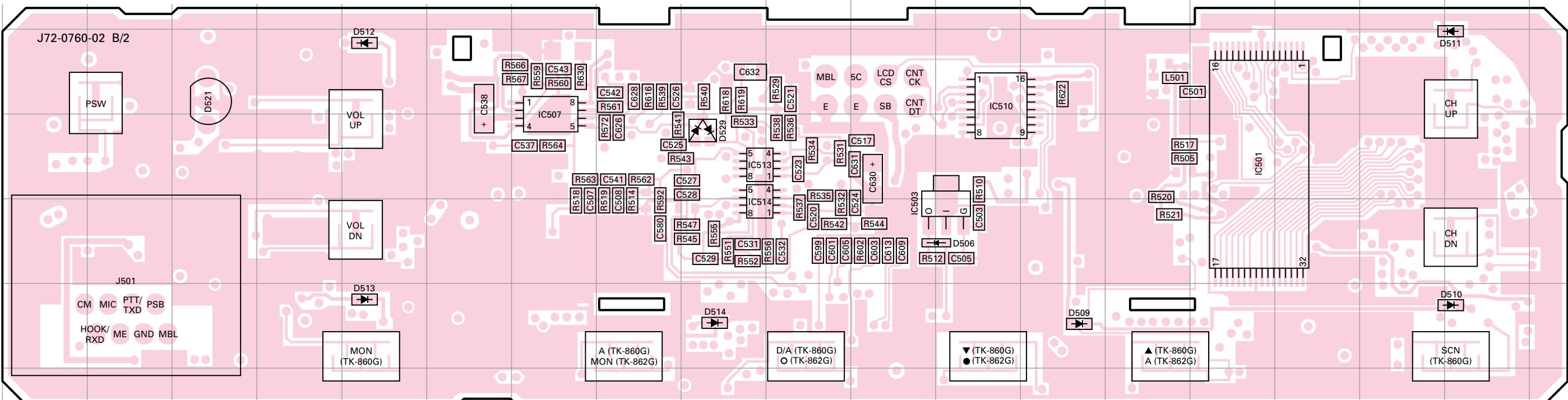


Ref. No.	Address														
IC1	11O	IC13	8R	Q8	7F	Q19	7Q	Q31	6L	D3	13Q	D18	12C	D31	9B
IC2	9J	IC14	9P	Q9	10F	Q20	8Q	Q32	4O	D4	13Q	D19	8R	D33	7C
IC3	10H	IC15	7E	Q10	13M	Q21	7Q	Q33	7F	D5	13P	D20	8P	D34	7C
IC4	12M	IC400	2I	Q11	11G	Q22	7H	Q34	10C	D8	11J	D21	7Q	D35	7C
IC5	12I	Q1	11R	Q12	11G	Q23	7O	Q35	12L	D9	9G	D23	12B	D36	7B
IC6	10M	Q2	12R	Q13	13I	Q24	8R	Q36	8I	D10	12K	D24	8P	D39	8H
IC7	9L	Q3	12L	Q14	10F	Q25	7I	Q37	11L	D11	12M	D25	5O	D40	11M
IC9	9M	Q4	12L	Q15	12E	Q26	8Q	Q38	12R	D14	10L	D27	8P	D41	6L
IC10	8O	Q5	11R	Q16	13G	Q27	6K	Q39	9N	D15	10R	D28	9C	D42	11G
IC11	10J	Q6	11R	Q17	9R	Q28	7K	D1	13P	D16	11F	D29	5P		
IC12	6O	Q7	11I	Q18	13F	Q29	7L	D2	12R	D17	7J	D30	5E		

PC BOARD VIEWS TK-860G/862G

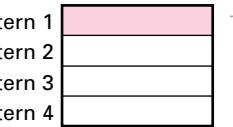
TX-RX UNIT (X57-5960-XX) (B/2) Component side view

-10 : TK-860G K,M -11 : TK-862G K -12 : TK-860G K2,M2 -13 : TK-862G K2 -14 : TK-860G K3



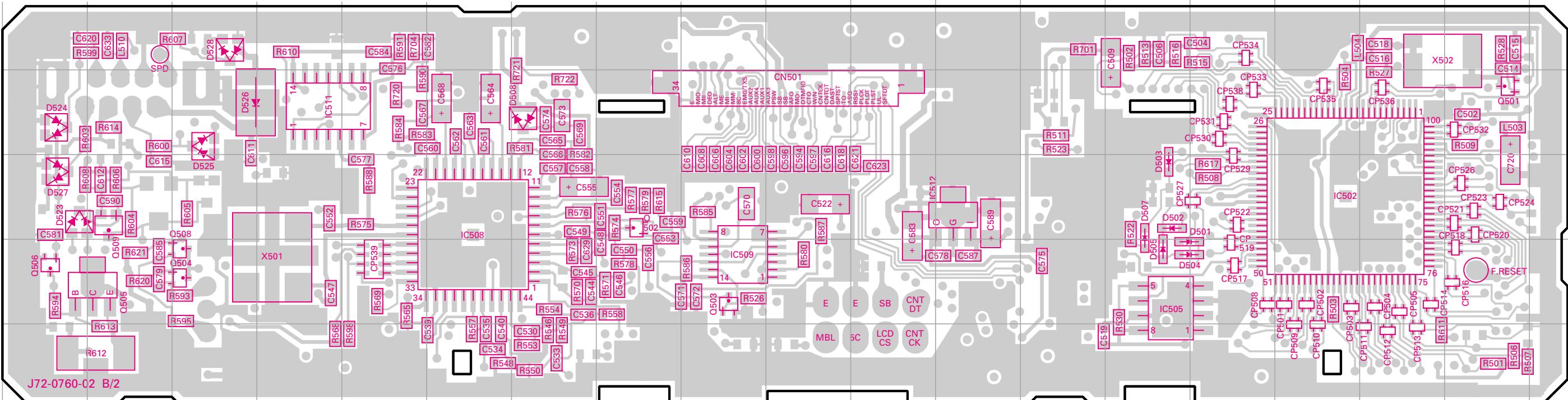
Ref. No.	Address								
IC501	3O	IC510	2L	D506	4L	D511	2R	D514	5I
IC503	4L	IC513	3I	D509	5M	D512	2E	D521	2C
IC507	2G	IC514	4I	D510	5R	D513	5E	D529	3I

Component side



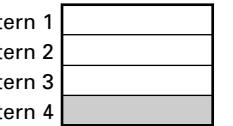
TX-RX UNIT (X57-5960-XX) (B/2) Foil side view

-10 : TK-860G K,M -11 : TK-862G K -12 : TK-860G K2,M2 -13 : TK-862G K2 -14 : TK-860G K3



Ref. No.	Address																
IC502	10P	IC509	11I	Q501	9R	Q504	11C	Q508	11C	D502	10N	D505	11N	D523	10A	D526	9C
IC505	11N	IC511	9D	Q502	10H	Q505	11B	Q509	10B	D503	10N	D507	10N	D524	9A	D527	10A
IC508	10F	IC512	10L	Q503	11I	Q506	11A	D501	11N	D504	11N	D508	9G	D525	9C	D528	8C

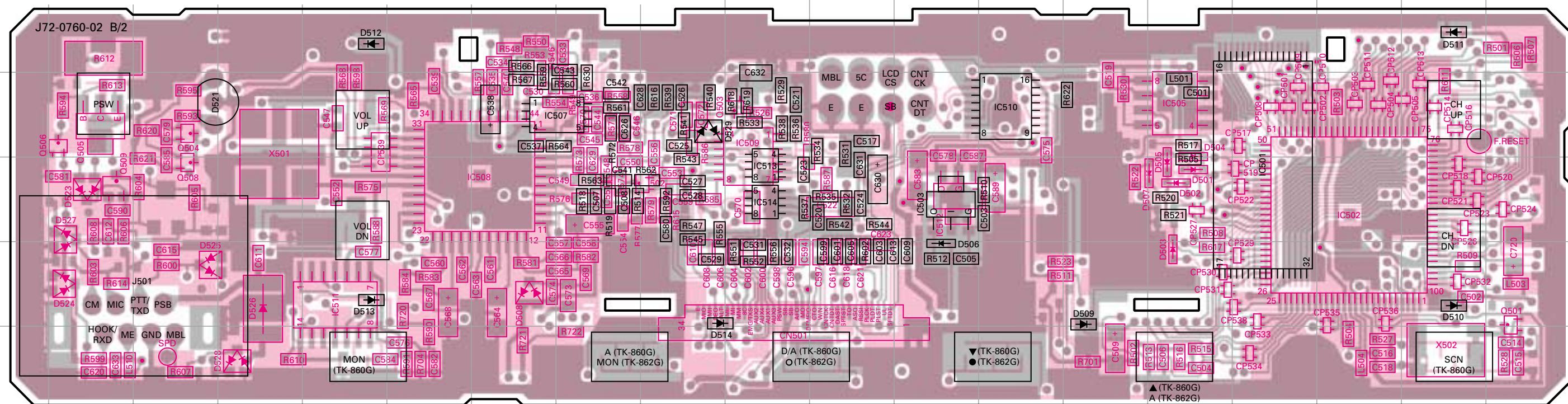
Component side



TK-860G/862G PC BOARD VIEW

TX-RX UNIT (X57-5960-XX) (B/2) Component side view + Foil side

-10 : TK-860G K,M -11 : TK-862G K -12 : TK-860G K2,M2 -13 : TK-862G K2 -14 : TK-860G K3

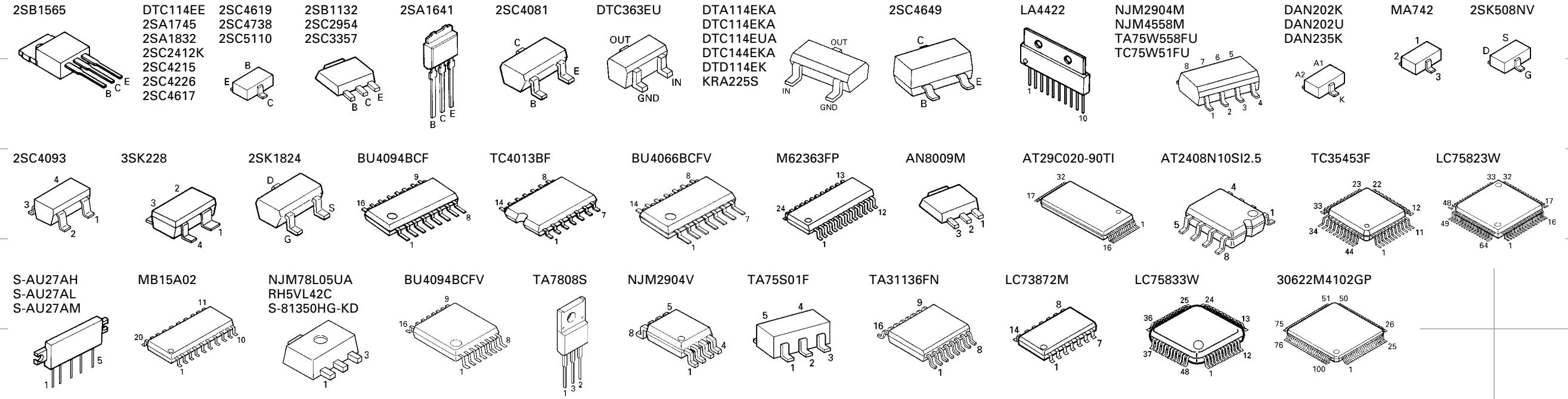


Ref. No.	Address										
IC501	4P	IC510	3M	Q503	3J	D502	4O	D509	5N	D523	4B
IC502	4Q	IC511	5E	Q504	3C	D503	5O	D510	5R	D524	5B
IC503	4L	IC512	4L	Q505	3B	D504	3O	D511	2R	D525	5C
IC505	3O	IC513	4J	Q506	3B	D505	4O	D512	2E	D526	5D
IC507	3H	IC514	4J	Q508	4C	D506	5L	D513	5E	D527	4B
IC508	4G	Q501	5S	Q509	4B	D507	4O	D514	5I	D528	6D
IC509	3J	Q502	4I	D501	4O	D508	5G	D521	3C	D529	3I

Component side
Pattern 1
Pattern 2
Pattern 3
Pattern 4

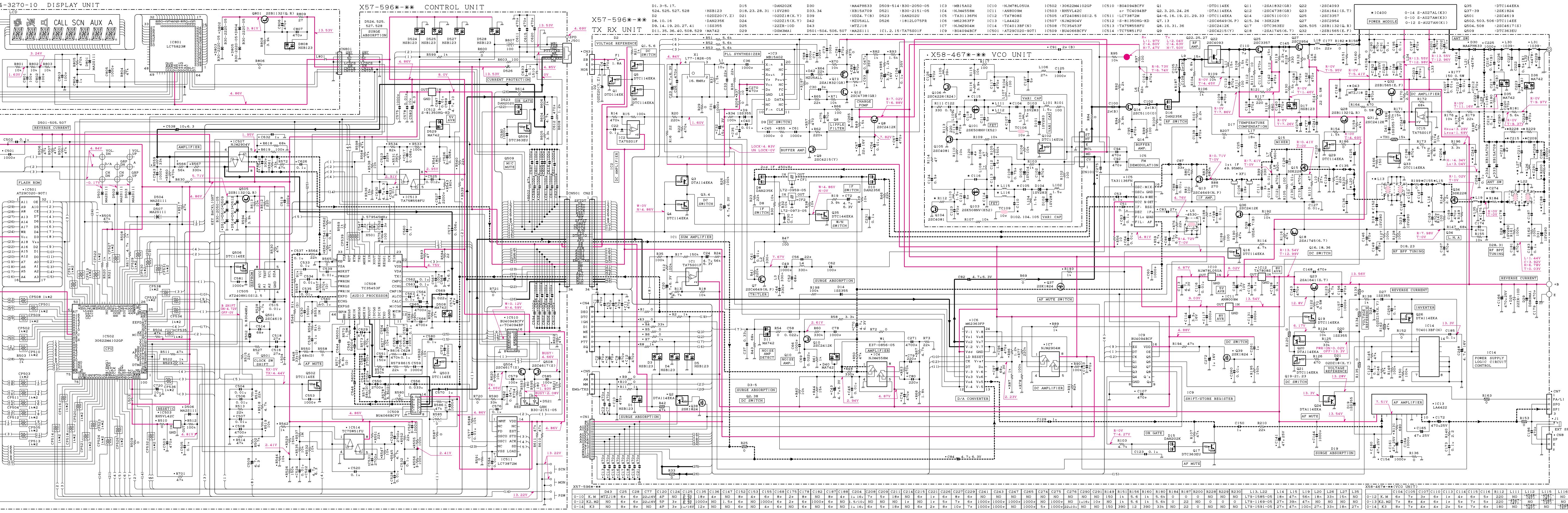
Foil side

● Connect 1 and 4



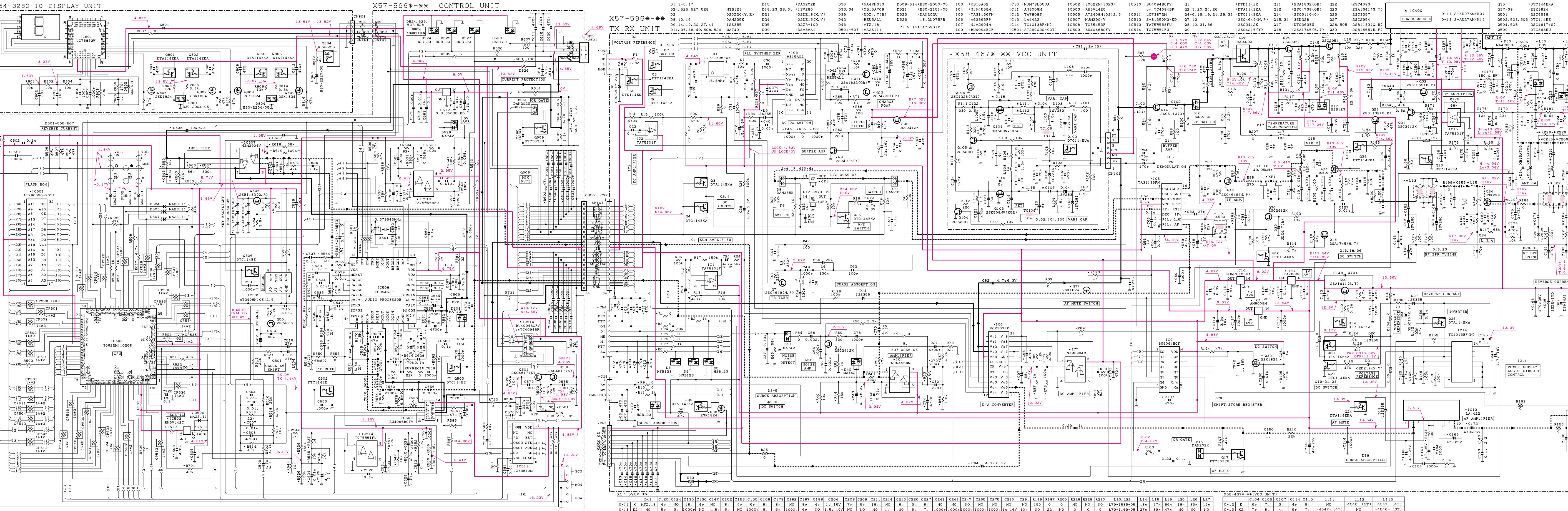
SCHEMATIC DIAGRAM TK-860G

Note : Components marked with a dot (-) are parts of pattern 1.



TK-862G SCHEMATIC DIAGRAM

Note : Components marked with a dot (-) are parts of pattern 1.



SPECIFICATIONS

GENERAL

Frequency Range	K2 : 485 to 512MHz	M2 : 485 to 520MHz
Number of Channels	TK-862G : Maximum 8 channels	TK-860G : Maximum 128 channels
Number of Groups	TK-860G : Maximum 128 groups	
Channel Spacing	Wide : 25kHz	Narrow : 12.5kHz
PLL Channel Stepping	5, 6.25kHz	
Operating Voltage	13.6V DC ±15%	
Current Drain	Less than 0.4A on standby	
	Less than 1.0A on receive	
	Less than 8.0A on transmit	
Operating Temperature Range	-30°C to +60°C (-22°F to +140°F)	
Dimensions & Weight	140 (5-33/64) W x 40 (1-37/64) H x 145 (5-45/64) D mm (inch), 940g (2.07 lbs)	
Channel Frequency Spread	K2 : 27MHz	M2 : 35MHz

RECEIVER (Measurements made per EIA standard EIA/TIA-204-D)

Sensitivity (12dB SINAD)	Wide : 0.28µV	Narrow : 0.35µV
Selectivity	Wide : 80dB	Narrow : 65dB
Intermodulation	Wide : 75dB	Narrow : 63dB
Spurious Response	85dB	
Audio Power Output	4.0W	
Frequency Stability	±2.5ppm	

TRANSMITTER (Measurements made per EIA standard EIA-152-C)

RF Power Output	25W
Spurious and Harmonics	65dB
Modulation	Wide : 16K0F3E Narrow : 11K0F3E
FM Noise	Wide : 50dB Narrow : 45dB
Audio Distortion	Less than 3%
Frequency Stability	±2.5ppm

TK-860G/862G

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