KENWOOD

Modification Information

For

TK-2180/ 3180/ 7180/ 8180

Version: *1.13 USA*
Last Updated: *Aug, 2004*
Language: *English*

CONTENTS

1 TERMINAL FUNCTION

This section describes Input/Output terminals of the transceiver.

1.1 Modular Mic Jack (8-Pin Connector)

(TK-7180/ 8180 only)

The 8-pin microphone connector is located on the front panel of the TK-7180/ 8180 transceivers. A user can use the connector to communicate with KMC-35/36 or use the transceiver with KMC-9C as a base station. The user can also write the configuration data via FPU (KPG-89D) or firmware update via FPRO into the transceiver by connecting a PC with KPG-46.

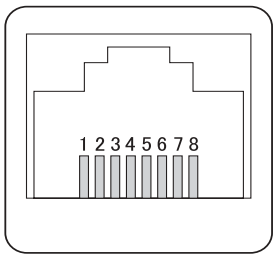


Figure 1-1 8-pin Modular Mic Jack

Table 1-1 8-pin Connector Pin Assignment

Pin	Signal name	Input/ Output	Description
1	BLC	Output	MIC Back Light Control for KMC-36
2	PSB	Input	DC 13.6 V+/-15% / 200mA typical / Switched by Power SW
3	E	-	Ground
4	PTT/ TXD	Input/ Output	PTT: PTT IN (ON;0V/ OFF; 5V) / TXD: Serial Data Output (C MOS Level)
5	ME	-	MIC ground
6	MIC	Input	MIC signal input: 60% Deviation with 1kHz 5.0+/-2.5mV Input signal
7	HOOK/ RXD	Input	HOOK: Hook detection / RXD: Serial Data Input (C MOS Level)
8	DM	Input/ Output	MIC DATA detection for KMC-36

1.2 26-pin Accessory Connector

The 26-pin connector is located on the main PCB inside of the transceiver and you can connect external devices, such as an optional board, to this connector.

Table 1-2 26-pin Accessory Connector Pin Assignment

Pin.	Signal Name	Input/ Output	Description
1	OPT1	Input/Output	Output; L= less than 0.45V, H= more than 4.7V/25kohm load Input; L= less than 1.0V, H= more than 4.0V, Input range 0 to 5V
2	OPT3	Input/Output	Output; L= less than 0.45V, H= more than 4.7V/25kohm load Input; L= less than 1.0V, H= more than 4.0V, Input range 0 to 5V
3	RXD1	Input	Serial Data Input; L= less than 1.0V, H= more than 4.0V, TTL level
4	TXD1	Output	Serial Data Output/ PTT signal Output; L= less than 0.45V, H= more than 4.7V/25kohm, TTL level
5	CK	-	Serial Clock Output (Not Available)
6	OPT4	Output	Output; L= less than 0.45V, H= more than 4.7V/25kohm load
7	USEL	Output	UART Speed Select Output; L=19200bps fixed, H: 115200 bps
8	OPT5	Output	Output; L= less than 0.45V, H= more than 4.7V/25kohm load
9	DGND	-	Ground
10	AGND	-	Ground
11	AI	Input	VGS Audio Input; Zin= more than 10kohm, 1Vpp max Input Range 0 to 5V
12	AO	Output	VGS Audio Output; Zo=less than 10kohm
13	AGND	-	Ground
14	5A	Output	5V Power supply Output; 78mAmax (TK-2180/3180)
	5E	Output	5V Power supply Output; 78mAmax (TK-7180/8180)
15	STON	Input	Side Tone Input; 1kHz 5Vpp
16	DI/ANI	Input	Data Signal Input; Zin=more than 22kohm, 600+/-200mVpp@STD (TK-2180/3180)
	DTI	Input	Data Signal Input; Zin=more than 22kohm, 600+/-200mVpp@STD (TK-7180/8180)
17	TCONT	Input	Speaker Mute Signal Input; L= less than 1.0V, H= more than 4.0V, Range 0 to 5V (TK-2180/3180)
	TCTL	Input	Speaker Mute Signal Input; L= less than 1.0V, H= more than 4.0V, Range 0 to 5V (TK-7180/8180)
18	MAN DOWN	Output	Man Down Output; L= less than 1.0V, H= more than 4.0V, Input range 0 to 5V (TK-2180/3180)
	NC	-	NC (TK-7180/8180)
19	INH	Input	Mic Mute Signal Input; L= less than 1.0V, H= more than 4.0V, Input range 0 to 5V (TK-2180/3180)
	AUDIH	Input	Mic Mute Signal Input; L= less than 1.0V, H= more than 4.0V, Input range 0 to 5V (TK-7180/8180)
20	OPT2	Input/Output	Output; L= less than 0.45V, H= more than 4.7V/25kohm load Input; L= less than 1.0V, H= more than 4.0V, Input range 0 to 5V
21	TXO	Output	Mic Signal Output; ZL= more than 22kohm, 130+/-50mVpp, Before Pre-Emphasis, AC coupled
22	RXEO	Output	Audio Signal Output; ZL=more than 30kohm, 1+/-0.3Vpp, After De-Emphasis, DC coupled
23	RXEI	Input	Audio Signal Input; Zin=more than 15kohm, 1+/-0.3Vpp, After De-Emphasis, DC coupled
24	TXI	Input	Mic Signal Input; Zin=more than 22kohm, 130+/-50mVpp, Before Pre-Emphasis, AC coupled
25	OPT6	Output	Output; L= less than 0.45V, H= more than 4.7V/25kohm load
26	SB2	Output	Switched Battery power/ 7.5V typ, 100mAmax
	8C	Output	8V AVR Output; 8.0V tpy, 100mAmax

1.3 25-pin D-Sub ACC Connector

(TK-7180/ 8180 only)

The 25-pin ACC connector is located on the rear panel of the TK-7180/ 8180 transceivers and you can connect external devices, such as the KDS-100, to this connector.

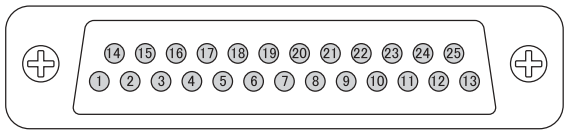


Figure 1-2 25-pin D-Sub ACC Connector

Table 1-3 25-pin D-Sub ACC Connector Pin Assignment

Pin number	Signal name	Input/ Output	Description
1	NC/ RSSI	-	No Connection. RSSI can be sent after modification; Output level 0.8 - 2.3V).
2	RXD1	Input	Serial Data Input 1 RS-232C Level, Input voltage range +/-30Vmax, L=less than 0.4V, H=more than 2.4V Zi=more than 5kohm
3	TXD1	Output	Serial Data Output 1 RS-232C Level, L=less than -5V, H=more than 5V Zo=more than 5kohm
4	AUX I/O 9	Input/ Output	Auxiliary I/O 9 Input: Active Low with 47kohm Pull-Up to 5V, L=less than 0.8V, H=more than 4.2V Output: Active Low with 47kohm Pull-Up to 5V, 0.2mAmax, L=less than 0.3V, H=more than 4.8V EMF
5	DI	Input	Data Signal Input 60% of System Deviation with 2Vp-p input (Data input level is adjustable), Input Impedance=10kohm or more, DC coupled, Frequency Response =+2/-3dB,
6	MI2	Input	External Mic Input: 60% Deviation with 1kHz 5.0+/-2.5mV Input signal
7	GND	-	Ground
8	AUX I/O 8	Input/ Output	AUX I/O 8: Same Level as AUX I/O 9.
9	TXD2	Output	Serial Data Output 2: C MOS Level, L=less than 0.7V H=more than 4.2V with 25kohm load, Zo=more than 1kohm
10	RXD2	Input	Serial Data Input 2 C MOS Level, Input voltage range=+5/0 Vmax, L=less than 0.8V H=more than 4.2V
11	GND	-	Ground
12	AUX I/O 7	Input/ Output	Auxiliary I/O 7: Same Level as AUX I/O 9.
13	AUX I/O 6	Input/ Output	Auxiliary I/O 6: Same Level as AUX I/O 9.
14	SB	-	Power Output in conjunction with the **Power** Switch DC 13.6V +/-15% 2.0Amax
15	AUX OUT 2	Output	Auxiliary OUT 2 Active Low, Open collector 500mAmax, Defualt=None, L=less than 0.3V
16	AUX OUT 1	Output	Auxiliary OUT 1 Active Low, Open collector 500mAmax, Defualt=None, L=less than 0.3V
17	AFO	Output	RX Filtered Audio Output DC coupled, AF low level output 700mVp-p typ with standard modulated signal receiving.
18	GND	-	Ground
19	DEO	Output	Detected Signal Output DC coupled, 740 mVp-p typ with standard moduration signal, AF output level is adjustable.
20	AUX I/O 5	Input/ Output	Auxiliary I/O 5: Same Level as AUX I/O 9.
21	AUX I/O 4	Input/ Output	Auxiliary I/O 4: Same Level as AUX I/O 9.
22	AUX I/O 3	Input/ Output	Auxiliary I/O 3: Same Level as AUX I/O 9.
23	AUX I/O 2	Input/ Output	Auxiliary I/O 2: Same Level as AUX I/O 9.
24	AUX I/O 1	Input/ Output	Auxiliary I/O 1: Same Level as AUX I/O 9.
25	ME	-	Mic Ground

1.4 14-pin Universal Connector

(TK-2180/ 3180 only)

The 14-pin connector is available on the TK-2180/ 3180 transceivers and you can connect external devices to this connector.

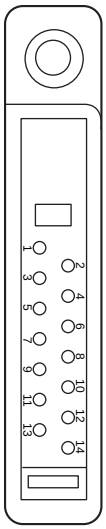


Figure 1-3 14-pin Universal Connector

Table 1-4 14-pin Universal Connector Pin Assignment

Pin number	Name	I/O	Function
1	SSW	I	Ext/Int Speaker Switch Input L=External Speaker On, H=Internal Speaker ON, Input Voltage= 0 - 5.0V
2	SP+	O	BTL Output + for External Speaker Audio Output Power at Volume Max 1.3+/-0.5W 8ohm, 0.9+/-0.5W 16ohm (typ)
3	SP-	O	BTL Output - for External Speaker Audio Output Power at Volume Max 1.3+/-0.5W 8ohm, 0.9+/-0.5W 16ohm (typ)
4	MSW	I	Ext/ Int Mic Switch Input L=External Mic On, H=Internal Mic On, Input Voltage= 0 - 5.0V
5	EMC	I	Ext Mic Input Impedance=1.8kohm Audio Level; 60% system deviation with 7.5+/-2.5mVrms Input, Normal DC Voltage; 5.0+/-1V.
6	ME	-	External Mic Ground
7	PTT	I	External PTT Input; L=PTT On
8	PF	I	Programmable Function Key Input Input voltage range; 0 - 5V (10kohm Pull-Up to 5V) Input Level; 5.0 to 4.4=None, 4.4 to 3.1V=PF1 key On, 3.1 to 2.3V= PF2 key On, 2.3 to 0V= PF1&2 key On
9	OPT	I/O	AUX I/O port (for External Option) Man Down Input; H=more than 4.0V/ L=less than 1.0V (Range 0 to 5V) Serial Data Input; H=more than 4.0V/ L=less than 1.0V (Range 0 to 5V), Data speed=57600bps max AUX Output; H=more than 4.7V/ L=less than 0.45V with 25kohm load.
10	E	-	Ground
11	5U	-	5 V Output (FPU programable), 140 mAmax
12	TXD	O	Serial Data Output C MOS Level, H=more than 4.7V/ L=less than 0.45V with 25kohm load, Baud rate =57600bpd max
13	RXD	I	Serial Data Input C MOS Level, H=more than 4.0V/ L=less than 1.0V (Range 0 to 5V), Baud rate =115200bpd max
14	NC (E)	-	Not use (GND)

1.5 Front Panel Terminal

(TK-7180/ 8180 only)

The front panel terminal is equipped with the 14-pin connector.

Table 1-5 The Front Panel Terminal Pin Assignment

Pin number	Name	I/O	Function
1	SPI	I	Front Panel Speaker Input
2	GND	-	Ground
3	8C	-	8 V Power Supply
4	SB	-	Power Supply (Switched B)
5	RA	O	Audio Output (for SP-MIC)
6	PSW	I	Power Switch Control Input
7	MIC	I	Mic Input
8	ME	-	Mic Ground
9	PSENS	I	Panel Sens. Input
10	TXD	O	Serial Data Output
11	RXD	I	Serial Data Input
12	GND	-	Ground
13	SHIFT	O	Beat Shift Output
14	RST2	O	Sub-u com Reset Output

1.6 Modification of Serial Port Level

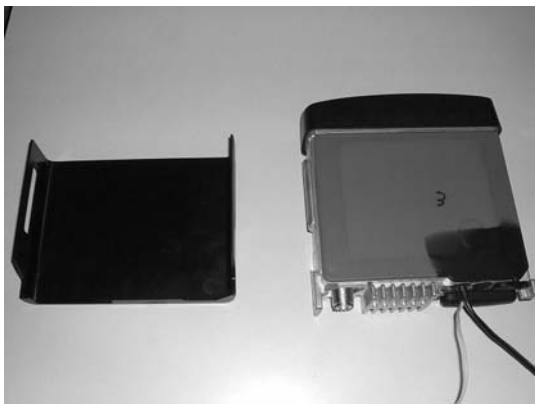
(TK-7180/ 8180 only)

The TXD2 and RXD2 of the 25-pin connectors are configured at the C MOS level (0/ 5 V) as a factory default setting.

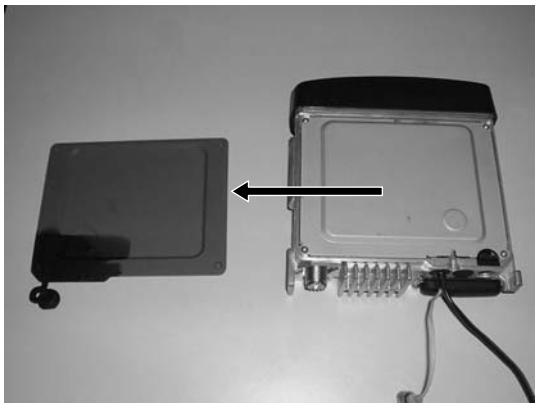
You can convert the level to the RS232 level (±12 V) by configuring the port. The following procedures shows how to change the serial port level to the RS232 level.

1. Remove the top cover of the TK-7180/ 8180 transceiver.

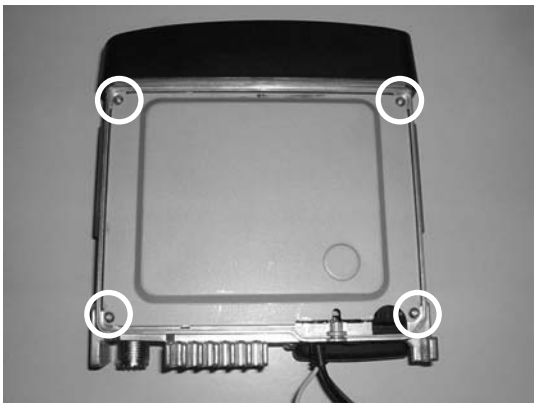
- Lift the top cover by widening two side tabs. Then, pull upward to remove the top cover from the transceiver body.



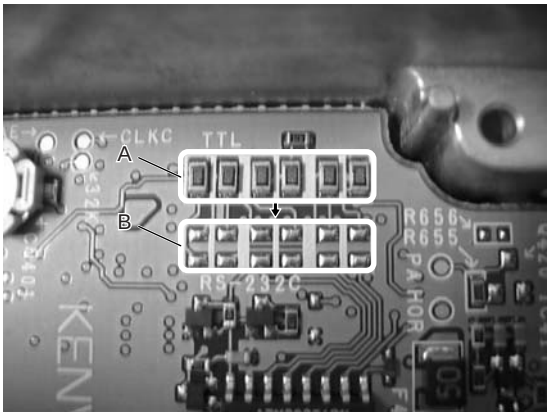
- Remove the top packing.



- Remove 4 screws and the shielding plate.



2. Remove the R622, R621, R625, R630, R629, R636 (A) Chip Jumpers (R92-0670-x5), and add the Chip Jumpers to R626, R627, R628, R631, R634, R637 (B).



3. Install the shield plate, upper packing and upper case to the transceiver.

2.1 Ignition Sense Cable

(TK-7180/ 8180 only)

Connect the Ignition Sense Cable (KCT-46) to the TK-7180/ 8180 transceivers.

2.1.1 Description

This product is the ignition sense cable for the TK-7180/ 8180 transceivers.

2.1.2 Features

- The cable length is 320 cm (10.5 ft).
- The cable has a plug-shaped terminal on the transceiver side and the terminal is covered by a plastic cap to avoid the short-circuit. The vehicle side cable has no plug (a bare wire).
- The mini-sized blade fuse (3 A) and the water-proof fuse holder are used for the cable to provide the water-proof holder.

2.1.3 Mechanical Specifications

■ Product Dimensions and Weight

Table 2-1 Product Dimensions and Weight

Item	
Length	320 cm (10.5ft)
Width	-
Thickness	-
Weight	60 g

■ Cable Specifications

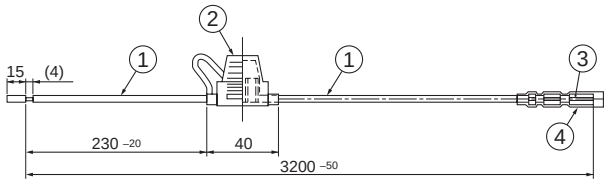


Figure 2-1 Mechanical Parts

Table 2-2 Mechanical Parts

No.	Part Name		Qty	Remarks
1	Lead Wire		1	UL1015 AWG18, 19A max, Color: Yellow
2	Mini Blade Fuse Holder	Body	1	PVC, Color: Black
		Terminal	2	Terminal: TCQ21
		Holder Cap	1	-
3	Bullet Terminal Rec		1	300541 (or Similar)
4	Conductor Sleeve		1	-

2.1.4 Standard Specifications

● **Display**

No remarks.

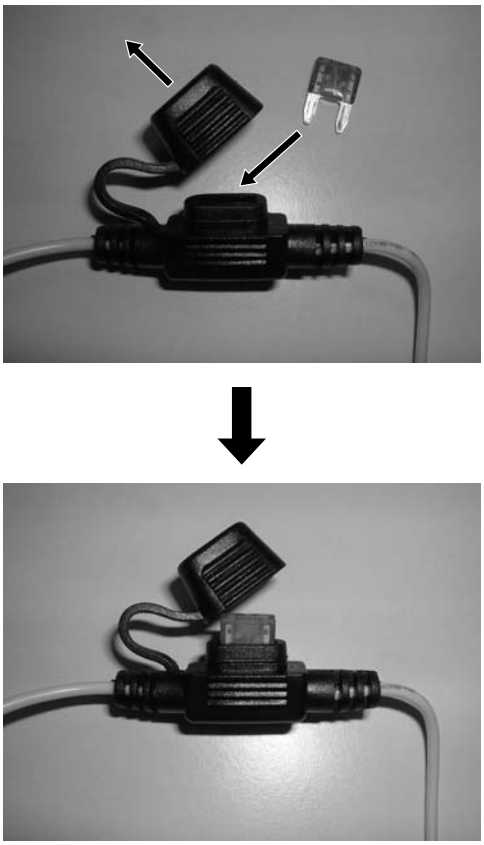
2.1.5 Supplied Accessories

Table 2-3 Supplied Accessories

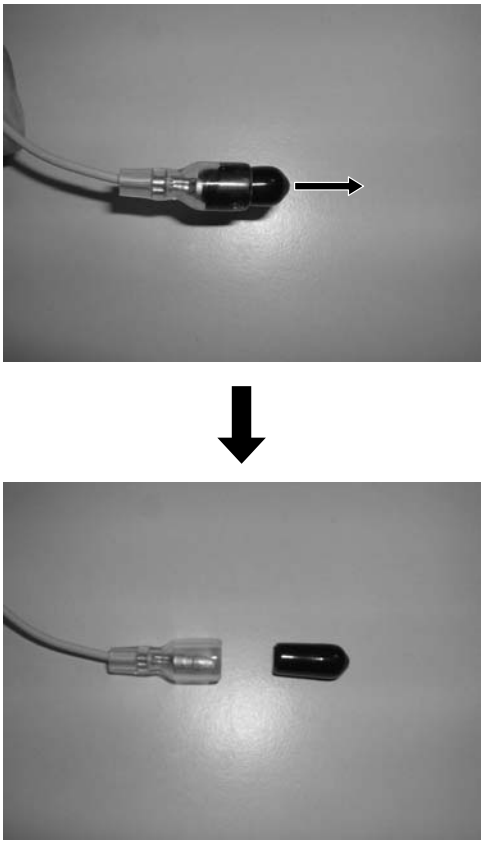
No.	Name	Part Number	Qty.	Remarks
1	Mini blade Fuse	-	1	3 A

2.1.6 Installing KCT-46 Cable

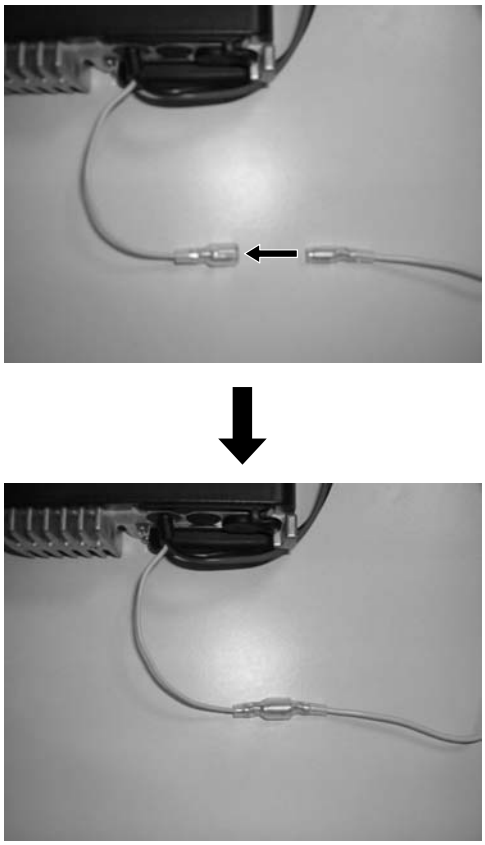
1. Open the KCT-46 fuse folder and insert the mini blade fuse (3 A).



2. Remove the shielding cover of the yellow cable terminal.



3. Connect the plug-form end of the KCT-46 cable to the yellow cable terminal of the transceiver.



4. Connect the other end of the KCT-46 cable to the Ignition Line of the vehicle.

2.2 KCT-40 Cable

(TK-7180/ 8180 only)

You can install the connection cable (KCT-40) for external devices to the TK-7180/ 8180 transceivers. This section describes how to connect the KCT-40 cable to the TK-7180/ 8180 transceivers.

2.2.1 Description

This product is the connection cable or external devices prepared for the TK-7180/ 8180 transceivers.

2.2.2 Features

- The cable length is 40 cm (1.3 ft).
- One end of the cable has the D-sub 25-pin connector (transceiver side) and the other end has the Molex 15-pin connector (KDS-100 or KGP-2A/ KGP-2B side).
- The Molex 15-pin connector is equipped with the dust-proof cover.

2.2.3 Mechanical Specifications

■ Product Dimensions and Weight

Table 2-4 Product Dimensions and Weight

Item	Connector	Cable Length
Length	55 mm	40 cm/ 1.3 ft
Width	47.5 mm	
Thickness	16.5 mm	
Weight	60 g	

■ Cable Specifications

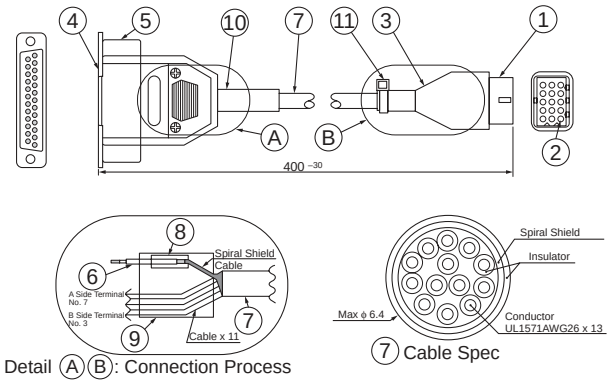


Figure 2-2 Mechanical Parts

Table 2-5 Mechanical Parts

No.	Part Name	Qty	Remarks
1	Housing	1	MOLEX: 39-03-3157
2	Terminal	14	MOLEX: 1855T (L)
3	Cover	1	521156
4	D-sub Connector	1	Used inch screw (No. 4 - 40UNC)
5	D-sub Cover Set	1	CD4225H0*00
6	Cable	2	UL1007AWG26 Color: Black Length: 30 mm
7	Cable	1	UL1007AWG26 13-pin Shield cable Length: 400 mm
8	Heat Shrink Tube	2	Sumi Tube ϕ 2.0 x 14 mm
9	Heat Shrink Tube	2	Sumi Tube ϕ 7.0 x 20 mm
10	Tube	1	Rubber ϕ 9.0 Clearwhite
11	Cable Tie	1	Color: Black

2.2.4 Electrical Specifications

■ Terminal Specifications

Table 2-6 Terminal Specifications

Pin No. D-Sub25	Function	Specification
1	-	-
2	-	-
3	-	-
4	-	-
5	DI	Data Signal Input: 60% system daviation with 2Vp-p Input/ Impedance=10kohm, Non Pre-emphasis
6	-	-
7	GND	Ground
8	AIO8	47kohm Pull-Up to 5V Input: L ≤ 0.8V, H ≥ 4.2V Output: 0.2mAmax, L≤ 0.3V, H≥ 4.8Vemf
9	TXD2	Serial Data Output 2: TTL Level, L ≤ 0.7V H ≥ 4.2V with 25kohm load, Zo ≥ 1kohm
10	RXD2	Serial Data Input 2: TTL Level(+5/0 Vmax), L≤ 0.8V H≥ 4.2V
11	-	-
12	AIO7	Same as Pin No.8
13	AIO6	Same as Pin No.8
14	SB	Switched Battery Voltage DC 13.6V +/-15% 2.0Amax
15	-	-
16	-	-

Pin No. D-Sub25	Function	Specification
17	-	-
18	-	-
19	DEO	Detected Signal Output 740 mVp-p with standard moduration Non De-emphasis/ Non Squelched
20	AIO5	Same as Pin No.8
21	AIO4	Same as Pin No.8
22	AIO3	Same as Pin No.8
23	AIO2	Same as Pin No.8
24	AIO1	Same as Pin No.8
25	-	-

2.2.5 Standard Specifications

- Display Specifications

  No remarks.

2.2.6 Supplied Accessories

No Supplied Accessory.

2.2.7 Connector Location

The following table explains how to interface with other peripherals.

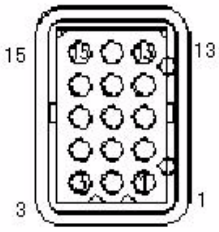


Figure 2-3 15Pin Molex Connecter

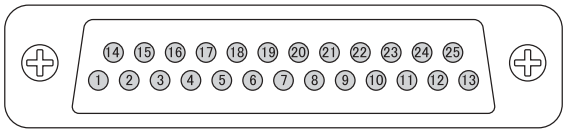


Figure 2-4 25Pin D-Sub Connector

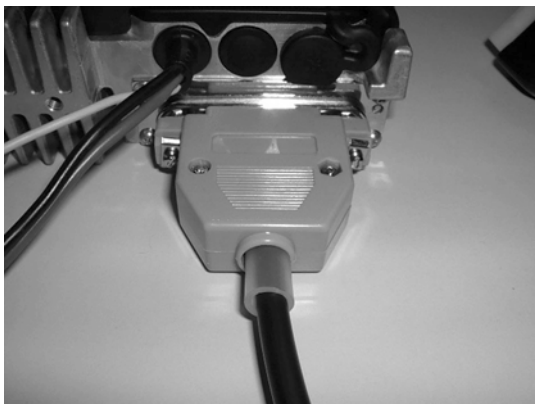
Table 2-7 KCT-40 Cable Connector Pin Assignment

D-sub 25-pin Pin number	Function	Molex 15-pin Pin number	KDS-100/ KGP-2A/B Function
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	DI	5	DO
6	-	-	-
7	GND	3	GND
8	AIO8	9	TXS/ LOK
9	TXD3	15	RXD
10	RXD3	14	TXD
11	-	-	-
12	AIO7	11	MIM
13	AIO6	6	PTT
14	SB	1	SB
15	-	-	-
16	-	-	-
17	-	-	-
18	-	-	-
19	DEO	4	DI
20	AIO5	8	SQ
21	AIO4	10	AM
22	AIO3	13	DISP OFF (KPG-2A/ 2B)
23	AIO2	12	-
24	AIO1	7	DTC
25	-	-	-

2.2.8 Connecting KCT-40 Cable

1. Remove the cap for accessory on the rear panel of the transceiver.

2. Connect the KCT-40 cable to the D-sub 25-pin connector on the rear side of the transceiver.



2.3 KDS-100

(TK-7180/ 8180 only)

You can connect the data terminal (KDS-100) to the TK-7180/ 8180 transceivers to make data communications. This section describes how to connect the KDS-100 to the TK-7180/ 8180 transceivers.

2.3.1 Description

This transceiver can be configured to work with a data terminal used to perform data transmission. This transceiver is equipped with serial input/ output and data modulation input/ output terminals. FleetSync compatible mobile transceivers,Kenwood TK-7100/ 8100/ 780/ 880/ 7150/ 8150/7180/ 8180/ x60G series or etc, support the KDS-100.

Also, this KDS-100 is equipped with DSP (Digital Signal Processing), general purpose serial ports, and general purpose I/O ports. Thus, it has been designed to work with various peripheral devices. Although we provide the FPU (programming software KPG-71D).

2.3.2 Features of KDS-100

- Full-dot display (240 x 64 dots) with backlight function
- A dealer programmable PF keys (Programmable Function Key) with backlight function
- The following external terminals are available.
  - Serial communication terminal
  - I/ O control terminal
  - Data modulation I/ O terminals
- The following internal terminals are available.
  - Two general purpose serial ports (compatible with the RS-232C signal level)
  - PC/ AT keyboard input terminal (ask R&D)
  - NMEA0183 GPS receiver connection terminal
  - Input terminal for differential GPS signal to transfer to the GPS equipment.
  - Two clock synchronizer serial input terminals (for low-cost card reader) (ask R&D)
  - General purpose I/O control terminals
- DSP for supporting high speed data communication
- Real time clock
- Battery status memory for data communication
- Tri-color LED indicating the communication port status
- Modem output level adjustment function using the command generated from the electronic volume (PC & Panel Tune)
- Firmware update function using a flash ROM
- This transceiver supports the following protocols.
  - Fleet-Sync protocol capable (Non-FleetSync capable LTR/ Conventional transceivers can be yet interfaced with FleetSync compatible MDT to work. i.e.TK-*60G)
  - FleetSync serial protocol 1 (for full FleetSync PC protocol 1 compatible transceiver. i.e. TK-780/880)
  - FleetSync serial protocol 2 (for full FleetSync PC protocol 2 compatible transceiver. i.e. TK-7180/ 8180)
- Internal alarm to notify the message reception
- Advanced message function utilizing the FleetSync Short/ Long Message
- PTT ID Display
- GPS Auto/Polling capability (Install GPS unit into the KDS-100 or Transciver)
- Radio Remote (For PC2 Protocol compatible Radio)
- PTT ID Display and Log backup
- Emergency Feature Capability (For PC2 protocol)

2.3.3 Mechanical Specifications

■ Product Dimensions and Weight

Table 2-8 Product Dimensions and Weight

Item	Body	
	A	B
Width	187 mm	187 mm
Depth	42 mm	46.5 mm
Height	88 mm	88 mm
Weight	0.50 kg	

A: Dimension without projections
B: Dimension including projections

■ Front Panel

- Key Layout: 9-key top set with rubber having LED backlight
- Display: 240 x 64 positive type full-dot matrix LCD with LED backlight
- LED: Tri-color LED
- Pigtail connection cable (15-pin Molex)

■ Rear Panel

- Screw hole for mobile bracket (4 mm screw)
- Connector for external devices

2.3.4 Appearance

■ Top Panel

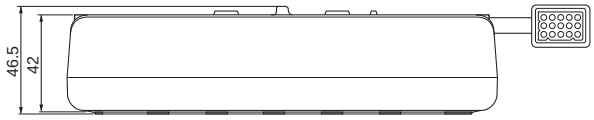


Figure 2-5 Top Panel

■ Side Panel and Front Panel

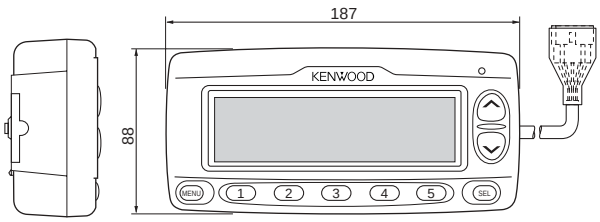


Figure 2-6 Side Panel and Front Panel

2.3.5 Electrical Specifications

■ Modulation

Table 2-9 Modulation Type

No.	Item	Description
1	Modulation	Minimum Shift Keying (MSK)
2	Baud Rate	1200/ 2400 bps

■ General Specifications

Measured and inspected under the standard conditions unless it is noted.

Table 2-10 General Specifications

No.	Item	Description
1	Power Voltage	Nominal Power Voltage: DC 13.6 V Negative Ground Range: DC 10.0 V - 15.7 V
2	Temperature Range	-20°C to +60°C
3	Measurement Environment	KIS 58-01: The transceiver is measured and tested under the product inspection specifications.
4	Low frequency output	KIS 58-01: The transceiver is measured and tested under the product inspection specifications.
5	Alarm Output Impedance	16 ohm
6	Modem Outpu Impedance	600 ohm
7	Modem Input Impedance	600 ohm

■ Electrical Specifications

Table 2-11 Electrical Specifications

No.	Item	Measurement Condition	Spec.
1	Modem Encode defualt Level	DO: 511random pattern/ 600ohm	700+/- 20mVrms
2	Modem Encode Level Range	DO: 1200Hz/ 600ohm	100 - 1000 mVrms
3	Modem Decode Level Range	DI: 1200Hz/ 600ohm	100 - 1000 mVrms
4	Retaining period for the received data	Lithium Battery Fully charged & GPS backup 30 µA	Above 2 months
5	Consumption Current for Storing the received data	Without GPS unit	Below 50uA
6	Bit Error Rate (1200 bps)	DI: 700 mVrms 12dB SINAD level	Below 0.5%
7	Bit Error Rate (2400 bps)	DI: 700 mVrms 12 dB SINAD level	Below 0.5%
8	Consumption current	INT/ EXT SP Max. When the INT/ EXT SP are at maximum.	Below 700 mA
9	Real time clock accuracy	Frequency Stability (25°C)	5+/-25ppm (1 min/ Month)
		Temperature Characteristic -10 to +70°C 25°C Reference	+10/-120 ppm

2.3.6 Optional Accessories

Table 2-12 Optional Accessories

No.	Model Name	Name (Specifications)
1	KPG-46	Programming Interface Cable (8-pin modular)
2	KPG-71D (For PC2 protocol; ver3.10 or later)	Field Programming Software (FPU)
3	KCT-34	Transceiver Interface Cable (for TK-780/880 mobile) *1
4	KCT-35	Transceiver Interface Cable (for TK-x60 series mobile) *1
5	KCT-39	Transceiver Interface Cable (for TK-7100/8100 mobile) *1
6	KCT-40	Transceiver Interface Cable (for TK-7150/8150/7180/8180) *1
7	KCT-36	Extension Cable *1

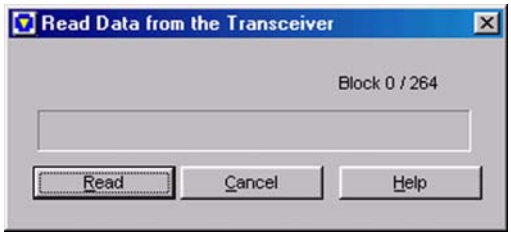
*1 Common option to the KGP-2A/ 2B (Modem GPS Receiver/ Controller)

2.3.7 Install KDS-100

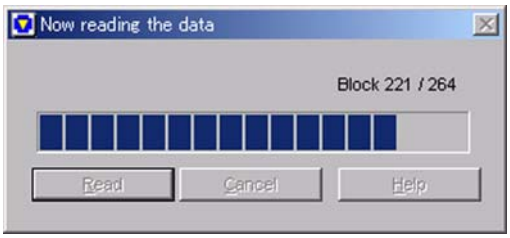
1. Connect the KCT-40 cable to the transceiver.
   (Refer to 2.2.8 Connecting KCT-40 Cable.)
2. Connect the KCT-40 cable to the KDS-100.
3. Turn the transceiver ON.
   The KDS-100 is also automatically turned ON.

2.3.8 Configuration using KPG-89D

1. Run the KPG-89D.
2. Select **"Program > Read Data from the Transceiver"**.
   You can also click the icon on the Toolbar.
   The Read Data from the Transceiver window appears.

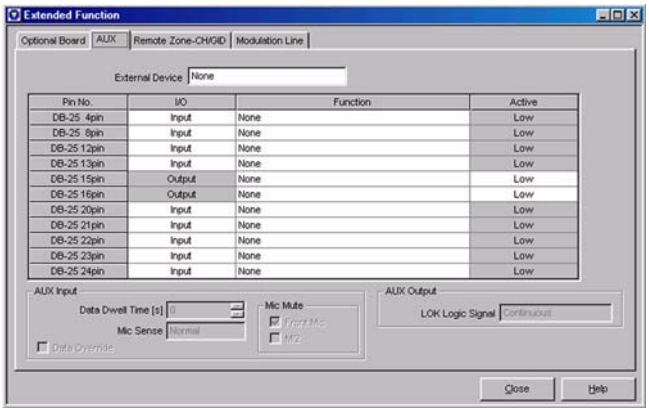


3. Click **"Read"**.
   The KPG-89D starts reading the configuration data from the transceiver.

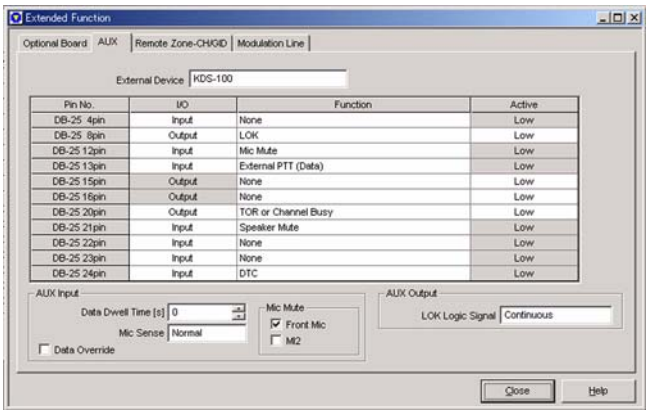


   The Extended Function window appears.

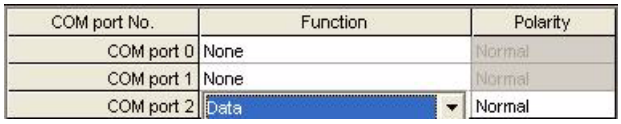
4. Select **"Edit" > "Extended Function"**.
5. Click the **AUX** tab.



6. Select "KDS-100" from the **External Device** pulldown menu.The necessary functions for the KDS-100 are automatically assigned to each port.

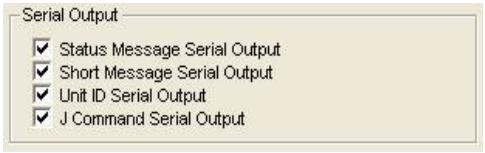


7. Select COM setting to **"Data"** for COM port 2.
   "Edit>Oprional Feature>Common-Page 3 Tab"

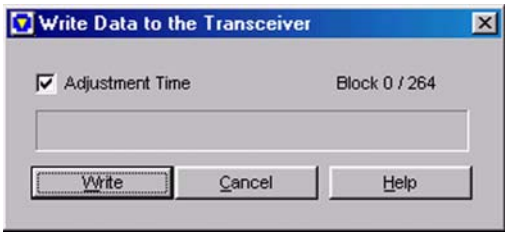


8. Select PC Interface protocol to "**Ver.2**".
   "Edit>FleetSync>>General 1 Tab"

9. Configure to be enable each serial Output for Status Message/Short Message/Unit ID serial Output.
   "Edit>FleetSync>>General 2 Tab"



10. Select **"Program" > "Write Data to the Transceiver"**.
    The Write Data to the Transceiver window appears.



11. Click **"Write"**.
    The configuration data is written to the transceiver.

Note:

To use KDS-100 with PC2 Protocol (Ver2), the above setting is neccessary. KENWOOD recomend PC2 Protocol for KDS-100 connection. By using PC2 Protocol, Radio remote feature will be available. To use the current PC protocol (Ver1) for connect KDS-100, skip the process 8.
And you can configure AUX input ports (pin 12,13,21) to other functions if select PC mode connection.
To use KDS-100 under Air mode, skip process 1,8,9. For using Air mode, configure deffuerent FleetSync ID to Radio and KDS-100.

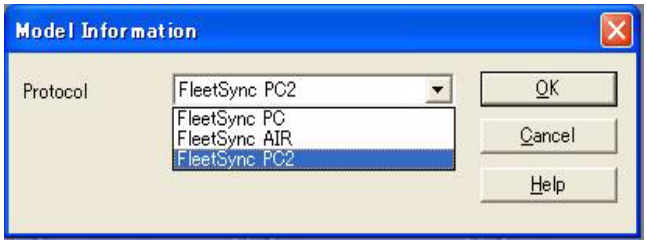
2.3.9 Configuration using KPG-71D

To configure KDS-100, use FPU KPG-71.
For PC2 connection, use FPU version 1.30 or later, and use latest firmware (Check sum=7AC5) or later. You can downroad them from Dealer Tools of KENWOOD Dealer Web site.

1. Open KPG-71D.

2. Read data from KDS-100.
"Program> Read from MDT ".

3. Change model type to **"FleetSync PC2"**.
"Model>Model Information".



The model information form appears, and select FleetSysnc PC2 from plldown menu. Then press OK.

4. Configure the port logic state in the following conditions to interface with the KDS-100 function port.
"Edit> Optional Features> Radio".

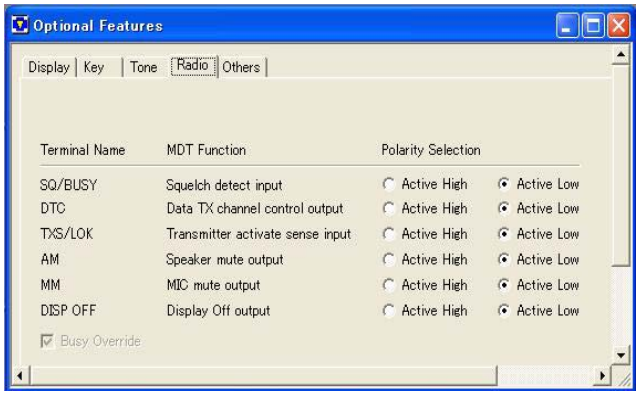


Table 2-13 Radio Port Logic Configuration

SQ	Squelch Detect Input	Active Low
DTC	Data TX Channel Control Output	Active Low
TXS/ LOK	Transmitter Active Sense Input	Active Low
AM	Speaker Mute Output	Active Low
MM	Mic Mute Output	Active Low

5. Select **"Program" > "Write to MDT"**.
The Write Data to MDT window appears.
Click "**Write**".
The configuration data is written to the KDS-100.

2.4 KGP-2A/ 2B

(TK-7180/ 8180 only)

You can connect the GPS receiver (KGP-2A/ 2B) to the TK-7180/ 8180 to utilize the location data of the transceiver. This section describes how to install the KGP-2A/ 2B to the TK-7180/ 8180 transceivers.

2.4.1 Install KGP-2A/ 2B

1. Connect the KCT-40 cable to the transceiver. (Refer to 2.2 KCT-40 Cable.)
2. Connect the KCT-40 cable to the KGP-2A/ 2B.
3. Turn the transceiver ON.

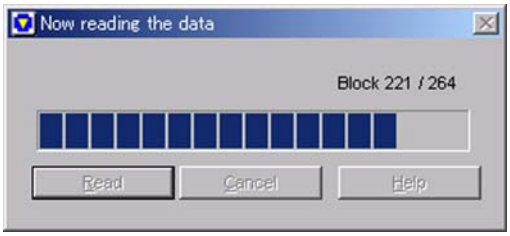
   The KGP-2A/ 2B are also automatically turned ON.

2.4.2 Configuration using KPG-89D

1. Run the KPG-89D.
2. Select **"Program" > "Read Data from the Transceiver".** You can also click the icon on the Toolbar.

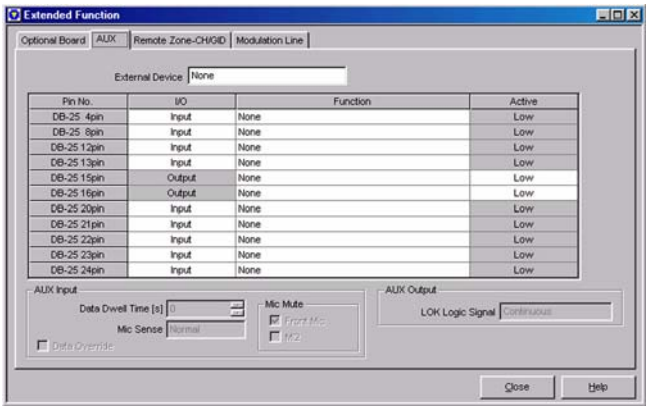
   The Read Data from the Transceiver window appears.
3. Click **"Read"**.

   The KPG-89D starts reading the configuration data from the transceiver.



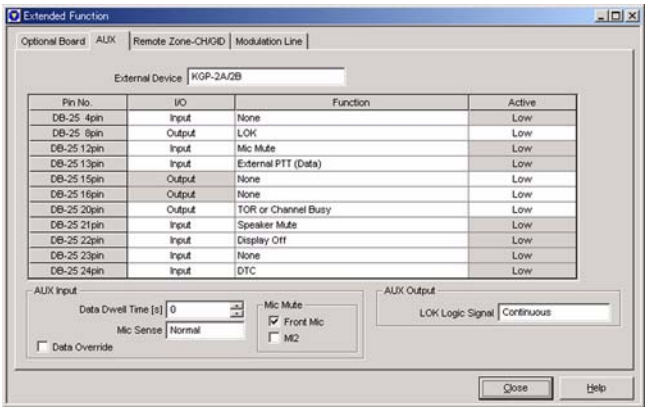
4. Select **"Edit" > "Extended Function".**

   The Extended Function window appears.
5. Click the **AUX** tab.



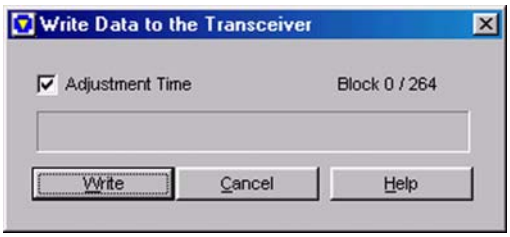
6. Select **"KGP-2A/ 2B"** from the External Device pulldown menu.

   The necessary functions to operate the KGP-2A/ 2B are automatically assigned to each port.



7. Select **"Program" > "Write Data to the Transceiver"**.

   The Write Data to the Transceiver window appears.



8. Click **"Write"**.

   The configuration data is written to the transceiver.

Note:

- You must have the KPG-73D to configure the KGP-2A/ 2B.
- You must configure the port logic state in the following conditions in the **Edit** pulldown menu > the **Hardware Setup** window to interface with the KGP-2A/ 2B function port.

Table 2-14 Transceiver Port Logic Configuration

SQ	Squelch Detect Input	Active Low
DISP	TX Display Off Output	Active Low
TXS/ LOK	Transmitter Active Sense Input	Active Low
AM	Speaker Mute Output	Active Low
MM	Mic Mute Output	Active Low

2.5 KRK-10

(TK-7180/ 8180 only)

You can install the KRK-10 to the TK-7180/ 8180 transceivers. This remote kit allows a user to use the transceiver remotely from the separate panel. This section describes the installation of KRK-10.

2.5.1 Description

This kit allows a user to use the transceiver remotely from the separate panel.

2.5.2 Features

- The length of the cable connecting the body and the panel is 700 cm (22.6 ft).
- The kit has the back panel for the remote head and the covering for the transceiver body.
- The same optional bracket parts for the KRK-9 is used for the installation flexibility.
- The remote panel is designed and constructed to meet the IP4/5 water-proof specifications.

2.5.3 Mechanical Specifications

■ Product Dimensions and Weight

Table 2-15 Product Dimensions and Weight

Item	Body Panel		Rear panel		Cable
Width	A	B	A	B	
	160 mm	160 mm	160 mm	160 mm	-
Depth	36.7 mm	40.7 mm	36.2 mm	40.2 mm	-
Height	45 mm	45 mm	45 mm	45 mm	-
Length	-	-	-	-	700 cm
Weight	0.83 kg (including weights of front and rear panels and cables)				

A: Dimension without projections
B: Dimension including projections

2.5.4 Appearance

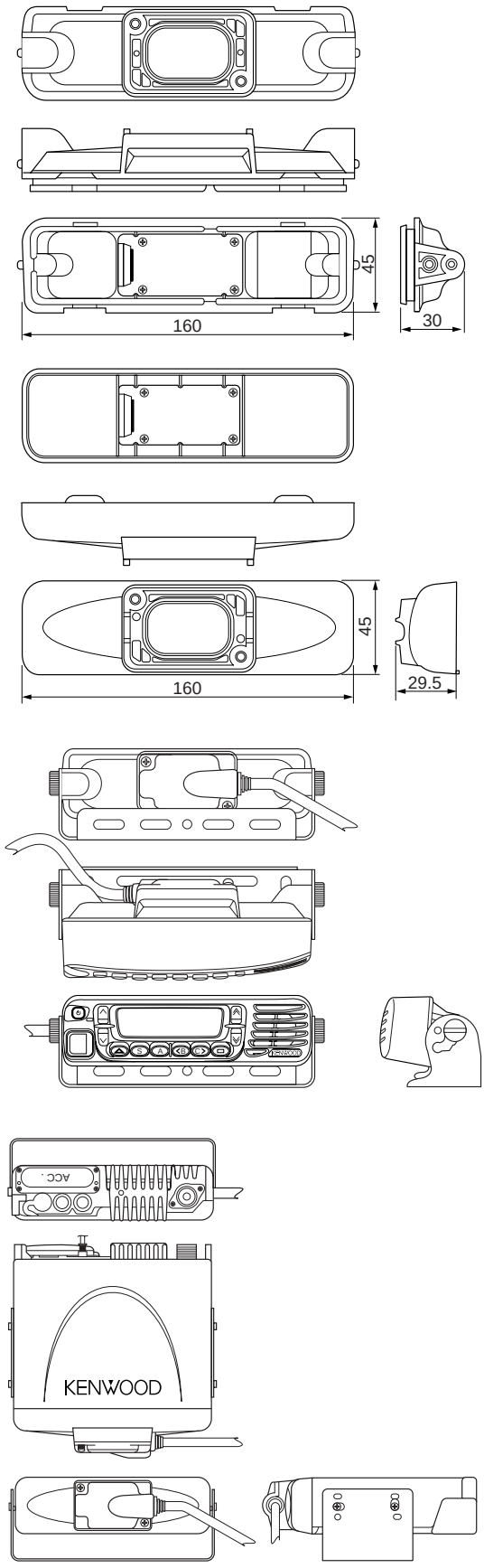


Figure 2-7 Appearance

2.5.5 Electrical Specifications

■ Terminal Specifications

Table 2-16 Terminal Specifications

PCB interconnection connector: E40-6378-x5 (14-pin Connector)

Panel Side		Description	Side Transceiver	
Pin Number	Signal Name		Pin Number	Signal Name
1	SPI	Front Panel Speaker Input	14	SPI
2	GND	Ground	13	GND
3	8C	8 V Power Supply	12	8C
4	SB	Power Entry After Power-on	11	SB
5	GND	Ground	10	GND
6	PSW	Power Switch Control Signal Input	9	PSW
7	MIC	Mic Signal Output	8	MIC
8	ME	Mic Ground	7	ME
9	PSENS	Panel Separate Output	6	PSENS
10	TXD	Serial Data Output	5	TXD
11	RXD	Serial Data Output	4	RXD
12	GND	Ground	3	GND
13	SHIFT	Beat Shift Output	2	SHIFT
14	RST2	Sub -com Reset Input	1	RST2

2.5.6 Standard Specifications

Table 2-17 Standard Specifications

- **MIL STANDARD**

  Meets the following specifications to comply with the specifications. The KMC-35/ 36 must be used with the specifications.

	MIL810-C	MIL810-D	MIL-810E	MIL-810F
Low Pressure	500.1/ Procedure I	500.2/ Procedure I, II	500.3/ Procedure I, II	500.4/ Procedure I, II
High Temp.	501.1/ Procedure I, II	501.2/ Procedure I, II	501.3/ Procedure I, II	501.4/ Procedure I, II
Low Temp.	502.1/ Procedure I	502.2/ Procedure I, II	502.3/ Procedure I, II	502.4/ Procedure I, II
Temp. Shock	503.1/ Procedure I	503.2/ Procedure I	503.3/ Procedure I	503.4/ Procedure I, II
Solar Radiation	505.1/ Procedure I	505.2/ Procedure I	505.3/ Procedure I	505.4/ Procedure I
Rain	506.1/ Procedure I, II	506.2/ Procedure I, II	506.3/ Procedure I, II	506.4/ Procedure I, III
Humidity	507.1/ Procedure I, II	507.2/ Procedure II, III	507.3/ Procedure II, III	507.4
Salt Fog	509.1/ Procedure I	509.2/ Procedure I	509.3/ Procedure I	509.4
Dust	510.1/ Procedure I	510.2/ Procedure I	510.3/ Procedure I	510.4/ Procedure I, III
Vibration	514.2/ Procedure VIII, X	514.3/ Procedure I	514.4/ Procedure I	514.5/ Procedure I
Shock	516.2/ Procedure I, II, III, V	516.3/ Procedure I, IV, V	516.4/ Procedure I, IV, V	516.5/ Procedure I, IV, V

- **IEC 529 (IP Code) IP-XX**

  Meets the following specifications to comply with the specifications. The KMC-35/ 36 must be used as an optional microphone.

Element	Code Letters	First Code	Second Code
Numbers or Letters	IP (International Protection)	5 (Dust-protection)	4 (Splashing) 5 (Jetting) *1

*1 If IP-x5 is applicable to the head unit only, IP-x4 is applicable to the transceiver body.
If the head unit is mounted to the transceiver body, IP4X is applicable to the transceiver.

- **Display**

  No remarks.

2.5.7 Supplied Accessories

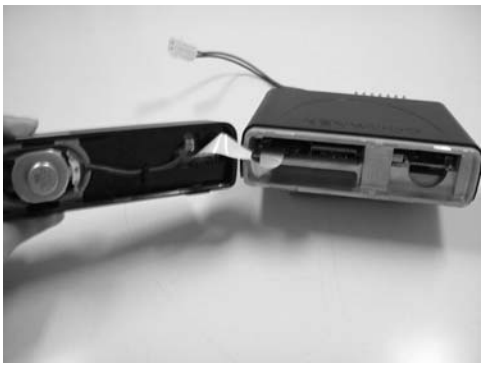
Table 2-18 Supplied Accessories

No.	Name	Part Number	Qty.	Remarks
1	Screw Set	N99-2040-x5	1	-
2	Bracket	J29-0698-x3	1	-
3	Dressed Screw	N08-0550-x4	2	-
4	Interface Cable	E30-7514-x5	1	Length: 700 cm
5	Rubber Cap	F07-1884-x3	2	-

2.5.8 Install KRK-10

1. Remove the panel.

Lift the rear panel by widening two side tabs, using a flat-head screw driver, or etc. Then, pull upward to remove the rear panel from the transceiver body.

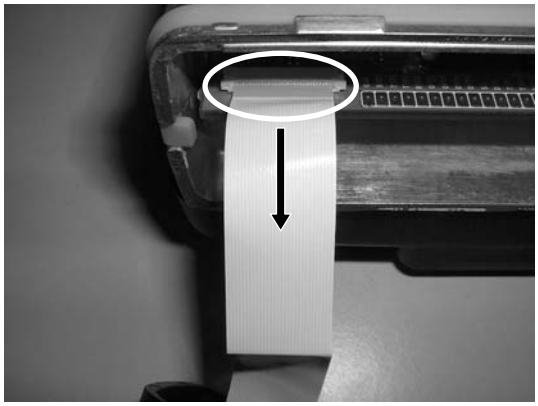


CAUTION

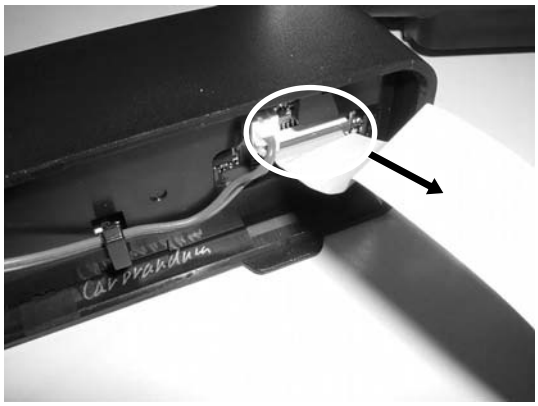
REMOVE THE PTANEL SLOWLY. OTHERWISE, THE FLAT CABLE MAY BE DAMAGED.

2. Remove the flat cable.

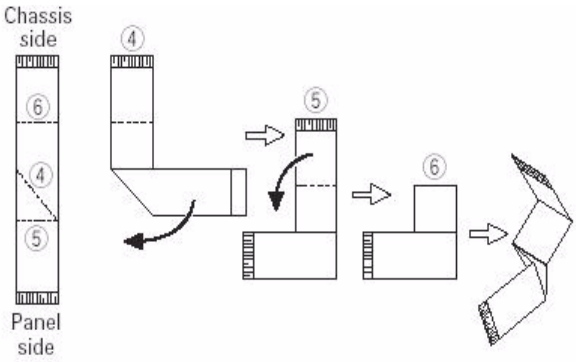
- Remove the cable from the connector on the PCB board.



- Remove the cable from the panel.



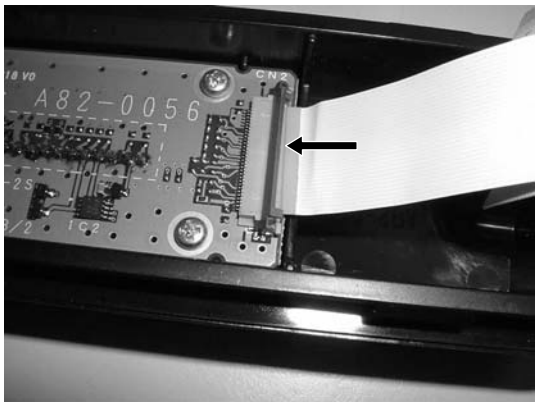
3. Fold the flat cable along with the black lines (3 lines).



- Fold the flat cable along with the diagonal black line as shown on the Point 4.
- Fold the flat cable along with the top black line as shown on Point 5.
- Fold the cable as shown on Point 6.

4. Insert the flat cable folded at the step 3 into the connector.

- Lift up the connector cover of the interface board (A/2) of the KRK-10 main panel (A62-1101-x1) and insert the cable into the connector as shown in the figure.



- Lock the cover.

- Insert the cable into the connector of the transceiver as shown on the figure.

CAUTION

MAKE SURE THAT THE METAL CONTACTS OF FLAT CABLE ARE FACING DOWNWARD WHEN THE FLAT CABLE IS INSERTED INTO THE CONNECTOR.

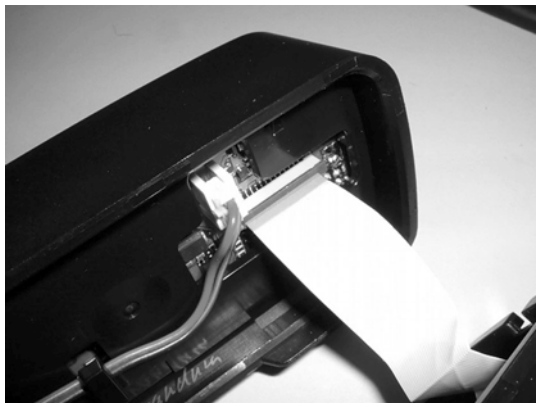
5. Install the KRK-10 blank panel (A62-1101-x1) to the transceiver.Install the panel by hooking two tabs to the panel.

CAUTION

YOU MUST KEEP THE FLAT CABLE AWAY FROM THE MAIN PANEL WHEN INSTALLING THE MAIN PANEL TO THE FRONT OF THE CHASSIS .

6. Insert the flat cable on the interface board (B/2) of the KRK-10 rear panel (A82-0056-x1) and insert the cable into the connector (CN902) on the display board.

- Lift the connector cover and insert the flat cable into the connector as shown in the figure.



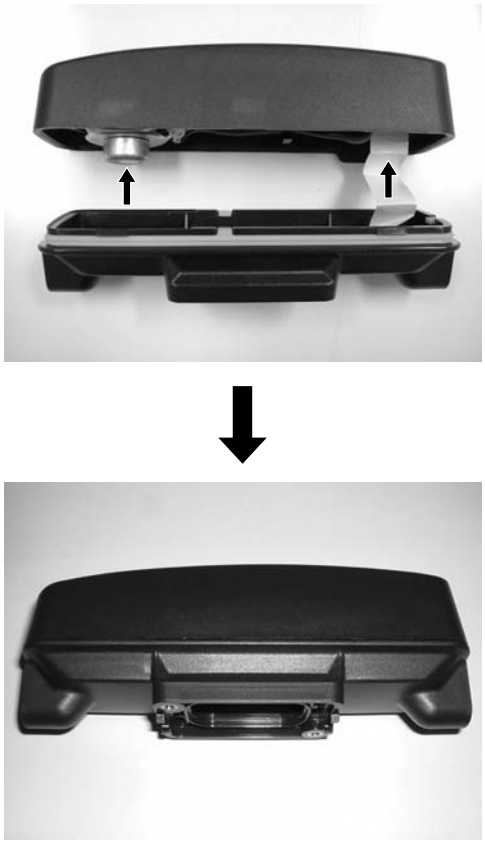
- Insert the connector cover and install the flat cable.

CAUTION

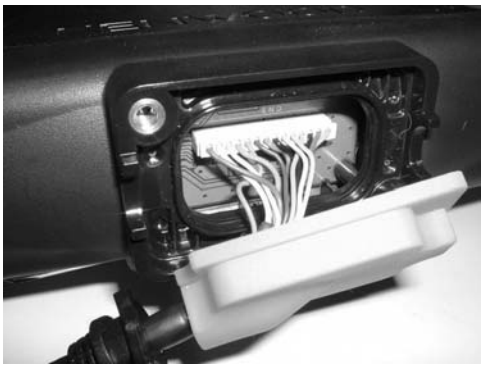
MAKE SURE THAT THE METAL CONTACTS OF FLAT CABLE ARE FACING DOWNWARD WHEN THE FLAT CABLE IS INSERTED INTO THE CONNECTOR.

Note: The flat cable is plugged into the connector as a factory default setting.

7. Install the panel by engaging two tabs on the rear panel.

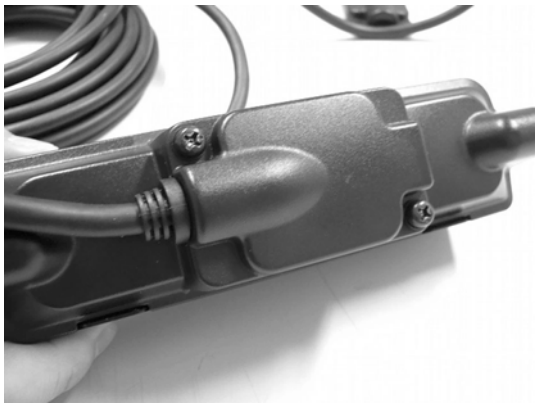


8. Insert 14-pin connector at the one end of the interface cable (E30-7514-x5) into the connector (CN3) of the interface board (A/2) of the main panel.



9. Secure the bushing part of the cable to the main panel and insert the waterproof packing (orange).

10. Install the rubber cap to the main panel and secure the cover with two sems screws (black) (N99-2040-x5).



11. Insert 14-pin connector at the other end of the interface cable (E30-7514-x5) into the connector (CN4) of the interface board (B/2) of the rear panel.

12. Secure the bushing part of the cable to the main panel and install the waterproof packing (orange).

13. Install the rubber cap to the main panel and secure the cover with two sems screws (black) (N99-2040-x5).

2.6 KAP-2

(TK-7180/ 8180 only)

The optional KAP-2 cable is available for the TK-7180/ 8180 transceivers. This cable allows you to add the PA, Horn Alert, and EXT SP functions. This section describes how to install the KAP-2 cable to the TK-7180/ 8180 transceivers.

2.6.1 Description

This cable has the unit allowing you to add the PA, Horn Alert, and EXT SP functions.

2.6.2 Features

- You can switch HOR1, HOR2, INT SP, and EXT SP functions using the jumper connector.

2.6.3 Mechanical Specifications

■ Product Dimensions and Weight

Table 2-19 Product Dimensions and Weight

Item	Board Size	Cable Length
Length	30.0 mm	260 mm
Width	27.5 mm	
Thickness	7.8 mm	
Weight	30 g	

■ Cable Specifications

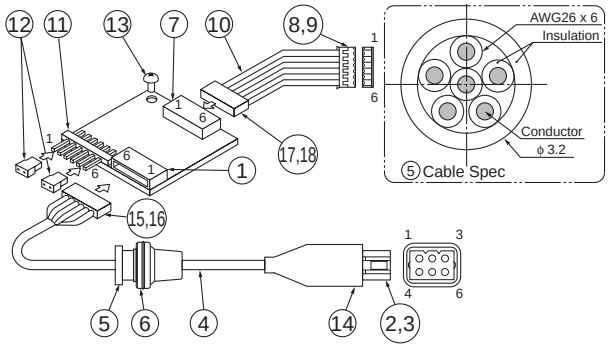


Figure 2-8 Mechanical Parts

Table 2-20 Table2-22 Mechanical Parts

No.	Part Name	Qty	Remarks
1	Housing	1	MOLEX:53015-0610
2	Housing	1	MOLEX:03-06-1062
3	Terminal	6	MOLEX:02-06-1132
4	Cable	1	UL1007 AWG26, 6-pin Cable, Length: 200 mm
5	Bushing	1	PVC Color: Black
6	Packing	1	Si-Rubber
7	Housing	1	MOLEX:53254-0610
8	Housing	1	MOLEX:51065-0600
9	Terminal	6	MOLEX:50212-8100
10	Cable	6	UL1007 AWG24, Length: 35 mm
11	Pin Assy	1	IRISO:E40-6375-x5
12	Socket	2	IRISO:E18-0254-x5
13	Brazier Head Taptite Screw	1	N87-2606-x8
14	CAP	1	513083
15	Housing	1	MOLEX:51004-0600
16	Terminal	6	MOLEX:50011-8100
17	Housing	1	MOLEX:51065-0600
18	Terminal	6	MOLEX:50212-8100

2.6.4 Electrical Specifications

■ Terminal Specifications

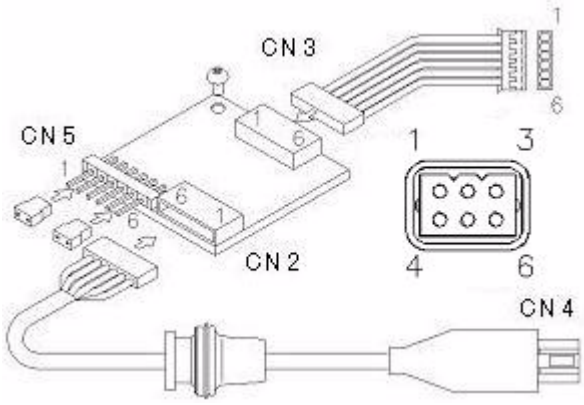


Figure 2-9 Connector Number

Table 2-21 CN 3 Pin Specifications

	CN3	Description
1	GND	Ground
2	HOR	Horn Alert Function control signal
3	PA	Pablic Address Function control signal
4	SPO	Speaker Output
5	SPI	Sleaker Input
6	SB	Switched B

Table 2-22 CN2/4 Pin Specifucation

	Name	Description
1	HR2	Horn Alert signal Output 2: 2Amax
2	GND	Ground
3	OSP	External speaker output (PA); 2Amax
4	ESP	External speaker output; 2A max
5	GND	Ground
6	HR1	Horn Alert signal Output 1; 2Amax

Figure 2-10 Jumper Pin Specifications (Top View)

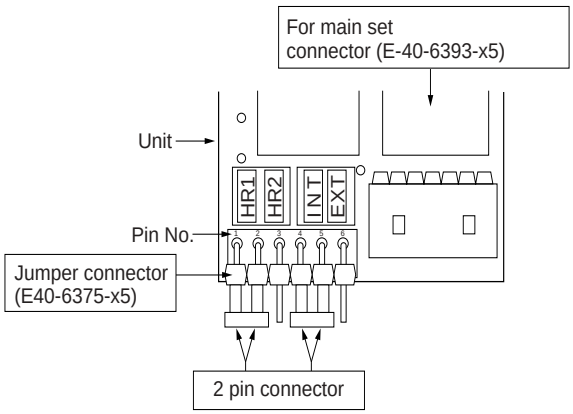


Table 2-23 Jumper Pin Specifications (CN 5)

Pin Location	HA	HR1 Relay	Pin Location	PA	AF OUTPUT
1-2 Pin	OFF	Open	4-5 Pin	OFF	Internal SP
	ON	Grounded		ON	Pablic Address
2-3 Pin	OFF	Open	5-6 Pin	OFF	External SP
	ON	Short with HR2		ON	Pablic Address

Note: 1-pin and 2-pin (HR1) connection and 4-pin and 5-pin connection are default setting.

- **External Speaker**

Connect KES-5 to Pin4 and Pin5 of the KAP-2 CN4 (Molex 6 Pin) with the supplied accessary connector and pins..

- **Pablic Address (PA) Function**

The PA outpu switch relay is controlled by turning the PA function on and off. When the PA is activated, the PA output flows through the following path.

The audio signal input from the microphone passes through the filter, amplefier and other circuits, then goes to CN3-pin 5 (SPI) of KAP-2. The audio signal passes through the relay (K2) and out to CN2-pin2.

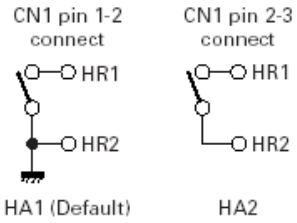
When the Jumper is located pin4 and pin5 while PA key is off, the receive audio come out from the internal soeaker. Otherwise, located pin5 and 6, the received audio is outputed from External spealer (KES-5).

- **Horn Alert (HA) Function**

The KAP-2 canbe controlled by turning the HA function on and off and by using a signaling decode output. The relay has a capability of current 2A maximum to work a horn relay of vehicle.

There are two Horn Alert settings. (HA1 and HA2)

CN1 Connect	Set Up
1-2	HA1
2-3	HA2



2.6.5 Standard Specifications

- **Display**

No remarks.

2.6.6 Supplied Accessories

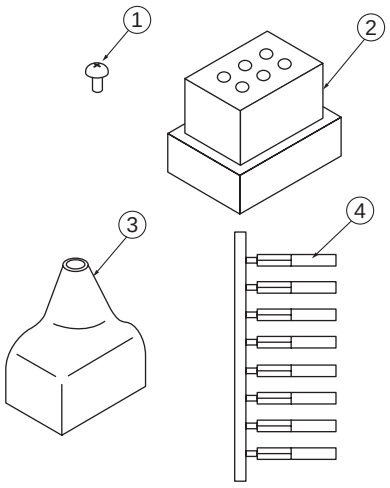


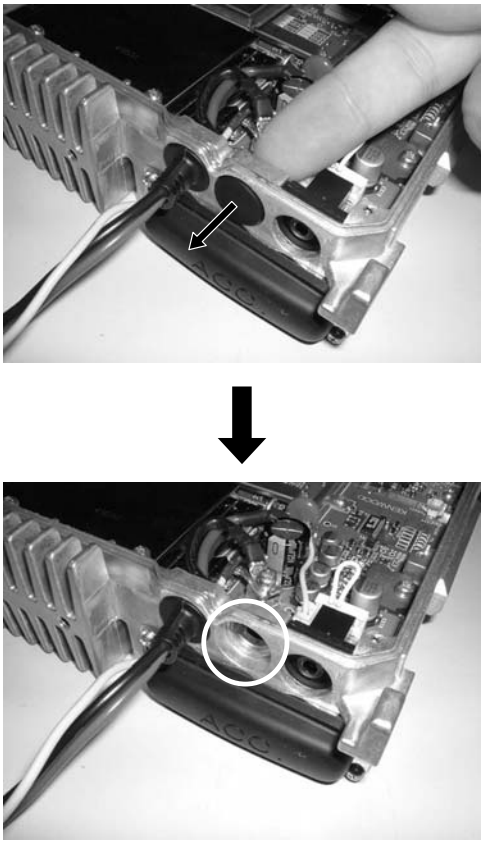
Figure 2-11 Supplied Accessories

Table 2-24 Supplied Accessories

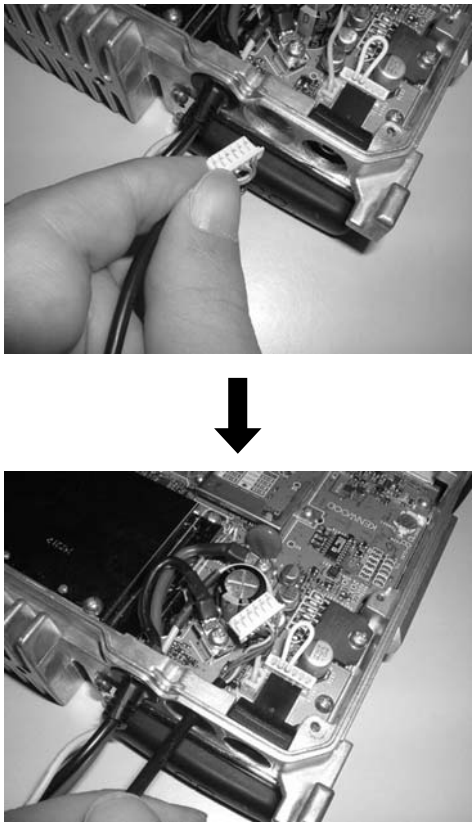
No.	Name	Part Number	Qty	Remarks
1	Screw (Brazier Head Taptite)	N87-2606-x8	1	
2	Square Plug	E59-0419-x5	1	
3	Insulating Cover	F29-0481-x5	1	
4	Crimp Terminal	E23-1257-x5	8	Chain Terminal

2.6.7 Install KAP-2

1. Remove the chassis of the TK-7180/ 8180 transceivers.
   - Lift the top cover by widening two side tabs, using a flat-head screw driver etc. Then, pull upward to remove the top cover from the transceiver body.
   - Remove the top rubber packing.
   - Remove 4 screws and then lift the shielding plate.
2. Push the cap on the rear panel of the chassis from the inside of the chassis.

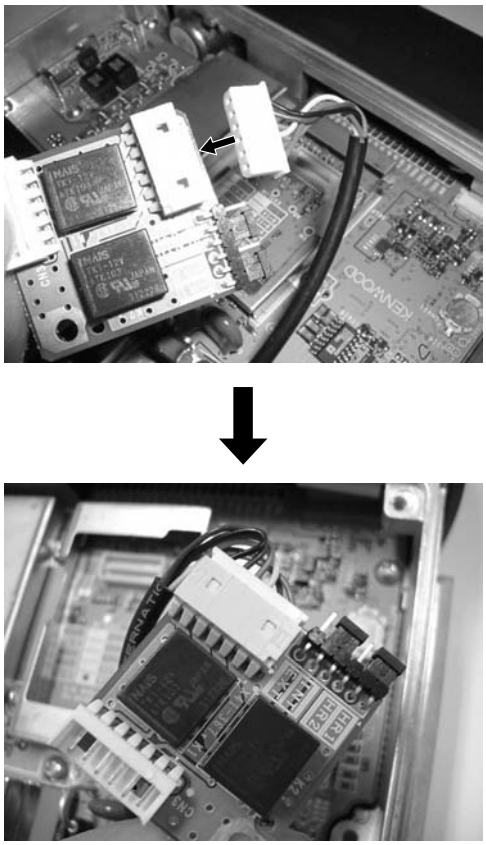


3. Insert the 6-pin connector of the connection cable .

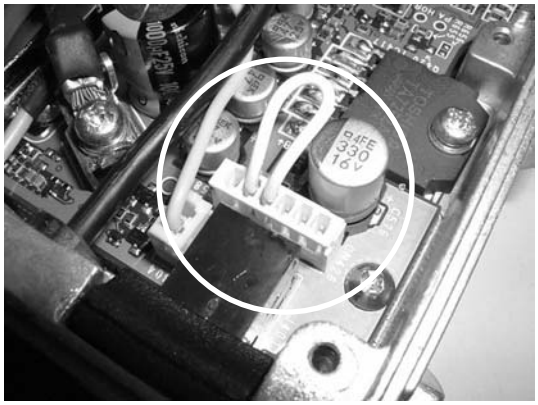


4. Insert the bushing part into the chassis hole fully .
5. Turn the bushing part of the connection cable clockwise 90 degrees as seen from the inside of the chassis.

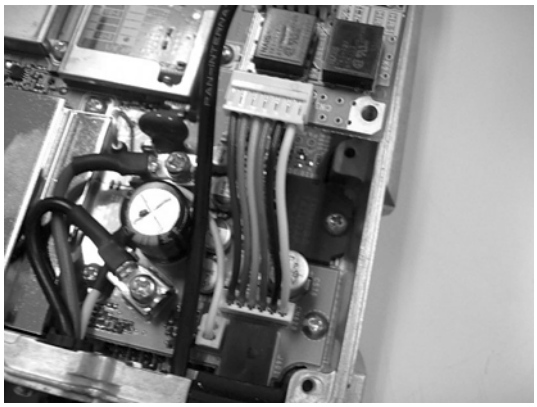
6. Insert the 6-pin connector of the connection cable into the interface board (CN2).



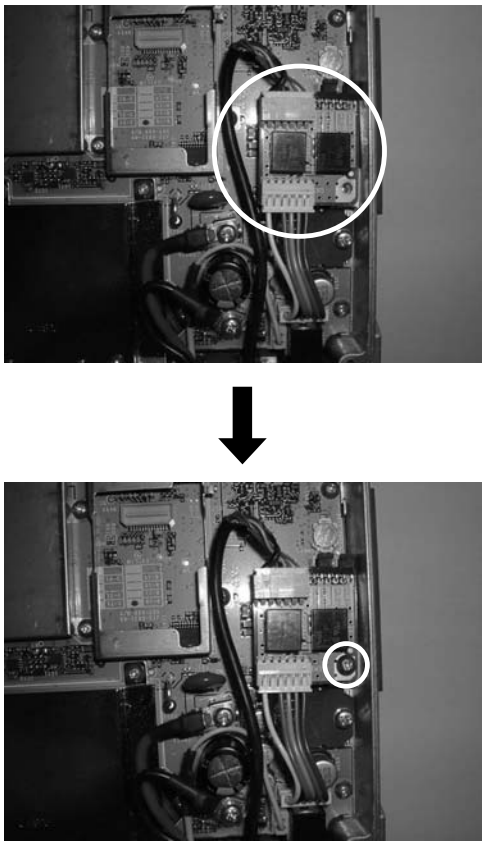
7. Remove the lead wire with the connector that is inserted into the connector (CN428) of the TX-RX board.



8. Plug a lead wire with the connector (E37-1114-x5) into the connector (CN3) on the Relay PCB, then plug another end into the connector (CN428) on the TX-RX PCB.



9. Position the relay board on the point shown in the figure and secure the board on the chassis using the supplied screw (N87-2606-x8) (8 kgf).



10. Reinstall the shielding plate, top rubber packing, and the top case to the transceiver.

2.7 VGS-1

You can install the optional voice recording/ playback unit to the transceivers. The VGS-1 is also capable of storing the GPS data. This section describes this VGS-1 optional accessories.

2.7.1 Description

The VGS-1 is an optional voice recording/ playback unit for the Kenwood transceivers.

2.7.2 Features

- Playing back the recorded voice of the Voice Memo Recording Channel.
- The voice is digitized and stored to the Static RAM temporarily. The voice data can be played back or stored to the flash ROM.
- Playing back the configured voice data
- Updating programming data or voice data
- Compatible with 3.3 V/ 5 V dual I/O voltage (only 5 V is required for the power source.)
- CPU clock oscillation circuit with the beat shift function.

2.7.3 Mechanical Specifications

■ Product Dimensions and Weight

Table 2-25 Product Dimensions and Weight

Item	Size and Weight
Length	33 mm
Width	23 mm
Thickness	42 mm (reference value)
Weight	20 g

2.7.4 Electrical Specifications

■ General Specifications

The transceiver is measured and inspected under the following conditions unless it is noted.

Table 2-26 General Specifications

No.	Item	Specifications	
1	Supply Voltage	Standard	5.0 V
		Range	4.5 V - 5.5 V
2	Temperature Range	Working	-30°C - 60°C
3	Load Impedance	Audio out	10kohm
		Audio input	10kohm
		I/O Port	47kohm

■ Terminal Specifications

Table 2-27 Terminal Specifications

PCB interconnection connector: E40-6358-x5 (8) (26-pin Board to Board Connector)

Pin Number	NAME	CONTENT	I/O	REMARKS
1	BUSY	Busy indication	O	Active H *1
2	PLAY	Play indication	O	Active H *1
3	SO	Serial Data Out	O	*1
4	SI	Serial Data In	I	H: 2.2 V to SV *2, L: less than 0.5 V
5	CLK	-	-	-
6	EN	Enable	I	H: 2.2 V to SV *2, L: less than 0.5 V
7	USEL	UART speed select	I	H: 115200 bps L: 19200 bps
8	RST	Reset	I	H: 2.2 V to SV *2, L: less than 0.5 V
9	DGND	Digital GND		
10	AGND	Analogue GND		
11	AO	Audio Out	O	3.0 Vp-p/10kohm max
12	AI	Audio In	I	100 mVp-p/10kohm max
13	AGND	Analogue GND		
14	5C	Supply Voltage	I	4.5 V - 5.5 V
15 - 26	Reserved	Reserved	Reserved	Not connected internally.

*1 Normally H = 3.3 V. Pull up to 5 V externally H = 5 V.

*2 Supply Voltage
Signal timing is specified in Software Specification Document.

■ Power Consumption

Table 2-28 Power Consumption

	Min.	Typ.	Max.	Unit	Condition
Supply Voltage	4.5	5	5.5	V	
Current (14-pin)		21		mA	Normal Operation
		44			Flash ROM Erase
		2.5			Standby

■ Output Characteristic

- **Conditions**
  - The signal source having the output impedance 600ohm provides the sinewave of 30 mVrms 1 kHz from the AI (12-pin) to the AGND (13-pin).
  - Power Voltage: 5 V ± 0.1 V
  - Terminate the AO terminal (11-pin) and AGND (10-pin) with a 10kohm resistor.
- **Result**
  - S/N when playing back the voice: Above 40 dB
  - Distortion when playing back the voice: Less than 8%

2.7.5 Standard Specifications

Unit is not provided. (Obtain through the body)

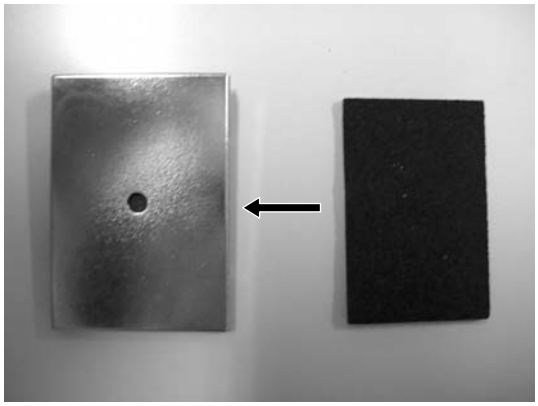
2.7.6 Supplied Accessories

Table 2-29 Supplied Accessories

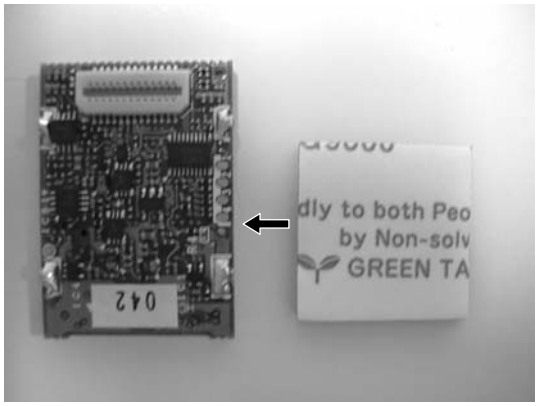
No.	Name	Part Number	Remarks	Qty
1	Instruction Manual	B62-1741-x0	7 languages	1
2	Cushion A	G13-1974-x4		1
3	Cushion B	G13-1992-x4		1
4	Cushion C	G13-1993-x4		1
5	Cushion D	G13-1994-x4		1
6	Cushion E	G13-1995-x4		1
7	spacer	J30-1292-x4		1

2.7.7 Configuration of VGS-1

1. Prepare the VGS-1 board.
2. Attach the cushion (G13-1995-x4) on the shield case of the VGS-1.



3. Attach the cushion (G13-1992-x4) on the component side of the VGS-1.



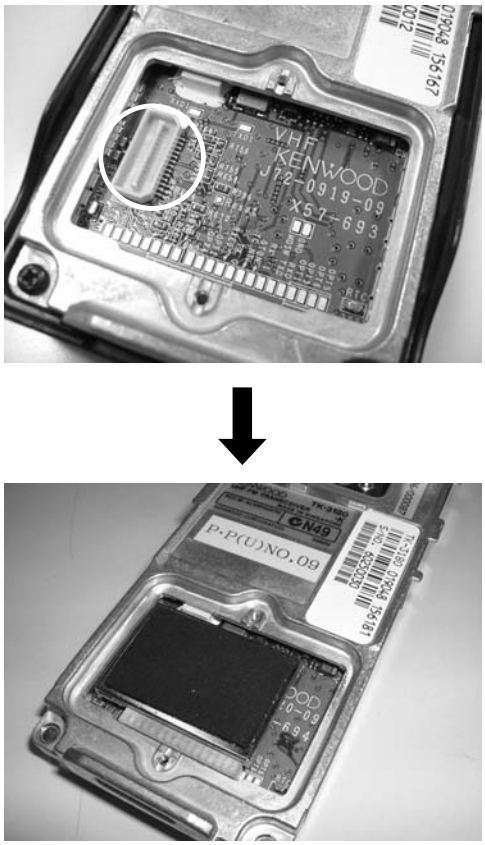
2.7.8 Install VGS-1 to TK-2180/ 3180

1. Remove two screws on the cover.

2. Insert the tweezers into the screw hole and then lift the cover.

3. Peel off of the tape cover of the Cushion (G13-1992-x4) on the component side of the VGS-1.

4. Insert the VGS-1 connector (CN1) into the connector (CN403) on the TX-RX PCB (B/1).



5. Peel off the tape cover of the Spacer (J30-1292-x4), and attach it to the space as illustrated.

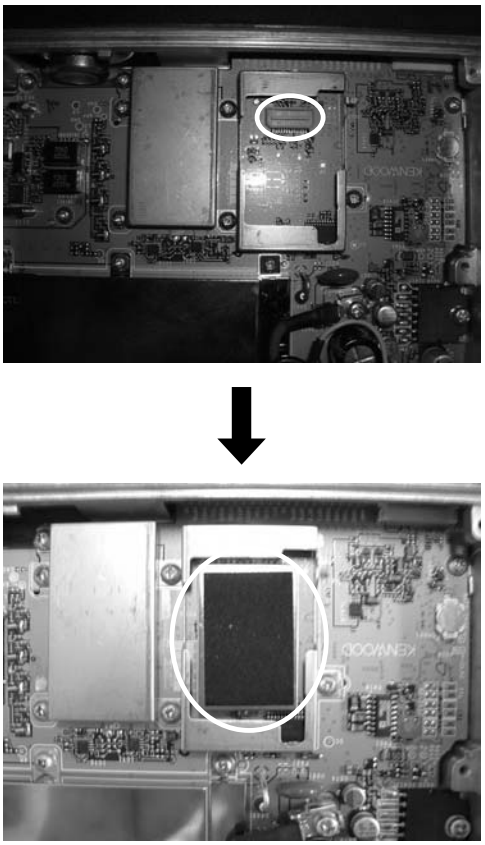
6. Reinstall the cover and battery pack.

2.7.9 Install VGS-1 to TK-7180/ 8180

1. Remove the chassis of the TK-7180/ 8180 transceivers.

- Pull and lift the top cover by widening two side tabs. Then, pull upward to separate the top cover from the transceiver body.
- Remove the top rubber packing.
- Remove 4 screws and then lift the shielding plate.

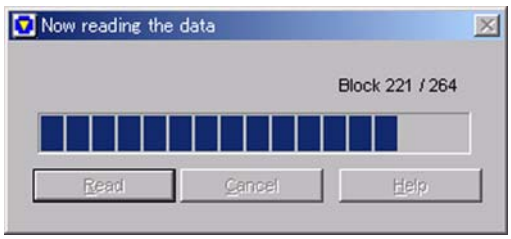
2. Insert the VGS-1 connector (CN1) into the connector (CN403) on the TX-RX PCB (B/3).



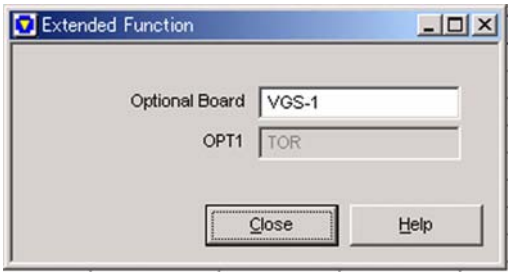
3. Reinstall the shielding plate, top rubber packing, and the top case to the transceiver.

2.7.10 Configuration using KPG-89D

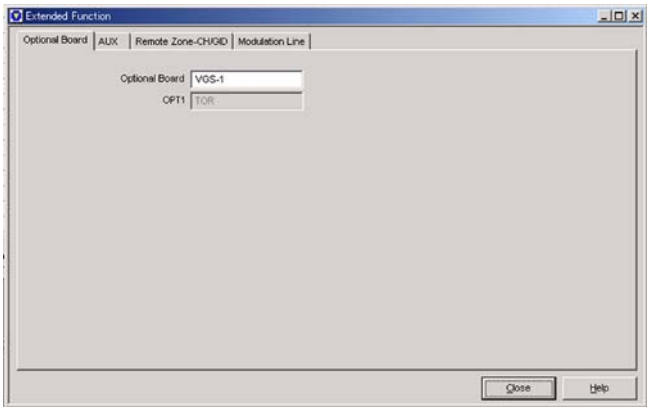
1. Run the KPG-89D.
2. Select **"Program" > "Read Data from the Transceiver".**
   You can also click the icon on the Toolbar.
   The Read Data from the Transceiver window appears.
3. Click **"Read"**.
   The KPG-89D starts reading the configuration data from the transceiver.



4. Select **"Edit> Extended Function> Option Board Tab".**
   The Extended Function window appears.
5. Select **"Optional Board" > "VGS-1"**.



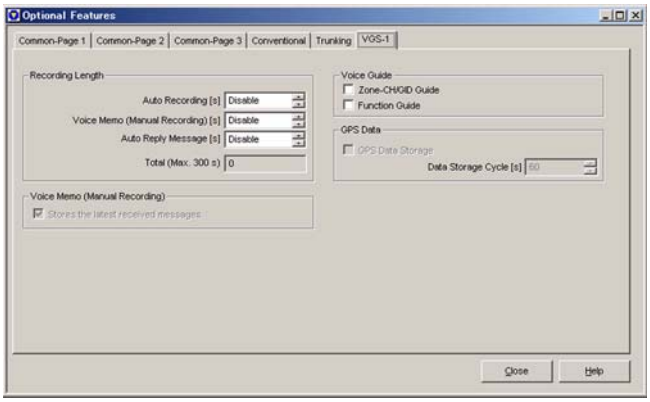
TK-2180/ 3180 Transceivers



TK-7180/ 8180 Transceivers

6. Select **"Edit" > "Optional Features> VGS Tab".**
   The Optional Features window appears.

Note: An error message appears when you click the **VGS-1** tab if the "VGS-1" is not selected in the **Extended Function** window > the **Optional Board** pulldown menu.



7. Configure the VGS-1 board.
   Refer to the "FPRG 7.6 VGS-1 Tab" for details.
8. Select **"Program" > "Write Data to the Transceiver"**.
   You can also click the icon on the Toolbar.
   The Write Data to the Transceiver window appears.
10. Click "**Write**".
    The configuration data is written to the transceiver.

3.1 Voice Scrambler Board

You can install the optional board, such as a Voice Scrambler board, to the transceiver. This section describes how to install the TRANSCRYPT SC20-460 to the transceiver.

Refer to the following URL or TRANSCRYPT for the product details.

http://www.intepla.com/transcrypt/Pages/Two-way/460.html

■ Items Required to Install

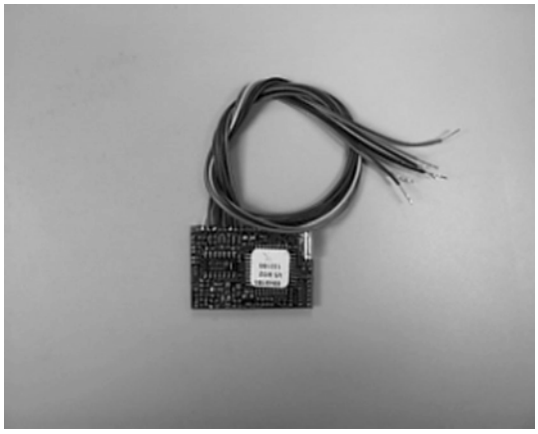
- Transceiver
- SC20-460
- Cushion Tape
- Protective cloth (N9440B, with an adhesive tape on one side)

CAUTION

YOU MUST TURN THE TRANSCEIVER OFF AND REMOVE THE POWER CABLE BEFORE CONNECTING THE OPTION TO THE TRANSCEIVER.

3.1.1 SC20-460 Board

1. Prepare the SC20-460 board.

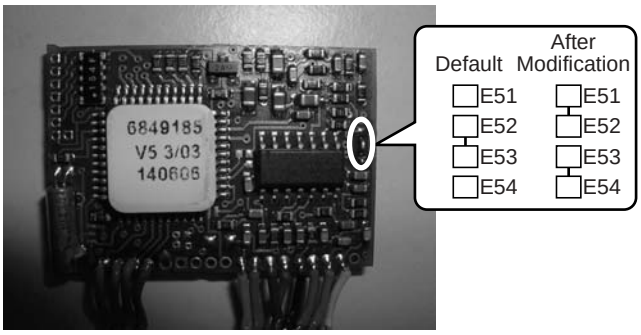


2. To modify the SC20-460 board and change the RX Audio Input method.

In the normal Voice Scrambler board, the transceiver enters the RX audio signals before de-emphasizing the signal.

However, the transceiver enters the RX audio signals after de-emphasizing the signal, so that you must modify the Voice Scrambler board.

- Cut the foil between E52 and E53.
- Solder the position between E51 and E52 to connect them.
- Solder the position between E53 and E54.



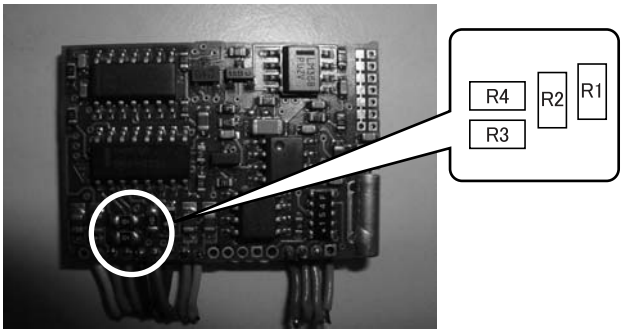
Note:

- The required modification must be performed to avoid symptoms, such as low level-audio signals from the speaker, or too loud and distorted voice.
- Refer to the instruction manual supplied with the Voice Scrambler for details.

3. Change the constant in conjunction with the TX/RX audio level.

- Replace the R1 with the part with 100kohm and R3 with the part with 100kohm in conjunction with the RX audio level.
- Replace the R2 with the part with 6.8kohm and R4 with the part with 6.8kohm in conjunction with the TX audio level.

Before Modification	After Modification
R1, R3: 100kohm (The SC20-460 board default)	R1, R3: 100kohm (No modification)
R2, R4: 100kohm (The the SC20-460 board default)	R2, R4: 6.8kohm



Note:

- The required modification must be performed to avoid symptoms, such as low-level audio signals from the speaker, or too loud and distorted voice.
- Refer to the instruction manual supplied with the Voice Scrambler for details.

4. Setup each signal of optional board following below. (Refer to 1.2 26-pin Accessory Connector.)

Table 3-1 Terminal Description

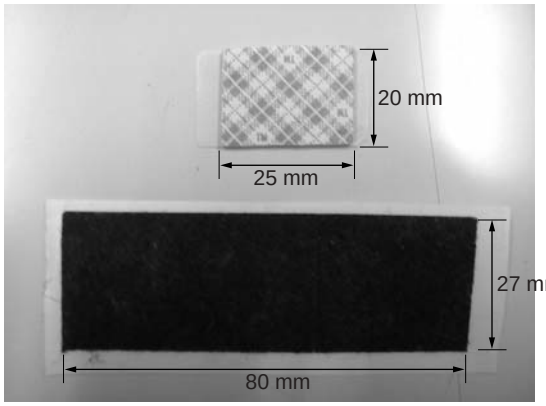
Land Name	I/O	Board Function	REMARKS
OPT1	O	CODE Select 1	Active L
OPT3	O	CODE Select 2	Active L
OPT6	O	CODE Select 4	Active L
OPT5	O	CODE Select 8	Active L
OPT2	O	SCRAMBLE	Active L
TXD1	O	PTT	TX; L
	I	PTT IN	Not Available (Ask R&D)
OPT4	O	ECHO PTT	Not Available (Ask R&D)
TXO	O	TX IN	Scrambled Transmit Audio
RXEO	O	RX IN	Receive Audio
RXEI	I	RX OUT	Scrambled Receive Audio
TXI	I	TX OUT	Transmit Audio
SB2/ 8C	O	+V	7.5V typ
			8.0V typ
GND		Ground	-

5. A protective cloth and adhesive cushion tape are required for the TK-2180/3180 transceiver and a cushion tape below is required for the TK-7180/8180 transceiver.

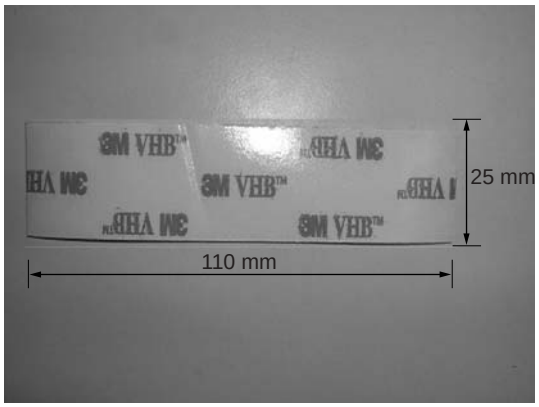
A cushion tape, manufactured by 3M (No. 4008 or No. 4018) is recommended. A No. 4008 tape is used for the TK-7180/8180 transceiver.

6. For the TK-7180/8180, cut out the cushion tape and cloth as same size as the SC20-460 PCB.

- As for the TK-2180/3180, cut out the cloth as 27mm x 80mm and as 20mm x 25mm for the adhesive cushion tape.



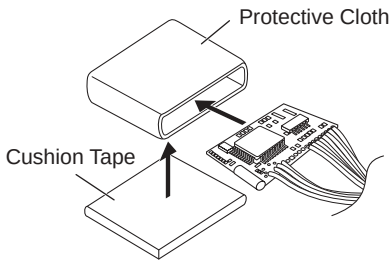
- Cut out the cushion tape as 110mm x 25mm as shown below (TK-7180/8180).



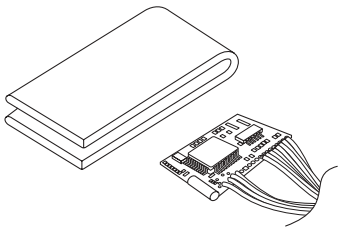
Note: The above cut-out sizes are for the typical installation purposes. The size may varies depending on the installation conditions.

7. Stick the cushion tape cut at the previous step on the SC20-460 board.

- Wrap all round to the SC20-460 board with the protective close and stick the cushion tape on the bottom side as illustrated for the TK-2180/ 3180 transceivers.



- Wrap and shape the board with the cushion tape as shown in the figure.

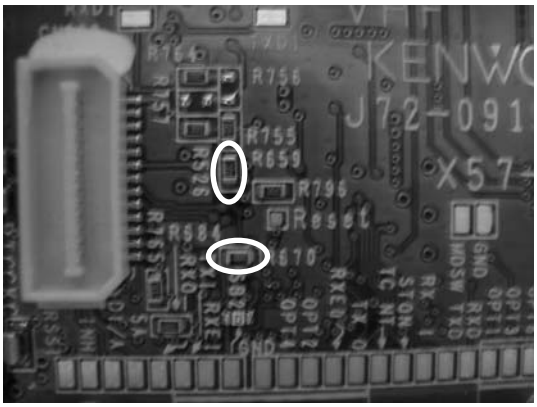


8. Cut the cable in order to solder easily.

- Approximately 10 mm for TK-2180/3180.
- Approximately 40 mm for TK-7180/8180.

3.1.2 Install SC20-460 to TK-2180/ 3180

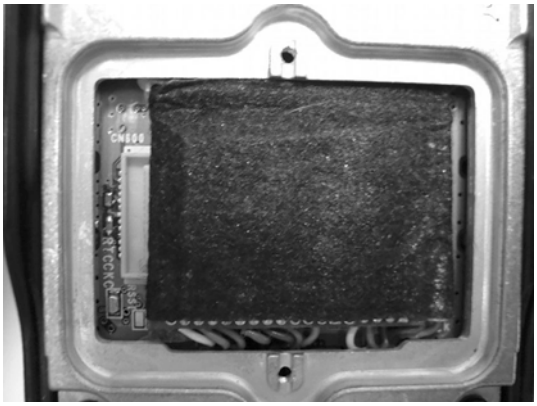
1. Remove two screws that hold the cover.
2. Insert the tweezers into the screw hole and then lift the cover.
3. Remove the jumper R670 and R659.



4. Solder the TX-RX PCB (X57-6930-x0) to the wires from the SC20-460 board.

   You must connect the terminals as shown in the following table.

5. Peel off the tape cover that holds the SC20-460 board and install the board on the position shown in the figure.



6. Reinstall the cover and battery pack.

3.1.3 Connection with SC20-460

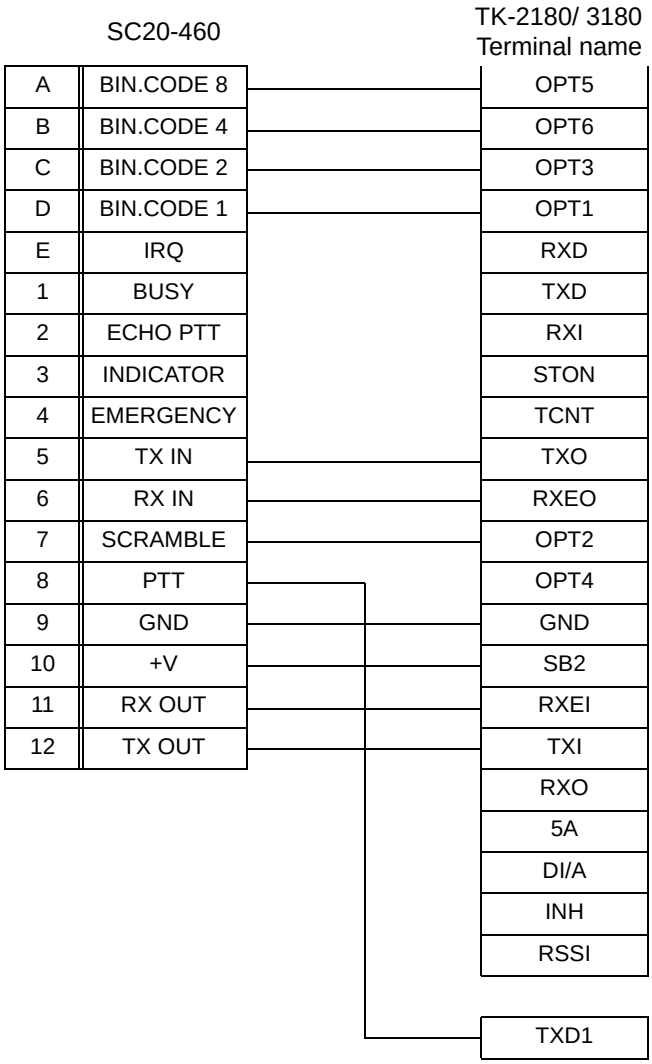


Figure 3-1 Connecting with SC20-460 Board

3.1.4 Install SC20-460 to TK-7180/ 8180

1. Remove the panel.

Unlatch the rear panel by widening two side tabs, using a flat-head screw driver, etc. Then, pull forward to separate the front panel from the transceiver body.

CAUTION

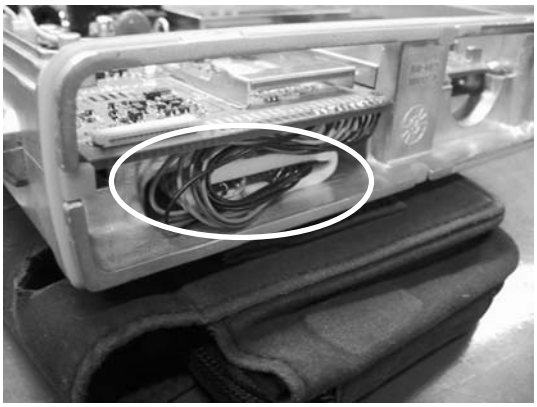
REMOVE THE PANEL SLOWLY. OTHERWISE, THE FLAT CABLE MAY BE DAMAGED.

2. Remove the flat cable from the connector.

3. Solder the TX-RX PCB (X57-6930-x0) to the wires from the SC20-460 board.

You must connect the terminals as shown in the following table.

4. Insert the SC20-460 board into the position.



CAUTION

DO NOT PEEL OFF THE COVER OF THE TAPE COVER THAT HOLDS THE SC20-460 BOARD. OTHERWISE, THE SC20-460 BOARD MAY NOT BE REMOVED AFTERWARDS.

5. Insert a flat cable, and install a panel to the transceiver.

3.1.5 Connection with SC20-460

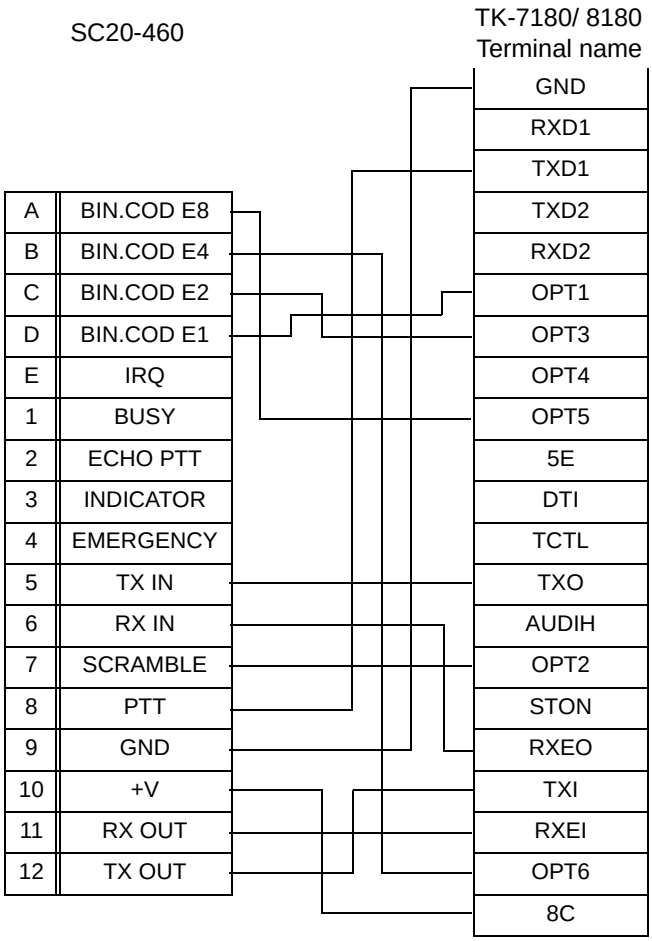


Figure 3-2 Connecting with SC20-460 Board

3.1.6 Configuration using KPG-89D

You can configure the Voice Scrambler information to the transceiver using the KPG-89D after installing the board.

Follow the procedures below to configure the SC20-460 board information into the transceiver.

1. Run the KPG-89D.

2. Select "**Program" > "Read Data from the Transceiver"**. You can also click the icon on the Toolbar.

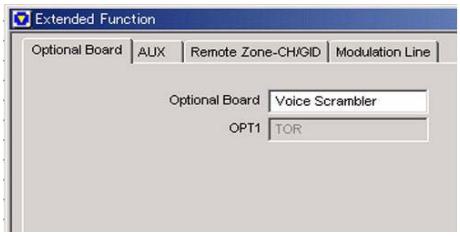
The Read Data from the Transceiver window appears.

3. Click "**Read**".

The KPG-89D starts reading the configuration data from the transceiver.

4. Select **"Edit" > "Extended Function"**.The Extended Function window appears.

TK-2180/ 3180 transceivers

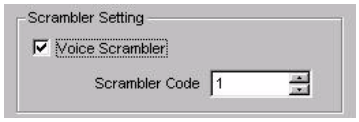


TK-7180/ 8180 transceivers

5. Select **"Voice Scrambler"** from the Optional Board edit box.

6. **"Edit > Zone Information > Channel Edit or GID Edit"**

   You can configure the **"Scrambler Setting"** for each channel. Refer to the "FPRG 6.3.17 Scrambler and 6.6.16 Scrambler" for details.



7. **"Edit > Key Assignment"**
   Assign the PF Scrambler key to one of function keys in the Key Assignment window. Refer to the "FPRG 6.8 Key Assignment" for details.

8. Select **"Program" > "Write Data to the Transceiver"**. You can also click the icon on the Toolbar.

   The Write Data to the Transceiver window appears.

9. Click **"Write"**.

   The configuration data having the Voice Scrambler information will be written to the transceiver.

3.2 ANI Board

You can install the ANI board to the transceiver. This section describes how to install the CIMARRON QE-2 to the transceiver.

Refer to the following URL for the information about the ANI board (QE-2).

http://www.cimtechcorp.com/qe1manual.pdf

■ Items Required to Install

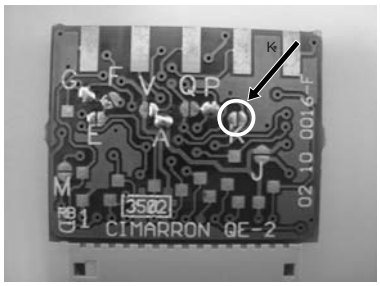
- Transceiver
- QE-2
- Adhesive Tape supplied with the QE-2.
- Cushion Tape

CAUTION

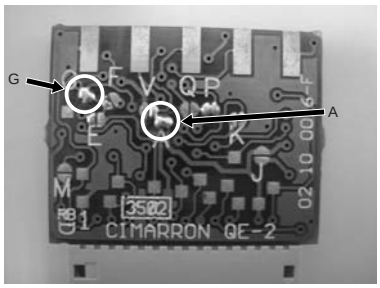
YOU MUST TURN THE TRANSCEIVER OFF AND REMOVE THE POWER CABLE BEFORE CONNECTING THE OPTION INTO THE TRANSCEIVER.

3.2.1 QE-2 Board

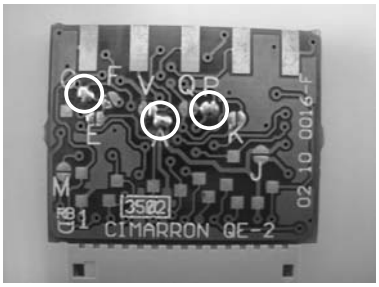
1. Unplug the QE-2 board from the connector if it is attached.
2. Modify and configure the QE-2 board as follows.
   - Suck and remove the soldering on K.



- Solder the position between G and A.



- Confirm that G, A, and P are soldered (bridged).



3. Configure each signal logic of optional board according to following table.
   (Refer to 1.2 26-pin Accessory Connector.)

Table 3-2 Terminal Description

Land Name	I/O	Board Function	REMARKS
OPT1	O	Channel Busy	Busy H/ LOK L
OPT3	I	KEY	Active L
OPT4	O	PTT	Active L
OPT5	O	Emergency	Active L
OPT2	I	Aux I/O	Active L
GND	O	V -	-
SB2 8C	I	V +	7.5V typ
			8.0V typ
STON	O	Sidetone	1kHz 5Vpp
INH AUDIH	I	Aud Inhib	Active L (Mic Mute)
DI/A DTI	O	Data Out	600mVpp STD
OPT6	O	Man-Down	Active L
TCNT TCTL	I	ToneCtl	Active H (Tone Sound)

Note: The radio Zone configuration includes Trunking or mixed Trunking and conventional mode, “CH busy” should be configured Transmit Mode as Trunking. Otherwise, when the radio is used under conventional mode only, “CH busy” should be selected “Conventional” for Transmit Mode.

We have checked a radio working under following condition of QE-2.

Transmit Option;

• Conventional Only
  Transmit Mode=Conventional
  Attack Delay=325ms
  check “Busy when Hi”

• Trunking and Mix with some
  Transmit Mode=Trunking
  Trunk Select Debounce Time=200ms
  check “Trunk Available when Low”

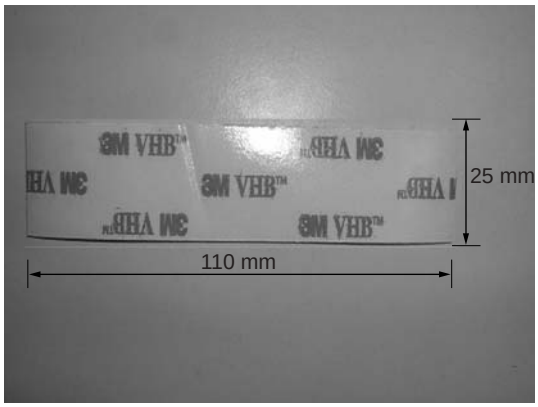
PTT Option; check “Key Follow PTT [TOT]”.

These setting depend of your system. Please make sure each timing and configuration consisted your System.

4. Plug the supplied cable (E37-1075-x5) to the QE-2 board.
5. Cut out the adhesive cushion tape for the TK-7180/ 8180 transceivers.

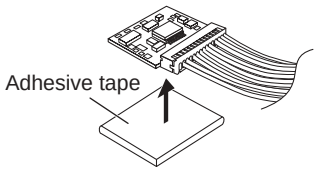
   No. 4008 (3M) tape is used for the TK-7180/8180 transceiver. No cushion tape is required for the TK-2180/3180 transceivers.
6. Cut out the tape as same size of the SC20-460 PCB.

   Cut out the tape as 110 mm x 25 mm for the TK-7180/ 8180 transceivers.

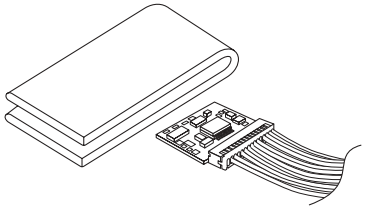


Note: The size may varies depending on the size of the board and installation conditions.

7. Attach the cushion tape and the adhesive tape supplied with the QE-2 to the QE-2 board.
   - Stick the cushion to both sides of the TK-2180/ 3180 transceivers.



   - Wrap and shape the board with the cushion tape as shown in the figure.



8. Cut the cable in order to solder easily.
   - Cut the cable for approximately 10 mm to 40 mm when using the TK-2180/ 3180 transceivers. Refer next table, which is shown a sample length for each wire.
   - Cut the cable for approximately 40 mm when using the TK-7180/ 8180 transceivers.

3.2.2 Install QE-2 to TK-2180/ 3180

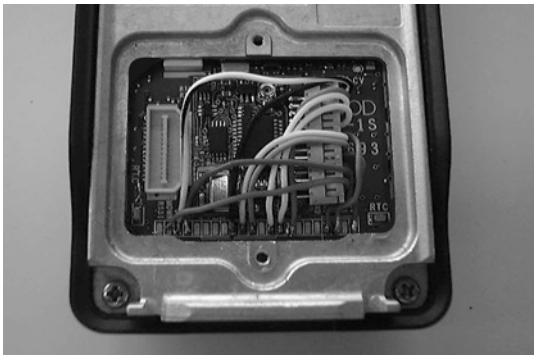
1. Remove two screws that hold the cover.
2. Insert the tweezer into the cover screw hole and pull out the cover.
3. Solder the TX-RX PCB (X57-6930-x0) to the wires from the QE-2 board.

   You must connect the terminals as shown in the following table.

QE-2	Length mm	Color	TK-2180/ 3180 Terminal name
			OPT5
Man Down	20	Blue	OPT6
A+	40	Red	OPT3
			OPT1
CH BUSY	20	Vio	RXD
Emergency	20	Grn	TXD
AUX I/O	40	Gry	RXI
PTT	40	Yew	STON
KEY	25	Bwn	TCNT
Tone Ctrl	40	W/Y	TXO
			RXEO
Aud Inhib	60	W	OPT2
Side Tone	40	Org	OPT4
Data Out	60	W/B	GND
A-	60	Blk	SB2
			RXEI
			TXI
			RXO
			5A
			DI/A
			INH

Figure 3-3 Connecting with QE-2 (TK-2180/ 3180)

4. Peel off the cover of the tape on the rear surface of the QE-2 board and attach the board in the position shown in the figure.



5. Reinstall the cover and battery pack.

3.2.3 Install QE-2 to TK-7180/ 8180

1. Remove the panel.

Unlatch the rear panel by widening two side tabs, using a flat-head screw driver. Then, pull forward to separate the front panel from the transceiver body.

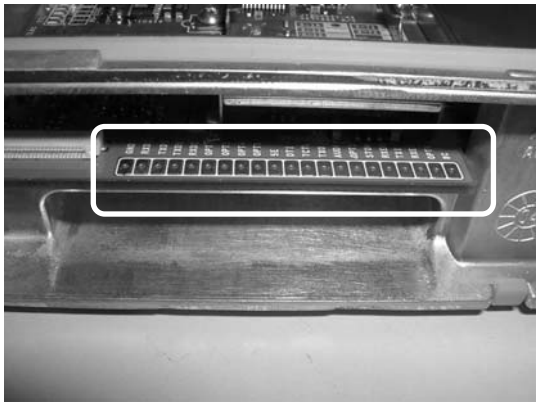
CAUTION

REMOVE THE PANEL SLOWLY. OTHERWISE, THE FLAT CABLE MAY BE DAMAGED.

2. Remove the flat cable from the connector.

3. Solder the TX-RX PCB (X57-6930-x0) to the wires from the QE-2 board.

You must connect the terminals as shown in the following table.



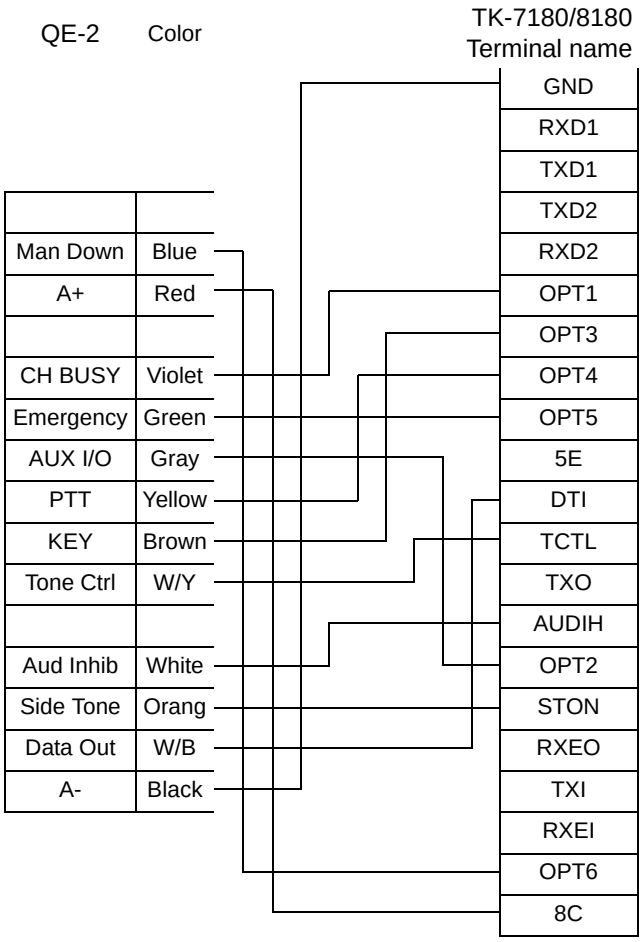


Figure 3-4 Connecting with QE-2 (TK-7180/ 8180)

4. Insert the QE-2 board into the position shown in the figure.

CAUTION

DO NOT PEEL OFF THE TAPE COVER THAT HOLDS THE QE-2 BOARD. OTHERWISE, THE QE-2 BOARD MAY NOT BE REMOVED AFTERWARDS.

5. Insert a flat cable, and install a panel to the transceiver.

3.2.4 Configuration using KPG-89D

You can configure the ANI board information into the transceiver using KPG-89D after installing the board.

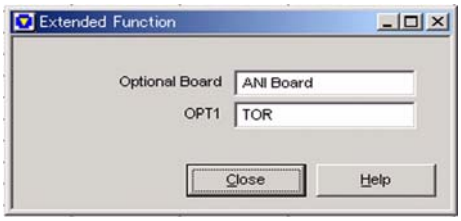
Follow the procedures below to configure the ANI board information into the transceiver.

1. Run the KPG-89D.
2. Select **"Program" > "Read Data from the Transceiver"**. You can also click the icon on the Toolbar.

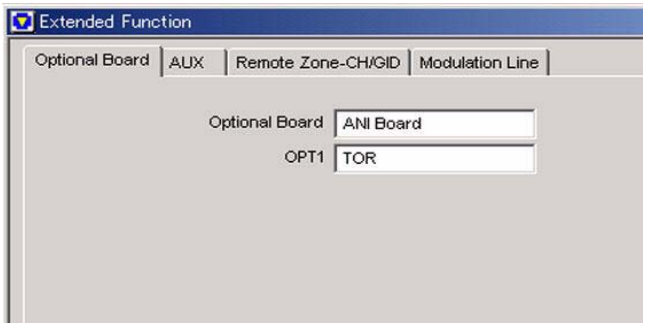
   The Read Data from the Transceiver window appears.
3. Click "**Read**".

   The KPG-89D starts reading the configuration data from the transceiver.
4. Select **"Edit" > "Extended Function"**.

   The Extended Function window appears.



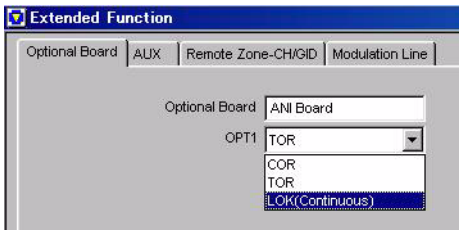
TK-2180/ 3180 Transceivers



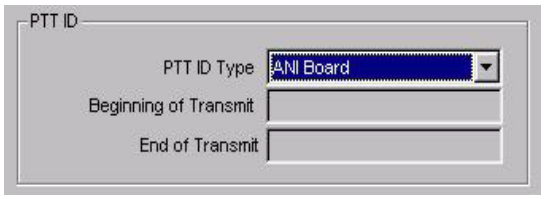
TK-7180/ 8180 Transceivers

5. Select **"ANI Board"** from the External Device pull-down menu.

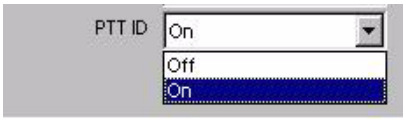
   Note: Refer to the instruction manual supplied with the ANI Board for configuration of the ANI Board.
6. Select signal as Channel busy of QE-2 from OPT1 pull-down menu.



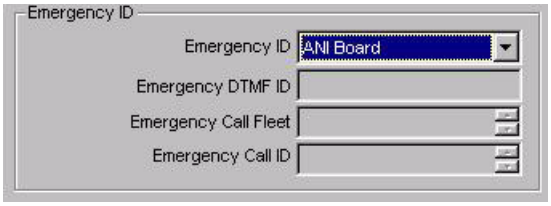
   When QE-2 board selects "Trunking" for transmit mode via QE-2 E2 programming software, it should be selected LOK., which is signal LTR link is success and possible to start talking. After this signal changes to Low, PTT ID and Emergency message will be transmitted. Otherwise, selecting "Conventional" for transmit mode, it should be choose COR or TOR, which is signal the radio is receiving signal and open squelch. During receiving that signal, QE-2 board handles to not start Emergency, Man-Down or PTT ID transmission.
7. Select PTT ID type on Optional Feature window.
   "Edit > Optional Feature > Common-Page 3".



8. Configure PTT ID sending channel/GID for each.
   "Edit > Zone Information > Channel/GID Edit"



   Note; Even if each channel are already selecting PTT ID "On" for FleetSync PTT ID before selecting PTT ID type to "ANI Board", it will be reset to off when you select ANI Board for PTT ID type or Optional board selecting. Please confirm it before writing data into the radio.
9. Configure Emergency ID on Emergency Information.
   "Edit > Emergency Information > Emergency ID"



   All Emergency transmitting and receiving are handled by QE-2 board. Configure the board for Emergency setup.
10. Select **"Program" > "Write Data to the Transceiver".** You can also click the icon on the Toolbar.

    The Write Data to the Transceiver window appears.
11. Click "**Write**".

    The configuration data having the ANI board information will be written to the transceiver.

3.3 Man Down Switch

(TK-2180/ 3180 only)

You can install the Man Down Switch to the TK-2180/ 3180 transceivers. This section describes how to install the Man Down Switch to the TK-2180/ 3180 transceivers.

■ Items Required to Install

- TK-2180/3180
- Man Down Switch *1

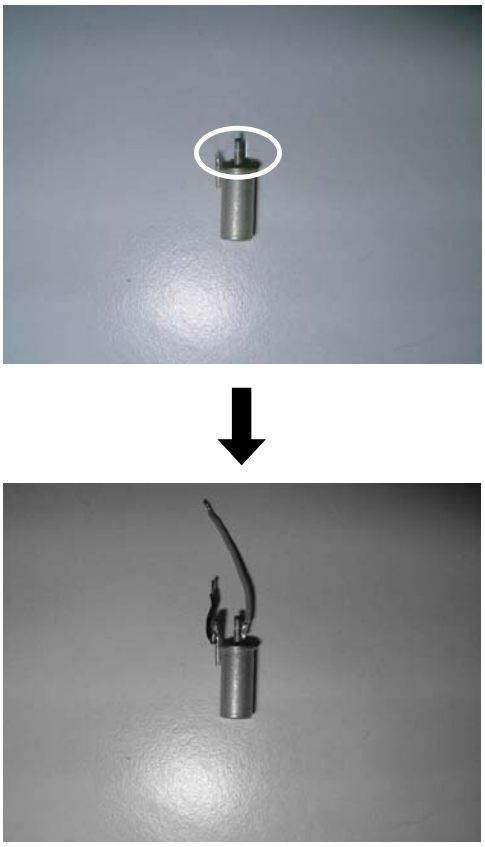
*1 This section explains about the modifications when the CIMARRON CAE-1.

CAUTION

YOU MUST TURN THE TRANSCEIVER OFF AND THEN REMOVE THE POWER CABLE BEFORE INSTALLING THE OPTION TO THE TRANSCEIVER.

3.3.1 Configuration of Man Down Switch

1. Prepare the Man Down Switch.
2. Solder the cable on the position shown in the figure.



3.3.2 Install Man Down Switch to the Rear Side of PCB

Install the Man Down Switch to the front of the TX-RX PCB. You may not be able to install the Man Down Switch to the rear of the TX-RX PCB when Scrambler Board, or ANI Board is already installed to the TK-2180/ 3180 transceivers. Refer to “3.4.3 Installing the Man Down Switch to the front of the TX-RX PCB”.

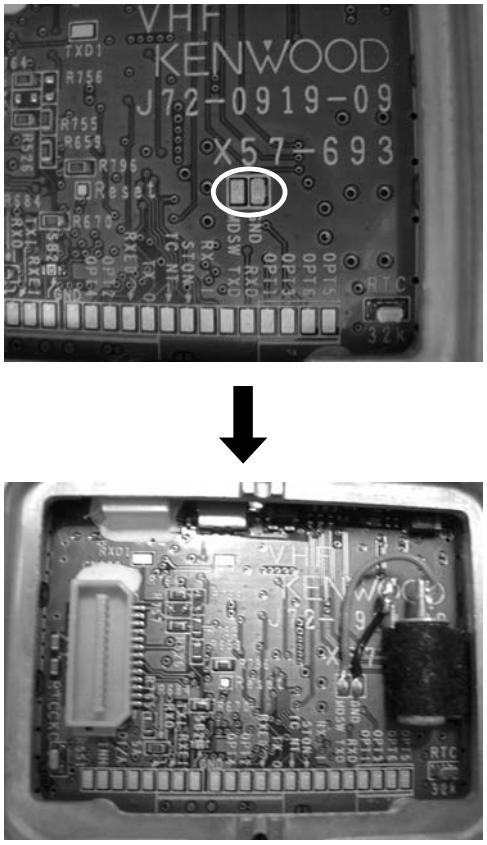
1. Remove two screws that hold the cover.
2. Insert the tweezer into the cover screw hole and pull out the cover.
3. Wrap the Man Down Switch with the protective cloth as illustrated.

4. Solder the Man Down Switch to the TX-RX PCB (X57-6930-x0).

   Connect the outside wire of the Man Down Switch to “GND” and the center wire to “MDSW”.

   Make sure that the top of the Man Down Switch points downward to the ground. Otherwise, the switch may not work properly. You must connect the wires to the

positions shown in the following figure. Connect the Man Down Switch to the place as illustrated.

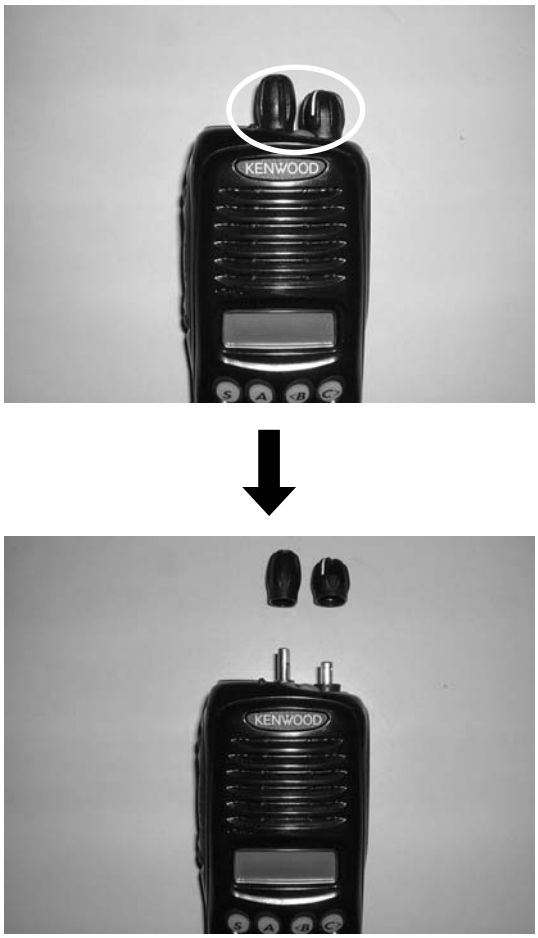


5. Reinstall the cover and battery pack.

3.3.3 Install Man Down Switch to the Front Side of PCB

Install the Man Down Switch to the rear surface of the TX-RX PCB. You cannot install the Man Down Switch to the front surface of the TX-RX PCB when the VGS-1, Scrambler Board, and ANI Board is already installed to the TK-2180/ 3180 transceivers.

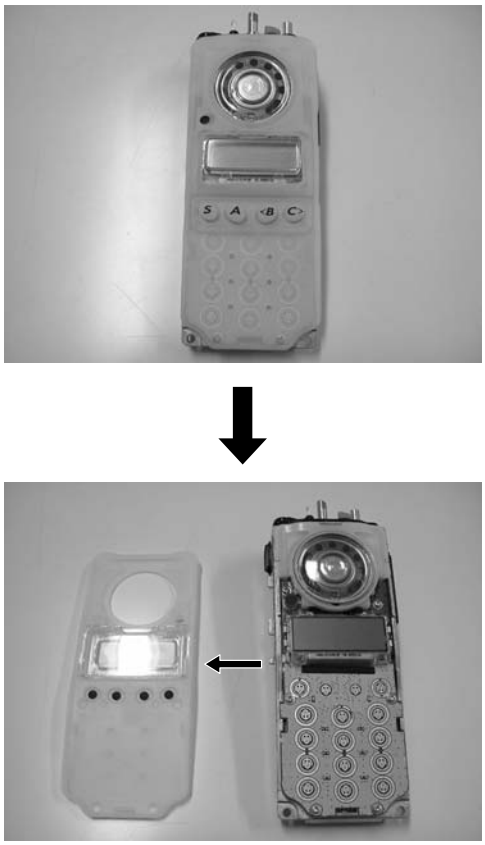
1. Remove the **Volume** control and the **Selector**.



2. Remove 2 screws that holds the chassis to the front panel.

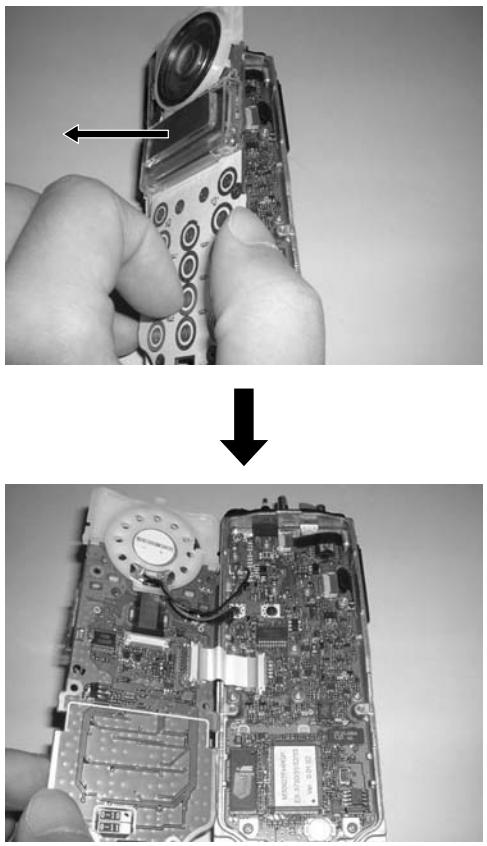
3. Pull up the tab on the chassis on the figure.

4. Remove the keypad rubber.



5. Remove 6 screws shown in the figure.

6. Slide a panel slightly to lower position, slowly lift up the panel to open to the left side.



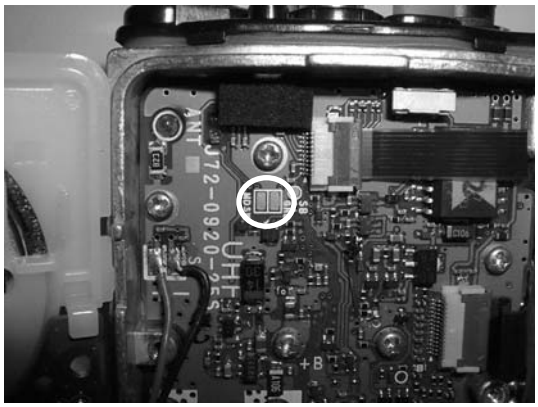
CAUTION

REMOVE THE PANEL SLOWLY. OTHERWISE, THE FLAT CABLE MAY BE DAMAGED.

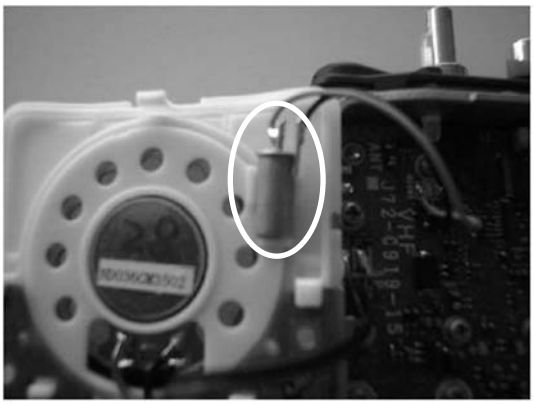
7. Solder the wires from the Man Down Switch to the TX-RX PCB (X57-6930-x0).

   Connect the outside wire of the Man Down Switch to "**GND**" and the center wire to "**MDSW**".

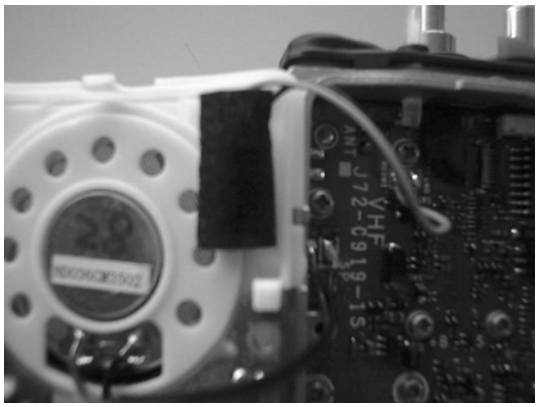
   You must connect the wires to the positions shown in the following figure.



8. Install the Man Down Switch on the position shown in the figure.



9. Fix the Man Down Switch with the protective cloth.



10. Reinstall the cover and battery pack.

3.3.4 Configuration using KPG-89D

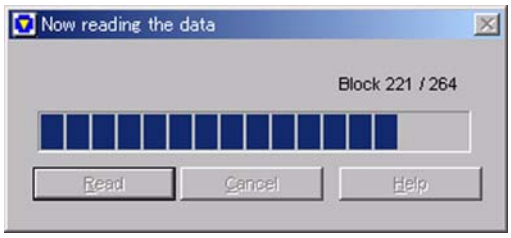
You can configure the Man Down Switch information into the transceiver using the KPG-89D after installing the switch.

Follow the procedures below to configure the Man Down Switch information into the transceiver.

1. Run KPG-89D.
2. Select **"Program" > "Read Data from the Transceiver"**. You can also click the icon on the Toolbar.

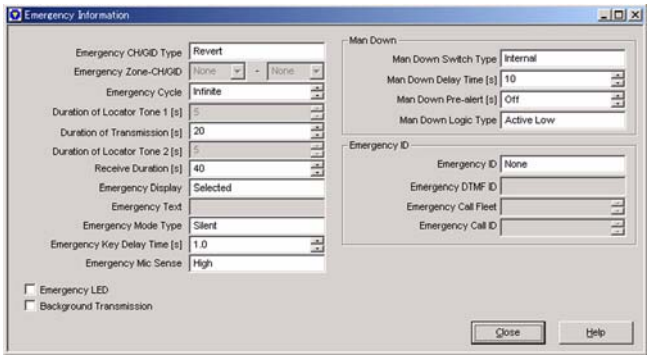
   The Read Data from the Transceiver window appears.
3. Click "**Read**".

   The KPG-89D starts reading the configuration data from the TK-2180/ 3180 transceivers.



4. Select **"Edit" > "Emergency Information".**

   The Emergency Information window appears.



5. Configure the Man Down Switch timing and Emergency information. Refer to the "FPRG 6.14 Emergency Information" for details.
6. Select **"Program" > "Write Data to the Transceiver".** You can also click the icon on the Toolbar.

   The Write Data to the Transceiver window appears.
7. Click "**Write**".

   The configuration data having the Man Down Switch information will be written to the transceiver.

3.4 Foot Switch

(TK-7180/ 8180 only)

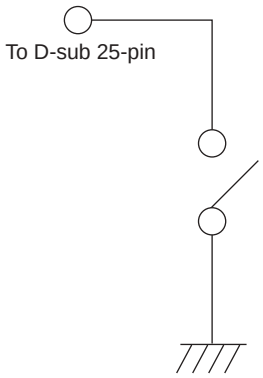
A general purpose foot switch can be connected to the TK-7180/8180 transceivers.

Follow the instructions below to attach and install the foot switch.

3.4.1 Install Foot Switch

1. Connect a cable from the foot switch to one of D-sub 25-pin male connector.

   The pin 4, 8, 12, 13, 20, 21, 22, 23, and 24 are available to adapt the foot switch.



2. Plug the D-sub 25-pin male connector to the back of the TK-7180/8180 transceivers.

3.4.2 Configuration using KPG-89D

After installation of the Foot Switch, the configuration data for the Foot Switch must be written to the transceiver via KPG-89D.

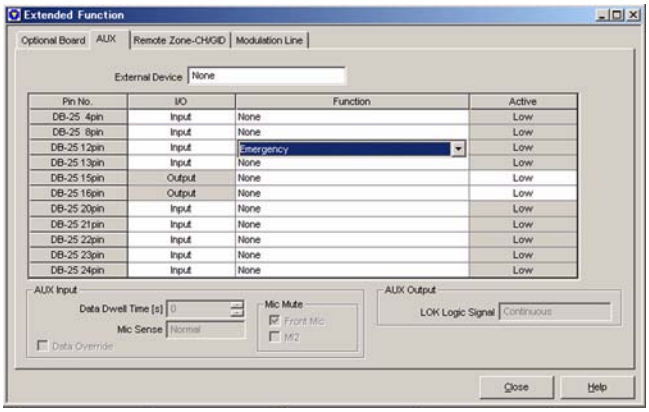
Following procedures is to configure the Foot Switch information into the transceiver.

1. Run KPG-89D.
2. Select **"Program" > "Read Data from the Transceiver"**. You can also click the icon on the Toolbar.

   The Read Data from the Transceiver window appears.
3. Click "**Read**".

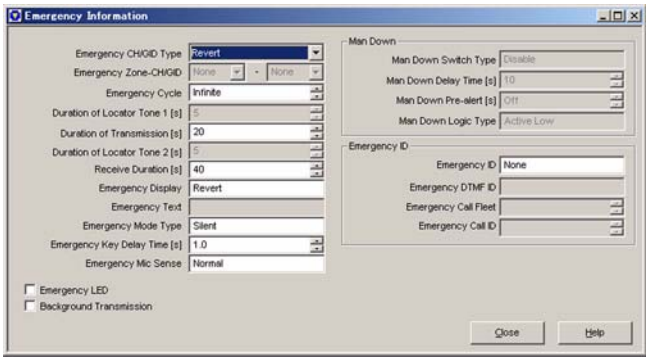
   The KPG-89D starts reading the configuration data from the TK-7180/ 8180 transceivers.
4. Select **"Edit" menu > "Extended Function"**.

   The Extended Function window appears.
5. Click the **AUX** tab.
6. Select "**Input**" from the I/O edit box for the pin that the Foot Switch is installed, and **"Emergency"** from the Function pull-down menu for the pin.



7. Select **"Edit" > "Emergency Information".**

   The Emergency Information window appears



8. Configure the Emergency information.

   Refer to "FPRG 6.14 Emergency Information Window" for the details of configuration.
9. Select **"Program" > "Write Data to the Transceiver**". You can also click the icon on the Toolbar.

   The Write Data to the Transceiver window appears.
10. Click "**Write**".

    The configuration data having the Emergency information will be written to the transceiver.

3.5 External GPS Unit

(TK-7180/ 8180 only)

You can install the GPS receiver to the TK-7180/ 8180 transceivers. This section describes how to install the Garmin GPS35-HVS to the TK-7180/ 8180 transceivers.

Refer to the following URL for the information about the GPS receiver (GPS35-HVS).

http://www.garmin.com/products/gps35/

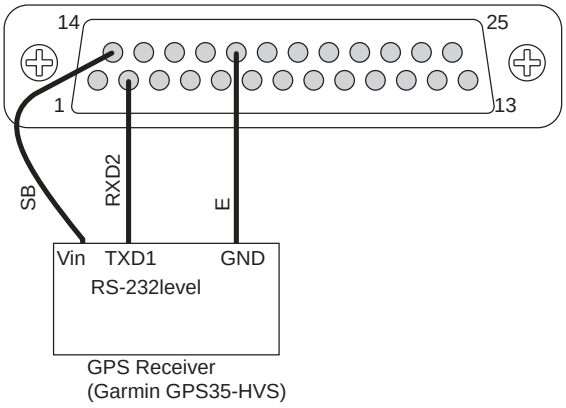
■ Required Items to Install

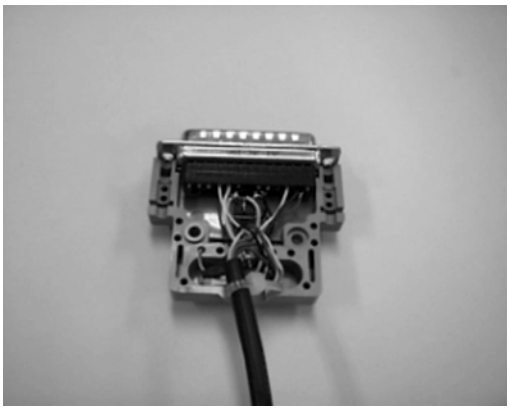
- TK-7180/ 8180
- GPS35-HVS
- D-sub 25-pin Connector

3.5.1 Install GPS-35HVS

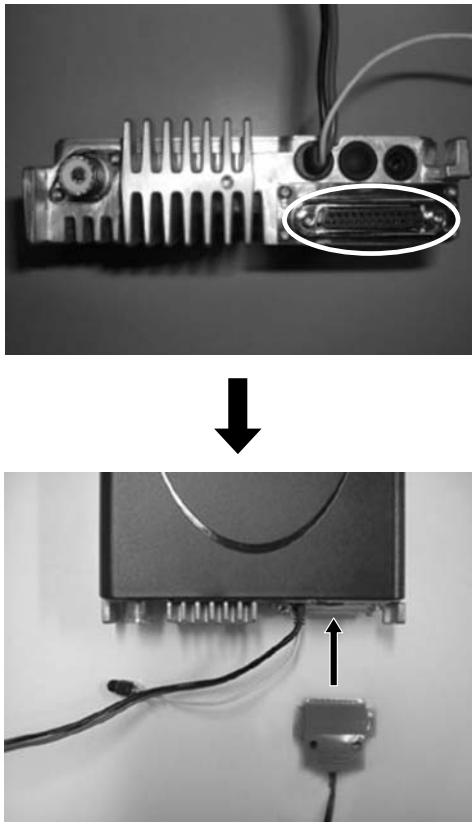
1. Connect the GPS35-HVS cable to the D-sub 25-pin connector.

Following procedures shows how to connect the GPS receiver.





2. Connect the D-sub 25-pin connector to the TK-7180/ 8180 transceivers.



3.5.2 Configuration using KPG-89D

You can configure the GPS receiver information to the transceiver via KPG-89D after installing the GPS unit.

Follow the procedures below to configure the GPS receiver information into the transceiver.

1. Run the KPG-89D.
2. Select **"Program" > "Read Data from the Transceiver"**. You can also click the icon on the Toolbar.

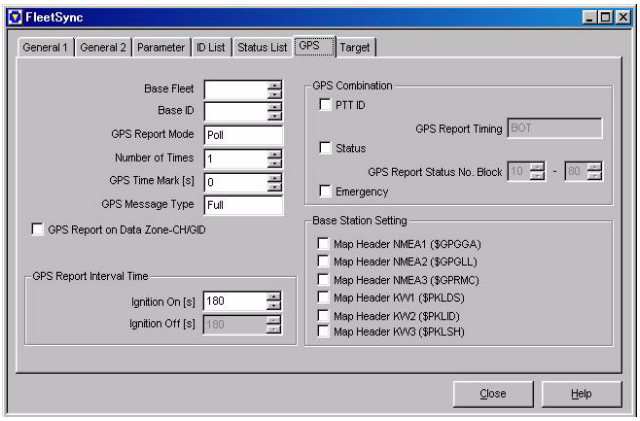
   The Read Data from the Transceiver window appears.
3. Click "**Read**".

   The KPG-89D starts reading the configuration data from the TK-7180/ 8180 transceivers.
4. Select "**Edit" > "Optional Features > Common-Page 3 Tab"**.The Optional Features window appears. Configure the COM port to GPS.

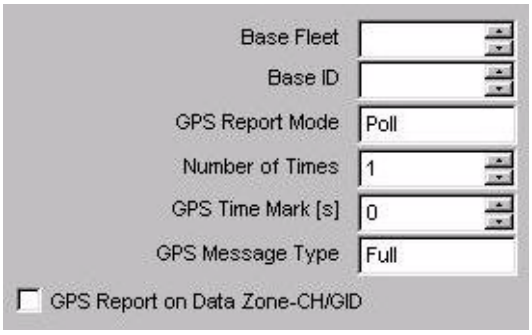
COM port No.	Function	Polarity
COM port 0	None	Normal
COM port 1	GPS	Normal
COM port 2		

Note: COM-1 can accept RS-232C level data. In case of GPS unit has TTL level data output, use COM2. And there is a capability to change polarity of data. If you install GPS-35 HVS (Garmin), it is not necessary to change it.

5. "Edit > FleetSync > GPS Tab".
Configure GPS Information on this screen.



Refer to the "FPRG 7.6 6.7.3 Common-Page 3 Tab" for details.



5.1 Configure Base station ID for sending GPS data.

5.2 Select GPS report mode
[Auto].....GPS data report automatically to the Base station every often configured following interval.
[Poll].....GPS data is report when radio receive a GPS sending request from Base station. Radio send GPS data for configured times with configured interval.

5.3 Configure GPS time mark. It is a offset configuration for GPS sending, based on UTC. If you are using several vehicle in same fleet, it can avoid the data transmitting collision. Each radio should be assigned different number.

5.4 Select GPS Message type. it does not need to change. But, to select "Short", you might save a air time to send GPS data.
[Full].....The current message type same as TK-*80. Its data format includes $GPGGL, $GPRMC and $GPGLL. (500ms/message)
[Short].....This GPS message type can save the air time. It includes $GPGLL only. If base station select $GPGGL and $GPRMC as serial output data, some part of data will be blank.

6. Configure GPS Report Interval Time. It is used for GPS auto report and report GPS data when receive GPS data request message from Base station.

7. Configure GPS combination such as PTT ID + GPS, Status message + GPS or Emergency Status + GPS if you need.

8. Select **"Program" > "Write Data to the Transceiver"**. You can also click the icon on the Toolbar.The Write Data to the Transceiver window appears.

9. Click "**Write**".

The configuration data having the GPS information will be written to the transceiver.

3.6 Internal GPS Board

(TK-7180/ 8180 only)

You can install the built-in type GPS receiver to the TK-7180/ 8180 transceivers. This section describes how to install the Garmin GPS 15L to the TK-7180/ 8180 transceivers.

Refer to the following URL for the information about the GPS receiver (GPS 15L).

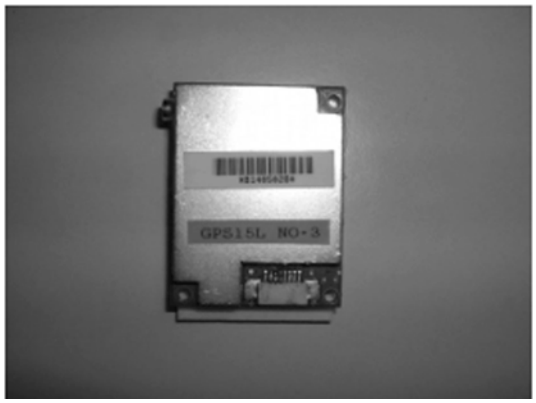
http://www.garmin.com/products/gps15h/

■ Items Required to Install

- TK-7180/ 8180
- GPS 15L (Input Voltage: 5 V)
- Cushion Tape

3.6.1 Configuration of GPS-15L

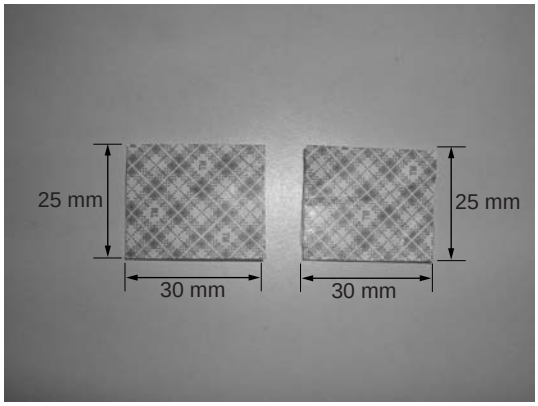
1. Remove the cables from the unit if it is attached



2. Prepare the cushion having a double-sided adhesive tape.

The cushion tape (No. 4016 or No. 4416) manufactured by 3M is recommended.

3. Cut out 4 cushion tapes as the GPS-15L (30 mm x 25 mm) size.



Note:

- The 3M cushion tape having a double-sided adhesive tape has following thickness.
  No. 4016 (or No. 4016): 1.6 mm (1/16 inch)
  No. 4416 (or No. 4416): 1.6 mm (1/16 inch)
- The above sizes are reference values. You must cut the cushion tape out the same size as the GPS Receiver board.

4. Attach the cushion tape to the GPS-15L.

3.6.2 Install GPS-15L to TK-7180/ 8180

1. Remove the shielding plate of the TK-7180/ 8180 transceivers.

- Pull and remove the top cover by lifting two tabs located at the side of the cover.
- Remove the top rubber packing.
- Remove 4 screws and the shielding plate.

2. Remove the panel.

Lift the rear panel by widening two side tabs, using a flat-head screw driver, or etc. Then, pull upward to remove the rear panel from the transceiver body

CAUTION

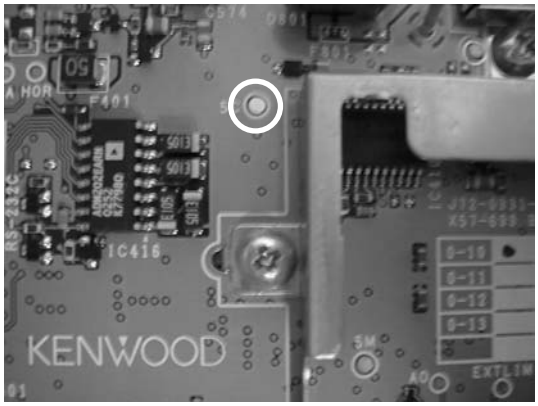
REMOVE THE PANEL SLOWLY. OTHERWISE, THE FLAT CABLE MAY BE DAMAGED.

3. Remove the flat cable.

- Remove the cable from the connector on the PCB board.
- Remove the cable from the panel.

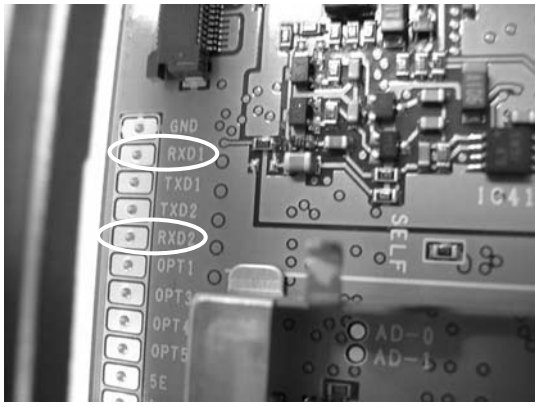
4. Solder the power wire of the GPS board at this positions (5C) for 5V. If your GPS board needs 8V,

solder power cable to the pad (8C) for optional board, which is front of TX-RX PCB.



5. Connect the GPS board cable to the following pad.

- Solder the TXD wire of the GPS board to the RXD1 or RXD2 pad of the TK-7180/ 8180 transceivers.



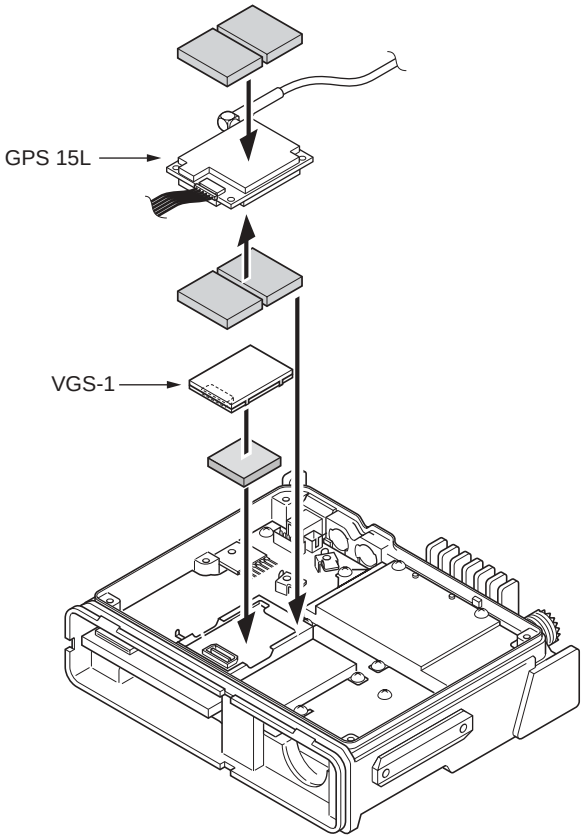
Note:

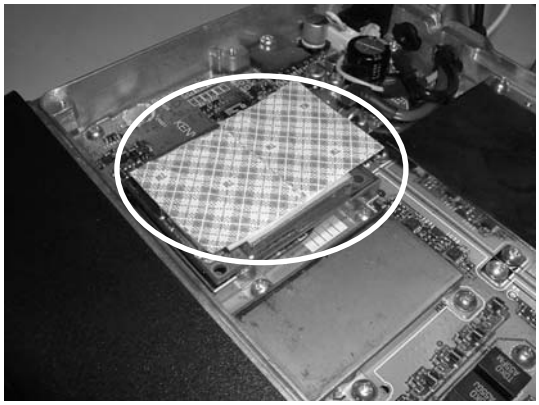
RXD1 and RXD2 are shared with DB-25 pin2 and pin10. If assigned it for Internal GPS port, it cannot use DB-25 RXD port. The internal ports are supporting RS-232C and TTL level both.

6. Install the GPS receiver to the transceiver.

- Peel off the cover of the tape on the bottom of the GPS-15L when installing the GPS-15L receiver with the VGS-1.

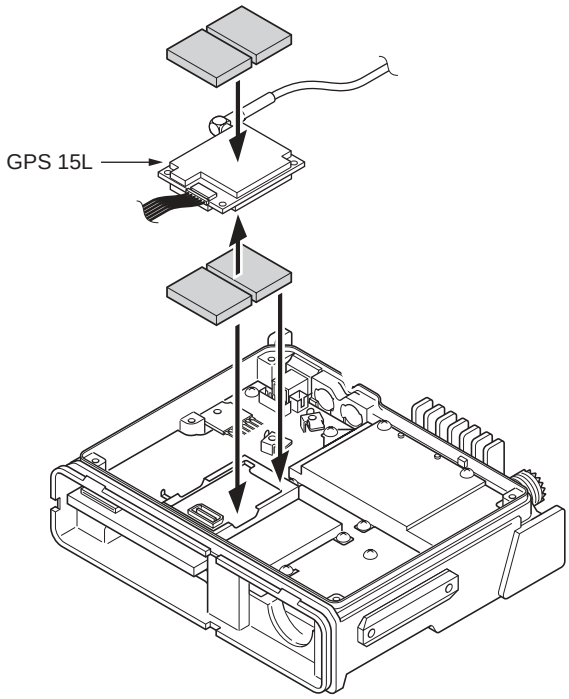
Figure 3-5 Install GPS with VGS-1





- Peel off the cover of the tape on the bottom of the GPS-15L only when install it as shown in the figure.

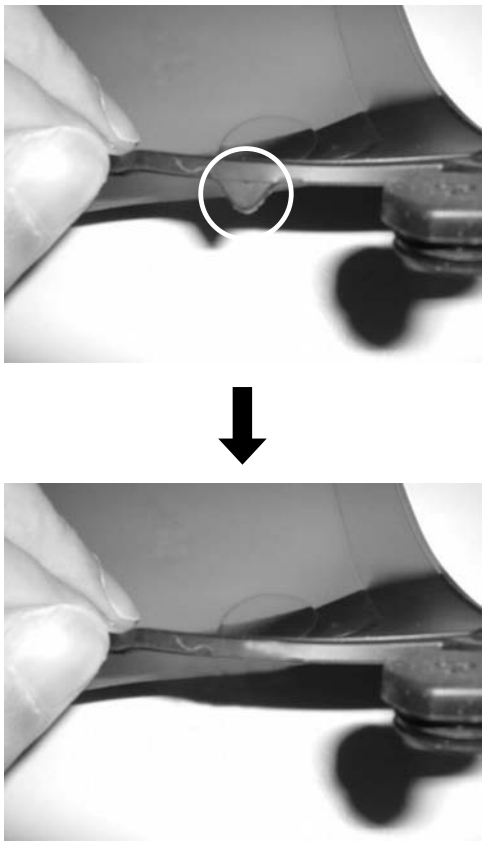
Figure 3-6 Instal GPS board only



CAUTION

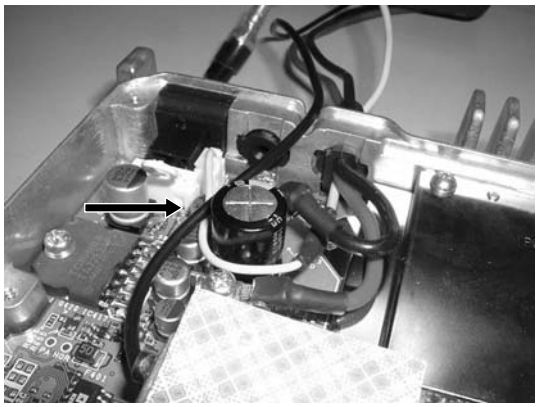
DO NOT PEEL OFF THE DOUBLE-SIDED ADHESIVE TAPE ON THE TOP OF THE GPS 15L. OTHERWISE, THE COVER MAY NOT BE REMOVED AFTERWARDS.

7. Cut off the part of the top rubber packing as shown in the figure by using nippers, etc.

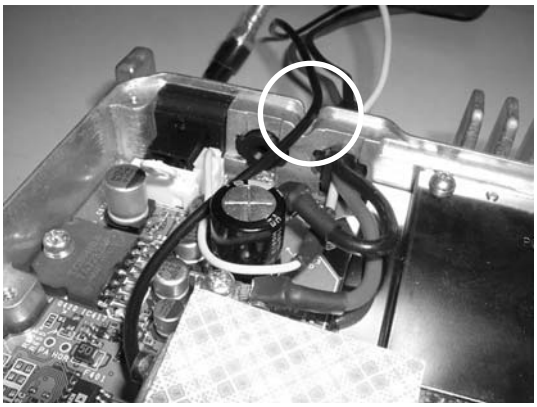


8. Let the GPS cable out from the unit.

- Position the cable from the GPS unit on the left side of a capacitor.



- Position other cable as shown below.



9. Reinstall the shielding plate, top rubber packing, and the top case of the TK-7180/ 8180 transceivers.

3.6.3 Configuration using KPG-89D

You can configure the GPS receiver information to the transceiver using KPG-89D after installing the receiver.

Following procedures shows how to configure the GPS receiver information.

1. Run the KPG-89D.
2. Select **“Program” > “Read Data from the Transceiver”.** You can also click the icon on the Toolbar.

   The Read Data from the Transceiver window appears.
3. Click “**Read**”.

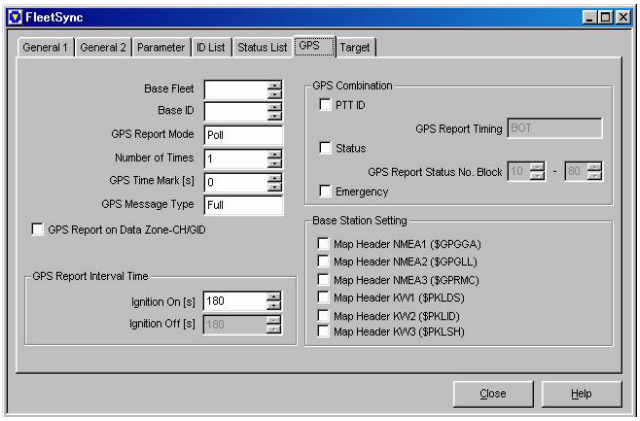
   The KPG-89D starts reading the configuration data from the TK-7180/ 8180 transceivers.
4. Select **“Edit” > “Optional Features”.**

   The **Optional Features** window appears.
5. Click the **Common-Page 3** tab.

   Configure the COM port 1 or 2 to “GPS” and polarity. Refer to the “FPRG 7.6 6.7.3 Common-Page 3 Tab” for details.
6. Select **“Edit” > “FleetSync”**.

   The FleetSync window appears.
7. Click the **GPS** tab.

   Configure the GPS function same as 3.5 External GPS Unit. Refer to the “FPRG 6.12.6 GPS Tab” for details.



8. Select **“Program” > “Write Data to the Transceiver”**. You can also click the icon on the Toolbar.

   The Write Data to the Transceiver window appears.
9. Click **“Write”**.

   The configuration data having the GPS information will be configured to the transceiver.