



D-STAR REPEATER SYSTEM

ID-RP2

Instruction Manual

IMPORTANT

READ THIS INSTRUCTION MANUAL CAREFULLY before attempting to operate the repeater.

SAVE THIS INSTRUCTION MANUAL. This manual contains important safety and operating instructions for the ID-RP2 system.

EXPLICIT DEFINITIONS

WORD	DEFINITION
⚠ WARNING	Personal injury, fire hazard or electric shock may occur.
⚠ CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk or personal injury, fire or electric shock.

PRECAUTIONS

⚠ DANGER! ID-RP2 installation, particularly ID-RP2L and antennas, is intended for professional installation only. We are not responsible for any building breakage, any damage resulting from a drop of the ID-RP2L or antenna from a high place or unstable site or resulting from any personal injury nor any accident in any other cases. Be sure to consult an expert engineer for installations.

⚠ WARNING RF EXPOSURE! This device emits Radio Frequency (RF) energy. Extreme caution should be observed when operating this device. If you have any questions regarding RF exposure and safety standards please refer to the Federal Communications Commission Office of Engineering and Technology's report on Evaluating Compliance with FCC Guidelines for Human Radio Frequency Electromagnetic Fields (OET Bulletin 65).

⚠ WARNING HIGH VOLTAGE! NEVER attach an antenna or internal antenna connector during transmission. This may result in an electrical shock or burn.

⚠ WARNING HIGH VOLTAGE! NEVER install the antenna at any place that person touch the antenna easily during transmission. This may result in an electrical shock or burn.

⚠ NEVER apply AC to the [DC 13.8V IN] connector. This could cause a fire or ruin the repeater.

⚠ NEVER apply more than 16 V DC, such as a 24 V battery, to the [DC 13.8V IN] connector on the repeater. This could cause a fire or ruin the repeater.

⚠ NEVER let metal, wire or other objects touch any internal part or connectors on the repeater. This may result in an electric shock.

⚠ NEVER operate or touch the repeater unit, ID-RP2C, ID-RP2D and ID-RP2V, with wet hands. This may result in an electric shock or damage to the repeater unit.

⚠ NEVER expose the repeater unit, ID-RP2C, ID-RP2D and ID-RP2V, to rain, snow or any liquids. These units have no water protection.

AVOID using or placing the repeater unit, ID-RP2C, ID-RP2D and ID-RP2V, in areas with temperatures below -10°C ($+14^{\circ}\text{F}$) or above $+50^{\circ}\text{C}$ ($+122^{\circ}\text{F}$). Be aware that temperatures can exceed 80°C ($+176^{\circ}\text{F}$), resulting in permanent damage to the repeater if left there for extended periods.

AVOID using or placing the ID-RP2L in areas with temperatures below -30°C (-22°F) or above $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$). Be aware that temperatures on a vehicle's dashboard can exceed 80°C ($+176^{\circ}\text{F}$), resulting in permanent damage to the repeater if left there for extended periods.

AVOID placing the repeater unit, ID-RP2C, ID-RP2D and ID-RP2V, in excessively dusty environments or in direct sunlight.

Place the repeater in a secure place to avoid inadvertent use by children.

DO NOT use chemical agents such as benzine or alcohol when cleaning, as they can damage the repeater's surfaces.

DO NOT modify the repeater for any reason.

Use the specified fuse only.

For U.S.A. only

CAUTION: Changes or modifications to this repeater, not expressly approved by Icom Inc., could void your authority to operate this repeater under FCC regulations.

CAUTION: The ID-RP2L is intended for use as a fixed base station with the antenna located outdoors on the rooftop or on antenna tower.

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The D-star repeater site can be constructed by combining with the following units according to the plan or scale.

- ID-RP2C : Repeater controller
- ID-RP2D : 1.2 GHz data repeater
- ID-RP2V : 1.2 GHz digital voice repeater
- ID-RP2L : 10 GHz microwave link repeater

In addition, the following options are also required for system repeater operations.

- AH-106 : 10 GHz Parabolic antenna 800 (d)
- AH-107 : 10 GHz Parabolic antenna 450 (d)
- AH-108 : 1.2 GHz Collinear antenna

■ ID-RP2C


➤ The ID-RP2C is a repeater controller and one controller should be used in each repeater site. The controller relays digital voice or data (traffic) signals for repeater operation.

➤ Total 4 interface connectors for local repeater connections are available.

Both digital voice and data repeaters can be connected as desired.

•Standard composition:

- Data repeater 1
- Digital voice repeater 1
- Spares 2 (for another band's repeater)

 **NOTE:** Connect only 1 or 2 repeaters for the same frequency band is recommended to avoid interference.

➤ Total 2 interface connectors for microwave link repeater connections are available.

Microwave link repeater can be connected as desired.

➤ One Ethernet port (10Base-T) is available for repeater site call sign, IP address settings etc., from the PC and the ID-RP2C utility software.

Or, a gateway control PC can be connected as desired.

➤ By connecting the ID-RP2L utility installed PC, operating frequency set and operation monitor can be made.

■ ID-RP2D

➤ ID-RP2D is a 1.2 GHz data (128 kbps) repeater and connects to the ID-RP2C.

*The ID-RP2D never functions as a repeater without ID-RP2C, due to no relay function is built-in.


➤ The ID-RP2D/V utility software, supplied with the ID-RP2C, and a PC are required for both receive and transmit frequency settings.

➤ Repeater operation is performed in simplex mode on the same frequency for data mode, however, different frequencies between transmit and receive can be set in simplex mode.

■ ID-RP2V

➤ ID-RP2V is a 1.2 GHz digital voice and slow-speed data repeater (4.8 kbps) and connects to the ID-RP2C.

*The ID-RP2V never functions as a repeater without ID-RP2C, due to no relay function is built-in.

 **NOTE:** No audio CODEC is performed in the ID-RP2V, thus the ID-RP2V receives and transmits 4.8 kbps serial data only.

➤ Different frequencies are used for each transmission and reception in semi-duplex mode.

➤ The ID-RP2D/V utility software, supplied with the ID-RP2C, and a PC are required for both receive and transmit frequency settings.

■ ID-RP2L

➤ ID-RP2L is a 10 GHz microwave link repeater (10 Mbps) and connects to the ID-RP2C. The microwave link repeater provides to linking with another repeater site (Area) for zone construction.

➤ Different frequencies are used for each transmission and reception in full-duplex mode and the reversed frequencies between transmit and receive are used for the oncoming repeater.

➤ The received GMSK serial bit-stream signal (10 Mbps) is applied to either ID-RP2D or ID-RP2V via the ID-RP2C. Then the GMSK serial data is transmitted to the local station.

➤ The ID-RP2L has a duplexer, and the condition of the microwave link repeater can be monitored when the ID-RP2L utility software (supplied with the ID-RP2C) installed PC is connected to the ID-RP2C.

◆ **AH-106 : 10 GHz parabolic antenna 800 (d)**

◆ **AH-107 : 10 GHz parabolic antenna 450 (d)**

➔ Both AH-106 and AH-107 are offset parabolic antenna and connect to ID-RP2L.

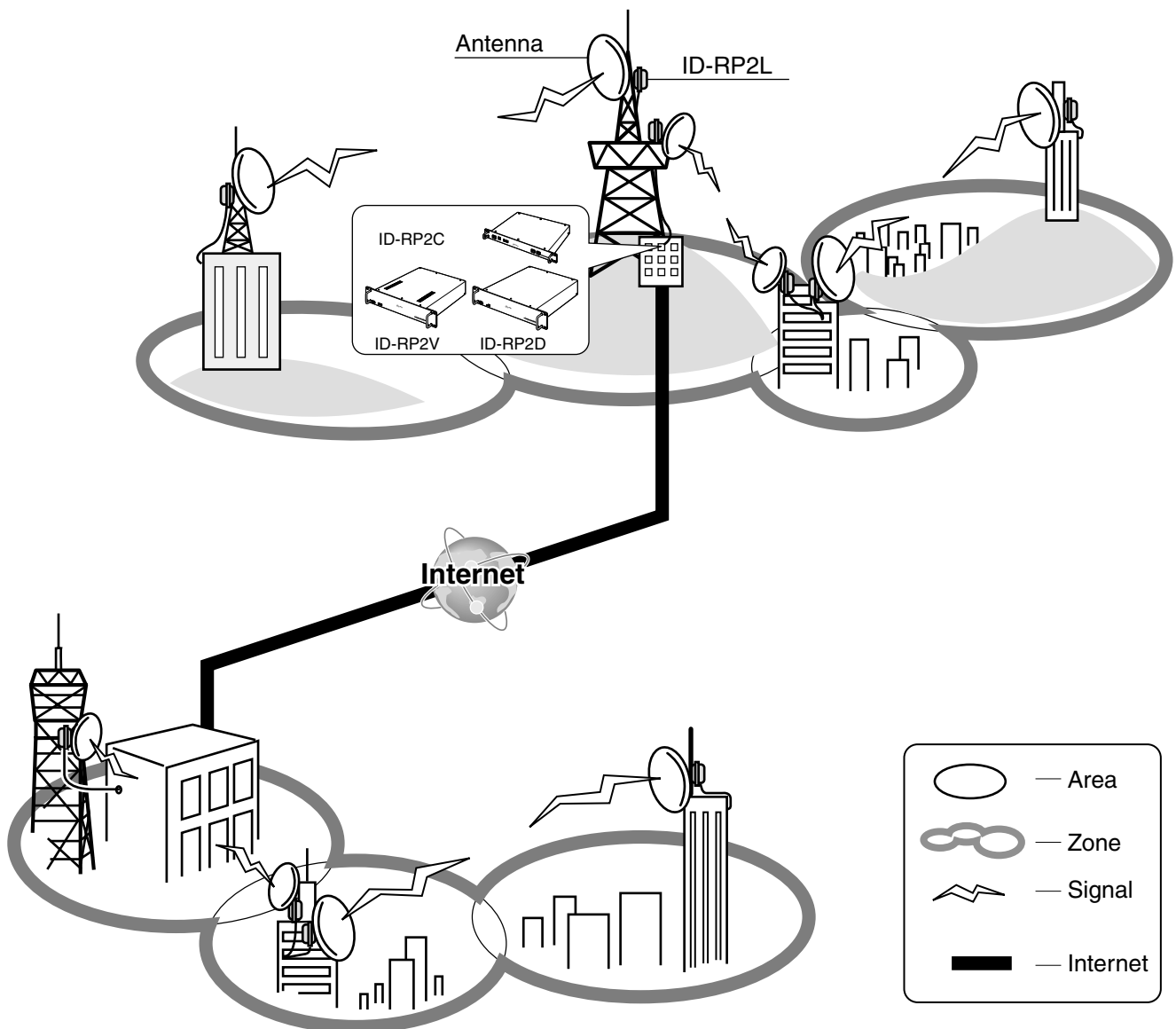
Up to 20 km (approx.; 12.4 miles)* or 8 km (approx.; 5 miles)* of communication range is provided when AH-106 or AH-107 is used at the both microwave link repeaters, respectively.

And up to 12 km (approx.; 7.5 miles)* of communication range is provided between AH-107 and AH-106's repeaters.

*Communication range may differ/change according to environment, such as weather, installed conditions, etc.

◆ **AH-108 : 1.2 GHz Collinear antenna**

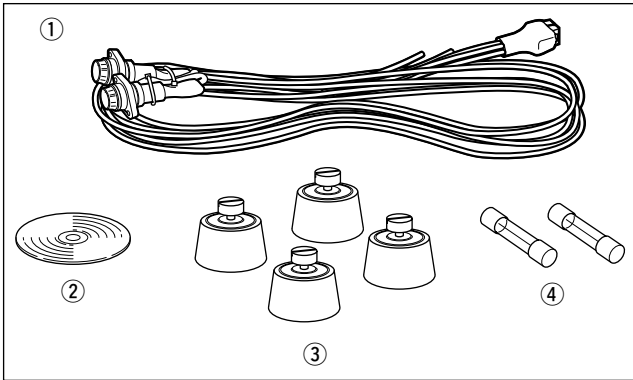
➔ 2 Collinear antennas are built-in and better isolation is provided than separated 2 antennas.



2

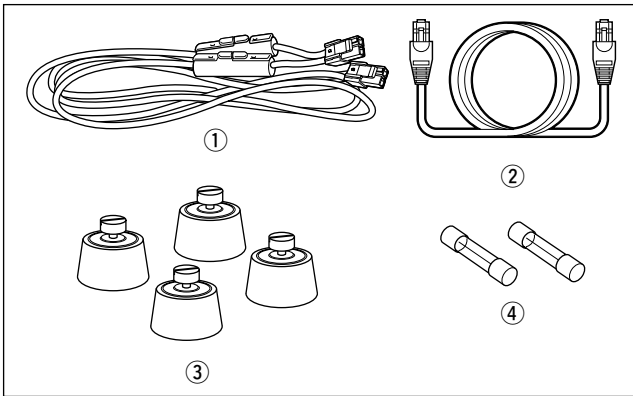
SUPPLIED ACCESSORIES

■ Accessories for ID-RP2C



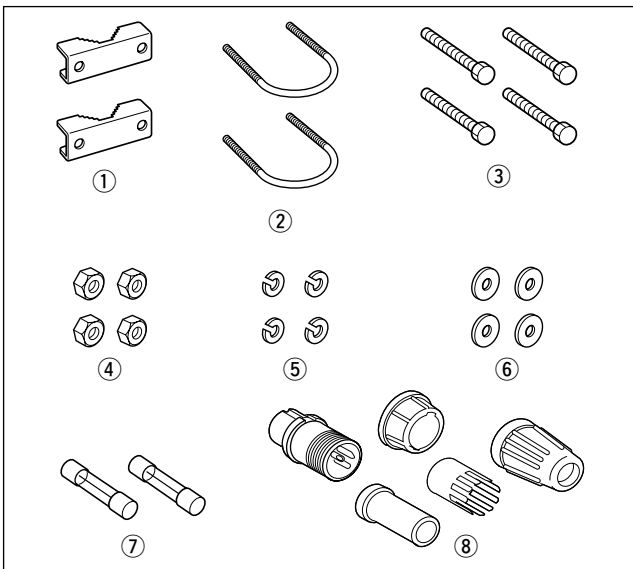
- ① Power cable (OPC-1380; approx. 3 m; 10 ft) 1
- ② Utility CD 1
- ③ Rubber feet 4
- ④ Spare fuses (FGB01 30A) 2

■ Accessories for ID-RP2D/ID-RP2V



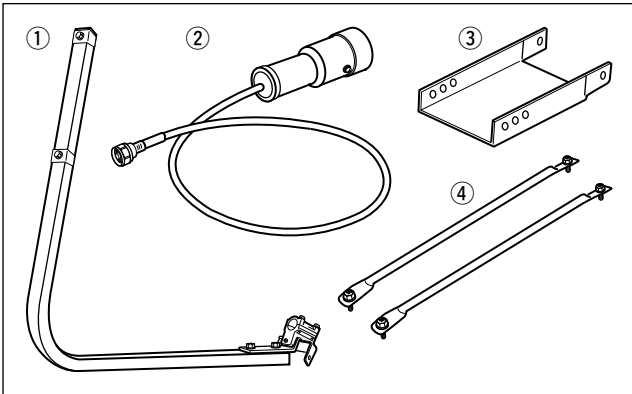
- ① Power cable (OPC-1309; approx. 1 m; 3.3 ft) 1
- ② Control cable (OPC-1069) 1
- ③ Rubber feet 4
- ④ Spare fuses (FGB10A) 2

■ Accessories for ID-RP2L



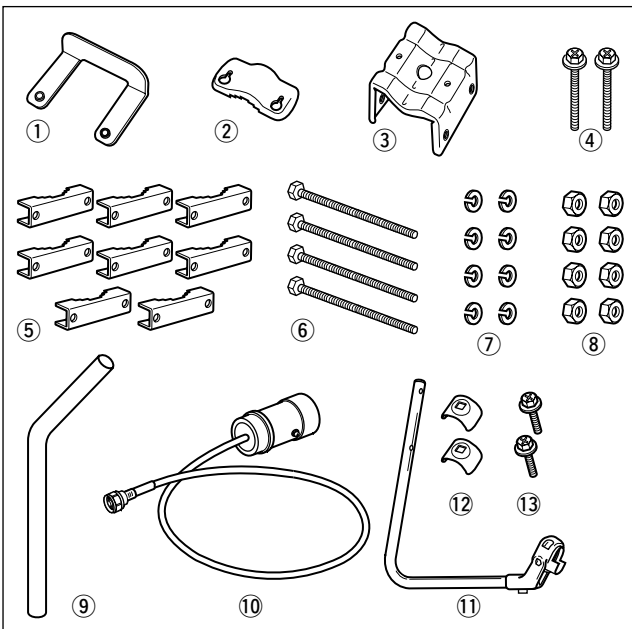
- ① Pole clamps 2
- ② U-bolts 2
- ③ Bolts (M6x50) 4
- ④ Nuts (M6) 4
- ⑤ Spring washers (M6) 4
- ⑥ Flat washers (M6) 4
- ⑦ Spare fuses (FGB5A) 2
- ⑧ Test plug 1 set

■ Accessories for AH-106



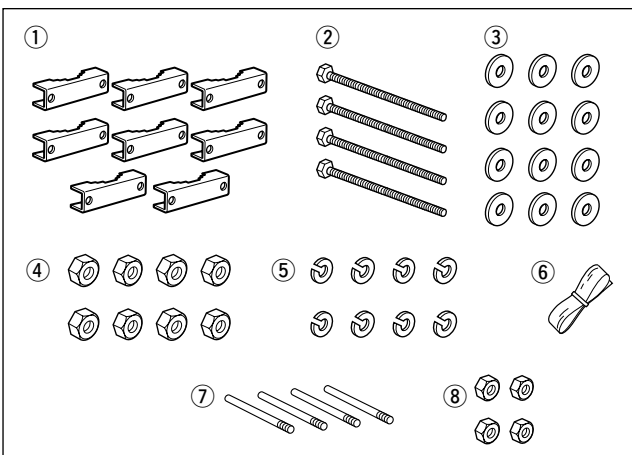
① Element arm	.....	1
② Element	.....	1
③ Elevation support plate	.....	1
④ Support arms	.....	2

■ Accessories for AH-107



① Pole stopper	.....	1
② Pole clamp	.....	1
③ Clamp base (w/bolts)	.....	1 set
④ Bolts (M6x65)	.....	2
⑤ Pole clamps	.....	8
⑥ Bolts (M8x170)	.....	4
⑦ Spring washers (M8)	.....	8
⑧ Nuts (M8)	.....	8
⑨ Pole	.....	1
⑩ Element	.....	1
⑪ Element arm	.....	1
⑫ Element arm holders	.....	2
⑬ Bolts (M6x30)	.....	2

■ Accessories for AH-108



① Pole clamps	.....	8
② Bolts (M8x160)	.....	4
③ Flat washers (M8)	.....	12
④ Nuts (M8)	.....	8
⑤ Spring washers (M8)	.....	8
⑥ Rubber vulcanizing tape (approx. 60 cm; 2 ft)	.....	1
⑦ Radials	.....	4
⑧ Nuts (M6)	.....	4

3

PANEL DESCRIPTIONS

■ ID-RP2C (Front panel)



❶ POWER SWITCH [POWER]

The power switch for ID-RP2C.
The LED indicator located at right lights when the power is turned ON.

❷ 10BASE-T CONNECTOR [10BASE-T] (p. 37)

Connects a PC via LAN cable (purchase separately) to set the details of the repeater site, such as the call sign, IP address.
A Gateway server can also be connected to this connector.

❸ SERVICE 1 CONNECTOR (p. 43)

Connects a PC via an USB cable (A-B type; purchase separately) to set the operating frequency or monitor the repeater operation for the microwave link repeater that is connected to [ASSIST1] connector.

❹ SERVICE 2 CONNECTOR (p. 43)

Connects a PC via an USB cable (A-B type; purchase separately) to set the operating frequency or monitor the repeater operation for the microwave link repeater that is connected to [ASSIST2] connector.

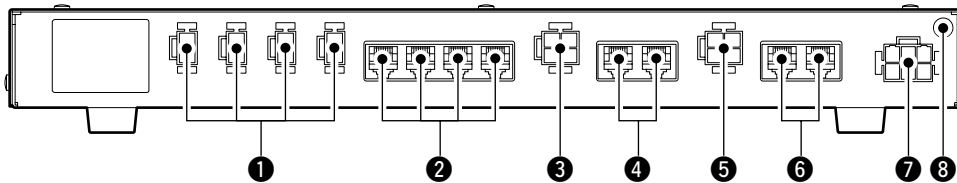
❺ ASSIST 1 SWITCH

Turns the microwave link repeater power ON and OFF, that is connected to [ASSIST1] connector.
The LED indicator located at right lights when the power is turned ON.

❻ ASSIST 2 SWITCH

Turns the microwave link repeater power ON and OFF, that is connected to [ASSIST2] connector.
The LED indicator located at right lights when the power is turned ON.

■ ID-RP2C (Rear panel)



❶ POWER CONNECTORS

[LOCAL RPT— DC13.8V OUT] (p. 11)
Outputs 13.8 V DC for local repeater.
Connects ID-RP2D/V via the supplied DC power cable (OPC-1309; supplied with the ID-RP2D/V).
The same voltage as the supplied voltage to [DC13.8V IN] connector is output regardless of the [POWER] switch condition on the front panel.

❷ [LOCAL RPT— CONT I/O] (p. 11)

Input/output ports for local repeater to received or transmitted serial data routing.
Connects ID-RP2D/V via the supplied control cable (supplied with the ID-RP2D/V).

❸ DC POWER CONNECTOR [ASSIST 1— DC 13.8V OUT]

Connects ID-RP2L's power cable.
The DC power is turned ON and OFF with [ASSIST 1] switch on the front panel.

❹ ASSIST 1— A/B (p. 11)

Connects ID-RP2L's data cable.
Connects data cable connector [A] to left and data cable connector [B] to right connector.

❺ DC POWER CONNECTOR [ASSIST 2— DC 13.8V OUT]

Connects ID-RP2L's power cable.
The DC power is turned ON and OFF with [ASSIST 2] switch on the front panel.

❻ ASSIST 2— A/B (p. 11)

Connects ID-RP2L's data cable.
Connects data cable connector [A] to left and data cable connector [B] to right connector.

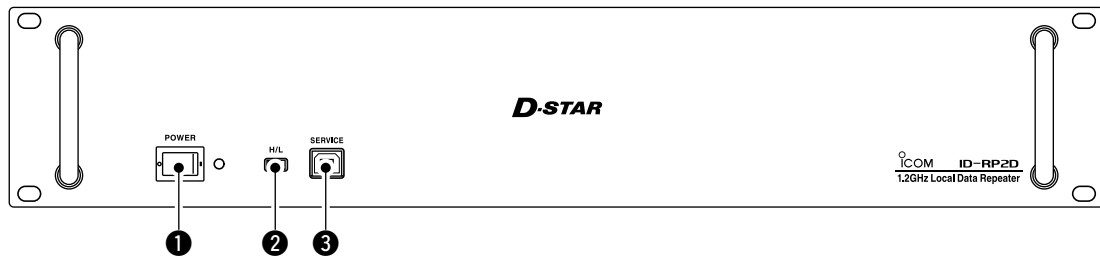
❼ POWER CONNECTOR [DC 13.8V IN] (p. 11)

DC power input connector for ID-RP2 system.
Connects a 13.8 V DC power supply unit via the DC power cable (OPC-1380; supplied with the ID-RP2C).

❽ GROUND TERMINAL [GND] (p. 10)

Connects to a ground to prevent electrical shocks, TVI, BCI and other problems.

■ ID-RP2D (Front panel)



❶ POWER SWITCH [POWER]

The power switch for ID-RP2D.
The LED indicator located at right lights when the power is turned ON.

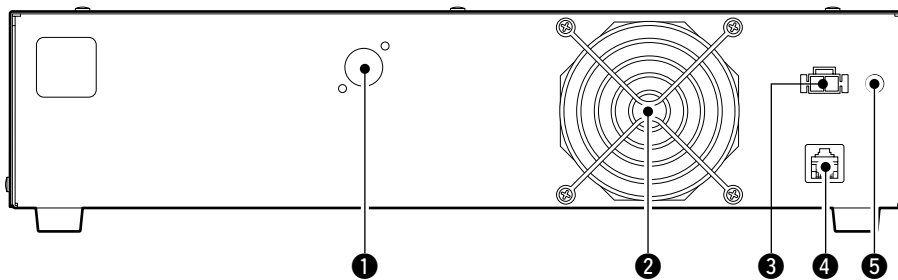
❷ HIGH/LOW POWER SELECT SWITCH [H/L]

Selects the transmit output power High (approx. 10 W) and Low (approx. 1 W).

❸ SERVICE CONNECTOR [SERVICE] (p. 41)

Connects a PC via a USB cable (A-B type; purchase separately) to set the both transmit and receive frequencies.

■ ID-RP2D (Rear panel)



❶ ANTENNA CONNECTOR [ANT] (p. 11)

Connect the optional AH-108 1.2 GHz Collinear antenna.

When both ID-RP2D and ID-RP2V is composed in a site, an antenna filter, such as bandpass filter, resonator, or so, should be installed between the ID-RP2D and antenna to protect the ID-RP2D reception from interference of the ID-RP2V downlink signal.

❷ COOLING FAN

❸ POWER CONNECTOR [DC13.8V] (p. 11)

Connects to ID-RP2C via the supplied DC power cable (OPC-1309) to be supplied the DC power.

❹ [CONT I/O] (p. 11)

Connects to ID-RP2C via the supplied control cable for received or transmitted serial data communication.

❺ GROUND TERMINAL [GND] (p. 10)

Connects to a ground to prevent electrical shocks, TVI, BCI and other problems.

■ ID-RP2V (Front panel)



❶ POWER SWITCH [POWER]

The power switch for ID-RP2V.
The LED indicator located at right lights when the power is turned ON.

❷ HIGH/LOW POWER SELECT SWITCH [H/L]

Selects the transmit output power High (approx. 10 W) and Low (approx. 1 W).

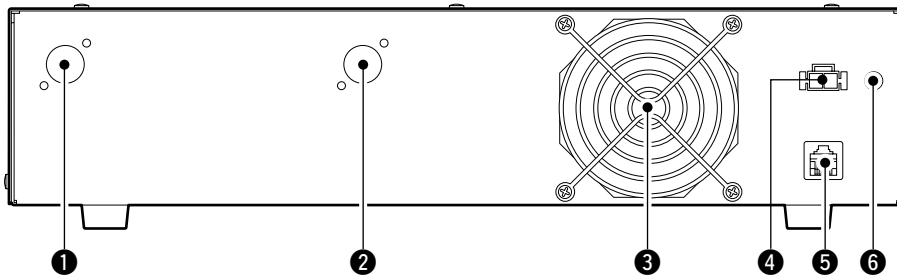
❸ SERVICE CONNECTOR T [SERVICE T] (p. 42)

Connects a PC via an USB cable (A-B type; purchase separately) to set the transmit frequency.

❹ SERVICE CONNECTOR R [SERVICE R] (p. 42)

Connects a PC via an USB cable (A-B type; purchase separately) to set the receive frequency.

■ ID-RP2V (Rear panel)



❶ RECEIVE ANTENNA CONNECTOR [ANT] (p. 11)

Connect the optional AH-108 1.2 GHz Collinear antenna through a duplexer.

❷ TRANSMIT ANTENNA CONNECTOR [ANT] (p. 11)

Connect the optional AH-108 1.2 GHz Collinear antenna through a duplexer.

❸ COOLING FAN

❹ POWER CONNECTOR [DC13.8V] (p. 11)

Connects to ID-RP2C via the supplied DC power cable (OPC-1309) to be supplied the DC power.

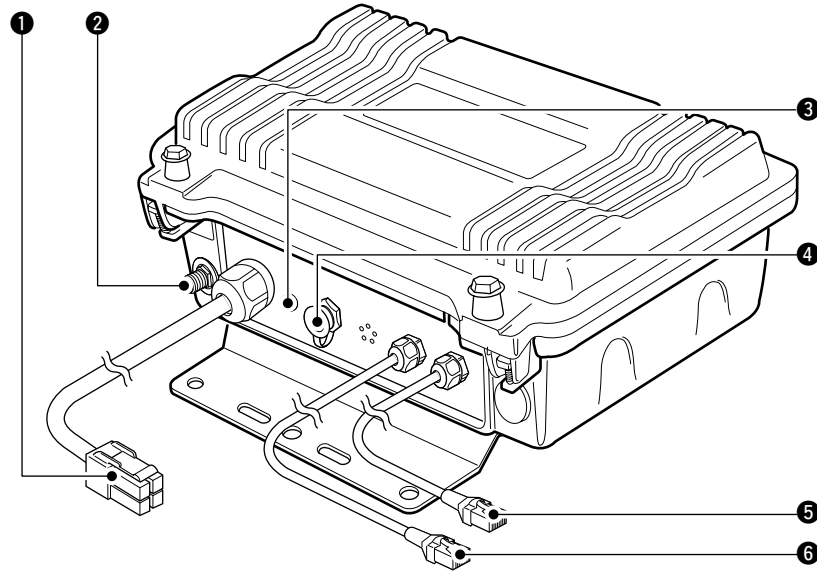
❺ [CONT I/O] (p. 11)

Connects to ID-RP2C via the supplied control cable for received or transmitted serial data communication.

❻ GROUND TERMINAL [GND] (p. 10)

Connects to a ground to prevent electrical shocks, TVI, BCI and other problems.

■ ID-RP2L



1 POWER CABLE CONNECTOR [DC13.8V] (p. 11)
Connects to ID-RP2C to be supplied the DC power.
Cable length: Approx. 30 m; 100 ft

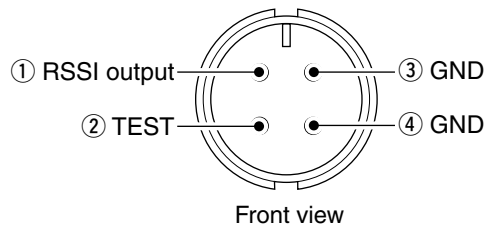
2 ANTENNA CONNECTOR [ANT] (p. 11)
Connects an optional parabolic antenna AH-106 or AH-107.

3 STATUS INDICATOR [STATUS]
Indicates the following unit conditions.

- Light : The power is ON and functioning correctly.
- Flashing slowly: Unlock PLL (Reboot the ID-RP2L. If the indicator still flashing even after rebooting, contact authorized Icom dealer or distributor.)
- Flashing fast : Setting data malfunction. (Data initializing and re-setting are required using with the ID-RP2L utility software.)
- Light off : The power is OFF.

4 TEST PLUG [TEST] (p. 18)
Connects the supplied test plug* when adjusting the parabolic antenna beam.
Test mode is automatically selected when connecting the test plug.

IMPORTANT!: Attach the waterproof cap during normal operation.



*See p. 18 for test plug assembling and connections details.

5 DATA CABLE CONNECTOR B [DATA B] (p. 11)
Connects to the ID-RP2C for transmit/receive signal data and control signal communications.
Cable length: Approx. 30 m; 100 ft

6 DATA CABLE CONNECTOR A [DATA A] (p. 11)
Connects to the ID-RP2C for transmit/receive signal data and control signal communications.
Cable length: Approx. 30 m; 100 ft

4

CONNECTIONS AND INSTALLATIONS

■ Precautions

⚠ DANGER! ID-RP2 installation, particularly ID-RP2L and antennas, is intended for professional installation only. We are not responsible for any building breakage, any damage resulting from a drop of the ID-RP2L or antenna from a high place or unstable site or resulting from any personal injury nor any accident in any other cases. Be sure to consult an expert engineer for installations.

NEVER expose the ID-RP2C/D/V to rain, snow or any liquids.

NEVER connect the repeater to a power source using reverse polarity. This will damage the repeater. And turn the repeater power OFF when connecting a power supply.

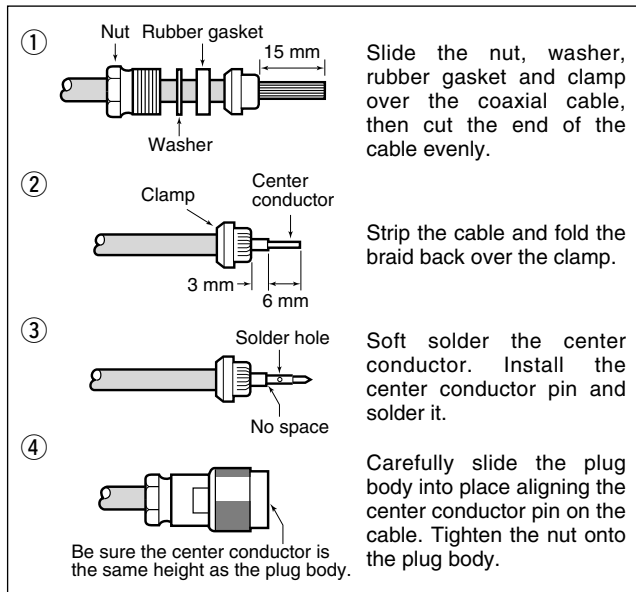
AVOID using or placing the ID-RP2C/D/V in areas with temperature below -10°C ($+14^{\circ}\text{F}$) or above $+50^{\circ}\text{C}$ ($+122^{\circ}\text{F}$).

AVOID placing the ID-RP2C/D/V in excessively dusty environments or in direct sunlight.

AVOID placing the ID-RP2C/D/V against walls or putting anything on top of the units. This will obstruct heat dissipation.

◇ About coaxial cable

•Type-N connector assembling



Use 50 Ω of impedance for both antenna (at Feeding power point) and coaxial cable.

Type-N connector is used for the connection between ID-RP2D/V and antenna.

RECOMMENDATION: Install a lightning protector between the ID-RP2D/V and antenna.

■ About the power supply

Be sure to the DC power supply that used with the ID-RP2 system is meet the followings:

Output voltage : 13.8 V DC $\pm 15\%$

Current capacity : At least the total current consumption of the connected equipments.

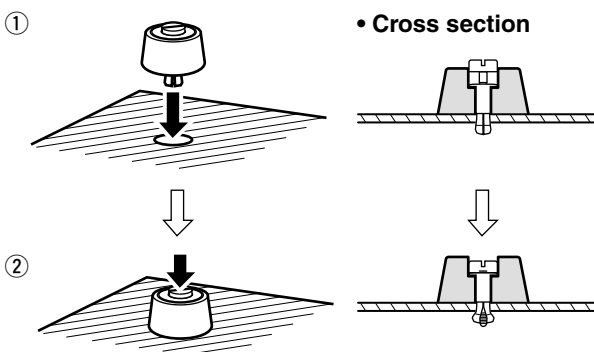
■ When install into system rack

The ID-RP2C/D/V are designed to install into the 19-inch rack (EIA standard) directly.

Use the supplied bolts with the rack when fixing the ID-RP2C/D/V.

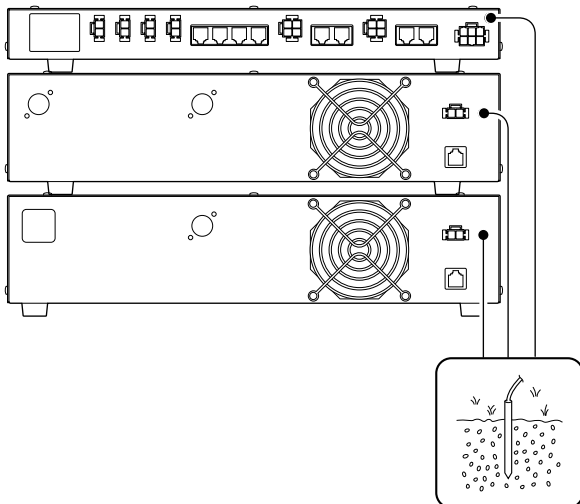
We recommend to use the rack that has rails due to the weigh of the ID-RP2D and ID-RP2V is approx. 6.2 kg (13.7 lbs) and approx. 7.5 kg (16.5 lbs), respectively.

■ Rubber feet attachment



Attach the supplied rubber feet onto the bottom of the ID-RP2C/D/V as shown at left when not installed into 19-inch rack. Desktop operation can be performed.

■ Grounding



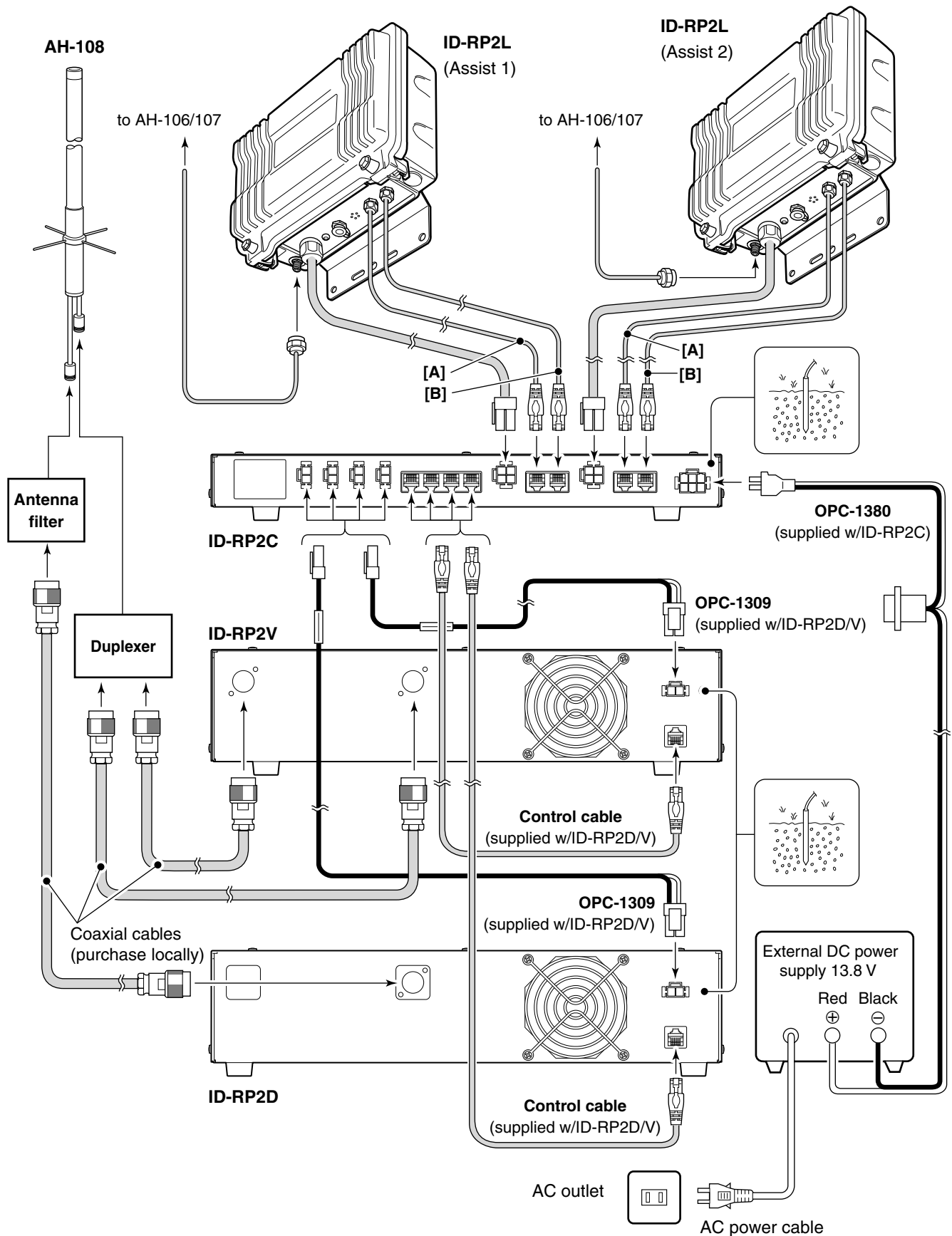
To prevent electrical shock, television interference (TVI), broadcast interference (BCI) and other problems, ground the transceiver through the GROUND terminal on the rear panel.

For best results, connect a heavy gauge wire or strap to a long earth-sunk copper rod.

Make the distance between the [GND] terminal and ground as short as possible.

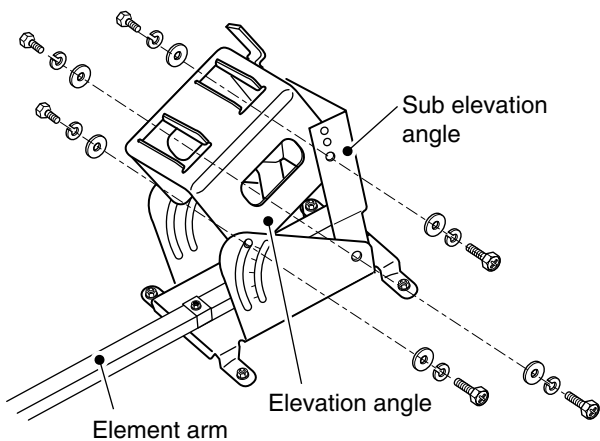
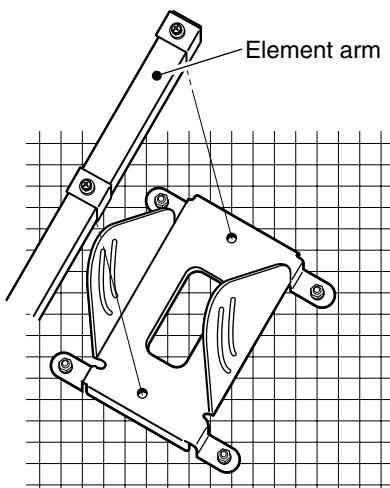
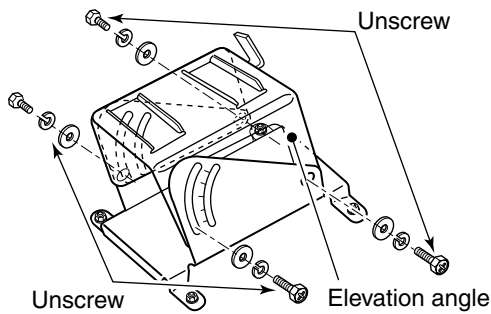
⚠ WARNING: NEVER connect the [GND] terminal to a gas or electric pipe, since the connection could cause an explosion or electric shock.

System connections



■ Antenna assembling

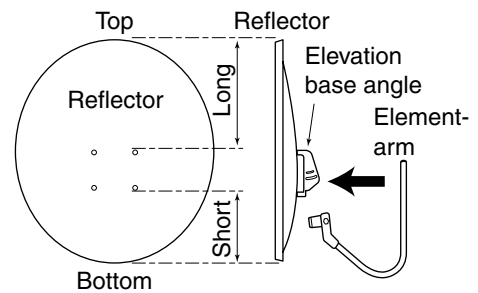
◆ AH-106



⚠ DANGER! Antenna installation is intended for professional installation only. We are not responsible for any building breakage, any damage resulting from a drop of the antenna from a high place or unstable site or resulting from any personal injury nor any accident in any other cases. Be sure to consult an expert engineer for installations.

- ① Remove the pole clamp that attached to the elevation angle.
- ② Unscrew 4 bolts from the elevation angle.

- ③ Attach the element-arm onto the reflector.
 // **NOTE:** Check the orientation.

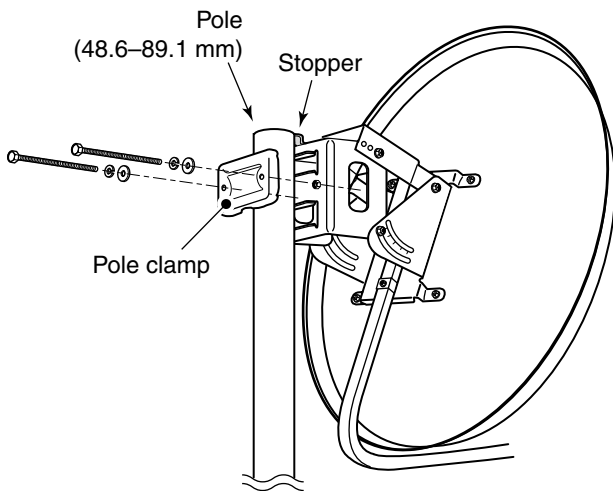


- ④ Attach the elevation and sub elevation angles as the diagram at left.
 Fix the angles using with the bolts that are unscrewed at steps ② and are attached with the sub elevation angle.

// **NOTE:** Select the suitable screw hole position that the point where the suitable parabolic antenna beams angle is provided with the sub elevation angle adjustment.

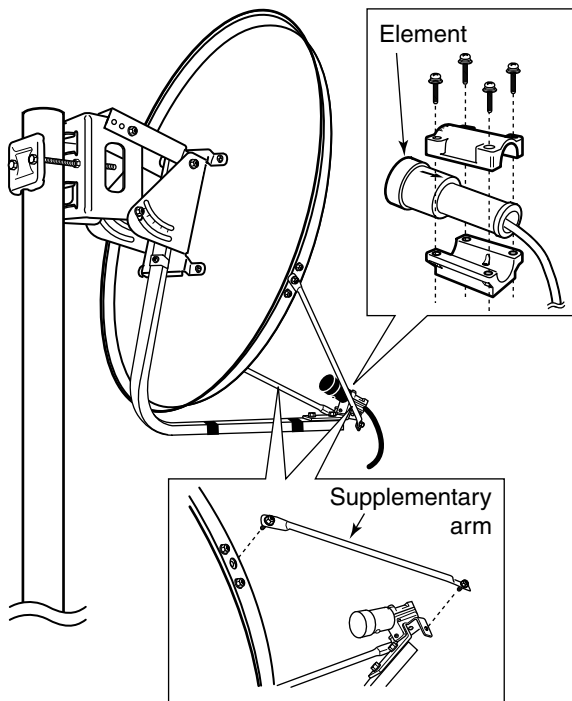
➡ Continue to the next page.

4 CONNECTIONS AND INSTALLATIONS



- ⑤ Attach the pole between the elevation angle and the pole clamp, that is removed in steps ①, as illustrated at left.

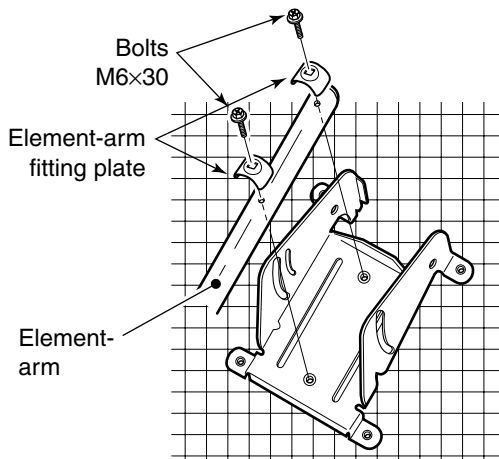
- Tighten the two bolts within an even torque.
- Use the stopper of the elevation angle when installing the antenna at the top edge of the pole.



- ⑥ Attach the supplementary arms between element arm and parabolic reflector, and attach the antenna element to the element arm.

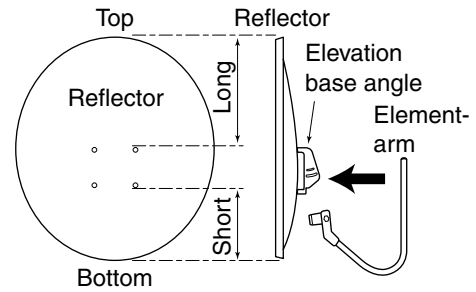
- NOTE:** The “V” stamps on the antenna element must be face up.

◆ AH-107

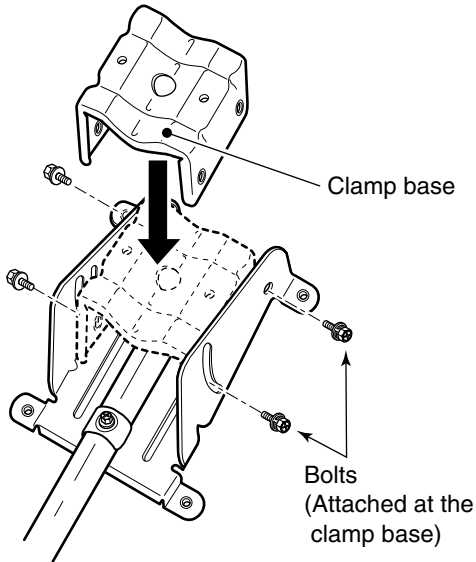


- ① Attach the element arm to the parabolic reflector using with the supplied bolts (M6×30) and the element arm fitting plates.

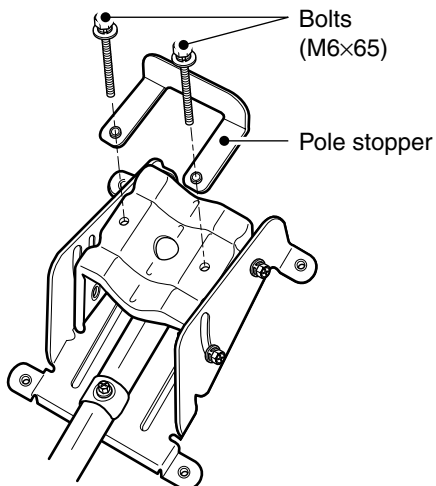
⚡ Note: Check the orientation.



- ② Attach the clamp base. Use the bolts that are attached to the clamp base.

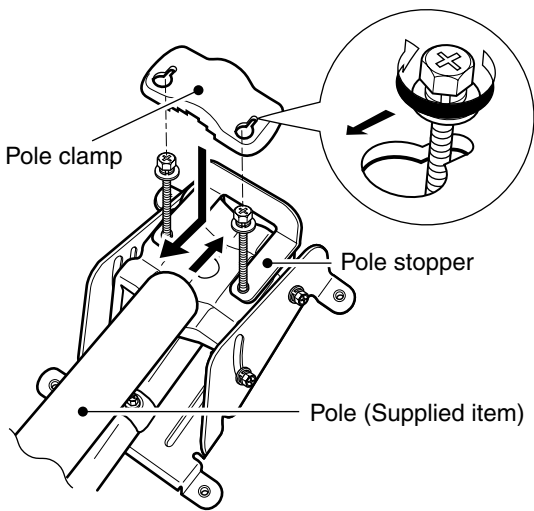


- ③ Attach the pole stopper with the supplied bolts (M6×65) temporary.

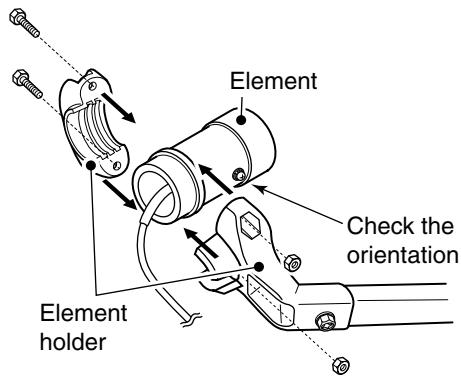


➡ Continue to the next page.

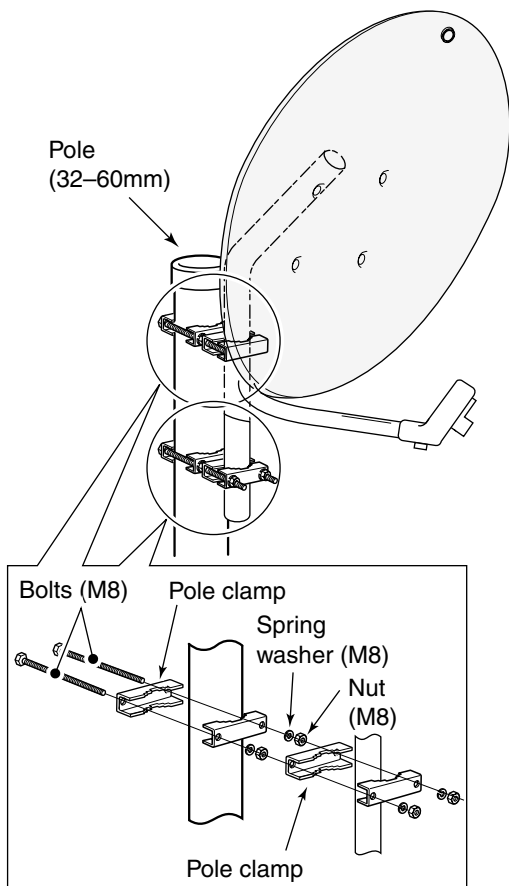
4 CONNECTIONS AND INSTALLATIONS



- ④ Fix the supplied pole with the pole clamp as illustrated at left.



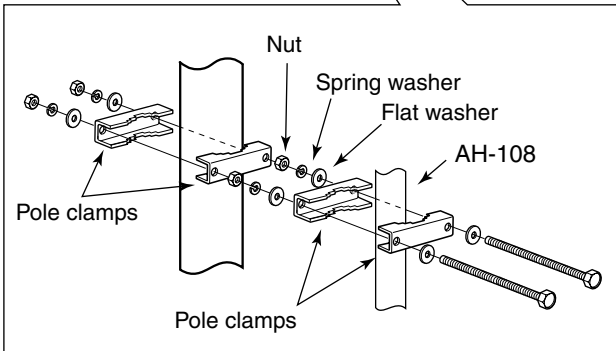
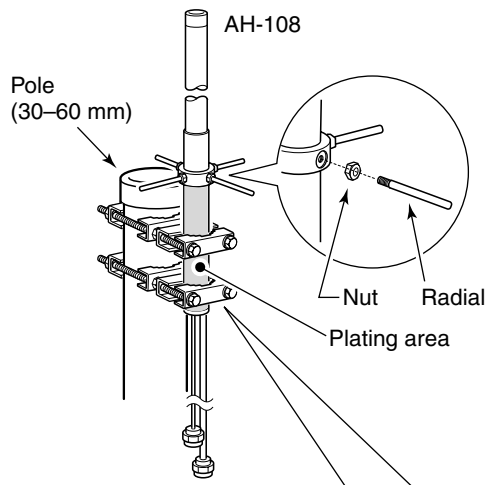
- ⑤ Attach the antenna element to the element holder.
NOTE: The “▼” stamps on the antenna element must be face up.



- ⑥ Install the assembled parabolic antenna to the pole.

IMPORTANT!
Make fast the parabolic antenna to the pole with the wire (purchase locally) through the ring in the upper behind of the reflector to prevent the parabolic antenna dispersion or the fall.

◆ AH-108



- ① Attach the nut (M6) to the radial, then attach the radial to the AH-108.
- ② Attach the supplied bolts, pole clamps, spring washers, flat washers and nuts to the AH-108 as illustrated at left.

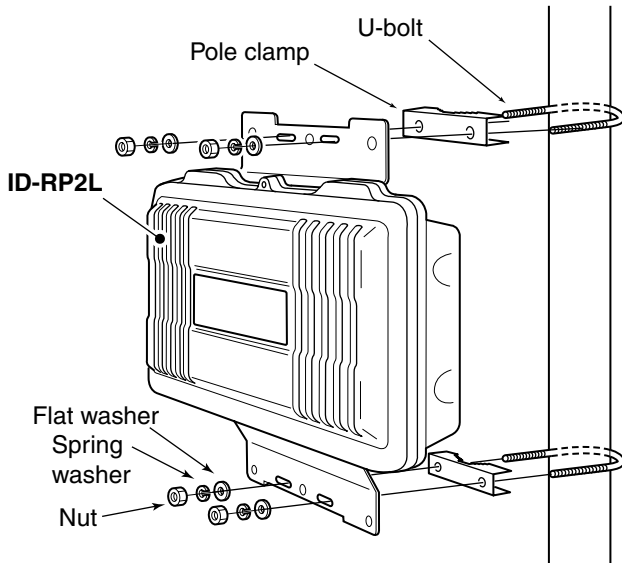
CAUTION! The pole clamps must be attached to the plating area only. Attachment to other part may cause damage of the AH-108 due to strength shortage.

- ③ Fix the AH-108 to the pole using with the supplied pole clamps, spring washers, flat washers and nuts.

■ ID-RP2L installation

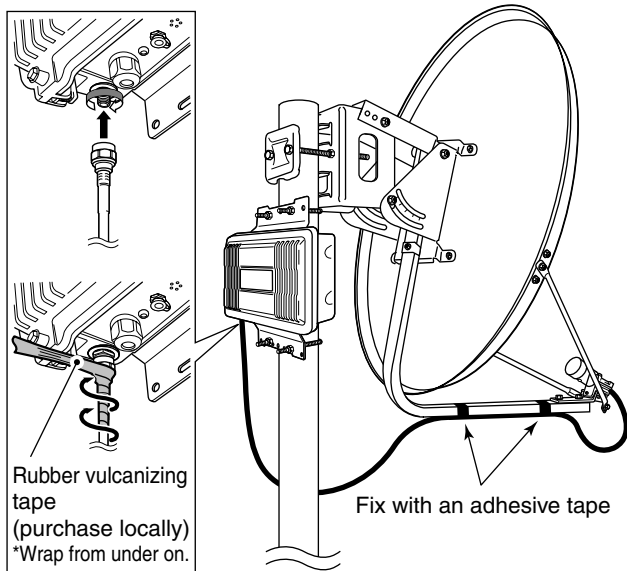
⚠ DANGER! The ID-RP2L installation is intended for professional installation only. We are not responsible for any building breakage, any damage resulting from a drop of the ID-RP2L from a high place or unstable site or resulting from any personal injury nor any accident in any other cases. Be sure to consult an expert engineer for installations.

ID-RP2L must be connected to the parabolic antenna element directly. The element cable extension may cause communication error, therefore the ID-RP2L must be installed right under the parabolic antenna.



- ① Install the ID-RP2L onto the pole, right under the parabolic antenna, using with the supplied U-bolts, pole clamps, flat washers, spring washers and nuts.

NOTE: The ID-RP2L must be installed where the place without obstacle to the parabolic antenna beam adjustment.

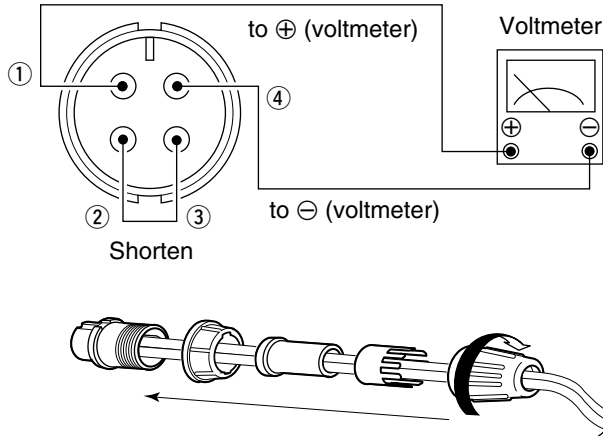


- ② Connect the antenna element to the ID-RP2L [ANT] connector.
- ③ Fix the antenna element cable to the element arm with slacks for both element and ID-RP2L sides using with vinyl tape or cable fastener, etc.

NOTE: Cover the antenna connector with rubber vulcanizing tape to protect the antenna connector from water intrusion.
*Wrap the rubber vulcanizing tape from the under on.

■ Adjusting the parabolic antenna

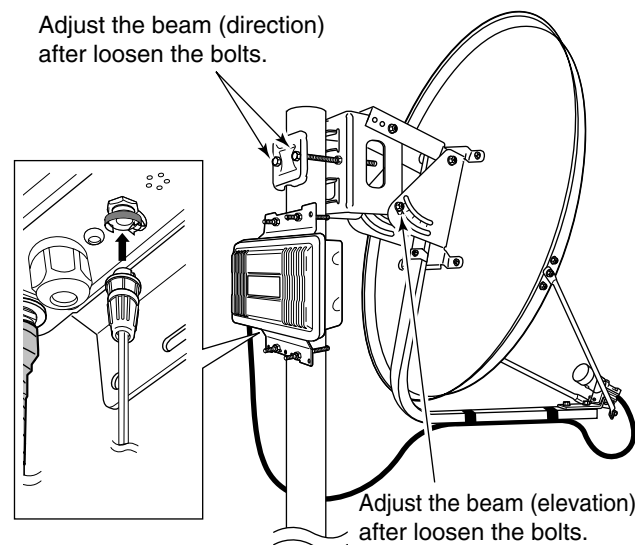
◇ About the test plug



Assemble the test plug before adjusting the parabolic antenna as follows.

- ① Shorten the TEST (pin 2) and GND (pin 3) terminals of the test plug, that supplied with the ID-RP2L.
- ② Connects a wire to each the RSSI (pin 1) and GND (pin 4) to be connected to a voltmeter.
- ③ Assemble the test plug as illustrated at left.

◇ Parabolic antenna beam adjustment



Adjust the parabolic antenna beam as the following instruction.

Due to very critical adjustment is required, attend 2 or more persons for adjustment.

- ① Turn the parabolic antenna beam to the opposed microwave link repeater, and fix it temporarily.
- ② Connects a voltmeter to [TEST] connector of the ID-RP2L through the test plug.
 - Transmits a test signal automatically.
 - Transmits a test signal from the opposed microwave link repeater also.
 - The voltmeter swings when the test signal is received from the opposed microwave link repeater.
- ③ Adjust the parabolic antenna beam direction and elevation angles to the point where the voltmeter shows maximum voltage, then fix the antenna.

5

DRIVER INSTALLATIONS

IMPORTANT!

A different USB driver from the ID-1 is used for the ID-RP2 system.

Uninstall the USB driver for ID-1 first, then install the USB driver for ID-RP2 system if the USB driver for ID-1 is installed in the PC.

The USB (Universal Serial Bus) cable (A-B type; purchase separately) is used for the connection between ID-RP2 and a PC.

So, the USB driver installation is required for the PC.

In addition, individual USB driver installation is required for each connector and unit, because the communication port number difference.

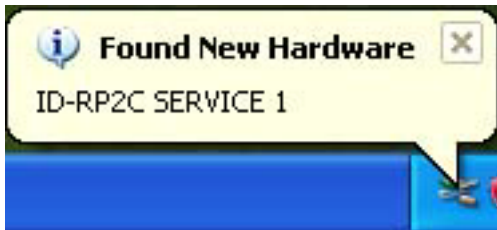
In this instruction, describes with the installation of the ID-RP2C [SERVICE1] connector for example.

NOTE:

The repeater unit connection may not be recognized with the PC according to the using USB cable length. Use the shorter USB cable as possible is recommended.

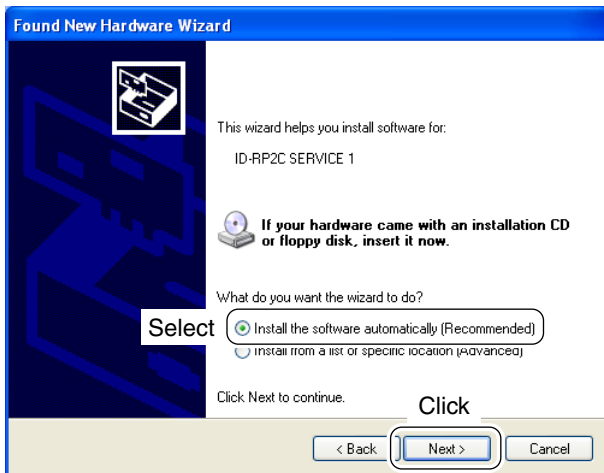
■ Microsoft® Windows® XP (Service Pack 2)

- ① Start up the Windows.
 - Quit all applications if activated.
- ② Insert the CD that comes with the ID-RP2C, into the CD drive.
- ③ Connect the PC and ID-RP2C [SERVICE1] connector using with an USB cable (A-B type; purchase separately).
- ④ “Found New Hardware ID-RP2C SERVICE 1” appears as at left.



- ⑤ The “Found New Hardware Wizard” will come up as at left. Select “No, not this time” then click [Next>].





- ⑥ Insert the supplied CD into the CD drive, select “Install the software automatically (Recommended),” then click [Next>].



- ⑦ The wizard starts searching for the driver and shows the dialog as at left during search.



- ⑧ While searching the driver, the “Hardware Installation” dialog box appears as at left. Click [Continue Anyway] to start the installation.

NOTE: If the dialog as at left does not appear, select “Install from a list or specific location (Advanced)” in step ⑥, then select the driver folder in the CD.

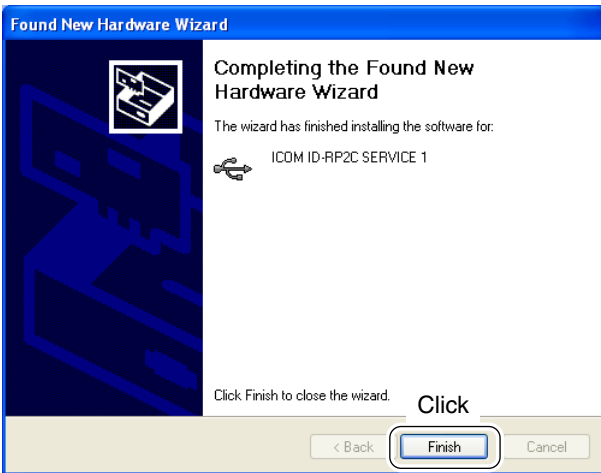
Continue to the next page.

■ Microsoft® Windows® XP (Service Pack 2)— continued

⑨ Windows starts installing the USB driver.



⑩ After the installation is completed, click [Finish].



⑪ After clicking [Finish], “Found New Hardware USB Serial Port” appears as at left.



⑫ The “Found New Hardware Wizard” will come up as at left. Select “No, not this time” then click [Next>].





- ⑬ Insert the supplied CD into the CD drive, select “Install the software automatically (Recommended),” then click [Next>].



- ⑭ The wizard starts searching for the driver and shows the dialog as at left during search.



- ⑮ While searching the driver, the “Hardware Installation” dialog box appears as at left. Click [Continue Anyway] to start the installation.

NOTE: If the dialog as at left does not appear, select “Install from a list or specific location (Advanced)” in step ⑬, then select the driver folder in the CD.

Continue to the next page.

■ Microsoft® Windows® XP (Service Pack 2)— continued



⑩ Windows starts installing the USB driver.



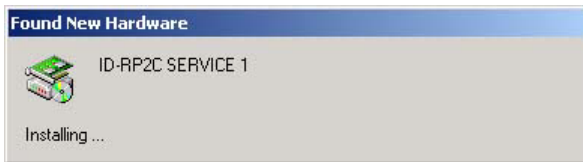
⑪ After the installation is completed, click [Finish].



⑫ After clicking [Finish], “Found New Hardware Your new hardware is installed and ready to use” appears as at left.

- ⑬ Eject the CD.
 - Rebooting the PC is recommended.

■ Microsoft® Windows® 2000



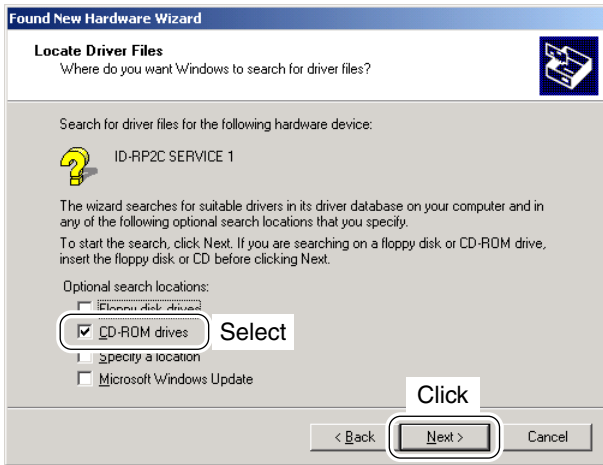
- ① Start up the Windows.
 - Quit all applications if activated.
- ② Insert the CD that comes with the ID-RP2C, into the CD drive.
- ③ Connect the PC and ID-RP2C [SERVICE1] connector using with an USB cable (A-B type; purchase separately).
- ④ “Found New Hardware ID-RP2C SERVICE 1” appears as at left.

- ⑤ The “Found New Hardware Wizard” will come up as at left. Click [Next>].

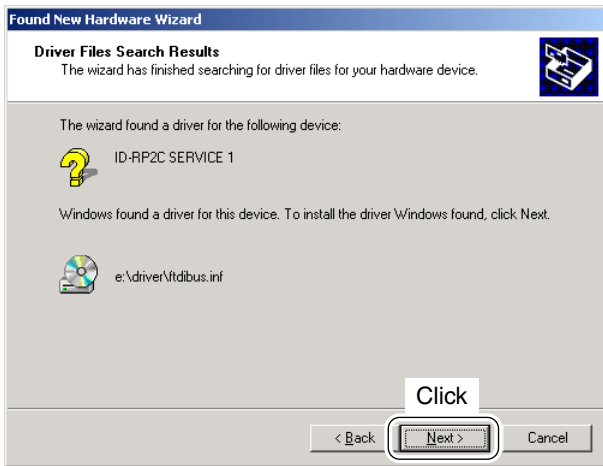
- ⑥ Insert the supplied CD into the CD drive, select “Search for a suitable driver for my device (recommended),” then click [Next>].

➤ Continue to the next page.

■ Microsoft® Windows® 2000— continued



⑦ Select “CD-ROM drives,” then click [Next >].



⑧ When the appropriate driver is found, the dialog box appears as at left appears. Click [Next >] to start the installation.



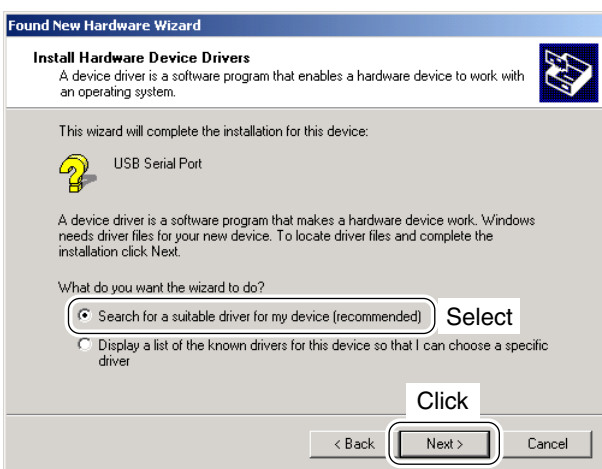
⑨ After the installation is completed, click [Finish].



⑩ After clicking [Finish], “Found New Hardware USB Serial Port” appears as at left.



- ⑪ The “Found New Hardware Wizard” will come up as at left. Click [Next>].



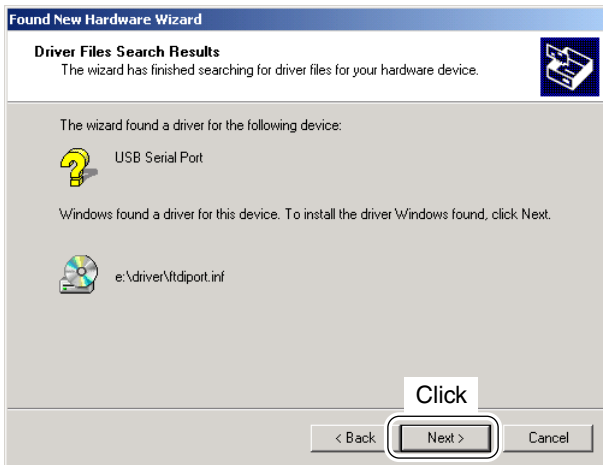
- ⑫ Insert the supplied CD into the CD drive, select “Search for a suitable driver for my device (recommended),” then click [Next>].



- ⑬ Select “CD-ROM drives,” then click [Next >].

Continue to the next page.

■ Microsoft® Windows® 2000— continued



- ⑭ When the appropriate driver is found, the dialog box appears as at left appears. Click [Next >] to start the installation.



- ⑮ After the installation is completed, click [Finish].
- ⑯ Eject the CD.
 - Rebooting the PC is recommended.

■ Microsoft® Windows® 98/Me



- ① Start up the Windows.
 - Quit all applications if activated.
- ② Insert the CD that comes with the ID-RP2C, into the CD drive.
- ③ Connect the PC and ID-RP2C [SERVICE1] connector using with an USB cable (A-B type; purchase separately).
- ④ The “Add New Hardware Wizard” will come up as at left. Click [Next>].

- ⑤ Insert the supplied CD into the CD drive, select “Search for the best driver for your device. (Recommended).”, then click [Next>].

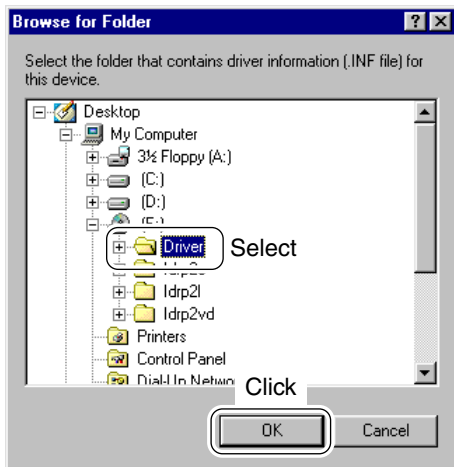
- ⑥ Click to add the check mark, “✓,” into “Specify a location:,” then click [Browse...].

NOTE: Remove the check mark, “✓,” from “Floppy disk drive,” “CD-ROM drive” and “Microsoft Windows Update” to prevent the incorrect driver selection.

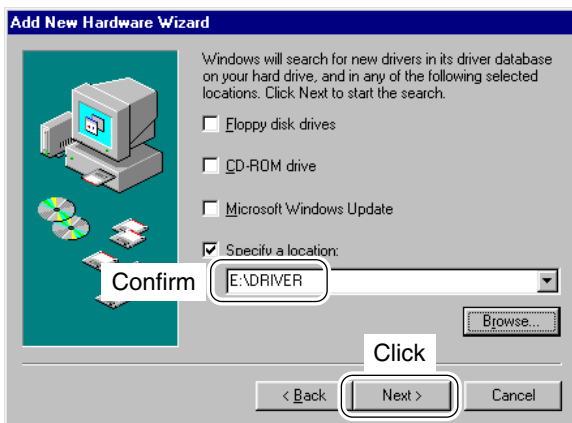
➤ Continue to the next page.

5 DRIVER INSTALLATION

■ Microsoft® Windows® 98/Me— continued



⑦ Select the “Driver” folder in the CD then click [OK].



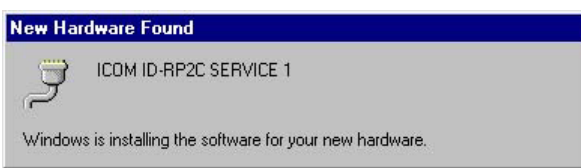
⑧ Confirm the driver folder in the CD is selected, then click [Next >].



⑨ When the driver is found, the screen as at left appears. Click [Next >] to start the driver installation.



⑩ After the installation is completed, click [Finish].

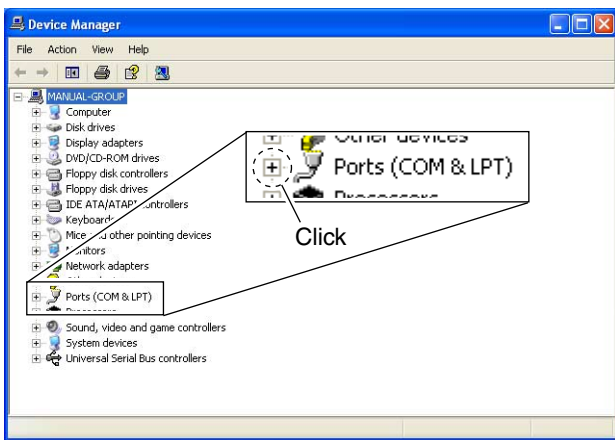


⑪ After clicking [Finish], “New Hardware Found ICOM ID-RP2C SERVICE 1” appears as at left.

⑫ Eject the CD.
• Rebooting the PC is recommended.

■ COM port confirmation

◇ Microsoft® Windows® XP/2000



Check the connected unit and connector names, and COM port number.
(In this example, the USB serial port number is "3.")

After the driver installation, confirm the driver availability and the port number are recommended. In this section, COM port number confirmation of the ID-RP2C [SERVICE1] connector is used for instruction example.

- ① Start up Windows.
- ② Connect the PC and the ID-RP2C [SERVICE1] connector through an USB cable (A-B type; purchase separately).
- ③ Right click "My Computer" then select "Properties."
• "My Computer" is available in <Start> menu with Windows XP.
- ④ "System Properties" screen appears as at left. Click [Hardware] tab and then click [Device Manager].

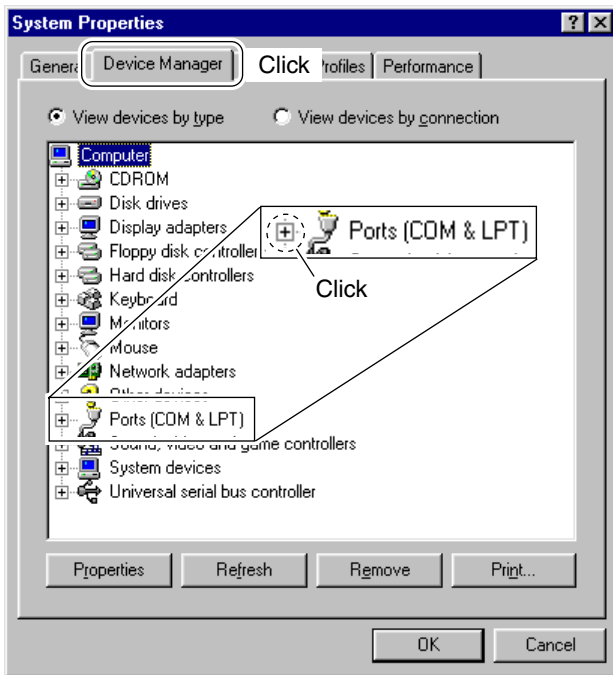
- ⑤ "Device Manager" screen appears. Click "+" of Ports (COM&LPT).

- ⑥ Confirm "ICOM ID-RP2C SERVICE1 (COM*)" is displayed.
• If not displayed, or few COM port numbers are displayed at the same time, the driver installation may not be installed properly. Un-install the USB driver then re-install the driver again in such cases.

NOTE: "*" is the COM port number, that is used for the communication setting with the utility software.

<e.g.: When driver re-installation is required>
"ICOM ID-RP2C SERVICE1 (COM*) (COM*)"

◇ Microsoft® Windows® 98/Me



Check the connected unit and connector names, and COM port number.
(In this example, the USB serial port number is "4.")

- ① Start up Windows.
- ② Connect the PC and the ID-RP2C [SERVICE1] connector through an USB cable (A-B type; purchase separately).
- ③ Right click "My Computer" then select "Properties."
- ④ "System Properties" screen appears as at left. Click [Device Manager] tab.
- ⑤ Click "+" of Ports (COM&LPT).

- ⑥ Confirm "ICOM ID-RP2C SERVICE1 (COM*)" is displayed.
 - If not displayed, or few COM port numbers are displayed at the same time, the driver installation may not be installed properly. Un-install the USB driver then re-install the driver again in such cases.

NOTE: "*" is the COM port number, that is used for the communication setting with the utility software.

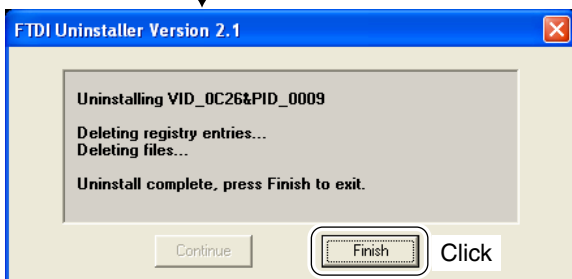
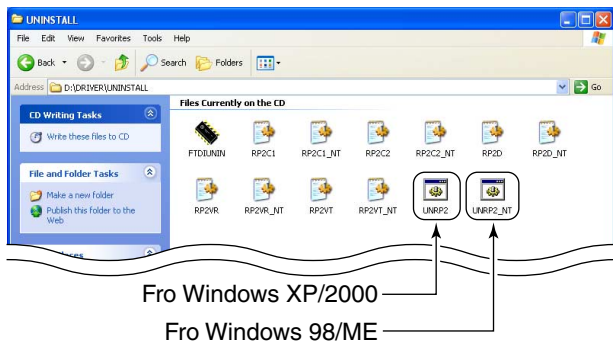
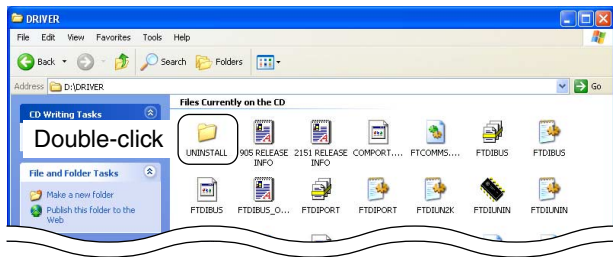
<e.g.: When driver re-installation is required>
"ICOM ID-RP2C SERVICE1 (COM*) (COM*)"

■ USB driver un-installation

IMPORTANT!

As described at first of this section, USB driver is installed for each unit and connector.

However, only one USB driver can be un-installed when using “Add and Delete” included in OS. So, you should perform the USB driver un-installation with the following instructions.



Un-install the USB drivers as follows.

- ① Start up Windows.
- ② Insert the CD that supplied with the ID-RP2C into the CD drive.
- ③ Open the CD drive directory using “My Computer” or “Explorer.”
 - Contents of the CD are displayed.
- ④ Double click the “Driver” and then the “Uninstall” folders to open and display the Uninstall folder contents.
- ⑤ Run the appropriate batch file according to the OS.
 - **For Windows XP/2000** : “UNRP2_NT.BAT”
 - **For Windows 98/Me** : “UNRP2.BAT”
- ⑥ The DOS screen appears and the un-installer starts automatically.
 - The un-installer starts several times according to the number of installed USB drivers.
 - Make sure no equipment is connected to the USB port, then click [Continue].
 - The screen as at left below appears after the un-installation, click [Finish].

NOTE: NEVER close the DOS screen manually. The un-installation is interrupted and the drivers cannot be un-installed properly when the DOS screen is closed manually.

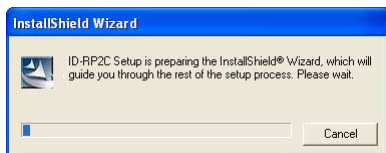
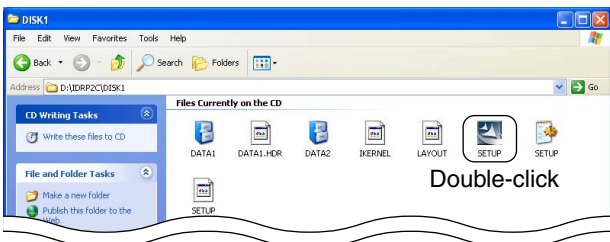
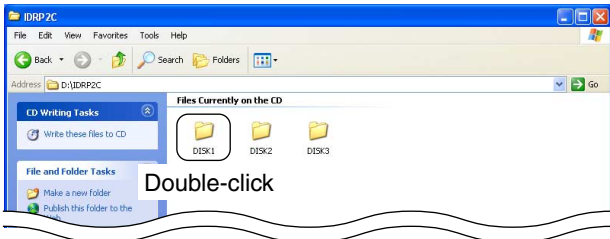
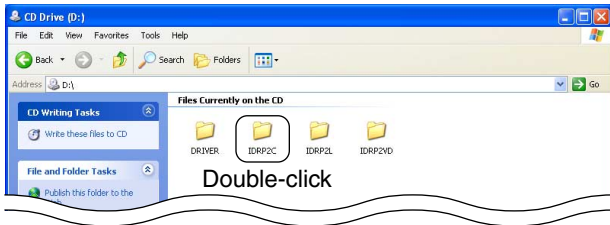
- **For Windows XP/2000:**
The DOS screen will be closed automatically after clicking [Finish].
- **For Windows 98/Me:**
Click [Finish] then close the DOS screen manually.

The utility is used for the setting of call sign and operating frequencies.

Separated utility for each ID-RP2 unit, ID-RP2C, ID-RP2D, ID-RP2L and ID-RP2V, is available.

In this section, describes the installation instruction with the utility software for the ID-RP2C for example.

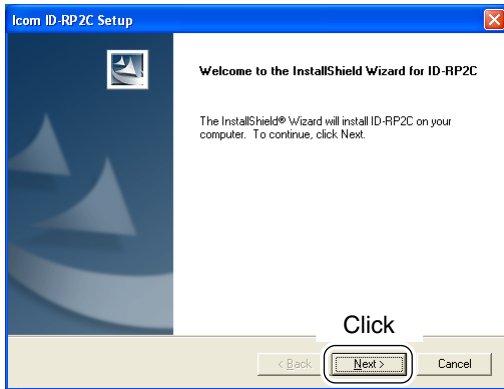
■ Installation



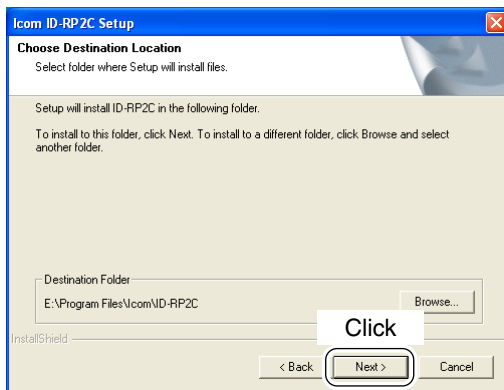
- ① Start up Windows.
 - Quit all other applications if running.
- ② Insert the CD, supplied with the ID-RP2C, into the CD drive.
- ③ Displays the contents of the CD using with the “My Computer” or Explorer.”
- ④ Double click “IDRP2C” folder.
Contents of the folder are displayed.
 - Double click “IDRP2DV” folder when installing the utility for ID-RP2D/V.
 - Double click “IDRP2L” folder when installing the utility for ID-RP2L.
- ⑤ Double click “Disk1” folder.
Contents of the folder are displayed.
- ⑥ Double click “SETUP.EXE” file.
- ⑦ “InstallShield Wizard” screen appears.

➡ Continue to the next page.

■ Installation— continued

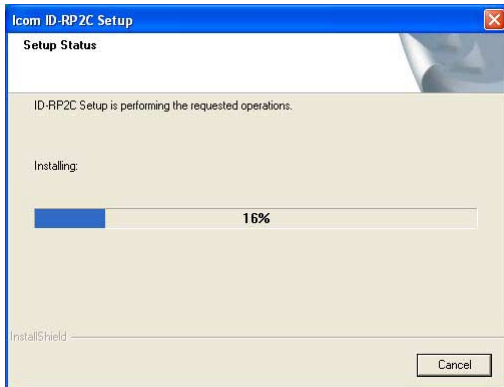


⑧ Click [Next>].



⑨ “Choose Destination Location” screen appears.

- When installing the utility into the displayed location, click [Next>].
- When installing into a different location, click [Browse...], select the desired location and then click [Next>].



⑩ Starts the utility installation.



⑪ “InstallShield Wizard Complete” screen appears when the installation is finished.

- Click [Finish] to complete the installation.

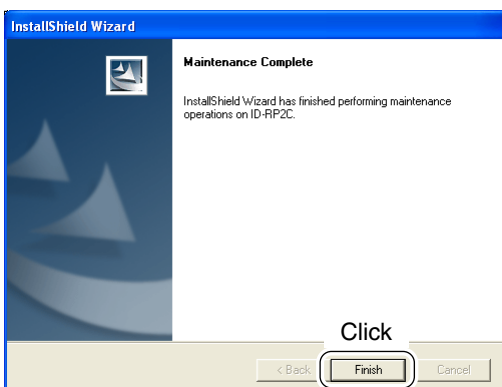
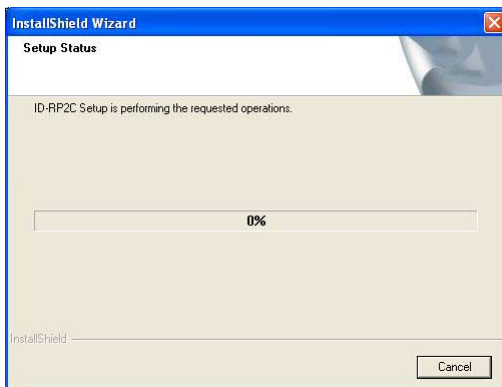
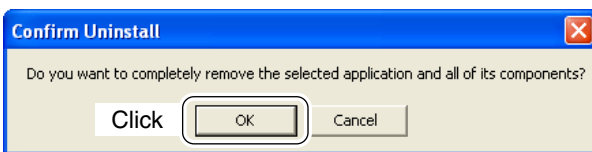
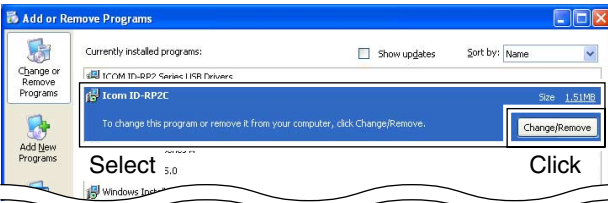
⑫ Eject the CD from the CD drive, then reboot the PC.

/// **NOTE:** Install the utility software for ID-RP2V/D and ID-RP2L with the same manner.

■ Un-installation

Un-install the utility software using with the standard application of the OS, “Add and Remove Programs,” as follows.

- ① Open “Control Panel.”
 - “Control Panel” is located in “Setting” in Start menu for Windows® 98/Me/2000.
- ② Click “Add or Remove Programs.”



- ③ Select the desired utility name, then click [Change/Remove].

- ④ “Confirm Uninstall” screen appears, click [OK].

- ⑤ The screen at left appears when the un-installation starts.

- ⑥ The screen at left appears when the un-installation is completed.
 - Click [Finish].
 - Repeat the steps ③ to ⑥ if you want to un-install another utility software.

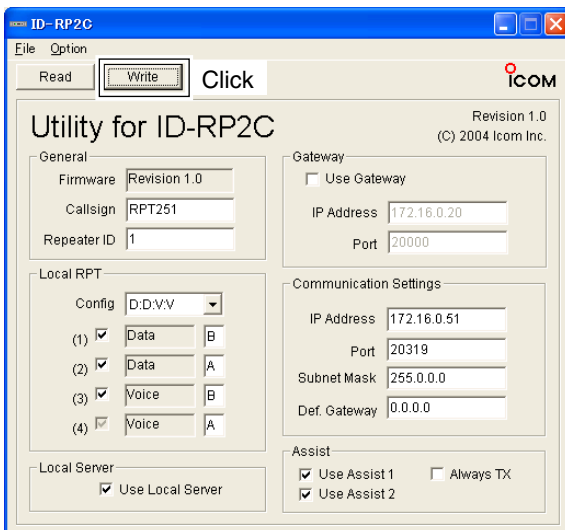
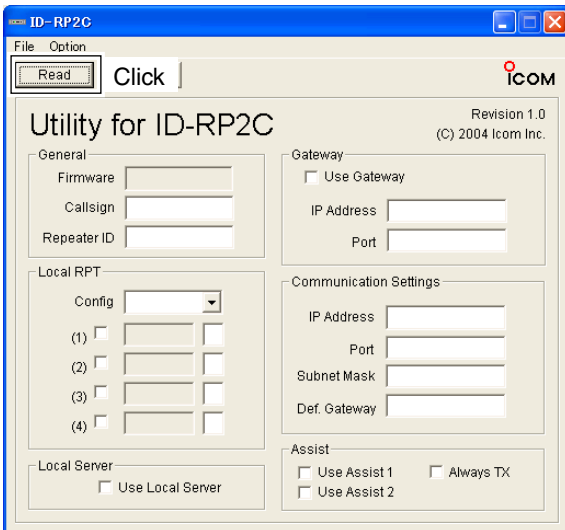
■ ID-RP2C setting

A LAN cable (patch connection; purchase separately) is used for the ID-RP2C setting.

And the fixed IP address that can be communicated to the ID-RP2C must be set to the PC in advance.

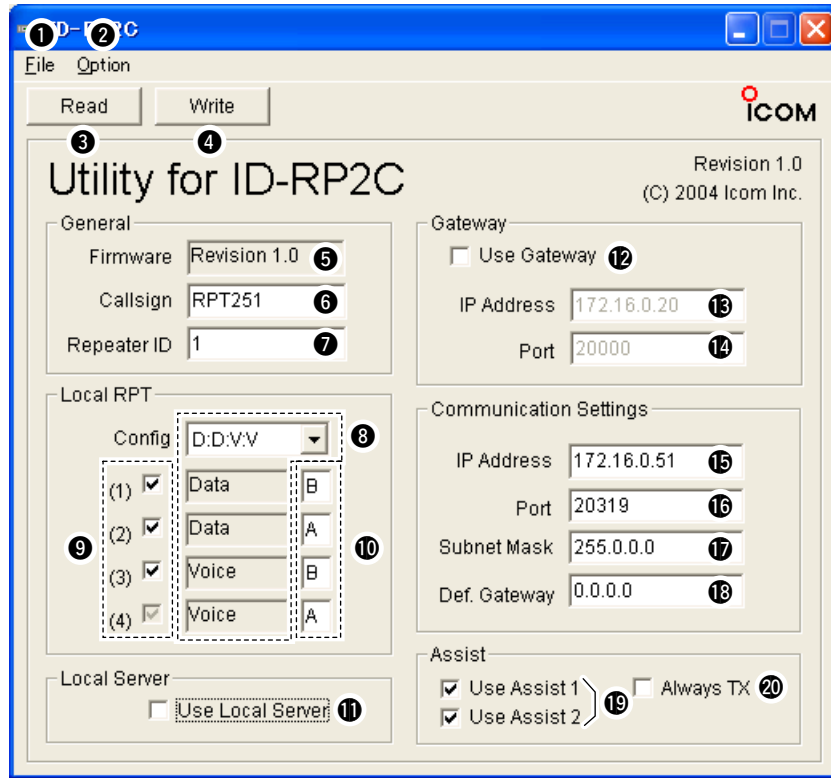
Refer to the instruction manual of the PC or LAN card for IP address setting details.

- ① Start up Windows.
- ② Connect the ID-RP2C [10BASE-T] connector and the PC's LAN port through a LAN cable (Patch connection; purchase separately), then turn the ID-RP2C power ON.
- ③ Start up the utility for ID-RP2C.
 - Double click "ID-RP2C" icon on the desktop, or select the ID-RP2C utility from "Program" in "Start" menu.
- ④ The screen as at left appears.
 - Check the IP address and the UDP port number using the "Network Setup" as described in ② Option menu in advance. (p. 38)
 - Click [Read].
- ⑤ "Network Password" screen appears.
 - Enter the password then click [OK].
 - Enter the password with alphanumeric characters (case sensitive).
 - "PASSWORD" (capital letters) is the default password.



- ⑥ Reads the ID-RP2C settings then the screen as at left appears.
 - When the error message screen appears, confirm the LAN cable connections, IP address and subnet mask for the PC.
 - And check the IP address and UDP port settings are set to "172.16.0.1 (default)" and "20319 (default)" respectively in "Network Setup" screen by selecting "Network Setup..." in "Option" menu.
- ⑦ Set the specified call sign, IP address, repeater configuration and microwave link repeater conditions.
 - After the setting, click [Write] to transfer and program the setting into ID-RP2C.
 - See the next page for the details of each item.
- ⑧ Quit the utility.
 - Select "Exit" in "File" menu or click "X" on the title bar.

◇ ID-RP2C utility screen



1 File menu

The following sub menus are displayed when clicked.

- **Clear:** Resets to the default setting for all items.
- **Read from controller:**
Reads the setting conditions from the ID-RP2C.
- **Write to controller:**
Transfers and programs the displayed setting conditions into the ID-RP2C.
- **Exit:** Quits the utility.

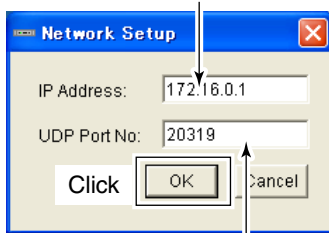
2 Option menu

The following sub menus are displayed.

• **Network setup...:**

The "Network setup" screen for IP address and UDP port number entering for accessing the ID-RP2C appears.

Enter the IP address of the ID-RP2C.
(Default: 172.16.0.1)

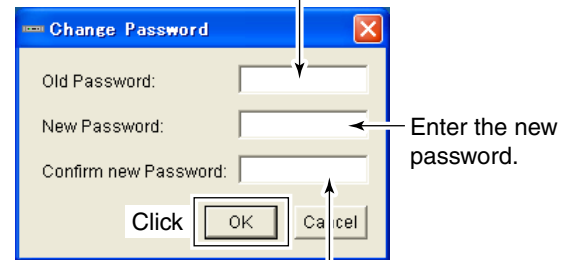


Enter the UDP port number of the ID-RP2C.
(Default: 20319)

• **Change Password...:**

The "Change Password" screen for password change for accessing the ID-RP2C.

Enter the current password. (Default: PASSWORD)



Enter the new password again for confirmation.

IMPORTANT! Enter the password using with alphanumeric character (case sensitive).

DO NOT forget the both IP address and password setting. The access to the ID-RP2C through the utility will be impossible if forgotten.

3 [Read]

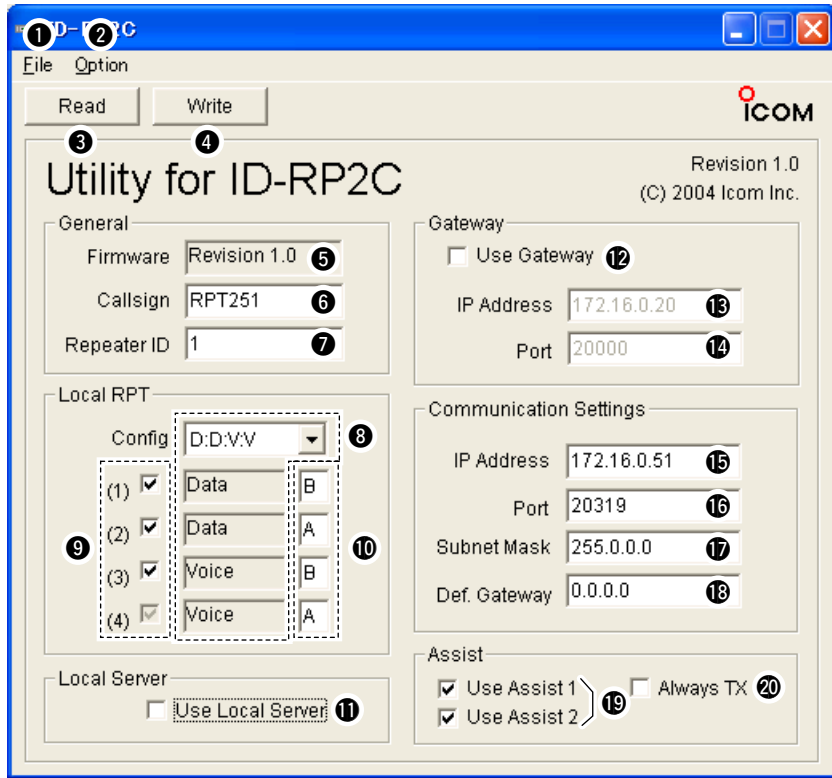
Reads the ID-RP2C setting condition.

4 [Write]

Transfers and programs the displayed setting condition into the ID-RP2C.

☞ Continue to the next page

◇ ID-RP2C utility screen— continued



5 Firmware (Revision) indication
Shows the revision number of the programmed firmware in the ID-RP2C.

6 Callsign (Call sign)
Enter the call sign (local repeater).

Usable characters are; A to Z (capital letters only), 0 to 9 and some symbols (!, ", #, \$, %, &, ', (,), *, +, ,, -, ., /, :, ;, <, =, >, ?, @, [, \,], ^, _).

7 Repeater ID
Enter the repeater identity code within 1 to 15.

The repeater ID code is an identification number allocated in each repeater, and a different code must be allocated for each repeater that operates in the same zone.

IMPORTANT!:
NEVER duplicate the ID number in the zone.
A unique ID number within 1 to 15 range must be entered. Otherwise the communications between local repeaters won't function properly.
The same repeater ID code can be allocated to the repeater if the repeater operates in a different zone.

8 Config (Local repeater configuration)
Selects the connected local repeater type (voice or data) for each [LOCAL RPT— CONT I/O] connector.

Click [▼] button then select the repeater type from the displayed list. The selected repeater type is displayed in the text box below.

The displayed contents cannot be edit.

9 Check box((1) to (4))
Click to display the check mark, "✓," in the corresponding connector name. The names correspond to [CONT I/O] connectors on the ID-RP2C rear panel ((1), (2), (3) and (4) from the left).

IMPORTANT!:
When no check mark is displayed, the local repeater cannot be operated even if the repeater is connected to the system.

10 Unit initial

Enter the local repeater initial (one character) for each connected local repeater to [LOCAL RPT—CONT I/O] connector.

This initial is an identical initial for each unit, and follows the call sign.

e.g.: The “C” is the initial of JA3YUA_C.

Usable characters are A to D (capital letters only).

IMPORTANT!

The initial “A” must be applied to both the ID-RP2D and ID-RP2V, and NEVER duplicate the initial within the data and the voice repeaters. Otherwise the communications between local repeaters won't function properly.

11 Use Local Server (local server usage)

Turn the local server (e-mail, WEB server, etc.) connection availability to the ID-RP2C ON and OFF.

Remove the check mark (✓) when no local server is connected.

Un-connectable command is automatically replied when the packet to the local server is received without the check mark (✓) setting.

NOTE: Gateway connection is excluded with this setting.

Therefore, remove the check mark (✓) when no local server is connected even when connecting a gateway server.

12 Use Gateway (gateway usage)

Selects the gateway connection capability with this local repeater ON and OFF.

Apply the check mark (✓) when persists the gateway connection, however, remove the check mark (✓) when inhibit the gateway connection.

Un-connectable command is automatically replied when the packet through a gateway is received without the check mark (✓) setting.

13 IP Address

Enter the IP address of the connectable gateway.

14 Port (port number)

Enter the UDP port number of the connectable gateway.

15 IP Address

Enter the local IP address of the repeater.

(Default: 172.16.0.1)

16 Port (port number)

Enter the UDP port number of the repeater.

(Default: 20319)

Use the default setting normally.

17 Subnet Mask

Enter the subnet mask of the network if the repeater is connected to the existing network (e.g., LAN).

Set the same subnet mask of the PC for repeater setting and server (gateway or local server, etc.), if connected.

18 Def. Gateway (Default gateway)

Set the default gateway address of the network that to be connected to, if connecting to another network through the repeater.

And, set the same default gateway address of the local server, if the local server has a different network setting from the repeater network setting.

19 Use Assist 1/2 (Assist repeater 1/2 usage)

This setting is for microwave link repeaters.

(1) and (2) connectors for the microwave link repeaters are available.

Apply the check mark (✓) into the corresponding initial's check box to activate the microwave link repeater.

20 Always TX (Continuous transmission)

Apply the check mark (✓) when continuous test transmission is required, such as when the microwave link repeater installation, parabolic antenna adjustment.

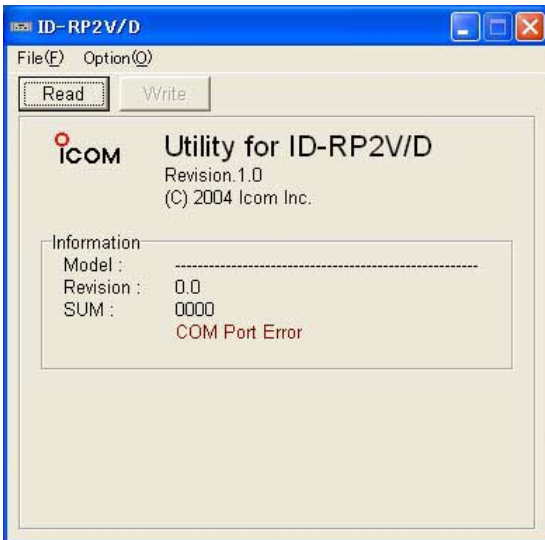
Remove the check mark (✓) in regular operation.

Frequency setting for ID-RP2D

NOTE:

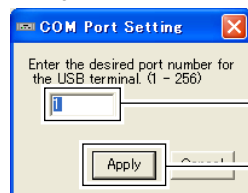
The repeater unit connection may not be recognized with the PC according to the using USB cable length. Use the shorter USB cable as possible is recommended.

- ① Start up the PC.
- ② Connect an USB cable (A-B type; purchase separately) between PC's USB port and [SERVICE] connector of the ID-RP2D, then turn the ID-RP2D power ON.
- ③ Start up the ID-RP2V/D utility.
Double click the "ID-RP2VD" icon on the desktop or select the "ID-RP2VD" in "Program" in "Start" menu.
- ④ The screen as at left appears, then the dialog below is displayed.
•Click [OK].



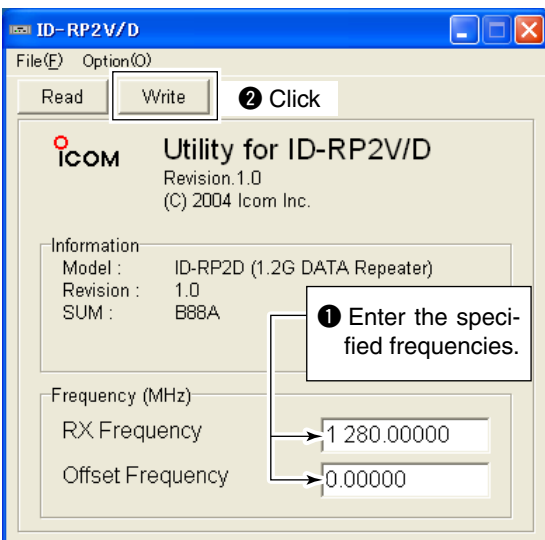
NOTE: The screen, described in steps ⑤, appears instead of these screens when the correct COM port number is set.

- Click <Option (O)> menu then select <COM Port(P)...>. Enter the allocated number of the ID-RP2D [SERVICE] connector then click [Apply] in the displayed "COM Port Setting" screen.



NOTE: See pages 31 and 32 for the COM port number confirmation details.

- ⑤ The utility reads the ID-RP2D setting and the screen as at left appears when the correct COM port number is set.
- ⑥ Enter the specified operating frequency into "RX Frequency" column.
• Enter the offset frequency into "Offset Frequency" column, if specified.
- ⑦ Click [Write] to program the set frequency into the ID-RP2D.

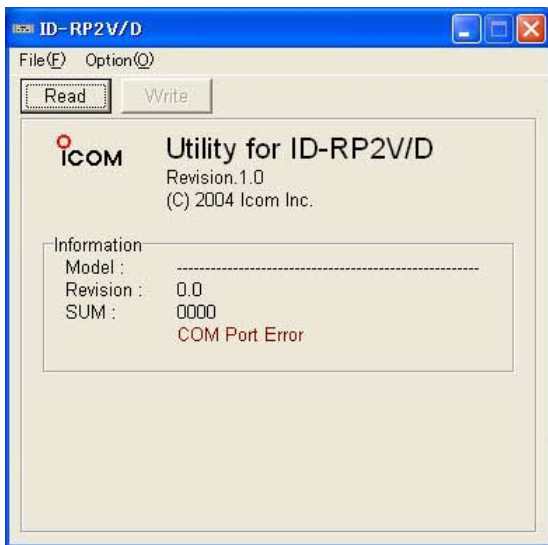


Frequency setting for ID-RP2V

NOTE:

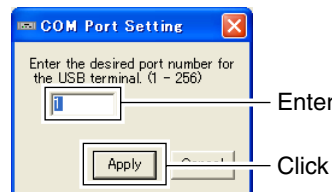
The repeater unit connection may not be recognized with the PC according to the using USB cable length. Use the shorter USB cable as possible is recommended.

- ① Start up the PC.
- ② Connect an USB cable (A-B type; purchase separately) between PC's USB port and ID-RP2V [SERVICE] connector, then turn the ID-RP2V power ON.
 - Connect an USB cable to [SERVICE R] when setting receive frequency.
 - Connect an USB cable to [SERVICE T] when setting transmit frequency.
- ③ Start up the ID-RP2V/D utility. Double click the "ID-RP2VD" icon on the desktop or select the "ID-RP2VD" in "Program" in "Start" menu.
- ④ The screen as at left appears, then the dialog below is displayed.
 - Click [OK].



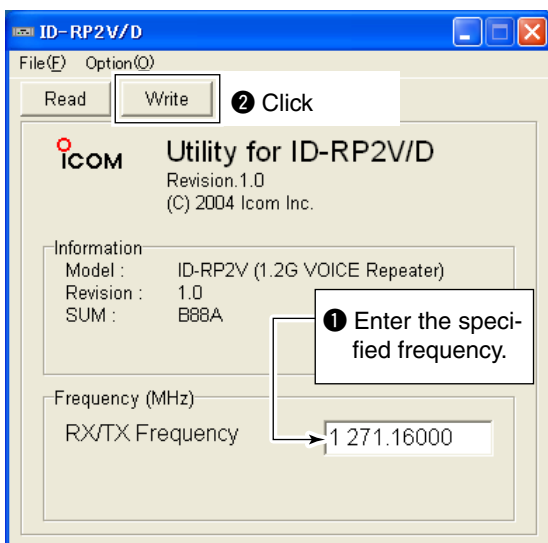
NOTE: The screen, described in steps ⑤, appears instead of these screens when the correct COM port number is set.

• Click <Option (O)> menu then select <COM Port(P)...>. Enter the allocated number of the ID-RP2V [SERVICE] connector then click [Apply] in the displayed "COM Port Setting" screen.



NOTE: See pages 31 and 32 for the COM port number confirmation details.

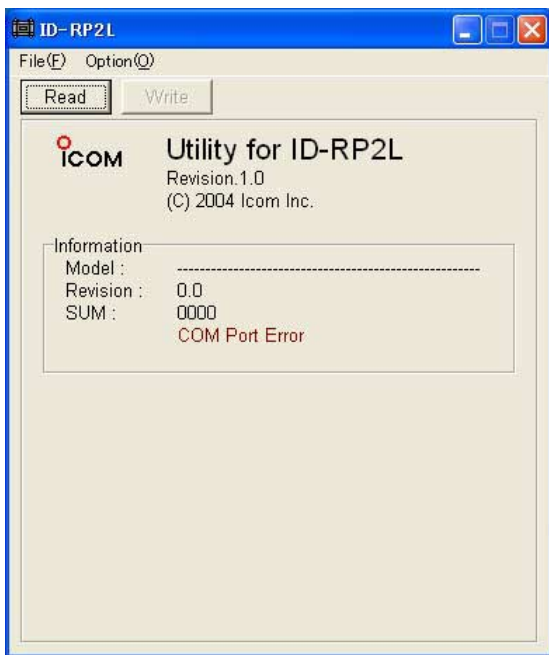
- ⑤ The utility reads the ID-RP2V setting and the screen as at left appears when the correct COM port number is set.
- ⑥ Enter the specified receive and transmit frequencies into "RX/TX Frequency" column.
- ⑦ Click [Write] to program the set frequencies into the ID-RP2V.



■ ID-RP2L setting

NOTE:

The repeater unit connection may not be recognized with the PC according to the using USB cable length. Use the shorter USB cable as possible is recommended.

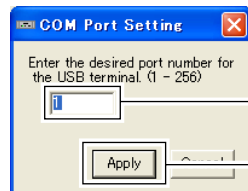


- ① Start up the PC.
- ② Connect an USB cable (A-B type; purchase separately) between PC's USB port and either [SERVICE 1] or [SERVICE 2] connector of the ID-RP2C, then turn the ID-RP2L power ON.
 - Connect an USB cable to [SERVICE 1] and turn the ID-RP2L power ON with [ASSIST 1] when setting the operating frequency of the ID-RP2L that is connected to ASSIST1.
 - Connect an USB cable to [SERVICE 2] and turn the ID-RP2L power ON with [ASSIST 2] when setting the operating frequency of the ID-RP2L that is connected to ASSIST2.
- ③ Start up the ID-RP2L utility.
Double click the "ID-RP2L" icon on the desktop or select the "ID-RP2L" in "Program" in "Start" menu.
- ④ The screen as at left appears, then the dialog below is displayed.
 - Click [OK].

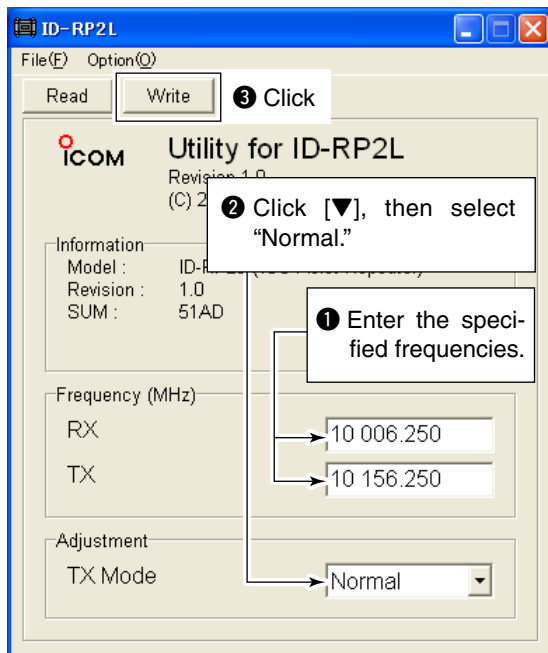


/// **NOTE:** The screen, described in steps ⑤, appears instead of these screens when the correct COM port number is set.

- Click <Option (O)> menu then select <COM Port(P)...>. Enter the allocated number of the ID-RP2C [SERVICE 1] or [SERVICE 2] connector then click [Apply] in the displayed "COM Port Setting" screen.



/// **NOTE:** See pages 31 and 32 for the COM port number confirmation details.



- ⑤ The utility reads the ID-RP2L setting and the screen as at left appears when the correct COM port number is set.
- ⑥ Enter the receive and transmit frequency for microwave link repeater operations in to “RX” and “TX” columns respectively.
 - Enter the transmit frequency of the opposed microwave link repeater into “RX,” receive frequency into “TX” column.
- ⑦ Click [▼] of “TX Mode,” then select “Normal.”
 - ⚠ **NOTE:** The selections of “External,” “PN” and “Carrier” are used for maintenance purpose only.
- ⑧ Click [Write] to program the set frequencies and conditions into the ID-RP2L.

■ Troubleshooting

If your repeater seems to be malfunctioning, please check the following points before sending it to a service center.

PROBLEM	POSSIBLE CAUSE	SOLUTION	REF.
Does not turn ON.	<ul style="list-style-type: none"> • Power connector has a poor contact. • Blown fuse. 	<ul style="list-style-type: none"> • Check the connector pins and re-connect the DC power cable. • Check for the cause, then replace the fuse. 	<p>p. 11</p> <p>p. 46</p>
No transmit output power, or only few output power.	<ul style="list-style-type: none"> • Antenna or coaxial cable has problems. 	<ul style="list-style-type: none"> • Check, and if necessary, replace the coaxial cable or solder the antenna connector again. 	<p>pgs. 9, 11</p>
Sensitivity is low and only strong signals are operatable.	<ul style="list-style-type: none"> • Antenna or coaxial cable has problems. 	<ul style="list-style-type: none"> • Check, and if necessary, replace the coaxial cable or solder the antenna connector again. 	<p>pgs. 9, 11</p>
Cannot be connected to another repeater site.	<ul style="list-style-type: none"> • Parabolic antenna beam does not adjusted properly. • Different frequencies are programmed from the opposed microwave link repeater. • No check mark (✓) is applied to "Use Assist 1/2." 	<ul style="list-style-type: none"> • Re-adjust the parabolic antenna beam. • Set the receive and transmit frequencies as the opposed microwave link repeater's transmit and receive frequencies respectively. • Apply the check mark (✓) into "Use Assist 1/2." 	<p>p. 18</p> <p>pgs. 43, 44</p> <p>p. 40</p>
Does not function even a signal is received.	<ul style="list-style-type: none"> • Unit initial setting is wrong or duplicated. • Config. Setting is wrong. • No check mark (✓) is applied. 	<ul style="list-style-type: none"> • Set "A" to each voice and data repeater and never duplicate the initial between voice repeaters and/or data repeaters. • Set the corresponding conditions to the connected repeater combination. • Apply the check mark (✓) into the appropriate connector number. 	<p>p. 39</p> <p>p. 39</p> <p>p. 39</p>
PC does not recognize the repeater	<ul style="list-style-type: none"> • Too long USB cable is used. 	<ul style="list-style-type: none"> • Use a shorter USB cable. 	<p>p. 19</p>
The settings cannot be programmed into the repeater properly.	<ul style="list-style-type: none"> • Too long USB cable is used. 	<ul style="list-style-type: none"> • Use a shorter USB cable. 	<p>pgs. 41–43</p>

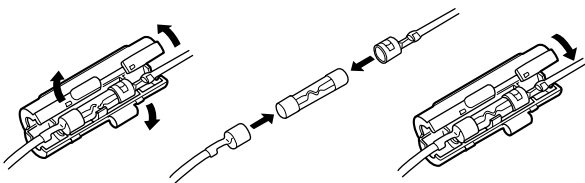
■ About cleaning

DO NOT use chemical agents such as benzine or alcohol when cleaning, as they can damage the repeater's surfaces.

■ Fuse replacement

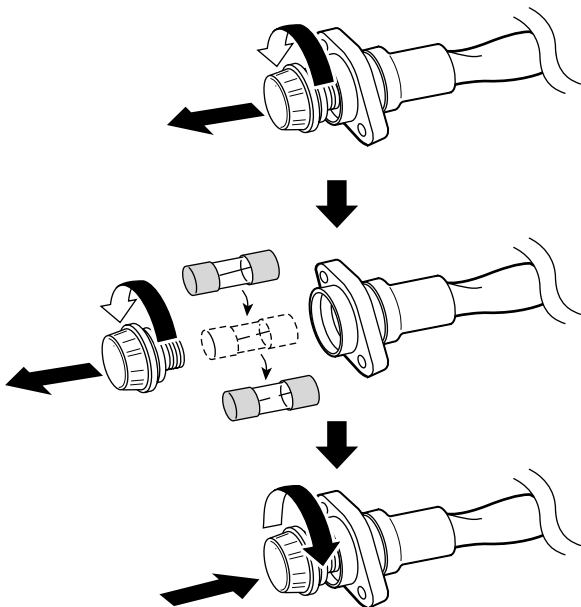
If the fuse blows or the repeater stops functioning, find the source of the problem if possible, and replace the damaged fuse with a new, rated one as shown below.

◇ OPC-1309



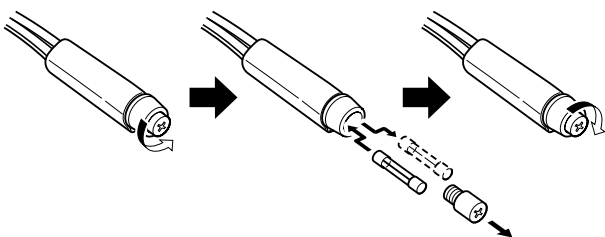
Fuse: FGB10A

◇ OPC-1380



Fuse: FGB01 30A

◇ ID-RP2L's DC power cable



Fuse: FGB5A

■ Specifications

◇ ID-RP2C

•General

Power supply requirement	: 13.8 V DC \pm 15% (negative ground)
Current drain	: Less than 0.5 A
Usable temperature range	: -10°C to $+50^{\circ}\text{C}$; $+14^{\circ}\text{F}$ to $+122^{\circ}\text{F}$
Dimensions (approx.; proj. not incl.)	: 483(W) \times 44(H) \times 257(D) mm; 19(W) \times 1 $\frac{3}{4}$ (H) \times 10 $\frac{1}{8}$ (D) in.
Weight (approx.)	: 2.7 kg; 5 lb 15 oz
Repeater control protocol	: Compatible to D-STAR standard

•Local repeater interface

Max. number of connections	: 4
Communication speed	: Data 128 kbps Voice 4.8 kbps
Cable length (approx.)	: 3 m; 10 ft (standard; supplied cable of the ID-RP2D/V)

•Assist repeater interface

Max. number of connections	: 2
Communication speed	: Data 10 Mbps Setting CPU communication 19.2 kbps
Cable length (approx.)	: 30 m; 100 ft (standard; connected cable of the ID-RP2L)

•Wired interface

Number of connector	: 1
Type of connection	: 10Base-T
MAC address	: Unique ID
IP address	: Programmed with the utility.

◇ ID-RP2L

•General

Frequency range	: Receive #06=10.000 to 10.025 GHz #07=10.150 to 10.175 GHz Transmit #06=10.150 to 10.175 GHz #07=10.000 to 10.025 GHz
Type of emission	: F1D* (GMSK) *F7W for system operation (w/ID-RP2C)
Frequency stability	: \pm 5 ppm (based on 25°C ; $+77^{\circ}\text{F}$)
Frequency resolution	: 250 kHz
Antenna connector	: Type-N (impedance: 50 Ω)
Communication speed	: 10 Mbps
Power supply requirement	: 13.8 V DC \pm 15% (negative ground)
Current drain	: Tx Less than 2.3 A Stand-by Less than 0.7 A
Usable temperature range	: -30°C to $+60^{\circ}\text{C}$; -22°F to $+140^{\circ}\text{F}$
Dimensions (proj. not incl.)	: 328(W) \times 262(H) \times 116(D) mm; 12 $\frac{29}{32}$ (W) \times 10 $\frac{5}{16}$ (H) \times 4 $\frac{9}{16}$ (D) in.
Weight (approx.; incl. cables)	: 14.6 kg; 32 lb 3 oz

•Transmitter

Output power (at 13.8 V)	: 2.0 W
Modulation system	: Quadrature (525.75 MHz)
Occupied bandwidth	: Less than 10.5 MHz
Spurious emissions	: Less than 100 μW

•Receiver

Receive system	: Double-conversion superheterodyne
Intermediate frequencies	: 1st 1747.5 MHz 2nd 374 MHz
Sensitivity (BER 1×10^{-2})	: Less than -78 dBm
Receive spurious	: Less than -57 dBm

◇ ID-RP2D/ID-RP2V

		ID-RP2D	ID-RP2V	
General	Frequency range	Receive	1240 to 1300 MHz	
		Transmit	1240 to 1300 MHz	
	Type of emission		F1D (GMSK)	F1D (GMSK) *F7W for system operation
	Frequency stability		±2.5 ppm (based on 25°C; +77°F)	
	Frequency resolutions		5/6.25 kHz	
	Antenna connector		Type-N (impedance: 50 Ω)	
	Communication speed		128 kbps	4.8 kbps
	Power supply requirement		13.8 V DC ±15% (negative ground)	
	Current drain	Tx (High)	Less than 6.0 A	Less than 7.0 A
		(Low)	Less than 2.7 A	Less than 3.0 A
		Rx Stand-by	Less than 0.7 A	Less than 1.0 A
	Usable temperature range		-10°C to +50°C; +14°F to +122°F	
Dimensions (proj. not incl.)		483(W)×88(H)×428(D) mm; 19(W)×3 ¹⁵ / ₃₂ (H)×16 ²⁷ / ₃₂ (D) in.		
Weight (approx.)		6.2 kg; 13 lb 10 oz	7.5 kg; 16 lb 9 oz	
Transmitter	Tx output power (at 13.8 V DC)	High	9–12 W	
		Low	0.5–1.2 W	
	Modulation system		Quadrature (243.95 MHz)	
	Occupied bandwidth		Less than 130 kHz	Less than 5.5 kHz
Spurious emissions		Less than -50dB		
Receive system		Double-conversion superheterodyne	Triple-conversion superheterodyne	
Intermediate freq.	1st	243.95 MHz	243.95 MHz	
	2nd	10.7 MHz	31.05 MHz	
	3rd	N/A	450 kHz	
Sensitivity (BER 1×10 ⁻²)		Less than 2.24 μV	Less than 0.45 μV	
Selectivity		More than 140 kHz/6 dB Less than 520 kHz/40 dB	More than 6 kHz/6 dB Less than 18 kHz/50 dB	
Receive spurious		Less than -57 dBm		
Spurious and image rejection ratio		More than 60 dB (General) More than 50 dB (IF and IF ₂)		

All stated specifications are subject to change without notice or obligation.

■ Options

ID-RP2D	1.2 GHz DATA REPEATER
ID-RP2V	1.2 GHz DIGITAL VOICE REPEATER
ID-RP2L	10 GHz MICROWAVE LINK REPEATER
AH-106	10 GHz PARABOLIC ANTENNA (800 (d))
AH-107	10 GHz PARABOLIC ANTENNA (450 (d))
AH-108	1.2 GHz COLLINEAR ANTENNA

Count on us!