iCOM

DIGITAL 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
⚠ DENGER	Personal death, serious injury or anexplosion may occur.
⚠ 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.

DO NOT use or place the repeater unit, ID-RP2C, ID-RP2D and ID-RP2V, in areas with temperatures below –10°C (+14°F) or above +50°C (+122°F). Be aware that temperatures can exceed 80°C (+176°F), resulting in permanent damage to the repeater if left there for extended periods.

DO NOT use or place the ID-RP2L in areas with temperatures below –30°C (–22°F) or above +60°C (+140°F). Be aware that temperatures on a vehicle's dashboard can exceed 80°C (+176°F), resulting in permanent damage to the repeater if left there for extended periods.

DO NOT place 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.

FOR CLASS B UNINTENTIONAL RADIATORS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

TABLE OF CONTENTS

1 SYSTEM OUTLINE

A Digital Smart Technologies for Amateur Radio (D-STAR) repeater can be constructed by combining the following equipment, depending on your site plan.

    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 may also be 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 must be used in each repeater site.
The controller relays digital voice or data (traffic) signals for repeater operation.

➥A total of four interface connectors for local repeater connections are available.
Both digital voice and data repeaters can be connected as desired.

  • **Typical configuration:**
  One data repeater
  One digital voice repeater
  Two extra for additional repeaters.

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

➥A total of two interface connectors for microwave link repeater connections are available, if linking is desired.

➥One Ethernet port (10Base-T) is available for setting the operating frequency, repeater site call sign, IP address and operation monitoring, using the PC and the ID-RP2C utility software.
Or, a gateway control PC can be connected if desired.

■ ID-RP2D

➥The ID-RP2D is a 1.2 GHz data (128 kbps) repeater and connects to the ID-RP2C.
  *The ID-RP2D never functions as a stand-alone repeater without the ID-RP2C, because 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

➥The 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 stand-alone repeater without the ID-RP2C, because 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 (not available in European countries)

➥The ID-RP2L is a 10 GHz, 10 Mbps microwave link repeater and connects to the ID-RP2C. The microwave link repeater provides linking to one or two other repeater sites (Area), for zone construction.

➥Different frequencies are used for each transmission and reception in full-duplex mode. The transmit and receive frequencies are the reverse of the opposite repeater.

➥The received GMSK serial bit-stream signal is sent to either the ID-RP2D, ID-RP2V or the ID-RP2L via the ID-RP2C. Then the data is transmitted to the local or another area repeater through a linking repeater.

➥The ID-RP2L has a duplexer, and the status of the microwave link repeater can be monitored when a PC with the ID-RP2L utility software installed 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.
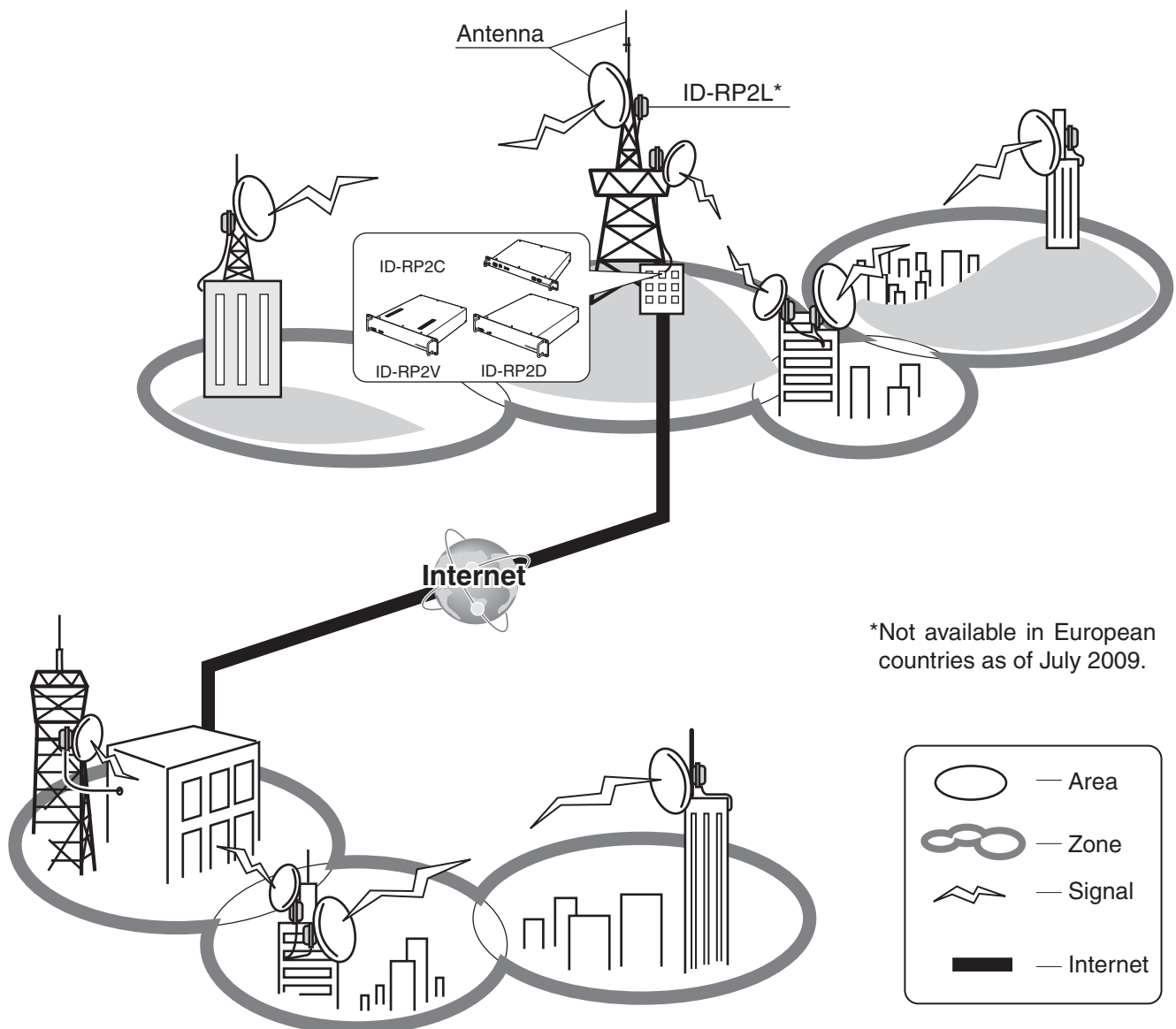Up to 20 km (approx.; 12.4 miles)* or 8 km (approx.; 5 miles)* of communication range is provided when AH-106 or AH-107 is used at the both microwave link repeaters, respectively.
And up to 12 km (approx.; 7.5 miles)* of communication range is provided between AH-107 and AH-106's repeaters.
*Communication range may differ/change according to the environment, such as weather, installed conditions, etc.

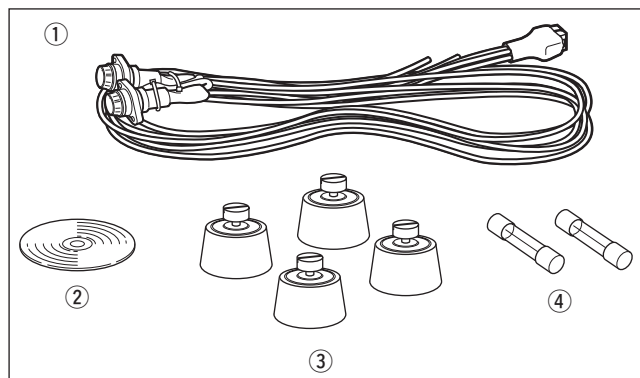◇ **AH-108 : 1.2 GHz Collinear antenna**

➥ Two collinear antennas are built-in and better isolation is provided than two separated antennas.
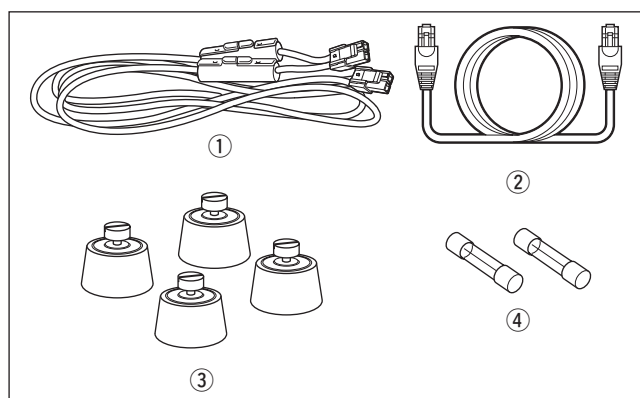
Antenna

ID-RP2L*

ID-RP2C

ID-RP2V   ID-RP2D

Internet

*Not available in European countries as of July 2009.

— Area

— Zone

— Signal

— Internet

2 SUPPLIED ACCESSORIES

■ Accessories for ID-RP2C

① Power cable (OPC-1380; approx. 3 m; 10 ft) 1
② CD (USB driver, Utility software)......................... 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
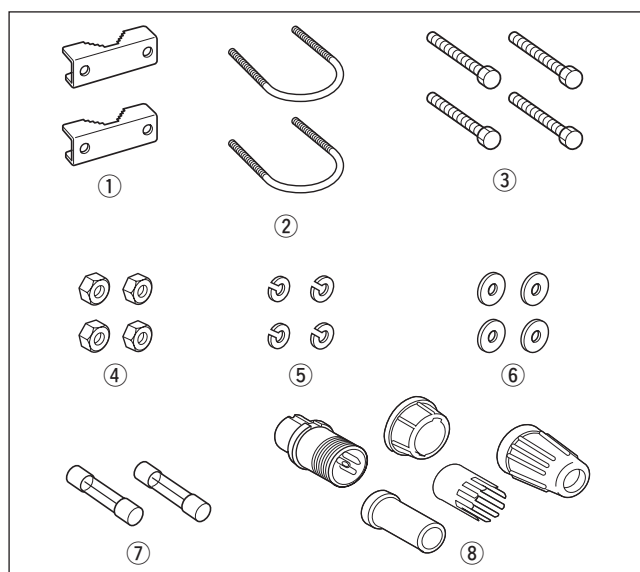
① Pole clamps 2
② U-bolts 2
③ Bolts (M6×50) 4
④ Nuts (M6) 4
⑤ Spring washers (M6) 4
⑥ Flat washers (M6) 4
⑦ Spare fuses (FGB5A) 2
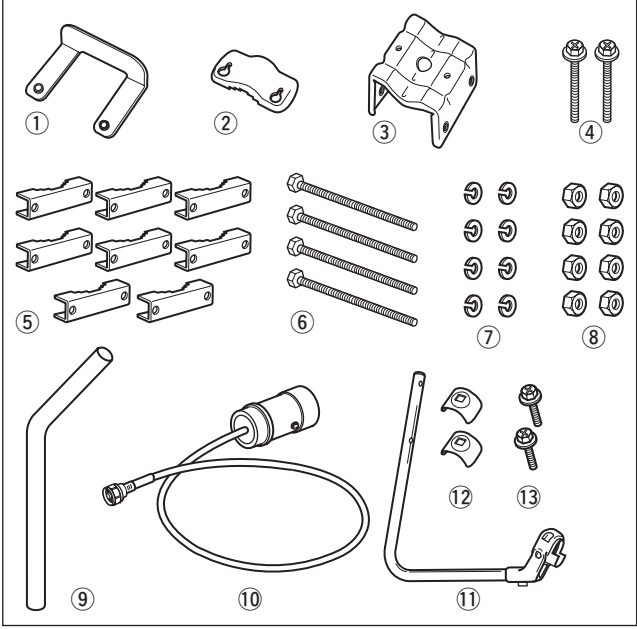⑧ Test plug .... 1 set

NOTE: Coaxial cables, USB and LAN cables and other hardware needed for installation, that are not listed in this manual as supplied, must be purchased separately.
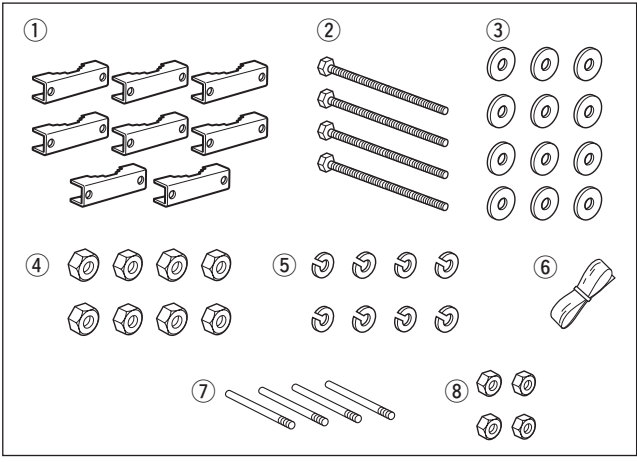
■ Accessories for AH-106
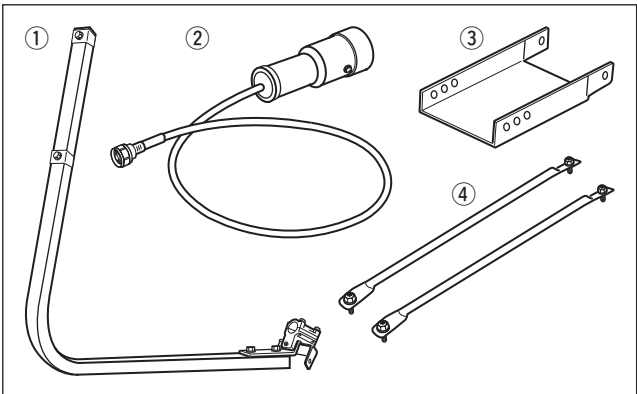
① Element arm 1
② Element 1
③ Elevation support plate 1
④ Support arms 2

■ Accessories for AH-107

① Pole stopper 1
② Pole clamp 1
③ Clamp base (w/bolts) .... 1 set
④ Bolts (M6×65) 2
⑤ Pole clamps 8
⑥ Bolts (M8×170) 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 (M6×30) 2

■ Accessories for AH-108

① Pole clamps 8
② Bolts (M8×160) 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)
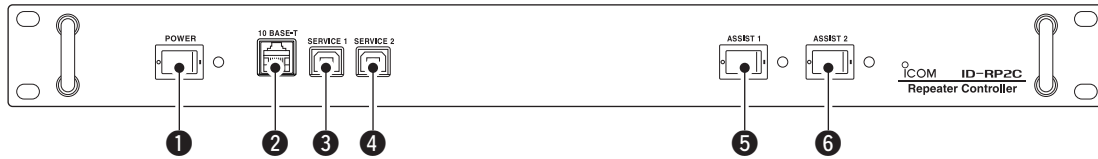
❶ **POWER SWITCH [POWER]**
The power switch for the ID-RP2C.
The LED indicator located at right lights when the power is turned ON.

❷ **10BASE-T CONNECTOR [10BASE-T]** (p. 43)
Connects a PC via LAN cable 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. 49)
Connects a PC via a USB cable (A-B type) to set the operating frequency or monitor the repeater operation for the microwave link repeater that is connected to an [ASSIST1] connector.

❹ **SERVICE 2 CONNECTOR** (p. 49)
Connects a PC via a USB cable (A-B type) 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)
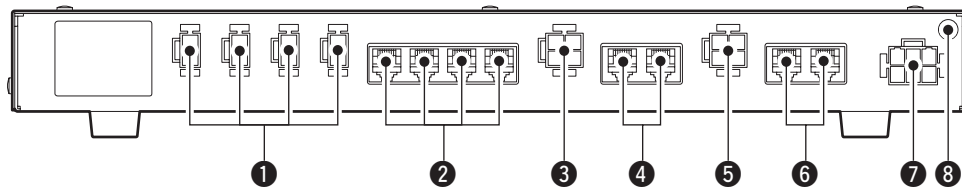
❶ **POWER CONNECTORS**
[LOCAL RPT— DC13.8V OUT] (p. 11)
Outputs 13.8 V DC for local repeater.
Connects the ID-RP2D/V via the supplied DC power cable (OPC-1309; supplied with the ID-RP2D/V).
The same voltage as the supplied voltage to [DC13.8V IN] connector is output regardless of the [POWER] switch condition 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 the 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 the ID-RP2L's power cable.
The DC power is turned ON and OFF with [AS-SIST 1] switch on the front panel.

❹ **ASSIST 1— A/B** (p. 11)
Connects the 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 the ID-RP2L's power cable.
The DC power is turned ON and OFF with [AS-SIST 2] switch on the front panel.

❻ **ASSIST 2— A/B** (p. 11)
Connects the ID-RP2L's data cable.
Connects data cable connector [A] to left and data cable connector [B] to right connector.
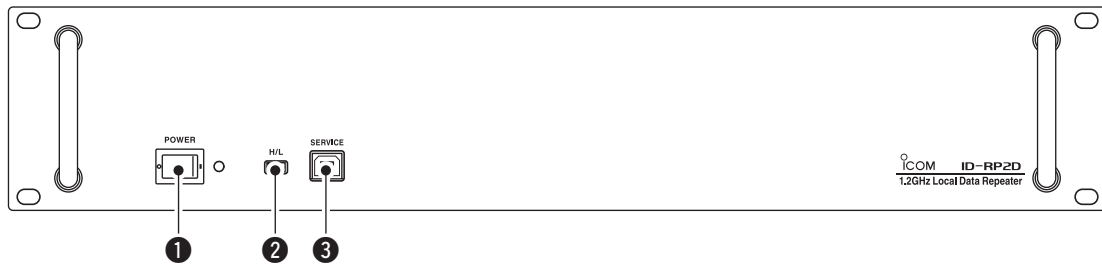
❼ **POWER CONNECTOR [DC 13.8V IN]** (p. 11)
DC power input connector for the ID-RP2 system.
Connects a 13.8 V DC power supply unit via the DC power cable (OPC-1380; supplied with the ID-RP2C).

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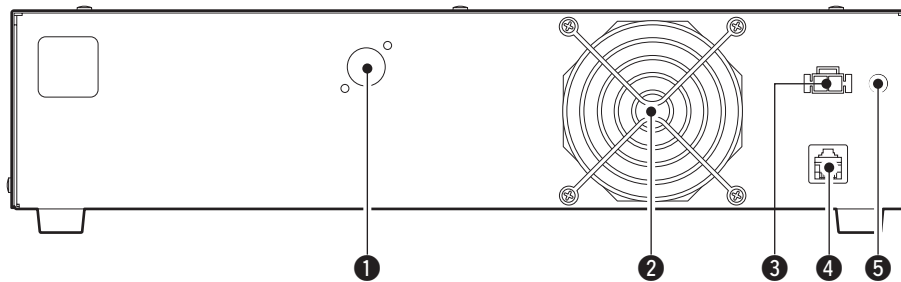The LED indicator located at right lights when the power is turned ON.

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. 47)
Connects a PC via a USB cable (A-B type) 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 the ID-RP2D and ID-RP2V is composed in a site, an antenna filter, such as band-pass 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 the 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)
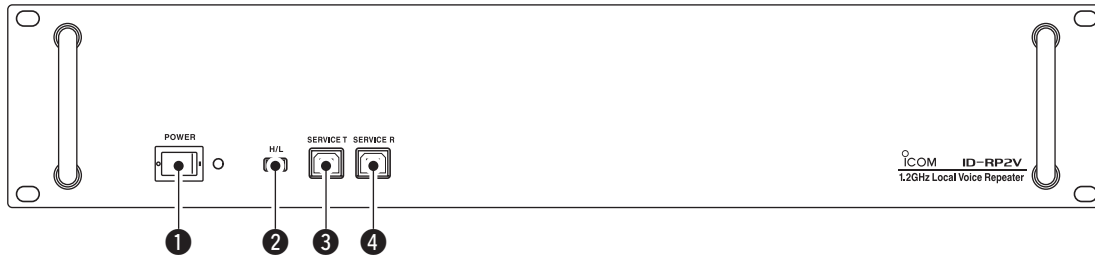
❶ **POWER SWITCH [POWER]**
The power switch for ID-RP2V.
The LED indicator located at right lights when the power is turned ON.

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. 48)
Connects a PC via a USB cable (A-B type) to set the transmit frequency.

❹ **SERVICE CONNECTOR R [SERVICE R]** (p. 48)
Connects a PC via a USB cable (A-B type) to set the receive frequency.

■ ID-RP2V (Rear panel)
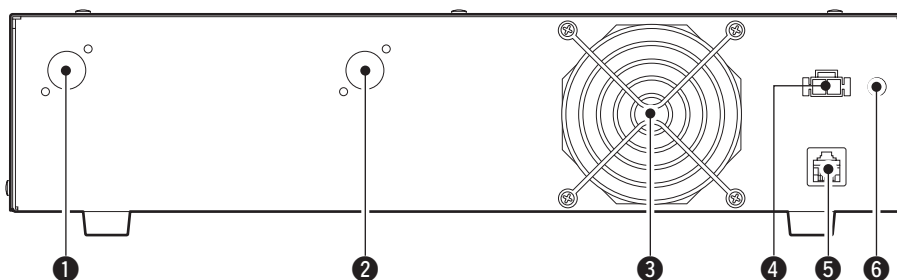
❶ **RECEIVE ANTENNA CONNECTOR [ANT]** (p. 11)
Connect the optional AH-108 1.2 GHz Collinear antenna through a duplexer.

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

❺ **[CONT I/O]** (p. 11)
Connects to the 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

(Not available in European countries)
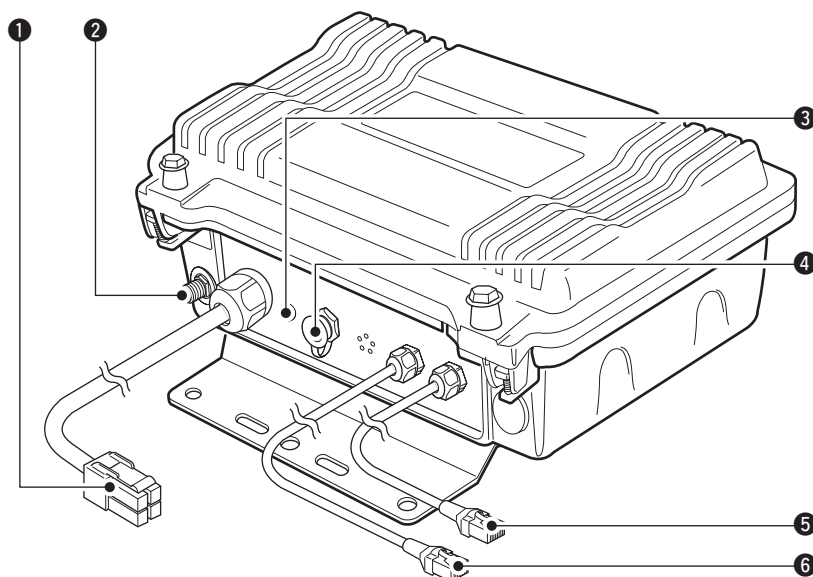
❶ **POWER CABLE CONNECTOR [DC13.8V]** (p. 11)
Connects to the ID-RP2C to be supplied the DC power.
Cable length: Approx. 30 m; 100 ft

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

❸ **STATUS INDICATOR [STATUS]**
Indicates the following unit conditions.
- Light : The power is ON and functioning correctly.
- Flashing slowly : Unlocked PLL (Reboot the ID-RP2L. If the indicator is 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 : There is no power to the unit.

❹ **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.

① RSSI output ③ GND
② TEST ④ GND
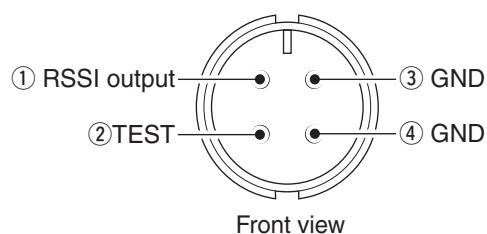
Front view
*See p. 18 for test plug assembling and connections details.

❺ **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

❻ **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!** The ID-RP2 installation, particularly the 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 under any circumstances. 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.
Turn the repeater power OFF when connecting a power supply.
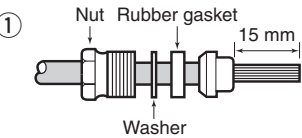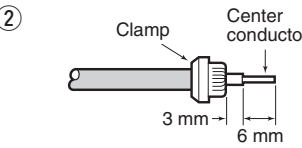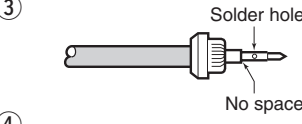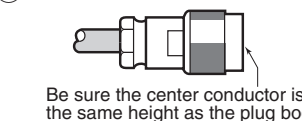
AVOID using or placing the ID-RP2C/D/V in areas with temperatures below −10°C (+14°F) or above +50 °C (+122°F).

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

①
Nut Rubber gasket

15 mm

Washer

Slide the nut, washer, rubber gasket and clamp over the coaxial cable, then cut the end of the cable evenly.

②
Clamp   Center conductor

3 mm →

6 mm

Strip the cable and fold the braid back over the clamp.

③
Solder hole

No space

Soft solder the center conductor. Install the center conductor pin and solder it.

④

Be sure the center conductor is the same height as the plug body.

Carefully slide the plug body into place aligning the center conductor pin on the cable. Tighten the nut onto the plug body.

Use a high quality, coaxial cable with 50 Ω impedance, that is rated for the operating frequency and power, for both antenna connections.

Use only type-N connectors for all RF connections between the repeaters, duplexers, filters and antenna.

▨ **RECOMMENDATION:** Install a surge protector between the ID-RP2D/V and antenna.

■ About the power supply

Make sure that the DC power supply that is used with the ID-RP2 system is meet the followings:
Output voltage : 13.8 V DC ±15%
Current capacity : At least the total current consumption of the connected equipment, with consideration for current fluctuations.
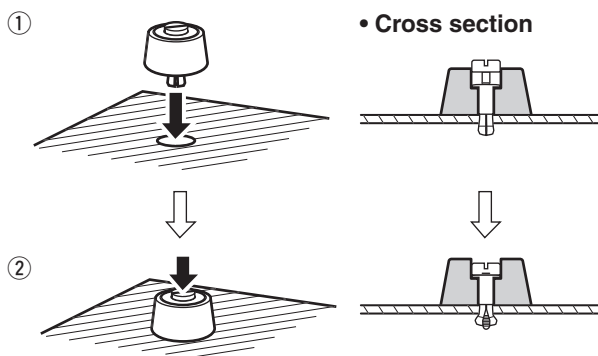
■ When install into system rack

The ID-RP2C/D/V are designed for installation into a standard EIA 19-inch rack.

Use the supplied bolts with the rack when fixing the ID-RP2C/D/V.
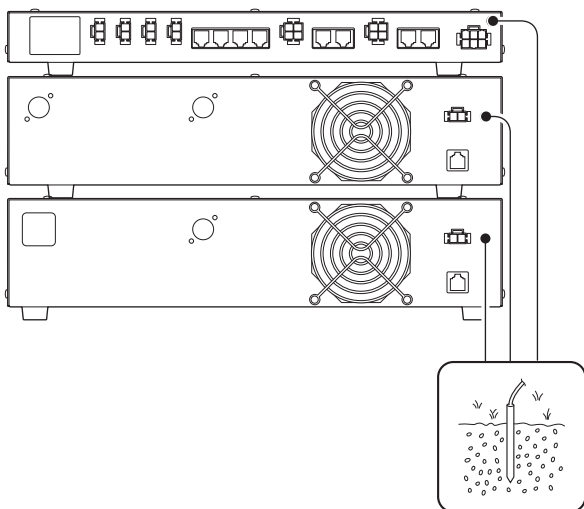
We recommend to use the rack that has rails because the weigh of the ID-RP2D and ID-RP2V is approx. 6.2 kg (13.7 lbs) and approx. 7.5 kg (16.5 lbs), respectively.

■ Rubber feet attachment

① • Cross section

②

Attach the supplied rubber feet onto the bottom of the ID-RP2C/D/V as shown at left when you do not install the ID-RP2C/D/V in 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] a gas or electric pipe, since the connection could cause an explosion or electric shock.

10

■ System connections

AH-108*

to AH-106/107*

ID-RP2L*
(Assist 1)

ID-RP2L*
(Assist 2)

to AH-106/107*

[A]
[B]

[A]
[B]

Antenna filter

ID-RP2C

OPC-1380
(supplied w/ID-RP2C)

Duplexer

ID-RP2V

OPC-1309
(supplied w/ID-RP2D/V)

Control cable
(supplied w/ID-RP2D/V)

Coaxial cables
(purchase separately)

OPC-1309
(supplied w/ID-RP2D/V)

External DC power
supply 13.8 V

Red Black
⊕   ⊖

ID-RP2D

Control cable
(supplied w/ID-RP2D/V)

*Not available in European
countries as of July 2009.

AC outlet

AC power cable

11

■ Antenna assembling

(Not available in European countries)

⚠ **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.

◇ AH-106
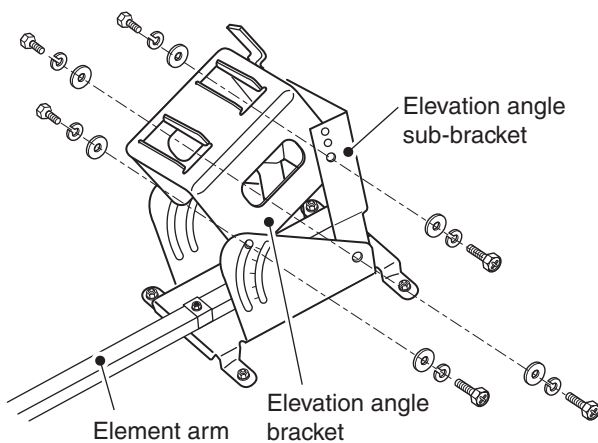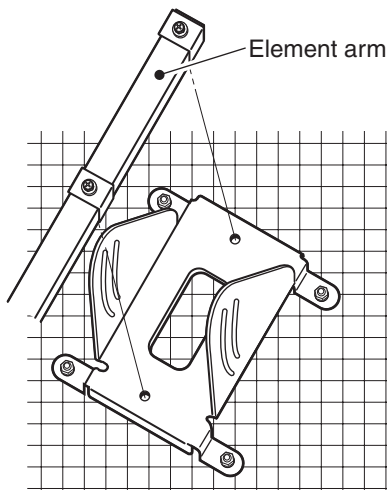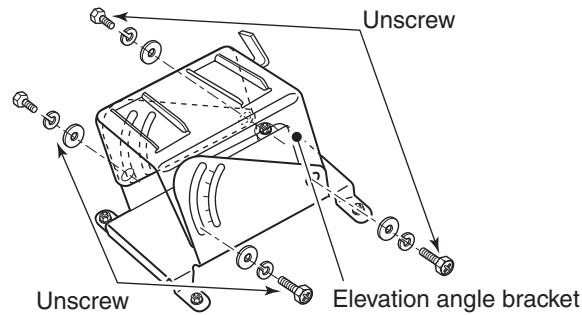
① Remove the pole clamp that attached to the elevation angle bracket.

② Unscrew 4 bolts from the elevation angle bracket.

③ Attach the element-arm onto the reflector.
   ⁄⁄ **NOTE:** Check the orientation.
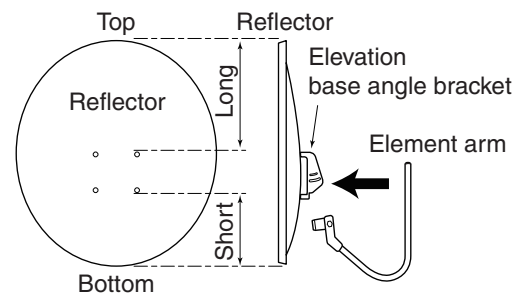
④ Attach the elevation angle and elevation angle sub-brackets, as illustrated in the diagram to the left.
   Fix the angles using with the bolts that are unscrewed at steps ② and are attached with the elevation angle sub-bracket.
   ⁄⁄ **NOTE:** Select the suitable screw hole position that the point where the suitable parabolic antenna beams angle is provided with the elevation angle sub-bracket adjustment.

Pole
(48.6–89.1 mm)
Stopper
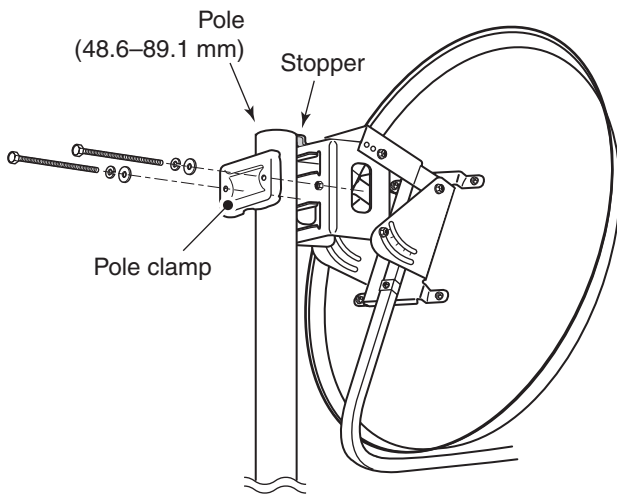
Pole clamp

⑤ Attach the pole between the elevation angle bracket 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 bracket when installing the antenna at the top edge of the pole.

Element
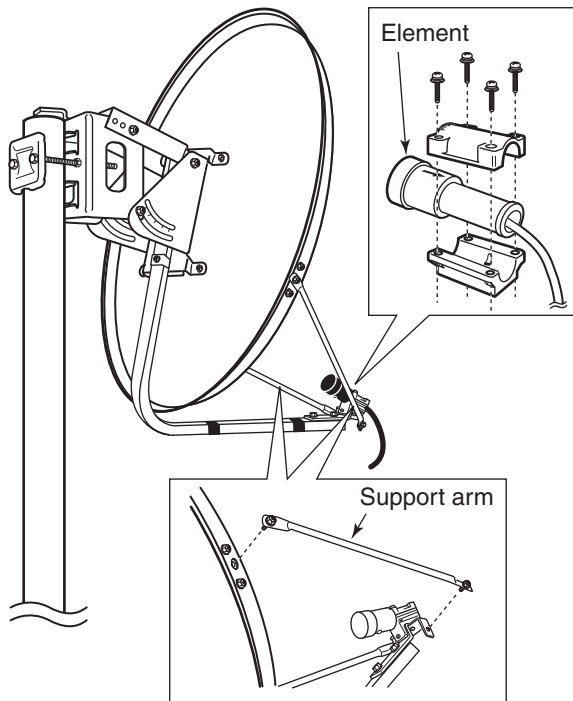
Support arm

⑥ Attach the support 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

Bolts
M6×30

Element-arm
fitting plate

Element-
arm

Clamp base

Bolts
(Attached at the
clamp base)

Bolts
(M6×65)

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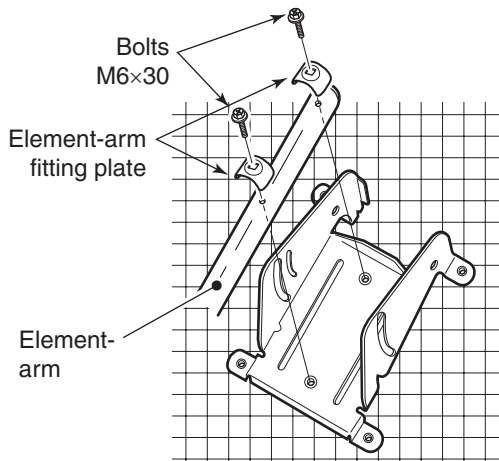
① Attach the element arm to the parabolic reflector using with the supplied bolts (M6×30) and the element arm fitting plates.

✐ **Note:** Check the orientation.

Top   Reflector

Reflector

Long

Short

Bottom

Elevation
base angle bracket

Element arm
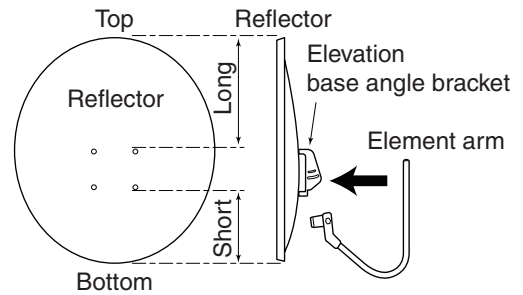
② Attach the clamp base.
Use the bolts that were attached to the clamp base.
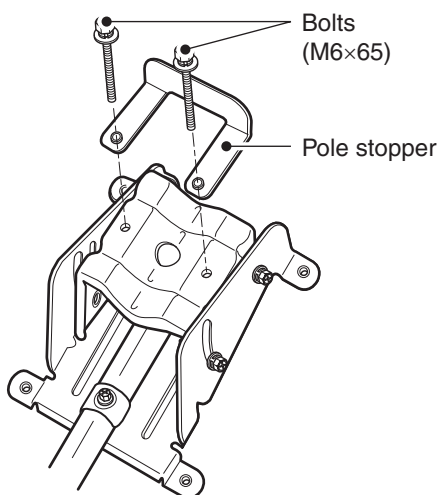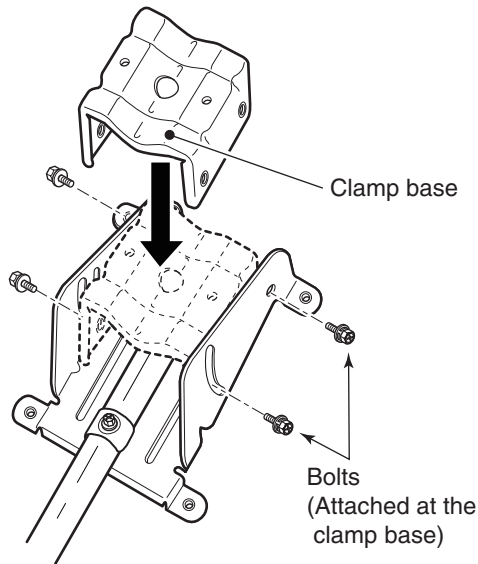
③ Temporarily attach the pole stopper with the supplied bolts (M6×65).

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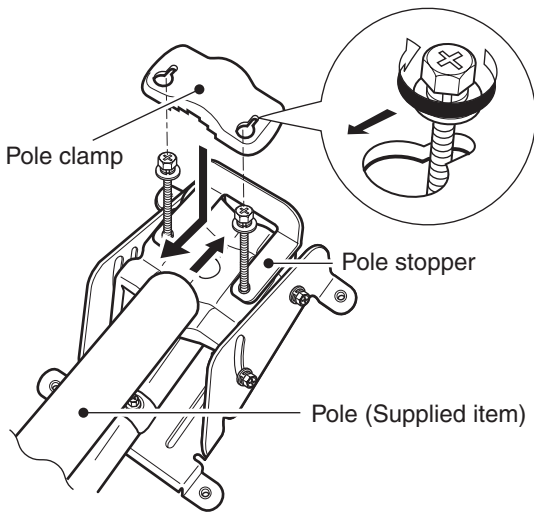
④ Fix the supplied pole with the pole clamp as illustrated at left.

Pole clamp

Pole stopper

Pole (Supplied item)
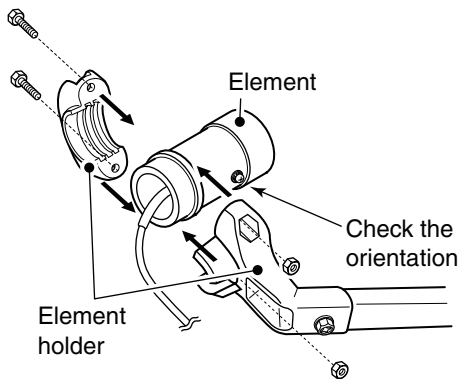
⑤ Attach the antenna element to the element holder.
   NOTE: The "▼" stamps on the antenna element must be face up.

Element

Check the orientation

Element holder
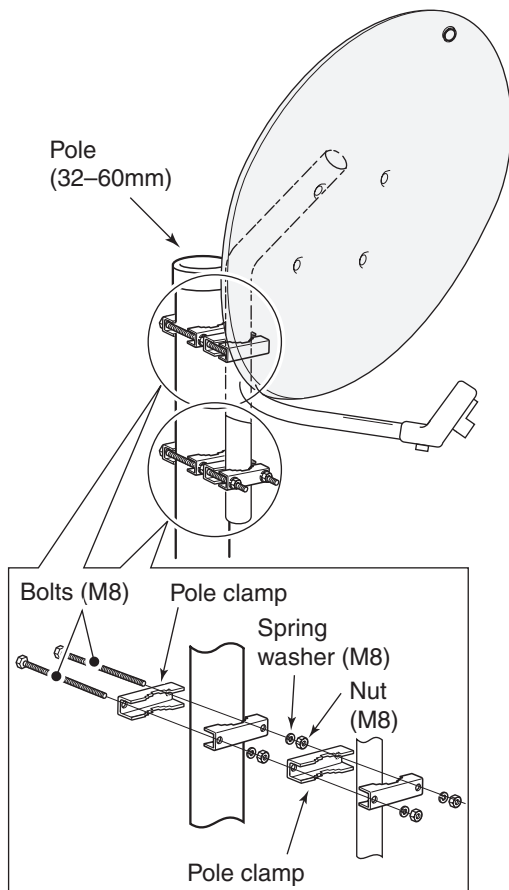
⑥ Install the assembled parabolic antenna to the pole.

Pole (32–60mm)

IMPORTANT!
Secure the parabolic antenna to the pole with a piece of wire (purchase separately) through the ring at the top of the reflector to prevent the parabolic antenna from accidently falling.

Bolts (M8)   Pole clamp

Spring washer (M8)

Nut (M8)

Pole clamp

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◇ **AH-108**

AH-108

Pole
(30–60 mm)

Nut   Radial

Plating area

Nut

Spring washer

Flat washer

AH-108

Pole clamps
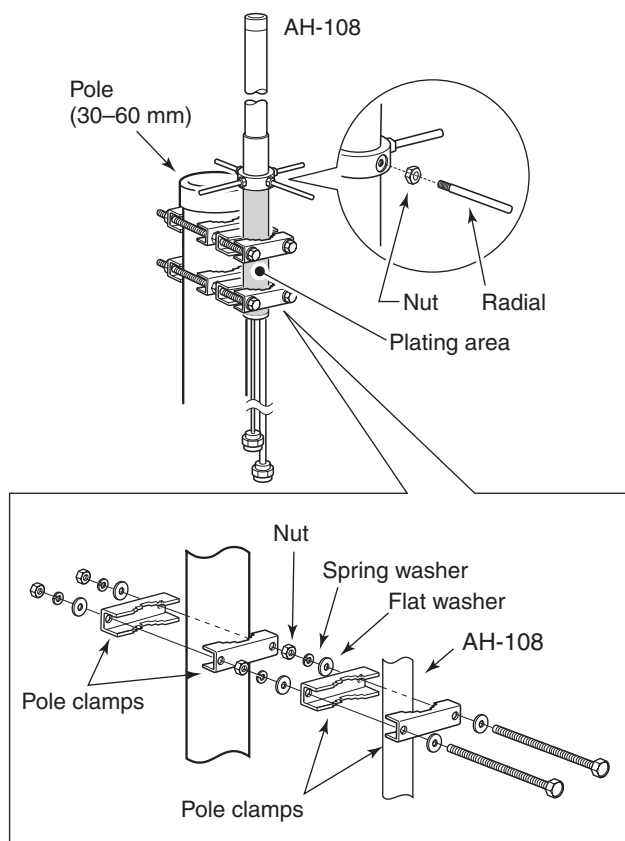
Pole clamps

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 dropping the ID-RP2L from a high place or unstable site or resulting from any personal injury or any accident under any circumstances. Be sure to consult an expert engineer for installations.

The ID-RP2L must be directly connected to the parabolic antenna element.

The element cable extension may cause communication error, therefore the ID-RP2L must be installed right under the parabolic antenna.
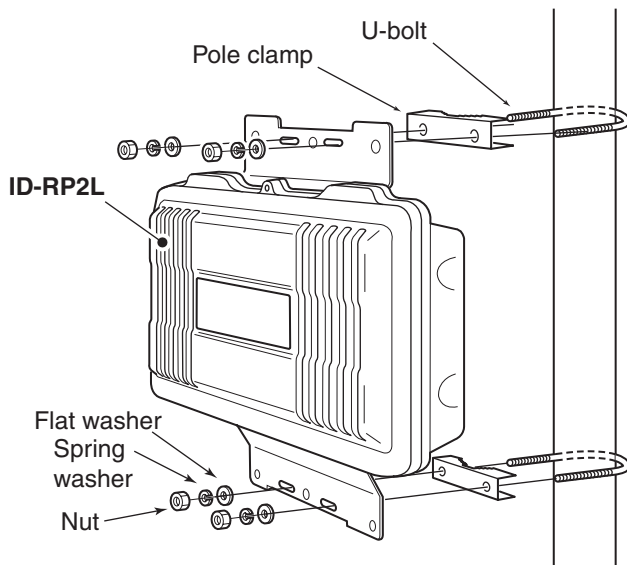
① Install the ID-RP2L onto the pole, right under the parabolic antenna, using with the supplied U-bolts, pole clamps, flat washers, spring washers and nuts.

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

U-bolt
Pole clamp
ID-RP2L
Flat washer
Spring washer
Nut
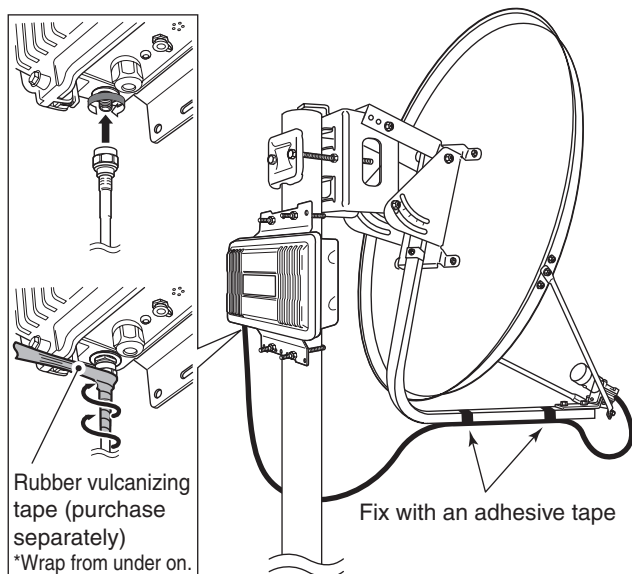
② Connect the antenna element to the ID-RP2L [ANT] connector.

③ Fix the antenna element cable to the element arm with slacks for both element and the 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.

Rubber vulcanizing tape (purchase separately)
*Wrap from under on.

Fix with an adhesive tape

■ Adjusting the parabolic antenna

◇ About the test plug

to ⊕ (voltmeter)

Voltmeter

① ④

② ③
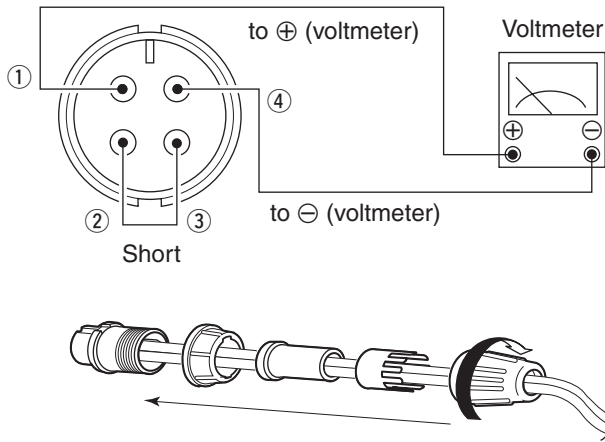
to ⊖ (voltmeter)

Short

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

① Short pin 2 (TEST) and pin 3 (GND) terminals of the test plug, that is supplied with the ID-RP2L.
② Connect a voltmeter between pin 1 (RSSI) and pin 4 (GND).
③ Assemble the test plug as illustrated at left.

◇ Parabolic antenna beam adjustment

Adjust the beam direction after loosening the bolts.

Adjust the beam elevation after loosening the bolts.
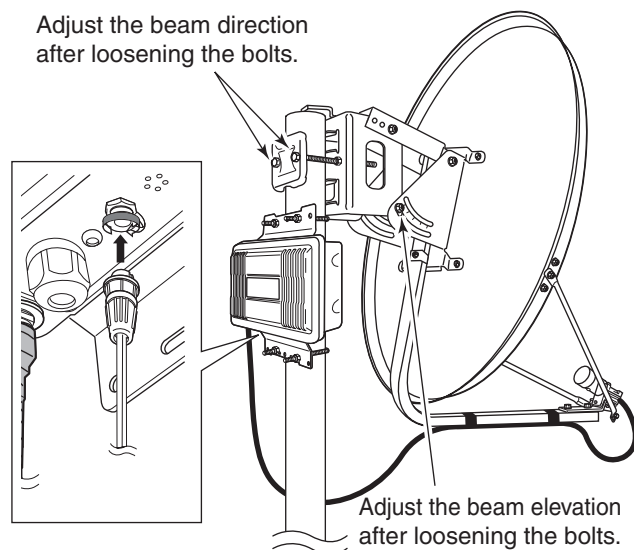
Adjust the parabolic antenna beam as follows.
Due to the very critical adjustments that are required, have two or more people available to assist in the adjustments.

① Aim the parabolic antenna beam at the opposite repeater's microwave antenna, and temporarily fix it in place.
② Connect a voltmeter to the [TEST] connector of the ID-RP2L, through the test plug, and make sure the shorting wire is in place.
  • The link transmitter will transmit a test signal automatically.
  • Transmit 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 in place.
④ Follow the antenna direction and elevation procedures for the opposite repeaters' antenna, and fix it in place.
⑤ Repeat the adjustments to optimize the signals and then securely fix the antennas in place.

5 DRIVER INSTALLATIONS

The USB (Universal Serial Bus) cable (A-B type) is used to connect the ID-RP2 and a PC.
So, the USB driver installation is required for the PC.

In addition, individual USB driver installations are required for each connector and unit, because the communication port numbers are different.
This instruction, describes with the installation of the ID-RP2C [SERVICE1] connector as an example.

NOTE:
The repeater unit connection may not be recognized by the PC, if the USB cable is too long.
Use the shortest USB cable possible.

■ Microsoft® Windows® XP (Service Pack 2)
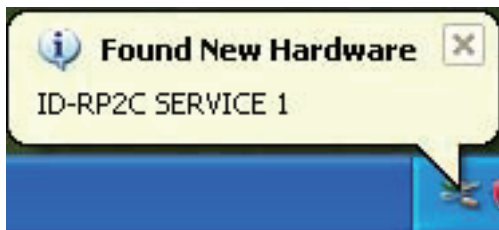
① Start up the Windows.
  • Quit all applications if activated.
② Insert the CD that comes with the ID-RP2C, into the CD drive.
③ Connect the PC and the ID-RP2C [SERVICE1] connector using with a USB cable (A-B type).
④ "Found New Hardware ID-RP2C SERVICE 1" appears as at left.

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

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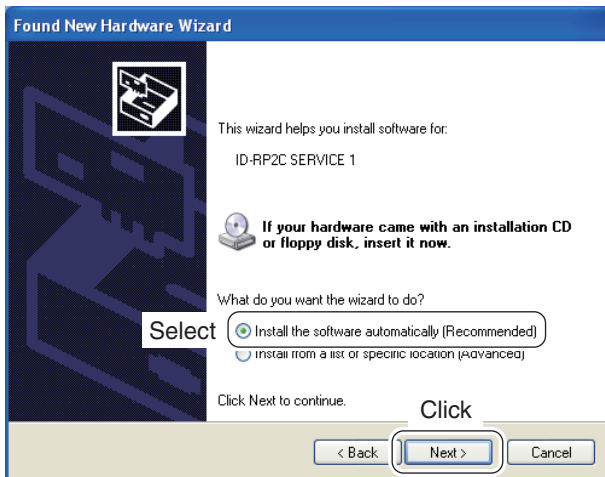
⑥ When the dialog box as at left is displayed, select "Install the software automatically (Recommended)," then click [Next>].
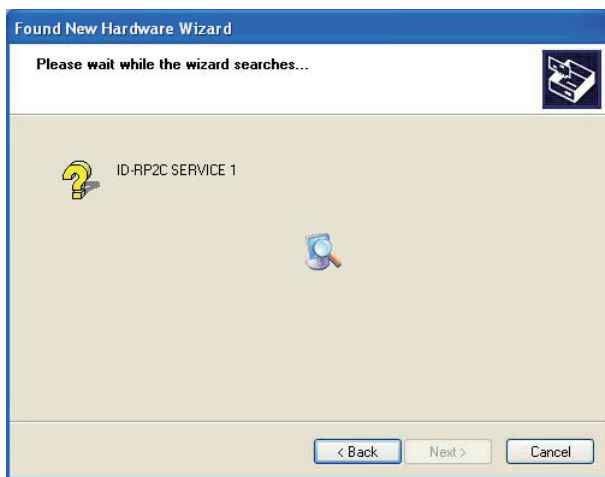
⑦ The wizard starts searching for the driver and shows the dialog as at left during search.

⑧ While searching for the driver, the "Hardware Installation" dialog box appears.
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 (Ad-
⟋⟋ vanced)" in step ⑥, then select the driver folder
⟋⟋ on the CD.

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

⑨ Windows starts installing the USB driver.

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

Click

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>].
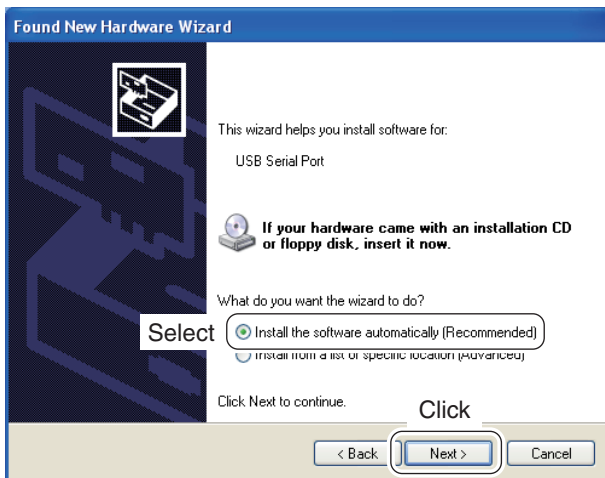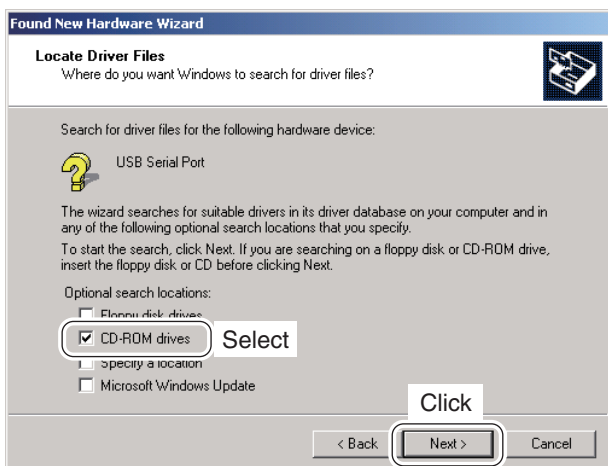
Select

Click

⑬ When the dialog box as at left is displayed, 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 for 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.*

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

⑯ Windows starts installing the USB driver.
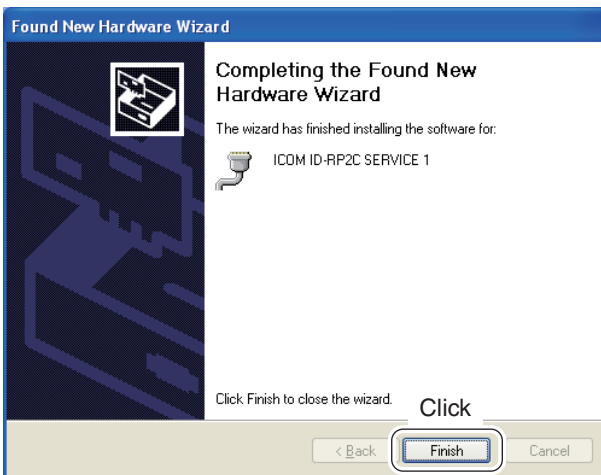
⑰ After the installation is completed, click [Finish].

⑱ After clicking [Finish], "Found New Hardware Your new hardware is installed and ready to use" appears as at left.
⑲ Eject the CD.
  • Rebooting the PC is recommended.
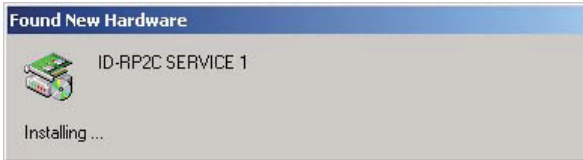
■ Microsoft® Windows® 2000

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 a USB cable (A-B type).
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 When the dialog box as at left is displayed, select "Search for a suitable driver for my device (recommended)," then click [Next >].

☞ *Continue to the next page.*

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■ Microsoft® Windows® 2000— continued
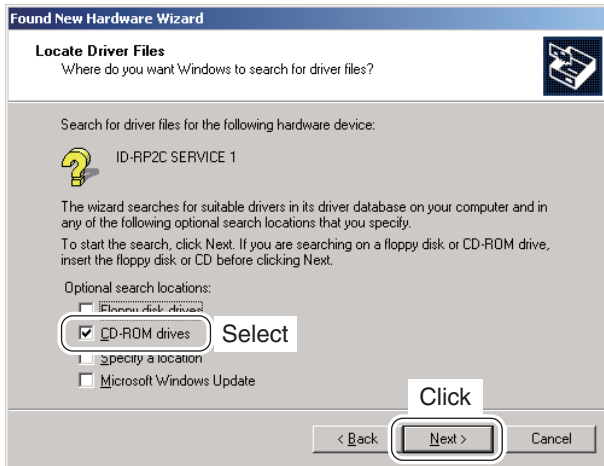
⑦ Select "CD-ROM drives," then click [Next >].
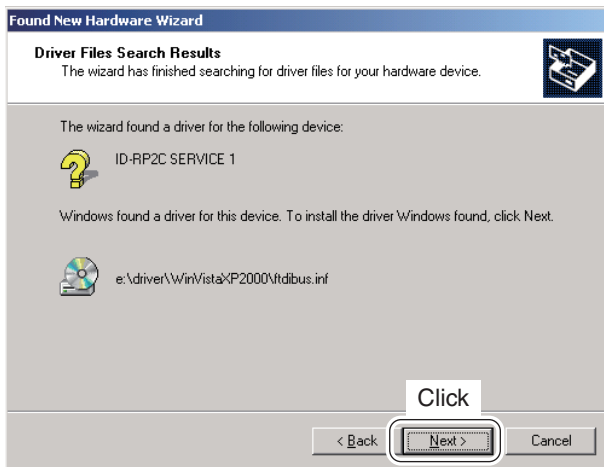
⑧ When the appropriate driver is found, the dialog box appears as at left appears.
Click [Next >] to start the installation.

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 When the dialog box as at left is displayed, select "Search for a suitable driver for my device (recommended)," then click [Next >].


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

■ Microsoft® Windows® 2000— continued

Click

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

Click

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

■ Microsoft® Windows® 98SE/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 the ID-RP2C [SERVICE1] connector using with a USB cable (A-B type).
④ The "Add New Hardware Wizard" will come up as at left.
  Click [Next>].

⑤ When the dialog box as at left is displayed, 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.

■ Microsoft® Windows® 98SE/Me— continued
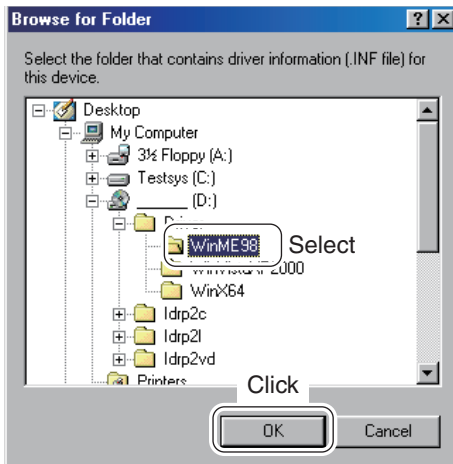
⑦ Double-click the "Driver" folder then select "WinME98" folder in the CD. Click [OK].

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.

Click

⑩ After the installation is completed, click [Finish].
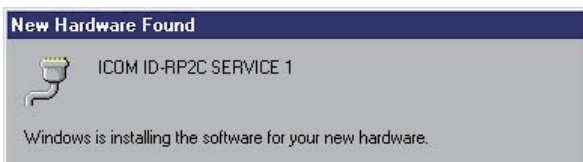
⑪ After clicking [Finish], "New Hardware Found ICOM ID-RP2C SERVICE 1" appears as at left.
⑫ Eject the CD.
  • Rebooting the PC is recommended.

■ Microsoft® Windows Vista®

▨ Even when the PC can be connected to the Internet, do not connect it.

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 the ID-RP2C [SERVICE1] connector using with a USB cable (A-B type).
④ "Found New Hardware" appears as at left.
   Click "Locate and install driver software (recommended)".
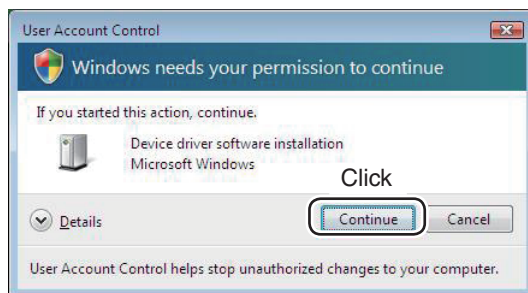
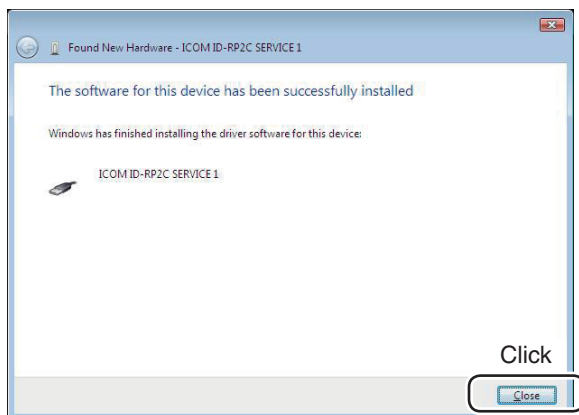⑤ In case "User Account Control" dialog box appears as at left, click [Continue].
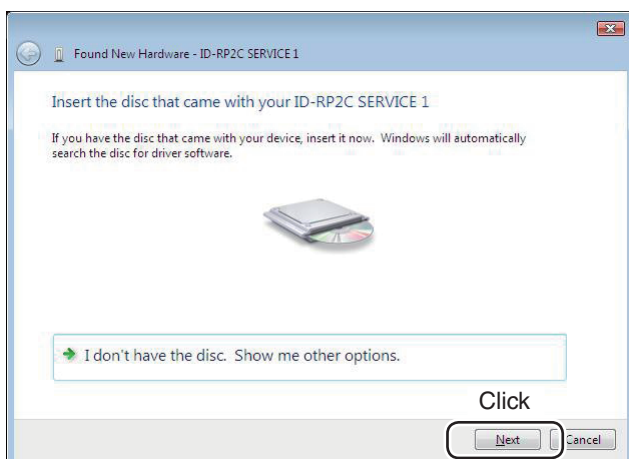
⑥ When the dialog box as at left is displayed, click [Next].
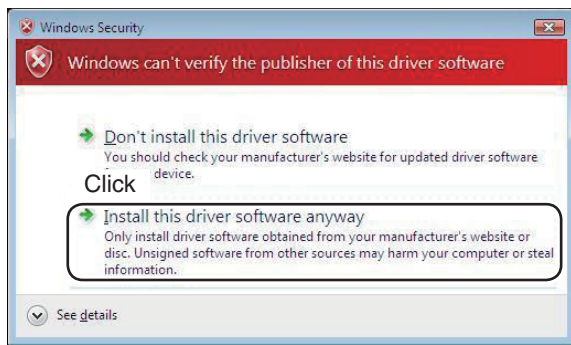
⑦ The dialog box as at left is displayed.
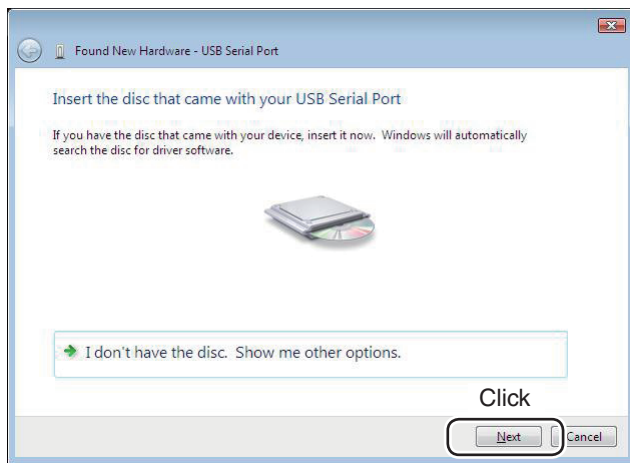Click "Install this driver software anyway" to start the installation.
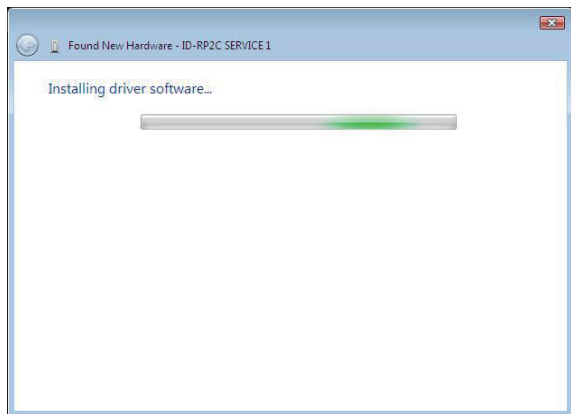
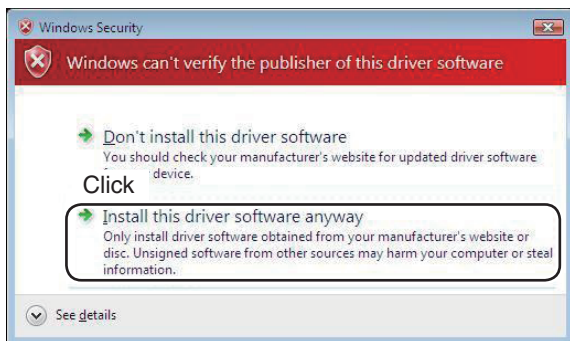⑧ The wizard starts searching for the driver and shows the dialog as at left during search.

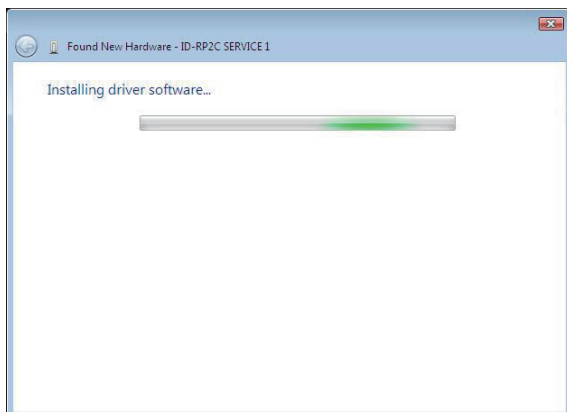⑨ After the installation is completed, click [Close].

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■ Microsoft® Windows Vista®— continued
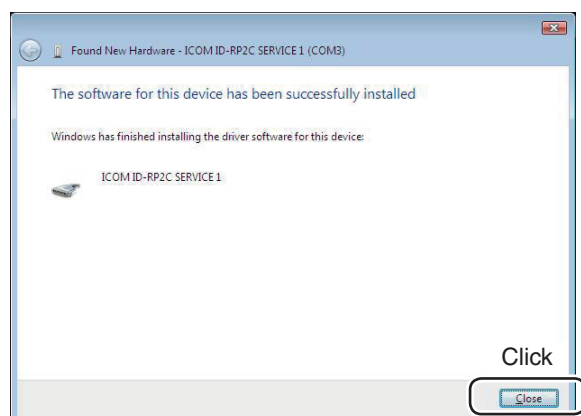

Click

⑩ When the "Found New Hardware -USB Serial Port" appears as at left, click [Next].

Click

⑪ The dialog box as at left is displayed.
Click "Install this driver software anyway" to start the installation.
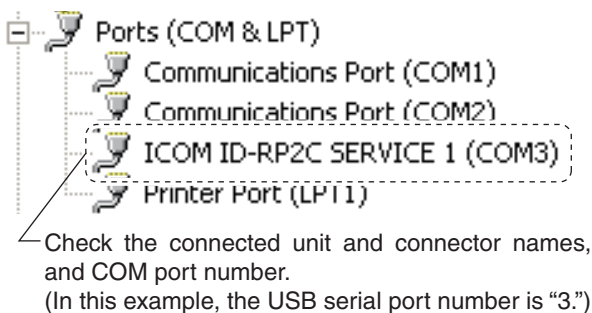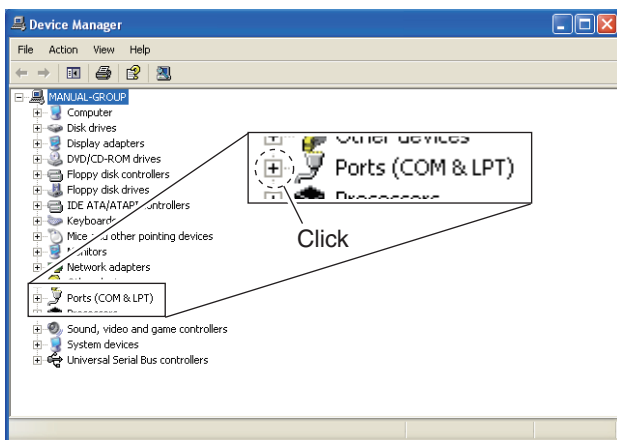

⑫ The wizard starts searching for the driver and shows the dialog as at left during search.

Click

⑬ After the installation is completed, click [Close].
⑭ Eject the CD.
  • Rebooting the PC is recommended.

■ COM port confirmation

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.

◇ Microsoft® Windows® XP/2000

① Start up Windows.
② Connect the PC and the ID-RP2C [SERVICE1] connector through a USB cable (A-B type).
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.
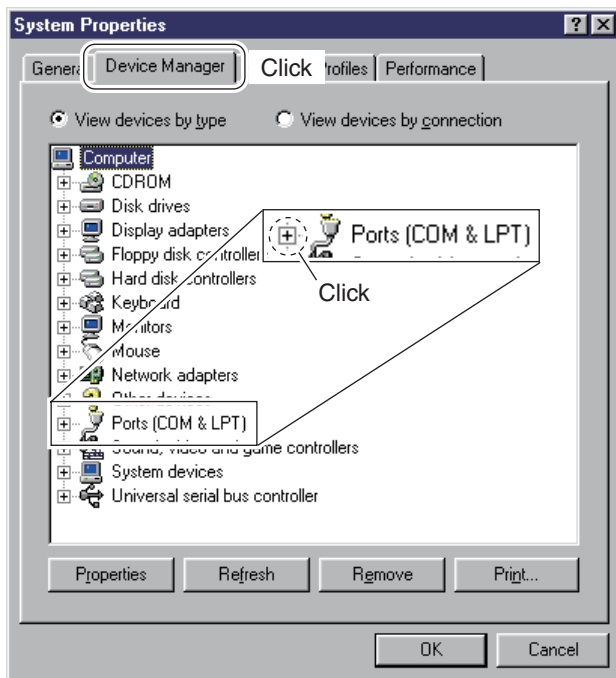 Click [Hardware] tub and then click [Device Manager].

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

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

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® 98SE/Me

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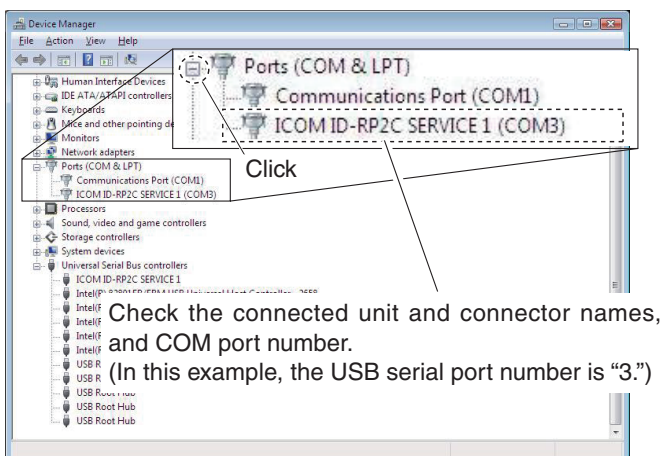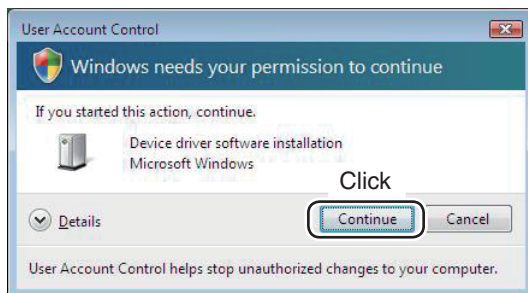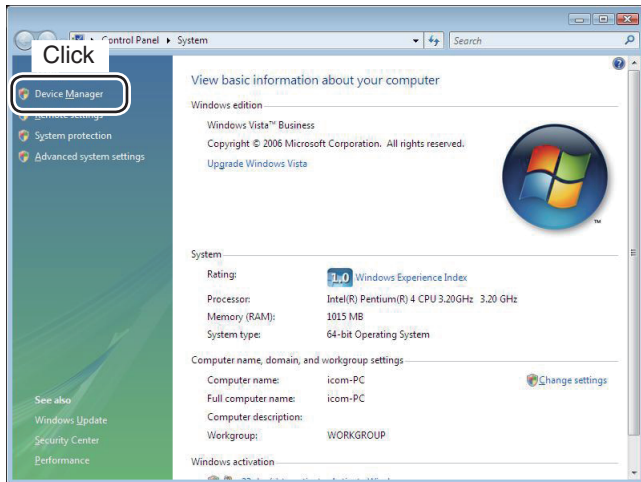⑤ Click " ⊞ " of Ports (COM&LPT).

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

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 Vista®

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

⑤ In case "User Account Control" dialog box appears as at left, click [Continue].

⑥ "Device Manager" screen appears.
  Click " ⊞ " of Ports (COM&LPT).
  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✱)"

37

■ 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.

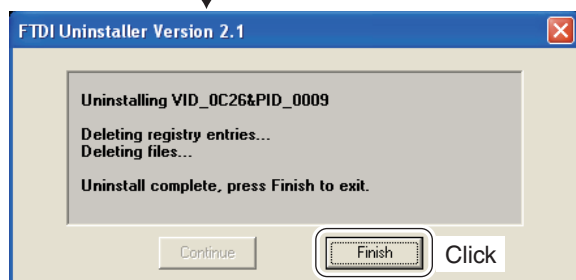Un-install the USB drivers as follows.
In this section, describes the un-installation instruction with Windows XP for example.

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 appropriate folder for your OS to open and display the folder contents.

Double-click
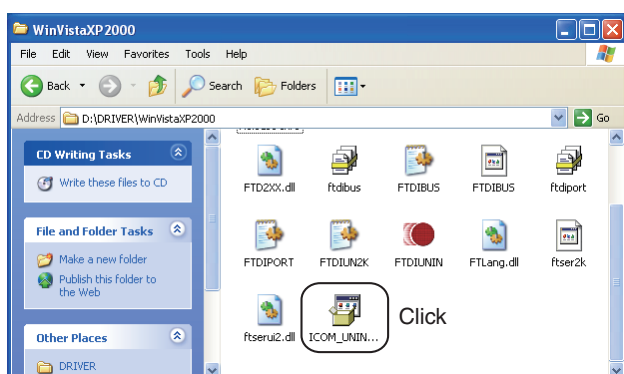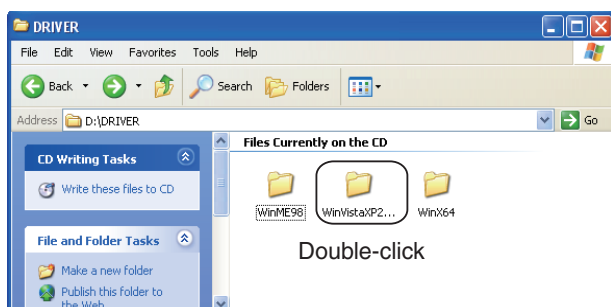
⑤ Run the appropriate 'exe' file according to the OS.
   • **For Windows XP/2000** : "ICOM_UNIN_NT.EXE"
   • **For Windows 98SE/Me** : "ICOM_UNIN_9x.EXE"

Click

⑥ The un-installer starts automatically.
   • The un-installer starts several times according to the number of installed USB drivers.
   • When the dialog box as at left is displayed, make sure no equipment is connected to the USB port, then click [Continue].
   • When the screen as at left below appears after the un-installation, click [Finish].

■ USB driver un-installation— continued

◇ Microsoft® Windows Vista®

Manual un-installation from each unit and connector is needed when using Microsoft® Windows Vista®.

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

① Start up Windows.
② Connect the PC and the ID-RP2C [SERVICE1] connector through a USB cable.
③ Open the "Device Manager" screen.
  • See "■ **COM port confirmation (p37)**" to open the "Device Manager" with Microsoft® Windows Vista®.
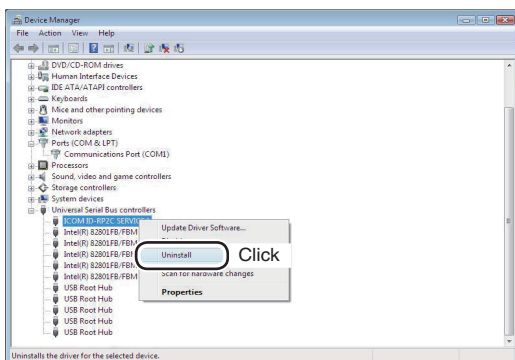
④ Click " ⊞ " of Ports (COM&LPT).
  Right click the "ICOM ID-RP2C SERVICE1 (COM✽)" , then select "Uninstall".
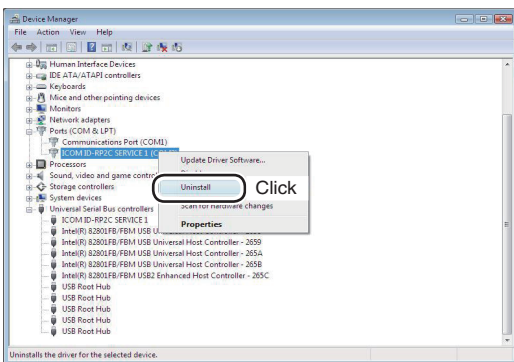
⑤ Click to add the check mark, "✔," into "Delete the driver software for this device." then click [OK].

⑥ Right click the "ICOM ID-RP2C SERVICE✽" , then select "Uninstall".

⑦ Click to add the check mark, "✔," into "Delete the driver software for this device." then click [OK].

NOTE: Un-install the USB drivers for ID-RP2V/D with the same manner.

This utility software is used to set the call sign and operating frequencies.
Separate utility software for each ID-RP2 unit, ID-RP2C, ID-RP2D, ID-RP2V and ID-RP2L, is available.

This section describes the installation instructions for the utility software for the ID-RP2C as the example.

■ Installation
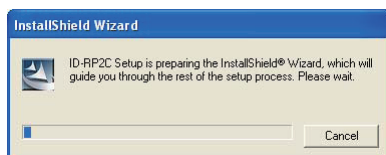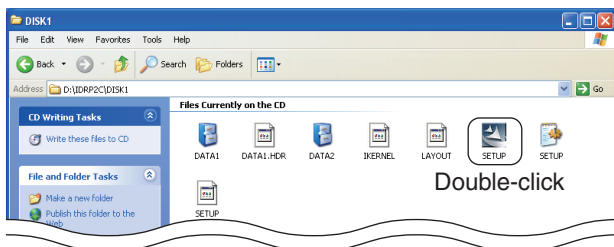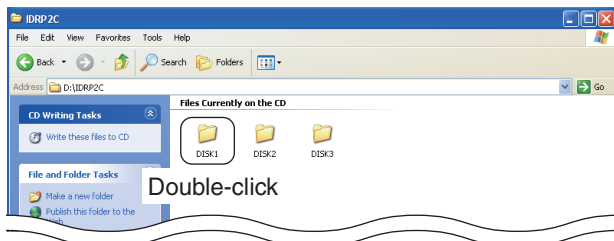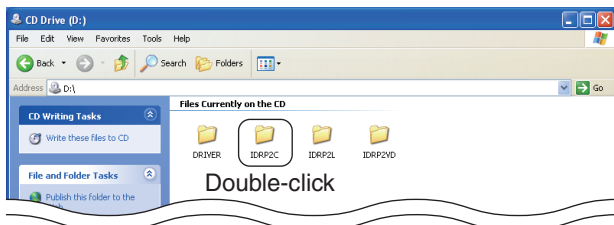
① Start up Windows.
  • Quit all other applications if running.
② Insert the CD, supplied with the ID-RP2C, into the CD drive.
③ Displays the contents of the CD using with the "My Computer" or "Explorer."
④ Double click "IDRP2C" folder.
  Contents of the folder are displayed.
  • Double click "IDRP2DV" folder when installing the utility software for the ID-RP2D/V.
  • Double click "IDRP2L" folder when installing the utility software for the ID-RP2L.

Double-click

⑤ Double click "Disk1" folder.
  Contents of the folder are displayed.

Double-click

⑥ Double click "SETUP.EXE" file.

Double-click

⑦ "InstallShield Wizard" screen appears.

☞ *Continue to the next page.*

■ Installation— continued
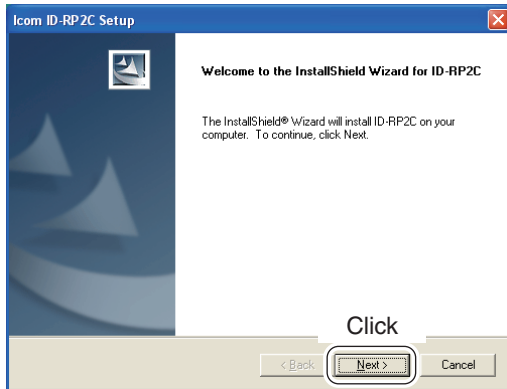
⑧ Click [Next>].
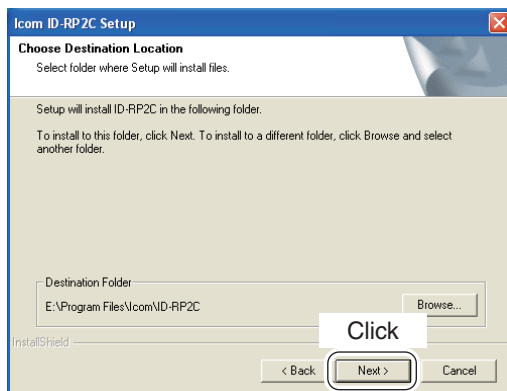
⑨ "Choose Destination Location" screen appears.
- When installing the utility software into the displayed location, click [Next>].
- When installing into a different location, click [Browse…], select the desired location and then click [Next>].
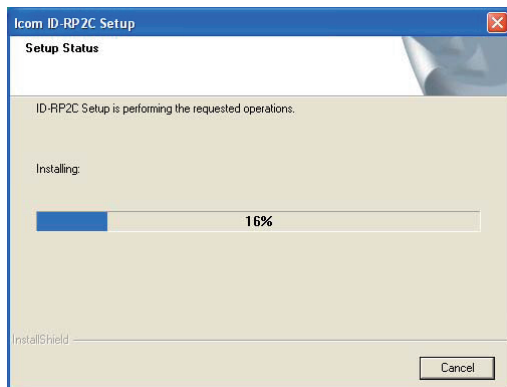
⑩ The utility software installation starts.
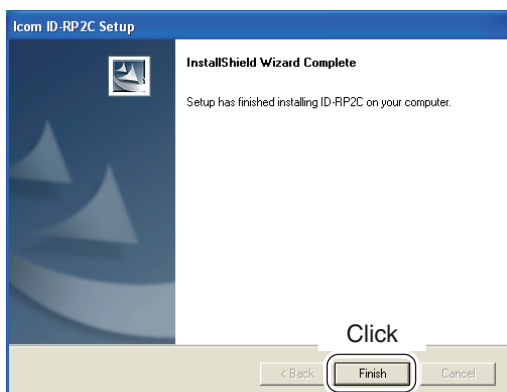
⑪ "InstallShield Wizard Complete" screen appears when the installation is finished.
- Click [Finish] to complete the installation.

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

    NOTE: Install the utility software for the ID-RP2V/D and the ID-RP2L in 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® 98SE/Me/2000 or Windows Vista®.

② Click "Add or Remove Programs."
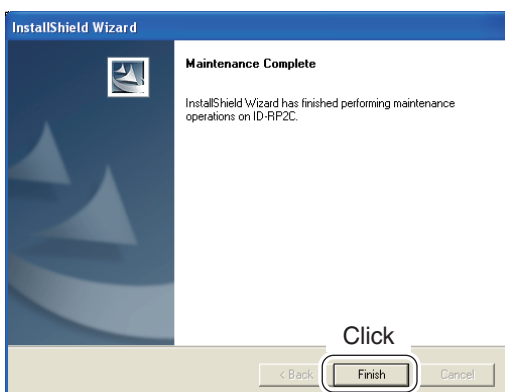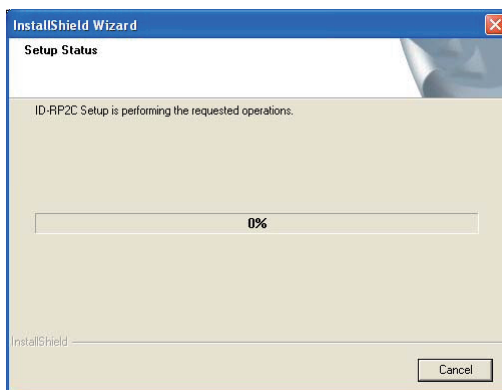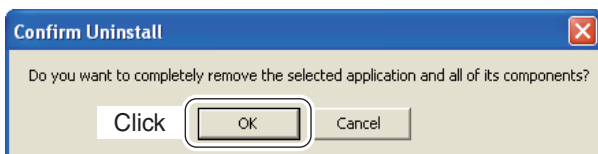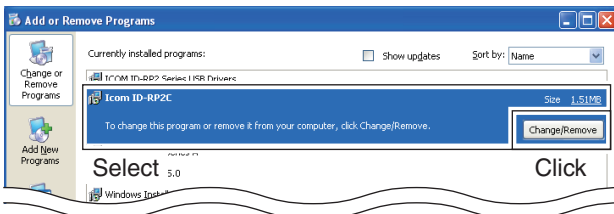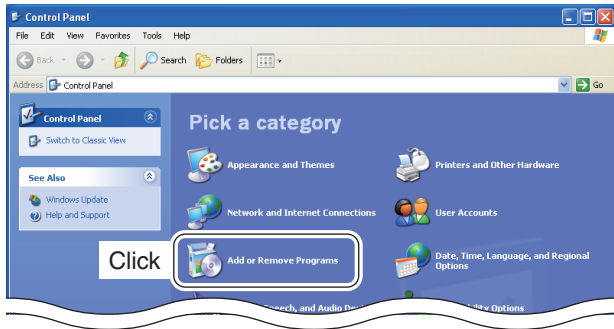
③ Select the desired utility software name, then click [Change/Remove].

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.

7 REPEATER SETTINGS

■ ID-RP2C setting

A LAN cable (patch connection) is used when setting the ID-RP2C settings.
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), then turn the ID-RP2C power ON.
③ Start up the utility software for the ID-RP2C.
　• Double click "ID-RP2C" icon on the desktop, or select the ID-RP2C utility software from "Program" in "Start" menu.
④ The screen as at left appears.
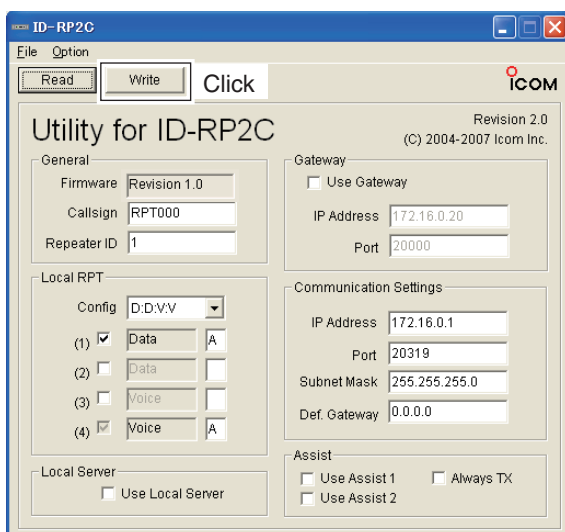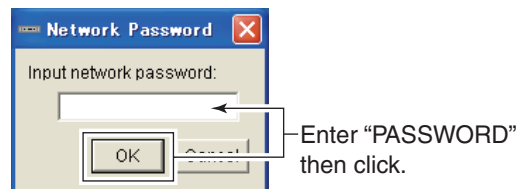　• Check the IP address and the UDP port number using the "Network Setup" as described in ❷ Option menu in advance. (p. 44)
　• Click [Read].
⑤ "Network Password" screen appears.
　Enter the password then click [OK].
　• Enter the password with alphanumeric characters (case sensitive).
　• "PASSWORD" (capital letters) is the default password.

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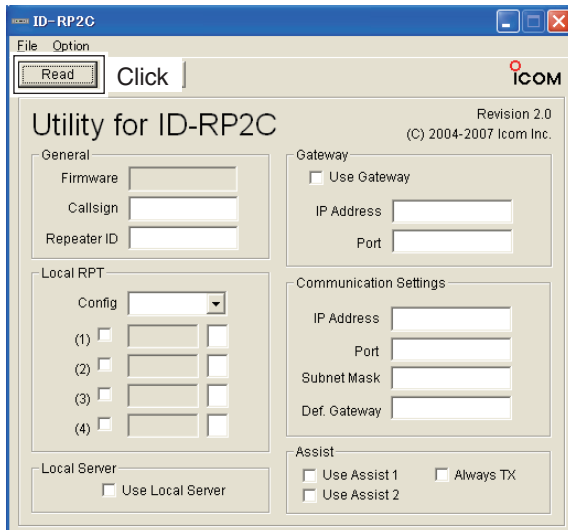
⑥ Reads the ID-RP2C settings then the screen as at left appears.
　• When the error message screen appears, confirm the LAN cable connections, IP address and subnet mask for the PC.
　• And check the IP address and UDP port settings are set to "172.16.0.1 (default)" and "20319 (default)" respectively in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

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◇ ID-RP2C utility screen
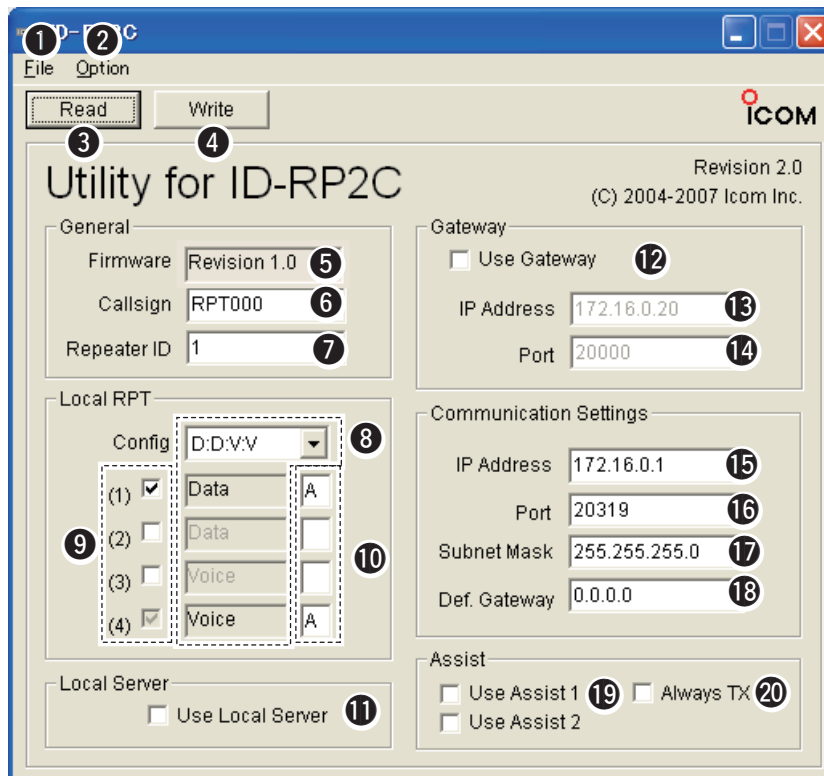
❶ **File menu**
The following sub menus are displayed when clicked.
- **Read from controller:**
  Reads the setting conditions from the ID-RP2C.
- **Write to controller:**
  Transfers and programs the displayed setting conditions into the ID-RP2C.
- **Restore factory default:**
  Resets to the default setting for all items.
- **Exit:** Quits the utility software.

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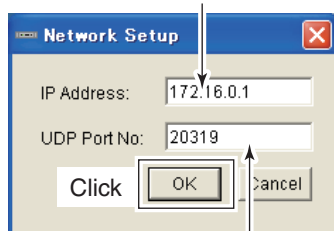
  Enter the UDP port number of the ID-RP2C.
  (Default: 20319)

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

  Enter the current password. (Default: PASSWORD)
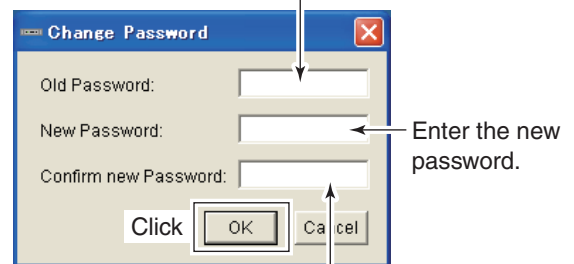
  Enter the new password again for confirmation.

  ▨ **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 software will be impossible if forgotten.

❸ **[Read]**
Reads the ID-RP2C setting condition.

❹ **[Write]**
Transfers and programs the displayed setting condition into the ID-RP2C.

◇ 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 be-
⫽ tween local repeaters won't function properly.
⫽ The same repeater ID code can be allocated to
⫽ the repeater if the repeater operates in a differ-
⫽ ent 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 re-
⫽ peater cannot be operated even if the repeater
⫽ is connected to the system.

❿ **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 initial voice repeater (ID-RP2V or other model) and the initial data repeater (currently ID-RP2D only). NEVER duplicate the initial with any additional data or voice repeaters installed at the site. Otherwise the communications between local repeaters won't function properly.

⓫ **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.

Without the check mark (✔) set, an Un-connectable command is automatically sent when the packet is received at the local server.

⚠ **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.

⓬ **Use Gateway (gateway usage)**
Selects the gateway connection capability with this local repeater ON and OFF.

Apply the check mark (✔) when you want to allow a gateway connection; remove the check mark (✔) when you want to inhibit the gateway connection.

Without the check mark (✔) set, an Un-connectable command is automatically sent when the packet is received through a gateway.

⓭ **IP Address**
Enter the IP address of the connectable gateway.

⓮ **Port (port number)**
Enter the UDP port number of the connectable gateway.

⓯ **IP Address**
Enter the local IP address of the repeater.
(Default: 172.16.0.1)

⓰ **Port (port number)**
Enter the UDP port number of the repeater.
(Default: 20319)
Use the default setting normally.

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

If a PC is connected, set the same subnet mask of the PC for the repeater and server (gateway or local server) settings.

⓲ **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.

⓳ **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.

⓴ **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.
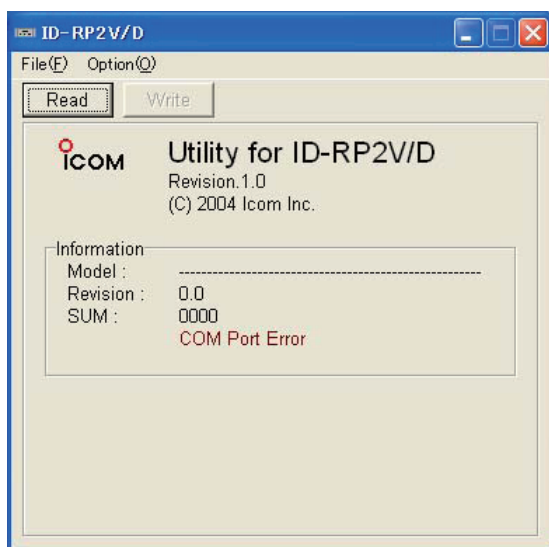
① Start up the PC.
② Connect a USB cable (A-B type) between PC's USB port and [SERVICE] connector of the ID-RP2D, then turn the ID-RP2D power ON.
③ Start up the ID-RP2V/D utility software.
Double click the "ID-RP2VD" icon on the desktop or select the "ID-RP2VD" in "Program" in "Start" menu.
④ The screen as at left appears, then the dialog below is displayed.
  • Click [OK].
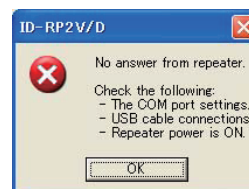
NOTE: The screen, described in steps ⑤, appears instead of these screens when the correct COM port number is set.

  • 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.

Enter the COM port number.

Click

NOTE: See pages 35 to 37 for the COM port number confirmation details.

⑤ The utility software 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.

❷ Click

❶ Enter the specified frequencies.
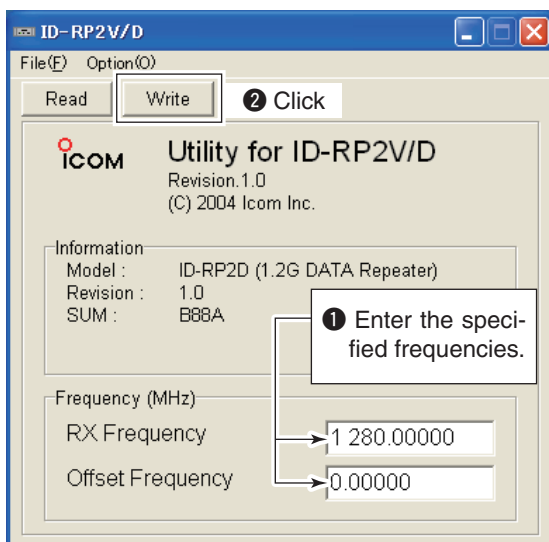
■ Frequency setting for ID-RP2V

NOTE:
The repeater unit connection may not be recognized with the PC according to the using USB cable length.
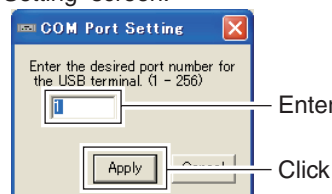Use the shorter USB cable as possible is recommended.
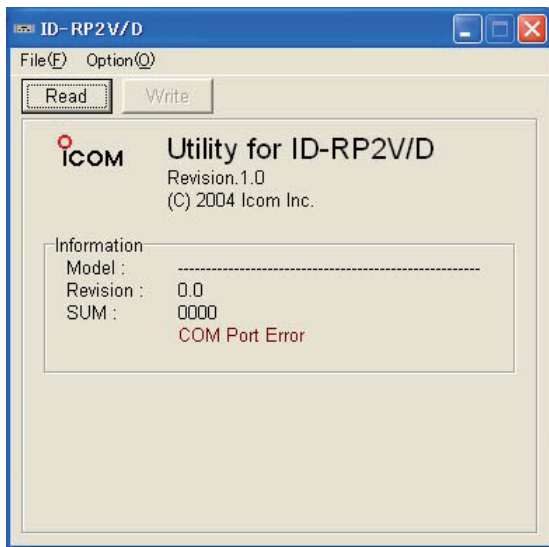
① Start up the PC.
② Connect a USB cable (A-B type) between PC's USB port and the ID-RP2V [SERVICE] connector, then turn the ID-RP2V power ON.
  • Connect a USB cable to [SERVICE R] when setting receive frequency.
  • Connect a USB cable to [SERVICE T] when setting transmit frequency.
③ Start up the ID-RP2V/D utility software.
  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.

Enter the COM port number.

Click

**NOTE:** See pages 35 to 37 for the COM port number confirmation details.

⑤ The utility software 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.
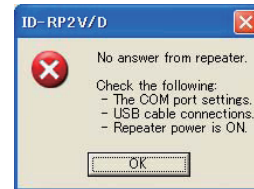
❷ Click

❶ Enter the specified frequency.
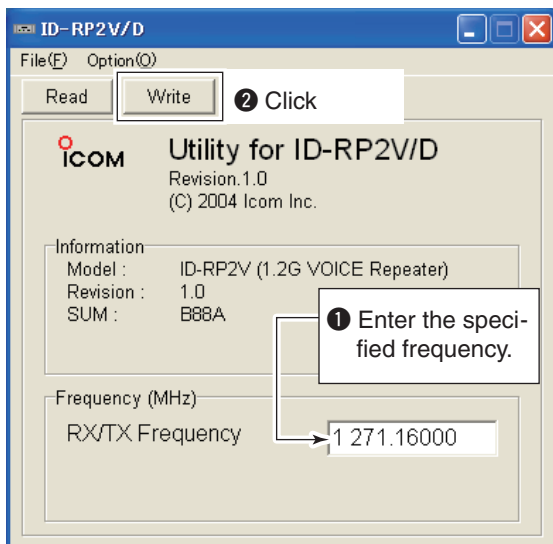
■ ID-RP2L setting

NOTE:
The repeater unit connection may not be recognized with the PC according to the using USB cable length.
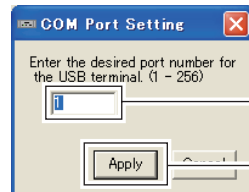Use the shorter USB cable as possible is recommended.
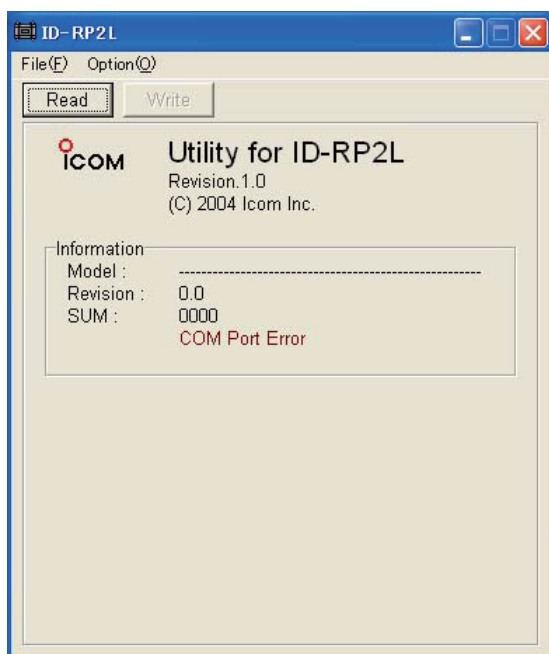
① Start up the PC.
② Connect a USB cable (A-B type) between PC's USB port and either [SERVICE 1] or [SERVICE 2] connector of the ID-RP2C, then turn the ID-RP2L power ON.
  • Connect a USB cable to [SERVICE 1] and turn the ID-RP2L power ON with [ASSIST 1] when setting the operating frequency of the ID-RP2L that is connected to AS-SIST1.
  • Connect a 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 AS-SIST2.
③ Start up the ID-RP2L utility software.
  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.
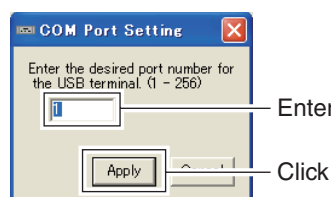
Enter the COM port number.

Click

NOTE: See pages 35 to 37 for the COM port number confirmation details.
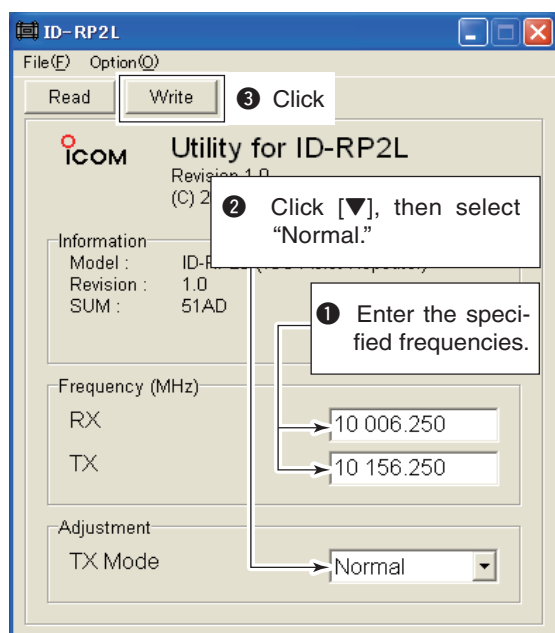
⑤ The utility software reads the ID-RP2L setting and the screen as at left appears when the correct COM port number is set.

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 purposes only.

⑧ Click [Write] to program the set frequencies and parameters into the ID-RP2L.

8   MAINTENANCE

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.	• Power connector has a poor contact.	• Check the connector pins and re-connect the DC power cable.	p. 11
	• Blown fuse.	• Check for the cause, then replace the fuse.	p. 52
No transmit output power, or low output power.	• Antenna or coaxial cable has problems.	• Check, and if necessary, replace the coaxial cable or solder the antenna connector again.	pgs. 9, 11
Sensitivity is low and only strong signals are received.	• Antenna or coaxial cable has problems.	• Check, and if necessary, replace the coaxial cable or solder the antenna connector again.	pgs. 9, 11
Cannot be connected to anther repeater site.	• Parabolic antenna beam does not adjusted properly.	• Re-adjust the parabolic antenna beam.	p. 18
	• Different frequencies are programmed from the opposed microwave link repeater.	• Set the receive and transmit frequencies as the opposed microwave link repeater's transmit and receive frequencies respectively.	pgs. 49, 50
	• No check mark (✔) is applied to "Use Assist 1/2."	• Apply a check mark (✔) into "Use Assist 1/2."	p. 46
Does not function even a signal is received.	• Unit initial setting is wrong or duplicated.	• Set "A" to each voice and data repeater and never duplicate the initial between voice repeaters and/or data repeaters.	p. 45
	• Config. Setting is wrong.	• Set the corresponding conditions to the connected repeater combination.	p. 45
	• No check mark (✔) is applied.	• Apply a check mark (✔) into the appropriate connector number.	p. 45
PC does not recognize the repeater	• Too long USB cable is used.	• Use a shorter USB cable.	p. 19
The settings cannot be programmed into the repeater properly.	• Too long USB cable is used.	• Use a shorter USB cable.	pgs. 47–50

■ About cleaning

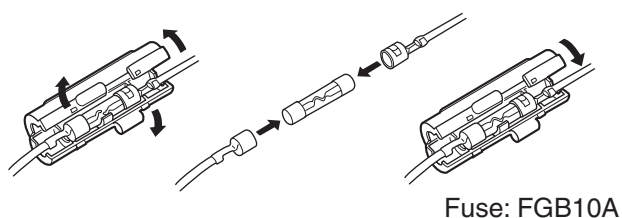DO NOT use chemical agents such as benzine or alcohol when cleaning, as they can damage the repeater's surfaces.
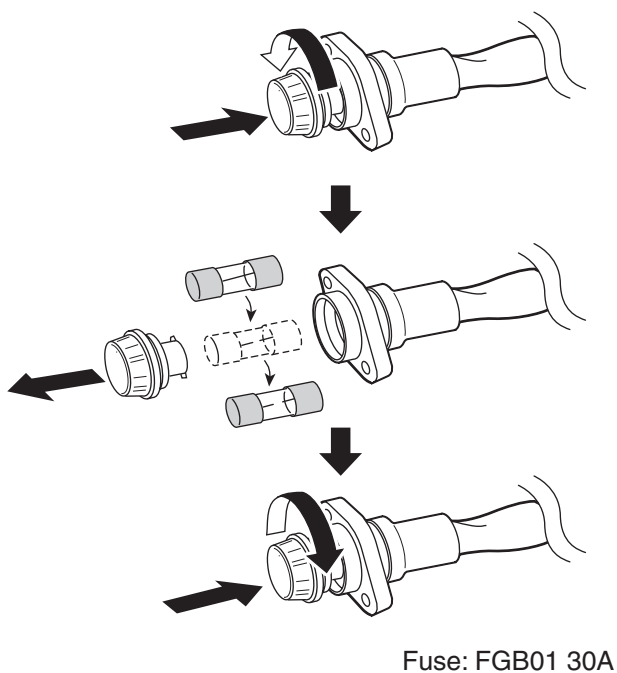
■ Fuse replacement

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.
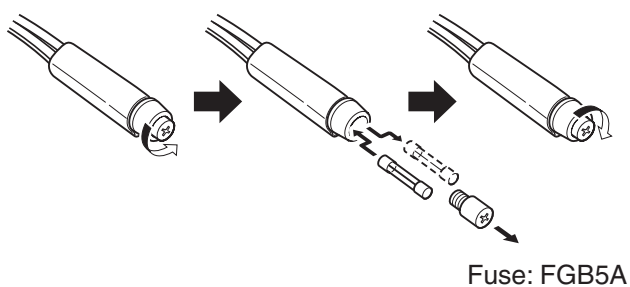
◇ OPC-1309

Fuse: FGB10A

◇ OPC-1380

Fuse: FGB01 30A

◇ ID-RP2L's DC power cable

Fuse: FGB5A

9 SPECIFICATIONS AND OPTIONS

■ Specifications

◇ ID-RP2C
• General
Power supply requirement	: 13.8 V DC ±15% (negative ground)
Current drain	: Less than 0.5 A
Usable temperature range	: −10˚C to +50˚C; +14˚F to +122˚F
Dimensions (approx.; proj. not incl.)	: 483(W)×44(H)×257(D) mm; 19(W)×1¾(H)×10⅛(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	: ±5 ppm (based on 25˚C; +77˚F)	
Frequency resolution	: 250 kHz	
Antenna connector	: Type-N	
Antenna impedance	: 50 Ω (unbalanced)	
Communication speed	: 10 Mbps	
Power supply requirement	: 13.8 V DC ±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˚C; −22˚F to +140˚F	
Dimensions (proj. not incl.)	: 328(W)×262(H)×116(D) mm; 12²⁹⁄₃₂(W)×10⁵⁄₁₆(H)×4⁹⁄₁₆(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	: QPSK (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 then −78 dBmReceive 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	
	Antenna impedance		50 Ω (unbalanced)	
	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	6–12 W
		Low	0.5–1.2 W	0.5–1.2 W
	Modulation system		QPSK (243.95 MHz)	
	Occupied bandwidth		Less than 130 kHz	Less than 5.5 kHz
	Spurious emissions		Less than −50dB	
Receiver	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-RP2000V	VHF DIGITAL VOICE REPEATER
ID-RP2V	1.2 GHz DIGITAL VOICE REPEATER	ID-RP4000V	UHF 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	*Not available in European countries as of July 2009.	

Approved Icom optional equipment is designed for optimal performance when used with an Icom transceiver. Icom is not responsible for the destruction or damage to an Icom transceiver in the event the Icom transceiver is used with equipment that is not manufactured or approved by Icom.

10 ABOUT CE

<table>
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í̊COM
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DECLARATION OF CONFORMITY
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We Icom Inc. Japan
     1-1-32, Kamiminami, Hirano-ku
     Osaka 547-0003, Japan

ϵ

Declare on our sole responsibility that this equipment complies with the essential requirements of the Radio and Telecommunications Terminal Equipment Directive, 1999/5/EC, and that any applicable Essential Test Suite measurements have been performed.

Düsseldorf 10th Aug. 2007
Place and date of issue

Kind of equipment: **REPEATER CONTROLLER**

Icom (Europe) GmbH
Himmelgeister straße 100
D-40225 Düsseldorf
Authorized representative name

Type-designation: **ID‒RP2C**

Version (where applicable):

This compliance is based on conformity with the following harmonised standards, specifications or documents:

H. Ikegami
General Manager

i) EN 301 489-1 V1.4.1 (2002-08)
ii) EN 301 489-15 V1.2.1 (2002-08)
iii) EN 60950-1 (2001): A11:2004
iv)
v)

Signature

Icom Inc.
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</table>

ϵ Versions of the ID-RP2C which display the "CE" symbol on the serial number label, comply with the essential requirements of the European Radio and Telecommunication Terminal Directive 1999/5/EC.

List of Country codes (ISO 3166-1)

	Country	Codes		Country	Codes
1	Austria	AT	18	Liechtenstein	LI
2	Belgium	BE	19	Lithuania	LT
3	Bulgaria	BG	20	Luxembourg	LU
4	Croatia	HR	21	Malta	MT
5	Czech Republic	CZ	22	Netherlands	NL
6	Cyprus	CY	23	Norway	NO
7	Denmark	DK	24	Poland	PL
8	Estonia	EE	25	Portugal	PT
9	Finland	FI	26	Romania	RO
10	France	FR	27	Slovakia	SK
11	Germany	DE	28	Slovenia	SI
12	Greece	GR	29	Spain	ES
13	Hungary	HU	30	Sweden	SE
14	Iceland	IS	31	Switzerland	CH
15	Ireland	IE	32	Turkey	TR
16	Italy	IT	33	United Kingdom	GB
17	Latvia	LV			

Count on us!

ID-RP2C
#11 (Europe)

<Intended Country of Use>
■ AT ■ BE ■ CY ■ CZ ■ DK ■ EE
■ FI ■ FR ■ DE ■ GR ■ HU ■ IE
■ IT ■ LV ■ LT ■ LU ■ MT ■ NL
■ PL ■ PT ■ SK ■ SI ■ ES ■ SE
■ GB■ IS ■ LI ■ NO ■ CH ■ BG
■ RO■ TR ■ HR