ICOM®

INSTRUCTION MANUAL

D-STAR REPEATER SYSTEM

ID-RP1

Icom Inc.

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-RP1 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

⚠ **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).

⚠ **NEVER** apply AC to the [DC13.8V] 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 [DC13.8V] jack 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.

AVOID using or placing the repeater in areas with temperatures below –10°C (+14°F) or above +60°C (+140°F).

Be aware that temperatures can exceed 80°C (+176°F), resulting in permanent damage to the repeater if left there for extended periods.

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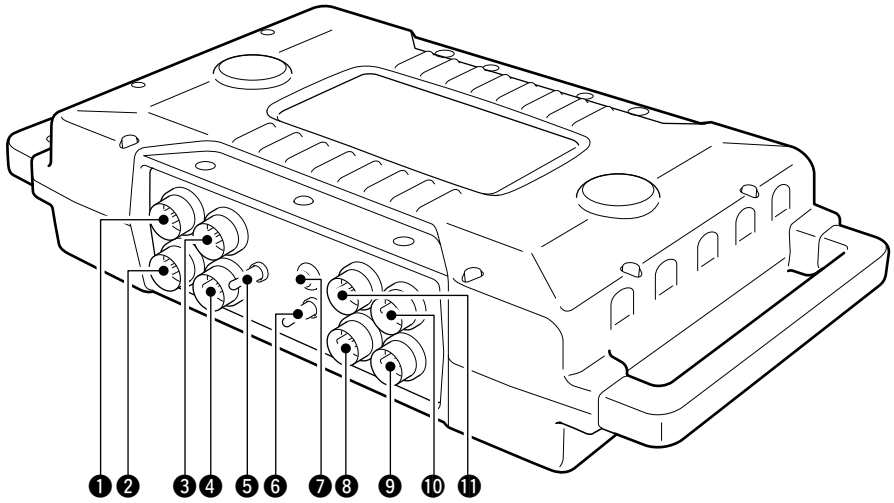
■ ID-RP1D

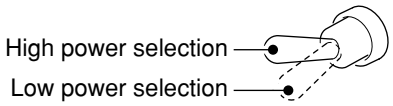


❶ DATA A CONNECTOR [DATA A]
❷ DATA B CONNECTOR [DATA B]
Connects to ID-RP1L's [DATA I/O].

❸ 10 BASE-T CONNECTOR [10 BASE-T]
Connects to a PC through the supplied Ethernet cable for the repeater maintenance.

❹ 13.8V INPUT [DC 13.8V IN]
Connects to a DC power supply.

❺ OUTPUT POWER SELECT SWITCH [HIGH/LOW]
Select the transmit output power.



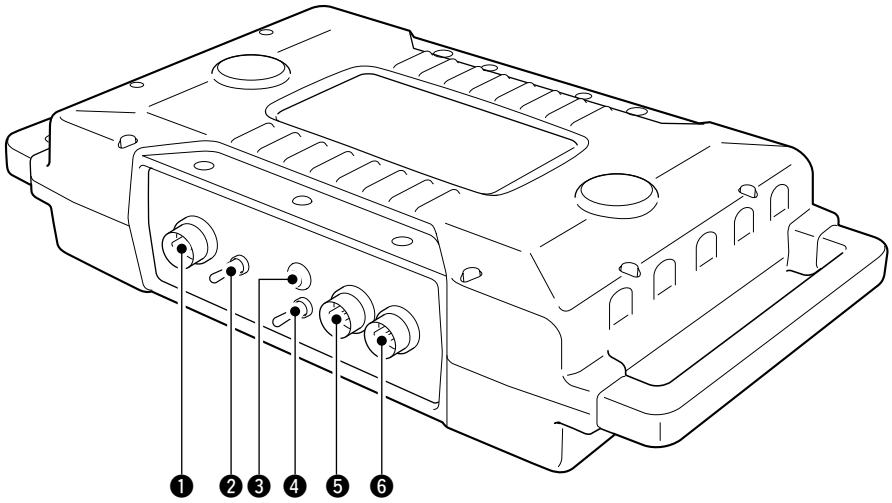
❻ POWER SWITCH [POWER]
Turns the repeater main power ON and OFF.

❼ POWER INDICATOR
Lights during the repeaters power is ON

❽ SERVICE CONNECTOR [SERVICE]
Connect a PC through the supplied USB cable receptacle for the repeater maintenance.

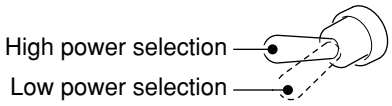
❾ CONTROL B CONNECTOR [CONT B]
❿ CONTROL C CONNECTOR [CONT C]
⓫ CONTROL D CONNECTOR [CONT D]
Connect the IC-RP1VS's [CONT I/O] connector.

■ ID-RP1VS



❶ CONTROL I/O CONNECTOR [CONT I/O]
Connects to ID-RP1D's [CONT B].

❷ OUTPUT POWER SELECT SWITCH [HIGH/LOW]
Select the transmit output power.



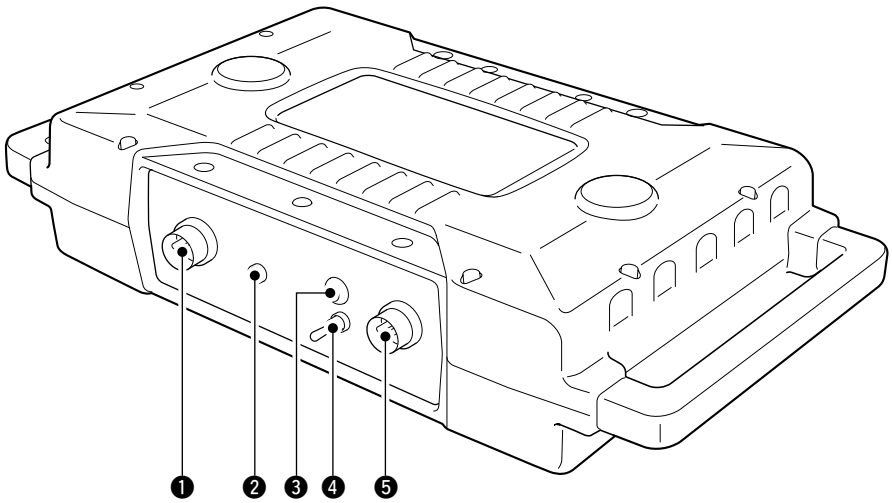
❸ POWER INDICATOR
Lights during the repeaters power is ON

❹ POWER SWITCH [POWER]
Turns the repeater main power ON and OFF.

❺ SERVICE CONNECTOR [SERVICE]
Connect a PC through the supplied USB cable receptacle for the repeater maintenance.

❻ 13.8V INPUT [DC 13.8V IN]
Connects to a DC power supply.

■ ID-RP1L



❶ DATA I/O CONNECTOR [DATA I/O]
Connects to ID-RP1D's [DATA A] or [DATA B] connector.

❷ RSSI OUTPUT CONNECTOR [RSSI]
Connects a voltmeter for the parabolic antenna adjustment.

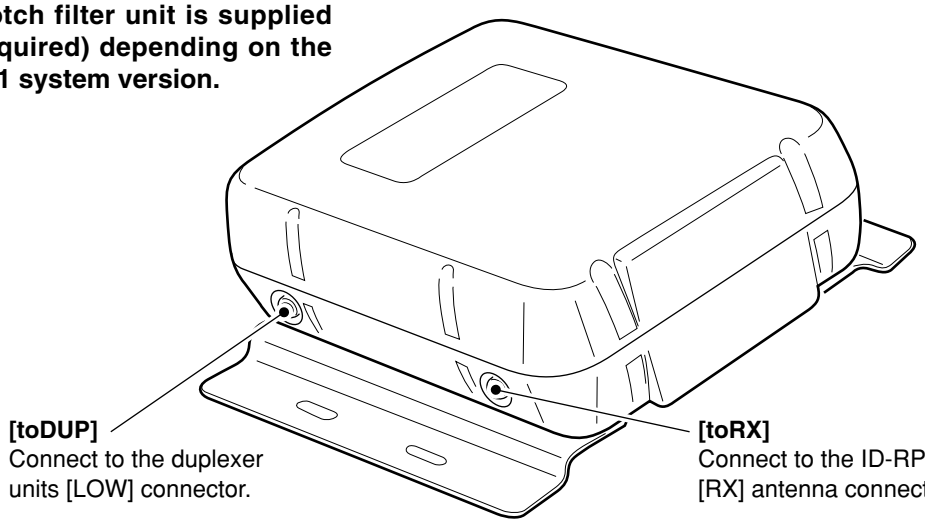
❸ POWER INDICATOR
Lights during the repeaters power is ON

❹ POWER SWITCH [POWER]
Turns the repeater main power ON and OFF.

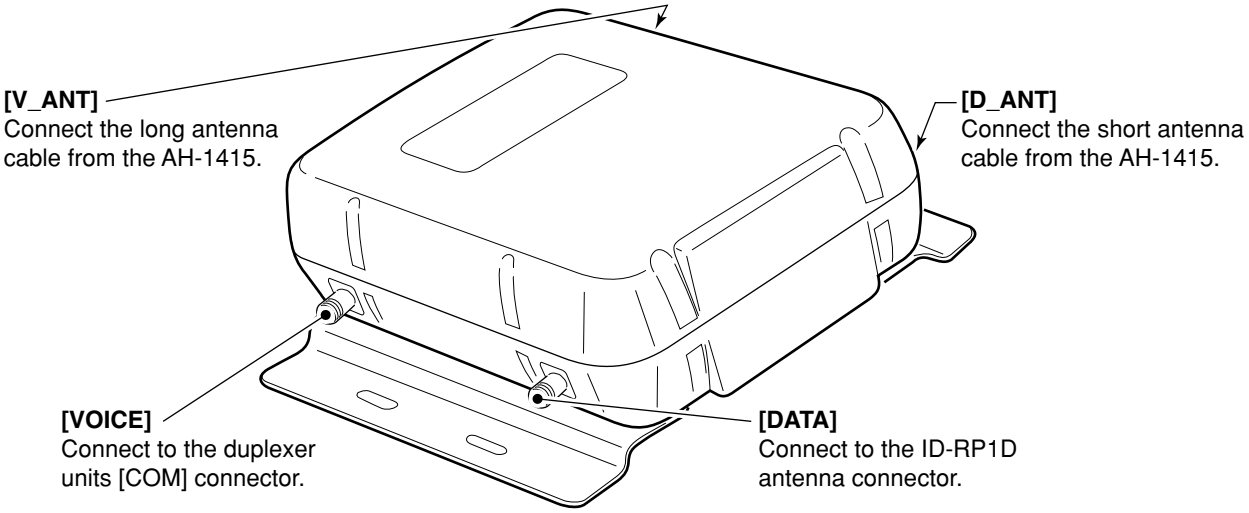
❺ 13.8V INPUT [DC 13.8V IN]
Connects to a DC power supply.

■ Notch filter unit (EX-2659)

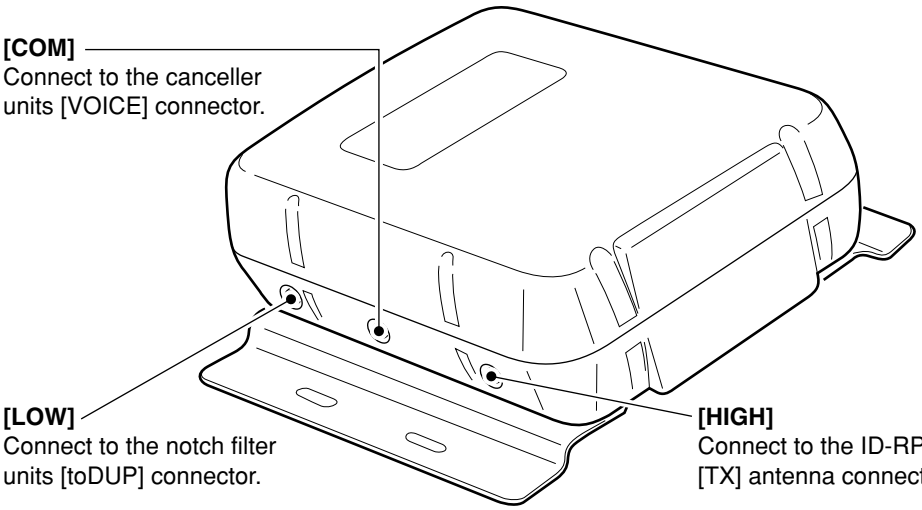
No notch filter unit is supplied (or required) depending on the ID-RP1 system version.



■ Canceller unit (EX-2660)



■ Duplexer (EX-2661)



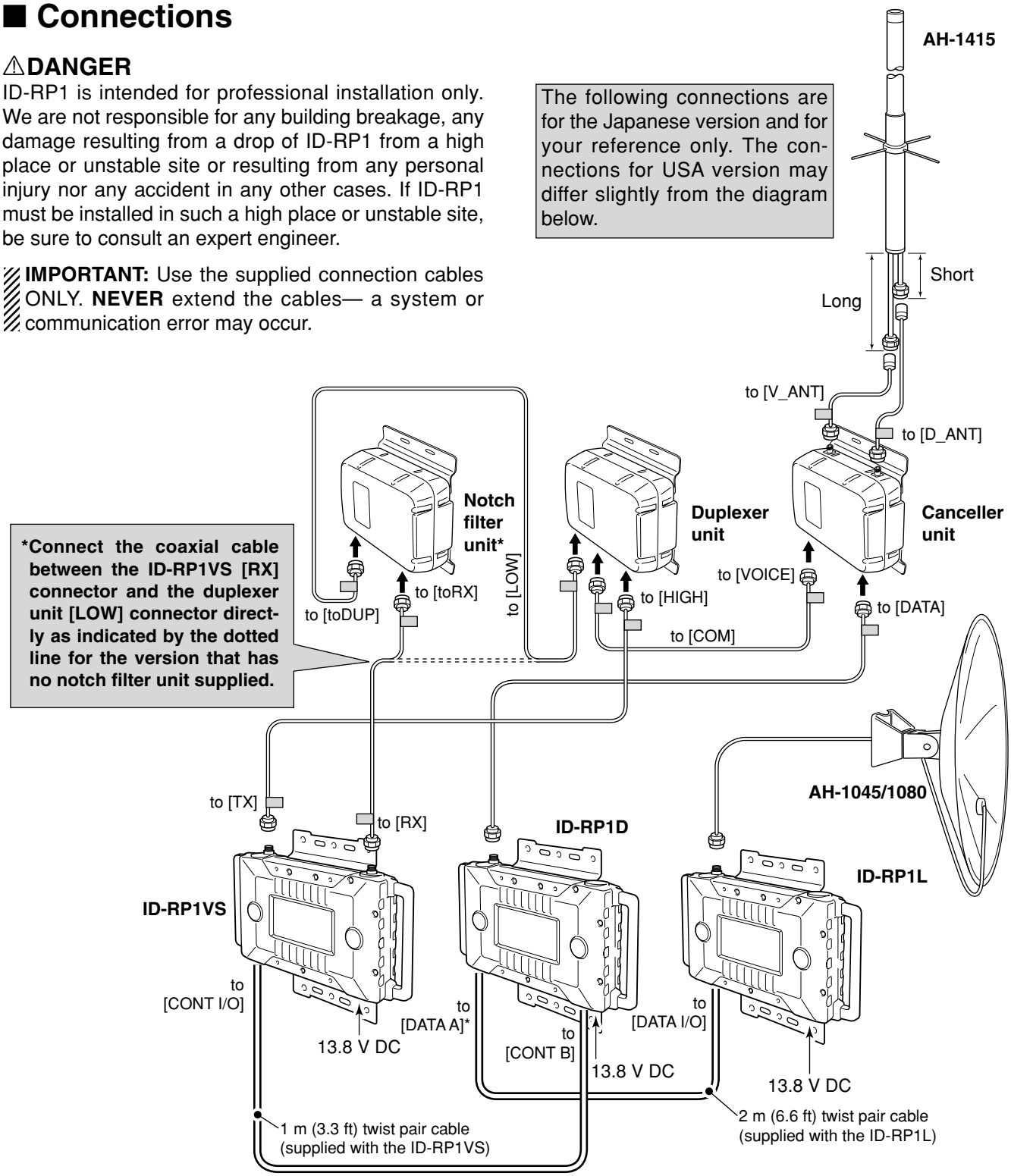
■ Connections

⚠DANGER

ID-RP1 is intended for professional installation only. We are not responsible for any building breakage, any damage resulting from a drop of ID-RP1 from a high place or unstable site or resulting from any personal injury nor any accident in any other cases. If ID-RP1 must be installed in such a high place or unstable site, be sure to consult an expert engineer.

IMPORTANT: Use the supplied connection cables ONLY. **NEVER** extend the cables— a system or communication error may occur.

The following connections are for the Japanese version and for your reference only. The connections for USA version may differ slightly from the diagram below.



✔For your convenience

A label ("▭" mark in the diagram above) is attached near the connector on the supplied coaxial cable to specifying the connection for guidance.

*Connecting connector can be selected with the ID-RP1D maintenance application. (See page 19) Before operating the repeater system, programming is necessary for both the ID-RP1D and the ID-RP1VS.

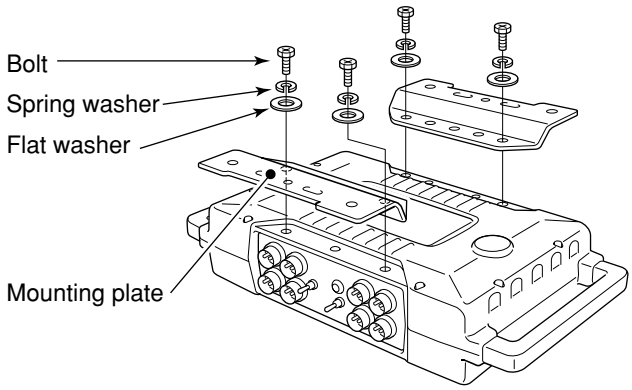
CAUTION!: NEVER turn the ID-RP1L power ON without connecting the parabolic antenna. The ID-RP1L starts transmission after power ON. Transmission without antenna may damage the ID-RP1L.

IMPORTANT: After the connections, turn the ID-RP1D power ON first to prevent system error.

■ Mounting plate attachment

Attach the supplied mounting plates onto the ID-RP1D, ID-RP1VS, ID-RP1L, notch filter, canceller and duplexer unit as illustrated at right.

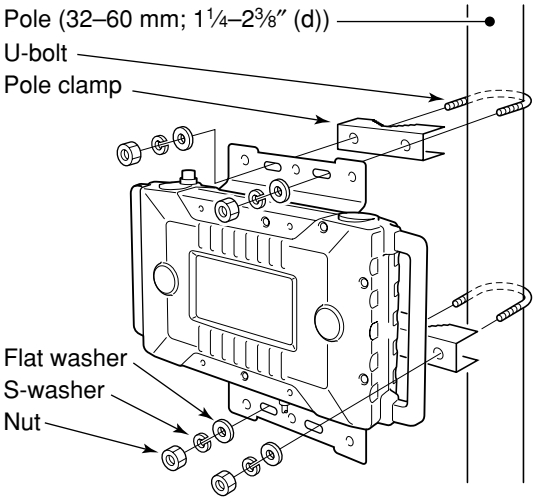
•Example— ID-RP1D



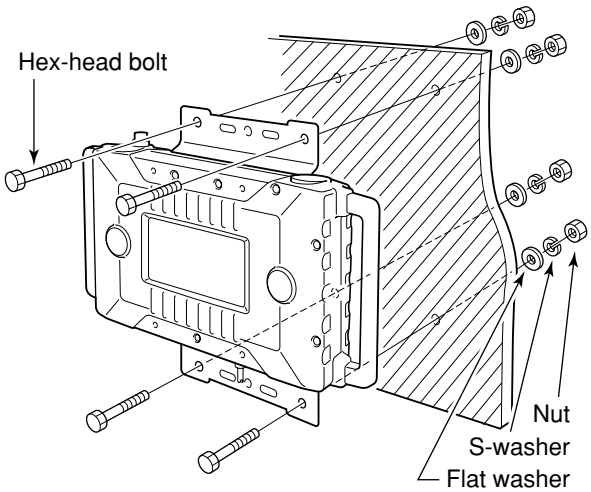
■ Mounting descriptions

◇ ID-RP1D/VS/L

•Mounting to a pole

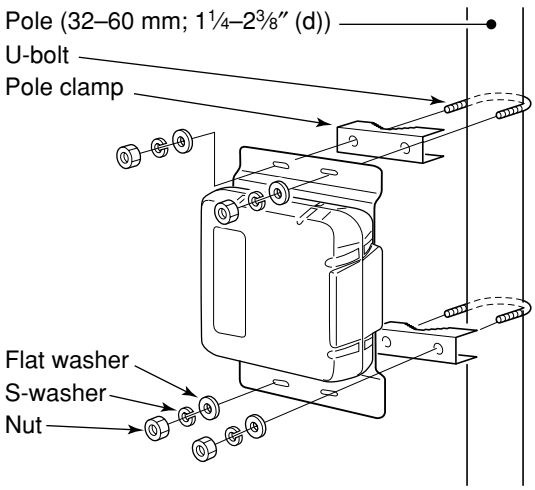


•Mounting onto a wall

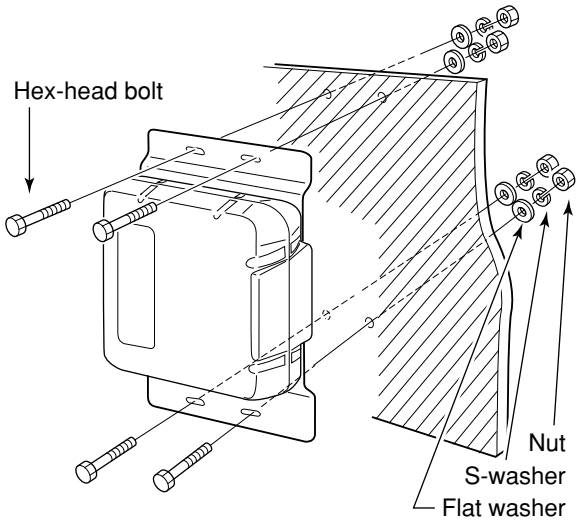


◇ Notch filter/Duplexer/Canceller unit

•Mounting to a pole

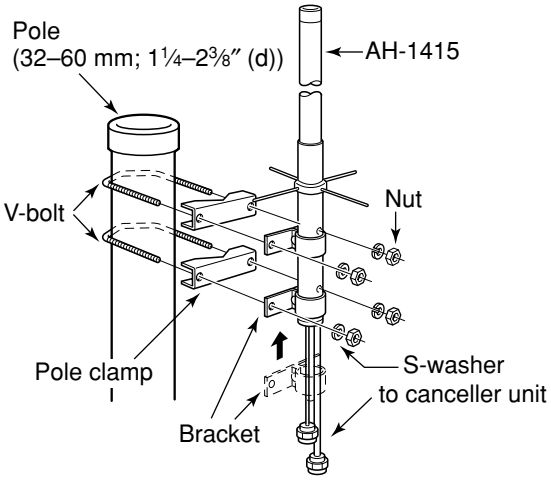


•Mounting onto a wall

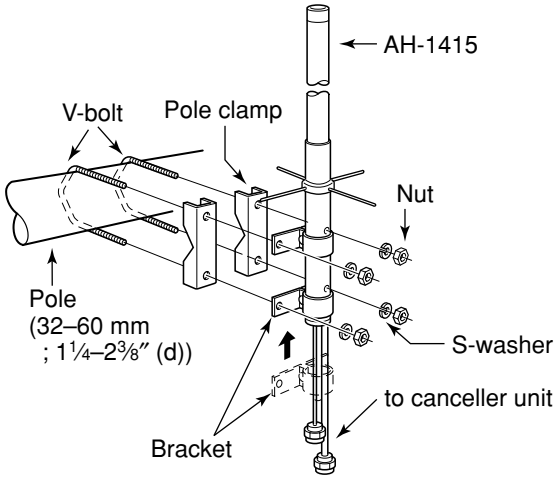


◇ AH-1415 (1.2 GHz antenna)

•Mounting to a pole 1



•Mounting to a pole 2

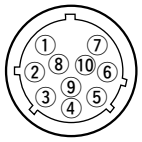


◇ AH-1045/AH-1080 (10 GHz Offset-Parabola antenna)

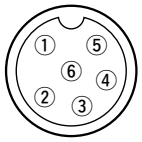
Direction and angle adjustment is required for the AH-1045/1080 installation. See the AH-1045/AH1080 instruction manual for both the installation and the adjustment details.

■ Connector information

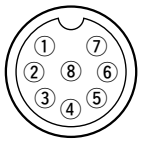
◇ [SERVICE] connector

Front view	Pin	Pin name	Description
	1	USB5V	Input terminal for USB 5 V of [USB1].
	2	USBDM	I/O terminal for –DATA of [USB1].
	3	USBDP	I/O terminal for +DATA of [USB1].
	4	USBGD	Ground terminal of [USB1].
	5	GND	F.G (shell) of [USB1].
	6	USB5V	Input terminal for USB 5 V of [USB2].
	7	USBDM	I/O terminal for –DATA of [USB2].
	8	USBDP	I/O terminal for +DATA of [USB2].
	9	USBGD	Ground terminal of [USB2].
	10	GND	F.G (shell) of [USB2].

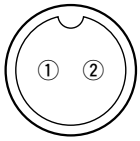
◇ [10BASE-T] connector

Front view	Pin	Pin name	Description
	1	TX+	Outputs data (+) and connected to RJ-45 pin 3.
	2	TX–	Outputs data (–) and connected to RJ-45 pin 6.
	3	NC	No connection. (Connected to RJ-45 pin 4.)
	4	NC	No connection. (Connected to RJ-45 pin 5.)
	5	RX+	Inputs data (+) and connected to RJ-45 pin 1.
	6	RX–	Inputs data (–) and connected to RJ-45 pin 2.

◇ [CONT B], [CONT C], [CONT D], [DATA A], [DATA B] connectors

Front view	Pin	Pin name	Description
	1	RSSI	Becomes high level (3.3 V) when effective data (RD) is applied.
	2	GND	Connected to ground.
	3	TE	Becomes high level when effective data (TD) is output.
	4	TD	Outputs data, synchronous to “TC.”
	5	TC	Inputs clock signal for data transmission.
	6	RD	Inputs data, synchronous to “RC.”
	7	RC	Inputs clock signal for data reception.
	8	GND	Connected to ground.

◇ [DC 13.8V IN] connector

Front view	Pin	Pin name	Description
	1	HV	13.8 V DC ±10% input.
	2	GND	Connected to ground.

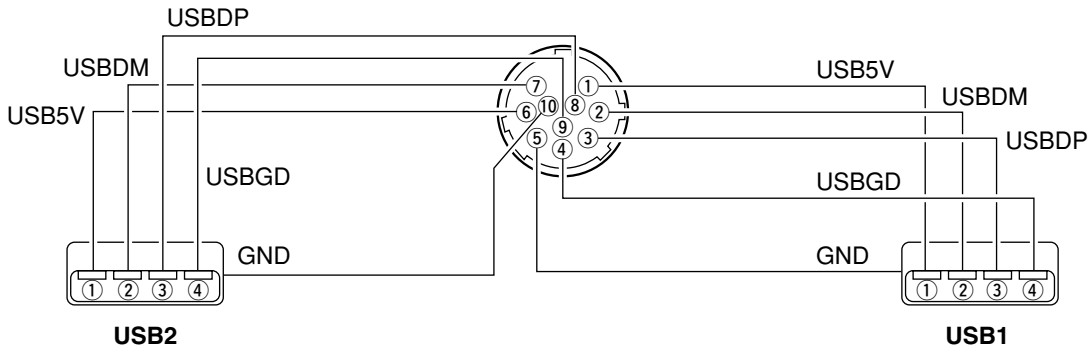
✔For your information

When extend the DC power cable (supplied DC power cable length: 2 m; 6.6 ft), use the cable at least 3.5 mm² thick or better than AWG No. 12.

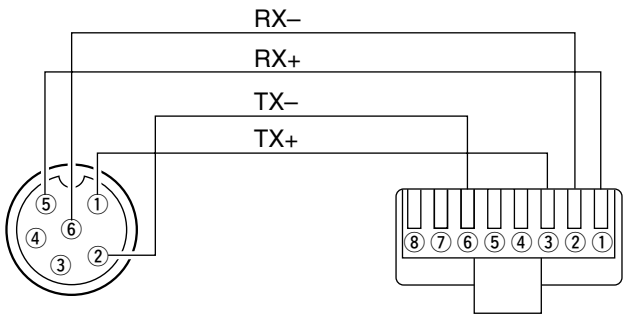
The DC power cable can be extended up to 20 m (65 ft), however, confirm the DC voltage is in the guaranteed range, 13.8 V ±10% (12.42–15.18 V DC), at the [DC 13.8V IN] connector while transmitting with high output power setting.

◇ Cable connection

•Service cable



•Ethernet cable

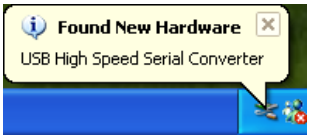


The same USB driver, supplied with the ID-1 can be used for the ID-RP1D/VS frequency programming software.

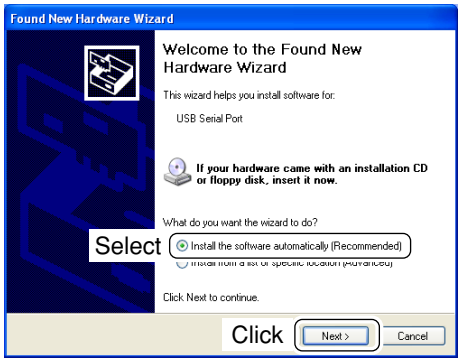
The displayed dialog boxes or indications may differ slightly from the following instructions according to your system conditions, or environment.

■ Microsoft® Windows® XP

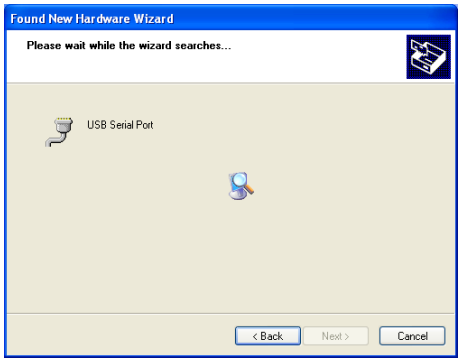
① Connect the ID-RP1D/VS [SERVICE] connector and the PC USB port via a USB cable and connector converter.
- Turn the power ON.
- "Found New Hardware USB < - > Serial" appears first, then "Found New Hardware USB High Speed Serial Converter" appears as below.



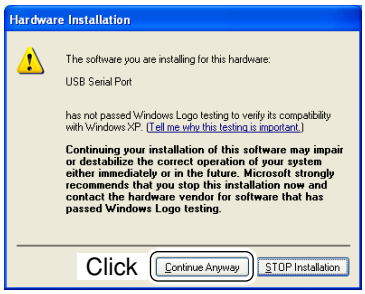
② The "Found New Hardware Wizard" will come up as below. Insert the supplied CD into the CD drive, select "Install the software automatically (Recommended)", then click [Next>].



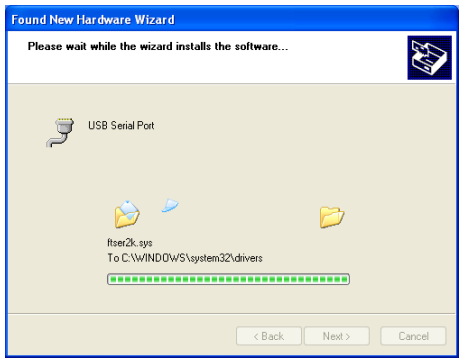
③ The wizard starts searching for the driver and shows the dialog below during search.



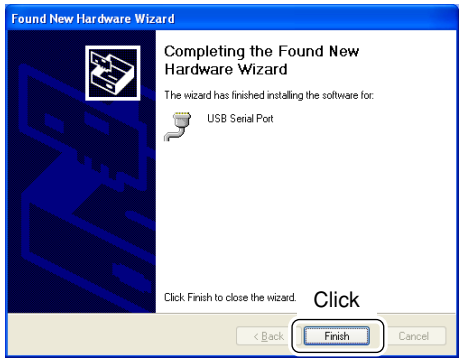
④ While searching the driver, the "Hardware Installation" dialog box appears as below.
Click [Continue Anyway] to start the installation.



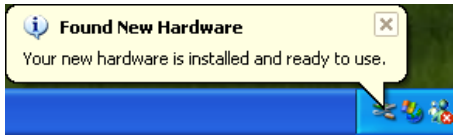
⑤ Windows starts installing the USB driver.



⑥ After the installation is completed, click [Finish].



⑦ After clicking [Finish], the dialog appears as below.



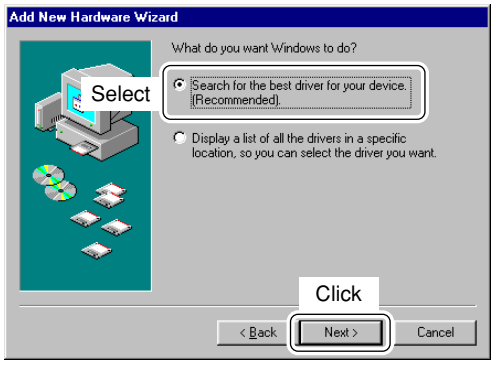
⑧ Eject the CD.
- Rebooting the PC is recommended.

■ Microsoft® Windows® 98/Me

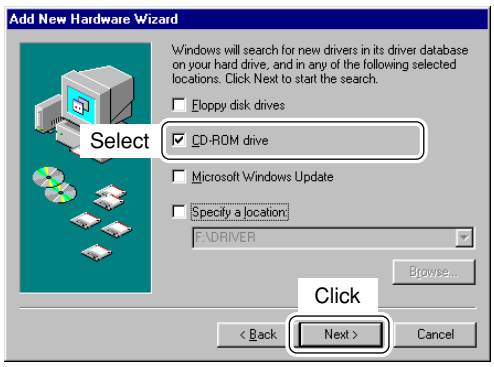
① Connect the ID-RP1D/VS [SERVICE] connector and the PC USB port via a USB cable and connector converter.
- Turn the power ON.
- "New Hardware is found" dialog box appears.

② The "Add New Hardware Wizard" will come up as below. Click [Next>].

③ Select "Search for the best driver for your device (Recommended).", then click [Next>].



④ Select "CD-ROM drive," and insert the supplied CD into the drive, then click [Next>].



⑤ When the driver is found, the following dialog is displayed. Click [Next>] to start the installation.

NOTE: When the appropriate driver is not found, a different dialog is displayed. In such case, select "Specify a location" and type "D:\driver" in the text box to select the "Driver" folder in the CD (if CD drive is D) in step ④.

⑥ After the installation is completed, the following dialog is displayed. Click [Finish] to finish the installation.

⑦ The "Add New Hardware Wizard" will come up again as below. Click [Next>].

⑧ Select “Search for the best driver for your device (Recommended).”, then click [Next>].

⑨ When the driver is found, the following dialog is displayed. Click [Next>] to start the installation.

⑩ After the installation is completed, the following dialog is displayed. Click [Finish] to finish the installation.

⑪ Eject the CD.

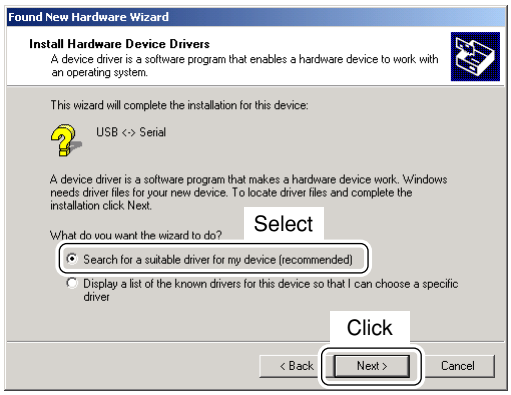
- Rebooting the PC is recommended.

■ Microsoft® Windows® 2000

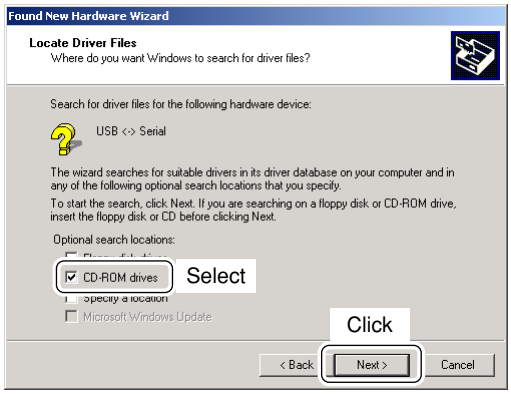
① Connect the ID-RP1D/VS [SERVICE] connector and the PC USB port via a USB cable and connector converter.
- Turn the power ON.
- "Found New Hardware" dialog box appears below.

② The "Found New Hardware Wizard" will come up as below. Click [Next>].

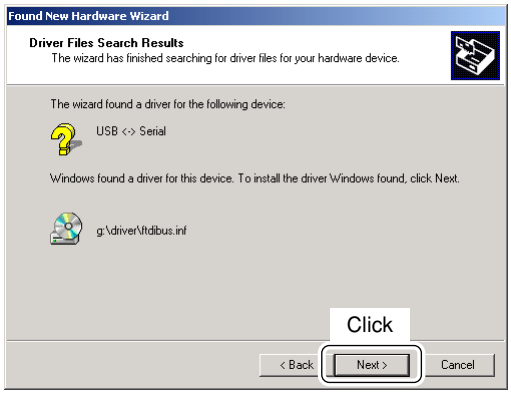
③ Select "Search for a suitable driver for my device (recommended)", then click [Next>].



④ Select "CD-ROM drives", and insert the supplied CD into the CD drive, then click [Next>].



⑤ When the driver is found, the following dialog is displayed. Click [Next>] to start the installation.



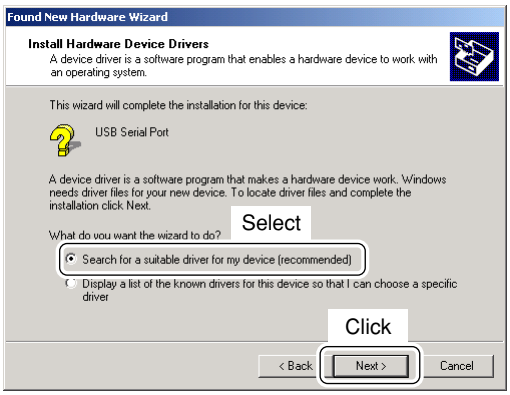
NOTE: When the appropriate driver is not found, a different dialog is displayed. In such case, click [<Back], select "Specify a location", click [Next>], then type "D:\driver" in the text box to select the "Driver" folder in the CD (if CD drive is D).

⑥ After the installation is completed, click [Finish].

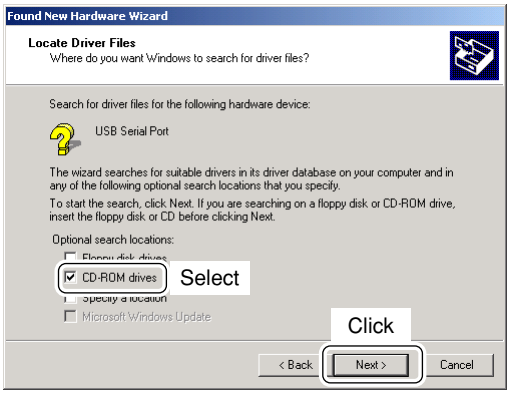
⑦ The "Found New Hardware" wizard appears again.

⑧ Click [Next>].

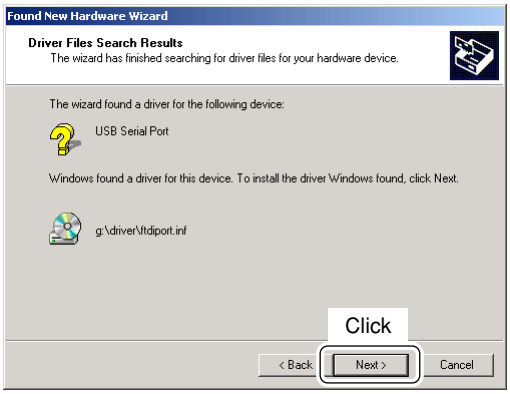
⑨ Select “Search for a suitable driver for my device (recommended)”, then click [Next>].



⑩ Select “CD-ROM drives”, then click [Next>].



⑪ When the driver is found, the following dialog is displayed. Click [Next>] to start the installation.



NOTE: When the appropriate driver is not found, a different dialog is displayed. In such case, click [<Back], select “Specify a location”, click [Next>], then type “D:\driver” in the text box to select the “Driver” folder in the CD (if CD drive is D).

⑫ After the installation is completed, click [Finish].

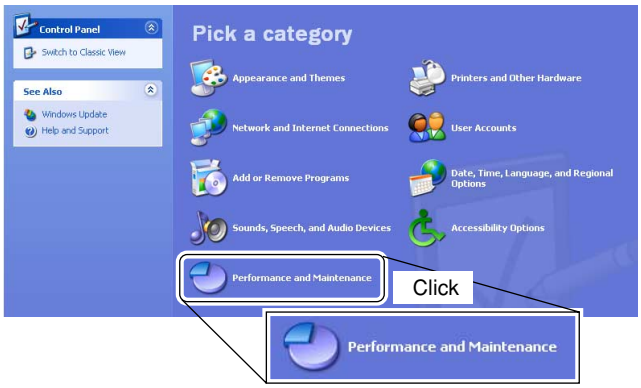
⑬ Eject the CD.
- Rebooting the PC is recommended.

■ COM port confirmation

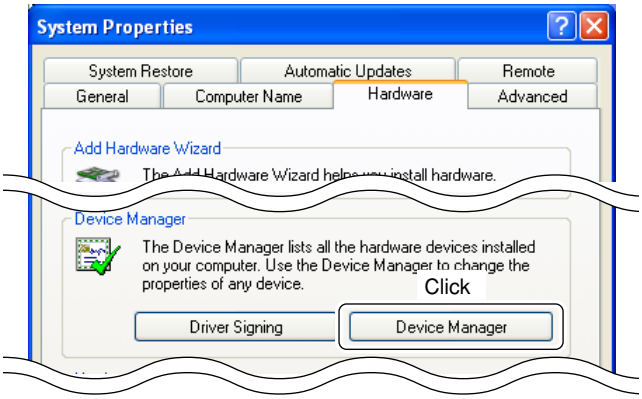
After the driver installation, confirmation of the driver availability and the port number is recommended.

In this section, screen shots of Windows XP are used for the instruction example. However, the instructions are similar to other operating systems, Windows 98, Me and 2000.

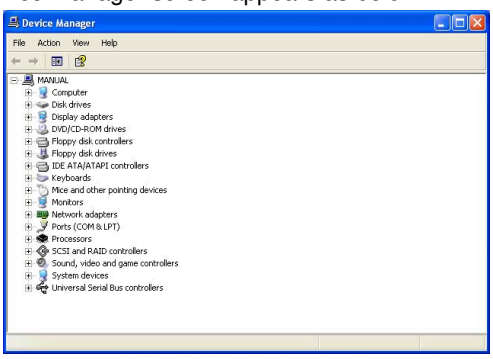
① Boot up Windows.
② Select “Control Panel” in the Start menu.
• Control panel appears as shown in the next step below.
③ Double click “Performance and Maintenance.”
• Performance and Maintenance menu appears.



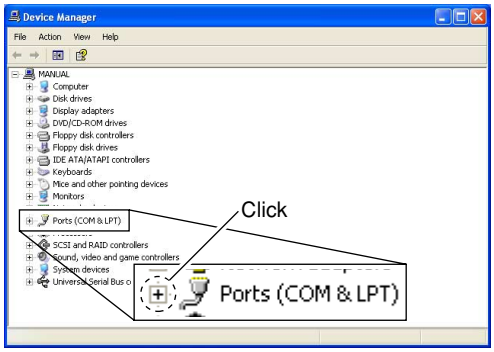
④ Double click “System,” then click the “Hardware” tub in the displayed System Properties screen.
⑤ Click “Device Manager.”



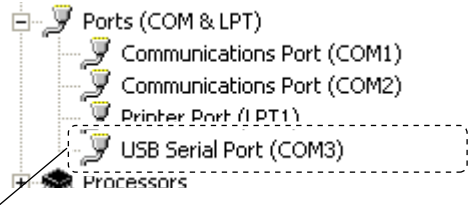
• Device Manager screen appears as below.



⑥ Click “⊞” of “Ports (COM & LPT)” to display the COM port and the port number that can be used.



⑦ Confirm the USB serial port availability and the COM port number.
• The COM port number is used for the COM port setup. (p. 17)

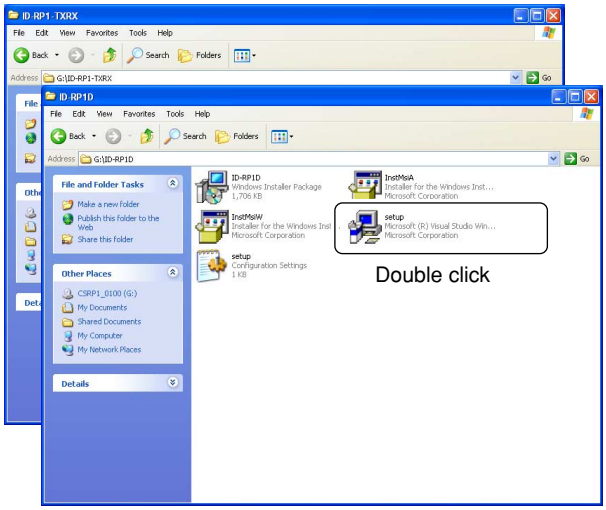


Confirm the USB serial port availability and the COM port number.
(In this example, the USB serial port number is “3.”)

⑧ Close the Device Manager, System Properties screen and then Control panel.

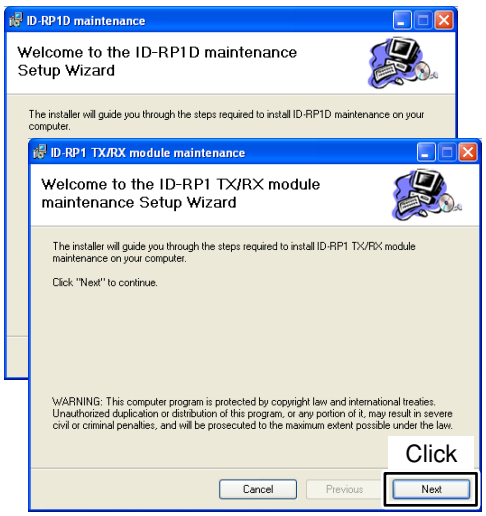
■ Application installation

① Insert the CD into the CD drive.
② Open the CD drive contents via “My computer” or “Windows Exproler.”
• “Driver,” “ID-RP1-TXRX” and “ID-RP1D” folders are available.
③ Double click “setup.exe” file in “ID-RP1-TXRX” or “ID-RP1D” folder.

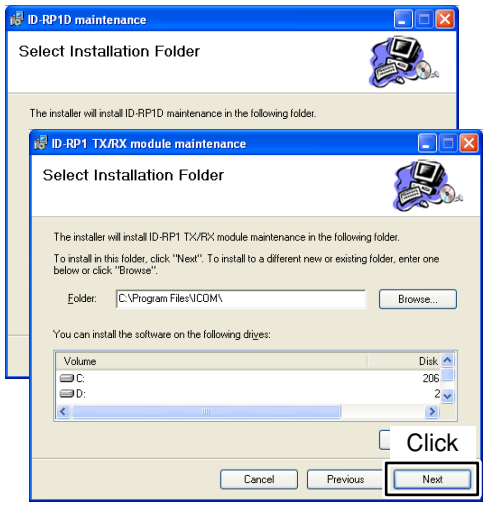


• The Windows Installer starts preparing the installation.

④ After the preparation, the following dialog is displayed. Click [Next].

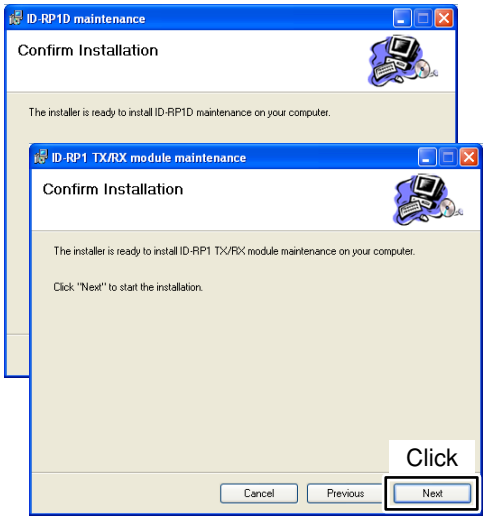


⑤ Confirm the location, then click [Next].

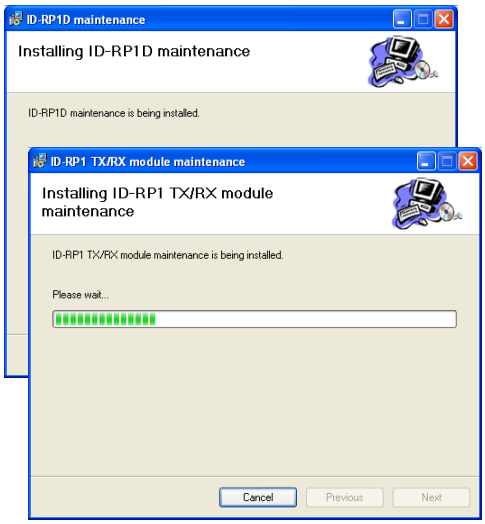


• Click [Browse...] then type the desired location if you are specifying the installation location.

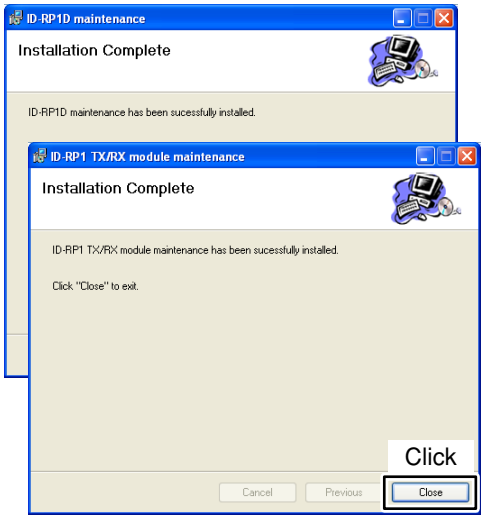
⑥ Click [Next] to start the installation.



⑦ The following dialog as below appears while installing.



⑧ After the installation is completed, click [Close].



⑦ Eject the CD.

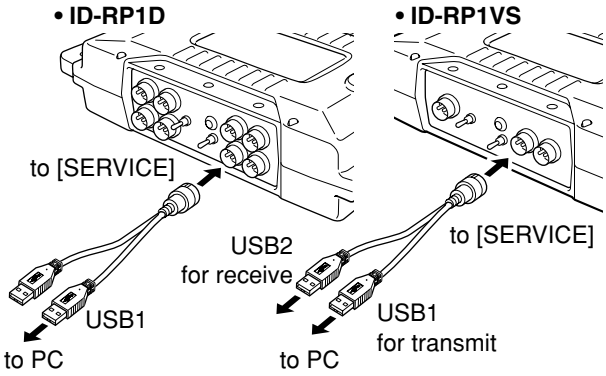
• Rebooting the PC is recommended.

■ General

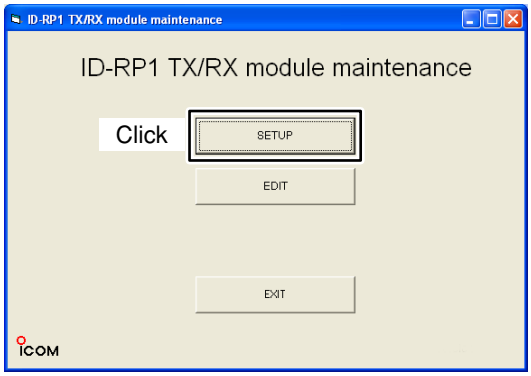
The ID-RP1 TX/RX module maintenance programs repeater operating frequencies, and the ID-RP1D maintenance programs call signs for the repeaters.

■ Repeater frequency setting

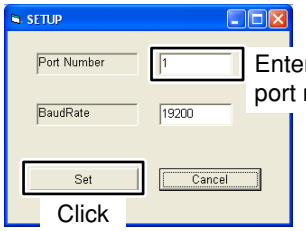
① Connect the PC and either ID-RP1D or ID-RP1VS [SERVICE] connector using the USB service cable.
- The connector converter for the ID-RP1VS has 2 USB connectors for setting receive and transmit frequencies independently.



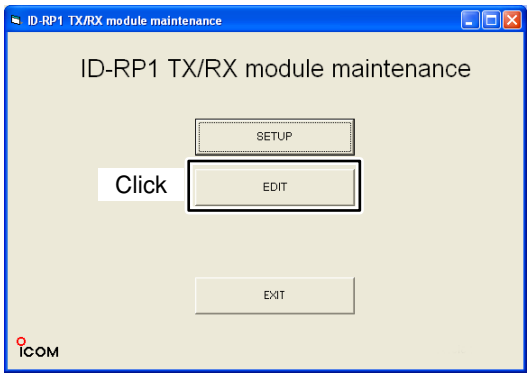
② Turn the repeater unit power ON.
③ Select the "ID-RP1 TX/RX module maintenance" menu in the program menu to start up the application.
④ Click [SETUP].



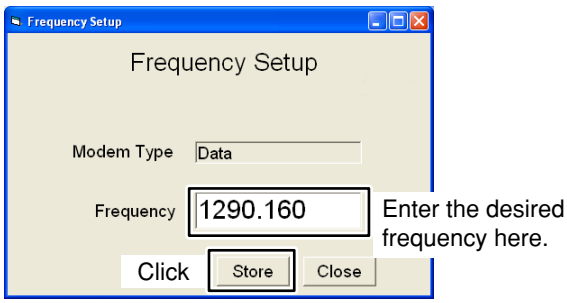
⑤ Enter the appropriate USB port number in the "Port Number" cell, then click [Set].
- The BaudRate is the fixed value.
- The screen disappears after clicking [Set].
- This setting is necessary for the first time only.



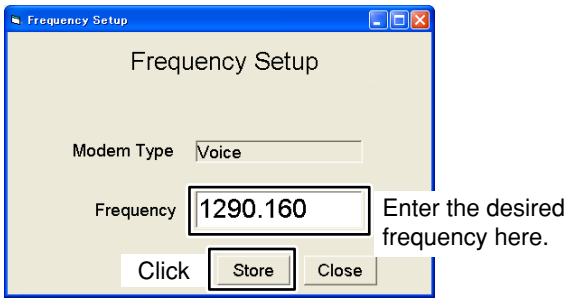
⑥ Click [Edit] to display the frequency setup screen.
- The displayed screen is different according to the connected unit and port.



⑦ Enter the desired frequency in the Frequency cell, then click [Store].
- After clicking [Store], the screen disappears.
- ***When connecting to ID-RP1D***



- ***When connecting to ID-RP1VS***

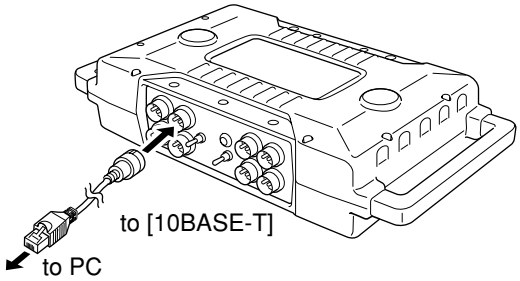


⑧ Click [EXIT] to quit the application.

■ Call sign setting

① Connect the PC and the ID-RP1D [10BASE-T] connector using the Ethernet service cable.

IMPORTANT: Connect the PC to the ID-RP1D directly. **NEVER** connect them via a router or a HUB.

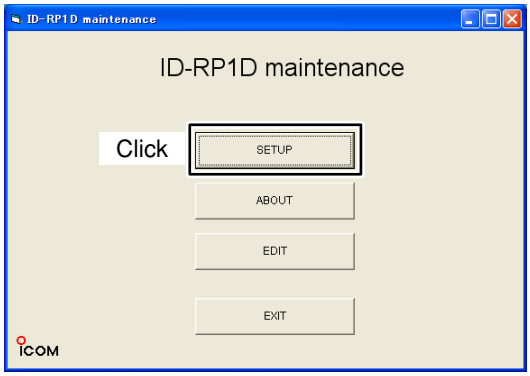


② Turn the ID-RP1D power ON.

③ Select the "ID-RP1D maintenance" menu in the program menu to start up the application.

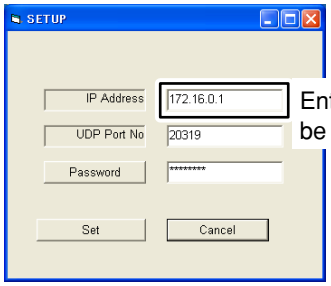
④ Click [SETUP].

- Click [ABOUT] to display the software revision number for confirmation.



⑤ Enter the IP address that is to be registered to the ID-RP1D.

- The IP address "172.16.0.1" is assigned as the default.



Enter the IP address that is to be registered to the ID-RP1D.

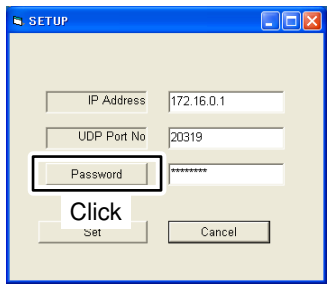
Hint!

For the PC accessing the ID-RP1D with the default settings, the PC must be set to the following conditions.

- IP address : Use 172.16.0.2
- DNS : Not used
- Subnet mask : Use 255.255.255.0
- Default Gateway : Not used

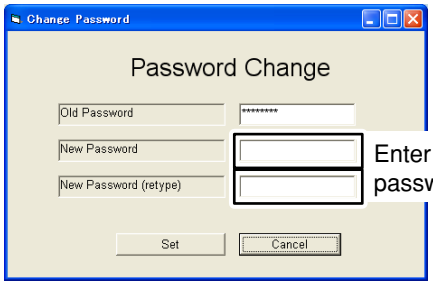
⑥ Click [Password], if you want to change the password.

- "PASSWORD" is set as the default.



⑦ Type the desired new password into the New Password and type the same password again into New Password (retype) cells.

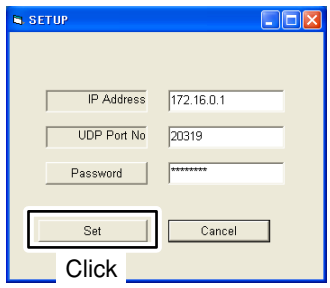
- The typed characters are masked with an "✱ (asterisk)."



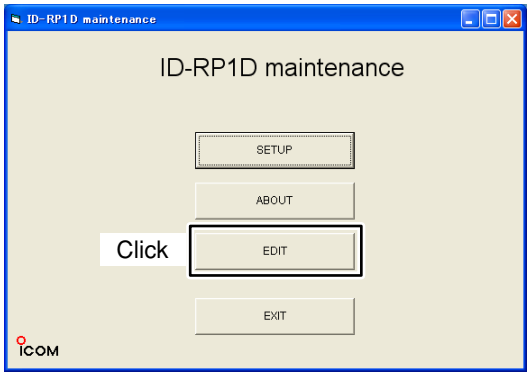
Enter the desired new password.

⑧ Click [Set] to set the new password and close the Change Password screen.

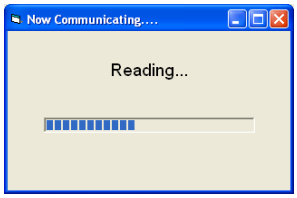
⑨ Click [Set] to close the Setup screen.



⑩ Click [EDIT].

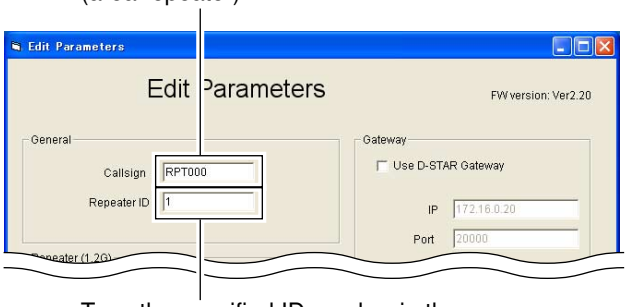


- The PC starts to read ID-RP1D current settings.
- After reading the all settings, the Edit Parameters screen appears.



⑪ Type the specified call sign for the system repeater (area repeater) and ID number into the “Callsign” and “Repeater ID” cells in “General,” respectively.

Type the specified call sign of the system repeater (area repeater).

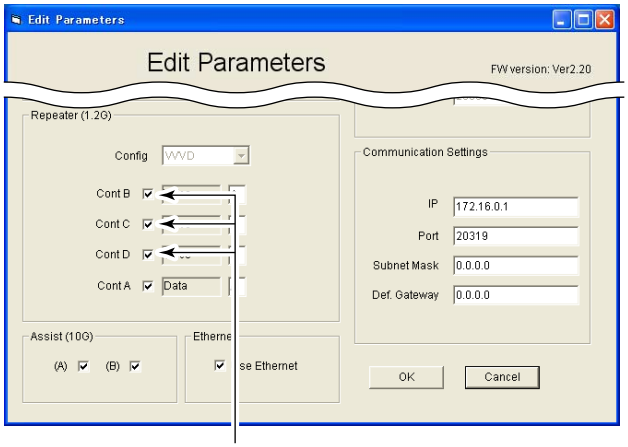


Type the specified ID number in the zone.

Important!

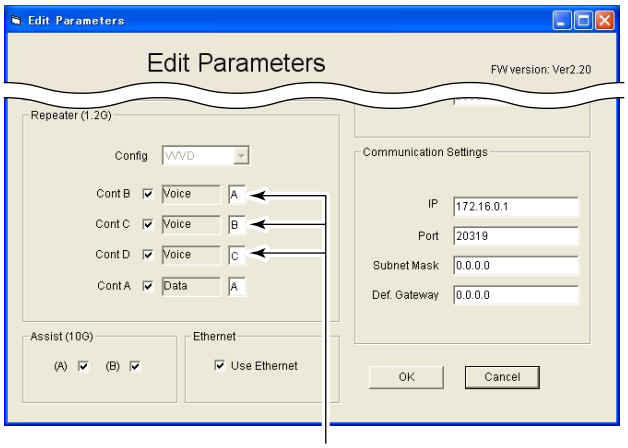
NEVER duplicate the ID number in the zone.
A unique ID number within 1 to 15 range must be entered. Otherwise the communications between area repeaters won’t be function properly.

⑫ Click the appropriate check box(es) beside “Cont B,” “Cont C” and/or “Cont D” in “Repeater (1.2G)” that the ID-RP1VS is connected to, to display the “✔” mark.



Click to add the check mark, “✔,” that the ID-RP1VS is connected to.

⑬ Type the desired unit initial A–D for each Data and Voice repeaters.

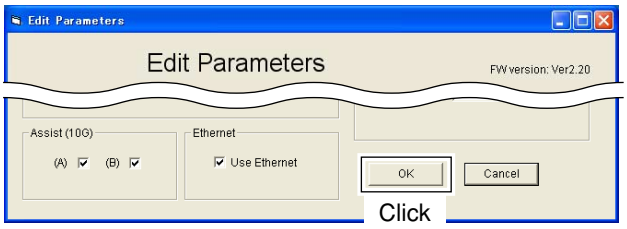


Type the unit initial A to D.

Important!

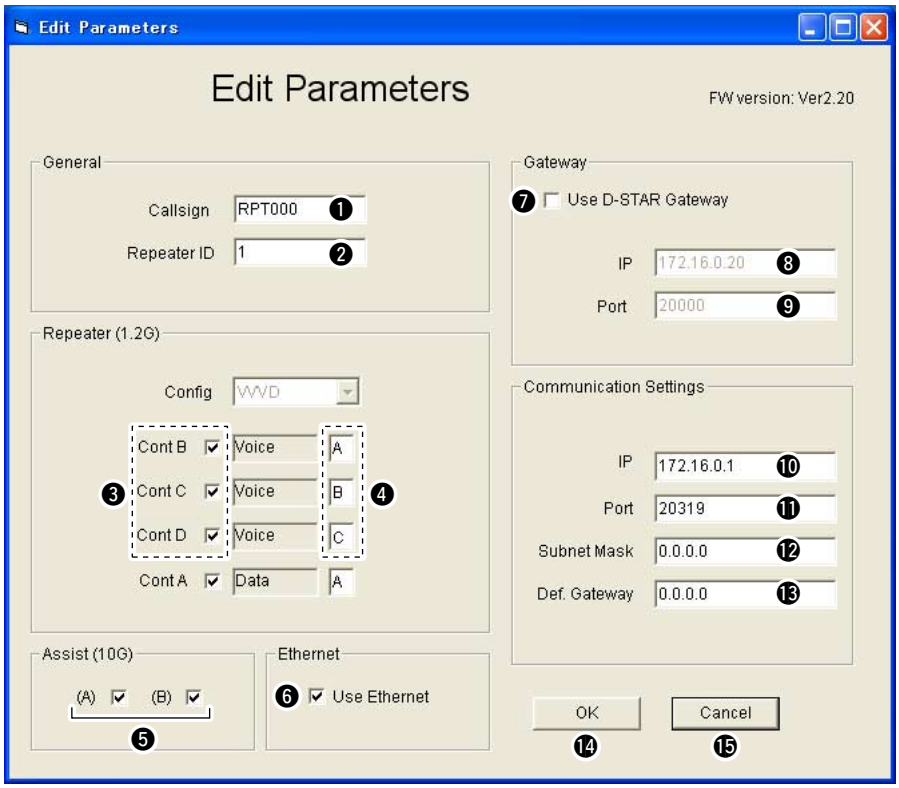
The initial “A” must be applied to both the ID-RP1D and ID-RP1VS, and **NEVER** duplicate the initial within data and voice repeaters. Otherwise the communications between area repeaters won’t be function properly.

⑭ Click [OK] to program the setting into the ID-RP1D and close the screen.



⑮ Turn the ID-RP1D power OFF, then turn the power ON again to save and activate the set conditions.

■ Screen description— Edit Parameters



❶ Callsign (Call sign)
Enter the call sign (area repeater).
Usable characters are; A to Z (capital letters only), 0 to 9 and some symbols (!, “, #, $, %, &, ‘, (,), *, +, ,, -, ., /, :, ;, <, =, >, ?, @, [, \,], ^, _).

❷ 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.

The same repeater ID code can be allocated to the repeater if the repeater operates in a different zone.

❸ Check box (Cont B to D)
Click to display the check mark (✔) in the corresponding connector name. The names correspond to [CONT B/C/D] connectors on the ID-RP1D.

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

❹ Unit initial
Enter the local repeater initial (one character) for each connected local repeater to [CONT B/C/D] connector.

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

e.g.: The “C” is the initial of RPT000_C.

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

The initial “A” must be added to one of the voice and data local repeaters when several local repeaters are connected.

NEVER duplicate the identical initial between local data repeaters, and/or local voice repeaters.

❺ Assist (10G) (Assist repeater 1/2 usage)
This setting is for assist repeaters.
[DATA A] and [DATA B] connectors for the assist repeater are available.

Apply the check mark (✔) into the corresponding initial’s check box to activate the assist repeater.

❻ **Ethernet (local server usage)**
Turn the local server (e-mail, WEB server, etc.) connection availability to the ID-RP1D 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.

❼ **Use D-STAR Gateway (gateway usage)**
Selects the D-STAR gateway connection capability with the ID-RP1D ON and OFF.

Apply the check mark (✔) when connecting a D-STAR gateway server, however, remove the check mark (✔) when no gateway server is connected.

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

❽ **IP (IP address)**
Enter the IP address of the connectable gateway.

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

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

⓫ **Port (port number)**
Enter the UDP port number of the repeater.
(Default: 20319)

⓬ **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.

⓭ **Def. Gateway (Default gateway)**
Set the default gateway address of the network that is 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.

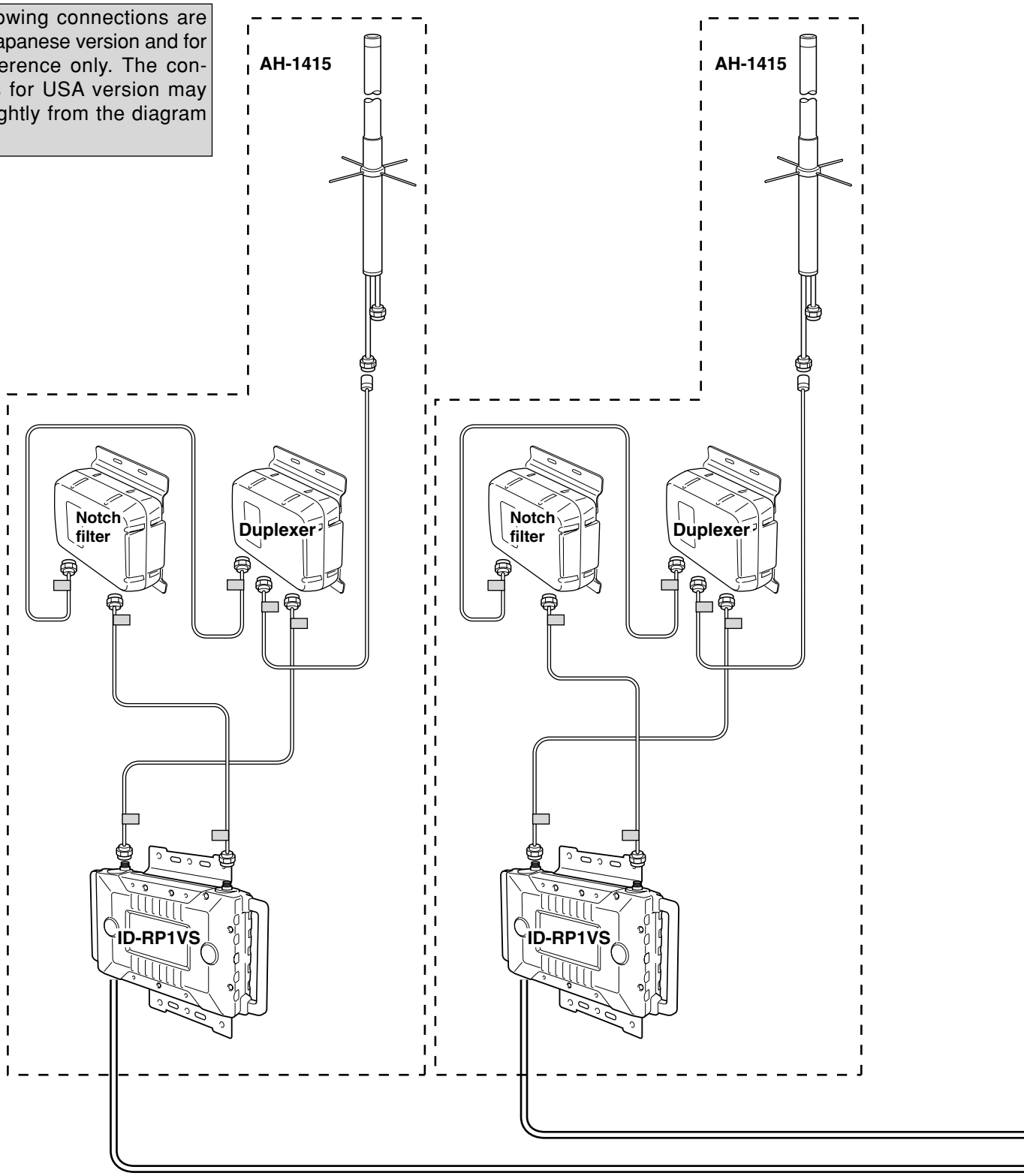
⓮ **[OK]**
Transfers and programs the displayed setting condition into the ID-RP1D.

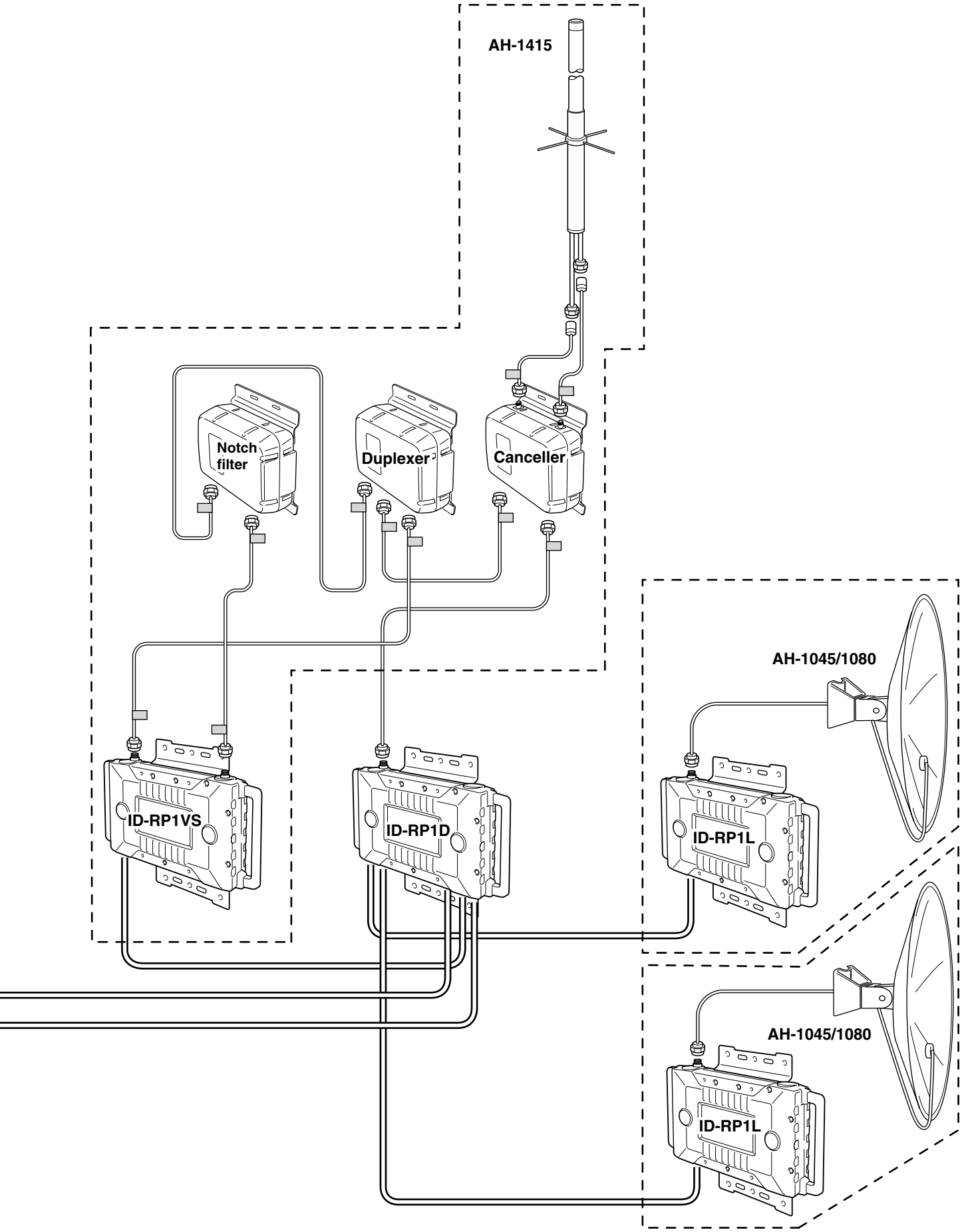
The screen is closed automatically when [OK] is clicked.

⓯ **[Cancel]**
Close the screen without programming.

6 EXAMPLE OF FULL CONNECTION SET-UP

The following connections are for the Japanese version and for your reference only. The connections for USA version may differ slightly from the diagram below.




AH-1415
Notch filter
Duplexer
Canceller
ID-RP1VS
ID-RP1D
AH-1045/1080
ID-RP1L
AH-1045/1080
ID-RP1L

MEMO

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