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TOA NF-2S Window Intercom System Expansion Set Instruction Manual

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TOA NF-2S Window Intercom System Expansion Set

Product Overview

Base Unit

Distributor

Sub-Unit
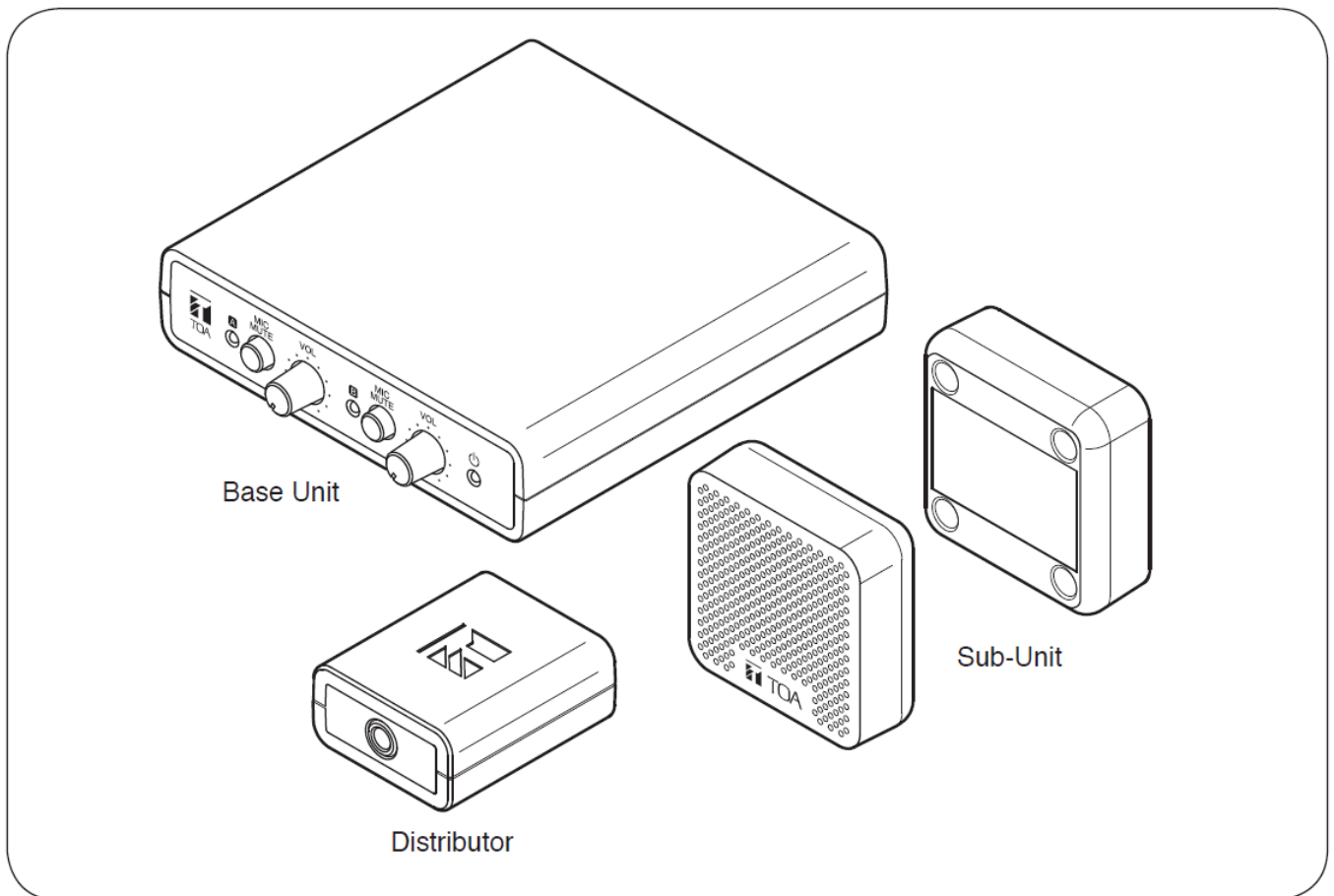
SAFETY PRECAUTIONS

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this manual handy for future reference.

  WARNING:Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Since the unit is designed for indoor use, do not install it outdoors. If installed outdoors, the aging of parts causes the unit to fall off, resulting in personal injury. Also, when it gets wet with rain, there is a danger of electric shock.
- Avoid installing the Sub-Unit in locations exposed to constant vibration.
  Excessive vibration can cause the Sub-Unit to fall, potentially resulting in personal injury.
- Should the following irregularity be found during use, immediately switch off the power, disconnect the power supply plug from the AC outlet and contact your nearest TOA dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
  - If you detect smoke or a strange smell coming from the unit
  - If water or any metallic object gets into the unit
  - If the unit falls, or the unit case breaks
  - If the power supply cord is damaged (exposure of the core, disconnection, etc.)
  - If it is malfunctioning (no tone sounds)
- To prevent a fire or electric shock, never open nor remove the unit case as there are high voltage components inside the unit. Refer all servicing to qualified service personnel.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert nor drop metallic objects or flammable materials in the ventilation slots of the unit's cover, as this may result in fire or electric shock.
- Avoid positioning sensitive medical equipment in close proximity to the Sub-Unit magnets, as the magnets could adversely affect the operation of such sensitive medical equipment as pacemakers, potentially leading to patients fainting.

Applicable to NF-2S only

- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.
- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects — including the unit itself — on the power cord, as doing so may result in fire or electric shock.
- Do not touch a power supply plug during thunder and lightning, as this may result in electric shock.
  CAUTION: Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.
- To avoid electric shocks, be sure to switch off the unit's power when connecting speakers.
- Do not operate the unit for an extended period of time with the sound distorting. Doing so may cause the connected speakers to heat, resulting in a fire.
  Avoid placing any magnetic media in close proximity to the Sub-Unit magnets, as this could have a harmful effect on the recorded contents of magnetic cards or other magnetic media, possibly resulting in damaged or destroyed data.

Applicable to NF-2S only

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Make sure that the volume control is set to minimum position before power is switched on. Loud noise produced at high volume when power is switched on can impair hearing.
- Be sure to use only the designated AC adapter and power cord. Using any other than the designated components could result in damage or fire.
- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.
- Note on the Use of Headsets: Be sure to perform the designated settings before using headsets, as failure to follow the instructions provided could generate overly loud sound output, possibly resulting in the temporary impairment of hearing.

Applicable to NF-CS1 only

- Do not connect headsets directly to the Distributor.
  If headsets are plugged into the Distributor, output from the headsets may become overly loud, potentially resulting in temporary impairment of hearing.
  The socket-outlet shall be installed near the equipment and the plug (disconnecting device) shall be easily accessible.

GENERAL DESCRIPTION

[NF-2S]
Consisting of one Base Unit and two Sub-Units, the NF-2S Window Intercom system is designed to relieve problems in understanding face-to-face conversations through a partition or face masks. Since the Sub-Units' built-in magnets allow them to be easily attached to both sides of a partition, they can be used even in locations without ample mounting space.

[NF-CS1]
The NF-CS1 Expansion Set is designed exclusively for use with the NF-2S Window Intercom System, and consists of a System Expansion Sub-Unit and a Distributor for sound distribution. The coverage area for assisted conversations can be expanded by increasing the number of NF-2S Sub-Units.

FEATURES

[NF-2S]

- Provides full, intuitive support for simultaneous two-way conversation thanks to DSP signal processing and wideband audio output, while eliminating dropouts in sound output.
- A compact and lightweight Sub-Unit design facilitates installation.
- Magnetically mounted Sub-Units are easily installed, eliminating the need for brackets and other metal fittings.
- Allows easy connection of commercially available headsets*1 as a replacement sound source for either of the pair of Sub-Units.
- The external control input terminal of MUTE IN allows easy muting microphone for Sub-Unit or Headset* which is connected to input A.
    - Headsets not supplied. Please purchase separately. TOA does not have any headsets available that are compatible with these products. (See "Connection of Commercially Available Headsets" on p. 13.)

[NF-CS1]

- The compact and lightweight design of Sub-Unit and Distributor facilitates installation.
- Magnetically mounted Sub-Units are easily installed, eliminating the need for brackets and other metal fittings.

USAGE PRECAUTIONS

- Do not remove the rubber feet attached to the rear panel of the Sub-Units. Purposely removing these rubber feet or using the Sub-Units with their rubber feet detached could result in unit failure.
- If howling* (acoustic feedback) occurs, lower the volume or change the mounting locations of the Sub-Units. An unpleasant, high-pitched shrieking noise produced when the output signal from a speaker is picked up by the microphone and reamplified in an endless intensifying loop.
- When installing multiple NF-2Ss in the same location or area, try to maintain at least a 1 m (3.28 ft) distance between adjacent Sub-Units.
- Follow the above procedure when using the NF-CS1 to increase the number of Sub-Units.
- If the units become dusty or dirty, wipe lightly with a dry cloth. If the units become especially dirty, wipe lightly with a soft cloth moistened with water-diluted neutral detergent, then wipe again with a dry cloth. Never use benzine, thinner, alcohols or chemically-treated cloths, under any circumstances.
- The recommended distance from a speaking person's mouth to the Sub-Unit microphone is 20 –50 cm (7.87″ – 1.64 ft). If the units are too far away from the user, the voice could become difficult to hear or the sound may not be picked up correctly. If too close, the voice output could become distorted, or howling could occur.
- Avoid blocking the front sub-unit microphone with fingers, objects or the like, as the audio signal cannot be correctly processed, potentially resulting in abnormal or highly distorted sound output. A similar type of sound distortion may also be generated when the front of the Sub-Unit is blocked due to it having fallen or other similar incident.
- This distortion, however, will likely vanish once the Sub-Unit is returned to its normal installed position. (Please keep in mind that this distorted sound does not indicate equipment failure.)

INSTALLATION PRECAUTIONS

[NF-2S]

- The supplied AC adapter and power cord* are designed exclusively for use with the NF-2S system. Do not use

these to power any other devices than the NF-2S system.

- Use the dedicated cables for connection between the Base Unit and the Sub-Units.
- The supplied dedicated cables are exclusively designed for use with the NF-2S. Do not use them with any other devices than the NF-2S system.
- Do not connect any external devices to the Base Unit other than the Sub-Units, compatible headsets or the optional Distributor.

  No AC adapter and power cord are supplied with the version W. For usable AC adapter and power cord, consult your nearest TOA dealer.

[NF-CS1]

- The supplied dedicated cables are exclusively designed for use with the NF-CS1 and NF-2S. Do not use them with any other devices than the NF-CS1 and NF-2S.
- Up to three Sub-Units (two Distributors) can be connected to each of the NF-2S Base Unit's A and B Sub-Unit jacks, including the Sub-Unit supplied with the NF-2S. Do not connect more than three Sub-Units at one time.
- Do not connect headsets directly to the Distributor.

NOMENCLATURE

NF-2S

Base Unit
[Front]
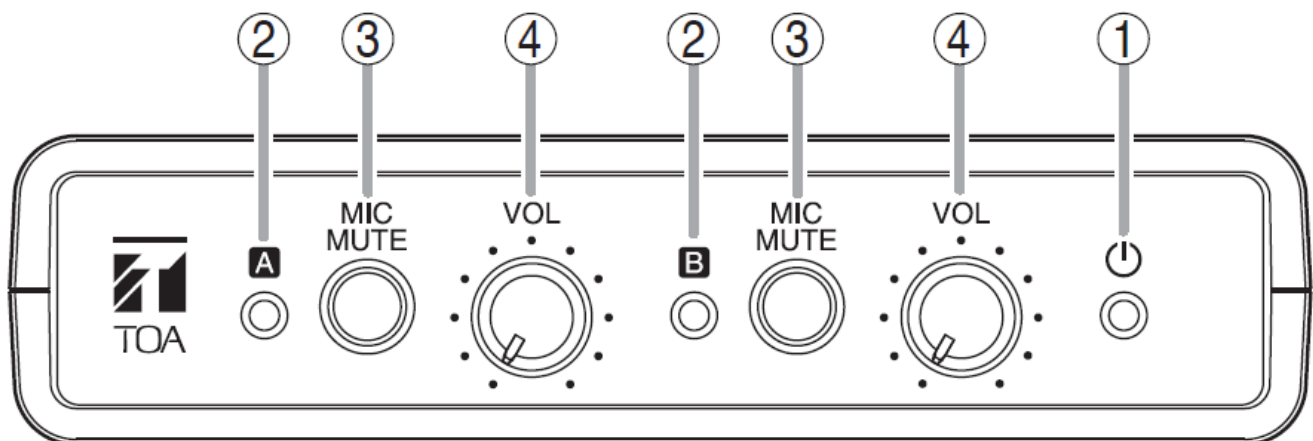
1. **Power indicator (green)**

   Lights when the Power switch (5) is turned ON, and extinguishes when turned OFF.
2. **Signal indicators (green)**

   These indicators light up whenever audio is detected from a Sub-Unit connected to Sub-Unit jacks A (8), B (7), or headset.
3. **Mute buttons**

   Used to mute the Sub-Unit microphones connected to the Sub-Unit jacks A (8), B (7), or headset microphones.
   Pressing a button mutes the microphone, and no voice output is transmitted from the opposite speaker.
4. **Volume controls**

   Used to adjust the output volumes of Sub-Units connected to the Sub-Unit jacks A (8) or B (7), or headset.
   Rotate clockwise to increase the volume and counter-clockwise to decrease.

[Rear]
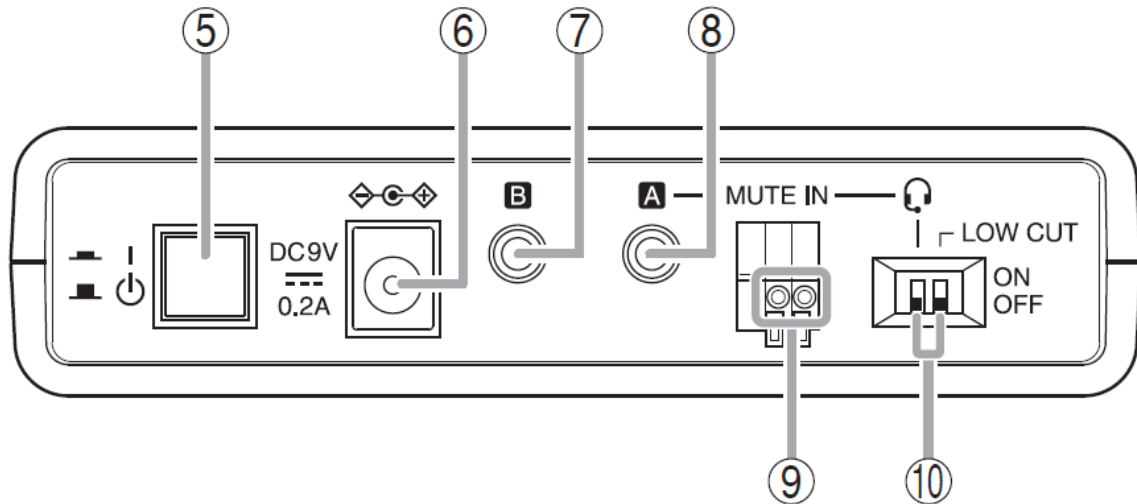
5. **Power switch**

   Press to turn ON the power to the unit, and press again to turn the power OFF.

6. **Socket for AC adapter**

   Connect the designated AC adapter here.

7. **Sub-Unit jack B**

   Connect the Sub-Units using the dedicated cable.

   When using the NF-CS1, use the dedicated cable to connect the Distributor to this jack.

   CAUTION: Never connect headsets directly to this jack. Failure to observe this caution could result in a loud noise from the headset that could cause momentary hearing loss.

8. **Sub-Unit jack A**

   Connect the Sub-Units using the dedicated cable.

   When using the NF-CS1, use the dedicated cable to connect the Distributor to this jack.

   Tip

   Commercially available headsets can also be connected to this jack (provided they use a ø3.5, 4-pole mini plug connector that conforms with CTIA standards.)

   CAUTION: When connecting headsets to this jack, first switch ON switch 1 of the DIP switch (10). Also, use only headsets that comply with CTIA standards. Failure to observe these cautions could result in loud noise from the headset that could cause momentary hearing loss.

9. **External control input terminal**

   Push-type terminal block (2P)

   Open circuit voltage: 9 V DC or less

   Short circuit current: 5 mA or less Connect a no-voltage 'Make' contact (push button switch, etc.) to enable the Mute function. While the circuit is 'made,' the microphone of the Sub-Unit or headset connected to Sub-Unit jack A (8) will be muted.

10. **DIP switch**

    This switch allows selection of the device being connected to Sub-Unit jack A (8), and enables/disables the low-cut filter of the Sub-Unit speaker.

    - **Switch 1**

      Selects type of device being connected to Sub-Unit jack A (8).

      Note

      Be sure the Power is turned OFF before performing this operation.

      ON: Headset

OFF: Sub-Unit or NF-CS1 Distributor (factory default)

- **Switch 2 [LOW CUT]**

  This switch enables or disables the low-cut filter used to suppress low-to-midrange sound output.

  Turn ON to suppress sound output if concerned about privacy or if the Sub-Unit is installed in a location where sound is likely to be muffled, such as near a wall or desk.

  ON: Low-cut filter enabled

 **OFF:** Low-cut filter disabled (factory default)

[Explanation of Unit Symbols]

| Indication	Position	Meaning
⏻	Front panel	The LED next to this symbol is the power indicator, which shows the system's operating status. Whether the system is in operation or standby mode is indicated by the LED being lit or extinguished.
▬ I	Rear panel	Indicates that the system is in operation.
▬ ⏻	Rear panel	Indicates that the system is in standby mode.
DC9V▬	Rear panel	Shows the system's power voltage (9 V DC).
◇−ⓒ−◈	Rear panel	Shows the polarity of the AC adapter socket. The center pin is positive and its surrounding surface is negative.

Sub-Unit
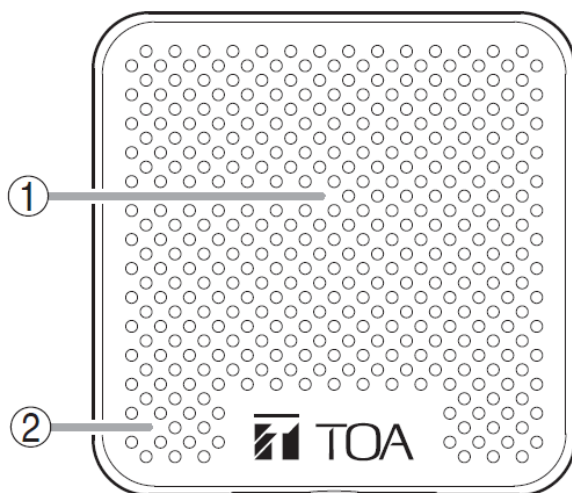
[Front]   **[Rear]**
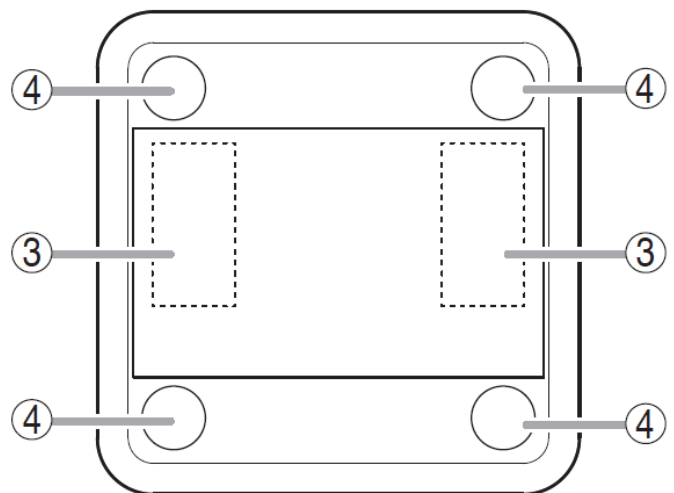
[Bottom]
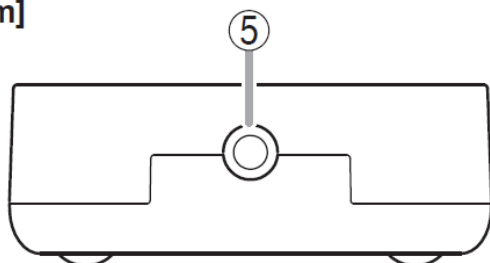
1. **Speaker**

   Outputs the voice signal picked up by the other paired Sub-Unit.

2. **Microphone**

   Picks up voice sounds, which are then output from the other paired Sub-Unit.

3. **Sub-Unit mounting magnet**

Used to attach the Sub-Unit to a steel plate or when mounting the two Sub-Units to both sides of a partition.

4. **Rubber feet**

Reduce the transmission of vibration to the Sub-Unit. Do not remove these rubber feet.
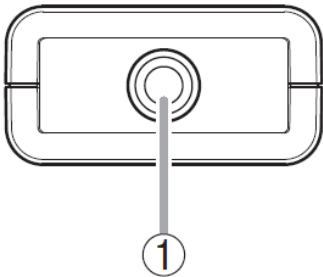
5. **Cable connector**

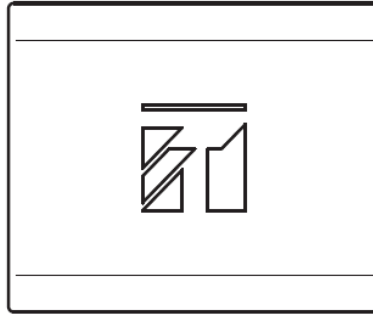Connects to the Base Unit or Distributor by way of the dedicated cable.

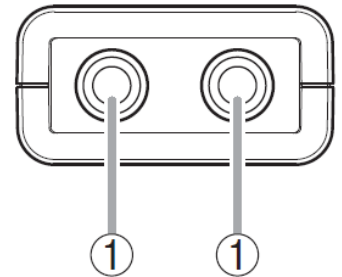**NF-CS1**

Distributor

[Left side] [Front] [Right side]

1. **I/O connector**

Use the dedicated cable to connect the NF-2S Base Unit's Sub-Unit jack, the Sub-Unit's Cable connector or another Distributor's I/O connector.

Sub-Unit
These are identical to the Sub-Units that come with the NF-2S. (See "Sub-Unit" on p. 10.)
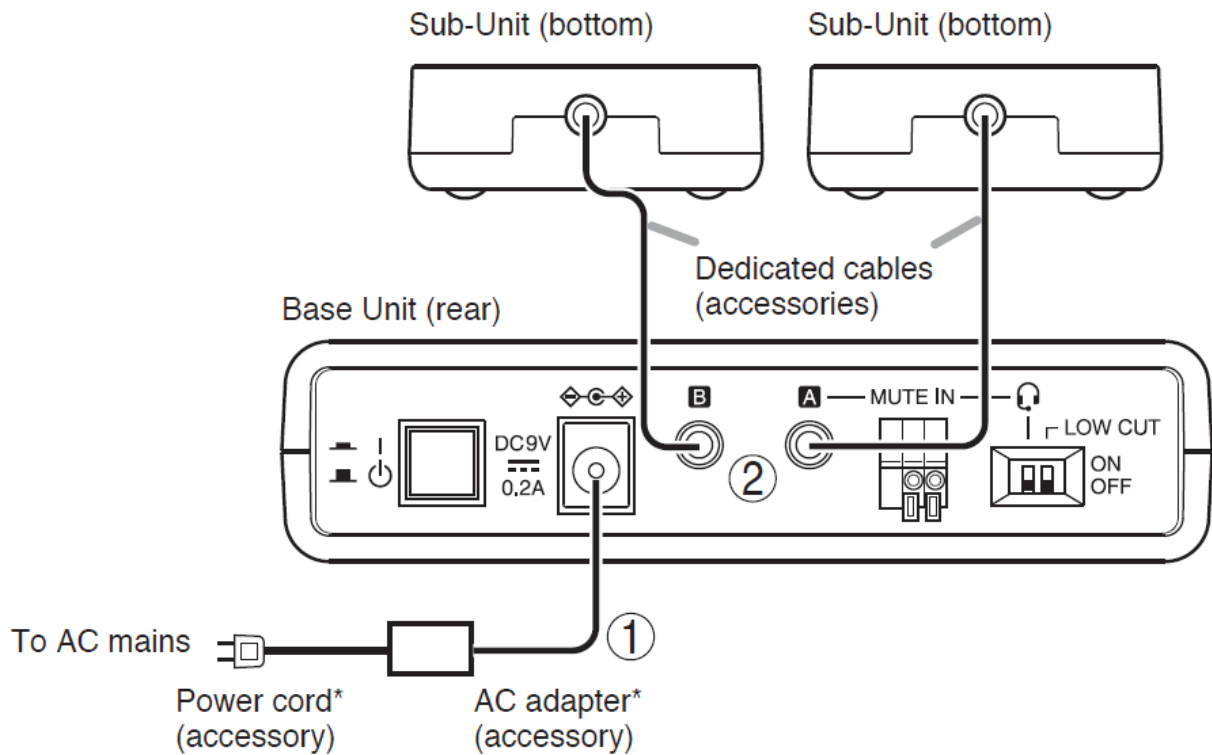
Tip
Although their labels may appear slightly different from those of the NF-2S's Sub-Units, operation and performance are exactly the same.

CONNECTIONS

Basic System Configuration
The basic system configuration of NF-2S is as follows.

Sub-Unit (bottom) Sub-Unit (bottom)

Base Unit (rear)

Dedicated cables (accessories)

To AC mains

Power cord*
(accessory)

AC adapter*
(accessory)

1. **AC adapter connection**

   Connect the Base Unit to an AC outlet using the supplied AC adapter and power cord*.

   CAUTION:Be sure to use only the designated AC adapter and power cord*. Using any other than the designated components could result in damage or fire. * No AC adapter and power cord are supplied with the version W. For usable AC adapter and power cord, consult your nearest TOA dealer.

2. **Sub-Unit connection**

   Connect Sub-Units to these jacks using the supplied dedicated cables (2 m or 6.56 ft). If the cables are not long enough for connection, use the optional YR-NF5S 5m Extension cable (5 m or 16.4 ft).

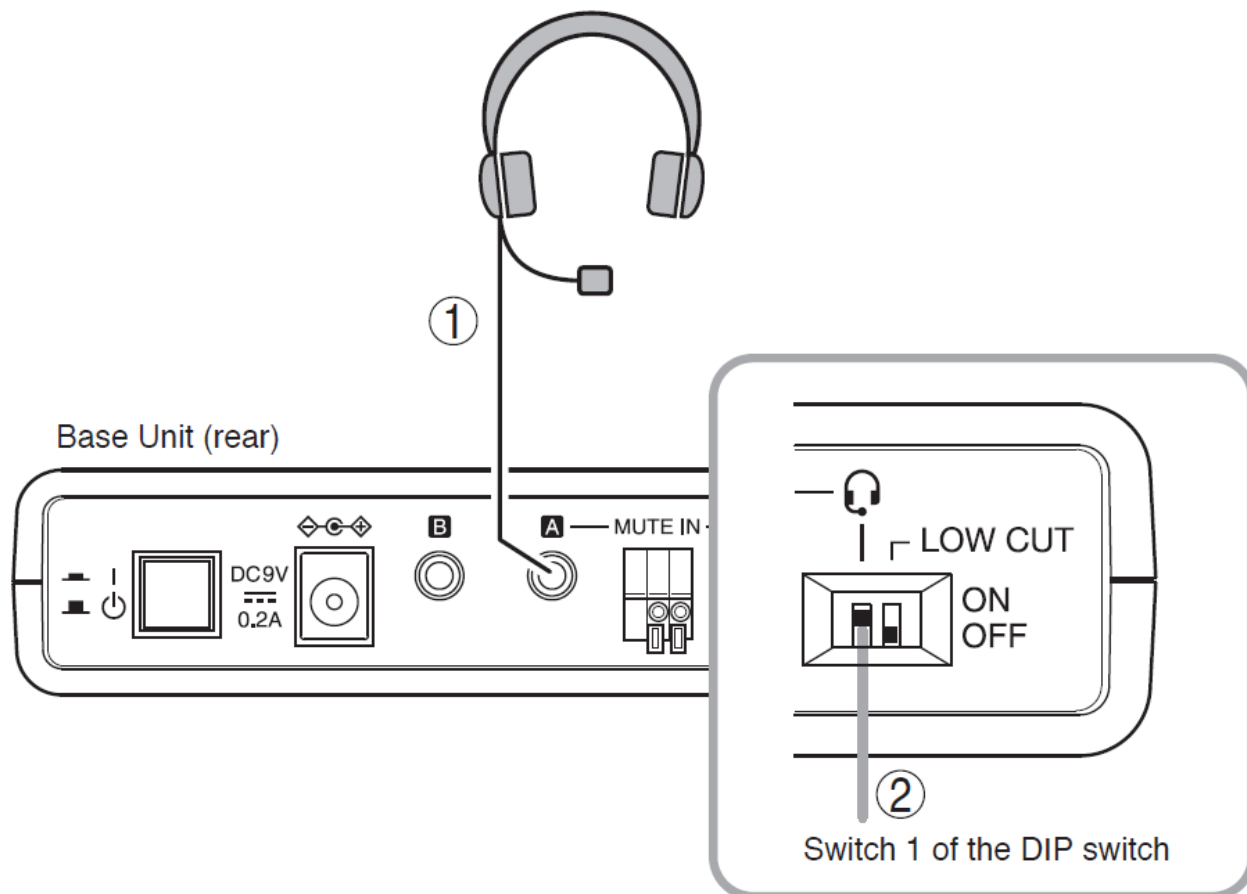**Connection of Commercially Available Headsets**

When using commercially available headsets, connect only to Sub-Unit jack A and turn ON switch 1 of the DIP switch.
Please note that the Sub-Unit or NF-CS1 Distributor cannot be connected to Sub-Unit jack A while switch 1 is ON.
Connections for the AC adapter and Sub-Unit jack B are identical to those shown in the "**Basic System Configuration**" on p. 12.

[**Compatible Headsets**]

Connector specifications:

- Compliant with CTIA Standards
- 3.5 mm, 4-pole mini plug

Base Unit (rear)

Switch 1 of the DIP switch

1. **Headset connection**

   Plug the connector of a commercially available headset into Sub-Unit jack A.

   Note: Headsets cannot be connected to Sub-Unit jack B or the NF-CS1 Distributor.
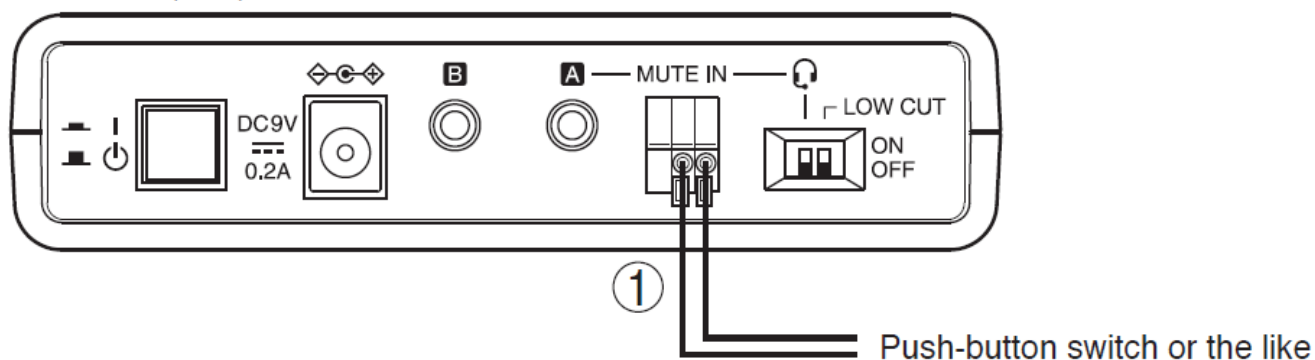
2. **DIP switch settings**

   Set switch 1 of the DIP switch to ON.

3. **Connection of Mute Switch**

   Any commercially available push-button switch can be connected to the external control input terminal.

   Note: If the external mute function is not to be used, do not connect any switch to the external control input terminal.

Base Unit (rear)

Push-button switch or the like

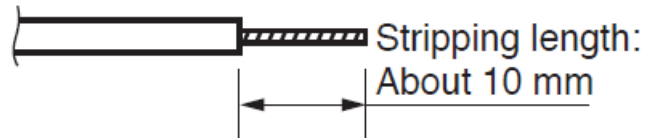1. External mute input device connection

   Connect a commercially available push-button switch or the like.
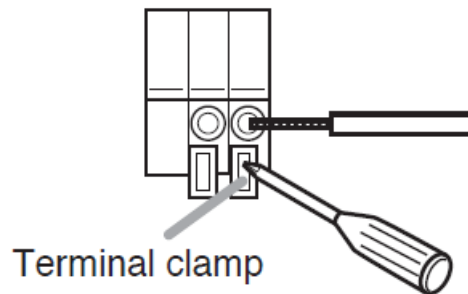
   Compatible wires sizes:

- **Solid wire:** 0.41 mm- 0.64 mm

  (AWG26 – AWG22)
- **Stranded wire:** 0.13 mm2 – 0.32 mm2

  (AWG26- AWG22)

Connection

**Step 1.** Strip back the wire insulation by about 10 mm.

Stripping length:
About 10 mm

Step 2. While holding open the terminal clamp with a screwdriver, insert the wire then let go of the terminal clamp to connect.

Terminal clamp

Step 3. Lightly pull on the wires to ensure that they don't pull out.
To prevent the cores of stranded wires from loosening over time, attach insulated crimp pin terminals on the ends of the wires.

Recommended ferrule terminals for signal cables (made by DINKLE ENTERPRISE)

Insulation sleeve
Contact area
a
b
l2
l1
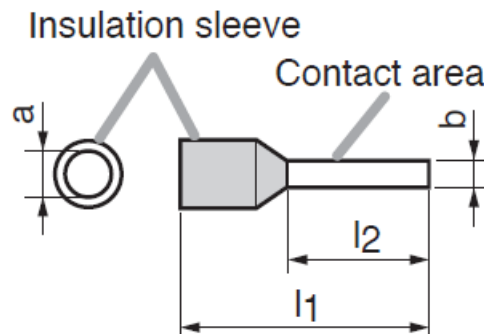
| Model Number	a	b	l	l
DN00308D	1.9 mm	0.8 mm	12 mm	8 mm
DN00508D	2.6 mm	1 mm	14 mm	8 mm

Sub-Unit Expansion

Up to two NF-CS1 Distributor can be connected to each of Sub-Unit jack A or B, for a total of 3 Sub-Units per jack.

Note: To prevent howling, ensure at least 1 m distance between connected Sub-Units.

Connection Example:
One Distributor (and two Sub-Units) connected to Sub-Unit jack A and two Distributors (and three Sub-Units) connected to Sub-Unit jack B. (Use of one NF-2S and three NF-CS1s.)
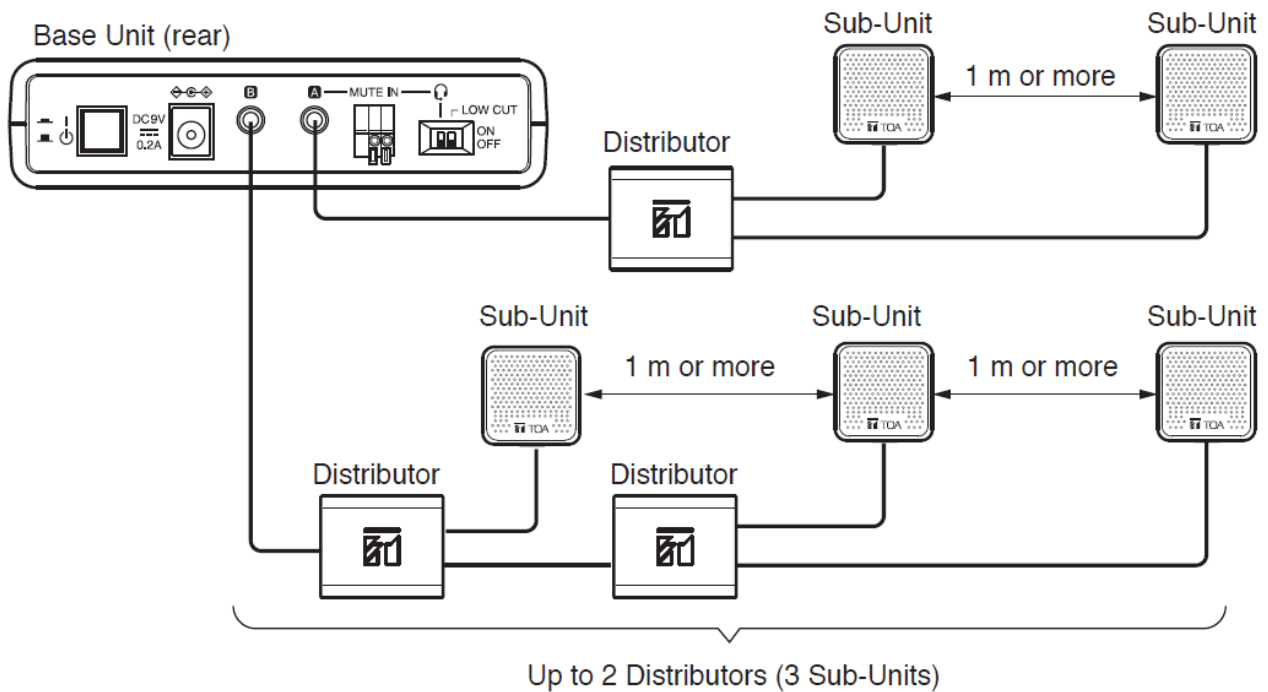
Note: The order of connected Sub-Units (whether those included with the original NF-2S or the NF-CS1) doesn't™ matter.

INSTALLATION

Base Unit Installation
When placing the Base Unit on a desk or similar surface, attach the supplied rubber feet to the circular indents in the Base Unit's bottom surface.

Sub-Unit Installation

1. **Mounting on both sides of a partition**

   Attach the Sub-Units to both sides of a partition by sandwiching it between the magnets built into their rear panels.

   Note: The maximum thickness of the partition is approximately 10 mm (0.39″). If the partition exceeds this thickness, use the pair of supplied metal plates for attachment. (See the next page for more information on the metal plates.)

Magnets (2 places)

Sub-Unit

Sub-Unit

Sandwich the partition.
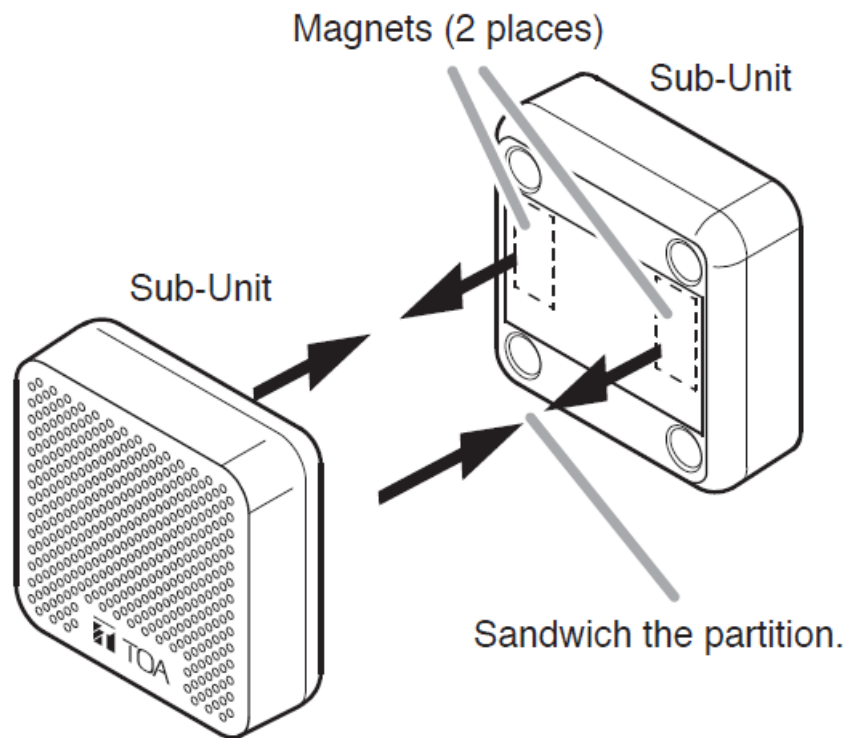
Notes:

- Ensure that the Sub-Units are positioned at least 15 cm (5.91″) away from the nearest edge of the mounting surface when mounting. If the distance to the edge is less than 15 cm (5.91″), howling could result.

Partition thickness: 10 mm (0.39") or less

15 cm (5.91")
or more

15 cm (5.91")
or more

15 cm (5.91")
or more

15 cm (5.91")
or more
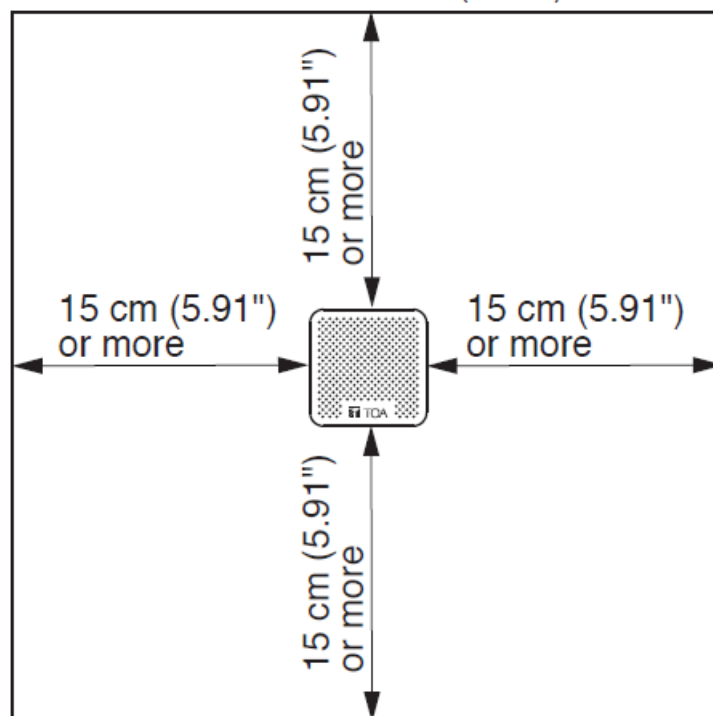
- Install the Sub-Units so that the top and bottom of each unit are facing in the same direction on both sides of the partition. Due to the polarity of the magnets, they cannot be installed in any other orientation.

2. **Use of the Metal Plates**

   Use the supplied metal plates to mount the Sub-Units in the following cases:

   - When the partition onto which the Sub-Units are to be mounted is over 10 mm (0.39″) in thickness.
   - When the two Sub-Units are not to be magnetically attached to each other.

- When the Sub-Units require a stronger mounting.

  Note: When using the metal plates, do not attach the rear panels of two Sub-Units to each other. If attached, howling will result even at low volumes.
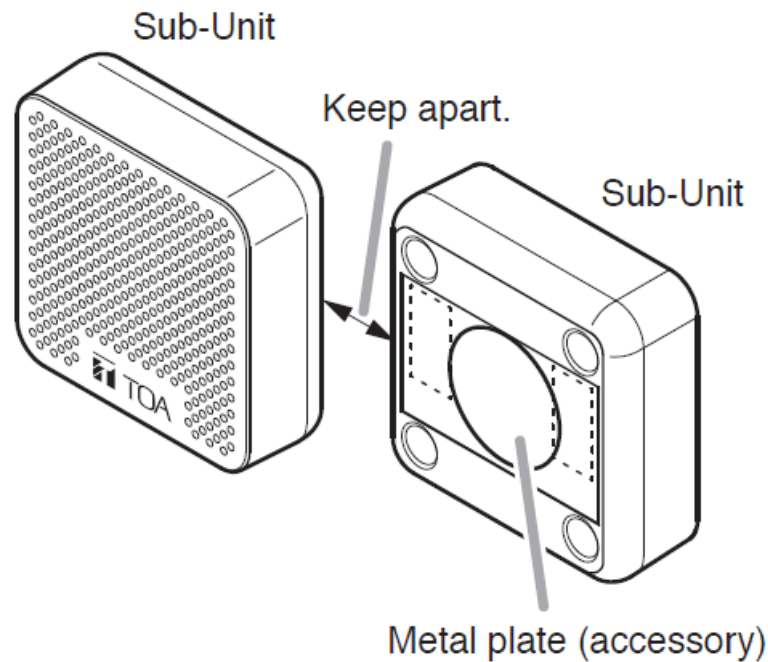

Step 1. Be sure to remove dust, oil and grime, etc. from the mounting surface.

Note Wipe clean. If dirt or grime is not sufficiently removed, the Sub-Unitâ€™s magnetic strength could be severely weakened, potentially causing the Sub-Unit to fall.

Step 2. Peel off the backing paper on the back surface of the metal plate and affix the metal plate to the intended mounting position.

Note: Securely attach the metal plate by pressing firmly on it. Failure to firmly press on the metal plate when attaching it to the partition could result in a weak initial attachment, leading to the metal plate peeling off when the Sub-Unit is removed or the mounted
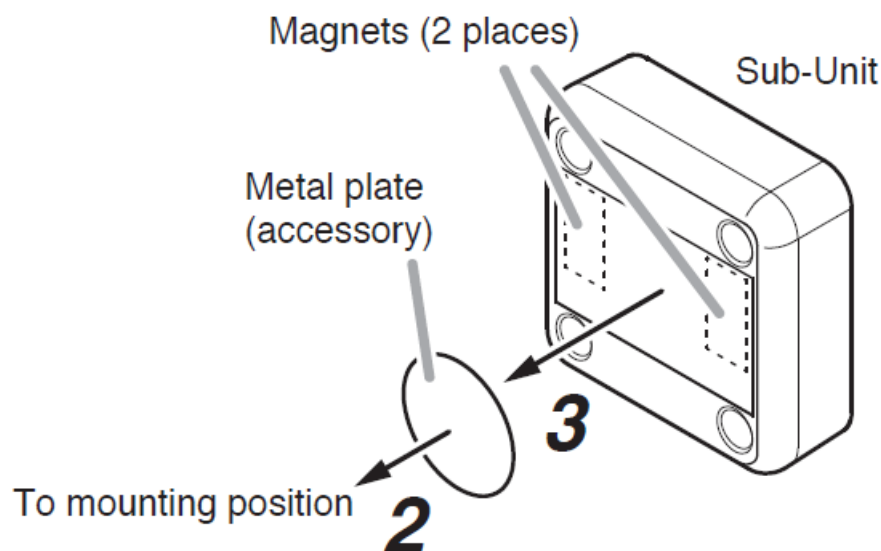

Step 3. Align the metal plate with the Sub-Unit's magnet and mount the Sub-Unit to the partition.

Notes

- When mounting the Sub-Units to the partition by magnetically sandwiching it between them, ensure that they are positioned at least 15 cm (5.91″) away from the nearest edge of the mounting surface. If the distance to the edge is less than 15 cm (5.91″), howling could be produced.

○ When mounting the Sub-Units to a partition without aligning their rear panels with each other, if the distance between the Sub-Units is too short, howling could result. In such cases, either lower the volume or change the mounting locations of the Sub-Units.

Partition, panel, etc.

15 cm (5.91") or more

15 cm (5.91") or more

15 cm (5.91") or more

15 cm (5.91") or more
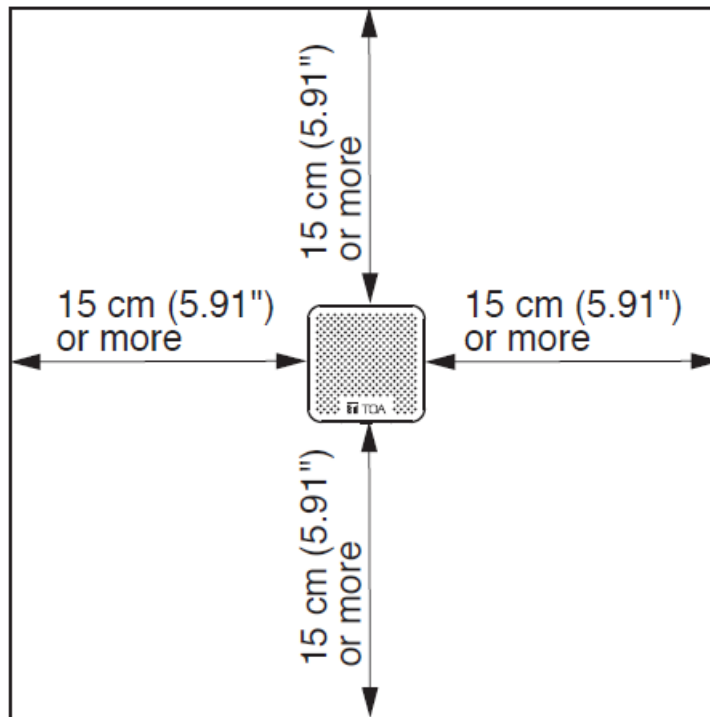
3. **For cable arrangement**

Cables can be neatly arranged during installation by using the supplied mounting bases and zip ties.

Sub-Unit

Mounting base

Zip tie

After securing the cables, cut the zip ties at the base.

Partition
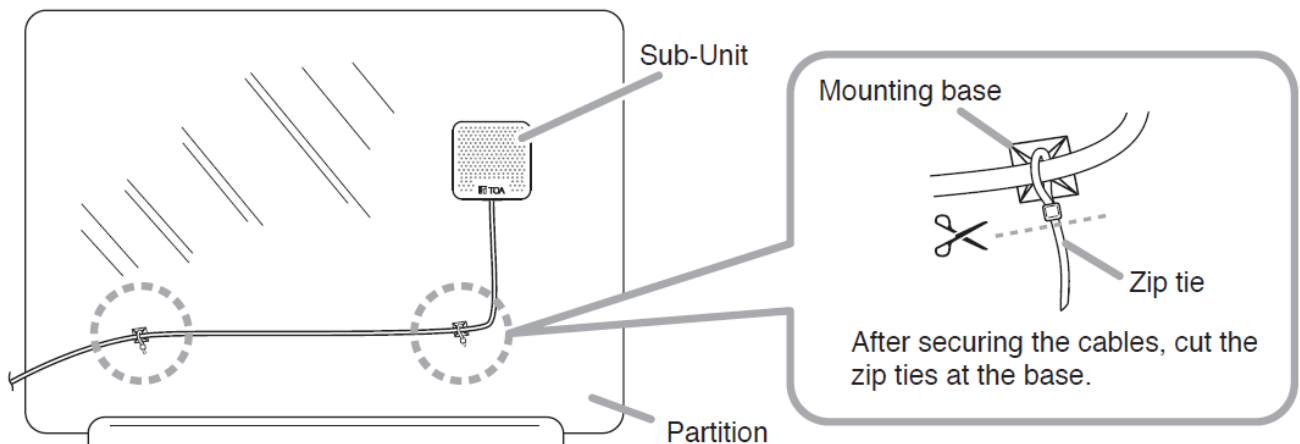
CHANGING AUDIO OUTPUT SETTINGS

Audio output settings can be changed by switching ON switch 2 of the DIP switch. (Factory default: OFF)

[Reducing sound propagation]
The range in which the Sub-Unit speaker can be heard can be reduced by suppressing the low-to-midrange sound output.

[If voice output sounds muffled and unclear, depending on installation conditions]
If the Sub-Unit is installed near a wall or desk, voice output may seem muffled.
Suppressing the low-to-midrange sound output may make it easier to hear the voice output.

Switch 2 of the DIP switch
ON
OFF

Base Unit (rear)

DC9V
0.2A

B   A — MUTE IN

LOW CUT
ON
OFF
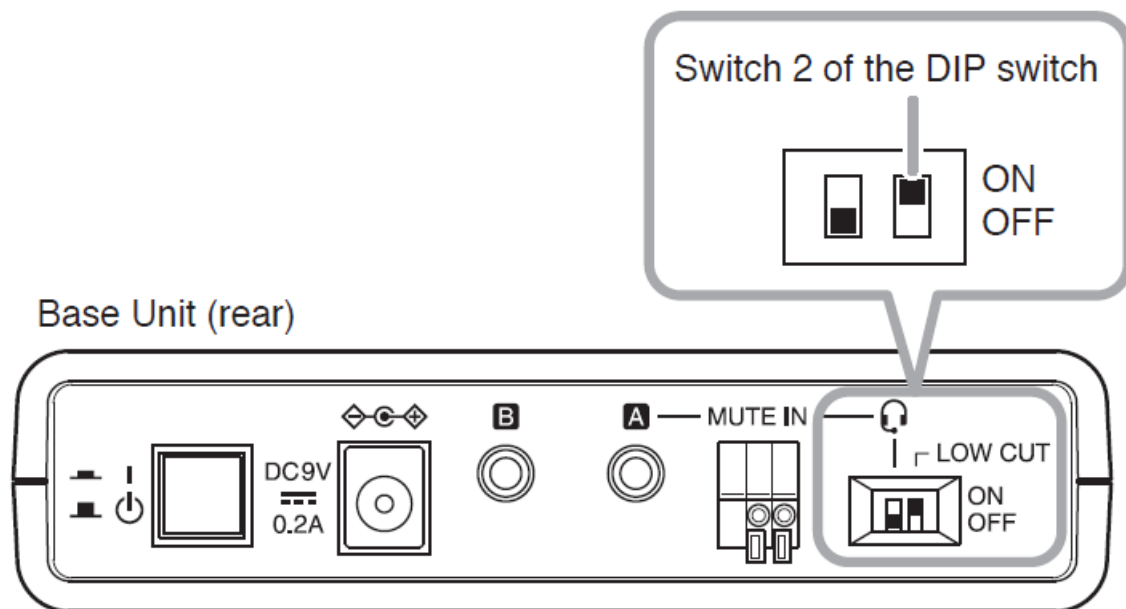
VOLUME ADJUSTMENT

Adjust the output volume of Sub-Units to an appropriate level using their corresponding volume knobs located on the front panel of the Base Unit.

DOWNLOAD SITE

The Sub-Unit Setup Guide and templates for Speak Here labels can be conveniently downloaded from the following URL:
https://www.toa-products.com/international/detail.php?h=NF-2S

REGARDING OPEN SOURCE SOFTWARE

The NF-2S utilizes software based on the Open Source Software license. If more detailed information regarding the Open Source Software employed by the NF-2S is required, please download it from the above download site. Also, no information will be provided about the actual contents of the source code.

SPECIFICATIONS

NF-2S

Power Source	100 – 240 V AC, 50/60 Hz (use of the supplied AC adapter)
Rated Output	1.7 W
Current Consumption	0.2 A
Signal to Noise Ratio	73 dB or more (volume: min.) 70 dB or more (volume: max.)
Mic Input	–30 dB[*1], ø3.5 mm mini jack (4P), phantom power supply
Speaker Output	16 Ω, ø3.5 mm mini jack (4P)
Control Input	External mute input: No-voltage make contact inputs, open voltage: 9 V DC or less short-circuit current: 5 mA or less, push-in terminal block (2 pins)
Indicators	Power indicator LED, Signal indicator LED
Operating Temperature	0 to 40 °C (32 to 104 °F)
Operating Humidity	85%RH or less (no condensation)
Finish	Base Unit: Case: ABS resin, white, paint Panel: ABS resin, black, paint Sub-Unit: ABS resin, white, paint
Dimensions	Base Unit: 127 (w) x 30 (h) x 137 (d) mm (5″ x 1.18″ x 5.39″) Sub-Unit: 60 (w) x 60 (h) x 22.5 (d) mm (2.36″ x 2.36″ x 0.89″)
Weight	Base Unit: 225 g (0.5 lb) Sub-Unit: 65 g (0.14 lb) (per piece)

[*1] 0 dB = 1 V
Note: The design and specifications are subject to change without notice for improvement.

Accessories

AC adapter*2 …………………………………………………………… 1
Power cord*2 (1.8 m or 5.91 ft) …………………………………. 1
Dedicated cable (4 pins, 2 m or 6.56 ft) …………………….. 2
Metal plate …………………………………………………………… 2
Rubber foot for Base Unit ………………………………………... 4
Mounting base ……………………………………………………. 4
Zip tie ………………………………………………………………… 4

2 No AC adapter and power cord are supplied with version W. For a usable AC adapter and power cord, consult your nearest TOA dealer.
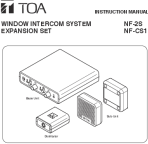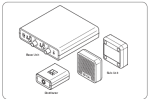
Optional products
5m Extension cable: YR-NF5S

NF-CS1

Input/Output	ø3.5 mm mini jack (4P)
Operating Temperature	0 to 40 °C (32 to 104 °F)
Operating Humidity	85%RH or less (no condensation)
Finish	Distributor: Case, Panel: ABS resin, white, paint Sub Unit: ABS resin, white, paint
Dimensions	Distributor: 36 (w) x 30 (h) x 15 (d) mm (1.42″ x 1.18″ x 0.59″) Sub Unit: 60 (w) x 60 (h) x 22.5 (d) mm (2.36″ x 2.36″ x 0.89″)
Weight	Distributor: 12 g (0.42 oz) Sub Unit: 65 g (0.14 lb)

Note: The design and specifications are subject to change without notice for improvement.

Accessories
Dedicated cable (4 pins, 2 m or 6.56 ft) …………………….. 2
Metal plate …………………………………………………………… 1
Mounting base ……………………………………………………. 4
Zip tie ………………………………………………………………… 4

Documents / Resources

	TOA NF-2S Window Intercom System Expansion Set [pdf] Instruction Manual NF-2S, NF-CS1, Window Intercom System Expansion Set, NF-2S Window Intercom System Expansion Set
	TOA NF-2S Window Intercom System Expansion Set [pdf] Instruction Manual NF-2S, NF-CS1, Window Intercom System Expansion Set, NF-2S Window Intercom System Expansion Set, System Expansion Set, Expansion Set

References

- **TOA DATA Library**
- **HOME | TOA - Sound and Communication**