Voice Synthsizer
Instruction Manual
[TYPE : BDV]

Thank you very much for purchasing the Voice Synthsizer. Before use, please read this Instruction Manual thoroughly and use the product correctly.In addition, keep this manual in a safe place.When carrying out maintenance/check, repair etc. , be sure to reread this manual.If an unclear point arises, please inquire to each sales office or technical consultation service written in the last page.

Safety Precautions

In order to prevent harm on users or other persons and damage on properties, the matters to be kept without fail are explained as follows.
■The degree of harm and damage that will occur when misuse is made by ignoring the contents of indication is classified and explained by the following indications.

⚠WARNING	The column with this indication shows the contents in which "possibility of death or being seriously injured is assumed."
⚠CAUTION	The column with this indication shows the contents in which "possibility of being injured or only occurrence of property damage is assumed."

1.Matters to be kept without fail for Safety Purpose

⚠WARNING
●At the wiring and mounting of products, be sure to cut off power source.There is a risk of electrical shock.
●Do not disassemble or modify the product.There is a risk of fire, electrical shock etc. For repair, check etc of inside the product, please inquire to each sales office or technical consultation service written in the last page.
●Pay attention not to mistake wiring work.If wiring is mistaken,the internal circuit may burn out and it will become a cause of fire.
●Be sure to use the power supply within the allowable voltage range of the product.Otherwise,it may become a cause of fire and/or failure.
●For the installation with execution of work,be sure to ask a professional company.Otherwise,there is a risk of electrical shock,fire and/or falling etc.

⚠CAUTION
●Be sure to connect the external fuse for protection of the power supply circuit and internal circuit of the product.
●Do not use it at the place where vibration exists that is exceeding the specifications. In addition,be sure to install on upright direction at the place where vibration exists.There is a risk of damage and/or falling of the product.

The trouble occurred due to mishandling against the warning and caution matters, and/or due to disassembling, modification, natural disaster etc. cannot be guaranteed. Further, avoid the usage under conditions other than the contents described in this manual.

─ Request ─
●Use it in the environment where strong radio waves and/or inductive noise do not exist.Otherwise,there is a risk of noise generation from the Speaker.
●Use it in the environment where corrosive gas does not exist. Otherwise, it will become a cause of failure.
●In order to avoid electrostatic breakdown,start to work after discharging static electricity which is charged on a human body.
By touching an earthed metallic part with a bare hand, static electricity can be discharged.
●Perform fitting of each part at a recommended torque value.
●Pay attention not to lose the parts such as the terminal covers,front covers etc. which are to be detached at performing work.
●If this product is used for the safety-sensitive security purpose, be sure to perform daily check, and establish the system design that can cope with the occurrence of accidental trouble and failure.

～Caution on copyright～
If a work that was recorded or copied from music CDs or other media is used at public places,law enforcement for copyright infringement may be imposed. When using a work that was recorded or copied from music CDs or other media, be sure to obtain permission from the author.In addition,the copyright of audio/music data which are distributed or sold by PATLITE Corporation belongs to PATLITE.
It is strictly prohibited to copy/reprint the partial or whole contents of audio/music data of PATLITE Corporation or to transfer/sell them on computer networks etc. without the permission of the right holder.
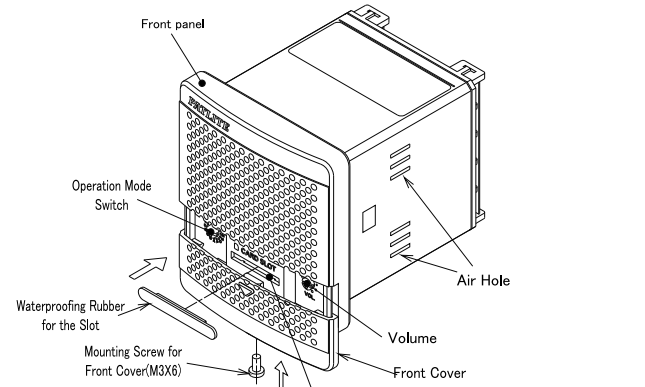
2.Indication Method of Models

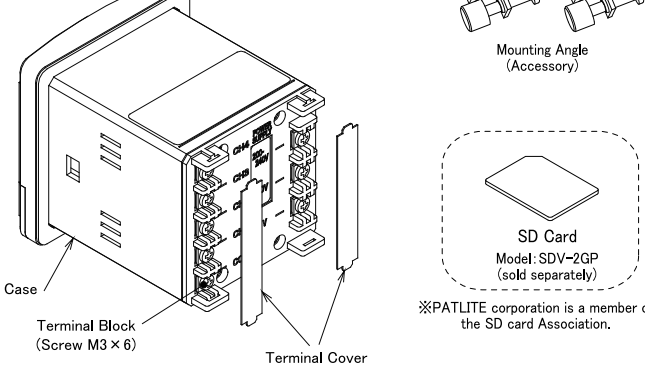### BDV – 15 K F – J

■Rated voltage
J: 12-24V DC
K: 100V/220V AC

■Body color
J :Light gray
K :Dark gray

3. Parts Names
【Front Side】

Front panel
Operation Mode Switch
Air Hole
Waterproofing Rubber for the Slot
Volume
Mounting Screw for Front Cover(M3X6)
Front Cover
Card Slot

【Rear Side】

Case
Terminal Block (Screw M3 × 6)
Terminal Cover

Mounting Angle (Accessory)

SD Card
Model: SDV-2GP
(sold separately)

※PATLITE corporation is a member of the SD card Association.

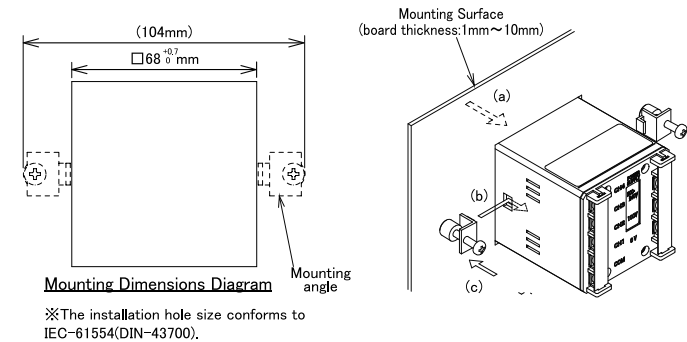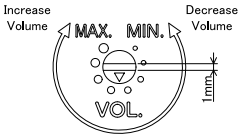## 4. How to install

Install the product according to the procedure below.
①Create mounting holes on a mounting surface (board thickness: 1mm – 10mm) where there is enough space for the mounting angle. (See the mounting dimensions diagram)
②(a)Insert the product from the front of the mounting surface.
(b)Attach the mounting angle which comes with the product to the holes on the side of the product.
(c)Then fasten the screws of the mounting angle. (Recommended tightening torque: 0.7±0.1N•m)
③Confirm that the product and the mounting angles are installed properly.

(104mm)
□68 +0.7/0 mm
Mounting Surface (board thickness:1mm～10mm)
(a)
(b)
(c)
Mounting angle

Mounting Dimensions Diagram
※The installation hole size conforms to IEC-61554(DIN-43700).

⚠WARNING
●At the mounting of products, be sure to cut off power source. There is a risk of electrical shock.
●For the installation with execution of work, be sure to ask a professional company. Otherwise, there is a risk of electrical shock, fire and/or falling etc.

⚠CAUTION
●Choose a location for the mounting surface where it has enough strength to support the weight of the product, and where there is less vibration. In addition, do not use as a vehicle. Failure to do so may be the cause of injury or damage to the product.
●Be sure to use both pieces of mounting angle, and fasten them with the recommended tightening torque. Failure to do so may be the cause of injury or damage to the product.

─ Request ─
●Secure a enough space in which the mounting angle can also be installed when choosing a mounting surface.
●Install the product on a flat surface without bumps and dips. Failure to do so may weak its resistance to water and dust.
●To prevent the product from falling in places where vibration may be generated, applthread locking adhesive or the like, and perform periodic checking of the tightness of the mounting angle.
●I When mounting it at a high place, choose the place where a foothold exists for facilitating repair work.
●If it is used under the connected state to the power supply, then provide a switch which can easily cut off power supply in proximity to the product, for the safety purpose.
●Please install it not to close the air hole.

─ Other Precautions ─
●The clamp face might resonate by the material, the thickness of the clamp face, and the reproduction volume of the product, and the vibration sound be generated. Measures can be done by reinforcing the clamp face.

5. How to perform wiring

Before wiring the product remove the terminal cover. And after the completion of the wiring attach the terminal cover.
●For the external contact of signal line, use no-Voltage contact circuit such as relay switch or open collector circuit(NPN type). As for the contact capacity,see the table below.
●The terminal screws should be fastened with the recommended tightening torque (0.3N•m)

■Wiring examples

●BDV-15KF

Wiring when NPN transistor is used
CH4 / CH3 / CH2 / CH1 / COM
POWER SUPPLY
200-240V / 100V / 0V
Fuse 250V 0.5A
220V AC
Fuse 125V 0.5A
100V AC
※Do not connect the power sources od 100V and 220V simultaneously

●BDV-15JF

Wiring when NPN transistor is used
CH4 / CH3 / CH2 / CH1 / COM
POWER SUPPLY
12-24V / 0V
No use
Fuse 125V 0.5A
12-24V DC

Do not supply a voltage for the signal line. Failure to do so may be damaged to the product.

Chart1.Specifications of Signal line

No-voltage contact curcuit
External point of contact BDV
7mA / 15V / Signal line / COM

NPN open collector curcuit
External point of contact BDV
7mA / 15V / Signal line / COM

Chart2. Contact Capacity
Current Capacity	10mA or more
Withstand Voltage	20V DC or more
Leakage Current	0.1mA or less
ON Voltage(Vsat)	1V or less

Chart3. Inrush current・Fuse
Model	Inrush Current	Fuse
BDV-JF	Max.6,5A / 20ms	125V 1A
BDV-KF	Max.1,5A /12ms	125V 0,5A

⚠WARNING
●At the wiring of products, be sure to cut off power source. There is a risk of electrical shock.
●Pay attention not to mistake wiring work. If wiring is mistaken,the internal circuit may burn out and it will become a cause of fire.

⚠CAUTION
●Be sure to connect the external fuse for protection of the power supply circuit and internal circuit of the product.
●The terminal screws should be fastened with the recommended tightening torque (0.3N•m). Otherwise, there is a risk of damage by short-curcuit, after wiring comes off.

─ Request ─
●Before switching on the power supply, confirm that the wiring is correctly performed.
●For countermeasure of noise, it is recommended to perform wiring as short as possible, and to use shielded wires. In addition, if a signal line is passing along high voltage cables or its wiring is located at the place likely to receive induction noise, there is a risk of malfunction by the effect of noise.
●If a no-voltage contact such as a relay or a switch etc. is used for power supply line, select the contact for which rush current is considered. If capacity is insufficie nt, it will become a cause of welding (deposition) of the contact and/or malfunction.
●The use of M3 ring terminals with insulating coating is recommended for the wiring of terminal block to prevent disconnection of wires. Recommended product: N1.25-3 (Product confirming to RoHS)

─ Other Precautions ─
●If power supply or signal lines are switched on simultaneously at the use of plural units, a shift of playing the voice period will occur.
●BDV-15JF comes to receive the influence of the noise easily if you connect the 0V terminal to the terminal COM.

6.How to use the product

6-1. Opening and closing the front cover

Open or close the front cover according to the procedure shown below when performing tasks such as adjusting the volume of the voice or selecting the mode switch.

①Remove the mounting screw (M3 × 6) for the front cover.
②Push the lower front cover section (Part A in the figure on the right) lightly with finger to slide it downward.
③When a SD card is to be used,remove the waterproof packing for the slot.
④After completing tasks, attach the parts removed in the procedure from ① to ③ in the opposite order.
(Recommended tightening torque: 0.3N•m)

Operation Mode Switch
Card Slot
Volume
Waterproof Packing
Part A
Front Cover
+Screw(M3X6)

─ Other Precautions ─
●Attach the waterproof packing for the slot securely. Failure to do so may weaken the product's resistance to water and dust.
●Fasten +screw for front cover with the recommended tightening torque.
●Please do not lose detached parts.

6-2.Selecting play mode
By operating mode switch, one of the play modes shown below can be selected.
[factory default setting]
The message is registered to No.4 or earlier:A
The message is registered to No.5 or later:B
Use a flat-blade screwdriver with the blade thickness of 1.0mm or thinner for turning the switch.
□how to select the play mode
①Change the operation mode switch to the play mode you want to use. When you select the mode I,J,K,L,M,N,O and P,The play mode is test mode.
②Reactivate the product.(It is also possible to reboot from the front side of the product with the SD card.When the SD card is inserted,the information sound is playing.Afterwards,when the information sound is playing again, the mode has been changed.)
③Confirm the message of each CH is playing, and the play mode was changed.

Play mode（Setting with operation mode switch）
A	Bit input mode	CH input : CH1 – CH5 / Number of playing messages : 5
B	Binary input mode	CH input : CH1 – CH5 / Number of playing messages : 31
C	Bit input sound redution mode	CH input : CH1 – CH4 / Number of playing messages : 4 CH5 : Input reduces the volume by 15dB.
D	Binary input sound redution mode	CH input : CH1 – CH4 / Number of playing messages : 15 CH5 : Input reduces the volume by 15dB.
E	Bit input Latest input priority play mode	CH input : CH1 – CH5 Number of playing messages : 5 When the next message is input while message is being play, the message that is being played is stopped and the latest input message is playing.
F	Binary input Latest input priority play mode	CH input : CH1 – CH5 Number of playing messages : 31 When the next message is input while message is being play, the message that is being played is stopped and the latest input message is playing.
G	Bit input Hold play mode	CH input : CH1 – CH5 Number of playing messages : 5 Message play is possible only while the input is held. The play stops when the input stops.
H	Binary input Hold play mode	CH input : CH1 – CH5 Number of playing messages : 31 Message play is possible only while the input is held. The play stops when the input stops.
I ~ P	Test mode	The message No.1 plays.

* Refer to "6.5 How to Play Messages"About the operation of each mode.

─ Request ─
●Make sure that there is no misalignment with the operation mode switch when selecting. If there is misalignment as shown in the figure on the right, the play mode selected may not play.

O   ×

6-3.Rewriting the Message
By using an SD card (Model: SDV-2GP Sold separately), and a sound writing tool (Model: FV-Win Sold separately), and a patlite playlist editor,the message can be rewritten. The maximum length of time for this product is a total of 63 seconds (in case of 64kbit/s, Fs=44.1kHz / internal memory size 508KB).For the method of creating data and storing it on an SD card, see the instruction manual for the sound writing tool.

Message rewriting procedure
①Turn on the power of the product,
Comfirm neither COM nor CH are short-circuited.
※The message rewriting cannot be done while the voice is playing or the test is playing.
②After opening the front cover and Inserting the SD card which be rewritten the playlist and message data, Playing the infomation sound "PIPO" and Rewriting is begun.
③When the rewriting is completed and information sound "PI", Remove the SD card.
*Rewriting should be completed within 60 seconds. When playing the information sound other than the above,or when no response, the rewriting is not successfully completed.
See Section "8. Before You Request a Repair."Moreover, when the volume has been minimized, the information sound is not heard.

SD Card
Card slot

─ Request ─
●For the SD card, use type SDV-2GP sold separately. Operation is not guaranteed if an SD card of any other type is used.
●When formatting the SD card, do it in either of FAT16.
●When inserting the SD card into the card slot, pay attention to the orientation of the SD card. And do not forcibly insert the SD card into the card slot. Doing so may cause damage to the product and the SD card.
●Please note that the foreign body doesn't enter the card slot.

6-4. Volume Adjustment

The sound level can be adjusted by the volume control.
Use a flat-head screwdriver with a blade width of 1.0mm or thinner for turing the volume control.

Increase Volume — MAX. MIN. — Decrease Volume — VOL.

PLEASE

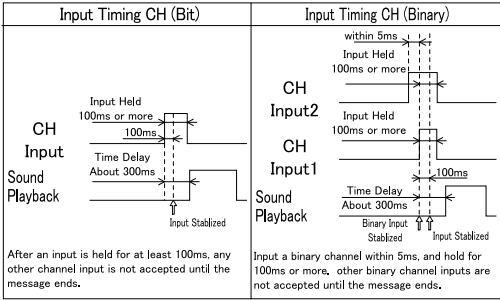● Turn the volume control lightly, a torque over 0.3N·m can damage the volume control.

NOTE

● As the sound increases, the possibiliy of distortion may also occur.
● Due to environmental conditions and tolerances. the volume may not be at zero sound level.
● The volume is turned half-way at the factory prior to shipment.

6-5. Message Playback

Turn the product on and short-circuit the signal line to the common line to for operation.
• Short-circuit the signal wire to common for 100ms or more (Pulse input).
• When controlling this product via the power supply, the start-up takes about 500ms before the sound can play back.
• The input timing for all modes and all the CH inputs are the same for when playing back messages. Please refer to the Input Timing Chart below for operation.
• When two or more signal wires are short-circuited at the same time to the common lines for bit input, the higher channel takes priority (bit input only).

Priority Input Order: CH4＞CH3＞CH2＞CH1

Input Timing CH (Bit) / Input Timing CH (Binary)

After an input is held for at least 100ms, any other channel input is not accepted until the message ends.

Input a binary channel within 5ms, and hold for 100ms or more, other binary channel inputs are not accepted until the message ends.

NOTE

● Although a pop noise may occur when the playback is controlled via the power supply or playback start and finish, it is not an indication of failure.
● Even when starting two or more units simultaneously, a lag will occur during message playback.

6-5-1. Bit Input Mode (Operation Mode Switch: A)

If signal wires from CH1 to CH4 are short-circuited to the common, the message of the selected channel will play back.

Signal Input Timing Chart (Bit Input)

Message No.: No.2 No.4 No.3 No.4 No.3 No.3
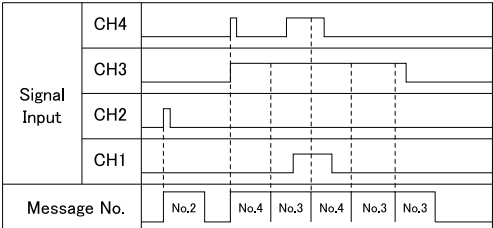
6-5-2. Binary Input Mode (Operation Mode Switch: B)

If signal wires from CH1 to CH4 are short-circuited to the common, the message corresponding to the binary input conversion table will be played back.
(Refet to the "Binary Input Table")

Signal Input Timing Chart (Binary Input)

Message No.: No.15 No.5 No.1 No.1 No.3
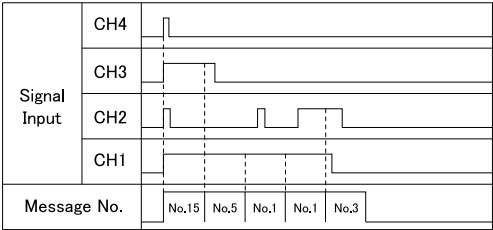
Binary Input Table

Message No.	CH1	CH2	CH3	CH4	Message No.	CH1	CH2	CH3	CH4
1	1	0	0	0	9	1	0	0	1
2	0	1	0	0	10	0	1	0	1
3	1	1	0	0	11	1	1	0	1
4	0	0	1	0	12	0	0	1	1
5	1	0	1	0	13	1	0	1	1
6	0	1	1	0	14	0	1	1	1
7	1	1	1	0	15	1	1	1	1
8	0	0	0	1					

※ A"1" in the table refers to the short-circuit of the signal line to the common line.

6-5-3. Bit Input Sound Reduction Mode (Operation Mode Switch: C)

CH1 to 3 corresponds to Bit Inputs. CH4 Input reduces the volume by 10dB.
• CH4 has no input priority.
• When multiple messages are entered during playback, the next message will be reduced.
• In some cases, the message will be reduced by 10dB during playback.

Sound Reduction Timing Chart (Bit Input)

Message No.: Sound Reduction No.3 / Sound Reduction No.1 / Sound Reduction No.2 / Sound Reduction No.1 / Sound Reduction No.3 / Sound Reduction No.3 / No.3, No.3
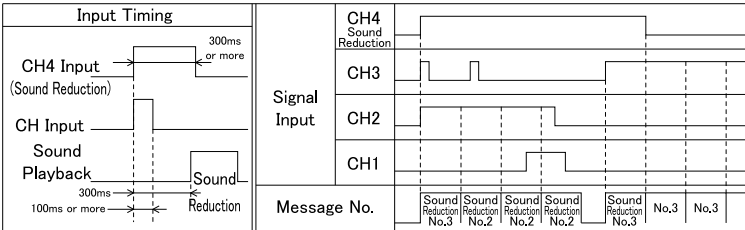
6-5-4. Binary Input Sound Reduction Mode (Operation Mode Switch: D)

CH1 to 3 corresponds to Binary Inputs. CH4 Input reduces the volume by 10dB.
• CH4 has no input priority.
• When multiple messages are entered during playback, the next message will be reduced.
• In some cases, the message will by reduced by 10dB during playback.

Sound Reduction Timing Chart (Binary Input)

Refer to Sec. 6-5-3 "Bit Input Sound Reduction Mode"

Message No.: Sound Reduction No.5 / Sound Reduction No.1 / Sound Reduction No.1 / Sound Reduction No.4 / Sound Reduction No.6 / No.6, No.6
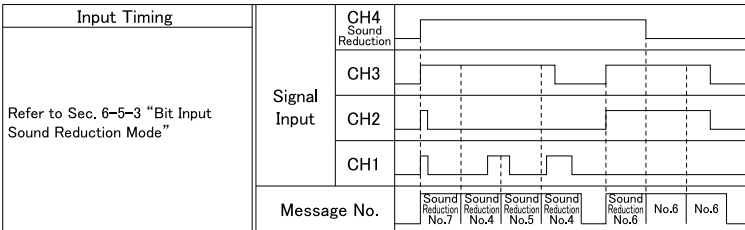
6-5-5. Bit Input Interrupt Playback Mode (Operation Mode Switch: E)

When one of the signal wires from CH1 to CH4 are entered for a bit input and an input message is entered during message playback, the message will interrupt the message being played.
• Even if the input is held down, the message playback will be reproduced only once.
• There is no Priority Input Order

Interrupt Playback Timing Chart (Bit Input)

Message No.: No.4 No.4 No.2 No.2 No.3 No.1
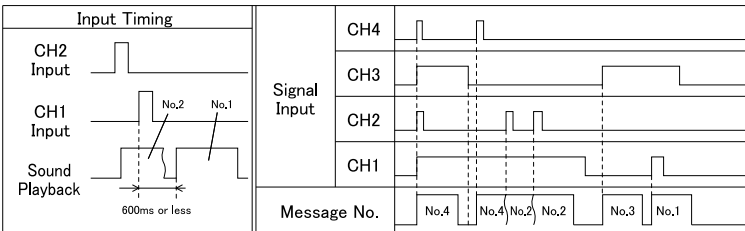
[∫] Indicates an interrupted message

6-5-6. Binary Input Interrupt Playback Mode (Operation Mode Switch: F)

When one of the signal wires from CH1 to CH4 for a binary input are entered and an input message is entered during message playback, the message will interrupt the message being played.
• Even if the input is held down, the message playback will be reproduced only once.
• There is no Priority Input Order

Interrupt Playback Timing Chart (Binary Input)

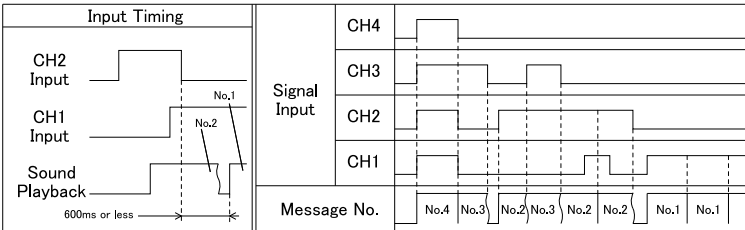Message No.: No.15 No.8 No.10 No.4
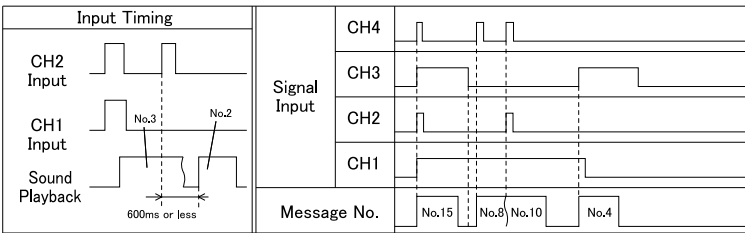
6-5-7. Bit Input Hold Playback Mode (Operation Mode Switch: G)

If the signal wires from CH1 to CH4 for a bit input are held when short-circuited to common, the message will repeat until the signal wire is removed from common.
• Once the input is lost, the playback will stop.

Hold Playback Timing Chart (Bit Input)

Message No.: No.4 No.3 No.2 No.3 No.2 No.2 No.1 No.1

6-5-8. Binary Input Hold Playback Mode (Operation Mode Switch: H)

If the signal wires from CH1 to CH4 for a binary input are held when short-circuited to common, the message will repeat until the signal wire is removed from common.
• Once the input is lost, the playback will stop.

Hold Playback Timing Chart (Binary Input)

Message No.: No.15 No.15 No.7 No.3 No.1
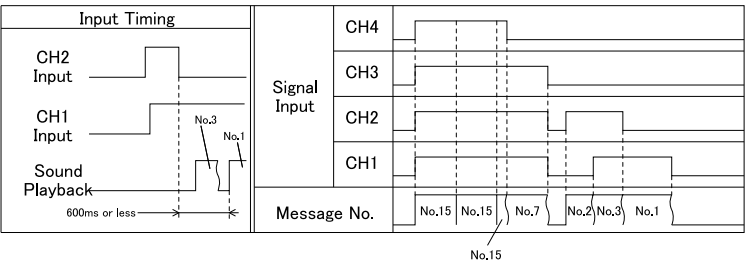
6-5-9. Test Playback (Operation Mode Switch: I through P)

Message from CH1 continues being played back. Any other CH inputs are ignored during test playback.
• Use the "Test Playback Mode" when checking the operation or adjusting the volume.
• To operate in the "Test Playback Mode", select the "Operation Mode Switch" to any mode from "I" to "P".
• Because the "Test Playback Mode" automatically resets the "Operation Mode" to 'A', reboot the product after exiting the "Test Playback Mode" in order for the new settings to take effect.

7. Options and Accessories

■ SD Card: Model SDV-128P
   The SD Card is used when changing the messages for the Voice Annunciator product.
■ Voice Playlist Editor: Model FV-Win
   MP3 Editor software.

8. Before Requesting Repair

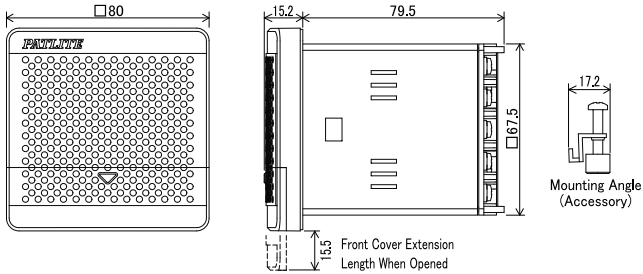| Problem	Where to Check	What to do
No Sound	Is there power supplied?	
	Is the signal line to common line short-circuited correctly?	Double check the wiring. (5. Wiring)
	Is the volume turned down to minimum?	Adjust the volume. (6-4. Volume Adjustment)
Different Channel Plays Back	Is the signal line to common line short-circuited correctly?	Double check the wiring. (5. Wiring)
	Is the Operation Mode Switch set correctly?	Double check the Selection Switch. (6-2. Playback Mode Selection)
Cannot Record Message	Is there power supplied?	Double check the wiring. (5. Wiring)
	Is the playlist created on the SD card?	Double check the contents of the SD Card Playlist and Data Folder. (FV-Win or Patlite Playlist Editor Help File.)
	Is the file name and contents of the playlist folder right?	
	Is the data storage location correct?	
	Is the SD card an option product from our company?	Double check the SD Card. (6-3. Message Rewriting)
	Is the SD card inserted correctly?	
	Is the volume turned down to minimum? (Overwrite beep may not be heard)	Adjust the volume. (6-4. Volume Adjustment)
SD Card not being read	Is the "SDV-2GP being used?	Double check the SD Card. (6-3. Message Rewriting)
	Is the SD Card correctly inserted?	

● Even after proper installation and handling, if the product does not operate correctly, contact your PATLITE Sales Representative.

9. Specifications

Model	BDV-15JF	BDV-15KF	
Rated Voltage	12 – 24V DC	100V AC (50/60Hz)	220V AC (50/60Hz)
Voltage Range	10.8 – 26.4V DC	100V AC ±10%	220V AC ±10%
Power Consumption	Max. 4W	Max. 5W	
Sound Pressure Level	Max. 87dB: Placed on a 300mm² base at a distance of 1 meter with a 1kHz sine wave at a −6dB input. Volume Adjustable ※Sound level of message will vary with the surrounding environment.		
Audio File	MPEG1 Audio Layer Ⅲ (MP3) Standard Bit Rate: 64kbit/s, Fs=44.1kHz (CD Quality)		
File Format	FAT16		
Internal Memory Size	508kB (MP3 data total)/ Maximum playback time 63sec (at Standard Bit Rate)		
Number of Playback Messages	Bit Input: 4 / Binary Input: 15		
Operating Temperature Range	−10 to +50℃		
Relative Humidity	85% RH or less (no condensation)		
Mounting Direction	Indoor: Upright, sideways and inverted mounting (Use Upright if water splashing is present) Outdoor: Upright Direction Only		
Protection Rating	IP54 (Upright Direction for Panel Mount only)		
Insulation Resistance	1MΩ or more (at 500V DC) between terminal and chassis		
Withstanding Voltage	500V AC for 1 minute (Between terminal and chassis)	1500V AC for 1 minute	
Vibration Resistance	19.6m/s² (Upright Position) At 30Hz in directions from back and fourth, left and right, up and down for 2 hours		
Mass	220g ±10%	340g ±10%	

● This product conforms to EN standard and shows the CE Marking. (24V type.)
This product has been tested and found to comply with the limits for a Class A device, pursuant to EMC DIRECTIVE. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product must not be used in residential areas.

【Outer Appearance Drawing】   Unit: mm

□80 / 15.2 / 79.5 / 67.5 / 17.2 / Mounting Angle (Accessory) / Front Cover Extension Length When Opened / 15.5

● PATLITE Corporation disclaims all liability for any malfunction or damage occurring as a result of handling contrary to the instructions, cautions and warnings mentioned in this manual.
● Specifications may change without notice due to continual product improvement.