PATLITE
Voice Annunciator
Signal Voice
Instruction Manual
[TYPE : BKV]

Thank you very much for purchasing the **PATLITE Signal Voice** MP3 Voice Annunciator. Please read these instructions carefully before installation, maintenance and repair. Store this manual in a safe place for future reference. If you have any questions regarding this product, please contact our PATLITE Sales Representatives.

Notice for Safe Operation

In order to prevent any damage to the user and other personnel or to assets, note the following:

■ The warning indications are divided into the following classes according to the degree of danger or damage incurred when the warning is not taken into consideration and the product is not correctly used.

⚠WARNING	Indicates an imminently dangerous condition : Failure to follow the instructions may lead to death or serious injury.
⚠CAUTION	Indicates a potentially dangerous condition: Failure to follow the instructions may lead to slight injury or property damage.

PLEASE	Indicates something to observe before using this product. The disregard to this indication may lead to product malfunction or failure.
NOTE	Notice regarding supplementary information or convenient explanation is indicated.

1. To operate this product properly, observe the following:

⚠WARNING
● Be sure the power is disconnected before wiring or installing this product. Possibility of electric shock may occur.
● Do not disassemble or modify this product. Possibility of fire or electric shock may occur. If repair is needed, refer to [8. Before Requesting Repair]. For questions concerning our product or for when repair is necessary, refer to the end of this document for contacting your nearest PATLITE Sales Representative.
● Be careful not to miswire this product. Possible miswiring can cause product failure or fire.
● Be sure to stay within the operating voltage range. Possibility of fire, failure or malfunction may occur.
● Request the installation and wiring be performed by a professional contractor. Otherwise, there is the possibility that fire, electric shock or falling from high places may result.

⚠CAUTION
● To protect the power supply and other internal circuitry, be sure to connect an external fuse.
● Do not install the product in a location where vibrations exceeding the specifications exist. If installing where vibrations do exist, install the product in the upright position to prevent the risk of product detaching and it falling, causing injury to a passer-by, etc.

Contrary to Warnings and Cautions indicated in this document, product failure due to mishandling, dissassembly, modifications or natural disasters, etc. is not covered by any Warranty. Moreover, avoid any applications outside those indicated in this document.

PLEASE
● Do not use in an environment exposing strong radio waves or inductance noise. Noise may be induced from the speaker horn causing malfunction or failure.
● Do not use in an environment where corrosive gas is present. Possible cause of failure may occur.
● To prevent damage from static electricity, touch hands or other body parts to metals or an earth ground to discharge the body from static charge before handling static sensitive parts, such as the SD Card.
● Use the recommended torque when attaching parts for installation, etc.
● When this product is used for security purposes, it should be inspected daily. In case a malfunction should occur, it is recommended that you use this product together with other security products.
● Do not misplace parts, such as the terminal cover or front plate, while perfoming maintenance or repair of the product to prevent possible damage.

- Caution on copyright -
Work that was recorded or copied from music CDs or other media used in public places may infringe upon copyrights and law enforcement 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, copyright of audio/music data distributed or sold by PATLITE Corporation belongs to PATLITE.
It is strictly prohibited to copy/reprint whole or partial contents of audio/music data belonging to PATLITE Corporation, or to transfer/sell such material on computer networks etc., without permission of the rightful holder.
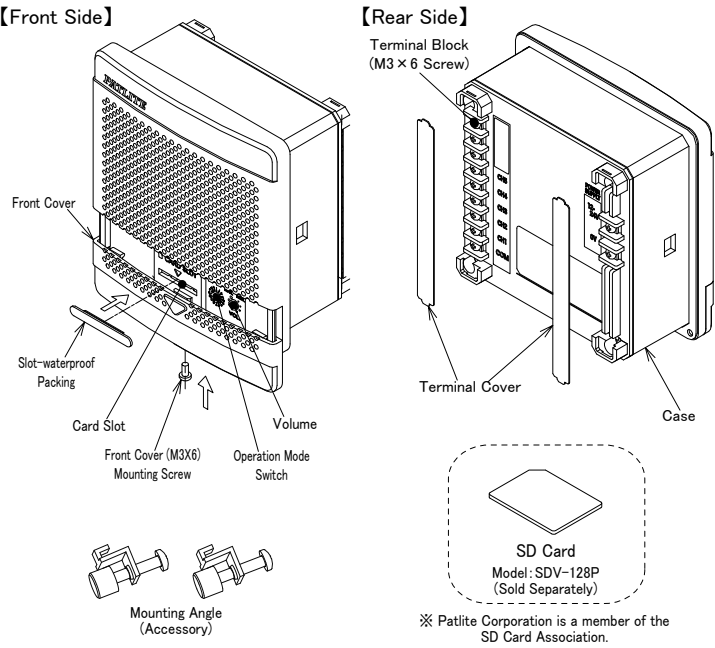
2. Model Number Configuration

BKV – 31 K F – J

■ Rated Voltage
J : 12-24V DC
K : 100V AC
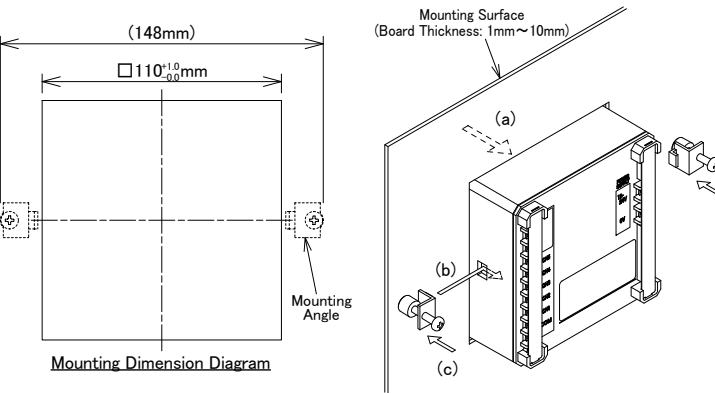Q : 220V AC

■ Body Color
J : Ivory White
K : Dark Gray

3. Part Names

【Front Side】
Front Cover
Slot-waterproof Packing
Card Slot
Front Cover (M3X6) Mounting Screw
Volume
Operation Mode Switch

【Rear Side】
Terminal Block (M3 × 6 Screw)
Terminal Cover
Case

Mounting Angle (Accessory)

SD Card
Model: SDV-128P (Sold Separately)
※ Patlite Corporation is a member of the SD Card Association.

4. Installation

Install the product in accordance to the procedure below:
① Drill mounting holes on a mounting surface (Board Thickness: 1mm - 10mm) with enough space for the mounting angle. (Refer to the "Mounting Dimension Diagram" below)
② Insert the product through the front (a) of the mounting surface. Attach the mounting angles (b) included with the product into the slots on the side of the product. Then tighten the screws (c) for the mounting angle. (Recommended Torque: 0.7±0.1N·m)
③ Confirm that the product and the mounting angles are installed properly.

(148mm)
□110⁺¹·⁰₋₀·₀mm
Mounting Surface (Board Thickness: 1mm~10mm)
Mounting Angle
Mounting Dimension Diagram

⚠WARNING
● Be sure the power is disconnected before wiring or installing this product. Possibility of electric shock may occur.
● Request the installation and wiring be performed by a professional contractor. Otherwise, there is a possibility that fire, electric shock or falling from high places may result.

⚠CAUTION
● Ensure the installation surface is sufficient enough to handle the weight of the product, and where there is less vibration. Also, do not install onto a vehicle. Failure to comply will lead to injury or damage to the product.
● Be sure to attach with both mounting angles, and fasten them only with the recommended tightening torque. Failure to comply will lead to injury or damage to the product.

PLEASE
● Install where adequate space is available for the mounting angle when choosing a mounting location.
● Install the product on a flat surface with no uneven surfaces. Failure to comply will weaken its resistance to water and dust.
● To prevent the product from falling in places where vibration may be generated, apply thread locking adhesive, etc., to the mounting angle screws and periodically check it.
● When installing in high places, choose a location which is accessible by a scaffold, ladder, etc., for repairs.
● When operating the product by controlling the power ON/OFF, be sure to include a switch by which the power supply can be easily cut near the main power for safety.

NOTE
● Depending on the material quality and thickness of installation surface and volume, the product may resonate and cause an oscillating sound. Take precautionary measures to reinforce the clamp face.

5. Wiring

Remove the terminal cover prior to wiring the product. Reinstall the terminal cover after the wiring is completed.
● When wiring to external contacts for the signal line, use non-voltage contacts such as a relay, switch or an NPN open collector circuit. Refer to Chart 3 below for contact capacity.
● Use the recommended torque (0.3N·m) when tightening the terminal screws.
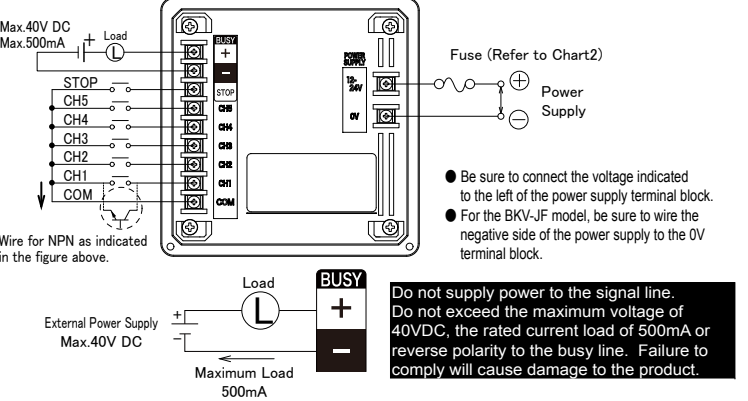
■ Wiring Example:
Max.40V DC
Max.500mA
Load
BUSY
STOP
CH5
CH4
CH3
CH2
CH1
COM
Fuse (Refer to Chart2)
Power Supply
Wire for NPN as indicated in the figure above.

● Be sure to connect the voltage indicated to the left of the power supply terminal block.
● For the BKV-JF model, be sure to wire the negative side of the power supply to the 0V terminal block.

Load
BUSY
External Power Supply
Max.40V DC
Maximum Load 500mA

Do not supply power to the signal line. Do not exceed the maximum voltage of 40VDC, the rated current load of 500mA or reverse polarity to the busy line. Failure to comply will cause damage to the product.

Chart 1. Signal Line Specifications

Non-voltage Contact Circuit
External Contact BKV
7mA Signal Line
12V (15V) COM
Wiring example for Model BKV–JF

NPN Open Collector Circuit
External Contact BKV
7mA Signal Line
12V (15V) COM
Wiring example for Model BKV–JF

Chart 2. Fuse Inrush Current

Model	Inrush Current	Fuse
BKV-JF	Max. 10A/5ms	125V 1.0A
BKV-KF	Max. 1.5A/12ms	125V 0.5A
BKV-QF	Max. 1.2A/0.5ms	250V 0.5A

Chart 3. Contact Capacity

Current Capacity	10mA or more
Withstanding Voltage	20V DC or more
Leakage Current	0.1mA or less
"ON" Voltage (V_sat)	1V or less

⚠WARNING
● Ensure the power has been disconnected before wiring. Possible electric shock may occur.
● Ensure the wiring is correct before connecting the power. Miswiring may result in failure or product damage.

⚠CAUTION
● To protect the power supply and other internal circuitry, be sure to connect an external fuse.
● Tighten the terminal screws with the recommended torque of 0.3N·m. Failure to comply will cause risk of damage by short-circuiting if wiring comes off.

PLEASE
● Confirm that polarities and rated voltages are correct before connecting the power supply.
● To countermeasure against interference noise, make wiring as short as possible and use shielded wires whenever possible. In addition, separate any signal lines which pass along high voltage cables or is susceptible to receive induction noises. Interference may influence signal inputs and cause product malfunction.
● If a non-voltage contact, such as a relay or switch etc., is used for the power supply line, consider inrush current capacity when selecting the contact. If the capacity is insufficient, it will cause pitting or welding of the contacts, causing malfunction.
● Use M3 ring terminals with insulated coating when wiring to the terminal block to prevent shorting any wire. Recommended M3 Ring Terminal: N1.25–3 (Conforms to the RoHS Directive)
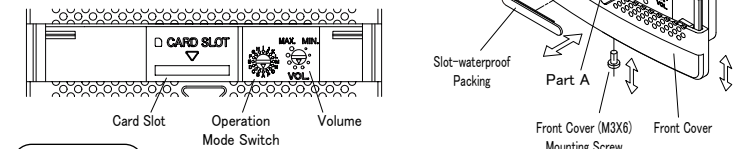
NOTE
● If the power supply or signal lines are switched on simultaneously from multiple units, their playback may not start at the same time.
● If the 0V terminal of the BKV-31JF is connected to the terminal COM, the influence of interference is greatly increased.

6. How to Operate

6-1. Front Cover Access

Follow the procedure below to open or close the front cover when performing tasks such as accessing the SD Card Slot, Mode Selection Switch or adjusting the volume.
① Remove the Front Cover (M3×6) Mounting Screw.
② Pull the Front Cover section ("Part A" in the figure to the right) lightly with finger and slide it downward.
③ Remove the Slot-waterproof Packing when using an SD card.
④ Repeat steps ① to ③ in the opposite order to close the Front Cover.
(Recommended Tightening Torque: 0.3N·m)

CARD SLOT
MAX. MIN. VOL.
Card Slot
Operation Mode Switch
Volume
Slot-waterproof Packing
Part A
Front Cover (M3X6) Mounting Screw
Front Cover

NOTE
● Attach the Slot-waterproof Packing securely. Failure to comply will weaken its resistance to water and dust.
● Fasten the front cover mounting screw with the recommended fastening torque. Failure to comply will result in risk of damaging threads from overtorque and/or the screw falling out.

6-2. Playback Mode Selection

One of the following play modes indicated below can be selected by the Operation Mode Switch.

[Factory Default Settings]
When up to 5 messages are registered, the Play Mode is set to A.
When more than 5 messages are registered, the Play Mode is set to B.
Use a flat-head screwdriver with the blade thickness of 1.0mm or thinner for turning the switch.

□ Selecting Play Mode
① Change the operation mode switch to the desired play mode. Selecting modes I,J,K,L,M,N,O and P will activate the test mode.
② Reboot the product by re-inserting the power or by inserting the SD Card. It is possible to reboot when the SD card is inserted, when after insertion an alarm sound will indicate the information was read.
When the alarm sound plays, it has indicated that the mode has been changed.
③ Confirm the message to each channel has played, and the desired play mode was changed.

Playback Mode (Operation Mode Switch Setting)

A	Bit Input Mode	A maximum of 5 messages can be used from CH1 toCH5
B	Binary Input Mode	A maximum of 31 messages can be used from CH1 toCH5
C	Bit Input Sound Reduction Mode	A maximum of 4 messages can be used from CH1 toCH4. When an input is applied to CH5, the volume decrease by 15dB.
D	Binary Input Sound Reduction Mode	A maximum of 15 messages can be used from CH1 toCH4. When an input is applied to CH5, the volume decrease by 15dB.
E	Bit Input Interrupt Playback Mode	A maximum of 5 messages can be used from CH1 toCH5. If an input is applied while a message is in playback, the message playing will stop and resume after the interrupted message ends.
F	Binary Input Interrupt Playback Mode	A maximum of 31 messages can be used from CH1 toCH5. If an input is applied while a message is in playback, the message playing will stop and resume after the interrupted message ends.
G	Bit Input Hold Playback Mode	A maximum of 5 messages can be used from CH1 toCH5. While the input is held on, the message will playback. When the input is released, the mesage playback will stop.
H	Binary Input Hold Playback Mode	A maximum of 31 messages can be used from CH1 toCH5. While the input is held on, the message will playback. When the input is released, the message playback will stop.
I / P	Test Mode	Messagel number 1 will playback if selected from I to P. To end the test mode, return switch back to any other mode.

＊ Refer to"6.5 Message Playback" for the operation of each mode.

PLEASE
● Make sure that there is no misalignment when changing the operation mode switch selection. If a misalignment occurs as shown in the figure on the right, the selected play mode may not play.

6-3. Message Rewriting

By using our PATLITE Playlist Editor (download from our homepage is possible without extra charge), an SD card (Model: SDV-128P sold separately), and an MP3 sound editing tool, the message can be rewritten. The maximum playback time for this product is 63 seconds (at a rate of 64kbit/s, Fs=44.1kHz and internal memory size of 504Kb). Refer to the "Help" section of the corresponding software for the procedure to create the MP3 Data and storing it onto an SD Card.
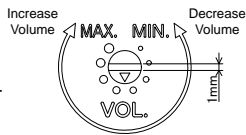
Message Rewriting Procedure:
① Turn on the power to the product and verify that neither the "COM" nor "CH" inputs are short-circuited.
＊ The message rewriting cannot be done during voice playback or in the test mode.
② After opening the front cover and inserting the SD Card from which the playlist and message data are to be written, a high-low beep will sound to indicate rewriting has begun.
③ When a short beep sounds, it indicates the rewriting sequence is completed, and the SD Card can be removed.
＊ Rewriting should be completed within 60 seconds. The rewriting is not successfully completed if beeping sounds other than indicated above are heard, or when there is no response (See Section "8. Before Requesting Repair").
In addition, if the volume has been minimized, the beeping sounds cannot be heard.

SD Card
Card Slot

PLEASE
● Optional SDV-128P type should be used for the SD card. Using other SD cards is not guaranteed for proper operation.
● When formatting an SD card, please use the FAT16 format.
● To prevent the possibility of damage to the product or SD card, please beware of the following.
 ・When inserting the SD card in the card slot, be careful of the direction of the SD card.
 ・Do not forcibly insert the SD card into the card slot.
 ・Do not operate the product with the SD card inserted.
 ・Avoid any foreign substances from entering 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.
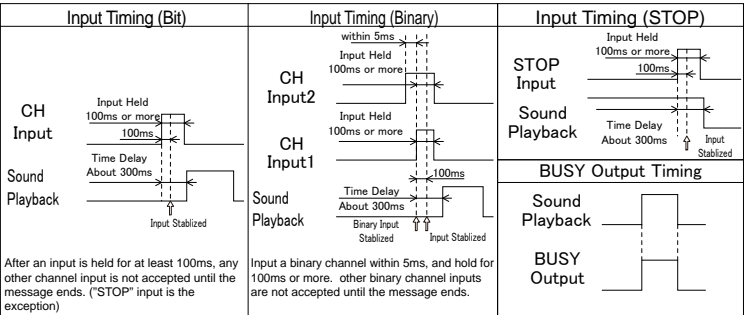
Increase Volume ◁ MAX. MIN. ▷ Decrease Volume

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, from the "BUSY" output to the "STOP" input, 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).
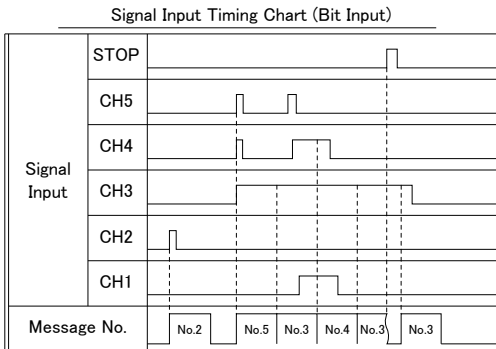　Priority Input Order: STOP>CH5>CH4>CH3>CH2>CH1

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

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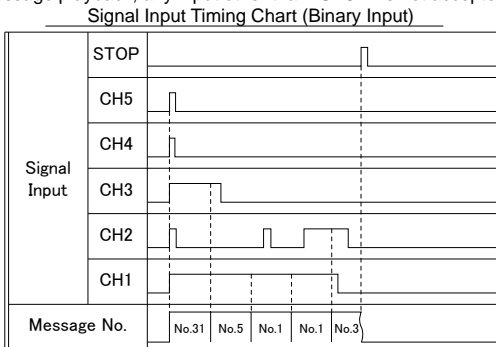
6-5-1. Bit Input Mode (Operation Mode Switch: A)

If signal wires from CH1 to CH5 are short-circuited to the common, the message of the selected channel will play back.
・ During message playback, any input other than "STOP" is not accepted.

Signal Input Timing Chart (Bit Input)

6-5-2. Binary Input Mode (Operation Mode Switch: B)

If signal wires from CH1 to CH5 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")
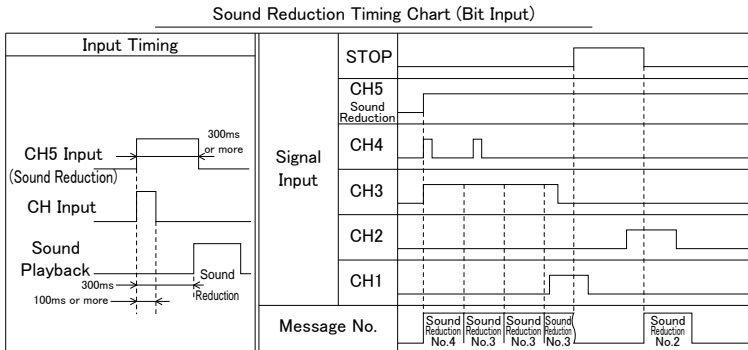・ During message playback, any input other than "STOP" is not accepted.

Signal Input Timing Chart (Binary Input)

Binary Input Table

Message No.	CH1	CH2	CH3	CH4	CH5	Message No.	CH1	CH2	CH3	CH4	CH5	Message No.	CH1	CH2	CH3	CH4	CH5
1	1	0	0	0	0	12	0	0	1	1	0	23	1	1	1	0	1
2	0	1	0	0	0	13	1	0	1	1	0	24	0	0	0	1	1
3	1	1	0	0	0	14	0	1	1	1	0	25	1	0	0	1	1
4	0	0	1	0	0	15	1	1	1	1	0	26	0	1	0	1	1
5	1	0	1	0	0	16	0	0	0	0	1	27	1	1	0	1	1
6	0	1	1	0	0	17	1	0	0	0	1	28	0	0	1	1	1
7	1	1	1	0	0	18	0	1	0	0	1	29	1	0	1	1	1
8	0	0	0	1	0	19	1	1	0	0	1	30	0	1	1	1	1
9	1	0	0	1	0	20	0	0	1	0	1	31	1	1	1	1	1
10	0	1	0	1	0	21	1	0	1	0	1						
11	1	1	0	1	0	22	0	1	1	0	1						

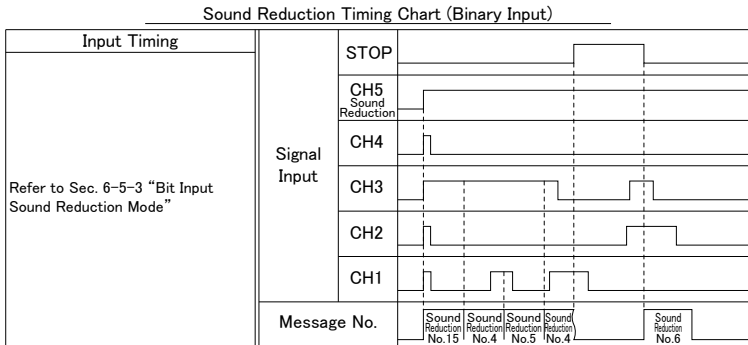※ A"1" in the table refers to the short-circuit of the signal line to the common line.

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

CH1 to 4 corresponds to Bit Inputs. CH5 Input reduces the volume by 15dB.
・ CH5 has no input priority.
・ When multiple messages are entered during playback, the next message will be reduced.
・ Any input other than "STOP" or "Sound Reduction" will be ignored during playback.
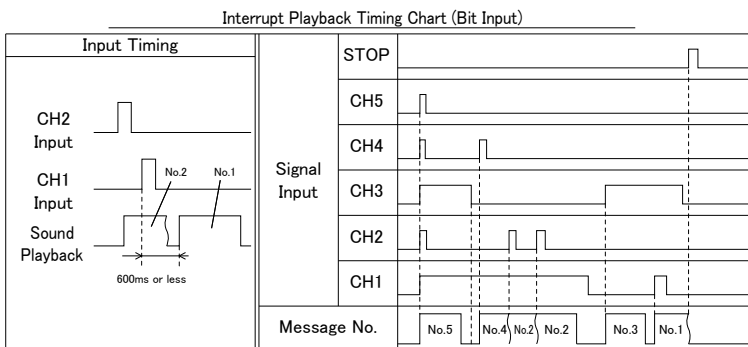

Sound Reduction Timing Chart (Bit Input)

6-5-4. Binary Input Sound Reduction Mode (Operation Mode Switch: D)

CH1 to 4 corresponds to Binary Inputs. CH5 Input reduces the volume by 15dB.
・ CH5 has no input priority.
・ When multiple messages are entered during playback, the next message will be reduced.
・ Any input other than "STOP" or "Sound Reduction" will be ignored during playback.

Sound Reduction Timing Chart (Binary Input)
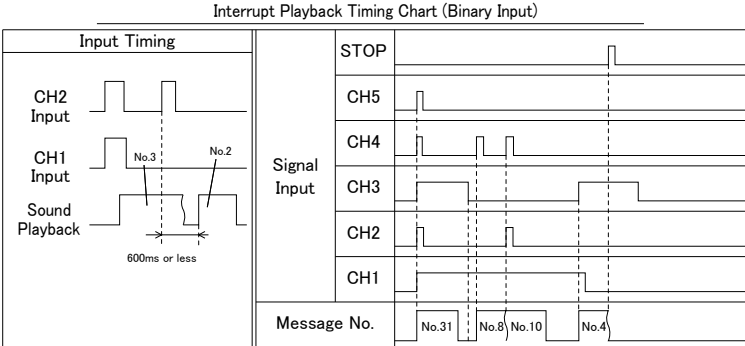
Refer to Sec. 6-5-3 "Bit Input Sound Reduction Mode"

6-5-5. Bit Input Interrupt Playback Mode (Operation Mode Switch: E)

When one of the signal wires from CH1 to CH5 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
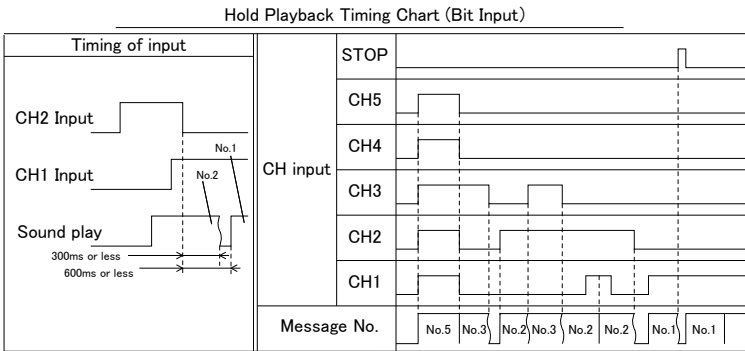

Interrupt Playback Timing Chart (Bit Input)

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

When one of the signal wires from CH1 to CH5 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
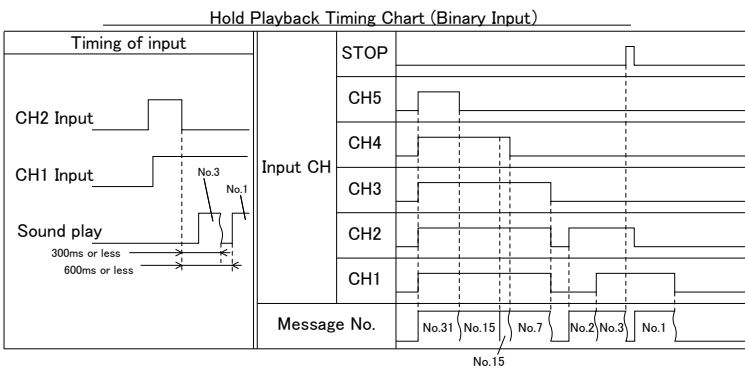

Interrupt Playback Timing Chart (Binary Input)

6-5-7. Bit Input Hold Playback Mode (Operation Mode Switch: G)

If the signal wires from CH1 to CH5 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)

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

If the signal wires from CH1 to CH5 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)

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 with a collection of 2000 MP3 standard messages.
■ Mounting Bracket: Model BK-001
　Available for Models BK・BKV
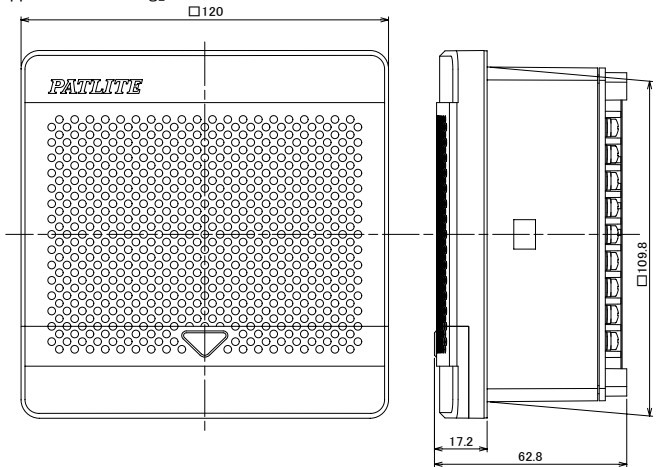
8. Before Requesting Repair

Problem	Where to Check	What to do
No Sound	Is there power supplied?	Double check the wiring. (5. Wiring)
	Is the signal line to common line short-circuited correctly?	
	Is the STOP input on?	
	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.
	Is the file name and contents of the playlist folder right?	
	Is the data storage location correct?	(FV-Win or Patlite Playlist Editor Help File.)
	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-128P" 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	BKV-31JF	BKV-31KF	BKV-31QF
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. 9W	Max. 10W	Max. 10W
Sound Pressure Level	Max. 95dB: 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	504kB (MP3 data total)/ Maximum playback time 63sec (at Standard Bit Rate)		
Number of Playback Messages	Bit Input: 5 / Binary Input: 31		
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 DC for 1 minute	1000V DC for 1 minute	1500V DC for 1 minute
	(Between terminal and chassis)		
Vibration Resistance	45.0m/s² (Upright Position)	19.6m/s² (Upright Position)	
	At 30Hz in directions from back and fourth, left and right, up and down for 2 hours		
Mass	350g ±10%	530g ±10%	

【Outer Appearance Drawing】 Unit: mm

● Despite the cautions and warnings provided in this manual, it is not the responsibility of PATLITE for any failure or damage occured from mishandling.
● Due to changes, improvements, etc., the contents of this manual may change without advance notice.