TOA

PROGRAM TIMER   TT-104B

TABLE OF CONTENTS

Thank you for purchasing TOA Program Timer.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

TOA Corporation

1. 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.

Safety Symbol and Message Conventions

Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety hazards.

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

⚠ **CAUTION**   Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

⚠ WARNING

When Installing the Unit

- 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.

- 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.

- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down and causing personal injury and/or property damage.

- Since the unit is designed for in-door use, do not install it outdoors. If installed outdoors, when it gets wet with rain, there is a danger of electric shock.

- The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

- The socket-outlet shall be installed near the equipment and the plug shall be easily accessible.

When the Unit is in Use

- Should the following irregularity be found during use, immediately 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.)

- 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.

- Do not touch a power supply plug during thunder and lightning, as this may result in electric shock.

⚠ CAUTION

When Installing the Unit

- 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.

• Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight or flame, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.

When the Unit is in Use

• Do not place heavy objects on the unit as this may cause it to fall or break which may result in personal injury and/or property damage. In addition, the object itself may fall off and cause injury and/or damage.

• 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.

• 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.

WARNING: (FOR U.S.A. only)

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the operating instructions, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.
Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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2. FEATURES

• 4 independent output channels.
• Weekly program capacity is 30 steps per channel, and each step can be programmed in 1-minute units.
• A channel assignment switch turns B, C and D outputs into A output.
• Programming, its change or cancellation can be performed easily and precisely through individual key operation and display.
• Setting the pause mode allows no program output to be delivered.
• Output is a no-voltage make contact that connects for 5 seconds at the programmed time.
• Built-in buzzer audibly warns the user of key operation error.
• Monthly error is ±5 seconds at 25°C (77°F) of ambient temperature.
• Clock and stored programs can be maintained for approximately 100 hours in the event of power outage.

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3. INSTALLATION PRECAUTION

• The supplied power supply cord is designed for exclusive use with this unit. Never use it with other equipment.
• Do not switch power on and off frequently because this can shorten the power-outage backup time.
• Be sure to set the memory backup switch to ON after installation.
• Do not install the unit close to a warm air vent or in locations where the unit is exposed to the sunlight. Installation in high temperature areas like on the amplifier makes a clock inaccurate. Install the unit in the area of which temperature is as close as possible to the room temperature.
• Install the unit as far as possible from a radio tuner or a wireless microphone.
• Be sure to ground the unit.
• Be sure to unplug power cord from the wall outlet when making connections.

4. NOMENCLATURE AND FUNCTIONS

[Front]
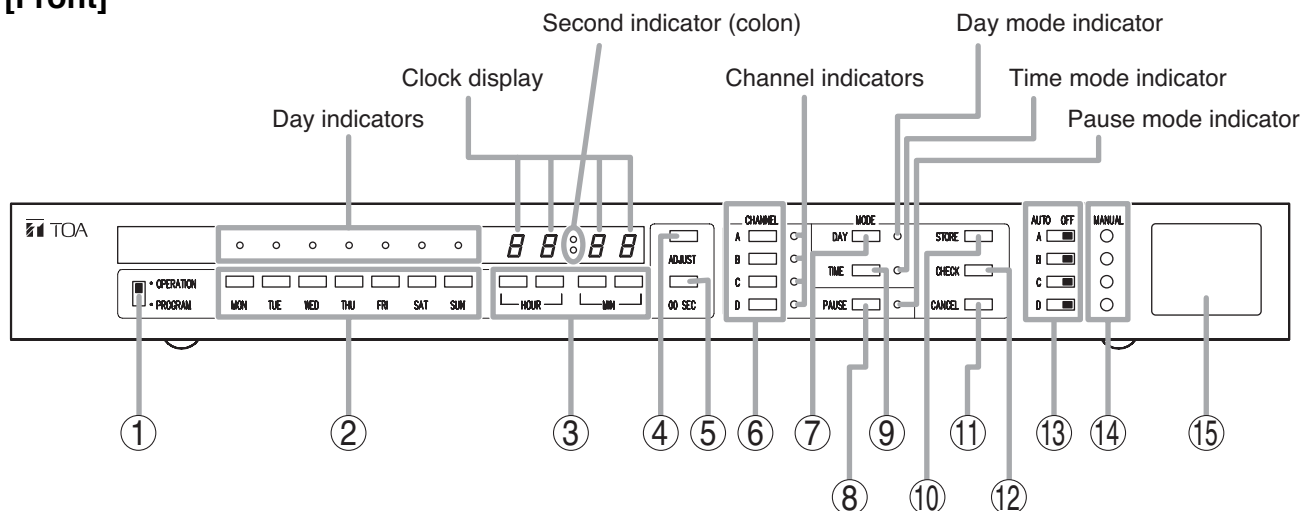
1. Program switch
Set this switch to OPERATION when setting a clock for the current time or when letting the timer work. Set the switch to PROGRAM to perform programming. (Factory-preset: OPERATION)

Note: The timer does not operate if the program switch is set to PROGRAM. Be sure to set it to OPERATION normally.

2. Day setting keys
To program a current day of the week into the timer, press this setting key with the ADJUST key (4) pressed continuously. This key is also used to register the day of the week of timer program.

3. Clock setting keys
Use these keys to set a clock for the current time. To do this, press this setting key with the ADJUST key (4) pressed continuously. These setting keys are also used to set the time of the timer program.

Note: Each time this setting key is pressed, the number over the setting key pressed increases by one.

4. ADJUST key
Pressing this key continuously, press the Clock setting key (3), Day setting key (2), or 00 SEC key (5) to set a clock for the current time.

5. 00 SEC key
Use this key to adjust a clock to seconds. As soon as the key is pressed with the ADJUST key (4) pressed continuously, the clock is reset to zero second and a new counting of second gets started.
In this case, when the clock counting is between 30 and 59 seconds, the minute indication automatically increases by one.

Note: This key works only when the program switch is set to OPERATION.

6. CHANNEL keys
Use these keys to select the program output. Pressing the key causes the corresponding channel indicator on the right side of each key to come on.

7. DAY mode key
This key is used to register a weekly program. Press the key, and the Day indicators from Monday to Sunday flash, allowing a day of the week to be set with the Day setting key (2) under each indicator.

8. PAUSE mode key
When it is desirable to stop the clock operation temporarily on a certain day because that day falls on a holiday, this can be accomplished by using this key. After pressing this key (the Day indicators flash), press the desired Day setting key (2) to set the pause day.

9. TIME mode key
Press this key to register the clock program, and the clock display flashes. Set time with the Clock setting keys (3) under the display.

10. STORE key
Press this key to store the day of the week or time set under the day, time or pause mode.

Note: No programs can be stored in a built-in memory unless this key is pressed.

11. CANCEL key
This key cancels the stored day of the week or time.
To cancel the day of the week, press the CHECK key (12) to call up the day of the week and cancel it with the CANCEL key.
Similarly, the stored time can be cancelled with both the CHECK key (12) and CANCEL key.

12. CHECK key

This key checks the day of the week or time for proper registration.

The corresponding Day indicator comes on when checking the day of the week.

Also, each time this key is pressed, the clock display shows the programmed times from the earliest time to the latest in sequence.

13. AUTO/OFF switches

Each individual output channel can be connected and disconnected with this switch.

Setting the switch to ON allows the corresponding output channel to operate at the programmed time.

When set to OFF, the output operation stops. (Factory-preset: OFF)

14. MANUAL keys

Use these keys to manually deliver the output regardless of actual program. Pressing each key closes a relay contact for 5 seconds.
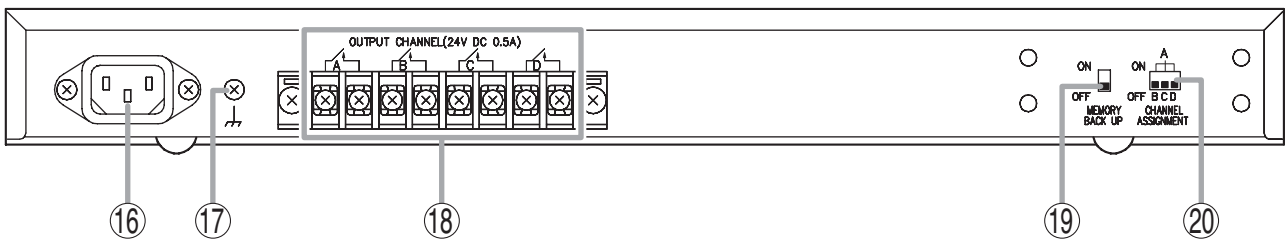
Notes

• The connected equipment can be manually activated with the keys regardless of program as well as position of the AUTO/OFF switches (13).

• The keys cannot be operated during power outage.

15. OUTPUT identification label

This label is supplied with the unit.

Write the names of programs of or equipment connected to each output channel in the label.

[Rear]

16. AC power inlet

Connect the supplied power cord to this inlet.

17. Earth terminal

Be sure to ground the unit.

18. OUTPUT CHANNEL terminal

• Output capacity: 24 V DC, 0.5 A (resistance load) Minimum load: 10 mV DC, 10 μA.

• A relay contact closes for 5 seconds at the programmed time.

• These relays provide dry contacts.

• Connect this terminal to start terminals of BGM player or spot announcing machines, etc.

19. MEMORY BACK UP switch

Be sure to set this switch to ON after installation. This switch allows clock and stored programs to be retained for approximately 100 hours during power outage. (Factory-preset: OFF)

20. CHANNEL ASSIGNMENT switch

Set each switch to ON when assigning all of B, C and D output channels to the A output channel.

When, for example, the B channel switch is set to ON, the A channel relay contact closes at the time programmed for both A and B channels. In this event, the B control output does not work. (Factory-preset: OFF)

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5. RACK MOUNTING

To mount the unit in a standard 19" equipment rack, the rack mounting bracket MB-15B (optional) is required. Follow the procedures below.

Step 1. Remove the rubber feet from the bottom of the unit.

Step 2. Attach the rack mounting bracket MB-15B to the unit.

Tapping screw 3 x 8
(supplied with the MB-15B)
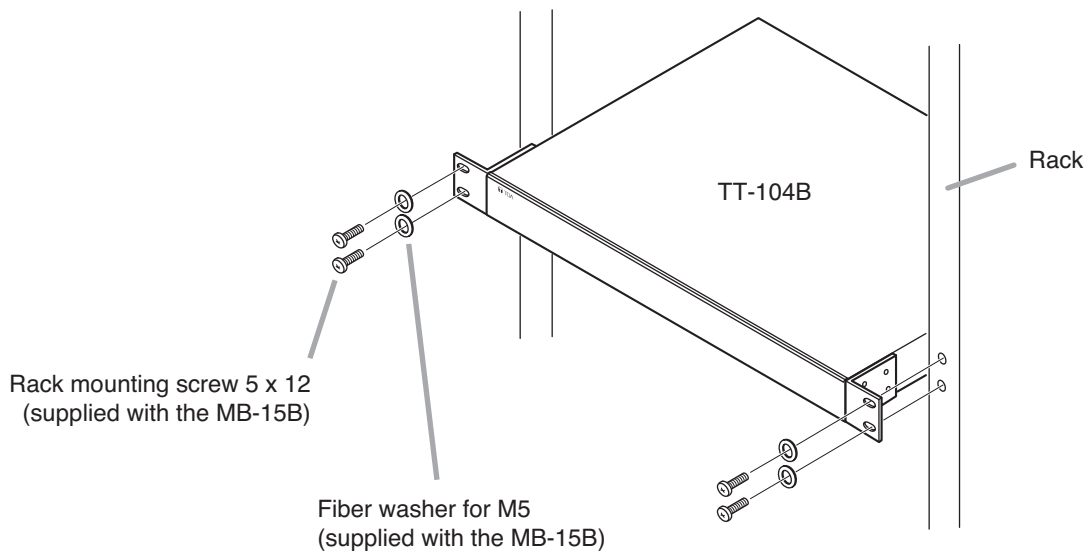
Rack mounting bracket MB-15B
(optional)
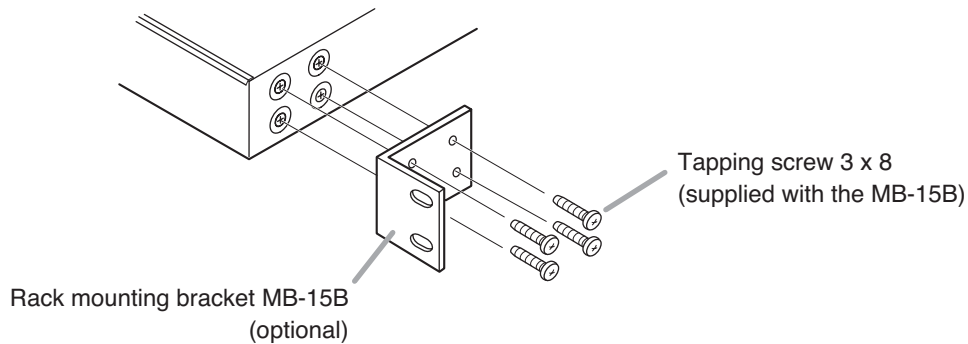
Step 3. Fix the unit in the rack.
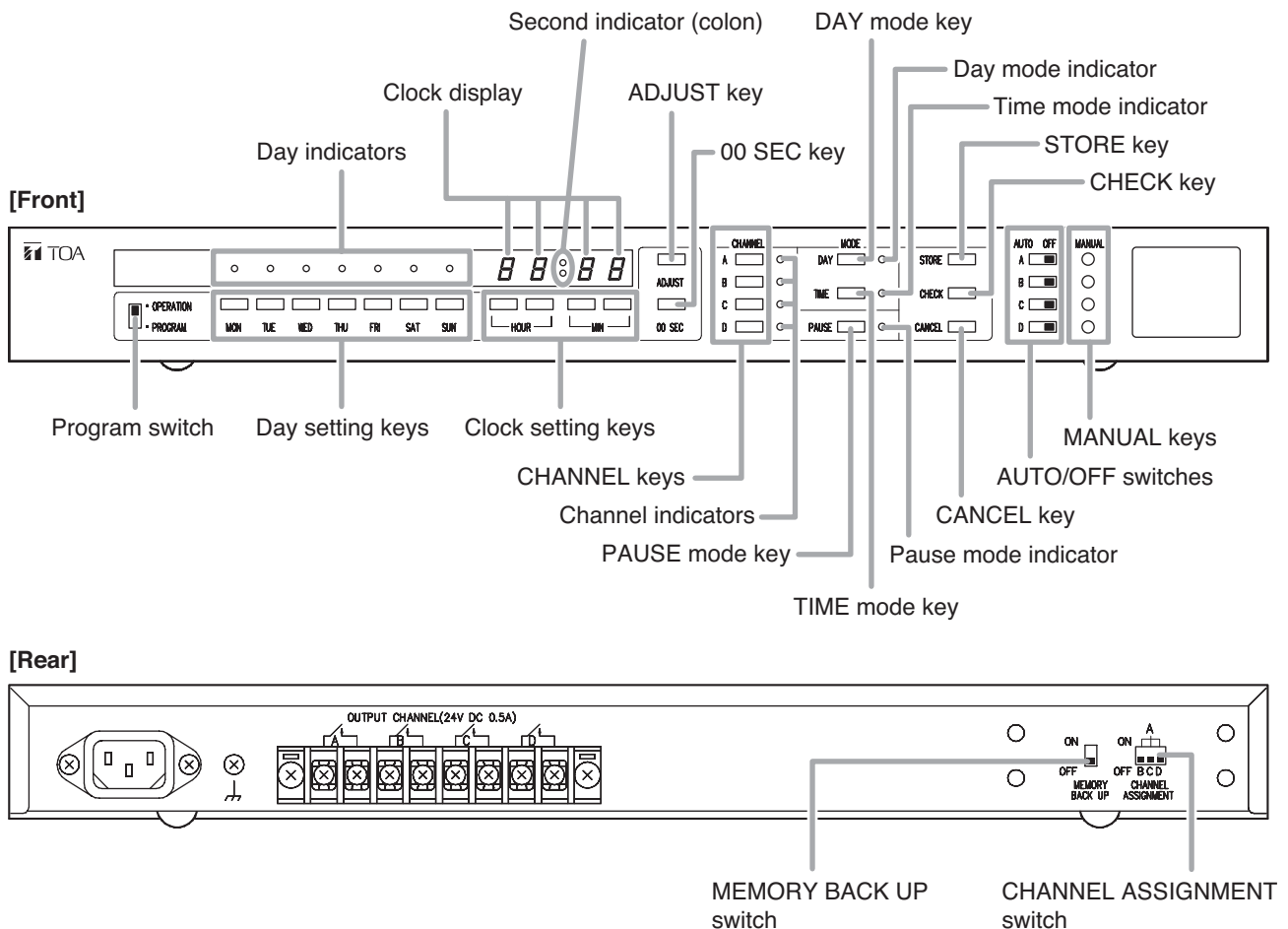Use the rack mounting screws that are appropriate for the rack.

Note
The rack-mounting screws supplied with the MB-15B can be used for the TOA equipment rack only.

Illustrated below is a unit mounting method to the TOA rack.

Rack

TT-104B

Rack mounting screw 5 x 12
(supplied with the MB-15B)

Fiber washer for M5
(supplied with the MB-15B)

6. OPERATION

[Front]

Second indicator (colon)
DAY mode key
Clock display
ADJUST key
Day mode indicator
Time mode indicator
STORE key
CHECK key
Day indicators
00 SEC key

Program switch
Day setting keys
Clock setting keys
CHANNEL keys
Channel indicators
PAUSE mode key
TIME mode key
Pause mode indicator
CANCEL key
AUTO/OFF switches
MANUAL keys

[Rear]

MEMORY BACK UP switch
CHANNEL ASSIGNMENT switch

6.1. Setting the Current Time

Step 1. Plug power cord in wall outlet.

Step 2. Set the Program switch to OPERATION.
The clock display flashes to show "0000" and at the same time, a warning tone beeps, indicating that the timer has to be set for current time.

Step 3. Set the rear-mounted MEMORY BACK UP switch to ON.
The switch allows a clock to work and the stored programs to be retained during power outage, but no timer output is delivered.

Step 4. Press the Day setting key (from Monday to Sunday) with the ADJUST key continuously pressed to set a day of the week.
The corresponding Day indicator comes on, while a Second indicator (colon) in indication "00:00" that appears in the clock display begins to flash at one second intervals, indicating that a clock is working. The beep stops.

Step 5. Pressing the ADJUST key continuously, press the Clock setting keys (HOUR and MIN) to set a clock for current time.
The number increases by one each time the setting key is pressed. If the unreal time is set which is not in a range from zero hour (00:00) to 23 hours and 59 minutes (23:59), both the Day indicator and clock display flash and at the same time, a warning tone beeps. In such a case, correct the time.

Step 6. Press the 00 SEC key, while pressing the ADJUST key continuously.
This resets the second of a clock to "00."
In this case, when the clock counting is between 30 and 59 seconds, the minute indication automatically increases by one. The minute indication does not change when the second is between 0 and 29 seconds.
(The clock display shows no second, but the clock is working in second.)

6.2. Time Correction

Step 1. Check to confirm that the Program switch is set to OPERATION.

Step 2. Pressing the ADJUST key continuously, press the 00 SEC key the moment the radio time signal tells zero second.
This allows the clock to be timed to the moment when the clock error is between 0 and 29 seconds.
If the clock error is more than 30 seconds, use the Clock setting keys while pressing the ADJUST key continuously so that the clock display indicates the correct time.

Note
The second of the clock is not reset to zero second even when a day of the week and the current time are set.

6.3. Program Registration

Note
The output of the TT-104B is a relay contact that closes for 5 seconds at the programmed time.
The relay contact cannot be kept closed or open by programs. Take care that equipment to accept the pulse output are connected to the timer.

Step 1. Enter programs in the program table supplied with the unit.
Lump the programs together per equipment connected and assign the output channel to each equipment.
If the same equipment are used but their programs are not the same, assign different output channels.

[Example]
If it is so programmed as to sound a chime both in the morning and in the afternoon of Monday through Friday, and in the morning of Saturday, and to play a piano accompaniment to the morning announcement every morning from Monday through Saturday, write on the table as follows.

PROGRAM TABLE

Output channel	A			B			C		
Equipment	Chime			Spot announcing machine					
Day	(Mon Tue Wed Thu Fri) Sat Sun			Mon Tue Wed Thu Fri (Sat) Sun			(Mon Tue Wed Thu Fri Sat) Sun		
Time	Hour	Minute	Note	Hour	Minute	Note	Hour	Minute	Note
1	0 9	0 0	Start of work	0 9	0 0	Start of work	0 8	4 0	Morning announcement
2	1 2	0 0	Lunch break	1 2	0 0	Close of work			
3	1 2	4 5	Close of lunch break						
4	1 5	0 0	Afternoon tea break						
5	1 5	0 5	Close of tea break						
6	1 7	3 0	Close of work						
7									
8									
9									

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Step 2. Program registration
Register the programs according to the contents written in the program table.

2-1. Set the Program switch to PROGRAM.
The Channel indicators (A, B, C, and D) and Pause mode indicator flash.

2-2. Press the A channel key to select the A channel.
The A channel indicator comes on, while both the Day mode and Time mode indicators flash.

2-3. Press the DAY mode key to put the timer in the day mode.
The Day mode indicator comes on. At the same time, the Day indicators from Monday to Sunday flash.

2-4. Press the Day setting key (from Monday to Friday) to designate a day of the week.
Note
When the wrong Day setting key has been pressed, press the same setting key again, and the corresponding Day indicator goes out. Then press the correct setting key.

2-5. Press the STORE key to register the day of the week.
The clock display indicates "PASS." At this point, all days from Monday to Friday have been registered into the A channel.
Note
The contents of the programs are not stored without pressing the STORE key.

2-6. Press the TIME mode key to put the timer in the time mode.
The Time mode indicator comes on. At the same time, a dotted line "– – – –" flashes in the clock display.

2-7. Set a clock for 08:55.
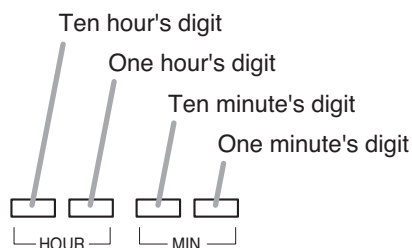Press the HOUR key (one hour's digit) 8 times.
The clock display shows "0800."

Press the MIN key (ten minute's digit) 5 times.
The clock display shows "0850."

Press the MIN key (one minute's digit) 5 times.
The clock display shows "0855."

Ten hour's digit
One hour's digit
Ten minute's digit
One minute's digit

HOUR   MIN

2-8. Press the STORE key to register the time 08:55.
The word "PASS" appears in the clock display, indicating the time 08:55 has been registered into the A output channel.
Note
The content of the program is not stored without pressing the STORE key.

2-9. Repeat **Steps 2-7** and **2-8** to register all the times from 09:00 to 17:30.
Notes
• Pressing the STORE key to register the unreal time other than one from 00:00 to 23:59 causes characters "Err" to appear in the clock display and the attempt of its registration is refused. Correct the time and register it again.
• When the same time is registered double, characters "Err" are indicated in the clock display.
• If a registration attempt is made in excess of the program capacity (30), the word "End" appears in the clock display, refusing the registration.

2-10. Repeat **Steps 2-2** through **2-9** to register days of the week and times into both B and C channels.

6.4. Program Check, Correction and Cancellation

After finishing program registrations, check the program contents.

Step 1. Set the Program switch to PROGRAM.
The Channel indicators (A, B, C, and D) and Pause mode indicator flash.

Step 2. Press the A channel key to select the A channel.
The A channel indicator comes on, while both the Day mode and Time mode indicators flash.

Step 3. Press the DAY mode key to put the timer in the day mode.
The Day mode indicator comes on. At the same time, the Day indicators from Monday to Sunday flash.

Step 4. Press the CHECK key to check the registered day of the week.
The indicator of the registered day of the week comes on.

[Correcting the day of the week]
After pressing the desired Day setting key, press the STORE key.

[Cancelling the day of the week]
Press the CANCEL key.
The word "PASS" is indicated in the display and all Day indicators from Monday to Sunday go out, achieving the cancellation.

Step 5. Press the TIME mode key to put the timer in the time mode.
The Time mode indicator comes on. At the same time, a dotted line "– – – –" flashes in the clock display.

Step 6. Press the CHECK key to check the registered time.
Each time the CHECK key is pressed, the registered time is shown in the clock display starting first with the earliest time to the latest in sequence.
Pressing the CHECK key when the last time is indicated causes the word "End" to appear in the clock display, returning the indication to the first time.

[Correcting the time]

(1) Press the CHECK key till that time appears in the display.
(2) Press the CANCEL key for cancelling the indicated time and then set the new time using the Clock setting keys (HOUR and MIN).
(3) Register the new time with the STORE key.

Note: Be sure to cancel the previous time when correcting it.

[Cancelling the registered time]

(1) Press the CHECK key to get that time in the clock display.
(2) Press the CANCEL key. The word "PASS" appears in the display and that time has been cancelled.
In this event, that cancelled time remains indicated in the display.
Further cancellations can be achieved in a similar manner by using both the CHECK and CANCEL keys.

Note: Pressing the CHECK key when no time is registered results in "End" being indicated in the display, with "Err" indicated when the CANCEL key is pressed.

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6.5. Entire Program Cancellation

It is impossible to simultaneously cancel all the programs registered into all channels.
Cancellation is only possible for each channel (A, B, C and D).
Follow the procedures below to cancel the A channel time program.

Step 1. Set the Program switch to PROGRAM.
The Channel indicators (A, B, C, and D) and Pause mode indicator flash.

Step 2. Press the A channel key to select the A channel.
The A channel indicator comes on, while both the Day mode and Time mode indicators flash.

Step 3. Press the TIME mode key to put the timer in the time mode.
The Time mode indicator comes on. At the same time, a dotted line "– – – –" flashes in the clock display.

Step 4. Press the CANCEL key with the A channel key continuously pressed.
The word "PASS" appears in the display, indicating that the whole time program registered into the A channel has been cancelled.

Similarly, the whole time program registered into each of the B, C and D channel can be cancelled.
For the day of the week, perform individual cancellations as instructed in the section 6.4. "Program Check, Correction and Cancellation."

6.6. Program Operation

Be sure to set the Program switch to OPERATION after programming is finished.
The timer does not work if the switch is set to PROGRAM.

• OPERATION

• PROGRAM
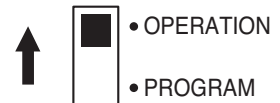
6.7. Pause Mode

• The PAUSE mode key is used to temporarily make the timer not to function on particular days. This is possible for up to the 7th day from the day of registration.
• No output is delivered from the timer on a day set for pause.
• After the pause day is over, the timer automatically returns to the normal state.

Use the pause function in such a case as the following example.

[Example]
Today is Friday and we want to stop the timer operation on Monday through Wednesday of next week since our office is closed on these three days due to holidays.

Note: When it is on Monday that Monday is registered for pause mode, the pause day is a Monday of the following week. Follow the procedures below to make Monday through Wednesday the pause days as in the example.

Step 1. Set the Program switch to PROGRAM.
The Channel indicators (A, B, C and D) and Pause mode indicator flash.

Step 2. Press the PAUSE mode key.
The Pause mode indicator comes on, while the Day indicators from Monday to Sunday flash.

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Step 3. Press the Day setting keys (Monday, Tuesday and Wednesday) to designate a day(s) of the week. Each corresponding Day indicator comes on.

    Note
    When the wrong Day setting key has been pressed, press that setting key again. The Day indicator goes out.

Step 4. Press the STORE key to register the day of the week. The word "PASS" appears in the clock display, indicating that the three days have been registered for pause.

    Note
    The contents of the program are not registered without pressing the STORE key.

Notes

· When the current day is set after the pause registration, perform the new pause registration.

· Set the Program switch to OPERATION after finishing programming.

6.8. Using the AUTO/OFF Switches

The AUTO/OFF switches (front-mounted) are used to stop actions of output relays regardless of the timer program.
When the switch is set to AUTO, the relay functions as programmed.
Setting the switch to OFF does not activate the relay.
The switchover is possible per channel.

6.9. Using the MANUAL Keys

Use the MANUAL keys (front-mounted) to activate the output relay regardless of the timer program.
Pressing the key causes the output relay to close for 5 seconds. This is possible for each individual output.
Use the keys when performing a test at time of equipment installation or for other purposes that necessitate the manual relay activation regardless of the timer program.

Note
These keys do not work during power outage.
These keys work regardless of the front-mounted AUTO/OFF switch setting.

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6.10. Using the CHANNEL ASSIGNMENT Switch

The CHANNEL ASSIGNMENT switch (rear-mounted) is used to switch over from the B, C or D channel to the A channel.
When the B channel switch is set to ON, the B program output is delivered from the A channel, with the A program output delivered from the A channel. In this event, no output is delivered from the B channel.

[Example 1]

A	B	C
8:30	9:00	12:00
9:30	10:00	
10:30	11:00	

Given that each of the output channels is programmed as Example 1, the output is delivered from each channel as follows.

If all the switches are set to OFF.
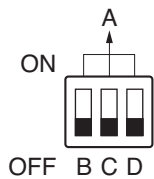
A channel: Output is delivered at 8:30, 9:30 and 10:30.

B channel: Output is delivered at 9:00, 10:00 and 11:00.

C channel: Output is delivered at 12:00.

If both the B and C switches are set to ON.
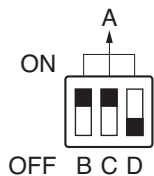
A channel: Output is delivered at 8:30, 9:00, 9:30, 10:00, 10:30, 11:00, and 12:00.

No output is delivered from both the B and C channels.

6.10.1. The CHANNEL ASSIGNMENT switch vs. AUTO/OFF switches

The AUTO/OFF switches (front-mounted) are effective for the program registered into each output.

If the CHANNEL ASSIGNMENT switch of B channel is set to ON and the AUTO/OFF switch of A channel to OFF in Example 1.
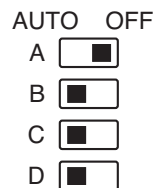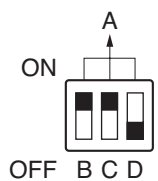
A channel delivers output at 9:00, 10:00 and 11:00.

B channel delivers no output.

C channel delivers output at 12:00.

Tips

• Since the A AUTO/OFF switch is set to OFF, the output is not delivered from the A channel at 8:30, 9:30 and 10:30 as programmed.

• Since the B channel is switched over to the A channel, the A channel delivers output at 9:00, 10:00 and 11:00, the times programmed into the B channel.

If the A channel MANUAL key is pressed under these conditions, the A output relay makes for 5 seconds. Pressing the B channel MANUAL key causes the A channel relay to close for 5 seconds because the B output is switched over to the A channel.

6.10.2. Use the CHANNEL ASSIGNMENT switch in such cases as shown below:

(1) To allow one single equipment to process four different programs through combined use of the CHANNEL ASSIGNMENT switch (rear-mounted) and the AUTO/OFF switch (front-mounted).

When, for example, the school has the Westminster chime and they want to utilize it for the following four different programs.

    1) Ordinary school hour program (Monday to Friday)
    2) Saturday program
    3) Temporary shorter school hour program
    4) Examination day program

    1) Register the ordinary school hour program into the A channel. (Register Monday through Friday.)
    2) Register the Saturday program into the B channel. (Register Saturday.)
    3) Register the temporary shorter school hour program into the C channel. (Register Monday through Saturday.)
    4) Register the examination day program into the D channel. (Register Monday through Saturday.)
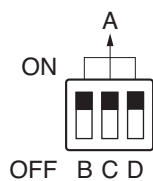
Set the CHANNEL ASSIGNMENT switches B, C and D to ON.

1) To operate the ordinary school hour program and Saturday program
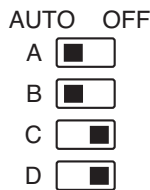
Set the AUTO/OFF switch to AUTO for the A and B channels, and to OFF for the C and D channels. This allows the ordinary school hour program to be operated on Monday through Friday, and the Saturday program on Saturday.

2) To operate the shorter school hour program
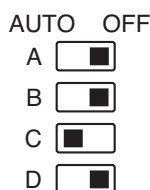
Set the AUTO/OFF switch of the C channel to AUTO, and those of other channels to OFF.
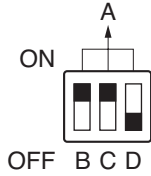
3) To operate the examination day program
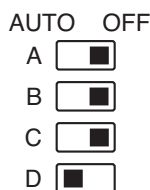
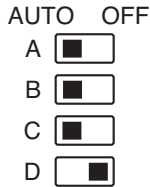Set the AUTO/OFF switch of the D channel to AUTO, and those of other channels to OFF.

Thus, by shifting the AUTO/OFF switches different programs can be readily operated.

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(2) If exceeding per-channel program capacity of 30.

When, for example, a frequently-used spot announcing machine needs to be activated 80 times a day.

Set the CHANNEL ASSIGNMENT switches (rear-mounted) of both B and C channels to ON.

Set the AUTO/OFF switches (front-mounted) of A, B, and C channels to AUTO and that of D channel to OFF.

This expands a program capacity to 80, with 30 being programmable into A channel, another 30 into B channel and 20 into C channel.
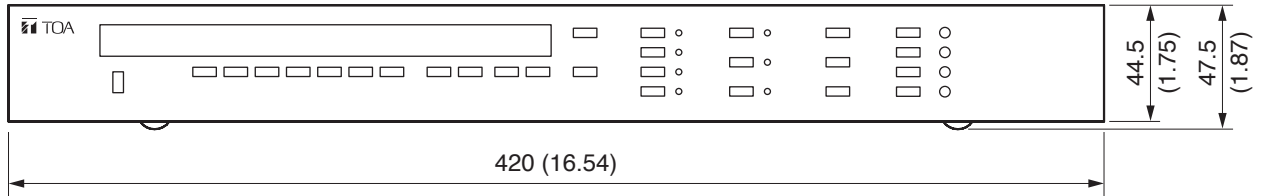
6.11. Points to Remember

· All the indications go out at time of power outage. However, a clock works normally and stored programs are maintained. No relay output is produced. After power restoration, the timer works normally and indicates the current time.

· A clock and stored programs are maintained for about 100 hours during power outage.
If the clock display flashes to indicate "0000" with beep after power restoration, this indicates that the battery has run down. In such a case, set a clock for the current time and register the program again.

· The 100-hour power outage protection is subject to the battery being kept fully charged. It takes about 200 hours to fully charge the battery. Frequent occurrence of power outage shortens the 100-hour protection time.
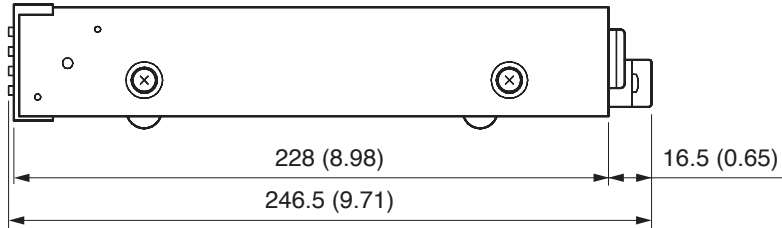
6.12. Output Relay

· Output is a no-voltage (dry) make contact.

· The relay contact closes for 5 seconds at preset time (pulse output system).

· Output relay contact capacity: Maximum: 24 V DC, 0.5 A (resistance load)
                                    Minimum: 10 mV DC, 10μA

7. DIMENSIONAL DIAGRAM

[Front]

44.5 (1.75)
47.5 (1.87)

420 (16.54)

[Side]

228 (8.98)   16.5 (0.65)
246.5 (9.71)

Unit: mm (inches)

8. SPECIFICATIONS

Power Source	AC mains, 50/60 Hz
Power Consumption	3 W
Displayed Contents	Day of the week, hour and minute
Programmable Items	Day of the week, hour, minute, output channel
Number of Channels	4 channels (A, B, C, D)
Output System	No-voltage (DRY) make contact (5 second pulse make output)
Output Capacity	24 V DC, 0.5 A
Output Terminal	M4 screw terminal, distance between barriers: 9 mm (0.35")
Program Capacity	30 steps per channel
Clock Accuracy	±5 seconds per month (25°C or 77°F)
Power Outage Protection Period	100 hours
Special Functions	Entire program cancellation, output switchover, pause mode, warning by tone and indication
Operating Temperature	0°C to +50°C (32°F to 122°F)
Finish	Panel: Aluminum, black, 30% gloss, paint Case: Pre-coated steel plate, black
Dimensions	420 (w) x 47.5 (h) x 246.5 (d) mm (16.54" x 1.87" x 9.71")
Weight	2.5 kg (5.51 lb)

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

· **Accessories**

Power cord (2 m or 6.56 ft) 1
Program table 1
Output identification label 1

· **Optional product**

Rack mounting bracket: MB-15B

TOA Corporation

URL: http://www.toa.jp/

133-05-276-5B