

BellKeeper™ TA-100A
Schedule Based Message Announcer

User's Manual
First Edition

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Overview

The BellKeeper™ TA-100A is a schedule based message announcer that plays pre-recorded MP3 files at scheduled times of the day through either an external power amplifier (such as a PA system) or, with the integrated telephone interface, a PBX phone system.

By using a simple text editor, the user can create playback schedules based on weekdays (e.g. one for Monday & Tuesday, one for Wednesday...) as well as user defined holiday schedules (e.g. 1/1, 7/4...) overriding weekday schedules if there are conflicts.

Message playback can be arranged in a number of ways, such as single file single play, single file multiple play, multiple files single play, and multiple files multiple play.

It is possible to play background music whenever the system is not playing audio. The background music can come from either an external source such as satellite radio, or a group of pre-recorded sound files stored on the SD card.

The system supports emergency message broadcasting by providing 5 hardware trigger inputs for emergency events such as fire and safety alerts. These trigger inputs are prioritized and each plays a unique, user-assigned sound file.

In order for telephone paging to work the PBX phone system must have paging support, as well as an analog port for the TA-100A to connect with.

Installing and operating the system is very easy, just follow this manual and complete these steps:

Examine Package Contents

LCD & Push Buttons

Controls & Connectors

Install Hardware

Create Schedule File

Convert Schedule File

Emergency Broadcast

Sound Files & SD Card

Power Up

Set Date & Time

Trouble Shooting

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Examine Package Contents

The TA-100A package contains:

QTY ITEM DESCRIPTION

1	TA-100A unit
1	Power Adaptor
2	Audio Patch Cord, RCA to 3.5mm (mono)
1	Audio Patch Cord, 3.5mm to 3.5mm (mono)
1	System SD Card
1	User's Manual

If any item is missing or broken upon opening of the package, please contact your dealer immediately.

The following items are not included but may be needed:

- Audio patch cords of other types
- Telephone cord (for phone paging)

System SD Card

The included System SD Card contains the following files:

- MakeTAS.exe conversion program
- DTMF touch tone files (TT*.mp3)
- Sample schedule file
- Sample sound files
- A PDF version of this manual

Please back up the files to a safe place in case the original should be lost.

Quick System Test

Insert the included SD memory card into the unit and turn on the power. Turn up the internal speaker volume (the VOLUME dial on the side of the unit) and you should be able to hear the sample background music. If not, contact your dealer for help.

LCD & Push Buttons



SET Enter/exit the setup mode.

NEXT (Setup Mode) Move to the next setup item.

PLUS (Setup Mode) Increase the value.

MINUS (Setup Mode) Decrease the value.

ABORT (Setup Mode) Exit setup without saving changes.

EMGCTY (Operation Mode) Function as the EM1 trigger button.

SPKR Toggle the internal speaker on and off. This button does not affect the audio outputs.

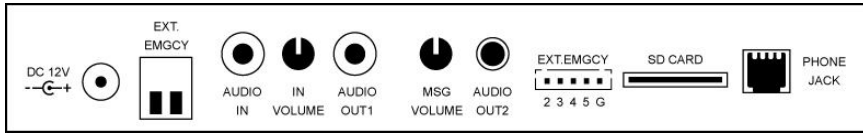
The ABORT/EMGCTY button serves as an ABORT button in the setup mode, and the EM1 trigger in the operation mode.

As the ABORT button, it exits the setup mode without saving changes.

As the EM1 trigger button, see **Emergency Broadcast** for detailed descriptions.

Controls & Connectors

A description of controls & connectors:



DC 12V

Use factory supplied power adaptor only.

EXT. EMGCV

EM1 emergency trigger input, dry contact closure. See *Emergency Broadcast* for detailed descriptions.

AUDIO IN

An external audio (e. g. background music) can be fed into the system via this RCA jack. The external audio will be played through the system when there is no event, and muted when the system executes events. If the external audio is stereo, a stereo-to-mono patch cord may be used to mix stereo into mono.

IN VOLUME

This pot adjusts the volume of the external audio fed through the AUDIO IN.

AUDIO OUT1

This RCA jack outputs balanced mono audio.

MSG VOLUME

This pot adjusts the volume of the sound files played from the SD card, including the touch tones for phone dialing. If this volume is set too low, phone dialing may not work.

AUDIO OUT2

This 3.5mm jack outputs unbalanced (single ended) mono audio.

EXT. EMGCV 2 3 4 5 G

EM2 ~ EM5 emergency trigger inputs, dry contact closure with G being the common. See *Emergency Broadcast* for detailed descriptions.

SD CARD

Supported memory card types are SD (2GB max.) and SDHC (32GB max.).

PHONE JACK

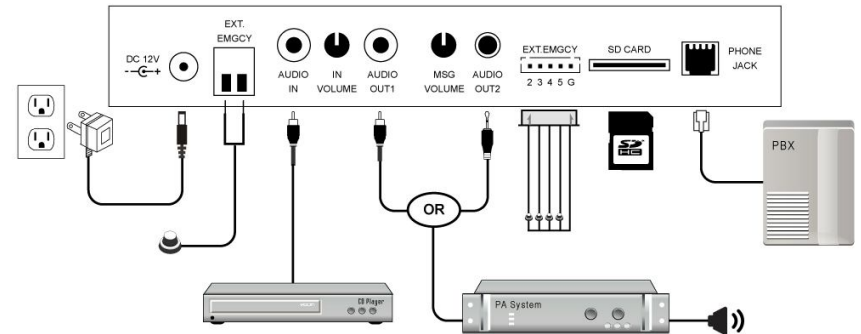
If phone paging is needed, connect the unit to a dedicated analog port on the PBX phone system with a regular RJ-11 telephone cord.

VOLUME

Located on the side of the unit, it adjusts volume of the internal speaker.

Install Hardware

Install hardware according to the typical connection diagram shown below. Note that not all connections are necessary, some are optional.



Create Schedule File

The system operates according to a schedule file created with a text editor such as Microsoft Notepad, Wordpad or Word. The file must be saved as a plain text file or it may not work properly. Text is case insensitive.

The schedule file consists of a list of event groups. An event group consists of a header followed by an event list. There are two kinds of headers: weekday header and holiday header. An event group is called a weekday group if it has a weekday header, or a holiday group if it has a holiday header.

For example, the following weekday group is for Wednesday and Saturday.

[WED, SATURDAY]
event list

Note that only the first 3 letters of the weekday's name is necessary, but a full name does not hurt.

The following holiday group is for 1/1 and 12/25:

[1/1, 12/25]
event list

A holiday group always takes priority over a weekday group. For example, in the example above 12/25 will follow the holiday schedule instead of the weekday schedule.

If a weekday or a holiday appears in multiple group headers, its events will include all those groups. However, if more than one event have the same time then only the first occurrence will be executed.

An event list is a list of events, with one event per line. Events do not need to be listed in any particular order.

An event consists of a time in the 24-hour format (HH:MM:SS) and a command, separated by an equal (=) sign. For example, the following event list plays file ABC one time at 8 AM, and file XYZ two times at 5 PM.

8:00:00=PLAY ABC
17:00:00=PLAY XYZ X 2

If two or more events for the same weekday/holiday have the same time, only the first occurrence will be executed.

The system can execute only one event at a time. If the time comes for a new event while the previous event has not finished, the system will stop the old event and start the new event immediately.

The schedule file must be converted to a TAS file before copying to the SD card. See **Convert Schedule File** for details.

Schedule File Example

```
[MON, TUE, WED, THU, FRI]
12:00:00=PLAY LUN X 3
13:00:00=PLAY ON2
08:00:00=PLAY ON1
17:00:00=PLAY OFF x 3

[SAT]
08:00:00=PLAY ON1
12:00:00=PLAY OFF X 3

[MONDAY]
09:00:00=PLAY L**
10:00:00=PLAY ABC X 12

[1/1, 12/25]
08:00:00=LOOP HOL
08:01:00=STOP
10:00:30=PAGE <34> HOL X 2
12:00:00=PLAY G** X 2
```

Notes:

1. Events in the first group are not listed in chronological order, which is fine.
2. There is no schedule for Sunday, which is fine.
3. Monday has additional events in a later group, which is fine as long as every event has a unique time. If more than one event have the same time then only the first occurrence will be executed.

Event - Play Single

Play a single file one time or multiple times.

SYNTAX

HH:MM:SS=PLAY *filename* X *play_times*

filename

First three letters of the filename. Special characters are not allowed. Be sure not to have multiple files with the same first three letters. The system will fail the power-up self test if the file is missing.

play_times

Number of times (1 - 15) to play. This parameter is optional.

Play Single One Time

8:00:00=PLAY ABC

Play file ABC one time. LCD example shows playing file ABC.

```
TUESDAY
2016/10/25  08:00:01

*PLAYING ABC    1/1
```

Play Single Multiple Times

08:00:00=PLAY XYZ X 6

Play file XYZ 6 times. LCD example shows playing file XYZ for the third time.

```
TUESDAY
2016/10/25  08:00:25

*PLAYING XYZ    3/6
```

Event - Play Group

Play a group of files one time or multiple times.

SYNTAX

HH:MM:SS=PLAY *group_name*** X *play_times*

group_name

One letter group name. For example, if the group name is G then the system will play G01, G02, G03... up to G99, or until the sequence is broken. For example, if G04 is not there then G05, G06... will not be played. The system will fail the power-up self test if a group's first file (01) is missing.

play_times

Number of times (1 - 15) to play. This parameter is optional.

Play Group One Time

8:00:00=PLAY H**

Play group H one time starting from file H01. LCD example shows playing file H03.

```
TUESDAY
2016/10/25  08:00:39

*PLAYING H03    1/1
```

Play Group Multiple Times

08:00:00=PLAY X** X 12

Play group X 12 times. LCD example shows playing file X02 for the 5th time.

```
TUESDAY
2016/10/25  08:02:18

*PLAYING X02    5/12
```

Event - Loop Single

Loop play a single file until interrupted by the ABORT button or the next event (which can be the STOP event or any other event).

SYNTAX

HH:MM:SS=LOOP *filename*

filename

First three letters of the filename. Special characters are not allowed. Be sure not to have multiple files with the same first three letters. The system will fail the power-up self test if the file is missing.

Loop Single

8:00:00=LOOP COM

Loop play file COM. LCD example shows looping file COM.

TUESDAY 2016/10/25 08:00:26 *LOOPING COM
--

Event - Loop Group

Loop play a group until interrupted by the ABORT button or the next event (which can be the STOP event or any other event).

SYNTAX

HH:MM:SS=LOOP *group_name*

group_name

One letter group name. For example, if the group name is G then the system will play G01, G02, G03... up to G99, or until the sequence is broken. For example, if G04 is not there then G05 ... will not be played. The system will fail the power-on self test if a group's first file (01) is missing.

Loop Group

8:00:00=LOOP 3**

Loop play group 3 starting from file 301. LCD example shows playing file 302 within the group.

TUESDAY 2016/10/25 08:00:53 *LOOPING 302
--

Event - Page Single

Dial a paging code and play a file one or more times through the phone interface. During this event both AUDIO OUT1 and AUDIO OUT2 are muted. The file automatically starts to play 2 seconds after the code is dialed.

Most phone systems have a code for paging a group of extensions, and another for paging all extensions. The message is automatically played through the speakerphone without the callee picking up the phone.

If this event is used to call a single extension the callee must pick up the phone in 2 seconds in order to hear the message from the beginning. In this case the event is often set up to play the file multiple times.

SYNTAX

HH:MM:SS=PAGE <paging_code> filename X play_times

paging_code

The extension number to page. Maximum 4 digits.

filename

First three letters of the filename. Special characters are not allowed. Be sure not to have multiple files with the same first three letters. The system will fail the power-up self test if the file is missing.

play_times

Number of times (1 - 15) to play. This parameter is optional.

Page Single One Time

8:00:00=PAGE <34> ABC

Page extension 34 and play file ABC one time. LCD examples shows paging first then playing file ABC.

```
TUESDAY
2016/10/25 08:00:01
*PAGING 34
```

```
TUESDAY
2016/10/25 08:00:12
*PLAYING ABC 1/1
```

Page Single Multiple Times

08:00:00=PAGE <34> R05 X2

Page extension 34 and play file R05 two times. LCD examples shows paging first then playing file R05 for the 1st time.

```
TUESDAY
2016/10/25 08:00:01
*PAGING 34
```

```
TUESDAY
10/25/2016 08:00:12
PLAYING R05 1/2
```

Event - Page Group

Dial a paging code and play a group of files one or more times through the phone interface. During this event both AUDIO OUT1 and AUDIO OUT2 are muted. The files automatically start to play 2 seconds after the code is dialed.

Most phone systems have a code for paging a group of extensions, and another for paging all extensions. The message is typically played through the speakerphone without the callee picking up the phone.

If this event is used to call a single extension the callee must pick up the phone in 2 seconds in order to hear the message from the beginning. In this case the event is often set up to play the file multiple times.

SYNTAX

HH:MM:SS=PAGE <paging_code> group_name** X play_times

paging_code

The extension number to page. Maximum 4 digits.

group_name

One letter group name. For example, if the group name is G then the system will play G01, G02, G03... up to G99, or until the sequence is broken. For example, if G04 is not there then G05, G06... will not be played.

play_times

Number of times (1 - 15) to play. This parameter is optional.

Page Group One Time

8:00:00=PAGE <34> H**

Page extension 34 and play group H one time. LCD examples shows paging first then playing file H01.

```
TUESDAY
2016/10/25 08:00:01
*PAGING 34
```

```
TUESDAY
2016/10/25 08:00:12
*PLAYING H01 1/1
```

Page Group Multiple Times

08:00:00=PAGE <34> H** X 12

Page extension 34 and play group H 12 times. LCD examples shows paging first then playing file H01 for the 1st time.

```
TUESDAY
2016/10/25 08:00:01
*PAGING 34
```

```
TUESDAY
2016/10/25 08:00:09
*PLAYING H01 1/12
```


Event - Stop

Stop the current event if any. It is often used to stop a LOOP event, but can be used to stop any event.

SYNTAX

HH:MM:SS=STOP

The STOP event does not display anything on the LCD.

There is no need to STOP a current event immediately before the next event because the next event will stop the current event anyway. For example:

08:00:00=LOOP A08

08:59:59=STOP (*this event is unnecessary*)

09:00:00=LOOP A09

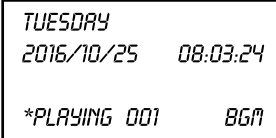
Event - Background Music

Background music is an event that does not need to be listed in the schedule file. It is automatically enabled by the presence of BGM files.

BGM files are files named 001, 002... up to 099. If they are present on the SD card then the system will automatically play them whenever it's not executing events. The BGM files will be played sequentially starting from 001, up to 099 or the last file before the sequence is broken. Then it will restart from 001 again. For example, if file 007 does not exist then file 001 will restart after file 006 is played even if file 008 exists.

If file 001 does not exist then background music is disabled, even if files 002, 003... and etc. exist.

LCD example shows playing BGM file 001.



TUESDAY
2016/10/25 08:03:24
*PLAYING 001 BGM

Instead of playing BGM files for background music, the system can play an external audio source (e.g. satellite music) via the AUDIO IN jack. The external audio source will be muted automatically during event execution.

If both the external audio source and the BGM files are present, they will be played at the same time.

Convert/Reverse Schedule File

A schedule file in the text format must be converted to a TAS file in order for the system to use. The conversion does the following:

- Syntax is checked and errors are pointed out.
- File is converted from text to data.
- Size of the converted file is checked and an error given if it's too big.

The conversion is done by using the MakeTAS program found on the included System SD Card. This Windows program needs no installation - just copy it to a folder and execute it from there.



Click [Make TAS], navigate to and open the schedule file. The TAS file will then be generated and placed in the same folder if there are no errors. The TAS file has the same filename as the schedule file but with TAS_ added to the beginning. For example, the TAS file for abc.txt is TAS_abc.txt. Note that although the TAS file has a txt file type it's not a text file anymore.

Error messages will be given for syntax errors and file size over-limit.

The TAS file should be copied along with message files to the SD card, but the original schedule file does not need to be copied.

Click [Reverse TAS] if you want to convert a TAS file back to a schedule file. Just navigate to and open the TAS file.

Emergency Broadcast

Activated via the EM1 ~ EM5 trigger inputs the system can stop the current event (if any) and broadcast an emergency message, files EM1.mp3 ~ EM5.mp3 respectively, in one of the following ways:

Route External Audio (AUDIO IN) To The Audio Outputs

If the corresponding message file is missing on the SD card then the system will simply route the external audio (from AUDIO IN) to the audio outputs for as long as the input is triggered.

Play Emergency File Through The Audio Outputs

If the message file is found and named EM?.mp3 where ? is 1 ~ 5, then the system will play the file through the audio outputs. The message will repeat for as long as the trigger is active.

Play Emergency File Through The Phone Interface

If the emergency file is found and named EM?#code.mp3 where ? is 1 ~ 5 and code is a number of up to 4 digits, then the system will page the code and play the file through the phone interface. For example, if input EM1 is triggered and the filename is EM1#34.mp3 then the system will first dial 34, wait 2 seconds (this delay is fixed at 2 seconds) and then play the file through the phone interface one time. The audio outputs will be muted at the same time for the emergency message to play through the phone system only.

The emergency trigger inputs are prioritized, with EM1 being the highest and EM5 being the lowest. A higher priority trigger will interrupt a lower priority trigger, but not vice versa.

The emergency broadcast can be triggered by a variety of devices such as push button switches, fire/security alarms and motion sensors. Just make sure the trigger signal is a normally open dry contact closure.

Sound Files & SD Card

Sound Files

Only MP3 files are accepted as sound files. Sound files in other formats must be converted to MP3. Stereo files will have the left & right channels internally mixed together since the output is monaural only.

Keep the first 3 characters of a filename unique since it is used by the system for identification. These 3 characters should not contain any space. Avoid using the following names that are reserved by the system:

EM1 ~ EM5 - emergency files for EM1 ~ EM5 respectively

001 ~ 099 - background music files

Group Files

A group has a single letter (A ~ Z) or digit (1 ~ 9) as its name. For example, the C group includes files C01, C02... up to C99 or when the sequence is broken. For example, if the card contains C01, C02, C04 but not C03, then the C group will include C01 and C02 only. In this case C04 belongs to no group and can be used as an independent sound file.

SD Card

The system requires an SD or SDHC memory card to operate. The card must be formatted with FAT or FAT32 file system, which is usually the case for brand new cards.

Copy the converted schedule file (the TAS file) and all necessary sound files onto the card via an SD card reader. If telephone paging function is needed then the 12 touch tone files (TT0 ~ TT9, TTP, TTS) found on the System SD Card must also be copied onto the card. All files must reside in the root folder.

The System SD Card may be used directly for operation. In that case it is recommended to back up the touch tone files and the MakeTAS program somewhere else.

Always turn the power off before inserting the card, or the system will not work properly.

Power Up

Upon power on the system will do a self test which is called the POST (Power On Self Test).

```
TA-100
FIRMWARE: 1.0

SELF TESTING...
```

The POST basically reads the TAS file and verifies that all necessary files are there on the SD card. If any file is missing then the LCD will show an error message and the system will be halted. Note that the POST stops at the first error, it will not show the second error (if any) until the first error is corrected.

If the POST is passed the system will go into the operation mode. The LCD shows the current date & time and the "SYSTEM RUNNING" status.

```
TUESDAY
2016/10/25 14:25:06

*SYSTEM RUNNING
```

The following LCD example shows SD card error. The card could be missing, defective or of the wrong type.

```
TA-100
FIRMWARE: 1.0

MEMORY CARD ERROR
```

The following LCD example shows file ABC is not found on the SD card.

```
TA-100
FIRMWARE: 1.0

FILE ABC IS MISSING
```

Note that for a file group the POST only verifies the existence of the first file (e.g. G01 for group G**). This is due to the fact that the system has no way of knowing how many files the group should have.

Set Date & Time

Press [SET] to enter the setup mode.

```
OFFSET = 0
2016/10/25 09:30:18
<+> SPEED UP CLOCK
```

The cursor will be blinking over the OFFSET value which can be adjusted to correct clock error. Press either [PLUS] or [MINUS] to change the value: increase it by one to make the clock run 68 seconds slower per year, decrease it by one to make the clock run 68 seconds faster per year. If the clock error is within +/- 34 seconds per year then no OFFSET adjustment is needed.

The OFFSET value is stored in nonvolatile memory and factory set to the optimal value (not necessarily 0), but may need adjustment if:

- The system operates in an environment much colder/hotter than 25°C.
- The system has aged a few years since the previous OFFSET adjustment.

If you do not wish to adjust OFFSET, press [NEXT] to move the cursor to the date/time line. The cursor on the date/time line is a underscore instead of a blinking block, as shown below.

```
OFFSET = 0
2016/10/25 09:30:18
<SET> SAVE & EXIT
```

Press [PLUS]/[MINUS] to change value, [NEXT] to move to the next item.

After all necessary changes are made, press [SET] to save the changes and exit the setup mode. Or press [ABORT] to discard the changes and exit.

The system has an internal rechargeable backup power that can keep the clock running for at least 24 hours without power, so that date & time would not be lost after power outages. But the internal backup power is not powerful enough to keep the whole system running during power outages.

Trouble Shooting

1. Clock is too fast or too slow.

Refer to *Set Date & Time* and adjust the clock offset accordingly. Do not adjust the clock offset unless the error is more than 34 seconds too fast/slow per year, otherwise the error will be even bigger.

2. Phone paging does not work.

Phone paging is possible only if the TA-100A is connected to the phone system via an analog port. A digital port would not work.

Make sure connections between the unit and the phone system are tight and secure. Test and make sure paging works with a phone.

If touch tone dialing cannot be heard from the internal speaker then there is something wrong with the TAS file.

If touch tone dialing can be heard from the internal speaker then its volume may be too low. Try turning the MSG VOLUME up.

Technical Specifications

Audio Output

- 1 x RCA Jack (600 Ohm balanced mono)
- 1 x 3.5mm Jack (unbalanced mono)
- 1 x RJ11 Phone Jack (for PBX paging)

Audio Input

- 1 x RCA Jack (unbalanced mono)

Sound File Support

MP3 (ISO 11172-3 up to 320 kbps)

Memory

SD (2GB max.) & SDHC (32GB max.)

Message Time: about 14 hours of 320 kbps MP3 on 2GB

LCD Display

20 x 4 (with backlight)

Emergency Trigger Inputs

EM1 (highest priority) ~ EM5 (lowest priority)

Included Accessories

- 1 x SD Card
- 1 x Power Adaptor
- 2 x Audio Patch Cord, RCA to 3.5mm (mono)
- 1 x Audio Patch Cord, 3.5mm to 3.5mm (mono)

Physical Dimensions

230mm x 174mm x 35mm