

BrassHat™ Annunciator

Message & Sound Player Model No. BH-21A

10-Track On-Demand Recorder/Player

- Record up to 10 messages/sounds and play **automatically** or **on-demand**
- Perfect for passenger station, yard and industry announcements
- Trigger playback with faceplate pushbuttons or connected electronics
- Automatic playback with fixed or random order, fixed or random timing
- Select a **user-recorded** background sound track or a **factory-recorded** sound track to play between triggered messages
- Record with built-in microphone or LINE IN jack from PC, CD player, etc.
- Over 3 1/2 minute total recording capacity – erased messages recycled to always maintain full capacity – no gaps!
- Speaker output or stereo jack for powered speakers (same audio on both stereo channels)
- Separate playback volume controls for messages and background sound
- 200 mA outputs drive LEDs, motors, relays on trigger or during playback

Simple Installation

- Faceplate/Circuit Assembly with Fascia Template for clean installation
- Screw terminals for all circuit board connections
- Power Supply: DC (9-12 V) or AC (7-9 V), 150 mA **required**
- 8-Ohm speaker or powered speakers **required**

Parts List

- **BrassHat™** Annunciator Faceplate/Circuit Assembly
- Fascia Template

Before You Install

- Your **BrassHat™** Annunciator can be damaged by static electricity. Before removing the circuit board from its packaging, discharge static electricity by touching a bare metal surface.
- Do not install or make connections when circuits or track are powered.
- Insulate all exposed connections, preferably with heat shrink tubing.
- Prevent contact between Annunciator and other wiring.
- Read through the rest of these instructions before beginning.
- Visit www.bouldercreekengineering.com for additional information.

1. Wiring Instructions

Figure 1 shows how to wire your **BrassHat™** Annunciator, along with key features on the circuit board.

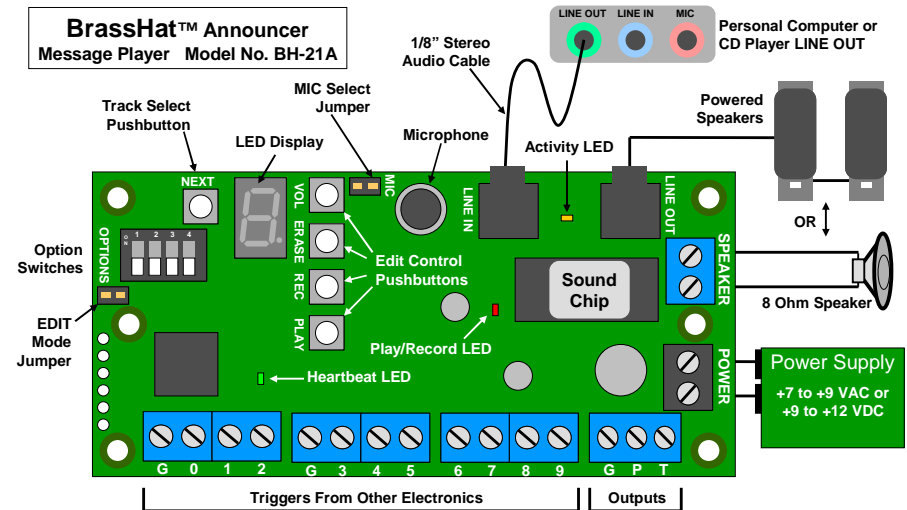


Figure 1: Circuit Board & Wiring Diagram

1. Connect two wires from your power supply to the Annunciator **gray** power terminals as shown in **Figure 1**. Polarity does not matter. The power supply must be 7 to 9 Volts AC or 9 to 12 Volts DC, with 150 mA capacity. Radio Shack sells an AC adaptor (#273-314) that works well.

Warning: Do not exceed 9 Volts AC or 12 Volts DC as this will damage the circuit board.

Warning: Do not share an AC Adaptor with other electronics as this will cause humming or buzzing interference in the audio output.

2. Connect either an 8 ohm speaker to the SPEAKER terminal block or connect powered speakers with a 1/8" stereo plug to the LINE OUT jack. (Audio output is mono.) Powered speakers are highly recommended as they provide much better sound quality and are available for about \$10 from Amazon.com and other Internet sources. (**Speakers are not included.**)

Warning: Connecting a speaker rated less than 8 ohms to the SPEAKER terminal block will damage the circuit board.

Your **BrassHat™ Announcer** is now ready to use with its onboard microphone as audio source, and Edit Control Pushbuttons and Faceplate Pushbuttons for control.

For additional features, you may want to make the following connections:

- If you want to record from a personal computer, CD player or other audio source, you can connect that source's LINE OUT to the Announcer's LINE IN jack as shown in **Figure 1**. Male-to-male 1/8-inch stereo audio cables are available from Radio Shack (#42-890) and other retailers.
- You can wire other electronics to trigger Announcer as in **Figure 1**. Grounding a Trigger Input is the same as pressing a faceplate pushbutton, allowing other electronics to control the Announcer. For more information, visit www.bouldercreekengineering.com/manuals.php.
- Announcer Output T is grounded when a Trigger Input is detected. Output P is grounded during playback. You can connect Outputs to other electronics as in **Figure 1**. For more information, visit www.bouldercreekengineering.com/manuals.php.

2. Testing Your Wiring

- Set all Option Switches to the **OFF** position.
- Check that both EDIT and MIC jumpers are in place.
- Apply power to your **BrassHat™ Announcer**. The Heartbeat LED should blink once every second. Check your power wiring if it does not.
- Turn Option Switch 1 on.
- The Heartbeat LED should remain on and "F" should show on the LED Display. You should hear the Factory Background sound track playing: passengers talking on an outdoor platform. Check your speaker wiring if not.
- Congratulations**, your Announcer is now operational!



Factory Background Track Playing

3. Edit Mode Operation

3.1 Entering Edit Mode

Remove the EDIT Mode Jumper to enter Edit Mode. See **Figure 1**. To avoid misplacing the jumper, reconnect it over just one of the gold pins.

When in Edit Mode, the green Heartbeat LED is on. The red Play/Record LED flashes when the Announcer is recording or playing messages. The yellow Faceplate Activity LED is on when playing.

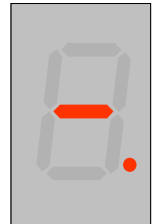
When working with the **BrassHat™ Announcer** circuit board, especially in Edit Mode, we recommend placing the Announcer Faceplate-down on a soft raised surface such as a foam pad or folded cloth. Place it so the Fascia Pushbuttons are off the edge of the soft surface and not being pressed.

3.2 Memory Capacity

BrassHat™ Announcer can store up to 216 seconds (3 minutes, 36 seconds) of recorded messages or sounds. The Announcer recycles erased message space and always maintains this capacity. This eliminates unusable gaps that can occur with tape, CD, and memory card recordings.

LED Display	Remaining Capacity
9	more than 90%
8	80% - 90%
7	70% - 80%
6	60% - 70%
5	50% - 60%
4	40% - 50%
3	30% - 40%
2	20% - 30%
1	10% - 20%
0	less than 10%

During recording and also when requested, the Announcer displays its remaining unrecorded capacity. The number shown on the LED display is the remaining capacity rounded down to the nearest 10% as in the table.



Memory Full

If recording completely fills all 216 seconds of capacity, recording stops and the ERROR TONE plays. The Announcer displays a dash and the decimal point lights up on the LED Display as shown here. The decimal point remains lit until an erase frees up memory.

3.3 Selecting Sound Tracks

BrassHat™ Announcer has 10 recordable sound tracks that can be triggered to play on demand, numbered 0 – 9. There is a User Background Track that you can record, displayed as "U". (The Factory Background Track is not accessible and displays "F" when playing.)

The LED Display shows Track 7 as the selected Track.



Track 7, Memory Full

Press and release the NEXT Pushbutton to advance to the next Track. Advancing wraps around from Track U back to Track 0.

3.4 Recording

Each Track is empty until recorded. Any Track can be recorded to any length, up to the Announcer’s full memory capacity.

For recording from the built-in Microphone, remove the MIC Select Jumper. See Figure 1. Reconnect it over just one of the gold pins for safe keeping.

To record from electronic sound sources (such as a PC, CD player or tape deck) through the Announcer’s LINE IN jack, connect the two gold MIC pins with the MIC Select Jumper. See Figure 1.

When LINE IN is selected, you will hear the source playing through the Announcer’s speaker (connected in Step 2 of Section 1). You will hear a change in the source sound when recording is started.

Select the Track you wish to record as described in Section 3.3.

Press and hold the RECORD Pushbutton to start recording. Release the RECORD Pushbutton to stop recording. While recording, the Play/Record LED will flash and the LED Display will show the remaining memory capacity as described in Section 3.2.

If the selected Track is already recorded, the ERROR TONE plays when you press RECORD. You must erase the Track before recording.

If recording completely fills all memory, recording stops and the ERROR TONE plays. The Announcer turns on the decimal point on the LED Display.

3.5 Playing

Select the Track you wish to play as described in Section 3.3.

Press and release the PLAY Pushbutton to begin playing. If the selected Track is not recorded, the ERROR TONE plays.

While playing, the Play/Record LED will flash and the LED Display will continue to show the selected Track. The selected Track will play to the end and stop.

While a Track is playing, press and release the PLAY Pushbutton to stop.

3.6 Erasing a Track

Select the Track you wish to erase as described in Section 3.3.

Press and release the ERASE Pushbutton to erase the Track.

The OK TONE plays when the Track has been erased. Long recordings take more time to erase than short recordings.

Note: Once erased, recordings cannot be retrieved.

3.7 Erasing All Tracks

Press and hold the ERASE Pushbutton. Continue to hold and press and hold the PLAY Pushbutton. The Announcer will play a WARNING TONE and show a big “E” on the LED Display.

After both Pushbuttons have been held for four seconds, the Announcer will erase all Tracks, including the User Background Track.

The OK TONE plays when all tracks have been erased. Now release both Pushbuttons.

Note: Once erased, recordings cannot be retrieved.



Erasing All Tracks

3.8 Checking Remaining Memory

Press and hold the NEXT Pushbutton. After two seconds, the OK Tone plays and the LED Display will show the remaining memory capacity as described in Section 3.2.

3.9 Adjusting Run Mode Volume

To adjust the Run Mode playback volume for all on-demand sound tracks (0 – 9), select any on-demand Track. To adjust the playback volume for both Background Tracks, select the User Track (U).

Press and release the VOLUME Pushbutton to change the sound volume.

Each press and release increases or decreases volume between 8 levels. Volume increases to maximum sound volume (8), then decreases to minimum sound volume (1), then increases again. The LED Display shows the new volume level after each press and release.

3.10 Changing Automatic Playback Timing

To select the delay between Tracks during Automatic Playback, select the Value (Track) with the LED Display matching the desired delay as shown in the table. For example, select “5” for 60 seconds.

Selecting 7 or 8 will randomly vary the delay between 0 to 15 or 0 to 120 seconds during Automatic Playback.

To change the delay, press and hold the NEXT Pushbutton. While holding the NEXT Pushbutton, immediately press the PLAY Pushbutton. The OK TONE will play when the change is completed.

Selected Value	Auto Play Delay (seconds)
8	Random (0 – 120)
7	Random (0 – 15)
6	120
5	60
4	30
3	15
2	8
1	4
0	0

4. Run Mode Operation

4.1 Entering Run Mode

To enter Run Mode, connect the two gold pins with the EDIT Mode Jumper. See **Figure 1**.

When in Run Mode with no Background Track playing, the green Heartbeat LED blinks once per second. When a Background Track is playing, the green Heartbeat LED is steadily on.

The red Play/Record LED flashes when the Announcer is playing messages. The yellow Activity LED is lit when playing a triggered (on-demand) Track.

4.2 Setting Options for Run Mode

Setting Option Switches on or off (see **Figure 1**) will change Run Mode Options as defined below.

OPTION SWITCH DEFINITIONS

1	2	3	4
Background	User BG	Auto Playback	

Switch 1 Background

- ON** Background Track plays between Triggered Tracks
- OFF** Background Track does not play between Triggered Tracks

Switch 2 User Background Track

- ON** User Background Track selected
- OFF** Factory Background Track selected

Switches 3, 4 Automatic Playback

- 3 OFF, 4 OFF** **No Auto Play.** Automatic Playback is disabled
- 3 OFF, 4 ON** **Track Order.** Tracks play in order, Track 0 first
- 3 ON, 4 OFF** **Shuffled.** All Tracks play in random order, then in another random order – all Tracks play once before reshuffle
- 3 ON, 4 ON** **Random.** Tracks play in random order; a Track may repeat before another Track plays even once; a particular Track may play twice in a row

4.3 Playing Tracks From Fascia Faceplate

Press and release Faceplate Pushbuttons **once** to play Tracks 0 – 4. Press and release Pushbuttons **twice** to play Tracks 5 – 9. See **Figure 2**.

Hold a Pushbutton after the first or second press to play the selected Track **continuously** as long as the Pushbutton is held.

Press the same Faceplate Pushbutton once while a triggered Track is playing to stop play.

Press a different Faceplate Pushbutton, once or twice, while a triggered Track is playing to stop play of the original Track and start play of the newly-selected Track.

Press any Faceplate Pushbutton, once or twice, while a Background or Auto Play Track is playing to stop play and start playing the selected Track.

The yellow Activity LED illuminates as each press is detected by **BrassHat™ Announcer**. The Activity LED also lights up while the selected Track plays.

4.4 Playing Tracks from Model Railroad Electronics

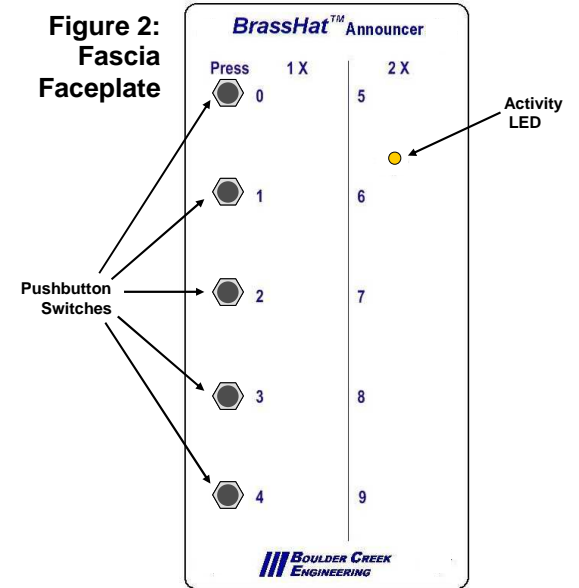
Grounding a **BrassHat™ Announcer** Trigger Input causes it to respond as if the corresponding Faceplate Pushbutton has been pressed. See **Figure 1**.

Visit www.bouldercreekengineering.com/manuals.php for more information on Trigger Input connections to other model railroad electronics.

4.5 Automatic Playback of Recorded Tracks

Select Automatic Playback with Option Switches 3 and 4 to play all recorded Tracks in the pattern selected as in **Section 4.2**. Unrecorded tracks are skipped.

Playback pauses between Tracks with the delay selected in **Section 3.10**.



4.6 Playing A Background Track

If selected, a Background Track plays when no other Track is playing. You can select either the Factory Track or the User Track that you record. See **Section 4.2**.

If you select the User Track before recording it, the ERROR TONE will play.

5. Fascia Installation

When you have recorded all desired sound tracks (see **Section 3**), you are ready to mount your **BrassHat™ Announcer** into your model railroad fascia:

1. Use the included Fascia Template to mark the screw and display holes on your fascia. The template shows clearance holes for No. 4 machine screws. **These holes will need to be much smaller for wood screws.**
2. Cut out the display hole; drill the screw holes.
3. Mount the Track Scale Faceplate/Circuit Assembly to your fascia with No. 4 pan-head screws (not included).

6. Helpful Hints

6.1 Microphone Recording

- Gently press and release the RECORD Pushbutton when recording from the Microphone. This will reduce the sound of the Pushbutton clicks in your recording.

6.2 Line In Recording

- If the volume of the audio source (PC, CD player, etc.) is too high or too low, recording through the LINE IN Jack will be distorted or difficult to hear. Lower the source volume to eliminate distortion. Raise the source volume if the recording is hard to hear.

6.3 Fascia Pushbuttons

- Pressing the Fascia Pushbuttons too rapidly will cause the Announcer to misread the Pushbutton and play the wrong Track.
- Watch for the yellow Activity LED to light as you press the Fascia Pushbuttons. When the LED lights, the Announcer has detected the press and you may release the Pushbutton.
- To play Tracks 5 – 9, press the Fascia Pushbutton a second time as soon as the yellow Activity LED goes out from the first press. If you delay too long after the first press, Announcer will not detect the second press.

Support & Service

If you have problems with your **BrassHat™ Announcer**, please consult our website www.bouldercreekengineering.com. If you need additional help, please contact us at support@bouldercreekengineering.com.

Your Announcer can be repaired with a charge for parts and labor. Please contact support@bouldercreekengineering.com for a cost estimate on non-warranty repairs before sending product to us.

Limited Warranty

Boulder Creek Engineering, LLC warrants its products to be free of defects in materials and workmanship for a period of **one (1) year** from the purchase date. Defective product received by Boulder Creek Engineering during the warranty period will be repaired or replaced at our option. You must pay shipping to and from Boulder Creek Engineering.

This warranty does not cover damage resulting from negligent installation, improper operation, or unauthorized repair or modification. Removal of the heat shrink voids this warranty. Boulder Creek Engineering makes no other warranty of any kind, expressed or implied. In no event shall Boulder Creek Engineering be liable for incidental or consequential damages.

For warranty service, please contact Boulder Creek Engineering for a Return Merchandise Authorization (RMA) number. Product must be shipped to Boulder Creek Engineering with dated proof of purchase (your receipt).



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