

PAR G5

AUDIO OPTIMIZATION

TECHNICAL BULLETIN - #157

Overview:

This document describes and illustrates the steps involved to set the Inbound Audio level and optimize the sound for the PAR G5 base- station.

Simple Summary of steps to optimize Audio (detailed in sub-sections below):

1. Make sure headset is properly fitted so the speaker is seated on the ear. – Check for levels
2. Raise volume on the headset – Check for levels
3. Set the Outbound audio first – About 12 to 14 maximum is the normal range.
4. Raise the Inbound volume settings on the basestation – Check for levels
5. Raise Microphone Preamp Gain in steps. – Check for levels and ensure there is no echo while taking into the headset mic.
6. Decrease Inbound Mic Noise Reduction setting – Check Inbound volume level, does the system pickup more background noise?
7. Measure ambient noise at the speaker post - 1 meter away (~ 3 feet) on axis to the microphone.
If the Sound Meter measure more than 65dB, you may have to create a barrier between the speaker post and the noise source.

Optimizing Inbound audio level:

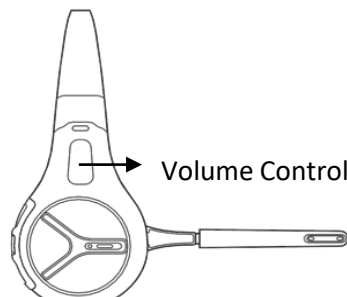
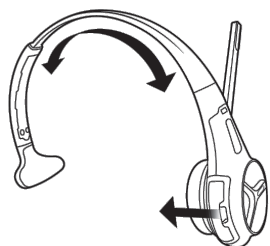
1. Proper fitting of headset

Make the following adjustments to the headset to make sure it is not only comfortable, less likely to fall off and easy for you to hear and speak clearly; but to also make sure the *speaker on the headset is properly aligned to your ear.*

- a) Adjust the size of the headband until the ear pad rests against one ear and the comfort pad cushion rests just above the other ear.
- b) To create a tighter fit, hold the headset with one hand on the Pod area and the other hand on the Comfort Pad area. Gently bring the two hands close to one another, then past one another. Slowly move one end back and forth.
- c) This ensures pressure is applied equally along the length of the headband. Applying excessive force in one area alone will create a crease on the headband.
- d) Rotate the microphone boom up or down so its tip is in line with the corner of your mouth. Do not bend the boom.
- e) Make sure the headset speaker foam covers your ear.

2. Volume setting on headset

Slide your finger up the Volume control area to raise the volume on the headset.



3. First set the Outbound Volume

Set the Outbound audio as low as reasonable but high enough to hear well.

4. Inbound Volume setting on basestation

Changing the inbound microphone volume affects the sound volume coming from the customer order point microphone. The range is 0 (silent) to 20 (maximum). The default factory setting for the Inbound Volume is at 17.

To turn up the inbound microphone volume:

- From the Run mode menu
- Enter your user passcode. (The default user passcode is 1234)
- Press Mode once to get to System Menu
The display will show the user name and ID number (e.g., User1 ID = 1).
- Now press Mode 2 times to get to System Menu
- Select **01 Drivethru Volume**. Then press ENTER.
- Navigate **Inbound Mic Volume** using the ▲, ▼, ◀, ▶ keys
- Raise in steps of 1, the value for **Inbound Mic Volume** until the desired Inbound Volume level is achieved.

Please Note: The default of 17 should be a good setting, setting of 20 indicates a possible problem.

- a. How old is the mic? At 3 years the mic has a 30% loss of efficiency and should be replaced.
- b. The mic and speaker may not be well isolated from each other or far enough apart.

4. Microphone Preamp Gain setting on basestation

The Mic Preamp Gain is the first stage of amplification from the microphone in the order point and can be adjusted to affects achieve the desired quality and level of the inbound audio volume.

You need to log into the basestation as an Installer to access to this setting. The basestation's Microphone PreAmp is factory set at 8 and can be changed to a maximum of 20. However, we do not recommend setting the pre-amp beyond 10.

Raising the preamp setting too high can introduce echo into the system and can be experienced on the Order Taker's headset while conducting an active transaction.

To change the microphone preamp gain

- From the Run mode menu
- Enter your Installer passcode. (The default Installer passcode is 12345)
- Press Mode 2 times to get to System Menu
The display will show the user name and ID number (e.g., Installer ID = 1).
- Select **01 Drivethru Volume**. Then press ENTER.
- Navigate **Mic Preamp Gain.(Installer Only!) <08>** using the ▲, ▼, ◀, ▶ keys
- Raise in steps of 1, the value for **Inbound Mic Volume** until the desired Inbound Volume level is achieved.

NOTE:

- This setting should be increased only one step at a time.
With the G5 do not be afraid to set Preamp at 9 or 10.

When you increase the Preamp you will decrease the Inbound volume setting.

- At each step you should check the inbound volume level to determine if the desired volume level has been achieved
- At each step, make sure you open up the Outbound on a headset (by pressing the Lane1 or Lane2 buttons) and observe for any echoes while speaking into the headset microphone.
- If you do experience an echo, drop the Preamp setting by 1 and confirm the new setting on the basestation by pressing the ENTER key.

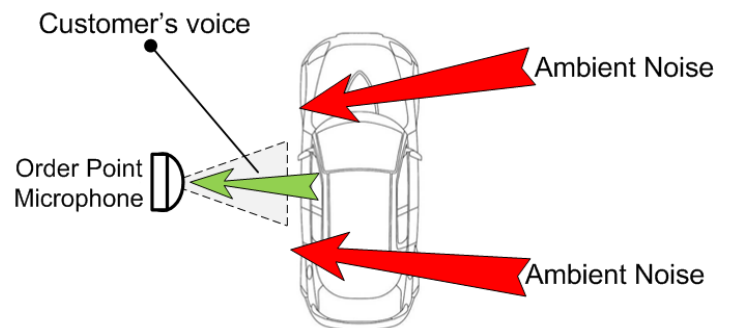
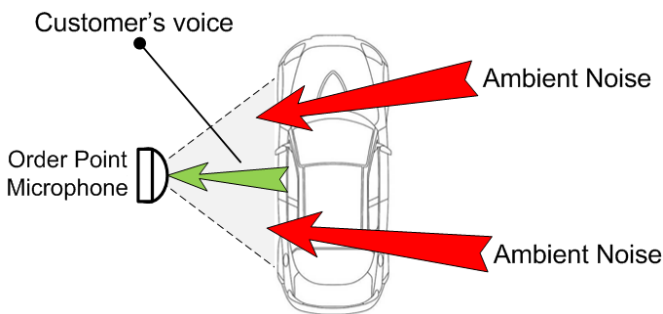
5. Inbound Mic Noise Reduction Level and Echo Cancellation settings on basestation

The inbound microphone noise reduction level setting helps remove the background (ambient) noise that is picked up by the microphone at the Order Point, when a customer is placing an order. The basestation's noise reduction level is factory set to Medium.

The way Noise Reduction works can be better understood by imagining a cone being present in front of the microphone.

NR being set to OFF is akin to having the cone wide open.

This allows more of the ambient sound into the microphone and thus



--- NR being set to MAX is similar to constricting the cone to a smaller angle

This limits the angle to where the customer is most probably located. A small amount of ambient noise may still make its way into the microphone. The system's noise cancellation algorithm will be able to minimize such small ambient noise.

A customer's voice level is usually around ~62dB. If the ambient noise, measured at 1 meter from the axis of the Order Point microphone, is greater than, say 65dB, there is very good probability for the customer's audio to be mixed in with the ambient noise. In this event, you may have to adjust the Noise Reduction setting to allow more of the audio into the microphone. Use the adjustments to experiment with Noise Reduction. It may also be critical to reduce the ambient noise with natural barriers to block road or other nearby noise.

Perform the following steps to decrease or increase the noise reduction level.

- From the Run mode menu
- Enter your user passcode. (The default user passcode is 1234)
- Press Mode again. The display will show the user name and ID number (e.g., User1 ID = 1).
- Make a new selection for **05 Noise Reduction > Inbound Mic Noise Reduction Level**.
Options are Off, Min, Low, Med, Hi, and Max.
You may need to experiment for a setting that works best for your ambient noise environment.

PLEASE NOTE: You will experience poor Audio results in a MAX setting for Noise Reduction or Echo

Cancellation. You should always avoid MAX in either Noise Reduction or Echo Cancellation!

5. Location of the speaker post in the drive thru lane and the mic and speaker location in the post.

The ideal distance between the microphone and the customer (in the car) is about 3 feet (*on axis to the microphone*). A customer's ability to park himself or herself right in front of the speaker post's microphone, at the recommended distance, depends on the following:

- Where the Speaker post is located on a drive thru and
- A car's turn radius

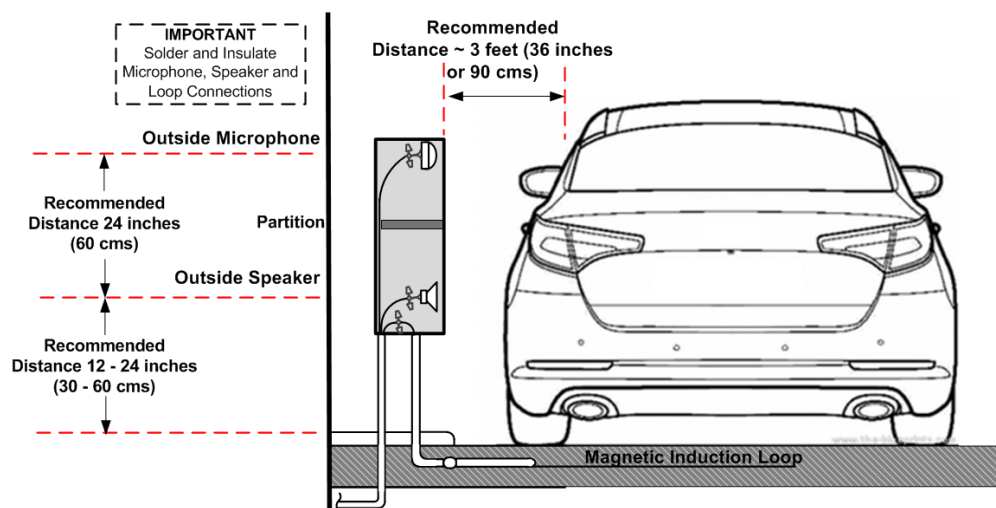
SOUND PRESSURE is the determining factor in the quality of sound one is able to collect from the microphone.

Factors that determine the sound pressure are Distance to the Customer, and the direction of the sound projection.

Possible problem locations

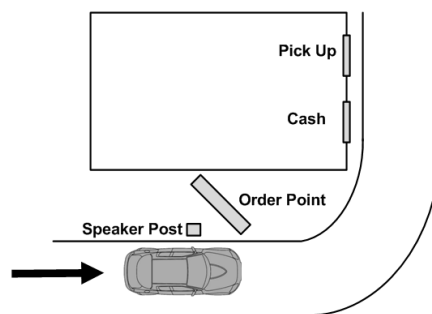
- Mics placed back from the curb, outside of 3 feet, or on a menu board
- Mics placed above or behind the natural arrival location of the car will be outside of audio projection and Sound Pressure
- A high microphone will also collect more ambient noise that needs to be overcome by the customer shouting
- Mics placed too close to the Speaker or not isolated from the Speaker in the post.

Ideal mic height is about 36 to 40 inches, just above the mirror and slightly forward of the majority of vehicles.

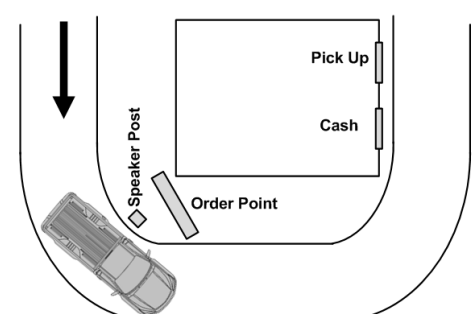


It is recommended that the speaker post be located on the straight edge of a drive thru as illustrated below and NOT situated on a corner. While vehicles with smaller turn radius may not have much difficulty maneuvering to a correct position in front of the speaker post, vehicles with large turn radius tend to stop

- Ahead of the speaker post or
- Short of the speaker post or
- Away from the speaker post.



Recommended Speaker Post position



Incorrect Speaker Post position

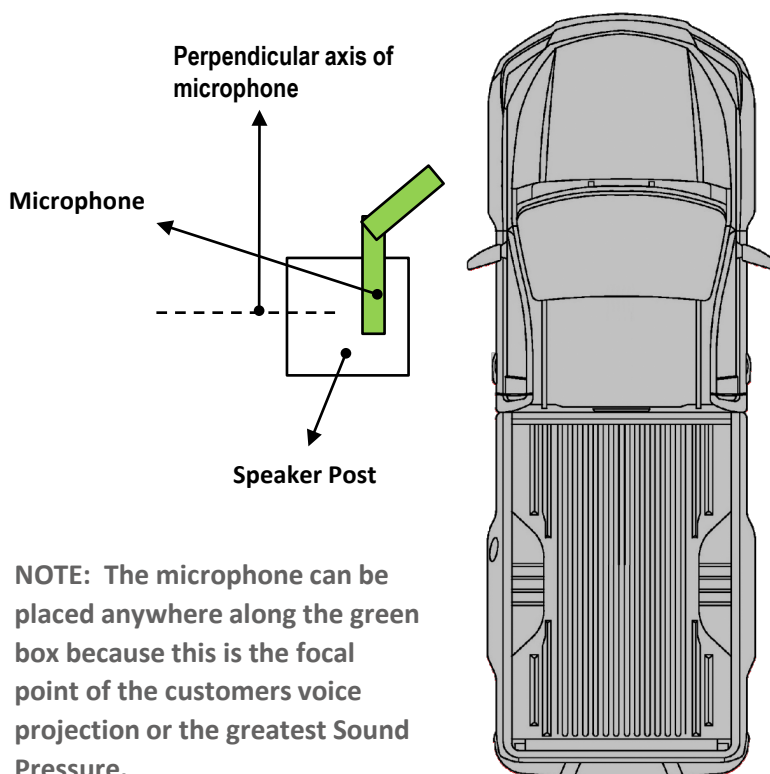
6. Microphone angles inside the speaker post

Inspect the speaker post to see if the microphone

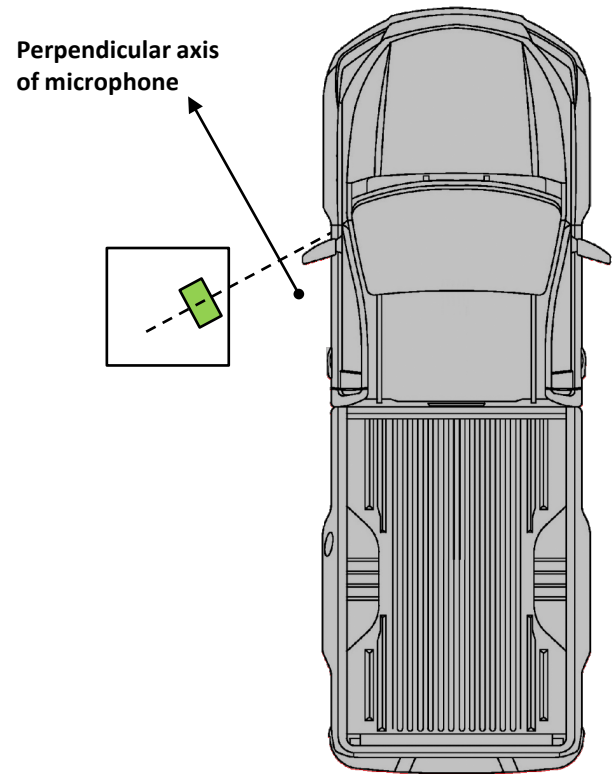
- The microphone has moved out of position or
- Any speaker post acoustic treatment material has slipped in front of the microphone
- The microphone is angled in such a way that it's perpendicular axis is no longer in line with the customer in the vehicle.

In such cases, the directional microphone will be unable to pickup all of the customer's voice. On the contrary it may pickup more of the ambient noise.

Correct positioning of microphone



Incorrect positioning of microphone



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