



Audiovisual and Lighting Guidelines

The Big Picture	2
General Philosophy	3
Sound	3
Video	3
Lighting	3
Understanding the Challenges	4
Audio Challenges	4
Visibility Challenges	4
Lighting Challenges	4
Audio Guidelines	4
Video Guidelines	6
Lighting Guidelines	7
Dealing With Complaints	8
Appendix A: OSHA Noise Exposure Limits	9
Appendix B: Measuring Volume	10
Slow average metering (the default approach)	10
Fast peak metering	10
Appendix C: Target Volumes	11

The Big Picture

Mission Statement: We seek to encourage and facilitate the corporate worship of God by His followers through the use of audiovisual and lighting technology.

As with every aspect of what happens at Providence Baptist Church, our goal is first and foremost to bring glory and honor to God and to encourage others to do the same. While amplification, competent audio mixing, customizable lighting, and projected visual aids may all seem like mere conveniences, we believe that even these practical things can be used to serve this Kingdom purpose.

The guidelines herein are not meant to provide an exhaustive, step-by-step recipe for operating all the various bits of audiovisual and lighting technology that we have and use at Providence. But we will attempt throughout this document to convey a few key things, such as:

- the philosophy of our approach to sound, video and lighting
- some of the challenges involved
- practical tips for success and pitfalls to avoid
- relevant governmental regulations

Our hope is that by understanding what is expected of our audiovisual and lighting technicians, you will be able to serve in this capacity with confidence and success.

General Philosophy

Technology must not be our master. Rather, technology exists to serve us as we attempt to serve God. Let's consider at a high level how these core technologies can best serve the church body.

Sound

It goes without saying that when the Word of God is proclaimed from our pulpit, it is critical that everyone in the room be able to clearly hear and understand what is being said. Without audio amplification, this is extremely difficult in venues of non-trivial size. Furthermore, corporate worship should be an active, participatory thing. Amplified sound allows worshippers to hear the music and song leaders' voices and to thus participate in unified singing. A house volume level that is too low – or that fails to emphasize the vocal aspect of the musical tribute – discourages participation by convincing the individual worshiper that they are precisely that: the sole, individual worshiper. Conversely, a house volume that is too loud discourages participation by convincing the individual worshiper that their contribution goes unnoticed. A careful balance must be struck here.

Video

Visual aids projected onto large, easily readable screens can be greatly beneficial to our congregation. Song lyrics allow worshippers to sing along together in a unified fashion without having to read the small text of printed material. Scripture verses allow folks who carry different translations of the Word of God to read from and study a common one at key points of the sermon. Other visual illustrations, promotional materials, and such bring widespread benefit as cognitive aids, helping the church to better understand, remember, and relate to the overall messaging of the church. But it's easy for these things to be a distraction, too. So visual aids should be simple and draw attention to what is important. For example, in teaching and singing, we wish to focus on words – those that we sing, those found in the Word of God, those which restate spiritual truths revealed in the Word of God, and so on – rather than on abstract or less important elements (as in the case of visually complex graphical still or motion loop backgrounds). Even the flashier graphical elements such as promotional slides should be easy to read (which is influenced by details such as font selection, text size and colors) from any seat in the Sanctuary.

Lighting

The lighting choices made for various segments of our services should practically support the goals and focal points of those segments. During the sermon, people need the house lights to be up so they can see well enough to write notes. For safety's sake, house lights should similarly be up when ushers or deacons are traversing the aisles (for example, during the collection of the offering or distribution of elements during Communion) and when the congregation is entering and exiting the room. During Baptism, lowering the house lights and raising the baptistry lights draws focus to that area of the room. During video segments, it's necessary to reduce the house and stage lighting so that the video display screens are free of light pollution and can be clearly observed.

Understanding the Challenges

We do our best to provide a consistent worship experience seat-to-seat and service-to-service for our church family and guests. But the individual experience that a given worshiper will have in one of our services can be affected by many different variables, beginning with the room itself. The Providence Worship Center Sanctuary is roughly octagonal, about 60-70 feet across the middle. A third of the floor-level seating is covered by a balcony, which itself provides seating. We estimate that the room can comfortably hold roughly 550-600 worshippers. With a space this large and offering such a wide variety of seats, it is impossible to ensure that every attendee has *exactly* the same audio, visual, and lighting experience as the next. Here are some specific ways in which these areas are affected.

Audio Challenges

The Sanctuary features a single cluster of four ceiling-hung house speakers, plus four supplemental speakers mounted beneath the front edge of the balcony. Put simply, the consistency of the amplified sound in the room varies wildly depending on where you sit. There are well-known “hot spots” (floor level center, just ahead of the balcony) and “dead spots” (floor level left and right wings). We use a digital sound console with a few baseline settings which serve as a good starting point for mixing the sound in each service. We also aim for relatively consistent input levels of various sound sources to compensate for variations in the instruments used and performance style of the various rotating worship band members. But there will always be variations across services. Sometimes there are but a handful of musicians playing simple, “unplugged”-type song arrangements; sometimes there is a full band with multiple electric guitarists. All these (and other) variables work against perfect consistency in our sound mixing approaches.

Visibility Challenges

Fortunately, visibility of the stage and projection screens are fairly consistent across the wide range of seats in the Sanctuary. There are some seats where visibility is obscured, notably the seats behind the balcony pillars in the lower section and certain of the first-row seats of the balcony. But these account for a very small percentage of the overall seating capacity. Ironically, one of the toughest spots from which to see the stage is the A/V booth itself!

Lighting Challenges

Lighting is another area where the facility lacks fine-grained controls. There is a mixture of wall-switch-driven sconces and DMX-controlled house and stage lights. The DMX lights are controlled using computer software, and we have a small collection of digital presets that are used for nearly every lighting situation that we have. It’s not a perfectly consistent experience, though. Because of the stained-glass skylights in the center of the room, ambient room lighting is directly affected by the amount of sunlight outside, which is affected by the weather, and time of day. Fortunately, the capabilities we have are sufficient to meet our current needs.

Audio Guidelines

Generally speaking, the sound we seek in the Sanctuary at all times is a balanced, “full” sound that favors the words being said or sung but supports them musically (where relevant). It’s extremely hard to either qualify or quantify this, but here are some helpful hints:

- **Normalize.** Each week, start with a copy of our baseline preset (“01 - Sunday”). Individually measure each instrument’s input level using the CUE feature of the sound console, targeting an input level that hovers around or just above -18 dB (where the sound console’s side panel meter switches from green indicators to yellow ones). For electric guitars and bass guitars (which have on-stage amplifiers), ask the musician to adjust his or her volume level up or down in order to achieve the desired input gain at the sound console. For other instruments and voices, you’ll need to adjust the input gain level of the channel yourself to match the target input levels. While this adds a bit of extra work each week, doing this consistently means that for every service, you are always working with the same input levels as for any other service, regardless of which instruments or musicians are participating in the service that week.
- **Listen.** For all its benefits, technology has never been good at determining the quality of sound. Close your eyes and listen. Do you hear sound coming from all around you? If so, then you’ve probably achieved fullness of sound in the room. But if with eyes closed you hear sound coming from only the stage or the main speakers, then the sound is probably not full enough. Insufficient fullness means that the musicians cannot properly hear each other and that every worshiper’s experience will be even more dependent upon where he or she is seated.
- **Worship.** You’re not just a servant of the church – you are a vital part of it, too! But practically speaking, unless you are singing the songs yourself, you cannot hope to evaluate the worship experience of other congregational singers. Unless you are listening to the sermon, you cannot be sure that other congregants are hearing the Pastor’s words clearly.
- **Trust.** If you’re working from an input-normalized copy of our baseline sound console preset, you can assume that from that point on your role is now a musical one – highlighting each song’s lead vocalist or key instruments during interludes. But this is also where things can get very subjective. If you find that your first instinct is to adjust something by more than 5 dB from the normalized preset, it’s possible that your own preferences and biases (which everyone has!) are influencing what you “hear”.

The overall volume of the room as determined from a particular location is one dimension of sound that we can measure for. The A/V booth is equipped with a sound meter for precisely this purpose. Audio technicians should routinely record (on the Order of Service printouts, usually) the average volume of the various service elements (songs, sermons, etc.) as measured from the A/V booth using the “Slow average metering” method described in [Appendix B: Measuring Volume](#). Not only will this help you to spot abnormalities, but it also ensures that we are in compliance with OSHA noise exposure regulations.

For your convenience, [Appendix C: Target Volumes](#) provides a list of the general volume ranges to shoot for during various elements of our typical worship services.

Video Guidelines

Our large-screen video displays are driven by MediaComplete's MediaShout software. MediaShout is presentation software written with the church in mind. It includes such features as:

- Automatic generation of multi-page Bible verse and passage slides from a vast library of translations.
- Support for importing worship song lyrics from the CCLI SongSelect lyric database.
- Support for driving Microsoft PowerPoint presentations.
- Audio and video file support.
- Motion and still graphic backgrounds.
- Time-based script automation.
- ...and much more

For each worship service (and many special events) at Providence, a MediaShout script is assembled which contains the various audio and visual artifacts required for the service, in the order of their use in the service, and often with additional comments for the operator to assist with driving the script.

Most of the visual elements in the MediaShout script are designed to be displayed at obvious times. There are a couple of important exceptions.

First, when driving the lyrics for congregational singing, it is extremely important that the next page of lyrics be shown before they are actually needed by the singers. This is true not only for the congregational singers, but also for the on-stage song leaders (who are reading the same lyrics from the confidence monitor and are sometimes just as unsure of the next line they must sing as anyone else)! As a rule, once the worship team has begun singing the last line of the currently displayed slide, you should advance the presentation to show the next slide. This timing can vary, of course, depending on the speed of the song. It is extremely beneficial for video operators to be familiar with the songs and their arrangements in advance so they can better judge the timing of these transitions.

Secondly, when driving the Pastor's sermon slides, let him lead with each sermon point. Unless the Pastor specifically requests otherwise, it's best to let him audibly make the sermon point he wishes to make first – and *then* display the slide which carries it – than to try to anticipate him and preemptively display the slide for that point before he makes it. While some speakers will provide a manuscript of their sermon or presentation to follow as you drive the slides, it is rare that he or she will precisely follow that manuscript. The human eye is an extremely sensitive organ, so every change of slide draws the attention of the worshippers (who spend most of their time looking at the speaker or down at their Bibles and notes in their laps). They may be distracted for only a moment, but that might be long enough for them to miss something important. So again, as a rule, use the slides to emphasize points *previously* made by the speaker.

Lighting Guidelines

Lighting is one area of our audiovisual ministry which generally requires very little decision-making. We have well-established patterns for operating the lights in the Sanctuary, and the need for something in this area which breaks from those patterns is extremely rare.

The lighting system in the Sanctuary is a combination of wall-switch-controlled lights and DMX fixtures controlled by a computer system running the Jands Vista application, plus a few additional light sources. Generally, we keep all the wall-switch-controlled lights on at all times during our services. These include the sconces on the outer walls of the Sanctuary, the illuminated cross in the baptistry, and a small collection of recessed lights at the very rear of the Sanctuary's ground level.

During our services, we select from a collection of preset lighting scenes programmed into the Vista application which carry revealing names such as "Praise Team", "Baptism", "Sermon", and "House". Additionally, there is a single manually operated spotlight in the A/V booth which we use during the sermon to combat some of the down-lighting shadows that are produced on the pastor/speaker's face.

This is not to say that our approach to lighting never has challenges. Like temperature, a light's brightness is interpreted by the human senses relative to other things. Thus a spotlight aimed at the stage will seem brighter when the overall ambient light in the room is lower than when there is more ambient light. Also, the human eye is extremely sensitive to visual changes, including changes in lighting. **So we ask that, to the degree possible, all transitions in lighting happen relatively slowly and ideally during a time of prayer in the service** (when worshippers generally have their heads bowed and eyes closed anyway).

Dealing With Complaints

Sound, video, and lighting are like temperature: they are certainly scientifically measurable things, but every individual person – including yourself! – has personal preferences and biases which drive their ideas about what is “right.” The old adage holds true: it is impossible to please everyone all of the time! Sadly, Satan has a long history of using precisely these elements of a church service to cause confusion and contention within the body of Christ.

So even if you are adhering perfectly to these Guidelines, please understand that complaints about what you are doing will come from time to time. Here are some tips for fielding them:

- **Be respectful, and show empathy.** Every complaint is coming from a person of worth, made in the image of the Creator. We can assume that no one will complain without having a reason that seems valid to them.
- **Anticipate vague and generalized complaints.** Comments such as, “The lights are too bright,” or, “The drums are too loud,” aren’t objective, scientific descriptions of a real problem. Often, they reveal more about a person’s perceptions and preferences than about the actual conditions. But the average person isn’t equipped or experienced enough to communicate their concerns in a more precise way. Knowing this in advance can help you to avoid unnecessary over- or under-reaction.
- **Double-check your presets.** Our sound and lighting configurations use digital controllers with programmed presets that offer consistent and near-ideal conditions, but it can be easy to inadvertently forget to *recall* those presets when preparing for a service. Additionally, sometimes the software just doesn't work correctly. Double-check to make sure that something isn’t out of sorts.
- **Advise relocation as the first remedy.** Because the sound, lighting and temperature can vary so wildly across regions of the Sanctuary, you should (and can in good conscience) recommend relocation to a different area of the Sanctuary as a viable remedy for the complaint.
- **Know who you serve.** You are a servant of the local church body, but the Senior Pastor is by function its representative. Assume that if the Senior Pastor is happy, everyone is happy. After all, any action that you take in response to an individual's complaint may negatively affect the worship experience of hundreds of other attendees! If the individual persists with complaints, encourage him or her to raise their concerns with the Senior Pastor directly.

Appendix A: OSHA Noise Exposure Limits

The Occupational Safety and Health Administration (OSHA) regulates workplace noise exposure in order to prevent the partial or complete loss of hearing of employees and customers. The system they use is based on sustained exposure to certain volume levels of sound, measured using the dbA scale (which is weighted for the human ear as opposed to being a generic gauge of air pressure), and time-weighted across an average 8-hour shift at a job site.

The following is a table of sound levels, some common sources of sounds that create sustained exposure to those sound levels, and OSHA's exposure limit regulations for those sound levels.

Volume Equivalencies and OSHA Exposure Limit Regulations

Environmental Noise Source¹	dBA	OSHA Exposure Limit for Steady Exposure²
<i>Pain threshold</i>	125	disallowed
Pneumatic chipper at ear	120	disallowed
Chain saw at 3'	110	15 minutes
Lawn mower	100	1 hour
Subway train at 200'	95	2 hours
Food blender	90	4 hours
City Traffic	85	8 hours
Telephone dial tone	80	unlimited
Classroom chatter	70	unlimited
Normal conversation	60	unlimited

¹ "Decibel Level Comparison Chart" <https://ehs.yale.edu/sites/default/files/files/decibel-level-chart.pdf>

² "How loud is too loud?" <https://www.osha.gov/SLTC/noisehearingconservation/#loud>

Appendix B: Measuring Volume

Though there are several weighing scales extant, we use only the A-weighted (dbA) scale mode of our SPL meter. We do not use the dbC mode of the meter. We also do not use uncalibrated tools such as smartphone volume meter apps, which generally employ the dbZ scale. While the dbC and dbZ scales offer a less biased measurement of sound pressure *in general*, they do not account for the nuances of the human ear, which is precisely what the dbA scale offers³. As such, OSHA and NIOSH standards (see [Appendix A](#)) are constructed around the dbA scale alone, and thus dbA is the scale of interest to us.

For the purposes of measuring the volume of our house sound, here are the sampling approaches that matter:

Slow average metering (the default approach)

Sound exposure in a church environment is a mixture of steady ambient noises (such as is produced by a climate control unit's fans) and other (generally louder) sources of noise whose volume levels vary and oscillate over time. So when we talk about the "the volume" of a segment of our worship services, we are talking about the average volume over a given sampling period. To measure this value, set the SPL meter as follows:

- Max: Off
- A/C: dbA
- Fast/Slow: Slow
- Level: 60~90 dB

Fast peak metering

The human ear is naturally sensitive to very quick bursts of high-volume noise, such as is produced by a gunshot or a hard snare drum hit at close range. While exposure to these sorts of noise bursts do not meaningfully influence the listener's *average* noise exposure, they still heavily influence comfort levels and can – in extreme circumstances – play a role in hearing damage or loss. Nothing in our regular worship services comes close to generating peak volumes loud enough to ignite any concern about hearing damage. But if you need for whatever reason to determine the maximum volume that can be measured over a period of time, set the SPL meter as follows:

- Max: On
- A/C: dbA
- Fast/Slow: Fast
- Level: 60~90 dB (or higher, if "OL" appears while measuring)

To reset the peak value, simply turn the "Max" setting off and back on again.

³ For those curious, dbC measurements of modern worship music will generally read 5-10 dB higher than dbA measurements of the same music, depending on how much of the music sits at very low (bass) and very high frequencies which have no effect on the human ear. dbZ readings may report an *additional* 5-10 dB higher still.

Appendix C: Target Volumes

The following are some general, albeit strongly advised, guidelines regarding the maximum average volumes to shoot for before factoring in audience participation. We've arrived at these target volumes after many years of experience and are pleased to note both that they are well within the safe listening levels that scientific studies and government bodies such as OSHA have published⁴ and that we observe greater congregational participation when these targets are being achieved consistently.

It is interesting to note that measurements taken from the A/V booth are some of the highest readings available in the entire audience area of the room. On the positive side, this fortunate coincidence of the room's speaker coverage design allows the audio technician the comfort of knowing that regardless of how loud the volume levels read from the booth, nearly everyone else in the Sanctuary is having a similar or quieter (up to 10 dB) experience, depending on where they are seated. On the down side, it means that in order for most of the room to be experiencing the kind of fullness of sound that is desired, the A/V booth is going to experience levels that may be louder than some operators would prefer.

By targeting a well-balanced mix at these prescribed volume levels, we can be confident that our sound levels are completely safe, that our congregation is enjoying a fullness of sound that invites participation, that our musicians can properly hear each other as they play, and that we are offering as consistent an experience week after week as can be reasonably hoped for in our Sanctuary.

Target Volumes for Service Segments (measured from the A/V Booth using the dbA slow scale)

Service Segment	Volume	Notes
Pre-/Post-service House Music	~55~60 dbA	This volume is just below typical conversation level. House music isn't designed to draw attention to itself, but to add subconscious energy to a space.
Spoken Word (preaching, announcements, etc.)	~60~70 dbA	This volume is just above animated conversation levels.
Choir Performance	~80~90 dbA	These vary wildly in terms of dynamics, from calm pieces to soaring anthems. Accompaniment music should remain full to support the vocal performance.
"Acoustic" Live Music (acoustic guitar, piano, etc.)	~80~85 dbA	At this volume, congregational singers can still hear the music and leaders as well as their own voices.
"Rock" Live Music (w/ electric guitars, drums, etc.)	~85~90 dbA	At this volume, congregational singers can still hear the music and leaders as well as their own voices.
Video Elements	~70~80 dbA	Use discretion here: some videos use audio solely to add character, while for others the audio <i>is</i> the content.

⁴ In order to be in violation of OSHA's standards, we would need to crank out volumes on par with rock music concerts (100+ dbA) for the duration of our entire service. Even for our occasional all-day events, sound levels would have to be at a *sustained* level of 85 dbA in order to be of any concern to our church family and guests.