The following narrative is the design basis for future Audiovisual systems and equipment at the Goshen Theater in Goshen, Indiana. Expected activities within the space would be live music with stage monitor mixing, Where given, some opinions of probable costs include installation and integration while others require installation by the General / Electrical Contractor. Opinions of probable costs do not include taxes and are based on equipment being bid directly to the Construction Manager or Owner. General Contractor overhead / profit markup is not included.



Typical Center Cluster

## Main Theater:

### Audio Reinforcement:

While the theater owns some QSC K8 active loudspeakers, they may not be suitable for all applications within the space, and WRL recommends a center cluster of loudspeakers in conjunction with a compact Left / Right active line array system. Each line array shall be coupled with an owner furnished QSC KSub to round out the low end of the frequency spectrum. Since the theater balcony shields sound from the back of the room, WRL recommends strategically placed under balcony loudspeakers required for coverage in those locations. The system will be coupled with an appropriate quantity of amplifiers to support the power requirements of the loudspeakers without distortion.



Typical Compact Active Line Array



Typical Under Balcony Loudspeaker

### Mixing Console:

The theater owns a Presonus StudioLive 16.4.2, which will work nicely in the space, but has some limitations in certain applications. WRL recommends adding another Presonus StudioLive 24.4.2 which could be used as the main mixing console for stage monitor mixing only, or as a slave to the existing board to expand capabilities to 32 channels in, 8 aux channels, and 4 discreet output channels.

### Playback and Processing Equipment:

Currently, the theater owns a used Apple Mac which is in use as a DAW, but they own no processing equipment. WRL recommends one (1) CD player with MP3 player dock, as well as enough processing equipment to handle the required discrete inputs and discrete outputs of the system. This processing equipment would allow the routing of individual audio channels to specific loudspeaker locations, as well as properly separate frequency information between loudspeakers and subwoofers to reduce opportunities for feedback to occur and provide a flat frequency response within the theater.



Typical Mixing Console



Typical Processing Equipment

**Audio Cabling, Connections, and Distribution:**

Currently, there are three (3) floor boxes in the stage floor for audio distribution with cabling back to the main AV Equipment rack located on Stage Right. There are eight (8) microphone inputs per box, and two (2) loudspeaker outputs per box. WRL recommends putting in a digital distribution system in order to provide flexibility in input/output locations as well as minimizing the cost of the supporting infrastructure such as wiring and conduits. Furthermore, this system would allow future expansion to the audio system with minimal equipment cost and almost no labor. The Digital Distribution System would be comprised of two (2) production panels (one on each side of the proscenium). Each production panel would be run back to both the house mix position and control booth, and would contain (see next page):


Typical Digital Audio Distribution System


Typical Production Panel

| | |
|---|---|
| Stage Left (TBD w/ Goshen Staff): | 16 channel digital I/O card frame with 12 mic inputs and 4 line level I/O |
| | 2 CAT6 Tie Lines for video distribution |
| | 2-channel intercom headset connectivity |
| | 1 – quad technical IG power receptacle |
| Stage Right (TBD w/ Goshen Staff): | 16 channel digital I/O card frame with 12 mic inputs and 4 line level I/O |
| | 2 CAT6 Tie Lines for video distribution |
| | 2-channel intercom headset connectivity |
| | 1 – quad technical IG power receptacle |
| Loose Production Box (TBD w/ Goshen Staff): | 16 channel digital I/O card frame with 12 mic inputs and 4 line level I/O |
| Left / Right Line Array Positions (TBD w/ Goshen Staff) | 2 line level XLR outputs – one for active line array, one for active subwoofer |
| Audience Chamber | (1) PTZ camera location with 2-channel intercom connectivity, audio stage monitor mic input, and network connection. |

| Mix Position and Control Booth | Lighting Position – 2-channel intercom headset connectivity, DMX over Ethernet connectivity, network connection |
| --- | --- |
| | Sound Position – 2 channel intercom headset connectivity, network connection, digital audio I/O distribution connectivity |
| | Stage Management Position – 2-channel intercom headset connectivity, paging mic input, (2) video outputs, |

**Wireless Audio Systems:**

Currently, the theater has no intercom or production support capabilities required for live theatrical and performance. WRL recommends a 2-channel portable intercom main station and two (2) video receivers housed in a portable 4RU rack case for use by a stage manager at production panel locations as well as house mix and control booth locations.  In addition, four (4) intercom beltpacks with headsets shall be included for use by a team of four production personnel (including stage manager).  As a production support system for the stage manager, a color camera for well-lit scenes and an IR camera for dark scene changes shall be included, whose signals will be sent to the stage manager's portable rack case referenced above.

**Production Support Systems:**

Currently, the theater has no intercom or production support capabilities required for live theatrical and performance. WRL recommends a 2-channel portable intercom main station and two (2) video receivers housed in a portable 4RU rack case for use by a stage manager at production panel locations as well as house mix and control booth locations.  In addition, four (4) intercom beltpacks with headsets shall be included for use by a team of four production personnel (including stage manager).  As a production support system for the stage manager, a color camera for well-lit scenes and an IR camera for dark scene changes shall be included, whose signals will be sent to the stage manager's portable rack case referenced above.

Typical ADA Hearing Assistance System

Typical Antenna Distribution System

Typical Production Support Equipment

**Video System Equipment:**

Currently, the theater has no video display systems. WRL recommends a fast-fold portable projection screen in an appropriate size in order to be visually intelligible and to be used when required. In addition, a projector with the appropriate brightness in order to achieve a 15:1 Projected System Contrast Ratio on the screen shall be provided and located in the control booth, along with an appropriate zoom lens and spare lamp.

Typical Video Projector

**Control System Equipment:**

Currently, the theater has no capability to control the flow of video signals throughout the space, or remotely manage any controlled items (e.g. projection screens, source selection, transport control). WRL recommends a control system processor with the ability to be remotely managed through a software interface, as well as local control via a wired control system interface and wireless control through an app loaded onto an owner furnished Apple iPad.

Typical Fast-fold projection screen

**Miscellaneous Equipment:**

WRL recommends an appropriate quantity of new racks with thermal and power management to house the associated AV equipment for the systems described above. In addition, a wired L3 router, a networked uninterruptible power supply, an owner furnished wireless router, and all associated miscellaneous rack cabling, hardware, connectors and accessories shall be included.

Typical Control System Equipment

Typical Miscellaneous Equipment

**AUDIOVISUAL EQUIPMENT OPINION OF PROBABLE COSTS:**

| | |
|---|---:|
| Audio Reinforcement | $47,800 |
| Mixing Console | $5,000 |
| Playback and Processing Equipment | $12,900 |
| Audio Cabling, Connections, and Distribution | $31,000 |
| Wireless Audio Systems | $16,400 |
| Production Support Systems | $28,300 |
| Video System Equipment | $33,700 |
| Control System Equipment | $17,200 |
| Miscellaneous Equipment | $16,400 |
| **Totals:** | **$208,700** |