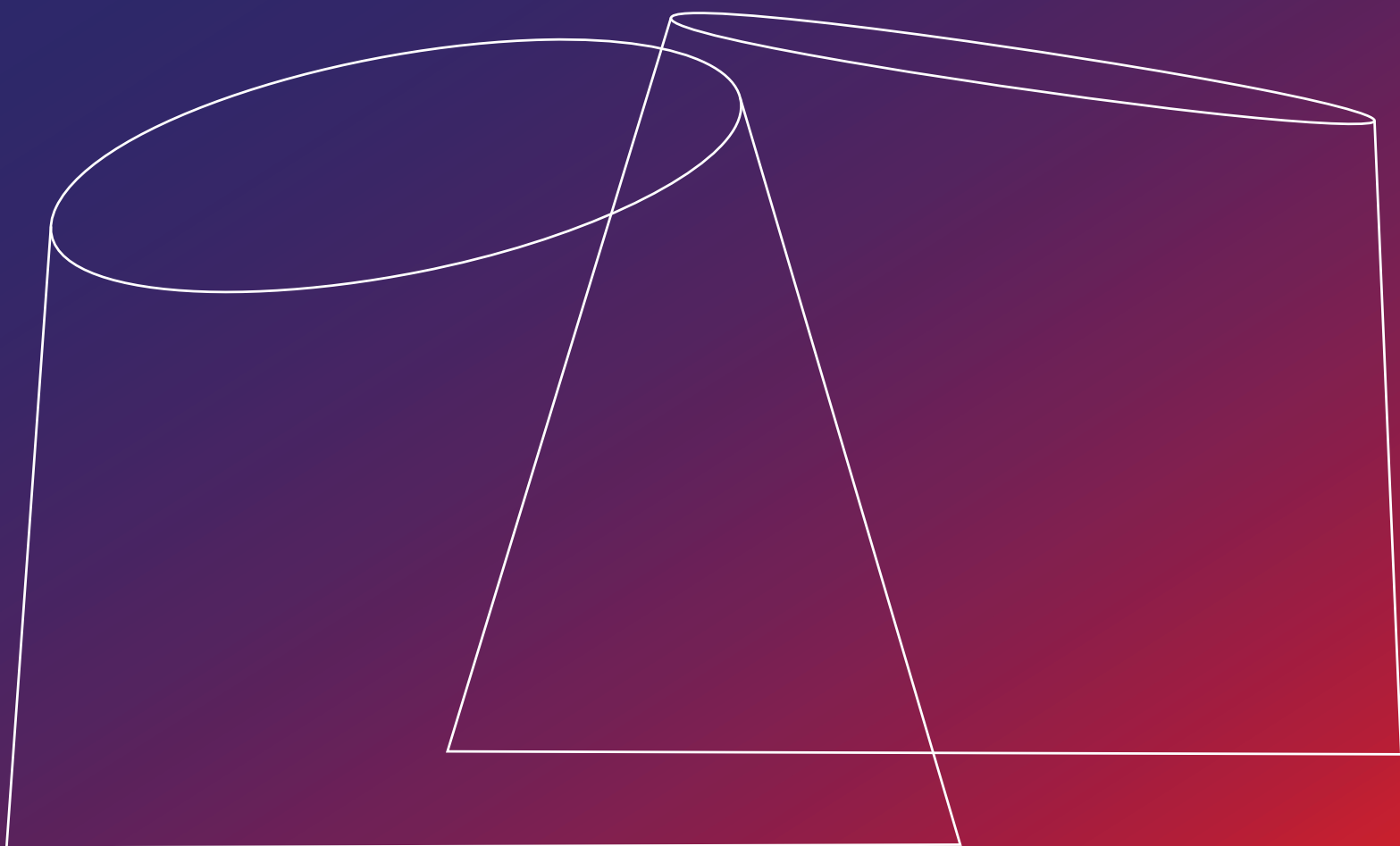


# TECHNICAL SPECIFICATION DOCUMENT



# General information

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Address	4801 Pierre de Coubertin avenue Montréal, Québec H1V 3V4
Phone numbers	Tickets counter 514-868-3000  Technical team 514-872-3613  Régie 514-872-3611  Room rental service <a href="mailto:eplv.locations@montreal.ca">eplv.locations@montreal.ca</a> 514-872-0859
Capacity	Milky Way Theatre: 192 sitting places Chaos Theatre: 200 m <sup>2</sup> , no fixed chairs
Floor	Milky Way Theatre: Carpet Chaos Theatre: Semi-reflective black
Dimension	360° projection dome, 18 metres in diameter Milky Way Theatre: 180° elevation Chaos Theatre: 194.2° elevation  <i>See appendix 1 for theatre plans</i>
Special effect	The use of smoke, pyrotechnics or other special effect producing smoke is PROHIBITED

# Digistar 7

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Digistar is the software that manages the audio system, the video projection system and the theatre lighting. It allows astronomical navigation through the Universe. It was developed by the American company Evens & Sutherland and is used in more than 2000 planetariums around the world.

It allows among other things to:

- Navigate in real time anywhere in space and time.
- Broadcast audio and video content.
- Control the theatre lighting system.

During a presentation, it is possible to switch between pre-rendered videos and real time navigation.

# Video

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## Milky Way Theatre :

Six Sony VPL-GTRZ270 (5 000 lumens) video projectors are covering the surface of the dome.

- DCI-P3 colour space
- 20 000 :1 contrast ratio
- Dome resolution is 25 598 Megapixels (6341x6341)
- Pixel size is 4,5 mm

## Chaos Theatre :

Four Christie D4k40-RGB (40 000 lumens) video projectors are covering the surface of the dome.

- Rec2020 colour space
- 5000 :1 contrast ratio
- Dome resolution is 20 365 Megapixels (5755x5755)
- Pixel size is 5,3 mm

*See appendix 1 for the position of the projectors*

There is an HDMI connection with the theatre console allowing the projection of content from an external source (ex: laptop) with a resolution up to 4k (4096 x 2048 pixels).

Jpg, png, tiff, tga, bmp image files can be projected on the surface of the dome directly from removable USB media.

For testing purposes, mp4 (H264) video files of up to 60 fps with a resolution of 4096 x 4096 pixels can be projected on the surface of the dome directly from removable USB-type media, but slowdowns may occur.

For maximum quality, a jpg or png sequence at 30 or 60 fps with a resolution of up to 6144 x 6144 pixels is required.

This sequence will be processed on the Planetarium's servers before it can be presented in the theatre.

In order to prepare the sequence, the creators must:

- Provide Dome Master images in jpg or png format of a maximum 6144 x 6144 pixels. (*See appendix 2*)
- Name the files as follows:  
*file\_0001.png, file\_0002.png, ...*
- Put all the images in a folder on a removable USB3 medium (NTFS or ExFAT) or on the Planetarium's SFTP site.  
(Credentials will be provided on request.)
- Provide the sequence at least 48 hours before viewing.

# Audio

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There are 17 speakers and three subwoofers around the dome.

Each speaker is an independent audio channel fed by the BSS audio processor.

Audio content can be streamed in different ways:

- From Digistar
  - It is possible to import audio files and to program the start, stop and volume of these.
  - Stereo, 5.1 or 7.1 mp3 or wav audio files are accepted.
  - Twenty mono audio files can be concatenated to make a 17.3 wav file.
  - The audio files will be in perfect synchronization with the playback of a video sequence.
- From the connection bay
  - A patch bay with 24 assignable inputs using a matrix is available.
  - It is possible to modify this configuration to choose the desired speaker combination.
  - Timecode can be supplied to the system to control a video file while it is playing.

## Microphones

A headset microphone and a stick microphone are available.

Other microphones can be added as needed.

## Sound console

Midas M32

Expansion module DN32-USB

2 x Digital Snake Behringer S16

*See Appendix 3 for the loudspeakers position.*

*See Appendix 4 for the assignment of loudspeakers according to the different configurations.*

# Lighting

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At the base of the dome are 169 twelve inches Philips Colorkinetics RGBA LED strips. This lighting is controlled from Digistar via GrandMa 2.

Near the floor are mood lights that can be controlled using the Digistar software.

Twelve Natech luminaries are providing powerful lighting before and after presentations.

# Starball

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At the centre of the Milky Way theatre, on a lifting platform, is the Konica Minolta Infinium S. It is an opto-mechanical star projector capable of positioning itself at any latitude and longitude.

The starball is not synchronized with Digistar, it is to be operated on its own and only displays stars and the Milky Way without the Moon, the Sun and the planets.

# List of equipment in theatre

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## Audio

### Microphones

- 2 Sennheiser Evolution receivers
- 1 Sennheiser ME-3N microphone
- 1 Sennheiser SKM 100 microphone

### Processors

- 1 Soundweb Blu-800
- 2 Soundweb Blu-100
- 1 Soundweb Blu- 120
- 2 Blu-BIB

### Speakers

- 9 Meyer Sound UPQ-1P (main speakers + zenith)
- 8 Meyer Sound UP-4XP (surround speakers)
- 1 Meyer Sound MPS-488HP (power supply for UP-4XP)
- 3 Meyer Sound X-800 (subwoofer)

## Video

- Milky Way Theatre: 6 Sony VPL-GTRZ270 projectors
- Chaos Theatre: 4 Christie D4k40-RGB projectors

## Network

- 1 closed wifi network
- 1 wifi network with internet access



# List of equipment for events

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## Audio

- 6 JBL PRX612M speakers
- 1 Subwoofer JBL PRX 800
- 1 Midas M32 digital audio console
- 2 Digital Snake Behringer S16
- 1 Analog Snake 8in 4 out
- Batch of small analog audio consoles (4@24 inputs)
- 1 Press box Whirlwind PressPower 2 (16 out)
- 4X Shure SM58
- 1X Shure SM57
- 2X DI Stereo Radial
- 3X DI mono
- 6 Sennheiser receivers EW300G3
- 3 Sennheiser wireless stick microphones
- 3 Sennheiser belt packs (possibility of headset or lavalier microphones)

## Video

- 2 X Samsung 47" TV on wheels (with mac mini)
- 2X TV Sharp 55" on wheels (with mac mini)
- 3X TV LG 70" on wheels (with mac mini)
- 1 X TV Samsung 42"
- Various HD video projectors (various sizes and lenses)

## Lighting

- GrandMA2 Lite Console
- Batch of Colorado zoom tour 4 (or equivalent model)
- Batch of Beamshot
- Set of small Chauvets RGB spotlights
- Set of ColorBlock
- 2 Spots LekoLED
- 2 Manfrotto stands

## Stage

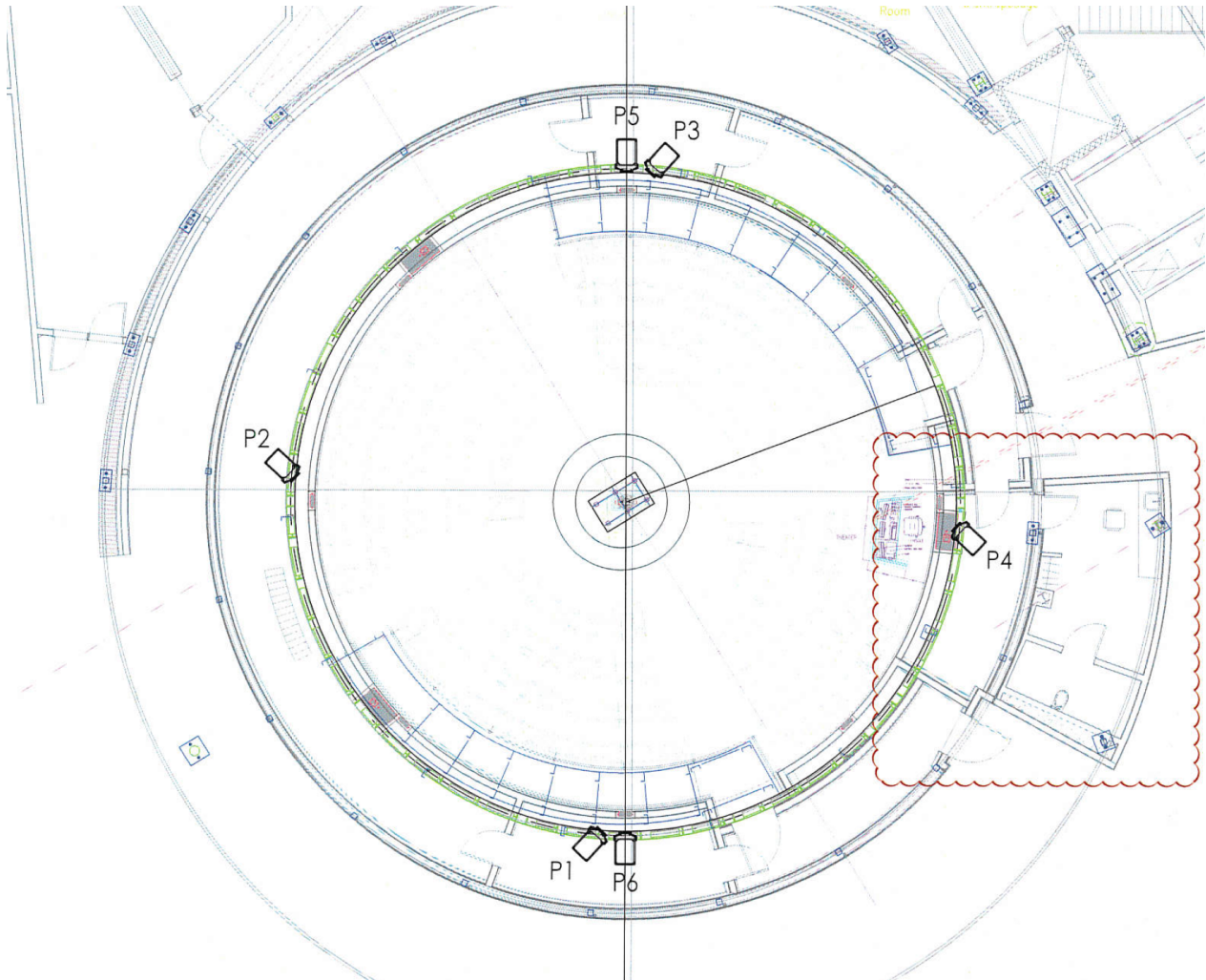
- A circular stage of 16' in diameter by 1' in height is available for occasional events.
- It consists of 10 panels that can be assembled as needed (ex: half-moon, square stage).
- The 2 rectangular central panels have a dimension of 8 feet by 4 feet.

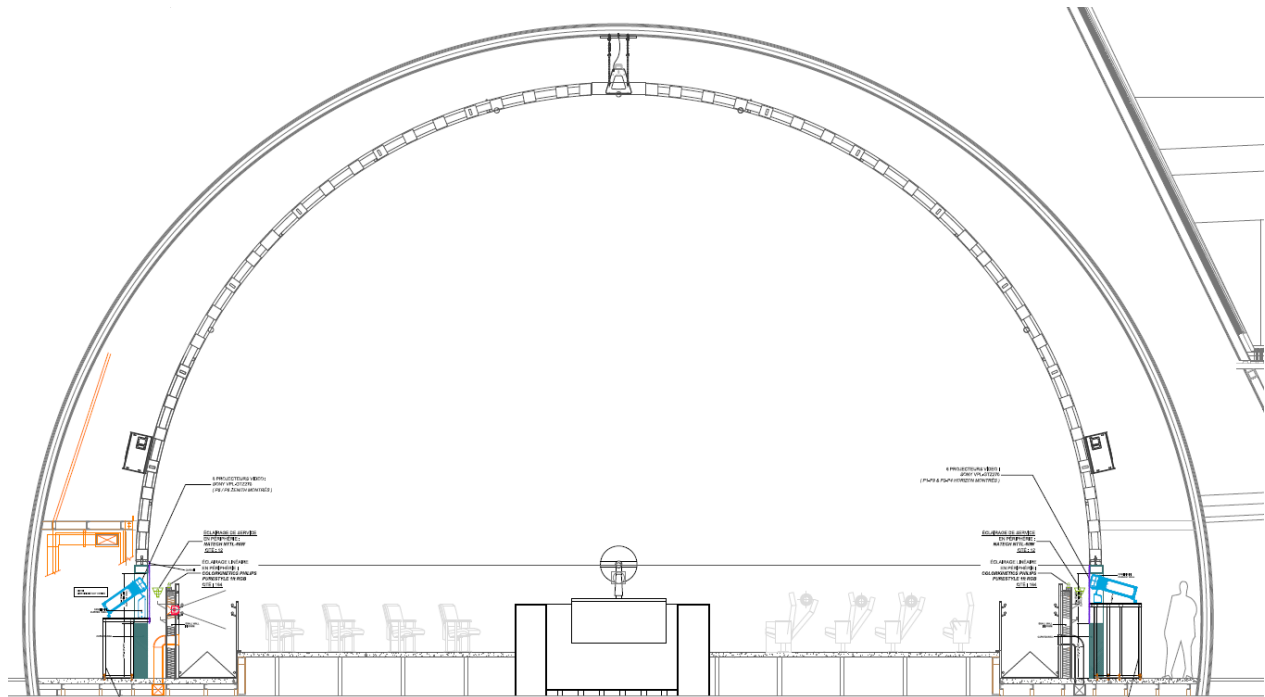
*See Appendix 5 for the diagram.*

# Appendix 1

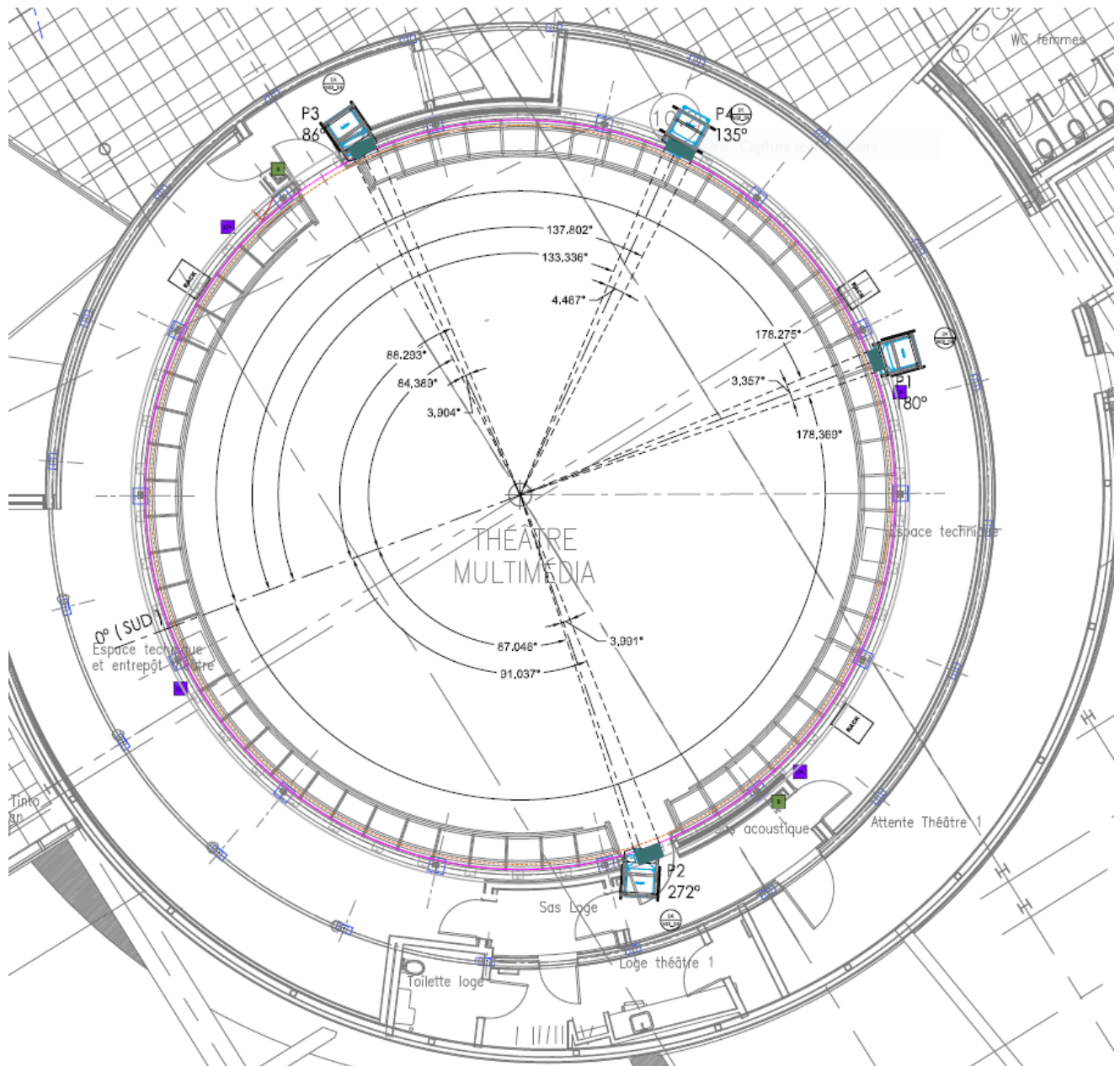
## Milky Way Theatre diagram

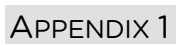
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# Chaos Theatre diagram







## Appendix 2

# Dome Master images

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- A Dome Master image is a square image of 1024x1024, 2048x2048, 4096x4096, 6144x6144 pixels, with a circle inside. Anything outside the circle will be ignored.
- The centre of the circle is the zenith and the circumference of the circle is the base of the dome.

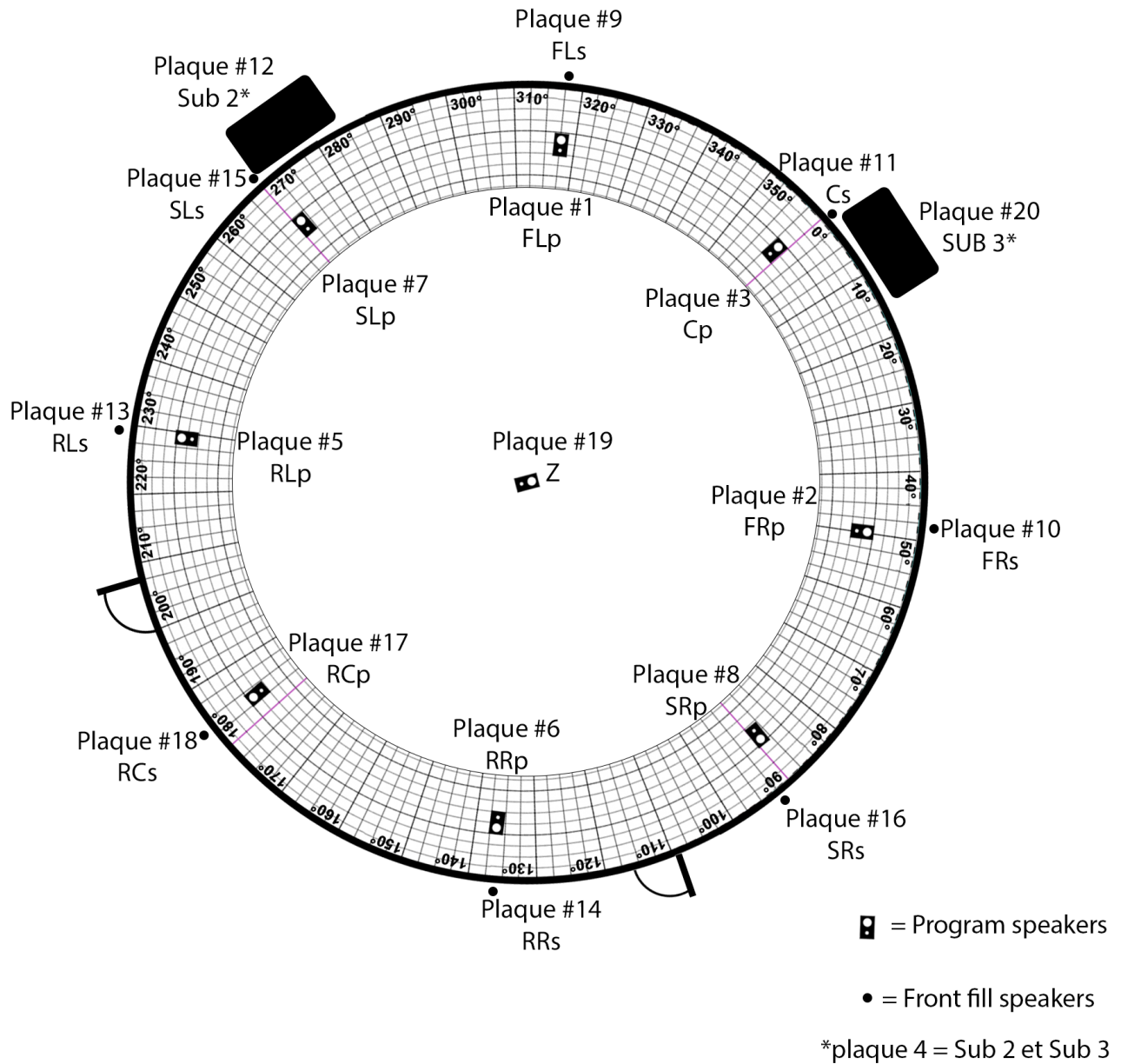


# Appendix 3

## Position of the loudspeakers

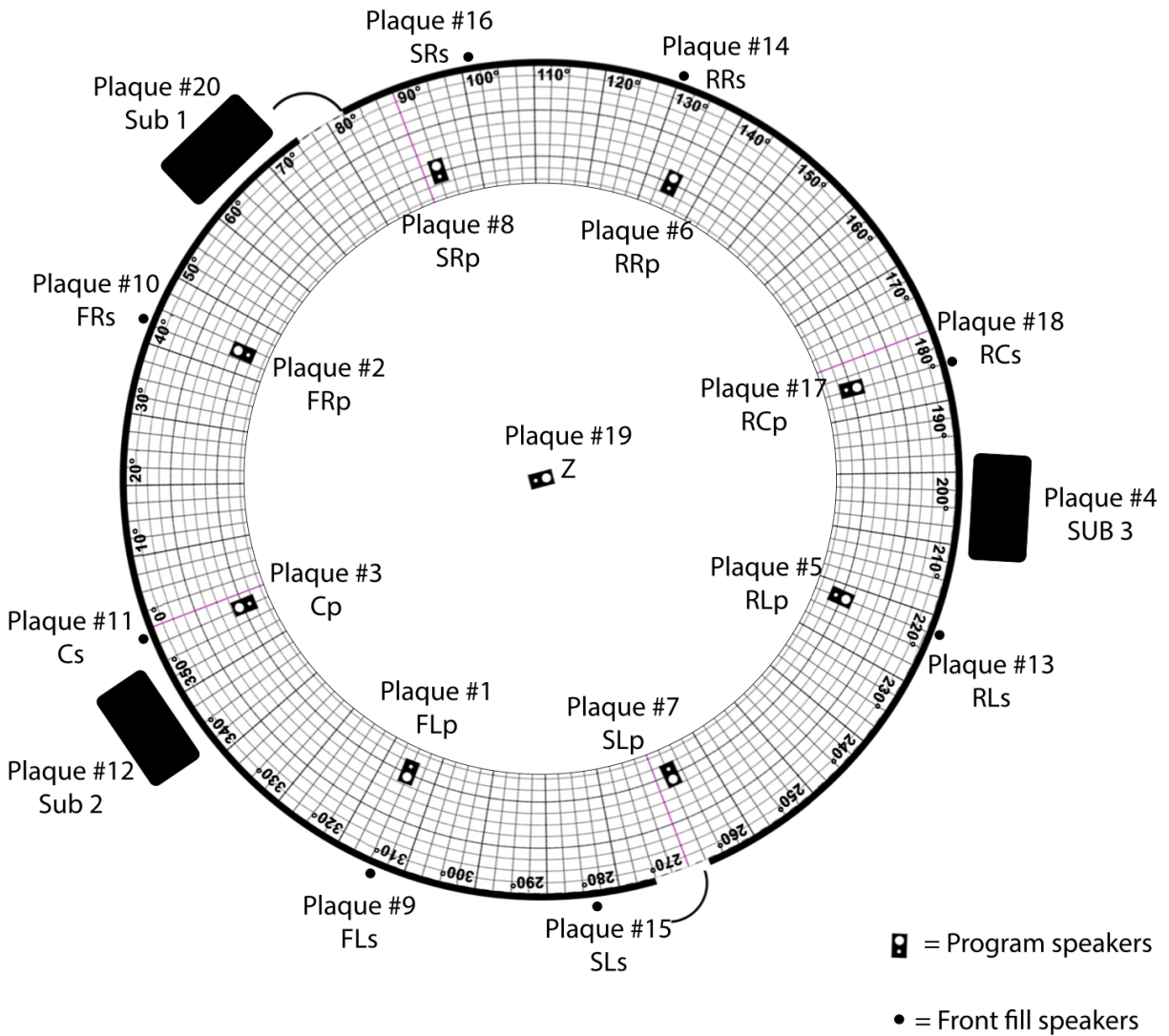
### Milky Way Theatre

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# Position of the loudspeakers

## Chaos Theatre





# Appendix 4

## Speaker Assignment

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STEREO		
Channel	Input	Speaker
1	Left	FLp
2	Right	FRp

5.1		
Channel	Input	Speaker
1	FL	FLp
2	FR	FRp
3	C	Cp
4	SUB	SUB 1/SUB 2/SUB 3
5	SL	RLp
6	SR	RRp

7.1		
Channel	Input	Speaker
1	FL	FLp
2	FR	FRp
3	C	Cp
4	SUB	SUB 1/SUB 2/SUB 3
5	RL	RLp
6	RR	RRp
7	SL	SLp
8	SR	SRp

17.3		
Channel	Input	Speaker
1	FL-P	FLp
2	FR-P	FRp
3	C-P	Cp
4	SUB-1	SUB 1
5	RL-P	RLp
6	RR-P	RRp
7	SL-P	SLp
8	SR-P	SRp
9	FL-S	FLs
10	FR-S	FRs
11	C-S	Cs
12	SUB-2	SUB 2
13	RL-S	RLs
14	RR-S	RRs
15	SL-S	SLs
16	SR-S	SRs
17	RC-P	RCp
18	RC-S	RCs
19	Z	Z
20	SUB-3	SUB 3

## Appendix 5

### Stage

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- 16 feet in diameter
- 1 foot in height

