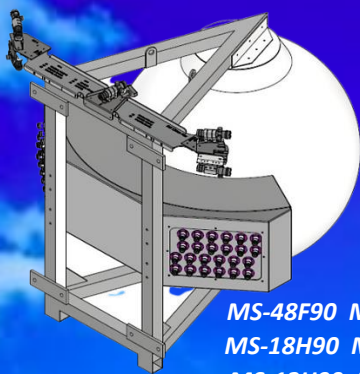




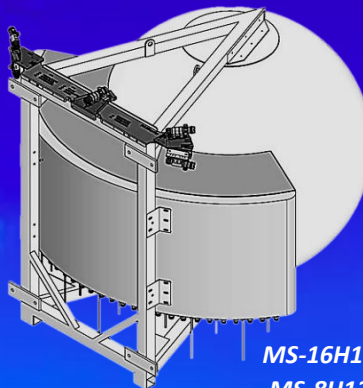
LENS TECHNOLOGY ENABLED

MS-LSA-SLP-2 User Guide

(Stadium Laser Pointer for 19 Antenna Models)



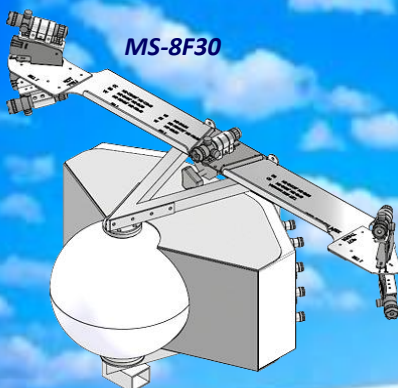
**MS-48F90 MS-24F90
MS-18H90 MS-12F90
MS-12H90 MS-6H90**



**MS-16H120
MS-8H120**

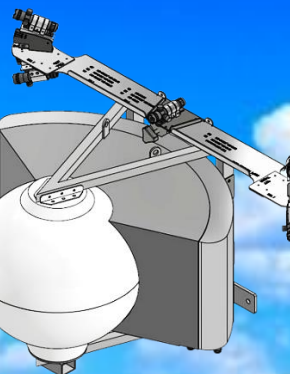


**MS-48H180
MS-24H180
MS-12H180**



MS-8F30

**MS-18F45
MS-12F45
MS-6F45**



**MS-24F60
MS-16F60
MS-8F60
MS-8H60**

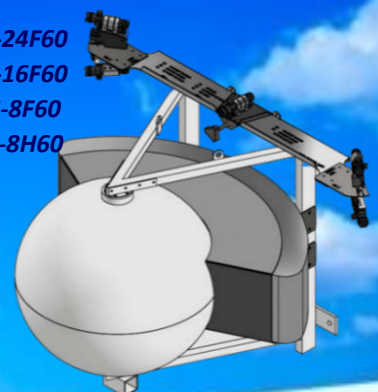


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8.20 Position confirmed and secure with marking

Revision History:

<u>Date</u>	<u>Description</u>	<u>Rev By</u>	<u>Check By</u>	<u>Rev no</u>
27-Jan-2024	Initial Release	RL	Pavel	0
26-Sep-2024	Document and part renaming and general update	RL	Pavel	1
02-Jan-2025	Add more comprehensive information and illustration picture	RL	Pavel	2
20-Jun-2025	Re-organize the guide by model configuration	RL	Pavel	3
28-Aug-2025	Add SET 3 Pre-Setting Plate for MS-12H180, MS-12F90 and MS-24F60	RL	Pavel	4

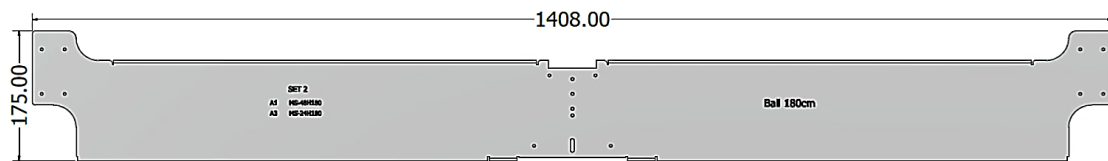
1.00 Applicable Antenna Models

A) 180 cm Lens	B) 120 cm Lens	C) 90 cm Lens	D) 60 cm Lens	E) 45 cm Lens
1 MS-48H180	4 MS-16H120	6 MS-48F90	12 MS-24F60	16 MS-18F45
2 MS-24H180	5 MS-8H120	7 MS-24F90	13 MS-16F60	17 MS-12F45
3 MS-12H180		8 MS-18H90	14 MS-8F60	18 MS-6F45
		9 MS-12F90	15 MS-8H60	
		10 MS-12H90		
		11 MS-6H90		
				F) 30 cm Lens
				19 MS-8F30

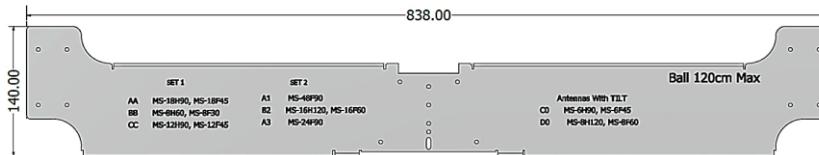
2.00 SLP: Parts and Description

2.10 Main Base Plate

- 2.11 180cm Main base plate ID: **"Ball 180cm"** (L=1408mm, Engraved with WHITE text)
(For 3 models: MS-48H180, MS-24H180, MS-12H180)



- 2.12 120cm Main base plate **"Ball 120cm Max"** (L=838mm, Engraved with WHITE text)
(For 16 models: Lens from 30cm to 120cm Antenna.)



2.20 Pre-Setting Plate ID & Tilting Plate

ID: **"SET 1" & "A-B-C" Tilting plate**

- 2.21 (For 6 models: MS-18H90, MS-18F45, MS-8H60, MS-8F30, MS-12H90, MS-12F45)

ID: **"SET 2" & "1-2-3" Tilting plate**

- 2.22 (For 6 models: MS-48H180, MS-48F90, MS-16H120, MS-16F60, MS-24H180, MS-24F90)

ID: **"SET 3" & "A" Tilting plate**

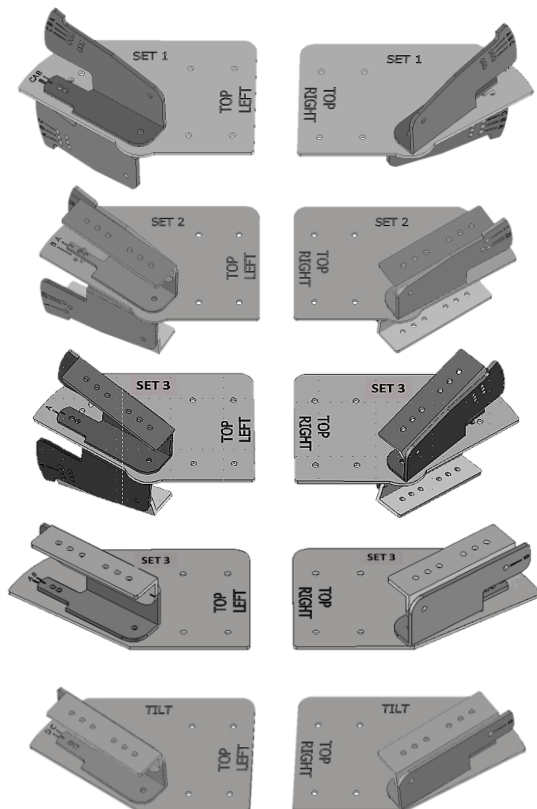
- 2.23 (For MS-24F60)

ID: **"SET 3" & "0" Tilting plate**

- 2.24 (For 2 models: MS-12H180, MS-12F90)

ID: **"TILT" & "0" Tilting plate**

- 2.25 (For 4 models: MS-6H90, MS-6F45, MS-8H120, MS-8F60)



2.30 Laser Pointer and Beds.

- 2.31 "PINTY" Laser pointer. (Not included)



- 2.32 "BUGLEMAN" Laser bed. (Not Included)



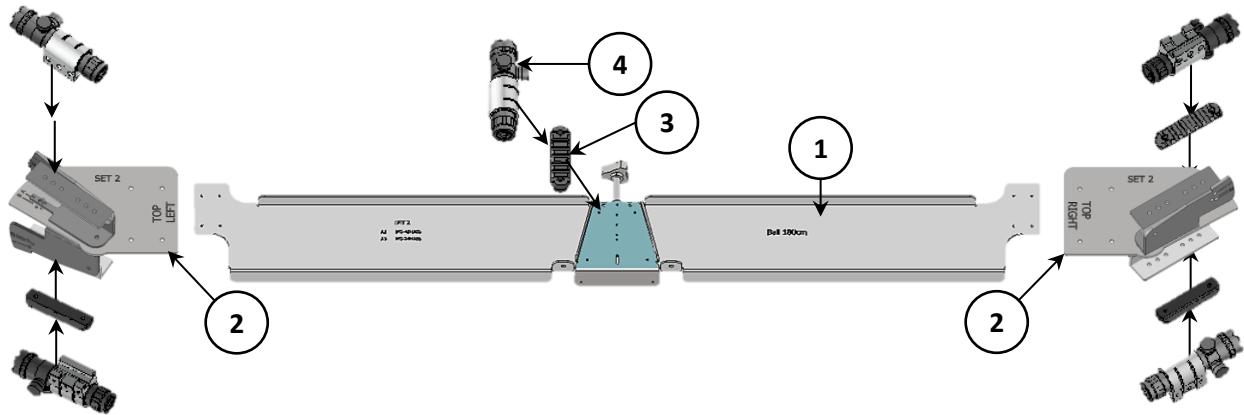
3.00 SLP: Parts Selection and Assembly

3.10 Example of Laser Pointer Assembly (Sample Model: MS-48H180)

3.11 Select main base plate "Ball 180cm"

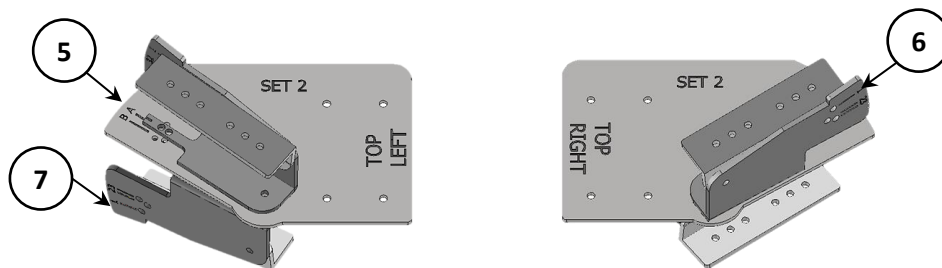
3.12 Select Pre-Setting plate "SET 2"

- ① Main base plate: "Ball 180cm".
- ② Secure the "SET 2" plate onto the "Ball 180cm" base plate.
- ③ Install all 5 Laser beds securely.
- ④ Install all 5 Lasers pointers in place.



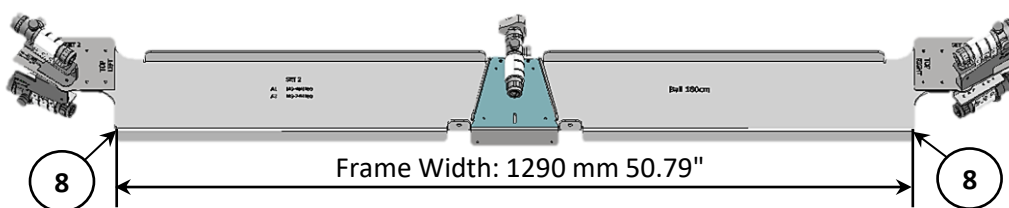
3.20 "SET 2" Plate Setting

- ⑤ Adjust to position "A" and securely fasten it.
- ⑥ Adjust the top tilting bracket to position "1" and securely fasten it.
- ⑦ Adjust the bottom tilting bracket to position "1" and securely fasten it.



3.30 Main base plate: Frame Marking

- ⑧ Mark the frame width on SLP rear latch as a reference point.

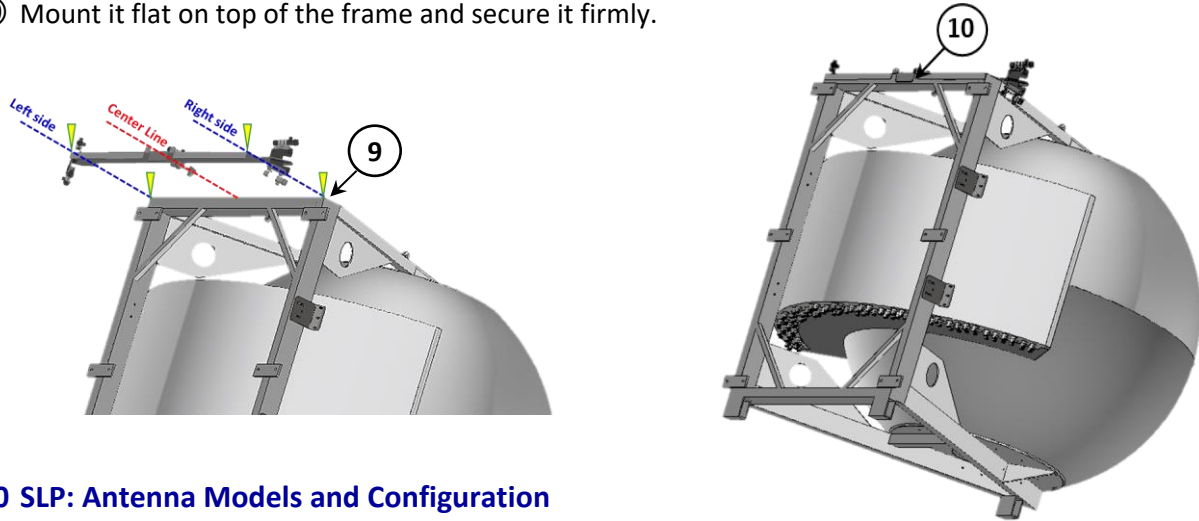


4.00 Laser Pointer: Safety Information and User Guide

- ⚠ **Never** point this device at reflective surfaces to avoid unintended light dispersion.
- ⚠ **Use this device** only in accordance with all applicable local and national laser laws and regulations.
- ⚠ **Never** aim the laser directly at an aircraft or at the eyes of any person or animal. Avoid viewing the laser through magnified or focused optics.
- This product** is resistant to standard precipitation. Avoid exposing it to pressurized water or allowing its internal electronics to become wet. If moisture exposure occurs, immediately remove the batteries and allow all components to dry completely before resuming use.

5.00 SLP: Lifting and Mounting

- ⚠ Workplace safety and health compliance measures must be followed when performing 'Work-At-Height' tasks.
- ⚠ Only certified personnel should use appropriate equipment, safety harnesses, and tools to perform the task safely.
- ⑨ Align the SLP frame width marker with the frame edge.
- ⑩ Mount it flat on top of the frame and secure it firmly.

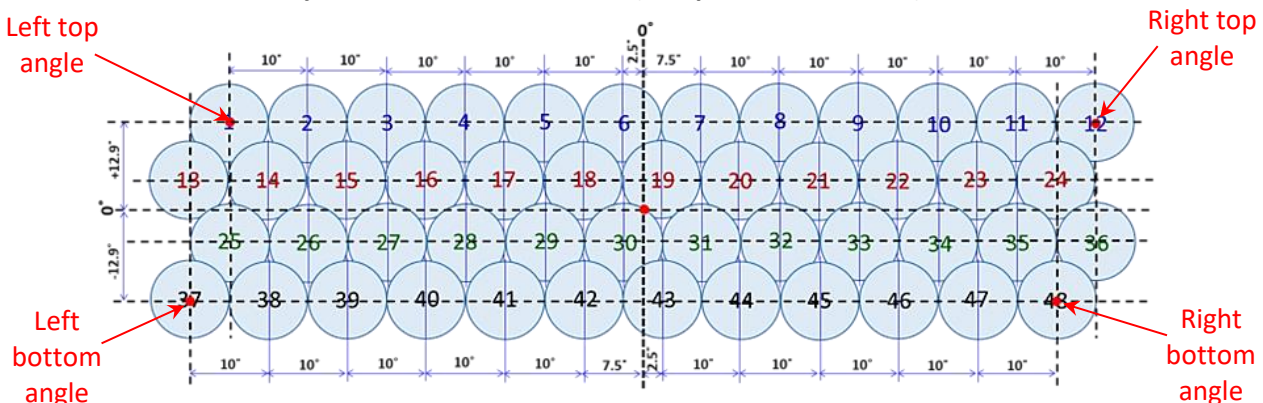


6.00 SLP: Antenna Models and Configuration

6.10 Antenna model and SLP parts configuration chart

no	Model	Frame width (mm/inch)	Main base plate ID	Base plate ID	Base plate setting	Tilt bracket setting	Left top (°)	Right top (°)	Left bottom (°)	Right bottom (°)	Tilt -up (°)	Tilt -down (°)
1	MS-48H180	1290.00/50.79"	Ball 180cm	SET 2	"A"	"1"	-52.5°	+57.5°	-57.5°	+52.5°	+12.9°	-12.9°
2	MS-24H180	1290.00/50.79"		SET 2	"A"	"3"	-52.5°	+57.5°	-57.5°	+52.5°	+4.3°	-4.3°
3	MS-12H180	1290.00/50.79"		SET 3	"B"	"0"	-55.0°	+55.0°				
4	MS-16H120	720.00/28.35"	Ball 120cm Max	SET 2	"B"	"2"	-56.2°	+48.8°	-48.8°	+56.2°	+6.5°	-6.5°
5	MS-8H120	720.00/28.35"		TILT	"D"	"0"	-52.5°	+52.5°				
6	MS-48F90	518.00/20.39"		SET 2	"A"	"1"	-52.5°	+57.5°	-57.5°	+52.5°	+12.9°	-12.9°
7	MS-24F90	518.00/20.39"		SET 2	"A"	"3"	-52.5°	+57.5°	-57.5°	+52.5°	+4.3°	-4.3°
8	MS-18H90	620.00/24.41"		SET 1	"A"	"A"	-55.0°	+45.0°	-55.0°	+45.0°	+17.0°	-17.0°
9	MS-12F90	620.00/24.41"		SET 3	"B"	"0"	-55.0°	+55.0°				
10	MS-12H90	535.00/21.06"		SET 1	"C"	"C"	-55.0°	+45.0°	-45.0°	+55.0°	+8.7°	-8.7°
11	MS-6H90	612.00/24.09"		TILT	"C"	"0"	-50.0°	+50.0°				
12	MS-24F60	466.80/18.38"		SET 3	"A"	"A"	-56.3°	+48.8°	-56.3°	+48.8°	+13.0°	-13.0°
13	MS-16F60	466.80/18.38"		SET 2	"B"	"2"	-56.3°	+48.8°	-48.8°	+56.3°	+6.5°	-6.5°
14	MS-8F60	466.80/18.38"		TILT	"D"	"0"	-52.5°	+52.5°				
15	MS-8H60	466.80/18.38"		SET 1	"B"	"B"	-52.5°	+37.5°	-37.5°	+52.5°	+13.0°	-13.0°
16	MS-18F45	350.80/13.81"		SET 1	"A"	"A"	-55.0°	+45.0°	-55.0°	+45.0°	+17.0°	-17.0°
17	MS-12F45	350.80/13.81"		SET 1	"C"	"C"	-55.0°	+45.0°	-45.0°	+55.0°	+8.7°	-8.7°
18	MS-6F45	350.80/13.81"		TILT	"C"	"0"	-50.0°	+50.0°				
19	MS-8F30	220.00/8.66"		SET 1	"B"	"B"	-52.5°	+37.5°	-37.5°	+52.5°	+13.0°	-13.0°

6.20 Antenna Beam Projection and Position Guide (Sample of MS-48H180)

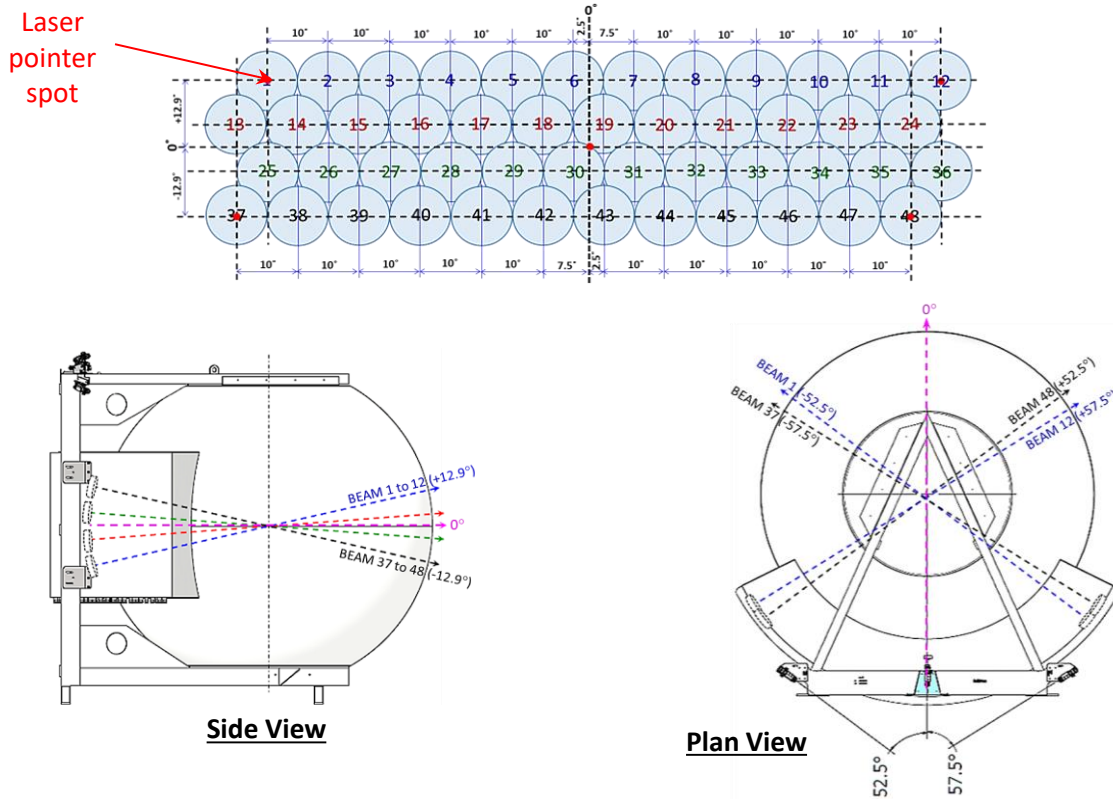


7.00 SLP: Antenna Models Positioning Guide

1 MS-48H180 SLP Configuration

(Frame Width: 1290mm, 50.79")

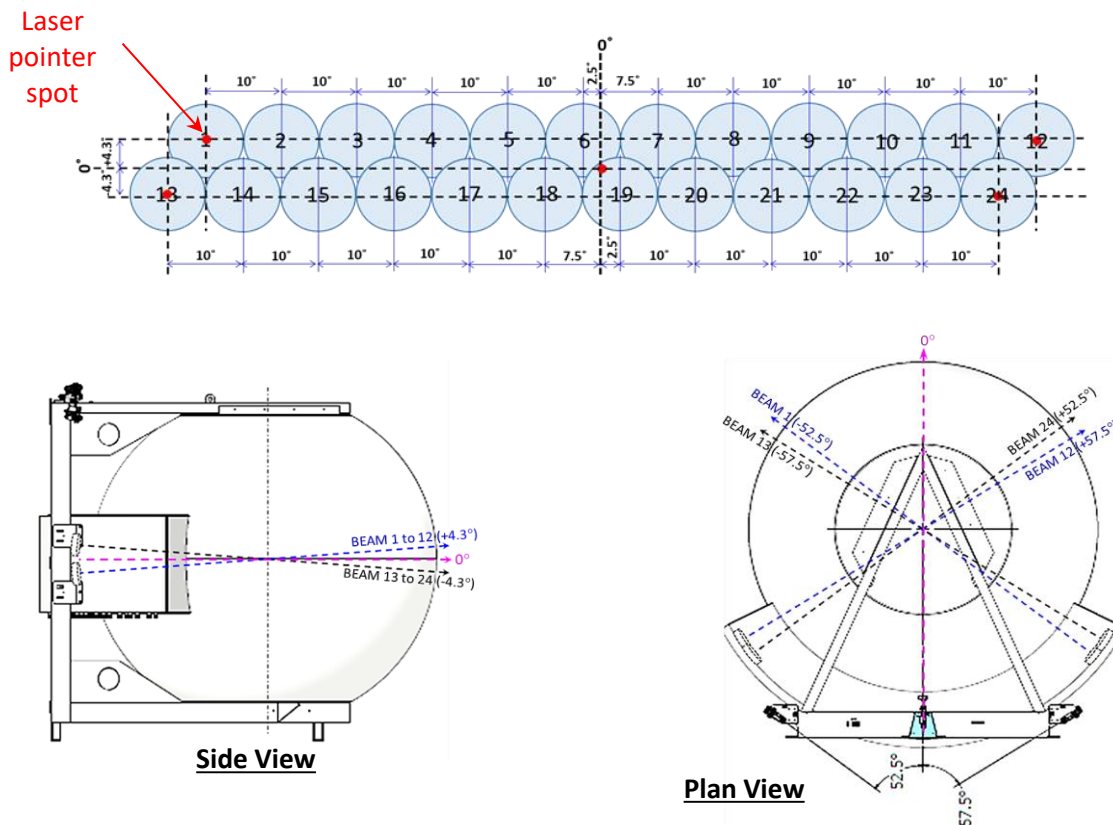
Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"1"	-52.5°	+57.5°	-57.5°	+52.5°	+12.9°	-12.9°



2 MS-24H180 SLP Configuration

(Frame Width: 1290mm, 50.79")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"3"	-52.5°	+57.5°	-57.5°	+52.5°	+4.3°	-4.3°

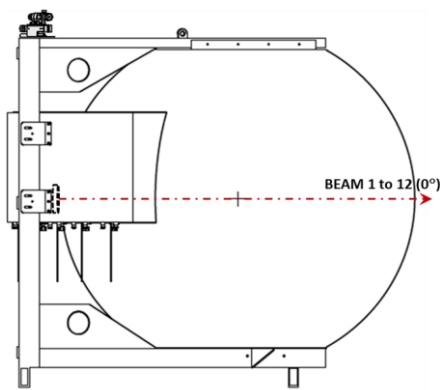
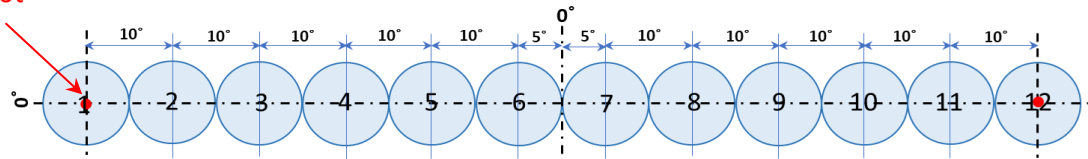


3 MS-12H180 SLP Configuration

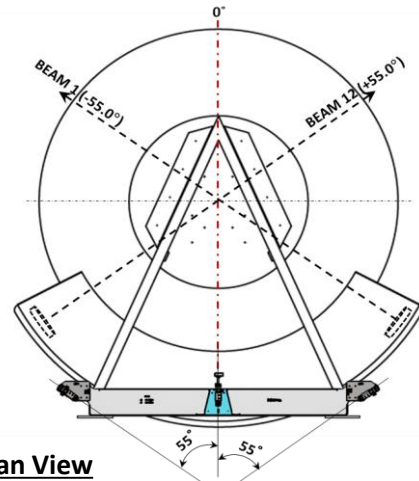
(Frame Width: 1290mm, 50.79")

Base Plate Setting	Tilt Bracket Setting	Left Top Angle	Right Top Angle
"B"	"0"	-55.0°	+55.0°

Laser
pointer
spot



Side View



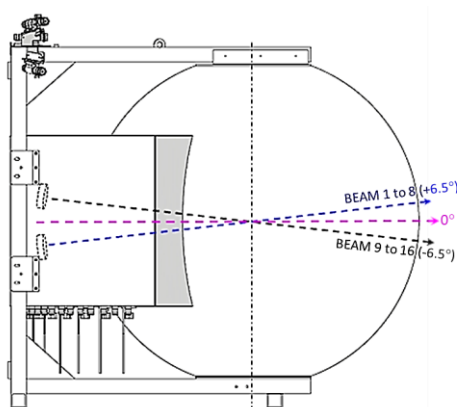
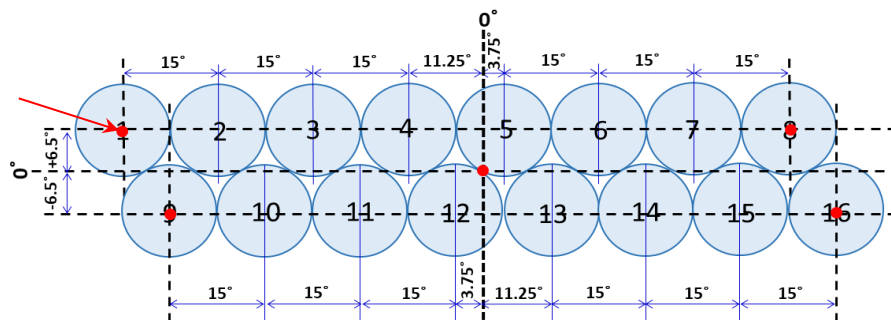
Plan View

4 MS-16H120 SLP Configuration

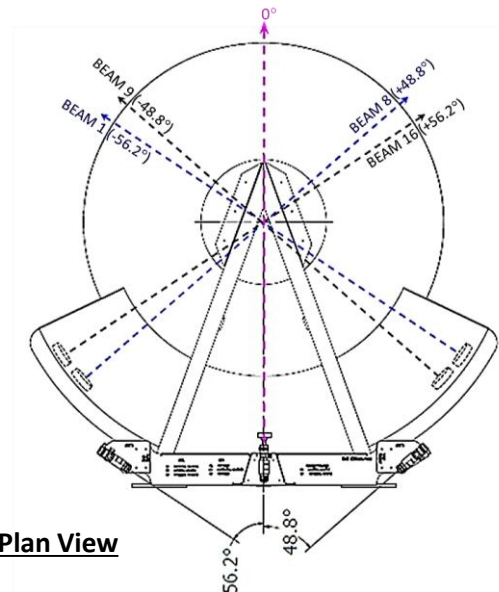
(Frame Width: 720mm, 28.35")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"B"	"2"	-56.2°	+48.8°	-48.8°	+56.2°	+6.5°	-6.5°

Laser
pointer
spot



Side View



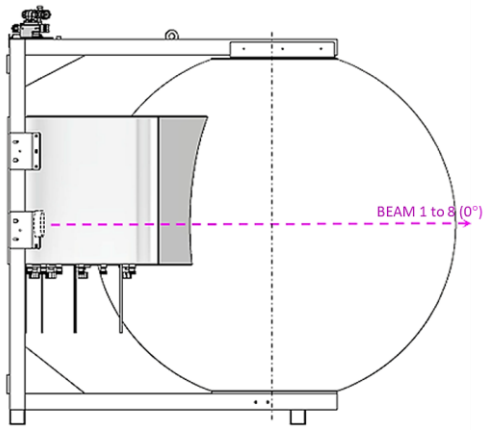
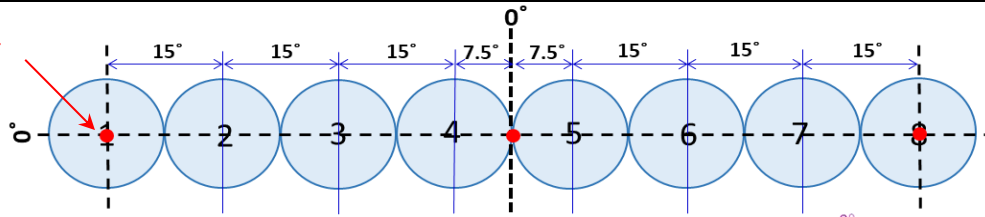
Plan View

5 MS-8H120 SLP Configuration

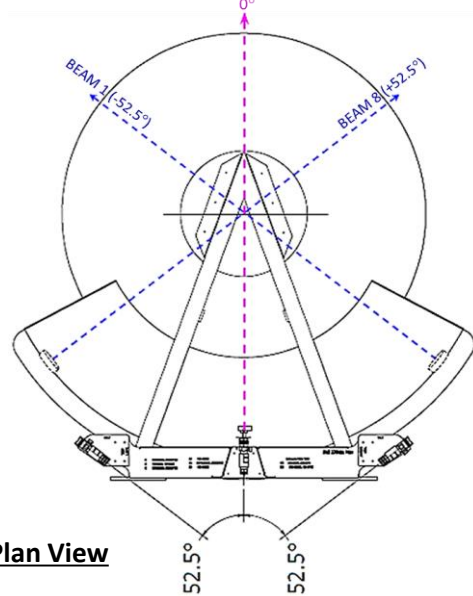
(Frame Width: 720mm, 28.35")

Base Plate Setting	Tilt Bracket Setting	Left Top Angle	Right Top Angle
"D"	"0"	-52.5°	+52.5°

Laser
pointer
spot



Side View



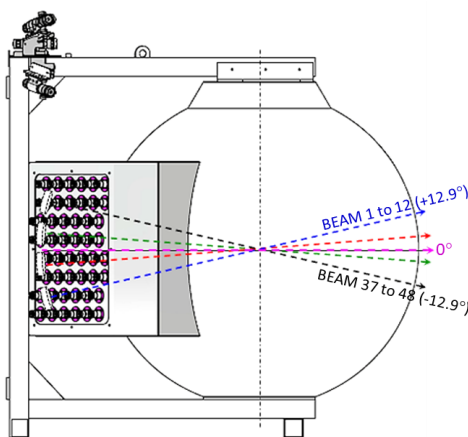
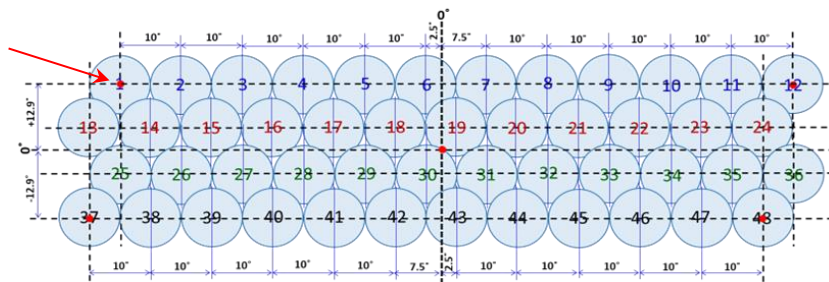
Plan View

6 MS-48F90 SLP Configuration

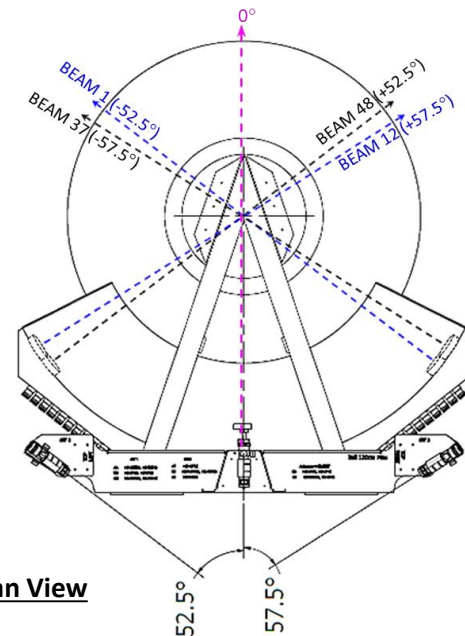
(Frame Width: 518mm, 20.39")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"1"	-52.5°	+57.5°	-57.5°	+52.5°	+12.9°	-12.9°

Laser
pointer
spot



Side View

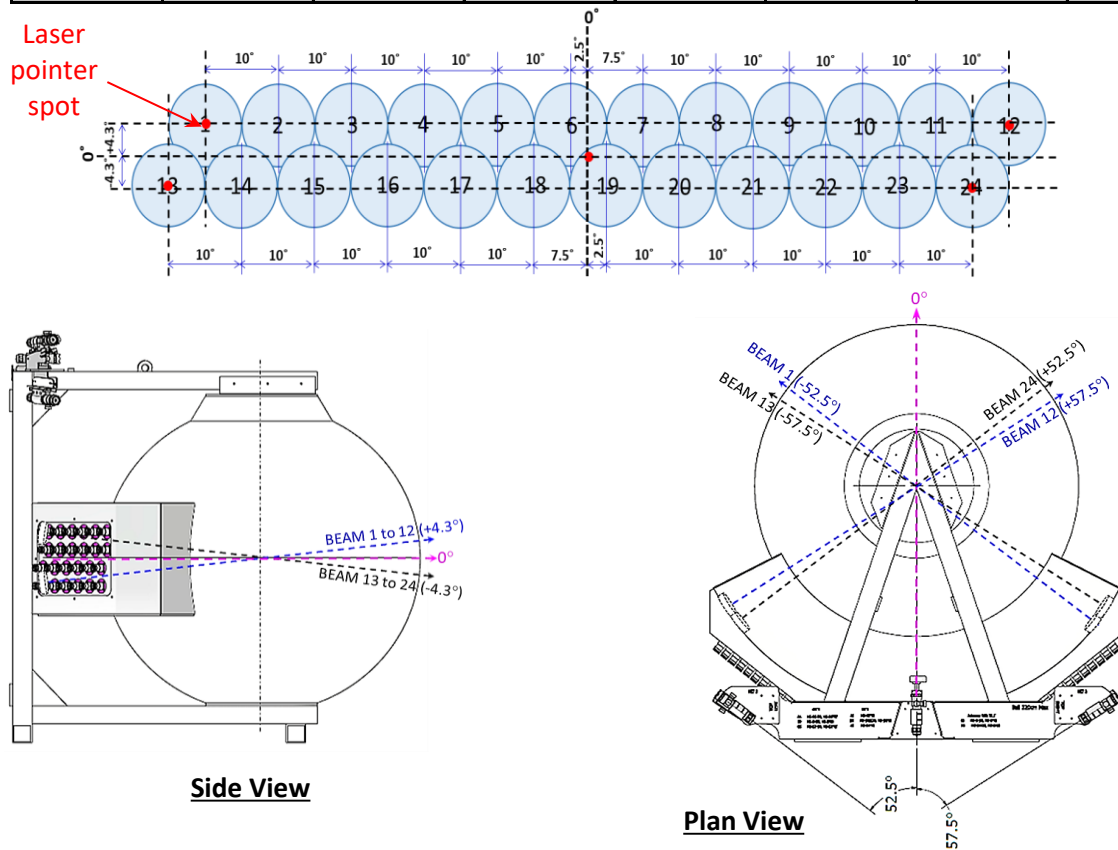


Plan View

7 MS-24F90 SLP Configuration

(Frame Width: 518mm, 20.39")

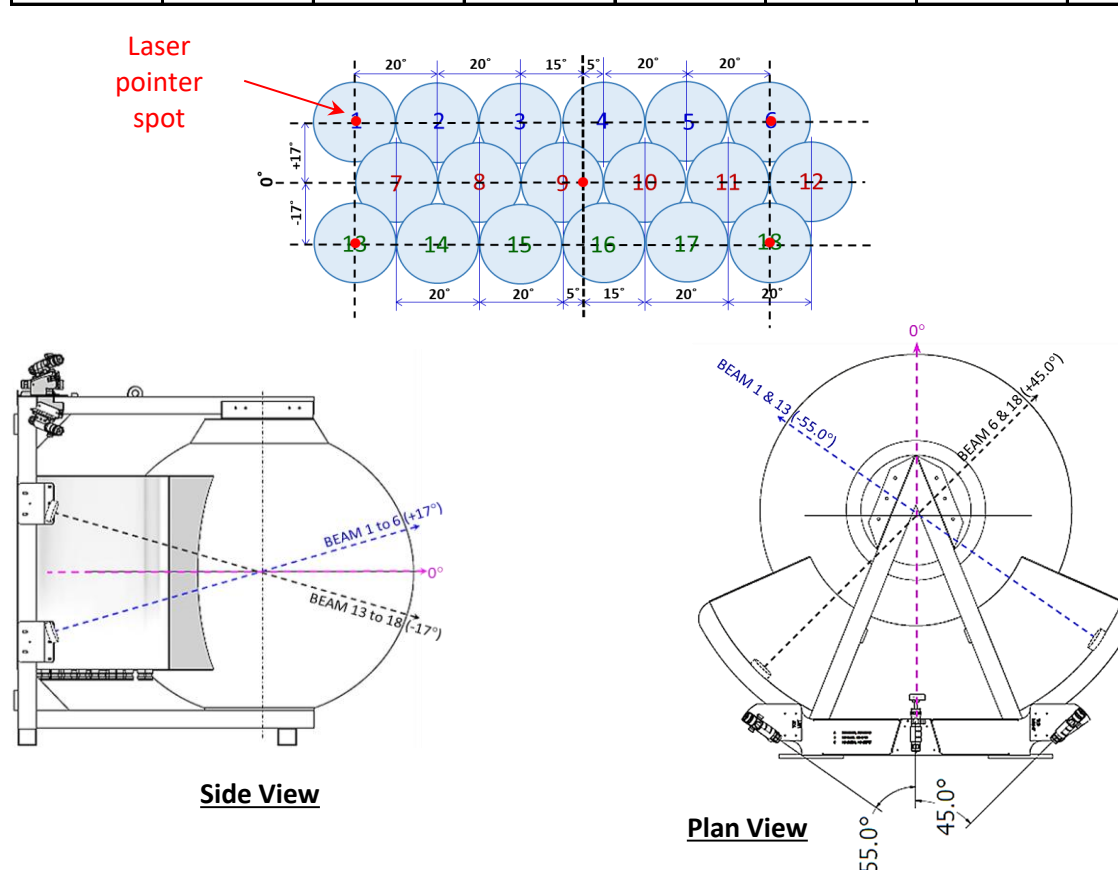
Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"3"	-52.5°	+57.5°	-57.5°	+52.5°	+4.3°	-4.3°



8 MS-18H90 SLP Configuration

(Frame Width: 620.00mm, 24.41")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"A"	-55.0°	+45.0°	-55.0°	+45.0°	+17°	-17°

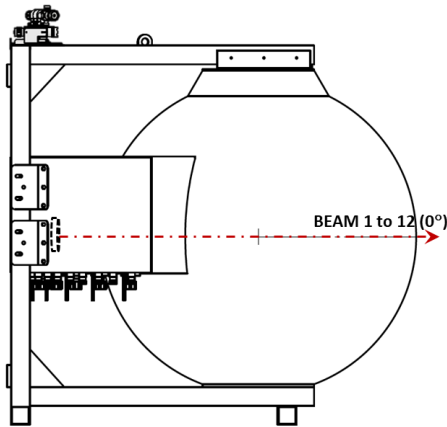
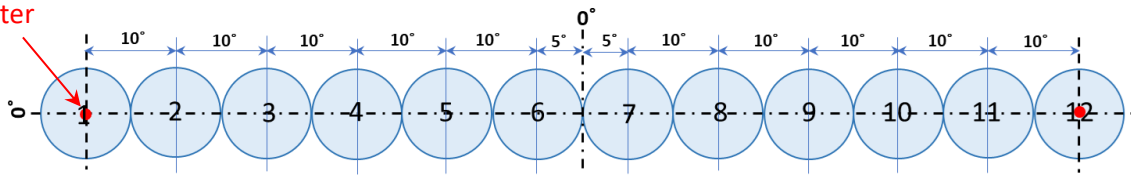


9 MS-12F90 SLP Configuration

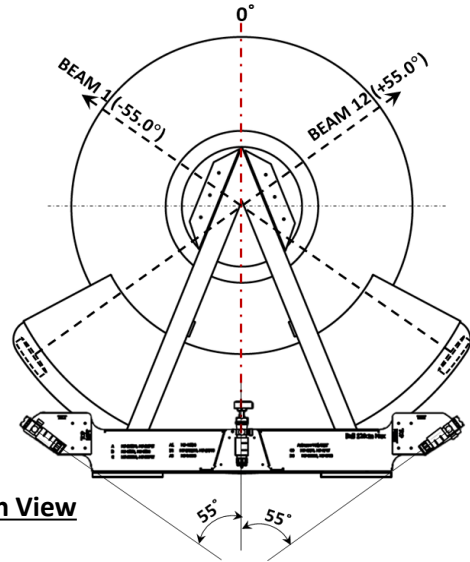
(Frame Width: 620.00mm, 24.41")

Base Plate Setting	Tilt Bracket Setting	Left Top Angle	Right Top Angle
"B"	"0"	-55.0°	+55.0°

Laser
pointer



Side View



Plan View

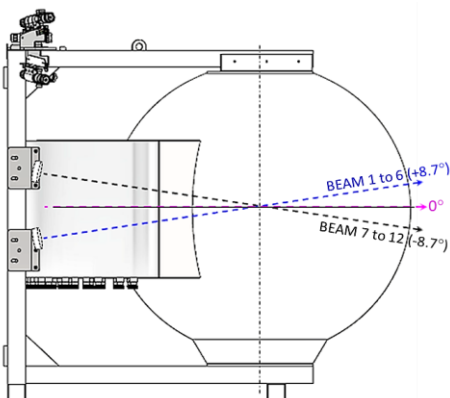
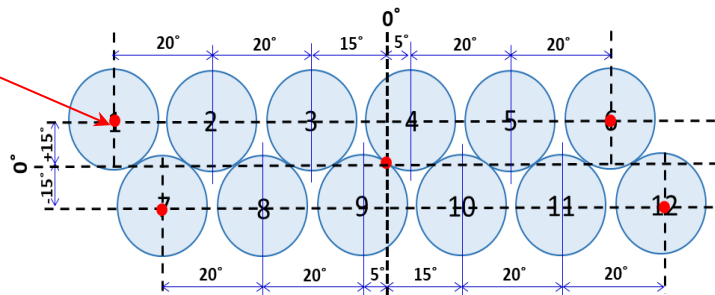
10 MS-12H90 SLP Configuration

(Frame Width: 535mm, 21.06")

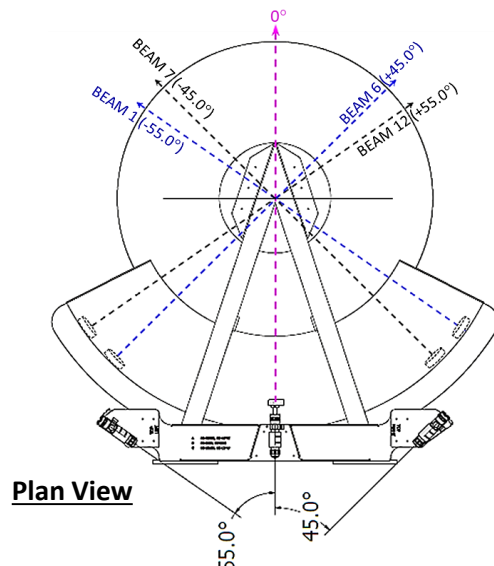
Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"C"	"C"	-55.0°	+45.0°	-45.0°	+55.0°	+8.7°	-8.7°

(** **Note** : MS-12H90 Tilt angle need to LOCK at +8.7 ° & -8.7 ° for laser spot positioning)

Laser
pointer
spot



Side View

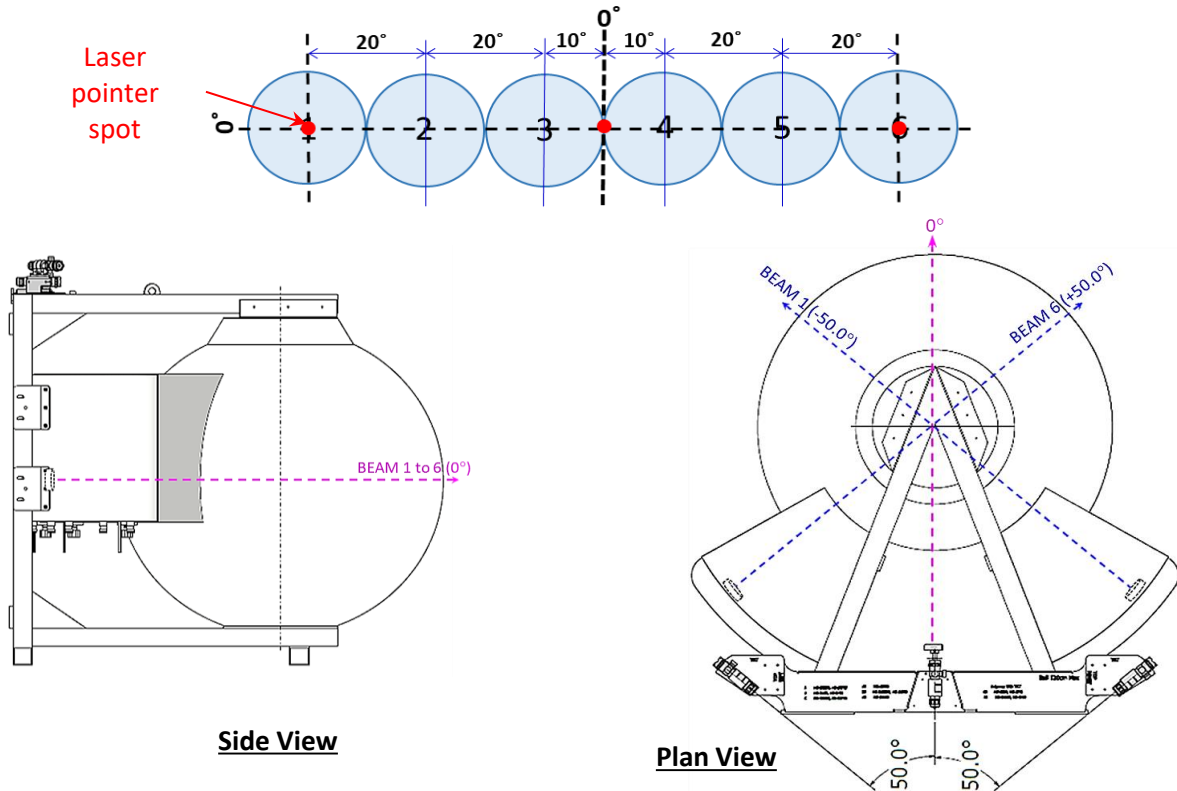


Plan View

11 MS-6H90 SLP Configuration

(Frame Width: 612.0mm, 24.09")

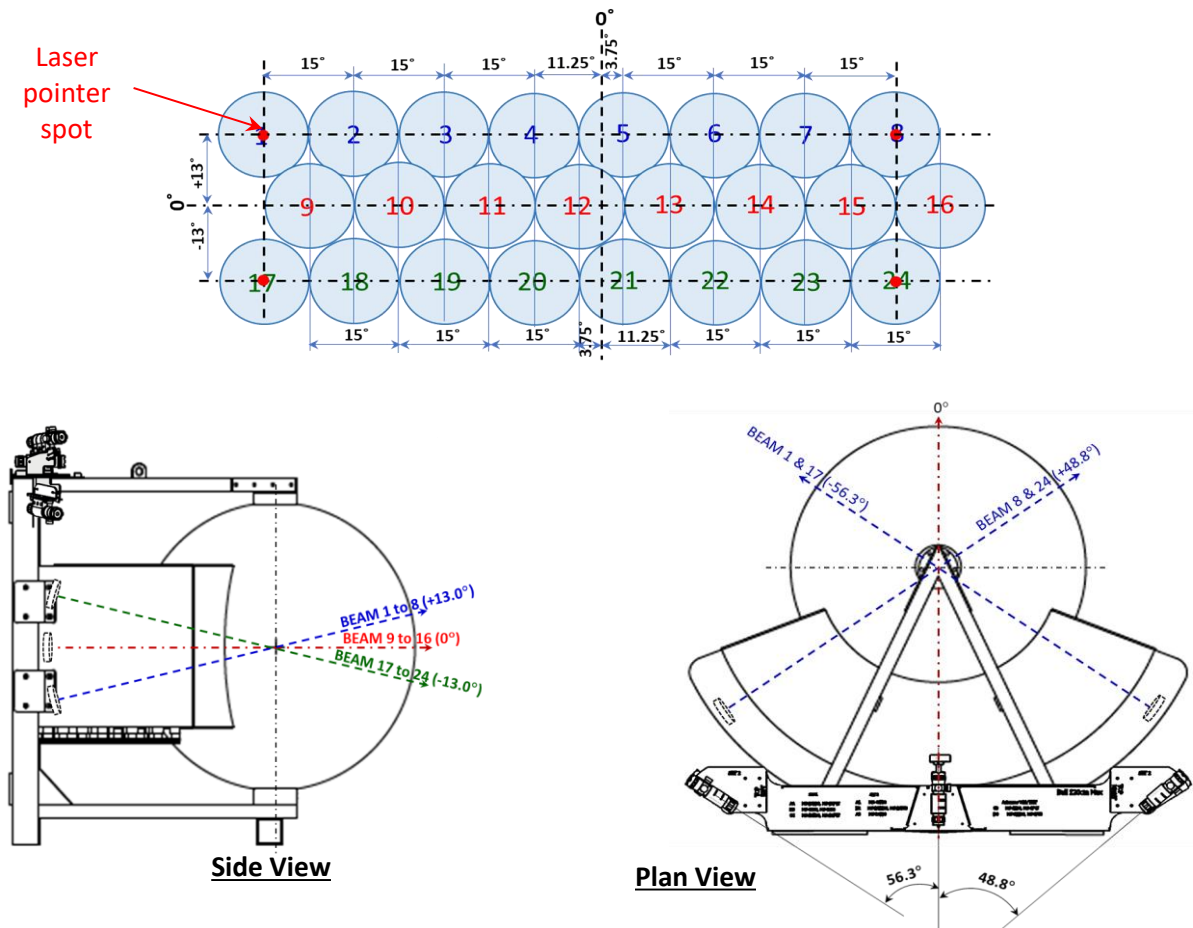
Base Plate Setting	Tilt Bracket Setting	Left Top Angle	Right Top Angle
"C"	"0"	-50.0°	+50.0°



12 MS-24F60 SLP Configuration

(Frame Width: 466.80mm, 18.38")

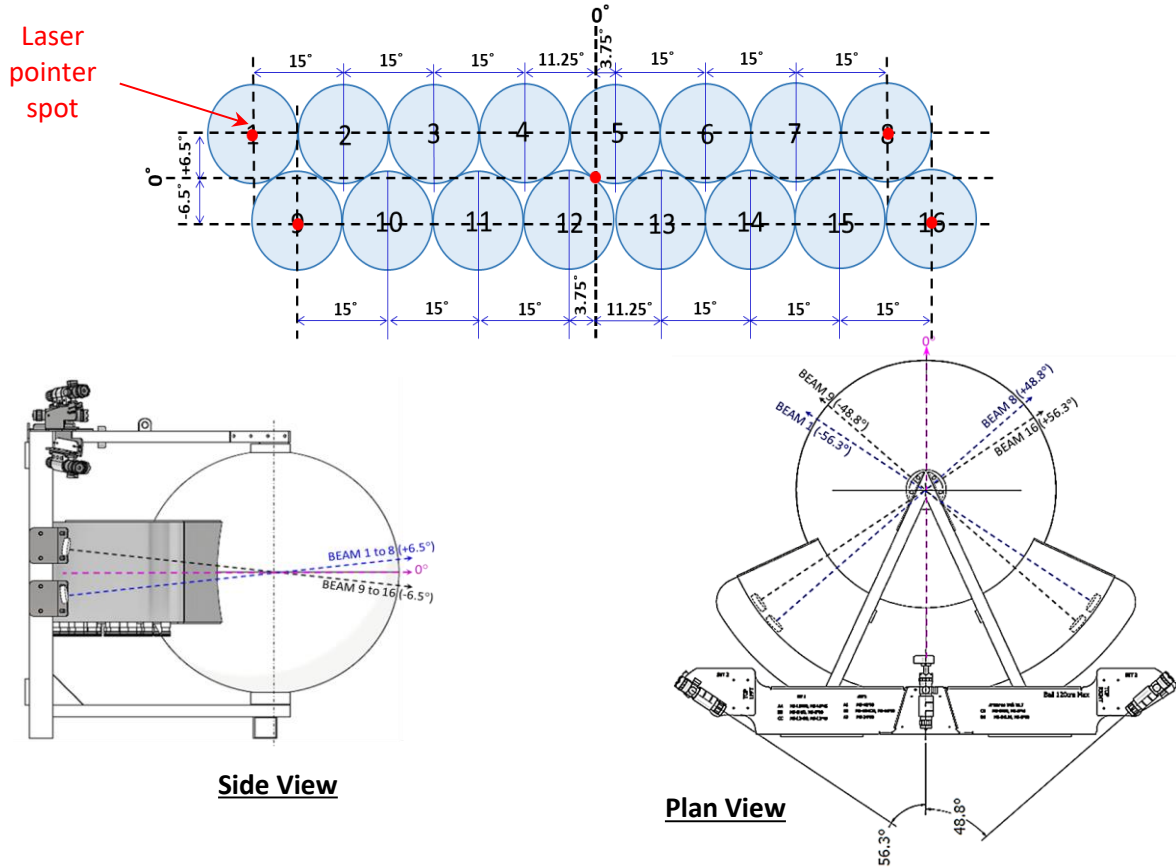
Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"A"	-56.3°	+48.8°	-56.3°	+48.8°	+13.0°	-13.0°



13 MS-16F60 SLP Configuration

(Frame Width: 466.80mm, 18.38")

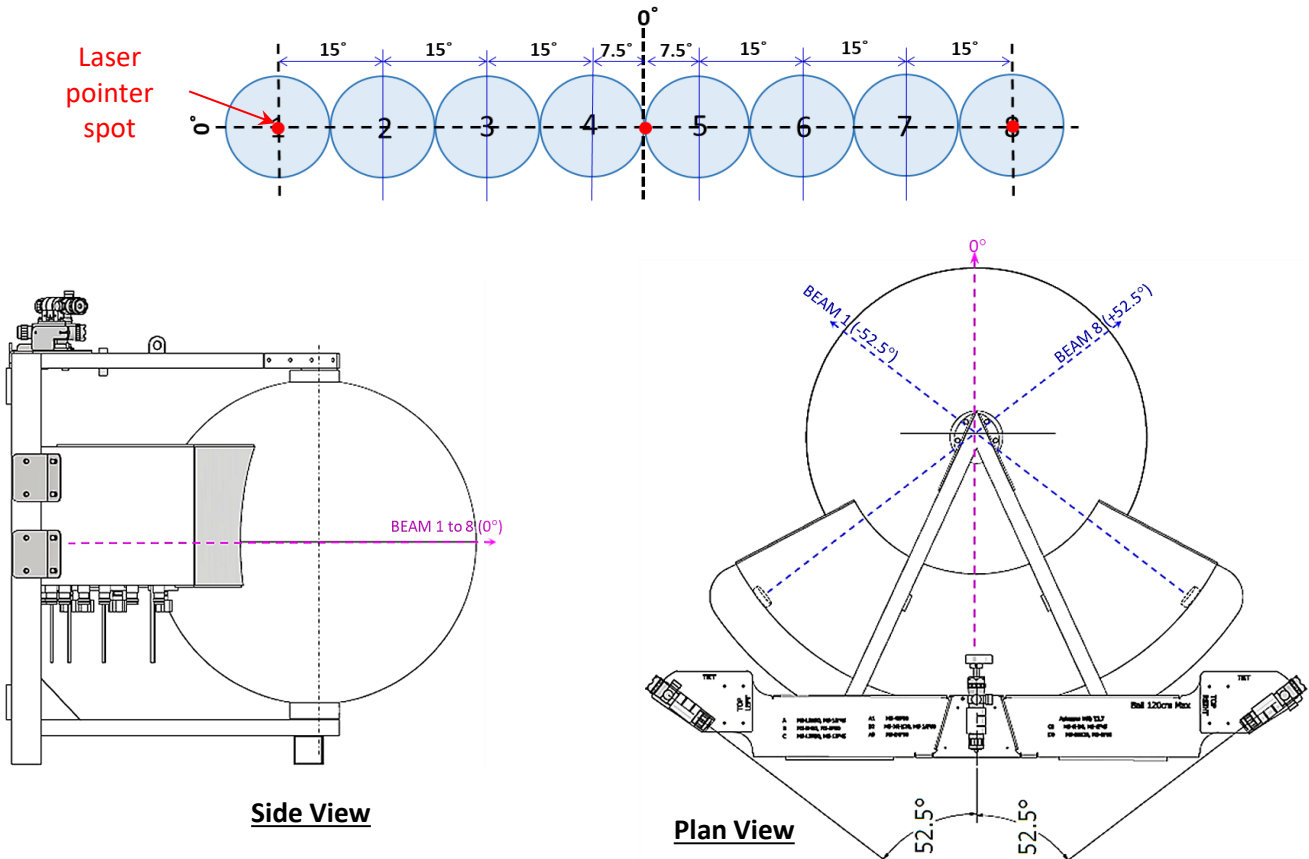
Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"B"	"2"	-56.3°	+48.8°	-48.8°	+56.3°	+6.5°	-6.5°



14 MS-8F60 SLP Configuration

(Frame Width: 466.80mm, 18.38")

Base Plate Setting	Tilt Bracket Setting	Left Top Angle	Right Top Angle
"D"	"0"	-52.5°	+52.5°

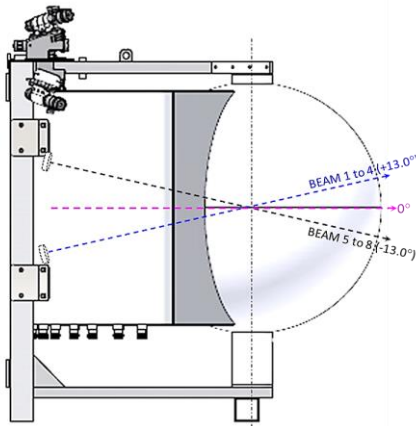
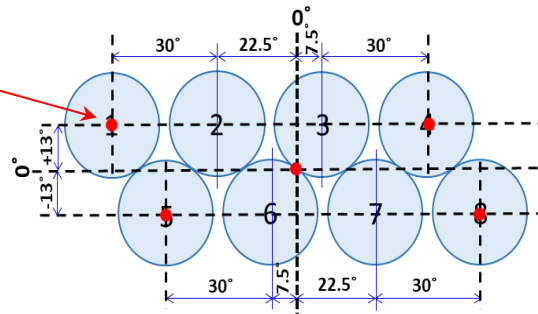


15 MS-8H60 SLP Configuration

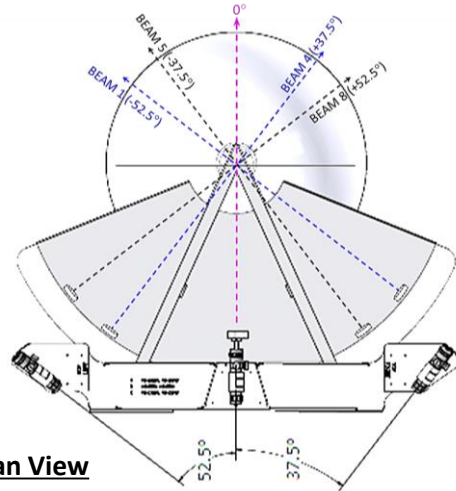
(Frame Width: 466.80mm, 18.38")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"B"	"B"	-52.5°	+37.5°	-37.5°	+52.5°	+13°	-13°

Laser pointer spot



Side View



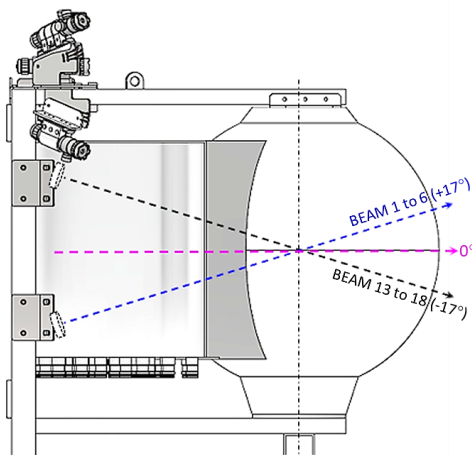
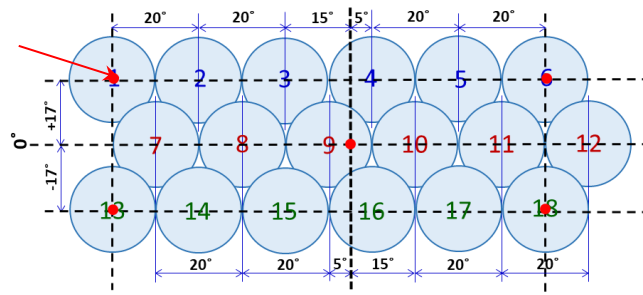
Plan View

16 MS-18F45 SLP Configuration

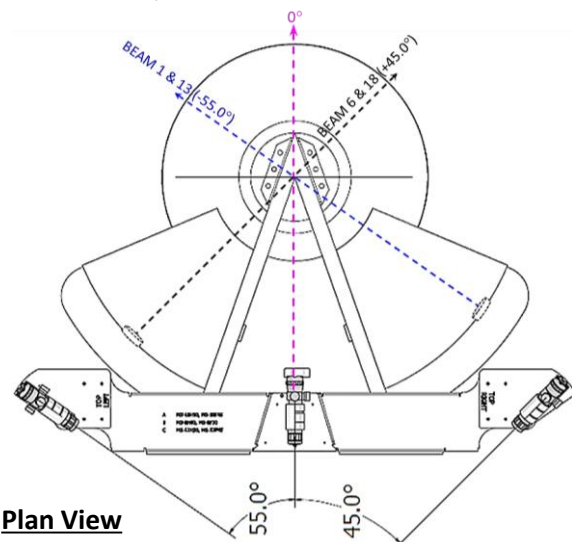
(Frame Width: 350.80mm, 13.81")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"A"	"A"	-55.0°	+45.0°	-55.0°	+45.0°	+17°	-17°

Laser pointer spot



Side View

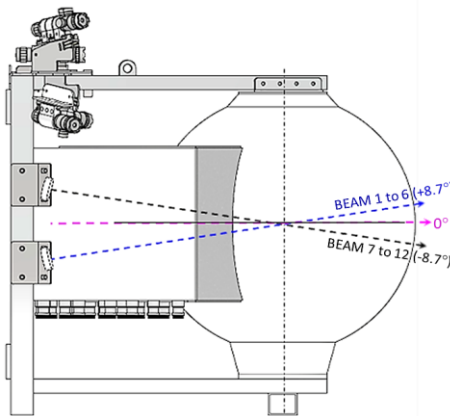
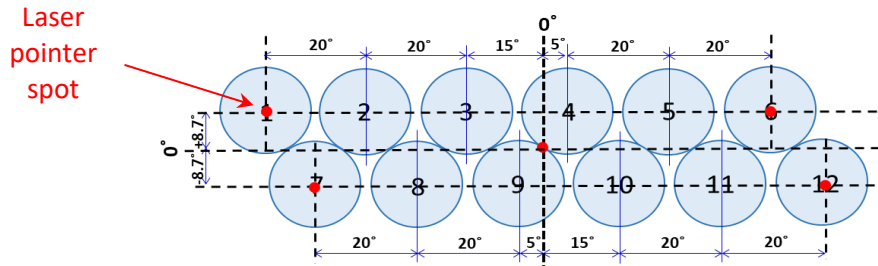


Plan View

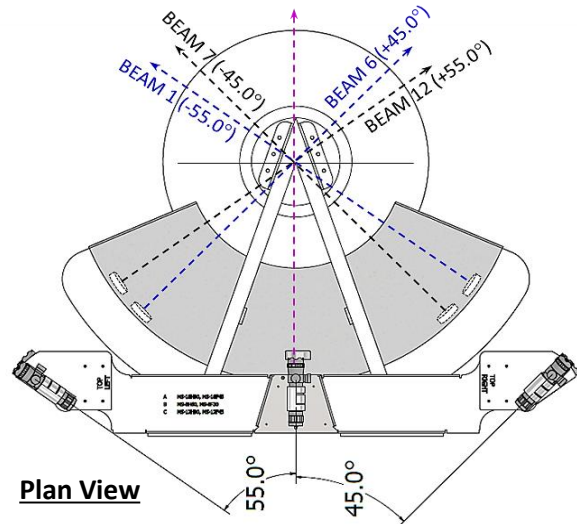
17 MS-12F45 SLP Configuration

(Frame Width: 350.80mm, 13.81")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"C"	"C"	-55.0°	+45.0°	-45.0°	+55.0°	+8.7°	-8.7°



Side View

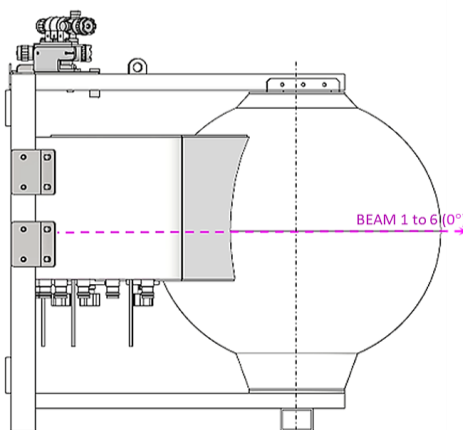
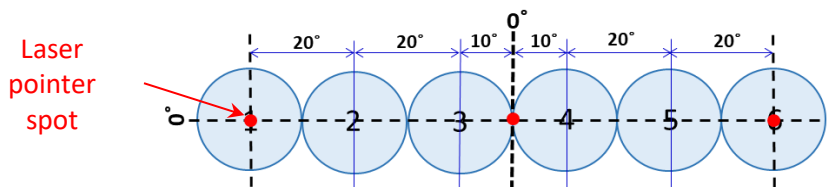


Plan View

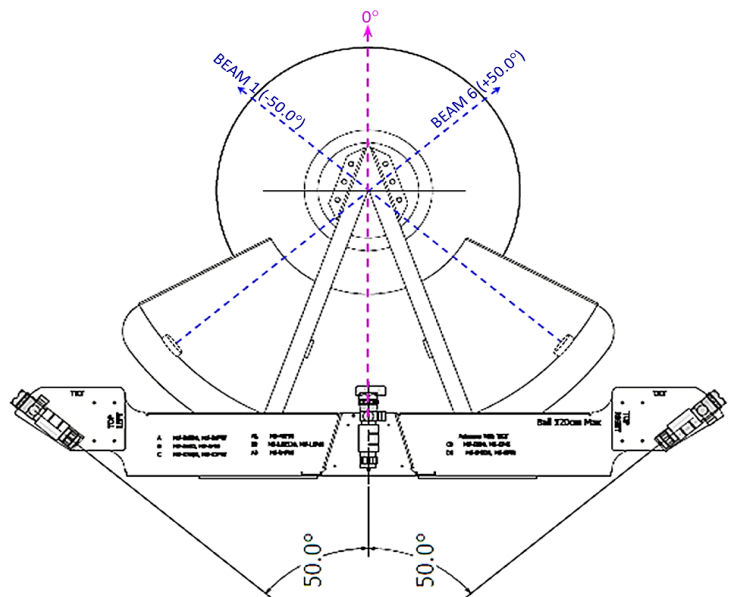
18 MS-6F45 SLP Configuration

(Frame Width: 350.80mm, 13.81")

Base Plate Setting	Tilt Bracket Setting	Left Top Angle	Right Top Angle
"C"	"0"	-50.0°	+50.0°



Side View

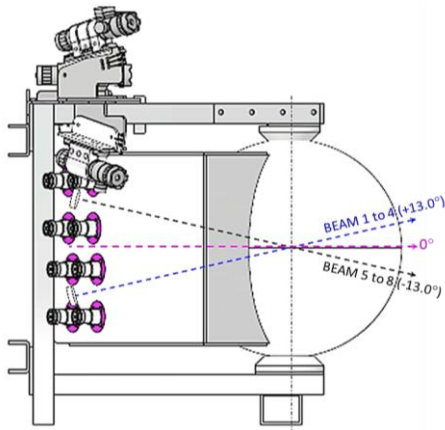
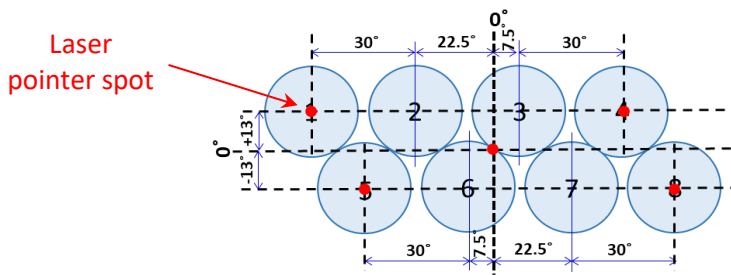


Plan View

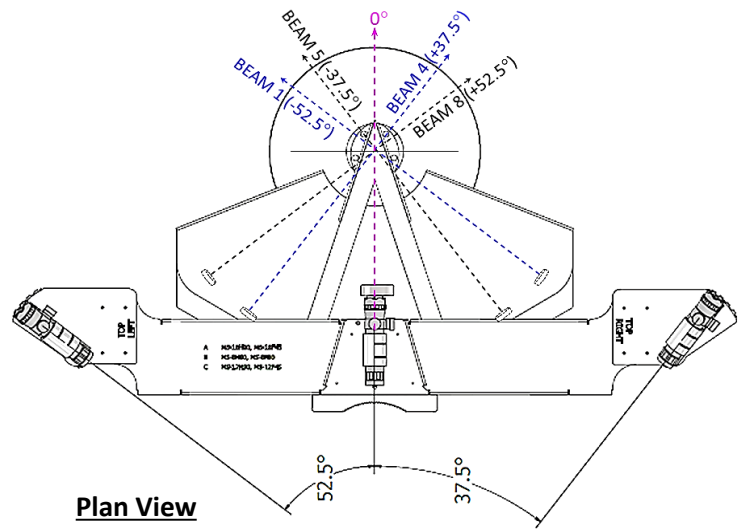
19 MS-8F30 SLP Configuration

(Frame Width: 220.00mm, 8.66")

Base Plate Setting	Tilt Bkt Setting	Left Top Angle	Right Top Angle	Left Btm Angle	Right Btm Angle	Tilt-Up Angle	Tilt-Down Angle
"B"	"B"	-52.5°	+37.5°	-37.5°	+52.5°	+13°	-13°



Side View

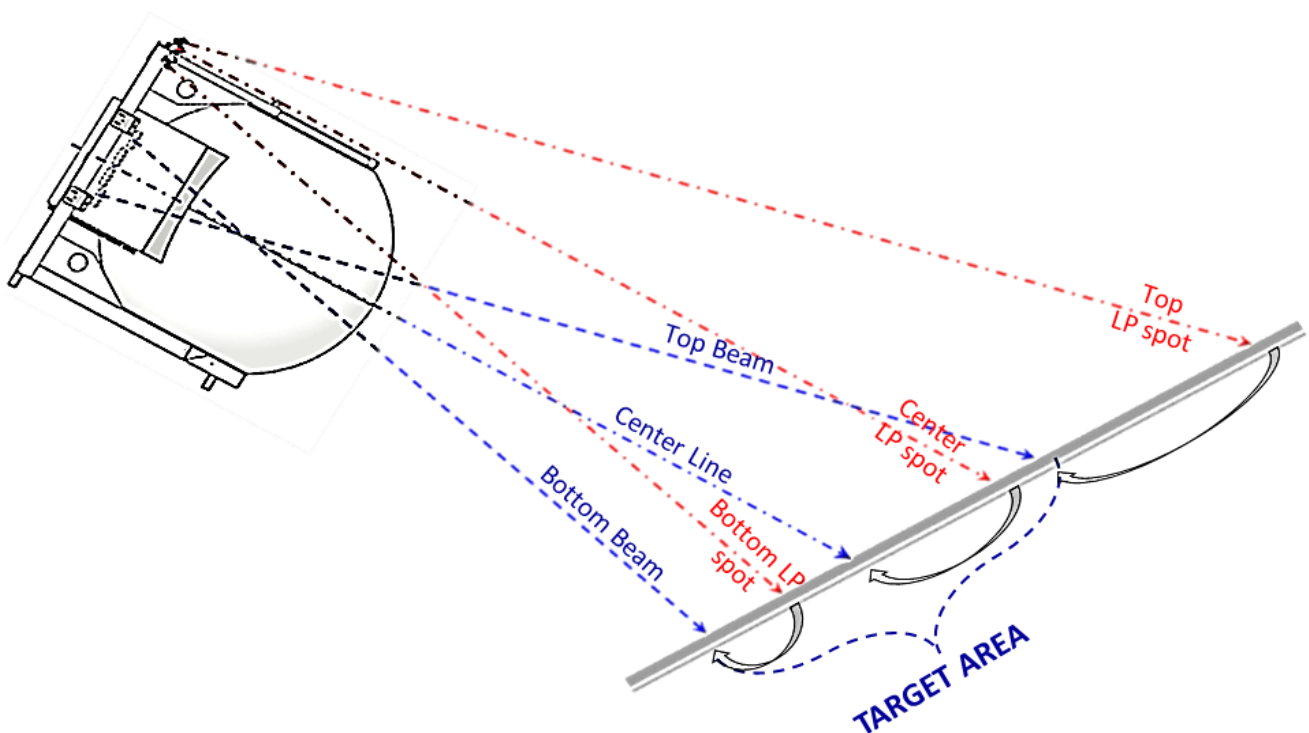


Plan View

8.00 SLP: Antenna Positioning

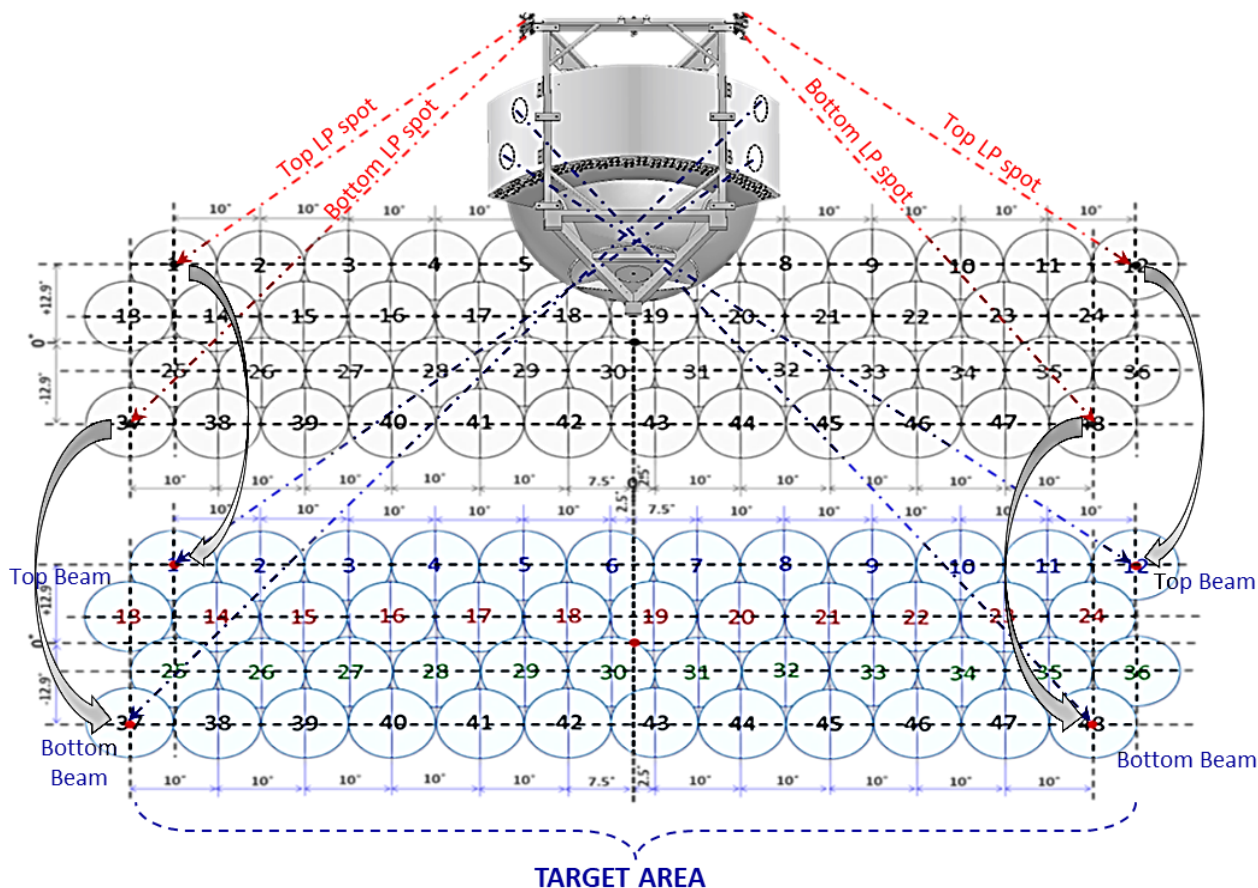
8.10 Example of MS-48H180

8.11 Side view



** Picture for illustration purpose

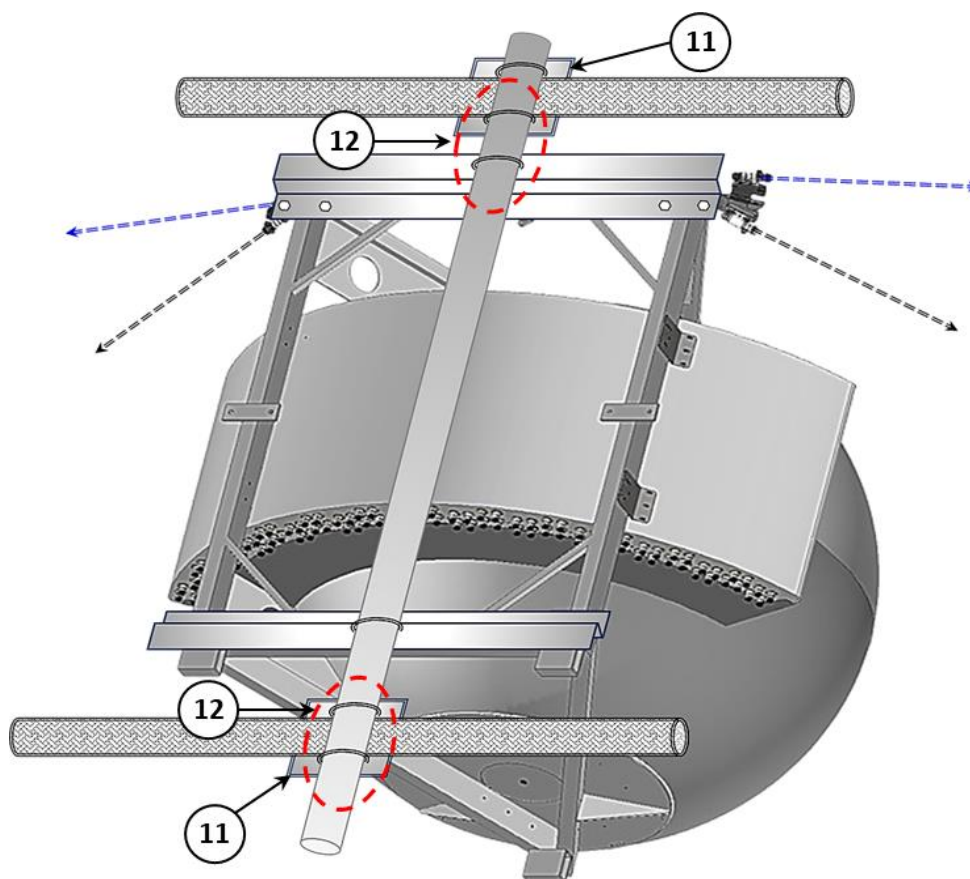
8.12 Rear view



8.20 Position confirmed and secure with marking

- ⑪ Once position confirmed, secure the antenna bracket.
- ⑫ Mark the position and record as a reference.

Note: This is a mechanical tilting process, which differs from RET/Manual element tilting.



** Picture for illustration purpose