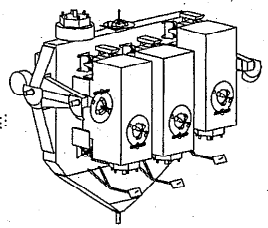


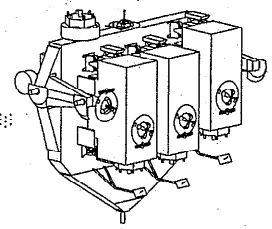
Ground Operation Working Group #10

ELM-ES

(Experiment Logistic Module - Exposed Section)

- *Sprinter Session*
  - > *Spandeck Layout Around ELM-ES*
- *Main Session*
  - > *EMC Assessment Report for ELM-ES's GSE*
  - > *Foot Print #7 Layout for JEM EF and ELM-ES*

JAXA JEM Project Team
IHI Aerospace Co., LTD.



Ground Operation Working Group #10

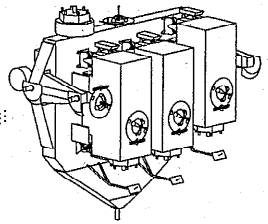
ELM-ES

(Experiment Logistic Module - Exposed Section)

EMC Assessment Report for ELM-ES's GSE

JAXA JEM Project Team
IHI Aerospace Co., LTD.

GOWG#10, Jan.31-Feb.4 2005 @ NASA KSC



1. Purpose

ELM-ES GSE EMC data was measured based on the EMC Test method of GSE used by NASA KSC SSPF.

2. Test Items

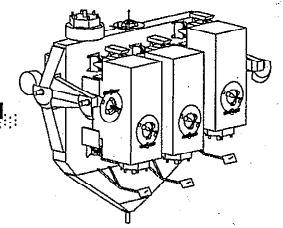
- RE02 measurement of the following state is carried out.
  - (1) Back Ground Noise
  - (2) GSE On
  - (3) GSE On + ELM-ES On

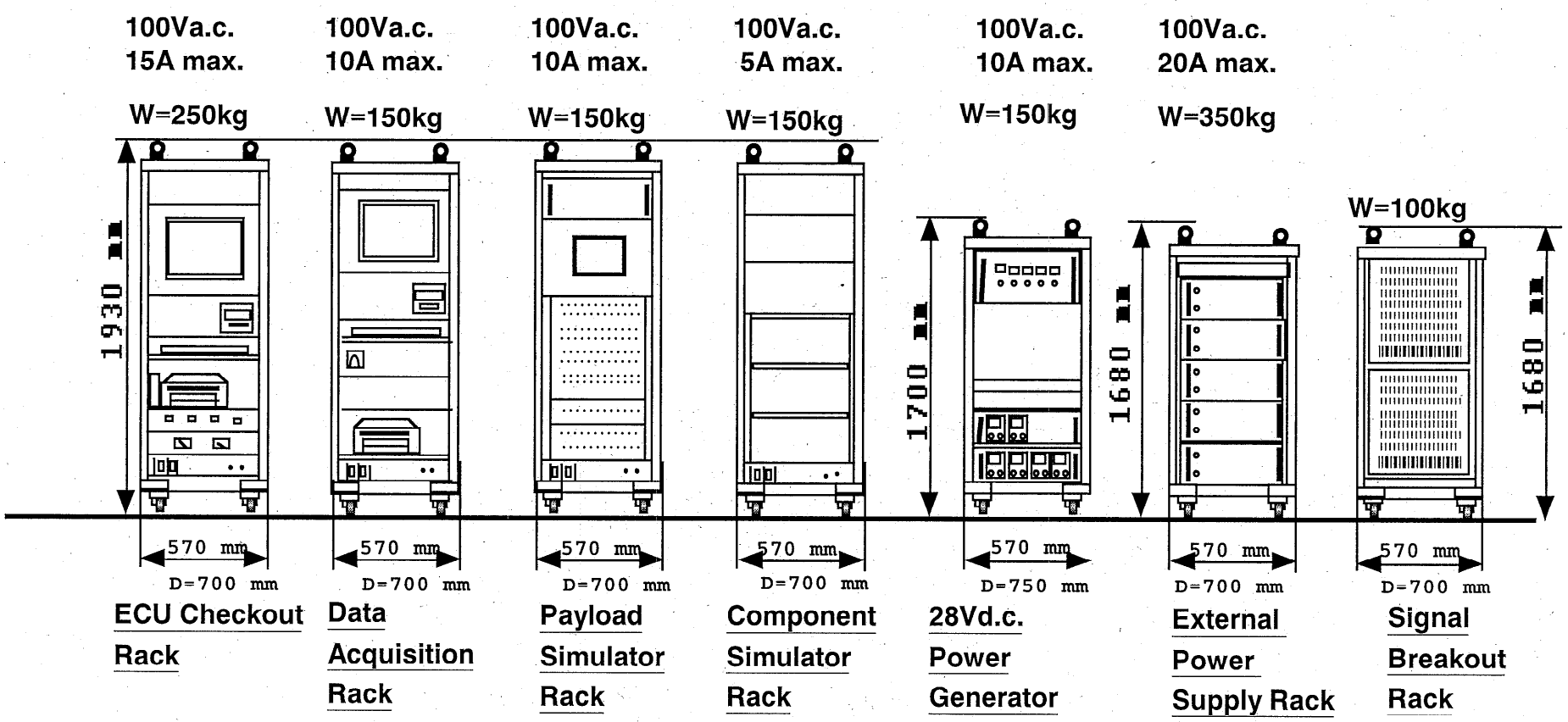
3. Measurement Method and Test Result

The antenna search was performed and RE02 was measured in the position where the noise level is the largest.
The peak point of acquisition data was extracted, an antenna factor and unit conversion were carried out, and it is compared with MIL-STD-461C RE02 standard and FCC Standard.

EMC Assessment Report for ELM-ES's GSE

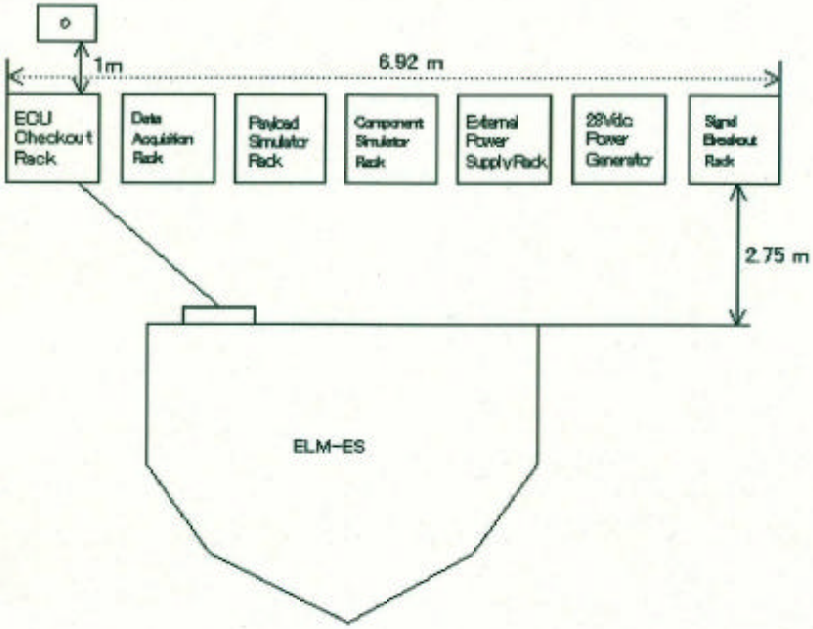
JEM Experiment Logistic Module - Exposed Section

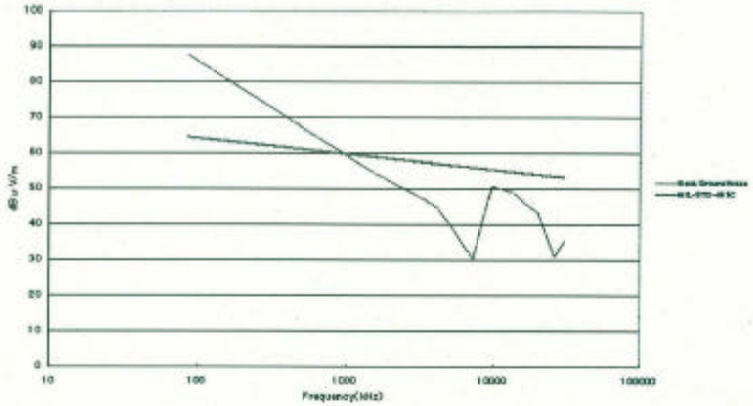




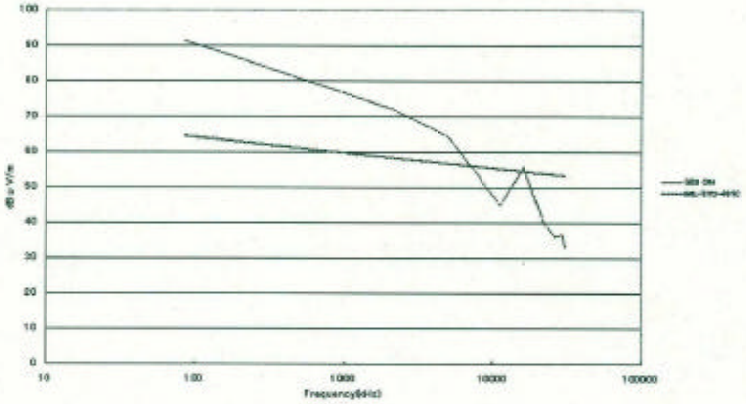
ELM-ES System Checkout Equipment

Active Rod Antenna(15KHz～30MHz)

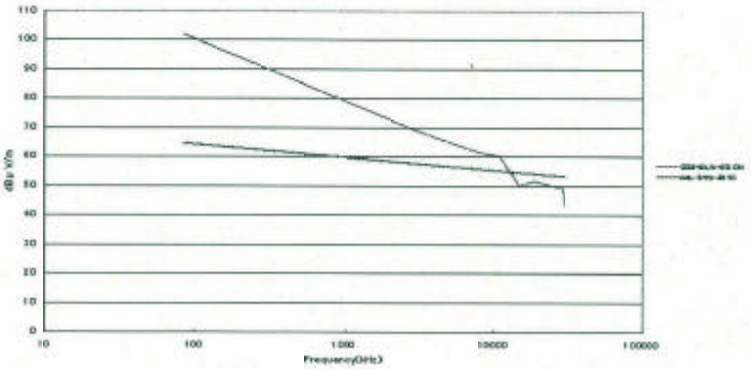




15kHz～30MHz Back Ground Noise



15KHz～30MHz GSE ON

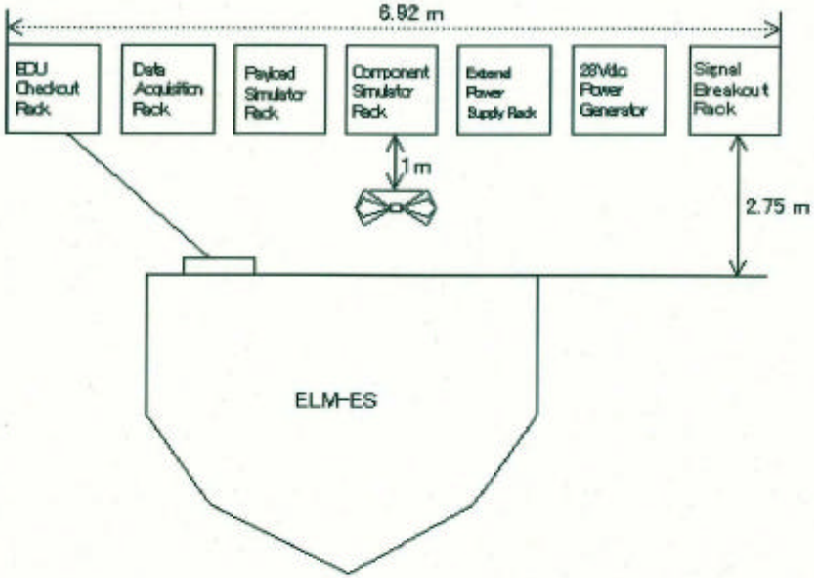


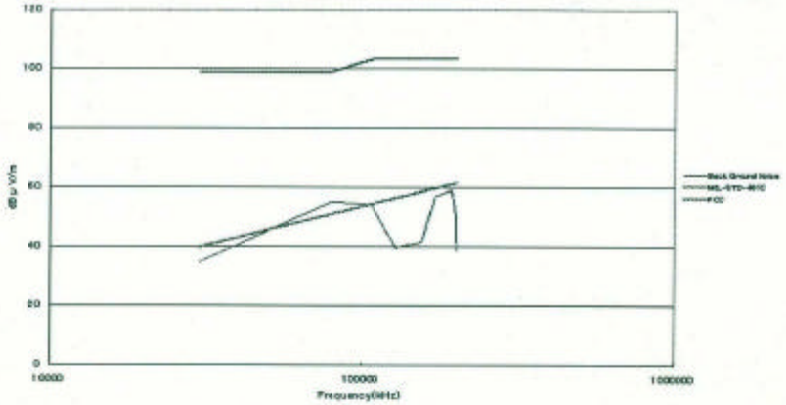
15kHz～30MHz GSE+ELM-ES ON

GSE EMC Measurement (RE02 15KHz～30MHz)

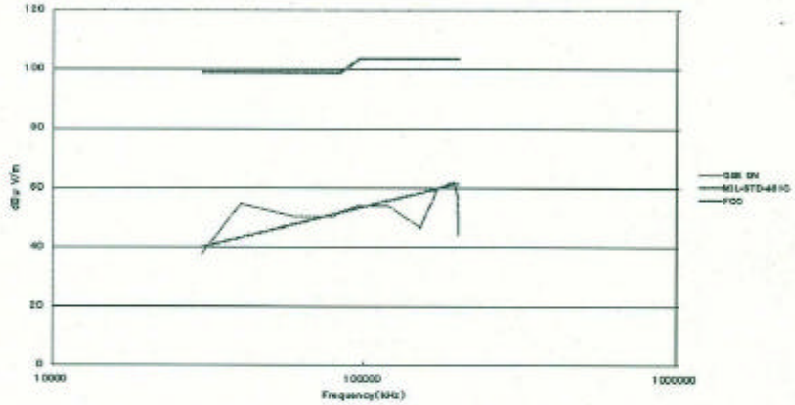
Biconical Antenna(30MHz～200MHz(Horizontal))

Since FCC standard was the standard value of 10m, it was converted into 1m(60dB up).

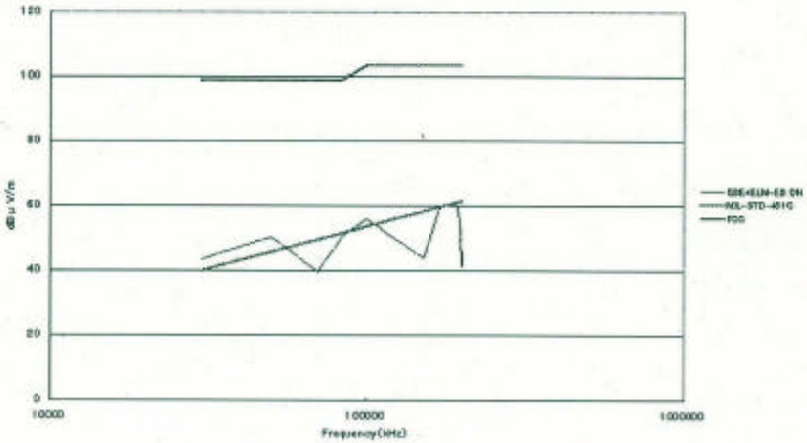




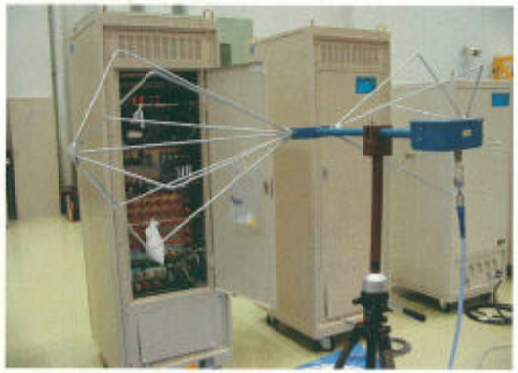
30MHz～200MHz Back Ground Noise(Horizontal)

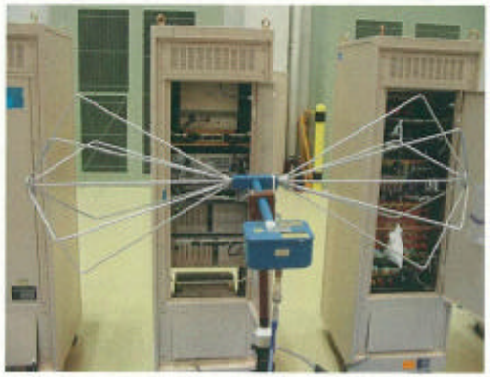


30MHz～200MHz GSE ON(Horizontal)



15MHz～30MHz GSE+ELM-ES ON

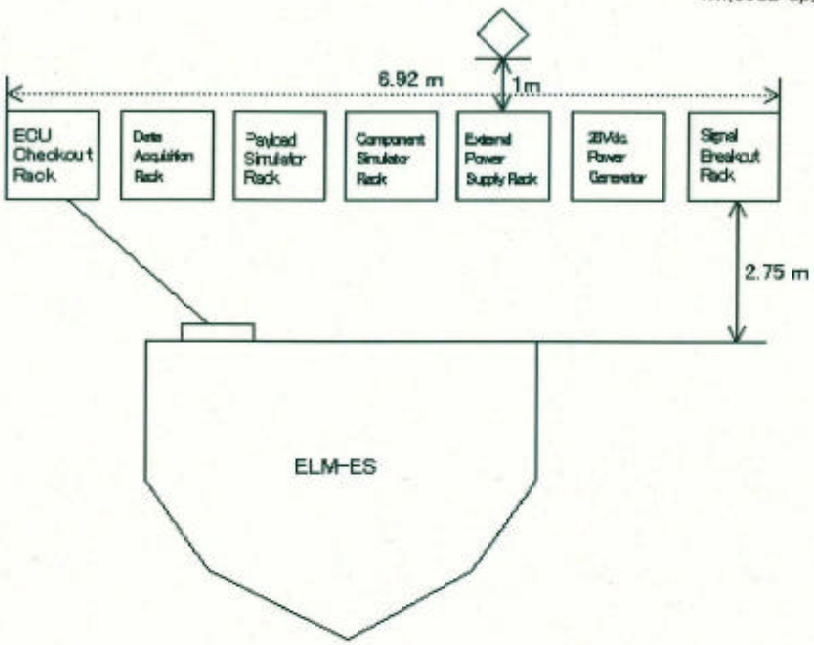


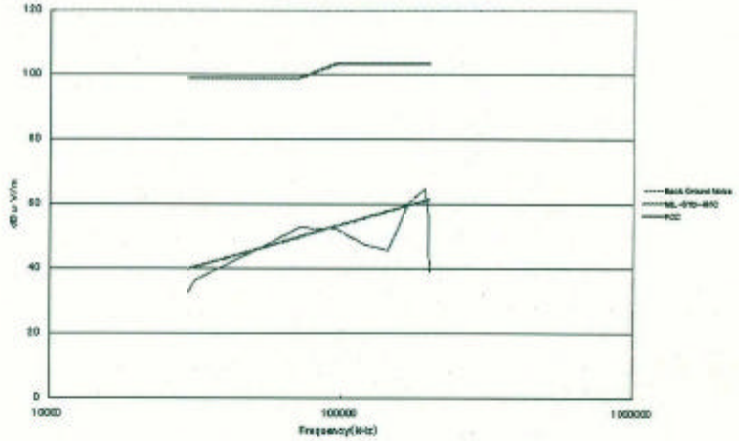


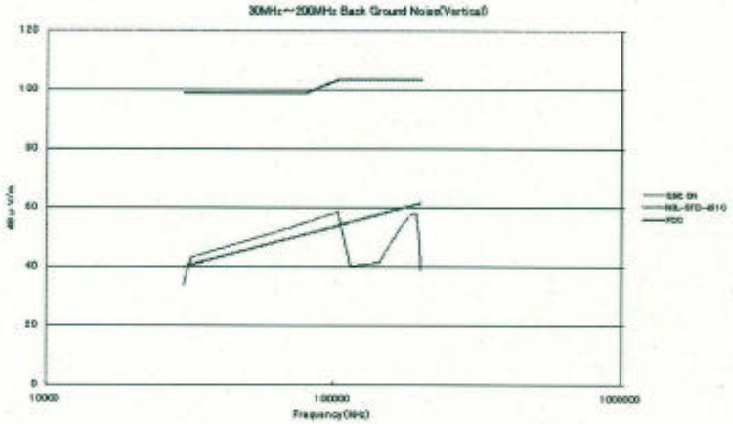
GSE EMC Measurement (RE02 30MHz～200MHz(Horizontal))

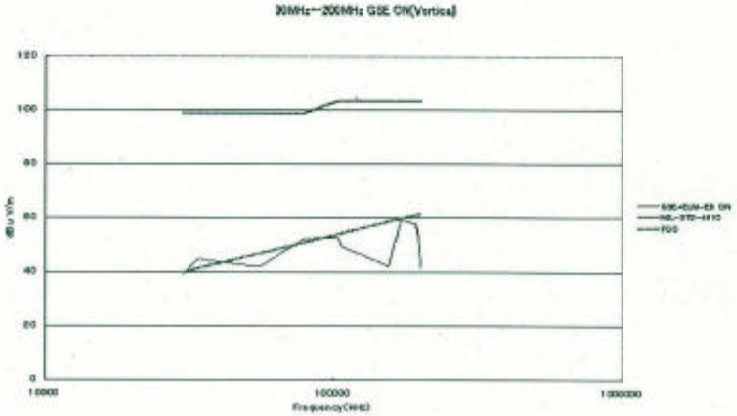
Biconical Antenna(30MHz～200MHz(Vertical))

Since FCC standard was the standard value of 10m, it was converted into 1m(60dB up).





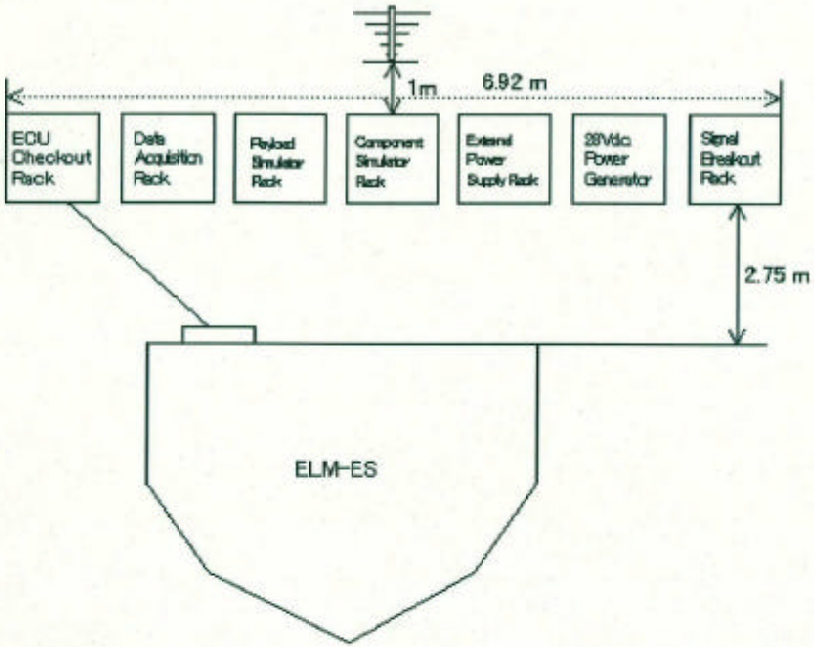


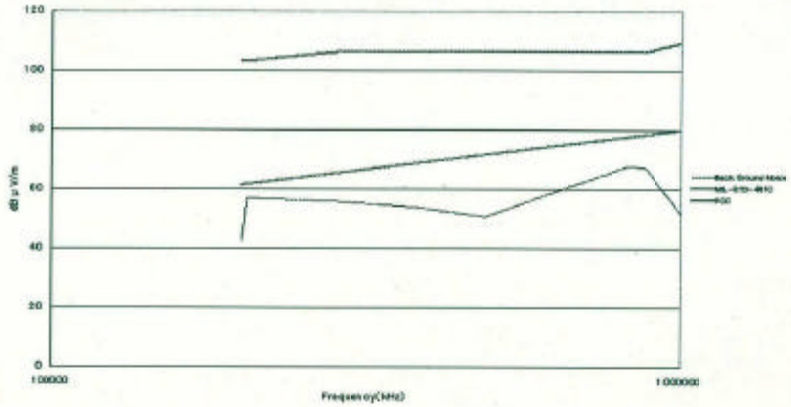


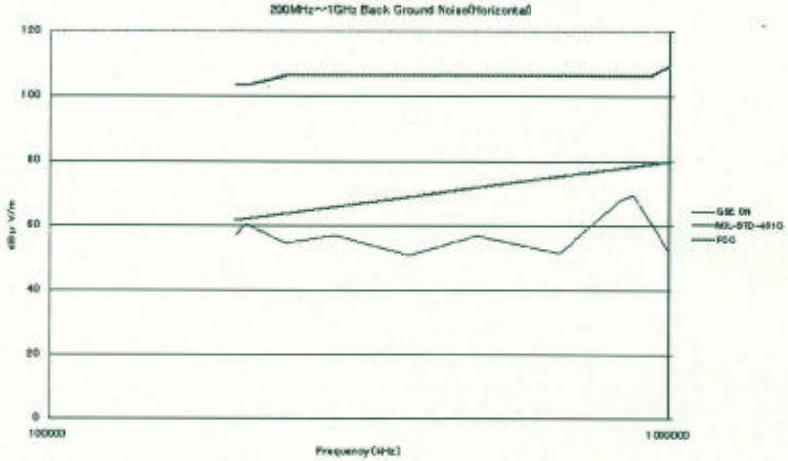
GSE EMC Measurement (RE02 30MHz～200MHz(Vertical))

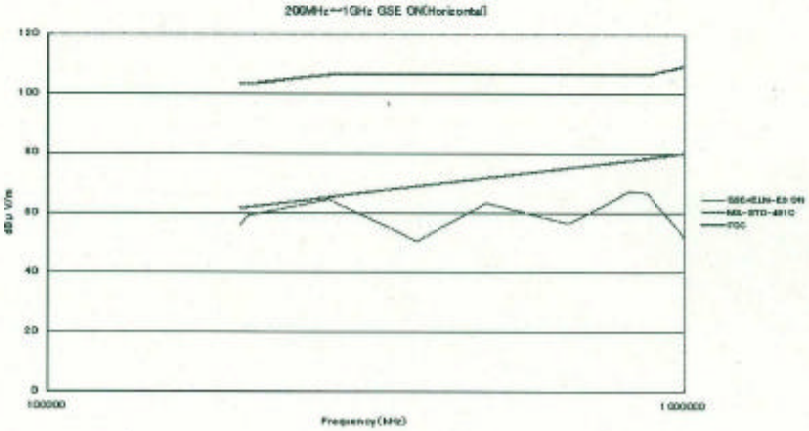
Log Periodic Antenna(200MHz～1GHz (Horizontal))

Since FCC standard was the standard value of 10m, it was converted into 1m(60dB up).







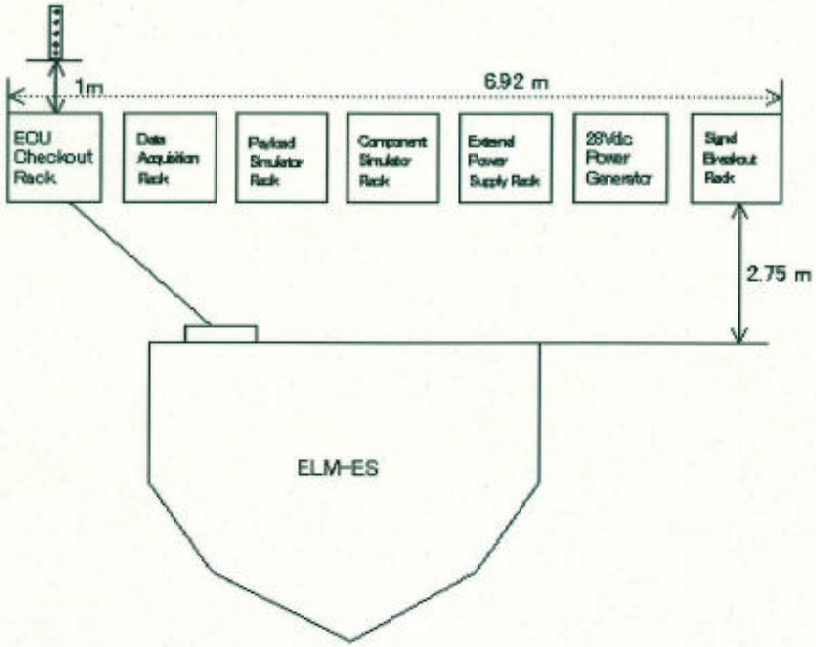


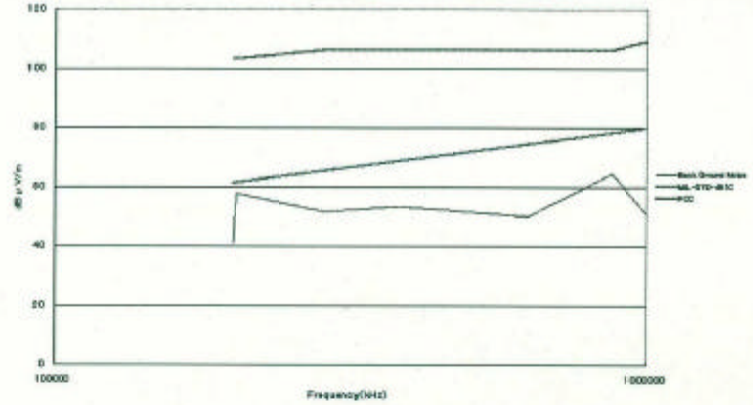
200MHz～1GHz GSE+ELM-ES ON(Horizontal)

GSE EMC Measurement (RE02 200MHz～1GHz(Horizontal))

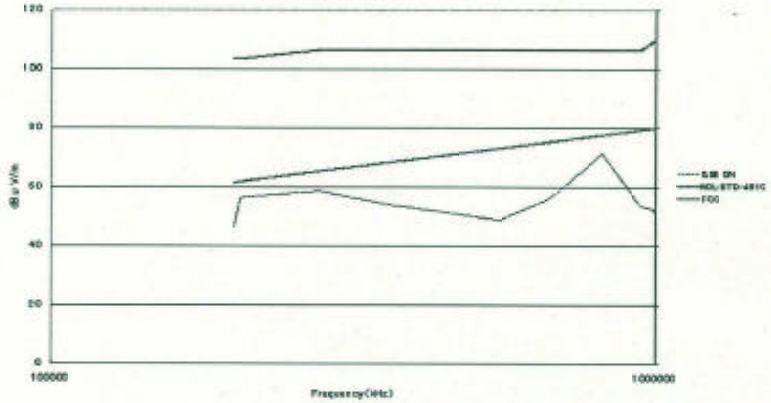
Log Periodic Antenna(200MHz～1GHz(Vertical))

Since FCC standard was the standard value of 10m, it was converted into 1m(60dB up).

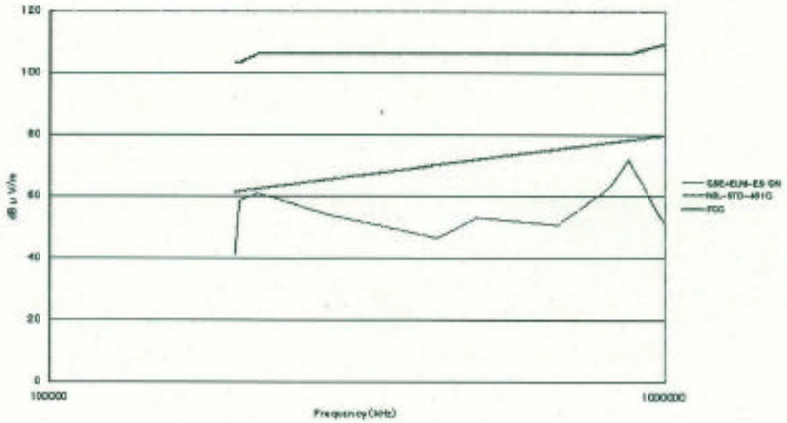




200MHz～1GHz Back Ground Noise(Vertical)

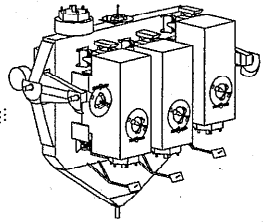


200MHz～1GHz GSE+ELM-ES ON(Vertical)



200MHz～1GHz GSE+ELM-ES ON(Vertical)

GSE EMC Measurement (RE02 200MHz～1GHz(Vertical))

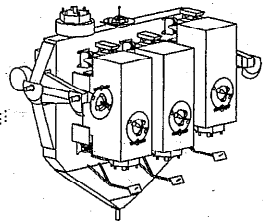


<< Conclusion >>

FCC standard was satisfied from test result.
However, a part of MIL-STD-461C was outside the standard.

<< Action Item Status >>

GOWG#9-10 of A/I are close by this data.



Ground Operation Working Group #10

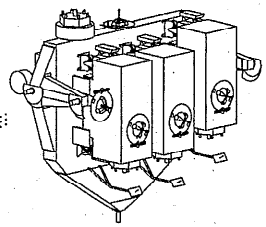
ELM-ES

(Experiment Logistic Module - Exposed Section)

Spandeck Layout Around ELM-ES

JAXA JEM Project Team
IHI Aerospace Co., LTD.

Spandeck Layout Around ELM-ES



JEM Experiment Logistic Module - Exposed Section

<< Back ground >>

Operations on ELM-ES is categorized work on Elevated.
Therefore, the spandeck is pared around ELM-ES, and it is made not to become work on elevated.
This case has acknowledged the safety panel of NASA KSC.

<< Specification of work on Elevated Structures >>

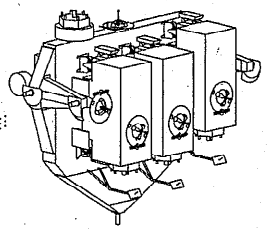
When handrails which are less than 42 inches provided in the work area at the height or 1.2m (4Ft) or higher.

<< Height on ELM-ES >>

- **Height on ELM-ES ... 1405mm**
- **Height on ELM-ES when covering with Spandeck**

... 1145mm < 1200mm (4Ft)

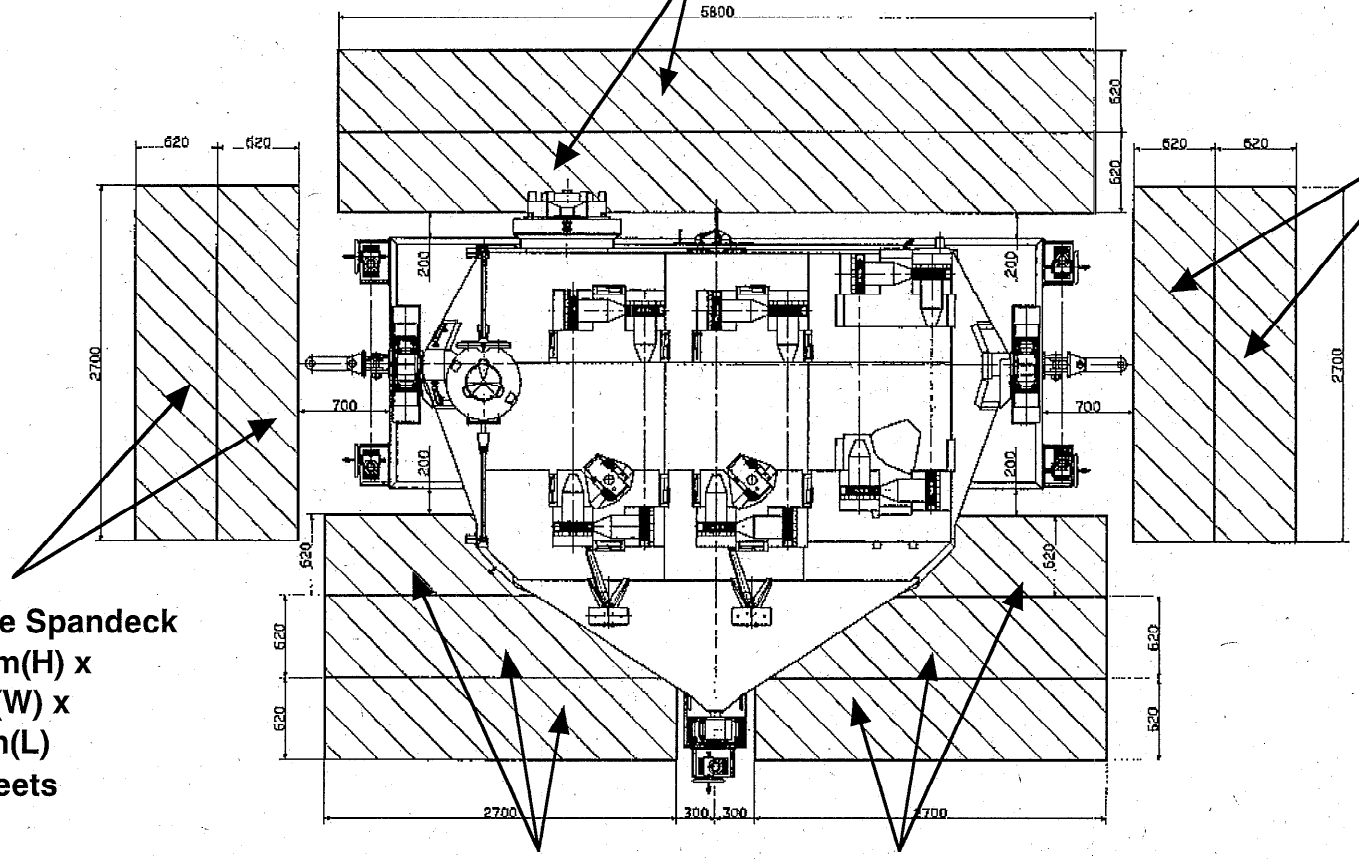
Spandeck Layout Around ELM-ES



JEM Experiment Logistic Module - Exposed Section

Top View

PIU Side Spandeck ; 130mm(H) x 620mm(W) x 5800mm(L)... 4 Sheets



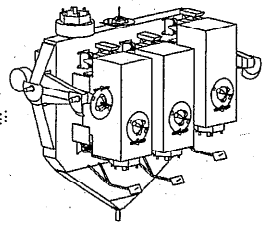
Right Side Spandeck ; 130mm(H) x 620mm(W) x 2700mm(L) ... 4 Sheets

Left Side Spandeck ; 130mm(H) x 620mm(W) x 2700mm(L) ... 4 Sheets

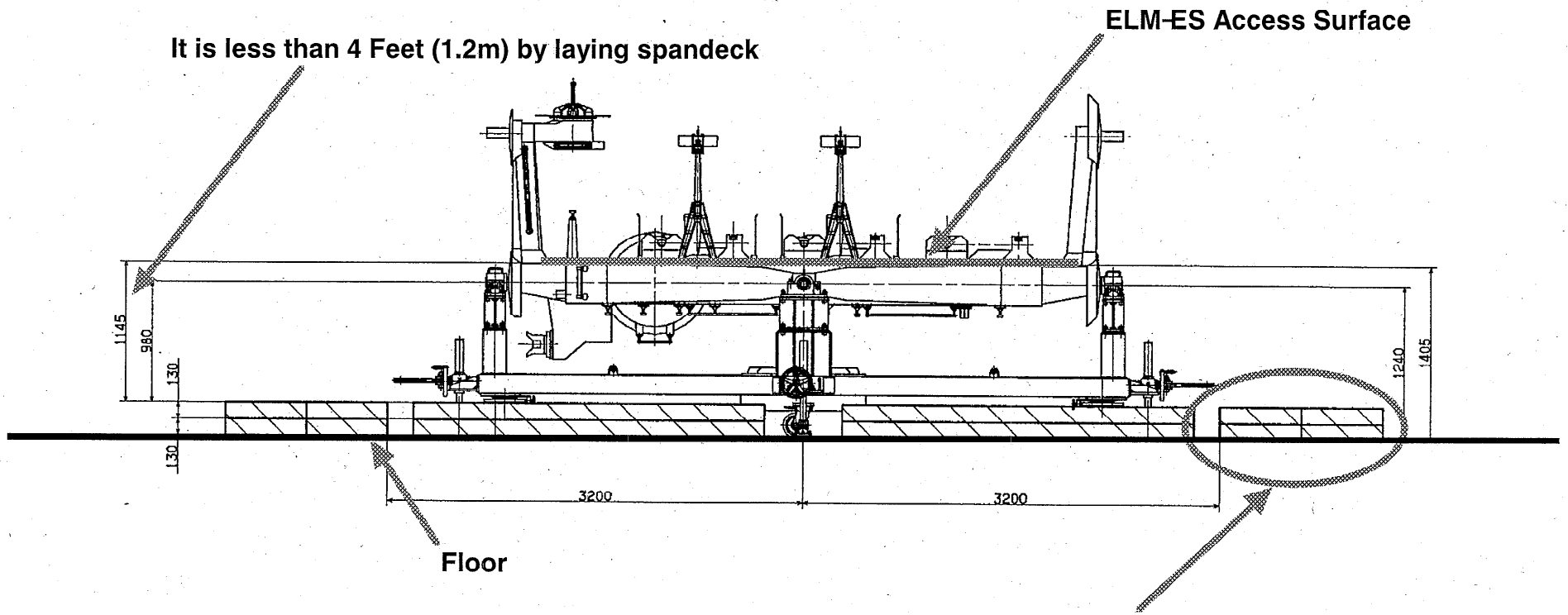
Keel Trunnion Side Spandeck ; 130mm(H) x 620mm(W) x 2700mm(L)... 12 Sheets

Spandeck Layout Around ELM-ES

JEM Experiment Logistic Module - Exposed Section

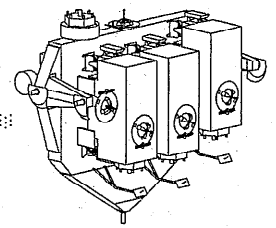


Keel Trunnion Side

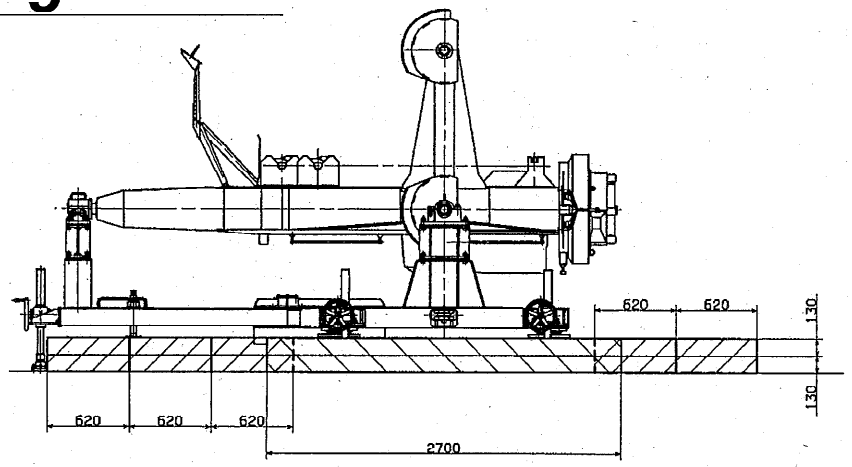


Spandeck Layout Around ELM-ES

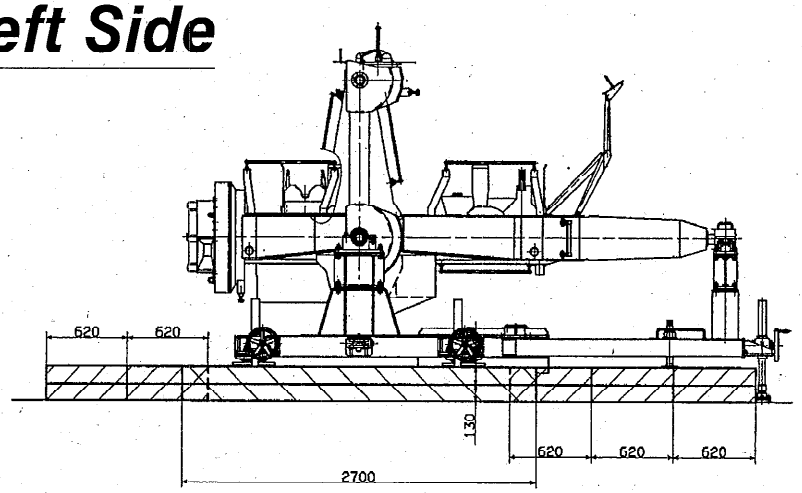
JEM Experiment Logistic Module - Exposed Section

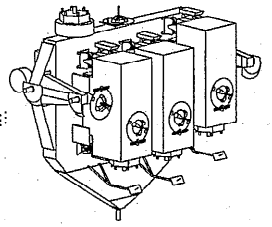


Right Side

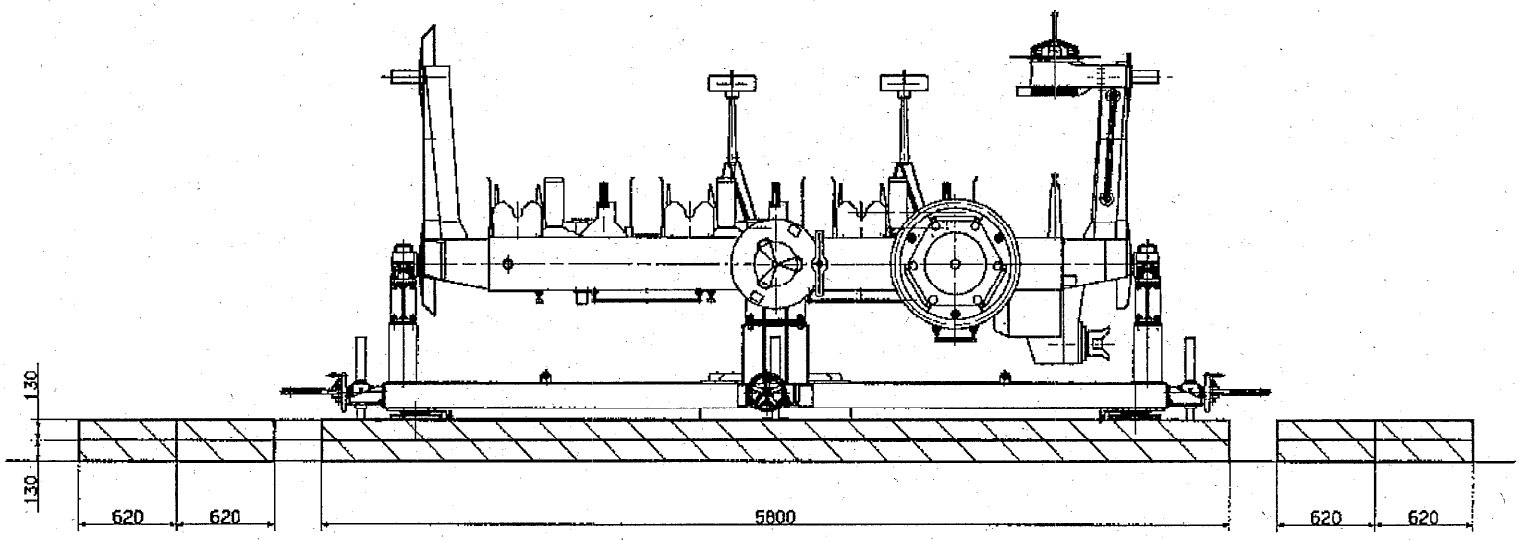


Left Side

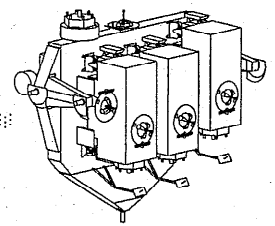




PIU Side

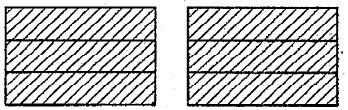


Spandeck Layout Around ELM-ES

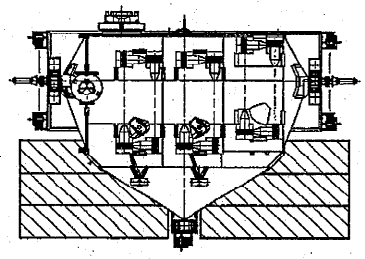


JEM Experiment Logistic Module - Exposed Section

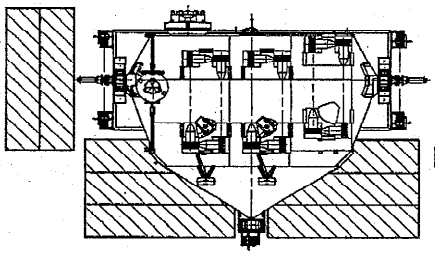
<< Procedure of covering with Spandeck >>



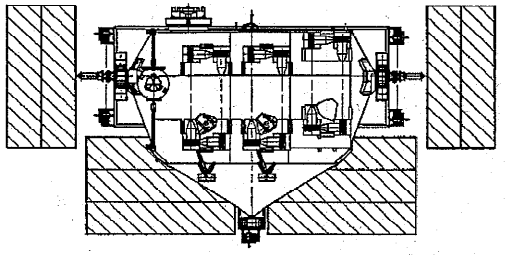
(1) Keel Trunnion side is covering with Spandeck



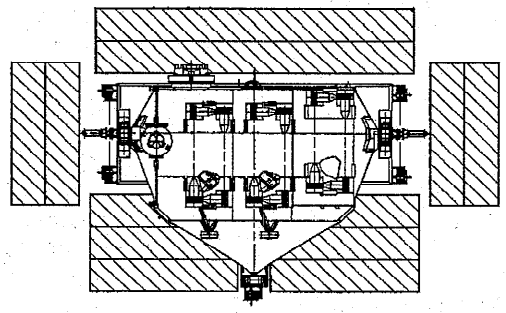
(2) ELM-ES Installation



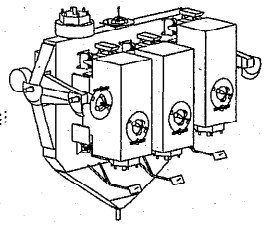
(3) Left side is covering with Spandeck



(4) Right side is covering with Spandeck

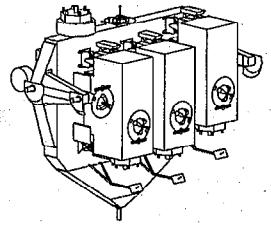


(5) PIU side is covering with Spandeck



<< Action Item Status >>

GOWG#9-23 of A/I are close by this data.



Ground Operation Working Group #10

ELM-ES

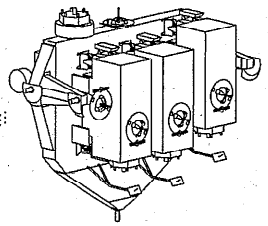
(Experiment Logistic Module - Exposed Section)

Foot Print #7 Layout for JEM EF and ELM-ES

JAXA JEM Project Team
IHI Aerospace Co., LTD.

Foot Print #7 Layout for JEM EF and ELM-ES

JEM Experiment Logistic Module - Exposed Section



1. Purpose

Work of EF and ELM-ES could carry out with one Foot Print, or layout examination was carried out.

2. Area

- Processing Area : SSPF Highbay Foot Print #7 ; 27.6m x 13.69m
  - ELM-ES ... 9 m x 10.6 m
  - EF... 14 m x 10.6 m

3. Foot Print set up procedure

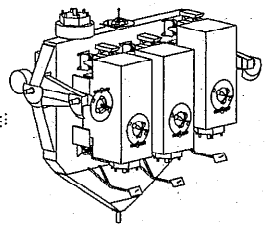
- EF and EF GSE unpackage

  ↓
- EF Test preparation

  ↓
- ELM-ES and ELM-ES GSE unpackage

  ↓
- ELM-ES Test preparation

Foot Print #7 Layout for JEM EF and ELM-ES



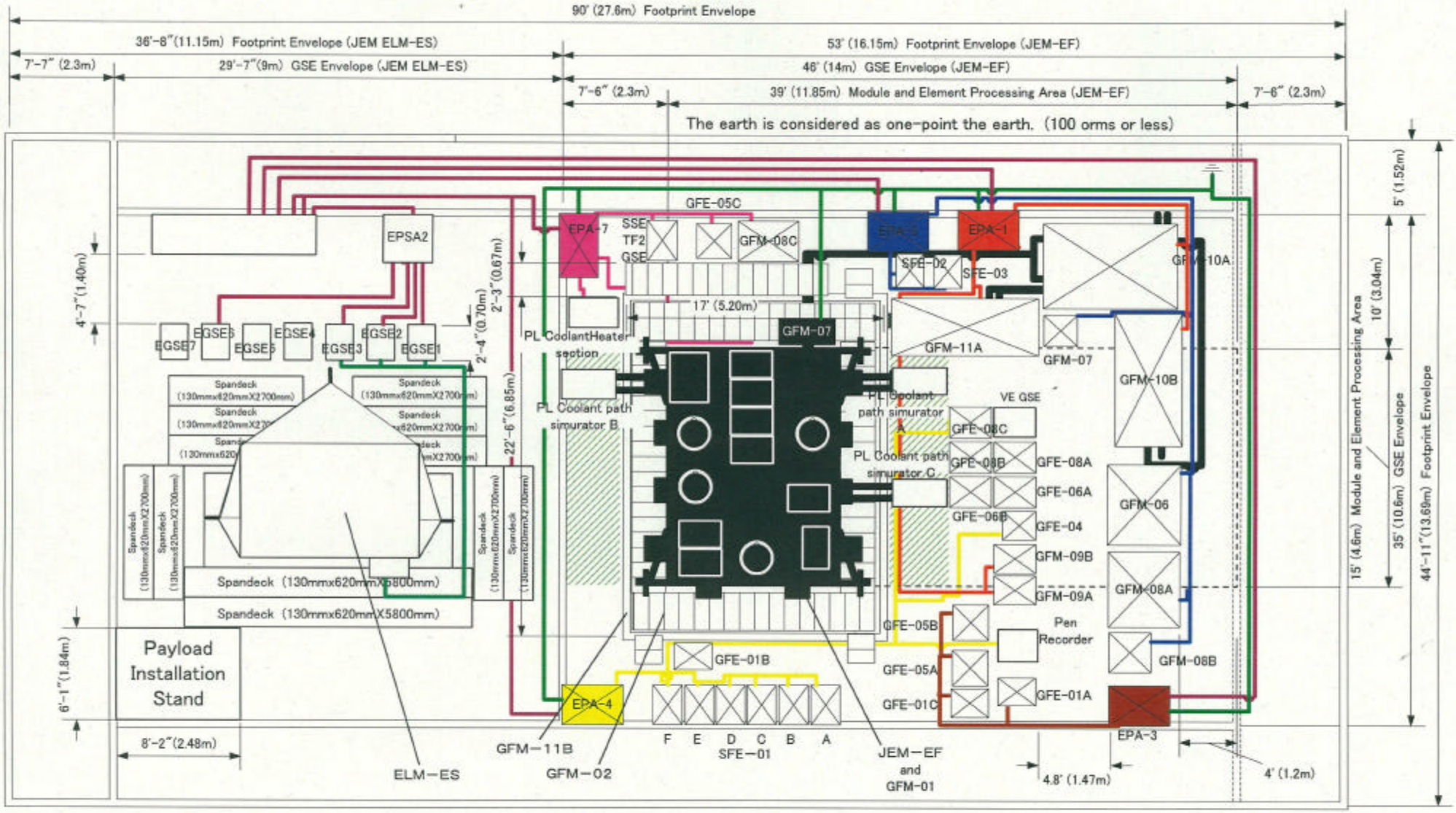
JEM Experiment Logistic Module - Exposed Section

4. Future Work

- Although EF and ELM-ES enter with one footprint, about the more course from Airlock to footprint, adjustment is required separately.

- At the time of ELM-ES/Payload interface check and loading, Payload is carried to footprint#7 from I-bay.Since there is no space which palces payload, it is necessary to use a passage.

- When using Payload Installation Stand, it disturbs 1m to a passage.



Foot Print#7 Layout for JEM EF and ELM-ES

GSE NAME

<EF Concern>

- GFM-01 : Horizontal Ass'y Dolly
- GFM-02 : Scaffolding
- GFM-03 : EF Sling Kit
- GFM-05-1 : Transport Container (EF) *Outdoor storage
- GFM-05-2 : Transport Container (NSTS Trunnions) *Outdoor storage
- GFM-06 : Coolant Supply / Drain Equipment
- GFM-07 : Accumulator Gas Supply Equipment
- GFM-08A : Coolant Deaerator (Main part section)
- GFM-08B : Coolant Deaerator (FC-72 Storage section)
- GFM-08C : Coolant Deaerator (Gas-chromatograph section)
- GFM-09A : Coolant Flow Measurement & Control Equipment (Monitor section)
- GFM-09B : Coolant Flow Measurement & Control Equipment (Measurement section)
- GFM-10A : Coolant Circulation Equipment (Main part section)
- GFM-10B : Coolant Circulation Equipment (Chilling section)
- GFM-11A : Humidity Environment Maintenance Equipment (Main part section)
- GFM-11B : Humidity Environment Maintenance Equipment (Tent section)
- GFE-01A : EF C&DH Test Equipment (Main part section 1/2)
- GFE-01B : EF C&DH Test Equipment (Main part section 2/2)
- GFE-01C : EF C&DH Test Equipment (Check out section)
- GFE-04 : Data Acquisition Equipment
- GFE-05A : Power Supply Equipment (PDB1)
- GFE-05B : Power Supply Equipment (PDB2)
- GFE-05C : Power Supply Equipment (EAU)
- GFE-06A : Electrical Characteristics Test Equipment (1/2)
- GFE-06B : Electrical Characteristics Test Equipment (2/2)
- GFE-07 : BM Interface Adapter
- GFE-08A : MME Data Analysis & Acquisition Equipment (Main part section)
- GFE-08B : MME Data Analysis & Acquisition Equipment (Router section)
- GFE-08C : MME Data Analysis & Acquisition Equipment (Analysis section)
- SFE-01A : Payload Simulator (6kw 1/2)
- SFE-01B : Payload Simulator (6kw 2/2)
- SFE-01C : Payload Simulator (3kw)
- SFE-01D : Payload Simulator (3kw ELM-ES)
- SFE-01E : Payload Simulator (Simple PL)
- SFE-01F : Payload Simulator (Simple PL / FLU)
- SFE-02 : SSE Simulator
- SFE-03 : PS-EDU Simulator

<ELM-ES Concern>

- EGSE1 : ECU Checkout Rack
- EGSE2 : Data Acquisition Rack
- EGSE3 : Payload Simulator Rack
- EGSE4 : 28Vd.c. Power Generator
- EGSE5 : Signal Breakout Rack
- EGSE6 : Component Simulator Rack
- EGSE7 : External Power Supply Rack
- EPSA2 : Electrical Power Subsystem Panel Assembly