



Minutes of meeting

Project: CRYOVIBRATION	Référence: M.T... / CSL... 4003/02
Location: SIRIUS	Date: 21.11.02
Secretary: GRODENT	Number of pages: ...1... de 30...

SUBJECT: INSTRUMENT'S MEETING

AGENDA:

- PLANNING
- DESCRIPTION of facility
- Mechanical interface
- Cabling

Distribution	Participants	Companies	Signatures
	N. NIKOLAIZIĆ	ESTEC	
	J. RAUTAKOSKI	"	
	A. HESKE	"	
	K. WIDENMAN	SRON	
	H. JOEDENS	"	
	DOUGLAS GRIFFIN	BAL	
	R. KATTERLOHER	MPE	
	G. JAKOB	"	
	Q. GRODENT	CSC	
	J. Seivaye		
	P. Barzin		
	J.P. Macan		



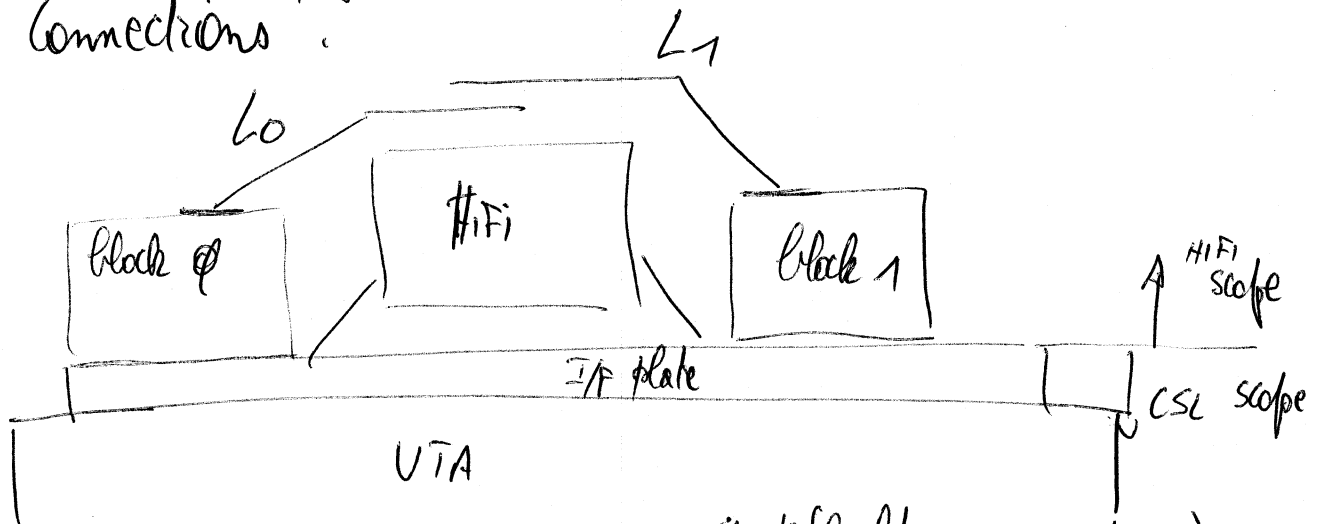
1. Status presentation HiFi.

HiFi is still defining the final interfaces (Conductive Strapping).

CSL is requesting to get informations the 1/02/02 at the latest.

- ↳ mechanical footprint
- ↳ straps

HiFi is coming with their own straps and "block connections".



The cabling description is given (No shield required)
(No twist)

HiFi is suggesting to use low conductive signals cables.
technical data will be given later.



HIFI will send the maximum allowable heat load on instruments and proposed acceptable impedance.
(Δ We have to compute heat load from conductivity not from current[#])

: No current during vibration \rightarrow No Joule effect
but cables must be compatible with current consumption during pre & post checks.

For HIFI, the temperature sensors are supplied and managed by the instrument but CSL is requested to supply additional w/o sensors.
CSL to send I/P details and sensor description.

No

accelerometers: 1e mono axis for each instrument

Depending on the test schedule (for each instrument)
CSL agrees to send some sensors in advance for integration

\rightarrow diode sensor DT-470-CU-11 4 WIRES compatible
with LAKESHORE 2185



2. SPiRE presentation.

SPiRE is requesting to put both JFETs (spectro & photo) on the adapter plate (VIA).

△ The harness between JFET & FPU is rigid \Rightarrow the relative position of JFETs w.r.t FPU is fixed !!!

SIM
↳ - p20 May 2003 revised list plan
} 30 June 2003 current 4

CSL is giving a proposal for F/P DRAWING - confirmation (approval) to be sent by end January 2003.

~~Four~~ Some 3 "tri-axes" accelerometers are requested \rightarrow plus accelerometer cables. 26.

2 weeks in advance for integration at KAC

promises.

△ No electrical test during vibration at cold

3. FACS

a) 6 acceleros on FPU.

3 + 3 + 1 mono axis near feet

⇒ Total inside chamber : 13 mono < 21

⇒ OK

b) FACS is requesting CSC to read 8 CERNOX.
With our Lakeshore PFS

⇒ No problem

c) FACS is requesting two TCs

⇒ OK because CSC is only
using 34 TCs

d) electrical lines:

12 line for cooler heat Switch.

8x4 lines " 8 CERNOX sensors

e) Cooling straps & foot prints

CSL is requesting PACS to slightly move some "straps" I/F in order to be inside the Helium Box.

→ 1°) PACS to make a proposal

2°) CSL to update the drawing.

⚠ The mechanical I/F of PACS instrument is not yet frozen.

3°) PACS to send their approval.

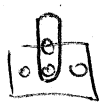
↳ 1/02/03

⚠ CSL is proposing a oblong hole at the two directions foot

↳ a circular hole at the 3 directions foot



1D



2D

Remarks

- The cryo chamber is not simulated!
- Venting
 - clean air
 - filter
 - cold trap up to 10 m bar.
 - adjustable venting speed.
- PACS STM dispo mid January 2003.

PlanningPACS

CQM V.B

22 09 03 → 31 10 03 (HARD)
5 11 03 → 16 12 03 (feasible)

FM V.B

02 05 04 → 10 06 04

		2004												2005																		
		N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D					
ID	Task Name	Start	Finish	Text1	[Redacted]																											
1	CRYVIBRATION TESTING PLAN				[Redacted]																											
2	Interface meeting # 2 - CSL	21/11/02	21/11/02		[Redacted]																											
3	FACILITY	03/02/03	15/02/03		[Redacted]																											
4	BLANK TEST	03/02/03	15/02/03		[Redacted]																											
5	I/F plates data inputs	03/02/03	03/02/03		[Redacted]																											
6	I/F plates drawing approvals	28/02/03	28/02/03		[Redacted]																											
7	I/F plates manufacturing	01/03/03	15/05/03		[Redacted]																											
14	SPIRE (data on 13 nov 2002)	16/11/02	31/07/03		[Redacted]																											
15	STM	20/05/03	31/07/03	itom" window	[Redacted]																											
16	FM				[Redacted]																											
11	PACS (data on 18 nov 2002)	22/09/03	10/08/04		[Redacted]																											
12	COM	22/09/03	17/12/03	itom" window	[Redacted]																											
13	FM	03/05/04	10/08/04		[Redacted]																											
8	HIFI (data on 15 nov 2002)	02/12/03	27/10/04		[Redacted]																											
9	COM	02/12/03	13/01/04		[Redacted]																											
10	FM	15/09/04	27/10/04		[Redacted]																											

21/11

BLANK TEST
03/02 16/02

03/02

28/02

01/03 16/05

20/05 STM
31/07
"reservation" window

22/09 COM
17/12
"reservation" window

03/05 FM
10/08

02/12 COM
13/01

15/09 FM
27/10

Special measures and levels

- ESD (SRON ESD Plan, Doc.nr. FPSS-00183)
- Cool down and warm up rate: TBS
- Evacuation rate: 100 hPa/h max
- Hoisting speed: TBS
- Vibration levels still under discussion with ESA

Special tools and mechanical support equipment

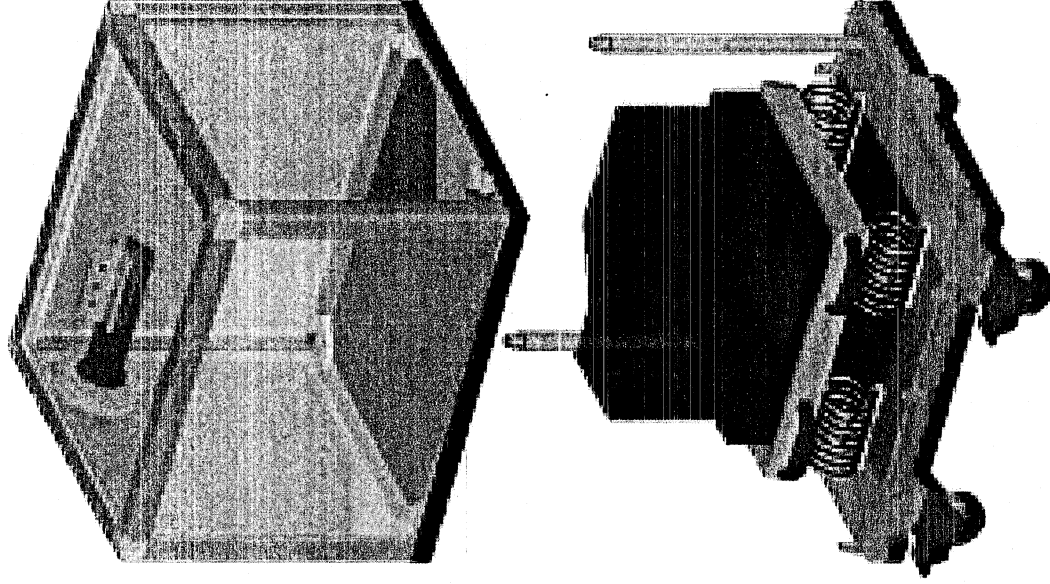
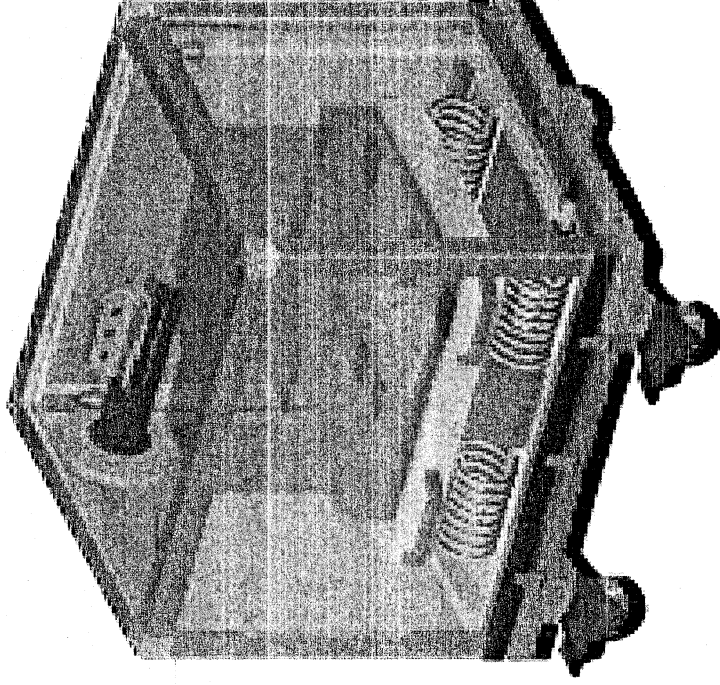
- Tools for mounting the FPU onto the optical bench
- Protection covers on feet and on M3
- Hoisting tool (rig)

Siron

FPU

HIFI

COA Transport Container



Test flow

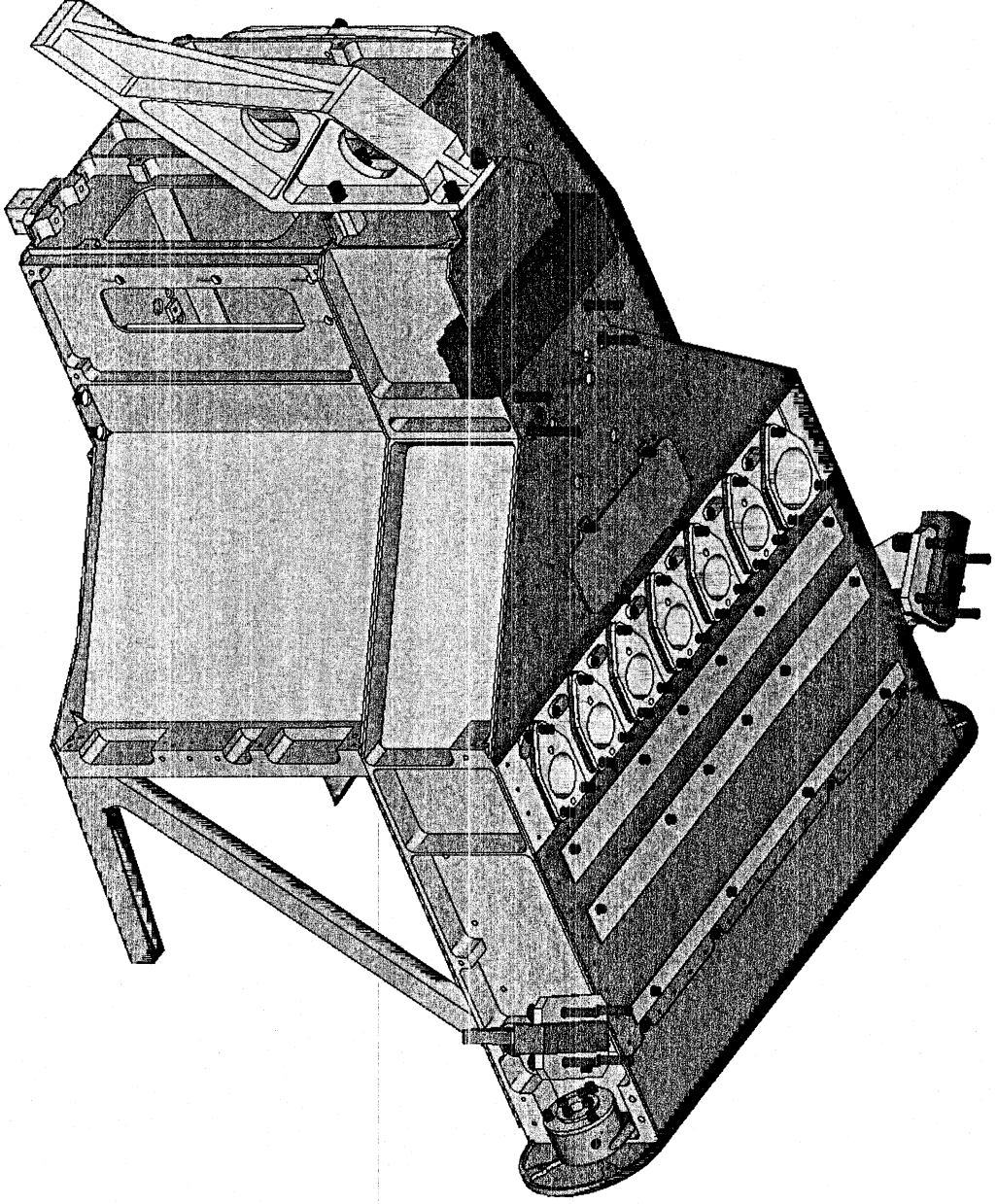
- Unpacking
(outer container, inner container, instrument)
- Install on shaker and install electrical check out equipment
(including FCU equivalent)
- Check out (only electrical and at room temperature)
- Vibration test
- Check out after each axis (only electrical, no optical check out foreseen)
- Packing

Siron

FPU

HIFI

Mounting Feet

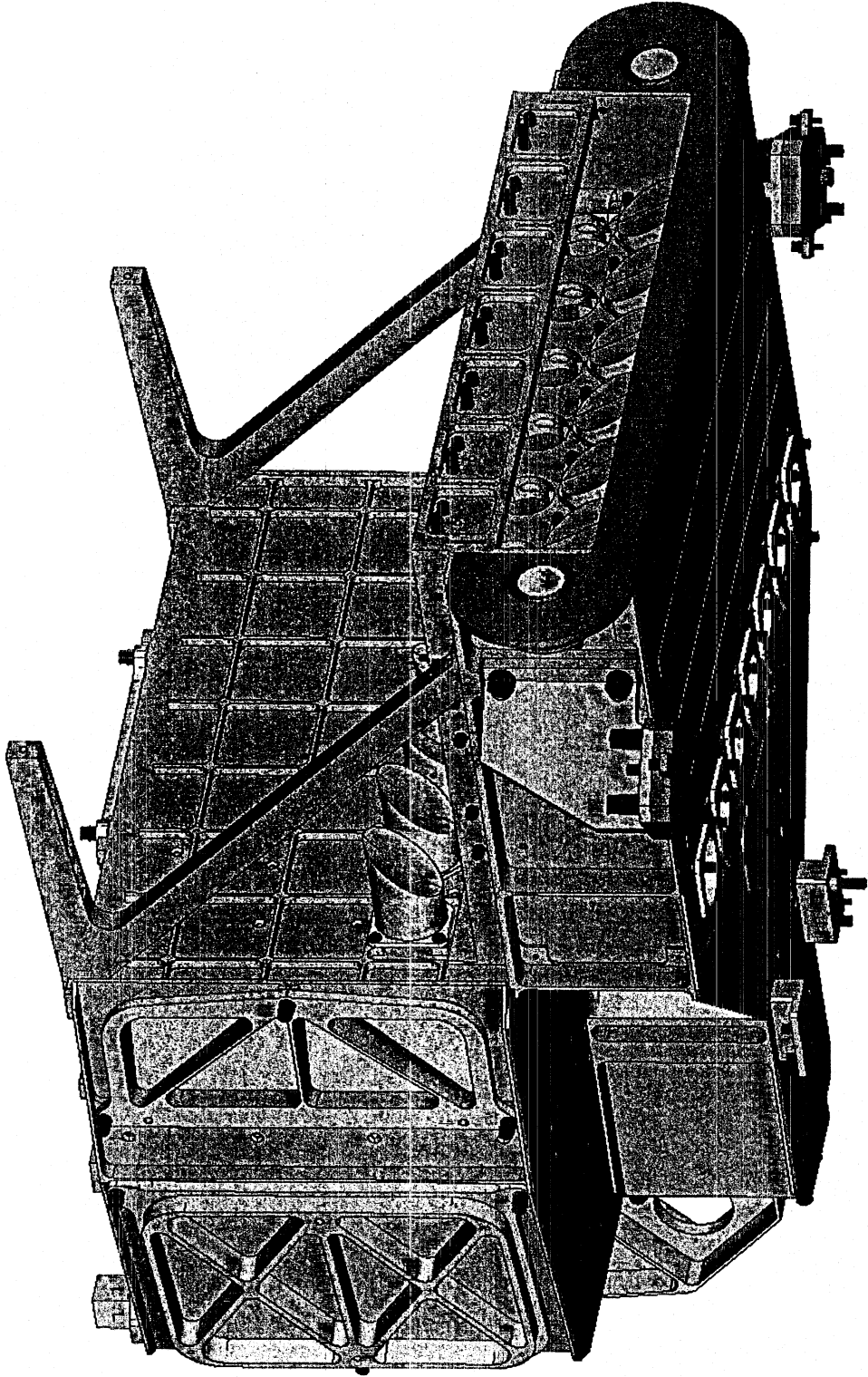


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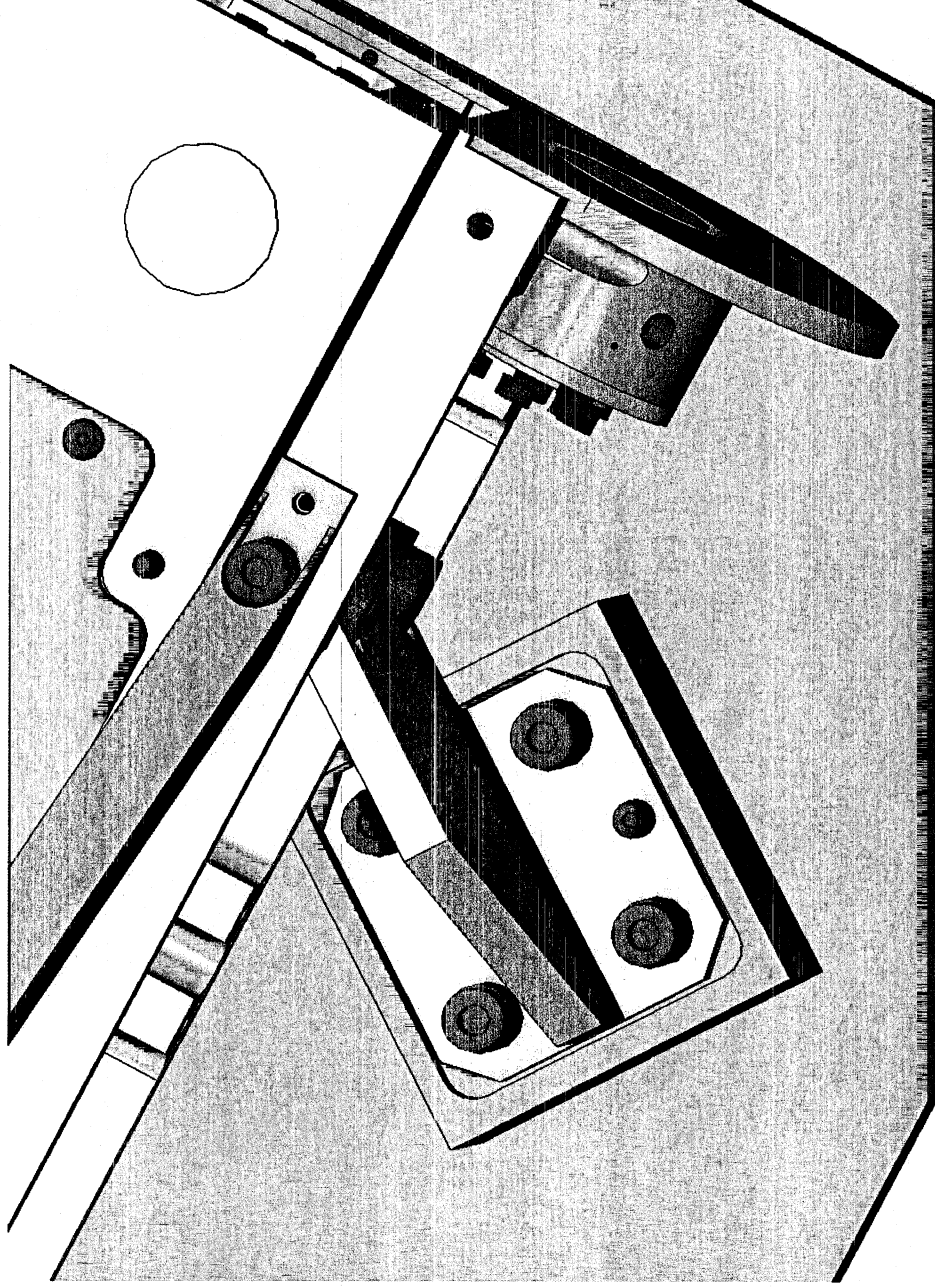
FPU

HIFI

Mounting Feet



Mounting Feet

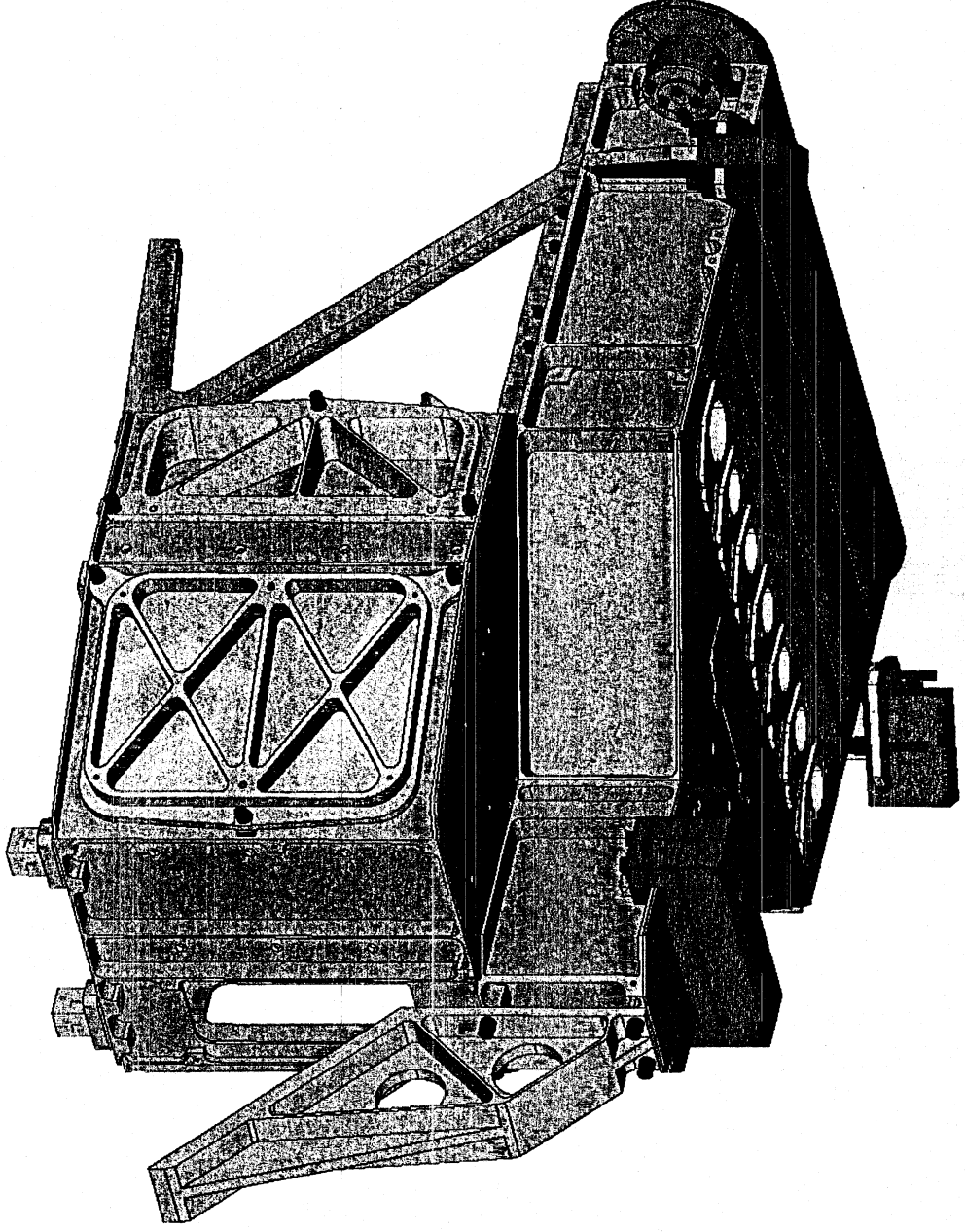


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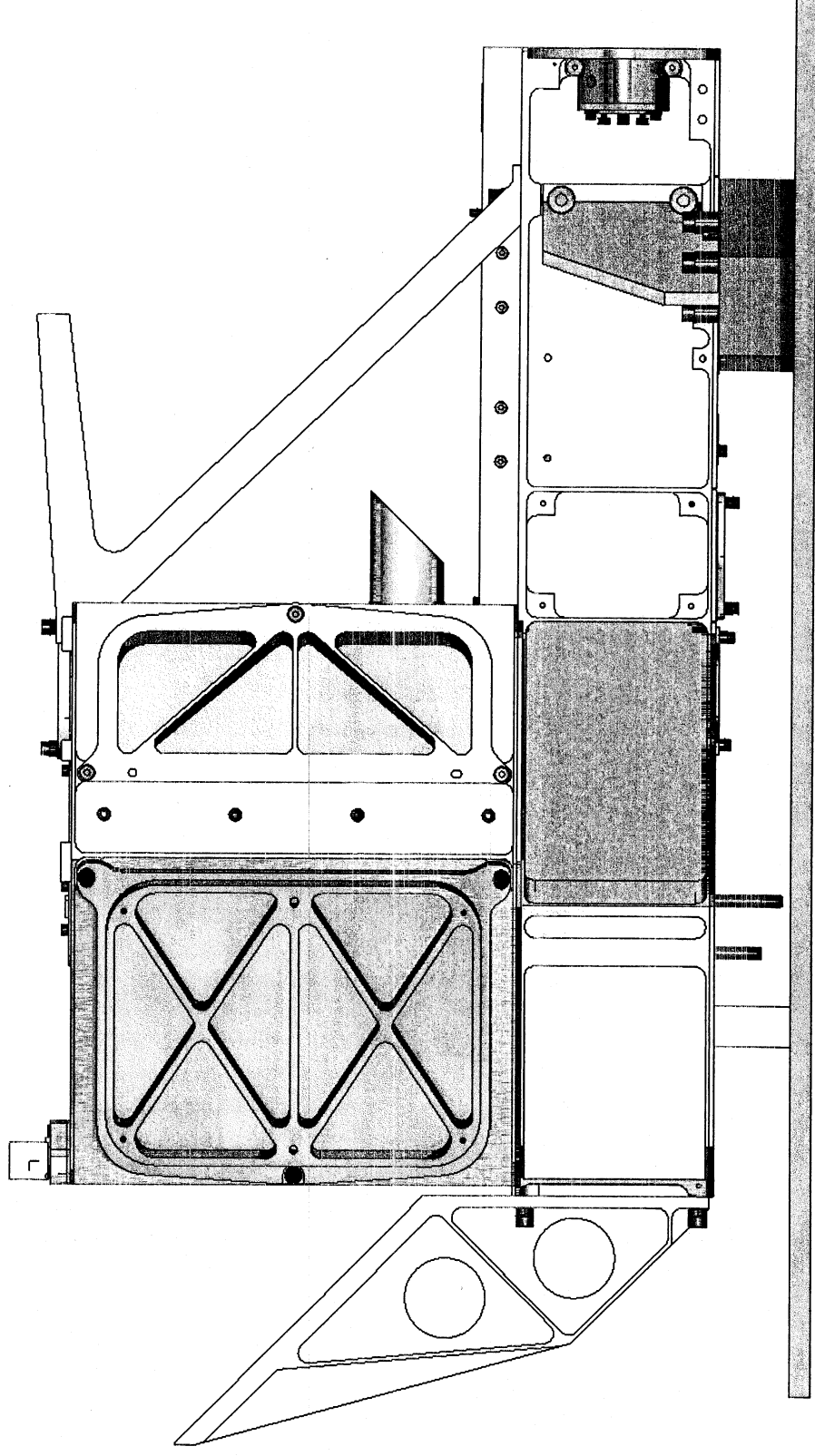
FPU

HIFI

Mounting Feet



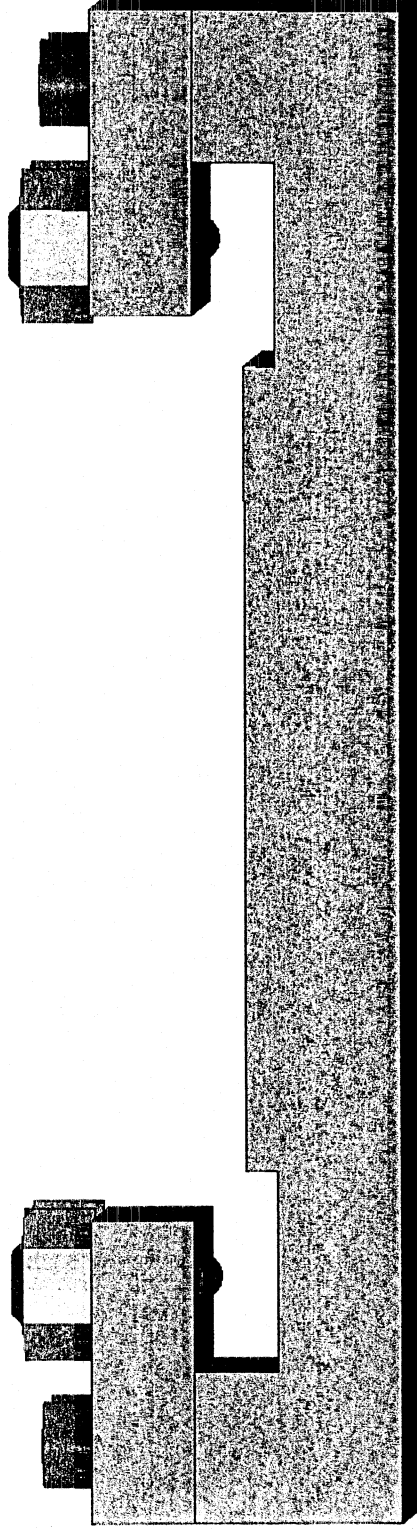
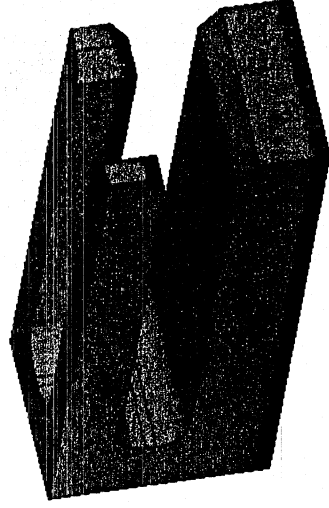
Mounting Feet



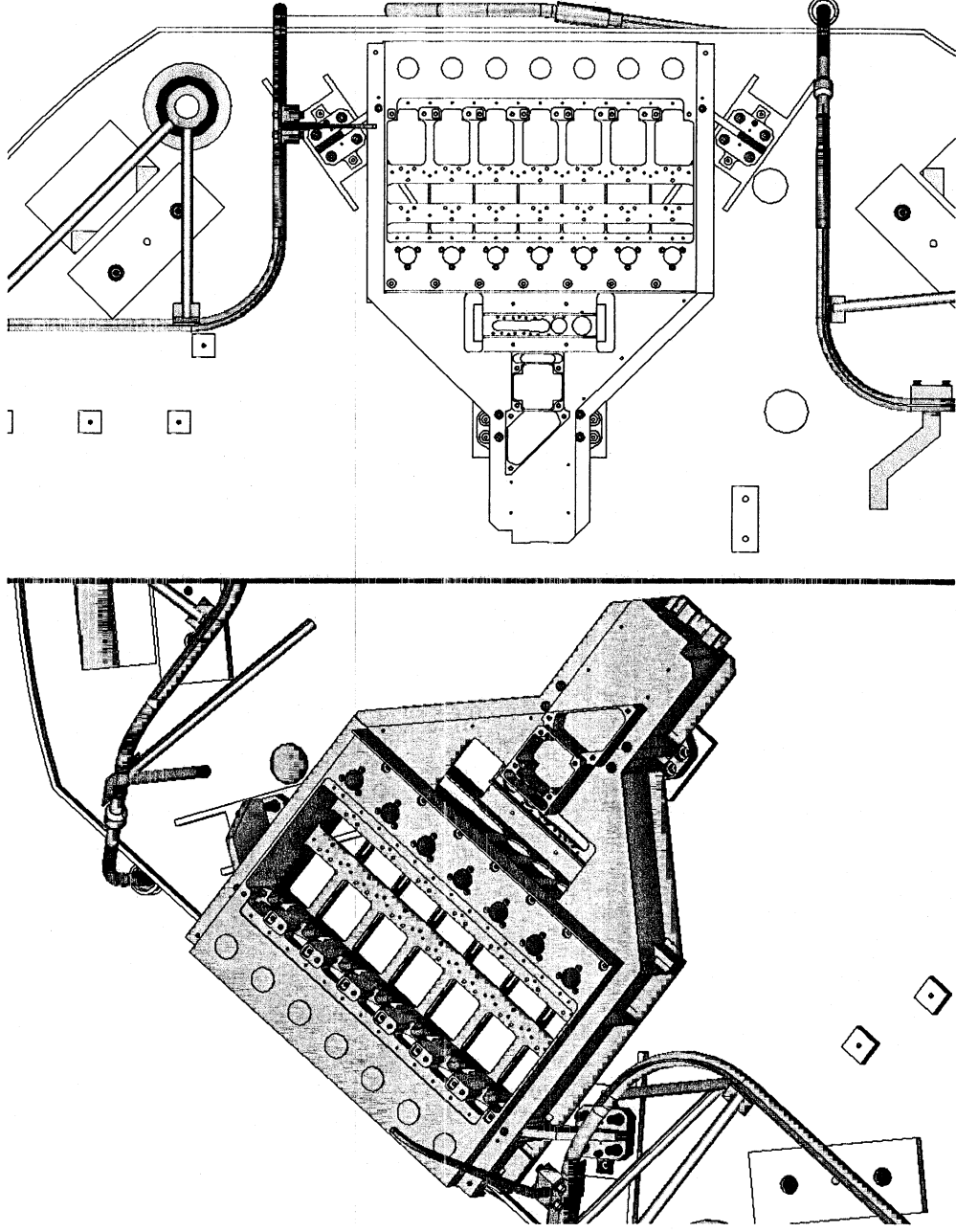
SRON

FPU

HIFI



Strap Routing

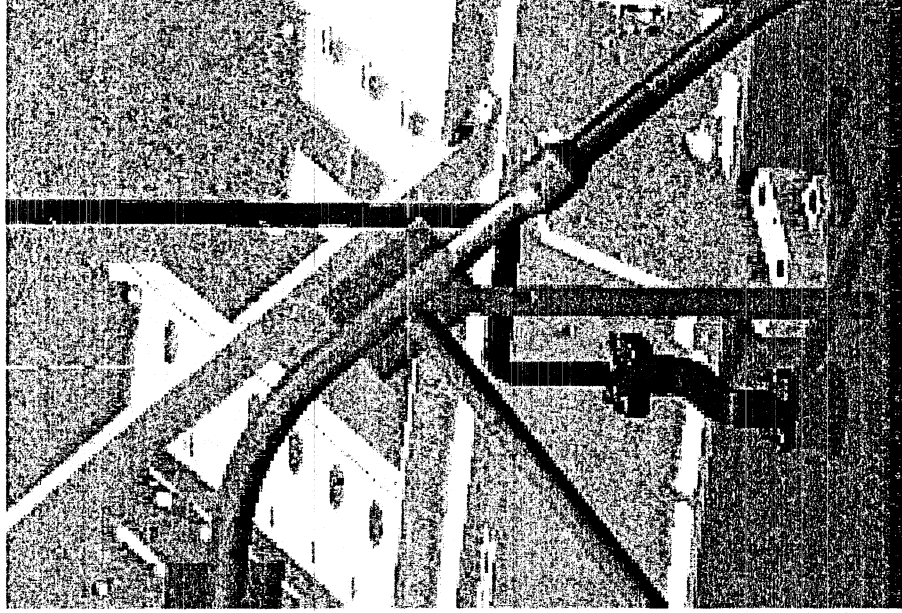


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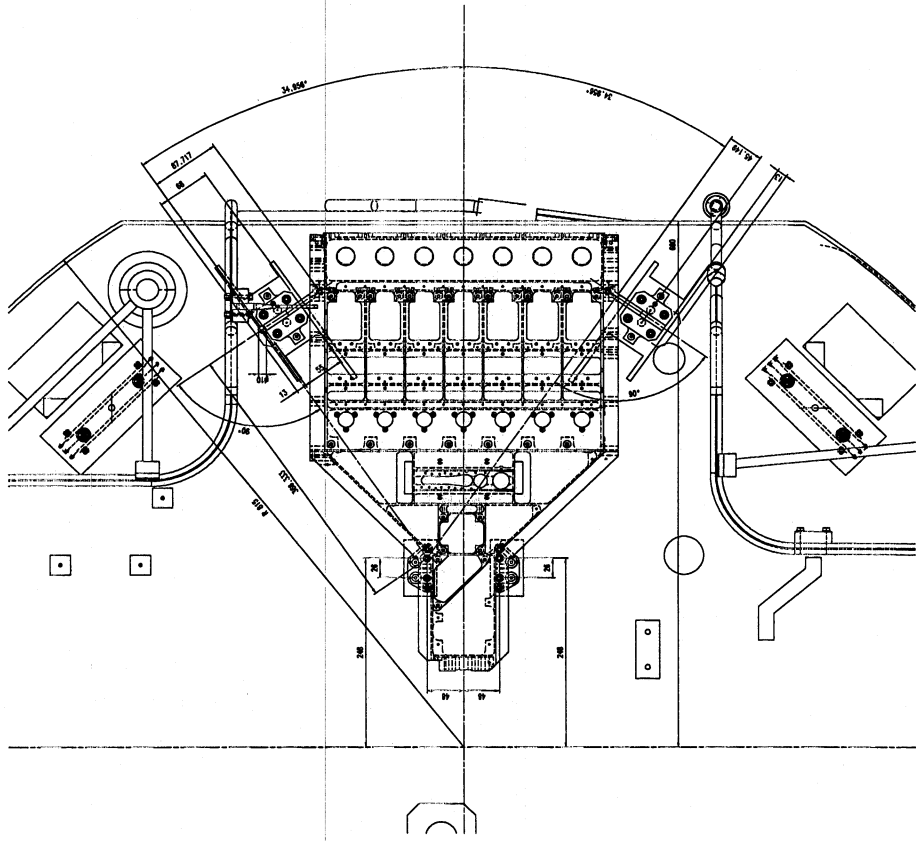
FPU

HIFI

L₀ Strap



Strap Routing

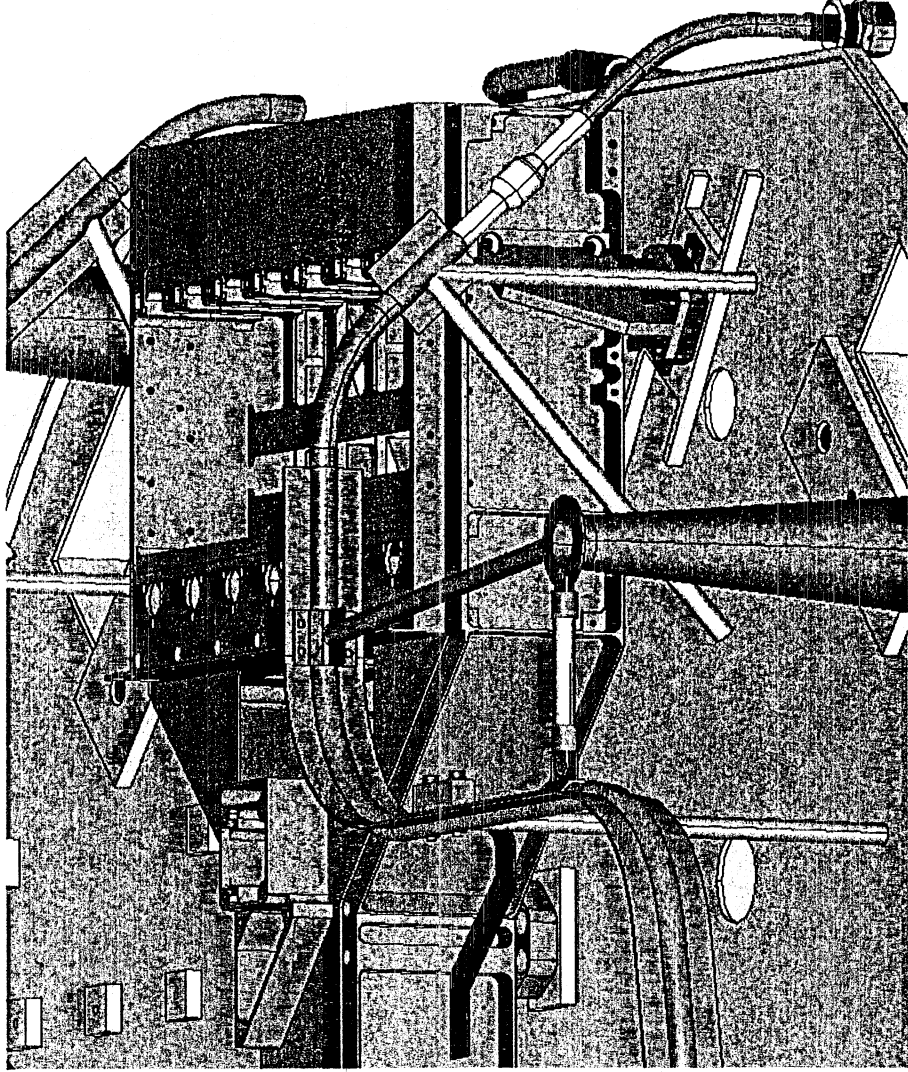


Siron

FPU

HIFI

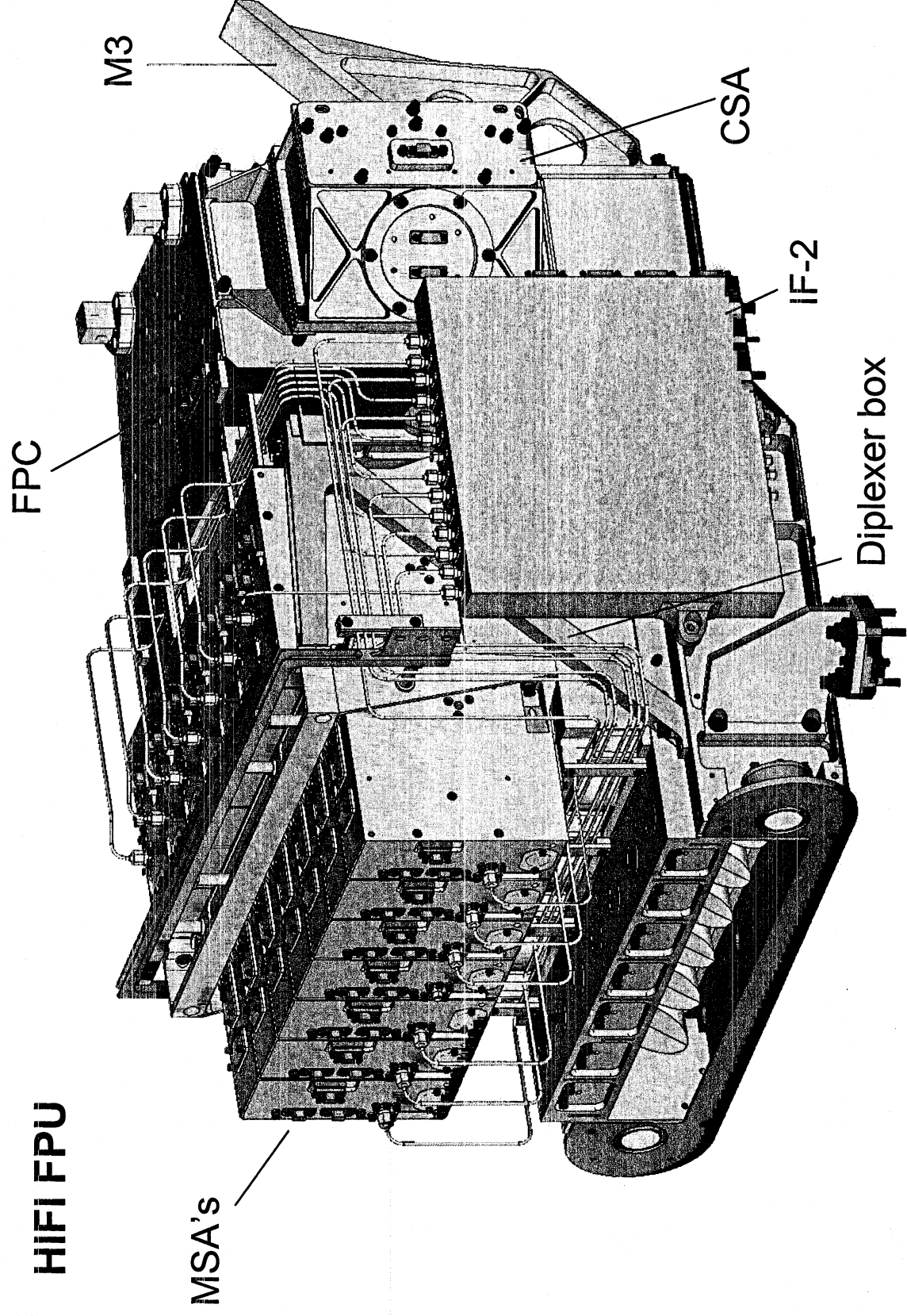
Strap Routing



Shron

FPU

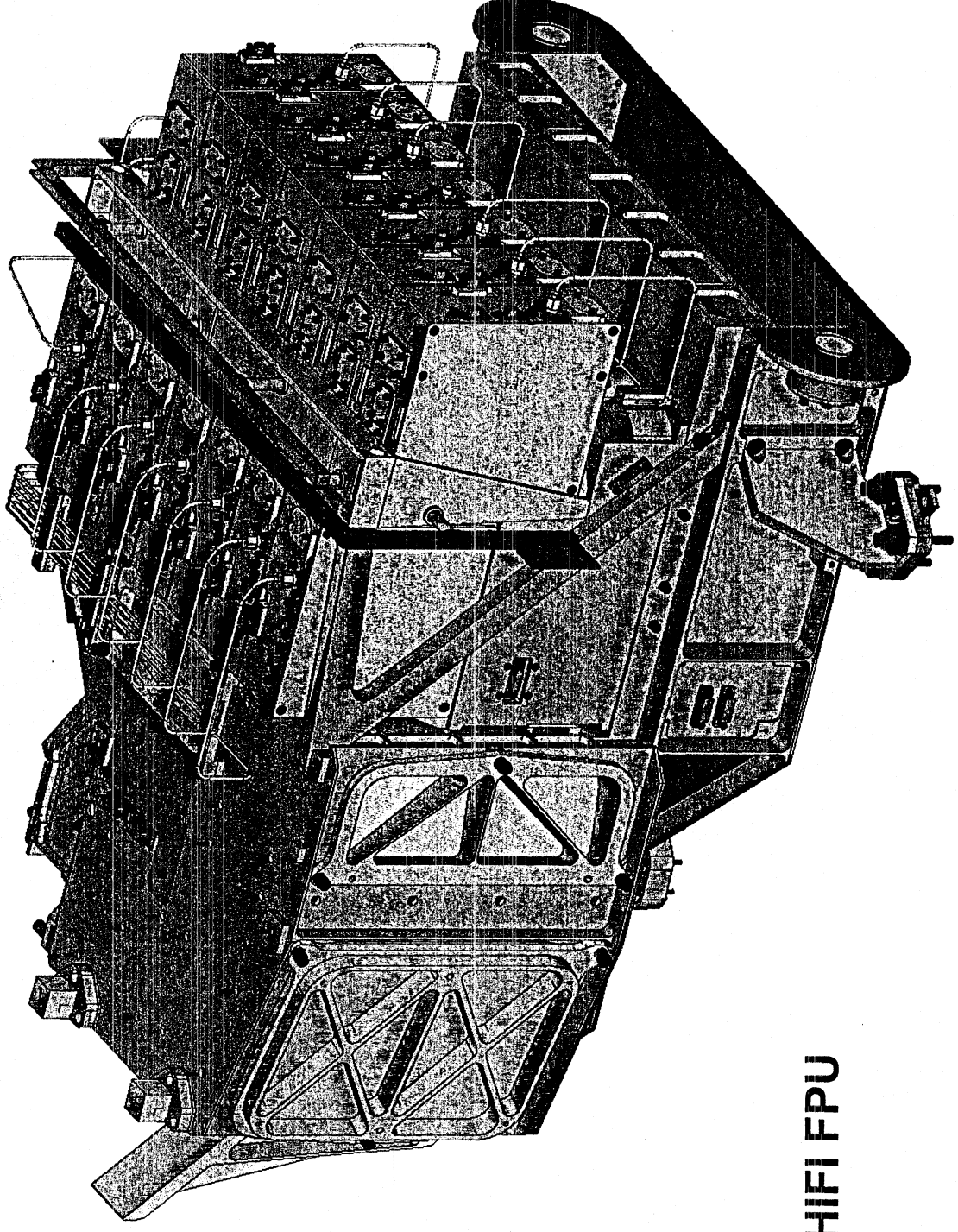
HIFI



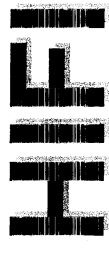
SPION

FPU

HIFI



HIFI FPU



HIFI FPU Cryo Vibration Meeting

Centre Spatial de Liege

November 21, 2002

K.J. Wildeman and H. Doedens



FPU

HIFI

Contents:

1. HIFI FPU master Schedule
2. Configuration of the FPU and the transport container
3. Test flow
4. Block diagram
5. Special tools
6. Special measures

Open items

- Mounting bolts
- Support of straps and connection of straps to a thermal system to avoid unacceptable temperature differences during cool down
- Accelerometer installation
(We asked for 18 single axis ones, e-mail of June 19th 2002)
- Some of these sensors to be delivered to SRON for pre-installation
- Temperature sensor installation
Sensor on our thermal strap i/f to control cool down and ΔT

SPIRE

Cryo vibration- Instrument interface

CSL

Nov 21st 2002

SPIRE

Douglas Griffin

Systems Engineer

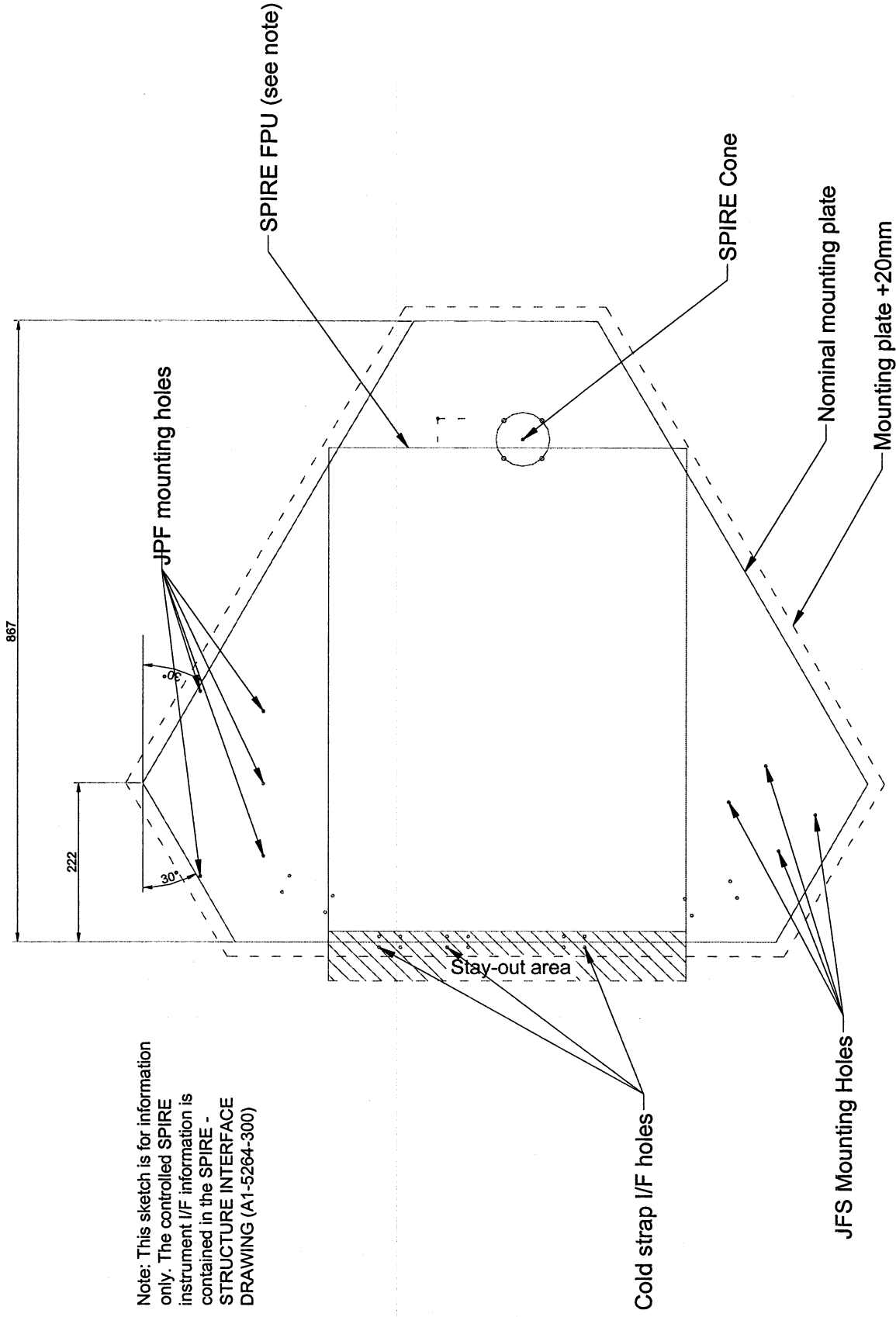
RAL

SPIRE Inputs

Douglas Griffin RAL

1

Shaker I/F



Note: This sketch is for information only. The controlled SPIRE instrument I/F information is contained in the SPIRE - STRUCTURE INTERFACE DRAWING (A1-5264-300)

Cold shake test windows

- **SPIRE is currently not able to give a definitive answer**
- **Two windows exist**
 - **30 June 2003 – current plan**
 - **20 May 2003 – revised test plan**
- **A definitive date should be available mid-Dec 2002**

Test procedure

- **Detailed procedure will be produced**
- **Deliver in draft three months prior to commencement of testing**
- **Formally issue one month later**

Issues

Provision of accelerometers and readout?

Installation of accelerometers inside SPIRE?

Incorporation of the JFETs and harnesses?

Cold strap I/F?

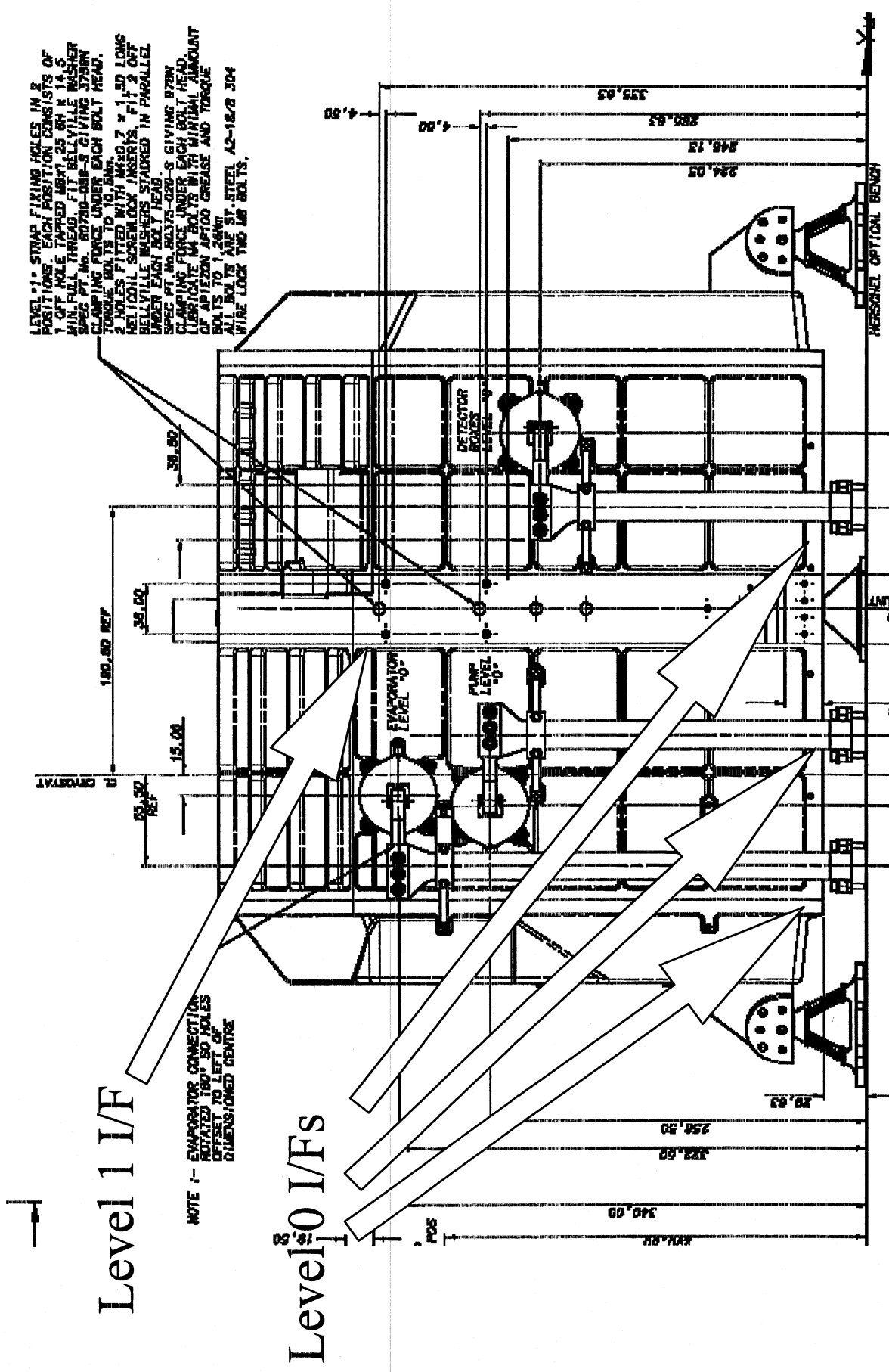
SPIRE

Cryo vibration- Instrument interface

CSL

Nov 21st 2002

Cold Strap i/F



LEVEL 1:- STRAP FIXING HOLES IN 2 POSITIONS. EACH POSITION CONSISTS OF 1 OFF HOLE TAPPED ABOUT 25 BY 14.5 MIN FULL THREAD. FIT BELLVILLE WASHER SPEC PT. NO. B07510-08P-S GIVING 3758N CLAMPING FORCE UNDER EACH BOLT HEAD. TORQUE BOLTS TO 10.0NM. 2 HOLES FITTED WITH M4X0.7 x 1.00 LONG HELICAL SCREWLOCK INSERTS. FIT 2 OFF BELLVILLE WASHERS STACKED IN PARALLEL UNDER EACH BOLT HEAD. SPEC PT. NO. B03375-020-S GIVING 8728N CLAMPING FORCE UNDER EACH BOLT HEAD. LUBRICATE ALL BOLTS WITH MINIMAL AMOUNT OF APIEZON APT100 GREASE AND TORQUE BOLTS TO 1.25NM. ALL BOLTS ARE ST-STEEL A2-1B/B 304 WIRE LOCK TWO M6 BOLTS.

SPIRE Inputs

Douglas Griffin RAL

Cryovibration Meeting #2

PACS Issues

Reinhard Katterloher
MPE

FPU Interface Requirements

- Mechanical and Thermal Interfaces
 - FPU feet (see configuration drawings)
 - hoisting device
 - 4 (level0) cooling straps to "cryostat OB"
 - 3 (level1) cooling straps to "cryostat OB"
- Accelerometers
 - 6 on FPU
 - 3+3+1 on I/F OB/FPU-feet
- Temperature Sensors (FPU internal, 8 in 4-wire readable?)
- Electrical supply lines (cooler heat switch activation)
- Questions: How is the impact of the cryoharness simulated?
How is contamination during venting controlled?

Overall Planning

- Delivery of CQM FPU to MPE is delayed and is now scheduled for 25-08-2003. At MPE, a minimum test period at LHe for functional and performance checks is then required.

That means:

- Cryovibration at CSL for CQM FPU is
 - either from 22-09-2003 to 31-10-2003 (hardly to meet)
 - or from 05-11-2003 to 16-12-2003 (most likely scenario)
- Cryovibration at CSL for FM FPU is from 02-05-2004 to 10-06-2004 (tentative)

CQM Test Sequence Scenarios

Scenario 1 "MPE-CSL-MPE"

- Full functional test at MPE
- Performance check
- Instrument EMC CM tests
- Cryovibration at CSL
- Full functional test at MPE
- Performance check and spectral calibration at MPE
- Delivery to ESA

Scenario 2 "MPE-CSL"

- Full functional test at MPE
- Performance check, short spectral calibration, Instrument EMC CM tests (all tests at MPE)
- Cryovibration at CSL
- Electrical continuity check short functional check at CSL
- Delivery to ESA

PROs and CONS

General test program is shortened: no emission lines from TUFIR are used and the test parameter range is reduced

- Scenario 1 has in principle the advantage that after cryovibration a degradation of instrument performance could be found out during the second test phase: performance qualification is then partly verified before delivery to ESA
- Main drawback is that pure test time at LHe is limited to a few days only in both test phases, this makes scenario 1 unrealistic
- Scenario 2 has the advantage that time for a second cool-down/warm-up after cryovibration is saved, these days and the duration of the second test phase can be added to the first test phase, which is "extended" now to 24 days.
- Disadvantage: part of performance qualification is then achieved at first during System Level Tests

CQM + AVM short ILT (Scenario 2, TBC)

