astrium

Minutes of Meeting

Herschel

Date:	21/03/03		
Doc.-No.:	HP-2-ASED-MN-0330		
Meeting place:	ASED, Friedrichshafen	Chairman:	Armin Hauser
Date/Time:	21/03/03, 09h00	Secretary	Horst Faas
Agenda dated:	See attached	Close of Meeting:	Close of Meeting

Subject: SPIRE Thermal Model Meeting

Participants:	RAL/MSSL: S. Hayes, AS Goizel ASED: H. Faas, K. Wagner, A. Hauser M. Langfermann (plt) M. Pastorino (plt)	Additional Distribution:	Dr. Moritz, W. Rühe, E. Hölzle, J. Kroeker, M. Langfermann, R. Hohn

Page: 1 of 7 Page(s) plus Annex 1, 2 and 3

☐ Brief-Minutes (except following sheets) ☐ Summary of Results of Sheets 2 till

astrium

Reference	Results	Remarks
	Agenda: 1. Discussion of new Astrium results 2. Further simplification of SPIRE absorption cone modelling 3. Identification of evolution of HERLIS Detailed TMM compared to HERLIS Reduced Model (available at RAL) 4. AOB Item 1: The detailed profiles during the recycling period have been discussed. RAL / ASG will provide an updated table / description how the nodal dissipation profiles assumed in the Spire TMM are derived.	

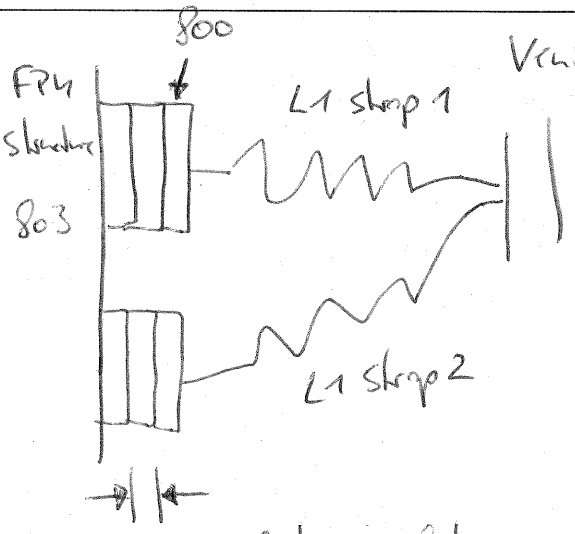
astrium

Reference	Results	Remarks
	RAL / AS Goitel will update the SPIRE Reduced ITMM to change the heat switch duration (to 30 sec) The timesteps during the recycling period in the ITMM was discussed. It was agreed that the setting of the thermal links to zero-heat capacity is a correct representation for the model run. RAL / AS Goitel should check the sensitivity of the timesteps used. The minimum timestep used in the detailed ITMM is 0.01 sec. Astrium allows 0.001 sec.	

astrium

Reference	Results	Remarks
	Lead-1 Thermal I/F: RAL will decide the I/F conductance in the Reduced ITMM. Currently ASED assumes that the I/F node (800) is at the Instrument side. But Astrium assumes that it will define the torque (2.7 Nm). If this has to be changed (due to the electrical insulation) the node position may be moved to the ASED Shop side. Action RAL and Astrium to add a joint on each side of Node 800 to account for the electrical insulation seperately.	

Reference	Results	Remarks



Conductance Assumption of sandwich:
$0.12 \frac{W}{K}$ (at 4K)

Level-1 with electrical insulation.

For the Level-0 thermal strap the responsibility of Astrium ~~is~~ includes the contact conductance to the SPIRE Thermal strap (node 814, 815 and 816). See Annex 1.

Level-3 strap

RAL to add thermal resistance of electrical insulation required, in the reduced ITMM.

astrium

Reference	Results	Remarks
23	I/F nodes ~~are to get~~ have to be ~~defined~~ introduced to cater for the electrical isolation	

	Structure	I/F node
Photo. JFET	801	831
Spect. JFET	802	832

RAL and ASED agreed to use the following figures for L3 I/F. The values need to be confirmed for the Thermal I/F Mtg. on 3 April 2003.

	Spect. JFET	Photo JFET
P	$\leq$ 15 mW	$\leq$ 42 mW
T_{L3}	$\leq$ 12 K	$\leq$ 14 K
C	$\leq 0.002 \frac{W}{K}$ (8 - 12 K; valid temp. range)	$\leq 0.002 \frac{W}{K}$ (8 - 14 K; valid temp. range)

astrium

Reference	Results	Remarks
	Item 3: Evolution of HEPLN detailed Model - L-3 I/F introduction (0.4K) - decoupling of harness (0.3K) - HiFi coax harness modification - beam enhance baffles and telescope refinement RAL/AS detail should perform an average load model run and check the HOB plate temperature. ~~The absorption cooler~~ Absorption Cooler ~~To~~ guarantee ~~$\leq$~~ 3K throughout and $\leq$ 2K at the end of recycling requires an accurate load profile on the evaporator step.	

astrium

Reference	Results	Remarks
	Options 1. Accurate thermo-dynamic model of the coil 2. Testing the sensitivity to temperature of the 6 K-stage cooler and possible impedance of the L-O evaporator stop Astrium stated that the current ~~through~~ shingle reveals a conductance of 80 mW/K (to He II) on the ASED part of the evaporator stop. This figure can be achieved without opening the He II tank.	

astrium

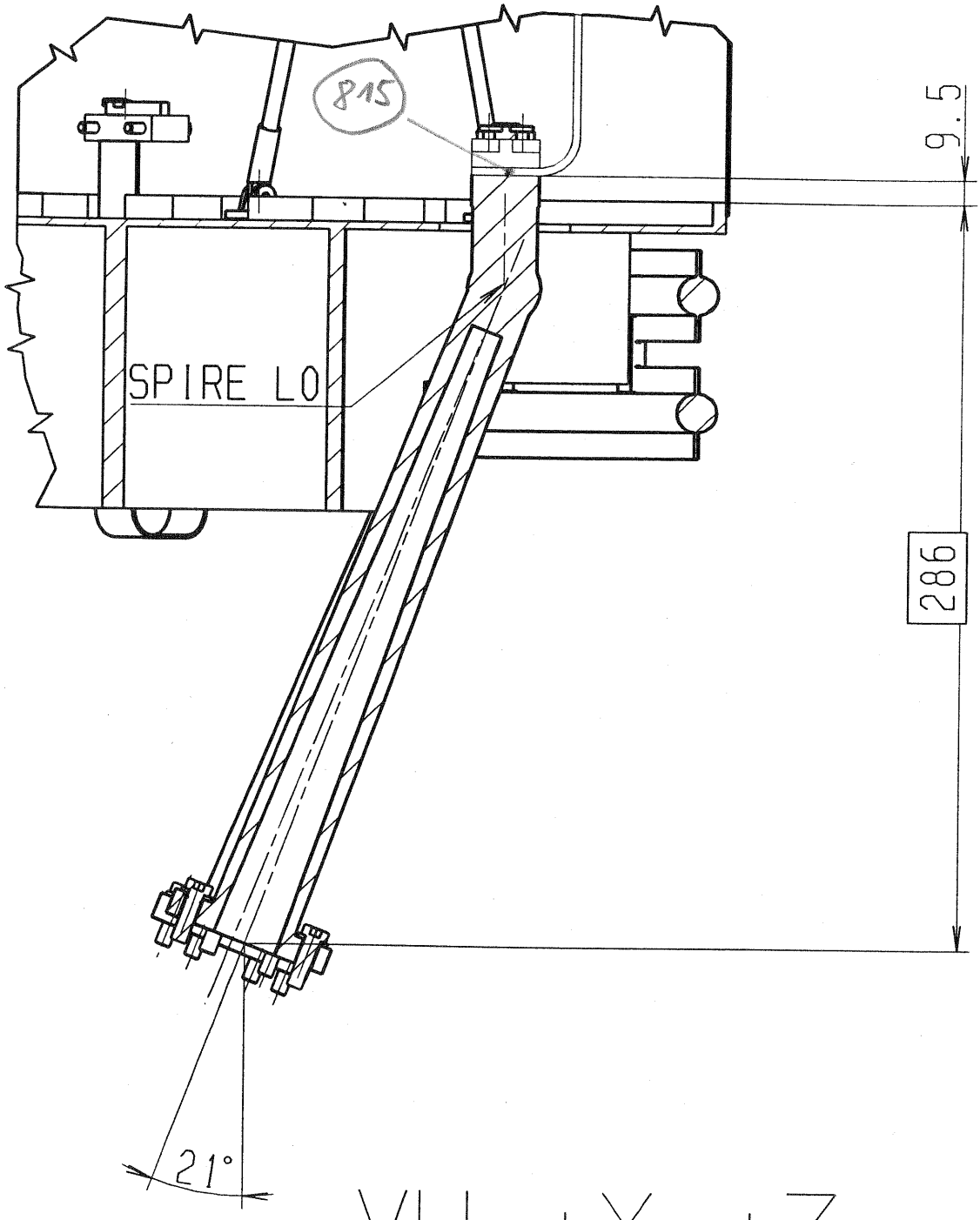
Reference	Results	Remarks
	He II mass The He II tank has been increased. The end-of-lifetime He II is currently only 5kg. This is not realistic, a more realistic value is 35kg. (constant name: MHE110)	

6-7

SCALE 1:2.5

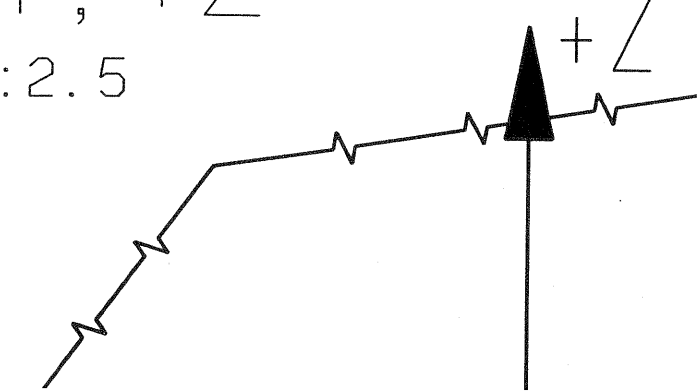
PUMP I/F

on strap side



VU +Y, +Z

SCALE 1:2.5

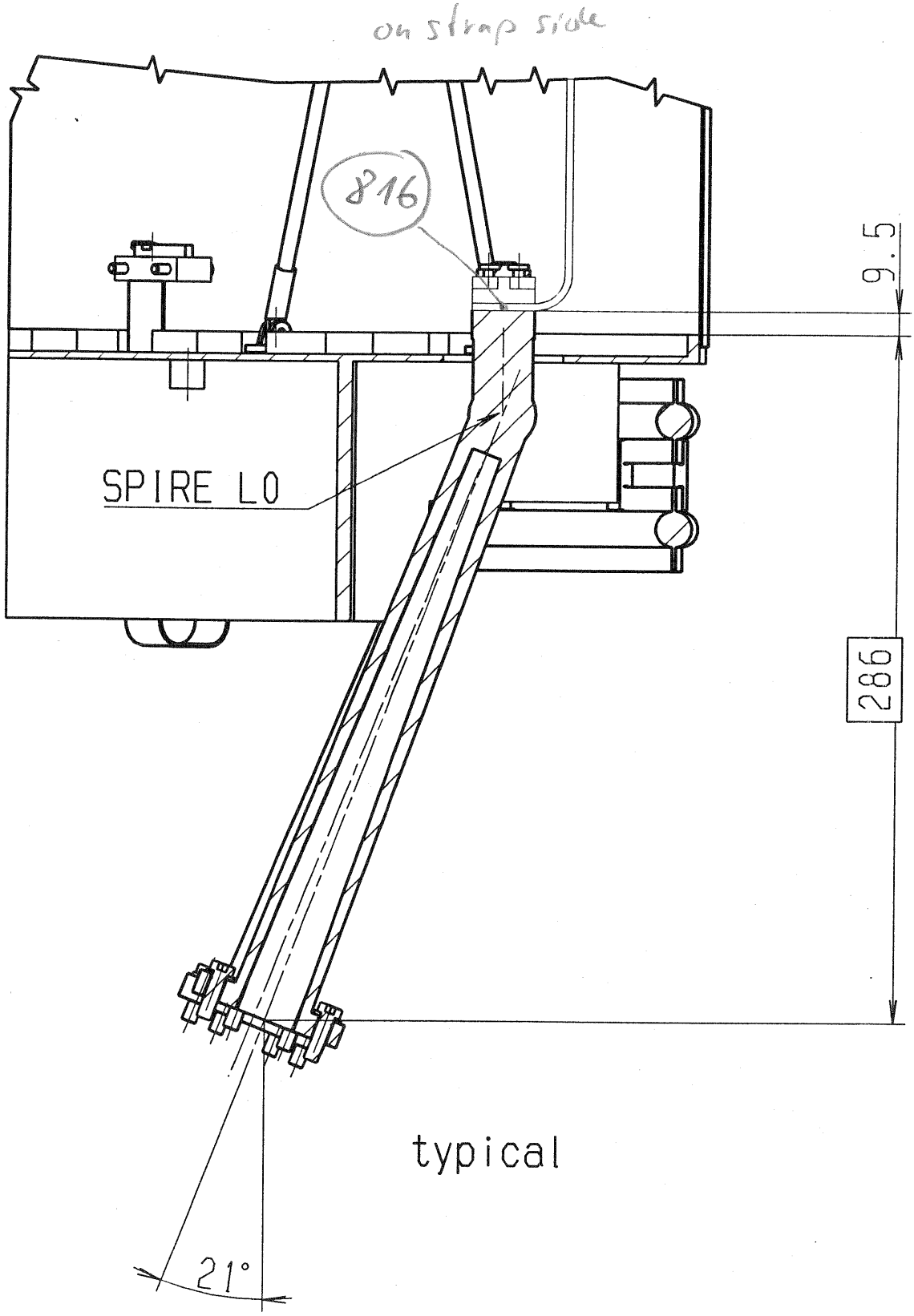


P–P

Evaporator

6-7

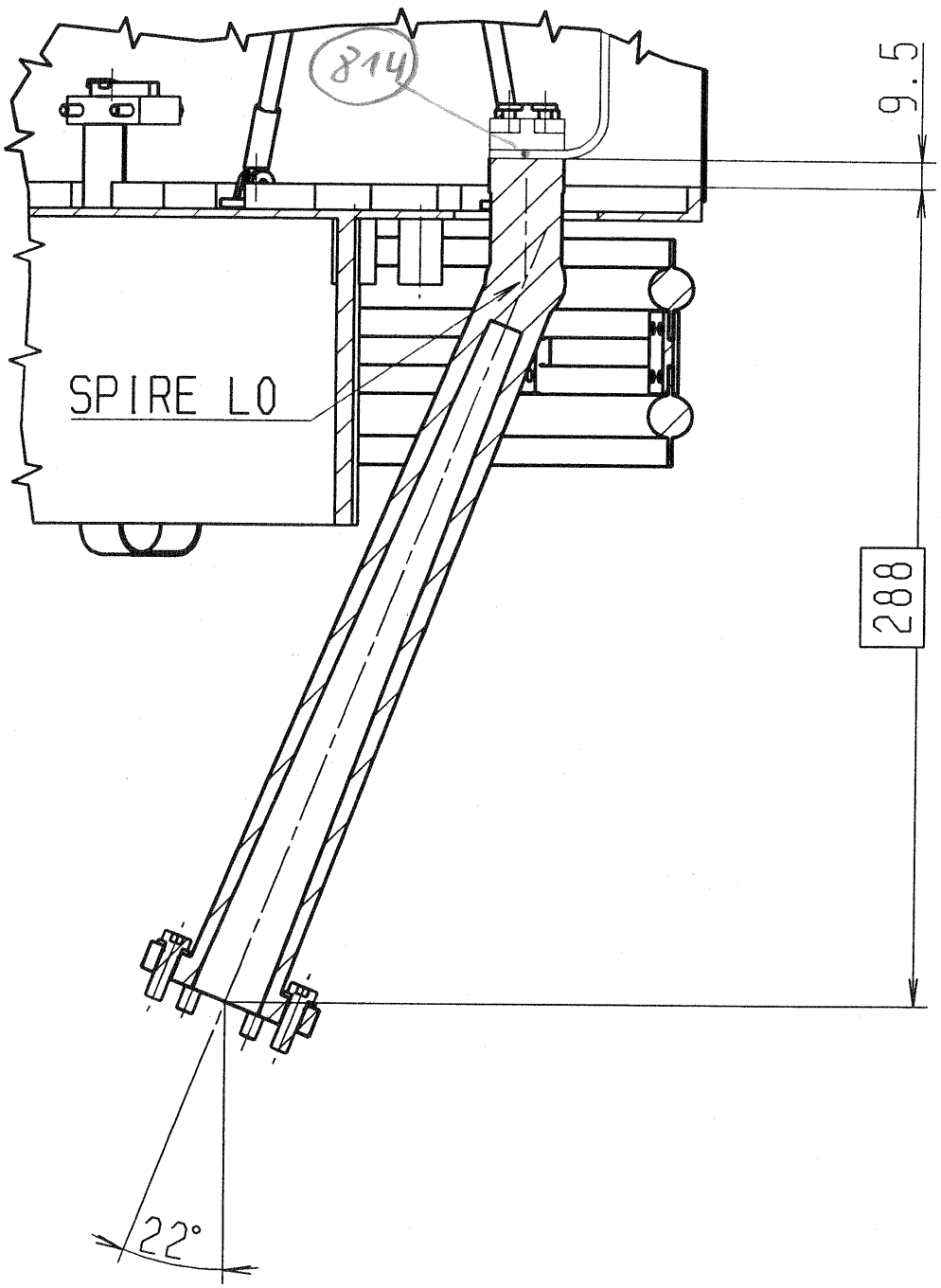
SCALE 1:2.5



R-R
6-7
SCALE 1:2.5

Detector Enclosure

on strap side



	Name	Dep./Comp.		Name	Dep./Comp.
	Alberti von Mathias Dr.	SM 34		Schäffler Johannes	OTN/EN 64
	Alo Hakan	OTN/IP 35	X	Schink Dietmar	ED 422
	Barlage Bernhard	ED 11		Schlosser Christian	OTN/EN 64
	Bayer Thomas	ED 541		Schweickert Gunn	SM 34
X	Faas Horst	EA 65		Stauss Oliver	SM 33
	Fehringer Alexander	SM 33		Steininger Eric	ED 422
	Frey Albrecht	ED 422		Stritter Rene	ED 11
	Gerner Willi	ED 11		Suttner Klaus	SM 32
	Grasl Andreas	OTN/EN 64		Tenhaeff Dieter	SM 34
	Grasshoff Brigitte	ED 521		Thörmer Klaus-Horst Dr.	OTN/ED 65
	Hartmann Hans Dr.	ED 422		Wagner Adalbert	OTN/IP 35
X	Hauser Armin	SM 31	X	Wagner Klaus	SM 31
	Hinger Jürgen	SM 31	X	Wietbrock, Walter	ED 521
X	Hohn Rüdiger	ED 541		Wöhler Hans	SM 34
X	Hölzle Edgar	ED 421		Zipf Ludwig	ACE 32
	Huber Johann	ED 543			
	Hund Walter	SE 76			
	Idler Siegmund	ED 432	X	Alcatel	ASP
	Ivády von András	ACE 32	X	ESA/ESTEC	ESA
	Jahn Gerd Dr.	SM 31		**Instruments:**	
	Kalde Clemens	ED 532		MPE (PACS)	MPE
	Kameter Rudolf	OTN/EN 64	X	RAL (SPIRE)	RAL
	Kersting Stefan	OTN/EN 63		SRON (HIFI)	SRON
	Kettner Bernhard	SM 34		**Subcontractors:**	
	Knoblauch August	ED 531		Air Liquide, Space Department	AIR
	Koelle Markus	ED 533		Air Liquide, Orbital System	AIRT
X	Kroeker Jürgen	ED 542		Alcatel Bell Space	ABSP
	Kunz Oliver	SM 31		Astrium Sub-Subsyst. & Equipment	ASSE
	Lamprecht Ernst	OTN/SM 222		Austrian Aerospace	AAE
	Lang Jürgen	SE 76		APCO Technologies S. A.	APCO
X	Langfermann Michael	ED 541		Astrium GmbH Space Infrastr.	ASIP
	Mack Paul	OTN/EN 64		Bieri Engineering B. V.	BIER
X	Moritz Konrad Dr.	ED 65		BOC Edwards	BOCE
	Müller Lutz	OTN/EN 64		Dutch Space Solar Arrays	DSSA
	Muhl Eckhard	OTN/EN 64		EADS CASA Espacio	CASA
X	Pastorino Michel	ASPI Resid.		EADS CASA Espacio	ECAS
	Peitzker Helmut	ED 65		Eurocopter	ECDE
	Peltz Heinz-Willi	SM 33		HTS AG Zürich	HTSZ
	Peters, Gerhard	ED 531		Linde	LIND
	Pietroboni Karin	ED 65		Patria New Technologies Oy	PANT
	Puttlitz Joachim	OTN/EN 64		Phoenix, Volkmarsen	PHOE
	Rebholz Reinhold	ED 541		Prototech AS	PROT
	Reuß Friedhelm	ED 62		Rembe, Brilon	REMB
X	Rühe Wolfgang	ED 6		SENER Ingenieria SA	SEN
	Runge Axel	OTN/EN 64		Stöhr, Königsbrunn	STOE
	Sachsse Bernt	ED 21		RYMSA, Radiación y Microondas S.A.	RYM