

# Solar B - EIS

**MULLARD SPACE SCIENCE LABORATORY  
UNIVERSITY COLLEGE LONDON**

**Author: A P Dibbens**

---

## INTERFACE MEETING AT MSSL – H HARA / K MATSUZAKI

**Document Number: MSSL/SLB-EIS/MN/001.01 21 February 2000**

### Distribution:

NRL	G Doschek	
	C Korendyke	
	S Myers	
	C Brown	
	K Dere	
	J Mariska	
ISAS	H Hara	
	T Watanabe	
RAL	J Lang	
	B Kent	
	D Pike	
BU	C Castelli	
	S Mahmoud	
	G Simnett	
Mullard Space Science Laboratory	J L Culhane	
	A Smith	
	L Harra	
	A McCalden	
	C McFee	
	R Chaudery	
	P Thomas	
	W Oliver	
	P Coker	
	R Gowen	
	K Al Janabi	
	M Whillock	
	A Dibbens	Orig

Author:

Date:

Authorised By:

Date:

Distributed:

Date:

**Dates:** 14 February 00 – 18 February 00**Location:** MSSL**Those Present were:****ISAS:** Hiro Hara; Keiichi Matsuzaki**MSSL:** AJM, RAC, KFJ, RAG, MCRW, CJM1, PDT, PGC, APD**Introduction**

Hiro and Keiichi were warmly welcomed by the MSSL team. Hiro tabled the latest version of MDP - EIS-ICU Electrical Interface Document (version 1.2, Feb 12, 2000). This document formed the basis of the week's discussions.

**Review of Document****Pages 1-4,** all OK

**Page 5,** Applicable Documents, Reference 1 should be labeled V 1.0 (draft) 16 Nov 99 Ref 2 should be dated 20 Nov 99 and Ref 3 should be V 0.17 20 Oct 99. References 4 & 5 are Intersil data sheets.

**Page 6,** OK

**Page 7,** Grounding diagram to be produced (current Action 244).

**Page 8,** There is a need to introduce a turn-off protection diode in the passive bi-level interface. Hiro to talk to Melco about this (new Action 274).

**Page 9,** In fig 4.3-1, the Driver/Receiver identifiers are reversed in the diagram.

The resistors at the driver end need to be sized to match the transmission line. AJM already has an action item (Action 219) to supply information to support this argument. MHI believe that there will be no problem of distortion with 100 ohm resistors at the speed of this interface. A choke is being considered at the driver end for common noise reduction.

In fig 4.3-2, all timing diagrams are referenced to the output inverter. The data line stays as the last bit state. The rise and fall times should be checked on the Intersil data sheets (new Action 259).

**Page 10,** In fig 4.4-1 a choke is to be considered for the driver side. The same comments for page 9 also apply about the 100 ohm resistors matching the cable. Check in Tsuneta-san's report for resistor values (new Action 260).

**Page 11,** Chokes to be inserted at the relevant driver ends.

NOTE: For all MDP interfaces, the interface point is the MDP connector. All the wave forms are to be measured on the TRUE pins on that connector (signals are measured differentially).

**Page 12,** Packet size is variable and can be decided by EIS.

**Page 13,** Fig 4.5-4, it was agreed to gate the clock in the ICU. Sub packets are transmitted in their entirety and it was confirmed that the last bit can be left in its last state.

The definition of the timing has changed:

T: 1/f

T1:  $T/2 \pm 10\%$

T2:  $T/2 \pm 10\%$

T3:  $T/2 \pm 10\%$

T4:  $T \pm 10\%$

T5:  $T/2 \pm 10\%$

T6: Multiple (integers) of T (starting at 1)

**Page 14, OK**

**Pin allocations.**

The connector on the MDP will be an MDM 51.

A cable diagram was prepared. Keiichi to confirm by System-side that primary power can be used for powering the mechanisms directly (new Action 261)

There appears to have been an error in the EIS power budget – an additional 15 watts is required for the operational heaters.

**Page 15,** In par 5.2.1,  $1 \leq n \leq \max$ , where  $127 \leq \max \leq 255$ .

**Page 16,** par 5.2.2 The TC uplink rate of 50ms was considered by MSSL as being a fast rate and a handshake would be required. However, this was thought not possible by the J-side. Slowing the TC by the ground seemed therefore the only option. The 50 ms could be increased in principle up to a maximum of 250ms. The specific figure for this time needs to be fixed by J-side and ideally this should be done at the March meeting. At a splinter meeting it was agreed that this timing would be achieved with a software ground handshake.

Par 5.2.4 is not now relevant and should be deleted.

**Page 17,** par 5.3.1 request for EIS status list (new Action 262).

The Serial Status Interface line will include status anomaly reports and memory dump packets (including table dumps). The interval between requests for status data will be 0.5s (as in the Japanese document).

In place of the diagram in 5.3.2, the status requests remain at 0.5s and every fourth request will be for status and the other 3 will be memory dump.

The format for the status packets will change

If no memory dump is needed, a packet will be sent saying no data.

It was agreed that there would be a status request every 2s even if the status has not been updated.

The size of the EIS status parameter list will be estimated by end Feb - new Action 262 (500bytes may be required).

MSSL will request that the 50ms response time be increased to 150ms. EIS will prioritise the status requests to help ensure that they are dealt with speedily. J-side confirmed that the response time for the serial status data can be increased to 250ms.

**Page 18, OK**

**Page 19,** par 5.5.1 should be moved to the hardware section.

Par 5.5.2 should move to the description of the MDP. The data rate of EIS to MDP in science mode is currently 1mbit/s, but could be increased to 2mbit/s.

**Page 20,** “for most cases” should be replaced by “except if buffer is full”.

**Page 21,** par 5.5.4 the header for image restoration is not yet defined. This is needed by MSSL by July 00. J-side will propose a format.

**Page 22, OK**

**Page 23**, par 5.7 Change “anything” to “different” in the first sentence. Remove “In general” at start of first sentence.

It was suggested that a dead end counter could be introduced to provide additional information on the number of errors occurring. “2 sec or so” to be changed to “10 sec”.

**Wednesday 16 – PM testing interfaces**

J-side will provide software which will support SDTP protocol by mid 00, new Action 263.

The PM will stay in ISAS for approximately 8 weeks and will then be returned to MSSL, together with its EGSE.

A request was made by MSSL for a facility to see commands as they are sent in the PM EGSE at ISAS, new Action 264.

**Page 24**, pars 6.1 & 6.2 OK

Par 6.2.1 An example will be provided. A decision will be made on whether or not the Command Size parameters will be included, new Action 265.

Par 6.2.2 OK

Par 6.2.3 Definition of bit order for memory uplink/downlink addresses to be included in a new par 4.7, new Action 266.

MSSL initially proposed 2 new commands in place of EIS-ICU observation table upload, 1 for observation upload, the other for Deferred Command (time tagged). After much discussion, it was agreed that 2 more IDs would be allocated by J-side to access different memory banks. It was also agreed that a further 4 IDs would also be required:

Working (768kw = 768k x 6bytes = 4.6mbytes)

Camera memory buffer (2m x 16bits = 4mbytes)

Mass memory A-low (3mw = 6m x 16bits = 12mbytes)

Mass memory B-low (3mw = 6m x 16bits = 12mbytes)

J-side to provide 6 new memory IDs, new Action 267.

MSSL asked if it was possible to uplink memory packets of a maximum size of 126 bytes (multiple of 6)? This would also confirm that the System side can uplink images given to it by EIS without changing them in any way (that is not performing any differencing), new Action 268.

**Page 25**, Par 6.2.4 6 IDs are required, the same as par 6.2.3.

Par 6.3.1 To be re-written by J-side, because of changes in Memory Dump and Status Data.

**Page 26**, Par 6.3.2 Title change to “Mission Status Data Format”. Maximum data to be 400 bytes (TBD).

Par 6.3.3 Title change to “Memory Dump Data Format” and the paragraph changed to remove Status Data. The EIS memory dump data of 501 to be confirmed by J-side, new Action 269.

Table 6.3-2 Supplied by instruments.

Blank data – all zeros

Confirmation – not yet clear

Packet sequence counter – start at 0

PIM ID – to be EIS ID

Table to be updated by J-side.

**Page 27**, par 6.4.1, already covered on page 12 – to be removed.

Par 6.4.2 Keiichi discussed with SOT about providing a different Mission Data packet type for spectrographic instruments. This is not recommended by J-side.

**Page 28, Par 6.4.3** The Main ID is equivalent to the MSSL raster ID. The sub ID will be the MSSL exposure ID.

EIS does not envisage, at present, any use for the Main Sequence Flag and the Main Sequence Counter. The Main Sequence Flag could possibly be used for counting exposures in a raster.

The Total Number of Packets cannot be implemented by EIS.

Instrument parameters to be provided to J-side By March meeting.

The Header Areas must be a multiple of 16 bytes.

**Page 29, Par 6.4.5** The first part of exposure information should read “Exposure Start Time”.

**Pages 30-34** OK

**Appendices** OK

### **AOB and Other Actions**

1. It was agreed that EIS would not store a Time Sequence Table. It will operate using the OP Table in the DHU. This Table will send a command at certain times to start sequences in EIS.
2. AJM to prepare information on the effect of resistors and chokes on all the electrical interfaces, new Action 271.
3. Melco have agreed that the EIS instrument can be moved 100mm in the +Z direction (forwards). Hiro will ask Melco to approve 2 other envelope changes relating to possible CCD radiator positions (radiator at end of instrument and radiator to the side at that same end), new Action 272.
4. MSSL to ask other instruments if they wish to or are able to use the EIS Event Flag, new Action 273.
5. Mass Memory – an explanation has been requested for the need for a circular buffer, new Action 274.
6. What are the temperature ranges of the electronics and other parts MSSL are responsible for, new Action 275.
7. What are the operating modes of EIS? New Action 276.
8. It was stated that the Power Budget may need to be increased.
9. It was requested that, because of the operating margin of the power converter, the operating temperature range for the ICU be changed to -20 to +40°C. This was confirmed as OK.
10. The EIS test configuration for PM is required by J-side, new Action 277.
11. MSSL to provide pin allocations for ICD, new Action 278.

### **Action Items**

See MSSL/SLB-EIS/AD/002.02