

# Solar B - EIS

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## **SOLAR B – EIS Mechanism Harnessing and Connector Conduits.**

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**CHANGE RECORD**

ISSUE	DATE	PAGES CHANGED	COMMENTS
01	13.9.2002	All New	DRAFT.
02	15.10.02	5,6,7,8,9	Known dimensions added.
03	5.3.2003	10	FPA/ROE harnessed finalized.

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## Overview.

### Connector conduits.

Birmingham University have designed an aluminum connector conduit (*Fig. 1, page 5*) for taking the mechanism harnesses through the CFRP honeycomb panels used on EIS. The two part conduits are bonded into the 11mm thick side and 19mm thick base panels before the structure is assembled. Connector conduits are used for MIR1, FPA1, SLA1 and GRA1 connectors.

The connector conduits have been designed to:

1. Keep EIS light tight.
2. Provide a mounting point for the mated mechanism/external harness D types.
3. Provide strain relief for the mechanism harness before and after integration.
4. Move all connector locking operations (gluing) to the outside of the structure during mechanism and external harness integration.

### Mechanism connectors.

An aluminum Connector Mounting Bracket (CMB) (*Fig. 2, page 5*) and thin metal gasket will be permanently attached to the back face of the connector before it is populated (*Fig. 3, connector shown pre wired*).

Two jackposts attach the CMB to the connector (*Fig. 4*). The jackposts are then locked in place with adhesive and baked.

The mechanism harness can now be fitted to the connector (*Fig. 5*) as the design of the CMB allows for the insertion and removal of connector pins in the usual manner.

Backshells are not used on the mechanism harness D types. The wires are formed at a right angle along the length of the connector and retained with a P clip. The CMB with P clip now provides strain relief to the connector wires.

### External harness connectors.

The close fitting MLI on EIS prevents the use of traditional D type backshells on the external harness. The external harness D types are recessed into the conduit and are effectively mounted within the honeycomb panel. The external harness is formed at right angles to the connector and lays flat on the surface of the panel. The first tie down point will be within 5cm of the conduit.

### Connector fitting to conduit.

At integration the mechanism connector is fitted to the conduit before the external harness connector. The four screws which hold the mechanism connector assembly are inserted from the outside of the instrument (*Fig. 6*). Screw locking is carried out on the outside of the instrument. The external harness connector is fitted afterwards using the jackposts in the usual way (*Fig. 8*). Locking is again carried out on the outside of the instrument.



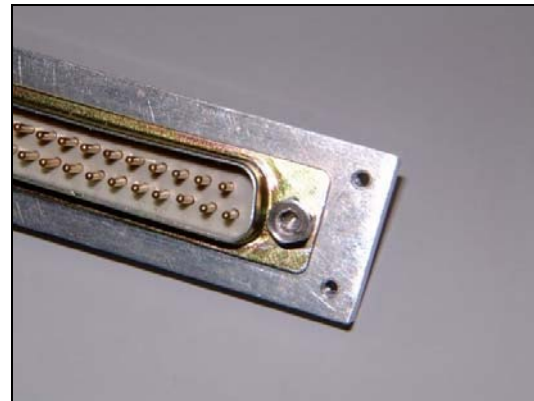
**Fig. 1** Connector conduit.



**Fig. 2** Connector mounting bracket.



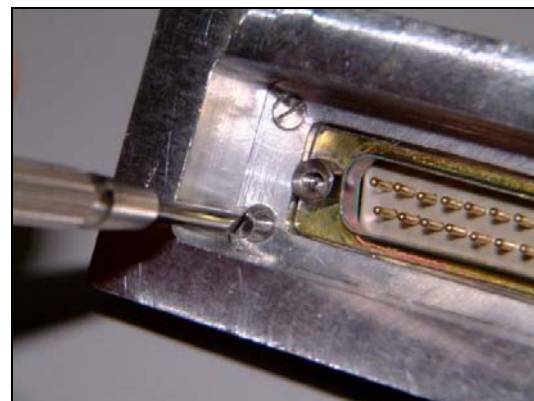
**Fig. 3** Mechanism connector.



**Fig. 4** Jackpost fixing.



**Fig. 5** Mechanism connector and P clip.



**Fig. 6** Fixing CMB / Mechanism connector to conduit (external view).



**Fig. 7** Internal view.



**Fig. 8** External view.

**Mechanism harness construction.**

Harness tie down points (Thomas & Betts TC105's) on EIS are glued to the individual panels before the structure is assembled. Once the panels are cleaned and baked the tiedown locations cannot be altered and additional ties cannot be added. Lengths of heat shrink (10-12mm) need to be added for protection at tie down points and the P clip.

*Fig. 9-14* (pages 6-10) show the mechanism mounting positions, connector conduits, harness tie bases and route to be taken for the Mirror, Slit-slot, Grating and FPA-ROE harnesses.

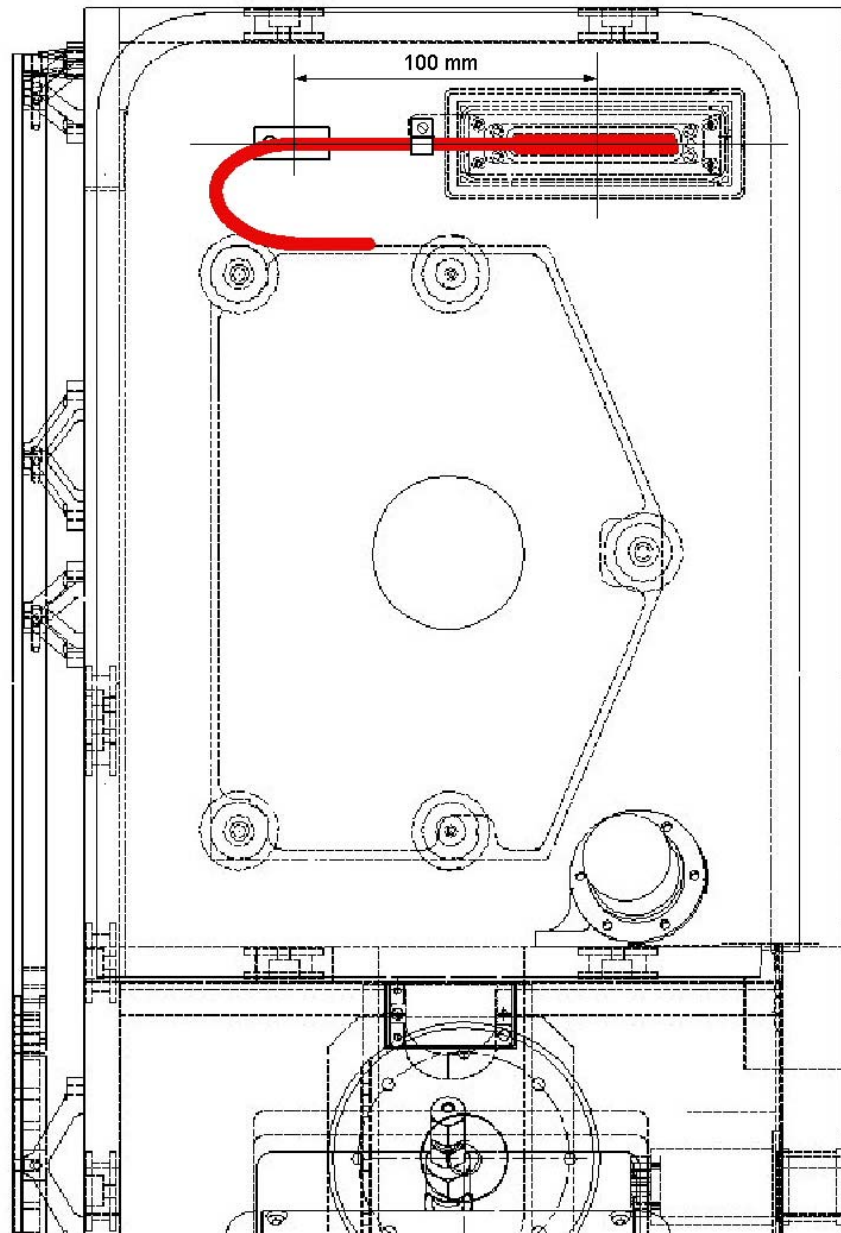
**Notes:**

BU will supply the CMB and gasket to NRL and MSSL.

Connector orientation is as shown on the EIS GA drawing (drawing number SR8193).

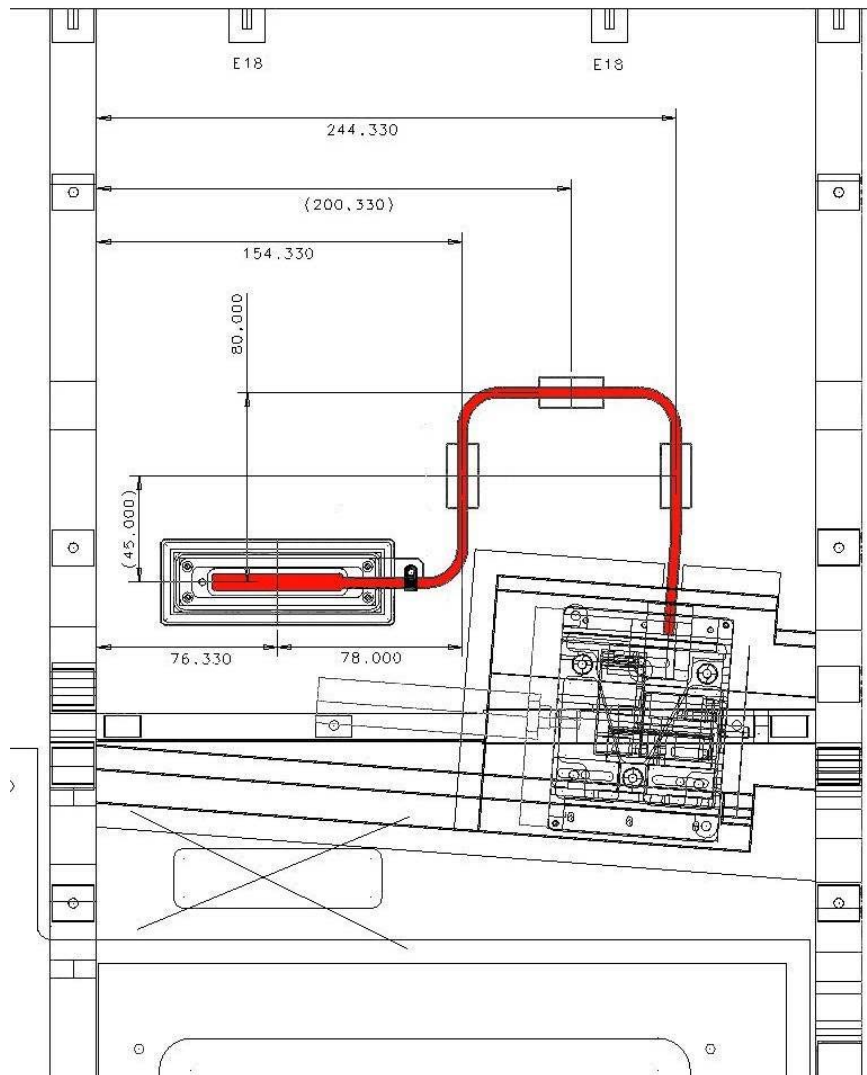
*Fig. 9*

Mirror harness and MIR1 connector along  $-Z$  axis (viewed from clamshell end).



*Fig. 10*

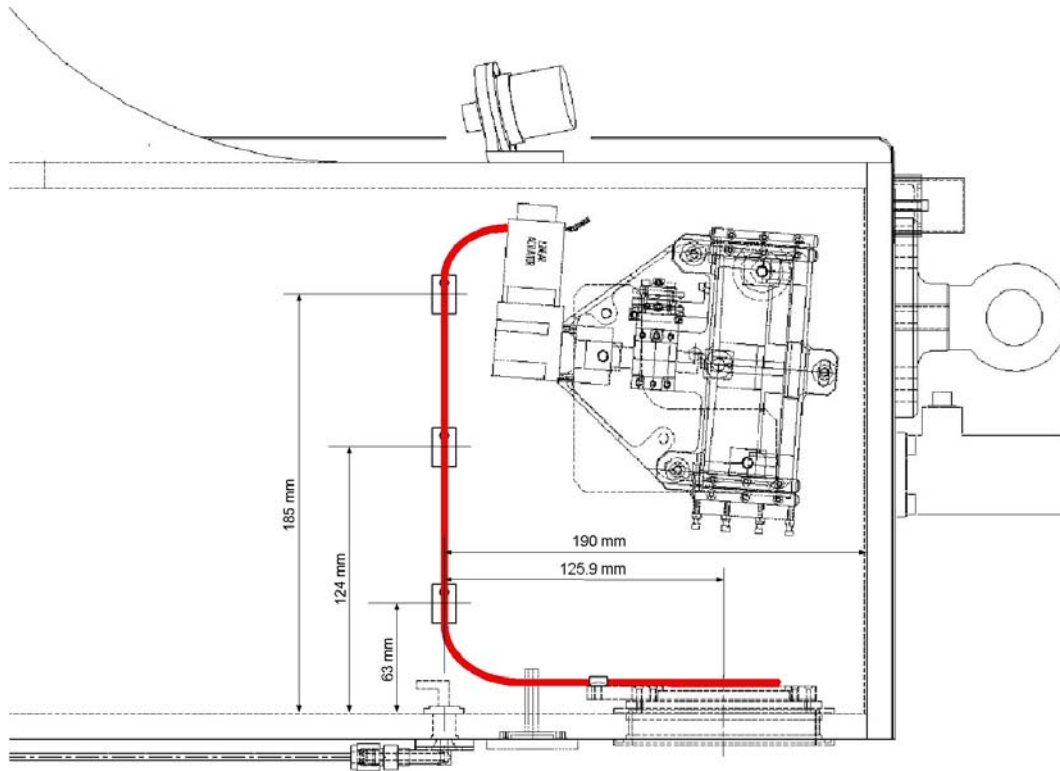
Slit-Slot harness and SLA1 connector along -Y axis (viewed from above).





*Fig. 11*

Grating harness and GRA1 connector along – Y axis (viewed from above).



*Fig. 12*

FPA / ROE harness and FPA1 connector.

