

HIRDLS

HIGH RESOLUTION DYNAMICS LIMB SOUNDER



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Subject / Title: **BEU to IFCBB Interface Control Document (ICD)**

Contents / Description / Summary:

The intra-subsystem interface definition control document for the In-Flight Calibrator (IFC) electronics unit and the IFC black body.

Definitions of the cable and connectors between BEU and IFCBB.

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BEU to IFCBB Interface Control Document (ICD)

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Log of Changes

Rev.	Date	Section	Change Description
draft	98-05-05		Initial draft.
draft-CLH	98-05-26		Incorporated comments from Loh, Whitney, Woodard.
draft-DMW	98-05-28	2.2	Added SP-HIR-211 to list of information docs.
		3.4	Added paragraph referencing SP-HIR-211.
		4	Acronym list: added BAD.
Initial	98-06-18		Initial release: content identical to draft of 98-05-28.
A draft	00-04-25	front	Updated front sheet and signature page.
		2.2	Information Documents List: Deleted reference to SP-HIR-211, which was never released.
		3.2.5.2	Table 3.2.5.2-1: J611P/P611S pins 12, 13, 29, 30 reordered per TCP-039. Figure 3.2.5.2-1: Updated figure from CLH submitted as part of TCP-039.
		3.3	Functional Interface: Changed TBD to N/A.
		3.4	Resolved backshell type TBDs; removed TBVs re. minimum compression requirements; deleted reference to SP-HIR-211, which was never released.
		4	Acronym List: Deleted BAD, Baseline Accommodations Document, which was never released.
A	00-05-02		Rev. A released; content same as draft of 2000-04-25.

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1 SCOPE

Interface Control Documents (ICDs) in the SP-HIR-2XX series define, as applicable, the specific design implementations of the Electrical, Functional, Mechanical, Thermal Conductive, and Optical interfaces between specified HIRDLS Subsystems or, in a few special cases, between units within the same subsystem.

This ICD defines the interface between the Black Body Electronics Unit (BEU) and the In-Flight Calibrator Black Body (IFCBB), both of which are part of the In-Flight Calibrator Subsystem (IFC). This interface consists only of the electrical and functional interfaces between the BEU and IFCBB. This ICD contains all the parameters required to ensure the electrical performance of the harness and for this purpose the wire type is specified and the harness accommodation/routing specification is referenced.

For the interface between the IFC and the Instrument Processor Subsystem (IPS), refer to SP-HIR-267.

2 DOCUMENT REFERENCES

2.1 Applicable Documents

The documents listed below are a part of this ICD to the extent specified herein. In the case of a conflict between the contents of this ICD and any Applicable Document, this ICD shall take precedence.

SP-HIR-013	Instrument Technical Specification (ITS)	Current Revision
SP-HIR-200	Internal Interface Control Document (IICD) (System Section)	Current Revision
ANSI/TIA/EIA 422-B-1994	Electrical Characteristics of Balanced Voltage Digital Interface Circuits	

2.2 Information Documents

The documents listed below are for information only and are explicitly not, by reference, part of this ICD.

SP-HIR-044	IFC Subsystem Specification	Current Revision
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3 INTERFACE REQUIREMENTS

3.1 Interface Concept Overview

The interface between the BEU and the IFCBB consists of an electrical interface analog data signals and heater supply. There are no mechanical, thermal, or optical interfaces between these units.

Figure 3.1-1 shows the system context of this interface. Only the BEU-IFCBB electrical interface is defined in this ICD.

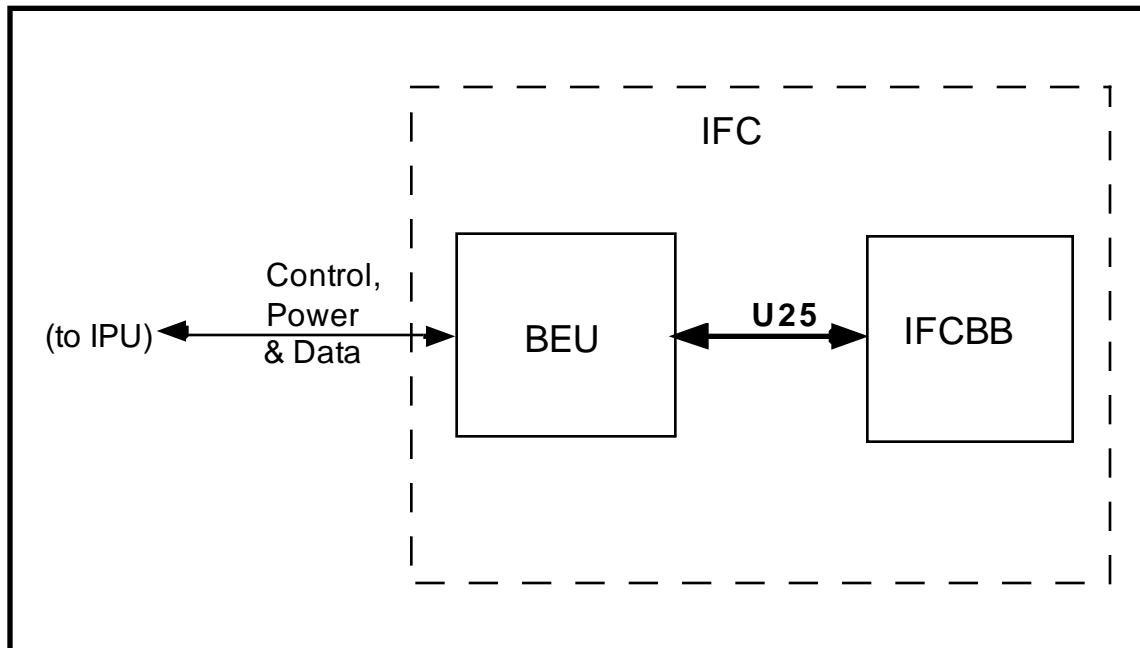


Figure 3.1-1 BEU-IFCBB Interface

3.2 Electrical Interface

Figure 3.2-1 identifies the harness and connector numbers associated with the BEU-IFCBB interface.

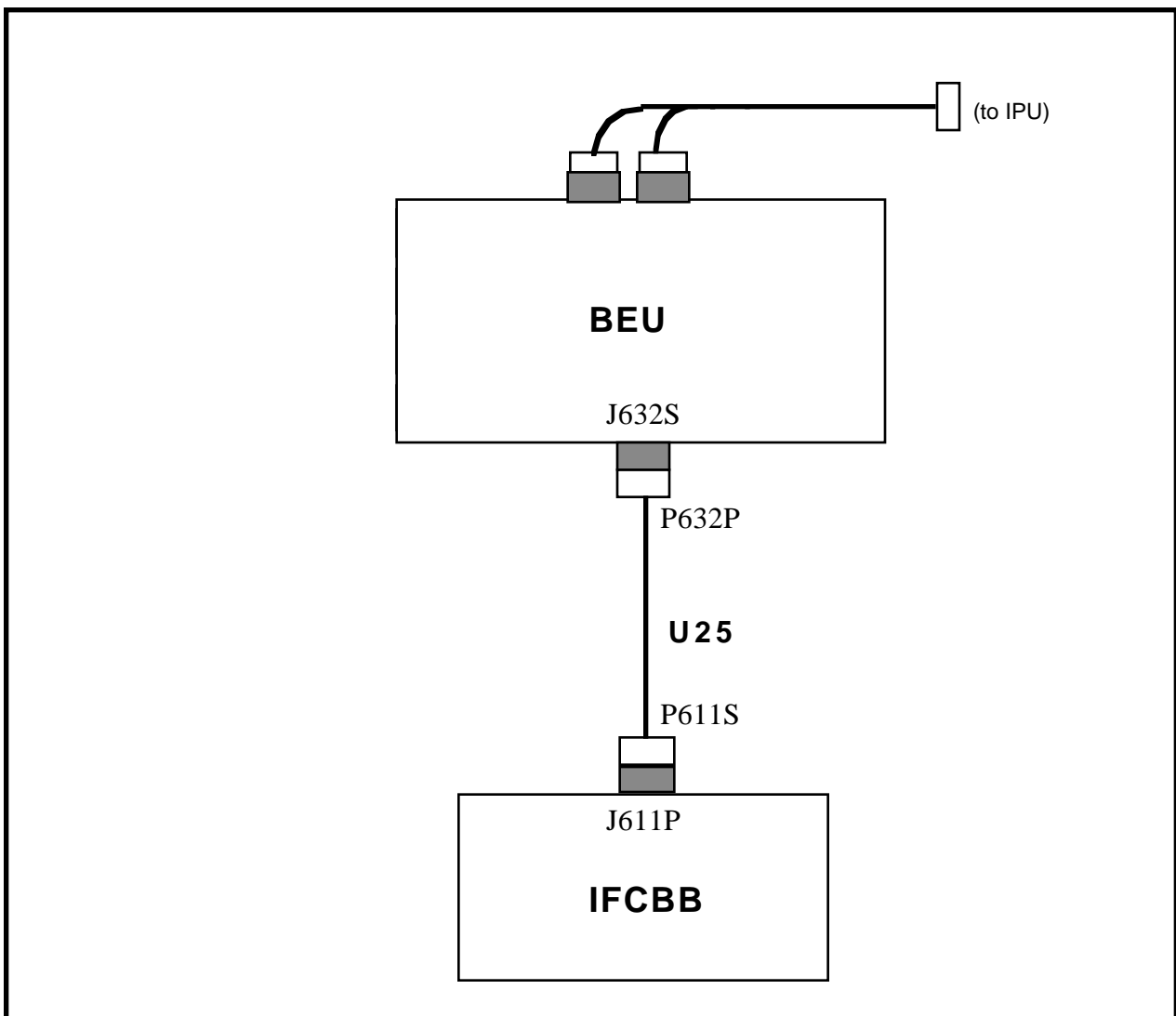


Figure 3.2-1 BEU-IFCBB Connector/Harness Identification

3.2.1 Grounding and Shielding

3.2.1.1 Primary Power Grounding and Shielding

N/A

3.2.1.2 Secondary Power Grounding and Shielding

N/A

3.2.1.3 Equipment Enclosure Grounding, Shielding, and Bonding

The BEU is grounded to the STH per SP-HIR-216. The IFCBB is grounded to the TSS/OBA per SP-HIR-246.

3.2.1.4 Wire and Cable Shield Grounds

The U25 harness overall shield shall be terminated on to the cable connector back-shells so as to close the shield circuit between the BEU and the IFCBB(See Section 3.2.5.3.). The electrical

connection between the overall shield and the connector back-shells shall be continuous all round with no gaps.

3.2.2 Power Interface

N/A

3.2.3 Control and Data Interface

N/A

3.2.5 Physical Electrical Interface

3.2.5.1 Connector Definition

Connectors hard mounted on boxes or the structure are referred to as “jacks” (or receptacles) and are so indicated by a “J” prefix in the connector number. Connectors located on harnesses, cables, or wires are referred to as “plugs” and are so indicated by a “P” prefix in the connector number.

Suffix letters “P” and “S” in the connector numbers indicate, respectively, a “pin” or “socket” contact type.

Connector number assignments and the GSFC PPL-21 part numbers for the selected connector types are shown in of Table 3.2.5.1-1.

Table 3.2.5.1-1 Connector types for U25 Plugs and mating Jacks

Jack Number	Location	PPL-21 Type	No. of Pins	Plug Number	PPL-21 Type
J632S	BEU	311P407-3S-B-12	44	P632P	311P407-3P-B-12
J611P	IFCBB	M83513/1-G	51	P611S	M83513/2-G

3.2.5.2 Connector Pinout Definition

Signal names and pin assignments for Cable U25 (BEU-IFCBB) are defined in Table 3.2.5.2-1.

Signal names and cable allocations are provided in Figure 3.2.5.2-1.

3.2.5.3 Wire/Cable Requirements

Wire types and gauges of conductors shall be selected to be consistent with the maximum voltages and currents shown in Table 3.2.5.2-1.

The complete set of co-axial cables and single wires shall be enclosed in a braid shield and over this shall be a protective outer cover of appropriate insulating material.

Table 3.2.5.2-1 Cable U25 Signals and Pin Assignments

PANEL JACKS→ U25 PLUGS→	Pin Assignments		Signal Group	Vmax V	Imax mA	Comment
	J632S P632P	J611P P611S				
Signal Name						
HEATER_A+	1	1	1	+8.4	120	unshielded twisted quad
HEATER_A+	16	19	1	0	0	unshielded twisted quad
HEATER_A-	17	20	1	+8.4	120	unshielded twisted quad
HEATER_A-	2	2	1	0	0	unshielded twisted quad
PRTS_A_I+	3	3	2	+15	1	coaxial
PRTS_A_I+_SH	18	21	2	0	0	coaxial
PRT_A1_V+	19	22	3	+15	1	coaxial
PRT_A1_V+_SH	4	4	3	0	0	coaxial
PRT_A1_V-	5	5	4	-15	1	coaxial
PRT_A1_V-_SH	20	23	4	0	0	coaxial
PRT_A2_V+	21	24	5	+15	1	coaxial
PRT_A2_V+_SH	6	6	5	0	0	coaxial
PRT_A2_V-	7	7	6	-15	1	coaxial
PRT_A2_V-_SH	22	25	6	0	0	coaxial
PRT_A3_V+	23	26	7	+15	1	coaxial
PRT_A3_V+_SH	8	8	7	0	0	coaxial
PRT_A3_V-	9	9	8	-15	1	coaxial
PRT_A3_V-_SH	24	27	8	0	0	coaxial
PRTS_A_I-	25	28	9	-15	1	coaxial
PRTS_A_I-_SH	10	10	9	0	0	coaxial
AD590_A+	31	36	20	+15	1	unshielded twisted pair
AD590_A-	32	37	20	0	1	unshielded twisted pair
HEATER_B+	15	18	10	+8.4	120	unshielded twisted quad
HEATER_B+	30	35	10	0	0	unshielded twisted quad
HEATER_B-	29	34	10	+8.4	120	unshielded twisted quad
HEATER_B-	14	17	10	0	0	unshielded twisted quad
PRTS_B_I+	13	16	11	+15	1	coaxial
PRTS_B_I+_SH	28	33	11	0	0	coaxial
PRT_B1_V+	27	32	12	+15	1	coaxial
PRT_B1_V+_SH	12	15	12	0	0	coaxial
PRT_B1_V-	11	14	13	-15	1	coaxial
PRT_B1_V-_SH	26	31	13	0	0	coaxial
PRT_B2_V+	33	30	14	+15	1	coaxial
PRT_B2_V+_SH	34	13	14	0	0	coaxial
PRT_B2_V-	35	12	15	-15	1	coaxial
PRT_B2_V-_SH	36	29	15	0	0	coaxial
PRT_B3_V+	37	38	16	+15	1	coaxial
PRT_B3_V+_SH	38	39	16	0	0	coaxial
PRT_B3_V-	39	40	17	-15	1	coaxial

PANEL JACKS→ U25 PLUGS→	Pin Assignments		Signal Group	Vmax V	Imax mA	Comment
	J632S P632P	J611P P611S				
PRT_B3_V-_SH	40	41	17	0	0	coaxial
PRTS_B_I-	41	42	18	-15	1	coaxial
PRTS_B_I-_SH	42	43	18	0	0	coaxial
AD590_B+	43	50	19	+15	1	unshielded twisted pair
AD590_B-	44	51	19	0	1	unshielded twisted pair

Special Requirements:

1. These co-axial cables shall be manufactured by Lakeshore and are type: miniature co-axial cable SC.
2. The heater wires are Raychem 26 AWG.

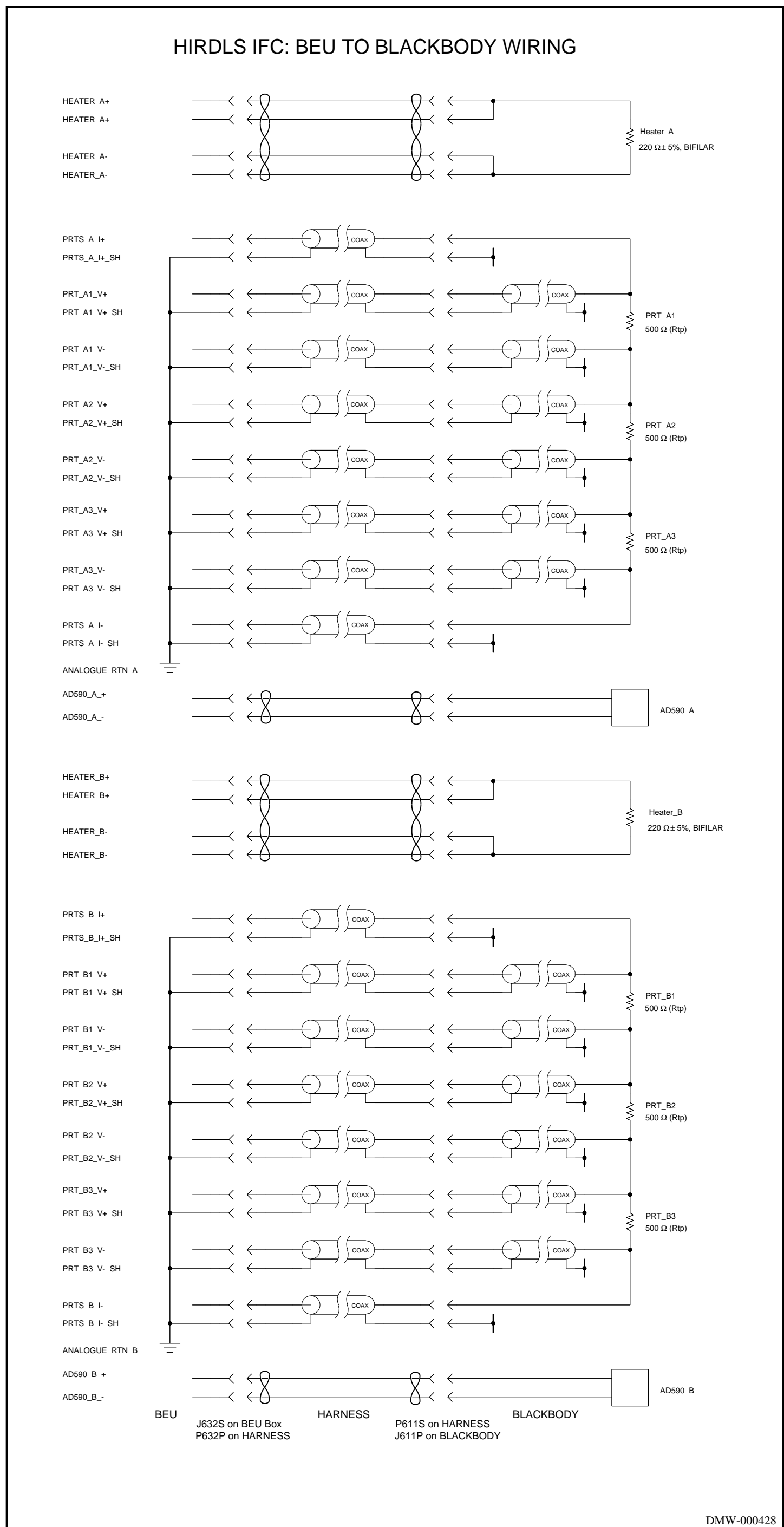


Figure 3.2.5.2-1 Cable U25 Signals and Wire Arrangement

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3.3 Functional Interface

N/A

3.4 Mechanical Interface

The P632P shall use a back-shell of the type Kern SDM90 25J 9935; the BEU end of the harness shall be tied to the instrument structure for strain relief with minimum compression.

The P611S shall use a back-shell of type Glenair-Miles Roystone 500T01051H09S; the IFCBB end of the harness shall be tied to the OBA structure for strain relief with minimum compression.

Cable length, bend radii, routing, and tie point locations shall be planned so as to avoid interference with other components or reserved access volumes.

3.5 Thermal Interface

N/A

3.6 Optical Interface

N/A

3.7 Other Interfaces

N/A

4 ABBREVIATIONS & ACRONYMS

ADC	Analog to Digital Converter
BEU	Blackbody Electronics Unit
IFCBB	IFC Black Body
IFC	In-Flight Calibrator (Subsystem)
ICD	Interface Control Document
IICD	Internal Interface Control Document
IPS	Instrument Processor Subsystem
IPU	Instrument Processor Unit
ITS	Instrument Technical Specification
OBA	Optical Bench Assembly
PPL	Preferred Parts List (GSFC)
TBD	To Be Determined
TBV	To Be Verified
TSS	Telescope Subsystem