Version 2.1
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SVXII Test Junction Board
Technical Specifications

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The SVXII junction board is a compact card which serves as an interconnect to merge the electrical cables from the SVXII power supplies and FIB transition modules on to a single Long Cu-Kapton flex cable. This document provides the technical design specification for a test version of this board. Such a version will have features that will make it more useful in test stands, with the result that it will be larger than the production version board.

- **Required features**

The test junction board receives input from 5 cables on five connectors, and sends output on to a single cable with two connectors. The board must provide a storage capacitor for each of the low voltage power supplies. It must also provide a filter for the high voltage bias lines. Resistors to connect the low voltage remote sensing lines with their respective power supply lines.

In order to allow continuous shielding of the FIB timing signals, it must have two ground planes, which lie above and below the connection trace layer(s). Vias to connect the top and bottom ground planes must be provided at regular intervals in sufficient quantities to ensure that the board provides shielding at the frequencies of interest.

For this test version, the board will have a duplicate set of connectors for the low voltage, high voltage, and timing signal cables. This will allow load boxes to be attached for power supply tests, and will allow the timing signals to be probed. Additionally, the resistors and capacitors indicated above should be discrete components, which can be replaced if necessary.

- **Connector Pinouts**

1. Analog low voltage connector. Positronics Industries DFDD26, 26-pin board mount female connector. (Load connector #2 is identical).

Pin Number	Signal Name	Pin Number	Signal Name
1	UAV_1	10	AG_1
19	UAV_2	2	AG_2
11	UAV_2	20	AG_2
3	UAV_3	12	AG_3
21	UAV_3	4	AG_3
13	UAV_4	22	AG_4
5	UAV_4	14	AG_4
23	UAV_4	6	AG_4
15	UAV_5	24	AG_5
7	UAV_5	16	AG_5
25	UAV_5	8	AG_5
17	UAV_5	26	AG_5
9	SHIELD	18	GROUND

3. Digital low voltage connector. Positronics Industries DFDD-44, 44-pin board mount female connector. (Load connector #4 is identical).

Pin Number	Signal Name	Pin Number	Signal Name
1	DVDD1	16	DGND1
31	DVDD2	2	DGND2
17	DVDD3	32	DGND3
3	DVDD4	18	DGND4
333	DVDD4	4	DGND4
19	DVDD5	34	DGND5
5	DVDD5	20	DGND5
35	+5V_DOIM	6	DGNDP
21	+5V_DOIM	36	DGNDP
7	+5V_DOIM	22	DGNDP
37	+5V_DOIM	8	DGNDP
23	+5V_DOIM	38	DGNDP
9	+5V_DOIM	24	DGNDP
39	+2V_DOIM	10	DGNDP
25	+2V_DOIM	40	DGNDP
11	+2V_DOIM	26	DGNDP
41	+2V_DOIM	12	DGNDP
27	DTERM	42	DGNDP
13	SHIELD	28	GROUND
15,29,43	N/C	14,30,44	N/C

5. Bias voltage connector. AMP Electronics 1-745967-4, 25-pin female connector.
6. Bias voltage load connector. AMP Electronics 1-745967-4 25-pin female connector.

Pin Number	Signal Name	Pin Number	Signal Name
1	DBZ1	14	DBP1
2	DBGND1	15	DPZ2
3	DBP2	16	DBGND2
4	DBZ3	17	DBP3
5	DBGND3	18	DBZ4
6	DBP4	19	DBGND4
7	DBZ5	20	DBP5
8	DBGND5	21	SHIELD
9	SHIELD	22	GROUND
10	GROUND	23	N/C
11,12,13	N/C	24,25	N/C

7. Remote sensing connector. AMP Electronics 1-745967-4 25-pin female connector.

Pin Number	Signal Name	Pin Number	Signal Name
1	SDVDD1	14	SDGND1
2	SDVDD2	15	SDGND2
3	SDVDD3	16	SDGND3
4	SDVDD4	17	SDGND4
5	SDVDD5	18	SDGND5
6	S5VDOIM	19	SDGNDP
7	S2VDOIM	20	SDGNDP
8	SDTERM	21	SDGNDP
9	SHIELD	22	SHIELD
10	GROUND	23	GROUND
11,12,13	N/C	24,25	N/C

8. FIB Timing signal connector. 3M 25 mil pitch, 26 pin female connector.
9. FIB signal probe connector. 3M 25 mil pitch, 26 pin female connector.

Pin Number	Signal Name	Pin Number	Signal Name
1	ICFE_CLKH	2	ICFE_CLKL
3	C_CLK	4	C_CLK*
5	C_DATA	6	C_DATA*
7	C_C0	8	C_C0*
9	C_C1	10	C_C1*
11	C_C2	12	C_C2*
13	C_C3	14	C_C3*
15	C_C4	16	C_C4*
17	ICBE_CLKL	18	ICBE_CLKH
19	C_L1A	20	C_L1A*
21	CPIPE_RD2*	22	CPIPE_RD2

10. Digital output connector. Berg Electronics #91930-21141, 41 pin receptacle.

Pin Number	Signal Name	Pin Number	Signal Name
1	SHIELD	2	ICFE_CLKH
3	ICFE_CLKL	4	C_CLK
5	C_CLK*	6	C_DATA
7	C_DATA*	8	C_C0
9	C_C0*	10	C_C1
11	C_C1*	12	C_C2
13	C_C2*	14	C_C3
15	C_C3*	16	C_C4
17	C_C4*	18	ICBE_CLKL
19	ICBE_CLKH	20	C_L1A
21	C_L1A*	22	CPIPE_RD2*
23	CPIPE_RD2	24	+5V_DOIM
25	+2V_DOIM	26	+5V_DOIM
27	+2V_DOIM	28	+5V_DOIM
29	DGNDP	30	DGNDP
31	DGND5	32	DVDD5
33	DGND4	34	DVDD4
35	DGND3	36	DVDD3
37	DGND2	38	DVDD2
39	DGND1	40	DVDD1
41	N/C		

11. Analog output connector. Berg Electronics #91930-21141, 41 pin receptacle.

Pin Number	Signal Name	Pin Number	Signal Name
1	AG_1	2	UAV_1
3	AG_2	4	UAV_2
5	AG_3	6	UAV_3
7	AG_3	8	UAV_3
9	AG_4	10	UAV_4
11	AG_4	12	UAV_4
13	AG_5	14	UAV_5
15	AG_5	16	UAV_5
17	AG_5	18	UAV_5
19	N/C	20	N/C
21	DBGND1	22	DBP1
23	DBZ1	24	N/C
25	DBGND2	26	DBP2
27	DBZ2	28	N/C
29	DBGND3	30	DBP3
31	DBZ3	32	N/C
33	DBGND4	34	DBP4
35	DBZ4	36	N/C
37	DBGND5	38	DBP5
39	DBZ5	40	N/C
41	N/C		

- **Interconnections**

Each connector should have a one-to-one connection with its duplicate connector, beginning with pin 1. The following are the pairs of connector/duplicate connector: 1-2, 3-4, 5-6, 8-9.

The Analog low voltage connector (1) is connected to the Analog output connector (11) as follows:

Signal Name	Connector 1 Pin Number(s)	Connector11 Pin Numbers(s)	Signal Name	Connector 1 Pin Number(s)	Connector11 Pin Number(s)
UAV_1	1	2	AG_1	10	1
UAV_2	11,19	4	AG_2	2,20	3
UAV_3	3,21	6,8	AG_3	4,12	5,7
UAV_4	5,13,23	10,12	AG_4	6,14,22	9,11
UAV_5	17,19,21,23	14,16,18	AG_5	8,16,24,26	13,15,17

The Digital low voltage connector (3) is connected to the Digital output connector (10) as follows:

Signal Name	Connector 3 Pin Number(s)	Connector10 Pin Numbers(s)	Signal Name	Connector 3 Pin Number(s)	Connector10 Pin Number(s)
DVDD1	1	40	DGND1	16	39
DVDD2	31	38	DGND2	2	37
DVDD3	17	36	DGND3	32	35
DVDD4	3,33	34	DGND4	4,18	33
DVDD5	5,19	32	DGND5	20,34	31
+5V_DOIM	7,9,21,23,35, 37	24,26,28	DGNDP	6,8,22,24,36, 38	29,30
+2V_DOIM	11,25,39,41	25,27	DGNDP	10,12,26,40	29,30
DTERM	27	N/C	DGNDP	42	29,30
SHIELD	13	1	GROUND	28	29,30

The Bias voltage connector (5) is connected to the Analog output connector (11) as follows:

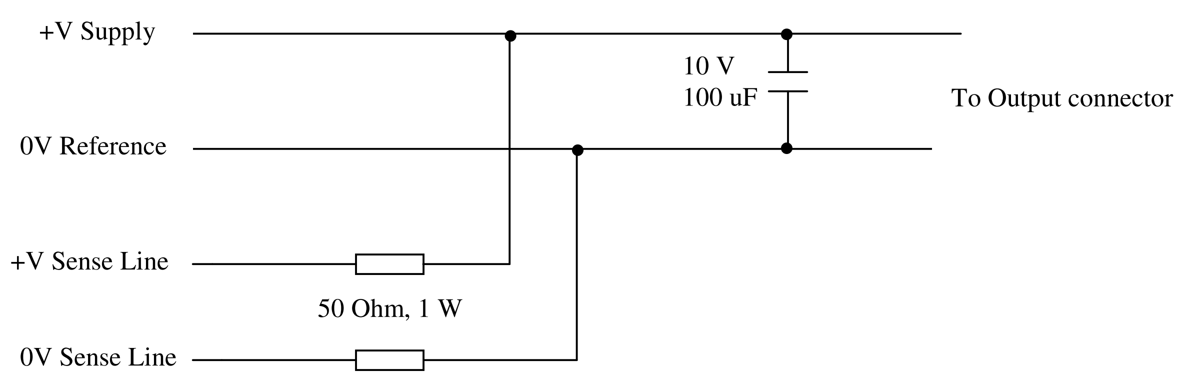
Signal Name	Connector 5 Pin Number(s)	Connector11 Pin Numbers(s)	Signal Name	Connector 5 Pin Number(s)	Connector11 Pin Number(s)
DBZ1	1	23	DBP1	14	22
DBGND1	2	21	DPZ2	15	27
DBP2	3	26	DBGND2	16	25
DBZ3	4	31	DBP3	17	30
DBGND3	5	29	DBZ4	18	35
DBP4	6	34	DBGND4	19	33
DBZ5	7	39	DBP5	20	38
DBGND5	8	37	SHIELD	9,21	N/C
GROUND	10,22	N/C			

The FIB timing signal connector (8) is connected to the Digital output connector (10) as follows:

Signal Name	Connector 8 Pin Number(s)	Connector10 Pin Numbers(s)	Signal Name	Connector 8 Pin Number(s)	Connector10 Pin Number(s)
ICFE_CLKL	1	3	ICFE_CLKH	2	2
C_CLK*	3	5	C_CLK	4	4
C_DATA*	5	7	C_DATA	6	6
C_C0*	7	9	C_C0	8	8
C_C1*	9	11	C_C1	10	10
C_C2*	11	13	C_C2	12	12
C_C3*	13	15	C_C3	14	14
C_C4*	15	17	C_C4	16	16
ICBE_CLKH	17	19	ICBE_CLKL	18	18
C_L1A*	19	21	C_L1A	20	20
CPIPE_RD2	21	23	CPIPE_RD2*	22	22

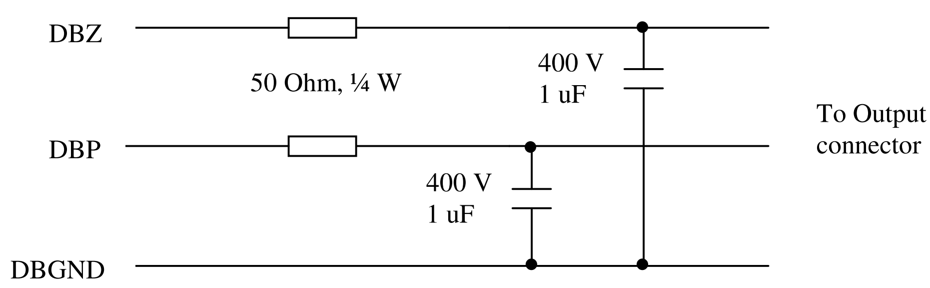
- **Storage Capacitors and Filter Circuits**

The supply lines +5V_DOIM, +2V_DOIM, and DVDD for all 5 layers have storage capacitors and are connected to remote sensing lines. The circuit arrangement is as follows:



The AVDD line for each layer also has a storage capacitor, as shown above, but there are no sense lines connected.

The bias lines have an RC filter. The circuit arrangement for these lines is as follows:



- **Parts List**

The following parts are required for each junction board:

- Resistors:

1. (14) 50 Ohms, 1 Watt rating
2. (10) 50 Ohms, ¼ Watt rating

- Capacitors:

1. (12) 100 uF, 10 Volt rating
2. (10) 1 uF, 400 Volt rating

- Connectors:

1. (2) Positronics Industries DFDD26, 26-pin female connector
2. (2) Positronics Industries DFDD44, 44-pin female connector
3. (3) AMP Electronics 1-745967-4, 25-pin male connector
4. (2) 3M 25-mil pitch, 26 pin female connector
5. (2) Berg Electronics 91930-21141, 41 pin receptacle