

J1 – I/O Connector

NOTE: For production boards, this is a blue 40-pin connector. The pin numbers on the schematic unfortunately are not the same as the connector numbering itself, for historical reasons! Pin 1 is in the upper right corner on the 40-pin connector.

Connector Pin No	Schematic Pin No	Function	Connector Pin No	Schematic Pin No	Function
1	35	TDC CLK+	2	36	TDC CLK-
3	33	TDC ENC+	4	34	TDC ENC-
5	31	TDC SDAT+	6	32	TDC SDAT-
7	29	TDC STB+	8	30	TDC STB-
9	27	TDO+	10	28	TDO-
11	25	TDI+	12	26	TDI-
13	23	TCK+	14	24	TCK-
15	21	TMS+	16	22	TMS-
17	19	DVdd sense	18	20	DGND
19	17	DVdd	20	18	DGND
21	15	DVdd	22	16	DGND
23	13	DGND*	24	14	DGND*
25	11	SHIELD*	26	12	SHIELD*
27	9	AGND*	28	10	AGND*
29	7	n.c.	30	8	n.c.
31	5	AVdd sense	32	6	AGND
33	3	AVdd	34	4	AGND
35	1	AVdd	36	2	AGND
37		n.c.	38		n.c.
39		n.c.	40		n.c.

* - connected only if corresponding jumper (JP30, JP31, JP32) are installed

JP1 – Threshold Jumper/Test Connector

Pin No.	Function
1	Select Threshold Pot
2	VT1 Test point
3	Select Threshold Common
4	VT2 Test point
5	Select Threshold DAC
6	Analog GND

Jumper 1-3 for Pot control
Jumper 3-5 for DAC control

Threshold is differential. Actual pulse threshold at the discriminator input is the voltage difference between VT1 and VT2. The common-mode voltage (Average of VT1 and VT2) should be about 1.65V.

J2, J3, J4 – LVDS Signal Test Connectors

Pin No	Function
1	Ch 1 +
2	Ch 1 –
3	Ch 2 +
4	Ch 2 –
5	Ch 3 +
6	Ch 3 –
7	Ch 4 +
8	Ch 4 –
9	Ch 5 +
10	Ch 5 –
11	Ch 6 +
12	Ch 6 –
13	Ch 7 +
14	Ch 7 –
15	Ch 8 +
16	Ch 8 –

These connectors provide access to the discriminator outputs from every ASD channel. The outputs are pairs of LVDS (differential) signals. They should be measured with either an LVDS receiver chip on a test fixture, or with two oscilloscope probes. In the latter case the oscilloscope should be set to subtract the two signals.

- J2 provides outputs from channels 1, 5 (top row of tubes)
- J3 provides outputs from channels 9, 13 (middle row of tubes)
- J4 provides outputs from channels 17, 21 (bottom row of tubes)

JP11, JP12, JP14 – Analog Signal Test Connectors

Pin No.	Function
1	Ch A +
2	Ch A –
3	Ch B +
4	Ch B -

These connectors provide a linear output from the ASD shaping amplifier. They are low-amplitude (about 30% of the signal level at the discriminator) and are meant to drive a scope probe only.

- JP11 provides outputs from channels 1, 5 (top row of tubes)
- JP14 provides outputs from channels 9, 13 (middle row of tubes)
- JP12 provides outputs from channels 17, 21 (bottom row of tubes)

J93 – Xilinx Programming Connector

Pin No.	Function
1	+3.3V
2	TCK
3	TMS
4	TDI
5	TDO
6	Digital GND

Note: This connector is intended for programming the Xilinx XC9572 FPGA which controls JTAG functions, using a Xilinx X-Checker cable only.

J6 – JTAG Test Connector

Pin No.	Function
1	TDO
2	TDI
3	TCK
4	TMS
5	TDINT (internal data connection between FPGA and AMT-1)
6	TRST
7	Digital GND
8	Digital GND

Note: This connector is intended for debugging only, and provides access to the TTL/CMOS level JTAG signals on the board.

JP8, JP10, JP9 – MDT Signal Input Connectors

Pin No.	Function
1	AGND
2	Channel 4 in
3	Channel 5 in
4	AGND
5	AGND
6	Channel 3 in
7	Channel 6 in
8	AGND
9	AGND
10	Channel 2 in
11	Channel 7 in
12	AGND
13	AGND
14	Channel 1 in
15	Channel 8 in
16	AGND

JP8 is for inputs 1-8 (top row of tubes)

JP10 is for inputs 9-16 (middle row of tubes)

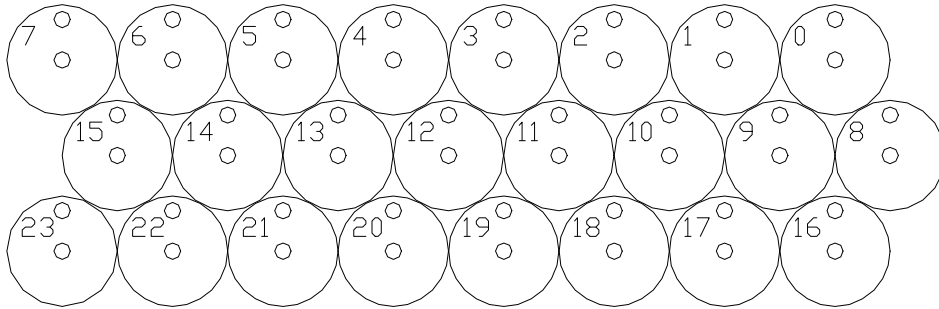
JP9 is for inputs 17-24 (bottom row of tubes).

Channel Numbers

Mezz Schematic	Input Header	TDC ch	ASD/input	Side
1	JP8/14	0	5/0	B
2	JP8/10	1	5/1	B
3	JP8/6	2	5/2	B
4	JP8/2	3	5/3	B
5	JP8/3	4	1/0	T
6	JP8/7	5	1/1	T
7	JP8/11	6	1/2	T
8	JP8/15	7	1/3	T
1	JP10/14	8	4/0	B
2	JP10/10	9	4/1	B
3	JP10/6	10	4/2	B
4	JP10/2	11	4/3	B
5	JP10/3	12	3/0	T
6	JP10/7	13	3/1	T
7	JP10/11	14	3/2	T
8	JP10/15	15	3/3	T
1	JP9/14	16	6/0	B
2	JP9/10	17	6/1	B
3	JP9/6	18	6/2	B
4	JP9/2	19	6/3	B
5	JP9/3	20	2/0	T
6	JP9/7	21	2/1	T
7	JP9/11	22	2/2	T
8	JP9/15	23	2/3	T

The mapping of TDC channel numbers to tube numbers for Type I and Type II hedgehog boards is given below.

TYPE I 3x8 Hedgehog



TYPE II 3x8 Hedgehog

