

FEB Production

Front End Board Testing on Support Plate

FEB Serial Nr.	Diode & Protection Res. Rework	Tested w/ 4 Hybrids FEB on Support Plate	Cleaned	Loaded on support plate	Comment
1	Yes	12/10/2014	-		Ben 12/15/14: "Board 1 wasn't getting a link when Omar tested last week. When I run on my desk with the test firmware it works fine. I recommend we flash the normal firmware back and try again." Omar 12/15/14: When hybrids are powered up, the current of CH 0 DVDD is ~0 and the currents of CH 1 and 2 AVDD are ~0. 1/27/15 - Fixed bad Hybrid regulators. Board seems to work now.
2	Yes	-	-	-	FEB mezzanine Amtech connector has been replaced but the board does not have any rework done. Ben 12/15/14 - Rework is now done. Had incorrect resistor divider on 3.3V rail resulting in 4.8 V output. May have damaged the FPGA. 1/24/15 - Took data. Not processed yet but board seems to work fine. 1/27/15 - PROM appears to have died. The FPGA config wont load on powerup and I can't program a new image into the prom. 1/30/15 - Sent to Amtech for PROM rework. This fixed it. Channel 3:2 is 0x3300 (probably ok). All others look good. 2/23/15 - Pelle: This board is dead according to Ben (sitting on his desk).
3	Yes	-	-	-	Waiting to be reworked. Initial test have shown that only 19/20 APV's can be synced. Ben 12/16/14 - Omar and were able to get all APVs to sync. Need to take data to see what noise looks like. Ben 01/16/14 - Issues observed in baseline ADC values with no hybrids attached. Replaced preamplifier circuit for hybrid channel 2, adc ch 2. Replaced ADC for hybrid channel 1. Baseline ADC values seem good now (~0x2000 on all 20 ADC channels). 1/25/15 - Hybrid0-ch3 and ch4 have high base and low peak.
4	Yes	12/10/14 results	-	-	Waiting to be reworked. Initial test have shown that, except for the edge channels, the noise on FEB CH 0-2 ranges from ~47-50 ADC counts. This is consistent with previous observations so these channels seem fine. There is a ripple in the noise present on FEB CH 03 and the noise across the whole hybrid is ~10 ADC counts higher than the rest of the channels. 1/25/15: All of FEB CH3 has high peaks and low bases. Board has normal 250MHz OSC instead of MEMS. 1/27/15: VTERM opamp that creates 1.25V reference for CH3 appears to be dead. Will replace. 1/30/15 - Sent to Amtech. Hy Ch 3 ADC and all CH3 preamps were replaced. Found bad cap (C354) on CH3 VTERM that Tan replaced. All channels sync well.
5	Yes	12/11/14 results	12/11/14	L4t	It looks fine.
6	Yes	12/11/14 results	-	L2-3b	The baseline and noise of FEB CH 00 has issues. Most of the events had a baseline at ~6150 ADC counts and the noise was ~900 ADC counts. The behavior worsened in subsequent runs. Ben 12/15/14: VREF level for CH 00 preamps was 1.8V instead of 1.25. This is now fixed. Board is awaiting retesting with the RCE. Omar 12/15/14: Looks fine after fix was applied.
7	Yes		-	L1b	This board looks fine.

8	Yes	12/11/14 results	12/11/14		This board looks fine. Update 1/14/15 - Board had 1 bad ADC channel. ADC2-CH2 reads 0x3200 on Ben's desk. Should be ~0x2000. Replaced ADC and now it looks good. 1/30/15 - Noticed bad channels on 0:2, 1:1, 1:3 and 2:2. Replaced these at Amtech. Now 0:2 and 1:4 are bad. VTERM is also 1.16 instead of 1.25. 2/23/16 - Pelle: This board is good according to Ben.
9	Yes	-	-		Ben 12/15/14 - Had short on C743. Fixed now. Needs testing with RCE. Omar 12/15/2014: Looks fine after fix was applied. Had power up issues when installed on plate. These issues haven't been seen when running on a bench. Not sure what's wrong but holding it out of the rotation. Pelle 2/23/16: Back to SLAC from JLab for testing.
10	Yes	12/11/14 results 1, results 2	12/11/14	L6t	After power cycling? everything looks fine now. 1/30/15 - U21 replaced at Amtech. Channel 2:4 is still bad.
11	Yes	12/10/14 results 1, results 2	12/11/214	L5t	Again, overall the noise looks fine (~50 ADC counts) but there seems to be some samples that still have a large shift in the noise. Looking at the baseline distribution, there seems to be some large tails so that's probably the problem (ADC sampling point is off?).
12	Yes	12/11/14 results	12/11/14	L5b	The baseline, once again, has tails but overall the noise looks fine on all FEB channels. The baseline and noise on FEB CH 1 and 3 have features similar to what we saw yesterday -- first sample noise is shifted by ~5-10 ADC counts. All other samples look fine.
13	Yes	12/10/14		L6b (installed 1/21/2015)	A link to the FEB couldn't be established. Board 13 has some known issues on its D1.0V rail Ben 12/15/14: Works on my desk. Seem to have intermittent problems. We should avoid using it in the system if we can. Omar 12/15/14: This board powers up fine, however, I was unable to sync any of the APV's. 1/21/15: Board 15 blew up, and this is the best working board of the spares. All channels sync fine. Installed in the system at L6b. 1/30/15: Board had wrong oscillator jumpers. Fixed now. Board went to Amtech to replace U15. All channels sync well now.
14	Yes	12/10/14 results	12/11/14	L2-3t	Looks fine.
15	Yes	12/10/14 results	12/11/14	L4b? (Replaced with 13 1/21/2015)	Baseline has tails and the shifts in the noise are present on the same APV's as before (on CH 1) but otherwise it looks fine. 1/21/15: A+2.9V_DVDD regulator circuit blew up. Replaced regulator. Still see issues. Cant reach 2.9V. Likely a bad cap somewhere. 1/23/15: Replaced all of the bypass caps on A+2.9V_DVDD. Voltage seems stable now. 1/25/15: All Channels sync. All base and peak values look good.

Front End Board Map

FEB S/N	Device DNA	Fd Serial	Loaded	Tested	Results	Status	Mounted on FEB cold plate	Servicing hybrids /layer	Notes
1	0x14084072 beb01c00	0xdb000015 df877001	09/2014	10/XX /2014 (OM)		OK	Yes		
2			09/2014			BAD	No		10/02/2014: DVDD is flaky. Seems like FPGA is unable to completely power up. - Missing pin found on the terminal side of the FEB
3	0x74d04072 beb01c00	0x42000015 df80ca01	09/2014	10/XX /2014 (OM)		OK	Yes		10/28/2014: Broken pin found on the terminal side of HV connector. The pin is redundant so the HV should be unaffected.
4	0x70d04072 beb01c00	0x53000015 dfa68a01	09/2014	10/XX /2014 (OM)		OK	No		
5	0x58d04072 beb01400	0x4d000015 df9e2101	09/2014	10/XX /2014 (OM)		OK	Yes		

