



US CMS EMU

ME1/2 chamber AFEB-ALCT cabling/integration

Prepared by N.Bondar
Revision #4 01/15/03

List of material

Items 2-13 must be installed on the chamber before the cables installation.

Position #	Assembly component	part number	Quantity
1	ME1/2 chamber with cooling pad		1
2	AFEB/P	MC-400010	18
3	AFEB bracket	MB-400055	18
4	Screw M4 x10 (thread forming)	MA-400049	36
5	AFEB/s stack assembly	MC-400011	2
6	AFEB/s assembly cover	MD-400028	2
7	AFEB input cables:		
	Input 1 - 2.5"	MC0400070	2
	Input 2 - 5.0"	MC0400071	2
	Input 3 - 7.5"	MC0400072	2
8	AFEB cover stand-off	MB-400021	3
9	Screw M6 x25 (thread forming)	BN	6
10	Cable strain relief clamp bottom part	MC-400017	1
11	Cable strain relief clamp top part	MC-400017	1
13	Screw M6 x18	BN610	6
	AFEB-ALCT cable set:		
14	3 Pitch LH	MC-400073	3
15	3 Pitch RH	MC-400074	6
16	4 Pitch LH	MC-400075	3
17	4 Pitch RH	MC-400076	6
18	5 Pitch RH	MC-400077	6
19	Cable tie	PLT4S-M 14-1/2	8
20	Cable tie	PLT4S-M	25
21	Cable strain relief part	RBPR-110	24
22	Screw M5 x25 (thread forming)	BN	12
	Tooling:		
	Torque wrench		1
	Power screwdriver with adjustable torque	#11137	1
	Craftsman 111370 or equivalent		
	Screwdriver Philips		1
	Screwdriver flat		1
	Screwdriver socket 7 mm		1
	Screwdriver socket 8 mm		1
	Screwdriver socket 10 mm		1
	Hex screwdriver 5 mm		1
	Wire cutter		1
	Jig:		
	Cable clamp holder		12
	Other material:		
	Alcohol		10g

Before the cable installation:

- Install the cooling pad on the chamber - 1, TDME-400000
 - Install ALCT board on the cooling pad - 2,
 - Install the bottom part of the cable strain relief clamp MC-400017 on the cooling pad - 3,
 - Install the anode amplifier boards (AFEB):
 - 4 - MC-400011
 - 4a - MC-400010
 - Install the AFEB cover standoff MB-400021 - 5,
- See Fig.1 for reference.
To install these components use corresponding instructions.

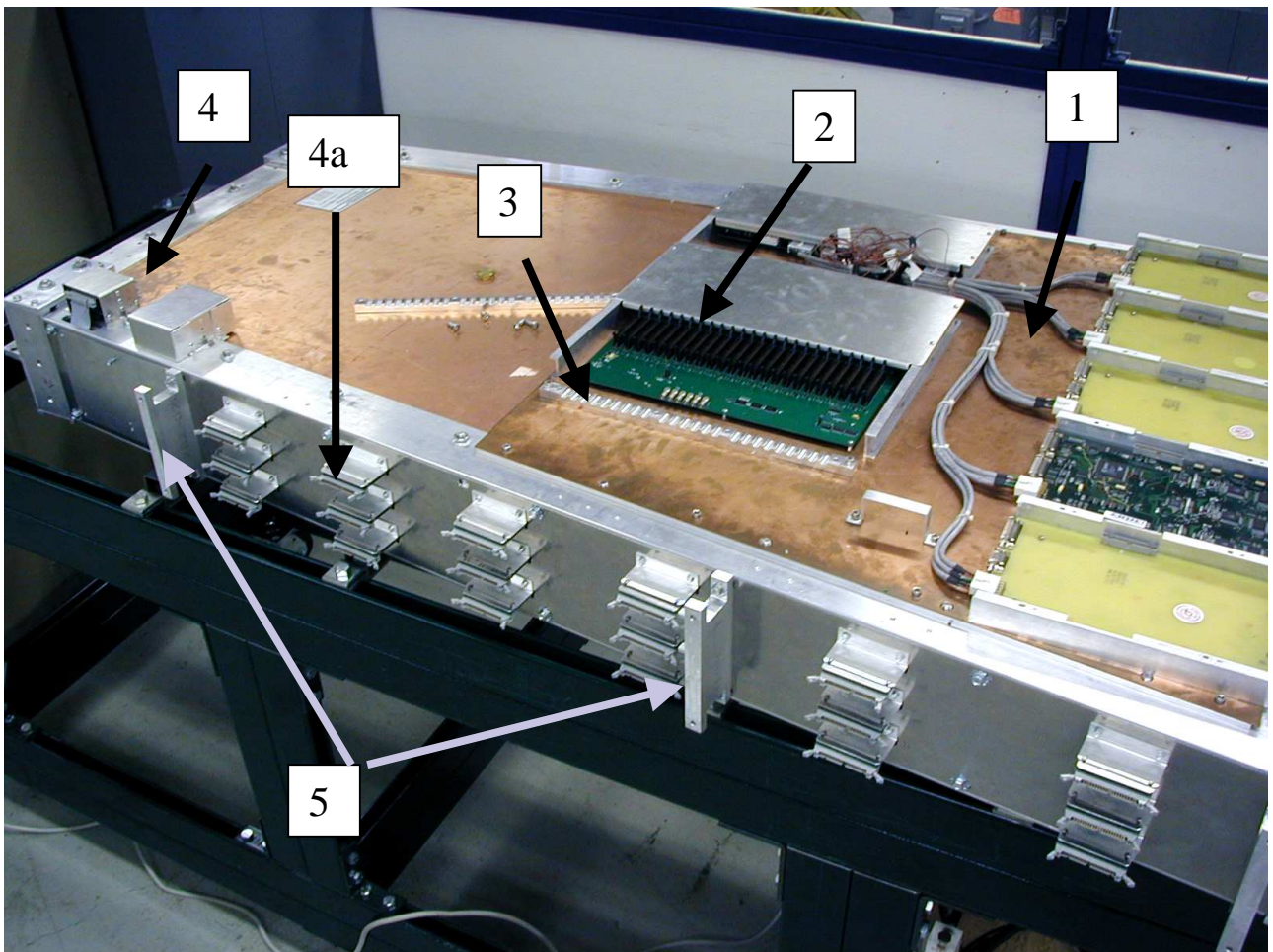


Fig.1. ME1/2 chamber prepared for cable installation

Cables installation.

- Connect AFEb-ALCT cables to the ALCT boards. The cable number must match the ALCT input connector number. Start connecting from the largest cable number.

Note: The cable drawing number label is located on the ALCT side of the cable!

- Spread the cables along the cable strain relief clamp in the corresponding slots.
- Install the top part of the strain relief clamp with M6 screws and tighten the cables firmly but gently. Avoid the cable pinching.

See Fig.2 for reference.

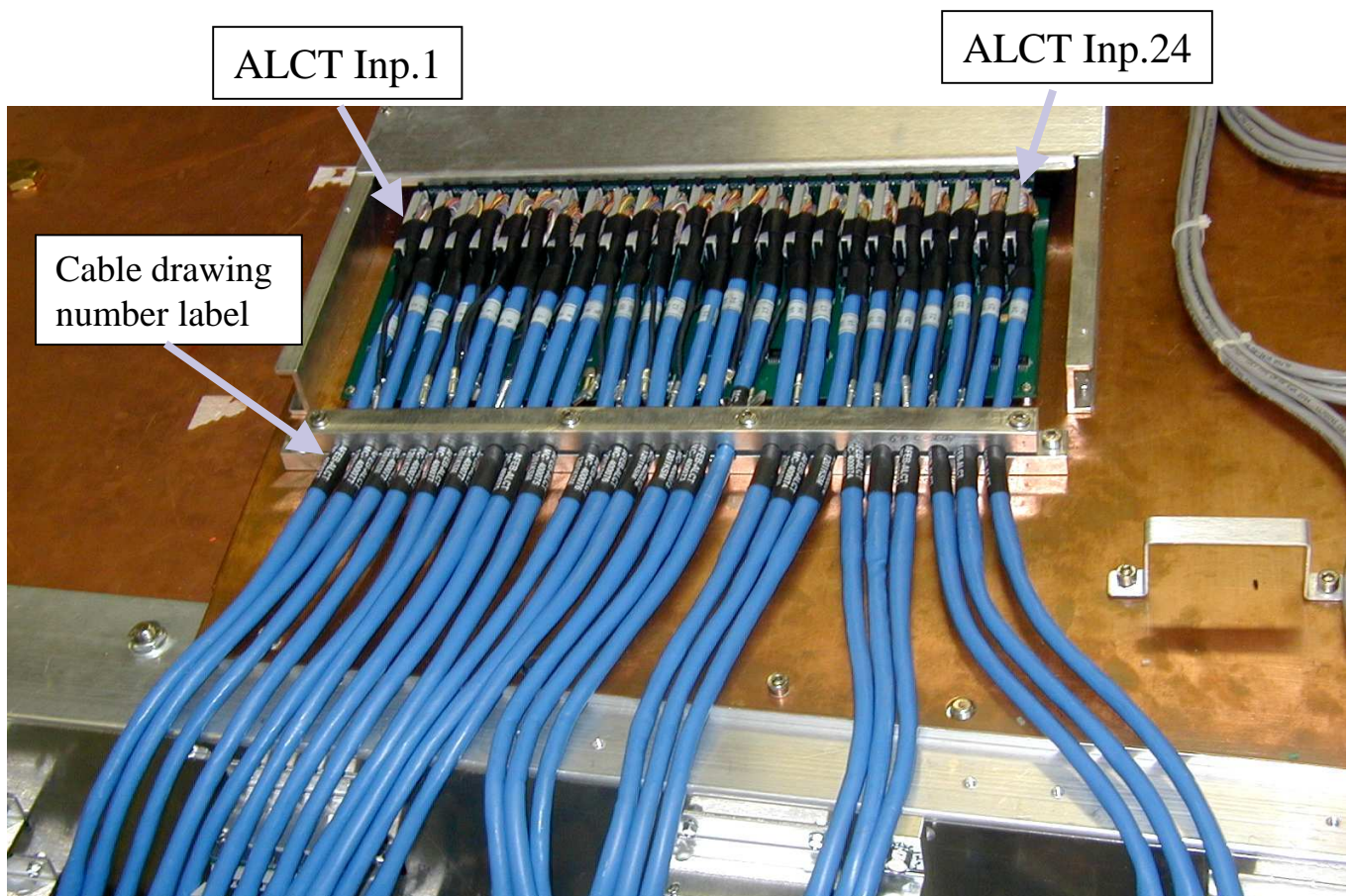


Fig.2. Cables clamped near the ALCT input

- Stretch the cables numbered 1, 2, 3 along the chamber, with the cable number 1 on the bottom, then the cable number 2, and the cable number 3 on the top. Fix that three cables into a bundle using the metal cable clamp holders.
 - Stretch the next three cables 4, 5, 6 in the same order, using the same technique.
 - Stretch the next three cables 7, 8, 9 in the same order, using the same technique.
 - Stretch the next three cables 10, 11, 12 in the same order, using the same technique.
- See Fig.3, Fig.3a for reference.

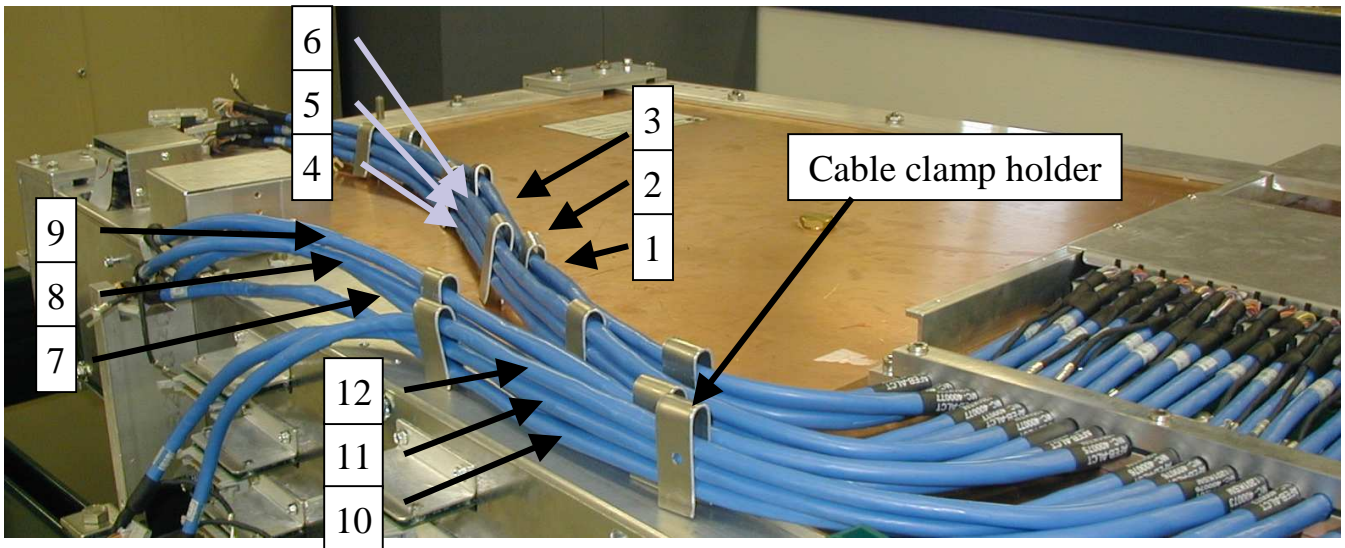
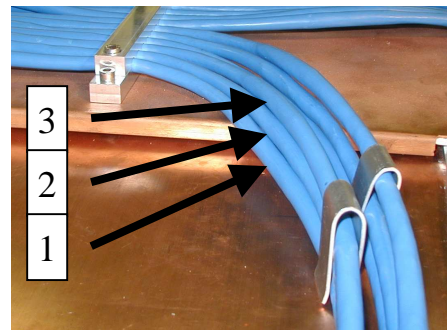


Fig.3. Pre-aligned cables on the top of the chamber

Fig.3a. The vertical cable order



- Fix cables 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 on the chamber frame with the cable strain relief RBPR –110.
- Arrange all cables in the natural order. See Fig.4 for reference

RBPR –110 cable strain relief installation.

The RBPR-110 strain relief consists of two identical plastic parts to clamp two cables between. To clamp the cable into the strain relief, use a M5 x 25 thread-forming screw and a 8 mm screwdriver socket. There are unthreaded holes in the chamber frame fitted to the screw. Use alcohol as a lubricant to install the screws. The maximum allowed torque to use on the screws is 18 pounds-inch.

Notice that for the bundles of 3 cables, one of the slots in the strain relief is not used.

See Fig. 4.

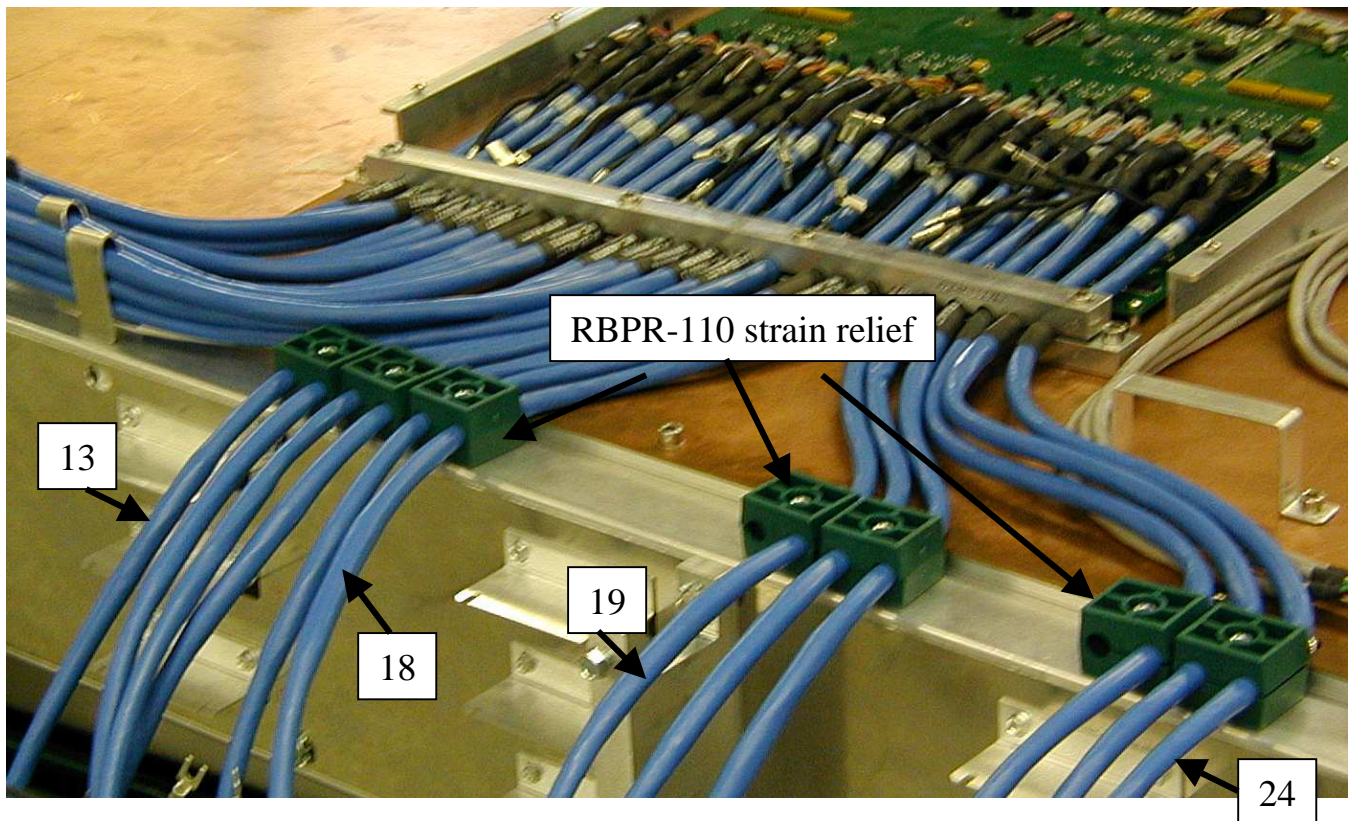


Fig.4. Cables fixed on the chamber frame.

- Equalize the curvature of cables 7, 8, 9, 10, 11 and 12 and then tighten them into one bundle using two PLT4S-M 14-1/2" cable ties. Remove the metal cable clamps during the tightening. Put one cable tie near the edge of the cooling pad, and the second one about 4" further away. See Fig. 5.
- Stretch these cables out along the chamber, and fix them into the strain relief RBPR-110 in the following order from left to right: 7, 8, 9, 10, 11, and 12.
- Equalize the curvature for cables number 1, 2, 3, 4, 5 and 6 and tighten them into one bundle using four 14-1/2" cable ties, PLT4S-M. Remove the metal cable clamps during the tightening. Put one tie near the edge of the cooling pad, and spread the other three ties along the bundle, as shown in Fig. 5.

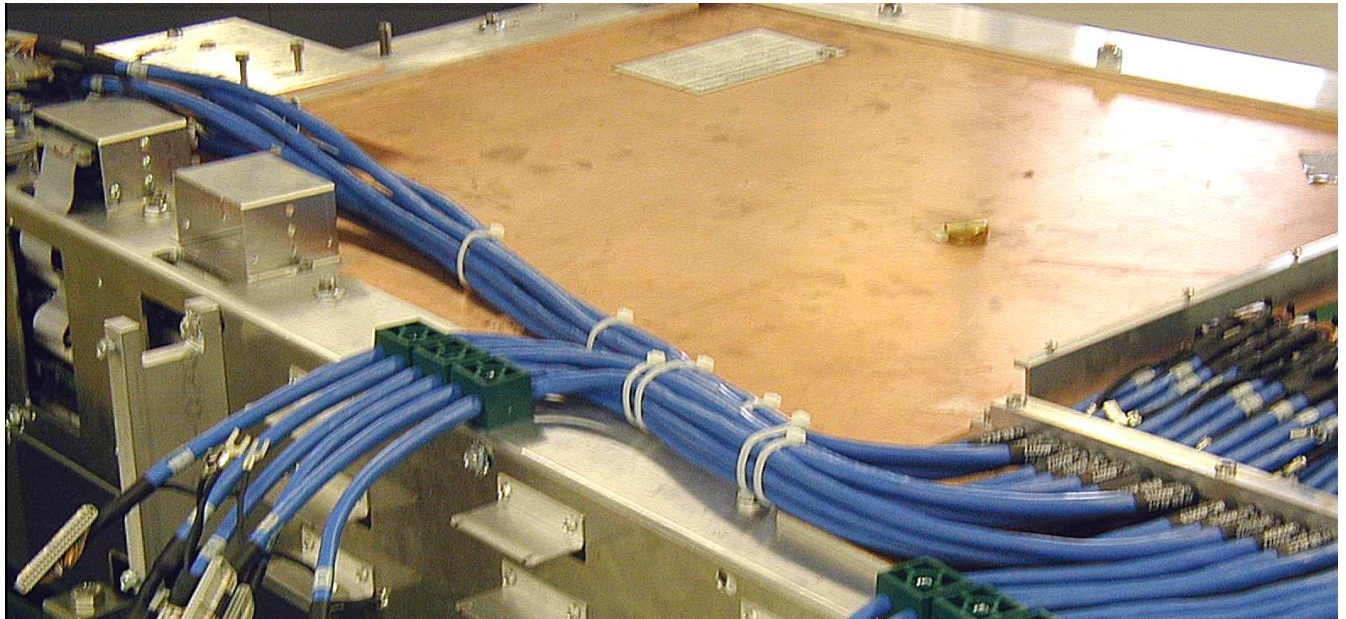
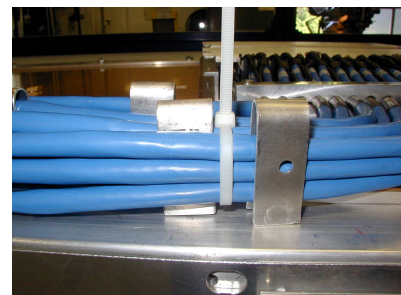


Fig.5. The position of long cables on top of the chamber.

Fig.5a. The best way to tighten cables between two clamps



- Connect cables 1,2,3 and 4,5,6 to the corresponding AFEB outputs, located on the top of the chamber. Match the label numbers on the cable to the numbers in chart on the top of the boxes.
- Tighten the cables to the special brackets using 142 mm cable ties, PLT1.5I-M.
- Attach the lug on the end of the cable grounding tail to the chamber using a metal sheet screw.
See Fig.6, Fig.6a, Fig.6b for reference.

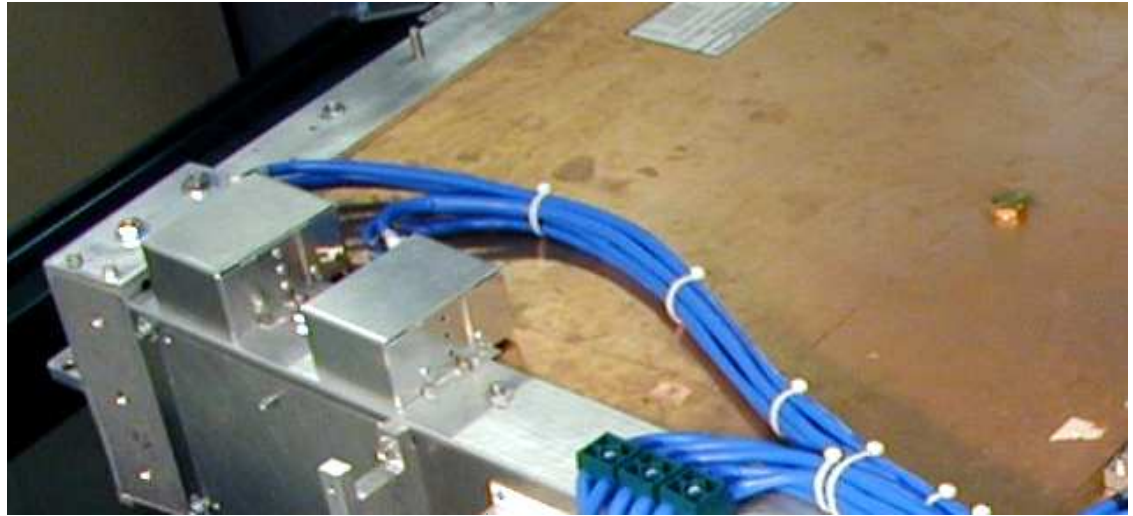


Fig.6. Cables connection to the stacked AFEB/s



Fig.6a. Ground lug connection to the AFEB stack assembly.



Fig.6b. Cables fixation with the cable tie at the AFEB stack assembly strain relief bracket.

- Connect the other cables to the corresponding AFEB outputs, matching the cable label number to the number on the chamber side panel next to each AFEB.
- Screw the black cable grounds to the ground lugs."
See Fig.7, Fig.7a, Fig.7b for reference.

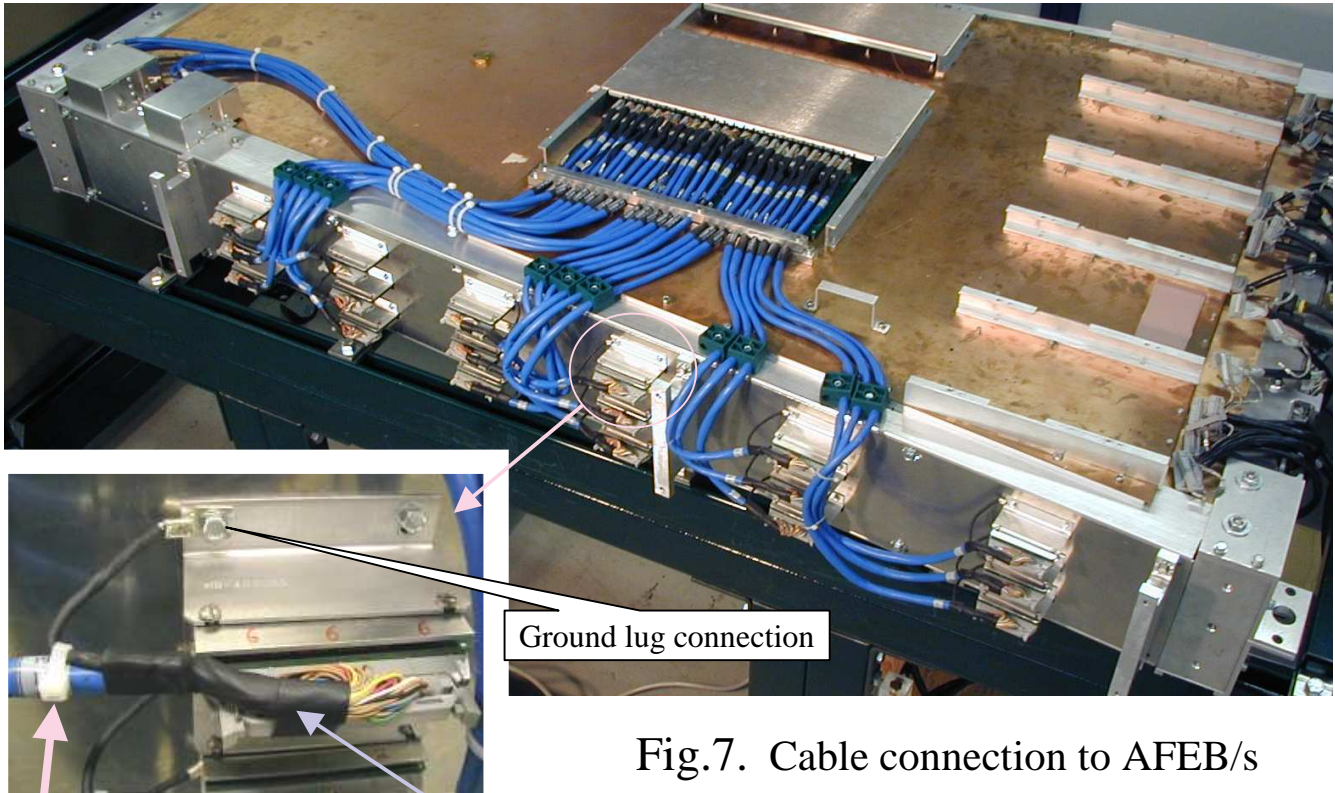


Fig.7. Cable connection to AFEB/s

Important note:

On the AFEB side the cable must go along the connector side wall, not on the top of the connector.

If necessary, put an extra cable tie to make the ground wire shorter for keeping the cable in the correct position.

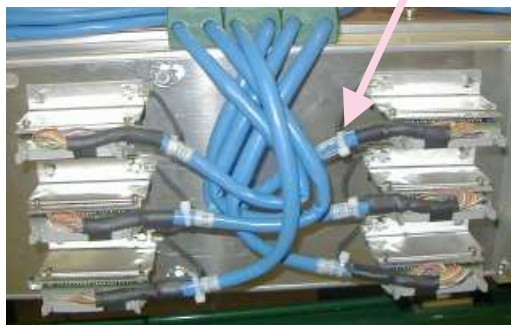


Fig.7a. Cable layout for AFEB/s #7- #18



Fig.7b. Cable layout for AFEB/s #19 - #24