

Figure 9: CARMA Correlator 15-antenna band indexing. A CARMA band uses 8 digitizer boards, 5 fanout boards, and 11 correlator boards. The band is housed in two compact PCI crates controlled by a single CPU (the crates are connected using PCI-to-PCI bridges). Correlator boards must be fed either from digitizer boards directly, or from fanout boards (this keeps the clock skews between cables from the digitizer boards close). The correlator boards calculate 10 cross-correlations and use three different FPGA configurations to ensure all possible cross-correlations are calculated. See Figure 10 for the 105-unique cross-correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	0-1	0-2	0-3	0-4	0-5	0-6	0-7	0-8	0-9	0-10	0-11	0-12	0-13	0-14	0
		1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	1-11	1-12	1-13	1-14	1
			2-3	2-4	2-5	2-6	2-7	2-8	2-9	2-10	2-11	2-12	2-13	2-14	2
				3-4	3-5	3-6	3-7	3-8	3-9	3-10	3-11	3-12	3-13	3-14	3
					4-5	4-6	4-7	4-8	4-9	4-10	4-11	4-12	4-13	4-14	4
						5-6	5-7	5-8	5-9	5-10	5-11	5-12	5-13	5-14	5
							6-7	6-8	6-9	6-10	6-11	6-12	6-13	6-14	6
								7-8	7-9	7-10	7-11	7-12	7-13	7-14	7
									8-9	8-10	8-11	8-12	8-13	8-14	8
										9-10	9-11	9-12	9-13	9-14	9
											10-11	10-12	10-13	10-14	10
												11-12	11-13	11-14	11
													12-13	12-14	12
														13-14	13

Correlator Board Index

Figure 10: CARMA Correlator 15-antenna, 105-baselines. The baselines are shown in terms of their antenna indices. The antenna indices are converted to antenna numbers using the antenna map. The figure also shows the correlator board indices where the correlations are calculated.

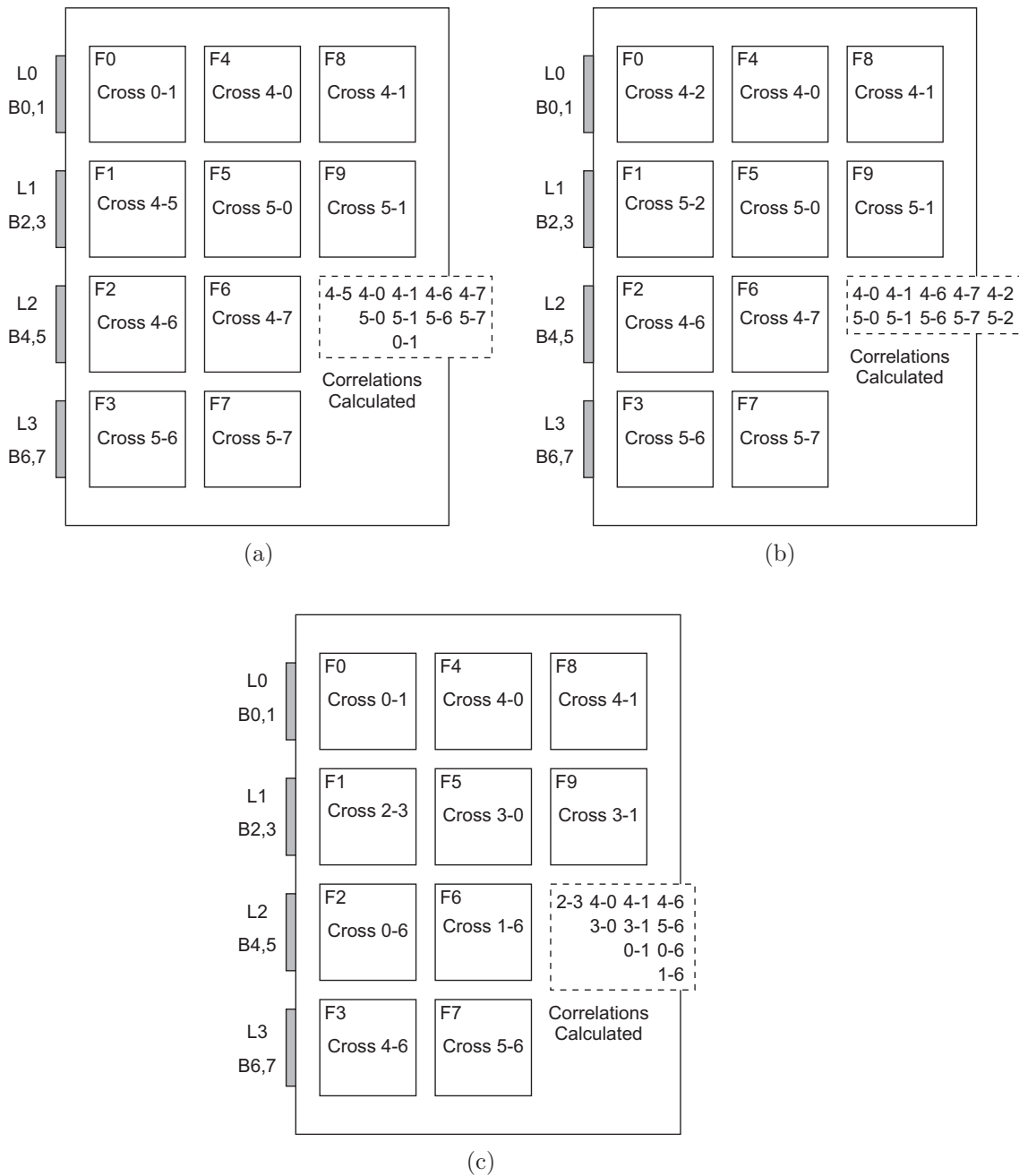


Figure 11: CARMA FPGA configuration lags locations. The CARMA Correlator uses three correlator board FPGA configurations; Configuration (a) #1, (b) #2, and (c) #3. The figure shows the correlations calculated based on the LVDS connector bus indices. These bus indices are mapped back to antenna indices using the cable map. See CARMA Memo#7 for more details on the FPGA routing.