

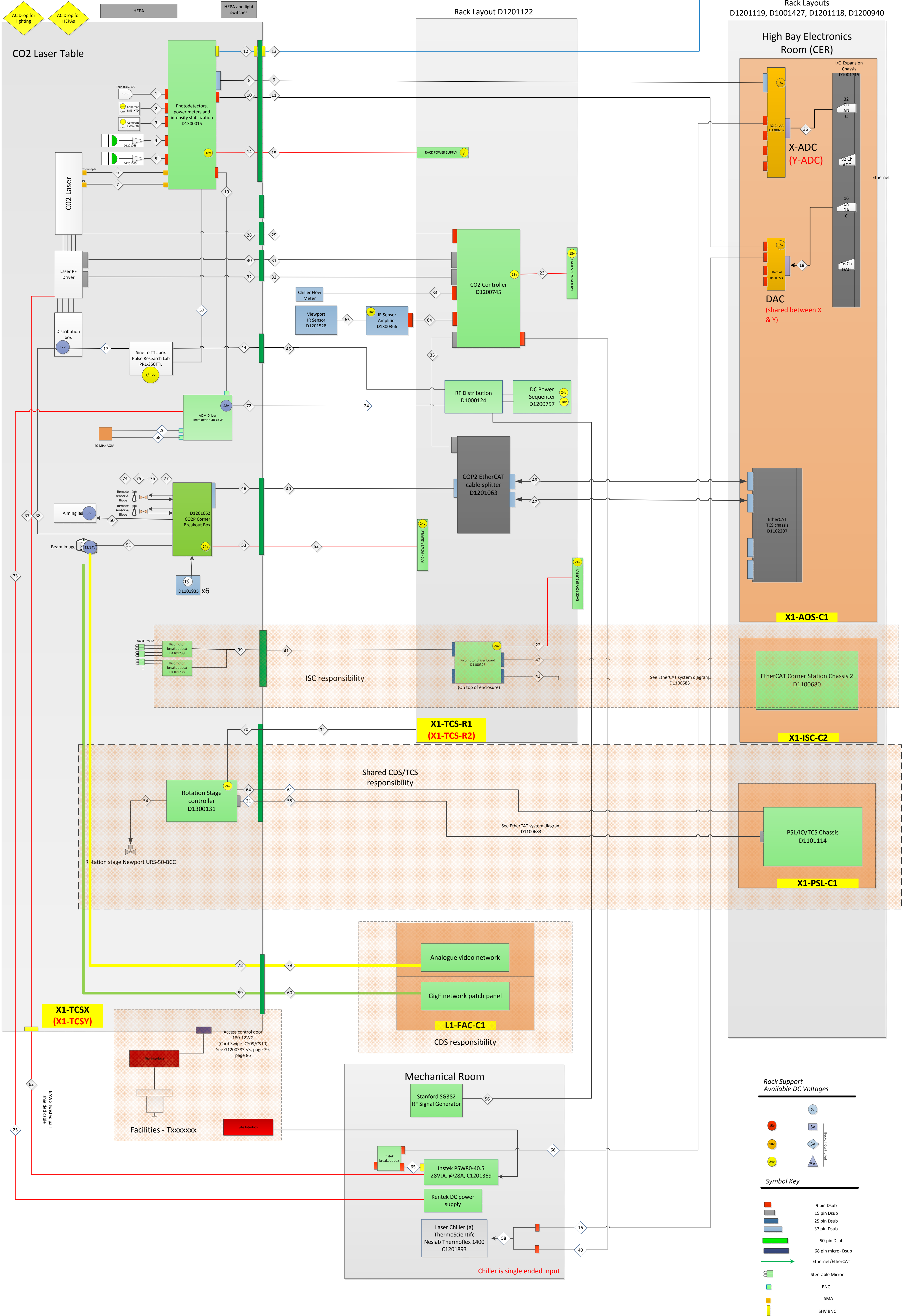
E1100892-v24 (page 1 of 5)

Corner Station (H1, L1) CO2 Laser projector (X & Y)

25-April-2014

This page shows the electronics layout for one TCS CO2 Laser Projector table. There are 2 such tables at each site, one for X-arm and one for Y-arm. These are identical, each having it's own laser table and field rack. This is denoted here by use of the X-arm names in black and Y-arm names in red.

The X and Y arms share one DAC (noted below as shared). The X and Y arms have separate ADCs (shown here in black for X arm and red for Y arm).



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Corner Station (H1, L1)

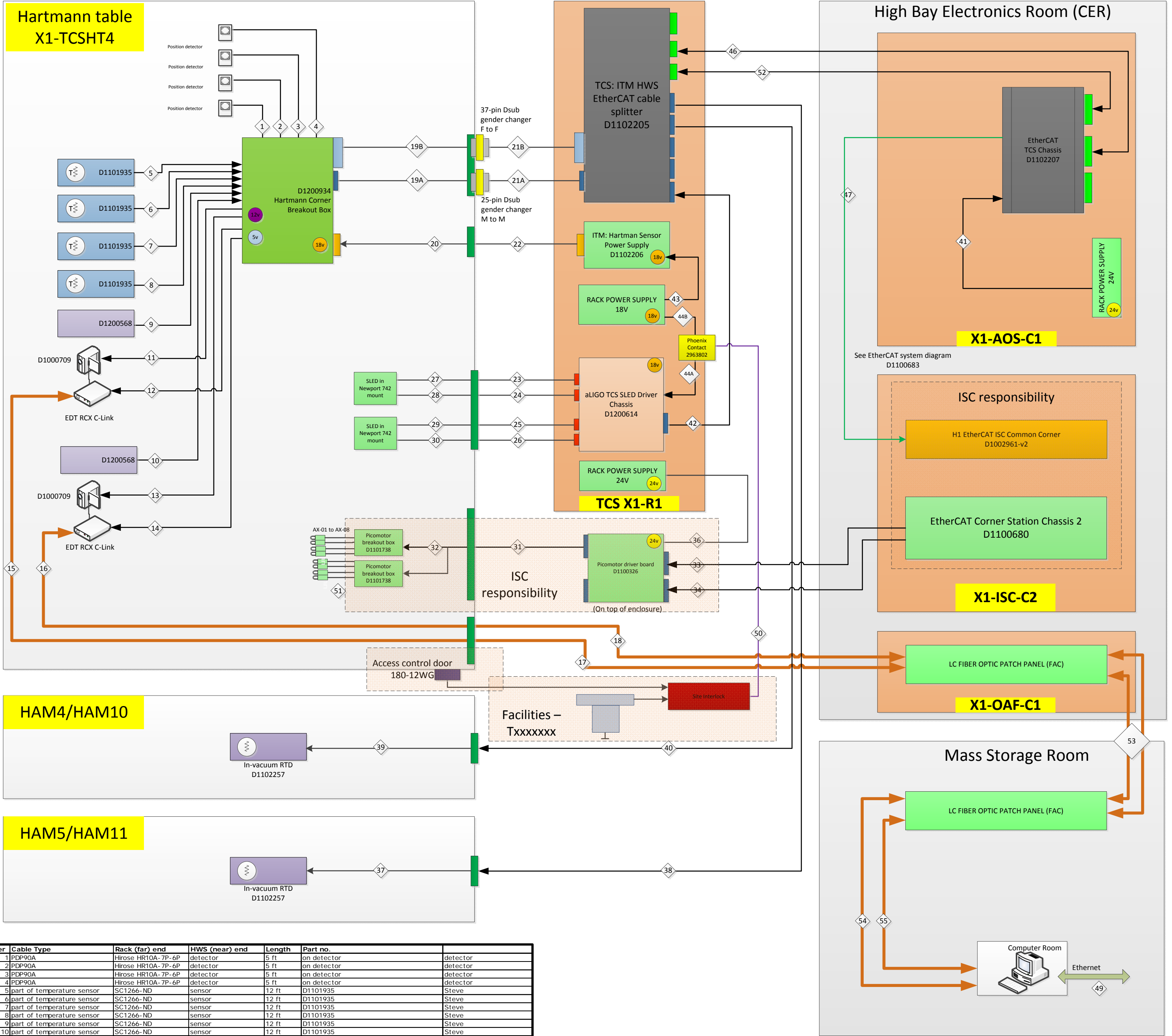
CO2 Laser projector X cables

Cable No.	colloquial name	Table end	Rack end	From / To	Cable type (part number)	Length	Price per cable	Total cost	Comments	Cable Designator
1	power meter extension	DB9 (f)	DB9 (m)	Table / ISS box on table	twisted pair	20ft			Extension cable	
2&3	QPD extension	D25 (f)	D25 (m)	Table / ISS box on table	twisted pair	20ft			Extension cable	
4&5	PD cable	D9 (f)	D9 (m)	PD / ISS	twisted pair	10ft				
6	laser pzt	SMA (m)	SHV (m)	Laser PZT / ISS box on table	100V rated coaxial	20ft			HV color and rating	
7	laser thermopile	SMA (m)	BNC (m)	Laser Thermopile / ISS box on table	coaxial	20ft				
8	ISS analogue outs	D37 (f)	D37 (m)	ISS box / Feedthrough	twisted pair	8ft				
9	ISS analogue outs to CER, H1-AOS-C1	D37 (f)	D37 (m)	TCSX feethrough / H1-AOS-C1	twisted pair	120ft			TCSX feedthrough to H1R1 (18')+H1R1 to B (63')+B to electronics room (29') + 10ft = 120'	
10	ISS inputs	D9 (f)	D9 (m)	ISS box / feedthrough	twisted pair	8ft				
11	ISS inputs from CER, H1-AOS-C1	D9 (f)	D9 (m)	TCSX feethrough / H1-AOS-C1	twisted pair	120ft			TCSX feedthrough to H1R1 (18')+H1R1 to B (63')+B to electronics room (29') + 10ft = 120'	
12	HV supply for PZT	SHV (m)	SHV (m)	ISS box / feedthrough	100V rated coaxial	8ft				
13	HV supply for PZT	SHV (m)	SHV (m)	TCSX feethrough / (CPR) X1-VDC-C6	100V rated coaxial	150ft			TCSX feedthrough to H1R1(18') +H1R1 to B (63') + B to X1-VDC-C4 (there is no C6 noted in diagram) 41' + 18' C4 to C6 +10' = 150'	
14	power to ISS	connec 24V	connec 24V	ISS box / Feedthrough		8ft				
15	power to ISS	connec 24V	connec 24V	Feedthrough / TCS-X1R1		40ft			Feedthrough to ground 8' + table to rack (low route) 20' ground to top of rack 8' +4ft = 40ft	
16	Laser chiller control	D15 (m)	D15 (f)	Mechanical room / H1-AOS-C1		155ft			Mech room to B 114' + B to H1-AOS-C1 29' +10ft, rounded up to 155ft	
17	TTL to RF splitter	sma	sma	table / table		3ft				
18	IO expansion chassis to AI				LCOM CA900-MM-2M			\$47.95	\$47.95	One cable shared with both tables
19	ISS to AOM analogue in	BNC (m)	BNC (m)	ISS box / Feedthrough		8ft				
20	not used									
21	rotation stage control	D15 (f)	D15 (m)	Feedthrough / Rotation stage control		15ft				
22	power picodriver	connec 24V (f)	connec 24V (m)	TCS-X1R1 / TCS-X1R1		8ft				
23	CO2 control/interlock	connec 24V (f)	connec 24V (m)	TCS-X1R1 / TCS-X1R1		8ft				
24	RF distribution to AOM driver patch panel	BNC (m)	BNC (m)	TCS X1R1 / Feedthrough		40ft			Rack to B 63' + B to mechanical room Rack to B (63') + B to mech room (114")+ 10ft = 187. Rounded to 190ft	
25	AOM driver power	connec 2pin (f)	washer ends 2pin (m)	TCS X1R1 / Mechanical room		190ft			Rack to B (63') + B to mech room (114")+ 10ft = 187. Rounded to 190ft	
26	AOM drive to AOM	BNC (m)	BNC (m)	AOM to AOM driver		20ft			10ft along, 5ft down, +5ft extra = 20ft	
27	not used									
28	Laser RTD extension	D9 (m)	D9 (f)	Laser / Feedthrough		20ft			10ft along, 5ft down, +5ft extra = 20ft	
29	Laser RTD extension	D9 (m)	D9 (f)	Feedthrough / TCS-X1R1		40ft			Feedthrough to ground 8' + table to rack (low route) 20' ground to top of rack 8' +4ft = 40ft	
30&32	Laser control	D-subminiature 15 (f)	D-subminiature 15 (m)	RF driver / Feedthrough		20ft			10ft along, 5ft down, +5ft extra = 20ft	
31&33	Laser control	D-subminiature 15 (f)	D-subminiature 15 (m)	Feedthrough / TCS-X1R1		40ft			Feedthrough to ground 8' + table to rack (low route) 20' ground to top of rack 8' +4ft = 40ft	
34	Flowmeter	Omega HN100542-15	D9 (m)	BSC3/ TCS-X1R1		40ft			Rack to B (63') + B to mech room (114")+ 10ft = 187. Rounded to 190ft	
35	Ethercat splitter to Interlock	D15	D15	TCS-X1R1 / TCS-X1R1		10ft			Cable needs to be long enough to come from back of rack to front	
36	IO expansion chassis to AA				LCOM CA900-MM-2M			\$47.95	\$47.95	One cable per table.
37	Laser power cable	5pin connec for 8AWG	5pin connec for 8AWG	Feedthrough / table		20ft			Connects to existing power connector on RF drive using 5pin connec	
38	RF splitter power	760k (m)	760k (m)	table / corner breakout		25ft				
39	Picomotor	D9 (m)	D25(f)	Picomotor breakout / Feedthrough		20ft				
40	Chiller fault cable	D15	D15	Mechanical room/TCS-X1R1		200ft				
41	Picomotor	DB25	DB25	Feedthrough / Picomotor driver		10ft			What is the location of this board?	
42	Ethercat corner station to picomotor	DB25	DB25	CER (X1-ISC-C2) / X Table		150ft			H1-ISC-C2 to B (52') + B to H1R1 (63') + H1R1 to TCSX (18') + 17ft = 150ft	
43	Ethercat splitter to picomotor	DB25	DB25	CER (X1-ISC-C2) / X Table		150ft			H1-ISC-C2 to B (52') + B to H1R1 (63') + H1R1 to TCSX (18') + 17ft = 150ft	
44	RF to laser	sma	sma	Feedthrough / TTL box	coaxial	20ft				
45	RF to laser	sma	sma	TCS X1R1/Feedthrough /	coaxial	40 ft			TCSX to TCS X1-R1 18', Rack to B (63') + B to mech room (114")+ 10ft = 205. Rounded to 210ft	
46&47	Ethercat splitter to ethercat box	D37 (m)	D37 (f)	TCS X1R1 / H1-AOSC1	twisted pair	112ft			H1R1 to B (63')+B to electronics room (29') + 20ft = 112'	
48	corner breakout to ethercat splitter	D37 (m)	D37 (f)	Table / Feedthrough	twisted pair	16ft				
49	corner breakout to ethercat splitter	D37 (m)	D37 (f)	Feedthrough / TCS-X1R1		40ft			Feedthrough to ground 8' + table to rack (low route) 20' ground to top of rack 8' +4ft = 40ft	
50	aiming laser power	DB9(f)	DB9 (m)	table / corner breakout		24ft				
51	beam imager power	DB9(f)	Custom camera power (m)	table / corner breakout		15ft			Connects to existing wire for FLIR	
52	power to corner breakout	connec 24V (f)	connec 24V	Feedthrough / TCS-X1R1		40ft			Feedthrough to ground 8' + table to rack (low route) 20' ground to top of rack 8' +4ft = 40ft	
53	corner breakout power	connec 24V (f)	connec 24V (m)	Table / Feedthrough		16ft				
54	rotation stage control to stage	D15 (f)	D15 (m)	Rotation stage controller to rotation stage		1m				
55	EtherCAT to rotation stage	15pin Dsub (male)	15pin Dsub (female)	X1-PSL-C1 / Feedthrough		100ft			TCSX feedthrough to H1R1(18') +H1R1 to B (63') + B to H1-PSL-C1 (34') +19' = 100ft	
56	Oscillator to splitter	BNC	TNC	Mechanical room / TSC X1R1		200ft			One cable for both tables	
57	Power for TTL square wave generator		DB9 (m)	Table / ISS box on table	3 conductor	25ft				
58	Chiller splitter cable	DB15	2x DB9	Mech room/ mech room		3 ft				
59	GigE connection	Ethernet	Ethernet	Camera / TCSX feedthrough		16ft				
60	GigE connection	Ethernet	Ethernet	TCSX feedthrough / Hanford equivalent to L1-FAC-C1 H1-UNK-C4		?			What is Hanford rack equivalent to L1-FAC-C1	
61	rotation stage control power	2pin Dsub - 649-DE2V2SA00LF	2pin Dsub - 649-DE2V2PA00LF	X1-PSL-C1 / Feedthrough		100ft			TCSX feedthrough to H1R1(18') +H1R1 to B (63') + B to H1-PSL-C1 (34') +19' = 100ft	
62	Laser power cable	5pin connec for 8AWG	ring terminals	Feedthrough TCSX/ Mechanical room	8AWG 4connector	210ft			TCSX to TCS X1-R1 18', Rack to B (63') + B to mech room (114")+ 10ft = 205. Rounded to 210ft	
63	Power supply interlock	Mil 26 pin connector(OMRON XG4 IDC plug)	Site Interlock System	Mechanical room / mechanical room					Pins 2 and 12 shorted to shutdown supply	
64	rotation stage control power	2pin Dsub - 649-DE2V2SA00LF	2pin Dsub - 649-DE2V2PA00LF	Feedthrough / Rotation stage control		15ft				
65	Instek IO cable splitter	OMRON connector	D9	Mechanical room / mechanical room		6 ft				
66	Instek power ADC cable	D9	D9	Mechanical room/CER		200 ft				
67	not required									
68	AOM interlock	BNC	BNC	Table/table		24ft				
69	not required									
70	rotation stage controller 24V cable	3-pin conec	3-pin conec	Feedthrough/table		7ft				
71	rotation stage controller 24V cable	3-pin conec	3-pin conec	TCS X1R1/Feedthrough /		40ft				
72	AOM RF input cable	BNC	BNC	Feedthrough/ AOM driver		8 ft				
73	AOM main power cable	DB9	bare wire to terminal block	Feedthrough/AOM driver		8ft				
74	Flipper 1 actuator cable	SMA	SMA	table/table		8 ft				
75	Flipper 1 power cable	SMA	Switchcraft	table/table		8ft				
76	Flipper 2 actuator cable	SMA	SMA	table/table		8 ft				
77	Flipper 2 power cable	SMA	Switchcraft	table/table		8 ft				
78	FLIR analogue OUT cable	BNC	BNC	Table/feedthrough		8ft				
79	FLIR analogue OUT cable	BNC	BNC	Feedthrough/analogue video network port		150 ft				

Corner Station (H1, L1) – HWS X & Y

(HWS-X and HWS-Y are housed on the same table)

(X1 = H1, L1)



Number	Cable Type	Rack (far) end	HWS (near) end	Length	Part no.	
1	PDP90A	Hirose HR10A-7P-6P	detector	5 ft	on detector	detector
2	PDP90A	Hirose HR10A-7P-6P	detector	5 ft	on detector	detector
3	PDP90A	Hirose HR10A-7P-6P	detector	5 ft	on detector	detector
4	PDP90A	Hirose HR10A-7P-6P	detector	5 ft	on detector	detector
5	part of temperature sensor	SC1266-ND	sensor	12 ft	D1101935	Steve
6	part of temperature sensor	SC1266-ND	sensor	12 ft	D1101935	Steve
7	part of temperature sensor	SC1266-ND	sensor	12 ft	D1101935	Steve
8	part of temperature sensor	SC1266-ND	sensor	12 ft	D1101935	Steve
9	part of temperature sensor	SC1266-ND	sensor	12 ft	D1101935	Steve
10	part of temperature sensor	SC1266-ND	sensor	12 ft	D1101935	Steve
11	9-wire	9-pin D Sub -M	6-pin Hirose	6 ft	D1200566	Steve
12	9-wire	9-pin D Sub -M	760K Switchcraft M	6 ft	D1200567	Steve
13	9-wire	9-pin D Sub -M	6-pin Hirose	6 ft	D1200566	Steve
14	9-wire	9-pin D Sub -M	760K Switchcraft M	6 ft	D1200567	Steve
15	Fiber-optic	LC	LC	2.0 m	L-Com FODLC50-CL-02	L-Com
16	Fiber-optic	LC	LC	2.0 m	L-Com FODLC50-CL-02	L-Com
17	Fiber-optic	LC	LC	100ft	L-Com CA LC LC 50DX OFR OR 100F	L-Com
18	Fiber-optic	LC	LC	100ft	L-Com CA LC LC 50DX OFR OR 100F	L-Com
19A	25-wire cable	25-pin D Sub F	25-pin D Sub M	10 ft	L-Com CRMN25MF-10	Steve
19B	37-wire cable	37-pin D Sub M	37-pin D Sub F	10 ft	L-Com CRMN37MF-10	Steve
20	5-wire - 18 gauge	5-pin Conec - M	5-pin Conec - F	10 ft	D1200571	Steve
21A	25-wire cable	25-pin D Sub F	25-pin D Sub M	15 ft	L-Com CRMN25MF-15	Steve
21B	37-wire cable	37-pin D Sub M	37-pin D Sub F	15 ft	L-Com CRMN37MF-15	Steve
22	5-wire - 18 gauge	5-pin Conec - M	5-pin Conec - F	15 ft	D1200571	Steve
23	15-wire	15-pin Dsub - M	15-pin Dsub - F	15 ft	L-Com CRMN15MF-15	Steve
24	9-wire	9-pin Dsub - M	9-pin Dsub - F	15 ft	L-Com CRMN9MF-15	Steve
25	15-wire	15-pin Dsub - M	15-pin Dsub - F	15 ft	L-Com CRMN15MF-15	Steve
26	9-wire	9-pin Dsub - M	9-pin Dsub - F	15 ft	L-Com CRMN9MF-15	Steve
27	15-wire	15-pin Dsub - M	15-pin Dsub - F	10 ft	L-Com CRMN15MF-10	Steve
28	9-wire	9-pin Dsub - M	9-pin Dsub - F	10 ft	L-Com CRMN9MF-10	Steve
29	15-wire	15-pin Dsub - M	15-pin Dsub - F	10 ft	L-Com CRMN15MF-15	Steve
30	9-wire	9-pin Dsub - M	9-pin Dsub - F	10 ft	L-Com CRMN9MF-15	Steve
31	25-wire	25-pin Dsub - M	25-pin Dsub - F	15 ft	L-Com CRMN25MF-15	Steve
32	25-wire	25-pin Dsub - M	2x 9-pin Dsub - F	10 ft	D1300484	Steve
33	25-wire	25-pin Dsub - M	25-pin Dsub - F	122 ft	D1002956	Steve
34	25-wire	25-pin Dsub - M	25-pin Dsub - F	122 ft	D1002956	Steve
35	n/a					
36	3-wire - 10 gauge	3-pin Conec - (FMF)	3-pin Conec - (FMF)	15 ft	D1002209 [Option 2]	Steve
37	in-vacuum temperature sensor cables				D1102257 + SYS connector to flange	Vacuum
38	4-wire	25-pin Dsub - M	25-pin Dsub - F	42 ft	D1002956	Steve
39	in-vacuum temperature sensor cables				D1102257 + SYS connector to flange	Vacuum
40	4-wire	25-pin Dsub - M	25-pin Dsub - F	85 ft	D1002956	Steve
41	3-wire 10-gauge	3-pin Conec - (FMF)	3-pin Conec - (FMF)	5 ft	D1002209 [Option 2]	Steve
42	25-wire	25-pin Dsub - F	25-pin Dsub - M	5 ft	L-Com CRMN25MF-5	Steve
43	3-wire - 10 gauge	3-pin Conec - M	3-pin Conec - F	6 ft	D1002209 [Option 1]	Steve
44A	3-wire - 10 gauge	3-pin Conec - M	3-pin Conec - F	3 ft	D1002209 [Option 1]	Steve
44B	3-wire - 10 gauge	3-pin Conec - M	3-pin Conec - F	3 ft	D1002209 [Option 1]	Steve
45	no longer required					
46	50-pin cable	50-pin D Sub M	50-pin D Sub F	122 ft	E1200842	Steve
47	Ethernet			250 ft		
48	Ethernet			30 ft		
49	Ethernet			30 ft		
50	Safety cable					
51	New Focus 8816-6			7 ft	part of pico-motor	pico-motor
52	50-pin cable	50-pin D Sub F	50-pin D Sub M	122 ft	E1200842	Steve
53	Fiber-optic cables	SITE				
54	Fiber-optic	LC	LC	30 ft	L-Com Custom	L-Com
55	Fiber-optic	LC	LC	30ft	L-Com Custom	L-Com

Rack Support Available DC Voltages

- 15v
- 12v
- 5v
- 5v
- 5v
- 24v

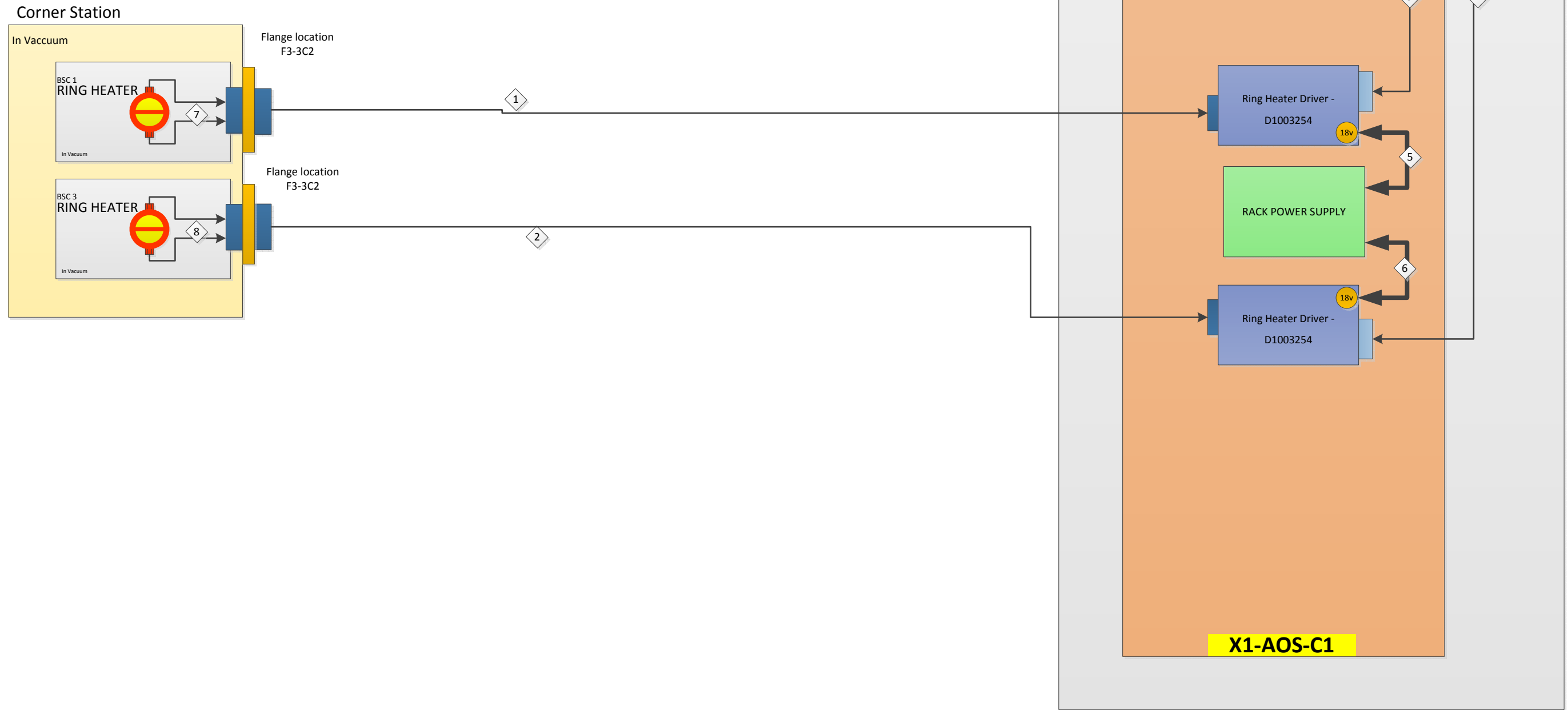
Symbol Key

- 25 pin Dsub
- 15 pin Dsub
- 37 pin Dsub
- 9 pin Dsub
- 50-pin Dsub
- 68 pin micro- Dsub
- Signal path OUT
- Signal path IN
- Ethernet/EtherCAT
- Duplex optical fiber
- Laser safety cables
- Uniblitz shutter
- Steerable Mirror

Corner Station (H1, L1)

Ring Heater X & Y

Rack Layouts D1201119



Number	Cable Type	Rack (far) end	RH (near) end	Length	Part no.
1	25 pin Dsub	25-pin Dsub M	25-pin Dsub - F	140 ft	L-Com Custom
2	25 pin Dsub	25-pin Dsub M	25-pin Dsub - F	140 ft	L-Com Custom
3	37 pin Dsub	37-pin Dsub - F	37-pin Dsub - M	5 ft	
4	37 pin Dsub	37-pin Dsub - F	37-pin Dsub - M	5 ft	
5	Conec	Conec 3-pin	Conec 3-pin	5 ft	
6	Conec	Conec 3-pin	Conec 3-pin	5 ft	
7	RH Cable Assy	n/a	n/a	n/a	D1001517
8	RH Cable Assy	n/a	n/a	n/a	D1001517