Control box

2: PIC microcontroller, I/O board

1: Single board computer

3: power management (converters, battery management)

Conduit to rim

Conduit to PAX

AWE5 (AR1)

R'

POF

AWC13 AWC11 AWC12 AWC10

AWC9

5V

5V

AWC4

A
B

AWC3

B
B

AWC2

A
B

AWE13

T
B

T
B

Elevation Encoder

B

AWE7

AWE17

24V HVaux
24V brakes

CAT5 AWC6

AWC7 9V AWC8 24V

A A

10BASE-FL/10BASE-T
Media converter

Power supply:
120 VAC input
24 VDC output

AWC1 IEC-320

A B

AWE4

AWC5

A

9P

A

AWE14

B

Battery

AC-MMF (SC)

AWE12

AWE16

B Float

AWE15

Azimuth

Encoder

R'

AWE5

AWE1

pot

AWE18

B

A

AWE19

ATA Alidade Relay Board
2005 Sep 19 (1.0)

AWE2

120 VAC
14AWG

110 VAC
14AWG

Transformer
1 kVA

AWE3

ECW3 Elevation Can

L T

El brake

ECW1

Terminal

M

El motor

ECW2

AWE6

AWE10

Driver box

- dual axis board
- 120 VAC, 24 VDC
- fuses
  - rectifiers, capacitors inside box

Daughter-board

LM 35

AWD4

AWD5

AWD3

Dual-axis drive board

D15 D25 D15 D25 LM 35

amplifier

LM 35

amplifier

AWD1 IEC-320

A

B

AWD2

A
B

AWE11

C Az brake

M

Az motor

B

AWE9

Wout, Vout, Uout, GND, Brake1, Brake2

AWE8

Win, Vin, Uin, A, /A, B, /B, X, /X, 5V, GND, Temp

AS-SMF

March 15, 2006
alidadewireharness.xls
ATA42fiberDistribution.doc

COMPUTER
RESET

MOTION
STOP

From
alidade (to
removable
connector)

To
alidade

H

N

G

From
node
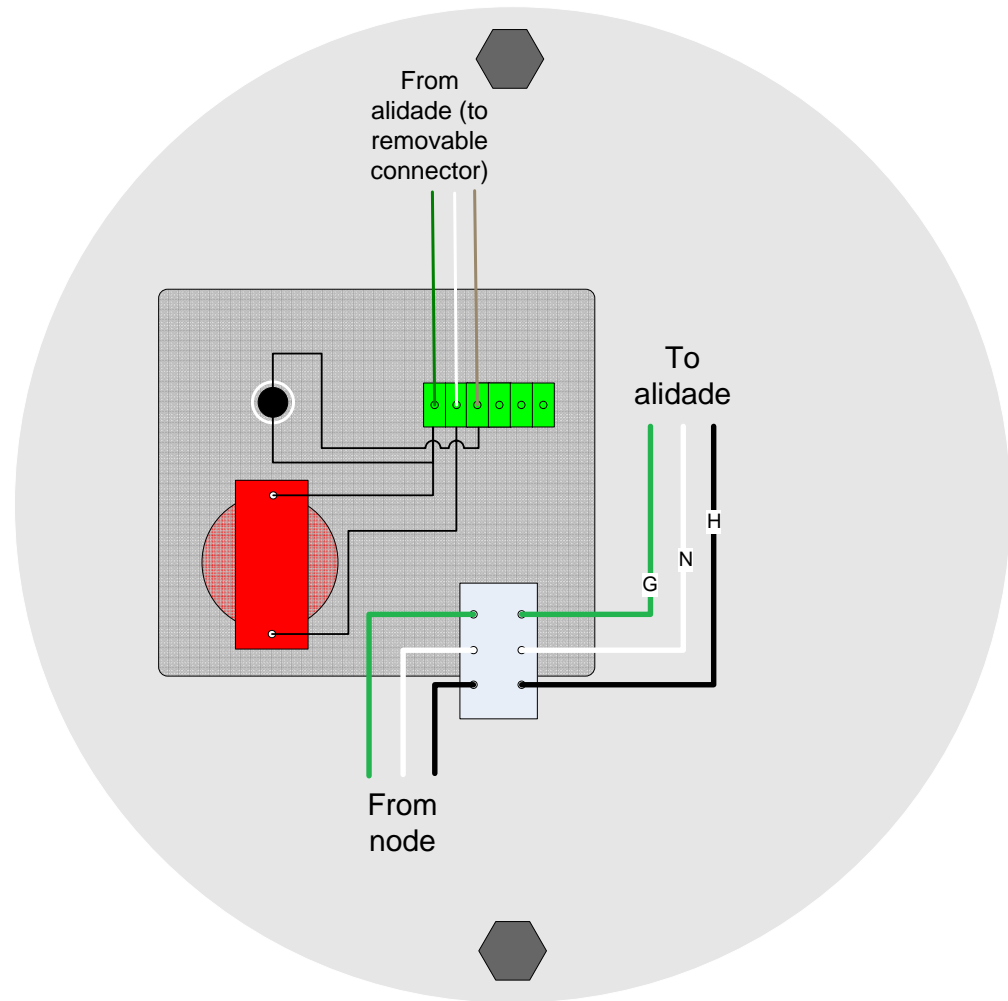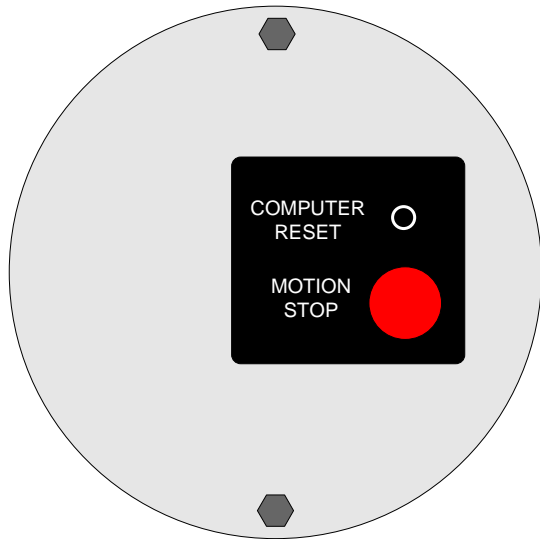
Alidade wire harnessing Enclosure

Reference ELMCOverview.vsd

15-Mar-06

AWE1		Input power wires through pedestal						
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires	1	120VAC		65 strand wire	white	#12		
	2	Return		Beldon 8527	black	#12		
	3	Ground		Beldon 8520	green	#14		
Ends	A	bare wire	screw terminal block behind pie-plate					
	B	39860-0103	Molex terminal on Alidade Relay Board					

AWE2		Transformer						
	A	**Description**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires	1	120VAC		These wires except Ground are all on the toroid, we provide connector	white	#14		
	2	Return			black	#14		
	3							
	4	100VAC			red	#14		
	5	Return			red	#14		
End	A	39860-0105	Molex connector on alidade relay card					

AWE3		Power to motors						
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires	1	110VAC		Use standard power cord and chop off plug	black	#14		2 ft
	2	Return			white	#14		
	3	Ground			green	#14		
Ends	A	39860-0104	Molex connector on alidade relay board					
	B	IEC-320	right angle plug on drive box					

AWE4		Power for control box						
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires	1	120VAC		Use standard power cord and chop off plug	white	#18		
	2	Return			black	#18		
	3	Ground			green	#18		
Ends	A	39860-0103	Molex connector on alidade relay board					
	B	IEC-320	right angle plug on control box (may not exist in rt angle?)					

AWE5		Power for rim power box		(also called **AR1**)				
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires	1	120VAC		wire	black	#14		
	2	Return			white	#14		
	3	Ground			green	#14		
Ends	A	39860-0103	Molex connector on alidade relay board					
	B	ParlBlade U Gnd	connector in rim power box					

AWE6		15-wire cable from alidade relay board to drive box						
	A	**Description**	**B**	**Comment**		**Size**		**Length**
Wires/pins	1	az brakes +24V	1	1&9 are controlled with the main drives transformer power				
	2	Ground	2					
	3	24V aux	3			all #24		23"
	4	Ground	4					
	5	drive enable +	5	5&13 are connected through relay contacts which are closed				
	6	Ground	6	when the main drives transformer power relay is latched				
	7	Az cw limit	7	7&15 are connected to 8 via NC switches				
	8	Az limit common	8					
	9	el brakes +24V	9					
	10	Ground	10	Belden 9947	maybe			
	11	24V aux	11	awaiting quote from cablestogo.com				
	12	Ground	12					
	13	drive enable -	13					
	14	Ground	14					
	15	Az ccw limit	15					
Ends	A	D15P	Dsub to alidade relay board					
	B	D15S	Dsub to drive box		connects to AWD2A			

AWE7	25-wire cable from alidade relay board to control box							
	A	**Description**	**B**	**Comment**				**Length**
Wires/pins	1	brakes +24V	1	1,3,5,11,14,16,18, 24 are power and control signals from the				
	2	Ground	2	control box				
	3	24V aux	3					
	4	Ground	4					
	5	5V sensor +	5					
	6	Ground	6					
	7	float in	7	7,8,9,10,12,13,20,21,22,23,25 are logic and sensor signals				
	8	T input1 -	8	returning to the control box				
	9	T input2 -	9					
	10	Az brake sense	10					
	11	Latch	11	main drives transformer power is latched by holding 24 logic high				
	12	Pot 1	12	while pulsing 11 logic low-high-low				
	13	Pot wiper	13	wrap pot is wired to relay board such that resistance between 13				
	14	brakes +24V	14	and 25 increases when azimuth rotates cw				
	15	Ground	15					
	16	24V aux	16					
	17	Ground	17					
	18	5V sensor -	18	awaiting quote from cablestogo.com				
	19	Ground	19					
	20	T input1 +	20					
	21	T input2 +	21					
	22	electronics reset	22					
	23	El brake sense	23					
	24	Unlatch	24					
	25	Pot 2	25					
Ends	A	D25S	Dsub to alidade relay board					
	B	D25P	Dsub to control box					

AWE8	motor power and brakes for azimuth							
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires/pins	1	W1	W		purple	#14		
	2	W2						
	14	W3						
	15	W4						
	3	N/C						
	16	N/C						
	4	V1	V		brown	#14		
	5	V2						
	17	V3						
	18	V4						
	6	N/C						
	19	N/C						
	7	U1	U		blue	#14		
	8	U1						
	20	U1						
	21	U1						
	9	N/C						
	22	N/C						
	10	G1	Ground		green	#14		
	11	G2						
	23	G3						
	24	G4						
	12	BP			blue	#16		
	13	BM			blue	#16		
	25	SHIELD			shield	shield		
Ends	A	D25P	filtered D25S on board					
	B	39-01-2063-P/39-00-0041-C						
	C	39-01-3023-P/39-00-0041-C	wires part of brake					

AWE9 — encoders and hall's for azimuth

	A	Description	B	Comment	Color	Size	Twist	Length
Wires/pins	1	N/C		GND on board	N/C			
	2	U			brown			
	3	V			gray			
	4	W			white			
	5	GND			black		V	
	6	X			purple		Z	
	7	B			green		Y	
	8	A			blue		X	
	9	thermal sensor		GPIN5	orange		W	
	10	GND thermal sensor		GND	orang/white		W	
	11	Vcc (+5V)			red		V	
	12	N/C		GND on board	N/C			
	13	/X			purple/blk		Z	
	14	/B			green/blk		Y	
	15	/A			blue/blk		X	
Ends	A	D15P	filtered D15S on board					
	B	M						

AWE10 — extender for motor power and brakes for elevation (plugs into ECW1)

	A	Description	B	Comment	Color	Size	Twist	Length
Wires/pins	1	W1						
	2	W2	W					
	14	W3						
	15	W4						
	3	N/C						
	16	N/C						
	4	V1						
	5	V2	V					
	17	V3						
	18	V4						
	6	N/C						
	19	N/C						
	7	U1						160"
	8	U1	U					
	20	U1						
	21	U1						
	9	N/C						
	22	N/C						
	10	G1						
	11	G2	Ground					
	23	G3						
	24	G4						
	12	BP						
	13	BM						
	25	SHIELD						
Ends	A	D25P	plugs into D25S on board					
	B	bare wire	terminal strip					

AWE11 — extender for encoders and hall's for elevation (plugs into ECW2)

	A	Description	B	Comment	Color	Size	Twist	Length
Wires/pins	1	N/C		GND on board				
	2	U						
	3	V						
	4	W						
	5	GND					V	
	6	X					Z	
	7	B					Y	
	8	A					X	160"
	9	thermal sensor		GPIN5			W	
	10	GND thermal sensor		GND			W	
	11	Vcc (+5V)					V	
	12	N/C		GND on board				
	13	/X					Z	
	14	/B					Y	
	15	/A					X	
Ends	A	D15P	filtered D15S on board					
	B	bare wire	terminal strip					

AWE12	encoder for azimuth			(P/N: R176H-03600Q-5L10-AT40SP-24MN)				
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
	1	A			yellow			
	2	B			green			
	3	IND			blue			
	4	N/C			shield			
	5	+V			red			
	6	/A			brown			
	7	/B			orange			
	8	/IND			white			
	9	COMMON			black			
	A	D9P		Dsub on control box				
	B	--		cable part of encoder				

AWE13	encoder for elevation			(P/N: 9220S03600D5L10D99SP04EA)				
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
	1	A			yellow			
	2	B			green			
	3	IND			blue			
	4	N/C			shield			
	5	+5V			red			
	6	/A			brown			
	7	/B			orange			
	8	/IND			white			
	9	COMMON			black			
	A	D9P		Dsub on control box				
	B	--		cable part of encoder				

AWE14	battery for control box							
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	
	1	+12V	1	Only 2 wires	red			
	2	+12V	1		red			
	3	N/C						
	4	GND	2		black			
	5	GND	2		black			
	6	+12V	1		red			
	7	N/C						
	8	N/C						
	9	GND	2		black			
	A	D9S						
	B	Spade						

AWE15	Signal from relay board to pie-plate			LappUSA (Olflex) 900P Cable, 3 conductor #24, 811442				
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	
	1	M-stop	1		white	#24		
	2	reset	2		brown	#24		
	3	GND	3		green	#24		
	A	Molex 43645-0300/43030-009		on alidade relay board	(Jameco 338360/337738)			
	B	bare		terminal behind pie plate				

AWE16	signal from az oil float							
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	
	1					#24		
	2							
	A	Molex 43645-0200/43030-009		on alidade relay board	(Jameco 338351/337738)			
	B	Crimps?						

AWE17	Signal from temperature sensor to relay board							
	A	**Description**	**B, C**	**Comment**	**Color**	**Size**	**Twist**	
	1	GND	B1		Black	#24		
	2	T	B2		Yellow	#24		
	3	+5V	B3		Red	#24		
	4	GND	C1		Black	#24		
	5	T	C2		Yellow	#24		
	6	+5V	C3		Red	#24		
	A	Molex 43025-0600/43030-009		to alidade relay board				
	B	solder to LM35		Lm-35 Device in TO-220				
	C	solder to LM35		Lm-35 Device in TO-220				

AWE18			Signal from az wrap potentiometer						
		A	Description	B	Comment	Color	Size	Twist	
Wires		1				red	#24		
		2				yellow			
		3				black			
Ends		A	bare wire	posts on pot					
		B	Molex 43645-0300/43030-009		on alidade relay board				
AWE19			Signal from elevation level sensor and thermal sensor						
		A	Description	B	Comment	Color	Size	Twist	Length
Wires		1	+5V			red	#24		
		2	T						160"
		3	GND						
		4	+5V						
		5	Level						
		6	GND						
Ends		A	Molex 43025-0600/43030-009		on relay board				
		B	bare wire						

Alidade wire harnessing: controller box								
Reference ELMCOverview.vsd								
15-Mar-06								

AWC1 — Power from relay board to power mgmt board

	A	Description	B	Comment	Color	Size	Twist	Length
Wires	1	100 VAC "L"			White	18		15"
	2	Return "N"			Black	18		15"
	3	Ground			Green	18		15"
Ends	A	IEC-320 0.25 quick disconnect F insulated						
	B	spade fork term #6, unins bent heat shrink						

AWC2 — 25-wire cable from alidade relay board

	A	Description	B,C,D	Comment	Color	Size	Twist	Length
Wires/pins	1	brakes +24V	C1		brown		Z	7.5"
	2	Ground	C2	power mgmt board	black		Z	7.5"
	3	24V aux	D1		purple		Y	7.5"
	4	Ground	D2		black		Y	7.5"
	5	+5V	B19		red		X	7.5"
	6	Ground	B15	microcontroller board	black		X	7.5"
	7	float in	B6		green			7.5"
	8	T 2 input	B9		blue			7.5"
	9	T 4 input	B10		yellow			7.5"
	10	Az brake sense	B13		white			7.5"
	11	Latch	B7		orange			7.5"
	12	Pot 1 (GND)	B18		black		W	7.5"
	13	Pot wiper	B16		green			7.5"
	14	brakes +24V	C1		brown		Z	7.5"
	15	Ground	C2	power mgmt board	black		Z	7.5"
	16	24V aux	D1		purple		Y	7.5"
	17	Ground	D2		black		Y	7.5"
	18	+5V	B20	microcontroller board	red		X	7.5"
	19	Ground	B3		black		X	7.5"
	20	T 1 input	B11		green			7.5"
	21	T 3 input	B12		blue			7.5"
	22	electronics reset (on/off)	B5		yellow			7.5"
	23	El brake sense	B8		white			7.5"
	24	Unlatch (drives on/off)	B14		grey			7.5"
	25	Pot 2 (+5V)	B17		red		W	7.5"
Ends	A	56-126-004	filtered D25 Socket on top of control b	connects to AWE7B				
	B	WM2527-ND/WM62510-ND	2x10 100mil ucntrlr board	(22-55-2201/16-02-0102)				
	C	770849-2/770522-1	power mgmt board	relay/brakes			JameCo 236321	
	D	770849-2/770522-1	power mgmt board	HV aux			JameCo 236321	

B:

1: N/C	3: GND	5: RST	7: LTCH	9: T2	11: T1	13: ABS	15: GND	17: P5V	19: +5V
2: N/C	4: N/C	6: FLT	8: EBS	10: T4	12: T3	14: ULTC	16: WPR	18: GND	20: +5V

AWC3 — encoder for azimuth (P/N: R176H-03600Q-5L10-AT40SP-24MN)

	A	Description	B	Comment	Color	Size	Twist	Length
Wires/pins	1	A	3		yellow		Z	5.75
	2	B	5		green		Y	5.75
	3	IND (Z)	7		blue		X	5.75
	4	N/C						
	5	+5V	9		red		W	5.75
	6	/A	4		brown		Z	5.75
	7	/B	6		orange		Y	5.75
	8	/IND (Z)	8		white	all wires #24 AWG	X	5.75
	9	COMMON	10		black		W	5.75
Ends	A	56-106-010	filtered Dsub 9 socket on control box	connects to AWE12A				
	B	WM2522-ND/WM62510-ND	2x5 0.100" on ucntrlr card	(22-55-2101/16-02-0102)				

1: NC	3: A	5: B	7: Z(IND)	9: +5V
2: NC	4: /A	6: /B	8: /Z(IND)	10: GND

in-line w/ battery

AWC4			encoder for elevation			(P/N: 9220S03600D5L10D99SP04EA)				
		A	**Description**	**B**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires/pins		1	A	3			yellow	all wires #24 AWG	Z	5.75
		2	B	5			green		Y	5.75
		3	IND (Z)	7			blue		X	5.75
		4	N/C							
		5	+5V	9			red		W	5.75
		6	/A	4			brown		Z	5.75
		7	/B	6			orange		Y	5.75
		8	/IND (Z)	8			white		X	5.75
		9	COMMON	10			black		W	5.75
Ends		A	56-106-010					connects to AWE13A		
		B	WM2522-ND/WM62510-ND	2x5 0.100" on ucntrlr card				(22-55-2101/16-02-0102)		

1: NC	3: A	5: B	7: Z(IND)	9: +5V
2: NC	4: /A	6: /B	8: /Z(IND)	10: GND

AWC5			battery							
		A	**Description**	**B**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires/pins		1	+12V	1		use 1-#18	red	18		4
		2	+12V	1		or 3-#22	red	same wire		
		3	N/C							
		4	GND	2		use 1-#18	black	18		4
		5	GND	2		or 3-#22	black	same wire		
		6	+12V	1			red	same wire		
		7	N/C							
		8	N/C							
		9	GND	2			black	same wire		
Ends		A	56-101-010	filtered Dsub 9 pin on control box				connects to AWE14A		
		B	770849-2/770522-1							

AWC6										
standard CAT5 cable			RJ-45							12

AWC7			9V to media converter from power mgmt board							
		A	**Description**	**B**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires		1	+9V	1			black/white	20		13
		2	Common	2			black	20		13
Ends		A	round							
		B	770849-2/770522-1	This connector numbering is opposite to 0.100" connectors						

AWC8			24 V from power supply to power mgmt board							
		A	**Description**	**B**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires		1	+24V	1			red	18		8.25
		2	Common	2			black	18		8.25
Ends		A	spade fork #6x18							
		B	770849-2/770522-1							

AWC9			5V to SBC							
		A	**Description**	**B**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires		1	+5V	1			red	18		7.5
		2	Common	2			black	18		7.5
Ends		A	15-24-4048							
		B	770849-2/770522-1							

AWC10			12 VDC from Power Management to uCntrlr board							
		A	**Description**	**B**		**Comment**	**Color**	**Size**	**Twist**	**Length**
Wires		1	+12V	1			red	18		4.5
		2	Common	2			black	18		4.5
Ends		A	770849-2/770522-1							
		B	770849-2/770522-1			0.156" pitch				

+++ControlBox+++

AWC11			SBC reset (goes between the uCntrlr board and SBC)							
		A	Description	B	Comment	Color	Size	Twist	Length
Wires		1	power	1		green	24	Z	9
		2	ground	2		black	24	Z	9
		3	reset	3		red	24	Z	9
		4	N/C	4	pin 1 on inboard side				
		5	N/C	5					
	Ends	A	WM2803-ND/WM62510-ND	1x5 100mil connector on ucntrlr card		(50-57-9005/16-02-0102)			
		B	WM2803-ND/WM62510-ND	1x5 100mil connector on SBC		(50-57-9005/16-02-0102)			
AWC12			electronics on/off (between uCntrlr board and power management board)						
		A	Description	B	Comment	Color	Size	Twist	Length
Wires		1	electronics on/off	1		green	24	Z	6.5
		2	ground	2		black	24	Z	6.5
		3	battery voltage /3	3		yellow	24	Z	6.5
	Ends	A	1x3 0.100" unpolarized						
		B	1x3 0.100" unpolarized						
AWC13			short cat 5 crossover cable between SBC (second LAN) and uCntrlr board						
crossover CAT5 cable									6"

Alidade wire harnessing: drive box
Reference ELMCOverview.vsd
10-Mar-06

AWD1	3-wire power cable from cover to rectifier						
	A	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1	100VAC (L)		white			13.75"
	2	Return (N)		black	18AWG		13.75"
	3	Ground		green			6.5"
	A	0.25 quick disconnec	solder terminals on IEC-320				
	B	bare wire	screw terminals on drive board		(soldered butt splice heat shrink)		

AWD2	15-wire cable from drive-box top to daughter board/drive board						
	A	**Description**	**B,C,D**	**Color**	**Size**	**Twist**	**Length**
	1	az brakes +24V	C	Brown			4.625
	2	Ground	C	Black			4.625
	3	24V aux	C	Red			4.625
	4	Ground	D	Black			9
	5	drive enable +	B1	Orange			12
	6	Ground	D	Black			9
	7	Az cw limit	B3	Yellow	all wires #22AWG		12
	8	Az limit common	B4	Green			12
	9	el brakes +24V	C	Blue			4.625
	10	Ground	C	Black			4.625
	11	24V aux	C	Purple			4.625
	12	Ground	D	Black			9
	13	drive enable -	B2	Grey			12
	14	Ground	D	Black			9
	15	Az ccw limit	B5	White			12
	A	56-111-010	filtered Dsub15P on driver box top	connects to AWE6B			
	B	WM2803-ND/WM625	1x5 100mil connector on daughter card	(50-57-9005/16-02-0102)			
	C	bare wire/solder	screw terminal on driver board				
	D	gnd lug	round #8				

AWD3	temperature sensor cable from drive board to daughter card						
wrong!?!?	**A**	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1	GND	3	black			5
	2	T	2	yellow			5
	3	+5	1	red			5
	A		50-57-9003		(on daughter)		
	B		22-01-2037/08-52-123		(on driver)		

AWD4	temperature sensor cable from heatsink to daughter card						
wrong!?!?	**A**	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1	GND		black	24		19
	2	T		yellow	24		19
	3	+5		red	24		19
	A		50-57-9003		(on daughter)		
	B		soldered/heat shrink		LM35		

AWD5	temperature sensor cable from airflow to daughter card						
wrong!?!?	**A**	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1	GND		black	24		16.75
	2	T		yellow	24		16.75
	3	+5		red	24		16.75
	A		50-57-9003		(on daughter)		
	B		soldered/heat shrink		LM35		

AWD6	rectifier to capacitor 1						
	A	**Description**	**B,C**	**Color**	**Size**	**Twist**	**Length**
	1		B,C 1	Red		18	7"
	2		B,C 2	Black		18	7"
	A						
	B						
	C						

AWD7	capacitor 1 to capacitor 2						
	A	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1 +			1 Red		18	8.5"
	2 -			2 Black		18	8.5"
	A #8 ring terminal	+ solder					
	B #8 ring terminal	+ solder					

AWD8	resistor (6) to drive board						
	A	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1			Red		18	9.5"
	2			Black		18	7.5"
	A						
	B						

AWD9	resistor to rectifier						
	A	**Description**	**B**	**Color**	**Size**	**Twist**	**Length**
	1			1 Red	#22		4"
	2			2 Black	#22		4"

Elevation Can								
Reference ELMCOverview.vsd								
15-Mar-06								
ECW1	motor power and brakes for elevation					Alternate Sort Pin #		
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
	1	W			purple	#14		
	4	V			brown	#14		
	10	GND			green	#14		
	12	BP			blue	#16		
	13	BM			blue	#16		
	25	SHIELD			shield	shield		
	A	D25P						
ECW2	encoders and hall's for elevation							
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	**Length**
	1	N/C		GND on board	N/C			
	2	U			brown			
	3	V			gray			
	4	W			white			
	5	GND			black		V	
	6	X			purple		Z	
	7	B			green		Y	
	8	A			blue		X	
	9	thermal sensor		GPIN5	orange		W	
	10	GND thermal sensor		GND	orang/white		W	
	11	Vcc (+5V)			red		V	
	12	N/C		GND on board	N/C			
	13	/X			purple/blk		Z	
	14	/B			green/blk		Y	
	15	/A			blue/blk		X	
	A	D15P	filtered D15S on board					
	B	D15P	D 15p on motor					
ECW3	Signal from elevation level sensor and thermal sensor							
	A	**Description**	**B**	**Comment**	**Color**	**Size**	**Twist**	
	1	+5V			red	#24		
	2	T						
	3	GND						
	4	+5V						
	5	Level						
	6	GND						
Ends	A	Molex 43025-0600/43030-00	on relay board					
	B	solder/leads in elevation can						