

February 13, 2006  
alidawireharness.xls  
ATA42fiberDistribution.doc

Alidade wire harnessing Enclosure								
Reference	ELMCO		Overview.vsd					
15-Feb-06								
AWE1 Input power wires through pedestal								
	A	Description	B	Comment	Color	Size	Twist	Length
Wires	1	120VAC		65 strand wire Beldon	white	#12		
	2	Return		8527	black	#12		
	3	Ground		Beldon 8520	green	#14		
Ends	A	bare wire	screw terminal block behind pie-plate					
	B	MlxB3	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	MlxB5	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	MlxB4	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	MlxB3	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	MlxB3	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				Length
s	1	az brakes +24V	1	1&9 are controlled with the main drives transformer power				
	2	Ground	2					
	3	24V aux	3					
	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				

Wires/pin	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	EI 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	
	1	W1	W		purple	#14			
	2	W2							
	14	W3							
	15	W4							
	3	N/C	V		brown	#14			
	16	N/C							
	4	V1							
	5	V2							
	17	V3							

Wires/pins	18	V4						
	6	N/C						
	19	N/C						
	7	U1	U					
	8	U1			blue	#14		
	20	U1						
	21	U1						
	9	N/C						
	22	N/C						
	10	G1	Ground					
	11	G2			green	#14		
	23	G3						
	24	G4						
	12	BP			blue	#16		
	13	BM			blue	#16		
	25	SHIELD			shield	shield		
Ends	A	D25P	filtered D25S on board					
	B	MIxS6a	M connector on motor					
	C	MIxS2a	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	M connector on motor					
AWE10	motor power and brakes for elevation					Alternate Sort Pin #		
	A	Description	B	Comment	Color	Size	Twist	Length
s	1	W1	W					
	2	W2			purple	#14		
	14	W3						
	15	W4						
	3	N/C						
	16	N/C						
	4	V1	V					
	5	V2			brown	#14		
	17	V3						
	18	V4						
	6	N/C						

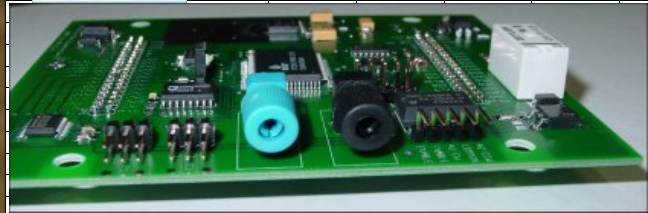
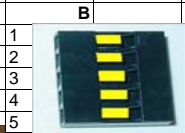
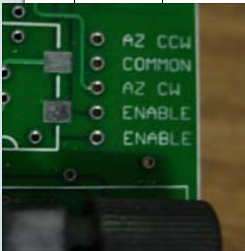
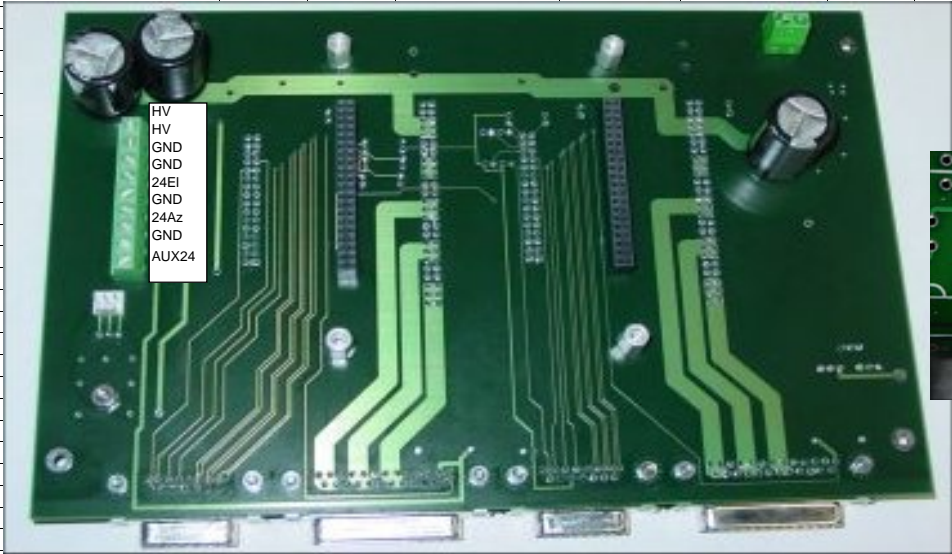
Wires/pin	19	N/C	U					
	7	U1						
	8	U1						
	20	U1			blue	#14		
	21	U1						
	9	N/C	Ground					
	22	N/C						
	10	G1						
	11	G2			green	#14		
	23	G3						
	24	G4						
	12	BP			blue	#16		
	13	BM			blue	#16		
	25	SHIELD			shield	shield		
Ends	A	D25P		filtered D25S on board				
	B	MlxS6a		M connector on motor				
	C	MlxS2a		wires part of brake				
<b>AWE11</b> encoders and hall's for elevation								
	<b>A</b>	<b>Description</b>	<b>B</b>	<b>Comment</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
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	D15P		D 15p on motor				
<b>AWE12</b> encoder for azimuth (P/N: R176H-03600Q-5L10-AT40SP-24MN)								
	<b>A</b>	<b>Description</b>	<b>B</b>	<b>Comment</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
Wires/pins	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			
Ends	A	D9P		Dsub on control box				
	B	--		cable part of encoder				
<b>AWE13</b> encoder for elevation (P/N: 9220S03600D5L10D99SP04EA)								

Wires/pins	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				
Ends	A	D9P	Dsub on control box					
	B	--	cable part of encoder					
AWE14 battery for control box								
Wires/pins	A	Description	B	Comment	Color	Size	Twist	
	1	+12V	1				Z	
	2	+12V	1				Z	
	3	N/C						
	4	GND	2		black		Y	
	5	GND	2		black		Y	
	6	+12V	1				Z	
	7	N/C						
	8	N/C						
9	GND	2		black		Y		
Ends	A	D9S						
	B	Spade?						
AWE15 Signal from relay board to pie-plate LappUSA (Olflex) 900P Cable, 3 conductor #24, 811442								
Wires	A	Description	B	Comment	Color	Size	Twist	
	1				black	#24		
	2				black	#24		
3					green/yello	#24		
Ends	A	MlxT3	on alidade relay board					
	B	bare	behind pie plate					
AWE16 signal from oil float								
Wire	1							
	2							
Ends	A	MlxT2	on alidade relay board					
	B	Crimps?						
AWE17-1 Signal from temperature sensor to relay board								
Wires	1		Lm-35 Device in TO-220					
	2							
	3							
Ends	A	MlxT3	to alidade relay board					
	B	?	temperature sensor					
AWE17-2 Signal from temperature sensor to relay board								
Wires	1		Lm-35 Device in TO-220					
	2							
	3							
ds	A	MlxT3	to alidade relay board					

Ends	B ?	temperature sensor					
<b>AWE17-3</b> Signal from temperature sensor to relay board							
Wires	1	Lm-35 Device in TO-220					
	2						
	3						
Ends	A MlxT3	to alidade relay board					
	B ?	temperature sensor	REMOVE (COMBINES W/ E-19)				
<b>AWE18</b> Signal from az wrap potentiometer							
Wires	1						
	2						
	3						
Ends	A bare wire	posts on pot					
	B MlxT3	on alidade relay board					
<b>AWE19</b> Signal from elevation level sensor							
Wires	1 red	+5V					
	2 green	signal	INCLUDE EL THERMAL				
	3 blue	ground					
Ends	A XXX connector	to alidade relay board					

<b>Alidade wire harnessing: drive box</b>							
Reference ELMCOOverview.vsd							
15-Feb-06							
<b>AWD1</b> 3-wire power cable from box lid to drive board							
	<b>A</b>	<b>Description</b>	<b>B</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
Wires	1	100VAC		white	14AWG		
	2	Return		black			
	3	Ground		green			
Ends	A	bare wire	solder terminals on IEC-320				
	B	bare wire	screw terminals on drive board				
<b>AWD2</b> 15-wire cable from drive-box top to daughter board/drive board							
	<b>A</b>	<b>Description</b>	<b>B,C,D</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
Wires/pins	1	az brakes +24V	C	Brown	all wires #22AWG	Z	5
	2	Ground	C	Black		Z	5
	3	24V aux	C	Red		Y	5
	4	Ground	D	Black		Y	9.5
	5	drive enable +	B5	Orange		X	12
	6	Ground	D	Black		W	9.5
	7	Az cw limit	B3	Yellow		W	12
	8	Az limit common	B2	Green		W	12
	9	el brakes +24V	C	Blue		V	5
	10	Ground	C	Black		V	5
	11	24V aux	C	Purple		Y	5
	12	Ground	D	Black		Y	9.5
	13	drive enable -	B4	Grey		X	12
	14	Ground	D	Black		W	9.5
	15	Az ccw limit	B1	White		W	12
Ends	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	screw terminal on driver board				
	D	gnd lug	round 6-32				
<b>AWD3</b> temperature sensor cable from drive board to daughter card							
	<b>A</b>	<b>Description</b>	<b>B</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
	1			red			
	2			yellow			
	3			black			
	A		1x3 100mil				
	B		3-wire molex socket				
<b>AWD4-1</b> temperature sensor cable from heatsink to daughter card							
	<b>A</b>	<b>Description</b>	<b>B</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
	1			red			
	2			yellow			
	3			black			
	A		1x3 100mil				
	B		leads				
<b>AWD4-2</b> temperature sensor cable from airflow to daughter card							
	<b>A</b>	<b>Description</b>	<b>B</b>	<b>Color</b>	<b>Size</b>	<b>Twist</b>	<b>Length</b>
	1			red			
	2			yellow			
	3			black			
	A		1x3 100mil				
	B		leads				





Temperature sensors in drive box (at daughter card)  
The top right temp sensor connector goes to the air outlet.  
The bottom right connector goes to the sensor on Calvin's board.  
The bottom left connector goes to the regeneration resistors.  
The top left connector is not connected.

**Alidade wire harnessing: controller box**

Reference ELMCOOverview.vsd

15-Feb-06

**AWC1** Power from relay board

Wires	1
	2
	3
Ends	A IEC-320
	B Leads

**AWC2** 25-wire cable from alidade relay board to control box

A	Description	B,C,D	Comment	Color	Twist	Length
Wires/pins	1 brakes +24V	C1		brown	Z	12"
	2 Ground	C2	power mgmt	black	Z	
	3 24V aux	D1	board	purple	Y	
	4 Ground	D2		black	Y	
	5 +5V	B1		red	X	
	6 Ground	B5		black	X	
	7 float in	B16		green		
	8 T 2 input	B11		blue		
	9 T 4 input	B12		yellow		
	10 Az brake sense	B7		white		
	11 Latch	B13		orange		
	12 Pot 1 (GND)	B4	microcontroller board	black	W	
	13 Pot wiper	B6		green		
	14 brakes +24V	C1		brown	Z	
	15 Ground	C2	power mgmt	black	Z	
	16 24V aux	D1	board	purple	Y	
	17 Ground	D2		black	Y	
	18 +5V	B2		red	X	
	19 Ground	B17		black	X	
	20 T 1 input	B9		green		all wires #24 AWG
	21 T 3 input	B10		blue		
	22 electronics reset	B15		yellow		
	23 El brake sense	B14		white		
	24 Unlatch	B8	microcontroller board	grey		
	25 Pot 2 (+5V)	B3		red	W	

Ends	A 56-126-004	filtered D25 Socket on top of control box connects to AWE7B
	B WM2527-ND/WM62510-ND	2x10 100mil ucntlr 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

1	3	5	7	9	11	13	15	17	19
2	4	6	8	10	12	14	16	18	20

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

A	Description	B	Comment	Color	Twist	Length
Wires/pins	1 A	4		yellow	Z	12"
	2 B	6		green	Y	
	3 IND (Z)	8		blue	X	
	4 N/C					all wires #24 AWG
	5 +5V	10		red	W	
	6 /A	3		brown	Z	
	7 /B	5		orange	Y	
	8 /IND (Z)	7		white	X	
	9 COMMON	9		black	W	

Ends	A 56-106-010	filtered Dsub 9 socket on control box connects to AWE12A
	B WM2522-ND/WM62510-ND	2x5 0.100" on ucntlr card (22-55-2101/16-02-0102)

1: NC | 3: /A | 5: /B | 7: /Z | 9: GND

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

**AWC4** encoder for elevation (P/N: 9220S03600D5L10D99SP04EA)

	A Description	B	Comment	Color	Twist	Length
Wires/pins	1 A	4		yellow	Z	12"
	2 B	6		green	Y	
	3 IND (Z)	8		blue	X	
	4 N/C					
	5 +5V	10		red	W	
	6 /A	3		brown	Z	
	7 /B	5		orange	Y	
	8 /IND (Z)	7		white	X	
	9 COMMON	9		black	W	

all wires #24 AWG

Ends A 56-106-010 connects to AWE13A  
 B WM2522-ND/WM62510-ND 2x5 0.100" on ucntlr card (22-55-2101/16-02-0102)

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

**AWC5** battery

	A Description	B	Comment	Color	Twist	Length
Wires/pins	1 +12V	1			Z	
	2 +12V	1			Z	
	3 N/C					
	4 GND	2		black	Y	
	5 GND	2		black	Y	
	6 +12V	1			Z	
	7 N/C					
	8 N/C					
	9 GND	2		black	Y	

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 10" long ?

**AWC7** 9V to media converter

	A Description	B	Comment	Color	Size	Twist	Length
Wires	1					18	
	2					18	

Ends A  
 B 770849-2/770522-1

**AWC8** 24 V from power supply to UPS board

	A Description	B	Comment	Color	Size	Twist	Length
Wires	1						
	2						

Ends A  
 B 770849-2/770522-1

**AWC9** 5V to SBC

	A Description	B	Comment	Color	Size	Twist	Length
Wires	1						
	2						

Ends A 770849-2/770522-1  
 B

**AWC10** 12 VDC from Pwer Mgment to uCntrlr board

	A Description	B	Comment	Color	Size	Twist	Length
Wires	1						

Wires	2							
Ends	A 770849-2/770522-1							
	B							
AWC11	SBC reset (goes between the uCntrlr board and SBC)							
	A Description	B	Comment	Color	Size	Twist	Length	
	1 power			green				
Wires	2 ground			black				
	3 reset			red				
	4 N/C							
	5 N/C							
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	
	1 battery voltage /3							
Wires	2 ground			black				
	3 electronics on/off							
Ends	A 1x3 0.100" unpolarized							
	B 1x3 0.100" unpolarized							
AWC13	short cat 5 crossover cable between SBC (second LAN) and uCntrlr board							
standard CAT5 cable		6" long	?					