ENCLOSURE SPECIFIC DATA
Vertex
Mount “KO”

Revision: 20 October 2011

1.0 INTRODUCTION

1.1 Appendix Organization

This appendix is provided as a supplement to the baseline RC4000 User’s Manual which describes the PCB board stack that is common to all systems. Section 2 describes the mechanical aspects of the controller, while section 3 describes the electrical connections.

2.0 MECHANICAL

2.1 RC4000 Antenna Controller Chassis and Lid

The ACU is mechanized as an embedded controller. The PCB board stacks are located inside a weatherproof enclosure. Figure 1 shows the ACU.

Figure 1

The chassis of the RC4000 provides provisions to mount the enclosure that include #10-32 hardware on the bottom of the enclosure, as well as the sides. Figure 2 shows the enclosure drawings.

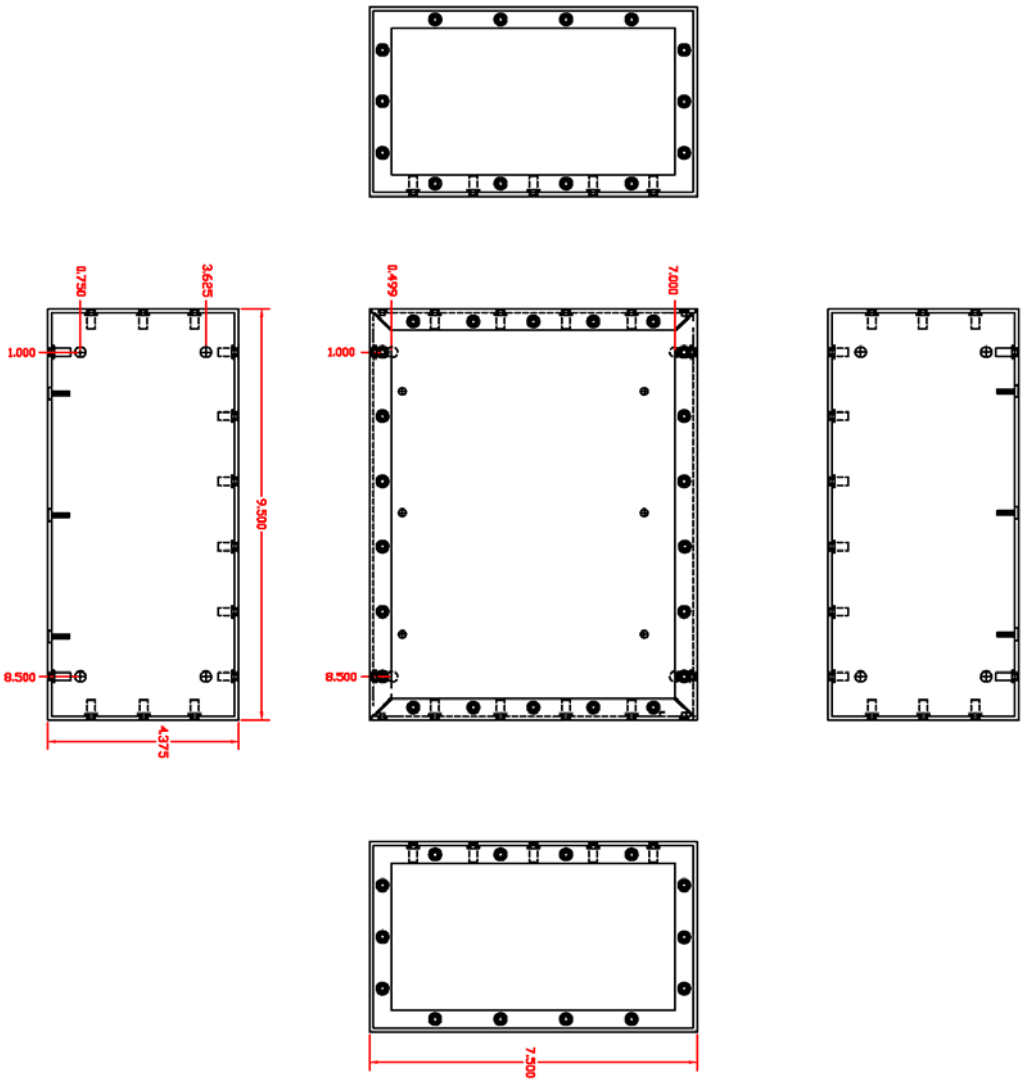


Figure 2

Figure 3 shows the lid of the enclosure.

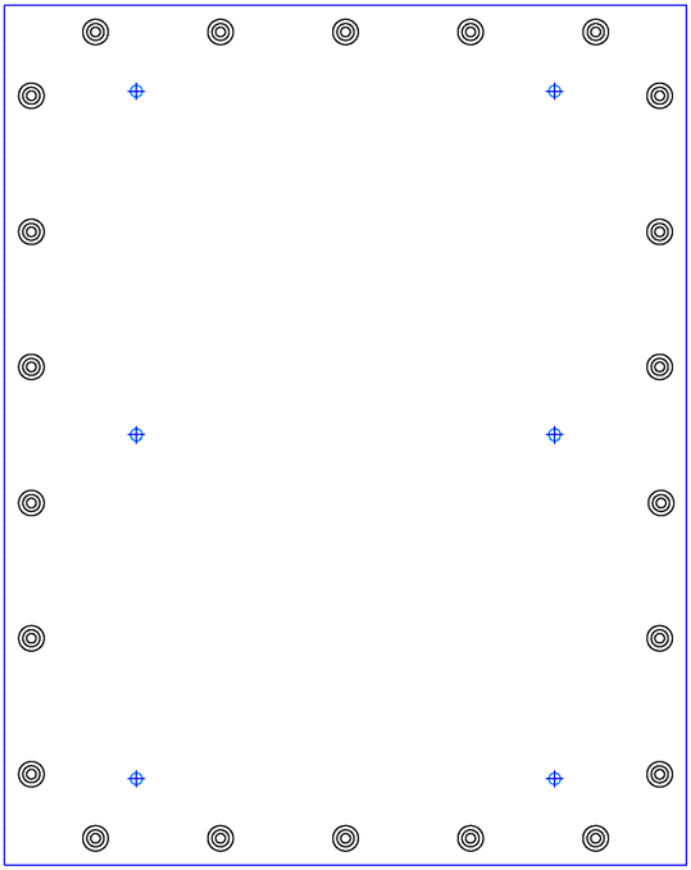
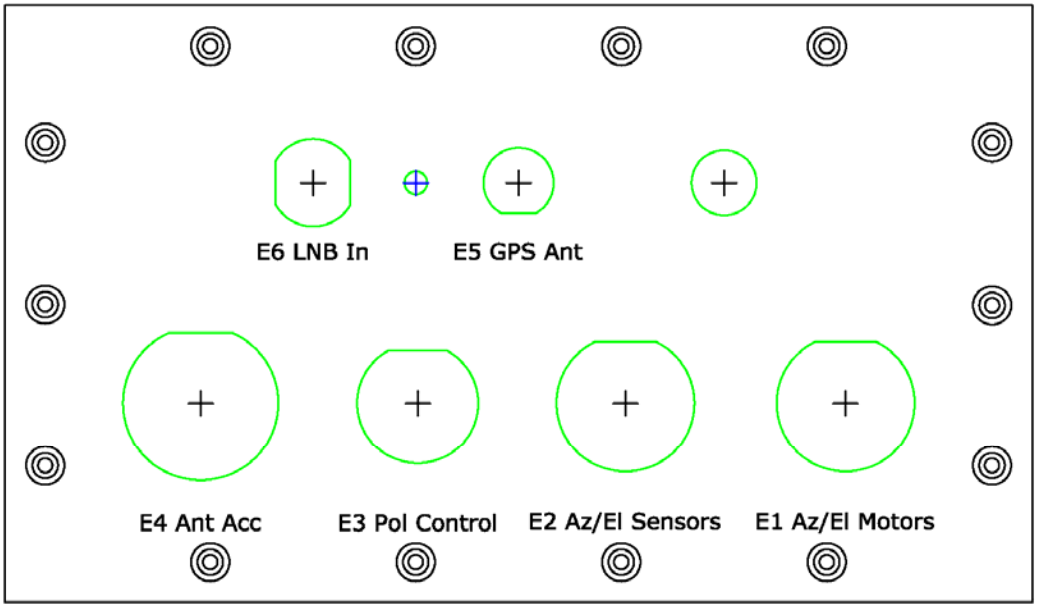


Figure 3

2.2 RC4000 End Panels

The RC4000 end panels are where the connectors are located. The User Interface end panel contains connectors that that the user may need to frequently have access to, such as the DC power, Ethernet, and buttons, for example. The other end is the Antenna Interface end panel, which includes connectors that primarily go to the antenna itself, such as the motor and sensors connections.
Figure 4 shows both end panels, with the Antenna Interface on top and the User Interface on bottom.



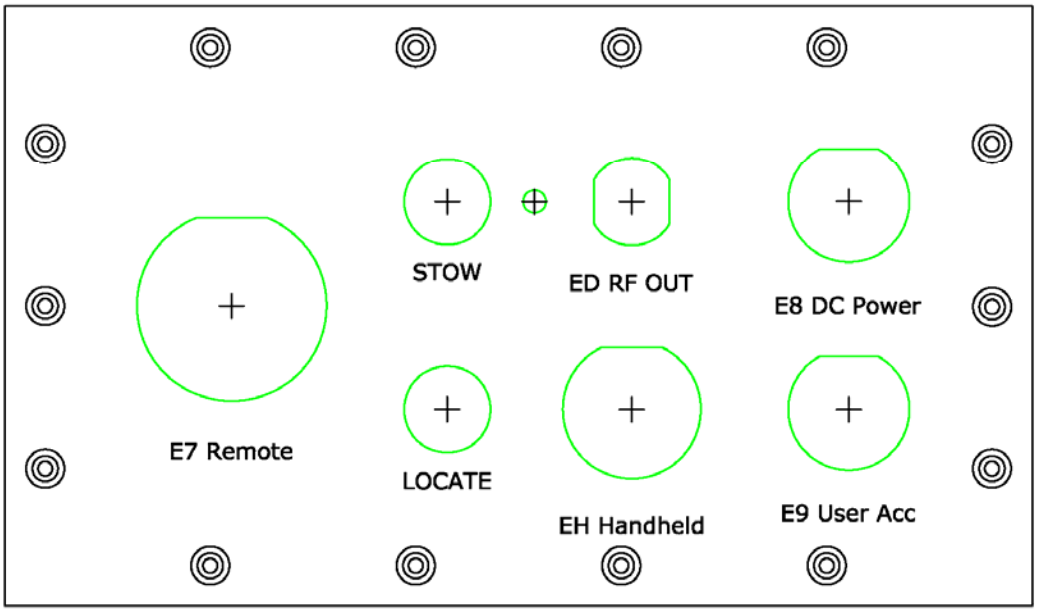


Figure 4

2.3 CONNECTORS

Table 1 provides a list of the external connectors on the enclosure end panels.

Ref Des	Part Number	Description
E1	Amphenol MS-3124E14-19P	Az/El Motors
E2	Amphenol MS-3124E14-19S	Az/El Sensors
E3	Amphenol MS-3124E12-10S	Pol Motor / Sensors
E4	Amphenol MS-3124E16-26P	Antenna Accessory
E5	Amphenol 122192	GPS In (TNC)
E6	Amphenol 172129	LNB In (N)
E7	Amphenol RJFTV71G	IP ** Must use environmentally sealed mating connector **
E8	Amphenol MS-3124E12-3P	DC Power In
E9	Amphenol MS-3124E12-10P	User Accessory
ED	Amphenol 172129	RF Out (N)
EH	Amphenol MS-3124E14-19S	3-Button Handheld

Table 1

3.0 ELECTRICAL

3.1.0 System Interface

Please refer to the main RC4000 User Manual to become familiar with specific capabilities and functionality of the RC4000 PCB board stack.

Figures 5 and 6 in Section 3.1.1 are provided to assist in interfacing to the RC4000. These diagrams list common equipment and how it connects to each connector on the enclosure.

Section 3.1.2 further describes the enclosure connectors and their respective pin-outs in a tabular form.

3.1.1 System Interface (Graphical)

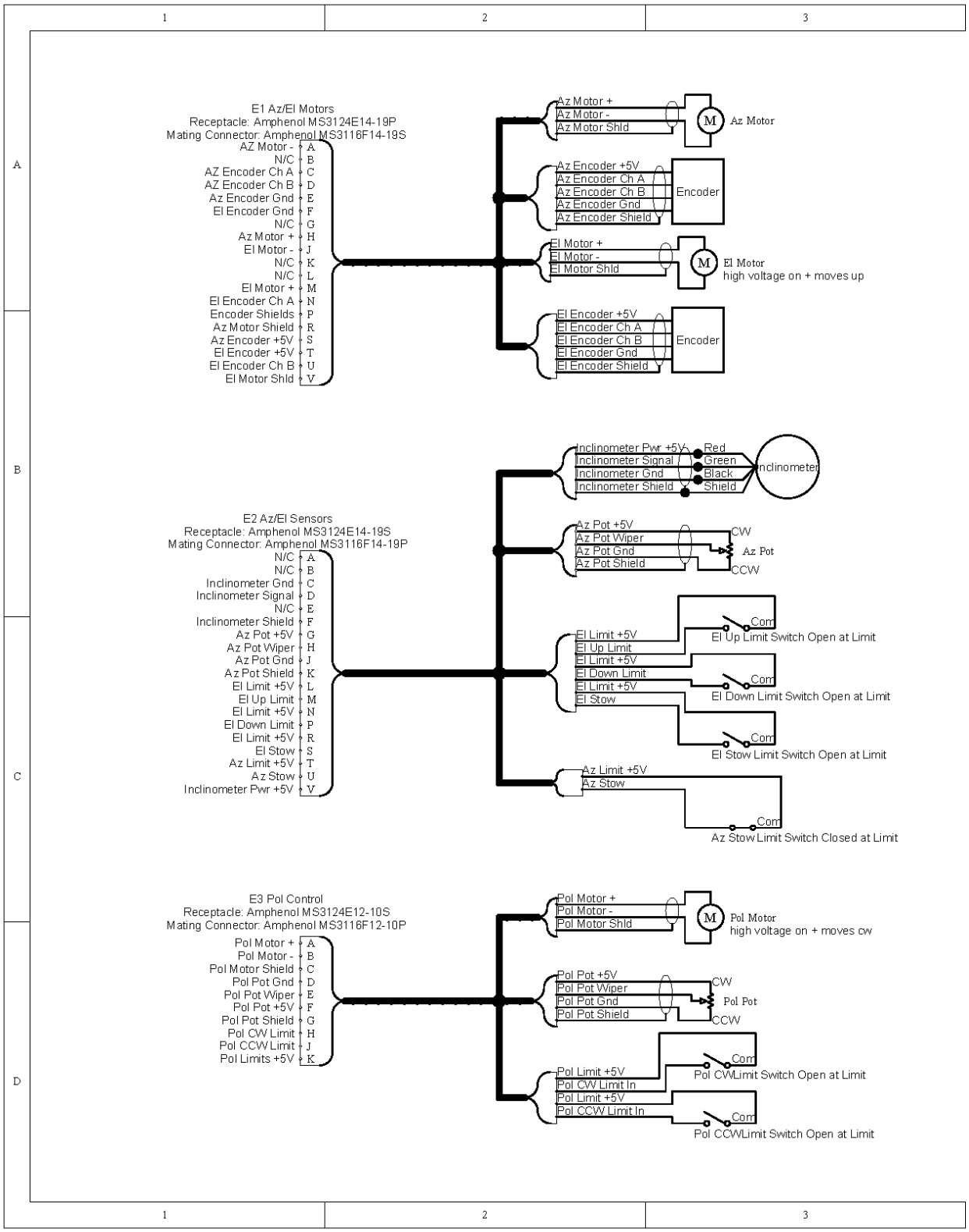


Figure 5

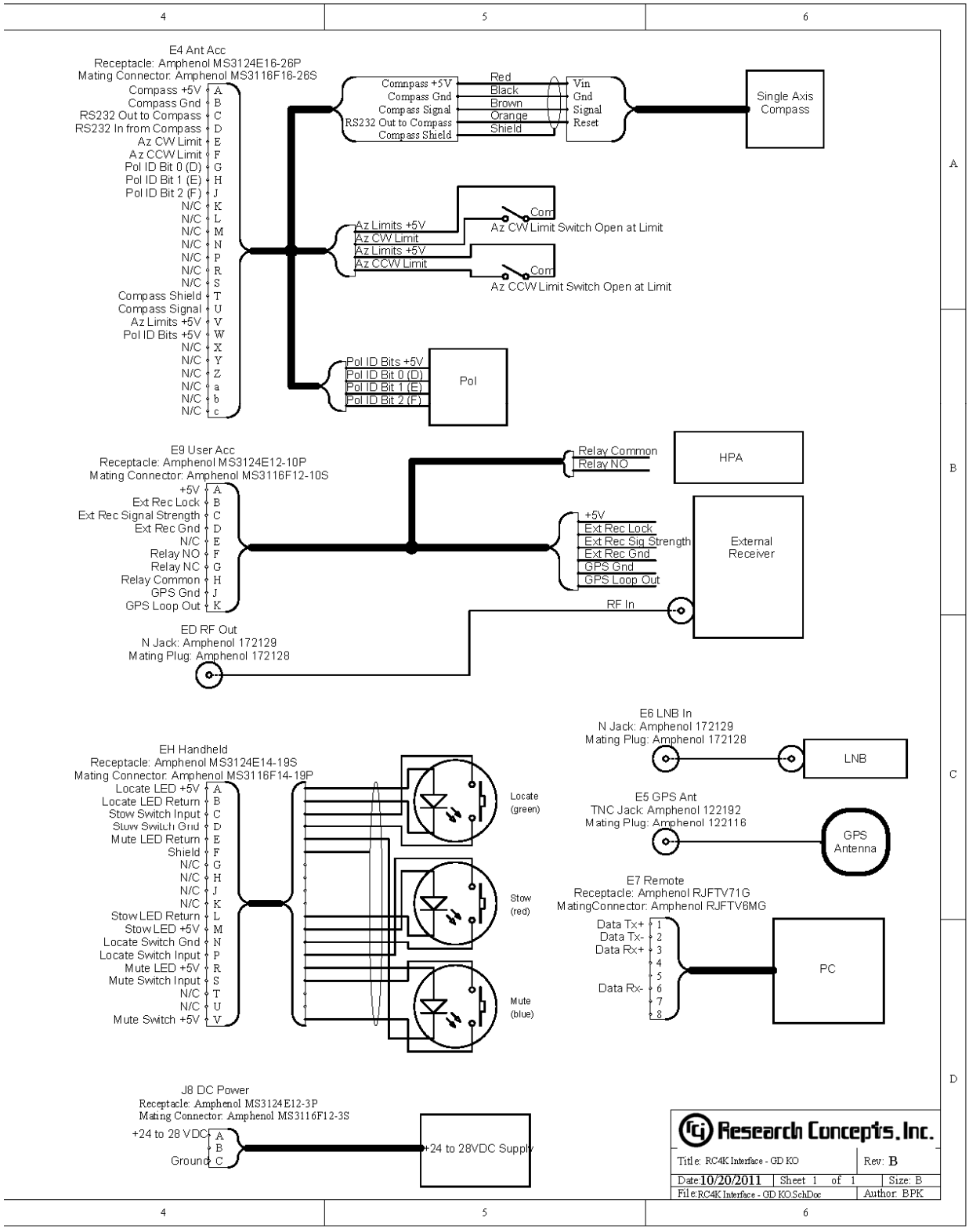
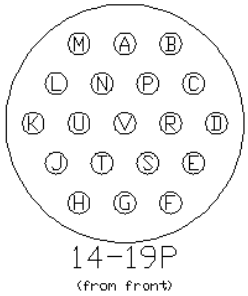

E4 Ant Acc
Receptacle: Amphenol MS3124E16-26P
Mating Connector: Amphenol MS3116F16-26S
Compass +5V A
Compass Gnd B
RS232 Out to Compass C
RS232 In from Compass D
Az CW Limit E
Az CCW Limit F
Pol ID Bit 0 (D) G
Pol ID Bit 1 (E) H
Pol ID Bit 2 (F) J
N/C K
N/C L
N/C M
N/C N
N/C P
N/C R
N/C S
Compass Shield T
Compass Signal U
Az Limits +5V V
Pol ID Bits +5V W
N/C X
N/C Y
N/C Z
N/C a
N/C b
N/C c
Comnpass +5V
Compass Gnd
Compass Signal
RS232 Out to Compass
Compass Shield
Red
Black
Brown
Orange
Shield
Vin
Gnd
Signal
Reset
Single Axis Compass
Az Limits +5V
Az CW Limit
Az Limits +5V
Az CCW Limit
Com
Az CW Limit Switch Open at Limit
Com
Az CCW Limit Switch Open at Limit
Pol ID Bits +5V
Pol ID Bit 0 (D)
Pol ID Bit 1 (E)
Pol ID Bit 2 (F)
Pol
E9 User Acc
Receptacle: Amphenol MS3124E12-10P
Mating Connector: Amphenol MS3116F12-10S
+5V A
Ext Rec Lock B
Ext Rec Signal Strength C
Ext Rec Gnd D
N/C E
Relay NO F
Relay NC G
Relay Common H
GPS Gnd J
GPS Loop Out K
Relay Common
Relay NO
HPA
+5V
Ext Rec Lock
Ext Rec Sig Strength
Ext Rec Gnd
GPS Gnd
GPS Loop Out
External Receiver
RF In
ED RF Out
N Jack: Amphenol 172129
Mating Plug: Amphenol 172128
E6 LNB In
N Jack: Amphenol 172129
Mating Plug: Amphenol 172128
LNB
E5 GPS Ant
TNC Jack: Amphenol 122192
Mating Plug: Amphenol 122116
GPS Antenna
EH Handheld
Receptacle: Amphenol MS3124E14-19S
Mating Connector: Amphenol MS3116F14-19P
Locate LED +5V A
Locate LED Return B
Stow Switch Input C
Stow Switch Gnd D
Mute LED Return E
Shield F
N/C G
N/C H
N/C J
N/C K
Stow LED Return L
Stow LED +5V M
Locate Switch Gnd N
Locate Switch Input P
Mute LED +5V R
Mute Switch Input S
N/C T
N/C U
Mute Switch +5V V
Locate (green)
Stow (red)
Mute (blue)
E7 Remote
Receptacle: Amphenol RJFTV71G
MatingConnector: Amphenol RJFTV6MG
Data Tx+ 1
Data Tx- 2
Data Rx+ 3
4
5
Data Rx- 6
7
8
PC
J8 DC Power
Receptacle: Amphenol MS3124E12-3P
Mating Connector: Amphenol MS3116F12-3S
+24 to 28 VDC A
B
Ground C
+24 to 28VDC Supply
Research Concepts, Inc.
Title: RC4K Interface - GD KO
Rev: B
Date: 10/20/2011
Sheet 1 of 1
Size: B
File: RC4K Interface - GD KO.SchDoc
Author: BPK

Figure 6

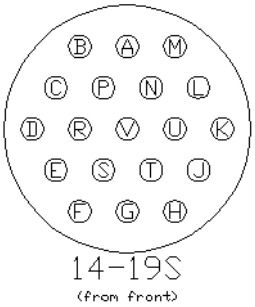
3.1.2 System Interface (Tabular)

Reference E1
Description Az/El Motors
RCI P/N CN-MS3124E1419P
Manufacturer Amphenol Industrial
Manufacturer P/N MS3124E14-19P
Mating Connector MS3116F14-19S
RCI p/n CN-MS31161419S
Mating Conn. Cap MS3180-14-CA
RCI p/n CN-MS3180-14CA



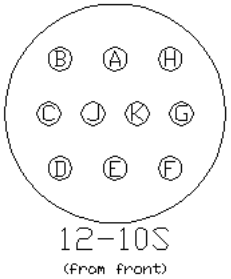
Pin	Description	Notes
A	Az Motor -	
B		
C	Az Encoder Ch A	
D	Az Encoder Ch B	
E	Az Encoder Gnd	
F	El Encoder Gnd	
G		
H	Az Motor +	
J	El Motor -	
K		
L		
M	El Motor +	
N	El Encoder Ch A	
P	Encoder Shields	
R	Az Motor Shield	
S	Az Encoder +5V	
T	El Encoder +5V	
U	El Encoder Ch B	
V	El Motor Shield	

Reference	E2
Description	Az/El Sensors
RCI P/N	CN-MS3124E1419S
Manufacturer	Amphenol Industrial
Manufacturer P/N	MS3124E14-19S
Mating Connector	MS3116F14-19P RCI p/n CN-MS31161419P
Mating Conn. Cap	MS3180-14-CA RCI p/n CN-MS3180-14CA



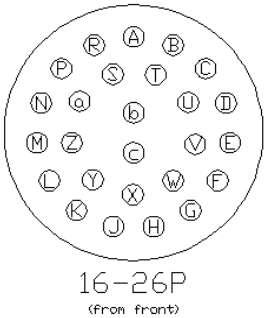
Pin	Description	Notes
A		
B		
C	Inclinometer Gnd	
D	Inclinometer Signal	
E		
F	Inclinometer Shield	
G	Az Pot +5V (CW)	
H	Az Pot Wiper	
J	Az Pot Gnd (CCW)	
K	Az Pot Shield	
L	El Up Limit +5V	
M	El Up Limit In	
N	El Down Limit +5V	
P	El Down Limit In	
R	El Stow Limit +5V	
S	El Stow Limit In	
T	Az Stow Limit +5V	
U	Az Stow Limit In	
V	Inclinometer +5V	

Reference	E3
Description	Pol Control
RCI P/N	CN-MS3124E1210S
Manufacturer	Amphenol Industrial
Manufacturer P/N	MS3124E12-10S
Mating Connector	MS3116F12-10P RCI p/n CN-MS31161210P
Mating Conn. Cap	MS3180-12-CA RCI p/n CN-MS3180-12CA



Pin	Description	Notes
A	Pol Motor +	
B	Pol Motor -	
C	Pol Motor Shield	
D	Pol Pot Gnd (CCW)	
E	Pol Pot Wiper	
F	Pol Pot +5V (CW)	
G	Pol Pot Shield	
H	Pol CW Limit In	
J	Pol CCW Limit In	
K	Pol Limits +5V	

Reference	E4
Description	Ant Acc
RCI P/N	CN-MS3124E1626P
Manufacturer	Amphenol Industrial
Manufacturer P/N	MS3124E16-26P
Mating Connector	MS3116F16-26S RCI p/n CN-MS31161626S
Mating Conn. Cap	MS3180-16-CA RCI p/n CN-MS3180-16CA



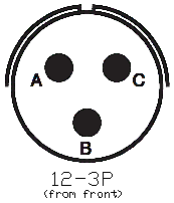
Pin	Description	Notes
A	Compass +5V	
B	Compass Gnd	
C	RS232 Out to Compass	
D	RS232 In from Compass	
E	Az CW Limit In	
F	Az CCW Limit In	
G	Pol ID Bit 0 (D) In	
H	Pol ID Bit 1 (E) In	
J	Pol ID Bit 2 (F) In	
K		
L		
M		
N		
P		
R		
S		
T	Compass Shield	
U	Compass Signal	
V	AZ Limit +5V	
W	POL ID Bit +5V (common)	
X		
Y		
Z		
a		
b		
c		

Reference E5
Description GPS Antenna, 50-Ohm TNC
RCI P/N CN-122192
Manufacturer Amphenol RF
Manufacturer P/N 122192

Reference E6
Description RF Input, 50 Ohm N-Type
RCI P/N CN-172129
Manufacturer Amphenol RF
Manufacturer P/N 172129

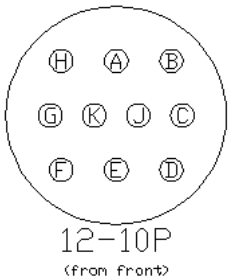
Reference E7
Description Ethernet Interface
RCI P/N CN-RJFTV71G
Manufacturer Amphenol
Manufacturer P/N RJFTV71G
Mating Connector RJFTV6MG
RCI p/n CN-RJFTV6MG
Mating Conn. Cap RJFTVC6G
RCI p/n CN-RJFTVC6G

Reference E8
Description VDC Power Input
RCI P/N CN-MS3124E12-3P
Manufacturer Amphenol
Manufacturer P/N MS3124E12-3P
Mating Connector MS3116F12-3S
Mating Conn. Cap MS3180-12-CA
RCI p/n CN-MS3180-12CA



Pin	Description	Notes
A	+24 to 28 VDC	
B		
C	Gnd	

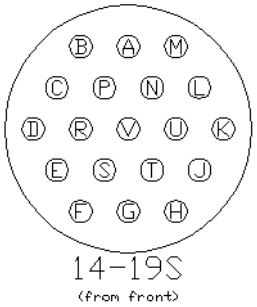
Reference E9
Description User Acc
RCI P/N CN-MS3124E1210P
Manufacturer Amphenol Industrial
Manufacturer P/N MS3124E12-10P
Mating Connector MS3116F12-10S
CN-MS31161210S
Mating Conn. Cap: MS3180-12-CA
RCI p/n CN-MS3180-12CA



Pin	Description	Notes
A	+5v	Max 150 mA
B	AGC Lock In	
C	AGC Signal In	
D	AGC Gnd	
E		
F	HPA Contacts NO	
G	HPA Contacts NC	
H	HPA Contacts Common	
J	GPS Gnd	
K	GPS RS232 Loopout	

Reference ED
Description RF Output, 50 Ohm N-Type
RCI P/N CN-172129
Manufacturer Amphenol RF
Manufacturer P/N 172129

Reference	EH
Description	3-Button Handheld
RCI P/N	CN-MS3124E1419S
Manufacturer	Amphenol Industrial
Manufacturer P/N	MS3124E14-19S
Mating Connector	MS3116F14-19P RCI p/n CN-MS31161419P
Mating Conn. Cap	MS3180-14-CA RCI p/n CN-MS3180-14CA



Pin	Description	Notes
A	Locate LED +5V	Locate: Green button Stow: Red button Mute: Blue button
B	Locate LED Return	
C	Stow Switch Input	
D	Stow Switch Gnd	
E	Mute LED Return	
F	Shield	
G	N/C	
H	N/C	
J	N/C	
K	N/C	
L	Stow LED Return	
M	Stow LED +5V	
N	Locate Switch Gnd	
P	Locate Switch Input	
R	Mute LED +5V	
S	Mute Switch Input	
T	N/C	
U	N/C	
V	Mute Switch +5V	

3.2 Internal Wiring

Figures 7 and 8 show the interconnections of the internal wiring of the enclosure.
For a more detailed explanation of functions of individual pins, please refer to the main RC4000 User Manual.

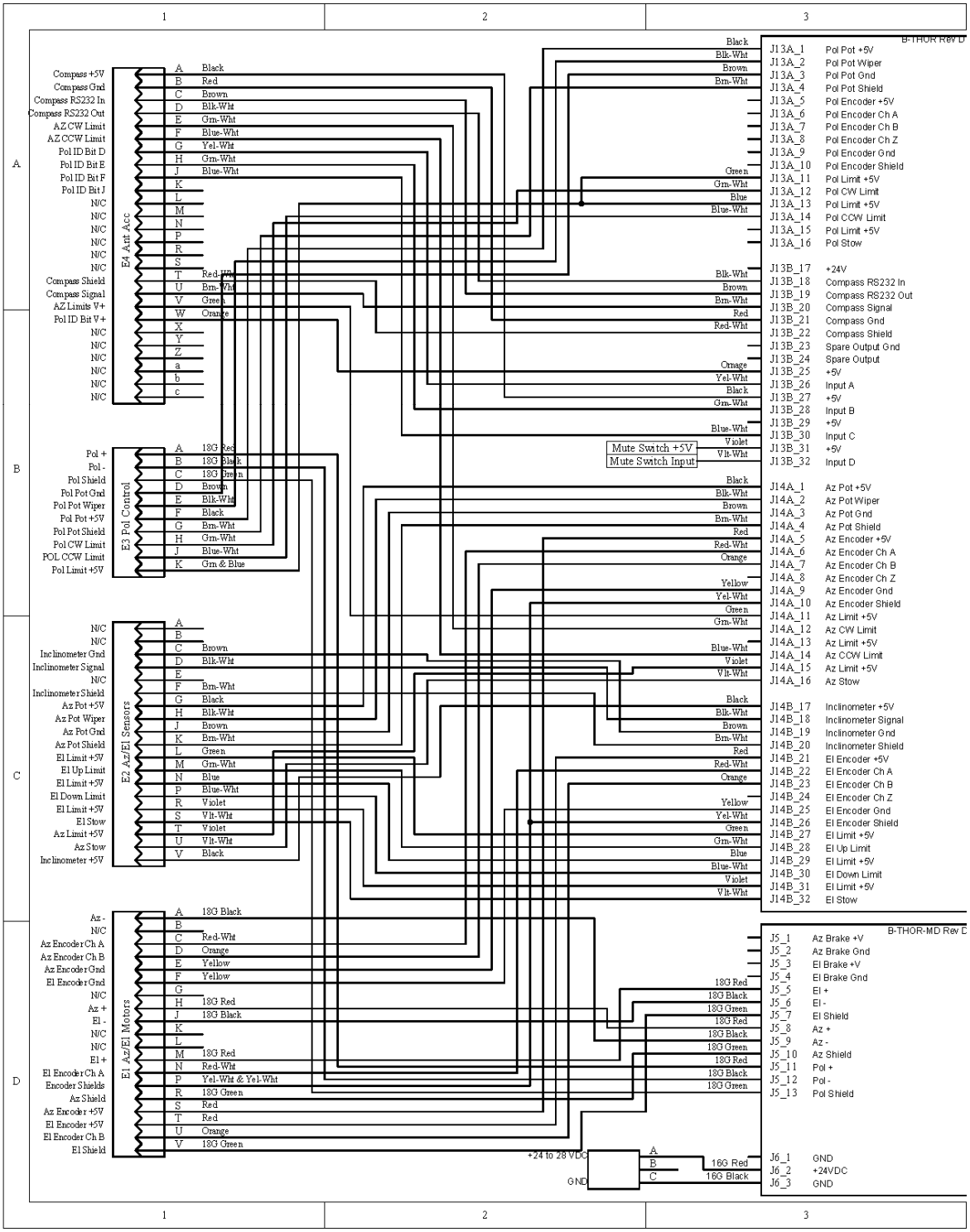

B-THOR Rev D
B-THOR-MD Rev D
E4 Ant Acc
E3 Pol Control
E2 Az/El Sensors
E1 Az/El Motors
Mute Switch +5V
Mute Switch Input
+24 to 28 VDC
GND

Figure 7

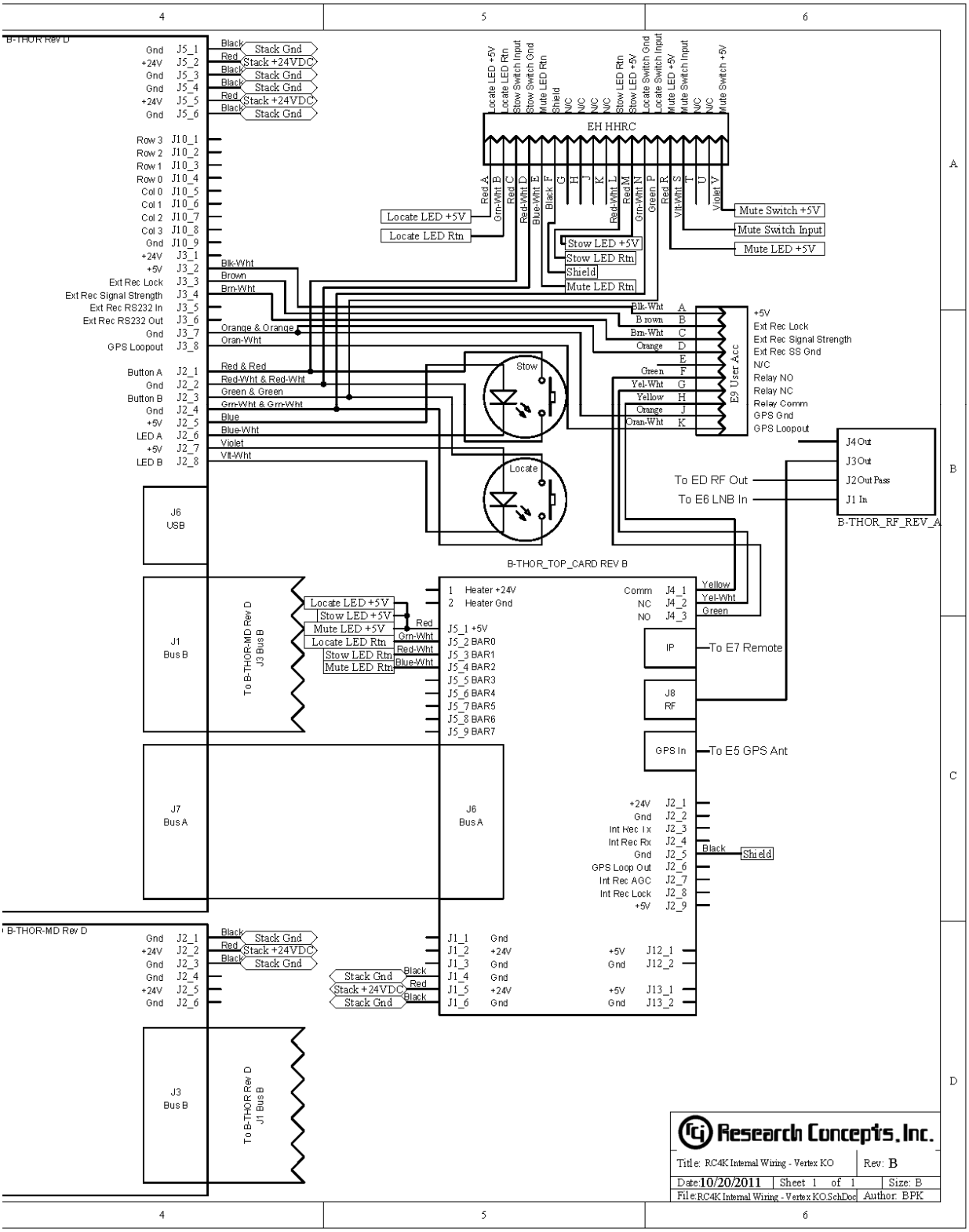

B-THOR Rev D
Gnd J5_1
+24V J5_2
Gnd J5_3
Gnd J5_4
+24V J5_5
Gnd J5_6
Black Stack Gnd
Red Stack +24VDC
Black Stack Gnd
Black Stack Gnd
Red Stack +24VDC
Black Stack Gnd
Row 3 J10_1
Row 2 J10_2
Row 1 J10_3
Row 0 J10_4
Col 0 J10_5
Col 1 J10_6
Col 2 J10_7
Col 3 J10_8
Gnd J10_9
+24V J3_1
+5V J3_2
Ext Rec Lock J3_3
Ext Rec Signal Strength J3_4
Ext Rec RS232 In J3_5
Ext Rec RS232 Out J3_6
Gnd J3_7
GPS Loopout J3_8
Button A J2_1
Gnd J2_2
Button B J2_3
Gnd J2_4
+5V J2_5
LED A J2_6
+5V J2_7
LED B J2_8
Blk-Wht
Brown
Brn-Wht
Orange & Orange
Oran-Wht
Red & Red
Red-Wht & Red-Wht
Green & Green
Grn-Wht & Grn-Wht
Blue
Blue-Wht
Violet
Vlt-Wht
J6 USB
J1 Bus B
To B-THOR-MD Rev D J3 Bus B
J7 Bus A
J6 Bus A
J3 Bus B
To B-THOR Rev D J1 Bus B
Locate LED +5V
Stow LED +5V
Mute LED +5V
Locate LED Rtn
Stow LED Rtn
Mute LED Rtn
Red
Grn-Wht
Red-Wht
Blue-Wht
J5_1 +5V
J5_2 BAR0
J5_3 BAR1
J5_4 BAR2
J5_5 BAR3
J5_6 BAR4
J5_7 BAR5
J5_8 BAR6
J5_9 BAR7
1 Heater +24V
2 Heater Gnd
B-THOR_TOP_CARD REV B
Comm J4_1
NC J4_2
NO J4_3
Yellow
Yel-Wht
Green
IP
To E7 Remote
J8 RF
GPS In
To E5 GPS Ant
+24V J2_1
Gnd J2_2
Int Rec Tx J2_3
Int Rec Rx J2_4
Gnd J2_5
GPS Loop Out J2_6
Int Rec AGC J2_7
Int Rec Lock J2_8
+5V J2_9
Black Shield
B-THOR-MD Rev D
Gnd J2_1
+24V J2_2
Gnd J2_3
Gnd J2_4
+24V J2_5
Gnd J2_6
Black Stack Gnd
Red Stack +24VDC
Black Stack Gnd
Stack Gnd Black
Stack +24VDC Red
Stack Gnd Black
J1_1 Gnd
J1_2 +24V
J1_3 Gnd
J1_4 Gnd
J1_5 +24V
J1_6 Gnd
+5V J12_1
Gnd J12_2
+5V J13_1
Gnd J13_2
EH HHRC
Locate LED +5V
Locate LED Rtn
Stow LED +5V
Stow LED Rtn
Shield
Mute LED Rtn
Mute Switch +5V
Mute Switch Input
Mute LED +5V
Red A
Grn-Wht B
Red C
Red-Wht D
Blue-Wht E
Black F
G
H
J
K
Red-Wht L
Red M
Grn-Wht N
Green P
Red R
Vlt-Wht S
T
U
Violet V
Stow
Locate
E9 User Acc
Blk-Wht A
Brown B
Brn-Wht C
Orange D
E
Green F
Yel-Wht G
Yellow H
Orange J
Oran-Wht K
+5V
Ext Rec Lock
Ext Rec Signal Strength
Ext Rec SS Gnd
N/C
Relay NO
Relay NC
Relay Comm
GPS Gnd
GPS Loopout
J4 Out
J3 Out
J2 Out Pass
J1 In
B-THOR_RF_REV_A
To ED RF Out
To E8 LNB In
Research Concepts, Inc.
Title: RC4K Internal Wiring - Vertex KO
Rev: B
Date: 10/20/2011
Sheet 1 of 1
Size: B
File: RC4K Internal Wiring - Vertex KO.SchDoc
Author: BPK

Figure 8