# APPENDIX B - MOUNT SPECIFIC DATA
# For
# RSI 240 MVO

This appendix describes RC3000 operations unique for two (potentiometer or resolver-based) RSI 240 MVO mounts.

Revision History. Date: 27 February 2002 - Software Version: 1.32

### 1.1 Manual Organization

This appendix is provided as a supplement to the baseline RC3000 manual. Differences between this version and the operation described in the baseline RC3000 manual are noted on a paragraph by paragraph basis.

### 1.2 RC3000 Features

All features described in the baseline manual are supported. Note that the optional tracking of inclined orbit satellites is not supported for MVO mounts that have potentiometers for azimuth and elevation position sensing.

**Hardware Configuration**. A RC3000E version of hardware is required for this mount. The E model is similar to a RC3000A (low voltage drive) model but the chassis backpanel contains the correct connectors to mate with standard MVO cables.

**Software Configuration**. Two variations of the MVO mount are supported by software.

One version supports MVO mounts that have potentiometers for the azimuth and elevation axes. This version will be designated as R3. Software will be designated as RC3K-R3-xxx

The second version supports mounts having resolvers on the azimuth and elevation axes. This version will be designated as R4. Software will be designated as RC3K-R4-xxx.

Many of the unique functions described in this appendix are common to both the R3 and R4 versions. Unique items to R3 or R4 will be noted.

### 1.3.1 Controller Description

RESOLVER BOARD. To support the R4 version, an additional resolver to digital conversion board must be added to the baseline RC3000 hardware. A schematic of this board is shown in section 4.2.

### 1.3.2 System Interface Requirements

The following unique interface requirements are common to the R3 and R4 versions:

- RC3000 relays normally used for HPA and alarm contact closure are used to energize azimuth and elevation brakes
- The MVO's CCW polarization limit switch drives the RC3000's polarization stow limit input
- Feed type (Circular/Linear, C, Ku, X) is sensed via the inputs normally used to sense pulse inputs.

The azimuth potentiometer input is used only for the R3 version.

Additionally the following unique interface requirements exist for the R4 version:

- No azimuth potentiometer exists, a resolver is used for sensing azimuth position and for performing high resolution (tracking) movements in azimuth.

- A resolver is used for high resolution (tracking) movements in elevation.

### 1.3.3 Operational Overview

The operation of the R3 and R4 versions are almost identical to that described in the baseline manual. Differences will be noted in the appropriate paragraphs.

### 1.3.7 Drive System

**Position Sensing and Limits**. In addtion to azimuth cw and ccw limit switches, azimuth software limits are implemented (R4 only). An elevation UP software limit is also implemented for the R4 version.

**Jam and Runaway Sensing**. Jammed and runaway sensing is based on resolver counts (R4 only).

**2.0 INSTALLATION**

**2.1.1 RC3000 Antenna Controller**

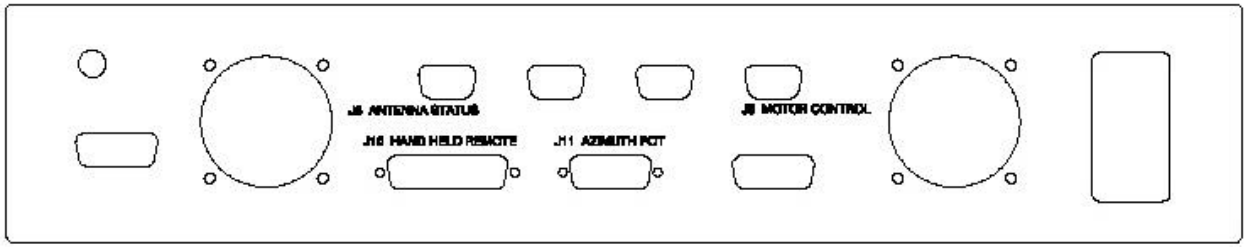
The RC3000E is slightly deeper (19.1" vs. 17.05") than the baseline RC3000. This additional depth is required to accommodate the backpanel with MVO connectors.

**2.1.4 Electronic Clinometer**

The inclinometer should be rigged with the backstructure vertical. With the backstructure vertical, the inclinometer should be mounted so that it is 22.7 (35.0 –22.3) degrees from vertical. This orientation will allow linear output from the inclinometer to a RF angle of 90 degrees.

**2.2 Electrical Connections.**

The RC3000E's backpanel contains the standard connectors for use with the RSI MVO's antenna status (J8) and motor control (J9) cabling. The following diagram shows this backpanel.




**2.2.1 Power Entry**

The RC3000E has the same fuse requirements as the RC3050A model (8 A. for 115, 4 A. for 230).

**2.2.2 Motor Drive**

**2.2.3 Drive Sense**

**2.2.4 Limit Switches**

**2.2.7 Accessories**

**2.2.10 Pulse Sensors**

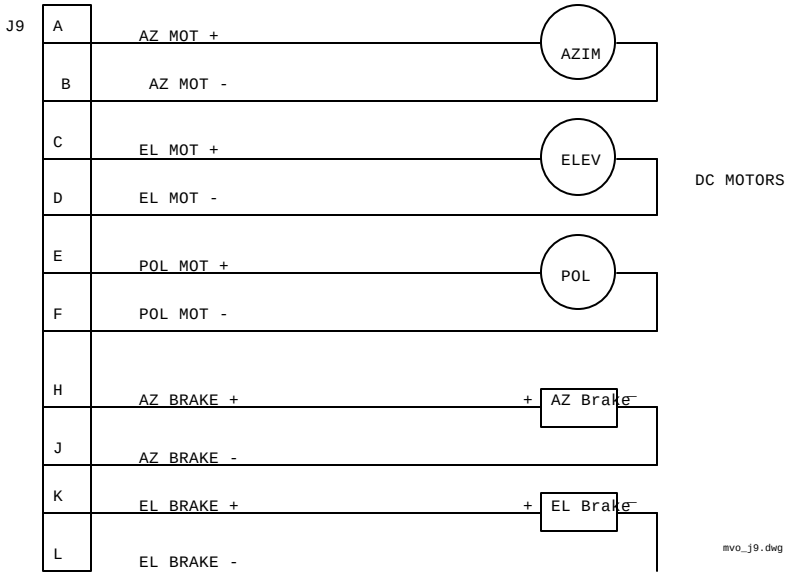
Internal to the RC3000E is cabling that adapts these standard interface connections shown in the baseline manual to the MVO style connectors on the backpanel. A schematic is provided in section 4.2 showing this adaptation.

NOTE: The relays provided via the RC3000's Accessories connector are used to energize the azimuth and elevation brakes. Also the RC3000's Pulse Sensor inputs are used for sensing the status of the MVO's feed type inputs. The mechanization of these inputs is shown in the adapter cable schematic.

The individual MVO connectors are now discussed.

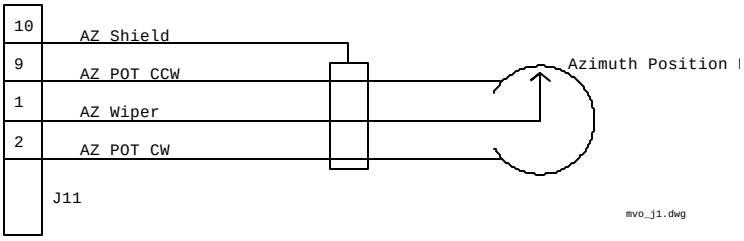
**Motor Control**.

Azimuth, elevation and polarization drive commands along with azimuth and elevation brake control is provided via J9. J9 is a female 35 pin Amphemnol MS (size 28-15) type connector.




**Azimuth Potentiometer.**

The azimuth potientiometer is interfaced via J11. J11 is a female DB-15 type connector.



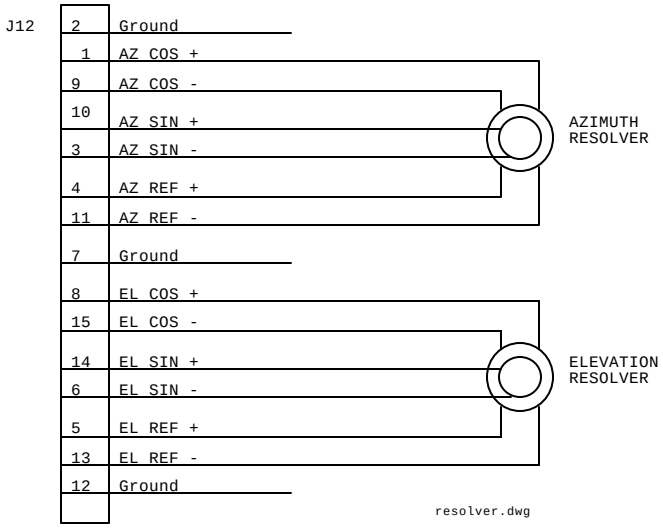
**Antenna Status.**

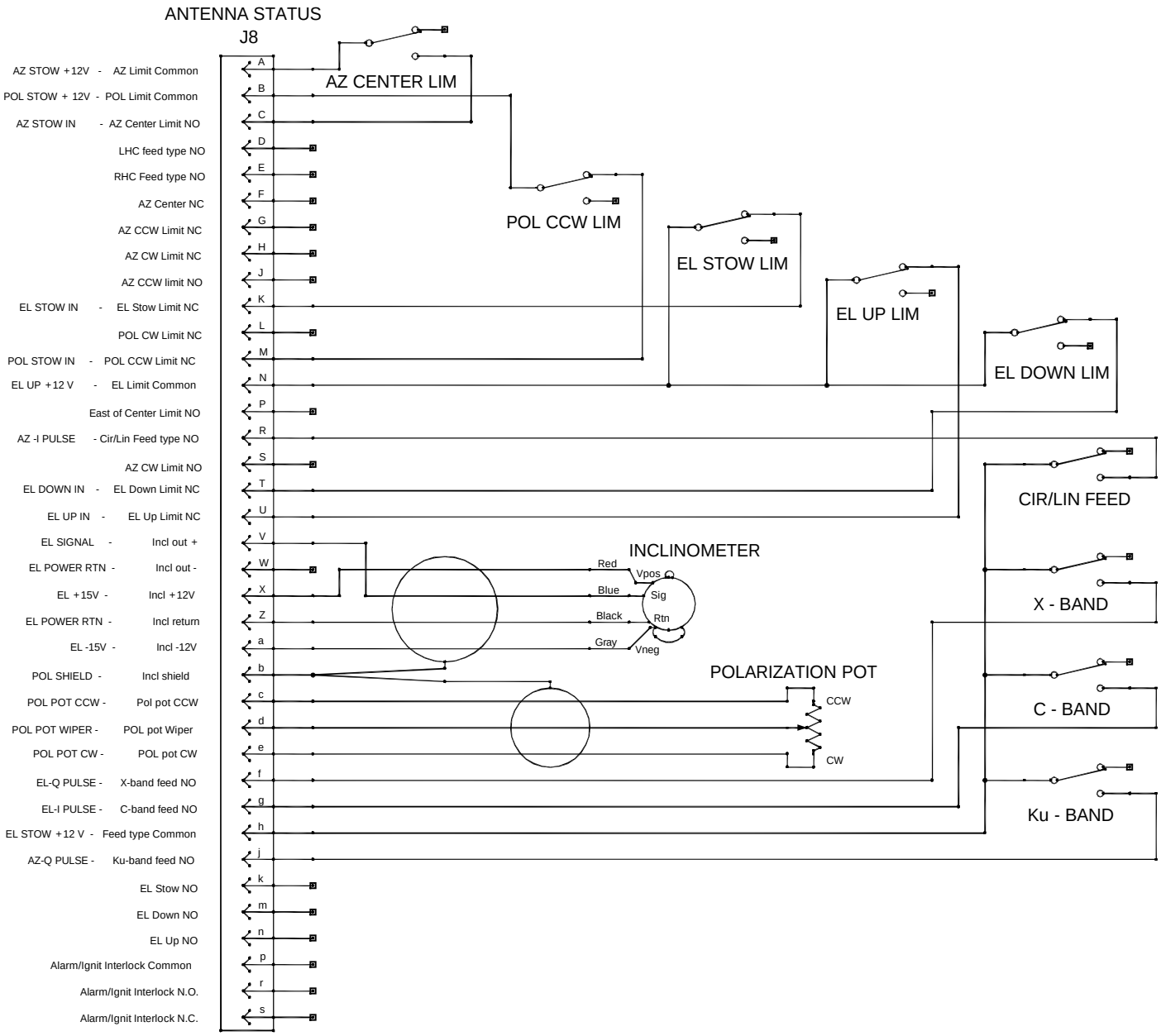
Limit switch status, feed type status, polarization and elevation position is provided via the J8 connector. J8 is a female 37 pin Amphemnol MS (size 28-21) type connector.

Pinouts for the J8 connectors are shown on the following page.

### 2.2.12 Resolver inputs

J12 is used for the resolver interface (R4 only).




ANTENNA STATUS
J8
AZ STOW +12V - AZ Limit Common
POL STOW + 12V - POL Limit Common
AZ STOW IN - AZ Center Limit NO
LHC feed type NO
RHC Feed type NO
AZ Center NC
AZ CCW Limit NC
AZ CW Limit NC
AZ CCW limit NO
EL STOW IN - EL Stow Limit NC
POL CW Limit NC
POL STOW IN - POL CCW Limit NC
EL UP +12 V - EL Limit Common
East of Center Limit NO
AZ -I PULSE - Cir/Lin Feed type NO
AZ CW Limit NO
EL DOWN IN - EL Down Limit NC
EL UP IN - EL Up Limit NC
EL SIGNAL - Incl out +
EL POWER RTN - Incl out -
EL +15V - Incl +12V
EL POWER RTN - Incl return
EL -15V - Incl -12V
POL SHIELD - Incl shield
POL POT CCW - Pol pot CCW
POL POT WIPER - POL pot Wiper
POL POT CW - POL pot CW
EL-Q PULSE - X-band feed NO
EL-I PULSE - C-band feed NO
EL STOW +12 V - Feed type Common
AZ-Q PULSE - Ku-band feed NO
EL Stow NO
EL Down NO
EL Up NO
Alarm/Ignit Interlock Common
Alarm/Ignit Interlock N.O.
Alarm/Ignit Interlock N.C.
A
B
C
D
E
F
G
H
J
K
L
M
N
P
R
S
T
U
V
W
X
Z
a
b
c
d
e
f
g
h
j
k
m
n
p
r
s
AZ CENTER LIM
POL CCW LIM
EL STOW LIM
EL UP LIM
EL DOWN LIM
CIR/LIN FEED
X - BAND
C - BAND
Ku - BAND
INCLINOMETER
Red
Blue
Black
Gray
Vpos
Sig
Rtn
Vneg
POLARIZATION POT
CCW
CW

**2.2.5 Signal Strength**

NOTE: The gain and offset potentiometers associated with the signal strength connector are recessed from the backpanel on the RC3000E model. The lid of the RC3000 may have to be removed in order to calibrate these pots. This connector is designated J2 on the 3000E backpanel.

**2.2.6 Navigation Sensors**

On "baseline" RC3000's the J9 connector is a 37 pin connector. An adapter "dongle" is supplied that adapts the DB-37 to two DB-9 connectors.

The RC3000E model supplies the two DB-9 connectors (J4-GPS, J5-Fluxgate) directly on the backpanel. Pinouts for these DB-9s are as shown in the baseline manual.

**2.2.9 Hand Held Remote**

NOTE: When the handheld remote control is placed in "MANUAL", the RC3000 deenergizes the azimuth and elevation brakes until the HHR is placed back in the "COMPUTER" position.

**2.2.8 RF Autopeak** Designated as J1 for RC3000E.

**2.2.11 PC Remote Control** Designated as J3 for RC3000E.

These connectors are provided on the backpanel of the RC3000E. Their function is as described in the baseline manual.

**2.3.1 Software Initialization**

Reset Defaults. The table at the end of the document supplies the default configuration item values for the R3 and R4 versions.

NOTE: All configuration item values should be examined to determine if they are appropriate for your specific installation.

**2.3.2 Elevation Calibration**

R3 Version - R3 utilizes just an inclinometer on the elevation axis. Elevation calibration will be as described in the baseline manual.

Elevation Reference Position. Both the inclinometer and elevation resolver should be calibrated while the backstructure is vertical (i.e. the elevation reference position).

With the inclinometer oriented as described in 2.1.4 the elevation reference voltage should be approximately 1.45 volts.

R4 Version - R4 also mechanizes a resolver on the elevation axis. The following modified steps are required for elevation calibration.

Sensor Polarity. The inclinometer should increase in voltage when going up, elevation resolver count (R4 only) should also increase.

Resolver Calibration (R4 only). Rotate the elevation resolver until a raw resolver angle of approximately 122.3 degrees in seen in the MAINTENANCE-VOLTS screen. Lock the elevation resolver in place and observe the raw resolver angle. Subtract 22.3 from this observed angle and enter it as the elevation resolver offset (see 3.3.1.2.2).

**2.3.3 Azimuth Calibration.**

R3 Version - The only position sensor on the azimuth axis is a potentiometer. Azimuth calibration will be as described in the baseline manual.

R4 Version - The only position sensor on the azimuth axis is the resolver. The following modified steps are required for azimuth calibration.

Sensor Polarity. Azimuth resolver "counts" should increase as the mount rotates clockwise. If it does not, the polarity may be changed by setting the azimuth resolver reverse flag.

Azimuth Reference Position. - Position the mount at the azimuth stow position as exactly as possible. Loosen and adjust the azimuth resolver to be as close to 180 degrees (seen at a/d volts screen 3.3.2.1) as possible. The azimuth resolver offset will be 0.0 – "raw resolver angle".

Azimuth Limits. In addition to using CW and CCW limit switch inputs, this version of the RC3000 implements "software" limits. The azimuth CW and CCW pulse limits (3.3.1.3.3) should be set to values that reflect the azimuth resolver count values near the end of azimuth travel. When the RC3000 senses that the azimuth axis has reached these values, it will generate a "software" limit condition even though the actual hardware limit has not been reached. If the user does not want to use the "software limit" feature, set these configuration items to values outside the range of normal azimuth travel.

**2.3.4 Polarization Calibration.**

Separate reference voltages are maintained for the three linear feed trypes. At power up the linear feed type is sensed and the reference voltage stored for that feed type is used. Therefore the reference voltage for each linear feed type used should be separately set.

**3.2.1 Manual Mode.**

If the feed type input has sensed that a circular polarized feed is installed, no POL field will be displayed since the RC3000 assumes that there is no need for polarization feedback from a circular polarized system.

R4 only - The azimuth angle is generated as a function of the azimuth resolver feedback. Elevation angle represents true mount elevation based on feedback from the inclinometer. The scroll up key will switch the display between azimuth and elevation angles to resolver "counts".

**3.2.2.2 Stow**

As part of the STOW sequence the polarization axis will be driven to the polarization CCW limit when a linear feed is attached. If the polarization axis is not at the CCW limit, elevation movement below the DOWN limit will not be allowed.

**3.2.2.8 Settings**

Signal Source.

In addition to selecting the signal source for autopeak movements, this will select the signal source for tracking.

**3.3.1.2.2 Elevation Calibration.**

In addition to the normal inclinometer calibration items, two elevation resolver calibration items are included.

```
REF_V:1.69 OFF:  0.0        CONFIG-ELEV
 DOWN:  0   UP: 90.0   SF:50.00
 LOOK:1    RES: 0.0   REV:0
SET REFERENCE VOLTAGE <0.50 – 3.50>
```

**RES: ELEV RESOLVER OFFSET<+/-300.00 DEGREES>**

The elev_resolver_offset configuration item defines the offset to be applied to the angle read directly from the elevation resolver for the purpose of displaying elevation angle. Example: If when at the elevation reference (stow) position the raw elevation resolver angle reads 122.3, a elev_resolver_offset of -100.0 will result in a resolver based elevation angle of 22.3.

NOTE: currently the resolver-based angle is not displayed on any screen.

**REV: ELEV RESOLVER<0-NORMAL 1-REVERSED>**

The elev_resolver_reversed configuration item defines whether the polarity of the elevation resolver matches that of the RC3000 resolver circuitry. If the raw elevation resolver angle decreases as the mount moves up, the elev_resolver_reversed item must be described as reversed.

**3.3.1.2.3 Azimuth Calibration**

In addition to the normal azimuth calibration items, two azimuth resolver calibration items are included. No azimuth reference_voltage item is displayed since no azimuth potentiometer is present.

```
          OFF: 0.0         CONFIG-AZIM
  CCW:180   CW:180
  RES: 0.0 REV:0
SET REFERENCE VOLTAGE <2.00 – 3.00>
```

**RES: AZIM RESOLVER OFFSET<+/-300.00 DEGREES>**

The azim_resolver_offset configuration item defines the offset to be applied to the angle read directly from the azimuth resolver for the purpose of displaying azimuth angle. Example: If when at the azimuth stow position the raw azimuth resolver angle reads 181.3, a azim_resolver_offset of –181.3 will result in a resolver based azimuth angle of 0.0.

**REV: ELEV RESOLVER<0-NORMAL 1-REVERSED>**

The elev_resolver_reversed configuration item defines whether the polarity of the elevation resolver matches that of the RC3000 resolver circuitry. If the raw elevation resolver angle decreases as the mount moves up, the elev_resolver_reversed item must be described as reversed.

**3.3.1.3.2 Azimuth Pot Drive**

Since no potentiometer exists on the azimuth axis, these items actually are used to tune azimuth movements based on angles derived from the resolver feedback.

**3.3.1.3.3 Azimuth Pulse Drive**

**3.3.1.3.6 Elevation Pulse Drive**

The items on the Pulse Drive screens are actually used to tune drive movements based on resolver “counts”. The resolver counts are used in the same fashion as pulse counts are used for making precise movements (during tracking, recall) of the mount.

NOTE: the azimuth and elevation pulses_per_radian values are set to 10,431. This is the number of resolver counts per radian.

360 degrees / 65536 total counts = 0.005493164 degrees/count or 182.044 counts/degree.

182.044 counts/degree * 57.29 degrees/radian = 10431 counts/radian

#### 3.3.1.3.4 Azimuth Drive Monitoring

#### 3.3.1.3.7 Elevation Drive Monitoring

The items on the Drive Monitoring screens are actually used to tune drive movements based on resolver “counts”. The resolver counts are used in the same fashion as pulse counts are used for making precise movements of the mount.

#### 3.3.2.1 Analog to Digital Voltages

R4 only - In addition to the normal voltages displayed this screen also shows “raw resolver” angles and counts.

```
AZ: 1.114   181.30 33004    AD VOLTAGES
EL: 1.143 1 122.30 22264   22.3
POL:2.237
SIG: 3.756(1) <1>RF <2>SS1 <3>SS2 <4>GND
```

The azimuth and elevation resolver angles and counts displayed are read directly from the resolvers without being biased by offset terms. NOTE: The displayed values will reflect if the azimuth or elevation resolver polarity has been reversed.

As an aid in calibrating the elevation resolver, the angle resulting from applying offset and reverse factors is also displayed.

#### 3.3.2.5 Limits Maintenance

```
AZIM CW:0  CCW:1  STOW:0          LIMITS
ELEV UP:1   DN:1  STOW:1 LN:1 C:1 ACTIVE
 POL CW:0  CCW:1  STOW:1 Ku:0 X:0  REM:1
<BKSP>MAKE LIMITS INACTIVE    <MODE>EXIT
```

**REM:1**

In addition to the normal limit switch state information, this screen also shows the state of the handheld remote/computer switch. The REM field will be 1 if the handheld remote is attached and the remote/computer switch is at remote. If the switch is at computer or if the handheld remote is not attached, the REM field will indicate 0.

**LN:1 C:1 Ku:0 X:0**

The state of the feed type inputs is shown. LN shows the state of the circular/linear input (1=linear). C, Ku and X show the state of the corresponding input (1 = input active).

| **CONFIGURATION ITEM** | **R3** | **R4** | | | | | | **INSTALL VALUE** |
|---|---|---|---|---|---|---|---|---|
| **SYSTEM DEFINITION** | | | | | | | | |
| Antenna_size_cm | 240 | 240 | | | | | | |
| GPS | 1 | 1 | | | | | | |
| COMP | 1 | 1 | | | | | | |
| MODE | 2 | 2 | | | | | | |
| WAVE | 0 | 0 | | | | | | |
| **ELEVATION CALIBRATION** | | | | | | | | |
| Zero Voltage | 0.81 | 0.81 | | | | | | |
| Elev_offset | 0.0 | 0.0 | | | | | | |
| Up_elev_limit | 90 | 90 | | | | | | |
| Down_elev_limit | 10 | 10 | | | | | | |
| Elevation_Scale_Factor | 50.00 | 50.00 | | | | | | |
| Elevation_look_configuration | 1 | 1 | | | | | | |
| Res | 0.00 | 0.00 | | | | | | |
| Rev | 0 | 0 | | | | | | |
| **AZIMUTH CALIBRATION** | | | | | | | | |
| Reference_voltage | 2.50 | N/A | | | | | | |
| Azim_Scale_Factor | 56.25 | N/A | | | | | | |
| Azim_offset | 0.0 | 0.0 | | | | | | |
| ccw_azim_limit | 135 | 135 | | | | | | |
| Cw_azim_limit | 135 | 135 | | | | | | |
| Res | N/A | 0.00 | | | | | | |
| Rev | N/A | 1 | | | | | | |
| **POLARIZATION CAL** | | | | | | | | |
| Zero Voltage | 2.50 | 2.50 | | | | | | |
| Polarization_Offset | 0.0 | 0.0 | | | | | | |
| CW Polarization Limit | 86.0 | 86.0 | | | | | | |
| CCW Polarization Limit | 91.0 | 91.0 | | | | | | |
| Pol_Scale_Factor | 40.90 | 40.90 | | | | | | |
| Polarization_type | 2 | 2 | | | | | | |
| H/V_Reference | 0 | 0 | | | | | | |
| Default Horizontal Position | -45.0 | -45.0 | | | | | | |
| Default Vertical Position | 45.0 | 45.0 | | | | | | |
| Pol_Automove_Enable | 1 | 1 | | | | | | |
| **SIGNAL PARAMETERS** | | | | | | | | |
| RF_Lock | 0 | 0 | | | | | | |
| RF_Time | 0.1 | 0.1 | | | | | | |
| Channel 1 Polarity | 1 | 1 | | | | | | |
| Channel 1 Threshold | 100 | 100 | | | | | | |
| Channel 1 Delay | 0.1 | 0.1 | | | | | | |
| Channel 1 Lock Type | 0 | 0 | | | | | | |
| Channel 2 Polarity | 1 | 1 | | | | | | |
| Channel 2 Threshold | 100 | 100 | | | | | | |
| Channel 2 Delay | 0.1 | 0.1 | | | | | | |
| Channel 2 Lock Type | 0 | 0 | | | | | | |

| **CONFIGURATION ITEM** | **R3** | **R4** | | | | | | **INSTALL VALUE** |
|---|---|---|---|---|---|---|---|---|
| **AUTOPEAK** | | | | | | | | |
| Autopeak Enabled | 0 | 0 | | | | | | |
| Signal Source | 1 | 1 | | | | | | |
| RF Band | 1 | 1 | | | | | | |
| Spiral Search AZ Limit | 5 | 5 | | | | | | |
| Spiral Search EL Limit | 5 | 5 | | | | | | |
| Spiral Signal Threshold | 200 | 200 | | | | | | |
| Scan Range Limit | 4 | 4 | | | | | | |
| Scan Signal Threshold | 200 | 200 | | | | | | |
| **AZIMUTH POT DRIVE** | | | | | | | | |
| Fast/Slow Threshold | 2.5 | 2.5 | | | | | | |
| Maximum Position Error | 0.20 | 0.20 | | | | | | |
| Coast Threshold | 0.1 | 0.1 | | | | | | |
| Maximum Retry Count | 3 | 3 | | | | | | |
| **AZIMUTH PULSE DRIVE** | | | | | | | | |
| Pulse Scale Factor | N/A | 10431 | | | | | | |
| CW Pulse Limit | N/A | 65000 | | | | | | |
| CCW Pulse Limit | N/A | 1000 | | | | | | |
| Fast/Slow Threshold | N/A | 50 | | | | | | |
| Maximum Position Error | N/A | 0 | | | | | | |
| Coast Threshold | N/A | 3 | | | | | | |
| Maximum Retry Count | N/A | 3 | | | | | | |
| **AZIM DRIVE MONITORING** | | | | | | | | |
| Jam Slop | 1 | 1 | | | | | | |
| Runaway Slop | 200 | 200 | | | | | | |
| Fast Deadband | 1000 | 1000 | | | | | | |
| Slow Deadband | 500 | 500 | | | | | | |
| **ELEV POT DRIVE** | | | | | | | | |
| Fast/Slow Threshold | 3.0 | 3.0 | | | | | | |
| Maximum Position Error | 0.2 | 0.2 | | | | | | |
| Coast Threshold | 0.4 | 0.4 | | | | | | |
| Maximum Retry Count | 3 | 3 | | | | | | |
| **ELEV PULSE DRIVE** | | | | | | | | |
| Pulse Scale Factor | N/A | 10431 | | | | | | |
| UP Pulse Limit | N/A | 65000 | | | | | | |
| Down Pulse Limit | N/A | 1000 | | | | | | |
| Fast/Slow Threshold | N/A | 50 | | | | | | |
| Maximum Position Error | N/A | 0 | | | | | | |
| Coast Threshold | N/A | 3 | | | | | | |
| Maximum Retry Count | N/A | 3 | | | | | | |
| **ELEV DRIVE MONITORING** | | | | | | | | |
| Jam Slop | 1 | 1 | | | | | | |
| Runaway Slop | 200 | 200 | | | | | | |
| Fast Deadband | 1000 | 1000 | | | | | | |
| Slow Deadband | 500 | 500 | | | | | | |

| **CONFIGURATION ITEM** | **R3** | **R4** | | | | | | **INSTALL VALUE** |
|---|---|---|---|---|---|---|---|---|
| **POL POT DRIVE** | | | | | | | | |
| Fast/Slow Threshold | 2.0 | 2.0 | | | | | | |
| Maximum Position Error | 0.5 | 0.5 | | | | | | |
| Coast Threshold | 0.3 | 0.3 | | | | | | |
| Maximum Retry Count | 3 | 3 | | | | | | |
| **POL DRIVE MONITORING** | | | | | | | | |
| Jam Slop | 1 | 1 | | | | | | |
| Runaway Slop | 200 | 200 | | | | | | |
| Fast Deadband | 1000 | 1000 | | | | | | |
| Slow Deadband | 500 | 500 | | | | | | |
| **TRACK** | | | | | | | | |
| Search Enable | N/A | 0 | | | | | | |
| Max Track Error | N/A | 3 | | | | | | |
| Search Width | N/A | 4 | | | | | | |
| Peakup Holdoff Time | N/A | 120 | | | | | | |
| Track Signal Source | N/A | SS1 | | | | | | |
| Signal Sample Time | N/A | 2 | | | | | | |
| **REMOTE CONTROL** | | | | | | | | |
| Remote Enabled | 1 | 1 | | | | | | |
| Bus Address | 50 | 50 | | | | | | |
| Baud Rate | 6 | 6 | | | | | | |
| **STOW / DEPLOY** | | | | | | | | |
| AZ STOW | 0.0 | 0.0 | | | | | | |
| EL STOW | -67.5 | -67.5 | | | | | | |
| PL STOW | -95.0 | -95.0 | | | | | | |
| AZ DEPLOY | 0.0 | 0.0 | | | | | | |
| EL DEPLOY | 22.3 | 22.3 | | | | | | |
| PL DEPLOY | 0.0 | 0.0 | | | | | | |
| PL ENABLED | 1 | 1 | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

4.2 Schematics

- Resolver board

- system interconnect

- antenna status (adapter) cable

*** insert resolver board schematic

CBL–25–22, BELDEN 9937,
7 INCH LENGTH, REMOVE
WIRES FROM JACKET

P3 Limit Switches

| | | |
|---|---|---|
| Pol Stow in | 1 | ORG |
| Pol Stow +12V | 2 | WHT |
| nc | 3 | |
| Limit Switch Shields | 4 | |
| EL Dwn +12V from EL Stow in | 5 | |
| EL Dwn in | 6 | RED/BLK |
| AZ Stow in | 7 | RED |
| nc | 8 | |
| AZ Stow +12V | 9 | BLK |
| EL Up +12V | 10 | BLU |
| EL Stow +12V | 11 | RED/GRN |
| nc | 12 | |
| EL Stow in | 13 | GRN |
| EL Up in | 14 | GRN/BLK |
| | 15 | |

To 8097BAN3 J3

CN–205206–3 DB15 M CRIMP
CN–66506–9 PIN CONTACT

P4 Pulse Sensors

| | | |
|---|---|---|
| AZ–I Rtn | 1 | |
| AZ–I Pulse | 2 | WHT/BLK |
| AZ–Q Rtn | 3 | |
| AZ–Q Pulse | 4 | ORG/GRN |
| EL–Q Pulse | 5 | ORG/RED |
| EL–Q Rtn | 6 | |
| EL–I Pulse | 7 | BLU/RED |
| EL–I Rtn | 8 | |
| AZ Shield | 9 | |
| AZ–I Pwr | 10 | |
| AZ–Q Pwr | 11 | |
| Alarm in | 12 | |
| EL–Q Pwr | 13 | |
| EL–I Pwr | 14 | |
| EL Shield | 15 | |

To 3K50FEAT J5

CN–205205–2 DB15 F CRIMP
CN–66504–9 SOCKET CONTACT

P1 AZ/EL/Pol Position

| | | |
|---|---|---|
| AZ pot wiper | 1 | BLK/WHT/RED |
| AZ pot CW | 2 | WHT/BLK/RED |
| Pol shield | 3 | GRN/WHT |
| Pol pot wiper | 4 | BLK/RED |
| nc | 5 | |
| EL +15V | 6 | BLU/BLK |
| EL Shield | 7 | |
| EL –15V | 8 | RED/WHT |
| AZ pot CCW | 9 | RED/BLK/WHT |
| AZ shield | 10 | |
| Pol pot CCW | 11 | BLU/WHT |
| Pol pot CW | 12 | RED/WHT |
| EL Sig Rtn | 13 | |
| EL Pwr Rtn | 14 | BLK/WHT |
| EL Sig | 15 | ORG/BLK |

To 8097BAN3 J1

CN–205206–3 DB15 M CRIMP
CN–66506–9 PIN CONTACT

CN–7568228–21S

J8
ANTENNA STATUS

| | | |
|---|---|---|
| BLK | A | AZ Limit Common |
| WHT | B | POL Limit Common |
| RED | C | AZ Center Limit NO |
| | D | LHC feed type NO |
| | E | RHC Feed type NO |
| | F | AZ Center NC |
| | G | AZ CCW Limit NC |
| | H | AZ CW Limit NC |
| GRN | J | AZ CCW limit NO |
| | K | EL Stow Limit NC |
| ORG | L | POL CW Limit NC |
| BLU | M | POL CCW Limit NC |
| | N | EL Limit Common |
| WHT/BLK | P | East of Center Limit NO |
| | R | Cir/Lin Feed type NO |
| RED/BLK | S | AZ CW Limit NO |
| GRN/BLK | T | EL Down Limit NC |
| ORG/BLK | U | EL Up Limit NC |
| | V | Incl out + |
| | W | Incl out – |
| BLU/BLK | X | Incl +12V |
| BLK/WHT | Z | Incl return |
| RED/WHT | a | Incl –12V |
| GRN/WHT | b | Incl shield |
| BLU/WHT | c | Pol pot CCW |
| BLK/RED | d | POL pot Wiper |
| WHT/RED | e | POL pot CW |
| ORG/RED | f | X–band feed NO |
| BLU/RED | g | C–band feed NO |
| RED/GRN | h | Feed type Common |
| ORG/GRN | j | Ku–band feed NO |
| | k | EL Stow NO |
| | m | EL Down NO |
| | n | EL Up NO |
| | p | Alarm/Ignit Interlock Common |
| | r | Alarm/Ignit Interlock N.O. |
| | s | Alarm/Ignit Interlock N.C. |

NOTES:
Pol Stow is located at POL CCW and is valid only when using a Ku–band linear feed.

J11
AZ POT CONNECTOR

| | | |
|---|---|---|
| BLK/WHT/RED | 1 | AZ pot wiper |
| WHT/BLK/RED | 2 | AZ pot CW |
| | 3 | |
| | 4 | |
| | 5 | |
| | 6 | |
| | 7 | |
| | 8 | |
| RED/BLK/WHT | 9 | AZ pot CCW |
| GRN/BLK/WHT | 10 | AZ shield |
| | 11 | |
| | 12 | |
| | 13 | |
| | 14 | |
| | 15 | |

CN–205205–2 DB15 F CRIMP
CN–66504–9 SOCKET CONTACT

Research Concepts, Inc.

Title: ANTENNA STATUS CABLE RC3K50E

| Size | Number | Rev |
|---|---|---|
| B | CN–RC3K50E–ASC | A |

| | | | |
|---|---|---|---|
| Date | DECEMBER 26, 2001 | Drawn by | LBM |
| Filename | CN–RC3K50E–ASC.sch | Sheet | 1 of 1 |

(RF J1)
ANTENNA STATUS
J8
28-21S
(PCRC)
J3
3k only
(GPS)
J4
3k only
(COMPASS)
J5
3k only
(HPA DISABLE)
J6
3k only
(AGC J2)
3k only
HHRC
J10
(AZ RESOLVER)
AZ POT CONNECTOR
J11
(EL RESOLVER)
J7
3k only
MOTOR CONTROL
J9
28-15S
AC POWER
CN-RC3K50E-ASC
NOT USED
RF
J1
AUTOPEAK
FB-3KAUTOPK
3K AUTOPEAK BOARD
AC POWER
PE-CE465100151
PE4
Neutral
Ground
Line
MOTOR CONTROL
J9
STD MOT DRV CN 22-20S
GRN
AZ MOT +
AZ MOT –
EL MOT +
EL MOT –
POL MOT +
POL MOT –
AZ BRAKE +
AZ BRAKE –
EL BRAKE +
EL BRAKE –
POL X-FER SW POS1. PWR
POL X-FER SW COMMON
POL X-FER SW POS2. PWR
POL X-FER SW IND1. POS2
POL X-FER SW IND COMMON
POL X-FER SW IND1. POS1
STATUS POS 2
POL X-FER SW STATUS COM
POL X-FER SW STATUS POS2
AZ TACH PICK UP +
AZ TACH PICK UP –
EL TACH PICK UP +
EL TACH PICK UP –
CN-7568228-15S
WHT/YEL 16 AWG 8"
YEL 16 AWG 8"
WHT/RED 16 AWG 8"
RED 16 AWG 8"
WHT/BLU 16 AWG 8"
WHT/BLK 16 AWG 15"
RED 20 AWG 23"
YEL 20 AWG 24"
RB1
25, 25W
RED 20 AWG 30"
RB2
25, 25W
ORG 20 AWG 27"
PE2
F-8A-SB-C for 115 VAC
F-4A-SB-C for 230 VAC
PE-4305_0017
SW1
SW-V1512101-6R
BLK
WHT
GRY
AUTO VOLTAGE SWITCH
230VAC
115VAC
PE1
PIN 1 IS NEAR EDGE OF PCB
Wht
Wht/Gry
Wht/Blu
Blk
FB-3KDRVPLT_A
Blu
Wht
Gry
Blk
FH2
F-1A-FB-G
FH1
F-1A-FB-G
TR2
TR-241-7-20
TR1
TR-UR2300-2012
Org
CT
Org/Wht
Yel
Brn
Red
Org
BR1
BR-GBPC35-04
AC1
AC2
Red
15,000uF
3.3K
Blk
BLK 16 AWG 14"
V_UNREG
V_UNREG_RTN
3k only
40 – HDR
DB-15P
J8
NAV PACK
J5
PULSE SENSORS
J1
ACC
DB-15R
J4
AUTOPEAK
6 – MOLEX
J17
+12V
2 – MOLEX
J2
POSITION SENSE
2X5 – HDR
J3
DRIVE COMMAND
2X5 – HDR
J13
ACCESSORY
J6
AC INPUT
3 – MOLEX
RC3K FEATURES BOARD
FC-3K50FEAT-1
2X5 – HDR
J10
RS422
3k only
2X5 – HDR
J11
RS232
J9
COMMS
J7
DIG BRD PWR
J16
ANALOG BRD PWR
2X7 – HDR
3 – MOLEX
6 – MOLEX
MOLEX
J13-1 nc
J13-2 + 12V V_BAT
J13-3 V_GND
J13-4 nc
J13-5 nc
J13-6 RELAY COM
J13-7 RELAY NC
J13-8 +12 V V_ACC
J13-9 EL STOW IND
K1
ORG
ORG
DB-15R
DB-15R
J1
Position Sense
J3
Limit Switch Input
8097 Analog Board
FC-8097BAN3
J10
Handheld Remote
26 – HDR
AC(W) nc
AC(B) nc
P3 Yel 18AWG 13"
P2 Wht/Blk 18AWG 18"
P1 Black 18AWG 11 1/2"
S2 Wht 18AWG 13 1/2"
S3 Wht/Red 18AWG 13 1/2"
S1 Red 18AWG 14"
A2 Gray 16AWG 14"
A1 Wht/Gry 16AWG 14"
AZ2 Wht/Yel 16AWG 10"
EL2 Wht/Red 16AWG 8"
EL1 Red 16AWG 8"
AZ1 Yel 16 AWG 8"
POL2 Wht/Brn 18AWG13 1/2"
POL1 Brn 18AWG 13 1/2"
CC Red 16 AWG 10"
CC nc
NC Org 20 AWG 9"
NC TERM IS FLYING LEAD FROM "NC" PAD
K1
RED 20 AWG 23"
J6
Power
J5
DRIVE COMMAND
J4
POSITION SENSE
6 – MOLEX
2X8 – HDR
2X8 – HDR
AUX RELAY BOARD
P3
P2
P2-3
S2
S3
S1
A2
A1
POL2
POL1
POL–
POL+
MT+
MT–
P2-2
P2-1
FC-3KRELAY-A
WHT/BLU
WHT/YEL
WHT/YEL
WHT/RED 16 AWG 8
WHT/BLU
RED/WHT
FPS3/6
RXE375
FPS2/5
RXE075
FPS1/4
RXE160
L2 50 UH
L1 50 UH
E
F
G
H
I
J
K
L
WHT/YEL
WHT/RED
WHT/BLU
WHT/RED
FB-3KDRVPLT_B
A1
Advanced Motion Controls
Motor–
Motor+
Z-25A8
+5V_5mA_Output
Signal_Ground
-5V_5mA_Output
-REF_IN
-REF_IN
Tachometer–
Tachometer+
Current_Mon.
Current_Ref_Output
Cont_Curr_Limit
RDY
RDY+
RDY–
Fault
nc
nc
High_Voltage
Power_Ground
Power_Ground
3K RESOLVER BOARD
FB-3KRSLVR
NOT USED
J16
ANALOG BRD POWER
J3 SIN COS REF AZ
J8 SIN COS REF EL
J11 SIN COS J10 REF POL
Tx3 HDR
J2
SECTOR BITS
2X8 – HDR
J1
BUS-BUS
2X20 – HDR
2X20 – HDR
6 – MOLEX
2X13 – HDR
2X13 – HDR
3 – MOLEX
J2
POWER IN
J4
DRIVE COMMAND
J3
POSITION SENSE
2X7 – HDR
J8
COMMS
3K DIGITAL BOARD
FC-3K50DIG-1
J6
RCI BUS
2X13 – HDR
2X13 – HDR
2X8 – HDR
J1
RCI-BUS
J2
FAIRING DRIVE
NOT USED
TB1
POWER
FB-3KFAIR
3K FAIRING DRIVE BOARD
J1
BUS-BUS
J7
KEYPAD
J5
LCD
1X8 – HDR
2X10 – HDR
KEYPAD
2X16 LCD
Research Concepts, Inc.
Title
SYSTEM INTERCONNECT
Size
C
Number
RC3K50E SYSTEM
Rev
A
Date
DECEMBER 28, 2001
Drawn by
LBM
Filename
RC3K50E_SYSTEM.sch
Sheet
1
of
1