APPENDIX B - MOUNT SPECIFIC DATA
For
Andrew 2.4 SNG
(RC3000F)

This appendix describes RC3000 functions unique for the Andrew 2.4 SNG mount.

Revision History. Date: 21 June 2006 - Software Version: 1.56

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 RC3000 features described in the baseline manual are present with this version. The unique features of this version of the RC3000 are:

1) The backpanel connectors are different from the baseline RC3000 connectors. These connectors allow use of standard Andrew interface cables.

2) The RC3000F drives brakes for the azimuth and elevation axis.

3) Azimuth, elevation and polarization position is sensed via resolvers rather than potentiometers.

4) An Emergency Stop input is provided

Hardware Configuration. This version of the RC3000 will be referred to as an “F” model. Internally this version is similar to an “A” version (low voltage DC motor control), but the backpanel of the chassis has been modified to connect directly to Andrew 2.4 SNG wiring.

Software Configuration. The model number for this version is **N4**.

NOTE: this appendix also covers a special instance of N4 known as NZ. For the NZ version, the emergency stop input is used as a signal that the antenna platform has been moved to a safe position.

1.3.1 Controller Description

In addition to the RC3000 components described in the baseline manual, the RC3000F includes a resolver interface board and power resistors for energizing the azimuth and elevation brakes.

A high level system interconnect drawing of the RC3000F is provided in section 4.3 (schematics).

1.3.2 System Interface Requirements

The following unique interface requirements are present for the RC3000F:

1) Resolver inputs for azimuth, elevation and polarization position sensing.

2) The RC3000F provides relays to energize the azimuth and elevation brakes.

3) azimuth stow and elevation stow, down and up limit switches do not exist

4) emergency stop / platform unsafe input

1.3.3 Operational Overview

Operation of the N4 versions is 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. Azimuth stow and elevation stow, down and up limits are implemented via software (no limit switches exist). An elevation synchronization switch is sensed to switch the drive to slow (creep mode) speed several degrees before reaching the elevation stow position.

Jam and Runaway Sensing. Jammed and runaway sensing is based on resolver counts.

2.0 INSTALLATION

2.1.1 RC3000 Antenna Controller

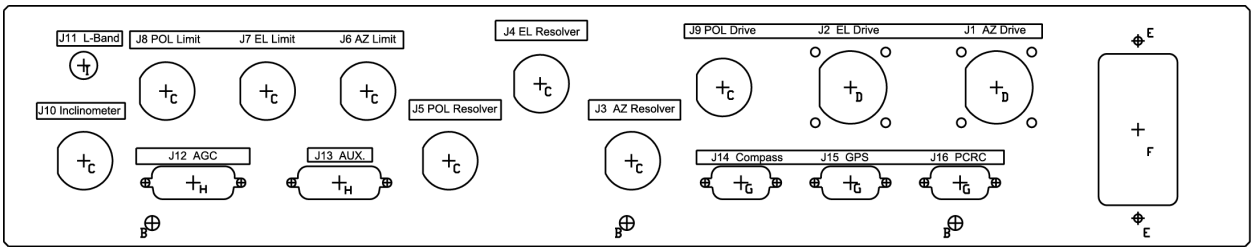
The RC3000F is slightly deeper (19.1” vs. 17.05”) than the baseline RC3000. This additional depth is required to accommodate the backpanel with Andrew connectors.

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 12.7 (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 RC3000F’s backpanel contains the standard connectors for use with the Andrew 2.4 SNG’s cabling. The following diagram shows this backpanel.



2.2.1 Power Entry

The RC3000F has the same fuse requirements as the RC3000A model (8 A. for 115, 4 A. for 230).

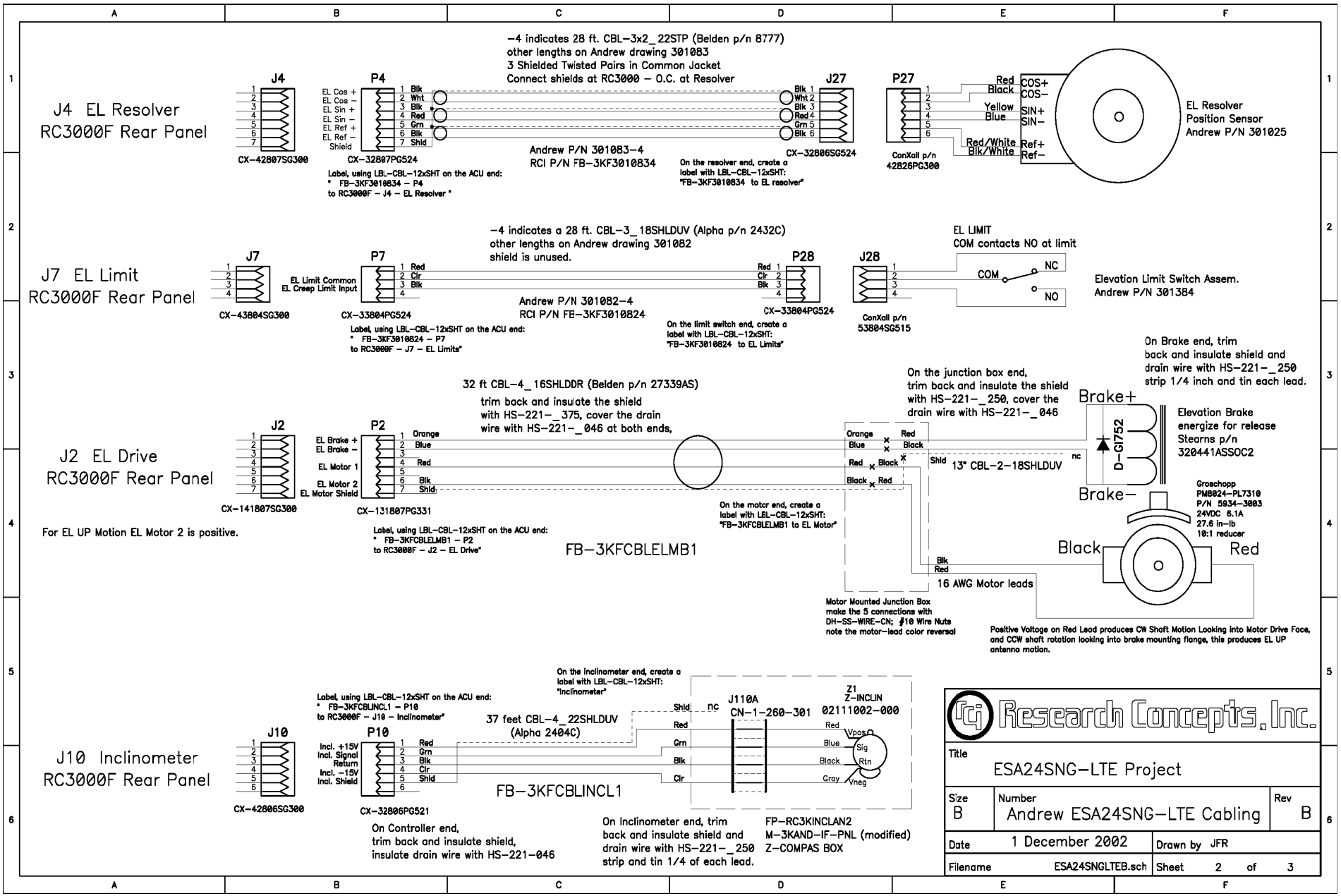
2.2.2 Motor Drive

2.2.3 Drive Sense

2.2.4 Limit Switches

Internal to the RC3000F is cabling that adapts the standard interface connections shown in the baseline manual to the Andrew style connectors on the backpanel. Schematics are provided in section 4.3 showing this adaptation.

Pinouts for the individual Andrew connectors are shown in the following diagrams.


J4 EL Resolver
RC3000F Rear Panel
J4
P4
J27
P27
CX-42807SG300
CX-32807PG524
CX-32806SG524
ConXall p/n
42826PG300
−4 indicates 28 ft. CBL−3x2_ 22STP (Belden p/n 8777)
other lengths on Andrew drawing 301083
3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 − O.C. at Resolver
Andrew P/N 301083−4
RCI P/N FB−3KF3010834
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KF3010834 − P4
to RC3000F − J4 − EL Resolver "
On the resolver end, create a
label with LBL−CBL−12xSHT:
"FB−3KF3010834 to EL resolver"
EL Cos +
EL Cos −
EL Sin +
EL Sin −
EL Ref +
EL Ref −
Shield
Blk
Wht
Blk
Red
Grn
Blk
Shld
Red
Black
Yellow
Blue
Red/White
Blk/White
COS+
COS−
SIN+
SIN−
Ref+
Ref−
EL Resolver
Position Sensor
Andrew P/N 301025
J7 EL Limit
RC3000F Rear Panel
J7
P7
P28
J28
CX-43804SG300
CX-33804PG524
CX-33804PG524
ConXall p/n
53804SG515
−4 indicates a 28 ft. CBL−3_ 18SHLDUV (Alpha p/n 2432C)
other lengths on Andrew drawing 301082
shield is unused.
Andrew P/N 301082−4
RCI P/N FB−3KF3010824
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KF3010824 − P7
to RC3000F − J7 − EL Limits"
On the limit switch end, create a
label with LBL−CBL−12xSHT:
"FB−3KF3010824 to EL Limits"
EL Limit Common
EL Creep Limit Input
Red
Clr
Blk
EL LIMIT
COM contacts NO at limit
COM
NC
NO
Elevation Limit Switch Assem.
Andrew P/N 301384
J2 EL Drive
RC3000F Rear Panel
J2
P2
CX-141807SG300
CX-131807PG331
32 ft CBL−4_ 16SHLDDR (Belden p/n 27339AS)
trim back and insulate the shield
with HS−221−_ 375, cover the drain
wire with HS−221−_ 046 at both ends,
On the junction box end,
trim back and insulate the shield
with HS−221−_ 250, cover the
drain wire with HS−221−_ 046
On Brake end, trim
back and insulate shield and
drain wire with HS−221−_ 250
strip 1/4 inch and tin each lead.
EL Brake +
EL Brake −
EL Motor 1
EL Motor 2
EL Motor Shield
Orange
Blue
Red
Blk
Shld
Brake+
Brake−
D−GI752
Elevation Brake
energize for release
Stearns p/n
320441ASSOC2
13" CBL−2−18SHLDUV
Groschopp
PM8824−PL7310
P/N 5934−3003
24VDC 6.1A
27.6 in−lb
10:1 reducer
For EL UP Motion EL Motor 2 is positive.
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KFCBLELMB1 − P2
to RC3000F − J2 − EL Drive"
FB−3KFCBLELMB1
On the motor end, create a
label with LBL−CBL−12xSHT:
"FB−3KFCBLELMB1 to EL Motor"
Black
Red
16 AWG Motor leads
Motor Mounted Junction Box
make the 5 connections with
DH−SS−WIRE−CN; #10 Wire Nuts
note the motor−lead color reversal
Positive Voltage on Red Lead produces CW Shaft Motion Looking into Motor Drive Face,
and CCW shaft rotation looking into brake mounting flange, this produces EL UP
antenna motion.
J10 Inclinometer
RC3000F Rear Panel
J10
P10
CX-42806SG300
CX-32806PG521
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KFCBLINCL1 − P10
to RC3000F − J10 − Inclinometer"
37 feet CBL−4_ 22SHLDUV
(Alpha 2404C)
On the inclinometer end, create a
label with LBL−CBL−12xSHT:
"Inclinometer"
J110A
CN−1−260−301
Z1
Z−INCLIN
02111002−000
Incl. +15V
Incl. Signal Return
Incl. −15V
Incl. Shield
Red
Grn
Blk
Clr
Shld
nc
Vpos
Sig
Rtn
Vneg
FB−3KFCBLINCL1
On Controller end,
trim back and insulate shield,
insulate drain wire with HS−221−046
On Inclinometer end, trim
back and insulate shield and
drain wire with HS−221−_ 250
strip and tin 1/4 of each lead.
FP−RC3KINCLAN2
M−3KAND−IF−PNL (modified)
Z−COMPAS BOX
Research Concepts, Inc.
Title
ESA24SNG−LTE Project
Size
B
Number
Andrew ESA24SNG−LTE Cabling
Rev
B
Date
1 December 2002
Drawn by JFR
Filename
ESA24SNGLTEB.sch
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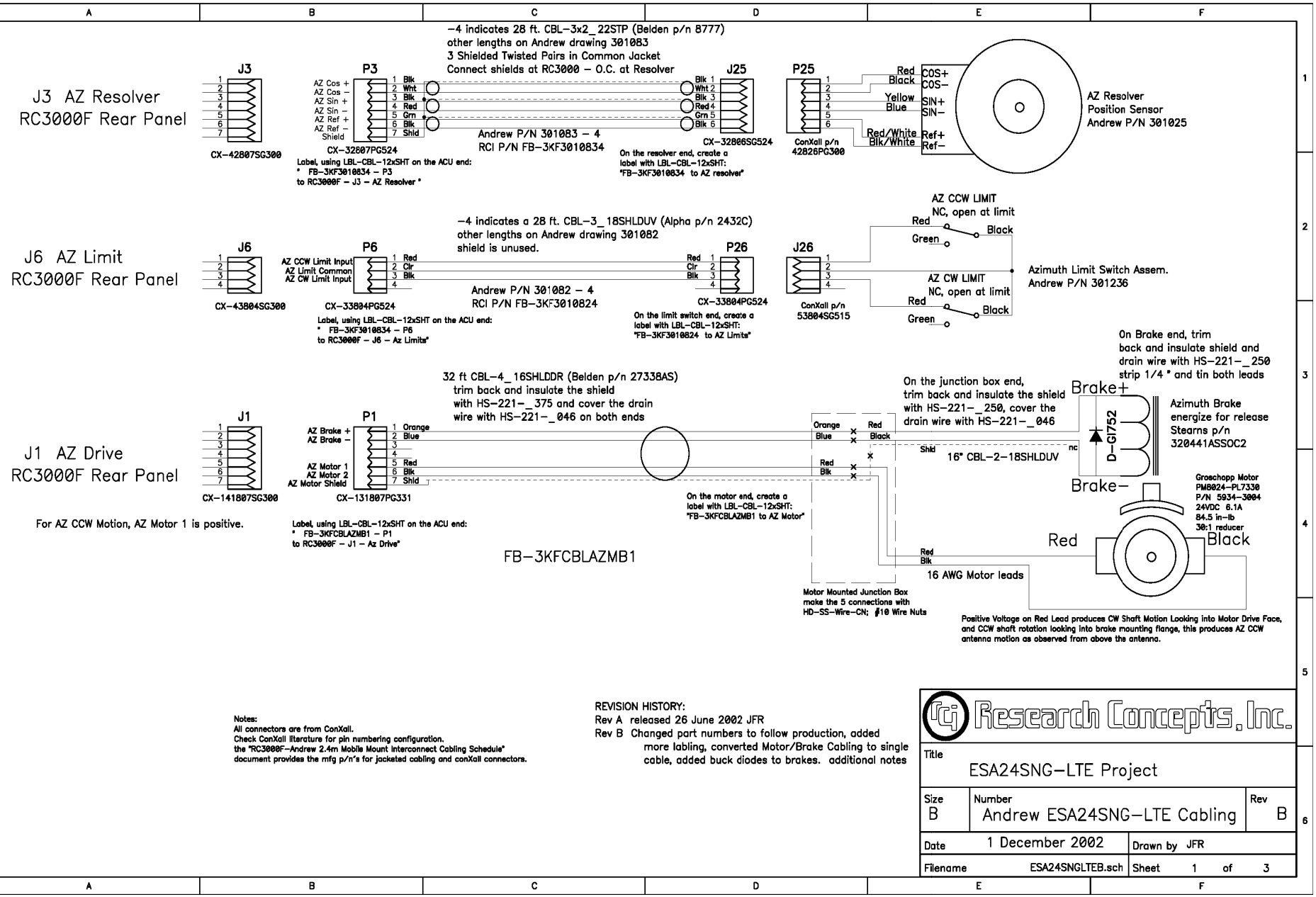
−4 indicates 28 ft. CBL−3x2_22STP (Belden p/n 8777)
other lengths on Andrew drawing 301083
3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 − O.C. at Resolver
J3 AZ Resolver
RC3000F Rear Panel
J3
CX−42807SG300
P3
AZ Cos +
AZ Cos −
AZ Sin +
AZ Sin −
AZ Ref +
AZ Ref −
Shield
Blk
Wht
Blk
Red
Grn
Blk
Shld
CX−32807PG524
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KF3010834 − P3
to RC3000F − J3 − AZ Resolver "
Andrew P/N 301083 − 4
RCI P/N FB−3KF3010834
J25
CX−32806SG524
On the resolver end, create a
label with LBL−CBL−12xSHT:
"FB−3KF3010834 to AZ resolver"
P25
ConXall p/n
42826PG300
Red
Black
Yellow
Blue
Red/White
Blk/White
COS+
COS−
SIN+
SIN−
Ref+
Ref−
AZ Resolver
Position Sensor
Andrew P/N 301025
J6 AZ Limit
RC3000F Rear Panel
J6
CX−43804SG300
P6
AZ CCW Limit Input
AZ Limit Common
AZ CW Limit Input
Red
Clr
Blk
CX−33804PG524
−4 indicates a 28 ft. CBL−3_18SHLDUV (Alpha p/n 2432C)
other lengths on Andrew drawing 301082
shield is unused.
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KF3010834 − P6
to RC3000F − J6 − Az Limits"
Andrew P/N 301082 − 4
RCI P/N FB−3KF3010824
P26
CX−33804PG524
On the limit switch end, create a
label with LBL−CBL−12xSHT:
"FB−3KF3010824 to AZ Limits"
J26
ConXall p/n
53804SG515
AZ CCW LIMIT
NC, open at limit
Red
Green
Black
AZ CW LIMIT
NC, open at limit
Red
Green
Black
Azimuth Limit Switch Assem.
Andrew P/N 301236
J1 AZ Drive
RC3000F Rear Panel
J1
CX−141807SG300
P1
AZ Brake +
AZ Brake −
AZ Motor 1
AZ Motor 2
AZ Motor Shield
Orange
Blue
Red
Blk
Shld
CX−131807PG331
32 ft CBL−4_16SHLDDR (Belden p/n 27338AS)
trim back and insulate the shield
with HS−221−_375 and cover the drain
wire with HS−221−_046 on both ends
On the junction box end,
trim back and insulate the shield
with HS−221−_250, cover the
drain wire with HS−221−_046
Shld
nc
16" CBL−2−18SHLDUV
On the motor end, create a
label with LBL−CBL−12xSHT:
"FB−3KFCBLAZMB1 to AZ Motor"
Motor Mounted Junction Box
make the 5 connections with
HD−SS−Wire−CN; #10 Wire Nuts
16 AWG Motor leads
On Brake end, trim
back and insulate shield and
drain wire with HS−221−_250
strip 1/4 " and tin both leads
Brake+
Brake−
D−GI752
Azimuth Brake
energize for release
Stearns p/n
320441ASSOC2
Groschopp Motor
PM8024−PL7330
P/N 5934−3004
24VDC 6.1A
84.5 in−lb
30:1 reducer
Red
Black
Positive Voltage on Red Lead produces CW Shaft Motion Looking into Motor Drive Face,
and CCW shaft rotation looking into brake mounting flange, this produces AZ CCW
antenna motion as observed from above the antenna.
For AZ CCW Motion, AZ Motor 1 is positive.
Label, using LBL−CBL−12xSHT on the ACU end:
" FB−3KFCBLAZMB1 − P1
to RC3000F − J1 − Az Drive"
FB−3KFCBLAZMB1
Notes:
All connectors are from ConXall.
Check ConXall literature for pin numbering configuration.
the "RC3000F−Andrew 2.4m Mobile Mount Interconnect Cabling Schedule"
document provides the mfg p/n's for jacketed cabling and conXall connectors.
REVISION HISTORY:
Rev A released 26 June 2002 JFR
Rev B Changed part numbers to follow production, added
more labling, converted Motor/Brake Cabling to single
cable, added buck diodes to brakes. additional notes
Research Concepts, Inc.
Title
ESA24SNG−LTE Project
Size
B
Number
Andrew ESA24SNG−LTE Cabling
Rev
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Filename
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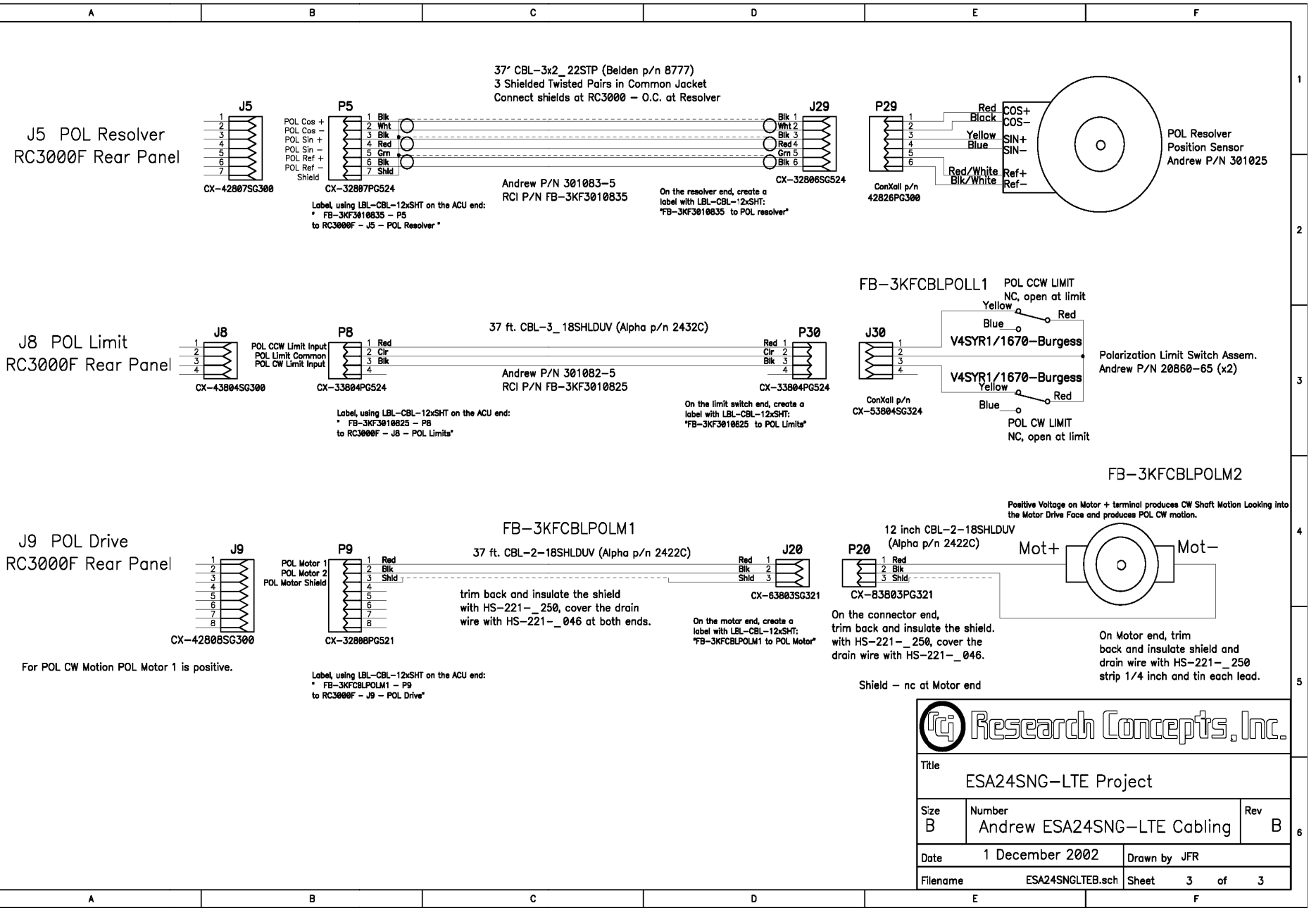
J5 POL Resolver
RC3000F Rear Panel
J5
CX-42807SG300
P5
CX-32807PG524
POL Cos +
POL Cos –
POL Sin +
POL Sin –
POL Ref +
POL Ref –
Shield
Blk
Wht
Blk
Red
Grn
Blk
Shld
37' CBL-3x2_22STP (Belden p/n 8777)
3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 – O.C. at Resolver
Andrew P/N 301083-5
RCI P/N FB-3KF3010835
J29
CX-32806SG524
Label, using LBL-CBL-12xSHT on the ACU end:
" FB-3KF3010835 – P5
to RC3000F – J5 – POL Resolver "
On the resolver end, create a
label with LBL-CBL-12xSHT:
"FB-3KF3010835 to POL resolver"
P29
ConXall p/n
42826PG300
Red
Black
Yellow
Blue
Red/White
Blk/White
COS+
COS–
SIN+
SIN–
Ref+
Ref–
POL Resolver
Position Sensor
Andrew P/N 301025
J8 POL Limit
RC3000F Rear Panel
J8
CX-43804SG300
P8
CX-33804PG524
POL CCW Limit Input
POL Limit Common
POL CW Limit Input
Red
Clr
Blk
37 ft. CBL-3_18SHLDUV (Alpha p/n 2432C)
Andrew P/N 301082-5
RCI P/N FB-3KF3010825
P30
CX-33804PG524
Label, using LBL-CBL-12xSHT on the ACU end:
" FB-3KF3010825 – P8
to RC3000F – J8 – POL Limits"
On the limit switch end, create a
label with LBL-CBL-12xSHT:
"FB-3KF3010825 to POL Limits"
FB-3KFCBLPOLL1
POL CCW LIMIT
NC, open at limit
J30
ConXall p/n
CX-53804SG324
Yellow
Red
Blue
V4SYR1/1670-Burgess
V4SYR1/1670-Burgess
Yellow
Red
Blue
POL CW LIMIT
NC, open at limit
Polarization Limit Switch Assem.
Andrew P/N 20860-65 (x2)
J9 POL Drive
RC3000F Rear Panel
J9
CX-42808SG300
P9
CX-32808PG521
POL Motor 1
POL Motor 2
POL Motor Shield
Red
Blk
Shld
FB-3KFCBLPOLM1
37 ft. CBL-2-18SHLDUV (Alpha p/n 2422C)
trim back and insulate the shield
with HS-221-_250, cover the drain
wire with HS-221-_046 at both ends.
J20
CX-63803SG321
On the motor end, create a
label with LBL-CBL-12xSHT:
"FB-3KFCBLPOLM1 to POL Motor"
Label, using LBL-CBL-12xSHT on the ACU end:
" FB-3KFCBLPOLM1 – P9
to RC3000F – J9 – POL Drive"
For POL CW Motion POL Motor 1 is positive.
FB-3KFCBLPOLM2
Positive Voltage on Motor + terminal produces CW Shaft Motion Looking into
the Motor Drive Face and produces POL CW motion.
12 inch CBL-2-18SHLDUV
(Alpha p/n 2422C)
P20
CX-83803PG321
Mot+
Mot–
On the connector end,
trim back and insulate the shield.
with HS-221-_250, cover the
drain wire with HS-221-_046.
Shield – nc at Motor end
On Motor end, trim
back and insulate shield and
drain wire with HS-221-_250
strip 1/4 inch and tin each lead.
Research Concepts, Inc.
Title
ESA24SNG-LTE Project
Size
B
Number
Andrew ESA24SNG-LTE Cabling
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Drawn by JFR
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The following connectors are provided on the backpanel of the RC3000F. Their pin assignments and function is as described in the baseline manual.

2.2.5 Signal Strength

This connector is designated J12 on the 3000F backpanel.

NOTE: The gain and offset potentiometers associated with the signal strength connector are recessed from the backpanel on the RC3000F model. The lid of the RC3000 will have to be removed in order to calibrate these pots.

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 RC3000F model supplies the two DB-9 connectors (J14-Fluxgate, J15-GPS) directly on the backpanel. Pinouts for these DB-9s are as shown in the baseline manual.

2.2.7 Accessories

This connector is designated as J13 on the RC3000F backpanel.

2.2.8 RF Autopeak

This connector is designated as J11 on the RC3000F backpanel.

2.2.9 Hand Held Remote

The handheld remote control option is not supported on the RC3000F.

2.2.11 PC Remote Control

This connector is designated as J16 on the RC3000F backpanel.

2.3 Calibration

While similar in scope, the calibration steps for the RC3000F are quite different from the procedure described in the baseline manual. These differences arise mainly due to the fact that the RC3000F interfaces to resolvers and that the elevation STOW, DOWN and UP limits are defined by resolver values rather than limit switches.

The calibration steps are defined in the following table.

#	STEP	ACTION
1	Inactivate Software Limits	**MAINTENANCE MENU - LIMITS** Press BKSP to inactivate software limits "** WARNING - LIMITS INACTIVE **" alarm will flash on line 4
2	Carefully move the mount to STOW position	**MANUAL** mode Use EL UP/DOWN, AZ CW/CCW to jog mount
3	Define Azimuth Reference Position Verify that mount is in exact center of azimuth travel (STOW position) NOTE: azimuth resolver should be rigged to approximately the 180 degree position	MAINTENANCE MENU - VOLTS Record raw azimuth resolver angle _____ **AZIMUTH CALIBRATION** Configuration Screen RES: enter angle required to obtain 0.0 from raw azimuth resolver angle. **MANUAL**: Confirm that AZIM: value is 0.0
4	Define Software Azimuth Stow Switch	**MANUAL** mode Press SCR UP to display azimuth resolver count value _____ **AZIMUTH PULSE DRIVE** Configuration Screen Enter recorded resolver count value in STOW: field
5	Define Elevation Inclinometer Reference Position Raise reflector to the "face vertical" position NOTES: - this step should be accomplished with the mount's platform level so that the elevation angle derived from the inclinometer and the resolver are the same.	MAINTENANCE MENU - VOLTS Record elevation input voltage _____ NOTE: a correctly oriented inclinometer should yield a voltage of 1.89 +/- 0.2 VDC. Reorient the inclinometer if the voltage falls out of this range. **ELEVATION CALIBRATION** Configuration Screen REF_V: Enter recorded voltage **MANUAL** mode: Confirm that ELEV: value is 22.3 +/- 0.2

6	Define Elevation Resolver Reference Position Performed from same position as in the last step - at this position the elevation resolver should be rigged to approximately 180 degrees	MAINTENANCE MENU - VOLTS Record raw elevation resolver angle _____ **ELEVATION CALIBRATION** Configuration Screen: RES: enter angle required to obtain 22.3 from raw elevation resolver angle. MAINTENANCE MENU - VOLTS Confirm that resultant elevation angle is 22.3
7	Determine Electronic Inclinometer Scale Factor After recording values at the elevation reference position, the mount will be raised approximately 40 degrees in elevation to characterize the scale factor for the installed elevation inclinometer	Before moving from reference position place accurate level on backstructure and record angle _____ **MAINTENANCE MENU - VOLTS** Record elevation input voltage _____ **MANUAL:** Move UP approximately 40 degrees and place accurate level on backstructure and record angle _____ **MAINTENANCE MENU - VOLTS** Record elevation input voltage _____ Calculate elevation scale factor as discussed in section 2.3.2 of the RC3000 User's Manual **ELEVATION CALIBRATION** Configuration Screen: Enter calculated scale factor (mV/deg.) in SF: field **MANUAL** mode: Confirm that ELEV reads 22.3 + number of degrees physically_rotated
8	Define Elevation UP Software Limit Move elevation axis to desired UP limit	**MANUAL** MODE: SCR UP to display and record ELEV: resolver count _____ **ELEVATION PULSE** Configuration Screen: Enter recorded resolver count in UP: field* * - entry may be delayed until step # 11
9	Define Elevation DOWN Limit Move elevation axis to desired DOWN limit Typically set around 5.0 degrees or required position to avoid obstacles while moving in azimuth.	**MANUAL** MODE: SCR UP to display and record ELEV: resolver count _____ **ELEVATION PULSE** Config Screen: Enter recorded resolver count in DOWN: field*

10	Define Elevation Sync Software Limit Move elevation axis to position where sync (creep) switch	**MANUAL** MODE: Synch (creep) switch is displayed by the ":"following ELEV changing to "." SCR UP to display and record ELEV:

	activates	resolver count _____ **ELEVATION PULSE** Configuration Screen: Enter recorded resolver count in SYNC: field*
11	Define Elevation STOW Software Limit Move elevation axis to desired STOW limit	**MANUAL** MODE: SCR UP to display and record ELEV: resolver count _____ **ELEVATION PULSE** Configuration Screen: Enter recorded resolver count in STOW: field
12	Define Polarization Reference Position Move polarization axis to the position where the feed is horizontal/vertical (nearest to center of travel). This position is approximately where the center feed set screw is horizontal. - at this position the polarization resolver should be rigged to approximately 180 degrees	MAINTENANCE MENU - VOLTS Record raw polarization resolver angle _____ **POLARIZATION CALIBRATION** Configuration Screen RES: enter angle required to obtain 0.0 from raw polarization resolver angle. **MANUAL** Confirm that POL: value is 0.0
13	Confirm Polarization CW, CCW limits Move to CW and CCW limits	**MANUAL** MODE: Confirm that "CW" and "CCW" limits are displayed
14	Define Azimuth Clockwise Software Limit Move azimuth axis to clockwise limit	**MANUAL** MODE: Confirm that "CW" limit is triggered via limit switch SCR UP to display and record AZIM: resolver count _____ **AZIMUTH PULSE** Configuration Screen: Enter recorded resolver count in CW: field
15	Define Azimuth Counter-Clockwise Software Limit Move azimuth axis to counter-clockwise limit	**MANUAL** MODE: Confirm that "CCW" limit is triggered via limit switch SCR UP to display and record AZIM: resolver count _____ **AZIMUTH PULSE** Configuration Screen: Enter recorded resolver count in CCW: field
16	Activate Software Limits	**MAINTENANCE MENU - LIMITS** Press BKSP to activate limits Alarm on line 4 will disappear
17	Confirm all limit switch actions and indications Move azimuth, elevation and polarization axes through their entire range of movement.	**MANUAL** MODE: Verify sanity of all angle and limit indications

3.2.1 Manual Mode.

As an aid in calibration, the state of the elevation synch switch is displayed next to the elevation limit field. When the synch switch is activated “ELEV.” appears instead of the normal “ELEV:”.

```
AZIM:    0.0 STOW    SS1: 50          MANUAL
ELEV. -42.5 DOWN     SAT:TELSTAR 402
 POL:   30.0 V       SPD:FAST             CST
<0-9>JOG ANTENNA <MODE>MENU      14:25:47
```

Note also that when the elevation axis is below the DOWN limit position the displayed elevation angle is derived from the elevation resolver rather than the electronic inclinometer.

3.2.2 Menu Mode

Note that when the “SYNC LIMIT ERROR” (see 3.4) is active, no automatic movements are allowed since the controller does not have confidence in the software limits. In this case the MENU screen will only show and allow items 7 (POSITION) and 8 (SETTINGS) to be activated.

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: the resolver-based angle is displayed in MANUAL mode when the elevation DOWN limit is active.

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

This screen has been modified to include definition of the azimuth stow position.

```
SCALE:10431              CONFIG-AZ PULSE
   CW:65000 STOW:32768 F/S:80  COAST:  3
  CCW:  100            MAX: 2  TRIES: 3
AZIM STOW PULSE LIMIT <0 -65535>
```

STOW: 32768

AZIM STOW PULSE LIMIT <0 -65535>

This fields allows the user to state (in azimuth resolver counts) the azimuth stow position.

Note that the RC3000F will display “STOW” when the azimuth axis is within +/- 1.0 degrees of this position.

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.

3.3.1.3.6 Elevation Pulse Drive

This screen has been modified to include definition of the elevation stow and sync positions.

```
SCALE:10431              CONFIG-AZ PULSE
   UP:40500 STOW:16420 F/S:100 COAST:  5
 DOWN:29600 SYNC:16500 MAX: 1  TRIES: 3
AZIM STOW PULSE LIMIT <0 -65535>
```

STOW: 32768

ELEV STOW PULSE LIMIT <0 -65535>

This fields allows the user to state (in elevation resolver counts) the elevation stow position.

STOW: 32768

ELEV SYNC PULSE LIMIT <0 -65535>

This fields allows the user to state (in elevation resolver counts) the elevation sync switch position.

3.3.2.1 Analog to Digital Voltages

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     L1:0
POL:2.237                          L2:1
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 SYNC:1   ACTIVE
 POL CW:0  CCW:1  STOW:1
<BKSP>MAKE LIMITS INACTIVE    <MODE>EXIT
```

SYNC:1

In addition to the normal limit switch state information, this screen also shows the state of the elevation synchronization switch. The SYNC field will be 1 if the synchronization switch is active.

3.3.1.2 Reset Defaults

The table at the end of this appendix supplies the default configuration item values for this mount. Space has also been provided to record installation specific changes to the configuration items. Note: recording of installation specific changes to defaults may prove valuable when trying to restore system configuration.

Also note that default values for the N4 and NZ versions are the same

3.4 Alarm Displays

The following alarms are unique to the RC3000F.

LIMITS INACTIVE!

As discussed in 3.3.6, if software limits are set inactive this alarm will be displayed.

AZIM LIMITS ERROR

If the stored value for the azimuth reference position is determined to be corrupt, this alarm is displayed.

ELEV LIMITS ERROR

If the stored value for the elevation reference position or the value for the elevation STOW, SYNCH, DOWN or UP limits is determined to be corrupt, this alarm is displayed.

SYNC LIMIT ERROR

The state of the synch limit switch is constantly checked versus the current elevation resolver value. If the state of the switch does not agree to within 1.0 degrees of the value stored for the SYNC limit, this alarm will be displayed. This alarm indicates that the controller cannot trust the resolver position and all motion will be disallowed. Software limits will need to be inactivated to allow debugging of the problem.

EMERGENCY STOP ACTIVE (N4 only)

If the emergency stop switch has been activated, all antenna movement is disabled.

DEPLOY PLATFORM (NZ only)

If the platform safety switch indicates the mount is not at a safe position, all antenna movement is disabled.

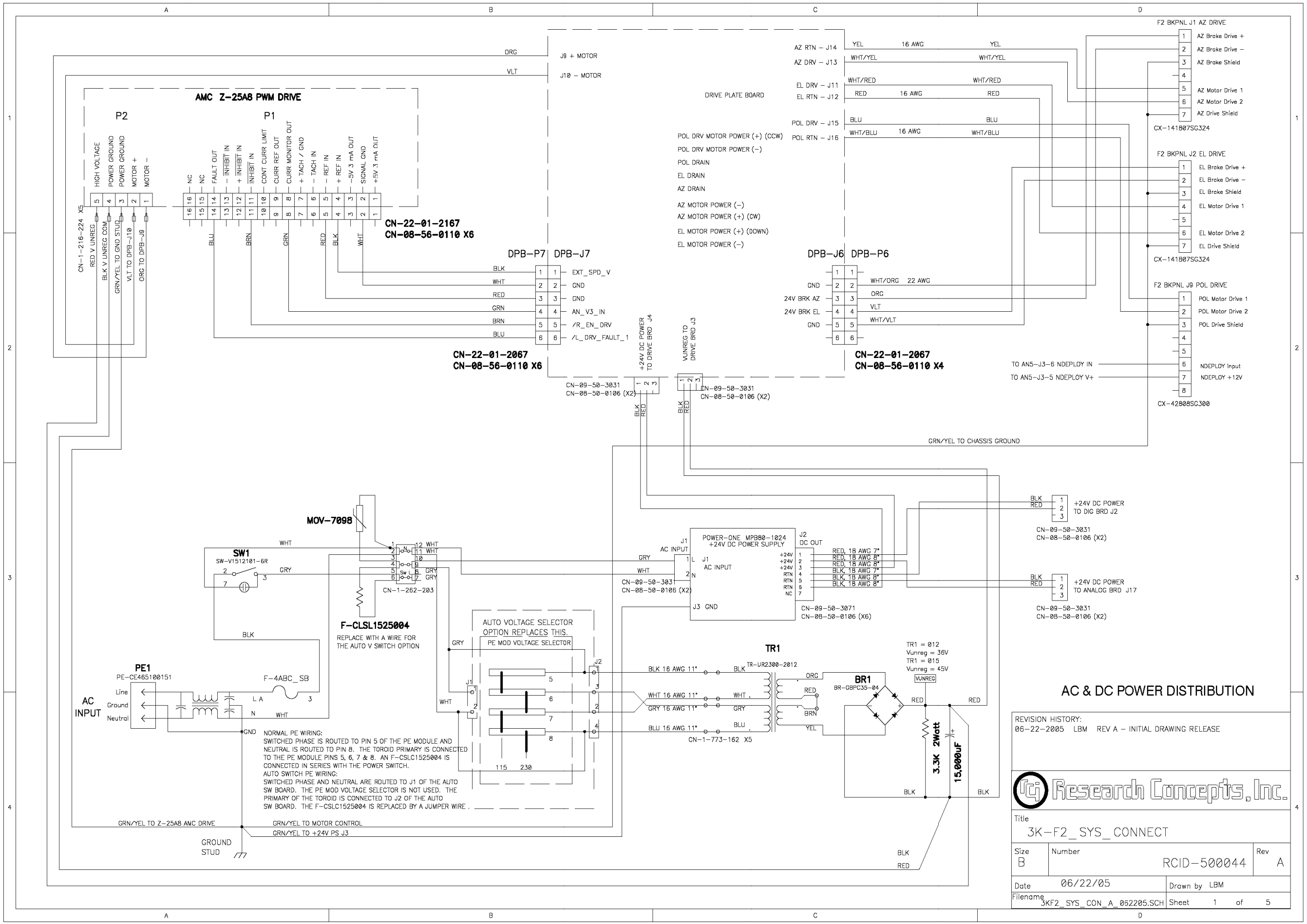
CONFIGURATION ITEM	**N4**							**INSTALL VALUE**
SYSTEM DEFINITION								
Antenna_size_cm	240							
GPS	2							
COMP	1							
MODE	2							
WAVE	0							
ELEVATION CALIBRATION								
Zero Voltage	1.89							
Elev_offset	0.0							
Up_elev_limit	65							
Down_elev_limit	0							
Elevation_Scale_Factor	50.00							
Elevation_look_configuration	1							
Res	-157.0							
Rev	0							
AZIMUTH CALIBRATION								
Reference_voltage	N/A							
Azim_Scale_Factor	N/A							
FG_offset	0.0							
ccw_azim_limit	175							
Cw_azim_limit	175							
Res	-180.0							
Rev	1							
POLARIZATION CAL								
Res	-180.0							
Rev	1							
CW Polarization Limit	90.0							
CCW Polarization Limit	90.0							
Pol_Scale_Factor	40.90							
Polarization_type	2							
H/V_Reference	1							
Default Horizontal Position	90.0							
Default Vertical Position	0							
Pol_Automove_Enable	1							
SIGNAL PARAMETERS								
RF_Lock	0							
RF_Time	0.1							
Channel 1 Polarity	1							
Channel 1 Threshold	100							
Channel 1 Delay	0.1							
Channel 1 Lock Type	0							
Channel 2 Polarity	1							
Channel 2 Threshold	100							
Channel 2 Delay	0.1							
Channel 2 Lock Type	0							

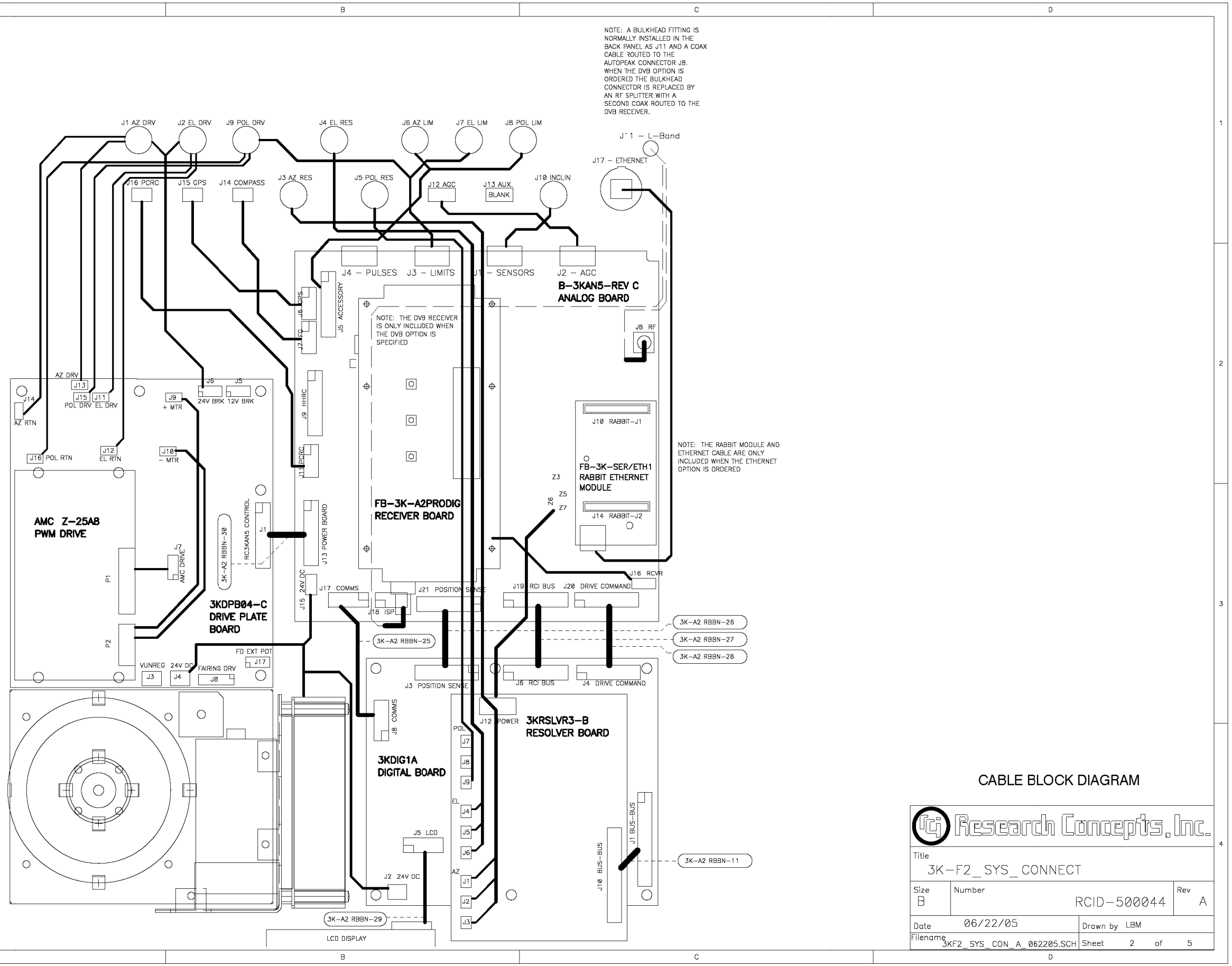
CONFIGURATION ITEM	**N4**							**INSTALL VALUE**
AUTOPEAK								
Autopeak Enabled	0							
Signal Source	1							
RF Band	1							
Spiral Search AZ Limit	3							
Spiral Search EL Limit	3							
Spiral Signal Threshold	200							
Scan Range Limit	8							
Scan Signal Threshold	200							
AZIMUTH POT DRIVE								
Fast/Slow Threshold	0.5							
Maximum Position Error	0.05							
Coast Threshold	0.0							
Maximum Retry Count	3							
AZIMUTH PULSE DRIVE								
Pulse Scale Factor	10431							
CW Pulse Limit	65000							
CCW Pulse Limit	100							
Stow Position	32768							
Fast/Slow Threshold	80							
Maximum Position Error	2							
Coast Threshold	3							
Maximum Retry Count	3							
AZIM DRIVE MONITORING								
Jam Slop	5							
Runaway Slop	200							
Fast Deadband	1000							
Slow Deadband	500							
ELEV POT DRIVE								
Fast/Slow Threshold	1.0							
Maximum Position Error	0.2							
Coast Threshold	0.3							
Maximum Retry Count	3							
ELEV PULSE DRIVE								
Pulse Scale Factor	10431							
UP Pulse Limit	40500							
Down Pulse Limit	29600							
Stow	16420							
Sync	16500							
Fast/Slow Threshold	100							
Maximum Position Error	1							
Coast Threshold	5							
Maximum Retry Count	3							
ELEV DRIVE MONITORING								
Jam Slop	5							
Runaway Slop	200							
Fast Deadband	1000							

CONFIGURATION ITEM	**N4**							**INSTALL VALUE**
POL POT DRIVE								
Fast/Slow Threshold	2.0							
Maximum Position Error	0.5							
Coast Threshold	0.3							
Maximum Retry Count	3							
POL DRIVE MONITORING								
Jam Slop	5							
Runaway Slop	200							
Fast Deadband	1000							
Slow Deadband	500							
TRACK								
Search Enable	0							
Max Track Error	3							
Search Width	4							
Peakup Holdoff Time	120							
Track Signal Source	2							
Signal Sample Time	2							
REMOTE CONTROL								
Remote Enabled	1							
Bus Address	50							
Baud Rate	6							
Jog	20							
STOW / DEPLOY								
AZ STOW	0.0							
EL STOW	-67.5							
PL STOW	0.0							
AZ DEPLOY	0.0							
EL DEPLOY	38.0							
PL DEPLOY	0.0							
PL ENABLED	0							

4.2 Schematics

- Internal Interconnects to Backpanel


AMC Z-25A8 PWM DRIVE
P2
P1
HIGH VOLTAGE
POWER GROUND
POWER GROUND
MOTOR +
MOTOR –
NC
NC
FAULT OUT
– INHIBIT IN
+ INHIBIT IN
INHIBIT IN
CONT CURR LIMIT
CURR REF OUT
CURR MONITOR OUT
+ TACH / GND
– TACH IN
– REF IN
+ REF IN
–5V 3 mA OUT
SIGNAL GND
+5V 3 mA OUT
CN–1–216–224 X5
RED V UNREG
BLK V UNREG COM
GRN/YEL TO GND STUD
VLT TO DPB–J10
ORG TO DPB–J9
CN–22–01–2167
CN–08–56–0110 X6
ORG
VLT
J9 + MOTOR
J10 – MOTOR
DRIVE PLATE BOARD
POL DRV MOTOR POWER (+) (CCW)
POL DRV MOTOR POWER (–)
POL DRAIN
EL DRAIN
AZ DRAIN
AZ MOTOR POWER (–)
AZ MOTOR POWER (+) (CW)
EL MOTOR POWER (+) (DOWN)
EL MOTOR POWER (–)
AZ RTN – J14
AZ DRV – J13
EL DRV – J11
EL RTN – J12
POL DRV – J15
POL RTN – J16
YEL
16 AWG
WHT/YEL
WHT/RED
RED
BLU
WHT/BLU
F2 BKPNL J1 AZ DRIVE
AZ Brake Drive +
AZ Brake Drive –
AZ Brake Shield
AZ Motor Drive 1
AZ Motor Drive 2
AZ Drive Shield
CX–141807SG324
F2 BKPNL J2 EL DRIVE
EL Brake Drive +
EL Brake Drive –
EL Brake Shield
EL Motor Drive 1
EL Motor Drive 2
EL Drive Shield
CX–141807SG324
F2 BKPNL J9 POL DRIVE
POL Motor Drive 1
POL Motor Drive 2
POL Drive Shield
NDEPLOY Input
NDEPLOY +12V
CX–42808SG300
TO AN5–J3–6 NDEPLOY IN
TO AN5–J3–5 NDEPLOY V+
DPB–P7
DPB–J7
BLK
WHT
RED
GRN
BRN
BLU
EXT_SPD_V
GND
AN_V3_IN
/R_EN_DRV
/L_DRV_FAULT_1
CN–22–01–2067
CN–08–56–0110 X6
DPB–J6
DPB–P6
WHT/ORG
22 AWG
24V BRK AZ
24V BRK EL
VLT
WHT/VLT
CN–22–01–2067
CN–08–56–0110 X4
+24V DC POWER TO DRIVE BRD J4
VUNREG TO DRIVE BRD J3
CN–09–50–3031
CN–08–50–0106 (X2)
GRN/YEL TO CHASSIS GROUND
MOV–7098
SW1
SW–V1512101–6R
F–CLSL1525004
REPLACE WITH A WIRE FOR THE AUTO V SWITCH OPTION
CN–1–262–203
AUTO VOLTAGE SELECTOR OPTION REPLACES THIS.
PE MOD VOLTAGE SELECTOR
115
230
PE1
PE–CE465100151
F–4ABC_SB
AC INPUT
Line
Ground
Neutral
GND
NORMAL PE WIRING:
SWITCHED PHASE IS ROUTED TO PIN 5 OF THE PE MODULE AND NEUTRAL IS ROUTED TO PIN 8. THE TOROID PRIMARY IS CONNECTED TO THE PE MODULE PINS 5, 6, 7 & 8. AN F–CSLC1525004 IS CONNECTED IN SERIES WITH THE POWER SWITCH.
AUTO SWITCH PE WIRING:
SWITCHED PHASE AND NEUTRAL ARE ROUTED TO J1 OF THE AUTO SW BOARD. THE PE MOD VOLTAGE SELECTOR IS NOT USED. THE PRIMARY OF THE TOROID IS CONNECTED TO J2 OF THE AUTO SW BOARD. THE F–CSLC1525004 IS REPLACED BY A JUMPER WIRE .
GRN/YEL TO Z–25A8 ANC DRIVE
GRN/YEL TO MOTOR CONTROL
GRN/YEL TO +24V PS J3
GROUND STUD
POWER–ONE MPB80–1024
+24V DC POWER SUPPLY
AC INPUT
DC OUT
J3 GND
CN–09–50–3071
CN–08–50–0106 (X6)
TR1
TR–UR2300–2012
BLK 16 AWG 11"
WHT 16 AWG 11"
GRY 16 AWG 11"
BLU 16 AWG 11"
CN–1–773–162 X5
TR1 = 012
Vunreg = 36V
TR1 = 015
Vunreg = 45V
BR1
BR–GBPC35–04
3.3K 2Watt
15,000uF
+24V DC POWER TO DIG BRD J2
+24V DC POWER TO ANALOG BRD J17
AC & DC POWER DISTRIBUTION
REVISION HISTORY:
06–22–2005 LBM REV A – INITIAL DRAWING RELEASE
Research Concepts, Inc.
Title
3K–F2_SYS_CONNECT
Size B
Number RCID–500044
Rev A
Date 06/22/05
Drawn by LBM
Filename 3KF2_SYS_CON_A_052205.SCH
Sheet 1 of 5



CABLE BLOCK DIAGRAM

Research Concepts, Inc.

Title: 3K-F2_SYS_CONNECT		
Size: B	Number: RCID-500044	Rev: A
Date: 06/22/05	Drawn by: LBM	
Filename: 3KF2_SYS_CON_A_062205.SCH	Sheet 2 of 5	

RC3KAN5 ANALOG BOARD

J1 SENSORS

J1 – SENSORS
DB–15R

AZ POT WIPER	1	P2
AZ POT CW (AZ REF +5V)	9	9
AZ POT CCW (GND)	2	2
AZ SHIELD (GND)	10	10
POL SHIELD (GND)	3	3
POL POT CW (POL REF +5V)	11	11
POL POT WIPER	4	4
POL POT CCW (GND)	12	12
nc	5	5
EL RTN (GND)	13	13
EL REF (+15V)	6	6
EL COM (GND)	14	14
EL SHIELD (GND)	7	7
EL SIGNAL	15	15
EL –15V	8	8

F2 BKPNL J10 INCLINOMETER

1	
2	
3	
4	
5	
6	

CX–42806SG300

J2 AGC

SIGNAL LOCK 1	1	P2
V_unreg	9	9
SIGNAL LOCK 2	2	2
GND	10	10
NC	3	3
–15V	11	11
NC	4	4
+15V	12	12
GND	5	5
V_offset_2	13	13
+5V	6	6
V_offset_1	14	14
AGC_Rtn	7	7
AGC_2	15	15
AGC_1	8	8

F2 BKPNL J12 AGC

1	SIGNAL LOCK 1
9	V_unreg
2	SIGNAL LOCK 2
10	GND
3	NC
11	–15V
4	NC
12	+15V
5	GND
13	V_offset_2
6	+5V
14	V_offset_1
7	AGC_Rtn
15	AGC_2
8	AGC_1

J3 LIMITS

J3 – LIMITS
DB–15R

POL STOW IN	1	P3
AZ STOW +12V	9	9
POL STOW +12V	2	2
EL UP +12V	10	10
nc	3	3
EL STOW +12V	11	11
GND	4	4
LIMIT A +12V	12	12
EL DOWN +12V	5	5
EL STOW IN	13	13
EL DOWN IN	6	6
EL UP IN	14	14
AZ STOW IN	7	7
LIMIT A IN	15	15
nc	8	8

TO F2 J9–7 POL DRIVE NDEPLOY V+
TO F2 J9–6 POL DRIVE NDEPLOY IN

F2 BKPNL J7 EL LIMIT

1	
2	
3	
4	

CX–43804SG300

J4 PULSES

AZ PULSE RTN (GND)	1	
AZ PULSE SHIELD (GND)	9	
AZ PULSE IN	2	
AZ PULSE POWER (V SENSOR)	10	
AZ Q PULSE RTN (GND)	3	
nc	11	
AZ Q PULSE IN	4	
ALARM INPUT SIGNAL	12	
EL Q PULSE IN	5	
nc	13	
EL Q PULSE RTN (GND)	6	
EL PULSE POWER (V SENSOR)	14	
EL PULSE IN	7	
EL PULSE SHIELD (GND)	15	
EL PULSE RTN (GND)	8	

POWER BOARD

TO RC3KAN5 J13

3K–A2 RBBN–30

TO 3KDPB04 J1

J13 – POWER BOARD
26 PIN HEADER

U36–30	R_EN_DRV		
U36–29	R_SLC_EL		
U36–33	R_SLC_PL		
U36–31	R_SFTY_RLY	RELAY DRIVE – POWER PCB	
U36–35	R_1_SPR		
U36–34	R_2_SPR		
U36–36	R_3_SPR		
U36–38	/L_DRV_FAULT_1		
U36–37	/L_DRV_FAULT_2	DRIVE FAULT BITS	
U36–41	R_AXIS_SPD0		
U36–43	R_AXIS_SPD1		
U36–42	R_AXIS_SPD2	ANALOG VOLTAGE CONTROL POWER PCB	
U36–45	R_POS_SPD		
U36–44	R_NEG_SPD		
U36–48	R_BRK_AZ		
U36–46	R_BRK_EL		
U36–86	C_PD_0	DRIVE/BRAKE	
U36–85	C_PD_1	DRIVE_EN/DISABLE FAIRING DRIVE BITS	
U36–87	C_PD_2	FAIRCLOSE/OPEN	
	AN_V3_IN		
	AN_V4_IN	ANALOG VOLTAGES IN	

CN–499505–7
CBL–RBBN–2650 (4")
CN–499505–7

J2

22 AWG WIRES, 14" LONG

SOLDER TO RC3KAN5 ANALOG BOARD

TO 3KAN5–Z7 (GND)	WHT/VLT	1	TO 3KRLSVR3 REV–B J12
TO 3KAN5–Z6 (–15V)	VLT	2	
		3	
		4	
TO 3KAN5–Z5 (GND)	WHT/RED	5	
TO 3KAN5–Z3 (+15V)	RED	6	

CN–09–50–3061
RESOLVER POWER
WITH 4 PCS CN–08–50–0106

Connectors on 3KRSLVR3

3KRSLVR_P2

CBL–2_22SHLD

AZ COS	–	BLK	26"	RED	1 AZ Cos +
	+	RED		BLK	2 AZ Cos –
	G	DRAIN		RED	3 AZ Sin +
				BLK	4 AZ Sin –
				RED	5 AZ Ref+
				BLK	6 AZ Ref –
				DRAIN	7 COS DRAIN

3KRSLVR_P1

AZ SIN	–	BLK	24"		
	+	RED			
	G	DRAIN			

3KRSLVR_P3

AZ REF	–	BLK	18"		
	+	RED			
	G	DRAIN			

F2 BKPNL J3 AZ RES

CX–42807SG300

EACH CONNECTOR
CN–22–01–2037
CN–08–56–0110 X3

3KRSLVR_P5

CBL–2_22SHLD

EL COS	–	BLK	26"	RED	1 EL Cos +
	+	RED		BLK	2 EL Cos –
	G	DRAIN		RED	3 EL Sin +
				BLK	4 EL Sin –
				RED	5 EL Ref+
				BLK	6 EL Ref –
				DRAIN	7 COS DRAIN

3KRSLVR_P4

EL SIN	–	BLK	24"		
	+	RED			
	G	DRAIN			

3KRSLVR_P6

EL REF	–	BLK	18"		
	+	RED			
	G	DRAIN			

F2 BKPNL J4 EL RES

CX–42807SG300

EACH CONNECTOR
CN–22–01–2037
CN–08–56–0110 X3

3KRSLVR_P8

CBL–2_22SHLD

PL COS	–	BLK	26"	RED	1 PL Cos +
	+	RED		BLK	2 PL Cos –
	G	DRAIN		RED	3 PL Sin +
				BLK	4 PL Sin –
				RED	5 PL Ref+
				BLK	6 PL Ref –
				DRAIN	7 COS DRAIN

3KRSLVR_P7

PL SIN	–	BLK	24"		
	+	RED			
	G	DRAIN			

3KRSLVR_P9

PL REF	–	BLK	18"		
	+	RED			
	G	DRAIN			

F2 BKPNL J5 POL RES

CX–42807SG300

EACH CONNECTOR
CN–22–01–2037
CN–08–56–0110 X3

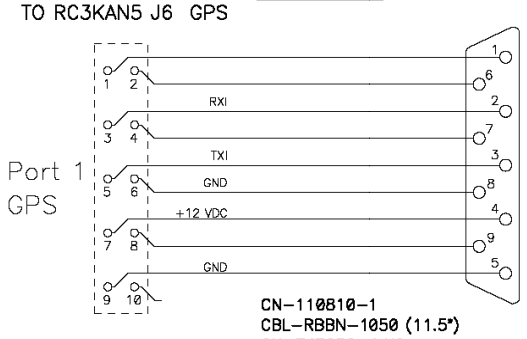
Research Concepts, Inc.

Title: 3K–F2_SYS_CONNECT		
Size: B	Number: RCID–500044	Rev: A
Date: 06/22/05	Drawn by: LBM	
Filename: 3KF2_SYS_CON_A_062205.SCH	Sheet 3 of 5	

TO RC3KAN5 J6 GPS

3K-A2 RBBN-24

F2 BACKPANEL J15 GPS

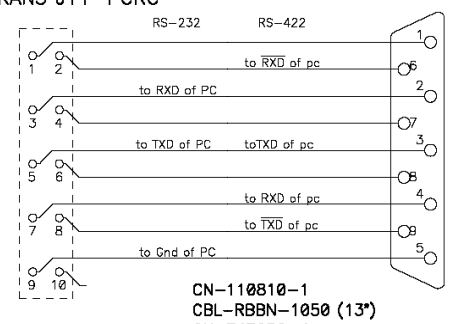


CN-110810-1
CBL-RBBN-1050 (11.5")
CN-747052-4 X2

TO RC3KAN5 J11 PCRC

3K-A2 RBBN-22

F2 BACKPANEL J16 PCRC

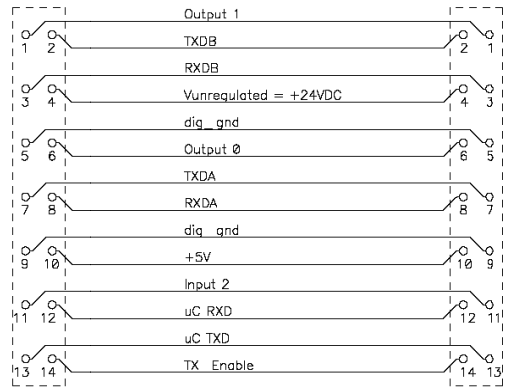


CN-110810-1
CBL-RBBN-1050 (13")
CN-747052-4

TO 3KAN5 J17 COMMS

3K-A2 RBBN-25

TO DIG BRD J8 COMMS

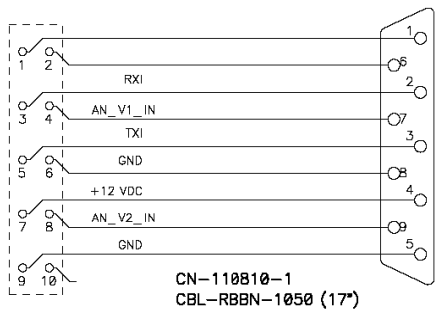


CN-89114
CBL-RBBN-1650 (5")
CN-89114

TO RC3KAN5 J7 FG

3K-A2 RBBN-23

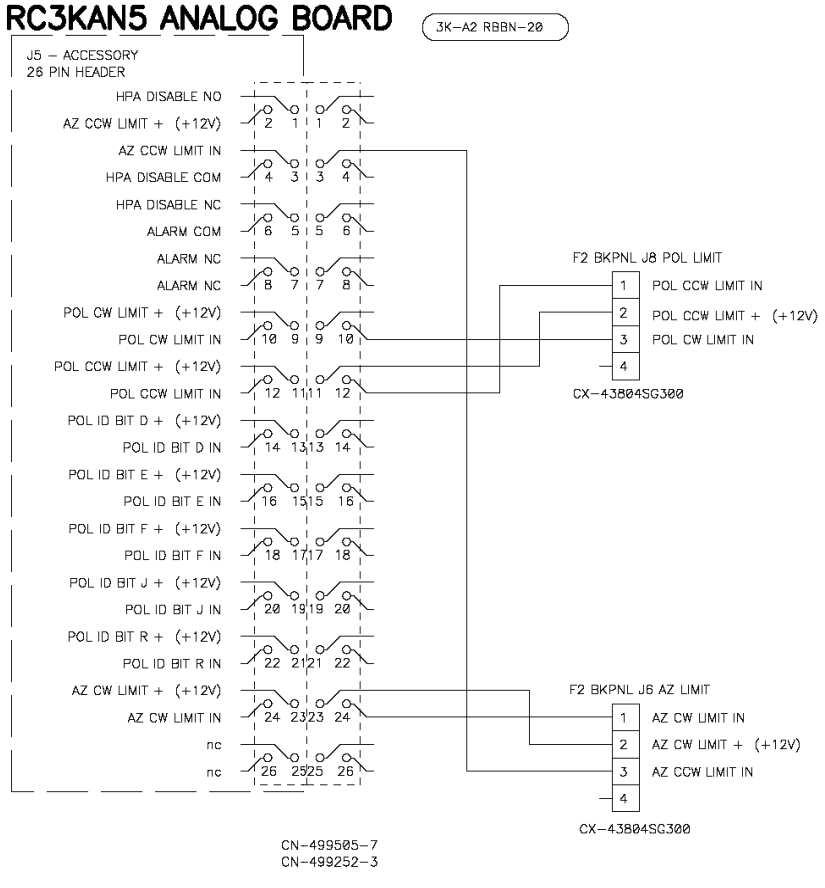
F2 BACKPANEL J14 COMPASS



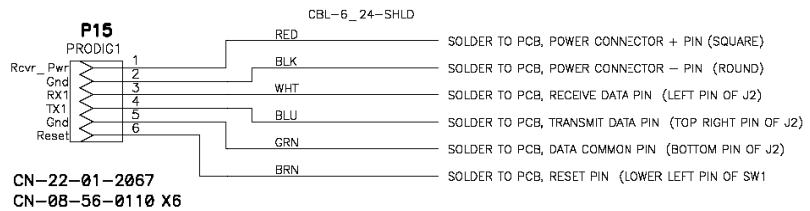
CN-110810-1
CBL-RBBN-1050 (17")
CN-747052-4

RC3KAN5 ANALOG BOARD

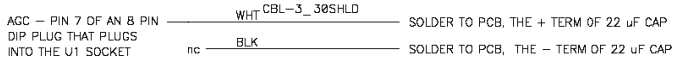
3K-A2 RBBN-20



CN-499505-7
CN-499252-3



CN-22-01-2067
CN-08-56-0110 X6



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Title: 3K-F2_SYS_CONNECT		
Size: B	Number: RCID-500044	Rev: A
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3K-A2 RBBN-26

3KDIG1B J3 POSITION SENSE — RC3KAN5 J21 POSITION SENSE

1	Az pos.	ACH4	1
2	ana_gnd		2
3	El pos.	ACH5	3
4	dig_gnd		4
5	El Range	PCU_DATA3	5
6	dig_gnd		6
7	Pol pos.	ACH6	7
8	El Down Lim	PB_DATA4	8
9	Pol Stow Lim	EPA4	9
10	El Up Lim	PB_DATA3	10
11	Pol CW Lim	PB_DATA7	11
12	Az Stow Lim	PB_DATA2	12
13	Pol CCW Lim	PB_DATA6	13
14	Az CCW Lim	PB_DATA1	14
15	El Stow Lim	PB_DATA5	15
16	Az CW Lim	PB_DATA0	16
17	ana_gnd		17
18	RSS	ACH7	18
19	Az Pulse	EPA0	19
20	El Pulse	EPA1	20
21	AZ Q Pulse (Az Alarm)	EPA2	21
22	EL Q Pulse (El Alarm)	EPA3	22
23	dig_gnd		23
24	Deploy Lim (EPA5)	EPA5	24
25	+5V		25
26	Alarm In (EPA7)	EPA7	26

+5V

CN-499505-7
CBL-RBBN-2650 (4')
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VUNREG.
+5V
3K-A2 RBBN-27

3KDIG1B J6 RCI BUS — RC3KAN5 J19 RCI_BUS

1	dig_gnd		1
2	unused spare_1	SPARE_1	2
3	unused spare_2	SPARE_2	3
4	+5V		4
5	unused spare_3	SPARE_3	5
6	Vunreg		6
7	dig_gnd		7
8	Local/Remote input	PCL_DATA3	8
9	PLD loop2/ unused	SPARE_6	9
10	unused	PCU_DATA2	10
11	I/O 1	P5.5	11
12	I/O 2	P5.7	12
13	ana_gnd		13
14	RSS	ACH7	14
15	Pol Stow Lim	EPA4	15
16	Vunreg		16
17	Deploy Lim	EPA5	17
18	A/D Mux 1	PCL_DATA0	18
19	A/D Mux 2	PCL_DATA1	19
20	Alarm Out	PCL_DATA2	20
21	dig_gnd		21
22	PLD loop2/ unused	SPARE_7	22
23	+5V		23
24	Az Alarm	EPA1	24
25	El Alarm	EPA3	25
26	dig_gnd		26

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CBL-RBBN-2650 (4')
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+5V
3K-A2 RBBN-11

3KDIG1B J1 BUS-BUS — 3KRSLVR3 J10 BUS-BUS

1			1
2		SLP0/AD0/P3.0	2
3		SLP1/AD1/P3.1	3
4		SLP2/AD2/P3.2	4
5		SLP3/AD3/P3.3	5
6		SLP4/AD4/P3.4	6
7		SLP5/AD5/P3.5	7
8			8
9		SLP6/AD6/P3.6	9
10		SLP7/AD7/P3.7	10
11		AD8/P4.0	11
12		AD9/P4.1	12
13		AD10/P4.2	13
14			14
15		AD11/P4.3	15
16		AD12/P4.4	16
17		AD13/P4.5	17
18		AD14/P4.6	18
19		AD15/P4.7	19
20			20
21		A16/EP.0	21
22		A17/EP.1	22
23		A18/EP.2	23
24		A19/EP.3	24
25		RESET	25
26			26
27		RD	27
28		WR	28
29		SPARE_1	29
30		SPARE_2	30
31		A8	31
32		A1	32
33		A2	33
34			34
35		A3	35
36		A4	36
37		A5	37
38		A6	38
39		A7	39
40			40

CN-89140
CBL-RBBN-4050 (6")
CN-89140

GND

3K-A2 RBBN-28

3KDIG1B J4 DRIVE COMMAND — RC3KAN5 J20 DRIVE COMMAND

1	dig_gnd		1
2	dig_gnd		2
3	Az/El Select	PA_DATA0	3
4	Pol Move	PA_DATA5	4
5	Az/El Dir.	PA_DATA1	5
6	Az/El Speed	PA_DATA2	6
7	Az/El Drive	PA_DATA3	7
8	Pol Dir.	PA_DATA6	8
9	+5V		9
10	Az/El Safety	PA_DATA4	10
11	dig_gnd		11
12	Contact Closure	PA_DATA7	12
13	dig_gnd		13
14	dig_gnd		14
15	Vref	VREF	15
16	dig_gnd		16
17	Az Reset	PCU_DATA0	17
18	El Reset	PCU_DATA1	18
19	A/D Mux 1	PCL_DATA0	19
20	dig_gnd		20
21	A/D Mux 2	PCL_DATA1	21
22	Alarm Out	PCL_DATA2	22
23	dig_gnd		23
24	Local/Remote input	PCL_DATA3	24
25	I/O 1	P5.5	25
26	I/O 2	P5.7	26

CN-499505-7
CBL-RBBN-2650 (4')
CN-499505-7

NOT USED

RC3KAN5 J9 HHRC

1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		15
16		16
17		17
18		18
19		19
20		20
21		21
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23		23
24		24
25		25
26		26

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Title: 3K-F2_SYS_CONNECT		
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Date: 06/22/05	Drawn by: LBM	
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