Appendix A - Mount Specific Data
For
Andrew 2.4 SNG
(RC3050F)

This appendix describes the unique functions of the RC3050 for the Andrew 2.4 meter SNG mount.

Revision History: 26 November 2002 reflecting software version 1.16.

1.1 Manual Organization

This appendix is provided as a supplement to the baseline RC3050 manual. The corresponding paragraphs in the baseline RC3050 manual are referred to when data specific to the Andrew 2.4m. SNG mount is described.

1.2 RC3050 Features

All RC3050 features described in the baseline manual are present with this version. The unique features of this version of the RC3050 are:

1) The backpanel connectors are different from the baseline RC3050 connectors. These connectors allow use of standard Andrew interface cables.

2) The RC3050F drives brakes for the azimuth and elevation axis.

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

Hardware Configuration. This version of the RC3050 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.

1.3.1 Controller Description.

In addition to the RC3050 components described in the baseline manual, the RC3050F includes a resolver interface board and power resistors for energizing the azimuth and elevation brakes.

A high level system interconnect drawing of the RC3050F is provided in section 4.3 (schematics).

1.3.2 System Interface Requirements.

The following unique interface requirements are present for the RC3050F:

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

2) The RC3050F provides relays to energize the azimuth and elevation brakes.

1.3.4 Drive System

Jam and Runaway Sensing is based on resolver counts.

2.0 INSTALLATION

This section highlights the items unique to installation of the RC3050F.

2.1.1 RC3050 Antenna Controller.

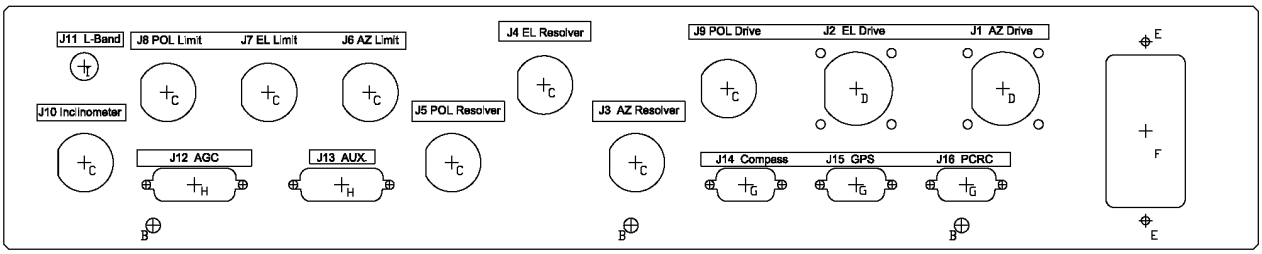
The RC3050F is slightly deeper (19.1" vs. 17.05") than the standard RC3050. This additional depth is required to accommodate the backpanel with the Andrew connectors.

2.1.2 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.

2.2 Electrical Connections

The RC3050F's backpanel contains the standard connectors for use with Andrew cabling. The following diagram shows these connectors.



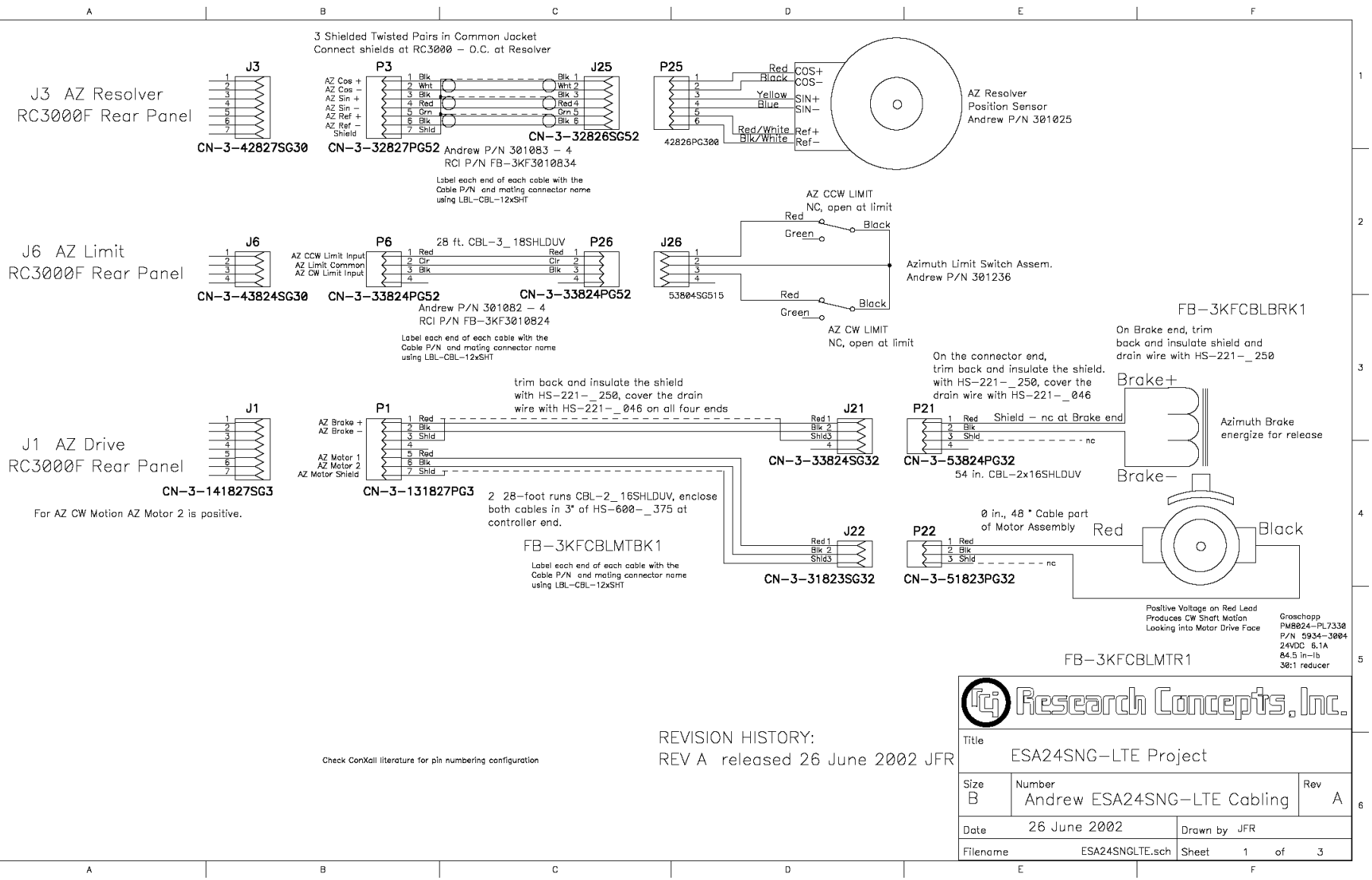
2.2.1 Power Entry

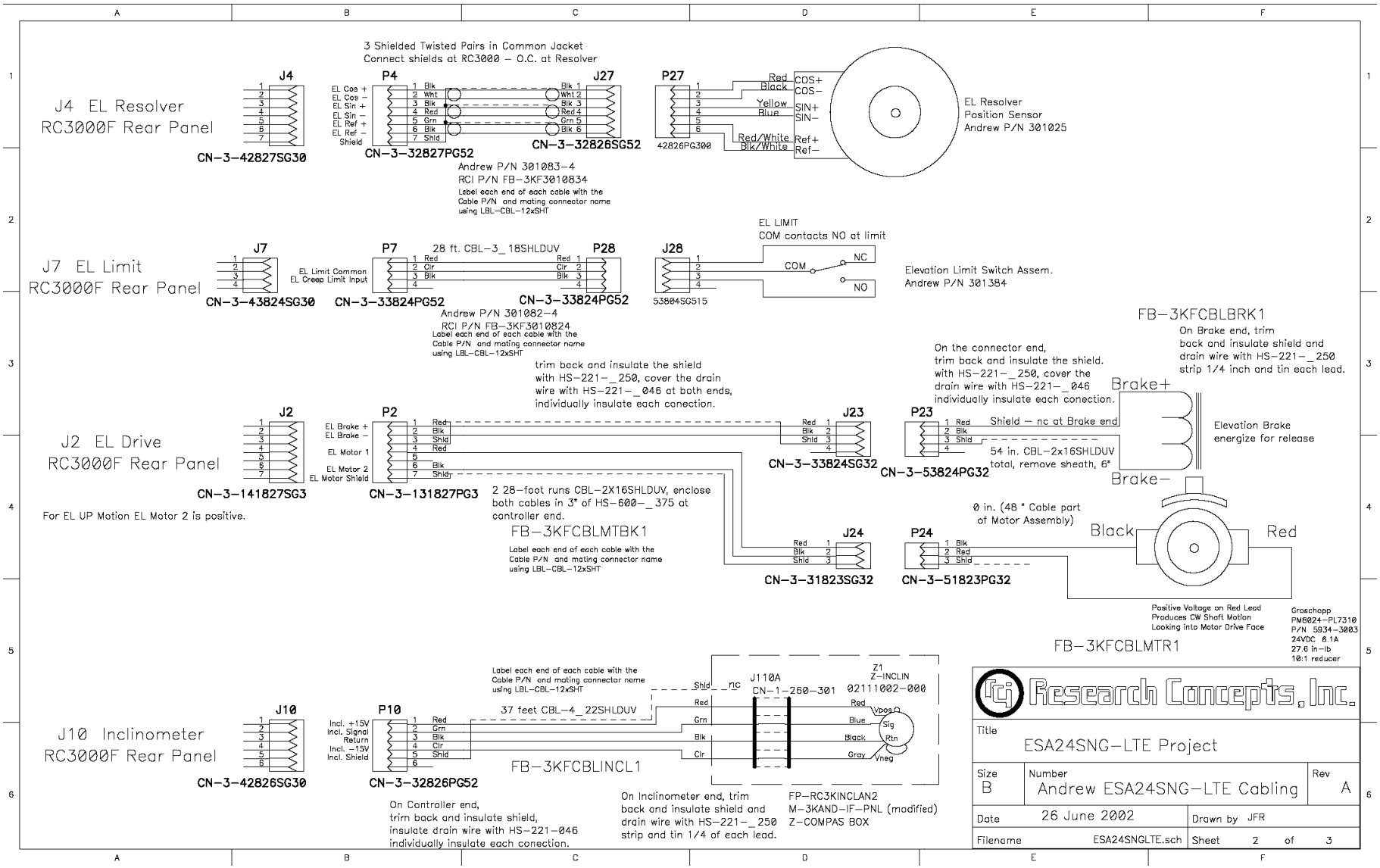
The RC3050F has the same fuse requirements as the RC3050A model (8 A. for 115, 4 A. for 230).

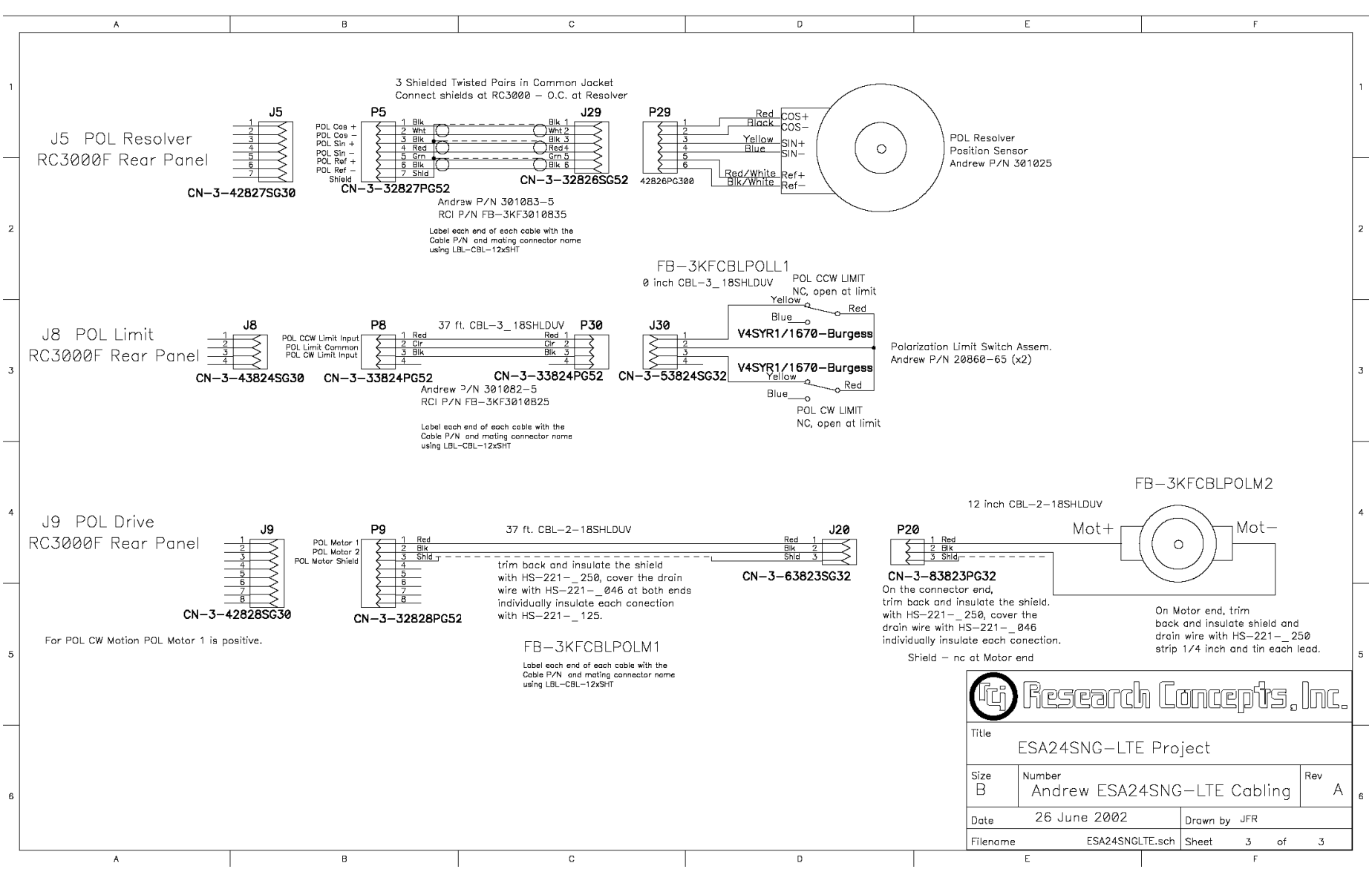
2.2.2 Motor Drive
2.2.3 Drive Sense
2.2.4 Limit Switches

Internal to the RC3050F is cabling that adapts the standard interface connections shown in the baseline manual to the Andrew style connectors on the backpanel. A schematic is provided in section 4.3 showing this adaptation.

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


3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 – O.C. at Resolver
J3 AZ Resolver
RC3000F Rear Panel
J3
CN-3-42827SG30
P3
AZ Cos +
AZ Cos –
AZ Sin +
AZ Sin –
AZ Ref +
AZ Ref –
Shield
1 Blk
2 Wht
3 Blk
4 Red
5 Grn
6 Blk
7 Shld
CN-3-32827PG52
J25
Blk 1
Wht 2
Blk 3
Red 4
Grn 5
Blk 6
CN-3-32826SG52
Andrew P/N 301083 – 4
RCI P/N FB-3KF3010834
Label each end of each cable with the Cable P/N and mating connector name using LBL-CBL-12xSHT
P25
Red
Black
COS+
COS–
Yellow
Blue
SIN+
SIN–
Red/White
Blk/White
Ref+
Ref–
42826PG300
AZ Resolver
Position Sensor
Andrew P/N 301025
J6 AZ Limit
RC3000F Rear Panel
J6
CN-3-43824SG30
P6
AZ CCW Limit Input
AZ Limit Common
AZ CW Limit Input
28 ft. CBL-3_18SHLDUV
CN-3-33824PG52
P26
CN-3-33824PG52
Andrew P/N 301082 – 4
RCI P/N FB-3KF3010824
Label each end of each cable with the Cable P/N and mating connector name using LBL-CBL-12xSHT
J26
53804SG515
AZ CCW LIMIT
NC, open at limit
Red
Green
Black
Azimuth Limit Switch Assem.
Andrew P/N 301236
Red
Green
Black
AZ CW LIMIT
NC, open at limit
J1 AZ Drive
RC3000F Rear Panel
J1
CN-3-141827SG3
For AZ CW Motion AZ Motor 2 is positive.
P1
AZ Brake +
AZ Brake –
AZ Motor 1
AZ Motor 2
AZ Motor Shield
1 Red
2 Blk
3 Shld
5 Red
6 Blk
7 Shld
CN-3-131827PG3
trim back and insulate the shield with HS-221-_250, cover the drain wire with HS-221-_046 on all four ends
J21
Red 1
Blk 2
Shld3
CN-3-33824SG32
2 28-foot runs CBL-2_16SHLDUV, enclose both cables in 3" of HS-600-_375 at controller end.
FB-3KFCBLMTBK1
Label each end of each cable with the Cable P/N and mating connector name using LBL-CBL-12xSHT
J22
Red 1
Blk 2
Shld3
CN-3-31823SG32
On the connector end, trim back and insulate the shield. with HS-221-_250, cover the drain wire with HS-221-_046
P21
1 Red
2 Blk
3 Shld
4
Shield – nc at Brake end
nc
CN-3-53824PG32
54 in. CBL-2x16SHLDUV
P22
1 Red
2 Blk
3 Shld
nc
CN-3-51823PG32
FB-3KFCBLBRK1
On Brake end, trim back and insulate shield and drain wire with HS-221-_250
Brake+
Brake–
Azimuth Brake
energize for release
0 in., 48 " Cable part of Motor Assembly
Red
Black
Positive Voltage on Red Lead
Produces CW Shaft Motion
Looking into Motor Drive Face
Groschopp
PM8824-PL7330
P/N 5934-3004
24VDC 6.1A
84.5 in-lb
30:1 reducer
FB-3KFCBLMTR1
Check ConXall literature for pin numbering configuration
REVISION HISTORY:
REV A released 26 June 2002 JFR
Research Concepts, Inc.
Title
ESA24SNG-LTE Project
Size
B
Number
Andrew ESA24SNG-LTE Cabling
Rev
A
Date
26 June 2002
Drawn by JFR
Filename
ESA24SNGLTE.sch
Sheet 1 of 3


3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 – O.C. at Resolver
J4 EL Resolver
RC3000F Rear Panel
J4
P4
J27
P27
EL Cos +
EL Cos –
EL Sin +
EL Sin –
EL Ref +
EL Ref –
Shield
Blk
Wht
Grn
Red
Shld
CN–3–42827SG30
CN–3–32827PG52
CN–3–32826SG52
42826PG300
Red
Black
Yellow
Blue
Red/White
Blk/White
COS+
COS–
SIN+
SIN–
Ref+
Ref–
EL Resolver
Position Sensor
Andrew P/N 301025
Andrew P/N 301083–4
RCI P/N FB–3KF3010834
Label each end of each cable with the
Cable P/N and mating connector name
using LBL–CBL–12xSHT
J7 EL Limit
RC3000F Rear Panel
J7
P7
28 ft. CBL–3_18SHLDUV
P28
J28
EL Limit Common
EL Creep Limit Input
Clr
CN–3–43824SG30
CN–3–33824PG52
CN–3–33824PG52
53804SG515
EL LIMIT
COM contacts NO at limit
COM
NC
NO
Elevation Limit Switch Assem.
Andrew P/N 301384
Andrew P/N 301082–4
RCI P/N FB–3KF3010824
Label each end of each cable with the
Cable P/N and mating connector name
using LBL–CBL–12xSHT
FB–3KFCBLBRK1
On Brake end, trim
back and insulate shield and
drain wire with HS–221–_250
strip 1/4 inch and tin each lead.
trim back and insulate the shield
with HS–221–_250, cover the drain
wire with HS–221–_046 at both ends,
individually insulate each conection.
On the connector end,
trim back and insulate the shield.
with HS–221–_250, cover the
drain wire with HS–221–_046
individually insulate each conection.
Brake+
Brake–
J2 EL Drive
RC3000F Rear Panel
J2
P2
J23
P23
EL Brake +
EL Brake –
EL Motor 1
EL Motor 2
EL Motor Shield
Shld
CN–3–141827SG3
CN–3–131827PG3
CN–3–33824SG32
CN–3–53824PG32
Shield – nc at Brake end
54 in. CBL–2x16SHLDUV
total, remove sheath, 6"
Elevation Brake
energize for release
For EL UP Motion EL Motor 2 is positive.
2 28–foot runs CBL–2X16SHLDUV, enclose
both cables in 3" of HS–600–_375 at
controller end.
FB–3KFCBLMTBK1
Label each end of each cable with the
Cable P/N and mating connector name
using LBL–CBL–12xSHT
J24
P24
CN–3–31823SG32
CN–3–51823PG32
Ø in. (48 " Cable part
of Motor Assembly)
Black
Red
Positive Voltage on Red Lead
Produces CW Shaft Motion
Looking into Motor Drive Face
Groschopp
PM8024–PL7310
P/N 5934–3003
24VDC 6.1A
27.6 in–lb
10:1 reducer
FB–3KFCBLMTR1
J10 Inclinometer
RC3000F Rear Panel
J10
P10
Incl. +15V
Incl. Signal Return
Incl. –15V
Incl. Shield
CN–3–42826SG30
CN–3–32826PG52
Label each end of each cable with the
Cable P/N and mating connector name
using LBL–CBL–12xSHT
37 feet CBL–4_22SHLDUV
FB–3KFCBLINCL1
J110A
CN–1–260–301
Z1
Z–INCLIN
02111002–000
nc
Vpos
Sig
Rtn
Vneg
On Controller end,
trim back and insulate shield,
insulate drain wire with HS–221–046
individually insulate each conection.
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
A
Date
26 June 2002
Drawn by JFR
Filename
ESA24SNGLTE.sch
Sheet 2 of 3


J5 POL Resolver
RC3000F Rear Panel
CN-3-42827SG30
J5
P5
CN-3-32827PG52
POL Cos +
POL Cos –
POL Sin +
POL Sin –
POL Ref +
POL Ref –
Shield
1 Blk
2 Wht
3 Blk
4 Red
5 Grn
6 Blk
7 Shld
J29
CN-3-32826SG52
Blk 1
Wht 2
Blk 3
Red 4
Grn 5
Blk 6
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
Label each end of each cable with the
Cable P/N and mating connector name
using LBL-CBL-12xSHT
P29
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
CN-3-43824SG30
P8
CN-3-33824PG52
POL CCW Limit Input
POL Limit Common
POL CW Limit Input
1 Red
2 Clr
3 Blk
4
37 ft. CBL-3_18SHLDUV
P30
CN-3-33824PG52
Red 1
Clr 2
Blk 3
4
Andrew P/N 301082-5
RCI P/N FB-3KF3010825
Label each end of each cable with the
Cable P/N and mating connector name
using LBL-CBL-12xSHT
FB-3KFCBLPOLL1
0 inch CBL-3_18SHLDUV
J30
CN-3-53824SG32
POL CCW LIMIT
NC, open at limit
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
CN-3-42828SG30
P9
CN-3-32828PG52
POL Motor 1
POL Motor 2
POL Motor Shield
1 Red
2 Blk
3 Shld
37 ft. CBL-2-18SHLDUV
J20
CN-3-63823SG32
Red 1
Blk 2
Shld 3
trim back and insulate the shield
with HS-221-_250, cover the drain
wire with HS-221-_046 at both ends
individually insulate each conection
with HS-221-_125.
FB-3KFCBLPOLM1
Label each end of each cable with the
Cable P/N and mating connector name
using LBL-CBL-12xSHT
For POL CW Motion POL Motor 1 is positive.
FB-3KFCBLPOLM2
12 inch CBL-2-18SHLDUV
P20
CN-3-83823PG32
1 Red
2 Blk
3 Shld
Mot+
Mot–
On the connector end,
trim back and insulate the shield.
with HS-221-_250, cover the
drain wire with HS-221-_046
individually insulate each conection.
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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Date
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Drawn by JFR
Filename
ESA24SNGLTE.sch
Sheet 3 of 3

2.3 Calibration

While similar in scope, the calibration steps for the RC3050F are quite different from the procedure described in the baseline manual. These differences arise mainly due to the fact that the RC3050F 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.

RC3050F SETUP STEPS FOR ANDREW 2.4 SNG

#	STEP	ACTION
1	Inactivate Software Limits	**In the POLARIZATION LIMIT screen:** Press F/S to inactivate software limits "LIMITS INACTIVE!" will flash on line 2
2	Move 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	**AZIM REF** maintenance screen: Press UP then DOWN to establish current position as the azimuth refernece **MANUAL**: Confirm that Az value in is 0.0
4	Define Software Azimuth Stow Switch	No action required. Azimuth STOW resolver count stored during previous step.
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.	**EL VOLTS** maintenance screen: Press UP then DOWN to establish current position as the elevation reference position for the inclinometer **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	**EL REF** maintenance screen: Press UP then DOWN to establish current position as the elevation reference NOTE: later (after limits reactivated), there should be a smooth transition in displayed elevation angle as the mount moves from above the DOWN limit (angle derived from inclinometer) to below the DOWN limit (angle derived from resolver)
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 _____ **EL VOLTS** Record elevation input voltage _____ **MANUAL**: Move UP approximately 40 degrees Place accurate level on backstructure and record angle _____ **EL VOLTS** Record elevation input voltage _____ Calculate: elevation scale factor (mV/deg.) = (Volts_1 - Volts_2) / (Angle_1 - Angle_2) **EL SF** Configuration Screen: Press UP/DN to nearest 0.1 value and press ENTER **MANUAL** mode : Confirm that El reads 22.3 + number_of_degrees_physically_rotated
8	Define Elevation UP Software Limit	**EL UP**: programming screen:

	Move elevation axis to desired UP limit	Press UP then DOWN to enter and confirm UP limit position
9	Define Elevation DOWN Software Limit Move elevation axis to desired DOWN limit Typically set around 5.0 degrees or required position to avoid obstacles while moving in azimuth.	**EL DOWN**: programming screen: Press UP then DOWN to enter and confirm DOWN limit position
10	Define Elevation Sync Software Limit Move elevation axis to position where sync (creep) switch activates	**MANUAL** MODE: Synch (creep) switch is displayed by the "."next to the elevation limit field **EL SYNC**: programming screen: Press UP then DOWN to enter and confirm SYNC limit position
11	Define Elevation STOW Software Limit Move elevation axis to desired STOW limit	**EL STOW**: programming screen: Press UP then DOWN to enter and confirm STOW limit position
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	**POL REF** maintenance screen: Press UP then DOWN to establish current position as the polarization refernece **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 "CC" limits are displayed
14	Confirm Azimuth Clockwise Limit Move azimuth axis to clockwise limit	**MANUAL** MODE: Confirm that "CW" limit is triggered via limit switch
15	Confirm Azimuth Counter-Clockwise Limit Move azimuth axis to counter-clockwise limit	**MANUAL** MODE: Confirm that "CCW" limit is triggered via limit switch
16	Activate Software Limits	**LIMITS DIAG-2** Press F/S to activate software limits Alarm on line 2 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

3.0 Detailed Operation

3.2 Operating Group

With the exception of two minor changes to the MANUAL mode (described below), operation of the RC3050F is identical to that described in the baseline RC3050 manual.

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 a "." appears.

```
Az    El  Pol
 180.0 -12.3 -90
F   CW .DOWN CCW
```

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

3.3 Programming Group

Additional programming screens have been added to accommodate the calibration of the various software limits. Several screens have been modified to allow calibration of the azimuth, elevation and polarization resolvers. All programming screens for the RC3050F will now be described.

3.3.1 Drive Error Resets

This screen functions as described in the baseline manual.

3.3.2 Reslover Reference Position

Three screens exist to define the "reference" position of the azimuth, elevation and polarization resolvers.

```
AZIM REF: 180.00
<UP>SET  (179.87)
```

Each screen shows the current resolver angle in parenthesis. The stored resolver reference position is displayed on the top line. To set a resolver reference angle press the UP key followed by the DOWN key to confirm the selection. This action is similar to the setting of reference voltages as described in the baseline manual.

The "reference" position for each axis is described in the installation procedure.

3.3.3 Elevation Reference Voltage

In addition to setting the reference position for the elevation resolver, the reference voltage for the electronic inclinometer must be set. This screen functions exactly as described in 3.3.3 of the baseline manual.

3.3.4 Elevation Software Limits

Four screens exist to define the elevation STOW, SYNCH, DOWN and UP limits.

```
EL STOW:  90.00
<UP>SET ( 91.23)
```

Each screen shows the current resolver angle in parenthesis. The stored limit position is displayed on the top line. To set a limit position press the UP key followed by the DOWN key to confirm the selection. This action is similar to the setting of reference voltages as described in the baseline manual.

3.3.5 Elevation Scale Factor

This screen allows the user to adjust the scale factor for the electronic inclinometer. This scale factor will be characterized during calibration.

```
EL SF:       49.3
<UP/DN> <F/S>SET
```

The current stored scale factor is displayed on the top line. Pressing the UP or DOWN key will increment or decrement the displayed value by 0.1. To set the value press the FAST/SLOW key followed by the DOWN key to confirm the action.

3.3.6 Limits Maintenance Screens

The Azimuth and Elevation Limit screen is unchanged from what is described in 3.3.5 of the baseline manual.

The ability to disable the software limits has been added to the Polarization Limit screen.

```
PL CW:0 CC:1 S:0
<F/S>ACTIVE
```

Pressing the FAST/SLOW key will toggle software limits between ACTIVE and INACTIVE. When the software limits are inactive the alarm “LIMITS INACTIVE!” will flash on the bottom row.

3.4 Alarm Displays

LIMITS INACTIVE!

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

AZIM LIMIT ERROR

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

ELEV LIMIT ERROR

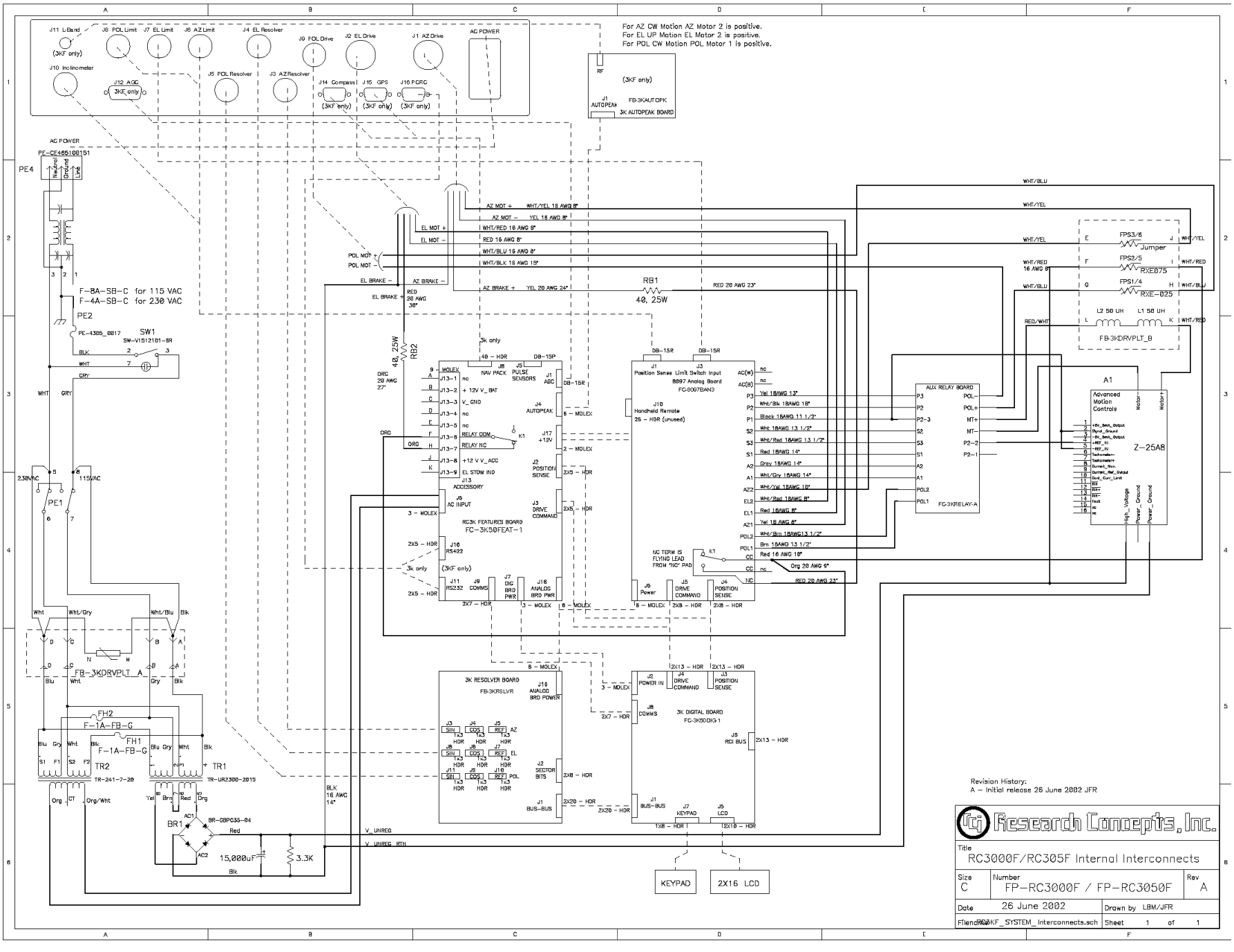
If the stored value for the elevation reference position or the value for the elevation STOW, SYNCH, DOWN or UP limits is determined to be corrupt, this alarm is displayed.

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 withing 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.

4.3 Schematics

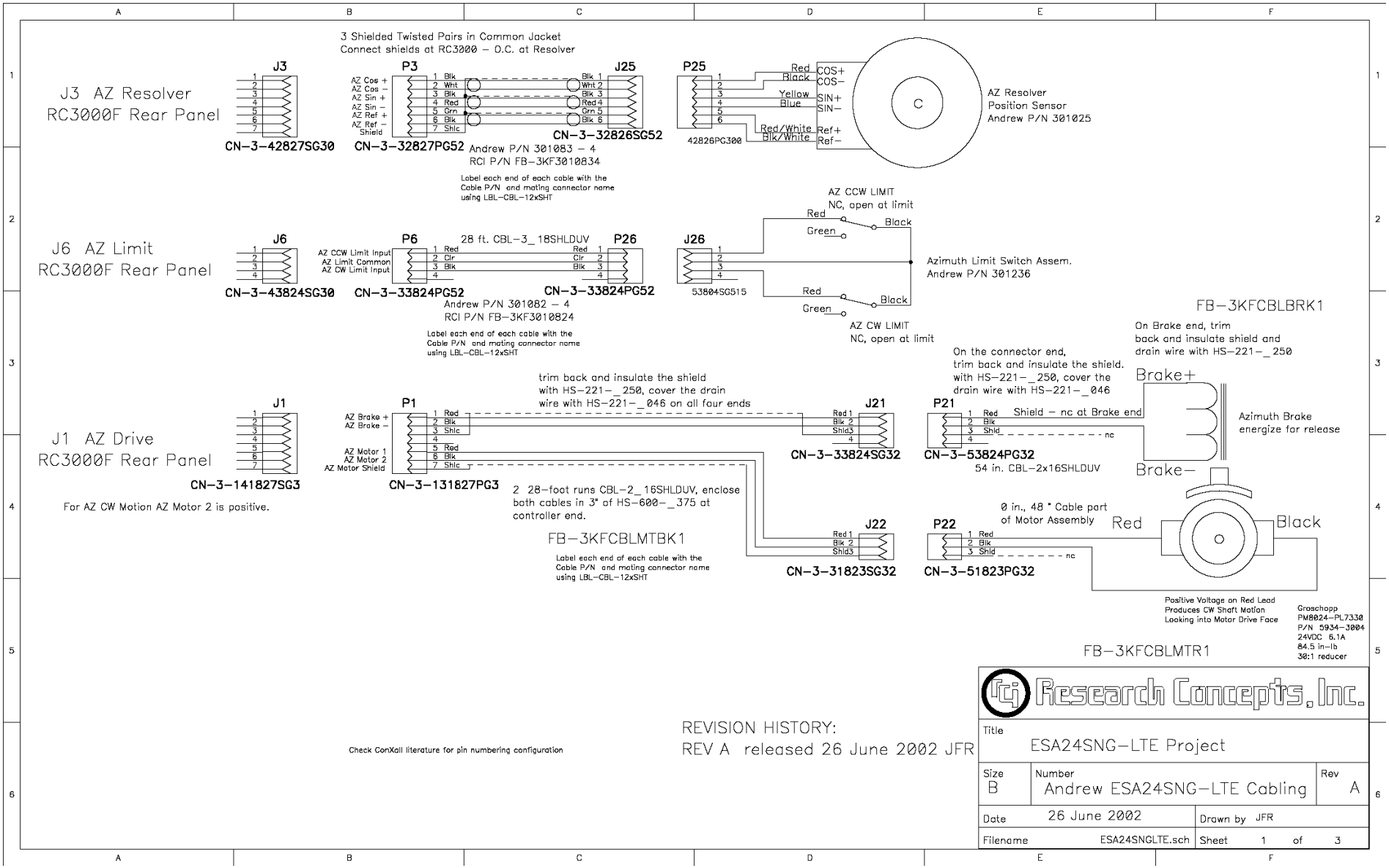
1. **RC3000F/RC3050F Internal Interconnects (1 of 1)**
2. **RC3000F Back Panel Interconnects (1, 2 and 3 of 5)**
3. **RC3000 Resolver Adapter**

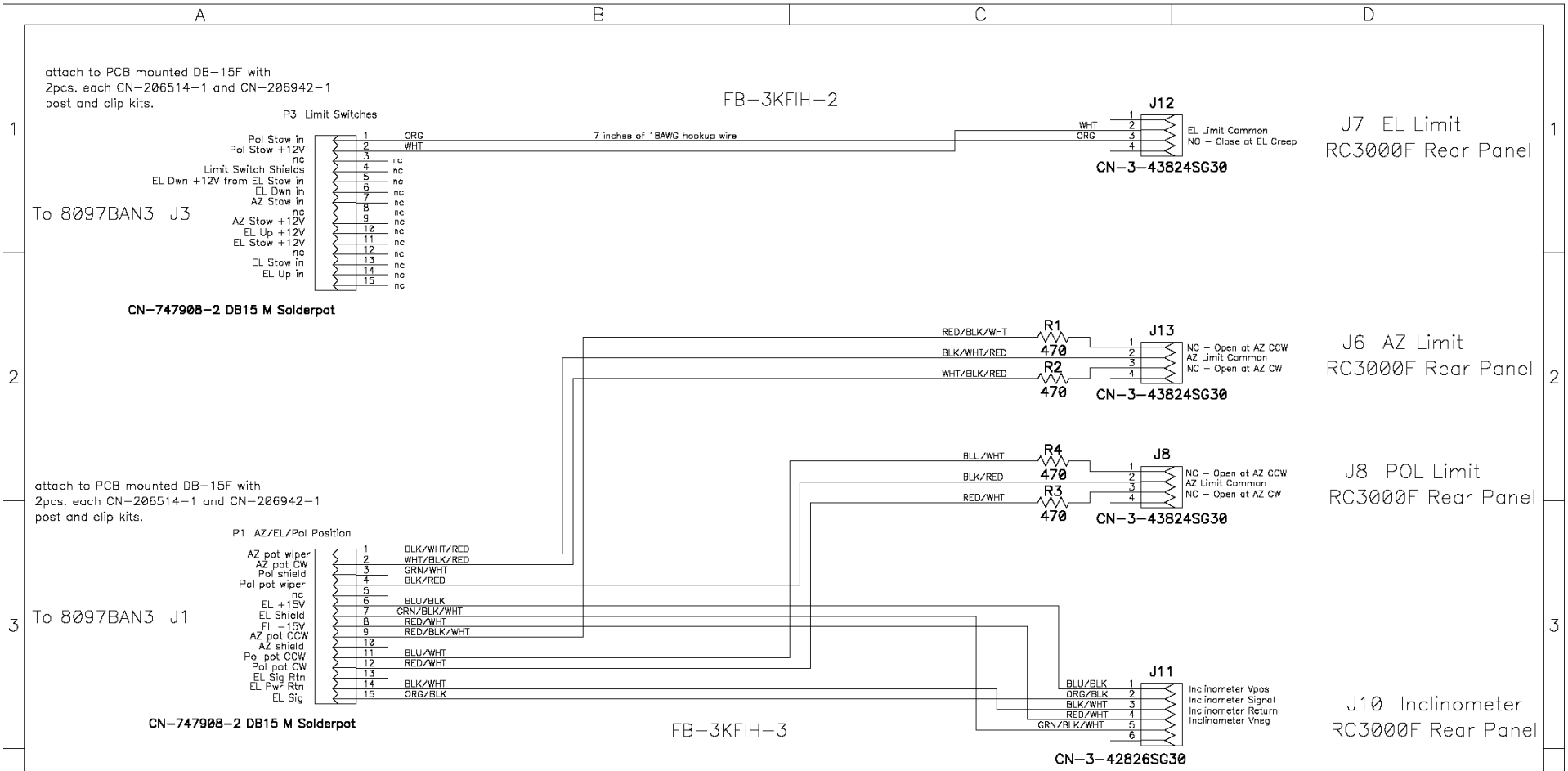


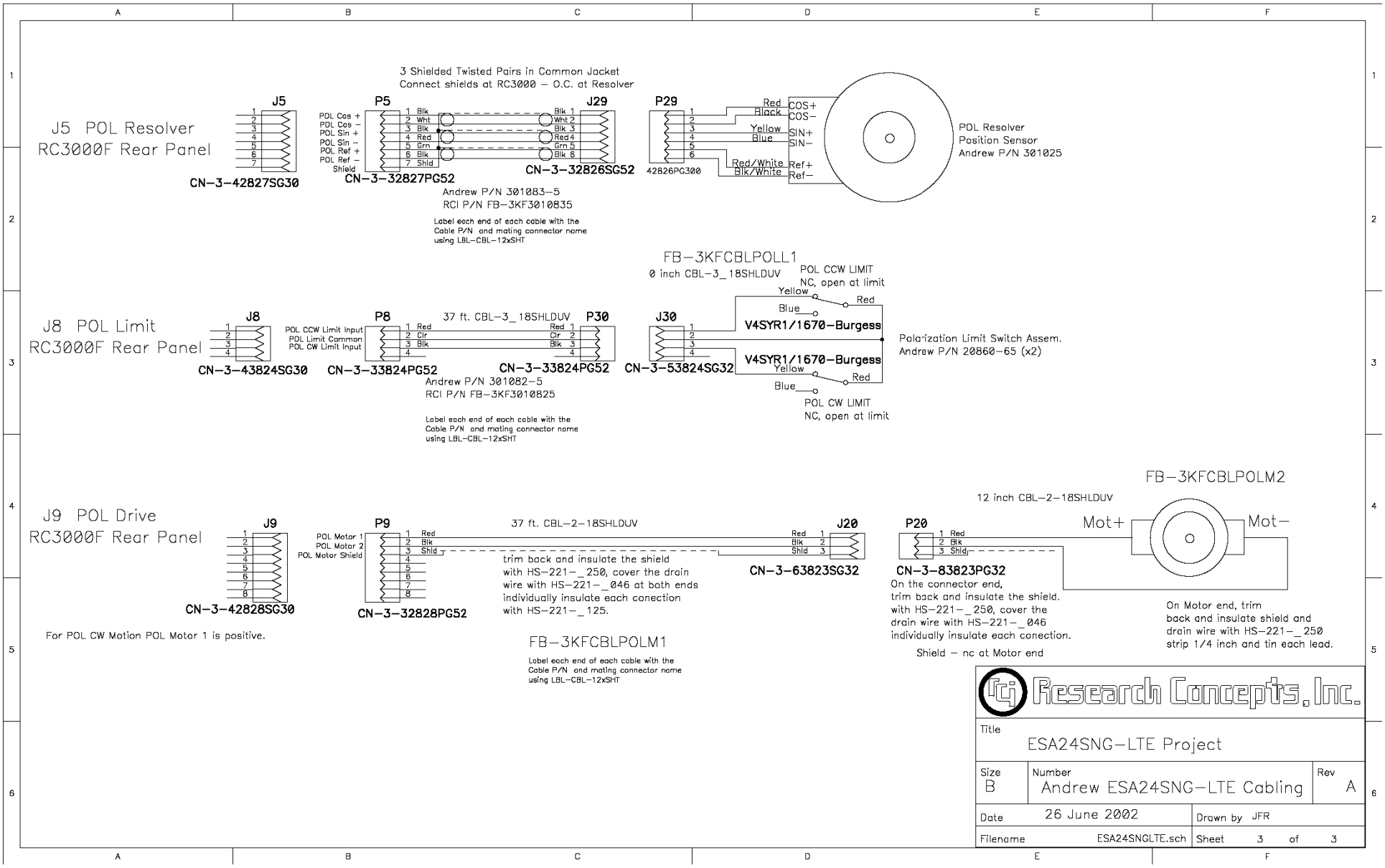
Revision History:
A – Initial release 26 June 2002 JFR

Research Concepts, Inc.

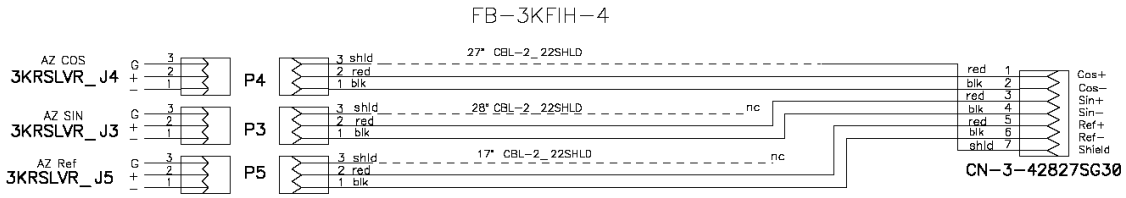
Title: RC3000F/RC305F Internal Interconnects		
Size: C	Number: FP–RC3000F / FP–RC3050F	Rev: A
Date: 26 June 2002	Drawn by: LBM/JFR	
File: RC3KF_SYSTEM_Interconnects.sch	Sheet 1 of 1	


3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 – O.C. at Resolver
J3 AZ Resolver
RC3000F Rear Panel
J3
CN-3-42827SG30
P3
AZ Cos +
AZ Cos –
AZ Sin +
AZ Sin –
AZ Ref +
AZ Ref –
Shield
1 Blk
2 Wht
3 Blk
4 Red
5 Grn
6 Blk
7 Shlc
CN-3-32827PG52
J25
Blk 1
Wht 2
Blk 3
Red 4
Grn 5
Blk 6
CN-3-32826SG52
Andrew P/N 301083 – 4
RCI P/N FB-3KF3010834
Label each end of each cable with the Cable P/N and mating connector name using LBL-CBL-12xSHT
P25
42826PG300
Red
Black
COS+
COS–
Yellow
Blue
SIN+
SIN–
Red/White
Blk/White
Ref+
Ref–
C
AZ Resolver
Position Sensor
Andrew P/N 301025
J6 AZ Limit
RC3000F Rear Panel
J6
CN-3-43824SG30
P6
AZ CCW Limit Input
AZ Limit Common
AZ CW Limit Input
1 Red
2 Clr
3 Blk
4
CN-3-33824PG52
28 ft. CBL-3_18SHLDUV
P26
Red 1
Clr 2
Blk 3
4
CN-3-33824PG52
Andrew P/N 301082 – 4
RCI P/N FB-3KF3010824
Label each end of each cable with the Cable P/N and mating connector name using LBL-CBL-12xSHT
J26
53804SG515
AZ CCW LIMIT
NC, open at limit
Red
Black
Green
Azimuth Limit Switch Assem.
Andrew P/N 301236
Red
Black
Green
AZ CW LIMIT
NC, open at limit
J1 AZ Drive
RC3000F Rear Panel
J1
CN-3-141827SG3
For AZ CW Motion AZ Motor 2 is positive.
P1
AZ Brake +
AZ Brake –
AZ Motor 1
AZ Motor 2
AZ Motor Shield
1 Red
2 Blk
3 Shlc
4
5 Red
6 Blk
7 Shlc
CN-3-131827PG3
trim back and insulate the shield with HS-221-_250, cover the drain wire with HS-221-_046 on all four ends
J21
Red 1
Blk 2
Shld3
4
CN-3-33824SG32
2 28-foot runs CBL-2_16SHLDUV, enclose both cables in 3" of HS-600-_375 at controller end.
FB-3KFCBLMTBK1
Label each end of each cable with the Cable P/N and mating connector name using LBL-CBL-12xSHT
J22
Red 1
Blk 2
Shld3
CN-3-31823SG32
On the connector end, trim back and insulate the shield. with HS-221-_250, cover the drain wire with HS-221-_046
P21
1 Red
2 Blk
3 Shld
4
Shield – nc at Brake end
nc
CN-3-53824PG32
54 in. CBL-2x16SHLDUV
P22
1 Red
2 Blk
3 Shld
nc
CN-3-51823PG32
FB-3KFCBLBRK1
On Brake end, trim back and insulate shield and drain wire with HS-221-_250
Brake+
Brake–
Azimuth Brake
energize for release
0 in., 48 " Cable part of Motor Assembly
Red
Black
Positive Voltage on Red Lead
Produces CW Shaft Motion
Looking into Motor Drive Face
Groschopp
PM8024-PL7330
P/N 5934-3004
24VDC 6.1A
84.5 in-lb
30:1 reducer
FB-3KFCBLMTR1
Check ConXall literature for pin numbering configuration
REVISION HISTORY:
REV A released 26 June 2002 JFR
Research Concepts, Inc.
Title
ESA24SNG-LTE Project
Size
B
Number
Andrew ESA24SNG-LTE Cabling
Rev
A
Date
26 June 2002
Drawn by JFR
Filename
ESA24SNGLTE.sch
Sheet 1 of 3

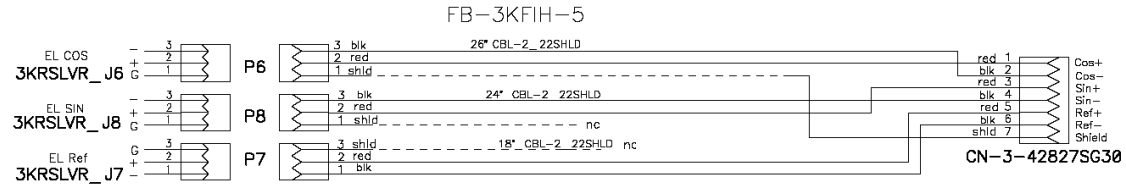

attach to PCB mounted DB-15F with
2pcs. each CN-206514-1 and CN-206942-1
post and clip kits.
P3 Limit Switches
Pol Stow in
Pol Stow +12V
nc
Limit Switch Shields
EL Dwn +12V from EL Stow in
EL Dwn in
AZ Stow in
nc
AZ Stow +12V
EL Up +12V
EL Stow +12V
nc
EL Stow in
EL Up in
ORG
WHT
nc
7 inches of 18AWG hookup wire
To 8097BAN3 J3
CN-747908-2 DB15 M Solderpat
FB-3KFIH-2
J12
WHT
ORG
EL Limit Common
NO - Close at EL Creep
CN-3-43824SG30
J7 EL Limit
RC3000F Rear Panel
RED/BLK/WHT
BLK/WHT/RED
WHT/BLK/RED
R1
470
R2
470
J13
NC - Open at AZ CCW
AZ Limit Common
NC - Open at AZ CW
CN-3-43824SG30
J6 AZ Limit
RC3000F Rear Panel
BLU/WHT
BLK/RED
RED/WHT
R4
470
R3
470
J8
NC - Open at AZ CCW
AZ Limit Common
NC - Open at AZ CW
CN-3-43824SG30
J8 POL Limit
RC3000F Rear Panel
attach to PCB mounted DB-15F with
2pcs. each CN-206514-1 and CN-206942-1
post and clip kits.
P1 AZ/EL/Pol Position
AZ pot wiper
AZ pot CW
Pol shield
Pol pot wiper
nc
EL +15V
EL Shield
EL -15V
AZ pot CCW
AZ shield
Pol pot CCW
Pol pot CW
EL Sig Rtn
EL Pwr Rtn
EL Sig
BLK/WHT/RED
WHT/BLK/RED
GRN/WHT
BLK/RED
BLU/BLK
GRN/BLK/WHT
RED/WHT
RED/BLK/WHT
BLU/WHT
RED/WHT
BLK/WHT
ORG/BLK
To 8097BAN3 J1
CN-747908-2 DB15 M Solderpat
FB-3KFIH-3
J11
BLU/BLK
ORG/BLK
BLK/WHT
RED/WHT
GRN/BLK/WHT
Inclinometer Vpos
Inclinometer Signal
Inclinometer Return
Inclinometer Vneg
CN-3-42826SG30
J10 Inclinometer
RC3000F Rear Panel
Notes:
Install R1, R2, R3, R4 directly in each back panel connector pin.
cover the entire resistor and connections with double HS.
insulate and strengthen each conection with HS-221-_125.
See Sheet 1 for revision history
Title RC3000F Back Panel Interconnects
Size B
Number FB-3KFIH-x
Rev A
Date 26 June 2002
Drawn by JFR
Filename RC3KF_BP_IntrcnA.sch
Sheet 2 of 5


J5 POL Resolver
RC3000F Rear Panel
J5
CN-3-42827SG30
P5
CN-3-32827PG52
3 Shielded Twisted Pairs in Common Jacket
Connect shields at RC3000 – O.C. at Resolver
POL Cos +
POL Cos –
POL Sin +
POL Sin –
POL Ref +
POL Ref –
Shield
Blk
Wht
Blk
Red
Grn
Blk
Shld
J29
CN-3-32826SG52
Andrew P/N 301083-5
RCI P/N FB-3KF3010835
Label each end of each cable with the
Cable P/N and mating connector name
using LBL-CBL-12xSHT
P29
42826PG300
Red
Black
COS+
COS–
Yellow
Blue
SIN+
SIN–
Red/White
Blk/White
Ref+
Ref–
POL Resolver
Position Sensor
Andrew P/N 301025
FB-3KFCBLPOLL1
0 inch CBL-3_18SHLDUV
POL CCW LIMIT
NC, open at limit
Yellow
Red
Blue
V4SYR1/1670-Burgess
V4SYR1/1670-Burgess
Yellow
Red
Blue
POL CW LIMIT
NC, open at limit
J8 POL Limit
RC3000F Rear Panel
J8
CN-3-43824SG30
P8
CN-3-33824PG52
37 ft. CBL-3_18SHLDUV
POL CCW Limit Input
POL Limit Common
POL CW Limit Input
Red
Clr
Blk
P30
CN-3-33824PG52
J30
CN-3-53824SG32
Polarization Limit Switch Assem.
Andrew P/N 20860-65 (x2)
Andrew P/N 301082-5
RCI P/N FB-3KF3010825
Label each end of each cable with the
Cable P/N and mating connector name
using LBL-CBL-12xSHT
FB-3KFCBLPOLM2
12 inch CBL-2-18SHLDUV
Mot+
Mot–
P20
CN-3-83823PG32
Red
Blk
Shld
On the connector end,
trim back and insulate the shield.
with HS-221-_250, cover the
drain wire with HS-221-_046
individually insulate each conection.
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.
J9 POL Drive
RC3000F Rear Panel
J9
CN-3-42828SG30
P9
CN-3-32828PG52
37 ft. CBL-2-18SHLDUV
POL Motor 1
POL Motor 2
POL Motor Shield
Red
Blk
Shld
J20
CN-3-63823SG32
trim back and insulate the shield
with HS-221-_250, cover the drain
wire with HS-221-_046 at both ends
individually insulate each conection
with HS-221-_125.
For POL CW Motion POL Motor 1 is positive.
FB-3KFCBLPOLM1
Label each end of each cable with the
Cable P/N and mating connector name
using LBL-CBL-12xSHT
Research Concepts, Inc.
Title
ESA24SNG-LTE Project
Size
B
Number
Andrew ESA24SNG-LTE Cabling
Rev
A
Date
26 June 2002
Drawn by JFR
Filename
ESA24SNGLTE.sch
Sheet 3 of 3

Connectors on 3KRSLVR1



J3 AZ Resolver
RC3000F/RC3050F
Rear Panel



J4 EL Resolver
RC3000F/RC3050F
Rear Panel

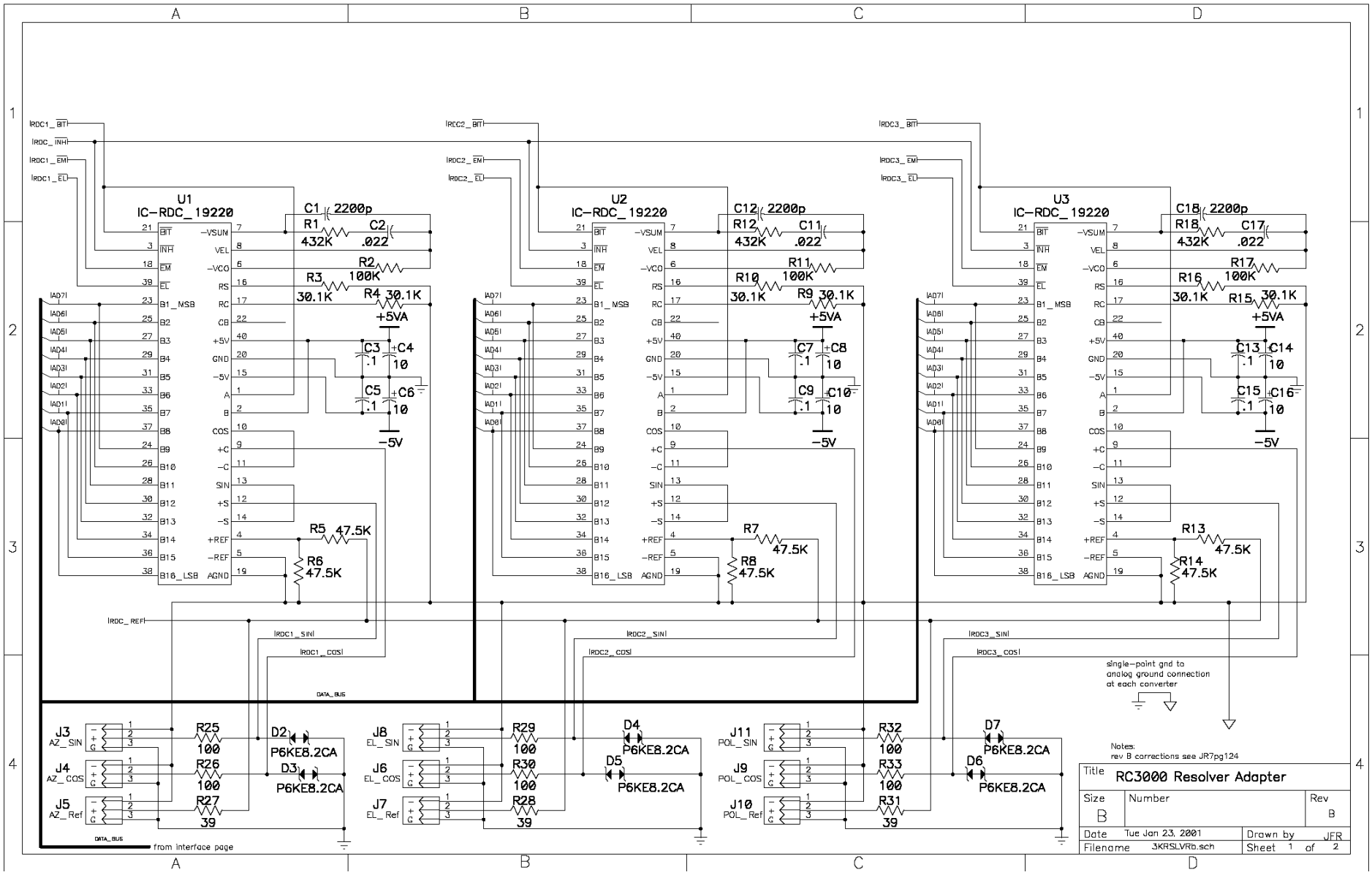
J5 POL Resolver
RC3000F/RC3050F
Rear Panel

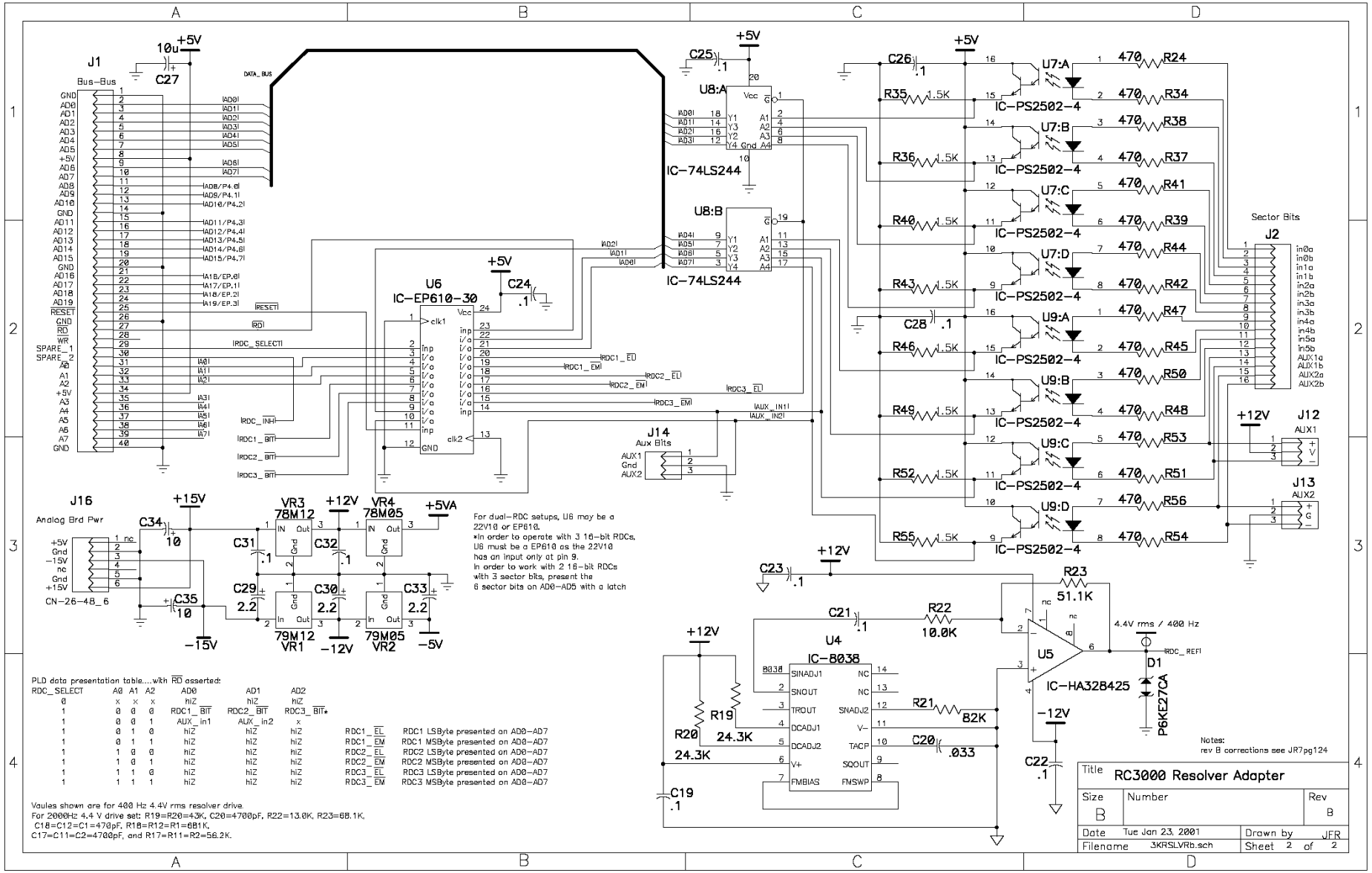
Connect just a single shield to pin 7 of J5. Leave the other shields open and insulated. Use HS-221-_ 046 over the open drain wire. Individually insulate each connection with HS-221-_ 125.

The 3KRSLVR1 end of each of these wiring harnesses requires 3 pcs CN-22-01-2037 and 9 pcs. CN-08-56-0110 or CN-08-50-0106.

See Sheet 1 for revision history

Title	**RC3000F Back Panel Interconnects**	
Size B	Number FB-3KFIH-x	Rev A
Date 26 June 2002		Drawn by JFR
Filename RC3KF_BP_intrcnA.sch		Sheet 3 of 5


U1
IC-RDC_19220
U2
IC-RDC_19220
U3
IC-RDC_19220
C1 2200p
R1 432K
C2 .022
R2 100K
R3 30.1K
R4 30.1K
+5VA
C3 .1
C4 10
C5 .1
C6 10
-5V
R5 47.5K
R6 47.5K
C12 2200p
R12 432K
C11 .022
R11 100K
R10 30.1K
R9 30.1K
C7 .1
C8 10
C9 .1
C10 10
R7 47.5K
R8 47.5K
C18 2200p
R18 432K
C17 .022
R17 100K
R16 30.1K
R15 30.1K
C13 .1
C14 10
C15 .1
C16 10
R13 47.5K
R14 47.5K
IRDC1_BIT
IRDC_INH
IRDC1_EM
IRDC1_EL
IRDC2_BIT
IRDC2_EM
IRDC2_EL
IRDC3_BIT
IRDC3_EM
IRDC3_EL
IRDC_REF
IRDC1_SINI
IRDC1_COSI
IRDC2_SINI
IRDC2_COSI
IRDC3_SINI
IRDC3_COSI
DATA_BUS
single-point gnd to analog ground connection at each converter
J3 AZ_SIN
J4 AZ_COS
J5 AZ_Ref
R25 100
R26 100
R27 39
D2 P6KE8.2CA
D3 P6KE8.2CA
J8 EL_SIN
J6 EL_COS
J7 EL_Ref
R29 100
R30 100
R28 39
D4 P6KE8.2CA
D5 P6KE8.2CA
J11 POL_SIN
J9 POL_COS
J10 POL_Ref
R32 100
R33 100
R31 39
D7 P6KE8.2CA
D6 P6KE8.2CA
DATA_BUS
from interface page
Notes:
rev B corrections see JR7pg124
Title RC3000 Resolver Adapter
Size B
Number
Rev B
Date Tue Jan 23, 2001
Drawn by JFR
Filename 3KRSLVRb.sch
Sheet 1 of 2



For dual-RDC setups, U6 may be a 22V10 or EP610.
*In order to operate with 3 16-bit RDCs, U6 must be a EP610 as the 22V10 has an input only at pin 9.
In order to work with 2 16-bit RDCs with 3 sector bits, present the 6 sector bits on AD0-AD5 with a latch

PLD data presentation table....with $\overline{RD}$ asserted:

RDC_SELECT	A0	A1	A2	AD0	AD1	AD2	
0	x	x	x	hiZ	hiZ	hiZ	
1	0	0	0	RDC1_$\overline{BIT}$	RDC2_$\overline{BIT}$	RDC3_$\overline{BIT}$*	
1	0	0	1	AUX_in1	AUX_in2	x	
1	0	1	0	hiZ	hiZ	hiZ	RDC1_$\overline{EL}$ RDC1 LSByte presented on AD0-AD7
1	0	1	1	hiZ	hiZ	hiZ	RDC1_$\overline{EM}$ RDC1 MSByte presented on AD0-AD7
1	1	0	0	hiZ	hiZ	hiZ	RDC2_$\overline{EL}$ RDC2 LSByte presented on AD0-AD7
1	1	0	1	hiZ	hiZ	hiZ	RDC2_$\overline{EM}$ RDC2 MSByte presented on AD0-AD7
1	1	1	0	hiZ	hiZ	hiZ	RDC3_$\overline{EL}$ RDC3 LSByte presented on AD0-AD7
1	1	1	1	hiZ	hiZ	hiZ	RDC3_$\overline{EM}$ RDC3 MSByte presented on AD0-AD7

Vaules shown are for 400 Hz 4.4V rms resolver drive.
For 2000Hz 4.4 V drive set: R19=R20=4.3K, C20=4700pF, R22=13.0K, R23=68.1K,
C18=C12=C1=470pF, R18=R12=R1=681K,
C17=C11=C2=4700pF, and R17=R11=R2=56.2K.