

APPENDIX B - MOUNT SPECIFIC DATA For

Overwatch Scientific Mount

Revision: 25 August 2008 Software Version: 1.59

1.2 Mount Models

This appendix describes the RC3000 variation built for use by the Overwatch "scientific" antenna. This model will be referred to as "B6".

1.3.2 System Interface Requirements

The B6 mount follows the standard RC3000 interface requirements with the following notable variations:

- resolvers present for azimuth, elevation and polarization
- no elevation inclinometer
- azimuth and polarization CW/CCW limit switches
- no azimuth or elevation stow switches

2.1.4 Inclinometer Orientation Not applicable

2.2.2 Motor Drive

The B6 controller has a unique J7 connector with pinouts per the following schedule:

| PIN | SIGNAL |
|-----|----------------------|
| A | POL A1 |
| B | POL A2 |
| C | Shield |
| D | EL A1 |
| E | EL A2 |
| F | AZ A1 |
| G | AZ A2 |
| H | AZ F1 |
| J | AZ F2 |
| K | POL F1 |
| L | POL F2 |
| M | EL F1 |
| N | EL F2 |
| P | Spare- Safety Ground |

2.2.4 Limit Switches

Limit switches are implemented via both the J3 and J8 connectors.

| LIMIT | CONNECTOR | PINS |
|------------------|-----------|---------|
| Azimuth CCW | J8 | 2 , 14 |
| Azimuth CW | J8 | 12 , 25 |
| Polarization CCW | J8 | 6 , 19 |
| Polarization CW | J8 | 5 , 18 |
| Elevation UP | J3 | 10 , 14 |
| Elevation DOWN | J3 | 5 , 6 |

3.2 Operating Group

The operation of this mount type is customized to performing precise movements of the antenna versus performing automatic location of satellites. While the operation is very similar to a baseline RC3000, the number of modes has been decreased for the mount's intended purpose.

The following paragraphs will describe the customized operation of this mount type.

3.2.1 Manual Mode

| | |
|------------------|---------------------|
| AZIM: -123.45 | MANUAL |
| ELEV: 45.67 | |
| POL: 30.0 V | SPD: FAST CST |
| <0-9>JOG ANTENNA | <MODE>MENU 14:25:47 |

MANUAL mode has been modified to display azimuth and elevation angles to the 0.01 degree resolution vs. the baseline resolution of 0.1 degrees. No signal strength or satellite name data is shown as this variation will not be performing automatic LOCATE functions.

3.2.2 Menu Mode

MENU mode allows the user to select one of listed modes. The only automatic mode provided for this mount variation is MOVETO. Pressing the Mode key will move to MANUAL mode.

| | |
|------------------------|----------|
| 1-MOVETO | MENU |
| | CST |
| <#>SELECT <MODE>MANUAL | 14:37:23 |

MENU mode displays the reference time and time zone in the lower right hand corner.

3.3.2.8 MOVETO

The MOVETO mode is intended to provide an easy way to move the antenna to a certain position for doing testing such as cutting antenna patterns. This mode is also useful for tuning up parameters associated with automatic movements.

| | |
|---------------------------------------|--------|
| AZIM: -123.45 (-123.45) | MOVETO |
| ELEV: 41.23 (41.23<5>SENSOR: PRIMARY | |
| POL: -13.3 (-13.3) <3>SPEED: FAST | |
| SET <1>AZ <2>EL<6>POL<4>START MOVE | |

For this mount type, azimuth and elevation angles are displayed to 0.01 degrees.

3.3.1.2.2 Elevation Calibration

The elevation_resolver_offset allows for 0.01 degree resolution.

```
REF_V:1.69 OFF: 0.0 CONFIG-ELEV
DOWN: 0 UP: 90.0 SF:50.00
LOOK:1 RES:-123.45 REV:0
SET REFERENCE VOLTAGE <0.50 - 3.50>
```

3.3.1.2.3 Azimuth Calibration

The azimuth_resolver_offset allows for 0.01 degree resolution.

```
OFF: 0.0 CONFIG-AZIM
CCW:180 CW:180
RES:-123.45 REV:0
SET REFERENCE VOLTAGE <2.00 - 3.00>
```

3.3.2.1 Analog to Digital Voltages

```
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 are displayed to 0.01.

3.3.1.2 Reset Defaults

The following table supplies the default configuration item values for this model of the RC3000.

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.

| CONFIGURATION ITEM | B6 | | | | INSTALL VALUE |
|------------------------------|-----------|--|--|--|----------------------|
| SYSTEM DEFINITION | | | | | |
| GPS | 0 | | | | |
| COMPASS MOUNT | 0 | | | | |
| COMPASS TYPE | 0 | | | | |
| MODE | 2 | | | | |
| antenna_size_cm | 120 | | | | |
| Waveguide | 0 | | | | |
| ELEVATION CALIBRATION | | | | | |
| Zero Voltage | 1.69 | | | | |
| Elev_offset | 0.0 | | | | |
| Up_elev_limit | 90 | | | | |
| Down_elev_limit | 0 | | | | |
| Elevation_Scale_Factor | 50.00 | | | | |
| Elevation_look_configuration | 1 | | | | |
| Resolver offset | -45.00 | | | | |
| Resolver direction | 0 | | | | |
| AZIMUTH CALIBRATION | | | | | |
| Fluxgate_offset | 0.0 | | | | |
| ccw_azim_limit | 200 | | | | |
| Cw_azim_limit | 200 | | | | |
| Resolver offset | -180.00 | | | | |
| Resolver direction | 0 | | | | |
| POLARIZATION CAL | | | | | |
| Polarization_Offset | 0.0 | | | | |
| CW Polarization Limit | 95.0 | | | | |
| CCW Polarization Limit | 95.0 | | | | |
| Polarization_type | 2 | | | | |
| H/V_Reference | 1 | | | | |
| Default Horizontal Position | -45.0 | | | | |
| Default Vertical Position | 45.0 | | | | |
| Pol_Automove_Enable | 1 | | | | |

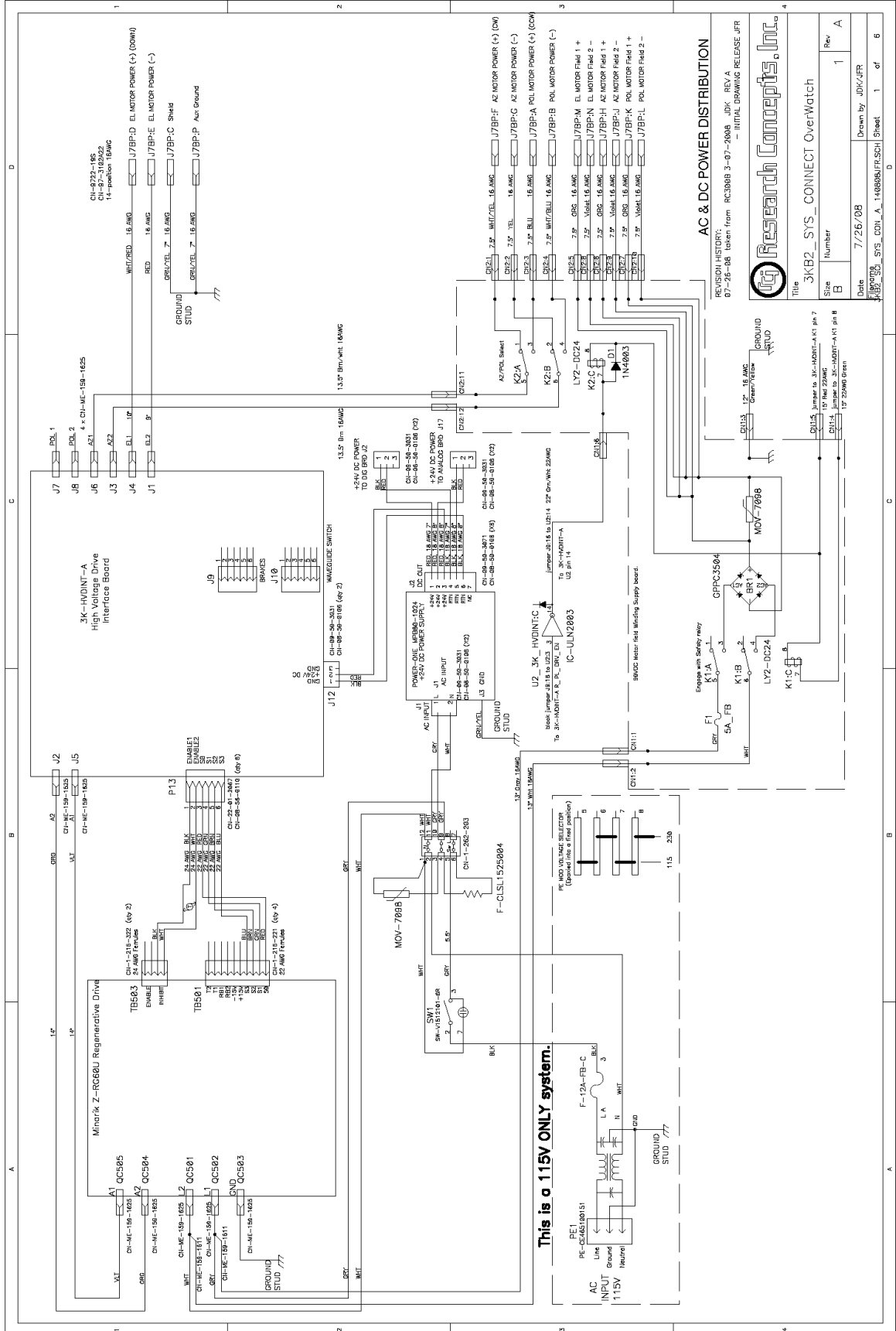
| CONFIGURATION ITEM | B6 | | | | | INSTALL VALUE |
|---------------------------|-----------|--|--|--|--|----------------------|
| SIGNAL PARAMETERS | | | | | | |
| RF Lock Type | 0 | | | | | |
| RF Delay | 0.1 | | | | | |
| Channel 1 Polarity | 1 | | | | | |
| Channel 1 Threshold | 100 | | | | | |
| 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 | | | | | |
| 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 | | | | | |
| Tilt Compensation | 0 | | | | | |

| CONFIGURATION ITEM | B6 | | | | INSTALL VALUE |
|------------------------------|-----------|--|--|--|----------------------|
| AZIMUTH POT DRIVE | | | | | |
| Fast/Slow Threshold | 2.5 | | | | |
| Maximum Position Error | 0.20 | | | | |
| Coast Threshold | 0.1 | | | | |
| Maximum Retry Count | 3 | | | | |
| AZIMUTH PULSE DRIVE | | | | | |
| Pulse Scale Factor | 10431 | | | | |
| CW Pulse Limit | 64000 | | | | |
| CCW Pulse Limit | 100 | | | | |
| Fast/Slow Threshold | 50 | | | | |
| Maximum Position Error | 1 | | | | |
| Coast Threshold | 3 | | | | |
| Maximum Retry Count | 3 | | | | |
| AZIM DRIVE MONITORING | | | | | |
| Jam Slop | 1 | | | | |
| Runaway Slop | 200 | | | | |
| Fast Deadband | 1000 | | | | |
| Slow Deadband | 500 | | | | |
| ELEV POT DRIVE | | | | | |
| Fast/Slow Threshold | 3.0 | | | | |
| Maximum Position Error | 0.2 | | | | |
| Coast Threshold | 0.4 | | | | |
| Maximum Retry Count | 3 | | | | |
| ELEV PULSE DRIVE | | | | | |
| Pulse Scale Factor | 10431 | | | | |
| UP Pulse Limit | 64000 | | | | |
| Down Pulse Limit | 100 | | | | |
| Fast/Slow Threshold | 50 | | | | |
| Maximum Position Error | 1 | | | | |
| Coast Threshold | 3 | | | | |
| Maximum Retry Count | 3 | | | | |
| ELEV DRIVE MONITORING | | | | | |
| Jam Slop | 1 | | | | |
| Runaway Slop | 200 | | | | |
| Fast Deadband | 1000 | | | | |
| Slow Deadband | 500 | | | | |
| 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 | 1 | | | | |
| Runaway Slop | 200 | | | | |
| Fast Deadband | 1000 | | | | |
| Slow Deadband | 500 | | | | |

| CONFIGURATION ITEM | B6 | | | | | INSTALL VALUE |
|---------------------------|-----------|--|--|--|--|----------------------|
| 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 Duration | 20 | | | | | |
| STOW / DEPLOY | | | | | | |
| AZ STOW | 0.0 | | | | | |
| EL STOW | 95.0 | | | | | |
| PL STOW | 0.0 | | | | | |
| AZ DEPLOY | 0.0 | | | | | |
| EL DEPLOY | 60.0 | | | | | |
| PL DEPLOY | 0.0 | | | | | |
| PL ENABLED | 2 | | | | | |
| EL_TIME | 0 | | | | | |
| SHAKE | | | | | | |
| AZ1 | -5.0 | | | | | |
| EL1 | 0.0 | | | | | |
| PL1 | 0.0 | | | | | |
| AZ2 | 5.0 | | | | | |
| EL2 | 0.0 | | | | | |
| PL2 | 0.0 | | | | | |
| AZ3 | 0.0 | | | | | |
| EL3 | 0.0 | | | | | |
| PL3 | 0.0 | | | | | |
| CYCLES | 5 | | | | | |
| DELAY | 1 | | | | | |

5.0 Schematics

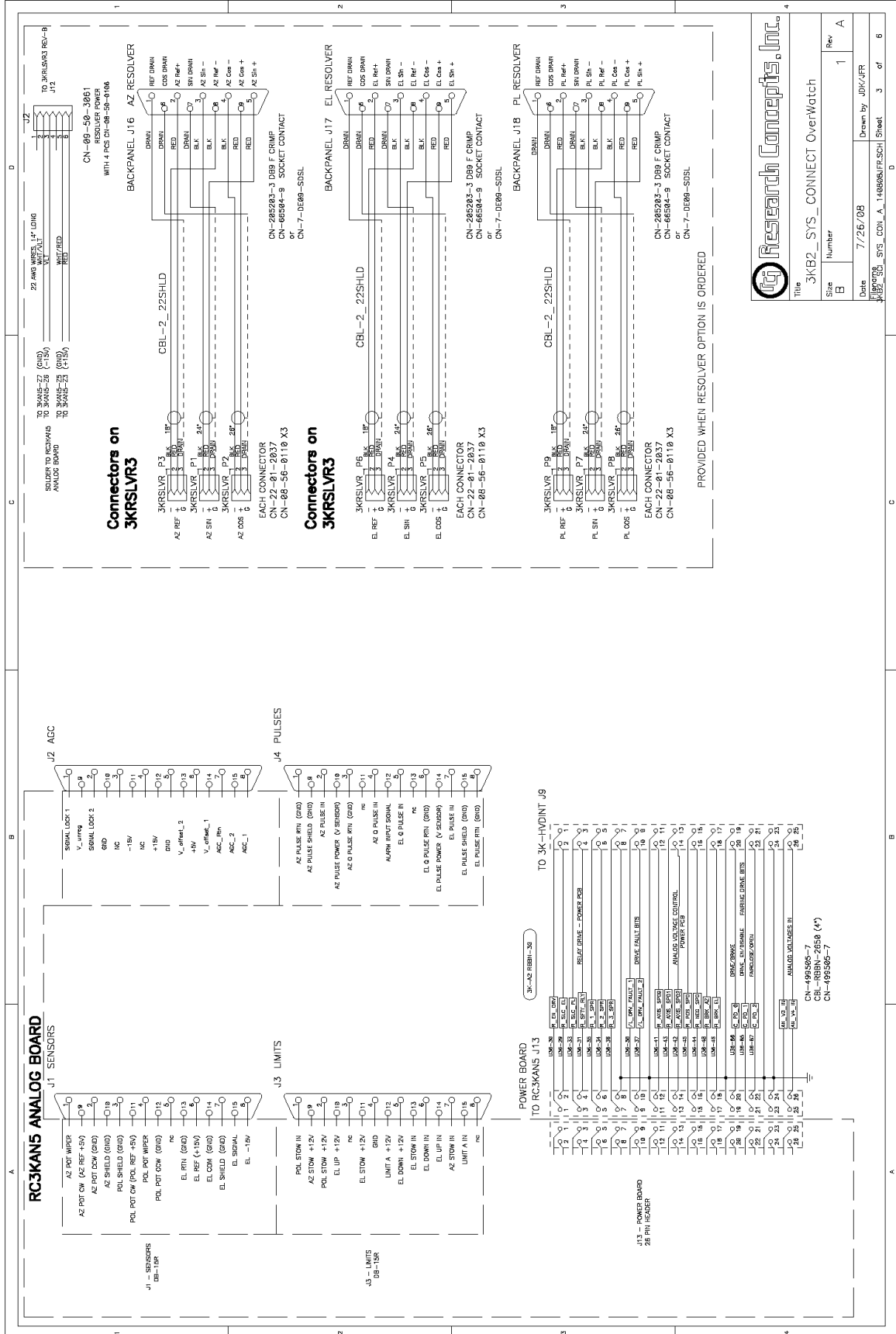
The following schematics detail items not covered by the baseline manual.



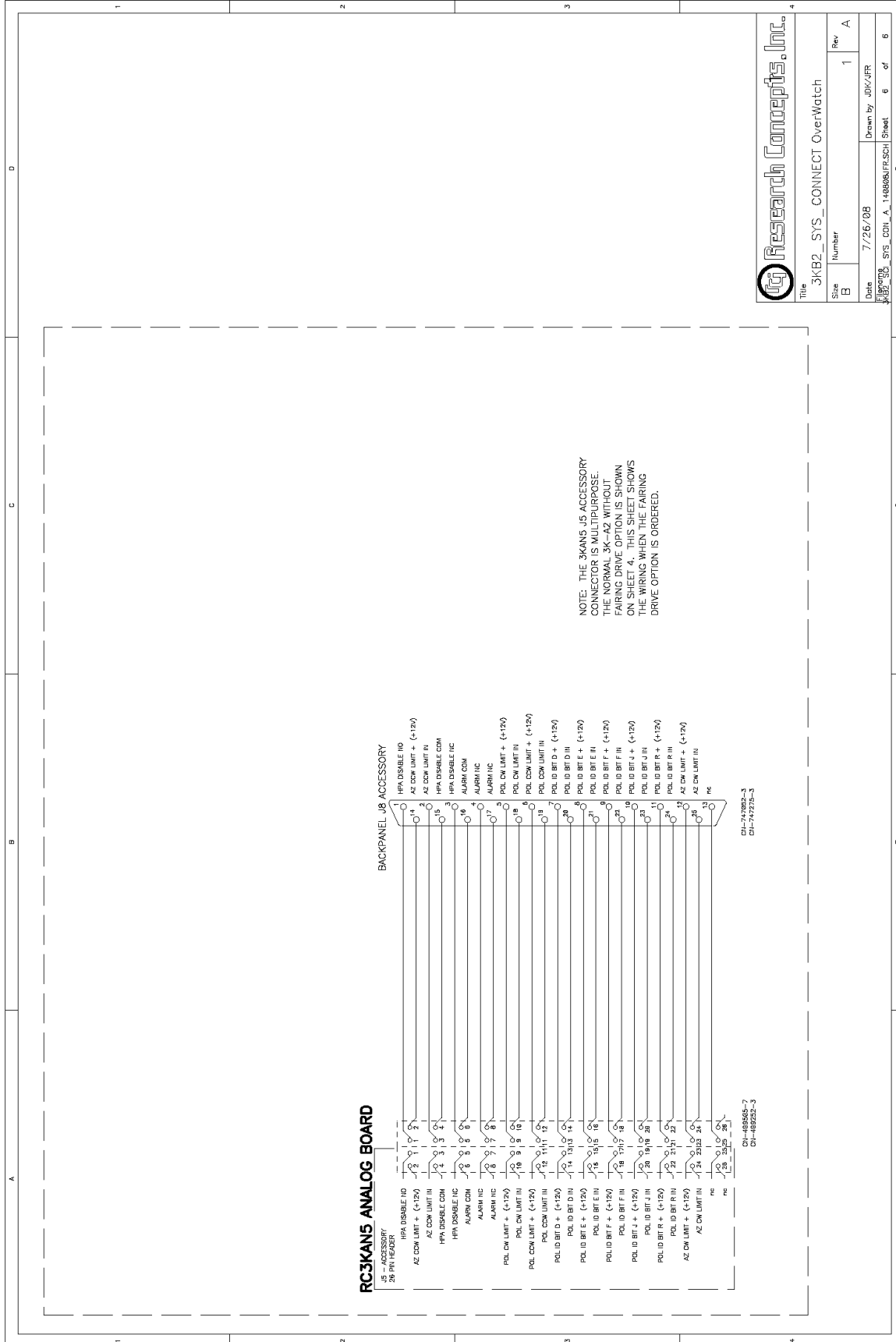
3KB2_SYS_CONNECT OverWatch

| | |
|----------|----------------------------|
| Title | 3KB2_SYS_CONNECT OverWatch |
| Size | B |
| Number | 1 |
| Rev | A |
| Date | 7/26/08 |
| Drawn by | JDB/JFR |
| Sheet | 1 of 6 |

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Title: 3KB2_SYS_CONNECT OverWatch
Size: B
Number: 1
Rev: A
Date: 7/26/08
Drawn by: JDB/zfr
3KB2_SYS_CONN_A_148696NFELSCH Sheet: 3 of 6



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| | | |
|----------|----------------------------|---------|
| Title | 3KB2_SYS_CONNECT OverWatch | |
| Size | Number | Rev |
| B | | 1 |
| Date | | 7/26/08 |
| Drawn by | | JDK/JFR |
| Sheet | | 6 of 6 |