

## APPENDIX B - MOUNT SPECIFIC DATA

### For AVL Technologies FlyAway Mounts with resolvers

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This appendix describes RC3000 operations unique for AVL FlyAway mounts equipped with resolvers. Differences between this version and the operation described in the "baseline" RC3000 manual are noted on a paragraph by paragraph basis.

#### 1.1 Manual Organization

This appendix is provided as a supplement to the baseline RC3000 manual.

#### 1.2 Mount Model

DESIGNATION	MODEL
GA	2.0 m. 2020 (with resolvers)
GB	1.2 m. 1020 (with resolvers)

#### 1.3.2 System Interface Requirements

The GA/GB mounts follow the standard RC3000 interface requirements with the addition of 3 inputs to identify which feed (polarization) system is currently installed.

#### 2.1.4 Inclinometer Orientation

The inclinometer should be rigged with the face of the reflector horizontal.

#### 2.2.7 Accessories

Feed type identification bits are interfaced through the J8 Accessories connector per the following schedule:

J8 pin7 - Feed Type Common

J8 pin 22 - Feed Type Bit 2

J8 pin 21 - Feed Type Bit 1

J8 pin 20 - Feed Type Bit 0

#### 2.3.2 Elevation Reference Position

MODEL	VOLTAGE	RF ANGLE
GA & GB	3.60	72.6 (face horizontal)

### 3.0 Detailed Operation

#### 3.2.1 Manual Mode

Instead of "POL:", linear feeds will show "P-" plus the band designation (P- C, P- X, P-Ku, P-Ka). Circular types will have a blank field as before.

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

NOTE: in situations where the default polarization positions will be used as predefined targets (H or V key pressed - no stored or located satellites), the controller will attempt to position polarization to either the 0 or 90 degree position.

### 3.3.1.2.4 Polarization Calibration

The multi-feed ("quad band") scheme allows for separate calibration of four linear and four circular feeds. Feed Type is sensed via bits 2, 1 & 0 as shown in the following table:

FEED #	Bit 2	Bit 1	Bit 0	Sensed Feed Type
1	0	0	0	C-Band Linear
2	0	0	1	X-Band Linear
3	0	1	0	Ku-Band Linear
4	0	1	1	Ka-Band Linear
5	1	0	0	C-Band Circular
6	1	0	1	X-Band Circular
7	1	1	0	Ku-Band Circular
8	1	1	1	Ka-Band Circular

Feeds 1 - 4 may be linear feeds. Each of these feeds will have a separate calibration screen to define the many parameters associated with a moveable feed.

Feeds 5 - 8 are defined as circular (non-moving) feeds. There is only one configuration screen that allows the band and LNB LO frequency for each circular feed to be defined.

### LINEAR FEED CALIBRATION SCREENS

Feeds 1-4 have individual screens to define parameters associated with a moveable feed. In order to fit all these parameters on one screen, each item's identification field is only one letter. Follow the line 4 prompt for each field.

```
B:0 Z:2.50 L: 5150 E:0 T:2 V:* FEED1
O:0 S:36.00 C:- 90 S: 0 P:*****
A:1 F: 0.0 W: 90 D: 20 R:*****
BAND <0-C 1-Ku 2-CK 3-L 4-X 5-Ka 6-S>
```

#### **B: BAND <0-C 1-Ku 2-CK 3-L 4-X 5-Ka 6-S>**

Define the RF band of the feed. This value will be used by automatic scans, etc. to determine how far to step the antenna for a certain amount of theoretical signal change (example- a 3 db step when operating at C-band will be larger than when operating at Ku-band).

#### **Z: REFERENCE VOLTAGE <1.00 - 4.00>**

The pol\_zero\_voltage defines the voltage present when the polarization axis is in its center of motion. See the zero voltage installation section 2.3.4.

NOTE: for resolver-based feed systems, this potentiometer related value is not applicable. Typically the default value in this situation will be set so as to show "\*\*\*\*\*" in this field.

**L: LO FREQUENCY <1000 - 30000>MHz**

This item defines the Local Oscillator frequency of the feed's LNB. This frequency will be used when automatically tuning optional integrated receivers such as a DVB or beacon receiver.

NOTE: the value associated with the currently sensed feed type will be reflected in the DVB ID configuration screen.

**E: STW/DPLY<0-NONE 1-STOW 2-DEPLOY 3-BOTH>**

This item defines if automatic movements of the feed are to be performed during STOW and DEPLOY operations.

NOTE: the value associated with the currently sensed feed type will be reflected in the STOW/DEPLOY configuration screen.

**S: STOW POSITION <-180 / 180>****D: DEPLOY POSITION <-180 / 180>**

This field defines the desired STOW and DEPLOY positions of the feed.

NOTE: the value associated with the currently sensed feed type will be reflected in the STOW/DEPLOY configuration screen.

**F: OFFSET <-90.0/90.0> DEGREES**

The pol\_offset item corrects for discrepancies between the polarization axis' electrical and mechanical alignment.

**T: TYPE <1>CIRCULAR <2>SINGLE <3>DUAL**

The polarization\_type configuration item specifies the configuration of the feed drive. This item will be used by the controller to determine the appropriate automatic movement of the polarization axis.

Circular type specifies that no movement will be needed to align the polarization axis.

Single type specifies that the installation has a feed in just one orientation and therefore separate movements must be made to achieve horizontal and vertical polarization positions.

Dual type specifies that separate feeds exist 90 degrees apart. For this configuration just one movement to achieve both horizontal and vertical positions is required. If this is not the case the system should be described as a single feed type so that separate movements will be made.

NOTE: Feed Types 1-4 are capable of specifying linear (moving) feeds but one of these feeds may be set to circular (non-moving) type as well by this item. In this case, all other items in this screen except LO frequency will not be applicable.

**S: SCALE FACTOR <1.00 -180.00 deg/volt>**

This value specifies the scale factor applicable to the potentiometer-based polarization feedback. NOTE: The default value for this item will typically be correct.

NOTE: for resolver-based feed systems, this potentiometer related value is not applicable. Typically the default value in this situation will be set so as to show "\*\*\*\*\*" in this field.

**C: CCW LIMIT <-180 / 180>****W: CW LIMIT <-180 / 180>**

The cw\_pol\_limit and ccw\_pol\_limit configuration items specify the range of polarization axis movement.

NOTE: as opposed to software versions < 1.56, these limits now must be entered with the correct polarity sign.

The values are used to check validity of stored satellite data and for calculating horizontal and vertical polarization positions. Actual polarization limits are typically set by potentiometers as described in the installation section.

**A: FEED LOCATE <0-NO 1-EX 2-DVB 3-BCN 4-RF>**

This item lets the user specify which signal source should be used for automatic LOCATEs with this feed. 0-NO indicates no automatic scan will be performed when using this feed. 1-EX indicates an external signal strength source will be used. 1-DVB indicates the internal DVB receiver (if present) will be used. 2-BCN indicates the integrated Beacon Receiver (if present) will be used. 4-RF indicates the L-Band power detector will be used as the signal source.

**O: REFERENCE ORIENTATION<0>HORIZONTAL <1>VERTICAL**

The orientation achieved by placing the polarization axis in the reference position.

NOTE: this orientation must be specified for the receive channel not the transmit channel. Automatic functions of the controller attempt to orient the receive feed in the correct position.

**V: RESOLVER ROTATION <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.

NOTE: for potentiometer based feed systems, this resolver related value is not applicable. Typically the default value in this situation will be set so as to show "\*" in this field.

**P: SCALE FACTOR <1-32767 COUNTS/RADIAN>**

This item defines the number of counts per radian.

NOTE: for potentiometer based feed systems, this resolver related value is not applicable. Typically the default value in this situation will be set so as to show "\*\*\*\*\*" in this field.

**R: RESOLVER OFFSET<+/- 300.00 DEGREES>**

The azimuth\_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 azimuth\_resolver\_offset of -181.3 will result in a resolver based azimuth angle of 0.0.

NOTE: for potentiometer based feed systems, this resolver related value is not applicable. Typically the default value in this situation will be set so as to show "\*\*\*\*\*" in this field.

## CIRCULAR FEED CALIBRATION

By definition, feed types 5-8 are considered circular (non-moving) feeds. A single screen allows the band, LO frequency and automatic locate source of each feed to be specified.

```
FEEDS 5-8
5B:0 5L: 5150 5A:1 6B:1 6L: 8000 6A:2
7B:2 7L:10750 7A:3 8B:3 8L:19200 8A:4
FEED5 <0-C 1-Ku 2-CK 3-L 4-X 5-Ka 6-S>
```

### 5B: FEED5 <0-C 1-Ku 2-CK 3-L 4-X 5-Ka 6-S>

Define the RF band of the feed. This value will be used by automatic scans, etc. to determine how far to step the antenna for a certain amount of theoretical signal change (example- a 3 db step when operating at C-band will be larger than when operating at Ku-band).

### 5L: FEED5 LO FREQUENCY <1000 - 30000>MHz

This item defines the Local Oscillator frequency of the feed's LNB. This frequency will be used when automatically tuning optional integrated receivers such as a DVB or beacon receiver.

NOTE: the value associated with the currently sensed feed type will be reflected in the DVB ID configuration screen.

### 5A: FEED5 LOCATE <0-NO 1-EX 2-DVB 3-BCN 4-RF>

This item lets the user specify which signal source should be used for automatic LOCATEs with this feed. 0-NO indicates no automatic scan will be performed when using this feed. 1-EX indicates an external signal strength source will be used. 1-DVB indicates the internal DVB receiver (if present) will be used. 2-BCN indicates the integrated Beacon Receiver (if present) will be used. 4-RF indicates the L-Band power detector will be used as the signal source.

**3.3.2.5 Limits Maintenance**

```

AZIM CW:0  CCW:1  STOW:0          LIMITS
ELEV UP:1  DN:1  STOW:1          ACTIVE
POL CW:0  CCW:1  STOW:1      2:0 1:1 0:1
<BKSP>MAKE LIMITS INACTIVE  <MODE>EXIT
    
```

**2: 1: 0:**

The state of the feed type bits is also shown. The numbers correspond to corresponding pin in the connector. A 1 indicates that a switch closure is sensed at the pin. The following table shows how the feed input combinations are interpreted.

FEED #	Bit 2	Bit 1	Bit 0	Sensed Feed Type
1	0	0	0	C-Band Linear
2	0	0	1	X-Band Linear
3	0	1	0	Ku-Band Linear
4	0	1	1	Ka-Band Linear
5	1	0	0	C-Band Circular
6	1	0	1	X-Band Circular
7	1	1	0	Ku-Band Circular
8	1	1	1	Ka-Band Circular

**3.3.1.2 Reset Defaults**

The following table supplies the default configuration item values for these mount models. Only the values for GB that are different from GA are shown.

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	GA	GB						INSTALL VALUE
<b>SYSTEM DEFINITION</b>								
antenna_size_cm	200	120						
compass	2							
Mode	2							
Waveguide	0							
DISP	1							
<b>AZIMUTH CALIBRATION</b>								
Azim_offset	0.0							
ccw_azim_limit	180							
Cw_azim_limit	180							
Azim_Resolver_Offset	-180.0							
Resolver Direction	0							
<b>ELEVATION CALIBRATION</b>								
Zero Voltage	3.60							
Elev_offset	0.0							
Up_elev_limit	90							
Down_elev_limit	0							
Elevation_Scale_Factor	50.00							
Elevation_look_configuration	1							
Elevation_Resolver_Offset	-107.40							
<b>SIGNAL PARAMETERS</b>								
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							
<b>AUTOPEAK</b>								
Autopeak Enabled	0							
Signal Source	1							
RF Band	1							
Spiral Search AZ Limit	5							
Spiral Search EL Limit	5							
Spiral Signal Threshold	200							
Scan Range Limit	10							
Scan Signal Threshold	200							



<b>FEED 1</b>	<b>GA</b>	<b>GB</b>						
Band	0							
Reference Orientation	1							
Locate Automove_Enable	1							
Reference Voltage	2.50							
Scale_Factor	38.40							
Offset	0.0							
LO Frequency	5150							
CCW Limit	-90							
CW Limit	90							
Stow/Deploy Enable	0							
Stow Position	0							
Deploy Position	0							
Polarization_type	2							
Resolver Rotation	N/A							
Pulse Scale Factor	N/A							
Resolver Offset	N/A							
<b>FEED 2</b>								
Band	4							
Reference Orientation	1							
Locate Automove_Enable	1							
Reference Voltage	2.50							
Scale_Factor	38.40							
Offset	0.0							
LO Frequency	8000							
CCW Limit	-90							
CW Limit	90							
Stow/Deploy Enable	0							
Stow Position	0							
Deploy Position	0							
Polarization_type	2							
Resolver Rotation	N/A							
Pulse Scale Factor	N/A							
Resolver Offset	N/A							
<b>FEED 3</b>								
Band	1							
Reference Orientation	0							
Locate Automove_Enable	1							
Reference Voltage	2.50							
Scale_Factor	38.40							
Offset	0.0							
LO Frequency	10750							
CCW Limit	-90							
CW Limit	90							
Stow/Deploy Enable	0							
Stow Position	0							
Deploy Position	0							
Polarization_type	2							
Resolver Rotation	N/A							
Pulse Scale Factor	N/A							
Resolver Offset	N/A							

<b>FEED 4</b>	<b>GA</b>						
Band	0						
Reference Orientation	1						
Locate Automove_Enable	1						
Reference Voltage	2.50						
Scale_Factor	38.40						
Offset	0.0						
LO Frequency	19200						
CCW Limit	-90						
CW Limit	90						
Stow/Deploy Enable	0						
Stow Position	0						
Deploy Position	0						
Polarization_type	2						
Resolver Rotation	N/A						
Pulse Scale Factor	N/A						
Resolver Offset	N/A						
<b>FEEDS 5-8</b>							
5 Band	0						
5 LO	5150						
6 Band	4						
6 LO	8000						
7 Band	1						
7 LO	10750						
8 Band	3						
8 LO	19200						

CONFIGURATION ITEM	GA	GB						INSTALL VALUE
<b>AZIMUTH POT DRIVE</b>								
Fast/Slow Threshold	2.5							
Maximum Position Error	0.20							
Coast Threshold	0.1							
Maximum Retry Count	3							
<b>AZIMUTH PULSE DRIVE</b>								
Pulse Scale Factor	10431							
CW Pulse Limit	64000							
CCW Pulse Limit	100							
Fast/Slow Threshold	50							
Maximum Position Error	1							
Coast Threshold	5							
Maximum Retry Count	3							
<b>AZIM DRIVE MONITORING</b>								
Jam Slop	1							
Runaway Slop	200							
Fast Deadband	1000							
Slow Deadband	500							
<b>ELEV POT DRIVE</b>								
Fast/Slow Threshold	1.5							
Maximum Position Error	0.2							
Coast Threshold	0.1							
Maximum Retry Count	3							
<b>ELEV PULSE DRIVE</b>								
Pulse Scale Factor	10431							
UP Pulse Limit	64000							
Down Pulse Limit	100							
Fast/Slow Threshold	50							
Maximum Position Error	0							
Coast Threshold	3							
Maximum Retry Count	3							
<b>ELEV DRIVE MONITORING</b>								
Jam Slop	1							
Runaway Slop	500							
Fast Deadband	1000							
Slow Deadband	500							
<b>POL POT DRIVE</b>								
Fast/Slow Threshold	2.0							
Maximum Position Error	0.5							
Coast Threshold	0.3							
Maximum Retry Count	3							
<b>POL DRIVE MONITORING</b>								
Jam Slop	1							
Runaway Slop	200							
Fast Deadband	1000							
Slow Deadband	500							

