User Manual

*A*lfaSpid by Hy-Gain

For use with:

*A*lfaSpid Rotator RAS1 & Controller Rot2Prog by Hy-Gain
Azimuth and Elevation rotator and controller AZ/EL RAS1
OR
Elevation rotator and controller EL REAL1



This manual is for use with units sold by Hy-Gain as RAS1 and controller Rot2-Prog (RAS-1C). Units sold by others may have different firmware and may operate from different voltages.
Current version and newer versions of this manual may be found on the internet at:

http://www.hy-gain.com or http://www.alfaspid.com

Last updated on September 5, 2008

Copyright *A*lfa Radio Ltd. 2008-09-05 www.alfaradio.ca 780 466 5779 Alfaspid-AZ-EL-2008-09-05-MFJ-manual.doc

Table of contents

Introduction 3
Shipping Contents 3
Technical Data 3
Control Panel 4
Rear Panel 5
Installation 6
  Wiring connections 6
  Bench Testing of Control Box 7
Resetting the Controller 8
Controller Operation 9
  Function Mode 9
  Setup Mode (SETUP) 10
Mouse Controller 12

Please check with our web sites for information on firmware updates, corrections, or changes to this information.

Updates may be found on
http://www.hy-gain.com or http://www.alfaspid.com

Introduction

The *A*lfaSpid RAS (AZ/EL) rotator is an extra heavy-duty rotator designed to run large satellite antennas and comes complete with an electronic control unit. The rotator is designed to be mounted pipe to pipe or on an optional adaptor plate for conventional in tower mounting. It can also be mounted outside of the tower on the mast, or used in a side mount configuration.

Shipping Contents

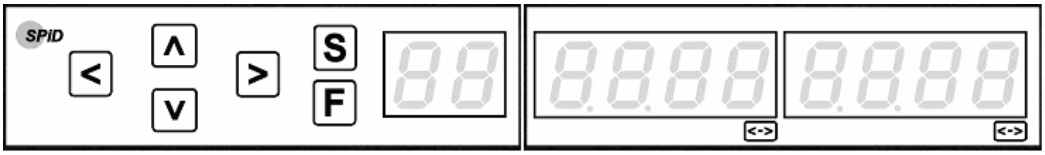
RAS Rotator 1
Rot2Prog controller 1
Spare Fuses 1
Custom Mouse 1

Technical Data

Rot2Prog and RAS

Input Voltage (Typical) ..... 12 – 24 Volts DC
Input Current (Nominal Draw) ..... 3 – 5 Amps
Motor ..... 13.8 – 24 Volts DC
Fuse ..... 8.0 AMP GMA
Rotation Speed (azimuth) ..... 120 sec (12 V) / 60 sec (24 V)
Rotation Speed (elevation) ..... 80 sec (12 V) / 40 sec (24 V)
Turning Torque (in lbs) ..... 1400 (12 V) / 1740 (24 V)
Braking Torque (in lbs) ..... > 14,000
Controller must have => 13.8 Volts DC or AC for correct operation

Control Panel



Buttons

< - Left (Decrease)
^ - Up (Increase)
v -Down (Decrease)
> - Right (Increase)
S - Setup (configuration)
F - Function

Indicators

<-> -Dot Overlap - Over travel

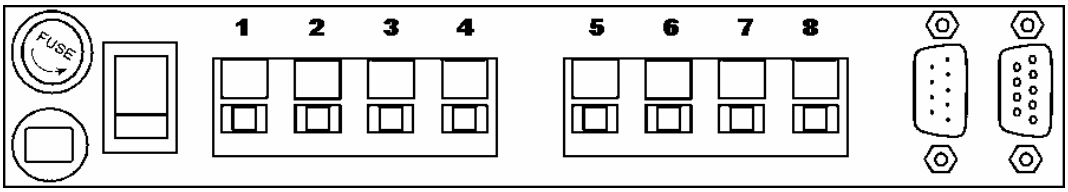
7 segment 4-digit display



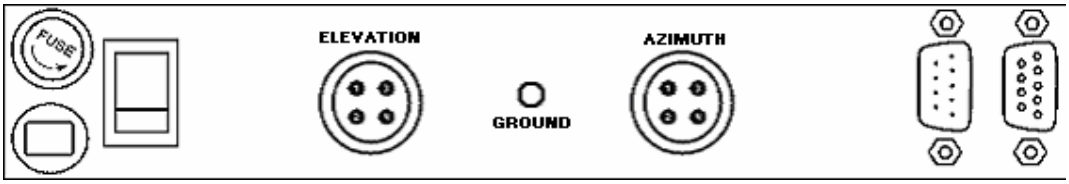
- Multifunction display

Elevation Azimuth

Rear Panel



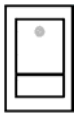
or

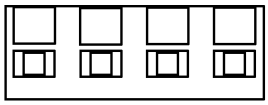


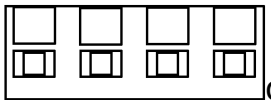


-Fuse Holder


- Power Cord


- Power Switch


or  - Terminal Strip for azimuth control (1,2,3,4)


or  - Terminal Strip for elevation control (5,6,7,8)


-DB-9 connector (male)


-DB-9 connector (female)

Installation

Wiring Connections

The rotator unit must be wired to the control unit with 8 wires cable. 4 wires – azimuth (1,2,3,4) and 4 wires - elevation (5,6,7,8). Diameter of wires in cable to connect the control unit to the rotator depends upon the distance between rotator and controller. The wire for the impulse sensing may be quite thin - #22 or similar, even for relatively long distances.

> ⚠ TIP:
> Before final installation of equipment, it is strongly suggested you check out all functions and connections on a workbench.

Length (distance)	Gauge Motor
10 m (32')	#18 (1.19 mm)
30 m (100')	#16 (1.42 mm)
60 m (200')	#14 (1.75 mm)

> ⚠ CAUTION:
> Do not accidentally switch the motor wires with the impulse wires.

Remove cover from the rotator and make connections as follows:

Azimuth:
1 Motor Drive to 1 on controller terminal
2 Motor Drive to 2 on controller terminal
3 Impulse Sense to 3 on controller terminal
4 Impulse Sense to 4 on controller terminal

Elevation:
5 Motor Drive to 5 on controller terminal
6 Motor Drive to 6 on controller terminal
7 Impulse Sense to 7 on controller terminal
8 Impulse Sense to 8 on controller terminal

Bench Testing of Control Box

The control box is normally expected to be operated from a 13.8 Volt DC supply, however it may be operated from other unregulated DC or AC sources as well. The output of supply source must be from 13.8 to 24 V, 6 Amps minimum.

The polarity of the power to the control box input leads is not critical, as a full wave bridge rectifier on the input will provide the proper polarity to the electronics.

TIP: *Because of several steering diodes in the motor path, the voltage delivered to the motor (neglecting wire loss)* ***will be about 1.4 volts less than the power supply voltage.*** *For longer runs and/or thin wiring a higher voltage (up to approx 24V) to the control unit is beneficial. A simple way to estimate if the voltage to the motor is adequate is by timing the rotation. Under no or a very small load, the 360 degree rotation time with 12V DC at the motor is about 120 seconds (2 minutes). With 24 V DC is about 60 seconds (1 minute). A DC Ammeter in the motor lead is also useful. It should indicate between 2 and 3 amps with a small load. On windy days or heavy load, the current may fluctuate up to 3 to 5 amps per motor.*

 It is highly recommended to ground the Control Box.

Notes – testing and troubleshooting

Azimuth:

Pressing [>] should make the rotator move clockwise.

Pressing [<] should make the rotator move counter-clockwise.

If rotation is reversed, switch lines 1 and 2 on the back of the controller.

Impulse sense lines (3 & 4) have no polarity concerns.

Elevation:

Pressing [∧] should make the rotator move up.

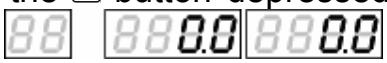
Pressing [∨] should make the rotator move down.

Resetting the Controller

If rotation is reversed, switch lines 5 and 6 on the back of the controller.
Impulse sense lines (7 & 8) have no polarity concerns.

Part of the overload protection circuitry involves removing motor power if the controller receives no sense indication. If the motor turns for a few seconds and then you hear the relay in the control box drop out, the motor has either stalled or there is a problem in the impulse sense wiring. **The controller has not detected motor movement.**

Turn the unit OFF.

While holding the F button depressed, turn control unit back on. This will now show  on the display.
This feature can be used if, for any reason, the direction of the antenna becomes incorrect. This may be caused by antenna to mast slippage or incorrect initial alignment. Re-alignment may be necessary.

IMPORTANT:
Azimuth
In order to set the limits for both the Azimuth and the Elevation sections of the rotator, first always start by setting up the azimuth section by pointing the rotator to 0 degrees or true north. Now reset the controller as previously outlined above. The controller is now set for azimuth.

The *A*lfaSpid rotator is now set at the counter-clockwise end of its normal rotation range. Normal rotation range is in a clockwise direction for 360 degrees.

From the reset position, you can rotate counter-clockwise an additional 180 degrees in over-travel, as well 360 degrees clockwise, plus an additional 180 degrees into clockwise over-travel.

Controller Operation

Counter-clockwise over-travel is indicated by a steady dot above the over-travel icon <->. <->. Rotation past 359 degrees into the clockwise over-travel is indicated by a blinking dot above the over-travel icon. <->

Elevation

Elevation, must be set to zero. To do this the controller and rotator must be positioned to zero degrees, both electronically and mechanically. Using the display down arrow (or the mouse) move the rotator to the full travel, which should be about (- 21.0). If the rotator stops and the display is not -21.0 then the mechanical stop in the rotator has been activated. After display on the controller reads -21.0 (or its lowest value) reset the unit by pressing the “F” button and turning on the power at the same time. Again, using the display down arrow (or the mouse) move the rotator to the full travel, which should be about (- 21.0), repeat this until there is no more travel.

Press the display up arrow until the 10.0 degree mark is met. Do a reset. Test for a full 180 degrees of travel. If it travel is 180 degrees or more then setup is correct. If it does not then repeat the process until it does. See section on “PP” for minor adjustments

Technical Note:

The *A*lfaSpid controller has multiple modes of operation. You will need to become familiar with these modes to be able to make full use of your rotator.

F Function Mode

The F button steps through the function menus. The leftmost character on the display indicates the function mode you are currently in.

88 880.0 880.0 - Normal Operations Mode

  - Half Auto Mode

  - CPU Mode

> ⚠ The 0 in the displays to the left will be replaced by your actual beam heading.

  Normal Operations Mode

In Normal Operations Mode, the [<], [∧], [∨], [>] buttons cause rotation as long as the buttons are pressed. Pressing [S] while in normal operations mode will take you to setup mode.

  - Half Auto Mode

In Half Auto Mode, the [<], [∧], [∨], [>] buttons can be used to pre-select the desired beam heading. The heading displayed on the controller will rapidly change in the direction of desired rotation. Once the desired beam heading is shown on the display, release the key. Approximately ½ of a second after no key presses have been detected, the display will revert back to the actual beam heading, and rotation towards the desired heading will take place. Pressing any key while in transit to the desired heading will cancel the action.

  - Auto (CPU) Mode

In Auto Mode, the controller will respond to commands from control software running on an attached computer. The [<], [∧], [∨], [>] buttons can still be used, but pressing of any of them will cause cancelling the data from software.

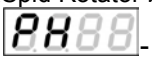
[S] Setup Mode

The [S] button steps through the setup menu, for modes other than manual control operate as **STOP**. The display cycles through each of the setup menu items.

  - Rotator Transmission

  - Program Simulation

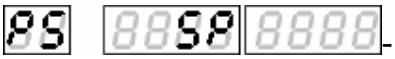
  - Heading Adjust


- Programmable High Limit Default flashing “DOT” 180

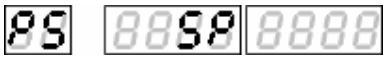

- Programmable Low Limit Default not flashing “DOT” 180


- Rotator Transmission

This value defines the resolution of controller operation.
1.0 means operating with 1 degree accuracy, 0.5 means 0.5 degree accuracy. On customized units this may be some other value.
0.25, 0.5, 1.0


- Program Simulation

Program Simulation allows the user to set the serial communication protocol used by the rotator. When set to emulate another brand of rotator, the *A*lfaSpid will respond to commands.
If your favourite software supports a rotator, chances are, the *A*lfaSpid will be able to interface to your software. There are 2 modes available:


- *A*lfaSpid

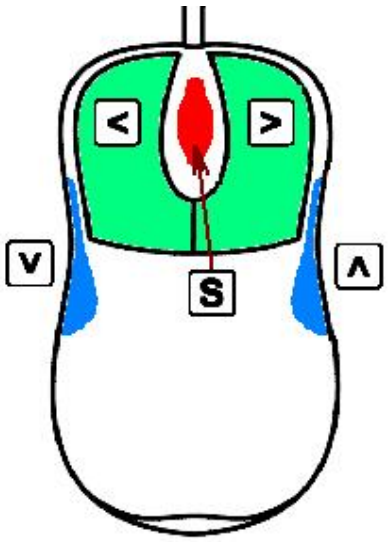

- Yaesu

(GS232 protocol, 600 baud N, 1, 8 bits)
(Data rate 600, 1 STOP bit, no even parity bit)
Operating mode change <, >.


- Heading Adjust

This setting can be used to make minor heading adjustments without causing the rotator to turn. If you notice that the heading displayed on the controller to a known signal source is out by a few degrees, you can change the heading displayed on the LED readout to match the known heading, rather than having to turn back to North and reset the controller. These settings are made by <, ∧, ∨, > buttons.

Mouse Controller



The optional mouse controller allows easy desktop access to the most commonly used front panel controls. These buttons are functionally equivalent to the corresponding front panel controls.

< - Left (Decrease)
^ -Up (Increase)
v -Down (Decrease)
> - Right (Increase)
S Setup Mode or **STOP**

⚠ The mouse controller is a highly modified computer mouse. You can not use a regular mouse with the *A*lfaSpid rotator nor vice-versa.

The mouse ball serves no function.

*A*lfa Radio Ltd. Trouble shooting tips

Before contacting Hy-Gain. Please make the following tests:.

NOTE: ON THE ELEVATION ROTATOR THERE ARE MECHANICAL SWITCHES WHICH OPEN THE POWER WHEN THE END LIMIT IS REACHED. A DIODE IS PLACED IN SERIES WITH THE MOTOR. TO TEST FOR THIS, REVERSE THE POWER TO THE MOTOR.

The following are some trouble shooting tips, if for some reason your AlfaSpid will not operate correctly.

It is important to confirm correct operation before installing on the tower. This will rule out any damage that may have been caused by the shipping company.

Check the Limits - PH and PL settings and rule out overlap.

Simple resistance tests can reveal incorrect or shorted wiring.

Pins 1 and 2 are the motor winding and will have a low resistance. Typical 2-3 ohms.

Pins 3 and 4 are the sense lines and typically will have either an open circuit or have about 1200 ohms depending on the status of the reed switch in the rotator and the length and gauge of used wire.

There should be no conductivity between 1 and 3 or 1 and 4, or between 2 and 3 or 2 and 4.

All lines should have **no** conductivity to ground.

Be careful not to over wind your coax with the next test, as there will be no protection from over turning.

Find a small 12 volts supply which will deliver 3 to 4 amps. (a small 12 Volt battery will work just fine)
To confirm that the motor runs you may connect 12 volts D.C. to the lines that go to the motor, pins 1 and 2, it should turn. Reversing the 12 Volts D.C. should cause the motor to turn in the reverse direction.

NOTE: ON THE ELEVATION ROTATOR THERE ARE MECHANICAL SWITCHES WHICH REMOVES THE POWER TO THE MOTOR WHEN THE END LIMIT IS REACHED. A DIODE IS PLACED IN SERIES WITH THE MOTOR. TO TEST FOR THIS REVERSE THE POWER TO THE MOTOR, THE UNIT SHOULD TURN.

To confirm that the sense circuit in the rotator is working, connect an ohm meter to the senses lines pins 3 and 4, apply 12 volts to the motor lines pins 1 and 2; you should see the ohm meter reading alternate between open circuit and about 1200 ohms.

Pin on Rotator not controller	Typical Reading	Your reading	
Pins 1 to 2	About 2 to 4 Ohms	_____	Depends on the length of wire to rotator
Pins 3 to 4	Open or 1200 Ohms	_____	Depends on the status of the read switch
Pins 1 to 3	Open	_____	
Pins 2 to 3	Open	_____	
Pins 2 to 4	Open	_____	
		_____	
Pin 1 to Ground	Open	_____	
Pin 2 to Ground	Open	_____	
Pin 3 to Ground	Open	_____	
Pin 4 to Ground	Open	_____	
		_____	
Voltage on controller			
Pins 1 to 2	About 12 volts with motor running		Depends on the supply voltage (14 volt applied)
Pins 3 to 4	About 8.5 volts or 2.5 volts		Depends on the status of the read switch and the Supply voltage

LIMITED WARRANTY

hy-gain® LIMITED WARRANTY

hy-gain Warrants to the original owner of this product, if manufactured by ***hy-gain*** and purchased from an authorized dealer or directly from ***hy-gain*** to be free from defects in material and workmanship for a period of **12** months for rotator products and **24** months for antenna products from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, cancelled check, credit card or money order receipt, etc.) describing the product to establish the validity of the warranty claim and submit the original or machine reproduction of such proof-of-purchase to ***hy-gain*** at the time of warranty service. ***hy-gain*** shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery shall be cause to void any and all warranty terms immediately.

2. ***hy-gain*** agrees to repair or replace at ***hy-gain's*** option without charge to the original owner any defective product under warranty, provided the product is returned postage prepaid to ***hy-gain.***

3. Under no circumstances is ***hy-gain*** liable for consequential damages to person or property by the use of any ***hy-gain*** products.

4. Out-of-warranty Service: ***hy-gain*** will repair any out-of-warranty product provided the unit is shipped prepaid. All repaired units will be shipped COD to the owner. Repair charges will be added to the COD fee unless other arrangements are made.

5. This warranty is given in lieu of any other warranty expressed or implied.

6. ***hy-gain*** reserves the right to make changes or improvements in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.

7. All ***hy-gain*** products to be serviced in-warranty or out-of-warranty should be addressed to ***hy-gain*****, 308 Industrial Park Road, Starkville, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.

8. This warranty gives you specific rights, and you may also have other rights which vary from state to state.

Contact Hy-Gain for authorization before shipping.

By Telephone:

General Information: (800) 973-6572 (662) 323-9538

Technical Support: (662) 323-9538

Fax Number: (662) 323-5803

By Mail:

Mailing Address: Hy-Gain

308 Industrial Park Road, Starkville, MS 39759, U.S.A.

By E-Mail:

Website Questions: website@hy-gain.com

Manual Requests: manuals@hy-gain.com

Catalog Requests: catalogs@hy-gain.com

Customer Service: hygain@mfjenterprises.com

Technical Support: hygain@mfjenterprises.com

PayPal Payments: hygainpaypal@mfjenterprises.com

NOTE: There is a **two to five day response time** for all technical support emails. If this is not fast enough for you, please call us on our technical support lines listed above.