Alfa Radio Ltd.
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Alfa ROT2Prog Controller

Revised 15 SEP 2022
http://www.alfaradio.ca

This manual is for use with units sold by Alfa Radio Ltd. of Edmonton, Alberta, Canada on or after March 1, 2022. Units sold by others may have different firmware and may operate using different voltages.

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1 Introduction

The ROT2Prog is an electronic controller used for turning rotators. The Controller may be connected to one Azimuth and Elevation rotator and operates with direct current motors.

The ROT2Prog is designed to work with either an Alfa RAS or BIGRAS or a combination of one azimuth rotator RAU, RAK and a RAEL rotator.

1.1 Features of the Rot2Prog Controller

Manual and/or computer control modes.

Digital readout with 0.5 degree resolution.

Large, easy to read, soft green LED display.

Supply voltage of 13.8 to 18 VDC @ 3 to 8 Amps/motor

Azimuth can be zeroed at any position to allow for installation inaccuracy or antenna mount slippage.

Generous Azimuth over travel (+/- 180) with electronic limits. Total of 720 degree travel

Small front panel simplifies stacking several units – takes less valuable space.

1 x USB host port for Computer control

1 port to interface with a custom built mouse (not a computer Mouse) to control the motors.

Interfaces with most commonly used satellite tracking programs

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1.3 Photos and description

1.3.1 Front Rot2Prog

1. Keyboard.

<	- Left (Decrease)
∧	- Up (Increase)
∨	-Down (Decrease)
>	- Right (Increase)

2. Setup and Function Keys
3. 2 digit function display
4. 4 digit Azimuth display
5. 4 digit Elevation dosplay

1.3.3 Back ROT2Prog USB
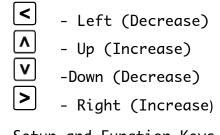
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1.3.4 Back ROT2Prog Serial
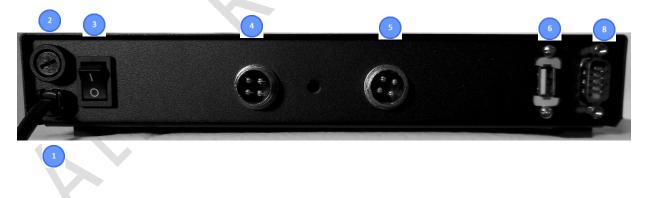

Note: This version of the ROT1Prog is no longer made. This information is provided for customers who already have one of these units.

1.   Power Cord — to connect to supply voltage of 13.8 to 18 VDC

           - The polarity of the Blue and Brown wires does not matter.

2.   Fuse Holder 8 Amps.

3.   Power Switch.

4.   4 pin Elevation Motor Connector.

       Pin 1 - Motor Drive
       Pin 2 - Motor Drive
       Pin 3 - Impulse Sense
       Pin 4 - Impulse Sense

5.   4 pin Azimuth Motor Connector.

       Pin 1 - Motor Drive
       Pin 2 - Motor Drive
       Pin 3 - Impulse Sense
       Pin 4 - Impulse Sense

6.   USB Computer control connector.

7.   RS-232 Computer control connector

8.   Connector for custom built RAS Mouse. See Section 2.2
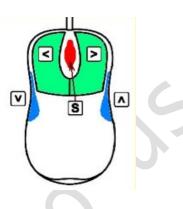
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2 INSTALLATION ROT2Prog

2.1 Wiring for BIG-RAS or RAS

Refer to Applicable Alfa Radio Rotator Manual

2.2 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)

| ∨ | - Down (Decrease)

| > | - Right (Increase)

| S | Setup Mode or STOP

⚠ The mouse controller is a highly modified computer mouse. You cannot use a regular mouse with the Alfa rotator nor vice-versa.

The mouse ball serves no function.

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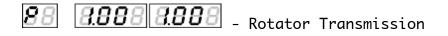# 3 SETUP ROT2Prog controller

3.1 ROT2Prog Controller configuration.

[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.

[8 8] [1.00 8][1.00 8] - Rotator Transmission

[8 5] [8 8 5 8][8 8 8 8] - Program Simulation

[8 8] [8 8 8.8][8 8 0.0] - Heading Adjust

[P H 8 8]- Programmable High Limit, Default "DOT" flashing 180

[P L 8 8]- Programmable Low Limit, Default "DOT" not flashing 180

[8 8] [1.00 8][1.00 8]- 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 other value such as 0.25, 0.5, 1.0

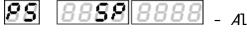[8 5] [8 8 5 8][8 8 8 8]- Program Simulation

Program Simulation allows the user to set the serial communication protocol used by the rotator. When set to emulate another brand of rotator, the Alfa

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controller will respond to commands. We can not guarantee non Alfa protocols will work.

If your favourite software supports a rotator, chances are, the *A*lfa controller will be able to interface to your software. There are 2 modes available:

`PS`   `88SP` `8888` - *A*lfa - Spid

`PS`   `8898` `8888` - Yaesu

> *A*lfa Radio does not support the use of Yaesu protocol when used with the ROT2Prog Controller

(RS232 protocol, 600 baud N, 1, 8 bits)

(Data rate 600, 1 STOP bit, no parity bit)

Operating mode change `<`, `>`.

`88`   `880.0` `880.0`- 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 `<`, `^`, `v`, `>` buttons.

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3.2 Computer Communication

ROT2Prog controllers sold prior to January 2015 were equipped with a DB9 Female connector. This connector can be connected to a PC or a USB to RS232 adapter, using a standard straight through serial cable.

ROT2Prog controllers sold after January 2015 are equipped with a USB connector. This connector can be connected to a PC using an A to A USB cable.

Most operating systems (Windows 7 and up, OS X and Linux) have drivers already installed or drivers that will install automatically when the USB cable is plugged in. The Controller is equipped with a FTDI FT232RL USB to Serial chip. If the operating system used does not have a driver installed or automatically loaded, it will be the user's responsibility to load the appropriate driver and get it to work.

Install Guidelines are available from FTDI at http://www.ftdichip.com/Support/Documents/InstallGuides.htm. Drivers can be obtained at http://www.ftdichip.com/Drivers/VCP.htm

To determine the communications port on the PC:

Windows: Open the Device Manager and expand the "Ports(COM & LPT)" to find out the comm port assigned to the Controller.

Linux: Open the terminal program.

Type "ls /dev/ttyUSB*". A list of ports will appear. The Controller port will appear like this, "/dev/ttyUSBX" where X is digit starting at 0

Mac OSX: Open the terminal in the utilities directory.

Type "ls /dev/tty.*". A list of ports will appear. The Controller port will appear like this, "/dev/tty.usbserial-XXXXXXXX" where XXXXXXXX is an 8 Alphanumeric serial number of the FTDI chip.

Comm Port settings are 600-8-n-1.

3.3 Rotator Testing

Refer to Alfa Radio Rotator Manual

3.4 Resetting the Controller

Turn the unit OFF.

While holding the ⌗F⌗ button depressed, turn control unit back on. This will now show ⎹88⎸ ⎹88⎸⎹0.0⎸⎹88⎸⎹0.0⎸ 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.

Note: Resetting the controller using this process does not reset the Limits or the preset settings.

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 Alfa 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.

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 travel is ~180 degrees or more then setup is correct. If it is not then repeat the process until it is. See section on "PP" for minor adjustments

3.5 Rotator Troubleshooting

Refer to Applicable Alfa Radio Rotator Manual

3.6 Alfa Radio Rotator 208 Condition.

On occasion, the Alfa Radio ROT2Prog controller will send a rotator to an azimuth of 208 degrees without any apparent command from the User or Computer.

The Controller is powered by an 8 bit Microcotroller running at 16 Mhz. Sending commands to the Controller, via the front panel and/or Computer, in quick succession, can cause the Microcontroller to become overloaded, resulting in the 208 condition.

To reduce this problem, ensure that commands to the controller are sufficiently spaced out.
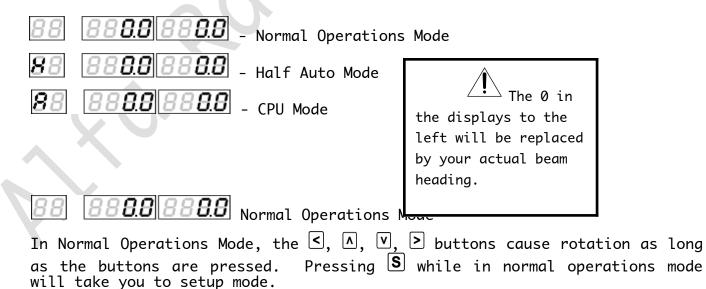
4 Operation

[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] [888.8][888.8] - Normal Operations Mode

[88] [888.8][888.8] - Half Auto Mode

[88] [888.8][888.8] - CPU Mode

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

[88] [888.8][888.8] Normal Operations Mode

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

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`88` `888 0.0` `888 0.0` – 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.

`88` `888 0.0` `888 0.0` – 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 any of them will cause the data from software to be cancelled.

NOTE:

Part of the overload protection circuitry involves cutting power to the motor, if the controller does not receive a sense indication. If the motor turns for a few seconds and then stops, the motor has either stalled or there is a problem in the reed switch sense wiring.

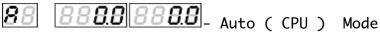# Alfa Radio Ltd.
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12 MONTH LIMITED WARRANTY
Alfa Rotators and controllers

Alfa Radio Ltd. warrants to original purchaser of the product, that the product will be free from defects in material and workmanship for the following periods after such date of purchase: Material - 12 months Workmanship - 12 months.

Alfa Radio Ltd. will, at its discretion, repair or replace free of charge such defective products subject to the following conditions:

1. Delivery of the product **prepaid** to **Alfa Radio Ltd.** or its authorized dealer.
2. Determination by **Alfa Radio Ltd.** that a defect exists and is covered by the limited warranty.
3. Defects due to alteration, repair by an unauthorized person, misuse, accidental damage, lightning strikes, use of the equipment for purposes other than those for which it was designed, and the like, are NOT COVERED by this limited warranty. Repairs in these cases will be subject to normal service charges.
4. Damage to a Alfa rotator or controller caused by using said rotator or controller with a rotator or controller manufactured by any other manufacturer will NOT BE COVERED by this limited warranty.
5. Repairs and replacement parts are covered under this limited warranty only for the remaining term of the original limited warranty.
6. Under no circumstances is **Alfa Radio Ltd.** liable for consequential damages to person(s) or property by the use of this product.
7. **Alfa Radio Ltd.** reserves the right to make changes or improvements in design or manufacture without incurring any obligations to install such changes in any of the products previously manufactured.
8. All claims of defect or shortage should be sent prepaid to:

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and must be accompanied by a letter describing the problem in detail along with a copy of your proof-of-purchase.

Contact **Alfa Radio Ltd.** before sending.