

APPENDIX - TFLA GUI Graphical User Interface for ComTech Transportable Fast Link Antenna

1.0 INTRODUCTION

This appendix describes the functionality provided by the graphical user interface (GUI) for the ComTech Transportable Fast Link Antenna (TFLA) RC4000 Antenna Control Unit (ACU).

1.1 Theory of Operation

The TFLA GUI allows control of the RC4000 ACU via a web browser. An integrated HTTP server internally communicates with the RC4000 boardset. The server allows monitoring and control of the ACU operation using a graphical web-based user interface.

1.2 Appendix Organization

Section 1 of this appendix supplies an overview of the GUI operation. Section 2 describes the interface and configuration required to implement the GUI. Section 3 provides the detailed operation of the GUI.

2.0 INTERFACE

2.1 Physical Interface

The user's PC or other web-enabled device connects to the TFLA ACU via the J5 Ethernet (RJ-45) Receptacle. Refer to section 2.3 of the TFLA Enclosure Specific Appendix for additional definition of this connector.

2.2 Network Settings

In order to communicate properly, a web-enabled device and the ACU must be properly configured to exist in the same subnet. What IP addresses exist within a given subnet and how to configure a particular ACU is an installation specific detail determined by the network's administrator.

The RC4000 ACU is factory configured to a default IP address of 192.168.1.1 and a subnet mask of 255.255.0.0. Restoring this default configuration is accomplished by jumpering pins J & K of the J7 connector for 15 seconds. Again refer to section 2.3 of the Enclosure Specific Appendix for further details. Modifying of the ACU's IP addressing is described in the TCP/IP Settings (section 3.1.1.1) of this appendix.

3.0 DETAILED OPERATION

Description of the TFLA GUI's operation is divided into three sections.

Section 3.1 (Configuration Pages) describes the web pages available for doing maintenance tasks such as changing the ACU's IP address and updating firmware.

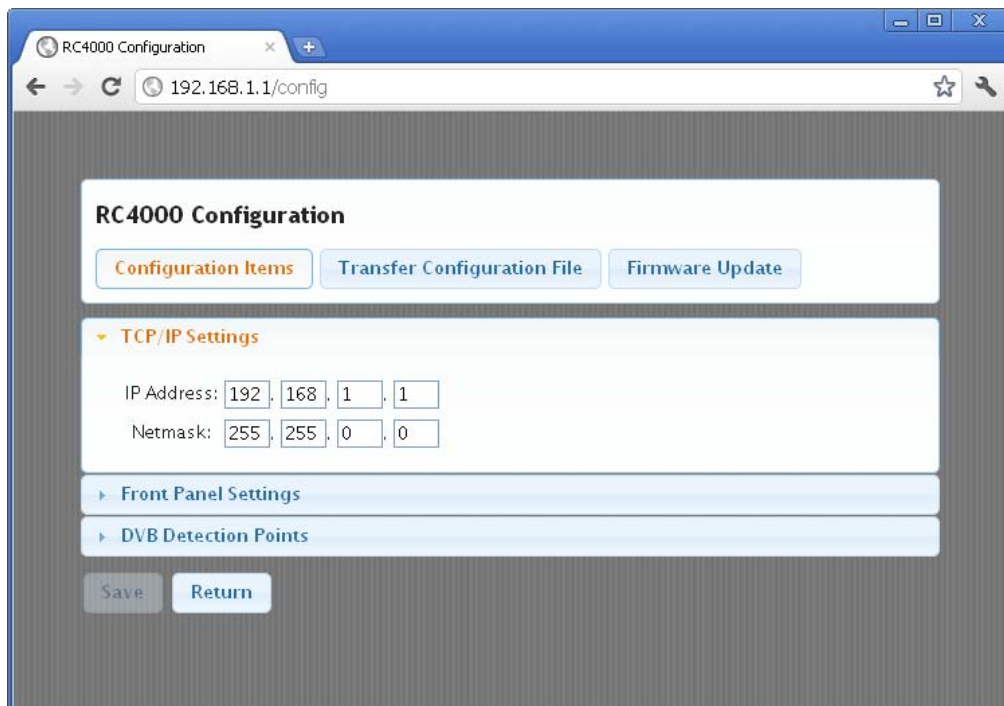
Section 3.2 (Remote Front Panel Pages) describes a web page interface that provides control by mimicking a "virtual" front panel of the ACU.

Section 3.3 (Graphical User Interface Pages) describes a more graphical interface available for routine operation of the ACU.

3.1 Configuration Pages

The configuration interface can be reached by adding “/config” to the end of the IP address of the ACU. For example, with the default IP address the configuration interface can be loaded by entering “192.168.1.1/config” into the address bar of a browser.

This section describes the various screens available through the web-based configuration interface. The main configuration interface panel has several navigation buttons. Clicking on these buttons will switch between the available pages. Any changes made to the current page must be saved by clicking the Save button before switching to a different page. The Save button will become enabled anytime a change has been detected. Each page has several expandable panels. These panels can be expanded and collapsed to show or hide various items. There is no need to save when switching between panels.

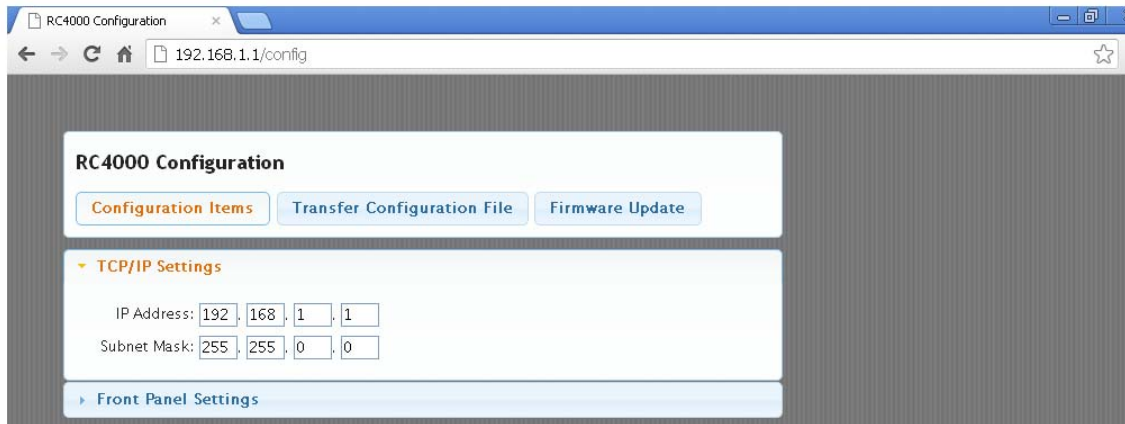


3.1.1 Configuration Items

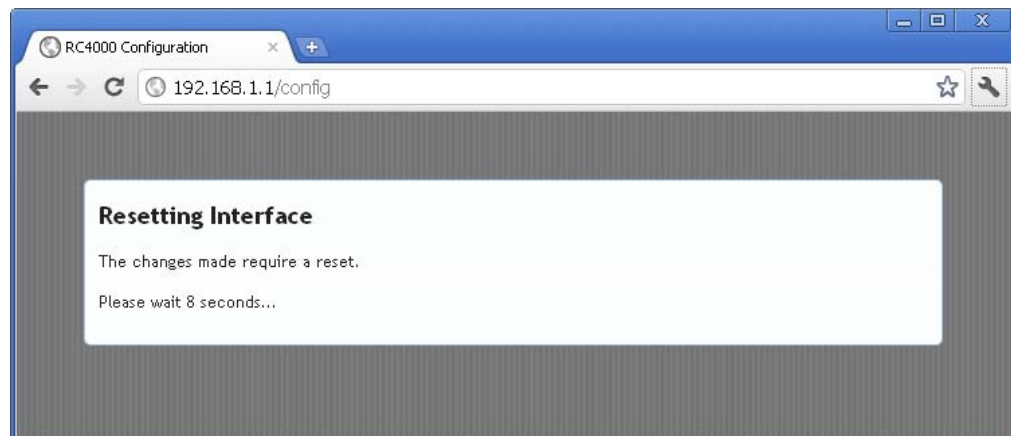
The Configuration Items set of panels provides screens for setting the IP address and changing the performance of the remote front panel screens.

3.1.1.1 TCP/IP Settings

The default IP address and subnet mask settings are shown in the following screen.

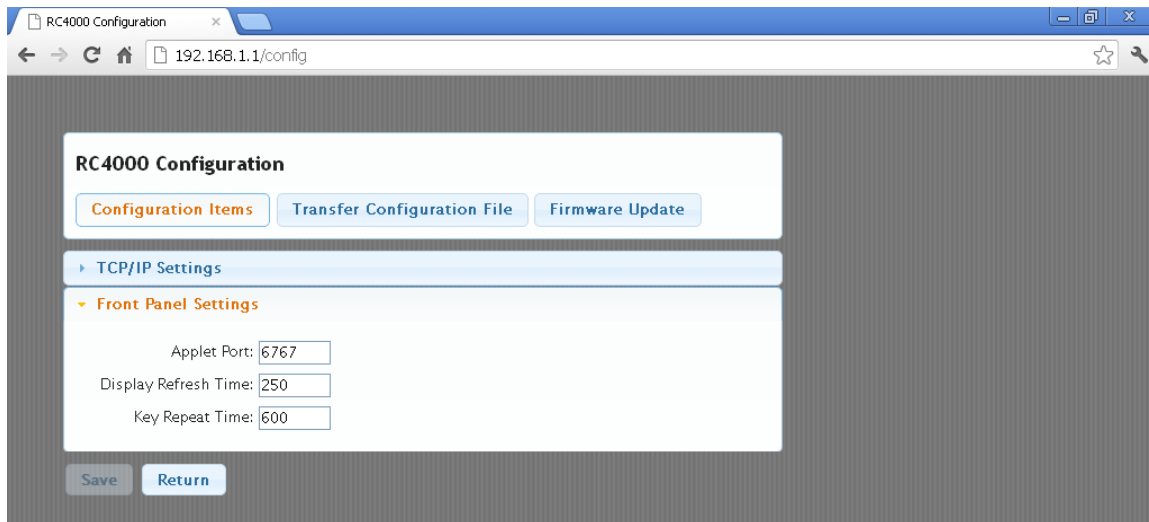


The interface must be reset if a change is made to any of these settings. The following panel will be displayed during the reset. After the reset is complete, the web browser will reload the page at the new settings.



3.1.1.2 Front Panel Settings

The available Front Panel Settings and default values are shown below.



Applet Port is the port on which the antenna controller will use to communicate with the JAVA Applet performing the remote front panel interface. This port must be open and not in use on the target web-enabled device.

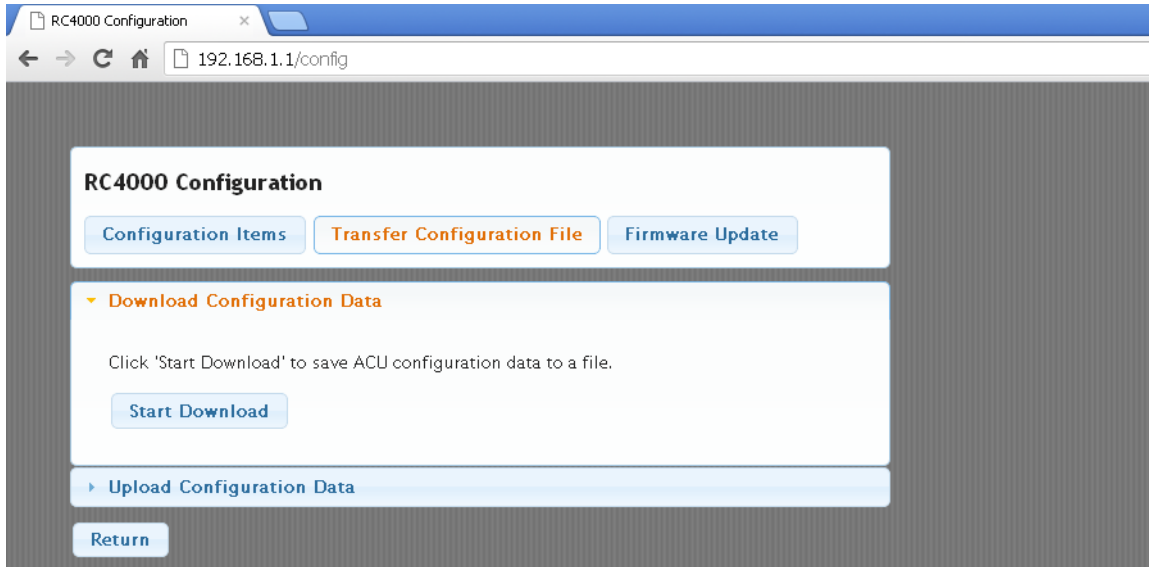
Display Refresh Time is the number of milliseconds between display updates. The default setting of 250 msec will allow updating of the screen almost four times a second which will typically provide adequate monitoring of the remote front panel display.

Key Repeat Time is the number of milliseconds between successive jog keystrokes. Both of these items may be changed to overcome network latency issues. **NOTE:** The default settings for Display Refresh Time and Key Repeat Time should be used unless instructed by support personnel.

NOTE: The remote front panel pages are mechanized as a Java applet. If Java is not available on the web-enabled device in use, an error will be displayed when attempting to access these pages.

3.1.2 Transfer Configuration File

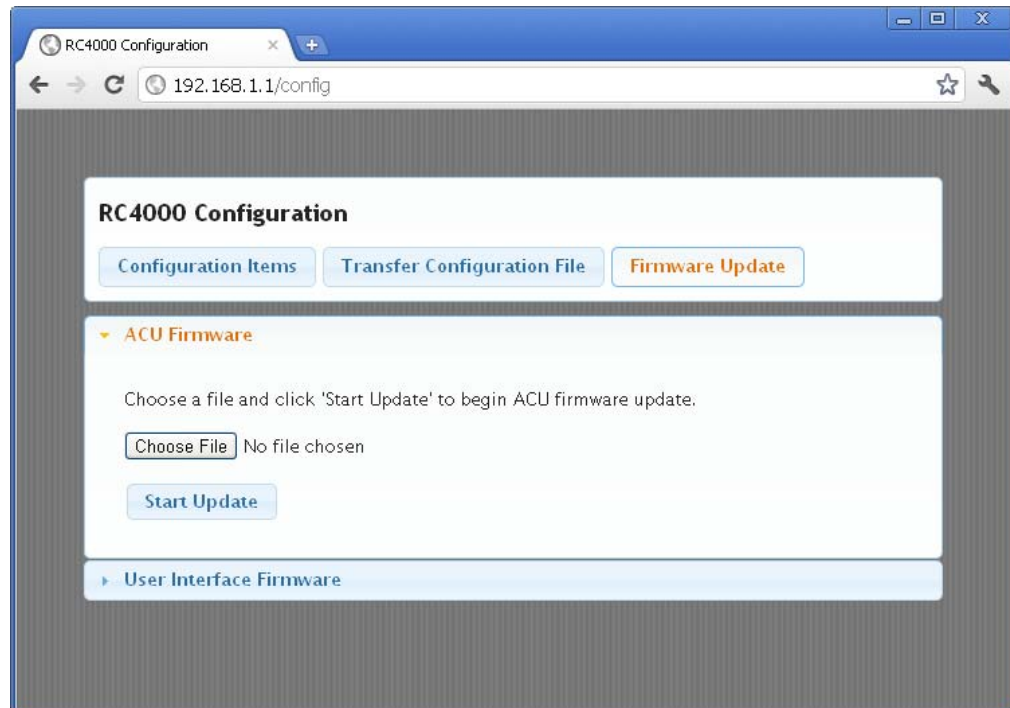
NOTE: The configuration file transfer functions have not yet been implemented.



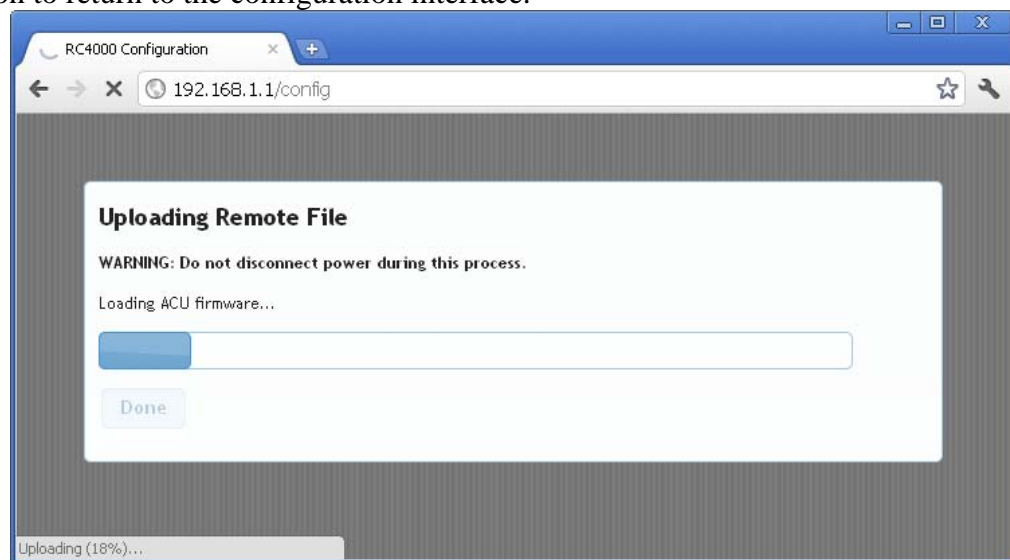
3.1.3 Firmware Update

3.1.3.1 ACU Firmware

The ACU Firmware panel is shown below. Choose a file (.hex file type) and click the Start Update button to start the antenna controller firmware update process.



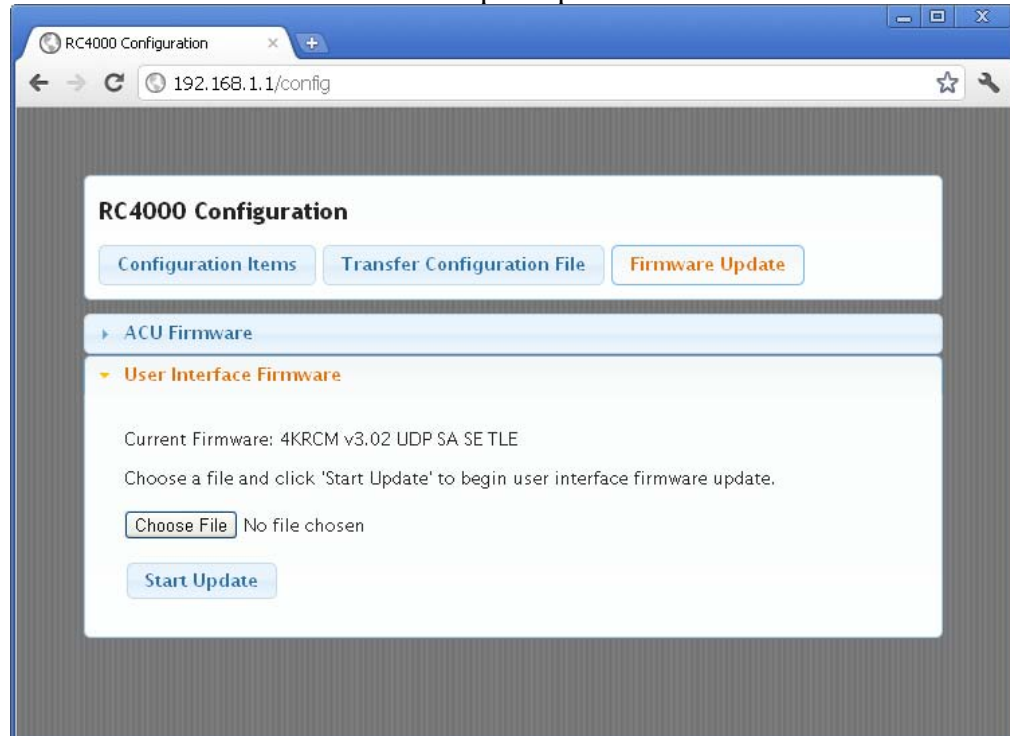
The following panel displays the current progress of the firmware update. Click the Done button to return to the configuration interface.



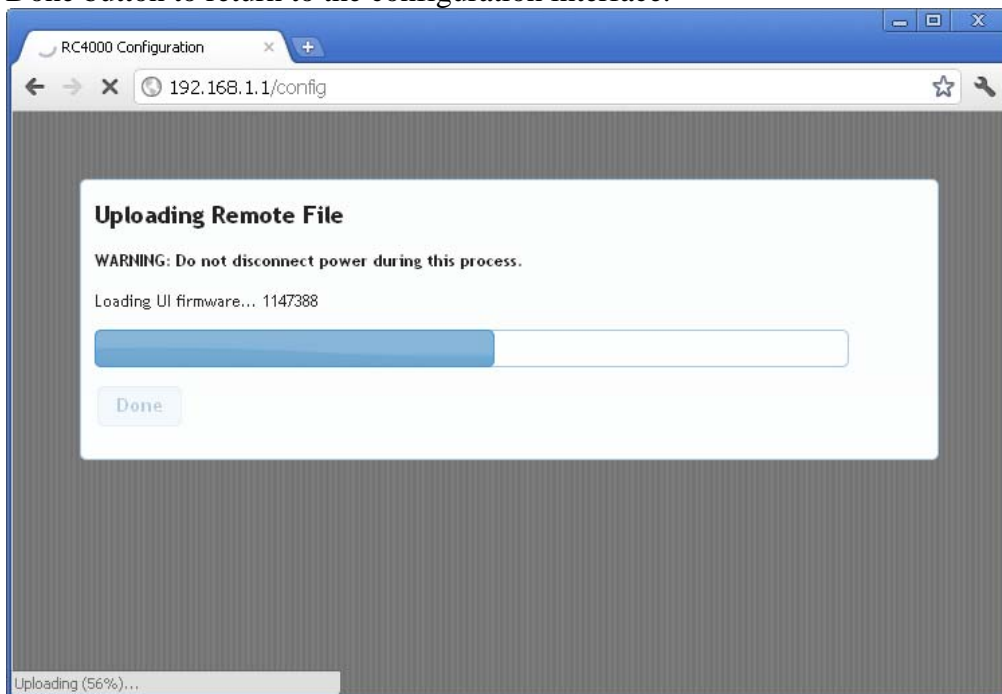
NOTE: the typical download time of ACU firmware is on the order of 15 minutes.

3.1.3.2 User Interface Firmware

The User Interface Firmware panel is shown below. The current firmware version and all available options are displayed. Choose a file (.rfi file type) and click the Start Update button to start the antenna controller firmware update process.



The following panel displays the current progress of the firmware update. Click the Done button to return to the configuration interface.



3.2 Remote Front Panel Pages

The Remote Front Panel pages can be reached by adding “/rcfp” to the end of the IP address of the ACU. For example, with the default IP address the remote front panel interface can be loaded by entering “192.168.1.1/rcfp” into the address bar of a browser.



The Remote Front Panel pages present a virtual front panel of an ACU with a 4x40 character display and a 16-button keypad. Pressing keys on the panel performs the same action as if keys were actually pressed on the ACU’s front panel. The current content of the RC4000 display is periodically reflected.

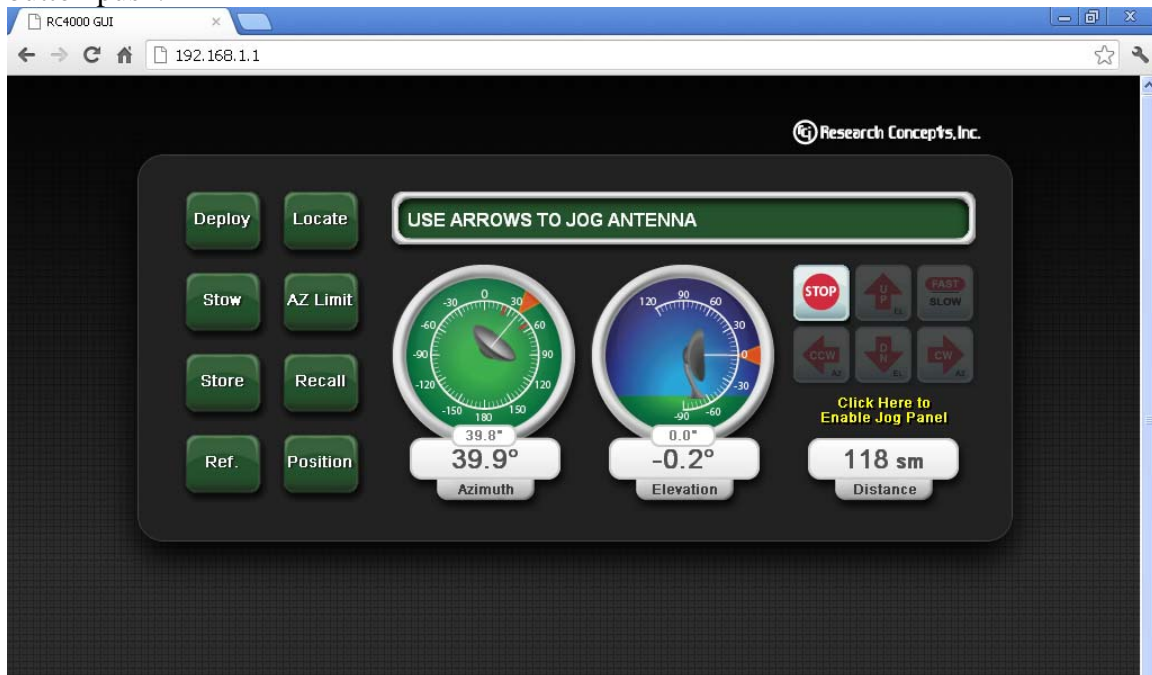
These pages provide access to configuration items and maintenance screens normally not needed for daily operations. While all ACU functions may be performed via the remote front panel interface, it is intended that normal operations be performed via the graphical user interface pages described in section 3.3. The scope of this document does not cover the descriptions of the dozens of ACU modes available via a front panel. Refer to the “RC3000 Users Manual for ComTech TFLA” for detailed descriptions of all ACU modes.

Below the remote front panel are two navigation buttons. Clicking on the “Configuration” button will send the display to the configuration pages described in section 3.1.

3.3 Graphical User Interface Pages

The GUI pages are reached via the base IP address (ex. 192.168.1.1) and are intended to provide a more intuitive graphical representation of ACU control and status than is available via the text-based front panel interface. The most typical operational modes of ACU functionality are available via the GUI pages. General knowledge of ACU functionality will aid in use of the GUI pages.

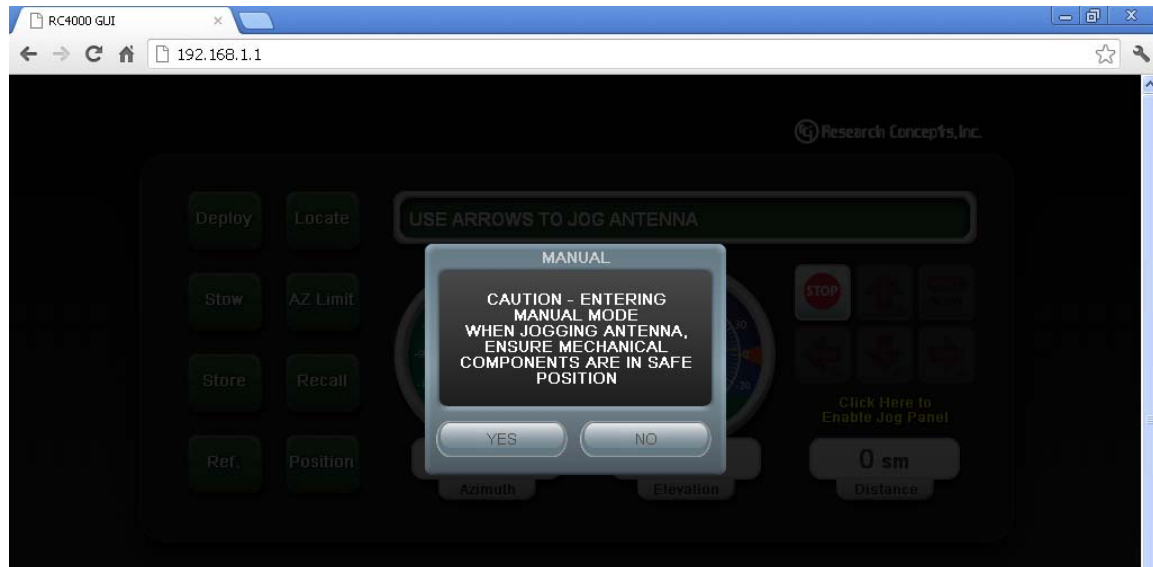
The following screenshot shows the GUI in a state similar to MENU mode via the front panel. Note that the buttons that allow manual jogging of the antenna are “grayed out” indicating that for safety reasons the antenna cannot be instantly moved by a single button push.



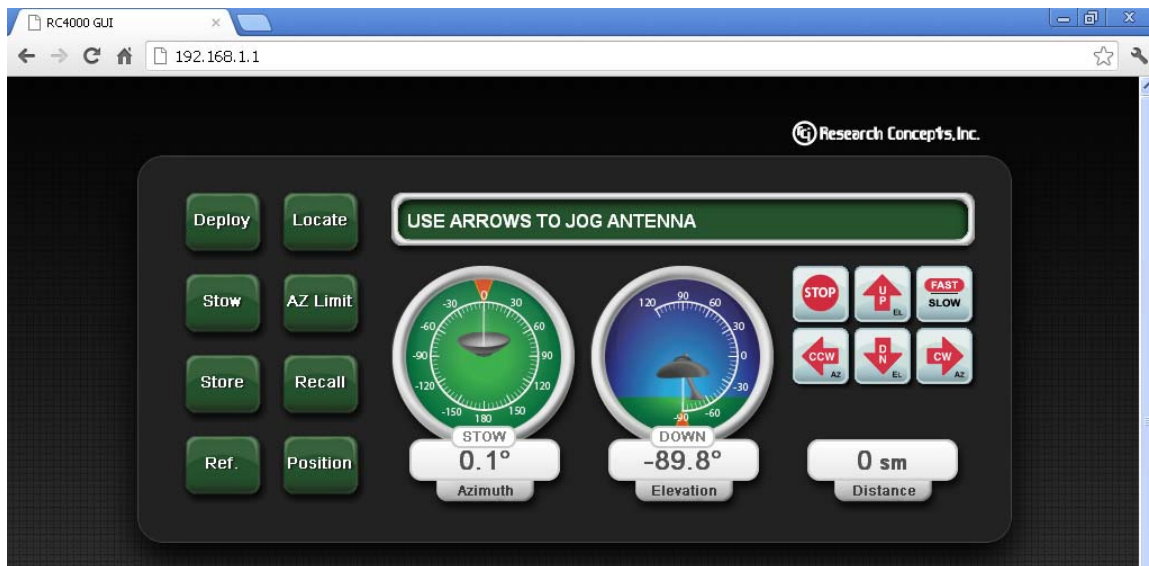
From this screen, automatic functions such as DEPLOY, LOCATE, etc. may be initiated from the buttons on the left. The actions triggered by these buttons will be described in sections 3.3.2 and beyond. Pressing the “Click Here to Enable Jog Panel” button will transfer the webpage to a manual jog screen next described in 3.3.1.

3.3.1 MANUAL JOG

As with front panel operation, a cautionary prompt is displayed when entering a mode of operation where the antenna may be jogged manually.



If safe operational conditions exist, pressing “YES” will proceed to the next screen. “NO” will place the GUI back in the MENU mode.



Pressing the UP/DOWN and CCW/CW keys will allow manual jogging of the antenna.

3.3.2 DEPLOY

Pressing the DEPLOY key from the menu will initiate the automatic antenna deployment operation.

If the antenna is below the elevation down limit, an initial prompt of **“Verify straps and latches are removed. Ready to Proceed?”** will be displayed.

After reaching the “setup” position, a prompt of **“Insert Highwind Feedhorn support pins. Ready to Proceed?”** will be displayed.

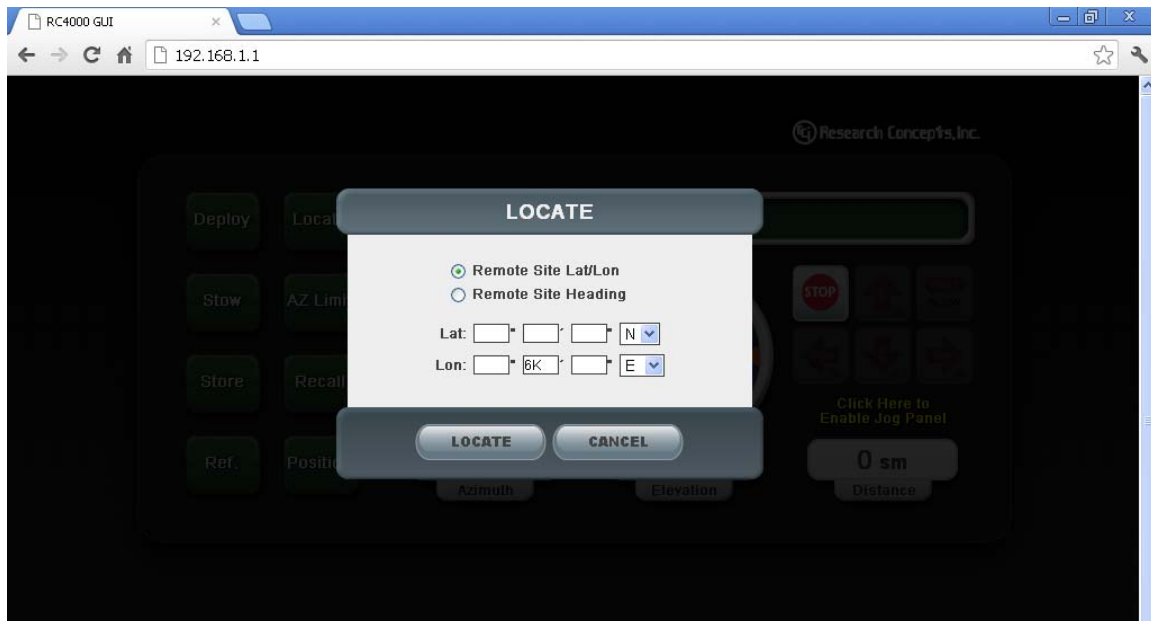
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3.3.3 LOCATE

As with front panel operations, the user may select a remote site target either defined by lat/lon or by magnetic heading.

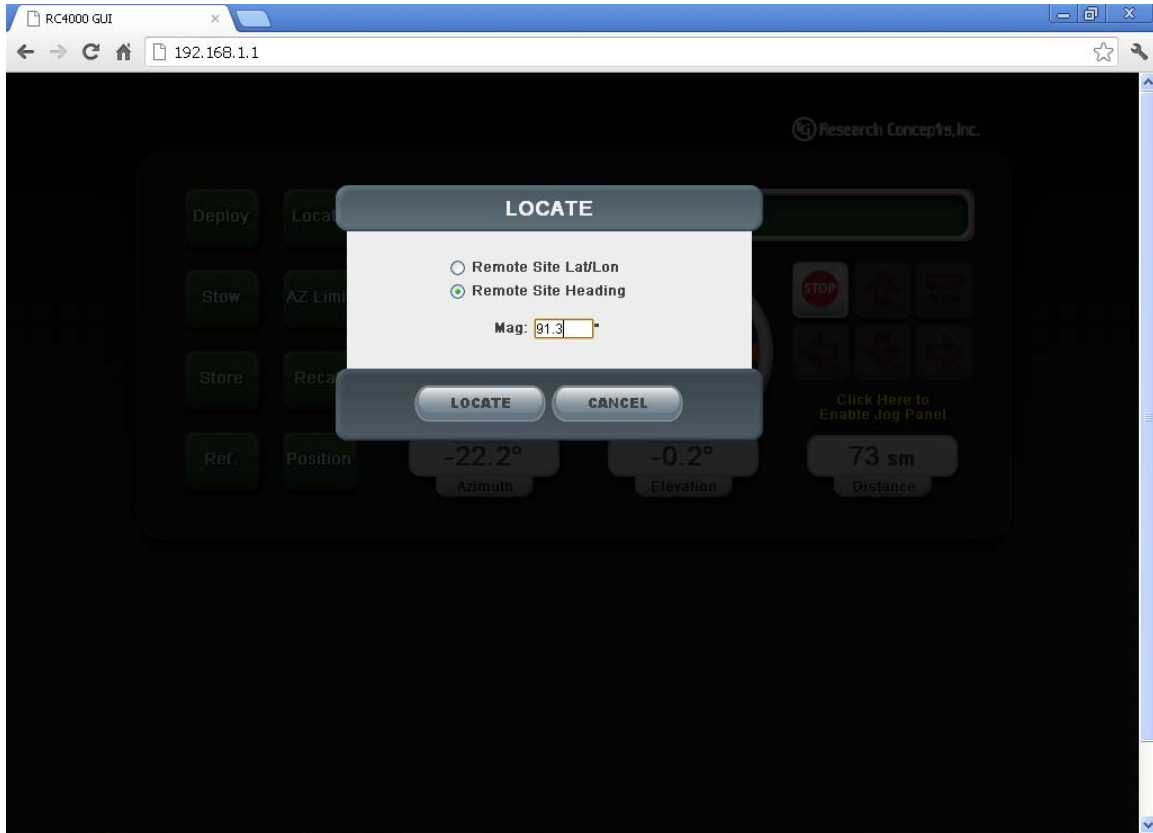
3.3.3.1 Remote Site Lat/Lon

When a lat/lon target is selected, fields are presented for entering the target’s lat/on in deg/min/sec format.



3.3.3.2 Remote Site Heading

When a magnetic heading target is selected, a field is presented for entering the targets magnetic heading in 0.0 to 359.9 format.



After selecting the appropriate target, pressing the LOCATE key will initiate the automatic locate sequence. Prompts will be displayed in a similar sequence to operations from the front panel.

3.3.4 STOW

Pressing the STOW key from the menu will initiate the automatic antenna stow operation.

An initial prompt of:

**A) High wind support removed?
B) Waveguides disconnected?
C) Messenger cables removed?
Ready to proceed?**

will be displayed.

After going to the “setup” position, an additional prompt of:

**Remove high wind feedhorn support pins.
Ready to proceed?**

will be displayed.

3.3.5 AZ LIMIT

In a similar fashion to front panel operations, the AZ LIMIT function will allow toggling of the state (enabled/disabled) of the dynamic azimuth limit.

ENABLE AZ LIMIT

**Command will set azimuth range limits around current position.
Ready to proceed?**

DISABLE AZ LIMIT

Command will disable azimuth range limit. Injury or equipment damage may occur.

Ready to proceed?

Note that the azimuth limit boundaries will be displayed as tick marks on the azimuth angle display (see display in section 3.3.8).

3.3.6 STORE

The STORE button initiates the storing of the current antenna angles (azimuth and elevation) for future potential recall.

**Store will overwrite previously stored data.
Okay to proceed?**

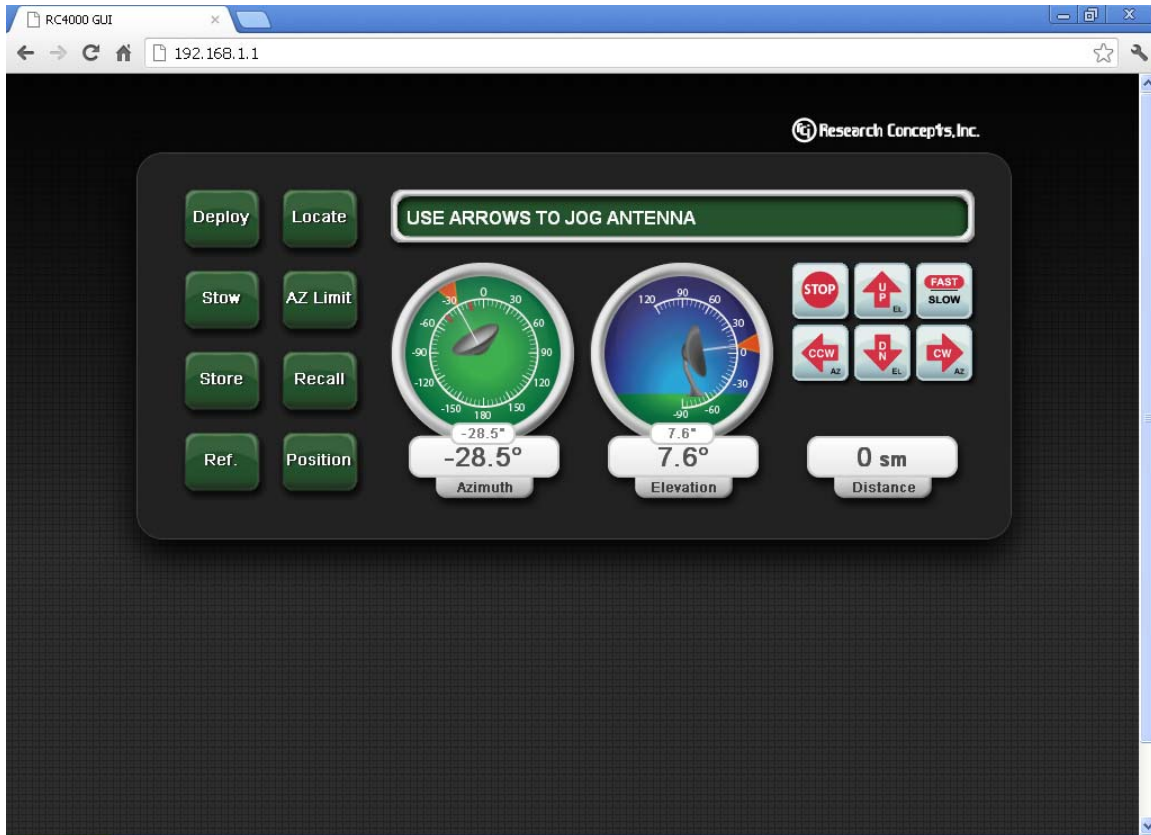
3.3.7 RECALL

If any STOREd antenna angles are available, the RECALL button will initiate movement to the stored angles.

**Recall will move antenna to last stored angles.
Okay to proceed.**

3.3.8 REFERENCE

The REFERENCE button will position the triangular “reference bug” to be positioned to the current azimuth and elevation angles.



3.3.9 POSITION

The GUI's position screen is not fully implemented. If required, better performance would be achieved by using the POSITION screen from the remote front panel.