Rhino

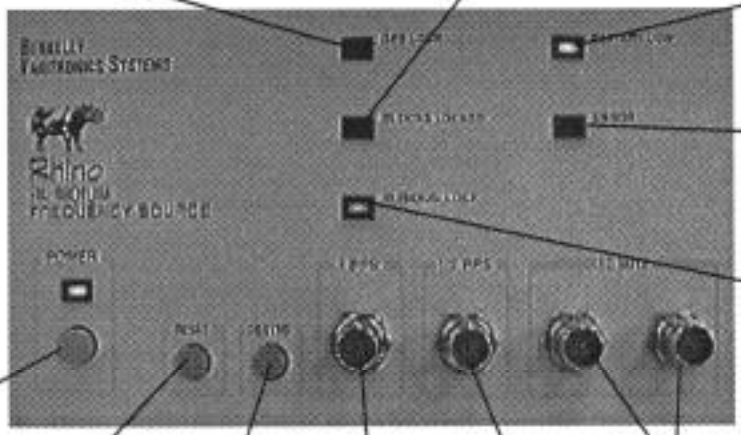
Manual Verison 1.0

Rhino Quick Reference Guide

GPS Lock:
Indicates when GPS receiver is locked

Clocks Locked:
Indicates when 1PPS is locked to GPS time

Battery Low:
Low battery indicator



Error:
Alarm indicator

Rubidium Lock:
Rubidium frequency standard

Power On/Off:
Keep off when external power (AC or DC) is not applied except of course for brief transportation between a car and a building without "unlocking"

Reset:
Repeats the locking process

Resync:
Resyncs the offset ADJj PPS

1 PPS:
1 Hz pulses

1/2 PPS:
0.5 Hz pulses

10 MHz:
10 MHz 1vpp

Battery:
Allows access to Rhino's internal battery

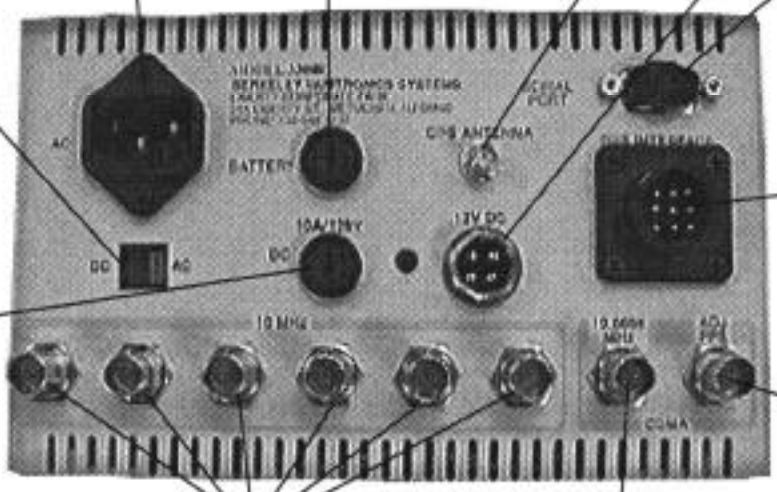
GPS Antenna:
Connector required for intial locking stage of GPS

12VDC:
12 volt DC power source

AC:
AC power connector

Serial Port:
RS-232 PC interface

DC AC:
Switch accordingly to the external power source used



BVS Interface:
Connector for BVS equipment

10A/125V:
10 Amp fuse insert

ADJ PPS:
1 Hz with an offset of the rising edge of a pulse

10 MHz:
10 MHz 1vpp

19.6608 MHz:
16 x CDMA chip rate

Be sure to run the Rhino off an external power source in its normal operating mode. Rhino's internal power source should not be used for more than a few minutes.

BVS RHINO PC INTERFACE SOFTWARE

INSTALLATION

Copy the file "rhino.exe" from the supplied disk to a directory on the hard drive of the computer.

PC SETTINGS

PC COM Port 1 must be set as follows using the WINDOWS control panel/device manager:

A) Handshake must be set to NONE or HARDWARE.
B) FIFO off (advanced settings).
C) The PC must be re-started in MSDOS mode.

CONNECTIONS

Connect PC COM Port 1 to the RHINO connector labeled SERIAL PORT using the cable supplied. The RHINO serial data is input and output at 1200 baud, 8 data bits, no parity with 1 stop bit.

RUNNING THE PROGRAM

Enter the directory where the file "rhino.exe" was saved and type RHINO followed by enter. The program will display the following screen:

BVS RHINO PC INTERFACE v1.00
(c) 1999 Berkeley Varitronics Systems, Inc.
RHINO to PC COM1 - 1200 baud

MAIN MENU
Press: S - for RHINO Status
G - for GPS data display
O - to set Chip Offset
R - to Re-Synch RHINO
Esc to return to DOS ?

PROGRAM MING MENU COMMANDS

Type 'S' to display current RHINO status as in the following example:

BVS RHINO STATUS DISPLAY
Firmware Version: x.xx
Synchronized
GPS Locked
3D Fix
Visible Satellite(s): 4
Chip Offset: 0000
Alarms: None
Last Offset Value: 0000
GPS Time: 17:00:05
Rubidium Locked
Battery OK

Clock Locked

Chip Offset reported is the value entered via the 'O' command, Last Offset Value is the measured value used to determine if the RHINO clock is locked. A value greater than +-8 will cause a clock alarm.

PROGRAM MAIN MENU COMMANDS

Type 'G' to display current GPS status as in the following example:

BVS RHINO GPS RECEIVER DATA DISPLAY

GPS Time: 15:23:45
Visible Satellites: 07
Tracked Satellites: 06
Lat: 40.547089
Lon: -74.380196
Height: 100.000000
Antenna: OK
Chan # Sat ID Track Mode Sigv Chan Stat
LOCKED 3D Fix

The last line of the display indicates GPS LOCK status. The table above it shows information about each satellite being tracked by the RHINO GPS receiver.

PROGRAM MAIN MENU COMMANDS

Type 'O' to offset the back panel ADJ PPS output from 0 to 32767 chips relative to the 1/2 PPS output. After entering the offset, the RHINO must be re-synchronized with MAIN MENU 'R' command.

Use the 'R' command, not the front panel 'RESYNC' button.

The rising edge of the "ADJ PPS" signal is delayed from the rising edge of the "1/2 PPS" signal, the delay is equal to:

(Chip Offset +- 0.5) * Tchip, where Tchip - 1/1.2288MHz, the IS 95 chip period.

BVS Rhino Controller (v1.00) Application Software

Introduction

The Rhino Controller application software is the Windows 95/98 interface that enables a user of the Rhino Frequency Source.

The Rhino Controller provides a programmable chip offset, which allows synchronization of an output adjustable pulse-per-second (PPS) to 1PPS with a desired offset from 1 to 32767 CDMA chips.

Also, the Rhino Controller monitors the information output from the GPS receiver and displays it on an alternate screen.

Application Overview

The Rhino Controller application mimics the display panel for the Rhino. The status is constantly updated approximately every other second as well as the GPS receiver status. The information is updated on the PC display as it comes in through the RS-232 port. The chip offset may be set from 0-32767 in this application.

The main menu contains three different submenus. The first submenu is FILE. The user may exit the application from this submenu.

The second submenu is COMMUNICATION. In this submenu, the user can select the port to which the Rhino is connected. This is the same screen that comes up upon launching the Rhino Controller application.

The final submenu is HELP. In this submenu, this user manual can be brought up. The About box displaying version information is also available.

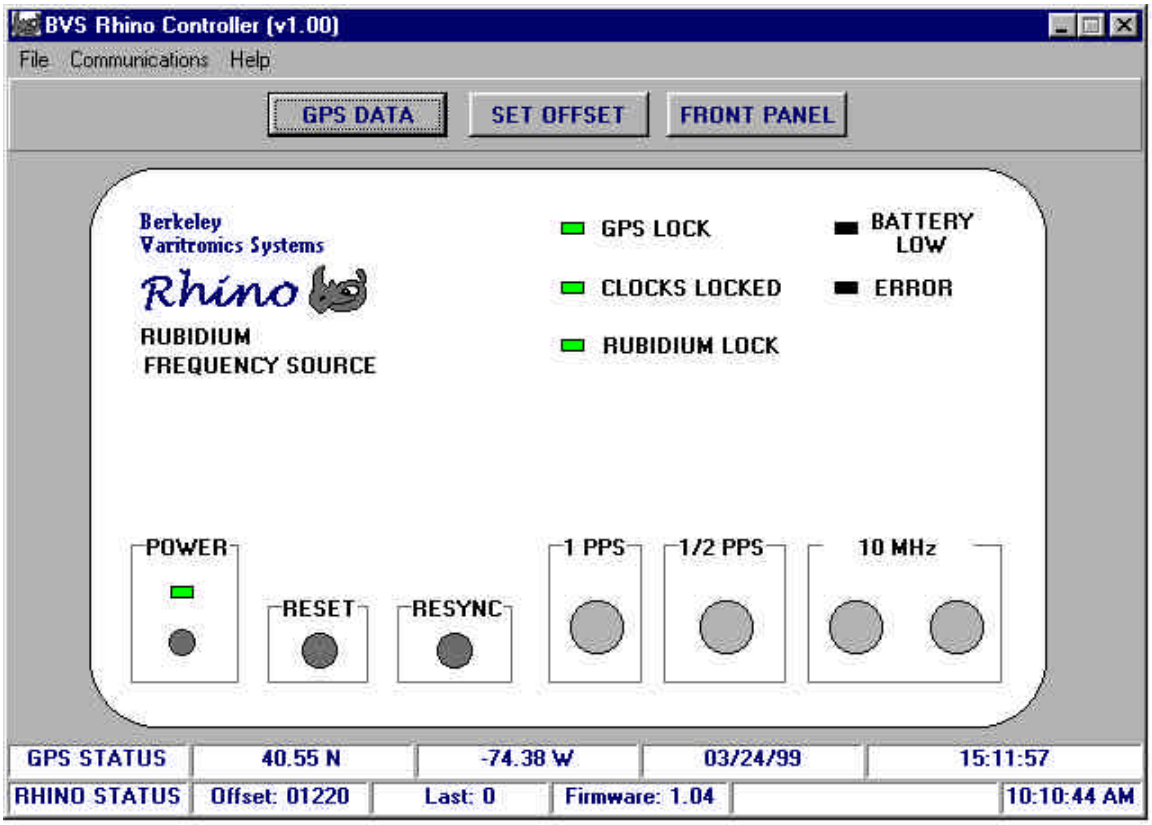


FIGURE 1 – BVS Rhino Controller

The main screen of the Rhino Controller can be seen in Figure 1. In addition to the status being updated in the display, the GPS Lock, Clocks Locked and Rubidium Lock simulated LED's will light up for the appropriate conditions.

There are two status bars located on the bottom of the screen. The "RHINO STATUS" bar displays the current chip offset, the last offset drift, the firmware version, and the real-time clock.

The other status bar is the GPS status bar, which contains the latitude and longitude, followed by the GPS date and time.

The individual features of the application software are discussed in the following sections.

Installing the Application

The application is installed by placing the diskette provided into a 3.5" drive. Run the SETUP.EXE application and InstallShield will prompt for further installation questions. After the installation is completed, an icon will be created in the folder specified during the installation process.

Starting the Application

Make sure that the Rhino is running and connected to a serial port on a PC using the cable packed with the unit. Clicking on the Rhino Controller icon starts the Rhino Controller application. When the PORT screen appears, choose the port to which the Rhino is connected.

When the main screen appears, check the status bar for verification that the connection was made to the Rhino. The firmware version box should report a version number and the GPS time should periodically change. You are now ready to control the Rhino.

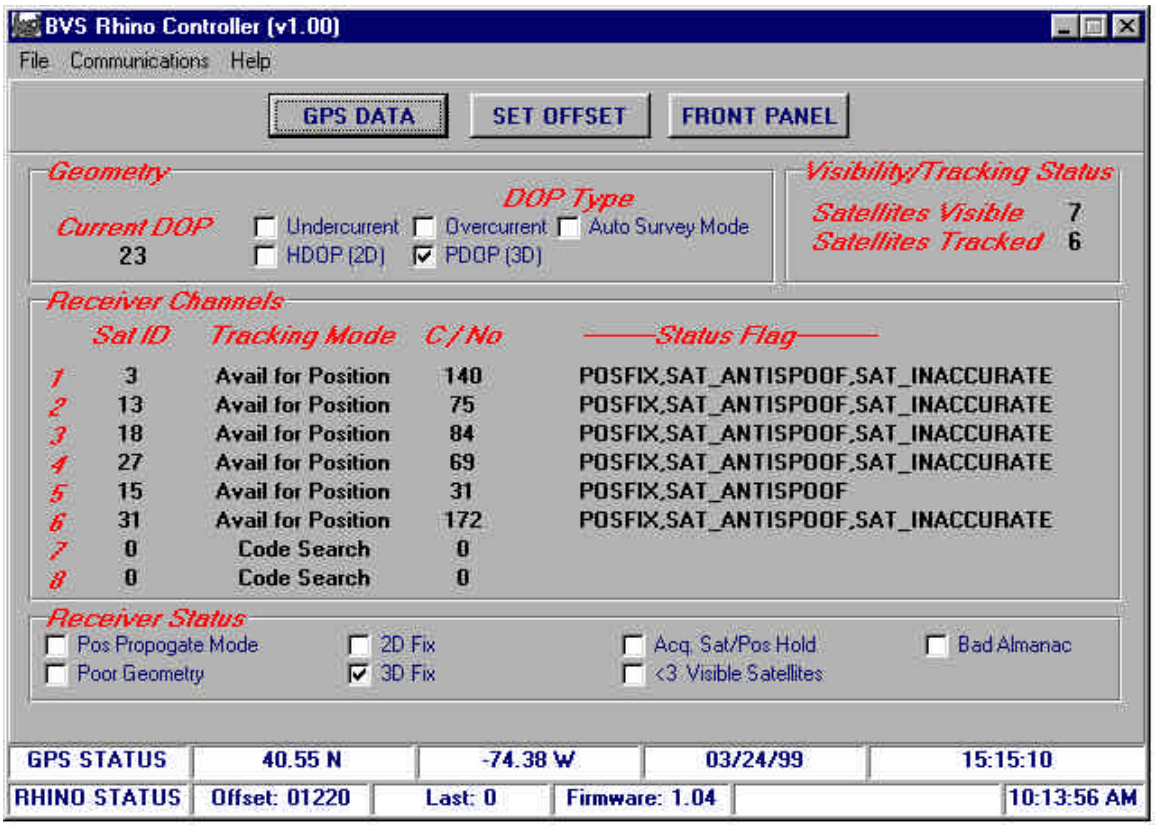


FIGURE 2 – GPS Receiver Display

Setting the Chip Offset

In order to set the chip offset of the Rhino, click on the "Set Offset" button. A dialog will appear and prompt for a new value. Enter a number between 0 and 32767. If a number is entered which is outside this range, the value will be adjusted to either 0 or 32767.

Viewing GPS Data

The entire gamut of GPS information may be viewed by clicking on the "GPS Data" button. A display will then appear which contains antenna information as well as the number of satellites visible and tracked. The statuses for up to eight satellites are also displayed. Click on "Front Panel" to return to the previous screen.

Glossary of Acronyms

AC	Alternating Current
A/D	Analog to Digital converter
AGC	Automatic Gain Control
BER	Bit Error Rate
BPSK	Binary Phase Shift Keying
BW	Band Width
CDMA	Code Division Multiple Access (spread spectrum modulation)
DC	Direct Current
D/A	Digital to Analog
dB	decibel
dBm	decibels referenced to 1 milliwatt
DOS	Digital Operating System
DSP	Digital Signal Processing
FIR	Finite Impulse Response
GHz	GigaHertz
GPS	Global Positioning System (satellite based)
GPS diff.	GPS error correction signal which enhances GPS accuracy
IF	Intermediate Frequency
I and Q	In phase and Quadrature
kHz	kiloHertz
LCD	Liquid Crystal Display
LO	Local Oscillator
Mbits	Megabits
MHz	MegaHertz
modem	modulator/demodulator
PCMCIA	Personal Computer Memory Card International Association
PC	Personal Computer
PCS	Personal Communications Service (1.8 to 2.1 GHz)
PN	Pseudo Noise
QPSK	Quaternary Phase Shift Keying, 4-level PSK
RF	Radio Frequency
RSSI	Receiver Signal Strength Indicator
UCT	Universal Coordinated Time
VAC	Volts Alternating Current
VGA	video graphic

Technical Support

- Up-to-date information is available on our web site at **http://www.bvsystems.com**
- The latest version of Rhino Controller is also available on our web site for download..
- If you wish to contact technical support, mail to **info@bvsystems.com**

Acknowledgements

Notice

Information in this document is subject to change without notice.

If you require technical assistance, or service to your Rhino, contact:

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