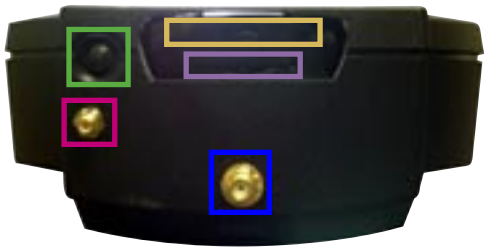
# Yellowjacket™ PLUS A

manual version 1.1

**Contents**

## INTRODUCTION

The **YellowjacketPLUS™** is an 802.11a Analysis System. It consists of an HP iPAQ PocketPC® integrated with custom hardware and software by BVS. This system contains a variety of features to analyze 802.11a networks including spectrum analysis over all 8 channels (5 GHz), a list of AP's and/or stations over all 8 channels and other data for each individual MAC address. The YellowjacketPLUS also contains a "Geiger-counter" feature to locate a single AP/ STAtion via audio/visual aids and a security feature to warn the user of possible unauthorized AP/ STAtions in the area based on a list of authorized MAC addresses. The data from a YellowjacketPLUS may be logged into resident memory for transfer to a desktop PC at a later time and then be converted from binary to ASCII using "Chameleon WLAN".



The top angle shows the removable antenna connection, stylus, GPS antenna connection (optional), IrDA port and SD card slot. Always keep the IrDA port clean and clear of obstacles for data transmission.

Your iPAQ can be reset using 2 different methods. If Yellowjacket software loses communications with Yellowjacket hardware, perform a soft reset with your stylus by pressing the reset button behind the battery door at the bottom of the unit. Perform a hard reset by holding in the two outer buttons for at least 10 seconds while performing a soft reset. **Warning!** Hard reset erases all RAM data from iPAQ so be sure to backup all data and re-install your Yellowjacket application software after a hard reset.

## STARTING UP YellowjacketPLUS

Power up your YellowjacketPLUS by pushing power button in upper right corner of unit. This power will automatically power up the YellowjacketPLUS receiver also. When you power down the iPAQ, (push the power button on the upper right quickly-holding this button will also toggle the backlight on and off) your YellowjacketPLUS receiver will also shut down. Connect the included antenna to the SMA connector and remove the stylus by pushing down on it. Use your stylus to tap onto the Windows® icon in the upper left corner. Choose YellowjacketPLUS in the pulldown menu. Data may be transferred to a PC via the IrDA window or USB or serial connection. Install YellowjacketPLUS software by connecting your iPAQ to your PC and inserting included BVS software CD-ROM into PC to begin installation. You may also use the provided Compact Flash Installer card. Be sure to turn off any internal WLAN or Bluetooth in your iPAQ before using your YellowjacketPLUS.

## YellowjacketPLUS ACCESSORIES

YellowjacketPLUS includes a 5 GHz antenna, 2 battery packs (10 Ni-MH cells), AC/DC charger & USB/IrDA communicator sled and carrying case.

**WARNING FOR USERS WITH BUILT-IN WIRELESS**
**(you must disable your iPAQ's Bluetooth and WLAN)**

1. Press the START button on the upper left hand side of the touch screen.
2. Click on the "iPAQ Wireless" folder.
3. Click on the "Wireless Control" program.
4. Click on "All wireless features OFF". The icons for Bluetooth and WLAN will have red backgrounds when disabled.


## YELLOWJACKET SD Card Installer

Insert SD card into the SD slot on the top of iPAQ
Tap on the "Start" icon on top left of screen
Tap on "Programs" in menu
Tap on the "File Explorer" folder
Choose "My Device"
Tap on "SD Card" or "Storage Card"
Choose Yellowjacket receiver and iPAQ model for installation and tap on "install"

**DATE:**_____

**If the Yellowjacket CF or SD Backup Installer card has been included, it may be used to log data files onto. It can also be used on iPAQs that have never been initially set up at the BVS factory, have had files erased or damaged in the ROM or after a hard reset has been performed on an iPAQ. Yellowjacket software that has been erased/lost from RAM may be restored at anytime by accessing the "install" file from the SD Card or Storage Card directory. Always make sure batteries are fully charged when doing any software installs. Yellowjacket software that has been erased from RAM may be restored at anytime by accessing the "reinstyj" file from the \\iPAQ File Store\\My Device directory.**

## YellowjacketPLUS Startup Screen


Getting Started

The YellowjacketPLUS 802.11a software can be started by:

1. Pressing the Start button on the Ipaq.

2. Pressing the "Yellow Jacket A" program option from the main drop-down list.

3. Tapping anywhere on the screen when the splash screen appears as shown below.

## YellowjacketPLUS Main Screen


The main menu of the YellowjacketPLUS software contains option buttons in the main viewing area and a series of toolbar options. The main viewing area is shown below. There are three choices in the main viewing area. You may choose spectrum analysis, which enters a spectrum analyzer-type screen which will show all RF being received within the range of the receiver. This mode also allows for zooming in to a particular channel.

The next option is the access point screen. This will allow the user to view individual access points being seen by the receiver and then to proceed to Geiger mode for locating the particular access point.

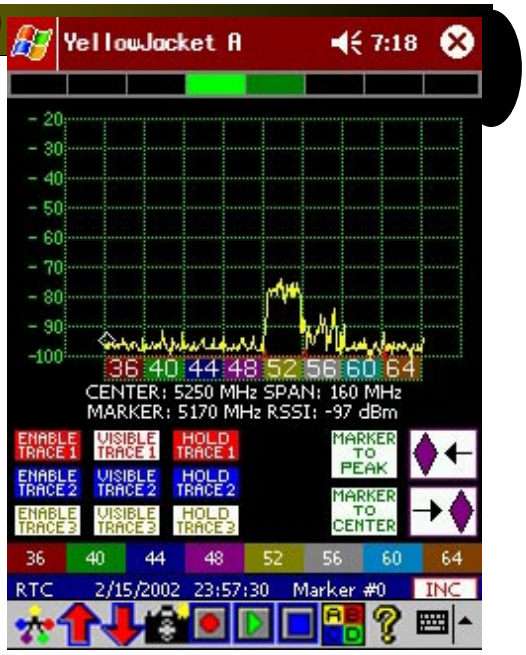
The next option is the MAC list screen. The access point list screen provides the user with a list of access points that are seen by the receiver. The user can then "zoom in" on a particular access point for further analysis as well as for pinpointing the AP's location.

The final menu option is the GPS Data screen. When the GPS receiver has locked to several GPS satellites, his screen displays vital GPS information such as LAT, LON, ALT, etc.

The toolbar gives the user more options on every screen. The first icon (from left to right) has five interconnected colored circles. Using this option will always return the user to the main menu. The second and third icons are arrows pointing upward and downward. These options have different uses depending on the currently active screen. For instance, on

the access point screen, the arrows are used to flip the current page of access points. The fourth icon represents a camera. This option takes snapshots of the current screen for later viewing. The "record" button is for logging a data file. The "stop" button is for terminating the logging of data. The "play" button will be implemented in a later version of the software. The icon with the letters "ABCD" enters the system options screen. The question mark icon reveals the application about box.

## Spectrum Analysis




The spectrum analysis feature of the YellowjacketPLUS allows a user to view any RF signals that is received by the receiver. It uses frequency for the X-axis and RSSI (received signal strength indicator) in dBm on the Y-axis.

Both the full spectrum and the single channel screens have the same options for the most part. There are three available traces. The red, blue, and yellow traces. Only one trace can be active at any one time.

Each of the three traces can be made visible by pressing their respective "visible" buttons. The active trace can be peak held by pressing it's "hold trace" button.

Use the "marker to peak" button to move the diamond marker to the current highest dBm valued point. Use the "marker to center" button to move the diamond marker to the center of the currently displayed section.

There are also buttons for moving the diamond peak mark to the left or right in the currently displayed screen.

Each spectrum screen displays information regarding the center frequency of the screen as well as the span in MHz. The current marker position and value is also displayed.

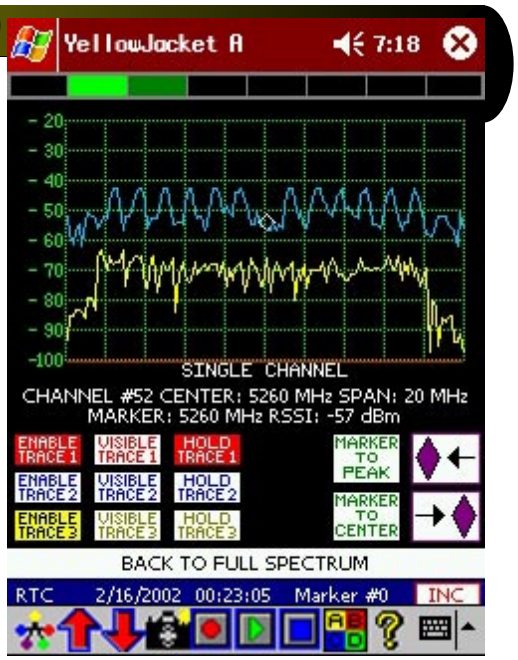
The full spectrum screen is the first one entered when going into the spectrum analysis option. This screen shows RF energy in dBm over all 8 channels seen by the receiver. Each vertical section represents a single channel. Simply look at the channel number at the bottom of the vertical section to reference the data to the channel.

To "zoom in" on a single channel, simply tap one of the col-

ored boxes located just above the RTC bar. For example, clicking on the green channel 40 box will zoom in to channel 40.

## Single Channel Spectrum

The single channel screen displays RSSI valued data within the channel specified (a 20 MHZ span). To return to the full spectrum mode, press the "BACK TO FULL SPECTRUM" button.




## Access Point List

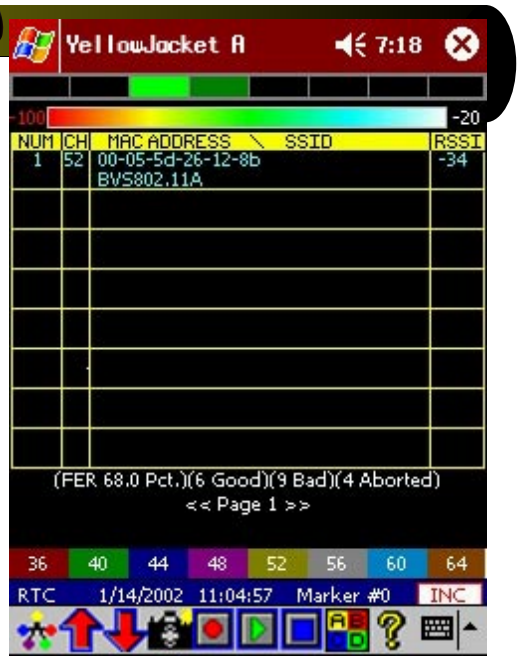
The access point list screen provides the user with a list of access points that are seen by the receiver. The user can then "zoom in" on a particular access point for further analysis as well as for pinpointing the AP's location.

### MAC List

The MAC list is shown on the main access point list screen. This list shows each of the access points seen and other information on each of the access points. This information includes such fields as the channel number associated with each access point, the MAC address and SSID of the access point, as well as the RSSI value in dBm of the access points.

The color of the information text for each access point will change as the RSSI value increases and decreases. The scale of colors are shown on the top of the list. White is the strongest value while red is the weakest. It is loosely based on the colors of stars, white being the hottest and red being the coolest.

Also, there are two pages of the access point list. To flip between these two pages, use the up and down arrows provided on the bottom of the screen in the toolbar.

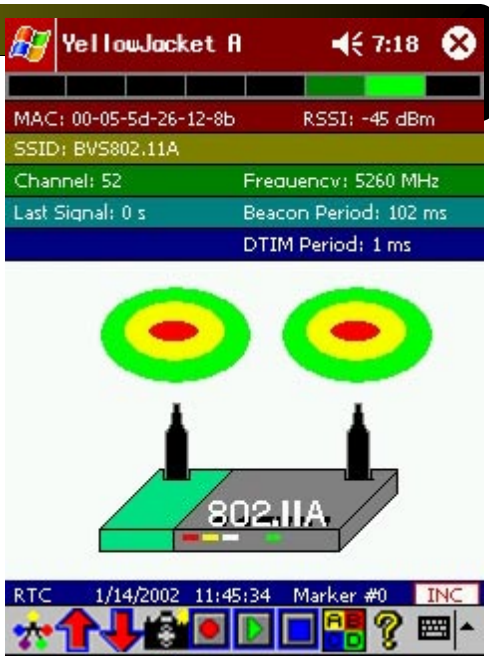


## System Information

On the bottom of the access point list is a line of data that represents statistics relating to the overall frame error rate.

This line shows the number of good frames, the number of bad frames, and the number of aborted frames. The frame error rate is calculated and displayed as well.

## MAC Locator (Geiger Mode)




When a single MAC address is selected, the 'Geiger screen' appears. This screen has individual MAC address information as well as a visual and audio representation of proximity to the access point.

As the signal from the access point becomes stronger, the audio effect of a submarine ping becomes more frequent. The visual effect of colored circles above each of the twin antennas becomes larger as the signal increases. This mode is even more useful when coupled with a directional antenna that would allow the user to "home" in on the transmitted signal more efficiently.

The information provided on the Geiger screen includes the MAC address and the SSID, as well as the channel on which the access point is transmitting. It also shows when the last packet was received. The frequency in MHz is shown, the beacon interval period is shown, and the DTIM period.

Finally, the RSSI level is also displayed as a numeric value in dBm.

## Real-Time Clock and Markers


It is noted that the blue bar on the AP list screen and other screens shows the Ipaq date and time as provided by the operating system. This date and time is used for marking logged records with a reference point in time.

There is also a marker number. When the INC button is pressed on this bar, the marker number will increment. This is also used in log files for a reference point to interesting data collection anomalies.


The security screen allows for entering and maintaining of authorized and unauthorized access point lists. This is a feature that is used for determining if there are rogue/hostile access points within striking distance of the network.

The "security feature" is enabled by checking the "check for unauthorized AP's" found on the screen.

Authorized List

The "authorized lists" is a list that contains the MAC addresses of access points that are authorized to broadcast in the area to be concerned. This list can be created one of three ways. The first way is by entering MAC addresses in the topmost edit field on the security screen. Then the "ADD" button is pressed to add the address to the list. The next method is to retrieve a previously saved list or a list that has been created on a PC or laptop.

The final method is by pressing the "GENERATE AUTHORIZED LIST" button. This may be pressed after leaving the YellowjacketPLUS in the access point screen for a period where all access points have been seen. All of these MAC addresses will be moved into the authorized list.

This list can be saved to RAM by pressing the "SAVE" button. This Authorized listing may be cleared by pressing the "CLR" icon on the iPaq. This is found next to the list box.

Unauthorized List

The unauthorized list is populated when the security feature is turned on via the option screen. Any MAC addresses seen and demodulated by the receiver that are not in the current authorized list will be flagged and inserted into the unauthorized MAC address list.

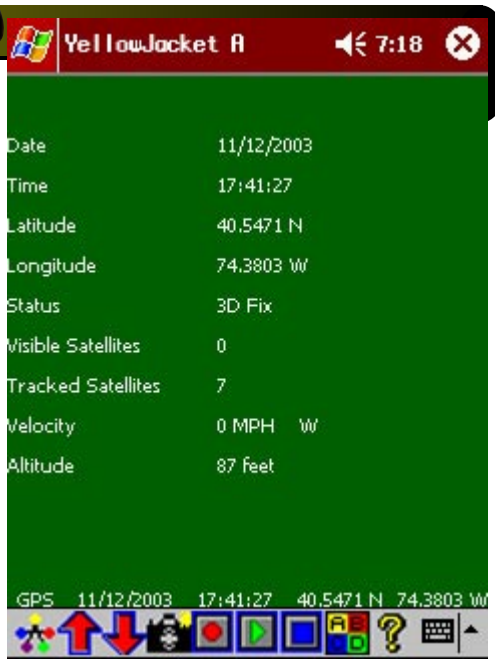
Items in this list can be saved or retrieved to/from RAM by pressing the "SAVE" or "RETRIEVE" buttons.

If the MAC addresses found in the unauthorized list is to be authorized, simply select the entry in the list box and press the "AUTH" button.

This list may be cleared by pressing the "CLR" button found next to the list box.

**Unauthorized Warning**

When YellowjacketPLUS detects any AP that is not included in the Authorized list, an ALERT! screen will appear and audible warning beep will be heard. Press OK to close the ALERT! screen. Remember that YellowjacketPLUS will continue to sound off the alarm each time any unauthorized AP is detected until it is placed in the Authorized list by the user. Check your Options Screen to turn this security alert ON or OFF.




The GPS Data screen of the Yellowjacket Plus provides position and timing information from the Global Positioning System of satellites. The Motorola GPS receiver provides accurate information after synchronizing with at least 3 of the 24 satellites.

The Yellowjacket Plus must have a clear view of a good portion of the sky in order to communicate with the GPS satellites. The GPS receiver should lock within a few minutes. The only exception is when the unit is turned on in a new area. If the receiver was last turned on in California and now in New Jersey, the GPS receiver could take up to an hour to lock.

The status bar at the bottom of the Yellowjacket Plus screen shows the current date and time (Greenwich Mean) as well as the current latitude and longitude in decimal degrees. There is also a separate GPS screen which shows satellite information.

The GPS information is stored in the log file when enabled for later conversion by Chameleon. Each record will be tagged with GPS information if so desired.

If you require GPS time-stamping with your 802.11a measurements and Yellowjacket PLUS does not display the GPS screen or the main menu screen does not show a bottom GPS data line similar to this:

We recommend you send in your Yellowjacket PLUS to be upgraded with the internal GPS option. See accessories page in this manual or contact BVS for more information.

RTC MARKER MODE

If there is no GPS module attached, the YellowJacket system uses the internal real-time clock of the iPAQ for timing. In addition, there is a marker that starts at 0. By pressing the button to the right of the marker value, the marker increases by 1. These values are stored in any log files created for later conversion by Chameleon. The screen above shows Yellowjacket with an internal GPS receiver detected. The screen below shows the RTC window when no GPS receiver is detected.


**Data Recording**

When the “record” button icon is pressed from the toolbar at

the bottom of the screen, the user will be prompted for a filename. This filename will be used to store collected data for later conversion by Chameleon WLAN.

The data is stored in a compact proprietary binary format. The YellowjacketPLUS will store data as it received from the hardware, depending on the currently active screen. If the spectrum screen is currently active, spectrum data will be stored. If the access point screen is currently active, access point information will be stored.

To save the collected data, press the "stop" button icon. To view the size of the log file while still logging, simply return to the main menu screen.

WARNING! : Make sure that the "stop" button is pressed to avoid the loss of data saved.

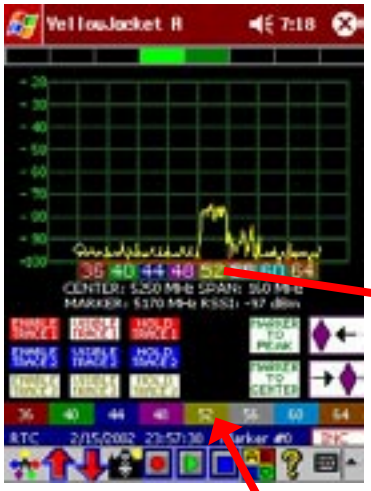
Snapshots

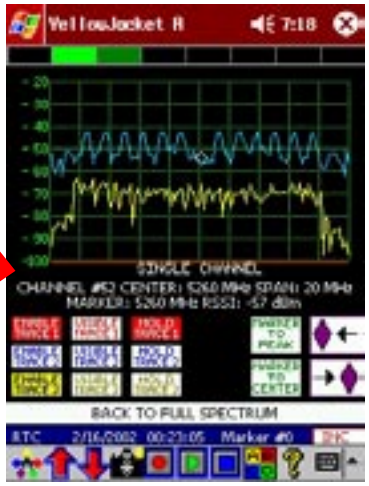
When the camera icon is pressed from the toolbar at the bottom of the screen, a snapshot of the currently viewable display is taken. The snapshot can be saved as a JPEG format picture (just like a digital camera) for viewing at a later time or for importing into documents and reports. As an example, the images of the YellowjacketPLUS screens shown in this section of the manual were saved using this option.

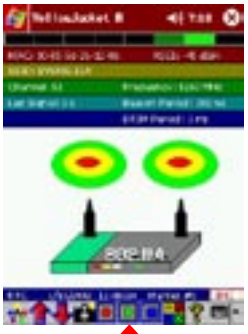
Data Conversion (using Chameleon WLAN)

Data that has been logged by the YellowjacketPLUS is stored in a proprietary binary format. It can be transferred to a PC or laptop. Once on the PC or laptop, the Chameleon WLAN utility application can be used to convert the binary data into an ASCII-readable format that can be imported into spreadsheet applications such as MS Excel or other applications that accept ASCII-delimited data.

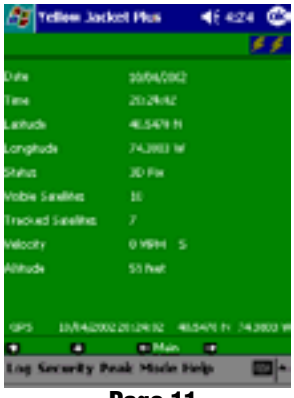
START HERE







This screen may only be accessed using a YellowjacketplusPLUS with the internal GPS receiver option installed.



**Troubleshooting**

• Active Sync not responding - Be sure that all applicable drivers are loaded onto your PC. Drivers are included with your IrDA USB adapter on a CD-ROM as well as drivers for Windows 2000, 98, XP and Me in a folder on the red BVS software CD labeled "IR".

• Cannot open Com port or System not responding – If the Yellowjacket PLUS stops responding, try pressing OK and restarting the application. If the Yellowjacket PLUS is still not responding, press the small reset button located at the bottom of your iPAQ. Do not force this reset button hard. You will see instant results simply by pushing it gently once. See Compaq's usage instructions for more info on performing a hard reset.

• Yellowjacket Application Software is missing or corrupted - You can find the Yellowjacket application the BVS Software CD (red writing) included with your Yellowjacket. Re-install your Yellowjacket software.

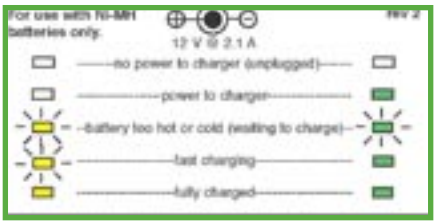

Users may experience COM PORT communication problems when moving from Bird's Eye Site Surveyor to Yellowjacket Data Logger in Pocket PC 2002. This may be remedied by simply pushing the reset switch on the bottom of the iPAQ. See Bird's Eye manual for more details.

The Yellowjacket SD Backup Installer card has been included as a courtesy. The card may be used to log data files onto. It can also be used on iPAQs that have never been initially set up at the BVS factory, have had files erased or damaged in the ROM or after a hard reset has been performed on an iPAQ. Yellowjacket software that has been erased/lost from RAM may be restored at anytime by accessing the "install" file from the SD Card or Storage Card directory. Always make sure batteries are fully charged when doing any software installs.


Yellowjacket software that has been erased from RAM may be restored at anytime by accessing the "reinstyj" file from the \\iPAQ File Store\\My Device directory.

# YELLOWJACKET PLUS BATTERY CHARGING INSTRUCTIONS

Please observe the two different battery status lights. When the amber status light on the iPAQ blinks, it is being charged and when it is on solid, it is fully charged. When there is no status light on iPAQ, there is no charge current. The charger status lights (label on back of charging station) only indicate the status of the Ni-MH battery pack inserted into the charger itself. Batteries may be charged using the charger station but NOT ALL AT THE SAME TIME. Insert battery pack (pull tab up) into charger only when charging the battery pack itself. A battery pack must NOT be inserted into charger when trying to power or charge the iPAQ's internal battery or the YellowjacketPLUS' internal battery pack. The included charger may only be used to charge the included Ni-MH battery pack. NOT Ni-CAD batteries. Batteries that are warm or hot to the touch (from constant usage or warm ambient temperatures) will take longer to charge than batteries of a normal temperature. Only use Ni-MH batteries with 1600 mAH or more rating. Expect over 500 cycles from each Ni-MH pack. Below are some popular charging configurations.




## Configuration 1 - charging YellowjacketPLUS removable battery pack and iPAQ internal battery

When the charger is plugged in and has power to it, this setup will power the Yellowjacket PLUS and simultaneously charge the iPAQ and internal battery pack (pack inside Yellowjacket PLUS unit).

Ni-MH battery pack is inserted

## Configuration 2 - charging removable battery pack inside charger

When the charger is plugged in and has power to it, this setup will only charge the battery pack inside the charger station. The Yellowjacket PLUS will operate in this configuration but will receive NO current for power or charging internal battery in iPAQ or internal battery pack (inside Yellowjacket PLUS).

Ni-MH battery pack is inserted

Avoid this configuration as it will charge only one battery pack (pack inside charger) and nothing else.

Ni-MH battery pack is inserted

Ni-MH battery pack is inserted

## What to do if the battery in the Ipaq computer completely dies and YellowJacket Plus software is erased

NOTE: If any of the following steps (installation) have been completed, proceed to the following step.

WHAT YOU WILL NEED:

1. YellowJacket Plus software CD
2. Compaq Ipaq software CD (for Microsoft ActiveSync)
3. XTNDAccess Infrared-USB driver CD
4. XTNDAccess Infrared-USB device
5. YellowJacket Plus
6. YellowJacket Plus recharging cradle
7. Windows-based computer with an available USB port

STEP 1: (CHARGE YELLOWJACKET PLUS)

Place YellowJacket Plus in charging cradle. Make sure it snaps into place. Attach AC power transformer into charger. Make sure orange light on Ipaq is flashing (means that you are charging the Ipaq).

STEP 2: (INSTALL MICROSOFT ACTIVESYNC)

Install Microsoft ActiveSync on your PC or laptop. Insert the Compaq Ipaq software CD. Find the installation setup program for ActiveSync and install onto your computer.

STEP 3: (INSTALL BAFO IR DEVICE)

Install BAFO infrared-USB device. Read the instructions for installing the device. The instructions come with the driver CD.

STEP 4: (CONNECT IR-USB DEVICE TO THE CHARGER)

Insert the IR end of the IR-USB device into the slot provided facing the infrared receptacle on the YellowJacket Plus on the charger base. Make sure the the USB end is connected to an available USB port on the host computer as directed by the BAFO installation instructions.

STEP 5: (CONNECT YELLOWJACKET PLUS TO HOST PC)

Make sure ActiveSync is running on your host computer (laptop or desktop). Check the connection settings option and make sure that the IR connection box is checked. This checkbox is for serial ports as well. Make sure the drop-down list is set to infrared port.

Press the START button on the YellowJacket Plus Ipaq. Click on ActiveSync. From the TOOLS menu on the bottom, choose the connect via IR option. Both the Ipaq and host PC should say CONNCTED after a few seconds. If not, check to make sure that the host PC is detecting another IR device by looking in the system tray near the clock on the bottom of the screen. If there is an icon showing an infrared device, try prssing the 'Get Connected' button on the host PC connection settings screen at the same time that you hit the 'connect via IR' on the Ipaq.

STEP 6: (INSTALL THE YELLOW JACKET PLUS SOFTWARE)

Insert the YellowJacket Plus software CD. After the autorun menu comes up, choose YellowJacket Plus 802.11a. After copying some file to a temporary directory, you will be prompted for installing the software on the Ipaq. Choose YES. It will take a couple of minutes for the software to load.

STEP 7: (RUN THE SOFTWARE)

Verify installation success by running the YellowJacket Plus software from the START menu on the Ipaq.

REMEMBER, ALWAYS CHARGE THE YELLOWJACKET PLUS WHEN NOT IN USE!!!

## TIPS

## BATTERY LIFE

**The Grasshopper™, Locust™, Yellow Jacket™ and Yellow Jacket Plus, Beetle™, Cricket™, and Cicada W-LAN receivers use 4 or 5 Ni-MH long-lasting "AA Cells".**

**1. Ni-MH batteries do not charge to full capacity the first time they are charged.**
**2. Ni-MH batteries do not charge to full capacity the first time they are charged after a long period of inactivity. or after a long period of non-use.**

**Cause:**

**When charging Ni-MH batteries for the first time after long-term storage, deactivation of reactants may lead to increased battery voltage and decreased capacity, (which causes premature termination of charging). Because batteries are chemical products involving internal chemical reactions, performance deteriorates with prolonged storage. This is normal in Ni-MH batteries.**

**Resolution:**

**Ni-MH batteries may not charge to full capacity the first time they are charged, or after a long period of inactivity.**

**The first-time charge of the Ni-MH Rechargeable Battery Pack should take approximately 2 hours. If the Receiver Dock light turns green, indicating a full charge, in less than 2 hours, repeat the charge cycle as follows:**

**First-time Charge:**

**1. To begin charging, place the instrument on the Charge Dock. Refer to your instrument's User Guide for details.**
**2. When the charge light turns green, remove the W-LAN Receiver from the dock and place back on the dock after several seconds.**
**3. Repeat steps 1 and 2 three or four times or until the combined charge time is 2 hours.**

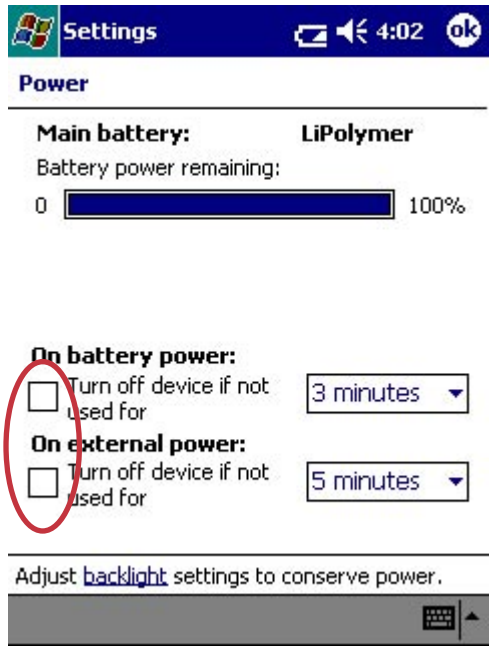
**Subsequent charges of the W-LAN Ni-MH Battery Pack will not require multiple charging cycles unless left uncharged for a long period of time (greater than 2 months).**

**NOTE: In order to prevent the Ipaq from freezing when running YellowjacketPLUS software (therefore rendering the power button useless), make sure to:**

**1. ALWAYS leave the checkboxes in the SETTINGS/SYSTEM/POWER screen unchecked. Power-save mode will lock up the application due to the fact that the application is stopped while communicating with the hardware..**

**2. Make sure that the battery level on the Ipaq remains above 40%. The serial card interface may cease to operate when the battery level is under 40%.**

**To resolve the freeze, simply press the soft reset button on the bottom of the Ipaq with the stylus.**




**In the PocketPC's OS, choose Settings and then choose System settings at the bottom. Select the battery icon for Power Settings to access this screen. These power settings come unchecked from the BVS factory to ensure Yellowjacketplus software runs optimally. Power must remain on during logging or else data might be corrupted.**

**NEVER LEAVE THE IPAQ ON FOR EXTENDED TIMES (10 HOURS OR GREATER) WITHOUT EXTERNAL POWER. ALWAYS SAVE ANY DATA AND THEN TURN OFF IPAQ (TOP RIGHT POWER BUTTON) WHEN NOT IN USE. NOT DOING SO WILL RESULT IN DAMAGE TO THE IPAQ'S INTERNAL BATTERY.**

## SOFTWARE INSTALLATION

### YELLOWJACKET SOFTWARE INSTALLATION FROM A SECURE DIGITAL (SD) CARD

Yellowjacket software comes pre-installed on your iPAQ, but as a courtesy, BVS includes a 128MB SD card containing a Yellowjacket software installer should you provide your own iPAQ or lose the factory installed files. This SD card may be used to store Yellowjacket data or other data.

Remember you must switch "lock" tab on side of SD card to "unlock" before storing or erasing any data.

To install the YellowJacket application from the SD card provided in the YellowJacket package, complete the following steps:

1. Insert SD card into the SD slot on the top of the iPAQ.
2. Using the stylus, tap on the "Start" button on the top of the screen.
3. Tap on "Programs" near the bottom of the menu.
4. Tap on the "File Explorer" folder.
5. Make sure that the shaded area on the top of the File Explorer says "My Device". If not, use the upside-down triangle next to the text to choose "My Device".
6. Tap on "SD Card".
7. Make sure that the shaded area on the top of the File Explorer says "SD Card". If not, use the upside-down triangle next to the text to choose "SD Card".
8. Choose your Yellowjacket receiver and iPAQ model for installation and tap on "install".
9. When the message "Installation is Complete" appears, you have successfully installed the application.

The YellowJacket application will be accessible by tapping on "Start" and then "Programs". Scroll down to the bottom and the YellowJacket application icon will appear.

## DRIVER INSTALLATION

The 24xx model iPAQ needs an updated driver for the Quatech serial card which interfaces to your BVS product. The driver installation program can be found in the "driver" directory of your product CD. Run this executable from your PC while the iPAQ is connected via ActiveSync. After installation, soft boot the iPAQ. Your product should be ready to go. Symptoms of an iPAQ needing this driver include loss of communication in a high-speed data transfer mode (such as spectrum on YellowJackets and Bumble Bee).

## SURVEYING

While surveying, Yellowjacket achieves the most accuracy when antenna is at a vertical 90 degree angle and completely perpendicular to the ground or floor as shown below.

## BVS CHAMELEON DATA CONVERSION UTILITY

### Introduction

The Chameleon application software is the universal data conversion and filtering tool for BVS Receivers.

The Chameleon was designed to greatly simplify the transfer of receiver data to many popular post-processing applications such as MapInfo and MS Excel.

The following sections of this document outline the various features of the Chameleon WLAN software.

### Installation

Installation of Chameleon is straightforward. Use the enclosed CD and follow the instructions.

### Starting the Application

Start Chameleon by clicking on the icon created by the installation utility. The main screen will show up. All steps for the conversion of data are taken from this screen.


**Chameleon WLAN Main Screen**

### Input File

The first step is the choosing of files for input and output. Choose the data file that is to be converted. The Chameleon will automatically determine which product created the file. Chameleon will display the product on the top of the screen. Then choose the name of the file to store the conversion results. By default, the filename for input will be chosen with a ".out" extension.

## Output Format

By selecting the appropriate post-processing application, the correct fields will be selected and placed in the field selection screen in the appropriate order. The user may also choose “none”. Whether or not the field titles are in the output can be selected.

Also, the delimiting character of the fields in the output file is chosen in this section.

## Output Field Selection

This section enables the selection of those fields that are to be placed in the output file. The individual fields for the data types will appear in the far right box when the data type is selected in the “selected” box.

## Conversion

The final step in the step-by-step process is the “conversion” section. Press the CONVERT button. The progress bar will be updated as the file is being processed. The speed of conversion will vary based on the size of the data file.

## YELLOW JACKET PLUS OPERATION WITH DOLPHIN™ SOFTWARE

**In order to get your YellowJacket Plus to interface with Dolphin real-time software, you must perform the following steps in the correct order:**

1. Start Dolphin software and create a geoset with your maps as outlined in the Dolphin manual. Enter the registration code for your hardware in the tools menu as outlined in the Dolphin registration letter in your package.

2. Make sure your YellowJacket Plus is locked into the charging cradle, the infrared device is connected to the USB port, and that the system tray on the host PC shows another infrared device is present.

3. Start your YellowJacket Portal software.

4. Start the YellowJacket Plus software on the YellowJacket Plus Ipaq device.

5. Go to the options menu in Yellowjacket and place a checkmark for 'Dolphin interface'.

6. Go back to the main menu and then enter the AP List screen.

You should now see GPS information on the YellowJacket Data Logger and on Dolphin.

**BVS Dolphin Real-Time Mapping Tool**
**User Manual**

**Minimum System Requirements**
**Pentium II**
**500 MHz**
**64MB RAM**
**100MB free on Hard Drive**
**Operating System: Windows 95, 98, ME, 2000**
**BVS GPS receiver interface: 1 free serial port:**

## INTRODUCTION

**The Dolphin real-time mapping tool is used as a companion to a BVS Receiver with GPS. This tool is used to display scanned points on a map at the location(s) scanned. The tool receives data from a BVS data logger that communicates with the BVS receiver.**

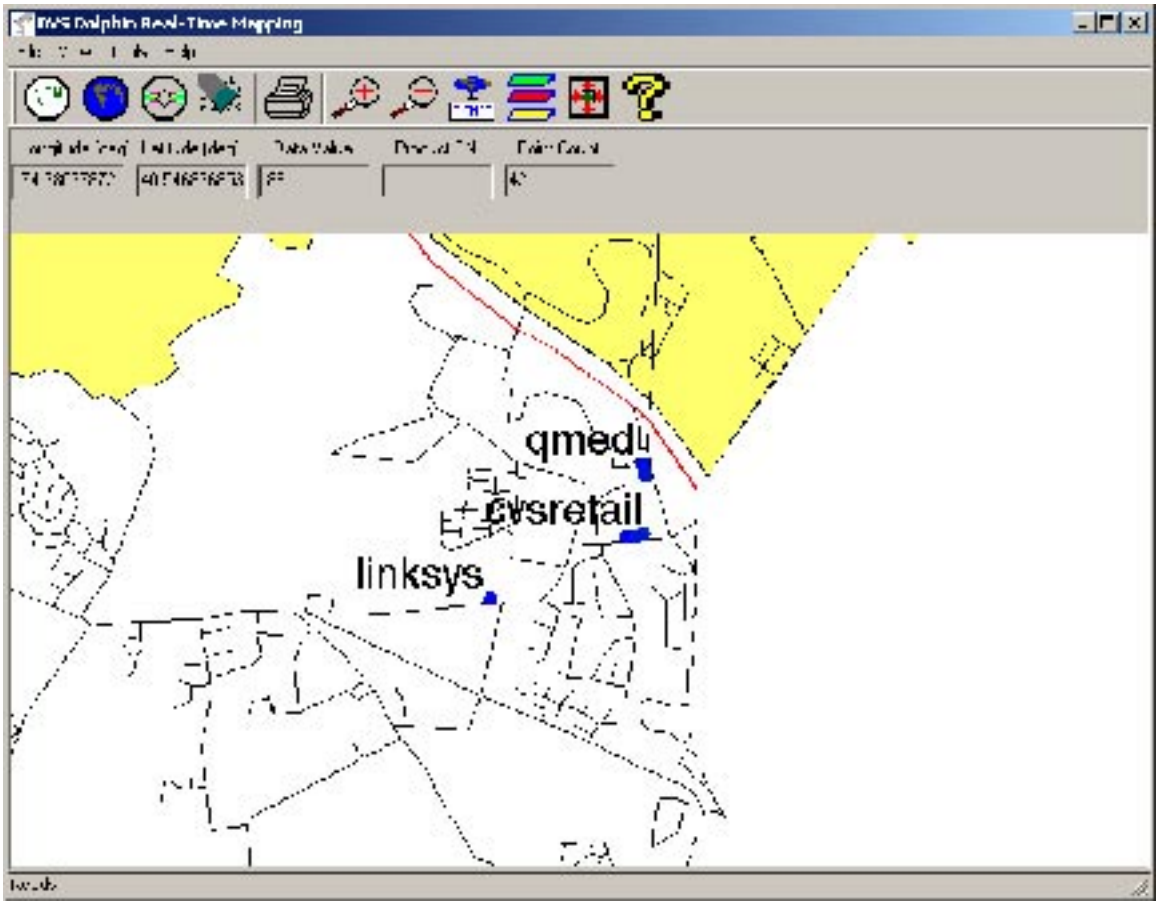



**FIGURE 1 – BVS DOLPHIN**

## OVERVIEW

**The Dolphin software receives data from the data logger for the individual product (see Figure 2). For example, if the Fox is the product, it would talk to the Fox Data Logger running on the PC. At the same time, the Dolphin software would also be running on the PC.**

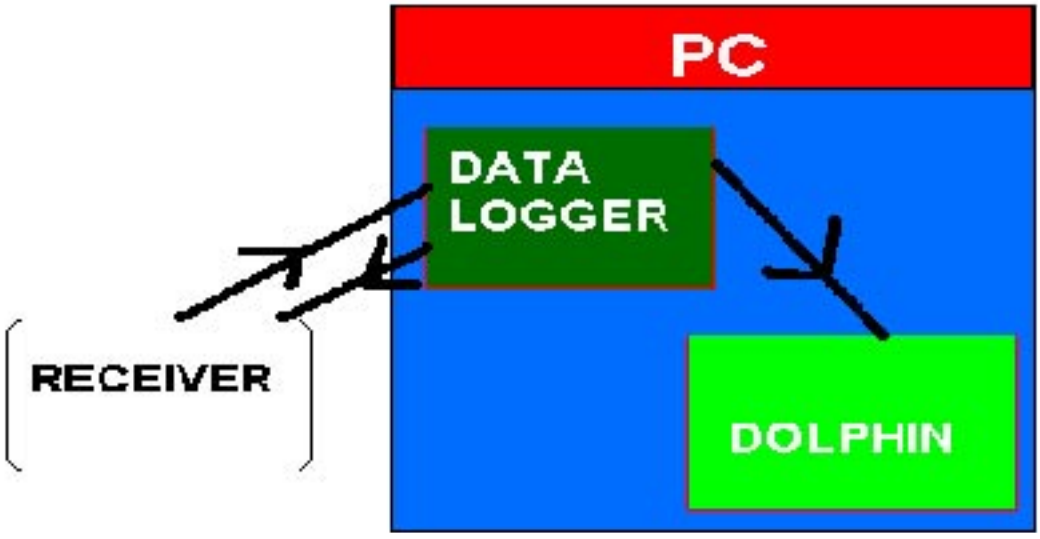



**FIGURE 2 – DOLPHIN DATA FLOW**

**The Fox Data Logger would send data in a Windows message that includes information wished to be stored on the map as well as the GPS coordinates last stored by the data logger from the unit.**

**The information received would then be displayed on the Dolphin screen in the form of a colored circle. If text were also passed, it would be displayed next to the circle. The color of the circle represents the level of the data value (usually RSSI).**

**This process continues until the data logger or the receiver is terminated.**

**QUICK START**

**The following steps will guide you through setup and use of the Dolphin tool.**

**1. Make sure you have the product (e.g. Fox) connected to a serial port or USB port and turned on.**

**2. Make sure the GPS antenna is attached and GPS mode is enabled.**

**3. Start the Dolphin software. When using the Dolphin for the first time with this product, you must enter the registration code in order to receive data. See 'REGISTRATION' below.**

**4. Open an existing geoset or create a new geoset. See 'CREATING A GEOSET' or 'OPENING A GEOSET'.**

**5. Add layers to your geoset corresponding to the appropriate maps of the area that you are surveying.**

**6. Start the data logger for the product. Make sure any necessary steps to enable Dolphin connectivity from the data logger have been taken. Some products don't require any steps but others have an option to check for Dolphin connectivity.**

**7. You should now see data populating the maps. Some products output data at different rates. Some 802.11a products only produce data when a new AP is found.**

**REGISTRATION**

**When using Dolphin with a product for the first time, the product must be registered with Dolphin. There is a registration letter that ships with Dolphin that shows the registration code to use to work with the**

product purchased. This code is matched against the serial number of the unit for verification. Use the TOOLS/PRODUCT REGISTRATION menu option to enter the correct code. This only needs to be done once and is stored in a file for recall on future uses.

**DISPLAY FIELDS**

Certain fields are displayed as data records come into the Dolphin system. These fields are (from left to right):

Longitude (in decimal degrees)
Latitude (in decimal degrees)
Data Value (usually RSSI in dBm)
Product Serial Number
Point Count (current count of points plotted on the map)

These always reflect the last data record to come into the Dolphin system.

**CREATING/OPENING A GEOSET**

When starting up the Dolphin system, a Geoset must be open in order for the data points coming in to be properly attached to map layers. You can open an existing geoset or create a new geoset.

An existing geoset will have the map layers already set up. When creating a new geoset, the layer dialog will appear. Choose layers from the maps that were purchased for use with the Dolphin. There will already be a 'DOLPHIN' layer. DO NOT REMOVE this layer. This is needed to store the data points.

After choosing the map layers, the geoset is now ready to accept points.

NOTE: The maps may not be visible until the first data point comes in to center the coordinates.

**SAVING A GEOSET**

Pressing the toolbar button that looks like a spinning CD allows you to save the geoset loaded. Save it to any filename for use in later Dolphin sessions.

NOTE: Data points will not be saved. Only the map layers.

**CLEARING DATA POINTS**

If you wish to clear the existing data from the geoset at any time, use the toolbar button that appears to be an eraser wiping off data. The next point taken in will be considered the first point again.

**PRINTING A MAP**

You may print out a copy of the map by pressing the printer icon on the toolbar.

**ZOOM MODE**

You may zoom in or out on the map by selecting the magnifying glass icon with a '+' sign for zooming in or a '-' sign for zooming out. This will turn the cursor into the appropriate magnifying glass. Simply click on the area to zoom in/out on and the map will adjust accordingly.

**SAVE AS BITMAP**

The map may be exported to a bitmap format by selecting the icon on the toolbar with a globe on the top and the word 'BITMAP' on the bottom.

**LAYER DIALOG**

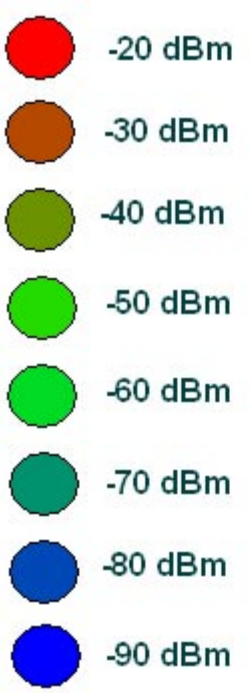
**The layer dialog is used to add or remove layers from the geoset. Layers can include landmarks, streets, water, etc. Choose the layers for the appropriate driving area from the maps that were purchased for use with the Dolphin.**

**RECENTERING FREQUENCY**

**The re-centering frequency icon looks like four arrows heading in from a square on the toolbar. This lets you choose how often you would like the map re-centered on the current point.**

**Depending on the rate of data coming into the Dolphin, the re-centering of the map may start to slow down the system and/or cause flicker. This option allows you to limit the number of times the screen is recentered.**

# Dolphin / Yellowjacket PLUS Signal Strength Legend



## Networking Basics

### Packets and traffic

Information travels across a network in chunks called "packets." Each packet has a header that tells where the packet is from and where it's going, similar to what you write on the envelope when you send a letter. The flow of all these packets on the network is called "traffic."

### Hardware addresses

Your PC "listens" to all of the traffic on its local network and selects the packets that belong to it by checking for its hardware address in the packet header or MAC (Media Access Control). Every hardware product used for networking is required to have a unique hardware address permanently embedded in it.

### IP addresses

Since the Internet is a network of networks (connecting millions of computers), hardware addresses alone are not enough to deliver information on the Internet. It would be impossible for your computer to find its packets in all the world's network traffic, and impossible for the Internet to move all traffic to every network, your PC also has an IP (Internet Protocol) address that defines exactly where and in what network it's located. IP addresses ensure that your local Ethernet network only
receives the traffic intended for it. Like the hierarchical system used to define zip codes, street names, and street numbers, IP addresses are created according to a set of rules, and their assignment is carefully administered.

Put another way, the hardware address is like your name; it uniquely and permanently identifies you. But it doesn't offer any clues about your location, so it's only helpful in a local setting. An IP address is like your street address, which contains the information that helps letters and packages find your house.

### Rules for Sending Information (Protocols)

A protocol is a set of rules that define how communication takes place. For instance, a networking protocol may define how information is formatted and addressed, just as there's a standard way to address an envelope when you send a letter.

### Networking Devices:

### Bridges

A bridge joins two networks at the hardware level. This means that as far as other protocols are concerned, the two networks are the same.

### Routers

A router connects two IP networks. In contrast to a bridge, which joins networks at the hardware level, a router directs network IP traffic based on information stored in its routing tables. A routing table matches IP addresses with hardware addresses. The router stamps each incoming IP packet with the hardware address that corresponds to that IP address. As a result, the packet can be picked up by the right computer on the hardware network.

### DNS (Domain Name Server)

Networks (domains) on the Internet have names that correspond to their IP addresses. A Domain Name Server maintains a list of domain names and their corresponding addresses. This is why you can go to Berkeley's Web site by entering www.bvsystems.com, instead of the IP address.

### Networking Terms:

**TCP/IP (Transport Control Protocol/Internet Protocol)**

**TCP/IP is a collection of protocols that underlies almost every form of communication on the Internet.**

**DHCP (Dynamic Host Control Protocol)**

**DHCP is a method of automatically assigning IP addresses. Instead of assigning addresses to individual users, addresses are assigned by the DHCP server when clients need them. This means that instead of entering several fields of long addresses, users need only to select DHCP as their configuration method for IP networking.**

**PPP (Point-to-Point Protocol)**

**PPP is the most common protocol for providing IP services over a modem.**

**NAT (Network Address Translation)**

**NAT is used to share one IP address among several computers. A device set up as a NAT router uses a collection of "private" IP addresses (in the range 10.0.1.2 to 10.0.1.254 for example) to allow several computers to access the Internet using one "public" IP address. When a computer using a private IP address requests information from the Internet, the NAT router keeps a record of the computer making the request, and sends the information to the Internet using its own IP address. When the response comes back from the Internet, the NAT router forwards the packet to the appropriate computer.**

## Accessories for your YELLOWJACKET PLUS

5 GHz Antenna
SMA connector
P/N SMA-001
$ 25.00

GPS Receiver
Internal 12-channel
GPS receiver
(BVS factory installed)
P/N YJP-GPS
$ 1000.00

Rugged Carrying Case
ABS Plastic
P/N P-CASE
$ 100.00

GPS Antenna
GPS magmount active antenna
with SMC male connector
P/N GPS-SMC
$ 45.00

Direction Finding Antenna
with mounting bracket,
cable & type N SMA male
9 dBi gain
P/N DFA-001
$ 250.00

Ni-MH Battery Charger with
switching transformer
P/N NIMH-000
$ 105.00

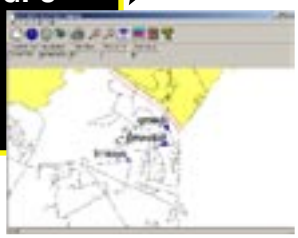
IrDA USB Adapter
wireless data transfer Adaptor
P/N IRDA-000
$ 125.00

Ni-MH Battery Pack
5 AA 7.5 V
P/N NIMH-005
$ 45.00

Hive Indoor Mapping Software
P/N 0075-BE
$ Call for Pricing

DC PowerCable Pack
Cigarette Lighter Adaptor
P/N 002NIMH
$ 50.00

Dolphin Realtime GPS
Mapping Software
P/N 0038-DOLP
$ Call for Pricing



# Hive™

## Yellowjacket Indoor 802.11 Wi-Fi Mapping Software

***Hive™*** is powerful mapping software that works with Berkeley's Yellowjacket 802.11 (B, A or B/G) Wi-Fi receiver system. ***Hive™*** runs on iPAQ® Pocket PC® allowing site surveys to be performed completely **INDOORS** and outdoors using real-time mapping coverage technology. No GPS reception needed. Simply walk through an office space, warehouse or multi-floor building - any interior space that needs to be surveyed - and take Access Point measurements. Next, place those measurements on top of any structural floorplan to get a comprehensive, bird's eye view of any WLAN based upon MAC addresses, RSSI, SSID and more. Export AutoCAD files into ***Hive™*** powerful floorplan Site Initiator and scale your rooms and walls for measurement overlays. All measurements can be transferred, stored, displayed and printed using any PC running Windows 98, 2000, ME or XP OS.

### 1 Create your floorplan: Site Initiator

Create floorplan layouts using bitmaps on any PC

Add rooms, floors, walls, and other clutter

Import existing floorplans for modification and surveys


Survey floorplans on a PocketPC. Create and organize survey maps on a PC.

### 2 Take your AP measurements: Site Supervisor

Touch-screen measurement points using PocketPC®

Customizable surveys based on MAC, RSSI, SSID

Export floorplans from AutoCAD® or any bitmap

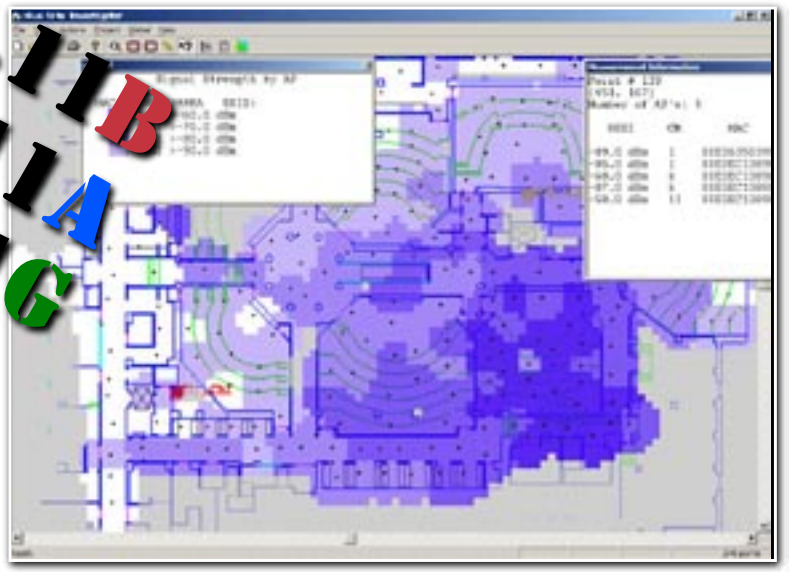
### 3 Organize and plot your coverage: Site Investigator:

Plot coverage by AP or AP groups

Save and print color plots of survey layout and collected data

Propagation data can be studied after or during any 802.11 survey

802.11B
802.11A
802.11G



Call us today for more information on Hive software:
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Internet: www.bvsystems.com
E-mail: info@bvsystems.com

wireless products
BERKELEY VARITRONICS SYSTEMS

# Glossary of Acronyms

| | |
|---|---|
| AC | Alternating Current |
| A/D | Analog to Digital converter |
| AGC | Automatic Gain Control |
| AP | Access Point |
| Applet | a small Application |
| BER | Bit Error Rate |
| BPSK | Binary Phase Shift Keying |
| BSS | Basic Service Set |
| 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 |
| DSSS | Direct Sequence Spread Spectrum |
| ESS | Extended Service Set |
| FHSS | Frequency-Hopping Spread Spectrum |
| FIR | Finite Impulse Response |
| GHz | GigaHertz |
| IF | Intermediate Frequency |
| I and Q | In phase and Quadrature |
| IBBS | Independent Basic Service Set |
| IrDA | Infrared Data Association |
| kHz | kiloHertz |
| LCD | Liquid Crystal Display |
| LO | Local Oscillator |
| MAC | Medium Access Control |
| Mbits | Megabits |
| MHz | MegaHertz |
| NIC | Network Interface Card |
| OFDM | Orthogonal Frequency Domain Multiplexing (802.11a) |
| PC | Personal Computer |
| PCS | Personal Communications Service (1.8 to 2.1 GHz frequency band) |
| PER | Packet Error Rate |
| PN | Pseudo Noise |
| QPSK | Quaternary Phase Shift Keying, 4-level PSK |
| RF | Radio Frequency |
| RSSI | Receiver Signal Strength Indicator |
| SSID | Service Set IDentification |
| STA | STAtion (generally a laptop WLAN card) |
| UCT | Universal Coordinated Time |
| VAC | Volts Alternating Current |
| VGA | Video graphic |
| WEP | Wired Equivalent Protocol |
| WLAN | Wireless Local Area Network |

**IMPORTANT SAFETY INSTRUCTIONS**

**When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:**

**1)Read and understand all instructions.**

**2)Follow all warnings and instructions marked on the product.**

**3)Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.**

**4)Do not use this product near water, for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.**

**5)Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.**

**6)Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating these openings must not be blocked or covered The openings should never be blocked by placing the product on the bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.**

**7) This product should be operated only from the type of power source indicated on the appliance. If you are not sure of the type of power supply to your home, consult your dealer or local power company.**

**8)Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.**

**9)Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.**

**10)Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.**

**11) To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified service facil4 when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the appliance is subsequently used.**

**12)Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:**

**A) When the power supply cord or plug is damaged or frayed. B) If liquid has been spilled into the product.**

**C)If the product has been exposed to rain or water.**

**D) If the product does not operate normally by following the operating instructions. Adjust only those controls, that are covered by the operating instructions because improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.**

**E) If the product has been dropped or the cabinet has been damaged. F) If the product exhibits a distinct change in performance.**

**13)Avoid using the product during an electrical storm. There may be a remote risk of electric shock from lightning.**

**14)Do not use the telephone to report a gas leak in the vicinity of the leak.**

**INSTALLATION INSTRUCTIONS**

**1. Never install telephone wiring during a lightning storm.**

**2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.**

**3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.**

**4. Use caution when installing or modifying telephone lines.**

**INSTRUCTION FOR BATTERIES**

**CAUTION: To Reduce the Risk of Fire or Injury to Persons, Read and Follow these Instructions:**

**1. Use only the type and size of batteries mentioned in owner's manual.**

**2. Do not dispose of the batteries in a fire. The cells may explode. Check with local codes for possible special disposal instructions.**

**3. Do not open or mutilate the batteries. Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.**

**4. Exercise care in handling batteries in order not to short the battery with conducting materials such as rings, bracelets, and keys. The battery or conductor may overheat and cause burns.**

**5. Do not attempt to recharge the batteries provided with or identified for use with this product. The batteries may leak corrosive electrolyte or explode.**

**6. Do not attempt to rejuvenate the batteries provided with or identified for use with this product by heating them. Sudden release of the battery electrolyte may occur causing burns or irritation to eyes or skin.**

**7. When replacing batteries, all batteries should be replaced at the same time. Mixing fresh and discharged batteries could increase internal cell pressure and rupture the discharged batteries. (Applies to products employing more than one separately replaceable primary battery.)**

**8. When inserting batteries into this product, the proper polarity or direction must be observed. Reverse insertion of batteries can cause charging, and that may result in leakage or explosion. (Applies to product employing more than one separately replaceable primary battery.)**

**9. Remove the batteries from this product if the product will not be used for a long period of time (several months or more) since during this time the battery could leak in the product.**

**10. Discard "dead" batteries as soon as possible since "dead" batteries are more likely to leak in a product.**

**11. Do not store this product, or the batteries provided with or identified for use with this product, in high-temperature areas. Batteries that are stored in a freezer or refrigerator for the purpose of extending shelf life should be protected from condensation during storage and defrosting. Batteries should be stabilized at room temperature prior to use after cold storage.**

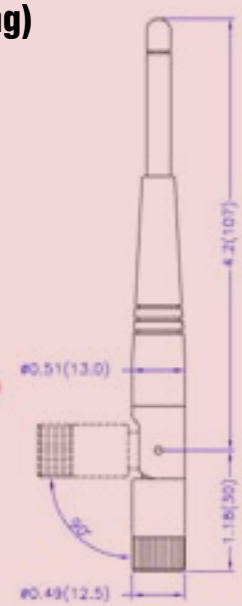
## 5 GHz Omni-Directional (5.5” long)

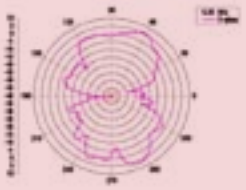
Electrical Properties:

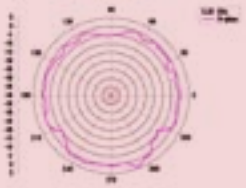
| | |
|---|---|
| Frequency Range: | 5.15~5.35 GHz |
| Impedance: | 50Ω nominal |
| VSWR: | <2.0:1 |
| Gain: | 5 dBi |
| Radiation: | Omni |
| Polarization: | Vertical |

Mechanical Properties:

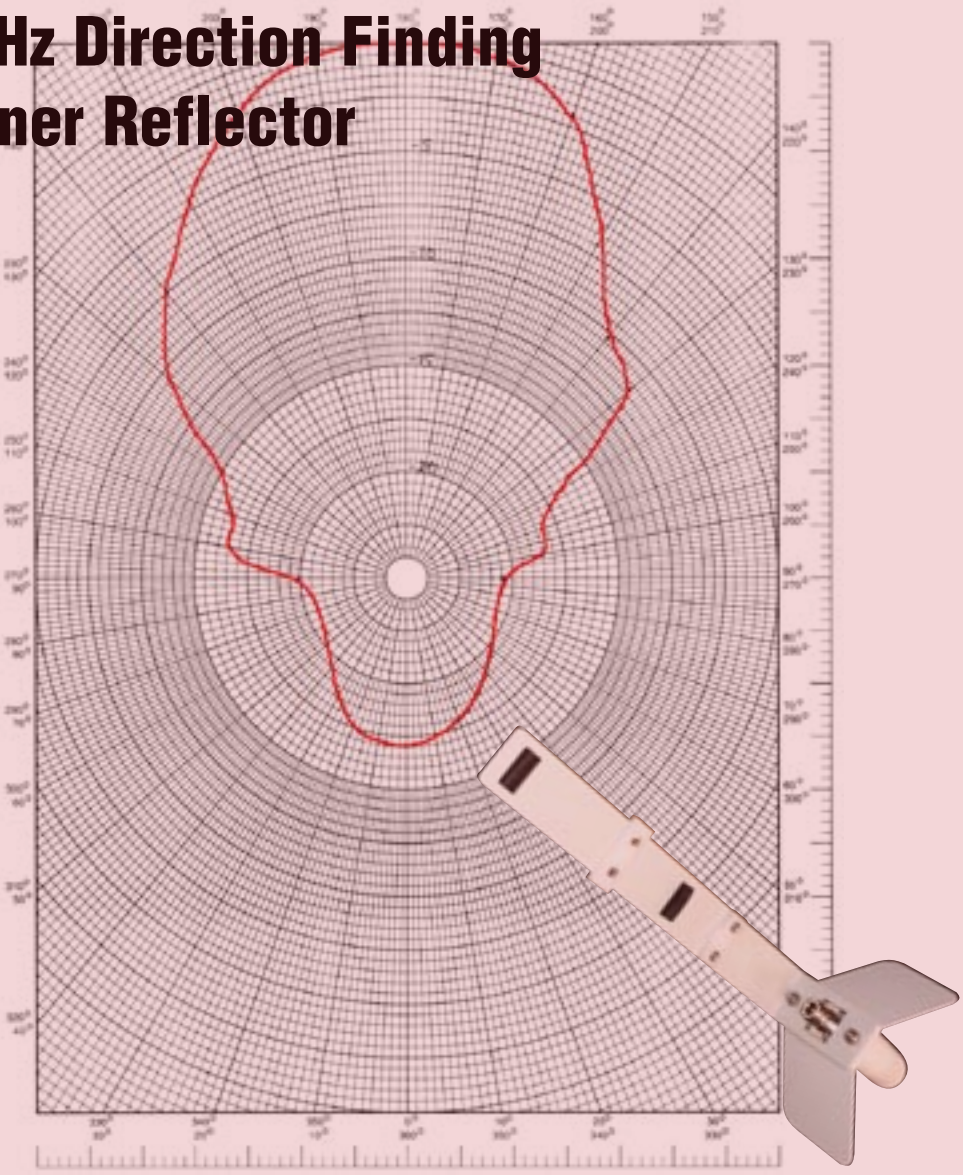
| | |
|---|---|
| Connector: | SMA Plug(male) |
| Material: | |
| Whip: | Polyurethene(Black) |
| Swivel Mechanism: | Polycarbonate(Black) |
| Connector: | Brass with black chrome plating |
| Operation Temp.: | -20°C to +65°C |
| Storage Temp.: | -30°C to +75°C |





## 5 GHz Direction Finding Corner Reflector



# YELLOWJACKET™ PLUS A

## 802.11a Wi-Fi Analysis System

***Yellowjacket™*** **PLUS 802.11a is a wireless receiver designed to work with HP's iPAQ® PocketPC® (built-in) in sweeping, analyzing and optimizing 5 GHz Wireless Local Area Networks. The receiver measures 8 OFDM network channels which operate on the *IEEE 802.11a* standard allowing the user to determine the AP's MAC address, SSID and RSSI signal levels for locating and optimizing access points of neighboring WLANs. *Yellowjacket™* 802.11a system uses a custom receiver, custom software and interfaces with the iPAQ series giving Yellowjacket the distinction of being the only true RF analysis and direction finding tool accurate to within 1 dB. Berkeley's 5 GHz calibrated receiver measures 8 OFDM network channels operating on the *IEEE 802.11a* standard identifying all access points on or off any 802.11a WISP or Hotspot. *Yellowjacket™* PLUS 802.11a also contains an optional internal 12-channel GPS receiver for geo-coding of all 802.11a measurments taken.**

# 802.11a


## FEATURES:

- Measure 5 GHz coverage for (OFDM) WLANs (IF wideband 22 MHz) within the **IEEE 802.11a** standard
- Receive, filter and process DSSS studies all in Windows CE®
- 64K color backlit display for real-time color-coded signal analysis
- Touch screen, Windows® PDA-like interface using a stylus pen
- Integrated HP IPAQ® PocketPC® PDA
- Measures RSSI (narrow band & total channel power)
- Complex Access Point Analysis including RSSI, Absolute Channel, Survey Sweep and SSID
- FER (system-wide)
- JPEG snapshot any screen instantly for later analysis
- Optional internal 12-channel GPS receiver available
- Optional Dolphin™ Real-time GPS mapping software available
- Removable battery pack (5 AA Ni-MH cells) and also can be powered from 12VDC car cigarette lighter

### YellowjacketPLUS Measurements:

- ✔ MAC
- ✔ SSID
- ✔ Total Channel Power
- ✔ Narrowband RSSI
- ✔ Survey Sweep
- ✔ AP Manufacturer's ID
- ✔ LAT/LONG/ALT/UTC via GPS

**Yellowjacket 802.11a scans and displays all APs listing them by channel, MAC, SSID and RSSI.**

**Call us today for more information:**
**(732) 548-3737 / Fax: (732) 548-3404**
**Internet: www.bvsystems.com**
**E-mail: info@bvsystems.com**

wireless products
BERKELEY VARITRONICS SYSTEMS

# YELLOWJACKET™ PLUS A

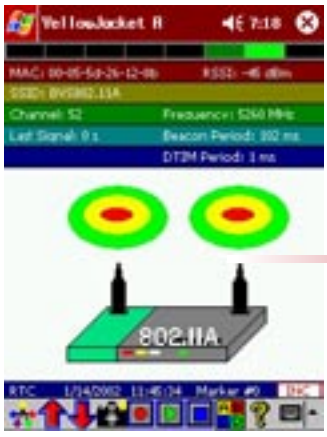
## 802.11a Wi-Fi Analysis System

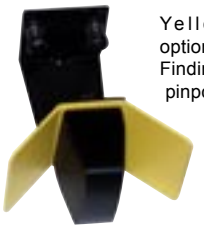
| | |
|---|---|
| **BANDS SUPPORTED** | U-NII lower band (5.180 - 5.240 GHz) (channel numbers 36,40,44,48) |
| | U-NII middle band (5.260 - 5.320 GHz) (channel numbers 52,56,60,64) |
| **RF SENSITIVITY (Wide Band)** | -20 to -90 dBm |
| **RSSI MEASUREMENT (Narrow Band)** | -30 to -90 dBm @ 156 kHz resolution bandwidth |
| **TUNING INCREMENTS** | Tunes 8 channels (36,40,44,48,52,56,60,64) |

### RECEIVER GENERAL SPECIFICATIONS

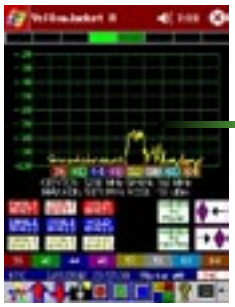
| | |
|---|---|
| IF Bandwidth: | Wideband 22 MHz |
| Stability: | ± 2.5 PPM Temp range 32° to 120 F° |
| Antenna: | SMA Female 50 ohm |
| Controls: | iPAQ PocketPC PDA |
| Warm Up Time: | < 3 minutes |
| Power: | Internal battery power (4 AA Ni-MH batteries in receiver) |
| Weight: | 3 lbs. |
| Dimensions: | 2” H x 4” W x 9” L (water resistant, high impact ABS plastic case) |


YellowjacketPLUS™ output data supports Microsoft Excel spreadsheets as well as Berkeley’s own Hive™ Real-time Indoor/Outdoor Mapping solution on iPAQ PocketPC®. No GPS required.



Yellowjacket’s optional Direction Finding Antenna pinpoints WLAN hackers and specific sources of interference.



### YELLOWJACKET FEATURES:

**SPECTRUM MODE:**
- Full spectrum (8 channel) sweep
- Single channel zoom
- Peak Search and Hold
- 3 distinct waveform signal traces

**AP ANALYSIS:**
- Survey sweep of all channels
- Individual channel analysis
- Absolute channel
- SSID
- AP manufacturer’s ID
- RSSI in true dBm
- “Geiger Mode” for direction finding individual APs

**NETWORK SECURITY:**
- Authorize or Unauthorize up to 1000 MAC addresses
- Generate valid AP list automatically
- Upload AP list from PC
- Flag invalid APs as “suspect”

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