Guide to Using the Trimble® Juno™ ST & Pendragon® Forms

Mapping Terrestrial Invasive Plants
Using Pendragon® Forms Software on
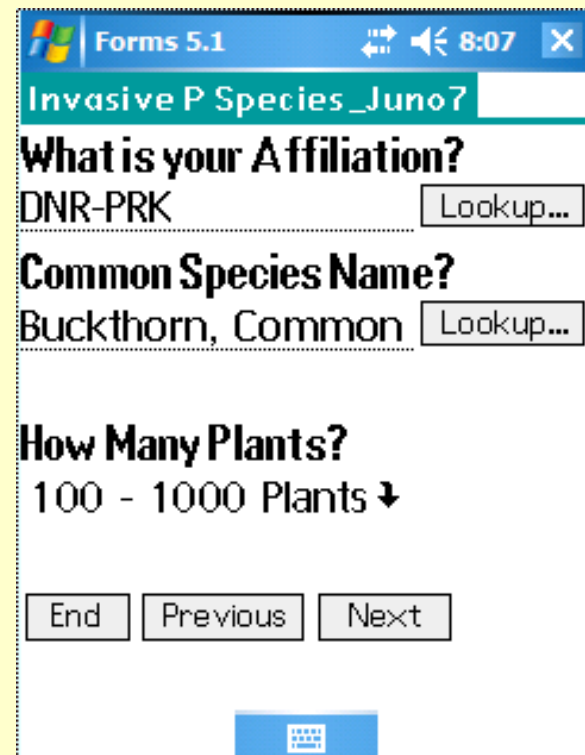## a Handheld PC

Credits

- Graphics and Text from Trimble® Juno™ ST PDF User Guide
- Screen Captures from Juno™ ST Handheld and Pendragon® Forms Software

Current Recommended Standard Data Collector and Software for MNDNR Terrestrial Invasive Data Collection

Juno™ ST

Pendragon® Forms

Division Leads for Invasive Data Collection

- ECO – Ann Pierce
- FOR –
- TAW – Dave Lonetti
- PRK – Ron Danielson
- WLD – Bruce Anderson
- FSH -

Trimble® Juno™ ST

- Powerful Handheld Computer
- Integrated GPS
- Relatively Cheap
- Windows Mobile Operating System
- Runs a Wide Variety of Software including ArcPad

Pendragon® Forms

- Easy to Use Data Entry Form

- MS Access Database

- GPS Compatible

- GPS Point Data Only

- Send Data to Server Via-Internet

Introduction to Juno ST

Basic Operation of the Juno ST

Before using the Juno™ ST it is recommended that you read through the user manual on the CD to familiarize yourself with the basic operation of the unit.
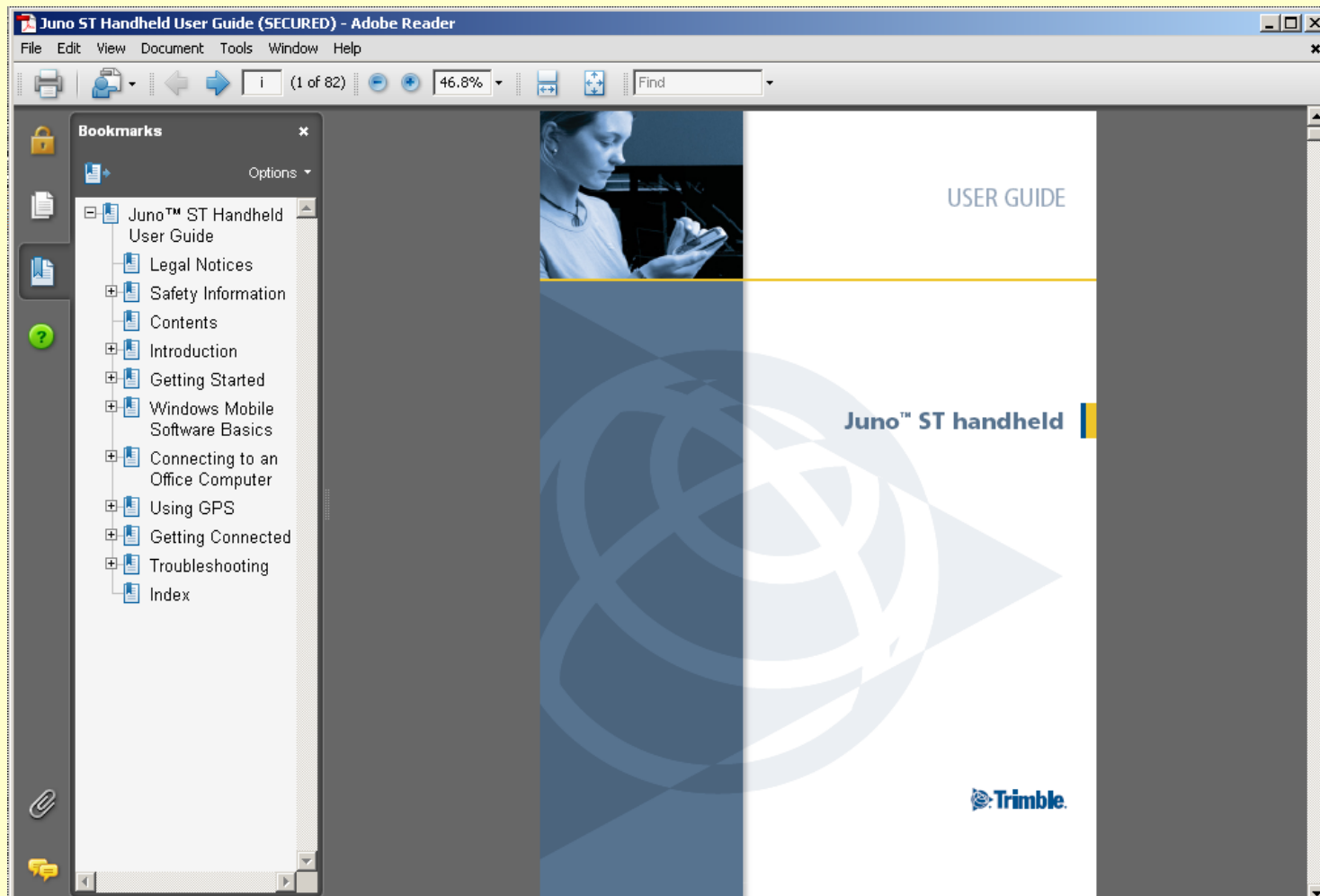
Getting Started

- Once you have purchased the software and hardware, your division lead will help you with setup
- Your division lead will also give you brief training on the operation of the equipment
- This presentation will touch on the basic operation of the unit and software
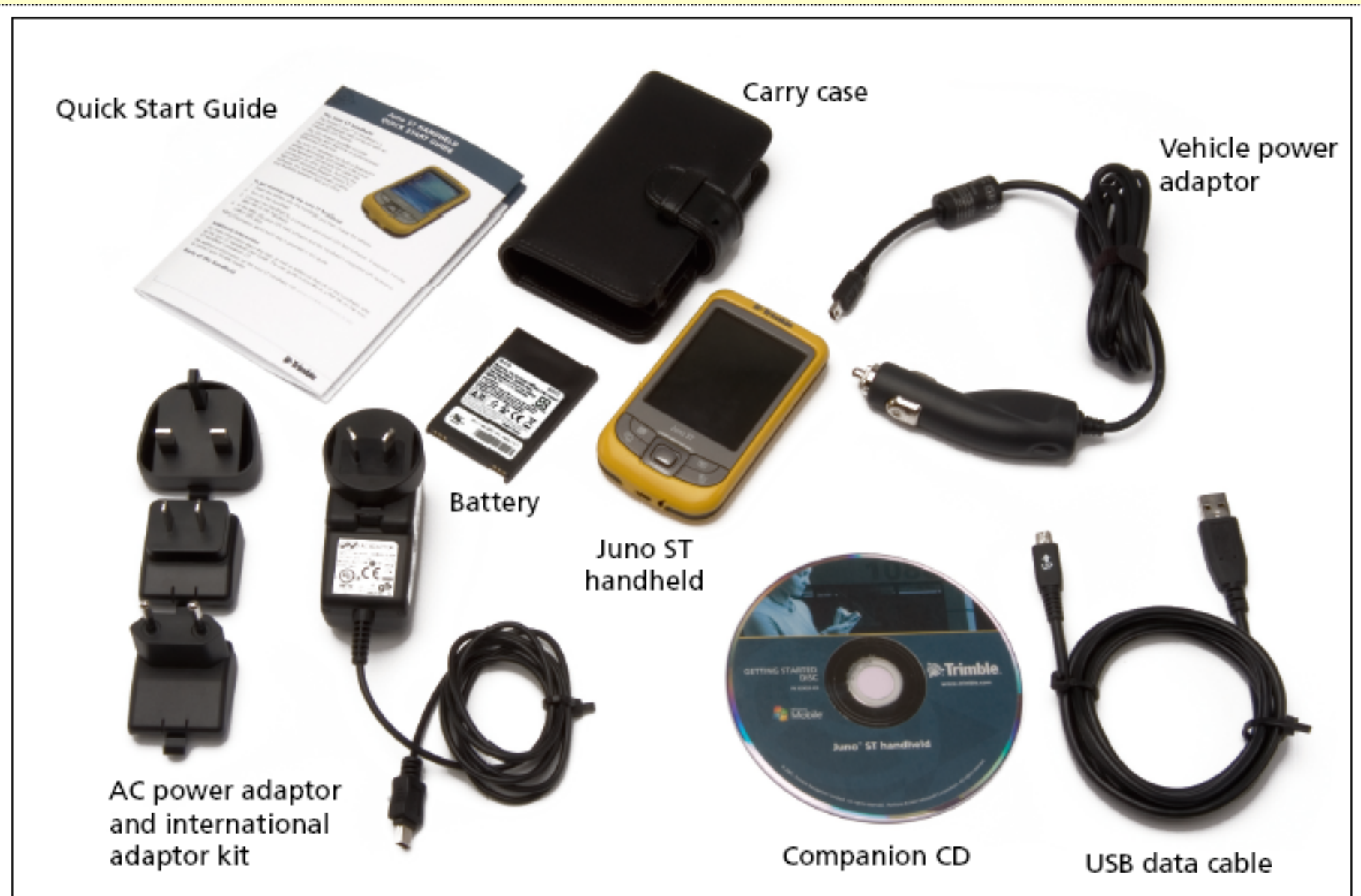- Refer to the manuals for more specifics

Quick Start Guide

Carry case

Vehicle power adaptor

Battery

Juno ST handheld

AC power adaptor and international adaptor kit

Companion CD

USB data cable

Figure 1.1   Items included with the Juno ST handheld

Use and care of the handheld

The Juno ST handheld is a non-rugged device. To protect it when not in use, Trimble recommends storing the handheld in the carry case provided.

When using the handheld:

- Keep the outer surface free of dirt and dust.

- Keep the external antenna port and the SD memory card slot free of dirt and dust (see Using an SD memory card, page 29).

- Protect the touch screen by using the stylus provided and avoid using excessive pressure and sharp or abrasive objects.

- Be careful not to drop the handheld or subject it to any strong impact. Do not place the handheld in your back pocket.

- Protect the handheld from extreme temperatures. For example, do not leave the handheld on the dashboard of a vehicle.

- The handheld is not waterproof. Do not expose the handheld to rain or moisture.

To clean the handheld, wipe it with a clean dry cloth. Do *not* immerse the handheld in water.

Waterproof Cases Available

Aquapac 100% Waterproof

$22.50

OtterBox 2600 PDA Case

Price: $49.95

Storage

If you are not going to use the handheld for three months or more, Trimble recommends that you:

1. Transfer any data that you need to a desktop computer (see Connecting to an Office Computer, page 41).

2. Press the **Power** button to turn off the handheld.

3. Store the handheld in a cool, dry place.

If the handheld has been stored for longer than six months, charge the battery before use (see Powering the handheld, page 22).

Headset connector

Touch screen

Start

Thursday 3:48 PM
January 25, 2007

Owner: Seaview GIS

No unread messages

1 Active task

Tomorrow: Project X status meeting
9:00AM-10:00AM

Tap here to sign in to Pocket MSN!

Calendar **Contacts**

Juno ST

Calendar application button

Contacts application button

Today screen button

Messaging application button

Directional button

Microphone (under keypad)

Power/USB socket

Figure 2.1　Juno ST handheld – Front view

External GPS antenna connector

Power button

Stylus (pull out)

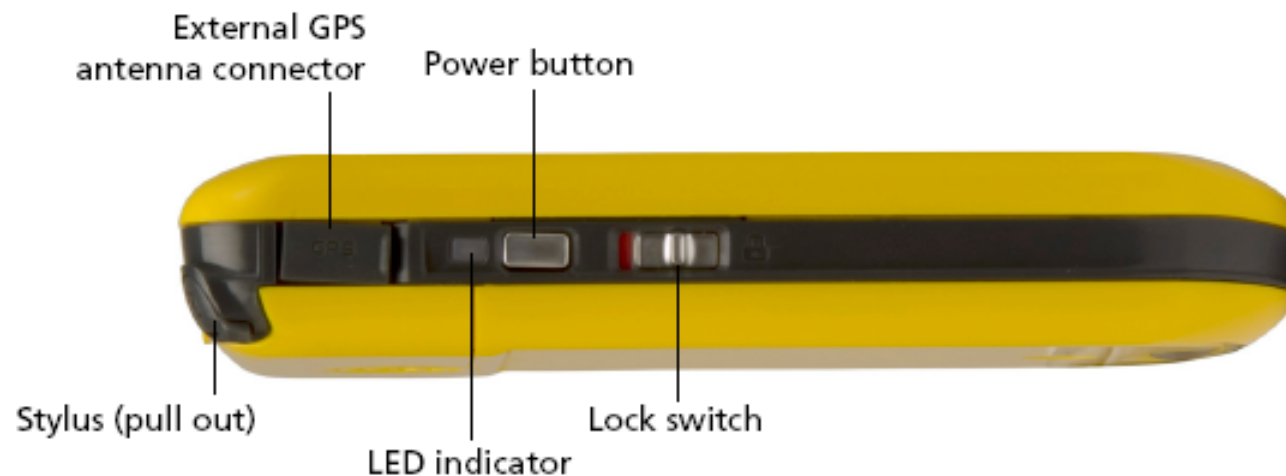LED indicator

Lock switch

Figure 2.2   Juno ST handheld – Left view

Turning on the handheld

If the screen on the handheld is blank, the handheld is turned off. To turn on the handheld:

1. Make sure the handheld is not locked. The **Lock** switch should be in the up (Unlock) position. A red bar is visible on the Lock switch when it is in the locked position.

2. Press the **Power** button briefly.

To turn off the handheld, press the **Power** button briefly again.

To turn off the backlight while the handheld is turned on, press and hold the **Power** button for approximately two seconds.
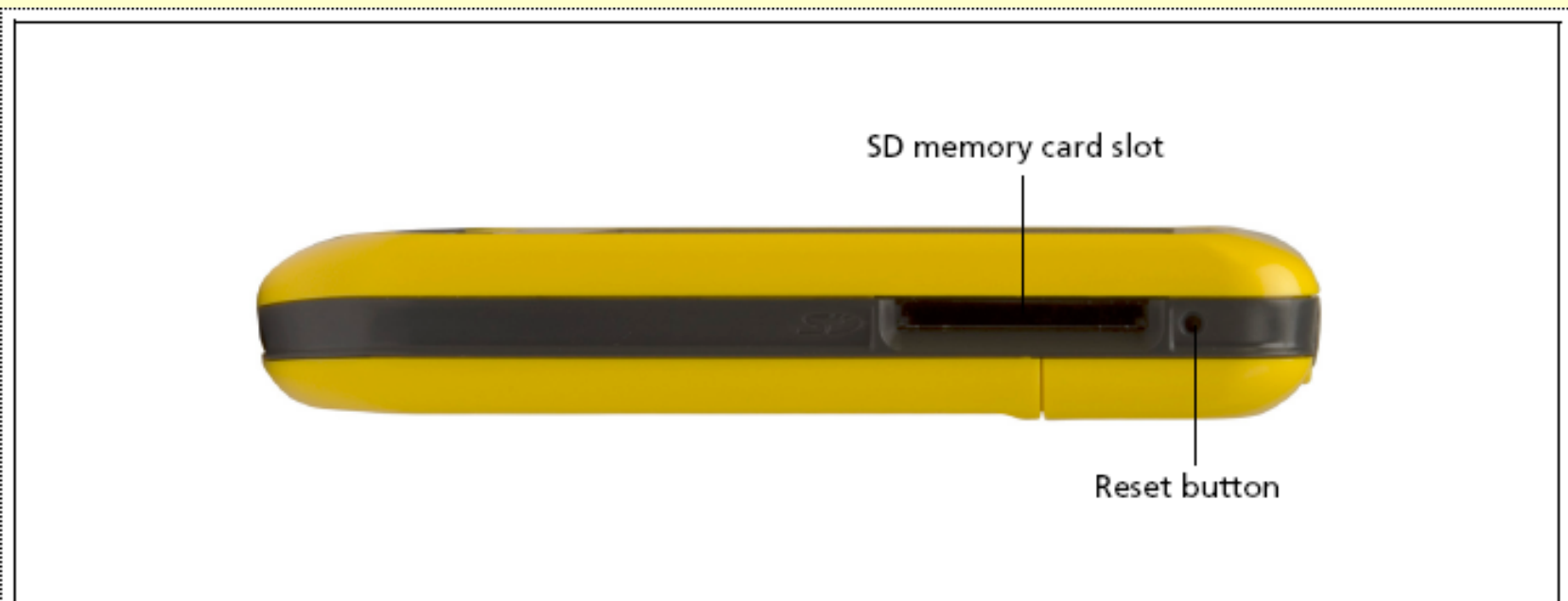
SD memory card slot

Reset button

Figure 2.3   Juno ST handheld – Right view

Resetting the handheld

If the screen on the handheld is blank, the handheld has turned off. Press the **Power** button to turn on the handheld.

If the handheld stops responding to the stylus, or if it does not respond when you press any of the keypad buttons, you may need to reset it. First, try a soft reset. If the handheld does not respond, perform a hard reset.

You can also reset the handheld to its factory default settings.

When the handheld 'freezes up' or does not respond as expected to stylus input – perform a reset…..

Performing a soft reset

Figure 2.6   Performing a soft reset

A soft reset is similar to rebooting a computer. A soft reset saves data and closes all open applications and then restarts the handheld. All data and settings are retained after a soft reset.

To perform a soft reset, use the tip of the stylus to lightly press the **Reset** button beside the SD card slot on the handheld.

Performing a hard reset

Figure 2.7   Performing a hard reset

A hard reset retains settings and data that you have previously saved on the handheld. However, any unsaved data may be lost.

Note – Perform a hard reset only if performing a soft reset does not resolve the problem.

To perform a hard reset, press and hold the **Power** button as you use the tip of the stylus to lightly press the **Reset** button beside the SD card slot on the handheld.

Stylus (pull out)

Speaker

Samsung
300MHz
processor

Rechargeable
Lithium-ion
battery

64 MB
SDRAM

128 MB internal
non-volatile
flash memory

Button to
open back
cover

Figure 2.4   Juno ST handheld – Back view

Inserting the battery

To insert the battery into the handheld:

1. On the back of the handheld, use your thumb to press the gray button below the Microsoft Windows logo and then slide the back cover down to remove it.

2. To insert the battery, angle the bottom of the battery into the handheld, with the label facing upwards (as shown in Figure 2.5). Press the battery flat until it clicks into place.
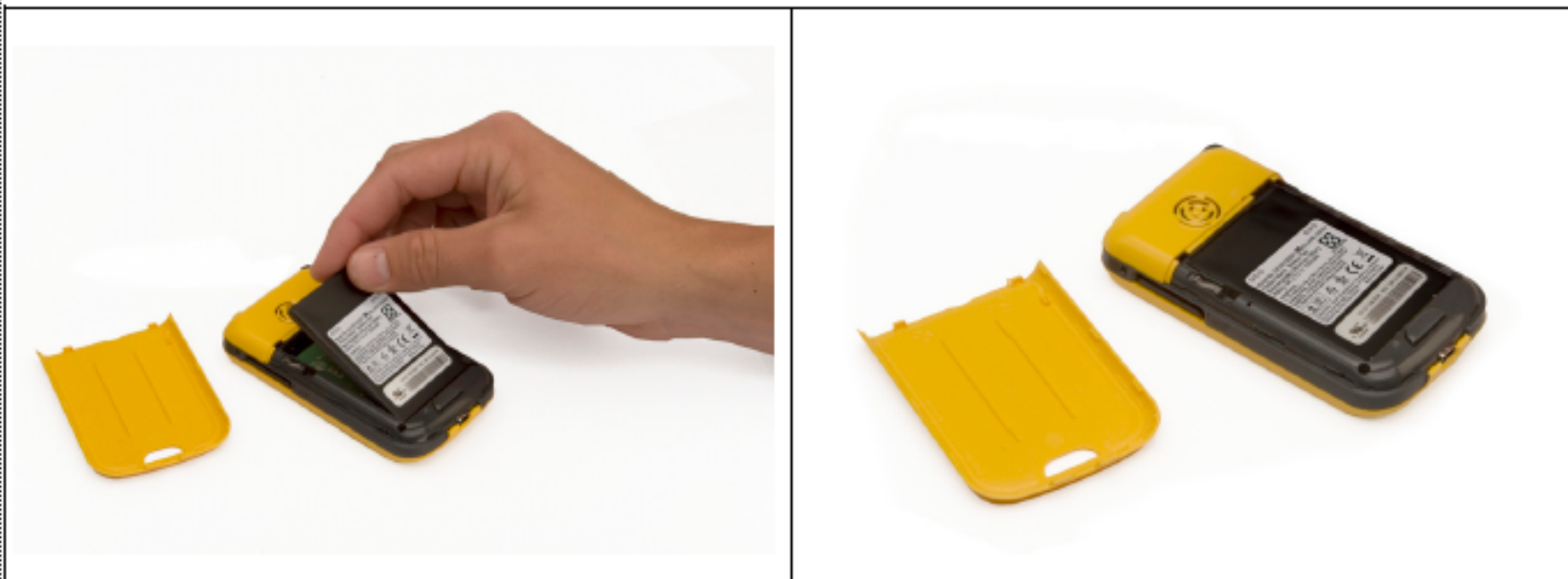
Figure 2.5   Inserting the battery

3. To replace the back cover, slide it upwards until it snaps closed.

Tip – To remove the battery, remove the back cover of the handheld and then insert your finger or the stylus in the notch above the top right corner of the battery. Then pull the top of the battery towards you.

Thursday 8:17 AM
March 06, 2008

Owner: Ron Danielson
(218) 327-4114

Calendar   Contacts
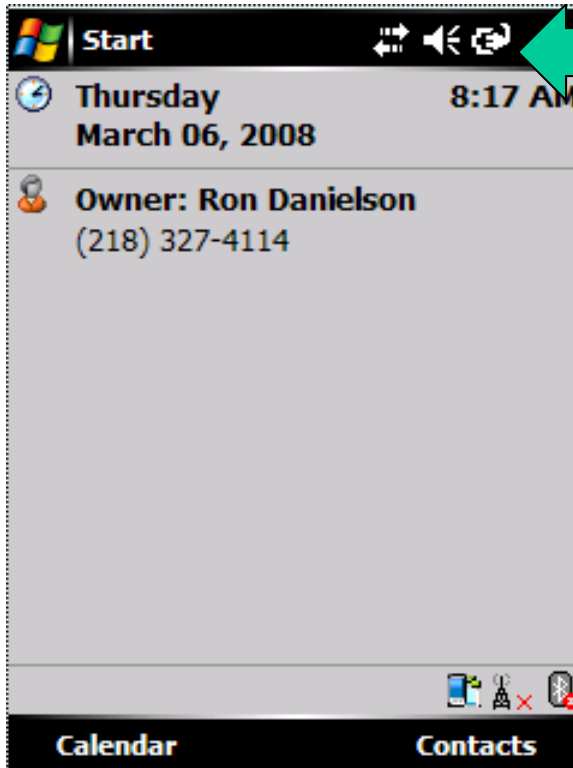
To check the remaining battery power, use the stylus and touch the battery indicator. Tap the ok button to close Main Battery Window.

Checking the level of battery power

To check the level of battery power remaining at any time, tap the battery icon ⌧ in the title bar of the *Today* screen.
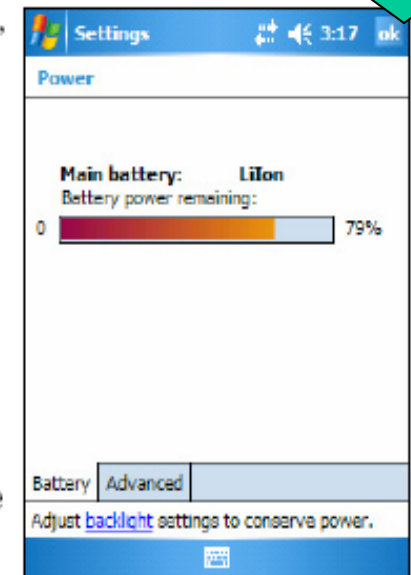
The Power control appears, displaying the *Battery* tab.

When the handheld is connected to a power source, the battery icon in the *Today* screen changes to ⮂. You can still tap the icon to view the level of battery power.

Low battery indicators

If the battery level becomes low during normal use of the handheld, the LED indicator flashes red and the battery icon in the title bar of the *Today* screen changes to ⮀.

Back up your data and then recharge the battery.

Settings 3:17 ok

Power

Main battery: LiIon
Battery power remaining:
0 [████████████   ] 79%

Battery | Advanced
Adjust backlight settings to conserve power.

Interacting With the Touch Screen

This handheld computer uses the Windows Mobile operating system.

While it looks very similar to other Windows systems, you interact with it using the stylus – touch screen method.

The other major difference is that you can shut down the unit at any screen and when you turn it back on, it returns to that screen.


Figure 3.1   Parts of the screen
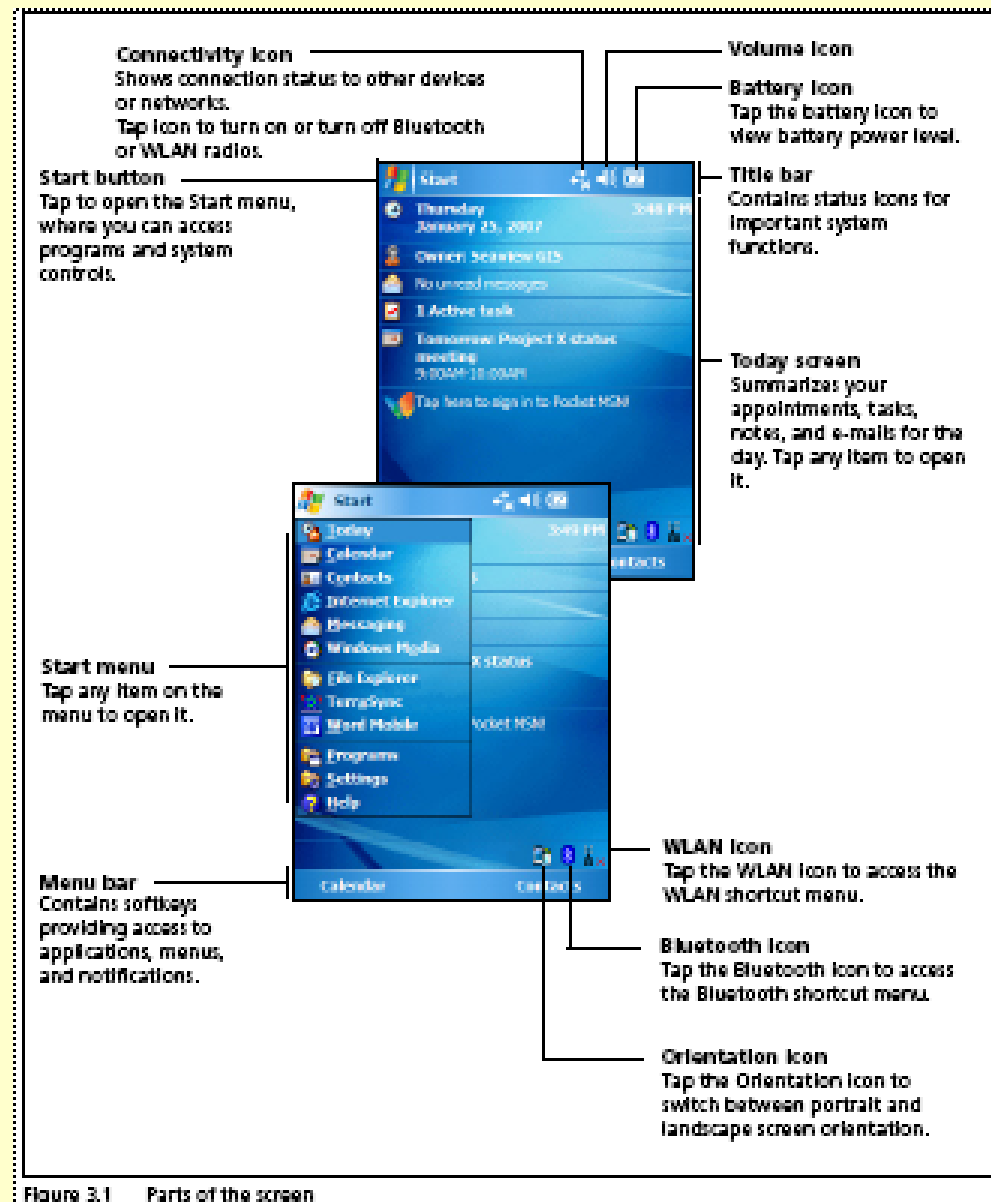
When you need to enter text an icon will appear at the bottom of the screen. You can open it by tapping on it with the stylus. While there are other options for entering text this is the most reliable and familiar.

Using the on-screen keyboard

To activate the on-screen keyboard, tap the keyboard icon [⌨] on the Input Panel displayed in the menu bar. The on-screen keyboard appears.

To enter text, tap the appropriate keys on the on-screen keyboard. When you finish entering text in a field, tap [Tab] to accept the text you have entered and then move to the next field.

To hide the keyboard, tap the keyboard icon again.
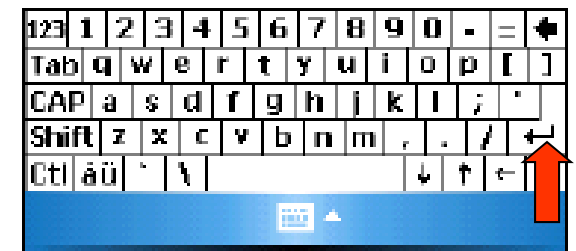
Input panel showing keyboard icon

IMPORTANT: Although there is a return key on the keyboard it should not be used while entering data in Pendragon. It does not give the expected result and adds invalid spaces and returns in the database!

Handheld Running Slow or Giving Program Conflict Messages?

- Does the handheld seem to be slowing down?

- Are you getting program error messages?

- Some programs do not completely stop when you 'X' them.

- They continue to run in the background and may be in conflict with a program you need to run.
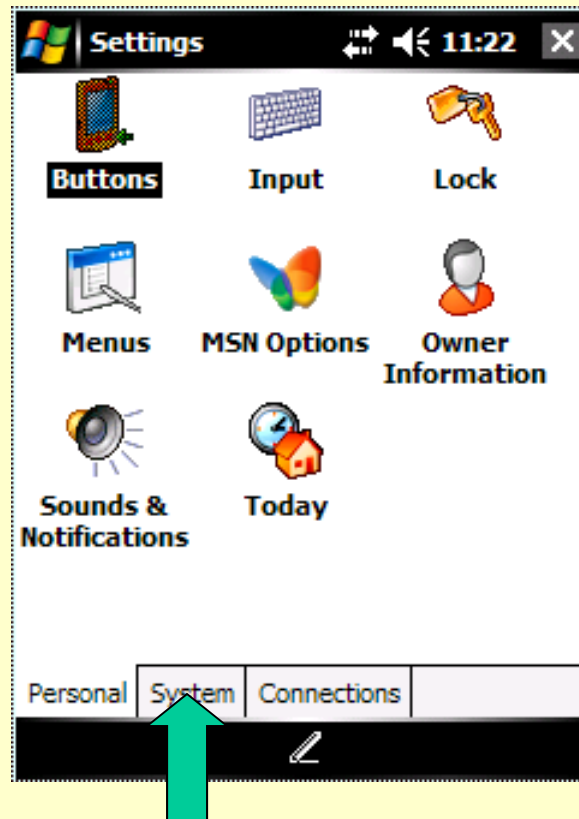
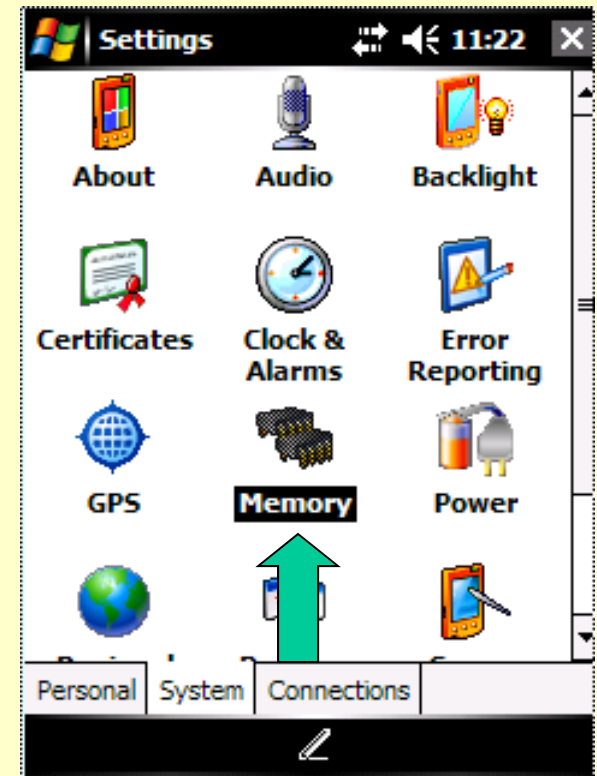# View All Running Programs and/or Stop Selected Programs
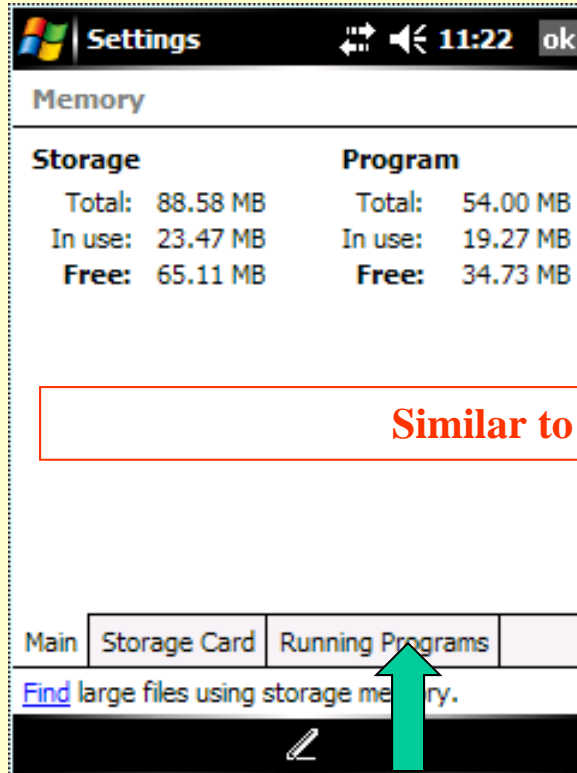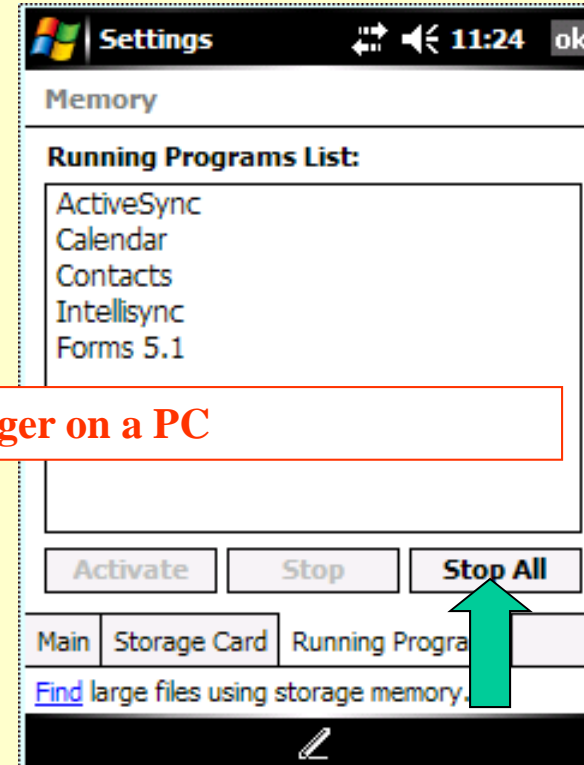
Tap Start Menu

Tap Settings
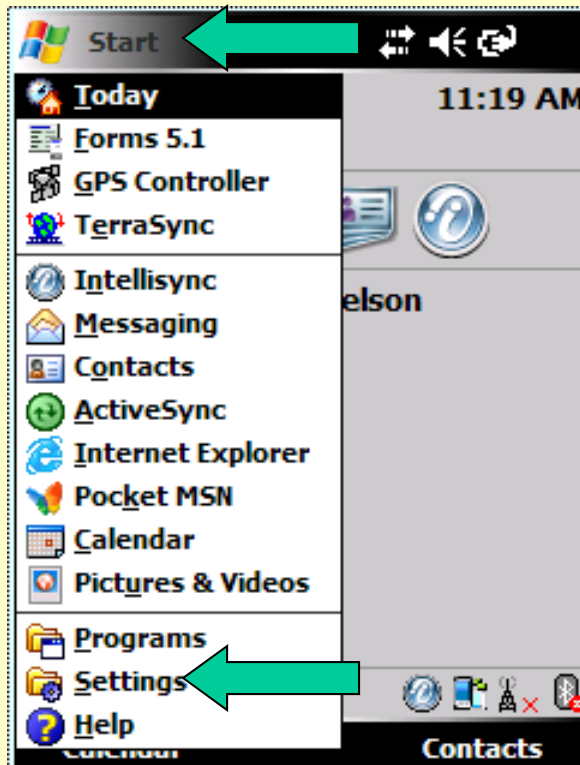
Tap System

Tap Memory

View Storage and Memory Usage

Tap Stop All

Or

Select Individual Program and Tap Stop

Settings	11:22 ok
Memory	

Storage
- Total: 88.58 MB
- In use: 23.47 MB
- **Free:** 65.11 MB

Program
- Total: 54.00 MB
- In use: 19.27 MB
- **Free:** 34.73 MB

Main | Storage Card | Running Programs

Find large files using storage memory.

Settings	11:24 ok
Memory	

Running Programs List:

ActiveSync
Calendar
Contacts
Intellisync
Forms 5.1

| Activate | Stop | **Stop All** |

Main | Storage Card | Running Progra

Find large files using storage memory.

Similar to Task Manager on a PC

Tap Running Programs

When done, return to Start menu and start the program(s) you want to use.

Occasionally the screen will not respond accurately to stylus input. Aligning the screen will correct this. This is often the problem if a right-hand person has been using the unit and the new operator is left-handed.

Screen

Use the *Screen* control to align the touch screen or to change the appearance of text on the screen. To open the *Screen* control:

- Tap 🪟 / *Settings* / *System* / *Screen*.

To change the screen settings:

1. Tap the *General* tab.

2. To change the orientation of the screen, select an option in the Orientation group.

3. To start the alignment sequence for the touch screen, tap **Align Screen**.

4. Tap **OK.**

To enable ClearType:

Using ClearType font smoothing can make text easier to read on the screen.

1. Tap the *ClearType* tab and then select the *Enable ClearType* check box.

2. Tap **OK.**
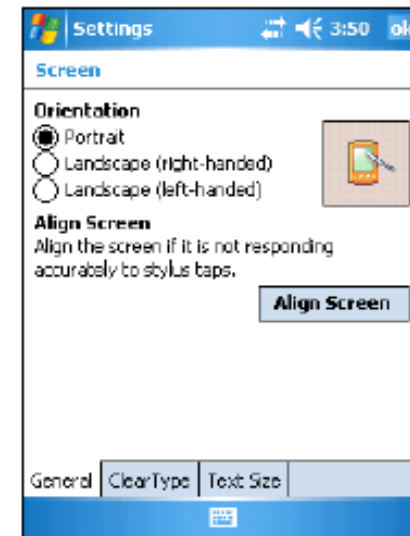
Settings	3:50 ok

Screen

Orientation
- ● Portrait
- ○ Landscape (right-handed)
- ○ Landscape (left-handed)

Align Screen
Align the screen if it is not responding accurately to stylus taps.

Align Screen

| General | ClearType | Text Size |

Connecting the handheld to a computer

To connect the Juno ST handheld to a computer:

1. Make sure that the handheld and the computer are switched on.

2. Make sure you have installed the appropriate connection management software onto the computer (see Connection management software, page 42).

3. To form a connection, do one of the following:

   – Connect one end of the USB data cable to the Power/USB socket on the handheld, and connect the other end of the USB data cable to a USB port on the computer.

Figure 4.1 Connecting the handheld to a computer using the USB data cable

The *Microsoft ActiveSync* window displays the message Connected:
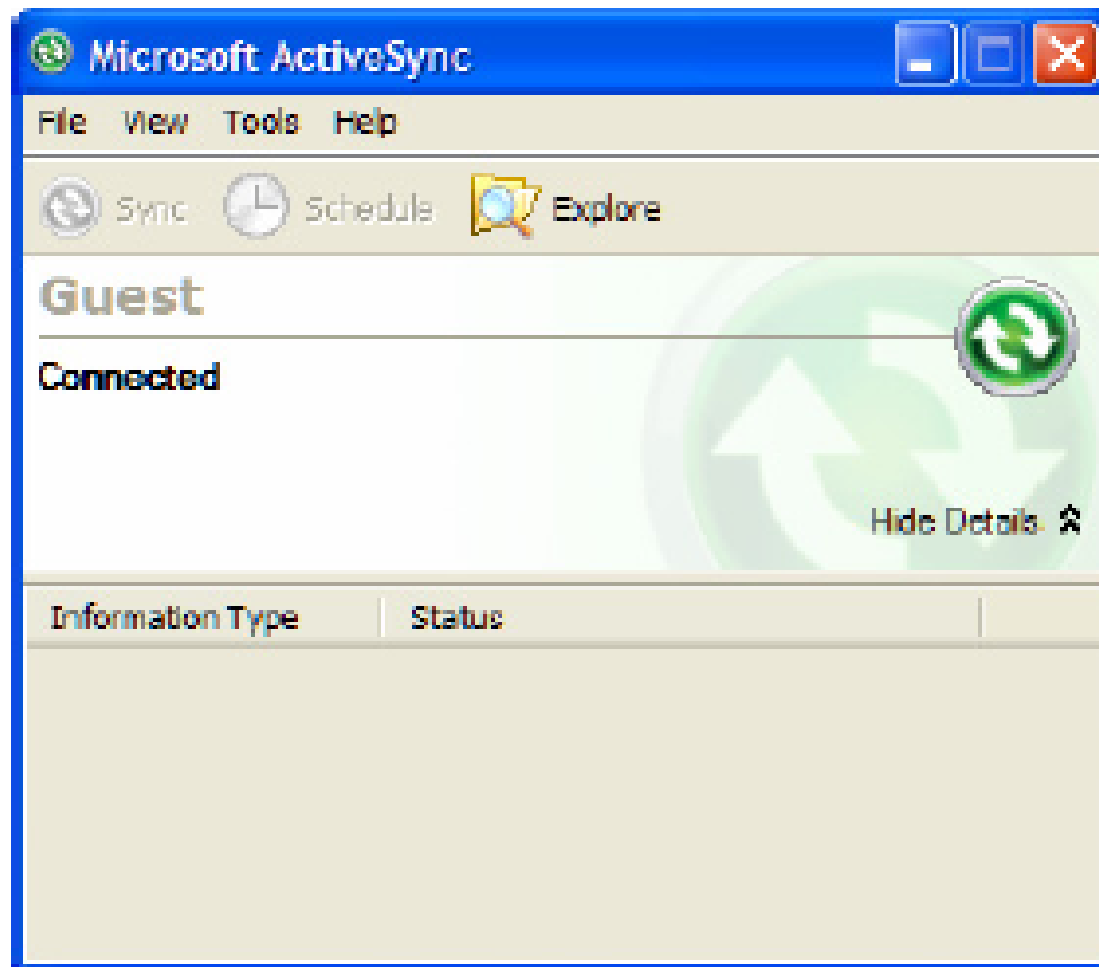
The handheld automatically synchronizes data between the two computers.

It also shows up like another drive in the My Computer window.

Introduction to Trimble GPS Controller

Basic Operation of the Juno ST GPS
in Conjunction with Pendragon
Forms

Using The GPS
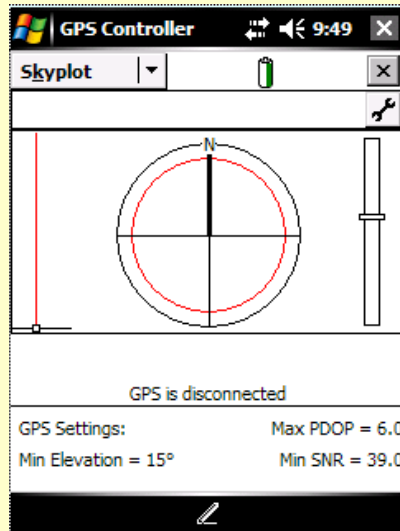
Using Trimble GPS Controller
software to support Pendragon Forms

GPS Basics

- Turning GPS On
- Acquiring Satellites
- Auto Locate
- Almanac Update
- Turning GPS Off
- Using With Pendragon Forms

Turning GPS On

- Tap Start Menu
- Tap GPS Controller Symbol
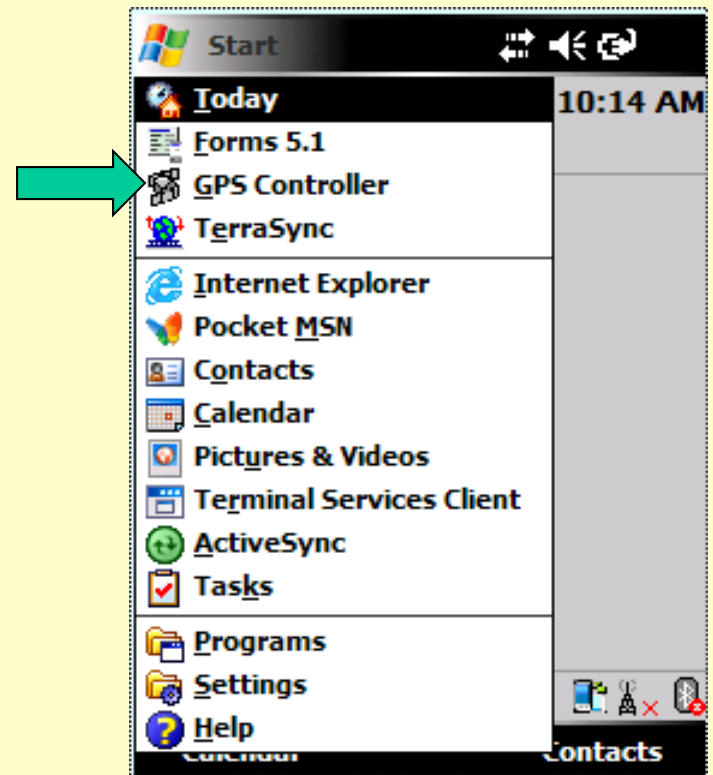
Activating the GPS

- Tap the menu dropdown on the left

- Tap Setup
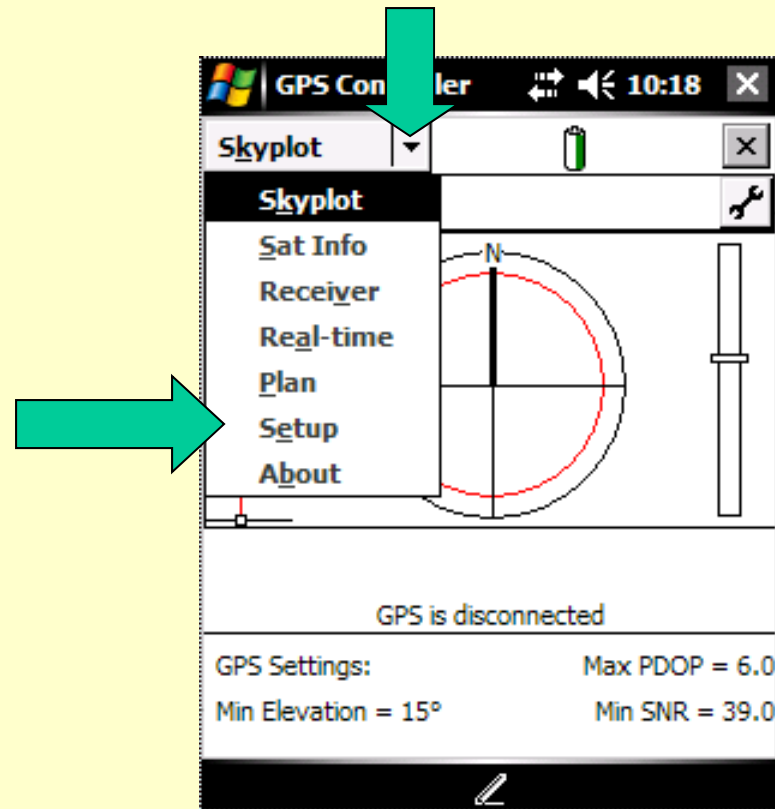
GPS Activation continued
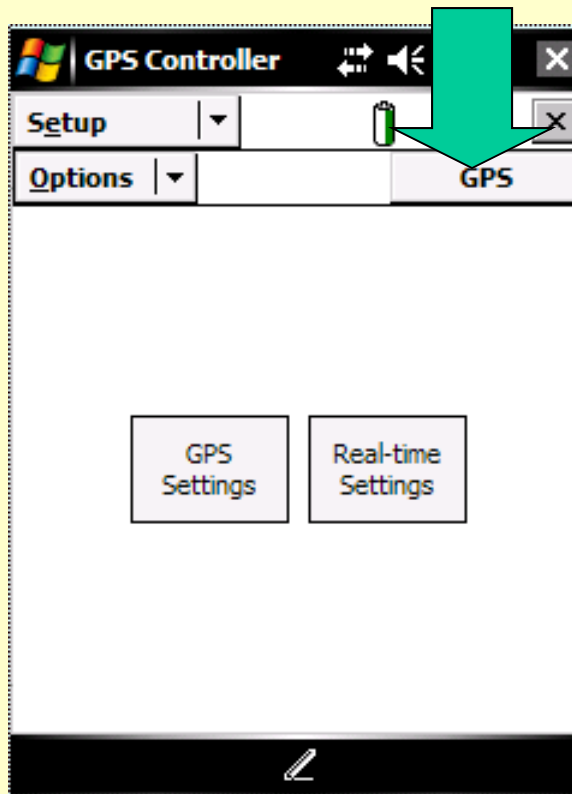
- Tap GPS to connect
- Tap ok to close window
- Observe Number of Satellites acquired
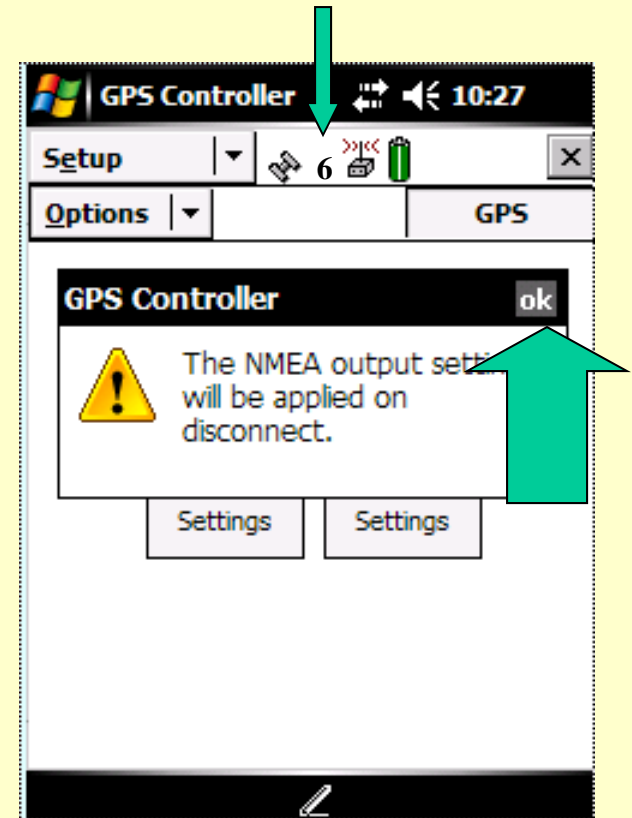
IMPORTANT!

- Do this before each data collection session
  - Before you start in the am
  - After an extended lunch break
  - If you've traveled several miles since last session

- IF you have not used the unit for over a week, run GPS for at least 10 minutes before turning off GPS and beginning data collection in Pendragon Forms
  - This will update the almanac and improve accuracy of data collection points

Turn GPS off to collect data with Pendragon Forms

- After satellites have been acquired and you are satisfied that you have updated the almanac, tap the GPS button

- Tap Yes to disconnect from GPS

- Pendragon will acquire the GPS only when needed to save battery power.
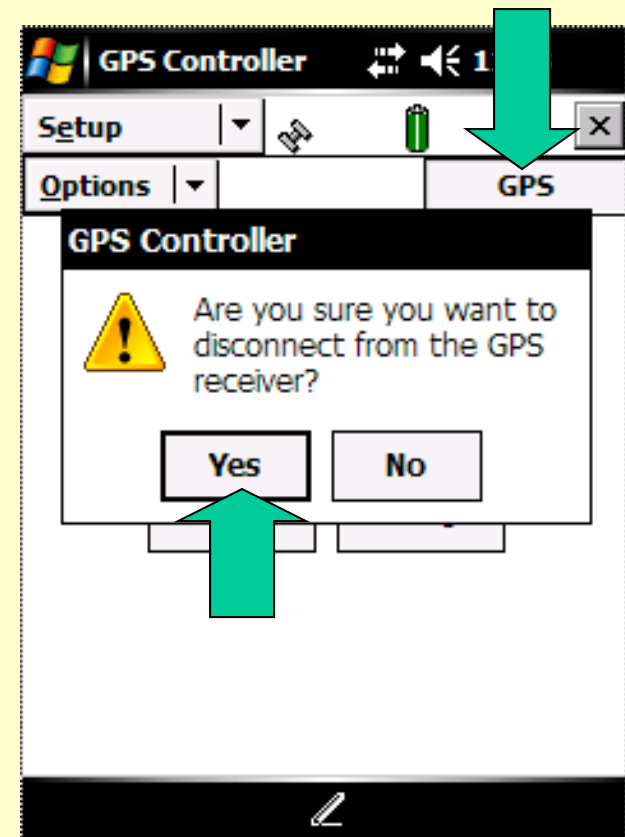
Closing GPS Window and Preparing to use Pendragon Forms

Tap X to close GPS window and return to main menu
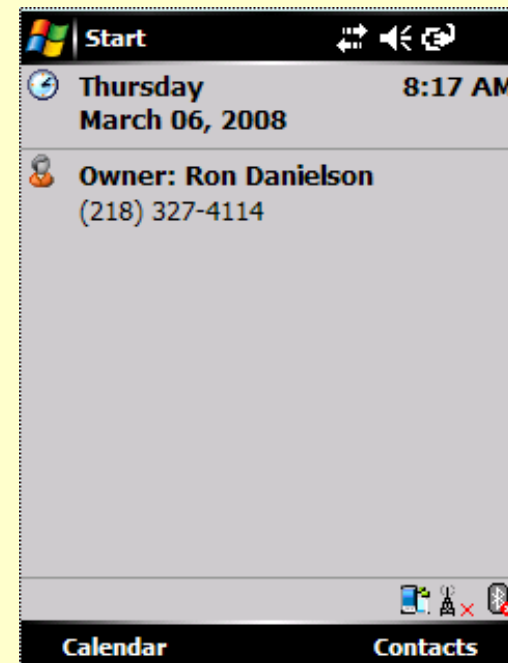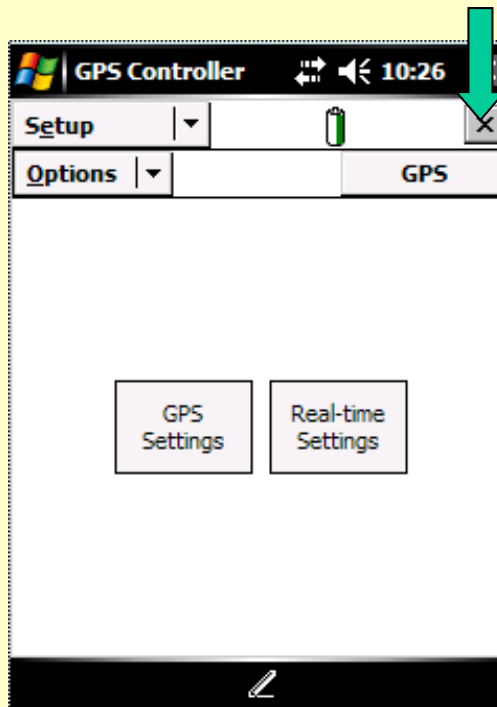
Data Collection Using Pendragon Forms

Tap Start to open Menu
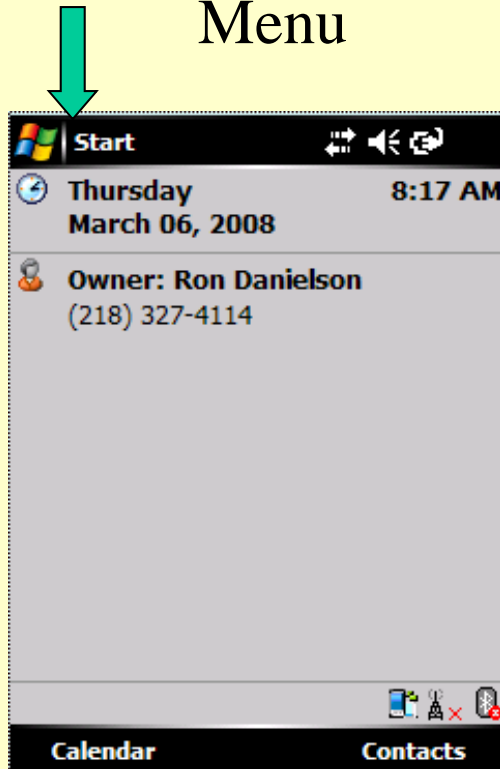
Tap Forms 5.1 to start Pendragon Forms

Using Pendragon Forms

Advanced Menus

Close Pendragon

Individual
Forms

Active Form

Forms 5.1 ⇄ 🔊 **12:10** ✕

Pendragon Forms ☑ Auto

▤ Invasive P Species_Juno7
▤ Location Reference Form
▤ Observer Reference Form

Create New Record

Delete Individual Records

| ↑New | Review | Sync | Delete... |

Upload Data to Server

Review Existing Records
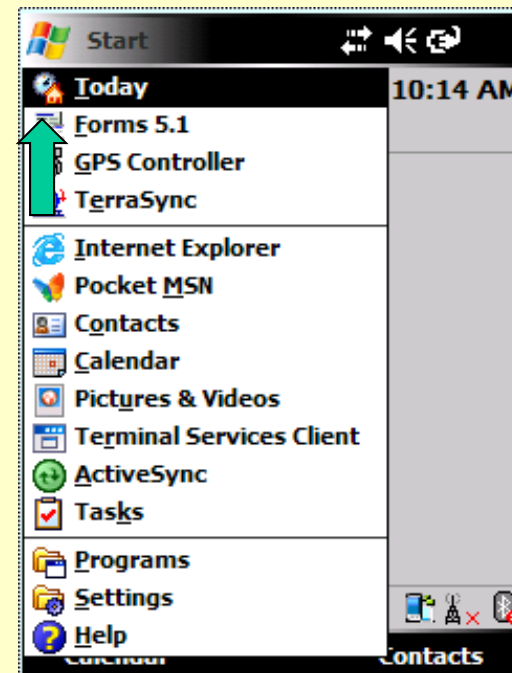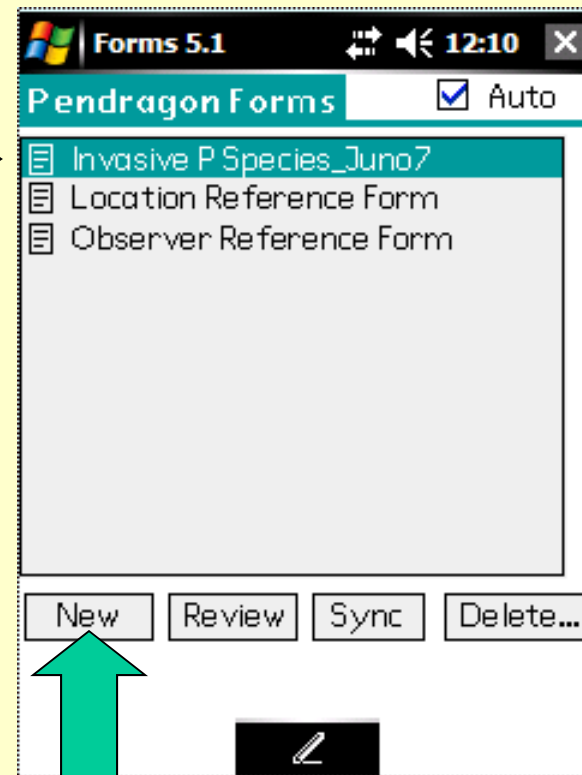
Pendragon Forms Main Menu
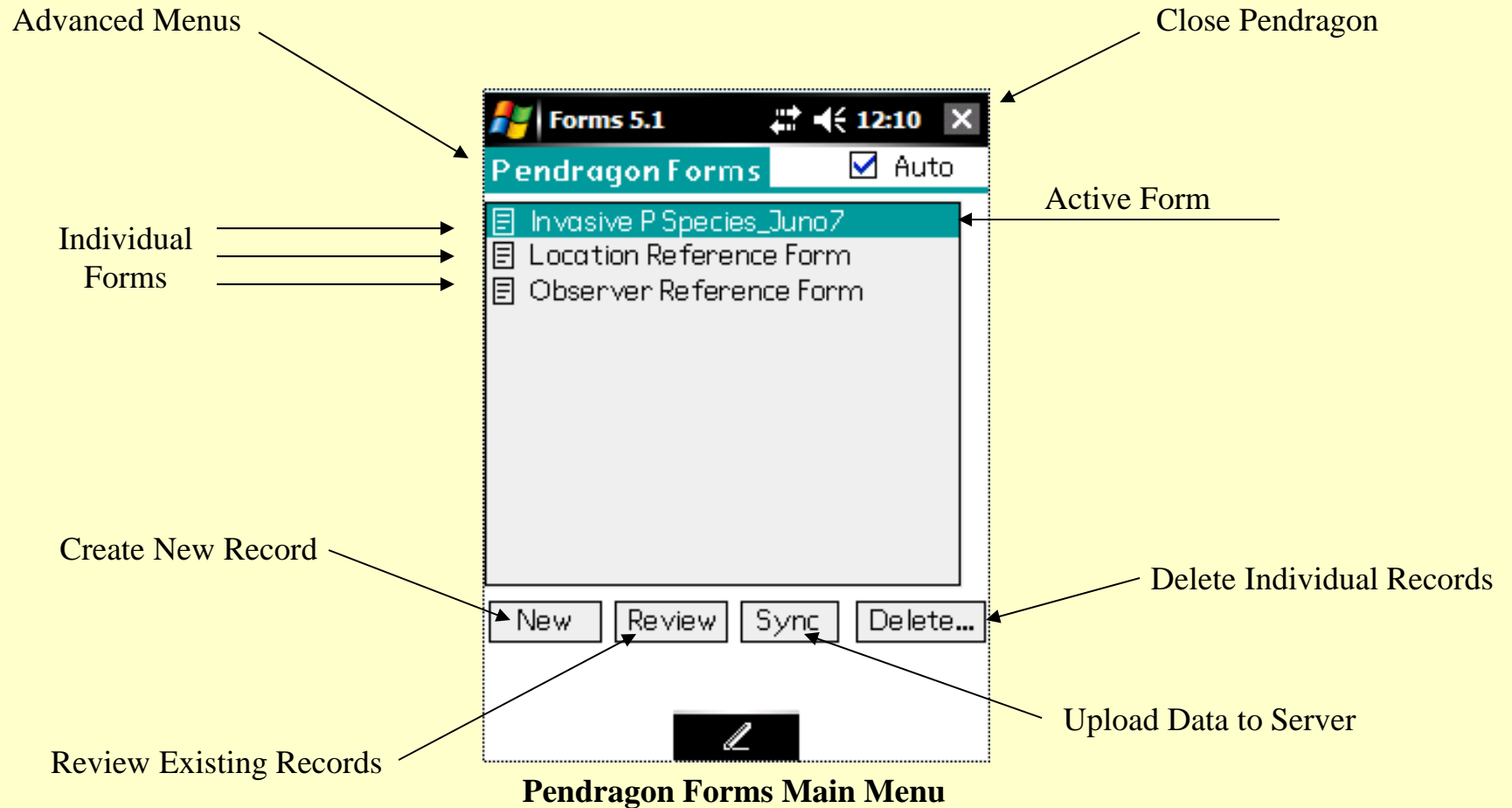
Mapping Invasives
Creating a New Record

Highlight **Invasive P Species_Juno7**
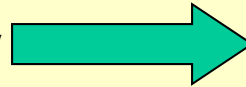
Tap New

Pendragon – Location, Date, Observer

Proper Name and
Description of DNR Unit

Tap Lookup….

To Add Location

Date
Automatically
Filled In
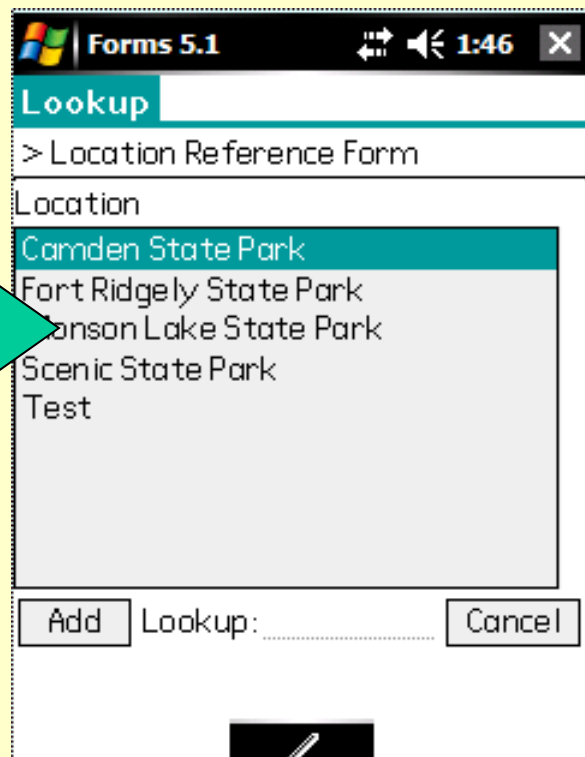
Full, Proper Name of
Surveyor

Forms 5.1   12:50 ✕

Invasive P Species_Juno7

Location

Lookup…

Today's Date:
3/6/08

Observer

Lookup…

End   Previous   Next

Add a Location

If the location exists in the list, tap the name you want entered. You will return to the data entry form and the data will be filled in.

Add a Location

If the location does not exist in the list, tap the Add button. When the new window opens, click the keyboard icon and add the new location.

Add a Location

Use the keyboard to add the new location. Use proper case, include unit description.

Location
Munger State Trail

When Location name is complete, tap End key to return to Location list.

| End | Previous | Next | ↑ |

123	1	2	3	4	5	6	7	8	9	0	-	=	←
Tab	q	w	e	r	t	y	u	i	o	p	[	]
CAP	a	s	d	f	g	h	j	k	l	;	'
Shift	z	x	c	v	b	n	m	,	.	/	↵
Ctl	áü	`	\					↓	↑	←	→
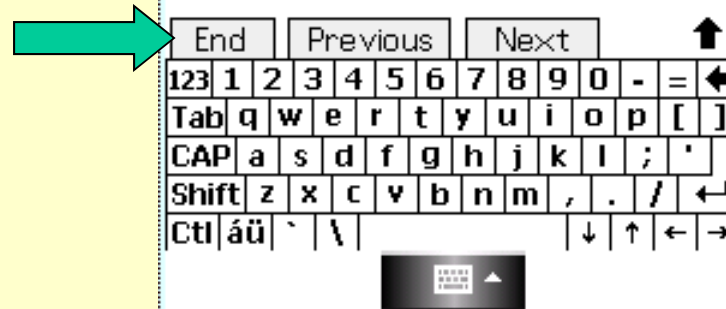
IMPORTANT!

Do NOT tap Return key when done!

Finalize a Location

Tap Keyboard icon to close keyboard

Tap Location Name to add data to record

Location Name added to Record. This entry will repeat with each new record until you change it.

Add Observer Name

Use the same procedure to add your name to the observer list.

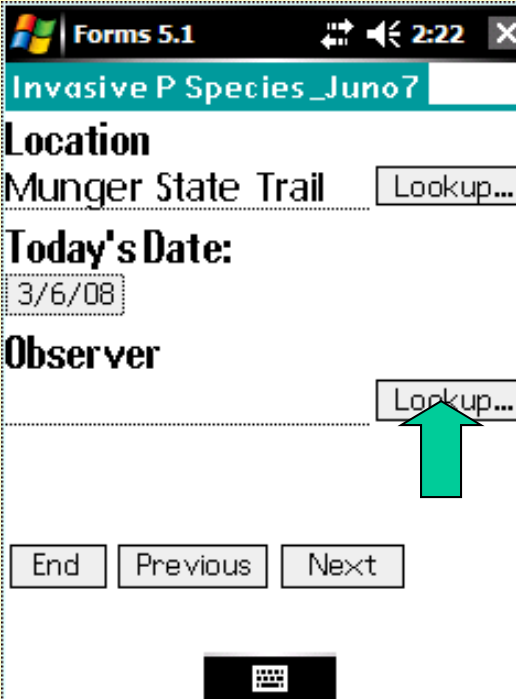**Tap your name if it is on the list or tap Add button to add your name**

Date automatically added

On to Screen 2

Tap Next

Remembered last entry!

Scroll down, page down, type first letter – Tap Selection
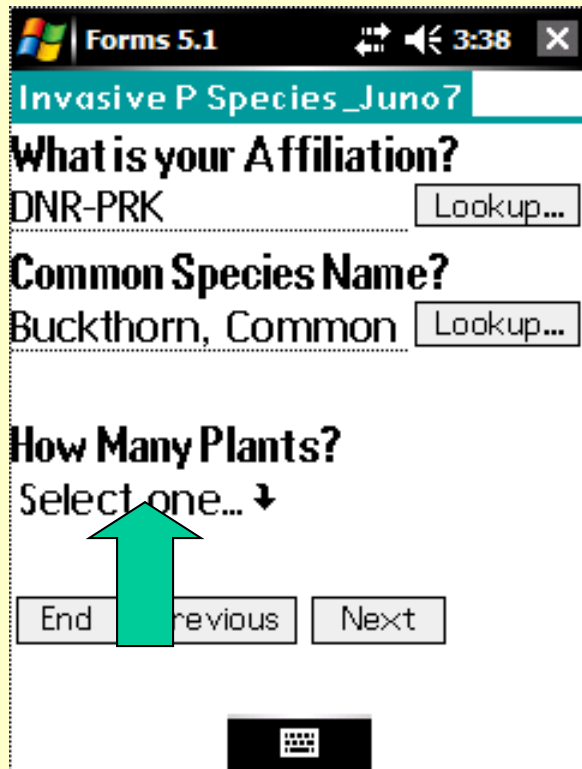
Add Common Name from Lookup

Finish Screen 2 – on to Screen 3

Tap dropdown list

Select Number of Plants

Automatically jumps to Screen 3

Screen 1:

Forms 5.1   3:38

Invasive P Species_Juno7

What is your Affiliation?
DNR-PRK   Lookup...
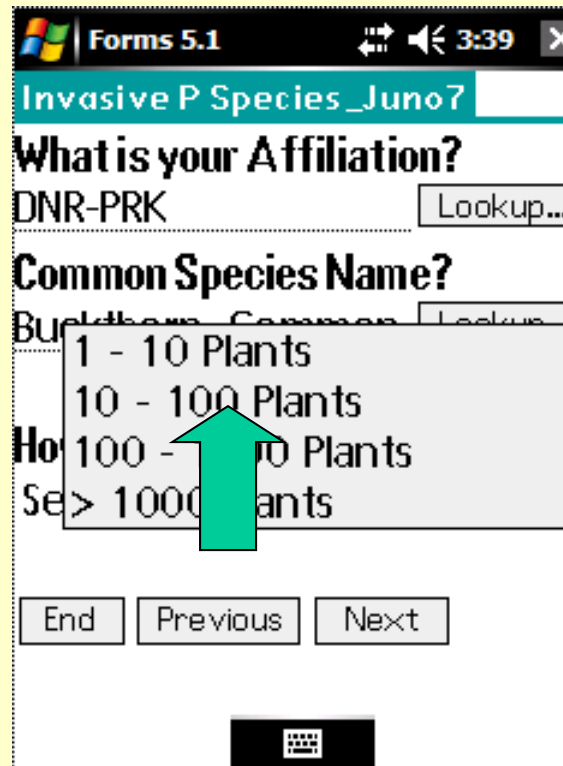
Common Species Name?
Buckthorn, Common   Lookup...

How Many Plants?
Select one... ↓

End   Previous   Next

Screen 2:

Forms 5.1   3:39

Invasive P Species_Juno7

What is your Affiliation?
DNR-PRK   Lookup...

Common Species Name?
Buckthorn, Common   Lookup...

1 - 10 Plants
10 - 100 Plants
100 - 1000 Plants
> 1000 Plants

End   Previous   Next

Screen 3:

Forms 5.1   3:41

Invasive P Species_Juno7

Plant Distribution?
Select one... ↓

Acres of Infestation?
Select one... ↓

Site Type?
Select one... ↓

End   Previous   Next

Continue with Selections

Screen 3

Select Plant Distribution

Forms 5.1   4:01 ✕

Invasive P Species_Juno7

Pla | Occurs Singly
Se | Scattered Pockets
| Continuous/Extensive

Acres of Infestation?
Select one...

Site Type?
Select one... ↓

[End] [Previous] [Next]

⌨

Select Acres of Infestation

Forms 5.1   4:02 ✕

Invasive P Species_Juno7

Pla | < 100 Square Feet
Co | 100 – 1000 Square Feet
| 1000 Square Ft to 1 Acre
Ac | 1 – 5 Acres
Se | 6 – 10 Acres
| 11 – 50 Acres
Sit | > 50 Acres
Select one... ↓

[End] [Previous] [Next]

⌨

Select Site Type

Forms 5.1   4:03 ✕

Invasive P Species_Juno7

Pla | Wetland
Co | Forest
| Lake/Stream
Ac | Prairie/Grassland
10 | Managed Areas
| Roadside
Sit | Cropland
Se | Pasture
| Other

[End] [Previous] [Next]

⌨

Automatically jumps to GPS screen after final entry

GPS Screen

Forms 5.1   4:12

Invasive P Species_Juno7

GPS: Acquire, Fix, Next

Acquire

Longitude:

Latitude:

| End | Previous | Next |

Clue: 3 steps on this screen

Tap Acquire – wait for GPS….

Acquire button Changes to Fix

Tap Fix – Populates Long/Lat

Tap Next Button to move to next screen

GPS Continued

At the first window tap Acquire

Once the GPS connects the Acquire button changes to Fix. Tap Fix

When Long/Lat fields are populated tap Next

Comments

Use Comment field only when needed to clarify a special circumstance. Example: If the plant community was difficult to find, you may add more specific comments.

Tap Keyboard icon to open

Type comment

Tap Keyboard icon to close

Tap End or Next

This is the last field of the record. You are now ready to collect another point.

Comment:
Left side of road

| End | Previous | Next |

123	1	2	3	4	5	6	7	8	9	0	-	=	←
Tab	q	w	e	r	t	y	u	i	o	p	[	]
CAP	a	s	d	f	g	h	j	k	l	;	'
Shift	z	x	c	v	b	n	m	,	.	/	↵
Ctl	áü	`	\					↓	↑	←	→

Keyboard icon

End Data Collection

You have been returned to the Main menu. Turn the unit off to save battery power.

You may continue with new data entries at this point.

Once you have finished data collection you are ready to return to the office and transfer your data to the central database.

Data Transfer/ActiveSync

Connecting the handheld to a computer

To connect the Juno ST handheld to a computer:
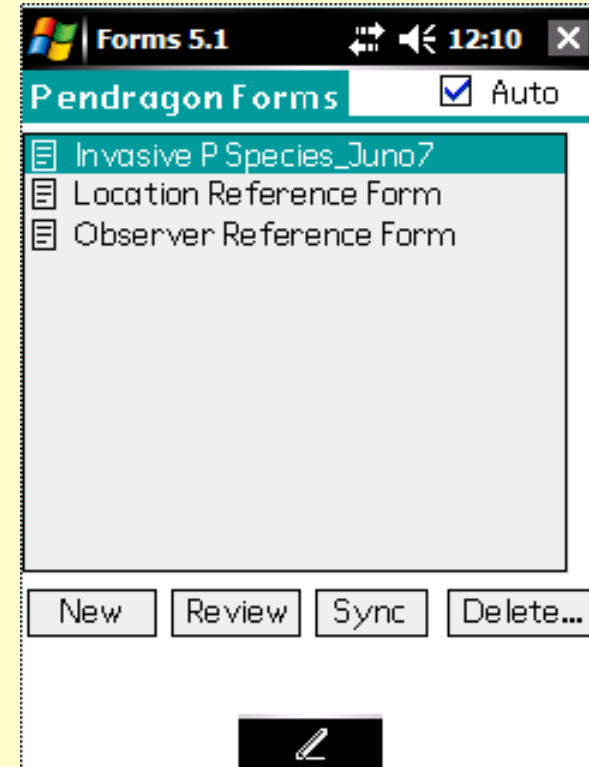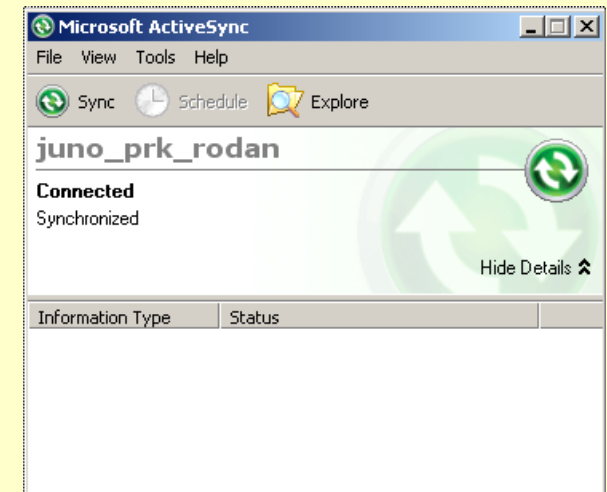
1. Make sure that the handheld and the computer are switched on.

2. Make sure you have installed the appropriate connection management software onto the computer (see Connection management software, page 42).

3. To form a connection, do one of the following:

   – Connect one end of the USB data cable to the Power/USB socket on the handheld, and connect the other end of the USB data cable to a USB port on the computer.

Figure 4.1   Connecting the handheld to a computer using the USB data cable

Microsoft ActiveSync
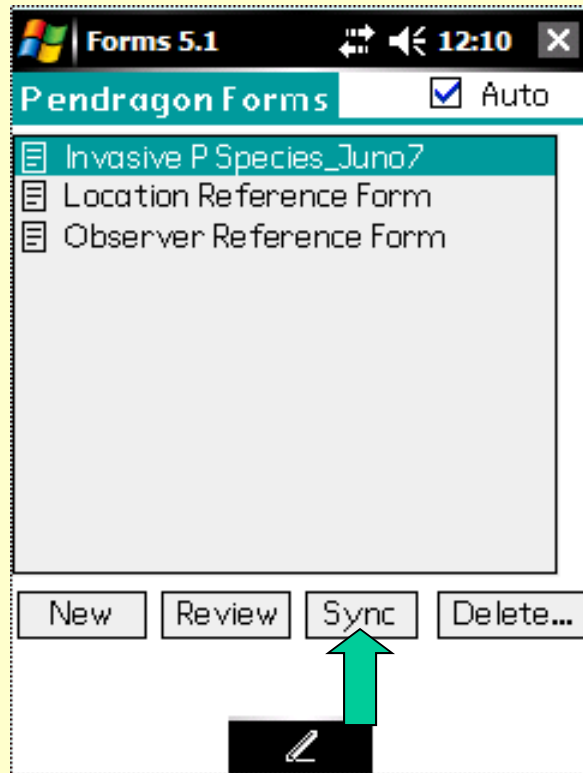
File   View   Tools   Help

Sync   Schedule   Explore

juno_prk_rodan

Connected
Synchronized

Hide Details ✕

Information Type	Status	

Internet Connection

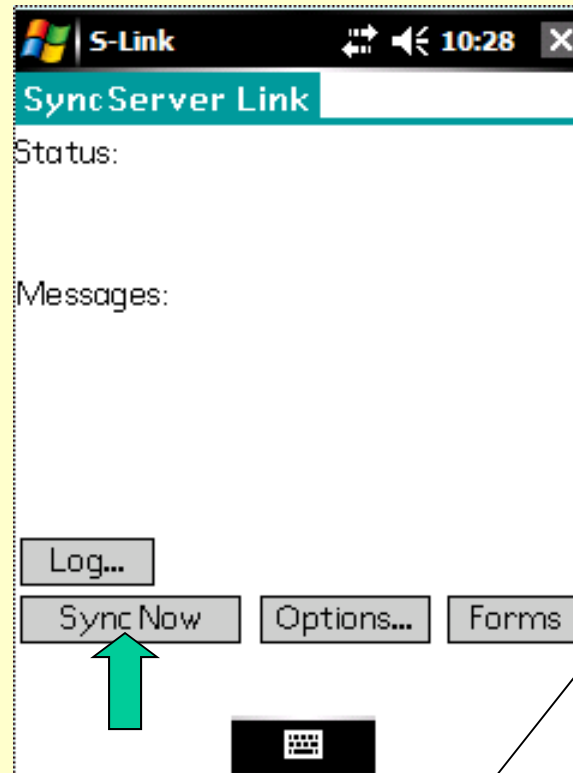**DNR Network – or – VPN Client Connection**

Sync to Main Database

Start Pendragon

Tap Sync button

Tap Sync Now button

After a successful Sync tap Forms button to return to main menu.

Forms 5.1	⇄ ◀€ 12:10 ✕
Pendragon Forms	☑ Auto

- ▤ Invasive P Species_Juno7
- ▤ Location Reference Form
- ▤ Observer Reference Form

[New] [Review] [Sync] [Delete...]

S-Link	⇄ ◀€ 10:28 ✕
Sync Server Link	

Status:

Messages:

[Log...]

[Sync Now] [Options...] [Forms]

S-Link	⇄ ◀€ 10:31 ✕
Sync Server Link	

Status:

Messages:
30 blocks sent to server, 33 blocks received.
Compression factors 65% up/61% down.
Sync successful.

[Log...]

[Sync Now] [Options...] [Forms]

Data transfer was successful

If you receive an error message, test all connections and try again

What Happened to the Data?

- Data has been transferred to a central database
- Data will run through some quality control checks
- Data will be added to the main dataset for distribution through GIS data resource site
- Data can be accessed using ArcView or ArcMap – Quick Layers – Environmental Quality – Terrestrial Invasive Species Observations

Questions