4. ELECTRONIC EQUIPMENT CARE AND MAINTENANCE

We use an electronic data collection system for tortoise monitoring to enhance the accuracy, validity and integrity of the data you collect. Effective use of an electronic data collection system, compared to a solely paper based system, allows us to:

1) reduce data entry errors such as misspelled words (carcass and carcas are not the same), by providing such tools as look up lists and drop down menus,

2) eliminate the problems associated with hand entered data (e.g. data entry errors due to repetitive tasks, undecipherable data from poor hand writing, lost data sheets),

3) reduce the time from field data collection to data assessment, final QA/QC and analysis,

4) enhance QA/QC by automating certain operations directly in the field and providing in-office QA/QC tools, both of which assist the contractor in providing USFWS the best data possible, and

5) automate and consequently reduce errors in spatial data collection (GPS grabs).

The goal of Electronic Equipment Care and Maintenance training is to enable you to confidently and correctly care for and operate the data collection equipment in your duties as a tortoise monitor. This portion of the training does not deal with what data to collect (e.g. MCL) or how to collect it (e.g. Tape measure, calipers, etc.). The outline below details the individual objectives and standards, as well as the final metric for which you will be held accountable after completing this training.

Objective 1: Proficiency with basic Juno operations.

You are responsible for ensuring that your Juno is operational and correctly set up each day. Each crew member will know how to

1. set up the Juno (e.g. charge, turn on/off, set date/time, components of Juno)
2. navigate menus
3. back up data
4. restore data
5. maintain the unit
6. troubleshoot common Juno problems through a soft reset or a hard reset.

Objective 2: Proficiency with built-in GPS receiver.

You are responsible for ensuring that your built-in GPS is operational each day. Each crew member will know

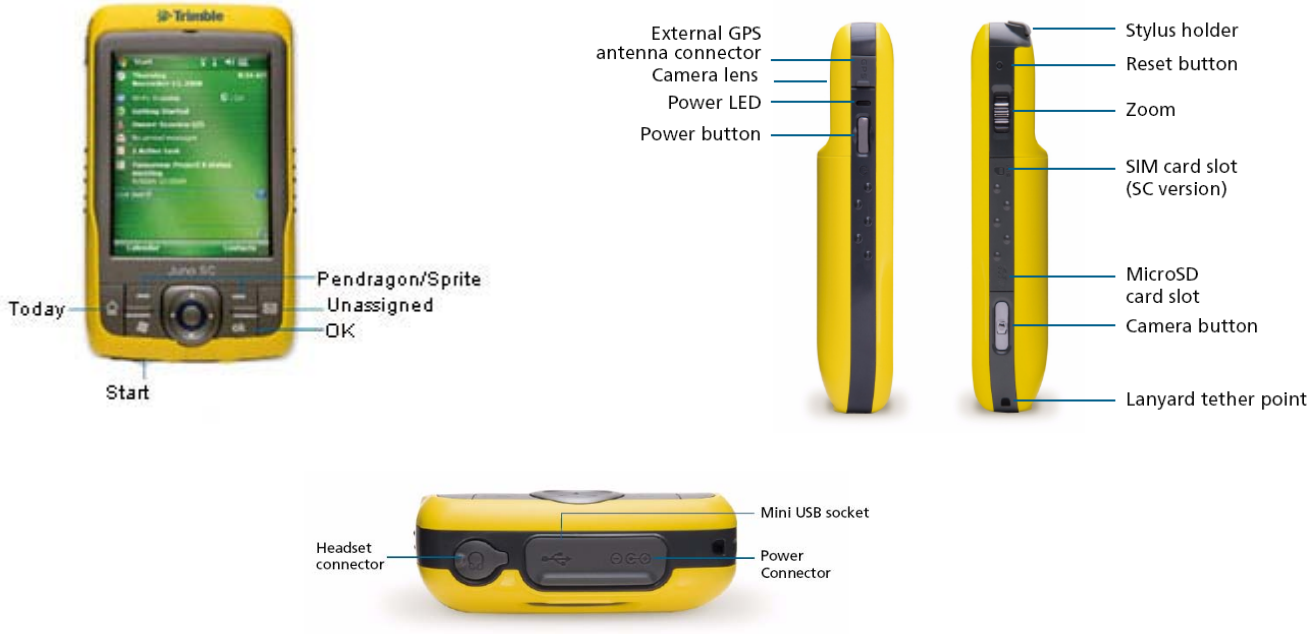
1. how to set up built-in GPS (with GPS controller)
2. how to adjust real-time settings

Objective 3: Proficiency with built-in Camera

1. Parts of the Camera and taking a picture
2. Adjusting camera settings

Metrics: During training you will be asked to demonstrate for an instructor how to set the Juno date and time; back up data; perform a soft reset; perform a hard reset and restore data and Pendragon Forms, and must successfully perform all tasks. Individuals will be given two opportunities to pass, which is required before the USFWS will accept them to participate in sampling.

Objective 1: Understanding Basic Juno operations



1. **Setting up the Juno**
   - **Components**
     i. the Juno itself,
     ii. USB cable used to connect to the computer,
     iii. AC adaptor cable used for charging,
     iv. Vehicle power adapter for charging, and
     v. Stylus, which is stored on the unit and used for entering data on the screen.
   - **Charging the unit**: Connect the AC adaptor to the bottom of the Juno at the power connector port. Plug the AC adaptor into a wall outlet. For safety reasons, make sure the Juno is **completely dry** before plugging it in. On a completely drained battery, charging time takes about 4 hours. Unplug the safety adapter when not in use.

   You can tell how full the battery is by following these steps:
     i. Turn Juno on, the power LED beside the power key indicates battery power (LED off is good battery level, LED flashing red is less than 5% battery level)
     ii. From the home-screen (Press Today to go to home-screen), tap on top title bar to open battery information screen. This screen displays the Battery Percentage remaining 

     .
     iii. Press the OK Button to return to the home-screen
   - **Turn the unit on or off**: Briefly press and release the Power button to turn the unit on. When turned on, it will return to the screen you were previously working with unless the battery has been drained or it has been turned off for an extended

period of time. To conserve battery power put the unit in suspend mode by briefly pressing the power button (i.e. between waypoints); the unit does this automatically when not in use for 30 seconds. Briefly press the power button to return from suspend mode. To turn the unit off, press and hold the power key for 5 seconds till completely off. It is recommended that the device be turned off only if it will not be used for three months or more.

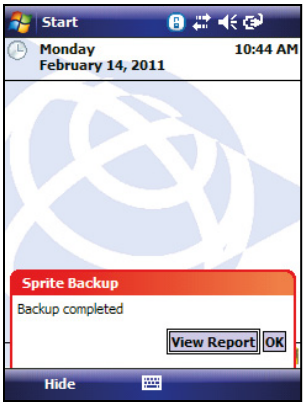
- **Setting Date and Time**: Turn unit on and press the Today button  if necessary. Tap 

on icon to open Date & Time settings. Tap the date to set it (make sure you're in the right year), Tap on the time to set it, select the correct time zone.
- **Screen Contrast**: Tap  , then Settings, then select System tab, then tap on Backlight. Check the box to turn off the backlight when the device is not in use, and select the time for 30 sec. You can also access the screen brightness control using the "configure" tab at the bottom, and then use the battery power slider to adjust darkness and brightness. Adjust the brightness to your liking in the field but remember that battery power is conserved when the screen is darker. Press OK when finished, and then Press  .

2. **Navigate Menus**: Menus on the Juno are navigated largely by using the stylus; however, shortcuts with the buttons have been created to navigate to the desired programs quickly. Below are the buttons and the programs they are linked to.

	**Today Button:** Pressing the Today button will take you to the home-screen, whether a program is running or not. The button only needs to be Pressed once. If lost within the Juno, Press Today and start again.
	**Start Button:** Pressing the Start button will display the Windows Mobile *Start* Menu. From the Menu, programs and device settings can be accessed.
	**Left Soft-Button:** Press this button and it will open up **Pendragon Forms**. Once in the forms program, use the stylus to navigate through the data collection process.
	**Right Soft-Button:** Press this button and it will open the **Sprite Backup** program, which is used to perform backups after every waypoint. If the device becomes unresponsive or requires a hard reset, the device and any collected data can be restored using these backups.
	**Mail Button:** This button has not been configured.
	**OK Button:** Pressing the OK button will select the OK option or close the current application.

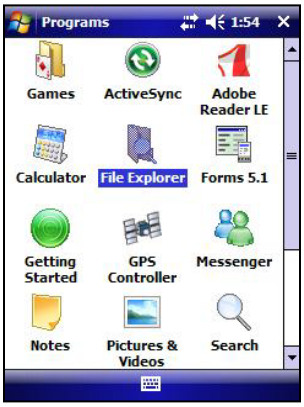
3. **Back up data:** The equipment you will be using is good, but not perfect; and at some point during your monitoring duties, chances are that the batteries will run down or the Juno will freeze up and require a hard reset (described in Standard 6 of this objective), losing all data and non-default applications. Because of this, **it is crucial that you know how to create backups of and restore the data you collect while walking transects**. You are expected to backup your data at every corner while walking on the transect and to know how to restore it on your own. It is simple to do, it takes only a couple of minutes, and will save you from having to re-enter or re-collect data if your Juno crashes or runs out of juice. Here's how:
    - While in the home-screen area (press Today if needed), press the right soft key button to start the Sprite Backup program.
    - Use the stylus and select Backup to start the process. If the backup file (Backup.exe) already exists on your SD card then you will see a confirmation message to replace the old file. Select "Yes" to replace the existing backup file and start the backup process. Do not operate the device while backup is in progress and until you see a notification "Backup Complete". The device will reset multiple times during this process.



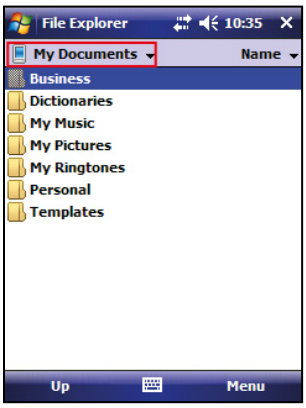
- On the notification message click "View Report" and check the status to confirm the Backup was completed successfully. Tap on OK and continue where you left off.

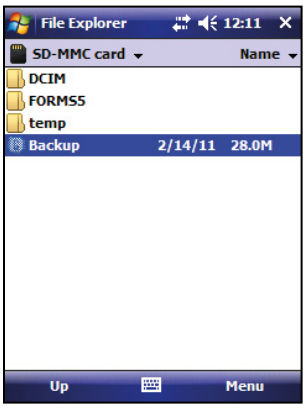
4. **Restore data and Pendragon Forms**: Your Juno has crashed and you had to run a Hard Reset (explained in Standard 6 of this objective), after which Pendragon Forms is no longer available and your data is gone. Do not panic, this happens from time to time. As long as you have been implementing regular backups, you will be back in operation in no time, just follow these steps:

    - Before you restore the Juno ensure that Date and Time settings are correct. If necessary, change the settings as described earlier under "Setting up Juno". A hard reset erases all data, installed applications, and settings in the handheld, with the exception of data or applications that were pre-installed on the handheld or are stored on a memory card. The device must be restored to make available Pendragon forms, other supporting applications, and any of your collected data that you have backed up. To restore the device, press  then choose Programs, and select File Explorer.

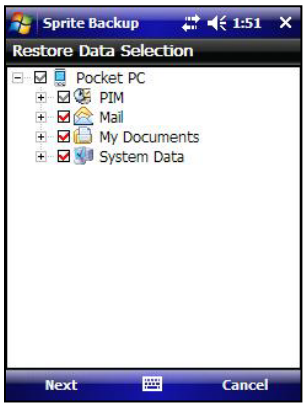


    - In the File Explorer Program, click on "My Documents" (on top left as shown below) and select the SD-MMC card location. You will see the contents of the memory card and the Backup file that you previously created (Backup). Click on the Backup file to initiate restoration of your data and settings

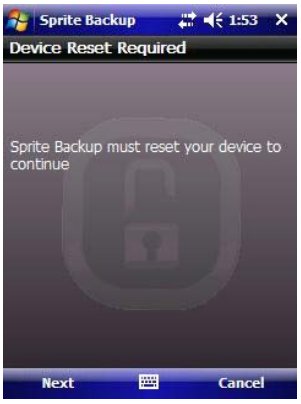




- This will take you to the Restore Data Selection Page. Make sure all folders are checked, and Press next.



- The Juno must go through a reset for the restore process to be complete. Press Next to Reset the Device. You will be given a restoration report at the end of the process. Just Press OK and the Restore is finished.



- Everything should be back to normal, but you'll probably have to re-collect whatever data you were working on when the Juno froze and re-enter anything that was not backed up.

NOTE: Perform a restore only after data loss (i.e. dead battery, hard reset); do not use the restore function as a means to undo mistakes.

5. **Maintaining Your Juno:** The Juno is basically a field computer running Windows Mobile operating system. It has an integrated high sensitivity GPS receiver with 5m accuracy when using real-time differential correction. They are durable devices, but are not fully rugged. We have added a case onto it but that does not make them rugged, waterproof or immune to dirt. Do not remove the Juno from its case under any circumstances. If there are technical issues, hand over the unit to the data specialist for your team.
    - **Keep the screen clean**. Touch-screens are great, but present a host of problems when used in the field. The Junos are enclosed in protective cases but their screens are only covered with a thin plastic cover. If care is not taken the screen can easily be scratched or damaged. Here are some tips for screen care:
        i. The provided **stylus** is the **only** object that you should ever use to Press or write on the screen. Do not use your fingernail, a pen cap, a twig, a pencil, or any other object you might think is suitable. Carry extra styli with you, they come cheap from any computer store.
        ii. If the case, protective plastic screen cover or the stylus is dusty or dirty, gently wipe them down with a clean cloth, damp if possible.
        iii. When stowing the Juno in your backpack, be aware of its placement. In the past, many screens have been ruined simply by the way they're carried around or stored. Do not store the Juno in your backpack and then use your backpack as a chair.
    - **Cleaning and storing the Juno:** You and your Juno are likely to encounter dirt and mud, if you are lucky enough to be rained on while walking transects. To clean the Juno, use a clean, damp cloth or, if really dirty, a soft bristle brush (do not use on screen). Make sure the Juno and all its protective covers are clean and completely dry before charging or operating. Store in a cool, dry place.
    - **Battery Care:**
        i. The Juno comes with a custom rechargeable Lithium Ion battery pack. You should never remove or handle the Juno's battery pack. For that matter, you should never attempt to remove the protective case on Juno.
        ii. Use only the vehicle power adaptor or AC adaptor to charge the unit. The included USB data cable is not used for recharging the Juno.
        iii. If possible, charge every night and avoid fully discharging the battery. Unlike most rechargeable batteries, Lithium Ion batteries will have a longer life span when consistently only partially drained.
        iv. Again, make sure the unit and cables are **completely dry** before plugging into an electrical source. Clean connections with a clean, dry cloth or compressed air, taking care not to freeze anything.
        v. Do not immerse battery in water, store in a hot vehicle, drop or puncture it, and do not open it.

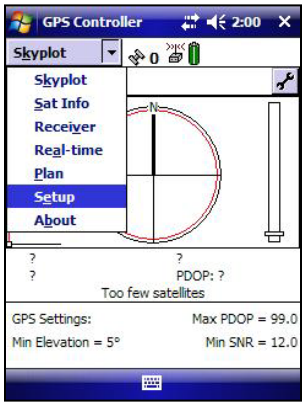
6. **Troubleshoot Common Juno Problems:** There are two typical ways to troubleshoot a non-responsive Juno: a soft reset and a hard reset. Try the soft reset first and if that doesn't do the trick, try a hard reset. If the problem persists, speak with your data specialist about possible resolutions.
    - **Soft Reset:** A soft reset gives the Juno a fresh start, similar to rebooting a computer. A soft reset saves data, closes all open applications, and then restarts the handheld. All data and settings are retained after a soft reset, so no restore is needed. To perform the Reset, use the tip of the stylus to lightly press the reset button.

    - **Hard Reset:** Do not perform a hard reset unless a soft reset does not solve the problem. A Hard reset erases all data, installed applications, and settings stored in the handheld, except for any data or applications that were pre-installed on the handheld or are stored on a memory card. To perform a Hard Reset, press and hold the power button at the same time you lightly press the reset button with your stylus. After this, hold the Power button and both Soft Keys to turn the device back on. You will briefly see a message "Hive Clean" before the device resets to factory defaults.

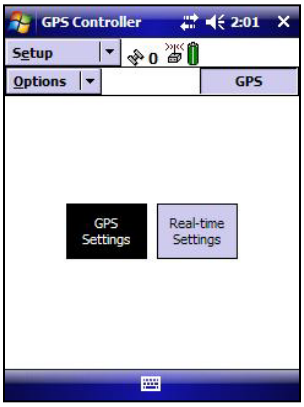
Objective 2: Built-In GPS settings

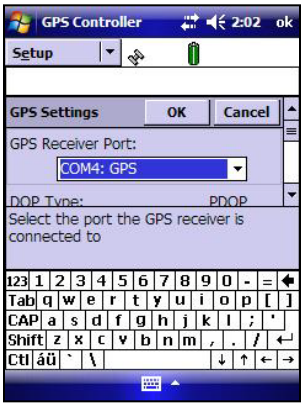
The GPS settings are already set on each Juno when the device is loaded with Pendragon forms. However if the GPS is not working or is having problems making GPS grabs, use the following procedure to verify that the settings on your Juno are correct.

- Press and select GPS Controller. In the top left corner of the screen, there is a drop-down menu. Press the menu and select "Setup" to begin.

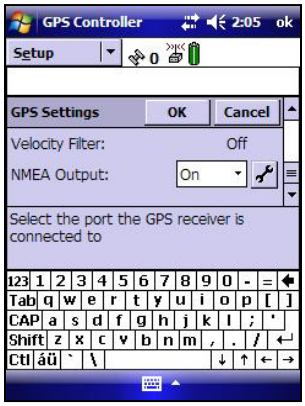


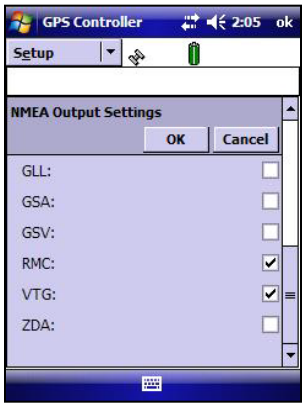
- In Setup there will be two options, one for GPS Settings, and one for Real-Time Settings. Press GPS Settings. In GPS Settings, the drop-down menu should read "COM4:GPS".



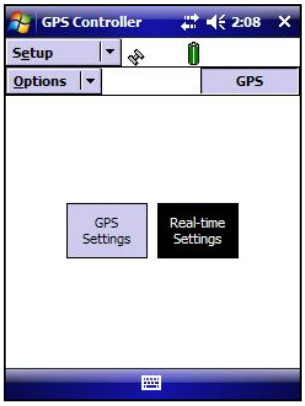


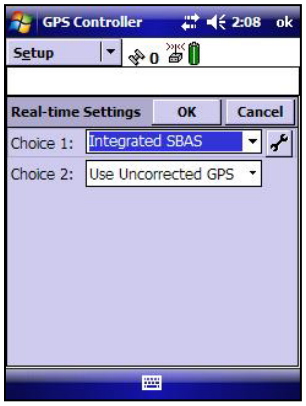
- Use the scroll bar on the right of the screen to scroll down to NMEA Output. Use the drop-down menu to select "ON". A Wrench Icon will appear that will allow you to adjust the NMEA Output settings. Press the Wrench Icon, scroll down to the RMC option, and make sure it is checked. Press OK until you are back at the Setup page.



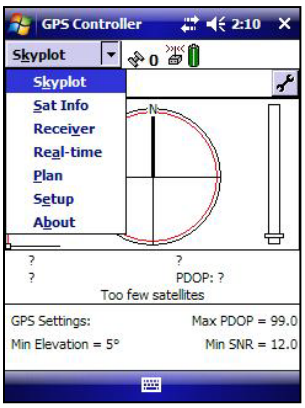


- In the Setup screen, Press Real-Time Settings. In the "Choice 1" drop-down menu, select Integrated SBAS. "Choice 2" will appear as will the Wrench Icon, but since no other settings need to be changed, Press OK.





- In the GPS Controller drop-down menu, select "Skyplot" to get out of the Setup screen and view the satellites being picked up by the device. You are finished setting up the built-in GPS.



Objective 3: Built-In Camera settings

1. Parts of the Camera and Taking a Picture

- Press the Camera Button on the right side of the device to start the Camera application. By default, the Camera application starts in image capture mode. Use the Zoom button to adjust the magnification of your image before taking your photo. To capture an image, point the Camera at the object, and press the Camera button. Because the Camera has autofocus, there will be a slight delay after depressing the Camera button. Continue to hold the Camera still until you hear the "click."

2. Adjusting Camera Settings

- To access the Camera settings, tap the screen while in the Camera application

- The Camera's current settings are displayed as icons on the screen. Tap the required icon to change its setting. The settings will stay the same whether you are in Image mode or Video mode. Press the image capture icon in the settings to change from image capture to video capture. When taking an image or video make sure that the file storage location is "MicroSD card" and not "Device memory". The default image settings you will use are highlighted in red below. To exit out of Camera settings, tap the screen or press the Camera button.

Camera mode	Setting	Icon
Image and video	Exit Camera application	
Image and Video	Operating mode	 Video capture  Image capture
Image and Video	File storage location	 MicroSD card  Device memory
Image and Video *Video only allows 320×240 to be selected	Resolution ***Note*** *– The larger the resolution, the larger the file size. Taking a picture with a larger resolution may take longer to capture; continue to hold the camera button until you hear the 'click'.*	

Camera mode	Setting	Icon
Image and Video	White balance. Set according to user environment to ensure accurate image color.	 Cloudy  Indoor  Outdoor  Auto
Image and Video	Exposure	 Night  Day
Image and Video	Brightness adjustment. Select plus numbers to lighten the image; select minus numbers to darken the image.	
Image	Image review	 On  Off
Image	Quality adjustment	 Low  Medium  High
Image	Focus	 Macro  Normal
Video	Mute	 On  Off