

9 RTI – Real-time Inventory Procedures

The following are procedures for efficient use of RTI with SoloForest and TCruise WinCE Pro:

9.1 Office Prep:

Basemaps:



- You may want to use basemaps such as shapefiles and aerial imagery from your desktop GIS to aid in your inventory. Clip these basemap layers to a manageable size.
- Before deployment to your handheld, be sure all basemap layers are in the same coordinate system and that that the coordinate system is supported by Solo. Solo supports UTM, State Plane, LLA WGS84, and some other coordinate systems where custom zone files have been created such as Albers.
- Basemap Data Transfer – Basemaps should be copy/pasted from your PC to the **My Documents/Basemaps** folder on the handheld:
 - **Tip** - You could also use a storage card to store your basemaps but they will perform better if stored in the Main Memory.
 - **Tip** - If you choose to store the basemaps in subfolders inside the **My Documents/Basemaps** folder don't put them more than 4 layers deep from My Documents.
 - Be sure to include world files with your aerial imagery if applicable.
 - For shapefiles, be sure to copy over just the **.dbf, .prj, shp, and .shx files**.
 - Be wary of the file size of your basemap layers. Keep them as small as possible.

Cruise Grids

- If you have a Plot Allocator application on your desktop PC such as SilvAssist or SoloOffice, you can generate your cruise grids more efficiently and then deploy them to your handheld(s).
- Remember that it is critical for all plots to have **unique PlotID's**. Problems will result if not.
- Use your waypoint convertor to create SoloForest .way files from plot shapefiles.
- Paste the Solo waypoint (.way) file(s) to the **My Documents/Solo** folder on the handheld.




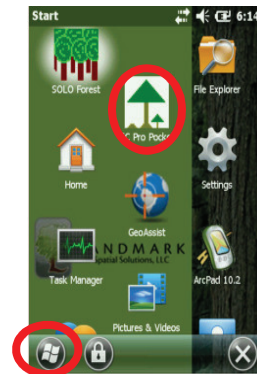
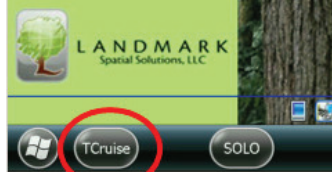
TCruise Codes Files:

- Your TCruise Desktop template holds all of the parameters for your cruise. From that template a tcc file is created which is a scaled down version used on the handheld.
- Transfer the appropriate tcc file from your PC to the **My Documents/TCruise CE folder** on the handheld.

9.2 RTI Field Setup Procedures

1. Launch TCruise using one of the following:

- Tap the Programs Button  and select TC Pro Pocket
- Press the Hotkey assigned to TCruise
- TCruise Soft Key
- Function key F6.



2. Select the appropriate TCruise Startup dialog box;

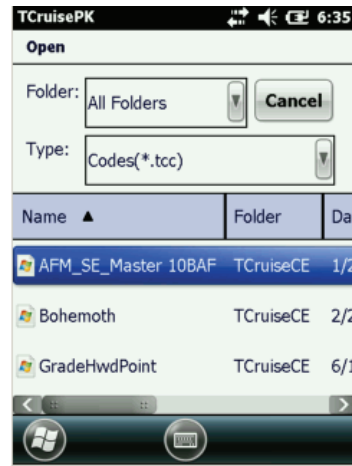
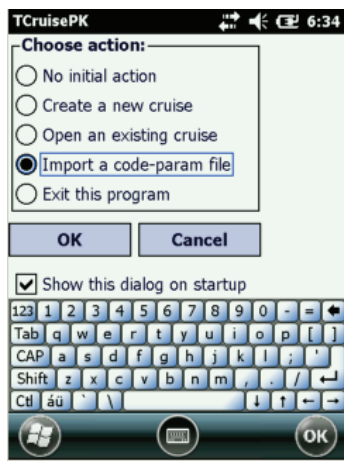
- No initial action

action

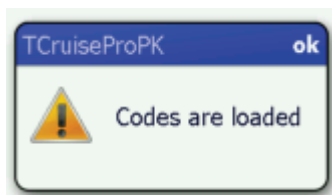
- Create a new cruise (**Never Use – it uses the default template.**)
- Open an existing cruise
- Import a code-param file (import a .tcc file to load your template)
- Exit this program

To **open an existing cruise** select Open an existing cruise and select the appropriate cruise file (.tce) to append.

For a **new cruise** you will select **Import a code-param file** and you will choose the appropriate .tcc file (field template).

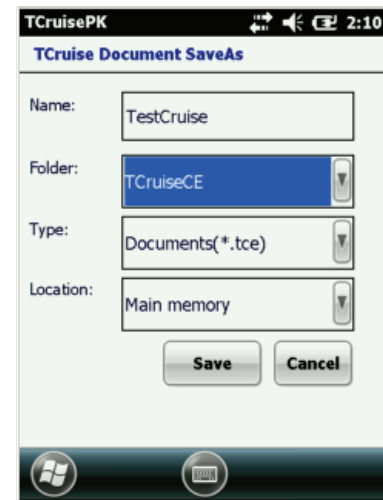


When you receive a confirmation that “Codes are loaded” you can press OK.



3. Save your cruise:

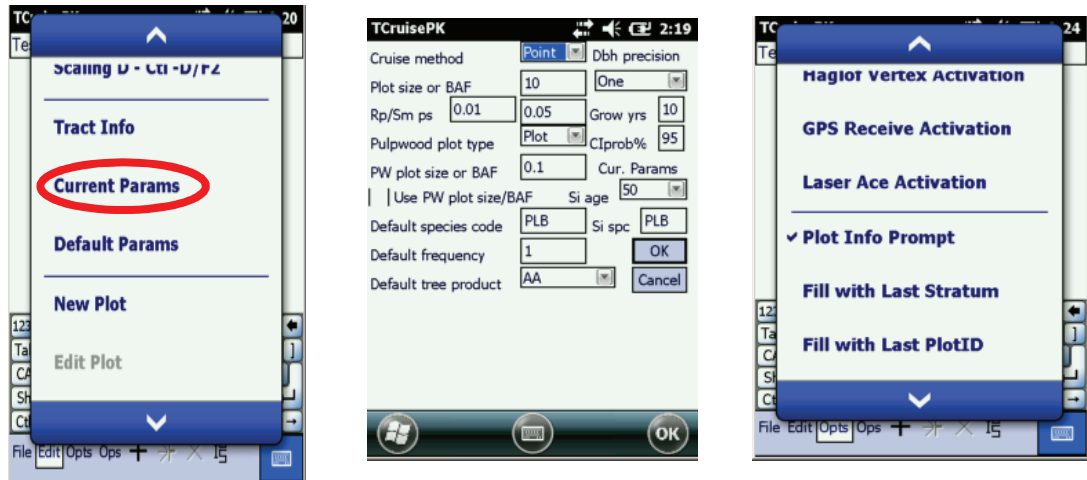
- Select **File > Save** from the TCruise Menu bar.
- Enter an appropriate File Name.
- Specify Folder (always choose TCruiseCE folder).
- Choose Location (Main Memory).
- Press **Save**.



With the cruise file saved, any plots that are added will automatically get appended to the cruise when you press the **Save Plot** button.

4. Check you cruise Parameters

Before you add any plots you should always check your **Current Params** settings under the Edit menu. This will insure that you are using the correct cruise method, BA or plot size, and allow you to set the default species, etc. Make any inputs or changes necessary and OK out.



Also, be sure that Plot Info Prompt is enabled so you can enter/verify your Strata and other Plot Level Info before entering tree data. Click **Opts** menu and verify that **Plot Info Prompt** is checked as shown above. Finally, you should click **Edit Menu > Tract Info** and enter your initials in the Cruiser field. TCruise is now ready. Next, let's focus on the SoloForest setup.

5. Launch SoloForest using ONE of the following:

- Press Programs button  then click 

- Press Right Hotkey 

- Solo Softkey 

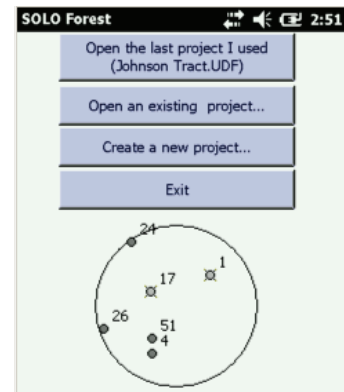
- F7 on the Forge keypad.

***Note that SoloForest will take a minute to load, so be patient.**


Choose an appropriate action from the SoloForest Startup Dialog:

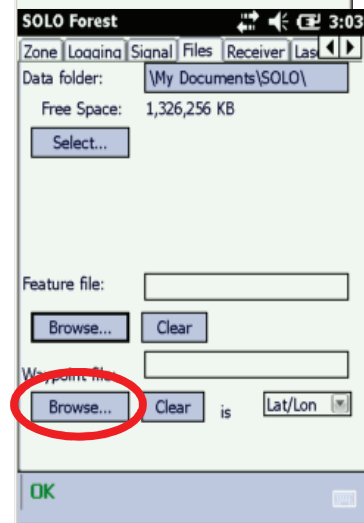
- Open the last project
- Open an existing project
- Create a new project
- Exit

If creating a new project, use a meaningful file name instead of the default name. Double check your project settings tabs and press OK.




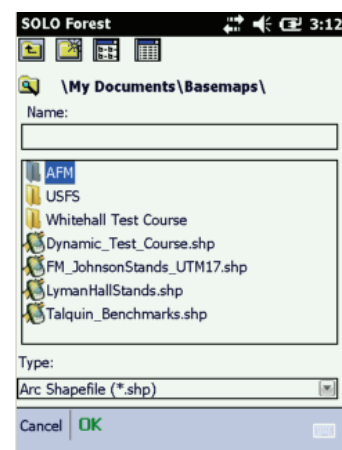
6. Load Waypoint File

- Once the Solo project is opened/created, click the **File Menu, then click Settings > Files tab.**
- Click **Browse** under Waypoint File and choose the desired .way file
- Press OK when done.
- Waypoints should be loaded.
- Press **Zoom to Everything** button  if you don't see them immediately on the map.



7. Load Basemaps (if desired).

- Click View menu > Map Layers
- Press the Add Layer Button 
- Navigate to the **My Documents/Basemaps** folder.
- Be sure the Type is set for ArcView Shapefile or whatever layer type you wish to add.
- Choose the layer and OK out.
- Load additional layers if desired. (See working with basemaps section of the manual for more info on basemaps).
- Save the Basemap layers to a Basemap Configuration File (.bmc)

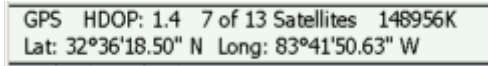


8. Enable RTI

Enable the RTI scripts that link TCruise and SoloForest together.
Select the **Tools menu > More > and tap RTI.**

9. Check GPS Status

Be sure you have a GPS signal by checking the SoloForest Status bar:



Field setup procedures are complete.

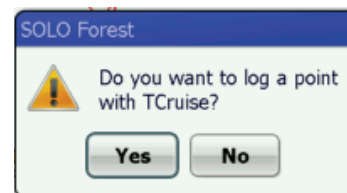
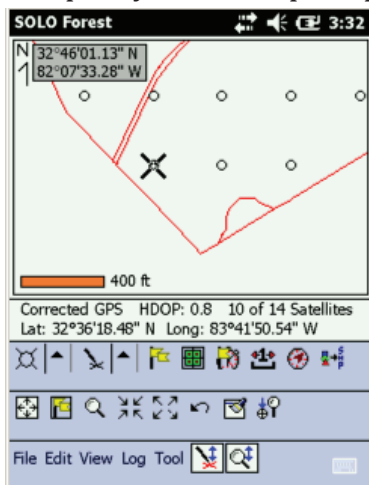
9.3 RTI Field Data Collection Procedures

You are now ready to begin cruising. The workflow is simple:

- Use SoloForest to navigate to cruise plots
- An alert tell you when you are near the plot
- TCruise will open and capture some Plot information
- Enter tree data
- Save your Plot
- Toggle back to SoloForest
- Do it again.....

1. Begin Cruising – Navigate to Plots

Navigate to your first plot using SoloForest. You can use the Navigation screen in Solo or just follow your GPS cursor to the plot (see the Navigation section of the Solo manual for more details). Once you are within the set tolerance distance of the plot, you will be prompted to **Log a point with TCruise**. Select **YES**.



2. Enter TCruise Data (example shown is from a Total Height template.)

- **Plot Info-** TCruise will automatically open and advance to the Plot info dialog screen if the Plot Info Prompt is enabled.
 - When using RTI the Stratum, Plot ID and Lat Long should be automatically populated for you.
 - **DO NOT** adjust or change the PlotID unless a value did not get passed to TCruise from Solo. Press **OK** to get to the Tree Tally screen.



- **Tree Tally** - Enter tree data on the tally card shown below. Here are the names for each data field (column) abbreviations used on a typical Total Height template:

- **Spp** – Species code. Choose from dropdown list.
- **Prd** – Product code. Default code is AA -AutoAssign.
- **Dbh**
- **THt** – Total Height. (Use for Pine species only.)
- **SwHt** – Height to sawlog top.
- **PwHt** – Height to PW top.
- **btd** – Broken top diameter (pines only)
- **Age** – SI age.
- **P** – Pulpwood always Pulpwood



Instructions for Column entries:

- **Species (Spp) field –**
 - Enter the desired species code using the drop down list.
 - The default species can be changed in the **Current Params** under the **Edit menu** when the tally screen is not open (ie. between plots).
 - With the cursor is on the spp column you may press the **<enter>** key and then use the **Up/Down** buttons to toggle thru the list. Press **<enter>** to select the desired species and the toggle right to advance to the next column.

- **Product (prd) column –**
 - This is also a pick list with valid products for the selected species.
 - Leaving the value of AA will assign the tree to the highest possible product class based on the species order in your in your merch specs and DBH.
 - There are a couple of big advantages to using AA vs. hard coding every three product:
 - This will speed up data collection since most trees will make the highest product. You should only need to change from the default value of AA if the tree should be downgraded due to defects.
 - You have the ability to change your dbh or top limits in the merch specs after the cruise. This will allow users to easily and quickly run different scenarios without the need to edit each plot and manually change product designations.

 - **Note - It is critical that you know your merch specs so that AA doesn't work against you. Here is a special case using Poles.** (See the merch specs table below)
 - See that Pole is set to the #2 product and shares the same min DBH as Chip-N-Saw.
 - Normally you would expect Pole to be set for Product 3 because it is a higher value product. However, in this case it has been strategically placed in product 2.
 - In the event a normal 10" Lob is tallied and the product is AA, the tree will be designated to CNS. This is because fewer 10" trees will have pole quality. The only way to get a tree designated as a Pole product is to enter a DBH of 8.6" or greater and manually assign POL in the product dropdown list.


SPECIFICATION:	PRODUCT				
	Pulpwood	Pole	Chip-N-Saw	Sawtimber	Cull
Number code	1	2	3	4	5
Alpha code	PW	POL	CNS	SAW	CL
Compute volumes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Threshold dbh...	4.6	8.6	8.6	11.6	NA
Pulpwood top(ob)	3	3	3	3	NA
Sawlog top(ob)...	3	6	6	8	NA

- **DBH** – enter the DBH to the nearest inch unless otherwise instructed.
- **THt** – Total Height .
 - Enter total tree heights for species like Pines assigned to taper/profile functions.
 - Because TCruise automatically does height subsampling; users need not measure total heights for each tree on the plot. One or two per plot should suffice.
- **SwHt** – Height to the sawlog top.
 - **For pines**, if there is defect that will prevent the stem from being merchandised all the way to them minimum sawlog top diameter in the specs, enter the sawlog stopper height here. Anything above this point will go into topwood.
 - **For hardwood** species assigned to a Mesavage Volume function this is the height to the merch top for a sawtimber tree. No min diameter is assumed.
- **PwHt** – Height to the PW top
 - For **pines** this would only be used when a tree has a broken PW top or a tree where no topwood should be expected above the entered height.
 - For **hardwoods**, this is the merch height for a standing PW tree.
- **Btd** – Broken top diameter
 - Used for **pines only with a broken top**. This is the estimated diameter at PwHt discussed above. This entry is critical since your taper equations expect each pine tree to have a total height (ht to a 0” top). The broken top diameter entry allows the taper equation to


properly “build” the profile of a stem and account for the missing top segment.

- **Age** – SI index age
 - Enter an age here only for dominant/co-dominant site index trees.
 - Only trees with an age will be used in SI calculations.
- **P** – Pulpwood, always pulpwood.
 - Enter a **1** in this field if the tree has defects so serious that it will never progress into a sawtimber quality tree.

3. Save Plot

- When tree data entry is complete, press the Save Plot button  on the TCruise toolbar.
- Be aware that the Save Plot button may be greyed out if the cursor is flashing in a cell. Tap another cell or press <enter> to get out of the cell edit mode.

4. Toggle Back to Solo –

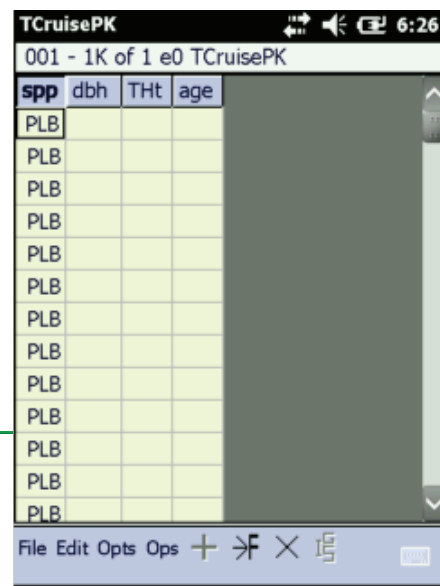
- Press the  (GIS) button on the TCruise toolbar to get back to SoloForest. This is the fastest method.

5. Repeat the steps for next plot.

- When the subsequent plots are saved, they will be saved to the .tce file that is currently open.

6. Close SoloForest and TCruise.

- When cruising is completed for the day, exit out of TCruiseWinCE after saving the last plot by using **File > Exit**.
- Exit out of SoloForest by selecting **File > Exit**.



9.4 Tree entry form examples:

Here are examples of nearly every type of tree you might encounter. If there are others, hopefully these examples will allow you to reason your way thru the proper method to input the data into the TCruise Tally screen.

For these examples we'll assume these specs for Pine which is also using a Taper equation and expects total heights:

Species Group Loblolly Pine Timber Product Merchandizing Specifications					
SPECIFICATION:	PRODUCT				
	Pulpwood	Pole	Chip-N-Saw	Sawtimber	Cull
Number code	1	2	3	4	5
Alpha code	PW	POL	CNS	SAW	CL
Compute volumes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Threshold dbh...	4.6	8.6	8.6	11.6	NA
Pulpwood top(ob)	3	3	3	3	NA
Sawlog top(ob)...	3	6	6	8	NA

And these for Hardwood species who use a Mesavage function and expect Merch heights:

Species Group Soft Hardwoods Timber Product Merchandizing Specifications					
SPECIFICATION:	PRODUCT				
	Pulpwood	Small ST	Med ST	Sawtimber	Cull
Number code	1	2	3	4	5
Alpha code	PW	SST	MST	SAW	CL
Compute volumes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Threshold dbh...	4.6	8.6	8.6	11.6	NA
Pulpwood top(ob)	4	4	4	4	NA
Sawlog top(ob)...	4	5	6	9	NA

1. Pine PW Tree

- no defect
- 8" Planted Lob
- 45' total height

spp	dbh	prd_	THt	SwHt	PwHt	btd	
PLB	8.0	AA	45				

Comments - It is OK to use AA (Auto Assign) for this tree since the smallest pine sawtimber product doesn't start until 8.6" DBH. A total height was entered since it was the first tree on the plot and thus, will be used as a height subsample tree.

2. Pine Sawtimber tree

- no defects
- 12" Planted Lob
- 67' Total Height

spp	dbh	prd_	THt	SwHt	PwHt	btd	
PLB	12.0	AA	67				

Comments: Good tree, no defects.

Product Assignment - It is OK to use AA (Auto Assign) for this tree since the Sawtimber product begins at 11.6" and this tree will be automatically assigned to the highest product for this Species Group.

Height - A total height was entered since it was the first tree on the plot.

Merchandising - TCruise will estimate where the 8" sawlog top is using a taper equation. The program will merchandise the sawlog segment all the way to that 8" top and merchandise everything above that point as topwood up to the 3" min PW top. Topwood is calculated as long as the topwood piece length is 16' or longer.

This tree will also be used as a **height subsample** tree since it has a total height entered.

3. Pine Sawtimber Tree with no Total Height entered

- 12" Planted Lob
- No defects
- No total height measured

spp	dbh	prd_	THt	SwHt	PwHt	btd	
PLB	12.0	AA					

Comments – This tree is the same as the previous, except with no total height entered. TCruise will estimate the total height of this tree using the height subsample regression. Since no stoppers are entered it is assumed that this tree is free of defects. TCruise will also estimate the height to the 8” sawlog top and 3” PW top for merchandising using the taper function.

4. Pine Sawtimber tree with a stopper

- 12” Planted Lob
- 67’ Total Height
- Fork at 31’

spp	dbh	prd_	THt	SwHt	PwHt	btd	
PLB	12.0	AA	67	31			

Comments – Same tree as above in #2 except it has a defect at 31 feet.

Product Assignment – Same as #2 above.

Height – A total height was entered since this tree has a defect that will also require a stopper height. 31’ was entered in the SwHt (sawlog stopper height) column.

Merchandising - Sawlog material will end at 31 feet and everything above will go into topwood.

This tree will also be used as a height subsample tree.

5. Pine Sawtimber size tree downgraded to PW

- 12” Planted Lob
- 67’ Total Height
- Poor form

spp	dbh	prd_	THt	SwHt	PwHt	btd	
PLB	12.0	PW	67				

Comments – Same tree as # 2 above. It has the diameter to make sawtimber but not the form.

Product Assignment - has been downgraded to PW.

Merchandising - The entire stem up the 3” PW top get assigned to the PW product.

6. Pine Sawtimber tree with Cull segment

- 14" Planted Lob
- 67' Total Height
- 37' to the sawlog top. Has 3' Cull segment at 18'.

spp	dbh	prd_	THt	SwHt	PwHt	btd
PLB	14.0	GAA				

Comments – This tree will need to be graded to capture the cull segment.

Product – has been set to GAA – Grade Auto Assign.

Merchandising – Notice that no height is entered in the THt or SwHt columns.

Grade trees have their segment lengths entered in the Grade screen. Stump ht can be left blank if you accept the default of 0.5 ft. The segment lengths were entered and assigned a grade product. A PW segment was entered since the Stopper was set to PW. If the user changed the Stopper to Saw in the pick list, the PW segment could be left off. TCruise will use the height subsample regression to estimate the total height of this tree.

TCruisePK 7:59

Seg length: GAA

Stump	Grade:	%Def
18	SW	
3	CULL	
16	SW	
23	PW	
	SW	
	SW	
	SW	

Buttons: OK, Cancel, Delete, Stopper, PW, Top dia.

7. Pine Pole

- 11" Nat Slash
- 68' Tot Height

spp	dbh	prd_	THt	SwHt	PwHt	btd
NSL	11.0	POL	68			

Comments – This tree could not be Auto Assigned because of the product ordering in the Merch Specs. If it did, it would have landed in the CNS product. It was “downgraded” to the POL product. This strategy was taken in the Merch Specs order to make AA more efficient since most trees less than 11.6” would be CNS rather than Poles.

8. Pine Site Index Tree

- Planted Lob
- 11.4" DBH
- 71' Tot Ht
- Age 21

spp	dbh	prd_	THt	SwHt	PwHt	btd	age	p
PLB	11.4	AA	71				21	

Comments – Tree DBH entered to the nearest tenth. Total height entered and age. Only trees with an age will be used in the Site Index calculations.

9. Pine PW tree with broken top

- 9" PSL
- Broken top at 35'
- Broken top dia = 5"

spp	dbh	prd_	THt	SwHt	PwHt	btd
PSL	9.0	PW			35	5

Comments – Tree product downgraded to PW. Note that no Tot Ht is entered since the tree does not have 0" top. Broken top height entered in the PwHt column and 5" entered in btd (broken top dia column). These entries will help the taper function build the form of this stem properly. If the broken top diameter had been 3", the user could have left the btd column blank. TCruise would expect an entry in the btd only if the top is broken at a diameter other than the min merch top size for PW (3" in this case).

10. Pine PW always PW tree

- 8" PLB
- 40' Tot ht.
- Poor form

spp	dbh	prd_	THt	SwHt	PwHt	btd	age	p
PLB	8.0	PW	40					1

Comments – This tree has such poor form it will never grow into a higher product category like sawtimber. These trees should be indicated by entering a 1 in the p column.

11. Pine Sawtimber tree with multiple sawlog segments

- 14" NLB
- 16' Sawtimber butt cut
- 20' CNS segment above

spp	dbh	prd_	THt	SwHt	PwHt	btd
NLB	14.0	GAA				

Comments – No heights entered on main tally screen. Prd is GAA. Segment lengths entered up to the sawlog top since the Stopper is set to SW. Stump is blank and assumes default stump height of 0.5 '.

TCruisePK 9:17

Seg length: GAA

Stump:

Grade: SW

Segment 1: 16

Segment 2: 20

Segment 3:

Segment 4:

Segment 5:

Segment 6:

Segment 7:

Buttons: OK, Cancel, Delete, Stopper (SW)

12. Pine Sawtimber tree with no topwood

- Open grown LL Pine
- 16" DBH
- 16' Butt log only
- Top cannot be merchandised for PW.

spp	dbh	prd_	THt	SwHt	PwHt	btd
LL	16.0	AA		16		12

Comments – No total height is entered, only the SwHt and an estimate of the sawlog top dia in the btd column. Even though this tree does not have a broken top, it is entered as if it does so topwood will not be computed for this tree.

13. Hardwood PW tree

- 10" SHd
- 35' merch ht.

spp	dbh	prd_	THt	SwHt	PwHt	btd
SHd	10.0	AA			35	

Comments – For hardwood species the merch height should be entered in the height column of the product. This 10" tree is AutoAssigned but based on the merch specs would be a PW tree, therefore the height goes in the PwHt column.

14. Hardwood Sawtimber tree

- 14" HHd
- 32' Merch ht

spp	dbh	prd_	Tht	SwHt	PwHt	btd
HHd	14.0	AA		32		

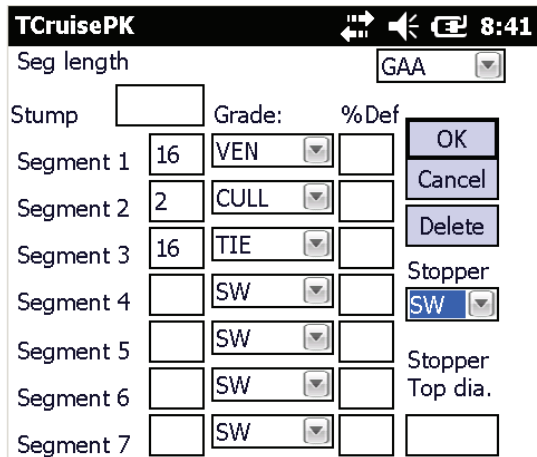
Comments – The merch ht for this tree is entered in the SwHt column since it will be Auto Assigned to Sawtimber.

15. Hardwood Sawtimber tree – Graded

- 14" HHd
- 16 Veneer butt log
- 2' Cull
- 16' Tie log

spp	dbh	prd_	Tht	SwHt	PwHt	btd
HHd	14.0	GAA				

Comments – No heights needed on the tree tally screen. The product is GAA which open the grade screen. Stump height is blank to accept the default stump height. Segments are entered up to the SW top and the Stopper is set to SW.



TCruisePK 8:41

Seg length: GAA

Stump: [] Grade: [] %Def: []

Segment 1	16	VEN	[]	OK
Segment 2	2	CULL	[]	Cancel
Segment 3	16	TIE	[]	Delete
Segment 4	[]	SW	[]	Stopper
Segment 5	[]	SW	[]	SW
Segment 6	[]	SW	[]	Stopper
Segment 7	[]	SW	[]	Top dia.

16. Premerch Trees

- Planted Lob
- 4" DBH
- 31' Total ht.
- Site tree

spp	dbh	Tht	age
PLB	4.0	31	9

Comments – This tree is a site tree so age is entered.

17. Reproduction Trees

- 4 Pines on plot

Spp	cnt	r	N/A
PINE	4	1	

Comments – Enter Species, count, and put a 1 in the r column. N/A column is left blank always.

9.5 Field User FAQ's

- **How to close out of TCruise?**
File menu > exit. Save changes? Yes.
- **Edit a Tree Data on a Plot?**
Edit menu > Edit Plot or Edit Plot by ID if you know the PlotID.
- **What is the difference between Plot # and PlotID?**
Plot number is the order in which you visited the plots. PlotID is the Solo waypoint ID.
- **How do I Edit Plot Level Info?**
Edit the plot in need of edits and then click *Edit Plot Info*.
- **I accidentally created a plot. How do get out of it or delete it?**
Press the X button on the TCruise toolbar if you are still on the tree tally screen. If you accidentally saved the plot, press *Edit menu > Delete Plot >* and enter Plot # to be deleted.
- **How can I change the default species code?**
Edit menu > Current Params and change the code. Species codes are case sensitive so if you are unsure of the proper abbreviation click *Opts menu > Species codes*.
- **How do I manually create a new plot?**
Press the *+ button* on the toolbar.
- **Where do I enter my cruiser initials so I don't have to enter them manually on each plot?**
Edit > Tract Info screen.
- **How can I tell how many plots I have saved on this cruise?**
Edit > Status. Here it will show the useable plots and deleted plots.
- **How can I tell how many height subsample trees I have tallied so I can fill in any missing gaps in the dbh range?**
Edit > Ht Subsamples. Choose the species group in question. You cannot be in an active plot for this to work.

- **How can I turn ON the Plot Info prompt?**
Opts menu > Plot Info Prompt.
- **Where can I check the limiting distance for a tree on a point sample?**
Ops menu > LmD
- **I accidentally loaded the wrong tcc Codes file. How can I load the correct one without exiting and re-opening the program?**
File menu > Import/Export > Import Params file.
- **The stratum I need to enter on the Plot Info screen is not in the strata list. How do I get it there?**
Manually enter it on the Plot Info field and it will automatically append to the list.
- **My handheld locked up in the middle of a plot. Will I lose all my data?**
You should only lose the plot that was not completed. All other data is safe.
- **I cannot get to a required plot on a cruise. How do I manually create a waypoint as a substitute for it?**
Walk to the location you would like to take the new plot. In SoloForest *click Tool > More > Add Waypoint at Current Location*. You will be prompted to enter the Waypoint Name and Description. Put the original Waypoint number in the Name field and the StandID in the Description field. The waypoint will be created and you will be prompted to Log a Point with TCruise.
- **I walked past my plot and did not get prompted to Log a Point with TCruise. What do I do?**
Just make a loop back around thru the plot center.
- **I accidentally cancelled out of a plot without saving it. How can I create a new plot?**
Press the + button on the TCruise toolbar and be sure to enter the correct Stand # in the Strata field and the correct Waypoint # in the PlotID field.
- **I visited a plot using RTI and after Logging a Point with TCruise I see my tally card already has tree data on it. What caused this? What do I do?**



This usually occurs when you have duplicate PlotID's in your waypoint file. TCruise see that a particular PlotID has been visited before on the same cruise and opens that plot as if the cruiser wanted to Edit the plot. To remedy this simply close out of the plot and create a new plot by tapping the + button on the TCruise toolbar. Enter the correct stand # in the Strata field and enter a unique PlotID like 9999.