Olympic Dam Archaeological Survey
Mobile GIS Manual

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12. Key to the ArcPad Preference Files

1. Turning the Recon on and getting it going

1. Press the **on/off** button
2. Tap 'Start' then 'ArcPad 7.0.1'
3. **Wait.** It may take a moment to open
4. Tap the **'Open File'** button, a file browsing window will appear
5. Look under where it says 'Name', 'Folder', 'Date' and tap the file 'ArcPad' (there should only be one, if there are more, then tap the one you want, you should know)
6. **Wait.** It may take a moment to open
7. Tap the **GPS button**, a message should appear "The GPS is not active. Would you like to activate it now?" tap 'Yes' the orange light on the GPS should come on and the GPS Position window will appear. Satellites will gradually appear, but the message "No current position fix available" may flash up a few times, ignore it. If the message is "No data is being received from your GPS receiver. Check your cables and configuration options" then see the instructions below under the heading 'Making the GPS work on the Recon' then come back here when it's working. **Wait**, it may take some time (perhaps 5 minutes) to get a position. When a fix is obtained the co-ordinates will appear in the position window (in lats and longs, ignore that). Close the little position window after the co-ords appear.
8. Tap **'GPS tracklog'** to turn on tracklog recording. This will keep a record of where you go so long as it's activated and the GPS is working. Very handy for calculating survey coverages and distances.
9. Tap the **layers** button
10. **Uncheck** the 'visible' checkbox for the layer 'GPS Tracklog'. This makes the tracklog invisible on the screen, which makes ArcPad run **much** faster. At any time you can return to check the visible checkbox to see the tracklog on the map (useful to see if you've already been somewhere) but when the tracklog is visible the constant screen refreshing of huge numbers of datapoints in the tracklog will be really slow ArcPad down a lot and likely cause it to freeze (requiring a reboot; holding the on/off button down for about 5 seconds).
11. While you're working with the layers, tap 'Add Layer' and check the boxes next to 'ArcSite.shp', 'BroadBrush.shp' and 'BackScatter.shp'. This is in preparation for recording sites and isolated finds.
12. Tap '**OK'** and you're ready to go!

2. Recording archaeological data with the Recon and ArcPad

There are three kinds of archaeological data that we have enabled ArcPad to collect: detailed site records (ArcSite layer and table), basic site records (BroadBrush layer and table) and isolated artefacts (BackScatter layer and table). The general method for recording each of these three kinds is very similar; make the layer editable, capture a point from the GPS, fill out the form that appears, and deactivate the layer to prevent accidental further additions. More specific instructions as follows:

How to use ArcPad for **detailed** site recording:

1. Make sure you're standing in about the centre of the site
2. Tap the layers button
3. Check the box in the 'Edit' column for the layer 'ArcSite' This is the layer for capturing detailed site information
4. Click 'OK'
5. The GPS is probably on and working, if so skip this step. Otherwise tap the GPS button, a message should appear "The GPS is not active. Would you like to activate it now?" tap 'Yes' the orange light on the GPS should come on and the GPS Position window will appear. Satellites will gradually appear, but the message "No current position fix available" may flash up a few times, ignore it. If the message is "No data is being received from your GPS receiver. Check your cables and configuration options" then see the instructions below under the heading 'Making the GPS work on the Recon' then come back here when it's working. **Wait**, it may take some time (perhaps 5 minutes) to get a position. When a fix is obtained the co-ordinates will appear in the position window (in lats and longs, ignore that). Close the little position window after the co-ords appear.
6. Tap the 'Capture Point' button. This places a point on the map using the GPS co-ordinates.
7. The site recording form will appear, enter the details for each of the many tabs until you get the 'salvage' tab at the end.
8. Tap 'OK' on the recording form
9. Tap the little padlock picture on the lower left side of the Recon screen to lock the screen and prevent accidental mid-taps.

How to use ArcPad for **broadbrush** site recording:

1. Make sure you're standing in about the centre of the site
2. Tap the layers button
3. Check the box in the 'Edit' column for the layer 'BroadBrush' This is the layer for capturing basic site information
4. Click 'OK'
5. The GPS is probably on and working, if so skip this step. Otherwise tap the GPS button, a message should appear "The GPS is not active. Would you like to activate it now?" tap 'Yes' the orange light on the GPS should come on and the GPS Position window will appear. Satellites will gradually appear, but the message "No current position fix available" may flash up a few times, ignore it. If the message is "No data is being received from your GPS receiver. Check your cables and configuration options" then see the instructions below under the heading 'Making the GPS work on the Recon' then come back here when it's working. **Wait**, it may take some time to get a position (perhaps 5 minutes). When a fix is obtained the co-ordinates will appear in the position window (in lats and longs, ignore that). Close the little position window after the co-ords appear.
6. Tap the 'Capture Point' button. This places a point on the map using the GPS co-ordinates.
7. The site recording form will appear, enter the details for each of the two tabs.
8. Tap 'OK' on the recording form
9. Tap the little padlock picture on the lower left side of the Recon screen to lock the screen and prevent accidental mid-taps.

3. Editing archaeological data with the Recon and ArcPad

These instructions allow you to return to a previously recorded site on the Recon and change the data

1. Tap 'Find' (under the Pan button)
2. Make sure the correct layer is selected, if not, change it by tapping the little picture of a table to the right of the layer name
3. Tap on the 'Results' tab at the bottom of the screen, when the message appears asking if all records should be displayed, tap 'Yes'
4. Tap on the record you want to edit to highlight it.
5. Tap on the 'Properties' button, the second little picture from the top on the right side of the screen
6. The site recording form will pop up. Make your edits and click 'OK when finished, and 'OK' a few more times to return to the map screen.

4. Is the GPS Broken? Making the GPS work on the Recon

There are a great number of reasons why the GPS might not work. These instructions cover the most likely cause; that ArcPad isn't correctly configured to connect to the GPS. The last two steps provide more radical solutions if some setting elsewhere on the Recon has been changed to break to connection with the GPS.

1. If when trying to activate the GPS in ArcPad you get the message "No data is being received from your GPS receiver. Check your cables and configuration options" or some other weird response, then quit ArcPad
2. Open Total Commander, navigate to Program Files|ArcPad|System and change 'Toolbar.apa and 'ArcPad.apx' to 'Toolbar.txt' and 'ArcPad.txt'.
3. Next in Total Commander go to 'My Documents' and change 'ArcPadPrefs.apx' to 'ArcPadPrefs.txt' These changes will deactivate the custom toolbars and activate the default toolbars which have more GPS options.
4. Open ArcPad, then tap 'GPS Preferences'
5. Tap the picture of the little binoculars, this will make ArcPad search for the GPS. **Wait**
6. It should find it on COM2 and show the message "NMEA GPS device found on COM2: Do you want to use this device?" Tap 'Yes', then 'OK'
7. Tap the GPS button, a message should appear "The GPS is not active. Would you like to activate it now?" tap 'Yes' the orange light on the GPS should come on and the GPS Position window will appear. The message "No current position fix available" may flash up a few times, ignore it. Wait about 5 minutes, satellites should gradually appear in the little window.
8. When a fix is obtained the co-ordinates will appear in the position window (in lats and longs, ignore that). Quit ArcPad.
9. Open Total Commander, and reverse the changes of steps 2 and 3. This will activate the custom toolbars again. Delete the default ArcPad files that were generated and rename the old ones to activate them again.
10. Start ArcPad and try out the GPS again, it should be working now.
11. If not, quit ArcPad, undo the top cover, pull out the GPS card, reboot the Recon (hold the on/off button in for 5 seconds), go to Start|Settings|System tab|GPS and make sure the in the 'Programs' tab that the GPS program port is COM3, in the 'Hardware' tab the GPS Hardware port is COM2, the Baud rate is 4800 and in the 'Access' tab the box is checked. Then close those windows and try again from step 2.
12. If that still doesn't work, connect the Recon to the laptop and reinstall GPSViewer1.5.exe (in 'ArcPadSoftwareBackups', double-click and follow the prompts to remove it, then double-click and follow the prompts (Yes/OK to everything) to reinstall, makes sure it goes onto the Storage Card, not the device) and start from 1. If that doesn't work then there might by a physical problem with the GPS, to check this, try replacing it with the GPS from the other Recon and repeat from 1.

5. Getting directions: Navigating with the GPS and ArcPad

How to navigate to any spot on the map:

13. Tap the little arrow to the right of the GPS button to pop-down the other buttons
14. Tap 'Goto'
15. Tap on the spot on the map you want to go to. A little dot labelled 'Mark' will appear there.
16. Tap the GPS button to show the GPS Position Window
17. Tap on the circles until the compass is displayed (scroll through the various displays), the arrow is showing the direction of travel to the spot, and the tiny red circle is the direction of the spot

How to navigate to any spot by entering co-ordinates:

1. Tap the little arrow to the right of the 'Pan button to pop-down the other buttons
2. Tap 'Find'
3. Tap the 'Location' tab
4. Ensure that the button next to 'GDA_1994_MGA_Zone_53 is selected
5. Enter the Easting and Northing in the X and Y boxes, and a label for the spot
18. Tap 'OK' Tap the GPS button to show the GPS Position Window
19. Tap on the circles until the compass is displayed (scroll through the various displays), the arrow is showing the direction of travel to the spot and the tiny red circle is the direction of the spot
20.

How to navigate to any point or polygon feature visible in the map layers:

1. Tap the 'layers' button
2. Check the box in the 'Identify' column for the layer that contains the feature of interest
3. Tap OK
4. Tap the little arrow to the right of the 'Pan' button to pop-down the other buttons
5. Tap 'Advanced Select'
6. A small window 'Feature Information' will appear, tap on the plus sign to show the details of the feature to check that the correct feature has been selected
21. Tap the 'Goto' button in the 'Feature Information' window, the window will close automatically
22. Tap the GPS button to show the GPS Position Window
23. Tap on the circles until the compass is displayed (scroll through the various displays), the arrow is showing the direction of travel to the spot.

How to navigate to any point or polygon feature present but not visible in the map layers (this is useful to avoid zooming and panning on the little ArcMap Screen):

1. Tap the little arrow to the right of the 'Pan' button to pop-down the other buttons
2. Tap 'Find'
3. Tap the small table to open the little 'Field Browser' window
4. Tap on the layer that contains the feature of interest
5. Tap 'OK'
6. Enter some detail about the feature of interest in the 'Find' box of the 'Criteria' tab. For example a site number or some text
7. Tap on the 'Results' tab, the results of the search are automatically displayed. The entire record of that feature is displayed, scroll across to view them.
8. Tap on one of the results to select it
9. Tap the 'Goto' button in the 'Results' tab, the window will close automatically
10. Tap the GPS button to show the GPS Position Window
11. Tap on the circles until the compass is displayed (scroll through the various displays), the arrow is showing the direction of travel to the spot.

6. Changing Drop-down menus in the ArcPad forms

This is something you need to do if you want to add another option to any of the drop-down menus in the recording forms. For example, if you need to add another name to the 'recorder' field.

1. Double-click on '**1. Select Map'** on the laptop desktop. **Wait** for ArcMap to open, it can take some time.
2. Click 'Add Data' and navigate to the folder 'ReconAlpha' C:\ODX_GIS_SoftwareBackups\Recording forms and double-click on 'DropDown.dbf
3. It will appear at the bottom of the Table of Contents on the left side of ArcMap. Right-click on it and select 'Open'
4. The table will appear and you can see the different columns for the various drop-down boxes.
5. Click 'Tools' on the drop-down menus at the top of ArcMap, then 'Editor Toolbar'
6. On the new toolbar Click 'Editor' then 'Start Editing'
7. A window will appear to select the layer to edit, scroll down to the last one, which will be 'DropDown' and click 'OK'
8. Double-click on the cell where you want to type to show the typing cursor, then go ahead and enter the new text.
9. When finished, click 'Editor' on the toolbar, then 'Stop Editing'
10. A window will appear asking if you want to save, click 'Yes'

11. Close the table, then right-click on 'DropDown' in the Table of Contents on the left side of ArcMap
12. Click on 'Remove'
13. Quit ArcMap and save changes
14. Navigate to the 'ReconAlpha' folder at C:\ODX_GIS_SoftwareBackups\Recording forms and copy the file 'DropDown.dbf' and paste into the folder 'ReconBeta'. A window will appear with the message "This folder already contains a file named 'DropDown.dbf' Would you like to replace the existing file with this one?" Click Yes.

7. Viewing data in ArcMap

1. Double-click on '**1. Select Map**' on the laptop desktop. **Wait** for ArcMap to open, it can take some time.
2. To browse the map, use the pan and zoom buttons on the far right of the toolbar to adjust the view. The scale bar at the bottom of the map window will automatically update.
3. To inspect the details of points and polygons in the layers, right-click on the layer of interest in the 'Table of Contents' on the LHS of the ArcMap window
4. Click 'Open Attribute Table', the table displaying all the details for the features displayed in the layer will appear.
5. Click on the small grey box to the left of the row of the feature of interest, this will select the row (and colour it light blue). Scroll across to see all the details of that feature.
6. Right-click on the same small grey box to show a menu, click on 'Pan To' (this is good because you can see the context of the feature) or 'Zoom To' (tends to zoom in too much, but if the map is crowded with other features then this is useful)
7. Close the Attribute Table, the feature of interest will be in the centre of the screen and highlighted with a light blue dot.

8. Updating the Terrain Patterns in the Office: Editing Polygons with ArcMap

If the boundaries of the terrain patterns do not accurately reflect what is actually on the ground, they can be edited in ArcMap. It can be done in the field – see the instructions 'Updating the Terrain Patterns in the Field: Editing Polygons with ArcPad' above, but is very fiddly and time consuming, so best done sitting comfortably. See the manual "Editing_Tutorial.pdf' in C:\Program Files\ArcGIS\Documentation for a quicker way to do this than described here.

1. Double-click on '**1. Select Map**' on the laptop desktop. **Wait** for ArcMap to open, it can take some time.
2. Click 'Tools' on the drop-down menus at the top of ArcMap, then 'Editor Toolbar'
3. On the new toolbar Click 'Editor' then 'Start Editing'
4. A window will appear to select the layer to edit, scroll down until the window displays 'Terrain_pattern_gelogical_landform_type' and click 'OK'
5. In the 'Task' box of the Editor Toolbar select 'Modify Feature' and check that the 'Edit Tool' is pressed (if it isn't then click it)

6. Click once on the boundary of the terrain pattern to be edited, it should turn light blue to show that it's been selected, and little green squares will appear atvertices of the polygon
7. Move the mouse pointer over one of the little green squares, then click-hold and drag the little green square to re-position the terrain pattern boundary. Release the click when the green square is where you want it.
8. If the edits are going to be extensive, save them frequently by clicking on 'Editor' then 'Save Edits'
9. Carry on moving the squares until the boundary is where you want it
10. Similarly, adjust the boundaries of neighbouring terrain patterns so they all meet up tidily
11. When finished adjusting boundaries, click 'Editor' on the Editor Toolbar, then 'Stop Editing'
12. A window will appear asking if you want to save, click 'Yes'
13. Quit ArcMap and save changes

10. Very hard reboot for when you can't turn it or off or do anything

This is the method of last resort for two reasons: first it will fix almost everything related to software troubles and second it requires quite a bit of time of re-install the software (but less time that couriering the unit back for repairs). This hard reboot will restore the handheld to factory settings so only Windows Mobile is installed. You have to reinstall ArcPad, the ArcPad preferences files, the GPS software and the Total Commander Browser.

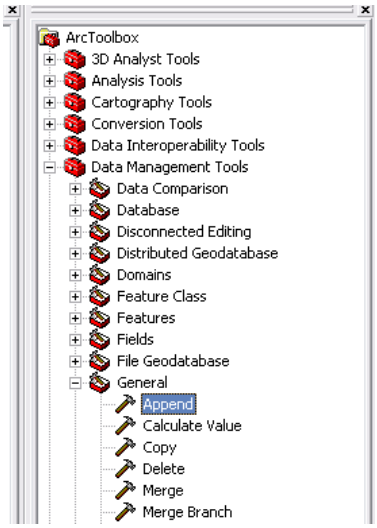
1. Make sure the battery is attached to the Recon and the power charging cable is connected to the battery. Leave it disconnected from the laptop.
2. Hold down the Power key to display a countdown. Continue to hold down the Power key until it counts down to zero and beeps twice.
3. Then immediately hold down the Start and OK keys simultaneously. After a few seconds, a screen will come up warning that if you continue, this operation will clear the persistent store including all user data, applications and settings.
4. Follow the instructions on the screen, this will completely clear the Recon of everything except the operating system. You'll have to reset the time and a few other things.
5. Now turn to the laptop and uninstall ArcPad :
    a. Start -> Control Panel -> Add or Remove Programs
    b. now find :'ESRI ArcPad 7.0.1' in the list of 'Currently Installed Programs'
    c. now click 'Change/Remove' and follow the instructions to completely remove the program from the computer.
6. Restart the computer
7. Re-install ArcPad by double-clicking 'setup.exe' in the ArcPad folder in the ODX_GIS_SoftwareBackups folder.

    a. Start ArcPad on the laptop (Start -> All Programs -> ArcGIS -> ArcPad 7 -> ArcPad 7 for Windows)
    b. Copy and paste this serial number to activate it: ~@RCP@DD00R~
    c. Check that everything looks right and then quit ArcPad
8. Now Connect the Recon to the laptop and follow the instructions on the laptop to establish the relationship. If the ActiveSync window shows 'connecting' or takes a very long time to show 'connected' (more than two minutes), then turn off the handheld, unplug the USB cable and reboot the handheld (press and hold the on/off button for about 5 seconds, until the onscreen boot countdown is complete), restart the laptop and then repeat. If the problem recurs, uninstall ActiveSync by following the instructions at step 5. Re-install ActiveSync by double-clicking ActiveSync45.msi in the ODX_GIS_SoftwareBackups folder and follow the instructions.
9. When the Recon-laptop connection is established, install ArcPad onto the Recon: Start -> All Programs -> ArcGIS -> ArcPad 7 -> Install ArcPad 7 Application on Windows Mobile
10. Check the screen on the Recon and when it asks where to install, chose the 'device' not the storage card. Wait for the install to finish, then start ArcPad on the Recon to check that it's working (go to Start -> Programs -> ArcPad 7). The buttons will look a bit different, these are the default settings. If it's not working at all, start again from step one.
11. Quit ArcPad now
12. Now use ActiveSync to copy over the ArcPad preferences files from the laptop to the Recon. These files can be found in the folder ODX_GIS_SoftwareBackups\ReconPrefsFiles Follow the instructions in the file 'Where to put these.txt' to see where the preferences files need to go on the Recon.
13. Go back to the folder ODX_GIS_SoftwareBackups, open the folders GR-271 -> English -> Utility and there you will see 'GpsViewer 1.5.exe' double-click on that file to install the GPS software. Follow the instructions on the laptop screen to install it on the Recon.
14. Test by opening GPS Viewer and tap "Scan..." it should find the GPS on COM2, if not, check that the GPS is inserted properly or replace it with the GPS from the other Recon to see if the GPS itself is broken.
15. Quit GPS Viewer
16. Install Total Commander on the Recon (ensure that it's connected to the laptop) by going to C:\ODX_GIS_SoftwareBackups and double clicking tcmdpocketarm.exe and following the instruction
17. Test by uploading map of where you are (e.g. the ODX office) and going for a wander outside to see if the GPS is working and the site recording forms are working. Download and inspect the shapefile in ArcMap to see if all the data looks right.
18. Start right from the start if you have to do it to another Recon… there are no shortcuts…

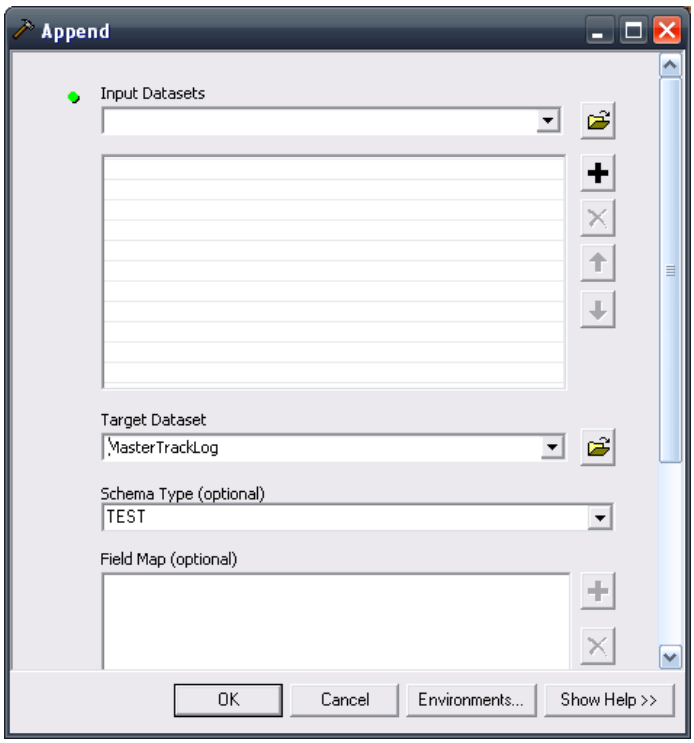
11. Updating the MasterTracklog

a. Double-click the "Update MasterTracklog" icon on the desktop
b. Wait for ArcMap to open, it might take a few moments…
c. On the toolbar of ArcMap, click on the red toolbox to open the ArcToolbox window

d. Click 'Data Management Tools' then 'General'



e. Double-click 'Append', a window will appear...



f. Click the little folder button at '**Input Datasets**' and find the file '**Tracklog.shp**' in the folder that you just added to ODX_GIS_DailyBackup
g. Double-click 'Tracklog.shp' in the folder that you just added to ODX_GIS_DailyBackup
h. Now click on the little down arrow near the folder button at '**Target Dataset**' and select **MasterTrackLog** from the dropdown menu. (this is the same as MAST.shp in the folder: C:\ODX_GIS_BaseMapData\ ODX_GIS_MasterTracklog\
i. Don't worry about the other options, just leave them as it.
j. Click '**OK**' and, a little window will appear while the program works, click 'close' when it's done
k. Have a look to see if your tracklog is in the right place
l. Click **Save** in ArcMap and then quit.

12.

Some notes on analysis in ArcMap...

- Distance of point to nearest polygon boundary: add field to point table, populate with calculator script
- Number of points per polygon: add 'count' field to point table, populate with '1' using calculator, select polygon feature, 'join' based on spatial location, 'sum', watch where results end up...
- Summarise number of sites per geol regime, for example: ArcToolbox, Analysis Tools, Statistics, Summary Statistics, choose fields then chose 'case', eg. geological regime that the summaries will be presented for. Watch for where the table ends up
- Calculate density, for example: summarise data, add field, use calculator to do count of sites per geol reg divided by area of geol reg
- Calculate polygon area: add field, use calculator, use VB ..
    1. Open the attribute table, right-click the field into which you want to calculate area, and open the Field Calculator.
    2. ◎ Check Advanced.
    3. ◎ Type the following VBA statement in the first text box:
    4. Dim dblArea as double
    5. Dim pArea as IArea
    6. Set pArea = [shape]
    7. dblArea = pArea.area
    8.
    9. ◎ Type the variable dblArea in the text box directly under the area field name.
    10. ◎ Click OK.

Key to the ArcPad Forms: ArcSite

This section explains the data entry fields of each page of the **ArcSite** ArcPad recording form. The corresponding database field is the relevant column in the ArcSite.dbf database file. When you enter field data into the ArcPad form, the values are stored in columns in the ArcSite.dbf file. This ArcSite.dbf file is then used to update the MasterArcSiteTable with queries in Access The drop-down boxes in the ArcPad forms and the equivalent Access forms are populated according to the contents of the columns in DropDown.dbf files that are specific to each drop-down box. For example, the choice of terrain patterns available on the form is determined by the row values in the column TERRPATT. If you want to change, add or remove what you can choose from in the drop-down boxes, see the instructions above 'Changing Drop-down menus in the ArcPad forms'

1. General Page: This is where it all starts, this page has to be completed for every site.

Field	*Explanation*	*Corresponding database column*
Date	Automatically inserts the today's date. Cannot be altered	DATE_
Recon ID	Refers to the number of sites recorded on that particular handheld computer. This number is used later when the Master table is updated to make an ODX ID number. Automatically inserts a number that is one more than the previous record. Cannot be altered	RSITED
Recorder	Drop-down list of names of people. You have to choose your name from the list or type it in. This field is compulsory; if you don't put something in there an alert appears.	RECORDER
Terrain Pattern	Drop-down list of Terrain Pattern types. You have to choose one from the list or type it in. This field is compulsory; if you don't put something in there an alert appears. The other two fields are for landform number and locality number. If you zoom out to see the terrain pattern polygon that you're standing in these numbers should appear in the label.	TERRPATT LANDFOR LOCALI
Site Type	Drop-down list of site types. You have to choose one from the list or type it in. This field is compulsory; if you don't put something in there an alert appears.	SITTYP
Sand Dune	Check this box if the site is in a sand dune	ENVSD
Sand Sheet	Check this box if the site is in a sand sheet	ENVSS
Interdunal Swale	Check this box if the site is in an interdunal swale	ENVIDS
Gibber Plain	Check this box if the site is on a gibber plain	ENVGP
Pan	Check this box if the site is in a pan	ENVPN
Distance to water (m)	Enter a whole number or text indicating the distance	DISTW

	of the site to water	
Water Source	Drop-down list of possible water sources. You have to choose one from the list or type it in	WATSRC
mE	Automatically inserts Easting of location of site. Cannot be altered	GRIDE
mN	Automatically inserts Northing of location of site. Cannot be altered	GRIDN

2. Sand Feature: Complete this page if the site is on a sand dune or sheet

Field	*Explanation*	*Corresponding database column*
North Side Swale	Check this box if the site is on a swale on the north side of a dune (more than one check box should be checked here if the site extends over several parts of the dune)	CBXSWN
North Side Toe	Check this box if the site is on a toe on the north side of a dune	CBXTON
North Side Flank	Check this box if the site is on a flank on the north side of a dune	CBXFLN
Crest	Check this box if the site is on a crest	CBXCRE
South Side Flank	Check this box if the site is on a flank on the south side of the dune	CBXFLS
South Side Toe	Check this box if the site is on a toe on the south side of the dune	CBXTOS
South Side Swale	Check this box if the site is on a swale on the south side of the dune	CBXSWS
Height of Feature (m)	Enter a whole number indicating the height of the feature	HEIFEA
Type of Exposure	Enter whole numbers in each box	EXPTYP
Dimensions of Exposure (m x m)	Enter whole numbers in each box	DIMEX1 DIMEX2
Shape of Exposure	Drop-down list of possible shapes. You have to choose one from the list or type it in. Populated by Shape.dbf	EXPSHP
Maximum Depth of Exposure (m)	Enter whole numbers in each box	EXPDEP

3. Swales, Pans or Gibber: Complete this page if the site in on a swale, pan of gibber

Field	*Explanation*	*Corresponding*

		database column
% Cover of Rocks	Enter a number	PERRCK
Is site on Eroded Exposure?	Drop-down yes/no list. You have to choose one from the list or type it in.	EROEXP
If Yes, Dimensions of Exposure (m x m)	Enter whole numbers in each box	DIMEXP1 DIMEXP2
For Pans, where is the site?	Drop-down list. You have to choose one from the list or type it in.	PAN

4. Lithology of Adjacent Swales: This page has to be completed to show what raw materials are available in the general area of the site

Field	*Explanation*	*Corresponding database column*
Swale Side	Which side of the swale was inspected as the adjacent area, north or south?	SWASID
Silcrete Quantity	Drop-down list for the overall abundance of this kind of raw material, of any quality. You have to choose one from the list or type it in.	RQSIL
Silcrete Flakable	Drop-down list only for the abundance of this kind of raw material that has potential to be flaked. You have to choose one from the list or type it in.	RFSIL
Quartzite Quantity Quartzite Flakable	As above for Quartzite	RQQTZ RFQTZ
Chert Quantity Chert Flakable	As above for Chert	RQCHT RFCHT
Sil. Breccia Quantity Sil. Breccia Flakable	As above for Siliceous breccia	RQSBR RFSBR
Silc. Pebbles (<65 mm) Silc. Cobbles Silc. Boulders (>250 mm)	Drop-down list for the abundance of silcrete according to three nodule sizes.	FPSIL FCSIL FBSIL
Qtzt. Pebbles (<65 mm) Qtzt. Cobbles Qtzt. Boulders (>250 mm)	As above for Quartzite	FPQTZ FCQTZ FBQTZ
Chert Pebbles (<65 mm) Chert Cobbles Chert Boulders (>250 mm)	As above for Chert	FPCHT FCCHT FBCHT
Sil. Brc. Pebbles (<65 mm) Sil. Brc. Cobbles Sil. Brc. Boulders (>250	As above for Siliceous breccia	FPSBR FCSBR FBSBR

mm)		

5. Site Characteristics: This page has to be completed to show important details about the archaeological site

Field	*Explanation*	*Corresponding database column*
Dimension (m x m)	Enter whole numbers in each box	DIMSIT1 DIMSIT2
Site Shape	Drop-down list of possible shapes. You have to choose one from the list or type it in	SITSHP
Number of Hearths	Enter a whole number in the box	HEARTHS
Total Number of Artefacts	Enter a whole number or text in the box	TOTART
Visual Estimate (artefacts/sq. m)	Enter a whole or decimal number in the box of estimated artefacts per square metre	VISEST
Density Counts (artefacts/sq. m)	Enter whole or decimal numbers in the boxes of the number of artefacts per square metre for each recording square	DENSQ1 DENSQ2 DENSQ3 DENSQ4 DENSQ5 DENSQ6 DENSQ7 DENSQ8 DENSQ9

6. Site Lithology: This page has to be completed to show the raw materials of the artefacts found at the archaeological site

Field	*Explanation*	*Corresponding database column*
Silcrete Quartzite Local Chert Exotic Chert Siliceous breccia Quartz Other	Enter a whole number in the boxes that indicates the percentage that each raw material contributes to the entire artefact assemblage	ARTSIL ARTQTZ ARTLCH ARTECH ARTSBR ARTQRT ARTOTH
Spatial Variability of Raw Material	This describes variation in raw material across the site. If lithology is uniformly mixed, then it's low. If there are clusters of different raw materials, then it's high. Drop-down list of variability levels. You have to choose one from the list or type it in	ARTRMV

7. Implement Pages: Complete these page if there are implements at the site

Field	*Explanation*	*Corresponding database column*
All Implements Recorded?	Drop-down yes/no list. You have to choose one from the list or type it in.	IMPREC
Tula Non-Slug Silcrete	Input a number indicating the amount of pieces	TULSIL
Quartzite		TULQTZ
Local Chert		TULLCH
Exotic Chert		TULECH
Siliceous breccia		TULSBR
Quartz		TULQTT
Other		TULOTH
Tula Slug Silcrete		TSLSIL
Quartzite		TSLQTZ
Local Chert		TSLLCH
Exotic Chert		TSLECH
Siliceous breccia		TSLSBR
Quartz		TSLQTT
Other		TSLOTH
Backed Artefact Triangular Silcrete	As above, etc.	BTISIL
Quartzite		BTIQTZ
Local Chert		BTILCH
Exotic Chert		BTIECH
Siliceous breccia		BTISBR
Quartz		BTIQTT
Other		BTIOTH
Backed Artefact Crescent Silcrete		BCRSIL
Quartzite		BCRQTZ
Local Chert		BCRLCH
Exotic Chert		BCRECH
Siliceous breccia		BCRSBR
Quartz		BCRQTT
Other		BCROTH
Backed Artefact Trapeze Silcrete		BTRSIL
Quartzite		BTRQTZ
Local Chert		BTRLCH

Exotic Chert		BTRECH
Siliceous breccia		BTRSBR
Quartz		BTRQTT
Other		BTROTH
Backed Artefact Woakwine Silcrete		BWOSIL
Quartzite		BWOQTZ
Local Chert		BWOLCH
Exotic Chert		BWOECH
Siliceous breccia		BWOSBR
Quartz		BWOQTT
Other		BWOOTH
Point Uni Margin Silcrete		PUNSIL
Quartzite		PUNQTZ
Local Chert		PUNLCH
Exotic Chert		PUNECH
Siliceous breccia		PUNSBR
Quartz		PUNQTT
Other		PUNOTH
Point Bi Margin Silcrete		PBISIL
Quartzite		PBIQTZ
Local Chert		PBILCH
Exotic Chert		PBIECH
Siliceous breccia		PBISBR
Quartz		PBIQTT
Other		PBIOTH
Point Pirri Silcrete		PPISIL
Quartzite		PPIQTZ
Local Chert		PPILCH
Exotic Chert		PPIECH
Siliceous breccia		PPISBR
Quartz		PPIQTT
Other		PPIOTH
Grindstone Dish Silcrete		GDISIL
Quartzite		GDIQTZ
Local Chert		GDILCH
Exotic Chert		GDIECH

Siliceous breccia		GDISBR
Quartz		GDIQTT
Other		GDIOTH
Grindstone Flat Silcrete		GFLSIL
Quartzite		GFLQTZ
Local Chert		GFLLCH
Exotic Chert		GFLECH
Siliceous breccia		GFLSBR
Quartz		GFLQTT
Other		GFLOTH
Grindstone Topstone Silcrete		GTPSIL
Quartzite		GTPQTZ
Local Chert		GTPLCH
Exotic Chert		GTPECH
Siliceous breccia		GTPSBR
Quartz		GTPQTT
Other		GTPOTH
Grindstone Other Silcrete		GOTSIL
Quartzite		GOTQTZ
Local Chert		GOTLCH
Exotic Chert		GOTECH
Siliceous breccia		GOTSBR
Quartz		GOTQTT
Other		GOTOTH
Hammer Silcrete		HAMSIL
Quartzite		HAMQTZ
Local Chert		HAMLCH
Exotic Chert		HAMECH
Siliceous breccia		HAMSBR
Quartz		HAMQTT
Other		HAMOTH
Anvil Silcrete		ANVSIL
Quartzite		ANVQTZ
Local Chert		ANVLCH

Exotic Chert Siliceous breccia Quartz Other		ANVECH ANVSBR ANVQTT ANVOTH

9. Manuports: Complete this page if there are manuports at the site

Field	*Explanation*	*Corresponding database column*
Manuports Present?	Drop-down yes/no list. You have to choose one from the list or type it in.	MANPRE
Abundance	Drop-down list of ranges. You have to choose one from the list or type it in.	MANABU
Raw Material (%) Silcrete Quartzite Chert Siliceous breccia Limestone	Enter a whole number in the boxes that indicates the percentage that each raw material contributes to the manuports in the assemblage	 MANSIL MANQTZ MANCHT MANSBR MANLIM

10. Knapping Floors: Complete this page if there are knapping floors are the site

Field	*Explanation*	*Corresponding database column*
Number of Knapping Floors	Enter a whole number in the box	KNANUM
Lithology Silcrete Lithology Quartzite Lithology Chert	Drop-down yes/no list. You have to choose one from the list or type it in.	KNASIL KNAQTZ KNACHT
Dominant/Co-Dominant	Select one or two boxes to indicate which raw material(s) are dominant at the site; Silcrete, Quartzite and/or Chert	KSIDOM KQTDOM KCHDOM

11. Salvage: This page has to be completed to provide information about the need for further work at the site

Field	*Explanation*	*Corresponding database column*
Further Work Required?	Drop-down yes/no list. You have to choose one from the list or type it in.	FURWOR
Further Recording Required?	As above	FURREC
Collect Specific Content?	As above	COLSPE
Collect the Whole Site?	As above	COLSIT
Special Comments and/or Photos	Type in any other details not captured elsewhere, photo numbers for site	SPECOM

Key to the ArcPad Forms: BroadBrush

This section explains the data entry fields of each page of the **BroadBrush** ArcPad recording form.

Exactly the same as above, except that the fields TULOTH, TSLOTH, BTIOTH and PUNOTH are the total counts of tulas, tula-slugs, backed artefacts and points of any sub-type and any raw material. The fields have been recycled and do not have the same meaning as data in the same fields collected using the ArcSite detailed form.

11. Key to the ArcPad Preference Files

This section explains the data the files that we've used to customise the appearance and function of ArcPad. If things go terribly wrong on the Recons and resets make no difference, these files can be deleted and replaced from the folder 'ArcPadPrefsBackups' on the laptop. They can also be edited to change the performance and appearance of ArcPad.

ArcPadPrefs.apx is stored on the Recon in the folder '**Mobile Device**' (aka Recon 'My Documents' if browsing on the Recon using Total Commander). It controls where ArcPad looks for files and where it saves files, GPS operation and some basic appearance details. To edit, change the extension from apx to txt and edit in Notepad or Word then change the extension back to apx. This is the text at 22Jun07:

```
<?xml version="1.0" encoding="UTF-8"?>
<ArcPad>
	<PREFERENCES>
		<SCRIPTING language="VBScript"/>
		<PATHS system="\Storage Card" data="\Storage Card" applets="\Storage Card" styles="" extensions=""/>
		<FONTS>
			<LABEL font="Tahoma" fontsize="6" charset="ANSI" fontstyle="regular"/>
		</FONTS>
		<MAPGRID>
			<SIMPLELINESYMBOL width="1"/>
			<TEXTSYMBOL fontcolor="Black" font="Tahoma" fontstyle="regular" fontsize="9"/>
		</MAPGRID>
		<GPS protocol="NMEA" datum="D_WGS_1984" initialize="" logfile="\My Documents\GPS.log" northreference="true">
			<COMPORT port="2" baud="4800" dtrcontrol="enable" rtscontrol="enable"/>
			<HEIGHT units="9001" geoidseparation="0" antennaheight="0"/>
			<QUALITYCONTROL level="0">
				<PDOP/>
				<EPE/>
				<MODE/>
			</QUALITYCONTROL>
			<AVERAGING point="10" vertex="5"/>
			<STREAMING interval="1" distanceinterval="10"/>
		</GPS>
		<LOCATION/>
		<ALERTS>
			<ALERT name="nogpsdata" sound=""/>
			<ALERT name="maxpdop" sound=""/>
			<ALERT name="maxepe" sound=""/>
			<ALERT name="nofix" sound=""/>
			<ALERT name="notdgps" sound=""/>
			<ALERT name="not3d" sound=""/>
			<ALERT name="approachingdestination" sound=""/>
			<ALERT name="datarateWarning" sound=""/>
		</ALERTS>
		<AUX>
			<COMPORT port="1" baud="4800" dtrcontrol="enable" rtscontrol="enable"/>
		</AUX>
		<RANGEFINDER protocol="" observerreference="foresight" autoactivate="false" capturebutton="any">
			<COMPORT port="1" baud="4800" dtrcontrol="enable" rtscontrol="enable"/>
		</RANGEFINDER>
		<CAMERA device="@WMC" quality="75" path="\My Documents\My Pictures" prefix="Photo" shortcut=""/>
		<TRACKLOG name="\Storage Card\TrackLog.shp"/>
		<LOCALE lcid="00000c09"/>
		<STATUSBAR coordsformat="4"/>
		<IMS/>
		<LAYERS autopack="true"/>
		<GREEKING>
			<POINT greeking="true" color="Gray" threshold1="0" threshold2="0" threshold3="0" threshold4="0"/>
			<POLYLINE greeking="true" color="Gray" threshold1="2" threshold2="5" threshold3="9" threshold4="0"/>
			<POLYGON greeking="true" color="Gray" threshold1="1" threshold2="2" threshold3="5" threshold4="9"/>
			<MULTIPOINT greeking="true" color="Gray" threshold1="3" threshold2="8" threshold3="0" threshold4="0"/>
		</GREEKING>
```

```
                    <DISPLAY>
                        <SYSTEMTRAY/>
                    </DISPLAY>
                </PREFERENCES>
</ArcPad>
```

ArcPad.apx is located on the **Recon Storage Card**, it is necessary to hide the default toolbars so the custom ones can be displayed. Edit in the same way as ArcPadPrefs.apx:, this is the text at 22Jun07

```
<ArcPad>
        <CONFIG>
 <TOOLBARS>
<TOOLBAR name="main" visible="false" create="false"/>
<TOOLBAR name="browse" visible="false" create="false"/>
<TOOLBAR name="draw" visible="false" create="false"/>
 </TOOLBARS>
        </CONFIG>
</ArcPad>
```

Toolbar.apa is located on the **Recon Storage Card,** it defines the custom toolbars. The custom toolbar shows a selection of tools on a single row of buttons while the default toolbar shows more buttons and on two rows (so less space to display the map). To show the default toolbar (see the manual ArcPad_UserGuide to find out exactly what buttons are displayed, many complicated editing functions are available from the default toolbar), change the filename of ArcPadPrefs.apx to ArcPadPrefs.apxyyyymmdd (where yyyymmdd is the date), this stops the program from 'seeing' the files ArcPad.apx and Toolbar.apa which alter the default toolbar (It makes a new ArcPadPrefs.apx file, which can be deleted before the extension of the original one is changed back to apx). This is the text of Toolbar.apa at 22Jun07:

```
<?xml version="1.0" encoding="UTF-8"?>
<ArcPad>
 <APPLET>
  <TOOLBARS>
   <TOOLBAR name="main" visible="false" caption=""></TOOLBAR>
   <TOOLBAR name="browse" visible="false" caption=""></TOOLBAR>
   <TOOLBAR name="draw" visible="false" caption=""></TOOLBAR>
   <TOOLBAR name="tlbrCustomMain1" caption="" visible="true">
    <TOOLBUTTON command="openmap">
     <MENUITEM command="newmap"></MENUITEM>
     <MENUITEM command="savemap"></MENUITEM>
     <MENUITEM command="savemapas"></MENUITEM>
     <MENUITEM command="options"></MENUITEM>
     <MENUITEM command="mapproperties"></MENUITEM>
     <MENUITEM command="togglescalebar"></MENUITEM>
     <MENUITEM command="togglestatusbar"></MENUITEM>
     <MENUITEM command="setmapscale"></MENUITEM>
     <MENUITEM command="help"></MENUITEM>
     <MENUITEM command="exit"></MENUITEM>
    </TOOLBUTTON>
    <TOOLBUTTON command="savemap"></TOOLBUTTON>
    <TOOLBUTTON command="gpspositionwindow">
     <MENUITEM command="gpsenable"></MENUITEM>
     <MENUITEM command="gpsselect"></MENUITEM>
     <MENUITEM command="gpstracklog"></MENUITEM>
     <MENUITEM command="modegoto"></MENUITEM>
     <MENUITEM command="centerongps"></MENUITEM>
```

```
    <MENUITEM command="addgpspoint"></MENUITEM>
    <MENUITEM command="modedrawfreehandline"></MENUITEM>
    <MENUITEM command="modedrawfreehandpolygon"></MENUITEM>
    <MENUITEM command="modedrawpoint"></MENUITEM>
    <MENUITEM command="modedrawrectangle"></MENUITEM>
    <MENUITEM command="modedrawellipse"></MENUITEM>
   </TOOLBUTTON>
   <TOOLBUTTON command="layers">
    <MENUITEM command="newlayer"></MENUITEM>
    <MENUITEM command="zoomtolayer"></MENUITEM>
    <MENUITEM command="addlayer"></MENUITEM>
    <MENUITEM command="delete"></MENUITEM>
    <MENUITEM command="find"></MENUITEM>
   </TOOLBUTTON>
   <TOOLBUTTON command="modepan">
    <MENUITEM command="modeidentify"></MENUITEM>
    <MENUITEM command="modeselect"></MENUITEM>
    <MENUITEM command="featureproperties"></MENUITEM>
    <MENUITEM command="find"></MENUITEM>
    <MENUITEM command="refresh"></MENUITEM>
    <MENUITEM command="modeadvancedselect"></MENUITEM>
   </TOOLBUTTON>
   <TOOLBUTTON command="modezoomin">
    <MENUITEM command="modezoomout"></MENUITEM>
    <MENUITEM command="zoomfullextent"></MENUITEM>
    <MENUITEM command="zoomtolayer"></MENUITEM>
    <MENUITEM command="zoomtoselected"></MENUITEM>
    <MENUITEM command="modefreehandmeasure"></MENUITEM>
    <MENUITEM command="zoomprevious"></MENUITEM>
   </TOOLBUTTON>
  </TOOLBAR>
 </TOOLBARS>
</APPLET>
</ArcPad>
```