ATAK Survey Kit

28 March 2016

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Android Tactical Survey Kit (ATSK)

Android Tactical Survey Kit (ATSK) provides an Android application to simplify the generation of Assault Zone surveys. The ATSK provides the ability to support Drop Zone (DZ), Landing Zone (LZ), Helicopter Landing Zone (HLZ), and Forward Air Refueling Point (FARP) preplanning, collection, and survey generation. ATSK interfaces with standard survey and DoD tools including laser range finders (LRF), GPS receivers, and Trimble RTK. ATSK generates required standard survey output including PDF, DCS XML, and KML. Per user requirements, ATSK will be added to the baseline of ATAK and will be presented as an additional menu option to ATAK users. Select the ATSK Tool to open the application. Select the side arrow to open the ATSK Side Panel menu options.
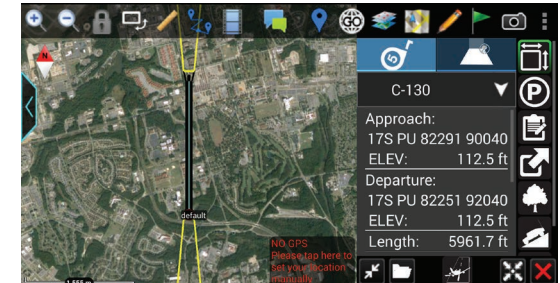
Survey Management

A new survey can be created or an existing survey can be opened by selecting the file at the bottom of the ATSK menu window. The user may select the Show Dialog an Start checkbox to launch the new and existing dialog when ATSK is launched. The user can access an existing survey by clicking the current survey name. Survey management allows the user to add, delete, rename surveys, as well as select the current survey. Show checkboxes are used to determine which surveys are visible (drawn) on the map.

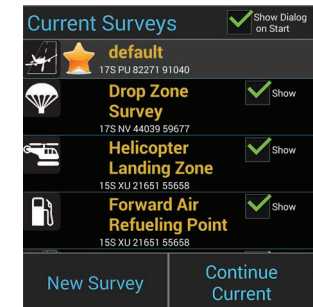Selecting New Survey allows the user to enter the new survey type and name the new survey.

Clicking a survey will display the survey options dialog.

Make Current allows collection, edit, and export of survey criteria. The current survey is denoted with a yellow star. Rename allows the user to rename a survey. Details provides a brief description of the survey. Delete the survey from the ATSK database.

Interface Overview

Side Panel

Most of the ATSK UI will live inside of this Side Panel. Note: Depending on the task and screen size, some of the panels require a scroll view.   Each side panel icon opens a new side panel for data entry or further menu navigation. To move back up the navigation tree, the android Back button is used.

Toolbar

The top right toolbar is used to determine the user's input selection. Most criteria values can be determined using GPS, LRF, and map events. ATSK will automatically open the toolbar when input selection is required.

Notification Bubble

The ATSK notification bubble is used to display the current map click position, display GPS and LRF status, and confirm LRF shots.   The Notification Bubble can be opened at any time during ATSK operation. If ATSK receives an LRF shot, the bubble is opened to display shot information and allow confirmation.
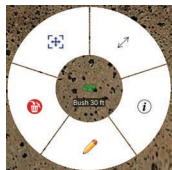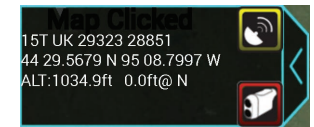
Radial Menus

ATSK icons and lines are clickable. Some items are only clickable in their respected tools (Obstructions in obstructions, AZ dimensions in Criteria, gradient lines and surface distresses in Gradient, etc.).   The menu allows the user to delete, edit object criteria and display object information.

Long Click Events

ATSK dropdowns and text fields utilize long click/press functionality. ATSK spinners (Drop Downs) can be long clicked. The Obstruction type spinner, for example, can be long pressed to access the available types. ATSK text/value fields can be long clicked/pressed to hand-jam the value and edit the display units. Building length, for example, can be long pressed to hand-jam the value.
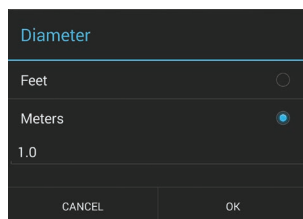
Hand Jam Dialogs

Long click any measurement/criteria field to hand-jam the value. The units selected in the hand-jam dialogs will be applied throughout ATSK.
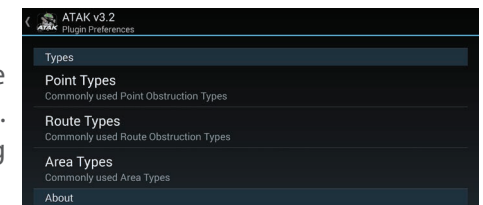
Obstruction Collection

Obstruction Collection is accessed from the ATSK home screen. Point Obstructions are non-movable obstructions that the user must add to the survey.

Layout

The user will define each obstruction prior to determining its position. Obstruction criteria can be determined using the input selection toolbar (single click) or hand jammed (long click).

Location Selection and Confirmation

Once the criteria are determined the user will determine the Obstruction location. Using the Input selection toolbar, the user will determine the position. Once the obstruction is collected, it is permanently placed using the Next button. Note: If the Next is not placed, it is considered a temporary obstruction.
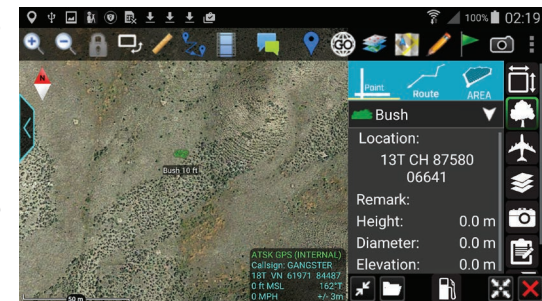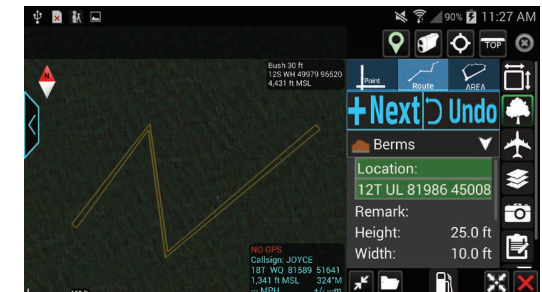
Point Plus Offset

ATSK point obstructions can be collected using the GPS point + offset method.

Route

Route Obstructions follow the same criteria collection as point obstructions. Obstruction vertices can be undone once collected. Vertices are collected at the Left, Center, or Right of the obstruction. The user will determine the collection placement using the toggle (below location L C R). Once the obstruction is completed, it is confirmed using the Next button.

Route Obstructions use additional hardware input methods to streamline the collection process. Vertex, breadcrumb, and point plus offset are used. Long-clicking the GPS selection will provide the following menu.
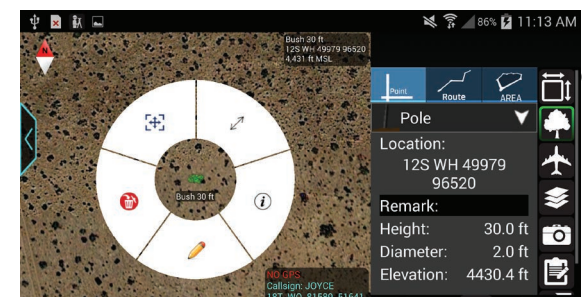
Area

Area obstructions are collected in the same manner as Routes. However, areas offer the ability to use GPS and LRF in the 2P+D method. Long-clicking the GPS or LRF selection will provide the additional icon.
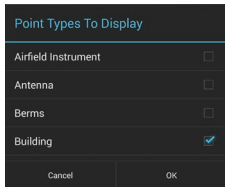
Edit

ATSK uses the ATAK radial menu feature. If an obstruction line or icon are selected, the user is presented with the option to delete, edit or view details.

Obstruction Collection (cont.)

ATSK makes use of all obstructions found in the XML database. The user can edit available obstruction types at any time. A long click on the type dropdown will show the type edit dialog.

Landing Zone

When the current survey is a Landing Zone the LZ collection toolbars will become available. The LZ Collection toolbars can be used to collect standard LZs Light Tactical Fixed Wing LZs, and STOL LZs.

LZ Criteria

AZ criteria will have the same look and feel as Obstruction collection. First, the user will select the current Aircraft. This aircraft will be used for minimum criteria analysis. The aircraft list is determined based on the included Aircraft.txt

Approach and Departure points are collected to determine the runway length and heading. If the user modifies the heading/length, the runway will rotate/grow from the approach point.

In addition to runway dimensions, this criteria tab allows the user to determine all runway information, as well as the surface type.

Runway info allows the user to see all LZ measurements. Overrun, surface type and runway name are also displayed.

ATSK automatically detects runway incursions using collected obstructions. Using elevation and obstacle height, ATSK will display incursions and the controlling obstacles.
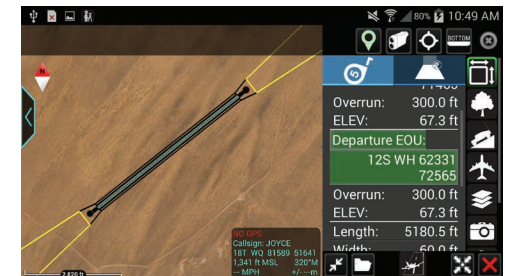
Aircraft Placement

ATSK can be used to collect parking plan aprons and taxiways. The user will collect the maximum size and orientation of each apron and select an aircraft to park on the runway. A max on ground (MOG) for aircraft, inter-aircraft spacing, and taxiways will be provided. After adding an apron the Next button must be selected to save the taxiway before leaving the collection display.

Taxiways can be collected as routes with a predetermined width.   The collector will select the left, right or center of the Taxiway to collect as with route obstructions. After adding a taxiway the Next button must be selected to save the taxiway before leaving the collection display.
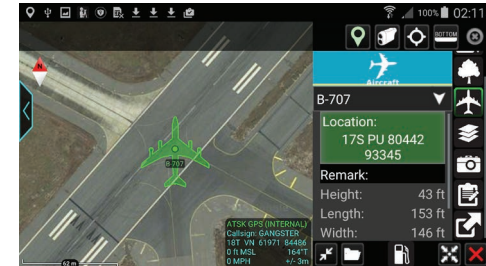
DCP

The DCP toolbar can import groups of CBR readings placed in the atsk/cbr imports folder of your android device. Each DCP reading will be drawn on the map if a position was provided in the CBR file.   The imported DCP readings can be filtered by the bounds of the current LZ, or individually enabled/disabled. All selected DCP readings will be exported to a single export file for import into PCASE.

Gradient Collection

While gradient is only used in HLZ or LZ surveys it can be collected from the top level menu regardless of the survey type. ATSK uses point cloud analysis to find Longitudinal and Transverse gradients in collected survey data so it is not necessary to indicate Longitudinal or Transverse when collecting gradient points.

Gradient collection is broken into three parts: Gradient Collection, Gradient Analysis, Surface Distress Collection. Because of its large size, gradient data is only displayed when inside the gradient collection menus.
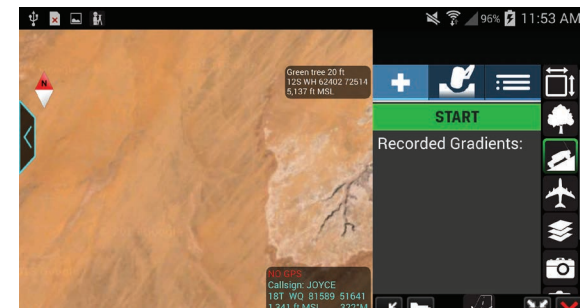
Gradient collection should be accomplished with an RTK GPS system for useful results. Each gradient collection can have a different ground->antenna height offset allowing different users to collect gradients and mix the resulting data for a single gradient. Once gradient collection is started, the user can move to the Surface Distress Collection screen and collect observed distresses while walking the AZ for gradient data. The user has the option to show and hide analyzed gradients in the collection screen. Showing analyzed gradients allows the graphic depiction of holes in previously collected data.

Landing Zone (cont.)

Surface Distress

Surface distresses can be collected while collecting gradients. The surface type, severity and location can be recorded. Surface distresses are filtered to the AZ and used to fill survey products.

Gradient Analysis

Gradient analysis should be completed after gradient collection is complete but can be completed multiple times to ensure gradient coverage or fill holes in collected data. Raw, unanalyzed data can be toggled from inside the Gradient Analysis screen. Whenever new data is available, the user must filter the gradient data on the AZ. After tweaking AZ position/orientation, a re-filtering must be completed.

After filtering gradient data, Analysis can be completed. Graphs of transverse and longitudinal gradient are available. The map will be annotated with indications of missing data and gradients outside the bounds of the survey requirements.
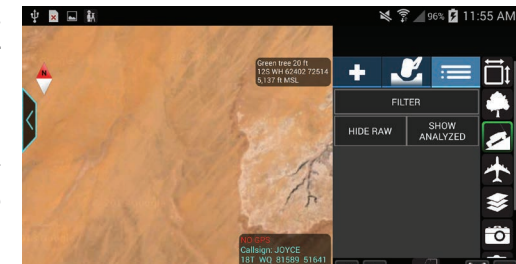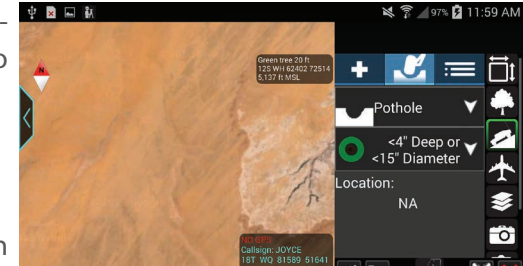
Drop Zone

When the currently selected survey is a Drop Zone (DZ) the DZ collection toolbar will be enabled. The user can collect DZ Criteria, complete the canned remarks section, and export survey products. The Drop zone export and remarks functionality is similar to the LZ export and remarks capability.
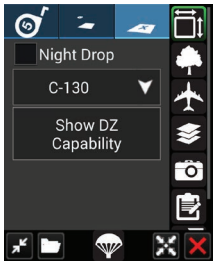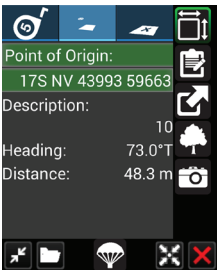
DZ Criteria

The DZ Criteria tab allows collection of rectangular or circular drop zones. The length, width and orientation can be collected similar to other collection events in ATSK.   For circular DZs, only a radius can be collected.
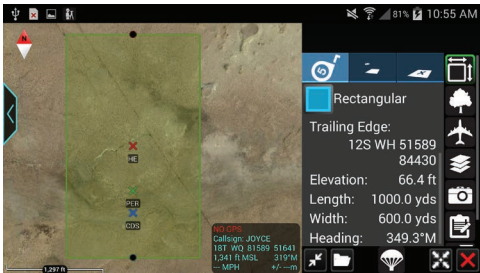
Point of Origin

The Point of Origin (PO) display collects the position and description of the user selected point of origin. A range and bearing from the PO to the center of the DZ will be displayed at the bottom of the collection fragment.

DZ Capabilities

The DZ Capabilities display allows application of Surveyed or Mission Specific impact point criteria to the DZ. Day/night drop capability and drop aircraft can be indicated and will be used for DZ capability and Point of Impact position calculations. The Show DZ Capability block allows review of the maximum capability of the selected DZ based on collected criteria and the aircraft drop altitude. The DZ capabilities and supported aircraft can be modified in the AircraftTemplates folder in the ATSK files.
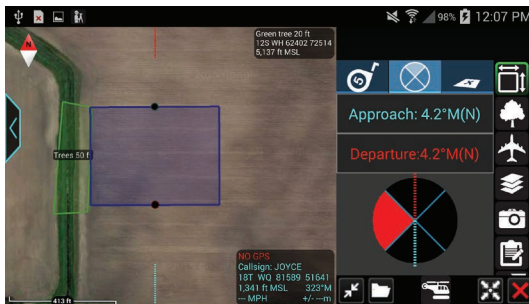
Helicopter Landing Zone

When the currently selected survey is a Helicopter Landing Zone (HLZ) the HLZ collection toolbar will be enabled. The user can collect HLZ Criteria, complete the canned remarks section, and export survey products. The Helicopter Landing Zone export and remarks functionality is similar to the DZ export and remarks capability.
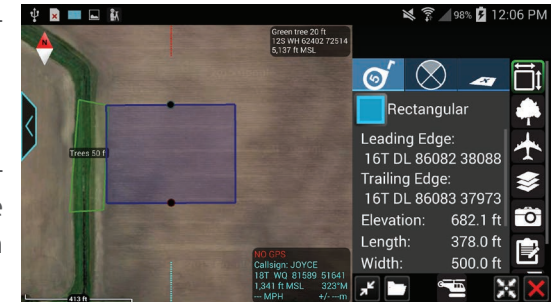

HLZ Criteria

The HLZ Criteria tab allows collection of rectangular or circular HLZs. The length, width and orientation can be collected similar to other collection events in ATSK. Additionally the slopes across the HLZ can be collected for incorporation into exported HLZ forms. For circular HLZs, only a radius can be collected.

HLZ Approach/Departure

The Approach and departures of the HLZ can be selected by clicking on the Approach or Departure button and then clicking on the map at an appropriate angle from the HLZ. While selecting the Approach/Departure, the Approach/Departure lines can be modified on the HLZ model below the A/D buttons. By long clicking on Approach/Departure the user can hand jam the approach and departure angles. Each quadrant of the HLZ model is shaded red when the minimum glide slope is not met by the obstructions collected.

HLZ Max on Ground

The Max on Ground (MOG) display allows selection of the type of HLZ collected, and the target platform. The list of platforms can be modified in the AZtemplates folder in the ATSK files.

Forward Air Refueling Point

When the currently selected survey is a Forward Air Refueling Point (FARP) the FARP collection toolbar will be enabled. The user can collect FARP Criteria, complete the canned remarks section, and export survey products. The FARP export and remarks functionality is similar to the HLZ export and remarks capability.

Placing a FARP consists of two separate collections; placement of the tanker aircraft and placement and type of refueling point and FAM cart

FARP Tanker Placement

The Tanker Placement screen allows the selection of nose wheel and rotation of the tanker aircraft. The FARP surface is collected for incorporation into survey products.

FAM/Refueling Point Placement

The type of FARP refueling points can be selected as Single, Double (Left, Right, Split), or Triple refu-

eling points. The refueling points grow off of the FAM cart positions. FAM cart placement is restricted to valid angles on the left and right of the aircraft based on settings in the Aircraft Templates folder of ATSK files.

After selecting the position of the FAM Cart, the angle of refueling points growing off of the FAM cart can be selected. While only 1 side will be used in operations, both left and right side FAM/Refueling combination can be collected.

Remarks

HLZ, DZ, and LZ all allow the opportunity to complete remarks templates for use in survey forms. Selecting the Remarks button from any AZ collection menu opens the remarks template wizard. A series of remarks categories are presented to the user. The remarks are presented as specific fields for the administrative portions of the survey including Surveyor, Approval, Reviewer, and Coordination data.

The user can output PDF/KML files directly from the remarks screen or wait until survey completion and use the Export functionality.

Survey Information	▶
Surveyor	▶
Reviewing Officer	▶
Approval	▶
Coordinating Activities	▶
Penetrations Block	▶
Remarks Block	▶
Generate PDF	

The primary remarks of each survey are presented as a fill in the blanks style, multiple choice selection. All values can be overridden by custom values. The multiple choices provided are a combination of survey specific, calculated values as well as canned choices provided in the Remarks Templates folder of the ATSK files. Remarks items with blanks to fill are indicated with blue text. Selecting a remark item will walk the user through the entire line of remarks allowing selection of canned, calculated, or custom values for each field. Selecting the top "Add Remarks" button allows inclusion of additional remarks lines as necessary.
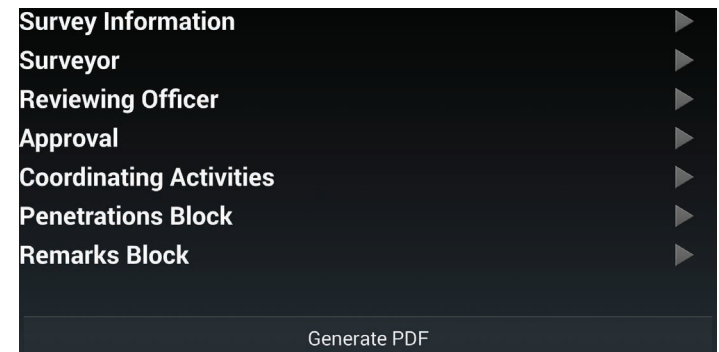
Export

ATSK allows creation of AZ products including AZ sketches, PDF forms, DCS files, KML, and mission packages. The status of file creation is indicated as a notification icon.

Camera

Tap on the Camera icon to access the Android device's camera, or another camera application. The user may discard a picture or save it. The user then has the ability to send, mark-up, center interface, or expand the picture. Saving the picture opens a map view in ATAK with a camera icon present at the user's location and attaches the image to the camera marker. ATAK has an integrated gallery added to view media attachments. The marker attachments are on the right side of the screen. The user can add a caption to the image file by opening the specific image in the gallery and tapping the line at the top of the image.