Condor Assigned Area Task (AAT) & Modified Assigned Task (MAT) Notes

by Eric Carden (ericcarden72@gmail.com)

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Introduction

This document describes and tells how to fly AATs and MATs. It gives specific instructions for doing so using LK8000 or SeeYou Mobile. If you have instructions for another flight computer program and would like them added to this document, please share them with me. For flying an AAT in Condor without an external PDA, see my separate document "Condor AAT Without External PDA.pdf".

What's an AAT or MAT?

An assigned area task (AAT), also known as a turnpoint area task (TAT), is a task with turnpoint (TP) *areas* instead of predefined exact TPs. Each pilot can choose which point in the TP area to use as his actual TP, and he need never declare his chosen point. After the flight, his track log is analyzed, and a computer determines which TPs maximize his course distance. Those points in the track log are then considered to be his TPs.

Each pilot's time is used in conjunction with his distance flown to calculate his average task speed, and scoring is based on this speed. An AAT requires a certain minimum time, as declared by the task planner, and any pilot finishing in less time will be scored as if his task took him the required minimum time. This effectively amounts to a penalty for finishing early.

A modified assigned task (MAT) is like a normal task (assigned task, or AT) except that (1) the pilot may proceed to the finish point after any of the task's TPs, (2) the task includes a minimum time (like for the AAT/TAT)[i], and (3) a pilot's best track point within a turnpoint cylinder is the turnpoint used for the purpose of calculating his task distance flown (like for AATs). Also, if there are no assigned TPs or the pilot finishes all assigned TPs and conditions are still good, he may fly to any TPs of his choice within the contest waypoint file, with two limitations. First, he may not repeat a TP without at least two intervening TPs (though the start and finish points aren't considered TPs for the purpose of this rule). For example, A-B-C-A is allowed, but A-B-A isn't. The other limitation is that the task may include a maximum of 11 turnpoints. There are some other special possibilities with MATs, but these are the basics.

LK8000 AAT Pre-Flight Procedures

1. Start LK8000 in simulator mode, selecting an aircraft profile where "Category" is set to "Glider". (LK8000 offers AAT functions only with this aircraft category setting.)
2. Create the task:
    a. Set "AAT" to "ON".
    b. Set "AAT min time" to the value provided in the Condor task notes (usually 105 minutes for Monday Night Soaring AATs).
    c. Set "Auto advance" to "Arm TPs".

d. Set sector radii as given in the task notes (or in the Flight Plan file if not in the task notes).
e. In "Task Rules", configure any maximum start height.
3. Configure the amount of ballast you're using.
4. In the "Task Calculator", set an MC value equal to the strongest average climbs you expect.
5. Make your altitude 3K' AGL (or your other best guess at start height) at the start point.
6. Use pan mode to position yourself about where you expect to start the task.
7. Review the course layout, and move TPs as needed to put as much of your course as possible over higher terrain or in areas of ridge lift and to provide a clear, unobstructed final glide. Aim for a finish time five minutes over the minimum time (i.e., LK "delta T" = 5).

LK8000 AAT In-Flight Procedures

1. Visit the "Task Calculator" occasionally to…
   a. Set MC to the highest average climb rate found so far.
   b. Check that "delta T" = 5.
   c. Adjust TPs if needed.
   d. Set MC back to the value you want for speed-to-fly purposes.
2. When ready to turn in a TP area, arm to proceed to the next WP.

SeeYou Mobile AAT or MAT Pre-Flight Procedures

Some of these instructions came from "AATTutorialForTheNaviterOudie.pdf"[ii].

1. To keep from having to do this step before each AAT or MAT flight, save the profile after making these changes. If you don't want these changes in your normal profile, then save a new profile just for flying AATs or MATs. Select the following navboxes for Map 1:
   a. Task Delta Time (tDelta) – This is the difference between your predicted total task time and the prescribed task minimum time. For example, "+0:02" means that you'll take two minutes more than the minimum time to fly the task.
   b. Mc Increase & Mc Decrease – Because you may choose to make speed-to-fly decisions using one MC setting but do your tDelta calculations based on another (higher) MC setting, you'll likely change MC setting often. Putting these navboxes on the map just makes it easier to change MC setting.
   c. If you expect to fly MATs using SSA Sport Class rules, then set your default task to use a start cylinder, turnpoint cylinders of one-statute-mile radii, and a finish cylinder. This will make task entry easier and will especially make it easier to add turnpoints in flight.
2. Select the appropriate waypoint file for this flight (Menu → Settings → Files → Waypoints), and set it as the "Active" waypoint file.
3. MAT Only: If this is an MAT, then disable any waypoint files containing waypoints in the expected flight area (except for the contest waypoint file, of course). Failure to do so could result in you accidentally choosing to add a turnpoint that isn't in the contest waypoint file and thus not getting credit for that turnpoint.
4. Create the task:
   a. Set sector radii as given in the task notes (or in the Flight Plan file if not in the task notes).

- b. Check "Assigned Area" for each TP.
- c. Uncheck "Auto next" for each TP.
5. Go to Menu → Task → Tools → Options.
6. Enter a task name in the "Description" field.
7. Set "Task time" to the minimum time provided in the Condor task notes (usually 1:45 for Monday Night Soaring AATs).
8. If there's a maximum start height, then set "Start Alt" (ft MSL) accordingly, and check "Start out of the top". Checking this box still lets you start out the side, but without this box checked, you can <u>only</u> start out the side (not out of the top). Condor lets you start out of the top.
9. Save the task.
10. If the task has a minimum finish height (MFH), then[1]…
    - a. Create a new waypoint at the finish position (Menu → Add waypoint).
    - b. Name the new waypoint like the original finish waypoint except with the MFH (in feet MSL) added to the end of the name (e.g., "MIFFLIN_AP" becomes "MIFFLIN_AP_1900", if MFH is 1900 ft MSL)[2]. Name it whatever you like – but in a way that you'll recognize as being this special waypoint.
    - c. Edit the new waypoint, making its elevation the MFH (MSL).
    - d. Replace the existing finish point in the task with this elevated finish point.
    - e. Save the modified task.
11. If you want to do some planning of turn locations (AAT or MAT) or additional turnpoints (MAT) before getting in the glider, then…
    - a. Put SYM in simulator mode (Menu → Settings → Input), choosing the task's start point as the glider's position.
    - b. Make your altitude 3500' AGL (or the maximum start height if known, Menu → Mc & Alt).
12. Set an MC value equal to the strongest average climbs you expect.
13. Configure the amount of ballast you're using?
14. Review the course layout in Condor, and move (AAT or MAT) or add (MAT) TPs as needed in SYM to (1) put as much of your course as possible over higher terrain or in areas of ridge lift, (2) provide an unobstructed final glide, and (3) give a tDelta of about five minutes. Here's how to adjust a TP (AAT or MAT) if needed:
    - a. While on a map page, tap anywhere in the TP sector in which you'd like to change your planned turnpoint.
    - b. If you're taken to the airspace page, tap "Task".
    - c. Drag the planned turnpoint as needed to make tDelta +0:05. I find five minutes to be a good bit of "insurance" against finishing early and believe that it rarely helps to stay on task much longer than the minimum time.
    - d. Tap "OK".
    If this is an MAT, here's how to add a turnpoint if needed:
    - a. Tap "Menu" and then "Task".
    - b. Tap the task point before which you want to insert a turnpoint.
    - c. Tap "Insert".

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[1] You can modify a task point's elevation in the task, but this modification isn't saved.
[2] I used to just add "_F" to the end of the name, but because the Contest Director may vary MFH at will – even at the same takeoff site – I decided to put the MFH in the name to avoid possible confusion.

d. Type part of the name of the desired turnpoint to insert.
e. Once you see the name of your desired turnpoint, tap "OK".
f. Tap the inserted turnpoint.
g. Tap "Edit".
h. Confirm that the "Radius1" and "Angle1" parameters are as you want. If they aren't, then adjust them.
i. Check "Assigned Area".
j. Uncheck "Auto next".
k. Tap "OK".
l. Tap "OK".
15. If you're in simulator mode, then exit simulator mode. To do so, either tap the message "Simulation mode. Tap here to stop." when it appears, or go to Menu → Settings → Input and select "Serial".

SeeYou Mobile AAT or MAT In-Flight Procedures

1. Start the task within one minute of the end of the start window, or manually force a task start (by selecting TP1 and tapping "Goto") at the end-of-window time.
2. Occasionally check on "tDelta" (shown in a navbox on the map):
    a. Set MC to the highest average climb rate you think you might find ahead.
    b. Make tDelta +0:05 by…
        i. AAT or MAT: adjusting one or more turnpoints as needed (using the above procedure).
        ii. MAT: inserting, deleting, or changing one or more turnpoints as needed. The procedure for inserting a turnpoint is given above. This document doesn't describe how to delete or change a turnpoint.
    c. Set MC back to the value you want to use for speed-to-fly purposes.
3. When you're ready to turn in a turn area, tap the black "GoTo Next" box. This box only appears while in an assigned area.

MAT Note: While the turnpoint cylinders in an MAT are relatively small (compared to those typically used in AATs), they're similar to AAT turn areas in that the point within the cylinder that gives you the best total task distance is considered your turnpoint for the purpose of calculating your total task distance flown. You can use this fact to slightly adjust your expected task finish time (e.g., by going more deeply into the cylinder if you need to extend your task time a little). For example, at a turnpoint where your task makes a 180° turn and the turnpoint radius is one mile, you can use this turnpoint to vary your total task distance by +/-2 miles, which may equate to +/- 1-2 minutes.

Scoring Condor AATs and MATs

Condor doesn't offer a way to score AATs or MATs, so another program must be used. I understand that the Condor Club website can do this, but so can a program called ShowCondorIGC[iii] (SCI).

I've used SCI to score several AATs but haven't yet used it to score an MAT. I first tried 5/19/16 but failed – apparently due to limitations described in the user manual (which I

hadn't yet read, of course). According to the user manual, only MATs of two very particular designs can be scored using SCI. I believe the fundamental limitation is that the pilot may only use turnpoints found in the Condor task. He can't just select any turnpoint from the Condor waypoint list for the landscape. For example, if the Condor task were S-A-B-C-D-F, then S-A-B-C-A-D-B-F would be valid, but S-A-B-C-D-E-F (includes point "E", which isn't part of the Condor task) wouldn't be valid. Rather than accept this limitation of SCI, I may try to find another way to score Condor MATs. Here are the two types of MATs SCI can score:

"MAT1" – All turnpoints are mandatory, but after tagging all turnpoints, the pilot may repeat turnpoints as desired (except that he can never return directly to the previous turnpoint without tagging another turnpoint first).

"MAT2" – In this type, only the first turnpoint is mandatory. To let SCI know that this is the type of MAT intended, the task designer must make the final turnpoint of the Condor task the same as the finish point.

Note: Both Condor and SCI allow starting out the top of the start sector.

Here's how to score an AAT using SCI:

1. Download and set up the ShowCondorIGC program:
    a. Download the program from http://dl.virtualsoaring.eu/SCI260.zip.
    b. Extract the contents of the downloaded ZIP file.
    c. Delete or archive the downloaded ZIP file.
    d. Move Scoring_ShowCondorIGC.pdf into the Condor program folder.
    e. Double-click InstallShowCondorIGC.exe.
    f. Install the program with the desired options.
    g. Delete the EXE setup file.
    h. Download the program update from http://dl.virtualsoaring.eu/ShowCondorIGC_Update.zip.
    i. Follow the instructions in the included file named "ReadMe.txt".
    j. Delete or archive the downloaded ZIP file.
2. Score an AAT race.
    a. Collect all pilots' IGC files into a single folder. (If you want an example to use for testing, try the MNS East 2/4/13 race, the IGC files for which are available at www.gliderracing.com.) The normal (not "VirtualStore") Condor "FlightTracks" folder works, but the "VirtualStore" one doesn't.
    b. Launch ShowCondorIGC.
    c. Click "Favorites".
    d. Click "Add (IGC)".
    e. Select "AAT".
    f. Enter the minimum task time. (There's no need to enter start time parameters. SCI apparently correctly gets this data from IGC files.)
    g. Click "OK".
    h. Browse to the folder containing the IGC files for the race.
    i. Select all IGC files for the race.

5

j. Click "Open". (I got an "unhandled exception" error here with the IGC files in the VirtualStore folder. Moving them to the normal Condor "FlightTracks" folder got me past this error.)
k. Click the "Calculation" tab.
l. Leave all the settings at their defaults:
    i. Pmax = 1000
    ii. Crash: both unchecked
    iii. Day Parameters: all unchecked except Day Factor (F) = 1
m. Click "Calculate".
n. Click the "Favorites" tab. There will be scores now. Here are some descriptions of data fields in the scoring results file generated:
    i. Dist – This is the actual task distance flown, taking into account how far the pilot flew into each turnpoint area. This is the distance used for calculating average task speed (and score).
    ii. Time – In a race with a regatta start, this is the time between the start time and finishing the task. This is the time used for calculating average task speed (and score).
    iii. Speed – This is the above "Dist" divided by the greater of task minimum time or the above "Time".
    iv. mCR – I believe this stands for "mean climb rate" and is the average climb rate in thermals.
    v. mGN – I think this is the average glide ratio on glides, but I'm not sure. Tim Moran found somewhere that this is "mean gliding number (without influence of wind)".
    vi. mIAS – I think this stands for "mean indicated airspeed", and I'd guess that it's the average IAS flown on glides.
    vii. nLift – I think this is the number of thermals in which the pilot circled.
    viii. AltLift – I think this is the average amount of altitude gained per thermal.
    ix. Detour% - I'm not sure how this is calculated, but I think it's a way of expressing how straight of lines were flown. A lower number is better, and I've seen numbers below 100%.
    x. Start – This is the time of day when the pilot exited the start sector (or crossed the start line).
    xi. RTime – This is the time between exiting the start sector (or crossing the start line) and finishing the task. This time isn't used for scoring purposes.
o. Click "Export (CSV)".
p. Click "Yes".
q. Save the file to the Desktop, named something like "20151229 AAT Race Results".

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i https://www.ssa.org/files/member/SRAGuide.PDF
ii http://www.cumulus-soaring.com/seeyou/AATTutorialForTheNaviterOudie.pdf
iii In the March 2012 issue of "Condor Corner", Frank Paynter mentions using this program to score a January 2012 Condor contest that included an AAT: https://www.cumulus-soaring.com/condor/CondorCorner-2012-03.pdf.