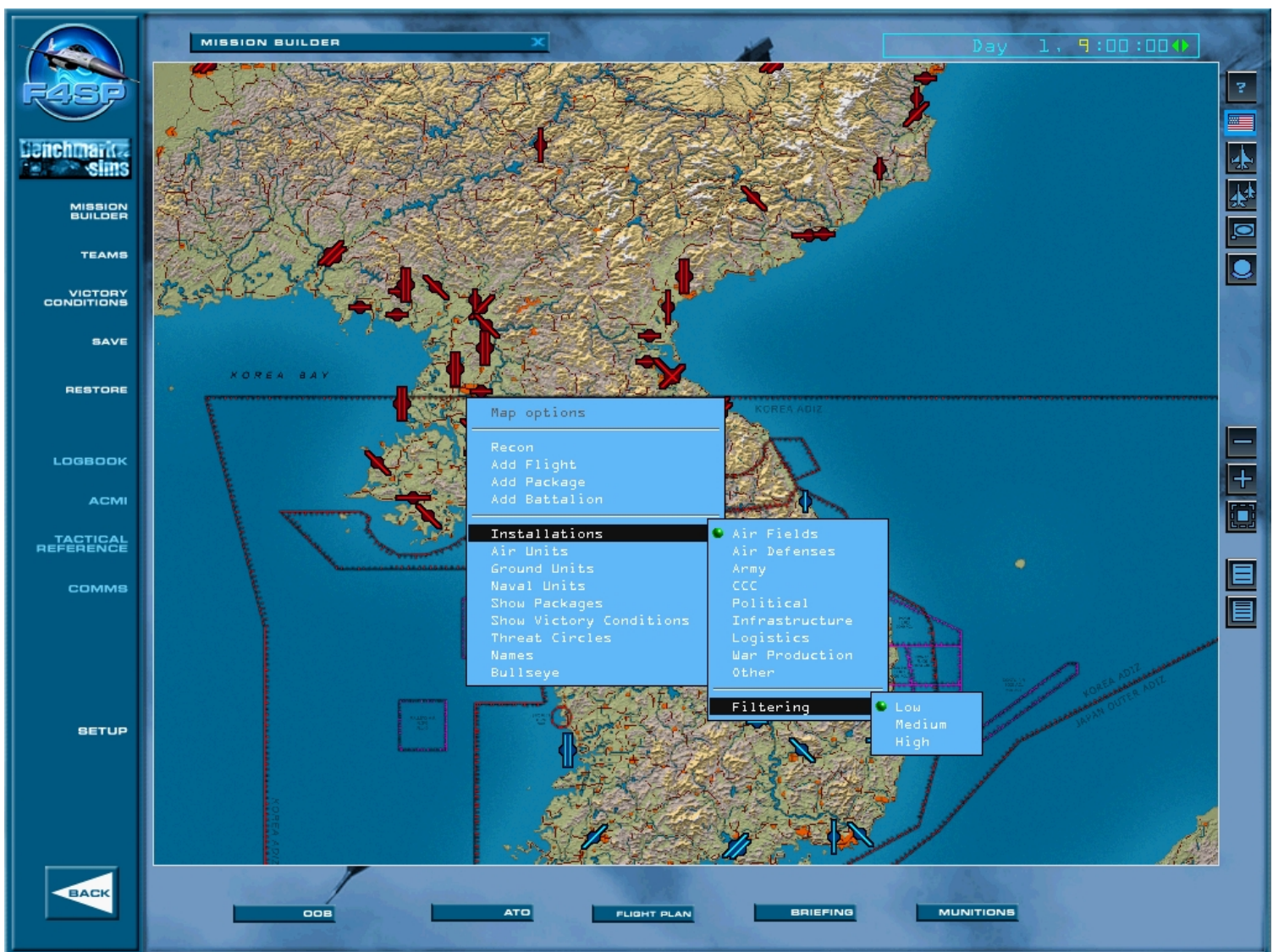


Falcon 4.0

Mission Builder Tutorial

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The disadvantage of pure text is that the article as it appears here has many "in editor" images to help guide you through the myriad of windows and options that are used in the editor. So before we continue, I would like to tell you a trick to allow you to build this mission without having to print out this article (although nothing beats printing this guide and following on paper while building in the editor).

Although I do not recommend using the "Alt-Tab" keystroke combo to change windows while in a Falcon flight, it does seem to work quite well while in the mission editor..... Therefore, you can have Combatsim open in your browser and the Falcon 4.0 TE editor open at the same time and just use the "Alt-Tab" key stroke trick to return to these instructions in your web browser as you build and follow along. WARNING! I have only tested this on a machine with 256 Megs of RAM. You might lock up or have other problems with less RAM (I just don't know), so try this approach carefully. If you run into odd problems, print it on paper and do it that way.

For the intermediate mission builder who already has some experience, I recommend reading the article like a book, and not necessarily building the actual mission as you go. But I assure you, you too will find some conceptual pearls in this article which will allow you to more deeply understand the constructs and nuances of the mission builder. There is something for everyone in this article, if you are interested in designing custom missions in Falcon 4.0.

The mission builder in Falcon 4.0, or the "Tactical Engagement" (TE) editor, is one of the many highly ambitious components of the Falcon 4.0 project. It has also proven to be one of the more complex and occasionally buggy parts of the program. Despite this fact, it contains many useful (and functioning) tools which can allow users to create and fly (in either single or multiplayer mode) custom designed missions complete with both air and ground war components.



Unfortunately, the ground war portion of TE has been the most frustrating. Those who ever flew EF2000 or even TAW know that the ground war is basically non-existent. There may be ground war elements, but they do not move and take objectives and follow waypoints and pull from their AI routines to respond to unexpected and dynamic elements of the game.

The promise of the TE mission builder is that one day (hopefully soon after Gilman and the boys get their much deserved holiday break), it will allow you to create missions with detailed ground war objectives which will run on their own, using sophisticated AI, keeping the evolution of any mission dynamic and variable. At this time, however, ground units are very limited in their function (unlike the way they work in the dynamic campaign that comes with the sim).

Only after reading and rereading the manual, followed by hours of tinkering (read: trial and error) did I finally learn to understand both the nuances and limitations of the TE ground war builder in its current state. Sadly, I must confess, in its current state, the ground war editor is nothing more than a limited, 2 waypoint, and one trick pony. Hopefully, this will be remedied in the near future, as this element of the game has so much potential to add strategic elements to an evolving T.E. mission.

The most important thing that one needs to do before starting a newly designed mission is to have a basic idea of what it is the mission will be about. In our example build, we will create a mission in which we attack a heavily defended radar installation.

Furthermore, we will create a situation in which not only will the radar site be defended by SAM missiles, but we will also get jumped by some SU-27s and Mig-29s while we are on our bombing run. This is what I call the imagination phase. First, we imagine what we want to have happen in our mission. Then we build it.

We also need to consider balance in order to make the mission fun for those who fly it. The mission should not be impossible to win, and at the same time, it should not be won if it is left solely to the AI to fly it. It should require expert human flying to tip the balance. (More on testing for balance at the end of this article).

Please note that in this mission, in order to limit the complexity, we will not have any ground war going on. I will discuss the ground war in a separate article, as I have mentioned earlier.

Now we must pick a radar installation to bomb on the map. Let me warn you right now, that if you attempt to display too many objects in the mission builder at once, it becomes a visual cluster duck (quack quack), and nothing is readable. So, my first trick is to set the mission builder map up such that we can see ONLY those things we need to see.

Do the following steps:

1. Run Falcon 4.0
2. Select the "Tactical Engagement button"
3. Select the "Saved" tab (the middle of the 3 tabs) in the TE window that just popped up.
4. Select the "NEW" button at the bottom-left of the window.

Now you are in the mission builder and you have a blank template on which to build. This is where the "Don't display too much lest we have a visual cluster-duck" rule applies. All we need to see at this point are the airfields, the air defenses (which include fixed SA-2 sites and radar stations) and the name labels of things. Once we see the names of our runways and targets of interest, we will turn the names label feature off. (quack quack).

1. Right click anywhere on the map.... a menu pops up. 2. Select installations..... a submenu pops up 3. Select the first two options in that submenu.... airfields and air defenses.



A green dot is placed next to them indicating they are selected, and they also appear as icons on your map. Already the map is getting crowded but don't worry, we will zoom in on the area of interest. A very important trick to learn now is that if you place your mouse cursor (which looks like a little f-16) over an object that is visible on the map, 2 things will happen.

The first thing is that a tiny little square appears next to the right wing of the "F-16 cursor". IT IS VERY IMPORTANT THAT YOU NOTICE THIS. This little "right wingtip flag" means that you are, in fact, touching the object... this will be VERY IMPORTANT later. Try this now: touch your "F-16 cursor" to an airfield icon on the map, and take note of the "right wingtip flag" which appears.

The second thing that happens, if you leave the cursor over the object for a couple of seconds, is that the object's name will appear. The "right click menu" which earlier allowed us to make the Airfields and the Air defenses visible, also has a "names" option. But unfortunately, like so much text in Falcon 4.0, the text is way too small, and it also heavily crowds the screen, such that labels start laying on top of each other, making them totally illegible. Try the "names" option, but usually the "mouse touch" technique described here is far more useful.

Zoom in on the map (using the + and - zoom buttons on the lower right side of the map) until you are looking closely at the DMZ (DMZ stands for the De-militarized Zone, seen on the map as the area where red and blue forces meet). Move the zoomed map by "left click dragging" the map until you are looking at the Eastern Shore of the DMZ. We are looking for 2 Airfields (not airstrips...they are very different though they all look like similar icons). In the south, on the shore, near the DMZ, find the airfield called *Gangneung Airbase*.



In the north, find the North Korean (DPRK ... here to referred to as *Commie red*) airbase along the Eastern Shore called *Sansago-ri Airbase*. It has 2 runways oriented like a cross, and is on the shore, so it is distinct and easy to find. Remember to use your "mouse touch labeling" technique to confirm these airbases by name. Zoom in/out and move your map until you can see both airbases on the screen at the same time, with the commie-red Sansago-ri airbase in the north and the friendly Gangneung airbase in the south.



Take note of another icon, somewhat oval with a pole in the middle pointing down. Those are "radar stations" and they appeared when you selected to show "air defenses" from the map's "right click menu". In between our 2 selected airbases, look for a commie-red radar station called Sinan-ni. The Sinan-ni Radar Station will be our target.



Ok. Now we are ready to start designing our mission. We have a friendly runway from which to fly our attack (Gangneung Airbase) , a commie-red airbase from which the enemy can deploy enemy flights to fight us (Sansago-ri Airbase) , and a target to attempt to destroy (Sinan-ni Radar Station).

Before we start making flights, let's lay down an enemy SAM installation near the radar station just to make things interesting.

1. First, note the button on the right side of the map, which looks like a little American flag. That is called the "TEAM SELECTOR"..... One of my most common mistakes is to not realize what team I am building for, so always look and see before you place anything on the map. If the flag is an American flag, then click the "TEAM SELECTOR" button once in order to change the flag to the commie-red's flag. (Note: if you forget to change teams before placing an object, you can right click on the object and change the allegiance of the object).



2. Once the red flag is showing in the "TEAM SELECTOR" button, note the buttons below it. The first is the single plane icon, which is the "ADD FLIGHT" button The next button is the 2 planes called the "ADD PACKAGE" button. The third button below the "TEAM SELECTOR" button is the button of interest for now, the "ADD BATTALIONS" button. This button is used to add everything from SAM units to mechanized tank battalions into the game world. We will use it to add some SAMs. **WARNING!!!** When any of these buttons are in the selected state (depressed), make sure you intend them to be. If, after you add this unit, you forget to "unselect" this button, you will start accidentally trying to "ADD BATTALIONS" when all you really wanted to do was click on the map to move it (or some other benign action.). So remember ... select to place something, place it, then unselect the button get it? This warning applies to the add flight and add package buttons as well, and also necessitates a certain logic when mission building. If you place twelve ground force units at once you will save time!

3. So you pressed the "ADD BATTALIONS" button (After insuring that the "TEAM SELECTOR" Button is set to the commie-red flag).... Now click on the thing/location you want the unit to be at. In this case, it is somewhere south of Sinan-ri Radar Station REMEMBERsince you are not placing this on a thing, but on the landscape, you will not see the little "right wingtip flag" appear next to the "F-16 cursor" before you click. That is normal when laying Battalions down on the landscape and not trying to associate them with cities or structures. Complex you say? Well, yes. But if you liked simple, you would be flying Novalogic products, right? See the pretty bird fly.

4. Once you clicked on the landscape somewhere south of the Sinan-ni Radar station (I suggest just a little south of the Station to create pucker factor while on the last leg of your attack run) a window pops up. The "ADD BATTALIONS" window. Note that since your team selector button is set to the commie-red team, your choices in the pop down menus are for commie-red units, like SA-5's. You won't see any patriot missiles in this list. Select to place a SA-5 unit and press OK. Don't worry if the SA-5 icon doesn't appear directly under the mouse pointer. That is normal. The manual states that sometimes the AI will place things on the landscape NEAR the place you pointed, but better situated strategically. NOW WARNING deselect the "ADD BATTALIONS" button. Good. Thanks. I feel better now.



It is time to save our mission. Select "SAVE" from the left side of the TE mission builder screen, type a name for your mission in the text field, and then press the save button. For subsequent saves, when you bring up the "save" window, locate the mission in the list and select it. That will move the name into the name box.

When you press the save button, it will ask you if you want to overwrite your mission. If you do, say yes, or simply add a number to each variant as you go along. In other words, the first time you save the mission, call it the Combatsim mission. Next time, select Combatsim mission from the save list but add the number 1 to the end of it before you save it. Next time, select Combatsim mission 1 from the list and change the "1" to a "2" and then save it. And so on. So if you make a huge error, you can always come back to an earlier version.



REMEMBER TO SAVE YOUR MISSION AT REGULAR INTERVALS! In fact, it might even be wise to create a back up copy every ten minutes or so. Do this by assigning a different, perhaps sequential, name to any copies you make. So by the end of half an hour you might have TE-TACT1, TE-TACT2 and TE-TACT3 in your save directory.

Now we are ready to set up a package of flights, which will fly out of the Gangneung Airbase with the intent of destroying the Sinan-ni Radar station. But before we can do this, we need to define a few things here (with their specific nuances in Falcon 4.0).

1. A "FLIGHT" is a group of 1 to 4 aircraft of the same type (say f-16s for this example) intent on accomplishing the exact same TASK.... note I didn't say objective ... I said TASK. In other words....If it is

a SEAD flight, all aircraft in that flight are there to do SEAD. None of the planes in the flight will perform CAP. They will all perform SEAD.

2. A "PACKAGE" is a bunch of flights (as many as you need), where each flight in the package can have different TASKs (one is SEAD, one is CAP, and one is STRIKE), but they are all working together as a "PACKAGE" to accomplish the same objective. In our example, the objective will be to destroy the Sinan-ni radar station. One flight in the package will be tasked with killing those pesky SAMs, a second flight will be tasked with protecting the actual strike flight, while the third flight in the package will be the actual strike flight. In this example, our package will be made up of the 3 aforementioned flights.

A "SQUADRON" is a bunch of airplanes and pilots. In Falcon 4.0, a squadron is comprised of 24 planes and 48 pilots. At least these are the numbers for f-16 squadrons. I'm not sure about other squadrons.

THIS IS IMPORTANT..... If you do not place squadrons at your airbases before you start adding packages, you will not be able to create new flights or packages "on the fly" while actually playing the mission, because the world will contain no extra pilots or planes.

You may only intend for your mission to have these flights and none other, but TE missions can take on a life of their own if you place squadrons to pool from for the players who play them. If they don't win the mission with the original flights, they can make more DURING game play and continue to evolve the mission. This allows for "Force on Force" Multiplayer missions. This concept will be expanded in a later article entitled "Force on Force" multiplayer missions. Look for it on Combatsim in the near future.

So the first thing we must do is place an F-16 squadron at Gangneung Airbase and an SU-27 and Mig-29 squadron at Sansago-ri Airbase. This is a good time to discuss a little nuance here. Although you may see many "airports" on the map of Korea, Some are "airSTRIPS" and some are "airBASES". though they may appear similar, the TE editor will not allow you to assign squadrons to airstrips (as it should be) because only airbases are equipped to supply and deal with the complexities of a fighter squadron.

1. Make sure the "TEAM SELECTOR" switch is set to the USA flag.
2. Press the "ADD SQUADRON" button (4th button beneath the team selector button)



3. Place your "F-16 cursor" on the Gangneung Airbase (look for the confirmatory "right wingtip flag"), and click.
4. The "ADD SQUADRON" window appears. Make sure the window is adding F-16s as the aircraft and that the airbase is Gangneung. Click OK. note the squadron icon placed on the map over the Gangneung airbase icon.



5. Toggle the "TEAM SELECTOR" switch to the commie-red flag.
6. Make sure the "ADD SQUADRON" button is still selected. If not, depress it. 7. Click on the Sansago-ri airbase up in commie-red land.
8. When the "ADD SQUADRON" box pops up, change the aircraft to an SU-27 by popping down that submenu and scrolling through the options.



9. Click OK.
10. Click on the Sansago-ri airbase icon again.
11. Again, up pops the "ADD SQUADRON" box. This time, select a Mig-29 aircraft and click OK.
12. Please.. oh please... DE-select the "ADD SQUADRON" button.

You now have a Mig-29 squadron and an SU-27 squadron housed in the northern Sansago-ri airbase and a lone, F-16 squadron housed in the south at the Gangneung airbase. You also have placed a battery of SA-5s near the intended target sight. We are now ready to create our attack package of flights.

Creating flight packages is a fun part of mission building, but it too is plagued with some bugs, so until they fix them, I will describe a means of building packages that will allow you to step over the land mines.

First, we will make the American package. It will be a single package made up of 3 flights of F-16's. The first trick to making these missions interesting is setting up their timing, and this, of course, brings up the issue of time. "Time" is critical in this sim. The first "time" you must deal with before any other is the time in which the world you are creating proceeds to exist.

This is set in the editor by the clock seen in the upper right hand corner of the TE editor. I believe the default is day one, 9 am. Unfortunately (and I believe this to be a bug) you cannot have any missions which stretch into day 2. If you set this clock past midnight of day 1, it will simply revert back to some other time on day 1 after you exit and return. So, as far as I can tell, all missions written in this TE editor as it stands now must start and finish on DAY 1.

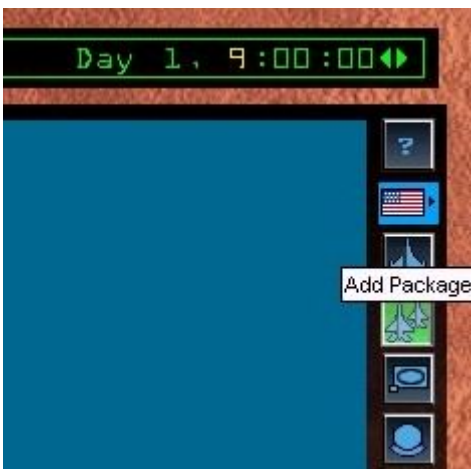
1. Highlight any part of the start clock in the upper right hand corner of the TE editor by clicking on it. Once highlighted in green, you can then use the arrows to the right of the clock to add or subtract time.

2. Go ahead and set the clock for 05:06:00 (5:06 AM). I chose this time because you will get to see the sunrise, as you are enroute to target.



By doing this, we must set all flights that we design to take off after this time, or when the mission starts, these flights will already be airborne. Now it is time to add our package.

1. Make sure the "TEAM SELECTOR" button is set to the USA flag.
2. Press the "ADD PACKAGE" button (the one with 2 planes in its icon). Note what it says at the bottom of the map window after you pressed this button. It says "Select Package Target, Patrol Area, or Destination". What this means is that the next thing you should select (left click on) is the target (or patrol area) for the package you are about to build.
3. Point your F-16 cursor on top of the Sinan-ni Radar Station (wait till you see the "right wingtip flag" and wait until the "mouse label" appears identifying it positively as the Sinan-ni Radar Station), then click.

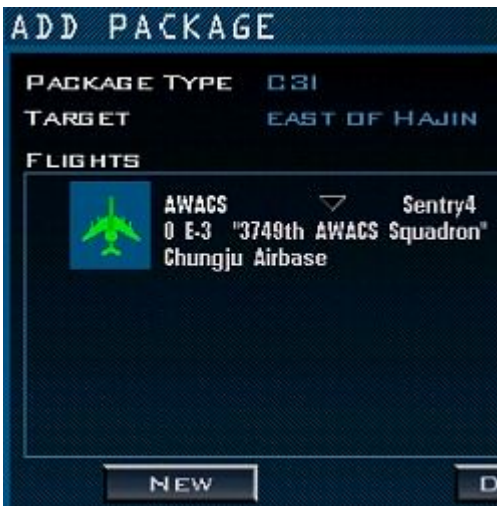


4. The "ADD PACKAGE" window appears. This is where things get real interesting.

The first thing to note about the "ADD PACKAGE" window is that no flights are currently displayed. That is because you have not defined any. Secondly, note that the Target, Sinan-ni Radar Station, is clearly listed as the Target for the package at the top of the window.



Oh and by the way, be careful that THIS doesn't happen to you



Notice that this dialogue box registers ZERO aircraft! If you should be the unfortunate victim of this plot to ruin your TE mission, you will have to delete the package or flights involved and start again. Yes, it IS possible to create a flight from a squadron whose resources are exhausted and there will be NO warning that you are doing so. Your mission may not run past this point at all. By the same token, if you create an AWACS flight be sure to designate only ONE aircraft in the flight. Be warned.

The next point of interest is at the bottom of the "ADD PACKAGE" window (and can be viewed in the prior image). It is the "times" section of the "ADD PACKAGE" window. 2 "times" are listed. "Takeoff" and "Time on Target". Take note of the little padlock images to the right of these times. **THIS CONCEPT IS VITAL TO UNDERSTAND.** Make sure that the padlock next to the "Time on Target" is in the "locked and green" configuration and that the padlock next to the "Takeoff Time" is in the ("unlocked and blue" configuration. If you need to change one, just click on it.

THE IDEA IS THIS (and this will hold true for all individual flights as well) If you lock the "Time on Target" and leave the "Takeoff Time" unlocked, then as you add individual flights to the package, the computer will determine all speeds between waypoints and takeoff times to insure that your planes arrive at target on time. If you attempt to lock the "Time on Target" time AND the "Takeoff" time, you may create a situation where the plane cannot physically make it to waypoint on time (or it may have to fly too slow!!) and your waypoint drawings on the map will be drawn in red.

RED WAYPOINT PATH LINES are impossible (or very difficult) for the aircraft. If you simply ALWAYS lock down the "Time on Target" and leave all other waypoint times as unlocked, the computer will very smartly assign times for each waypoint, including the take off time, to ensure that planes can easily arrive at target ON TIME. This feature is very peculiar in TE in so far as it appears to work very well :)

I'm going to repeat this rule in a short, succinct way. Whenever the opportunity arises to set flight times (whether it be in the "ADD PACKAGE" window or in the individual "flight waypoint editor" windows which we will discuss soon), ALWAYS lock the "Time on Target" and ALWAYS unlock the times at ALL OTHER WAYPOINTS, including Takeoff.

THIS IS THE KEY to trouble free, conflict free flight plans . Also important to note is that if you ever attempt to adjust the TOS (Time on Station) for any waypoint (TOS is the term used in the "flight waypoint editor" window to be discussed soon), it will automatically change that waypoint's time to a "LOCKED" status. That may cause you problems. So unlock it after you are done if that waypoint is not the Target waypoint.

Be sure you pay attention and double check that only the "Time on Target" is locked in the "ADD PACKAGE" window, and that only the Target "TOS" (time on station for the target waypoint) is the locked waypoint at the "flight waypoint editor" level. We will discuss the individual "flight waypoint editor" shortly.

This "locking of the target waypoint only" rule has another VERY USEFUL side effect. Once this is properly done, you can click and drag flight waypoints around on the map without even looking at the waypoint editor window. All the "TOS" (Time on Station) and "airspeed" fields will be properly updated within the limits of physical possibility (because they are unlocked and therefore allowed to be adjusted by the unseen mission planners...people who work behind the scenes for you getting all the math right).

If you exceed those limits, the game will automatically move your takeoff times (or whichever leg of the flight it needs to manipulate) in order to achieve flight legs which are physically possible. This may result in creating flights with takeoff times, which occur even before the starting time of the engagement (defined by the clock in the upper right hand corner of the TE Editor).

This is actually OK, and when you start a mission with such a flight, you will notice that that flight is already "ENROUTE" under the flight status listing when you first enter the mission/engagement. You can still join this flight enroute as long as it is not on its target waypoint run or RTB status. (RTB = Return to Base)

Now that I have explained this concept, I must reveal to you what appears to be a bug in the mission planner interface. The idea is supposed to be that you first lock the "Time on Target" element of the "ADD PACKAGE" window. Then, as you add flights to the package, they all end up with Target "TOS"s (Times on Station) within a few minutes of the one you locked in the "ADD PACKAGE" window. This feature does not seem to work all of the time, and I cannot figure out why (it works most of the time). I must assume it is a bug.

This bug, however, is not a reason to avoid using good form in the "ADD PACKAGE" window, as we fully expect these major bugs to be fixed over the next few months. Also, this feature appears to work most of the time, and when it does not work, it is easily correctable at the "flight waypoint editor" level.

Now, let's start adding flights to our package. It is VERY IMPORTANT to understand that the first flight we add to a package reserves a special place and meaning to that package. The first flight we add to a package defines the MAIN PURPOSE of the package, and all subsequent flights added to the package are IN SUPPORT of that primary flight. This is more than convention.

The manual clearly states that this first flight to a package affects the behavior of the subsequent flights, and although the manual is not crystal clear on exactly what the implications are, it does state that the AI responds, in some fashion, to this ordering of flights in a package. So in order to get the best results in our package, we will make the flight which will strike the radar station (that is the main purpose of our package) as the FIRST flight in the package.

We now should have our "ADD PACKAGE" Window open. I am warning you about what appears to be another bug, (or a poor design decision, or maybe just something I haven't figured out even after 10's of hours in this thing). Once you have the "ADD PACKAGE" window open, be sure and add ALL the flights before you close it. I have found no way to come back and add flights to a package after the "ADD PACKAGE" window has been closed. So let's add all three flights (Strike first, then SEAD, then BARCAP) to our package now, right after we set the times.

1. Set the "Time on Target" in the "ADD PACKAGE" window to 5:30 am. Make sure the little lock symbol to the right of "Time on Target" is set to "green and locked" and that the takeoff time is set to "Blue and unlocked"
2. Press the "NEW" button in the "ADD PACKAGE" window ...note the options in the "ADD FLIGHT" window which appears as a result of pressing the "NEW" button.



3. Make sure the Aircraft is set to F-16
4. Pop down the options for "Role" and select "strike"
5. Set the size to 2 (that's the number of planes in the flight)
6. Since we only have one squadron of F-16s added to this world, the squadron will be set correctly.
7. Since that lone F-16 squadron is placed at Gangneung airbase, it too will already be set.

8. This leads to an interesting point. when you have multiple squadrons set at different airbases, you must know which squadron is where, because when you pop down the options under the squadron menu in this window, you will see all that are listed for your current side. Depending on which you pick will determine the airbase... after all, you placed specific squadrons at specific airbases.

9. You will see that the target is already set for you... it knows this since it is a flight for a package whose target was already defined.

10. Press **ok**.

You are now back at the "ADD PACKAGE" window. **DO NOT PRESS OK.** if you do, and you close the "ADD PACKAGE" window, you will not be able to add more flights to this package. I just talked about this bug/feature/design oversight a moment ago.

1. Press **"NEW"** again...this time we will add the **SEAD** flight

2. Set it for **F-16's**.

3. When you pop down the "role" menu, and scroll down, you may notice that there are 2 types of SEAD missions. Select **"SEAD escort"**. This will tell the AI that you have a specific flight to escort. It will default (as you will soon see) to whichever flight is the first in the package. The other option, SEAD strike, simply attacks a known and designated radar station.

4. Set size to **4**

5. Squadron and airbase should already be correct. Double-check and be sure that it's the boys from Gangneung Airbase.

6. You may not recognize the entry in the "target" field, but it is the name of the strike flight that you just created prior, as the first flight of the package. In the case of "SEAD escort", the target is not an enemy target. Rather, it is a friendly flight it is intent on escorting.

Also, **"SEAD escort"** performs best if it is out in front of the flight it intends to escort by a few minutes. If you do this correctly, when we come back to see the target "TOS"s that the computer assigned, you will see that the strike flight is given a particular target "TOS", and the Escort will arrive a few minutes earlier (to insure a clear path)



7. Press OK to close the "ADD FLIGHT" window. AGAIN I REPEATDO NOT yet close the "ADD PACKAGE" window!

Hit the "NEW" button one more time. Now I am no master of mission "role" types, but TARCAP seems to be the best choice here for the final flight to be added. It stands for Target Combat Air Patrol, and this role is usually designed to protect strike flights as they approach and egress their strike target.

THE PROBLEM IS THAT THE TARCAP OPTION IS TOTALLY PORKED. It won't even appear as a flight if you select it. It is a glaring omission. It is a massive bug-a-roo. So the next best thing that gets these guys to CAP in a fairly aggressive fashion is the BARCAP (Barrier CAP) type mission. Setup a third and final flight in this package as 4 f-16s out of Gangneung flying BARCAP as their role. Select OK to close the "ADD FLIGHT" window.



Now that you have all three flights in the "ADD PACKAGE" window, and you have the "Time on Target" locked to 5:30 AM, and you have the takeoff time in the "unlocked and blue" state, say OK and close the window.

Strong work. If I appear repetitious at times, it is because I am. One of my instructors in medical school used to always say "Repetition is the cornerstone of adult education". He was right.

Now we want to go and look closer at those flights we created and make sure that all the individual waypoints and "Times on Target" work for us. We need to do this before we create the enemy flights that will oppose us.

And so we introduce yet another level of military planning known as the "Air Tasking Order" or the ATO (as it will be called from here on). The ATO is a complete listing of all air operations, their individual packages, and the flights as they are arranged in each package. This is our organized filing cabinet for every package and flight in the mission we are building. Once you are actually playing the mission however (remember, we are in the editor right now), the ATO will only show you the packages and flights on your side of the fence as it should be.

1. Click on the ATO button (looks like a little book with pages and says A.T.O. on the cover) at the bottom left of the mission planner screen.

2. Highlight the little switch at the bottom of the window, which says "show all packages".

3. The word "USA" will appear with a plus sign next to it. click on that plus sign.

4. The word "strike" appears. this is the type of package. If we had other packages, their types would also appear. Click on the plus next to it.

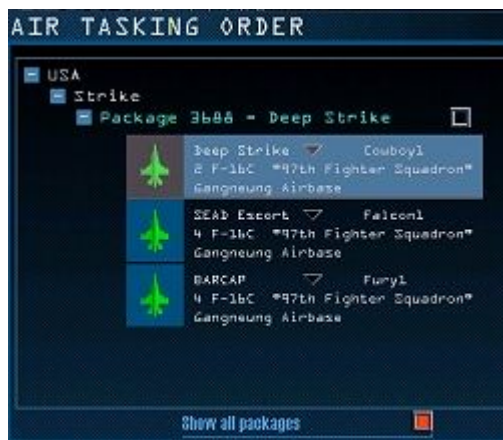
5. Now the actual strike package designator appears. Mine was designated "package 3688"...yours may get a different designation..... it also goes on to call it a deep strike. Just like mission planners assign names to all flights and packages, so does Falcon 4.0.

You do not get to pick the numerical designators for packages or the cutesy little flight names like "cowboy" or "stud". The AI mission planners do this for you. As long as my flight doesn't get designated as "Dandelion", I'll be ok letting those pencil pushers call 'em. Now press the plus sign next to it.

6. We now see the 3 flights we created in this package, with some very important information. It tells you the role (which you can actually change with the pop down right next to it...but you shouldn't need to if you got it right when you were adding flights initially) and it tells you the airbase, and the squadron name etc. BUT THE MOST IMPORTANT THING to glean from this page is the designation name of the flight. THIS IS KEY.

If you know that the strike flight is "Cowboy 1", and you choose later to fly that mission, then you will be able to recognize radio calls that are meant for you and your flight. Furthermore, if you know that "Fury1" refers to the BARCAP flight and "Falcon 1" refers to the SEAD flight, then all the radio calls will be meaningful, and you can actually get a picture in your mind of what everyone is up to as the radio chatter gets wild. Radio chatter is only chatter, if you don't know whom they are talking too.

If they are part of your package, it helps to know their names. If your BARCAP calls RTB and you don't realize it, you may not know that your ass no longer has BARCAP protection, and it's open for attack. KNOW THE CALLSIGNS OF THE FLIGHTS IN YOUR PACKAGE. It gives you situational awareness and a sense of being part of a greater thing.



Now that you are looking at the flight submenu of the ATO, you can use it as a tool to see the flights on the map. Click on the strike flight and notice what happens on the map beneath the window. (I wish they had made the ATO window with 2 options...big and clunky, like it is, and miniaturized, with symbols only...oh well...)

When you pick the flight in the ATO window, the waypoints for that flight are displayed on the map beneath it. Now close the ATO window so you can see the map. Note that the Target waypoint is the one with the blue triangle. Also note that some mission roles like BARCAPs have 2 target waypoints (called station waypoints) because the planes go back and forth between those 2 waypoints for a designated period of time (called "remaining on station").

Anyway, click on the **target waypoint** for the strike flight (The target waypoint is the waypoint on the map with the **BIG BLUE TRIANGLE**). When you place your "F-16 cursor" over the waypoint, you get visual confirmation because the "F-16 cursor" changes to the circular "waypoint cursor". When you see this change over the blue, triangular, target waypoint, then click. The "package/flight waypoint editor" window pops up. Note that the waypoint you clicked on is the one currently displayed in the waypoint editor window.

Also note that "Time on Station" (TOS) for the target waypoint is "locked and green". This flight's Target "TOS" may not be exactly 5:30 AM. If all worked correctly, it will probably be closer to 5:36 AM. This is because as you check the Target "TOS"s for all the flights in this package, you will see that the BARCAP will arrive first, the SEAD escort will arrive close behind, and the strike flight will arrive a few minutes behind it. It is attempting to space the flight according to what the programmers believed was military doctrine. Most of the time, the spacing makes sense. We will soon double-check them though.



Note also that you can scroll through all the other waypoints by clicking the arrows next to the waypoint number. Do that now and make sure that all other "TOS" times are in the "unlocked and blue" state except for the target waypoint. Now go back to the target waypoint (probably waypoint 5) for the strike flight. You want detail...good! This thing has detail. Look at the bottom of the waypoint window.

See the button that says "ASSIGN"? Click it. The target list window appears. This is where we actually pick the actual target we are going to kill. Click on the "+" plus sign next to the "Sinan-ni Radar station" entry to see all the **subtargets** of that radar station. Scroll through the list. Notice that the "Depot" has a "very hi" priority rating, and all the other knick knack parts of the station are rated as essentially unimportant.

Highlight the depot and press the "ASSIGN" button. You just assigned this depot as the target for the strike waypoint of your first flight. If we look at the bottom of the "flight waypoint editor" window next to the "ASSIGN" button, we see the words, target : depot. Bingo! We have the depot at the Sinan-ni Radar Station set as the attack target for that waypoint.



Re-open the target list by again pressing the "ASSIGN" button at the bottom of the "Package/Flight waypoint editor" window. You can also select to "recon" the depot by pressing the "recon" button as long as the depot is still the highlighted target. Take a close look at the recon images.

Play with the viewing options. If all you see is a black screen, press the up arrow to raise the camera above the earth until the target comes into view. Sometimes, the recon camera starts with its lens stuck in the mud. This appears to be a minor bug of sorts. They may help you later I.D the target in flight. Also, you can "recon" targets from within the actual game as well. Okee dokee then. Lets close the recon window and the "target List" window



Tired yet? Hang in there our mission is almost done

Reopen the ATO window. If all the flights are not clearly shown, click all the plus signs and make sure that the "show all packages" button is highlighted. Select the second flight (the SEAD escort). Close the ATO window. Click on any waypoint on the map to bring up the "waypoint editor" window.

Scroll through all the waypoints insuring that you like the "TOS" time for the attack waypoint, and that only the target waypoint in this flight has its "TOS" time "locked and green". Be sure that all other waypoints are in the "unlocked and blue" state. Reopen the ATO window and select the third flight in the package. Close the ATO window. Confirm its "TOS"s and locked times.

I alluded to this before, but I'll repeat myself now. Certain missions, such as BARCAPs, will show 2 target waypoints. That is because the idea of these missions is to fly back and forth between these 2 points in order to "Patrol" or "remain on station" for a designated period of time.

When you are looking at the "Package/Flight waypoint editor" window for the BARCAP flight, and you have selected to look at the target waypoint, notice the "patrol time" clock at the bottom of the window. The default is set to 15 minutes. That will do fine unless you are trying to fill up a whole days worth of CAP missions; in this case you may want to move this up to an hour.

The final step is to set up a BARCAP mission flown by the enemy, so that they will challenge this incoming package. I figure that 2 SU-27's, 3 Mig-29s and those pesky SAMs south of the target should be enough to balance out this mission. To keep things simple, we will make one enemy package, consisting of 2 flights. One will be a flight of SU-27s and one a flight of Mig-29's and both flights will originate out of Sansago-ri Airbase (that's where we placed those squadrons... remember?)

We will assign them to BARCAP (barrier CAP), and we will have them arrive on their patrol near the Radar station a few minutes before we get there. We will also tell them to stay on station for 30 minutes, so they will definitely be there and looking for a fight when we arrive with our strike package. If all goes well, our 4 BARCAP aircraft will have their hands full as the SEAD flight tries to knock out the SAMs and the strike flight tries to get an uninterrupted attack run on the Depot at the Radar station.

This leads to an interesting thing I read in the manual. "One Pass and Haul Ass". With these sorts of numbers, you will be lucky (assuming you choose to fly the strike package flight) if you get one clean pass at the depot. We have yet to choose our load outs, and for simplicity purposes in this already very long article, we are gonna accept the default weapons load out for this mission. Once playing it, however, the player can always change the loadout, no matter what the mission designers intended.

Ok... first thing to remember is that the strike package is set to arrive at about 5:30 AM, so lets agree to have our BARCAP package on station near the radar station at 5:30 AM.

1. Set the "TEAM SELECTOR" button to commie-red
2. Select the "ADD PACKAGE" button
3. Click on an area of the map just south of the Sinan-ni Radar station and the "ADD PACKAGE" window appears. (because we are setting up a barrier CAP mission, the barrier should be setup to protect the Radar Station from anything coming in from the south)
4. Remember... we must add both flights before we close this "ADD PACKAGE" window.
5. Set the "Time on Target" time in the bottom right to 5:30 and make sure it is in the "locked and green" status. make sure the "takeoff" time is in the "un-locked and blue" status
6. Click the "NEW" button. The "ADD FLIGHT" window appears
7. Make sure the aircraft is an SU-27. select it from the list if it is not.
8. Set the "role" to BARCAP
9. Check that the flight originates out of Sansago-ri airbase. since we have no other SU-27 squads in this TE mission we built, it should do that automatically.
10. Select to have a size of 2 aircraft.
11. The target will read something vague like "south of Sinan-ni". That is fine, because BARCAPs don't have specific targets like the Radar station.. they just cover certain areas.
12. Press OK in the "ADD FLIGHT" window. DO NOT CLOSE THE ADD PACKAGE WINDOW !!!
13. Press "NEW" again. the "ADD FLIGHT" window appears
14. This time, select a flight of 3 Mig-29's, set their "role" to BARCAP, and make sure that they are also flying out of Sansago-ri Airbase.
15. Select OK. Now YOU CAN SELECT OK in the "ADD PACKAGE" window to close it, because we are done adding flights to this package. Remember, I think it's a bug, but once you close the "ADD PACKAGE" window, you can never again add flights to that package. That's why I am so neurotic about repeating this.

Now open the ATO window and you will see a new entry. It is an entry for the DPRK (the commie-reds). Click all the plus signs until you get down to the level where you can see the 2 BARCAP missions we just created. Click on the first one, which will highlight its waypoint path on the map. Now, close the ATO window.



1. Click on the first of the 2 TARGET waypoints (the ones with the blue triangle around them). I am going to repeat myself now. This mission has 2 target waypoints because it is a BARCAP mission. BARCAP missions go back and forth between 2 target waypoints (called "remaining on station" or "Patrol time") for a designated period of time. We get to designate that time in the waypoint editor window for the package. However, the default is 15 minutes, and we will leave it as such.
2. Scroll through all the waypoints of the flight, being sure that the "TOS" for the first BARCAP target waypoint is "locked" at around 5:30. If it is set to some time close to, but not exactly 5:30, you may choose to leave it alone. The manual states that as flights are added to packages, sometimes the Target "TOS" is near the designated package "Time on Target" but not exactly, so as to appropriately space flights apart for maximum coverage.
3. Also check that all other waypoints are "unlocked". Note that when you are looking at the first (or second) target waypoint, a "PATROL DURATION" selector with an adjustable clock appears at the bottom of the waypoint editor. It defaults to 15 minutes, and that will suffice to insure all hell breaks loose in this mission.
4. Reopen the ATO window, and select the second BARCAP enemy flight. Close the ATO window.
5. Click on the first target waypoint of this flight to see the waypoint editor for the package.
6. As before, insure that the Target "TOS" is locked and that all other waypoints are not. Be sure the target "TOS" is set correctly to around 5:30 am (or thereabouts) and that the patrol duration (which is only seen when you have the target waypoint selected) is set to the default of 15 minutes.
7. Close the waypoint editor window for the package.

One thing you can do if you like is move the waypoints for the BARCAP flights (by physically dragging them around the map with the mouse) so they are creating more of a barrier out in front of the Sinan-ni Radar station. This is easily done by simply dragging the target waypoints to new locations.

If you followed my "lock only the target TOS" rule carefully, then all other waypoint times that may be affected by these waypoint moves will be automatically updated and the target "TOS" will still be the 5:30AM (or thereabouts) we set it for (because it was locked). In my example mission, which is available for download from this site (called Combatsim Teacher), I have done this to layout a forward barrier for the enemy BARCAPs to ensure an early intercept.

The full-featured nature of this mission planner is incredible and has more detail than I have ever seen. We can even adjust the intended altitudes for each waypoint in yet another feature of the sim. However, this article has gone on long enough, so I will introduce that feature in another article. We will stick to the default altitudes of the sim, and they are appropriate (as far as I can tell) for the mission role assigned to each flight. (A notable exception to this occurs when you create helicopter missions. It's best to check the ALT on each waypoint).

SAVED YOUR MISSION LATELY?

Now we must do something which makes this mission planner even more amazing ... and complicatedwe must setup victory conditions so that those who play our mission will know whether they have won the mission or not. After that, we will write a brief mission objective statement which players of our mission can read, then we will be done!

1. Select the button on the left, which says "VICTORY CONDITIONS". The "VICTORY CONDITIONS" window opens up.



2. In this mission, we will only set the victory conditions for the Americans. In plain English, our job is to destroy the depot at the Sinan-ni Radar station, but we also have another job. And that other job is to decide how many planes/pilots we can afford to lose ... after all, is the mission really successful if we bomb the target but half our boys die in the process? I think not.

The problem here is that learning to set up complex sets of victory conditions is worthy of it's own article, so I will tackle this topic more thoroughly in a later article. Let it suffice that for this mission, despite the losses, the only means of victory for the USA is to successfully bomb (and destroy) the depot at the radar station.

3. With the "VICTORY CONDITIONS" window open, we must first be sure that the "MISSION TYPE" at the top of the window is set to "engagement". If it reads as "sortie" then pop down the menu at the end of this word to change it to engagement.

4. Next, we must set the start time for the engagement. You would think that it would be set to the start time of the world, which we originally set to being 5:06 AM. This is a bug. It will still be set at the default 9am so set it back to the same time as the world proceeds to exist 5:06

5. Set the time limit clock to some time many hours later ... the default of 14:00 is probably ok.

6. Place your cursor in the "Points for Victory" numerical field and click to get a typing cursor, type the number "10" then hit you enter key. I REPEAT !! then HIT YOUR ENTER KEY. Another poor interface design issue in this game is that some times, after entering things in text fields, they appear to be there. But, if you don't end the entry by hitting the "enter" key, it won't be saved when you save your mission. That one had me stumped for a while, but I finally figured it out. ALWAYS HIT THE ENTER KEY AFTER ENTERING TEXT (including numbers) INTO TEXT FIELDS.

7. This "10" you entered is the number of points either team needs to win. We are going to make a very simple condition. If we get the depot, we get 10 points and we win. If we don't get the depot, then the game is a stalemate. We could add victory conditions for the commie-reds, but that would only further complicate this first article, so as I said before, I will soon release an article dedicated completely to understanding the "Victory Conditions" Screen of the TE editor.

8. Now, press the "NEW" button at the bottom of the "VICTORY CONDITIONS" window.

9. Note that the team portion of the "VICTORY CONDITIONS" entry is set to USA ... if it is not, then pop down its selection arrow, and select USA

10. Notice the underlined word "assign" ...click on this.... some text appears at the bottom of the window, which reads "Select target on map for victory condition" .. so now we need to click on the Sinan-ni radar station. That , however, can be tough depending on what is currently visible in the Map. Sometimes, the target we want to select is covered by other things like waypoints and other icons.

Do what ever you need to do to the map (by right clicking on it and going through the display options to unclutter the cluster duck appearance) until you can clearly see the Sinan-ni Radar Station. Make sure that you have the "air defenses" under the "installations" submenu of the "right click menu" selected or you won't be able to pick the radar station as a target for victory conditions.

Make sure that when you lay your "F-16 cursor" on it, you see the "right wingtip flag" appear, AND that you also wait for the "Sinan-ni Radar Station" label to pop up BEFORE you click. This way you are picking what you think you are picking. Once you click, the target "Sinan-ni Radar station" appears in the victory condition's line. To the left of it appears the word "degrade" and to the right appears a percentage. But we do not want to degrade a percentage of the station. We want to "destroy" the depot at the radar station SPECIFICALLY.

11. Select the down arrow next to the word "degrade" and switch it to "destroy". the "TARGET LIST" window will appear. Open the target list for the Sinan-ni radar station by selecting the plus sign to see all the individual parts of that radar station. The first one at the top of the list is the Depot. Select the "Depot" and press the "ASSIGN" button. The "TARGET LIST" window automatically closes.



12. The victory condition line now reads "USA (to) Destroy (the) Sinan-ni Radar Station('s) : Depot (for) 0 points."

13. We need to set the points earned to 10, so go to the "points" text field at the end of the victory condition line, and click to get a typing cursor. Then type the number "10" into the line and then PRESS ENTER. Don't forget to PRESS ENTER.



OK. Our last step is to enter a mission statement, and set the difficulty level of the AI in both flight and air defenses and we are done.

Maybe now is a good time to save our mission again?

1. Select the "TEAMS" button on the left. The "TEAMS" window appears.
2. Make sure the American flag is selected and it says USA in the text field below.

3. Set the AI (for the pilot skill) to rookie. Set the ADA skill to ace. A thing I have noticed here, is that you cannot differentially set the AI between teams and make one team's AI smarter than the other. Either this is a bug, or an intentional thing to insure a balance of function between teams. Who knows?

4. Click in the mission statement area, and write a short mission statement like " Destroy the depot at the Sinan-ni Radar station and get home alive"... .AND PRESS ENTER .. if you forget to PRESS ENTER, your mission statement will not be saved.



5. Now select the commie red flag up top. The text field will read DPRK.

6. Type in an enemy mission statement in the field, like "Defend the Radar station at Sinan-ni from the Americans at all costs, or your families will be moved to very low rent housing"... REMEMBER TO PRESS ENTER...



Do a final save and your mission is ready for prime time. After you have saved your mission, the first thing to do is to play it out in highly accelerated real time as the first test.

- 1. Select to go back to the main menu.
- 2. Select "TACTICAL ENGAGEMENT" from the left side.
- 3. Select the "SAVED" tab of the TE window.
- 4. Highlight the mission (maybe its called Combatsim mission or whatever)
- 5. Pick the fly/commit button in the bottom right (the jet that goes whoosh)

Some recommendations are in order for testing your mission in real play.

The first few times you run the mission, don't even fly it. Just sit at the pre-mission interface, accelerate the time clock to 32 or 64x (this is done with the pop down menu at the upper right of the pre-flight interface next to the clock) and focus the map on the area of interest. (The Sinan-ni radar station). Just watch the icons bop around on the map, and read the news reports.

If the whole thing goes as planned, you should be reading about all the air to ground and air to air engagements, and if the depot gets successfully bombed, you should receive the "win" screen. It is with this technique that you will learn if your mission is well balanced or not.

I have included my version of the mission, which is called "Combatsim Teacher". I have run my version this way many times, and every time I run it, the mission is unsuccessful (Click [HERE](#) to download). What this means is, if the mission is left to run entirely with the AI and without changing the default weapons load outs, the commies will repel the attack on the Sinan-ni Radar Station. THE ONLY WAY FOR THIS MISSION TO BE WON IS WITH A HUMAN FLYING IT. And it can probably only be won if a human flies as the strike leader (or wingman).

This is the essence of designing a well-balanced mission. As you play, you may wish to tweak your "Times on Target" or your waypoints to alter your strategy a little. You can do these things from within the game while the clock is ticking. There is no need to do it from within the editor. These would be strategic, pre-flight decisions.

If you wish, however, to alter the waypoints' of the enemy flights, you must return to the editor. You can only alter flights for the side you are fighting on once you have started a mission.

Now go to SETUP and make sure you have selected the option which allows you to turn on labels. When you start to fly, press Shift-L to turn on labels, so that planes which are too far away to see with the naked eye can be tracked by their labels. This allows you to look around and take outside views during the test flights and confirm visually that all parts of the packages are showing up on time and doing what they are supposed to be doing. Labels On is not for playing if you want realism, but it is tailor made for testing the true function of your missions before you release them to the public.

As soon as you start the mission, run the ACMI for the duration (You turn it on by pressing the letter "f" on your keyboard, and the red, "recording" indicator appears in the top center of your screen). Go back and review the recording later to insure that your guys are following orders and doing what they are supposed to be doing.

Now go and actually fly the mission, turn labels on, and see how goes the war. Once you like the way the "TOS"s and fights work out, then save your mission and share it with others. Remember, just because you know when the enemy will jump you doesn't mean the guy you give your mission to will know. He can always cheat and go into the editor and look, but if he wants a challenge, he will simply play the mission, recon the target, fly and see if he can win. And oddly enough, even though you know what will happen and when it will happen, flying your own missions can still be fun and challenging.

So have fun, and stay tuned for more articles on the unique and amazing features of the TE editor.

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