

ATC Basics

1 / 2008

Introduction

ATC (Air Traffic Control) is not something to be taken lightly. On the contrary, if it weren't for ATC, modern day air traffic with all its intensity, safety, and organizational handling would be impossible. You can imagine this is an enormous task. That's why ATC is a generic name for a series of services that Air Traffic Controllers provide. In this chapter, we will describe these services for you, and tell you how Radar Contact implements them.

The developers have done their utmost to make this as realistic as possible, short of going through a three year curriculum. With input from our international beta team, RC implements many critical worldwide ATC procedures making it the most versatile, accommodating software available.

Separation Minima and Traffic Calls

Beginning year 2005, RVSM (Reduced Vertical Separation Minimum) was implemented in the United States adding six usable flight levels available for cruise (FL300, 320, 340, 360, 380 and 400). The RVSM checkbox (RC's Controller Info) is checked by default. Uncheck it to operate without RVSM (optional). RVSM incorporates the following separation minimums:

Altitude	Lateral Separation	Vertical Separation
Surface to FL410	5 miles	1000 ft. above or below
FL430 and higher	5 miles	2000 ft. above or below
FL420, 440, 460 etc		Unusable Altitudes

Be sure to dial your altimeter to 29.92 when in the PCA or "Positive Control Airspace" and do not forget to reset to the local altimeter when descending back below the PCA. Don't bust your assigned altitude or we'll both be talking to FSDO (Flight Standards District Office).

In Europe and other non FAA controlled areas, the altimeter needs to be set to 1013mb above the Transition Altitude. Descending through the Transition Level, set the altimeter to the local pressure.

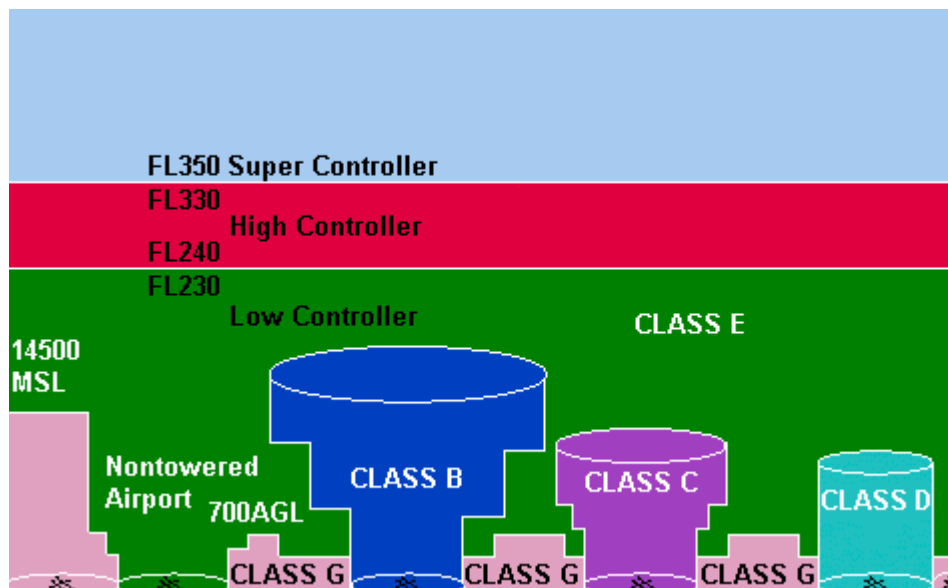
In your climb, cruise, or descent you'll be notified of other IFR aircraft in your proximity via "Traffic Calls". The FAA requires controllers to make these calls when you have traffic crossing at minimum vertical separation. Controllers are there to

guarantee absolute and consistent separation from other IFR traffic.

Although controllers will make all the IFR traffic calls and as many VFR traffic calls as he sees targets, there is no guarantee he is seeing all the VFRs out there! You'd be surprised the number of times controllers have heard "Center, we need to know what's going on! A Skyhawk just passed within 100 feet!" Not all aircraft have transponders. Not all aircraft have Mode C, so keep your Right Seat's nose pointed out the window until you are safely in the PCA (VFR flight isn't permitted in the PCA).

ATC Airspace Structure

With few exceptions, the airspace of the Air Traffic Control system is comprised of many hundreds of Terminal Areas, usually at large airports. Terminal Airspace encompasses the airspace 40 miles around the airport from the ground up to and including 150. Outside Terminal Airspace lies Center (ARTCC) Airspace structured as follows:



Varying levels of ATC Service

RC no longer subscribes to the "all or nothing" format; "All Terminal Controllers", or "none at all". This is a huge leap in realism.

RC uses a database which provides the realistic ATC service levels, for your departure and arrival fields, your alternate airports or any change of destination (COD) field. Now, far more realistic than previous versions, you may find your arrival airport has no Approach controller, but does have Tower and Ground services. Or, a field may provide radar service but there are no Tower or Ground

controllers.

This information is automatically preset after you choose your .pln or .apl flight plans. What controllers can be expected to be where, can be viewed on the Controller Info within the program. You're welcome to make changes, or leave your controller checkboxes default. You may change the frequency for a given controller, or add a departure controller because you wish to use the Departure Procedure(s) feature, or simulate EHAM, KJFK as fully uncontrolled fields.

IMPORTANT NOTE - If an airport has an Approach controller, that field will have a departure controller as well. You cannot select one without the other. If an airport has a Tower controller, the Ground controller field is populated.

As an example, choose a flight plan then click the Controllers Info button. You see several "Controller" options along the left header. These fields are automatically (and realistically) "checked".

If there's a clearance delivery service at your departure airport for instance, you'll see the corresponding checkbox selected along with a frequency. If your arrival airport has no Approach controller, but does have a Tower (possibly an FAA contracted VFR Tower operation), the Approach checkbox will not be checked while the Tower/Ground fields will be filled out.

IMPORTANT NOTE - You won't be able to make changes to the Controller fields after starting your flight, however, returning to the Controller Info after you launch is permitted. If you wish to know what controller services you can expect going into a field you're unfamiliar with (company called with an in-flight Change of Destination; Emergency, etc.), visiting this tab tells you exactly what to expect.

The following section(s) explain what to expect of, and how to handle the varying combinations of controllers and different levels of control services.

The Front-end Flight Phase

This section takes you from the ramp to the end of your takeoff runway. We'll get a weather briefing, receive our IFR clearance, and (if applicable) setup to call the Tower controller.

All RC "contact" or "frequency switch" functions default to #1 on the AdvDisp, *except* receiving your IFR clearance or getting a weather briefing under varying circumstances. Unless listed otherwise, you'll use #1 on your AdvDisp for these "contact/frequency switch" functions. It couldn't be easier than following the

prompts on the AdvDisp.

Getting a Weather Briefing

How you get your weather is very simple and easy to follow using your AdvDisp. Your first priority and responsibility as pilot in command, is to get an accurate weather briefing.

Weather through ATIS

ATC provides a weather reporting service in the form of ATIS (Airport Terminal Information Service). ATIS is available at all fully controlled airports. ATIS provides information about the weather, the runways in use and other pertinent details about the airport, whether certain taxiways are closed, building activities, perhaps with cranes in the area, etc.

RC ATIS provides:

- clouds
- altimeter setting or barometric pressure
- winds
- visibility
- precipitation
- temperature and dew point
- active runway
- alphabetic identifier ("Information Kilo")

There are two important moments for you to tune in to ATIS. The first time is after starting Radar Contact. At this moment, as a part of the cockpit preparation, you get the latest weather info, and write down the pertinent information. Set the altimeter according to the ATIS report, and program the FMC (Flight Management Computer) according to the temperature given.

The other important moment is when you are descending to land, usually when you're about 50 nautical miles from your destination airport. We'll cover this in the Descent Phase section.

Weather through the Local FSS

FSS (Flight Service Station) – Used if ATIS isn't available at your departure airport. FSS is available at smaller, uncontrolled, or partially controlled fields. Though a FSS won't be physically available at all airports not served by ATIS, local FBOs (Fixed Based Operators) normally offer toll-free phone service to the FSS serving their region.

Your FSS weather briefing is not a recorded briefing. You'll make the phone call and be greeted by the FSS specialist on duty. He'll have your briefing shortly. Don't take these weather briefings lightly, pay particular attention to wind direction/velocity. If your departure airport has no Ground controller, you'll need to know the preferred runway.

Your IFR Clearance

Receiving your IFR clearance is as important as the weather sequence (and equally as simple). Most "contact/frequency switch" functions of RC are by default #1 on the AdvDisp. Getting your weather briefing, depending on what services are available, require the use of #2 or #3. Simply follow the AdvDisp prompts.

IFR Clearance though Clearance Delivery (CD)

It's pretty simple: Delivery tells you 'cleared as filed', which means you can fly the plan just as you filed it. You'll be issued an initial interim altitude and transponder code, a so-called 'squawk', which can be a number between 1000 and 7999. Certain numbers which have a special meaning are excluded however: 1200 for instance is used for flights operating under visual flight rules, and certain numbers over 7000 are used for various emergencies.

A typical clearance might read: *"King Air 1231C, cleared to the XXX airport as filed. Climb and maintain (altitude). Expect (filed altitude) within ten minutes after departure. Squawk XXXX. Departure frequency XXX.XX"*.

If your first filed checkpoint is within 30 miles of your departure airport (constituting a DP), or if you selected one of the Departure Procedure option checkbox(s), your clearance will include the phrase "...via published Departure Procedures, then as filed".

If you selected NOTAMs for your departure airport, your clearance will include appropriate instructions.

Departure Procedures, NOTAMs and more are covered in the Tutorial Flights and User Interface sections.

TIP: Dial in your initial cleared altitude and your squawk code immediately as you receive them. There are many things to do in a cockpit, and this helps to reduce your workload.

Clearance requires you to repeat back the instructions you have just received. This is implemented in RC. Unless you have checked the option 'Pilot Autoreply' (the RC Options input screen), you must acknowledge the clearance: frequencies, altitudes,

transponder, etc. Default keyboard command 7.

IFR Clearance through Ground

This defaults to #3 on the AdvDisp. Many airports have Ground and Tower controllers, but no Clearance Delivery service available. In these cases the Ground controller issues your clearance. Use the #3 menu item in these cases, clearly displayed on the AdvDisp. Your clearance will mirror a clearance had there been Delivery Service.

IFR Clearance through FSS

At uncontrolled fields, if the departure weather is IMC you'll have no choice but to get your clearance through FSS. If the departure weather is VFR, you have the option to get your clearance through FSS (#4), or after airborne through Departure or Center (#5). Follow your menu prompts, and pay close attention to your clearances and instructions.

Chatter

If you enabled AI or Pre-Recorded chatter, you'll likely hear other planes receiving their clearance while you are on clearance's frequency or ground frequencies when there is no clearance delivery frequency.

Ground Operations

Ramp and tarmac operations can be equally as dangerous as airborne traffic. Large numbers of aircraft, all headed to different gates, crossing taxiways, throw in poor weather, with conditions like fog, can lead to a potential disaster! This is where the Ground controller comes into play. With his sophisticated equipment, and ability to keep several things sorted out at the same time, he makes quick sense out of it all. The Ground controller is the sole ingredient to safety before takeoff and after landing.

Ground at Controlled Fields

Your flight plan is now confirmed, and you're ready to leave the gate. You can request a push-back and start-up clearance from the Ground controller (optional). He issues clearances for start-up, as well as taxiing at the larger airports. Acknowledge push-back and start-up clearance.

After push-back and start-up, you are ready to taxi to the active runway. Ground provides the necessary clearance. Be careful, listen closely! In close proximity of other taxiing aircraft, you'll likely hear:

“...give way to the (company; type aircraft), taxi to rwy...” (if assigned a different rwy than the AI),

or

“...follow the (company; type aircraft), taxi to rwy...” (if assigned the same rwy as AI).

Simply follow your clearance(s). Do not contact Tower until told to do so.

It's possible that you are not satisfied with the proposed runway. Perhaps you're flying a prop and don't need to use the entire 11000 feet of concrete that's laid out before you. You might be much happier taking off from a parallel, much shorter and less busy runway. Just scroll down the menus, and then select your runway of preference and ask Ground to assign that runway. You will almost certainly be given that clearance.

A new feature will appear in the AdvDisp window, showing you the bearing to the runway you have chosen and the distance to the threshold. You can use this at unfamiliar airports to find your way to the active.

Ground at Uncontrolled Fields (UF)

After your weather briefing through FSS, and regardless of whether you chose “Clearance through FSS” or “Clearance in Air”, watch for sub menus to appear. The first menu will denote “Taxi to” runways. Select the menu line corresponding with your choice of runways, to announce *“Local traffic, (callsign) taxiing to runway XXX”*.

Taxi to “the end”, complete your run-up if applicable, and ready yourself for takeoff.

Notice, by now another sub menu will have appeared showing “Taking off XXX” runways. When in position and ready to roll, make your choice. A final menu will quickly appear displaying directions of flight. Choose whatever's appropriate for your flight, be it North, East, South or West to announce *“Local traffic, (your callsign) taking off rwy XX, East Departure”*.

Responsibility for separation at uncontrolled fields rests largely on the pilot's shoulders. ATC provides separation from other IFR traffic. Separation from VFR traffic is pilot responsibility, though you can expect ATC to issue traffic calls on those he sees.

That's ***on those he sees***. Because you're not hearing traffic calls, until you're safely in the PCA that does not mean you're the only one in the area.

For those interested in uncontrolled field operations at this time only, skip to the Departure or Center sections below, whichever is applicable to your flight plan.

Chatter

If you enabled AI chatter, you will hear other AI planes making “local” position calls at the varying phases of progress.

The Tower and Departure Phase

Approaching the Runway

Nearing “the end”, Ground will have you either “contact” or “monitor” Tower (giving a frequency). Acknowledge and “Contact” if told to do so (AdvDisp #1 default).

If told to “monitor Tower nnn.nn” (also AdvDisp #1 default), acknowledge that instruction and tune the radio to the tower frequency. Do not contact! Remember you aren’t calling Tower yet, you’re actually waiting for Tower to call you. And he will when he’s ready. Listen up for your callsign; do exactly as you’re told.

Tower

Tower may or may not clear you directly onto the runway depending on your place in line for takeoff. Be patient. You’re not the only aircraft out there. Taxi into position and hold when told to do so and be ready to go.

If you’ve filed a Departure Procedure (either in the flight plan or through the Departure Procedure checkbox on the Controller Info screen), or have enabled NOTAMs, you will not be assigned any sort of heading after take-off.

You are responsible for flying the DP. If the DP calls for a 45 degree heading change after reaching 1000 feet, do it. If it calls for straight out for the first 15 nm, do it. If the DP calls for unusual altitude constraints, adhere. Departure Procedures, NOTAMs and more are covered in detail in the Tutorial Flights and User Interface sections.

However, if you have not filed a DP or enabled NOTAMs, Tower will assign you an initial heading. That can be runway heading, up to 30 degrees off the runway heading, or a heading change after reaching a certain altitude. Listen and adhere to the instructions.

If you’ve checked the NOTAM box on the RC controller screen, every instruction will be prefaced with ‘if feasible’. You, as pilot in command are responsible for all obstruction clearance procedures

(not flying into a mountain.).

Chatter

If you enabled AI chatter, you will hear other AI planes in front of you cleared to taxi into position and hold, cleared for taxi and switched to departure (if there is a departure controller). You will also hear arriving AI planes checking into Tower when they are within 7 miles of the airport, cleared to land, and to exit the runway and instructed to contact ground.

Departure

When you are clear of local traffic, Tower will switch you to the Departure controller. He will clear you to higher altitudes. If you've filed NOTAMs, you will have to advise the Departure controller (or the controller next in line, the center controller) that you can proceed on course. From that moment on, you are expected to follow the controller's instructions to the letter.

If your departure airport had no Tower, the Departure controller will be the first you contact. For those who got their clearance on the ground, Departure will call 'radar contact', issue altitudes and possibly headings respect to other traffic, and you're on your way. If you're elected to get your clearance in the air, Departure assigns a transponder code before issuing your clearance.

IMPORTANT NOTE – It is now that you can give the aircraft controls to your co-pilot, upon contacting Departure (or Center if he's first in line). Your co-pilot will not accept the plane before this.

Remember what your assigned altitude is and never exceed 250 kts below...

The standard "250kt" altitude in North America is 10,000 ft. This altitude varies in other countries. RC allows you to change this altitude on the General tab.

Flying a loaded B747 or other heavy? TOGW really up there? It's common practice in Euro countries for pilots to ask for (and receive) clearance to waive this speed restriction while on Departure frequency.

For non-FAA airports and only when you have selected an aircraft

type of "Heavy" RC will allow for this request. Find "250kt Relief" on pg2 of the AdvDisp after takeoff. You must be filed type "Heavy"; all other aircraft type will be denied. Above 10,000 (or set value if you've changed it) you can fly at speed your discretion.

IMPORTANT NOTE – RC supported DPs end at 30 miles from your departure airport. By that time, Departure (or Center if you've climbed high enough) expects you to be on course and "as filed". If you've enabled NOTAMs, be sure to notify Departure (or Center) when you can proceed on course.

You'll notice the menu items, Lv Freq for Wx, Cancel IFR, Altimeter Check, and Emergency are now available. At 10 miles from your departure airport, Return to XXXX becomes available as well.

Chatter

If you enabled AI chatter, you will hear other AI planes checking in with departure after takeoff. Other AI planes will be switched from departure to center. If approach and departure share the same frequency, you will hear some AI planes checking in to approach, and switched from approach to tower (if there is a tower controller)

The Enroute Phase

Center Control in RC is now internationalized, built on varying standards of practice and phraseologies. Don't be intimidated. The basis of all operations stays the same, worldwide. Otherwise, pilots would have to study a whole new library of rules whenever they enter another country's airspace. The input from our beta team (many of whom *are not* American) has been enormous. RC implements many critical worldwide ATC procedures making it the most versatile, accommodating software available.

Center

The USA contains 20 centers that basically are responsible for maintaining order in the airspace between the so-called 'terminal areas of the airfields. A terminal area is a cylinder shaped segment of the air: it has a 40 mile radius around the airfield and stretches as high as 15,000 feet. So you can fly over an airport at 23,000 feet and never have to contact the terminal controller (Tower, Departure, or Approach). You will remain with the Center controller.

Center airspace is divided into "stratums". The "LOW" controller controls the airspace outside the terminal area up to FL 230. "HIGH" controllers carry responsibility for the flight levels between 240 and 340. "SUPER" controllers manage airspace at FL350 and above. Most airliners fly under either HIGH or

SUPER control.

These controllers will issue you your filed altitude and will expect you to fly your flight plan. Also, these Center controllers will pay attention to any deviation from your filed flight plan. You don't have much latitude here. Fly your plan, or get your behind busted. Controllers base separation decisions on pilots doing what's expected of them.

You will never hear the terms "LOW controller", "HIGH controller", or "SUPER controller". These terms exist to help you understand the concept of stratus.

IMPORTANT NOTE – You can dictate the level of controller tolerance by editing your Deviations settings. Go to the General tab within the program. Under the Deviations header you'll find Heading, Altitude, and Speed.

In previous versions, Radar Contact vectored you for fictitious traffic. These vectors and the option to control the amount of vectors have been removed. In this version, RC vectors AI planes that are going to cause a conflict, out of the way.

Cruise flight is often boring and monotonous in the real world. RC flights are no different. From both a controller and pilot's point of view, this is good. Things are under control, not a lot of excitement. Use this time to explore the many menu items.

This version of Radar Contact, we introduce the concept of sectors within centers. In so doing, the amount of switches from controller to controller within a center will increase.

RC offers several advanced enroute features making it the most enhanced ATC simulation available. A few of these features include the option to:

- Make requests to deviate for weather (you must tell the controller when you're able to proceed on course when the time comes).
- Advise the controller you can't hold altitude due to chop (you must tell the controller when you're able to hold assigned altitude again).
- Request higher/lower altitudes. Specific altitudes. Not just "higher" or "lower".
- Request a clearance direct a NAVAID you've filed for beyond that which you're currently flying towards.
- Change your destination in the middle of the flight.
- Report an emergency and request emergency handling.

Chatter

If you enabled AI chatter, you will hear other AI planes checking into the sector/center you are currently in, or they will be instructed to contact a different sector/center when they reach that boundary. When the AI plane is landing at a non terminal airport, you will hear Center giving them non terminal arrival clearances. When the AI plane is landing at a terminal airport, you will hear center telling them to contact approach.

Change of Destination

In various spots throughout RC, you have the option to Return to Departure airport, or head towards either of the two Alternate Airports you filed. Great features, but we know you need more.

Company's notified you that an important client needs to be picked up at an airport that's not in your flight plan. Or, you're on that long cross country when you see the winds aren't as forecasted. Sure would be convenient to get another 100 miles in.

Well, convenience is here. Within certain limitations on Center frequency, the Change of Destination (COD) menu item will be available. Selecting this menu item calls a pop-up window. Use your mouse to select the ICAO letter identifier on the keypad, and then ENTER. Of course, a NOTAMs checkbox is also provided. If you're not *sure* it won't be needed, use it. Once you select ENTER, there's no calling NOTAMs after-the-fact.

After you select ENTER, the controller will check to see if you'd like another altitude. Your current altitude will always be defaulted as #1, but you're welcome to make another selection via the displayed menu items. You must select an altitude, even if it's the one you're currently at.

If the airport you choose happens to be directly beneath you and you're in the flight levels, you will be vectored away from the airport so you can lose altitude, and then be vectored back into the airport area. You are not limited to one COD selection per flight. Half way to COD#1, the fuel's not holding up as you thought it would. Not a problem. Make another COD request, make as many as you wish.

Your route of flight will always be "via direct". There is no option to request specific routing(s). COD airport Levels of ATC Service are, as are your dept/arrival/alternate airports, per our data base, realistic.

COD is not available on Tower, Departure, or Arrival frequency. COD is also not

available while on Center frequency once inside 60 miles of your arrival airport.

The Descent Phase

Beginning with your descent, and throughout the rest of your flight is where you'll find the most dynamic and exciting changes of RC.

If cruising in the SUPER stratum you will be cleared to FL350 and switched to a HIGH controller who will clear you to FL240 and switch you to LOW. Assuming there is no conflicting traffic; LOW will clear you to 11000 or 12000, or appropriate altitude for your "type" aircraft.

The importance of getting a current arrival weather briefing cannot be stressed enough. Use the "Lv Freq for Wx" menu item at 50 miles from the destination airport as a matter of practice. This is the good moment to ask permission to leave the frequency to get the ATIS report for your arrival airport. The same information is included as described earlier. You'll know what runway to expect to land on, qnh, winds, visibility, clouds, and rain.

In real life, pilots normally use their second radio to tune in to ATIS, and leave their first radio available on the center's frequency. However, since many aircraft in Flight Simulator only have a single radio, you will ask permission to "*leave the frequency to get weather*". That permission is always given, and you'll be told to be back up on the controller's frequency within 4 minutes. Radar Contact does this for you automatically.

Your co-pilot (if you've given the comms to him/her) will do all this without prompting at 50 miles out. If your arrival field isn't served by ATIS, the same action will put you in contact with an In-flight Weather Briefer.

Destination Airport Served by Approach

On Low's frequency, you'll likely get a pilot's discretion clearance – "*descend at pilot's discretion maintain (altitude). You can expect, I say again, expect a clearance to cross 40 miles from (fix) at (altitude) 250 knots*". This means you can stay at your current altitude for the time being (or if descending, level off if you wish) but be prepared to get down. Otherwise, you won't be in time for that crossing restriction. That restriction won't be a request folks.

If you are flying a jet, expect to be instructed to cross 40 miles from the destination airport at either 11000 or 12000 (altitudes) with a possible speed restriction @250 kts. Turbo-Props and Props can expect to cross 40 miles from the destination airport at 7000 feet and 4000 feet respectively. Turbo-Props, don't forget to slow to 250 kts before descending below 10000. Normal speed is fine for props. See "Near-side /

Far-side Crossing Restrictions” section below for further detail.

More discussion on discretion descent clearances, crossing restrictions, holding pattern, and delay vector issues to follow.

Destination Airport not Served by Approach

Center/Tower/Ground – You will experience simple step descents, and no crossing restrictions. At 60 miles from destination, Center will ask if you have the arrival weather, and which approach you’re planning on. Sub menus appear making answering these questions very easy. You’ll be handled with respect to your answers.

If at 60 miles you told Center you’d like a visual, you can at anytime change your mind and request a specific precision or non-precision, IAP approach. An IAP approach means you fly “the full” approach with no assistance from the controller. RC does not tell you how to fly an IAP approach. You’ll need those plates. Or, if at 60 miles you requested an IAP but see the airport as you near the area, request a Visual.

Center only – You will experience simple step descents, and no crossing restrictions. You can make an IAP approach request as early as 60 miles out if you wish, or hold out a bit while you watch for the airport to come into view.

Don’t forget that arrival weather as you get closer to your destination.

Pilot Discretion Descent Clearances

I’ve heard time and time again, “I was given some altitude, then I was told to cross X miles at a different altitude. Does this mean I should wait until 40 miles out before descending? Do I have to start down now? Which altitude do I descend to?” Excellent questions.

Fact: Your most recently received control clearance supersedes all other clearances. Example: You’ve been given “...PD to FL190”, then later the controller says “...descend and maintain FL180”. FL180 is now your assigned altitude. FL190 is no longer of any consequence, and “descend and maintain” means now. This is a totally different clearance that negates the PD FL190 clearance. Again, your most recently received control clearance supersedes all other clearances.

We issue PD clearances because we’re very aware of the cost benefits that “staying high” yields (less fuel burned).

If you’re told to “...descend at pilot’s discretion maintain FL190...”, then later get “...cross four zero miles from (fix) at 11000 ft/250 kt...” FL190 is no longer in the

picture. That's no longer your assigned altitude. 11000 is your assigned altitude.

Further, a crossing restriction **is a pilot's discretion descent clearance**. This is very unlike a "...descend and maintain..." altitude clearance where descent is required. What does that mean to you? Given that a crossing restriction is a PD clearance, you're welcome to level off at FL190 or any other altitude without fear of annoying the controller.

However, you need to plan whether to level off somewhere (optional), adjust your descent rate, all respect to your speed, based on the requirement that **you have to be at your newly assigned altitude** (in this case 'one one thousand', or 11,000 ft), **at or before whatever point ATC gave you in the crossing restriction**. This usually means 40 miles from your final checkpoint. You have to be level at the assigned altitude, at or before reaching this point. If you wait until 40 miles out to begin your descent you will be told to start a descending 360 degree turn until you are at the right altitude, or you will be given a series of vectors until you have met your crossing restriction altitude.

Controllers, not FMCs, determine when initial descents are started but those using FMCs will like this! While at cruise altitude and when you get your 1st descent clearance you'll notice the menu item "3-PD". Use this feature to request a "Pilot's Discretion Descent". The RC controller will approve or deny this request depending on varying circumstances.

Use wise judgment in making the call when to start down! If approved, RC will not issue the "expect" clearances for crossing restrictions that normally come on Low's frequency, but you can bet some sort of restriction will be given.

IMPORTANT NOTE – You're co-pilot will always acknowledge any clearance to descend from cruise, thus forcing you to begin descent. If you wish to use this feature, be sure you're doing the talking.

Many such questions and topics are regularly discussed on our AVSIM forum (www.avsim.com). If you prefer, email doug@idtlc.com directly. Where possible, these emails will be addressed individually. If Doug directs you to the forum, don't be shy. There's a reason, most likely that many can learn from this topic. The only silly question is the question not asked.

Crossing Restrictions

If your destination airport has an Approach Controller, expect a crossing restriction. Depending on several factors, you'll hear one of these two types of restrictions:

- "...cross four zero miles from XXX at (altitude), two five zero knots (if applicable)..."
- "...descend and maintain (altitude). Start down now

please. I need you level in thirty miles or less.” (Thank you Mr. Larry Holcomb., retired KORD management)

As you’ll see on your AdvDisp, you have the option to accept or deny these restrictions. If you acknowledge the restriction, you bought it. Meet it. If you choose “Unable”, the controller will issue alternate instructions.

IMPORTANT NOTE – Your co-pilot is a very accommodating individual. The co-pilot will always acknowledge any crossing restriction. Once a restriction is acknowledged, there’s no turning back. There is no “I Changed My Mind”. If you see you’re too high to realistically meet the crossing restriction you know is coming, take those comms back beforehand. Crossing restrictions are usually issued at approximately 30 miles from your final checkpoint, or 70 miles from your destination airport.

Near-side / Far-side Crossing Restrictions

Traffic management is always looking for better, more efficient ways to expedite a traffic flow. Implementing the “Near-side / Far-side” concept does that in crossing restrictions. It can benefit you the user by allowing you to stay higher-faster under certain circumstances, than what was once considered standard.

If filed aircraft type is Jet or Heavy, expect your crossing altitudes to be either 11000 or 12000. If you’re assigned 11000, the 250kt speed restriction will come with it. No speed restriction is issued with the 12000 altitude. Keep it rolling if you wish, remembering that at some point the Approach controller will clear you below the 250kt altitude, *by which time* you must be at or slower than 250kts!

Now, what determines Near-side / Far-side. **It’s dependant on which direction you’re approaching the airport, and which runway is being used.**

Example: Your destination airport is KATL with the active landing runway being 09R (an east/west rwy). Picture two halves, east/west halves, split by the ATL 360° and 180° radials .

Flights approaching the KATL area from the east (inbound on any of the ATL radials 360° clockwise to the 179°) would be considered Near-side (or Short-side).

Flights approaching the KATL area from the west (inbound on any of the ATL radials 180° clockwise to the 359°) would be considered Far-side (or Long-side).

Picturing this, you can see where if you’re approaching the KATL area from the west with an active rwy 09R, you’ll be flying a shorter distance to the threshold once in Approach airspace than if you were approaching from the east, the opposite side of the field. With Near-side, the Approach controller has less time to get you down

to the MSA, less time to get you sequenced etc. Thus, Near-side he wants you lower and slower than had you come from the Far-side.

Final comments on Near-side / Far-side, and Crossing Restrictions

Depending on where your final flight planned checkpoint lays, and from which direction you're approaching destination airport reference the active landing runway, you'll hear any one of the following crossing restrictions:

- “(callsign), cross four zero miles from (checkpoint) at one one thousand, two five zero knots. Altimeter xxx”. (Final checkpoint 5m or less from destination airport, Near-side)
- “(callsign), cross four zero miles from (checkpoint) at one two thousand. Altimeter xxx”. Final checkpoint 5m or less from destination airport, Far-side)

Radial/DME Crossing Restrictions (above) require final checkpoint to be a VORTAC. If your final checkpoint is something other than a VORTAC (waypoint, intersection, NDB etc), and even if this final checkpoint is closer than five miles from the arrival airport, you'll get one of the two following crossing restrictions:

- “(Callsign), descend and maintain one one thousand. Reaching one one thousand reduce speed to two five zero knots. Start down now please. I need you level in thirty miles or less. Altimeter xxx”. (Final checkpoint >5m from destination airport, Near-side)
- “(callsign), descend and maintain one two thousand. Start down now please. I need you level in thirty miles or less. Altimeter xxx”. (Final checkpoint >5m from destination airport, Far-side)

NOTAMs and Crossing Restrictions

If you checked NOTAMs for your arrival airport, this is the time you start looking out for those mountains. Your crossing restriction will include the NOTAM Advisory. Clearances will be preceded by the phrase ‘when able’ or ‘if feasible’. That gives you some latitude to disregard instructions which would otherwise get you plastered on the side of a mountain. Be aware, the RC controllers issue heading and altitude clearances based on where you *should* be, not necessarily from where you are. To every extent possible, accommodate your control clearances.

TIP - Remember, use the MSA entry boxes on the Controller Info to accurately enter or amend the area's safe altitudes per your arrival charts

and/or approach plates.

Unlike NOTAMs on the departure side, with arrival NOTAMs there is no need (nor option) to advise any controller you're able to adhere to instructions.

With respect to arrival NOTAMs, expect very similar handling in the descent and arrival phases of your flight, regardless of level of ATC service.

Enroute Holding Patterns and Delay Vectors

RC features Holding Pattern/Delay Vectors in both enroute and as options after Missed Approach. This section covers enroute only.

Both pilots and controllers dislike delays. In a perfect world there would be none. Unforeseen traffic saturation and weather can wreak havoc on the ATC system. There will come a time when you will have to accept delay vectors or holding instructions, just as the real-world pro's do. RC will let you choose whether you will be held always, or never held, or held based on weather. The chances for being held for weather are as follows:

If 10 or more rwys (5 pavement or greater):

35% hold – 65% no hold = Visibility 3m or less, and ceiling 400ft or less

20% hold – 80% no hold = Visibility 3m or less, or ceiling 400ft or less

5% hold – 95% no hold = Visibility > than 3m, and ceiling > than 400ft

If 6 or 8 rwys (3 or 4 pavement):

35% hold – 65% no hold = Visibility 2m or less, and ceiling 400ft or less

20% hold – 80% no hold = Visibility 2m or less, or ceiling 400ft or less

5% hold – 95% no hold = Visibility > than 2m, and ceiling > than 400ft

If 4 or fewer rwys (1 or 2 pavement):

35% hold – 65% no hold = Visibility 1m or less, and ceiling 400ft or less

20% hold – 80% no hold = Visibility 1m or less, or ceiling 400ft or less

5% hold – 95% no hold = Visibility > than 1m, and ceiling > than 400ft

Normally the controller will give you the option of taking the delay using holding

patterns or delay vectors. If you prefer holding instructions choose 'Holding Pattern' on the Pilot's Menu. If you're in the mood to allow the controller to fly your airplane for the duration of the delay, choose 'Delay Vectors'.

IMPORTANT NOTE – If your co-pilot has the aircraft controls, Delay Vectors will be mandated by the controller, regardless of who has the aircraft comms.

Delay Vectors

The controller will assign an altitude and various headings, keeping you reasonably close to the Arrival Gate. It might be a good time for that cup of coffee, but be sure to listen up. Missed clearances result in many problems, and the controller will not allow another aircraft to be inconvenienced or lose his slot because the pilot is sightseeing.

Holding Pattern

What follows is for those pilots who don't know how to fly a standard holding pattern or have never heard holding instructions. It is very detailed. Read carefully. By choosing holding instructions you're telling the controller that you know what you're expected to do. After being issued these instructions you won't hear from Center again except for traffic calls, to issue a revised Expect Further Clearance (EFC) time, or until it's time to go in.

IMPORTANT NOTE - You must always retain the aircraft controls during a holding pattern (as opposed to delay vectors). Do not give the aircraft controls to your co-pilot anytime while in a holding pattern

When you hear "I've got holding instructions, advise when ready to copy", get ready to write. There are five specific items to listen for.

- Radial and DME fix (your new clearance limit)
- Direction of turn
- Leg length
- Altitude assignment
- EFC time

Most likely you will be in your descent while being issued the holding instructions. It seems necessary to do two or three things at once:

- Fly your aircraft
- Copy the instructions
- Verify your position with respect to your new clearance limit.

Keep in mind how easy it is to overlook your assigned altitude through all this. Make it priority to enter the assigned altitude in the AP window when issued.

A sub-menu appears when you choose Holding Pattern, containing your choice of leg lengths. Choose from 5 mile, 10 mile, 15 mile, or 20 mile legs. You're all set.

Assume you're destination is Memphis, TN (KMEM) and your general direction is from the northeast. You're heading 235° inbound on the MEM 055° radial. Remember, radials "radiate from" VORTACs. A three six zero degree radial radiates north. A zero seven five-degree radial radiates east-north-east. A two two five degree radial radiates directly south-west, and so on. For simplicity we'll assume no-wind conditions and no magnetic variation.

Typical holding instructions might go like this: *"Delta 432, cleared to the Memphis zero five five radial, four zero mile fix, hold northeast. Right turns, two zero mile legs approved. Maintain one four thousand, expect further clearance one four two five"*.

In this case the MEM $055^\circ/40\text{mi}$ is your "Clearance Limit". A Clearance Limit is a definite point along your filed route of flight that you may not progress beyond without an additional clearance from ATC. Your holding "dot in the sky" is the MEM $055^\circ/40\text{mi}$ fix.

The controller will assign you to hold on whatever radial you're inbound on, rounded to the closest 5° increment. In other words, if you're inbound on the 053° radial (heading 233°), controller will hold you on the 055° radial at the four zero mile fix. Generally you won't have to turn more than 15° - 20° to intercept the appropriate radial. You want to be established on the radial before reaching the forty-mile fix. Don't become so preoccupied with the radial/DME fix with respect to your current position that you bust your assigned altitude.

Established inbound on the MEM 055° radial (heading 235°), begin a standard rate right turn at the forty mile DME fix, your clearance limit. In other words, when you're 40 miles out, it's time to turn outbound. Roll out on the heading, which is reciprocal of the inbound heading given no wind conditions. In this case your outbound heading would be 055° . You are heading away from the airport area, now parallel to the inbound radial, which should be a few miles off your right wing. (Some might say "It's not possible to not go beyond the MEM $055^\circ/40\text{mi}$ by beginning your turn at the 40-mile DME fix."). Centers and Terminals have agreed upon "Protected Airspace" in the LOAs whereby they expect and allow for "overshoot". Again, this is the controller's problem, not yours. Begin your turns at the radial/DME fix and we'll all be happy).

Right turns are standard. Two zero mile legs are popular in the real world but as you saw earlier, RC allows you to fly legs of other lengths. When you're sixty miles out

(if you chose 20 mile legs), still heading 055°, begin a standard right turn (to heading 235°) to intercept the 055° radial. Once again, you're heading for that forty-mile fix where you will again turn outbound. Headings will vary given changing wind conditions. Correct as necessary.

Obviously, had you chosen 5 mile legs you'd begin your turn inbound at 45 miles. If you had chosen 10 mile legs you'd start the turn at 50 miles.

You will see how easy it is to miss items in a rapid-fire holding clearance. Altitude is usually the first. Many pilots write the instructions down as they come, but the altitude is always the first thing adjusted in the assigned altitude windows.

Finally, you will be given an EFC time. Why? What if two-way communication is lost between ATC and your flight? Are you supposed to remain in holding until running out of fuel? It is at the EFC time that ATC will expect you to do what the FARs tell you to do, that is continue on to the airport without a verbal clearance out of holding.

If it becomes necessary for the controller to keep you in the pattern longer than originally anticipated, he'll issue you a new EFC before the original runs out. If your EFC time has come and gone without being issued a revised EFC, chances are you have lost two-way communications.

When traffic settles down or the weather pushes out, Arrival will call Center telling them to return to normal procedures. Don't fall asleep. The point at which you're cleared out of hold is not predictable because we don't know when Arrival will call. When you are cleared in, at about 40 miles out Center will switch you to Approach.

Minimum Fuel

Aviation authorities require a pilot to ensure a fuel load citing specific minimums. There are many variables that go into the different regulated fuel minima. For RC's purposes, we suggest you go with the standard fuel load: Allow for the duration of the flight plus alternate airport, plus forty-five minutes. Remember, this is a minimum. Check arrival weather, anticipate delays, and load fuel appropriately.

"Minimum Fuel" is something normally seen from the military but you have the option as well. While in an enroute Holding Pattern or Delay Vector routine and you see you're running low on fuel, select the 'Declare Minimum Fuel' item on the Pilot's Menu. You will be issued a new Clearance Limit (the destination airport) immediately. You can call minimum fuel anytime after you're advised of the delay, right away or after you've entered the holding pattern. It's not necessary to wait until after you've received your holding instructions before declaring minimum fuel.

ATC will always gladly accommodate and give priority to this request. No one wants to see a disaster, but you can expect a visit from the authorities who will want

to know what happened. Use with discretion.

The Arrival Phase

The majority of this section will cover standard Approach control services, IAP Approaches, Missed Approach, and the various options available.

With respect to Levels of ATC Service, the important thing to remember is Center does not vector to final. Consequently, the “Req Vector App” menu item isn’t available after missed approach at fully and some partially uncontrolled airports. Where this doc may say “Approach will”, that controller will be Center if there is no Approach controller.

Again, you can do everything with and make similar clearance requests to Center as you can an Approach controller with the exception of vectors to an ILS.

Approach Control

One of the first things you'll be told after having contacted Approach is which runway to expect for landing. If for any reason you'd like to request an alternate runway or one of your alternate airports, you can do it here. The Approach controller will essentially take over your aircraft, assigning headings, altitudes, and speeds. Follow instructions to the letter. Unless you request a Visual or IAP approach, the controller will set you up for some type of "Localizer" (ILS or SDF) approach.

Vectored “Pattern” Approaches

Arrival airports staffed by Approach controllers offer vectors to an ILS or localizer as default. Depending on your angle of approach to the airport with respect to the preferred runway you'll be given a heading taking you directly at the field, unless your angle of approach calls for a "Straight-In".

Runway Selection

This may be one of the most controversial issues in RC, certainly the most debated. The decision has been made, RC goes with the flow. We have to make the best of a bad situation. RC will put you on the same runway your AI are using, even if that runway isn't the most advantageous/logical runway considering winds.

We've seen it all too often and it's blatantly obvious, AI simply do not always land on wind-preferred runways. This is unfortunate, a shame really but putting you on runways that always point you into the wind guarantees, sooner or later you'll come face to face with a B757 who's landed opposite runway. And of course, your Req Alt Rwy feature is still there at your disposal.

Downwind

At approximately sixteen miles from the airport you'll be turned "downwind", that is parallel to the runway in the opposite direction of landing. It's always preferred to land into the wind making your ground speed at touchdown slower, though we've discussed this won't always happen. Along your downwind leg do not exceed 230 kts.

At larger airports and during busy periods of traffic, it's likely you'll have been switched to a second Approach controller, the "Final" controller. Final handles all sequencing from this point on and will switch you to Tower at the appropriate time.

Short Final

Approach turns you to downwind. "Ugh. Do I really have to get so far out from the airport?" You can ask Approach for a Short Final, an early turn onto base/final anytime while on their downwind legs. Short final is available on the AdvDisp page 2. Approach will accommodate this request according to traffic load.

Get out your geometry books. You're on downwind with 12 miles showing in your DME and you've already passed the airport. You make the Short Final request and it's approved. You're turned 90° to base heading directly perpendicular to the localizer. Your DME shows you getting closer and closer to the field.

You should not expect to intercept the localizer at 12 miles out, but in this case maybe 8 miles or even closer. This is a learned tool to be sure. It's very easy, very tempting to make this request too early - early enough that overshooting the localizer is almost guaranteed. Remember, the localizer is a "cone", very narrow at the runway expanding as you get further from the threshold.

Several tips for optimum use:

- Practice. Get used to it and your abilities as a pilot. RC's Save/Load feature comes in handy here.
- Wait until your glide slope needle is at or above the Center of your NAV 1.
- While on base before you're turned onto the localizer, slow the aircraft 10-15kts slower than you normally would.

In time you'll make this request with confidence, especially if you fly the same type aircraft a lot. Making requests too early will become a thing of the past and you'll be intercepting the localizer well inside the default vectors. But wait. Don't forget. You're not the only one out there.

Base

The initial approach into the airport area is described above. Eventually you'll be turned "base" approximately sixteen miles out. **The Base Leg** is a ninety degree left/right turn from downwind. We're setting you up for "final". Do not exceed 210 kts on base.

Intercept

At the appropriate time you'll be turned further left/right off base to get you started towards your final approach heading. At all times watch your assigned altitudes. You should be well into the checklists by now.

Final Approach

The final approach clearance is critical because it sets you up for a smooth entrance to a clean approach. Listen carefully; it goes by fast. Expect this sequence of words and instructions:

'(your callsign), (your position), (a heading to intercept the localizer/final approach course), (the FAP, or the Final Approach Altitude), (cleared for approach).'

For example: American four twenty one, one zero miles from the marker, fly heading one two zero, maintain three thousand two hundred until established on the localizer, cleared ILS runway 09R approach.

The Final Controller isn't done with you until you're switched to Tower

IAP Approaches

IAP Approaches allow you to execute a full approach per your plates, whether the airport's served by an Approach controller or not.

Watch for the IAP Approach menu item, available as early as 60 miles from the arrival airport (if that airport is not served by an Approach controller), or as early as initial contact to Approach if it is.

Choose IAP Approach. You'll be prompted to provide the type of approach you are going to fly: ILS, GPS, and NDB, etc. (all clearly listed on sub-menus). After your approach clearance, you won't hear from the controller again, unless you stray out of the Approach area (40 miles away from the airport), or naturally, traffic calls. You can fly the approach by the numbers on your charts and get established on final.

An IAP Approach clearance will be (for example): *"Baron 5231C, maintain (MVA) until the initial. Cleared the full NDB runway 23 approach"*. Don't forget to

acknowledge.

If you're well into an IAP Approach and suddenly you see the airport, you have the option to ask for a Visual Approach. If you're well into an IAP Approach (an NDB for example), and decide you'd prefer the Localizer Back-Course, make that request.

IMPORTANT NOTE – Your co-pilot will not fly an IAP Approach. If you choose an IAP, the plane's controls will be returned to you.

Visual Approach

The Visual Approach menu item is available per the same parameters as is IAP. You can tell Approach (or Center if applicable) you "have the field in sight", prior to or even after any other approach clearance. If the menu item's available, you can use it.

IMPORTANT NOTE – Your co-pilot will not fly a Visual Approach. If you choose Visual, the plane's controls will be returned to you.

Chatter

If you enabled AI chatter, you will hear other AI planes checking in with approach. AI planes will also be switched to tower, if there is a tower controller. If approach and departure share the same frequency, you will hear AI planes checking in with departure, vectored on course, and switched to center.

Tower

Approach will allow you to take a breath, then at five miles out switch you to Tower. You will be given the winds and told which "number" you are for landing. Keep the localizer/glide slope needles cross-haired. "Wind Check" is available on the menu if the numbers go by too quickly.

FROM THE FILES here's one for you. I've witnessed at a major international airport Ground Control send a Skyhawk onto an active runway to chase off a coyote that had decided to siesta on the paint. This coyote was keeping large jets from taking off, delaying several multi-million dollar operations. Point is, be ready. You'll surely hear that dreaded phrase from Tower 'Go Around.' if you fly into Terminals often enough. I'll pass on to you what my flight instructor once told me - 'When you hear this, react. Don't question. Methodically react to your practiced procedures,

now. Don't look, don't wonder. Do it.' Tower will put you back on Approach when he's done with you and you'll be vectored back in sequence.

Chatter

If you enabled AI chatter, you will hear other AI planes checking in with tower, they have their initial landing clearance, their final clearance, and told to contact ground when off the active. You will also hear departing AI being cleared to taxi into position and hold, cleared for takeoff, and switched to departure.

Missed Approach

You have the authority to "Miss Approach". You do not need ATC's approval. As in all cases of air traffic, ultimately the pilot is truly in command. If for any reason you don't like what you see as you approach the numbers you stray from centerline, you're too high/low, too fast/slow "Missed Approach" is there for you on the menu. Tower will acknowledge and accommodate your intentions. Clean up the aircraft and begin your climb holding runway heading. As soon as you achieve a positive rate of climb, Tower will switch you to Approach.

Once on this frequency, Approach will assign altitudes and headings and ask what your intentions are. They are:

- **Vector Approach** (Approach controller only) – You'd like to try the same approach again, and you'll take vectors. Approach takes you out and about, and then sets you up for another shot.
- **Hold as Published** (Approach and Center) – You'd like to delay a bit in a holding pattern. You'll be told "...hold as published, maintain (altitude)". There is no assigned radial/dme fix. You're holding per your plates. After a random holding period, expect the controller to vector you back into the pattern or clear you for another IAP Approach, whichever approach routine you just missed from.
- **Delay Vectors** (Approach) – You'd like to delay a bit but you don't have any plates. The controller issues various delay vectors, keeping you within 30 miles of the airport. After a random holding period, expect the controller to vector you back into the pattern or clear you for another IAP Approach, whichever approach routine you just missed from.
- **IAP Approach** (Approach and Center) – You'd like to shoot a "full" approach without assistance from ATC. Choose this whether you've just come from an IAP, or standard vectors. You're welcome to shoot the same NDB you just

missed from, or try the Localizer-BC this time, your call.

- **Land at XXX** (Approach and Center) – Your filed Alternate Airport (#1). If you choose this, advise Approach of your requested altitude per the menu(s). He'll have you contact Departure who gets you on your way.

IMPORTANT NOTE – “But I wanted to go to my filed Alternate Airport #2.” You can do that and more. The above conditions can be applied in any combination, at any time, under the following circumstances:

Land at XXX airports (your Alt #1, Alt #2, and your departure airport) will be available after missed approach, and have chosen Hold as Pub, Delay Vectors or IAP Approach. You may have noticed they're also available from initial contact with Approach up till the time you contact Tower. Change your mind, just about anytime.

Vector Approach (Approach only) becomes available once in Hold as Pub or Delay Vectors. Tell the Approach controller you'd like to try the approach again, even after requesting an IAP or Visual approach. He'll set you up for the preferred.

The Visual and IAP approach options are there before and during all other approaches.

The value of our Save/Load feature should be obvious. Use it, anytime at any point in any part of any flight.

IMPORTANT NOTE - If your co-pilot has the radios at missed approach, he/she will always opt for the “Vect Apch” option. If you'd prefer something else, you need to be talking.

Alternate Airport(s)

The weather's below minimums at your arrival airport. The runway isn't visible as you approach DH. You elected Hold as Pub hoping for things to improve (checking Lv Freq for Wx periodically) but it's become obvious, this isn't going to work.

That's why there are alternate airports. Having a “plan B” in mind is always prudent even in VMC (visual meteorological conditions) and mandatory when the weather goes IMC (instrument meteorological conditions).

What airport you choose for your alternate(s) is up to you. Logic would say the location(s) should be far enough away from your primary destination, to not fall

under the same weather pattern. Plan your flights wisely.

However, the Alternate(s) can be used beyond the obvious intentions. Let's take a scenario with four airports; A, B, C, and D. Airport A is your departure field, Airport B your primary arrival. Airports C&D are alternates you file. No two airports are further than 45 miles-60 miles from the others. After all, this is Sunday afternoon practice. Need to be home in time for supper.

You've carefully chosen these airports, knowing each field offers at least one precision or non-precision approach you need time on. Let's really mix things up and make it interesting:

Airport A – fully controlled field

Airport B – served by an Approach control only (no Tower/Ground)

Airport C – fully uncontrolled

Airport D – served by Tower only (you'll talk to Center at some point)

The controllers from Airport A get you in the air and on course towards Airport B. Again, any combination of pilot requests is perfectly acceptable. For illustration purposes:

- At Airport B you're vectored to an ILS, miss approach, then head towards Airport C
- At Airport C you ask Center for IAP. An NDB, miss approach, a VOR-DME, then on towards Airport D
- At Airport D you ask Center for yet another IAP, the SDF. After the "missed", we practice holding pattern work ('Hold as Pub' after missed approach).

At D you'd planned on one final IAP after the holding but see time's moving right along. Only time enough for one final approach before having to head home. Let's go back to Airport B, this time asking Approach if we can shoot "the full" (IAP) ILS approach we'd done earlier. Are you ready to go home? Airport A's waiting for you. As an RC customer, *to every extent possible* it's up to you what happens in a flight.

Ground

Touchdown. Talk to Ground, turn off the runway at the first available intersection, and taxi to your gate. Shut down the plane and select "Flight Critique". Why not listen to how you've done. RC will critique your performance: how well did you adhere to instructions? What were your deviations from assigned headings, altitudes?

Did you carry enough fuel? Did you look out for other traffic? Did you make the controller repeat himself all the time? All these aspects will be critiqued, so you have to perform well.

If you foresee you will be grounded by FSDO, you can skip the critique as well by selecting “End RC”. This immediately shuts the program down. Just pick your choice from the menu.

Chatter

If you enabled AI chatter, you will hear other AI planes checking in with ground and being instructed to taxi to the ramp. You will also hear departing AI being told to taxi to the active runway, and being switched to tower.

EMERGENCY

Unexpected, critical moments in the cockpit are inevitable. Air carriers very often declare an emergency if a passenger suddenly has trouble breathing, smoke in the cockpit, air rage, bird strike, or loss of pressure. The list goes on and on.

These situations require everyone involved to remain objective, focused and calm. Controller and pilots alike practice various emergency procedures quite often. It’s only through clear communication between the two, that expeditious and calculated assistance be guaranteed. Lives are saved *every day*, thanks to the professionalism of pilots and controllers.

When a situation arises qualifying, in your opinion as pilot in command as an emergency, do not hesitate to select the EMERGENCY menu item. A set of sub-menus will appear (2 pages), displaying ten types of emergencies. They include:

Air Rage	Hydraulic Failure
Collision	Loss of Pressure
Cracked Windshield	Fuel Leak
Electrical Failure	Medical
Engine out	Smoke in Cockpit

You’ll notify Center of the Emergency by making the selection from this list. ATC is very structured and has a strict guideline to go by in these situations. He’ll first ask your intentions. Your choices are:

- **Vectors to Closest Airport** – The controller chooses what

airport is most appropriate, taking distances to the field and runway lengths per your type aircraft into account. You'll likely be put on an initial vector, then cleared "via direct". The RC Center controller will not vector you into a pattern as an Approach controller does.

IMPORTANT NOTE - If you elect to have ATC Vector to Closest Airport, that airport may end up being a fully uncontrolled field, a field you're very unfamiliar with that offers no precision approaches. You've put the responsibility for airport selection on the controller's shoulders. He will assume (as always), you know where you are, where you're going and what it'll take to execute his clearances. He will assume you're prepared for any clearance that comes your way.

- **Request Direct** – You make an airport specific request from a listing that will appear after a few moments.
- **Return to (Departure Airport)** – Obvious. You prefer to return to your field of departure.

After you've received the clearance to your emergency airport, Center follows up with the minimum required questions he must ask. *"Say fuel and souls on board", then "will you need any special handling on the ground?"* Answer these questions per the new sub-menus, **but . . .**

Always remember, satisfying ATC is not your priority as pilot in command in an emergency. *Your safety* is priority, always. Fly that airplane first. Be sure things are, to every extent possible, under control first. If you don't have time to answer ATC's questions, lose no sleep. The controller's been here before; he knows what you're doing and what you're going through.

Expect priority handling. There will be no holding, no crossing restrictions. For fields with multiple ILS runways, expect to be setup with reference to the direction you're approaching the airport from, not necessarily the wind-preferred. You can always ask for an alternate runway.

We strongly suggest to all users, unless you own a complete set of approach plates, or use various approach information software from interest sites like www.myairplane.com, use Vectors to Closest Airport with extreme caution.

The Emergency option is available throughout all phases of flight, except on Ground and Tower frequencies.

Uncontrolled Field (UF) "Nice-to-Know" Info

Not interested in flying out of or into large metropolitan airports? Corporate Learns

must fly wherever the boss wants to go. Check haulers go into the most remote of airports. Package jockeys for Fed Ex or UPS run to Non-Terminals on a regular basis, all night long.

Radar Contact has you in mind too by including support for varying levels of uncontrolled airports. These airports are those normally lying outside the forty-mile arc surrounding the larger Terminal airports, those airports lying in between the Terminal Areas. There are in fact thousands more uncontrolled, or partially controlled fields throughout the world than there are Terminal's.

In the RC program, the Controller Info displays clearly whether a service will be available at all airports entered. As discussed earlier, you can edit these fields (checkboxes) and/or frequencies as desired.

Use your imagination when making your choices. It wouldn't be realistic for instance to create a flight plan where Paris-Charles de Gaulle is an uncontrolled airport, but you have that option. We suggest you leave these fields, the checkboxes and frequencies default, as real world data will be automatically entered for you, default.

A complete set of Jeppesen or other type of aeronautical charts are essential if you plan on frequenting uncontrolled fields. You will be required to shoot all IFR approaches 'on your own', making these approach plates a critical part of your flight. If you don't have access to the entire volumes you will likely find plates to specific airports at various sites on the Net. Without the approach plates you will be limited to Visual Approaches, thereby limiting your access to when VFR conditions exist.

The most noticeable difference between controlled and uncontrolled (or partially controlled) airports is that you'll have odd combinations of Clearance Delivery, Ground, Tower, Approach, or Departure controllers. At fully uncontrolled fields for instance, Center issues clearances either directly to the pilot if he/she calls for the clearance in the air, or through FSS (Flight Service Stations) if the pilot requires the clearance prior to takeoff. Under certain conditions, your Ground controller may be the one to issue your IFR clearance. If there is no Tower, don't expect to hear 'Cleared to Land'. RC covers all these possibilities for you.

IMPORTANT NOTE - If an airport has an Approach controller, that field will have a Departure controller as well. You cannot select one without the other. If an airport has a Tower controller, the Ground controller field will be populated.

Uncontrolled Field Departures

ATIS is not available. Get your weather briefing on the ground by selecting the appropriate menu item.

If weather at your departure airport is VFR (a reported one thousand foot ceiling or

higher with 3 mile visibility or greater), you have the option to takeoff VFR and pick your IFR clearance up in the air. If you intend to takeoff VFR be sure to listen for your local Center frequency in the briefing. Radio coverage at the lower altitudes is poor. Wait until you're 1000' AGL or higher before contacting Center. At that time Center controller will give you a discrete transponder code and issue you your IFR. Remain clear of clouds until you've received your clearance.

If weather is IFR (making it illegal to takeoff VFR), you must receive your clearance from Center through FSS while on the ground. Again, select the appropriate menu item. After you've received and understand your clearance, ready your aircraft, know what you're doing and what you need, then takeoff, calling Center leaving 1000' AGL.

An IFR clearance through FSS, is similar to a normal clearance with an important distinction: your 'Clearance Void Time'.

You will hear this important sequence sound like this: *"Clearance void if not off by 2125. If not off by 2125, advise Center not later than 2130 of intentions"*.

IMPORTANT NOTE – Many users have commented, "This is wrong. There's something wrong. I'm being told '...if not off by if not off by'". They're right, but it's *not* wrong. Carefully re-read the sentence.

Your void time will normally be 20 minutes from the time the clearance was issued, allowing more than enough time to get airborne and establish two-way. What is the purpose of the void time? When you are issued an IFR clearance and you hang up the phone, essentially you 'own' that airport. ATC cannot clear anyone into or out of that airport until:

- You are heard from and are well clear of the area
- It is ½ hour past your void time, with pilot concurrence
- It is 1 hour past since your void time

If the center doesn't hear from you by your void time, he notifies the Supervisors. If it has been ½ hour, he notifies the airport area's local Sheriff to check the ramp. If one hour has gone by without hearing from you, he calls SAR (Search and Rescue). Controllers look until they find you, and barring a disaster there will be a lot of questions.

Uncontrolled Field Arrivals

From your cruise altitude you will be given a step descent into the destination airport area eventually being issued the MVA (Minimum Vectoring Altitude). Example: *'Dakota 34F, maintain two thousand two hundred, if able report the field in sight for*

a visual approach'.

Just as with Terminal Arrivals, you should request to leave the Center frequency to get the weather for your airport at approximately 50 miles from the airport. Just select the appropriate menu items.

Closing your IFR flight plan / Canceling IFR

If there is no Tower to confirm your safe landing, it's your responsibility to see that your IFR flight plan's been canceled. You're free to 'Cancel IFR' while in the air (below the PCA) given VFR conditions. This is a common practice once landing is assured (and you have yet good radio coverage), saving the trouble of another phone call to FSS telling them you've landed. The AdvDisp includes the Cancel IFR menu item

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