

Miramar Community Leaders Forum
July 2010

Military and Commercial Aviation above San Diego County

MIRAMAR GROUND - DEVIL DOG ONE TWO FIVE - TAXI FOUR HORNETS
WITH CHARLIE - REQUESTING LAKEE DEPARTURE

ROGER DEVIL DOG – TAXI RUNWAY TWO FOUR RIGHT- CLEARANCE ON
REQUEST

MIRAMAR TOWER – DEVIL DOG ONE TWO FIVE WITH YOU – FLIGHT OF
FOUR – LAKEE

DEVIL DOG ONE TWO FIVE POSITION AND HOLD RUNWAY TWO FOUR
RIGHT

DEVIL DOG ROGER TWO FOUR RIGHT

DEVIL DOG SQUAWK THREE TWO ZERO ZERO – WIND TWO FOUR ZERO AT
EIGHT - SWITCH DEPARTURE CLEARED FOR TAKEOFF

DEVIL DOG - GOOD DAY SIR

SOCAL - DEVIL DOG WITH YOU PASSING THREE THOUSAND - FLIGHT OF
FOUR

RADAR CONTACT - CLIMB AND MAINTAIN SIX THOUSAND

DEVIL DOG ONE TWO FIVE - ROGER SIX THOUSAND

DEVIL DOG SAY INDICATED

TWO FIVE ZERO

ROGER COME RIGHT ZERO TWO ZERO FOR TRAFFIC – GIVE ME AN
INDICATED TWO THREE ZERO

TWO THREE OH

DEVIL DOG CLEARED DIRECT JULIAN CLIMB AND MAINTAIN FLIGHT
LEVEL TWO FOUR ZERO

Well, now just what was all that? Over the years I've had many residents ask me why a flight of jets just flew over Rancho Bernardo and not farther north? As a former military aviator, I'm familiar with flight procedures in and around San Diego County as well as the shorthand, chopped language of the aviation community. But people who have nothing to do with commercial or military aviation don't necessarily understand the complexity of keeping all these airplanes from running into each other. So I thought it might be helpful to explain what it is like to fly around here and deal with some of the challenges of our congested airspace.

My apologies to my friends in the F-18s, Miramar Tower, and the FAA for the departure from official lingo. It has been quite a few years since I flew these very same routes in the F-4J Phantom. A few details have changed over the years, but the concept of positive control has been around for quite awhile. So here, in a nutshell, is a non-pilot's description of our airspace and its complexity.

Suppose you want to go to Julian for some of that great apple pie. You know the route. Just hop in the car and hop on the highway 67 through Ramona. Not much of a challenge. Sure, there are other cars on the road, but they are following the same road as you and even cars coming in the opposite direction have their clearly marked lane in which to drive. As long as everyone stays in their lane, obeys the speed limits, and keeps an eye out for conflicting traffic, traveling to Julian is a very safe endeavor.

Now suppose that you want to FLY to Julian instead of drive. To get there, you have to pick a path, an altitude and a proper airspeed. Along the way you encounter many other aircraft, all of them flying to different destinations. They are flying many different altitudes, and different directions to get to their planned destinations. But unlike the slow speed of the automobile, these aircraft can easily fly 500 miles per hour. That is covering a lot of ground in a very short time.

Now think about this: You are flying east toward Julian at 10,000 feet and coming the opposite way is another aircraft at the same altitude. Even if you have clear weather and are able to see each other a couple of miles apart, you will close the distance between the two of you in mere seconds. Now suppose it is cloudy – you can see only a few hundred feet – absolutely no time to avoid another aircraft. Add to that the fact that there are also aircraft crossing your flight path from left to right and vice versa. There are other aircraft climbing through your flight path and other aircraft descending down through your flight path from their previous position above you. And then you must consider that some of the aircraft are jets and fly very fast, while the smaller propeller driven aircraft fly hundreds of miles per hour slower. To avoid running into another aircraft, a pilot quite often must change his planned flight parameters in order to avoid conflict with another aircraft, and he must take action soon enough to be able to complete the change of heading or altitude before the conflicting aircraft can close to the point of collision. He must take this action even before he sees the other aircraft. If this almost sounds too hard, it is (without help).

The Air Operations personnel at Miramar recently granted me permission to spend some time in the radar room as well as up in the top of the control tower. This was a rare, inside look at the complex task of ensuring all pilots have a safe flight.

In the radar room at Miramar there are approximately 10 individuals, both military and civilian who monitor the radarscopes and assist the pilots with navigation close to the airfield. There is a similar though much larger facility just outside the base that is manned by Air Traffic Controllers of the Federal Aviation Administration (FAA). These people are responsible for safe flight over a much larger area (Southern California). The control tower has another 10 or so personnel, both Marines and Department of Defense civilian controllers. My visit on July 30th was to the smaller radar room on the air station as well as to the control tower.

When one of our F-18s starts his engines for a training mission, he turns on his radio and listens to a prerecorded message called ATIS. That stands for Automatic Terminal Information System. This recording is made and regularly updated by personnel in the control tower. Information contained on this recording would be such things as which runway is in use, and what the altimeter setting is (The altimeter is a gauge that tells the pilot how high he is above sea level). In order for the instrument to read accurately the pilot must adjust the instrument to correct for changes in atmospheric pressure). Other information such as construction work on the airfield or navigation system status may be included in the message.

Once he has this information from ATIS, the pilot will change radio frequencies and talk to a controller in the tower whose responsibility is to direct the aircraft while they are moving about on the ground prior to taking the runway for takeoff.

The pilot will taxi his aircraft to an area just short of the end of the assigned runway and there he will run up his engines to check all his instruments to be sure his aircraft is ready for flight. At the conclusion of this engine check, the pilot will switch radio frequencies once again and contact a different controller in the control tower. This individual is the one who will tell the pilot that he is cleared to position his aircraft on the runway, and when FAA air traffic controllers in that big building north-east of the base (the people in charge of all airspace over Southern California) determine that the flight path planned for that F-18 is clear, they will tell the controller in Miramar's control tower that the airplane can be cleared for takeoff. At that time, the pilot will be directed to switch to yet another radio frequency (departure control) and he will run up his engines and release the brakes for the takeoff roll. It is important to note that at this very second the aircraft comes under the direction of the FAA controller in the SOCAL building. He will tell the pilot what direction to fly, what altitude the pilot should fly to and even adjust the pilot's speed if necessary. The physical control of the aircraft is in the hands of the pilot, but he is only doing what he is told. The pilot can deviate from the controller's direction only in an extreme emergency.

The pilot, if he is a civilian commercial pilot, will fly all the way to his destination under the precise control of the air traffic controller, a civilian sitting at a radarscope on the

ground. The military pilot is under the same restriction until such time as he is in a military restricted area; such as a bombing range in the desert or an air combat range out at sea. But once the pilot leaves the military training area, he finds himself right back in the situation of following the directions of an air traffic controller.

In the radar room, it is startling to look at one of the controller's radarscopes and see as many as a hundred aircraft depicted. The symbology depicts each aircraft, his call sign (DEVIL DOG) in our example above. It also shows his direction of flight, his altitude, and a special code transmitted by one of the aircrafts instruments (transponder). The air traffic controller must be able to instantly visualize where these aircraft are in the airspace and if there is a possible conflict. The instrumentation helps, but the radar equipment is also connected to computers that can predict conflicting flight paths. It analyzes ground track, altitude and airspeed of each aircraft and mathematically determines if an aircraft needs to change direction, or altitude to avoid coming dangerously close to another aircraft. This is called collision avoidance (CA) and is very helpful in keeping pilots from running together.

In addition, there are some standing rules that help keep aircraft from conflicting with each other. For instance, aircraft flying in an easterly direction usually fly at an odd numbered altitude (7,000 or 9,000 feet, for instance). Aircraft flying in a westerly direction are expected to fly even altitudes (6,000 or 8,000 feet as an example). Aircraft are separated vertically by at least one thousand feet when flying below 41,000 feet. Above that, the aircraft maintain at least a 2,000 feet vertical separation (for same direction of flight). Aircraft are also separated laterally or horizontally as well. All of this helps maintain flight safety.

So, the point is that quite contrary to popular belief, the pilots of our military jet aircraft are only flying the aircraft in strict accordance with orders from the ground. Fifty years ago, that was not the case. Many pilots could simply fly routes of their own choosing. Not anymore.

There are many aircraft in the air at any one time and they all are in communication with air traffic control personnel on the ground. These departure and arrival routes that are published for MCAS Miramar are preferred routes, but can be (and often are) modified by the controllers on the ground to maintain safe distances between aircraft. That is why sometimes you will see (and hear) a flight of F-18s right over Rancho Bernardo. These pilots are flying the precise direction, altitude, speed and rate of climb dictated by controllers who do not work for the Marine Corps, they work for the Federal Aviation Administration and by extension, all of us.

Respectfully submitted,

Jeffrey C Frederick