University of Colorado Boulder

NOTAM submission guidance

Division of Public Safety – Flight Operations

Purpose:

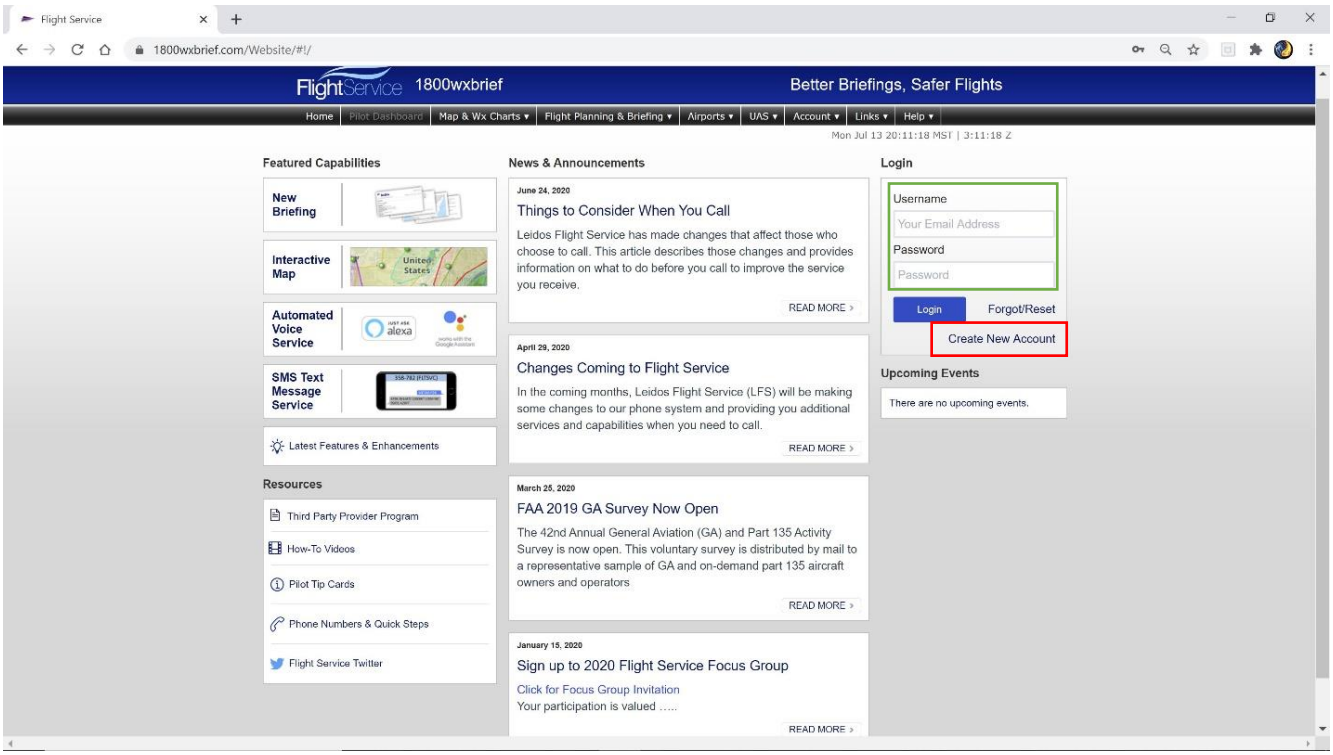
This documents purpose is to provide extra clarification and specific instruction pertaining to submitting FAA UAS NOTAMs to satisfy the UCB COA requirements. This is a supplemental document supporting the information given in the UCB initial PIC ground training session. NOTAM submission has been identified as one of the more confusing and misconstrued topics for UCB certified PICs and PICs in training. The intent with this document is to elevate and clarify common misconceptions by illustrating a step by step process on how to submit a UCB UAS COA NOTAM.

NOTAM Submission Website:

The FAA certified Leidos Flight Service Organization receives, processes, and disperses the majority of NOTAMs throughout the US. The Leidos Flight Service website can be found at the following link: www.1800wxbrief.com. This is the website which UCB PICs and crewmembers will use to submit the required UAS NOTAMs to conform with UCB COA requirements.

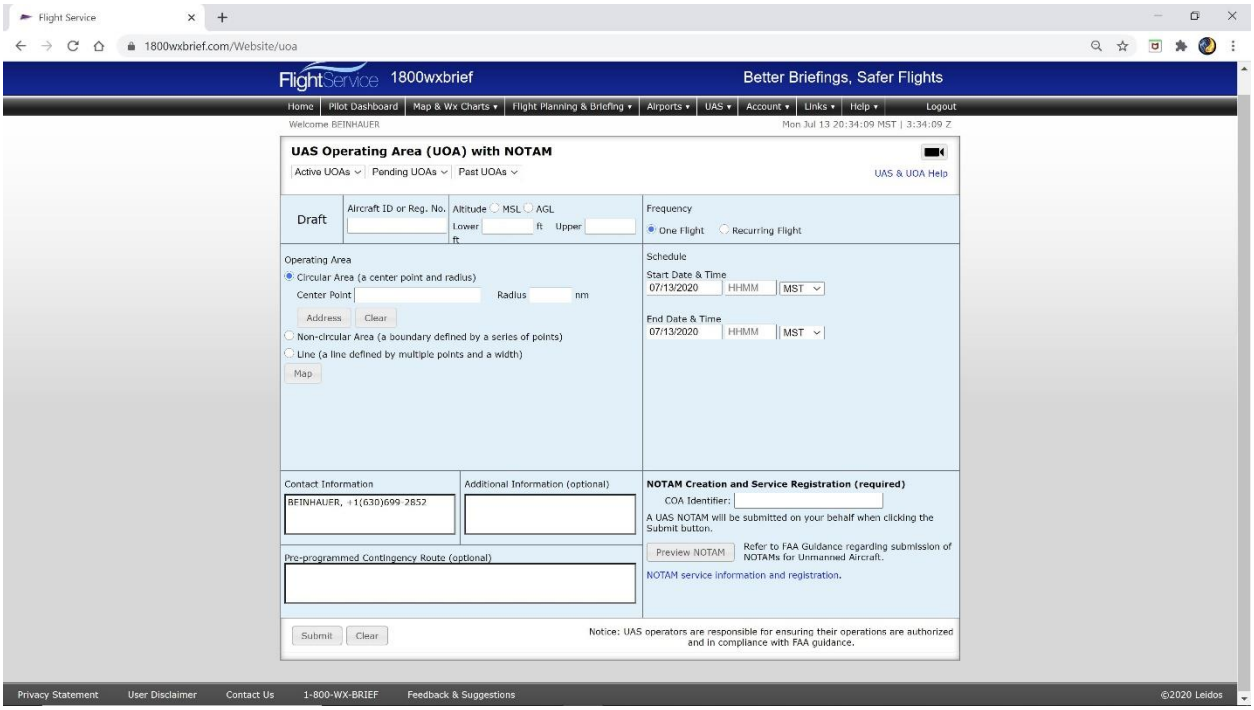
Website familiarity and usage:

When viewing the website for the first time the user will see a picture similar to what is shown in the photo on the next page. The home page typically displays news and announcements in the center of the screen, features on one side, and a login section on the other. On the top there are multiple different tabs which provide links to weather sections, charts, airport info etc. For the purposes of UCB UAS work we will only be using the UAS tab. While still on the home page, it is important for the PIC/user to register with Leidos Flight Service. This can be done at the by clicking on the “create account” shown in the red box overlaid on the picture. Once the user creates an account the PIC can log in on the homepage in the login area shown in the green box overlaid on the picture.



NOTAM Submission Format:

To navigate to the NOTAM submission page, click on the UAS tab or hover over the UAS tab and click on management. This will then display a page which looks much like the one shown below. The NOTAM submission page has multiple sections all of which are relevant to file a proper NOTAM. The "Aircraft ID or Reg. No" section is for the UAS's aircraft commercial registration number. This is the number that is generated and assigned to the UAS when it is registered with the FAA. The section to the right of that is the "Altitude" section. This section is used for selecting the altitude at which the UAS operation will take place. The altitude can be denoted as a block altitude in height above mean sea level (MSL) or from the surface to some predetermined height (AGL). The "Frequency" section is used if the UAS operation will repeat at consistent intervals. The "Schedule" section is for inputting the times at which the proposed flight will occur. The "Operating Area" section is used for defining an area where the UAS operation will take place (under current COA regulations this area must be defined with a radius about a point defined from a VOR radial and distance). The "Contact Information" section is for PIC, Company, or University contact information (this is typically a name and phone number). The "Additional Information" section could describe the type of UAS activity and or any other relevant information. The "Pre-programmed Contingency Route" section is for commonly used for autonomous preprogrammed drone routes. The "NOTAM Creation and Service Registration" section allows for COA identifier inputs (this allows the administrator to see the specific authorization origin for the flight being conducted).



Specific NOTAM requirements:

One of the most common issues with NOTAM submissions come from correctly defining an operating area. The information which needs to be typed into the "Operating Area" section next to the "Center Point" box and "Radius" box is discussed below.

NOTAMs must be submitted with a center point defined by a radial and distance to the nearest VOR. This is done through a standard 9 plus character sting in "Center Point" box. The VOR will have a 3-letter identifier. This makes up the first part of the NOTAM string. Secondly, the radial is needed – this is essentially the heading from the VOR to the center point. Finally, the distance in nautical miles is required. In the end, the NOTAM string looks something like this:

> [VOR IDENTIFIER][RADIAL][DISTANCE]
> ABC012098.7 - In this case, the NOTAM is 98.7 nm away from the ABC VOR on the 012 radial.

Many students offer the following questions: Why bother with defining the center point using this method? Wouldn't it be easier to just define a set of coordinates? Why does it matter how the NOTAM is submitted anyway? – the COA does not specify how to define the center point.

On the cover page of the COA, the following is stated: "A copy of the application made for this certificate shall be attached and become a part hereof." Essentially, this means that any information contained in the application for the COA – the so-called back matter – is binding. In applying for the latest blanket COA, the application states that we are renewing the original blanket COA issued to CU-Boulder in 2015. This COA specifically requires the NOTAM to be submitted with the center point defined based on the nearest VOR. And since the back matter for the present blanket COA references the old COA, the requirement to submit NOTAMs this way still stands.

Further, the main purpose of the NOTAM is to aid in preventing conflicts with manned aircraft. Using a VOR is a far more meaningful method of communicating the flight location to manned pilots as opposed to a set of coordinates.

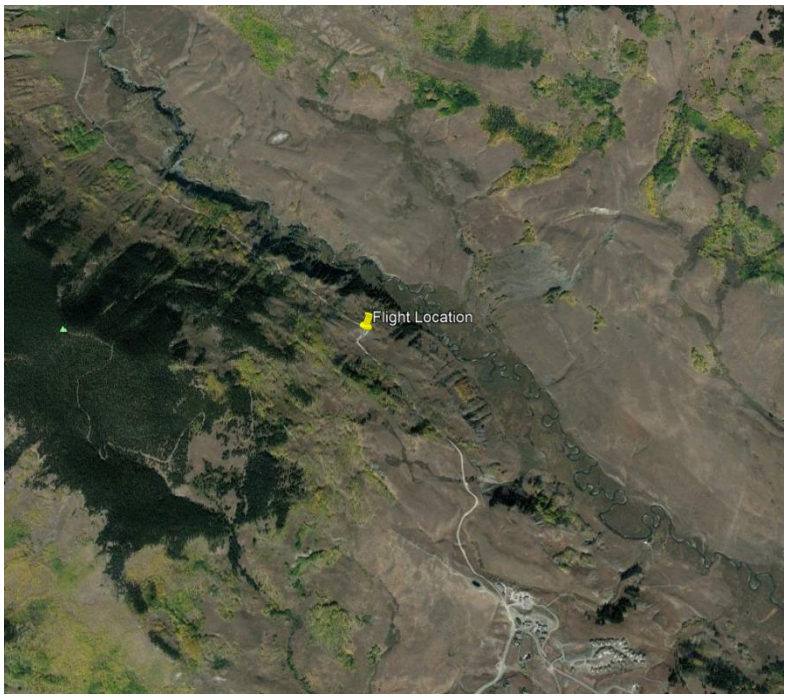
First steps:

While it is possible and permissible to use a variety of methods to obtain the NOTAM center point, we will walk through doing so using Google Earth.

You will start by downloading and installing Google Earth and then downloading VFR sectional charts for use with this application. Go to chartbundle.com/charts/ and scroll down to the .kml/.kmz charts for use with Google Earth. Once downloaded, click them to open it in Google Earth. In Google Earth, be sure to right-click on 'Chartbundle Aviation Charts' and choose 'Save to my places'. Otherwise the charts will be gone when you restart Google earth. There are several sets of charts contained in the Chartbundle package; the package 'Sectional charts' contains the relevant charts.

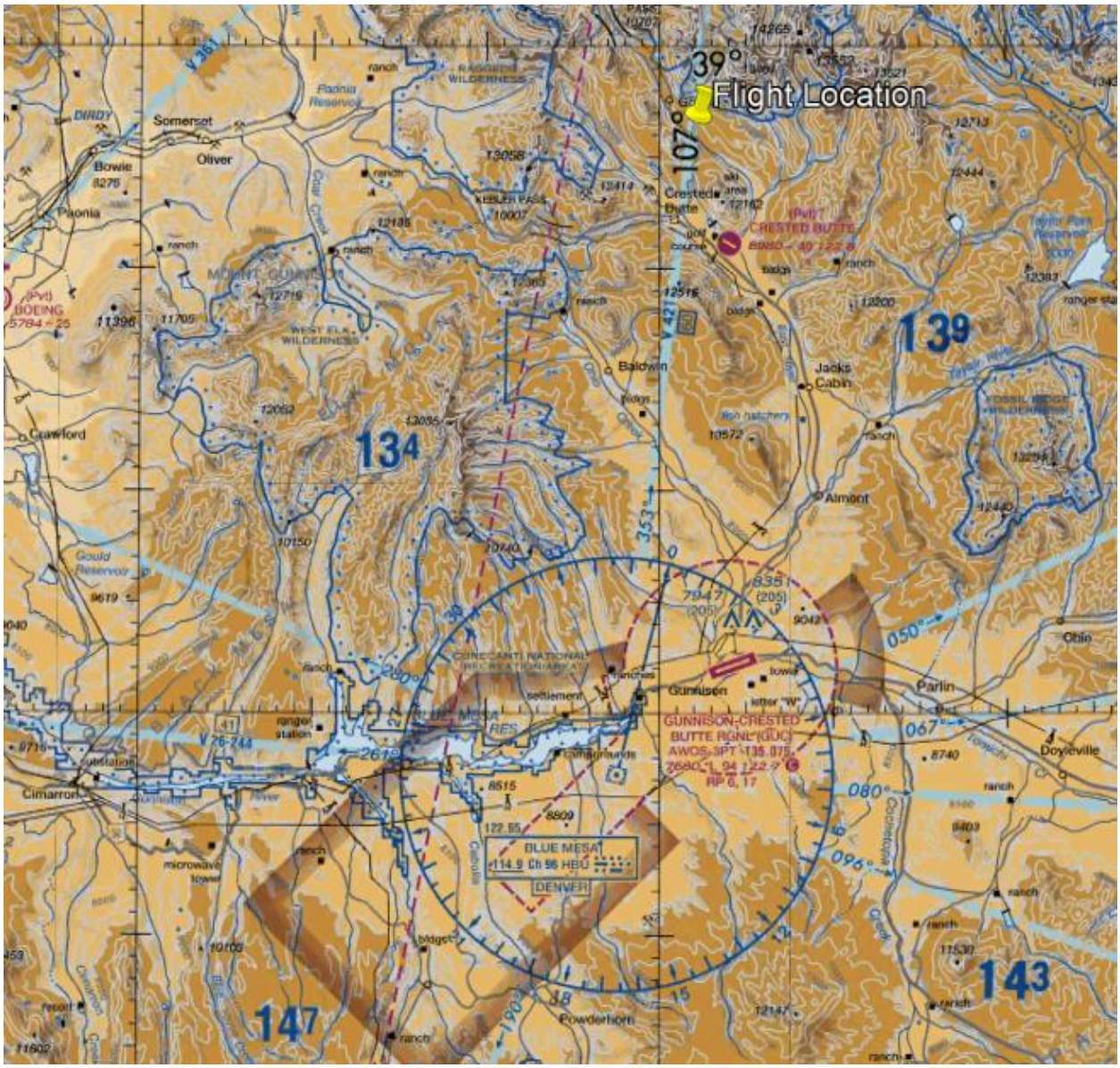
Finding the NOTAM string:

In Google Earth the first step is to find the location of the flight sight.; Often, the area of interest is not depicted on the sectional chart. So, it helps to locate the flight area with the sectional charts turned off.
In the example, we will survey a section of road near the town of Crested Butte, Colorado. Use Google Earth to drop a pin over the flight location.

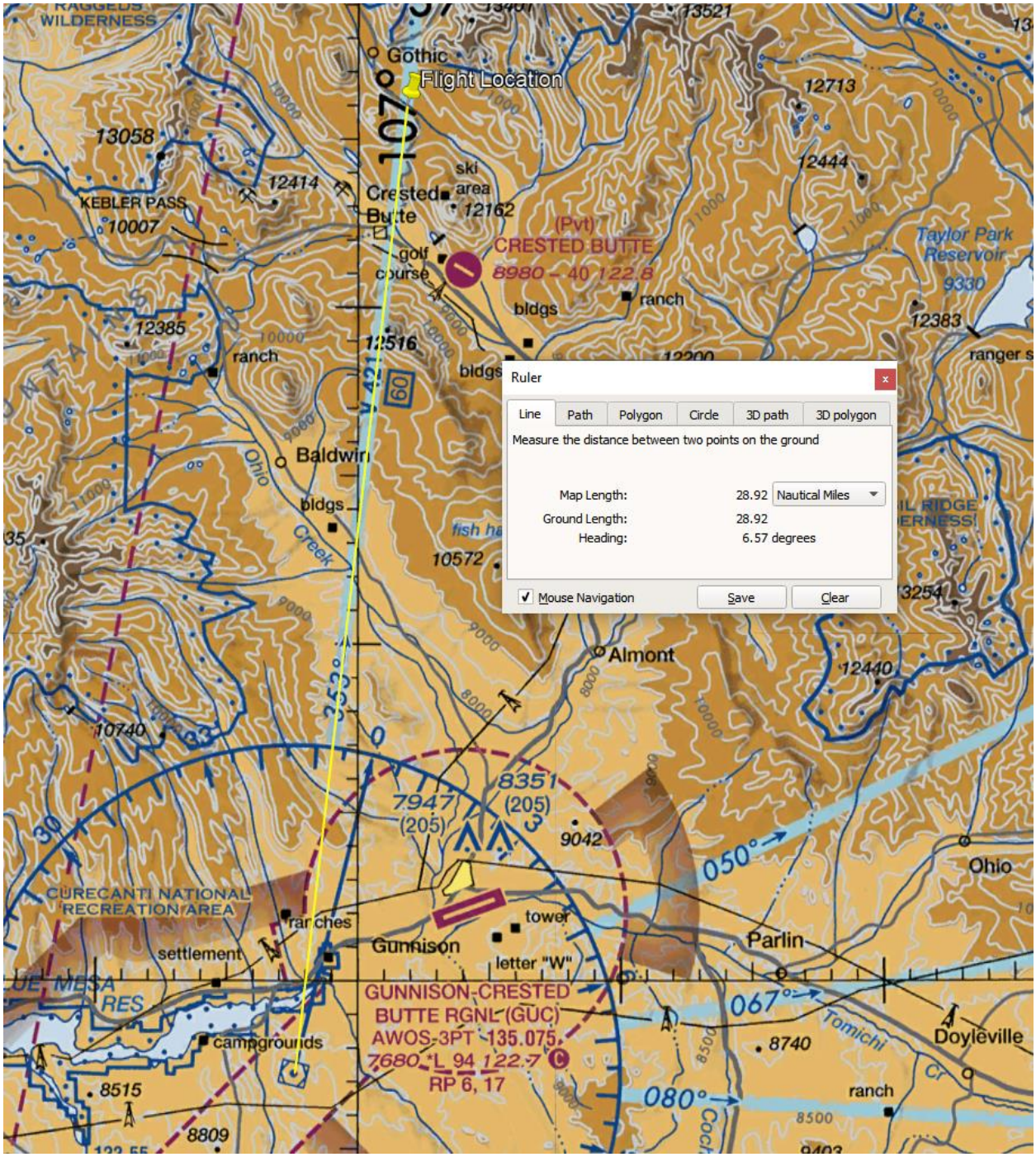


Now we will enable the sectional charts and locate a nearby VOR. Refer to the airspace guide for identifying a VOR and determining its 3-letter identifier.

This example happens to be midway between two VORs. However, using the ruler tool in Google Earth, we can identify that the Blue Mesa VOR is closest. Here is what the flight location looks like on a VFR sectional chart:



The identifier for the VOR is HBU. This makes up the first three characters of the NOTAM string. The next information that is needed is the radial and distance. Find this by using the ruler tool and measuring *from* the VOR *to* the flight location. This is what Google Earth returns:

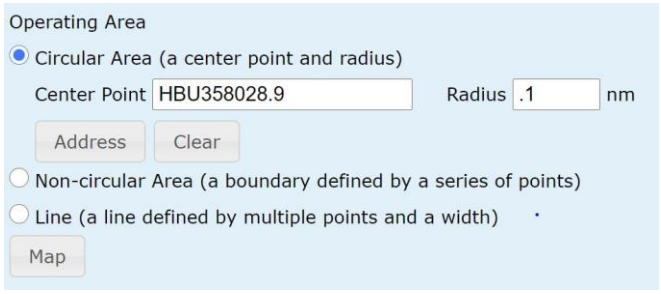


We have a heading of 6.57 degrees and a distance of 28.9 nautical miles. However, Google Earth measures headings relative to true north, and VORs are oriented relative to magnetic north. To make this conversion, we look for the nearest line of constant magnetic variation (again reference the airspace guide for more information). We find that the variation is about 8.5 degrees east. Easterly variation is subtracted, so we end up with a heading of about 358 degrees. Note that westerly variation is added.

Now we can construct the NOTAM string. We need the VOR identifier, heading (expressed with 3 digits, rounded to the nearest degree), and distance (expressed with 3 digits plus an optional decimal point). So we end up with: HBU358028.9.

It is likely that this first cut of the NOTAM string will not quite place the NOTAM in the desired location and will need some adjustment. We will enter this data into the1800wxbrief NOTAM page under the “Operating Area” section, in the “Center Point” box. Start with a radius of 0.1 nm or so – the typical distance to maintain VLOS is only 0.1-0.5nm depending on aircraft type.

When this is entered into Flight Service, we see that the NOTAM is west of the desired location:



To remedy this, we will adjust the heading. Be advised that there is some amount of trial and error involved in fine-tuning the heading and distance.

After some tweaking, we end up with: HBU353028.9.

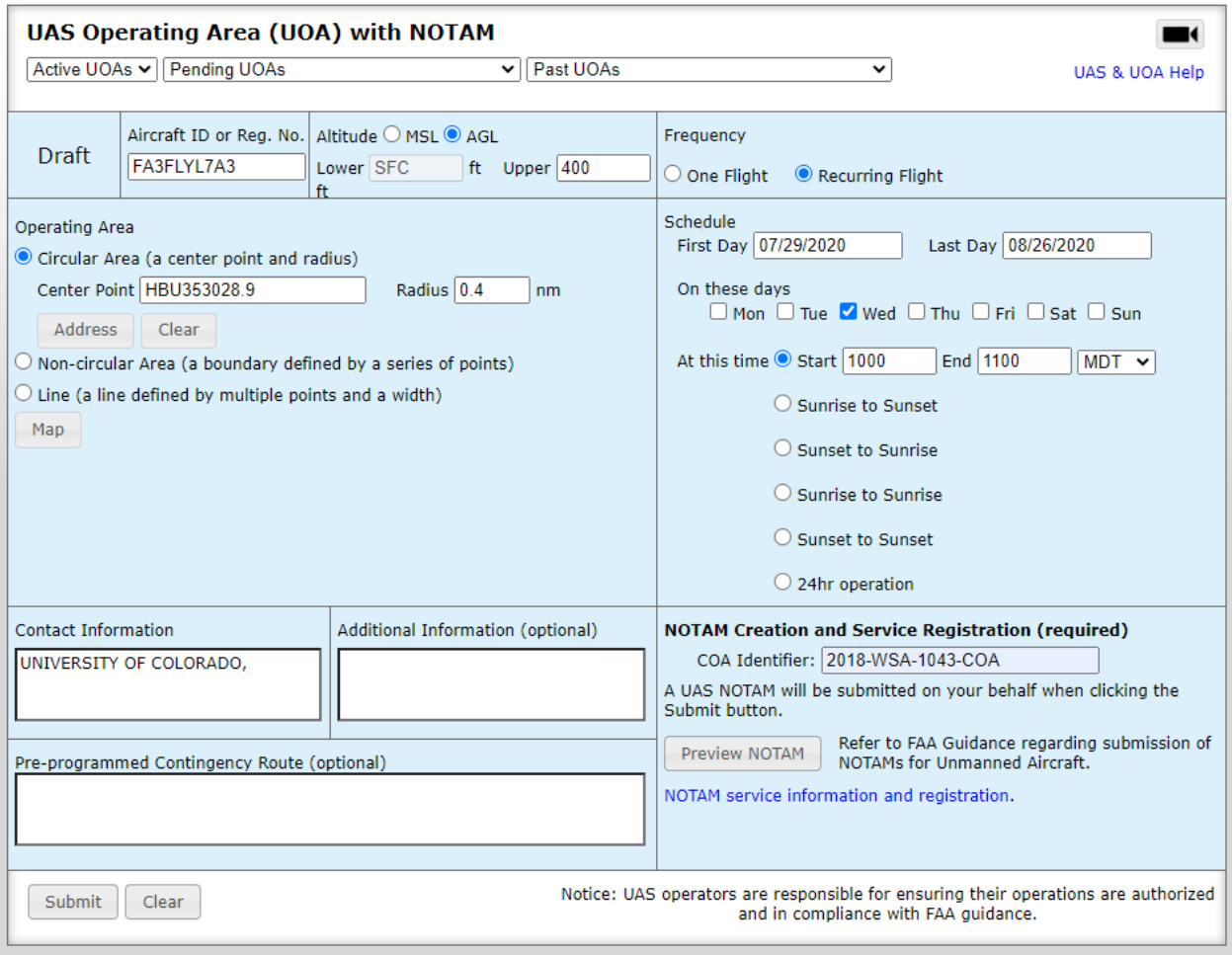
The flight location happens to exist between 2 headings – at either 352 or 353, the NOTAM is a little bit offset from the flight location. So, we compensate for that by increasing the radius to 0.4 nm. As can be seen, this setup covers the intended flight location:

It is important to not make the radius larger than is needed. Increasing the radius to account for limited precision in defining the center point is acceptable, but in general, keep the radius to the minimum required value. An example of an unacceptable radius would be using something like 1nm for flying a small multirotor – VLOS will run out well before 1nm, and this NOTAM would overstate the impact of our operations on the NAS.

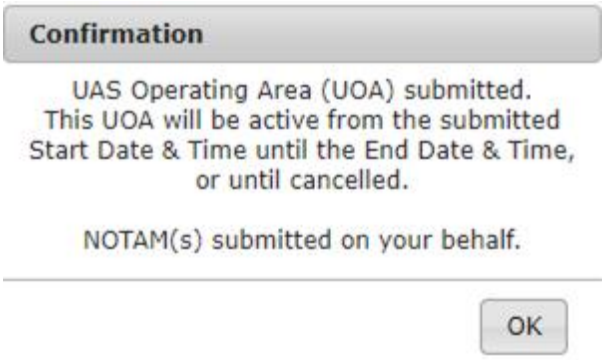
Now that the NOTAM string has been defined, we enter the aircraft identifier, altitude, times, and COA ID:

- Aircraft identifier: this is not presented to pilots when the NOTAM is issued. However, it is good practice to use the aircraft ID of the aircraft which will be flown.
- Altitude: use the maximum altitude specified by the COA unless other limitations warrant a lower altitude. Further, if your operations will not require the full COA altitude, input your expected maximum altitude for the mission.
- Time: For a one-time flight, specify the start date/time and the end date/time. Note that the website converts the time to Zulu time. This means that if a NOTAM is made for a flight occurring after a seasonal time change, the NOTAM times will be off by 1 hour. Use the recurring flight menu for regular flights, for instance, flights that occur at the same day/time/location every week.
- COA: enter the ID for the COA used in the flight. Note that as of July 2020, Flight Service does not recognize the new (2019) blanket COA. As a workaround, use the old COA ID: 2018-WSA-1043-COA.

Below is an example of a properly filled out NOTAM for a recurring flight:



If the NOTAM is submitted correctly, you will see the following window:



If you do not see this window, the NOTAM has not been submitted correctly. Note: if you submit the NOTAM more than 72 hours beforehand, the text will read *NOTAM(s) will be submitted on your behalf.*

Concluding thoughts

Note that the flight service website will allow NOTAMs to be submitted incorrectly – for instance, it will allow all the following:

- Submitting the NOTAM with an incorrectly defined center point
- Submitting the NOTAM with an altitude above legal limits
- Submitting the NOTAM in a location where flight is not legal
- Submitting the NOTAM with too little time in advance of the flight
- Submitting the NOTAM under a COA owned by a different public entity
- Submitting the NOTAM with a COA that does not authorize the desired operations

This is all to say: just because the NOTAM submits successfully does not mean that it is correct. You still must ensure that your NOTAM and your flight meet all legal requirements and the provisions in the FOM.