Shooting Big Moons

"Moon Over OKC Number 29," one of my entries in Metro's very first Projected Digital Images competition at the February 26, 2007 meeting, caught the attention of several people, especially Critique Master Joe Wilson, who simply had to know how it was done.

Well, it's a considerable process, requiring a bit of detective work, and more than just a little luck. The luck part is easy – if it's overcast during the full moon, you're out of luck. But if the skies are clear, or at worst, just barely "partly cloudy," your in business.

I'll walk you through the process, using April 2nd, 2007, as my sample date. That's the next time when the moon will be full, and I'll be free to go shoot.

There are several things you'll need to do all of this, starting with an Internet connection (at the library, if no where else). You'll also need a fairly detailed map of the area you're interested in (in my case, OKC), a protractor, a ruler, and a pencil. Later on, a compass will keep you from getting lost.

Hoping for a nice night for photography, it all begins with knowing when the moon will be full. The Farmer's Almanac or any of several computer programs or Internet sources will answer that question.

Armed with the date of the full moon, the next thing is a visit via the Internet to the U.S. Naval Observatory's Astronomical Applications Department, specifically a page titled, "Sun or Moon Altitude/Azimuth Table for One Day" (http://aa.usno.navy.mil/data/docs/AltAz.html).

Here is where we'll find the data that tells us not only the exact time the moon will rise, but where in the sky it will happen. This information is available for any place in the world, but I stick to "Form A - U.S. Cities or Towns."

Under "Object," make sure to check the moon, or you'll get data for the sun (which could be useful, too, but that's another story). Then enter the correct date. I leave the Tabular Interval set at the default of 10 minutes. Then enter the state, followed by the place (in our example, Oklahoma City). Then click on "Compute Table."

A new page will appear, confirming the data we just put in, and including, as a little extra bonus, OKC's longitude and latitude, for those who don't now it (or like me, can't remember it). Below all of that, the page is divided into four columns: hours & minutes, altitude, azimuth (East of North), and fraction illuminated. Under that last column, it should read 1.00, which means the moon is full. If not, scroll down until it you see 1.00.

We need to look down the altitude column. Notice some of the numbers are positive, and some are negative. The negative numbers (i.e., -10.3) indicate the moon is below the horizon. We want the first instance after the last negative number. This tells us the moon is just breaking over the horizon. Our data shows the first positive number after the last negative number to be 1.7, next to 19:20 hours (it's important to note that their times are in military 24 hour clock time, and it's all in standard time, never Daylight Savings Time).

Converting 19:20 hours to civilian time, and correcting for DST, we now know the moon will break over the horizon at roughly 8:15 PM. At 8:10, it's just at the horizon, and at 8:20, it's 1.7° above the horizon. We won't actually see it at 8:15, because there are trees, buildings, and possibly a few clouds on the horizon blocking our view, but this will get us in the ballpark.

Now look at column #3. This is the azimuth, or the number of degrees East of North the moon will rise. In other words, the moons position on the horizon as it breaks over. In this case, 102.7° East, or just a tiny little bit to the Southeast.

Now get out your map, and mark whatever feature you want interacting with your moon. Here at home, I like big buildings, starting with the Chase Tower, but I'll settle for the Kerr McGee building.

I mark the Chase Tower. I want to mark a line back to the west, so I'll know where to set up, and the way to find that is by plotting a line on the map in that direction. To find that line, I take the 102.7° figure, and add 180° to it. I get 282.7°.

I put my protractor on my map, centered on my subject (the Chase Tower), and orient the protractor to North/South/East/West. Then I find 282.7° (282 is close enough), and put a mark there. This mark should be several inches (the width of the protractor or so) from our first mark.

Using my ruler, I draw a line from the first mark, through the second mark, clear across OKC.

Now comes the fun part. You've got to get in the car, and go exploring. You have to drive every street and parking lot that intersects that line, hopefully about 4 miles or so from the subject (the Chase Tower), until you find something that offers at least a somewhat clear shot of downtown. I found mine just off I-44, near where the old Allsports Stadium used to be at the Fairgrounds.

Armed with this information, on the appointed day, I pack my tripod, my camera, my 400mm lens, some bug spray (I hate gnats, and they can get thick), my compass, and anything else I might need (remote/cable release?, a chair?, something to drink or a snack?), and head out there.

I have sat on the shoulder of the exit ramp from I-44 north to 10th street east. It's a little hairy, as cars and trucks race by, but I've done it.

I get out my compass, and double check. With the compass needle pointing north, the compass should be pointing at downtown. For those who know and understand magnetic declination, I ignore it, as I'm not in a life or death situation. I'm shooting photos, and in this case, close is good enough.

Mount the lens/camera on the tripod, take rough aim (but don't lock it down too tight yet), and have a seat. And I make sure that I never take my eyes off that target. Of course, since this is not an exact science, the “target” is the entire downtown skyline.

I shoot with a digital Nikon SLR, which means I'm dealing with a 1.5 crop factor. For all you film and Canon full frame nuts, that means my 400mm is acting like a 600mm lens would if I were shooting film or full frame. It really sucks me into the skyline – I can almost see what those people in the office buildings are doing. But from that particular vantage point, anything longer won't give me the room I need to get the moon and several buildings in the shot, and anything shorter won't get it all close enough or the moon big enough.

I leave my white balance on Daylight (although I'd like to play around with that one of these days), and exposure is by guess and by gosh (which is why I shoot RAW – I can recover from pretty severe underexposure). Needless to say, I bracket like a madman.

From there, it's a matter of waiting, and watching. When the moon finally starts coming up behind those building, it's pretty exciting. Aim, compose, focus, bracket, shoot like crazy.

The reason this works is because the big telephoto lens not only compresses the distance between the camera and the buildings, it also magnifies the moon, making it appear much, much larger than it does to the naked eye.

So that's what I did. I've done this several times, including once at Arches National Park, and once at Monument Valley. On those two occasions, the moon appeared right where it was supposed to. But it's so darn dark out there (no light pollution) that the only thing that appeared in the photo was the moon! No landscape! Nuts. But the concept works.

Provided it isn't overcast, and provided my boss doesn't decide I have to work that night, I'll be out there by the old ballpark on April 2nd, trying to get another, better shot. Of course, the fair people are making it a challenge but adding all sorts of tall things to the fairgrounds, but hey, if it was easy, anybody could do it.

There is a catch to all of this – I know everyone says it's not the equipment, but in this case, it really is. With a Nikon digital SLR, you really need a 400mm lens to get the image you want. If you're shooting film or full frame digital, you'll need something close to a 600mm (a 500mm might do, too). But without that reach, the moon and the buildings are gonna look a little puny. Sorry, but it's true.

That's not to say you shouldn't get out there and try it. Go shoot. You might come up with a great shot.

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