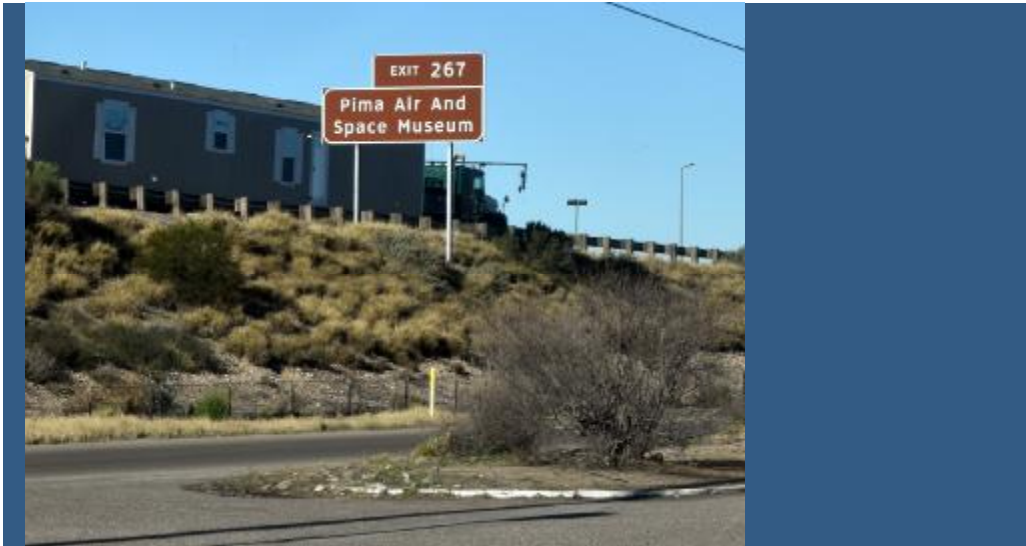




In Search of Eldorado



Day 35
 Friday
 February 8th

*Pima Air and Space
 Museum
 and the
 Richard F. Caris
 Mirror Laboratory*

Weather
 60's and Sunny

Hello to Family & Friends

As I was sitting in the driver's seat at my overnight spot at the truck stop, wrestling with my GPS to input the route to the Pima Air and Space Museum, I looked up and noticed the sign above. I guess I am closer than I thought.

A lot of pictures today, and a very good day it was. So let's get right to it. There are a lot of plaques, but most are only to show names of the associated picture, and I only took pictures of the most interesting displays, or at least what I thought were interesting



First stop is the Museum above, one of the largest air and space museums in the world. I have been looking forward to this because of the "aircraft boneyard". 2600 acres containing over 4000 stored aircraft. Not sure when I first heard about this "graveyard", but I know it from the 1946 Best Movie Oscar winner "THE BEST YEARS OF OUR LIVES". Great movie if you get a chance.

Eldorado

By Edgar Allen Poe

Gaily bedight,
 A gallant knight,
 In sunshine and in shadow,
 Had journeyed long,
 Singing a song,
 In search of Eldorado.

But he grew old—
 This knight so bold—
 And o'er his heart a shadow—
 Fell as he found
 No spot of ground
 That looked like Eldorado.

And, as his strength
 Failed him at length,
 He met a pilgrim shadow—
 'Shadow,' said he,
 'Where can it be—
 This land of Eldorado?'

'Over the Mountains
 Of the Moon,
 Down the Valley of the Shadow,
 Ride, boldly ride,'
 The shade replied,—
 'If you seek for Eldorado!'

At the entrance gate



THIOKOL SPACE SHUTTLE
SOLID ROCKET BOOSTER



This is an actual solid fuel rocket booster from the Space Shuttle program. It's hard to tell in the photo, but it is 150' long.



Jets were taking off every few minutes from the Air Force base across the street. This is a pretty good snap considering he is moving about 200 MPH and a mile or more away.

Bad news L The boneyard is now run by the government, oh oh, and a reservation for the boneyard tour is now required at least 10 days in advance so that they can do a background check on everyone who applies. Our tax dollars at work.

On to the museum!



General Electric J47 Jet Engine

The J47 was developed from the earlier J35 in 1948. It was used in many American military aircraft from the 1950s including the F-86 Sabre, the B-47 Stratojet, the B-45 Tornado, and the B-36 Peacemaker. In all more than 30,000 J47 engines were built between 1948 and 1956.

I thought it was kinda cool to see the interior workings of a jet engine



Remember the McCulloch that founded Lake Havasu City and brought the London Bridge here? Same guy. His aircraft division had several displays.

**TAIL GUNNER'S COMPARTMENT OF
BOEING B-52D STRATOFORTRESS
SERIAL NUMBER 56-0659**

There is no way for a tail gunner to get from this position to the rest of the plane once it is in the air. Thus the need for the bucket.



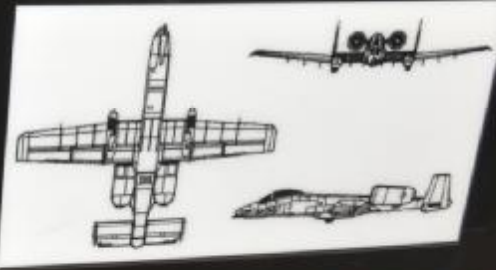
**GRUMMAN F-11A
(F11F-1) TIGER**

The Blue Angels above, and the Thunderbirds below



In the 2009 post-apocalyptic motion picture "Terminator: Salvation" the Warthog is shown as one of the few aircraft remaining to the insurgent human resistance to the take over of the planet by robot killing machines. This actually makes sense as the A-10 is a rugged, easy to repair aircraft that could probably be kept operational when more high-tech aircraft would be impossible to keep in the air.

The cockpit section on display here was used in the production of the movie for scenes where the actress Moon Bloodgood and others were shown flying A-10s.



I have never seen this movie, but I thought the mock-up was interesting.

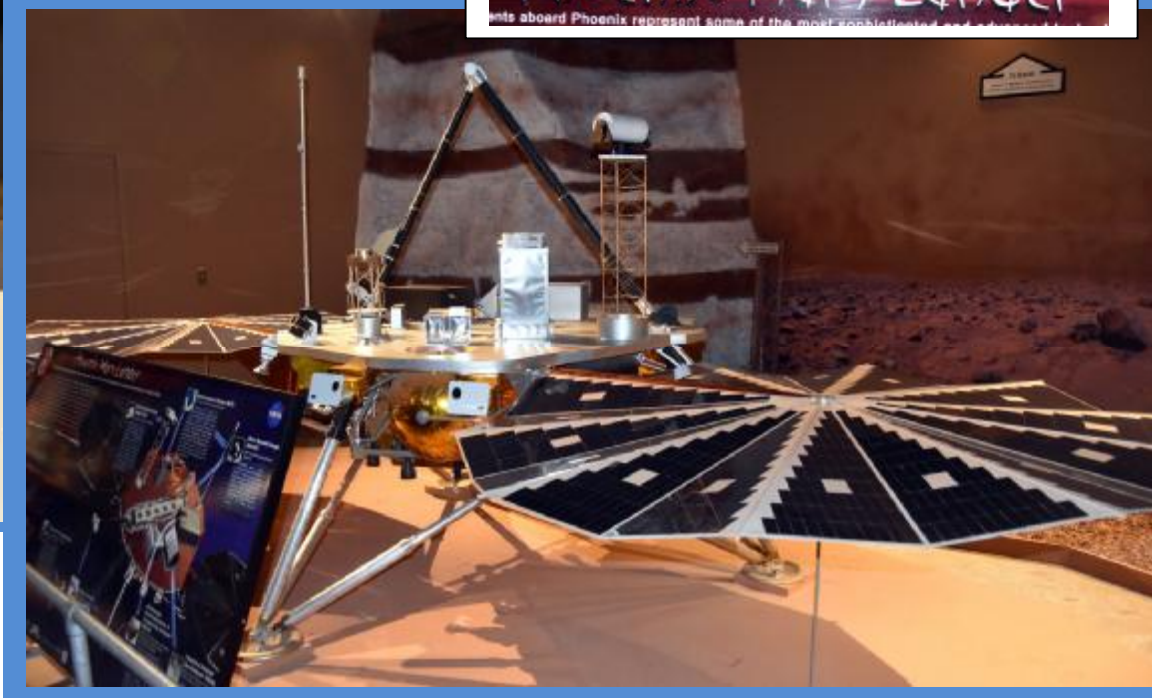


I was looking forward to this one since I am more of a space guy and not just an aircraft guy. Holy Moly!!! Talk about plaques and/or just note cards. You could spend two 8 hour days in here and probably still not read everything there is to read. TMI !! Almost everything was a model or a mock-up also, nothing original.

This moon rock did not show up too well. It was hard to read in person also, or even to just see the rock. It is that small and about 4' behind the railing.



As leader of Exploration Lunar Sample
Presented to
Pima Air & Space Museum
On behalf of the
National Aeronautics and Space Administration
and
Lieutenant Colonel Frank Borman



Back outside to the aircraft



I have always been more fascinated with helicopters than with planes or jets, and this type of Skycrane Helicopter just amazes me with its design and capabilities



BOEING
B-52D
STRATOFORTRESS
BOMBER
1956 - 1983
ON LOAN FROM THE NATIONAL
MUSEUM OF THE UNITED STATES
AIR FORCE

This thing is HUGE !!



CONVAIR
B-26J
PEACEMAKER
STRATEGIC BOMBER
1947-1950

ON LOAN FROM THE
NATIONAL MUSEUM
OF THE
UNITED STATES AIR FORCE

I think they were drinking on the assembly line when they built this one, the props are on the wrong side of the wings.



AVRO
AEW. Mk. 2
Shackleton
Airborne Early Warning
1951-1991

PRIMA AIR & SPACE MUSEUM
Donated by Air Atlantique

Two sets of props on each engine. Never seen this one before either.



I believe there is a lot of radar gear inside that dome



There are three floors of windows in this thing. Look how high up the cockpit is.



Aptly named, don't you think? I have no idea what cargo they would put up there.



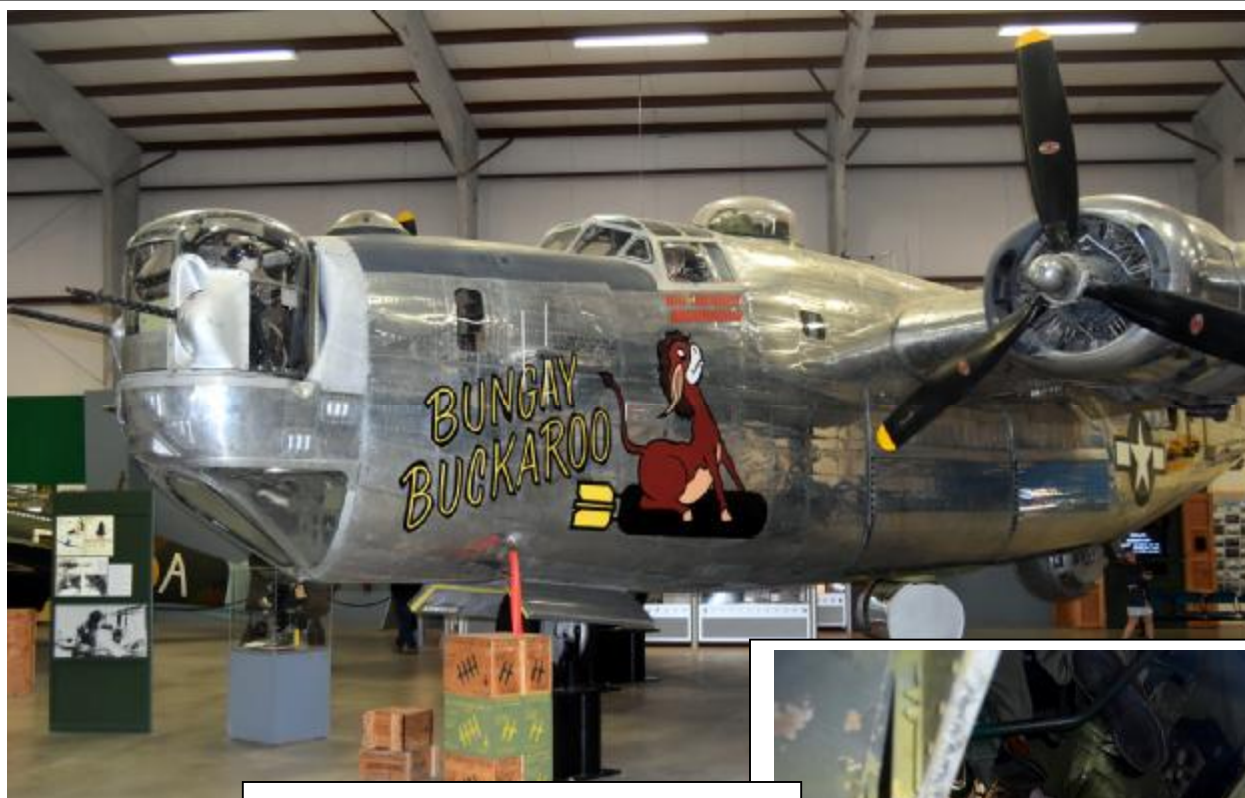
Alright, something does not seem right here. According to a website the top photo, a jet, was delivered in 1959 and used as Air Force One by Eisenhower, Kennedy, Johnson and Nixon. But this model was replaced in 1962 with a newer VC-137C, I assume also a jet powered aircraft. Yet the bottom photo states this plane, a prop engine plane, was used by Kennedy and Johnson. That does not compute.



This is an operational jet in a mechanics hanger behind the fence - no public access. GE Propulsion Test Platform is printed on the side. No other info available.

RUHRSTAHL SD 1400 X "FRITZ X" GUIDED BOMB

I think several of us reading this are aware of what a "FRITZ GUIDED BOMB" is.



The photo to the right is a partial of the interior of the plane. The mannequin you can see in the navigations engineer.



ALLIS-CHALMERS TURBOSUPERCHARGER 1940s

ALLIS-CHALMERS



SUPERCHARGED ENGINES DATE BACK INTO THE 1930s. SUPERCHARGERS ARE SIMPLY PUMPS OR COMPRESSORS THAT FORCE AIR OR AN AIR-FUEL MIXTURE INTO INTERNAL COMBUSTION ENGINES. THE PURPOSE IS TO PROVIDE THE ENGINE MORE AIR OR AIR-FUEL MIXTURE THAN WOULD OTHERWISE BE AVAILABLE AT THE PREVAILING ATMOSPHERIC PRESSURE. THUS, PLANES MOST LIKELY TO BE SUPERCHARGED ARE THOSE WHICH OPERATE AT HIGH ALTITUDES.



B-17 with superchargers marked with arrows

Home grown in West Allis, Wisconsin



HAWKER HURRICANE

The Hawker Hurricane was the first modern monoplane fighter flown by the Royal Air Force.

ROBERT STANFORD TUCK

Wing Commander Bob Tuck was one of the Royal Air Force's highest scoring aces of the first half of World War II. He scored his first victory on May 23rd 1940 over France while flying Spitfires with 92 Squadron. On September 11th 1940 he was transferred to command 257 Squadron which was flying Hurricanes. Tuck advanced in rank and victories until January 28, 1942 when he was shot down by anti-aircraft fire and taken prisoner. He remained a POW until February 1945 when he escaped to Soviet lines. He retired from the RAF in 1949 and spent the rest of his life as a farmer in the Kentish countryside. He served as a technical advisor for the movie "The Battle of Britain" along with German ace Adolf Galland. Robert Tuck died May 5th 1987.

Tuck's Scorecard

| | | | |
|------------|----------|----------|---------|
| | | 12 Dec. | 1 Bf109 |
| | | 29 Dec. | 1 Do17 |
| 1940 | | 1941 | |
| 23 May | 3 Bf110 | 2 March | 1 Do17 |
| 24 May | 2 Do17 | 19 March | 1 Do17 |
| 25 May | 1/3 Do17 | 9 April | 1 Ju88 |
| 2 June | 1 He111 | 11 May | 1 Ju88 |
| | 1 Bf109 | 21 June | 2 Bf109 |
| 13 August | 1/3 Ju88 | 8 July | 1 Bf109 |
| 14 August | 2 Ju88 | 7 August | 1 Bf109 |
| 18 August | 1 Ju88 | Total: | 29 |
| 25 August | 1 Do17 | | |
| 15 Sept. | 1 Bf110 | | |
| 23 Sept. | 1 Bf109 | | |
| 4 October | 1 Ju88 | | |
| 12 October | 1 Bf109 | | |
| 25 October | 1 Bf109 | | |
| 9 Dec. | 1 Do17 | | |

In the 1980s a Bf109 crash found in England was traced to an action in which Tuck had claimed a "Probable" victory. This raised his total to 30 confirmed victories.



Parachute Bridal Dress

During and after World War II it was common to see brides wearing bridal gowns made from parachute material. Parachutes were made from either silk or nylon, which due to their military use were not readily available for civilian uses. Paratroopers and airmen often returned from the war with a parachute as memento of their wartime service. Other servicemen often came home with captured German or Japanese parachutes. Many of these servicemen would offer their parachute as fabric for their brides' dress.

This dress was worn by Winifred Malone Stadtherr, wife of Nicholas Stadtherr. Nicholas was the commanding officer of the 457th Parachute Field Artillery Battalion of the 11th Airborne Division. He brought home one of his parachutes which along with silk from a Japanese parachute was used in making Winifred's bridal dress.



CONSOLIDATED MODEL 28-5AMC CANSO A
(PBY-5A CATALINA)
SERIAL NUMBER 9742
N68740

I like planes that land on water. I was hoping for a full size version of the one Indiana Jones flies in from the US to Nepal, but all I found was a model.

Cockpit

The cockpit layout of a Lockheed Lodestar is typical of most multiengine airplanes. The pilot sits in the seat on the left and the copilot sits in the seat on the right. The pilots control the aircraft using the flight yoke in front of them and the rudder pedals on the floor. The gauges on the instrument panel give the pilots the information they need to fly the aircraft. The instruments include a compass, altimeter, airspeed indicator, artificial horizon, turn and bank indicator, various pressure gauges, temperature gauges, and fuel gauges. Between the pilots is the engine control pedestal. Here the pilots control engine throttle, propeller pitch, landing gear, flaps, and trim tabs.



About This Flag

"He was up there and I was down below," said Don Drain of his brother during a 1994 press interview. Don's brother, Richard, was a gunner in the 570th Squadron of the 390th Bombardment Group (H).

Don Drain was just 19 years old when his boat landed at UTAH Beach on D-Day. He recalls being on the first boat to land, but that was not intentional. LCT 777 was ahead of Drain's boat in the first flotilla. It struck a German sea mine and exploded into a mass of twisted metal and fire. Drain's boat, the 766, chugged ahead.

At approximately 6:30am, LCT 766 unleashed its load of Army combat engineers onto the beach. Amidst a hail of German machine gun and mortar fire, Drain took down the 766's signal flag and hoisted this flag up the boat's main flag pole.



I thought about going out to the RV for lunch and coming back in, but I decided to give the Flight Lounge a try. This is my \$15 lunch. Next time I use the RV.

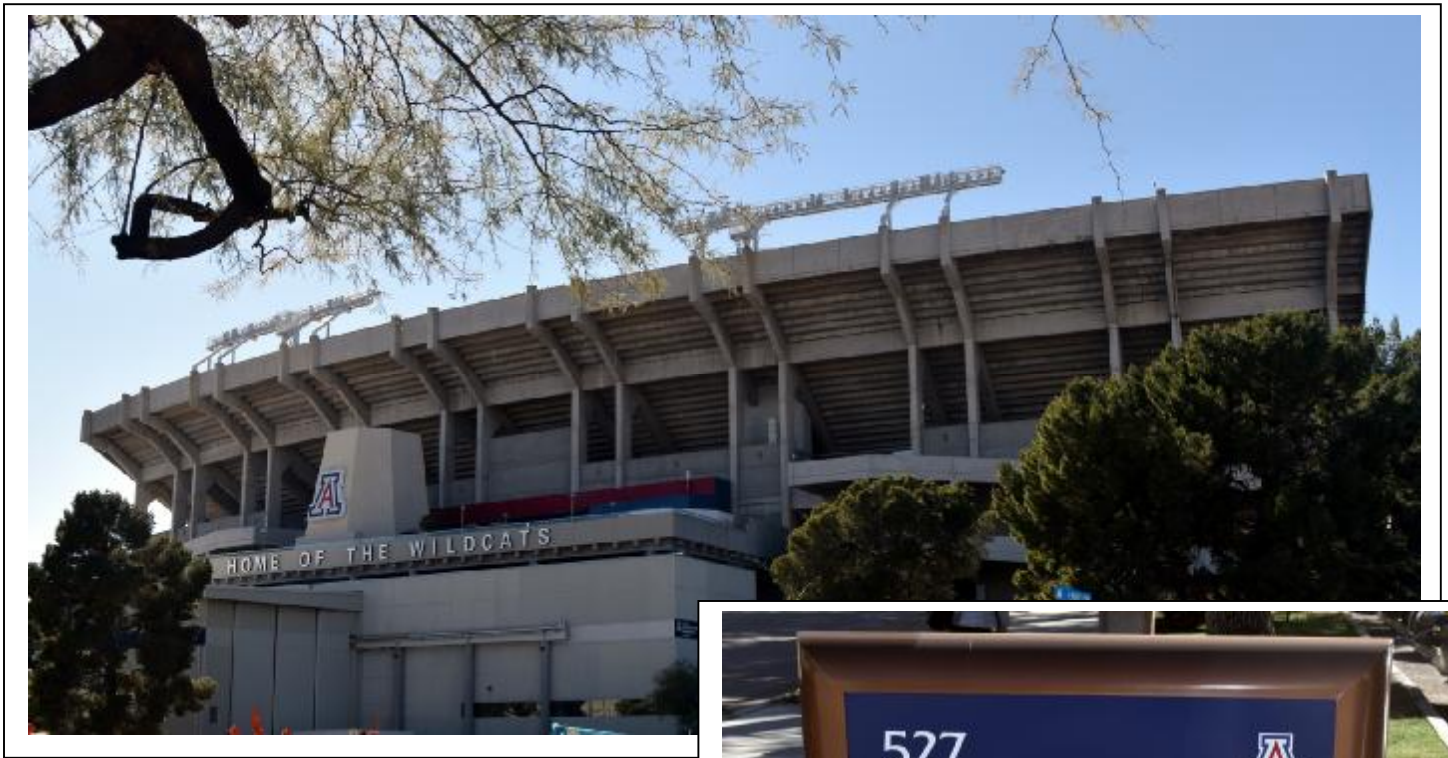


Since I could not visit the boneyard today, I might give it a try on my way to Houston or back, I decided to drive by and get what photos I could. The last one is from the roof of the RV.

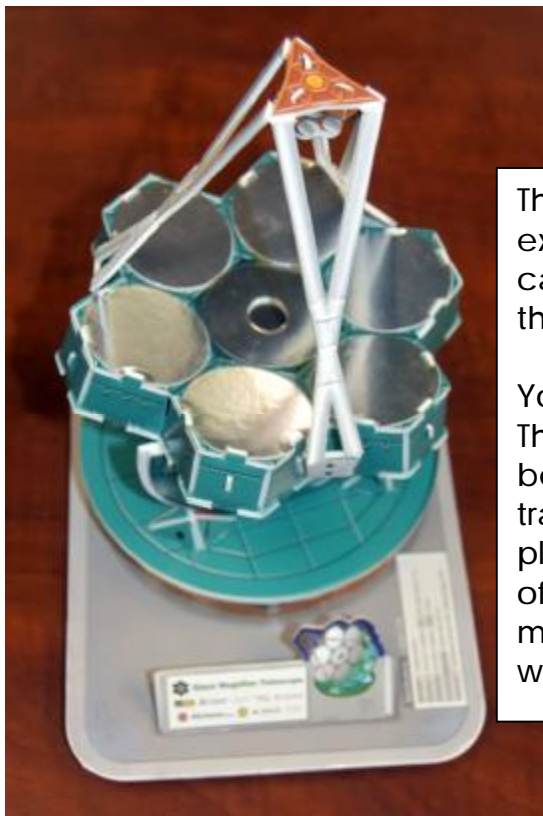




My next stop is under the University of Arizona Wildcats football stadium. That's right, UNDER.



Remember all those telescopes up on Kitt Peak a couple days ago? Well, this lab is where the biggest and best telescope mirrors in the world are made - under the football stadium.



The tour started with a one hour talk by Jerry, who was excellent, about how mirrors are made for telescopes. I cannot even begin to explain the entire process, but here is the gist of it.

You may have heard of the GMT - Giant Magellan Telescope. That is a model of it to the left. Because a single mirror cannot be made larger than an 8.4 meter (about 28') due to transportation issues (trucking under bridges and so forth) the plan is to have six mirrors surrounding the central mirror. Each of those mirrors is 28' across. They are building a structure on a mountain top in Chile, five stories tall, where the entire building will rotate. Three of the mirrors have been completed.

The process involves assembling several hundred honeycomb shaped ceramic substrates in the diameter of the requested mirror. On the right are three of the honeycombs with a cutaway to see the inside.



The sand used to make the mirrors comes from northern Florida, shipped to Japan. Japan melts it into 1000 LB blocks then uses a blowtorch to cut them into smaller pieces. Those pieces are shipped back and placed on top of the honeycomb as seen to the left.

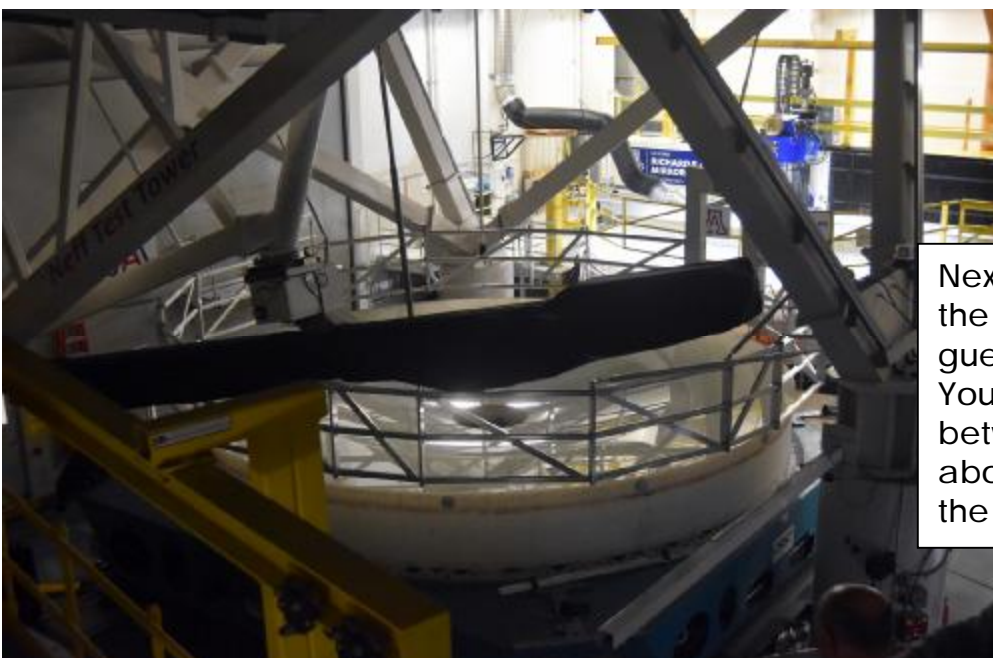
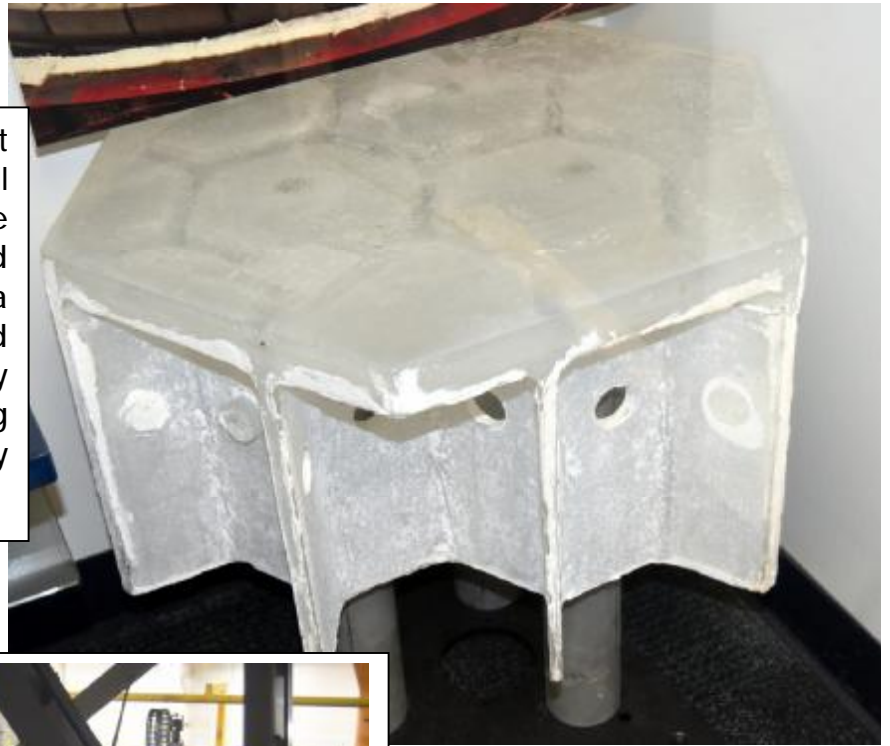
Once the glass is correctly distributed, the furnace walls are constructed around the honeycomb and the top is put in place. The entire furnace, about 40' across spins at 5 RPM as the glass melts so that, like swirling liquid in a cup, the melting glass fills the honeycomb and is higher at the sides than in the middle. This gives the glass a parabolic shape.





Once the entire thing cools down, the furnace walls are removed and a crane tilts the mirror up until it is standing on end. Then a power washer is used to remove the ceramic honeycomb substrate.

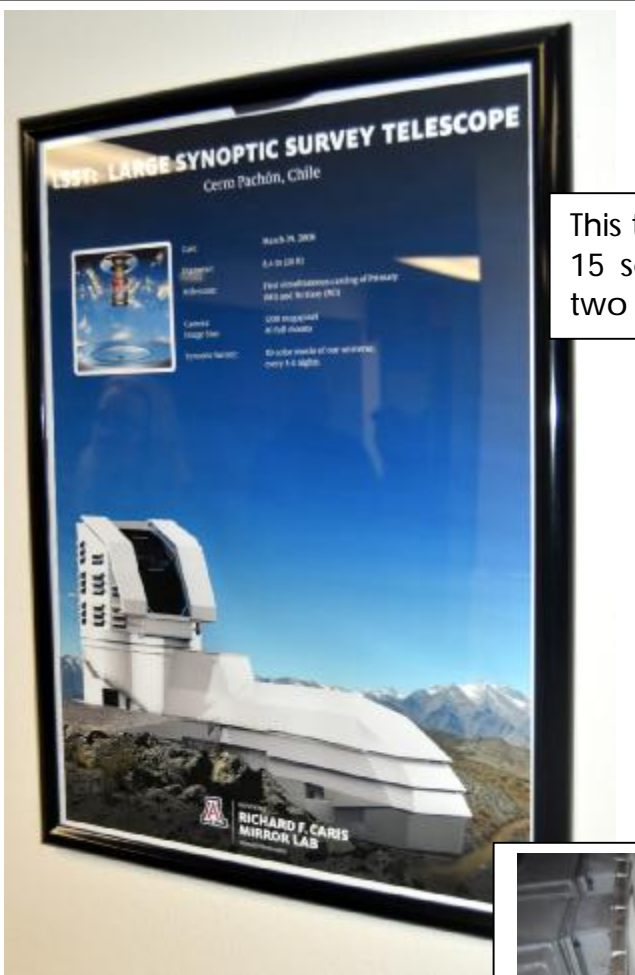
After the honeycomb is removed it looks like the photo to the right. All pure glass. The reason for the honeycomb shape is the reduced weight. Just imagine how much a piece of glass 28' in diameter and 15" thick would weigh. They eliminate about 20,000 lbs by using this method, and they are the only lab that does it this way.



Next the entire mirror is moved to the polishing room where, you guessed it, the mirror gets polished. You can see the difference between the rough structure above and the polished one to the left.

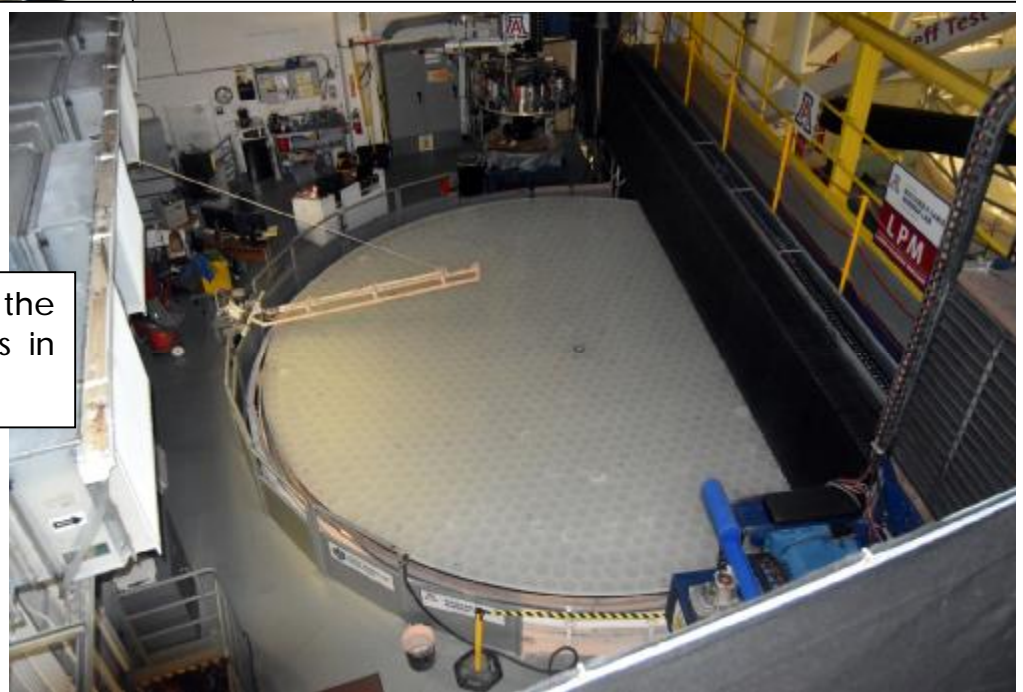
If you look closely, or follow the arrow, you can see where this mirror has two different shapes in one. The outer ring is flatter and the inner ring is much more concave.

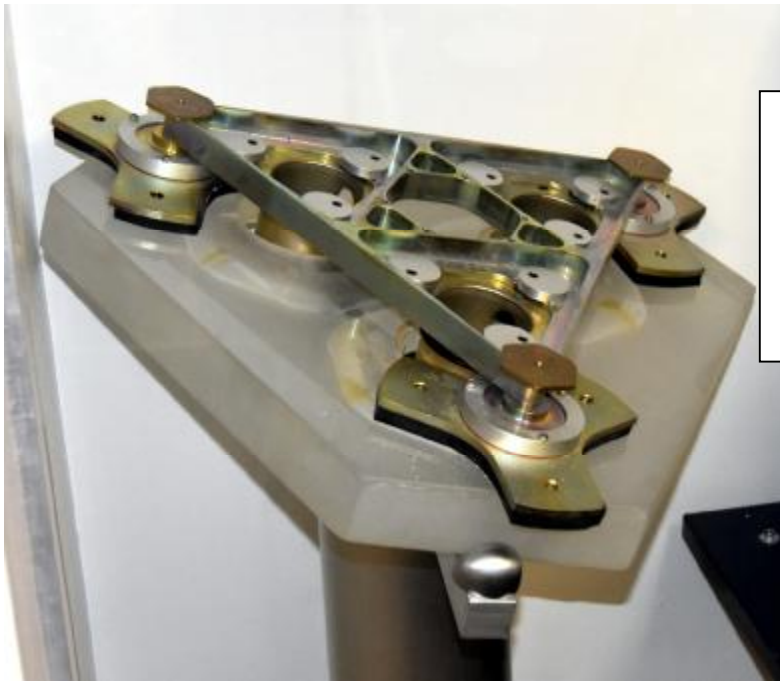
This mirror is for the LSST: Large Synoptic Survey Telescope – which will be placed in the building pictured below.



This telescope will take two photos, each with a 15 second exposure, shift a degree and take two more, every night for 10 years.

This is one of the mirrors for the GMT mentioned earlier that is in the process of polishing.





Once the mirror is polished, it is flipped over and several hundred of these devices are glued to the bottom. They are actuators that adjust the mirror by 1000ths of an inch when it is tilted upwards or for the effect of the wind. Remember how windy it was up on Kitt Peak.

What's next? Packing and shipping. To the right is a completed GMT mirror that is ready to be shipped to a storage facility. Why storage? The telescope building will not be ready for about 3-4 years. The GMT is not scheduled to be online until 2024.

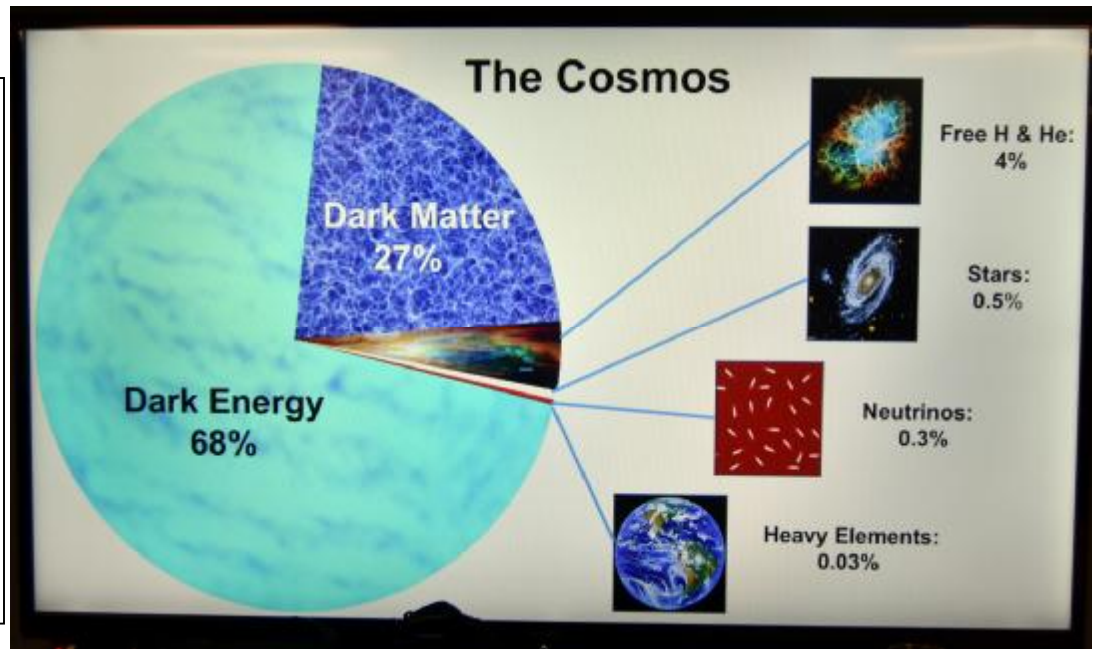


What does the future hold? The photo to the left depicts a completed Magellan I and II. This will create a telescope almost one kilometer across.



I know what you're asking yourself right now...Why?

Dark Energy, which we know basically nothing about, makes up 68% of the Cosmos. Dark Matter, which again is an unknown, another 27%. This means we really only know what 5% of the Cosmos contains.



The Hubble telescope has a 2.5 meter mirror. The GMT will have a 25.2 meter (84') mirror once the entire unit is complete. The GMT will be able to see 1000 times better from the Earth than the Hubble does from space.

A little of what I have learned over the past three days and my visits to Kitt Peak and the Mirror Lab: I already knew light travels at 186,000 miles per second; I already knew that a light year is the distance that light travels in one year; I never did the math but it turns out that one light year is equivalent to 5.9 Trillion miles; there are supernovas whose light is reaching us right now, but the explosion took place 170 million light years away; that the light we see now, shows astronomers what was happening in the Cosmos, in this particular instance, 170 million years ago.

The numbers are mind boggling. I don't think I'd have the patience to study the amount of data that will be recorded. Speaking of data - the mind behind most of these techniques is Roger P. Angel. He has come up with many ideas and was told "that can't be done", but he found a way to do it. In the instance of data, he was told there would be too much data to process. He told them not to worry, data processing is moving so fast they will have a way to process the data by the time the telescope goes online.

If you are ever in the Tucson area, make sure to visit this lab, it is a phenomenal experience.

Wow, this is a long one crammed with a lot of information. I hope I'm not boring anyone. If I am, just delete it, I'll never know.

I'll see if I can do a little cowboy stuff tomorrow.

Until next time.....