Robinson Helicopter Company



Photo courtesy of Robinson Helicopter Company

Attending the Robinson Factory Safety Course

Way back in 1987, I attended the Robinson Factory Safety Course. This was when Robinson Helicopters was in a small building on Crenshaw Blvd. The purpose of the safety course is to increase safety by teaching pilots how to avoid the more common mistakes when flying a Robinson Helicopter. I went back for a refresher in 2006 and brought along my camera. I'd like to thank Frank and Kurt Robinson for allowing me to take pictures inside their factory, something that they seldom allow. I'd also like to thank Gavino Rivas for escorting me through the factory, and Judy Neily for helping to coordinate the visit. Gavino also provided me with the first two pictures you see on this page. The rest of the pictures I took while touring the factory with him.

Back in 1997 I helped my friend Anne bring her R22 back to Boston from the factory, and by then Robinson had moved into a wonderful new building on Airport Drive. In the picture at the top of this page, that is the section of the building to the upper right. The employees now call that the "old" building, and the portion to the lower left of the picture is called the "new building".

The entire safety course group was given a tour of the factory, and a lot of people in my group mentioned what an amazing factory it is. For one, it's huge. You can see that in the picture above. It's also amazingly clean and well lit. In the following picture you can see that there are many skylights built into the ceiling of the building. This allows the workplace to be lit by natural light, saving electricity. It also gives the inside of the building a really bright clean feeling. You can see in this picture that there are lights on the ceiling which are not turned on. They are only turned on when weather prevents sufficient sunlight from illuminating the factory floor.



Photo courtesy of Robinson Helicopter Company

During the class tour of the factory, we were able to see almost every part of the factory. Gavino explained that there would only be a few sections of the factory that I would be allowed to photograph. I'll try to explain what I was able to see on my tour, but not to photograph. First of all, unlike a company like Boeing that has many many subcontractors producing large portions of their aircraft, Robinson makes over 80% of their helicopters in this factory. We were able to see on the tour large stocks of steel and aluminium to be processed into all the different parts of the helicopters. The factory literally takes raw materials in one side, machines thousands of different parts, and then assembles those parts into a working helicopter. We were told that the reason Robinson does so much of the manufacturing themselves is so that they can maintain an extremely high level of quality.



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Another thing that surprised me about the Robinson factory was the amount of high tech production machinery. I remember even in the old Crenshaw Blvd building that they had some high tech machines, but in the current factory there are row after row of them. In the above picture, you can see various parts that have been machined, and are waiting for the next step in the manufacturing process. The pointy objects approximately in the middle of the picture are part of the blade grip assembly. I can't identify the rest of the parts you can see, but the factory is filled with gleaming objects machined from steel and aluminium.



There is a fair amount of sheet metal in a helicopter, and during the tour we were able to see a water jet machine cutting sheets of aluminum into various shapes, including all the holes for screws, rivets, and accessories. The water jet produces a smooth cut that does not need to be deburred. We were able to touch a freshly cut sheet of aluminium, and the cuts were smooth to the touch. Really cool. The factory also has laser systems for cutting steel, as well as large hydraulic presses for cutting and shaping aluminium parts. Frankly, if you had told me they were building Space Stations, I would probably have believed you - it was that high tech.

Part Two -- lots more pictures of the plant ...

The Factory



Even to my fairly experienced eye, there are large sections of the factory producing parts of assemblies that I can't identify. Some of the larger parts, such as a main rotor transmision, or a rotor blade, are easily identified. It's more difficult to determine what some of the small parts are.





This guy is apparently taking (upper or lower?) sheaves (pulleys) that have already been machined into shape, and machining in the grooves that the belts ride in.



You can see in the foreground the component before it has been machined for the drive belts. In the cart at the left you can see the grooves where the drive belts fit onto the sheave. You can tell from the size that these are parts for the R44 (four place Robinson helicopter).

Part Three -- Assembling the Helicopters

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Assembling Helicopters



Large sections of the factory are used to assemble little parts into bigger subassemblies that really can't be identified as part of a helicopter. However, once we reach this part of the factory, you can see the fuselage being formed. When we walked through, I noticed one line of R22s, and two lines of R44s. I'm having a hard time remembering, but one line might have been Raven I helicopters, and the other line Raven II helicopters (which is similar but has a fuel injected engine instead of a carburated one. The helicopters in this picture are R44s.



This picture is taken from almost the same spot, but you can just see an R22 fuselage in the far right of the picture, and the same R44s being assembled on the left side.



Our tour guide explained to us that every once in a while the helicopters are moved down the assembly line. When they are still relatively light, the workers just pick them up and move them. Later on they use the regular helicopter moving device that we all use at our home airports - it picks up the belly of the aircraft, and the helicopter rolls on it's regular ground handling wheels.



The picture above was taking in the painting area. You can see that this helicopter has already been painted and is being touched up and prepared by hand. I asked about the paint operation versus air pollution - I remember reading a few years back that McDonnell Douglas had to fly aircraft from their Long Beach factory to Arizona to be painted with certain kinds of paint. Robinson experimented with a different kind of paint a number of years ago, but didn't get the results they liked, so they went back to the original paint and instead installed a special incinerator to burn off the paint particles. Our tour guide claimed the air coming out of the incinerator is cleaner than the air outside.





The final stop before test flight is in the rigging section. In this area, riggers attach main rotor blades and tail rotor blades. They statically balance them. Any other final adjustments are being done in this particular room which is a pretty large room, but tiny compared to the overal size of the factory.



If you look behind the tailboom that happened to be in the way of this picture, you can see racks of blades ready to be installed on helicopters. Blades are sorted and matched so that the two blades that get attached to a particular helicopter are as identical as possible. This makes it possible to get the best track and balance.



In the foreground of the picture, you can see a landing gear waiting for a fuselage. The red helicopter behind the guy in the white shirt is an R44 Clipper - it has fixed floats allowing it to land in the water. Robinson also makes emergency pop-out floats, where the floats are packed very tightly on the skid, but can be inflated by a bottle of helium if the pilot pulls the emergency inflation lever. This lets you have the safety of floatation, without the performance degradation of a pair of fixed floats.









You can see how the R44 tailcone attaches in this picture. If you look at the front of the visibile tailcone, you can see some of the steel frame exposed. Fairings cover that area when the aircraft is fully assembled.





Flying The Helicopters



The back of the Robinson Factory faces the runway at the airport. This picture is looking at the runway side of the new building. You can see the old building in the distance on the left side of the picture. The helicopters in the distance in the left of the picture are in the area where helicopters are run up and their rotor blades dynamically tested.











These helicopters are being flown by other students from the same safety course that I attended. People are practicing autorotations in these pictures.



Autorotation is a technique for gliding the helicopter should the engine ever quit. Most people assume the helicopter will fall out of the sky, but they don't as long as the pilot properly performs an autorotation. The reason the helicopter nose is up in these two pictures is that the pilot is performing a flare. The flare reduces the descent rate and forward speed of the helicopter. If the pilot does it properly the helicopter comes to a stop just above the ground and will land as soft as a feather. They are loads of fun to practice, and very satisfying when you land in exactly the area you intended with a nice soft landing. They are not that hard - we teach our student pilots how to do it before we let them fly solo.



The same helicopter hovering in to the ramp, with a couple of R22s in the background practicing hovering autorotations.



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