

GET TO THE CHOPPA!

Internship at Eurocopter Deutschland



For most people Bavaria, Germany, is best known for the Bierfests, Lederhosen, Schlager music and Weisswürste. However, it is also the home of various high-tech companies, such as Eurocopter Deutschland, and for this reason it also became my home for a six month period during my internship. In November 2009, I left the Low Countries behind to cruise down South on the Autobahn towards Munich to find out what it entails to be a Hubschrauber Ingenieur.

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During my Bachelor and Master I have always wanted to go into the aircraft design direction. At some point my interest was caught by rotorcraft; there is 'something' about the highly complex rotor system which consists of numerous parts that are rotating around each other at high velocities. However, the lack of courses offered by our faculty on this topic was a bit disappointing. This provided me with only one solution: find an internship at a helicopter company. As many students before me, I immediately encountered the red tape of applying for an internship at a company where you have no contacts. I would recommend always first going to your principle course teachers and asking them for any contacts within industry; it took me one e-mail and I was off to Germany!

EUROCOPTER

Eurocopter was founded almost twenty years ago by the merger of the helicopter departments of the German DaimlerChrysler Aerospace and the French Aérospatiale-Matra. It became part of EADS in the year 2000. This merger created one of the largest helicopter companies in the world with a rich heritage and a large and versatile range of helicopters. Of all the 15,600 employees almost 5,000 are working for Eurocopter Deutschland at one of the three sites in Germany. The two most important sites are Donauwörth and Ottobrunn. In Donauwörth most of the assembly work and flight-tests are done. The Ottobrunn site, which is very close to Munich, is the place where all the engineering-magic happens, so for me this was the place to be.

One of the appealing things of Eurocopter is the emphasize on innovation and development. In the passed eighteen months alone two new helicopters, the EC175 and EC145 T2, and one experimental hybrid helicopter, the X3, have been introduced, as seen in figures 1 and 2.

THE WORK PLACE

During my internship I was part of the ETGVG -Dynamics and Vibrations- department, which is one of several General Engineering departments located at the Ottobrunn site. This department has around twelve to fifteen employees and several students which concern themselves with a broad range of activities, such as: dynamics (rotors, drive trains and structures), stability issues (with respect to aeroelasticity, ground resonance and



Figure 1. EC145 T2 presentation at Donauwörth with its predecessors, the EC145 and BK117, in the background



Figure 2. Flight test of X3 high-speed hybrid helicopter

coupling phenomena), vibration problems (hub loads, isolation and fuselages) and control (active systems and controller design).

I experienced the working atmosphere as really good. The majority of the students are located in a big student room, which creates an international and social but also productive environment. As students from all General Engineering departments are seated here it is also quite easy to gain some insight into other activities at Eurocopter. Besides working there was enough time to practice some office humour and occasionally have a Weisswurst Frühstück. This typical Bavarian breakfast of white sausages and Bretzen (pretzels) is served with a Weissbier at ten o'clock in the morning, Guten Appetit!

The bulk of my activities consisted of working with specialized commercial rotorcraft software which combines helicopter aerodynamics and dynamics. Basically almost every conceivable rotorcraft can be modelled using this program. The characteristics of these models are then studied by performing calculations on loads, performance, vibrations and stability. Obviously, it takes some time and 'herding' to get familiar with this sort of software but quite soon I was building my first models and getting results. One of the projects I was involved in was the Future Transport Helicopter, a new heavy-lift tandem transport helicopter for the Germans and French, or in short: a Chinook on steroids. Another investigation I worked on concerned the active rotor system with trailing edge flaps. This system, a world's first from Eurocopter, is able to reduce vibratory loads and noise production. Additionally, I also performed the modelling of a high-speed rotor system.

The biggest, and basically only, disadvantage of working in Ottobrunn is that it is almost impossible to get some 'hands-on'

time with the machines you are working on. Except for a small helicopter company on the same site, which almost only fly Augusta's, none are to be found. Luckily, a student's day in Donauwörth is organized where every 'helicopter-nut' can get his or her fix! It is truly a magnificent sight to see all these brand-new Tigers and NH-90s lined up, to have a look at the assembly line, hear the good ol' 'bwoop-bwoop' sound of a Huey passing by and, with a bit of luck, catch a glimpse of some test-flights.

MÜNCHEN MAG DICH

Besides working, your period abroad is of course a perfect time to do some cultural sniffing; and I was in luck because Munich and its surroundings offer everything to keep a student from Delft busy. The first thing you notice when you hit the streets might sound cliché but it is the typical German 'Gemütlichkeit'. The city is very liveable: clean, green, safe and plenty of stuff to do all year round. The typical building styles, the historic city centre and the restrictions on building high-rise flats gives Munich a 'village-like' feeling, it is not without reason Germans call it 'Millionendorf'.

Finding a room in Munich can be tricky and expensive. The good people of EADS offered me a variety of apartments but most where in the villages around Eurocopter, and I didn't come to Germany to live in a small village. I can recommend anyone to find a place in Munich; it is definitely worth the extra costs and effort as you are able to fully enjoy the city life. Eventually, I was able to get a room in student house where around twenty other students were living. This is also a good way of getting to know people, outside of Eurocopter, who know their way around town.

As with all big cities where people are crammed up in their gardenless apart-

ments, everyone tends to go outside when the sun is shining. The Englische Garten, the areas around the river Isar, which flows through Munich, and all Biergartens make great places to go for a run, go cycling or just relaxing in the sun with a beer and your friends. In the Englische Garten a spectacular site can be found; a so-called standing wave is used for surfing. Another good way of spending your weekends is to get a bit cultural. Munich is packed with museums; from the world renowned Pinakotheken to the BMW museum.

The ultimate way of exploring the Bavarian traditions is by visiting a beer festival. The prejudice that the Germans have somewhat of a beer drinking culture is not totally untrue... During my stay I was able to attend two different fests; Starkbierfest and Frühlingsfest. These fests could be described as the more traditional, little brothers of the world famous Oktoberfest; which actually makes them more enjoyable. Besides the bierfests, Munich also offers a really good nightlife with its numerous Brauhausen, bars and clubs.

The surroundings of Munich have as much to offer as the city itself. On a clear day you can see the Alps, which are about an hour away, and within ninety minutes you are in Austria. This is perfect for anyone who enjoys snowboarding or skiing in winter and hiking or mountain biking in summer. Every weekend a train goes to the skiing area at the Zugspitze, the highest mountain of Germany, dropping you off nearly on the slopes. Nothing better to get you ready for a week of work than riding powder all weekend! If you crash you might even be supporting Eurocopter as most Austrian Bergwacht helicopters are paid for by the insurance of Dutch tourists according to our guide of the assembly line in Donauwörth. ✈