

Engineering In Real Life (IRL)



**Meet Ian Marks, Aircraft Conceptual Designer,
Lockheed Martin Aeronautics, Skunk Works®**

As a recurring feature on Engineering Connect, we're taking a closer look at the lives and stories of our very own Lockheed Martin engineers:

What's your earliest memory of wanting to be an engineer or being excited about engineering?

Ian: My passion for aerospace goes back to early childhood and pointing at airplanes while looking at the sky. I then started watching movies ("Top Gun," "The Right Stuff," "Memphis Belle" to name a few) as well as aircraft video games (Ace Combat franchise, Microsoft Flight Sim, X-Plane, Starfox, and more).

Tell us about your Lockheed Martin career journey.

Ian: I wanted to be a part of Lockheed Martin for years since I knew they worked on aircraft. I have been mentored by several employees through the local American Institute of Aeronautics and Astronautics (AIAA) professional section; I started applying at the end of my sophomore year of college and kept applying until I took a gamble between graduating in the summer or taking an internship. By the time I successfully joined Lockheed Martin, I had applied more than 150 times. Since my internship I have had conversations with aircraft designers, test pilots and technological visionaries. There are times I pinch myself to make sure I am not dreaming.

What field of engineering are you in?

Ian: Aerospace engineering. I currently work in aircraft conceptual design, which combines several fields of engineering together to build a vehicle that both excels in performance and still looks good to almost everyone.

What do you do in your job?

Ian: My job varies on a daily (if not hourly) basis. I enjoy working multiple assignments that can go from determining the right shape of the aircraft to investigating how innovative technologies impact an aircraft design space. The example I use to explain how conceptual design works is with a hypothetical example of a future airliner. Madame Customer comes with a big bag of money asking to find a way to get herself and her friends (20 people) from New York to London (about 3,500 miles away) in one hour or less. Being the conceptual designer and given the mission, questions start to be asked. Does it need to look like a 747 or Concorde? Does it need to be an aircraft? Why not build a fast boat? What about rocket boosting to the edge of space and gliding to a safe landing like SpaceShipOne?

Would a fusion-drive improve the design? There are several options that could be explored, and a conceptual designer works with their fellow engineers to brainstorm potential options and decide on the most reasonable and producible solution. Also, the solution needs to be found quickly so it can be refined, improved and built.

Why do you like your job?

Ian: I was offered my dream job after I graduated college. I always wanted to work as an aircraft designer creating unique shapes and prototypes. I want to point up at the sky as a unique looking aircraft flies overhead and say, “I designed that.”

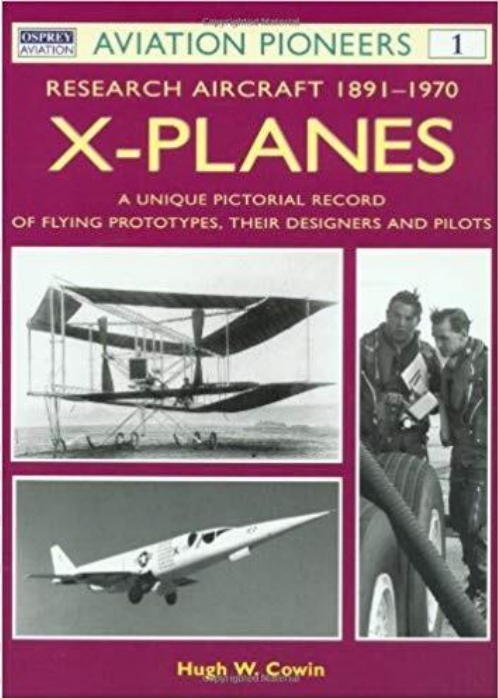
What attracted you to Lockheed Martin and what keeps you here?

Ian: Lockheed Martin is a company known for designing unique looking aircraft that push the limits of speed, altitude and technology. The predecessors of Lockheed Martin Aeronautics (Convair, General Dynamics, Martin Marietta, Lockheed Aircraft) provide decades of past work that an engineer can use to “stand on the shoulders of giants” while working on the cutting edge of aerospace. I also like the support from leadership in my involvement with professional societies including the AIAA, Society of Flight Test Engineers (SFTE) and the Society of Automotive Engineers (SAE International). The mentoring I’ve received over the years has also helped connect me with the aerospace industry far beyond what I initially expected.

When did you first decide to take STEM courses and/or pursue a career in engineering?

Ian: I decided on aerospace engineering back in sixth grade when I was carrying around a book about X-Planes at school. I was fascinated by the variety of shapes and sizes of aircraft that all flew

and impact aerospace. I then got involved with robotics in high school and SAE aero design in college.



What excites you most about the future of engineering?

Ian: There are several “new in aerospace” events happening ranging from building operational hypersonic platforms (think of it like owning a Ferrari that requires the maintenance of a Corolla), integration of artificial intelligence and digital engineering into aircraft design, rapid low-cost approaches to space access, flying lasers and electric aircraft.

What piece of advice would you give to someone in the engineering community who is struggling with the transition of becoming an early-career engineer?

Ian: There is hope! Amongst the struggle of assignments (schoolwork and classwork), get your hands on what you are studying. For example, I understood stress and strain conceptually after I broke stuff. There are resources online (Google is your friend) to learn more about how to get into engineering and understand concepts.



Aside from your current field of engineering, what other fields interest you the most. And why?

Ian: I enjoy being able to do multidisciplinary design and work on the cutting edge of aerospace. My other dream job would be flight testing where I'd get to crawl around an aircraft and help make history with first flights and excursions that push the envelope. If I am lucky, I would hope to fly in a chase plane or be a "back-seater" during a test.

If you weren't a successful Lockheed Martin engineer, what would you be doing?

Ian: Probably still applying to Lockheed Martin, flying and providing engineering support work.

What hobbies or passions define you outside of engineering?

Ian: AIAA, SFTE, mentoring students and airplane crazy people, visiting museums, visiting family, sailing and theatre.

What was the most recent thing you learned in your career?

Ian: In my work reports, I always write down lessons learned since there are always new things. One of my recent lessons learned is "Asking questions always helps."

What materials, blogs, websites, journals or Twitter feeds do you follow to keep up on the ever-changing world of engineering?

Ian: I read AIAA publications, SFTE membership news, Aviation Weekly, Smithsonian Air & Space and whatever my friends send me.

What one piece of advice would you give to your past self?

Ian: It's ok to be nervous when doing something difficult. Say you are nervous and then do it. To quote the "Magic School Bus," "Take chances, make mistakes, get messy!"

