

The Anit G Suit

Chris Morino, University of Rhode Island Biomedical Engineering BME 181
Second Presentation, April 8 2013, <cmorino@my.uri.edu>

Throughout the history of mankind technology has always been improving in many different ways. Humans are thinking beyond what the human body is capable of and creating new inventions to push the limits of what we are able to do. The Anit G suit is one of those inventions. It allows train pilots to overcome the symptoms of hypoxia. Hypoxia is when if blood is allowed to pool in the lower areas of the body, the brain will be deprived of blood. Hypoxia first causes a dimming of vision, called a greyout, followed by tunnel vision and ultimately complete loss of vision blackout followed by g-induced Loss Of Consciousness or g-LOC.

History of The Anit G suits begins in the Era of World War II. During this period everyone was concerned about the War including a man name Dr. Wilbur Franks from the University of Toronto in Canada. As Aviation tactics became more of a necessity in combat, the aircrafts pilots used were becoming more advanced which led to pilots experiencing higher G forces causing them to pass out and crash during a dog fight. Frank's idea was simple when the pilot went into a turn and experienced Gs, the suit would pump water into the bladders and constrict the body, forcing the blood upward and helping to ensure that the pilot didn't lose consciousness. The suit was a great idea but, when further tests were done it proved to be that it didn't need to be a full body suit but, instead focus pressure on the legs and waist. impractical, heavy, and hot making it a very poor match for desert and topical climates. The United States was also doing research on G forces at the Mayo Clinic. A small team under Dr. Earl Wood were using a centrifuge to spin up g forces on test subjects. The other doctors on the team doing research were Dr. Edward Baldes, Dr. Charles Code, and Dr. Edward Lambert. With each test improvements were made until they reach a breakthrough to use pressurized air to inflate the bladders instead of water.

The one problem scientist faced when designing Anti G suits. How is the G Suit suppose to know when it inflate and deflate during a flight. That is when they invented the Preview Control, the movement of the control stick is used to predict what the G force on the aircraft will be ahead of time. Then a computer determines what pressure is need in the suit to safeguard the pilot at that G -force.



Along with helping pilots and astronauts, G suit can help people with Orthostatic intolerance. When a normal person stands, approximately 750 ml of thoracic blood is abruptly translocated downward. People who suffer from OI don't have the basic mechanism to compensate for this deficit. With the help of old modify G suit people with OI can compensate for not being able to pump the blood on their own. The only need to withstand 1 G and with the help of G suit they can live normal lives again.

References

1. "Contents." *HistoricWings.com A Magazine for Aviators Pilots and Adventurers*. N.p., n.d. Web. 06 Apr. 2013. <<http://fly.historicwings.com/2012/11/the-anti-g-suit/>>.
2. "BME 181 Biomedical Engineering Seminar I." *Department of Electrical, Computer, and Biomedical Engineering*. N.p., n.d. Web. 06 Apr. 2013. <<http://www.ele.uri.edu/Courses/bme181/>>.
3. "G-suit." *Wikipedia*. Wikimedia Foundation, 04 June 2013. Web. 06 Apr. 2013. <<http://en.wikipedia.org/wiki/G-suit>>.
4. "Patent EP0646523A1 - Anti-G Suit with Pressure Regulator - Google Patents." *Google Books*. N.p., n.d. Web. 06 Apr. 2013. <<http://www.google.com/patents/EP0646523A1?cl=en>>.