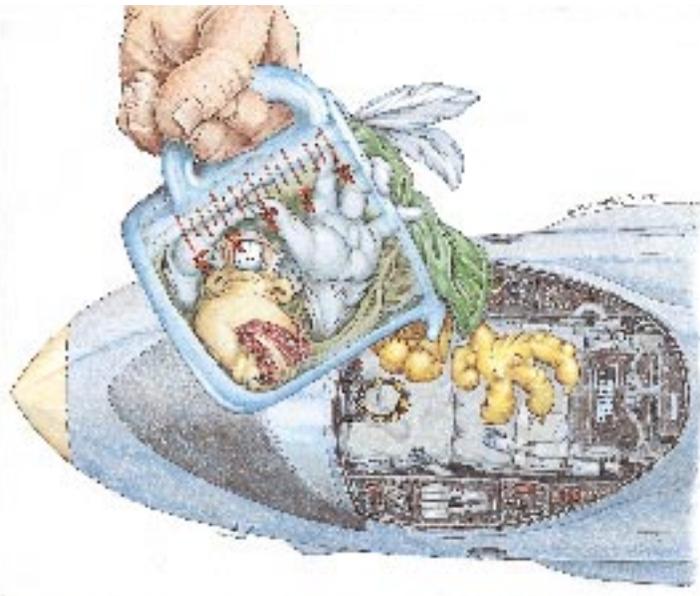




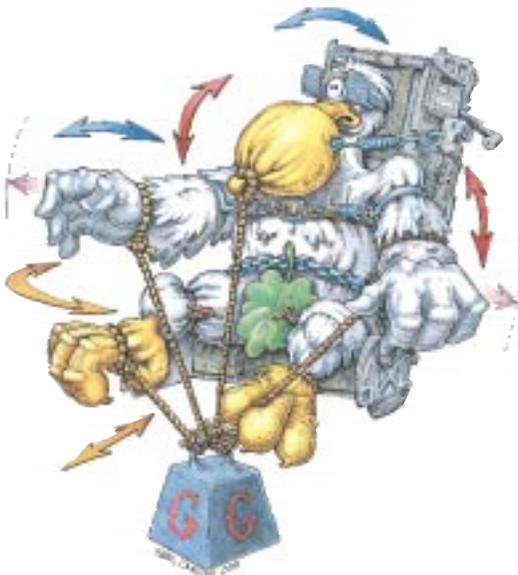
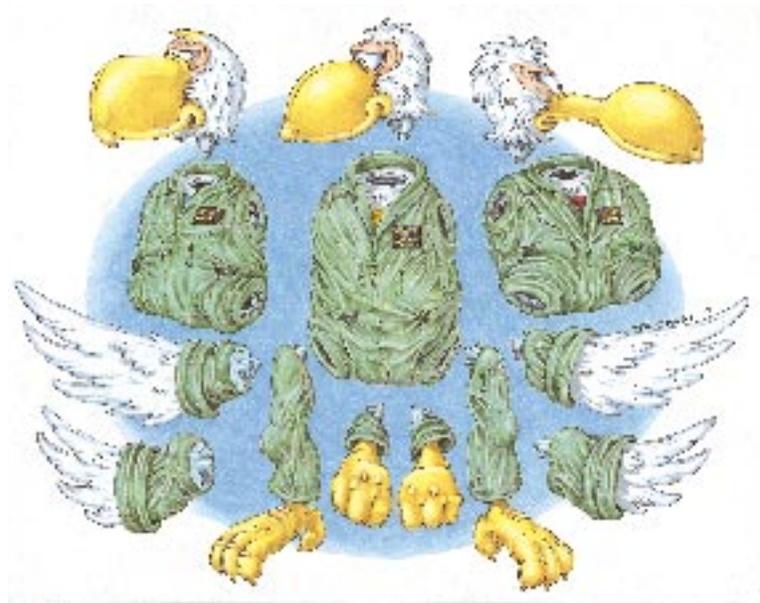
# Hank Caruso's Aerocatures™ Sketchbook: Aircrew Accommodation—Making the Pieces Fit

*The Aircrew Accommodation Expansion Program in the Crew Systems Department, NAWCAD Patuxent River, Md., strives to ensure that there is a proper match between the aircrew and aircraft. The foundation of this program is the development of a rigorous scientific database of anthropometric measurements which can then be compared to specific cockpit dimensions.*

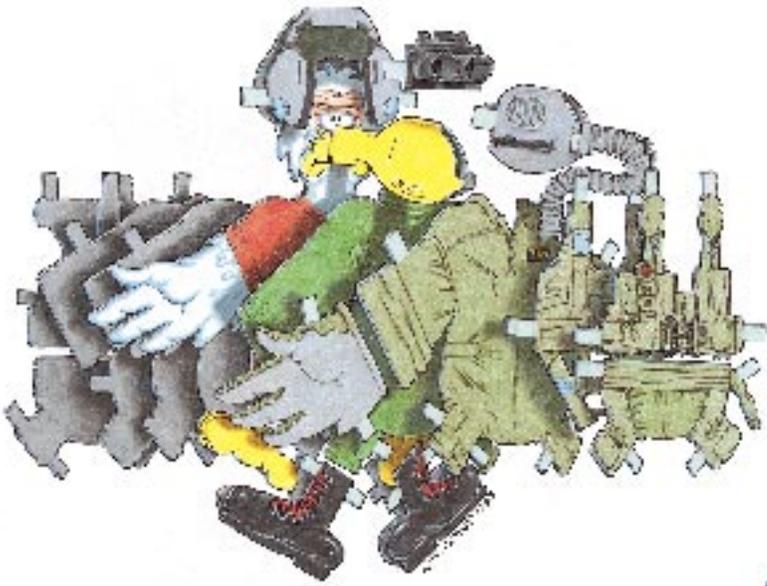


**P**ouring the Aviator into the Cockpit. There is no guarantee that a candidate to fly naval aircraft will fit into a given cockpit and be able to perform all required functions effectively. Aircrewmembers cannot simply be poured into a cockpit and flow into the right places.

**M**ix & Match the Variables. Simple averages may be convenient, but they are not adequate descriptors for aircraft accommodation tasks. An aviator is not cut from the same cookie cutter as the rest of his or her peers. There is a wide range of body configurations that must be accommodated in aircraft cockpit design.

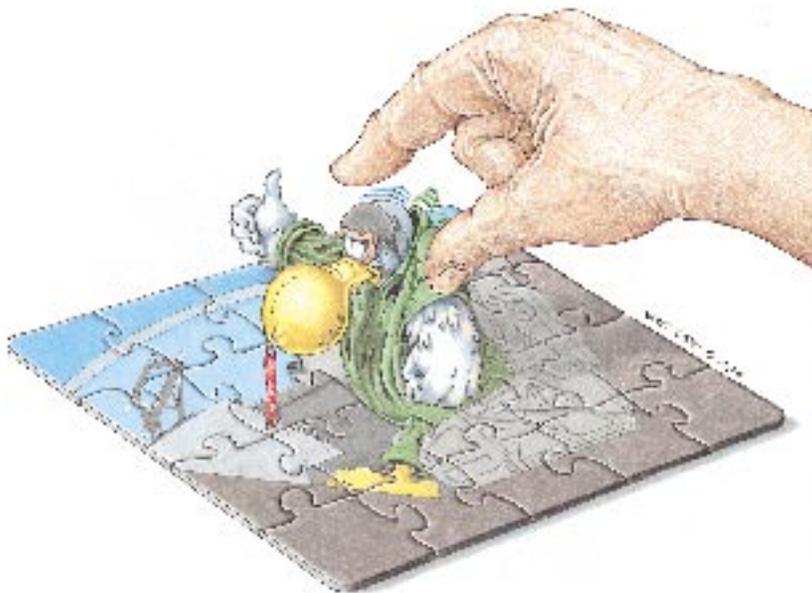
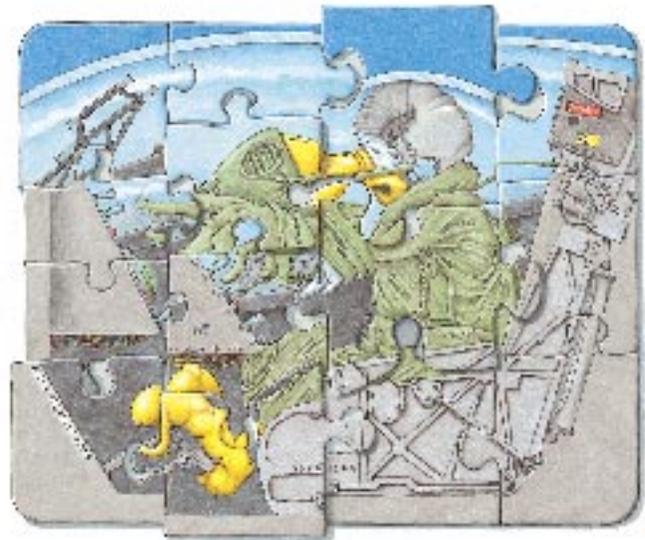


**T**he Forces of Flight. As shown in the front cover illustration, there are significant complications for an aviator in flight wearing full flight and survival gear, including: powerful positive and negative G-forces associated with aircraft maneuvers; restrained body motion from many layers of stiff and bulky protective gear and harnesses; constrictions from masks and G-suits; visual obstructions, tactile barriers and body reactions, such as sweat, disorientation or nausea; and degraded flight conditions associated with weather, system malfunctions or aircraft damage. These factors are not always obvious.



**G**ear Factors. Each aviator wears up to 40 pounds of flight gear, which may include a dry suit (for cold water emergencies), torso harness, helmet, G-suit, survival vest, boots, oxygen mask and night-vision goggles. While necessary for survival and mission effectiveness, this gear restricts movement and can reduce aircrew endurance and degrade the ability to perform mission tasks effectively. It would be a serious mistake to oversimplify the aircrew accommodation task by comparing it to sitting a driver comfortably in an automobile.

**W**hat Happens When the Pieces Don't Fit? Integrating interrelated human and equipment factors is like putting together a complicated jigsaw puzzle. Seemingly small aviator/cockpit mismatches can interfere with mission tasks under operational conditions or during emergencies, reduce aircrew efficiency or degrade decision-making abilities, render safety provisions inaccessible or create destructive interference between aircrew and aircraft structures. The pieces must match or the aviator and the mission are at risk.



**M**aking the Pieces Fit. Ultimately, the aircrew accommodation puzzle relies on: data consistency to ensure that measurements are free from error; personnel training to make certain the measurements made for decision making are accurate and appropriate; and personnel experience to assure measurements are interpreted correctly and without bias. Only a thorough scientific process, implemented by trained specialists, can make the pieces fit properly.

The author acknowledges the technical and administrative support provided by Greg Kennedy, head of the Aircrew Accommodation Expansion Program, and Tom Fleischman of SEMCOR, Inc., the Navy's support contractor for this effort.