



**Fig. 1.** Simulated pilot operation. Task consists of cockpit-like console with a stick, rudder pedals, and a throttle quadrant control.

#### AUGUST 1990

*Effects of altitude on intraocular pressure (Aero Medical Research Unit, Air Corps, Materiel Division, Wright Field, Dayton, OH):* "In a previous study of the effects of various rates of atmospheric pressure change on the eye it was noted that 'an injection of the bulbar conjunctiva accompanied by a smarting or burning sensation' sometimes occurred in the human at altitudes as low as 10,000 feet. The cause of this phenomenon was undetermined. In the rabbit, ascents to high altitudes produced 'an irregular slight subretinal albuminous exudate and occasionally a few subcapsular globular spaces in the lens substance' (Armstrong, 1939). The cause of this pathology is likewise unknown..."

"The intra-ocular pressure of anesthetized rabbits was measured directly with a capillary mercurial manometer during environmental pressure changes equivalent to rates of ascent and descent of 1,000 to 30,000 feet per minute up to altitudes of 40,000 feet. These environmental pressure changes produced no alteration in the intra-ocular pressure sufficient to cause concern as to any injury or discomfort to the eye."<sup>3</sup>

#### AUGUST 1965

*Considering "go/no-go" pills for the aviation environment (School of Aerospace Medicine, Brooks AFB, TX):* "The operational deployment of high performance fighter aircraft on extended missions poses some significant problems related to the effects of drugs upon pilot proficiency. This study was designed to simulate a pre-mission crew-conditioning program and a 12-hour flight. The research goal was to determine the performance effects of secobarbital taken the night before and of d-amphetamine taken during the mission.

"The results on 48 subjects indicated that performance decrement, unpredictable by selected psychologic test scores and not related to gross physiologic measures, occurred as a residual effect of secobarbital using the SAM Multidimensional Pursuit Test as the measure of proficiency. Individuals receiving an hypnotic dose (200 mg.) of secobarbital at bedtime demonstrated a performance decrement 10 hours later at the start of their simulated 'flight' [see Fig. 1] and continued to demonstrate degraded performance at the completion of their mission 12 hours later. Those subjects who received 5 mg. of d-amphetamine 'in flight' showed the often-documented enhancement of performance, but those who received secobarbital at bedtime and d-amphetamine 'in flight' showed an altered performance response curve in terms of increased latency and lower peak performance."<sup>2</sup>

#### AUGUST 1940

*Orientation by acoustic signal (School of Aerospace Medicine, Brooks Air Force Base, TX):* "An initial version of an acoustic orientation instrument (AOI), in which airspeed was displayed as sound frequency, vertical velocity as amplitude modulation rate, and bank angle as right-left lateralization, was evaluated in a T-40 (Link GAT-3) motion-based simulator. In this study, 15 pilots and 3 non-pilots were taught to use the

AOI and flew simulated flight profiles under conditions of neither visual nor auditory instrumentation (NO INPUT), AOI signals only (AOI), T-40 simulator instrumentation only (VISUAL), and T-40 simulator instrumentation with AOI signals (BOTH)...

"Acoustic signals can be useful indicators of the orientational state of an aircraft; interaural intensity differences, representing bank angle, are particularly effective in this regard. Using acoustic signals, a pilot can maintain level flight with no other input..."

"The results of the present study indicate that the potential benefit from use of the Acoustic Orientation Instrument warrants continued exploration to define optimal signals for providing auditory orientation information to pilots."<sup>1</sup>

#### REFERENCES

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This column is prepared each month by Walter Dalitsch III, M.D., M.P.H. Most of the articles mentioned here were printed over the years in the official journal of the Aerospace Medical Association. These and other articles are available for download from Mira LibrarySmart via <https://submissions.miraed.com/asmaarchive/Login.aspx>.

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DOI: 10.3357/AMHP4385.2015