

Solid-fuel rocket restarted

Solid-fuel rocket motors, often more reliable and less costly than their complicated liquid-fuel counterparts, have largely been confined to simple applications in which they need to be ignited only a single time. They could represent substantial advantages in space missions if they could be stopped and started more than once with precise timing.

After years of single-firing use by NASA and the military services, a multiple firing of a spacecraft-type solid-fuel engine has finally been accomplished. At the Air Force Rocket Propulsion Laboratory in California, a 12,000-pound-thrust motor was fired once for 39 seconds, then extinguished in a fraction of a second by using pressurized helium to force 12 pounds of water through hundreds of small ports in the first of two "quench tanks." After an eight-second wait to be sure the motor was really stopped, it was reignited using a pair of externally mounted ignition devices and allowed to burn for 18 more seconds before being shut off with the second quench tank. Although the second firing blew off one of the ignition devices, causing a decrease in thrust, test directors from the Jet Propulsion Laboratory called the project a success.

The test, in a normal atmosphere at sea-level pressure, will be followed this summer by a double firing under simulated high-altitude conditions, to be sure the system will also work in space.

"And now a word from our sensor . . ."

How would you feel if you knew that the pilot of your airliner was landing the plane by watching the field on television? The National Aeronautics and Space Administration is trying just that, although not for commercial aircraft. As high-performance aircraft are designed for greater and greater speeds, they tend, for reasons of streamlining, to have smaller windows and smaller wings. Smaller windows, which come with increasingly sleek noses, restrict visibility, while smaller wings, necessary to reduce drag at high speeds, often require a plane to land with its nose much higher than its tail. Both conditions make it harder for the pilot to see the runway.

At NASA's Flight Research Center in California, tests are beginning with a television camera installed atop a small, twin-engine, propeller-driven aircraft. Pilots, their windows blocked by curtains, will attempt landings using a 5-by-7-inch TV monitor in their instrument panel as their only visual reference. (A safety pilot, his view unobstructed, rides in the other seat.)

The agency is also considering such a system to guide operators of remotely piloted vehicles known as RPV's—unmanned aircraft controlled from the ground for use in target practice, bomb delivery and other tasks. This could eliminate the need for recovering RPV's by parachute, which can cause some damage, or by mid-air recovery, which requires the expensive presence of a manned aircraft.

Kelly Johnson retires

Clarence "Kelly" Johnson, one of the leading figures in the evolution of high-performance aircraft, has retired from the Lockheed Aircraft Corp. In some 40 years of much honored service, he played a major role in the design of many aircraft, including the F-80 (the first U.S. production jet), the high-flying U-2, the Constellation transport, the Hudson bomber, the ultra-high-performance SR-71, the T-33 jet trainer and the ubiquitous F-104.

Women's reactions toward childbirth

A woman's perception of her mother's childbirth experiences greatly influences her anticipation toward labor and delivery, but it does not color her evaluation of her actual delivery. The outcome of delivery, instead, is influenced by the intensity of communication on childbirth between mother and daughter, conclude two University of Florida psychologists from a study they made on 60 white middle-class women undergoing first pregnancies.

Judith M. Levy and Richard M. McGee report in the January *JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY* that women who heard extreme reactions (highly favorable or unfavorable) or who received no communication at all tended to evaluate their deliveries as negative. Women who rated their childbirth experiences positively tended to receive moderate communication from their mothers. The researchers postulate that those who received no communication or highly positive communication were unprepared for the more unpleasant aspects of childbirth. Individuals who anticipated a favorable experience felt "victimized" by the stress impact, and for those who received extreme negative attitudes, the contemplation of the stress of childbirth was too shattering for a reversal of outlook.

The researchers conclude that there is a need for childbirth counseling that is individualized to the needs of each woman. "Many prenatal programs operate on the assumption that reassurance and alleviation of anxiety results in favorable childbirth experiences," the researchers state. "While this type of communication may be successful with highly anxious women, it would defeat its purpose by strengthening the defenses of those who are unable to confront and anticipate the more unpleasant aspects of childbirth."

Mothers of hyperactive children

Observing mother-child interaction among groups of 13 hyperactive, learning-disabled and normal boys in a problem-solving situation, psychologist Susan B. Campbell of The Montreal Children's Hospital, Quebec, found that the mothers of hyperactive children tend to interact with and assist their boys more than do mothers of disabled or normal children.

Campbell asked the eight-year-old boys to produce block designs with their mother present. Mothers were instructed to aid their children as much or as little as they liked. Campbell reports in the January *AMERICAN JOURNAL OF ORTHOPSYCHIATRY* that the mothers of hyperactive boys provided more encouragement, more suggestions about impulse control and more disapproval than did mothers of the other children. The hyperactive child asked for more feedback and made more commentary on his performance than the other boys. In addition, the mothers of hyperactive boys perceived their children as having more conduct problems and being less mature than the other mothers of the comparative groups. They described their children as more active, aggressive, attention-seeking and disobedient.

"Taken together, these data suggest that the mothers of the hyperactive group were responding in the interaction situation so as to structure the tasks and thereby optimize performance," Campbell says. "It could be argued that mothers of hyperactive boys, by providing suggestions about the task solution and impulse control, as well as negative feedback and encouragement, were attempting to provide direction and keep attention focused on the task at hand."