adopt the essential principles of e management concept of concur-e, wherein each element of the al weapon system is integrated into ingle plan, program and budget, and implemented concurrently, consistent th lead time requirements. It would costly in time to develop the vari-s subsystems first, he said.

Gen. Schriever said weapon system velopment based on technical feasi-ility requires that the military:

"Conduct a vigorous research, applied search, component, and subsystem de-lopment program.

"Conduct constant evaluation and alysis of the programs, aided by ience and industry, to insure timely itiation of space weapon system de-elopment programs.

"Centrally manage and control space apon system programs to insure ef-ctive systems engineering, integration d testing, which is essential to the ntricate technical interface between nd among the several subsystems com-rising the total weapon system."

The ability to apply this philosophy weapon system initiation to space hicles will be complicated if there an excessive division of subsystem velopment projects among agencies if there is not a timely decision as the military operator.

Military Role

There is a clear military role firmly tached to space weapon systems now der development, Gen. Schriever said. ese systems include the long range llistic missiles, the reconnaissance and rly warning satellites as well as com-unication, weather, navigation and apping and charting satellites.

While there isn't any question that ce will provide all three services with e ability to do their jobs better, par-ularly in the support areas, Gen. chriever added, it will be the Air rce's primary combat mission that ill be the most vitally affected.

He said the actual combat role of e Army will not be changed by space cause the foot soldier will still be eeded to occupy land, and the Navy going to continue to have ships on e surface and underneath the ocean. owever, by 1970 and perhaps long fore that, he said, the strategic and r defense missions of the Air Force ill be taken over by space weapon stems—ballistic missiles, satellites and acecraft.

"I think it is clear that our responsi-ility under the National Security Act that we provide the systems that will st do the strategic and air defense b," Gen. Schriever emphasized. "Un-ss the Air Force is clearly given this ission to do, we might very well end p being largely an air transport or gistical service."

High Intensity Radiation Produces Convulsions, Death in Monkey

Glaser
Bailey Pearce was quoted
Aviation Week — ,29-30 (4 May 1959)
This is Baldwins Work

Washington—Recent experiments by National Institute of Health show that close-range exposure of the brain of a monkey to high intensity radio waves can produce convulsions, and five minutes continuous exposure can cause death.

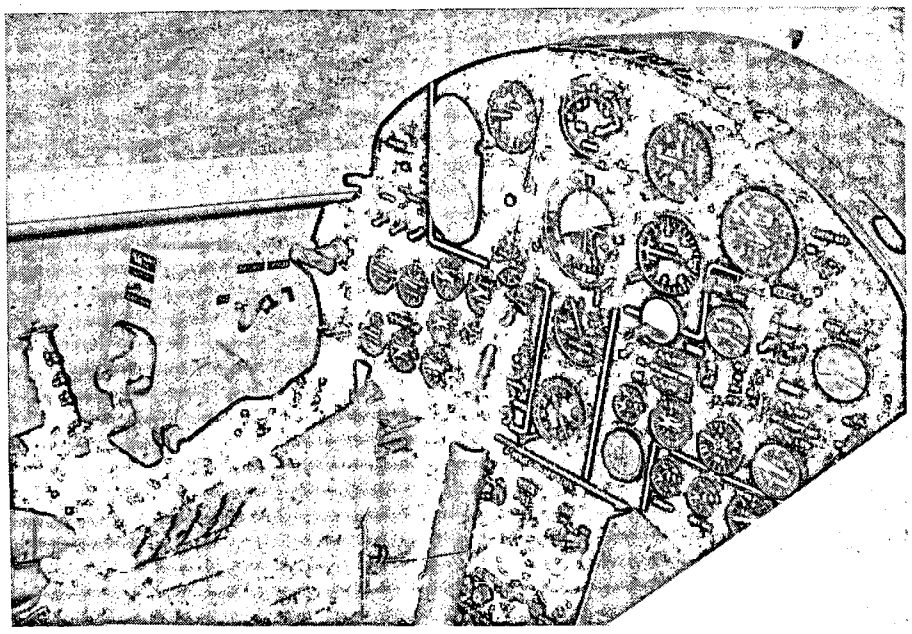
First details on the experiments conducted in March were revealed by Dr. Pearce Bailey, director, National Institute of Neurological Diseases and Blindness, in budget hearings before House Appropriations Subcommittee.

Dr. Bailey speculated that the discovery of possible brain damage from radio/radar waves might explain "mysterious airplane accidents." However, avionic experts point out that a metal fuselage acts as an effective shield and that aircraft operate at considerable distances from powerful radars which further attenuates their energy intensity.

Brain disturbances in the presence of high intensity radiation also have been observed recently in mice, chickens and dogs by scientists at Rome Air Development Center, AVIATION WEEK has learned. RADC tests are part of a program to assess biological damage due to electromagnetic radiation and to establish safe limits for human exposure. It has been known for some time that high internal body temperatures can be produced by exposure at close range to high intensity radar energy, not unlike the controlled effect produced by short-wave diathermy machines for medical use.

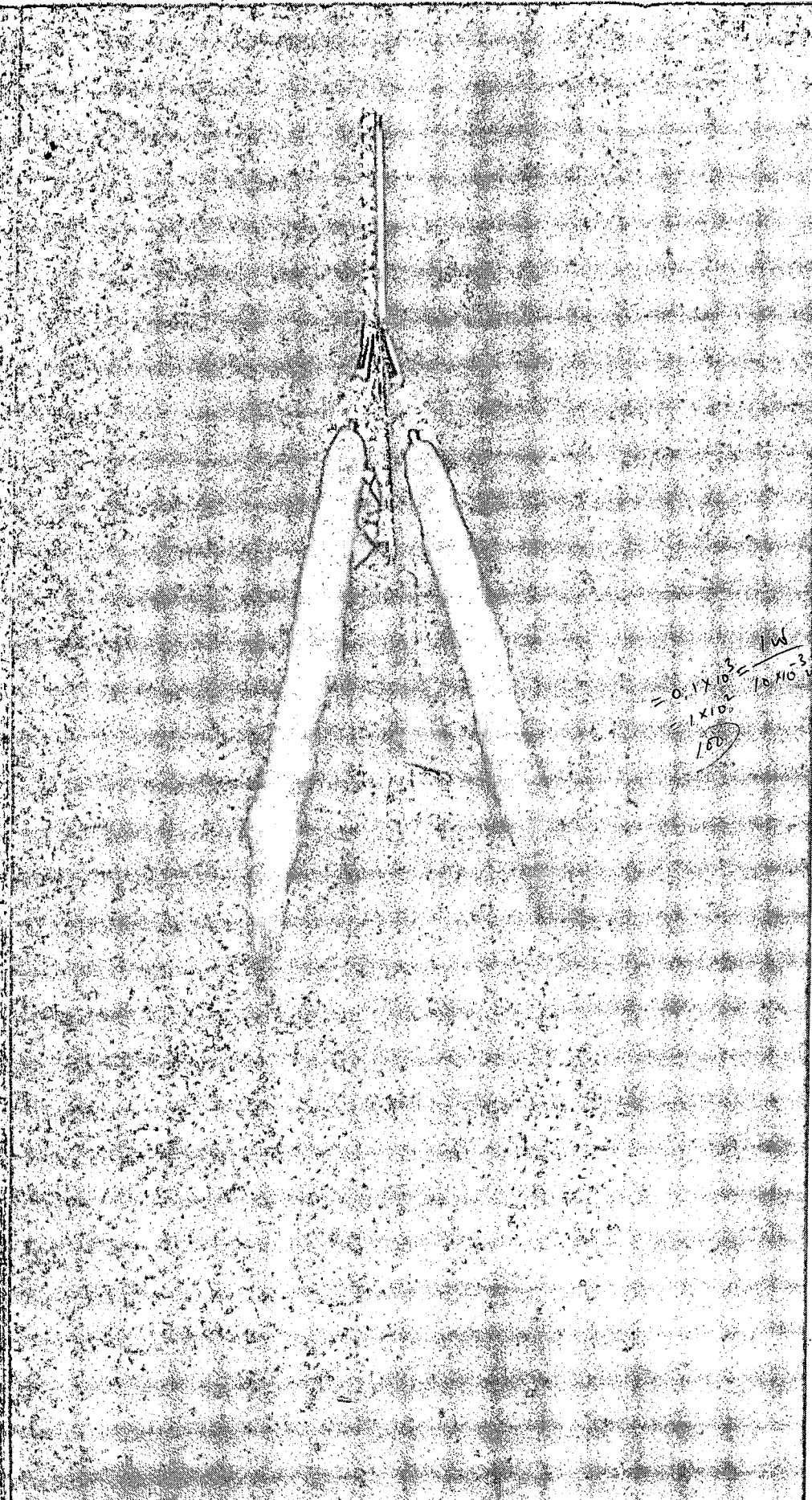
In the experiments, the monkey was fastened to a chair in a sitting position inside a drum-shaped cage which served as a resonating cavity to greatly strengthen the electromagnetic energy within the cage. A radio antenna fitted to the top of the cage pointed toward the monkey's head, in line with his brain stem—the central vital portion of the brain. Antenna was excited by an AN/GRC-27 ultra frequency transmitter which operates in the 225 to 400 mc. range, has a peak output of about 100 w.

When the transmitter was turned on, the monkey was apparently unaffected for a few seconds, then it became drowsy. After a minute or so, Dr. Bailey



X-15 Cockpit Mockup Shows Location of Controls

Mockup of the North American X-15 rocket research aircraft was displayed at the Air Force Assn.'s World Congress of Flight in Las Vegas, Nev. The mockup has a wrist control stick on the right-hand side (not visible) for conventional aerodynamic control. Center stick moves simultaneously with it. Center stick is installed for landing because pilots are accustomed to using a stick during landing. A semi-wrist-motion control is on the left side of the cockpit; it is used for ballistic control and activates small jets for out-of-atmosphere control. This control operates up or down or left or right. Oxidizer and fuel tanks are trimmed with jettison trim control (toggle switch above ballistic control) which trims the center of gravity of the plane and also controls jettisoning of fuel. Sideslip, roll and pitch instrumentation (center of panel) is required for the flight test program to get accurate settings for these regimes, since the conventional ball indicator does not give a close enough reading. This mockup differs somewhat from the actual X-15 cockpit.



NASA Tests Project Mercury Escape System

Escape system of the Project Mercury manned orbital capsule is tested at National Aeronautics and Space Administration Pilotless Research Station, Wallops Island, Va. Escape rockets carried a full-scale one-ton "boilerplate" model of capsule to 2,250-ft. altitude. Tripod then separated and capsule parachuted into water and was recovered by helicopter.

said, the monkey became agitated, moving its head from side to side. In another minute there appeared unmistakable signs of some impending disturbance in the vital centers of the brain, which were probably resonating with these electromagnetic waves, Dr. Bailey said. Finally the monkey was thrown into a major convulsion a few seconds before death occurred.

Examination of the brains of monkeys which died in the experiments revealed no pathological cause of death, Dr. Bailey said. Another 10 monkeys whose exposure was cut short of death showed symptoms which resembled those of Parkinson's disease in humans. Most survivors recovered completely.

Dr. Bailey said the discovery of brain effects offers great possibilities as a new research tool in brain research and ways of developing improved devices to protect against electromagnetic radiation.

Rome Air Development Center tests have been run with radiation intensities of up to one watt per square centimeter on the test animals, approximately 100 times the maximum dosage considered safe for humans. Tests have been conducted over a wide range of frequencies from approximately 200 mc. to 27,000 mc. All test animal deaths to date have resulted from hyperthermia—excessive internal body temperature.

Although high intensity radiation exposure has produced mental disturbances in the test animals, RADC scientists have succeeded in training some of the animals to perform normal tasks despite the radiation. RADC has an extensive radiation biology program under way at a number of universities, including Buffalo, California, Iowa, Miami, Pennsylvania, Rochester, Tulane and Tufts.

Snecma Arranging For J75 Production

Paris—The state-owned engine manufacturer Snecma and Pratt & Whitney are ironing out details of a deal under which Snecma would manufacture the jet engines under license. (AW Feb. 8, p. 23).

The engines would be used in the production version of the Mirage IV bomber (AW April 27, p. 27) slated to make its first flight in the spring of 1961, and possibly in a Super Caravelle with 90-100 passenger capacity.

The deal involves financial participation by Pratt & Whitney. Although Snecma officials would not disclose what arrangements were being discussed, one indicated that Pratt & Whitney would get some—probably less than 20%—of Snecma's stock, now owned by the French government.

Snecma recently signed an agreement with Pratt & Whitney to maintain and overhaul J75s in Europe.