

ADVANCED TECHNOLOGY

(Remarks by C. R. Able, Group Vice President, Missile and Space Systems)

Our next topic is advanced technology. The space-directed programs within the Missile and Space Systems Division's area of future interest are the responsibility of our Advanced Systems and Technology directorate.

We often describe this entire advanced technology operation as analogous to working with technical building blocks. In effect, the AS&T engineering staff creates the building blocks that will eventually comprise a space system. In practice, as each building block requirement is identified, every aspect is researched and engineered until it becomes technically practical.

This activity is supported by our own Independent Research and Development (IRAD) program and by Contract Research and Development (CRAD) funding. The projects and programs undertaken are relevant to and directed toward a matrix of selected end-point systems. Typically, they are study contracts or technical building blocks experimental contracts that range in funded cost from a few thousand dollars to as much as \$3 million. The total effort in our Advanced Systems and Technology activity now exceeds \$30 million a year.

Since 1961-62, when we established a separate program for manned spacecraft, the considerable expenditure that we have made advanced our technological capability until we were able to bid for and win the contract to design and build the Manned Orbiting Laboratory. Our "homework," these IRAD and CRAD funded studies and experiments, was the most important factor contributing to that success.

By identifying what the general needs of the manned space station business were, and by doing our homework, Douglas has become qualified to lead the way in the development of manned space stations. Through these processes, we have been able to systematically resolve the technical problems that were critical to the space station development. We are still conducting studies and experiments that will lead to the eventual development of increasingly sophisticated space stations.

Looking ahead to a more diversified manned space program, we are now conducting studies of problems ranging from those associated with the approaching need for reusable spacecraft and launch vehicles, to the development of nuclear stages and new concepts for providing secondary power. Our belief that maneuverable spacecraft and lifting-body entry vehicles will constitute important steps in the evolution of reusable spacecraft has prompted us to supplement our contracted studies in this area with company-funded studies.