

requirements. As of February 1966, the Space Administration was still not in a position to make such a determination, because a study of the required magnitude was not yet available.

We believe that, if the assigned responsibilities at Headquarters for the central management of automatic data processing equipment activities are properly carried out, more effective planning for and utilization of such equipment throughout the Space Administration will result. Similarly, if the newly established Ames review board effectively monitors equipment utilization and systems development and evaluates proposed equipment acquisitions, we believe that deficiencies of the type discussed in this report will be eliminated or greatly minimized. Because of the importance of automatic data processing to the Space Administration's research and development activities, we plan to devote more attention to this area in the future.

We are making this report to the Congress because of the increasing importance of computer technology in Government operations and the increasing costs being incurred therefor. We believe that the practices described in this report demonstrate the need for effective control.

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REVIEW OF DEVELOPMENT OF CERTAIN SCIENTIFIC INSTRUMENTS FOR THE SURVEYOR PROJECT, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The objectives of the Surveyor project are to soft-land a series of unmanned instrumented spacecraft on the moon's surface, gather scientific and engineering data about the moon, and transmit the data back to the earth, where it will be disseminated to the scientific and engineering communities. In our review we learned that the Space Administration had expended about \$5.7 million for the design and development of certain scientific instruments which were removed from the approved Surveyor spacecraft payload after a reduction in the predicted capability of the Atlas/Centaur launch vehicle required a drastic reduction in the weight of the spacecraft instrument payload. We therefore undertook a review of the management of instrumentation development, to determine whether costs of this nature could be avoided or reduced.

On the basis of our review, we believe that a significant part of these costs were incurred after it became apparent that the use of the instruments was no longer feasible. We found that the Space Administration had not promptly initiated appropriate studies for establishing the instrumentation it desired for a lighter weight spacecraft for the early Surveyor flights when it was evident that such action was necessary. We found also that the Space Administration took no action to discontinue the development of instruments for use on a heavier weight spacecraft at the time that data became available which showed that the reduced launch vehicle performance and the correspondingly reduced instrument payload would apply to all approved flights.

We believe that, had the Space Administration taken timely action to suspend or discontinue development of these instruments for which, on the basis of available information, there was no reasonably fore-