

Center Directors to initiate work and change emphasis within a broad subprogram at any time during the year.

In answer to part e. of this question, the development of techniques for enhancing distorted photographic images through the use of computers was undertaken by NASA to provide technology necessary for such spacecraft as Surveyor, Lunar Orbiter, and some Mariners. Once these techniques were proved successful, their possible applicability to biomedical problems was pointed out by NASA's Office of Technology Utilization. The NASA Office of Advanced Research and Technology (OART) supported preliminary investigations of these applications and, when it became apparent that these computer techniques did indeed have biomedical applications, NASA queried the National Institutes of Health (NIH) as to their interest in supporting further research along these lines. NIH has indicated a strong interest in pursuing this line of applied research at the Jet Propulsion Laboratory and has approved a grant to Cal Tech for this purpose.

Question No. 2. In your testimony you cited a number of instances where NASA is doing work for other agencies; however, you do not discuss what work other agencies are doing for NASA. Please describe the extent of this latter effort and the amount of money normally involved annually.

(a) How is NASA kept aware of the work being performed in laboratories of other agencies?

(b) What criteria are there to determine if NASA should perform work in-house, contract to industry or universities, or have the work performed by another government agency?

Response. Virtually every agency in the Federal Government provides some support to NASA in some form. The following is a list of the agencies which were reimbursed for some form of support in 1968:

- Agency for International Development
- Atomic Energy Commission
- Civil Service Commission
- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Health, Education, and Welfare
- Department of the Interior
- Department of Labor
- Department of State
- Department of Transportation (FAA)
- Government Printing Office
- General Services Administration
- Library of Congress
- National Academy of Sciences
- National Science Foundation
- Post Office Department
- Smithsonian Institution
- Veterans' Administration

The total reimbursement to these agencies in 1967 was \$312.7 million, and in 1968 this total is expected to decline to \$281 million. Approximately 81% of this sum is to the Department of Defense.

The support provided covers a broad range of activities from research to custodial and related services. In the Space Applications Program, for example, support is received from DOD, Department of Commerce, Department of Interior, AEC, and the Department of Agriculture, for work in supporting research and technology, NIMBUS, geodetic satellites and meteorological soundings. Much of the DOD support to NASA over several years has been operational support for the manned space flight program. In the Apollo program for instance, DOD provides, through its various services, spacecraft technical support and contract administration; launch vehicle technical support, propellants, and contract administration; technical and administrative support at the Eastern Test Range; engine development testing; range operations, aircraft services; and manned space flight recovery operations. The Corps of Engineers has been instrumental in carrying out the bulk of NASA's major facility construction needs since the earliest days of the agency.

NASA also obtains support from DOD and other agencies on smaller research and development activities on a non-reimbursable basis. These activities are usually arranged informally between NASA laboratory directors and their counterparts in other research establishments, on the basis that the requested assistance is consistent with the existing research program of the helping organization.