

Document Title: J.R. Killian, Jr., "Memorandum on Organizational Alternatives for Space Research and Development," December 30, 1957.

Source: Dwight D. Eisenhower Papers, Eisenhower Library, Abilene, Kansas.

In the wake of Sputnik I and II there was a wholesale reexamination of U.S. organization for space related activities. In 1955, when a scientific satellite program was initiated, it was given a low priority in comparison to other military efforts. At the time there was concern that even a small civilian space program, if given too many resources, could adversely affect critical ballistic missile programs. The issue was not so much one of cost, but the scarcity of human resources and development and test facilities. However, the political firestorm set off by the Soviet satellite brought into question the relatively low priority given the scientific space program. From the time the first Sputnik was launched until NASA was established, almost all elements of the government were engaged in the debate on how best to redress the situation and reestablish the prestige of the United States. The failure of the first Vanguard launch on December 6, 1957, only intensified the calls for change. Sputnik also created the necessary impetus in the White House for the creation of the position of Presidential Science Advisor. On November 7, James R. Killian, President of MIT, was appointed to this position. One of Killian's first duties was to address the issue of alternatives for space research organization. Some of his thoughts in this early memorandum eventually formed the basis of the administration's future policy towards the creation of a space agency.

[1] December 30, 1957

MEMORANDUM ON ORGANIZATIONAL ALTERNATIVES

FOR SPACE RESEARCH AND DEVELOPMENT

This memorandum is based upon the following assumptions:

A. That the Department of Defense proceeds with its announced plan for a Special Projects Division, reporting directly to the Secretary and including, as one of its major responsibilities, space research and development for the DOD.

B. That there is a broad area of non-military basic research relating to space which will command the interest and participation of scientists and engineers in a variety of non-government and government institutions.

With these assumptions in mind, we can proceed to a discussion of how the Government's sponsorship of space research and development can be handled and how the military and non-military programs can be related.

There have been proposals for a new Government agency analogous to either NACA or the AEC to handle all space research and development. In appraising this approach, the following considerations are of importance:

A. The DOD is committed to a space program and is in process of setting one up, although the nature of the program has not been clearly defined.

[2] B. Those aspects of space research and development which relate to the use of missile engines, and the testing and launching of vehicles must be closely associated with DOD missile programs. The necessity of such close association may dictate the placing of responsibility in the DOD for the development, testing, and use of rocketry for putting up space vehicles. It would seem unwise for a new agency, independent of the DOD, to have to create and use test facilities other than those built by DOD.

It seems of greatest importance that the DOD's own space program be very closely related to its missile program or for the two programs at some time to be merged.

These considerations seem to indicate clearly that the DOD must play a major role in space research and development if we are to use the nation's manpower and facilities in this area to the greatest advantage.

The DOD will, of course, be primarily concerned with those aspects of space research and development which will have military value. It is hard at this stage, however, to separate out of space R&D those elements, however basic and purely scientific, which would not contribute to military objectives. It seems entirely feasible for DOD to be the major sponsor and entrepreneur of space research and development, both military and "non-military."

There are many scientists and others, however, who are opposed to the centralization of all space R&D under the DOD. There are deeply felt convictions that the more purely scientific and non-military aspects of space research should not be under the control of the military. In the first place, [3] such an arrangement might improperly limit the program to narrowly concerned military objectives. In the second place, it would tag our basic space research as military and place the United States in the unfortunate position before the world of apparently tailoring all space research to military ends.

The problem of planning our non-military basic space research, then, becomes one of devising the means for non-military basic space research while at the same time taking advantage of the immense resources of the military missile and recon satellite programs, there are several possible ways of doing this:

A. The D.O.D. as a part of its program would establish a central space laboratory with a very broad charter which would permit the conduct of the most basic sort of research as well as R and D, having obvious military objectives. We see the pattern for this is such a Laboratory as the Los Alamos Scientific Laboratory of the A.E.C. Such a laboratory might also have the authority to sponsor research in civilian institutions.

B. The Department of Defense might confine itself to its military mission and some other agency or agencies external to the D.O.D. might engage in basic research. One obvious way of doing this would be to encourage N.A.C.A. to extend its space research and to provide it with the necessary funds to do so. A second [4] method (and this one might be handled along with an N.A.C.A. program) would be to provide funds either through the Department of Defense or

otherwise to the National Research Council, the Council in turn sponsoring a series of projects in universities and industrial laboratories. The N.A.C.A. itself might do sub-contracting as indeed it does now to a limited extent. The problem here would be not to burden the N.A.C.A. with so large a program that the nature of N.A.C.A. would be changed. In its present form, it has been very successful but an undue enlargement of its program might reduce its effectiveness.

If either the N.A.C.A. or N.R.C. methods or both were followed, it would be necessary to carefully work out a cooperative arrangement with the D.O.D., for the D.O.D. would have to be an active partner with these agencies.

Such combination of sponsorship and programs would probably be the most advantageous way of carrying on space research for meeting both military and non-military objectives.

In considering these various alternatives and means, it is important to keep in mind existing resources available in the D.O.D., the Army's ABMA has a highly competent group for space research. The Air Force's BMC has important resources, including a going program for the development of a recon satellite. Cal Tech's Jet Propulsion Laboratory has advantages and resources for space research--a laboratory which has been closely associated with the Army. In the interest of conserving [5] man power and utilizing skill and experience already in being, these agencies must be considered in planning a new program. Some one or combination of these might well be made the nucleus of an extended program.

There should be some mechanism, however, which gives coherence to the broad program and which avoids a program encouraging inter service rivalries.

The overall plan must permit and provide for bold, imaginative research and planning. It must recognize the importance of providing the means of incentives for pure scientists to move effectively into space research without regard to practical applications. We must realize that in addition to such obvious objectives as space travel and reconnaissance, there are extraordinary opportunities to extend our knowledge of the earth and its environment and enormously to extend astronomical observations. It may well be that these kinds of pure, non-practical research objectives may prove to be the most important and in the end the most practical.

The overall plan, then, must keep steadily in view the need for those means and programs which will command the interest and participation of our best scientists. We must have far more than a program which appeals to the "space cadets." It must invoke, in the deepest sense, the attention of our best scientific minds if we as a nation are to become a leader in this field. If we do not achieve this, then other nations will continue to hold the leadership.

December 29, 1957

J.R. Killian, Jr.

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