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THE WHITE HOUSE
WASHINGTON

August 22, 1958

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Current And Proposed Air Defense Radar Coverage

The primary search radar used in this country for air surveillance is the AN/FPS-3. This radar is able to detect fighter size targets up to an altitude of approximately 50,000 feet. There is, however, a modification program in progress to increase the search capability of this radar. The converted AN/FPS-3, known as the AN/FPS-20, has a high probability of detecting fighter type aircraft at altitudes up to 60,000 feet. Approximately 35 percent of the AN/FPS-3's are presently converted, and the modification program should be completed by January 1960. It should be noted that these altitude limitations on detection performance do not represent the fundamental limits of radar technology. They result only from the fact that these radars were developed at a time when 50,000 feet appeared to be a reasonable objective for high altitude detection.

In addition to the radar modification program, the Air Force has a long range plan for providing the air surveillance system with modern search equipment. Procurement of the AN/FPS-7 as well as an accelerated development effort on at least one of the new radar systems (AN/FPS-24, 27 and 35) will be required if this plan is to be fully implemented. With high priority budgetary support, complete modernization of this country's radar surveillance system would be possible by mid-1963. All the radar being considered for this program will be able to detect fighter aircraft up to 200,000 feet or higher.

By and large, the present and proposed future radars are able to detect targets of medium and heavy bomber size at 1 1/2 or 2 times the several altitudes quoted for fighter aircraft.

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All of the present ground based search radars are vulnerable to electronic jamming from enemy aircraft. The radars being developed under the Air Force long range air surveillance modernization plan will, as a result of their increased power and broad-band operating characteristics, increase the enemy's jamming requirements. A still greater effectiveness in the face of electronic counter-measures could be realized if future radars were equipped with passive receiving channels to provide bearing information from enemy jamming signals.

This country's air surveillance is extended beyond the coast with AEW aircraft and Radar Picket Ships. There is not, however, any adequate means of rapidly processing the radar information collected by these units such as exists in the SAGE system for ground based radars. Thus enemy aircraft approaching over water cannot be effectively engaged before they actually reach the coast. Present weapon systems have the range capability to engage aircraft several hundred miles at sea, however, without a high speed data processing and control system, they cannot be directed to potential targets in off-shore areas.

The high altitude coverage of the Distant Early Warning line is provided by AN/FPS-19's. These radars are able to detect fighter aircraft at altitudes of 50,000 to 60,000 feet. The Air Force plans to replace these units with an improved model known as the AN/FPS-30. If this program is implemented, the DEW line will have a 100,000 feet altitude detection capability for all aircraft by 1963. The high altitude coverage of the DEW line seaward extensions is provided by Radar Picket Ships. The radars on these ships at the present time can detect all aircraft up to 100,000 feet in altitude.

(Signed) J. R. Killian, Jr.

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