NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON 25, D.C.

October 29, 1962

OFFICE OF THE ADMINISTRATOR

The President
The White House
Washington 25, DC

Dear Mr. President:

In accordance with the request you made during your recent tour of selected NASA installations, a preliminary analysis has been completed to determine the feasibility and the resources implications of accelerating the manned lunar landing program in order to establish a target date for the first landing in late 1966, one year earlier than the present target.

The late 1967 target date is based on a vigorous and driving effort, but does not represent a crash program. A late 1966 target would require a crash, high-risk effort. The nature of a development program such as the manned lunar landing, however, makes the possibility of achieving target dates set this far in advance no better than fifty-fifty. In contrast, the odds that we can accomplish the landing within this decade are excellent. You might, therefore, think of this matter of target dates as one in which we fix a date which is difficult, but not impossible to attain. We schedule the work against thus date and thereby insure a driving effort. However, until later in the development cycle, target dates cannot be viewed as certain forecasts of when the mission will be accomplished.

The depth of this special analysis on a late 1966 target date is in no way comparable with the detailed analysis which formed the basis of the operating plan for a late 1967 target date. A definitive study of time and resources requirements for many sequential events involved in the accomplishment of this mission by late 1966 would necessitate a much more intensive and detailed review by the NASA headquarters and field centers, our prime contractors and the principle subcontractors. However, the preliminary analysis which follows permits a gross evaluation of the possibilities currently available.

Current Plan Mission in late 1967

The NASA operating plan of $3.7 billion for FY 1963 and the requested budget level of $6.2 or FY 1964 are aimed at the target date of late 1967 for the manned lunar landing. levels, the amounts 1anned for the manned lunar landing are $2.4 billion in FY 1963 and $4.2 billion in FY 1964. These funds include $2.0 billion and $3.4 billion respectively for propulsion systems, launch vehicles, spacecraft, facilities and, flight operations; and $.4 billion and $.8 billion respectively for necessary supporting effort in unmanned scientific investigations, advanced technology, and improvements to the tracking network. These funds do no cover the personnel

costs of NASA employees or amounts for the operation of the NASA centers for which the totals are $446 million in FY 1963 and $579 million in FY 1964. The major program segments are funded at the following rate under this plan:

	(In Billions) 1963	1964
Spacecraft and Flight Missions	$ .7	$ 1.5
Development of Launch Vehicle and Propulsion Systems	$ .7	$1.0
Facilities, Launch Operations, Integration and Checkout, Systems Engineering and Aerospace Medicine	$ .6	$.9
	$ 2.0	$ 3.4

Alternative Plan Mission in Mid-1967

In preparing an operating plan for FY 1963 base on Congressional appropriations, it was estimated from detailed studies that the first landing might be possible six months earlier if an additional $427 Million were available early in FY 1963. Thus, the late 1967 target date in the current plan is six months later than a date possible with optimum FY 1963 funding. The additional funds in FY 1963 would provide (1) heavier contractor effort on launch vehicles at Chrysler, Boeing, North American Aviation and Douglas (2) procurement of hardware associated with Apollo spacecraft which is now deferred until FY 1964, and (3) accomplishment of the Gemini rendezvous mission nine months earlier than the current plan with resulting benefit to Apollo. The revised program would then be as follows:

	(In Billions) 1963	1964
Spacecraft and Flight Missions	$ .9	$ 1.5
Development of Launch Vehicle and Propulsion Systems	$ .8	$1.0
Facilities, Launch Operations, Integration and Checkout, Systems Engineering and Aerospace Medicine	$ .7	$.9
	$ 2.4	$ 3.4

Analysis indicates that if a mid-1967 target date were approved and the additional $427 million were made available in a FY 1963 supplemental appropriation in the early days of the 88th Congress, NASA could revise its target date to mid-167. NASA would also require deficiency authority to cover total agency operations until receipt of the supplemental, since it would be necessary to commence operation at a higher level immediately in order to attain this schedule.

Alternative Plan Mission in late 1966

In analyzing the actions which would be necessary to establish a target date for manned lunar landing in late 1966, the following major milestone changes would have to be accomplished relative to the current plan:

1. Advance the first manned Apollo command module flight on the Saturn launch vehicle six months to November 1964 from May 1965.

2. Move the first manned Apollo command and service module flight on the Saturn C-1B launch vehicle forward seven months to October 1965 from May 1966.

3 Accelerate the first Advanced Saturn development flight seven months to September 1965 from April 1966.

4. Change the first manned Apollo command and service modu1e flight on Advanced Saturn 12 months to June 1966 from June 1967.

If these new milestones could be achieved, the first manned lunar landing would be late 1966. To achieve these milestone changes, a number of departures would have to be made from the present development plan. (1) The extremely tight schedule would require heavy sub-system effort very early in the development cycle and would leave no room for any significant test or flight failures. (2) Parallel testing of all stages and an increased rate of development on the Advanced Saturn first stage would be necessary. (3) Concurrent development would have to be initiated on alternative components and subsystems to give better assurance that schedules could be met. (4) The current contractor overtime rate and amount of double and triple shifting would be markedly increased and extensive overtime and multiple shifting would be necessary. (5) A crash contractor manpower buildup and heavy NASA effort would be required to reschedule and execute the new plan.

The runout cost from FY 1965 through FY 1967 for the late 3966 target date is estimated to be 10-15% higher than the funds required for a late 1967 date. The funds required in FY 1963 and FY 1964 to meet this schedule are approximately $900 million and $800 million more respectively than the current FY 1963 availability and FY 1964 budget request. The total would be distributed as follows:

	(In Billions)	
	1963	1964
Spacecraft and Flight Missions	$ 1.1	$ 1.9
Development of Launch Vehicle and Propulsion Systems	$ 1.0	$1.2
Facilities, Launch Operations, Integration and Checkout, Systems Engineering and Aerospace Medicine	$ .8	$1.1
	$ 2.9	$ 4.2

Summary

On the basis of our current analysis, we believe that we can maintain the late 1967 target date for the manned lunar landing with $3.7 billion in FY 1963 funds and $6.2 billion in FY 1964. A budget increase of $427 million to $4.1 billion in FY 1963 and $6.2 billion in FY 1964 is required for a mid-1967 target date; and total resources of $4.6 billion in F? 1963 and $7.0 billion in FY 1964 are required for a late 1966 target date.

Let me emphasize again the preliminary nature of our conclusion that a target date of late 1966 could be established for the manned lunar landing with the indicated funding levels. This conclusion is not based on detailed programmatic plans. With this qualification, however, we are prepared to place the manned lunar landing program n an all-out crash basis aimed at the 1966 target date if you should decide this is in the national interest.

Respectfully yours,

James E. Webb Administrator