

16 August 1956  
 Mr. E. B. Lindley  
 J. C. Floyd  
 CP-100 Mark 6

CONFIDENTIAL

Notwithstanding the correspondence and discussions which have taken place on the establishment of the Mark 6 configuration, I have been thinking about this quietly during the vacation period and want to tell you that I am worried about our present approach to this job.

Almost everyone in the Company has a different idea of what the Mark 6 should consist and the R.C.A.F. themselves do not seem to be clear on what they require, despite the Draft Specification. The only basic facts that we have at the present time are :-

- (a) A Draft Specification, which we are attempting to meet in all respects, but which the R.C.A.F. have generally agreed could be revised if we show good cause for doing this.
- (b) A date of delivery of the first production aircraft by June 30, 1958.

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Aside from these basic requirements, the position is, to say the least, nebulous. We have at present no agreement on who will do the system management on the project, what the fire control system modifications consist of, or the details of the Sparrow missile and auxiliaries. These missing links will obviously sort themselves out in time, and for the purpose of estimating the cost of the job, planning our manpower requirements, and generally getting started on the project, we will have to make some assumptions. The first item to be decided is the general content of work in the Mark 6 version.

With regard to the detail configuration of the Mark 6, the position appears to be that we have indicated two ways of tackling the job, and the R.C.A.F. now require from us a

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schedule and costs for long nose, short nose, etc., in order to determine in effect how they wish us to achieve the specification.

To cut a long story short, everyone seems to be waiting for everyone else, and since the timing on the project is so short, I am sure that we must, once and for all, make up our minds on what we feel is the best way to meet the specification, or what sensible deviations we feel could be suggested to minimize the job and make it more compatible with the tight schedule, and then sell this to the R.C.A.F. Any other method of trying to finalize the configuration will involve considerable time and we will miss the schedule by a mile.

#### LONG NOSE

With regard to this configuration, I certainly understand your reasons for specifying the long nose with a complete radar package, but again, in thinking about this, I feel that we are possibly jeopardizing the effectiveness of the aircraft as a whole in order to achieve a packaging concept for the Fire Control System. In reading through Carl's memo to Jim Chamberlin dated the 24th of July, I cannot help but share Carl's feeling about the possible deterioration of handling characteristics, since while the longer nose cannot in any way improve the performance, there is every possibility that it will bring a number of real problems, some of which are listed below.

- (a) Destabilizing effects of the longer nose
- (b) Possible increase in tail load
- (c) Increased load on the nosewheel
- (d) Deterioration of directional stability, which will be further decreased by the Sparrow installation.
- (e) Increase in weight of the aircraft due to the longer nose structure.
- (f) Possible deterioration in performance and handling, higher stick force per 'g', etc.

Even if all of these problems are sorted out satisfactorily by test or calculation, we are obviously going to

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have to incorporate a number of structural changes in the front fuselage, possibly affecting the main longerons, and we will be required to carry out a considerable amount of flight test work on handling and stability, etc., due to the change in configuration. All this will involve design and flight test manpower and will be an added load on an already almost impossible schedule, and the cost of the aircraft will be correspondingly increased by the higher content of work.

In view of the problems outlined above I strongly suggest that we fully examine the situation to ascertain whether the same result can be achieved by some means other than changing the nose shape, either by deletion of equipment, which may be in the Specification, but which we do not necessarily feel is essential for the efficient operation of the aircraft and the fulfilment of intent of the Specification, or by ingenuity in packaging.

The obvious way to achieve these requirements with the minimum change is to retain the present nose structure, use the Douglas Sparrow Computer and delete the ARB-11 Radar Hower, which I understand is not available for some time in any case, and for which we are only required to provide space. I believe that the RB-2 system has in any case an I-band homing facility which, although somewhat limited in comparison to the ARB-11, since it will not detect GCI jamming sources, is still a pretty effective homing device.

While we would obviously have to get agreement on this concept from the R.C.A.F., I believe that the deletion of ARB-11, and the use of the Douglas Computer for the Sparrow, in place of the APA-24 Hughes Computer, would enable us to get everything else into the nose, including the IFF, and keep the radar package principle without re-design of the nose structure or lines.

I understand from Jim Chamberlin that the use of the Douglas Computer in place of the modified APA-24 does not degrade the weapon effectiveness of the system, and he feels that the Douglas Computer is the most effective package for its size and will meet the full intent of the Specification, although there is some indication in the Specification that provision should be made for a piece of equipment the same size as APA-24. We would obviously have to agree this with the R.C.A.F.

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I believe that the above arrangement gives the optimum solution, bearing in mind making the minimum change to the aircraft, resulting in a distinct possibility of meeting the schedule without any decrease in performance or handling of the aircraft, and still retaining the package principle for the radar nose, and I am sure that if we make this clear enough to the A.C.A.F. they would go along with us.

If they are unwilling to accept the Douglas Computer for some obscure political reason, and will not agree to the elimination of AMB-11, I am still convinced that it would be in the best interest of the Company overall, bearing in mind the ramifications of the first part of this memorandum, to move the power supply from the nose, while still retaining the package principle for the basic radar equipment which requires frequent adjustment.

The situation on the establishment of the Mark 6 configuration has now become extremely critical since Manufacturing should be doing their planning and costing immediately to meet the schedule. I have asked Carl to indicate to Manufacturing the work content of both concepts, and I would like to discuss this whole question with you on your return.

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