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STRICTLY CONFIDENTIAL

THE ARROW CONTROVERSY

In view of the fact that on return from my recent trip to the United Kingdom I was shocked by the air of dependency and gloom which had settled on the program in Canada, I feel that it might be worthwhile to put on paper a summary of my own thoughts on the subject, since, from 3,000 miles away, I was able to take a more distant and, I think, a clearer look at the overall situation.

My only reason for doing this is the hope that it might help to shake a few people out of the "square" into which they appear to have lapsed at the moment.

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In reading some of the press reports, I believe that too much emphasis has been put on the unemployment aspects of the decision to come, and there is no doubt in my mind that if the Arrow was a "dud", or not required for the defense of Canada, we should not wish to proceed with it solely on the basis of "keeping people busy", since they would obviously be better employed on some other program that was of more significance.

My points, therefore, will be based on the facts as I now see them, from the military standpoint, and the defense of our country.

1. It is an established fact that for some time to come the armed bomber will be a major threat. There are, at the present time, over 4800 SAC type bombers in service in the world capable of carrying a nuclear offensive weapon, and the U.S.S.R. possesses more than half of this total.
2. Russia is known to be developing a new delta wing bomber (the Bomber).
3. Intelligence estimates put the RCAF on a real threat in 1964-65, with bombers will the maximum threat at that time.

CONCLUSION NO.1)

There is general agreement that the manned bomber will be the major threat for the next 5 to 6 years at least, and will continue to be a threat even after that time.

4. The considered opinion of the responsible people with whom I talked in the United Kingdom is that, as a result of recent developments, and from the results of Operation Sunbeam recently carried out as a U.K. defensive exercise, the manned interceptor is the best means of dealing with both high level and low level threats, and in the face of coordination jamming, which the Russians are known to possess, the two-man interceptor is considered to be the only means of reasonable defence available for some time to come, since it is considered that the enemy can completely jam out range information for the operation of a close controlled guided missile, including Bomarc. The people responsible for carrying out the defence of the U.K. (not the politicians), are now apparently convinced that the manned interceptor is an essential element in the defence of the U.K., and this decision was reached within the last two months.

5. We personally saw a demonstration of a new interception technique which had been studied at the Central Fighter Establishment in the U.K., and which was used in Operation Sunbeam with great success, even against low level attacks, assuming that all ground radar was jammed, i.e., conditions under which a defensive ground to air missile would be out of action.

It might be argued that the defence of the U.K. is somewhat different to that of Canada. However, the manned interceptor philosophy is obviously also being followed in the United States, where the F.105 long range interceptor is now being developed as another generation.

CONCLUSION NO. 2)

There now appears to be complete agreement, at least at the military level, that a manned interceptor is required for defence against the manned bomber threat, especially in the face of electronic jamming, which the Russians are known to possess at the present time, and the adaptation of the Bomarc by the R.C.A.F., which is obviously to fill in some gaps in the eastern Bomarc cluster defending the United States, cannot be considered as an alternative to a manned interceptor.

6. Assuming then that everybody is in agreement with the first two conclusions, the question now arises as to which manned interceptor should Canada adopt. It may be argued that, despite the 1953 requirement for an all-Canadian aircraft to meet particular Canadian defence requirements at that time, which launched the Arrow into being, the threat and general defence picture has changed to the extent that, say, the F.106, which is available from the United States, while inferior to the Arrow, might now be adequate. However, I believe that the following points will show this not to be the case, although in the final analysis of course, the R.C.A.F. must decide what, in fact, is adequate for the defence of Canada.

1. The Arrow with the presently conceived armament pack containing MB-1 and Falcon missiles plus fuel, has a subsonic radius of action, based on indications of drag from flight test, of around 300 N.M., with a supersonic combat and all allowances, which is considerably higher than any other aircraft in its class.

Whilst our Air Force have said they do not have any stated requirement for increased range, I believe that operating under jammed conditions without close control, which is the environment now assumed by all the experts in the U.K., range will be particularly important on the latter type of mission suggested by C.F.E. as being the optimum defence, and as demonstrated in Operation Sunbeam.

2. The Arrow has more military payload capacity than any other contemporary bomber-destroyer, and this will be particularly useful when other versions of the aircraft are considered. For instance, we are carrying out a study to check whether an anti-ICBM missile can be carried and launched from the large armament bay, and this looks very promising.

In a country such as Canada, which can only afford one major aircraft project per generation, this flexibility has always been assumed to be very important.

3. At the price per aircraft quoted by Mr. Gordon, the Arrow in production appears to be approximately the same cost as the F.106 with the advantage that, in the case of the Arrow, the money stays in Canada.

7. The continuation of the Arrow program retains technical skills which have been collected together with great difficulty, and provides continuity in the aeronautical research and development programs in Canada which, if properly exploited, should give our country a fine foundation

to participate in an active way in the future technical progress in astronautics, space research, etc.

The case, then, for the manned Interceptor, and for the Arrow in particular, is ironclad to even the most unbiased Canadian, and this philosophy is also understood and agreed in the United Kingdom (without solicitation!).

How then can we account for the statements made by the Prime Minister and, more recently, by the Minister of Defence, who said the other day that nobody wanted the Arrow? (Incidentally, when we were at C.F.E. and Bomber Command, they both expressed a great desire to get their hands on a quantity of Arrows, and C.F.E. in fact said that they believed they could adequately defend the United Kingdom with 200 Arrows, and they knew of nothing else that would be just as good.)

We can only assume that the policy makers in Ottawa have not been provided with the facts (since they are obviously sincere and honest people), otherwise, they could only have come to the same conclusion as did the people who have the facts, assuming of course that their prime concern is the defence of Canada, rather than political expediency, which point we would not question.

Whatever the reason, the results have been the most confused and ridiculous situation ever to come up for major decision by any Government, and Gilbert and Sullivan could not have done any better! The Russians must be almost falling off their chairs in amusement at the present situation, since Mr. Khrushchev could not have done a better job himself of creating such a ridiculous situation.

Having said all this, the important thing is, how can we deal with the situation? In this regard, we will have to take the more important individuals, such as the Chief of the Air Staff and the Minister of Defence and try to provide them with the facts on which to base a firm recommendation. I believe the best way to tackle this would be as follows:

Chief of the Air Staff

He should be provided with the facts contained in the briefing given to us by C.F.E., showing concrete evidence of the requirement for

manned fighters, and the facts about the performance of guided weapons under jammed conditions.

He should also be briefed on the performance of the Arrow, with the range and performance that we believe would be obtained with a new weapon pack, so that this can be compared with the F.106.

Minister of Defence

He should be given the same facts as the Chief of the Air Staff, which would serve two purposes. Firstly, to provide him with information pertaining to the defence of Canada, which apparently he does not at present possess, and, secondly, he should be provided with an "out" for changing his mind, since politicians usually find it very difficult to admit a mistake, and, if he was given the briefing by C.F.E., this would provide the opportunity for him to indicate that further and more recent facts were now available to him to assist in making a decision.

Over and above this, I believe there is much to be done within the Company, and we are not all apparently agreed on how this should be tackled. My own opinion is as follows:

1. Since the budget for this fiscal year has already been established, we should not attempt to penny-pinch but, with that allocation, should strive to achieve the absolute maximum prior to the date of decision, since the status of the project at that time will obviously have a direct bearing on the decision.
2. I would particularly suggest that we avoid falling into the trap of freezing the aircraft on paper at a stage too early in the development. For instance, I understand that the engine is to be frozen on paper at a point where the afterburner fuel consumption is 25% too high, and the range performance of the aircraft will generally be affected.

Similarly, I understand that it has been decided to freeze the aircraft on paper at a point where the control system is not sufficiently developed to provide an airplane which would be considered a squadron aircraft with regard to handling.

I fully understand the reasons for freezing at some point, and also

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understand that development will be continued on the basis of E.C.P.'s after the freezing point. However, we should be very cautious about providing the performance report on the frozen minimum airplane, since this could easily be used as an argument that the Arrow is inferior to the F.106 on the basis of the Convair brochure figures.

5. Above all, I feel very strongly that we should not allow our morale to be undermined by the peculiar propaganda from a number of sources, such as the recent article by Blair Fraser in Maclean's Magazine, which was obviously written in complete ignorance of the facts, and our efforts must be towards moving as fast as we can, and achieving as much as we can prior to March.

This includes positive decisions on immediately proceeding with MA-1, etc., regardless of government authority, and, in other words, moving heaven and earth to achieve the maximum state of development as early as possible, even if it means spending a considerable amount of our own money. I personally know of no better investment at this time.

I am sure that all these facts must be understood within the Company, and my only excuse for writing this memorandum is to think aloud, and to include the inputs I obtained from the United Kingdom, which I believe have a significant bearing on the over-all situation.

J. C. Floyd,
Vice-President, Engineering.

JCF-las
Cc's
Mr. Fred T. Smye
Mr. J.A. Marley
Mr. W.H. Riggs
Mr. J. Turner

IMPORTANT REPORT. (ON MY RETURN FROM UK)
IN THE LIGHT OF LATER REVELATIONS, I DON'T KNOW IF MY SUGGESTIONS ON PAGES 4 TO 6 WOULD HAVE WORKED. HOWEVER, I WAS IN TOUCH WITH SIR THOMAS PIKE + SIR GEORGE GARDNER TO SEE IF THEY ^{COULD} SEND A SENIOR OFFICER OVER TO BRIEF THE RCAF AND GOV. ON THEIR THOUGHTS ON THE ARROW. HOWEVER, AS I MENTIONED, JOHN PIERCE PUT A SPOKE IN THAT WHEEL AND INSISTED THAT I LEAVE THE POLITICS TO HIM. I HAD TO PHONE BOTH PIKE + GARDNER TO TELL THEM THAT I WAS NOW OUT