

**SECRET**

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CANADA

## Department of National Defence

Royal Canadian Air Force

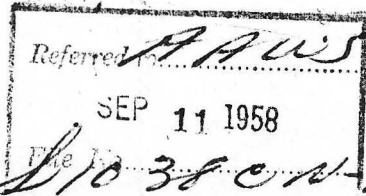
Malton Ont  
08 Sep 58

Ref Your S1038CN-180(AMTS/AAWS) 2 Sep 58

~~22 Aug 58 (unsigned copy left  
by F/L Hall with 1202 TSD)~~

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Chief of the Air Staff  
Air Force Headquarters  
Ottawa Ontario



*1038CN-183.5*  
*AAWS 26/7/58*

### ① Arrow Weapon System - Provision of Genie Capability

1 As agreed at the meeting held among representatives of AAWS, Avro and 1202 TSD in Ottawa, Wednesday 27 Aug, the TSD has informally discussed the implications of the CAS Genie decision with the co-ordinating contractor. F/L Hall represented AAWS at this meeting.

2 Attached to this letter are some notes which served as an agenda for the discussion with Avro. The points listed were not all discussed in detail, although each of the general headings received some comment. Since the purpose of the meeting was to do no more than determine those areas where difficulties would be encountered in achieving the CAS requirement, the opinions expressed by Avro people were more or less "off the cuff" and cannot be considered as being official company policy.

3 It was pointed out by Avro immediately, that whether or not a Genie program is introduced, the original ground rules laid down in report WSC-1 have not been in all cases met and that there is very little likelihood that the RCAF's minimum operational requirements will be met by 1 Jan 61. The addition of Genie to a program already limited by time and money means that something has got to give, i.e. the date on which the aircraft enters squadron service, the minimum capability of the weapon system, or the amount of money and man power available for the project. It appears probable that the addition of Genie will affect all three of these factors.

### 4 ENGINEERING

(a) Security Clearances. Unless arrangements are expedited for obtaining all the security clearances which Avro will require, it will be impossible for Avro engineering to release engineering drawings in time to introduce Genie in early 1961. At the present time, Avro has only four clearances to Douglas and two to Holloman AFB. These people do not represent all the design groups. A great many more will be required. It is understood that, even with RCAF help, these clearances will take at least one month. If there is any real hitch in obtaining the clearances, or if the USAF will not allow Avro and RCA full access to Genie information, the CAS deadline cannot possibly be met.

(b) Engineering Assumptions. Avro engineers are assuming, based on the little information which they have, that the Genie pack will be easier to design than that for the Sparrow. Although a large increase in the engineering man power will be required, the design will be simple enough to carry out provided

that the method of launch already suggested by Avro in its first Genie report proves to be satisfactory. If a complete re-design and proving of the ejection system is necessary, then an early 1961 date would be entirely unrealistic. All things being equal, Avro expects to be able to start releasing engineering drawings and to commence the manufacture of an experimental pack six months after contractual go ahead.

(c) Test Pack. It is envisaged that flight test can be carried out on a hand made weapon pack while simultaneously engineering drawings can be used for starting production. The fuel-carrying feature of the production pack should not be a problem, or require extensive air test.

(d) ASTRA. It was the impression at the meeting that certain parts of the RCA problem would be relatively easy, and that a degree of Genie capability could be attained by 1961. A new radome will be necessary but will not be an insurmountable problem. RCA has indicated, however, that they have not included in their flight test program measurements of any Genie parameters and that in the time available, the RCAF can have Genie or Sparrow capability but not both. One obvious problem, and a major one, is the development of ECCM capability. Several people expressed the opinion that Genie is particularly vulnerable to ECM and that RCA would not have this problem solved in 1961. In other words, Genie capability would be "clear air" capability.

## 5 FLIGHT TEST

(a) Program. It does not appear possible for Avro to institute the Genie flight test program much sooner than two years after engineering go ahead; the flight program would take at least six months to complete. This would mean that flight test would not start before late 1960. The fact that flight test would not start until 1960 would mean that manufacturing of the production packs from engineering drawings would be well on the way before any test results could be obtained. One Avro engineer felt that this risk would be relatively small provided that there was no great trouble with the launching mechanism.

(b) Aircraft Allocation. This did not seem to be a major problem. Two aircraft will be required to cover the mechanics of the pack and the electronic system. One suggestion was to use aircraft 22 for the ASTRA part of the program. It was also thought that RCAF phases could be more closely integrated to make an additional one or two aircraft available. Arbitrary decisions by RCAF will, of course, be required here.

6 MANUFACTURING. Based on the release of engineering drawings commencing May 59, the following rough estimates can be made for the manufacture of production packs. Tooling will be finished no sooner than Jan 60; detailed parts by Sep 60; the first pack in Nov or Dec 60. The second pack could come off the line in Jan 61, the third in Feb 61, the fifth in March 61, etc. It would not be pessimistic to say that the RCAF would fly away its first production pack in Mar 61.

## 7 CO-ORDINATION

Stephens foresees no real problem here; some additional man power in his section may be required. There will, of course, be a delay in the issue of many of the documents now being prepared by AWSC, because Genie must now be taken into consideration in all planning. The undersigned directed that those reports being prepared for the 7 Oct meeting in Ottawa should ignore the CAS decision, and be published under existing ground rules.



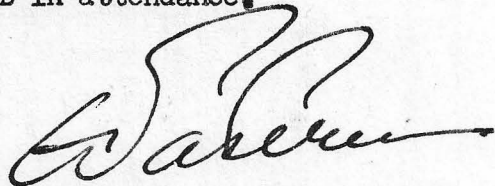
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SUMMARY

The situation would appear to be as follows:  
Financial authority for the Genie program must be available by 1 Nov 58. If the Genie launching system does not provide a real obstacle to the Avro Engineering Department, then it should be able to release drawings to production starting in May 59. An experimental pack can be made available in the summer of 59 with flight tests starting no later than Oct 59. Production packs would be available in Mar 61. Assuming that RCA has had some success with ASTRA, it could then be said that Genie capability had been attained by the Arrow Weapon System. It is likely, however, that unless astronomical amounts of money are made available immediately, the Genie/Arrow Weapon System, which will be delivered early in 1961, will not be that defined by your headquarters as a minimum weapon system. Genie capability, however, would be there and it is assumed that rapid improvements would be added in 1961 and early 1962.

9 It would not be possible for Avro to give you a complete report on the installation of Genie in the Arrow by 15 Oct. A great deal of the mathematical work necessary cannot possibly be completed by that time. It was agreed, however, that Avro would begin gathering information immediately, with the aim of completing as much of the formal report as possible by 15 Oct, the remainder of the information to be made available as soon as possible thereafter. Avro is prepared to work without DDP authority until 15 Oct to gather this information and to prepare this report.

10 It is felt that the meeting which has been briefly summarized above will prove of great assistance to all those who are responsible for the Genie installation. It is suggested that such a meeting be convened at RCA in the near future with representatives of Avro and 1202 TSD in attendance.



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