

DEPARTMENT OF NATIONAL DEFENCE

TELECOMMUNICATIONS SERVICES

RADAR

MID CANADA LINE

**USE INSIDE COVER FOR CROSS REFERENCES**

[illegible]

**"B.F." - DO NOT HOLD THIS FILE WHEN LAPSE  
IN ACTION MAY EXCEED 48 WORKING HOURS**



# RECLASSIFICATION NOTICE

To: \_\_\_\_\_

File: S 955-100-80/7

1. OUTGOING - Letter ☐ Memo ☐  
Copy Copy

2. INCOMING - Letter ☐ Memo ☐

Addressed to \_\_\_\_\_

Originator \_\_\_\_\_

Date \_\_\_\_\_

Date \_\_\_\_\_ Ref. No. \_\_\_\_\_

3. GENERAL CORRESPONDENCE ☒ Dated from \_\_\_\_\_ to \_\_\_\_\_

Synopsis: \_\_\_\_\_

Re Disposal to D O T.  
ASR-3 Radars  
Mid Canada Line

4. Has been reclassified to file S 1903-100-74/68

5. May your records be amended accordingly for any future action.

Date 16 March 62 (per) \_\_\_\_\_

A. Pagan  
Directorate of Central Registries.

DND 715

Mail Record Amended

\_\_\_\_\_  
(Initials)



MAIN FILE No. S- A 955-160-80/7 T.D. No. 1125

DEPARTMENT OF NATIONAL DEFENCE

# SECRET

# TEMPORARY DOCKET

# AIR FORCE

4/5/6

| ROUTING  |                             |              |          | P.A. & B.F. ENTRIES |          |              |             | REGISTRY ONLY |           |
|----------|-----------------------------|--------------|----------|---------------------|----------|--------------|-------------|---------------|-----------|
| REFERRED | REMARKS                     | DATE OF PASS | INITIALS | DATE OF P.A.        | INITIALS | DATE OF B.F. | CANCEL B.F. | DATE RECEIVED | INSPECTED |
| ✓ Cas.   | WITH PAPERS CR MAY 5 - 1961 | PS           |          |                     |          |              |             |               |           |
| VCAS     |                             | 9 May        | D        |                     |          |              |             |               |           |
| Cham     | ②                           | 11 May       | J        |                     |          |              |             |               |           |
| Dair-P   |                             | 12 May       | L        |                     |          |              |             |               |           |
| DSE      |                             | 15 May       | Stae     |                     |          |              |             |               |           |
| C Phmsl  |                             | 19 May       | Stae     |                     |          |              |             |               |           |
| VCAS     |                             | 18 May       | L        |                     |          |              |             |               |           |
| Cham     |                             | 23 May       | L        |                     |          |              |             |               |           |
| Dair-P   |                             |              |          |                     |          |              |             |               |           |
| 2-2      | REQUEST CR JUN 28 1961      |              |          |                     |          |              |             |               |           |

## INSTRUCTIONS

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Ontario.

Ref: ADCHQ letter 8960-100-80/7(ADC)

MAY 24 1961

Air Officer Commanding,  
Air Defence Command,  
RCAF Station St Hubert,  
PQ.

Requirement for Heavy Radars  
Great Whale, Winisk, Knob Lake

1 Your letter outlining the requirement for heavy surveillance radars at Winisk, Great Whale and Knob Lake has been studied with interest. It is agreed that these additional radars, by increasing coverage, would extend the line of intercept northward with corresponding tactical gains by the early assignment of fighters and by early engagement of attacking bombers by the air defence weapons.

2 Your proposal is being considered in conjunction with our comments on NADOP 63-67. When the COSC position on this document has been determined, you will be informed of the acceptance or otherwise of your proposal.

(D. M. SMITH)  
AIR VICE-MARSHAL  
Vice Chief of the Air Staff

MAY 23 1961  
(Hugh Campbell)  
Air Marshal  
Chief of the Air Staff

G/C GH Elms:J  
DAirP - 6-7151

Date Prepared: 19 May 61

Distribution: CAS(2), CPlansI, DAirP, Circ, Ref.C., CH.

451-11

K1046



M E M O R A N D U M

Ref: ADCHQ letter S960-100-80/7(ADC)

CAS

Requirement for Heavy Radars  
Great Whale, Winisk, Knob Lake

- 1           Attached is a suggested reply for your signature to the AOC ADC on his proposal for three additional radars.
- 2           In the event you desire to postpone final action on this proposal until after NADOP 63-67 has been processed through the Chiefs of Staff Committee, a suggested interim reply is also attached.

(DM Smith) A/V/M  
VCAS

Attach:



SECRET

IN REPLY PLEASE QUOTE

No. S960-100-80/7

(AOC)



CANADA

# Department of National Defence

St Hubert, PQ

1125 MAY 4 1961

Chief of the Air Staff  
Air Force Headquarters  
Ottawa 4, Ontario

①

|             |               |
|-------------|---------------|
| Referred to | V/CAS         |
| MAY 5 1961  |               |
| File No.    | 5955-100-80/7 |
| Chg'd to    | C.O.P.S.      |

27/3/61

Requirement for Heavy Radars -  
Winisk - Great Whale - Knob Lake

1 In May 1960, as Cmdr NNR I submitted to CINCNORAD a recommendation for the installation of heavy radars in the Winisk, Great Whale and Knob Lake areas. A copy of my submission was forwarded to you under cover of my letter of even file dated 6 Mar 60. (For easy reference purposes, I have attached to this letter an additional copy). Subsequent to my submission to NORAD I modified my recommendation so as to have three FPS20 radars installed at the above mentioned sites. CINCNORAD has supported me and the

by  
claim!

② V/CAS  
In examination  
in connection  
with the current  
revision of NADOP 62-67,  
and for reply to AOC.  
CAS has seen this  
letter

③  
C. H. [Signature]  
Referred as min 2.

④ V/CAS  
To see memo b  
CAS also.  
[Signature]  
claim  
18 May 61

E.M. RE (NO)  
AIR COMMODORE  
D/V/CAS  
MAY 11 1961



MAY 8 61 AM



CHIEF OF THE AIR STAFF

mentioned since. CINCORAD has supported me and I

so as to have three 19820 rears installed at the store

to my recommendation to HONORARY I submitted my recommendation

have received in this letter an additional copy. In respect

even life stated in Mr. G. J. (19820 reference proposed, I

and decision was for/should be you under cover of my letter of

inquiry. Please make and know these areas. A copy of my

recommendation for the installation of heavy rears in the

In 19820, as Chief of the Air Staff I submitted to CINCORAD

Minister - Chief of the Air Staff - Knop 1 side

Recommendation for heavy rears -

Chief of the Air Staff

|                        |
|------------------------|
| CHIEF OF THE AIR STAFF |
| MAILED                 |
| MAY 2 1961             |
| DELIVERED TO           |

MAY 4 1961

Set Indirect

RECOMMENDATION OF AIR STAFF

19820-1-100-1001

(100)



NORAD Objectives Plan, NADOP 63-67, reflects the requirement accordingly. In addition to the attached letter I would like to point out considerations brought to light by later studies, and to make certain recommendations.

2        In order to intercept as far out as possible, our current tactics involve the scramble of interceptors from their bases to orbit points, upon the MCL being penetrated. This tactic although reasonably effective can be wasteful as some fighters will not engage for reason of being out of position, brought about by the lack of tracking data. Although we have been able to afford this tactic, as the number of interceptors are reduced and especially considering the possible number of F101s, early and continuous accurate tracking information must be provided so that each fighter does achieve at least one interception. Additionally more recent studies which I have conducted show, with radars located on the MCL and with F101s employed from Val d'Or and Bagotville against a 500 kt



target, that the most northerly line of intercept could be extended 120 miles beyond the gain provided by the Moosonee and Chibougamau radars. I consider this to be a very significant gain against the ASM carrier threat.

3 I have also given further consideration to the employment of Bomarcs from North Bay and Lamacaza, in regard to the proposed MCL radars. Considering the maximum tactical range of the Bomarc B as being 365 nm, as set out in the USAF ADC operational Employment Plan for the Bomarc, my study indicates that against a 500 kt target, radars at Great Whale and Knob Lake would extend the most northerly intercept line 25 nm for the North Bay Bomarcs and 85 nm for the Lamacaza weapons (beyond that derived from Moosonee and Chibougamau). Against a high speed Mach 1.5 target the maximum gain would be 95 nm for North Bay Bomarcs and 150 nm for those at Lamacaza - the limitations against both low and high speed targets being the tactical range of the Bomarc. To achieve this extension however, would require the transmission of digital



data from these MCL radars to the North Bay DC since current and foreseen employment of the Bomarc requires the acquiring of the target by SAGE prior to Bomarc launch. Notwithstanding this however, and if the MCL radars were not SAGED, at least reasonably accurate information would be available well in advance so that tactical pre-launch decisions could be made regarding the employment of the Bomarc.

4 In view of the gain which could be achieved in the employment of Bomarc, I have had preliminary studies carried out regarding the communication requirements for SAGEing the three radars. These studies although not exhaustive indicate the inadequacy of existing communications, particularly rearwards, for the transmission of SAGE data. However, it is suggested that the problem of data transmission be investigated further by your HQ so as not to rule out the possibility of operating the radars in the SAGE environment.

5 In any event, I am prepared to accept the three radars under manual operation and consider that sufficient communications are available both laterally and rearwards over the

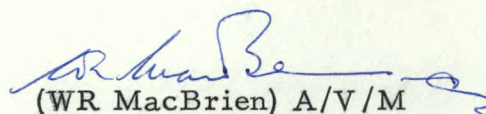


RCAF owned system for this purpose. Although as indicated previously the radars would be operated primarily in the surveillance role in order to accomplish scramble of interceptors to engage hostiles prior to ASM release and facilitate decisions regarding Bomarc employment, I feel that an intercept control capability should be available on an austere basis. Controllers who under peace time conditions would normally be employed on other primary jobs would be utilized for the limited control function ie, operations officer and available shift workers.

6 NORAD has indicated the possibility of procuring the three FPS20s as a result of reductions in USAF operational radars. This should reduce materially the cost involved. Additionally, you may wish to consider extending the CADIN Plan to include the radars and have their cost shared between the US and Canada along the same formula as for CADIN.



In any event, as NORAD has now stated the requirement, I recommend that action be initiated with the US authorities without delay to acquire radars for Winisk, Great Whale and Knob Lake.

  
(WR MacBrien) A/V/M  
AOC ADC

Encl. 1





HEADQUARTERS  
NORTHERN NORAD REGION  
RCAF STATION ST HUBERT, QUEBEC

25 MAY 1960

Commander-in-Chief,  
North American Air Defense Command  
Ent Air Force Base  
Colorado Springs, Colorado

Requirements For Heavy Radars North  
of the Critical Eastern Target Area

1       The pending overall reduction in the defense budget and the two critical target areas defined by CINCNORAD reveals the need for increased radar surveillance and control in the Northern NORAD Region. It is recommended that NORAD provide continuous radar cover to exploit the full potential of century series interceptors and missiles ahead of this critical target area.

2       It is assumed that NORAD will provide defense in depth to the extent possible with the forces available. That the radar extension and improvement programs will proceed as planned and that USAF combat ready interceptors will be deployed to North Bay, Val d'Or, Bagotville and Chatham on increased readiness. Also that Bomarc B's will be deployed at Duluth, Kinross, Niagara, North Bay and Lamacaza and the bomber threat will include a 300 nm air-to-surface missile with a speed of Mach 2 to 2.5.



3 By October 1961 the extension program's radars at Moosonee and Chibougamau will have manual GCI capability. Moosonee will overlap the Mid-Canada Line and the Pinetree intercept line will be moved about 60 miles northward. With this new forward cover, fighters from Kinross and North Bay, can intercept 250 miles from base while those from Val d'Or and Bagotville can intercept 60 miles farther northwards or about 100 miles from base.

4 If it is recognized that an air-to-surface missile threat exists, it becomes immediately clear that with present and planned radar cover the minimum line of interception for fighters defending approach routes to principle targets is behind the bomb release line. Therefore, in defending these targets, it would be operationally desirable to either employ Bomarc against the ASMs, or extend forward radar cover to ensure engagement of the carrier before launching of its ASMs. This can be accomplished by deploying two FPS24 or FPS7 radars at Great Whale and Knob Lake. By so doing, the Mid-Canada Line in this area would be covered by surveillance and control radars and the minimum line of interception would be moved 100 nm further North of the critical target area. As an alternative, three FPS20 radars at Winisk, Great Whale and Knob Lake would also provide an improved capability and permit the century series interceptors to exploit their maximum range or radius.

5 Because of the overall reduction in weapons, CINCNORAD has indicated there will be no regular forces employed West of Duluth. Therefore, it is questioned that there is a continuing need for all of the five extension program radars in Western Canada. The improvement of US radars along the border should provide additional coverage for weapons defend-



ing that area. If the main defense effort is to be shifted to the Eastern area then we should strengthen our defenses so as to provide area defense in depth to meet the bomber/ASM threat. It would be better to reduce the five Western radars by two FPS7s, in the event FPS24s are not available, and shift them to the Northern NORAD Region. This redeployment will provide 700 miles of contiguous radar ahead of northern fighter bases. With both the offense and defense using nuclear weapons it is essential that the air battle be fought farther northward.

6        The radars under consideration in this letter are costed as follows:

|       |             |
|-------|-------------|
| FPS24 | 3.7 million |
| FPS7  | 2.4 million |
| FPS20 | 1. million  |

If the two Western FPS7s were utilized construction costs would be greatly reduced because they could be located on sites that are now in operation.

7        If agreement is reached to take two FPS7 radars from the West and install them at Knob Lake and Winisk it can be anticipated that they could be operational by end 1962. Operational time for FPS24 is estimated to be in late 1962 if two radars can be diverted from US production. Installation time of FPS20s would be dependent upon the ability of Canadian industry to produce three radars of this type.

8        If the recommendation is accepted, the MCL would become redundant since solid high radar cover would take its place. There would be gaps in the low cover now available via the MCL, but with the threat of supersonic bombers and air-to-surface missiles it would appear that the MCL, even at low altitudes, has lost much of its value.



9        It is recommended that two FPS24 radars be installed at Winisk and Knob Lake to extend surveillance and control cover north of the CINCNORAD designated critical target area. In the event arrangements cannot be made for procurement of FPS24s the second choice would be installation of two FPS7s at the same location. Third priority would be the installation of three FPS20s at Winisk, Great Whale and Knob Lake.

(Signed)

(WR MacBrien) A/V/M  
Commander  
Northern NORAD Region

C O P Y



MAIN FILE No. S- 8953-100-807 I.D. No. 03304

DEPARTMENT OF NATIONAL DEFENCE

# SECRET

# TEMPORARY DOCKET

# AIR FORCE

22 Dec. 60

| ROUTING  |                |              |          | P.A. & B.F. ENTRIES |          |              |             | REGISTRY ONLY |           |
|----------|----------------|--------------|----------|---------------------|----------|--------------|-------------|---------------|-----------|
| REFERRED | REMARKS        | DATE OF PASS | INITIALS | DATE OF P.A.        | INITIALS | DATE OF B.F. | CANCEL B.F. | DATE RECEIVED | INSPECTED |
| Cops     | WITH PAPERS CR | DEC 23 1960  | B.M.     |                     |          |              |             |               |           |
| DRDP     | Refused        | 27 Dec 60    | RBW      |                     |          |              |             |               |           |
| Cops.    | —              | 28 Dec 60    | RBW      |                     |          |              |             |               |           |
| ✓ Cas    |                | 9 Jan 61     | BK.      |                     |          |              |             |               |           |
| 6 Dec    |                | 11 Jan 61    | 200      |                     |          |              |             |               |           |
| DRDP     |                | 16 Jan 61    | JY       | 18 Jan 61           | a/L      |              |             | JAN 19 1961   |           |

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# ACTION REQUEST

TO

 Ops

LOCATION

FOR:

FILE NO.

5453-100-80/7

|                                     |               |
|-------------------------------------|---------------|
| <input type="checkbox"/>            | ACTION        |
| <input checked="" type="checkbox"/> | APPROVAL      |
| <input type="checkbox"/>            | COMMENTS      |
| <input type="checkbox"/>            | DRAFT REPLY   |
| <input type="checkbox"/>            | INFORMATION   |
| <input type="checkbox"/>            | INVESTIGATION |
| <input type="checkbox"/>            | MORE DETAILS  |
| <input type="checkbox"/>            | NOTE & FILE   |

|                          |                |
|--------------------------|----------------|
| <input type="checkbox"/> | NOTE & FORWARD |
| <input type="checkbox"/> | NOTE & RETURN  |
| <input type="checkbox"/> | REPLY, PLEASE  |
| <input type="checkbox"/> | SEE ME, PLEASE |
| <input type="checkbox"/> | SIGNATURE      |
| <input type="checkbox"/> | TRANSLATION    |
| <input type="checkbox"/> | YOUR REQUEST   |

PREPARE MEMO TO:

REPLY FOR SIGNATURES OF:

REMARKS:

For your approval and  
submission to VCAS for  
signature

P

FROM

PHONE

LOCATION

DATE

CTel

6-6627

9/1



Ont.,

JAN 13 1961

Ref your A33 7 Nov and A112 7 Sep

Air Officer Commanding  
Air Defence Command  
RCAP Station St Hubert  
PQ

MCL-ASR-3 Radars  
De-activation

1 Your proposal for the withdrawal of ASR-3 radars at Knob Lake, Cranberry Portage and Stoney Mountain has been reviewed.

2 To avoid a possible misinterpretation that the removal of these radars indicates a downgrading in our requirement for air defence radars, I consider the following course of action more advisable, while still in consonance with your recommendation;

- (a) The radars may be de-activated immediately, however, they are to be retained in situ at each unit pending further decisions concerning their future.
- (b) AMC has been instructed to amend the operation and maintenance contract of the MCL to delete the line item pertaining to the maintenance of ASR-3 radars effective 31 Mar 61, or sooner if practicable. Further spares procurement is to be cancelled and spares peculiar to the equipment will be quarantined.

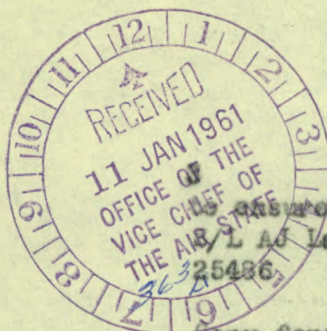
The de-activated radars are to be afforded adequate protection to ensure economical removal from the MCL sites at the appropriate time.

L AF LaFleche:cc

Copy for: VCAS

IRDP Ciro  
CTel  
CTel Ciro  
ATPC  
File ✓

(DE Smith) A/V/M  
for CAS



*[Handwritten signature]*  
DCEO/CEO-2

*[Handwritten signature]*  
11 Jan 61  
*[Handwritten signature]*  
Abdus

*[Handwritten signature]*  
AC

*[Handwritten signature]*  
9/1/61

686-3 2753



0258 A  
Referred to COPS

DEC 20 1960

File 955-100-3018

~~TOP SECRET~~  
~~SECRET~~  
~~CONFIDENTIAL~~  
~~RESTRICTED~~  
UNCLASSIFIED

MEMORANDUM Chg'd to

22 Dec 60

Cops

1 The following extract from the minutes of the 124th ASPC meeting, held 12 Dec 60, is passed for your action. When action has been completed on this item, please pass this file to CAS/Sec for information and PA.

*R.A. Roane*  
(R.A. Roane) F/L  
Secretary  
(2-3433)

Removal of ASR-3 Radars from the  
Mid-Canada Line

File: S964-102(Cops) SECRET

Introduction

17 The aim of the paper tabled by Cops was

to determine whether the ASR-3 surveillance radars on the MCL are still required.

18 The paper recommended that:

- (a) the ASR-3 radars be removed from service on the MCL;
- (b) they be declared surplus to RCAF requirements and,
  - (i) be offered to the Department of Transport, or,
  - (ii) disposed of through normal channels should they not be wanted by DOT.

Discussion

19 In his introduction, Cops said that both CINCNORAD and AOC ADC have recommended the removal of the ASR-3 surveillance radars from the MCL on the basis that they do not materially assist in the performance of the identification function.

20 Cops explained that ASR-3 radars had been installed at three locations on the MCL because of an expected problem in identification of light aircraft crossing the MCL in the vicinity of these three locations. However, operational experience over the past three years has proved that the MCL Section Control Stations are quite capable of identifying air traffic by utilizing Doppler information alone, thereby making the short-range ASR-3 radars unnecessary.



21 In conclusion, COps indicated that the removal of these radars would effect an approximate saving of \$36,000 per annum in the contract for operation and maintenance of the MCL.

22 Noting that the DOT has expressed a desire to obtain these radars should they be declared surplus, the Chairman questioned why, if the DOT can make use of these radars, the RCAF cannot do so as well. COps explained that the feasibility of utilizing the ASR-3 radars in alternative roles in the RCAF, including air-field surveillance, gap fillers, and trainers has been considered. However, employment in any of these roles would necessitate extensive modification that would be more expensive than currently programmed equipment or equipment modifications.

23 The Chairman expressed concern that declaring these radars surplus at this time could have a detrimental effect on the pending gap filler programme. He indicated that there was a strong possibility that the true function of these radars

might be misunderstood, with the result that declaration of these radars surplus might be misinterpreted to the effect that the RCAF is downgrading the requirement for air defence radars.

#### Decisions

24 After further discussion it was agreed that:

- (a) the operation and maintenance contract of the MCL be amended to delete the ASR-3 radars eff 31 Mar 61;
- (b) the ASR-3 radars be deactivated but not removed from sites pending further decisions concerning their future.

CTel  
COps



MAIN FILE No. S- S955-100-8017 T.D. No. 1338

DEPARTMENT OF NATIONAL DEFENCE

# SECRET

# TEMPORARY DOCKET

MAIN FILE NUMBER S- *8955-107-817* T.D.No. *958*

22 Dec. 68

[illegible]

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~~TOP SECRET~~  
~~SECRET~~  
~~CONFIDENTIAL~~  
~~RESTRICTED~~  
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Referred to

DEC 23 1960

## MEMORANDUM

22 Dec 60

CTel

1 The following extract from the minutes of the 124th ASPC meeting, held 12 Dec 60, is passed for your action. When action has been completed on this item, please pass this file to CAS/Sec for information and PA.

*McRone*  
 (R.A. Roane) F/L  
 Secretary  
 (2-3433)

Removal of ASR-3 Radars from the  
 Mid-Canada Line

File: S964-102(COps) SECRET

Introduction

17 The aim of the paper tabled by COps was

to determine whether the ASR-3 surveillance radars on the MCL are still required.

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2 Action by RDP 2-2  
 21 revision  
 RDP 2-4-7  
 25621  
 9 Jan 61



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CTel  
Cops



0314

# SECRET

# TEMPORARY DOCKET

8 Nov. 60

[illegible]

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# RECLASSIFICATION NOTICE

To: \_\_\_\_\_

File: 8955-100-80/7

1. OUTGOING - Letter ☐ Copy Memo ☐ Copy

Addressed to \_\_\_\_\_

2. INCOMING - Letter ☐ Copy Memo ☐ Copy

Originator Signal  
Canardey

Date \_\_\_\_\_

Date 7/11 Ref. No. A38

3. GENERAL CORRESPONDENCE ☐ Dated from \_\_\_\_\_ to \_\_\_\_\_

Synopsis: ASR3 Radar at Knob Lake

4. Has been reclassified to file 8955-100-80/7 TD0315

5. May your records be amended accordingly for any future action.

Date 10/17

(per) EP  
Directorate of Central Registries.

DND 715

Mail Record Amended

(Initials)



MAIN FILE No. S- 8955-100-80/7 T.D. No. 0815

DEPARTMENT OF NATIONAL DEFENCE

SECRET

TEMPORARY DOCKET

AIR FORCE

MAIN FILE NUMBER S- 8955-100-80/7 T.D. No. 0815

| ROUTING    |                |              |          | P.A. & B.F. ENTRIES |          |              |             | REGISTRY ONLY |           |
|------------|----------------|--------------|----------|---------------------|----------|--------------|-------------|---------------|-----------|
| REFERRED   | REMARKS        | DATE OF PASS | INITIALS | DATE OF P.A.        | INITIALS | DATE OF B.F. | CANCEL B.F. | DATE RECEIVED | INSPECTED |
| WC&O       | WITH PAPERS CR | NOV 10 1960  | EP       |                     |          |              |             |               |           |
| Cops       | for Sig        | 14/11/60     | RBW      |                     |          |              |             |               |           |
| VCA5       | (3630)         | 15/11        | Don      |                     |          |              |             |               |           |
| Com        |                | 1 Dec        | prf      |                     |          |              |             |               |           |
| WC&O       | C 880          | 6 Dec        | ec       |                     |          |              |             |               |           |
| Cops       | Memo.          | 7 Dec        | RBW      |                     |          |              |             |               |           |
| VCA5       |                | 8/12         | Don      |                     |          |              |             |               |           |
| CAS/503    | (2)            | 9 Dec        | if       |                     |          |              |             |               |           |
| VCA5/4A    | (3)            | 9/12         | W        |                     |          |              |             |               |           |
| Com        | (4)            | 9 Dec        | prf      |                     |          |              |             |               |           |
| DRDP/RDP-2 |                | 4/1/61       | RBW      |                     |          |              |             |               |           |
| Cops.      |                | 9 Jan 61     | BR       |                     |          |              |             |               |           |

VCA5  
6 Dec  
DRDP

INSTRUCTIONS

JAN 19 1961

1. Temporary Dockets are to deal WITH ONE CASE ONLY.
2. T.D.'s NOT to be placed on main file UNLESS Central Registry informed by means of a File Control Form.
3. T.D. No. together with main file number to be quoted on all correspondence originated.
4. T.D.'s not to be passed from one service to another.
5. Action should be taken as soon as possible in order that main file may be kept up to date. If action cannot be taken within 48 hrs. B.F. Docket.
6. T.D.'s to be requisitioned, passed, P.A.'d, B.F.'d, etc., in the same manner as main files by means of a File Control Form.



SECRET

S964-102(DCEO)

MEMORANDUM

7 Dec 60

VCAS

①

ASPC Submission - Removal of ASR-3 Radars  
from the MCL.

1 As directed, attached are 15 copies of an ASRC  
Submission requesting approval of the Air Council Submission  
concerning the removal of ASR-3 radars from the MCL.

④

COps / Coord

*you may wish to have this held until  
after the ASPC meeting on Monday and  
then perhaps DOT should be sent  
another interim reply.*

9 Dec 60.

*[Signature]*  
VCAS/CA  
(2-4338)  
CAS/503

*[Signature]*  
(10 Birchall) AG  
COps  
2-2769

*For ASPC on Monday pls. +  
return file to me.*

*[Signature]*  
VCAS/CA  
(2-4338)

9 Dec 60

③ VCAS/CA

*Item placed on agenda  
of 124th ASRC meeting to  
be held 12 Dec 60.*

*[Signature]*  
VCAS/CA  
2-3433

9-12-60



7 2/12



SECRET

SECRET

File No: S964-102

Copy No: 2

Submitted by: COps

②  
Cops  
Please take this  
letter to ASPC for clearance  
before submission to Air Council

(M. D. LISTER)  
AIR COMMODORE  
DVCAS

③  
Cops/EA  
Also set up  
per min  
②  
Supporting Data  
For  
Air Council Meeting

①  
Michele  
5-12-60

Subject: Removal of ASR-3 Radars from the Mid Canada Line

### Introduction

1 The Canada - U.S. Early Warning Operations Working Group recommended the installation of short range surveillance radars at points of high traffic density on the Mid Canada Line (MCL) to assist in identification in these areas. After reviewing the expected traffic density in the MCL region, it was decided that the ASR-3 radar with a maximum range of 50 miles to an altitude of 10,000 feet would be installed at three places on the MCL - Stoney Mountain, Cranberry Portage and Knob Lake.

2 The Commander-in-Chief of NORAD and the Air Officer Commanding, Air Defence Command, have recommended the removal of these surveillance radars from the MCL on the basis that they do not materially assist in the performance of the identification function.

### Aim

3 To determine the requirement for the ASR-3 surveillance radars on the MCL and, if applicable, recommend disposal action.

### Discussion

4 In the early design and planning stages of the MCL and its doppler equipment, it was necessary to theorize to a certain degree on the operational performance of this new method of aircraft detection. To ensure optimum effectiveness the planners attempted to foresee and forestall difficulties in the completed system and, to this end, the ASR-3 radar was programmed to cater to an expected problem in the identification of an anticipated number of smaller type aircraft crossing the Line in the vicinity of the three locations. Operational



experience over the past three years has proved that the MCL Section Control Stations are quite capable of handling and identifying air traffic by utilizing the Doppler information alone, thereby making the short range ASR-3 radars unnecessary. The additional ability of the MCL equipment to differentiate between small and large aircraft further lessens the requirement for these radars to augment the basic detection system. The density of air traffic at these crossing points is not expected to increase sufficiently to present a problem in the future.

5       The feasibility of utilizing the ASR-3 radars in alternative roles in the RCAF, including airfield surveillance, gap filler and as a trainer, has been considered. Employment in any of these roles would necessitate extensive modification that would be more expensive than currently programmed equipments or equipment modifications. The Department of Transport has already installed, or are in the process of installing, modern high-altitude, long-range radars at all those locations at which they have a requirement. They have indicated that the short-range, low-altitude capability of the ASR-3 may be beneficial in augmenting the close-in coverage at some of these locations, and have expressed a desire to obtain these sets should they be declared surplus by the RCAF.

6       The removal of these radars would constitute an approximate saving of \$36,000 per annum in the Operations and Maintenance contract. The Department of Defence Production has disclosed that the amendment of the contract to effect the deletion of the ASR-3 radars would not present any difficulty.

#### Conclusions

7       The ASR-3's are not required in an MCL role, and they cannot be converted economically to meet any present or future RCAF needs.



8        The deletion of the ASR-3 radars will effect a considerable annual saving in the Operations and Maintenance Contract of the Mid Canada Line.

Recommendations

- 9        It is recommend that:
- (a) The ASR-3 radars be removed from service on the MCL;
  - (b) They be declared surplus to RCAF requirements and,
    - (i) be offered to the Department of Transport, or,
    - (ii) disposed of through normal channels should they not be wanted by DOT.



DEPARTMENT OF NATIONAL DEFENCE

OFFICE OF CHIEF OF THE AIR STAFF

~~Memorandum~~

Air Council submission at  
fly-leaf, Sir.



SECRET

S-955-100-80/7 TD 0315 (Cops)

File Ref

R C A F

MINUTE SHEET

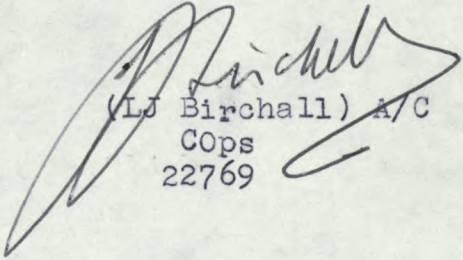
Min (2)

VCAS

1 Min (1) is a message from A/V/M MacBrien confirming that there is no operational requirement for the ASR-3 radars on the MCL. This message would appear to substantiate the operational justification for removal of these radars from the MCL. In this regard, you are referred to CTel's Min (4), para. 4 (Flag 1).

2 In view of the AOC ADC's reiteration of his earlier request for removal of these ASR-3 radars from the MCL sites at Knob Lake, Cranberry Portage and Stoney Mountain, it is recommended that the attached Air Council Submission be forwarded to Air Council.

14 Nov 60

  
(LJ Birchall) A/C  
Cops  
22769





AFHQ  
COMM CENTRE

~~5964-102~~  
**ROUTINE**

VMA003BVA001

Nov 8 00 32 '60

RR RFEPFZ

DE RFEMVB 1/08

R M 072200Z

FM CANAIRDEF

TO RFEPFZ/CANAIRHED

INFO ZEN/NNR ST HUBERT

BT

/S E C R E T/A38 7 NOV

FOR VCAS FROM AOC PD REFERENCE MY A112 DATED 7 SEP PD  
REQUEST DECISION IN THIS MATTER AS SOON AS POSSIBLE PD

I REITERATE THAT THERE IS NO OPERATIONAL REQUIREMENT FOR THE  
ASR 3 RADARS AT KNOB LAKE CMM STONEY MOUNTAIN CMM AND CRANBERRY  
PORTAGE

BT

08/0013Z

**A** PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

**SECRET**

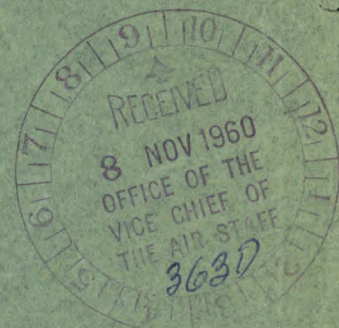
**SECRET**

VCAS

1 com

0314

Referred to Col's  
NOV 9 1960  
File No 955-100-8017  
Chg'd. to .....



K253



OROP

ROUTINE

AFHQ  
COMM. STAFF

Nov 8 00 35.00

WAGGERS VAGG

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EN CANALIST

TO REFETACANISHED

INFO XENITH ST MENT

ET

VS E C RE TARS 3 NOV

FOR VAS TRO AND PD REFERENCE IN ALL DATED 7 SEP 50

REQUEST DECISION IN THIS MATTER AS SOON AS POSSIBLE PD

ILLUSTRATE THAT THERE IS NO OPERATIONAL REQUIREMENT FOR THE

AND 3 RADARS AT KNOX LAKE OWN STAFF MOUNTAIN COM AND GRAN LRY

PORTAL

ET

07.2002

PARAPHRASE NOT REQUIRED

NOT UNCLASSIFIED REPLY OR REFERENCE

RECEIVED

SECRET



# MESSAGE FORM

1950-100-ASR3 TD 0274 P  
FILE (DCEO)

FOR COMMEN/SIGNALS USE

NUMBER

|                                        |           |                               |                   |                                          |
|----------------------------------------|-----------|-------------------------------|-------------------|------------------------------------------|
| PRECEDENCE - ACTION<br><b>PRIORITY</b> |           | PRECEDENCE - INFO<br>DEFERRED | DATE - TIME GROUP | MESSAGE INSTRUCTIONS                     |
| FROM                                   | CANAIRED  |                               |                   | PREFIX<br>GR                             |
| TO                                     | CANAIRDEF |                               |                   | SECURITY CLASSIFICATION<br><b>SECRET</b> |
| INFO                                   |           |                               |                   | ORIGINATOR'S NUMBER<br>DCEO385 4 NOV     |

REF YOUR ALL2 07 SEP AND TELECON WC HIGGINS WC STRANGE THIS  
DATE PD REQUIRE FIRM STATEMENT THAT SURVEILLANCE AND IDENTIFICATION  
FUNCTIONS CAN BE CARRIED OUT ON THE MCL USING ONLY DOPPLER  
INFORMATION WITHOUT RECOURSE TO INFORMATION FROM THE SHORT RANGE  
SURVEILLANCE RADARS PD FURTHER THAT NORAD AND NNR HAVE AGREED THAT  
THERE IS NO OPERATIONAL REQUIREMENT FOR THE THREE ASR 3 RADARS AT  
KNOB LAKE CMM CRANBERRY PORTAGE AND STONEY MOUNTAIN OR ANY  
WHERE ELSE ON THE MCL

|                                                                     |      |                   |        |                                  |                                                        |                  |      |               |          |
|---------------------------------------------------------------------|------|-------------------|--------|----------------------------------|--------------------------------------------------------|------------------|------|---------------|----------|
| PAGE OF PAGES                                                       |      | REFERS TO MESSAGE |        | DRAFTER'S NAME<br>(RB WYBOU) F/L |                                                        | OFFICE<br>CEO2-4 |      | TEL.<br>25384 |          |
| CLASSIFIED YES <input type="checkbox"/> NO <input type="checkbox"/> |      |                   |        |                                  |                                                        |                  |      |               |          |
| FOR OPR'S USE<br><b>R</b>                                           | DATE | TIME              | SYSTEM | OPERATOR                         | <b>D</b>                                               | DATE             | TIME | SYSTEM        | OPERATOR |
|                                                                     |      |                   |        |                                  | RELEASING OFFICER'S SIGNATURE<br>(SM STRANGE) W/C DCEO |                  |      |               |          |

CAFB 1719 (JSF) (REV 3/59)  
CNS 1320 B (REV 3/59)  
RCAF S42 (REV 3/59)  
7530 - 21 - 562 - 1557

COPY 2



SECRET

CHIEF OF TELECOMMUNICATIONS MINUTE SHEET

SECRET  
CONFIDENTIAL  
RESTRICTED

**FILE:** S964-102(CTel)

**DATE:** 31 Oct 60

MIN (3)

**TO:** VCAS

1 Any decision to retain or remove the ASR-3 radars from MCL must be based on the operational need of the identification function of the line, and the ability of the ASR-3 to meet that need. There is neither technical reason nor logistic reason to remove them. They have been remarkably easy to maintain and are technically an excellent radar unit. They are well spared and not difficult to support logistically.

2 Since there are no radar technicians at the three sites in question who work solely on the equipment in question, the proposed saving of \$38,000 per annum on the O and M contract is questionable. The greatest savings will likely accrue from the reduced logistic support, which is not a burdensome one.

3 As their original function (to assist in the identification of local aircraft) called for a very short maximum range, the maximum range of 50 miles (which they reach with ease) has been quite satisfactory for the role to which they were assigned.

4 Since the removal of these units is not fully supportable on either technical or logistic grounds, I would suggest that we obtain from ADC considerably more detail on their operational shortcomings than is contained in their signal All2 of 7 Sep. In particular, they should show how effectively the MCL doppler equipment handles the local flying problem. If in fact the ASR-3 provides no support in this area, then the removal of the 3 units should be approved. Until this kind of information is available, I feel that any Air Council paper on the subject is premature.

*EC Poole*  
(EC Poole) A/C  
CTel  
66627

④ COp  
VCAS asked for CTel's comments and in min. 3 CTel says the paper is premature. VCAS has not yet seen min 3, but you may wish to review the situation in the light of CTel's comments. Also, an interim reply should likely be sent to DCA.  
2 Navco.

*W. J. Howard*  
VCA/FA.  
(2-4338)

581C  
82/11

K753



6

CITEL

For review and comments pls.

*Smith.*

(D. M. SMITH)  
AIR VICE-MARSHAL  
Vice Chief of the Air Staff

OCT 29 1960

666-4.

K753



## DEPARTMENT OF NATIONAL DEFENCE

SECRET

## MINUTE SHEET

S964-102 Vol 1 (COps)

Referred to

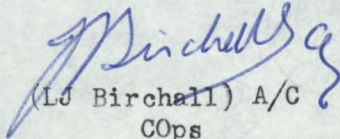
## REMARKS

To be signed in full showing Appointment, Telephone Number &amp; Date

Min (5)

VCAS

1 Attached are twenty copies of an  
Air Council Submission re the future of the  
ASR 3 radars on the Mid-Canada Line.

  
(LJ Birchall) A/C

COps

2-2769





YOUR FILE No. ....

OUR FILE No. 6802-57

ASSISTANT DEPUTY MINISTER—AIR  
DEPARTMENT OF TRANSPORT  
OTTAWA, CANADA

Referred to

DC E O

OCT 20 1960

File

1903-74/68

Card to

ATPC2

October 19, 1960.

11/10/60

Attention: S/L D. H. Evans.

Dear Sir,

Re: ASR-3 Surveillance Radar.

It is understood that ASR-3 type equipment is being withdrawn from use at Knob Lake, Cranberry and McMurray and may be declared surplus to requirement.

In such an event we would be very interested in obtaining this equipment in order to supplement our civil radar coverage for control of air traffic. Actual locations would have to be determined but it is assumed that we would bear the cost of removal to such locations.

We would, therefore, be pleased to know what further action you would like us to take in this matter if you decide on declaring these equipments surplus to your requirement.

Yours very truly,

*A. de Niverville*  
(A. de Niverville),  
Assistant Deputy Minister, Air.

Chief of the Air Staff,  
Department of National Defence,  
RCAF Headquarters,  
OTTAWA, Ontario.

③ Note for File  
our letter  
dated 14 Nov 60

5955-100-807 TO 0315  
provides an interim reply.  
14 Nov 60.  
R. Blythe  
DC EO/CE 2-4  
2-5384

② COPS  
To note. This must be  
processed subsequent to dir  
Council decision. DOT has been  
informed by phone.  
2006/CE 2-2  
21086 2-1106



SECRETSTAFF STUDYON THEPOSSIBLE USE OF THE ASR-3 RADARAFTER REMOVAL FROM THE MCL

1 Three ASR-3 radars are being considered for removal from the MCL. These radars are presently located at Knob Lake, Stoney Mountain and Cranberry Portage, and are installed in 30' x 30' x 50' towers complete with rigid radomes. This study is an attempt to consider a re-employment of these radars under the following categories;

- (a) Airfield Surveillance Radar
- (b) Gap Filler Radars
- (c) Training Aid Radars

2 Other known factors which have an influence on this study:

- (a) These radars were installed to assist in the identification problems in areas considered to have high density traffic. Experience has shown that these radars are of negligible value due to their short range and low altitude coverage.
- (b) The spares supply is good to excellent. Most of the initial 2 year supply (\$120,000) is intact due to the light consumption resulting from restricted use of the equipment.
- (c) The design and construction aspects are almost obsolete by modern standards.

Airfield Surveillance Radars

3 The ASR-3 is an "S" band search radar, using a cosecant squared vertical pattern antenna. Other characteristics are, range 50 NM, vertical coverage 10,000', peak power 460 KW. Scanning is clockwise thru 360° at 25 RPM. The nose of the beam can be adjusted from 0° to 5° above the horizontal. The radar is capable of detecting small aircraft.

4 Consulting with COps/DAirS staff confirms a nil requirement for its re-use as an airfield surveillance radar. This is mainly because of its short range and low altitude coverage deems it unsuitable to jet aircraft control. The RCAF is now spending \$150,000 per installation to improve 17 existing GCA's to fulfill this role. The ASR-3 radar would require similar improvements to the dual tx and rx, at an estimated cost of \$75,000 per channel. The ASR-3 indicators display video on a 10" CRT. DAirS have stated a requirement exists for 12" displays. The cost of an improved indicator is \$12,000.

5 A requirement exists at Comox to improve the surveillance coverage of the CPN4. This improvement is over and above the mentioned product improvement programme, since the problem is geographical and involved re-siting and separating the search portion



**FLAG**

**No.** 1



of the CPN-4 from the trailers. The ASR-3 could meet this requirement at Comox, subject to the above cost estimates. However if this is considered, we are accepting a radar which is obsolete in design and construction and would be the only one of its kind. Further a solution to the Comox problem has been proposed at half the cost mentioned in this report. *(cut down costs)*

#### Gap Filler Radar

6 The ASR-3 is a semi-dual channel radar. One transmitter and one Receiver constitutes a single channel. Operations and maintenance can be continuous. Switching channels is done manually. The equipment is located at three sites, namely, local, remote and repeater sites. Remoting can be up to 1.7 NM.

7 A cursory study, based on the Product Improvement Kit for GCA's, estimates a cost of \$165,00 per installation, to modify the ASR-3 to make it compatible to the Gap Filler Radars. These modifications include, increasing tx power, increasing receiver sensitivity, providing remote facilities up to 120 NM, and procuring a new antenna to give proper beam coverage.

8 Training Radar - While the ASR-3 is equipped with most of the current design features, ie, MTI, AFC, other aspects are obsolete. The FPS-502 radar at Clinton Ontario, has all features contained in the ASR-3 and is being used as a basic training radar. Further, the FPS-508 replaces the FPS-502 in 1960 at Clinton as the typical basic modern radar. Therefore, not only would the ASR3 be superfluous as a trainer, but also the FPS-502.

9 Radomes - A requirement exists for radomes to protect the Quadraders. However, because of the "S" band design of the radomes used with the ASR-3 these radomes would not be suitable for use with the X band Quadraders. These radomes would be suitable for erection over the Gap Filler radars.

#### Conclusions

10 It is the opinion of the writer that the ASR-3 would not fulfil the role as an airfield surveillance radar without considerable modifications to raise its performance to the level of the CPN 4's and the DOT ASR's, which are adequately fulfilling this requirement.

11 It is considered unlikely this radar could fulfil the Gap Filler requirement. Considerable expense could be anticipated to modify this equipment, and its present design does not make it suitable for unmanned operation.

12 The training radars in use are considered adequate, and are of the latest design. RCAF Clinton have recently completed an FPS-20 installation which precludes any consideration to other radar training aids.

#### Recommendations

13 It is recommended that the ASR-3 radars be removed from the MCL and be declared surplus to other government agencies, such as the Canadian Army, RCN, DOT, NRC. If these agencies do not require this equipment then it is recommended that the three ASR-3's be shipped to 6RD Trenton for cannibalizing purposes. Experience has shown that other redundant radars, ie FPS-3 have been sold by public tender, at a selling price as low as \$27. The benefits to the RCAF derived by cannibalizing would far exceed this price. *Is the cost of storage 2 yr? cannibalizing would do it?*

14 Common stock from the \$120,000. support spares should be held at supply depots for re-issue.



- 3 -

15        The redundant radomes should be dis-assembled and stored  
for possible future use to protect "S" band radars.

*WJ Blackman*  
(WJ Blackman) F/O  
RDP2-3-5  
23880



Cost Estimate to Raise ASR-3 Performance Compatable to CPN4/MPN11

|                                                                  |               |
|------------------------------------------------------------------|---------------|
| New antenna for improved vert. coverage                          | 11,000        |
| entended range kit to increase tx power from<br>460 KW to 800 KW | 50,000        |
| Search Sensitivity kit to increase coverage                      | 4,200         |
| New 12" Indicators                                               | <u>12,000</u> |
| Total cost, one channel                                          | \$ 77,200     |
| Cost for dual channel<br>(single ant required only)              | 143,400       |

Cost Estimate to Raise ASR-3 Performance  
Compatible to FPS-18 Gap Filler (absolute)

|                                                                                   |               |
|-----------------------------------------------------------------------------------|---------------|
| New antenna for improved coverage                                                 | 20,000        |
| Extended range kit-mod to tx and mod ti increase<br>power output 460 KW to 1.3 MW | 50,000        |
| Search sensitivity kit                                                            | 4,200         |
| Remote monitoring and switching kits (FST1 & FSW1)<br>(up to 120 NM)              | <u>38,000</u> |
| Cost single channel                                                               | 112,200       |
| Cost dual channel                                                                 | 166,400       |

These prices are based on known costs for similar equipments and improvements already negotiated by the RCAF.



SECRET

SI950-100-ASR3

MEMORANDUM

①

9 Sep 60

DADO

→ DCEO

ASR-3 Radars - Mid Canada Line

- 1 Attached is a copy of NNR message NRAP 582 dated 23 Aug regarding withdrawal of ASR-3 radars from MCL stations.
- 2 In anticipation of an ADC request for approval of this withdrawal may this directorate be advised of your comments or concurrence on this matter.

*Robert Evans*

(EH Evans) G/C

DADR

2-3783

attach:

② DADR

*Concur that these radars  
no longer required.*

*J M. H. H. H. H. H.*

DCEO

13 Sept 60 24706

③ DCEO/CEO 2

*For your info as per tel con to Evans/K/S/Ramsay*

20 Sep 60

*Ed Ramsay*

ASR 4-2

37732



COPY

SECRET

VMA03 4BVA017

DE RFEMVB 34/23

R23203Z

FM NNR ST HUBERT

TO ZEN/CANAIRDEF (AOC)

INFO RFEPFZ/CANAIRHED

BT

SECRET/ NRAP582 23 AUG

REF OUR NRA548 DATED 15 JUL PD NORAD AND THIS HQS CONSIDERS THERE  
IS NO OPERATIONAL REQUIREMENT FOR ASR-3 RADARS AT KNOB LAKE CMM STONEY  
MOUNTAIN AND CRANBERRY PORTAGE PD THEREFORE RECOMMEND THEIR WITHDRAWAL  
FROM MCL PD REQUEST THIS HQS BE ADVISED OF ACTION TAKEN

BT

23/2032Z RFEMVB



## DEPARTMENT OF NATIONAL DEFENCE

## MINUTE SHEET

*Secret*

Referred to

## REMARKS

To be signed in full showing Appointment, Telephone Number &amp; Date

*men@*  
*DOCO*

1. Frank to conversation w/ Kopp -  
 r/c Wybon pertinent to men@, this TD  
 contains two studies undertaken by  
 AS&S staff related to the removal of the  
 AS&S from the MCL.

2. I understand you are preparing a  
 paper on this matter and these studies  
 may be of assistance. I would appreciate  
 the opportunity to review and comment  
 on your paper, in draft.

3. Please return this T.D. when you have  
 extracted the useful data.

11 Oct 60

*[Signature]*  
*DOCO*  
 2-5486

③  
DRDP/RDP2

Thanks.

*Wybon*  
 DECO/CEO 2-4  
 2-5384

14 Oct 60.



# DEPARTMENT OF NATIONAL DEFENCE

## MINUTE SHEET

Referred

REMARKS

To be signed in full showing Appointment, Telephone Number & Date

Referred to

SEP 16 1960

File No.

Chg'd to

(4)

COps

1 In order to take a decision to close down these three radars it will be necessary to put a paper before Air Council. This paper should review the operational concept to meet which the radars were procured and the experience to date with these radars. The Department of Transport will be vitally concerned in any suggestion to close down these radars and therefore there should be staff discussions with them and their views should be incorporated in the paper submitted to Air Council.

2 Will you please take the necessary action to bring this matter forward for decision.

(MD Lister) A/C...  
D/VCAS  
2-3100

14 Sep 60

DCEO

The prepare as per. min 4.)

16.9.60



**SECRET**

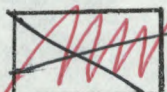
OFFICE OF CHIEF OF THE AIR STAFF

TO:

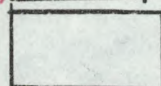
*VCAS*

Date:

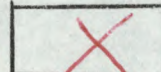
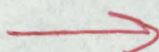
SEP - 8 1960



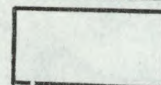
For your information and ~~amendment~~



For your retention



Take appropriate action



Copy Passed for info/action to;

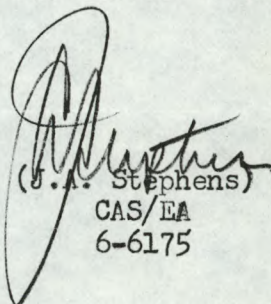
Referenced correspondence placed on

File.....Vol.....TD.....

② *cops*

*Do you agree?*

*Ed Beam n/c  
acting DVCS  
8 Sept 60*

  
(J. A. Stephens) W/C,  
CAS/EA  
6-6175

③

*DVCAS*

*Lagne*

*Winkley*

*Cops 9.9.60*

*87/581C*

K153



PRIORITY

AFHQ  
COMM CENTRE

SEP 7 04'60

SECRET

VCAS  
COM

NNNNVMA055BVA021

PP RFEPFZ RFEPMR

DE RFEMVB 30/07

P 071 330Z

FM CANAIRDEF

TO RFEPFZ/CANAIRHED

INFO RFEPMR/CANAIRMAT

ZEN/NNR ST HUBERT

BT

// SECRET // A112 07 SEP

REFERENCE NRA548 15 JUL 60 PD THIS MESSAGE IN TWO PARTS PD PART ONE PD  
CINCNO RAD HAS STATED AGREEMENT IN THE DELETION FROM THE AIR DEFENSE  
SYSTEM THE ASR 3 RADARS AT KNOX LAKE CMM CRANEERRY PORTAGE AND STONEY  
MOUNTAIN PD THESE RADARS WERE INSTALLED TO ASSIST IN THE IDENTIFICA-  
TION PROBLEMS IN AREAS CONSIDERED TO HAVE HIGH DENSITY TRAFFIC PD  
EXPERIENCE HAS SHOWN THAT THESE RADARS ARE OF NEGLIGABLE VALUE DUE TO  
THEIR SHORT RANGE CMM POOR SITING AND DIFFICULT MAINTENANCE PD PART  
TWO PD REQUEST AUTHORITY TO SHUT DOWN ALL OF THESE RADARS AS SOON AS  
POSSIBLE PD IF AUTHORITY GRANTED NORMAL REMOVAL PROCEDURES WILL BE  
INSTITUTED

BT

07/2021Z

SECRET

AL PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

89/



39  
NNNNVMA055BVAC021

PP RFEFZ RFEPMR

DE RFEMVB 30/07

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FM CANAIRDEF

TO RFEFZ/CANAIRHED

INFO RFEPMR/CANAIRMAT

ZEN/NNR ST HUBERT

BT

// S E C R E T // A112 07 SEP

REFERENCE NRA548 15 JUL 60 PD THIS MESSAGE IN TWO PARTS PD PART ONE PD CINCINORAD HAS STATED AGREEMENT IN THE DELETION FROM THE AIR DEFENSE SYSTEM THE ASR 3 RADARS AT NOB LAKE CMM CRANBERRY PORTAGE AND STONEY MOUNTAIN PD THESE RADARS WERE INSTALLED TO ASSIST IN THE IDENTIFICATION PROBLEMS IN AREAS CONSIDERED TO HAVE HIGH DENSITY TRAFFIC PD EXPERIENCE HAS SHOWN THAT THESE RADARS ARE OF NEGLIGIBLE VALUE DUE TO THEIR SHORT RANGE CMM POOR SITING AND DIFFICULT MAINTENANCE PD PART TWO PD REQUEST AUTHORITY TO SHUT DOWN ALL OF THESE RADARS AS SOON AS POSSIBLE PD IF AUTHORITY GRANTED NORMAL REMOVAL PROCEDURES WILL BE INSTITUTED

BT

07/2021Z

PRIORITY

SECRET 6

DRDP

VCAS  
SCOM 2-3

SECRET

ALL PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED



SECRET

AFHQ  
COMM CENTRE  
AUG 23 20 55 '60

ICAS  
COR 14

2049

VMA034BVA017

RR RFEPFZ

DE RFEMVB 34/23

R232030Z

FM NNR ST HUBERT

TO ZEN/CANAI RDEF (AOC)

INFO RFEPFZ/CANAI RHED

BT

/ S E C R E T / NRAP582 23 AUG

REF OUR NRA548 DATED 15 JUL PD NORAD AND THIS HQS CONSIDERS THERE  
IS NO OPERATIONAL REQUIREMENT FOR ASR-3 RADARS AT KNOB LAKE CMM STONEY  
MOUNTAIN AND CRANBERRY PORTAGE PD THEREFORE RECOMMEND THEIR WITHDRAWAL  
FROM MCL PD REQUEST THIS HQS BE ADVISED OF ACTION TAKEN

BT

23/2032Z RFEMVB

**A** PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

SECRET

K637



SECRET

STUDY OF RADAR ASR-3 REMOVAL AND REINSTALLATION  
METHODS AND COSTS-TECHNICAL AND OPERATIONAL STATUS

Technical Characteristics

- 1 (a) Coverage - Capable of detecting small aircraft such as a Piper Cub from 5 degrees to 20 degrees above the horizontal up to an altitude of 10,000 feet at a range of 26 miles through 360 degrees in azimuth. Range for most of the present RCAF aircraft would be near the PPI maximum of 50 miles.
- (b) Antenna Pattern - Azimuth beam width of 2.5 degrees at the minus 3 db points, 4.5 degrees at the minus 10 db points and 6.25 degrees at the minus 17 db points. Vertical pattern is cosecant squared. Scanning is clockwise through 360 degrees at 25 rpm. The nose of the beam can be adjusted from 0 to 5 degrees above the horizontal. Gain 36 db.
- (c) Display  
 One 10 inch PPI  
 Ranges 6, 10, 20, 30 and 50 nm  
 Marker 2 nm on 6 and 10 mile ranges  
       5 nm on 20 and 30 mile ranges  
       10 nm on 50 mile range.  
 Trace can be off-centered in any azimuth.
- (d) Frequency  
 2700-2900 mcs.
- (e) Modulation  
 Pulse 1 usec  
 PRF 1200  
 Duty Cycle .0012  
 Peak Power 460 Kw  
 Average Power 550 watts.
- (f) Receiver  
 Bandwidth 2.25 mcs  
 Noise figure 12 db or less  
 Sensitivity 90 db below 1 mw when S/N = 2  
 Gain, including video, 106 db.
- (g) MTI  
 Sensitivity same as normal receiver  
 Subclutter visibility  
 Gating 0 to 50 nm giving a combination of MTI and normal video in proportion.
- (h) Primary Power Requirements  
 208 volts, 60 cycle, 3 phase 9 Kw for transmitter-receiver equipment. Power factor .84. 120 volts 60 cycle, 1 phase 1.7 Kw, .9 power factor for control tower equipment.



- 2 -

(j) Installation Requirements

Display and control equipment may be located a maximum of 1.7 nm from the transmitter-receiver group. The antenna requires a tower with a top height of 70 feet (50 feet on the MCL).

Present Installations

- 2 (a) Location - There are 3 ASR-3's installed on the Mid Canada Line at Cranberry Portage, Stoney Mountain and Knob Lake.
- (b) Towers - Standard 30 x 30, 50 feet high.

Weight and Dimensions Uncrated

- 3 Given in Appendix 1. Total weight per set, less spares and test equipment, is approximately 10,000 lbs. Equipment illustrated in Appendix 2.

Removal From MCL and Reinstallation

- 4 (a) ATC advise that the equipment including spares and test equipment but less the antenna reflector can be moved via DC-3 aircraft in 3 or 4 flights per site. The dimensions of the antenna reflector, 177 inches wide, 168 inches high, 68 inches deep with a weight of 590 pounds uncrated is too large to be handled by RCAF aircraft. The ASR-3 sites are near or on rail lines which is the only practical means of moving such a large object. Since the possible destinations of these radars are unknown it is impossible to calculate the transportation costs.
- (b) Removal Costs - It is estimated that 1 supervisor and 4 technicians will require 10 working days to dismantle, identify, tag and crate or box each ASR-3 exclusive of the equipments building and tower. The following estimated minimum cost is based on figures obtained from DDP.

|                                              |                  |
|----------------------------------------------|------------------|
| 1 supervisor at \$25.00 per day for 10 days  | \$ 250.00        |
| 4 technicians at \$21.00 per day for 10 days | \$ 840.00        |
|                                              | <u>\$1090.00</u> |
| Overhead 50%                                 | <u>545.00</u>    |
|                                              | \$1635.00        |
| Living expenses \$3.00 per day for man       | 150.00           |
| Travel costs - rough estimate                | <u>1000.00</u>   |
| Total                                        | \$2785.00        |

This minimum figure would rapidly increase if there were any delays due to weather and or technical problems. A figure of \$5000 would be more realistic to cover such contingencies.



*Spares  
Situation*

**FLAG**

**No.** *1*



- 3 -

(c) Installation Costs

It is estimated that the installation will require the same team as used for removal plus an engineer for 5 days at \$50.00 to \$100.00 per day to set up and adjust the radar.

|                                            |                   |
|--------------------------------------------|-------------------|
| 1 Team cost as in (b) above                | \$1090.00         |
| 1 Engineer at \$50.00 per day for 5 days   | <u>250.00</u>     |
|                                            | \$1340.00         |
| <br>Overhead 50%                           | <br><u>670.00</u> |
|                                            | \$2010.00         |
| <br>Living Expenses \$3.00 per day for man | <br>165.00        |
| Travel costs - rough estimate              | <u>1200.00</u>    |
| Total                                      | \$3375.00         |

Evaluation of ASR-3 for Future RCAF Use

5 (a) Operational

The limited range, 1 10 inch display, lack of height or GCA facilities restrict this set to an ASR function on smaller airfields. The problem of the 10 inch display could be overcome by adding 1 or more 12 inch PPI's though the marginal improvement would hardly justify the additional cost.

(b) Reliability and Maintenance

ADCHQ and AMCHQ confirm the ASR-3 is not difficult to maintain judging from their experience during the rather limited use of the radars.

(c) Technical Status - While the equipment has most of the current design features, MTI, AFC, double banked transmitter receiver equipment etc., the design and construction aspects are almost obsolete by modern standards.

(d) Spares

The spares supply is good to excellent as most of the initial 2 years supply (\$120,000) is intact due to the light consumption resulting from the restricted use of the equipment.

Buildings

6 No attempt was made to estimate the cost of the transmitter-receiver building and tower at a new location as the requirements will depend on the site layout and topography.

*H. C. Wilson*  
(HC Wilson)  
RDP 2-4-2  
2-5621

19 Aug 60



TABLE III  
DIMENSIONS AND WEIGHTS OF UNITS SUPPLIED

| Name of Unit                   | CA Type<br>No. | Symbol No.<br>Series | Quantity | Uncrated Dimensions<br>(in inches) |        |        | Uncrated Weight<br>Per Unit<br>(in pounds) |
|--------------------------------|----------------|----------------------|----------|------------------------------------|--------|--------|--------------------------------------------|
|                                |                |                      |          | Width                              | Height | Depth  |                                            |
| 1. Antenna Assembly            | 3120           |                      | 1        | -                                  | -      | -      | 1567                                       |
| A. Antenna Reflector           | 3122           |                      | 1        | 127                                | 168    | 68     | 590                                        |
| B. Antenna Feed                | 3123           |                      | 1        | 11-1/2                             | 9-3/4  | 7      | 7                                          |
| C. Antenna Pedestal            | 3124           | 1101-1199            | 1        | 72                                 | 72     | 36     | 902                                        |
| D. R-F Rotary Joint            | 3125           |                      | 1        | 6-1/2                              | 15     | 12     | 68                                         |
| 2. Transmitter Assembly        | 3130           |                      | 2        | 48                                 | 84     | 31     | 1540                                       |
| A. Transmitter Cabinet         | 3131           | 2001-2099            | 2        | 48                                 | 84     | 31     | 1450                                       |
| B. Pre-Amplifier               | 3132           | 2101-2199            | 2        | 10                                 | 8-1/2  | 4      | 5.5                                        |
| C. Auto. Frequency Control     | 3133           | 2201-2299            | 2        | 23                                 | 12     | 8-3/4  | 37.5                                       |
| D. Trigger Amplifier           | 3134           | 2301-2399            | 2        | 13-1/2                             | 10-3/4 | 10     | 17                                         |
| E. Stalo                       | 3135           | 2401-2499            | 2        | 15-1/2                             | 3-3/4  | 5-1/2  | 17                                         |
| F. Duplexer                    | 3136           | 2001-2099            | 2        | 13                                 | 14-3/4 | 5-3/4  | 13                                         |
| 3. Receiver Assembly           | 3140           |                      | 2        | 40                                 | 84     | 27     | 725                                        |
| A. Receiver Cabinet            | 3141           | 3001-3099            | 2        | 40                                 | 84     | 27     | 440                                        |
| B. Pre-Canceller               | 3142           | 3101-3199            | 2        | 36-1/2                             | 17     | 8-1/2  | 21                                         |
| (1) MTI I-F Amplifier          | 3143           | 3201-3299            | 2        | 27-1/4                             | 3-3/4  | 5      | 7.5                                        |
| (2) Coho                       | 3144           | 3301-3399            | 2        | 18-1/4                             | 3-3/4  | 4      | 4.5                                        |
| (3) Normal I-F Amplifier       | 3145           | 3401-3499            | 2        | 20-1/4                             | 5-1/4  | 5      | 8                                          |
| C. Canceller                   | 3146           | 3501-3599            | 2        | 36-1/2                             | 18     | 7-1/4  | 15                                         |
| (1) Comparator                 | 3147           | 3601-3799            | 2        | 16-1/2                             | 16-1/2 | 8-1/4  | 31                                         |
| (2) Synchronizer               | 3148           | 3801-3999            | 2        | 16-1/4                             | 11-1/2 | 7-1/2  | 18                                         |
| D. Synchroscope Panel          | 3154           | 4501-4599            | 2        | 36-1/2                             | 7-1/2  | 7-3/4  | 8                                          |
| (1) Synchroscope               | 3252           | 4301-4499            | 2        | 11-3/4                             | 6-1/2  | 21     | 25                                         |
| (2) Line Driver                | 3149           | 4001-4099            | 2        | 18                                 | 6-1/4  | 6      | 7                                          |
| E. Receiver Voltage Regulator  | 3152           | 4101-4199            | 2        | 36-1/2                             | 11     | 10-3/4 | 28                                         |
| F. Receiver Power Supply       | 3153           | 4201-4299            | 2        | 36-1/2                             | 16-1/4 | 17-1/2 | 120                                        |
| 4. Control Assembly            | 3160           |                      | 1        | 40                                 | 49     | 27     | 408                                        |
| A. Control Cabinet             | 3161           | 5001-5099            | 1        | 40                                 | 49     | 27     | 269                                        |
| B. Local Control Panel         | 3162           | 5101-5199            | 2        | 18                                 | 18     | 17     | 28.5                                       |
| C. Control System Power Supply | 3163           | 5201-5299            | 2        | 18                                 | 10     | 10-3/4 | 19.5                                       |
| D. Relay Panel                 | 3164           | 5301-5399            | 2        | 18                                 | 16     | 9-1/2  | 21.5                                       |



TABLE III

DIMENSIONS AND WEIGHTS OF UNITS SUPPLIED (Continued)

| <u>Name of Unit</u>                  | <u>CA Type</u><br><u>No.</u> | <u>Symbol No.</u><br><u>Series</u> | <u>Quan-</u><br><u>tity</u> | <u>Uncrated Dimensions</u><br>(in inches) |               |              | <u>Uncrated Weight</u><br><u>Per Unit</u><br>(in pounds) |
|--------------------------------------|------------------------------|------------------------------------|-----------------------------|-------------------------------------------|---------------|--------------|----------------------------------------------------------|
|                                      |                              |                                    |                             | <u>Width</u>                              | <u>Height</u> | <u>Depth</u> |                                                          |
| 5. Plumbing                          |                              |                                    |                             |                                           |               |              |                                                          |
| A. Directional Coupler               | 3101                         | 1201-1299                          | 2                           | 35                                        | 8             | 5-1/4        | 19                                                       |
| B. Phase Shifter                     | 3102                         |                                    | 2                           | 31                                        | 5-1/2         | 5-1/2        | 12.5                                                     |
| C. Waveguide Switch                  | 3103                         | 1301-1399                          | 2                           | 26-1/2                                    | 9             | 26-1/2       | 68                                                       |
| D. Dummy Load                        | 3104                         |                                    | 2                           | 24-1/2                                    | 8             | 6            | 34                                                       |
| 6. Console Assembly                  | 3190                         |                                    | 2                           | 30                                        | 45            | 28           | 401                                                      |
| A. Console Cabinets                  | 3191                         | 6001-6099                          | 2                           | 30                                        | 45            | 28           | 215                                                      |
| B. Plan Position Indicator           | 3192                         | 6101-6199                          | 3                           | 30                                        | 23-1/4        | 26-1/2       | 90                                                       |
| (1) PPI Driver                       | 3193                         | 6201-6399                          | 3                           | 18-1/4                                    | 21-3/4        | 8            | 41                                                       |
| (2) CRT Power Supply                 | 3196                         | 6401-6499                          | 3                           | 7-1/2                                     | 11            | 14-1/4       | 26.5                                                     |
| C. Monitor Panel                     | 3194                         | 6501-6599                          | 3                           | 26-1/2                                    | 5-1/2         | 4            | 5                                                        |
| D. Servo Amplifier                   | 3195                         | 6601-6699                          | 3                           | 9                                         | 8-1/4         | 17-1/2       | 23.5                                                     |
| 7. Synchroscope Assembly             | 3254                         | 6701-6750                          | 2                           | 14                                        | 8             | 21-1/2       | 29                                                       |
| A. Case                              |                              |                                    | 2                           | 14                                        | 8             | 21-1/2       | 4                                                        |
| B. Monitor Synchroscope              | 3252                         | 4301-4499                          | 2                           | 11-3/4                                    | 6-1/2         | 21           | 25                                                       |
| 9. Master Console Equipment Assembly | 3170                         |                                    | 1                           | 50                                        | 72            | 27           | 919                                                      |
| A. Master Console Equipment Cabinet  | 3171                         | 7001-7099                          | 1                           | 50                                        | 72            | 27           | 442                                                      |
| B. Console Voltage Regulator         | 3172                         | 7801-7899                          | 2                           | 23                                        | 19-1/2        | 17-1/4       | 90                                                       |
| C. Console Power Supply              | 3173                         | 7101-7199                          | 2                           | 23                                        | 11-1/2        | 12-1/2       | 88                                                       |



TABLE III  
DIMENSIONS AND WEIGHTS OF UNITS SUPPLIED (Continued)

| Name of Unit                                             | CA Type<br>No. | Symbol No.<br>Series | Quan-<br>tity | Uncrated Dimensions<br>(in inches) |        |        | Uncrated Weight<br>Per Unit<br>(in pounds) |
|----------------------------------------------------------|----------------|----------------------|---------------|------------------------------------|--------|--------|--------------------------------------------|
|                                                          |                |                      |               | Width                              | Height | Depth  |                                            |
| D. Line Repeater                                         | 3174           | 7301-7399            | 2             | 23                                 | 23-1/2 | 9-1/2  | 16.5                                       |
| (1) Line Compensator                                     | 3175           | 7401-7499            | 2             | 19                                 | 8-1/4  | 6-1/4  | 14                                         |
| (2) Repeater Line Driver                                 | 3176           | 7501-7599            | 2             | 13-1/4                             | 6-1/4  | 6-1/4  | 7                                          |
| (3) Video Mixer                                          | 3177           | 7601-7699            | 2             | 19-1/4                             | 5-1/2  | 6-3/4  | 9.5                                        |
| E. Monitor Synchro-<br>scope                             | 3252           | 4301-4499            | 1             | 11-3/4                             | 6-1/2  | 21     | 25                                         |
| F. Console Equipment<br>Control Panel                    | 3178           | 7201-7299            | 2             | 4                                  | 9-3/4  | 2-5/8  | 1.5                                        |
|                                                          |                |                      |               |                                    |        |        |                                            |
| 11. Transmitter House<br>Cable Junction<br>Box           | 3106           | 1401-1499            | 1             | 36-1/2                             | 26-1/2 | 7-1/2  | 175                                        |
| 12. Equipment Room Cable<br>Junction Box                 | 3106A          | 1801-1899            | 1             | 42-1/2                             | 42-1/2 | 7-1/2  | 245                                        |
| 13. Three-Phase A-C<br>Voltage Regulator                 | 3108           | 1501-1599            | 2             | 24-1/2                             | 40-1/2 | 17-1/2 | 390                                        |
| 14. A-C Voltage<br>Regulator                             | 3263           | 8601-8699            | 2             | 9-1/4                              | 27     | 11     | 134.5                                      |
| 15. Transmitter House<br>A-C Power Dis-<br>tribution Box | 3105           | 1501-1599            | 1             | 30-3/4                             | 32-1/2 | 12     | 133                                        |
| 16. Equipment Room A-C<br>Power Dist. Box                | 3105A          | 1701-1799            | 1             | 21-1/2                             | 21-1/2 | 9-3/4  | 62                                         |

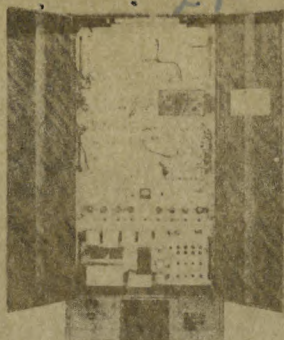


TABLE III  
DIMENSIONS AND WEIGHTS OF UNITS SUPPLIED (Continued)

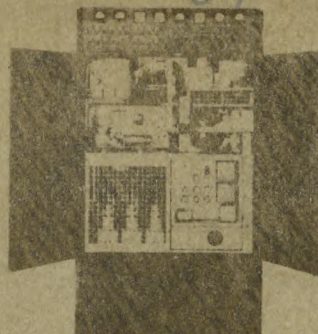
| <u>Name of Unit</u>                          | <u>CA Type No.</u> | <u>Symbol No. Series</u> | <u>Quantity</u> | <u>Uncrated Dimensions (in inches)</u> |               |              | <u>Uncrated Weight Per Unit (in pounds)</u> |
|----------------------------------------------|--------------------|--------------------------|-----------------|----------------------------------------|---------------|--------------|---------------------------------------------|
|                                              |                    |                          |                 | <u>Width</u>                           | <u>Height</u> | <u>Depth</u> |                                             |
| 17. Test Equipment                           |                    |                          |                 |                                        |               |              |                                             |
| A. Echo Box<br>TS-270A/UP                    |                    |                          | 1               | 8-3/4                                  | 12-1/4        | 14-1/2       | 25.75                                       |
| B. Signal Generator<br>TS-155C/UP            |                    |                          | 1               | 16-3/4                                 | 9             | 12-3/4       | 41                                          |
| C. Dumont 303A<br>Oscilloscope               |                    |                          | 2               | 12-1/8                                 | 16            | 19-3/4       | 75                                          |
| D. Hewlett-Packard<br>VTVM                   |                    |                          | 2               | 7-1/4                                  | 11-1/4        | 8            | 11                                          |
| E. Mobile Test<br>Table                      | 3107               | 1601-1699                | 2               | 25-1/8                                 | 37            | 34-1/2       | 53                                          |
| 18. Intercommunication<br>Equipment          |                    |                          |                 |                                        |               |              |                                             |
| A. Transmitter and<br>Console Equip-<br>ment |                    |                          | 2               | 13-1/2                                 | 7-1/2         | 8            | 17                                          |
| B. Console                                   |                    |                          | 1               | 16-1/2                                 | 7-1/2         | 8            | 19                                          |
| C. Sound Powered<br>Phones                   |                    |                          | 2               |                                        |               |              | 25                                          |
| 20. Misc. Control<br>Tower Equipment         |                    |                          |                 |                                        |               |              |                                             |
| A. Test Junction Box*                        | 3109               | 1901-1950                | 1               | 5                                      | 3-1/4         | 9-1/4        | 2                                           |
| B. Test Junction Box*                        | 3109A              | 1951-1999                | 1               | 5                                      | 3-1/4         | 9-1/4        | 2                                           |

\* Dimensions do not include attached cables.

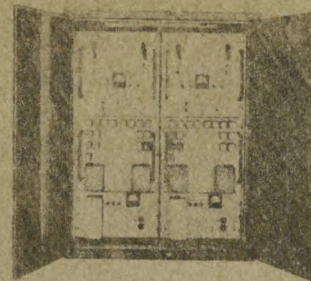




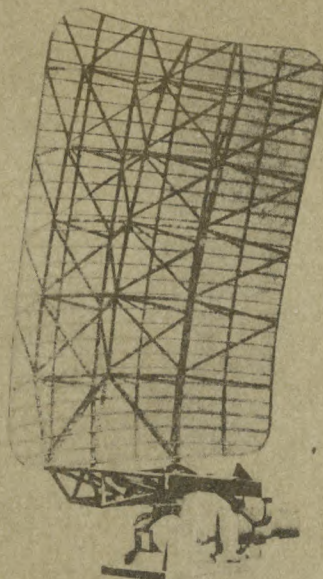
RECEIVER ASSEMBLY  
CA-3140



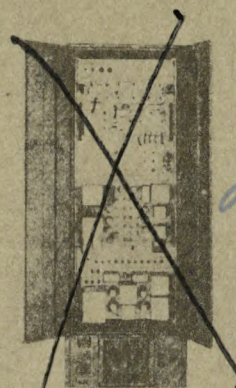
TRANSMITTER ASSEMBLY  
CA-3130



CONTROL ASSEMBLY  
CA-3160

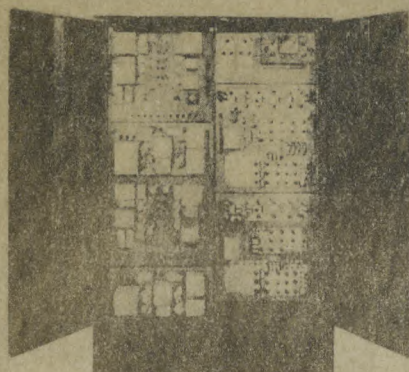


ANTENNA ASSEMBLY  
CA-3120

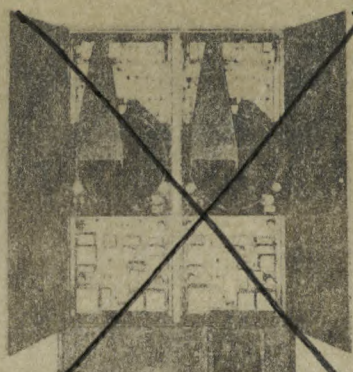


REPEATER CONSOLE EQUIPMENT  
ASSEMBLY CA-3180

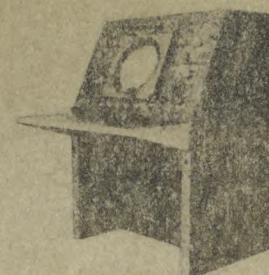
*Not supplied to MCH*



MASTER CONSOLE EQUIPMENT  
ASSEMBLY CA-3170



VIDEO MAPPING ASSEMBLY  
CA-3200



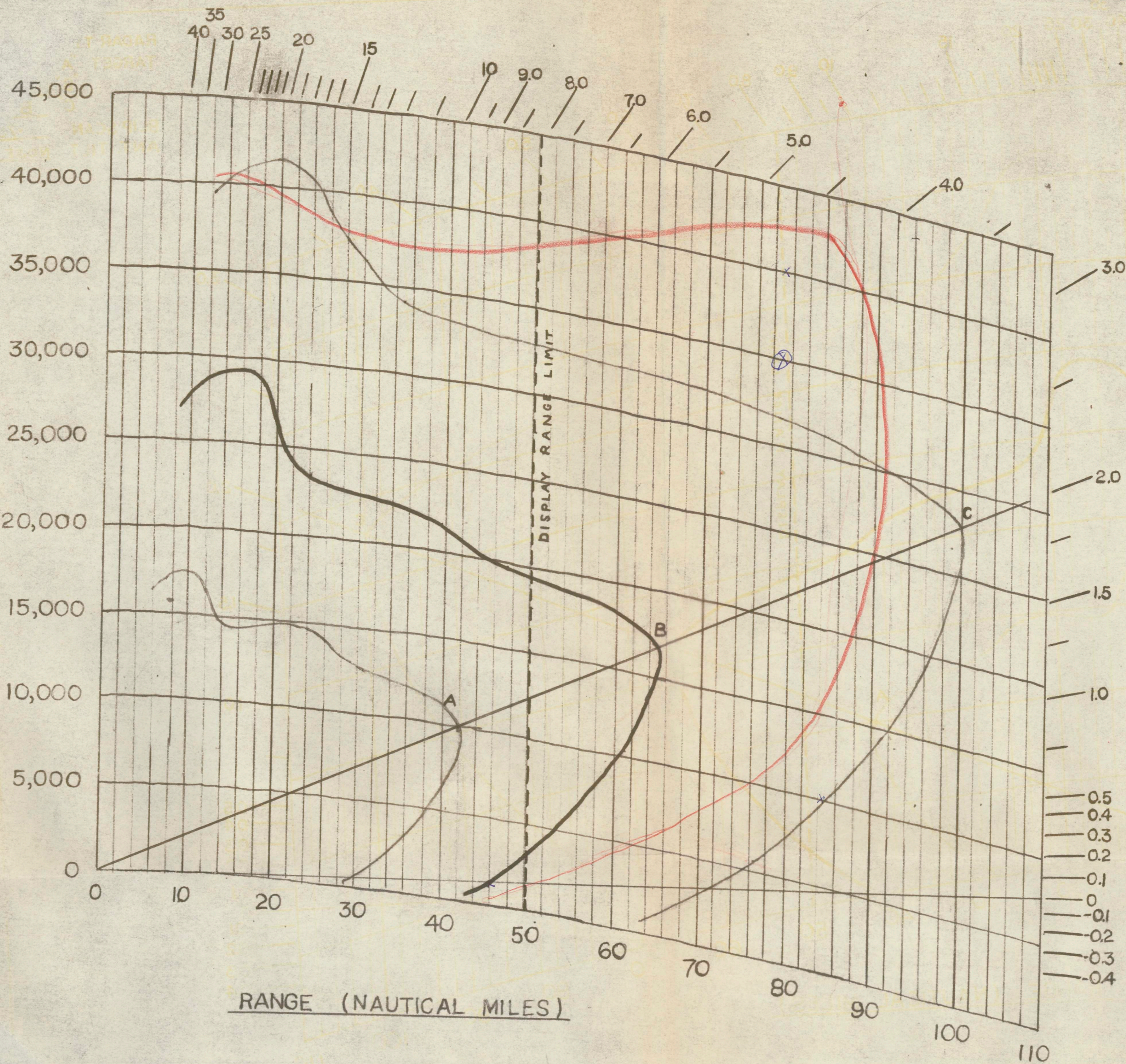
CONSOLE ASSEMBLY  
CA-3190

*Not supplied to MCH*

Figure 1-1. Airport Surveillance Radar  
(ASR-3) Set



HEIGHT IN FEET



RADAR TYPE ASR-3  
TARGET "A" F86  
"B" B47  
"C" B29  
BLIP SCAN .75  
ANT. TILT NOSE 2°

— coverage of  
CPN-4 with  
Sensitivity Kit

RANGE (NAUTICAL MILES)



|            |         |
|------------|---------|
| RADAR TYPE | AS R-3  |
| TARGET "A" | F86     |
| "B"        | B47     |
| "C"        | B29     |
| BLIP SCAN  | .75     |
| ANT. TILT  | NOSE 5° |

HEIGHT IN FEET

45,000

40,000

35,000

30,000

25,000

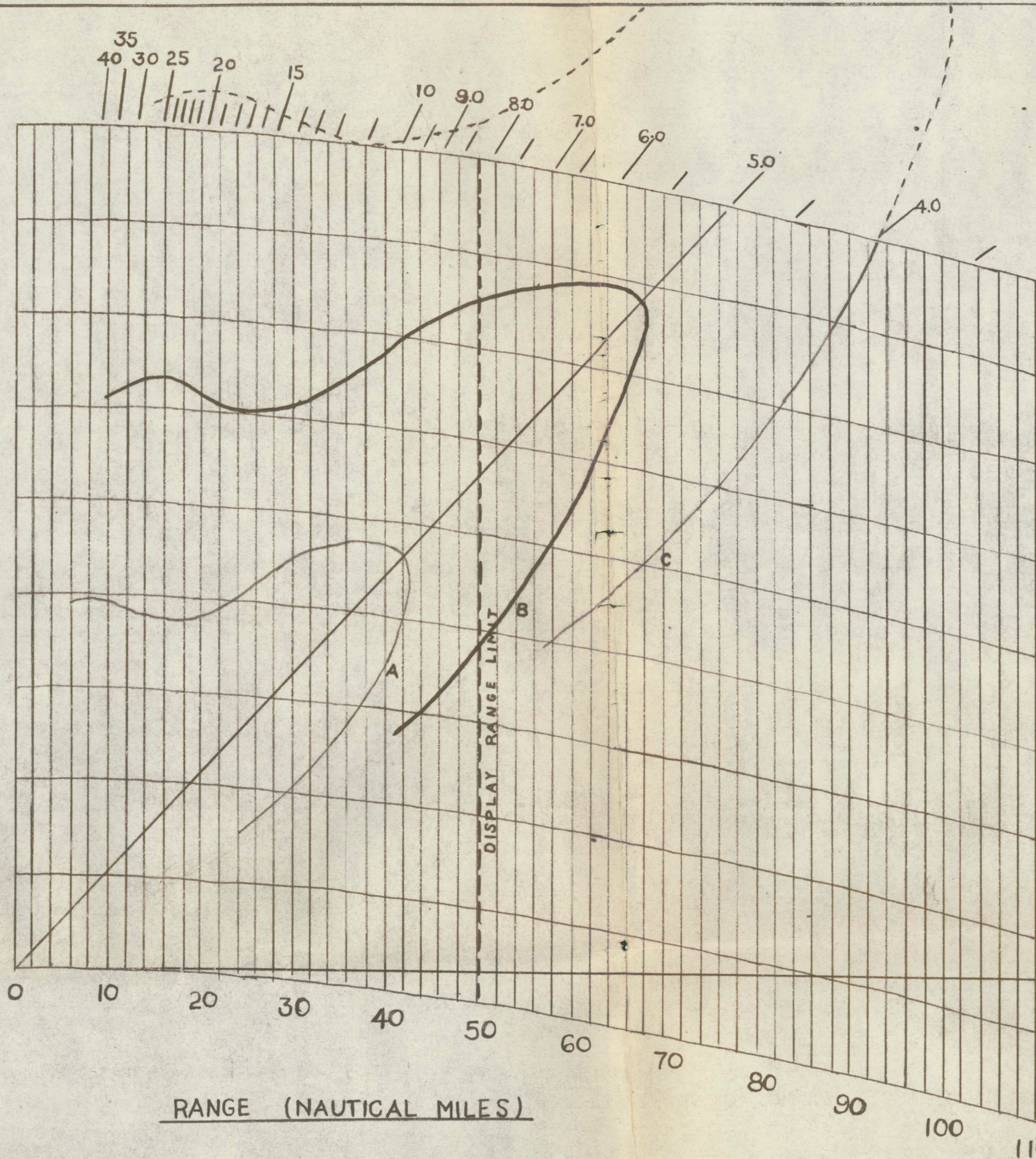
20,000

15,000

10,000

5,000

0



RANGE (NAUTICAL MILES)

DISPLAY RANGE LIMIT

A

B

C

3.0

2.0

1.5

1.0

0.5

0.4

0.3

0.2

0.1

0

-0.1

-0.2

-0.3

-0.4

35

40

30

25

20

15

10

9.0

8.0

7.0

6.0

5.0

4.0

3.0

2.0

1.5

1.0

0.5

0.4

0.3

0.2

0.1

0

-0.1

-0.2

-0.3

-0.4

-0.5

-0.6

-0.7

-0.8

-0.9

-1.0

-1.1

-1.2

-1.3

-1.4

-1.5

-1.6

-1.7

-1.8

-1.9

-2.0

-2.1

-2.2

-2.3

-2.4

-2.5

0

10

20

30

40

50

60

70

80

90

100

110



AFHQ  
COMM CENTRE

AUG 11 20 05 '60

NNNNC VMA056VBA021

MM RFEFZ

DE RFEMVB 26/11

M 111610Z

FM NNR ST HUBERT

TO CANAIRHED

BT

/C ON F I D E N T I A L/NRAC3533 11 AUG

YOUR DRDP 185 8 AUG ANSWERED BY CANAIRDEF MSG S305 9 AUG

PD THIS HQ RAISED INITIAL OPERATIONAL REQUIREMENT FOR REMOVAL OF ASR3

RQDARS ONLY AND NOT IN A POSITION TO PROVIDE INFORMATION ON

TECHNICAL STATUS OF EQUIPMENT

BT

11/2000Z

CONFIDENTIAL

DRDP/RDP 243

PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

CONFIDENTIAL

NNNN



288  
1842  
AFHQ  
COMM CENTRE  
AUG 9 21 08 '60  
DRDP 2-4-3  
L1950-100-ASR3

VMA054BVA027

MM RFEPTZ

DE RFEMVB 44/09

M 092030Z

CONFIDENTIAL

FM CANAIRDEF

TO CANAIRHED

BT

// C O N F I D E N T I A L // S305 9 AUG

YOUR DRDP 8 AUG PD ASR 3 MOD REFERRED TO IS 6B/1 NOW COMPLETED ON ALL  
SETS CMM ANY PREVIOUS NNR REFERENCE TO MAINTENANCE NO LONGER RELEVANT  
BT

09/2033Z

CONFIDENTIAL

PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

RDP 243  
Have Copy on local file  
RDP 243-2



## MESSAGE FORM

FILE S1950-100-ASR-3(DRDP)

FOR COMMCEN/SIGNALS USE

NUMBER

AFHQ  
COMM CENTRE

AUG 8 20 12 '60

SCR

|                                |                               |                                               |                                      |
|--------------------------------|-------------------------------|-----------------------------------------------|--------------------------------------|
| PRECEDENCE - ACTION<br>ROUTINE | PRECEDENCE - INFO<br>DEFERRED | DATE - TIME GROUP<br><del>1900</del> 081900 Z | MESSAGE INSTRUCTIONS                 |
| FROM CANAIRBED                 |                               |                                               | PREFIX<br>GR                         |
| TO NNR ST HUBERT               |                               |                                               | SECURITY CLASSIFICATION<br>CONFID    |
| INFO CANAIRDEF                 |                               |                                               | ORIGINATOR'S NUMBER<br>DRDP185 8 AUG |

REF ADCHQ MESSAGE S497 4 AUG PD ADVISE DETAILS ASR 3 MODIFICATIONS REQUIRED

PARAPHRASE NOT REQUIRED  
PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

|               |    |       |                                         |                             |                                                   |   |                                                                                |                |
|---------------|----|-------|-----------------------------------------|-----------------------------|---------------------------------------------------|---|--------------------------------------------------------------------------------|----------------|
| PAGE          | OF | PAGES | REFERS TO MESSAGE                       |                             | DRAFTER'S NAME<br><i>HC Wilson</i><br>(HC WILSON) |   | OFFICE<br>C4121                                                                | TEL.<br>2-5621 |
|               |    |       | CLASSIFIED YES <input type="checkbox"/> | NO <input type="checkbox"/> |                                                   |   |                                                                                |                |
| FOR OPR'S USE | R  | DATE  | TIME                                    | SYSTEM                      | OPERATOR                                          | D | DATE                                                                           | TIME           |
|               |    |       |                                         |                             |                                                   |   |                                                                                |                |
|               |    |       |                                         |                             |                                                   |   | RELEASING OFFICER'S SIGNATURE<br><i>HC Wilson</i><br>(HC WILSON) DRDP/RDP2-4-3 |                |



(1792)

NNN VMA0065

AFHQ  
COMM CENTRE

AUG 4 18 53 '60

BVA020

CR To PA  
S1950-100-ASR-3

VMA065BVA017

MM RFEPFZ

DE RFEMVB 20/04

M 041818Z

FM CANAIRDEF

TO RFEPFZ/CANAIRHED

INFO ZENGXNNR ST HUBERT

BT

//SECRET// S497 4 AUG

REF NRA548 15 JUL AND YOUR DRDP1 45 27 JUL NOT TO NNR RE ASR-3 REMOVAL PD  
NNR ADVISE THAT MAINTENANCE PROBLEMS REFERRED TO ARE THE MODIFICATIONS  
REQUIRED CMM RADOME REPAIR AT CRANBERRY PORTAGE PD NO SERVICING PROBLEMS  
WERE NOTED

BT

04/1820Z

ALL PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

SECRET

RD P/RDP-243



AFHQ  
COMM CENTRE  
AUG 3 01 45 '60

RMCO05

MM RFEPFZ

DE RFEPMR 8C/02

M 021955Z

FM CANAIRMAT

TO CANAIRHED

BT

// C O N F I D E N T I A L // LOG7233 2 AUG

MAINTENANCE OF ASR3 RADARS DEEMED LESS EXTENSIVE THAN AVERAGE  
RADAR PD TO THIS DATE PROCUREMENT OF PECULIAR SPARES HAS BEEN  
PRACTICALLY NIL PD CONSUMPTION OF COMMON COMPONENTS DEEMED  
AVERAGE CMM ACCURATE FIGURE NOT PROVIDED HERE DUE TO EXTENSIVE  
SEGREGATION FROM TOTAL RCAF CONSUMPTION REQUIRED

BT

02/2016Z

**CONFIDENTIAL**

1760  
235

Copy on  
local RDP 27-1

**CONFIDENTIAL**

**ALL PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED**



## MESSAGE FORM

FILE S1950-100-ASR3(DRDP)

FOR COMMCEN/SIGNALS USE

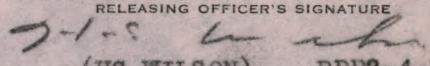
NUMBER

AFHQ  
COMM CENTRE

JUL 27 19 33 '60

|                                |                               |                               |                                       |
|--------------------------------|-------------------------------|-------------------------------|---------------------------------------|
| PRECEDENCE - ACTION<br>ROUTINE | PRECEDENCE - INFO<br>DEFERRED | DATE - TIME GROUP<br>27/19/82 | MESSAGE INSTRUCTIONS                  |
| FROM CANAIRHED                 |                               |                               | PREFIX<br>GR                          |
| TO CANAIRDEF                   |                               |                               | SECURITY CLASSIFICATION<br>SECRET     |
| INFO                           |                               |                               | ORIGINATOR'S NUMBER<br>DRDP145 27 JUL |

RADAR ASR3 PD NRR MESSAGE NRA548 15 JUL GIVES DIFFICULT MAINTENANCE AS ONE OF THE REASONS FOR RECOMMENDING REMOVAL OF THE 3 MCL ASR3 RADARS PD REQUIRE REPORT ON MAINTENANCE PROBLEMS TO ASSESS POSSIBLE FUTURE USE OF THESE RADARS IF THEY ARE REMOVED FROM MCL

|                                                                                                                                                |    |       |                                                                     |        |                |   |        |      |        |          |
|------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|---------------------------------------------------------------------|--------|----------------|---|--------|------|--------|----------|
| PAGE                                                                                                                                           | OF | PAGES | REFERS TO MESSAGE                                                   |        | DRAFTER'S NAME |   | OFFICE |      | TEL.   |          |
|                                                                                                                                                |    |       | CLASSIFIED YES <input type="checkbox"/> NO <input type="checkbox"/> |        | (HC WILSON)    |   | C4121  |      | 2-5621 |          |
| FOR OPR'S USE                                                                                                                                  | R  | DATE  | TIME                                                                | SYSTEM | OPERATOR       | D | DATE   | TIME | SYSTEM | OPERATOR |
| RELEASING OFFICER'S SIGNATURE<br><br>(HC WILSON) RDP2-4-3 |    |       |                                                                     |        |                |   |        |      |        |          |



## MESSAGE FORM

FILE S1950-100-ASR3(DRDP)

MCEN/SIGNALS USE

NUMBER

|                                       |                               |                                     |                                              |
|---------------------------------------|-------------------------------|-------------------------------------|----------------------------------------------|
| PRECEDENCE - ACTION<br><b>ROUTINE</b> | PRECEDENCE - INFO<br>DEFERRED | DATE - TIME GROUP<br><b>27/9322</b> | MESSAGE INSTRUCTIONS                         |
| FROM <b>CANAIRHED</b>                 |                               |                                     | PREFIX<br><b>GR</b>                          |
| TO <b>CANAIRMAT</b>                   |                               |                                     | SECURITY CLASSIFICATION<br><b>CONFD</b>      |
| INFO                                  |                               |                                     | ORIGINATOR'S NUMBER<br><b>DRDP149 27 JUL</b> |

REF MCL PD ADVISE IF MAINTENANCE OF MCL ASR3 RADARS MORE DIFFICULT OR EXTENSIVE THAN  
AVERAGE RADAR PD IF POSSIBLE SUPPLY LIST OF SPARE CONSUMED SINCE ASR3 BECAME OPERATIONAL

|                     |    |       |                                                                     |        |                |   |                                                                              |        |
|---------------------|----|-------|---------------------------------------------------------------------|--------|----------------|---|------------------------------------------------------------------------------|--------|
| PAGE                | OF | PAGES | REFERS TO MESSAGE                                                   |        | DRAFTER'S NAME |   | OFFICE                                                                       | TEL.   |
|                     |    |       | CLASSIFIED YES <input type="checkbox"/> NO <input type="checkbox"/> |        | (HC WILSON)    |   | C4121                                                                        | 2-5621 |
| FOR<br>OPR'S<br>USE | R  | DATE  | TIME                                                                | SYSTEM | OPERATOR       | D | DATE                                                                         | TIME   |
|                     |    |       |                                                                     |        |                |   |                                                                              |        |
|                     |    |       |                                                                     |        |                |   | RELEASING OFFICER'S SIGNATURE<br><i>[Signature]</i><br>(HC WILSON) RDP 2-4-3 |        |



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(1)

ROUTINE

FM NNR ST HUBERT

TO CINCINORAD

INFO CANAIRDEF CANAIRHED

**SECRET**

S E C R E T

NRA 548 15 JUL 60

SUBJECT ASR3 RADARS AT MCL STATIONS KNOB LAKE STONEY MTNCMM AND CRANBERRY  
PORTAGE PD THIS MESSAGE IN TWO PARTS PD PART ONE PD THE MID CANADA  
LINE IS EQUIPPED WITH THREE ASR3 RADARS AT KNOBLAKE CMM STONEY MTM CMM  
AND CRANBERRY PORTAGE PD THESE RADARS WERE INSTALLED TO ASSIST IN THE  
IDENTIFICATION PROBLEM IN AREAS CONSIDERED TO HAVE HIGH DENSITY TRAFFIC PD  
EXPERIENCE HAS SHOWN THAT THESE RADARS ARE OF NEGLIGIBLE VALUE DUE TO  
THEIR SHORT RANGE CMM POOR SITING AND DIFFICULT MAINTENANCE PD PART TWO IT  
IS ~~VERY~~ <sup>MY</sup> INTENTION TO RECOMMEND REMOVAL OF THESE RADARS UNLESS YOUR HQs  
POSES ANY OBJECTION PD REQUEST YOUR COMMENTS

BT

16/8/60

DRDP copies



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S1950-100-ASR3 (DRDP)

ROUTINE

FM CANAIRHED

TO CANAIRDEF

SECRET

S E C R E T

DRDP145 27 JUL

INFO RADAR ASR3 PD NRR MESSAGE NRA548 15 JUL GIVES DIFFICULT MAINTENANCE  
AS ONE OF THE REASONS FOR RECOMMENDING REMOVAL OF THE 3 MCL ASR3 RADARS PD  
REQUIRE REPORT ON MAINTENANCE PROBLEMS TO ASSESS POSSIBLE FUTURE USE OF  
THESE RADARS IF THEY ARE REMOVED FROM MCL

(HC WILSON) C4121 2-5621

(HC WILSON) RDP2-4-3



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3

FM CANAIRDEF

TO RFEFPZ/CANAIRHED

INFO ZENGXNNR ST HUBERT

BT

//SECRET// S497 4AUG

REF NRA548 15 JUL AND YOUR DRDP145 27 JUL NOT TO NNR RE ASR-3

REMOVAL PD NNR ADVISE THAT MAINTENANCE PROBLEMS REFERRED TO ARE  
THE MODIFICATIONS REQUIRED GMM RADOME REPAIR AT CRANBERRY PORTAGE

PD NO SERVICING PROBLEMS WERE NOTED

BT

04/1820Z

SECRET



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S1950-100-ASR3 (DRDP)

ROUTINE

**CONFIDENTIAL**

FM CANAIRHED

TO

CANAI RMAT

CONFD

INFO

DRDP149 27 JUL 60

REF MCL PD ADVISE IF MAINTENANCE OF MCL ASR3 RADARS MORE DIFFICULT OR EXTENSIVE  
THAN AVERAGE RADAR PD IF POSSIBLE SUPPLY LIST OF SPARE CONSUMED SINCE  
ASR3 BECAME OPERATIONAL

(HC WILSON)

C4121

2-5621

(HC WILSON) RDP 2-4-3



5  
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Y

FM CANAIRMAT

TO CANAIRHED

BT

CONFIDENTIAL

// C O N F I D E N T I A L // LOG7233 2 AUG

MAINTENANCE OF ASR3 RADARS DEEMED LESS EXTENSIVE THAN AVERAGE RADAR  
PD TO THIS DATE PROCUREMENT OF PECULIAR SPARES HAS BEEN PRACTICALLY  
NIL PD CONSUMPTION OF COMMON COMPONENTS DEEMED AVERAGE CMM ACCURATE  
FIGURE NOT PROVIDED HERE DUE TO EXTENSIVE SEGREGATION FROM TOTAL RCAF  
CONSUMPTION REQUIRED

BT

ORIGINAL ON S1950-100-ASR3



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CONFIDENTIAL

ROUTINE

FM CANAIRHED

CONFD

TO ENR ST HUBERT

DRDP185 8 AUG

INFO CANAIRDEF

REF ADCHQ MESSAGE S497 4 AUG PD ADVISE DETAILS ASR3 MODIFICATIONS REQUIRED

(HC WILSON) C4121 2-5621

(HC WILSON) RDP/2-4-3



7  
C  
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FM CANAIRDEF

TO CANAIRHED

BT

**CONFIDENTIAL**

/ C O N F I D E N T I A L // S305 9 AUG

YOUR DRDP8 AUG PD ASR3 MOD REFERRED TO IS 6B/1 NOW COMPLETED ON ALL  
SETS CMM ANY PREVIOUS NNR REFERENCE TO MAINTENANCE NO LONGER RELEVANT

BT

09/2033Z



8  
C  
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P  
Y

FM NNR ST HUBERT

TO CANAIRHED

**CONFIDENTIAL**

BT

//C O N F I D E N T I A L// NRAC3533 11 AUG

YOUR DRDP185 8 AUG ANSWERED BY CANAIRDEF MSG S305 9 AUG PD THIS HQ  
RAISED INITIAL OPERATIONAL REQUIREMENT FOR REMOVAL OF ASR3 RQDARS ONLY  
AND NOT IN A POSITION TO PROVIDE INFORMATION ON TECHNICAL STATUS OF  
EQUIPMENT

BT

11/2000Z



4042

**ROUTINE**

AFHQ  
COMM CENTRE

VMA003BVA001

4632

NOV 8 00 32 '60

RR RFEFPZ

DE RFEMVB 1/08

R M 072200Z

FM CANAIRDEF

TO RFEFPZ/CANAIRHED

INFO ZEN/NNR ST HUBERT

BT

/S E C R E T/A38 7 NOV

FOR VCAS FROM AOC PD REFERENCE MY A112 DATED 7 SEP PD

REQUEST DECISION IN THIS MATTER AS SOON AS POSSIBLE PD

I REITERATE THAT THERE IS NO OPERATIONAL REQUIREMENT FOR THE

ASR 3 RADARS AT KNOB LAKE CMM STONEY MOUNTAIN CMM AND CRANBERRY

PORTAGE

BT

08/0013Z

**SECRET**

CRPA

S955-100-80/7  
TDO 315

VCAS

OROP

form  
DEO

E/K Wyblow

**A** PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED REPLY OR REFERENCE  
PERMITTED

**SECRET**

② Note for File  
This is a copy, orig. message is on  
file S955-100-80/7 TDO 319.  
S955-100-80/7 TDO 315  
10 Nov 60.  
2-5384.

211K

C 756



439

3806

AFHQ  
COMM. CENTRE

JUL 21 13 56 '60

PRIORITY

VMA023E VA003

PP RFEPFZ

DE RFEMVB 5/21

P 211315Z

FM CANAIRDEF

TO CANAIRHED

BT

4402  
CR/PA

5955-100-80/7

TD 0315  
OROP 2-3

VCA S

SECRET

~~CONF~~

SECRET AC1703 21 OCT

REQUEST ANSWER TO OUR A112 07 SEPT 60 BE EXPEDITED

BT

21/1340Z

③ Note for ~~File~~  
Message prepared for VCA S Signature - Believe this  
is ASR 3 removed.  
Not sent.

SECRET

PARAPHRASE NOT REQUIRED  
NO UNCLASSIFIED FOR REFERENCE

DC/CEO 2-4  
2-5384

Per reply.  
R. K. K. K.  
ROR 2-3

24 Oct. 23880









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Ottawa, ON K1A 0N4

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Ottawa, ON K1A 0N4

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|                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------|
| TITLE/TITRE :<br><b><i>Mid-Canada Line</i></b>                                                                       |
| FILE/DOSSIER :                                                                                                       |
| REFERENCE NUMBER / NUMÉRO DE RÉFÉRENCE:<br><b><i>RG24-E-1-c, Volume number: 18069, File number: 955-100-80/7</i></b> |
| PAGE(S) : <b>82</b>                                                                                                  |
| DATE : <b>13/11/2025</b>                                                                                             |