

5-1300-30

212

DEPARTMENT OF NATIONAL DEFENCE

U.S.N. - R.C.N. - R.N. COMMUNICATIONS IN THE
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FILE NO.	SUBJECT
TS 1300-30	Top Secret file of same subject

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NMWC 1300-30
Our file ref.



CANADA

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN JOINT STAFF

Reply to
Naval Member

2450 Massachusetts Ave., N.W.
Washington 8 D.C.
U.S.A.

4 October, 1963

SHIP TYPE ELECTRONICS PLAN (STEP)(U)

Enclosure: (A) Change 2 to OPNAVINST P09670.2A
of 11 May, 1961 - Ship Type Electronics
Plan (STEP)(U) - 2 copies

Submitted for the information of Naval Headquarters
is enclosure (A).

J. J. Jones
COMMODORE

The Naval Secretary

10-10 Attention: Director of Naval Communications

*Change 2 entered
in Registry.
Hart 63*

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Referred to	<i>Staff</i>
OCT 9 1963	
File	<i>1300-30</i>
Chg'd to	<i>Peto & Sons</i>

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Directorate of Naval Communications

NSS 1961-22-1 TD 2184
NS 9810-1 (STAFF)

PFW/DF

- ROYAL CANADIAN NAVY -

4, Ontario.

10 JUL 1962

CAN-UK-US NAVAL COMMUNICATIONS BOARD -
ITEM W-1.2 - SIDE-BY-SIDE LISTING OF CIRCUITS

Reference: (a) Conclusions of Second Board Meeting,
Paragraph 9 d.

Operational commanders have commented favourably on the proposed circuit nomenclature. There were a few minor suggestions for improvement, however, Naval Headquarters considers the system should be introduced for trial at sea as it stands.

2. Since operational trials will no doubt generate a number of changes, it is recommended that the CAN-UK-US navies introduce the system for a six months period before arriving at firm conclusions. Introduction to NATO should await completion of the trial period.

7mo
For Despatch
Date 10-7-62
Initials AK

R.B.
NAVAL SECRETARY.

Naval Member Canadian Joint Staff, (WASHINGTON)

CONFIDENTIAL

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Directorate of Naval Communications.

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NSC 9810-1 TD 2176
(STAFF)

- ROYAL CANADIAN NAVY -

4, Ontario.

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RADIO COMMUNICATION CIRCUIT NOMENCLATURE

References: (a) FC:S: 9810-1 dated 31 May, 1962.

(b) ACC 1300-1 dated 21 June, 1962.

The comments contained in references (a) and (b) are noted and will be taken into account.

2. Since a fair measure of CAN-UK-US agreement on the present draft has already been achieved, it is preferable to accept it at this stage. After general fleet acceptance the CAN-UK-US Naval Communications Board intends to implement the system operationally in the CAN-UK-US navies and, at the same time, introduce it to NATO.

3. Suggestions from Senior Officers in Command are invited after the nomenclature has been tried out at sea. It is intended that the system be kept under constant review to meet the ever-changing needs of Naval operations.

4. With regard to the basic functional words, every effort has been made to avoid words which have a meaning peculiar to only one navy. For example:

"Combat Information" and "Plot" are omitted; the former "CIP" nets will use the basic functional word "Reporting", which should be understood by all nations.

5. On frequency bands, the specified ranges "UHF (225-400 mc/s)", "HF (2.0-30.0 mc/s)" and "MF (300-600 kc/s)" were chosen to cover the bands normally used in maritime operations and those covered by the majority of ship and aircraft communication equipment. Obviously they stray from the accepted international division of the frequency spectrum.

6. The draft nomenclature will probably be implemented in the autumn of 1962.

P.C.
NAVAL SECRETARY.

Flag Officer Atlantic Coast.

Flag Officer Pacific Coast.

J.M.

For Despatch

Date 2. 8. 62

Initials *AR.*

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CANADA

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2176

DEPARTMENT OF NATIONAL DEFENCE

ROYAL CANADIAN NAVY

ACC: 1300-1
Office of the Flag Officer Atlantic Coast
Fleet Mail Office
Halifax, N.S.

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JUN 21 1962

RADIO COMMUNICATION
CIRCUIT NOMENCLATURE

Reference: (a) NS: 9810-1 (STAFF) dated 5 April, 1962

Submitted for the consideration of Naval Headquarters in accordance with reference (a) is the report on the proposed system for Radio Communication Circuit Nomenclature.

2. Comments from Fleet Commanders favour adoption of the system proposed after trial by units employed in Maritime operations; however, some recommendations for minor changes to the nomenclature have been submitted and are forwarded with covering comments.

3. Recommendations and comments are listed under each of the three main components used in reference (a) to arrive at a circuit title.

PARA 2 (b) BASIC FUNCTIONAL WORDS

No recommendations are made to alter the existing list of functional words as these appear to be adequate.

PARA 2 (c) AMPLIFYING PREFIXES

Comment By Cancomflt

Cancomflt submits that the amplifying prefix Combat Information Plot be added to the list promulgated.

Recommendation

Concur that an amplifying prefix to describe "Combat Information" should be included, however, it is considered that the prefix "Plot" combined with a basic functional word would suffice i.e. "Plot Reporting UHF". It is submitted that the requirement for other prefixes would become apparent during the trial period.

The Naval Secretary

.../2

Copy to: Flag Officer Pacific Coast

Maritime Commander Atlantic

Senior Canadian Officer Afloat (Atlantic)

Joint Maritime Warfare School

Officer-in-Charge
Communications Division
Fleet School

Referred to <i>Staff</i>
JUN 25 1962
File No. <i>9810-1</i>
<i>24/7/62</i> .000137

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- 2 -

PARA 2 (d) AMPLIFYING SUFFIXES

Comment by CJMWS

CJMWS suggests that to designate a net more specifically, a requirement exists to indicate whether the net is Voice, CW or RATT with an indicating group for SSB as necessary; then a circuit designation would appear as "Task Group Tactical UHF Voice or Primary". For operational purposes this could be abbreviated to an amplifying prefix, basic function and amplifying suffix indicating circuit use i.e. Primary, Secondary, or Overload with the communication plan specifying the frequency (hence the frequency range) and the type of emission.

Comment by Combrax Hfx.

(1) Indicates there is a preference for an emission designator rather than frequency band information.

(2) Suggests that para 2 (d) (1) be amended to read:

MF (1.5 - 3.0 Mc/s)
LF (Below 600 Kc/s)

(3) Recommends retention of the term Overload because current doctrine does not provide for Secondaries to be used as Overload circuits.

(4) Requests that consideration be given to the adoption of a common circuit designation system at the same time as a common nomenclature, that is, a distinctive numbering feature to readily identify CAN-UK-US circuits.

Recommendations

Concerning comment by CJMWS and Combrax Hfx. (1) above it is recommended that the system be tried as originally proposed with further amplifying data shown in pertinent operation orders or communication plans. i.e. When reference is made to a circuit in communication doctrine it would appear thus "Task Group Tactical UHF" while in a communication plan this would be shown as "Task Group Tactical" -- 282.2mc -- A3.

Comment (2). Para 2 (d) (A) through (C) appear to be in line with practical usage terms in vogue, however, it is submitted that if the practical point of view is the premise then the term LF would be more appropriate for frequencies below 600 Kc/s and the terms HF encompass frequencies from 1.5 to 30.0 Mc/s; then the use of MF (the broadcast band) could be discarded.

.../3

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- 3 -

Comment (3). Since the term Secondary implies that the circuit be available for immediate use it is recommended the term Overload be retained for those circuits required for reasons of volume only; at the same time, it is realized that the requirement for an Overload Circuit is rare indeed.

Comment (4). It is considered that this would be difficult because of regional frequency differences. Therefore, it is recommended that circuit designators be promulgated in Communication plans or operation orders.

W. H. Landym
REAR ADMIRAL



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DEPARTMENT OF NATIONAL DEFENCE

ROYAL CANADIAN NAVY

PC:S:9810-1

2152

Office of
The Flag Officer Pacific Coast

MAY 31 1962

RADIO COMMUNICATION CIRCUIT NOMENCLATURE

Reference: (a) NS 9810-1 (Staff) dated 5 April, 1962.

Submitted for the information of Naval Headquarters are the following comments in accordance with reference (a).

2. The requirement for a common nomenclature is concurred in, and the proposed system of naming circuits adequately meets known requirements.

3. It is recommended that the following additional Basic Functional Words and suffixes be included in Enclosure (A) to reference (a):

Para 2 (b) - Basic Functional Words

- (i) Umpire
- (ii) Safety

Para 2 (d) - Amplifying Suffixes

- (i) Voice
- (ii) CW
- (iii) RATT

[Handwritten signature]
The Naval Secretary.

cc:

The Flag Officer Atlantic Coast.

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[Handwritten signature]

RECEIVED

Referred to *[Handwritten signature]*

JUN 1 1962

File No. *[Handwritten: 9810-1]*

Chgd to *[Handwritten: 2152-1/15]*

CONFIDENTIAL

NS 9810-1 (STAFF)

✓ NS 1300 -30

ROYAL CANADIAN NAVY

Ontario.

5 April 1962 -

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RADIO COMMUNICATION CIRCUIT NOMENCLATURE

Enclosure: (A) A System for Naming Circuits.

Because of the variety of circuit nomenclatures in use in the allied navies, the CAN-UK-US Naval Communications Board has agreed a draft circuit nomenclature, which it is hoped will come into common use in the CAN-UK-US navies and eventually NATO. A copy is enclosed.

2. The Board has asked the three navies to send the draft nomenclature to fleet Commanders for comment. The system is flexible and self-evident, and with minor modifications, would meet the requirement for a common nomenclature. After agreement on the draft, the nomenclature will be introduced to the CAN-UK-US navies for trial at sea.

3. Please co-ordinate comments with Maritime Commanders and report by 31 May.

Original signed by
PC
fr NAVAL SECRETARY.

The Flag Officer Atlantic Coast.

The Flag Officer Pacific Coast.

Copy to: Maritime Commander Atlantic.

Maritime Commander Pacific .

Chief of the Air Staff.

Air Officer Commanding, Maritime Air Command.

Officer-in-Charge, Communication Division Fleet School.

CONFIDENTIAL

C O N F I D E N T I A L

APPENDIX D to W-1.2/3/A
2.2/3/A
4-2/3/A

29 December, 1961.

A SYSTEM FOR NAMING CIRCUITS

1. During the preparation of the list of circuits in Appendix A, it was noted that some circuits used for similar purposes had different names in each navy. Also other circuits which had similar names were used for different purposes. Therefore it appeared that one part of the compatibility problem could be solved by agreeing on a CAN-UK-US title for each circuit on which compatibility was considered necessary.

2. Reference was made first to ACP 176 which contains the only agreed instructions for the nomenclature of nets. It was found that, although those instructions defined the categories of nets required and listed names for certain specific nets, ACP 176 did not cater adequately for the naming of new circuits and nets which were necessitated by changing concepts of operations. Therefore the following system for naming circuits which has been used in Appendix A is proposed for forwarding to fleet commanders for their comments.

(a) INTRODUCTION

Every circuit title, when described in full, shall consist of three components:

- (1) an amplifying prefix;
- (2) a basic functional word;
- (c) an amplifying suffix.

(b) BASIC FUNCTIONAL WORDS

The basic functional words are as follows:

- (1) tactical;
- (2) control;
- (3) reporting;
- (4) administrative;
- (5) co-ordination;
- (6) broadcast;
- (7) ship-shore;
- (8) logistics;
- (9) command.

(c) AMPLIFYING PREFIXES

One or more amplifying prefixes may be added to the basic functional word to describe a circuit more fully. The amplifying prefixes are as follows:

AAW	land-launch	ship
AEW	minesweeper	shore
air (craft)	missile	sonar

C O N F I D E N T I A L

.... /2

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C O N F I D E N T I A L

- 2 -

APPENDIX D

amphibious	OTC	spoke
area	patrol	spotting
ASW	picket	strike(ing)
CAP	radar	submarine
carrier	reconnaissance	support
commander(s)	replenishment	surface
convoy	SAR	task element
data	SAU (letter)	task fleet
escort	scout (ing)	task force
EW	screen	task group
fleet	search	task unit
helicopter	sector	weapon

(d) AMPLIFYING SUFFIXES

One or two amplifying suffixes may be added to the basic functional word to describe a circuit more specifically. The suffixes are of two types:

(1) to specify the frequency range:

- A. UHF (225-400 mc/s)
- B. HF (2.0-30.0 mc/s)
- C. MF (300-600 kc/s)

(2) to describe the use of different frequencies assigned to a circuit:

- A. Primary - the normal frequency used;
- B. Secondary - for use when the primary is overloaded or for any other reason cannot be used.

(e) EXAMPLES

- (1) Task Group Tactical UHF
- (2) Task Group Reporting UHF
- (3) EW Control HF
- (4) ASW Co-ordination UHF
- (5) ASW Helicopter Control UHF
- (6) SAU Tactical UHF
- (7) Air Co-ordination HF
- (8) Task Force/Task Group Command HF
- (9) Task Group Administrative HF

C O N F I D E N T I A L

.../3

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C O N F I D E N T I A L

APPENDIX D

- 3 -

(f) NOTES

- (1) There is no objection to abbreviated titles within a force once the circuits are established in a communication plan. For example, "Task Group Tactical UHF" could be called simply "Tactical UHF".
- (2) Every circuit must contain a "basic functional word".
- (3) The list of "amplifying prefixes" is not complete. Operational commanders may introduce new prefixes as required to fulfil their needs, but must submit them for promulgation in the basic instructions.

C O N F I D E N T I A L

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Our file ref. NMWS:1300-30

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN JOINT STAFF

2450 Massachusetts Ave., N.W.
Washington 8 D.C.
U.S.A.

Reply to
Naval Member

REC'D BY EEC-E2
DATE- 25/5/58
TO: VEA

BEST AVAILABLE COPY

6 November, 1958.

U.S. PLANNING OF HIGH POWER, HIGH FREQUENCY
TRANSMITTING STATION

- Reference: (a) CANAVUS 052043Z Sep 58
(b) CANAVHED 101437Z Sep 58
(c) CANAVHED 162053Z Sep 58
- Enclosure: (A) OP 302C/ga Ser 003703P30
dated 31 January, 1958.
(B) OP 302C/es Ser 003725P30
dated 25 August, 1958.

Submitted for the information of Naval Headquarters further to the above noted references are enclosures (A) and (B). As a result of the details given to the USN from references (b) and (c), the enclosures were passed to the RCN for information. Enclosure (A), para.2 emphasizes the importance the USN is placing in establishing a positive control of its communication link to Polaris and Missile type submarines.

2. The USN has stated that the information contained in the above noted enclosures has been furnished upon the condition that it will not be released to another nation without the specific authority of the Department of the Navy of the United States; that it will not be used for other than military purposes; that individual or corporate rights originating in the information, whether patented or not, will be respected; and that the information will be provided substantially the same degree of security afforded it by the Department of the Navy of the United States.

3. It is expected further information may be made available in due course.


COMMODORE

The Naval Secretary

13-11 Attention: Director of Naval Communications

SECRET

Staff
1300-30
PC 1000145

CH CAFA 511

SECRET

OP-302C/es
Ser 003725P30

SECRET

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From: Chief of Naval Operations
To: Chief, Bureau of Ships

Subj: High Power, High Frequency transmitting facility (U)

Ref: (a) BUSHIPS ltr ser 744-002603 of 6 Aug 1958
(b) CNO ltr ser 003703P30 of 31 Jan 1958

1. Reference (a) forwarded the preliminary study and recommendations for siting the subject facility. Reference (b) forwarded the planning guidance and communication operational requirements for this station.
2. The report forwarded by reference (a) recommended selection of a site in the Eastern United States. This recommendation was based largely on the advantages of such a site in covering the Eastern Atlantic and Mediterranean area south of 55°N. The Northeastern Atlantic Ocean north of 55°N, and the Norwegian Sea constitute a most important area. This area should be given special consideration in siting this high power station in view of the almost total lack of high frequency coverage provided by present facilities. It must also be emphasized that only one high power station is planned and the maximum benefit from such a single station is desired.
3. The recommendations forwarded by reference (a) are not approved for the reasons stated above. It is requested that further engineering of this project give priority to coverage of the Norwegian Sea and include a site in the Northwest or North Central United States.

/s/ P. Virden
P. VIRDEN
Rear Admiral, U.S. Navy
Director, Naval Communications
By direction

Copy to:
BUDOCKS
INPWO GND
OP-301P
OP-44
OP-300
OP-30T

Enclosure (3) to CNO (OP-302C) ltr ser 003725P30 of

ENCLOSURE

SECRET

SECRET

OP-302C/ga
Ser 003703P30
31 Jan 1958

SECRET

From: Chief of Naval Operations
To: Chief, Bureau of Ships

BEST AVAILABLE COPY

Subj: High power, high frequency transmitting station; planning of

1. The following information is forwarded to provide planning guidance in the development of engineering and technical criteria for a high-power, high-frequency (HF/HF) radio transmitting station.
2. This station is to serve initially as an alternate for the very-low-frequency (VLF) primary shore/ship Command Communication Link to the FHM submarines. An alternate Command Communication Link is considered necessary to provide an additional means in order that the FHM submarines could receive an order to fire even if our VLF capability, or a part thereof, were to be destroyed in the initial phase of a nuclear attack. The prime operational requirements for this HF/HF station, therefore, are that it be as reliable as practicable and capable of being placed in full operation on short notice. Normally, the transmitters will be keyed only for essential testing.
3. For strategic reasons, this station must be located within the central United States on a site which is remote from major target areas but is accessible to primary and alternate telephone trunk line facilities. Facilities for the station will include two high-frequency radio transmitters capable of 600-kilowatt peak-power operation. The location and design of the HF/HF facility should provide for the highest possible probability of reception at any point in the world, but particularly the eastern and northeastern Atlantic, the western Pacific, and Mediterranean areas.
4. In the consideration of world-wide coverage, and inasmuch as the antennas may need to be installed in increments, it is imperative that first priority be given to the capability of reception in the northeast Atlantic and Mediterranean areas. The date for the station to be operational for the above initial areas is 1 January 1961, or earliest practicable thereafter.
5. Insofar as practicable, and in order to provide deception as to its intended function, this station should not have the general appearance of a vital communication activity.
6. Funds for procurement of equipment and construction of the station will be requested in the Fiscal Year 1960 Budget. It is planned to use high-power amplifier being procured on Contract N00017-58-1000 with Continental Electronics. Funds for the remainder of the facility are being budgeted as follows:

Enclosure (1) to CNO(OP-302C) ltr ser 003733P30
of _____

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ENCLOSURE

SECRET

OP-302c/ga
 Ser 003703P30
 31 Jan 1958

SECRET

- a. One additional power amplifier, and two driver amplifiers - \$600,000.
 - b. Construction of the station, including antenna, ground-system, and ancillary facilities - \$15,142,000.
7. It is requested that technical planning and criteria for this HF/HF radio station be developed as a priority matter. The most urgent item required is technical criteria for site selection. It is further requested that site criteria be provided as soon as possible and not later than 1 April 1958. An on-site survey party representing the Chief of Naval Operations, Bureau of Ships, and Bureau of Yards and Docks will then conduct site surveys prior to 1 June 1958.

J.S. DORNEY
 Captain, U.S. Navy
 Assistant Director, Naval Communications
 By direction

Copy to:
 BUDOCKS
 OP-30F
 OP-301P
 OP-30T
 OP-30BQ
 OP-30BJ
 OP-302H
 OP-303

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DEPARTMENT OF NATIONAL DEFENCE

CANADIAN JOINT STAFF

2450 Massachusetts Ave., N.W.
Washington 8 D.C.
U.S.A.

ppa

Reply to
Naval Member

9 October, 1958.

USN FLEET INSTALLATION OF
SINGLE SIDE BAND - GENERAL

Submitted for the information of Naval Headquarters as a result of informal discussions with USN authorities is a general report of the planning in the USN Fleet SSB installation programme.

2. Reiterating that there is no change in the proposed objectives in the USN, there continues to be:

- (a) 300 miles of gapless voice and data coverage ship-to-ship;
- (b) provision for a single side band capability in modern DSB receivers where extreme stability is not a requirement;
- (c) provision for a 1000 mile ship-to-ship voice and data transmission coverage for long range co-ordination of tactics and intelligence;
- (d) provision for a 2000 mile ship-to-ship voice and morse transmission for long range coverage of atomic attack groups with high command posts ashore;
- (e) an ultimate provision of multi channel capabilities to provide more efficient use of spectrum and high communications in the task force situation;
- (f) an integration of communications into weapon systems and information centres; and
- (g) the maintaining of Double Side Band capabilities so long as operational requirements exist therefor.

3. The objectives in paragraph 2 are designed for five years or longer. The following is a tentative time phasing programme of Single Side Band equipment. This is being used for planning purposes only.

The Naval Secretary

Attention: Director of Naval Communications
Electrical Engineer in Chief

CAFA 511

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15/10 ✓

Deferred to	Staff. 1/2
OCT 15 1958	
File No.	C 1300-30
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FISCAL:

YEAR	AN/URC 32	AN/WRT 2	AN/WRR 2	O-451/U	CCDP (AN/WRA 1)	CV/591/URR
58	138 (144)	160 (152)	158 (238)	155 (82)	70	0 (58)
59	74 (80)	80 (47)	80 (0)	77 (164)	100	0 (598)(1427)
60	137 (136)	165 (269)	138 (269)	67 (380)	0	571 (800)
61	150	225	305	144	0	615
62	131 <u>280</u>	238 <u>468</u>	259 <u>507</u>	106	0	301
63	92	162	142	73	0	91
64	0	70	47	9	0	16
65	0	56	13	0	0	0
66	0	10	0	0	0	0
Unit Cost:	\$23,000	\$30,000	\$16,000 (\$12,000?)	\$10,000 (\$13,000?)	\$2,000	\$500. (\$800.?)

Note:- The figures in brackets are changes from the original quantity and unit cost projected.

The equipment cost changes are due to contract arrangements and in some cases overall lowering of unit costs. It should be noted that some of these unit costs are at variance with the actual costs, including those previously submitted to Naval Headquarters. These figures are only approximate and the values bracketed with the unit costs are merely indications of expected price changes for planning purposes.

4. A typical variation in unit costs is the AN/URC 32. This equipment is being procured under two contracts. The first contract will be for ships already in commission. The second contract will be for new construction (spares will not be included as in the present financial encumbrance, but shown under an overall separate FE). In which case, unit prices may decrease to as low as \$11-12,000.)

5. The overall value of Single Side Band equipment as presently projected (approximate for planning purposes) is \$146,000,000 for the next ten years. During the fiscal year 1958, \$12,000,000 has been allotted, and in 1959 a figure slightly under \$14,000,000 is anticipated.

6. It is believed the foregoing may be of general interest in Single Side Band planning in the Royal Canadian Navy.


COMMODORE

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Our file ref. NMWC 1300-30, Vol.2

DEPARTMENT OF NATIONAL DEFENCE

CANADIAN JOINT STAFF

CANADA

Reply to
Naval Member

2450 Massachusetts Ave., N.W.
Washington 8 D.C.
U.S.A.

25 September, 1958.

STAFF STUDY ON THE OVERALL UHF PROBLEM

Enclosure: (A) Copy of TAB "K" to FAAB 26/58
dated 18 March, 1958 (Op 301Z)

Submitted for the information of Naval Headquarters is the above noted enclosure. It represents a study by the USN Frequency Allocation Advisory Board to determine what can be done to accomodate their stated requirements in the 225-400 mc. band which have created a mutual interference problem.

2. US Navy Electronics Laboratory Report 747, quoted on page 15, para. 22 of the enclosure was forwarded by the Defence Research Member (Washington) to the Director Scientific Information Services (Defence Research Board, Ottawa) under Indent No. 57/715 dated 18 June, 1957.

[Signature]
COMMODORE

The Naval Secretary

Attention: Director of Naval Communications
Electrical Engineer in Chief

CAFA 510 20

CONFIDENTIAL

Referred to.....	<i>[Signature]</i>
SEP 29 1958	
File No.....	C1300-30
Chgd to	fc to DN
	000151

CONFIDENTIAL

TAB K
to
FAAB 26/58

*Mr. P. K. Smith
EEC/E2*

18 March 1958

STAFF STUDY
OR
THE OVERALL UHF PROBLEM

Prepared for the Frequency Allocation Advisory Board in collaboration with:

LCDR J P CONWAY (OP-301Z)

Mr. V G STINGLEY (OP-301Q)

MAJ C A YOUNG, USMC (OP-301Q)

Mr. W D GREENE (SHIPS 939)

Mr. T D HOBART (SHIPS 830)

Mr. G W DAVIS (BUAER AV 4142)

Mr. H I ROTHROCK (OP-534)

CDR J F MILLER (OP-303L)

CDR H S FOOTE (OP-345)

CAN 394

E. T. Hogan
E T HOGAN
CDR, USN

Head, Aeronautical Communications
Section

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TAB K

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ENCLOSURES:

- (1) Present and Future UHF Fleet Voice Communication Requirements
- (2) UHF Systems Performance Limitations
- (3) Navy Frequency Usage in the 225-400 Megacycle Spectrum (Graphic Display)

CONFIDENTIAL

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TAB K

to

FAAB 26/58

THE PROBLEM

1. To determine what can be done to accommodate the stated Navy requirements for the 225-400 MC band.

BACKGROUND

2. The present and future requirements in the 225-400 MC band have created a potential mutual interference situation. This problem is a direct result of:

- a. The great demand for channel assignments.
- b. Present equipment limitations.
- c. Antenna system design and siting limitations, particularly aboard ships and aircraft.

3. In December 1950, the Joint Communications-Electronics Committee, in JCEC 671/1, approved allocations for the three military services in the 225-400 MC spectrum as follows:

- | | |
|--|----------------------|
| a. U.S. Navy single channel communications | 212 channels |
| b. U.S. Air Force single channel communications | 212 channels |
| c. Joint single channel communications | 210 channels |
| d. U.S. Army single channel communications | 42 channels |
| e. Radio relay multi-channel communications - 48 channels involving 28.8 MCS of spectrum | |
| f. Navigation aids (Glide Path and YE/YG Beacon) | 10.8 MCS of spectrum |

The allocation was made on the basis of 200 KC separation. An emission band-width of 6 KCS for single channel communications, and 600 KCS for multi-channel radio relay was envisaged. The emission band-width for glide slope was 0.3 KCS

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with 1660 KCS for the YE/YG beacon. The 28.8 MC spectrum allocated for radio relay was based on individual service requirements as follows:

U.S. ARMY	20 channels	12 MCS
U.S. NAVY	10 channels	6 MCS
U.S. AIR FORCE	10 channels	6 MCS
JOINT	8 channels	4.8 MCS

4. On 16 January 1958, JOEC approved an allocation of 22 MCS of spectrum in the 225-400 MC portion of the UHF band for missile and upper atmosphere research telemetering purposes on an interim basis. The target date for telemetering to vacate the 225-260 MC band is 1 January 1970. This approval involves 90 channels previously allocated for single channel tactical communications. The 4 MCS of spectrum for the YE/YG band was reallocated exclusively for telemetering since the requirement for YE/YG beacons has been deleted.

PRESENT AND FUTURE REQUIREMENTS

5. Fleet - The present assignments to the Fleet Operating Forces in the 225-400 MC band consist of 197 frequencies, 159 of which are assigned in compatible families varying from 19 to 9 frequencies per family. Some of these frequencies are allocated for Joint use to meet present and future Joint requirements. Only 101 of the above channels are crystallized for use by one-crystal-per-channel equipment. The remaining 97 frequencies are usable only with AN/GRC-27 or ARC-27 equipment which employ crystal synthesizer circuits. Enclosure (1) contains a discussion of anticipated Fleet UHF voice communication requirements by functions. No overall reduction in voice communications channels

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is indicated in the period prior to 1965. The advent of the Navy Tactical Data Systems (NTDS and ATDS) will demand additional channels, at least during the introductory phases of the programs (1959-1965). Spectrum requirements for NTDS appear to be 2 (100 KC) channels in 1959 and 2 additional channels each year in 1961, 1962; 1963, and 1964.

6. Air Traffic Control - The great majority of military air/ground communications take place in the UHF band. Therefore, air traffic control communication with military aircraft, regardless of its civil (CAA) or military origin, must also be located in the UHF band. 66 frequencies in the 225-400 MC spectrum have been assigned to Naval and Marine Corps Shore Air Activities for air traffic control purposes to meet the requirement for Radar Air Traffic Control Centers, (RATCC), airdrome control, UHF homer, and mobile GCA. CAA has stated a requirement for 86 additional channels for enroute traffic control and approach control to civil airports by military aircraft. 65 of these 86 channels have been made available for CAA use from those channels allocated for Joint military use. The remaining 21 channels are under consideration. With the increase in aircraft congestion dictating the expansion of air traffic control facilities, the problem of providing additional interference-free channels in a given geographical area becomes more acute. The requirement for additional air traffic control channels is expected to be lessened only if an air/ground data link can replace multiple voice channels as the primary means of effecting air traffic control communication.

7. Other Requirements - Ten (10) frequencies in the 225-400 MC spectrum have been assigned to the Naval Air Training Command in addition to 49 frequencies

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which are shared with the Fleet Operating Forces. Six (6) frequencies have been assigned for UHF homers in the Fleet in addition to the fifteen (15) frequencies assigned to UHF homers at Naval Air Stations and overseas air activities. The telemetering requirements of the Navy will be met within the 22 MCS (44 500 KC channels) of spectrum allocated by JCEC agreement of 16 January 1958. Other requirements which employ frequencies in the same operational environment with the Fleet and Air Traffic Control include: Joint Air Force - Navy Air Defense, Search and Rescue, Shoran Navigation and single channel communications for Harbor Defense, Overseas Shore Air Activities, and communications incidental to operation of missile test ranges and other research and test activities.

OPERATIONAL LIMITATIONS

8. Shoran radio navigation equipment is installed at major harbors for harbor defense mine laying and sweeping operations. The frequencies 230, 250, and 300 MCS are assigned for this purpose. Shoran is a pulse system and the emission band-width is approximately 2400 KCS. Extra side band radiations from Shoran transmissions create an interference source to communication systems of approximately 1 2500 KCS, or 5 MCS total. Thus, one Shoran system utilizes approximately 15 MCS of spectrum or 150 (100 KCS) communication channels. The Shoran Harbor Defense system was established on an interim basis to meet emergency situations pending the development of a harbor navigation system outside the 225-400 MCS band. Interference has been caused by Shoran to Navy control tower operations at NAS San Diego and NAS Oceana. Current Navy control tower frequencies are being changed, in accordance with the RATCC

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and Mobile GCA plan, to be sufficiently removed from the Shoran frequencies so that further interference should not be encountered. Frequency provisions currently made for telemetering specify that Shoran equipment be operated on a non-interference basis, and that local coordination be effected with telemetering activities as necessary. c

9. Missile test ranges have large requirements for frequencies in the 225-400 MCS band for telemetering, range instrumentation, air/ground communications and ancillary functions in support of multiple guided missile and upper atmosphere research programs. Such requirements can normally be satisfied by assigning frequencies on a shared basis with other naval activities. It is desirable that these assignments be separate from fleet assignments in coastal areas. Frequency requirements of large missile test facilities, such as NAMTC Point Mugu, will require frequency separations of 1 MCS or less in the foreseeable future.

10. The RATCC and Mobile GCA frequencies to be employed for air traffic control were selected to be 3 MCS apart at any one station, and 200 KCS removed from fleet assignments. However, when fleet aircraft operate from Air Stations, frequencies normally employed in the fleet may not be usable ashore unless they are sufficiently separated from the locally assigned RATCC or Mobile GCA frequencies. It may be necessary, therefore, to assign specific fleet frequencies to air stations which must be employed when fleet units move ashore.

11. The SAGE system will impose a large channel requirement on the 225-400 MCS band. Approximately 177 frequencies are needed for the present system in the continental U.S. The AF plans to satisfy this requirement on Air Force and Joint allocated channels.

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12. The Army has recently proposed a reallocation of the 225-400 MCS band to provide additional spectrum for Army radio relay operations. Approximately 37.2 MCS of primary Army allocated space is requested. The proposed re-allocation would require some changes in currently allocated Navy channels. This reallocation is being generally opposed by the Navy because it will limit frequency assignment flexibility for single channel communications. Each radio relay channel requires five 100 KCS channels.

SYSTEM PERFORMANCE LIMITATIONS

13. Major Factors - Three major factors influence the engineering of a UHF communication system: the antenna system layout, the communication equipment characteristics, and the frequency plan. These factors combine to establish definite and serious limitations on the number of assignable frequencies aboard a given ship or shore activity. Deviation from frequency assignment criteria imposed as a consequence of these limitations results in the following operational compromises:

a. Decreased receiver sensitivity and therefore communication range, during periods of adjacent channel transmissions.

b. Strong "on channel" signal interference due to both transmitter and receiver generated intermodulation products.

c. Superimposition upon the desired signal carrier of intelligence components of adjacent channel transmissions.

d. Erratic communication coverage and/or reduced maximum range capability due to shadow areas or "nulls" in the transmitting and receiving antenna radiation patterns.

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The cumulative effects of the above are such as to render unusable those families of frequencies not compatible with currently established assignment criteria. A more detailed discussion of these factors is contained in enclosure (2).

It is common practice for fleet and tactical commanders to provide backup and secondary or reserve channels to meet operational needs when a lesser number of channels would suffice. This practice does not lend itself to the most efficient and economical use of the UHF spectrum when large numbers of channels are reserved.

NEW DEVELOPMENTS

15. Planned Improvements - The technical characteristics, and hence the operational performance of existing UHF systems can be materially improved by the following actions:

- a. Procure and install highly selective filters to improve transmitter and receiver mutual interference characteristics. The antenna multi-coupling capabilities of this type accessory simultaneously enables a reduction in total antenna quantities required.
- b. Procure and install receivers of greatly improved selectivity characteristics.
- c. Provide UHF transmitters and receivers with the capability of rapid shift to any assignable UHF frequency.
- d. Provide the maximum practicable physical separation between transmitting and receiving antennas and assure that existing arrangement criteria is adhered to within each transmitting and receiving antenna group.

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16. Receivers - At the present time two (2) developmental models of an improved type of UHF receiver preselector are available which show promise of offering substantial improvement in regard to closer channel spacing. These preselectors are presently at the Naval Research Laboratory for evaluation. An additional improved UHF preselector is soon to become available. This unit will be an integral part of the AN/SRR-17 radio receiving set which is intended for the Navy Tactical Data System program. To determine the feasibility of back fitting existing receivers with the improved (most promising) preselector the following figures are submitted:

(1) Number of UHF receivers in the fleet:

(a) Active -

AN/URR-13	: 806	AN/URR-35	: 954
AN/URR-13A	: 1593	AN/URR-35A	: 43
AN/URR-13B	: 382	AN/URR-35B	: 148
TOTAL	<u>2781</u>	AN/URR-35C	: 2300
		TOTAL	<u>3445</u>

(b) Reserve -

AN/URR-13	: 1796	AN/URR-35	: 134
AN/URR-13A	: 2439	AN/URR-35A	: 100
AN/URR-13B	: 916	TOTAL	<u>234</u>
TOTAL	<u>5151</u>		

(2) Cost for converting present broad-band IF equipment to narrow band IF:

(a) Replacing AN/URR-13's with AN/URR-35's

Total AN/URR-13 (Active Fleet Only) - 2781

Unit Cost AN/URR-35 - \$1260.00

Total Cost - \$3,504,060.00

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This would allow assignment of frequencies in 100 KC increments in lieu of the 200 KC increment now required.

(b) Incorporating improved UHF preselector (Includes modification of new AN/URR-35's which replaced 13's)

AN/URR-35 (Active Fleet)	6226
AN/URR-35 (Future Procurement)	2300
Total AN/URR-35	8526
Unit Cost (Estimate)	\$2000.00
Total Cost	\$17,052,000.00

17. Transmitters - In addition to deficiencies in UHF receivers outlined above, tactical communications in the fleet operating forces are severely limited by the fact that most shipboard equipments are provided with crystals for only 101 channels. This results in little or no usage on many of the frequencies allocated for Navy use.

This condition can be corrected by

- (1) Providing additional equipment crystals for unused channels.
- (2) Providing synthesizer frequency generators for equipments requiring quick shift capability. This would provide operation of the equipment on any of the channels physically available.

The first of these alternatives is the least costly (less than \$5/crystal) but will be unsatisfactory in the future for frequency stability reasons particularly in transmitter diversity operations. In addition, the UHF equipment in many of the larger ships is located in widely separated spaces. Under such conditions the problems involved, in providing immediate access to all crystals at each equipment site, preclude the capability of rapid shift to any assignable UHF frequency.

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The second of these alternatives would cost about \$600/equipment (large procurements of 1000) but will provide frequency stability of 1 part in 100 million/day which would provide improved operation as well as provide the possibility of a large increase in available channels by going to 50 KC channelization. The O-406/URC synthesizer for TED, AN/URR-13-35 equipment has been developed for this application and could be produced on a 12 month lead time basis. Newly developed equipment such as the AN/SRT-18 and AN/SRT-20 equipment will use this frequency synthesizer technique.

18. Antenna Systems - The problem aboard ship and aircraft is quite acute. An effort is being made to increase separation of antennas but due to the limitations imposed by physical environment this program will only provide minor improvement. The use of multi-couplers to minimize the number of antennas required is a step in the right direction but weight and size limitations preclude their use on aircraft. While they are used to some extent on board ship and shore stations the best solution to the interference problem is to improve the RF and IF selectivity of the receiving equipment. At shore activities a program to provide transmitter/receiver antenna separation has been underway since 1950. Current criteria calls for 1000 feet between transmitter and receiving antennas, with the separation between antennas in each group keyed to the specific antenna type in use. Systems installed in this way will provide adequate improvement. Since the provision of separate transmitter and receiver sites is a very expensive undertaking, the application of this measure is reserved for those activities having the greatest number of channel

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requirements such as our Radar Air Traffic Control Centers (RATCC). The small number of channels used at some activities does not appear to warrant conversion to implement this program.

19. Impact of Improvements on Frequency Assignment Criteria - By effecting the improvements outlined above, existing frequency assignment criteria for shore stations can be substantially modified. These modifications are outlined below and assume maximum transmitter power of 100 watts and use of AN/URR-35 or similar receivers.

a. CU-547/GR type filters on each transmitter output and receiver input; transmitter to receiver antenna separation 1000 feet: No interference predicted with nominal frequency separation of 0.6 MCS.

b. Same filtering as (a) but transmitter/receiver separation reduced to 20 feet: No interference predicted with nominal frequency separation of 1.5 MCS.

c. Same as (b): No interference except intermodulation products with frequency separation of 1.0 MCS.

The above frequency separations, termed "nominal", are considered valid up to operating frequencies of 300 MCS. At higher frequencies the separation must be increased, reaching plus 20% at 400 MCS. The above interference calculations are based on published filter characteristics and have not been verified by evaluation.

Improvements in frequency separation criteria of a similar order of magnitude can be realized in shipboard installations. However, the exact frequency separation realized will vary with the physical environment i.e., antenna layout on the different types of vessels as well as variations of classes within type.

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FREQUENCY UTILIZATION ANALYSIS

20. This analysis was compiled from July-October 1957 frequency usage reports and appropriate sections of JANAP 195(E). There is a total of 1005 assignments in the 225-400 MCS band of which 782 assignments are on Navy allocated frequencies.

21. A breakdown of JANAP 195(E) sections and general functional use is as follows:

SECTION	FUNCTION	NAVY ALLOCATED FREQS ASSIGNED	NON-NAVY FREQS ASGD	TOTAL PER SECTION
ALPHA		3	1	4
A2 - Sec Ship/Shore		1	0	1
A7 - UHF RATT		2	1	3
BRAVO		0	0	0
CHARLIE Fleet Operations		<u>370</u>	<u>95</u>	<u>465</u>
C-1 to C-3.28		97	35	132
C-3.29		144	15	159
C-3.3 to C-24		55	18	73
C-25		74	27	101
DELTA Amphibious Ops.		<u>31</u>	<u>3</u>	<u>34</u>
ECHO - Aircraft		<u>234</u>	<u>37</u>	<u>271</u>
E-2.2		59	0	59
E-2.3		30	0	30
E-3		50	10	60
E3-1		39	9	48
E-3.11 to E-15		15	17	32
E-15.2		13	1	14
E-15.4 to E-31		28	0	28

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SECTION	FUNCTION	NAVY ALLOCATED FREQS ASSIGNED	NON-NAVY FREQS ASGD	TOTAL PER SECTION
BORGE	Fleet Admin	<u>1</u>	<u>0</u>	<u>1</u>
CLO	Training	<u>2</u>	<u>0</u>	<u>2</u>
MA	Fleet Admin	<u>0</u>	<u>1</u>	<u>1</u>
REBEC	Districts & Telemetering	<u>142</u>	<u>81</u>	<u>223</u>
MEMO	Reserve use	<u>2</u>	<u>2</u>	<u>4</u>

the following assignments, which are to be incorporated in JANAP 195(E),

have been made as follows:

SECTION	NAVY ALLOCATED FREQS ASSIGNED	NON-NAVY FREQS ASGD	TOTAL PER SECTION
ATCC & Mobile CCA Plan	<u>64</u>	<u>2</u>	<u>66</u>

1. Transmit Time Analysis:

total hours transmit time reported	--	339,932
total users reporting	--	9504
total frequencies (listed in reports)	--	352
average transmit time per user	--	35.77 hours
average transmit time per frequency	--	965.7 hours
average number of assignments per frequency	--	2.86

1. Figures are compiled from both Navy allocated and non-Navy allocated assignments in the 225-400 MCS band.

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Activities are not required to report navigational aids (homers). Test facilities are not required to report test or experimental use nor is telemetering usage reflected in the above.

23. Enclosure (3) is a graphic presentation of the individual frequency usage for communications by naval activities in the 225.0 to 400 MC band during the four month period 1 July to 31 October 1957. The usage data was compiled from all reports of Navy and Marine Corps activities and represents combined reports over a four month period. It can readily be seen that some frequencies are heavily used whereas other frequencies receive little or no usage. Frequencies assigned common functions (i.e. Fleet Common, Air Traffic Control, etc.) will always receive greater usage than those assigned to meet individual functional requirements.

The graph also includes frequencies allocated to the Navy which have not been assigned to naval activities. This is due primarily to equipment or system limitations. Equipment and system improvements outlined in paragraphs 15 through 19 will permit assignment and utilization of a large proportion of these currently unused frequencies.

CONCLUSIONS

24. No reduction in Navy voice channel requirements is foreseen during the time period 1958-1965.

25. Tactical Data Systems will demand additional spectrum during the 1958-1965 time period.

26. Frequency provisions for air/ground telemetering between 225 and 260 MCS will require an adjustment of naval communications and will result in a greater concentration on frequencies above 260 MCS until 1970.

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27. A portion of the 225-400 MC band allocated for communications is being employed for radio navigation functions in addition to those frequencies specifically allocated for Navigational Aids.

28. A large number of frequencies are assigned for exclusive use as backup, secondary or reserve channels limiting the number of assignable channels for other navy requirements in the same operating area.

29. Limitations imposed by present UHF equipment characteristics and system engineering practices precludes satisfaction of requirements to use many frequencies simultaneously in a given area. This is particularly critical in the case of ships and aircraft.

30. The increased peace time requirements coupled with the foregoing systems limitations restricts the Naval capability for rapid expansion in UHF communications during a military emergency.

31. Technical improvements in equipment and antenna systems engineering have been developed and must be implemented to allow greater utilization of Navy allocated frequencies to meet the requirements anticipated by 1965.

RECOMMENDATIONS

32. That the material bureaus take immediate steps to implement the equipment improvement program outlined in paragraphs 15 through 19 of the foregoing study.

33. That systems engineering design provide for the maximum isolation of transmitting and receiving antennas to permit optimum utilization of navy allocated frequencies.

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34. That transmitter design incorporate the provision for controlling radiated power commensurate with the communication range required.

35. That a positive program be initiated to provide means of meeting Shoran, UKF Homers and Telemetry requirements in other than the 225-400 MC band in order to reserve this band primarily for military communications.

36. That current and future tactical doctrine be analyzed to minimize the reliance upon communications for execution in order to reduce the number of transmissions required in the 225-400 MC band.

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Present and Future UHF Fleet Voice Communications Requirements

1. The present requirements for UHF voice communications in the fleet are based on command and functional nets. Functional nets are those which are set aside to accomplish a specific purpose under a certain set of circumstances. They may or may not serve other purposes or be operated continuously. The chain of command nets are those required for the Commander of an Organization to exercise control over his subordinates, and are especially necessary in a complex organization when several diverse tasks occur simultaneously and must not interfere with one another.
2. The following functional nets are required for any sort of task organization and are not infringed upon by other circuit requirements, e.g., the Maneuvering net may not be used as a Submarine Attack Unit net.
 - a. Maneuvering Net
 - b. Combat Information Net
 - c. Ship/Air Net

These nets are assigned frequencies at the Task Force level and remain the same throughout the force.

3. In the complex task organization, each commander requires a chain of command net with his subordinates.
 - a. CTF Command Net
 - b. CTG Command Net
 - c. CTU Command Net

The number of these nets will vary with the size of the overall organization and the number of subordinate organizations simultaneously occurring. They may also serve as functional nets as described later.

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4. The functional nets in addition to those listed in paragraph 2 above are small. The following is a listing of the more common functional nets.

- a. A/A Coordination Net - also used as a Task Group Administration Net
- b. Air Control Net
- c. Sonar Information Net
- d. Task Force/Group/Unit Common
- e. Fleet Common
- f. ASW Net
- g. SAU Net (A,B,C, etc.)
- h. Flag Conference Net
- i. Screen Tactical Net
- j. Other nets designated by the particular fleet, force, group, or

unit commander and often peculiar to that organization only.

Some of these particular voice nets are covered by the Chain of Command Nets previously listed. The frequency and channel assignments are listed in JANAF 195(E).

5. The fact that a net is listed in an operation order as a functional or chain of command net does not indicate that it will be in operation continuously. It is rather activated when and if the organizational unit is activated. For instance, an ASW force having several SAU may never have all of them activated simultaneously. It becomes impossible to tabulate all of the UHF voice channels required by a hypothetical task organization, simply because the requirements change as the tactical situation changes. A minimum of channels required can be described, but the maximum is determined by the needs of the moment. At present the number of UHF voice channels required by a Task Force organization runs as high as fourteen (14) for ship to ship uses.

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6. Fleet requirements for ship to air UHF channels vary from one operation to the next.

a. Certain fixed requirements are as follows:

- (1) Land/Launch
- (2) Plane Guard
- (3) Carrier Controlled Approach
- (4) UHF Homer
- (5) Military Common Emergency Guard

b. Other channel requirements which vary as the need varies are:

- (1) Fighter Air Direction Nets (none to several)
- (2) Screen Helicopter Control Nets
- (3) ASP Control Nets
- (4) AEW Reporting
- (5) Strike Control
- (6) Helicopter Direction Nets (none to several)
- (7) HUK Nets (A,B,C, etc.)

When channels are assigned for air strike and squadron tactical commons, the number of channels increase until sharing on the same frequency is sometimes necessary.

7. At present the number of UHF voice frequencies is considered adequate but the utilization of the band is limited by the number of interference-free families of frequencies which can be used at one site. These families contain from ten to fifteen frequencies per family for which the Navy is presently crystallized and up to twenty per family where continuous tuning capability is available.

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8. No reduction in voice communication requirements is indicated in the foreseeable future. The advent of new equipments and techniques should make better use of the channels now available and may eventually result in a reduction in the number of channels required for fleet operations both ship-to-ship and ship-to-air. Command attention is required at all levels to encourage more extensive use of standard tactical doctrine with a minimum of communications in order to achieve optimum effectiveness of the communication channels available.

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UHF SYSTEMS PERFORMANCE LIMITATIONS

1. Introduction - The performance of a UHF communication system depends on many variables, only some of which are under the partial control of the systems planner. There are two general classes of these variables: those that govern the performance of a single channel, and those that become important when several channels are operated simultaneously from a limited area. Most of the variables which influence the performance of a single channel are well recognized and allowance is made for their effect in the systems design. Those that become important when several individual channels are integrated into a coordinated system are not always well considered and the overall systems performance may fail to meet expectations. An understanding of these latter variables is urgently needed, because the simultaneous operation of a comparatively large number of channels from a platform of limited size is of vital importance to the Navy. The paragraphs which follow are based on data contained in the U.S. Naval Electronics Laboratory Research Report (NEL/Report 747) entitled "The Influence of Antenna System and Equipment Characteristics on Frequency Allocations for UHF Communication Systems." This report is "recommended reading", and should be widely distributed throughout the Naval Establishment.

2. Antenna System Layout - This problem is probably of greatest importance to the Navy because of its frequent and almost unique need to operate many channels simultaneously from a very limited area, a single ship. This problem is also acute in aircraft where more than one UHF communication radio set is installed. There are, of course, physical limitations as to how far apart antennas can be placed. Because of this need and the necessity for minimum

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channel separation due to channel demands, the U.S. Navy Electronics Laboratory in their report 747 have recommended that transmitters be grouped on one antenna, receivers on another, using antenna couplers. Under this arrangement the degree of isolation between transmitter and receiver is better than for any other, tending to reduce certain transmitter-to-receiver interferences, such as receiver desensitization and receiver cross-modulation which are important in establishing the minimum channel separation. To a limited extent, receiver susceptibility to transmitter spurious radiation and to transmitter inter-modulation products is also reduced by this arrangement. However, this arrangement cannot be used in aircraft where the transceiver type of communication equipment is used due to weight and space limitations.

3. Antenna Coupler Characteristics - The selectivity and insertion loss characteristics of antenna couplers have an important effect upon the interference between communication channels operated simultaneously from a single ship or aircraft. Naturally, good system design demands that antenna couplers with the best characteristics in selectivity and insertion loss be used.

4. Receiver Characteristics - The selectivity of the receivers has a strong influence upon the interference characteristics of the system. It may be divided into two kinds: intermediate-frequency selectivity, and front end or radio frequency selectivity.

The intermediate-frequency selectivity is much greater than the radio-frequency selectivity, and determines the minimum frequency increment required to separate weak signals on adjacent channels.

The radio-frequency or front-end selectivity of a receiver largely determines its response in the presence of strong signals. It is important

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in such interference effects as receiver desensitization, receiver cross-modulation, receiver intermodulation, and most types of receiver spurious responses. Since Navy communication receivers almost invariably operate in the presence of many other strong signals from transmitters on the same ship, receiver action under conditions of strong undesired signals is very important.

5. The Interference Problem - There are many possible types of interference between communication equipments. Some are negligible in comparison with others and require consideration only in unusual situations. Others can be controlled by careful system design such as by the provision of adequate antenna separation or by the use of couplers. A few are so severe that only the avoidance of certain frequencies or combinations of frequencies can control them. For convenience, interferences between communication equipments may be divided into two general classes: interferences that occur when only one transmitter is operating, and interferences produced only when two or more transmitters are operated simultaneously in close proximity. Both classes are influenced by the isolation between antennas, by the channel frequency assignments, and by the equipment characteristics. Both classes influence the minimum permissible frequency separation between channels and determine what particular frequencies must remain unassigned in a frequency plan.

6. Interference Existing When Only a single Transmitter is Operating - The principal interferences and interactions between transmitters and receivers that may exist when only one transmitter is operating are: (1) transmitter spurious radiations, (2) receiver spurious radiations, (3) receiver spurious responses, (4) receiver desensitization, (5) receiver cross-modulation,

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(6) shunting of receiver input terminals by an adjacent receiver input impedance, (7) transmitter energy dissipation in adjacent antennas and load impedances, and (8) transmitter detuning due to impedance coupled into the transmitter output circuit by adjacent antennas. These effects do exist also when two or more transmitters operate simultaneously aboard a ship or aircraft, but the simultaneous operation of a number of transmitters is not required for their existence and does not greatly increase their seriousness.

7. Spurious Radiations of a Single Transmitter - A single transmitter isolated from other transmitters produces in addition to the desired carrier frequency, two classes of spurious radiations: radiations on harmonics of the carrier frequency, and radiations to the harmonics of the master oscillator frequency. These spurious radiations must be suppressed by selectivity or filtering before reaching the transmitter antenna because, after radiation, they become indistinguishable from true signals on the same frequency. Selectivity or filtering between the transmitted output terminals and the transmitting antenna can be provided by the use of antenna couplers. This advantage of couplers supplements their main function of reducing the number of antennas. The couplers act as harmonic and spurious radiation suppression filters.

8. Receiver Spurious Radiations - Receivers sometimes radiate small quantities of energy due to the receiver local oscillator which may cause some interference in cases where receivers are operated in close proximity or from a common antenna. These radiations occur at the receiver local oscillator frequency or harmonics thereof, or at multiples of the crystal oscillator frequency when frequency

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multiplication is used to obtain the local oscillator frequency. The receiver acts as a very-low-powered transmitter. Receiver spurious radiations must be suppressed at the source or must be attenuated by selectivity or filtering inserted between the radiating receiver antenna terminals and the associated receiving antenna. Once they are radiated, they become indistinguishable from true weak signals from distant transmitters operating on the same frequency.

9. Receiver Spurious Response - A superheterodyne receiver, in addition to responding to the frequency to which it is tuned, invariably responds to some extent to a number of other frequencies called spurious response frequencies. These spurious responses can be very troublesome when several transmitters and receivers are operating in a limited area, such as aboard a single ship or aircraft. The common use of frequency multiplication schemes to derive the heterodyne frequency from the local oscillator or crystal oscillator frequency also tends to substantially increase the number of spurious responses. The principal types of spurious responses may be classified as follows: (1) direct signal pickup at the receiver intermediate frequency, (2) image frequency response, (3) responses at the submultiples of the receiver operating frequency, (4) responses due to harmonics of the heterodyne frequency, (5) responses due to harmonics of the master or crystal oscillator when frequency multiplication is used to obtain the heterodyne frequency, and (6) responses due to combinations of the master or crystal oscillator and harmonics of the signal frequency.

Spurious response due to direct signal pickup at the receiver intermediate frequency is caused by leakage or insufficient attenuation between antenna input and the intermediate frequency amplifier.

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Image response is one of the most troublesome of receiver spurious responses. Two frequencies can beat with the heterodyne frequency to produce the intermediate frequency, one higher than the heterodyne frequency by an increment equal to the intermediate frequency and the other below it by an equal amount. In most Navy receivers the desired response frequency falls below the heterodyne frequency, and the image response frequency falls above it. The undesired signal of image response frequency is attenuated by the radio frequency selectivity of the selective circuits between the receiver input terminals and the mixer stage input, the selectivity corresponding to a frequency difference equal to twice the intermediate frequency.

Spurious receiver responses at submultiples of the receiver operating frequency may be due to slight nonlinear effect in the radio frequency portion of the receiver caused by tube characteristic curvature. This nonlinear effect produces harmonics of any strong signal entering the receiver front end and, if one of these harmonics corresponds in frequency to that to which the receiver is tuned, a spurious receiver response will result.

Spurious responses may result from harmonics of the heterodyne frequency. Harmonics of the heterodyne oscillator mix with the spurious signal frequency and produce the intermediate frequency, thus resulting in receiver output at frequencies other than those to which the receiver is tuned.

In the usual UHF receiver the heterodyne frequency is generated by a crystal oscillator operating at a submultiple of the heterodyne frequency and converted by frequency multiplication to the heterodyne frequency. The multiple harmonics of the crystal oscillator mix with the spurious signal frequencies, thus producing the intermediate frequency and receiver undesired responses. There is considerable evidence that receiver design or filtering to eliminate harmonics of the crystal oscillator will not control this type

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of interference.

In addition to the spurious frequencies themselves mixing with the crystal oscillator harmonics, harmonics of the spurious frequencies may be produced in the radio-frequency portion of the receiver by nonlinear action. These harmonics may also mix with the crystal oscillator harmonics, thus producing the intermediate frequency and a receiver response. Spurious responses of this type are very numerous and may give considerable trouble in situations where receivers are exposed to strong local signals, as almost always is the case aboard a ship or aircraft.

10. Receiver Desensitization - When a receiver operates in close electrical proximity to a transmitter, but on a somewhat different frequency, receiver desensitization may occur. The transmitter may feed sufficient off-channel energy into the receiver input terminals to alter the operating point or bias of the radio frequency amplifier and mixer tubes. This shift reduces the receiver gain on the desired signal frequency and may seriously impair the reception of a weak signal. Receiver desensitization can be controlled by selectivity preceding the radio frequency portion of the receiver, or by space attenuation of the interfering radiation. Increased frequency separation of adjacent channels or the use of antenna couplers increases the selectivity. Increased spacing between receiving and transmitting antennas increases the space attenuation.

11. Receiver Cross-Modulation - When a receiver operates in close electrical proximity to a modulated transmitter, but on a somewhat different frequency, receiver cross-modulation may occur, as well as receiver desensitization. The transmitter feeds sufficient off-channel modulated energy into the receiver input terminals to alter the operating point or bias of the radio frequency

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amplifier and mixer tubes. Since the modulated signal varies in amplitude in accordance with the modulation, the operating point of the radio frequency amplifier or mixer tubes also shifts in accordance with the modulation. If the characteristics of these tubes are nonlinear, as they must be in the case of the mixer tube the interfering signal modulation is transferred to the weak desired signal and causes interference. Receiver cross-modulation and receiver desensitization are closely related and appear at approximately the same signal levels. The precautions that control desensitization are also effective in controlling cross-modulation. Good front-end or radio frequency selectivity, either in or preceding the receiver, alleviates both effects.

12. Reduction of Effective Receiver Sensitivity by Shunting Effect of Adjacent Receiver Input Impedance - When two or more receivers are connected in parallel to a common antenna, considerable loss in receiver output may occur due to the shunting effect of the relatively low input impedance of the non-resonant receivers. In the UHF band, where receiver noise rather than atmospheric noise is generally the limiting factor in effective receiver sensitivity, such loss of signal input to a receiver may impair the signal-to-noise ratio and reduce the communication range. If antenna couplers are used to parallel receivers much of this difficulty disappears, provided sufficient frequency separation exists between the channels to which the receivers are tuned.

13. Transmitter Energy Dissipation in Adjacent Antennas - If a transmitting antenna is closely coupled to a nearby antenna, the latter may absorb a portion of the radiated energy of the transmitting antenna and reduce the effective radiation. An antenna system should be planned to achieve sufficient isolation

CONFIDENTIAL

between antennas so that under the most unfavorable impedance termination of the power-absorbing antenna, the power absorption will not be more than an arbitrary fraction, say 1 db. The isolation between two coupled antennas depends primarily upon the physical spacing and configuration. With couplers, it depends upon coupler selectivity due to frequency separation of channels. The power absorbed by an antenna depends also upon the impedance of the antenna load, it being a maximum when the load impedance equals the reciprocal of the source impedance.

14. Transmitter Detuning Due to Coupled Antennas - Coupling effects between adjacent antennas, or through antenna couplers connected to a common antenna, also may reduce the effective output of a transmitter by a detuning action. Assume that a transmitter is adjusted to provide full rated output into a definite load impedance, such as a transmitting antenna at a given frequency. If the transmitting antenna is closely coupled to other antennas in the system, a change in the equipment associated with any of the coupled antennas may change their load impedance and reflect a change of impedance into the transmitting antennas. This alteration may reflect a resistance and reactance change into the transmitter output circuit and detune the power output stage, thereby reducing the power output. This detuning effect is a function of the physical spacing and configuration of the antenna as well as of the load impedances connected to those antennas.

15. Interferences Due to Simultaneous Operation of Transmitters - The types of interference that become evident only when two or more transmitters are operating simultaneously in close proximity are: (1) transmitter cross modulation, (2) transmitter inter-modulation, and (3) receiver inter-modulation. One of these

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interferences, transmitter cross-modulation is seldom serious under average conditions. The second, transmitter inter-modulation, is extremely serious when several circuits must be operated from a limited area such as a ship or aircraft. The third type of interference, receiver inter-modulation, sometimes exists but is not as troublesome as transmitter inter-modulation.

16. Transmitter Cross-Modulation - When two transmitters are operating in close electrical proximity, but on channels differing somewhat in frequency, energy from one transmitter may be fed by common coupling backward into the output terminals of the second transmitter, and thereby reach the plate circuit of its final tube. When the interfering transmitter is modulated, the modulation may be transferred to the carrier of the second transmitter by the nonlinear modulator action of the final tube, thus producing a cross modulation. A similar action also takes place in the reverse direction between the second and first transmitters. The magnitude of the cross-modulation depends on the degree of coupling between the transmitters. When antenna couplers are not used the coupling depends on the separation and placement of the antennas and on the selectivity of the second transmitter output circuit corresponding to the frequency separation between the two channels. When the two transmitters are connected by couplers to the same antenna, the coupling depends on the selectivity of the coupler channel associated with the second transmitter and the selectivity of the second transmitter output circuit, both corresponding to the frequency separation between the two channels. Any appreciable attenuation of the interfering carrier will place it well below the level of the second transmitter carrier and the cross-modulation amplitude will be well below the

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ENCLOSURE (2) to TAB K
CONFIDENTIAL

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second transmitter carrier level. If the cross-modulation component is at least 10 db below the carrier level at the source, it will be at least 10 db below the carrier level everywhere and unimportant as a source of interference. In practical cases this requirement is almost always met and this type of interference is not a problem.

17. Transmitter Intermodulation - When two or more transmitters operate simultaneously in a situation where appreciable coupling exists between their outputs, spurious radiations called intermodulation products may be produced by the mixer or modulator action due to nonlinearity of the final power amplifier. Two voltages are present in the plate circuit of the final power amplifier, one due to the desired transmitter and of channel frequency, and the second due to coupled energy from the interfering transmitter and of a nearby frequency. The spurious radiations occur at frequencies related to the sum-and-difference frequencies of the two signals, and multiples thereof. The degree of coupling between transmitters needed to produce the spurious radiations due to intermodulation usually exists only between transmitters on the same ship. In the design of the average system to avoid intermodulation interference, it will be necessary to take into consideration all third-order intermodulation products and to leave unassigned all channels upon which these products fall. In addition the strongest of the fifth-order products must be considered and the channels upon which these products fall left unassigned.

18. Receiver Intermodulation - When two strong signals on different frequencies simultaneously reach the input terminals of a receiver an effect very similar

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to transmitter intermodulation may be produced by lack of sufficient receiver selectivity and non-linear action of the mixer tube. The simultaneous presence of the two signals at the mixer circuit produces sum and difference frequencies and multiples thereof. These receiver intermodulation products are of the same nature and on the same frequencies as the transmitter intermodulation products discussed in the preceding paragraph. Extensive precautions to avoid receiver intermodulation effects do not appear to be essential at the present time in Naval UHF shipboard communication systems. The transmitter intermodulation effect produces interference upon the same channel frequencies as does receiver intermodulation and usually at such amplitude levels as to make those channels unusable. Since control measures available for the reduction of the effects of transmitter intermodulation are insufficient to clear the channels for normal use, the receiver intermodulation effect would fall upon channels already subject to interference and therefore better left unassigned.

19. Determination of Parameters for a Communication System Frequency Plan -

Two classes of basic parameters need to be determined in designing a frequency plan for an interference-free communication system: first, the minimum frequency separation required between adjacent channels, and, second, the individual spot frequencies that are subject to interference.

20. Minimum Frequency Separation Between Adjacent Channels - The minimum permissible channel spacing under strong signal conditions commonly found on board Navy ships is determined by the amount of selectivity or attenuation required to control the following types of potential interference and interaction: (1) receiver desensitization, (2) receiver cross-modulation, (3) reduction in effective receiver sensitivity by shunting effects of other receivers,

ENCLOSURE (2) to TAB K

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(4) reduction of transmitter power output by detuning due to coupling effects, (5) transmitter energy dissipation in nearby coupled antennas, and (6) transmitter cross-modulation. Each type of interference requires a certain minimum channel separation to control it, depending upon the arrangement of the antenna system and types of communication equipment used. The largest of these channel separations is the minimum channel separation that can be used in the frequency plan. Of the six types of potential interference mentioned above only the first two are important. Of those two, the cross-modulation requirements are more severe than the desensitization requirements and set the minimum channel separation. The tests conducted by the U.S. Navy Electronics Laboratory on the above potential interferences emphasize several characteristics of importance. First is the relatively great difference in the minimum channel separations required at the low frequency end and at the high frequency end of the band because of the poorer performance of receivers and selective circuits as the frequency increases. Second, is the considerable difference in performance between various brands of couplers with its corresponding effect upon minimum channel separation. Third, is the considerable advantage of the antenna arrangement whereby transmitters are grouped in one antenna, receivers grouped on another using antenna couplers with respect to the minimum channel separation required.

21. Spot Frequencies Subject to Interference - In addition to requirements for a minimum frequency separation, certain isolated "spot" frequencies are subject to various types of interference. Many of these spot frequencies are not fixed, but change as the transmitter or receiver channels are changed. They are

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particularly difficult to control in a communication system having many circuits operating simultaneously in a limited area, and tend to make a considerable number of channels unusable. The interference on spot frequencies are of the following types: (1) transmitter spurious radiations, (2) receiver spurious radiations, (3) receiver spurious responses, (4) transmitter intermodulation, and (5) receiver intermodulation. All the minimum channel separation requirements established by the first four are so great that they cannot be adhered to in any frequency plan that requires more than a few channels for simultaneous use. Channels closer in frequency than the minima required can be assigned provided the spot frequencies upon which the resulting intermodulation products fall remain unassigned. The fifth type of spot frequency interference, that due to receiver intermodulation, will be overshadowed by the transmitter, intermodulation effect. In both instances the interferences fall upon the same channel of frequencies.

22. Calculation of Frequency Plans - The calculation of acceptable frequency plans is a major factor influencing the engineering of a UHF communication system. The ideal approach to the development of a frequency plan would be as follows: The first step is to establish a basic list of frequencies from which a selection can be made. The second step is to determine the minimum frequency separation between channels for channel assignments. This depends on the equipments and antenna arrangements used. This separation will also differ for the low, medium, and high - third of the frequency band and must be taken into account. The next step is to consider the elimination of interference due to intermodulation products. The basic requirement to insure that no third-

ENCLOSURE (2) to TAB K

CONFIDENTIAL

order intermodulation products fall on an operating channel is that the frequency difference between each and every combination of two channels must not be equal to the frequency difference between any other combination of two channels. The strongest fifth-order intermodulation products must also be considered. When a fifth-order interference of this type exists the channel involved should be rejected. The fifth step is the check for spot frequency interferences. Specific examples and application of the above details in devising frequency plans are contained in the U.S. Navy Electronics Laboratory Report 747. In general when a completely interference-free frequency plan of sufficient channels cannot be devised, it is desirable to assign priority in channel selection - to eliminate interference in the following order: first, the intermodulation products; second, the transmitter spurious radiations; third, the receiver image response; fourth, the other receiver spurious responses; and fifth, the receiver oscillator radiation. This priority should result in the most satisfactory over-all frequency plan.

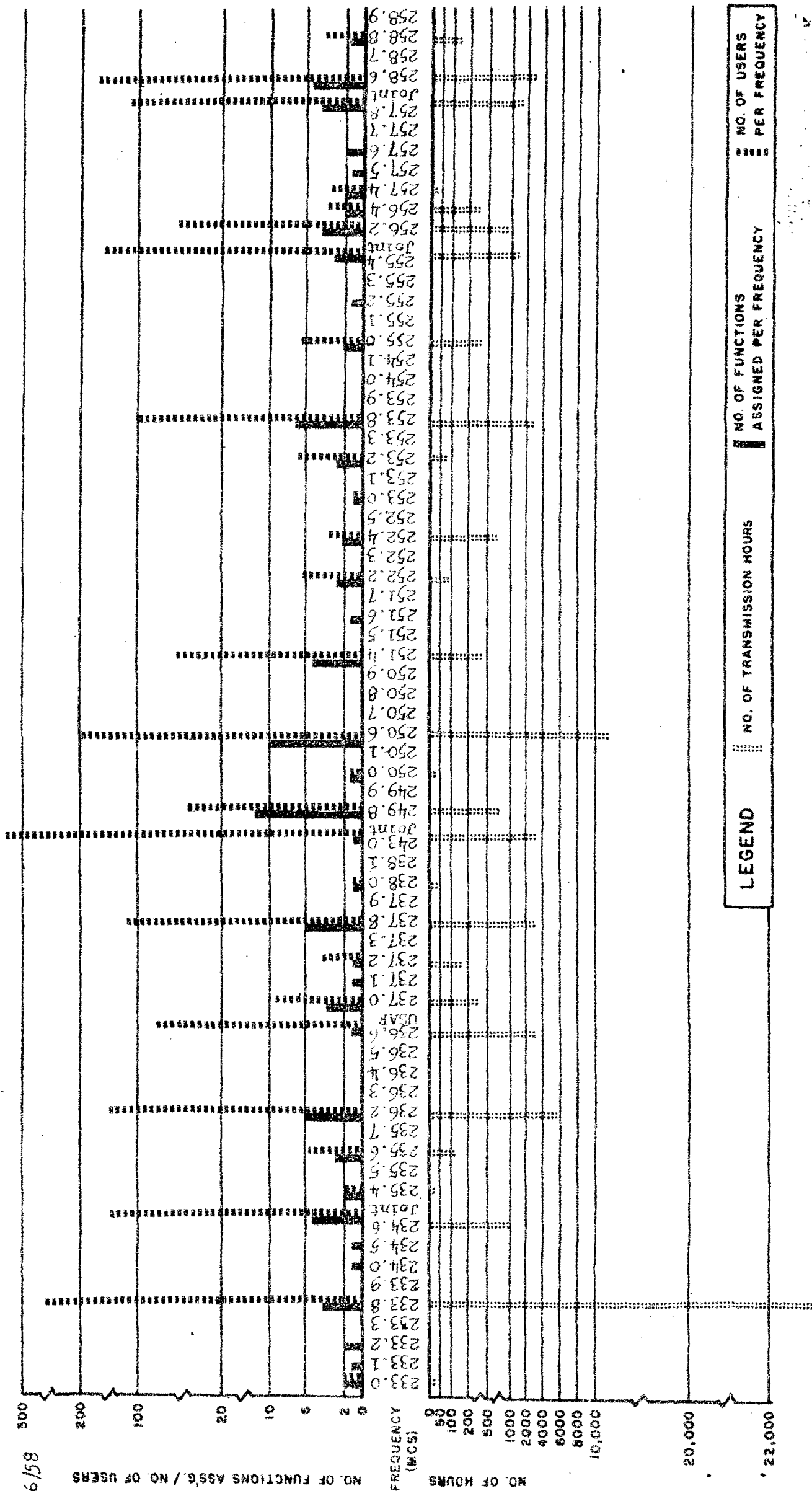
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NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

1 JULY 1957 TO 31 OCTOBER 1957

CONFIDENTIAL

TAB K
to
FAAB 26/59



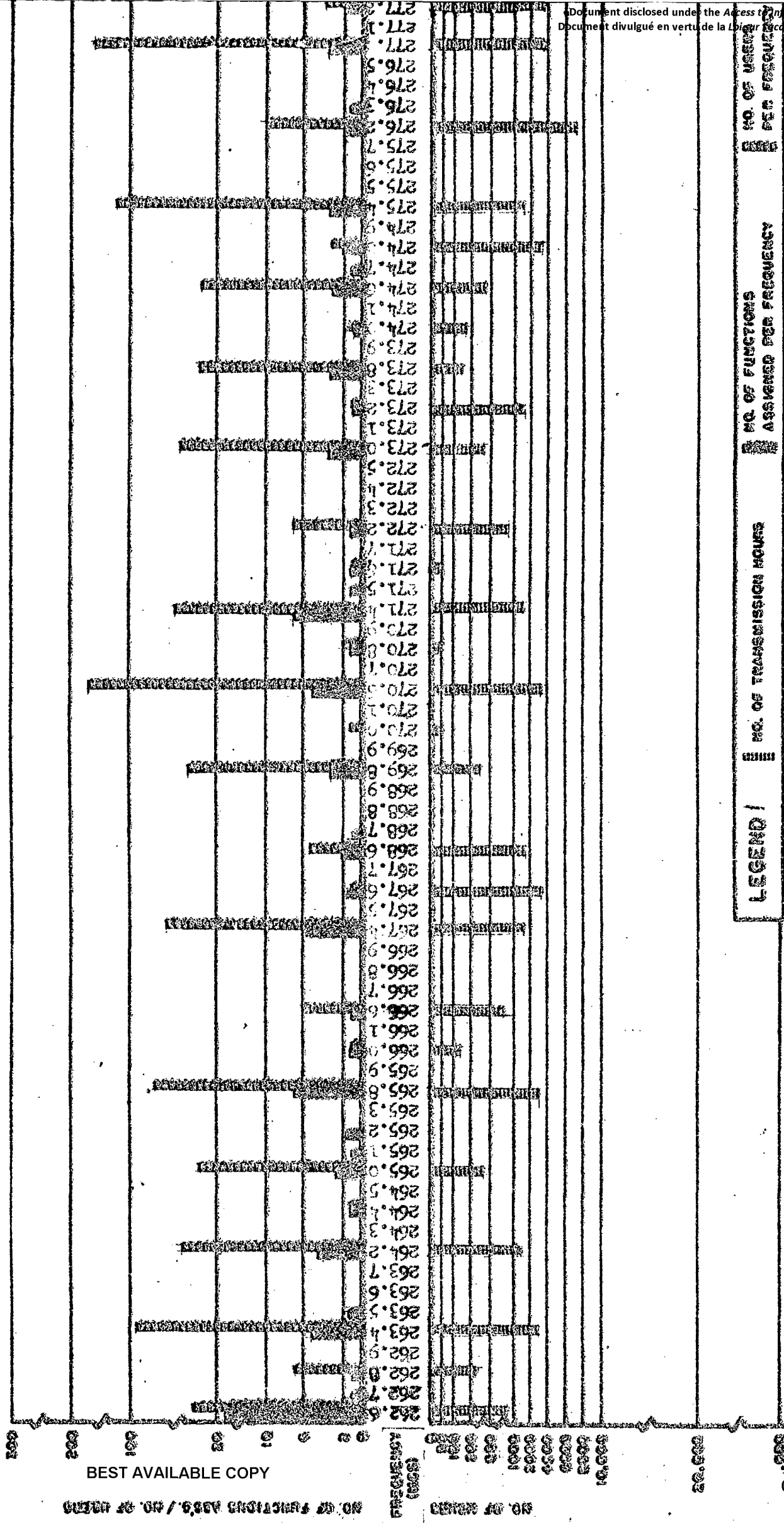
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NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

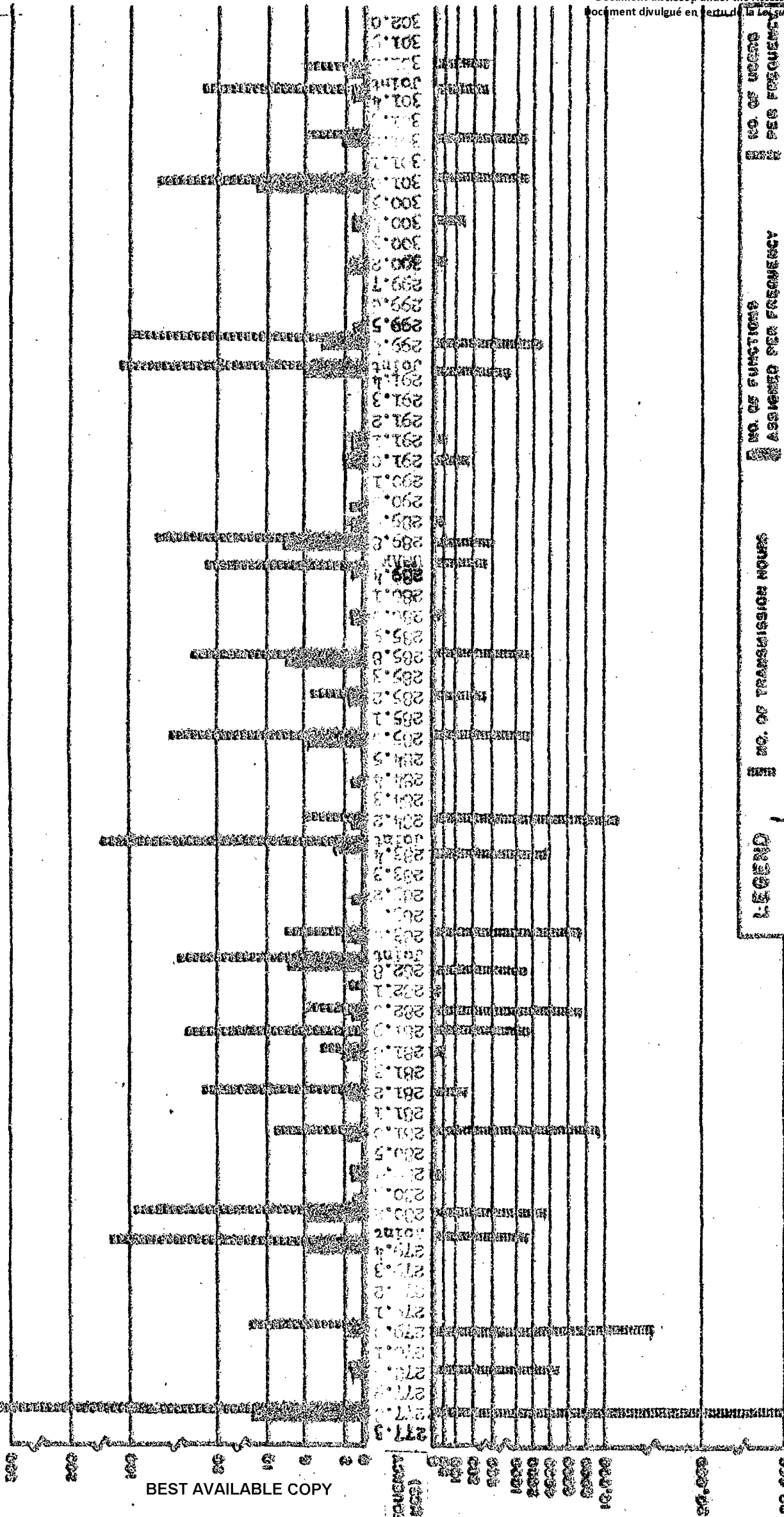
1 JULY 1957 TO 31 OCTOBER 1957



3

NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

AS OF 1500100Z 15 OCT 1967



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NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

1 JULY 1957 TO 31 OCTOBER 1957

300

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NO. OF FUNCTIONS ASSG. / NO. OF USERS

FREQUENCY (MCS)

NO. OF HOURS

LEGEND

NO. OF TRANSMISSION HOURS

NO. OF FUNCTIONS ASSIGNED PER FREQUENCY

NO. OF USERS PER FREQUENCY

CONFIDENTIAL
ENCLOSURE (3) to TAB E

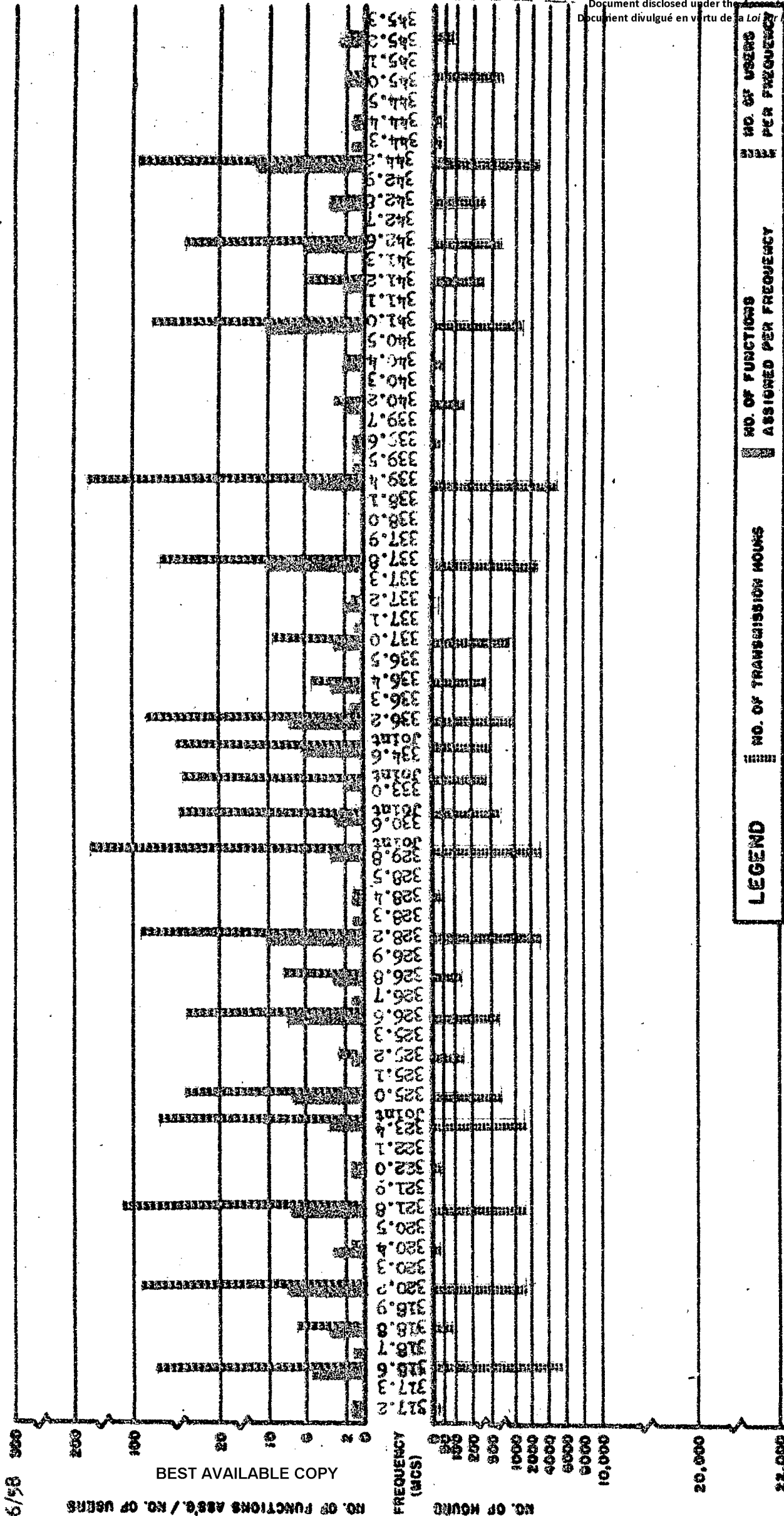
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NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

5.

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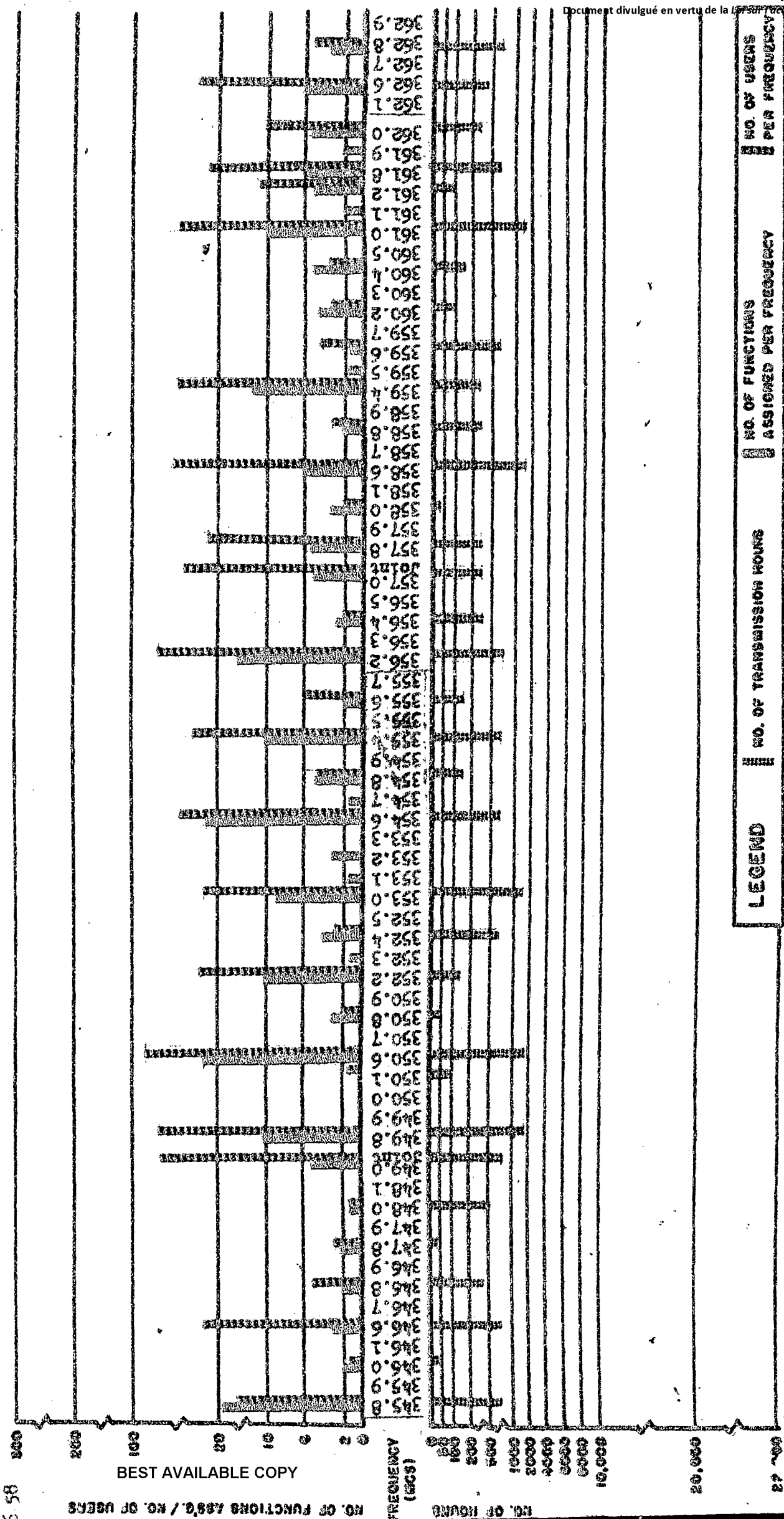
1 JULY 1957 TO 31 OCTOBER 1957



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ENCLOSURE (3) to TAB 8

NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

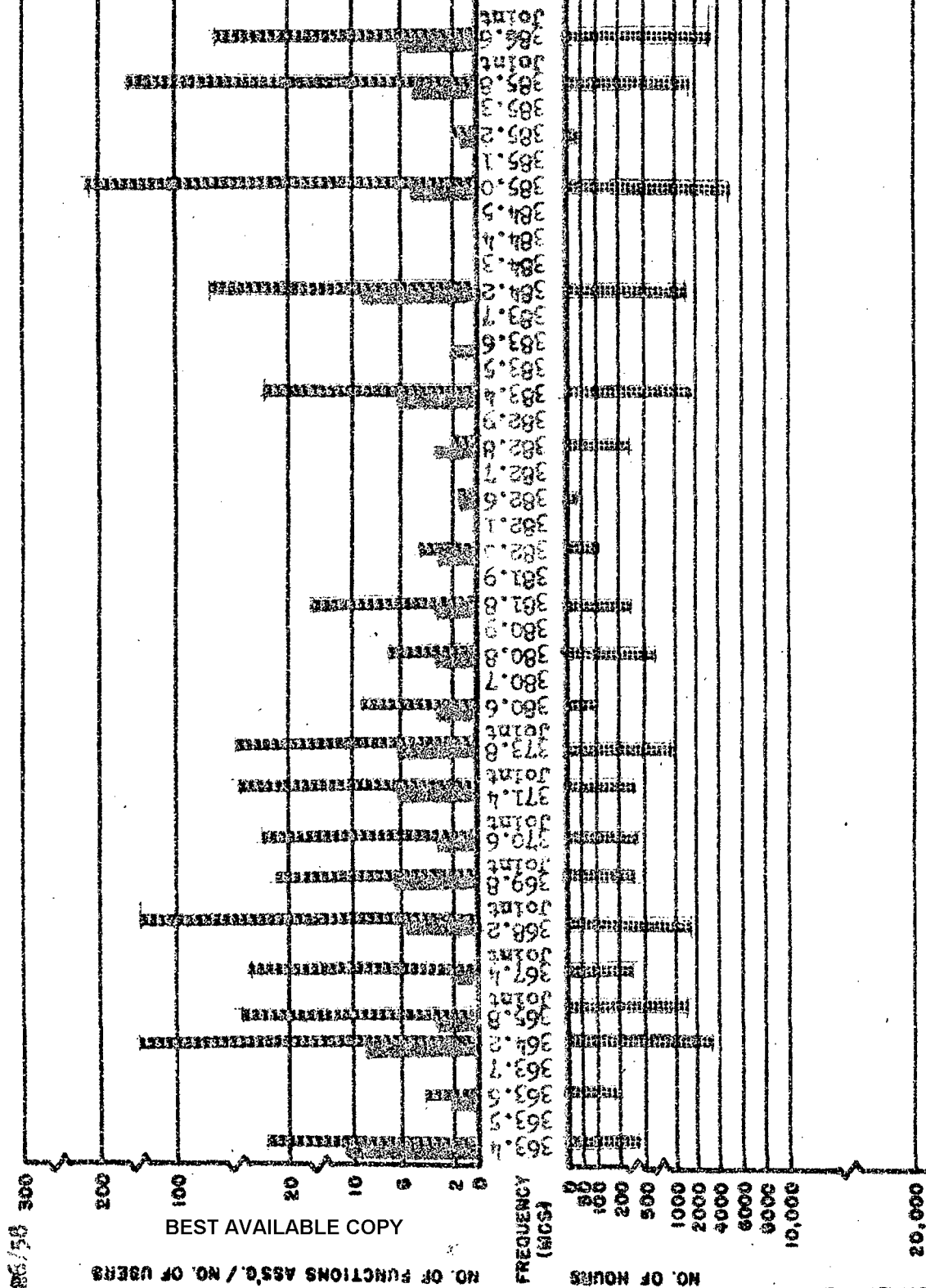
1 JULY 1957 TO 31 OCTOBER 1957



NO. OF TRANSMISSION HOURS (3) TO TAB K

NAVY FREQUENCY USAGE IN THE 225.0 TO 400.0 MEGACYCLE SPECTRUM

1 JULY 1957 TO 31 OCTOBER 1957



DN Com. PA

R2214

ROUTINE

DN COM

FM CANAIRHED

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TO CANAIRWASH

"AC" NO UNCLASSIFIED REPLY OR
REFERENCE IF DATE TIME GROUP IS
QUOTED

EEC

INFO CANAVHED

D/SEC/
STAFF

CANAVUS

S531-102 (DAPS)

DNPO

ACNS(P)

ACNS(W)

CHAIRMAN CHIEFS OF STAFF

US NAVAL ATTACHE US EMBASSY OTTAWA

NSS 1300-30

NAVY GR

BT

DPS 16 22 FEB

IN LETTER OP-302W SLANT JBC SER 002975P30 29 AUG 56 TONAVAL MEMBER CJSW
THE CNO USN RAISED REQUIREMENT FOR COMMUNICATIONS BETWEEN TRAFFIC CONTROL
CENTRE GANDER AND CINCLANT FLT NORFOLK FOR AIR MOVEMENTS INFORMATION IN
CONNECTION WITH USN OPERATION OF EARLY WARNING BARRIER ARGENTIA AZORES PD
REQUEST REFERRED TO NAVAL HEADQUARTERS BY NAVAL MEMBER CJSW IN LETTER
NMMS 7401 DASH 280/SEP 56 AND SUBSEQUENTLY TO AFHQ FOR RESOLUTION PD
CANAVUS 201410Z NOV 56 AND ITEM 13B OF PJBD JOURNAL JAN 57 ALSO REFER PD
REQUEST YOU CONVEY SUBSTANCE OF THE FOLLOWING TO USN PD
PERMISSION IS GRANTED FOR THE INSTALLATION OF COMMUNICATIONS BETWEEN
GANDER CENTRE ARGENTIA AND NORFOLK PD IF REQUIRED CIRCUITS ARE PRESENTLY

PAGE TWO

OWNED OR LEASED BY US MILITARY AGENCIES DETAILS OF GANDER TERMINATION MAY BE NEGOTIATED BETWEEN BARRIER COMMANDER IN ARGENTIA AND GANDER CENTRE HOWEVER IF ADDITIONAL CIRCUITS ARE TO BE LEASED FROM CANADIAN COMMERCIAL AGENCIES THEN REQUIREMENTS SHOULD BE NEGOTIATED THROUGH CJSW PD IT WILL NOT BE POSSIBLE FOR DOT TO PROVIDE PERSONNEL FOR GANDER TERMINAL FOR APPROXIMATELY TWELVE TO EIGHTEEN MONTHS THEREFORE IT IS SUGGESTED THAT USN PROVIDE NECESSARY PERSONNEL UNTIL DOT CAN TAKE OVER PD PERMISSION IS GRANTED ON STRICTLY INTERIM BASIS FOR US MAVAL PERSONNEL TO PERFORM REQUIRED FUNCTION IN GANDER CENTRE PD DETAILS MAY BE WORKED OUT BETWEEN BARRIER COMMANDER AND DOT GANDER PD

USN HAVE OFFERED REIMBURSEMENT FOR DOT CIVIL PERSONNEL WHO WILL ULTIMATELY BE EMPLOYED ON THIS TASK HOWEVER DISCUSSION OF THIS ASPECT SHOULD BE DEFERRED UNTIL THE PRECISE PERSONNEL REQUIREMENT CAN BE DETERMINED PD THE ESTABLISHMENT OF AIR MOVEMENTS IDENTIFICATION SERVICE IN ALL DOT ATC CENTRES INCLUDING GANDER WILL HAVE BEARING ON THIS

AND IT MAY EVOLVE THAT FEW ADDITIONAL PERSONNEL OVER THOSE TO BE ESTABLISHED FOR OUR OWN NEEDS WILL BE REQUIRED.

BT TOR 252040Z/FEB/57

CONFIDENTIAL

Classification *Confidential*

Extracted 31/1/57... 124R.

File Reference *A. 1300-30*

VCNS

A/VCNS

① ACNS (P) *11/2/57*

② *DNPO 17-1987 3/2/57*


ACNS (Air)

ACNS (W)

③ *DNCom 11/2/57*

**~~VICE CHIEFS OF STAFF COMMITTEE~~
PERMANENT JOINT BOARD ON DEFENCE**

The following extract from the minutes of the 22-24 Jan. 57. meeting of the above committee held at *Louisa* is referred for information and necessary action.



Secretary to
Vice Chief of the Naval Staff

13.

(B) (CONFIDENTIAL) COMMUNICATION BETWEEN OAC GANDER, CINCLANTFLT AND COMBARLANT

The U.S. Navy member stated the urgency and importance of having OAC GANDER provide information on westbound ocean flights crossing the seaward extension of the DEW Line to CINCLANTELT and COMBARLANT. He said that this required a direct telephone circuit from OAC GANDER to COMBARLANT at Argentia and CINCLANTFLT at Norfolk.

The Department of Transport representative replied that, even though it would be the Canadian preference to man the circuit with Department of Transport civilian personnel, due to the extensive training required for operators and present Department of Transport commitments, the civilian personnel required could not be provided for approximately 12 to 18 months.

The U.S. Navy member and the Department of Transport representative then agreed that the U.S. Navy would provide USN communications personnel as required to man this circuit until Department of Transport personnel were available. At that time USN personnel would be withdrawn and civilian personnel would be provided by the Department of Transport on a reimbursable basis.

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HH/j1

Directorate of Naval Communications

1300-30

PA

ROYAL CANADIAN NAVY

Canada,

26 October, 1956.

USN TAPE RELAY ORGANIZATION

Enclosure: (A) One copy Tape Relay
Organization.

Enclosed one copy of "USN TAPE
RELAY ORGANIZATION" for information and
retention.

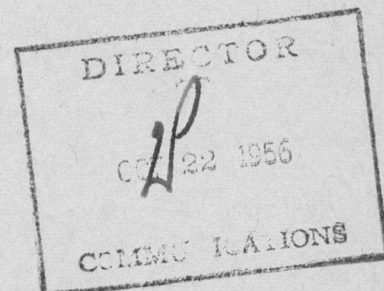
LBS
NAVAL SECRETARY

Flag Officer,
Pacific Coast.

Copy to:

Flag Officer,
Atlantic Coast.

Encl. (1)



RESTRICTED

*FMD ✓
24/10/56
JWS*

*24/10
DIN com*

HH/jl
RESTRICTED

Directorate of Naval Communications

1300-30

ROYAL CANADIAN NAVY

Canada,

26 October, 1956.

USN TAPE RELAY ORGANIZATION

Enclosure: (A) One copy Tape Relay
Organization.

Enclosed one copy of "USN TAPE
RELAY ORGANIZATION" for information and
retention.

LBS
NAVAL SECRETARY

Flag Officer,
Naval Divisions.

Copy to:

HMCS Cornwallis Communication School,
Cornwallis, N. S.

Encl. (1)

RESTRICTED



000200

*FWD
26/10/56 ✓
kwp*

ADDRESS REPLY TO:



IN REPLY REFER TO

N. 1 Member

NMW 1300-1 Vol.2

CANADIAN JOINT STAFF

2450 MASSACHUSETTS AVE., N.W.

WASHINGTON 8, D.C. 27 September, 1956

USN TAPE RELAY ORGANIZATION

Enclosure: (A) Seven copies Tape Relay Organization

Submitted for the information of Naval Headquarters and if desired, for distribution to HMC Communications School and Communication Training Centers, for training purposes.



COMMODORE

The Naval Secretary.

- 1 COMM SCHOOL
- 1 MAJOR HALIFAX
- 1 MAJOR ESQ

LR

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Referred to.....	<i>Staff</i>
OCT 2 1956	
File No.....	<i>1300-30</i>
Chgd to.....	<i>PC DN Comm</i>

SECRET

NSS 1300-30 PA

~~NSS 7401-250-ED 6255~~
(STAFF)

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20 September, 1956.

CHIEF OF THE AIR STAFF

OCEAN FLIGHT DATA FROM OAC GANDER

Reference: (a) CSC 5-1-7 (JPO) dated 18
September, 1956.

Enclosures: "A" - Chief of Naval Operations'
letter Ser. 002975P30, dated
29 August, 1956.

"B" - Naval Member, Canadian Joint
Staff Washington's letter
LHNS 7401-280 Vol. 2, dated
6 September, 1956.

"C" - CANAVHED's message 142129Z
September, 1956.

Enclosures "A" and "B" are forwarded to
comply with the wishes expressed by the Canadian
Chairman at the 3/56 MCC Meeting, Reference (a).
Because the USN request regarding provision of
ocean flight data from OAC Gander concerns Air
Defence, the Canadian Chairman considered that this
matter would be investigated by the RCAF and the
US Section advised. This view is concurred with.

2. Prior to the promulgation of the Joint
Staff memorandum, Reference (a), preliminary discussions
took place with the Department of Transport following
which Enclosure "C" was despatched to the Naval Member,
Canadian Joint Staff, Washington, as an interim reply.

H.G. DeWolf
(H.G. DeWolf),
for Vice-Admiral, RCN,
CHIEF OF THE NAVAL STAFF.

Despatched to
N. Sec.

Date
Time

219



encl 20/9

SECRET

NPS-1300-300

~~NSS 7401-250-250 #6255 (Staff)~~

18 September, 1956.

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CHIEF OF THE AIR STAFF

COMMUNICATION ARRANGEMENTS FOR EVALUATION
OF CONTACT REPORTS GENERATED BY THE AIRCRAFT
EARLY WARNING SYSTEM (BARRIER)

- References: (a) Chief of Naval Operations letter Op-3027/jbc
Ser 002975P30 of 29 August, 1956.
- (b) Naval Member of the Canadian Joint Staff,
Washington letter JNES 7401-280 Vol. 2 of
6 September, 1956.

Reference (a) may be summarized as a request, by the United States Navy, for OAC Gander to join a telephone circuit connecting the Barrier Commander, Argentia and the Commander-in-Chief, Atlantic Fleet (CINCLANTFLT) in order that the latter two authorities may receive information on westbound overseas flights for evaluation purposes.

2. This matter has been discussed informally with the Department of Transport and they have indicated that they are unable to undertake the information handling problem, which would arise as a consequence of the addition of this circuit, due to the shortage of personnel and space at Gander. However, the Department of Transport made it known that OAC Gander has a circuit to the Air Defence Division Headquarters at Fort Pepperrell to carry flight information and suggested that a loop from this circuit to the Argentia-CINCLANTFLT circuit might solve the problem.

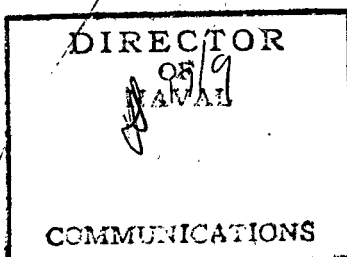
3. As this subject is primarily one of Air Defence, it is requested that your comments and recommendations on this problem may be forwarded.

4. An interim reply has been made by message to Naval Member of the Canadian Joint Staff in Washington giving the information contained in paragraph 2 above.

*rewritten in
conjunction with DN Com.*

DNPO - Commence

(H.G. DeWolf)
Vice-Admiral
Chief of the Naval Staff.



SECRET

1300-30

DEFERRED

SECRET

TOD 150239Z SEP/56

M 142129Z

"AC" NO UNCLASSIFIED REPLY OR
REFERENCE IF DATE TIME GROUP IS QUOTED

FROM CANAVHED

TO CANAVUS

NAVY GR 141

BT

INTERIM REPLY TO NMWS 7401-280 VOL 2 OF 6 SEP X

2. DOT HAVE INDICATED THAT THEY ARE UNABLE TO ACCEPT ANY
ADDITIONAL COMMITMENTS AT OAC GANDER AS THEY ALREADY INFORM
FORT PEPPERREL AIR DIV HQ OF AIRCRAFT MOVEMENTS WHICH INCLUDE
WESTBOUND OVERSEAS FLIGHTS X

3. SUGGEST THAT USN INVESTIGATE POSSIBILITY OF EXTENDING
GANDER FORT PEPPERRELL AIR DEFENCE CIRCUIT TO INCLUDE BARRIER
COMMANDER ARGENTIA AND CINCLANTFLT X

4. RCAF BEING APPROACHED TO OBTAIN FURTHER INFORMATION

BT

7401-280

DRAFTED BY DNCOM(MAC)

VCNS ACNS(W) DNCOM SOC EEC D/SEC/STAFF DSRA PPCC

SECRET



RESS REPLY TO:

Naval Member

IN REPLY REFER TO

NMWS 7401-280 Vol.2

CANADIAN JOINT STAFF

2450 MASSACHUSETTS AVE., N.W.
WASHINGTON 8, D.C.

6 September, 1956

COMMUNICATION ARRANGEMENTS FOR EVALUATION OF
CONTACT REPORTS GENERATED BY THE AIRCRAFT
EARLY WARNING SYSTEM (BARRIER)

Enclosure: (A) Op-302W/jbc Ser 002975P30 dated
29 August, 1956

Submitted for the consideration of Naval Headquarters is the attached letter from the USN. It is a request that co-ordination be effected to procure approval from the Department of Transport for ^{the} OCA Gander to co-ordinate with USN representatives at Argentia direct as necessary to provide technical circuit arrangements for relaying ocean flight data to CINCLANTFLT, to assist in evaluating contact reports originated by the Aircraft Early Warning System (Barrier). The requirement is for a circuitry arrangement only at ^{the} OCA Gander, to provide a voice link between CINCLANTFLT, OCA-GANDER and the Barrier Commander at Argentia. ^{one} _{one}

2. The USN consider this requirement a matter of military urgency, particularly with their forthcoming operation LANTBEX 1/56 (Atlantic Barrier Exercise) on 19-28 September to test the Barrier System. It is also understood that the USN member of the CAN-US Military Co-operating Committee intends tabling the subject at the next meeting of this group on 10-13 September.

3. An approval by message, prior to 14 September in view of paragraph 2 above, is requested, if the USN proposal is acceptable as an interim measure solely for the purpose of LANTBEX 1/56, followed at a later date by Naval Headquarters' final decision.

COMMODORE

The Naval Secretary.

SECRET

Referred to Staff

SEP 11 1956

File No. S. 7401-250

9 1300-30

Chgd to.....

000205

COPY

DEPARTMENT OF THE NAVY

Office of the Chief of Naval Operations

Washington 25, D.C.

SECRET

Op-302W/jbc
Ser 002975P30

29 Aug 1956

SECRET

From: Chief of Naval Operations
To: Navy Member, Canadian Joint Staff, Washington, D.C.
Subj: Assistance in effecting communication arrangements; request for

1. The Commander in Chief U.S. Atlantic Fleet is responsible for the evaluation of contact reports generated by the Aircraft Early Warning System (Barrier). In order to perform this evaluation effectively, it is necessary that CINCLANTFLT receive information on westbound overseas flights crossing the Barrier as this information becomes known to the civil agencies which control the flights. It is especially important that the ocean flight data, known to the OAC Gander, be made available due to the extent and location of this control area in relation to the Barrier.
2. Specifically, the information required will consist of the route, ground speed, altitude, location, time, and identity of known westbound air flights traversing the Barrier. In addition, it may be necessary to obtain amplifying information on individual flights from OAC Gander as it becomes available.
3. To assure the provision of the information outlined above CINCLANTFLT requested that the Chief of Naval Operations provide a telephone circuit connecting the Barrier Commander, Argentia, OAC Gander, and CINCLANTFLT Headquarters at Norfolk, Virginia. The above circuit configuration was specified in order that both CINCLANTFLT and the Barrier Commander would simultaneously receive the flight information transmitted by OAC, Gander. The Chief of Naval Operations has been advised by the U.S. Naval Station, Argentia that the above telephone circuit is ready for activation, but approval for OAC Gander to join the circuit and provide the required flight data would have to be arranged through contact with appropriate Canadian representatives.
4. Accordingly, it is requested that necessary coordination be effected to procure approval for OAC Gander to coordinate with U.S. Navy representatives as required to effect provision of the technical circuit arrangements and the indicated information to CINCLANTFLT and Barrier Commander, Argentia. The technical arrangements consist of extending local communication channels from the USAF terminals at Gander to the OAC to permit circuit operation as prescribed.
5. Such additional equipment that may be required at OAC Gander to effect the foregoing will be provided by the Chief of Naval Operations when requested by the Commanding Officer, U.S. Naval Station, Argentia, who has been authorized to complete arrangements with OAC Gander representatives.
6. The requirement for the establishment of a capability to evaluate

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- 2 -

Barrier contact reports is considered a military urgency and should be prosecuted as a high priority item. Inasmuch as operation of the Barrier commenced on a limited scale, on 1 July 1956, early action to permit the implementation of arrangements requested will be greatly appreciated.

(sgd) G.L. Caswell

G.L. Caswell
Captain, US Navy
Assistant Director, Naval Communications
By direction

SECRET

000207

Date Extracted

5.9.56

pc - D n Comm

Classification

51300-30

File Reference

CHIEFS OF STAFF COMMITTEE
DEFENCE COUNCIL
CABINET DEFENCE COMMITTEE

PA 13/9/56 R.P.
SU#E 1158

CNS

VCNS

CNTS

CNP

A/CNS(W) 11/9/56 12/9

A/CNS(A)

A/CNS(P)

DNPO

DNI

DTSD

DN GOM 1.0/9 11/10/9

DN INF

A/CNTS (EMP)

A/CNTS (Ships)

A/CNTS (Air)

WOC

SOC

DGNO

DCNP

N SEC

A/CNS 2/10/56 7/9

The following extract from the minutes of the 54th meeting of the above committee held 31.8.56 is referred for information and necessary action.

ADMIRAL'S SECRETARY

IX. NORTHWEST TERRITORIES AND YUKON RADIO SYSTEM (CONFIDENTIAL)

41. The Committee had for consideration a submission by the Chief of the General Staff recommending that:

- the Army should take immediate steps to dispose of the five radio stations at which the traffic does not justify the operating cost; and
- that the Advisory Committee on Northern Development should review this problem to decide whether another agency should take over the operation of the system.

(CSC:5.5.5. TD:1 dated 22 Aug 56)

42. The Chairman, Chiefs of Staff outlined the background of the establishment of the Northwest Territories and Yukon Radio System and the method of costing and repayment. He considered that in view of the requirement to limit military commitments and the pressure to expand facilities in the north, it should now be decided whether or not the radio system should be turned over to a civilian department of government.

43. The Chief of the General Staff presented the Canadian Army view of this problem and indicated the cost to the Department of National Defence for which there was no return.

44. The Secretary to the Cabinet suggested that an alternative arrangement might be to form a Crown company to run the system with the secondment of Army personnel to operate it. This suggestion would relieve the Army of the cost of pay and allowances for the operators.

45. The Committee agreed:

- a) that there was no military necessity to retain the Northwest Territories and Yukon Radio System within the responsibility of the Department of National Defence; and
- b) that the matter should be placed before the Advisory Committee on Northern Development for their consideration.

SECRET

MEMORANDUM TO: CHIEF OF THE NAVAL STAFF

SUBJECT: Northwest Territories and Yukon FILE NO.:
Radio System.

Agenda item for the 596th meeting of the Chiefs of Staff Committee to be held on Thursday 30 August 1956.

BACKGROUND:

The Chairman, CSC, has asked whether the Northwest Territories and Yukon Radio System, at present operated by the Royal Canadian Corps of Signals, should not be the responsibility of the Department of Transport. This system handles governmental and civilian communication traffic throughout the Yukon and Northwest Territories.

2. The Army now operates 18 stations in this system. These are:

<u>Main Stations</u>	<u>Secondary Stations</u>	<u>Tributary Stations</u>
Edmonton	~ Aklavik	Fort Chipewyan
Fort Simpson	Beaverlodge	~ Fort Good Hope
Fort Smith	Dawson	Fort Reliance
Fort MacMurray	Resolution	Fort Norman
~ Norman Wells	Hay River	Fort Providence
~ Yellowknife	Mayo	
	Radium	

The approved complement for these stations is 230 officers and men; strength on 1st January, 1956 was 141 soldiers and 50 civilians.

3. The CGS states:-

- (a) That a communication system is needed in this area.
- (b) This system provides valuable operating and administration training for RCCS personnel.
- (c) The system provides a valuable nucleus for a military network should it be needed.
- (d) The system provides services of financial value in excess of cost of operation.
- (e) Five tributary stations do not handle enough traffic to justify their existence.
- (f) The Army loses money in operating the system, since no charge is made to governmental agencies and crown corporations for service, although commercial activities are charged.

SECRET

4. The CGS recommends that:-

- (a) The Army dispose of the five tributary stations.
- (b) Further study be made to determine whether this service could be better handled by another agency.
- (c) Should the Army be left to operate it, arrangements be made to have other governmental agencies bear part of the expense.

COMMENT:

5. In general, the statements in para 3 (a) to 3 (e) are concurred in. This service is needed and it provides valuable training for radio operators, and would, in time of war, provide a nucleus for a communication network. However, in peacetime its military value is doubtful.

6. Figures quoted in para 7 of the CGS's memo dated 16 August (attached) are misleading. The cost of operating the system in 1954 is given as \$1,266,708. Revenue received in cash was \$250,788. Thus it would appear that the cost of this service to the Army was \$1,000,000. However, this figure includes the salaries and wages of the personnel, who would have to be paid irrespective of their place of employment. A figure of approximately \$500,000 may be assumed as the salary requirements for 200 men for a year, with a consequent decrease in cost of the NWT & Y system to approximately \$500,000. Against this figure may be offset the cost to the Army were its own messages to be handled over commercial lines. In the final analysis, the net cost is very low.


7. Closing of the five tributary stations would reduce this cost, and would cause no hardship to the inhabitants of the area, since all these places have a Hudson Bay Company post, with a very efficient radio service.

8. It is foreseeable that there might be a requirement to link this system into the DEW and MID-CANADA line communication complexes. Should this be so, it would be much less complicated if it were a military system.

RECOMMENDATIONS:

9. It is recommended that:-

- (a) The Army close down the five tributary stations.
- (b) The Army continue to operate the system.
- (c) Should the Army consider that the cost of operating this system is greater than the value of training received, other governmental agencies concerned should be approached to share the cost of operating the system.


VICE CHIEF OF THE NAVAL STAFF.

CSC:5.5.5 TD:1

SECRET

CHIEFS OF STAFF COMMITTEE

OFFICE OF THE SECRETARY
NATIONAL DEFENCE HEADQUARTERS

OTTAWA, 22 August 1956.

MEMORANDUM TO: Chairman, Chiefs of Staff

CAS
CGS
| CNS
CDRB

SUBJECT:

Northwest Territories
and Yukon Radio System

1. The following document concerning the above mentioned subject is forwarded herewith:

HQS 2001-581/0 Vol 2 (DMO&P Coord)
dated 16 August 1956

2. This matter will be placed on the agenda of the 596th meeting of the Chiefs of Staff to be held on Thursday 30 August 1956.

F.W.T. Lucas
(F.W.T. Lucas)
Captain, RCN
Secretary

FWTL/6-6756/mck

c.c. Deputy Minister
Secretary to the Cabinet
Under-Secretary of State
for External Affairs
Coordinator Joint Staff

SECRET

(COPY)

MEMORANDUM

HQS 2001-581/0 Vol.2
(DMO&P Coord)

16 Aug 56

SECRET

Chairman, Chiefs of Staff.

Northwest Territories and Yukon Radio System

1. At the special meeting of the Chiefs of Staff (4-7 Jun 56) you questioned whether the Northwest Territories and Yukon Radio System should not be more properly the responsibility of the Department of Transport. I have looked into this matter and my views are below.
2. In 1922 the Department of the Interior asked the Department of National Defence to establish a radio telegraph system in the Canadian Northwest to serve government departments and residents or travellers in the area. Department of National Defence agreed, and the first stations were opened by the Army in 1923. Since that time additional stations have been opened to meet the growing need for communications and to assist the Department of Transport in the meteorological and air service field. The Army system now consists of 18 stations, with an establishment of 230 men and a strength in Jun 56 of 141 soldiers and 50 civilians.
3. In January 1951, studies were made of how the Army might be relieved of responsibility for operating this system. Progress was made in this only to the extent of handing over to DOT after much reluctance and delay on their part, four stations (Embarras, Ennadai, Wrigley and Brochet).
4. A further study made this summer shows that at five stations the cash value of the traffic is considerably less than the cost of operations and maintenance. For this reason, these five stations provide little training value to the Army. We therefore propose either to close them or hand them over to other agencies, eg, Department of Transport, Hudsons Bay Company. This will reduce the system to thirteen stations, all of which appear to be required for the traffic available. Each of these would therefore provide worthwhile training for the Royal Canadian Corps of Signals.
5. From a purely military point of view, it is advantageous to have under our control a nucleus of a communication system in the Northwest, both as firm communication bases for operations or exercises in the area and to stimulate and facilitate the passage of information. A civilian network would not be entirely satisfactory for this basic task.
6. The Army having operated the system since 1923, has gained materially from the experience in pioneering and operating the System in a technically difficult broadcast area. The system has provided both an incentive and the means of keeping the RC Sigs abreast of the methods, techniques and equipments required to maintain communications over great distances and in the special conditions of northern latitudes. The value of the System has been proven in

-2-

SECRET

this respect, particularly in the maintenance of personnel in a high state of training, both technically and administratively, and the results were very apparent in that Corps when mobilization took place in 1939.

7. Financially, the Department is at a disadvantage in operating the System. Prior to 1939, funds for the operation and maintenance of the System were provided by the Department of Mines and Resources. Since 1939 the Army has borne the cost and there has been no financial recovery to the Army votes for traffic handled or service provided for civilian or government agencies. In 1954, for example, the approximate cost of operating the System was \$1,266,708, including salaries and wages. In the same year, the value at commercial rates of services provided to other government departments was \$1,668,969. In addition actual revenue was received from commercial traffic in the amount of \$250,788.

8. If it is agreed that this service is required in our North-West, and I would think this is self-evident, there is no reason to believe that it could be provided any more efficiently or economically by another Government or commercial agency. On the other hand it is unfortunate that the costs must be borne by Army funds, and I would welcome any simple arrangement for costs to be shared among the users of the System on a more equitable basis.

9. In summary, it is apparent that a system such as the NWT & Y Radio System is a continuing requirement for Canada and that it renders service of financial value in excess of the cost of operating it. From the military point of view there are certain operational advantages in having the system run by the Army. From the Army point of view there is useful training value for RC Sigs in operating it.

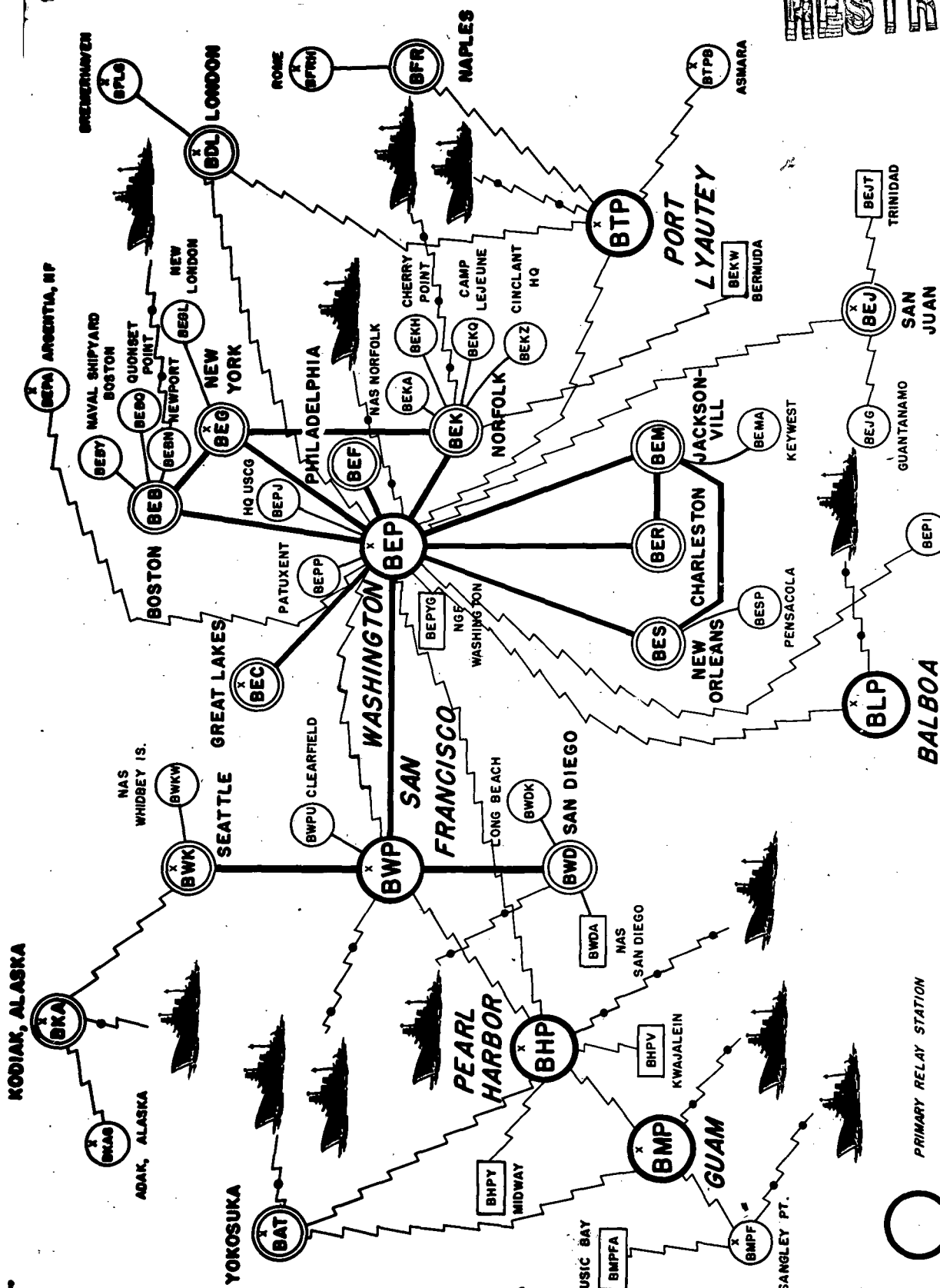
10. I therefore suggest that action be taken along the following lines:

- a) The Army should take immediate steps to dispose of the five stations at which the traffic does not justify the operating cost. These are Fort Chipewyan, Alberta, Fort Good Hope, NWT, Fort Norman, NWT, Fort Providence, NWT, Fort Reliance, NWT.
- b) That the Advisory Committee on Northern Development should review this problem to decide whether another agency should take over the operation of the system and if not, to devise a better arrangement for covering its costs by revenue from the users rather than finding the gross cost from Defence funds.

(SGD) H.D. GRAHAM
(HD Graham)
Lieutenant-General
Chief of the General Staff

SECRET

RESTRICTED



LANDLINE (OR CABLE) TELETYPE TRUNK
CIRCUIT TO MINOR RELAY OR
TRIBUTARY STATION
X AUTHORIZED TRANSFER POINT
— LANDLINE TELETYPE TRUNK CIRCUIT

RIO DE JANEIRO

FORCES AFOAT

TO FORCES AFOAT

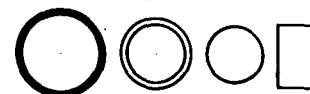
RADIO TELETYPE
TRUNK CIRCUIT

PRIMARY RELAY STATION

MAJOR RELAY STATION

MINOR RELAY STATION

TRIBUTARY STATION (ALL
TRIBUTARY STATIONS NOT SHOWN)



RESTRICTED

SECRET

NOTICE

1. The BRANCH SECRETARIAT must be informed when you pass a file by hand.

2. Secretariats or File Rooms must inform Central

NAS 1300-30
TO /81 (Staff)

ROYAL CANADIAN NAVY

Canada,

26 April, 1955.

P.P.A.

OPERATING SIGNAL "QSS"

Information has been received from the Department of Transport through communication with the International Telecommunications Union as follows:

"The Administration of the United Kingdom of Great Britain and Northern Ireland informed me that its experience in the operation of the maritime mobile radiotelegraph service in the exclusive bands between 4,000 Kc/s and 23,000 Kc/s has shown that there is an urgent need for a service abbreviation with the following meaning:

Question: What working frequency will you use?

Answer: I will use the working frequency Kc/s.
(Normally the last three figures only of the frequency need be inserted)."

2. Many countries engaged in maritime shipping have approved the abbreviation "QSS" for this meaning which they have agreed to use at their H/F coast stations. Canada offers no objections to its use at this time.

3. All operators should be acquainted with this abbreviation and its meaning. It may be used when communicating with ships.

BEST AVAILABLE COPY

NAVAL SECRETARY

Officer-in-Charge,
Albro Lake Naval Radio Station, Dartmouth. ✓

Officer-in-Charge,
Naval Radio Station, Aldergrove. ✓

Copy to: Flag Officer,
Atlantic Coast.

Flag Officer,
Pacific Coast.

DN Com 28/4

AIR SERVICES
TELECOMMUNICATIONS DIVISION



REFER TO FILE NUMBER

5872-1

11-17-6

BEST AVAILABLE COPY

Referred to *Staff*
MAR 22 1955
File No. *1200-30*
Sir:
Chgd to *Sec 4-3*

DEPARTMENT OF TRANSPORT

Ottawa, March 17, 1955.

Attention: Lieut. Commander Lee

1. We have been advised by the Secretary General of the International Telecommunication Union as follows:-

"The Administration of the United Kingdom of Great Britain and Northern Ireland informed me that its experience in the operation of the maritime mobile radiotelegraph service in the exclusive bands between 4,000 kc/s and 23,000 kc/s has shown that there is an urgent need for a service abbreviation with the following meaning:

Question: What working frequency will you use?

Answer: I will use the working frequency...kc/s
(Normally the last three figures only of the frequency need be inserted).

The United Kingdom Administration would like to bring the abbreviation--for which it suggests that "QSS" might be used--into use on 1 December 1954."

2. From subsequent notices received from the International Telecommunication Union it is indicated that many countries engaged in maritime shipping have approved this abbreviation which they have agreed to use at their HF coast stations.
3. Although the use of this abbreviation cannot be included in the International Radio Regulations until the next Ordinary Administrative Radio Conference, Canada offers no objection to its use at the present time.
4. It is therefore suggested that your coast stations at Halifax and Vancouver should be acquainted with this abbreviation and its meaning and that it may be used by your stations when communicating with ships.

Yours truly,

G.C.W. Browne
G.C.W. Browne
Controller of Telecommunications

23/3
The Secretary, Naval Board,
Department of National Defence,
(Naval Service),
Ottawa, Ont.

JCH/JS

NAVAL SERVICE—MINUTE SHEET

FILE No NSS 1300-30.....
(STAFF)

REFERRED TO

REMARKS

(WITH SIGNATURE, POSITION AND DATE)

DNCOMRadio Facility ChartsRef NSS 1300-30 (STAFF)
dated 9 October, 1953.

RCAF co-ordinating authority informed NFA required.

Ray Davis
DCNAOTTAWA, Ontario,
27 October, 1953.

NSS 1300-30 (Staff)

P.C. H.M. com

MEMORANDUM TO: DCNA(T) ^{14/10}

DPP.

RADIO FACILITY CHARTS

Reference: (a)ABD: 1300-1 dated 21 September, 1953.

Forwarded for information and action as considered
necessary by the RCAF promulgating authority.

John A. Charles
(John A. Charles)
Commander, RCN,

DIRECTOR OF NAVAL COMMUNICATIONS.

OTTAWA,
9 October, 1953.

BEST AVAILABLE COPY

CORRECTIONS TO B.R.C.N. 725
(CANAS' ABD: 1300-1, DATED 21ST SEPTEMBER, 1953)

II

AC: 1867-1

Submitted for the information of Naval Headquarters. Paragraph 1 (b), Minute I, amend to read, "Customs available on request". It is requested that the requisite authority may be informed.

J. Jordan

REAR ADMIRAL
FLAG OFFICER ATLANTIC COAST

The Naval Secretary, Naval Headquarters.

Copy: The Commanding Officer, RCN Air Station, Dartmouth, N.S.

29th September, 1953.



✓
D.H. Campbell 17/6

Referred to *Staff*
OCT 2 1953
1300 No 1300-20
Chgd to *PC* D.H. Campbell

FROM: The Commanding Officer, R.C.N. Air Station, Dartmouth, N.S.

DATE: 21 September 1953

File: A.S.N. 1300-1

TO: THE FLAG OFFICER ATLANTIC COAST, H.M.C. DOCKYARD, HALIFAX, N. S.

CORRECTIONS TO B.R.C.N. 725

It is submitted that the following errors and omissions have been noted in the 1 August 1953 edition of Radio Facility Charts for North Atlantic East Canada (B.R.C.N. 725) and are forwarded for necessary action in accordance with Page 1, para. 4, sub-paras. (b) and (c) of the subject publication:

(a) Page 40

Under Dartmouth/Halifax, N.S. Column headed I.L.A.

I.L.S. at Dartmouth is unserviceable until further notice.

(b) Page 41

The following commercial broadcast stations are incorrectly plotted:

CFAB 1450 K/cs. plotted at 4441N6340W.

Correct position 4500N6409W.

CHRS 960K/cs. plotted at 4541N6315W.

Correct position 4442N6340W.

CKCL 1400K/cs. not shown.

Correct position 4523N6317W.

(c) Page 80

Under Canada column headed "Station" Dartmouth/Halifax, Ont.

Should read: Dartmouth/Halifax, Nova Scotia.

(d) Page 82

Under column headed "Station" Dartmouth/Halifax, Ont.

Should read: Dartmouth/Halifax, Nova Scotia.

This change applies to both listings in this column.

(e) Page 84

Opposite CYXF under column headed "Station" Dartmouth, Ont.

Should read: Dartmouth, Nova Scotia.

(f) Page 90 - I.L.S.

Under column headed "Remarks" opposite Halifax/Dartmouth add:

Unserviceable until further notice.

(g) Page 96 - Commercial Broadcasts

Add: Truro, N.S. CKCL 1400 K/cs. 4523N 6317W.

(h) Page 101

Under Canada column headed "Aerodrome" Dartmouth/Halifax, Ont.

Should read: Dartmouth/Halifax, N.S. and in "Remarks" add:

Customs available.

(A.H.G. Storrs),
CAPTAIN, R.C.N.

BEST AVAILABLE COPY

*S.P. Com: Forwarded for information. Please
return file to EEC (E2). JAW E 16/1/53*
EEC. Lndv (E2) 23/1/53.

P39-38-492
P39-38-572

Ottawa 4, Ontario,
January 12, 1953.

Department of National Defence (Navy)
E.E.C., Cartier Square,
Ottawa, Ontario.

Attention: Lt. J. Wildey,
Room 2414, "C" Building.

Your File Reference NSC 7401-650
NES 1300-30

referred to *TS*

JAN 14 1953

15710 Rev 4/53
File No. *1300-30*

to *PC & Gm Com*

Re: Enquiry to Canadian Industry on Price and
Availability of two 10 KW, LF Transmitters
and Antenna Systems.

Dear Sirs:

On December 11, 1952 the Department of Defence Production sent out an enquiry on the price and availability of two 10 KW LF Transmitters and an associated Antenna System in accordance with Navy requirements. A copy of this enquiry was sent to the Department of National Defence (Navy) on December 16, 1952.

The Canadian General Electric Company have replied to the Department of Defence Production enquiry and stated "that they have, at present, no established design for the ten KW Transmitters as outlined in Schedule A and that if a new design were considered a two-year period would be required for design initiation and delivery".

The RCA Victor Company have informed the Department that they also do not have an established design to meet the Navy requirements. The RCA Victor Company consider that their 10-KW LF Transmitter Type TE-343A which they produced for the Navy during 1942 is of an obsolete design and therefore would not recommend further manufacture of it. The Department expects a proposal from the RCA Victor Company shortly giving the time required to initiate a new 10 KW LF design.

*Original & enclosures
on*

NSC 7401-650

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-2-

A detailed proposal from the Canadian Westinghouse Company is expected by approximately January 20, and a copy will then be sent to the Navy for study. The Canadian Marconi Company have submitted a proposal dated January 8, 1953 to the Department of Defence Production; a copy of this proposal is attached. The delivery requirements as stated on your enquiries NSC 7401-650 and NSF 13CC-30 dictate that the transmitters be of an established design.

Because only the Canadian Marconi Company and the Canadian Westinghouse Company have such designs your special consideration of the proposals from these two firms is solicited. The TH-49 transmitter recommended by the Canadian Marconi Company is of Canadian design and is currently being produced for requirements of the Department of National Defence. The equipment offered by the Canadian Westinghouse Company, on the other hand, is of American design and no known equipments are in service for the Department of National Defence. Prior to any Financial Encumbrance which the Department of National Defence (Navy) may raise to meet the requirements for the two transmitters, the Department of Defence Production would welcome the opportunity to discuss the merits of the proposals with representatives of the Office of the Electrical Engineer-in-Chief (Navy). The Department therefore suggest a meeting to be held near the end of January 1953 for this purpose. At such a time the Canadian Westinghouse Company proposal will have been received.

Because a detailed proposal on an antenna system requires one or two months and considerable expense the Department of Defence Production recommend the issuance of an investigation contract to cover the work of making a detailed proposal. The matter of the antenna system could be included in the agenda of the proposed meeting.

Yours very truly,

DEPARTMENT OF DEFENCE PRODUCTION

J. O. Macmillan
J. O. Macmillan, Lt. Col.,
Equipment Chief, Communications Section,
Electronics Division (Production)

JG-LB

DEPARTMENT OF NATIONAL DEFENCE

Department of Defence Production,
Ottawa, Ontario.

OTTAWA, Ont.

Address

18 November, 1952.

Date

ENQUIRY

The following is a complete description of stores (or services):

(a) For which there is a requirement at the present time if they are available on satisfactory terms.

or

(b) On which an estimate is requested, for planning purposes.

Request approximate cost and availability date of a
LOW FREQUENCY TRANSMITTER with following characteristics:-

- (a) Power output to the antenna to be 10 KW plus or minus 1 KW.
- (b) The minimum frequency range must cover the band 90 to 120 Kc/s
- (c) The transmitter must be capable of keying speeds up to 125 W.P.M.
- (d) The transmitter must be capable of CW and frequency shift transmissio
- (e) The transmitter must be capable of operation with a total frequency shift of 200 C.P.S.
- (f) The transmitter must have provision for either Master Oscillator or crystal control.
- (g) The transmitter should not require a separate building to house the antenna tuning components.
- (h) Frequency Tolerance of the transmitter to be 0.02% maximum in ambient conditions from 0° to 50°C.

In addition to the above, the following information is required.

- (a) The power input requirements.
- (b) The physical size of the complete transmitter.
- (c) The estimated cost of a suitable antenna including towers, (omni-directional propagation in the horizontal plane, and an efficiency of at least 50%).
- (d) The availability date of the towers in (c) above.
- (e) The estimated cost of the ground system required for the transmitt

BEST AVAILABLE COPY

Please advise the approximate price at which these stores (or services) can be obtained, and the approximate time required for delivery (or for completion of the work).

Prices quoted are to include delivery costs to

Any further details required in regard to the nature or/and use of these stores (or services) may be obtained from

.....W.J. GREY.....at local.....5564

Strike out (a) or (b)
as applicable.

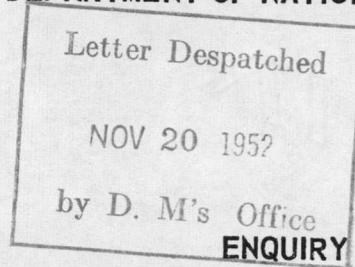
C.A.F.D. 987
3M-3/51

Original Signed by
J. E. CHISHOLM
Signature
(C.M. Drury)
DEPUTY MINISTER.
Title

000226

DEPARTMENT OF NATIONAL DEFENCE

Department of Defence Production,
Ottawa, Ontario.



OTTAWA, Ont.

Address

18 November, 1952.

Date

The following is a complete description of stores (or services):

(a) For which there is a requirement at the present time if they are available on satisfactory terms.

OR

(b) On which an estimate is requested, for planning purposes.

Request approximate cost and availability date of a
LOW FREQUENCY TRANSMITTER with following characteristics:-

- (a) Power output to the antenna to be 10 KW plus or minus 1 KW.
- (b) The minimum frequency range must cover the band 90 to 120 Kc/s
- (c) The transmitter must be capable of keying speeds up to 125 W.P.M.
- (d) The transmitter must be capable of CW and frequency shift transmissio
- (e) The transmitter must be capable of operation with a total frequency shift of 200 C.P.S.
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In addition to the above, the following information is required.

- (a) The power input requirements.
- (b) The physical size of the complete transmitter.
- (c) The estimated cost of a suitable antenna including towers, (omni-directional propagation in the horizontal plane, and an efficiency of at least 50%).
- (d) The availability date of the towers in (c) above.
- (e) The estimated cost of the ground system required for the transmitter

BEST AVAILABLE COPY

Please advise the approximate price at which these stores (or services) can be obtained, and the approximate time required for delivery (or for completion of the work).

Prices quoted are to include delivery costs to

Any further details required in regard to the nature or/and use of these stores (or services) may be obtained from

W.J. GREY

5564

.....at local.....

Strike out (a) or (b)
as applicable.

C.A.F.D. 987
3M-3/51

Original Signed by
J.R. CHISHOLM
Signature
(C.M. Drury)
DEPUTY MINISTER.
Title
Commander-in-Chief, C.N.
Deputy Director General of Staff
and Fleet Administration

000227

- NSS 1300-30 (EEC)
NSC 7401-650 (EEC)MEMORANDUM TO: DGSFA
(DNS) ✓LOW FREQUENCY TRANSMITTER - NEWPORT CORNERS, N.S.


An urgent requirement exists for a low frequency transmitter to be located at Newport Corners Naval Radio Station. The service requirements are such that it is intended to procure a standard commercial transmitter if available.

2. The salient characteristics of the required transmitter are as follows:

- (a) Power output to the antenna to be 10 KW plus or minus 1 KW.
- (b) The minimum frequency range must cover the band 90 to 120 Kc/s.
- (c) The transmitter must be capable of keying speeds up to 125 W.P.M.
- (d) The transmitter must be capable of CW and frequency shift transmission.
- (e) The transmitter must be capable of operation with a total frequency shift of 200 C.P.S.
- (f) The transmitter must have provision for either Master Oscillator or crystal control.
- (g) The transmitter should not require a separate building to house the antenna tuning components.
- (h) Frequency Tolerance of the transmitter to be 0.02% maximum in ambient conditions from 0° to 50°C.

3. It is requested that D.D.P. be asked to investigate the possibilities of procuring a transmitter which incorporates the features outlined in paragraph 2 above. In view of the urgent requirement for this transmitter, it is further requested that D.D.P. treat this as a priority item. In addition the following information is required.

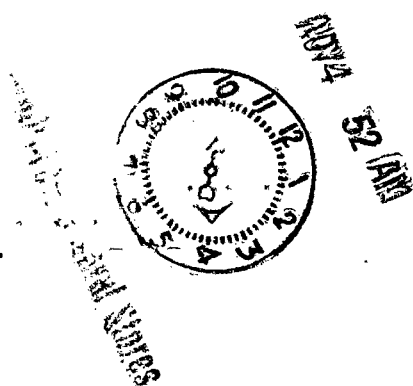
- (a) The approximate cost and availability date of the transmitter.
- (b) The power input requirements.
- (c) The physical size of the complete transmitter.
- (d) The estimated cost of a suitable antenna including towers, (omni-directional propagation in the horizontal plane, and an efficiency of at least 50%).
- (e) The availability date of the towers in (d) above.
- (f) The estimated cost of the ground system required for the transmitter.


(W.H.G. Roger)
A/Commodore (L) R.C.N.
ELECTRICAL ENGINEER-IN-CHIEF.

O T T A W A ,
30 October, 1952.

DN. Com for concurrence.

000228



CJM:BJ

NSS 1300-30 (Staff)

PPH
27/11

MEMORANDUM TO: EEC

COMMUNICATION REQUIREMENTS - NEWPORT CORNER

Reference: (a) NSS 1300-30 (Staff) dated 13 October, 1950.

In addition to the Broadcast facilities listed in paragraph 1 of reference (a), a further requirement for a 10 KW L/F transmitter exists. This transmitter will be used for back up purposes for the Primary Fleet and Commercial Broadcasts in the event of a failure of the L/F component of either these broadcasts or when they are shut down for maintenance routines.

2. This transmitter should be capable of operation in the frequency range 90 to 120 Kc/s and possess approximately the same capabilities as the present transmitters with regard to frequency tolerance, stability and types of modulation.
3. EEC is requested to investigate and make recommendation for a suitable transmitter which will meet the above requirements and confirm that funds are available for this project. On receipt of the above information DN COM will prepare a submission to Staff for approval of this purchase.
4. It is requested that this be considered as a priority item.

John A. Charles

(John A. Charles)
Commander, RCN,
DIRECTOR OF NAVAL COMMUNICATIONS

OTTAWA,
24 October, 1952.

D.N. Com 26.11

Action taken on
27/11

NSS 1300-30 (EEC)

NSC 7401-650 (EEC)

Dated 30 Oct 1952

25/11

JAW E2
25-
for EEC 11

file in Navy file

MEMORANDUM TO; D. Admin.(Army)

~~NIS~~ 1300-30TD 5
Pers(N)"T"

on Army file

ARTICLE 27 OF THE GENEVA CONVENTION

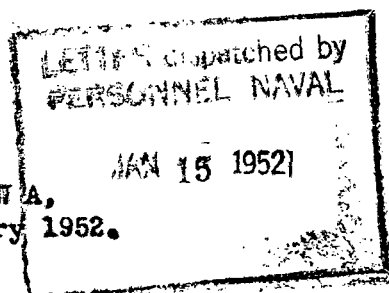
With reference to your minute of 13 December 1951 to Assistant Chief of Naval Personnel (Administration) on the above noted subject, the Royal Canadian Navy is in favour of Belgium's proposal regarding notification of particulars of coastal rescue craft.

2. The RCN at present have no vessels in this category other than two HSL's recently acquired from the RCAF.

3. Your correspondence from the Department of External Affairs is returned herewith.

AS
NAVAL SECRETARY.

OTTAWA,
15 January 1952.



CIRCULATION SLIP

REFERRED TO:

Dep N. Lee Pers (v)

It looks as tho this

reply should go to
originator of memo dated
13 Dec on this file, (Sadam)
Pls check with ACP and
pass as required.

TC9/
NAVAL SECRETARY

BEST AVAILABLE COPY

000232

HGJW:MES
W

NSS 1300-30TD 5
(STAFF)

MEMORANDUM TO: DEPUTY MINISTER

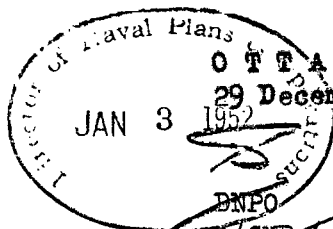
ARTICLE 27 OF THE GENEVA CONVENTION

The RCN is in favour of Belgium's proposal regarding notification of particulars of coastal rescue craft.

2. The RCN at present have no vessels in this category other than two HSL's recently acquired from the RCAF.

BEST AVAILABLE COPY

NAVAL SECRETARY.



OTTAWA,
29 December, 1951.

DNFO
A/CND (A)

for concurrence.

PD264

Rutgers

H.Q. 1024

NAVAL SERVICE - MINUTE SHEET

FILE NO. -

REFERRED TO

REMARKS (With Signature, Position & Date)

DNPO

What do you
suggest?

PRR

ALONP (A)

14/1-2

DEPARTMENT OF NATIONAL DEFENCE

MESSAGE FORM

FOR UNCLASSIFIED MESSAGES ONLY

INDICATE FREE OF PRIORITY		FOR MESSAGE CENTRE USE ONLY	
OPERATIONAL IMMEDIATE			
PRIORITY			
ROUTINE	X		
IF NOT MARKED WILL BE TRANSMITTED DEFERRED			
		FROM	
			CANAVHED
		ACTION ADDRESSEE/S	
			CANAVUS
INFORMATION ADDRESSEE/S			
UNCLAS X		ORIGINATOR'S NO.	

YOUR 082130Z X LETTER NSS 1300-30 OF 10 JAN 1951 REFERS

SECRETARY D.N. COM.

11/1/52.

ORIGINATOR	TELEPHONE	DATE - TIME GROUP	FILE NO.
DRAFTED BY DN COM (TJB)	6145	11/1/52 Z	1300-30

C.N.S. 1320J-500M-12-49 (3327)
C.A.F.B. 1616 (4 PARTS) H.Q. 224-21-B-1616
R.C.A.F. 543-300M-1-50 (6193)

FILE COPY

000235

IN
JAN 11 17 34Z52

NAVAL CCO
OTTAWA

1123
LOGGEE HC
CHECKER
CODER
DESPATCHEE



C O N F I D E N T I A L

Document disclosed under the Access to Information Act -
Document divulgué en vertu de la Loi sur l'accès à l'information

IN REPLY PLEASE QUOTE

Department of National Defence

No. NMWS 1300-30

CANADIAN JOINT STAFF

1700 MASSACHUSETTS AVE., N.W.
WASHINGTON 6, D.C.

20th November, 1951.

BEST AVAILABLE COPY

FROM: Naval Member, Canadian Joint Staff,
Washington, D.C.

TO: Naval Secretary, Naval Headquarters,
Ottawa, Canada.

Subject: ARGENTIA NAVAL RADIO STATION

Reference: (a) CANAVHED letter NSS 1300-30
(Staff), dated 29 June 1951

Submitted for the information of the
Director of Naval Communications that CINCLANT has
not yet reported to OPNAV on his review of North
Atlantic communications.

2. Steps are being taken by OPNAV to hasten
the review. Discussions will be recommenced and re-
ported to Naval Headquarters when the report has been
received from CINCLANT.

D. N. Lay
24/11

H. N. Lay
(H.N. Lay)

Commodore, R.C.N.

Naval Member, Canadian Joint Staff

Referred to *[Signature]*
NOV 23 1951
File No. 1300-30
Chgd to *D. N. Lay PC*

C O N F I D E N T I A L

000237

2. PGM:BJ

Director of Naval Communications.

NSS 1300-30 TD 151
(Staff)

Ottawa, Canada,

3 November, 1951.

TELETYPE EQUIPMENT - MODIFICATION OF PRINTING HEADS

Reference: (a) CANFLAGLANT's letter AC: 9810-1 dated 16 October, 1951.

(b) CANAVERD's letter NSS 1300-30 (Staff) dated 29 May, 1951.

It is confirmed that the modification as specified in reference (b) need not apply to Model 14 typing reperforators.

2. All reference to Model 14 machines in (b) above, therefore, should be deleted.

NAVAL SECRETARY

Secretary (Staff)

Flag Officer,
Atlantic Coast.

BEST AVAILABLE COPY

To: G.M.O.

For Director

Date: 6/11/51

By: [Signature]

PGM:BJ

Director of Naval Communications.

NSS 1300-30 TD 151
(Staff)

Ottawa, Canada,

3 November, 1951.

TELETYPE EQUIPMENT - MODIFICATION OF PRINTING HEADS

Reference: (a) CANAVHED's letter NSS 1300-30 (Staff) dated 29 May, 1951.

It is considered unnecessary to modify Model 14 typing reperforators as specified in reference (a) due to the fact ambiguity between letters and figures could not arise in this case.

2. All reference to Model 14 machines in (a) above, therefore, should be deleted.

BEST AVAILABLE COPY

NAVAL SECRETARY

Deputy Secretary (Acting)

Flag Officer,
Pacific Coast.

C O N F I D E N T I A L

IN REPLY PLEASE QUOTE

No. NMWS 1340-1

Department of National Defence

CANADIAN JOINT STAFF

1700 MASSACHUSETTS AVE., N.W.
WASHINGTON 6, D.C.

22 October 1951

FROM: Naval Member,
Canadian Joint Staff,
Washington, D.C.

TO: Naval Secretary,
Department of National Defence,
(Naval Service)
Ottawa, Canada.

Referred to	<i>Staff</i>
OCT 26 1951	
File No.	<i>61300-20</i>
Chgd to	<i>Perm change to 07 Com</i>

SUBJECT: RCN RADIO ORGANIZATION - ATLANTIC

24 com

REFERENCE: (a) ACP 177 -
(b) JANAP 149(A)
(c) C.G.O. COM A3

BEST AVAILABLE COPY

Submitted for the information and consideration of the Director of Naval Communications that consideration is being given to early revision of ACP 177 to incorporate up-to-date information and to complete details not included at present.

2. It is requested that ACP 177 be reviewed and required amendments to Canadian sections be forwarded with the following information, if available, for inclusion in ACP 177, paragraphs 1102(d), 2201, and 2202.

(a) What changes to peacetime details of Broadcast L will be made in an emergency?

(b) What authorities are/will be able to key Broadcasts L and GL?

(c) Who are/will be Broadcast L and GL checking authorities?

(d) What are the arrangements to provide broadcast coverage for area LL in the event of Broadcast L breakdown?

(e) To whom should messages be routed for transmission on Broadcasts L and GL?

(f) What are/will be repetition arrangements for Broadcasts L and GL?

3. It is noted that C.G.O. COM A3 subparagraph 8(b)(i) forecasts a separation of Fleet and Merchant ship broadcasts in an emergency. At present the frequencies shown in ACP paragraphs 1102(d) and 2201 are the same as those in JANAP 149(A) paragraph 1235. It is strongly recommended that

...2.

C O N F I D E N T I A L


-2-

BEST AVAILABLE COPY

C O N F I D E N T I A L

complete details of separate merchant ship broadcasts be shown in Admiralty Notice to Mariners No. 3 (GBMS organization) and JANAP/ACP 149 (MERCASST Organization) at an early date so that merchant ships are informed of the details of any change before an emergency arises. The setting up of separate merchant ship broadcasts may require amendments to naval broadcast details shown in ACP 177 and other publications. It is considered desirable that these changes, if any, be promulgated at an early date for the information of naval activities.

4. In addition to the information requested in paragraph 2 above, it is requested that other CANAVHED recommendations for the revision of ACP 177 be forwarded by 30 November 1951.



(H.N. Lay)

Commodore, R.C.N.

Naval Member, Canadian Joint Staff

1300-30

T.D. No.

151

SECRET

TEMPORARY DOCKET

DEPARTMENT OF NATIONAL DEFENCE

[illegible]

000242

FROM: The Flag Officer Atlantic Coast

DATE: 16th October, 1951 AC: 9810-1

TO: The Naval Secretary, Naval Headquarters
(Copy to: Superintendent, H.M.C. Dockyard, Halifax, N.S.)

Reference Staff
22 1951
File No 1300-30
Chgd to EEC 30-5

TELETYPE EQUIPMENT - MODIFICATION OF PRINTING HEADS

Reference (a) NS 1300-30 (Staff) dated 29th May, 1951.

All model 15 and 19 teletype machines in the Command owned by the R.C.N. have now been modified in accordance with reference (a).

2. Confirmation is requested that model 14 machines are also to be modified. In this case there can be no ambiguity between letters and numbers as they print on opposite sides of the drive perforators in the tape.

John C. Reed
REAR ADMIRAL *cdv*

WHH:FN
WHH

NBS 1300-30
(Staff)

CONFIDENTIAL

Ottawa, Canada,

29 June, 1951.

ARGENTIA NAVAL RADIO STATION

Reference (a) NBS 1300-30, dated 16 April, 1951.

I am directed to inform you that in view of the information contained in reference (a) this subject has been placed in abeyance until CIECLANT has completed his review of North Atlantic Communications.

2. It is regretted that the information requested by paragraph 3 of reference (a) cannot be supplied until a solution is reached by the FARC.

3. The RCN prefers an HF RATT circuit between Halifax and Argentina over an LF circuit due to the shortage of LF transmitters at Halifax and the fact that this circuit will serve merely as a back up to a land line circuit. Naval Headquarters concurs in the view that two RATT circuits will not be required.

[Signature]
NAVAL SECRETARY

Naval Member Canadian Joint Staff (Washington),
1700 Massachusetts Avenue, N.W.,
Washington 6, D.C., U.S.A.

[Signature]
JN Com

to F.M.O.
For *[initials]*
Date 3/7/51
Sgt M.G.S.

000245

CONFIDENTIAL✓NSS 1300-30 (Staff)
NSC 7401-650MEMORANDUM TO: EECWARTIME FREQUENCIES - NEWPORT CORNER, N.S.

Reference is made to my memorandum NSTS 11300-30 (Staff) dated 13 October, 1950.

2. The following LF frequencies will be employed as shown:

- (a) Primary Fleet Broadcast - 74 kc/s
- (b) Merchant Ship Broadcast - 115-3 kc/s
- (c) Local Broadcast - 475 kc/s

(M.G. Stirling)
Commander, RCN,
DIRECTOR OF NAVAL COMMUNICATIONS

OTTAWA,
16 May, 1951.



Department of National Defence
CANADIAN JOINT STAFF
1700 MASSACHUSETTS AVE., N.W.
WASHINGTON 6, D.C.

IN REPLY PLEASE QUOTE

No. NMWS.1300-1

CONFIDENTIAL

10th April, 1951.

FROM: Naval Member, Canadian Joint Staff,
Washington, D.C.

TO: Naval Secretary, Naval Headquarters,
Ottawa, Canada.

Subject: RADIO CALL SIGNS

References: (a) CANFLAGLANT letter ACC: 1300-30,
dated 16th March, 1951.

(b) CANAVHED letter NSS 1300-30 (Staff),
dated 2nd April, 1951.

(c) CGO Com. A.3

Referred to	<i>Staff</i>
✓	APR 14 1951
File No.	<i>1300-30</i>
C'd to	<i>P.C. Dulan</i>

2N com

Submitted for the information of the Director of Naval Communications, that the difficulties reported in Para 3 of Reference (a) do not appear applicable only to NATO traffic. When Reference (c) is made effective, and call signs are encrypted, this difficulty will exist in all messages.

2. It appears that the solution is for each service and nation to take action to ensure that the printing heads of all teletypewriters differentiate between these characters. In this connection, it is understood that on 14th March, 1951, Committee "C" of the BJCEB discussed the problem of ZERO and OBOE and passed it to Committee "S", recommending that the GPO be requested to modify all teletypewriters so that ZERO is printed as THETA.

3. It is noted that Reference (a) refers to the NAOR Communication Plan. The effective publication regarding NAOR ship-shore traffic is ACP.177 (Chapter 4).

H.N. Lay
(H.N. Lay)

Commodore, R.C.N.,
Naval Member, Canadian Joint Staff.



Department of National Defence

CANADIAN JOINT STAFF

1700 MASSACHUSETTS AVE., N.W.
WASHINGTON 6, D.C.

IN REPLY PLEASE QUOTE

NO. NMWS. 1300-30

CONFIDENTIAL

BEST AVAILABLE COPY

16th April, 1951.

FROM: Naval Member, Canadian Joint Staff,
Washington, D.C.

TO: Naval Secretary, Naval Headquarters,
Ottawa, Canada.

Subject: ARGENTIA NAVAL RADIO STATIONS

References: (a) CANAVUS letter NMWTS 11300-30, dated
17th March, 1951.

(b) CANAVHED Letter NSTS.11300-30 (Staff),
dated 4th April, 1951.

Referred to	<i>SLP</i>
APR 19 1951	
File No.	<i>2 1300-30</i>
By	<i>RCN</i>

DN com

Submitted for the information of the Director of Naval Communications, that reference (b) above, although marked "Air Mail", was not received by CANAVUS until 10th April, 1951. The information and queries contained in Reference (b) were discussed with Captain T.L. Greene (OP201) and Commander W.A. Ellis (OP201P). As the communication requirements for Argentia are presently being reviewed by CINCLANT, it is considered that a visit by D.N. Com. at a later date would be of more value than one at the present time.

2. Generally speaking, it is considered by Captain Greene that the Argentia secondary broadcasts would be activated only if required for forces in the local area. Similar secondary broadcasts are now operating from other U.S. ports such as Norfolk, San Diego, Kodiak, etc. It was pointed out that the R.C.N. had found it necessary to establish a broadcast from Gaspe during World War II, and the U.S.N. consider that Argentia might be used similarly in the future. It is certainly intended that U.S. ships in area LL will copy Halifax, as shown in ACP.177.

3. It is requested that the frequencies which will be used in war for fleet, administrative, and merchant ship broadcasts, from Halifax, be forwarded for inclusion in ACP.177 and 149 (B).

4. Captain Greene stated that approval had been given to CTF.62 in Argentia to initiate a simplex CW circuit on 4265 and 8530 kcs, between Halifax and Argentia. The U.S. Navy concur in carrying out trials on low frequency between these two stations, and it is recommended that CANAVHED clear a frequency and give permission to CANFLAGLANT to arrange trials. Captain Greene does not envisage sufficient traffic between Halifax and Argentia during war, to require two circuits. The situation should become clearer when SACLANT assumes his command and completes his operational plan.

H.N. Day
(H.N. Day)

Commodore, R.C.N.,
Naval Member, Canadian Joint Staff.

A I R M A I L

Ottawa, Canada,

4 April, 51

CONFIDENTIAL

NCTS-11300-30 (Staff)

NSS 1300-30

ARGENTIA NAVAL RADIO STATION

Reference: (a) NMICJS, Washington, letter NMTS 11300-30 dated 17 March, 1951.

Enclosure: (A) List of Transmitters at Naval Radio Station, Newport Corner, N.S.

I am directed to inform you that reference (a) has been noted by NAVAL HEADQUARTERS.

2. Enclosure (A) is a revised list of transmitters being procured for installation at NAVAL RADIO STATION, NEWPORT CORNER, N.S. It is anticipated that this program will be completed by mid-1952.

3. The RCN is prepared to implement all of its commitments as listed in ACP 177 immediately on the outbreak of war, using existing equipment. The purpose of the procurement program is to replace equipment which is inferior and obsolete with modern radio equipment and to provide some margin for spares and unforeseen requirements.

4. Further information is requested as to the purposes of the Secondary (local) Fleet Broadcast, the Secondary (local) General Broadcast, and the Ice Warning Broadcast in reference (a). It is the opinion of NAVAL HEADQUARTERS that all NATO vessels passing through the Canadian sub-area should be required to read the Primary Fleet Broadcast and/or the Local Fleet Broadcast for that area. Certainly HEC Ships will not carry sufficient operators in wartime to read these broadcasts and the ARGENTIA broadcasts as well. It is very doubtful if many other NATO ships will be able to either. If these two broadcasts are intended purely for US vessels it is pointed out that these vessels will also be expected to read the Primary Fleet Broadcasts and/or the Local Broadcast for the Canadian sub-area, vide ACP 176, paragraphs 605-607. Confirmation is required that US Naval ships will in fact comply with these instructions and that the ARGENTIA broadcasts already mentioned are not intended to usurp the functions of the HALIFAX broadcasts.

5. The proposal to arrange for LF trials between HALIFAX and ARGENTIA vide paragraph 3 of reference (a) is concurred in and prospective dates are requested. In wartime it is intended that the HALIFAX-ARGENTIA RATT circuit be augmented by cable between these points on a 24 hour basis.

Naval Member Canadian Joint Staff,
1700 Massachusetts Avenue, N.W.,
Washington 6, D.C.

- 2 -

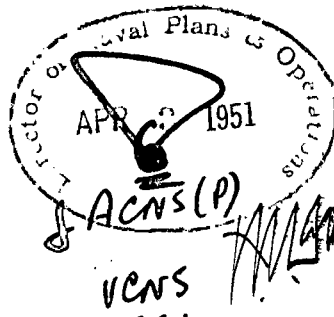
6. In view of the information contained in reference (a) plans to set up duplicate ship-shore facilities in NEWFOUNDLAND and HALIFAX have been placed in abeyance.

7. In the interests of clearing these points the DIRECTOR OF NAVAL COMMUNICATIONS is prepared to visit WASHINGTON within the next ten days if this is considered desirable.

BEST AVAILABLE COPY

huf
f.

NAVAL SECRETARY.



FM O
For [unclear]
on 5 Apr 51
on 9 B.

TRANSMITTING STATION AT NEWPORT CORNER, N.S.

<u>FREQUENCY RANGE</u>	<u>EMISSION</u>	<u>POWER</u>	<u>TYPE</u>	<u>REMARKS</u>
43 - 150 Kcs	A1, A2, F1	250 KW	TE 147	Primary Fleet
100 - 150 Kcs	A1, A2, F1	25 KW	TE 343A	Mercast
200 - 500 Kcs	A1, A2, F1	10 KW	NK (as yet)	Local Broadcast
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Administrative
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Broadcast
2 - 28 Mcs	A1, A2, F1	20 KW	CGRT1	" "
2 - 28 Mcs	A1, A2, F1	20 KW	CGRT1	Whitehall F.S.
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Primary Fleet Broad-
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	cast
2 - 28 Mcs	A1, A2, F1	20 KW	CGRT1	" "
2 - 28 Mcs	A1, A2, F1	20 KW	CGRT1	Greenland F.S.
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Mercast
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Mercast
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Spare
2 - 28 Mcs	A1, A2, F1	20 KW)	CGRT1	Spare
3 - 21.7 Mcs	A1, A2, F1	8 KW	SWB-11 THA1	Ottawa F.S. *
3 - 21.7 Mcs	A1, A2	8 KW	SWB-11 THA1	Washington F.S. *
3 - 21.7 Mcs	A1, A2, F1	8 KW	SWB-11 THA1	Local Broadcast *
2 - 24 Mcs	A1, A2	300 Watts	ET4332B	Spare
2 - 24 Mcs	A1, A2	1 KW	52410	Local Broadcast
2 - 28 Mcs	A1, A2	300 Watts	TEL 5	Spare
2 - 14 Mcs	A1, A2	500 Watts	PV500HB	Port Lave
100 - 500 Kcs	A1, A2	500 Watts	PV500L	Spare
2 - 28 Mcs	A1, A2, F1	500 Watts	PV500HM2	Argentia F.S.
2 - 28 Mcs	A1, A2	500 Watts	PV500HM2	Argentia F.S.
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1	Local Broadcast
100 - 500 Kcs	A1, A2	1 KW	LCS5	Argentia F.S.
375 - 550 Kcs) 2 - 20 Mcs)	A1, A2, A3	100 Watts	CM11	Reserved for Emergency Local Intercom.
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	Experiments will be
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	undertaken to
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	increase to 5 KW
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	and up frequency
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	range to 28 mcs.
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	All for ship-shore
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	answering.
3 - 19 Mcs	A1, A2	500 Watts	PV500HM1)	

Directorate of Naval Communications

Ottawa, Canada,

2 April, 1951.


CONFIDENTIAL

NATO SHIP-SHORE TRAFFIC

Enclosure: (a) CANFLAGLANT's letter ACC 1300-30 dated
16 March, 1951.

The enclosed self-evident memorandum is forwarded
for your information and for tabling in the Communication
Sub-Committee of the North Atlantic Regional Planning Group.

2. Information is requested if similar difficulties
have been encountered by other Navies since the inception
of the North Atlantic ship-shore plan and if so what
remedial steps have been taken.



NAVAL SECRETARY.

Naval Member Canadian Joint Staff (Washington),
1700 Massachusetts Avenue, N.W.,
Washington 6, D.C.

ref u o
for Comm.
24 Apr 51
411 176



Department of National Defence

CANADIAN JOINT STAFF

1700 MASSACHUSETTS AVE., N.W.
WASHINGTON 6, D.C.

IN REPLY PLEASE QUOTE

No. NMWS 11300-30

CONFIDENTIAL

17th March, 1951.

BEST AVAILABLE COPY

FROM: Naval Member, Canadian Joint Staff,
Washington, D.C.

TO: Naval Secretary, Naval Headquarters,
Ottawa, Canada.

Subject: ARGENTIA RADIO STATION N.A.A.

Referred to	<i>Staff</i>
MAR	21 1951
File	<i>11300-30</i>
Chg'd to	<i>P. C. Dufrenoy</i>

DN com

Reference: (a) CANAVHED letter NSTS.11300-30 (Staff),
dated 5th March 1951.

(b) CANAVUS letter NMWS.1300-1,
dated 7th February, 1950.

Reference (a) has been discussed with Officers of OP201 and the following information is submitted for the attention of the Director of Naval Communications.

2. Construction of the new transmitting station at Argentia is continuing and should be completed in the fall of this year. Equipment will then have to be installed and the station will presumably be ready for operation by the spring of 1952. Plans for the new receiving station mentioned in Para 4 of reference (b) have been discontinued.

3. The list of circuits and equipment in reference (b) has been revised, and the following is the current list in order of priority:

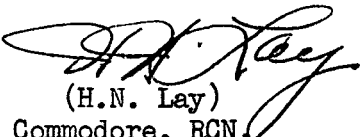
<u>Circuit</u>	<u>Equipment</u>
(a) Argentia-Washington (H/F RATT)	2 TEB (15 KW)
-(b) Secondary (local) Fleet Broadcast	3 TEB
(c) Air/ground	10 TDH (3 KW)
(d) Argentia-Grondal	1 TDH
(e) Ship-Shore (NERK)	5 TDH
-(f) Ice Warning	1 TDH, 1 TAB (1 KW)
(g) Harbour CW and voice	2 TDO (400/250W)
(h) Argentia-NAS in Eastern U.S.A.	1 TDH
-(i) Secondary (local) General Broadcast	3 TDH
(j) HF and MF Distress	1 TDH, 1 TAB
(k) Air/ground (local)	1 TDO
(l) SAR and Weather	2 TDH
(m) Argentia-Boston	1 TDH
(n) Argentia-Loran Stations	1 TDO

- 2 -

Two 6 KW LF transmitters will be installed to provide backup as necessary for circuits (b), (d), and (i) above. Some trials on LF have been carried out between Argentia and Boston which have proved fairly satisfactory. As it is considered this circuit will eventually be Argentia - Halifax, it is proposed to arrange LF trials between NAA and CFH, if this meets with CANAVHED's approval.

4. The broadcasts and ship-shore circuits which will be activated in Argentia in war will, like all other U.S.N. broadcasts and ship-shore circuits, be available for transmission and reception of NATO traffic. For this reason, it does not appear necessary for the R.C.N. to install complete ship-shore facilities at St. John's, Newfoundland. Mention of Argentia was purposely omitted from ACP's 176 and 177, as the installation was incomplete. Argentia will probably be included in the new editions when these publications are revised.

5. Information regarding the dates by which all circuits for Halifax, already listed in ACP 177, will be ready to operate is requested, as this information would be of value in future discussions with the Royal Navy and the U.S. Navy, and with NAOR Communications Sub-Committee.


(H.N. Lay)
Commodore, RCN
Naval Member, Canadian Joint Staff.

CONFIDENTIAL

FROM: The Flag Officer Atlantic Coast

DATE: 16th March, 1951

ACC: 1300-30

Referred to	<i>Staff</i>
MAR 20 1951	
File No.	<i>81300-30</i>
Org'd to	<i>Dr. Com</i>

TO : The Naval Secretary, Naval Headquarters

DN com

NATO SHIP/SHORE TRAFFIC

Reference (a) NAOR Communication Plan.

Consequent upon the inauguration of reference (a) a small amount of traffic from ships of NATO Nations is being received in Albion Lake Naval Radio Station.

2. To date all such traffic has had to be routed to Whitehall Radio for onward transmission to a Naval Shore Station of the same nationality, as the originator as prescribed in Annex (A) article 4 of (a) above.

3. The traffic has been passed by radio teletype on Fixed Service 5 and difficulty has been experienced by Whitehall Radio in distinguishing ZERO from OBOE and ONE from ITEM in call signs when presented with a page copy.

4. The situation is not considered serious at present but as NATO traffic increases, delays and errors will occur and it is felt this matter should be brought up at the outset.

John C. Reed
for REAR ADMIRAL *can*

NAVAL MESSAGE

To:

HA-1 FAX NAVCOMCEN

From:

OTTAWA NAVCOMCEN

CONFIDENTIAL
PARAPHRASING REQUIRED
DEFERRED

PERSONAL FOR SCO FROM DN COM X
YOUR 131817Z HAD NOT HEARD OF THESE DIFFICULTIES X
ZERO CAN BE CLARIFIED BY SCORING FACE OF ZERO TYPE
WITH FILE TO GIVE THETA X HOW MUCH SHIP SHORE RATT
ARE YOU RECEIVING X FORWARD REMARKS AND COMMENTS X

142152Z OR 60

NDCS AT 150033Z

NDCS CODE 14/MAR/51 HD 1310

DRAFTED BY: DN COM (MOS)

000256

NAVAL MESSAGE

To: **NAVCOMCEN OTTAWA**

**CONFIDENTIAL
DEFERRED
PARAPHRASING REQUIRED**

From: **NAVCOMCEN HALIFAX**

PERSONAL DN COM FROM SCO X
IN HANDLING NATO SHIP SHORE TRAFFIC ON RATT CIRCUITS
WHERE PAGE COPY INVOLVED ALBRO LAKE EXPERIENCING
DIFFICULTY DIFFERENTIATING BETWEEN ZERO AND OBOE ALSO
ONE AND ITEM IN CALL SIGNS X UNDERSTAND UNOFFICIALLY
FROM WHITEHALL RADIO MATTER IS UNDER DISCUSSION X REQUEST
ANY INFORMATION AVAILABLE X

131817Z GR 87

NDCS CODE

13/1957Z/MAR/51 HD 2569

CONFIDENTIAL

FROM: The Flag Officer Atlantic Coast

DATE: 19th February, 1951

ACC: 1300-30

TO : The Naval Secretary, Naval Headquarters

NAOR COMMUNICATION PLAN

Referred to	Staff
FEB 22 1951	
File No.	1300-30
Chg'd to	

With reference to Headquarters' letter NSS 1300-30 (Staff) dated 5th February, 1951, enclosure (i) *DN com* to ACC: 1300-30 dated 24th January, 1951 is forwarded herewith.

2. The omission is regretted.

F.W.T. Lucas Cdr
for REAR ADMIRAL

000258

CONFIDENTIAL.

FROM: The Commanding Officer,
H.M.C.S. "MAGNIFICENT"
At Halifax, N.S.

DATE: 22nd December, 1950.

FILE: AMT-C-1300-312/2.

TO: The Flag Officer Atlantic Coast,
H.M.C. Dockyard,
Halifax, N.S.

NAOR COMMUNICATION PLAN.

Reference: NSTS 11300-30 (Staff) dated
16th October, 1950.

Submitted that experience gained during the European cruise proves that little or no difficulty should be experienced by the ships of any NATO nation.

2. It was found that, although the W/T procedure varied between U.S., British, and Commercial procedures; no difficulty was experienced by our operators, nor the foreign operators, in making one another understood. This was true of the following NATO nation shore stations: Belgium, Denmark, France, Netherlands, Norway, Portugal, and of course the United States and Great Britain.

3. In the majority of cases, the foreign nations took pains to translate their messages into English before transmitting to us. However, the French sent all their messages in French and they were translated on board. Our operators did not find it difficult to copy the French traffic.

4. I believe that the greatest drawback in operating with foreign forces will be found in the use of voice tactical circuits between ships of an English speaking nation and those of a nation whose people are not encouraged nor taught to speak English. e.g. France.

5. It seems that the French are very much like the English, American and Canadian people--they insist on speaking their own language. This will be especially true in wartime, when the naval personnel have not had the advantage of a higher education.

6. The only answer to this is to ensure that adequate liaison personnel are sent to such foreign ships that will be operating with our own forces.

7. My final conclusions are that the NAOR Communication Plan should work extremely well provided the following difficulties are overcome:

- (a) The completion of combined NAOR tactical books, signal books, call signs, operating signals, and procedures. (Understand that is almost completed.)

-2-

- (b) Constant combined exercises using (a) by all nations at every opportunity.
- (c) The training of adequate Communications personnel at liaison and interpreting duties for placing in foreign ships to man tactical voice circuits.

Original signed by
K. F. ADAMS

(K.F. Adams,)
COMMODORE, R.C.N.

NSS 1300-30 (Staff

CONFIDENTIAL

Ottawa, Canada,

5 February, 1951.

NAOR COMMUNICATION PLAN

Reference: (a) CANFLAGLANT letter AGC: 1300-30 dated 24th
January, 1951.

AMT C 1300-312/2 dated 22nd December, 1950, which
is noted as an enclosure in your above referenced letter was
not received.

2. It is requested that a copy be forwarded, please.


NAVAL SECRETARY.

The Flag Officer,
Atlantic Coast.

F.M.O.
Vaf
FC
6 Feb 51
REB

2-274

CONFIDENTIAL

FROM: The Flag Officer Atlantic Coast

DATE: 24th January, 1951 ACC: 1300-30

TO: The Naval Secretary, Naval Headquarters

NAOR COMMUNICATION PLAN

Reference (a) NSTS 11300-30 (Staff) dated 16th
October, 1950.

Enclosure (i) AMT C 1300-312/2 dated 22nd December
1950.

Enclosure (i) is forwarded in accordance
with reference (a).

2. The plan has been studied with much interest
and is considered to be a most carefully prepared and
laid out publication. However, certain points have
been noted and the following comments are forwarded as
requested.

PART I

3. In paragraph 2 the use of British books on
procedure by Canada is noted with interest. However as
Allied Communication Publications are forthcoming, little
importance is attached to this point.

4. In paragraph 18, it is observed no mention is
made of the bearing and distance from a prearranged reference
position (e.g. ZZ) method of expressing position. It is con-
sidered this tried and reliable method should be included.

PART II

5. In paragraph 47, it is felt amplification of the
instructions for the use of the call signs is required.
As the call signs are pronounceable it is assumed they are
intended to be pronounced rather than spelt out phonetically
when used as voice calls; however such is not clear.

6. In paragraph 60, the M/F Common allocated to the
Atlantic is outside the frequency range of equipment now
fitted in RCAF Maritime aircraft. It is understood the RCAF
possesses M/F radio equipment which is considered unserviceable
and it would be of interest to this command to know whether the
RCAF plans to install suitable M/F equipment in their maritime
aircraft.

7. In paragraph 62, it is considered a sub-paragraph (f)
entitled Mercasts and containing a brief description of those
broadcasts should be inserted in order to present a complete
broadcast summary.

8. In paragraph 64, it is noted the Western and Southern
boundaries of Area B and Western boundary of Area E are not
prescribed. It is presumed the Western boundaries of Areas B
and E are on the same meridian and form also the dividing line
between the Eastern and Western Atlantic Areas. It is con-

- 2 -

sidered the complete information should be included in this paragraph.

ANNEX "A"

9. In paragraph 4, the reference to Annex (I) appears to be a misprint for Appendix (J).

10. In Appendix (H) the Radio Teleprinter periods for Broadcast "L" outlined in paragraph 10 f are not those presently operated by Halifax radio.

11. As regards further distribution within the Atlantic Command, the following is recommended:

- (a) The Officer-in-Charge, Albro Lake Naval Radio Station.
- (b) The Commanding Officers, H.M.C. Destroyers and Frigates.
- (c) The Commanding Officer, R.C.N. Air Station Dartmouth.

12. It is considered in due course when details of Administrative and Local Area Broadcasts for Area D are available and the provision of the necessary equipment is in hand the Officer-in-Charge Newport Corners Naval Radio Station and, if any plans include radio stations in Newfoundland, the Commodore, Newfoundland, should be included in the distribution.


Go- REAR ADMIRAL

NSS 1300-30 (Staff)

CONFIDENTIAL

Ottawa, Canada,

10 January, 1951.

RCN RADIO ORGANIZATION - ATLANTIC

References: (a) NMCS (W) letter NLWS 1340-1, dated 22 October, 1951.

(b) ACP 177.

(c) JANAP 149.

(d) CGO Com A3.

2. Reference (a) with its suggested amendments to references (b), (c) and (d) has been under consideration at NAVAL HEADQUARTERS.

Major revisions of the relevant publications are now in hand, but the provision of suitable frequencies to carry out the services, the clearance and co-ordination of frequencies with the Department of Transport (Radio Division) and FAWPSC of the JTC and the lack of information of other shore facilities to be activated has delayed the promulgation of the planned revisions.

3. It is anticipated that the revisions to all relevant publications will be completed and forwarded at an early date.

BEST AVAILABLE COPY

NAVAL SECRETARY

Naval Member of the Canadian Joint Staff (Washington).

000264

S E C R E T755 1300-30
NSTS 11300-30 (Staff)MEMORANDUM TO: EECWARTIME COMMUNICATION REQUIREMENTS

With the general acceptance of the NAOR Communication Plan it is now possible to predict with accuracy the transmitter requirements on the East Coast. A breakdown of the Broadcast requirements is as follows:

<u>Service</u>	<u>Characteristics</u>	<u>Power</u>	<u>Time</u>
1. Primary Fleet Broadcast	1 LF 1 HF 1 HF	250 kw. 20 kw. 20 kw.	Continuous Continuous (1200-2200 (2200-1200
2. Merchant Ship Broadcast (Mercast)	1 LF 1 HF 1 HF	25 kw. 20 kw. 20 kw.	Continuous Continuous (1200-2200 (2200-1200
3. Administrative Broadcast	1 HF 1 HF	20 kw. 20 kw.	Continuous (1200-2200 (2200-1200
4. Local Broadcast	1 LF 1 HF 1 HF	10 kw. 5 kw. 5 kw.	Continuous Continuous (1200-2200 (2200-1200

Broadcasts 1, 2 and 3 will be from NAVAL RADIO STATION, NEWPORT CORNER, N.S. The location of the Local Broadcast has not been finally determined. All components of each Broadcast will be keyes simultaneously.

2. The following fixed Services will be required:

<u>Service</u>	<u>Characteristics</u>	<u>Power</u>
1. Halifax-Ottawa) Halifax-Washington) Halifax-Vancouver)	1 HF	10 kw.
2. Halifax-Godthaab (Greenland)	1 HF	20 kw.
3. Halifax-Whitehall	1 HF	20 kw.

The requirement is for Duplex RATT in each case. The first three Fixed Services are shown in present plans and no change in their characteristics is envisaged, other than increasing the power used on the Ottawa-Halifax Service. A possibility exists that a further circuit Halifax-Bermuda may be added at a later date. Confirmation of this requirement is being sought.

3. The following transmitters will be required for the Ship-Shore organization:

<u>Service</u>	<u>Characteristics</u>	<u>Power</u>
1. Ship-Shore Answering	5 HF keyed individually 1 HF	5 kw. 0.5 kw.
2. Port Wave	1 MF (2844 kcs)	0.5 kw.

- 2 -

S E C R E T

4. This list does not include the transmitters required for CANAS, DARTMOUTH. These transmitters will be installed in NAVAL AIR RADIO STATION at EASTERN PASSAGE and will be dealt with at a later date. Similarly, sets for purely local and short range emergency communications have not been shown.

5. The future of the East Coast Reserve Division Net has not been finally decided but it is clear that if this net continues to function in wartime it will be of very secondary importance.

6. It is important that all preparations to implement these commitments be completed at the earliest possible date. Particular attention should be given to the question of antenna space, construction required, etc., as well as the procurement of equipment. EEC is requested to study these requirements and recommend steps to be taken by DN COM.

(M.G. Stirling)
Commander, RCN,
DIRECTOR OF NAVAL COMMUNICATIONS

OTTAWA,
13 October, 1950.

NAVAL SERVICE - MINUTE SHEET

FILE NO. -

REFERRED TO

REMARKS (With Signature, Position & Date)

Letter from Captain R.G.
Onslow, D.S.O., R.N., Tactical &
Staff Duties Division, Naval Staff,
Admiralty, London, dated July, 1950
(registered in C.R. Aug. 9, 1950)
to Captain E.P. Tisdall, R.C.N.,
removed from file NSS 1300-30 and
retained in D.W.T.

R. Nyquist

Secretary - D.W.T.
10/8/50

*noted. P.A.**WZ**15/8/50**Release**PA
4/1/51*

ATLANTIC AREA

FOR CROSS REFERENCES SEE INSIDE COVER

P. C. to D. C.

[illegible]

CROSS REFERENCES

[illegible]

Tip-Back
File Cover
CAN. PAT. NO. 361978
No. Sp. 2966