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MEMORANDUM FOR THE SECRETARY OF DEFENSE*

Subject: LORAN installation Plan

1. The LORAN Installation Plan, 1957, Appendix _____ constitutes the coordinated requirements of the United States Navy and United States Air Force for LORAN.

2. The Joint Chiefs of Staff recognizes the requirement for a long-range navigation aid such as LORAN, but feel that specific requirements of the individual Departments should be programmed and budgeted for by the Department having the requirement. The Joints Chiefs of Staff will continue to coordinate the requirements so as to preclude duplication.

3. Also attached as Appendix _____ is a proposed letter to Secretary of the Treasury transmitting the new Plan and citing policies changes. The proposed letter also answers the letter from the Secretary of Treasury to the Secretary of Defense forwarded by your memorandum* of 19 April 1957, subject: "LORAN Stations in Japan, Korea, and Brazil".

4. With further reference to your memorandum of 19 April 1957 and in connection with the State Department's informal proposal concerning Brazil, the requirement for LORAN coverage in the Brazil area has been deleted.

5. It should be noted that the policy concerning provision and operation of LORAN facilities in foreign countries supersedes the policy contained in the memorandum** of 2 February 1953, subject: "LORAN Facilities and Personnel Discussions with Japan" from the Chairman, Joint Chiefs of Staff.

* Transcribed from original located in NARA, Washington, DC – parts are missing.

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6. It should be noted that the Plan may require a reprogramming of unobligated funds based on an anticipated detailed study by the implementing Agency. It is estimated that approximately \$26,000,000 in additional funds will be required for the accomplishment of the Plan.

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ANNEX TO APPENDIX "A" TO ENCLOSURE "C"
LETTER TO THE SECRETARY OF THE TREASURY

The current LORAN Installation Plan (1957)* is forwarded herewith. This plan is a revision of the plan** furnished you in 1955.

It should be noted that there are new requirements for LORAN-C coverage in the Greenland, Norwegian, Barents Seas Area, the Mediterranean Area and the Northern Pacific Area and that a portion of LORAN-A coverage outlined in the 1955 Plan has been deleted. During the revision, consideration was given to your letters of 21 September 1956,*** and 31 October 1956.****

Special note has been taken of the difficulties in site acquisition and their effect on the scheduled completion of the program. In the event that assistance in connection with site acquisition is deemed necessary by you, it is requested that you so advise this office.

The policy concerning the operation of LORAN sites in foreign countries has been revised to reflect current national policy and its concept of collective security. the policy is:

“Based on collective security concept, the goal should be that LORAN facilities be provided for and operated by the nation in whose territory the facility is located.”

It is recognized that it will be necessary for you to make exceptions to this policy in implementing the LORAN Plan.

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The following comments are made with reference to the questions raised in your letter of 31 October and in view of the policy stated in the foregoing paragraph: (1) The existing LORAN chain in the Japanese area and the Japanese proposed coverage with medium power equipment will be satisfactory in this area. The PUSAN station should be relocated as proposed.

For our information, the Joints Chiefs of Staff have requested* the U. S. Representative to the Standing Group, NATO, to exert his influence towards the early implementation of the NATO LORAN Plan.

The LORAN Installation Plan (1957) includes certain LORAN-C requirements. In view of these requirements and recognizing the limits resources of your operating agency, the U. S. Navy is prepared to furnish operational and engineering assistance in order that the scheduled completion dates may be met. To facilitate this assistance, it is requested that the Commandant, U. S. Coast Guard, be authorized to communicate directly with the Chief of Naval Operations.

In order to meet the LORAN-C requirements in the European area by their scheduled completion dates, it may be necessary to reprogram some unobligated funds from the 1956, 1957, and 1958 LORAN appropriations and to obtain additional funds. However, negotiations for LORAN-A sites in certain areas may have proceeded to the point where it might be expedient for the United States to complete certain LORAN-A installations, thereby limiting the funds which can be reprogrammed. Accordingly, the Treasury Department is requested to advise this office of the requirements for reprogramming and/or additional funds to complete LORAN-C portion of the plan and, subsequently, to provide a funding program for the entire plan based on target date of end of Fiscal Year 1962.

In this regards it is hoped that

* Appendix "C" hereto

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Annex to Appendix "A" to
Enclosure "C"

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Subject: NATO LORAN Plan

References: a. DUSM-171-56, dated 28 November 1956

b. OSD Message to USRO Paris, DEF 913018 DTG
072116 November 1956

1. The Joints Chiefs of Staff have completed their annual review of the U. S. LORAN Installation Plan, and during this review it was noted that reference a. above, stated no progress has been reported on construction of NATO LORAN stations. It is requested that you exert your influence within the Standing Group in an effort to insure the expeditions completion of the NATO LORAN stations.

2. In connection with the action requested above, reference b. above, stated that the United States planned the establishment of a LORAN station in Northwest Spain as a part of the NATO LORAN Installation Plan.

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APPENDIX "C" TO ENCLOSURE "C"

LORAN INSTALLATION PLAN 1957

1. The LORAN Installation Plan, 1957, consists of five parts:

- Part I List of existing LORAN Chains
- Part II List of additional LORAN-A chain requirements
- Part III World chart showing present LORAN-A coverage and required additional LORAN-A coverage.
- Part IV List of additional LORAN-C chain requirements
- Part V World chart showing present LORAN-C coverage and required additional LORAN-C coverage.

2. Parts I, II, and III include the chains which are listed in the NATO LORAN Installation Plan. NATO chains are so indicated. Since the U. S. can not indicate a priority for installations in the NATO plan, priorities for NATO chains have been omitted. However, the NATO chains are shown in the desired precedence with relation to other U. S. requirements. The United States has accepted responsibility for installation of one LORAN-A station in Spain which will be part of the NATO Bay of Biscay chain. This station should be programmed for completion at the same time as the NATO stations in the chain.

3. Target date for completion of this plan is the end of FY 1962.

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PART I
LIST OF EXISTING LORAN-A STATIONS

<u>CHAIN</u>	<u>NO. OF STATIONS</u>	<u>LOCATIONS-OPERATED BY</u>	<u>PRESENTLY REQUIRED BY</u>
<u>LORAN-A</u>			
Northeast Atlantic	3	Hebrides Is.-Great Britain Faroes-Denmark Vik-Iceland	USN, USAF NATO
Baffin Bay	3	Nipisat-Denmark US Cape Christian-US Cape Atholl-US	USN, USAF
Northwest Atlantic	3	Frederickstal-Denmark Battle Harbor-Canada Bona Vista-Canada	USN, USAF NATO
East Coast-Canada	3	Port Aux Basques-Canada Deming-Canada Baccaro-Canada	USN, USAF NATO
East Coast-U.S.	5	Nantucket-US Sandy Hook-US Cape Hatteras-US Folly Island-US Hobe Sound-US	USN, USAF NATO
Gulf of Mexico	3	Venice-US Cape San Blas-US Biloxi-US	USN, USAF
West Coast-US	4	Pt. Arguello-US Pt. Arena-US Cape Blanco-US Pt. Grenville-US	USN, USAF
West Coast-Canada	1	Spring Island-Canada	USN, USAF

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PART I

(Continued)

<u>CHAIN</u>	<u>NO. OF STATIONS</u>	<u>LOCATIONS-OPERATED BY</u>	<u>PRESENTLY REQUIRED BY</u>
Gulf of Alaska	3	Sitka-US Yakutat-US Kodiak-US	USN, USAF
Aleutian	3	Unimak-US Adak-US Attu-US	USN, USAF
Hawaii	5	Hawaii-US Molokai-US Kauai-US French Frigate Shoals-US Johnston Island-US	USN, USAF
Marshall	3	Wake-US Eniwetok-US Kwajalein-US	USN, USAF
Mariannas	4	Saipan-US Guam-US Ulithi-US Palau-US	USN, USAF
East Philippine	3	Catanduanes-US Batan-US Miyako Jima-US	USN, USAF
West Philippine	3	Naulo Point-US Talampulan-US Tarumpitao-US	USN, USAF
Japan	8	Matsumae-US Niigate-US Miho-US Pusan-US Nomaike-US Okinawa-US Iwo Jima-US O Shima-US	USN, USAF

Bahama (temporary chain)	3	San Salvador-US Grank Turk-US Aguadilla-US	USN
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TOTAL 60

TOTAL US 46 49?? 3 Baffin Bay are listed in NATO*

TOTAL
NATO 14

LORAN-C

East Coast-US	3	Martha's Vineyard, Mass-US Cape Fear, N.C.-US Jupiter Inlet, Fla.-US	USN
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TOTAL 3

* Handwritten

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PART II

LIST OF ADDITIONAL LORAN-A REQUIREMENTS

<u>PRIORITY</u>	<u>AREA</u>	<u>NAME OF CHAIN</u>	<u>APPROXIMATE NUMBER OF STA- TIONS REQUIRED</u>	<u>REQUIREMENT GENERATED BY</u>
1	E	W. Indies	5	USN
*? 2	D	Panama East	3.	USN
	H	Denmark Strait	3*	USN, NATO
	J	Greenland Sea	3*	
	I	North Sea	3**	USN, NATO
	G	Bay of Biscay (SW approaches to United Kingdom)	2**	USN, NATO
		Note – The Unites States has assumed the responsibility to provide 1 station of the chain		
	F	Azores	4**	USN, NATO
3	A	Hawaiian Is. Chain Extension	1	USN -? <i>Johnston Is.</i>
4	C	Panama West	3	USN
5	B	Extension of West Coast, U.S.	1	USN
			—	
		TOTAL	29	
			TOTAL US	14
			TOTAL NATO	15

Note – Areas are designated “A”, “B”, “C”, etc . on chart included in Part III.

* Italics are Handwritten

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ENCLOSURE "C"

ANNUAL REVIEW OF THE LORAN INSTALLATION PLAN (U)

THE PROBLEM

1. To revise the LORAN Installation Plan* as necessary.

ASSUMPTIONS BEARING ON THE PROBLEM

2. See Appendix "D" To Enclosure "C".

FACTS BEARING ON THE PROBLEM

3. On 9 July 1953 the Joints Chiefs of Staff directed** the Joint Communications-Electronics Committee to revise the LORAN Installation Plan to meet the fixing requirements not only of the United States but also of CAN-UK-US and NATO. The revised LORAN Installation Plan, was then forwarded*** by the Secretary of Defense to the Secretary of the Treasury on 22 December 1955 for implementation by the U. S. Coast Guard. At that time, the Secretary of Defense requested that the Treasury Department, through the Coast Guard make available to the Joint Chiefs of Staff, annually, a review of the plan, including any changes which are recommended, and a review of the status of the accomplishment of this plan.

4. On 6 June 1957 the Joint Chiefs of Staff referred the report of the Joint Communications-Electronics Committee (JCEC) on the Annual Revision of the LORAN Installation Plan to the Joint Strategic Plans Committee for comment or recommendation. On 26 July 1957 the Joint Chiefs of Staff approved a recommendation**** of the Chief of Naval Operations that concurrent consideration be given in the revision of this plan to provide for

* Appendices "A" and "B" to Enclosure "A" to J.C.S. 141/70

** Decision on J.C.S. 141/88

*** Note to Holders of J.C.S. 141/70, dated 27 Dec. 1955

**** Decision on J.C.S. 141/85, dated 26 July 1957

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Enclosure "C"

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ENCLOSURE "D"

ASSUMPTIONS BEARING ON THE PROBLEM

1. The Joint Chiefs of Staff will approve the following conclusions of the basic study.
 - a. There is no Joint requirement for a worldwide LORAN system.
 - b. Department of Defense funding responsibilities for LORAN installations should be accomplished by the Service having the requirement for LORAN coverage.
 - c. Based on the collective security concept, the goal should be the LORAN facilities should be provided for and operated by the nation in whose territory the facility is located.

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APPENDIX "E" TO ENCLOSURE "C"

ADDITIONAL FACTS BEARING ON THE PROBLEM

1. The Secretary of Defense on 9 December 1956 forwarded* to the Joint Chiefs of Staff an annual review of accomplishment under the "Revised LORAN Installation Plan"*** prepared by the Treasury Department. Among other things this review pointed out the effect that difficulties in site acquisition were having on implementation of the program.

2. The Secretary of Defense on 19 April 1957 requested*** views and recommendations of the Joint Chiefs of Staff on proposals**** by the Secretary of Treasury relating to operation and control of LORAN Stations in Japan by the Japanese and informal proposals by the State Department to provide LORAN installations in Brazil under the Mutual Assistance Program.

3. On 2 February 1953 the Joint Chiefs of Staff informed# the Secretary of Defense that for security reasons they did not consider it desirable for the Coast Guard to employ or train Japanese technicians at U. S. LORAN Stations in the Japanese area. On 16 March 1953 an Assistant Secretary of defense letter## informed the Secretary of Treasury of this policy.

2. NATO LORAN Plan.

a. In 1955 the Military Committee promulgated### the NATO Interim LORAN Plan, North Atlantic and Mediterranean consisting of forty-three LORAN stations. Fourteen of these had been installed.

* J.C.S. 141/79
** J.C.S. 141/70
*** Enclosure to J.C.S. 1418/83
**** Appendix to Enclosure to J.C.S. 141/83
J.C.S. 141/63

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b. SACEUR has stated* that he had no requirement for LORAN coverage in the Mediterranean Sea. The Infrastructure Committee has deleted the Mediterranean LORAN Stations from SACEUR's Fourth Slice, NATO Common Infrastructure Program.

c. The Department of Defense has stated** the United States will guarantee the establishment of a LORAN station in northwestern Spain.

d. The second annual summary*** of progress on the NATO Interim LORAN Plan North Atlantic and Mediterranean was forwarded from the Acting Deputy U.S. Representative to the Standing Group indicated along with other information that no progress had been reported on construction.

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APPENDIX "F" TO ENCLOSURE "C"

DISCUSSION

1. The revised plan, LORAN Installation Plan, 1957 (Appendix "D") lists coordinated requirements for existing and planned LORAN-A and LORAN-C coverage. Specific changes from the LORAN Installation Plan (1955) are as follows:

a. In order to meet the U.S. Navy's requirement* for accurate coverage in the Mediterranean, a LORAN-C chain has been added for the Eastern and Western Mediterranean with priorities No. 1 and No. 3 respectively.

b. In order to the U.S. Navy's requirement* for accurate coverage in Greenland, Norwegian, and Barents Sea, a LORAN-C chain has been added with priority No. 2.

c. In order to the U.S. Navy's requirement for accurate coverage in the area between Midway and the Aleutian Islands, a LORAN-C chain has been added with priority No. 4.

d. Present NATO policies prohibit the NATO funding for facilities in non-NATO countries. The Department of Defense has stated** that the United States will guarantee the establishment of a LORAN station in Northwestern of Spain. The station previously planned for Spain is retained in the plan as part of a NATO Chain but now is shown as a U.S. responsibility.

e. The number of NATO stations in the Azores and the western approaches to the Mediterranean sea area has been changed*** from 6 to 4.

f. SACEUR has stated that he has no requirement for LORAN coverage in the Mediterranean, and the Mediterranean stations have been deleted therefore, from the Fourth Slice. Even though no revision has yet been made to NATO Interim LORAN plan to reflect these actions the U. S. plan has been revised to show a deletion of 8 LORAN-A

* J.C.S. 141/85

** OSD message to USRD Paris, DEF 9130 18 DTG 072116Z

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stations in the Mediterranean.

g. The U. S. Navy has withdrawn its requirement for LORAN-A coverage in the following areas: Northeast Japan, Carolina Islands, West Coast of Mexico and Central America from Guadalupa Island, Mexico to waters wets of Panama, Arabian Sea and Brazil. Accordingly, the chained planned for these areas, consisting of 31 stations, have been deleted form the plan.

h. The scheduled completion date of this plan has been changed to end of Fiscal Year 1962 so as to provide a more realistic objective.

2. For background and comparison proposes the following installation cost estimates are furnished. The installation care are given only to indicate the general magnitude of the various plans. Installation and procurement casts vary with location of sites and sources of procurement. Value of existing stations is based on replacement cost. Funding should be based on more accurate data.

	<u>No. of Stations</u>	<u>Installation Cost</u>
<u>a. Existing Stations</u>		
U.S. LORAN-A	46	\$50,600,000
U.S. LORAN-C	<u>3</u>	<u>2,100,000</u>
Total	49	52,700,000
NATO LORAN-A	14	
<u>b. LORAN Installation Plan (1955)</u>		
U.S. LORAN-A	44	48,000,000
NATO LORAN-A	26	
<u>c. LORAN Installation Plan (1957)</u>		
U.S. LORAN-A (Note includes 1 station to be located in Spain as a U.S. responsibility but which will operate as a part of a NATO Chain.	14	15,400,000
U.S. LORAN-C	<u>11</u>	25,850,000
TOTAL	25	41,250,000
NATO LORAN-A	15	

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3. The budgetary problems which delayed the implementation of the LORAN Installation Plan^{*}, 1951, were resolved in 1955 when the Department of Defense assumed the responsibility to budget for the construction costs of additional LORAN stations required to implement the Revised LORAN Installation Plan(1955)^{**}. \$4,200,000 has been appropriated for the Department of Defense and transferred to the Treasury Department for construction of the seven LORAN stations scheduled for FY1956^{***} and \$5,450,000 for the six stations scheduled in FY 1957^{****}. The Department of Defense requested \$20,458,000 for LORAN in its FY 1958 budget. The Bureau of Budget reduced# this request to \$5,544,000. It can be seen, therefore, that approximately \$15,000,000 has been made available in the last three Fiscal years to meet the LORAN Installation Plan (1955).

4. LORAN-C coverage in the Mediterranean area is required by 1 January 1959 and in the Norwegian, Greenland, Barents Sea, and the North Pacific areas by 1 January 1960. A preliminary chart study undertaken to determine the number of stations needed to meet the Navy LORAN-C requirements reveals that three chains consisting of a total of eleven LORAN-C stations will be required at an approximate cost of \$26,000,000. No funds have been made available specifically to manufacture LORAN-C equipment or to construct LORAN-C stations. Previous year funds have been partially obligated and mostly committed to construct LORAN-A stations in the Caribbean area and to extend the Hawaiian Island Chain. Diplomatic representations have been made to foreign countries in the Caribbean area for formal agreements relative to site acquisition and permission to operate LORAN stations. An estimate expenditure of around \$9,000,000 is necessary to carry these negotiations to completion and should be so used. Funds already appropriated but not needed to meet the foregoing commitments (around \$6,000,000) could be made available to initiate the LORAN-C program. It can be seen that additional funds on the order of \$20,000,000 will be required for the LORAN-C program.

* Appendix to Enclosure "A" to J.C.S. 141/59

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5. There are in operation on the East Coast of the United States in connection with a testing range for self-contained navigational system a LORAN-C chain and two receiver-indicators, using all engineering model equipment. No other LORAN-C transmitting or receiving equipment is available. Engineering development would have to be completed as part of the procurement action for additional equipment. In view of the above and considering the limited resources of the U.S. Coast Guard, operational and engineering assistance may be required from the Department of Defense. In this regard the services and facilities of the Department of the Navy should be made available as necessary, to assist the Coast Guard in meeting the LORAN-C requirements. Direct communication between Commandant, USCG, and Chief of Naval Operations should be authorized for this purpose.

6. LORAN-C operates in the 90-110kc band. This band is internationally assigned for the development of long distance radio navigation systems which will become exclusively allocated, wholly or in part, for the use of any one such system as soon as it is internationally adopted. In addition, the International Telecommunications Union radio regulations provide that “during the experimental period prior to the international adoption of any long distance navigation system in this band, the rights of existing stations operating in this band will be continue to be recognized”. There are existing point-to-point communications services in the 90-110 kc band which may demand protection under these provisions from harmful interference by LORAN-C transmitters. The USCG is of the opinion that frequency conflicts can be resolved.

7. As part of the JCEC annual review of the LORAN Installation Plan progress in the development and implementation of new long-range navigation systems has been reviewed. These systems include Navarho, Dectra, LORAN-C, Radux-Omega, Radio-Web, Draco, and the self-contained systems (Doppler and Inertial). While several of these systems show a potential

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for significant improvement over LORAN-A in accuracy and coverage, none of these systems has been proven sufficiently to justify its installation as the standard system. LORAN-C is recommended to meet specific limited requirements that LORAN-A will not meet. Any further installation of LORAN-C to replace LORAN-A should wait until:

- a. Current evaluations of LORAN-C as a long distance navigation system for aircraft and ships at sea are complete.
- b. Assurance has been obtained that the frequency problems of the 90-110 kc band can be solved.
- c. Arrangements have been made to insure an orderly conversion of LORAN-A to LORAN-C receiver equipment.

8. The Secretary of the Treasury, on 21 September 1956, requested*

- a. Guidance as to whether current conditions permitted control and operation of existing and proposed LORAN stations by the Japanese;
- b. Authority to negotiate with the Japanese with a view toward providing them with high-powered equipments to meet U.S. requirements in the area;
- c. Authority to move the Pusan station to Japanese territory and transfer its control and operation to the Japanese.

In view of the policy of having foreign countries assume full responsibility for operation of LORAN facilities located in their territory and the fact that requirements for additional coverage in the Japanese area no longer exists, the Secretary of Defense should concur in the proposals of the Secretary of the Treasury. Specifically:

- a. The above-mentioned policy permits control and operation of the LORAN stations by the Japanese and supersedes the policy laid down in memorandum of 2 February 1953;
- b. Existing LORAN coverage in the Japanese area meets U.S. requirements for the present;

* Appendix to Enclosure to J.C.S. 141/83

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c. Transfer of existing U.S. LORAN installations in the Japanese area to Japan under existing laws should be arranged;\

d. Negotiations should be initiated to move the Pusan station to Japanese territory.

The same policy applies to the informal proposals by the Secretary of State to the Secretary of Defense in the case of LORAN installations in Brazil. However, since the requirement for LORAN coverage in the Brazil area has been deleted, no further negotiations should be carried out

9. Since foreign site acquisition is the primary obstacle to the implementation of the U.S. Plan, the Department of Treasury should be advised that the Department of Defense is prepared to assist as desired by the Secretary of Treasury in an effort to expedite the site acquisitions.

10. The Second Annual Summary of Progress on the NATO Interim Plan North Atlantic and Mediterranean states that no progress has been reported on construction of LORAN stations. The desirability of early completion of the LORAN program should be brought to the attention of the Standing Group and cognizant members requested to exert an effort to expedite construction.