

# **CERTAIN MARINE RADAR SYSTEMS FROM THE UNITED KINGDOM**

**Determination of No Injury  
in Investigation No. AA1921-210  
Under the Antidumping Act, 1921,  
as Amended, Together With  
the Information Obtained  
in the Investigation**

**USITC PUBLICATION 1016  
NOVEMBER 1979**



# UNITED STATES INTERNATIONAL TRADE COMMISSION

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# NEWS

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## USITC REPORTS NO INJURY TO U.S. INDUSTRY FROM IMPORTS OF MARINE RADAR SYSTEMS FROM THE UNITED KINGDOM

The United States International Trade Commission today reported to the Secretary of the Treasury its determination, by a 5-to-0 vote, that there is no injury or the likelihood of injury or prevention of establishment of an industry in the United States by reason of sales of certain marine radar systems from the United Kingdom at less than fair value (LTFV) within the meaning of the Antidumping Act, 1921, as amended.

Chairman Joseph O. Parker, Vice Chairman Bill Alberger, and Commissioners George M. Moore, Catherine Bedell, and Paula Stern concurred in the determination.

The Commission's investigation was instituted on August 27, 1979, following the receipt of advice from the Treasury Department that certain marine radar systems from the United Kingdom are being, or are likely to be, sold at less than fair value within the meaning of the Antidumping Act, 1921, as amended. A public hearing in connection with the Commission's investigation was held on October 10, 1979, in Washington, D.C.

The petition which led to Treasury's determination of LTFV sales was filed on behalf of the Raytheon Marine Co., of Manchester,

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USITC REPORTS NO INJURY TO U.S. INDUSTRY FROM IMPORTS OF MARINE RADAR FROM THE UNITED KINGDOM

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N.H., the only known domestic producer of small ship marine radar systems. Raytheon also imports certain models of small ship marine radar systems from Japan and resells them in the United States. Two firms--ITT Decca Marine, Inc., and Epsco, Inc.--accounted for virtually all U.S. imports of such marine radar systems from the United Kingdom.

The marine radar systems included in the scope of the investigation are used principally for navigational purposes on pleasure craft and small commercial vessels; they are not designed primarily for large ocean-going ships. Such small-ship marine radar systems typically consist of a "display" unit (i.e., a cathode-ray tube and radar screen of less than 11 inches in diameter), a "scanner" unit consisting of a transmitter-receiver and rotating antenna, and a power supply.

The Commission's public report, Certain Marine Radar Systems From the United Kingdom (USITC Publication 1016), contains the views of the Commissioners in the investigation (No. AA1921-210). Copies may be obtained by calling (202) 523-5178; from the Office of the Secretary, 701 E Street NW., Washington, D.C. 20436; or at the Commission's regional office, 6 World Trade Center, Suite 629, New York, N.Y. 10048, telephone (212) 466-5598.

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## C O N T E N T S

	<u>Page</u>
Determination of no injury-----	1
Statement of reasons of the Commission-----	3
Information obtained in the investigation:	
Summary-----	A-1
Introduction-----	A-3
The product:	
Description and uses-----	A-4
U.S. tariff treatment-----	A-6
Nature and extent of sales at LTFV-----	A-7
The U.S. market-----	A-8
U.S. imports-----	A-10
Consideration of injury or likelihood thereof-----	A-13
U.S. production and capacity utilization-----	A-14
Shipments-----	A-15
Inventories-----	A-19
Employment-----	A-20
Profit-and-loss experience-----	A-21
Consideration of the causal relationship between LTFV imports from the United Kingdom and the alleged injury:	
U.S. consumption and market penetration of LTFV imports-----	A-23
Lost sales-----	A-26
Prices:	
Pricing practices-----	A-26
List prices-----	A-27
Comparability of models and domestic and import prices-----	A-28
Appendix A. Treasury's letters to the Commission concerning LTFV sales---	A-33
Appendix B. Notice of the Commission's investigation and hearing-----	A-37
Appendix C. Statistical tables-----	A-41
Appendix D. Comparison of published specifications and evaluation of expected performance of certain Raytheon and Decca small-ship marine radar systems-----	A-47

## Figures

1. Certain marine radar systems: Domestic shipments by the Raytheon Marine Co., by specified models, 1974-78, and January-August 1979--- A-18
2. Certain marine radar systems: Weighted average prices received for sales of specified models to dealers, by quarters 1976 and 1977, by months 1978 and January-August 1979----- A-31

CONTENTS

	<u>Page</u>
Tables	
1. Certain marine radar systems: Various specifications for particular models sold in the United States-----	A-42
2. Radar apparatus designed for boat or ship installation: U.S. imports for consumption, by principal sources and by months, 1978, and January-July 1979-----	A-43
3. Radar apparatus designed for boat or ship installation: U.S. imports for consumption, by specified sources and by customs districts, 1978-----	A-44
4. Certain marine radar systems: U.S. imports from the United Kingdom, by importer and by model, 1974-78, January-August 1978, and January-August 1979-----	A-45
5. Certain marine radar systems: List prices to end users and weighted average prices received by the Raytheon Marine Co. and by ITT Decca Marine, Inc., for sales of specified models to dealers, by quarters, 1976-78 and January-August 1979-----	A-46

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Note.--Information which would disclose confidential operations of individual concerns may not be published and therefore has been deleted from this report. Deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

(AA1921-210)

CERTAIN MARINE RADAR SYSTEMS FROM THE UNITED KINGDOM

Determination of No Injury

Determination

On the basis of information developed during the course of investigation No. AA1921-210, the Commission unanimously determines that an industry in the United States is not being injured, is not likely to be injured, and is not prevented from being established, by reason of the importation of certain marine radar systems from the United Kingdom provided for in item 685.60 of the Tariff Schedules of the United States, which the Department of the Treasury has determined are being, or are likely to be, sold at less than fair value within the meaning of the Antidumping Act, 1921, as amended (19 U.S.C. 160 et seq.).

Procedural background

On August 17, 1979, the United States International Trade Commission received advice from the Department of the Treasury that certain marine radar systems from the United Kingdom are being, or are likely to be, sold in the United States at less than fair value (LTFV) within the meaning of the Antidumping Act, 1921, as amended. Accordingly, on August 27, 1979, the Commission voted to institute investigation No. AA1921-210 under section 201(a) of said act, to determine whether an industry in the United States is being or is likely to be injured, or is prevented from being established, by reason of the importation of such merchandise into the United States.

In connection with the investigation, a public hearing was held in Washington, D.C., on October 10, 1979. Notice of the institution of the investigation and the public hearing was given by posting copies of the notice at the Office of the Secretary, U.S. International Trade Commission,

Washington, D.C., and at the Commission's office in New York City, and by publishing the notice in the Federal Register of August 31, 1979 (44 F.R. 51348).

The Treasury Department instituted its investigation after receiving a complaint filed on October 12, 1978, from counsel acting on behalf of the Raytheon Marine Co. Treasury's notices of withholding of appraisement and determination of sales at less than fair value were published in the Federal Register of May 17, 1979 (44 F.R. 28907) and August 22, 1979 (44 F.R. 49322), respectively.

In arriving at its determination, the Commission gave due consideration to all written submissions from interested parties and information adduced at the hearing as well as information obtained by the Commission's staff from questionnaires, personal interviews, and other sources.



## Statement of Reasons of the Commission

In order for the Commission to find in the affirmative in an investigation under the Antidumping Act, 1921, as amended (19 U.S.C. 160(a)), it is necessary to find that an industry in the United States is being or is likely to be injured, or is prevented from being established, 1/ and the injury or likelihood thereof must be by reason of imports at less than fair value (LTFV).

On the basis of the evidence developed during the course of the investigation, we determine that an industry in the United States is not being and is not likely to be injured by reason of the importation of certain marine radar systems from the United Kingdom which the Department of the Treasury (Treasury) has determined are being, or are likely to be, sold at LTFV.

The imported articles and the domestic industry

For the purpose of Treasury's investigation, the term "certain marine radar systems" was defined as--

X-band radar systems provided for in item 685.60 of the Tariff Schedules of the United States designed principally for boat or ship installation with direct current power supply from 6 to 60 volts, having a maximum viewable display dimension of less than 11 inches, and having an antenna assembly with transmitter-receiver permanently affixed, and parts thereof; all the foregoing, whether such radar system components are imported together as units or separately.

The marine radar systems included in the scope of this investigation are used principally for navigational purposes on recreational craft

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1/ Prevention of the establishment of an industry is not an issue in this investigation and will not be discussed further.

(both sailboats and powerboats) and small commercial vessels; they are not designed primarily for ocean-going ships, although their use is not inherently restricted to small craft. The Raytheon Marine Co., Manchester, N.H., is the only domestic producer of the marine radar systems covered here.

#### LTFV sales

Since virtually all imports of the subject merchandise from the United Kingdom during June 1-November 30, 1978, were exported to the United States by Decca Radar, Ltd., and Electronic Laboratories, Ltd., Treasury limited its investigation to sales by those two firms. Fair-value comparisons were made on all U.S. sales by the two producers during the period of investigation. LTFV margins ranging from 3.2 percent to 25.8 percent were found on sales made by Decca Radar, Ltd.; the weighted average margin for the total sales compared for that firm was approximately 4.4 percent. No LTFV margins were found on sales made by Electronic Laboratories, Ltd. 1/

#### No injury by reason of LTFV sales

Treasury determined that three different models of marine radar systems within the definition of "certain marine radar systems" set forth above were being sold at LTFV by Decca Radar, Ltd., through its affiliate ITT Decca Marine, Inc. (IDM). During this proceeding, however, the

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1/ The Federal Register notice of Treasury's Determination of Sales at Less Than Fair Value (44 F.R. 49322) stated that a margin of 7.3 percent was found on 72 percent of the sales made by Electronic Laboratories, Ltd.; the weighted average margin for all sales compared for that firm was 5.2 percent. However, on Oct. 31, 1979, the Commission was informed by Treasury that--

Information lacking at the time of the final determination with respect to Electronic Laboratories has recently been verified and analyzed by the Customs Service. Treasury has determined that an adjustment of the margins calculated is appropriate based on that evidence. Consequently, we now wish to inform the Commission that Electronic Laboratories has not been found to have sold marine radar systems in the United States at less than fair value.

petitioner directed its allegations principally to one imported model. It alleged that the Decca model 060 was the principal cause of injury to it, specifically because of its impact on petitioner's model 3100. In its brief, the petitioner stated that it "considers its 3100 and the Decca 060 to be the radar systems among all those in the class of merchandise involved to be of closest comparability from a performance, reliability, and capability viewpoint." 1/ The information gathered during the investigation has established, however, that petitioner's models 2600 and 2700, both of which are imported from Japan and marketed by Raytheon, are also of critical importance in this investigation because they are far more competitive with the Decca 060 in terms of specifications and performance than the Raytheon 3100.

Set forth below is a table indicating the Aug.-Sept. 1978 and current list prices to end users and certain specifications for the four models:

Seller and model	List price	Display size (inches)	Peak power (kilowatts)	Antenna size (feet)	Maximum range (miles)
Aug.-Sept. 1978 <u>1/</u> :	:	:	:	:	:
Raytheon:	:	:	:	:	:
3100-----	\$4,295	7	7	2.5	32
2700 <u>2/</u> -----	3,795	7	5	2.5	24
2600 <u>2/</u> -----	2,995	6	3	2.5	24
Decca 060 <u>3/</u> ----	2,995	6	3	2.5	24
:	:	:	:	:	:
Aug. 1979 <u>4/</u> :	:	:	:	:	:
Raytheon:	:	:	:	:	:
3100-----	4,495	7	7	2.5	32
2700 <u>2/</u> -----	3,995	7	5	2.5	24
2600 <u>2/</u> -----	3,245	6	3	2.5	24
Decca 060 <u>3/</u> ----	3,695	6	3	2.5	24

1/ Third and fourth months of the period investigated by Treasury.

2/ Model is imported from Japan by Raytheon and resold in the United States.

3/ Model is the most comparable model produced in the United Kingdom and exported to the United States at LTFV prices to models produced and sold in the United States by Raytheon.

4/ Most recent month for which price data are available by questionnaire.

1/ Post hearing brief of petitioner, p. 12.

Although all four models are competitive with each other to some extent, the similarities between the Raytheon 2600 and the Decca 060 are apparent.

During this investigation, the Commission obtained information from Raytheon and IDM with respect to their published list prices and the quarterly weighted average prices each firm received from sales to dealers of the four models listed above. 1/ This information shows that in the first quarter of 1976 the Decca model 060 undersold the petitioner's model 3100 by \$935. By the last quarter of 1977, this margin of underselling had narrowed to about \$450 as a result of the gradual decline in the price of the 3100 and an increase in the price of the 060. Notwithstanding this change in the comparative price relationship between the two models, domestic shipments of the 3100 declined in 1977 as they had in 1976. Shipments of the Decca 060 also declined in 1977 as both models lost market share to the model 2700 which Raytheon was importing from Japan and which had been reduced in price by about 15 percent from the last quarter of 1976 to the last quarter of 1977.

The petitioner does not allege that it suffered injury by reason of LTFV imports prior to 1978. In its brief, Raytheon stated that until early 1978 it "believed the 3100 was holding its market position adequately despite the significant percentage and dollar amount . . . by which the 060 undersold the 3100." 2/ Thus, the petitioner has focused its allegations on market developments during 1978.

The major market development in 1978 was the introduction in February 1978 by Raytheon of the model 2600 which it imported from Japan and sold

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1/ Although the weighted average prices received by Raytheon and IDM may be more indicative of competitive price levels, such data follow similar trends to those of list prices. Since the weighted average prices are confidential list prices are discussed in the following paragraphs.

2/ Post hearing brief of petitioner, pp. 12-13.

at a list price of \$2795. The list price for the 2600 was more than \$200 below the list price for the Decca 060 (even though the list price of the 060 had been reduced \$550) and \$1200 and \$700 below the list price of the Raytheon models 3100 and 2700, respectively.

The competitive effect of the introduction of the model 2600 can be seen in the pricing relationship and market penetration of the four models. During 1978, the list price of the Decca 060 declined from \$200 above that of the Raytheon 2600 to the point where it was the same as the model 2600, its closest competitor. There were sharply increased sales of both models. It is clear that the Decca 060 was being priced to meet its competitor, the model 2600, which was rapidly gaining market acceptance. The prices of Raytheon's models 2700 and 3100 increased in 1978. Sales of both models increased, however, notwithstanding the price increases and the lower price of the Decca 060.

While shipments of domestically made "certain marine radar systems" increased slightly in 1978, sales by Raytheon of the model 2600 imported from Japan caused total domestic shipments to double from 1977 to 1978. Data on total U.S. consumption are not available because of lack of information from sources other than the United Kingdom. It is likely, however, that Raytheon maintained or increased its market share through shipments of the model imported from Japan.

During the period January-August 1979, the list price of the Decca 060 increased and by the end of this period it was about 14 percent above the 2600. In the same period, the difference between the list price and the average weighted price of the Decca model 060 and those of the 3100 narrowed from the prevailing 1978 prices, but shipments of the Raytheon model 3100 decreased. Thus, the increase in the price of the IDM model 060, relative to the 3100, was not accompanied by any increase in

shipments of the latter. Instead, both have lost market share to the model 2600 which has continued the upward trend in market penetration begun in 1978 and is now clearly the most important source of competition for domestically produced "marine radar systems."

Further evidence of the model 2600's impact on sales of the Raytheon 3100 is shown by information regarding alleged lost sales. Raytheon alleged it had lost sales of its domestically produced model 3100 to LTFV imports from the United Kingdom. Of the 9 firms contacted by the Commission regarding these allegations, none had reduced purchases of the 3100 to purchase the LTFV models. In fact, none of them carried the Decca line. While some of the dealers indicated their firms had allegedly lost sales to firms handling Decca, they also pointed out that sales of the model 2600 had adversely affected the sales picture for the 3100.

On the basis of these factors, we have made a negative determination.

## INFORMATION OBTAINED IN THE INVESTIGATION

## Summary

Investigation No. AA1921-210 was instituted on August 27, 1979, by the United States International Trade Commission following the receipt of advice on August 17, 1979, from the Department of the Treasury that certain marine radar systems from the United Kingdom are being, or are likely to be, sold at less than fair value (LTFV) within the meaning of the Antidumping Act, 1921, as amended. A public hearing in connection with the Commission's investigation was held on October 10, 1979, in Washington, D.C.

The marine radar systems included in the scope of this investigation are used principally for navigational purposes on pleasure craft and small commercial vessels; they are not designed primarily for large ocean-going ships, although their use is not inherently restricted to small craft. Such "small-ship" marine radar systems typically consist of a "display" unit (i.e., a cathode-ray tube and radar screen of less than 11 inches in diameter), a "scanner" unit consisting of a transmitter-receiver and rotating antenna, and a power supply.

Treasury's investigation of U.S. imports of such marine radar systems from the United Kingdom covered the 6-month period June 1-November 30, 1978. Treasury found that virtually all imports of the subject merchandise from the United Kingdom during that period were exported to the United States by Decca Radar, Ltd., and Electronic Laboratories, Ltd., and, therefore, limited its investigation to sales by those two firms. Fair-value comparisons were made on all U.S. sales by the two producers during the period of investigation. A comparison of exporter's sales price (in the case of Decca) or purchase price (in the case of Electronic Laboratories) with home-market prices of such or similar merchandise resulted in LTFV margins ranging from 3.2 percent to 25.8 percent on sales made by Decca Radar, Ltd.; the weighted average margin over the total sales compared for that firm was approximately 4.4 percent. No LTFV margins were found on sales by Electronic Laboratories, Ltd.

The petition which led to Treasury's determination of LTFV sales was filed on behalf of the Raytheon Marine Co., the only known domestic producer of small-ship marine radar systems. Raytheon also imports certain models of small-ship marine radar systems from Japan and resells them in the United States. Two firms, ITT Decca Marine, Inc. (IDM), and Epsco, Inc. (Epsco), account for virtually all U.S. imports of such marine radar systems from the United Kingdom. Raytheon and the two importers of merchandise made in the United Kingdom market their products in a similar manner--through a network of dealers, with very few sales made directly to end users.

Imports from the United Kingdom by IDM and Epsco of the marine radar systems herein under investigation jumped from \* \* \* units in 1977 to \* \* \* units in 1978--or by about 83 percent. However, imports during January-August 1979 were less than half those during the corresponding period of 1978. Most models imported by both firms from the United Kingdom showed similar trends, i.e., rising sharply from 1977 to 1978, but dropping in January-August 1979.

Japan is currently the largest supplier of small-ship marine radar systems to the United States, having replaced the United Kingdom in the past 2 or 3 years. Although complete data on imports of the certain marine radar systems herein under investigation from Japan are not available, it is estimated that about \* \* \* such units were imported in 1978. In contrast to the decline in imports from the United Kingdom during January-August 1979 over the corresponding period of 1978, imports from Japan are believed to have remained constant or even to have increased. Inasmuch as Japan and the United Kingdom supply virtually all U.S. imports of small-ship marine radar systems, total imports of such items in 1978 were estimated at 7,300 units, valued at approximately \$15.6 million.

Raytheon's production of certain marine radar systems increased from \* \* \* units in 1974 to \* \* \* units in 1976, slipped to \* \* \* units in 1977, but then jumped by 83 percent in 1978 to \* \* \* units. During January-August 1979, production of Raytheon's 3900 model \* \* \* but \* \* \* 3100 models were produced. The cause of the \* \* \* was an \* \* \* which, in the face of record production in that year, resulted in a large inventory buildup by the close of the year. Stocks of the 3100 model had largely been worked off by August 31, 1979, and production of that model was \* \* \*.

Raytheon's theoretical capacity to produce small-ship marine radar systems \* \* \*. The firm's rate of utilization of its productive facilities reached a peak of \* \* \* percent on \* \* \* during January-August 1978, and a peak of \* \* \* percent on \* \* \* during January-August 1979.

Raytheon's total domestic shipments of certain marine radar systems remained stable during 1974-76, but then almost trebled between 1976 and 1978, rising from \* \* \* units to \* \* \* units. Such shipments in January-August 1979 amounted to \* \* \* units, 4 percent more than shipments in the corresponding period of 1978. The great bulk of Raytheon's domestic shipments in 1974 and since 1976 of such radar systems has consisted of models imported from Japan and resold in the United States. The U.S.-made models 3100 and 3900 accounted for \* \* \* of such shipments in 1975 and 1976, but for only \* \* \* in 1977, \* \* \* in 1978, and \* \* \* percent in January-August 1979. Except for a decline in 1977, Raytheon's export shipments have increased regularly since 1974. Exports accounted for \* \* \* percent of the firm's total shipments of models 3100 and 3900 in 1978 and for \* \* \* percent in January-August 1979. About \* \* \* percent of Raytheon's shipments of U.S.-made marine radar systems during 1975-78 resulted from sales to Government agencies such as the U.S. Coast Guard.

Employment and man-hours worked in producing small-ship marine radar systems followed the trend in production of such items, increasing from 1974 to 1976, slipping in 1977, peaking in 1978, and then falling again in January-August 1979. Operations on such radar systems accounted for about \* \* \* percent of Raytheon's total establishment employment and man-hours worked in 1975 and 1976, \* \* \* percent in 1977 and 1978, and \* \* \* percent in January-August 1979. There has been no clear trend in the productivity of Raytheon's workers in manufacturing small-ship marine radar systems in recent years, other than a sharp drop in January-August 1979, reflecting \* \* \* during that period.

Raytheon realized net operating profits of \* \* \* in 1974 and \* \* \* in 1975. During the next 3 years, however, the firm suffered net operating losses as



follows: 1976-- \* \* \*, 1977-- \* \* \*, and 1978-- \* \* \*. In January-August 1979, an operating profit of \* \* \* was earned. The ratios of net operating profit or (loss) to net sales of small-ship marine radar systems were as follows: 1974-- \* \* \*, 1975-- \* \* \*, 1976-- \* \* \*, 1977-- \* \* \*, 1978-- \* \* \*, and January-August 1979-- \* \* \*. Although the firm reported losses in producing such radar systems in most periods covered, such operations nevertheless compared favorably with its total establishment operations, which ranged from an operating loss of \* \* \* in 1977 to a profit of \* \* \* in 1975.

Apparent domestic consumption of the certain marine radar systems included in the scope of this investigation, as estimated from U.S. shipments reported by Raytheon and the principal importers of such merchandise (including IDM and Epsco), amounted to about \* \* \* units in 1978. Measured at the level of sales to dealers, such consumption had a value of approximately \* \* \* million. Shipments by Raytheon of its domestically produced systems (models 3100 and 3900) accounted for only \* \* \* percent of estimated consumption in 1978 and for less than \* \* \* percent in January-August 1979. Total shipments by that firm, including its Japanese-made models, accounted for \* \* \* percent of consumption in 1978 and for \* \* \* percent in January-August 1979. Shipments of merchandise imported from the United Kingdom fell from almost \* \* \* percent of apparent U.S. consumption in 1978 to about \* \* \* percent in January-August 1979. On the other hand, shipments of Japanese-made marine radar systems (other than those marketed by Raytheon) jumped from \* \* \* percent of estimated U.S. consumption in 1978 to \* \* \* percent of such consumption in January-August 1979. It is estimated that LTFV imports from the United Kingdom may have accounted for about \* \* \* percent of total U.S. consumption of certain marine radar systems in 1978.

Small-ship marine radar systems are customarily sold on the basis of published suggested list prices to end users, with dealers being given various discounts from the list prices; such discounts typically range from 15 percent to 35 percent of the list price. List prices to end users in the United States for the various models of small-ship marine radar systems made domestically or imported from the United Kingdom currently range from \$3,000 to \$12,000. During the period covered by Treasury's investigation, the margin of underselling between the Decca model 060 (the model toward which virtually all testimony by Raytheon's witnesses was directed at the Commission's hearing) and the Raytheon 3100 ranged from \* \* \* percent to \* \* \* percent on a weighted average price basis, while the LTFV margins found by Treasury on the Decca 060 ranged from \* \* \* percent to \* \* \* percent (as a percent of fair-market value). In terms of dollars, these LTFV margins on the Decca 060 ranged from \* \* \* to \* \* \*, while the amount of underselling was \$1,000 at the retail level.

#### Introduction

On August 17, 1979, the United States International Trade Commission received advice from the Department of the Treasury that certain marine radar systems from the United Kingdom are being, or are likely to be, sold at less than fair value within the meaning of the Antidumping Act, 1921, as amended

(19 U.S.C. 160(a)). 1/ Accordingly, on August 27, 1979, the Commission instituted investigation No. AA1921-210 under section 201(a) of the act to determine whether an industry in the United States is being or is likely to be injured, or is prevented from being established, by reason of the importation of such merchandise into the United States. For the purposes of Treasury's investigation, the term "certain marine radar systems" was defined as X-band radar systems provided for in item 685.60, Tariff Schedules of the United States, designed principally for boat or ship installation with direct current power supply from 6 to 60 volts, having a maximum viewable display dimension of less than 11 inches, and having an antenna assembly with transmitter-receiver permanently affixed, and parts thereof; all the foregoing, whether such radar system components are imported together as units or separately.

Notice of the institution of the Commission's investigation and the public hearing to be held in connection therewith was given by posting copies of the notice at the Office of the Secretary, U.S. International Trade Commission, Washington, D.C., and at the Commission's office in New York City, and by publishing the notice in the Federal Register of August 31, 1979 (44 F.R. 51348). 2/ The public hearing was held in Washington, D.C., on October 10, 1979.

The complaint which led to Treasury's determination of sales at LTFV was filed in proper form on October 12, 1978, by counsel acting on behalf of the Raytheon Marine Co., which is believed to be the sole domestic producer of the subject marine radar systems. Treasury's antidumping proceeding notice, withholding of appraisement notice, and determination of sales at LTFV were published in the Federal Registers of November 6, 1978 (43 F.R. 51744), May 17, 1979 (44 F.R. 28907), and August 22, 1979 (44 F.R. 49322), respectively.

## The Product

### Description and uses

The marine radar systems included in the scope of this investigation are used principally for navigational purposes on recreational craft (both sailboats and powerboats) and small commercial vessels; they are not designed primarily for large ocean-going ships. Such so-called small-ship marine radar systems typically consist of either two or three basic component units. In 3-unit systems there is a display unit consisting of a cathode-ray tube and radar screen, together with various operating controls; a scanner unit consisting of a transmitter-receiver and a rotating antenna; and a power supply. In 2-unit systems the power supply is contained in either or both the display and scanner units. In all such small-ship systems, the maximum dimension of the viewable display (which is usually circular in shape) is 11 inches or less (so-called large-ship marine radar systems normally have 12-inch or larger displays).

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1/ Copies of Treasury's letters to the Commission concerning LTFV sales from the United Kingdom are presented in app. A.

2/ A copy of the Commission's notice of investigation and hearing is presented in app. B.

As indicated previously, Treasury defined "certain marine radar systems" as "X-band radar systems . . . designed principally for boat or ship installation with direct current power supply from 6 to 60 volts having a maximum viewable display dimension of less than 11 inches, and having an antenna assembly with transmitter-receiver permanently affixed . . ." The characteristics that essentially distinguish the marine radar systems herein under investigation from other radars are as follows:

- (1) Frequency.--Most radars operate in the microwave region of the electromagnetic spectrum--i.e., between 1,000 and 35,000 megahertz (MHz). The frequencies near 10,000 MHz are called X-band. X-band radars are commonly used for navigational and surface search purposes on vessels.
- (2) Power supply.--Direct current power supply from 6 to 60 volts implies small ship or boat application. Larger ships and ground sites would have alternating current power readily available.
- (3) Display dimension.--Size and weight limitations on smaller craft necessitate the use of smaller radar systems. Small-ship marine radar systems typically have radar screens from 6 inches to 10 inches in diameter, while large-ship radar systems usually have radar screens 12 inches or 16 inches in diameter. Small-ship marine radar systems may be used on larger vessels, normally in conjunction with larger radar equipment, but the reverse would not generally be true.
- (4) Antenna assembly.--The term "*having an antenna assembly with transmitter-receiver permanently affixed*" would again imply small craft suitability, since such craft would have masts or other supporting structures less capable of bearing loads and, consequently, lighter radar equipment is essential. 1/

The domestic producer and both U.K. producers that export to the United States market several models of small-ship marine radar systems. Table 1 (app. C) shows various specifications for particular models made domestically or imported

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1/ In a letter to the Secretary of the Commission, dated Sept. 25, 1979, counsel for the two U.K. producers and for ITT Decca Marine, Inc., advised that Decca models 926 and 929 do not have an "*antenna assembly with transmitter-receiver permanently affixed*" (the transmitter-receiver in such systems is mounted below the antenna and is connected thereto by means of a wave guide run) and, consequently, claimed that such units were not among the certain marine radar systems subject to the Commission's notice of investigation and hearing or to the Department of the Treasury's determination of sales at less than fair value. Treasury was apparently unaware of the nature of the antenna assembly of models 926 and 929, since the file obtained from Treasury includes LTFV calculations on both models. Raytheon's 10-inch systems (models 1025/4X, 1025/6X, and 1025/9X) have a similar antenna assembly structure, and in addition use 115 volt alternating current as their standard power supply. It is obvious from Raytheon's petition to Treasury, however, that the firm considered both Decca models and its own 10-inch systems as small-ship marine radar systems.

from the United Kingdom or Japan. 1/ As indicated, such models range in display size from 6 to 10 inches in diameter, in peak power output from 3 to 25 kilowatts, in antenna size from 2.5 to 9 feet, in maximum range from 12 to 72 miles, 2/ and in retail price from \$3,000 to \$12,000

#### U.S. tariff treatment

Imported radar apparatus and parts thereof are classified for tariff purposes under item 685.60 of the Tariff Schedules of the United States (TSUS). The current most-favored-nation rate of duty (which is applicable to imports from the United Kingdom) is 7.5 percent ad valorem; this rate has been in effect since January 1, 1972. As a result of concessions granted by the United States during the recently concluded Multilateral Trade Negotiations, the U.S. most-favored-nation rate of duty is to be reduced to 4.9 percent by January 1, 1987. 3/ The statutory rate of duty, applicable to imports from certain designated Communist-dominated countries, is 35 percent ad valorem. There are no known imports of the articles herein under investigation from such sources. Imports of radar apparatus and parts thereof from designated beneficiary developing countries are eligible for duty-free treatment under the Generalized System of Preferences, but no known imports of the marine radar systems subject to this investigation have been received from such countries.

For statistical reporting purposes, the following three suffix numbers were created effective January 1, 1978: 4/

TSUS item No.	Statistical suffix	Articles
685.60		Radio navigational aid apparatus, radar apparatus, and radio remote control apparatus, all the foregoing and parts thereof:
	21	Radar apparatus, and parts thereof: Designed for boat or ship installation.
	25	Other radar apparatus.
	35	Parts.

1/ Table 1 includes data on models which are outside the definition of certain marine radar systems--i.e., Decca models 926 and 929 and Raytheon's 10-inch systems.

2/ The range capability of a marine radar system with a given power and frequency is essentially a function of (a) the earth's curvature effect (i.e., the height of the radar antenna and target above the water), (b) atmospheric conditions, and (c) the reflective characteristics of the target. A claim of 48 miles or more at sea level is possible only when the antenna is mounted sufficiently high above the water and the target is very large and has excellent reflective characteristics.

3/ The current rate of duty is to be reduced in eight stages, as follows (as of Jan. 1 of each year shown): 1980--7.2 percent, 1981--6.9 percent, 1982--6.5 percent, 1983--6.2 percent, 1984--5.9 percent, 1985--5.6 percent, 1986--5.2 percent, and 1987--4.9 percent.

4/ Prior to Jan. 1, 1978, the relevant TSUSA item No. was 685.6020--radar apparatus, and parts thereof.

## Nature and Extent of Sales at LTFV

Treasury's investigation of U.S. imports of certain marine radar systems from the United Kingdom covered the 6-month period June 1-November 30, 1978. Treasury found that virtually all imports of the subject merchandise from the United Kingdom during that period were exported to the United States by Decca Radar, Ltd., and Electronic Laboratories, Ltd., and, therefore, limited its investigation to sales by those two firms. Fair-value comparisons were made on all U.S. sales by the two manufacturers during the period of investigation. The basis of comparison was between the purchase price or exporter's sales price, as appropriate, and the adjusted home-market price of such or similar merchandise to unrelated customers in the United Kingdom.

Exporter's sales price was used in the case of sales by Decca Radar, Ltd., since all its U.S. sales are made to a related firm (ITT Decca Marine, Inc.). The exporter's sales price was calculated on the basis of the resale prices to unrelated U.S. customers. Adjustments were made for ocean freight, marine insurance, discounts and rebates where applicable, U.S. customs duty, brokerage fees, inland U.S. freight costs, warranty charges, and selling and administrative expenses incurred in the United States. In the case of sales by Electronic Laboratories, Ltd., the purchase price was used in comparing sales, since all that firm's U.S. sales are made to one unrelated customer (Epsco, Inc.). The purchase price was calculated on the basis of an ex-works price in the United States; no adjustments were made to the purchase price.

Treasury found LTFV margins ranging from 3.2 percent to 25.8 percent on sales made by Decca Radar, Ltd.; 1/ the weighted average margin on the total sales compared for that firm was approximately 4.4 percent. 2/ No LTFV margins were found on sales by Electronic Laboratories, Ltd. 3/ A summary of Treasury's

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1/ Although the Federal Register notice of Treasury's determination indicates a range in LTFV margins of 3.2 percent to 25.8 percent on sales made by Decca Radar, Ltd., the file obtained from Treasury indicates that margins on sales by that firm ranged from \* \* \* percent to 25.8 percent.

2/ On the basis of the Commission's method of calculating LTFV margins (home-market price minus purchase price or exporter's sales price, divided by home-market price), the above margins ranged from 3.1 percent to 20.5 percent on sales made by Decca Radar, Ltd. The comparable weighted average margin on the total sales compared was 4.2 percent, and the weighted average margin on those sales made at LTFV was \* \* \* percent.

3/ The Federal Register notice of Treasury's determination of sales at less than fair value (44 F.R. 49322) stated that a margin of 7.3 percent was found on 72 percent of the sales made by Electronic Laboratories, Ltd., and the weighted average margin over all sales compared for that firm was 5.2 percent. However, on Oct. 31, 1979, the Commission was informed by Treasury that "Information lacking at the time of the final determination with respect to Electronic Laboratories has recently been verified and analyzed by the Customs Service. Treasury has determined that an adjustment of the margins calculated is appropriate based on that evidence. Consequently, we now wish to inform the Commission that Electronic Laboratories has not been found to have sold marine radar systems in the United States at less than fair value." A copy of this letter is presented in app. A.

price comparisons for sales made by the two firms in the United States during June 1-November 30, 1978, is shown in the table on the following page. As indicated, about \* \* \* percent (in terms of value) of Decca Radar's sales were at LTFV; the weighted average margin on those sales made at LTFV was approximately \* \* \* percent. No margins were found on sales of Decca models 050 or 110, whereas more than \* \* \* percent of Decca models 060 and 914 were sold at LTFV; about \* \* \* of the 916 models sold had LTFV margins. 1/

#### The U.S. Market

The Raytheon Marine Co. (Raytheon) is the only known domestic producer of the subject small-ship marine radar systems. The firm produces such items at its Manchester, N.H., facility and distributes them through a network of about 210 dealers (typically marine or electronic supply outlets) in the United States. The dealers, in turn, resell the marine radar systems to end users--principally owners of recreational craft and small commercial vessels. Raytheon does not sell its small-ship radar systems directly to end users. 2/ Raytheon is also an importer/distributor of such radar systems produced in Japan. Three of the various models of small-ship marine radar systems currently marketed by Raytheon in the United States are imported from Japan; there is no domestic production of these models. 3/ Raytheon acts as the exclusive U.S. importer/distributor for these Japanese-made models, which are marketed through the firm's established network of dealers.

Two firms account for virtually all U.S. imports of the subject marine radar systems from the United Kingdom. ITT Decca Marine, Inc., Palm Coast, Fla., is the importer/distributor of Decca marine radar systems. 4/ Epsco, Inc., Westwood, Mass., is the exclusive U.S. importer/distributor of marine radar systems produced by Electronic Laboratories, Ltd. Both IDM and Epsco market small-ship marine radar systems in the United States in the same manner used by Raytheon. Epsco markets its marine radar systems through about 220 dealers; no sales are made to end users. IDM has approximately 150 U.S. dealers; about \* \* \* percent of the firm's sales are made directly to end users.

About eight firms import small-ship marine radar systems from Japan, the largest U.S. supplier of such equipment. These importers generally operate in

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1/ As indicated in footnote 1 on page A-5, because of the nature of their antenna assembly, Decca models 926 and 929 are not within Treasury's definition of certain marine radar systems but were included in its LTFV calculations. The effect of excluding these models on the margins found on sales by Decca Radar, Ltd., would be negligible--the weighted average margin over the firm's total sales would \* \* \* and the weighted average margin for those sales made at LTFV would \* \* \*.

2/ \* \* \* percent of Raytheon's domestic sales of U.S.-made small-ship marine radar systems during 1975-78 were made to U.S. Government agencies.

3/ The Japanese-made model numbers are 2600, 2800 (which replaced the 2700 in 1979), and the recently-introduced 6400; all are made by the Japan Radio Corp.

4/ Decca Radar, Ltd., owns slightly more than 50 percent of IDM.

Summary of price comparisons made by Treasury, June 1-Nov. 30, 1978

Item	Total sales			Sales at fair value			Sales at LTFV						
	Units	Value	Units	Value	Units	Value	LTFV margins as a percent of purchase price or exporter's sales price		LTFV margins as a percent of fair market value		Range	Average	
							Percent	Range	Percent	Range			
Decca Radar, Ltd., model:													
050	***	***	***	***	***	***	***	***	***	***	***	***	***
060	***	***	***	***	***	***	***	***	***	***	***	***	***
110	***	***	***	***	***	***	***	***	***	***	***	***	***
914	***	***	***	***	***	***	***	***	***	***	***	***	***
916	***	***	***	***	***	***	***	***	***	***	***	***	***
926	***	***	***	***	***	***	***	***	***	***	***	***	***
929	***	***	***	***	***	***	***	***	***	***	***	***	***
Total or average	***	***	***	***	***	***	***	***-25.8	***	***-20.5	***	***	***
Electronic Laboratories model: 1/													
Seascan	***	***	***	***	***	***	***	***	***	***	***	***	***
Seaveyor	***	***	***	***	***	***	***	***	***	***	***	***	***
Total or average	***	***	***	***	***	***	***	***	***	***	***	***	***

1/ The sales shown for Electronic Laboratories represent amounts of each model contracted for with Epsco, Inc., the U.S. importer, that were scheduled for delivery during 1979; the corresponding quantities contracted for during 1978 were \* \* \* Seascan units and \* \* \* Seaveyor units. According to information in the file obtained from Treasury, Electronic Laboratories shipped \* \* \* Seascan units and \* \* \* Seaveyor units during the period investigated by Treasury.

Source: Compiled from information contained in the file obtained from the U.S. Department of the Treasury.

a manner similar to that employed by Raytheon, IDM, and Epsco--i.e., distributing their products through a network of dealers and making few, if any, sales directly to end users. The largest importer of marine radar systems from Japan is Furuno U.S.A., Inc., South San Francisco, Calif.; 1/ this firm is related to the Furuno Electric Co., Ltd., of Japan, a producer of marine radar systems. The second largest importer of Japanese-made small-ship marine radar systems is the Raytheon Marine Co., which in 1978 accounted for \* \* \* of total estimated imports of such items from Japan.

Many, if not most, dealers carry two or more competing lines of small-ship marine radar systems. For example, the dealer lists supplied to the Commission by Raytheon, IDM, and Epsco indicate that almost 40 dealer outlets carry items manufactured or marketed by all three firms. Several of the larger dealers have a number of market outlets; some dealers have outlets in more than one State. Dealers can be supplied in a relatively short period from inventories maintained by Raytheon and the various importers in warehouses throughout the country. 2/

#### U.S. Imports

Official statistics on U.S. imports of the specific items which are the subject of this investigation, i.e., "X-band radar systems . . . designed principally for boat or ship installation with direct current power supply from 6 to 60 volts, having a maximum viewable display dimension of less than 11 inches, and having an antenna assembly with transmitter-receiver permanently affixed, and parts thereof . . ." are not available. TSUSA item 685.6021, which was created effective January 1, 1978, includes all radar apparatus designed for boat or ship installation (except parts). Prior to 1978, such items were included in TSUSA item 685.6020, which included all radar apparatus and parts thereof. The table on the following page shows U.S. imports under the relevant TSUSA item numbers since 1975. As indicated, Japan and the United Kingdom are, by far, the largest suppliers of radar apparatus designed for boat or ship installation; Japan has replaced the United Kingdom since 1976 as the largest U.S. source of such equipment. Japan supplied 54 percent of U.S. imports of radar apparatus designed for boat or ship installation in 1978 and January-July 1979, while the share held by the United Kingdom slipped from 41 percent in 1978 to 37 percent in January-July 1979. The table also indicates that (a) a large proportion of U.S. imports of all radar apparatus and parts thereof from the United Kingdom and Japan--77 percent and 82 percent, respectively, in 1978--consists of items designed for boat or ship installation, and (b) imports from those two countries rose quite rapidly from 1976 to 1978, but have since slowed or, in the case of the United Kingdom, declined substantially.

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1/ Furuno U.S.A., Inc., was established on Oct. 1, 1978; prior to that time Furuno products were distributed in the United States by the Konel Corp.

2/ Raytheon maintains stocks at its Manchester, N.H., plant and at a warehouse in Torrance, Calif. IDM's principal distribution center is Palm Coast, Fla., but it maintains inventories at public warehouses in New York, N.Y., Miami, Fla., New Orleans, La., Los Angeles, Calif., and Seattle, Wash. Epsco has facilities at Westwood, Mass., New Orleans, La., and Seattle, Wash.



Radar apparatus and parts thereof: U.S. imports for consumption, by principal sources, 1975-78, January-July 1978, and January-July 1979

Item	(In thousands of dollars)						
	Total	United Kingdom	Japan	Canada	Italy	Federal Republic of Germany	Other
Radar apparatus, and parts thereof, total: 1/							
1975-----	31,360	6,848	2,517	19,619	1,344	544	488
1976-----	28,659	5,680	3,487	15,419	2,864	366	843
1977-----	30,395	5,929	7,819	12,619	1,369	580	2,079
1978-----	36,783	11,264	13,787	8,523	1,150	599	1,460
January-July--							
1978-----	23,726	7,687	7,934	6,249	991	431	434
1979-----	22,460	5,149	8,409	5,186	747	725	2,244
Designed for boat or ship installation: 2/							
1978-----	20,952	8,632	11,350	514	204	186	66
January-July--							
1978-----	12,670	5,831	6,148	433	126	81	51
1979-----	12,354	4,609	6,743	335	453	197	17
Parts: 3/							
1978-----	11,194	1,451	810	6,882	945	185	921
January-July--							
1978-----	7,892	985	538	5,178	864	135	192
1979-----	8,092	496	1,153	4,033	277	485	1,648

1/ For 1975-77, represents imports under TSUSA No. 685.6020; for 1978 and Jan.-July 1979, represents imports under TSUSA Nos. 685.6021, 685.6025, and 685.6035.

2/ Imports under TSUSA No. 685.6021.

3/ Imports under TSUSA No. 685.6035.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2 shows U.S. imports of radar apparatus for boat or ship installation, by principal sources and by months, during 1978 and January-July 1979. Table 3 shows such imports during 1978, by principal sources and by customs districts. 1/ Imports from the United Kingdom entered principally through New Orleans (both IDM and Epsco have warehouses there), Miami (IDM), Tampa (IDM), Seattle (both IDM and Epsco), New York (IDM), Los Angeles (IDM), and Boston (Epsco).

Imports from the United Kingdom by IDM and Epsco of the certain marine radar systems herein under investigation, as reported in response to the Commission's questionnaires, are shown in table 4 and summarized as follows (in units):

Period	Total	IDM <u>1/</u>	Epsco <u>2/</u>
1974-----	***	***	***
1975-----	***	***	***
1976-----	***	***	***
1977-----	***	***	***
1978-----	***	***	***
January-August--			
1978-----	***	***	***
1979-----	***	***	***

1/ Excludes imports of Decca models 926 and 929 (because of the nature of their antenna assembly).

2/ Epsco, Inc., began importing marine radar systems from the United Kingdom in April 1977, when it purchased the firm (Brocks Electronics Corp.) that had previously imported such items from Electronic Laboratories, Ltd.

As shown above, imports from the United Kingdom jumped from \* \* \* units in 1977 to \* \* \* units in 1978, or by about 83 percent. However, imports during January-August 1979 were less than half those during the corresponding period of 1978. As shown in table 4, most models imported by both firms from the United Kingdom showed similar trends--i.e., rising sharply from 1977 to 1978, but dropping in the first 8 months of 1979.

Japan is currently the largest supplier of small ship marine radar systems to the United States, having replaced the United Kingdom in the past 2 or 3 years. Although complete data on imports of the certain marine radar systems herein under investigation from Japan are not available, it is estimated that about \* \* \* such units were imported in 1978. In contrast to the decline in imports from the United Kingdom during January-August 1979 over the corresponding period of 1978,

1/ Data on value are a more accurate indicator of trends in imports of marine radar systems, since quantity data are in some cases distorted by imports whose low average unit value and country of origin indicate that they are something other than radar systems (e.g., the importation of 1,257 "units" from Spain in June 1978, with an average unit value of less than \$4).

imports from Japan are believed to have remained constant or even to have increased (chiefly because of sharply increased imports by \* \* \*--even though imports by some firms, including \* \* \*, declined). Inasmuch as Japan and the United Kingdom supply virtually all U.S. imports of small-ship marine radar systems, total U.S. imports of such items in 1978 were estimated at 7,300 units, valued at approximately \$15.6 million.

As indicated previously, the domestic producer, Raytheon, imports certain small-ship marine radar systems from Japan and resells them in the United States ( \* \* \* ). Raytheon's imports from Japan, as reported in response to the Commission's questionnaire, were as follows:

Model	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
Quantity (units)							
2600-----	***	***	***	***	***	***	***
2700-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
Value (1,000 dollars)							
2600-----	***	***	***	***	***	***	***
2700-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***

#### Consideration of Injury or Likelihood Thereof

As indicated previously, the Raytheon Marine Co. is the only known domestic producer of the marine radar systems which are the subject of this investigation. <sup>1/</sup> This firm, a subsidiary of the Raytheon Co., <sup>2/</sup> produces such small-ship marine

<sup>1/</sup> Trade sources report that a firm originally called Ridge Electronics, Charlottesville, Va., formerly produced small-ship marine radar systems. This concern reportedly experienced financial difficulties (as well as a fire), was reorganized and renamed several times, but apparently ceased operations 2 or 3 years ago. The staff was unable to contact any officials or former officials of the firm.

<sup>2/</sup> The Raytheon Co., Lexington, Mass., (and its subsidiaries) manufactures electronic systems and subsystems, household appliances, and educational materials; does seismic exploration for oil and natural gas; and designs and builds heavy construction equipment, chemical and petrochemical processing plants, industrial plants, and electric power generating facilities. Standard and Poor's reports that in 1978 the firm had 63,600 employees, net sales of \$3.2 billion, operating income of \$294 million, and net after-tax income of \$150 million. Electronics accounted for 56 percent of net sales, energy services for 24 percent, major appliances for 12 percent, and other items for 8 percent. U.S. Government end-use business (e.g., missile systems) provided 37 percent of sales.

radar systems at its facility in Manchester, N.H. Other items produced at this establishment include large-ship marine radar systems (e.g., those with 12-inch or 16-inch radar screens), marine radiotelephones, fathometer depth sounders, loud hailers, Loran C equipment, and other marine navigational aids. The following information relevant to the question of injury or likelihood thereof to a domestic industry was obtained chiefly from Raytheon's response to the Commission's questionnaire.

U.S. production and capacity utilization

Raytheon reported domestic production of small-ship marine radar systems as shown in the following tabulation. Although the firm's domestically produced 10-inch systems (models 1025/4X, 1025/6X, and 1025/9X) are outside Treasury's definition of certain marine radar systems (because of the nature of their antenna assembly and their use of 115-volt alternating current as a standard power supply), data are shown separately for such models (in units):

Model No.	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
3100-----	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***
10-inch systems--	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***

Raytheon's production of certain marine radar systems (i.e., models 3100 and 3900) increased from \* \* \* units in 1974 to \* \* \* units in 1976, slipped to \* \* \* units in 1977, but then jumped by 83 percent in 1978 to \* \* \* units. During January-August 1979, production of the 3900 model \* \* \*, but \* \* \* 3100 models were produced. A company source \* \* \*, which in the face of record production in that year, resulted in a large inventory buildup. Production of the 3100 model was \* \* \*.

Raytheon reported that its capacity to produce small-ship marine radar systems has remained unchanged since 1974, as follows:

<u>Model</u>	<u>Units per year</u>
3100-----	***
3900-----	***
10-inch systems-----	***
Total-----	***

These theoretical capacity figures, which were derived by Raytheon's manufacturing

department, have \* \* \*. <sup>1/</sup> On the basis of the reported capacity, Raytheon's rates of utilization of its productive facilities are shown in the following tabulation (in percent):

Model	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
3100-----	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***
10-inch systems--	***	***	***	***	***	***	***
Average-----	***	***	***	***	***	***	***

### Shipments

Raytheon's domestic and export shipments of U.S.-made and imported small-ship marine radar systems are shown in the table on the following page. Several observations which can be made from an analysis of the data in this table are--

(1) Raytheon's total domestic shipments of certain marine radar systems (excluding its 10-inch systems) remained stable during 1974-76, but then almost trebled between 1976 and 1978, rising from \* \* \* units to \* \* \* units. Such shipments in January-August 1979 amounted to \* \* \* units, 4 percent more than during the corresponding period of 1978.

(2) The great bulk of Raytheon's domestic shipments in 1974 and since 1976 of certain marine radar systems has consisted of models imported from Japan and resold in the United States. The U.S.-made 3100 and 3900 models accounted for \* \* \* of such shipments in 1975 and 1976, but for only \* \* \* in 1977, \* \* \* in 1978, and \* \* \* percent in January-August 1979.

(3) In contrast to the previously noted \* \* \* percent increase in production of the 3100 model from 1977 to 1978 and the subsequent \* \* \* in January-August 1979, fluctuations in shipments of that model were much more moderate, increasing \* \* \* percent in 1978, but falling \* \* \* percent in January-August 1979 from the amount shipped in the corresponding period of 1978.

(4) The Japanese-made model 2600, which was introduced into Raytheon's line in February 1978, quickly became its largest selling

<sup>1/</sup> The Commission's questionnaire requested capacity data "based on operating your facility 1 shift per day, 5 days per week, assuming the product mix would be the same as that actually experienced in each period shown, and making allowance for scheduled maintenance downtime." Although methods of estimating capacity vary substantially, most are based upon some measure of proven production capability achieved during periods of peak output.

Certain marine radar systems: Shipments of domestically produced and imported merchandise by the Raytheon Marine Co., by specified models, 1974-78, January-August 1978, and January-August 1979

Item	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
Quantity (units)							
Domestic shipments:							
U.S.-made models:							
3100-----	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***
10-inch systems-----	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***
Imported models:							
2600-----	***	***	***	***	***	***	***
2700-----	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***
Total, domestic shipments-----	***	***	***	***	***	***	***
Export shipments:							
U.S.-made models:							
3100-----	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***
10-inch systems-----	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***
Imported models:							
2700-----	***	***	***	***	***	***	***
Total, export shipments-----	***	***	***	***	***	***	***
Total, domestic and export shipments-----	***	***	***	***	***	***	***
Value (1,000 dollars)							
Domestic shipments:							
U.S.-made models:							
3100-----	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***
10-inch systems-----	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***
Imported models:							
2600-----	***	***	***	***	***	***	***
2700-----	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***
Total, domestic shipments-----	***	***	***	***	***	***	***
Export shipments:							
U.S.-made models:							
3100-----	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***
10-inch systems-----	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***
Imported models:							
2700-----	***	***	***	***	***	***	***
Total, export shipments-----	***	***	***	***	***	***	***
Total, domestic and export shipments-----	***	***	***	***	***	***	***

Source: Compiled from data submitted in response to the questionnaire of the U.S. International Trade Commission.

model and greatly stimulated the firm's shipments. As shown in table 1, Raytheon's model 2600 was \* \* \* in sales volume in the United States during January-August 1979. Shipments of all models marketed by Raytheon in the United States rose from 1977 to 1978, but \* \* \* of the increase was due to the model 2600. Similarly, \* \* \* in January-August 1979 \* \* \* in shipments of the U.S.-made model 3100 and the imported model 2700.

(5) A corollary of the preceding point is the apparent substitutability among certain models offered by Raytheon. As illustrated in figure 1 on the following page, it is possible that at least part of the growth in shipments of model 2600 was achieved at the expense of models 2700 and 3100. For example, \* \* \* more 2600 models were shipped during January-August 1979 than during the corresponding period of 1978, but combined shipments of the 2700 and 3100 models fell by \* \* \* units.

About \* \* \* percent of the value of Raytheon's shipments of U.S.-made marine radar systems during 1975-78 resulted from sales to Government agencies (such as the Coast Guard); the firm reported that it made no sales to end users (other than such Government agencies). The following tabulation includes shipments of Raytheon's 10-inch systems (in thousands of dollars):

Type of customer	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
Dealers-----	***	***	***	***	***	***	***
Government agencies----	***	***	***	***	***	***	***
Export shipments-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***

Figure 1.--Certain marine radar systems: Domestic shipments by the Raytheon Marine Co., by specified models, 1974-78, and January-August 1979

\* \* \* \* \*



Inventories

Raytheon does not inventory complete radar systems as such. The data in the following tabulation represent the firm's estimated end-of-period inventories of domestically produced and imported systems, based upon stocks of component parts (in units):

Item	1973	1974	1975	1976	1977	1978	Jan.-Aug.--	
							1978	1979
Domestically produced models:								
3100-----	***	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***	***
10-inch systems-----	***	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***	***
Imported models:								
2600-----	***	***	***	***	***	***	***	***
2700-----	***	***	***	***	***	***	***	***
Subtotal-----	***	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***	***

Immediately apparent in the above data is the large buildup of Raytheon's stocks during 1978, followed by an even larger reduction in inventories during January-August 1979. As indicated previously, the large increase in stocks of model 3100 from yearend 1977 to yearend 1978 (from \* \* \* units to \* \* \* units) resulted from the very large increase in production in 1978 (from \* \* \* units in 1977 to \* \* \* units in 1978) coupled with a much more modest increase in shipments in that year (from \* \* \* units to \* \* \* units). Inventories of model 3100 at the close of August 1979 were still somewhat higher than those during 1975-77, but were greatly reduced from stocks at yearend 1978.

Raytheon's inventories of two other models, both of which are imported from Japan, showed large increases in 1978 and subsequent declines in January-August 1979. As previously stated, the model 2600 was introduced in early 1978 and quickly became Raytheon's best selling small-ship marine radar system. 1/ The popularity of model 2600 is evidenced by the \* \* \*. A company source confirmed that \* \* \*. As shown in the preceding tabulation, inventories of model 2700 \* \* \* during 1978 but fell to only \* \* \* units by August 31, 1979, since production of that model has been discontinued. 2/

1/ The point has previously been made concerning the apparent substitutability among certain models sold by Raytheon; thus it appears that the introduction of model 2600 may have contributed to the increase during 1978 in Raytheon's inventories of models 2700 and 3100.

2/ The model 2700 is being replaced with a new 2800 model, which is similar to the 2600 model, except that the new model has an open antenna rather than aA-19 radome. The model 2800 is also produced entirely in Japan.

Employment

The average number of employees and man-hours worked by production and related workers at Raytheon's Manchester facility are shown below:

Item	1974	1975	1976	1977	1978	Jan.-Aug.--		
						1978	1979	
Average number of employees								
All persons-----	***	***	***	***	***	***	***	***
Production and related workers engaged in the production of--								
All products-----	***	***	***	***	***	***	***	***
Small-ship marine radar systems <u>1</u> /----	***	***	***	***	***	***	***	***
Man-hours worked (thousands)								
Production and related workers engaged in the production of--								
All products-----	***	***	***	***	***	***	***	***
Small-ship marine radar systems <u>1</u> /----	***	***	***	***	***	***	***	***

1/ Includes operations on Raytheon's 10-inch systems.

As shown in the preceding tabulation, total employment at the Manchester plant rose irregularly from \* \* \* in 1974 to a peak of \* \* \* in January-August 1978, but then fell off to \* \* \* during the corresponding period of 1979. Raytheon reported in its petition to Treasury (in August 1978) that:

Although Raytheon has the capacity to produce a great many more units of the merchandise in question, unemployment has not been a problem at Raytheon's Manchester, New Hampshire, facility. This is because new product lines have been introduced and produced at that locale to offset the disappointing sales of the small ship radar product line. In 1977 for example, Raytheon introduced a new family of large ship radars, which has actually resulted in a growth of employment at the Manchester facility. Raytheon's power supply line of products has also been growing rapidly in recent years. While net employment at the Manchester facility has increased, it must be emphasized that such employment level would have been substantially higher if Raytheon were producing small ship radar systems at a satisfactory rate of capacity utilization.

Employment and man-hours worked in producing small-ship marine radar systems (including Raytheon's 10-inch systems) followed the trend in production of such items, increasing from 1974 to 1976, slipping in 1977, peaking in 1978, and then falling again in January-August 1979. Operations on such radar systems accounted for about \* \* \* percent of total establishment employment and man-hours worked in 1975 and 1976, \* \* \* percent in 1977 and 1978, and \* \* \* percent in January-August 1979.

There has been no clear trend in the physical productivity of Raytheon's workers in manufacturing small-ship marine radar systems in recent years, other than a sharp drop in January-August 1979, reflecting \* \* \* during that period. The following tabulation shows the number of units produced per production and related worker and per 1,000 man-hours worked by such employees:

<u>Period</u>	<u>Per worker</u>	<u>Per 1,000 man-hours</u>
1974-----	***	***
1975-----	***	***
1976-----	***	***
1977-----	***	***
1978-----	***	***
January-August--		
1978-----	***	***
1979-----	***	***

Profit-and-loss experience

The table on the following page shows Raytheon's profit-and-loss experience on all operations of the Manchester facility and on operations in producing small-ship marine radar systems (including its 10-inch models). As indicated, the firm reported net operating losses on its total operations in each period except 1975 and January-August 1979; such losses ranged from \* \* \* in 1974 to \* \* \* in 1977. A net operating profit of \* \* \* was recorded during January-August 1979. Raytheon realized net operating profits in producing small-ship marine radar systems of \* \* \* in 1974 and \* \* \* in 1975. During the next 3 years, however, the firm suffered net operating losses as follows: 1976 \* \* \*, 1977 \* \* \*, and 1978 \* \* \*. In January-August 1979, an operating profit of \* \* \* was earned from Raytheon's operations in producing small-ship marine radar systems. Although the firm reported losses in producing small-ship marine radar systems in most periods covered by the table, such operations nevertheless compared favorably with its total establishment operations, as indicated by the following ratios of net operating profit or (loss) to net sales (in percent):

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>Jan.-Aug.--</u> <u>1978</u>	<u>1979</u>
Total establishment operations-----	***	***	***	***	***	***	***
Operations on small-ship marine radar systems----	***	***	***	***	***	***	***

Profit-and-loss experience of the Raytheon Marine Co. on all operations of their establishment in which small-ship marine radar systems are produced, and on operations in producing such marine radar systems, 1/ 1974-78, January-August 1978, and January-August 1979

Item	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
Total establishment operations							
Net sales-----1,000 dollars--:	***	***	***	***	***	***	***
Cost of goods sold-----do----:	***	***	***	***	***	***	***
Gross margin-----do-----:	***	***	***	***	***	***	***
Fixed overhead <u>2/</u> -----do----:	***	***	***	***	***	***	***
Independent development-----do----:	***	***	***	***	***	***	***
Marketing and administrative expenses-----1,000 dollars--:	***	***	***	***	***	***	***
Net operating profit or (loss)-----1,000 dollars--:	***	***	***	***	***	***	***
Interest expense-----do----:	***	***	***	***	***	***	***
Other income (expense), net--do----:	***	***	***	***	***	***	***
Net profit (loss) before income taxes-----1,000 dollars--:	***	***	***	***	***	***	***
Net assets employed in production (end of period):							
Book value-----1,000 dollars--:	***	***	***	***	***	***	***
Original value-----do----:	***	***	***	***	***	***	***
Ratio of net operating profit or (loss) to:							
Net sales-----percent--:	***	***	***	***	***	***	***
Book value of net assets---do----:	***	***	***	***	***	***	***
Operations on small-ship marine radar systems <u>1/</u>							
Net sales-----1,000 dollars--:	***	***	***	***	***	***	***
Cost of goods sold-----do----:	***	***	***	***	***	***	***
Gross margin-----do-----:	***	***	***	***	***	***	***
Fixed overhead <u>2/</u> -----do----:	***	***	***	***	***	***	***
Marketing and administrative expenses-----1,000 dollars--:	***	***	***	***	***	***	***
Net operating profit or (loss)-----1,000 dollars--:	***	***	***	***	***	***	***
Interest expense-----do----:	***	***	***	***	***	***	***
Net profit (loss) before income taxes-----1,000 dollars--:	***	***	***	***	***	***	***
Ratio of net operating profit or (loss) to net sales--percent--:	***	***	***	***	***	***	***
Ratio of net sales to total establishment net sales-percent--:	***	***	***	***	***	***	***
Ratio of cost of goods sold to total establishment cost of goods sold-----percent--:	***	***	***	***	***	***	***
Ratio of fixed overhead to total establishment fixed overhead-----percent--:	***	***	***	***	***	***	***

1/ Includes data only on Raytheon's operations in producing small-ship marine radar systems (including the firm's 10-inch systems) in the United States.

2/ Includes overhead to support production, occupancy costs, controller expense, industrial relations support, and purchasing.

Source: Compiled from data submitted in response to the questionnaire of the U.S. International Trade Commission. A-22

In response to the Commission's questionnaire, Raytheon reported making no capital expenditures during January 1974-August 1979 for facilities used principally in the manufacture, warehousing, or marketing of U.S.-produced small-ship marine radar systems. The firm's reported research and development expenses incurred in developing such products are shown in the following tabulation:

	<u>Expenses</u>
1975-----	***
1976-----	***
1977-----	***
1978-----	***
1979 (January-August)-----	***

Most of the above expenses were incurred in \* \* \* \*; such expenses amounted to \* \* \* in 1977, \* \* \* in 1978, and \* \* \* in January-August 1979. An additional \* \* \* of the above expenses shown during January-August 1979 were incurred in \* \* \*.

Consideration of the Causal Relationship Between LTFV Imports  
From the United Kingdom and the Alleged Injury

U.S. consumption and market penetration of LTFV imports

Apparent domestic consumption of the certain marine radar systems included in the scope of this investigation, as estimated from U.S. shipments reported by Raytheon and the principal importers of such merchandise (including IDM and Epsco), amounted to about \* \* \* units in 1978. Measured at the level of sales to dealers, such consumption had a value of approximately \* \* \* million. The various components of domestic consumption in 1978 and in January-August of 1978 and 1979 are shown in the table on the following page. As indicated, shipments by Raytheon of its domestically produced systems (models 3100 and 3900) accounted for only \* \* \* percent of estimated consumption in 1978 and for less than \* \* \* percent in January-August 1979. Total shipments by that firm, including its Japanese-made models, accounted for \* \* \* percent of consumption in 1978 and for \* \* \* percent in the first 8 months of 1979. Shipments of merchandise imported from the United Kingdom fell sharply in January-August 1979 in relation to those during 1978; such shipments were equivalent to almost \* \* \* percent of apparent U.S. consumption in 1978, but to only \* \* \* percent in January-August 1979. On the other hand, shipments of Japanese-made marine radar systems (other than those marketed by Raytheon) jumped from \* \* \* percent of estimated U.S. consumption in 1978 to \* \* \* percent of such consumption in January-August 1979.

Complete data on domestic shipments of Japanese-made radar systems, other than those by Raytheon are not available. Consequently, as indicated in the table on the following page, data on aggregate domestic consumption of the certain marine radar systems herein under investigation are not available for years prior to 1978. In order to show trends over a longer period, however, the table on page A-25 compares shipments by Raytheon with those by the two importers of merchandise made in the United Kingdom. As indicated in the table, models found

Certain marine radar systems: Domestic shipments, by firm and by country of origin, 1974-78,  
January-August 1978, and January-August 1979

Item	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
Quantity (units)							
Shipments by Raytheon:							
U.S.-made models-----	***	***	***	***	***	***	***
Japanese-made models-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
Shipments of models made in the United Kingdom:							
By IDM:							
Models found by Treasury to have been sold at LTFV in June 1-Nov. 30, 1978-----	1/ ***	***	***	***	***	***	***
Other models-----	1/ ***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
By Epsco-----	***	***	***	***	***	***	***
Total, models made in the United Kingdom-----	***	***	***	***	***	***	***
Shipments of other imported models:							
From Japan-----	2/	2/	2/	2/	***	***	***
From other countries-----	2/	2/	2/	2/	1/ ***	1/ ***	1/ ***
Total-----	2/	2/	2/	2/	***	***	***
Total shipments from all sources-----	2/	2/	2/	2/	***	***	***
Percent of total							
Shipments by Raytheon:							
U.S.-made models-----	2/	2/	2/	2/	***	***	***
Japanese-made models-----	2/	2/	2/	2/	***	***	***
Total-----	2/	2/	2/	2/	***	***	***
Shipments of models made in the United Kingdom:							
By IDM:							
Models found by Treasury to have been sold at LTFV in June 1-Nov. 30, 1978-----	2/	2/	2/	2/	***	***	***
Other models-----	2/	2/	2/	2/	***	***	***
Total-----	2/	2/	2/	2/	***	***	***
By Epsco-----	2/	2/	2/	2/	***	***	***
Total, models made in the United Kingdom-----	2/	2/	2/	2/	***	***	***
Shipments of other imported models:							
From Japan-----	2/	2/	2/	2/	***	***	***
From other countries-----	2/	2/	2/	2/	***	***	***
Total-----	2/	2/	2/	2/	***	***	***
Total shipments from all sources-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Partly estimated.

2/ Not available.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Certain marine radar systems: Domestic shipments by the Raytheon Marine Co. and by importers of merchandise made in the United Kingdom, 1974-78, January-August 1978, and January-August 1979

Item	1974	1975	1976	1977	1978	Jan.-Aug. 1979
Quantity (units)						
Shipments by Raytheon:						
U.S.-made models	***	***	***	***	***	***
Japanese-made models	***	***	***	***	***	***
Total	***	***	***	***	***	***
Shipments of models made in the United Kingdom:						
By IDM: 1/						
Models found by Treasury to have been sold at LTFV in June 1-Nov. 30, 1978	***	***	***	***	***	***
Other models	***	***	***	***	***	***
Total	***	***	***	***	***	***
By Epsco	***	***	***	***	***	***
Total, models made in the United Kingdom	***	***	***	***	***	***
Total shipments by Raytheon and by importers of merchandise made in the United Kingdom	***	***	***	***	***	***
Percent of total						
Shipments by Raytheon:						
U.S.-made models	***	***	***	***	***	***
Japanese-made models	***	***	***	***	***	***
Total	***	***	***	***	***	***
Shipments of models made in the United Kingdom:						
By IDM: 1/						
Models found by Treasury to have been sold at LTFV in June 1-Nov. 30, 1978	***	***	***	***	***	***
Other models	***	***	***	***	***	***
Total	***	***	***	***	***	***
By Epsco	***	***	***	***	***	***
Total, models made in the United Kingdom	***	***	***	***	***	***
Total shipments by Raytheon and by importers of merchandise made in the United Kingdom	100.0	100.0	100.0	100.0	100.0	100.0

1/ Excludes shipments of models 926 and 929.

by Treasury to have been sold at LTFV during June 1-November 30, 1978, accounted for \* \* \* percent of total shipments in 1978 by Raytheon, IDM, and Epsco. The corresponding percentages in the other periods shown were: 1974--\* \* \*, 1975--\* \* \*, 1976--\* \* \*, 1977--\* \* \*, and January-August 1979--\* \* \*.

Using the ratios of LTFV sales to total sales of each model imported from the United Kingdom and checked by Treasury during the period June 1-November 30, 1978 (as calculated from the table on page A-9), and assuming that those ratios can be applied to all imports of each of those models during the entire year (shown in table 4), yields the following estimate of total LTFV imports during 1978:

<u>Model</u>	<u>Units</u>
Decca 060-----	***
Decca 914-----	***
Decca 916-----	***
Total-----	***

Thus, if LTFV imports in 1978 amounted to \* \* \* units, such imports accounted for about \* \* \* percent of estimated U.S. consumption of certain marine radar systems in that year (excluding imports of Decca models 926 and 929).

#### Lost sales

In response to the Commission's questionnaire, Raytheon listed nine dealers to whom it had allegedly lost sales of domestically produced marine radar systems because of competition from LTFV imports of comparable merchandise from the United Kingdom. The alleged lost sales, which in the aggregate amounted to \* \* \* units valued at \* \* \*, involved only Raytheon's 3100 model. In an effort to verify the information concerning lost sales, the staff contacted the nine dealers. Four of the nine also sell marine radar systems distributed by Epsco, but none handles the Decca line. Thus, none of the dealers had reduced purchases of Raytheon's 3100 model in order to purchase the Decca 060--the model toward which Raytheon's witnesses at the public hearing directed virtually all of their testimony. The thrust of statements made by these nine Raytheon dealers was instead directed toward sales their own firms had allegedly lost to other area dealers that did handle the Decca line. The dealers advised that during 1978 most lost sales of the Raytheon 3100 were to lower priced models, primarily the Decca 060 and the Japanese-made Raytheon 2600. Some dealers added that their firms had lost sales of the Raytheon 2600 to the Decca 060 because of late shipments by Raytheon of that model.

#### Prices

Pricing practices.--The marine radar systems which are the subject of this investigation--i.e., those sold predominantly for use on pleasure craft and small commercial vessels--are customarily sold on the basis of published suggested



dealer resale prices to end users. <sup>1/</sup> Dealers are granted various discounts (such as a so-called standard discount, prompt payment discounts, quantity discounts, and package discounts for buying several different items from the distributor or producer), with such discounts also being published. For example, Raytheon's standard dealer discount is 25 percent on its less-expensive models (2600, 2700, 3100, and 3900) and 20 percent on its 10-inch systems. ITT Decca Marine, Inc., grants its dealers standard discounts ranging from 25 percent on Decca models 050 and 060 to 16 percent on models 926 and 929. In addition to the standard discount, IDM dealers may receive prompt payment discounts of 5 percent to 10 percent with payment terms ranging from 30 to 60 days. IDM has also offered its dealers a quantity discount on model 060--5 percent off the list price if 25 units or more of that model were ordered. Epsco, Inc., the U.S. importer/distributor of small-ship marine radar systems produced by Electronic Laboratories, Ltd., has dealer discounts ranging from 20 percent to 33 percent, depending on volume. Distributors of Japanese-made marine radar systems have similar pricing arrangement with their dealers.

Small-ship marine radar systems are sold on a f.o.b. factory or warehouse basis, with dealers paying freight charges incurred in delivering the merchandise to their establishments. Raytheon has a warehouse in California from which its prices are identical to those at its Manchester facility. Similarly, both IDM and Epsco price their merchandise identically at all of each firm's distribution points in the United States.

List prices.--The table on the following page shows the current list prices in the United States (to end users) for all small-ship marine radar systems marketed by Raytheon or imported from the United Kingdom. Table 1 lists various specifications for these and other models, and shows U.S. shipments of each model during January-August 1978 and January-August 1979. Table 5 shows changes in Raytheon's and IDM's list prices and in the weighted average prices received by each firm for sales of specified models to dealers, by quarters, during 1976-78 and January-August 1979.

---

<sup>1/</sup> As indicated previously, the domestic producer and both importers of small-ship marine radar systems produced in the United Kingdom sell such products almost entirely to dealers (other than sales by Raytheon to Government agencies).

Small-ship marine radar systems: List prices in the United States, by specified producer and by model, as of Oct. 1, 1979

Raytheon Marine Co.		Decca Radar Ltd.		Electronic Laboratories	
Model	List price	Model	List price	Model	List price
2600 <u>1/</u> -----	\$3,295	050-----	\$3,250	Seascan-----	\$2,995
2700 <u>1/2/</u> -----	3,995	060-----	3,695	Seaveyor-----	<u>3/</u> 4,395
3100-----	4,495	090 <u>4/</u> -----	4,995	Do-----	<u>5/</u> 4,695
3900-----	5,395	110-----	6,295		
6410/4U <u>1/4/</u> -	7,995	914-----	8,795		
1025/4X <u>6/</u> ---	8,750	916-----	9,595		
6425/6U <u>1/4/</u> -	8,895	926 <u>6/</u> -----	10,995		
1025/6X <u>6/</u> ---	9,250	929 <u>6/</u> -----	11,995		
1025/9X <u>6/</u> ---	10,100				

1/ Model is imported from Japan and resold in the United States by Raytheon.

2/ Model was discontinued in late 1979 and replaced by model 2800 (also imported from Japan), whose list price is \$3,795

3/ With 3-foot antenna.

4/ New model introduced in late 1979.

5/ With 4 1/2-foot antenna.

6/ Model is outside Treasury's definition of certain marine radar systems.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Comparability of models and domestic and import prices.--The technical specifications of various marine radar systems marketed by Raytheon and the importers/distributors vary widely, as does the emphasis placed upon such specifications by these firms. As a result, direct price comparisons between different models are of limited validity since no two models are exactly the same. Judging the comparability of individual models is additionally complicated by the fact that manufacturers frequently make improvements to or variations of existing models, as well as introducing new "generations" of such products. Among the factors which figure prominently in rating the competitiveness of the models stressed at the Commission's hearing, including the current list price and certain easily recognizable technical specifications, are those shown in the table on the following page. As indicated, the Decca 060 and the Raytheon 2600 (imported from Japan and resold by Raytheon) are alike in display size, peak power output, antenna size, and range. The Raytheon 3100 uses more than twice the power for an 8-mile (33 percent) increase in range. The Decca 050 is similar to the Decca 060 and the Raytheon 2600 in most specifications. The Decca 050, the Decca 060, and the Raytheon 2600 are priced in a similar range, from \$3,250 to \$3,695, 1/ while the

1/ Two other models imported from Japan--the Furuno FR-240 and the Koden 5/7--are within this price range. Both models have proven to be formidable competitors of models sold by Raytheon, IDM, and Epsco; as shown in table 1, both posted large gains in sales volume in January-August 1979 in comparison with the corresponding period in 1978. A-28

Certain marine radar systems: Technical specifications for models stressed at the Commission's hearing, and list prices in the United States for such models as of Oct. 1, 1979

Producer and model	List price <u>1/</u>	Display size	Peak power output	Antenna size	Maximum range
		<u>Inches</u>	<u>Kilowatts</u>	<u>Feet</u>	<u>Miles</u>
Raytheon 3100-----	\$4,495	7	7	2.5	32
Raytheon 2700 <u>2/3/</u> -----	3,995	7	5	2.5	24
Decca 060-----	3,695	6	3	2.5	24
Raytheon 2600 <u>3/</u> -----	3,295	6	3	2.5	<u>4/</u> 24
Decca 050-----	3,250	6	3	2.5	12

1/ As of Oct. 1, 1979.

2/ Model was discontinued in late 1979.

3/ Model is imported from Japan by Raytheon and resold in the United States.

4/ The Raytheon 2600 originally had a 16-mile range; it was subsequently increased to 24 miles.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Raytheon 3100 retails for more than \$4,000. Appendix D contains a comparison of certain published specifications of several Raytheon and Decca small-ship marine radar systems, and an evaluation of the expected performance of such models. As indicated, the Raytheon 3100 is significantly better in expected performance than the Decca 060 or the Raytheon 2600.

The subject marine radar systems are sold primarily in three markets, namely the sailboat market, the recreational powerboat market, and the fishing boat market. Industry sources indicate that a 10-mile range is necessary in the recreational and fishing boat markets, while longer ranges are required for transatlantic and defense ships. Raytheon is under contract with the U.S. Coast Guard to supply acceptable radars, but according to one trade source, the Coast Guard \* \* \*. Raytheon has subsequently made the \* \* \*, which means that such units may be competing directly with the Raytheon 2600, the Decca 060, and the Decca 050.

During the Commission's hearing there was general agreement by the parties concerned that in February 1978 IDM made a substantial reduction in its prices on the model 060 (table 5). Dealers that were interviewed claimed that until the Decca price reduction, the Raytheon 3100 was competitive with the Decca 060, even though the latter sold for \$450 less. Such dealers felt that the price differential was largely offset by Raytheon's better warranty, 1/ greater power, and longer effective range. However, when IDM lowered the list price of the

1/ IDM offers a 2-year warranty on parts (excluding magnetrons, which are for 1 year) and 6 months on labor; Raytheon currently offers a similar warranty on parts, but gives 1 year on labor.

Decca 060 by \$550 to \$2,995 (\$1,000 less than the Raytheon 3100, as shown in table 5) and extended larger discounts to its dealers, the Raytheon 3100 was reportedly unable to compete effectively with the Decca 060.

In addition, in February 1978 Raytheon introduced its Japanese-made 2600 model. That model initially had a 16-mile range, but it was subsequently increased to 24 miles, making its specifications equivalent to those of the Decca 060. IDM claims that it was forced to lower the price of its 060 model in order to compete with the Raytheon 2600. Weighted average prices received for sales of specified Raytheon and Decca models to dealers are shown in table 5 and in figure 2 on the following page.

The increase in the list price of the Raytheon 3100 for the year ending October 1, 1979, was about 5 percent, while most other models in Raytheon's line increased by approximately 10 percent in list price. During the period covered by Treasury's investigation, the margin of underselling between the Decca 060 and the Raytheon 3100 ranged from \* \* \* percent to \* \* \* percent on a weighted average price basis (table 5), while the LTFV margins found by Treasury on the Decca 060 ranged from \* \* \* percent to \* \* \* percent (as a percent of fair-market value). In terms of dollars, these LTFV margins on the Decca 060 ranged from \* \* \* to \* \* \*.

Figure 2.--Certain marine radar systems: Weighted average prices received for sales of specified models to dealers, by quarters 1976 and 1977, by months 1978 and January-August 1979

\* \* \* \* \*



APPENDIX A

TREASURY'S LETTERS TO THE COMMISSION  
CONCERNING LTFV SALES



THE GENERAL COUNSEL OF THE TREASURY  
WASHINGTON, D.C. 20220.

AUG 16 1979

79 AUG 17 PM 3 00


Dear Mr. Chairman:

In accordance with section 201(a) of the Antidumping Act, 1921, as amended, you are hereby advised that marine radar systems from the United Kingdom are being, or are likely to be, sold at less than fair value within the meaning of the Act.

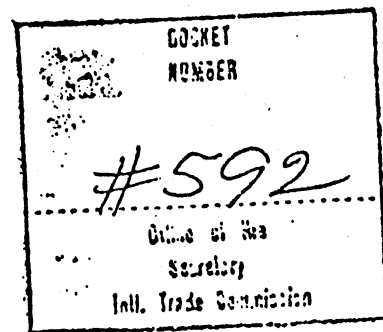
The U.S. Customs Service will make available to the International Trade Commission as promptly as possible the file on sales or likelihood of sales at less than fair value of marine radar systems subject to this determination. The file is for the Commission's use in connection with its investigation as to whether an industry in the United States is being, or is likely to be, injured, or is prevented from being established, by reason of the importation of this merchandise into the United States.

Because some of the data in this file is regarded by the Customs Service to be of a confidential nature, it is requested that the Commission consider all information therein contained for the official use of the Commission only, and not to be disclosed to others without prior clearance with the Customs Service.

Sincerely,

  
David R. Brennan  
Acting General Counsel

The Honorable  
Joseph O. Parker  
Chairman, U.S. International  
Trade Commission  
Washington, D.C. 20436







THE GENERAL COUNSEL OF THE TREASURY  
WASHINGTON, D.C. 20220

OCT 31 1979

Dear Mr. Chairman:

In a letter dated August 16, 1979, the Treasury Department informed the International Trade Commission of its determination that "marine radar systems from the United Kingdom are being, or are likely to be, sold at less than fair value within the meaning of the [Anti-dumping] Act."

The Federal Register notice of that determination, published on August 22, 1979, (44 FR 49322), accompanied the letter. That notice indicated that in the case of Electronic Laboratories, Ltd., one of the two companies involved in the investigation, various adjustments had been disallowed because sufficient documentation of those claims had not been received as of that date. As a result, Treasury reported to the Commission that Electronic Laboratories was found to have sold marine radar systems in the United States at less than fair value. A margin of 7.3 percent was found on 72 percent of the sales made by that company; the weighted-average margin over all sales compared was 5.2 percent.

Information lacking at the time of the final determination with respect to Electronic Laboratories has recently been verified and analyzed by the Customs Service. Treasury has determined that an adjustment of the margins calculated is appropriate based on that evidence. Consequently, we now wish to inform the Commission that Electronic Laboratories has not been found to have sold marine radar systems in the United States at less than fair value. In accordance with section 159.38 of the Customs Regulations (19 CFR 159.38), Electronic Laboratories will be excluded from a "Finding of Dumping," should that action become necessary following the Commission's review of this case.

I regret that this change should occur at such a late date in the Commission's consideration of the marine radar systems case. However, the Commission staff has already been informally notified of this change and, I understand, has made note of it in the staff's report to the Commissioners.

Sincerely,

Robert H. Mundheim

The Honorable  
Joseph O. Parker, Chairman  
U.S. International Trade Commission  
Washington, DC 20436



APPENDIX B

NOTICE OF THE COMMISSION'S  
INVESTIGATION AND HEARING

UNITED STATES INTERNATIONAL TRADE COMMISSION  
Washington, D.C.

[AA1921-210]

## Certain Marine Radar Systems from the United Kingdom

## Notice of Investigation and Hearing

Having received advice from the Department of the Treasury on August 17, 1979, that certain marine radar systems (provided for in item 685.60 of the Tariff Schedules of the United States (TSUS)) from the United Kingdom are being, or are likely to be, sold at less than fair value, the United States International Trade Commission, on August 27, 1979, instituted investigation No. AA1921-210 under section 201(a) of the Antidumping Act, 1921, as amended (19 U.S.C. 160(a)), to determine whether an industry in the United States is being or is likely to be injured, or is prevented from being established, by reason of the importation of such merchandise into the United States.

For purposes of the Treasury Department's determination "certain marine radar systems" means X-band radar systems provided for in item 685.60, Tariff Schedules of the United States, designed principally for boat or ship installation with direct current power supply from 6 to 60 volts, having a maximum viewable display dimension of less than 11 inches, and having an antenna assembly with transmitter-receiver permanently affixed, and parts thereof; all the foregoing, whether such radar system components are imported together as units or separately.

Public hearing. A public hearing in connection with this investigation will be held on Wednesday, October 10, 1979, in the Commission's Hearing Room, U.S. International Trade Commission Building, 701 E Street, NW., Washington, D.C. 20436, beginning at 10 a.m., e.d.t. All interested persons will be afforded an opportunity to be present, to appear by counsel or in person, to provide information, and to be heard at such hearing. Requests to appear at the hearing should be received in writing in the office of the Secretary to the Commission,

United States International Trade Commission, 701 E Street, NW., Washington, D.C., not later than noon, Friday, October 5, 1979.

Written statements. Interested parties may submit statements in writing in lieu of, or in addition to, appearing at the public hearing. A signed original and nineteen true copies of such statements should be submitted. Requests for confidential treatment should be directed to the attention of the Secretary. Any business information which a submitter wishes the Commission to treat as confidential should be clearly marked "Confidential Business Data." Submitters seeking confidential treatment must conform with the requirements of section 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). Should a request for confidential treatment be denied, the submission will be returned to the submitting party.

All written submissions, except for confidential business data, will be made available for inspection by interested persons. To assure that such statements are given due consideration by the Commission, such statements should be received not later than the close of business, Friday, October 19, 1979.

By order of the Commission.

  
Kenneth R. Mason  
Secretary



APPENDIX C  
STATISTICAL TABLES

Table 1.--Certain marine radar systems: Various specifications for particular models sold in the United States

Country of origin	Model	Current list price <u>1/</u>	Display size	Peak power output	Antenna size	Maximum range	U.S. shipments in Jan.-Aug.--	
							1978	1979
			Inches	Kilowatts	Feet	Miles	Units	Units
U.K.	Epsco Seascan	\$2,995	6	3	2.5	16	***	***
U.K.	Decca 050	3,250	6	3	2.5	12	***	***
Japan	Raytheon 2600 <u>2/</u>	3,295	6	3	2.5	24	***	***
Japan	Koden 5/7	3,495	7	5	3	32	***	***
U.K.	Decca 060	3,695	6	3	2.5	24	***	***
Japan	Furuno FR-240	3,695	7	3	3	24	<u>3/</u>	***
Japan	Raytheon 2700 <u>2/4/</u>	3,995	7	5	2.5	24	***	***
U.K.	Epsco Seaveyor	4,395	8.5	3	3	36	***	***
U.S.	Raytheon 3100	4,495	7	7	2.5	32	***	***
U.K.	Decca 090 <u>5/</u>	4,995	8.5	3	2.5	36	***	***
U.S.	Raytheon 3900	5,395	7	7	4	32	***	***
Japan	Furuno FR-701 <u>6/</u>	5,495	7	5	4	48	***	***
Japan	Furuno FRS-24	5,695	7	7	3	24	<u>7/</u>	***
Japan	Furuno FRS-36E	5,995	7	7	4	36	<u>7/</u>	***
Japan	Koden 20/22	5,995	7	6	4	48	***	***
U.K.	Decca 110	6,295	7	3	4	36	***	***
Japan	Furuno FR-711 <u>6/</u>	6,595	7	10	4	72	***	***
Japan	Furuno FRS-48	6,995	7	7	6.5	48	<u>7/</u>	***
Japan	Furuno FR-1011 <u>6/</u>	7,995	10	10	6.5	72	***	***
Japan	Raytheon 6410/4U <u>2/</u>	7,995	10	10	4	<u>8/</u>	***	***
Japan	Koden 23	7,995	10	10	4	48	***	***
U.S.	Raytheon 1025/4X <u>9/</u>	8,750	10	20	4	48	***	***
U.K.	Decca 914	8,795	9	7	4	48	***	***
Japan	Furuno FRM-64	8,795	10	10	6.5	48	<u>7/</u>	***
Japan	Raytheon 6425/6U <u>2/</u>	8,895	10	25	6	<u>8/</u>	***	***
U.S.	Raytheon 1025/6X <u>9/</u>	9,250	10	20	6	48	<u>10/</u>	<u>10/</u>
U.K.	Decca 916	9,595	9	7	6	48	***	***
U.S.	Raytheon 1025/9X <u>9/</u>	10,100	10	20	9	48	<u>10/</u>	<u>10/</u>
U.K.	Decca 926 <u>9/</u>	10,995	9	25	6	48	***	***
U.K.	Decca 929 <u>9/</u>	11,995	9	25	9	48	***	***

1/ Effective as of Oct. 1, 1979.

2/ Model is imported from Japan by Raytheon and resold in the United States.

3/ Not available; Furuno model 240 replaced its model KRA-116, which was marketed in the United States by the Konel Corp. The latter was acquired by Furuno U.S.A., Inc., on Oct. 1, 1978.

4/ Model was discontinued in late 1979 and replaced by model 2800, which is also imported from Japan.

5/ New model introduced in late 1979.

6/ New model introduced in mid-1979; shipments shown for Jan.-Aug. 1979 were made entirely in August.

7/ Not available; see footnote 3.

8/ Not known at this time; model was introduced in late 1979.

9/ Model is outside Treasury's definition of "certain marine radar systems."

10/ Included in shipments of Raytheon model 1025/4X.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.



Table 2.--Radar apparatus designed for boat or ship installation: U.S. imports for consumption, by principal sources and by months, 1978, and January-July 1979

Year and month	Total	United Kingdom	Japan	Canada	Italy	Federal Republic of Germany	Other
Quantity (units)							
1978:							
January-----	1,230	116	956	0	118	0	40
February-----	2,156	250	1,888	0	0	6	12
March-----	876	609	247	9	3	2	6
April-----	1,336	527	773	15	12	8	1
May-----	1,427	752	665	0	0	0	10
June-----	2,576	426	651	241	0	1	1,257
July-----	892	216	654	6	15	1	0
August-----	1,283	176	1,105	1	0	0	1
September-----	748	250	285	0	1	3	209
October-----	842	189	640	8	1	4	0
November-----	616	223	379	0	0	2	12
December-----	699	190	497	0	10	2	0
1979:							
January-----	2,400	484	490	12	0	14	1,400
February-----	529	125	369	7	10	0	18
March-----	1,154	143	989	9	10	3	0
April-----	945	333	610	0	0	2	0
May-----	867	343	462	32	26	1	3
June-----	352	25	309	0	18	0	0
July-----	684	78	601	4	0	1	0
Value (1,000 dollars)							
1978:							
January-----	580	202	341	-	24	-	13
February-----	1,249	760	456	-	-	32	1
March-----	2,486	1,675	619	134	16	10	30
April-----	2,631	890	1,491	133	83	33	1/2
May-----	1,486	689	795	-	-	-	4
June-----	2,512	1,124	1,313	65	-	6	-
July-----	1,726	491	1,132	100	2	1/	-
August-----	1,923	391	1,530	1	-	-	1
September-----	1,480	834	595	-	1/	40	11
October-----	1,593	498	971	80	1	44	-
November-----	1,452	596	842	-	-	12	2
December-----	1,832	482	1,263	-	77	10	-
1979:							
January-----	2,186	1,342	590	126	-	121	6
February-----	1,256	338	730	76	101	-	10
March-----	2,707	388	2,185	104	12	19	-
April-----	1,831	1,321	488	-	-	22	-
May-----	2,022	929	863	18	197	14	1
June-----	860	44	673	-	144	-	-
July-----	1,493	247	1,214	11	-	20	-

1/ Less than \$500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Because of rounding, figures for value may not add to the totals shown above.

Table 3.--Radar apparatus designed for boat or ship installation: U.S. imports for consumption, by specified sources and by customs districts, 1978

Customs district	Total	United Kingdom	Japan	Canada	Italy	Federal Republic of Germany	Other
Quantity (units)							
Portland, Maine-----	4	1	2	1	0	0	0
St. Albans, Vt-----	1	0	0	1	0	0	0
Boston, Mass-----	878	447	285	0	117	0	29
Ogdensburg, N.Y-----	32	0	0	32	0	0	0
Buffalo, N.Y-----	287	0	0	244	0	0	43
New York, N.Y-----	904	503	396	0	0	0	5
Philadelphia, Pa-----	222	1	210	0	0	1	10
Baltimore, Md-----	17	1	16	0	0	0	0
Norfolk, Va-----	65	0	44	0	21	0	0
Wilmington, N.C-----	3	0	0	0	3	0	0
Tampa, Fla-----	1,555	449	1,106	0	0	0	0
Mobile, Ala-----	2	0	2	0	0	0	0
New Orleans, La-----	440	436	1	0	1	0	2
Port Arthur, Tex-----	2	1	0	0	1	0	0
Los Angeles, Calif--	1,788	454	1,131	1	2	0	200
San Francisco,							
Calif-----	6,953	367	5,329	0	0	0	1,257
Portland, Oreg-----	20	0	20	0	0	0	0
Seattle, Wash-----	806	678	127	1	0	0	0
Minneapolis, Minn---	1	1	0	0	0	0	0
Chicago, Ill-----	1	1	0	0	0	0	0
Detroit, Mich-----	1	0	1	0	0	0	0
Miami, Fla-----	578	559	18	0	0	0	1
Houston, Tex-----	63	18	2	0	15	28	0
Washington, D.C-----	58	7	50	0	0	0	1
Total-----	14,681	3,924	8,740	280	160	29	1,548
Value (1,000 dollars)							
Portland, Maine-----	8	1	6	1	-	-	-
St. Albans, Vt-----	11	-	-	11	-	-	-
Boston, Mass-----	1,079	547	521	-	8	-	3
Ogdensburg, N.Y-----	332	-	-	332	-	-	-
Buffalo, N.Y-----	170	-	-	163	-	-	7
New York, N.Y-----	1,113	886	225	-	-	-	2
Philadelphia, Pa-----	361	1	359	-	-	1/	1
Baltimore, Md-----	8	2	7	-	-	-	-
Norfolk, Va-----	336	-	160	-	176	-	-
Wilmington, N.C-----	16	-	-	-	16	-	-
Tampa, Fla-----	3,625	1,437	2,188	-	-	-	-
Mobile, Ala-----	11	-	11	-	-	-	-
New Orleans, La-----	2,060	2,049	1/	-	1	-	10
Port Arthur, Tex-----	8	8	-	-	1/	-	-
Los Angeles, Calif--	2,644	550	2,082	2	1/	-	10
San Francisco,							
Calif-----	5,503	22	5,477	-	-	-	4
Portland, Oreg-----	31	-	31	-	-	-	-
Seattle, Wash-----	1,347	1,093	250	4	-	-	-
Minneapolis, Minn---	1/	1/	-	-	-	-	-
Chicago, Ill-----	4	4	-	-	-	-	-
Detroit, Mich-----	5	-	5	-	-	-	-
Miami, Fla-----	2,055	2,020	9	-	-	-	26
Houston, Tex-----	197	8	1	-	2	186	-
Washington, D.C-----	23	5	16	-	-	-	2
Total-----	20,952	8,632	11,350	514	204	186	66

1/ Less than \$500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Because of rounding, figures for value may not add to the totals shown above.

Table 4.--Certain marine radar systems: U.S. imports from the United Kingdom, by importer and by model, 1974-78, January-August 1978, and January-August 1979

Importer and model	1974	1975	1976	1977	1978	Jan.-Aug.--	
						1978	1979
Quantity (units)							
ITT Decca Marine, Inc:							
050-----	***	***	***	***	***	***	***
060-----	***	***	***	***	***	***	***
110-----	***	***	***	***	***	***	***
914-----	***	***	***	***	***	***	***
916-----	***	***	***	***	***	***	***
926-----	***	***	***	***	***	***	***
929-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
Epsco, Inc: <sup>1/</sup>							
Seascan-----	***	***	***	***	***	***	***
Seaveyor-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
Total, both importers-----	***	***	***	***	***	***	***
Value (1,000 dollars)							
ITT Decca Marine, Inc:							
050-----	***	***	***	***	***	***	***
060-----	***	***	***	***	***	***	***
110-----	***	***	***	***	***	***	***
914-----	***	***	***	***	***	***	***
916-----	***	***	***	***	***	***	***
926-----	***	***	***	***	***	***	***
929-----	***	***	***	***	***	***	***
Parts for above Decca models-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
Epsco, Inc: <sup>1/</sup>							
Seascan-----	***	***	***	***	***	***	***
Seaveyor-----	***	***	***	***	***	***	***
Parts for Seascan and Seaveyor models-----	***	***	***	***	***	***	***
Total-----	***	***	***	***	***	***	***
Total, both importers-----	***	***	***	***	***	***	***

<sup>1/</sup> Epsco, Inc., began importing from the United Kingdom in April 1977, when it bought out the firm (Brocks Electronics Corp.) that had previously imported from Electronic Laboratories, Ltd.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

Table 5.--Certain marine radar systems: List prices to end users and weighted average prices received by the Raytheon Marine Co. and by ITT Decca Marine, Inc., for sales of specified models to dealers, by quarters, 1976-78 and January-August 1979

Firm and model no.	(Dollars per unit)														
	1976			1977			1978			1979					
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	July-Aug.
List prices to end users															
Raytheon:															
2600-----	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2700-----	3,695	3,695	3,695	3,695	3,332	3,150	3,150	3,150	3,495	3,495	3,495	3,495	2,795	2,995	3,245
3100-----	4,395	4,428	4,495	4,495	4,161	3,995	3,995	3,995	3,995	3,995	3,995	4,295	3,795	3,795	3,995
3900-----	4,995	4,995	4,995	4,995	4,662	4,495	4,495	4,495	4,495	4,495	4,495	4,795	4,295	4,295	4,495
ITT Decca:															
050-----	2,995	2,795	2,795	2,595	2,795	2,795	2,795	2,795	2,795	2,795	2,795	2,895	2,895	2,895	3,250
060-----	3,460	3,545	3,545	3,545	3,545	3,545	3,545	3,545	2,995	2,995	2,995	3,395	3,395	3,395	3,695
110-----	4,995	4,995	4,995	4,995	4,695	4,695	4,695	4,695	4,695	4,695	4,695	5,295	5,295	5,295	6,295
914-----	7,495	8,355	8,355	6,995	6,995	7,495	7,495	7,495	7,495	7,495	7,495	8,135	8,135	8,135	8,795
916-----	8,435	9,120	9,120	7,635	7,635	8,135	8,135	8,135	8,135	8,135	8,135	9,295	9,295	9,295	9,595
Weighted average prices received for sales to dealers															
Raytheon:															
2600-----	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2700-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3100-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
3900-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
ITT Decca:															
050-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
060-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
110-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
914-----	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
916-----	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/	1/

1/ Included in prices shown for model 914.

Source: Compiled from data submitted in response to questionnaires of the U.S. International Trade Commission.

APPENDIX D

COMPARISON OF PUBLISHED SPECIFICATIONS AND EVALUATION OF  
EXPECTED PERFORMANCE OF CERTAIN RAYTHEON AND DECCA  
SMALL-SHIP MARINE RADAR SYSTEMS

The following evaluation of the expected performance of six specified models of Raytheon and Decca small-ship marine radar systems was made by the Commission's staff based upon an analysis of the published specifications for such models. Certain comparative specifications and characteristics, which were taken from published brochures and sales literature issued by ITT Decca Marine, Inc., and by the Raytheon Marine Co., are shown in the attached table (page A-50). Neither retail nor wholesale prices were considered in the analysis.

In summary, the subject marine radar systems may be segregated into two groups according to design criteria and expected level of performance. The Raytheon 3100, the Raytheon 3900, and the Decca 110 are significantly better in overall expected performance than the Decca 060, the Decca 090, or the Raytheon 2600.

#### Lower Performance Group

Referring to the table, the first three radars--the Decca 090, the Decca 060, and the Raytheon 2600--are less capable of target identification than the last three radars. The Decca 090, despite a larger viewing screen, is quite similar to the Decca 060 and could be expected to be only marginally better in performance than the Decca 060.

These less sophisticated radars are characterized by low peak transmitter power output, short antenna lengths suitable for enclosure in small, streamlined radomes, simple transmitter-receiver units, and lower power input. Low power input is a consequence of the first three characteristics. Assuming that radar receivers are capable of about the same performance (as shown in the specifications), then transmitter peak power and antenna length (closely related to antenna gain) determine the maximum expected detection range (all other parameters such as antenna height, target size, and target height being the same). With respect to the transmitter-receiver specifications, both Decca units represent a design compromise, with their single pulse repetition rate and single intermediate frequency bandwidth. 1/ Overall performance, however, should be quite adequate.

The Decca 090 has a larger display screen than the Decca 060 or the Raytheon 2600 and is advertised as having a maximum range of 36 nautical miles. However, the normal maximum range is 24 miles. An expansion to 36 miles can be obtained only by depressing a spring-loaded push button. In the transmitter is momentarily overloaded, 2/ then the 36 mile scale may be of some use. Otherwise, only abnormal atmospheric conditions (superrefraction of the radar waves) can be expected to produce echoes from vessels at ranges in excess of 24 miles. Therefore, the Decca 090 has been grouped with the lower performance radars.

---

1/ Cost is a likely factor in the selection of this design.

2/ This is not stated in the published data, but it is likely to be the method used.

The Raytheon 2600 also appears to have some engineering compromises. This radar has the shortest antenna length, approximately 24 inches (estimated). As would be expected, the horizontal beam width is somewhat greater than that for longer antennas. Although the antenna gain figure is not published, it should be less than that for longer antennas. On the other hand, the radar transmitter has two pulse rates, the higher for the shorter ranges. Once again, considering its intended use, overall performance should be quite adequate for this popular radar.

#### Higher Performance Group

The three radars grouped in the higher performance category are the Raytheon 3100, the Raytheon 3900, and the Decca 110. The grouping of these radars could be challenged on the grounds of dissimilar characteristics, but these radars are essentially a cut above and readily distinguishable from the previous group.

These more sophisticated radars are characterized by higher peak power output (except the Decca 110), higher power input, receivers with I.F. bandwidth matched to transmitter pulse width, longer maximum detection ranges (except the Decca 110), and longer antennas (except the Raytheon 3100). With regard to these radars, it should be noted that the higher power consumption and the open antennas (except the Raytheon 3100) effectively limit the use of such units in the sailboat, small pleasureboat, and fishboat markets.

The Decca 110, a 3 kilowatt (K.W.) peak-power radar, is grouped with two 7 K.W. radars. The Decca 110 is normally shipped with a 48-inch open antenna (the 36-inch antenna given in the attached table is a less efficient option). It is generally true that the longer the antenna, the more it is able to concentrate the available transmitter power on the targets. Therefore, although the figures given in the table are for the optional 36-inch antenna, the radar with the more efficient 48-inch antenna is certainly capable of performance equivalent to the Raytheon 3100.

The Raytheon 3900 is included in this group of more sophisticated radars because it appears to be the parent of the 3100. In all aspects except the antenna, the 3100 and the 3900 appear technically equivalent. The 3900 radar with its heavier 48-inch open antenna consumes more power. This can be attributed to its larger antenna unshielded from the effects of relative wind velocity.

Specification	Model number and country of origin					
	Decca 090 U.K.	Decca 060 U.K.	Raytheon 2600 Japan	Raytheon 3100 U.S.	Decca 110 U.K.	Raytheon 3900 U.S.
General:						
Screen size 1/-----inches---	8.5	6	6	7	7	7
Power input (24 V/d.c.)-----watts---	2/ 110	2/ 110	80	216	170	264
Antenna enclosure-----radome---	radome	radome	radome	radome	open	open
Peak transmitter power output-----kilowatts---	3	3	3	7	3	7
Transmitter:						
Pulse repetition rate-----p.p.s.---	1) 1,500	1,500	1,200	1,500	1,500	1,500
	2) -	-	2,400	3,000	3,000	3,000
Pulse width-----microseconds---	1) 0.65	0.65	0.50	0.67	0.50	0.67
	2) .10	.10	.15	.10	.08	.10
Antenna:						
Type 3/-----c.f.---	c.f.	c.f.	c.f.	e.f.	c.f.	e.f.
Revolutions per minute-----	23	23	24	30	30	30
Length-----inches---	30	30	4/ 24	30	36	48
Weight (including transmitter-receiver)-----pounds---	57	57	35	44	114	100
Horizontal beam width-----degrees---	3.0	3.0	3.8	3.5	3	2
Gain-----db.---	25	25	5/ 24	24	24	5/ 24
Receiver:						
Type 6/-----Lin. B.M.---	Lin. B.M.	Lin. B.M.	Lin. B.M.	Lin. B.M.	Lin. B.M.	5/ 5/
Noise figure-----db.---	10	10	10	10	10	11
FTC 7/-----Yes---	Yes	Yes	Yes	Yes	Yes	Yes
STC 8/-----Yes---	Yes	Yes	Yes	Yes	Yes	Yes
I.F. bandwidth-----Single---	Single	Single	Single	Dual	Single	Dual
Maximum range 9/-----nautical miles---	10/ 24	24	24	32	4/ 30	32

1/ Size of cathode-ray tube, without magnifier.  
 2/ At 32 volts/direct current.  
 3/ C.F. means center feed; e.f. means end feed.  
 4/ Estimated.  
 5/ Not available.  
 6/ Lin. B.M. means linear balanced mixer.  
 7/ FTC means fast time constant.  
 8/ STC means sensitivity control.  
 9/ Calculated or theoretical.  
 10/ Can be extended to 36 nautical miles for brief periods of time.



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