

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES  
SAFETY EVALUATION OF DEVICE

NO.: NR-313-D-101-S

DATE: NOV 9 1993

PAGE 1 OF 4

DEVICE TYPE: Laser Target Designator/Ranger

MODEL: ~~117 Laser Designator~~ AN/AAS-38A LASER DESIGNATOR

MANUFACTURER/DISTRIBUTOR: LORAL AEROSPACE CORPORATION  
~~Ford Aerospace Corporation~~  
Aeronutronic Division  
Ford Road  
Newport Beach, CA 92658

SEALED SOURCE MODEL DESIGNATION: Amersham Model # AMM. ~~1001H~~

ISOTOPE:

Americium-241

MAXIMUM ACTIVITY:

9 microcuries

LEAK TEST FREQUENCY: Not required

PRINCIPAL USE: (0) Ion Generators, Static Eliminators

CUSTOM DEVICE:   X   YES        NO

CUSTOM USER: U.S. Department of Defense  
Principally the U.S. Navy

Copy

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DEVICE TYPE: Laser Target Designator/Ranger

DESCRIPTION:

AN/AAS-38A LASER

The Loral Aeronutronic Model ~~117~~ is used for laser target range and designation. This device is attached to the Loral Aeronutronic F/A-18 forward looking infrared (FLIR) Pod located on the outer surface of the left engine inlet on the U.S. Navy F/A-18 aircraft.

The device is contained in an environmental controlled cavity (AN/AAS-38A FLIR Pod). The device shown in Figure Nos. 1 and 2, contains two NRC-approved americium-241 (Am-241) sources (NR-136-S-~~174-1/2~~<sup>203</sup>), for the removal of static charge, one at each end of the laser's Q-Switch crystal permitting it to maintain its large characteristic discrimination ratio. The two sources are screwed and secured into the Optical Access Cover which is located on the laser transreceiver directly over the optics. The cover is an aircraft standard aluminum alloy machining, 7.5 inches long by 3.4 inches wide by 0.4 inches high, which mounts the sources. The optical elements of the laser are mounted within a sealed cavity directly below the cover. The cavity is approximately 1.7 inches deep and is also machined from aluminum. The sources are shown attached to the cover in Figure No. 5. The minimum thickness of the cover is .040 inches. The sources are placed approximately 1.5 inches apart and are threaded into the cover. An O-ring is placed between the chassis and cover. The cover is secured with seventeen screws and is opened only for depot maintenance. This prevents the ingress of moisture and the cavity is filled with dry nitrogen. Once assembled there is no ~~normal~~ access to the AM-241 sealed sources. 17?

The AM-241 foil disk is crimped within a cylindrical stainless steel (304) housing. This sealed source is then placed in an aluminum holder and then secured within an aluminum threaded cylinder which is appropriately marked. ?

LABELING:

Each source assembly will be labeled on the sides of the threaded holder with the following: serial number, isotope, activity and the trefoil radiation symbol. The Optical Access Cover will be labeled as shown in Figures No. 3 and 4. IN ACCORDANCE WITH 10 CFR 20.203 AND IT GRANTED A COLOR EXEMPTION.

DIAGRAM:

See Attachments 1 thru 4.

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DEVICE TYPE: Laser Target Designator/Ranger

CONDITIONS OF NORMAL USE:

The sealed sources have obtained an ANSI classification of C54545. The device is subjected to a military aircraft environment and is expected to have a service life of 15 years. The extremes of environment for which the device is designed to withstand are as follows: temperature -62°C to 95°C; vibrations 50-2000 Hertz; high humidity; salt fog; explosion; sand, dust, and fungus. Due to the sealed construction of both the Optical Module and the FLIR Pod, the device should not be affected by atmospheric conditions.

PROTOTYPE TESTING:

The manufacturer reports that the device was tested to MIL-specs except for salt, fog, and dust. The FLIR pod that has also been tested to meet military specifications (MIL-STD-810C). The device has been field tested in the configuration and with no incident of source failure.

EXTERNAL RADIATION LEVELS:

The manufacturer reports that there are no detectable radiation levels above background from the device.

QUALITY ASSURANCE AND CONTROL:

~~The quality control program for the~~ <sup>LITTON LASER SYSTEMS</sup> laser contained in the module is implemented by ~~Ferranti International. Ferranti International~~ <sup>LITTON LASER SYSTEMS</sup> has supplied an adequate quality assurance and control program that conforms to MIL-Q-9858A and NATO ~~A QAP-19~~. A copy of the quality requirements governing the supply of the sources is on file with the Material Licensing Branch.

A Certificate of Conformity ensuring that the device meets the design specifications is supplied with each source and further checked by the USA manufacturer. The USA manufacturer evaluates each component of the module to conform with MIL-specs.

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DEVICE TYPE: Laser Target Designator/Ranger

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

- o The devices shall be distributed only to the specific licensee referred to on this document (U.S. Department of Defense).
- o Handling, Storage, Use, Transfer, and Disposal: Shall be determined by the licensing authority.
- o Reviewer Note: Service to the inside of the Optical Module must also include a swipe test to determine if there is any removable contamination.
- o This registration sheet and the information contained with the references shall not be changed without the written consent of the NRC.

SAFETY ANALYSIS SUMMARY:

AN/AAS-38A LASER

Based on our review of the information and design of the device, the past history of the sealed source design, we conclude that Model ~~117A~~ device is acceptable for custom licensing purposes. Furthermore, we conclude that this device would be expected to maintain its containment for normal conditions of use which might occur during the uses specified in this registration sheet.

REFERENCES:

AN/AAS-38A

The following supporting documents for the Model ~~117A~~ Laser Target Designator are hereby incorporated by reference and are made a part of this registry document:

- Application dated September 13, 1988 with enclosures thereto.
- Letter dated October 7, 1988 with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: NOV 9 1988

Reviewer: Stacy B. Bell

Date: NOV 9 1988

Concurrence: Stacy B. Bell

NO.: NR-313-D-101-S

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Technical drawing of a source capsule assembly, showing a top view and a cross-sectional side view.

**Top View Dimensions:**

- Overall diameter:  $\phi 8.5$
- Inner diameter:  $\phi 7$

**Side View Dimensions:**

- Overall length: 15.5
- Distance from front face to center of source: 10
- Source diameter:  $\phi 5.54$
- Source length: 3.5
- Source thickness: 2.5
- Source inner diameter: 1.5
- Source outer diameter: 5.54
- Source inner diameter: 5.54
- Source outer diameter: 5.54
- Source inner diameter: 5.54
- Source outer diameter: 5.54

**Material Specifications:**

- Source: AMERICIUM 241 FOIL WITH PROTECTIVE GOLD RHELLADIUM ALLOY TO SPEC. 11583-00101 FOIL CAPSULE MATERIAL STAINLESS STEEL 304S15 OR AISI 304
- Housing (inner): STAINLESS STEEL 304S15 OR AISI 304
- Housing (outer): STAINLESS STEEL TYPE 304S15 OR AISI 304

**Assembly Notes:**

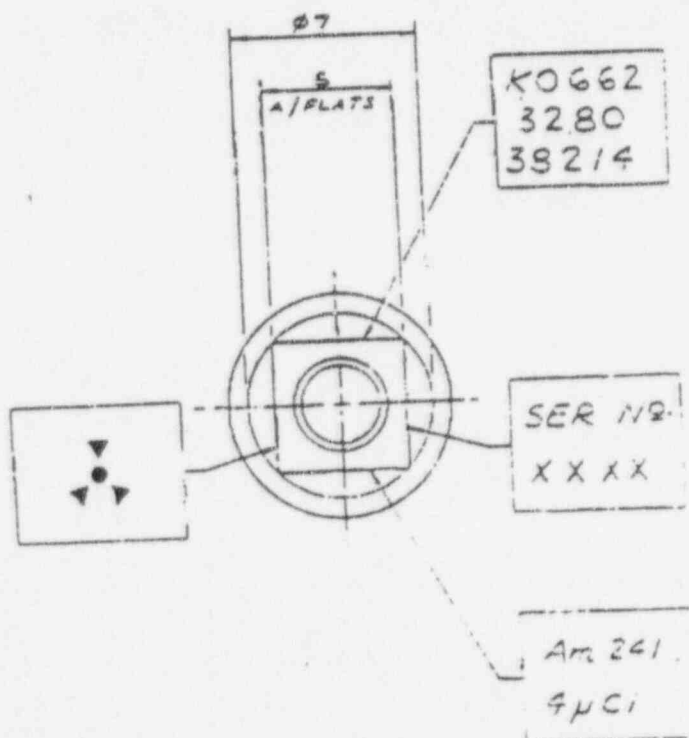
- TO BE BONDED IN POSITION USING ECCOBOND 45LV SEMI-RIGID MIX TO SPEC. WIS J11050.
- 6-32 UNC-2B TO BS 560 OR ASA B11

**Labels:**

- CAMPED EDGES
- AMERICIUM 241
- FOIL WITH PROTECTIVE GOLD RHELLADIUM ALLOY TO SPEC. 11583-00101
- FOIL CAPSULE MATERIAL STAINLESS STEEL 304S15 OR AISI 304
- HOUSING (INNER) MATERIAL STAINLESS STEEL 304S15 OR AISI 304
- HOUSING (OUTER) STAINLESS STEEL TYPE 304S15 OR AISI 304

**Text at bottom left:**

SUGGESTED SOURCE OR SUPPLY  
 AMERICIUM INTERNATIONAL PLC.  
 WHITE LION ROAD  
 AMERSHAM  
 BUCKINGHAMSHIRE HP7 9LL  
 UNITED KINGDOM  
 MANUFACTURED PART No AMMK 3377



See new  
PAGE  
FIGURE NO

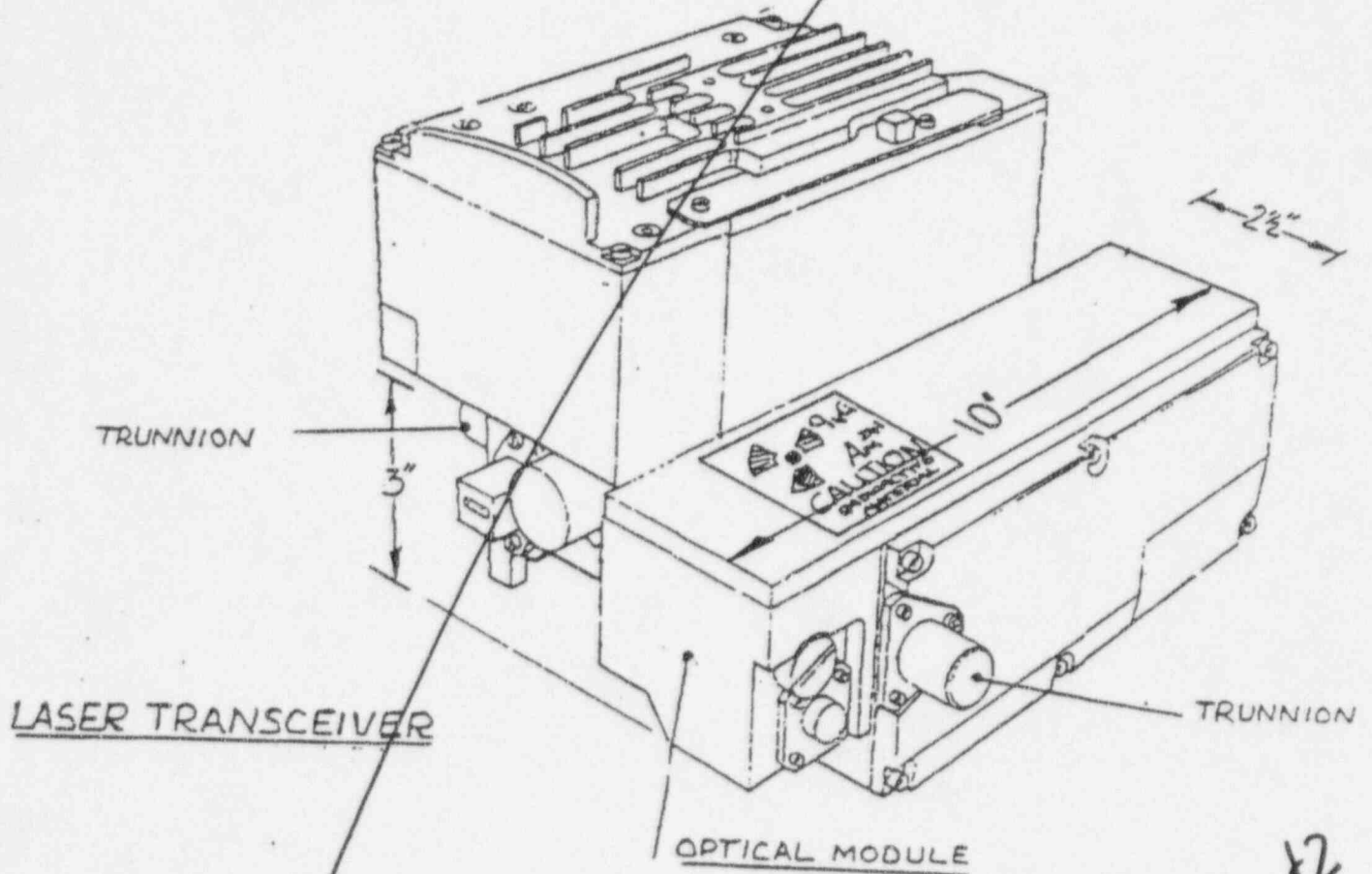
$$ZV M_{1/2}^{1/2} \approx 0.5$$

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ATTACHMENT 3



*Replace  
BY FIGURES 1 & 2*

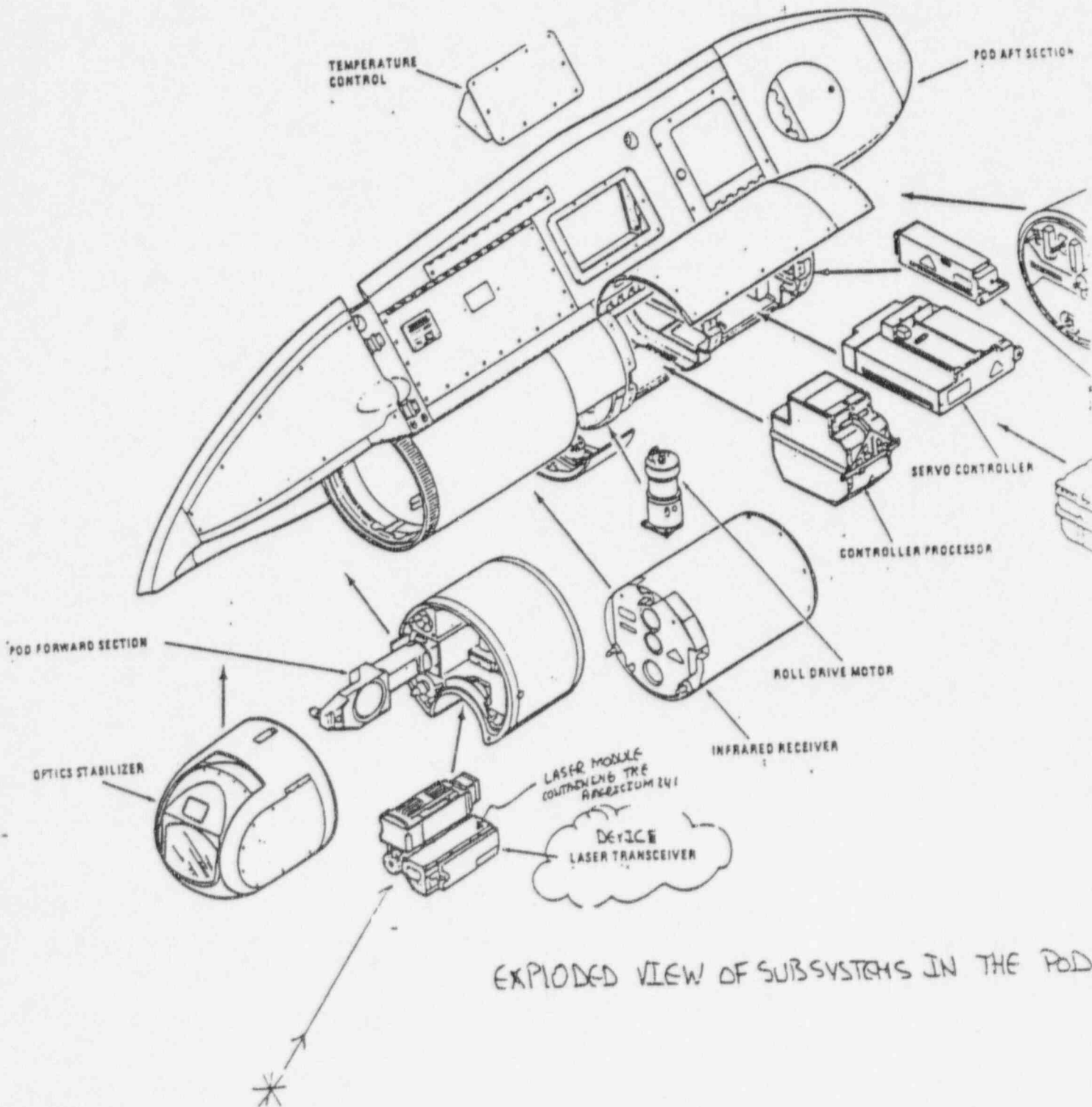


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ATTACHMENT 4



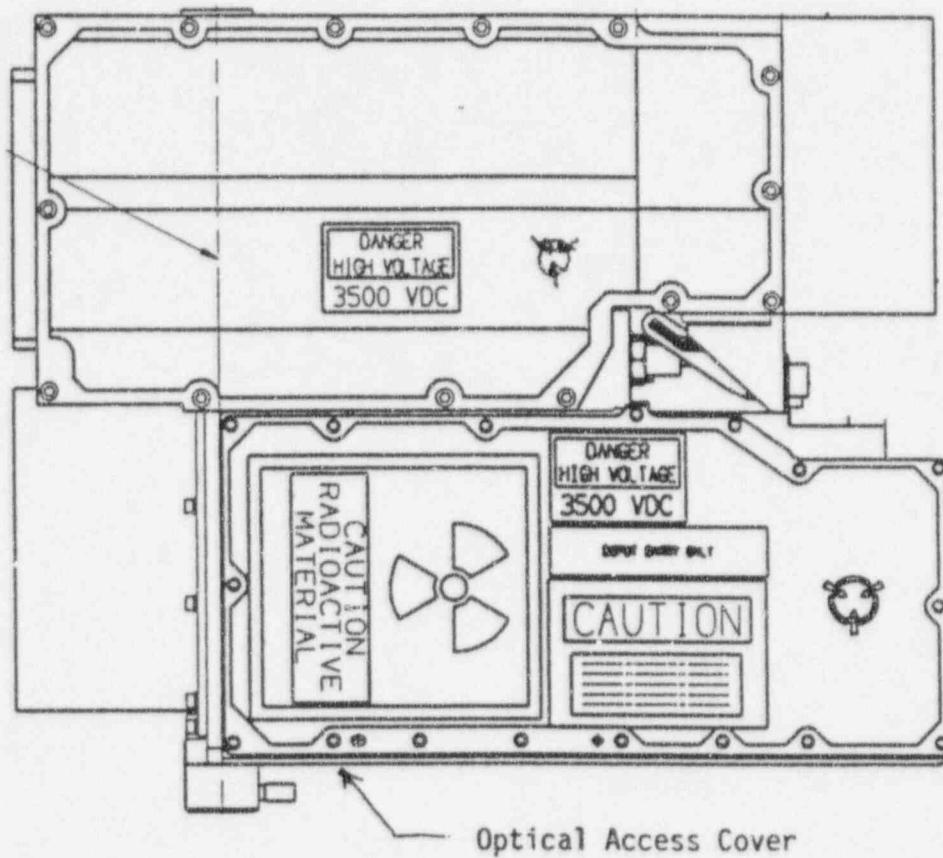


Figure No. 1 Laser Transceiver (Top View)



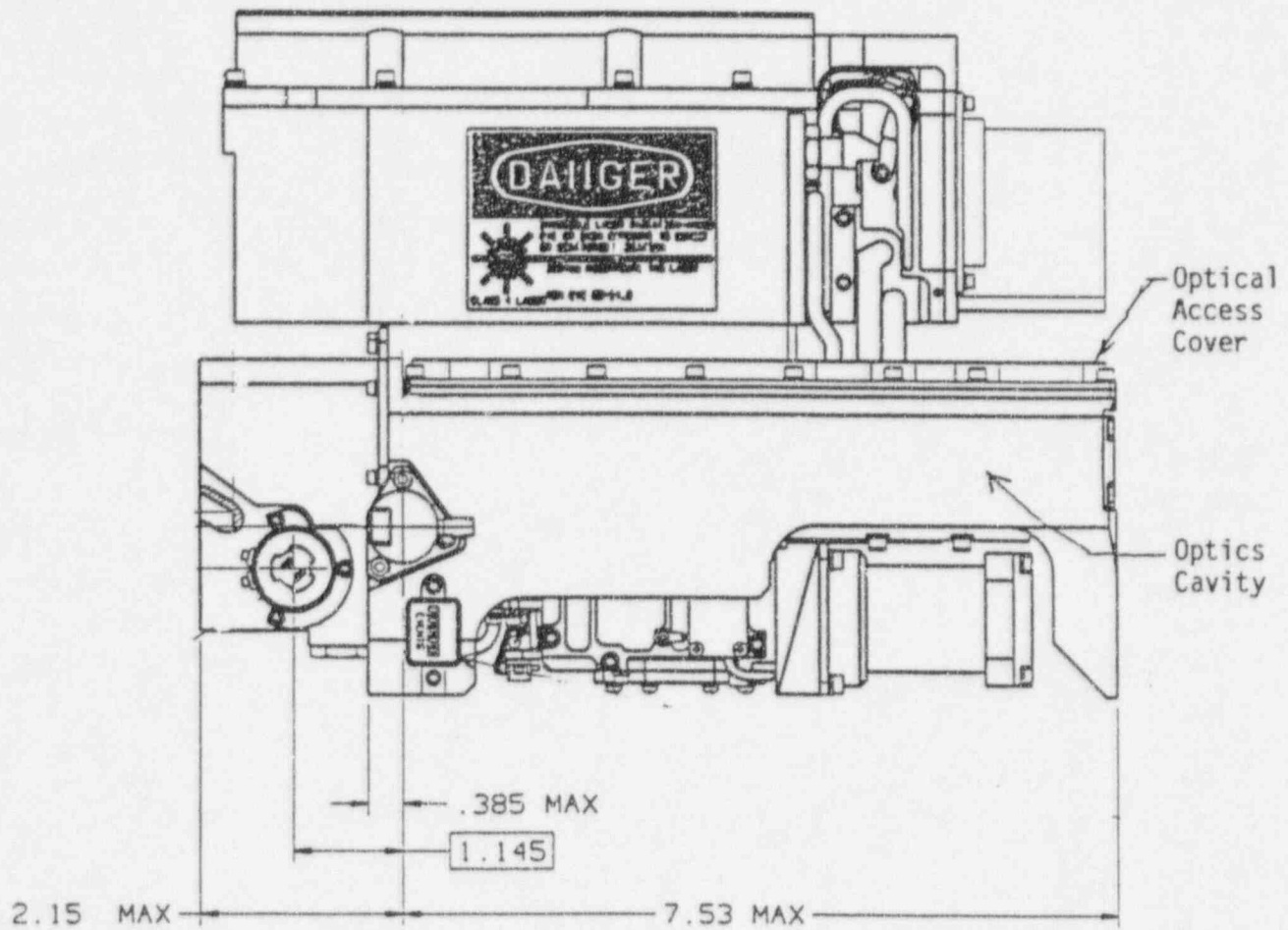


Figure No. 2 Laser Transceiver (Side View)

6/6/91

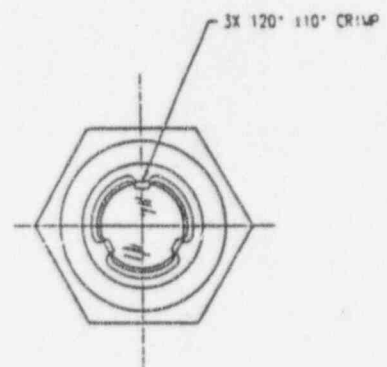
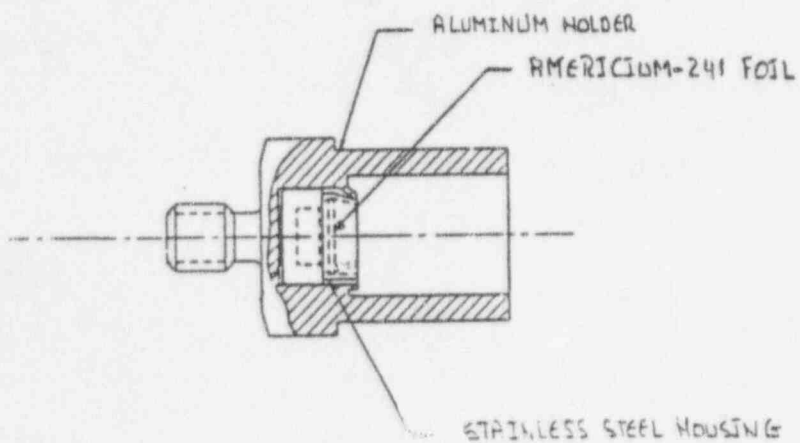
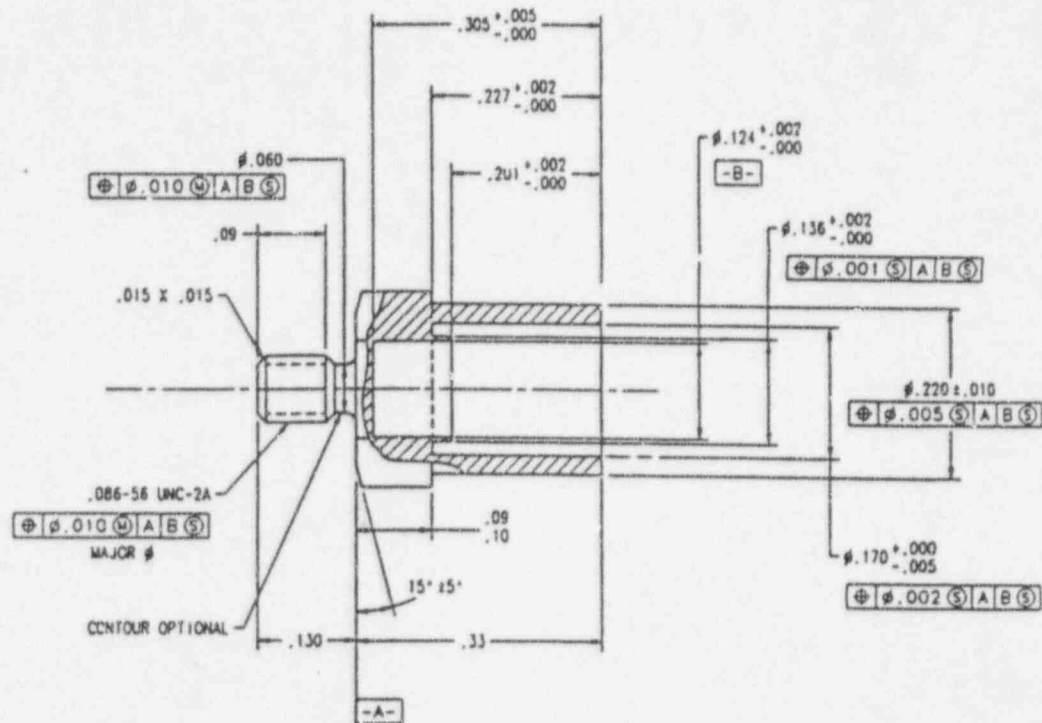


Figure No. 5. Sealed Source Assembly

6/6/91

# LORAL

Aeronutronic

Ford Road  
Newport Beach, CA 92658  
(714) 720-1700

M250-91-P245

April 2, 1991

U.S. Nuclear Regulatory Commission  
NMSS - MAILSUP 6-H-3  
Washington, DC 20555

Attention: Mr. T.W. Rich

Subject: Registry Certificate No. NR-313-D-101-S

Gentlemen:

Per your telephone conversation with R. Macare' on February 27, 1991 concerning a change of supplier of the device associated with Registry Certificate No. NR-313-D-101-S, accept the following as an update to the existing certificate:

1. New Supplier of Device: Litton Laser Systems  
P.O. Box 547300  
Orlando, FL 32854-7300

Old Supplier Was: Ferranti Defence Systems Ltd.  
Laser Systems Group  
Electro-Optics Dept.  
Robertson Avenue  
Edinburgh EH11 1PX U.K.

2. Distributor Name Change:

Was - Ford Aerospace Corporation  
Is - Loral Aerospace Corporation, Aeronutronic

3. Model Name Change:

Was - 117 Laser Designator  
Is - AN/AAS-38A Laser Designator

A red-lined copy of the current Certificate of Registration is attached to this letter along with change pages in order to further clarify the required changes due to change of supplier.

Your support in reviewing and updating the Certificate of