

REGISTRY OF RADIOACTIVE SEALED SOURCE AND DEVICES  
SAFETY EVALUATION OF DEVICE  
(AMENDED)

NO: NR-313-D-101-S

DATE: JUN 06 1991

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DEVICE TYPE: Laser Target Designator/Ranger

MODEL: 117 LASER DESIGNATOR

MANUFACTURER/DISTRIBUTOR:

Loral Aerospace Corporation, Aeronutronic  
Formerly Ford Aerospace Corporation  
Aeronutronic Division  
Ford Road  
Newport Beach, CA 92658

SEALED SOURCE MODEL DESIGNATION: Amersham Model AMM

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

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DESCRIPTION:

The Ford Aerospace Corporation Model 117 is used for laser target range and designation. This device is attached to the Ford Aerospace 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 contains two NRC-approved americium-241 (AM-241) sources Model AMM.1001H, for the removal of static charge, at the end of the laser's Q-Switch crystal permitting it to maintain its large characteristic discrimination ratio. The two sources are screwed and secured onto the lid of the Optical Module which is located on the laser transreceiver. The Optical Module is an aircraft standard aluminum alloy box, 8 inches long by 2.5 inches wide by 2.5 inches high, which contains the sources and the optical elements of the laser. The minimum thickness of the box is .060 inches. The sources are placed 1.5 inches apart and are threaded into the lid of the box. An O-ring is placed between the box and the lid. The box and lid are sealed with (18) threaded fasteners. This prevents the ingress of moisture and is filled with dry nitrogen. Once assembled there is no access to the AM-241 sealed sources.

The Am-241 foil disk is bonded to the end of a stainless steel (304) T-shaped housing. A 304 stainless steel wire cloth (16 mesh by .375mm) is placed in front of this housing and is held in place by crimping the outer edges of the housing.

LABELING:

Each source will be labeled on the sides of the source with the following: serial number, isotope, activity, and the trefoil radiation symbol. The Optical Module will be labeled in accordance with 10 CFR 20.203 and is granted a color exemption.

DIAGRAM:

See Attachments 1 thru 4

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CONDITIONS OF NORMAL USE:

The sealed sources have obtained an ANSI classification of 77C54545. 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 laser contained in the module is implemented by Ferranti International. Ferranti International has supplied an adequate quality assurance and control program that conforms to MIL-Q-9858A and NATO a QAP-1. 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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LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE:

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

SAFETY ANALYSIS SUMMARY:

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

REFERENCES:

The following supporting documents for the Model 117 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, April 2, 1991 with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: JUN 06 1991

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Reviewer:

Concurrence:

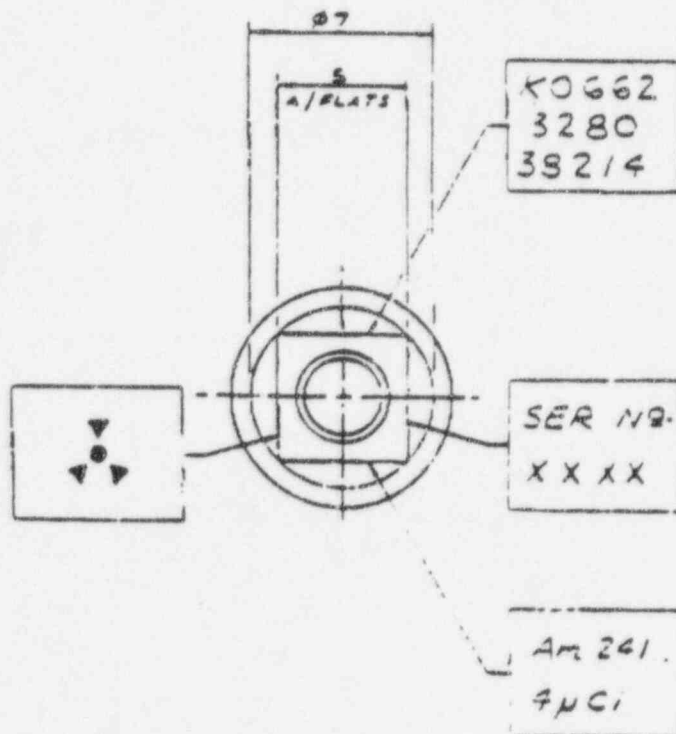
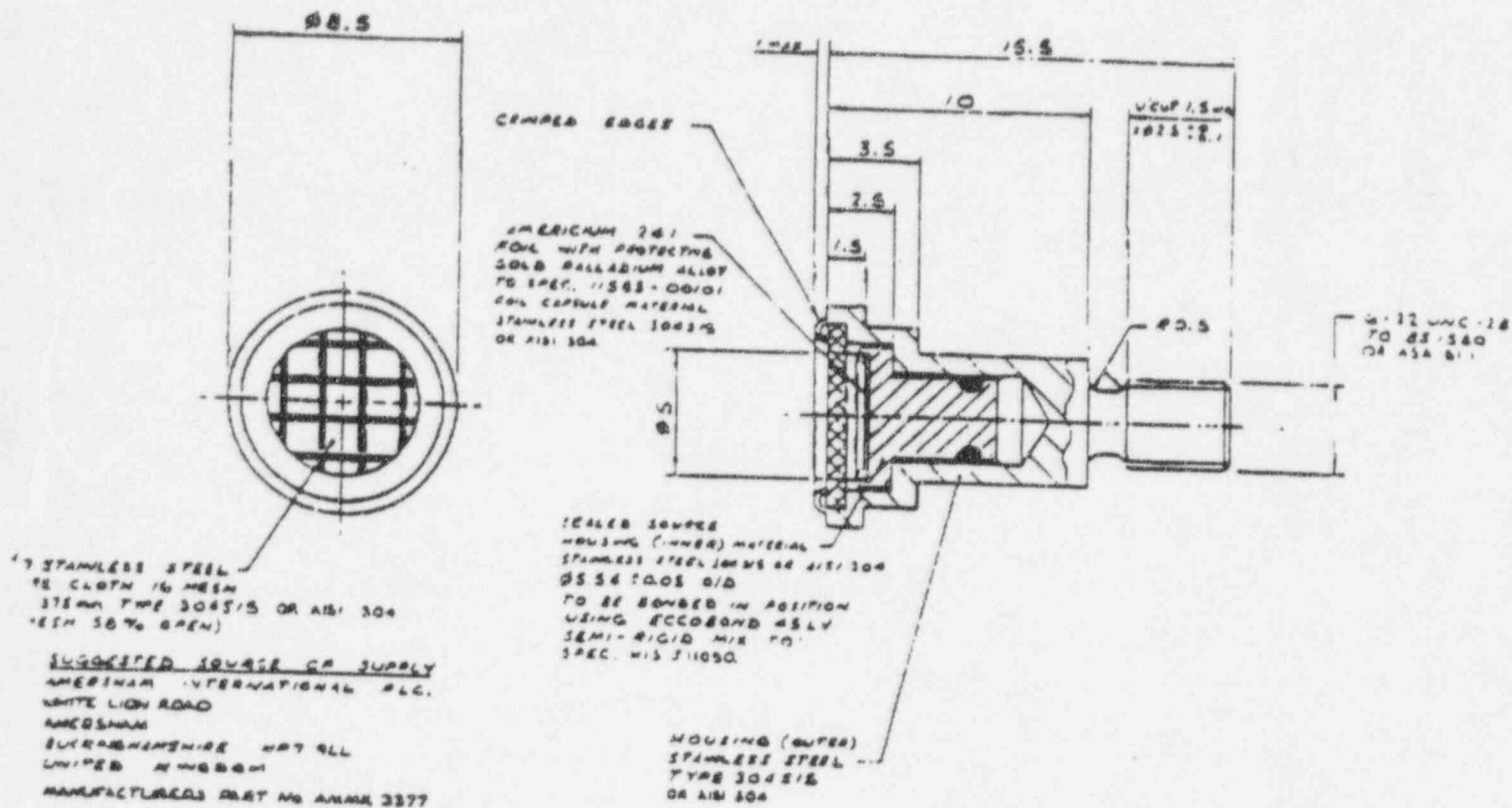
*James N. Rich*  
*[Signature]*

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ATTACHMENT 1



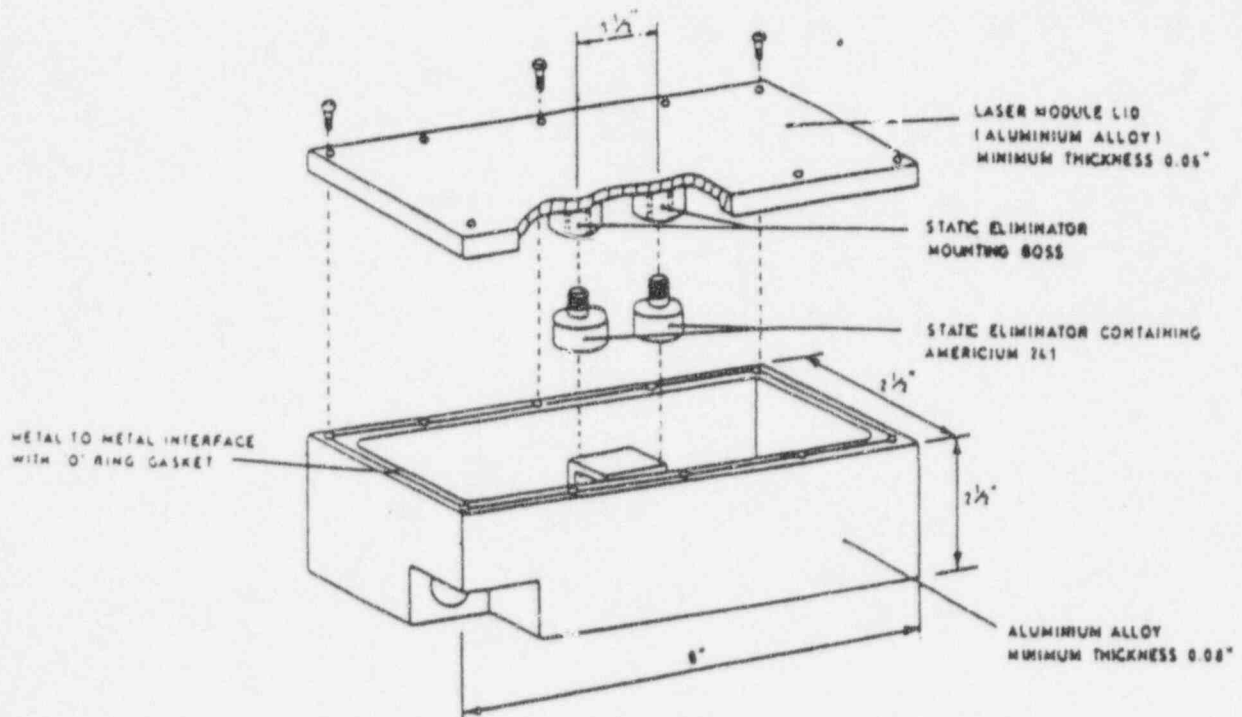
IN MILLI-GRAMS

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ATTACHMENT 2



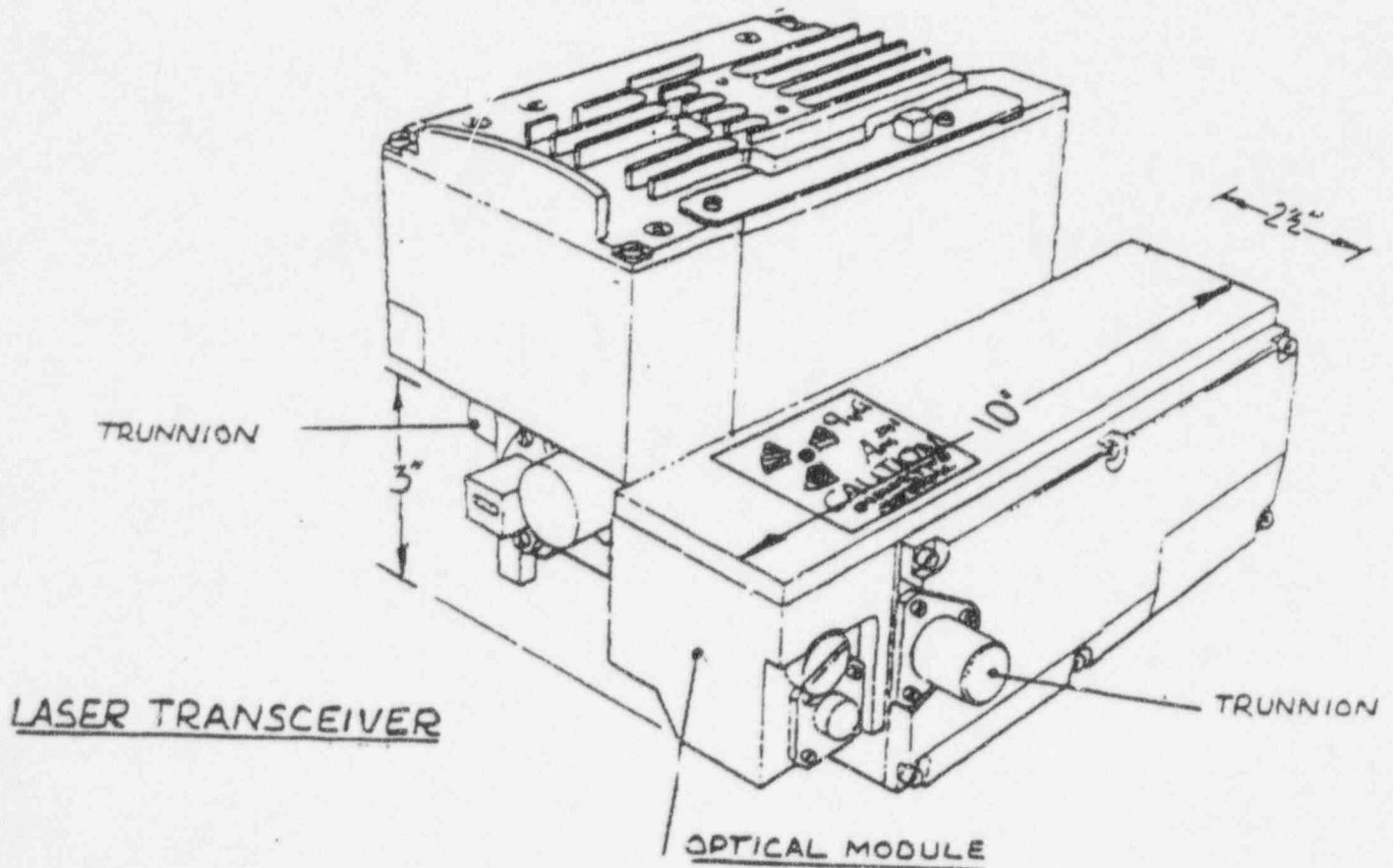
OPTICAL MODULE WITH STATIC ELIMINATORS

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