



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEP 9 1988

Mr. R. T. Enomato
Contract Administrator
Ford Aerospace and Communications Corp.
Newport Beach, CA 92658-9983

Gentlemen:

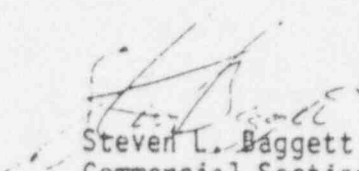
Based on the information and test data submitted by your letter dated September 13, 1988, we conclude that the model 117 optical module design is acceptable for licensing purposes in accordance with the conditions of the enclosed certificate of registration.

Please read over this certificates in its entirety and notify us immediately if there are any errors.

If you have any questions, please contact me or Thomas Rich, 492-0511. My phone number is 492-0542.

(302)

Sincerely,


Steven L. Baggett
Commercial Section
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and Medical
Nuclear Safety
Office of Nuclear Material
Safety and Safeguards

Enclosures:
Certificate No. NR-313-D-101-S

cc: Glenda Jackson w/encl.
✓ R. Macare

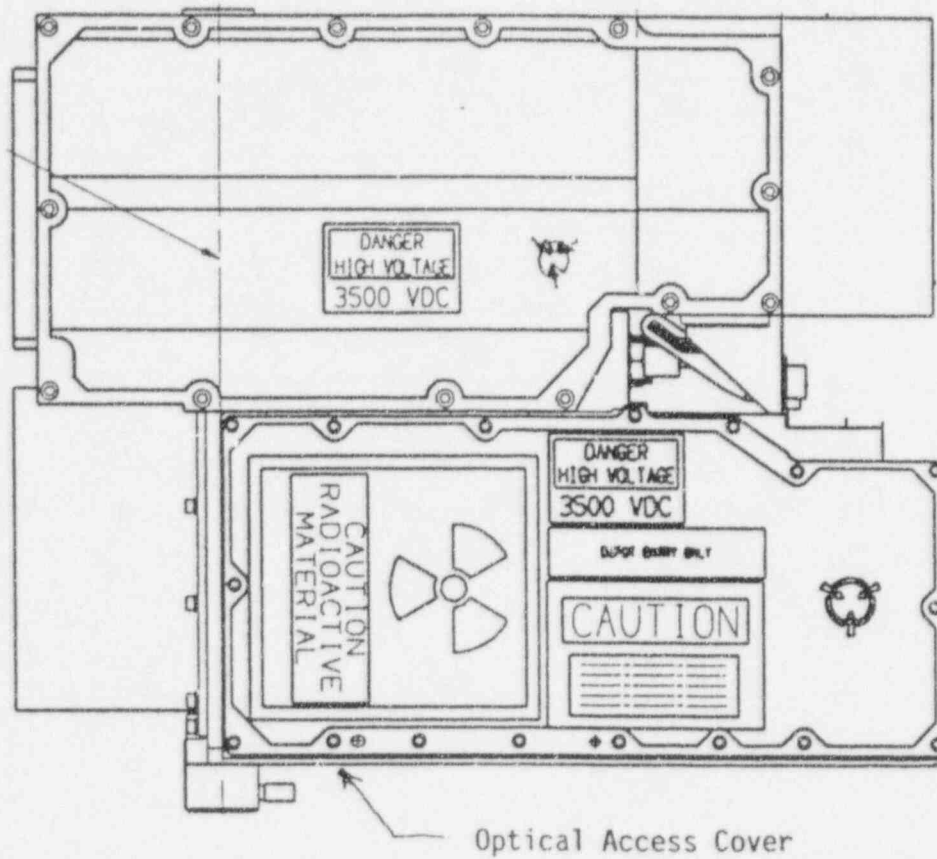


Figure No. 1 Laser Transceiver (Top View)

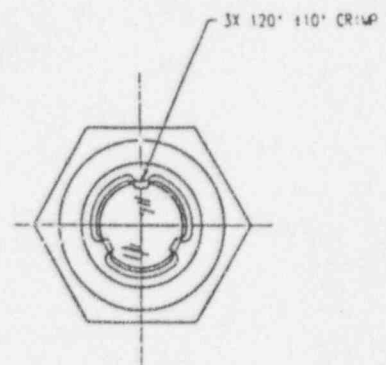
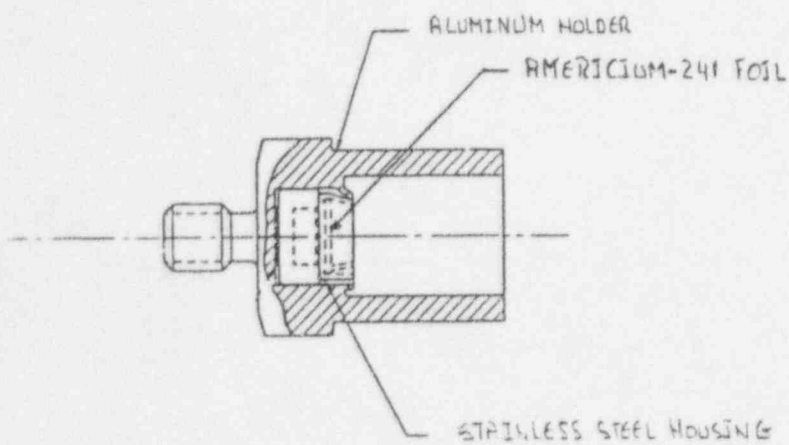
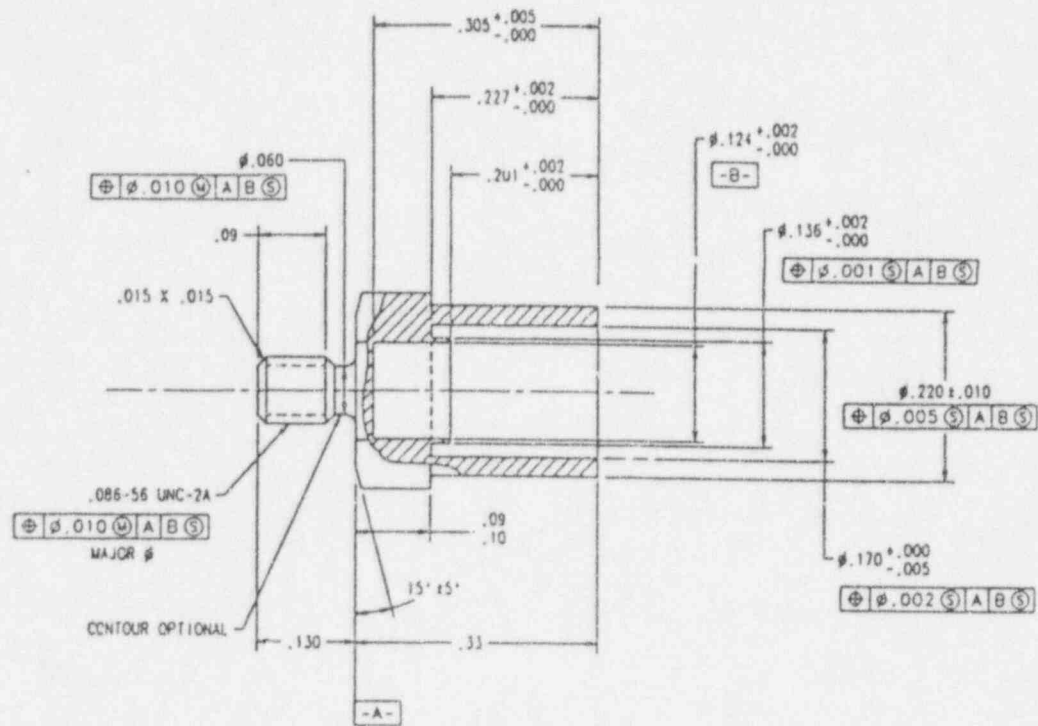


Figure No. 5. Sealed Source Assembly

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 92656

SEALED SOURCE MODEL DESIGNATION: Amersham Model # AMM. ~~1001H~~ 2

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

9410310130 11P

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: DEC 22 1988

PAGE 2 OF 4

DEVICE TYPE: Laser Target Designator/Ranger

DESCRIPTION:

LORAL AEROSPACE

AN/AAS-38A LASER

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.

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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 (NR-136-S-174-U), 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 in the laser transceiver. 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 (8)(18) threaded fasteners. This prevent 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.

SEE NEW PAGE

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: DEC 22 1988

PAGE 3 OF 4

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 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.~~

LITTON LASER SYSTEMS LITTON LASER SYSTEMS

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.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

PAGE 4 OF 4

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-3BA 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 ~~117~~ 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-3BA

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 with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: NOV 9 1988

Reviewer: Steve B. [Signature]

Date: NOV 9 1988

Concurrence: Steve W. Bell

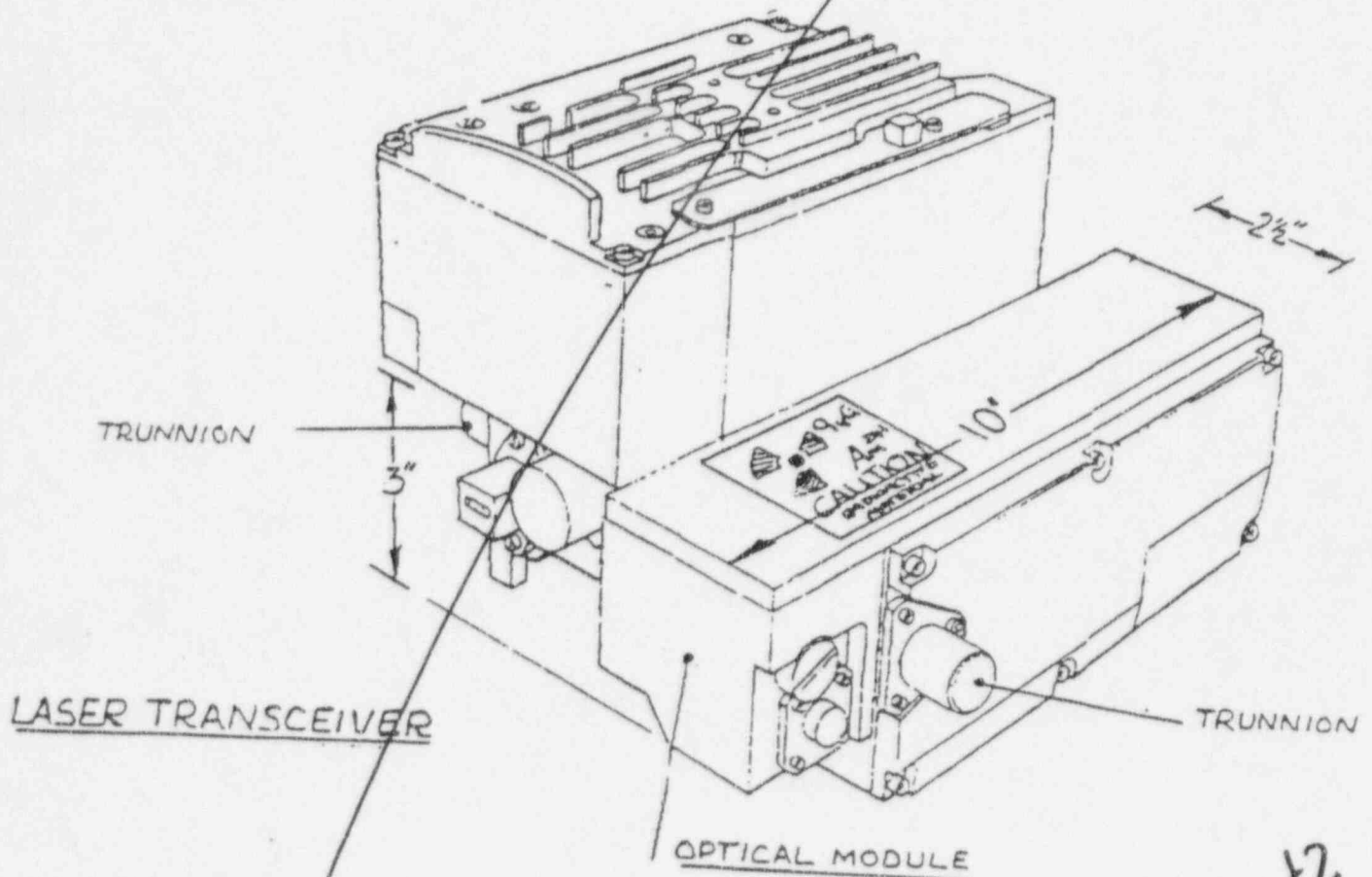
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REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1983

ATTACHMENT 3



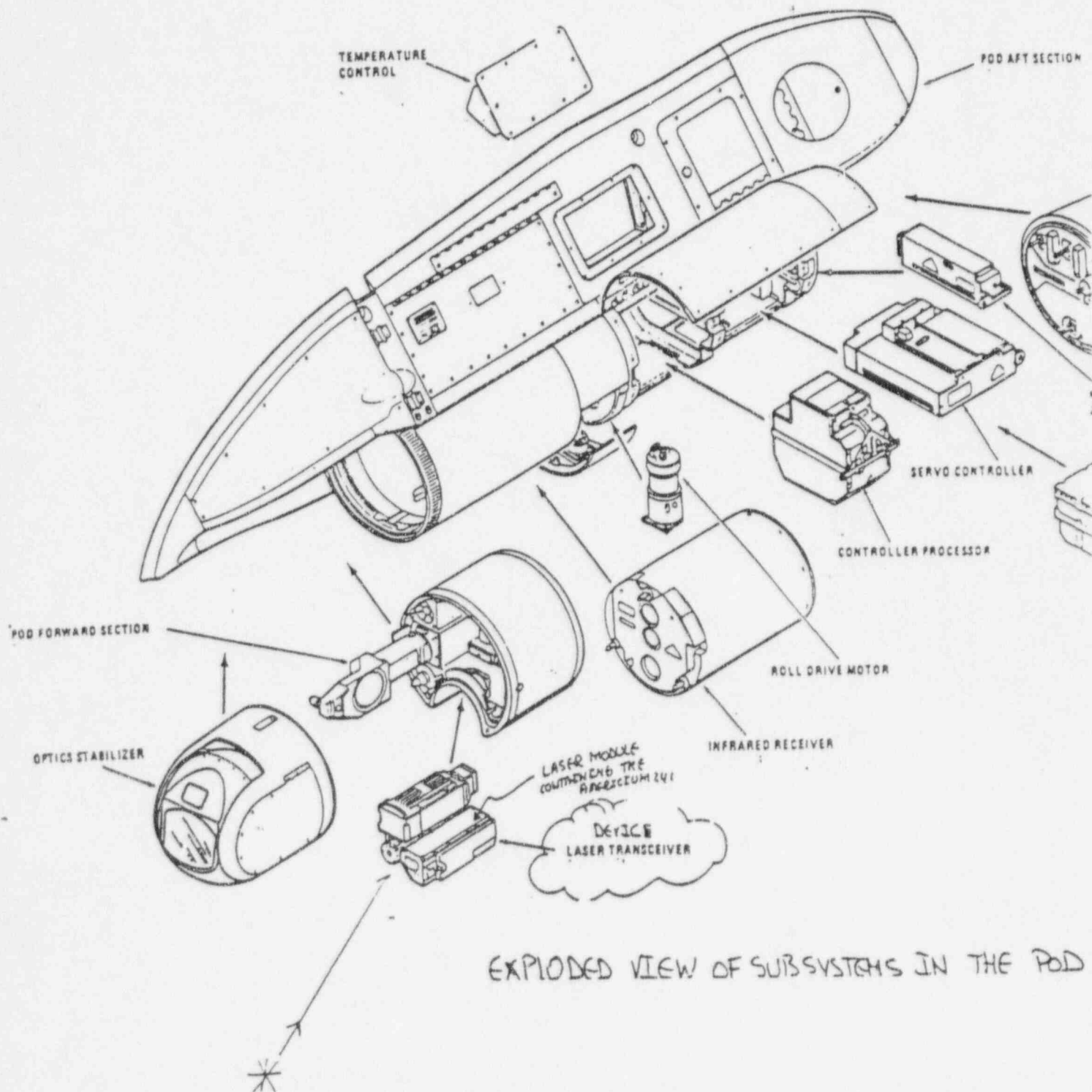
*Replace
BY FIGURES 1 & 2*

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

ATTACHMENT 4



REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: NR-313-D-101-S

DATE: ~~9 NOV 1986~~

PAGE 2 OF 4

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~~²⁰⁶), 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.

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.

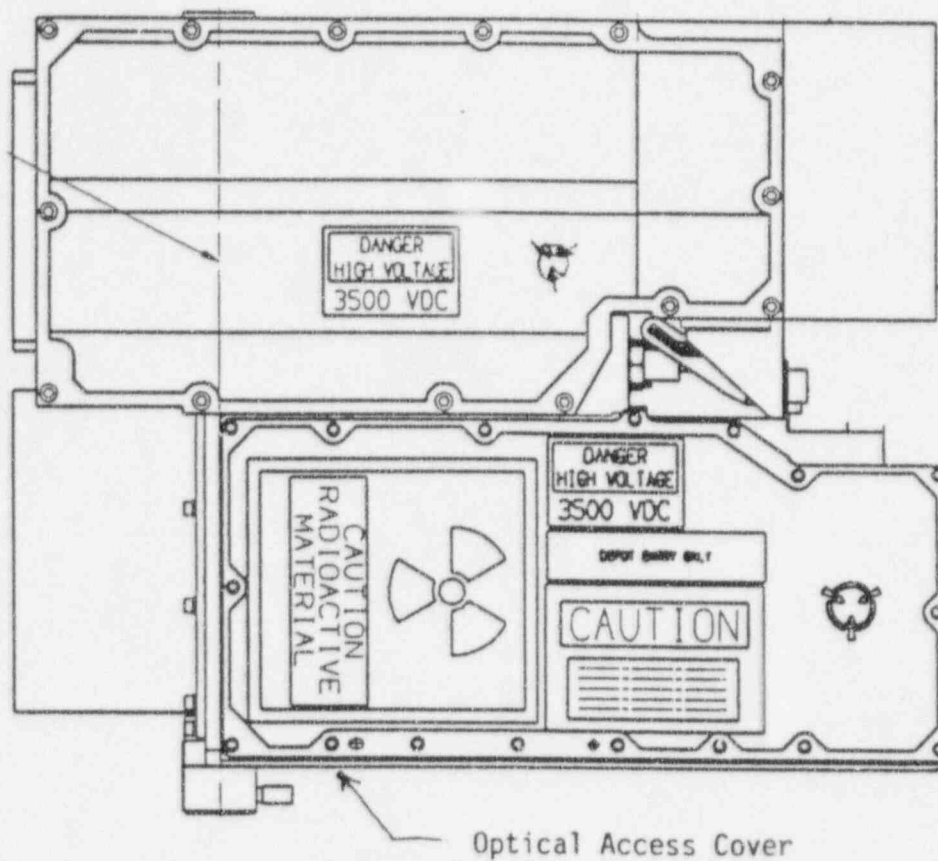


Figure No. 1 Laser Transceiver (Top View)

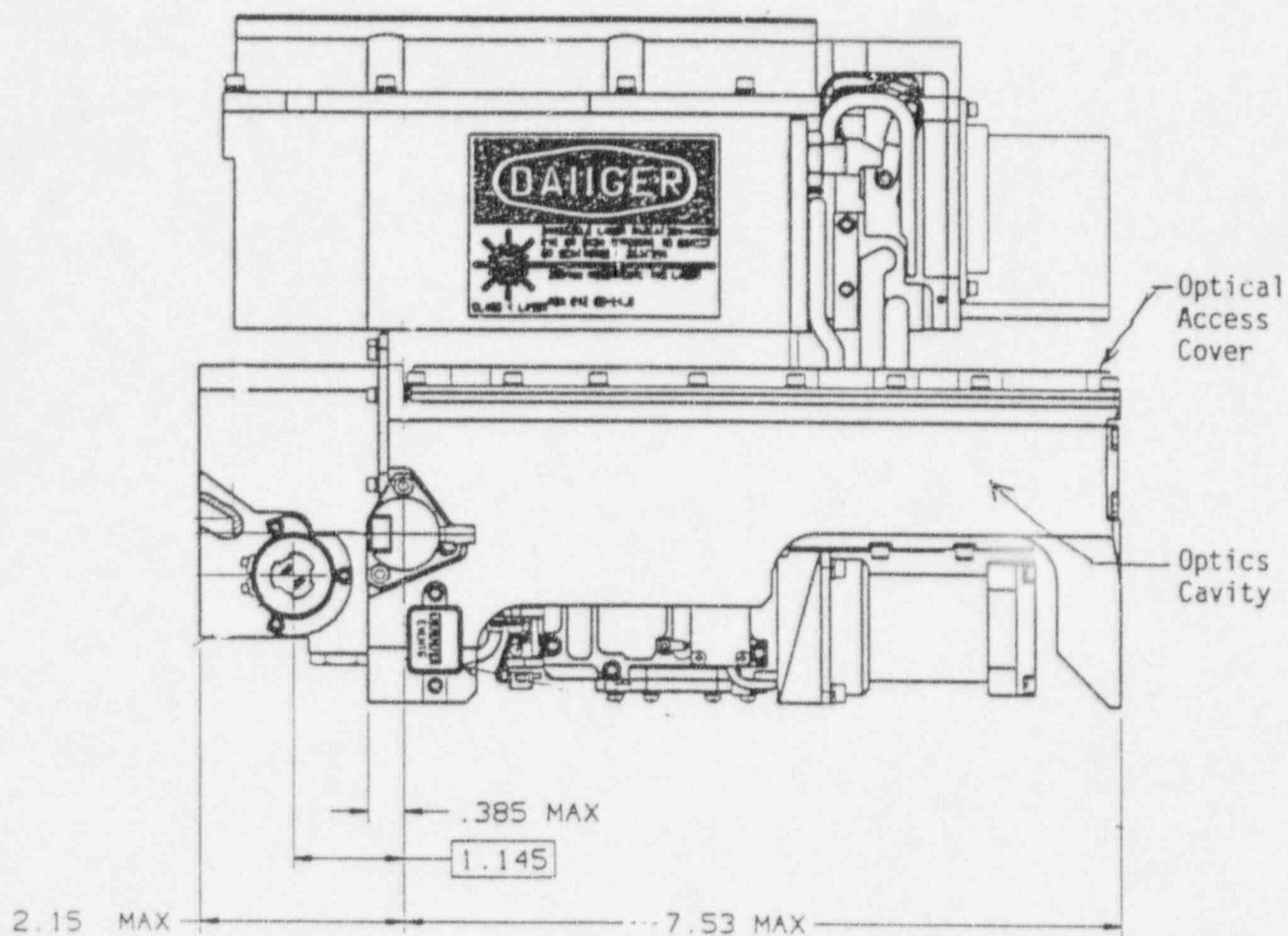


Figure No. 2 Laser Transceiver (Side View)

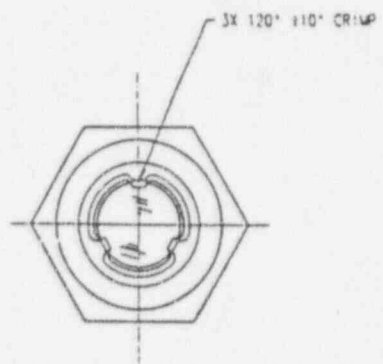
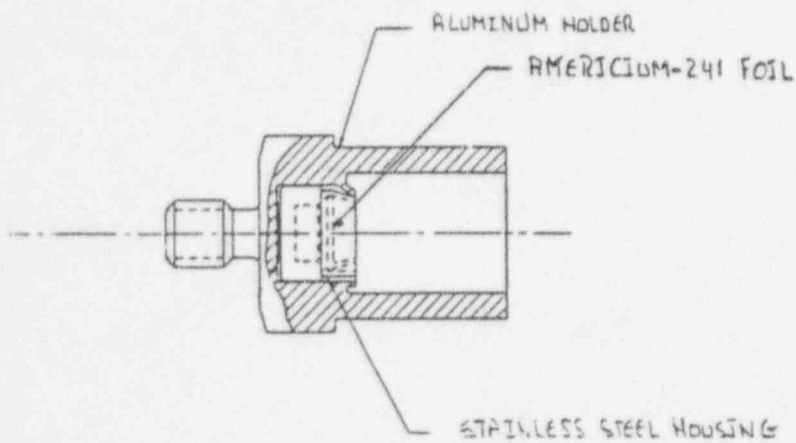
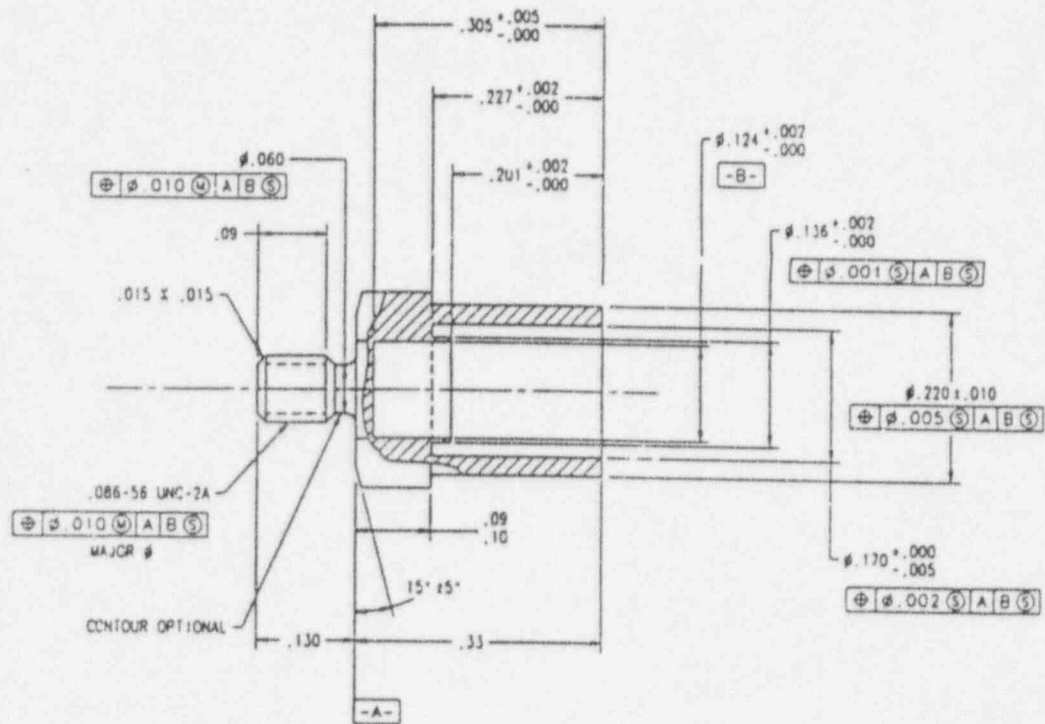


Figure No. 5. Sealed Source Assembly



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

107 9 1988

Mr. R. T. Enomato
Contract Administrator
Ford Aerospace and Communications Corp.
Newport Beach, CA 92658-9983

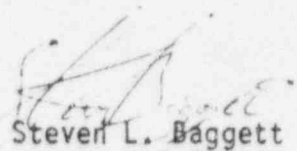
Gentlemen:

Based on the information and test data submitted by your letter dated September 13, 1988, we conclude that the model 117 optical module design is acceptable for licensing purposes in accordance with the conditions of the enclosed certificate of registration.

Please read over this certificates in its entirety and notify us immediately if there are any errors.

If you have any questions, please contact me or Thomas Rich, 492-0511. My phone number is 492-0542.

Sincerely,


Steven L. Baggett
Commercial Section
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and Medical
Nuclear Safety
Office of Nuclear Material
Safety and Safeguards

Enclosures:
Certificate No. NR-313-D-101-S

cc: Glenda Jackson w/encl.
R. Macare

Approval and original
certificate.

Model 117

Date Nov. 9, 1988

Note: page 3&4 was later
corrected 12/22/88. This
is not reflected in the
file until the 4/2/91
amendment request from
Loral.

9610310284 1P

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

PAGE 1 OF 4

DEVICE TYPE: Laser Target Designator/Ranger

MODEL: 117 Laser Designator

MANUFACTURER/DISTRIBUTOR: 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

910310105 8PP

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

PAGE 2 OF 4

DEVICE TYPE: Laser Target Designator/Ranger

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 (NR-136-S-174-U), 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 in 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 adhesive and (8) threaded fasteners. This prevent 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.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

PAGE 3 OF 4

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 -52°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 itself was not tested but is built to MIL-specs and placed into the FLIR pod that has 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.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

PAGE 4 OF 4

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:

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 conditions 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 with enclosures thereto.

ISSUING AGENCY:

U.S. Nuclear Regulatory Commission

Date: NOV 9 1988

Reviewer:

John B. [Signature]

Date: NOV 9 1988

Concurrence:

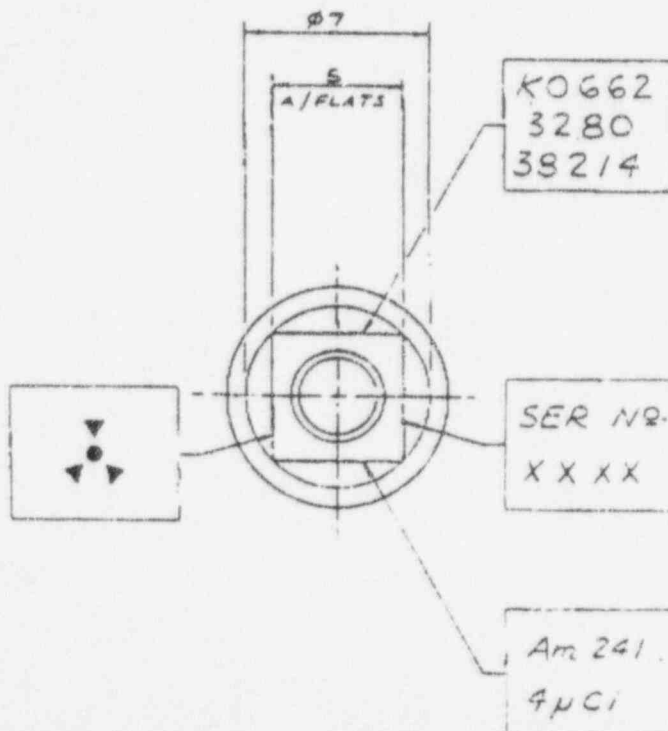
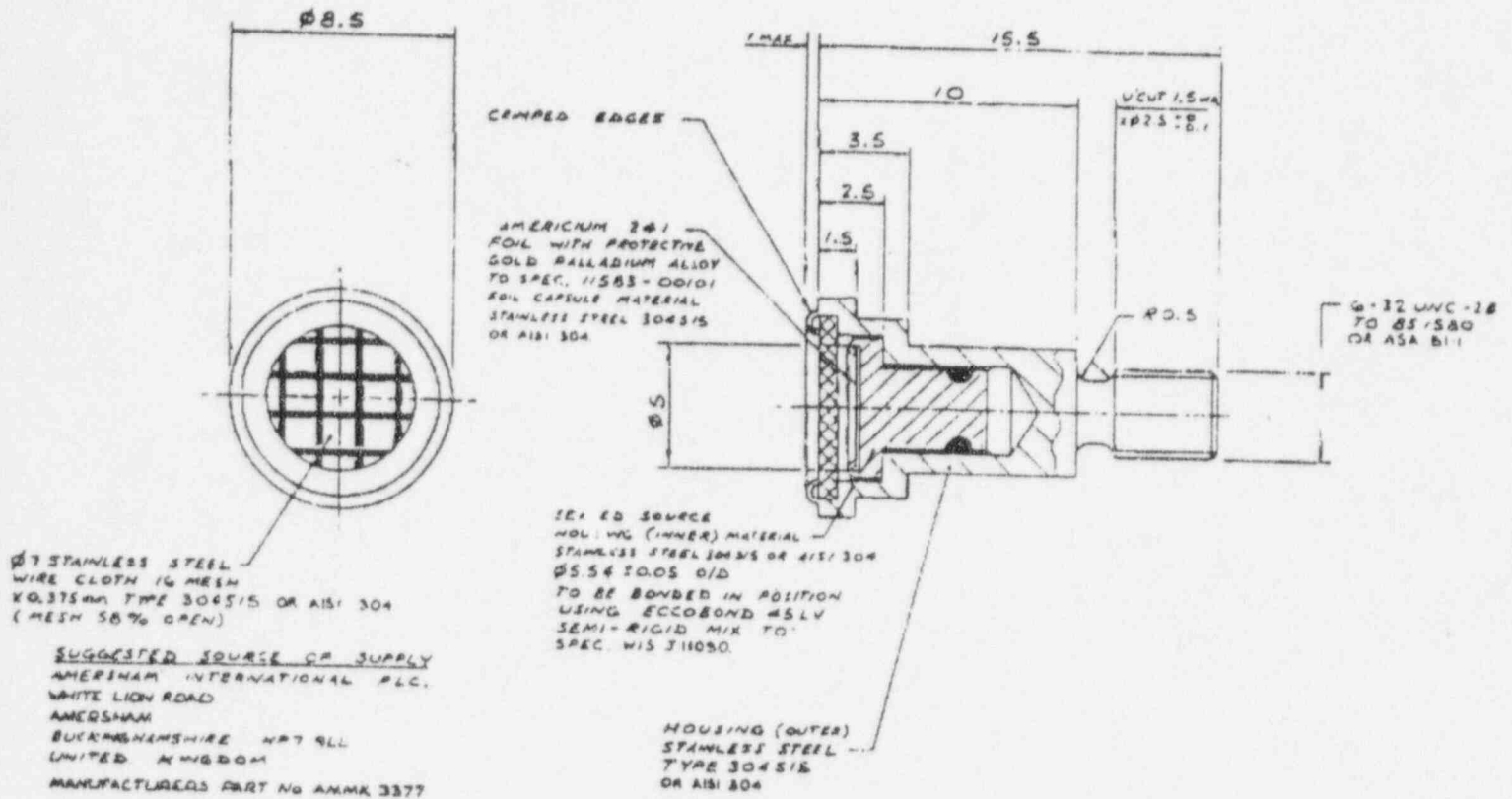
Stacy W. Bell

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

ATTACHMENT 1



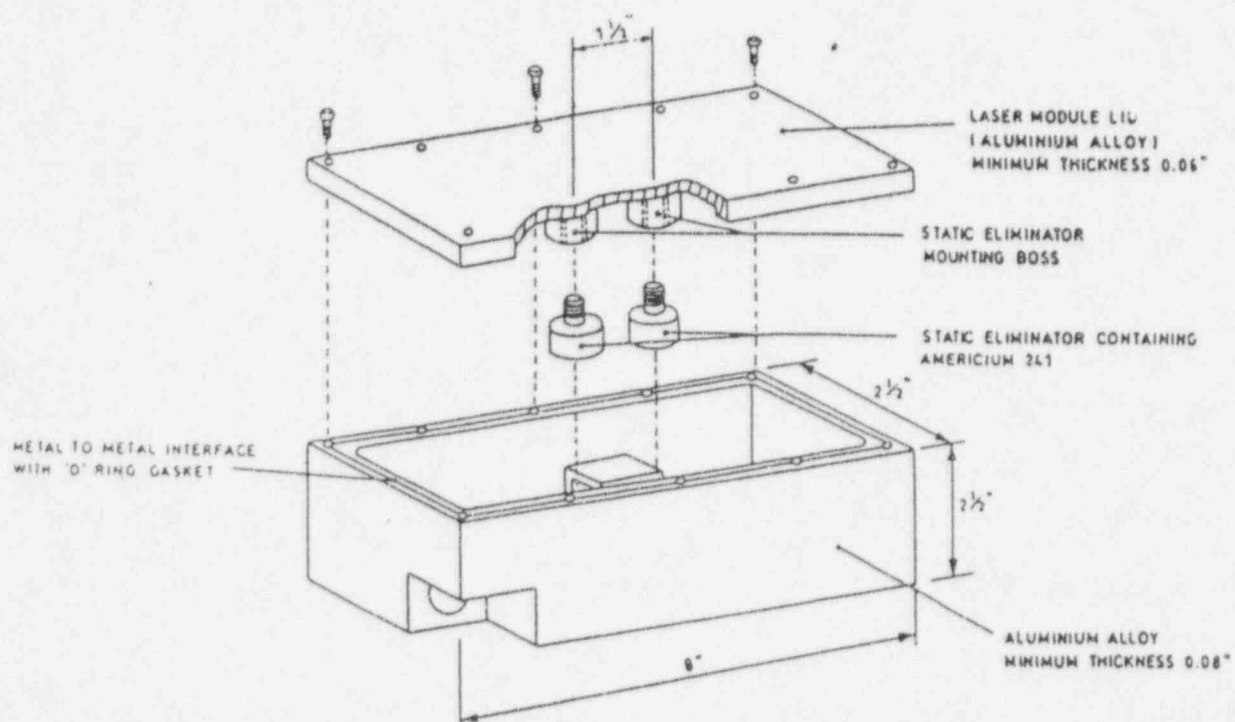
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REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

ATTACHMENT 2



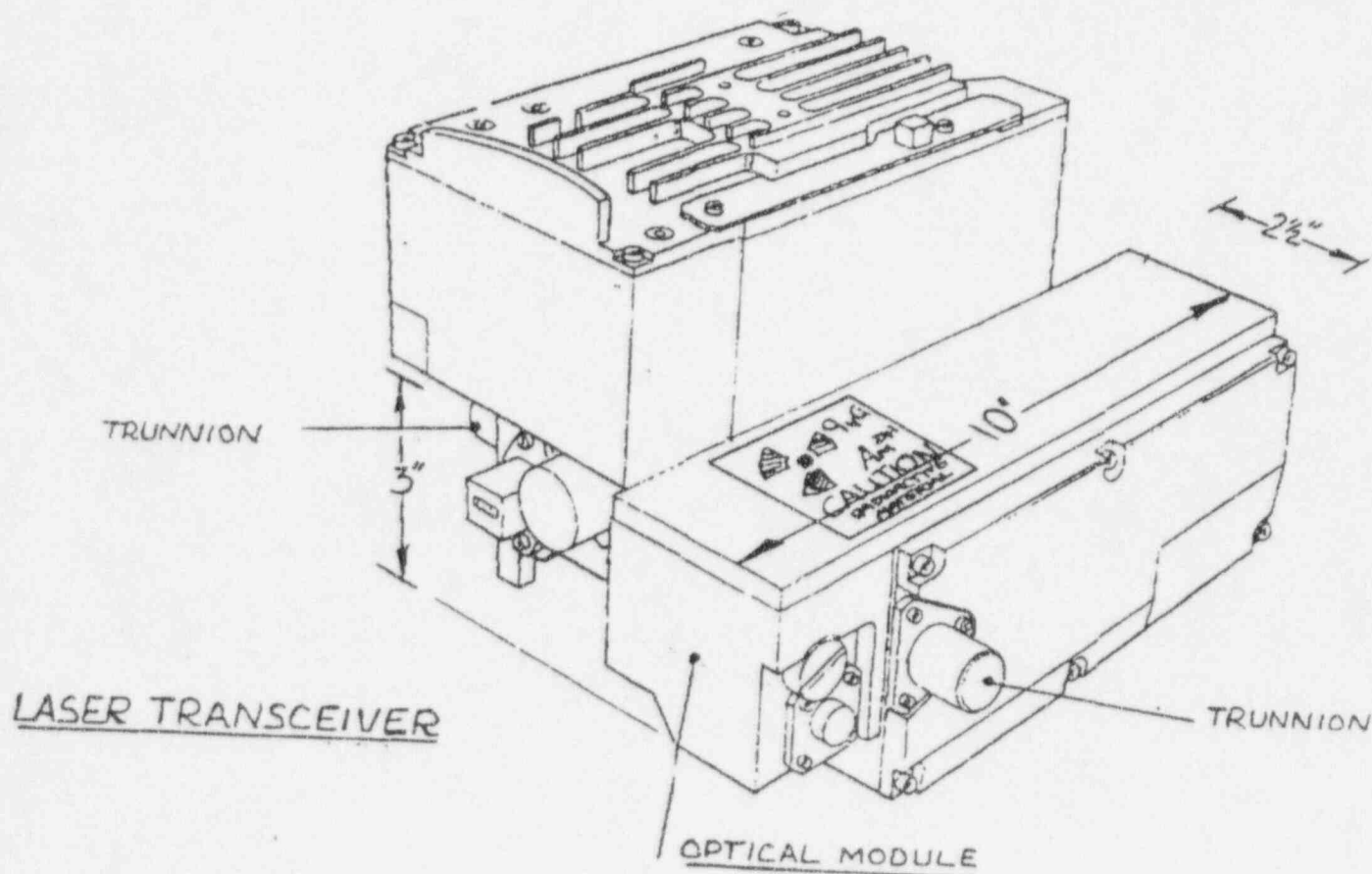
OPTICAL MODULE WITH STATIC ELIMINATORS

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

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

DATE: NOV 9 1988

ATTACHMENT 3



REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO.: NR-313-D-101-5

DATE: NOV 9 1988

ATTACHMENT 4

