recd 5/23/96

SAFENIGHT TECHNOLOGY INC.

"the safer smoke detector network"

2121 Electric Road SW
Roanoke, Virginia 24018
(703) 989-5738

May 21, 1996

Ms. Michelle Burgess, Mechanical Engineer
United States Nuclear Regulatory Commission
#2 Wide Flint North
11555 Rockville Pike T-8f5
Rockville, MD 20852

Re: Response to 5/3 deficiency call

Dear Michelle:

In response to your call, attached are answers to questions you had.

1) On page 2, the correct Amersham model number is AMM.1001H

2) Our smoke detectors will be distributed from a location to be determined and listed on our distribution license.

3) Concerning prototype testing:

   a) all prototype tests were done looking for removable contamination only. All were accomplished with wipe tests and a PC-based 3 inch NaI multichannel Gamma Ray Spectroscopy System.

   b) on May 17, 1996, we performed further drop testing on a SafeNight unit. A Model SN-100 PCB with ion chamber attached (no plastic housing) was dropped 15 times from a height of 9 feet on to bare concrete flooring. Such testing was adopted to emulate absolute worst case residential smoke detector abuse short of willful destruction over its expected lifetime. Results.... the source remained in place, the chamber cup cover remained attached, and the ion chamber remained screwed to the PCB. Wipe tests were taken from immediate environs of the ion chamber. No removable contamination was recorded.

4) On page B10, check #9b), we will not be checking dimensions of the chamber. We will only be confirming that it is the correct chamber.

5) On page B17, #24g) 5% here refers to the submitted LTPD = 5% Table on page B32

6) On page B11, #9c, the contractor will be required to check 100% of the lot and correct them prior to its return to us.

7) Please accept substitution of new pages 3,4,5,6,7,10, 11, and 12. They should clear up conflicting data on old sheets.... materials, dimensions. They also add further dimensions to the HomeWatch Source Holders (for Amersham and NRD). One modification was added.... p.11, snap-lock and screwed covers were added as possible options. Since our prototype testing has been on PCB without a plastic case, these have no worse impact on "device" integrity.

8) On the chamber drawings, M3 designates a metric screw/ opening size

9) Our January 31st letter contained a typographical error. The "and" between MICROCURIE and U.S. should not be there.

I look forward to hearing back from you. I will call to confirm receipt of this package next week.

Sincerely,

Scott N. Markwell
President

SNM/ct

Attachments

3.2) SUMMARY DESCRIPTION

3.2.1 Written Description

SafeNight smoke detectors are designed to safe lives by giving the earliest possible warning of fire to the residential consumer. While most battery-powered smoke detectors are single station only, the Model SN-100 is interconnected with radio signals. When one detector senses smoke, it will signal all others and all will alarm as a multi-station system. Thus, the consumer will get early notification of fire from remote or hard to hear locations such as basements.

The detector is designed for ceiling or wall installation with screws and anchors. It is not portable and will be installed in a fixed location.

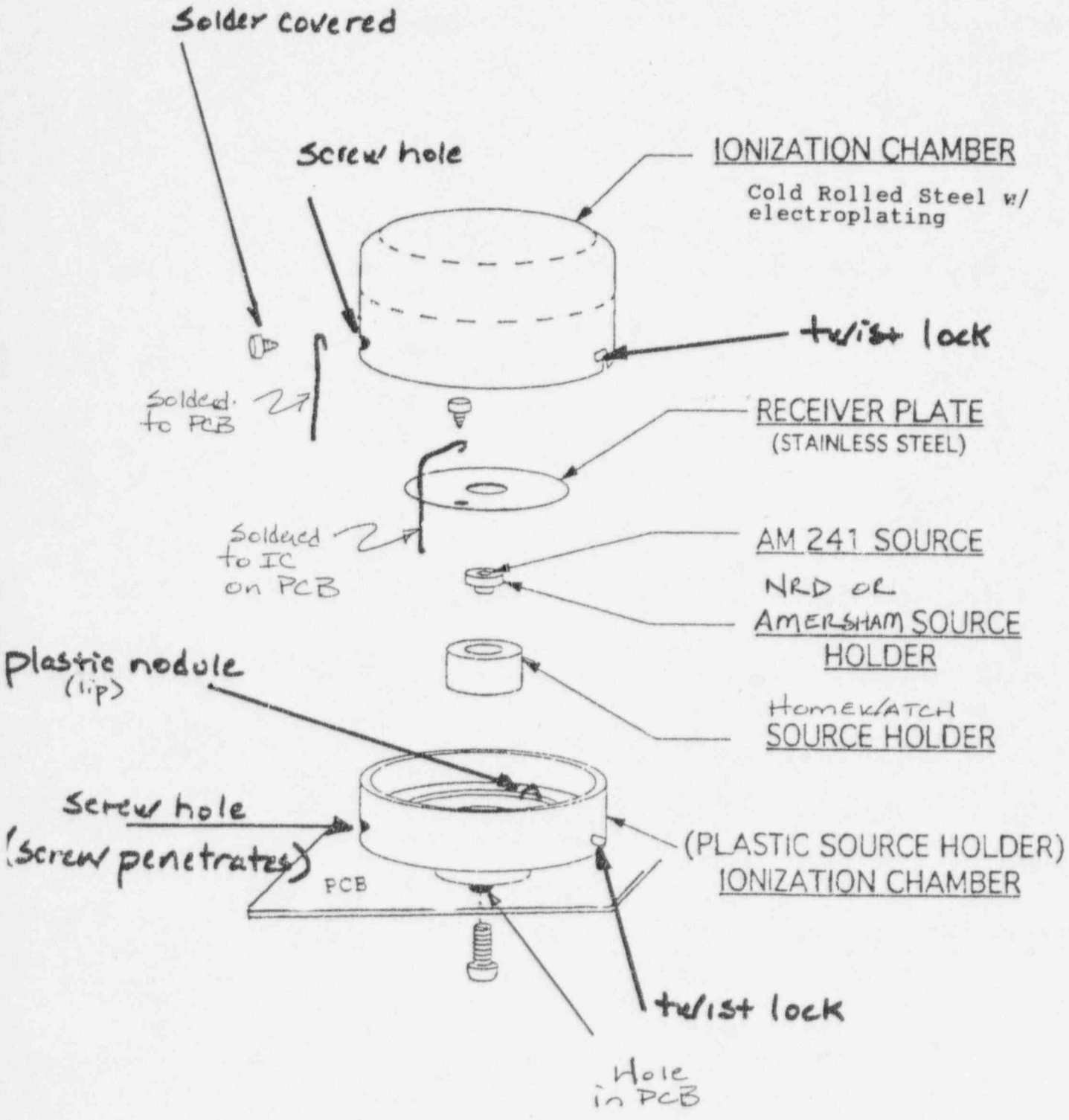
The source housing does not move during use.

The ionization chamber includes a sealed source (Americium 241) and source holder from Amersham or NRD with certification that they have been leak tested in accordance with USNRC leak test requirements. The source holder is crimped into a Homewatch source holder which is recessed into a hard plastic lower chamber and then attached to the printed circuit board by screw. The other part of the ionization chamber consisting of a cover (perforated and insect proof) is screwed, soldered, and snapped around and over the source cup for security.

3.2.2 Drawing

Drawings of our chamber are detailed in the Following Figures 1,2,3,3A,4. Further detail as to the Amersham and NRD source and source holders are included in Appendix A.

FIGURE 1



CONTAINMENT OF SOURCE WITHIN DETECTOR

FIGURE 1

HW

CHAMBER CONSTRUCTION

Pg(5)

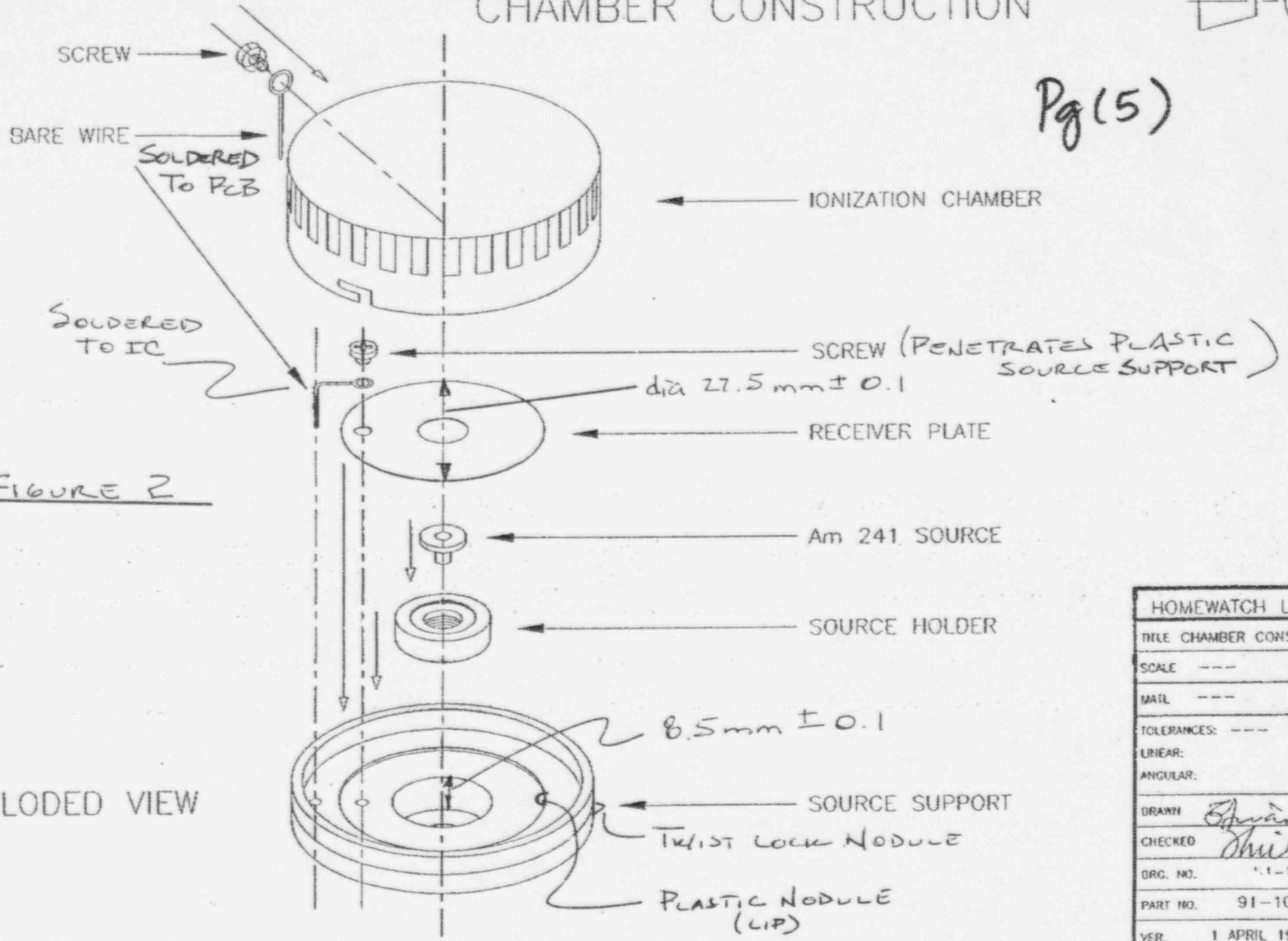
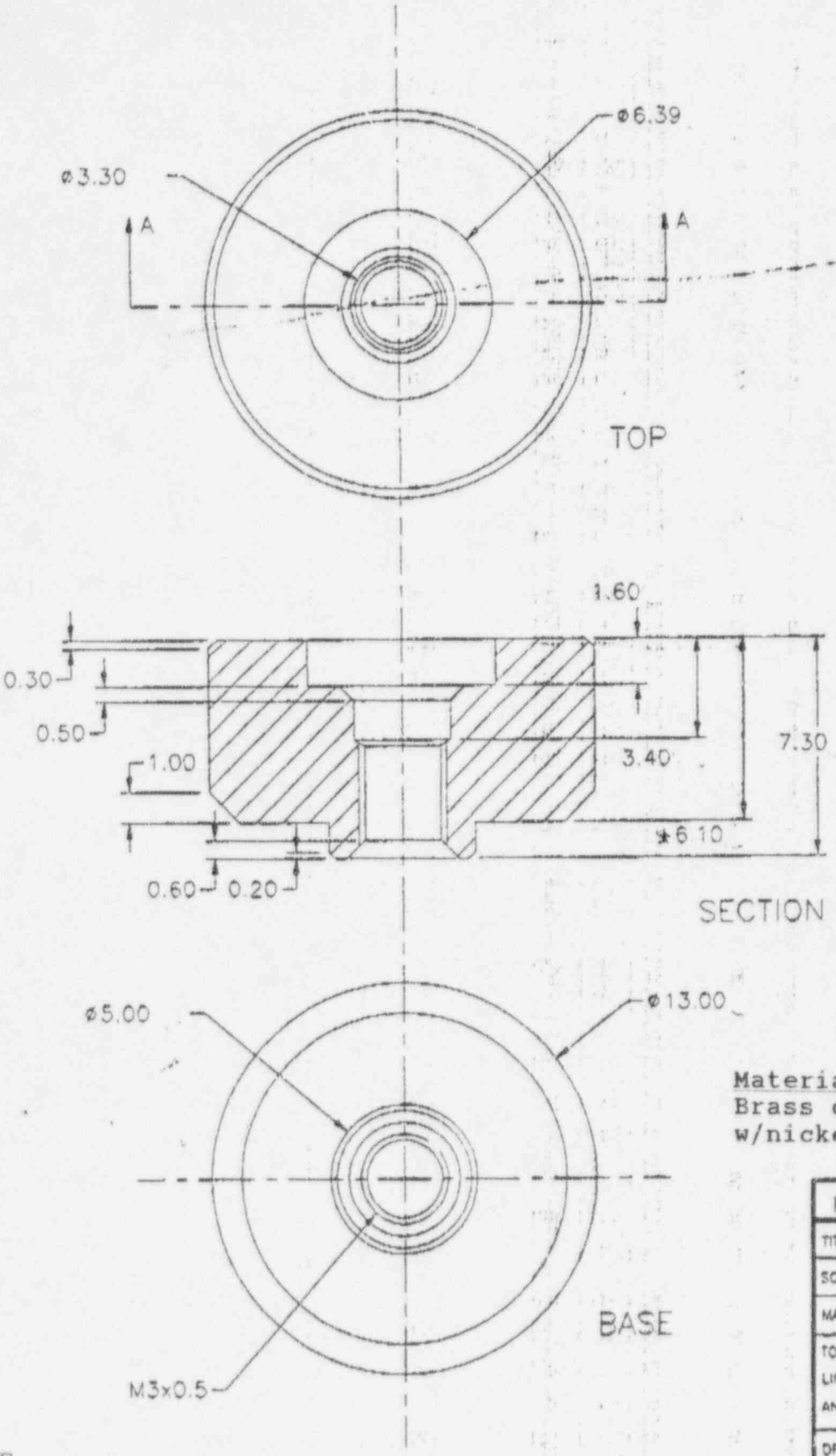


FIGURE 2

EXPLODED VIEW

HOMEWATCH LIMITE	
TITLE	CHAMBER CONSTRUCT
SCALE	---
MATL	---
TOLERANCES:	---
LINEAR:	
ANGULAR:	
DRAWN	
CHECKED	
DRG. NO.	91-100C
PART NO.	91-101001
VER.	1 APRIL 1991 (A
SHEET	ONE ONLY

HW



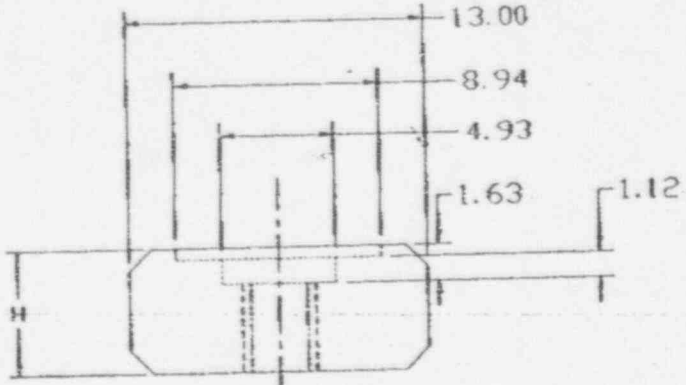
Material
Brass or copper
w/nickel plating

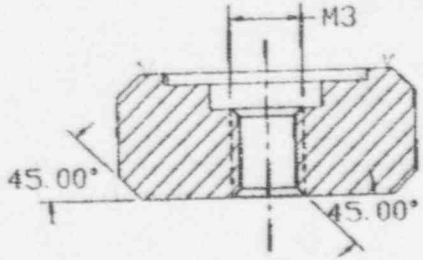
HOMEWATCH LIMITED	
TITLE	NRD SOURCE HOLDER
SCALE	4.5:1 UNIT=MM
MATL	
TOLERANCES: LINEAR:	± 0.1
ANGULAR:	
DRAWN	
CHECKED	
DRG. NO.	HW-M18
PART NO.	34-408206A
VER.	
SHEET	ONE ONLY

F

FIGURE #3

HW





Sectional view A-A

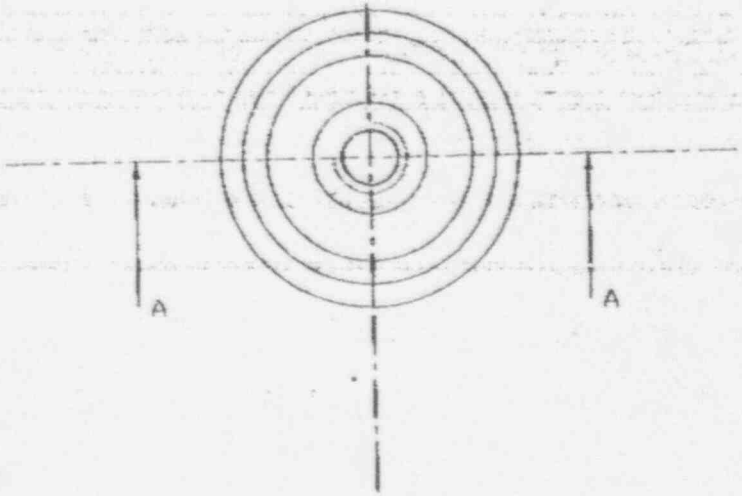


FIGURE #3A

Material
Brass or copper
w/nickel plating

Remark: H equals -
6.10mm for part no. 34-408208A.

HOMEWATCH LIMITED	
TITLE	Source Holder (Amersham)
SCALE	3 : 1
TOLERANCES:	
LINEAR:	± 0.1
ANGULAR:	
DRAWN	Edwin Wong
APPROVED	
DWG. NO.	H1-008C
DATE	
REVISION	
PART NO.	34-408208 & A

Occasions the Consumer will be near the device:
The initial installation of the device will take less than twenty minutes and should be a one-time event. We will recommend weekly testing which will require less than one minute for the system. The device will require a new battery once per year. It is estimated that this will take 2 minutes or less per unit. Should the unit go into alarm, the alarm is latching and will have to be reset. Reset will take less than one minute for the system. Of course, alarming whether real or false should be an unusual event. Lastly, we will recommend once per year vacuuming the outside of the unit, and this should take less than one minute per unit.

Possibility the Device Used as a Component of Another Product:
It is not expected that the device could be used as a component of anything other than as an independent unit of a fire or security system.

Expected Useful Life:
The expected useful life is 10 years.

3.3.2 Details of Construction

1) Engineering Details of the Chamber and Contents:

Please see Figures 1,2,3,3A,4 in section 3.2.2.

Method of Fabrication:
The Homewatch source holder is fabricated with a female plug in it. The source holder from NRD or Amersham is crimped around the edge into the source holder. Both are then pressed down inside a snug fitting plastic source holder. The process does not contact the sealed source.

There is a gap between the top of the source holder and the bottom of the receiver plate. The receiver plate is placed on top of a plastic ledge in the plastic source support above the source holders and held in place by a screw and plastic nodule (lip) present on the plastic source holder. The screw penetrates all the way down to the plastic holder. The cover cup is then placed over the plastic source holder (again a snug fit) and twist-locked. A screw is applied that penetrates

both the cover cup and the plastic source holder. This screw will be covered with solder to prevent tampering and untwisting action.

The chamber is aligned on the PCB using a nodule present at the bottom of the plastic holder and a small hole in the PCB. Then it is screw connected from the other side. The lead wire from the receiver plate is soldered to the smoke detector chip and the other lead wire is soldered to the board. Both will prevent the screwing of the chamber from the board short of destruction.

2) Dimension and Materials of the Circuit board:

See Figure 5. The circuit board will be of a standard PCB material.

3) Attachment of the chamber to the board:

Please see Figures 1,2,4 in section 3.2.2.

4) Housing:

Materials - the material of the outer housing will be ABS meeting U.L. 94-HB.

a) diameter of the housing: minimum 4.25"; maximum 6.50" (will minimally accomodate PCB dimensions)
b) thickness of the housing: minimum 1.25"; maximum 2.0"
d) method of attachment of the board to the housing: four or five plastic snaps
e) method of opening/closing: hinged or snap-locked or screwed cover
f) color: varies

3.3.3 Labeling

1) Device Labeling Description:

All models will include a durable paper label fastened to the top of the ion chamber. It will contain the verbiage "CONTAINS RADIOACTIVE MATERIAL AMERICIUM 241 0.9 MICROCURIE" and "U.S. NRC License No. XXX".

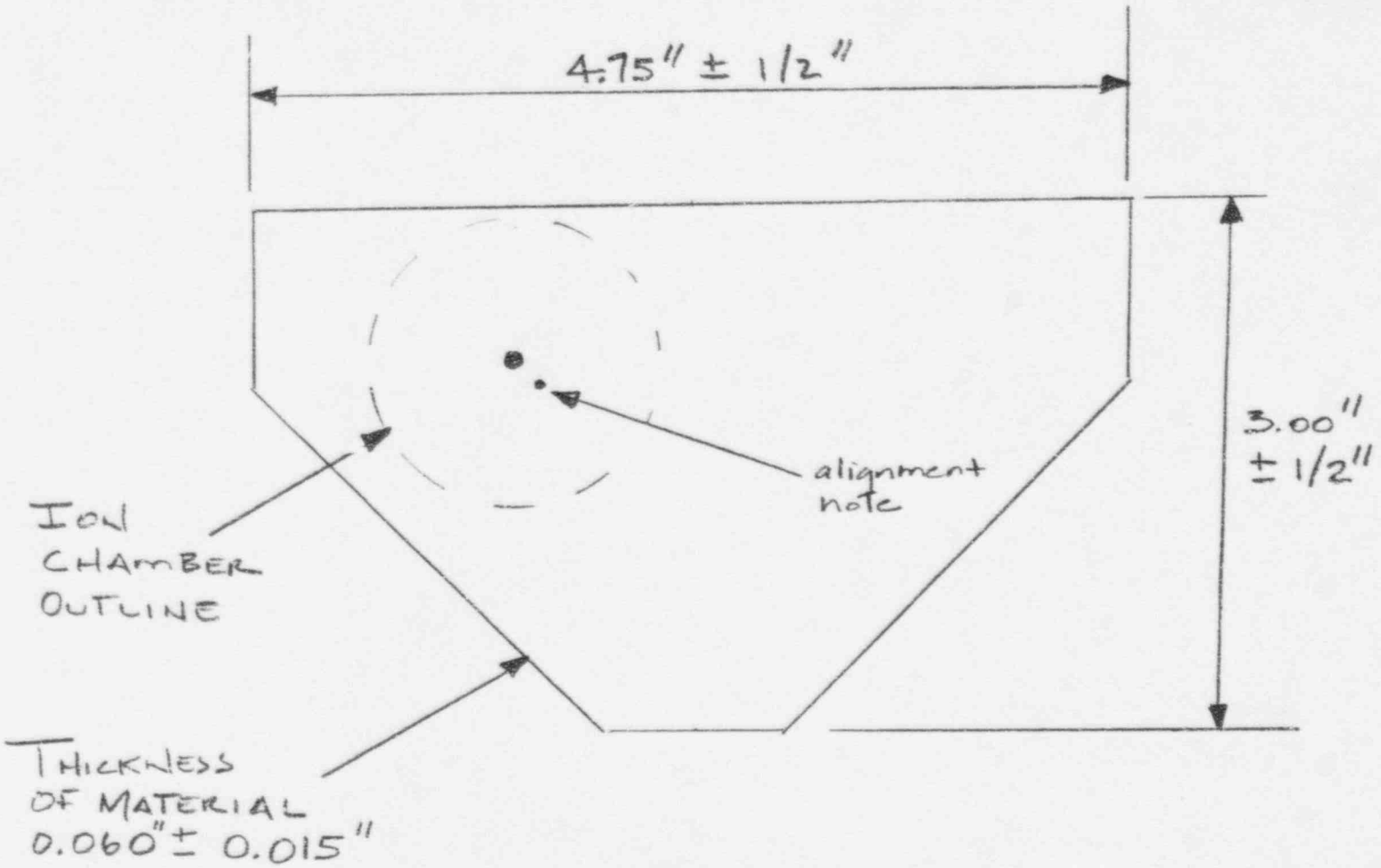


FIGURE 5

PCB LAYOUT
NOT TO SCALE

Call Scott Markwell 540 989 5738
~~5/6 2:15, left msg. that phone call log is a bit~~
phone call 5/3/96

General

1. If you are using the AMM1001H source holder as registered by Amersham, please state that.

2. What is initial distribution point?

Prototype testing

3. You state that after the drop and impact tests, "no removable contamination was observed above background levels and did not exceed 0.005 uCi". Are you referring to the dose rates around the ion chamber ("above background") or to removable contamination?

4. In addition, the prototype tests should demonstrate source containment integrity over normal use conditions. Your drop test results indicate that you chose to perform seven drops, and that the ion chamber cover came off on drop number four. This seems to indicate that the ion chambers did not pass the drop test. Please submit additional information that explains how your tests, as conducted, demonstrate the source containment integrity.

Design

5. There are several apparent contradictions in the drawings and descriptions submitted. For example, the ion chamber cover is described as steel/tin in section 3.2.1 of your application and is described as steel/tin or steel/copper or steel/nickel on one of the drawings. Another example is that the Homewatch source holder is listed as nickel plated copper in one place and nickel plated brass on one of the drawings. There were also discrepancies in the dimensions listed. For example, section 3.3.2 4(a) states that the diameter of the housing is 5+/-2 inches, which results in a range of 3-7 inches. In contrast, the drawing of the PCB layout lists the larger dimension of the PCB as 5+/-1 inches, which results in range of 4-6 inches. This range does not allow for a circuit board that would fit in the smallest requested diameter of the housing. Another example is section 3.3.2 states that the height of the cover is 2+/-1 inches, which results in a range of 1-3 inches. Based on measurements submitted for the ion chamber, the apparent height of the ion chamber is 1.01 inches, which would not fit into the smallest requested cover height. In view of these and other apparent discrepancies, please review the information your drawings and descriptions, and resubmit complete and corrected information.

6. Please explain the use of the word "and" in your smoke detector label.

QA

7. Please specify what drawing will be used in #9(b) of "II Finsihed Goods Testing".

8. In question #24(g) in the "SafeNight On-Site Test Location Audit" checklist, please specify whether the 5% is a simple 5% sample or is from the modified LTPD 5% tables. Please specify that all references to LTPD 5% are intended to be to the modified LTPD 5% tables, where the acceptance number is equal to zero.

9. The guidance in Reg Guide 6.9 states that all failed units must pass the test criterion before release. The procedures described in section 9) Nonconforming Material seem to contradict this. Please describe how your procedures meets the guidance.

B.11