

DIAGNOSTIC DESIGN

MAST Installation

PLEASE NOTE THAT COMMENTS REGARDING THE DESIGN, FROM JUNE 19TH MEETING, APPEAR IN THESE BOXES

Overview

- Materials
 - 316 stainless steel
 - Boron Nitride Grade COMBAT A ceramic solid from St. Gobain
 - Phosphor Bronze PB102 (custom insert)
- Secure Screws
 - Spot-welding SS wire on SS316 screws
 - Spot-welding SS wire on BN?
- Diagnostic Design
 - 4-channel array
 - Each channel separated by 7.5 degrees

COMMENT 2

ISSUE: IS GRADE OF BN CERAMIC APPROPRIATE?

IDEA: CONTACT MAST COLLEAGUES

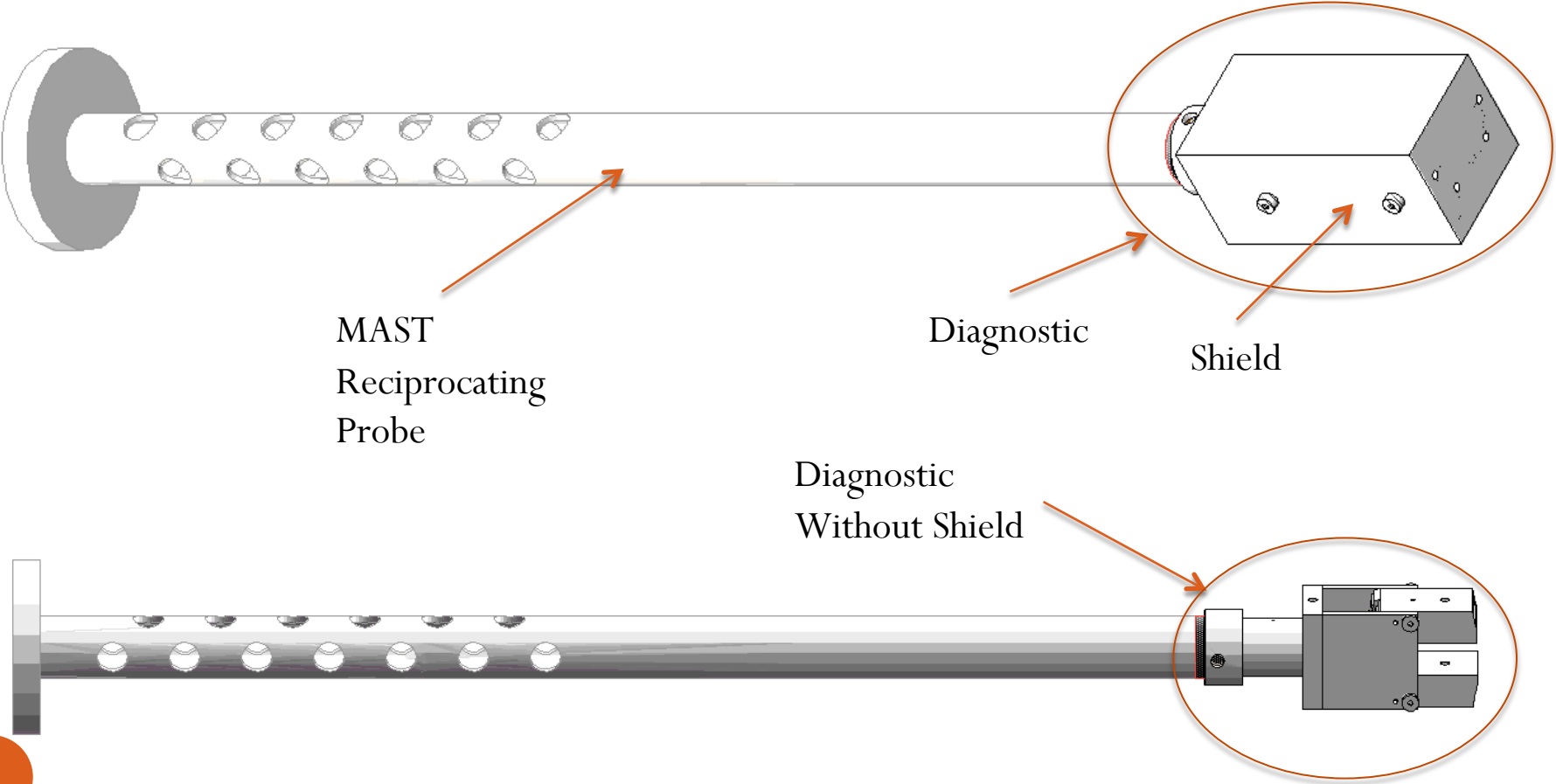
COMMENT 9

ISSUE: MAST DESIGN REGULATIONS REGARDING DIAGNOSTICS

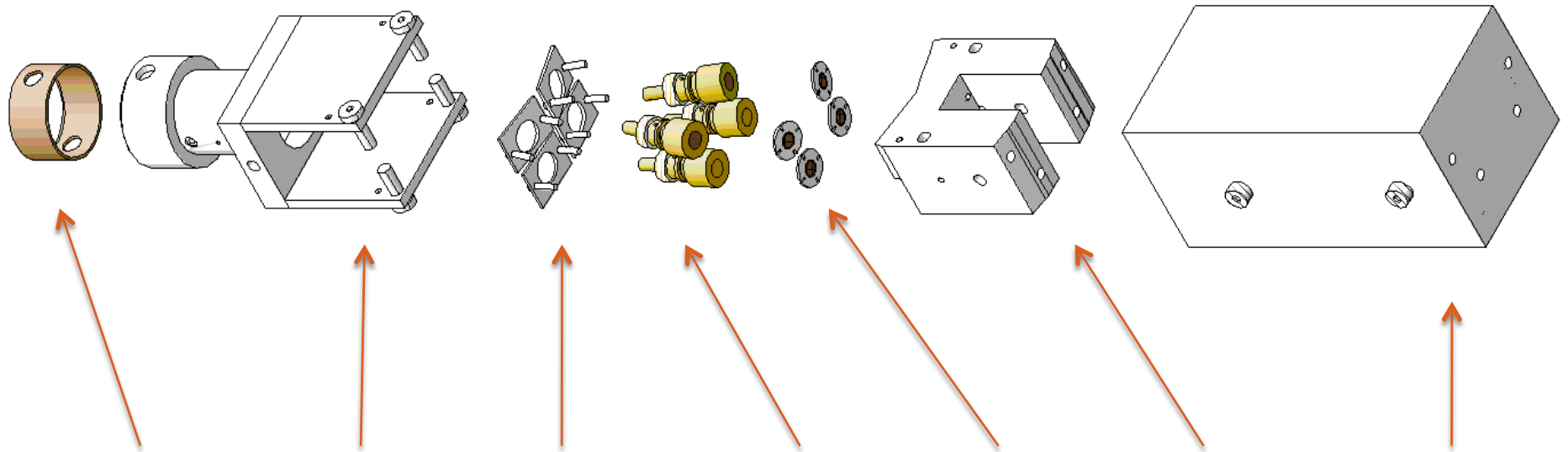
IDEA: CONTACT MAST COLLEAGUES

Total Assembled View

NOTE THAT SLIDE 14 HAS COMMENTS ON SHIELD



Total Exploded View



Bronze insert

Connector

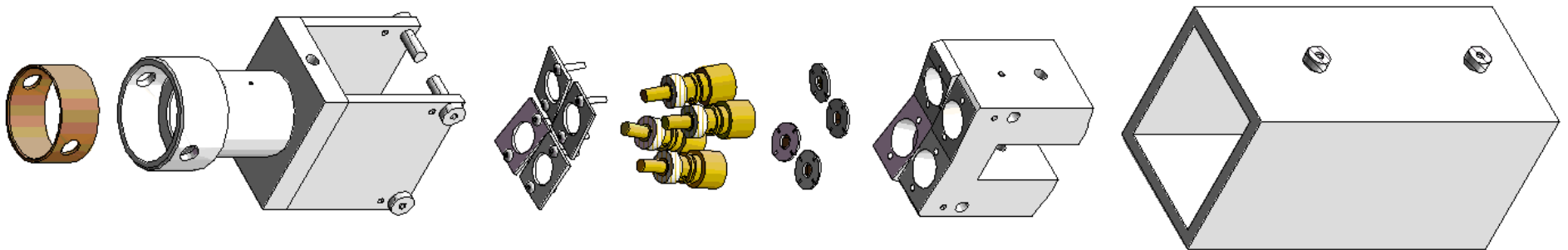
Base X 4

Detector X 4

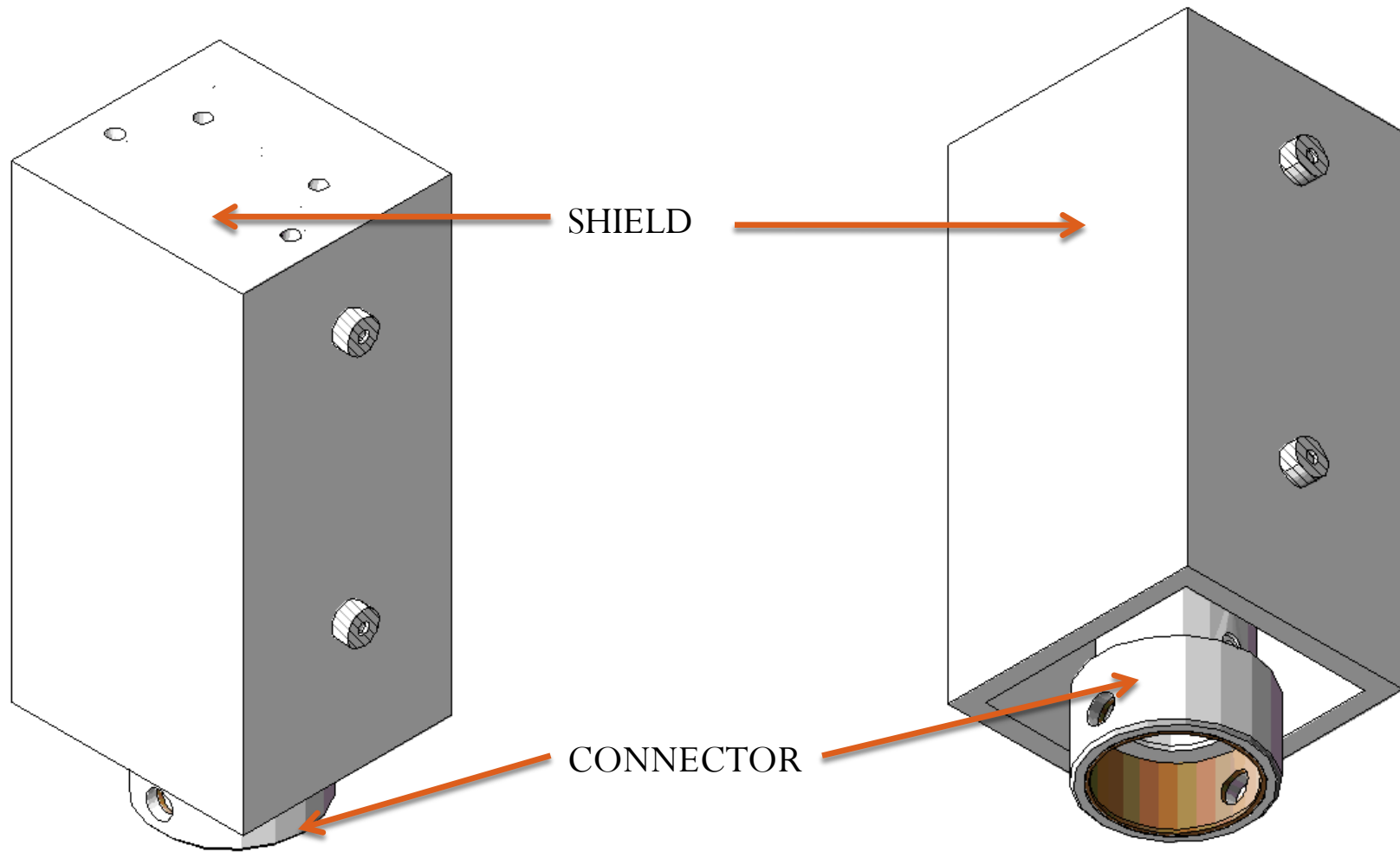
Foil X 4

Module

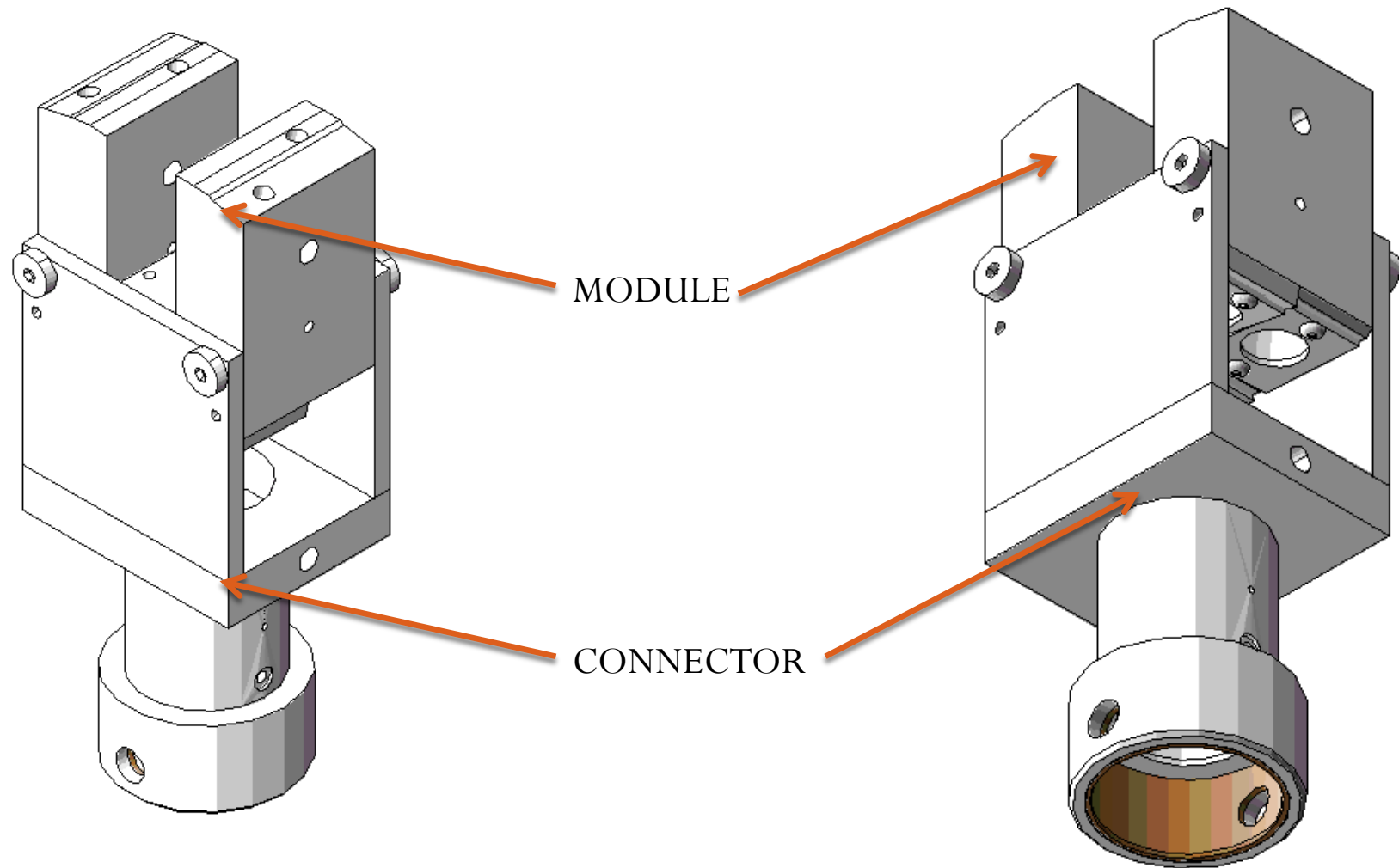
Shield



Assembled View with Shield

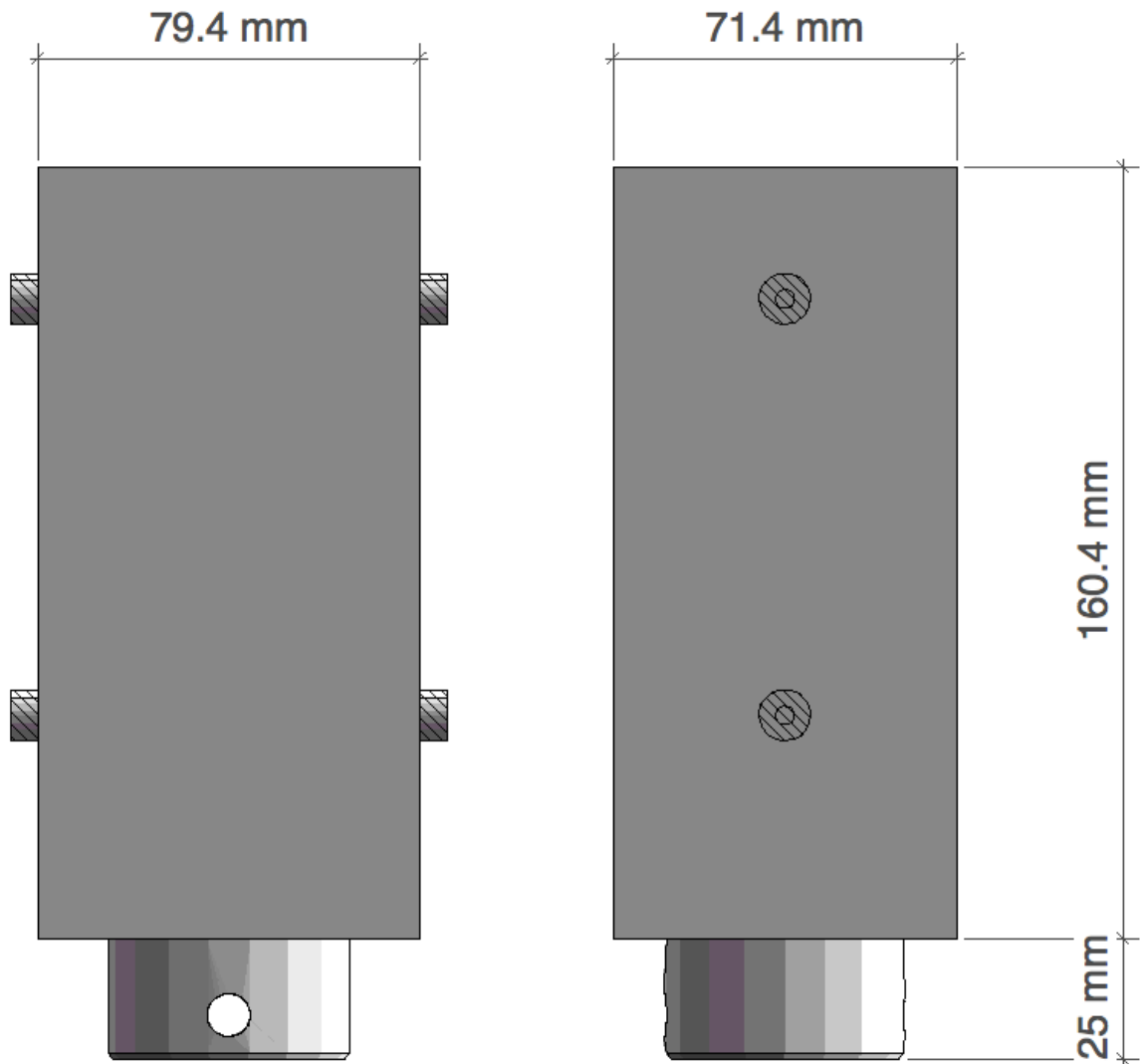


Assembled View without Shield

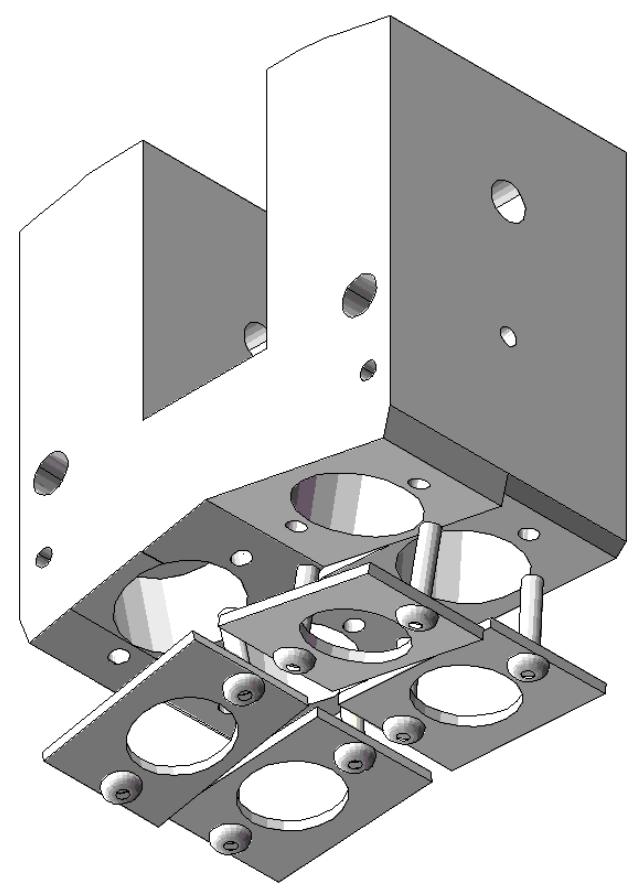
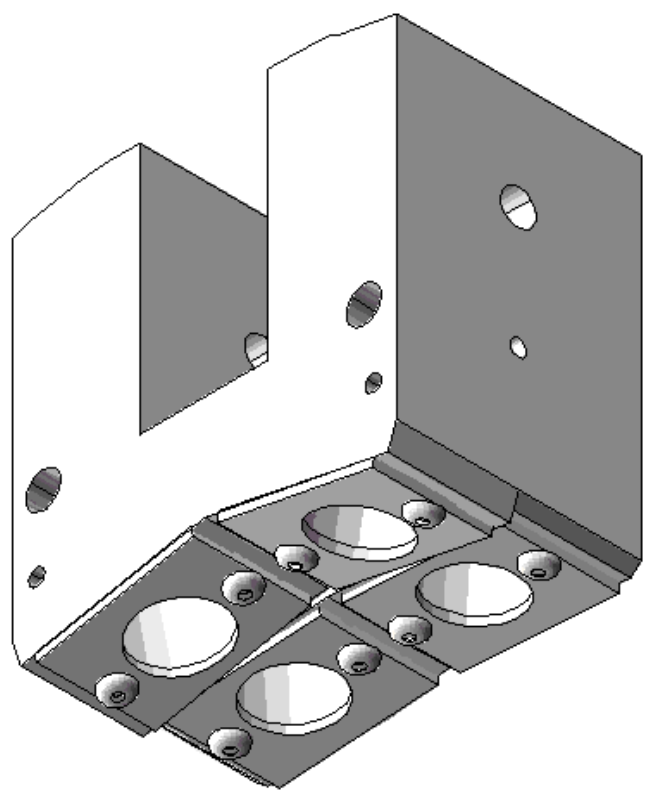
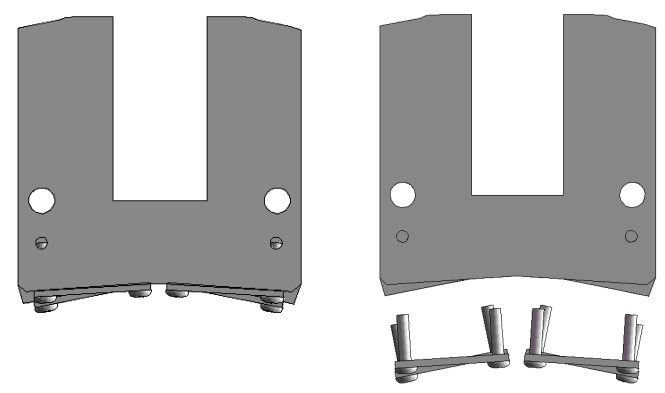


Total Assembled Dimensions

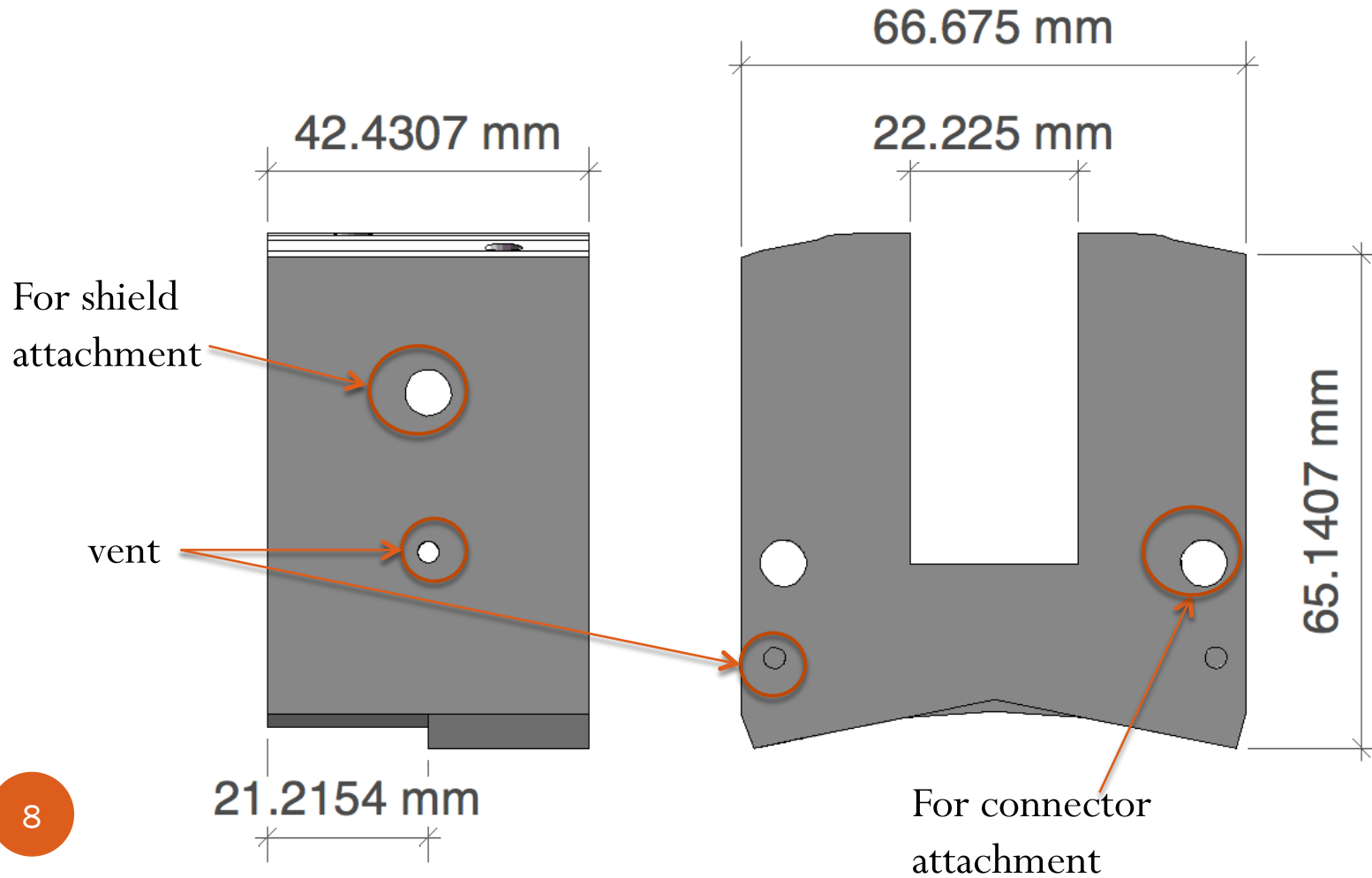
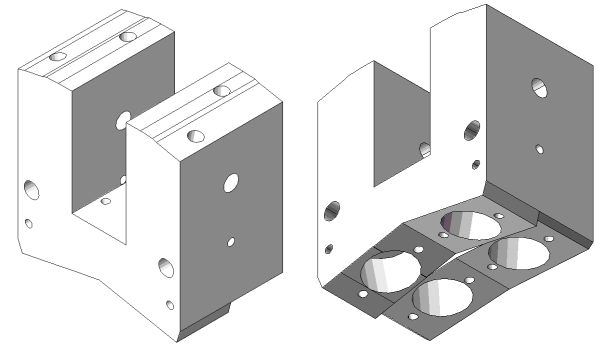
COMMENT 1
ISSUE: POSSIBLE
HARDWARE
COMPLICATIONS AT
MAST, FOR EXAMPLE
NEEDING TO REPLACE A
MACHINE SCREW
IDEA: CHANGE ALL
MEASUREMENTS AND
HARDWARE TO METRIC



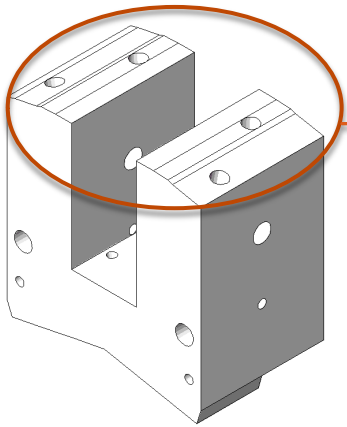
Module Exploded View with Bases



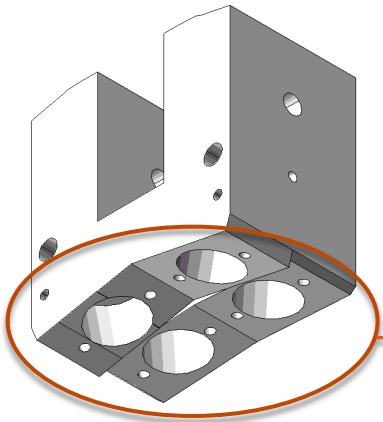
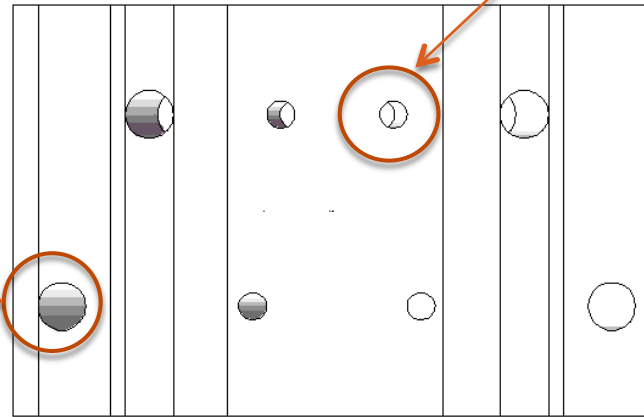
Module Dimensions



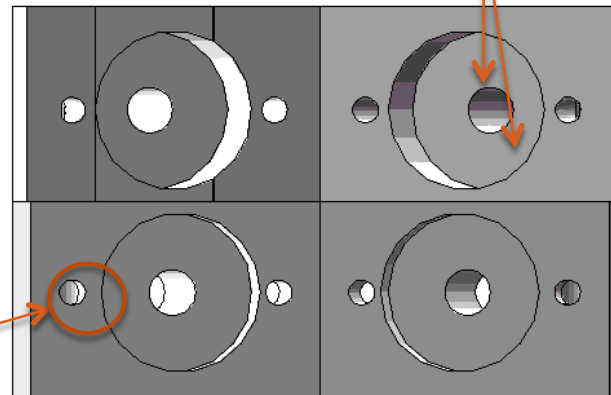
Module



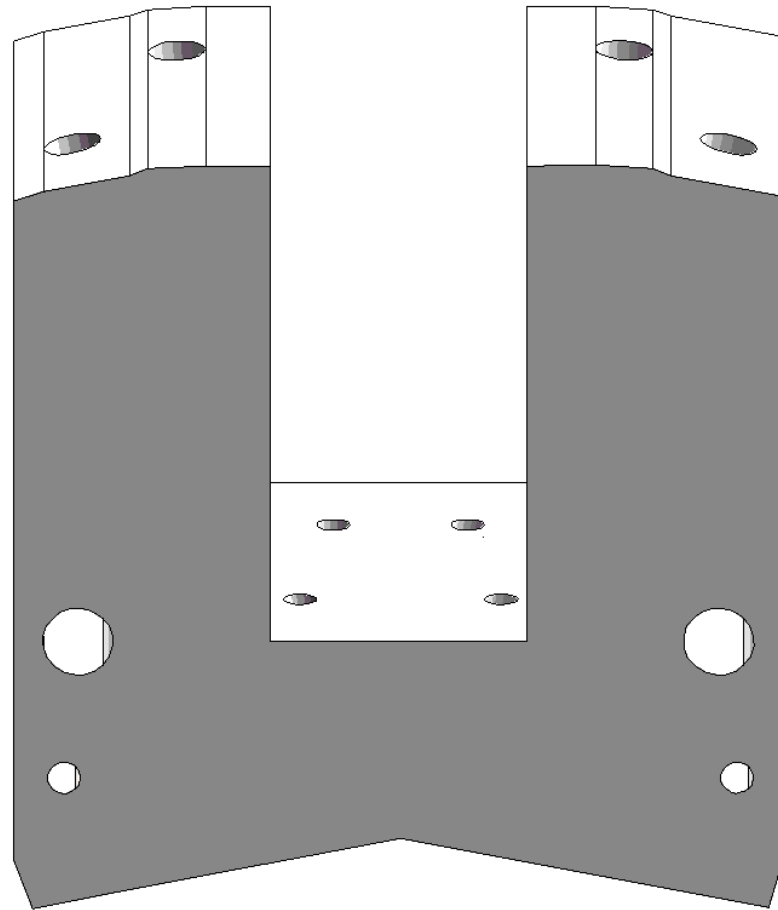
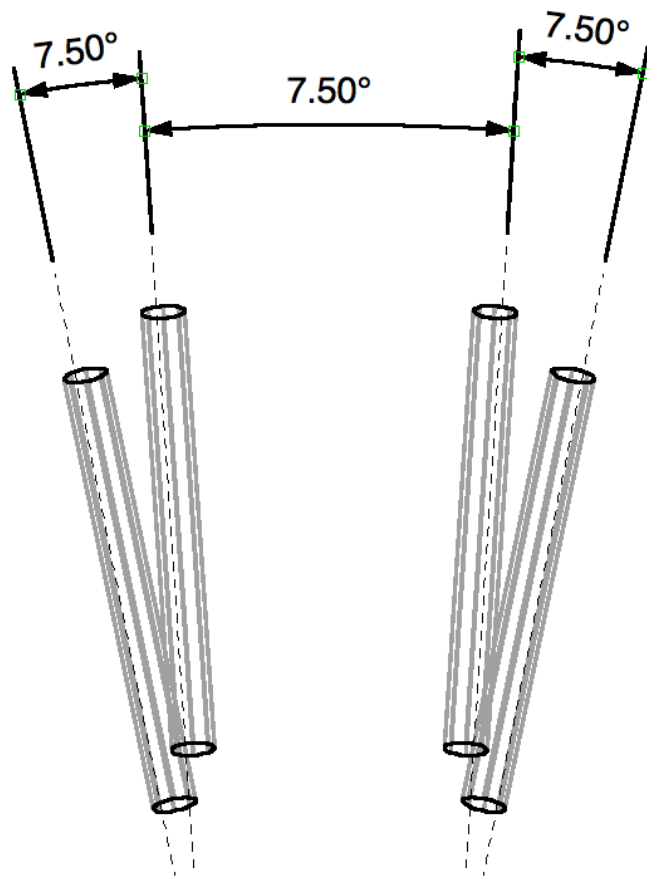
collimator
hole



detector and
collimator hole



Module Angles

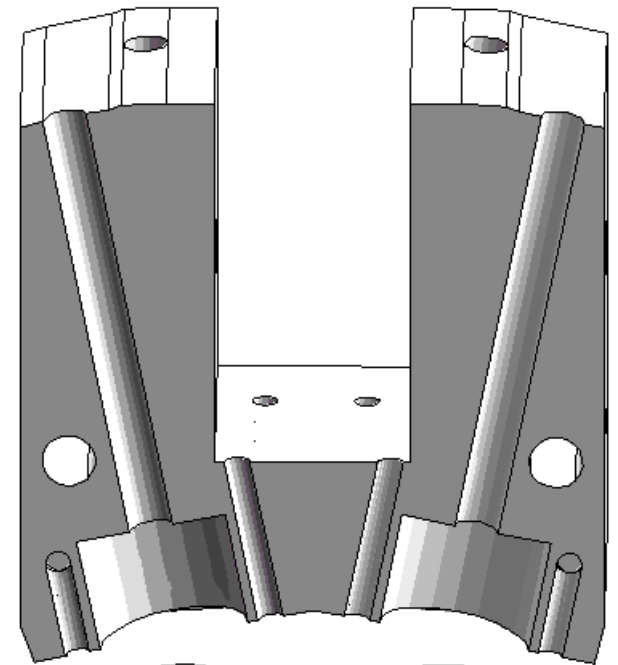
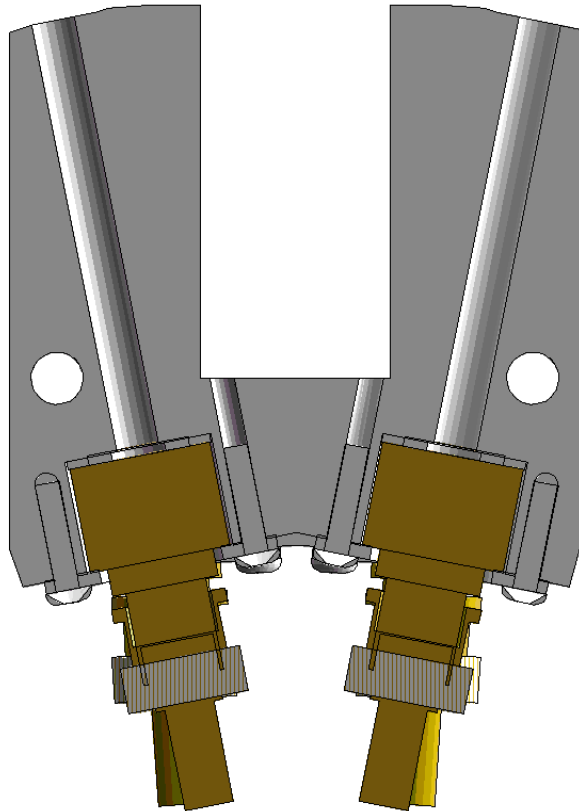


Module Cross Section

COMMENT 8

ISSUE: DETECTOR INSULATION

IDEA: USE UHV (ULTRA HIGH VACUUM) APPROVED INSULATOR SUCH AS PEEK, VESPEL, MAYCOR, BN CERAMIC, OR TEFLON TO CREATE A THIN SLEEVE AROUND INDIVIDUAL DETECTORS; CONTACT MAST COLLEAGUES FOR MATERIAL APPROVAL



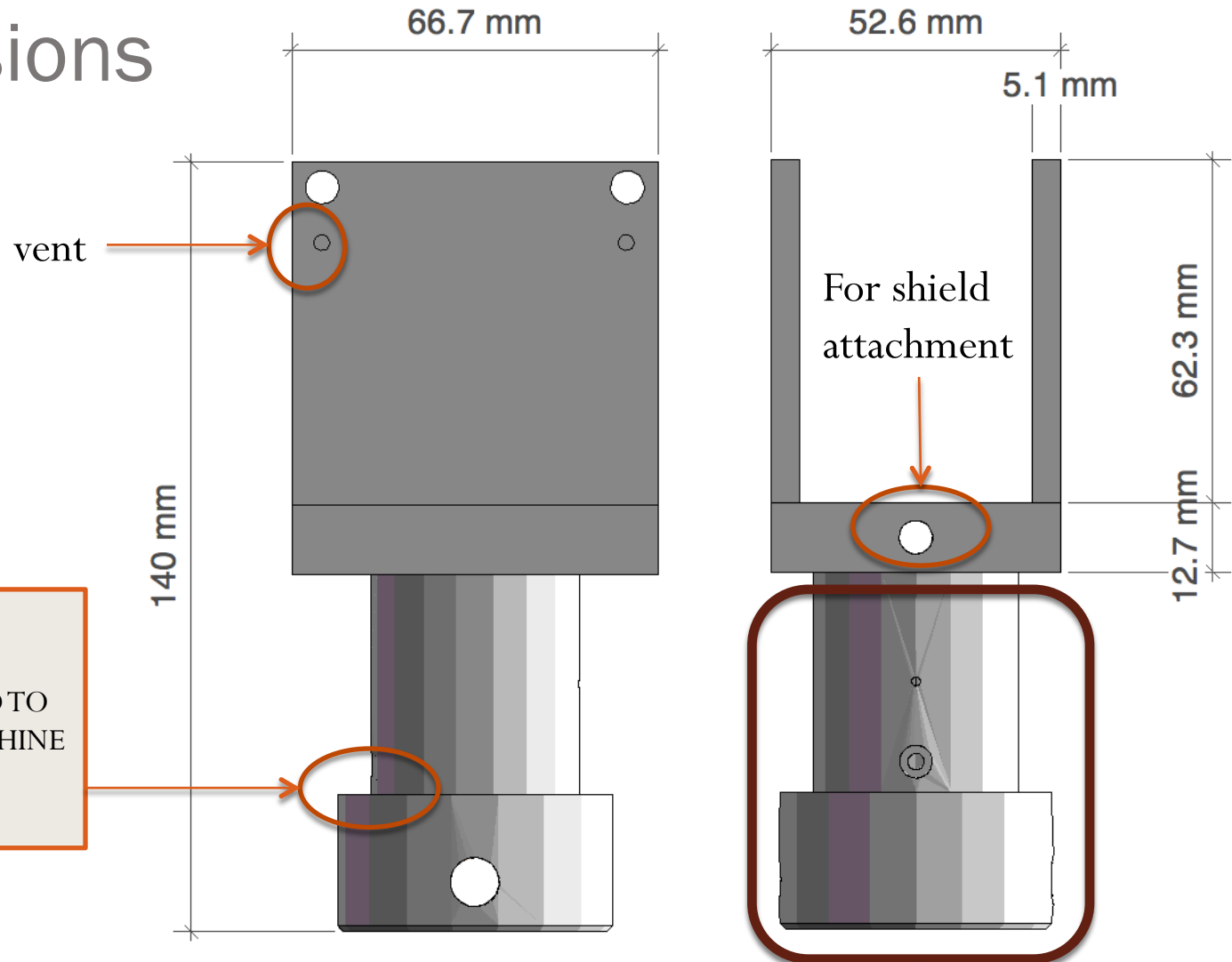
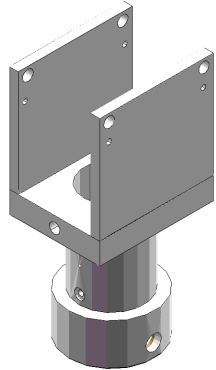
Foil

Detector

Base

BNC connector

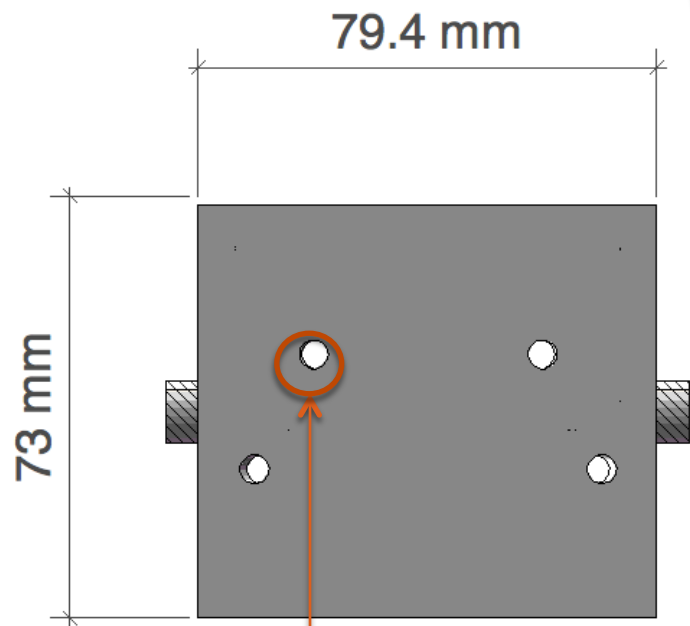
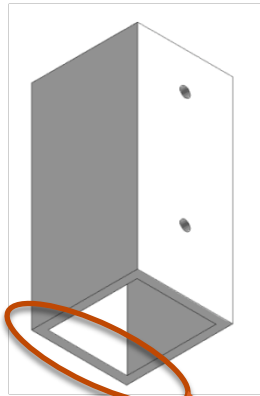
Connector Dimensions



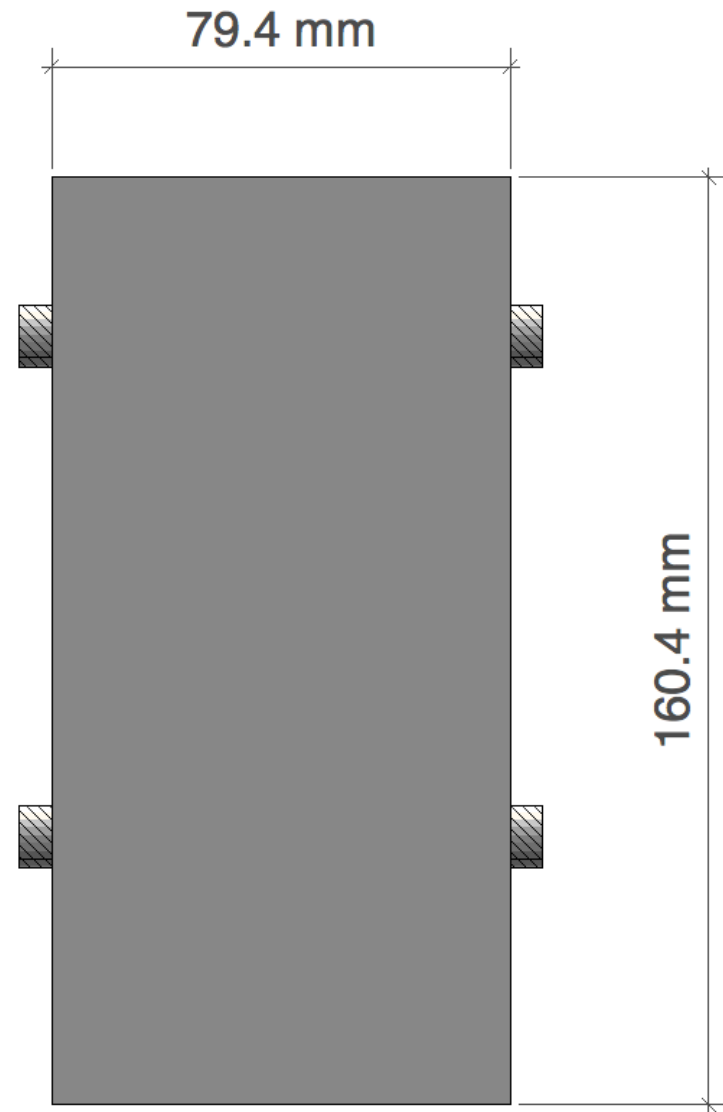
COMMENT 7
STATEMENT: THIS SHARP
EDGE WILL BE ROUNDED TO
REFLECT THE MAST MACHINE
DRAWINGS

This part is replicated from MAST machine drawings
to provide for attachment to reciprocating probe

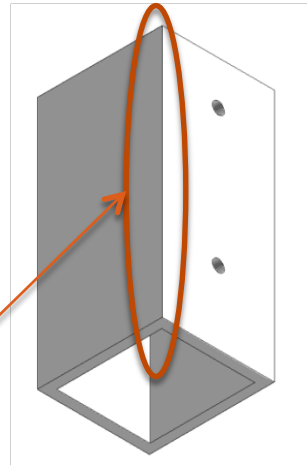
Shield Dimensions



collimator diameter: 5mm
wall thickness: 6.35 mm



Shield



COMMENT 5

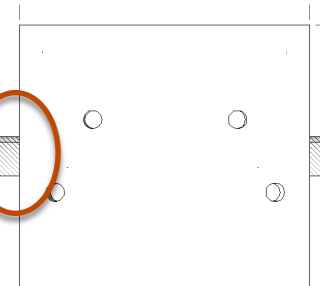
ISSUE: SHARP EDGES ON SHIELD

IDEA: ROUND ALL EDGES ON SHIELD
(INCREASE SHIELD THICKNESS SO EDGES
ARE STILL 6.35mm IN THICKNESS)

COMMENT 6

ISSUE: IS ROUNDED RECTANGULAR SHAPE OKAY
FOR SHIELD, OR DOES MAST PREFER
CYLINDRICAL?

IDEA: CONTACT MAST COLLEAGUES



COMMENT 4

ISSUE: SCREWS NOT FLUSH WITH SURFACE

IDEA: RECESS SCREW HEAD SO IT IS FLUSH
WITH THE SHIELD SURFACE

COMMENT 3

ISSUE: SECURE SCREWS TO BN SHIELD

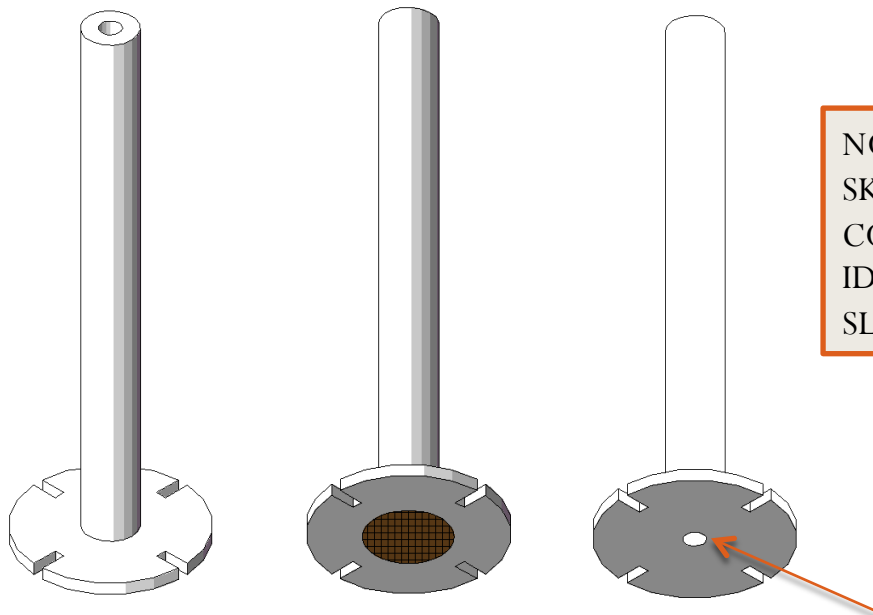
IDEA: SPOTWELD SHIMSTOCK STRAP FROM
SCREW HEAD TO CONNECTOR OR USE
APPROVED UHV CERAMIC ADHESIVE

Alternate Washer to Change Collimator Size

COMMENT 10

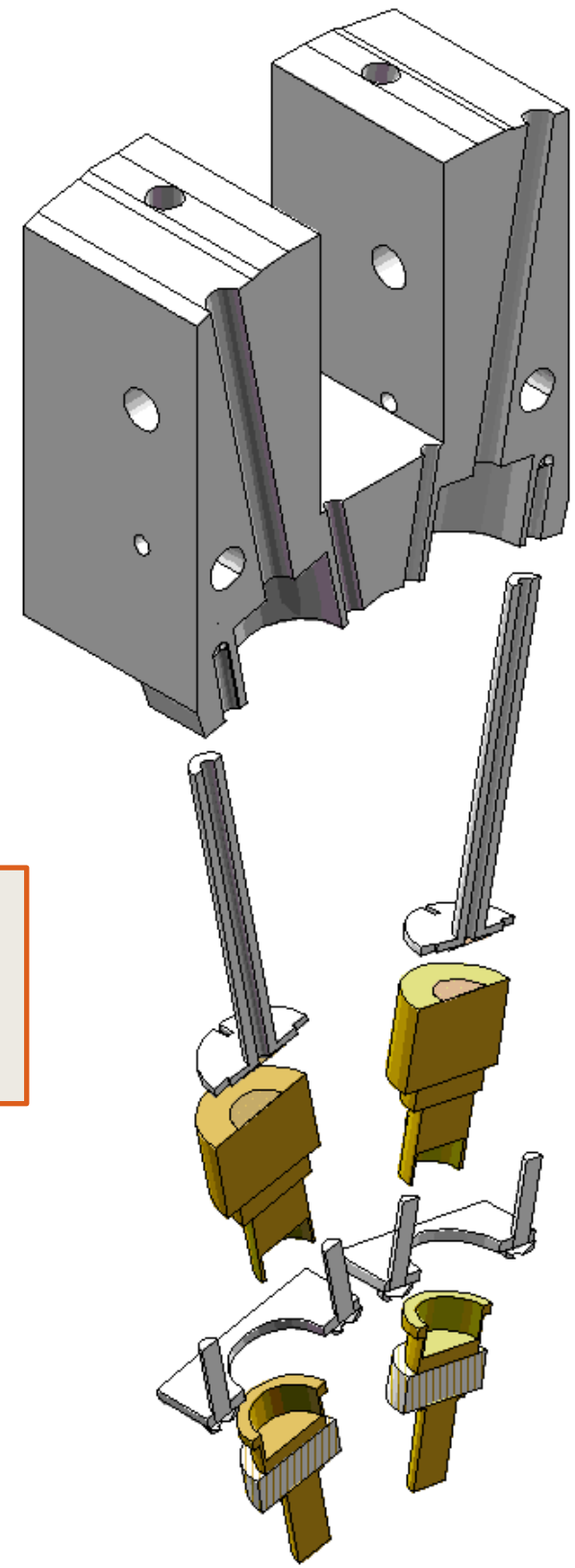
ISSUE: NEED ANOTHER WAY TO CHANGE COLLIMATOR SIZE, PREFERABLY ONLY REQUIRING THE REMOVAL OF THE BN SHIELD (UNLIKE METHOD SHOWN HERE)

IDEA: INSERT NEW COLLIMATOR CYLINDER THROUGH TOP OF MODULE AND PROVIDE FOR ATTACHMENT



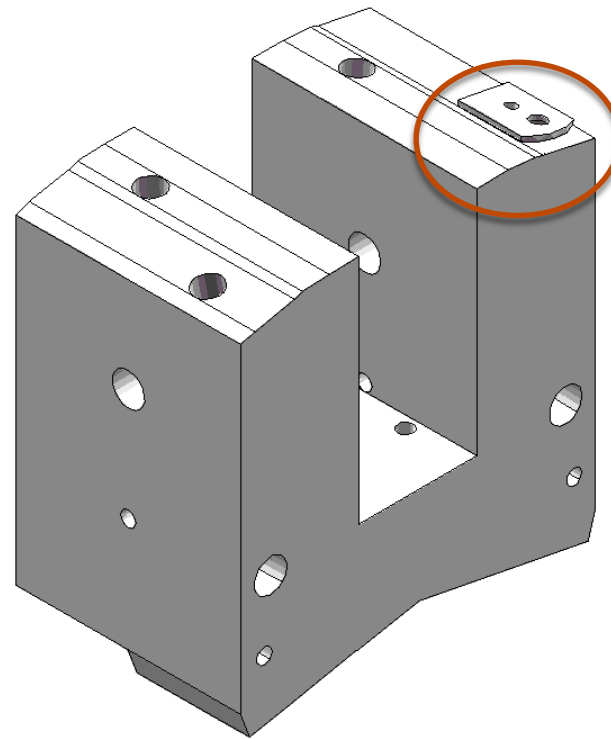
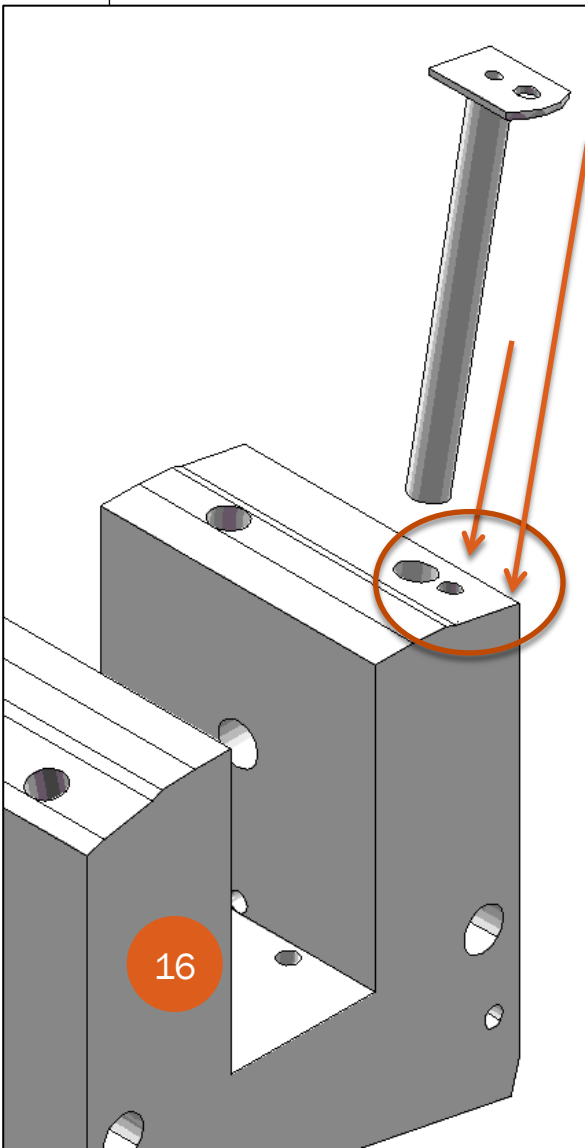
NOTE THAT SKETCH FOR COMMENT 10 IDEA IS ON SLIDE 16

New collimator size

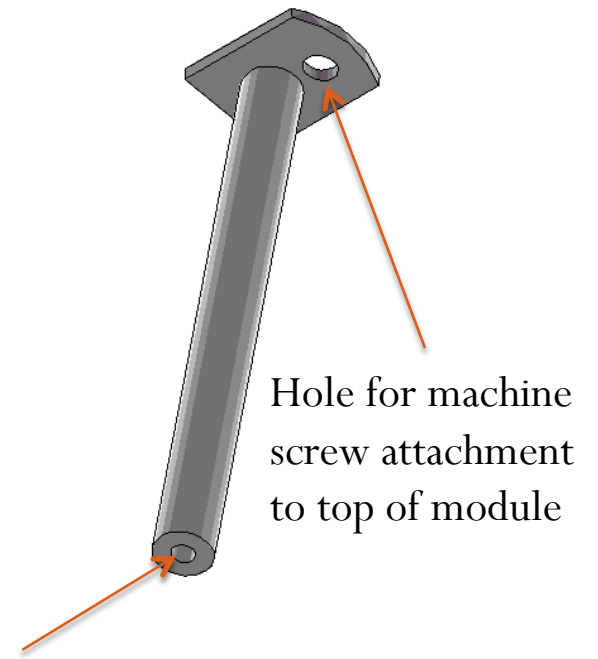


Alternate Washer to Change Collimator Size

SKETCH OF IDEA FOR
COMMENT 10



New collimator size



Hole for machine
screw attachment
to top of module