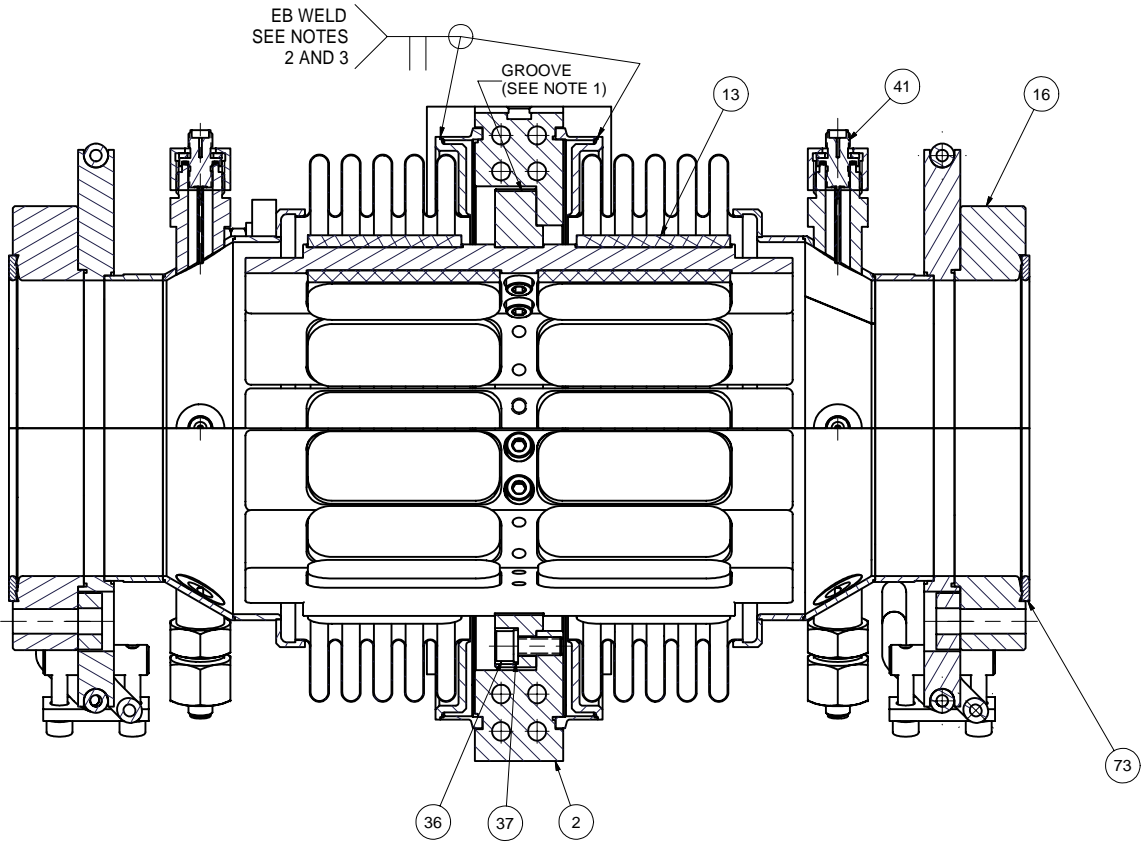
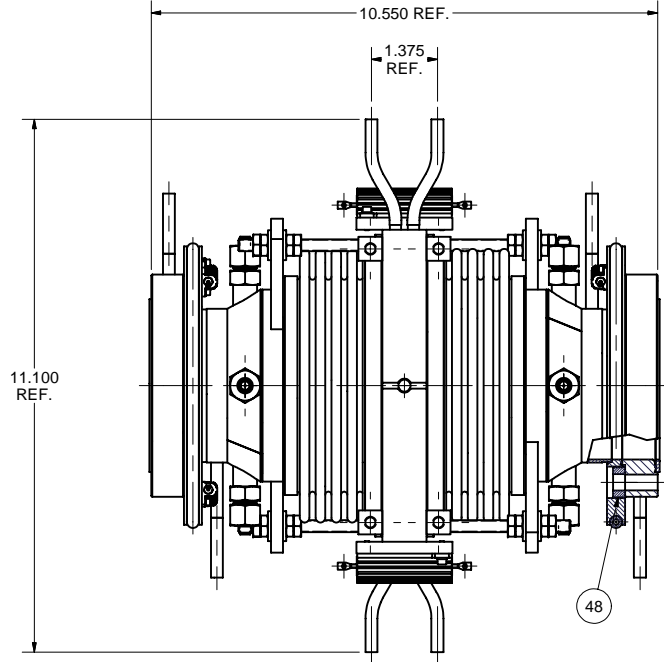
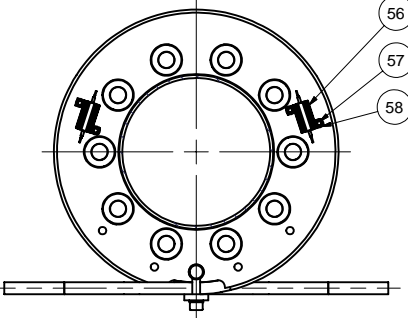
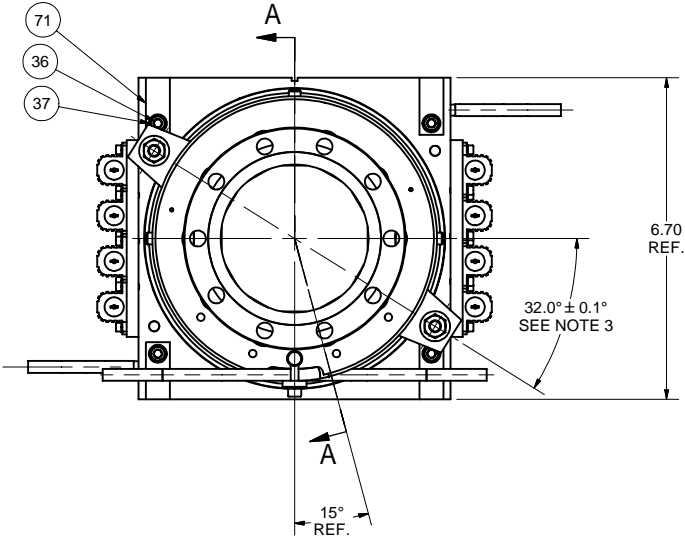
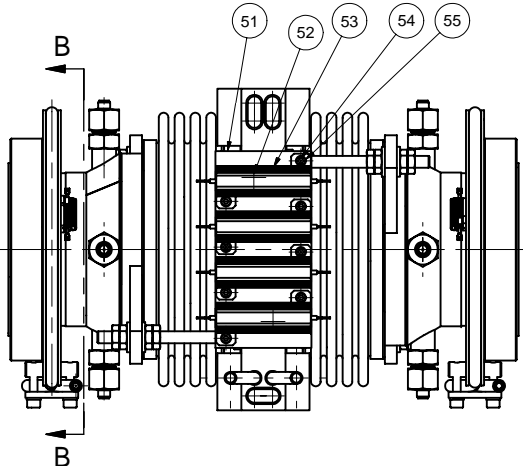
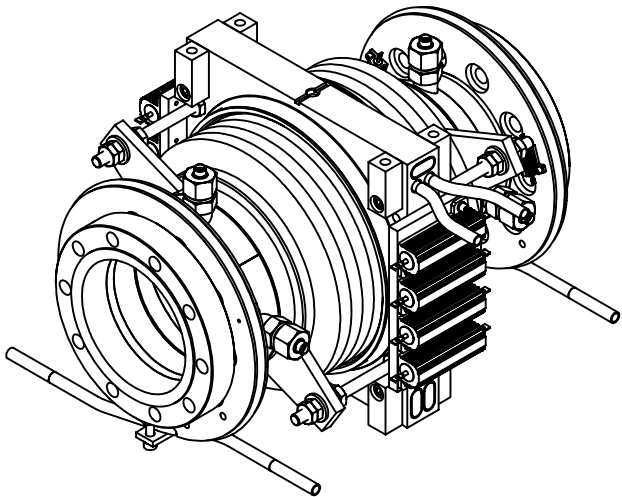


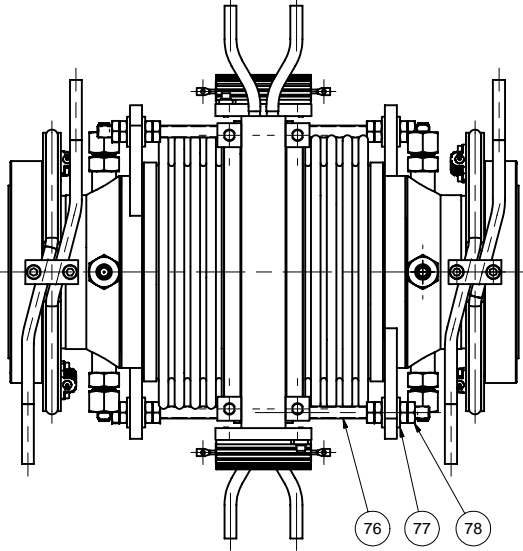
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		5 K HEAT SINK PLATE ADDED. BELLOWS AND 80 K COOLING LINES MODIFIED.	12/2/05	VM
B		5 K HEAT SINK MODIFIED. 80 K COOLING LINES MODIFIED. 50 W AND 5 W RESISTORS ADDED.	2/8/06	VM
C		PARTS ITEM 74, 76, 77, 78 ADDED.	4/3/06	VM
D	D-6 C-5	IN PART INFO, NOTE #4 WAS #3. NOTE #3 IS NEW. 18.0" REF. WAS 18.0" ADDED DIM. 32.0"± 0.1"	4-17-06	VM
E		FASTENERS ITEM 49, 50,72, 74 REMOVED.	01/24/07	VM



SECTION A-A
SCALE 1 : 1



SECTION B-B



- 1 78 MM HOM LOAD ASSEMBLY
- FILE NAME: 7102-017
SHEET NO.: 1
DFT. SCALE: 1:2
MATERIAL:
QTY: 3 PER CRYOMODULE
- NOTES: 1. PAY ATTENTION ON SUBASSEMBLY ITEM 13 GROOVE POSITION: IT SHOULD BE ON TOP.
2. WELDS TO CONFORM TO UHV SPEC.
3. RODS ITEM 16 SHOULD BE IN CENTER OF BELLOWS BRACKET HOLES WITHIN 0.01 IN.
4. LEAK RATE: $\leq 1 \times 10^{-10}$ mbar x l/sec.

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):	TIO	3-8-06	
MACHINE SHOP (Kaminski):	JKP	3-8-06	
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):	JOS	3-8-06	
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	QUANTITY	REMARKS	REV.
78	-	1/4-28 Hex Jam Nut	20			MMC 94805A209 316 SST		
77	-	1/4 WASHER	8			MMC 90107A029 316 SST		
76	7102-017 (SH. 11)	1/4-28 THREADED ROD	4			316 SST		
73	7102-024 (SH. 1)	4-5/8" CF GASKET MODIF.-78	2			-		
71	7102-017 (SH. 9)	SUPPORT BAR	8			316L SST		
58	-	#2 Spring Lock Washer	8			MMC 92147A410, 316 SS		
57	-	2-56 x 1/4 Socket Head Cap Screw	8			MMC 92185A077, 316 SS		
56	-	5 W RESISTOR (RH005 TYPE)	16			-		
55	-	#4 Spring Lock Washer	16			MMC 92147A415, 316 SS		
54	-	4-40 x 3/8 Socket Head Cap Screw	16			MMC 92185A108, 316 SS		
53	-	50 W RESISTOR (RH050 TYPE)	16			-		
52	-	10-32 x 1/2 Sock. Flat Head Cap Screw	8			MMC 90585A989, 316 SS		
51	7102-017 (SH. 9)	50 W RESISTORS PLATE	4			OFE COPPER		
48	7102-017 (SH. 9)	THICK WASHER	20			316L SST		
41	7102-017 (SH. 11)	RF PROBE-78 SUBASM	8			-		
37	-	#10 SPRING WASHER	20			MMC 92147A430 316 SST		
36	-	10-32 x 1/2 SOCK. HD. CAP SCREW	20			MMC 92185A989 316 SST		
16	7102-017 (SH. 9)	OUTER HALF SUBASM-78	2			-		
13	7102-017 (SH. 4)	ABSORBERS SUBASSEMBLY-78	1			-		
2	7102-017 (SH. 2)	COPPER BASE SUBASM-78	1			-		
1	7102-017 (SH. 1)	78 MM HOM LOAD ASSEMBLY	X			-		

7102-017
SH. NO. 1 OF 12

REV. E

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES:
TOLERANCES ON:
.00 ± .010
.000 ± .005
FRACTIONS ± 1/64
ANGLES ± 0.5°
ALL SURFACES

CORNELL UNIVERSITY
LEPP
LABORATORY FOR ELEMENTARY PARTICLE PHYSICS

CORNELL UNIVERSITY
Floyd R. Newman Laboratory
Ithaca, NY 14853

CHECKED BY: J. SEARS
APPROVED BY: M. LIEPE

DRAWN BY: VM
DRAWN FOR: M. Liepe

DATE: 4/2/2006

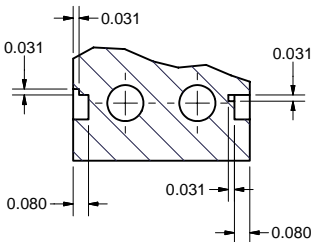
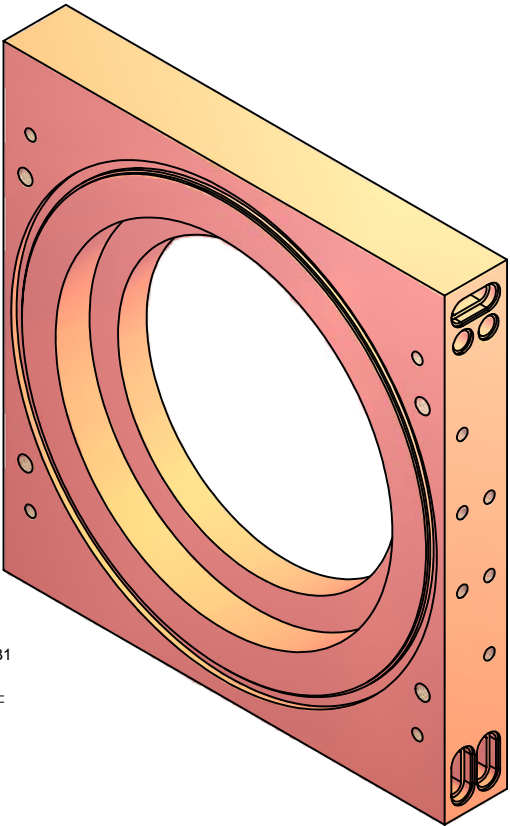
SCALE: -

D

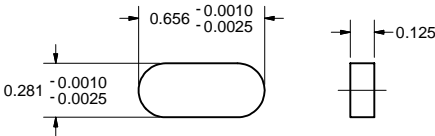
7102-017
SH. NO. 1 OF 12

REV. E

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		PART ITEM 5 ADDED. PART 4 WAS 0.560 IN. LONG.	12/2/05	VM
B		NEW DESIGN OF COPPER BASE (ITEM 3). PARTS ITEMS 5 AND 6 - NEW.	2/8/06	VM
C	E,F-5 E,F-9	FOUR 1/4-28 HOLES ADDED TO PART ITEM 3.	4/1/06	VM

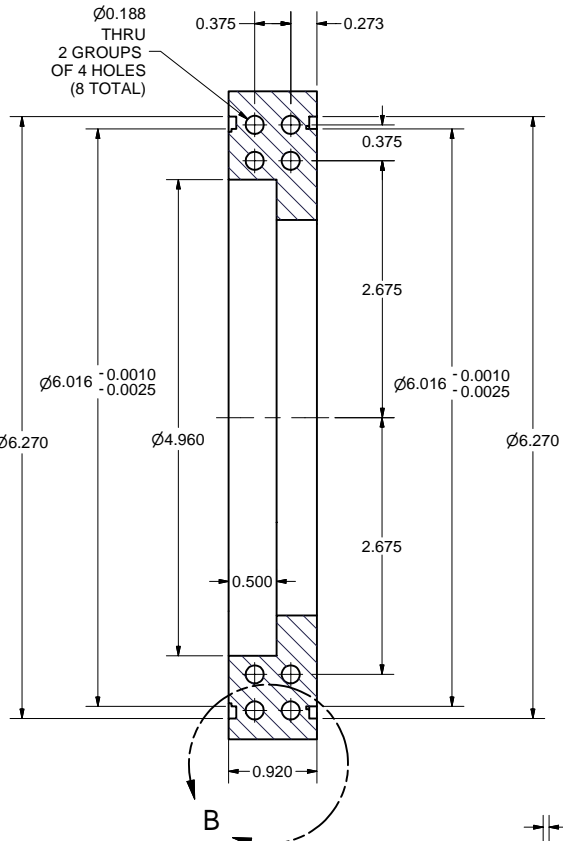


DETAIL B
SCALE 2 : 1



6 CAP 1

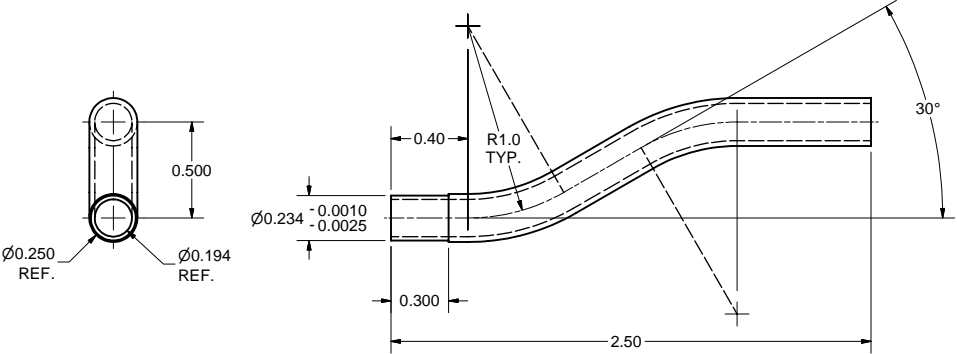
FILE NAME: 7102-017
SHEET NO.: 3
DFT. SCALE: 2:1
MATERIAL: OFE COPPER
QTY: 6 PER ASSEMBLY
NOTES:



SECTION A-A

3 COPPER BASE-78

FILE NAME: 7102-017
SHEET NO.: 3
DFT. SCALE: 1:1
MATERIAL: OFE C10100 COPPER (RRR-200 OR BETTER)
QTY: 1 PER ASSEMBLY
NOTES: 1. BLUNT SHARP EDGES ON OUTER CONTOUR
WITH 0.015" CHAMFER OR RADIUS



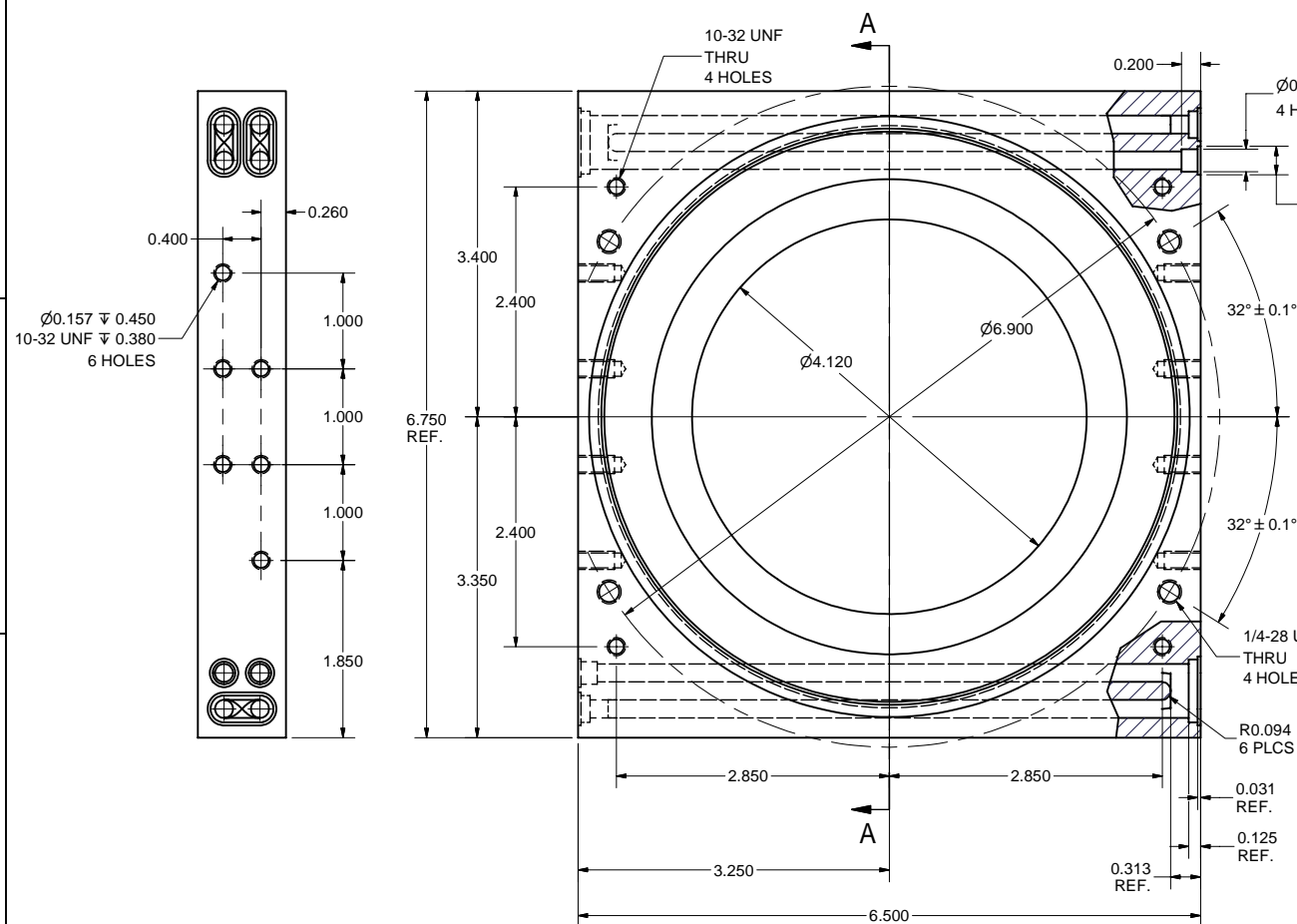
5 80 K COOLING TUBE

FILE NAME: 7102-017
SHEET NO.: 3
DFT. SCALE: 2:1
MATERIAL: 1/4" OD x 0.028 W 316L STAINLESS STEEL
QTY: 4 PER ASSEMBLY
NOTES: 1. DEVELOPED LENGTH: L = 2.576".

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

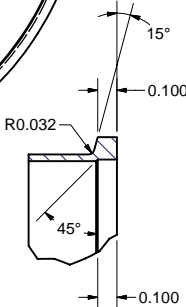
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.
			QUANTITY				
PRINT DISTR.	7102-017 SH. NO. 3 OF 12	CR-1	PLOT DATE: 6/14/2006 CAD FILE NAME: 7102-017-rev-C.idw				
		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES	CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853				
		ERL INJECTOR CRYOMODULE 78 MM HOM LOAD					
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE	DRAWN BY VM	DRAWN FOR M.Liepe	DATE 4/2/2006	SCALE -	D	7102-017 SH. NO. 3 OF 12	REV. C

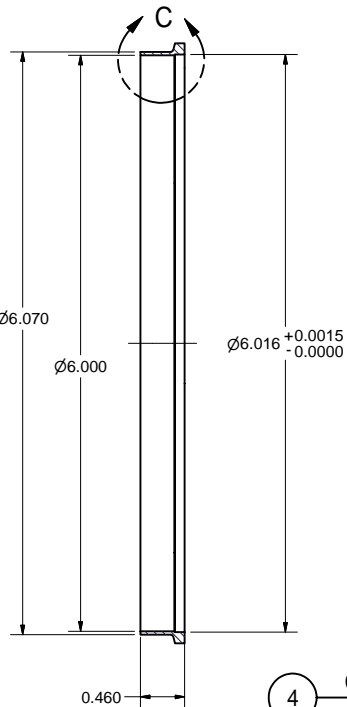


4 CONNECTION RING-78

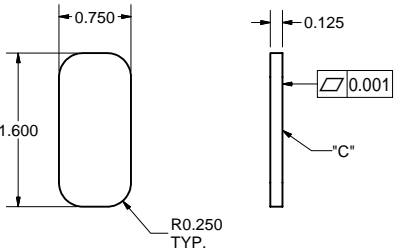
FILE NAME: 7102-017
SHEET NO.: 3
DFT. SCALE: 1:1
MATERIAL: 316L ST. STEEL
QTY: 2 PER ASSEMBLY
NOTES:



DETAIL C
SCALE 2 : 1



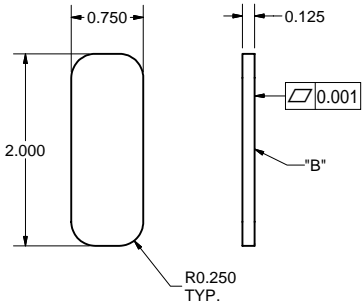
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		MAJOR CHANGES IN PARTS NAMES AND MATERIALS.	12/2/05	VM
B		NEW ABSORBER PLATE TYPE (ITEM 12) ADDED.	2/8/06	VM



18 SMALL ABSORBER TILE 1-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: Trans-Tech #TT2-111R or Equiv.
QTY: 8 PER ASSEMBLY
NOTES: 1. METALLIZE SURFACE "C"
PER LEPP SPEC. PEB-02.

20 SMALL ABSORBER TILE 2-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: Trans-Tech #Co2Z or Equiv.
QTY: 8 PER ASSEMBLY
NOTES: 1. METALLIZE SURFACE "C"
PER LEPP SPEC. PEB-02.

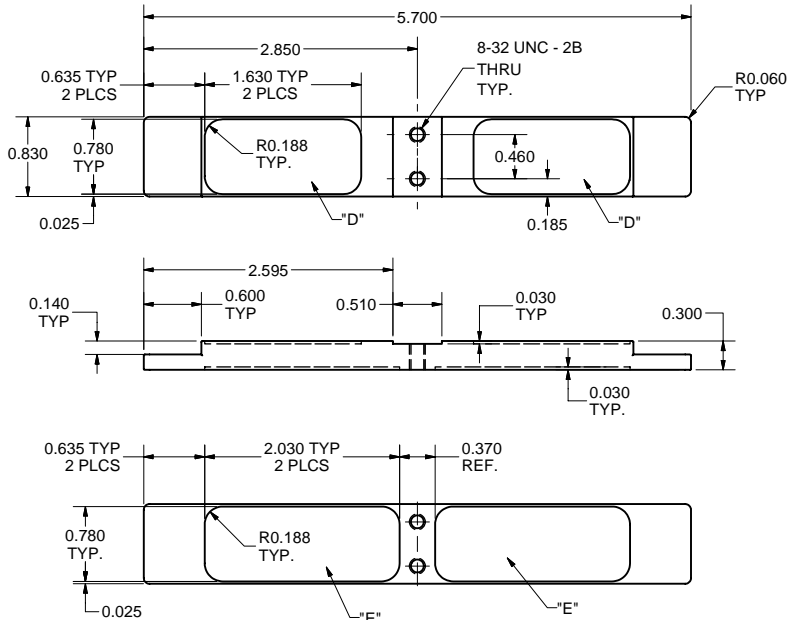
22 SMALL ABSORBER TILE 3-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: CERALLOY 137 ZR 10
QTY: 8 PER ASSEMBLY
NOTES:



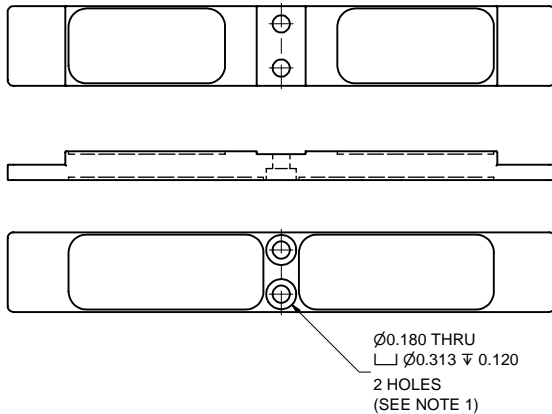
17 LARGE ABSORBER TILE 1-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: TransTech #TT2-111R or Equiv.
QTY: 8 PER ASSEMBLY
NOTES: 1. METALLIZE SURFACE "B"
PER LEPP SPEC. PEB-02.

19 LARGE ABSORBER TILE 2-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: Trans-Tech #Co2Z or Equiv.
QTY: 8 PER ASSEMBLY
NOTES: 1. METALLIZE SURFACE "B"
PER LEPP SPEC. PEB-02.

21 LARGE ABSORBER TILE 3-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: CERALLOY 137 ZR 10
QTY: 8 PER ASSEMBLY
NOTES:



14 ABSORBER PLATE 1-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: 10W3 ELKONITE (W-75%, Cu-25%)
QTY: 8 PER ASSEMBLY
NOTES: 1. BREAK ALL SHARP EDGES R=0.01"
EXCEPT MACHINED RECESSES.
2. METALLIZE SURFACES "D" AND "E" PER LEPP SPEC. PEB-01.



12 ABSORBER PLATE 2-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL: TUNGSTEN ALLOY 18 (W-95%, Ni-3.5%, Cu-1.5%), NONMAGNETIC.
QTY: 4 PER ASSEMBLY
NOTES: 1. ALL OTHER DIMENSIONS ARE SAME AS FOR ITEM 14.
2. BREAK ALL SHARP EDGES R=0.01"
EXCEPT MACHINED RECESSES.

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

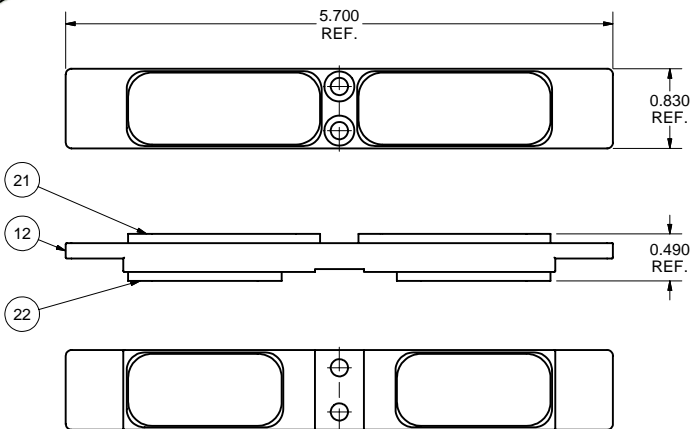
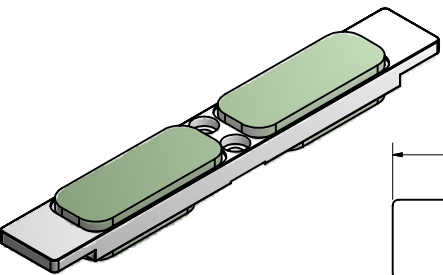
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.
PLOT DATE: 6/14/2006 CAD FILE NAME: 7102-017.idw			QUANTITY				
22	7102-017 (SH. 5)	SMALL ABSORBER TILE 3-78			2	CERADINE	
21	7102-017 (SH. 5)	LARGE ABSORBER TILE 3-78			2	CERADINE	
12	7102-017 (SH. 5)	ABSORBER PLATE 2-78			1	W-18	
20	7102-017 (SH. 5)	SMALL ABSORBER TILE 2-78		2		Co2Z	
19	7102-017 (SH. 5)	LARGE ABSORBER TILE 2-78		2		Co2Z	
18	7102-017 (SH. 5)	SMALL ABSORBER TILE 1-78	2			TT-2	
17	7102-017 (SH. 5)	LARGE ABSORBER TILE 1-78	2			TT-2	
14	7102-017 (SH. 5)	ABSORBER PLATE 1-78	1	1		10W3 ELKONITE	
26	7102-017 (SH. 5)	ABSORBER PLATE SUBASM 3-78			X	-	
25	7102-017 (SH. 5)	ABSORBER PLATE SUBASM 2-78	X			-	
24	7102-017 (SH. 5)	ABSORBER PLATE SUBASM 1-78	X			-	
DRAWN BY: VM			DRAWN FOR: M.Liepe			DATE: 4/2/2006	SCALE: -
CHECKED BY: J. SEARS			APPROVED BY: M. LIEPE			7102-017 SH. NO. 5 OF 12	REV. B

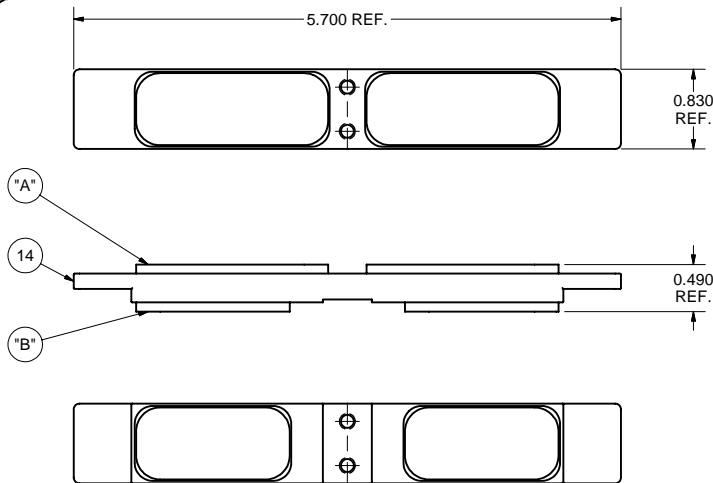
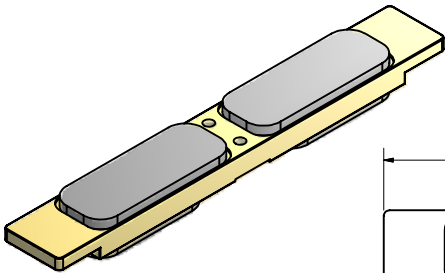


ERL INJECTOR CRYOMODULE
78 MM HOM LOAD

CORNELL UNIVERSITY
Floyd R. Newman Laboratory
Ithaca, NY 14853



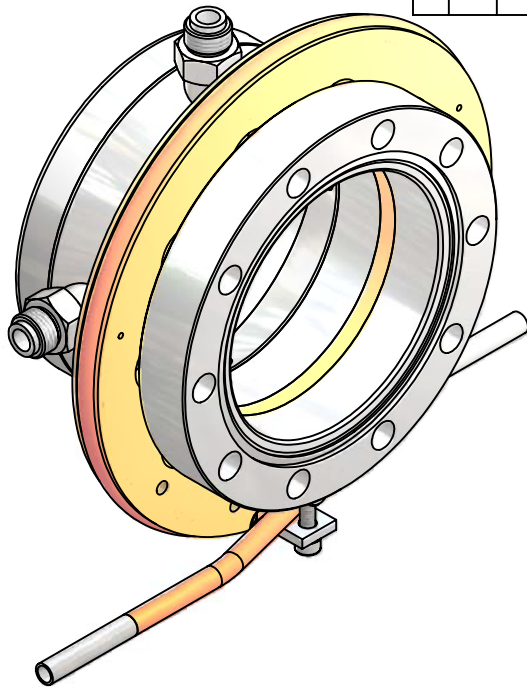
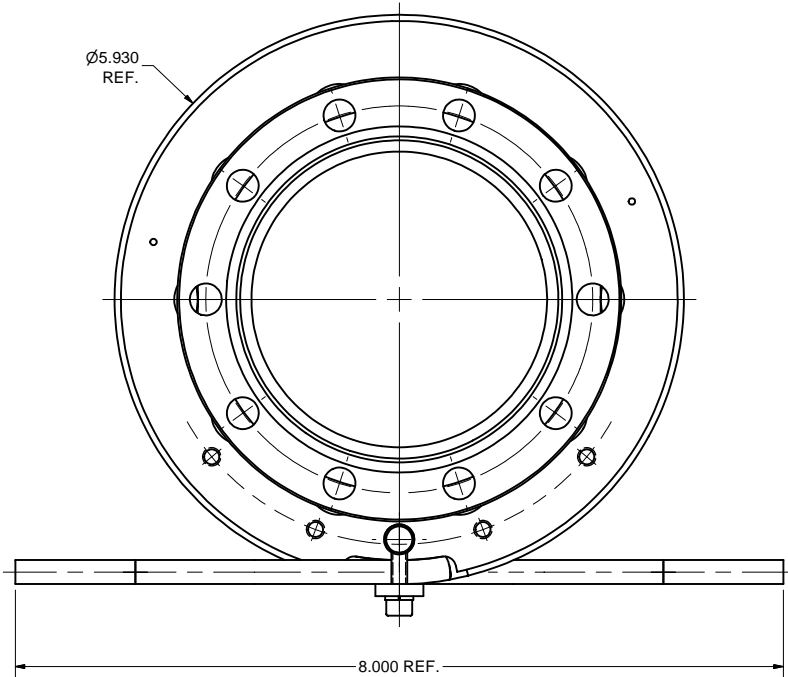
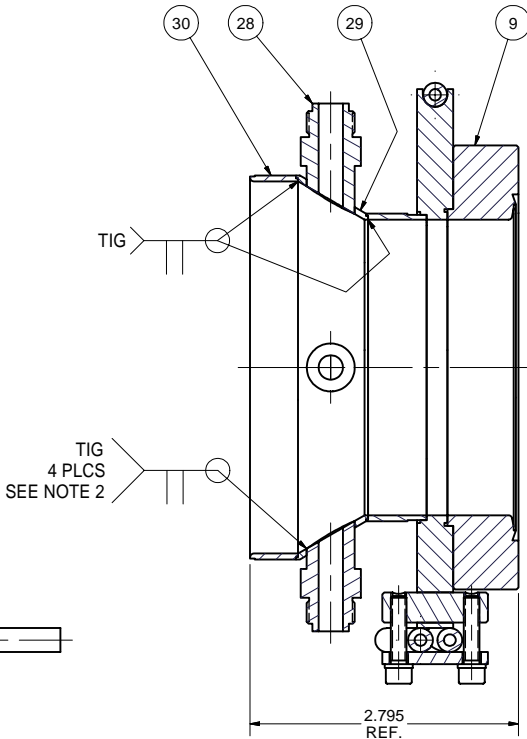
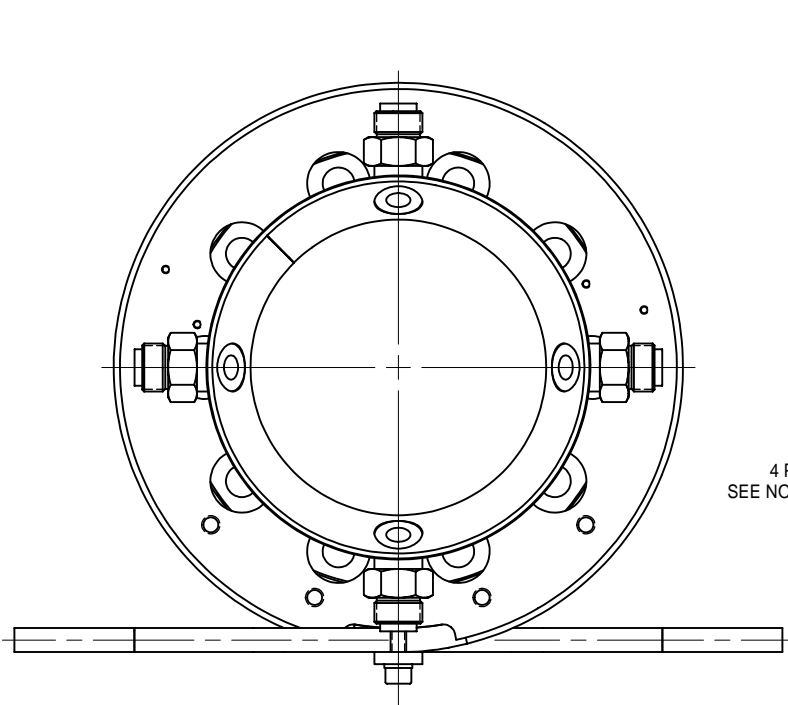
26 ABSORBER PLATE SUBASM 3-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL:
QTY: 4 PER ASSEMBLY
NOTES: 1. BRAZE TILES 21 AND 22 TO PLATE 12
ACCORDING TO LEPP SPEC. NAS-01.



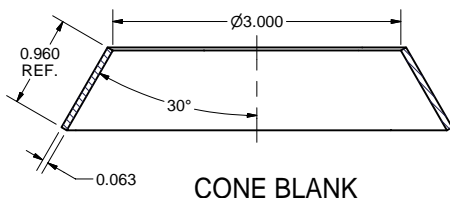
24 ABSORBER PLATE SUBASM 1-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL:
QTY: 4 PER ASSEMBLY
NOTES: 1. PARTS: "A" - ITEM 17, "B" - 18.
2. SOLDER TILES "A" AND "B" TO PLATE 14
ACCORDING TO LEPP SPEC. PEB-03.

25 ABSORBER PLATE SUBASM 2-78
FILE NAME: 7102-017
SHEET NO.: 5
DFT. SCALE: 1:1
MATERIAL:
QTY: 4 PER ASSEMBLY
NOTES: 1. PARTS: "A" - ITEM 19, "B" - 20.
2. SOLDER TILES "A" AND "B" TO PLATE 14
ACCORDING TO LEPP SPEC. PEB-03.

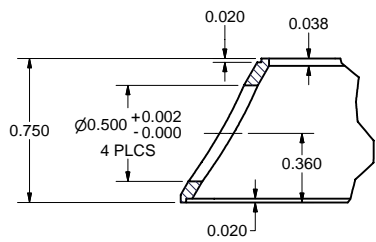
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		PART 23 ADDED TO SUBASM 27. PART 40 MODIFIED.	12/2/05	VM
B		NEW DESIGN OF SUBASM ITEM 27	2/8/06	VM
C		PART ITEM 75 - NEW.	4/1/06	Vm



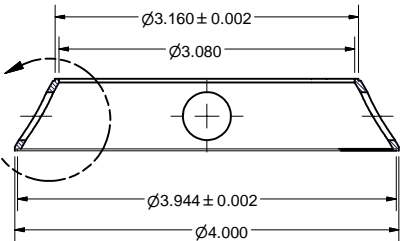
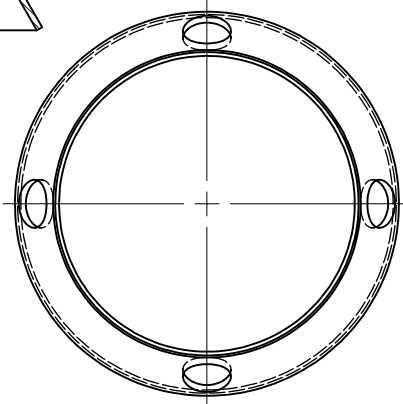
27 FLANGE UNIT SUBASSEMBLY-78
FILE NAME: 7102-017
SHEET NO.: 6
DFT. SCALE: 1:1
MATERIAL:
QTY: 2 PER ASSEMBLY
NOTES: 1. ALL WELDS TO CONFORM TO UHV SPEC.
2. WELD RF PROBE HOUSINGS (ITEM 28) LAST.



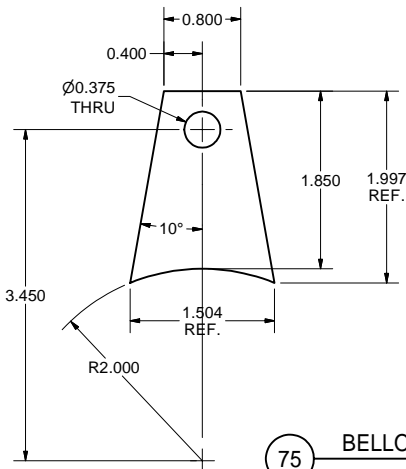
CONE BLANK



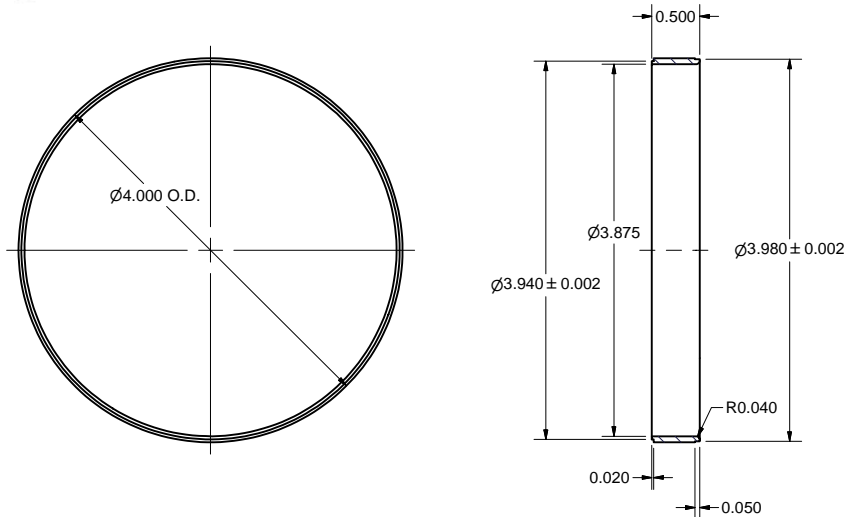
DETAIL E
SCALE 2 : 1



29 CONE-78
FILE NAME: 7102-017
SHEET NO.: 6
DFT. SCALE: 1:1
MATERIAL: 316L STAINLESS STEEL
QTY: 2 PER ASSEMBLY
NOTES:



75 BELLOWS BRACKET-78
FILE NAME: 7102-017
SHEET NO.: 6
DFT. SCALE: 1:1
MATERIAL: 1/4" 316L STAINLESS STEEL SHEET
QTY: 4 PER ASSEMBLY
NOTES:



30 LARGE TUBE-78
FILE NAME: 7102-017
SHEET NO.: 6
DFT. SCALE: 1:1
MATERIAL: 316L STAINLESS STEEL
QTY: 2 PER ASSEMBLY
NOTES:

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	QUANTITY	REMARKS	REV.
30	7102-017 (SH. 6)	LARGE TUBE-78	1			316L SST		
29	7102-017 (SH. 6)	CONE-78	1			316L SST		
28	7102-017 (SH. 9)	RF PROBE HOUSING	4			316L SST		
9	7102-017 (SH. 7)	5 K HEAT SINK SUBASM-78	1			-		
27	7102-017 (SH. 6)	FLANGE UNIT SUBASM-78	X			-		

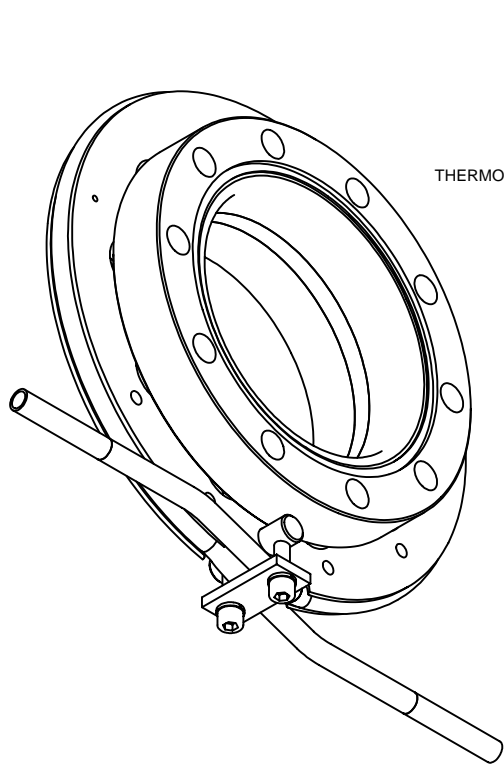
FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
OK	DATE	N/A	
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

REV.	SH. NO.	DATE	BY	APP.
D	6	6/14/2006	J. SEARS	
C	6	4/2/06	M. LIEPE	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES	CORNELL UNIVERSITY LEPP LABORATORY FOR ELEMENTARY PARTICLE PHYSICS	CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE	DRAWN BY: VM DRAWN FOR: M. Liepe	DATE: 4/2/06 SCALE: -
7102-017 SH. NO. 6 OF 12	REV. C	

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
B		ALL PARTS ARE NEW.	2/8/06	VM
C		BOM EDITED TO STANDARDIZE VENDOR PART #s. D.M.E.	6-14-06	TIO

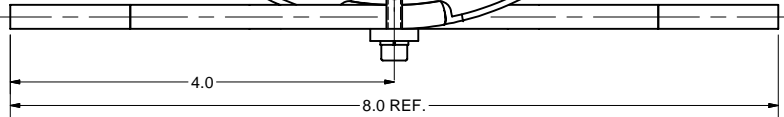


2-ND BRAZING:
CUSIL @ 780° C
(OR EQUIV.)
THERMO-CONDUCTIVE JOINT
SEE NOTE 1

1.585
REF.

1-ST BRAZING:
NIORO @ 1000° C
(OR EQUIV.)
IN VACUUM
(JOINTS TO CONFORM
TO UHV SPEC.)

Ø5.930
REF.



4.0

8.0 REF.

Ø0.194 I.D.
REF.

Ø0.250 O.D.
REF.

Ø0.210
+0.0015
-0.0000

0.150

1.250

64

5 K END TUBE

FILE NAME: 7102-017

SHEET NO.: 7

DFT. SCALE: 4:1

MATERIAL: 1/4" OD x 0.028" W 316L STAINLESS STEEL TUBE

QTY: 4 PER ASSEMBLY

NOTES:

9

5K HEAT SINK SUBASM-78

FILE NAME: 7102-017

SHEET NO.: 7

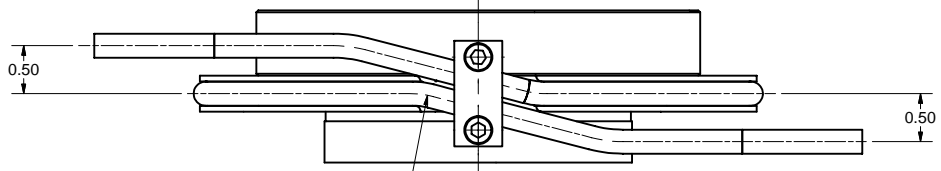
DFT. SCALE: 1:1

MATERIAL:

QTY: 2 PER ASSEMBLY

NOTES: 1. TENSION TUBE ITEM 7 BEFORE 2-ND BRAZING.
USE TENSION DEVICE (ITEM 65, SEE SHEET 12).

0.50



0.50

-R1.0
TYP.

B

23.365

Ø0.120 I.D.
REF.

Ø0.250 O.D.
REF.

63

5 K COOLING TUBE-78

FILE NAME: 7102-017

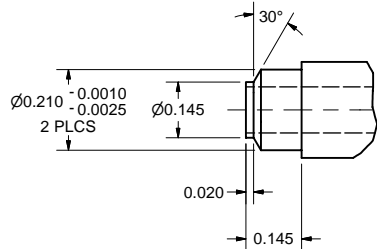
SHEET NO.: 7

DFT. SCALE: 2:1

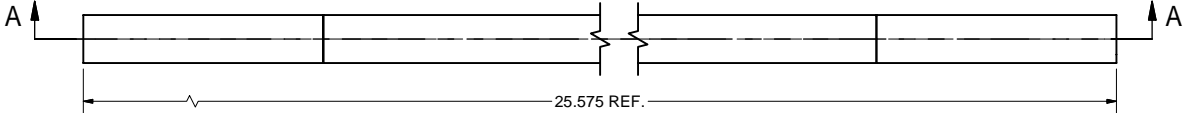
MATERIAL: 1/4" OD x 0.065" W OFE COPPER TUBE

QTY: 2 PER ASSEMBLY

NOTES:



DETAIL B
SCALE 4 : 1



BRAZING:
PALCUSIL-15 @ 900° C
(OR EQUIV.)
VACUUM-TIGHT JOINTS
2 PLCS

Ø0.250
REF.

SECTION A-A

7

5 K COOLING TUBE SUBASM-78

FILE NAME: 7102-017

SHEET NO.: 7

DFT. SCALE: 2:1

MATERIAL:

QTY: 2 PER ASSEMBLY

NOTES:

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			



PRINT
DISTR.

D

CR-1

7102-017

SH. NO. 7 OF 12

REV.

C

3

ITEM DWG. NO. DESCRIPTION

64 7102-017 (SH. 7) 5 K END TUBE

63 7102-017 (SH. 7) 5 K COOLING TUBE-78

62 - 8-32 x 3/4 Socket Head Cap Screw

61 - #8 Spring Lock Washer

60 7102-017 (SH. 8) CLAMP PLATE

59 7102-017 (SH. 8) CLAMP ROD

40 7102-017 (SH. 8) 4-5/8" CF FLANGE MODIFICATION

31 7102-017 (SH. 8) SMALL TUBE-78

23 7102-017 (SH. 8) 5 K HEAT SINK PLATE-78

7 7102-017 (SH. 7) 5 K COOLING TUBE SUBASM-78

9 7102-017 (SH. 7) 5 K HEAT SINK SUBASM-78

G1 G2 G3

QUANTITY

REMARKS

REV.

PLOT DATE: 6/14/2006

CAD FILE NAME: 7102-017-rev-C.idw

UNLESS OTHERWISE
SPECIFIED:

DIMENSIONS ARE IN INCHES:

TOLERANCES ON:

.00 ± .010

.000 ± .005

FRACTIONS ± 1/64

ANGLES ± 0.5°

ALL SURFACES



CORNELL UNIVERSITY
Floyd R. Newman Laboratory
Ithaca, NY 14853

ERL INJECTOR CRYOMODULE
78 MM HOM LOAD

CHECKED BY: J. SEARS

APPROVED BY: M. LIEPE

DRAWN BY

VM

DRAWN FOR

M.Liepe

DATE

4/2/2006

SCALE

-

D

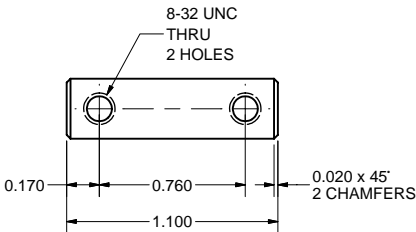
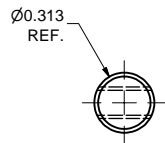
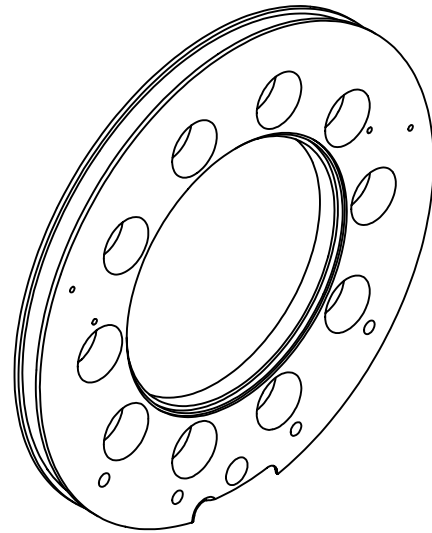
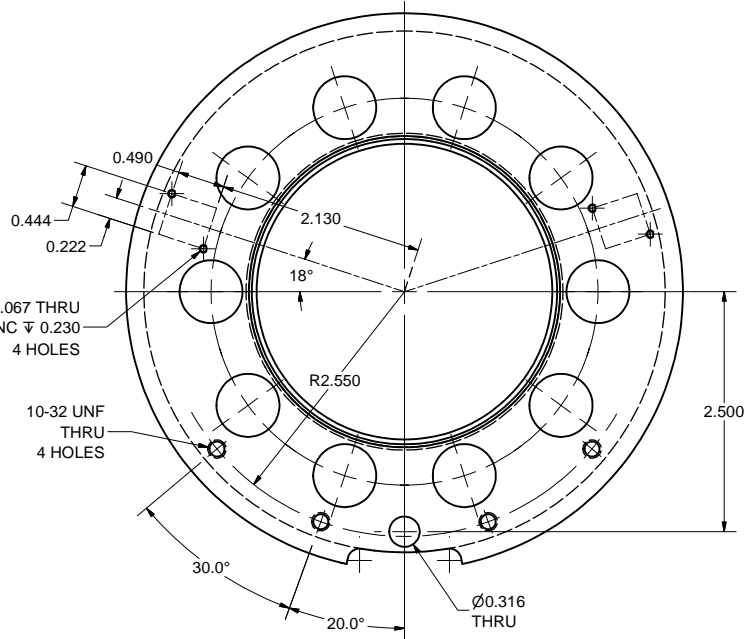
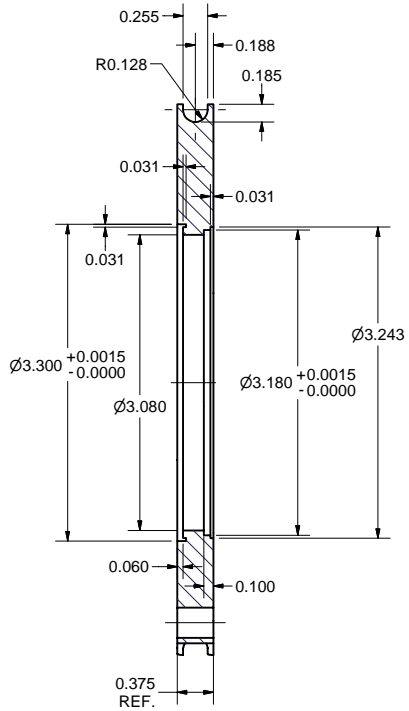
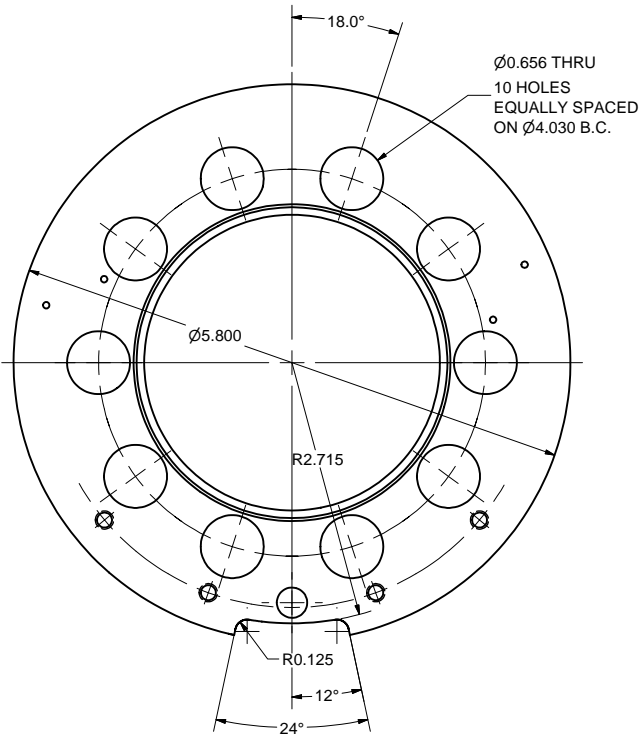
7102-017

SH. NO. 7 OF 12

REV.

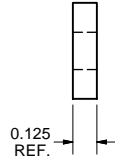
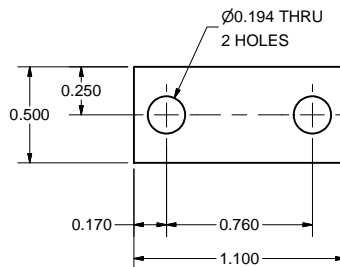
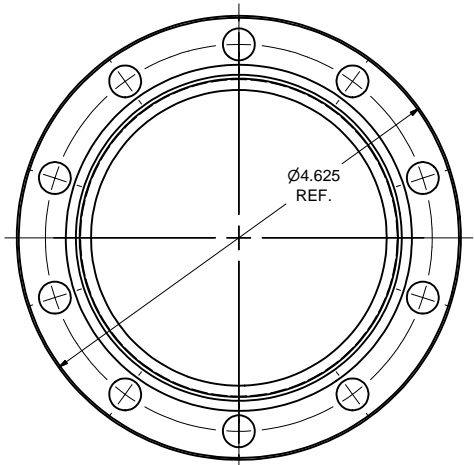
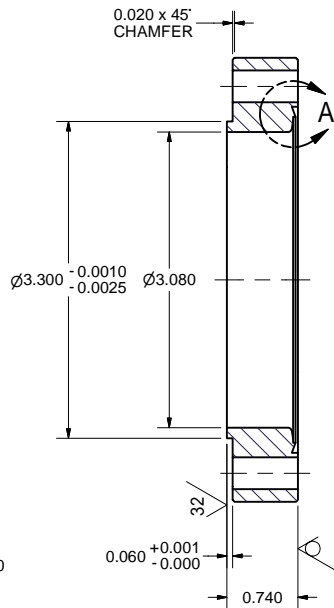
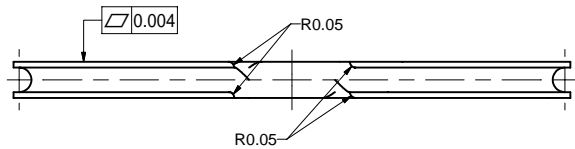
C

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		PART 23 - NEW.	12/2/05	VM
B		NEW DESIGN OF HEAT SINK PLATE ITEM 23. PARTS ITEM 59 AND 60 ADDED.	2/8/06	VM

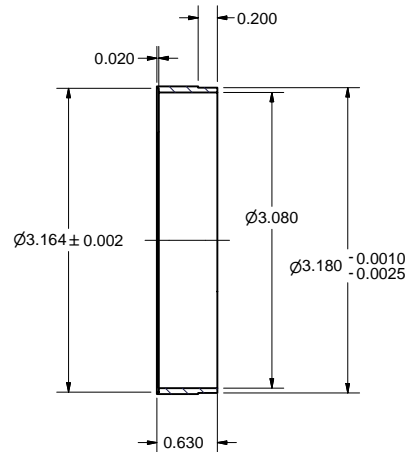
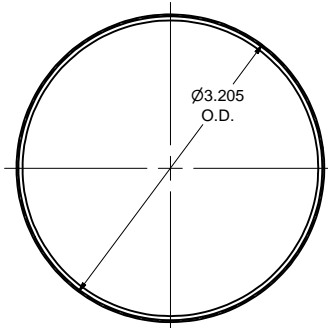


59 CLAMP ROD
FILE NAME: 7102-017
SHEET NO.: 8
DFT. SCALE: 2:1
MATERIAL: 5/16" 316L STAINLESS STEEL ROD
QTY: 2 PER ASSEMBLY
NOTES:

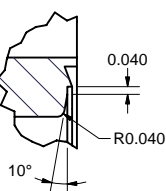
23 5 K HEAT SINK PLATE-78
FILE NAME: 7102-017
SHEET NO.: 8
DFT. SCALE: 1:1
MATERIAL: 3/8" OFE C10100 COPPER SHEET (RRR-200 OR BETTER)
QTY: 2 PER ASSEMBLY
NOTES:



60 CLAMP PLATE
FILE NAME: 7102-017
SHEET NO.: 8
DFT. SCALE: 2:1
MATERIAL: 1/8" 316L STAINLESS STEEL SHEET
QTY: 2 PER ASSEMBLY
NOTES:



31 SMALL TUBE-78
FILE NAME: 7102-017
SHEET NO.: 8
DFT. SCALE: 1:1
MATERIAL: 316L ST. STEEL
QTY: 2 PER ASSEMBLY
NOTES:










DETAIL A
SCALE 2 : 1

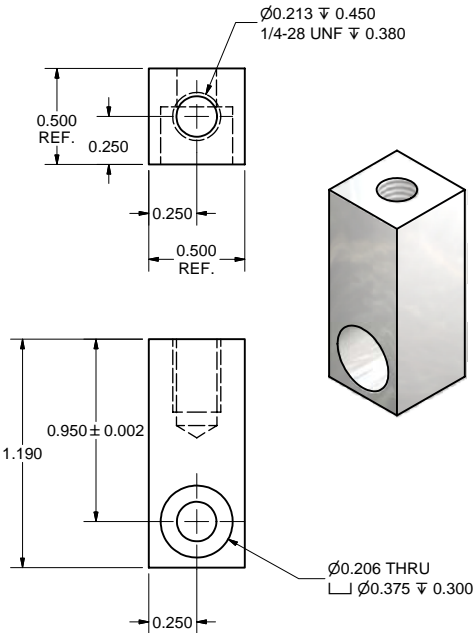
40 4-5/8" CF FLANGE MODIFICATION
FILE NAME: 7102-017
SHEET NO.: 8
DFT. SCALE: 1:1
MATERIAL: SEE NOTE 1
QTY: 2 PER ASSEMBLY
NOTES: 1. MAKE FROM VACUUM GENERATORS #ZFL463A OR EQUIV.
MATERIAL: 316LN ST. STEEL

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

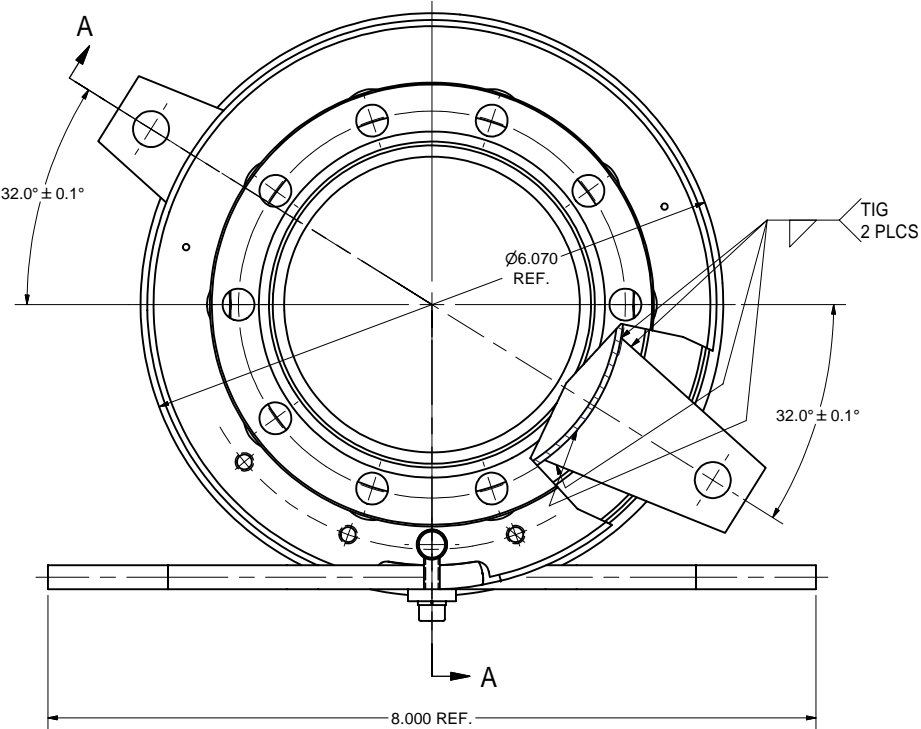
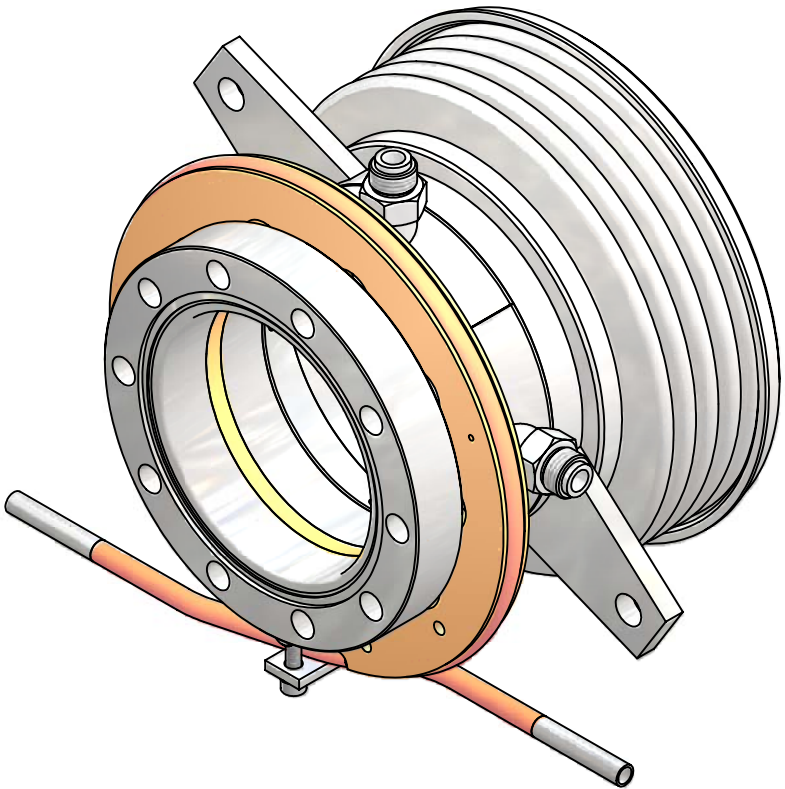
TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

	ITEM	DWG. NO.	DESCRIPTION			G1	G2	G3	REMARKS	REV.
						QUANTITY				
	PRINT DISTR.	PLOT DATE: 6/14/2006 CAD FILE NAME: 7102-017-rev-C.idw								
	CR-1	<div>UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES </div>	<div>  CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853 </div> <div>ERL INJECTOR CRYOMODULE 78 MM HOM LOAD</div>							
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE			DRAWN BY VM	DRAWN FOR M.Liepe	DATE 4/2/2006	SCALE -		7102-017 SH. NO. 8 OF 12		REV. B

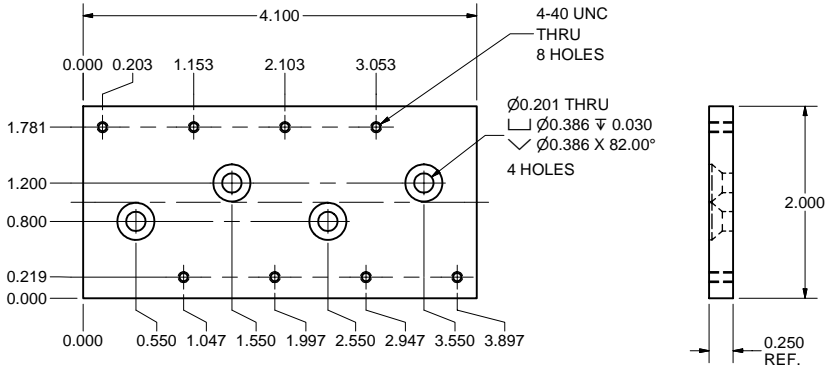
REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
B		NEW DESIGN OF SUBASM ITEM 16. PARTS ITEM 51 AND 71 ADDED.	2/8/06	VM
C		BRACKETS ITEM 75 ADDED. PARTS ITEM 71 AND 51 CHANGED: 1/4-28 WAS 10-32, 1/2 x 1/2 WAS 3/8 x 1/2, DIM. 0.550 WAS 0.300, 3.550 WAS 3.800.	4/1/06	VM



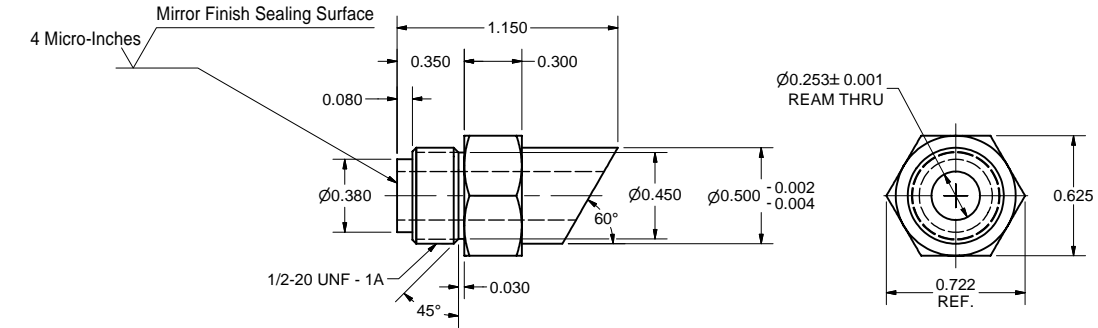
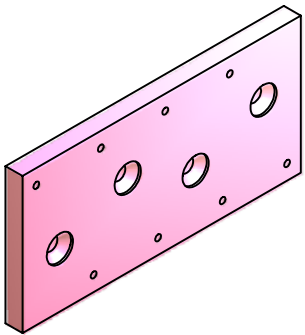
71 SUPPORT BAR
 FILE NAME: 7102-017
 SHEET NO.: 9
 DFT. SCALE: 2:1
 MATERIAL: 1/2" x 1/2" 316L STAINLESS STEEL BAR
 QTY: 8 PER ASSEMBLY
 NOTES:



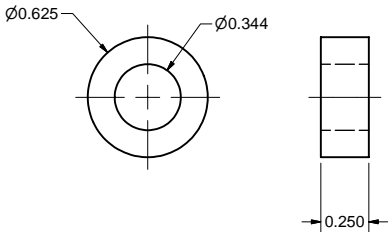
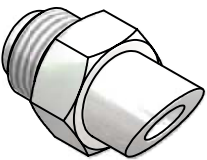
16 OUTER HALF SUBASM-78
 FILE NAME: 7102-017
 SHEET NO.: 9
 DFT. SCALE: 1:1
 MATERIAL:
 QTY: 2 PER ASSEMBLY
 NOTES: 1. WELD TO CONFORM TO UHV SPEC.
 2. COPPER PLATE 0.0004" SURFACE "B".



51 50 W RESISTORS PLATE
 FILE NAME: 7102-017
 SHEET NO.: 9
 DFT. SCALE: 1:1
 MATERIAL: 1/4" OFE COPPER SHEET
 QTY: 2 PER ASSEMBLY
 NOTES:



28 RF PROBE HOUSING
 FILE NAME: 7102-017
 SHEET NO.: 9
 DFT. SCALE: 2:1
 MATERIAL: 316L SST
 QTY: 8 PER ASSEMBLY
 NOTES:



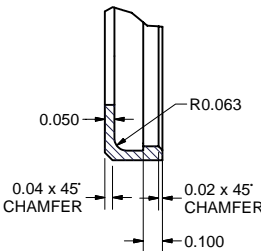
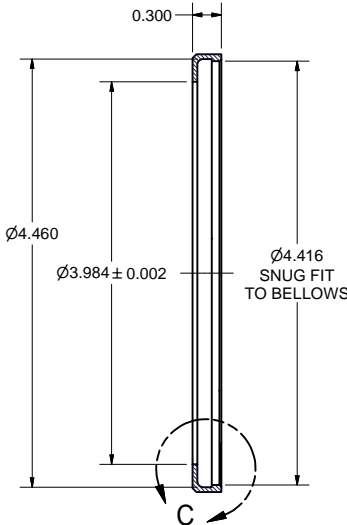
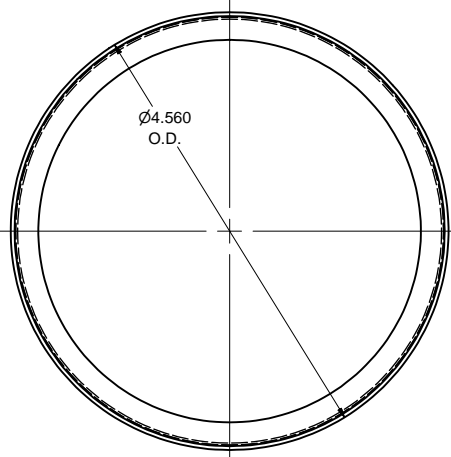
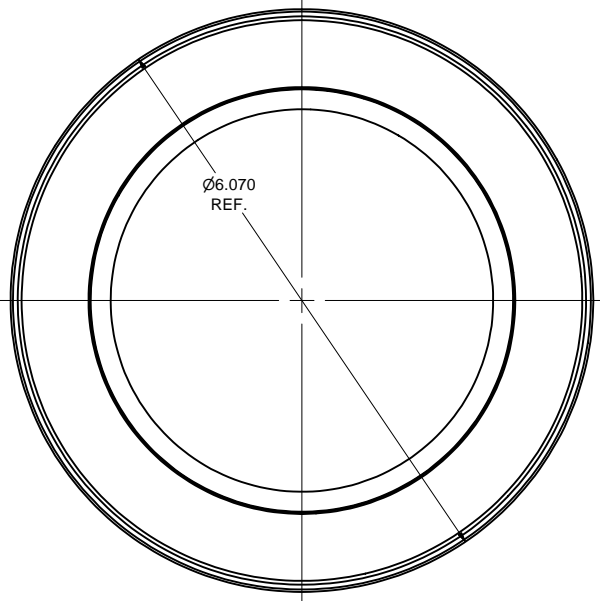
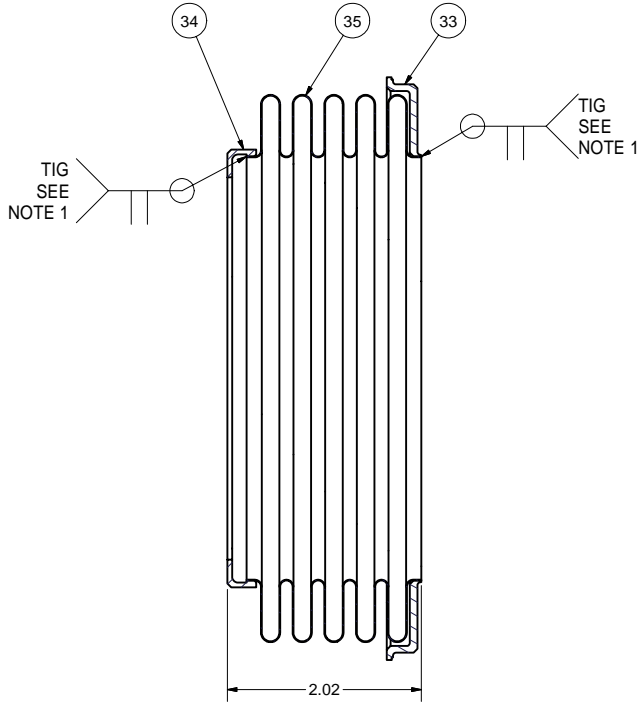
48 THICK WASHER
 FILE NAME: 7102-017
 SHEET NO.: 9
 DFT. SCALE: 2:1
 MATERIAL: 316L STAINLESS STEEL
 QTY: 20 PER ASSEMBLY
 NOTES:

FOR MACHINING LUBRICANT USE ONLY
 ALKALINE DETERGENT LUBRICANT CIMSTAR 40
 OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	QUANTITY	REMARKS	REV.
75	7102-017 (SH. 6)	BELLOWS BRACKET-78	2		316L SST
32	7102-017 (SH. 10)	BELLOWS SUBASM-78	1		-
27	7102-017 (SH. 6)	FLANGE UNIT SUBASM-78	1		-
16	7102-017 (SH. 9)	OUTER HALF SUBASM-78	X		-
G1 G2 G3					
QUANTITY					
REMARKS					
REV.					
PLOT DATE: 6/14/2006 CAD FILE NAME: 7102-017.idw					
CR-1					
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES					
CORNELL UNIVERSITY FLOYD R. NEWMAN LABORATORY ITHACA, NY 14853					
ERL INJECTOR CRYOMODULE 78 MM HOM LOAD					
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE					
DRAWN BY: VM DRAWN FOR: M. Liepe					
DATE: 4/2/2006 SCALE: -					
D					
7102-017 SH. NO. 9 OF 12					
REV. C					

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		PARTS 33 AND 34 MODIFIED. NEW BELLOWS TYPE IN SUBASSEMBLY 32.	12/2/05	VM
B		RETURNED TO ORIGINAL VERSION WITH MINOR CHANGES TO PARTS DIMENSIONS.	2/8/06	VM



DETAIL C
SCALE 2 : 1

OPERATING CONDITIONS:

Temperature: 5 K to 77 K across bellows
Vacuum inside and outside
Stroke: 2 mm (0.08 inch)
Shift: 1 mm (0.04 inch)
Maximum temperature: 200 C (473 K)
Minimum temperature: -268 C (5 K)
Leak Rate: < 1E-9 mbar x l/sec

DESIGN SPECIFICATION:

Burst Pressure, Internal: >= 30 psia (2 bar) @ 293 K
External: >= 22.5 psi (1.5 bar) @ 293 K
Working Pressure: > 15 psia (1 bar) @ 293 K

Size:

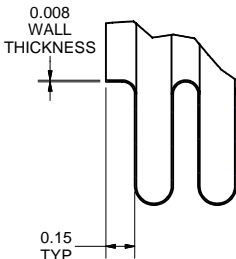
O.D.: 5.7 inch (144.8 mm)
I.D.: 4.4 inch (111.8 mm)
Overall Length: 1.82 inch (46.2 mm)
Pitch: 0.33 inch (8.4 mm)
Minimum Stroke: ± 0.250 inch (6.4 mm)
Minimum Lateral Shift: 0.08 inch (2 mm)
Minimum Cycle Life: 10000

32 BELLOWS SUBASM-78

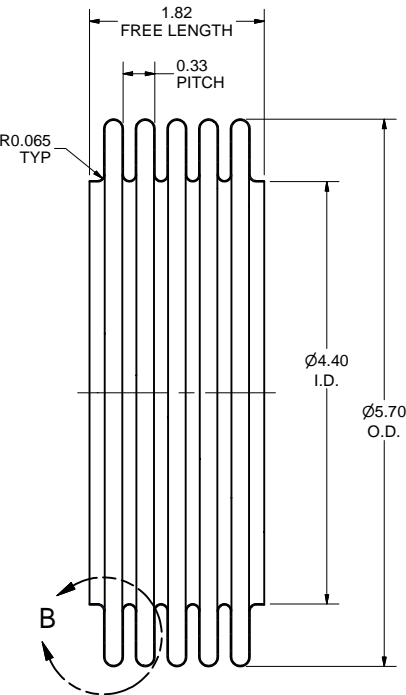
FILE NAME: 7102-017
SHEET NO.: 10
DFT. SCALE: 1:1
MATERIAL:
QTY: 2 PER ASSEMBLY
NOTES: 1. WELDS TO CONFORM TO UHV SPEC.
2. MANUFACTURER: AMERIFLEX INC. (OR EQUIV).

34 SMALL BELLOWS RING-78

FILE NAME: 7102-017
SHEET NO.: 10
DFT. SCALE: 1:1
MATERIAL: 316L STAINLESS STEEL
QTY: 2 PER ASSEMBLY
NOTES:

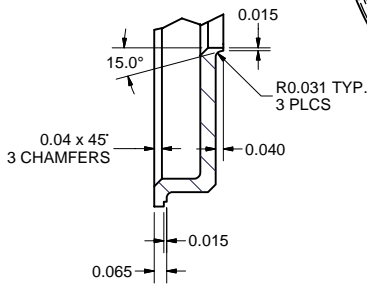
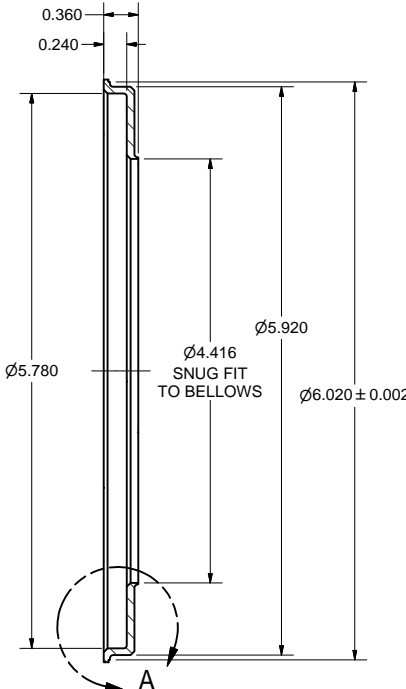
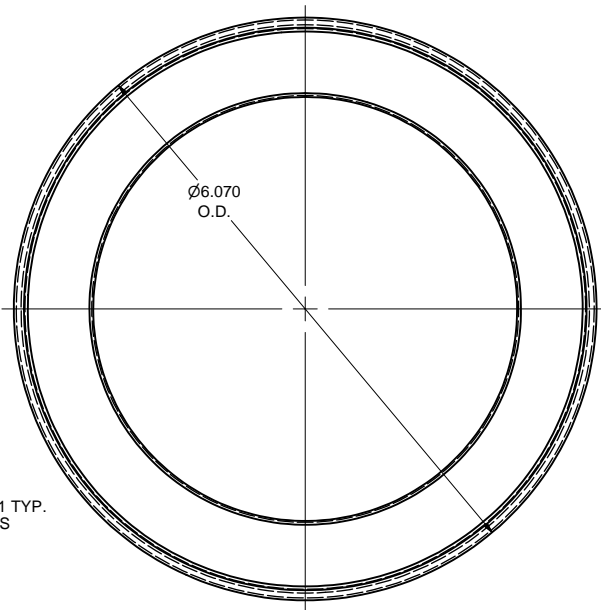


DETAIL B
SCALE 2 : 1



35 BELLOWS 4.4 x 5.7 x 0.008 x 5

FILE NAME: 7102-017
SHEET NO.: 10
DFT. SCALE: 1:1
MATERIAL: 316L STAINLESS STEEL
QTY: 2 PER ASSEMBLY
NOTES: 1. NO. OF CONVOLUTIONS: N = 5.
2. MANUFACTURER: AMERIFLEX INC. (OR EQUIV).




DETAIL A
SCALE 2 : 1

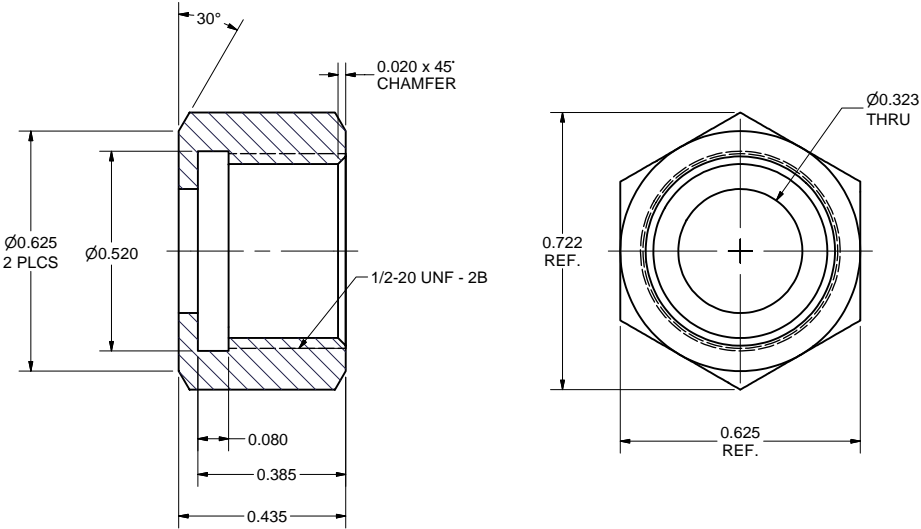
33 LARGE BELLOWS RING-78

FILE NAME: 7102-017
SHEET NO.: 10
DFT. SCALE: 1:1
MATERIAL: 316L STAINLESS STEEL
QTY: 2 PER ASSEMBLY
NOTES:

35	7102-017 (SH. 10)	BELLOWS 4.4 x 5.7 x 0.008 x 5	1			316L SST	
34	7102-017 (SH. 10)	SMALL BELLOWS RING-78	1			316L SST	
33	7102-017 (SH. 10)	LARGE BELLOWS RING-78	1			316L SST	
32	7102-017 (SH. 10)	BELLOWS SUBASM-78	X			AMERIFLEX	

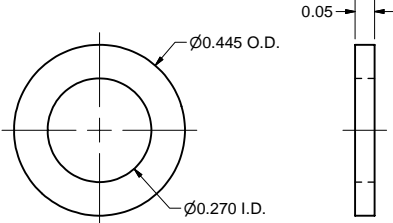
		ITEM	DWG. NO.	DESCRIPTION			G1	G2	G3	REMARKS	REV.
					QUANTITY						
D	PRINT DISTR.	PLOT DATE: 4/17/2006 CAD FILE NAME: 7102-017-rev-C.idw									
		CR-1	<div>UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES ✓</div>	<div><div> CORNELL UNIVERSITY Floyd R. Newman Laboratory Ithaca, NY 14853</div><div>ERL INJECTOR CRYOMODULE 78 MM HOM LOAD</div></div>							
CHECKED BY: J. SEARS				DRAWN BY VM	DRAWN FOR M.Liepe	DATE 4/2/2006	SCALE	D	7102-017	SH. NO. 10 OF 12	REV. B
APPROVED BY: M. LIEPE											

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
A		ADDED THE WHOLE SHEET.	12/2/05	VM
B		NO CHANGES ON THIS SHEET.	2/8/06	VM
C		PART ITEM 76 - NEW.	4/1/06	Vm
D		ITEM 41: 1.385 WAS 1.625, (ITEM 28, SH.9) WAS (ITEM 28, SH.5) ITEM 43: NOTE 1 P/N WAS 1053086-1. ITEM 44: MATL WAS 316L SST. ITEM 45: Ø0.270 ID WAS Ø0.253 ID. ITEM 46: DELETED NOTE 1, PROBE TIP IS .800 LONG. D.M.E.	8-29-07	JOS



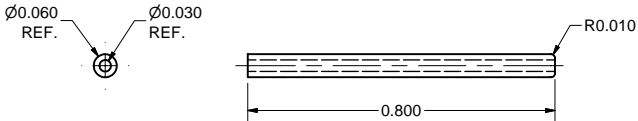
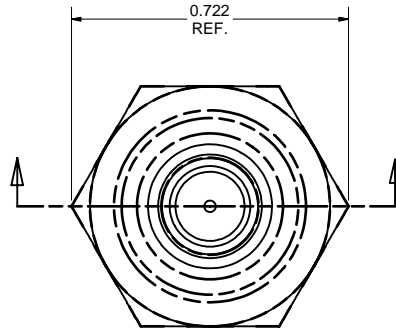
44 RF PROBE SEAT NUT

FILE NAME: 7102-017
SHEET NO.: 11
DFT. SCALE: 4:1
MATERIAL: 0.625" SILICON BRONZE, ALLOY 655 HEX ROD (OR 3/4" ROUND ROD)
QTY: 8 PER ASSEMBLY
NOTES:



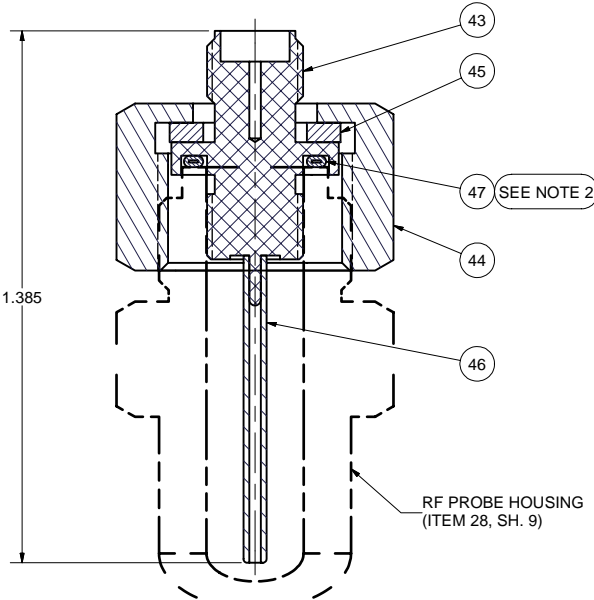
45 RF PROBE WASHER

FILE NAME: 7102-017
SHEET NO.: 11
DFT. SCALE: 4:1
MATERIAL: ALUM/BRONZE, AMPCO-18 OR EQUIV.
QTY: 8 PER ASSEMBLY
NOTES:



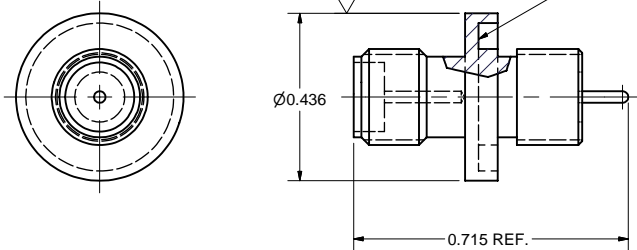
46 RF PROBE TIP-78

FILE NAME: 7102-017
SHEET NO.: 11
DFT. SCALE: 4:1
MATERIAL: 1/16 O.D. COPPER TUBE. K+S ENGINEERING #117 OR EQUIV.
QTY: 8 PER ASSEMBLY
NOTES:



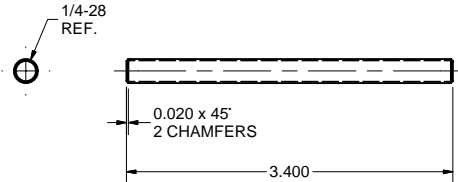
41 RF PROBE-78 SUBASM

FILE NAME: 7102-017
SHEET NO.: 11
DFT. SCALE: 4:1
MATERIAL:
QTY: 8 PER ASSEMBLY
NOTES: 1. USE OMNI-SPECTRA CRIMPER, 76873-2, SETTING #3 TO FIX TIP 46 ON CONNECTOR 43.
2. MAY USE 0.060 DIA. INDIUM INSTEAD OF PARKER SEAL.



43 RF CONNECTOR MODIFICATION

FILE NAME: 7102-017
SHEET NO.: 11
DFT. SCALE: 4:1
MATERIAL: SEE NOTE 1
QTY: 8 PER ASSEMBLY
NOTES: 1. MAKE FROM TYCO/AMP 1053137-1 CONNECTOR.
2. REMOVE GOLD PLATING FROM SEALING SURFACE "A".



76 1/4-28 THREADED ROD

FILE NAME: 7102-017
SHEET NO.: 11
DFT. SCALE: 1:1
MATERIAL: 1/4-28 316 STAINLESS STEEL THREADED ROD
QTY: 4 PER ASSEMBLY
NOTES:

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

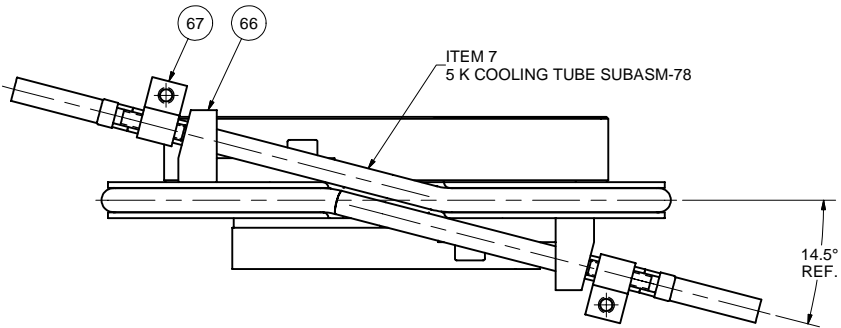
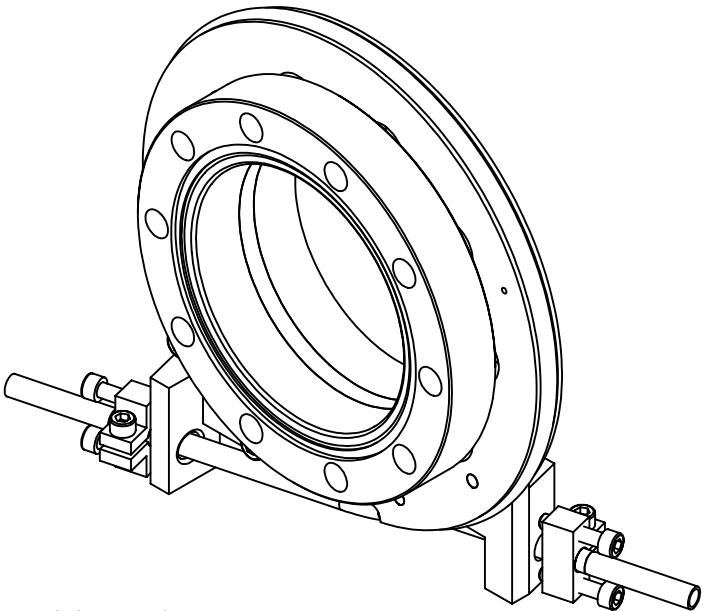
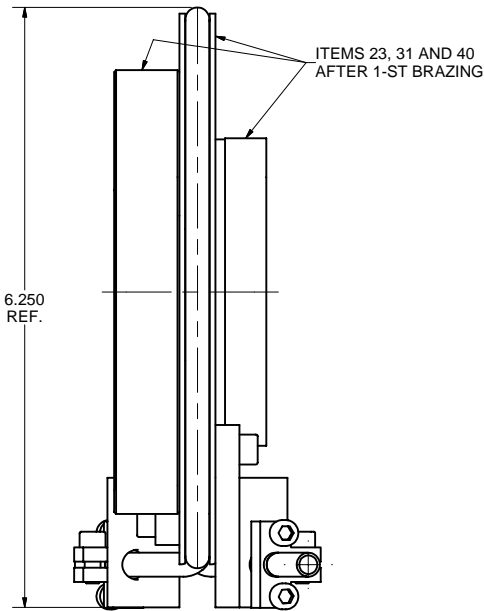
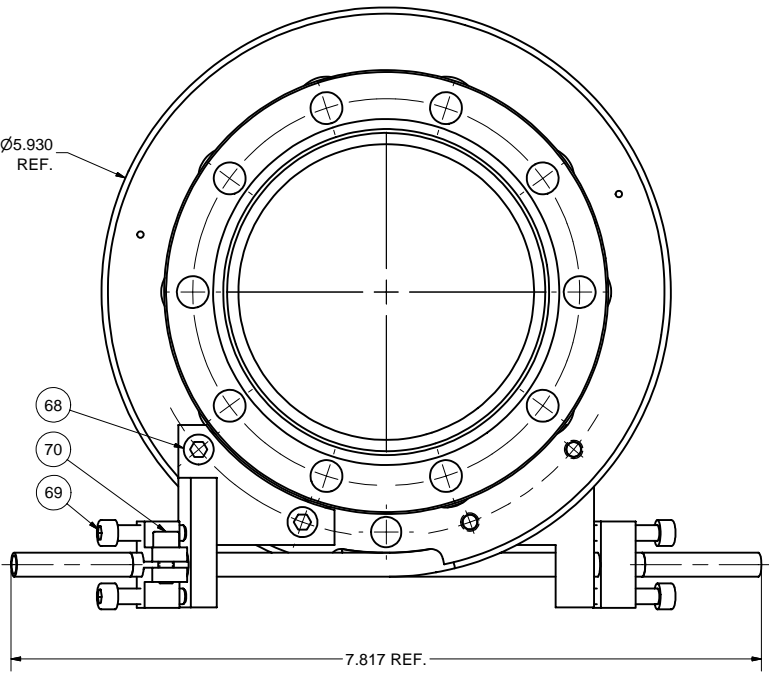
ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	QUANTITY	REMARKS	REV.
47	-	PARKER ULTRA SEAL #QO-55				1	SEE NOTE 2	
46	7102-017 (SH. 11)	RF PROBE TIP-78				1	COPPER	
45	7102-017 (SH. 11)	RF PROBE WASHER				1	AMPCO 18	
44	7102-017 (SH. 11)	RF PROBE SEAT NUT				1	316L SST	
43	7102-017 (SH. 11)	RF CONNECTOR MODIFICATION				1	-	
41	7102-017 (SH. 11)	RF PROBE-78 SUBASM				X	-	
PLOT DATE: 8/29/2007 CAD FILE NAME: 7102-017.idw								
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES								
CHECKED BY: J. SEARS APPROVED BY: M. LIEPE		DRAWN BY VM	DRAWN FOR M.Liepe	DATE 4/2/2006	SCALE -	D	7102-017 SH. NO. 11 OF 12	REV. D



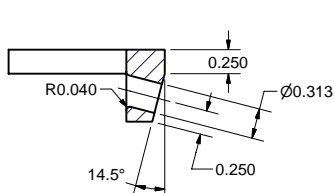
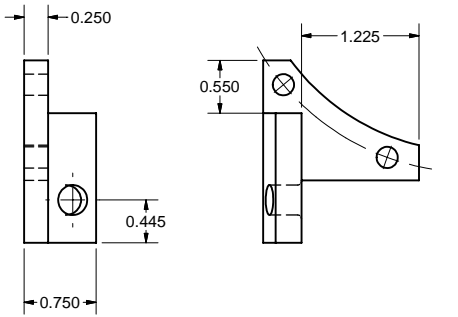
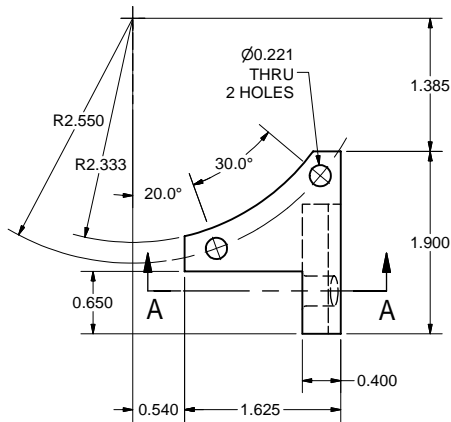
CORNELL UNIVERSITY
Floyd R. Newman Laboratory
Ithaca, NY 14853

ERL INJECTOR CRYOMODULE
78 MM HOM LOAD

REVISIONS				
SYM.	ZONE	DESCRIPTION	DATE	APP.
B		ALL PARTS - NEW.	2/8/06	VM
C		BOM EDITED TO STANDARDIZE VENDOR PART #'s. D.M.E.	6-14-06	TIO

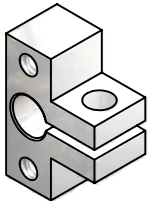
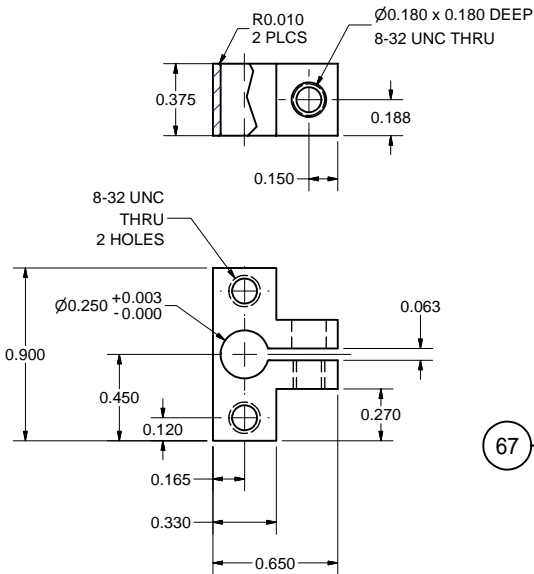


65 5 K COOLING TUBE TENSION DEVICE-78
FILE NAME: 7102-017
SHEET NO.: 12
DFT. SCALE: 1:1
MATERIAL:
QTY: 1 PER PROJECT
NOTES:



SECTION A-A

66 TENSION BRACKET-78
FILE NAME: 7102-017
SHEET NO.: 12
DFT. SCALE: 1:1
MATERIAL: 304 STAINLESS STEEL
QTY: 2 PER PROJECT
NOTES:



67 TUBE CLAMP
FILE NAME: 7102-017
SHEET NO.: 12
DFT. SCALE: 2:1
MATERIAL: 304 STAINLESS STEEL
QTY: 2 PER PROJECT
NOTES:

FOR MACHINING LUBRICANT USE ONLY
ALKALINE DETERGENT LUBRICANT CIMSTAR 40
OR EQUIVALENT APPROVED BY CORNELL LEPP

TECHNICAL RESOURCE APPROVALS REQUIRED BEFORE FABRICATION			
	OK	DATE	N/A
DRAFTING (O'Connell):			
MACHINE SHOP (Kaminski):			
CHEMISTRY (Conklin):			
ELECTRONICS SHOP (Barley):			
FURNACE BRAZING (Sherwood):			
BEAM WELDING (Sears):			
WELDING OTHER (Gallagher):			
UTILITIES INTEGRATION (Gallagher):			
STOCKROOMS (Lockwood):			

ITEM	DWG. NO.	DESCRIPTION	G1	G2	G3	REMARKS	REV.
70	-	8-32 x 3/8 Socket Head Cap Screw	2			MMC 92185A192 316 SST	
69	-	8-32 x 3/4 Socket Head Cap Screw	4			MMC 92185A197 316 SST	
68	-	10-32 x 5/8 Socket Head Cap Screw	4			MMC 92185A990 316 SST	
67	7102-017 (SH. 12)	TUBE CLAMP	2			304 SST	
66	7102-017 (SH. 12)	TENSION BRACKET-78	2			304 SST	
65	7102-017 (SH. 12)	5 K COOLING TUBE TENSION DEVICE-78	X			-	
PLOT DATE: 6/14/2006 CAD FILE NAME: 7102-017-rev-C.idw							
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES: TOLERANCES ON: .00 ± .010 .000 ± .005 FRACTIONS ± 1/64 ANGLES ± 0.5° ALL SURFACES		CORNELL UNIVERSITY FLOYD R. NEWMAN LABORATORY ITHACA, NY 14853					
DRAWN BY VM		DRAWN FOR M.Liepe		DATE 4/2/2006		SCALE D	
7102-017 SH. NO. 12 OF 12		7102-017 SH. NO. 12 OF 12		7102-017 SH. NO. 12 OF 12		7102-017 SH. NO. 12 OF 12	