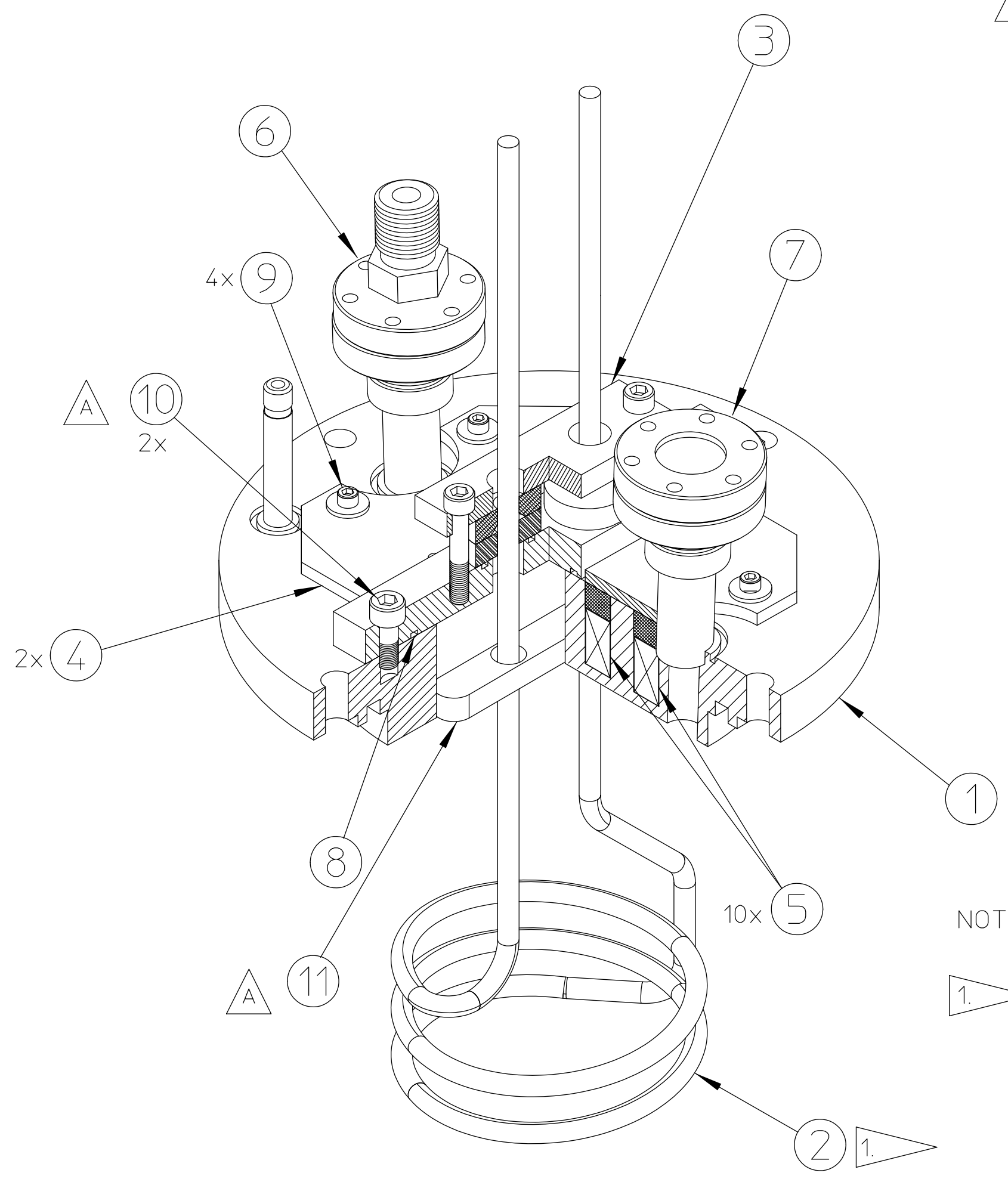


D | | C | | B | | A

REQ	ITEM	PART NUMBER	DESCRIPTION
1	1	21G7723	ION SOURCE BACK FLANGE WELDMENT
1	2	21C8423	RF ANTENNA (2 TURNS)
1	3	21G7802	ALUMINA RF FEEDTHRU FLANGE ASSEMBLY
2	4	21C9992	BACK FLANGE MAGNET COVER PLATE ASSY
10	5	21C8502-2	MAGNETS, BACK FLANGE (1" LONG)
1	6	21G7552	GAS INLET FLANGE
1	7	9722213	VIEWPORT, ZERO LENGTH FUSED SILICA "ISI INC"
1	8	2-035	O-RING 2.25IDx.06W BUNA N, "PARKER SEAL CO"
4	9		CAPSCR SOC HD #4-40UNCx1/4" LG SST
2	10		CAPSCR SOC HD #10-32UNCx.625" LG SST
1	11	21G7611	BORON NITRIDE PLASMA SHIELD



21G7543B

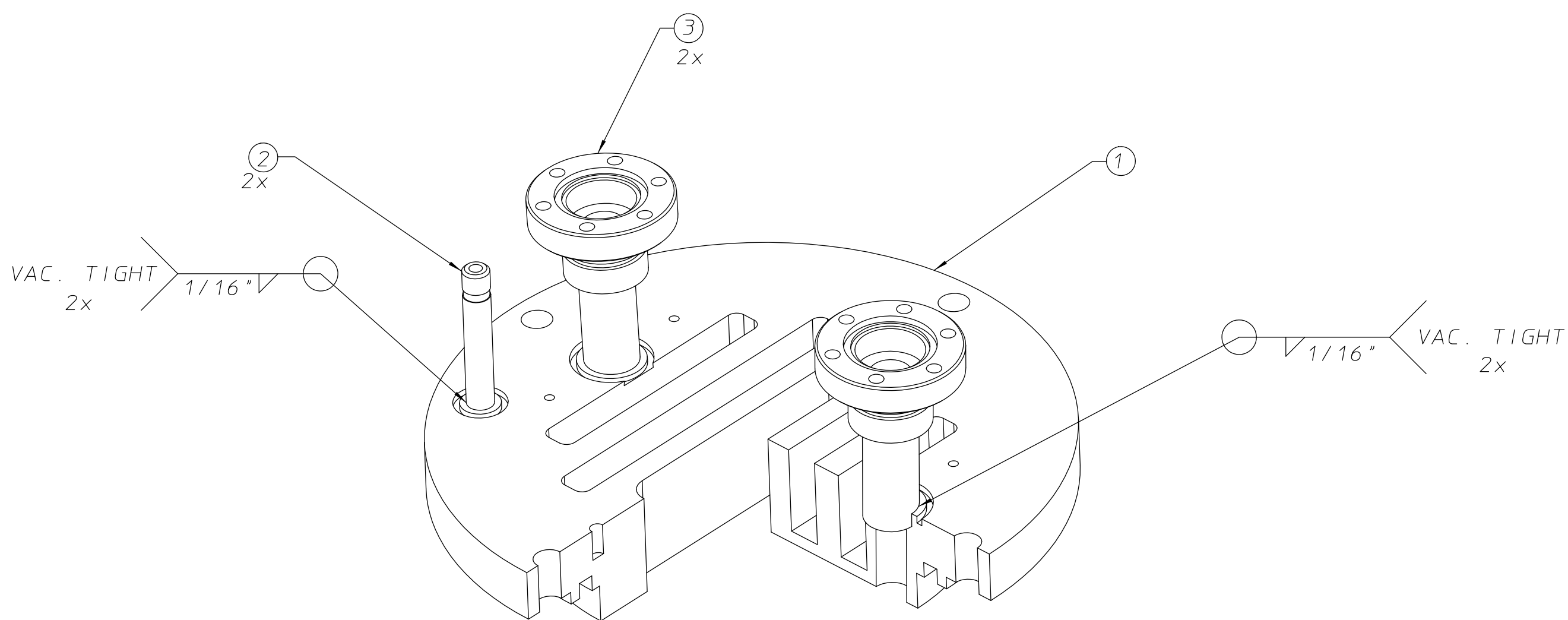
NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. ANTENNA (ITEM 2) SHALL BE INSTALLED AFTER ANTENNA ASSEMBLY (ITEM 3) IS ATTACHED TO BACK FLANGE (ITEM 1).

					UNLESS OTHERWISE SPECIFIED		SHOP ORDERS			LAWRENCE BERKELEY LABORATORY				
					TOLERANCES	.X ±	FRAC. ±	ACCT. NO.	SERIAL NO.	UNIVERSITY OF CALIFORNIA-BERKELEY				
						.XX ±	ANGLES ±	DATE ISSD	DATE REQD.	NO. REQD.	ION BEAM TECHNOLOGY			
						.XXX ±	FINISH 125√	DELIVER TO		SNS-FES ION SOURCE AND LEBT STRUCTURE				
B	DWC	B4	3/13	CHANGED ITEM #3 FROM 21G7471 TO 21G7802	THREADS ARE CLASS 2		SURFACE TREATMENT DEGREASE			BACK FLANGE ASSEMBLY				
A	DWC	D3	3/13	ADDED LABELS FOR ITEMS 10 AND 11	CHAMFER ENDS OF ALL SCREW THREADS 30°		IDENT. METH.			PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
A	DWC	B4	3/13	ADDED ITEMS 10 AND 11	CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.		BY: RAY LOW			MICROFILMED	ASSEMBLY		FULL	
A	DWC	B4	3/13	ITEM 1 P/N 21G7723 WAS 21C9874	BREAK EDGES .016 MAX. ON MACHINED WORK		DATE: 06-30-00			DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE	REV.
REV	DWG	CHK	ZONE	DATE	REMOVE BURRS WELD SPLATTER & LOOSE SCALE		DATE: 06-30-00			8212-AC	FE3111	21G7543		B
				CHANGES	REFERENCES: ANSI Y14.5 & B46.1.									

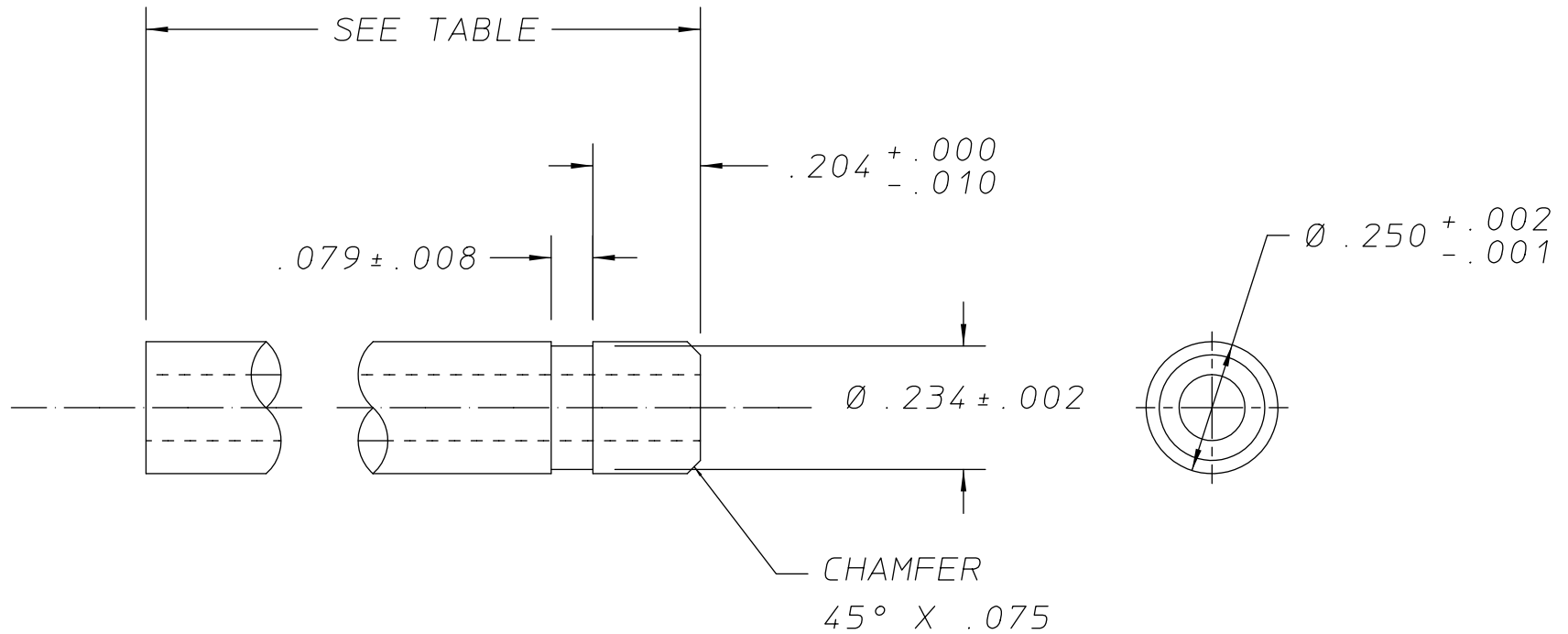
D | | C | | B | | A

REQ	ITEM	PART NUMBER	DESCRIPTION
1	1	21C9874	BACKFLANGE
2	2	21C7711-1	1/4" LeGRIS WATER FITTING PREP, 1.50" LG.
2	3	21G7732	ION SOURCE BACKFLANGE WELD NIPPLE



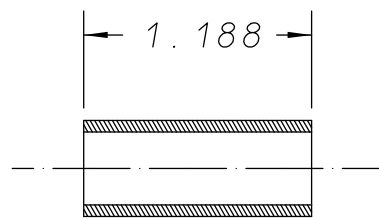
21G7723

					UNLESS OTHERWISE SPECIFIED		SHOP ORDERS			LAWRENCE BERKELEY LABORATORY									
					TOLERANCES		ACCT. NO.			UNIVERSITY OF CALIFORNIA-BERKELEY									
					.X ± .1		FRAC. ± 1/64			SNS-FES ION SOURCE AND LEPT									
					.XX ± .01		ANGLES ± .01°			MECHANICAL SYSTEMS									
					.XXX ± .005		FINISH 125√			ION SOURCE BACKFLANGE WELDMENT									
					THREADS ARE CLASS 2							PATENT CLEAR		DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS		
					CHAMFER ENDS OF ALL SCREW THREADS 30°.							MICROFILMED		DETAIL	21G7543	FULL			
					CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.							DATE		03-05-01	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE	REV.
					BREAK EDGES .016 MAX. ON MACHINED WORK							DATE		03-05-01	8212-CU	FE3130	21G7723		
					REMOVE BURRS WELD SPLATTER & LOOSE SCALE							CHK. BY		D. CHENG					
					REFERENCES: ANSI Y14.5 & B46.1.							DATE							
REV	DWG	CHK	ZONE	DATE	CHANGES														

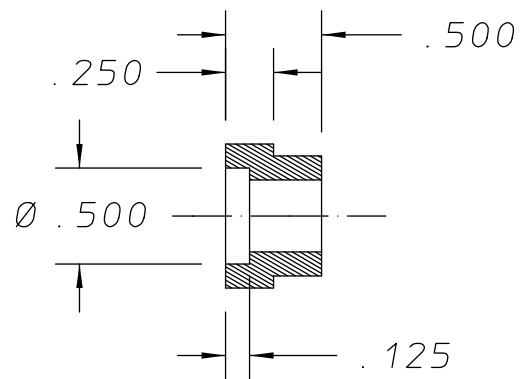
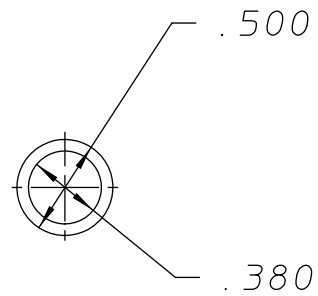


PART NO.	LENGTH
21G7711-1	1.500"
21G7711-2	9.000"

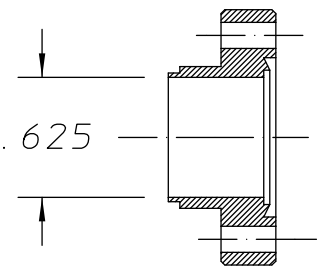
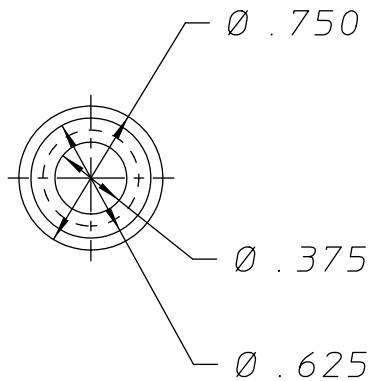
Material - TUBING, STAINLESS, Ø.250" OD X Ø.125" ID		-	-	-	-
Unless Otherwise Noted		Rev	Dwn	Date	Changes
.X ± .1 .XX ± .025 .XXX ± .005 Angles ± .5°		LAWRENCE BERKELEY LABORATORY University of California - Berkeley SNS-FES ION SOURCE AND LEBT MECHANICAL SYSTEMS 1/4" LeGRIS WATER FITTING MACHINING PREP			
Break Edges .016 Max on Machined Work					
Remove Burrs Weld Splatter and Loose Scale					
References: ANSI Y 14.5 & B46.1					
Account Number -	Finish ✓ 64				
Date Issued -	Date Reqd -				
Number Required -	Deliver To -	Shown on Dwg No.			
Surface Treatment Degrease	Identific Method Tag	Patent Clear	Category Code FE-3130	Do not Scale Prints	
Drawn By D. CHENG	Date 3/2/01	Micro-Filmed	Drawing Scale 3:1	Dwg. No. 21G7711	Size Rev
Check By	Date	Design Account 8212-CU	Drawing Type Detail		



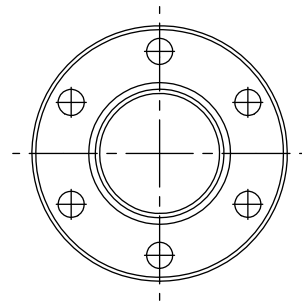
③ TUBING



② ADAPTER PIECE

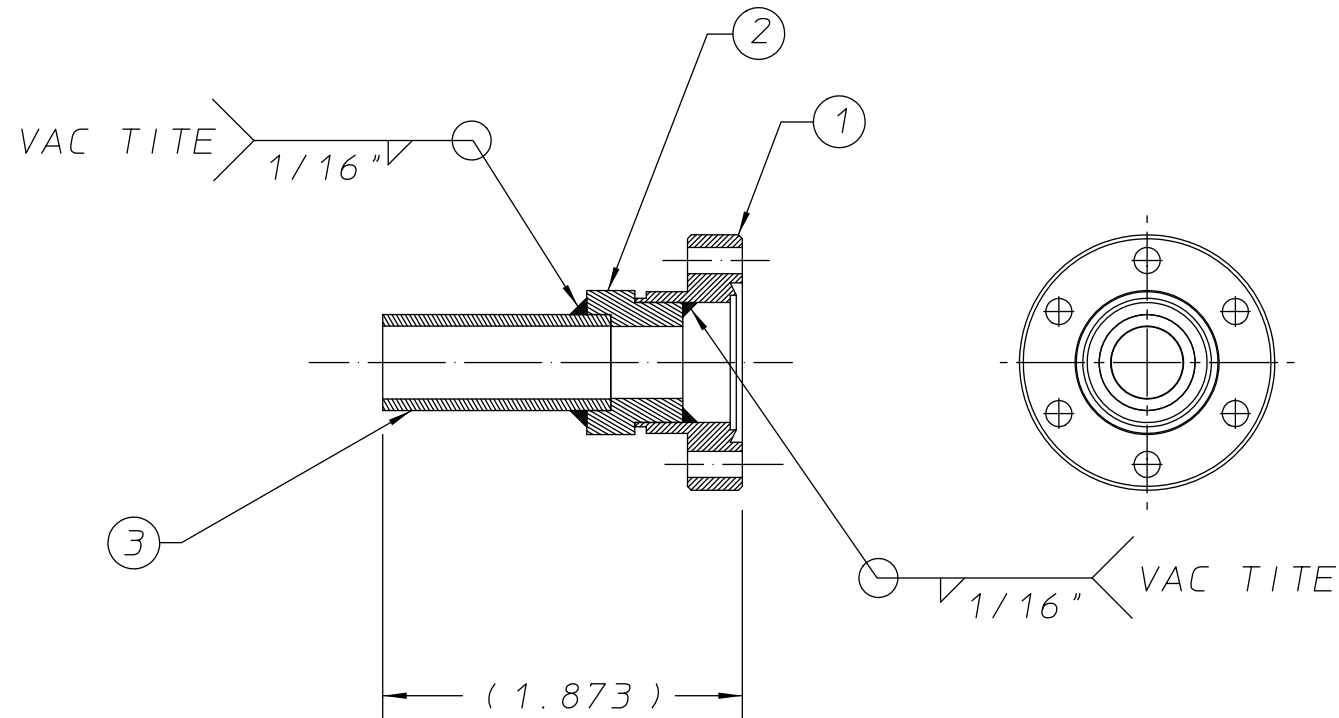


① MDC MINI-CONFLAT



21G7732

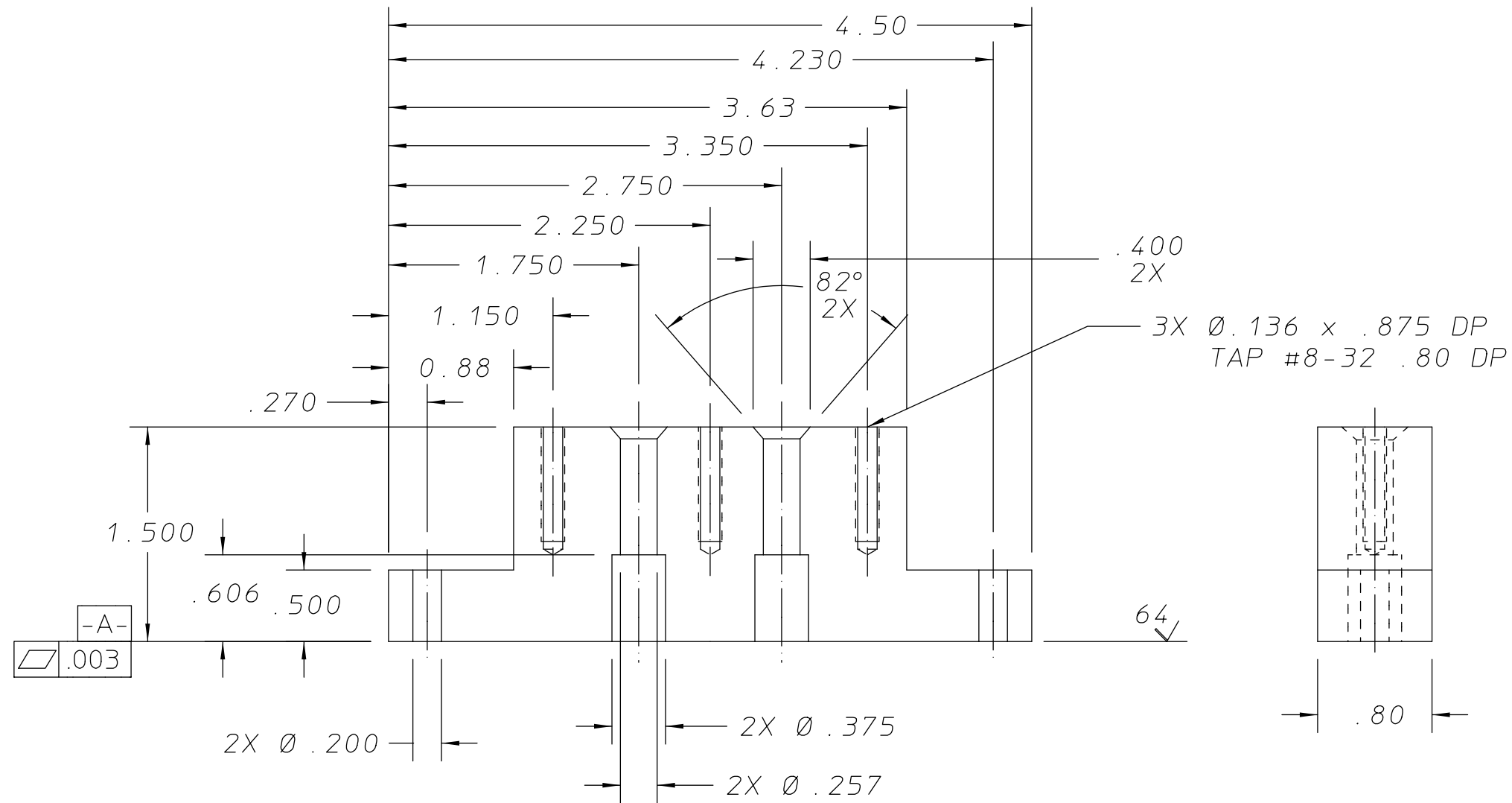
REQD	ITEM	PART NUMBER	DESCRIPTION
1	1	130004	MDC VACUUM CORP., 1-1/3" O.D. CF FLANGE, TAPPED
A/R	2	-	ROD, STAINLESS 304, .750" OD
A/R	3	-	TUBING, STAINLESS 304, .500" OD, .060" WALL



NOTE:
PART IS CANNOT BE UHV
CLEANED AFTER WELDING.

				UNLESS OTHERWISE SPECIFIED			SHOP ORDERS			LAWRENCE BERKELEY LABORATORY							
				TOLERANCE .X ± .1 .XX ± .01 .XXX ± .005			ACCT NO		SER NO		UNIVERSITY OF CALIFORNIA-BERKELEY						
				SURFACE FINISH 64 ✓			DATE ISSD		DATE REQD		NO REQD		SNS-FES ION SOURCE AND LEBT				
				1. SAWED, FLAMECUT, SHEARED OR CUT STOCK FINISH. 2. THREADS CLASS 2. 3. CHAMFER ENDS OF ALL SCREW THRDS 30°. 4. 1 1/2 PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT THRDS. 5. BREAK EDGES 1/64 MAX. ON MACHINE WORK. 6. REMOVE BURRS, LOOSE SCALE AND WELD SPLATTER. 7. REF. -USAS1 OR ASA STDS SECT Y-14 & B46-1.			DELIVER TO			MECHANICAL SYSTEMS							
							SURFACE TREATMENT			ION SOURCE BACKFLANGE WELD NIPPLE							
							IDENTIFIC TAG			PAT CLEAR		DWG TYPE		SHOWN ON		SCALE: FULL	
							DWG BY D. CHENG			DATE 03-05-01		DETAIL		21G7723		DO NOT SCALE PRINTS	
							CHK BY			DATE		DESIGN ACCT NO		CATEGORY CODE		DWG NO	
												8212-CU		FE3130		21G7732	
																REV	
REV	DWN	CHK	DATE	DESCRIPTION													

21G7782A	REQD	ITEM	PART NUMBER	DESCRIPTION
	A/R			MACHINEABLE (GREEN) CERAMIC, 85% AL2O3

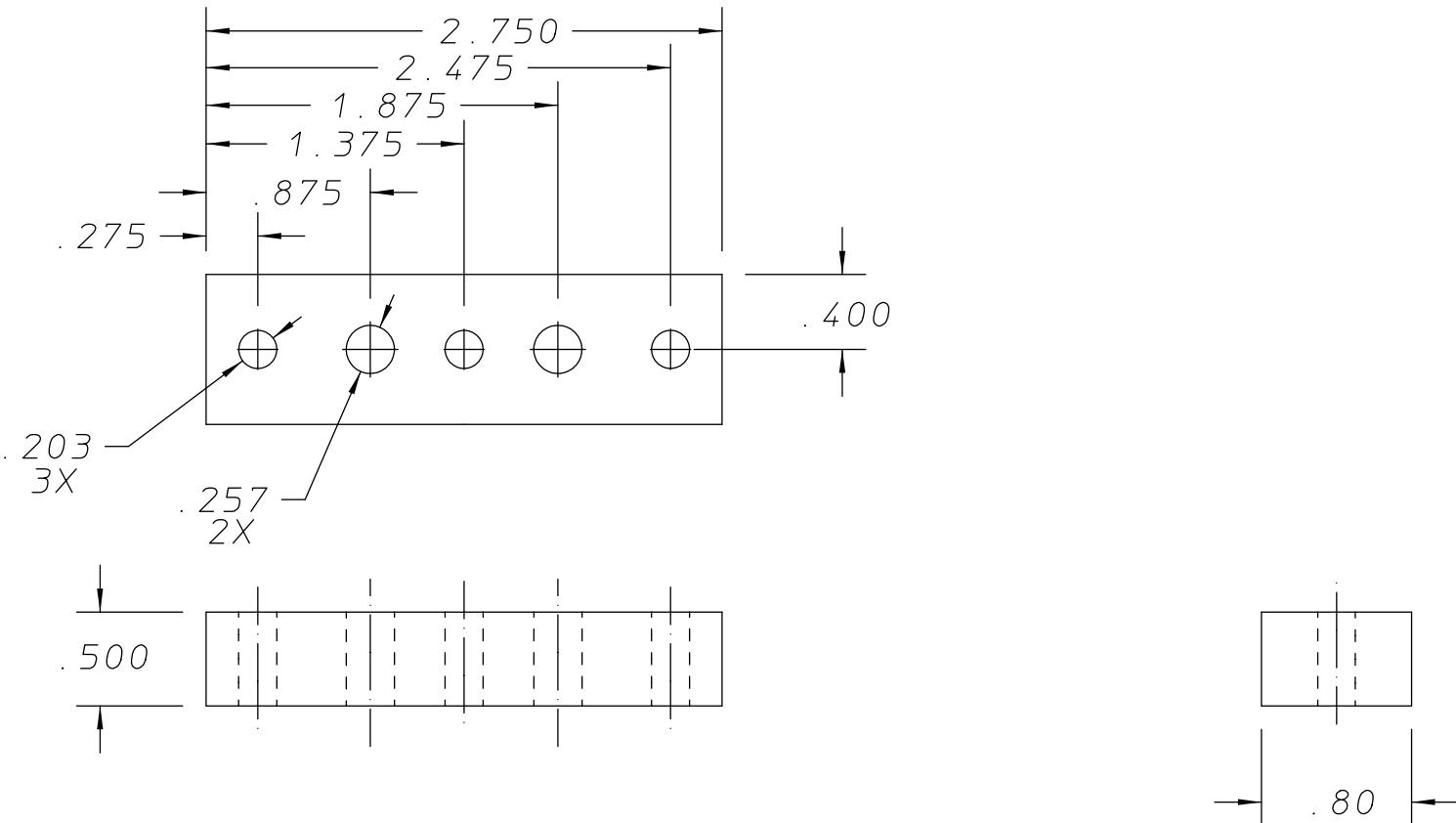


				UNLESS OTHERWISE SPECIFIED	SHOP ORDERS			LAWRENCE BERKELEY LABORATORY					
				TOLERANCE .X ± .1 .XX ± .01 .XXX ± .005	ACCT NO	SER NO		UNIVERSITY OF CALIFORNIA-BERKELEY					
				SURFACE FINISH 125 ✓	DATE ISSD	DATE REQD	NO REQD	SNS-FES ION SOURCE AND LEBT					
				1. SAWED, FLAMECUT, SHEARED OR CUT STOCK FINISH. 2. THREADS CLASS 2. 3. CHAMFER ENDS OF ALL SCREW THRDS 30°. 4. 1 1/2 PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT THRDS. 5. BREAK EDGES 1/64 MAX. ON MACHINE WORK. 6. REMOVE BURRS, LOOSE SCALE AND WELD SPLATTER. 7. REF. -USASI OR ASA STDS SECT Y-14 & B46-1.	DELIVER TO			SOURCE 65mA UPGRADE					
					SURFACE TREATMENT DEGREASE			ALUMINA RF ANTENNA FEEDTHRU					
					IDENTIFIC TAG			PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL		
A	DWC	7/25/01	.400 DIMENSION WAS .361		DWG BY D. CHENG			DATE 07-12-01	DETAIL	DO NOT SCALE PRINTS			
REV	DWN	CHK	DATE		CHK BY			DATE	MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	REV
									8212-CU	FE3130	21G7782A		

21G7792

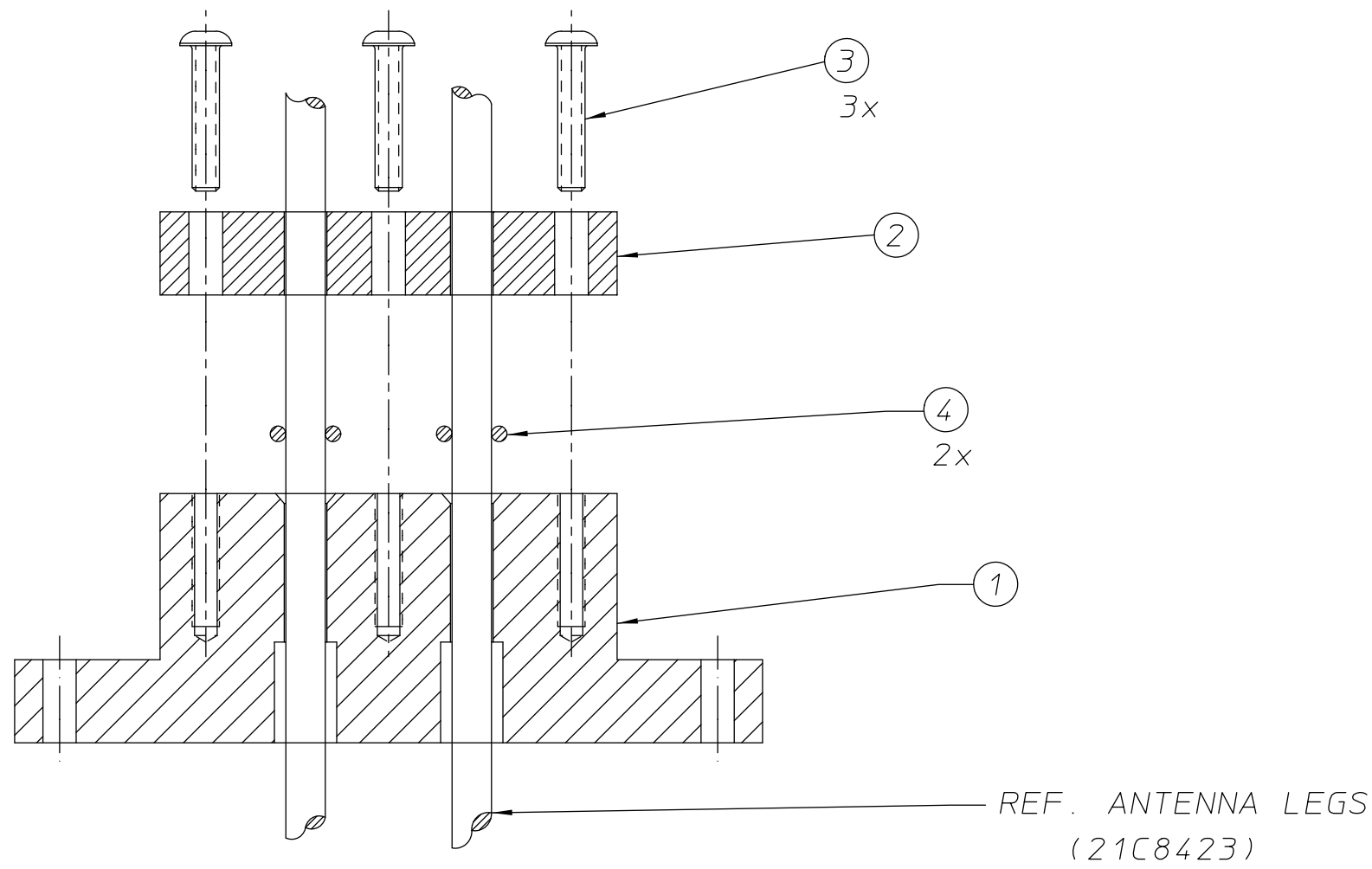
REQD	ITEM	PART NUMBER
A/R		

DESCRIPTION
ALUMINA, AL2O3



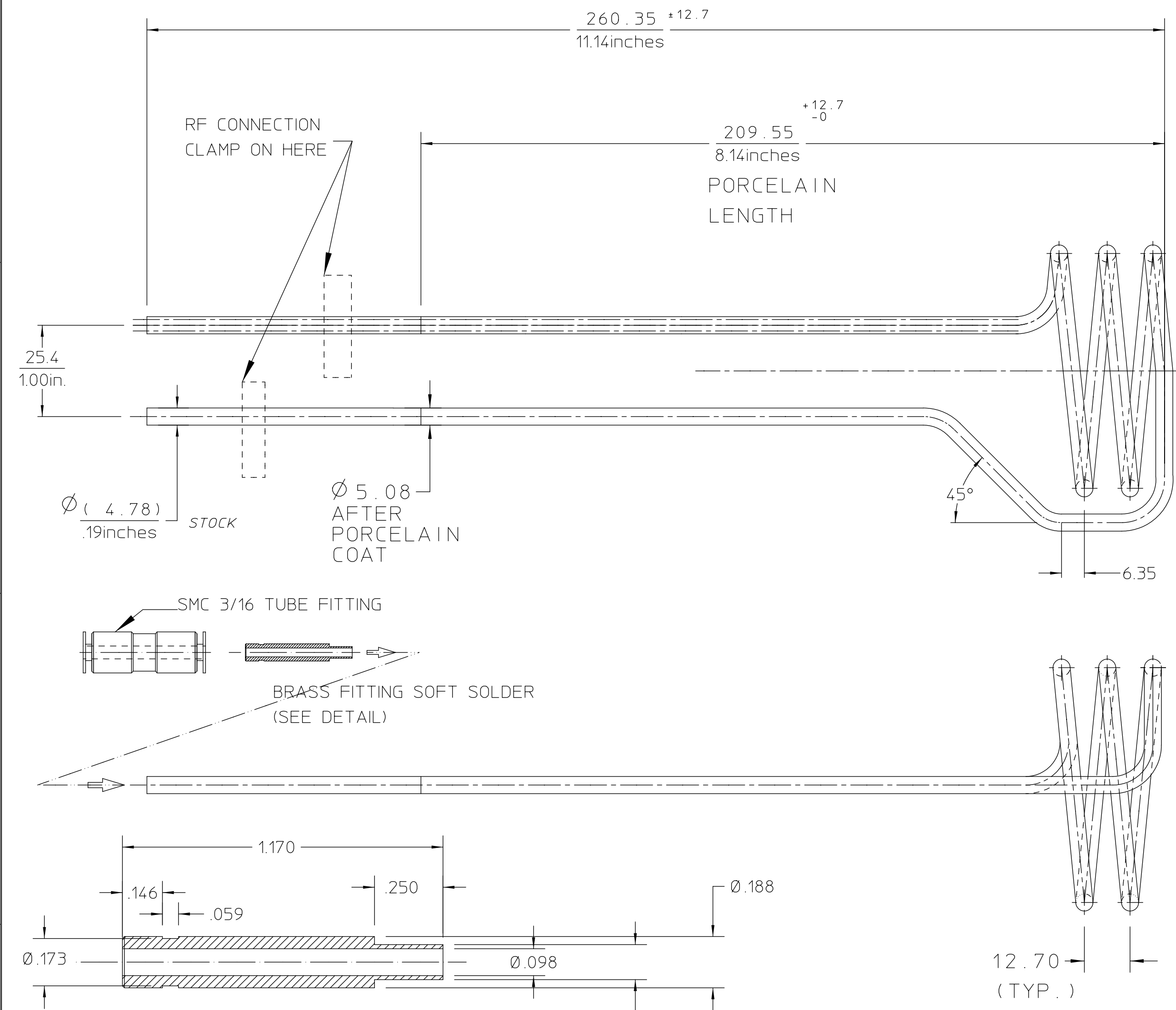
				UNLESS OTHERWISE SPECIFIED	SHOP ORDERS			LAWRENCE BERKELEY LABORATORY					
				TOLERANCE .X ± .1 .XX ± .01 .XXX ± .005	ACCT NO	SER NO		UNIVERSITY OF CALIFORNIA-BERKELEY					
				SURFACE FINISH 125 ✓	DATE ISSD	DATE REQD	NO REQD	SNS-FES ION SOURCE AND LEBT					
				1. SAWED, FLAMECUT, SHEARED OR CUT STOCK FINISH. 2. THREADS CLASS 2. 3. CHAMFER ENDS OF ALL SCREW THRDS 30°. 4. 1 1/2 PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT THRDS. 5. BREAK EDGES 1/64 MAX. ON MACHINE WORK. 6. REMOVE BURRS, LOOSE SCALE AND WELD SPLATTER. 7. REF. -USASI OR ASA STDS SECT Y-14 & B46-1.	DELIVER TO			SOURCE 65mA UPGRADE					
					SURFACE TREATMENT DEGREASE			ALUMINA RF ANTENNA FEEDTHRU CLAMP					
					IDENTIFIC METHOD TAG			PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL		
					DWG BY D. CHENG			DATE 07-24-01	DETAIL	DO NOT SCALE PRINTS			
					CHK BY			DATE	MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	REV
REV	DWN	CHK	DATE	DESCRIPTION				8212-CU	FE3130	21G7792			

	REQD	ITEM	PART NUMBER	DESCRIPTION
21G7802	1	1	21G7782	ALUMINA RF ANTENNA FEEDTHRU
	1	2	21G7792	ALUMINA RF ANTENNA FEEDTHRU CLAMP
	3	3		SCREW, TEFLON, SIZE 8-32 X .875 LG.
	2	4	2-106	O-RING, VITON, PARKER INC.

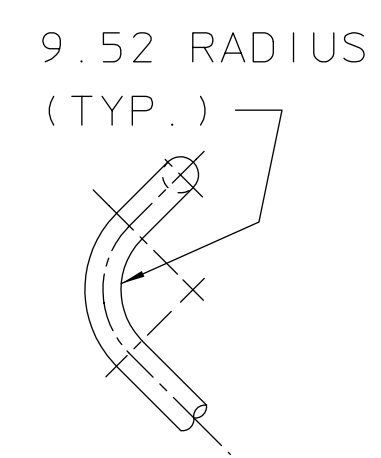
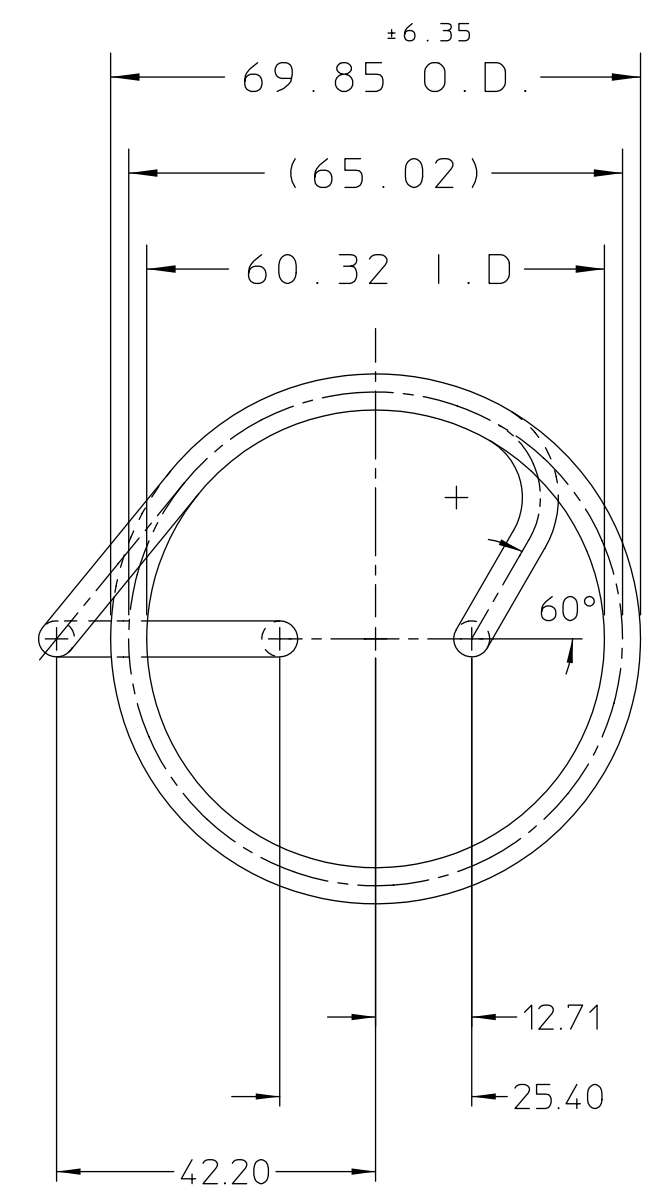


				UNLESS OTHERWISE SPECIFIED	SHOP ORDERS			LAWRENCE BERKELEY LABORATORY				
				TOLERANCE .X ± .1 .XX ± .01 .XXX ± .005	ACCT NO	SER NO		UNIVERSITY OF CALIFORNIA-BERKELEY				
				SURFACE FINISH 125 ✓	DATE ISSD	DATE REQD	NO REQD	SNS-FES ION SOURCE AND LEBT				
				1. SAWED, FLAMECUT, SHEARED OR CUT STOCK FINISH. 2. THREADS CLASS 2. 3. CHAMFER ENDS OF ALL SCREW THRDS 30°. 4. 1 1/2 PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT THRDS. 5. BREAK EDGES 1/64 MAX. ON MACHINE WORK. 6. REMOVE BURRS, LOOSE SCALE AND WELD SPLATTER. 7. REF. -USASI OR ASA STDS SECT Y-14 & B46-1.	DELIVER TO			SOURCE 65mA UPGRADE				
					SURFACE TREATMENT	DEGREASE		ALUMINA RF ANTENNA FEEDTHRU ASSEMBLY				
					IDENTIFIC METHOD	TAG		PAT CLEAR	DWG TYPE ASS'Y	SHOWN ON	SCALE: FULL	
					DWG BY	D. CHENG		DATE	07-25-01		DO NOT SCALE PRINTS	
					CHK BY			DATE			DWG NO	REV
											21G7802	
REV	DWN	CHK	DATE		DESCRIPTION				DESIGN ACCT NO	CATEGORY CODE	DWG NO	REV
								8212-CU	FE3130	21G7802		

REQ	ITEM	PART NUMBER	DESCRIPTION
			TUBE, 3/16" O.D., COPPER (REFRIGERATION TUBE)



- NOTES: UNLESS OTHERWISE SPECIFIED.
1. POSITIONAL TOLERANCES AND DATUM FEATURES OF SIZE APPLY REGARDLESS OF FEATURE SIZE.
 2. ALL DIMENSIONS ARE IN MILLIMETERS.
 3. PORCELAIN COATING MUST HAVE A RESISTANCE OF GREATER THAN 20 MILLION OHMS WHEN SUBMERGED IN SALT WATER SOLUTION.
 4. USE OF SULFUR OR SILICONE BEARING OILS, LUBRICANTS OR COOLANTS ARE STRICTLY PROHIBITED.
 5. USE OF RESIN OR RUBBER BONDED ABRASIVES UNDER POWER IS STRICTLY PROHIBITED. USE VITREOUS BONDED ABRASIVES ONLY.
 6. PROTECT FINISHED PART BY BAGGING OR SIMILAR METHOD TO PROTECT AND MAINTAIN CLEANLINESS DURING SHIPMENT AND STORAGE.



21C8423

DETAIL (3X SIZE)

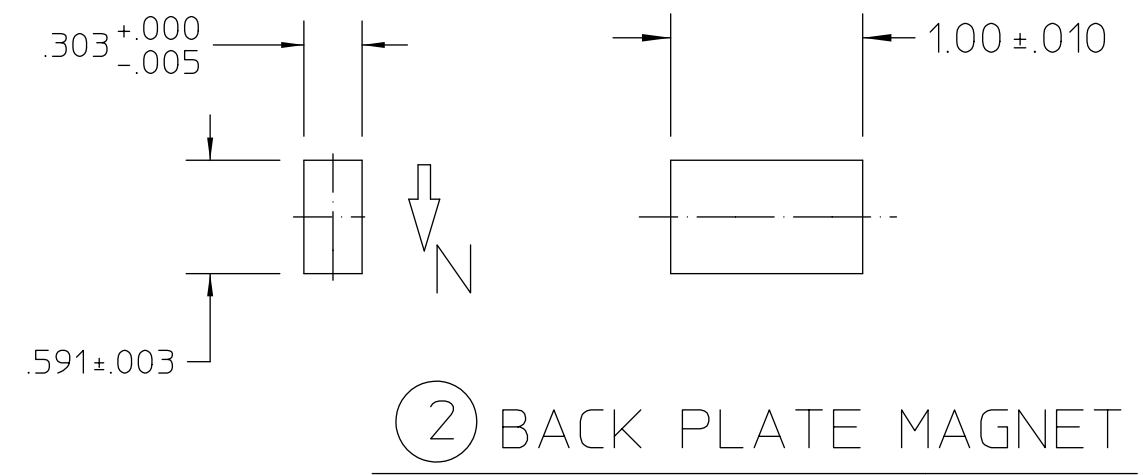
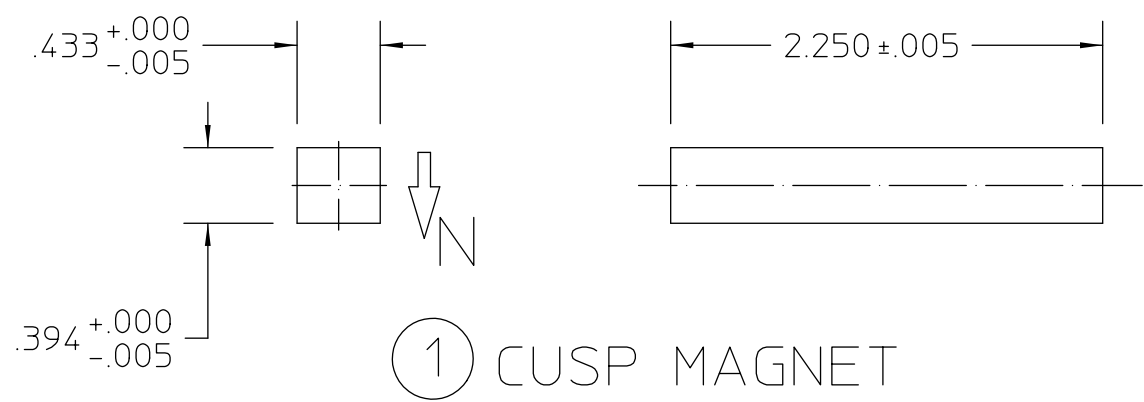
				UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		LAWRENCE BERKELEY LABORATORY					
				TOLERANCES		ACCT. NO.		UNIVERSITY OF CALIFORNIA-BERKELEY					
				ANGLES ± 1°		DATE ISSD		SNS - FRONT END SYSTEM					
				FINISH 3.2		DATE REQD.		ION SOURCE PROTOTYPE DESIGN					
				X.XX ± 3.17		DELIVER TO		RF ANTENNA (2 TURN)					
				THREADS ARE CLASS 2		SURFACE TREATMENT		PATENT CLEAR		DWG. TYPE		SCALE FULL	
				CHAMFER ENDS OF ALL SCREW THREADS 30°		DEGREASE		MICROFILMED		CD		DO NOT SCALE PRINTS	
				CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL		IDENT. METH. TAG		DESIGN ACCT. NO.		SHOWN ON		SIZE	
				ON MACHINE CUT THREADS.		DWG. BY SAM/C. A. MATUK		8210-14		21C8406		REV.	
				BREAK EDGES .016 MAX. ON MACHINED WORK		DATE 01-04-99		CATEGORY CODE		DWG. NO.		REV.	
				REMOVE BURRS WELD SPLATTER & LOOSE SCALE		DATE		FE1100		21C8423		REV.	
				REFERENCES: ANSI Y14.5 & B46.1.									
REV	DWG	CHK	ZONE	DATE	CHANGES								

D C B A

21C8502	REQD	ITEM	PART NUMBER	DESCRIPTION
	40	1	-1	10mmx11mm CUSP MAGNET
	10	2	-2	7.6mmx15mm BACK PLATE MAGNET

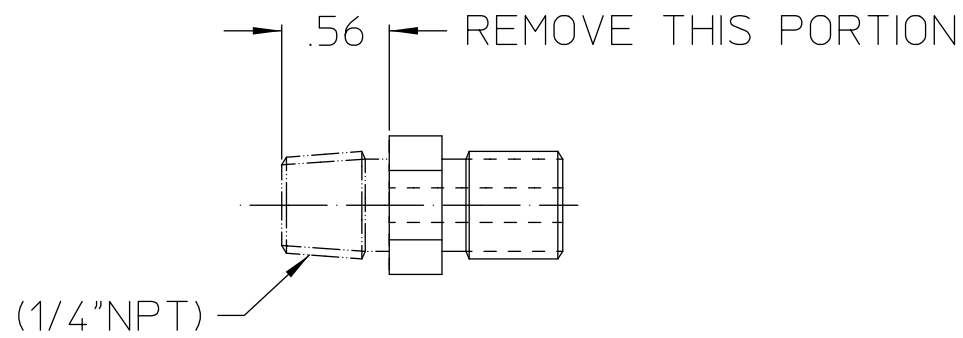
NOTES:

- MATERIAL IS SINTERED NdFeB
THE ARROW DENOTES MAGNETIZATION DIRECTION
- ALL DIMENSIONS ARE INCHES
- MAGNET PROPERTIES
BR = 13500 Gauss
Hc = 11700 Oe.
BHmax = 45 MGOe.

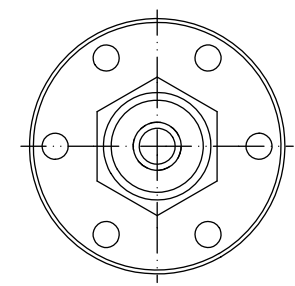
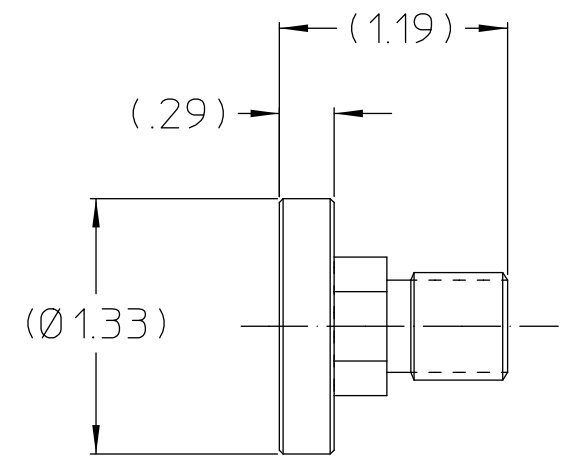
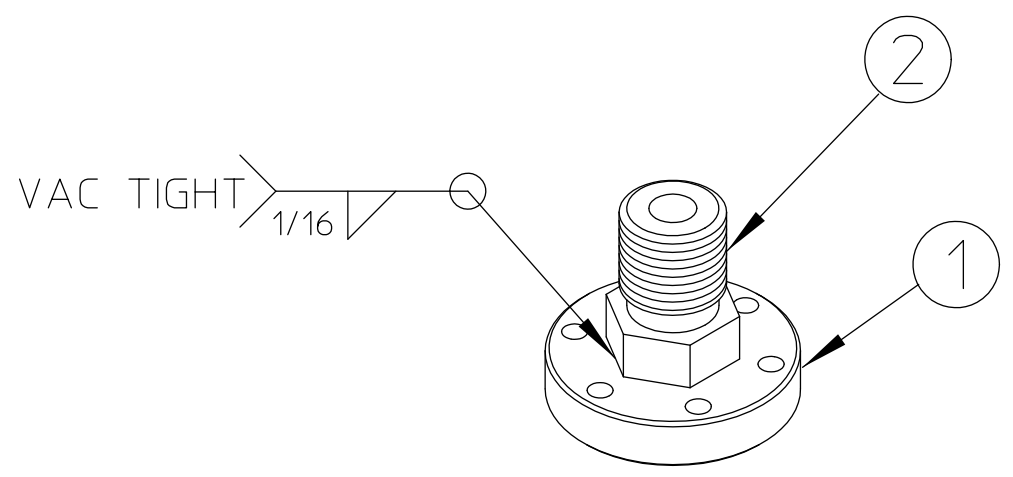


				UNLESS OTHERWISE SPECIFIED	SHOP ORDERS			LAWRENCE BERKELEY LABORATORY				
				TOLERANCE .X ± .1 .XX ± .01 .XXX ± .001	ACCT NO	SER NO		UNIVERSITY OF CALIFORNIA-BERKELEY				
				SURFACE FINISH 125 ✓	DATE ISSD	DATE REQD	NO REQD	SNS -FRONT END SYSTEM				
				1. SAWED, FLAMECUT, SHEARED OR CUT STOCK FINISH. 2. THREADS CLASS 2. 3. CHAMFER ENDS OF ALL SCREW THRDS 30°. 4. 1 1/2 PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT THRDS. 5. BREAK EDGES 1/64 MAX. ON MACHINE WORK. 6. REMOVE BURRS, LOOSE SCALE AND WELD SPLATTER. 7. REF. -USASI OR ASA STDS SECT Y-14 & B46-1.	DELIVER TO	ION SOURCE PROTOTYPE DESIGN			CUSP MAGNET SIZE			
					SURFACE TREATMENT -	PAT CLEAR			DWG TYPE	SHOWN ON	SCALE: FULL	
					IDENTIFIC METHOD TAG	MICROFILMED			DETAIL		DO NOT SCALE PRINTS	
					DWG BY S. MUKHERJEE	DATE	03-16-99	DESIGN ACCT NO	CATEGORY CODE	DWG NO	REV	
REV	DWN	CHK	DATE		DESCRIPTION	CHK BY M. LEITNER	DATE	00-00-00	8210-14	FE1100	21C8502	

21G7552	REQD	ITEM	PART NUMBER	DESCRIPTION
	1	1	110001	FLANGE CFF, 1/4" IDx1-1/3" OD MINI "MDC CORP"
	1	2	SS-4-VCR-1-4	MALE NPT CONN VCR "SWAGelok"



ITEM ② MODIFICATION



				UNLESS OTHERWISE SPECIFIED	SHOP ORDERS			LAWRENCE BERKELEY LABORATORY				
				TOLERANCE .X ± .XX ± .01 .XXX ±	ACCT NO		SER NO		UNIVERSITY OF CALIFORNIA-BERKELEY			
				SURFACE FINISH 125 ✓	DATE ISSD	DATE REQD	NO REQD	ION BEAM TECHNOLOGY				
				1. SAWED, FLAMECUT, SHEARED OR CUT STOCK FINISH. 2. THREADS CLASS 2. 3. CHAMFER ENDS OF ALL SCREW THRDS 30°. 4. 1 1/2 PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT THRDS. 5. BREAK EDGES 1/64 MAX. ON MACHINE WORK. 6. REMOVE BURRS, LOOSE SCALE AND WELD SPLATTER. 7. REF. -USAS1 OR ASA STDS SECT Y-14 & B46-1.	DELIVER TO			SNS-FES ION SOURCE AND LEPT STRUCTURE				
					SURFACE TREATMENT DEGREASE			GAS INLET FLANGE				
					IDENTIFIC METHOD			PAT CLEAR	DWG TYPE C-DETAIL	SHOWN ON 21G7543	SCALE: FULL	
					DWG BY RAY LOW			DATE 07-03-00	MICROFILMED	DESIGN ACCT NO 8212-AC	CATEGORY CODE FE3111	DWG NO 21G7552
REV	DWN	CHK	DATE	DESCRIPTION	CHK BY DAN CHENGE	DATE 07-03-00						