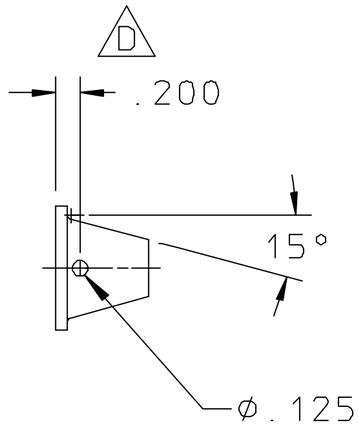
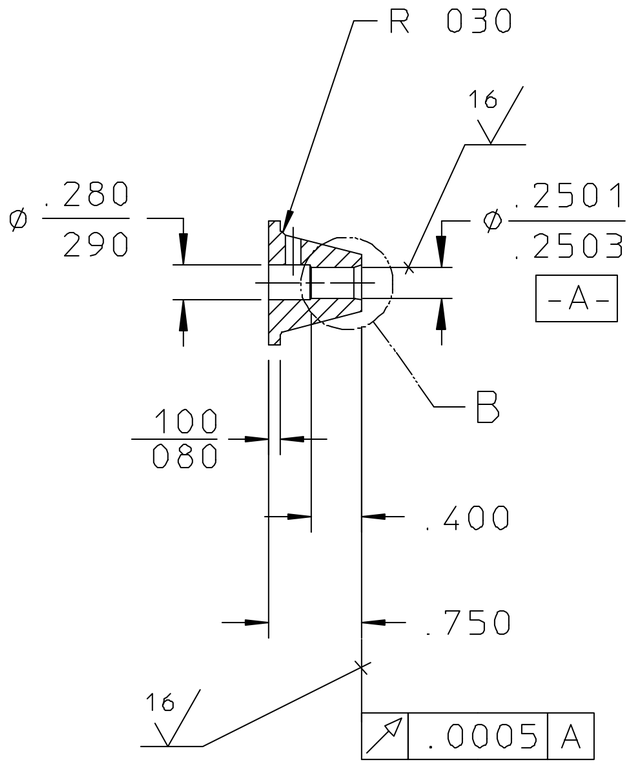
REQ	ITEM	PART NUMBER	DESCRIPTION
			ø1.00 ROD, 17-4PH STAINLESS STEEL, CONDITION "A"



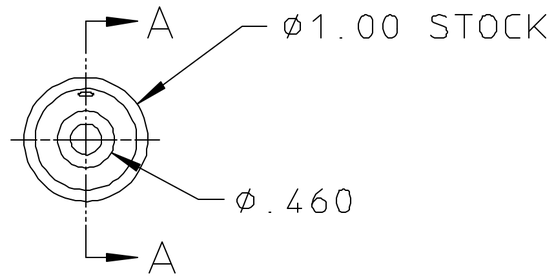
NOTES UNLESS OTHERWISE SPECIFIED

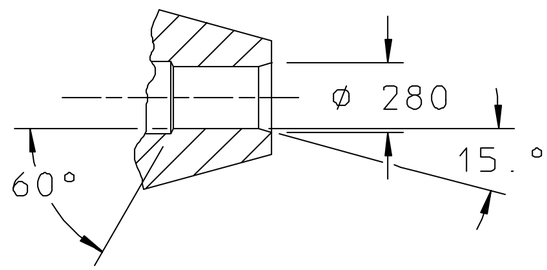
1. HEAT TREAT IN INERT ATMOSPHERE FURNACE AT 900°F FOR 1 HOUR. FURNACE COOL APPROXIMATE HARDNESS IS ROCKWELL "C" 45.



SECTION A-A

SCALE 1:1





DETAIL B

SCALE 2·1

20Q5363D

REV	DWG	CHK	ZONE	DATE	CHANGES
D	EF		D-4	1/27/89	DIM 200 WAS 250 ± 020
C	JA			11/23/88	REDRAW CAD DRAWING
B	JWC			10/4/88	REDESIGNED

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± | FRAC ± | XX ± | ANGLES ± 1° | XXX ± .010 | FINISH 63

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .015 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14 5 & B46 1

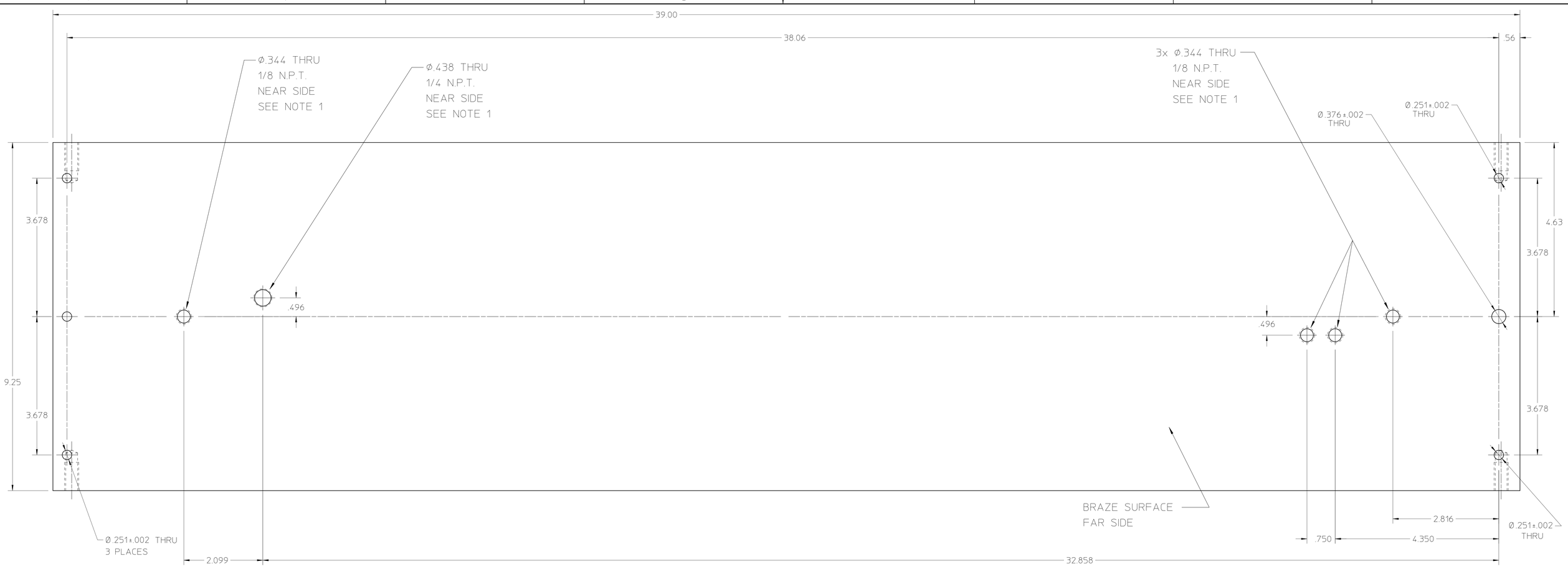
SHOP ORDERS

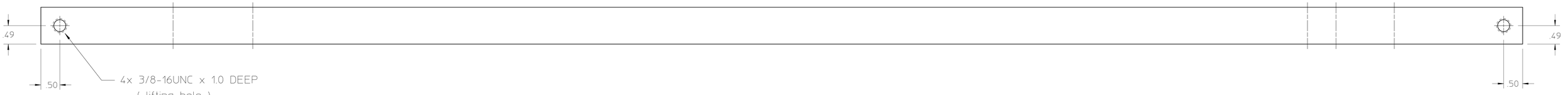
ACCT NO | SERIAL NO | DATE ISSD | DATE REQD | NO REQD | DELIVER TO | SURFACE TREATMENT DEGREASE | IDENT. METH TAG | DWG BY J AKRE DATE 11-23-88 | CHK BY T.LAURITZEN DATE 1-27-89

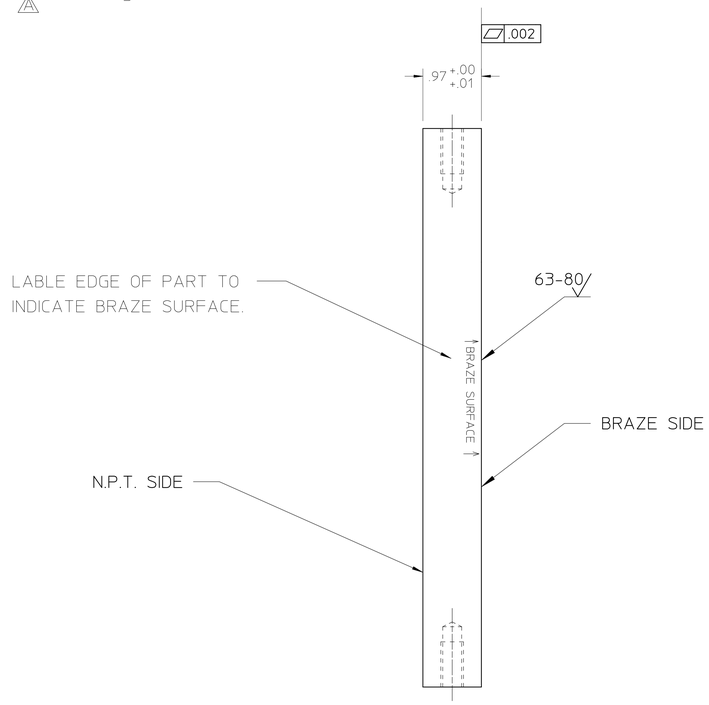
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

ALS SURVEY
FIXTURES
SURVEY FIDUCIAL POST

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:1	DO NOT SCALE PRINTS
	C-DETAIL			
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE AL0907	DWG. NO. 20Q5363	SIZE D / REV.







END VIEW

NOTES

1. CUT N.P.T.'S TO MAXIMUM DEPTH TO MAKE ROOM FOR A .030" CLEAN-UP CUT AT A FUTURE MACHINING OPERATION.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 112 LBS.

25B0286A

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MOH		B-8	6-23-99	ADDED 4x 3/8-16UNC TAPS

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

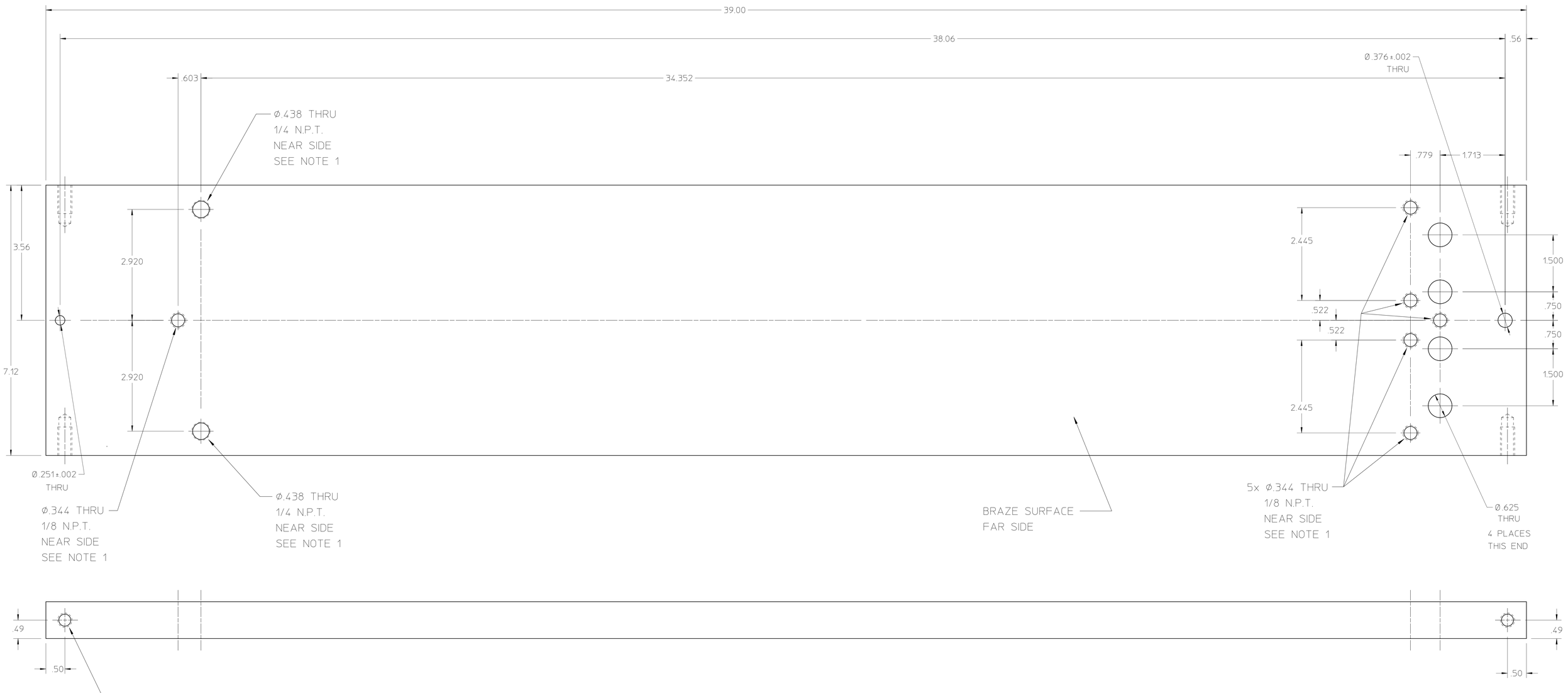
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE 02-08-99
CHK. BY: DATE

REQD	ITEM	PART NO.	DESCRIPTION
			GLIDCOP AL-15

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ R&D
RFQ R&D
ALPHA MODULE GLIDCOP MACHINING MAJOR VANE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25B0676	1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8210-46	FE1400	25B0286	A



NOTES

1. CUT N.P.T.'S TO MAXIMUM DEPTH TO MAKE ROOM FOR A .030" CLEAN-UP CUT AT A FUTURE MACHINING OPERATION.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 86 LBS.

25B0296A

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		C-8	4-23-99	ADDED 4x 3/8-16UNC TAPS

REQD	ITEM	PART NO.	DESCRIPTION
			GLIDCOP AL-15

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE 02-08-99
CHK. BY DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ R&D
RFQ R&D
ALPHA MODULE GLIDCOP MACHINING MINOR VANE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25B0686	1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8210-46	FE1400	25B0296	A

SLOT POCKET

27.474

(29.276)

5.209

(4.308)

R 4.20

R 4.20

1.03

1.91

1.00

1.00

8.00

8.00

4x DRILL & TAP FOR A 3/8-16UNC THREADED INSERT x 1.0 DEEP (lifting hole)

A

1x ø.070 (#50 drill) x 1.0 DEEP ONE SIDE ONLY

B

19.5

SECTION C-C

CENTER CHANNEL DETAIL

39.00

37.88

.56

1x ø.382 x 1.25 DP.

A

C

C

2.61

.13

.257

.125

R.13

5.21

.250

SIDE CHANNEL

SEE DWG. 25B0326 FOR DIMENSIONS.

A

ENTRANCE END

29.276

4.308

EXIT END

21/64 (.328) DRILL x 3.94 DEEP DRILL THIS HOLE BEFORE MACHINING CENTER CHANNEL AS SHOWN IN SECT. C-C.

21/64 (.328) DRILL x 3.94 DEEP DRILL THIS HOLE BEFORE MACHINING CENTER CHANNEL AS SHOWN IN SECT. C-C.

SLOT POCKET

(29.276)

(3.94)

35°

(4.308)

(3.94)

35°

25B0306B

.008

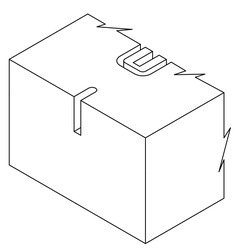
3.50

SIDE CHANNEL

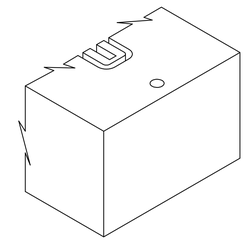
(.25)

(5.21)

CENTER CHANNEL



ISOMETRIC VIEW - ENTRANCE END
SCALE 1:2



ISOMETRIC VIEW - EXIT END
SCALE 1:2

SECTION A-A

DIMENSIONS ARE IN INCHES

SEE DRAWING 25B0326 FOR DIMENSIONS DESCRIBING THE SIDE CHANNEL GEOMETRY.

THIS PART WEIGHS APPROX. 216 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH		D-4	5-07-99	ADDED 1x ø.070 X 1.0 DEEP
A	MDH		D-6	4-22-99	ADDED 4x 3/8-16UNC TAPS

UNLESS OTHERWISE SPECIFIED
TOLERANCES: X ± .1; FRAC. ±1/64; XX ± .01; ANGLES ± 1°; XXX ± .004; FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG MATT HOFF BY
DATE 02-10-99
CHK. BY
DATE

REQD	ITEM	PART NO.	DESCRIPTION
			C10100 COPPER

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ R&D

RFQ R&D

ALPHA MODULE C101 MACHINING MAJOR VANE

PATENT CLEAR
MICROFILMED
DWG. TYPE: DETAIL
SHOWN ON: 25B0656
SCALE: 1 : 1
DO NOT SCALE PRINTS
DESIGN ACCT. NO: 8210-46
CATEGORY CODE: FE1400
DWG. NO: 25B0306
SIZE: B
REV: B

SLOT POCKET

27.474

5.209

R 4.20

(29.276)

(4.308)

1.03

R 4.20

1.91

1.00

1.00

8.00

4x DRILL & TAP FOR A 3/8-16UNC THREADED INSERT X 1.0 DEEP (lifting holes)

A

SECTION C-C

CENTER CHANNEL DETAIL

1x ⌀.070 (#50 drill) x 1.0 DEEP ONE SIDE ONLY

B

8.00

19.5

39.00

37.88

.56

SEE DWG. 25B0336 FOR DIMENSIONS.

A

1x ⌀.382 x 1.25 DP.

C

C

3.56

.125

.257

.13

R .13

.250

7.12

ENTRANCE END

A

29.276

4.308

EXIT END

21/64 (.328) DRILL x 3.94 DEEP DRILL THIS HOLE BEFORE MACHINING CENTER CHANNEL AS SHOWN IN SECT. C-C.

21/64 (.328) DRILL x 3.94 DEEP DRILL THIS HOLE BEFORE MACHINING CENTER CHANNEL AS SHOWN IN SECT. C-C.

SLOT POCKET

(3.94)

35°

(29.276)

(4.308)

(3.94)

35°

25B0316B

ISOMETRIC VIEW - ENTRANCE END

SCALE 1:2

⌭ .008

3.50

SIDE CHANNEL

(.25)

(7.12)

CENTER CHANNEL

SECTION A-A

ISOMETRIC VIEW - EXIT END

SCALE 1:2

DIMENSIONS ARE IN INCHES

SEE DRAWING 25B0336 FOR DIMENSIONS DESCRIBING THE SIDE CHANNEL GEOMETRY.

THIS PART WEIGHS APPROX. 304 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH		D-4	5-07-99	ADDED 1x ⌀.070 x 1.0 DEEP
A	MDH		D-6	4-23-99	ADDED 4x 3/8-16UNC TAPS

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1; FRAC. ± 1/64; .XX ± .01; ANGLES ± 1°; .XXX ± .004; FINISH 250

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDER'S

ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF
DATE: 02-10-99
CHK. BY
DATE

REQD	ITEM	PART NO.	DESCRIPTION
			C10100 COPPER

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

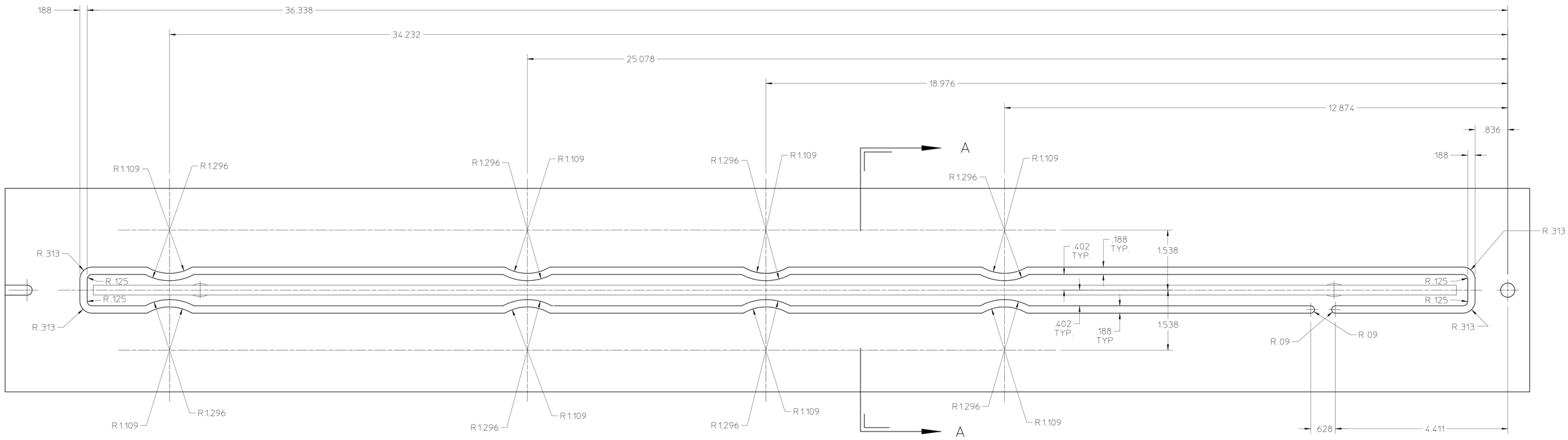
SNS-FE RFQ R&D

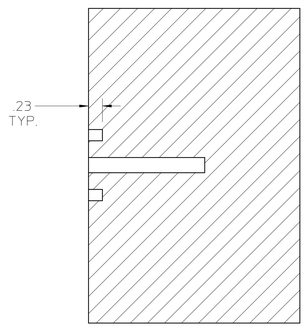
RFQ R&D

ALPHA MODULE C101 MACHINING MINOR VANE

PATENT CLEAR | MICROFILMED

DWG. TYPE: DETAIL
SHOWN ON: 25B0666
DESIGN ACCT. NO.: 8210-46
CATEGORY CODE: FE1400
SCALE: 1 : 1
DO NOT SCALE PRINTS
DWG. NO.: 25B0316
SIZE: B
REV: B





SECT. A-A

25B0326

THIS DRAWING DESCRIBES THE SIDE PASSAGE GEOMETRY SHOWN ON DRAWING 25B0306

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 216 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
		25B0306	C101 MACHINING MAJOR VANE

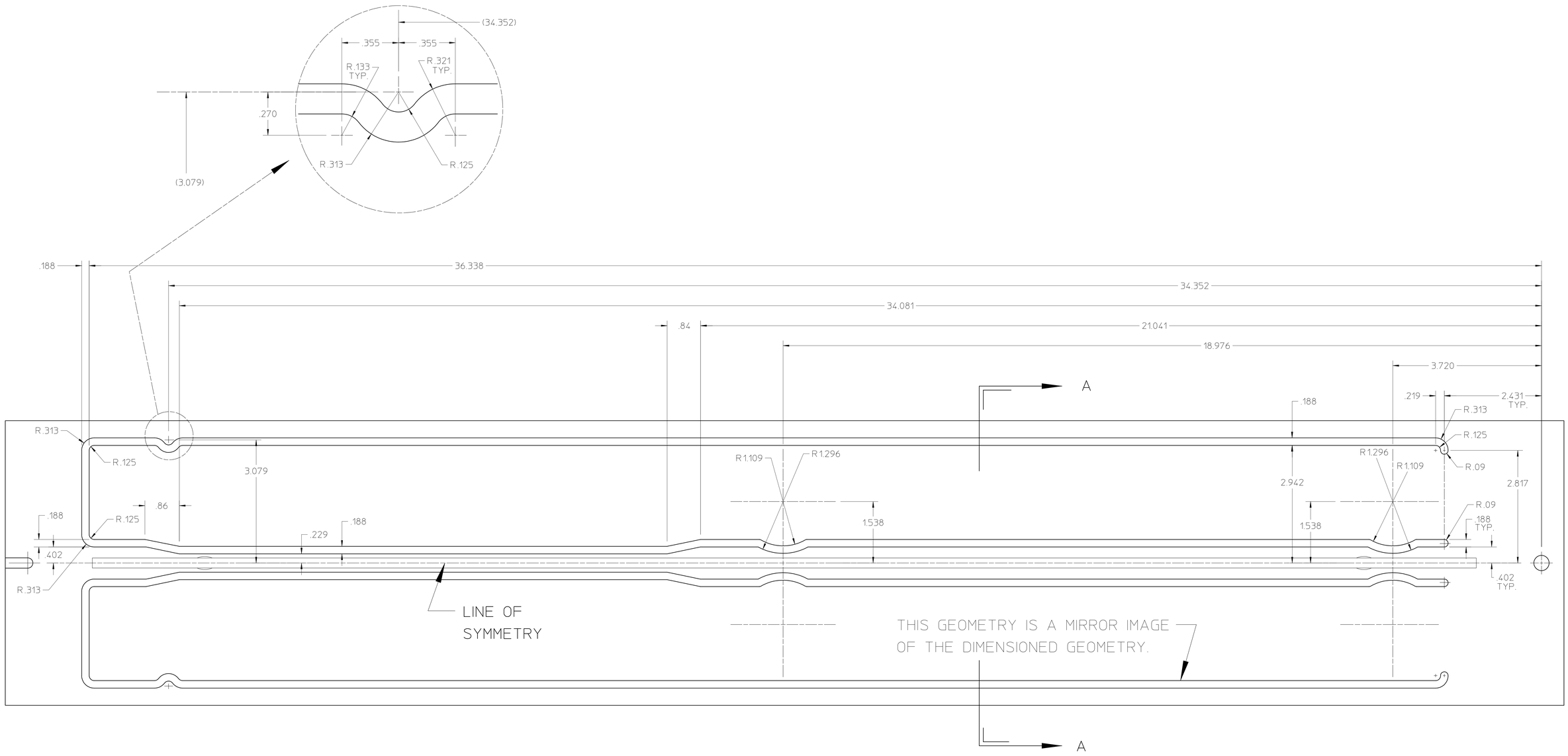
REV	DWG	CHK	ZONE	DATE	CHANGES

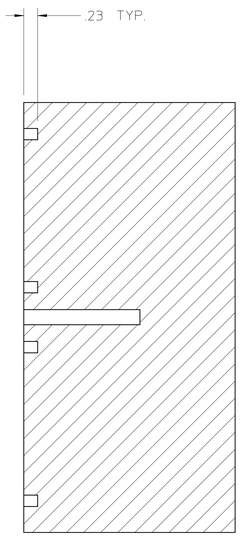
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE 02-11-99
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FE RFQ R&D
RFQ R&D
ALPHA MODULE CHANNEL DETAILS MAJOR VANE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25B0656	1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV
	8210-46	FE1400	25B0326	





SECT. A-A

25B0336

THIS DRAWING DESCRIBES THE SIDE PASSAGE GEOMETRY SHOWN ON DRAWING 25B0316

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 304 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
		25B0316	C101 MACHINING MINOR VANE

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC. ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

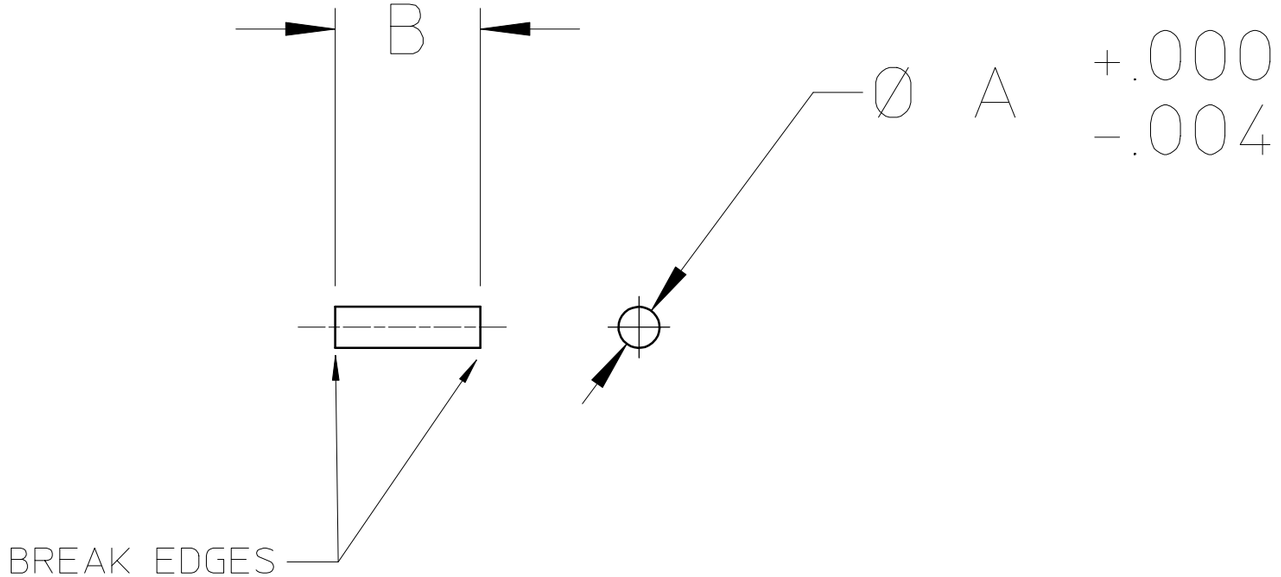
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY MATT HOFF
DATE 07-11-99
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FE RFQ R&D
RFQ R&D
ALPHA MODULE CHANNEL DETAILS MINOR VANE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:1	DO NOT SCALE PRINTS
	DETAIL	25B0666		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV.
	8210-46	FE1400	25B0336	

25B0442A	REQD	ITEM	PART NUMBER	DESCRIPTION
				C10100 copper rod

	DIM. A	DIM. B
VERSION 1	.248	.88
VERSION 2	.248	1.20
VERSION 3	.373	1.50



DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		4-9-99	ADDED VERSIONS

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .02 .XXX ±.002

SURFACE FINISH 125

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 03-02-99
CHK BY		DATE

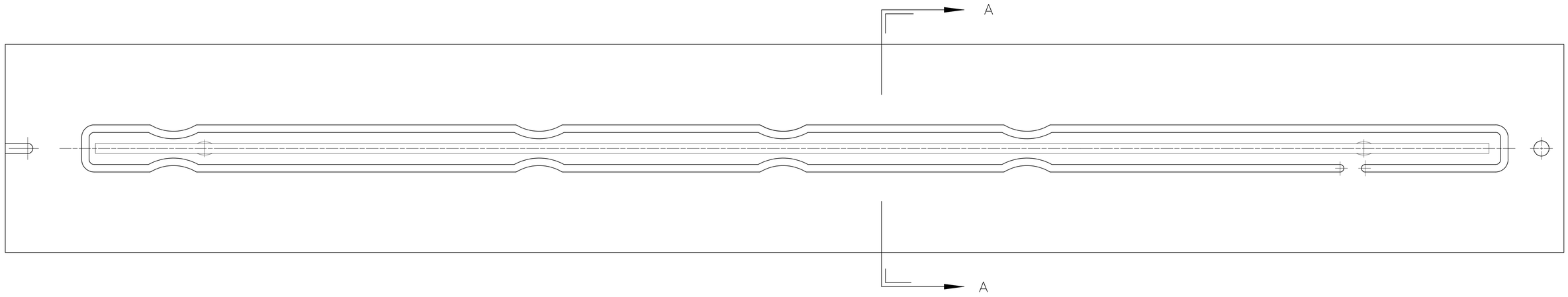
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

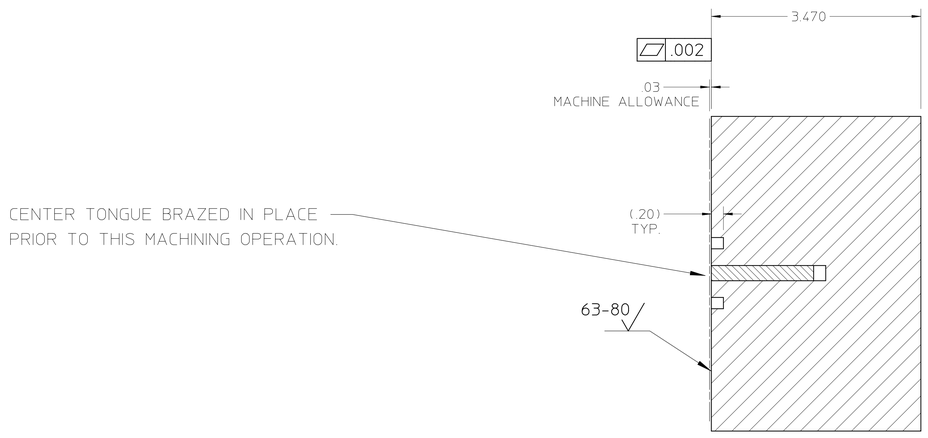
SNS-FE RFQ R&D

RFQ R&D

10" MODEL COPPER DOWEL PIN

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	25B0424	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8210-46	FE1400	25B0442A





SECT. A-A

25B0456

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 222 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
		25B0656	TONGUE BRAZE MAJOR VANE

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 03-04-99
CHK. BY: | DATE:

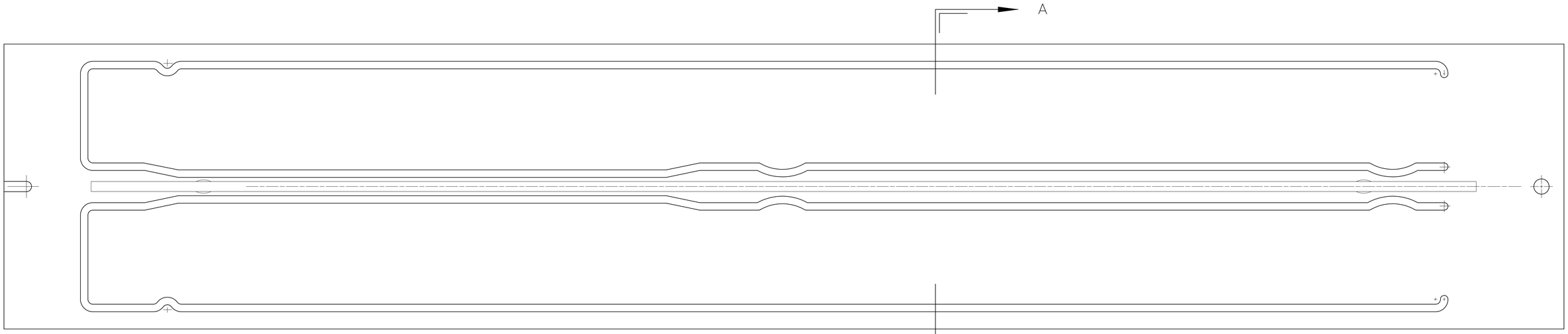
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

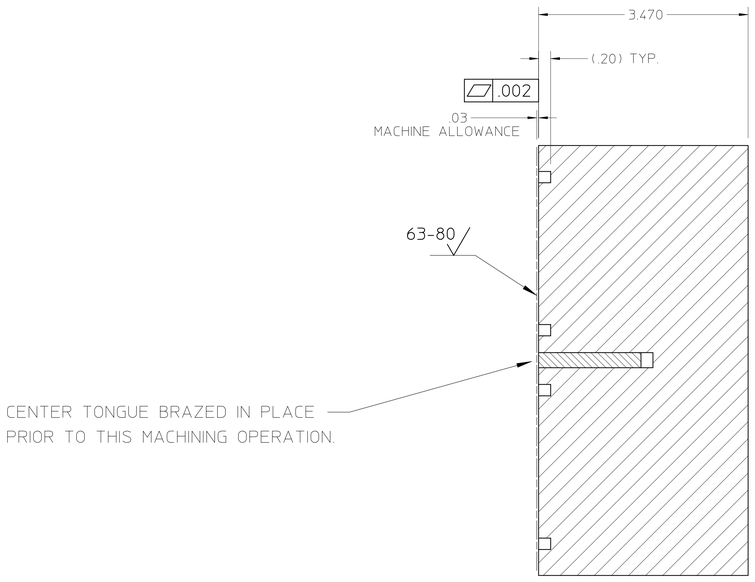
SNS-FE RFQ R&D

RFQ R&D

ALPHA MODULE C101 BRAZE PREP MAJOR VANE

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 25B0676 | SCALE: 1:1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8210-46 | CATEGORY CODE: FE1400 | DWG. NO.: 25B0456 | SIZE | REV.





SECT. A-A

25B0466

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 309 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC. ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .005 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF
DATE 03-04-99
CHK. BY
DATE

REQD	ITEM	PART NO.	DESCRIPTION
		25B0666	TONGUE BRAZE MINOR VANE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

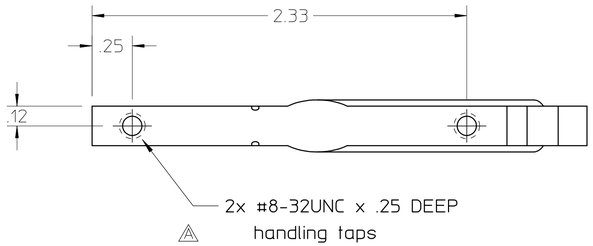
SNS-FE RFQ R&D

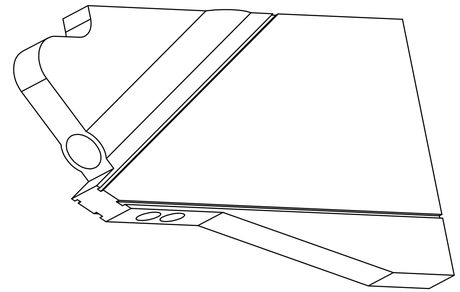
RFQ R&D

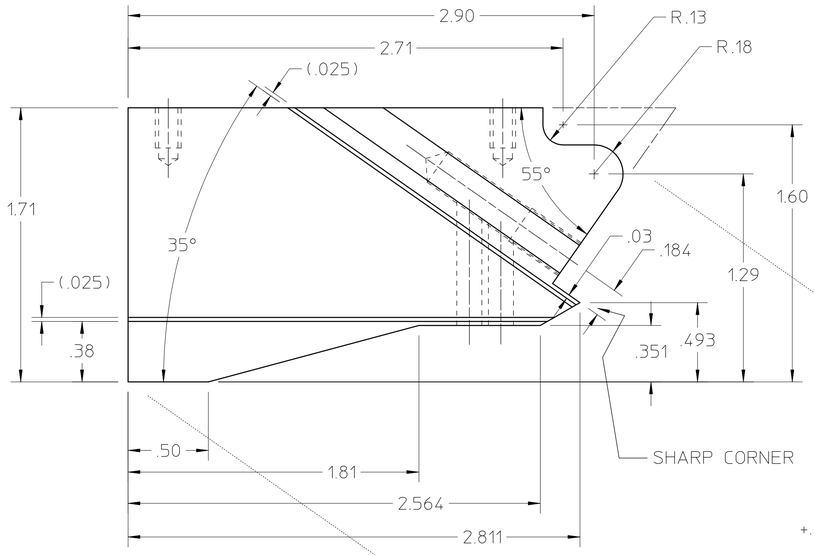
ALPHA MODULE C101 BRAZE PREP MINOR VANE

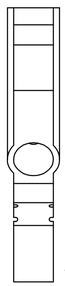
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 1	DO NOT SCALE PRINTS
	DETAIL	25B0686	DWG. NO.	SIZE REV.
MICROFILMED	DESIGN ACCT. NO. 8210-46	CATEGORY CODE FE1400	25B0466	

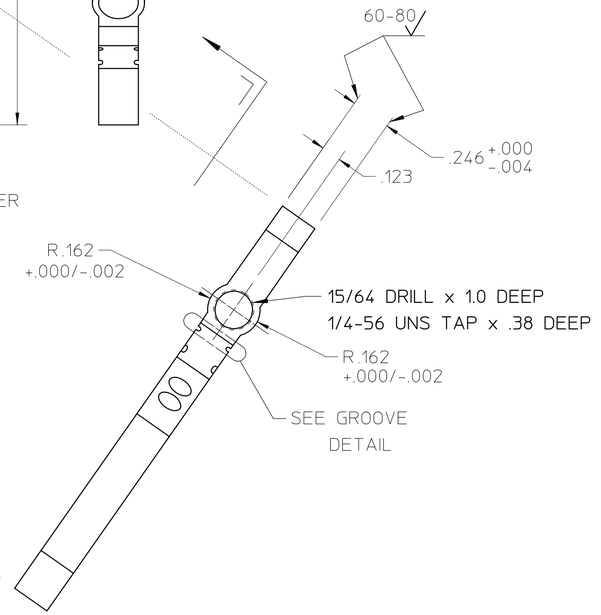
REQ	ITEM	PART NUMBER	DESCRIPTION
			C101 COPPER STOCK

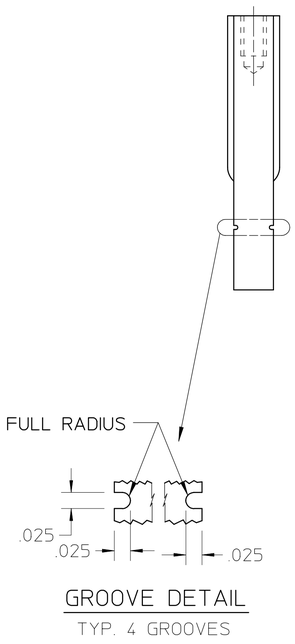




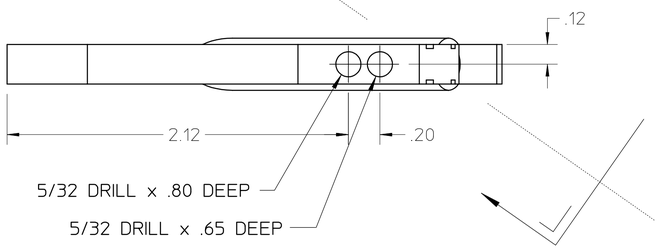


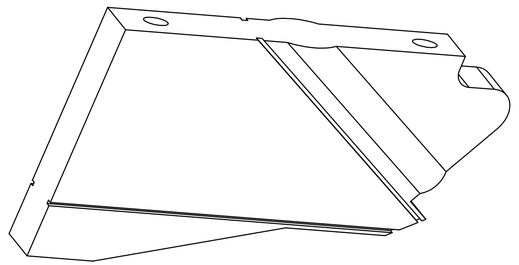






GROOVE DETAIL
TYP. 4 GROOVES





25B0494A

DIMENSIONS ARE IN INCHES

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		D-6	5-14-99	ADDED 2x #8-32 and revised cat.code

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .005 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 03-05-99
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

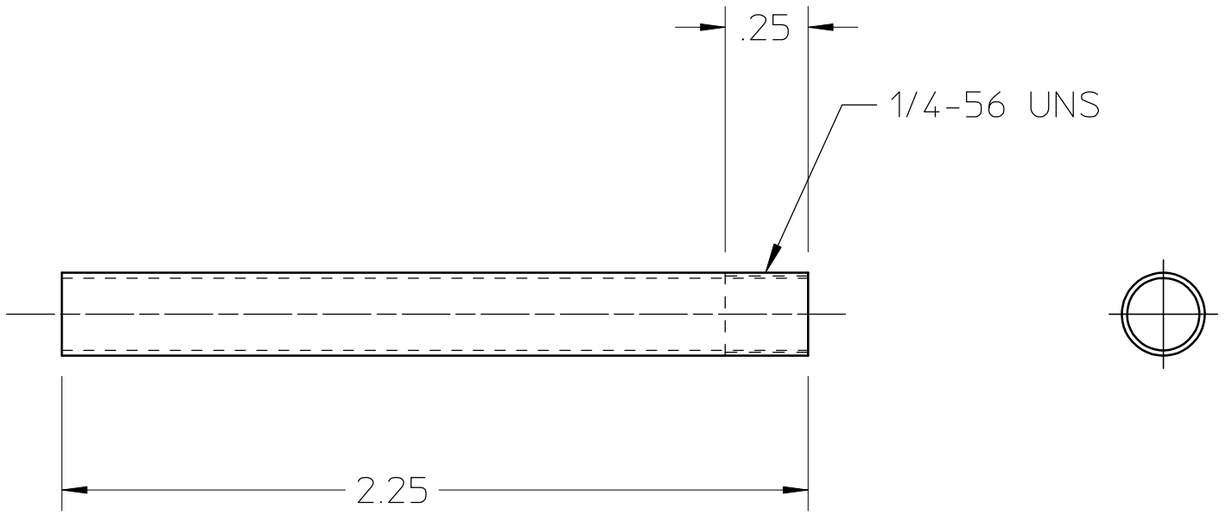
SNS-FES R&D

GENERAL

ALPHA MODULE - SQUIRT TUBE HOLDER

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25B0656	2 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8210-46	FE1000	25B0494	A

25B0502	REQD	ITEM	PART NUMBER	DESCRIPTION
				304 ST. STEEL TUBE, 1/4 O.D. x .218 I.D., TUBESALES



DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 03-08-99	
CHK BY		DATE	

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

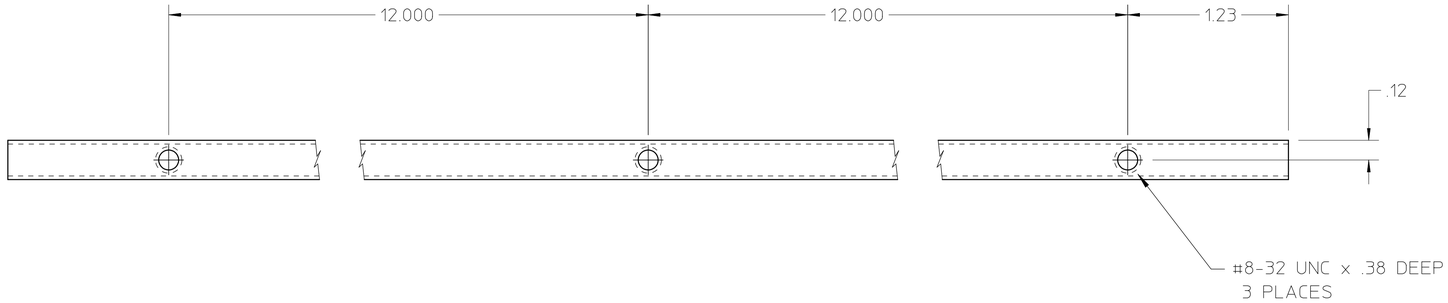
SNS-FE RFQ R&D

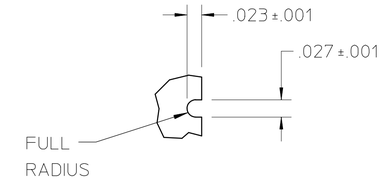
RFQ R&D

ALPHA MODULE - SQUIRT TUBE

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 2:1
	DETAIL	25B0656	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8210-46	FE1400	25B0502

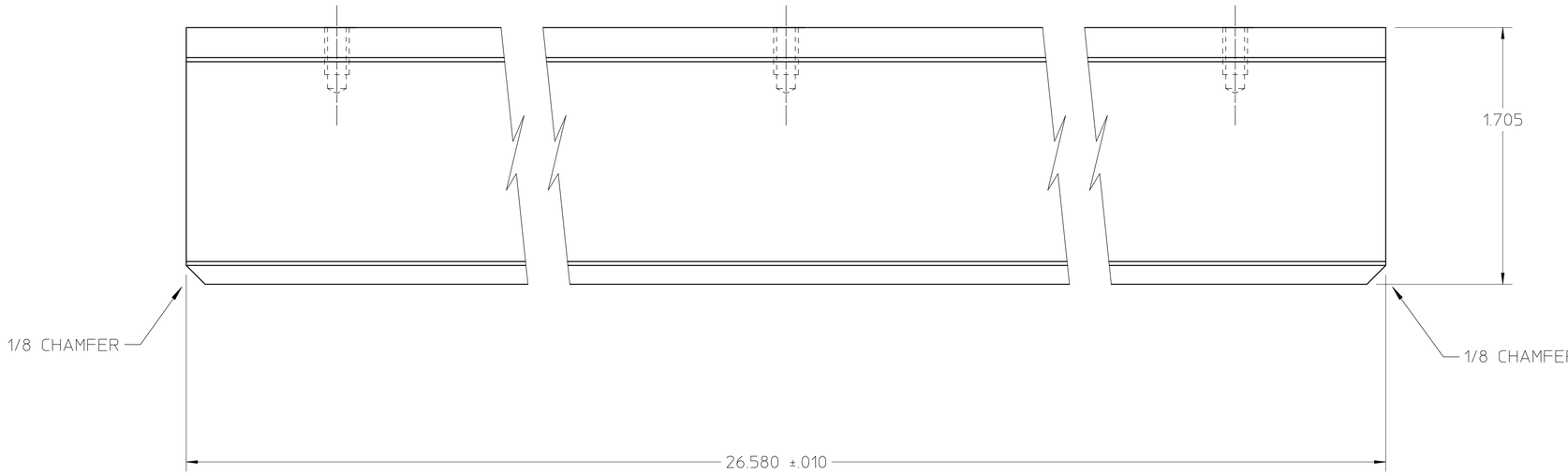
REQ	ITEM	PART NUMBER	DESCRIPTION
			C101 COPPER STOCK

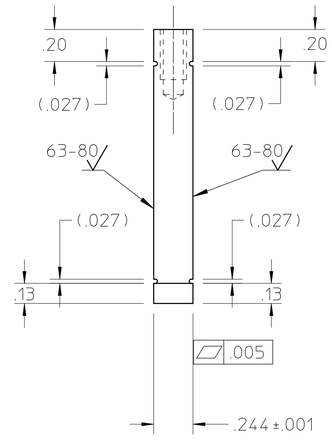




TYPICAL GROOVE DETAIL

4:1





25B0514B

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH			5-17-99	26.580 was 26.460
A	MDH			4-30-99	ADDED GROOVES, .244 WAS .248

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ±1°; .XXX ± .005 FINISH 125

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 03-10-99
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

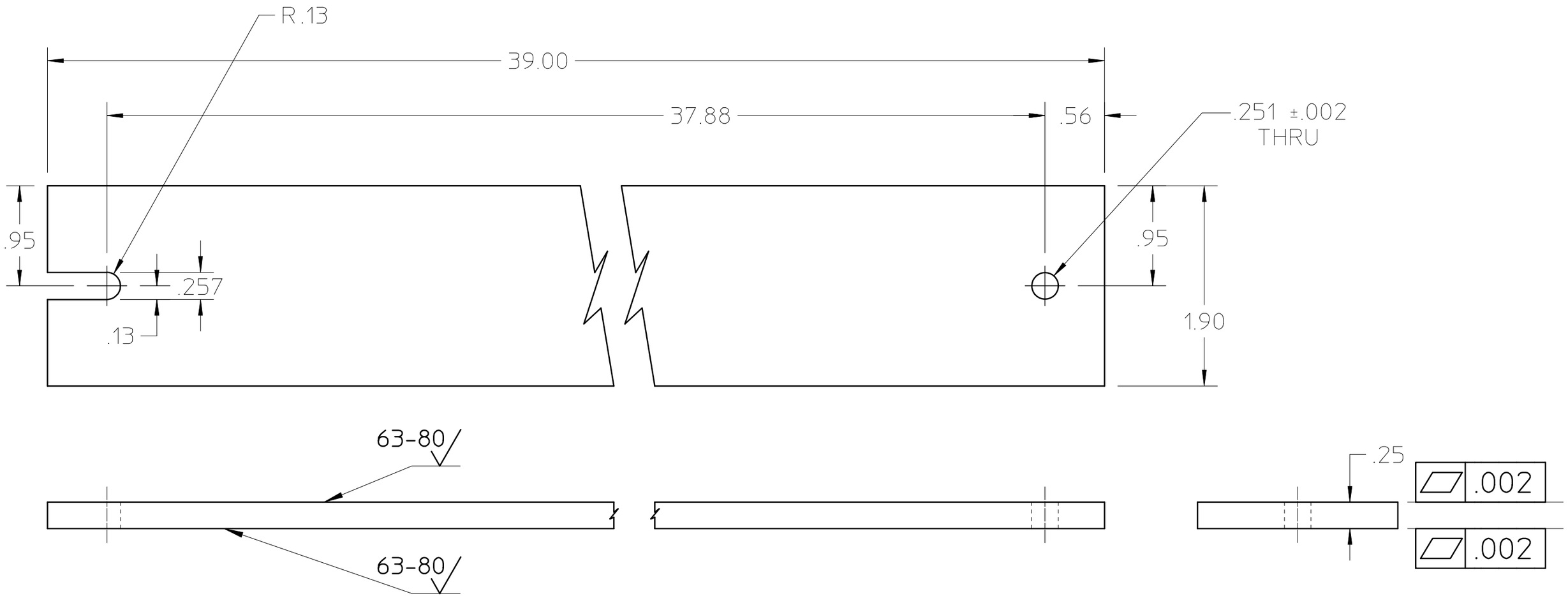
SNS-FE RFQ R&D

RFQ R&D

ALPHA MODULE - CENTER TONGUE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25B0656	2 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8210-46	FE1400	25B0514	B

25B0642	REQD	ITEM	PART NUMBER	DESCRIPTION
				C10100 copper



DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .02 .XXX ±.002

SURFACE FINISH 125

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 03-18-99
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

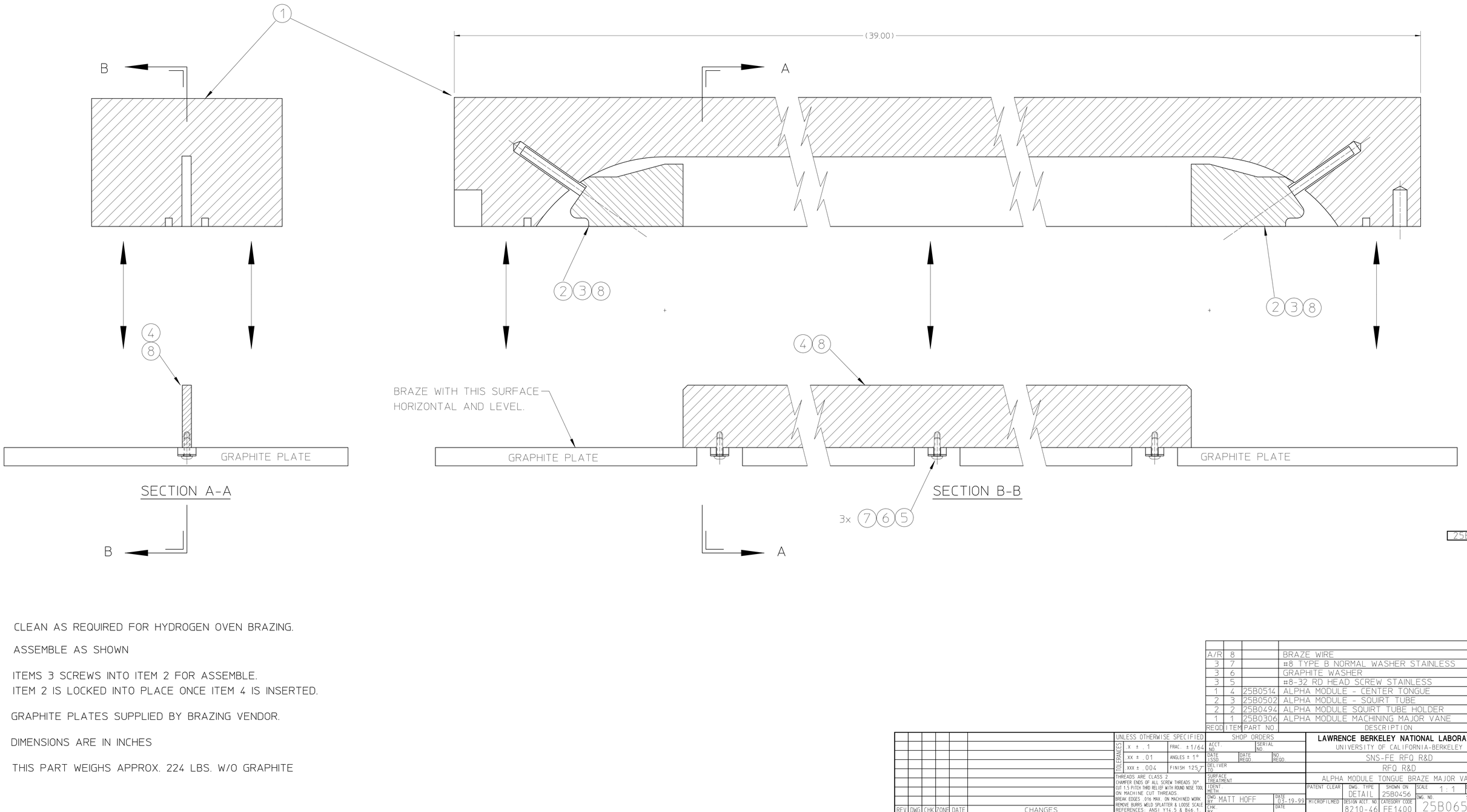
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ R&D

RFQ R&D

ALPHA MODULE C101 EXTENSION MAJOR VANE

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	25B0676	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8210-46	FE1400	25B0642



25B0656

CLEAN AS REQUIRED FOR HYDROGEN OVEN BRAZING.

ASSEMBLE AS SHOWN

ITEMS 3 SCREWS INTO ITEM 2 FOR ASSEMBLE.
ITEM 2 IS LOCKED INTO PLACE ONCE ITEM 4 IS INSERTED.

GRAPHITE PLATES SUPPLIED BY BRAZING VENDOR.

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 224 LBS. W/O GRAPHITE

REQD	ITEM	PART NO	DESCRIPTION
A/R	8		BRAZE WIRE
3	7		#8 TYPE B NORMAL WASHER STAINLESS
3	6		GRAPHITE WASHER
3	5		#8-32 RD HEAD SCREW STAINLESS
1	4	25B0514	ALPHA MODULE - CENTER TONGUE
2	3	25B0502	ALPHA MODULE - SQUIRT TUBE
2	2	25B0494	ALPHA MODULE SQUIRT TUBE HOLDER
1	1	25B0306	ALPHA MODULE MACHINING MAJOR VANE

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG MATT HOFF BY
DATE 03-19-99
CHK. BY
DATE

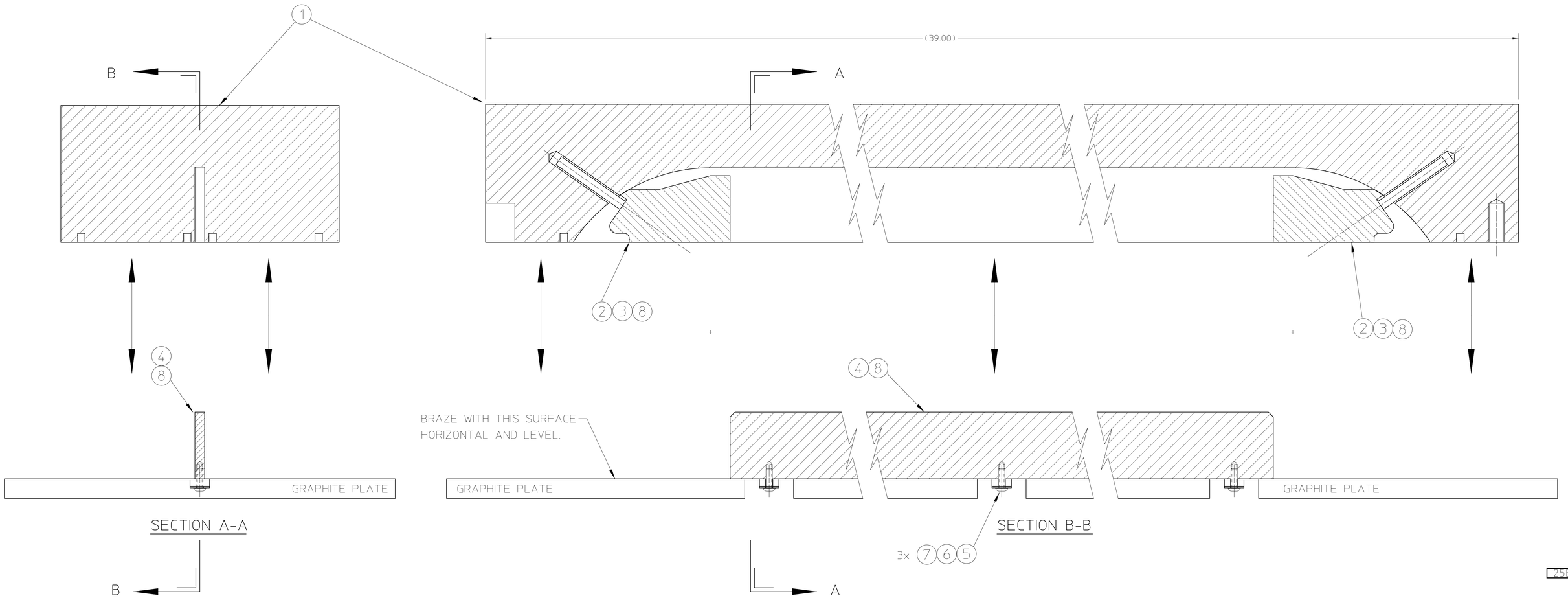
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ R&D

RFQ R&D

ALPHA MODULE TONGUE BRAZE MAJOR VANE

PATENT CLEAR | DWG. TYPE DETAIL | SHOWN ON 25B0456 | SCALE 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8210-46 | CATEGORY CODE FE1400 | DWG. NO. 25B0656 | SIZE | REV.



25B0666

CLEAN AS REQUIRED FOR HYDROGEN OVEN BRAZING.

ASSEMBLE AS SHOWN

ITEMS 3 SCREWS INTO ITEM 2 FOR ASSEMBLE.
ITEM 2 IS LOCKED INTO PLACE ONCE ITEM 4 IS INSERTED.

GRAPHITE PLATES SUPPLIED BY BRAZING VENDOR.

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 312 LBS. W/O GRAPHITE

REQD	ITEM	PART NO	DESCRIPTION
A/R	8		BRAZE WIRE
3	7		#8 TYPE B NORMAL WASHER STAINLESS
3	6		GRAPHITE WASHER
3	5		#8-32 RD HEAD SCREW STAINLESS
1	4	25B0514	ALPHA MODULE - CENTER TONGUE
2	3	25B0502	ALPHA MODULE - SQUIRT TUBE
2	2	25B0494	ALPHA MODULE SQUIRT TUBE HOLDER
1	1	25B0316	ALPHA MODULE MACHINING MINOR VANE

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY: MATT HOFF DATE 03-22-99
CHK. BY
DATE

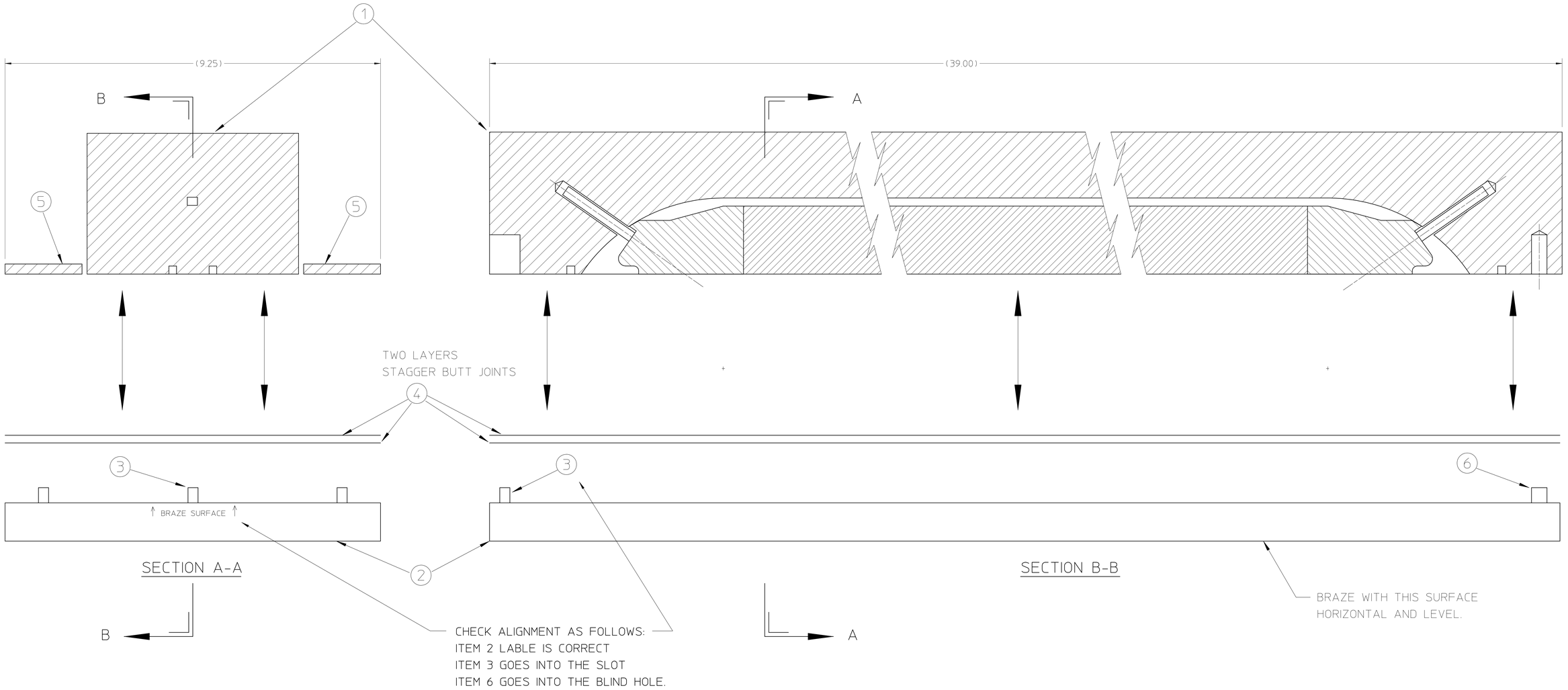
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ R&D

RFQ R&D

ALPHA MODULE TONGUE BRAZE MINOR VANE

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 25B0466 | SCALE: 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8210-46 | CATEGORY CODE: FE1400 | DWG. NO.: 25B0666 | SIZE | REV.



25B0676

REQD	ITEM	PART NO.	DESCRIPTION
	8		
	7		
1	6	25B0442	VERSION 3 (ø.38) COPPER DOWEL PIN
2	5	25B0642	ALPHA MODULE C101 EXTENSION
A/R	4	25B0514	.002 THK. 50-50 Au-Cu Foil Braze material (970°)
5	3	25B0442	VERSION 2 (ø.25) COPPER DOWEL PIN
1	2	25B0286	ALPHA MODULE GLIDCOP MACHINING MAJOR VANE
1	1	25B0456	ALPHA MODULE C101 BRAZE PREP MAJOR VANE

CLEAN AS REQUIRED FOR HYDROGEN OVEN BRAZING.

ASSEMBLE AS SHOWN

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 348 LBS. AFTER BRAZING.

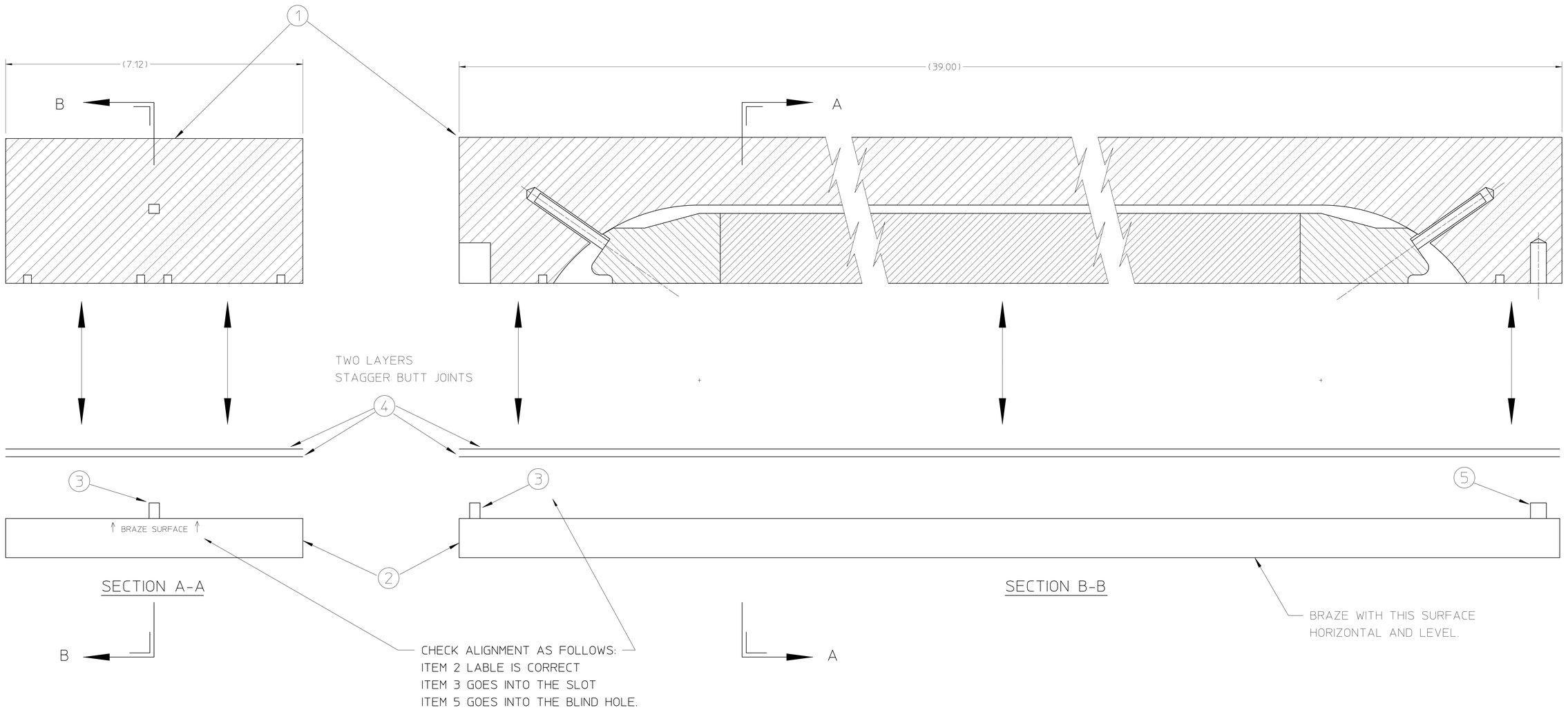
REV. | DWG. | CHK. | ZONE | DATE | CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG. BY: MATT HOFF | DATE: 03-22-99
CHK. BY: | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FE RFQ R&D
RFQ R&D
ALPHA MODULE HORIZONTAL BRAZE MAJOR VANE

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 25BOXX6 | SCALE: 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8210-46 | CATEGORY CODE: FE1400 | DWG. NO.: 25B0676 | SIZE | REV.



25B0686

REQD	ITEM	PART NO	DESCRIPTION
	8		
	7		
	6		
1	5	25B0442	VERSION 3 (Ø.38) COPPER DOWEL PIN
A/R	4		.002 THK. 50-50 Au -Cu Foil Braze material (970°)
1	3	25B0442	VERSION 2 (Ø.25) COPPER DOWEL PIN
1	2	25B0296	ALPHA MODULE GLIDCOP MACHINE MINOR VANE
1	1	25B0466	ALPHA MODULE C101 BRAZE PREP MINOR VANE

CLEAN AS REQUIRED FOR HYDROGEN OVEN BRAZING.

ASSEMBLE AS SHOWN

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 398 LBS. AFTER BRAZING.

REV	DWG	CHK	ZONE	DATE	CHANGES

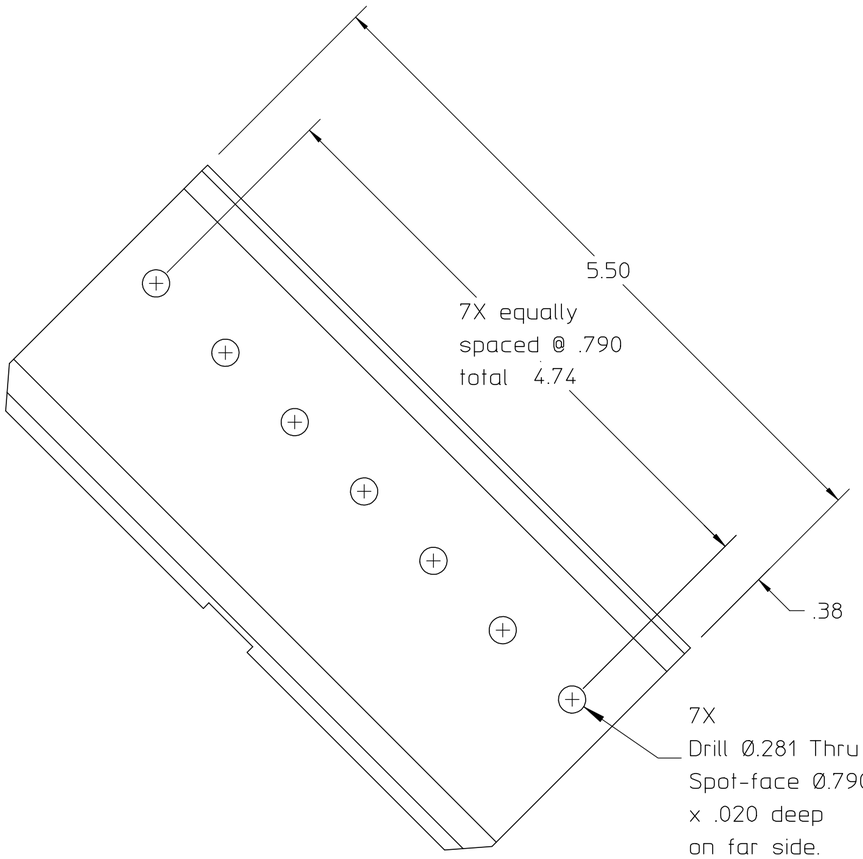
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

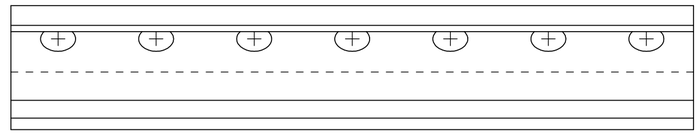
SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG MATT HOFF | DATE 03-22-99
CHK. BY | DATE

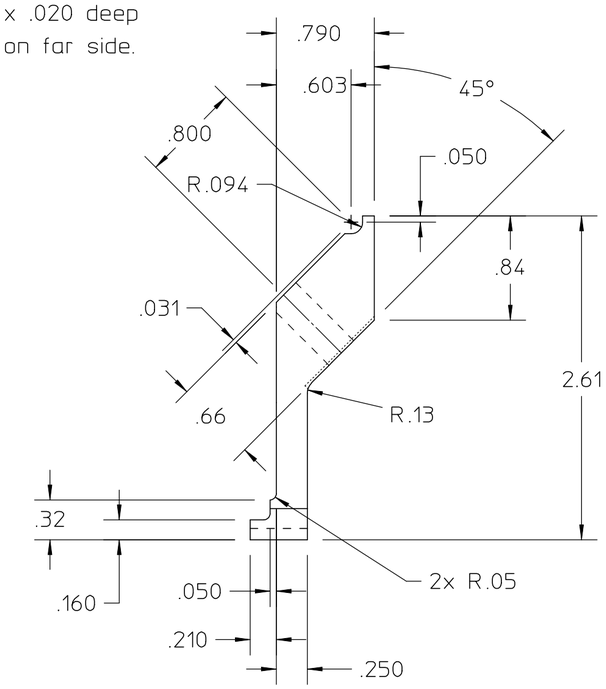
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FE RFQ R&D
RFQ R&D
ALPHA MODULE HORIZONTAL BRAZE MINOR VANE

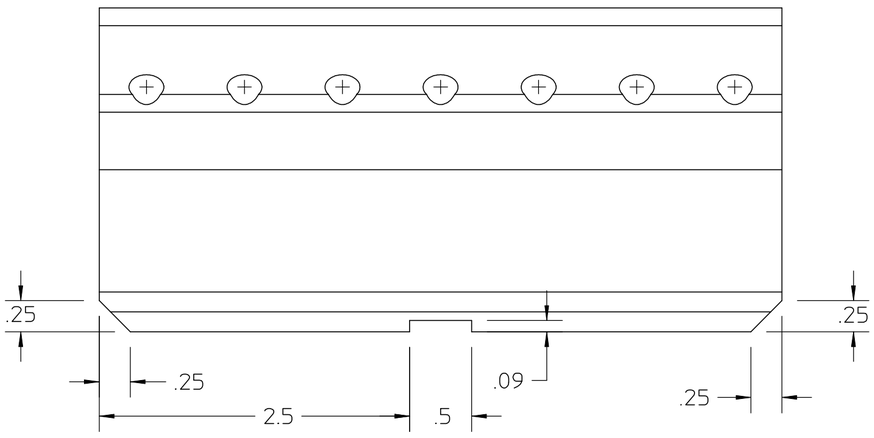
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25B0XX6	1 : 1	
MICROFILMED	DESIGN ACCT. NO	CATEGORY CODE	DWG. NO	SIZE / REV.
	8210-46	FE1400	25B0686	

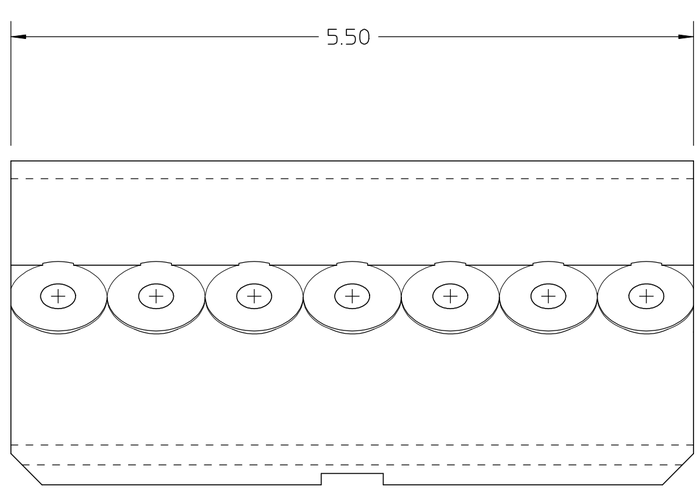
REQ	ITEM	PART NUMBER	DESCRIPTION
			1.00 STAINLESS STEEL PLATE











25B0803A

BREAK EDGES AND CORNERS

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			2-27-01	ADDED .25 CHAMF AND .5 x .09 SLOT

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- .X ± -
- FRAC. ± -
- .XX ± .01
- ANGLES ± .5°
- .XXX ± .005
- FINISH 125√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO.	SERIAL NO.	
DATE ISSD	DATE REQD.	NO. REQD.
DELIVER TO		
SURFACE TREATMENT	UHV CLEAN	
IDENT. METH.	-	
DWG. BY	MACGILL	DATE 05-10-99
CHK. BY	-	DATE -

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES-R&D

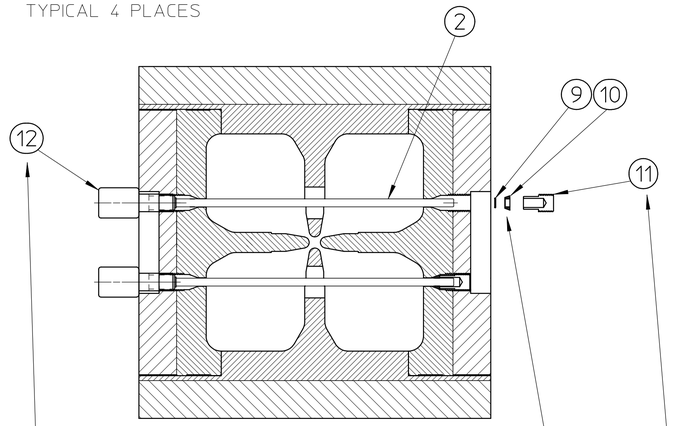
GENERAL

BRAZING CORNER CLAMP

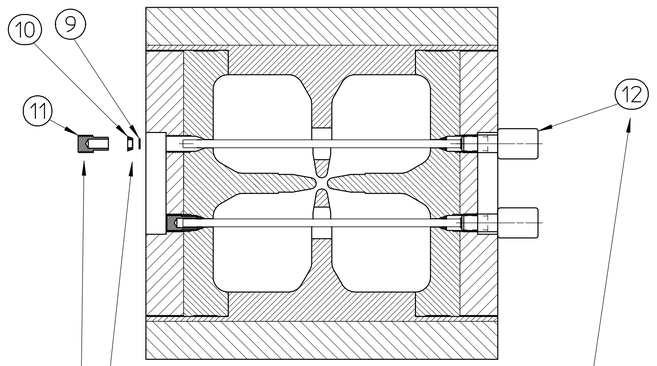
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	-	DWG. NO. 25B0803	SIZE A / REV. A
MICROFILMED	DESIGN ACCT. NO. 8210-46	CATEGORY CODE FE1000		

SWAGED Pi-MODE STABILIZER ROD INSTALLATION
7/16-14 UNC HOLE

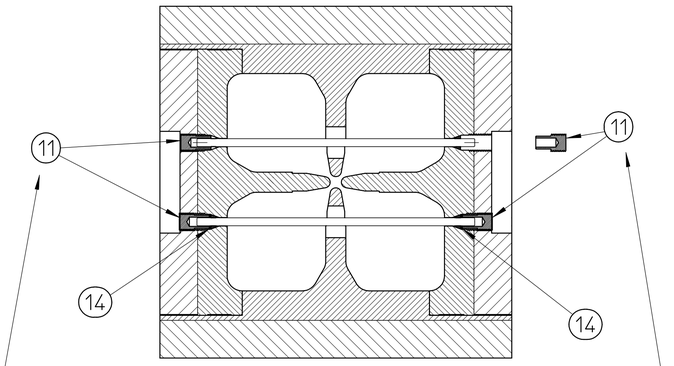
TYPICAL 4 PLACES



SLIDE ITEM 2 INTO PLACE AND CENTER USING ITEM 12.
INSTALL ITEM 9 IN OPEN SIDE FOLLOWED BY ITEM 10.
SCREW IN ITEM 11 AND SWAGE ITEM 10 TILL ROD IS LOCKED INTO PLACE.
REMOVE ITEM 11 AFTER SWAGING.



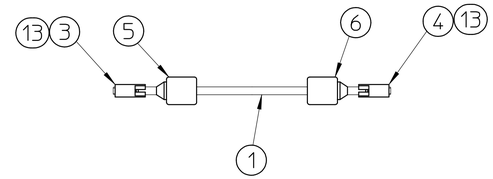
MOVE ITEM 12 TO THE SIDE JUST SWAGED.
INSTALL ITEM 9 AND 10 IN THE OPEN END.
SCREW IN ITEM 11 AND SWAGE ITEM 10.



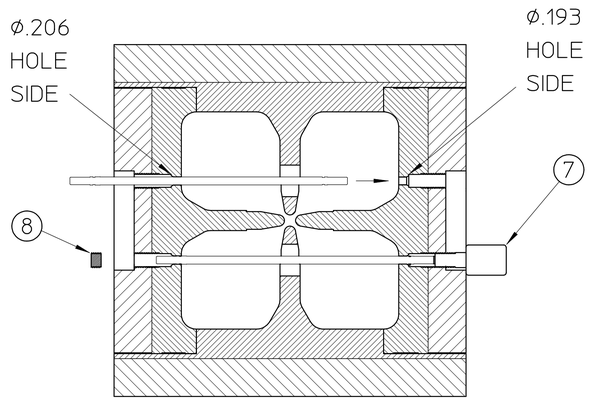
KEEPING ITEM 11 IN PLACE, REMOVE ITEM 12 FROM THE OPPOSITE SIDE.
INSTALL A NEW ITEM 11 IN THE END THAT ITEM 12 WAS JUST REMOVED FROM.
RE-TIGHTEN ITEMS 11 TO INSURE ITEM 2 AND ITEMS 10 ARE LOCKED IN PLACE.
REMOVE ITEMS 11 AND INSERT ITEMS 14 INTO EACH END.
REINSTALL ITEMS 11 WITH A COAT OF ANTI-STICK.

FITTED Pi-MODE STABILIZER ROD INSTALLATION
3/8-16 UNC HOLE

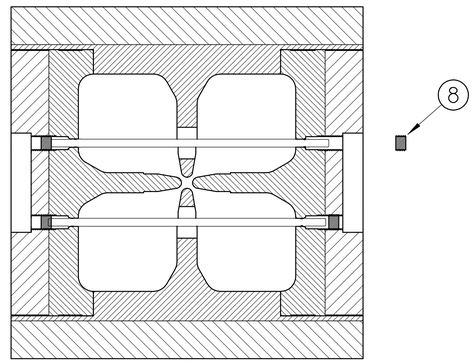
TYPICAL 4 PLACES



Determine item 1's large and small end.
Slide item 5 & 6 onto rod with cutting ends pointing out.
Slide and clamp into grooves item 13. Use items 3 & 4 to hold item 13.
Using TIG welder, drip CUSIL onto item 13 to secure it in place.
Remove items 3 & 4. Remove items 5 & 6, trimming the wire flush.



INSERT THE SMALL END OF THE ROD INTO THE ø.206 HOLE.
CENTER ROD USING ITEM 7.
FIX LOCATION ON ONE SIDE USING ITEM 8.



REMOVE ITEM 7 AND REPLACE WITH AN ADDITIONAL ITEM 8.
LEAVE BOTH ITEM 8 IN DURING BRAZE.

REQ	ITEM	PART NUMBER	DESCRIPTION
4	1	25B0702	Pi-mode stabilizer rod
4	2	25B0892	Swaged pi-mode stabilizer rod
1	3		Braze wire clamping tool - ø.205
1	4		Braze wire clamping tool - ø.195
1	5		Braze wire cutting tool - ø.205
1	6		Braze wire cutting tool - ø.195
1	7	25B0xx2	Locating tool - 3/8-16 size
8	8	25B0xx2	Rod locking screw - 3/8-16 size
8	9		.025 cusil braze wire ring - ø.196
8	10	25B0902	Pi-mode stabilizer rod ferrule
8	11	25B0xx2	Swaging tool
1	12	25B0xx2	Locating tool - 7/16-14 size
8	13		CUSIL brazing wire flattened to .010 thk. formed to a .172 I.D.
8	14	25B0xx2	Graphite Washer

25B0834

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .001 | FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 05-26-99
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

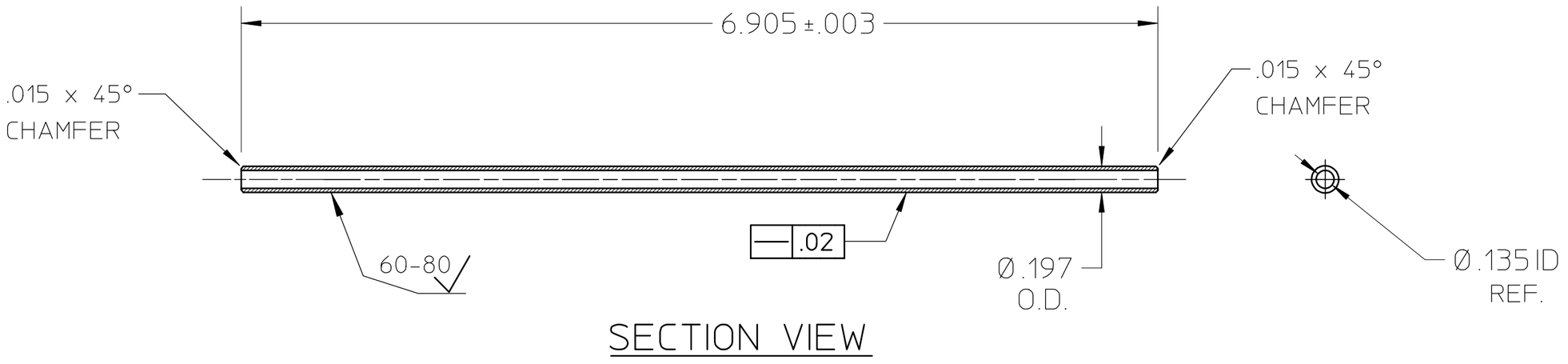
SNS-FES R&D
GENERAL
Pi-MODE STABILIZER ROD INSTALLATION

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSEMBLY	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8210-46	FE1000	25B0834	

25B0892	REQD	ITEM	PART NUMBER	DESCRIPTION
				C101 copper tubing .205 OD x .135 ID

DIMENSIONS ARE IN INCHES

PRESSURE CHECK TO 300 PSI AFTER MACHINING.



SECTION VIEW

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 04-12-99
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

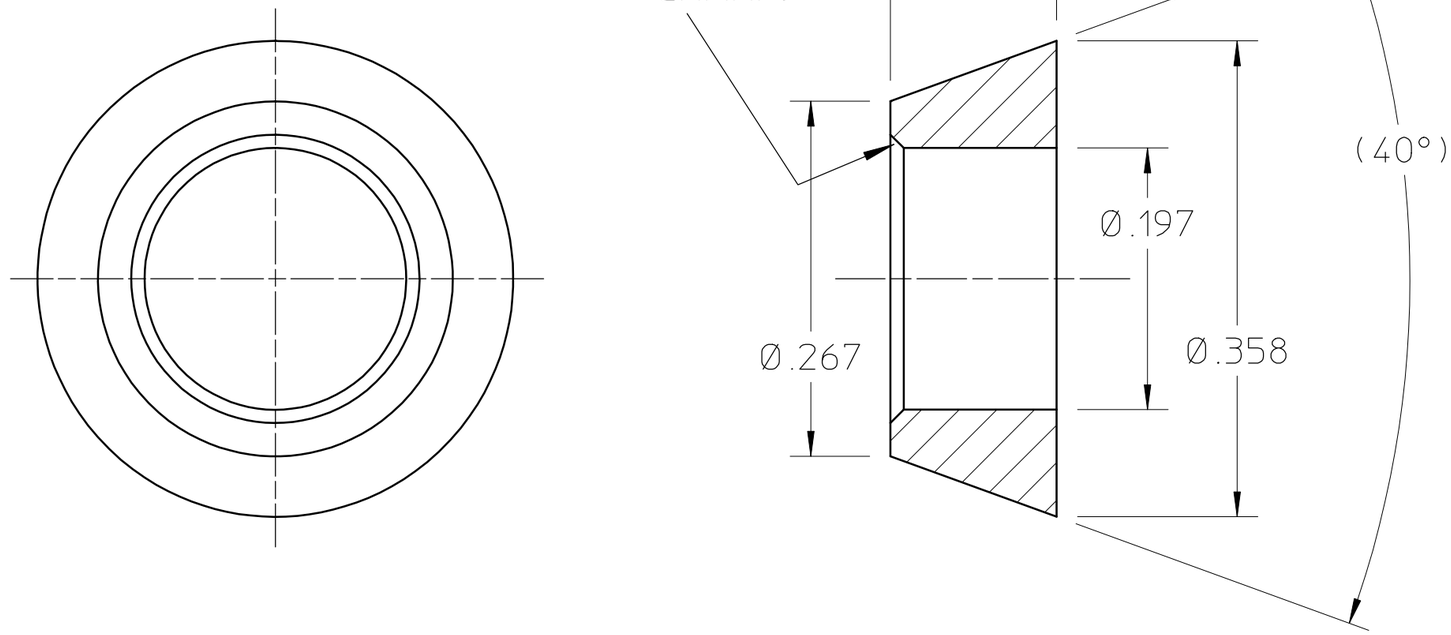
SNS-FES RFQ

MECHANICAL STRUCTURES

SWAGED Pi-MODE STABILIZER ROD

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	25Bxxxx	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B0892

25B0902	REQD	ITEM	PART NUMBER	DESCRIPTION
				C101 COPPER



DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 06-15-99
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

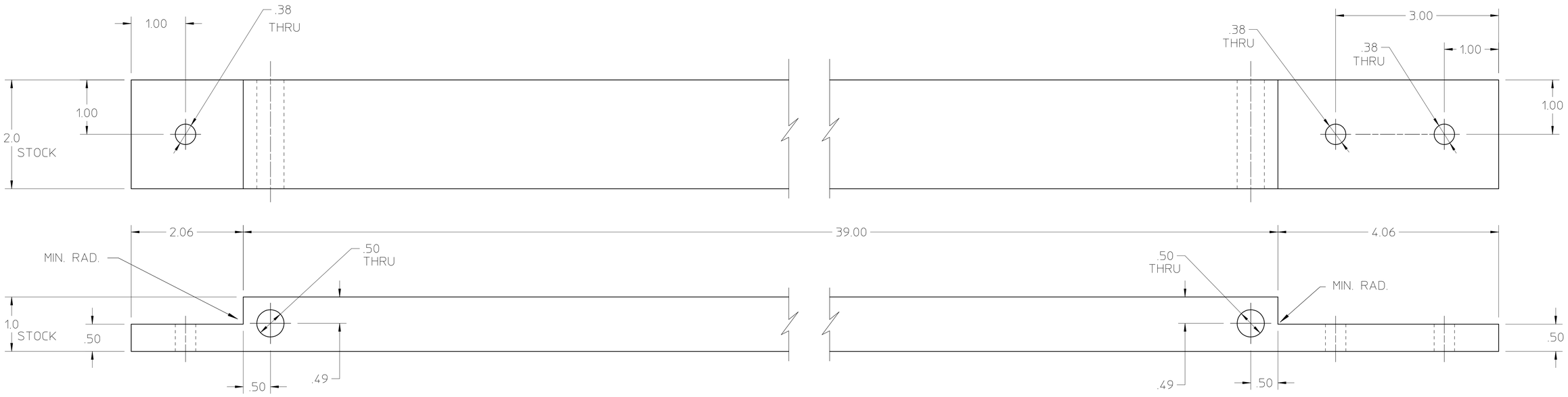
SNS-FES RFQ

MECHANICAL STRUCTURES

PI-MODE STABILIZER ROD FERRULE

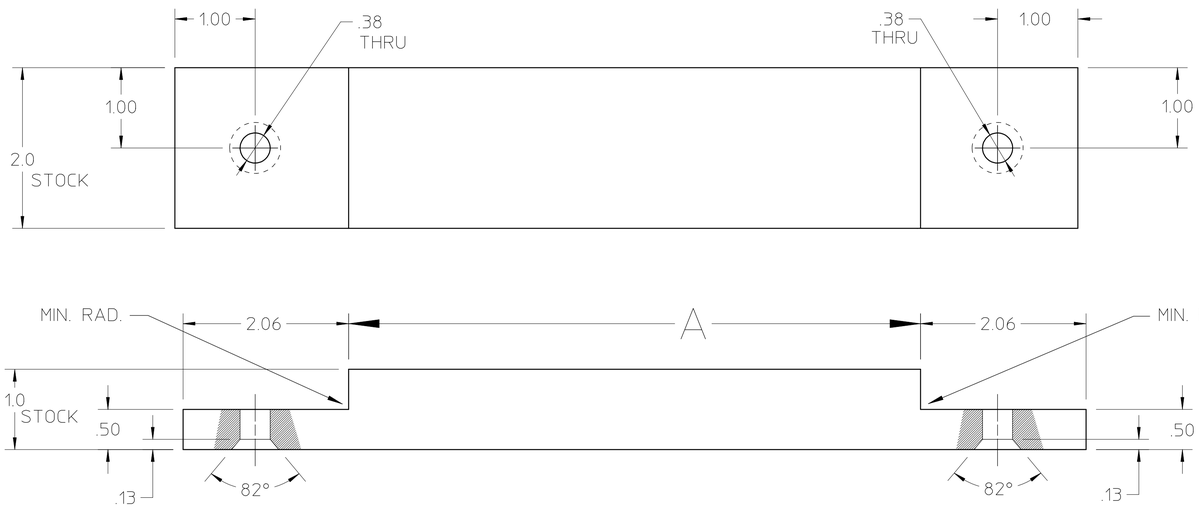
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 8:1
	DETAIL	25BXXXX	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B0902

REQ	ITEM	PART NUMBER	DESCRIPTION
			1 x 2 inch Stainless bar stock



VERSION C

24 LBS.



25B0914

BREAK ALL SHARP CORNERS AND EDGES.

DIMENSIONS ARE IN INCHES

VERSION A	DIMENSION A = 9.25	6 LBS.
VERSION B	DIMENSION A = 7.12	5 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- .X ± .1
- .XX ± .01
- .XXX ± .001
- FRAC. ±1/64
- ANGLES ±1°
- FINISH 125√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 07-28-99
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

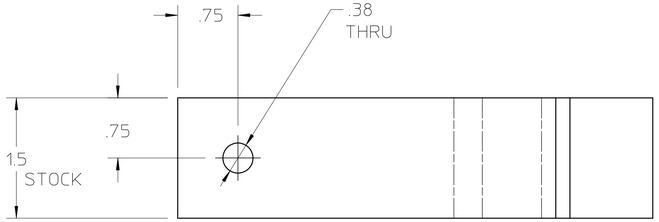
SNS-FES R&D

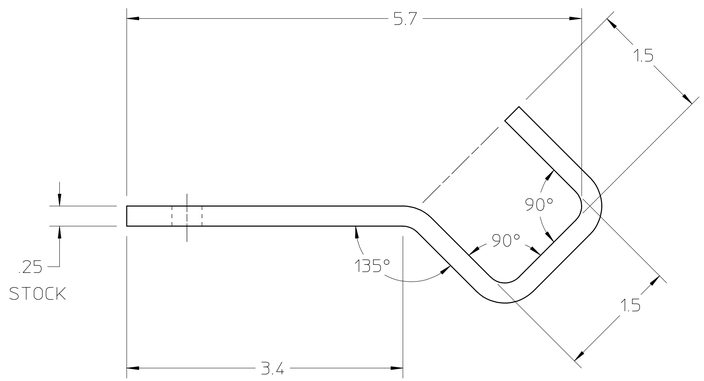
GENERAL

ELECTROFORMING FRAME RAIL

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAILS	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8210-46	FE1000	25B0914	

REQ	ITEM	PART NUMBER	DESCRIPTION
			.25 x 1.5 inch Stainless bar stock





25B0924

BREAK ALL SHARP EDGES AND CORNERS.

DIMENSIONS ARE IN INCHES

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .001 | FINISH 125

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF | DATE 07-28-99
CHK. BY | DATE

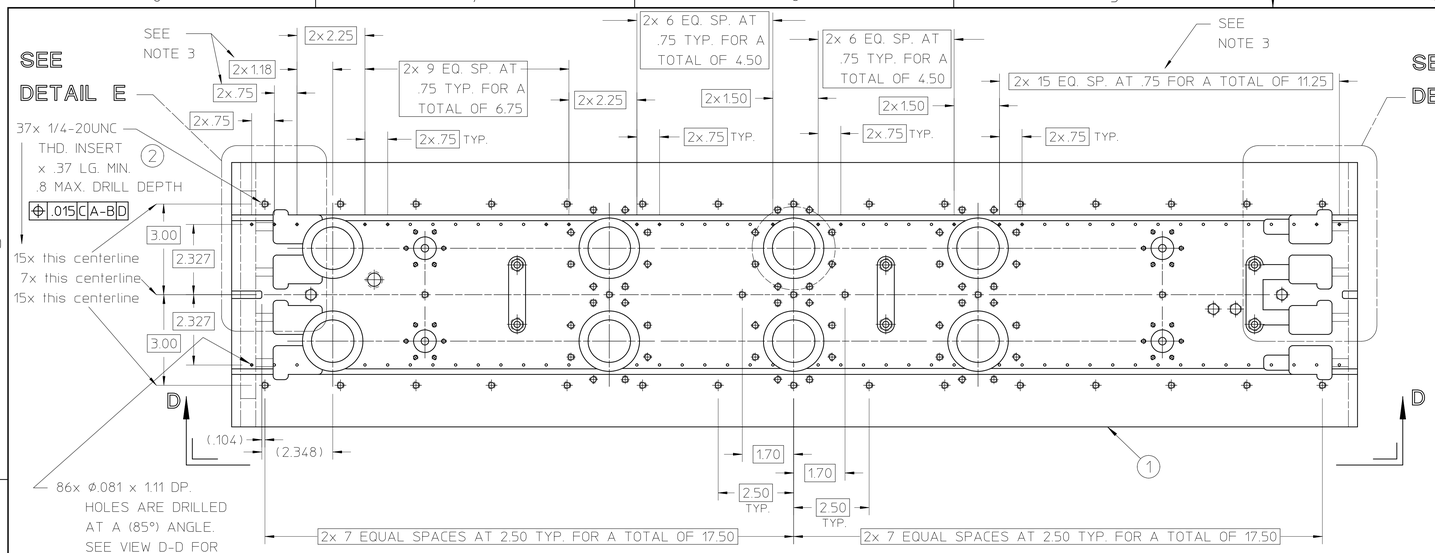
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

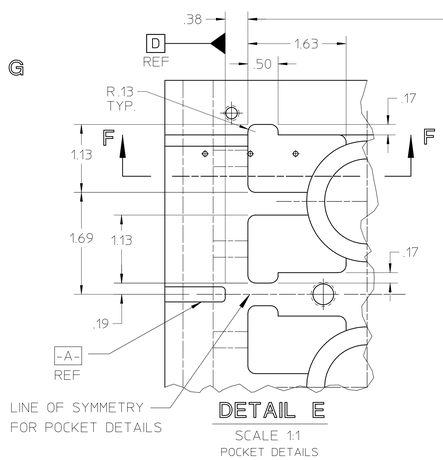
SNS-FES R&D

GENERAL

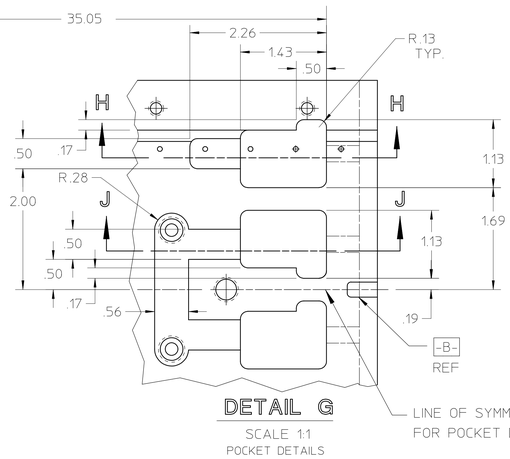
ELECTROFORMING FRAME HOOK

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	DETAILS	00X0000	DWG. NO. 25B0924	SIZE / REV.
MICROFILMED	DESIGN ACCT. NO. 8210-46	CATEGORY CODE FE1000		

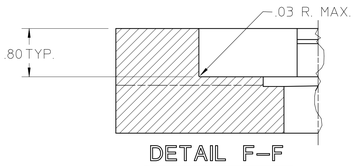




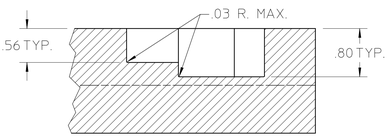
DETAIL E
SCALE 1:1
POCKET DETAILS



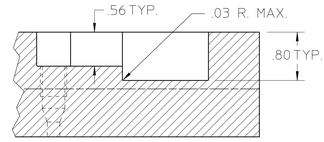
DETAIL G
SCALE 1:1
POCKET DETAILS



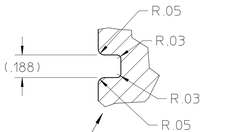
DETAIL F-F
SCALE 1:1



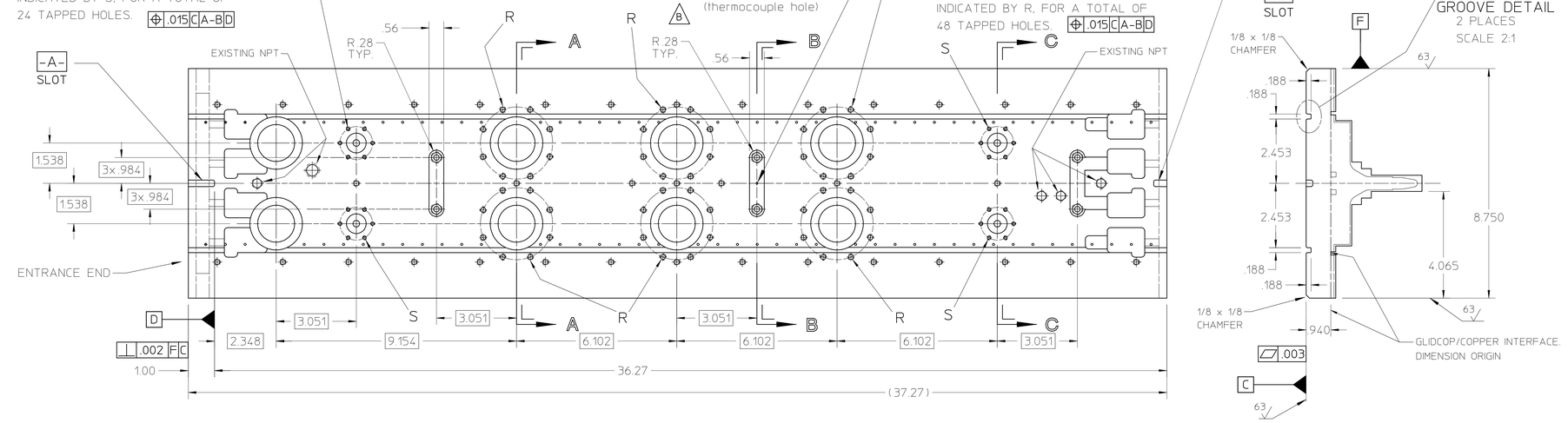
SECTION H-H
SCALE 1:1

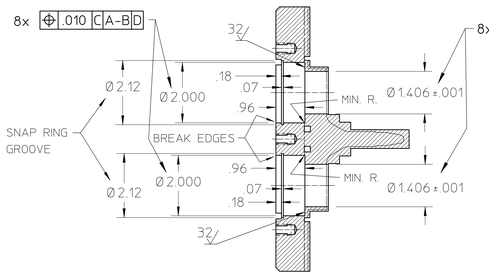


SECTION J-J
SCALE 1:1

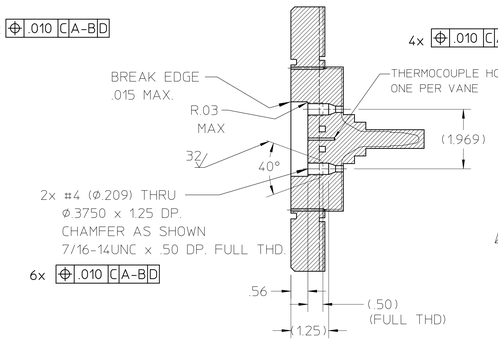


GROOVE DETAIL
2 PLACES
SCALE 2:1

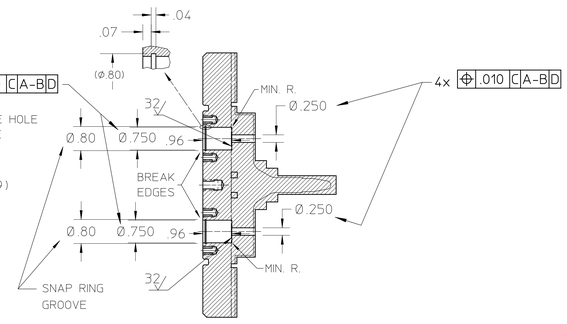




SECTION A-A
TYP. 4 PLACES
TUNER PORTS



SECTION B-B
TYP. 3 PLACES
Pi-MODE SABILIZER ROD PORTS



SECTION C-C
TYP. 2 PLACES
SENSING PORTS

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.
25B0946B
2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. THIS DIMENSION APPLIES ONLY IF THE Ø.081 HOLE IS DRILLED BEFORE THE POCKET IS MILLED IN. IF THE POCKET IS MILLED FIRST, NEW DIMENSIONS NEED TO BE CALCULATED.
4. ALL DIMENSIONS ARE IN INCHES.
5. THIS PART WEIGHS APPROX. 190 LBS. BEFORE MACHINING. APPROX. 160 LBS. AFTER MACHINING.

REQD	ITEM	PART NO	DESCRIPTION
24	3		#10-24UNC HELICOIL THREADED INSERT
85	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B0966	ALPHA MODULE MAJOR VANE ROUGH OUT

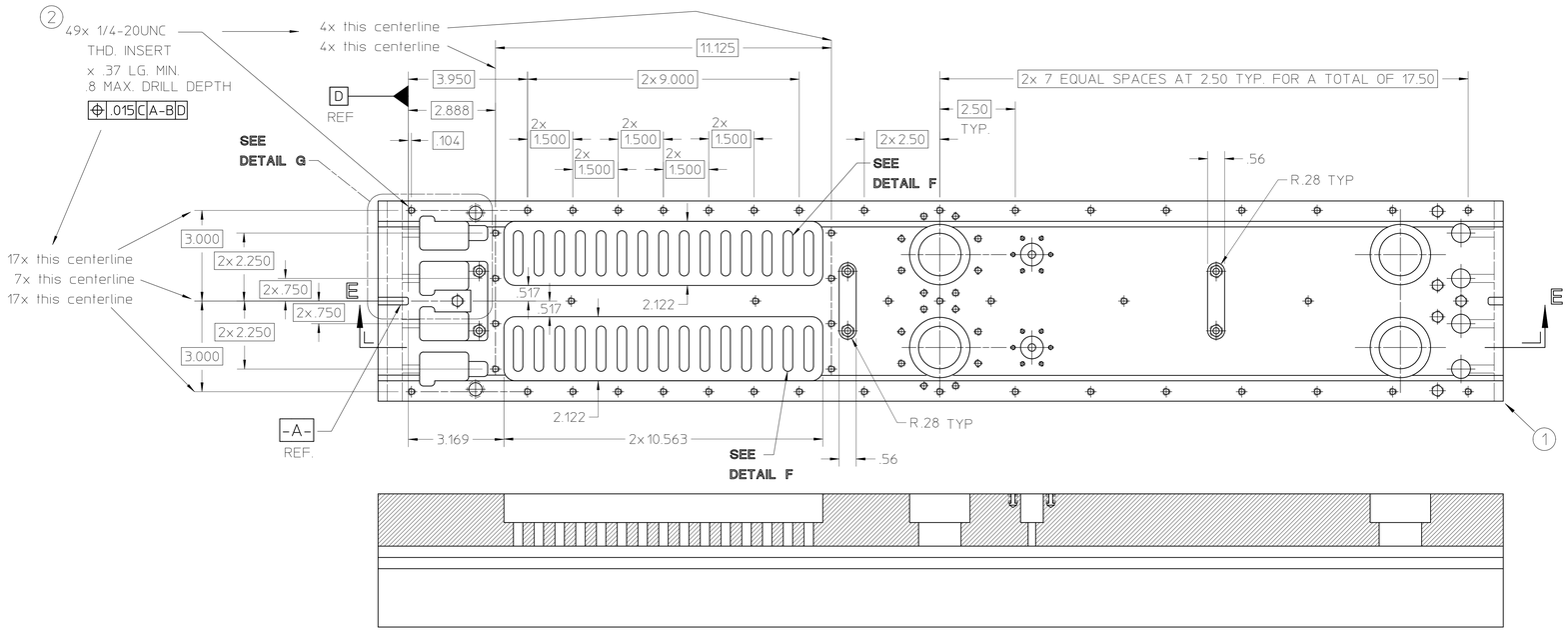
REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH		C-6	04-26-00	ADDED Ø.070 HOLE FOR THERMOCOUPLE
A	MDH			10-15-99	REVISED POSITION TOLERANCES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

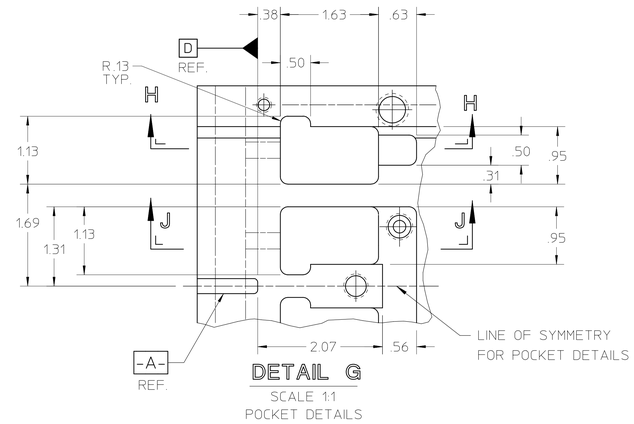
SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY: MATT HOFF DATE: 08-17-99
CHK. BY: DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MAJOR VANE PORT MACHINING

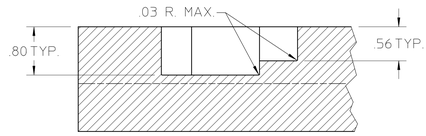
PATENT CLEAR	DWG: TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1:2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B0946	B



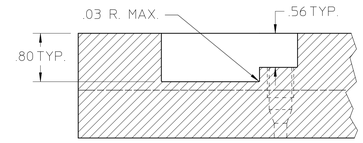
SECTION E–E



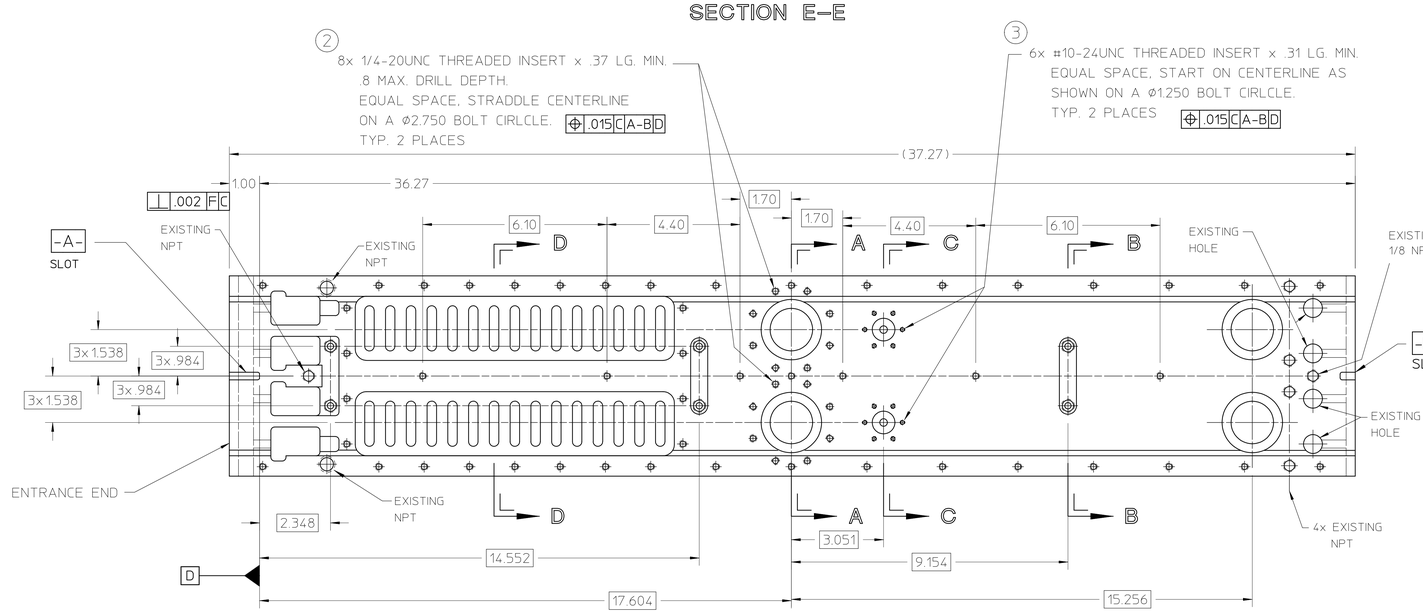
DETAIL G
SCALE 1:1
POCKET DETAILS

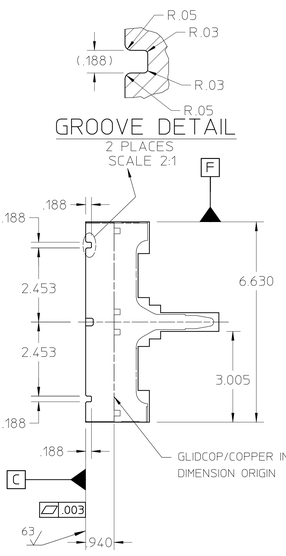


SECTION H–H
SCALE 1:1

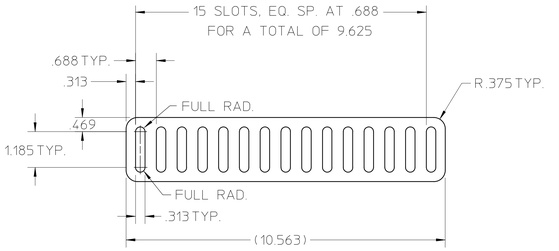


SECTION J–J
SCALE 1:1

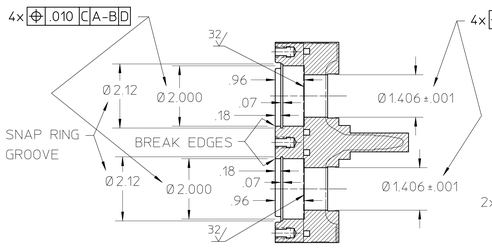




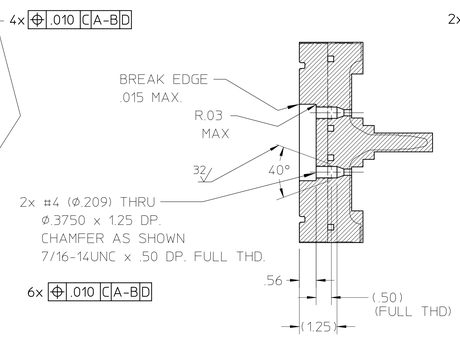
GROOVE DETAIL
2 PLACES
SCALE 2:1



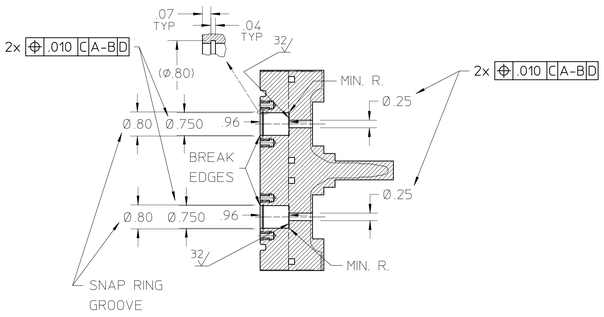
DETAIL F
VACUUM PORT DETAIL
ALSO SEE SECTION D-D



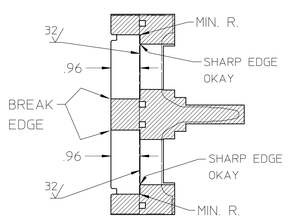
SECTION A–A
TYP. 2 PLACES
TUNER PORTS



SECTION B–B
TYP. 3 PLACES
PI-MODE STABILIZER ROD PORTS



SECTION C–C
TYP. 2 PLACES
SENSING PORT



SECTION D–D
VACUUM PORTS
ALSO SEE DETAIL F

25B0956A

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.
2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. ALL DIMENSIONS ARE IN INCHES.
4. THIS PART WEIGHS APPROX. 186 LBS. BEFORE MACHINING. APPROX. 152 LBS. AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION
12	3		#10-24UNC HELICOIL THREADED INSERT
65	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B0976	ALPHA MODULE MINOR VANE ROUGH OUT

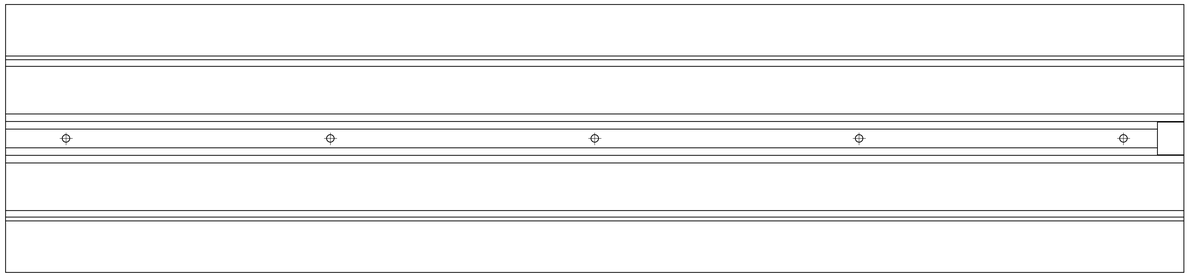
REV.	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			10-15-99	ADDED SECT. H-H and J-J

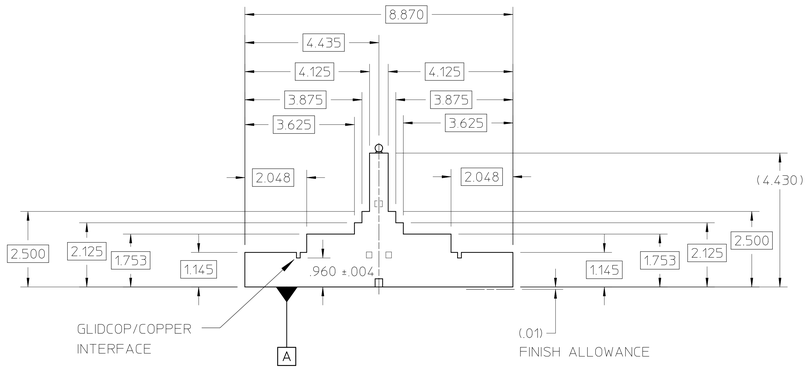
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

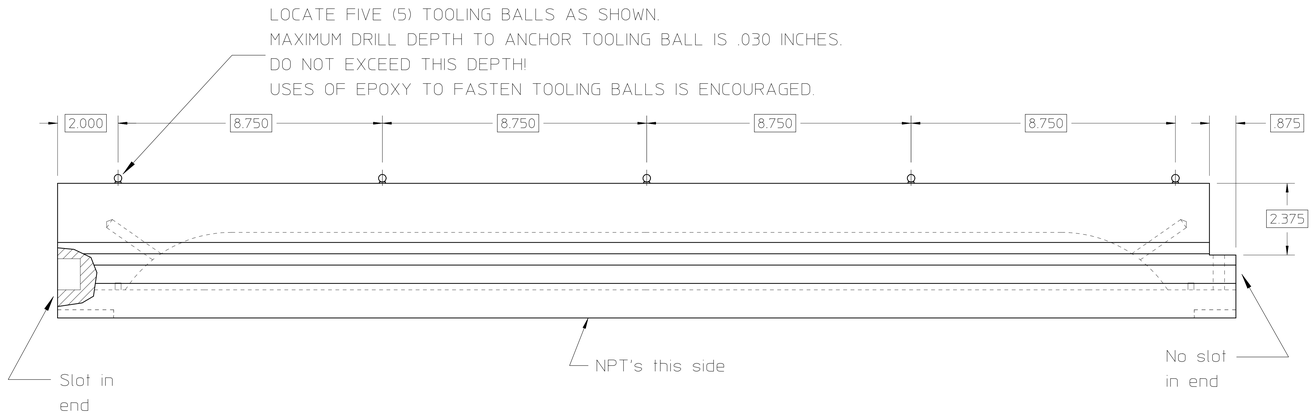
SHOP ORDERS
ACCT. NO.: SERIAL NO.:
DATE ISSD.: DATE REQD.: NO. REQD.:
DELIVER TO:
SURFACE TREATMENT:
IDENT METH.:
DWG. BY: MATT HOFF DATE: 08-19-99
CHK. BY: DATE:

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MINOR VANE PORT MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B0956	A







PROCEDURE:

1. MACHINE DATUM A TO THE .960 DIMENSION FIRST.
2. IF THIS IS NOT A 100% CLEAN-UP CONTACT MATT HOFF.
3. ATTACH FIVE (5) TOOLING BALLS. SEE TOOLING BALL NOTE.
4. RECORD FLATNESS OF DATUM A AND LOCATION OF TOOLING BALLS.
5. MACHINE REMAINING SURFACES AS INDICATED. THIS WILL LEAVE .060 OF COPPER FOR THE FINISH MACHINING.
6. RE-MEASURE DATUM A FOR FLATNESS. RE-MEASURE TOOLING BALL LOCATIONS.
7. ADD SLOTS IN GLIDCOP AS SHOWN. LOCATE SLOTS ON CENTERLINE USING THE CENTERLINE DETERMINED BY THE EXISTING END SLOT AND HOLE. LOCATE END OF GLIDCOP SLOT FROM CENTER OF N.P.T. AS ACCURATELY AS REASONABLE. THESE SLOT WILL BECOME A FIDUCIAL FEATURE IN THE NEXT MACHINING STEP.

25B0966A

TOLERANCE ON ALL BASIC DIMENSIONS ARE ±.010

THIS PART WEIGHTS APPROX. 348 LBS BEFORE MACHINING
APPROX. 190 LBS AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MOH			10-8-99	ADDED NOTE 7. VIEWS AND SLOTS

REQD	ITEM	PART NO.	DESCRIPTION

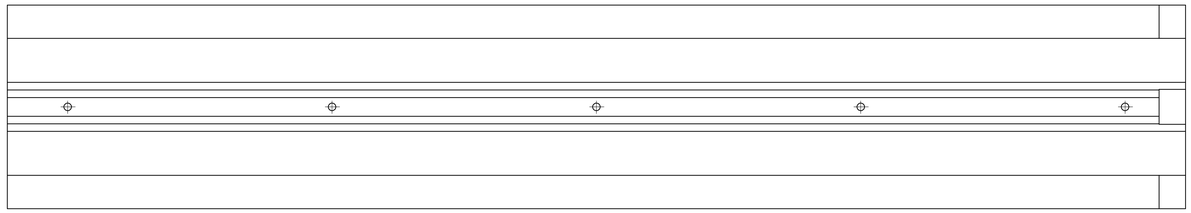
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .001 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

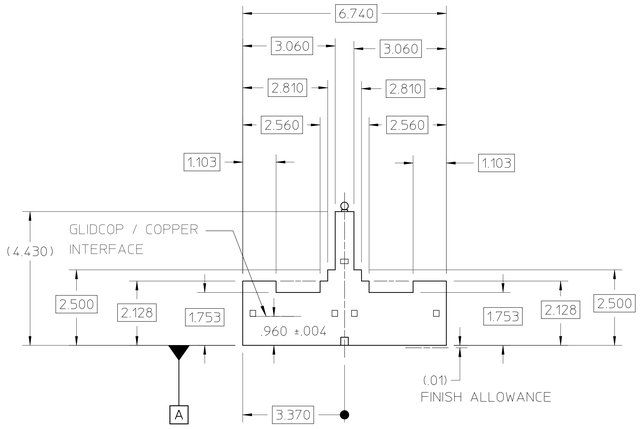
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE 08-27-99
CHK. BY
DATE

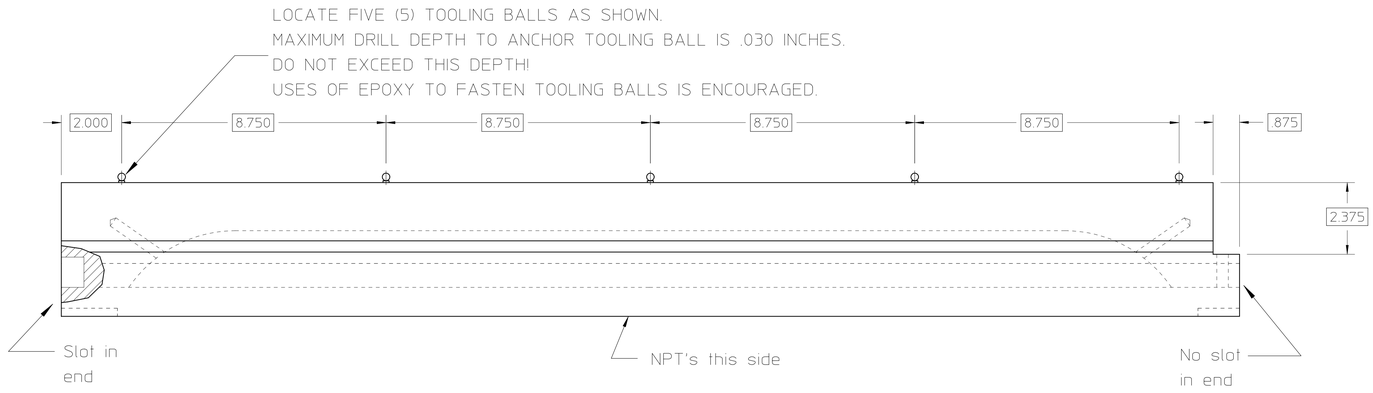
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MAJOR VANE ROUGH OUT

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1 : 2 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B0966 | SIZE: A | REV.







PROCEDURE:

1. MACHINE DATUM A TO THE .960 DIMENSION FIRST.
2. IF THIS IS NOT A 100% CLEAN-UP CONTACT MATT HOFF.
3. ATTACH FIVE (5) TOOLING BALLS. SEE TOOLING BALL NOTE.
4. RECORD FLATNESS OF DATUM A AND LOCATION OF TOOLING BALLS.
5. MACHINE REMAINING SURFACES AS INDICATED. THIS WILL LEAVE .060 OF COPPER FOR THE FINISH MACHINING.
6. RE-MEASURE DATUM A FOR FLATNESS. RE-MEASURE TOOLING BALL LOCATIONS.
7. ADD SLOTS IN GLIDCOP AS SHOWN. LOCATE SLOT ON CENTERLINE USING THE CENTERLINE DETERMINED BY THE EXISTING END SLOT AND HOLE. LOCATE END OF GLIDCOP SLOT FROM CENTER OF N.P.T. AS ACCURATELY AS REASONABLE. THESE SLOTS WILL BECOME A FIDUCIAL FEATURE IN THE NEXT MACHINING STEP.

25B0976A

TOLERANCE ON ALL BASIC DIMENSIONS ARE ±.010

THIS PART WEIGHTS APPROX. 398 LBS BEFORE MACHINING
APPROX. 186 LBS AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			10-8-99	ADDED NOTE 7. VIEWS AND SLOTS

REQD	ITEM	PART NO.	DESCRIPTION

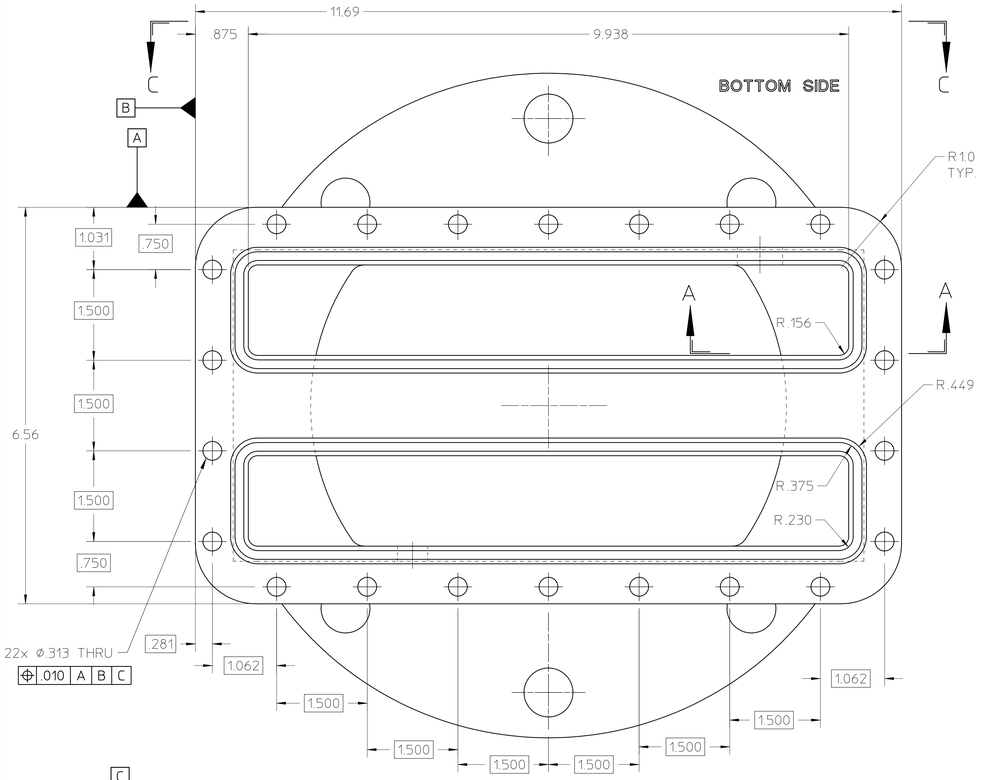
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64 | .XX ± .01 ANGLES ± 1° | .XXX ± .001 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

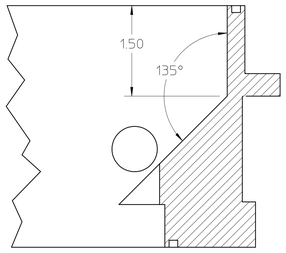
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE 08-27-99
CHK. BY DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

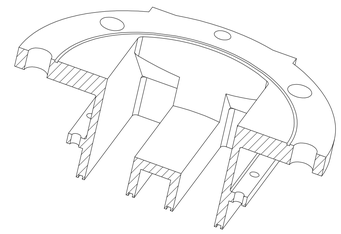
SNS FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MINOR VANE ROUGH OUT

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B0976	A

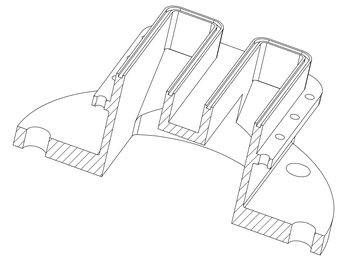




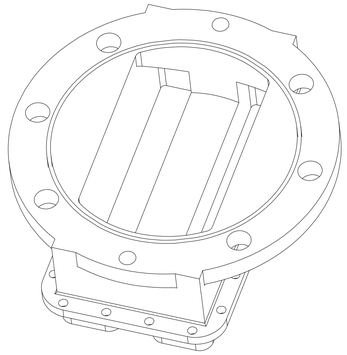
SECTION A-A



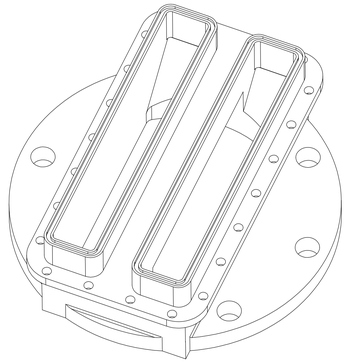
3-D SECTION VIEW - O-RING SIDE DOWN



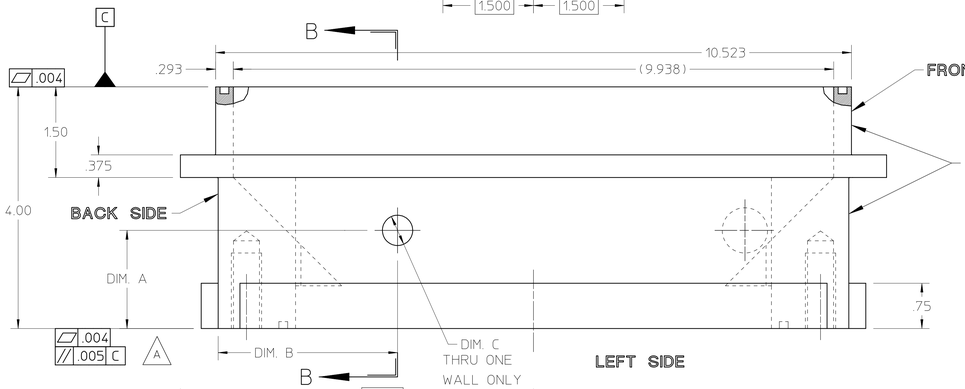
3-D SECTION VIEW - O-RING SIDE UP



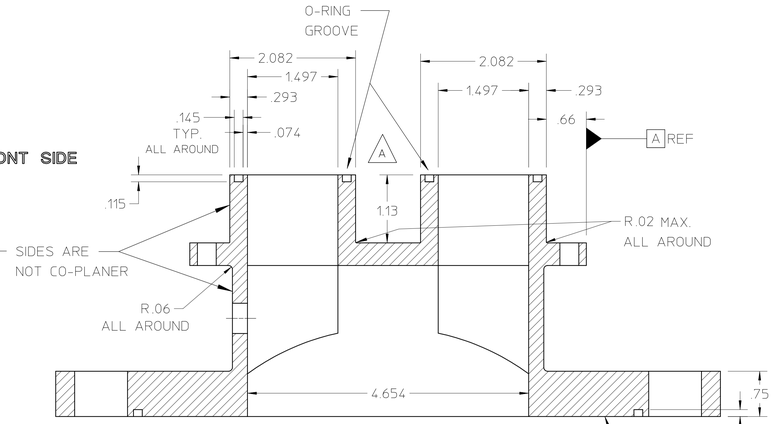
3-D FULL VIEW - O-RING SIDE DOWN



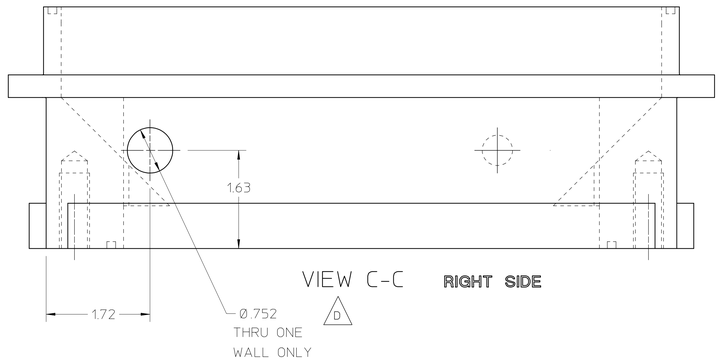
3-D FULL VIEW - O-RING SIDE UP



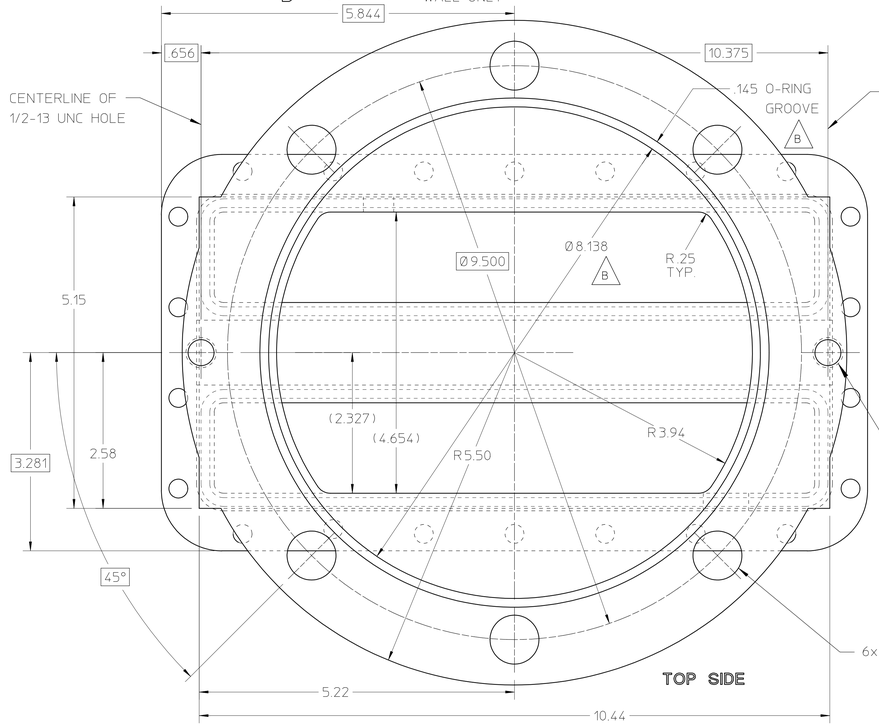
LEFT SIDE



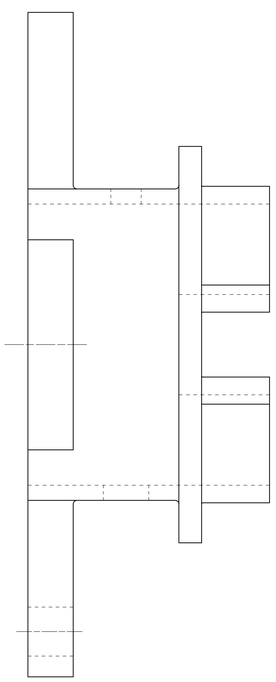
SECTION B-B



VIEW C-C RIGHT SIDE



TOP SIDE



A	DIM. A	DIM. B	DIM. C
VERSION 1	---	---	NO HOLE
VERSION 2	1.63	2.97	Ø.502
C VERSION 3	1.63	2.97	Ø.752

25B0986D

1. O-RING GROOVES TO BE MACHINED TO A 63 OR BETTER.
2. ALL DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 34 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES
D	MDH			6-25-01	ADDED VIEW C-C, ADDED .752 DIA. HOLE
C	MDH			8-10-00	ADDED VERSION 3
B	MDH			8-03-00	ADDED O-RING GROOVE
A	MDH			1-10-00	1.13 DIM WAS .38 ADDED VERSION TABLE & VERSION DIM. TO PART

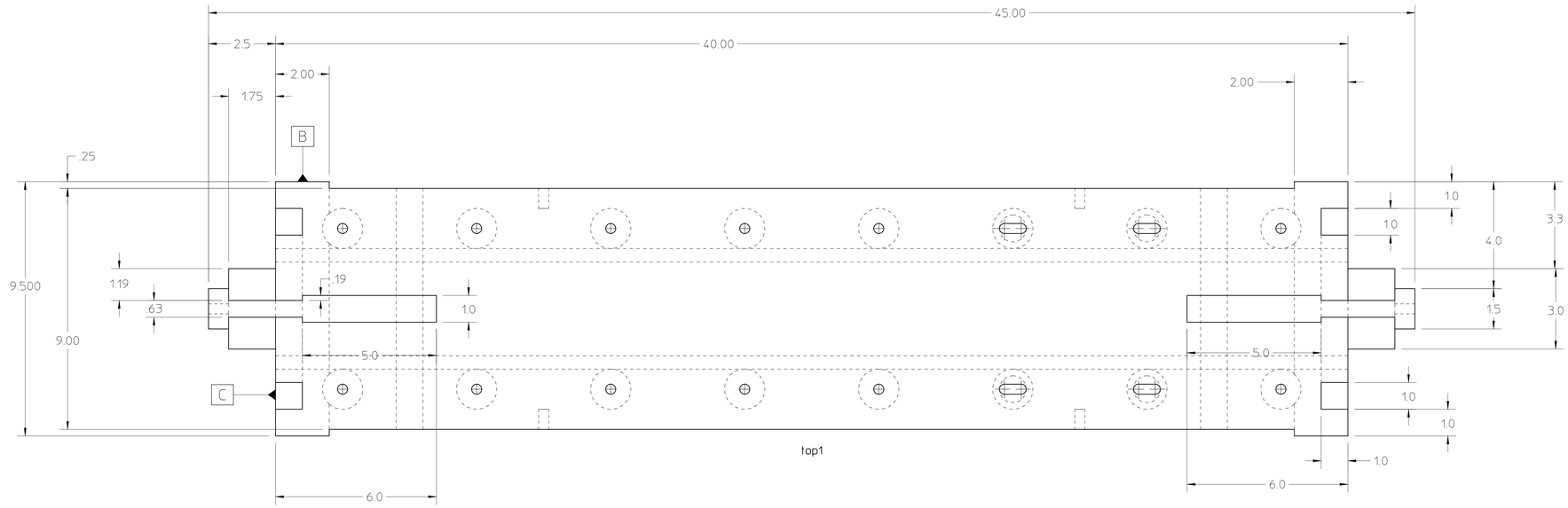
TOLERANCES: UNLESS OTHERWISE SPECIFIED
.X ± .1 FRAC. ± 1/64
.XX ± .01 ANGLES ± 3°
.XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG MATT HOFF
DATE 11-24-98
CHK.
BY
DATE

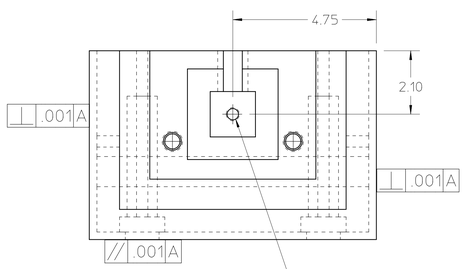
REQD	ITEM	PART NO.	DESCRIPTION
			FORGED ESR STAINLESS STEEL, GRADE F 304, ANNEALED

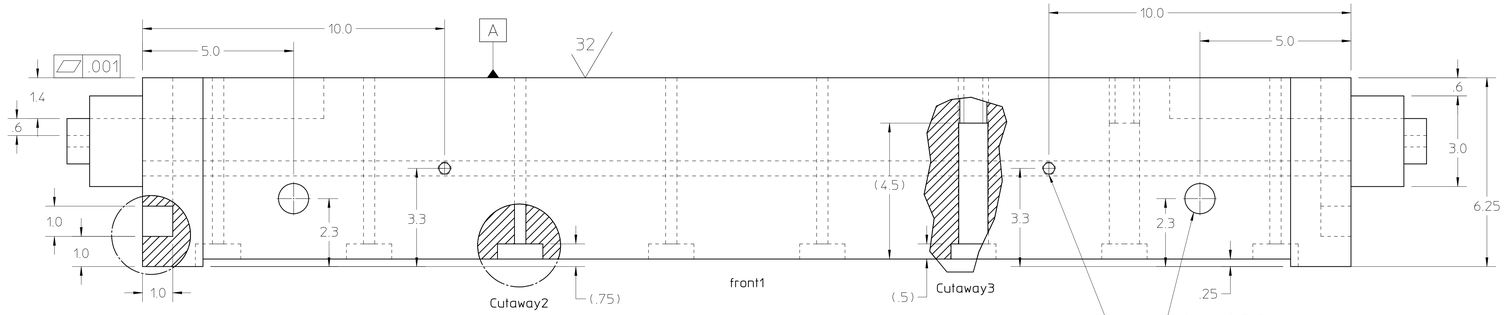
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS - FES RFQ
MECHANICAL STRUCTURES
VACUUM PORT MANIFOLD

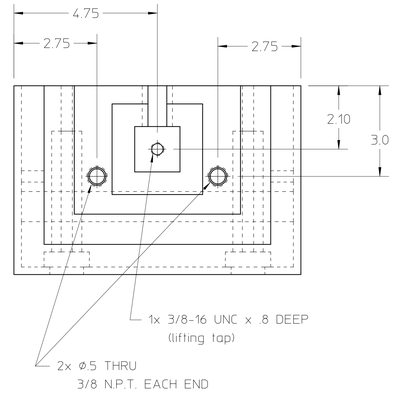
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	DETAIL	00X0000		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B0986	D

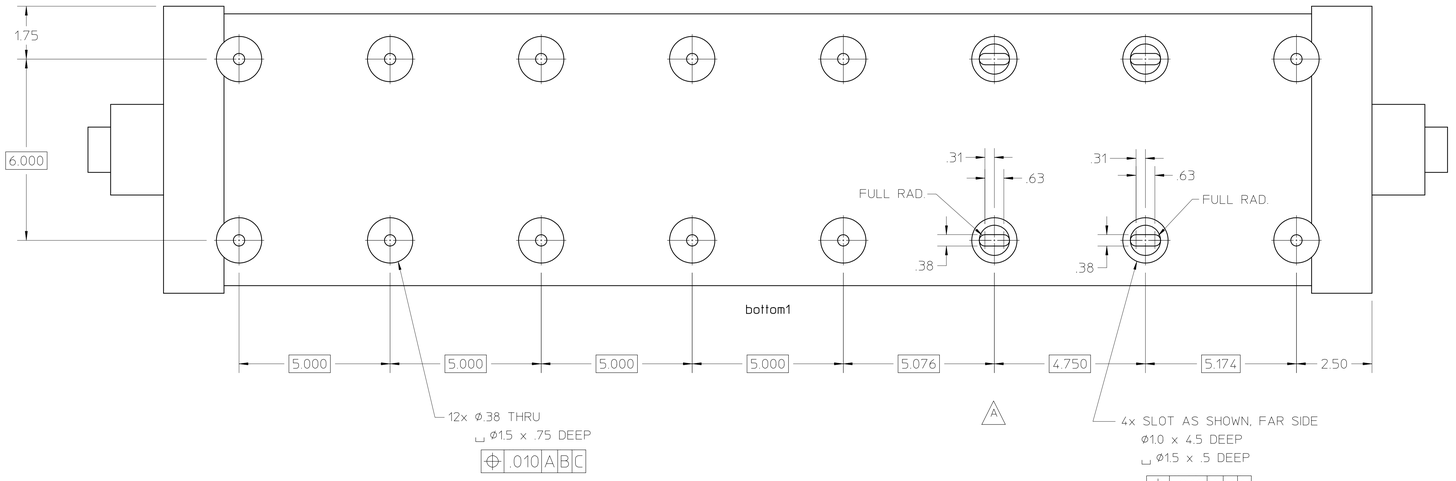


top1

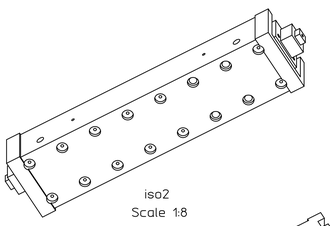




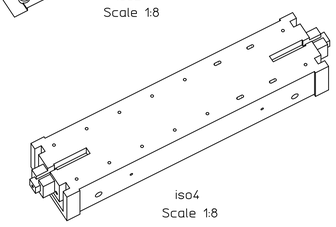




bottom1



iso2
Scale 1:8



iso4
Scale 1:8

25B0996A

DIMENSIONS ARE IN INCHES.

THIS PART WEIGHS APPROX. 575 LBS.

ALL INSIDE CORNERS SHOULD BE ROUNDED .06 R. MIN.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH	-	4A	2-6-01	5.076 was 5.000, 4.750 was 5.000, 5.174 was 5.000

REQD	ITEM	PART NO.	DESCRIPTION
-	-	-	DURA BAR G-2 (CLS-40) GRAY IRON

SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± – FRAC. ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: AOE Y14.5M-1994 & ANSI B46.1

SHOP ORDERS
ACCT. NO. – SERIAL NO. –
DATE ISSD. – DATE REQD. – NO. REQD. –
DELIVER TO –
SURFACE TREATMENT –
IDENT. METH. –
DWG. BY Matt Hoff DATE 9-16-99
CHK. BY – DATE –

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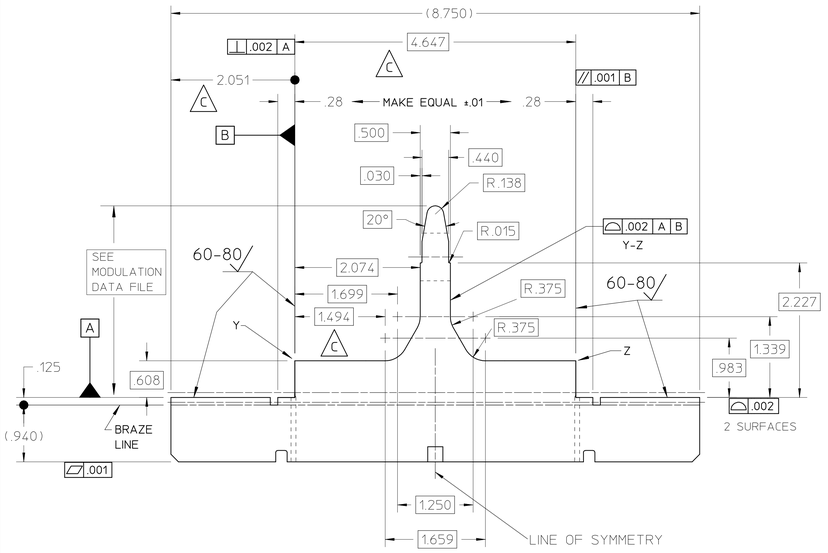
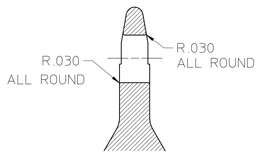
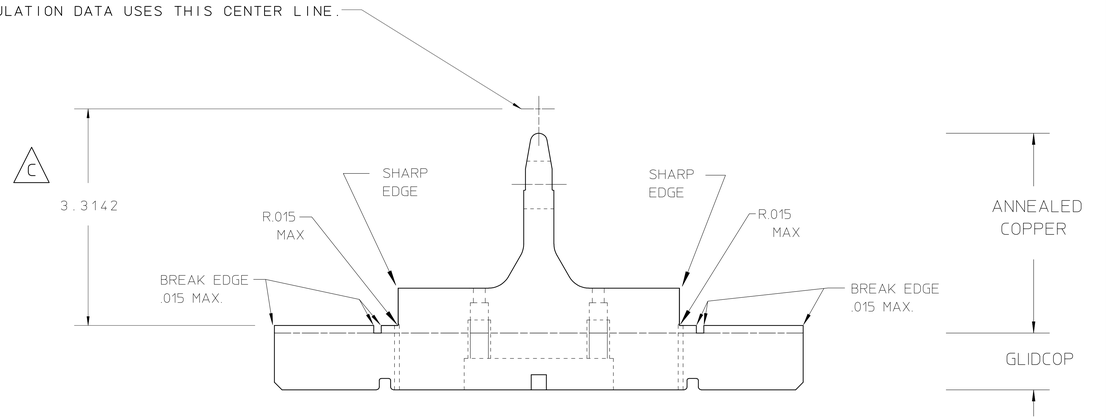
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES R&D
GENERAL
GRINDING FIXTURE

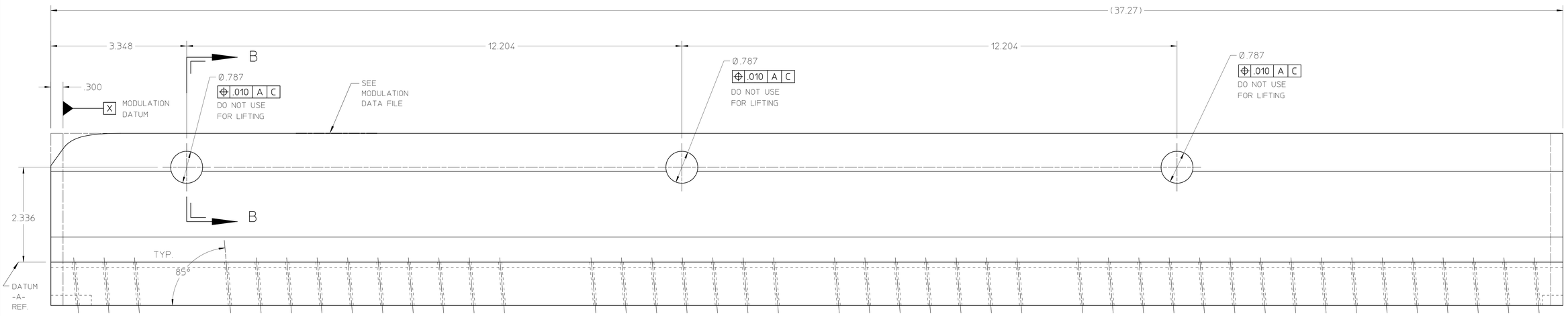
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	–		SIZE REV
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	
	8210-46	FE1000	25B0996A	

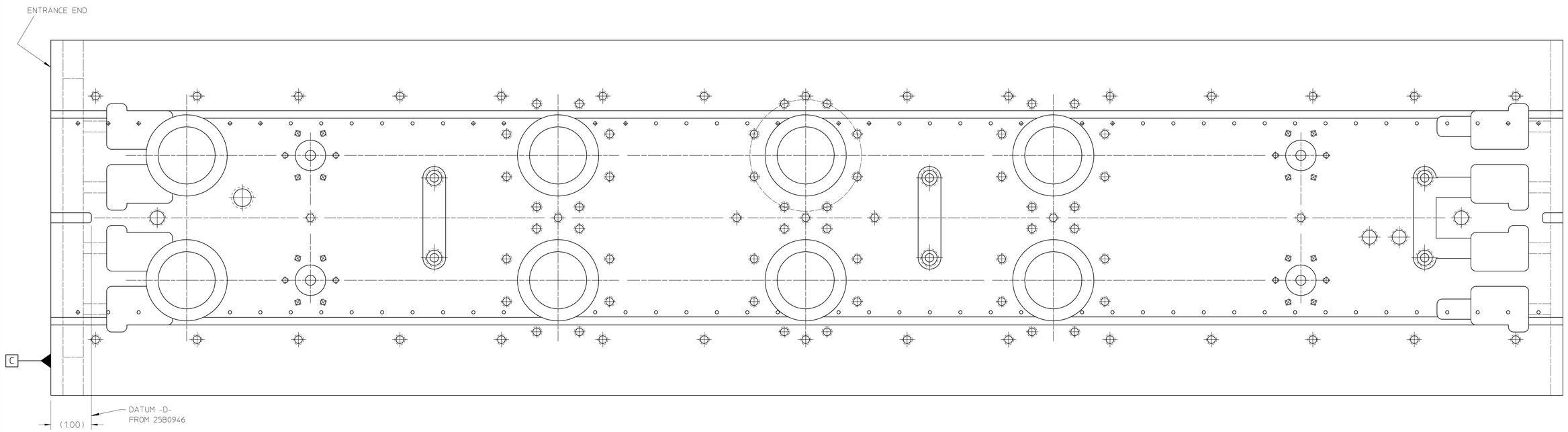




SECTION B-B







25B2056C

1. MODULATIONS ARE MACHINED USING DATUMS -A- , -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 150 LBS. AFTER MACHINING.

C 5. The original target dimensions for achieving the correct cavity frequency were 3.3105 and 4.655. After fabrication and testing, these dimensions were reground to the 3.3142 and 4.647 dimensions shown.

REV	DWG	CHK	ZONE	DATE	CHANGES
C	MDH			05-01-01	ADDED NOTE 5. AS BUILT.
B	MDH			10-27-99	UPDATED DRAWING
A	MDH			10-19-99	ADDED MODULATION DATUM

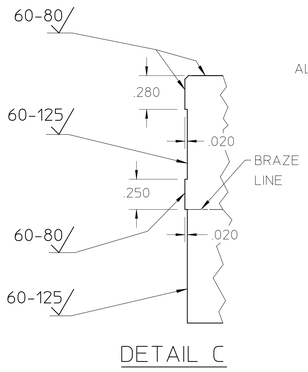
REQD	ITEM	PART NO.	DESCRIPTION
		25B0946	ALPHA MODULE MAJOR VANE MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

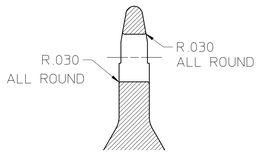
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD 10-05-99
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF
DATE 10-05-99
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MAJOR VANE FINISH MACHINING

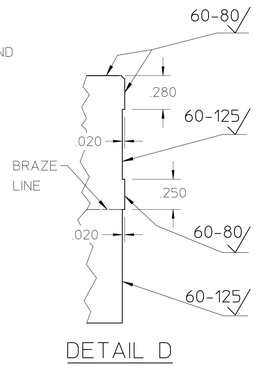
PATENT CLEAR | DWG. TYPE DETAIL | SHOWN ON 00X0000 | SCALE FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B2056 | SIZE C | REV. C



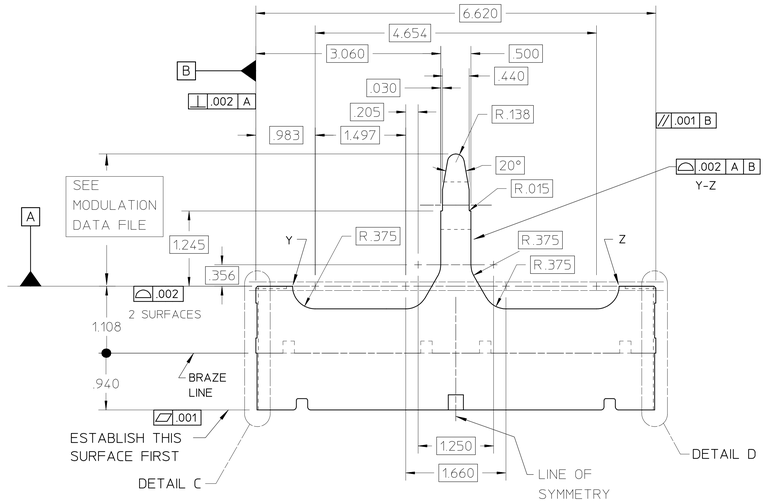
DETAIL C

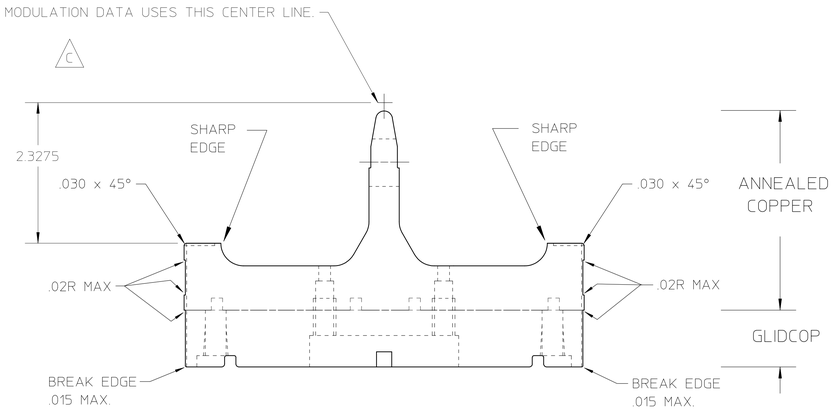


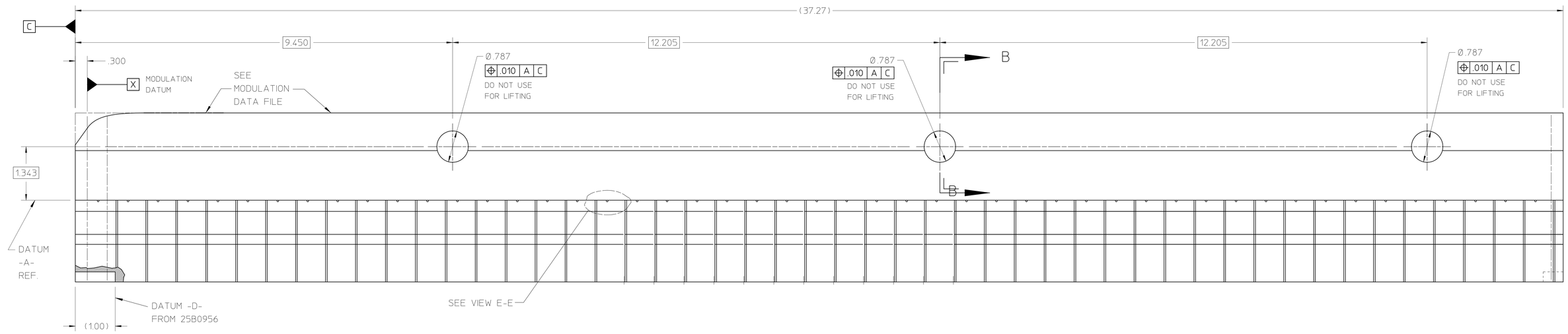
SECTION B-B

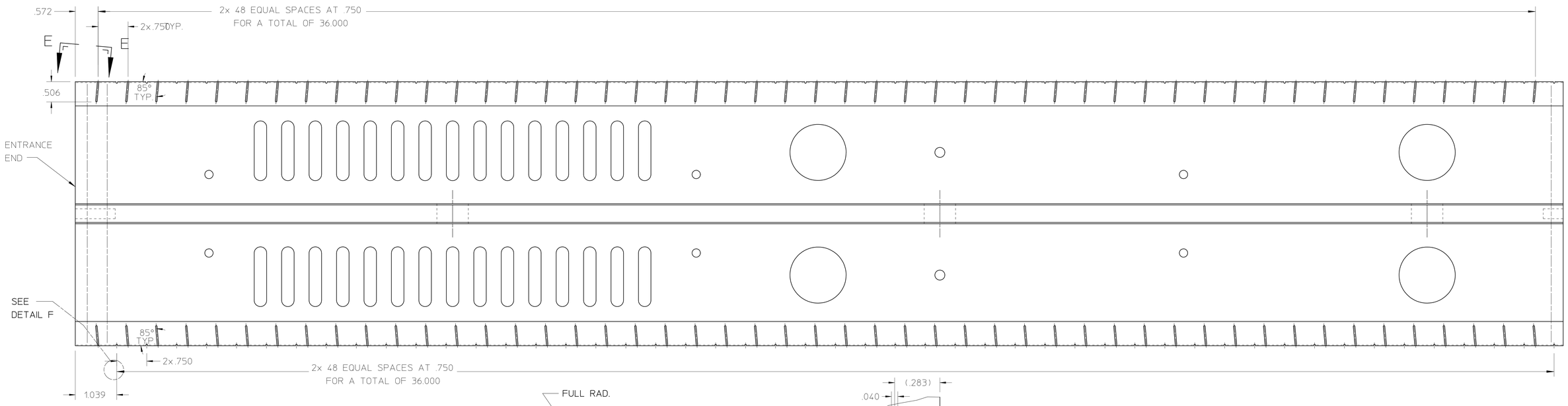


DETAIL D



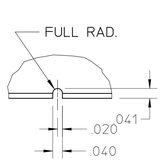




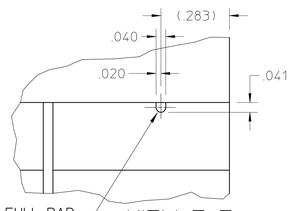


25B2066C

1. MODULATIONS ARE MACHINED USING DATUMS -A-, -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 142 LBS. AFTER MACHINING.



DETAIL F
TYP. 98 PLACES



VIEW E-E

REV	DWG	CHK	ZONE	DATE	CHANGES
C	MDH		3-D	05-01-01	ADDED MODULATION DATA C-LINE.
B	MDH			10-27-99	UPDATED DRAWING
A	MDH			10-19-99	ADDED MODULATION DATUM

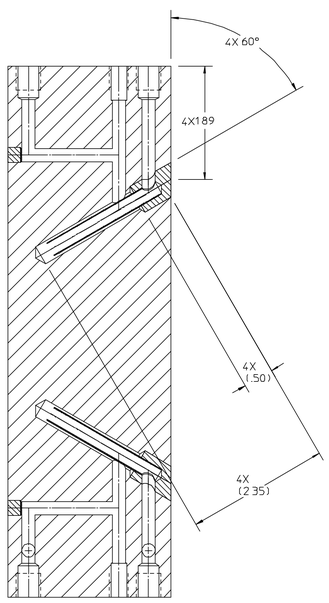
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-05-99
CHK. BY | DATE

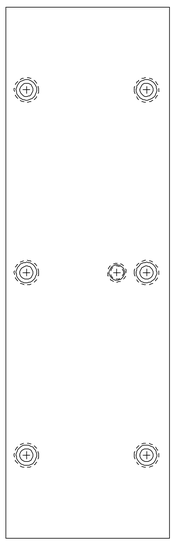
REQD	ITEM	PART NO.	DESCRIPTION
		25B0956	ALPHA MODULE MINOR VANE MACHINING

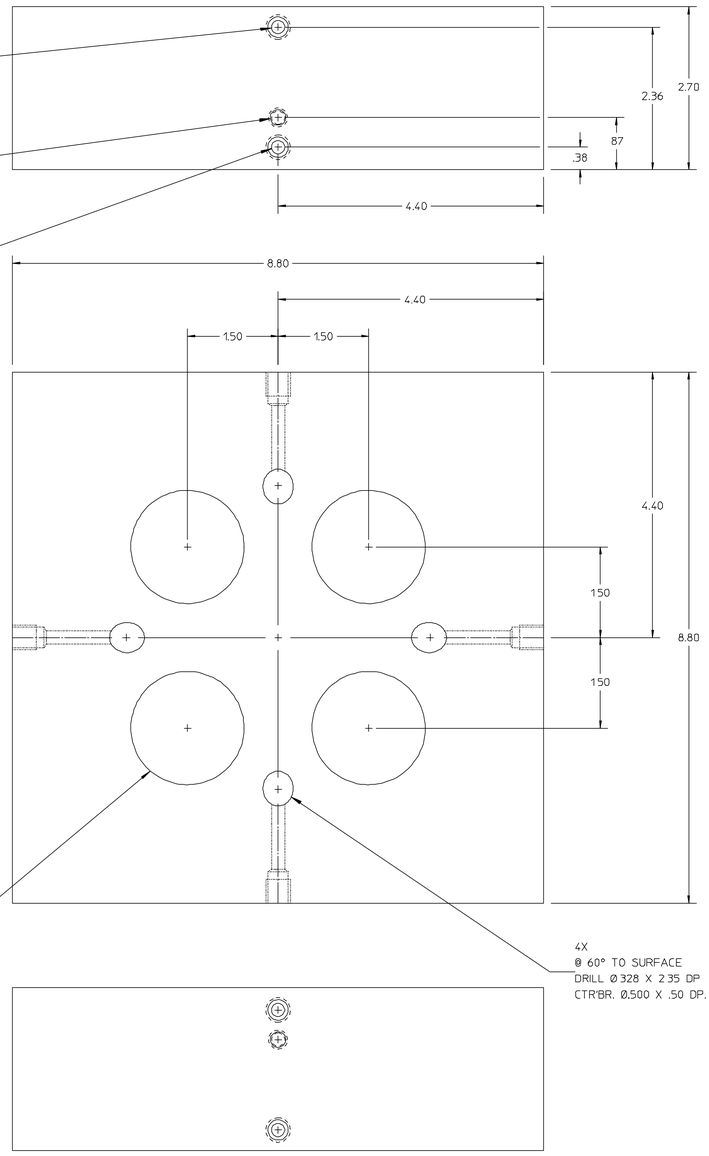
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MINOR VANE FINISH MACHINING

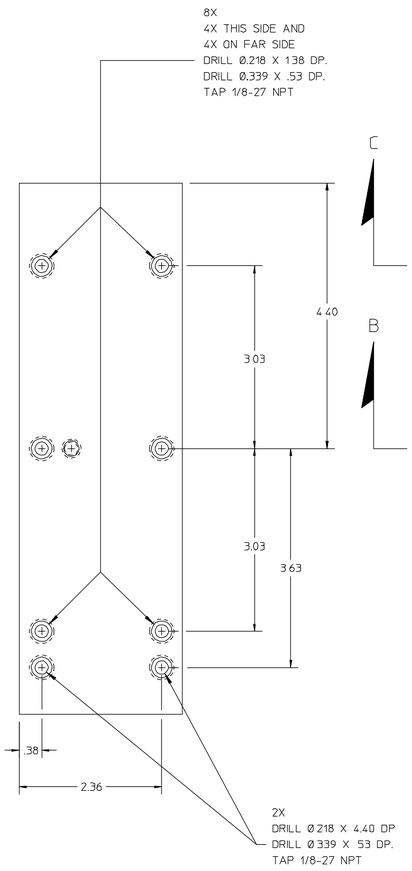
PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B2066 | SIZE: C | REV.

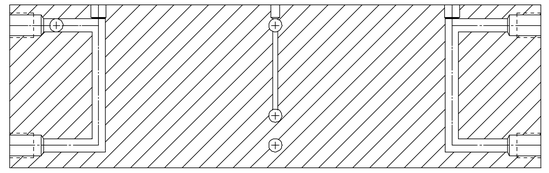


SECTION A-A

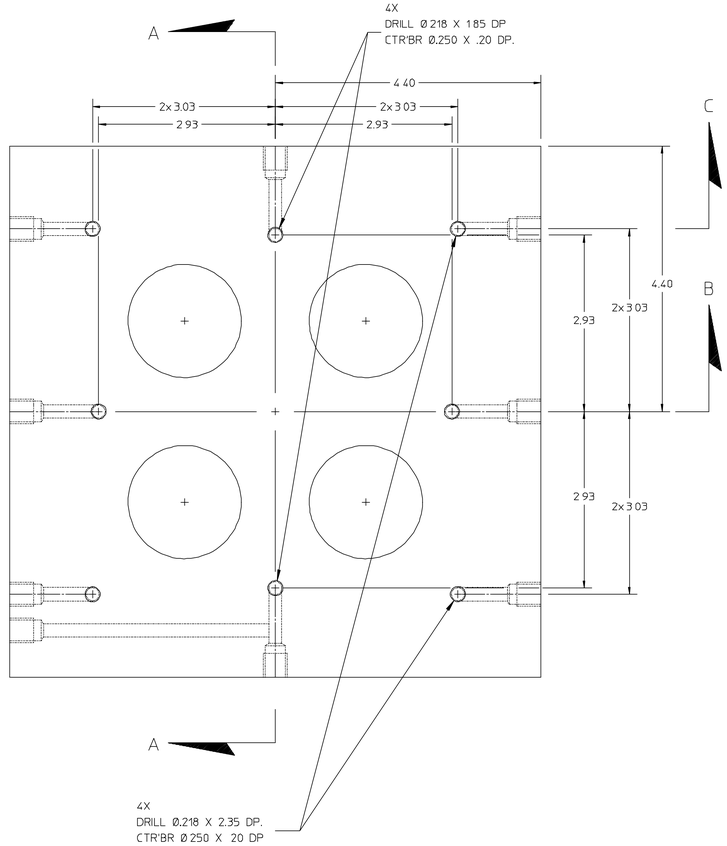


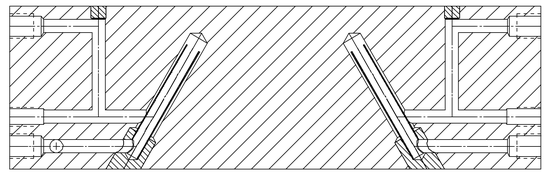






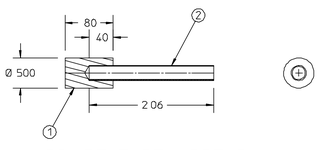
SECTION C-C





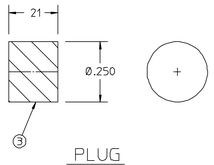
SECTION B-B

NOTE: - PLUG AND SQUIRT TUBE ASSEMBLY TO BE SOLDERED TOGETHER 'VAC TIGHT'
- ALSO, AFTER SOLDERING THE Ø.218 X 1.90 HOLE MUST BE REDRILLED PRIOR TO VACUMM CHECKING.



SQUIRT TUBE ASSEMBLY

Scale Full
Items 1 & 2 Brazed Together
Quanity 4



PLUG

SCALE: 4X
QTY 12

REQD	ITEM	PART NO	DESCRIPTION
1	4		2.75 COPPER PLATE, OFHC
12	3		Ø.250 COPPER ROD
4	2		.250 OD X .035 WALL BRASS TUBE
4	1		Ø.500 COPPER ROD

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± – FRAC ± – ; XX ± .01 ANGLES ± 1° ; XXX ± .005 FINISH 63√
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14.5 & B46.1

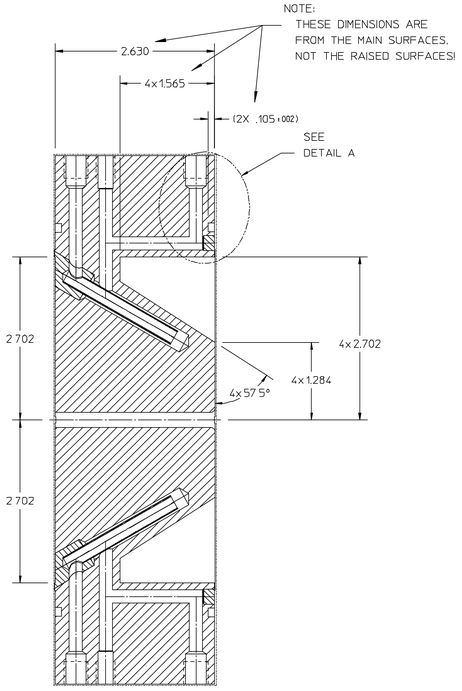
SHOP ORDERS
ACCT NO. | SERIAL NO
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT UHV CLEAN
IDENT METH –
DWG BY MacGill | DATE 06-29-99
CHK. – BY | DATE –

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES - RFQ
MECHANICAL STRUCTURES
END BLOCK - ROUGH MACHINING

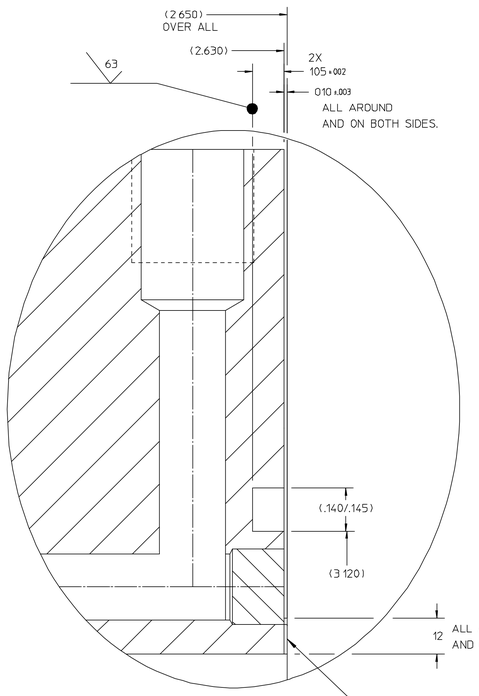
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	–		
MICROFILMED	DESIGN ACCT NO 8210-46	CATEGORY CODE –	DWG NO 25B2176	SIZE REV –

25B2176

NOTE:
THESE DIMENSIONS ARE
FROM THE MAIN SURFACES,
NOT THE RAISED SURFACES!

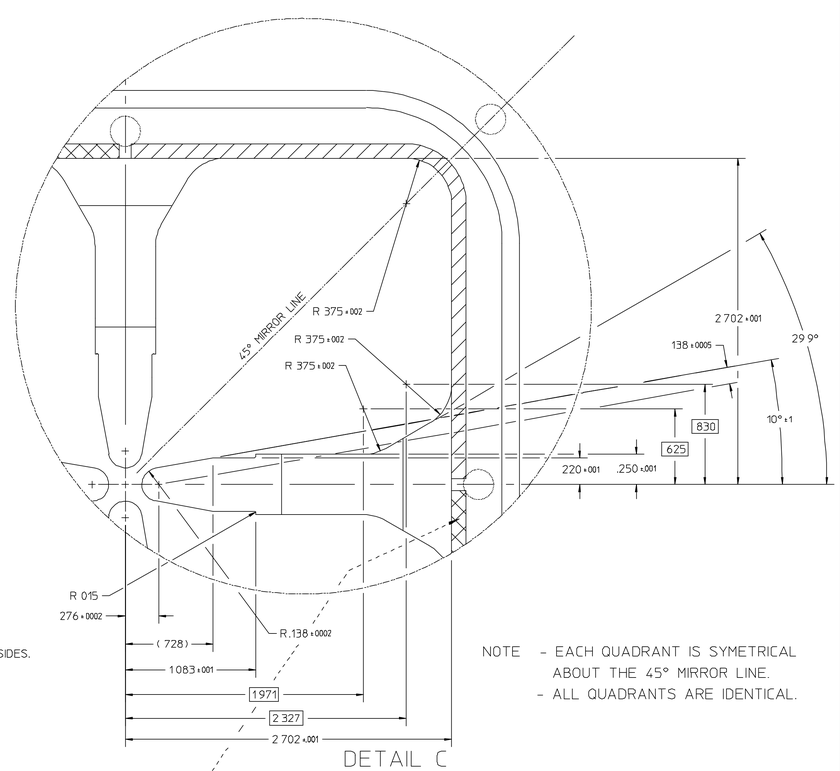


SECTION A-A



DETAIL A

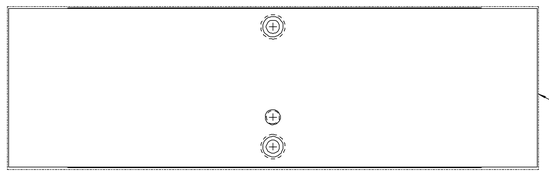
SCALE: 5X



DETAIL C

SCALE 2X

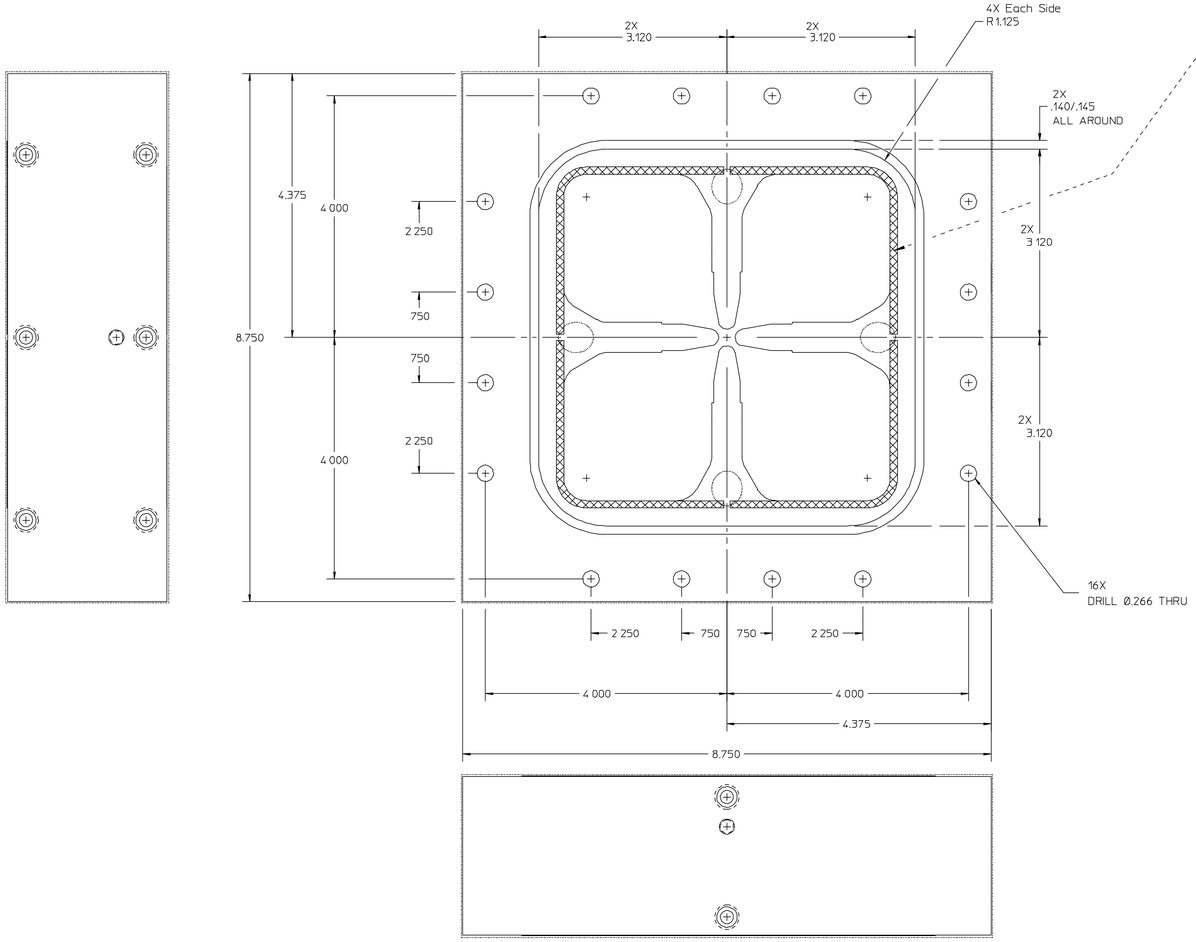
NOTE - EACH QUADRANT IS SYMETRICAL
ABOUT THE 45° MIRROR LINE.
- ALL QUADRANTS ARE IDENTICAL.



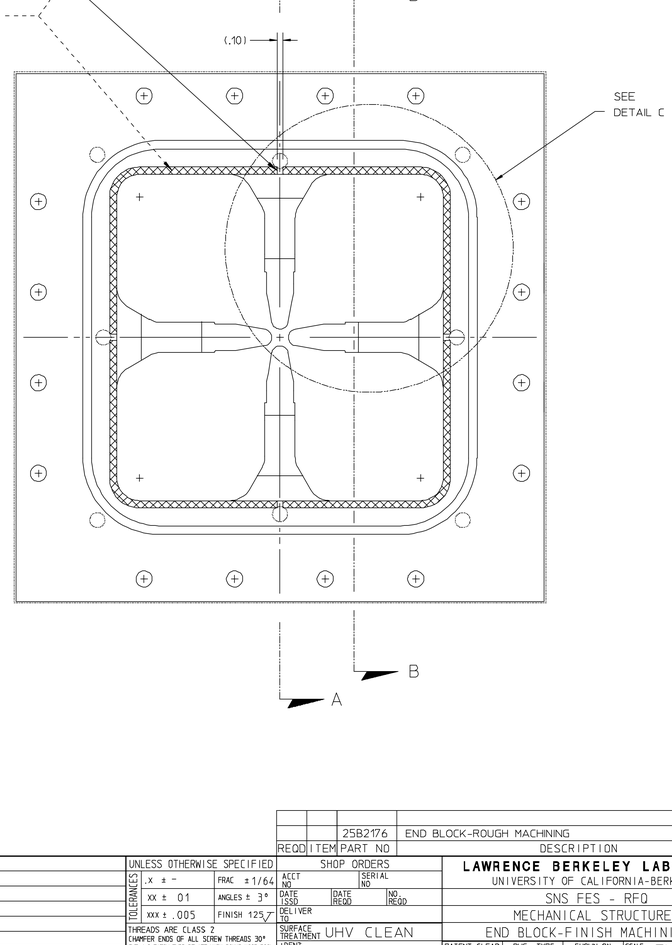
NOTE: DOTTED LINES REPRESENT
A SKIN CUT OF APPROX
.025 ON ALL SIX FACES
OF ROUGH MACHINED
PART

4X
EACH SIDE
CUT GROOVE
.10 WIDE
X 010 DP

HATCHED AREAS ARE
.010± 003 PROUD
OF THE REST OF
THE FACE.



SECTION B-B



25B2186

REQD	ITEM	PART NO	DESCRIPTION
		25B2176	END BLOCK-ROUGH MACHINING

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± – FRAC ± 1/64; XX ± .01 ANGLES ± 3°; XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14.5 & B46.1

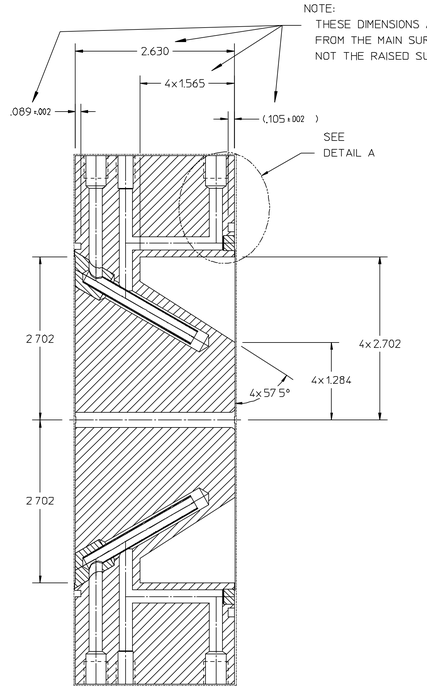
SHOP ORDERS
ACCT NO
SERIAL NO
DATE ISSD
DATE REQD
NO. REQD
DELIVER TO
SURFACE TREATMENT: UHV CLEAN
IDENT METH: –
DWG BY: MacGill DATE 06-29-99
CHK.: – DATE –

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
END BLOCK-FINISH MACHINING-A

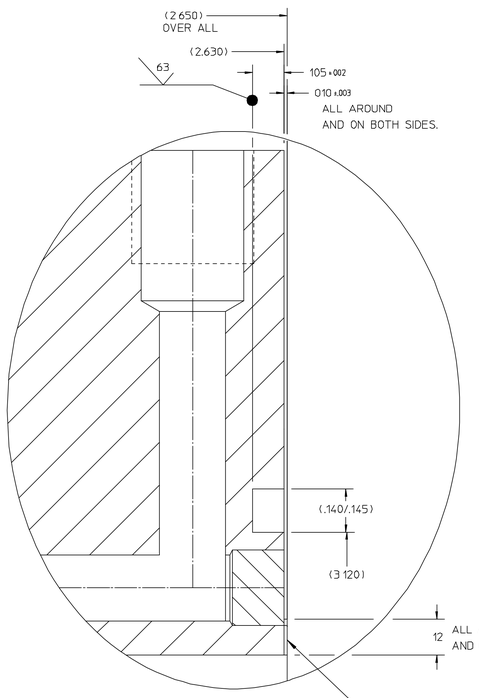
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	–		
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	SIZE REV
	8212-D1	–	25B2186	–

NOTE:
THESE DIMENSIONS ARE
FROM THE MAIN SURFACES,
NOT THE RAISED SURFACES!



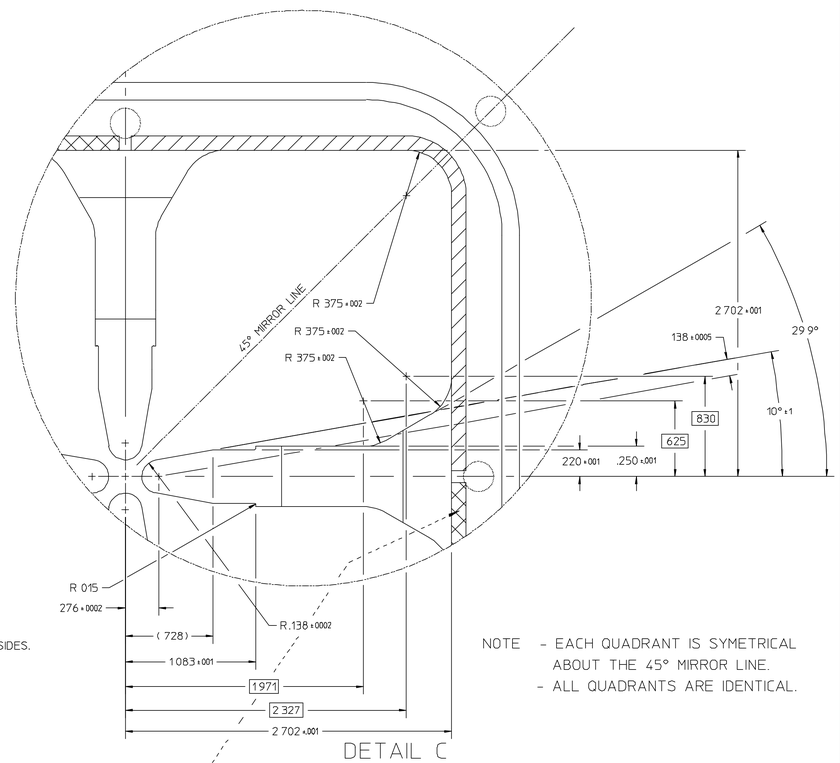
SECTION A-A

NOTE.
THE TWO GROOVES, ONE
ON EACH SIDE, ARE
DIFFERENT.



DETAIL A

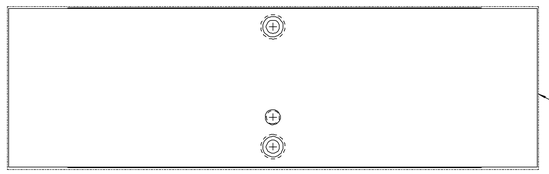
SCALE: 5X



DETAIL C

SCALE 2X

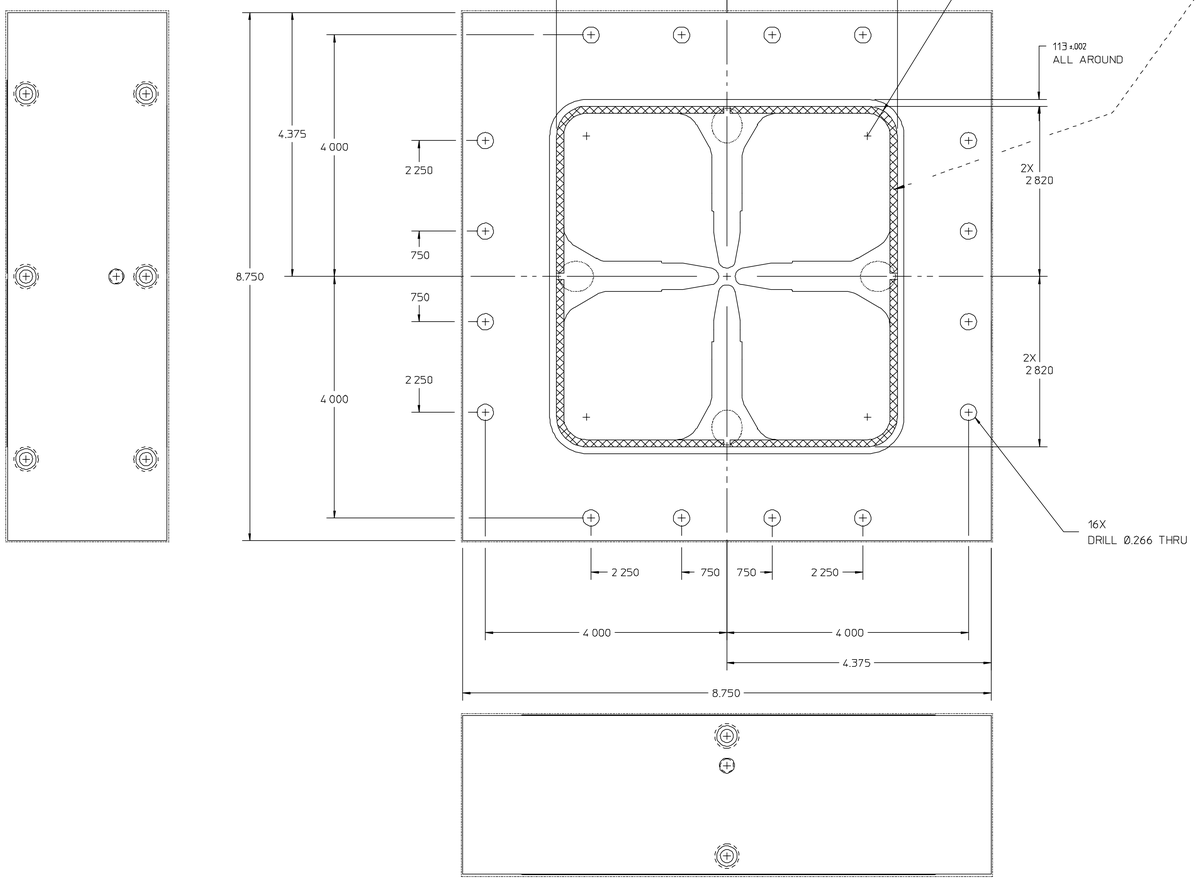
NOTE - EACH QUADRANT IS SYMETRICAL
ABOUT THE 45° MIRROR LINE.
- ALL QUADRANTS ARE IDENTICAL.

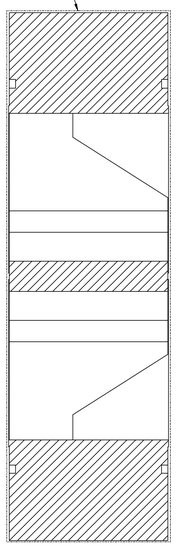


NOTE: DOTTED LINES REPRESENT
A SKIN CUT OF APPROX
.025 ON ALL SIX FACES
OF ROUGH MACHINED
PART

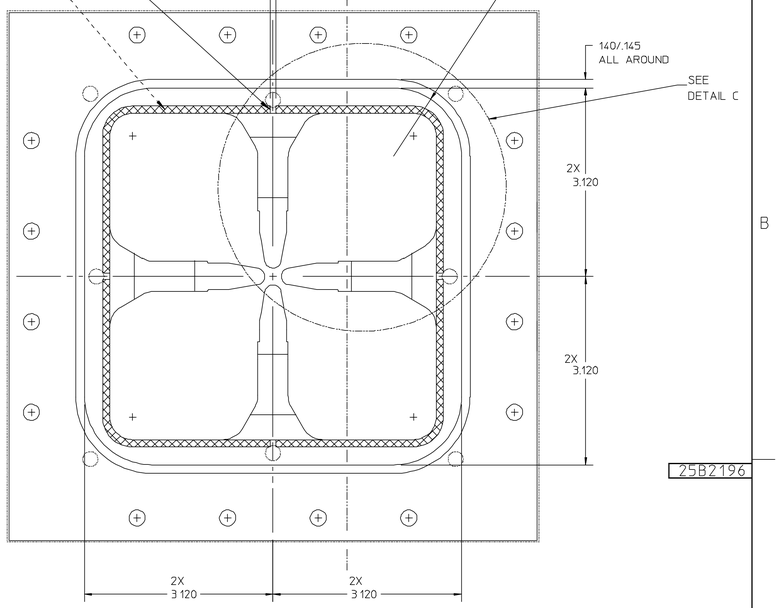
4X
EACH SIDE
CUT GROOVE
.10 WIDE
X .010 DP

HATCHED AREAS ARE
.010± .003 PROUD
OF THE REST OF
THE FACE.





SECTION B-B



25B2196

REQD	ITEM	PART NO	DESCRIPTION
		25B2176	END BLOCK-ROUGH MACHINING

REV	DWG	CHK	ZONE	DATE	CHANGES

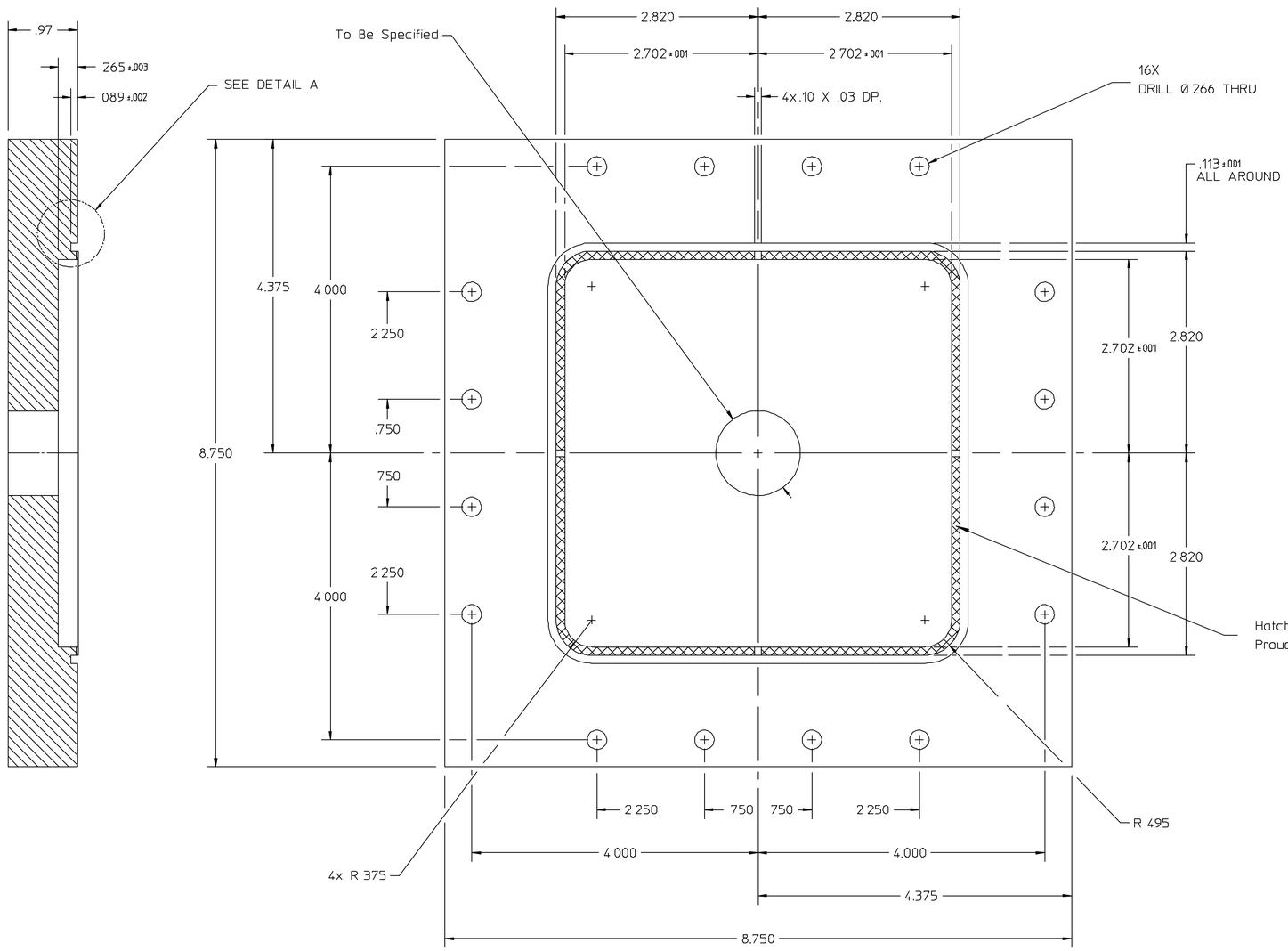
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± – FRAC ±1/64; XX ± .01 ANGLES ± 3°; XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14.5 & B46.1

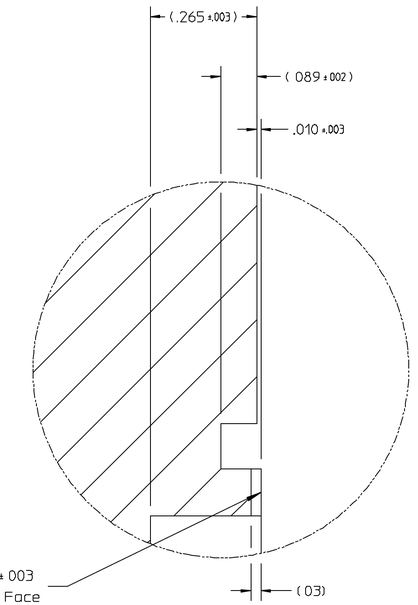
SHOP ORDERS
ACCT NO | SERIAL NO
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT: UHV CLEAN
IDENT METH: –
DWG BY: MacGill | DATE 06-29-99
CHK: – | DATE –

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES - RFQ
MECHANICAL STRUCTURES
END BLOCK-FINISH MACHINING-B

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	–		
MICROFILMED	DESIGN ACCT NO 8212-D1	CATEGORY CODE –	DWG NO 25B2196	SIZE – REV –

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.00 COPPER PLATE, OFHC





DETAIL A

SCALE 5X

25B2204

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- X ± -
- XX ± .01
- XXX ± .005
- FRAC ±1/64
- ANGLES ±1°
- FINISH 64√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS

ACCT. NO		SERIAL NO.	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT	UHV CLEAN		
IDENT. METH	-		
DWG BY	MacGill	DATE	06-29-99
CHK BY	-	DATE	-

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

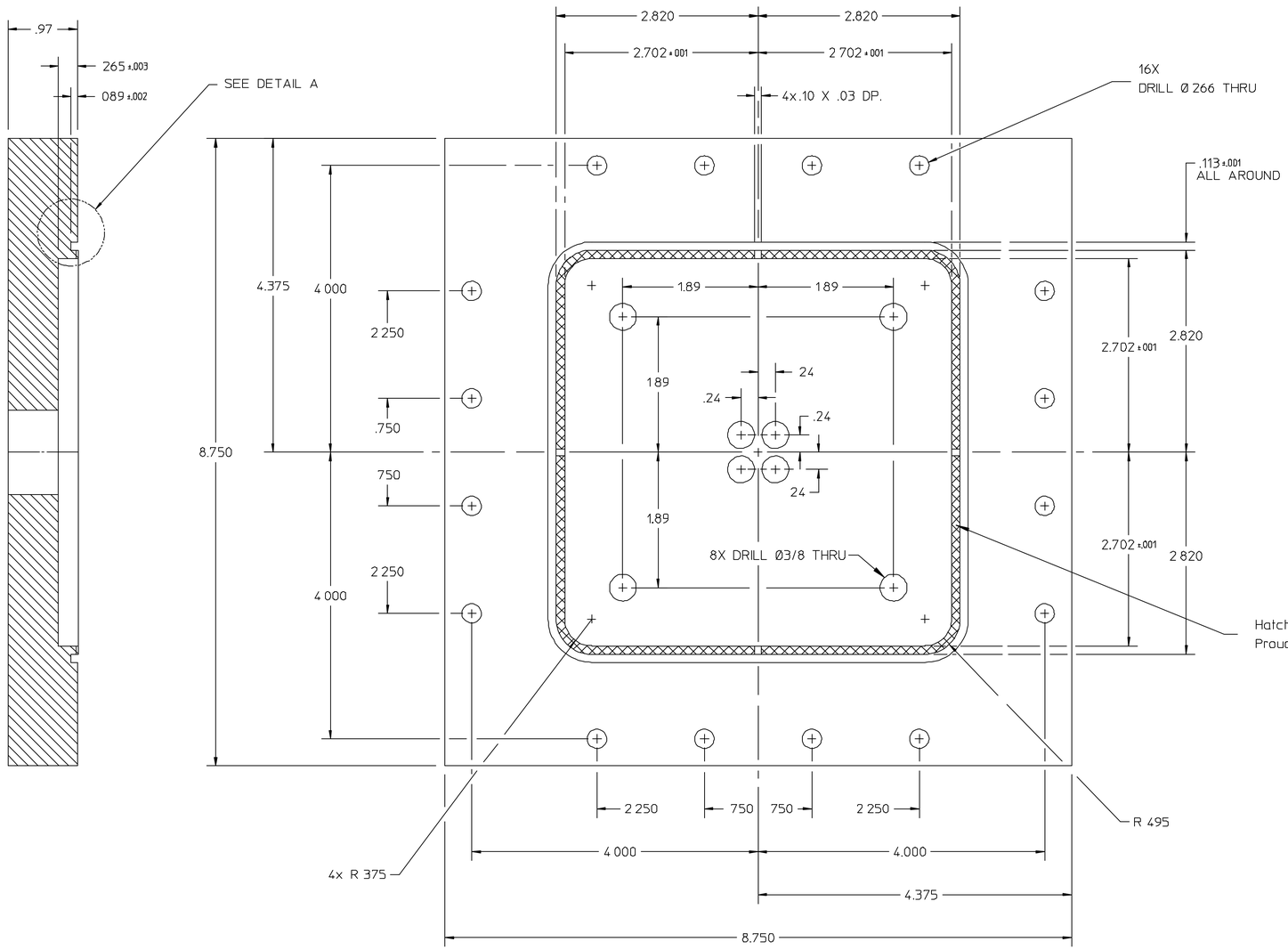
SNS FES - RFQ

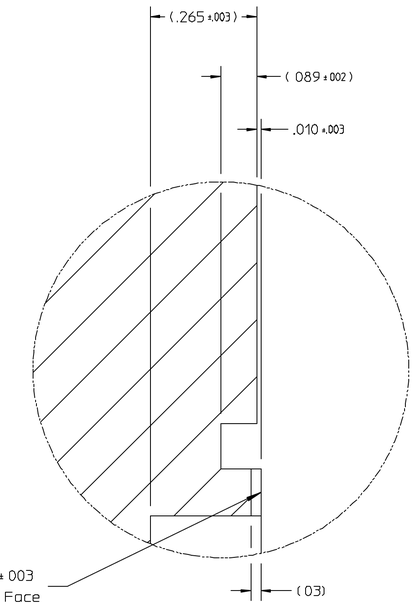
MECHANICAL STRUCTURES

END PLATE WITH O-RING GROOVE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	-		
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-D1	-	25B2204	-

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.00 COPPER PLATE, OFHC





25B2214

DETAIL A

SCALE 5X

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- X ± -
- FRAC ±1/64
- XX ± .01
- ANGLES ±1°
- XXX ± .005
- FINISH 64√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS

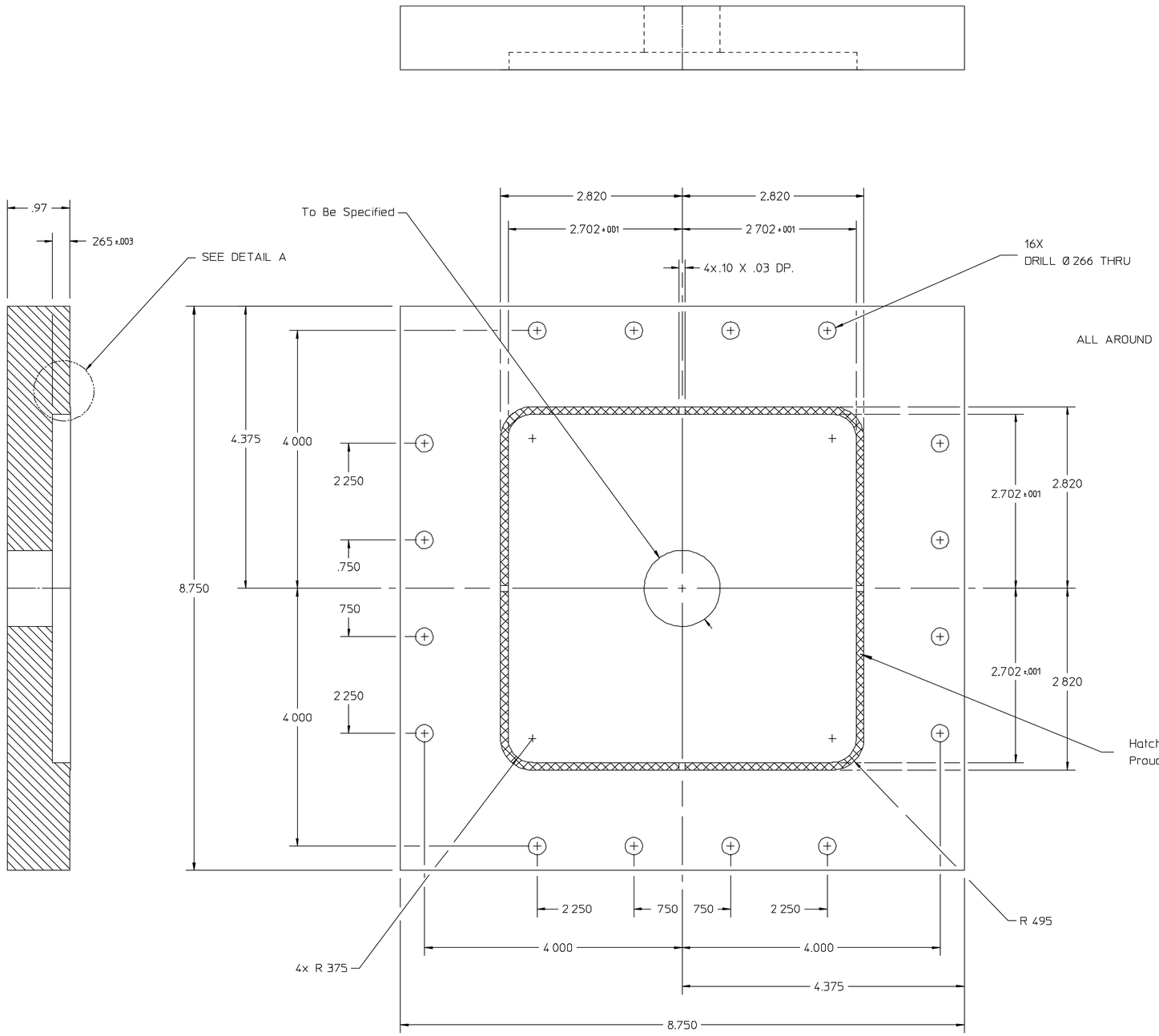
ACCT. NO		SERIAL NO.
DATE ISSD	DATE REQD	NO. REQD
DELIVER TO		
SURFACE TREATMENT	UHV CLEAN	
IDENT. METH	-	
DWG BY	MacGill	DATE 06-29-99
CHK BY	-	DATE -

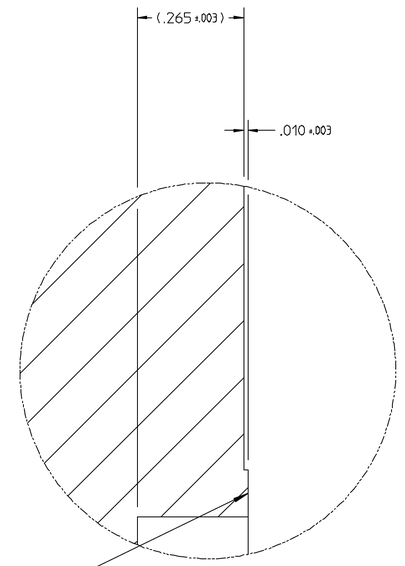
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
END PLATE FOR BEAD PULL

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	-		
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG. NO. 25B2214	SIZE / REV.
	8212-D1	-		-

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.00 COPPER PLATE, OFHC





25B2224

DETAIL A

SCALE 5X

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES		
X ± -	FRAC ±1/64	
XX ± .01	ANGLES ± 1°	
XXX ± 005	FINISH 64 √	

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS

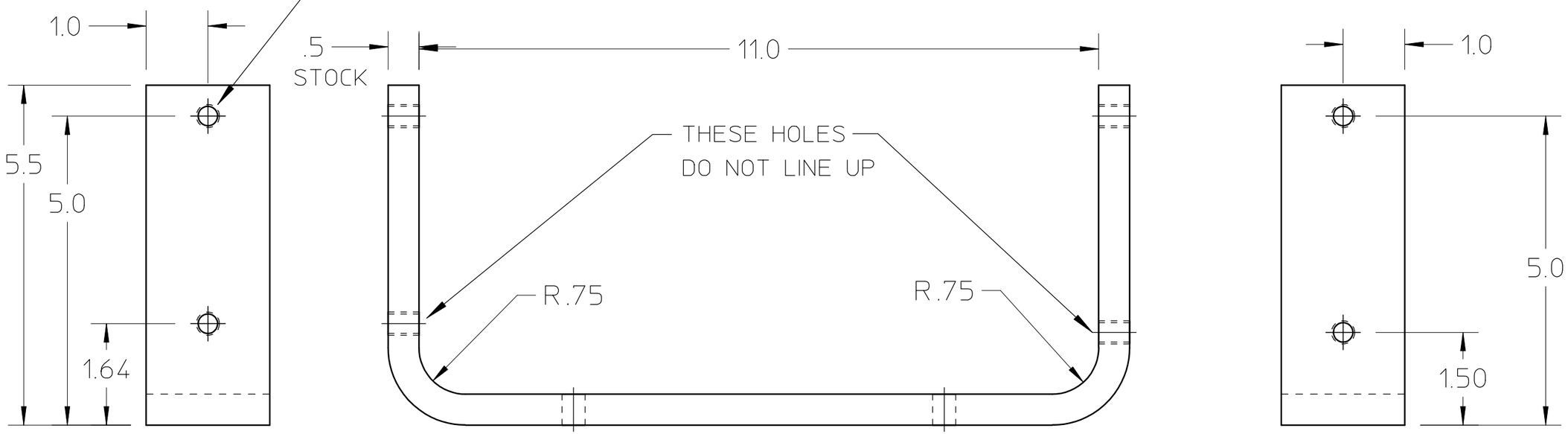
ACCT. NO		SERIAL NO.
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	UHV CLEAN	
IDENT. METH	-	
DWG BY	MacGill	DATE 11-17-99
CHK BY	-	DATE -

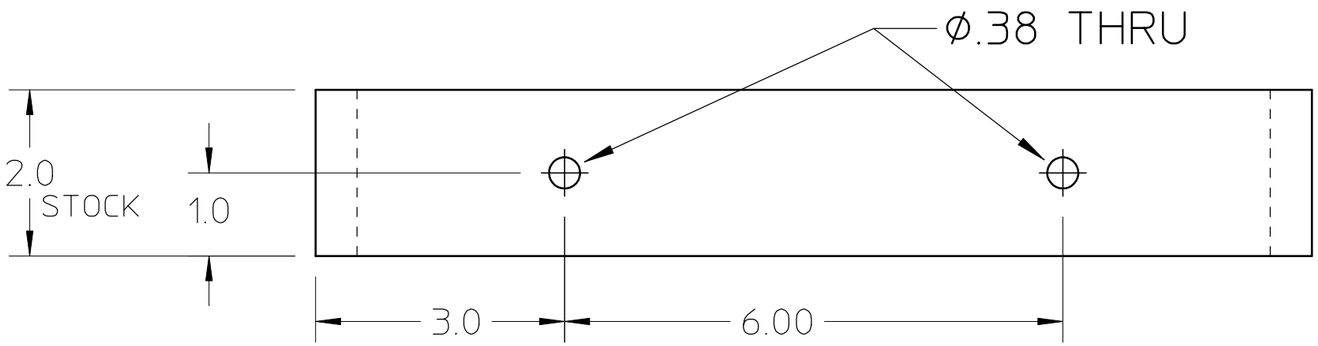
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
END PLATE - NO GROOVE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	-		
MICROFILMED	DESIGN ACCT NO 8212-D1	CATEGORY CODE -	DWG. NO. 25B2224	SIZE REV. -

25B2282	REQD	ITEM	PART NUMBER	DESCRIPTION
				2.0 x .5 STAINLESS BAR STOCK





REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO		
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 10-18-99	
CHK BY		DATE	

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

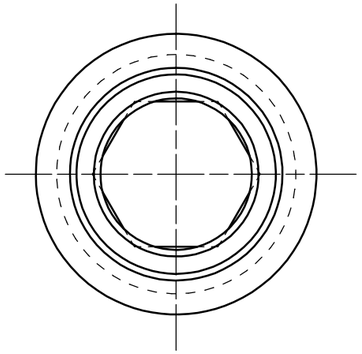
SNS FES RFQ

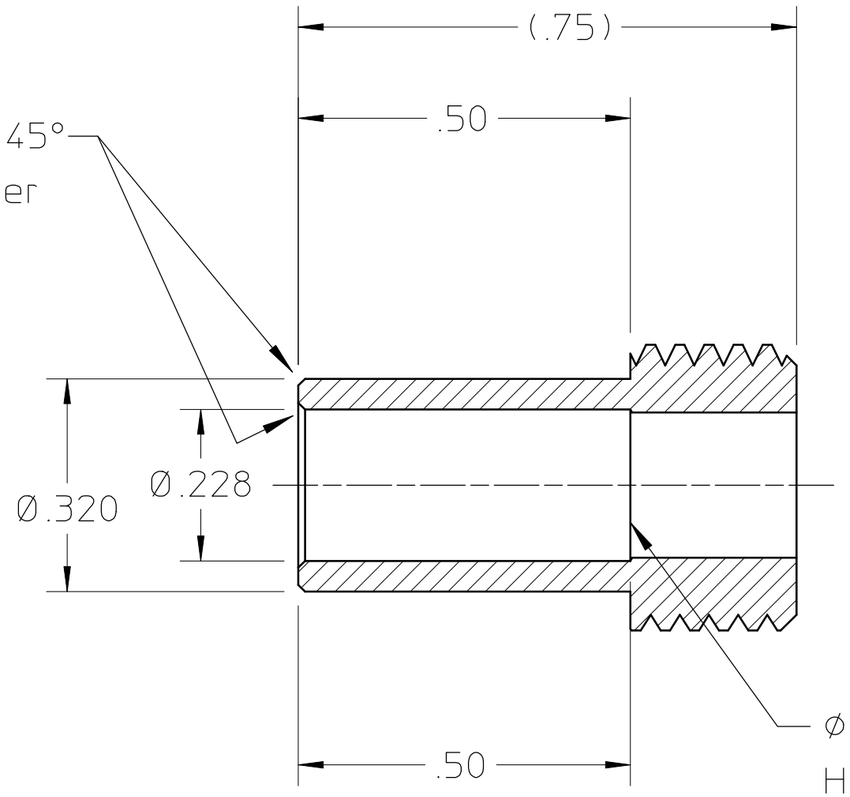
MECHANICAL STRUCTURES

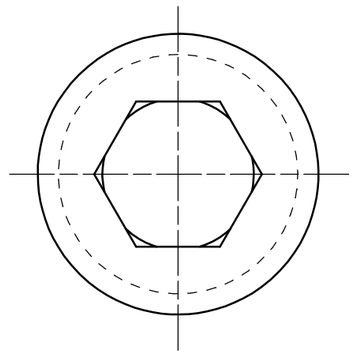
VANE HANDLING FIXTURE

PAT CLEAR	DWG TYPE DETAIL	SHOWN ON	SCALE: 1:2 DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B2282 REV

25B2332	REQD	ITEM	PART NUMBER	DESCRIPTION
				7/16UNC-14 x .75 LG. SOCKET SET SCREW, STAINLESS







REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 07-26-99
CHK BY		DATE

LAWRENCE BERKELEY NATION LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

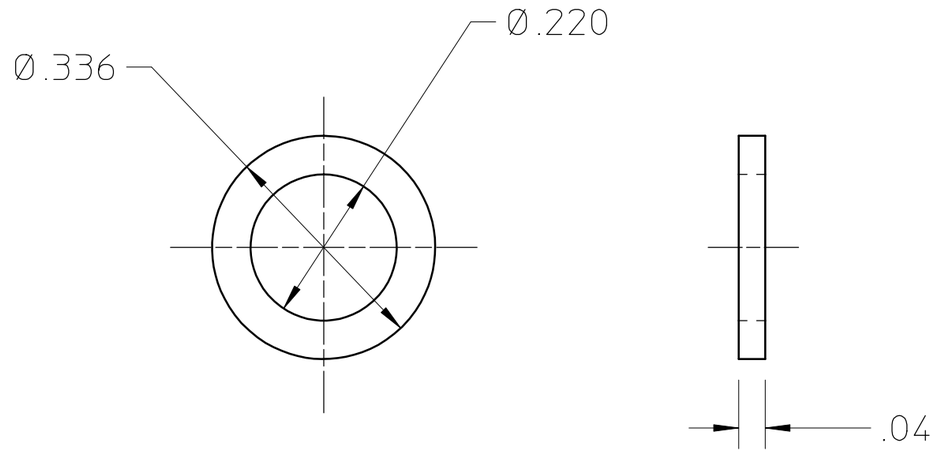
SNS-FES RFQ

MECHANICAL STRUCTURES

Pi-MODE STABILIZER ROD SWAGE TOOL

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 4 : 1
	DETAIL	25Bxxxx	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B2332

25B2342	REQD	ITEM	PART NUMBER	DESCRIPTION
				Graphite



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 06-25-99
CHK BY		DATE

LAWRENCE BERKELEY NATION LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

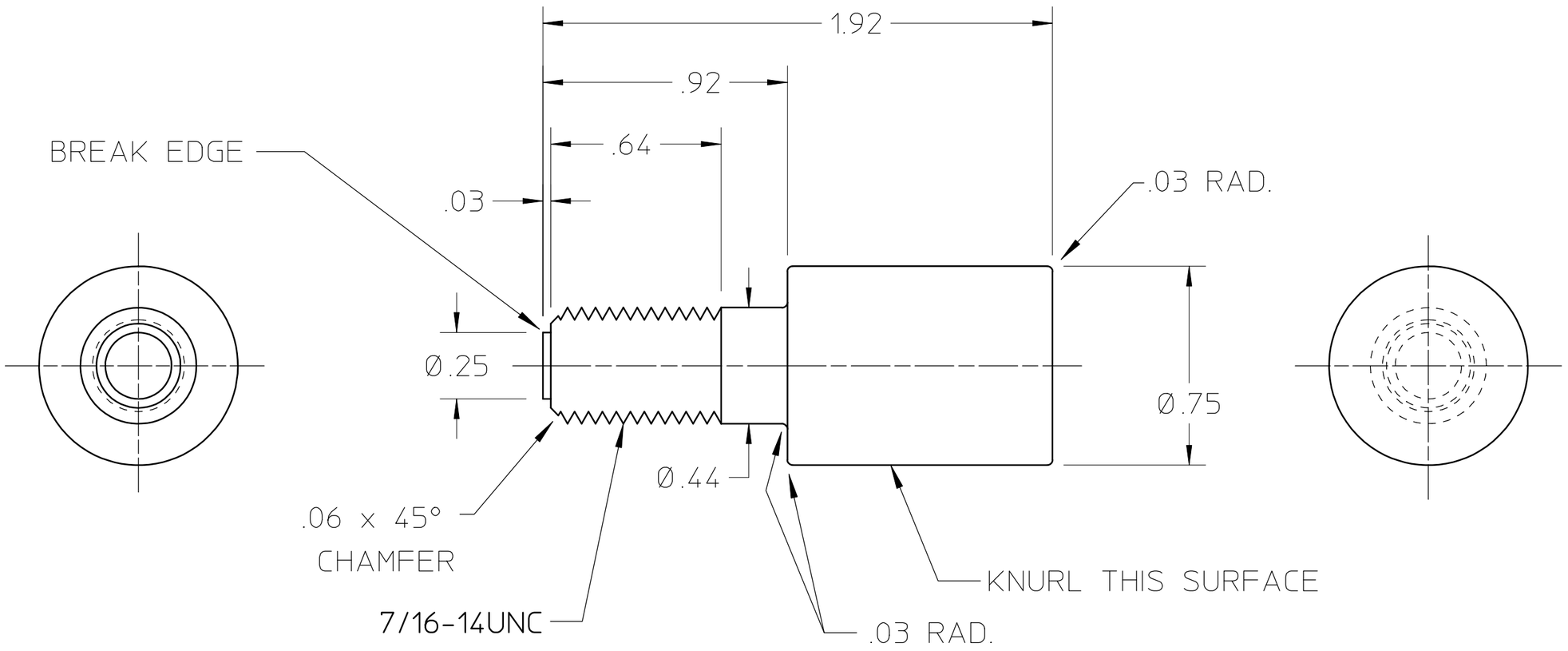
SNS-FES RFQ

MECHANICAL STRUCTURES

SWAGED BRAZING WASHER

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 4 : 1
	DETAIL	25Bxxxx	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B2342

25B2352	REQD	ITEM	PART NUMBER	DESCRIPTION
				ALUMINUM BAR STOCK



DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO		
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 06-17-99	
CHK BY		DATE	

LAWRENCE BERKELEY NATIONAL LABORATORY

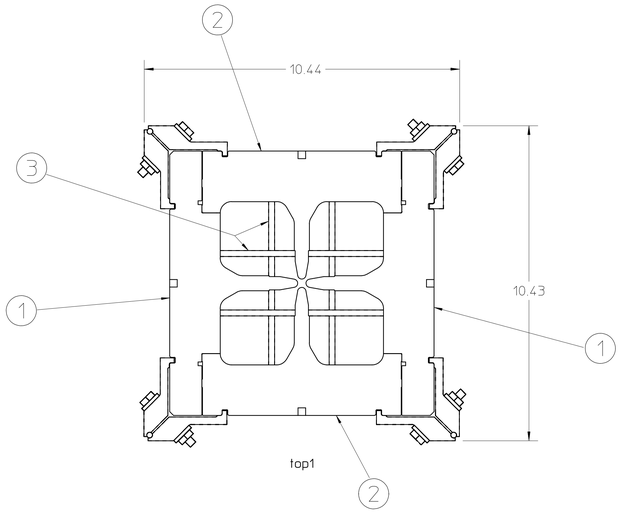
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ

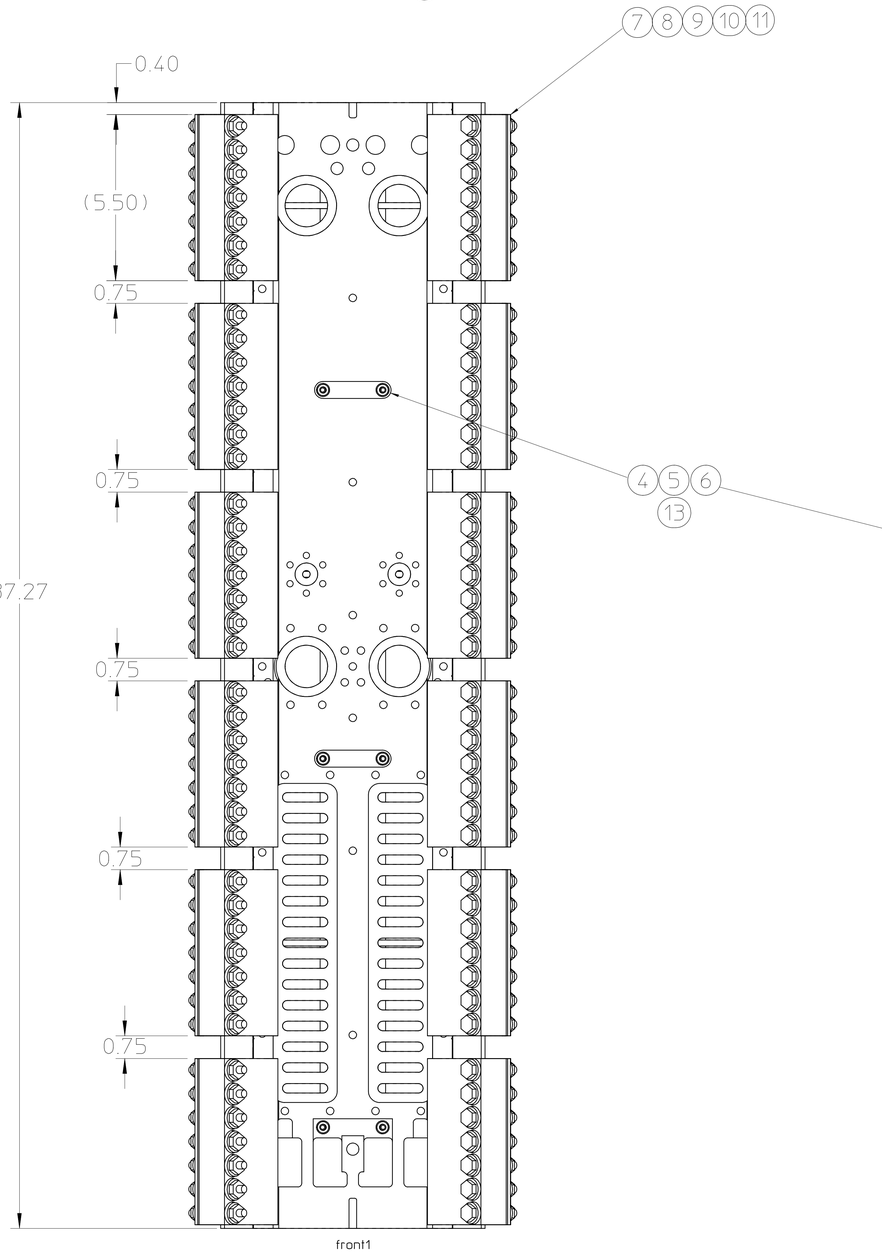
MECHANICAL STRUCTURES

Pi-MODE STABILIZER ROD SPACING TOOL

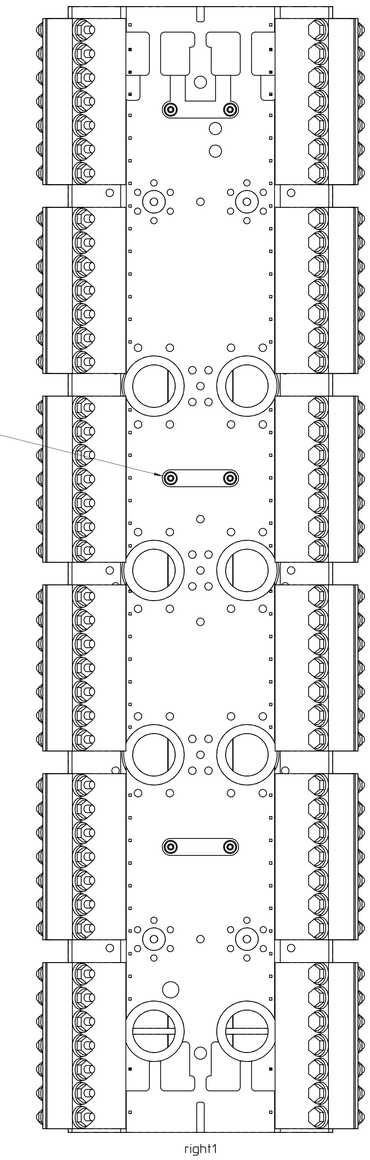
PAT CLEAR	DWG TYPE DETAIL	SHOWN ON 00X0000	SCALE: 2:1 DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B2352 REV



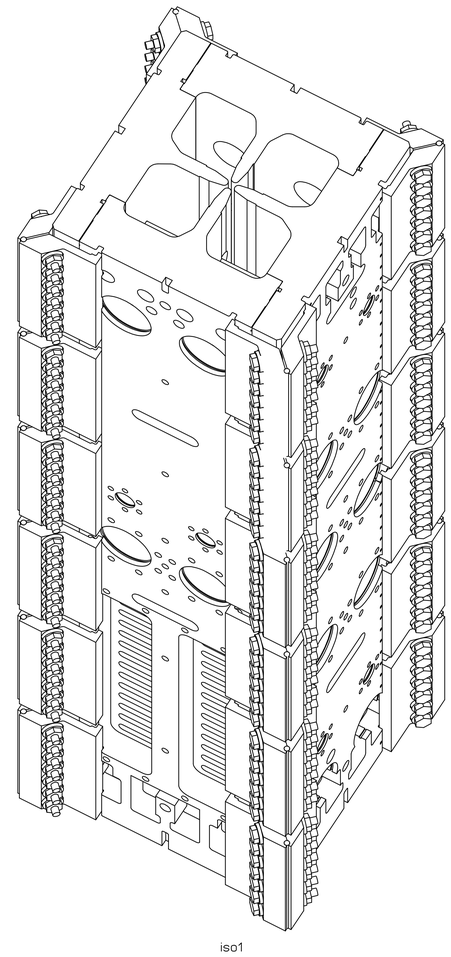
top1



front1



right1



iso1

THIS ASSEMBLY WEIGHS APPROX. 675 LBS.

DIMENSIONS ARE IN INCHES

25B2376

REQD	ITEM	PART NO	DESCRIPTION
24	13		.025 DIA. CUSIL WIRE FORMED INTO Ø.196 RING
A/R	12		.040 DIA. CUSIL BRAZING WIRE
336	11		BELLEVILLE INCONEL WASHER, .255 x .75 x .04 thk
168	10		1/4-20 STAINLESS NUT
168	9		1/4-20 x 1.75 STAINLESS BOLT
24	8		3/16 x 5.5" STAINLESS ROD STOCK
48	7	25B0803	BRAZING CORNER CLAMP
24	6	25B2332	PI-MODE STABILIZER ROD SWAGE TOOL
24	5	25B2342	SWAGED BRAZING WASHER
24	4	25B0902	PI-MODE STABILIZER ROD FERRULE
12	3	25B0892	SWAGED PI-MODE STABILIZER ROD
2	2	25B2066	ALPHA MODULE MINOR VANE FINISH MACHINING
2	1	25B2056	ALPHA MODULE MAJOR VANE FINISH MACHINING

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC. ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH – √

THREADS ARE CLASS 2

CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.

BREAK EDGES .016 MAX. ON MACHINED WORK.

REMOVE BURRS WELD SPLATTER & LOOSE SCALE

REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

ACCT. NO. | SERIAL NO.

DATE ISSD. | DATE REQD. | NO. REQD.

DELIVER TO

SURFACE TREATMENT –

IDENT. METH. –

DWG BY Matt Hoff DATE 11-09-99

CHK BY – DATE –

LAWRENCE BERKELEY NATIONAL LABORATORY

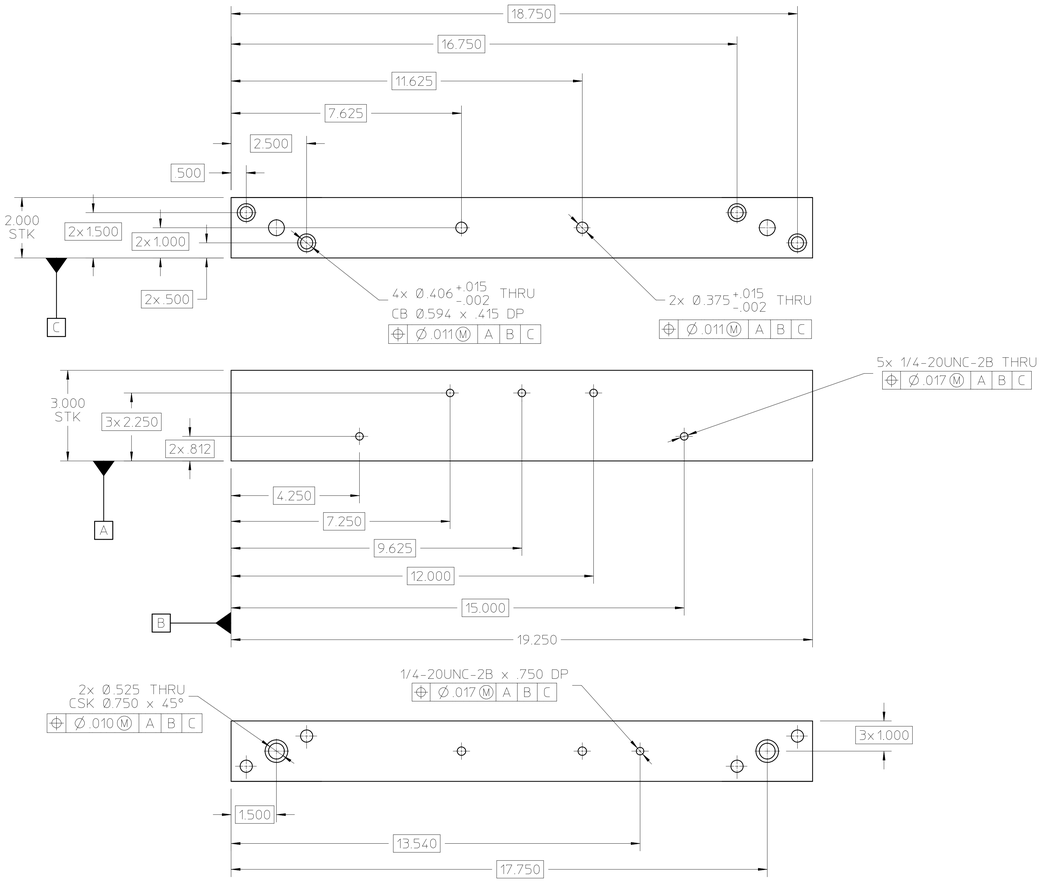
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ

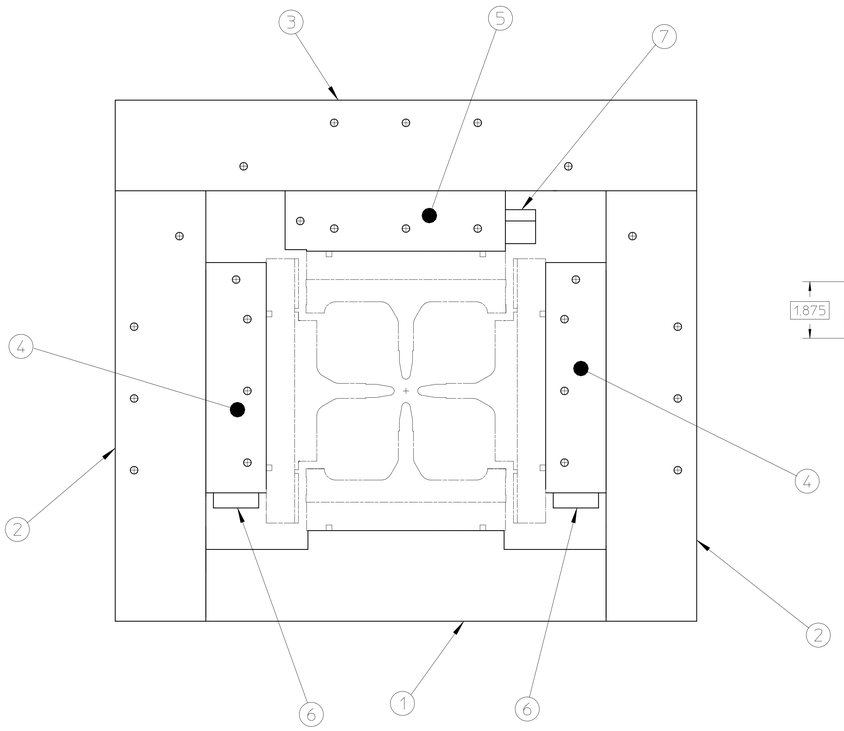
MECHANICAL STRUCTURES

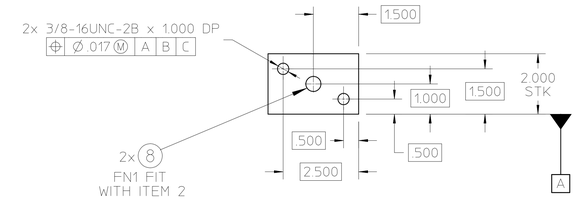
ALPHA MODULE VERTICAL BRAZE ASSEMBLY

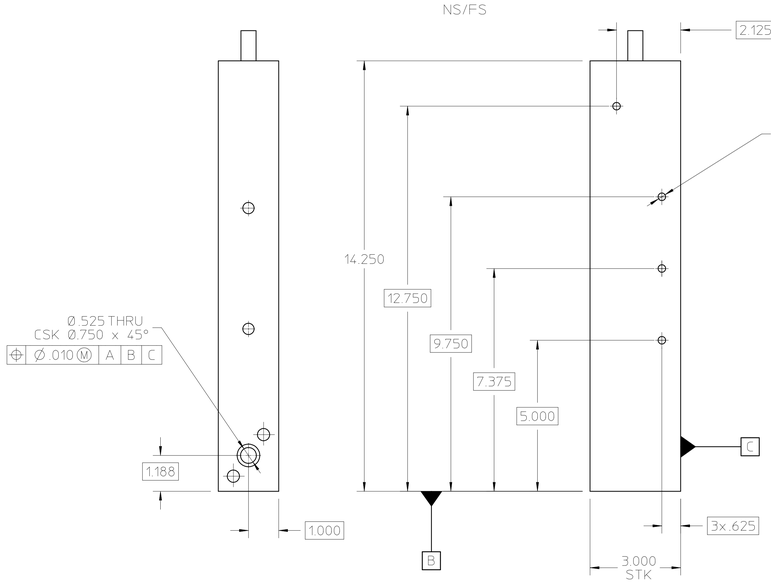
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	ASSY	–		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV
	8212-DB	FE3211	25B2376	

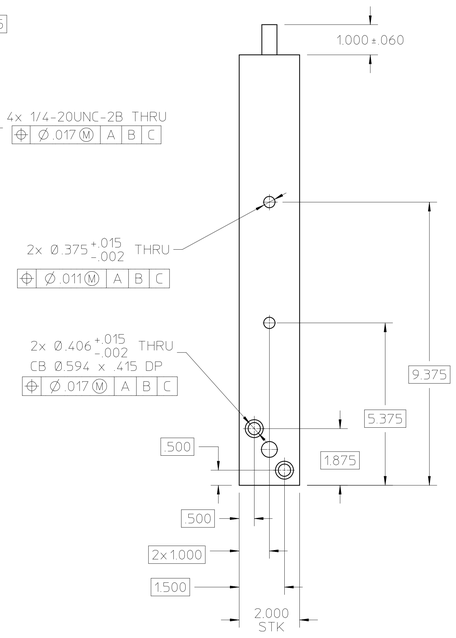


DETAIL ITEM 3

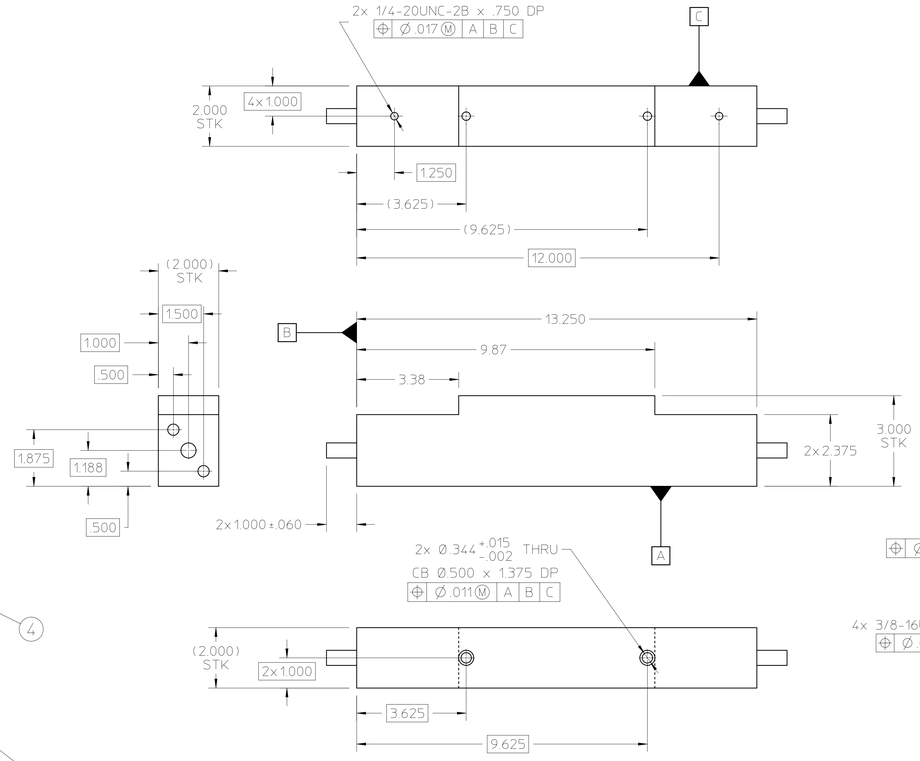


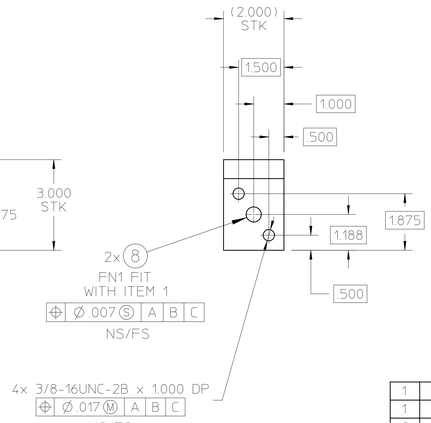






DETAIL ITEM 2





DETAIL ITEM 1

25B2386A

REQD	ITEM	PART NO	DESCRIPTION
1	8		PIN, DOWEL Ø.500 x 1.500 LG, SST
1	7	-7	BAR, FLAT 1.000 THK, Al T6-6061
2	6	-6	BAR, FLAT .500 x 1.500, Al T6-6061
1	5	-5	BAR, SQUARE 2.000, Al T6-6061
2	4	-4	BAR, SQUARE 2.000, Al T6-6061
1	3	-3	BAR, FLAT 3.000 x 2.000, Al T6-6061
2	2	-2	BAR, FLAT 3.000 x 2.000, Al T6-6061
1	1	-1	BAR, FLAT 3.000 x 2.000, Al T6-6061

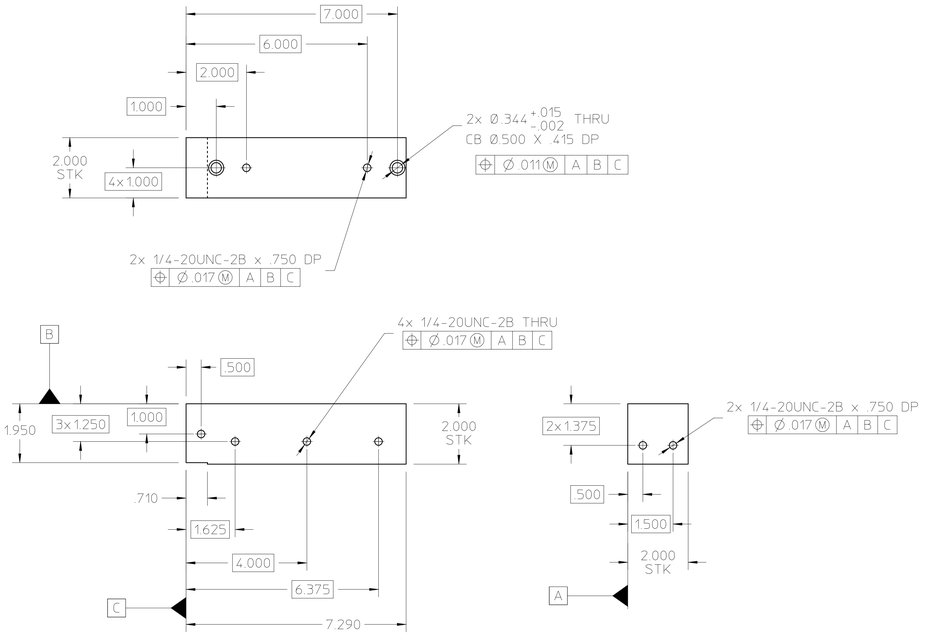
REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

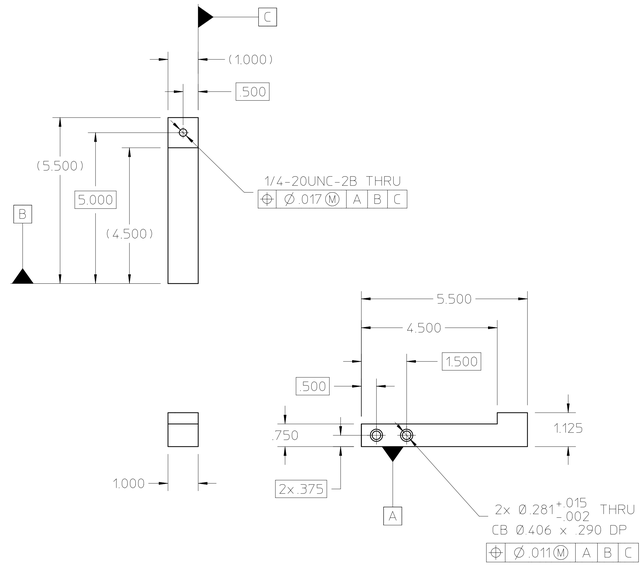
SHOP ORDERS: ACCT NO | SERIAL NO | DATE ISSD | DATE REQD | NO REQD | DELIVER TO
SURFACE TREATMENT: DEGREASE
IDENT METH: TAG
DRN BY: J. GONZALEZ 11-17-99
CHK BY: J. GONZALEZ 11-22-99

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
FRAME-RFQ BRAZEMENT FIXTURE

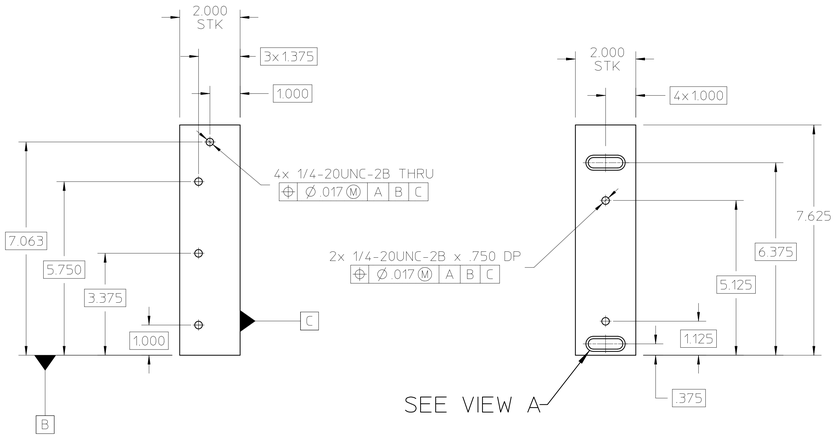
PATENT CLEAR | DWG TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1 : 2 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT NO: 8212-DB | CATEGORY CODE: FE3211 | DWG NO: 25B2386 | SIZE: A | REV:

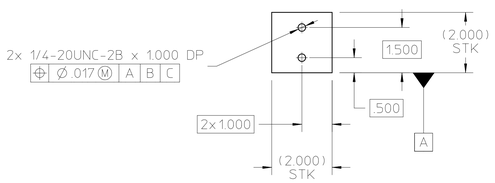


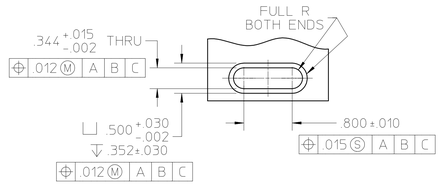
DETAIL ITEM 5



DETAIL ITEM 7



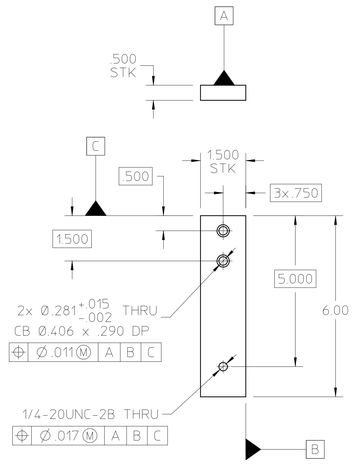




VIEW A

SCALE: 1/1

DETAIL ITEM 4



DETAIL ITEM 6

25B2386A

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED (TOLERANCES): .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63

THREADS ARE CLASS 2. CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS. BREAK EDGES .016 MAX ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE. REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS: ACCT NO. | SERIAL NO. | DATE ISSD | DATE REGD | NO REGD | DELIVER TO

SURFACE TREATMENT: DEGREASE

IDENT METH: TAG

DWG BY: J. GONZALEZ DATE: 11-19-99

CHK BY: J. GONZALEZ DATE: 11-22-99

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ

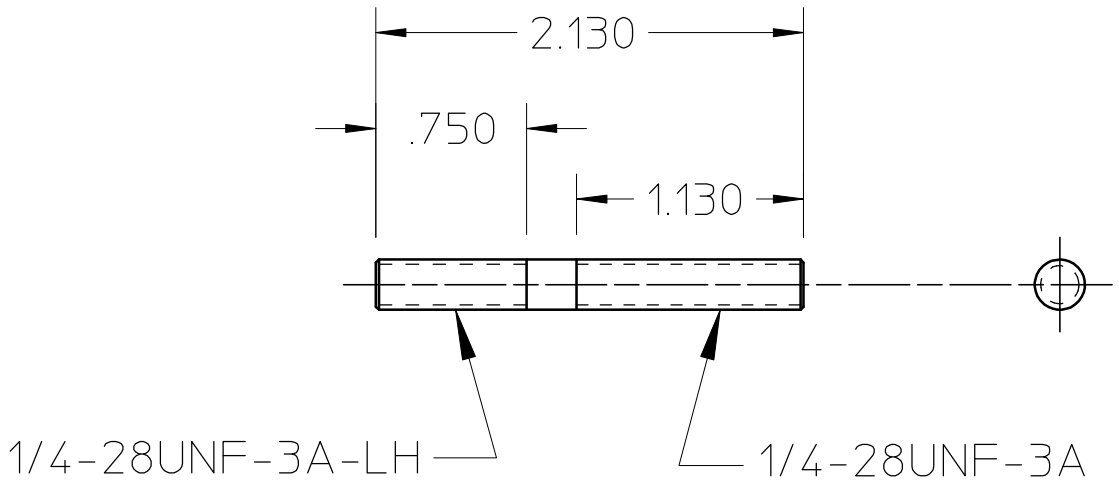
MECHANICAL STRUCTURES

FRAME-RFQ BRAZEMENT FIXTURE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV
	8212-DB	FE3211	25B2386	B

SHT 2 OF 2

Dwg. No. 25B2391A Size A Rev

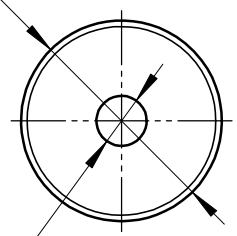


Material 304 SST (OPTIONAL 303 SST)				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ± .1 | .XX ± .025 | .XXX ± .010 | Angles ± .5°				LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FES RFQ			
Account Number –	Finish √ 63			MECHANICAL STRUCTURES			
Date Issued –	Date Reqd –			FRAME ADJUSTMENT, THREADED ROD LH/RH (1/4-28UNF)			
Number Required –	Deliver To –			Shown on Dwg No. 00X0000			
Surface Treatment Degrease	Identific Method Tag			Patent Clear	Category Code FE 32 11	Do not Scale Prints	
Drawn By J. GONZALEZ	Date 11-17-99			Micro-Filmed	Drawing Scale Full	Dwg. No. 25B2391	Size A Rev
Check By J. GONZALEZ	Date 11-22-99			Design Account 8212-DB	Drawing Type Detail		

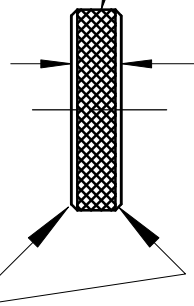
Dwg. No. 25B2401A Size Rev

MEDIUM DIAMOND KNURL (CL I)

Ø1.000 ±.015
BEFORE KNURLING



1/4-28UNF-3B THRU



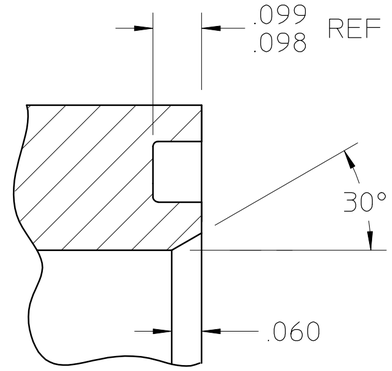
.030 X .030
CHAMFER

Material BRASS				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ± .1 | .XX ± .025 | .XXX ± .010 | Angles ± .5°				LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FES RFQ			
Account Number –	Finish √ 63			MECHANICAL STRUCTURES			
Date Issued –	Date Reqd –			NUT, KNURLED Ø1.00 OD x 1/4-28UNF			
Number Required –	Deliver To –			Shown on Dwg No. 00X0000			
Surface Treatment Degrease	Identific Method Tag			Patent Clear	Category Code FE 32 11	Do not Scale Prints	
Drawn By J. GONZALEZ	Date 11-19-99			Micro-Filmed	Drawing Scale Full	Dwg. No. 25B2401	Size A / Rev
Check By J. GONZALEZ	Date 11-22-99			Design Account 8212-DB	Drawing Type Detail		

REQ	ITEM	PART NUMBER	DESCRIPTION
			BAR, ROUND Ø2.000, BRASS

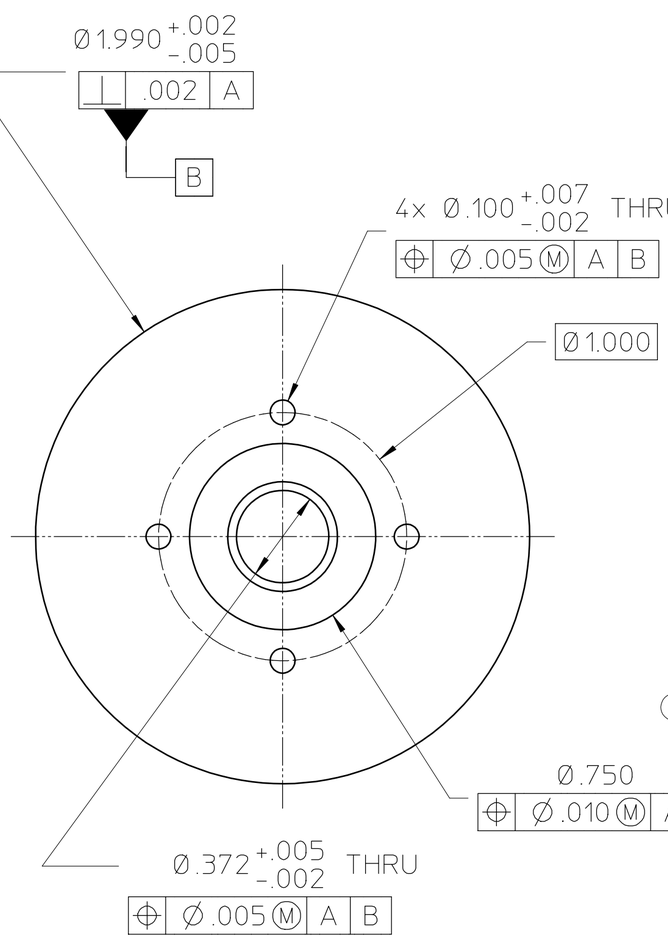
NOTES: UNLESS OTHERWISE SPECIFIED

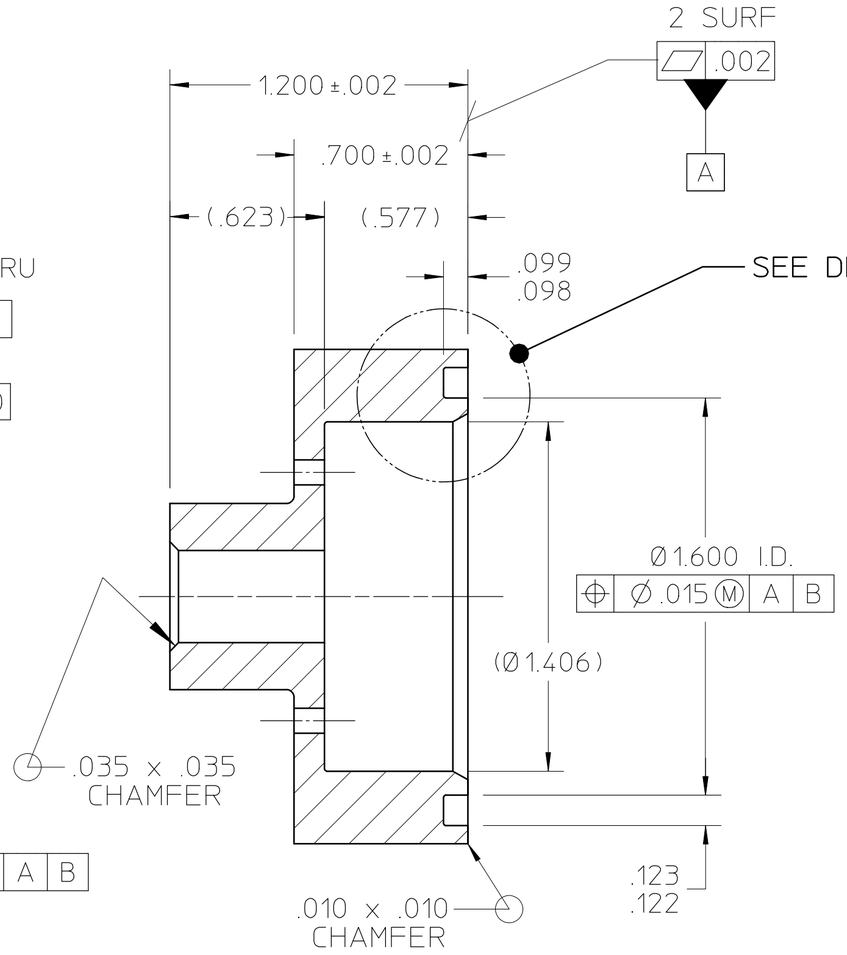
1. ALL INTERNAL RADII .010 MAX.

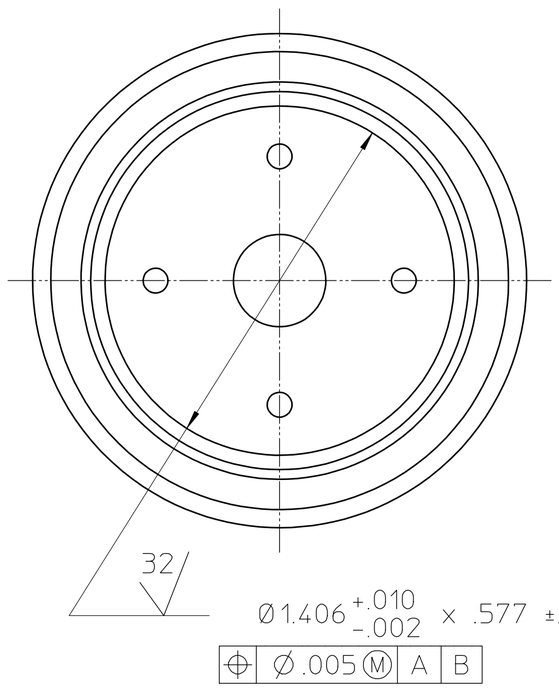


DETAIL A

SCALE: 4/1







25B2423A

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .005 | FINISH 63

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT: DEGREASE
IDENT. METH.: TAG
DWG. BY: J. GONZALEZ | DATE: 12-01-99
CHK. BY: - | DATE: 00-00-00

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

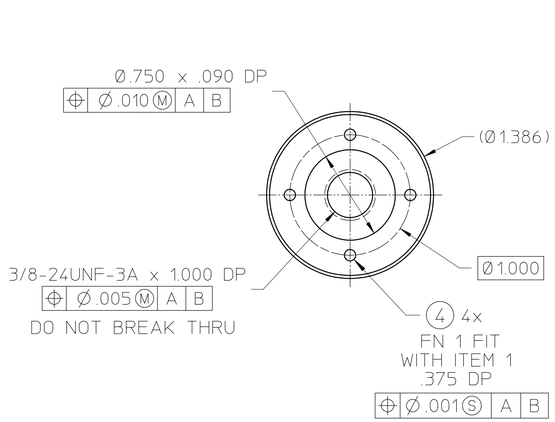
SNS-FES RFQ

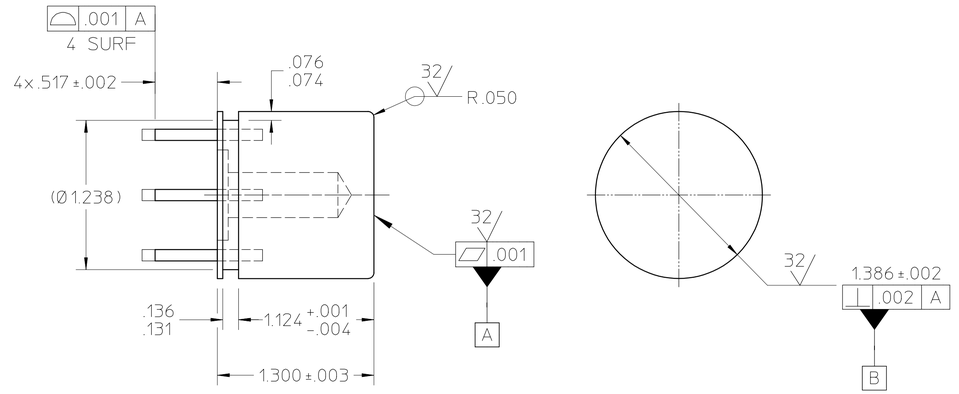
MECHANICAL STRUCTURES

CAP, TUNER

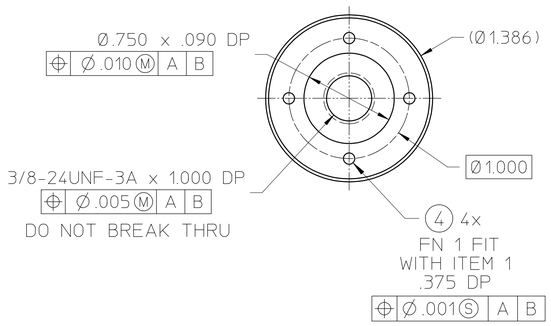
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 2 : 1	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B2423	SIZE A / REV.
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211		

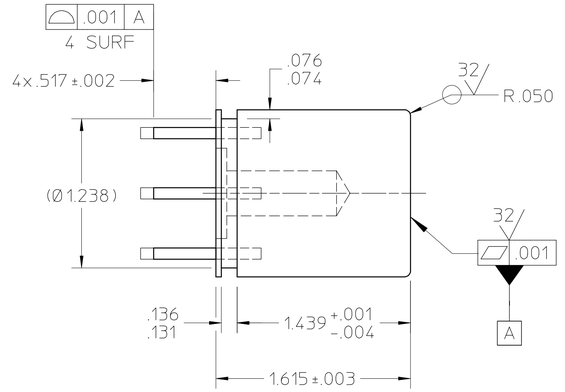
REQ	ITEM	PART NUMBER	DESCRIPTION
	1	-1	BAR, ROUND Ø1.500, BRASS (UNS C36000)
	2	-2	BAR, ROUND Ø1.500, BRASS (UNS C36000)
	3	-3	BAR, ROUND Ø1.500, BRASS (UNS C36000)
AR	4		PIN, DOWEL, 3/32 DIA x 1.000 LG, 18-8 SST

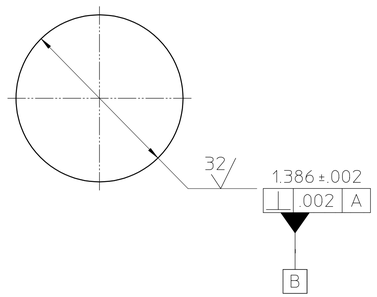




DETAIL ITEM 1

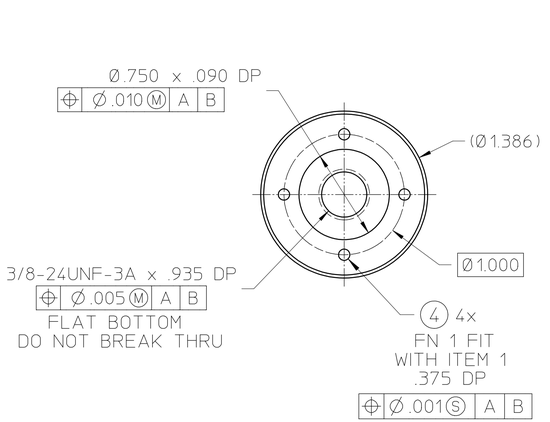


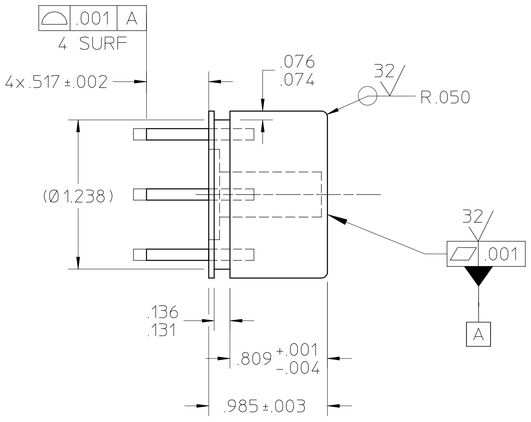


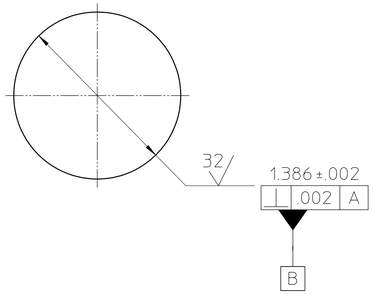


DETAIL ITEM 2

25B2434A







DETAIL ITEM 3

NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL INTERNAL RADII .010 MAX.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- .X ± .1 — FRAC. ±1/64
- .XX ± .01 — ANGLES ±1°
- .XXX ± .005 — FINISH 63

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO.		SERIAL NO.	
DATE ISSD.	DATE REQD.	NO. REQD.	
DELIVER TO			
SURFACE TREATMENT	DEGREASE		
IDENT. METH.	TAG		
DWG. BY	J. GONZALEZ	DATE	12-03-99
CHK. BY	-	DATE	00-00-00

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ

MECHANICAL STRUCTURES

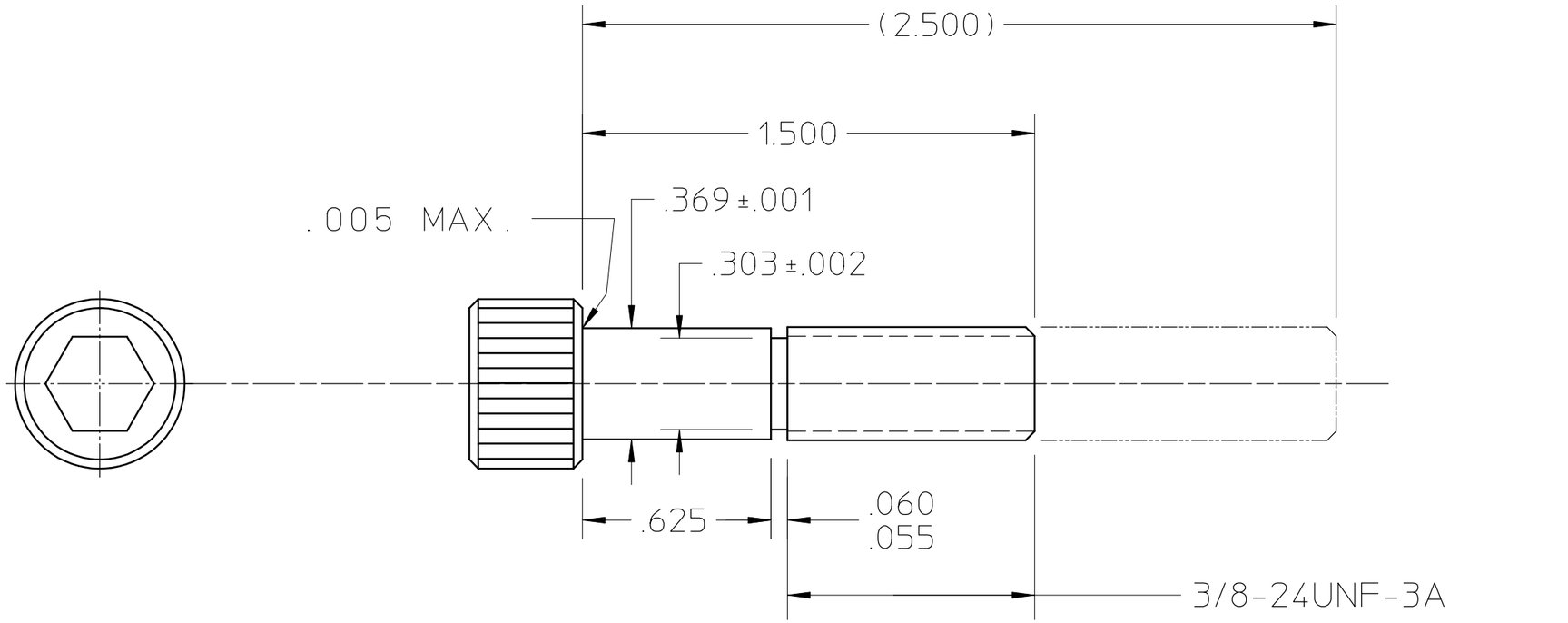
TUNER

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B2434	A

25B2442B	REQD	ITEM	PART NUMBER	DESCRIPTION
				SCR, SCH 3/8-24UNF x 2.500 LG, SST

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL INTERNAL RADII .005 MAX.



REV	DWN	CHK	DATE	DESCRIPTION
B	MDH		3-12-01	ADDED .369 DIM.

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY J. GONZALEZ		DATE 12-01-99
CHK BY -		DATE 00-00-00

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

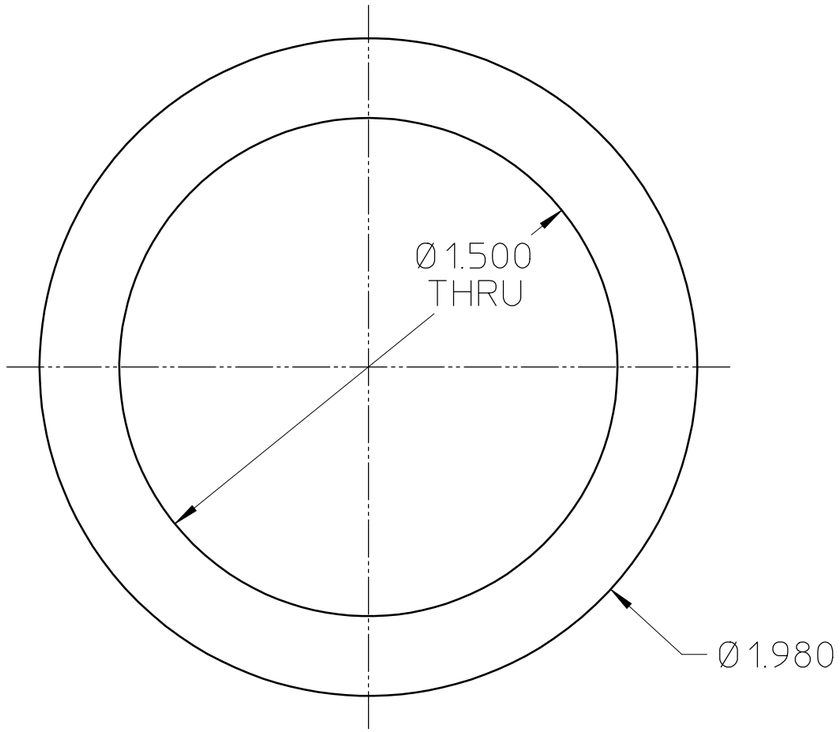
SNS-FES RFQ

MECHANICAL STRUCTURES

SCREW, TUNER ADJUSTMENT

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 2:1
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8212-DB	FE3211	25B2442B

25B2452A	REQD	ITEM	PART NUMBER	DESCRIPTION
				SHEET, .010 THK, BRASS



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY J. GONZALEZ		DATE 12-05-99
CHK BY -		DATE 00-00-00

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

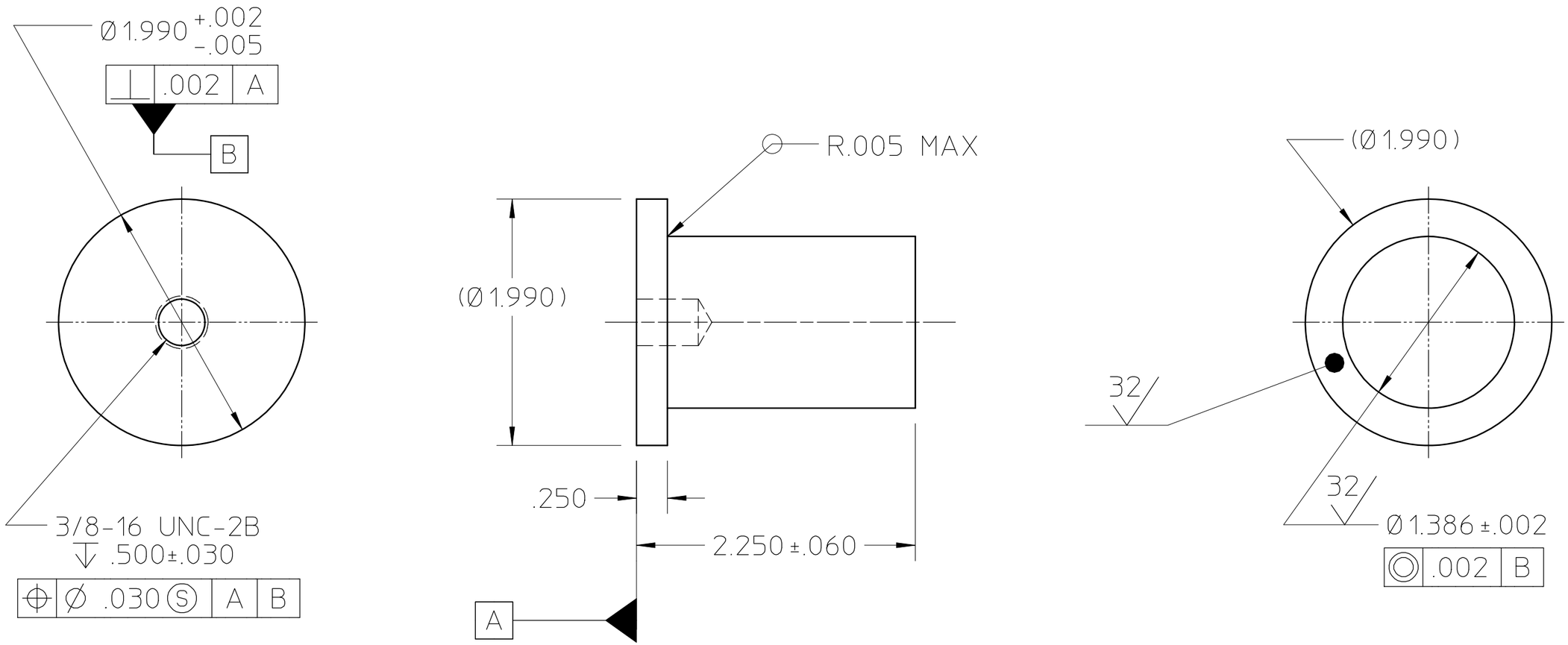
SNS-FES RFQ

MECHANICAL STRUCTURES

SHIM, TUNER

PAT CLEAR	DWG TYPE DETAIL	SHOWN ON 00X0000	SCALE: 2:1
			DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B2452A REV

25B2462A	REQD	ITEM	PART NUMBER	DESCRIPTION
				BAR, ROUND Ø2.000, COPPER C10100



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 63 √

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.

SHOP ORDERS

ACCT NO	SER NO		
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT	DEGREASE		
IDENTIFIC METHOD	TAG		
DWG BY	J. GONZALEZ	DATE	12-15-99
CHK BY		DATE	

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ

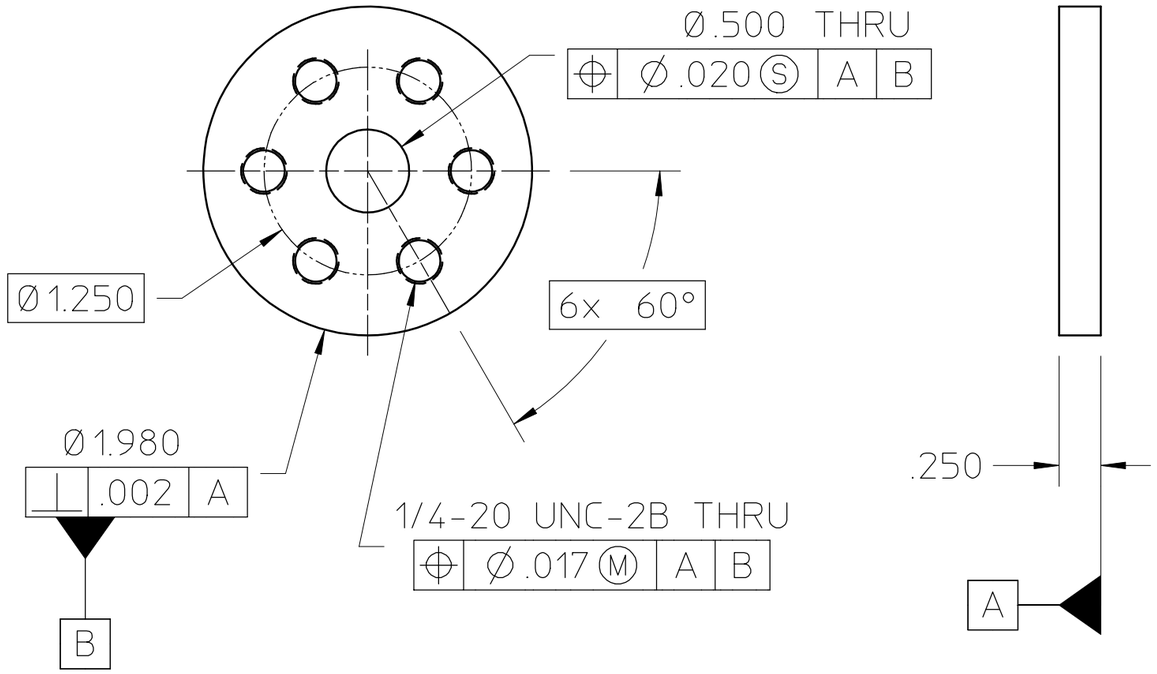
MECHANICAL STRUCTURES

BLANK, TUNER

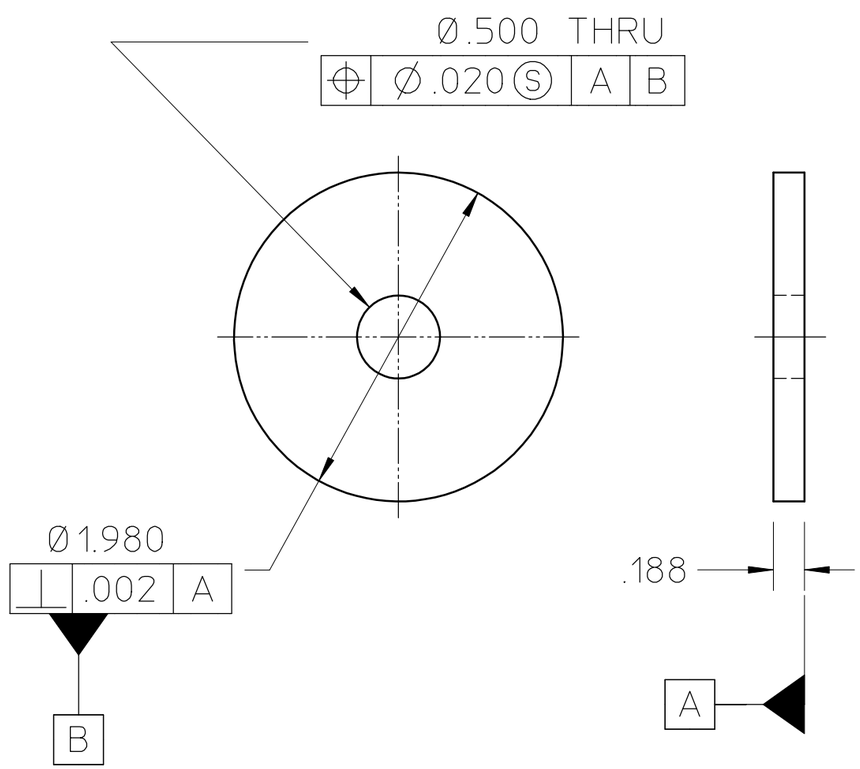
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B2462A

NOTES: UNLESS OTHERWISE SPECIFIED.

25B2472B	REQD	ITEM	PART NUMBER	DESCRIPTION
	AR	1	-1	BAR, ROUND Ø2.000 (OR PLATE, FLAT .250 THK), 304 SST
	AR	2	-2	BAR, ROUND Ø2.000 (OR PLATE, FLAT 3/16 THK), 304 SST



DETAIL ITEM 1



DETAIL ITEM 2

REV	DWN	CHK	DATE	DESCRIPTION
B	MDH		11-22-00	DELETED SLOT

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO | SER NO

DATE ISSD | DATE REQD | NO REQD

DELIVER TO

SURFACE TREATMENT: DEGREASE

IDENTIFIC METHOD: TAG

DWG BY: J. GONZALEZ | DATE: 12-15-99

CHK BY | DATE

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

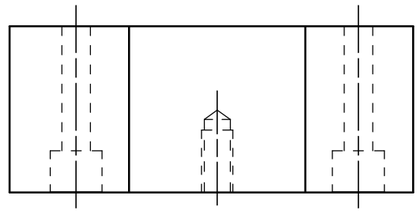
SNS-FE RFQ

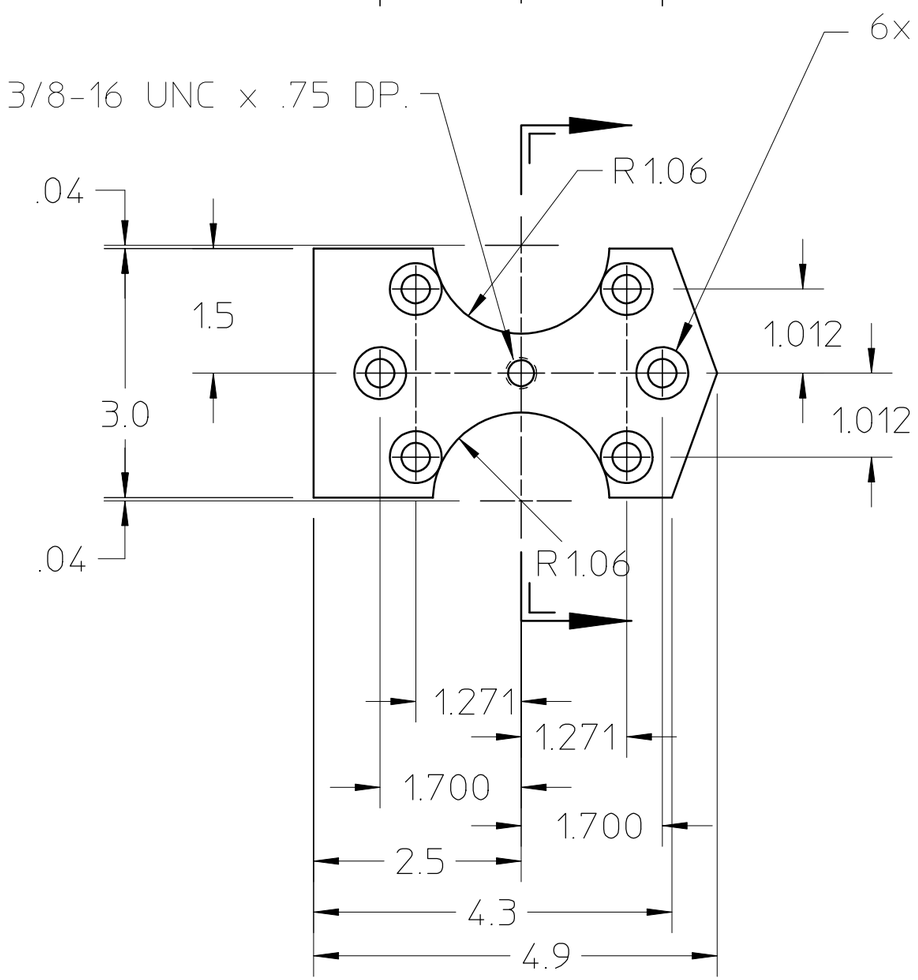
MECHANICAL STRUCTURES

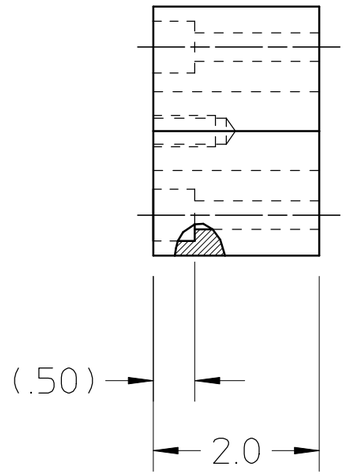
RETAINING DISKS, TUNER

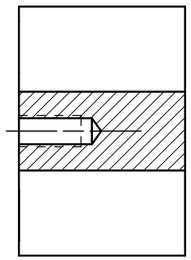
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8212-DB	FE3211	25B2472B

25B2552A	REQD	ITEM	PART NUMBER	DESCRIPTION
				MILD STEEL









SECTION VIEW

BREAK ALL EDGES AND CORNERS.

DIMENSIONS ARE IN INCHES.

REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		3-5-01	4.9 WAS 5.0, ADDED 4.3 DIM

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO | SER NO

DATE ISSD | DATE REQD | NO REQD

DELIVER TO

SURFACE TREATMENT: FLASH NICKLE PLATE

IDENTIFIC METHOD

DWG BY: Matt Hoff | DATE: 11-22-99

CHK BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ

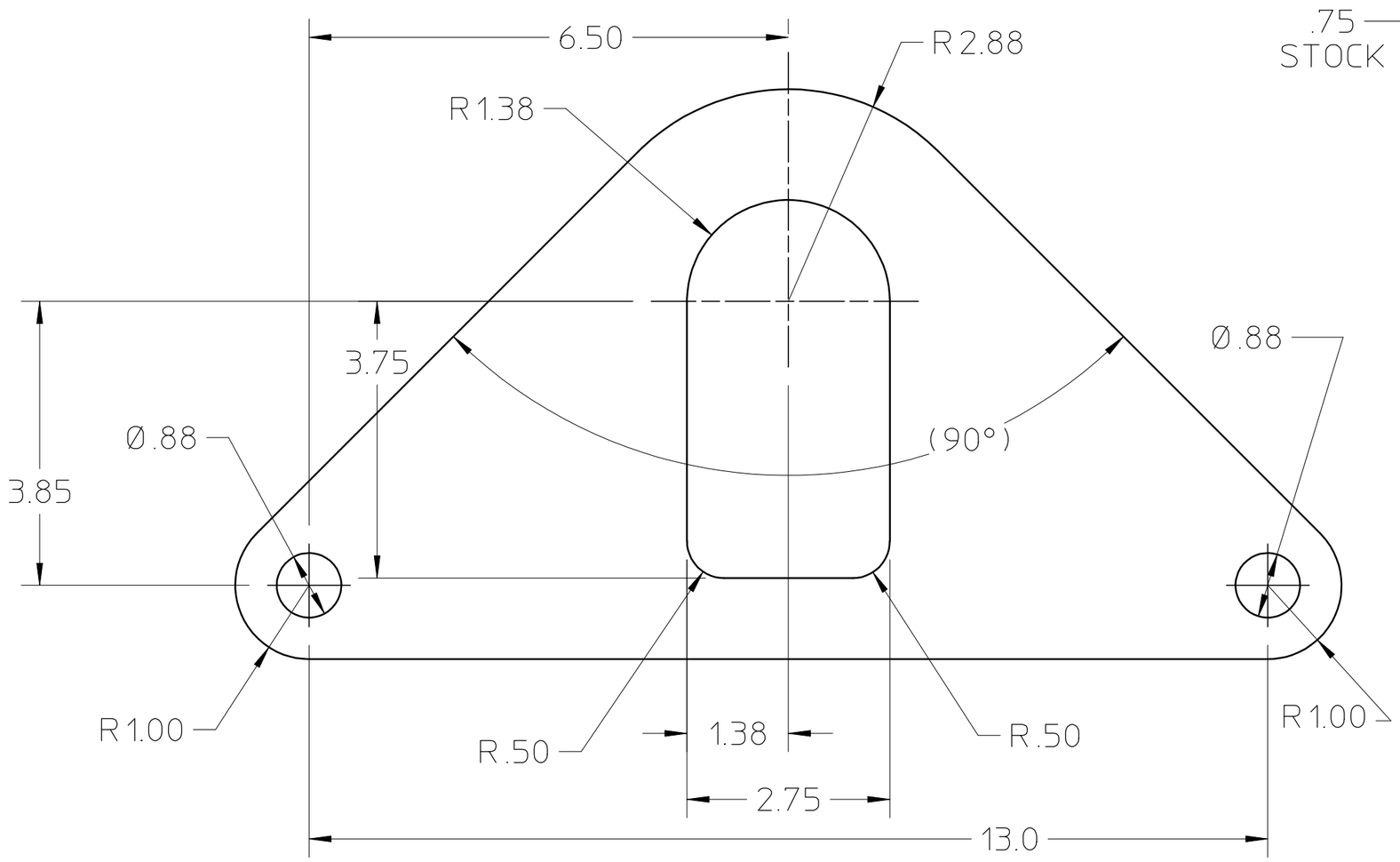
MECHANICAL STRUCTURES

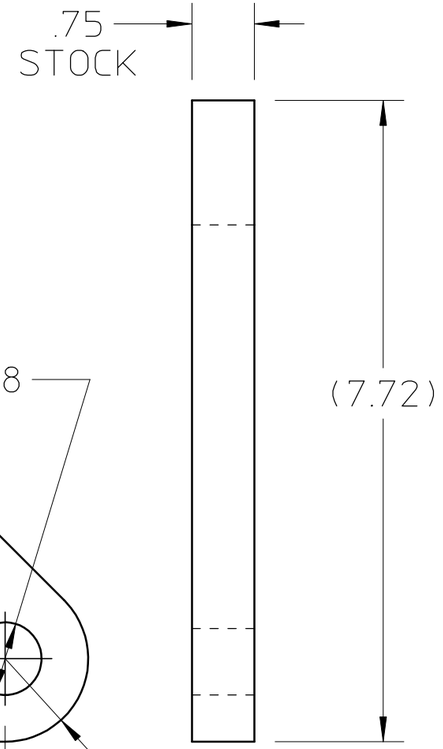
ALPHA MODULE LIFTING LUG

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8212-DB	FE3211	25B2552A

25B2562	REQD	ITEM	PART NUMBER	DESCRIPTION
				MILD STEEL

STAMP ON BOTH SIDES
OF SPREADER BAR:
"MAX. LOAD 1000 LBS."





BREAK ALL EDGES AND CORNERS.

DIMENSIONS ARE IN INCHES.

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY Matt Hoff		DATE 11-22-99
CHK BY		DATE

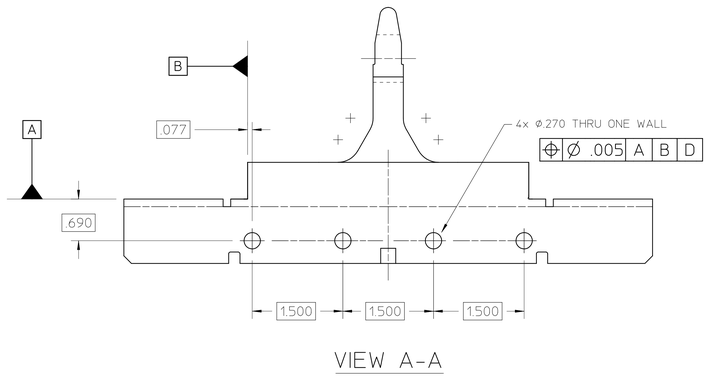
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ

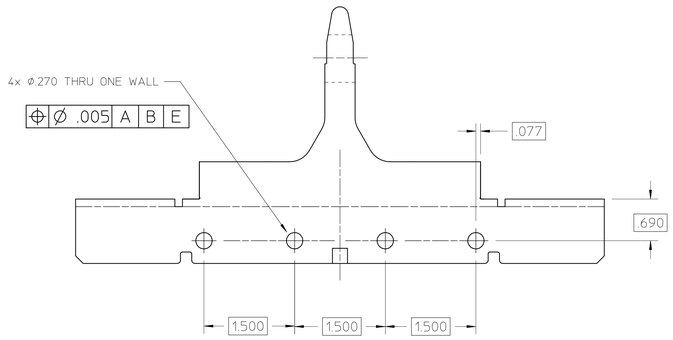
MECHANICAL STRUCTURES

ALPHA MODULE LIFTING SPREADER BAR

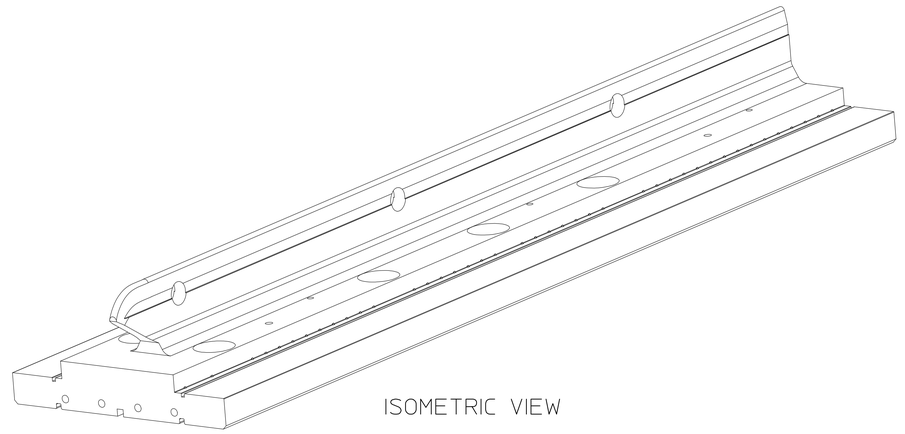
PAT CLEAR	DWG TYPE DETAIL	SHOWN ON 00X0000	SCALE: 1:2 DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B2562 REV



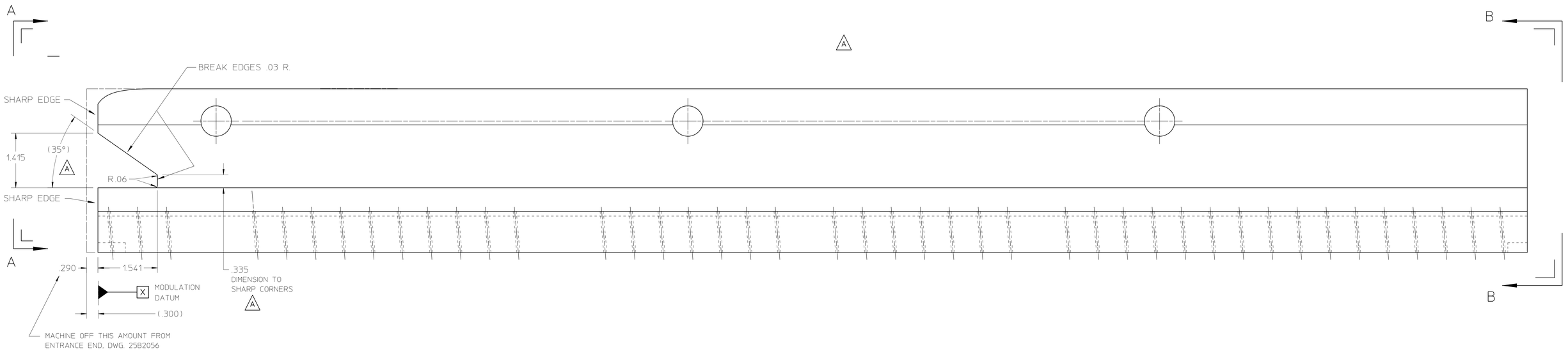
VIEW A-A

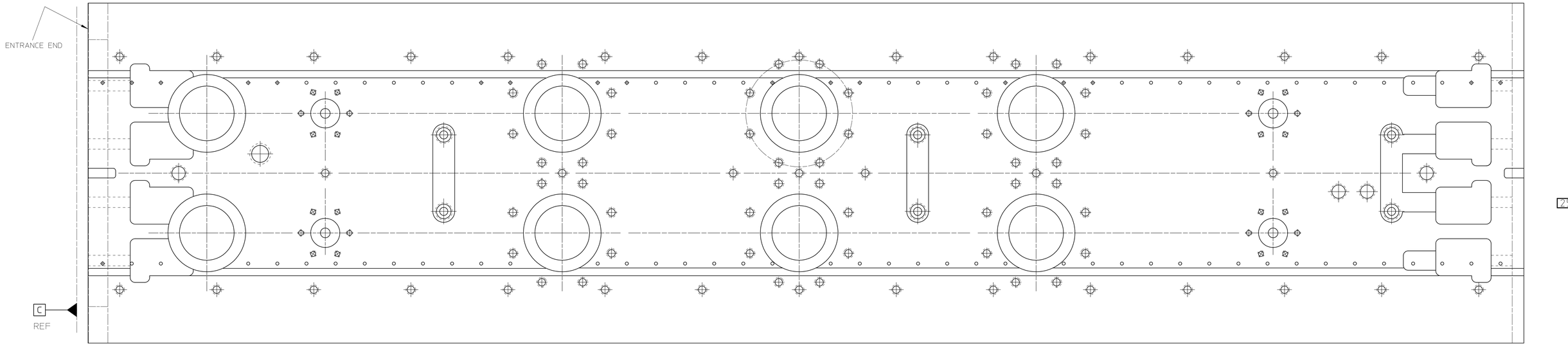


VIEW B-B



ISOMETRIC VIEW





25B2576A

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 150 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		C-8	12-14-99	35° was 32.5°, .355 was .304, deleted 36.686

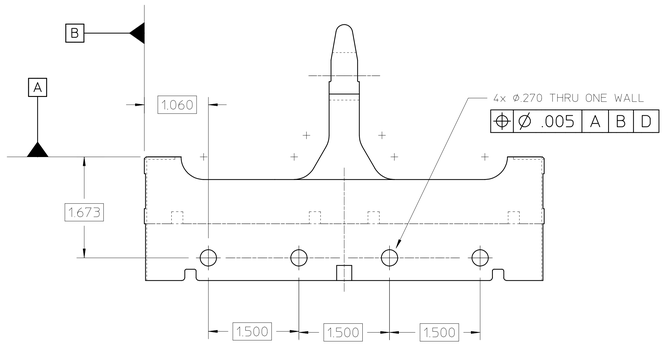
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .003 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE: 12-01-99
CHK. BY
DATE

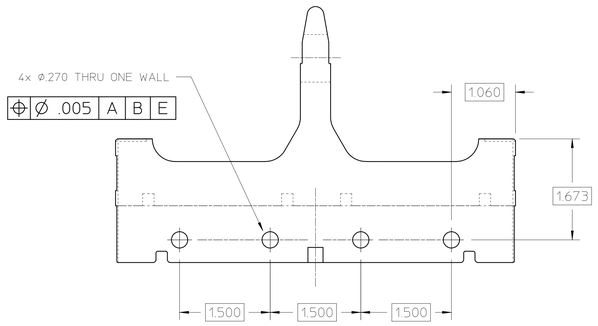
REQD	ITEM	PART NO.	DESCRIPTION
		25B2056	ALPHA MODULE MAJOR VANE FINISH MACHINING

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MAJOR VANE CUTBACK MACHINING

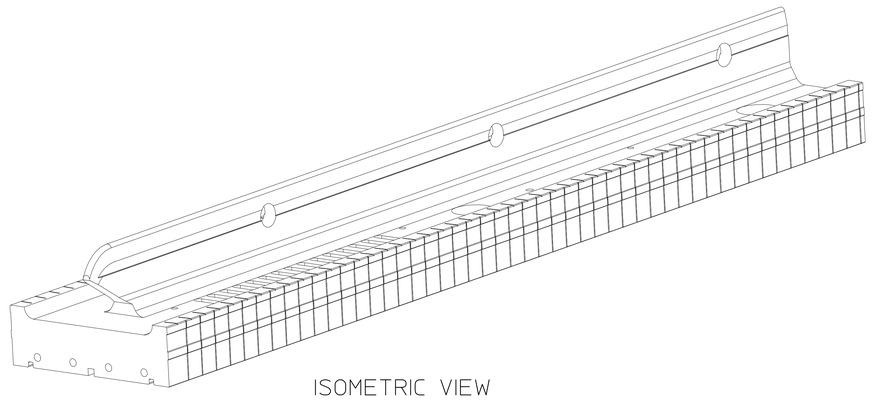
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B2576	SIZE A / REV.
MICROFILMED	DESIGN ACCT NO. 8212-DB	CATEGORY CODE FE3211		



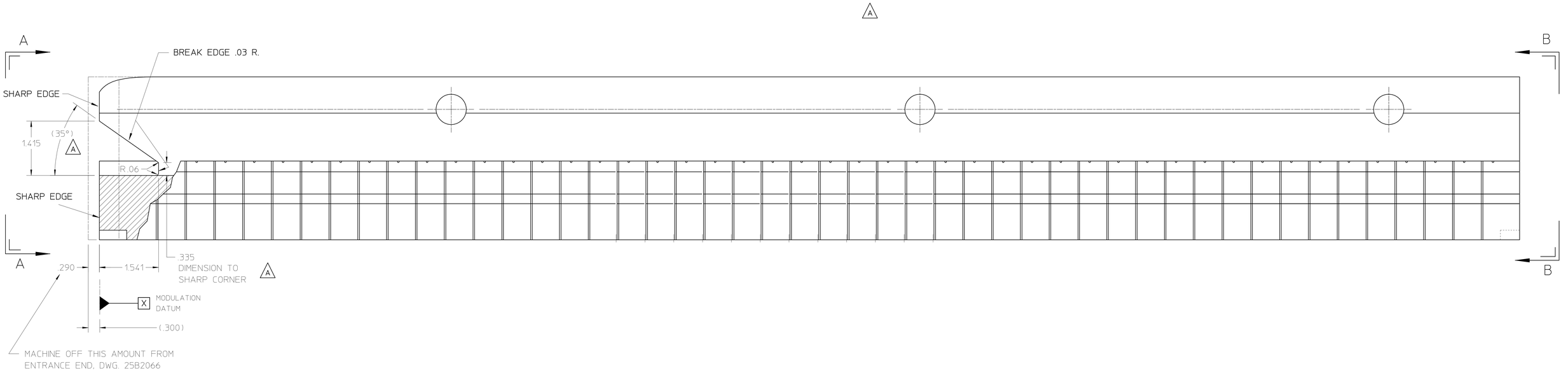
VIEW A-A

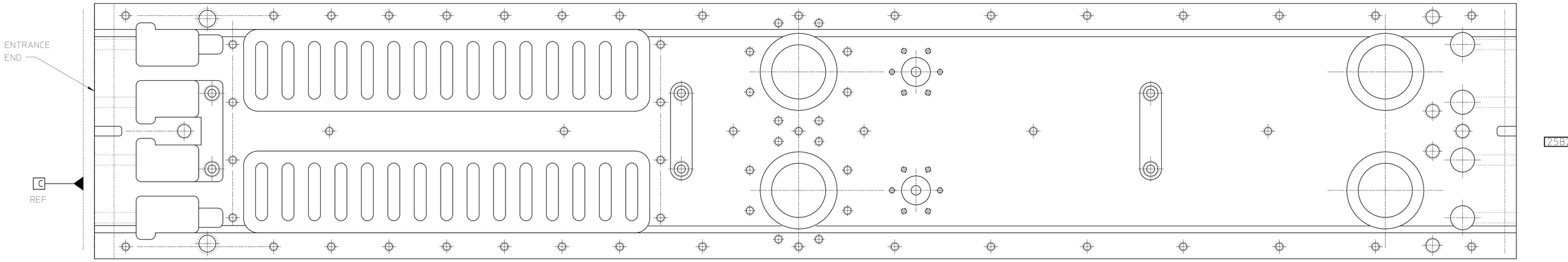


VIEW B-B



ISOMETRIC VIEW





25B2586A

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 142 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		C-8	12-15-99	35° was 32.5°. .335 was .304. deleted 36.686

REQD	ITEM	PART NO.	DESCRIPTION
		25B2066	ALPHA MODULE MINOR VANE FINISH MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .003 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

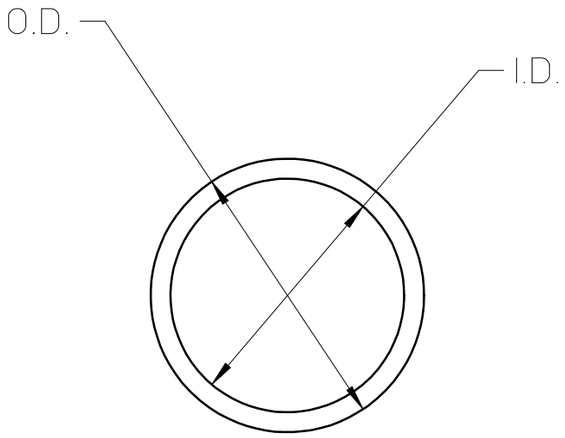
SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE RECD | NO. RECD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF | DATE: 12-01-99
CHK. BY: | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MINOR VANE CUTBACK MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B2586	A

25B2592B	REQD	ITEM	PART NUMBER	DESCRIPTION
				.010 THICK TIN (Sn) ASTM Grade A
				This Tin is >99.9% pure. Purchased from:
				Alcoa Foil Products, St. Louis, Mo. (Alumax Foils Inc.)



	I.D.	O.D.	
VERSION 1	ø 1.410 ±.003	ø 1.650 ±.003	(TUNERS)
VERSION 2	ø .255 ±.003	ø .495 ±.003	(SENSING LOOPS)
VERSION 3	ø 1.500 ±.003	ø 1.990 ±.003	(DRIVE LOOPS)
VERSION 4	ø 3.220 ±.003	ø 3.520 ±.003	(WINDOWS)

BREAK ALL EDGES AND CORNERS.

DIMENSIONS ARE IN INCHES.

REV	DWN	CHK	DATE	DESCRIPTION
B	MDH		12-12-01	ADDED version 4
A	MDH		7-5-01	ADDED REV. 3

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY Matt Hoff		DATE 12-08-99
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

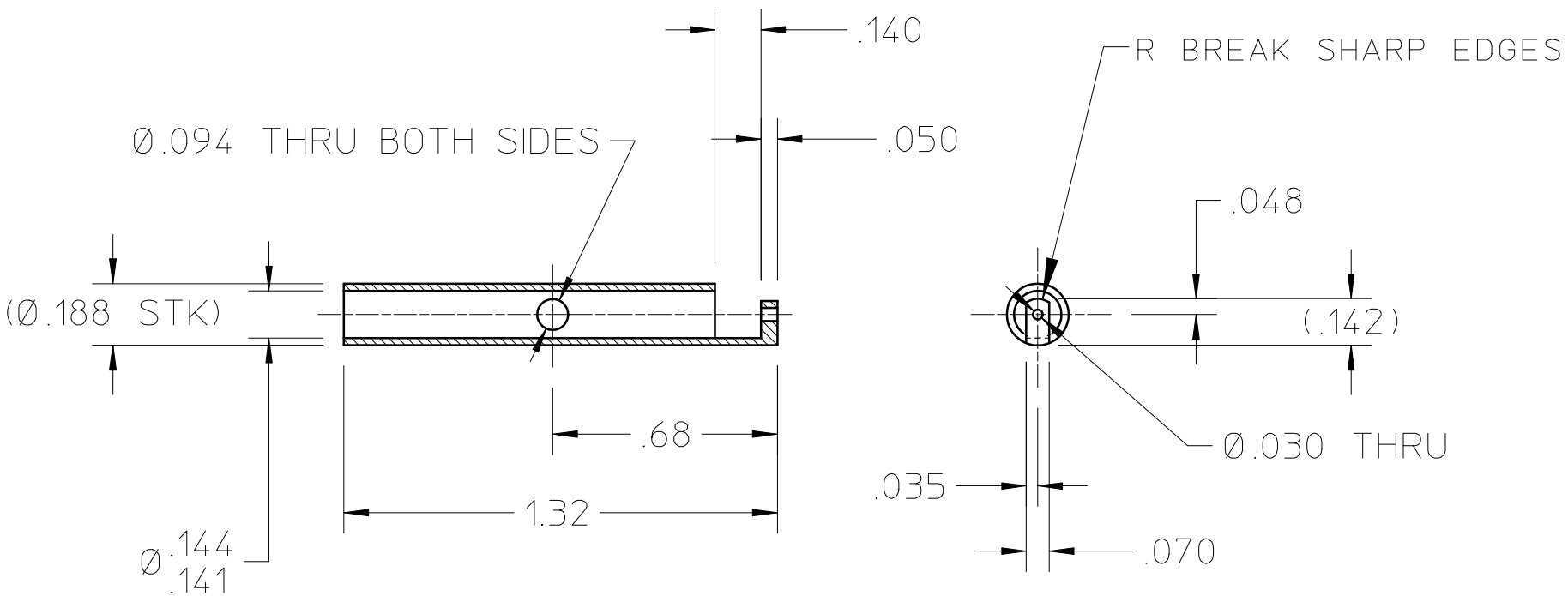
SNS FES RFQ

MECHANICAL STRUCTURES

ALPHA MODULE TIN SEAL

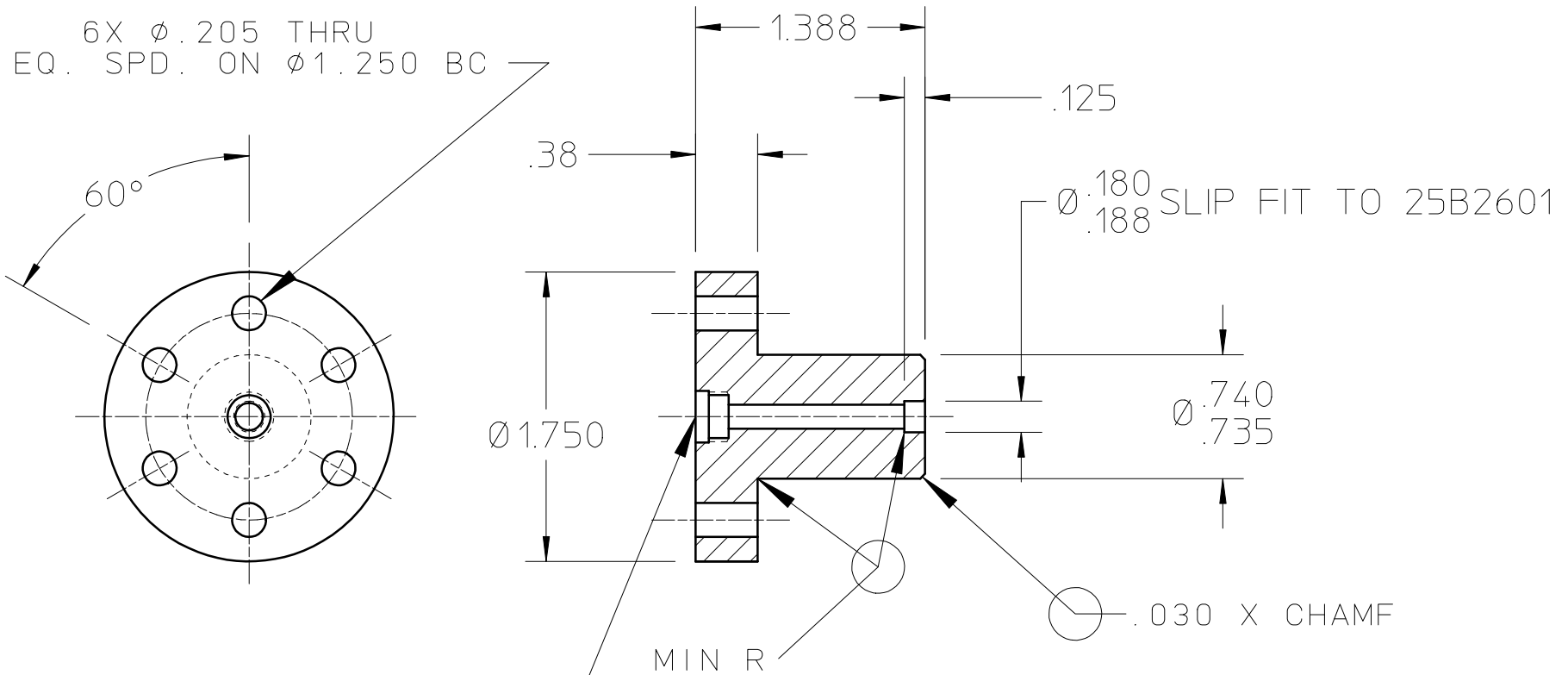
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: NTS
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B2592B

Dwg. No. 25B2601 Size Rev

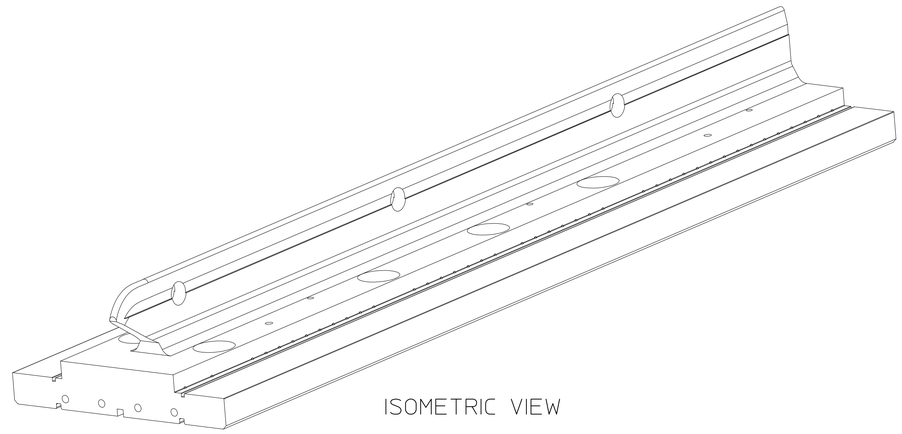


Material - .188 DIA BRASS ROD				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ±	.XX ± .010	.XXX ± .005	Angles ± .5°	LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California - Berkeley			
				SNS-FES RFQ			
Account Number -	Finish √ 125			MECHANICAL STRUCTURES			
Date Issued -	Date Reqd -			TUBE, SENSOR LOOP			
Number Required -	Deliver To -			Shown on Dwg No			
Surface Treatment Degrease	Identific Method Tag			Patent Clear	Category Code FE 32 11	Do not Scale Prints	
Drawn By J.M.PRUYN	Date 12/7/99			Micro-Filmed	Drawing Scale 2X	Dwg. No. 25B2601	Size Rev
Check By S.VIROSTEK	Date 12/8/99			Design Account 8212D1	Drawing Type Detail		

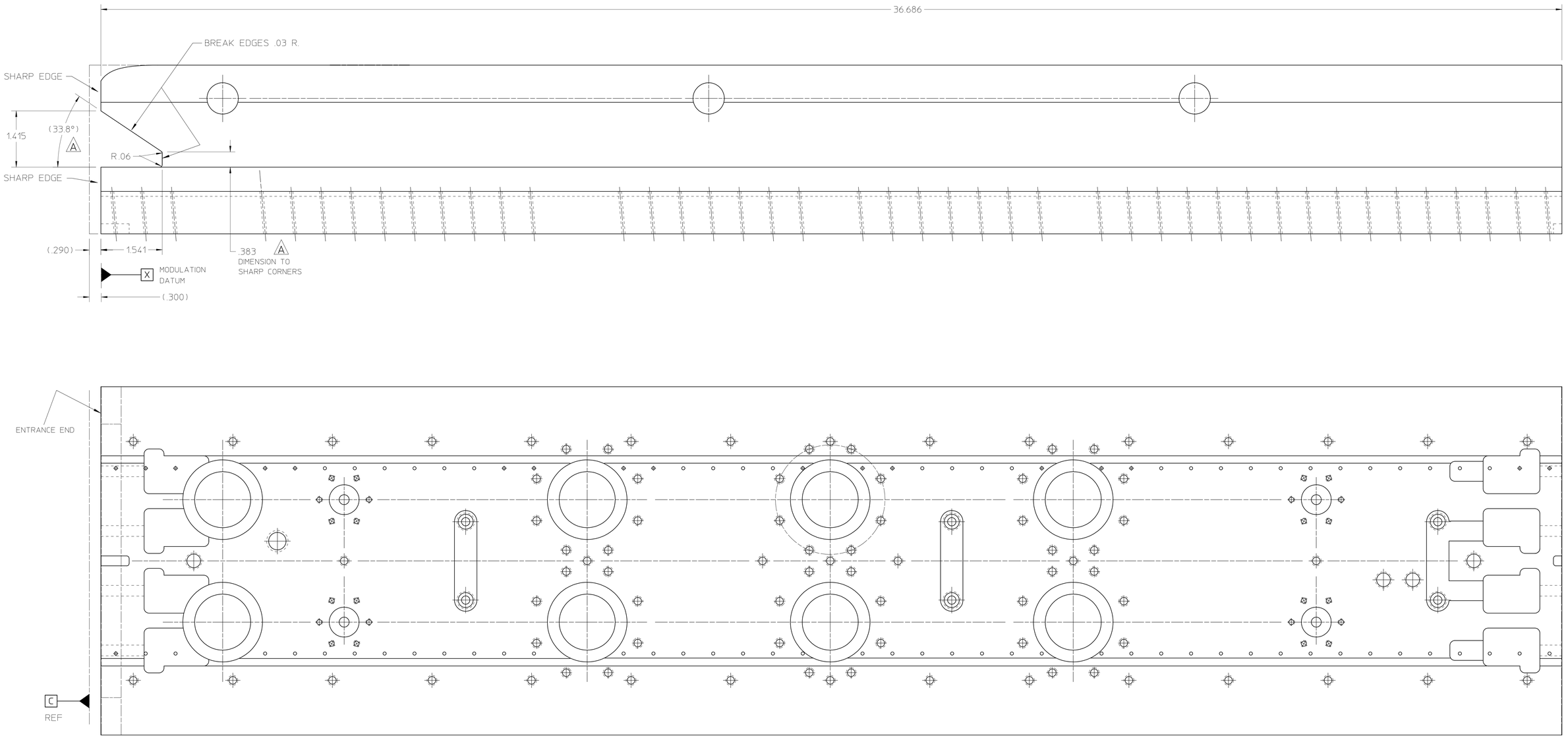
Dwg. No. 25B2611 Size Rev



Material - BRASS ROD				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ± .1 | .XX ± .010 | .XXX ± .005 | Angles ± .5°				LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FES RFQ			
Account Number -	Finish √ 125			MECHANICAL STRUCTURES			
Date Issued -	Date Read -			BODY - SENSOR LOOP			
Number Required -	Deliver To -	Shown on Dwg No.					
Surface Treatment Degrease	Identific Method Tag	Patent Clear	Category Code FE3211	Do not Scale Prints			
Drawn By J.M.PRUYN	Date 12/7/99	Micro-Filmed	Drawing Scale 2X	Dwg. No. 25B2611	Size	Rev	
Check By S.VIROSTEK	Date 12/8/99	Design Account 8212D1	Drawing Type Detail				



ISOMETRIC VIEW



25B2626A

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 150 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		C-8	2-14-00	383 WAS .404, (33.8) WAS (33.3)

REQD	ITEM	PART NO.	DESCRIPTION
		25B2576	ALPHA MODULE MAJOR VANE CUTBACK MACHINING

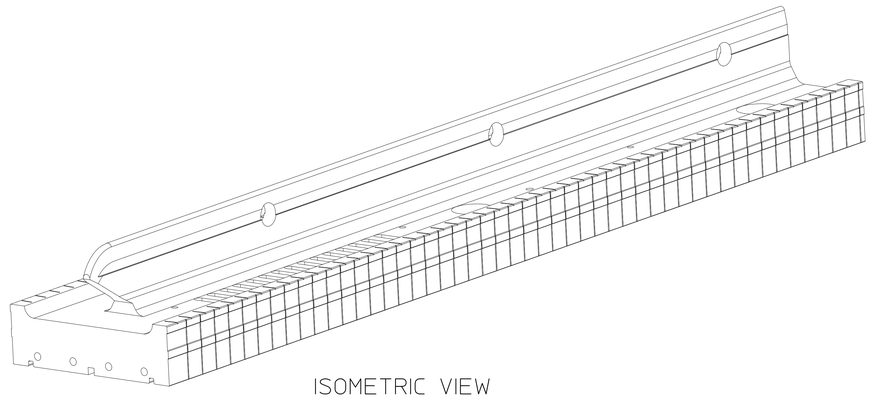
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .003 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF DATE 12-17-99
CHK. BY DATE

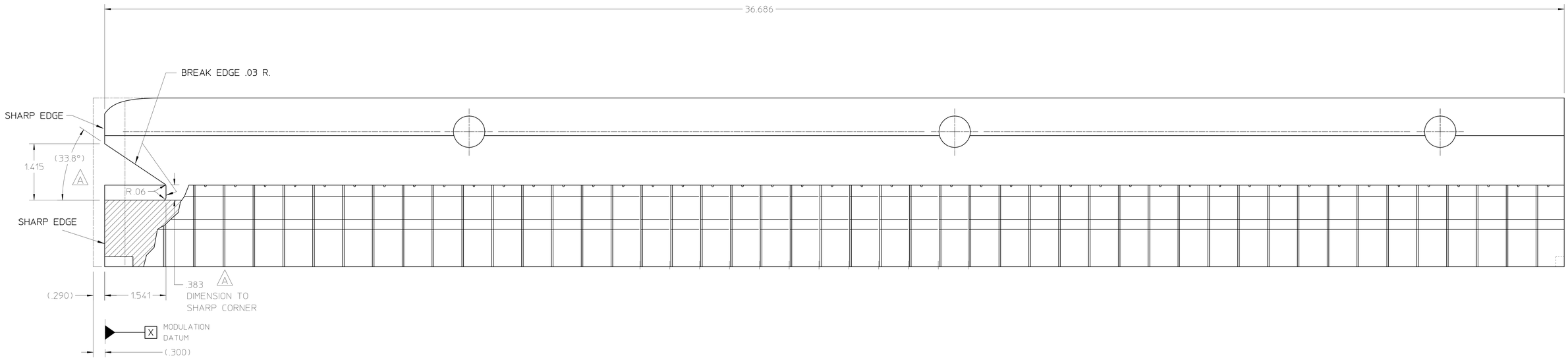
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

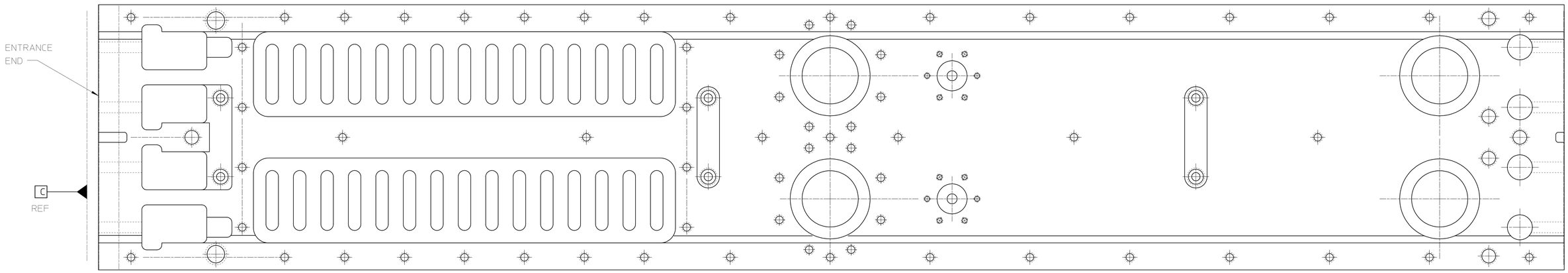
SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MAJOR VANE FINISH TRIM

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B2626	A



ISOMETRIC VIEW





25B2636A

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 142 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		C-8	2-4-00	.383 WAS .404. (33.8) WAS (33.3)

REQD	ITEM	PART NO.	DESCRIPTION
		25B2586	ALPHA MODULE MINOR VANE CUTBACK MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .003 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS MILD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE RECD
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY MATT HOFF
DATE 12-17-99
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE MINOR VANE FINISH TRIM

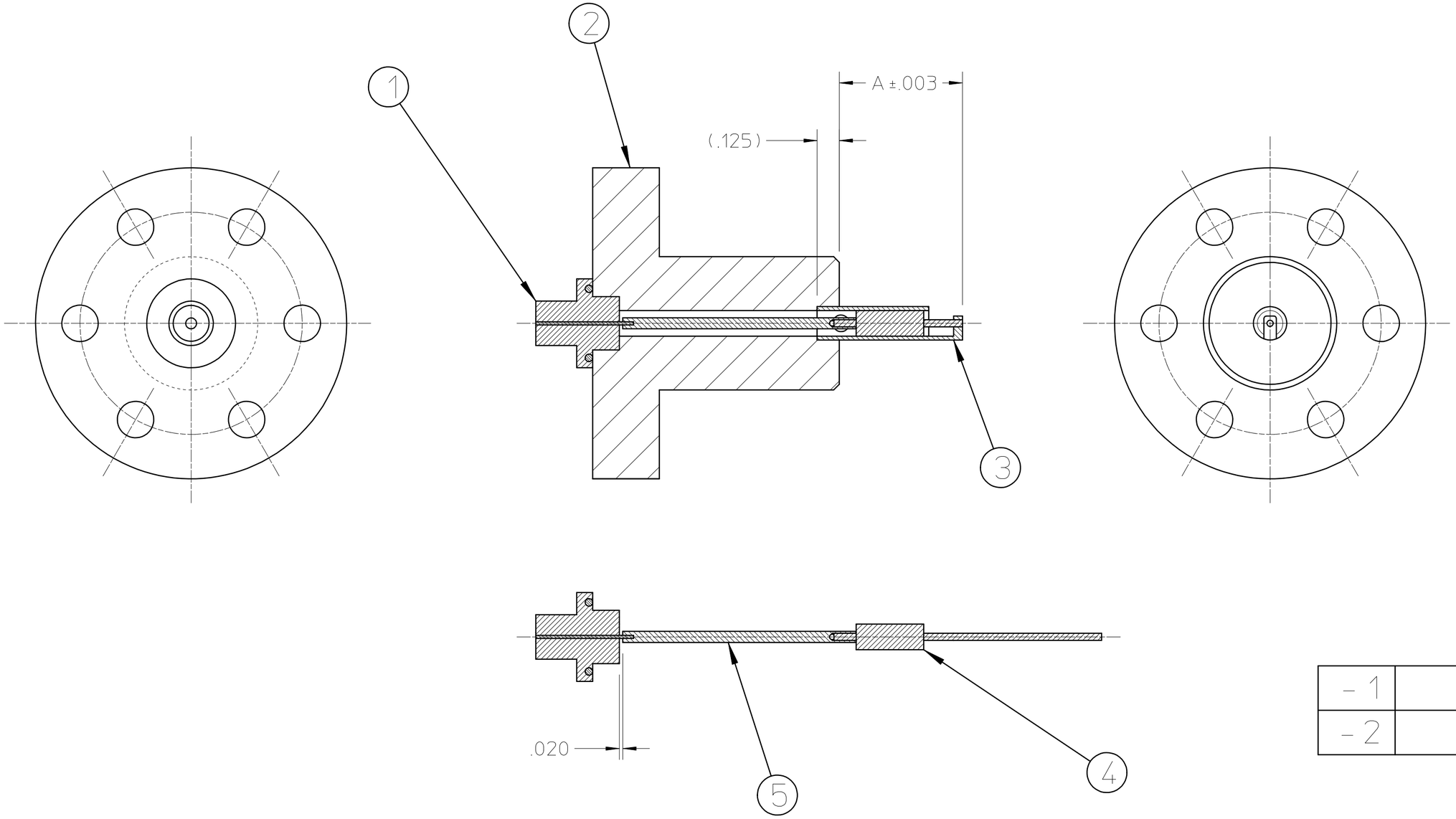
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B2636	A

NOTE:

1) SOLDER WITH ACID FREE SOLDER
2) COMPLETELY REMOVE ALL TRACES OF FLUX

REQ	ITEM	PART NUMBER	DESCRIPTION
	1	25B2661	CONNECTOR
	2	25B2611	BODY
	3	25B2601	TUBE
	4	✳	RESISTOR
	5	25B2651	CENTER PIN

✳ RESISTOR: 1/2 WATT, 51 OHMS, 5% TOL
NEWARK NO: 10N532 TYPE:RC1/2G510JT



A	
-1	.693
-2	

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ±.01°; .XXX ± .001 FINISH 125√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT: DEGREASE
IDENT. METH.: TAG
DWG. BY: J.M.PRUYN DATE: 12/20/99
CHK. BY: S.VIROSTEK DATE: 12/21/99

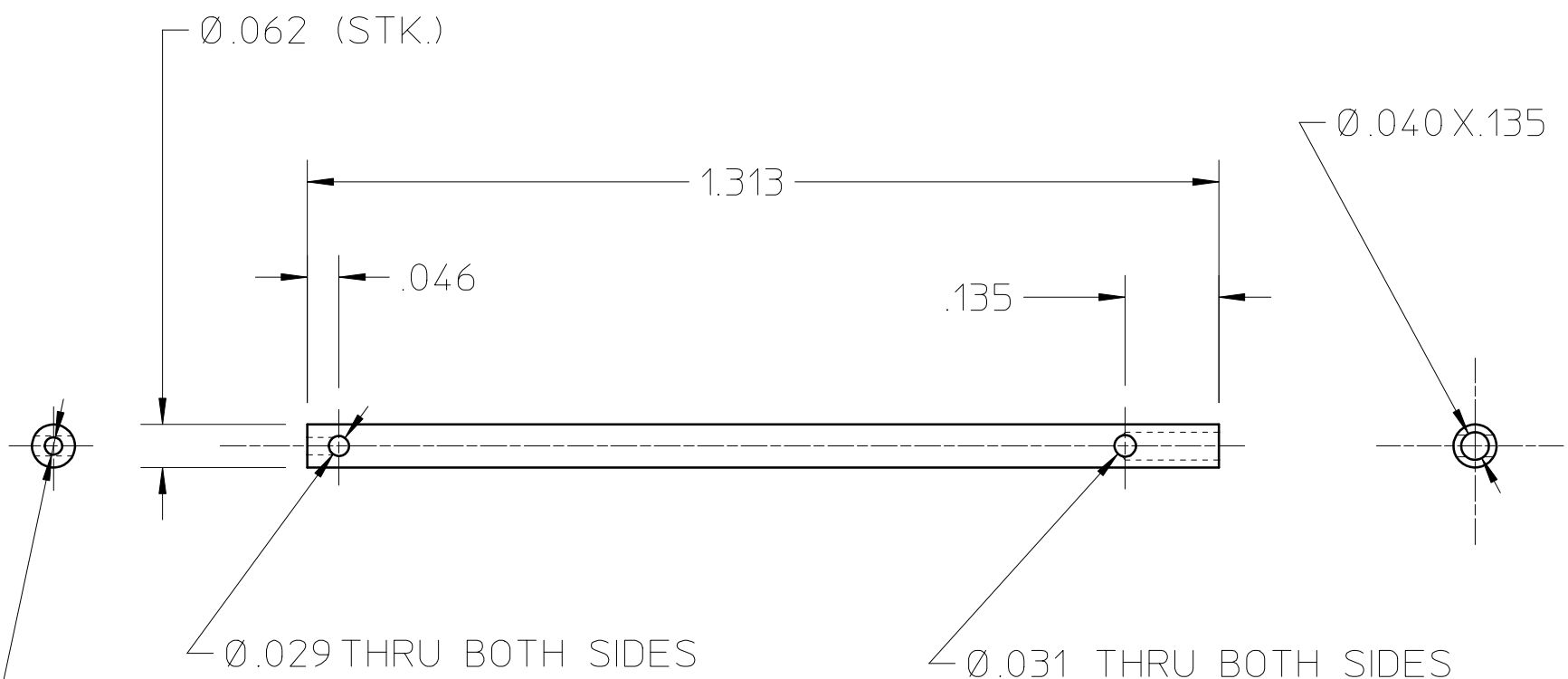
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
ASSEMBLY - SENSOR LOOP

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 2X	DO NOT SCALE PRINTS
	ASSEMBLY		DWG. NO. 25B2643	SIZE / REV.
MICROFILMED	DESIGN ACCT. NO. 8212D1	CATEGORY CODE 8212D1		

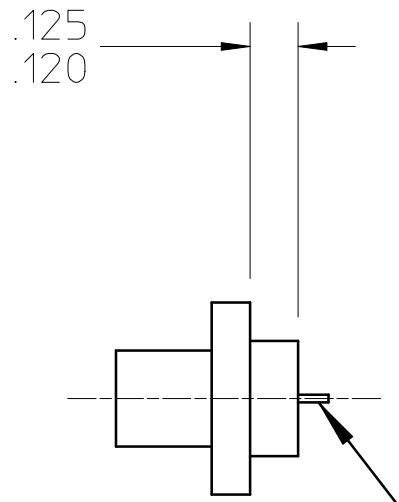
25B2643

Dwg. No. 25B2651 Size Rev



Material - .063 DIA BRASS ROD				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ±	.XX ± .010	.XXX ± .005	Angles ± .5°	LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FES RFQ			
Account Number -		Finish √ 125		MECHANICAL STRUCTURES			
Date Issued -		Date Reqd -		CENTER PIN			
Number Required -		Deliver To -		Shown on Dwg No			
Surface Treatment Degrease		Identific Method Tag		Patent Clear	Category Code FE 32 11	Do not Scale Prints	
Drawn By J.M.PRUYN		Date 12/15/99		Micro-Filmed	Drawing Scale 4X	Dwg. No. 25B2651	Size Rev
Check By S.VIROSTEK		Date 12/16/99		Design Account 8212DB	Drawing Type Detail		

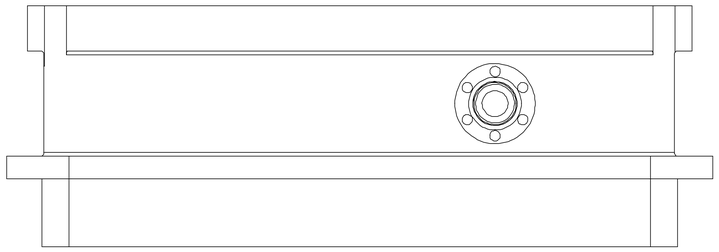
Dwg. No. 25B2651 Size Rev



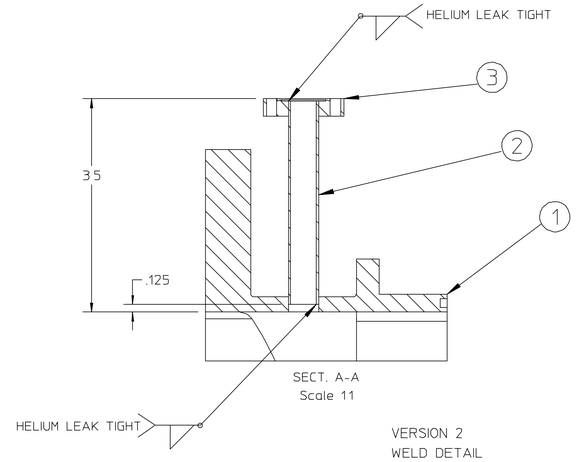
CONNECTOR:
SV MICROWAVE SV2991-6002

CAREFULLY MACHINE AWAY CONNECTOR
BODY TO EXPOSE INNER CONDUCTOR

Material –				–	–	–	–
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ± .1 | .XX ± .025 | .XXX ± .010 | Angles ± .5°				LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FES RFQ			
Account Number –	Finish √ 125			MECHANICAL STRUCTURES			
Date Issued –	Date Reqd –			CONNECTOR MODIFICATION			
Number Required –	Deliver To –	Shown on Dwg No. 25B2651					
Surface Treatment Degrease	Identific Method Tag	Patent Clear	Category Code FE 32 11	Do not Scale Prints			
Drawn By J.M.PRUYN	Date 12/21/99	Micro-Filmed	Drawing Scale 2X	Dwg. No 25B2661	Size	Rev	
Check By S.VIROSTEK	Date 12/22/99	Design Account 8212DB	Drawing Type Detail				

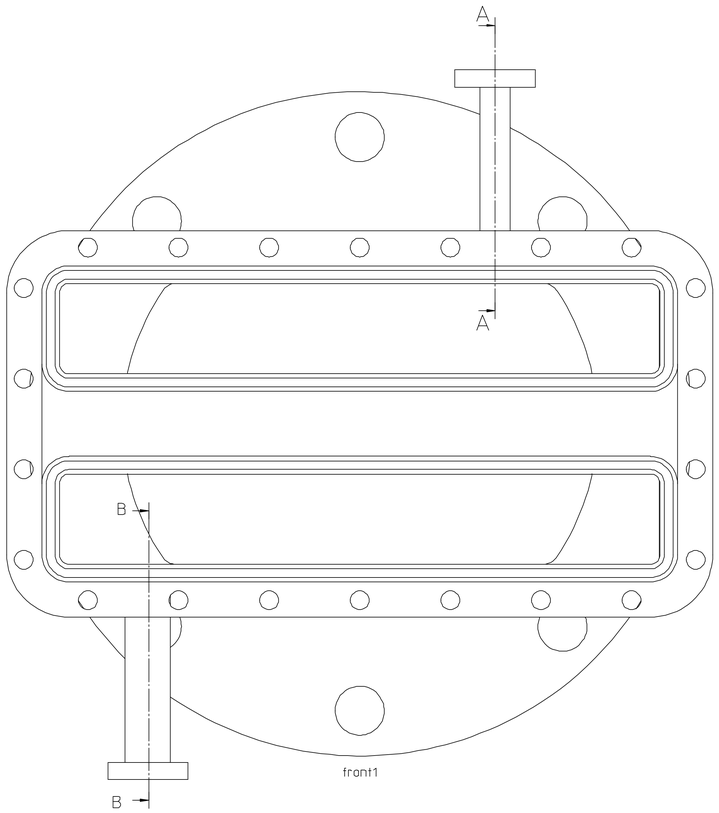


top1

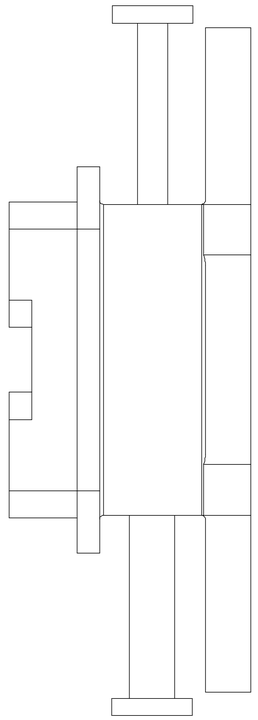


SECT. A-A
Scale 11

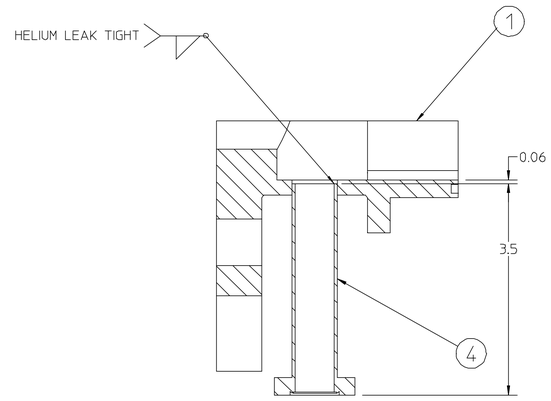
VERSION 2
WELD DETAIL



front1



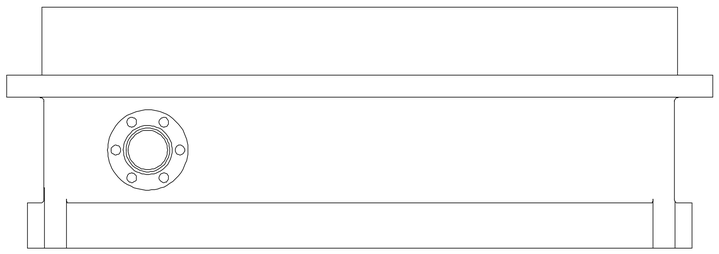
right1



Section B-B
Partial1
SCALE 1:1

VERSION 3
WELD DETAIL

25B2676B



BOTTOM1

MANIFOLDS WERE BUILT WITH A SINGLE CONFLAT PORT AND WITH TWO CONFLAT PORTS THEREFORE SOME MANIFOLDS DO NOT HAVE A SECTION A-A.

USE A SIZE -263 O-RING ON THE RECTANGULAR PORTS.

REQD	ITEM	PART NO.	DESCRIPTION
1	4		1-1/3 O.D. CONFLAT FLANGE, HALF NIPPLE
1	3		1-1/3 O.D CONFLAT FLANGE, MDC PART # 110003
1	2		50 O D x .035 WALL x 3 38 LG 304 STAINLESS TUBE
1	1	25B0986	VACUUM PORT MANIFOLD

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH			3-14-02	ADDED VERSION AND GENERAL NOTES.
A	MDH	-	-	6-29-01	ADDED SECTION B-B

SHEET 1 OF 1

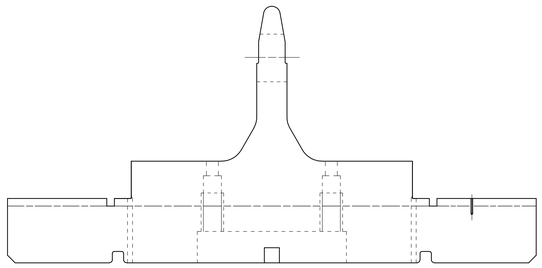
UNLESS OTHERWISE SPECIFIED
TOLERANCES: X ± 1 FRAC ± - ; XX ± 01 ANGLES ± - ; XXX ± - FINISH - √
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° (UT 1 5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ASME Y14.5M-1994 & ANSI B46.1.

SHOP ORDERS
ACCT NO. | SERIAL NO
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT -
IDENT METH. -
DWG BY Mall Hoff | DATE 1-07-00
CHK BY - | DATE -

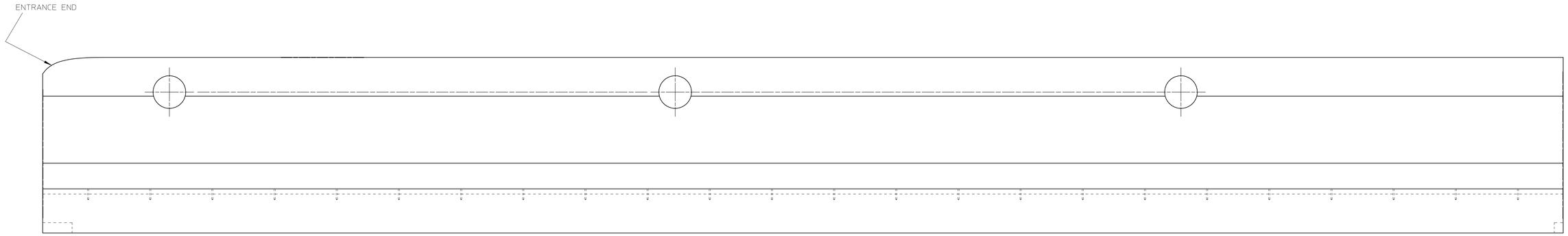
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ
MECHANICAL STRUCTURES
RFQ VACUUM MANIFOLD WELD ASSEMBLY

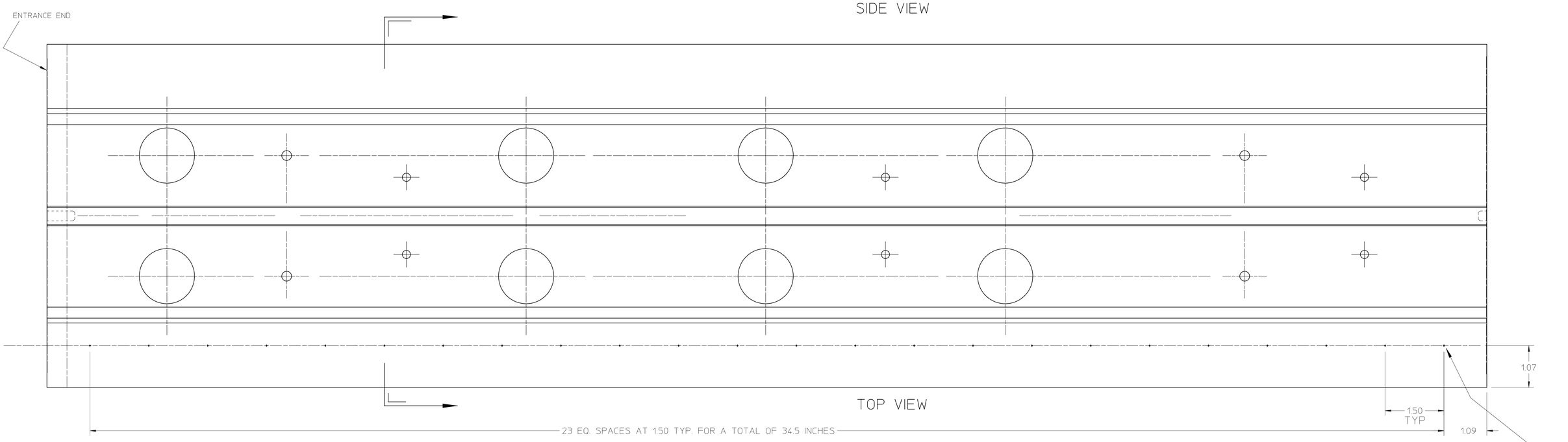
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 1	DO NOT SCALE PRINTS
	ASSY	-	DWG NO	SIZE REV
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	25B2676B	
	8212-DB	FE3211		



SECTION VIEW



SIDE VIEW



TOP VIEW

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 150 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .x ± .1 FRAC. ±1/64; .xx ± .01 ANGLES ± 1°; .xxx ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF DATE 01-21-00
CHK. BY: DATE

REQD	ITEM	PART NO.	DESCRIPTION
		25B0946	ALPHA MODULE MAJOR VANE MACHINING

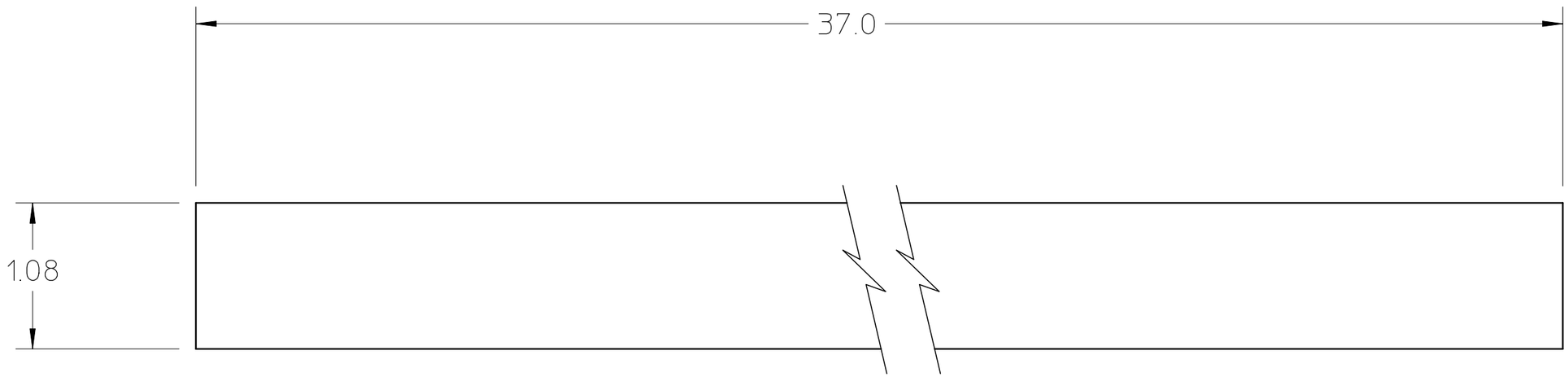
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE MODIFICATION FOR SHIM

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B2696 | SIZE | REV.

USE SHIM STOCK SUPPLIED BY MATT HOFF.
THICKNESS WILL RANGE FROM .0150 TO .0175 INCHES.

25B2702	REQD	ITEM	PART NUMBER	DESCRIPTION
				C101 COPPER SHIM STOCK



BREAK EDGES AND CORNERS

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED
TOLERANCE .X ±.1 .XX ± .01 .XXX ±.003
SURFACE FINISH 125 √

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.

SHOP ORDERS

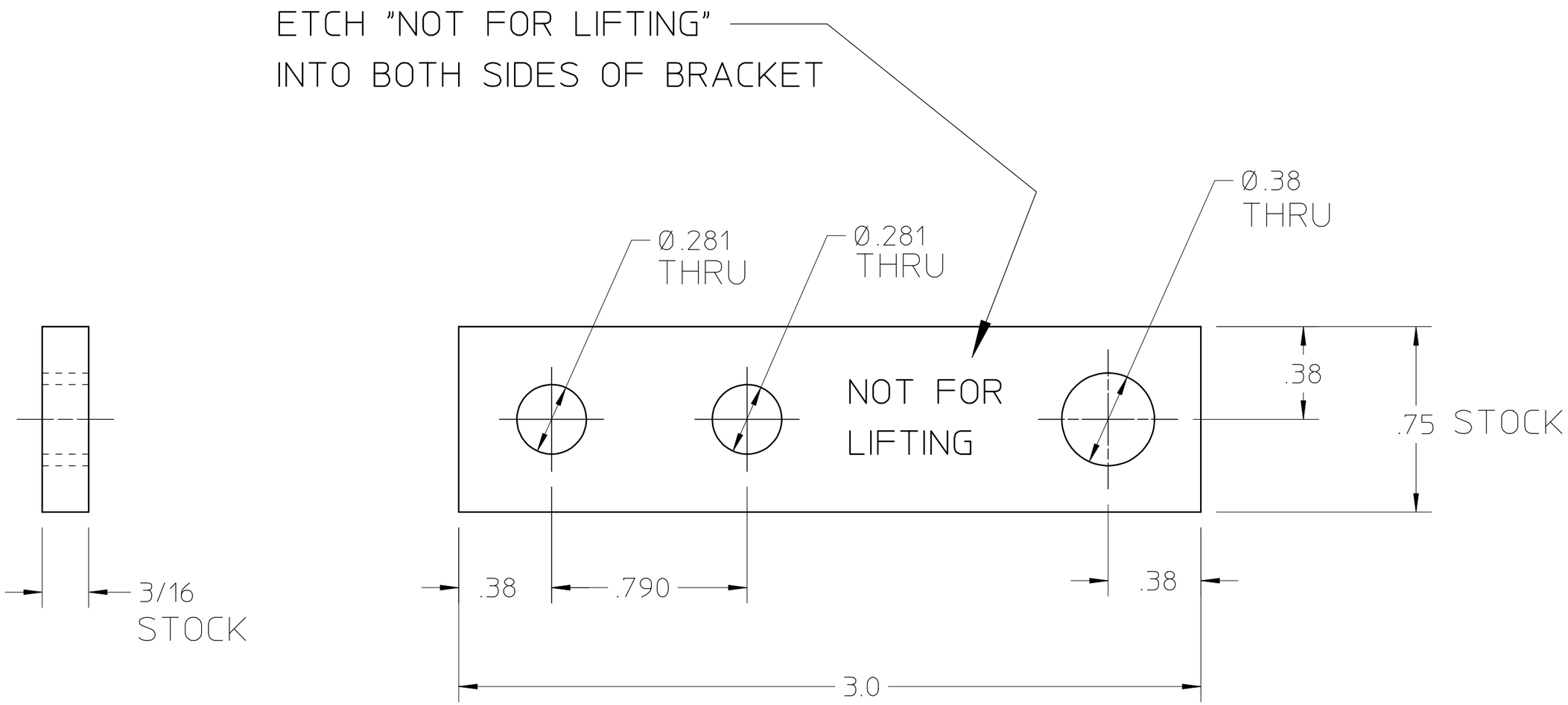
ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 02-09-00
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ
MECHANICAL STRUCTURES
VANE REPAIR SHIM

PAT CLEAR	DWG TYPE DETAIL	SHOWN ON	SCALE: 1:1 DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B2702 REV

25B2732	REQD	ITEM	PART NUMBER	DESCRIPTION
				STAINLESS STEEL



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.003

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO

DATE ISSD	DATE REQD	NO REQD

DELIVER TO

SURFACE TREATMENT

IDENTIFIC METHOD

DWG BY Matt Hoff — DATE 3-2-00

CHK BY — DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ

MECHANICAL STRUCTURES

CORNER CLAMP SHACKLE BRACKET

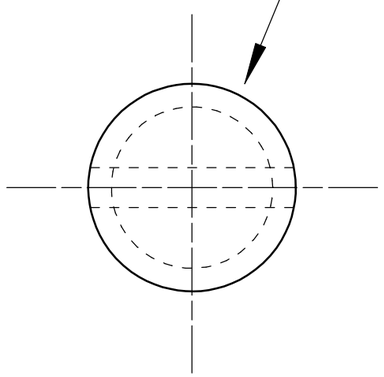
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 2:1
	DETAIL		DO NOT SCALE PRINTS

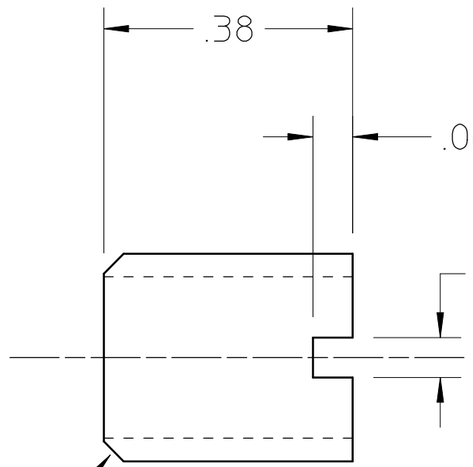
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	REV
	8212-DB	FE3211	25B2732	

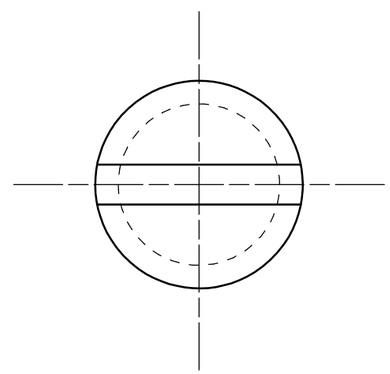
25B2782A	REQD	ITEM	PART NUMBER	DESCRIPTION
				C101 COPPER

5/16-24 UNF THREAD

A







DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		4-19-00	5/16-24 was 5/16-18

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.003

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY Matt Hoff		DATE 4-04-00
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

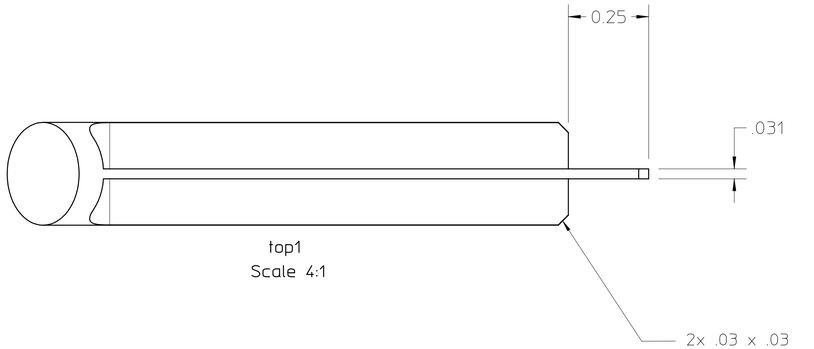
SNS-FES RFQ

MECHANICAL STRUCTURES

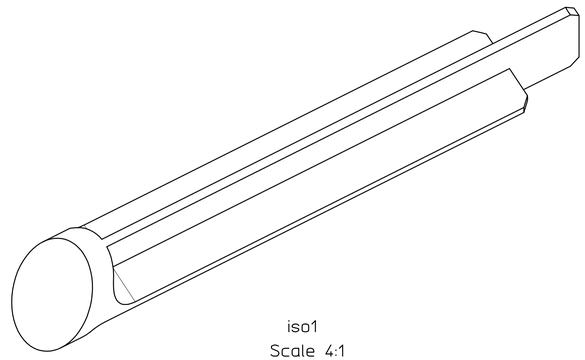
TONGUE LOCKING SCREW

PAT CLEAR	DWG TYPE DETAIL	SHOWN ON	SCALE: 4 : 1
			DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B2782A REV

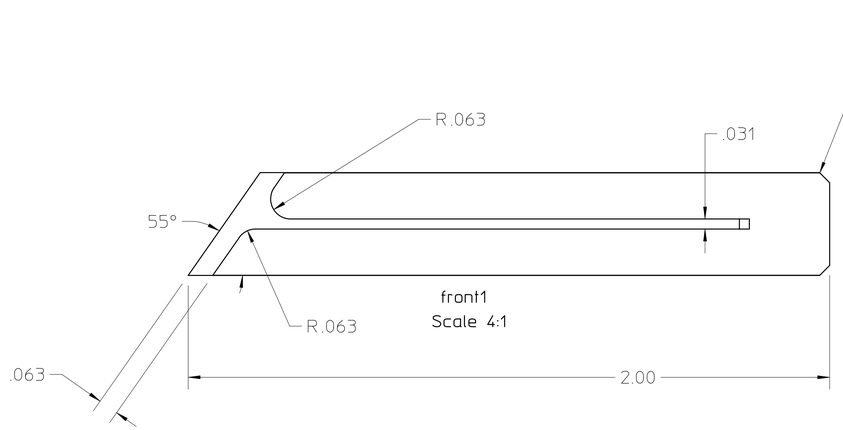
REQ	ITEM	PART NUMBER	DESCRIPTION
-	-	-	STAINLESS STEEL



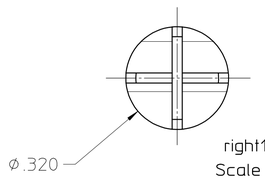
top1
Scale 4:1



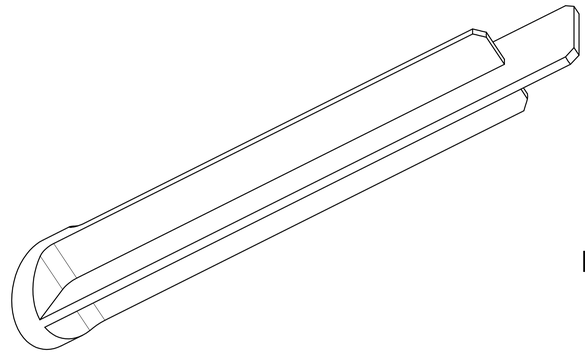
iso1
Scale 4:1



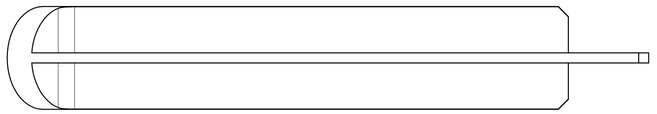
front1
Scale 4:1



right1
Scale 4:1



iso3
Scale 4:1



bottom1
Scale 4:1

25B2794

DIMENSIONS ARE IN INCHES

SHEET 1 OF 1

REV	DWG	CHK	ZONE	DATE	CHANGES
-	-	-	-	-	-

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± - | FRAC. ± - | .XX ± - | ANGLES ±- | .XXX ± - | FINISH - √

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT -
IDENT. METH. -
DWG. BY MATT HOFF | DATE 4-07-00
CHK. BY - | DATE -

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

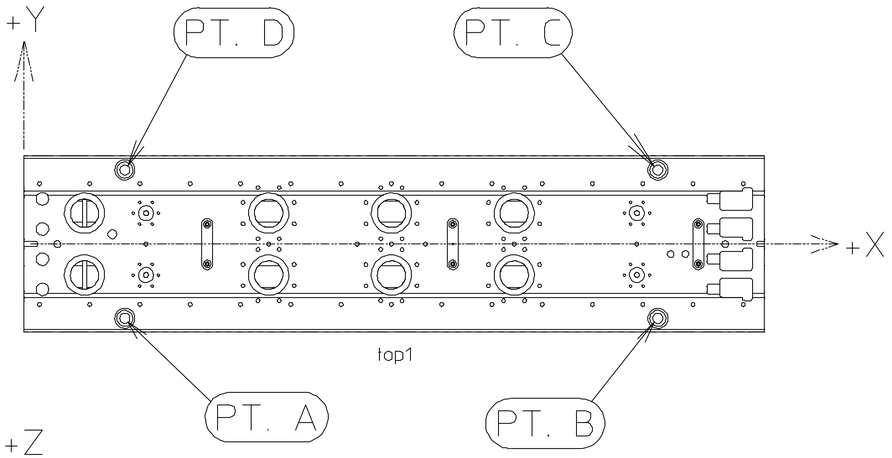
SNS FES - RFQ

MECHANICAL STRUCTURES

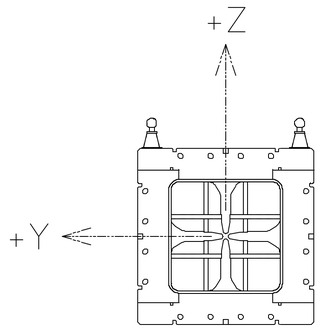
SQUIRT TUBE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 1	DO NOT SCALE PRINTS
	DETAIL	-		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV
	8212-DB	FE3211	25B2794	

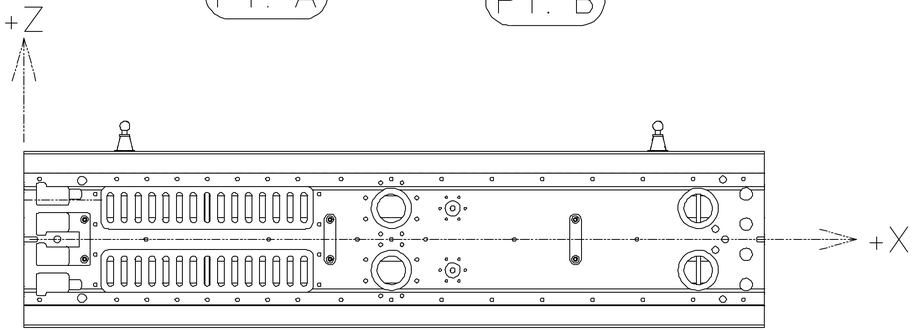
REQ	ITEM	PART NUMBER	DESCRIPTION
-	-	25B3496	MODULE 2 END WALL MACHINING
		25B3674	FIDUCIAL POST LOCATION HOLE MACHINING



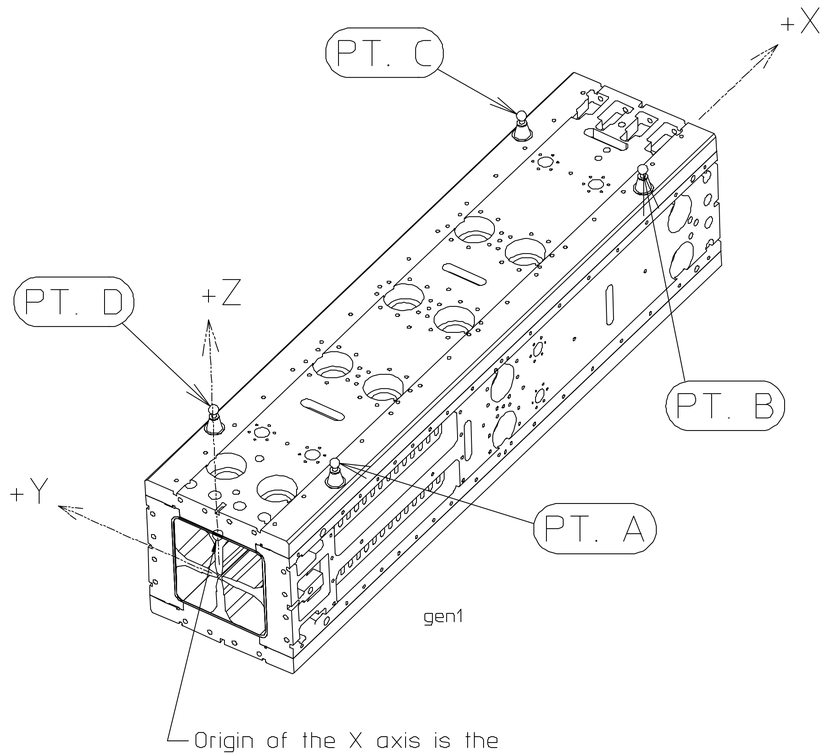
top1



front1



right1



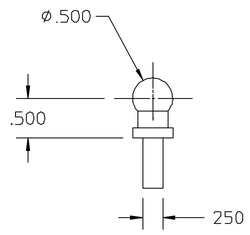
gen1

Origin of the X axis is the
raised surface shown hatched

	X	Y	Z
PT A	127 088466	-93.786801	141.322180
PT. B	800.057041	-93.612939	141.312515
PT C	800 010359	93.587615	141.337346
PT. D	127 088421	93.513011	141.350157

DIMENSIONS ARE IN MILLIMETERS

Measurements taken by Robert Connors, LBNL, on 5-07-01
at 20 degrees C on the Fanamation Coordinate Measuring Machine.



Tooling Ball Detail

The origin of the coordinate system is basically the start of the RFQ modulations and +X is the beam centerline traveling downstream.

The local origin of axis Y and Z were determined by measuring the inside walls of the entrance and exit ends of the RFQ. Those measurements were taken 6 mm in from the ends The distance from opposite walls was averaged to create the X axis

The origin of the X axis was determined by the surface shown hatched in the drawing.

25B2884A

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH	-	-	3-15-02	ADDED BOM INFORMATION

UNLESS OTHERWISE SPECIFIED

TOLERANCES: X ± - | FRAC ± - | XX ± - | ANGLES ±- | XXX ± - | FINISH - √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1.

SHOP ORDERS

ACCT. NO.		SERIAL NO.
DATE ISSD.	DATE REQD	NO. REQD
DELIVER TO		
SURFACE TREATMENT	-	
IDENT. METH	-	
DWG BY	Matt Hoff	DATE 2-13-01
CHK BY	-	DATE -

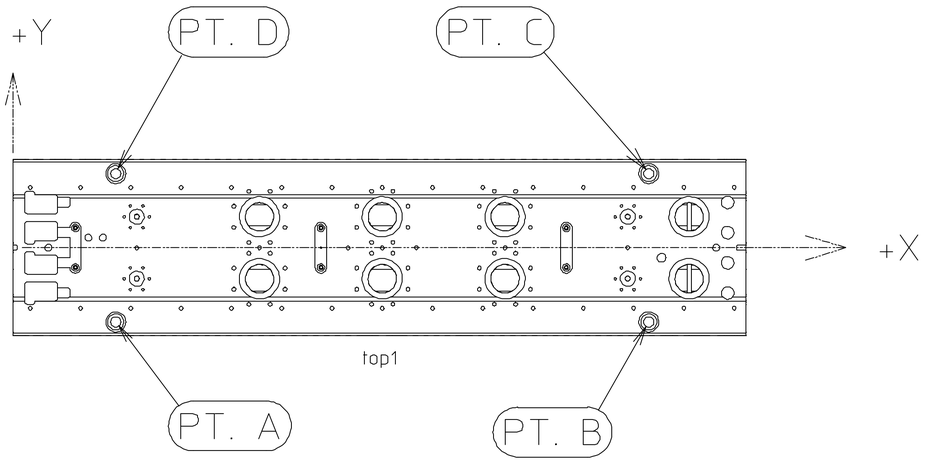
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
MODULE 2 FIDUCIALIZATION

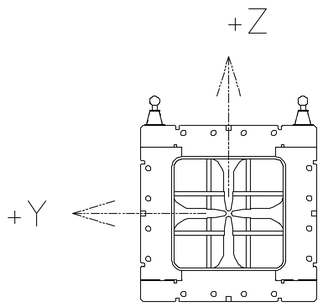
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	-	-	1 : 4	
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG. NO.	SIZE REV
	8212-DB	FE3211	25B2884A	

SHEET 1 OF 1

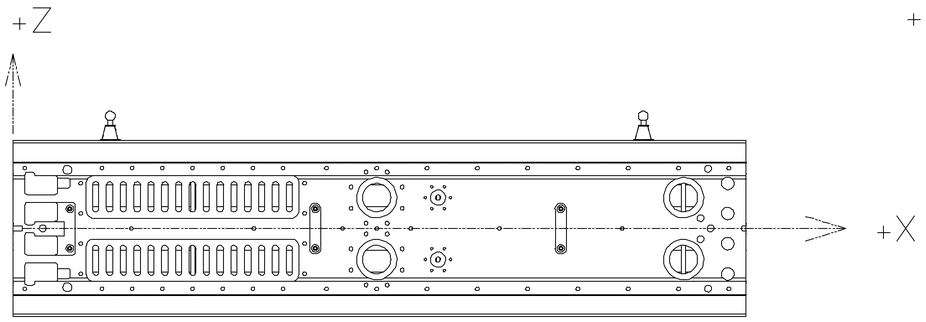
REQ	ITEM	PART NUMBER	DESCRIPTION
-	-	25B3506	MODULE 3 ENDWALL MACHINING
		25B3674	FIDUCIAL POST LOCATION HOLE MACHINING



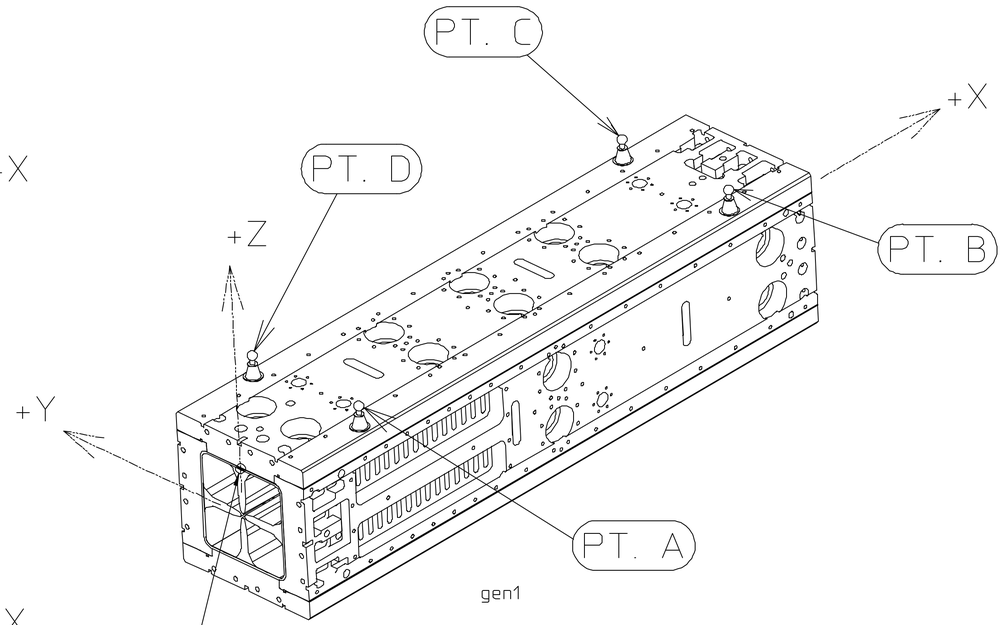
top1



front1



right1



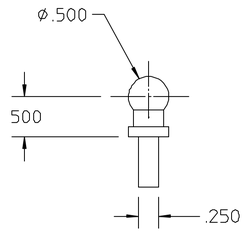
gen1

Origin of the X axis is the raised surface shown hatched

	X	Y	Z
PT. A	122.572155	-93.581572	141.312778
PT. B	795 705636	-93 517409	141.298439
PT. C	795 555500	93.761863	141.376345
PT. D	122.414521	93.397890	141.399701

DIMENSIONS ARE IN MILLIMETERS

Measurements taken by Robert Connors, LBNL, on 06-05-01
at 20 degrees C on the Fanamation Coordinate Measuring Machine.



Tooling Ball Detail

25B2894A

The origin of the coordinate system is basically the start of the RFQ modulations and +X is the beam centerline traveling downstream

The local origin of axis Y and Z were determined by measuring the inside walls of the entrance and exit ends of the RFQ Those measurements were taken 6 mm in from the ends. The distance from opposite walls was averaged to create the X axis.

The local origin of the X axis was determined by the surface shown hatched in the drawing

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH	-	-	3-14-02	ADDED BOM ITEMS

UNLESS OTHERWISE SPECIFIED
TOLERANCES: X ± - FRAC ± - ; XX ± - ANGLES ±- ; XXX ± - FINISH - √
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1 5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14 5M-1994 & ANSI B46 1.

SHOP ORDERS
ACCT. NO
SERIAL NO.
DATE ISSD
DATE REQD
NO. REQD
DELIVER TO
SURFACE TREATMENT -
IDENT. METH -
DWG BY Matthew Hoff
DATE 2-15-01
CHK BY -
DATE -

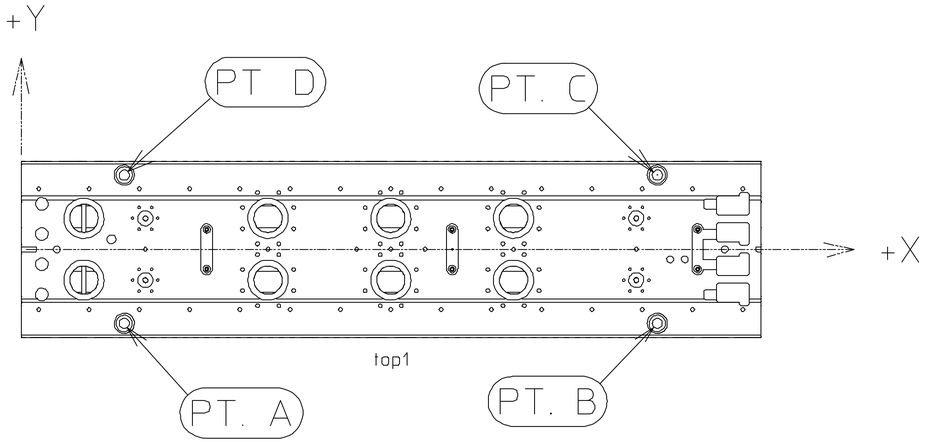
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
MODULE 3 FIDUCIALIZATION

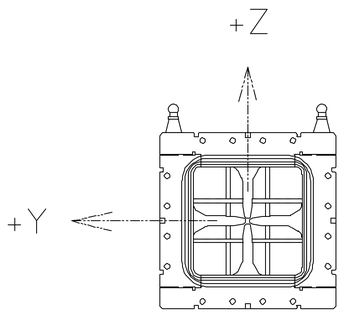
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 4	DO NOT SCALE PRINTS
	-	-	DWG. NO.	SIZE REV
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	25B2894A	

SHEET 1 OF 1

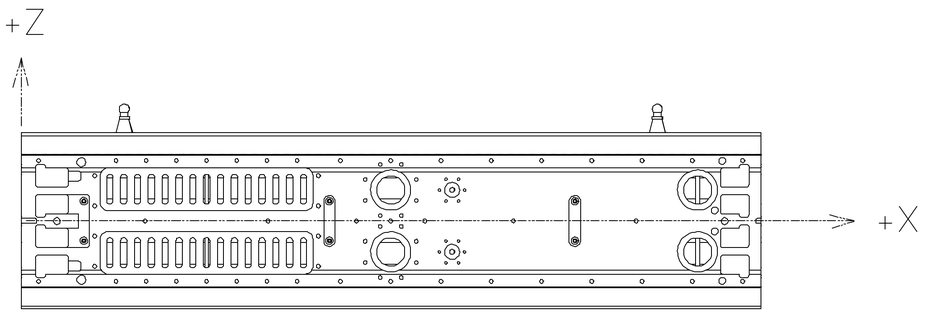
REQ	ITEM	PART NUMBER	DESCRIPTION
-	-	25B3716	MODULE 4 END WALL MACHINING
		25B3674	FIDUCIAL POST LOCATION HOLE MACHINING



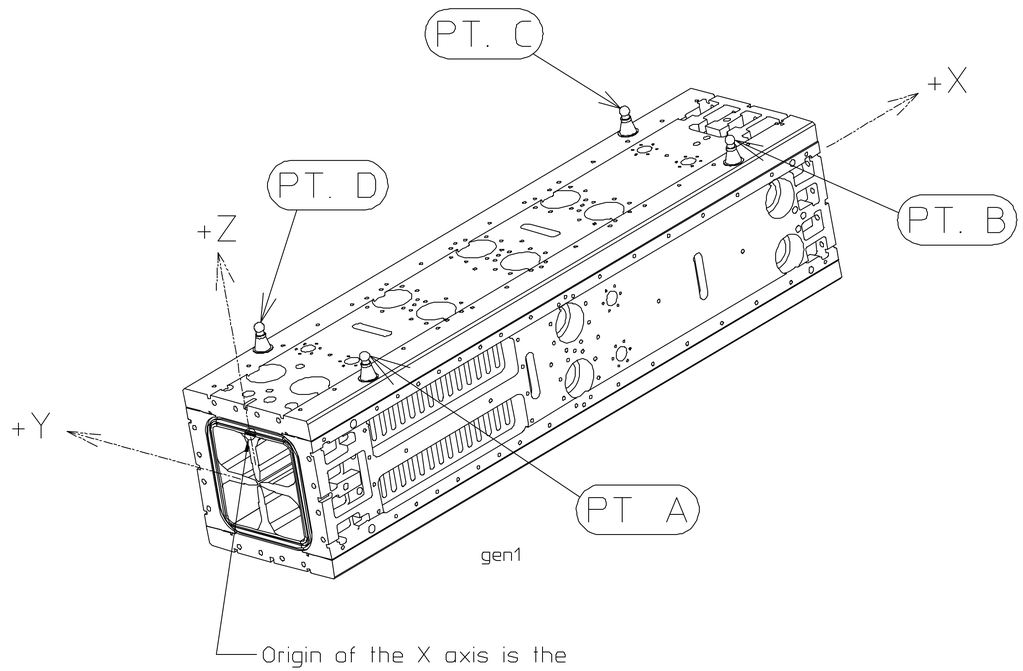
top1



front1



right1



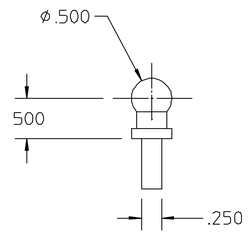
gen1

Origin of the X axis is the raised surface shown hatched.

	X	Y	Z
PT. A	127.000000	-93.789500	140.055600
PT. B	800.138100	-93.715840	139.997180
PT. C	800.100000	93.266260	140.081000
PT. D	127.073660	93.413580	140.126720

DIMENSIONS ARE IN MILLIMETERS

Measurements taken by Wally Whitrmore of the Bennett-Hopkins Corp. of Redwood City, Ca. on 9-20-01 by a Carl Zeiss Coordinate Measuring Machine



Tooling Ball Detail

25B2904A

The origin of the coordinate system is basically the start of the RFQ modulations and +X is the beam centerline traveling downstream.

The local origin of axis Y and Z were determined by measuring the inside walls of the entrance and exit ends of the RFQ. Those measurements were taken 6 mm in from the ends The distance from opposite walls was averaged to create the X axis

The local origin of the X axis was determined by the surface shown hatched in the drawing.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH	-	-	3-15-02	ADDED BOM INFORMATION

UNLESS OTHERWISE SPECIFIED

TOLERANCES: X ± - FRAC ± - ; XX ± - ANGLES ±- ; XXX ± - FINISH - √

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1.

SHOP ORDERS

ACCT. NO		SERIAL NO.
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	-	
IDENT. METH	-	
DWG BY	Matt Hoff	DATE 9-21-01
CHK BY	-	DATE -

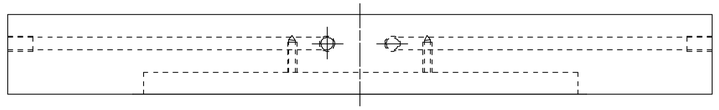
SHEET 1 OF 1

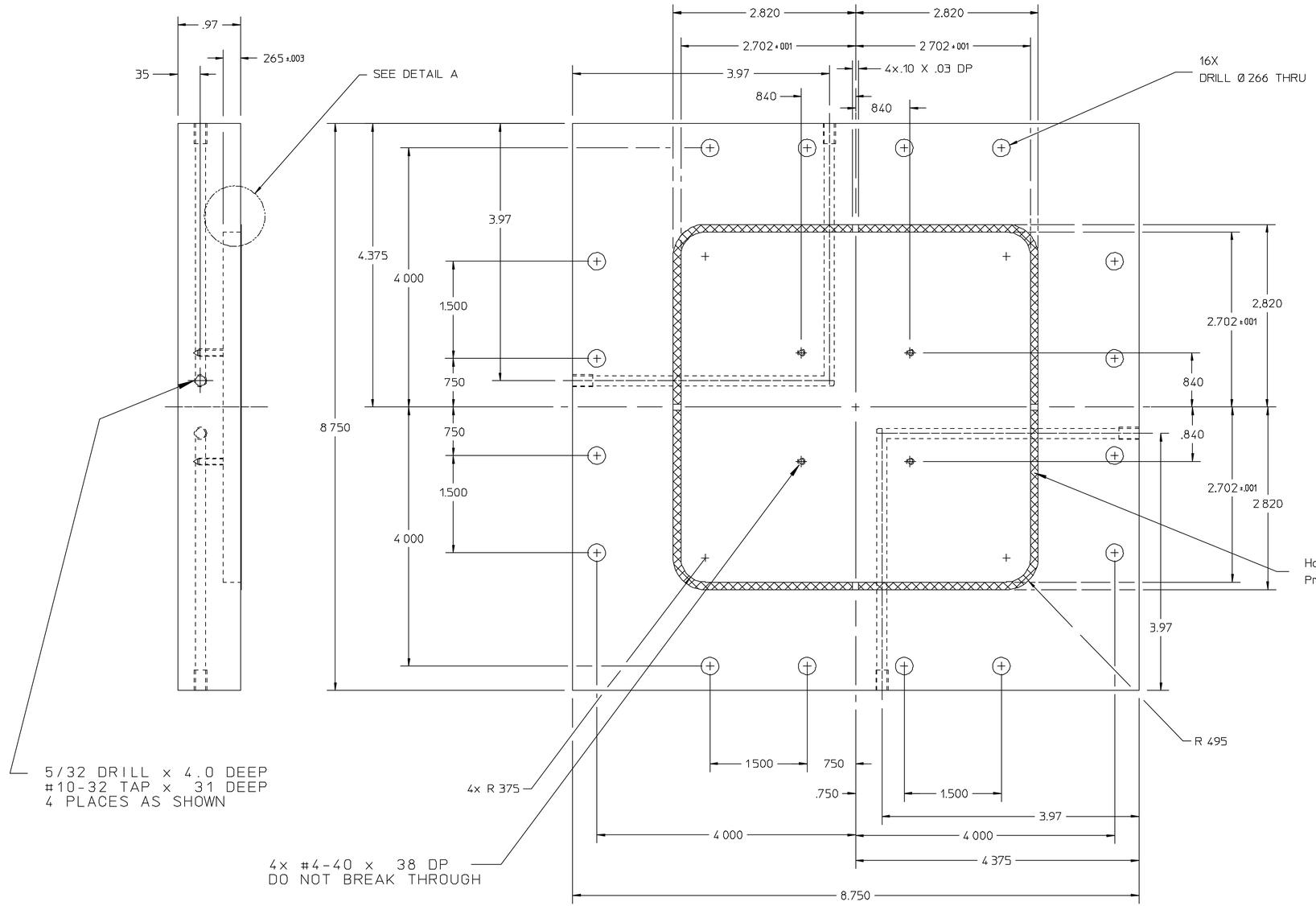
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

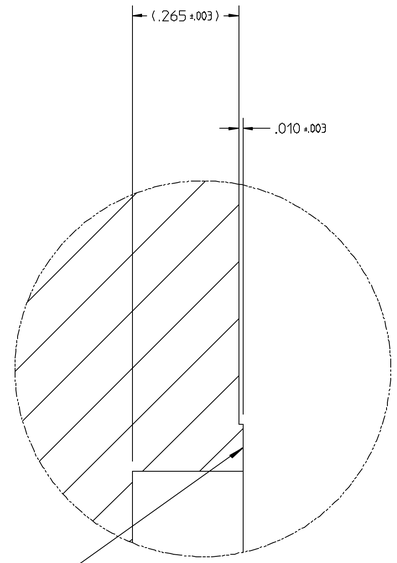
SNS FES - RFQ
MECHANICAL STRUCTURES
MODULE 4 FIDUCIALIZATION

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 4	DO NOT SCALE PRINTS
	-	-	DWG. NO.	SIZE REV
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	25B2904A	

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.00 COPPER PLATE, OFHC







25B2914

DETAIL A

SCALE 5X

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- X ± -
- FRAC ±1/64
- XX ± .01
- ANGLES ± 1°
- XXX ± 005
- FINISH 64 √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1 5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14 5 & B46 1

SHOP ORDERS

ACCT. NO		SERIAL NO.
DATE ISSD	DATE REQD	NO REQD

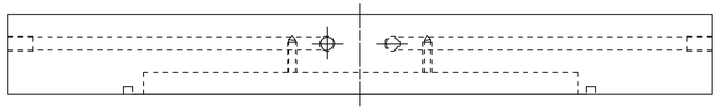
DELIVER TO
SURFACE TREATMENT UHV CLEAN
IDENT. METH -
DWG BY Matt Hoff DATE 04-19-01
CHK BY - DATE -

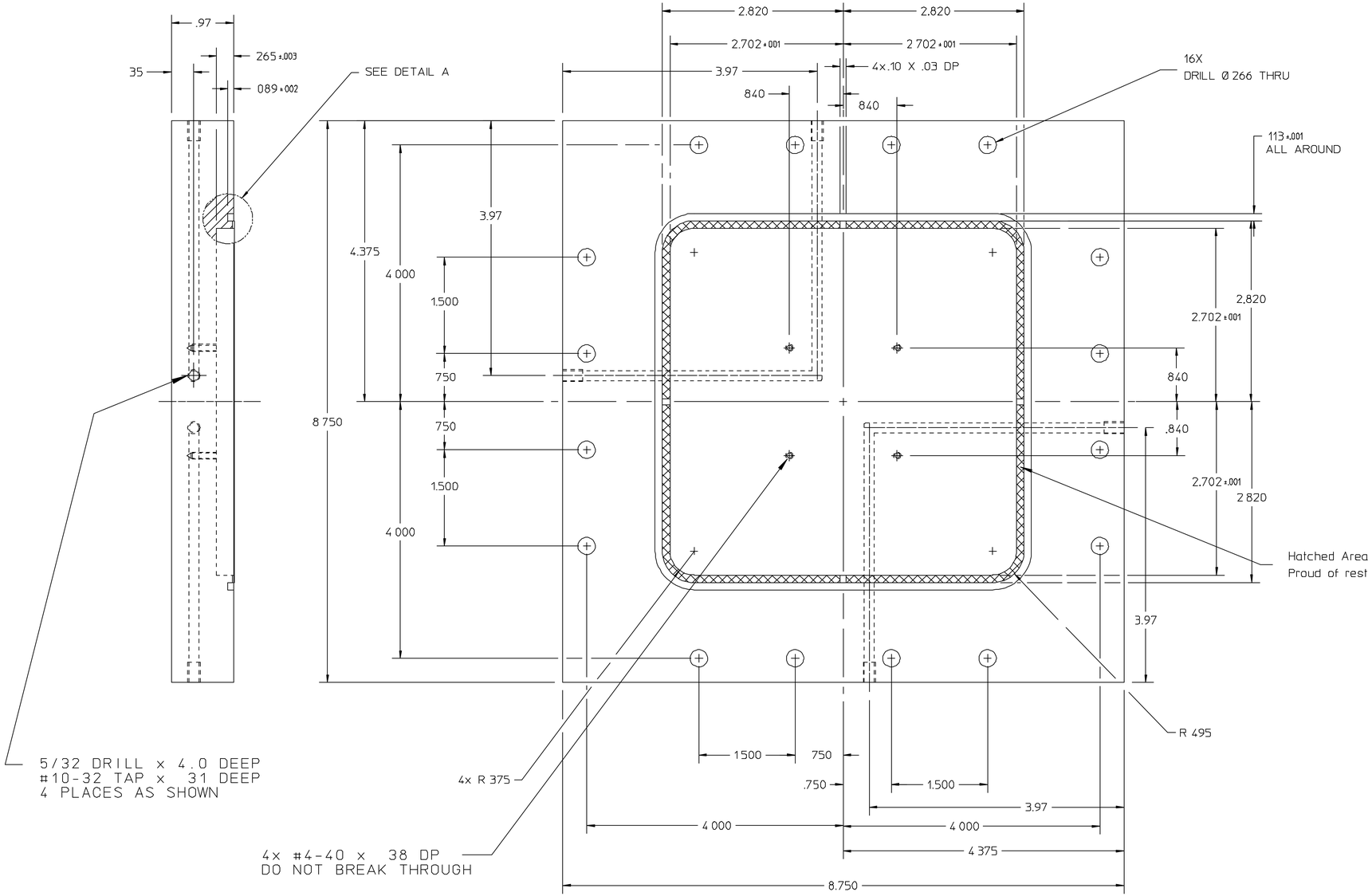
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

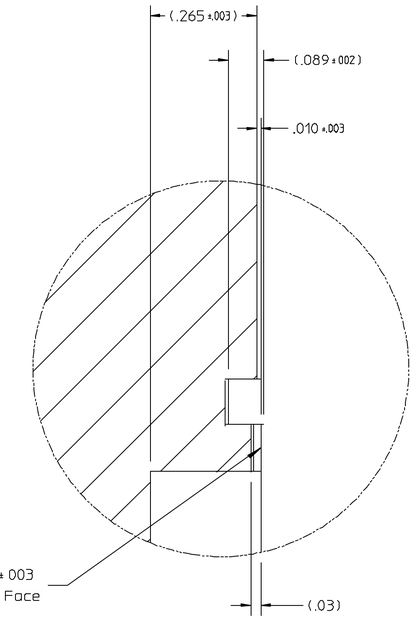
SNS FES RFQ
MECHANICAL STRUCTURES
END PLATE-COOLED-NO GROOVE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	-		
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE -	DWG. NO. 25B2914	SIZE REV. -

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.00 COPPER PLATE, OFHC







DETAIL A

SCALE 5X

25B2924

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- X ± -
- FRAC ±1/64
- XX ± .01
- ANGLES ± 1°
- XXX ± .005
- FINISH 64 √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS

ACCT. NO	SERIAL NO.
DATE ISSD	DATE REQD / NO REQD
DELIVER TO	
SURFACE TREATMENT	UHV CLEAN
IDENT. METH	-
DWG BY	Matt Hoff
DATE	04-20-01
CHK BY	-
DATE	-

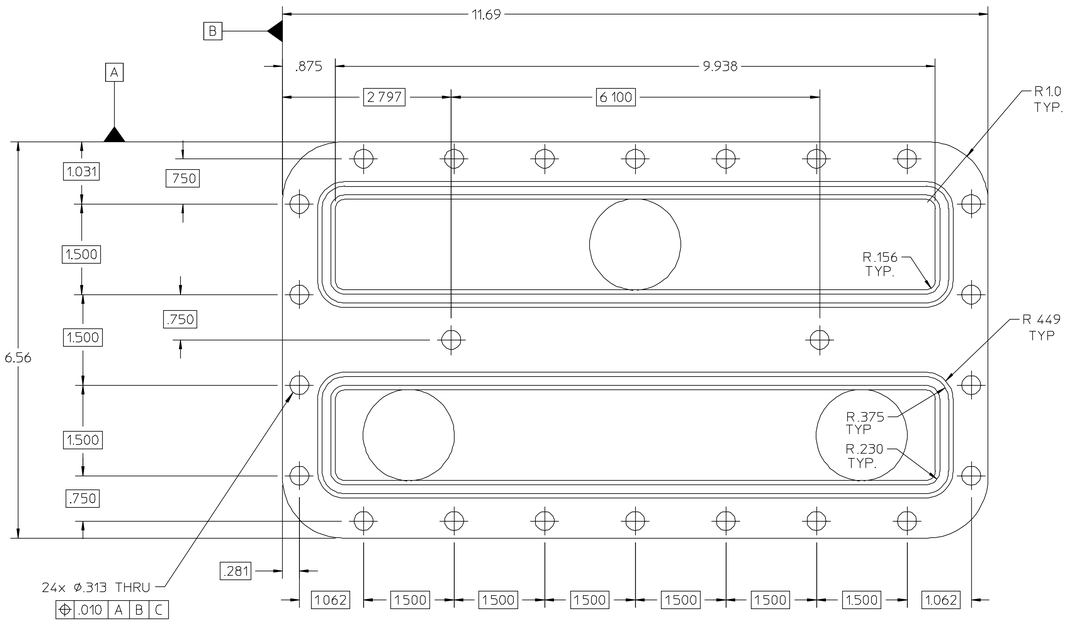
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

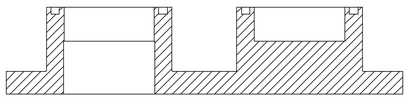
SNS FES RFQ

MECHANICAL STRUCTURES

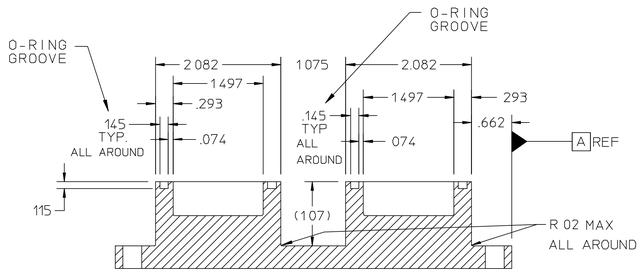
END PLATE-COOLED-WITH GROOVE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	CD	-		
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE -	DWG. NO. 25B2924	SIZE / REV. -

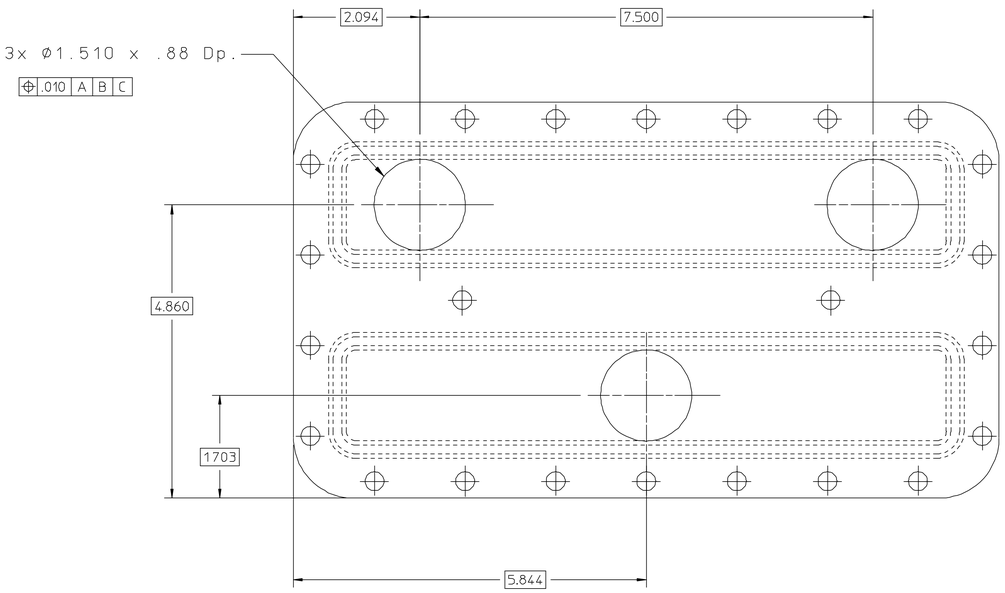




SECTION A-A



SECTION B-B



25B2936

1. O-RING GROOVES TO BE MACHINED TO A 63 OR BETTER.
2. ALL DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX 15 LBS AFTER MACHINING

REQD	ITEM	PART NO.	DESCRIPTION
			304 STAINLESS STEEL PLATE, 1.5 THK., ANNEALED

REV	DWG	CHK	ZONE	DATE	CHANGES

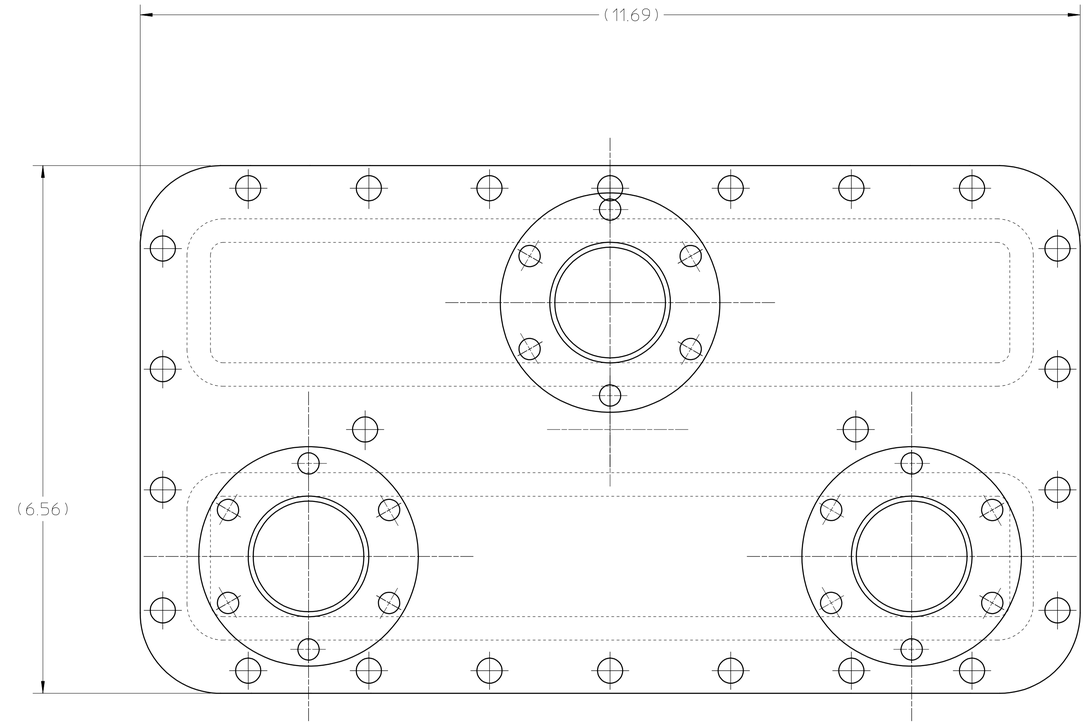
UNLESS OTHERWISE SPECIFIED
TOLERANCES: x ± 1 | FRAC ± 1/64 | xx ± 01 | ANGLES ± 3° | xxx ± .004 | FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14.5 & B46.1.

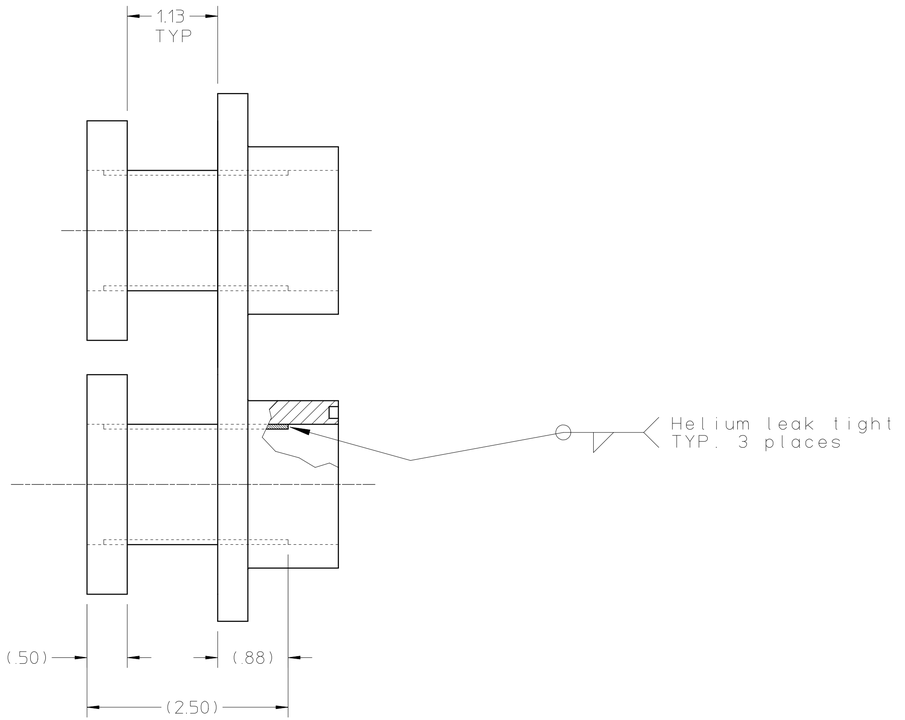
SHOP ORDERS
ACCT NO.
SERIAL NO
DATE ISSD
DATE REQD
NO. REQD
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY MATT HOFF
DATE 05-21-01
CHK. BY
DATE

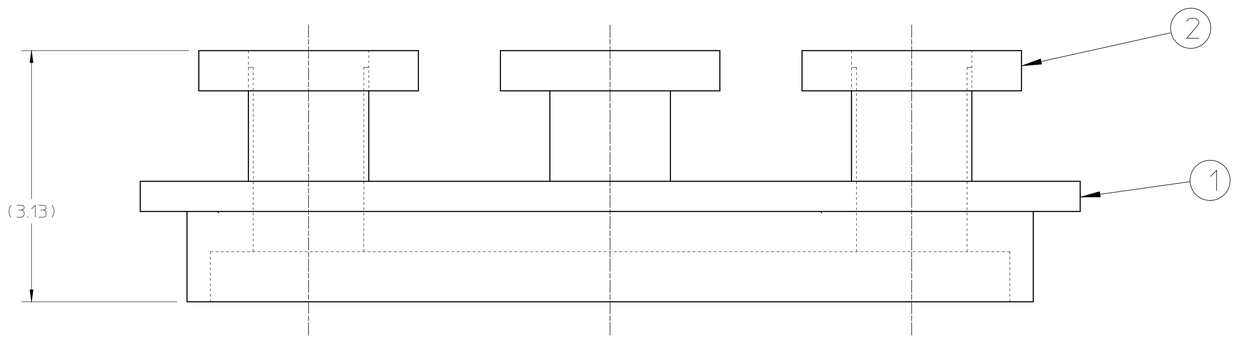
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS - FES RFQ
MECHANICAL STRUCTURES
VACUUM PORT BLANK OFF PLATE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	SIZE / REV
	8212-DB	FE3211	25B2936	

REQ	ITEM	PART NUMBER	DESCRIPTION
1	1	25B2936	VACUUM PORT BLANK OFF FLANGE
3	2	401022	MDC CONFLAT HALF NIPPLE model #150-1R







25B2944

Dimensions are in inches.

This part weights approx. 16 lbs.

Take precaution to protect all sealing surfaces.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .001 | FINISH 125√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF | DATE: 05-25-01
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ

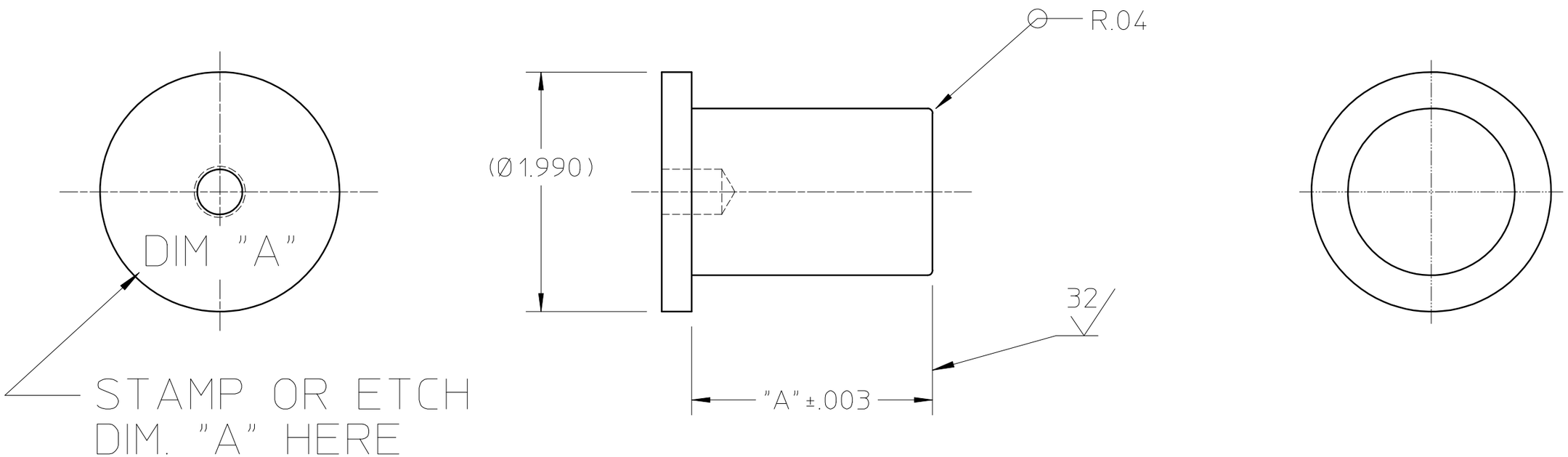
MECHANICAL STRUCTURES

VACUUM PORT BLANK OFF FLANGE ASSEMBLY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSEMBLY		FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B2944	

VERSION	DIMENSION "A"
VER. 1 (5mm)	.916
VER. 2 (7mm)	1.010
VER. 3 (8mm)	1.024
VER. 4 (9mm)	1.069
VER. 5 (13mm)	1.225

25B2972	REQD	ITEM	PART NUMBER	DESCRIPTION
			25B2462	BLANK, TUNER



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 07-11-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

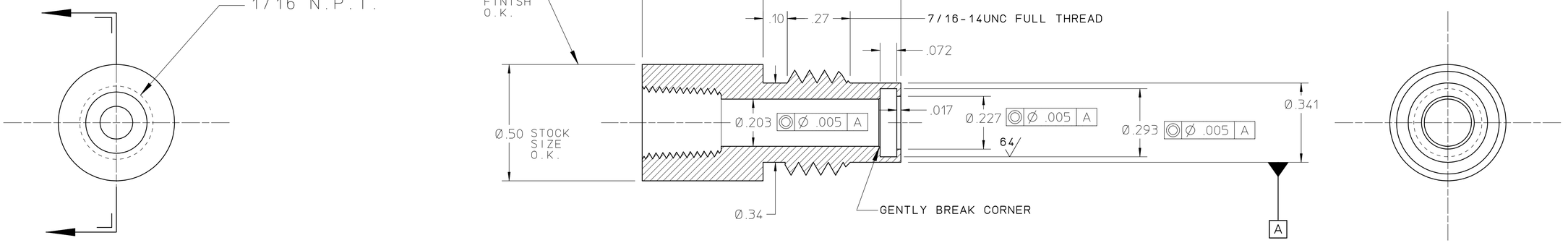
SNS-FE RFQ

MECHANICAL STRUCTURES

SLUG TUNER

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B2972

REQ	ITEM	PART NUMBER	DESCRIPTION
			STAINLESS STEEL BAR STOCK



25B2994A

DIMENSIONS ARE IN INCHES

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			10-11-01	ADDED GD&T

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .002 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

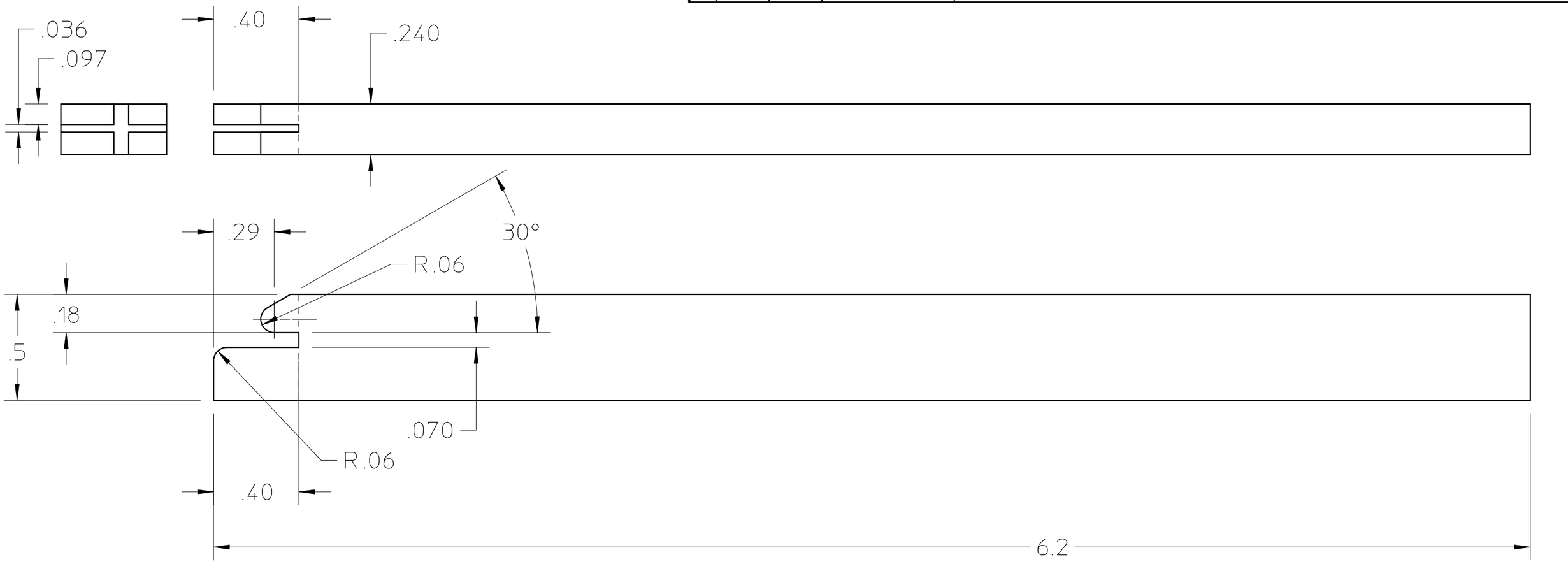
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: Matt Hoff | DATE: 07-17-01
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ
MECHANICAL STRUCTURES
COOLING CONNECTOR - STYLE D

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 4 : 1	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B2994	SIZE A / REV. A
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211		

25B3002	REQD	ITEM	PART NUMBER	DESCRIPTION
				STEEL BAR STOCK



DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.003

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT	FLASH NICKEL PLATE		
IDENTIFIC METHOD			
DWG BY	Matt Hoff	DATE	4-10-00
CHK BY		DATE	

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

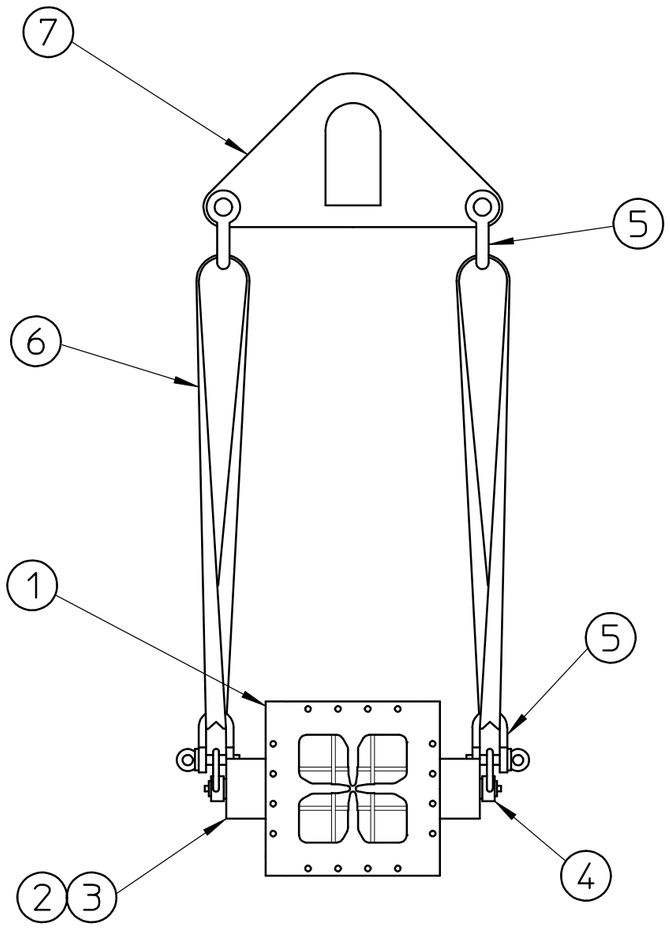
SNS-FES RFQ

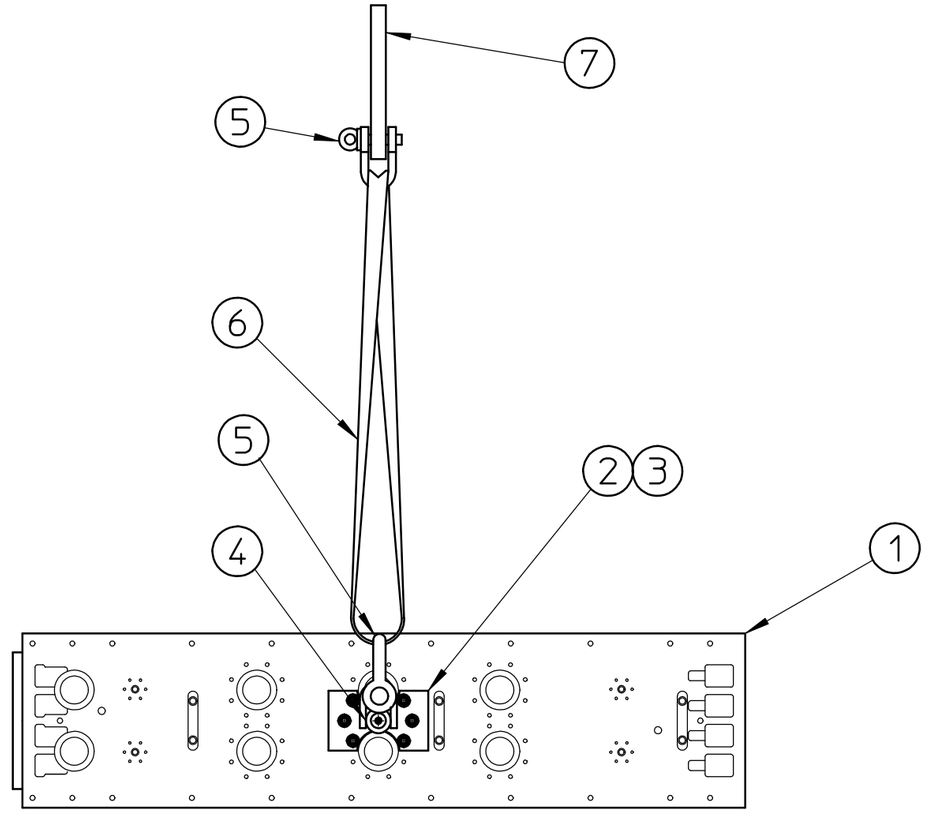
MECHANICAL STRUCTURES

DIVERTER INSERT TOOL

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 4 : 1
	DETAIL		DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8212-DB	FE3211	25B3002

25B3012	REQD	ITEM	PART NUMBER	DESCRIPTION
	1	1		RFQ
	2	2	25B2552	LIFTING LUG
	12	3		SPECIAL SHCS ø.304-20TPI x 1.5 lg STAINLESS
	2	4		3/8-16 UNC HOIST RING
	4	5		SHACKLE
	2	6		3 FOOT SLING
	1	7	25B2562	LIFTING - SPREADER BAR





REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 04-17-00	
CHK BY		DATE	

LAWRENCE BERKELEY NATIONAL LABORATORY

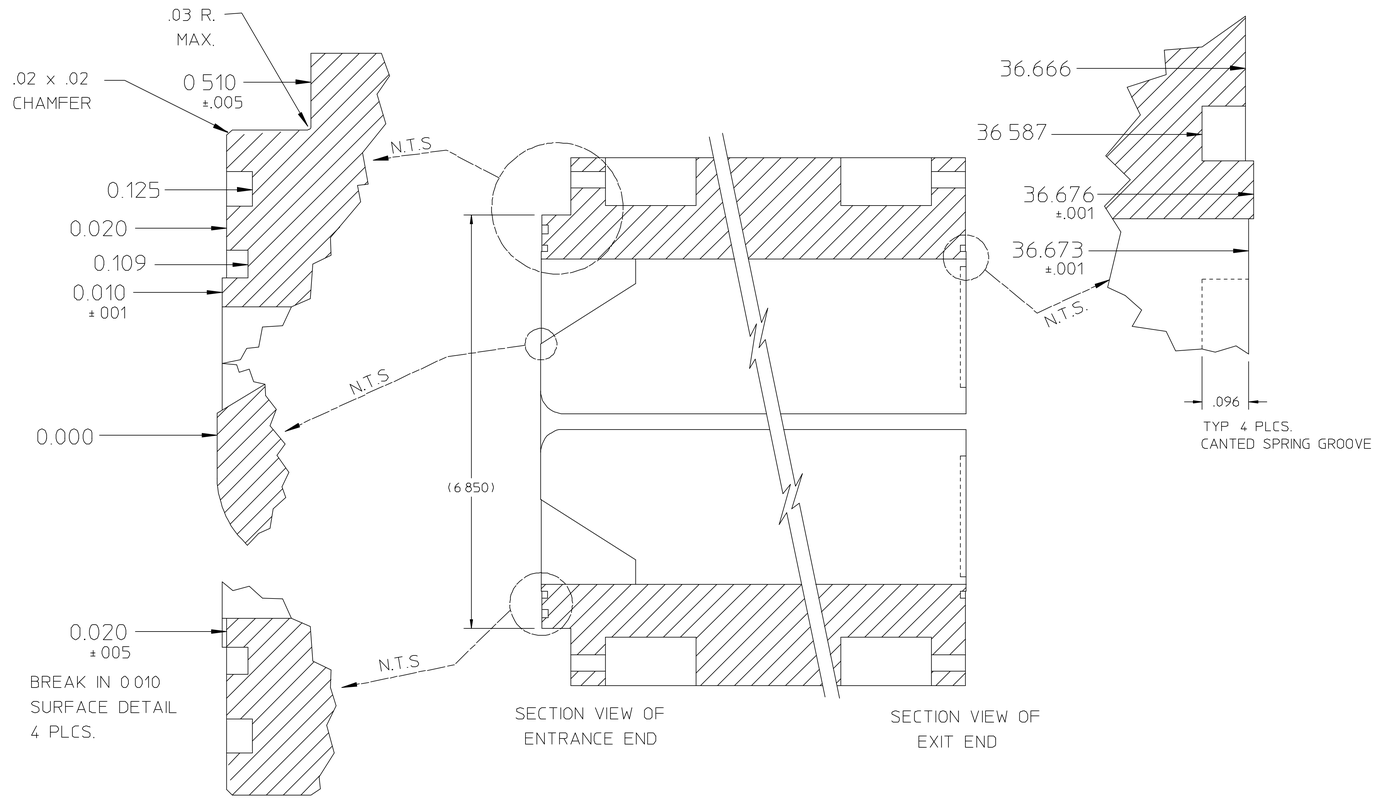
UNIVERSITY OF CALIFORNIA-BERKELEY

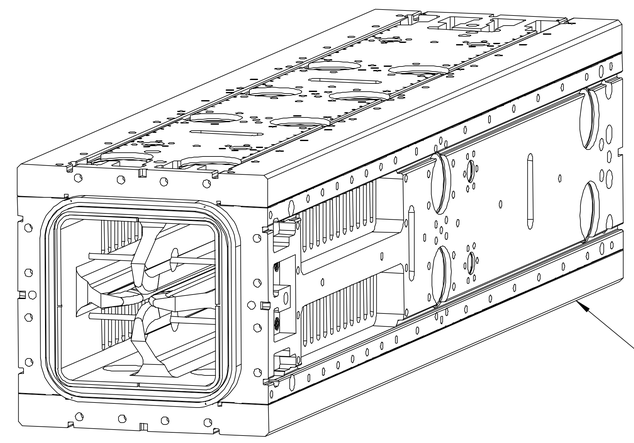
SNS FES - RFQ

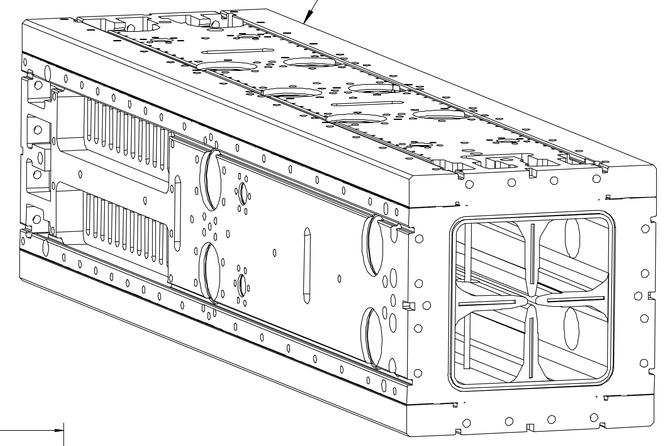
MECHANICAL STRUCTURES

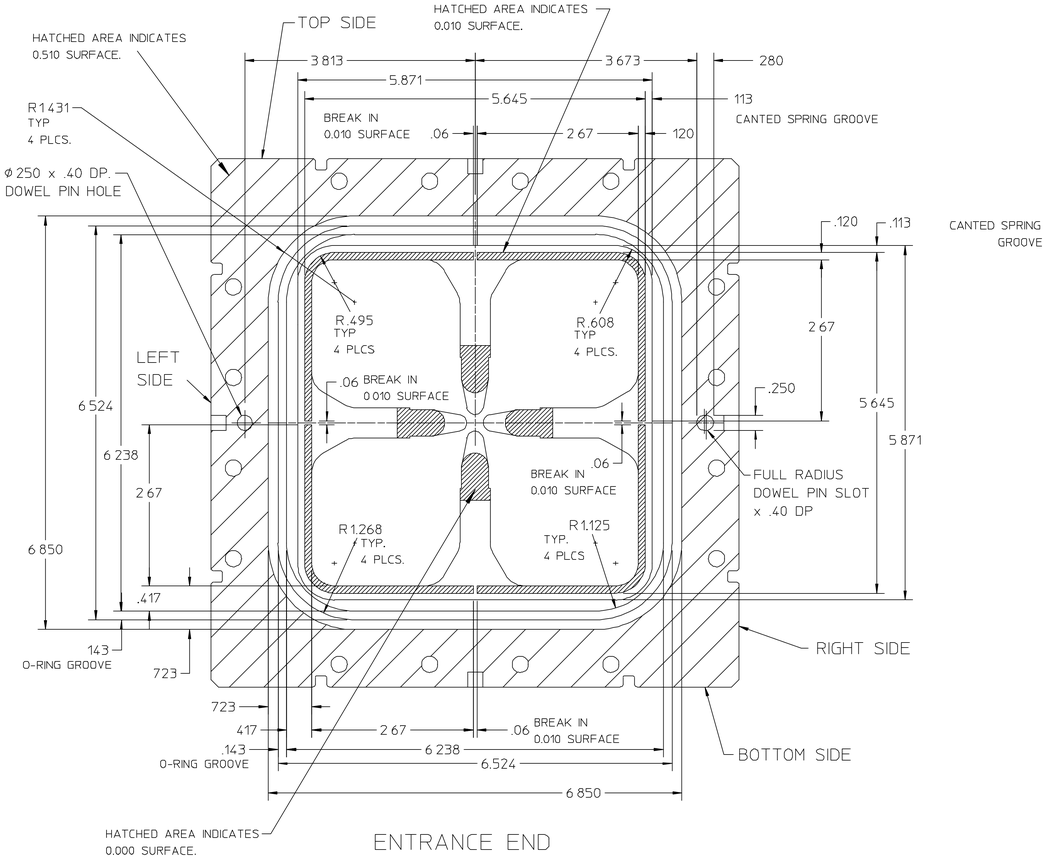
SPREADER BAR LIFTING ARRANGEMENT

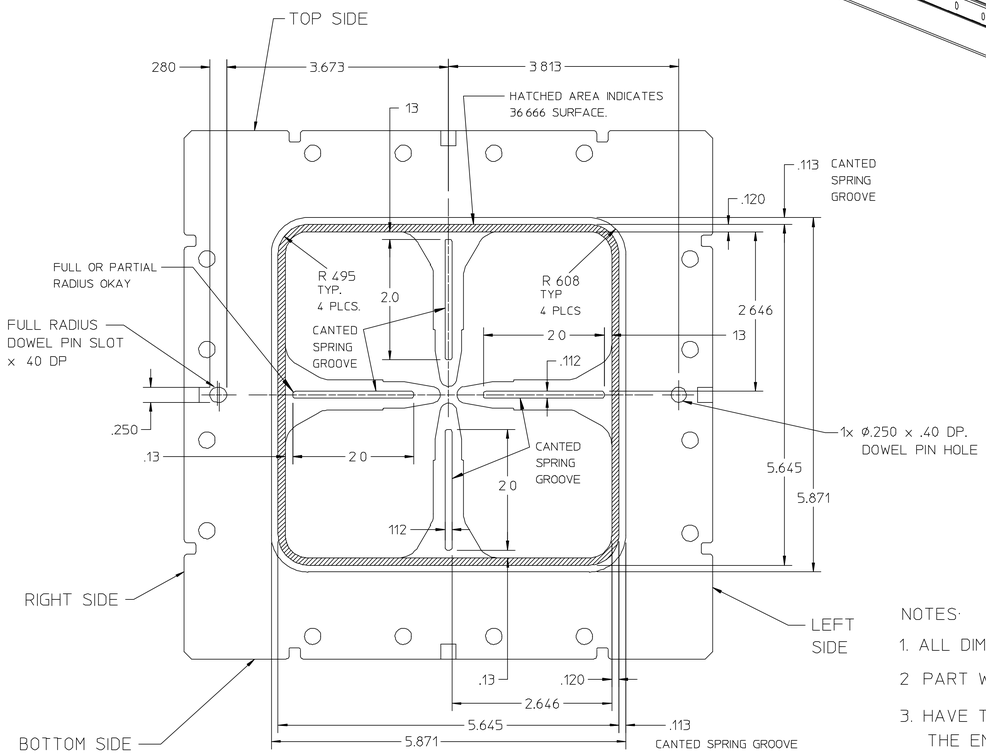
PAT CLEAR	DWG TYPE ASSY	SHOWN ON	SCALE: NONE
			DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B3012 REV











25B3026A

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. PART WEIGHS 630 LBS
3. HAVE THE PLATING SHOP DETERGENT CLEAN THE ENTIRE PART AFTER MACHINING

REQD	ITEM	PART NO	DESCRIPTION
		25B2376	VERTICAL BRAZE ASSEMBLY

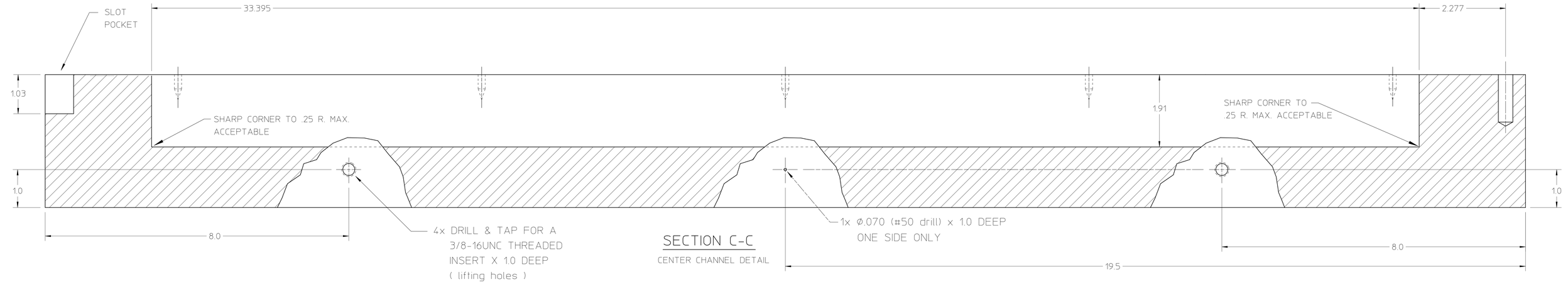
REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			3-15-02	ADDED BOM INFORMATION

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± 1 FRAC ± 1/64; XX ± 01 ANGLES ± 1°; XXX ± .003 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1 5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14 5 & B46 1

SHOP ORDERS
ACCT NO | SERIAL NO
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT: DETERGENT CLEAN
IDENT METH
DWG BY: MATT HOFF | DATE: 04-19-00
CHK. BY | DATE

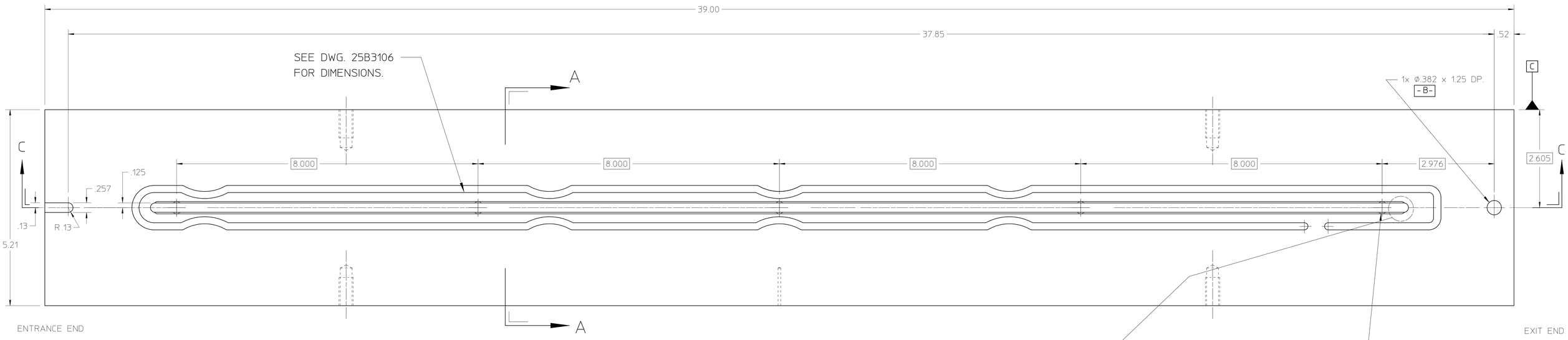
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES - RFQ
MECHANICAL STRUCTURES
ALPHA MODULE END WALL MACHINING

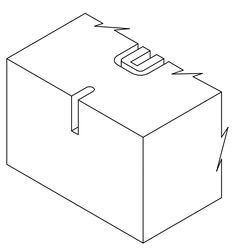
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	SIZE / REV
	8212-DB	FE3211	25B3026	A



SECTION C-C

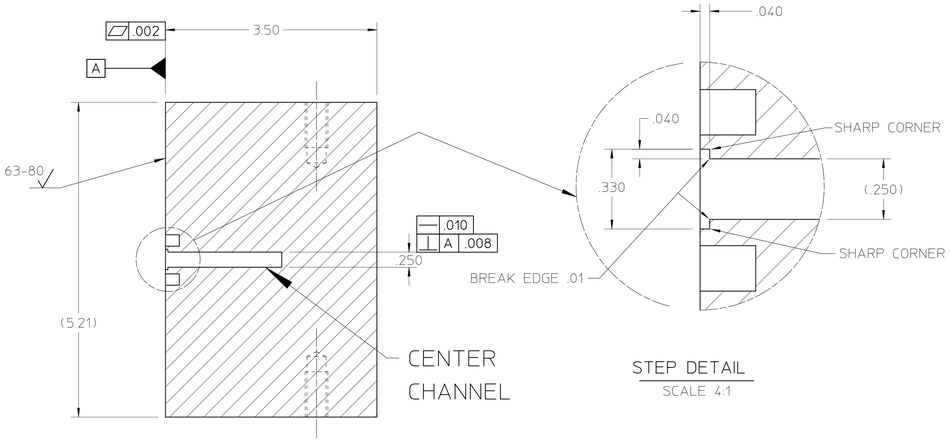
CENTER CHANNEL DETAIL





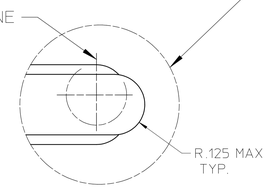
ISOMETRIC VIEW - ENTRANCE END

SCALE 1:2



STEP DETAIL

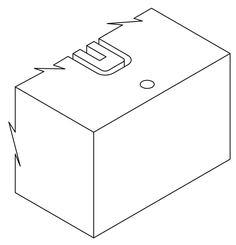
SCALE 4:1



STEP END DETAIL

TYP BOTH ENDS

SCALE 4:1

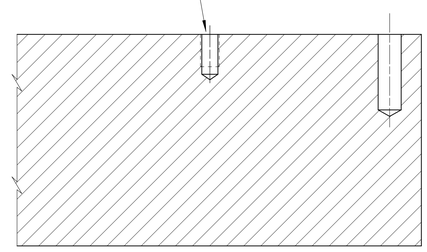


ISOMETRIC VIEW - EXIT END

SCALE 1:2

5x H (.266) DRILL x .75 DP
5/16-24UNF x 3/8 FULL THRD
TAP BEFORE MACHINING
CENTER CHANNEL

⌖ A B C .030



25B3066

SECTION VIEW BEFORE CENTER CHANNEL MACHINING

5x 5/16-24UNF TAPPED HOLES MUST BE MACHINED PRIOR TO MACHINING CENTER CHANNEL.

SECTION A-A

DIMENSIONS ARE IN INCHES

SEE DRAWING 25B3106 FOR DIMENSIONS DESCRIBING THE SIDE CHANNEL GEOMETRY.

THIS PART WEIGHS APPROX. 216 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

REQD	ITEM	PART NO.	DESCRIPTION
			C10100 COPPER

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF DATE 05-25-00
CHK. BY DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE - C101 MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3066	

SLOT POCKET

33.395

2.277

1.03

SHARP CORNER TO .25 R. MAX. ACCEPTABLE

1.91

SHARP CORNER TO .25 R. MAX. ACCEPTABLE

1.0

1.0

8.0

4x DRILL & TAP FOR A 3/8-16UNC THREADED INSERT X 1.0 DEEP (lifting holes)

1x ⌀.070 (#50 drill) x 1.0 DEEP ONE SIDE ONLY

8.0

19.5

SECTION C-C

CENTER CHANNEL DETAIL

39.00

37.85

.52

SEE DWG. 25B3106 FOR DIMENSIONS.

A

1x ⌀.382 x 1.25 DP. -B-

C

8.000 | 8.000 | 8.000 | 8.000 | 2.976

2.605

C

.125

.257

.13

R.13

5.21

ENTRANCE END

EXIT END

A

4.377

CENTERLINE OF MILL

21/64 (.328) DRILL x 3.94 DEEP DRILL THIS HOLE BEFORE MACHINING CENTER CHANNEL AS SHOWN IN SECT. C-C.

⌖ A B C .020

5x H (.266) DRILL x .75 DP 5/16-24UNF x 3/8 FULL THRD TAP BEFORE MACHINING CENTER CHANNEL

⌖ A B C .030

R.125 MAX TYP.

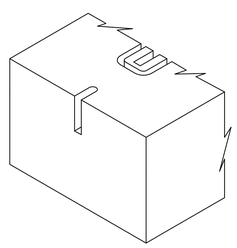
STEP END DETAIL

TYP BOTH ENDS
SCALE 4:1

(3.94)

35°

25B3076



ISOMETRIC VIEW - ENTRANCE END
SCALE 1:2

.002 A

3.50

63-80

.010 A .008

.250

(5.21)

CENTER CHANNEL

.040

.040

SHARP CORNER

.330

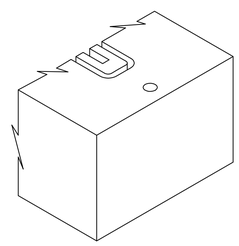
(.250)

SHARP CORNER

BREAK EDGE .01

STEP DETAIL

SCALE 4:1



ISOMETRIC VIEW - EXIT END
SCALE 1:2

SECTION VIEW BEFORE CENTER CHANNEL MACHINING

5x 5/16-24UNF AND 1x 21/64 DRILLED HOLE MUST BE MACHINED PRIOR TO MACHINING CENTER CHANNEL.

SECTION A-A

DIMENSIONS ARE IN INCHES

SEE DRAWING 25B3106 FOR DIMENSIONS DESCRIBING THE SIDE CHANNEL GEOMETRY.

THIS PART WEIGHS APPROX. 216 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
			C10100 COPPER

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE: 05-23-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE - C101 MACHINING with SQUIRT HOLE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3076	

SLOT POCKET

33.395

2.277

1.03

SHARP CORNER TO .25 R. MAX. ACCEPTABLE

1.91

SHARP CORNER TO .25 R. MAX. ACCEPTABLE

1.0

1.0

8.0

4x DRILL & TAP FOR A 3/8-16UNC THREADED INSERT X 1.0 DEEP (lifting holes)

SECTION C-C

CENTER CHANNEL DETAIL

1x Ø.070 (#50 drill) x 1.0 DEEP ONE SIDE ONLY

8.0

19.5

39.00

37.85

.52

SEE DWG. 25B3116 FOR DIMENSIONS.

A

1x Ø.382 x 1.25 DP. -B-

C

3.560

C

C

8.000

8.000

8.000

8.000

2.976

.125

.257

.13

R.13

7.12

ENTRANCE END

EXIT END

A

SIDE CHANNEL

.002 A

3.50

63-80

.010

A .008

.250

(7.12)

CENTER CHANNEL

.040

.040

.330

SHARP CORNER

(.250)

SHARP CORNER

BREAK EDGE .01

STEP DETAIL

SCALE 4:1

CENTERLINE OF MILL

R.125 MAX TYP.

STEP END DETAIL

TYP BOTH ENDS

SCALE 4:1

5x H (.266) DRILL x .75 DP
5/16-24UNF x 3/8 FULL THRD
TAP BEFORE MACHINING
CENTER CHANNEL

⌖ A B C .030

25B3086

ISOMETRIC VIEW - ENTRANCE END

SCALE 1:2

ISOMETRIC VIEW - EXIT END

SCALE 1:2

SECTION VIEW BEFORE CENTER CHANNEL MACHINING

5x 5/16-24UNF TAPPED HOLES MUST BE MACHINED PRIOR TO MACHINING CENTER CHANNEL.

SECTION A-A

DIMENSIONS ARE IN INCHES

SEE DRAWING 25B3116 FOR DIMENSIONS DESCRIBING THE SIDE CHANNEL GEOMETRY.

THIS PART WEIGHS APPROX. 304 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

C10100 COPPER

REQD	ITEM	PART NO.	DESCRIPTION

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
.X ± .1 FRAC ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH
DWG BY: MATT HOFF DATE 05-25-00
CHK BY: DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MINOR VANE - C101 MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		1 : 1	
MICROFILMED	DESIGN ACCT NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3086	

SLOT POCKET

33.395

2.277

1.03

SHARP CORNER TO .25 R. MAX. ACCEPTABLE

1.91

SHARP CORNER TO .25 R. MAX. ACCEPTABLE

1.0

1.0

8.0

4x DRILL & TAP FOR A 3/8-16UNC THREADED INSERT X 1.0 DEEP (lifting holes)

SECTION C-C

CENTER CHANNEL DETAIL

1x Ø.070 (#50 drill) x 1.0 DEEP ONE SIDE ONLY

8.0

19.5

39.00

37.85

.52

SEE DWG. 25B3116 FOR DIMENSIONS.

A

1x Ø.382 x 1.25 DP. -B-

C

3.560

C

8.000

8.000

8.000

8.000

2.976

C

.125

.257

.13

R.13

7.12

ENTRANCE END

A

4.377

EXIT END

SIDE CHANNEL

.002 A

3.50

63-80

(7.12)

.010

⊥ A .008

.250

CENTER CHANNEL

.040

.040

.330

SHARP CORNER

(.250)

SHARP CORNER

BREAK EDGE .01

STEP DETAIL

SCALE 4:1

CENTERLINE OF MILL

R.125 MAX TYP.

STEP END DETAIL

TYP BOTH ENDS

SCALE 4:1

21/64 (.328) DRILL x 3.94 DEEP DRILL THIS HOLE BEFORE MACHINING CENTER CHANNEL AS SHOWN IN SECT. C-C.

⌖ A B C .020

5x H (.266) DRILL x .75 DP 5/16-24UNF x 3/8 FULL THRD TAP BEFORE MACHINING CENTER CHANNEL

⌖ A B C .030

(3.94)

35°

25B3096

ISOMETRIC VIEW - ENTRANCE END

SCALE 1:2

ISOMETRIC VIEW - EXIT END

SCALE 1:2

SECTION A-A

SECTION VIEW BEFORE CENTER CHANNEL MACHINING

5x 5/16-24UNF AND 1x 21/64 DRILLED HOLE MUST BE MACHINED PRIOR TO MACHINING CENTER CHANNEL.

DIMENSIONS ARE IN INCHES

SEE DRAWING 25B3116 FOR DIMENSIONS DESCRIBING THE SIDE CHANNEL GEOMETRY.

THIS PART WEIGHS APPROX. 304 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

TOLERANCES: UNLESS OTHERWISE SPECIFIED
.X ± .1 FRAC ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

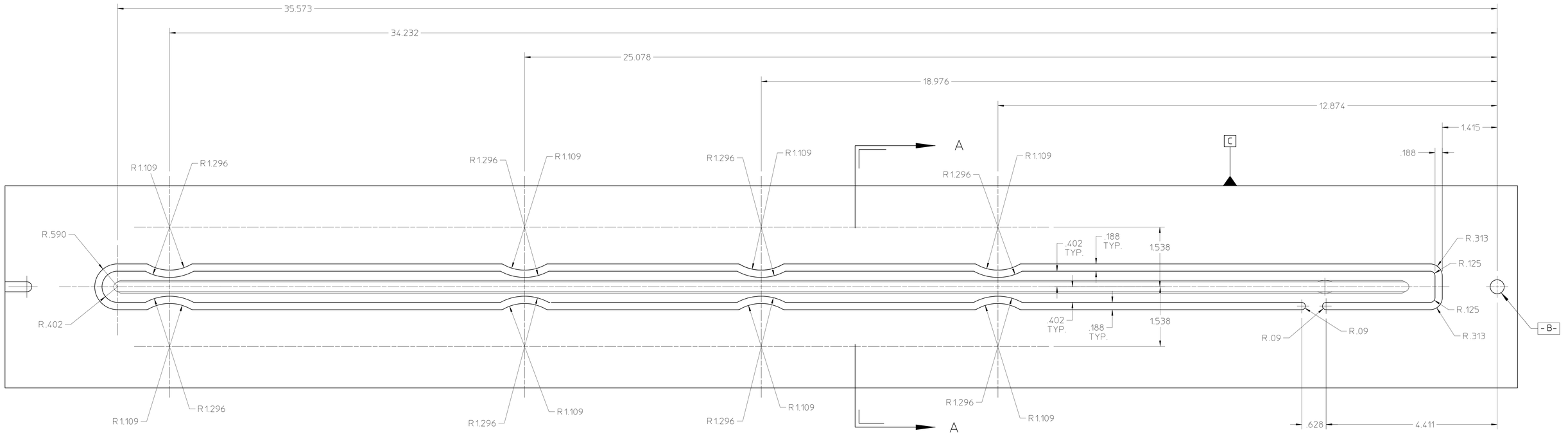
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH
DWG BY: MATT HOFF DATE 05-22-00
CHK. BY: DATE

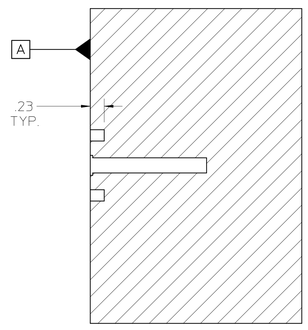
C10100 COPPER

REQD	ITEM	PART NO	DESCRIPTION

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MINOR VANE - C101 MACHINING with SQUIRT HOLE

PATENT CLEAR | DWG. TYPE DETAIL | SHOWN ON | SCALE 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B3096 | SIZE | REV.





SECT. A-A

25B3106

THIS DRAWING DESCRIBES THE SIDE PASSAGE GEOMETRY SHOWN ON DRAWING 25B3066 & 25B3076

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 216 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
		25B0306	C101 MACHINING MAJOR VANE

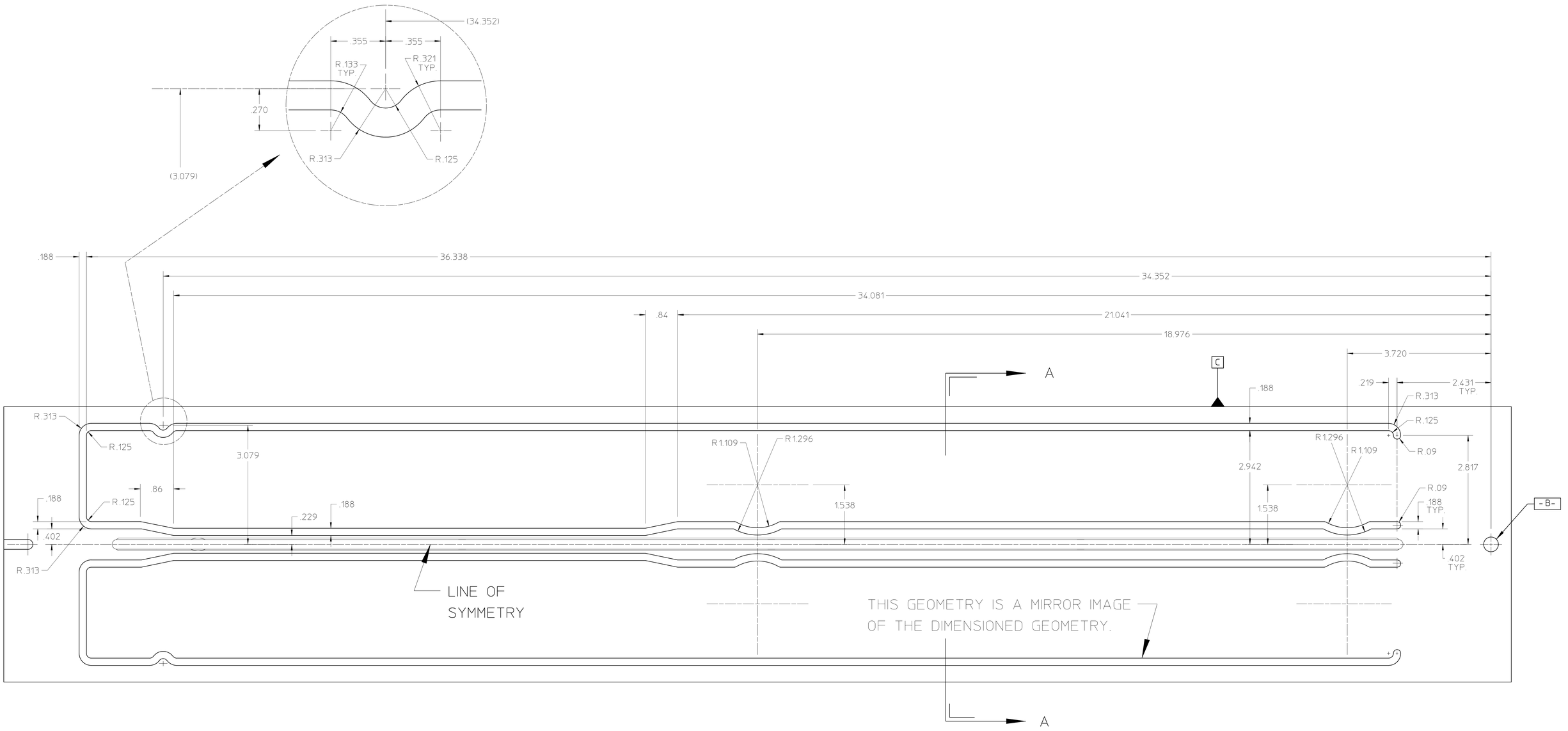
REV.	DWG.	CHK.	ZONE	DATE	CHANGES

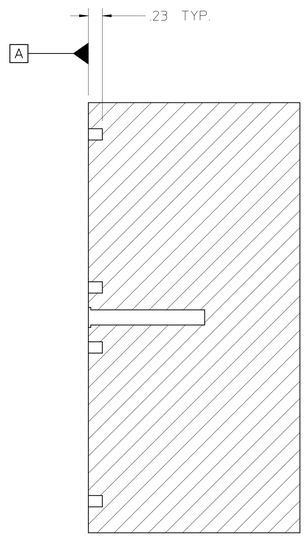
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG. BY: MATT HOFF | DATE: 05-23-00
CHK. BY: | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE - CHANNEL DETAILS

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON | SCALE 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B3106 | SIZE | REV.





SECT. A-A

25B3116

THIS DRAWING DESCRIBES THE SIDE PASSAGE GEOMETRY SHOWN ON DRAWING 25B3086 & 25B3096

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 304 LBS.

REQD	ITEM	PART NO	DESCRIPTION
		25B2756	VANE C REPLACEMENT - C101 MACHINING

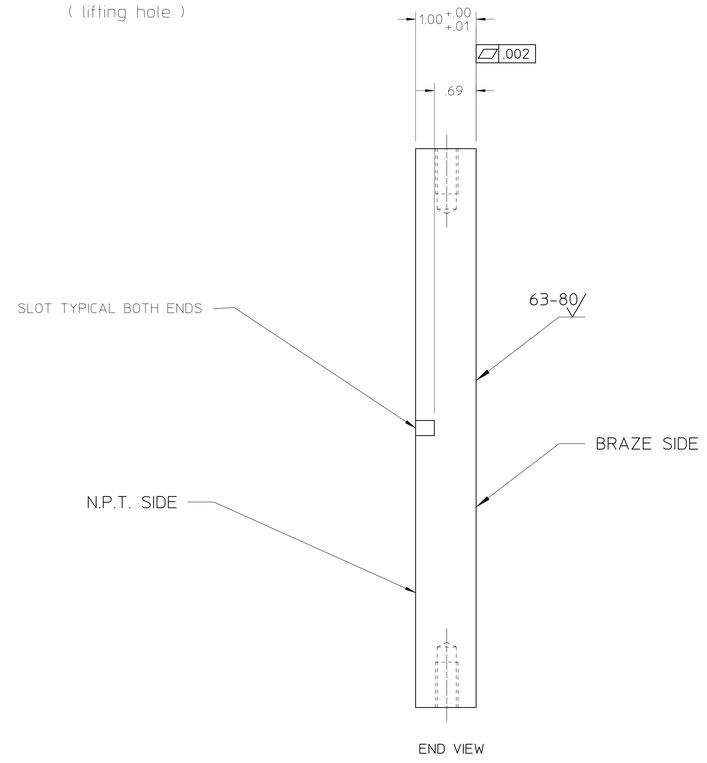
REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC. ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF DATE 05-23-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MINOR VANE - CHANNEL DETAILS

PATENT CLEAR	DWG TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		1 : 1	
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	SIZE REV
	8212-DB	FE3211	25B3116	



FABRICATION SEQUENCE

STEP 1.
Skim cut stock material to a 125um finish on one 9.25 x 39 inch surface. A 95% clean-up is acceptable. Shim plate as necessary so as to remove as little material as possible. When complete, machine the opposite side parallel and to a 125 um finish. 95% clean-up is acceptable on this side also.

PART 2.
Heat piece in a hydrogen furnace and maintain a plate temperature of 1000 degrees C for 10 minutes. Take steps to keep the plate as flat as possible during this process. Past plates have bowed .040 inches after this step. Similar results should be expected from this plate.

STEP 3.
Hold plate for LBNL inspection of surface after furnace cycle.

STEP 4.
Finish plate to the dimensions and tolerances indicated on this drawing.

25B0312

NOTES

1. DIMENSIONS ARE IN INCHES
2. TAKE EXTRA CARE NOT TO SCRATCH OR DAMAGE THE BRAZE SIDE OF THE PLATE AFTER MACHINING.
3. THIS PART WEIGHS APPROX. 112 LBS.

REQD	ITEM	PART NO	DESCRIPTION
			HIP GLIDCOP AL-15

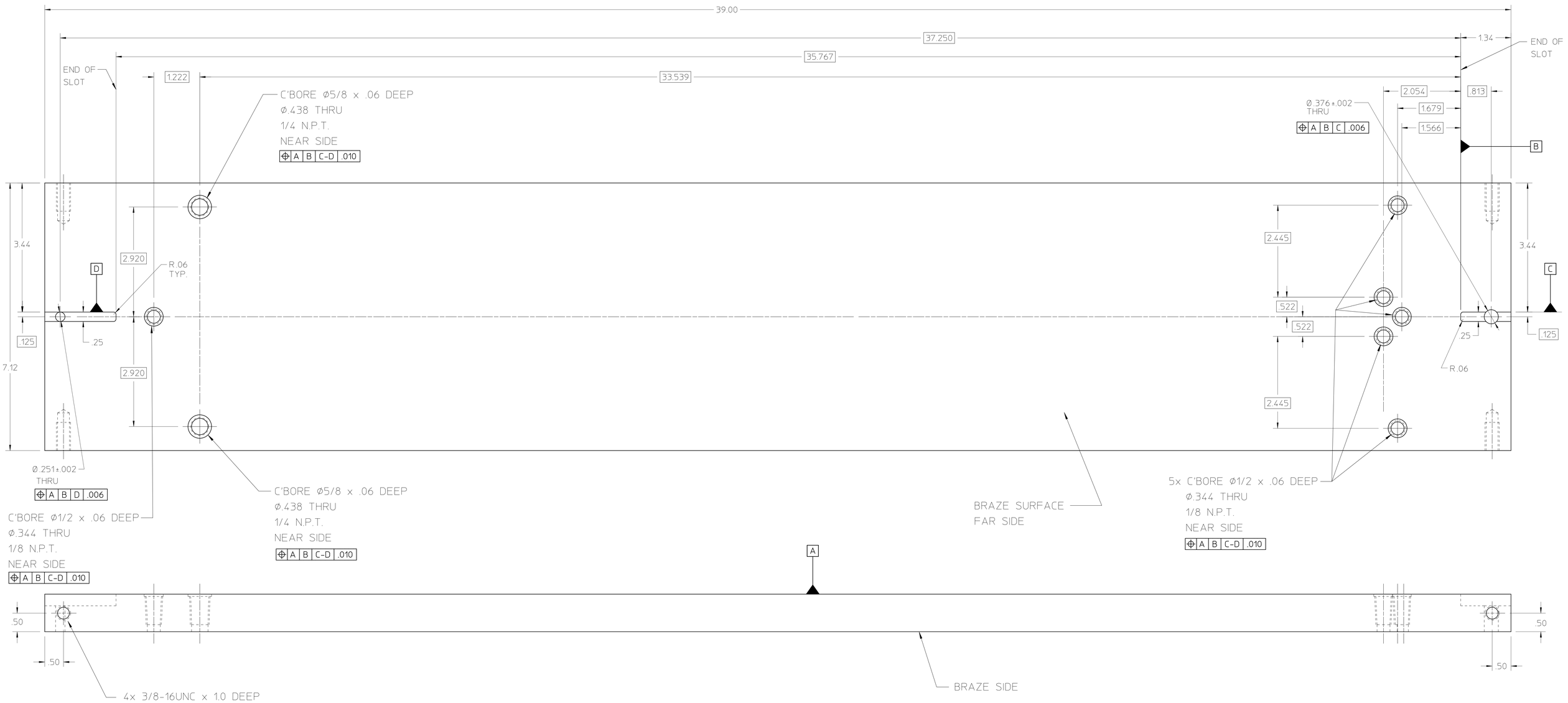
REV	DWG	CHK	ZONE	DATE	CHANGES

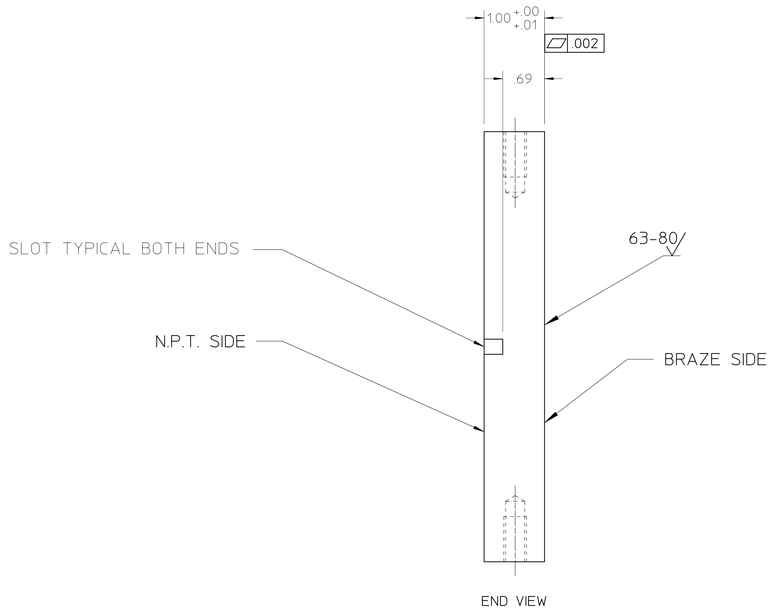
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE: 05-19-00
CHK. BY: DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE - GLIDCOP MACHINING

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON | SCALE 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B3126 | SIZE | REV.





FABRICATION SEQUENCE

STEP 1.
Skim cut stock material to a 125um finish on one 9.25 x 39 inch surface. A 95% clean-up is acceptable. Shim plate as necessary so as to remove as little material as possible. When complete, machine the opposite side parallel and to a 125 um finish. 95% clean-up is acceptable on this side also.

PART 2.
Heat piece in a hydrogen furnace and maintain a plate temperature of 1000 degrees C for 10 minutes. Take steps to keep the plate as flat as possible during this process. Past plates have bowed .040 inches after this step. Similar results should be expected from this plate.

STEP 3.
Hold plate for LBNL inspection of surface after furnace cycle.

STEP 4.
Finish plate to the dimensions and tolerances indicated on this drawing.

25B3136

NOTES

1. DIMENSIONS ARE IN INCHES
2. TAKE EXTRA CARE NOT TO SCRATCH OR DAMAGE THE BRAZE SIDE OF THE PLATE AFTER MACHINING.
3. THIS PART WEIGHS APPROX. 86 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
			HIP GLIDCOP AL-15

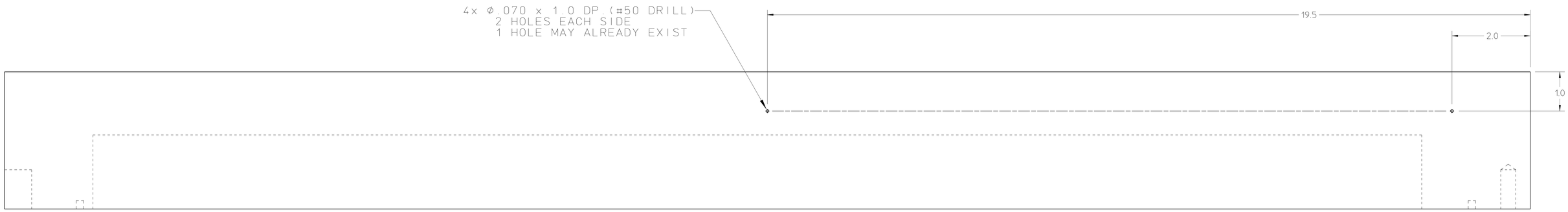
REV	DWG	CHK	ZONE	DATE	CHANGES

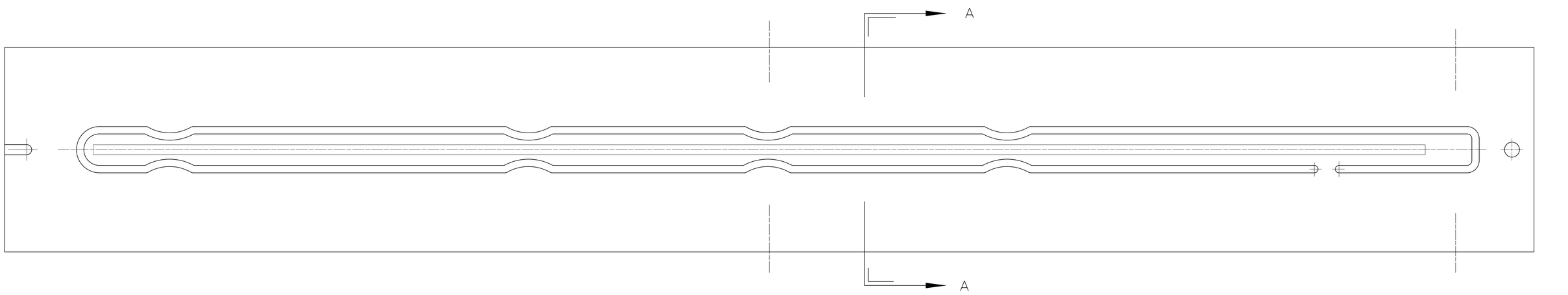
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE.
REFERENCES: ANSI Y14.5 & B46.1

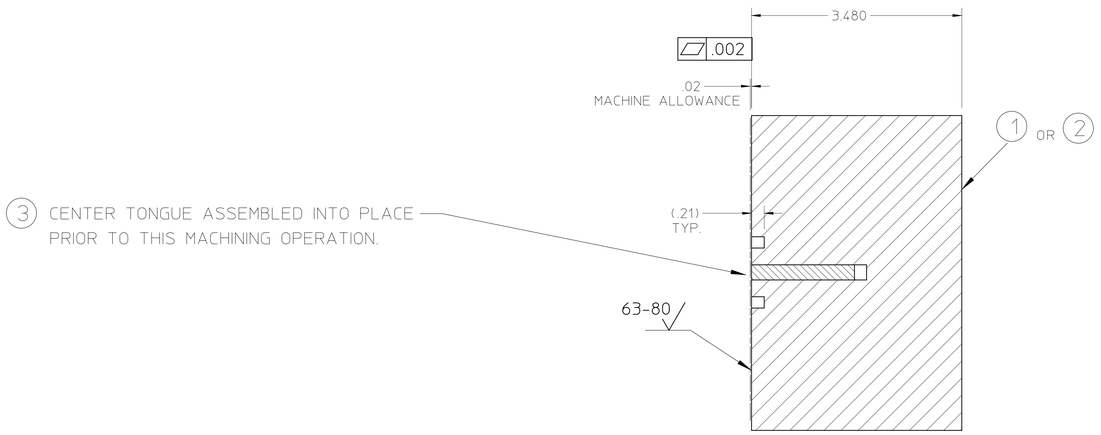
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF DATE 05-19-00
CHK BY DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MINOR VANE - GLIDCOP MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3136	







SECT. A-A

25B3146A

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 222 LBS.

REQD	ITEM	PART NO.	DESCRIPTION
	3	25B3176	CENTER TONGUE ASSEMBLY
	2	25B3076	MAJOR VANE - C101 MACHINING W/ SQUIRT HOLE
	1	25B3066	MAJOR VANE - C101 MACHINING

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			12-08-00	ADDED ITEM NUMBERS

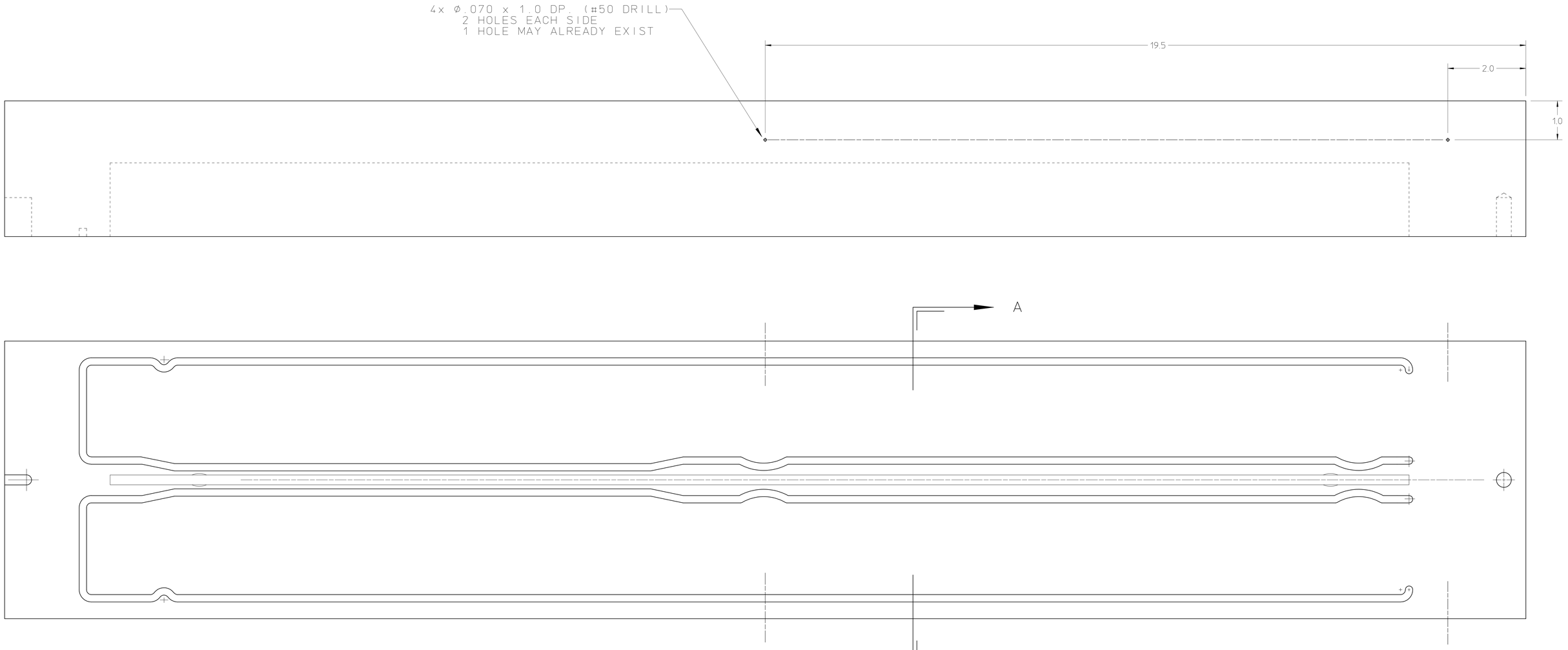
UNLESS OTHERWISE SPECIFIED
TOLERANCES: X ± .1 | FRAC ±1/64 | XX ± .01 | ANGLES ± 1° | XXX ± .005 | FINISH 250
THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE.
REFERENCES: ANSI Y14.5 & B46.1

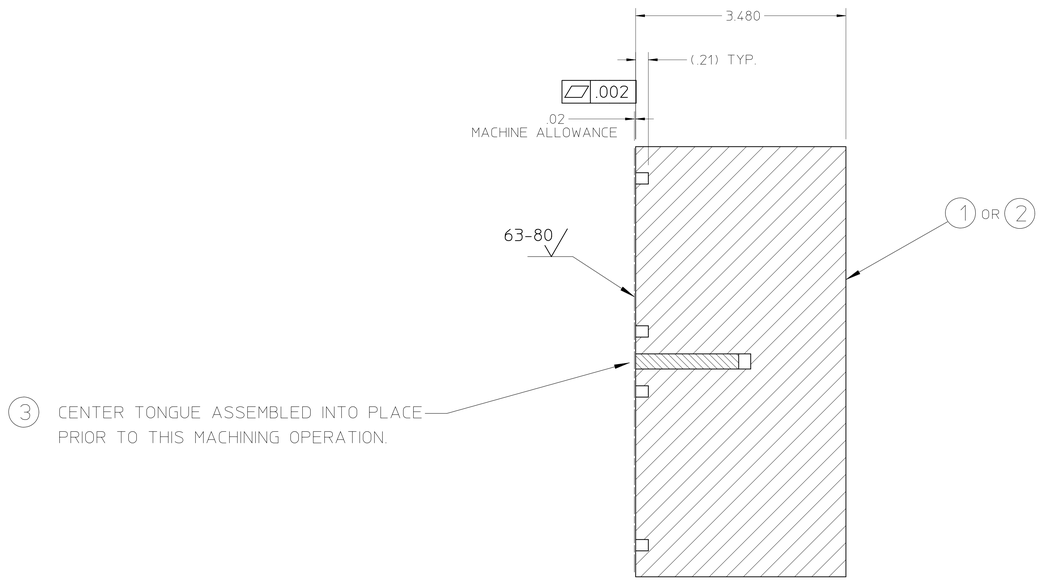
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO:
SURFACE TREATMENT:
IDENT. METH.:
DWG BY: MATT HOFF
DATE: 05-31-00
CHK. BY:
DATE:

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE - BRAZE PREP

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3146	A





SECT. A-A

25B3156A

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 309 LBS.

REQD	ITEM	PART NO	DESCRIPTION
	3	25B3176	CENTER TONGUE ASSEMBLY
	2	25B3096	MINOR VANE - C101 MACHINING W/ SQUIRT HOLE
	1	25B3086	MINOR VANE - C101 MACHINING

REV.	DWG.	CHK.	ZONE	DATE	CHANGES
A	MDH			12-08-00	ADDED ITEM NUMBERS

UNLESS OTHERWISE SPECIFIED (TOLERANCES): .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 250

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

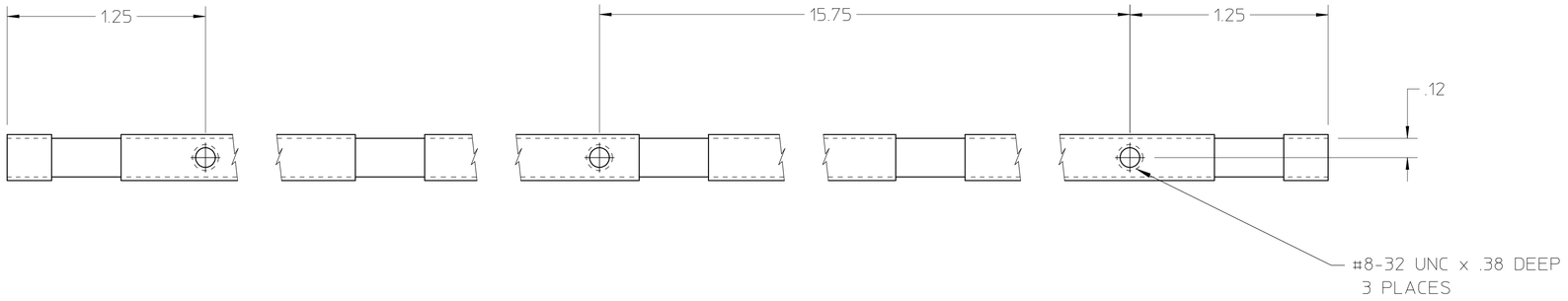
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY: MATT HOFF
DATE: 05-31-00
CHK. BY
DATE

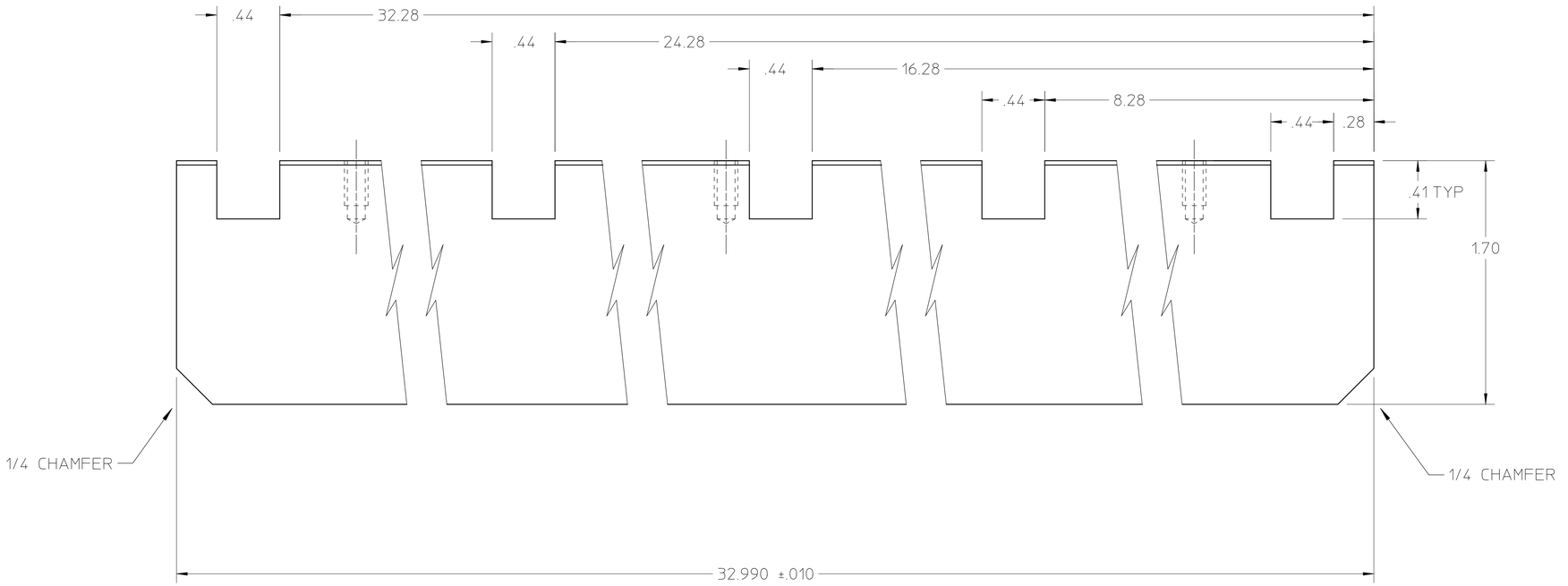
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

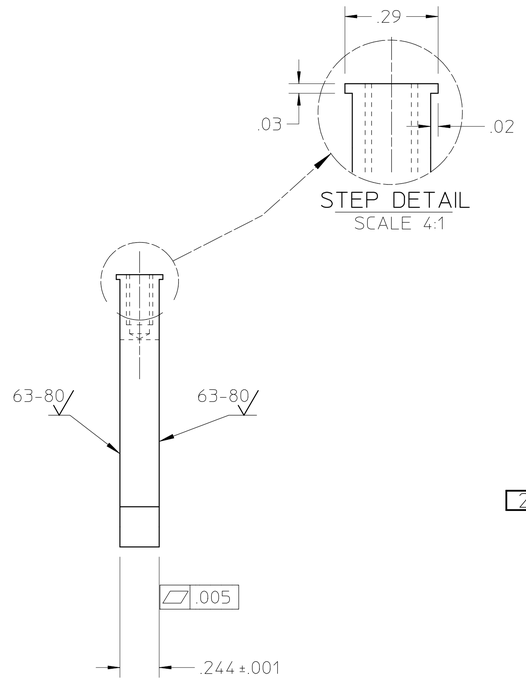
SNS-FES RFQ
MECHANICAL STRUCTURES
MINOR VANE - BRAZE PREP

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON | SCALE 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B3156 | SIZE | REV. A

REQ	ITEM	PART NUMBER	DESCRIPTION
			C101 COPPER STOCK







25B3164

DIMENSIONS ARE IN INCHES

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- .X ± .1
- .XX ± .01
- .XXX ± .005
- FRAC. ±1/64
- ANGLES ±1°
- FINISH 125√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO.		SERIAL NO.
DATE ISSD.	DATE REQD.	NO. REQD.
DELIVER TO		
SURFACE TREATMENT		
IDENT. METH.		
DWG. BY	MATT HOFF	DATE 05-31-00
CHK. BY		DATE

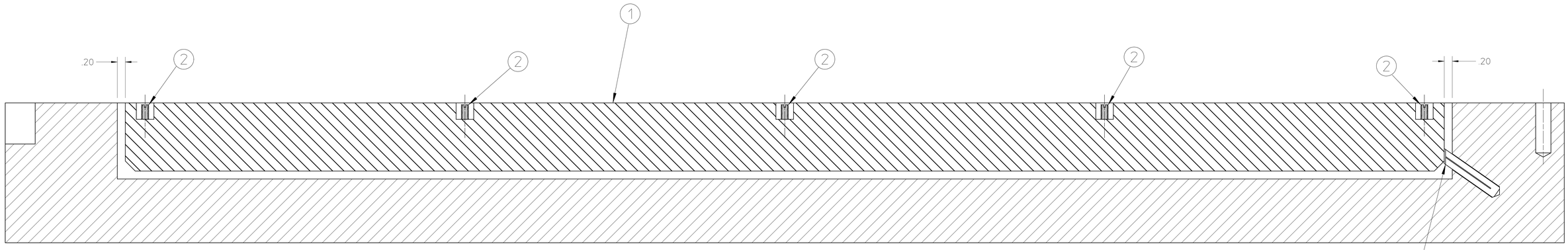
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ

MECHANICAL STRUCTURES

STEPPED CENTER TONGUE - SHORT

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		2 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3164	



SECTION VIEW

3 INSTALL DIVERTER ONLY IN VANES THAT CONTAIN A SQUIRT HOLE.

4 USE DIVERTER INSERT TOOL TO ORIENT DIVERTER AS SHOWN. DIVERTER IS CUT LONG, SO A FEW TRIAL FITS AND TRIMMING MAY BE REQUIRED FOR FINAL FIT.

25B3176

REQD	ITEM	PART NO	DESCRIPTION
1	4	25B3002	DIVERTER INSERT TOOL
1	3	25B2794	DIVERTER INSERT
5	2	25B2782	TONGUE LOCKING SCREW
1	1	25B3164	STEPPED CENTER TONGUE - SHORT

DIMENSIONS ARE IN INCHES

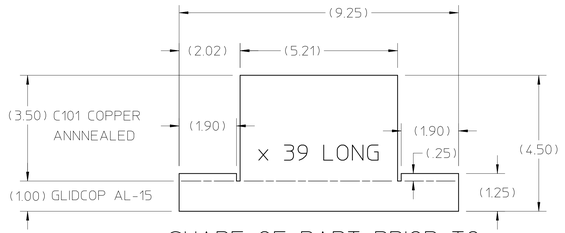
REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC. ±1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

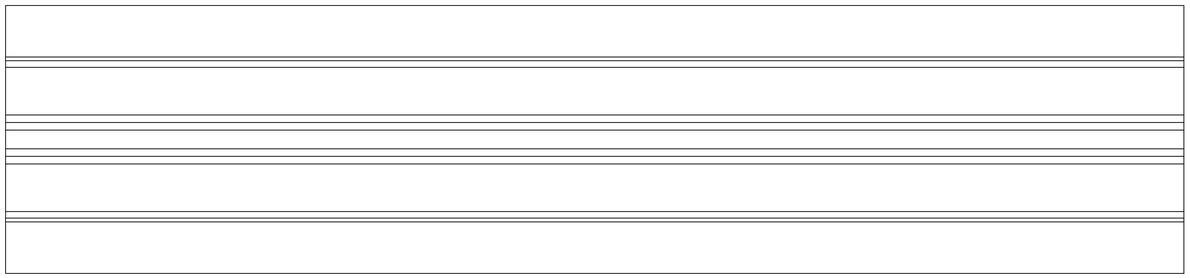
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF DATE 06-02-00
CHK. BY
DATE

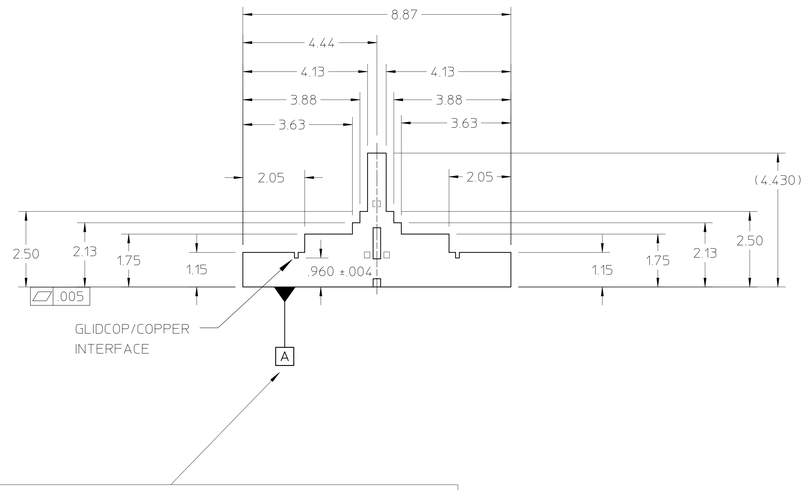
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
CENTER TONGUE ASSEMBLY

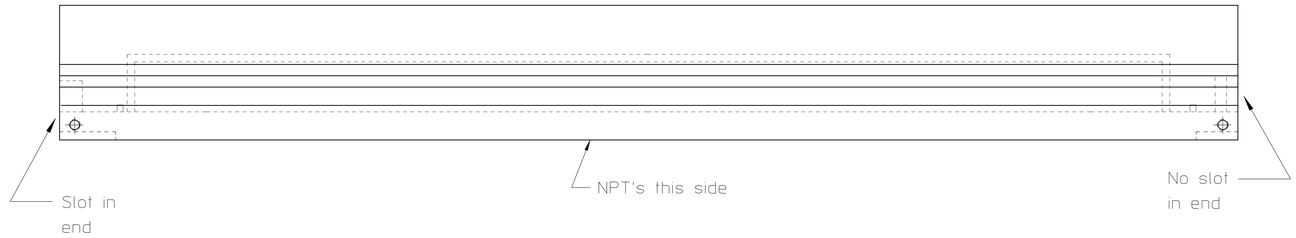
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 1	DO NOT SCALE PRINTS
MICROFILMED	ASSY		SIZE	REV.
	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211	DWG. NO. 25B3176	



SHAPE OF PART PRIOR TO
THIS MACHINING STEP.



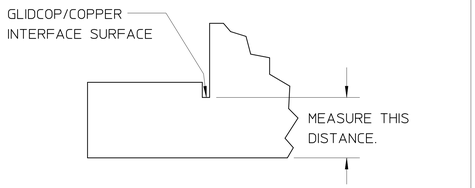




MACHINE DATUM A TO THE .960 DIMENSION FIRST.

THE GLIDCOP/COPPER INTERFACE CAN BE LOCATED AT THE BOTTOM OF BOTH CHANNELS AS SHOWN IN SKETCH A.

IF DATUM A DOES NOT 100% CLEAN-UP. CONTACT MATT HOFF



SKETCH A

25B3186

NOTES:

1. DIMENSIONS ARE IN INCHES.
2. PROTECT COOLING PASSAGES FROM DIRT AND CHIPS. PLUG OR TAPE SHUT PIPE TAPS PRIOR TO MACHINING.
3. THIS PART WEIGHTS APPROX. 348 LBS BEFORE MACHINING APPROX. 190 LBS AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION

REV	DWG	CHK	ZONE	DATE	CHANGES

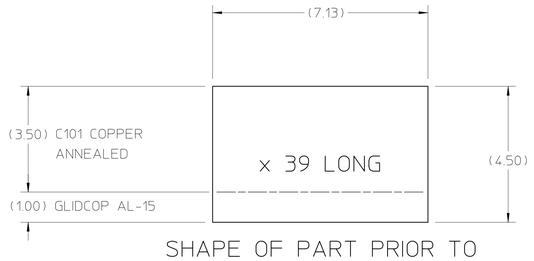
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF — DATE: 06-05-00
CHK. BY:
DATE

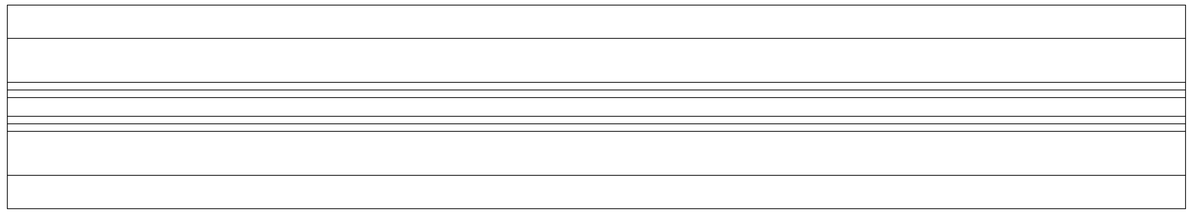
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

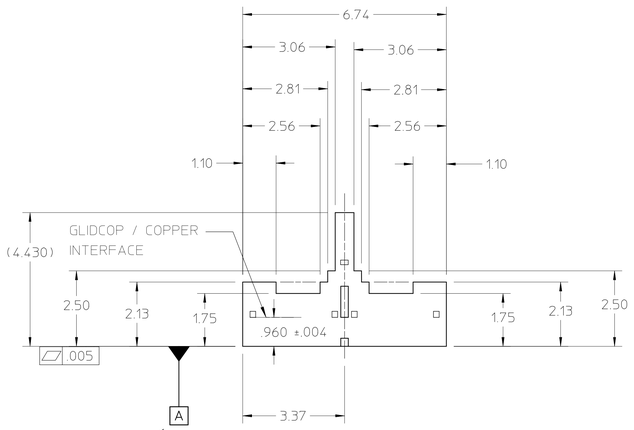
SNS FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE ROUGH OUT

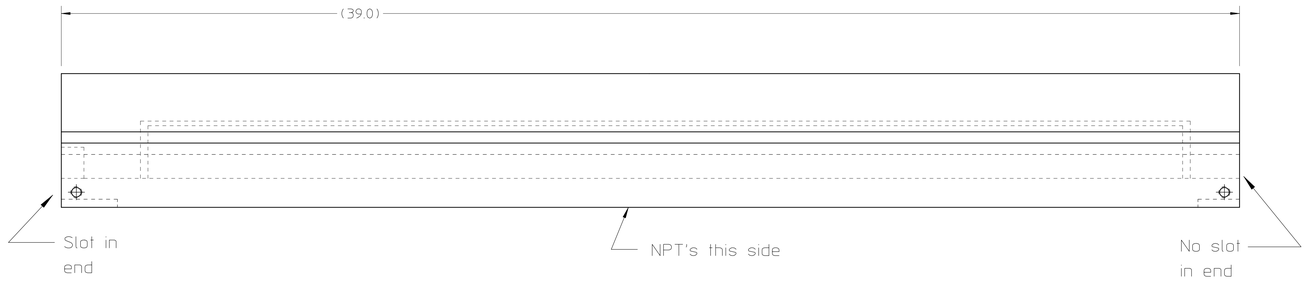
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3186	



SHAPE OF PART PRIOR TO
THIS MACHINING STEP.



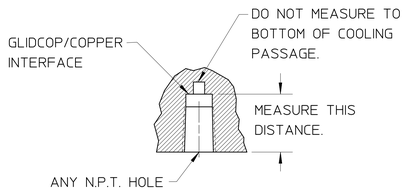




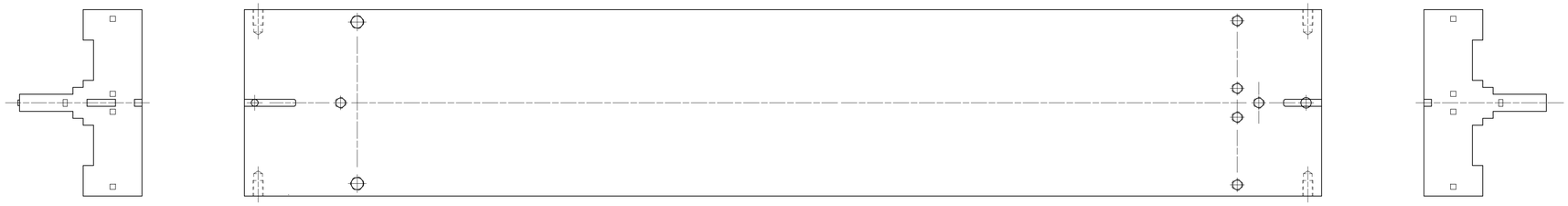
MACHINE DATUM A TO THE .960 DIMENSION FIRST.

THE GLIDCOP/COPPER INTERFACE CAN BE LOCATED AT THE BOTTOM OF THE N.P.T. HOLES AS SHOWN IN SKETCH A.

IF DATUM A DOES NOT 100% CLEAN-UP. CONTACT MATT HOFF



SKETCH A



25B3196

NOTES:

1. DIMENSIONS ARE IN INCHES.
2. PROTECT COOLING PASSAGES FROM DIRT AND CHIPS. PLUG OR TAPE SHUT PIPE TAPS PRIOR TO MACHINING.
3. THIS PART WEIGHTS APPROX. 398 LBS BEFORE MACHINING APPROX. 186 LBS AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION

REV	DWG	CHK	ZONE	DATE	CHANGES

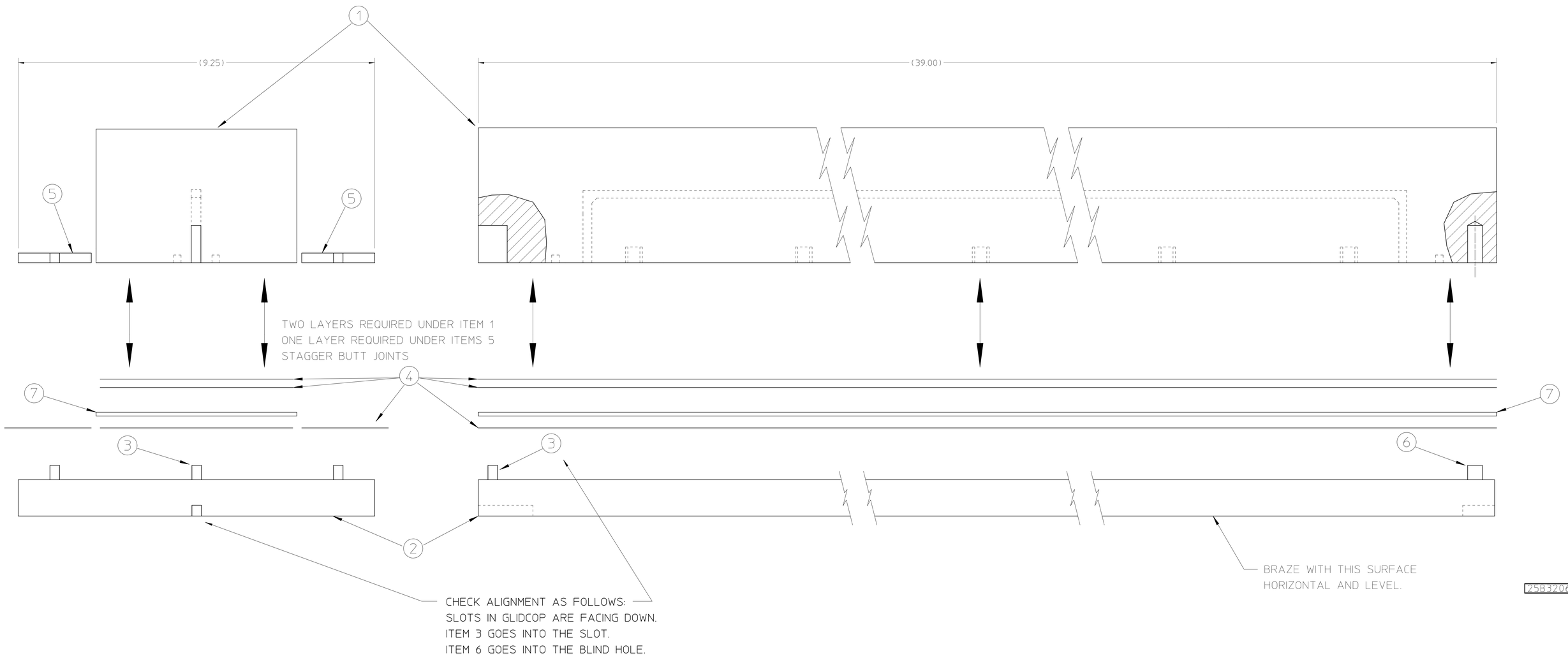
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF — DATE 06-05-00
CHK. BY — DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ
MECHANICAL STRUCTURES
MINOR VANE ROUGH OUT

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3196	



25B3206A

CLEAN AS REQUIRED FOR HYDROGEN OVEN BRAZING.

ASSEMBLE AS SHOWN

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 348 LBS. AFTER BRAZING.

REQD	ITEM	PART NO	DESCRIPTION
	8		
1	7	25B3604	BRAZE JOINT SHEET - MAJOR VANE
1	6	25B0442	VERSION 3 (Ø.38) COPPER DOWEL PIN
2	5	25B0642	ALPHA MODULE C101 EXTENSION
A/R	4		.002 THK. 50-50 Au-Cu Foil Braze material (970°)
5	3	25B0442	VERSION 2 (Ø.25) COPPER DOWEL PIN
1	2	25B3126	MAJOR VANE GLIDCOP MACHINING
1	1	25B3146	MAJOR VANE BRAZE PREP

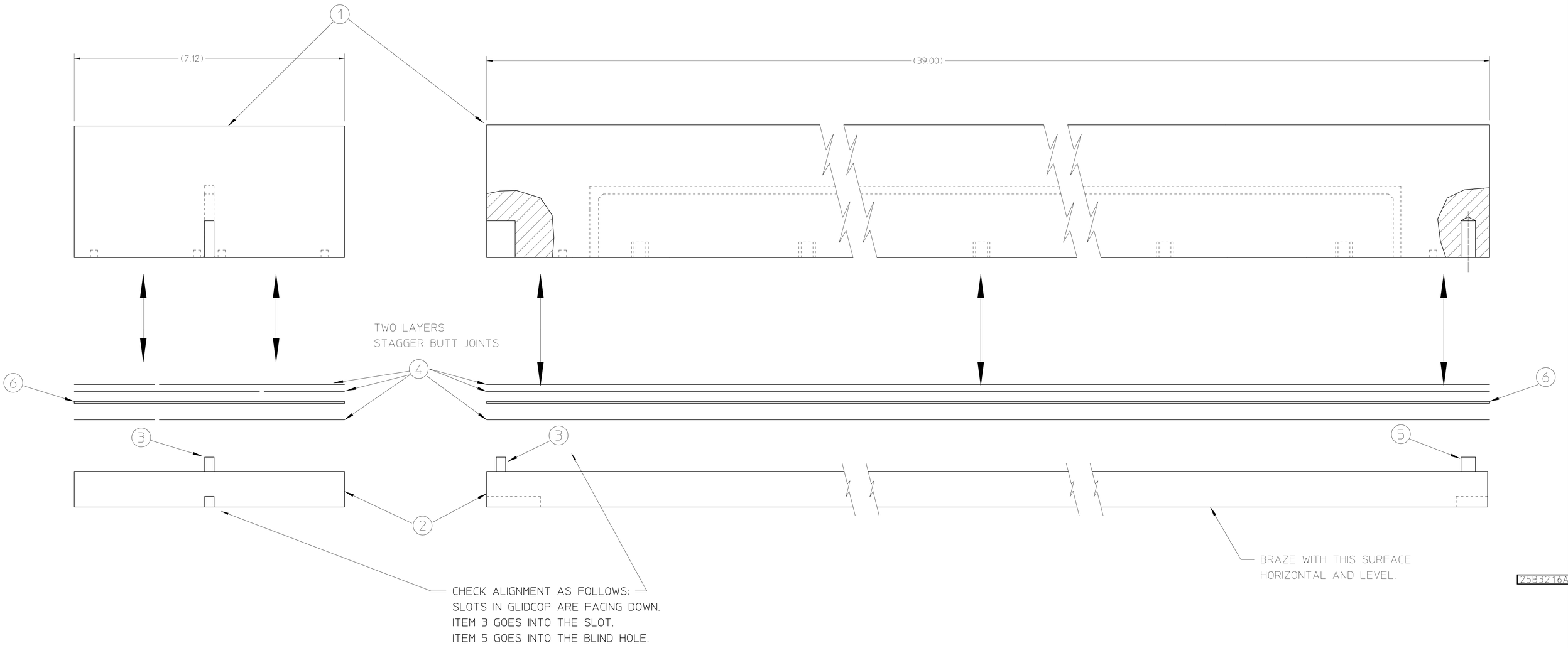
REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			10-27-00	ADDED ITEM 7

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF | DATE: 06-07-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE HORIZONTAL BRAZE

PATENT CLEAR | MICROFILMED
DWG. TYPE: DETAIL | SHOWN ON: 25B0XX6 | SCALE: 1 : 1 | DO NOT SCALE PRINTS
DESIGN ACCT. NO: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO: 25B3206 | SIZE | REV.: A



25B3216A

REQD	ITEM	PART NO	DESCRIPTION
	8		
	7		
1	6	25B3594	BRAZE JOINT SHEET - MINOR VANE
1	5	25B0442	VERSION 3 (Ø.38) COPPER DOWEL PIN
A/R	4		.002 THK. 50-50 Au -Cu Foil Braze material (970°)
1	3	25B0442	VERSION 2 (Ø.25) COPPER DOWEL PIN
1	2	25B3136	MINOR VANE GLIDCOP MACHINING
1	1	25B3156	MINOR VANE BRAZE PREP

CLEAN AS REQUIRED FOR HYDROGEN OVEN BRAZING.

ASSEMBLE AS SHOWN

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 398 LBS. AFTER BRAZING.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			10-27-00	ADDED ITEM 6

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC ±1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .004 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY MATT HOFF
DATE 06-07-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

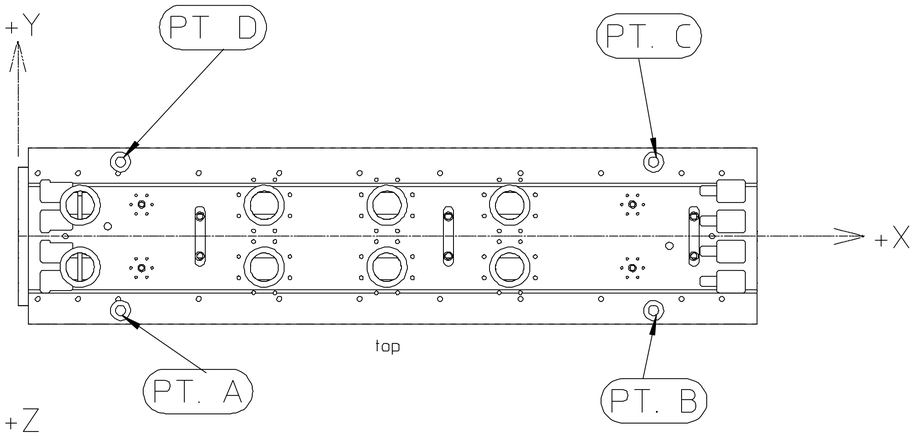
SNS-FES RFQ

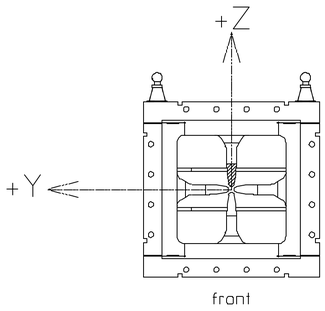
MECHANICAL STRUCTURES

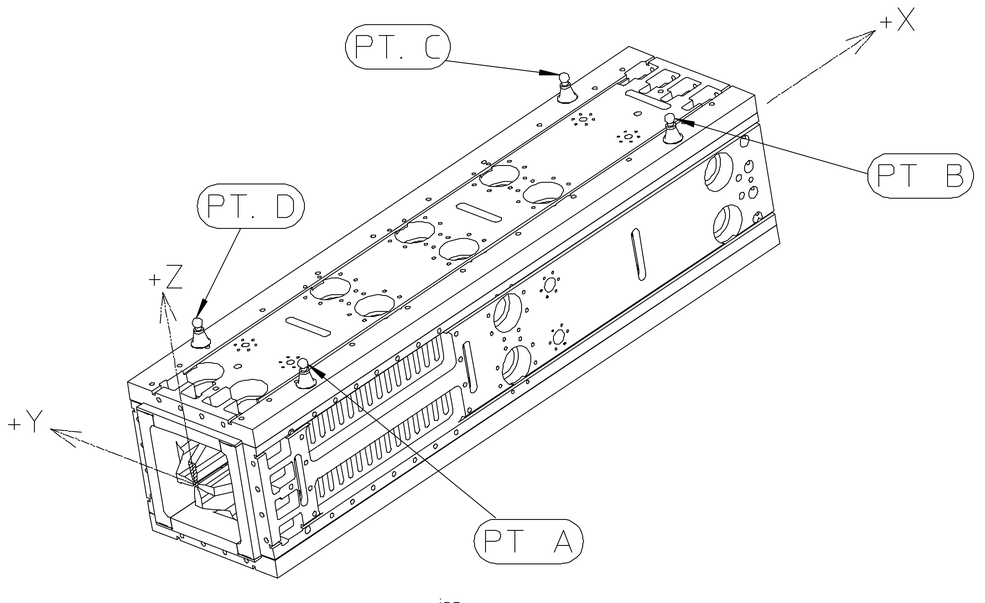
MINOR VANE HORIZONTAL BRAZE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	25BXXX6	1 : 1	
MICROFILMED	DESIGN ACCT. NO	CATEGORY CODE	DWG. NO	SIZE / REV.
	8212-DB	FE3211	25B3216	A

REQ	ITEM	PART NUMBER	DESCRIPTION
-	-	25B3026	ALPHA MODULE END WALL MACHINING
		25B3764	FIDUCIAL POST LOCATION HOLE MACHINING



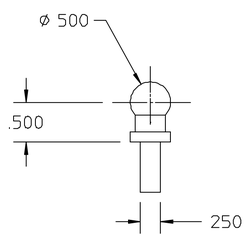




	X	Y	Z
PT. A	128.927860	-93.459300	141.376400
PT. B	801.979600	-93.538040	141.399260
PT. C	801.608760	93.502480	141.386560
PT. D	128.518920	93.466920	141.325600

DIMENSIONS ARE IN MILLIMETERS

Measurements taken by Robert Connors, LBNL, on 6-15-00
at 20 degrees C on the Fanamation Coordinate Measuring Machine



Tooling Ball Detail

The origin of the coordinate system is basically the start of the RFQ modulations and +X is the beam centerline traveling downstream.

The origin of axis Y and Z were determined by measuring the inside walls of the entrance and exit ends of the RFQ. Those measurements were taken 6 mm in from the ends. The distance from opposite walls was averaged to create the X axis.

The origin of the X axis was determined by the surface shown hatched in the drawing The surface corresponds to Datum -X- of Vane B

25B3224A

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH	-	-	3-15-02	ADDED BOM INFORMATION

UNLESS OTHERWISE SPECIFIED

TOLERANCES: X ± - | FRAC ± - | XX ± - | ANGLES ±- | XXX ± - | FINISH - √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1.

SHOP ORDERS

ACCT. NO | SERIAL NO.
DATE ISSD | DATE REQD | NO REQD
DELIVER TO
SURFACE TREATMENT –
IDENT. METH –
DWG BY MATT HOFF | DATE 07-03-00
CHK BY – | DATE –

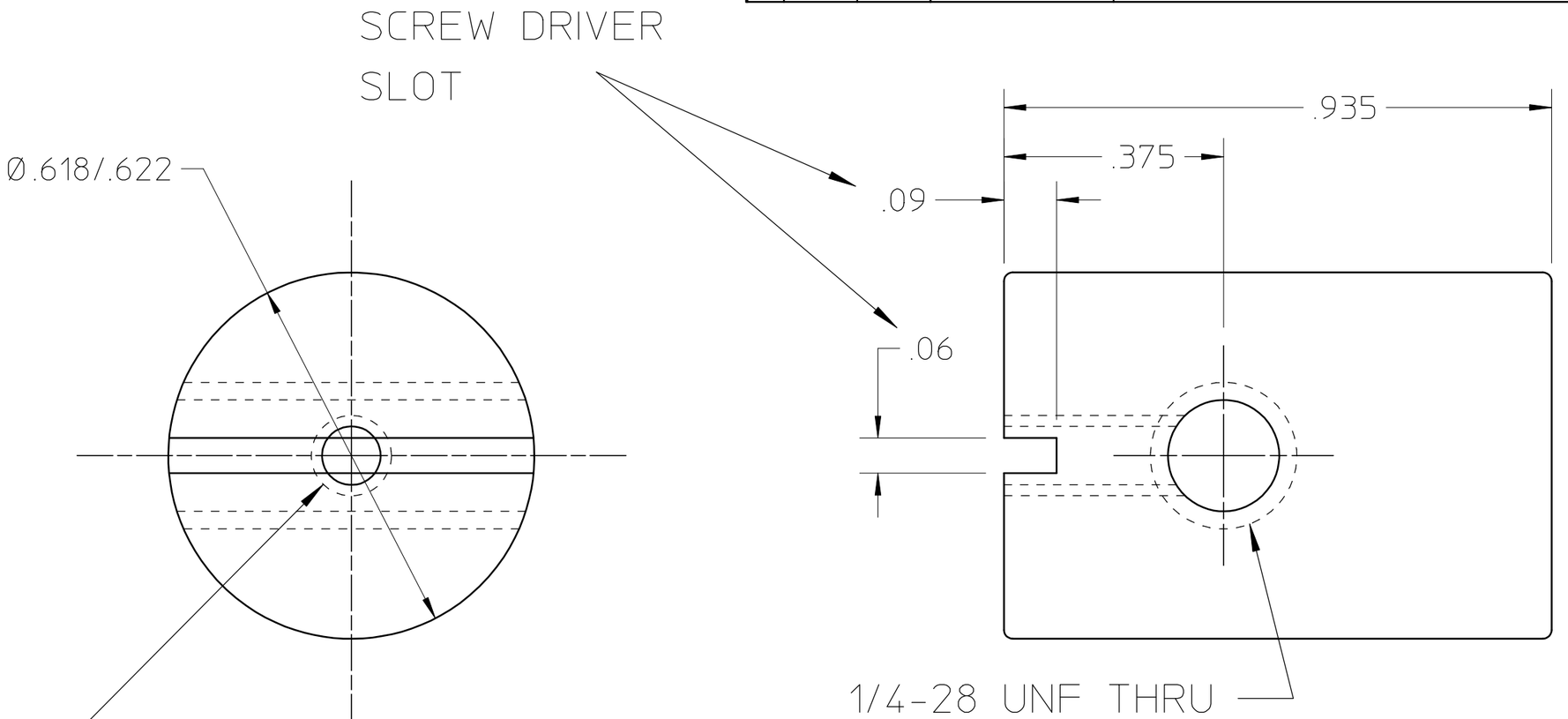
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE FIDUCIALIZATION

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 4	DO NOT SCALE PRINTS
	DETAIL	–	DWG. NO.	SIZE REV
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	25B3224A	

SHEET 1 OF 1

25B3232	REQD	ITEM	PART NUMBER	DESCRIPTION
				316 STAINLESS STEEL BAR STOCK



BREAK EDGES AND CORNERS
DIMENSIONS ARE IN INCHES

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .02 .XXX ±.003

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	FLASH Ag PLATE	
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 07-11-00
CHK BY		DATE

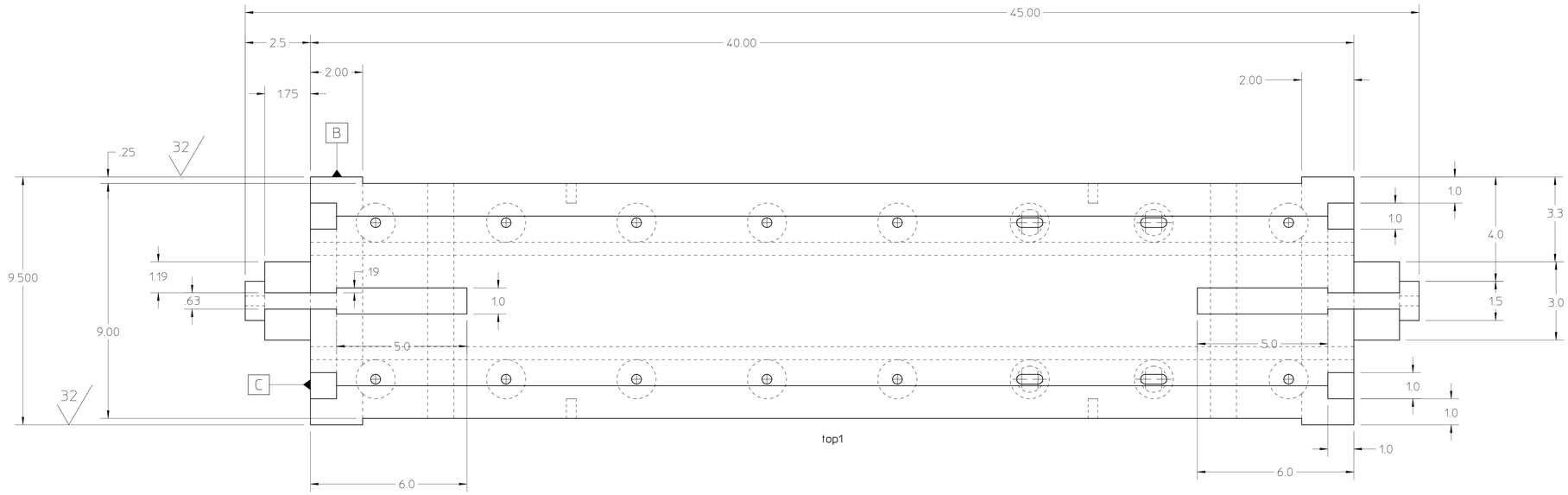
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ

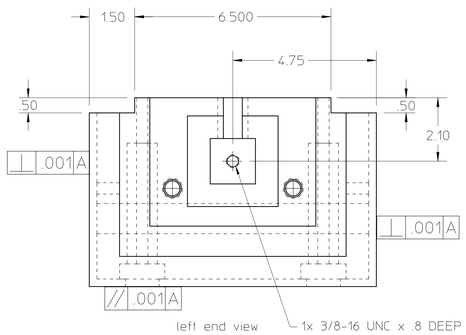
MECHANICAL STRUCTURES

RFQ BARREL NUT

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 4 : 1
	DETAIL		DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B3232

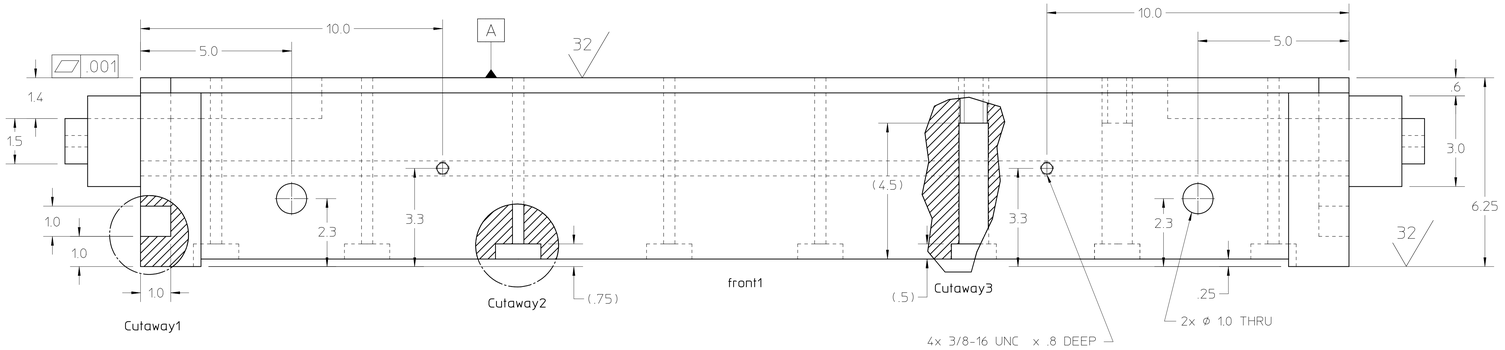


top1



left end view

1x 3/8-16 UNC x .8 DEEP
(lifting tap)



Cutaway1

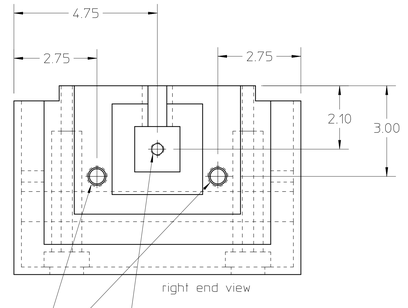
Cutaway2

front1

Cutaway3

2x Ø 1.0 THRU

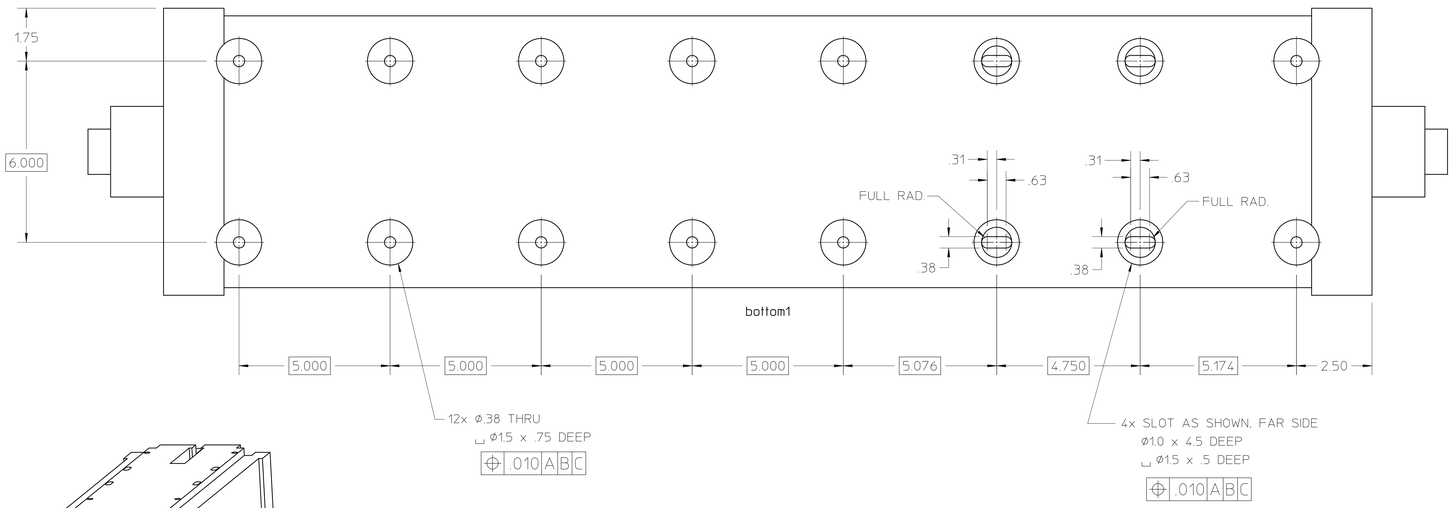
4x 3/8-16 UNC x .8 DEEP
(lifting tap, 2 each side)



right end view

1x 3/8-16 UNC x .8 DEEP
(lifting tap)

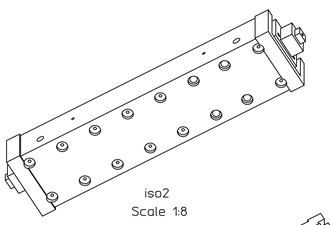
2x Ø.5 THRU
3/8 N.P.T. EACH END
4 N.P.T. TOTAL



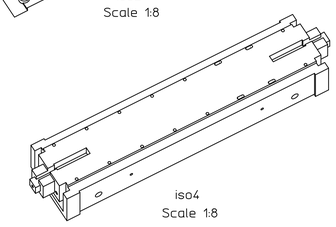
bottom1

12x Ø.38 THRU
⌴ Ø1.5 x .75 DEEP
⌖ .010 A B C

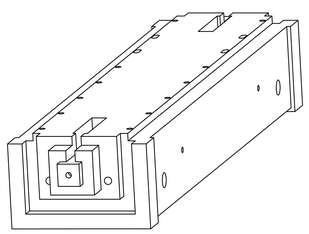
4x SLOT AS SHOWN, FAR SIDE
Ø1.0 x 4.5 DEEP
⌴ Ø1.5 x .5 DEEP
⌖ .010 A B C



iso2
Scale 1:8



iso4
Scale 1:8



gen1
Scale 1:4

25B3246

DIMENSIONS ARE IN INCHES.

THIS PART WEIGHS APPROX. 558 LBS.

ALL INSIDE CORNERS SHOULD BE ROUNDED .06 R. MIN.

LEFT AND RIGHT END VIEWS ARE IDENTICAL.

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED
TOLERANCES:
.X ± – FRAC. ± –
.XX ± – ANGLES ±–
.XXX ± – FINISH 250
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS W/LO SPLATTER & LOOSE SCALE
REFERENCES: AOE Y14.5M-1994 & ANSI B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT –
IDENT. METH. –
DWG. BY Matt Hoff
DATE 7-14-00
CHK. BY –
DATE –

REQD	ITEM	PART NO.	DESCRIPTION
–	–	–	DURA BAR G-2 (CLS-40) GRAY IRON

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ
MECHANICAL STRUCTURES
MINOR VANE GRINDING FIXTURE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	–		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV
	8212-DB	FE3211	25B3246	

SEE DETAIL E

SEE NOTE 3

2x 2.25 | 2x 1.18 | 2x .75 | 2x .75 | 2x .75

2x 9 EQ. SP. AT .75 TYP. FOR A TOTAL OF 6.75

2x 6 EQ. SP. AT .75 TYP. FOR A TOTAL OF 4.50

2x 6 EQ. SP. AT .75 TYP. FOR A TOTAL OF 4.50

SEE NOTE 3

2x 16 EQ. SP. AT .75 FOR A TOTAL OF 12.00

2x 2.25 | 2x 1.50 | 2x 1.50

2x .75 TYP. | 2x .75 TYP. | 2x .75 TYP. | 2x .75 TYP.

SEE DETAIL G

⌖ .015 C A-B D

37x 1/4-20UNC THD. INSERT x .37 LG. MIN. .8 MAX. DRILL DEPTH (2)

15x this centerline
7x this centerline
15x this centerline

3.00 | 2.327 | 2.327 | 3.00

D

(.107) | (2.351)

1.70 | 1.70 | 2.50 TYP. | 2.50 TYP.

(1)

90x Ø.081 x 1.11 DP. HOLES ARE DRILLED AT A (85°) ANGLE. SEE VIEW D-D FOR ADDITIONAL DIMENSIONS

2x 7 EQUAL SPACES AT 2.50 TYP. FOR A TOTAL OF 17.50

2x 7 EQUAL SPACES AT 2.50 TYP. FOR A TOTAL OF 17.50

⌖ .010 C A-B D

85° TYP.

ENTRANCE END

EXIT END

(3) 6x #10-24UNC THREADED INSERT x .31 LG. MIN. EQUAL SPACE, START ON CENTERLINE AS SHOWN ON A Ø1.250 BOLT CIRLCLE. THIS PATTERN IS REPEATED 4 TIMES, INDICATED BY S, FOR A TOTAL OF 24 TAPPED HOLES. ⌖ .015 C A-B D

VIEW D-D

ONLY Ø.081 HOLES SHOWN HIDDEN

1x Ø.070 (#50 drill) x 7/8 DEEP (thermocouple hole)

(2) 8x 1/4-20UNC THREADED INSERT x .37 LG. MIN. .8 MAX. DRILL DEPTH. EQUAL SPACE, STRADDLE CENTERLINE ON A Ø2.750 BOLT CIRLCLE. THIS PATTERN IS REPEATED 6 TIMES, INDICATED BY R, FOR A TOTAL OF 48 TAPPED HOLES. ⌖ .015 C A-B D

-A- SLOT

EXISTING NPT | .56 | R | A | R.28 TYP.

EXISTING NPT | .56 | R | B | R.28 TYP.

S | C | EXISTING NPT

1.538 | 3x .984 | 1.538 | 3x .984

ENTRANCE END

D

S | 3.051 | A | R | 3.051 | B | R | 3.051 | S | C

2.351 | 3.051 | 9.154 | 3.051 | 6.102 | 3.051 | 6.102 | 6.102 | 3.051

(1.89) | 37.11

(39.00)

-B- SLOT

1/8 x 1/8 CHAMFER

F

63

.188 | .188 | 2.453 | 2.453 | .188 | .188

R.05 | R.03 | (.188) | R.03 | R.05

8.750 | 4.065

1/8 x 1/8 CHAMFER

63

.940

⌖ .003 C

63

GLIDCOP/COPPER INTERFACE. DIMENSION ORIGIN

GROOVE DETAIL

2 PLACES

SCALE 2:1

.26 D REF

35.29

4x Ø.625 x .94 DP. FLAT BOTTOM HOLE ⌖ .010 C A-B D

F | F

1.50 | .75 | .75 | 1.50

-A- REF

LINE OF SYMMETRY FOR POCKET DETAILS

DETAIL E

SCALE 1:1

POCKET DETAILS

2.26 | 1.63 | .50

R.13 TYP.

H | H

.50 | .17 | R.28 | 2.00 | J | J | .50 | .50 | .17 | .56

1.13 | 1.69 | 1.13 | .19

-B- REF

LINE OF SYMMETRY FOR POCKET DETAILS

DETAIL G

SCALE 1:1

POCKET DETAILS

DETAIL F-F

SCALE 1:1

.56 TYP. | .03 R. MAX. | .80 TYP.

SECTION H-H

SCALE 1:1

.56 TYP. | .03 R. MAX. | .80 TYP.

SECTION J-J

SCALE 1:1

8x ⌖ .010 C A-B D

32 | .18 | .07 | .96 | MIN. R. | Ø1.406 ±.001

Ø2.12 | Ø2.000 | SNAP RING GROOVE | BREAK EDGES

.96 | .07 | .18 | MIN. R. | Ø1.406 ±.001 | 32

8x ⌖ .010 C A-B D

SECTION A-A

TYP. 4 PLACES

TUNER PORTS

BREAK EDGE .015 MAX. | R.03 MAX | 32 | 40°

THERMOCOUPLE HOLE ONE PER VANE | (1.969)

2x #4 (Ø.209) THRU Ø.3750 x 1.25 DP. CHAMFER AS SHOWN 7/16-14UNC x .50 DP. FULL THD.

6x ⌖ .010 C A-B D

.56 | (.50) (FULL THD) | (1.25)

SECTION B-B

TYP. 3 PLACES

Pi-MODE SABILIZER ROD PORTS

4x ⌖ .010 C A-B D

.04 | .07 | (Ø.80) | 32 | MIN. R. | Ø.250

Ø.80 | Ø.750 | .96 | BREAK EDGES | Ø.250 | Ø.80 | Ø.750 | .96 | SNAP RING GROOVE | 32 | MIN. R.

4x ⌖ .010 C A-B D

SECTION C-C

TYP. 2 PLACES

SENSING PORTS

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.
2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. THIS DIMENSION APPLIES ONLY IF THE Ø.081 HOLE IS DRILLED BEFORE THE POCKET IS MILLED IN. IF THE POCKET IS MILLED FIRST, NEW DIMENSIONS NEED TO BE CALCULATED.
4. ALL DIMENSIONS ARE IN INCHES.
5. THIS PART WEIGHS APPROX. 190 LBS. BEFORE MACHINING. APPROX. 171 LBS. AFTER MACHINING.

25B3256

REQD	ITEM	PART NO	DESCRIPTION
24	3		#10-24UNC HELICOIL THREADED INSERT
85	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B3186	MAJOR VANE ROUGH OUT

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .005 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY: MATT HOFF | DATE 07-24-00
CHK. BY: | DATE

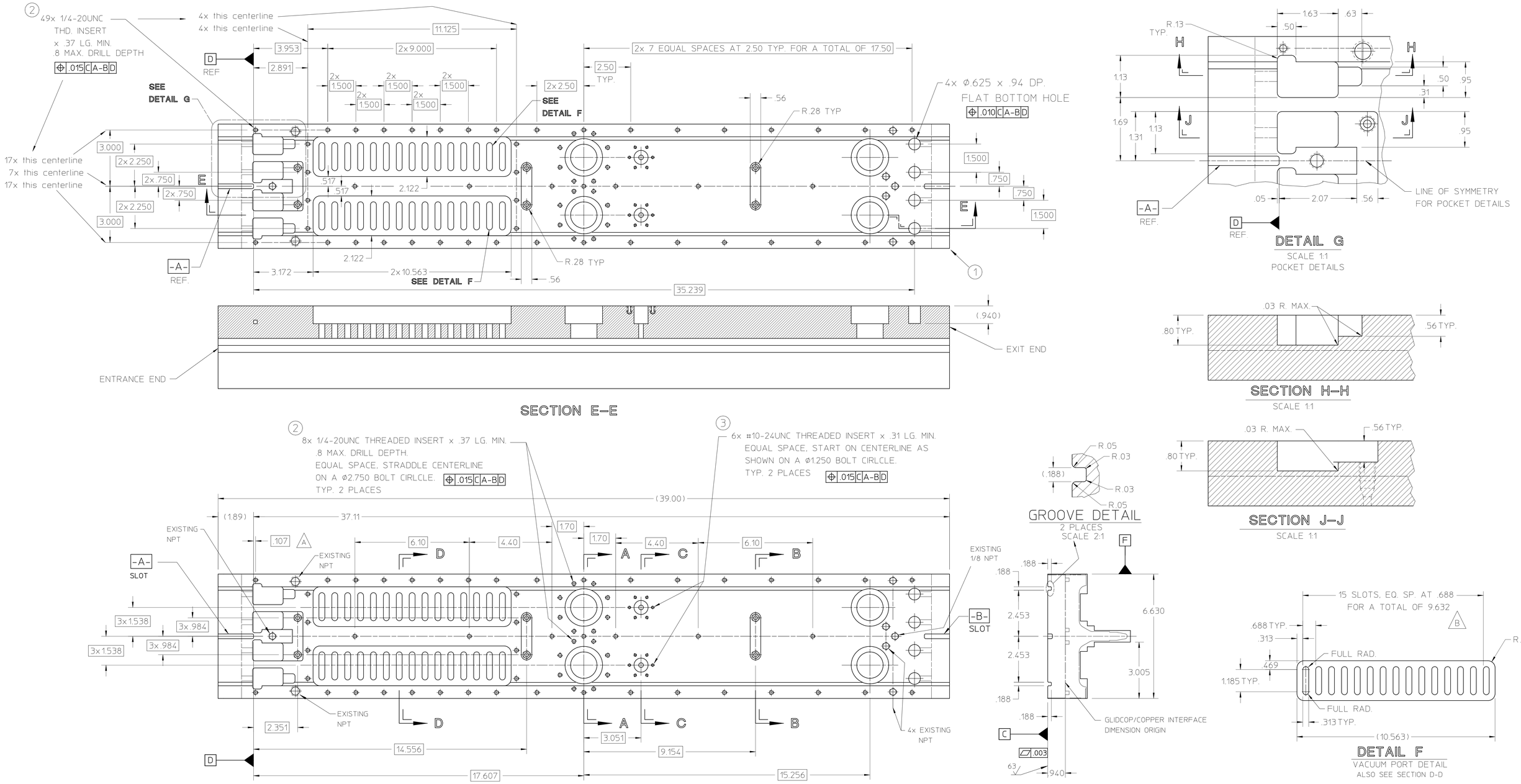
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ

MECHANICAL STRUCTURES

MODULE 2 MAJOR VANE PORT MACHINING

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1:2 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B3256 | SIZE | REV.



SECTION E–E

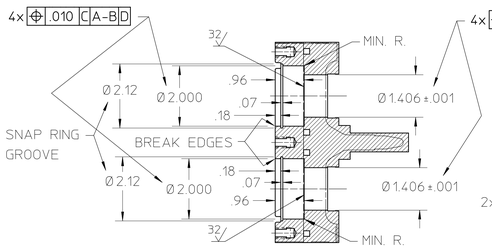
DETAIL G
SCALE 1:1
POCKET DETAILS

SECTION H–H
SCALE 1:1

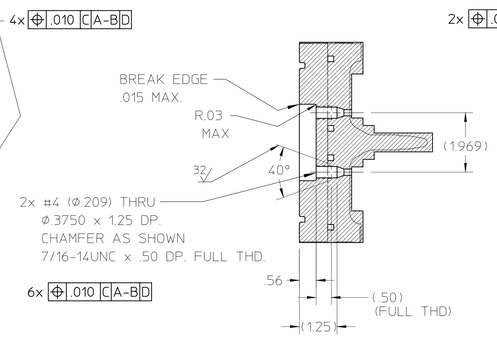
SECTION J–J
SCALE 1:1

GROOVE DETAIL
2 PLACES
SCALE 2:1

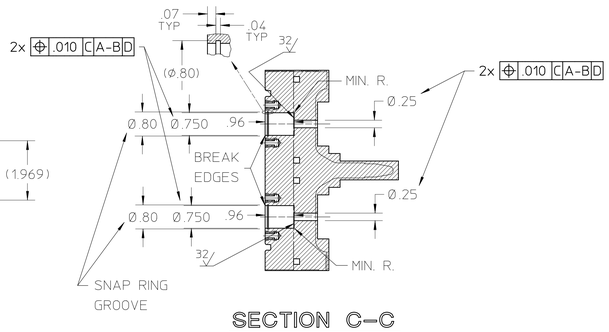
DETAIL F
VACUUM PORT DETAIL
ALSO SEE SECTION D-D



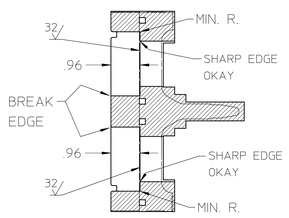
SECTION A–A
TYP. 2 PLACES
TUNER PORTS



SECTION B–B
TYP. 3 PLACES
PI-MODE STABILIZER ROD PORTS



SECTION C–C
SENSING PORT



SECTION D–D
VACUUM PORTS
ALSO SEE DETAIL F

25B3266B

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.
2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. ALL DIMENSIONS ARE IN INCHES.
4. THIS PART WEIGHS APPROX. 186 LBS. BEFORE MACHINING. APPROX. 158 LBS. AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION
12	3		#10-24UNC HELICOIL THREADED INSERT
65	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B3196	MINOR VANE ROUGH OUT

REV.	DWG.	CHK	ZONE	DATE	CHANGES
B	MDH		B-1	12-08-00	9.632 was 9.625
A	MDH			11-10-00	ADDED .107 DIMENSION

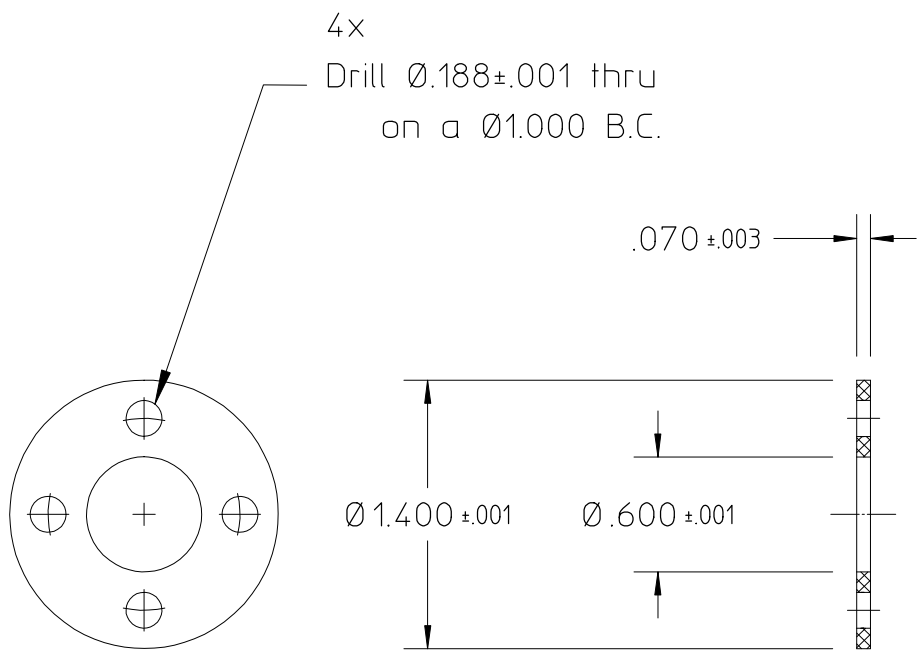
UNLESS OTHERWISE SPECIFIED TOLERANCES: .X ± .1, FRAC. ± 1/64; .XX ± .01, ANGLES ± 1°; .XXX ± .005, FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF
DATE: 07-27-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 2 MINOR VANE PORT MACHINING

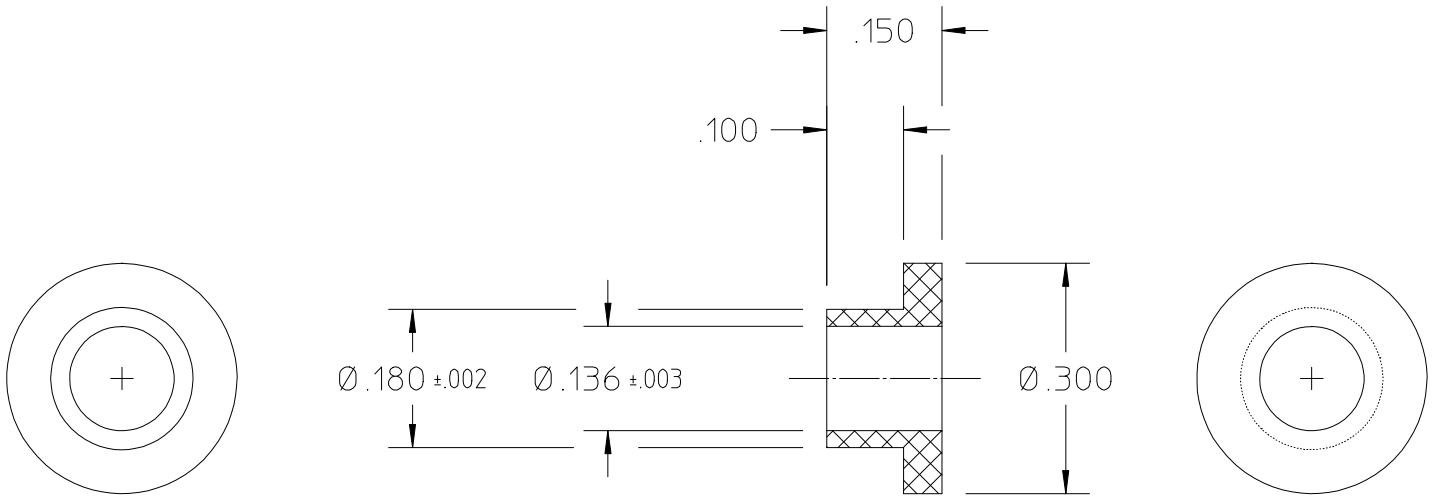
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3266	B

Dwg. No. 25B3271 Size Rev

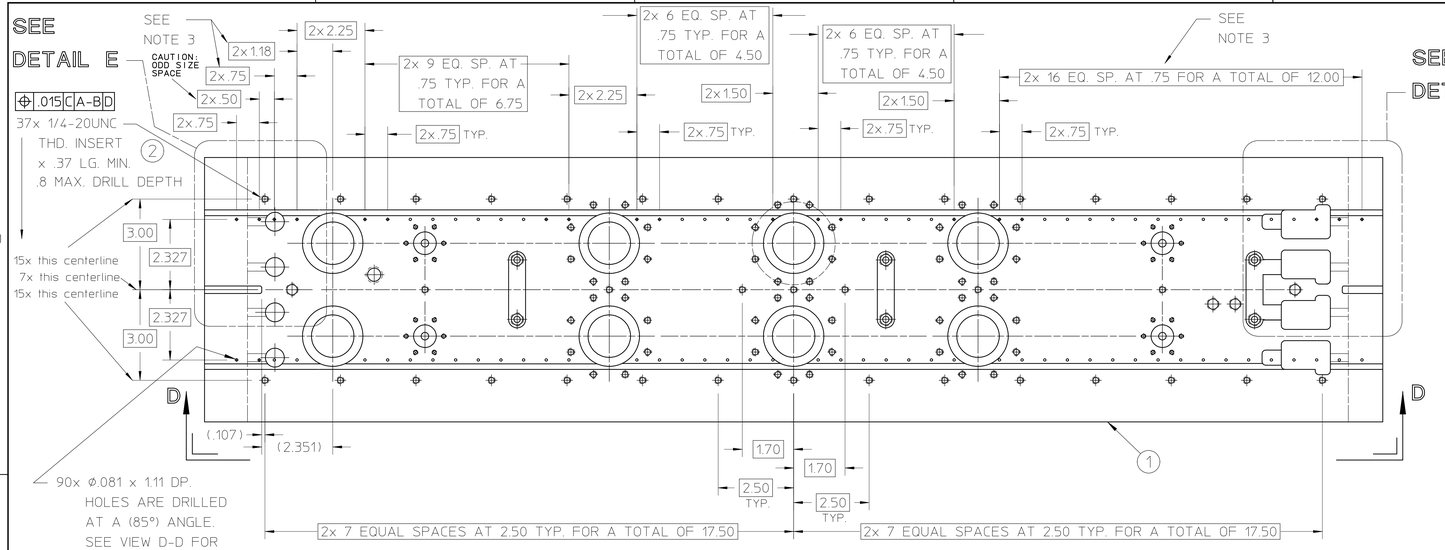


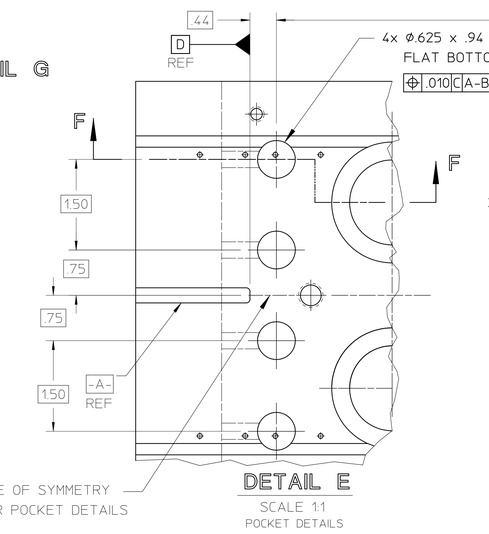
Material Machinable Aluminum Nitride				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ± .1 | .XX ± .025 | .XXX ± .010 | Angles ± .5°				LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FE LEBT CHOPPER R&D			
Account Number -	Finish √ 63			LEBT BEAM CHOPPER DEVELOPMENT			
Date Issued -	Date Reqd -			TEMP. DETECTOR - INSULATOR-1			
Number Required -	Deliver To -	Shown on Dwg No. 25B332_					
Surface Treatment UHV Clean	Identific Method -	Patent Clear		Category Code FE1300		Do not Scale Prints	
Drawn By MacGill	Date 07-24-00	Micro-Filmed		Drawing Scale Full		Dwg. No. 25B3271	Size Rev -
Check By -	Date -	Design Account 8210-32		Drawing Type CD			

Dwg. No. 25B3281 Size Rev

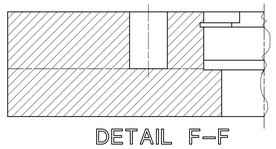


Material Machinable Aluminum Nitride				-	-	-	-
Unless Otherwise Noted				Rev	Dwn	Date	Changes
.X ± .1 | .XX ± .025 | .XXX ± .005 | Angles ± .5°				LAWRENCE BERKELEY LABORATORY			
Break Edges .016 Max on Machined Work Remove Burrs Weld Splatter and Loose Scale References: ANSI Y 14.5 & B46.1				University of California – Berkeley			
				SNS-FE LEBT CHOPPER R&D			
Account Number –	Finish √ 63			LEBT BEAM CHOPPER DEVELOPMENT			
Date Issued –	Date Reqd –			TEMP. DETECTOR - INSULATOR-2			
Number Required –	Deliver To –			Shown on Dwg No. 25B332_			
Surface Treatment UHV Clean	Identific Method –			Patent Clear	Category Code FE1300	Do not Scale Prints	
Drawn By MacGill	Date 07-24-00			Micro-Filmed	Drawing Scale 4X	Dwg. No. 25B3281	Size Rev –
Check By –	Date –			Design Account 8210-32	Drawing Type CD		

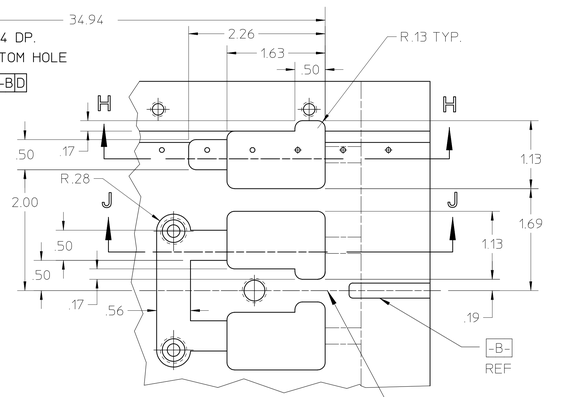




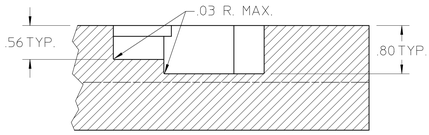
DETAIL E
SCALE 1:1
POCKET DETAILS



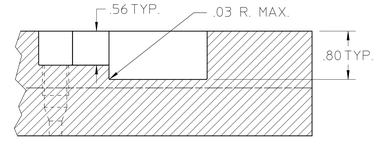
DETAIL F-F
SCALE 1:1



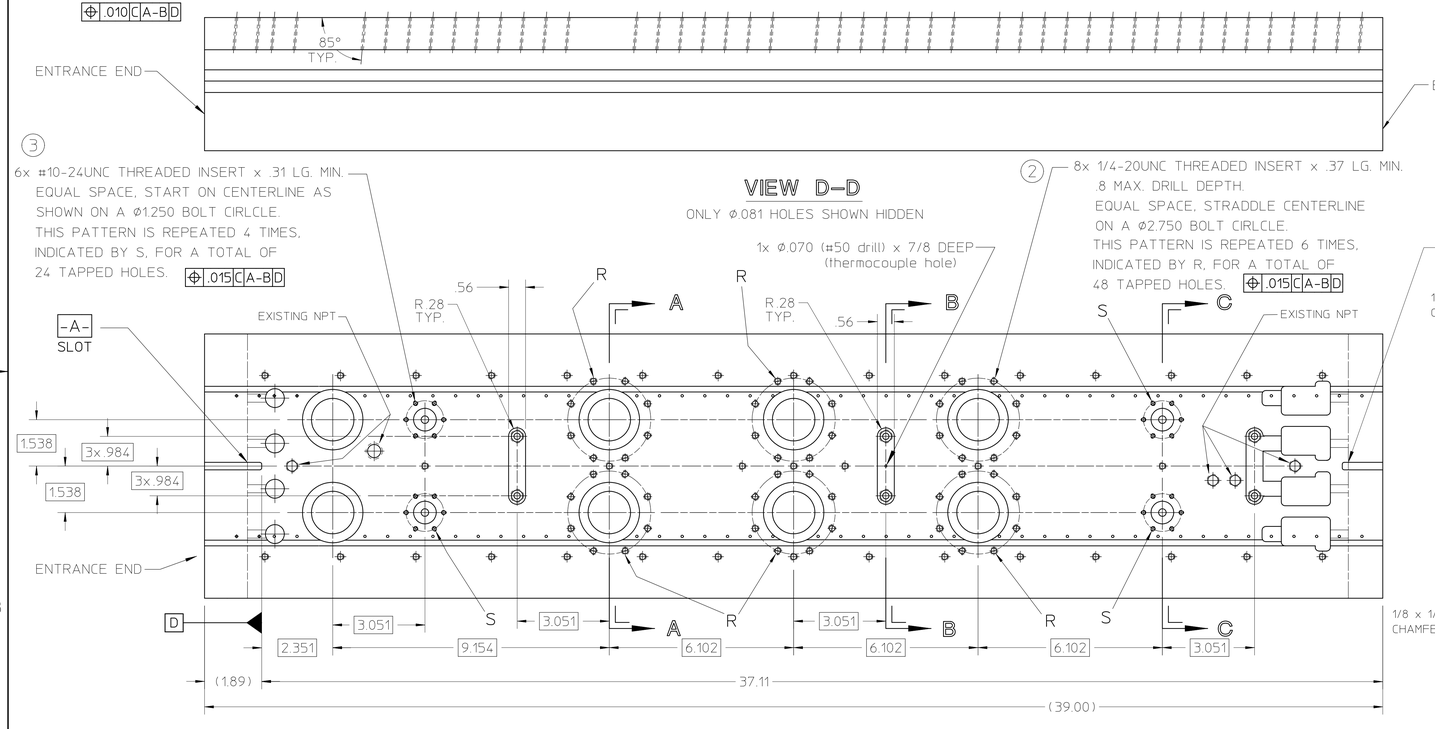
DETAIL G
SCALE 1:1
POCKET DETAILS

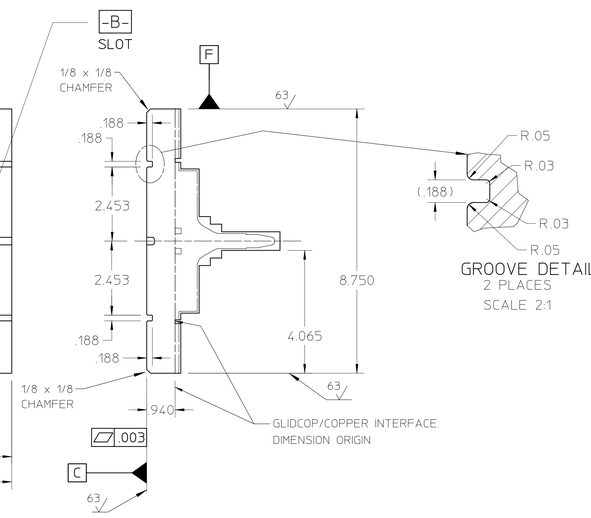


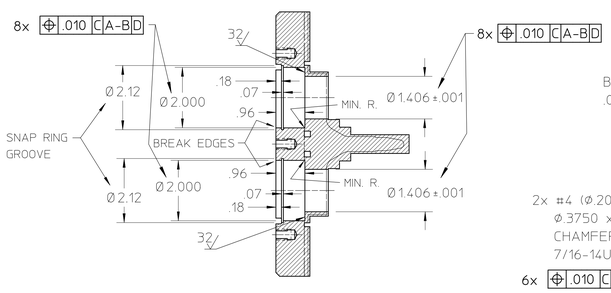
SECTION H-H
SCALE 1:1



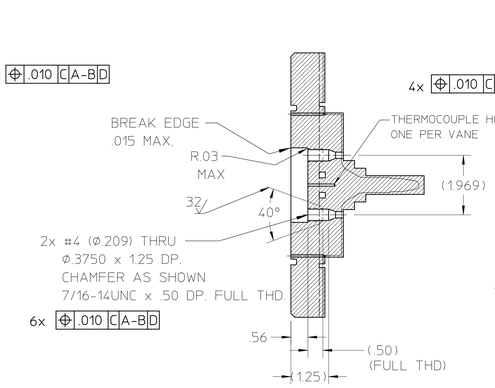
SECTION J-J
SCALE 1:1



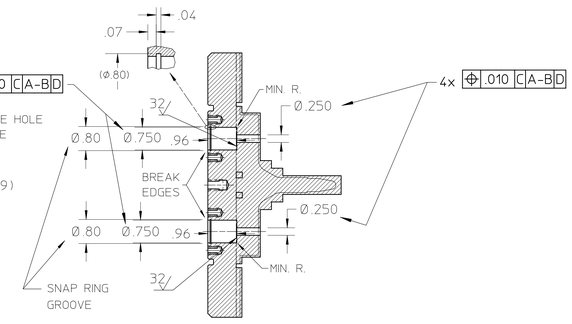




SECTION A-A
TYP. 4 PLACES
TUNER PORTS



SECTION B-B
TYP. 3 PLACES
Pi-MODE SABILIZER ROD PORTS



SECTION C-C
TYP. 2 PLACES
SENSING PORTS

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.

25B3336

2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. THIS DIMENSION APPLIES ONLY IF THE Ø.081 HOLE IS DRILLED BEFORE THE POCKET IS MILLED IN. IF THE POCKET IS MILLED FIRST, NEW DIMENSIONS NEED TO BE CALCULATED.
4. ALL DIMENSIONS ARE IN INCHES.
5. THIS PART WEIGHS APPROX. 190 LBS. BEFORE MACHINING. APPROX. 171 LBS. AFTER MACHINING.

REQD	ITEM	PART NO	DESCRIPTION
24	3		#10-24UNC HELICOIL THREADED INSERT
85	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B3186	MAJOR VANE ROUGH OUT

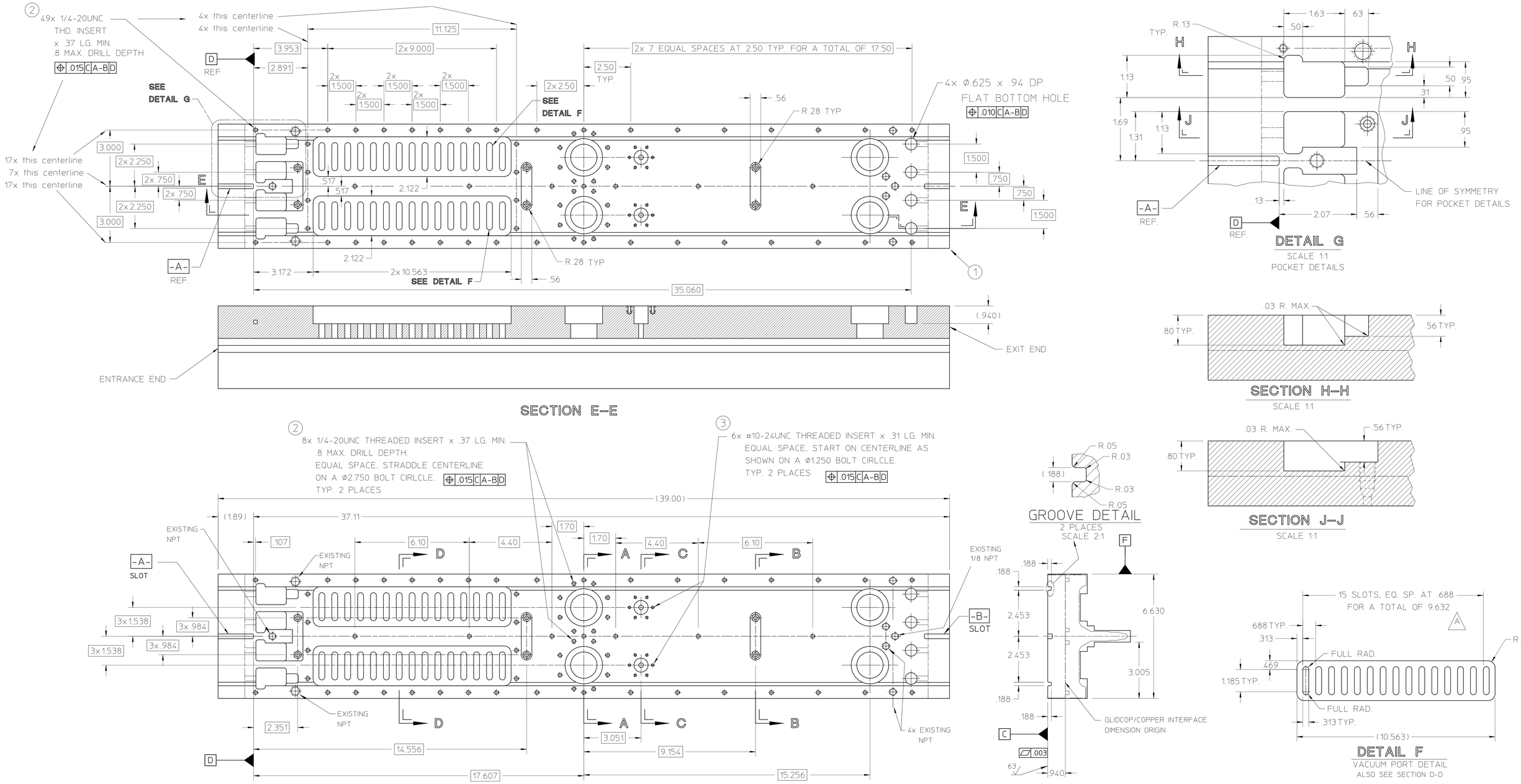
REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: X ± .1 FRAC. ± 1/64; XX ± .01 ANGLES ± 1°; XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY: MATT HOFF DATE: 07-31-00
CHK. BY: DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 3 MAJOR VANE PORT MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1:2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV.
	8212-DB	FE3211	25B3336	



SECTION E–E

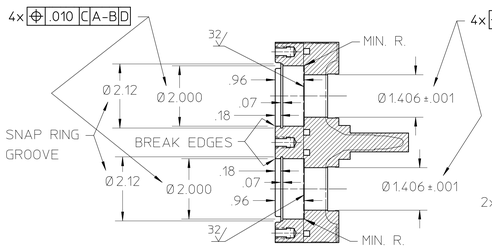
DETAIL G
SCALE 1:1
POCKET DETAILS

SECTION H–H
SCALE 1:1

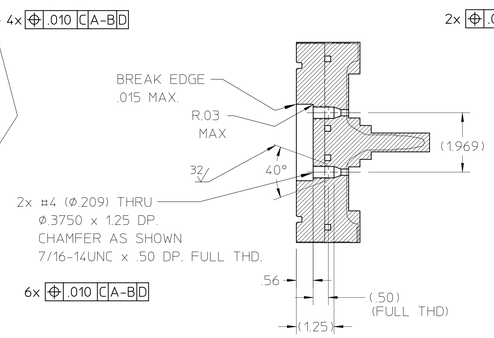
SECTION J–J
SCALE 1:1

GROOVE DETAIL
2 PLACES
SCALE 2:1

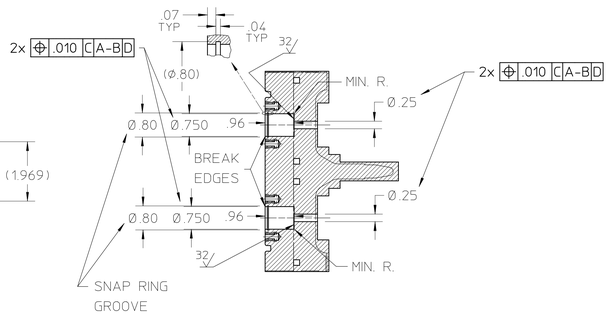
DETAIL F
VACUUM PORT DETAIL
ALSO SEE SECTION D-D



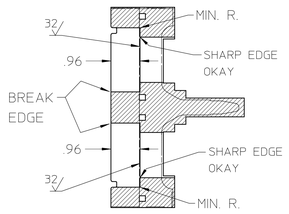
SECTION A–A
TYP. 2 PLACES
TUNER PORTS



SECTION B–B
TYP. 3 PLACES
PI-MODE STABILIZER ROD PORTS



SECTION C–C
SENSING PORT



SECTION D–D
VACUUM PORTS
ALSO SEE DETAIL F

25B3346A

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.
2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. ALL DIMENSIONS ARE IN INCHES.
4. THIS PART WEIGHS APPROX. 186 LBS. BEFORE MACHINING. APPROX. 158 LBS. AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION
12	3		#10-24UNC HELICOIL THREADED INSERT
65	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B3196	MINOR VANE ROUGH OUT

REV.	DWG.	CHK	ZONE	DATE	CHANGES
A	MDH		B-1	12-08-00	9.632 WAS 9.625

UNLESS OTHERWISE SPECIFIED TOLERANCES: .X ± .1; FRAC. ± 1/64; .XX ± .01; ANGLES ± 1°; .XXX ± .005; FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS: ACCT. NO.; SERIAL NO.; DATE ISSD; DATE REQD.; NO. REQD.; DELIVER TO.; SURFACE TREATMENT; IDENT. METH.; DWG. BY MATT HOFF; DATE 07-31-00; CHK. BY; DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 3 MINOR VANE PORT MACHINING

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1:2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3346	A

SEE DETAIL E

SEE NOTE 3

2x 2.25 | 2x 1.18 | 3x .75 | 2x .75 | 2x .75

2x 9 EQ. SP. AT .75 TYP. FOR A TOTAL OF 6.75

2x 6 EQ. SP. AT .75 TYP. FOR A TOTAL OF 4.50

2x 6 EQ. SP. AT .75 TYP. FOR A TOTAL OF 4.50

SEE NOTE 3

2x 16 EQ. SP. AT .75 FOR A TOTAL OF 12.00

2x 2.25 | 2x 1.50 | 2x 1.50 | 2x .75 TYP. | 2x .75 TYP. | 2x .75 TYP. | 2x .75 TYP.

SEE DETAIL G

⌖ .015 C A-B D

37x 1/4-20UNC THD. INSERT x .37 LG. MIN. .8 MAX. DRILL DEPTH

②

15x this centerline
7x this centerline
15x this centerline

3.00 | 2.327 | 2.327 | 3.00

D — D

(.107) | (2.351)

1.70 | 1.70 | 2.50 TYP. | 2.50 TYP.

①

90x Ø.081 x 1.11 DP. HOLES ARE DRILLED AT A (85°) ANGLE. SEE VIEW D-D FOR ADDITIONAL DIMENSIONS

2x 7 EQUAL SPACES AT 2.50 TYP. FOR A TOTAL OF 17.50

2x 7 EQUAL SPACES AT 2.50 TYP. FOR A TOTAL OF 17.50

⌖ .010 C A-B D

85° TYP.

ENTRANCE END

EXIT END

③

6x #10-24UNC THREADED INSERT x .31 LG. MIN. EQUAL SPACE, START ON CENTERLINE AS SHOWN ON A Ø1.250 BOLT CIRLCLE. THIS PATTERN IS REPEATED 4 TIMES, INDICATED BY S, FOR A TOTAL OF 24 TAPPED HOLES. ⌖ .015 C A-B D

VIEW D-D

ONLY Ø.081 HOLES SHOWN HIDDEN

1x Ø.070 (#50 drill) x 7/8 DEEP (thermocouple hole)

② 8x 1/4-20UNC THREADED INSERT x .37 LG. MIN. .8 MAX. DRILL DEPTH. EQUAL SPACE, STRADDLE CENTERLINE ON A Ø2.750 BOLT CIRLCLE. THIS PATTERN IS REPEATED 6 TIMES, INDICATED BY R, FOR A TOTAL OF 48 TAPPED HOLES. ⌖ .015 C A-B D

-A- SLOT

EXISTING NPT | .56 | R | R.28 TYP. | A | B | C | S

1.538 | 3x .984 | 1.538 | 3x .984

ENTRANCE END

D | 2.351 | 3.051 | 9.154 | 3.051 | 6.102 | 3.051 | 6.102 | 3.051 | 6.102 | 3.051

(1.89) | 37.11 | (39.00)

-B- SLOT

1/8 x 1/8 CHAMFER

F | 63

.188 | .188 | 2.453 | 2.453 | .188 | .188 | 8.750 | 4.065

R.05 | R.03 | (.188) | R.03 | R.05

1/8 x 1/8 CHAMFER

.940

⌭ .003 C

GLIDCOP/COPPER INTERFACE. DIMENSION ORIGIN

GROOVE DETAIL

2 PLACES

SCALE 2:1

.26 D REF

35.16

4x Ø.625 x .94 DP. FLAT BOTTOM HOLE ⌖ .010 C A-B D

F | 1.50 | .75 | .75 | 1.50 | -A- REF | F

LINE OF SYMMETRY FOR POCKET DETAILS

DETAIL E

SCALE 1:1

POCKET DETAILS

2.26 | 1.63 | .50 | R.13 TYP.

H | H | J | J

.50 | .17 | 2.00 | R.28 | .50 | .50 | .17 | .56

1.13 | 1.69 | 1.13 | .19

-B- REF

LINE OF SYMMETRY FOR POCKET DETAILS

DETAIL G

SCALE 1:1

POCKET DETAILS

DETAIL F-F

SCALE 1:1

.03 R. MAX. | .56 TYP. | .80 TYP.

SECTION H-H

SCALE 1:1

.56 TYP. | .03 R. MAX. | .80 TYP.

SECTION J-J

SCALE 1:1

8x ⌖ .010 C A-B D

32 | .18 | .07 | .96 | MIN. R. | Ø1.406 ±.001 | Ø2.12 | Ø2.000 | SNAP RING GROOVE | BREAK EDGES

SECTION A-A

TYP. 4 PLACES

TUNER PORTS

BREAK EDGE .015 MAX. | R.03 MAX | 32 | 40° | THERMOCOUPLE HOLE ONE PER VANE | (1.969)

2x #4 (Ø.209) THRU Ø.3750 x 1.25 DP. CHAMFER AS SHOWN 7/16-14UNC x .50 DP. FULL THD.

6x ⌖ .010 C A-B D

.56 | (.50) (FULL THD) | (1.25)

SECTION B-B

TYP. 3 PLACES

Pi-MODE SABILIZER ROD PORTS

4x ⌖ .010 C A-B D

.04 | .07 | (Ø.80) | 32 | MIN. R. | Ø.250 | Ø.80 | Ø.750 | .96 | BREAK EDGES | SNAP RING GROOVE

SECTION C-C

TYP. 2 PLACES

SENSING PORTS

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.

25B3356

2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. THIS DIMENSION APPLIES ONLY IF THE Ø.081 HOLE IS DRILLED BEFORE THE POCKET IS MILLED IN. IF THE POCKET IS MILLED FIRST, NEW DIMENSIONS NEED TO BE CALCULATED.
4. ALL DIMENSIONS ARE IN INCHES.
5. THIS PART WEIGHS APPROX. 190 LBS. BEFORE MACHINING. APPROX. 171 LBS. AFTER MACHINING.

REQD	ITEM	PART NO	DESCRIPTION
24	3		#10-24UNC HELICOIL THREADED INSERT
85	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B3186	MAJOR VANE ROUGH OUT

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .005 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.

DATE ISSD | DATE REQD. | NO. REQD.

DELIVER TO

SURFACE TREATMENT

IDENT METH.

DWG BY: MATT HOFF | DATE 08-10-00

CHK. BY: | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

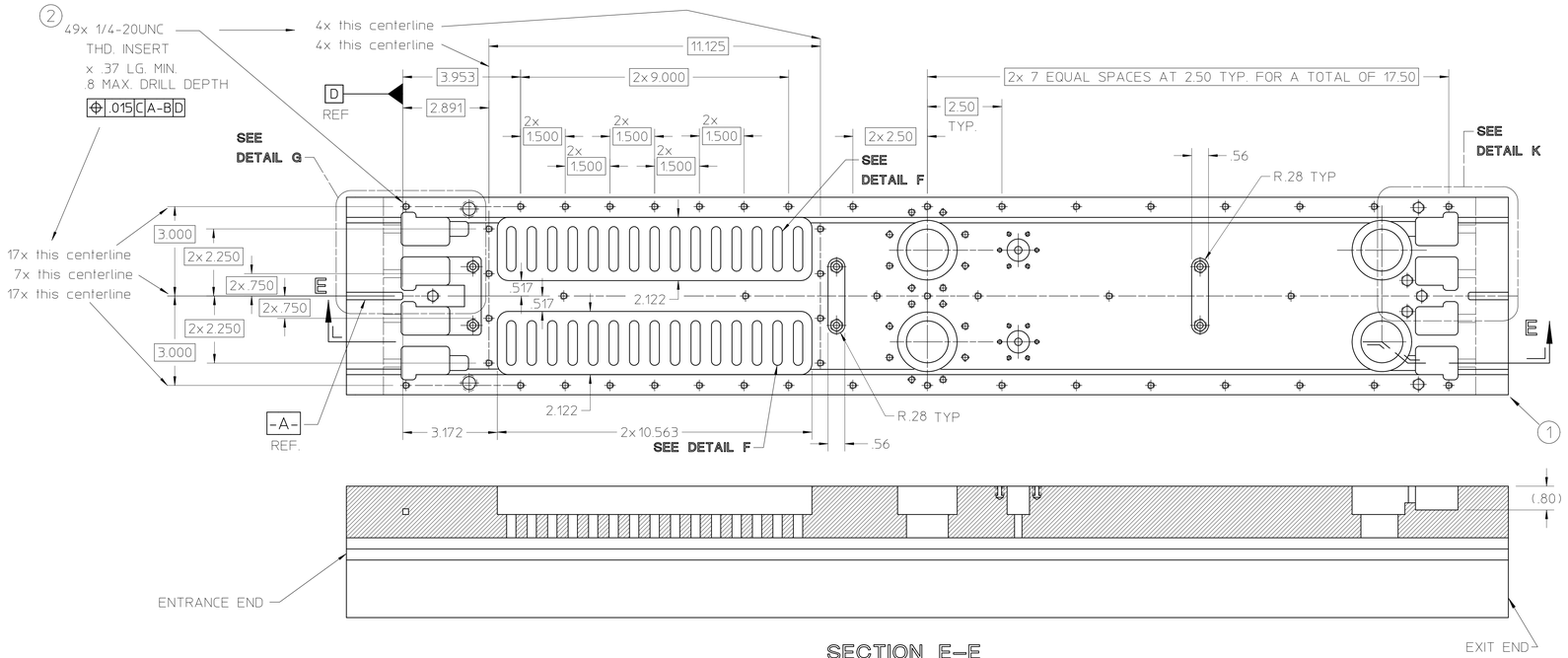
SNS FES RFQ

MECHANICAL STRUCTURES

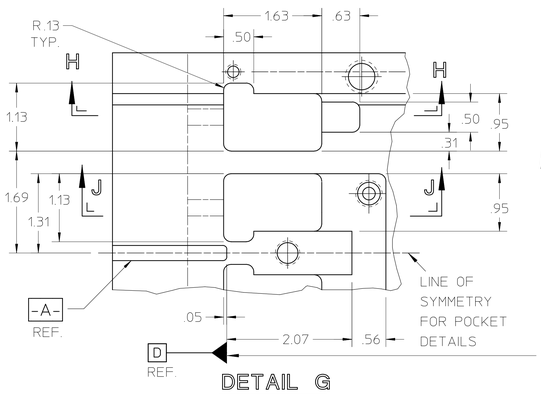
MODULE 4 MAJOR VANE PORT MACHINING

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1:2 | DO NOT SCALE PRINTS

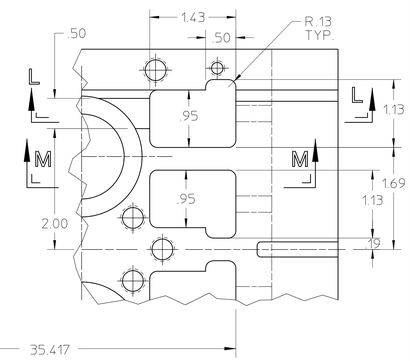
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B3356 | SIZE | REV.



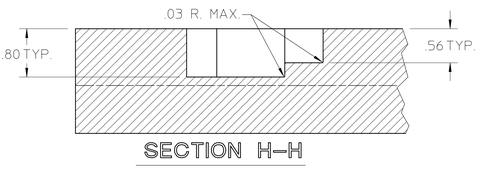
SECTION E–E



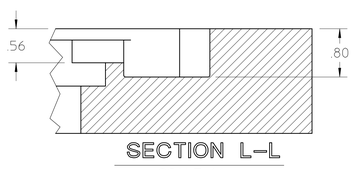
DETAIL G
SCALE 1:1
ENTRANCE END POCKET DETAILS



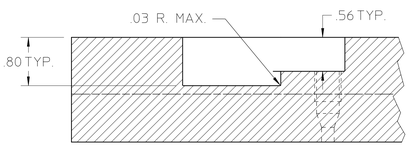
DETAIL K
SCALE 1:1
EXIT END POCKET DETAILS



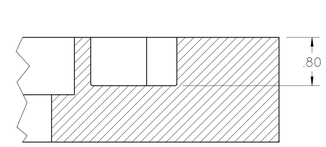
SECTION H–H
SCALE 1:1



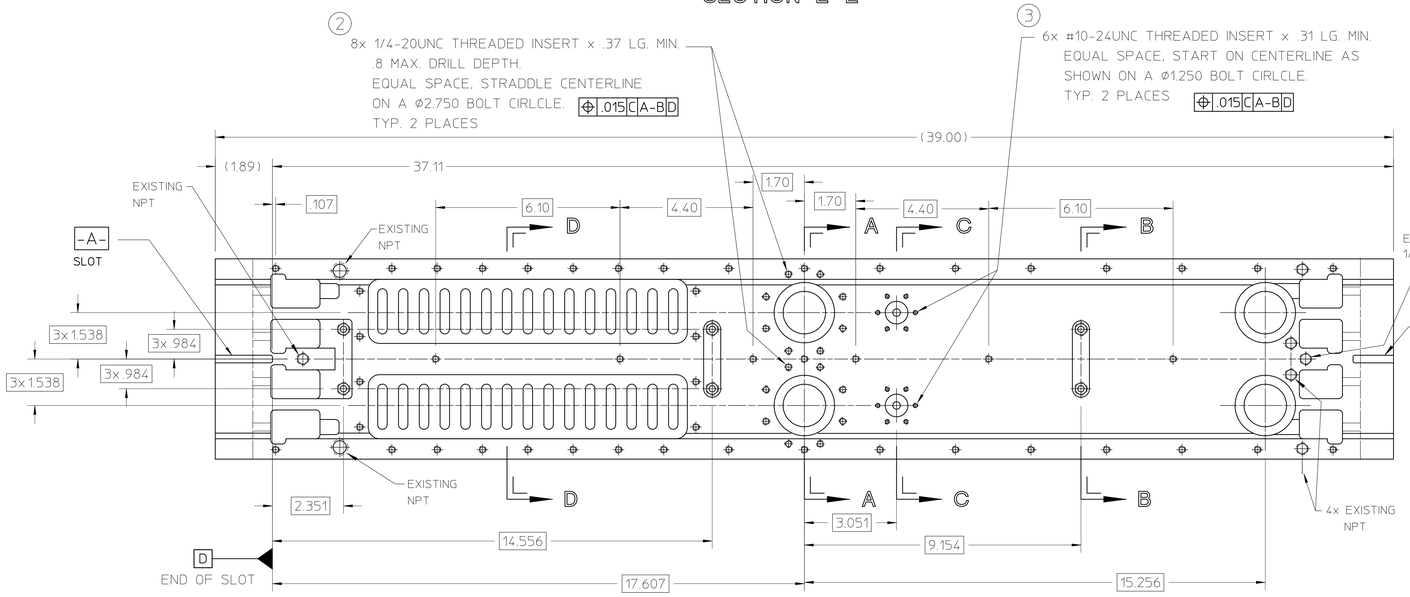
SECTION L–L
SCALE 1:1

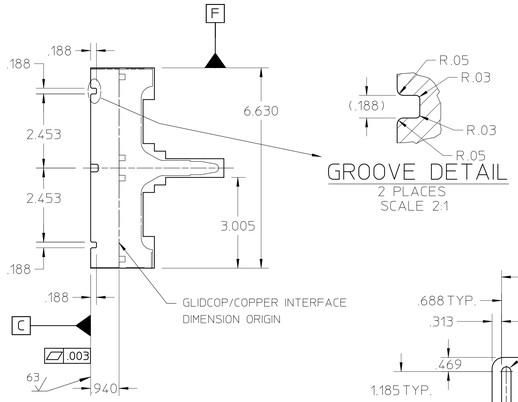


SECTION J–J
SCALE 1:1

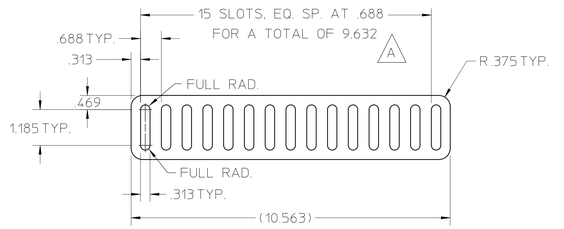


SECTION M–M
SCALE 1:1

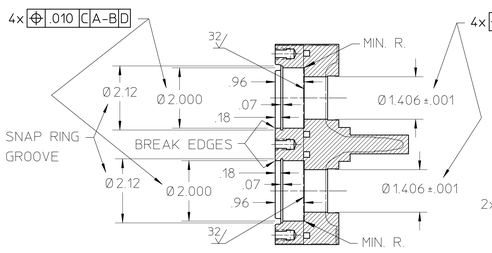




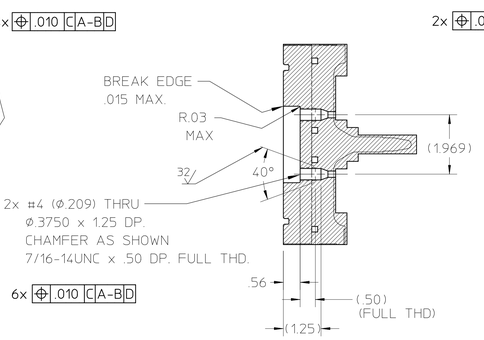
GROOVE DETAIL
2 PLACES
SCALE 2:1



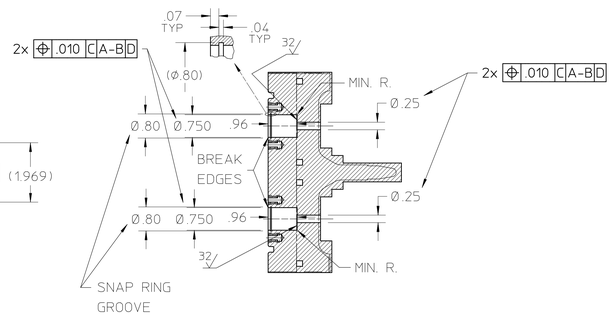
DETAIL F
VACUUM PORT DETAIL
ALSO SEE SECTION D-D



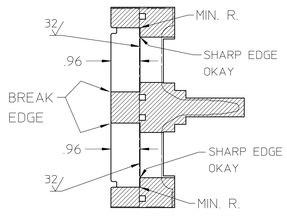
SECTION A–A
TYP. 2 PLACES
TUNER PORTS



SECTION B–B
TYP. 3 PLACES
PI-MODE STABILIZER ROD PORTS



SECTION C–C
SENSING PORT



SECTION D–D
VACUUM PORTS
ALSO SEE DETAIL F

25B3366A

NOTES:

1. USE DATUM -A- SLOT AND DATUM -B- SLOT TO CREATE THE MAIN CENTERLINE, DATUM A-B.
2. SEAL EXISTING N.P.T. HOLES TO EXCLUDE CHIPS DURING MACHINING.
3. ALL DIMENSIONS ARE IN INCHES.
4. THIS PART WEIGHS APPROX. 186 LBS. BEFORE MACHINING. APPROX. 158 LBS. AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION
12	3		#10-24UNC HELICOIL THREADED INSERT
65	2		1/4-20UNC HELICOIL THREADED INSERT
1	1	25B3196	MINOR VANE ROUGH OUT

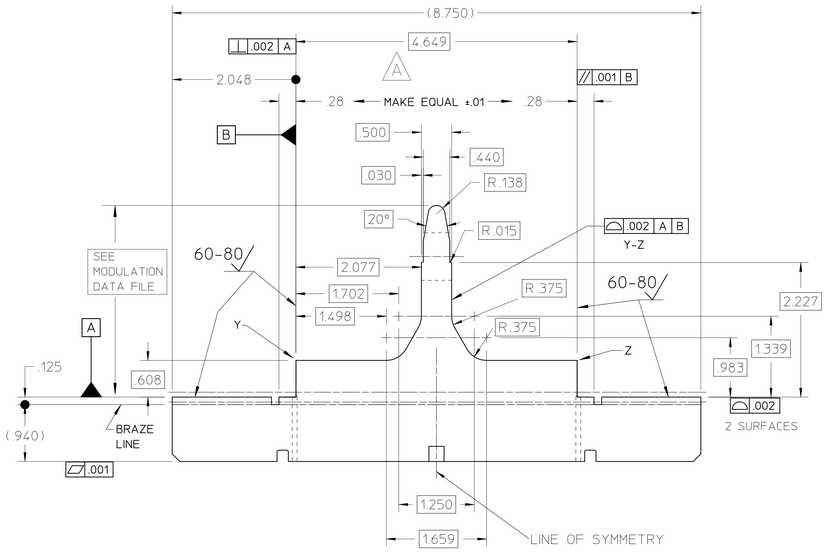
REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		B-1	12-08-00	9.632 WAS 9.625

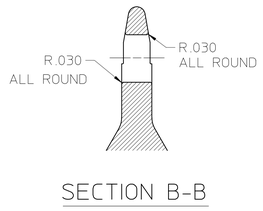
UNLESS OTHERWISE SPECIFIED (TOLERANCES): .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS: ACCT. NO. | SERIAL NO. | DATE ISSD | DATE REQD. | NO. REQD. | DELIVER TO | SURFACE TREATMENT | IDENT. METH. | DWG. BY: MATT HOFF | DATE: 08-10-00 | CHK. BY | DATE

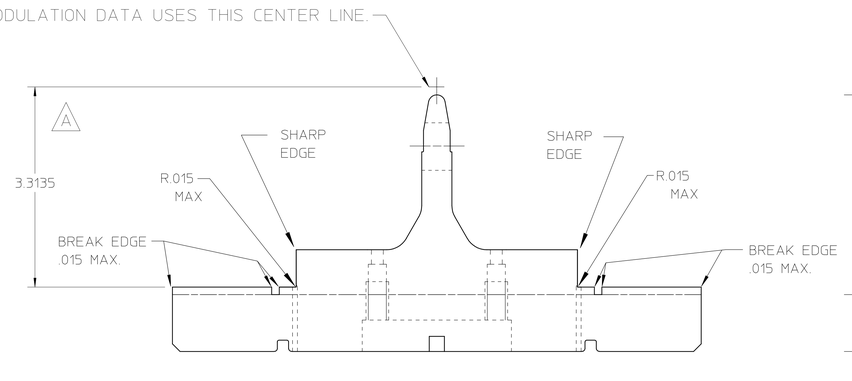
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 4 MINOR VANE PORT MACHINING

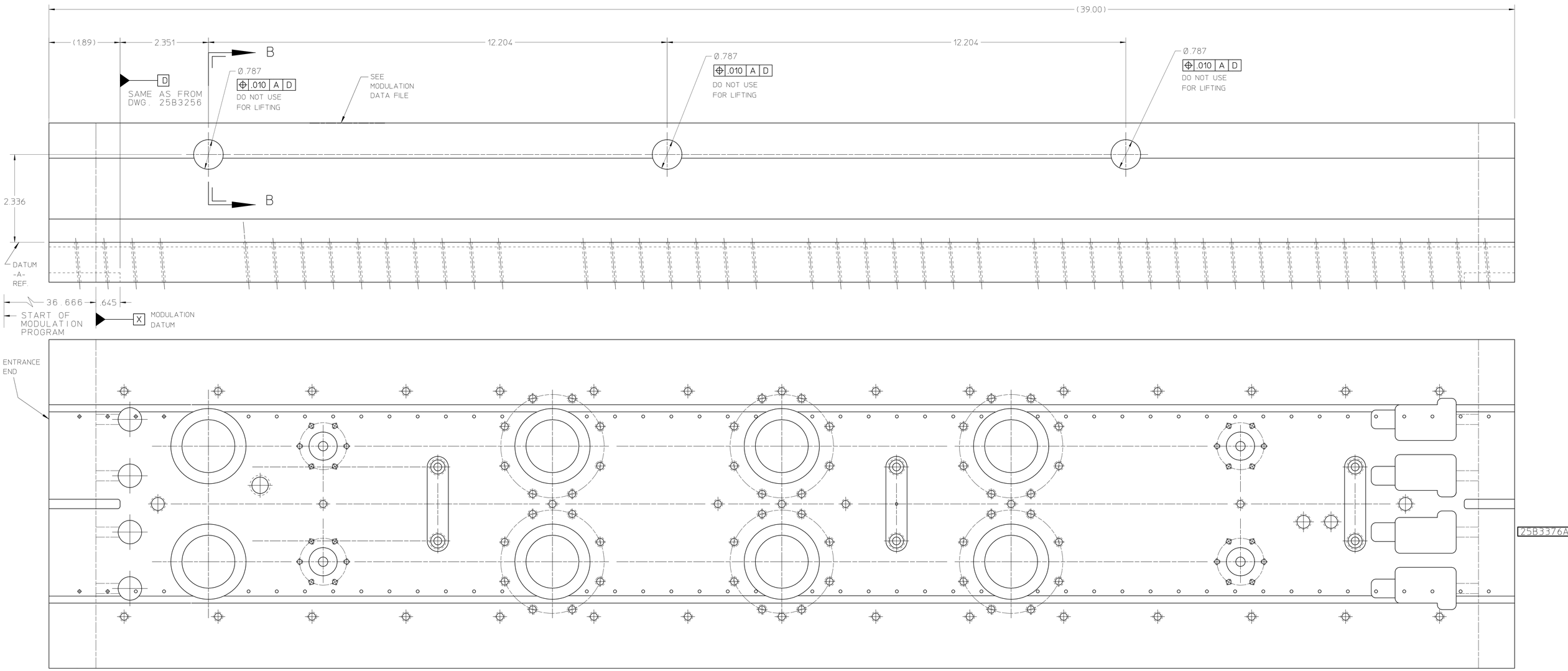
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	00X0000		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3366	A





SECTION B-B





25B3376A

1. MODULATIONS ARE MACHINED USING DATUMS -A- , -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 150 LBS. AFTER MACHINING.

A

5. The original target dimensions for achieving the correct cavity frequency were 3.3105 and 4.655. After fabrication and testing, these dimensions were reground to the 3.3135 and 4.649 dimensions shown.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			5-01-01	AS BUILT DIMENSIONS ADDED

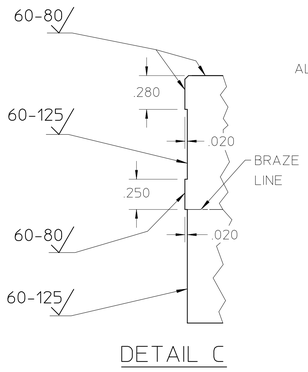
REQD	ITEM	PART NO	DESCRIPTION
1	1	25B3256	MODULE 2 MAJOR VANE PORT MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

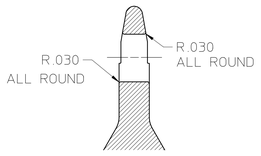
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF DATE 06-16-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 2 MAJOR VANE FINISH MACHINING

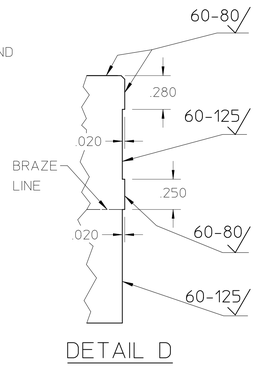
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3376	A



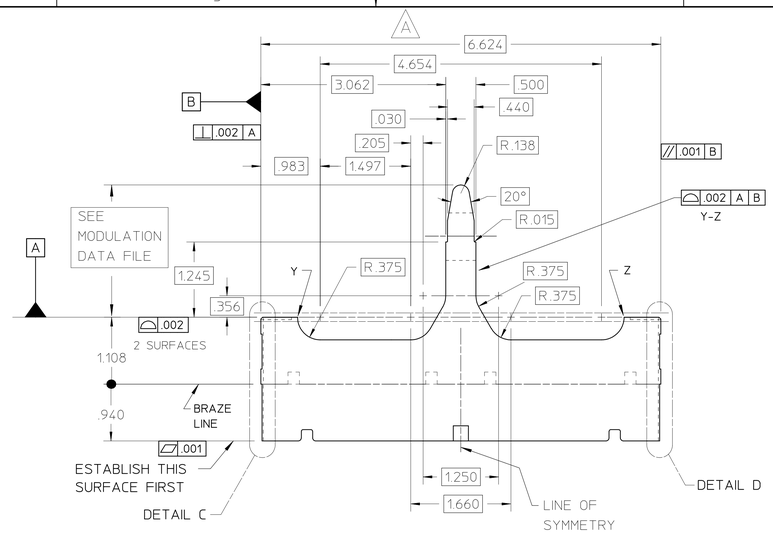
DETAIL C

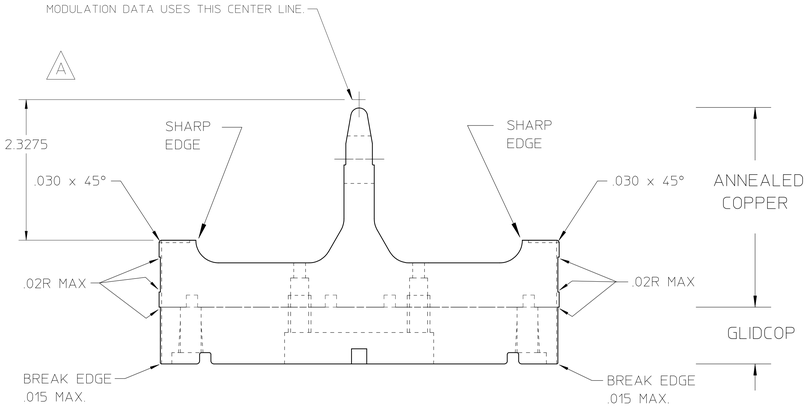


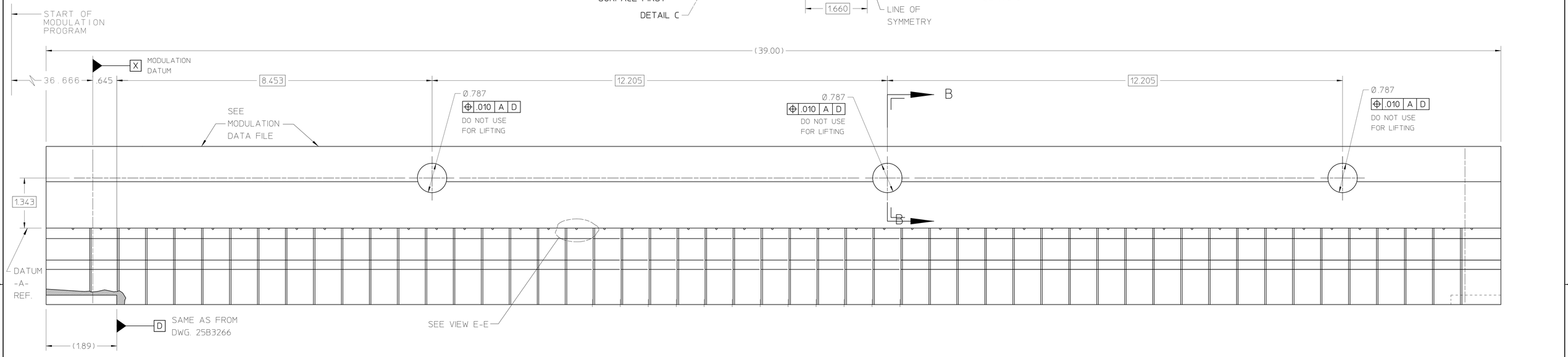
SECTION B-B

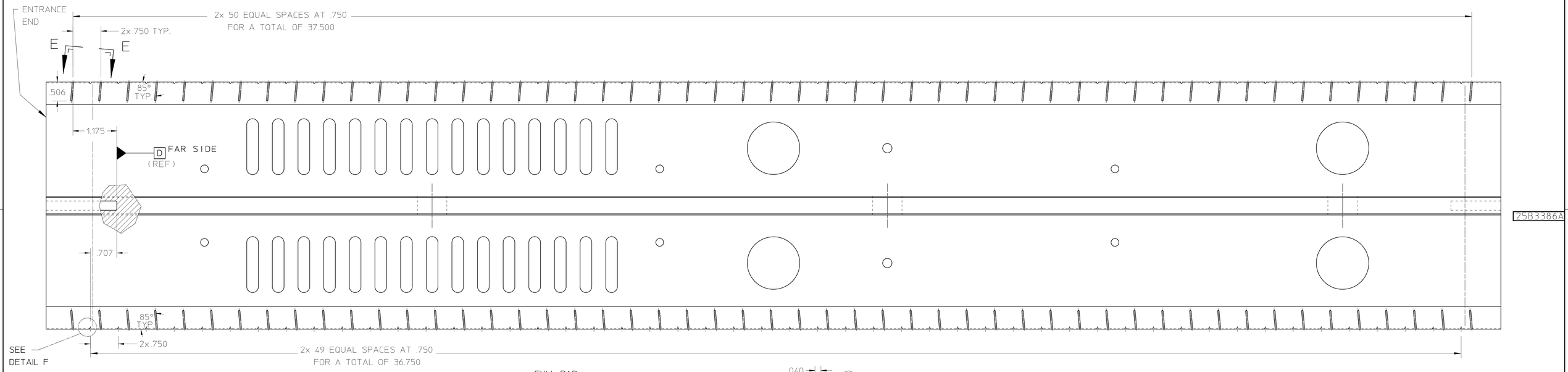


DETAIL D



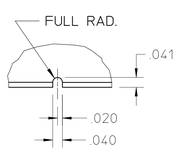




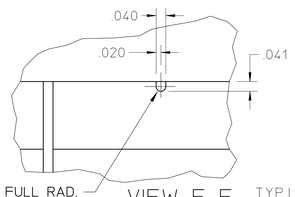


25B3386A

1. MODULATIONS ARE MACHINED USING DATUMS -A-, -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 142 LBS. AFTER MACHINING.



DETAIL F
TYP. 100 PLACES



VIEW E-E
TYPICAL 102 PLACES

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			5-01-01	AS BUILT AND DATA C-LINE ADDED.

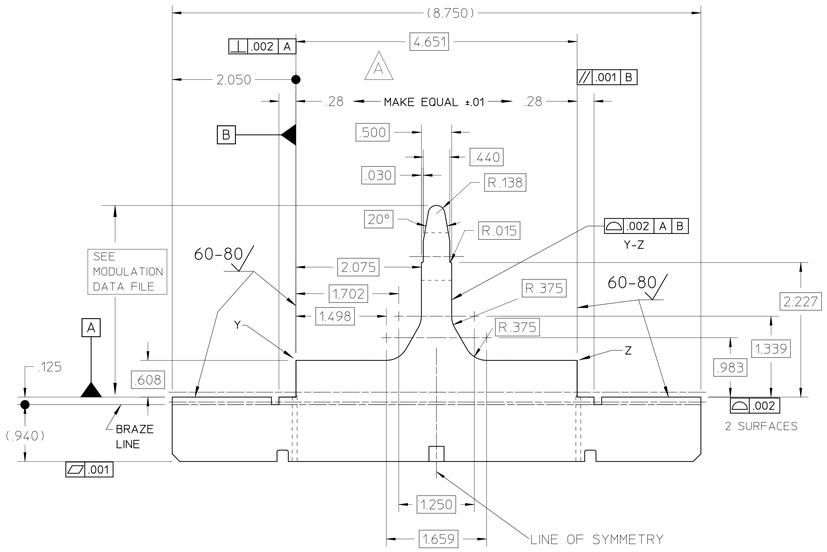
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

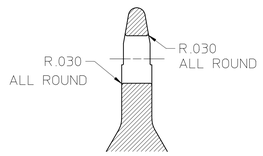
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF DATE: 08-25-00
CHK. BY
DATE

REQD	ITEM	PART NO.	DESCRIPTION
		25B3266	MODULE 2 MINOR VANE PORT MACHINING

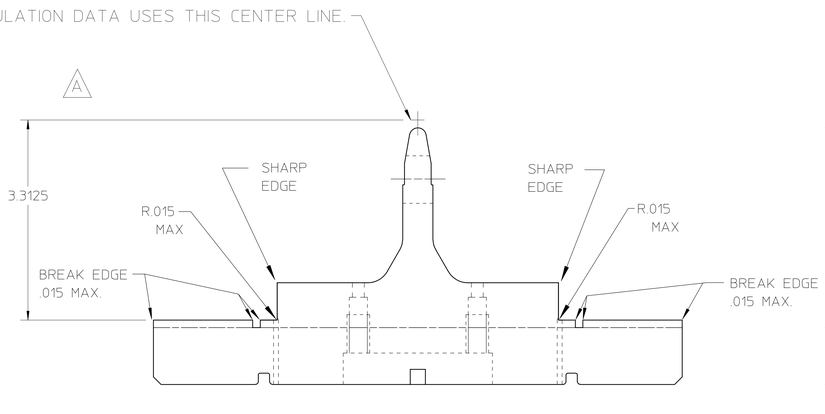
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MODULE 2 MINOR VANE FINISH MACHINING

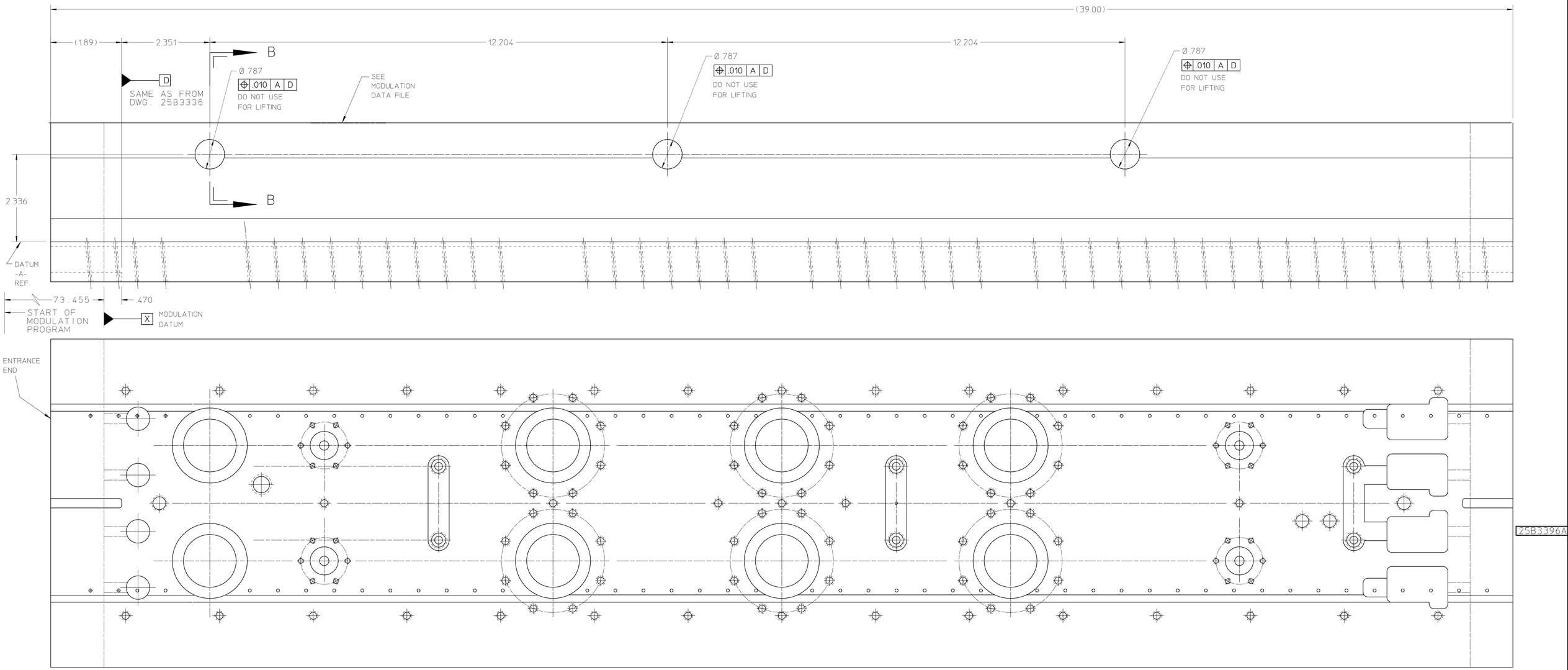
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3386	A





SECTION B-B





25B3396A

1. MODULATIONS ARE MACHINED USING DATUMS -A- , -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 150 LBS. AFTER MACHINING.

A

5. The original target dimensions for achieving the correct cavity frequency were 3.3105 and 4.655. After fabrication and testing, these dimensions were reground to the 3.3125 and 4.651 dimensions shown.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			5-01-01	AS BUILT DIMENSIONS ADDED.

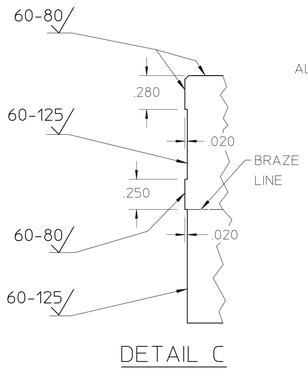
REQD	ITEM	PART NO	DESCRIPTION
1	1	25B3336	MODULE 3 MAJOR VANE PORT MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

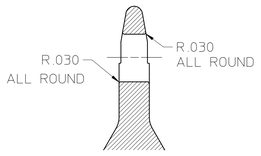
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH.
DWG BY MATT HOFF DATE 08-28-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 3 MAJOR VANE FINISH MACHINING

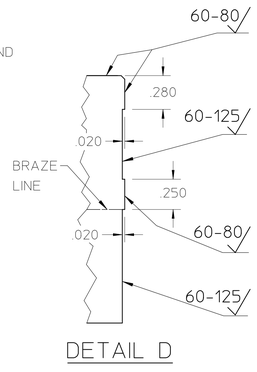
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	1 : 1	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3396	A



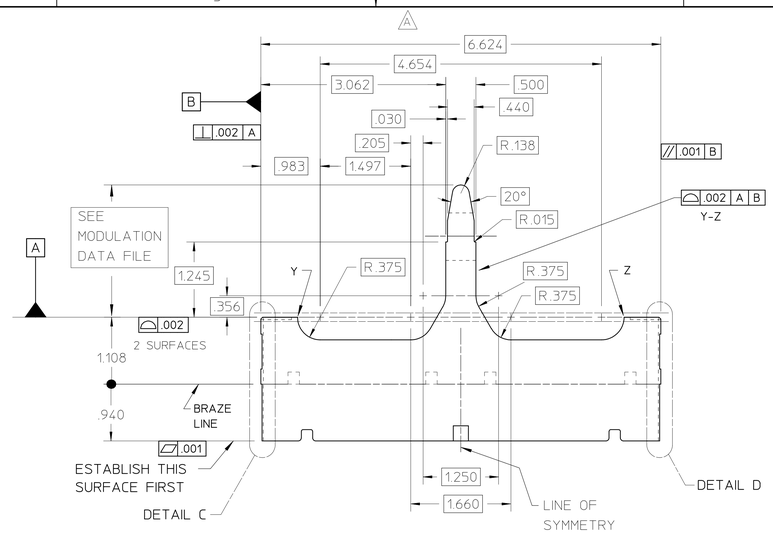
DETAIL C

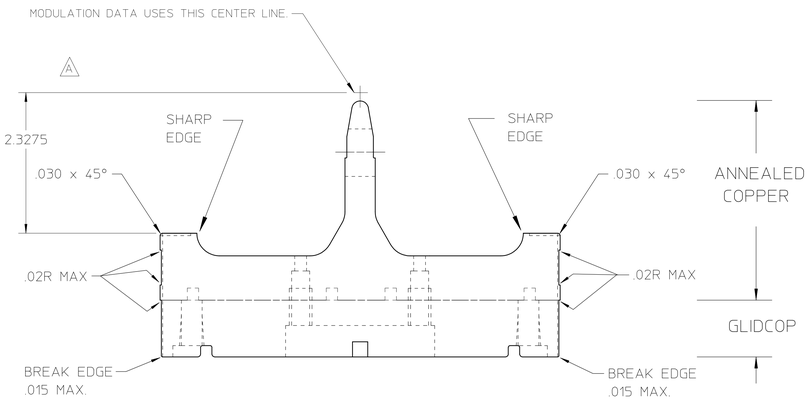


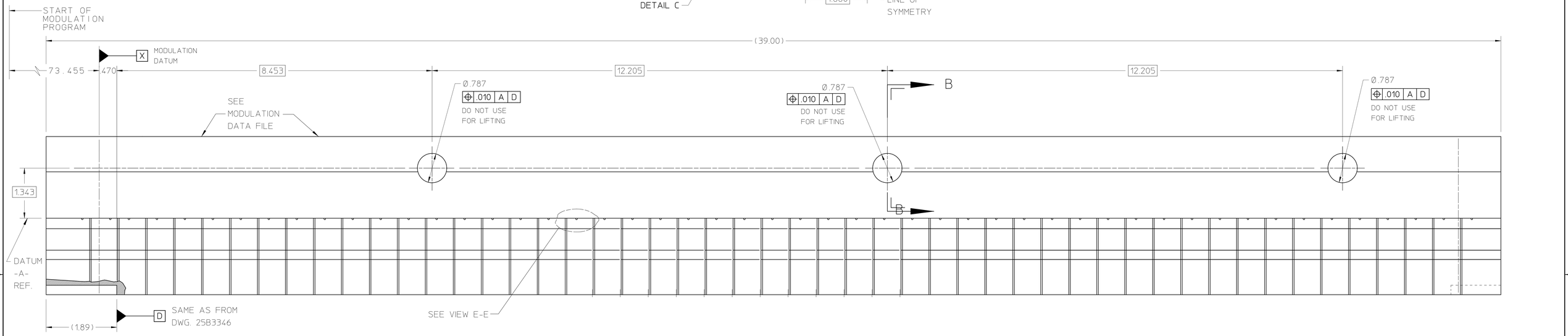
SECTION B-B

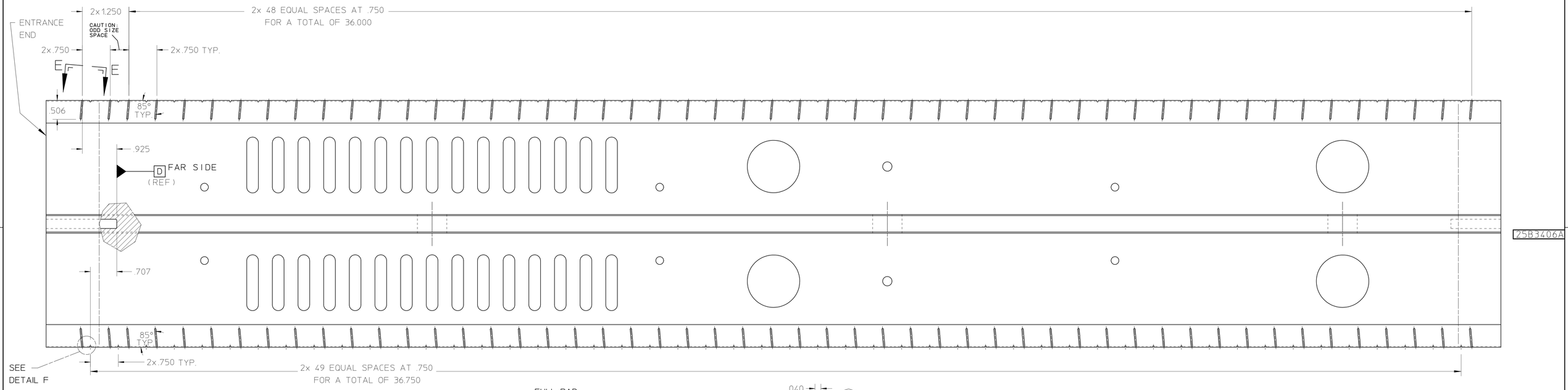


DETAIL D



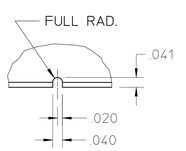




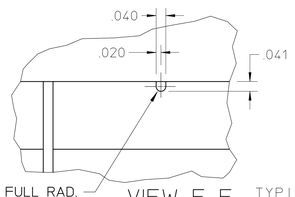


25B3406A

1. MODULATIONS ARE MACHINED USING DATUMS -A-, -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 142 LBS. AFTER MACHINING.



DETAIL F
TYP. 100 PLACES



VIEW E-E
TYPICAL 102 PLACES

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			5-01-01	AS BUILT AND DATA C-LINE ADDED.

UNLESS OTHERWISE SPECIFIED TOLERANCES	SHOP ORDERS
.X ± .1 FRAC. ± 1/64	ACCT. NO. / SERIAL NO.
.XX ± .01 ANGLES ± 1°	DATE ISSD / DATE REQD. / NO. REQD.
.XXX ± .005 FINISH 63	DELIVER TO
THREADS ARE CLASS 2	SURFACE TREATMENT
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.	IDENT. METH.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE	DWG. BY MATT HOFF / DATE 08-28-00
REFERENCES: ANSI Y14.5 & B46.1	CHK. BY / DATE

REQD	ITEM PART NO. / DESCRIPTION
	25B3346 MODULE 3 MINOR VANE PORT MACHINING

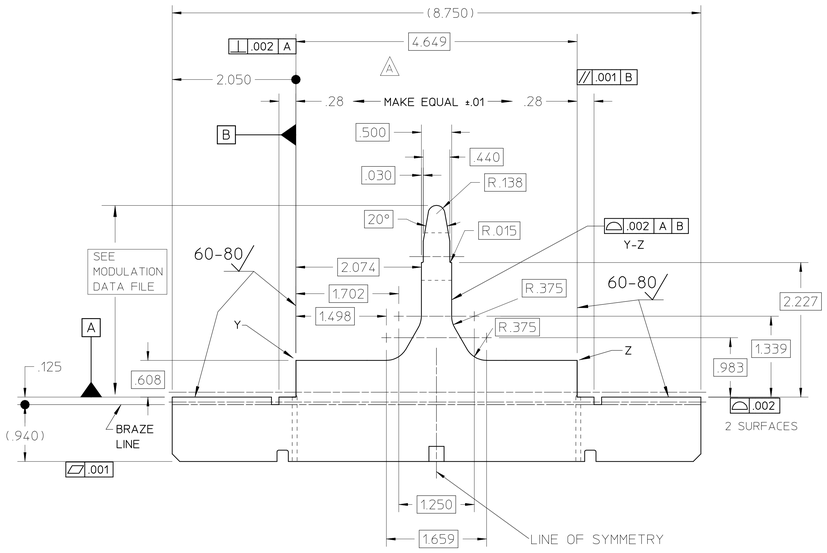
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

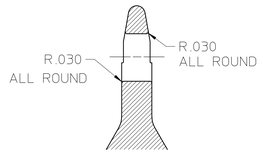
SNS-FES RFQ

MECHANICAL STRUCTURES

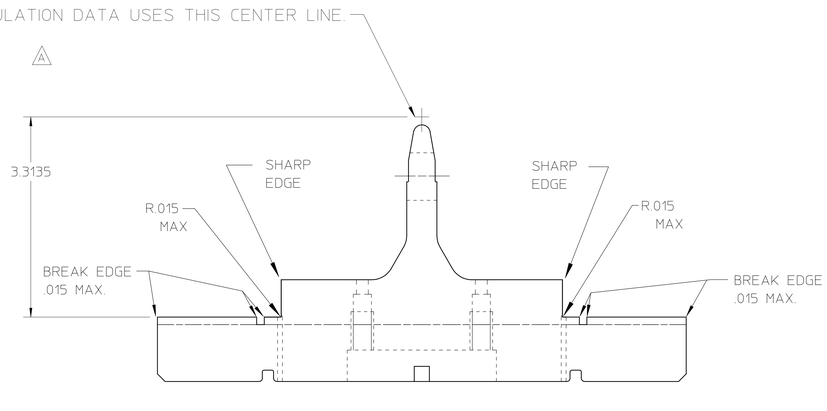
MODULE 3 MINOR VANE FINISH MACHINING

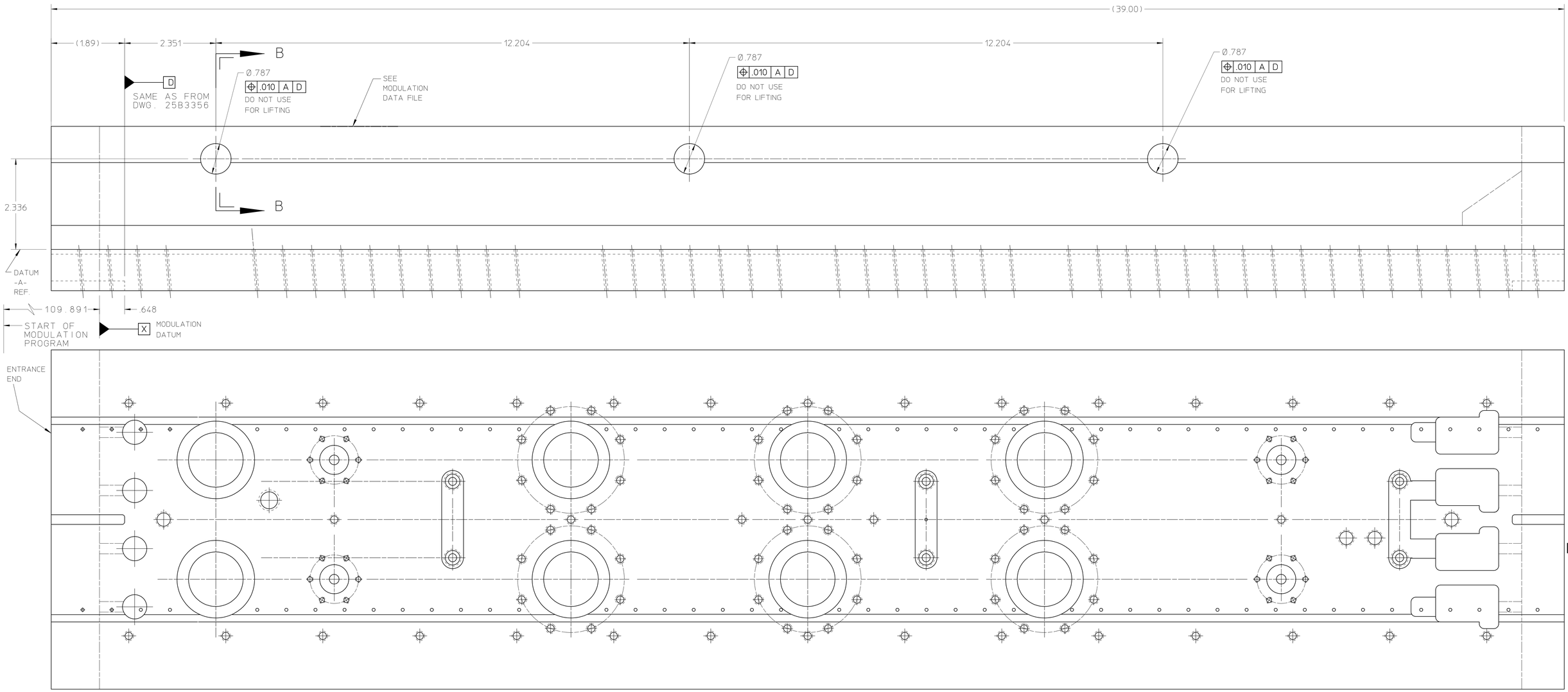
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3406	A





SECTION B-B





25B3416A

1. MODULATIONS ARE MACHINED USING DATUMS -A- , -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 150 LBS. AFTER MACHINING.

5. The original target dimensions for achieving the correct cavity frequency were 3.3105 and 4.655. Based on the experience of the three previous modules, the dimensions of 3.3135 and 4.649 were used to make this vane. These dimensions take into account the adjustments made to the prior vanes to bring them into frequency.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			5-01-01	AS BUILT DIMENSIONS ADDED.

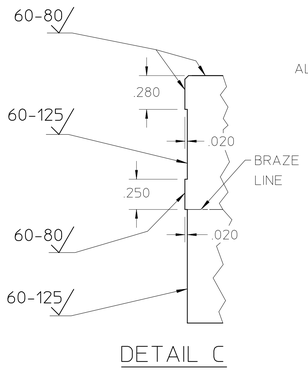
REQD	ITEM	PART NO.	DESCRIPTION
1	1	25B3356	MODULE 4 MAJOR VANE PORT MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

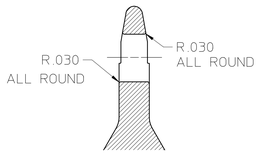
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG MATT HOFF
DATE 09-01-00
CHK.
DATE
BY

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 4 MAJOR VANE FINISH MACHINING

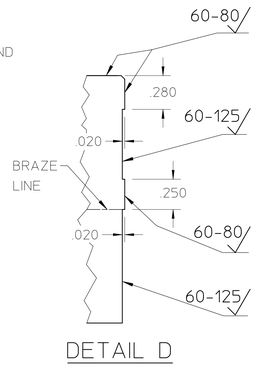
PATENT CLEAR | MICROFILMED
DWG. TYPE: DETAIL
SHOWN ON: 00X0000
SCALE: 1 : 1
DO NOT SCALE PRINTS
DESIGN ACCT. NO.: 8212-DB
CATEGORY CODE: FE3211
DWG. NO.: 25B3416
SIZE: A
REV.: A



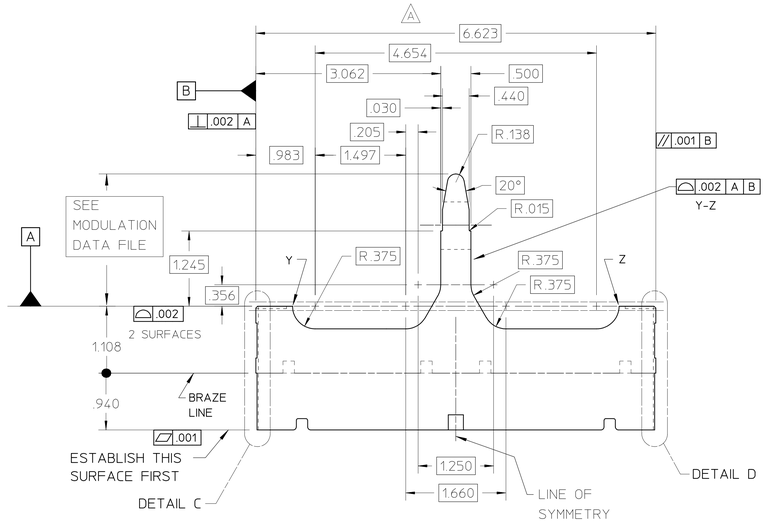
DETAIL C

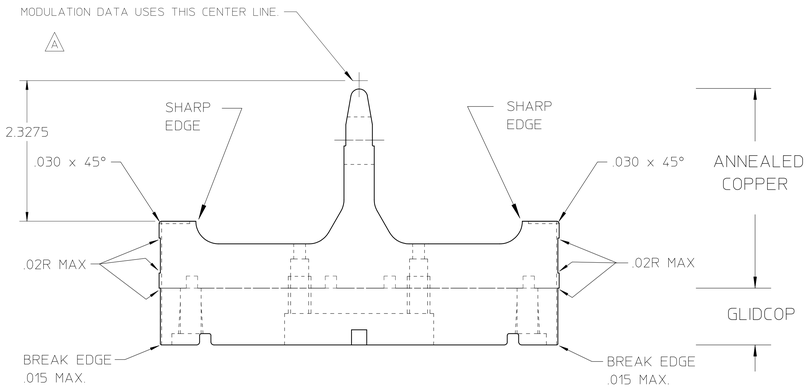


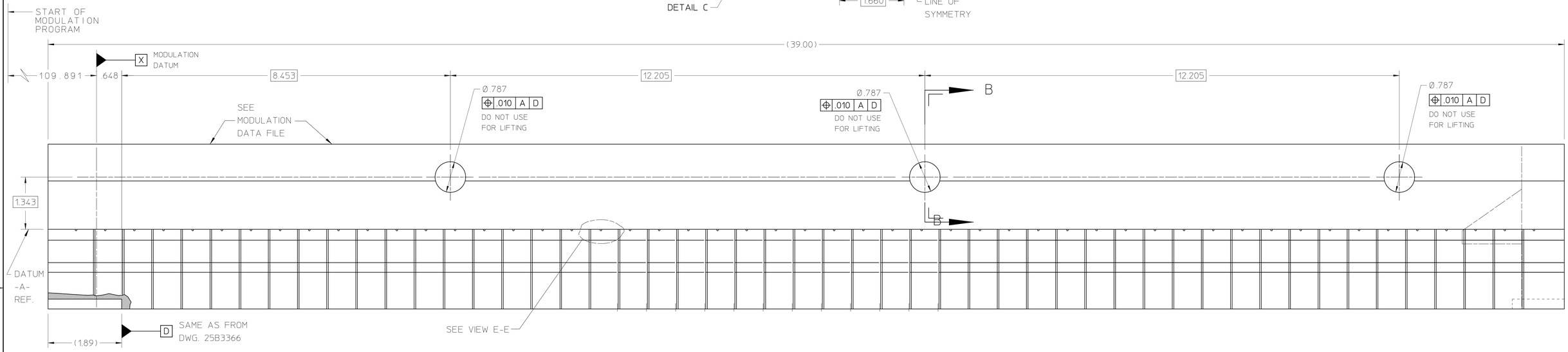
SECTION B-B

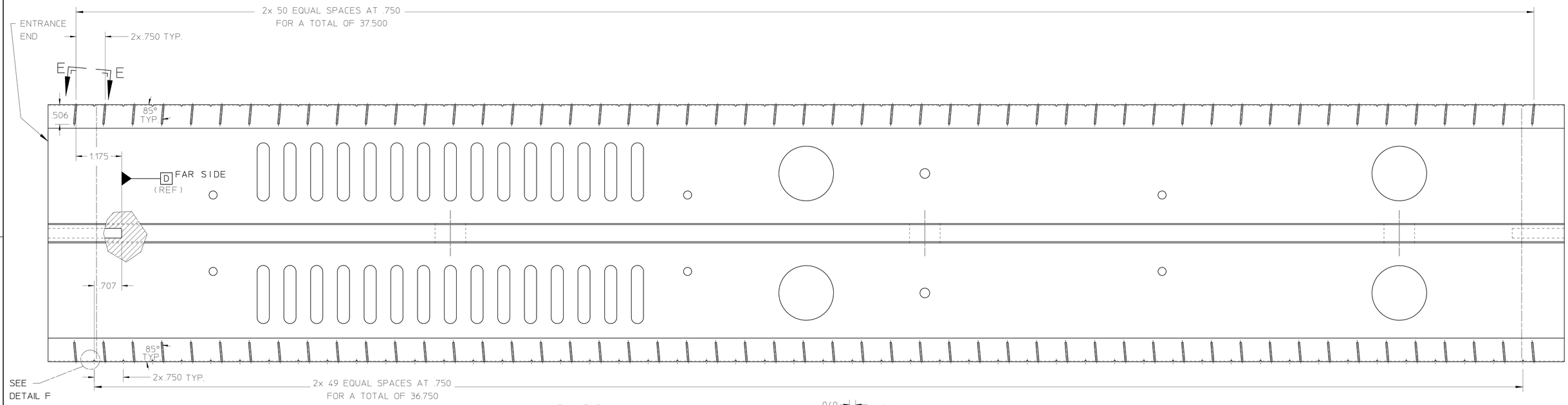


DETAIL D



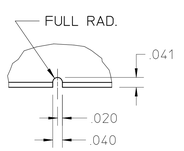




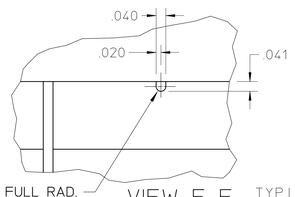


25B3426A

1. MODULATIONS ARE MACHINED USING DATUMS -A-, -X- AND -B-.
2. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
3. DIMENSIONS ARE IN INCHES
4. THIS PART WEIGHS APPROX. 142 LBS. AFTER MACHINING.



DETAIL F
TYP. 100 PLACES



VIEW E-E
TYPICAL 102 PLACES

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			5-01-01	AS BUILT DIMENSIONS ADDED.

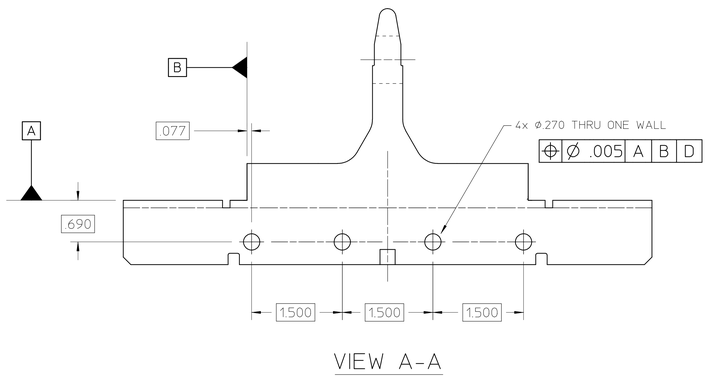
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE 09-01-00
CHK. BY | DATE

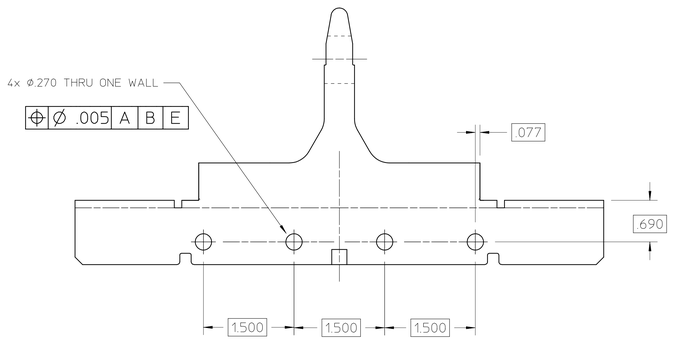
REQD	ITEM	PART NO.	DESCRIPTION
		25B3366	MODULE 4 MINOR VANE PORT MACHINING

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL STRUCTURES
MODULE 4 MINOR VANE FINISH MACHINING

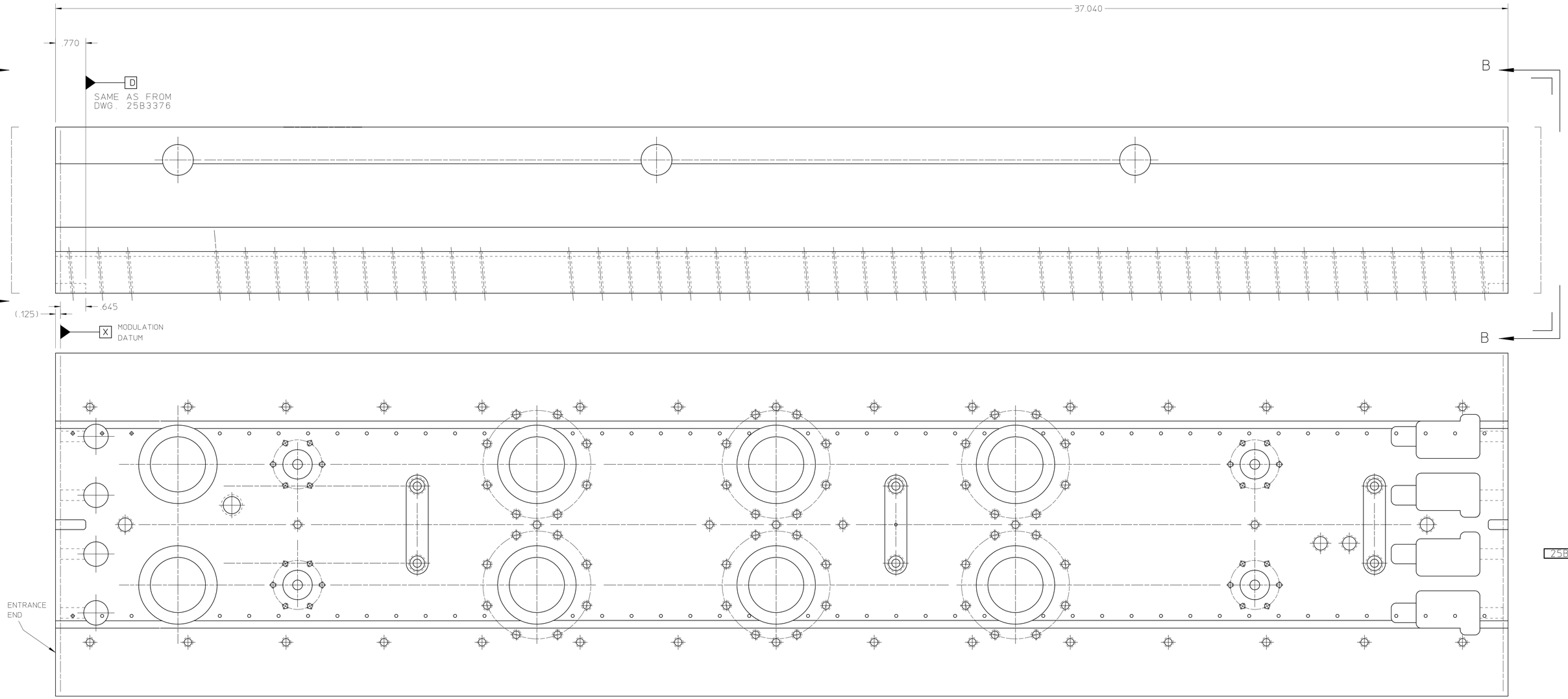
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3426	A



VIEW A-A



VIEW B-B



1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 142 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES

REQD	ITEM	PART NO.	DESCRIPTION
1	1	25B3376	MODULE 2 MAJOR VANE FINISH MACHINING

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

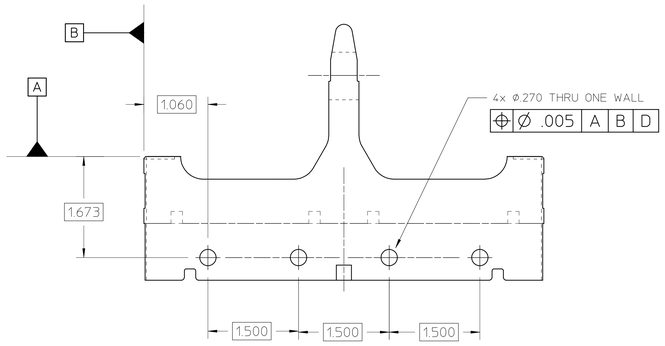
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY: MATT HOFF DATE: 09-11-00
CHK. BY
DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

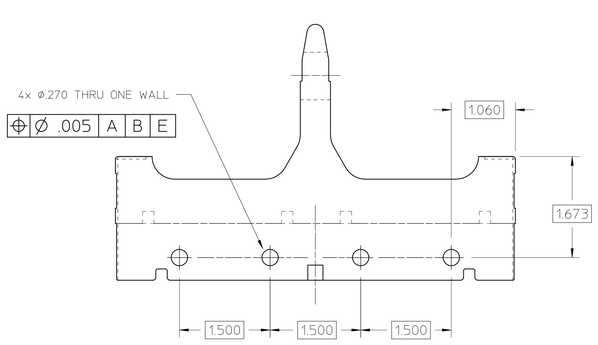
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 2 MAJOR VANE TRIM

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B3436 | SIZE | REV.

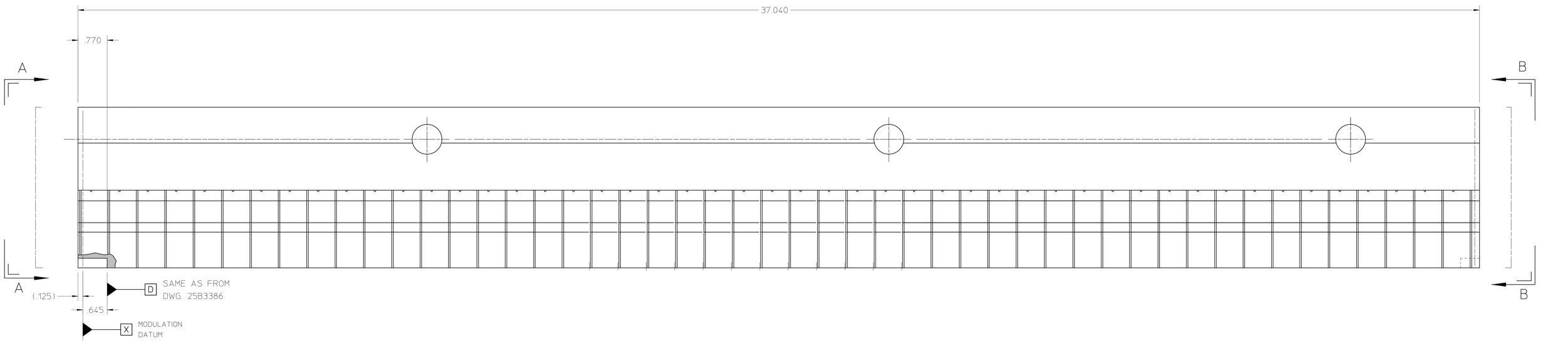
25B3436

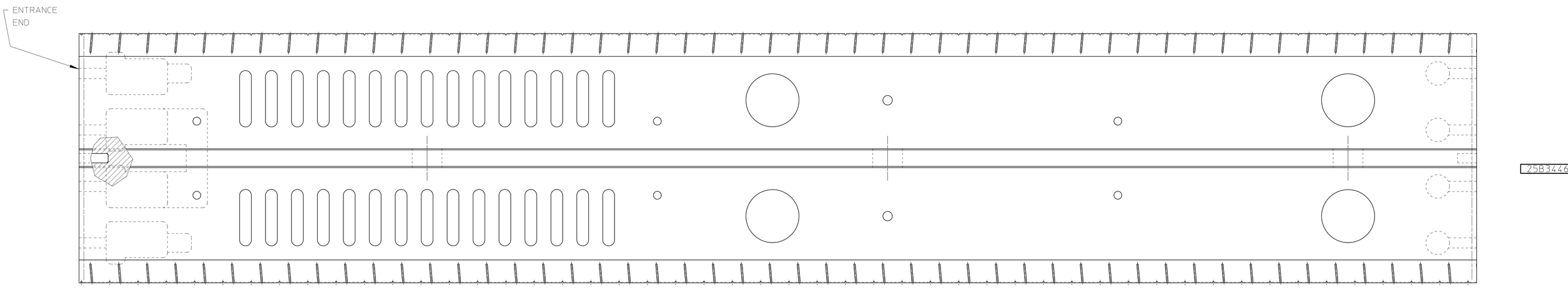


VIEW A-A



VIEW B-B





25B3446

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 134 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES
					25B3386 MODULE 2 MINOR VANE FINISH MACHINING

REQD	ITEM	PART NO.	DESCRIPTION

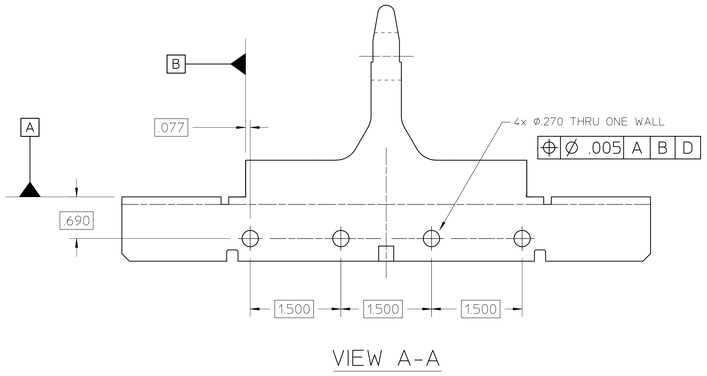
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE 09-11-00
CHK. BY | DATE

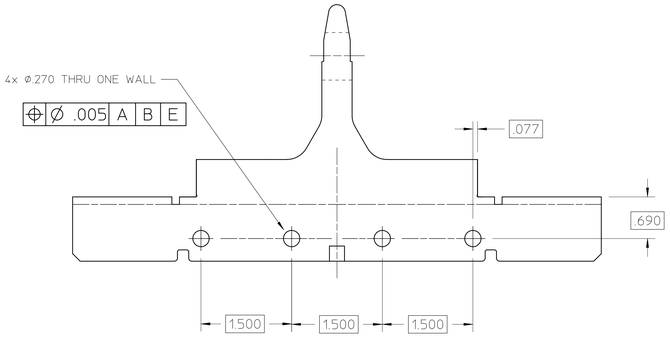
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
MODULE 2 MINOR VANE TRIM

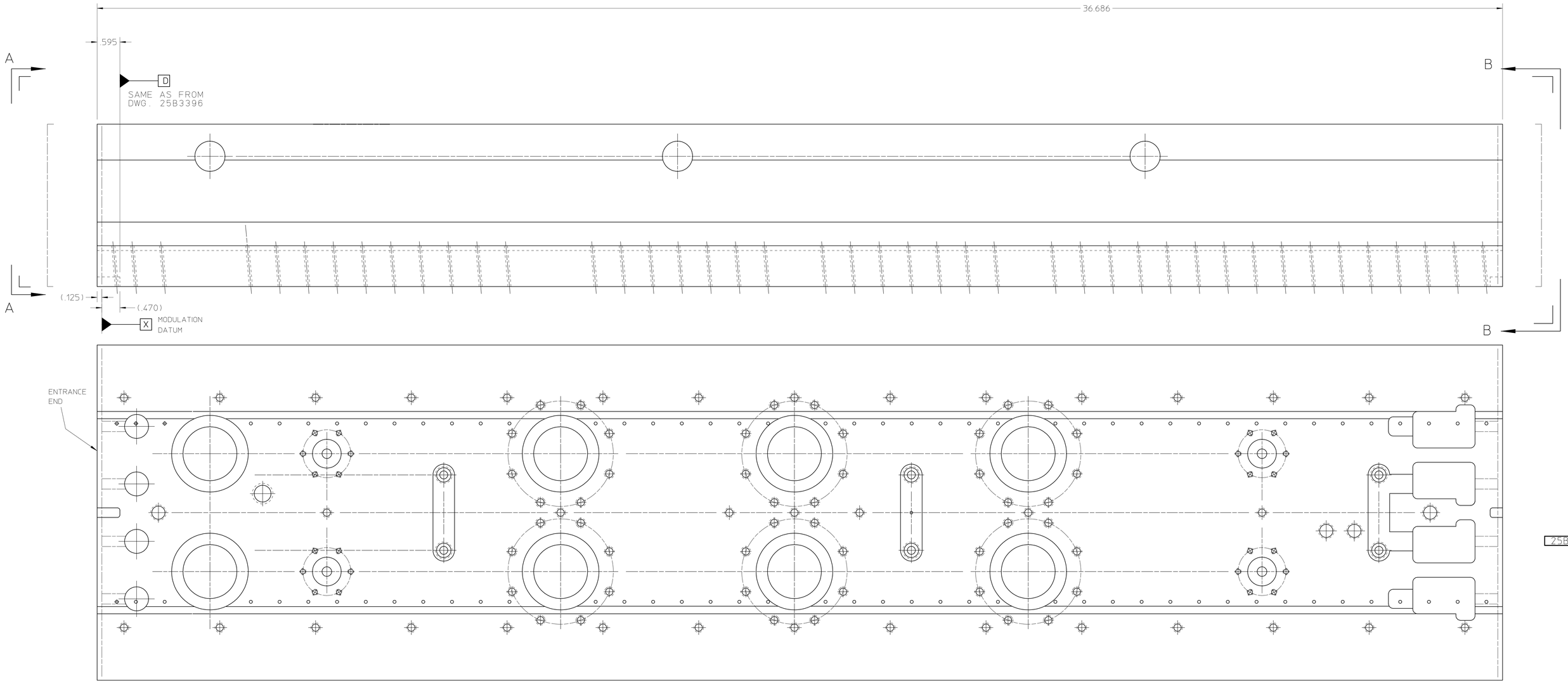
PATENT CLEAR | DWG. TYPE DETAIL | SHOWN ON 00X0000 | SCALE FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B3446 | SIZE | REV.



VIEW A-A



VIEW B-B



1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 141 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .005 | FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO:
SURFACE TREATMENT:
IDENT. METH.:
DWG BY: MATT HOFF | DATE 05-12-00
CHK. BY: | DATE

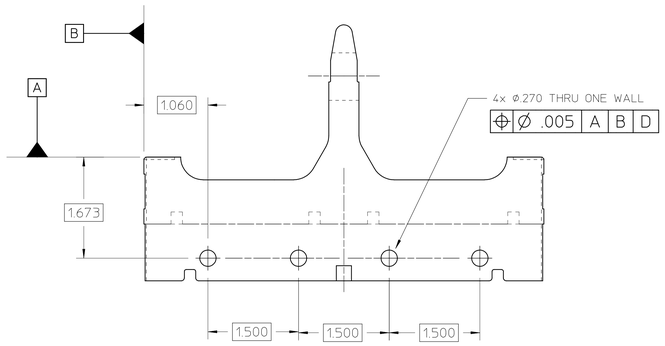
REQD	ITEM	PART NO.	DESCRIPTION
1	1	25B3396	MODULE 3 MAJOR VANE FINISH MACHINING

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

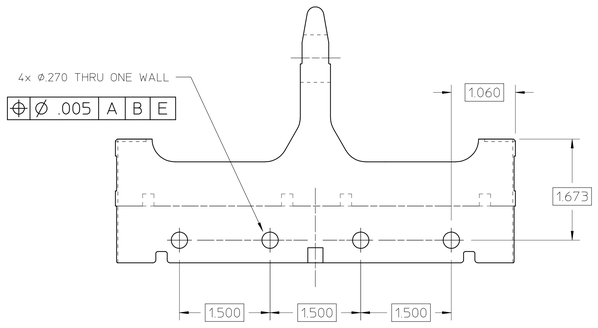
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 3 MAJOR VANE TRIM

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1 : 1 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B3456 | SIZE | REV.

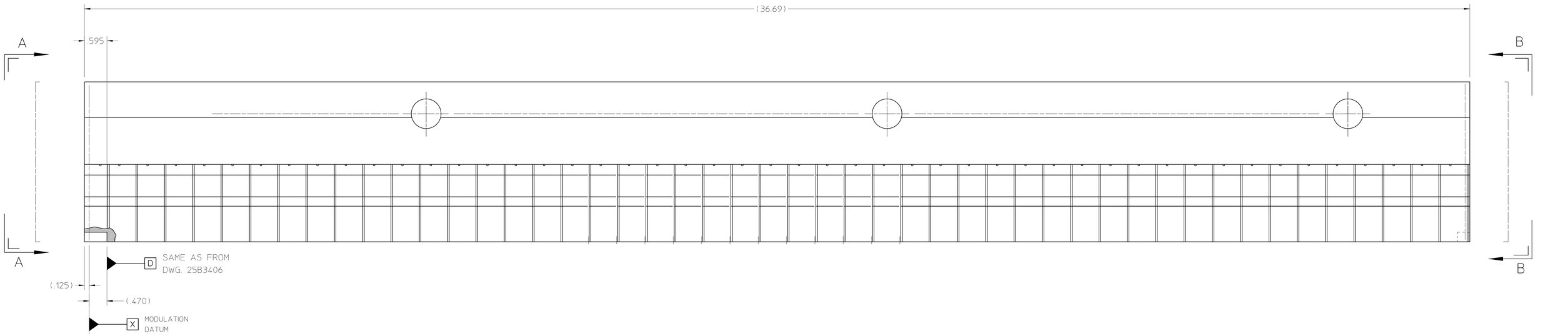
25B3456

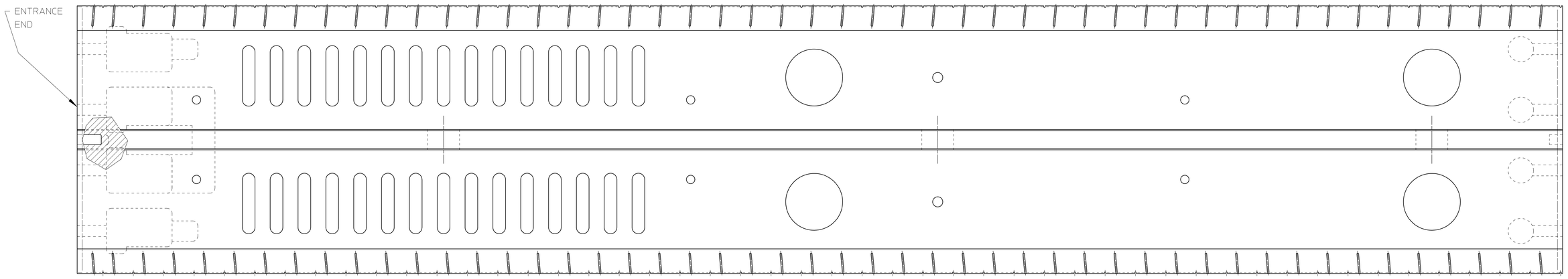


VIEW A-A



VIEW B-B





25B3466

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 133 LBS. AFTER MACHINING.

REQD	ITEM	PART NO.	DESCRIPTION
		25B3406	MODULE 3 MINOR VANE FINISH MACHINING

REV	DWG	CHK	ZONE	DATE	CHANGES

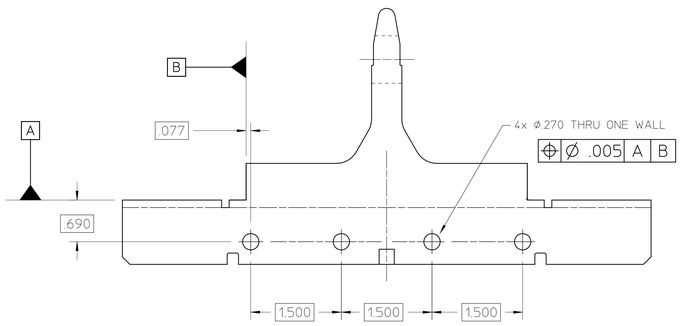
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 09-12-00
CHK. BY | DATE

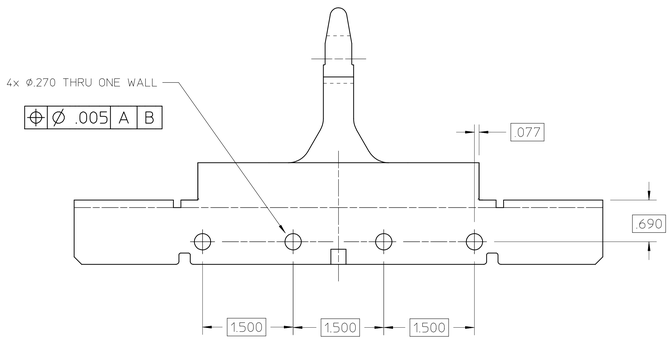
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
MODULE 3 MINOR VANE TRIM

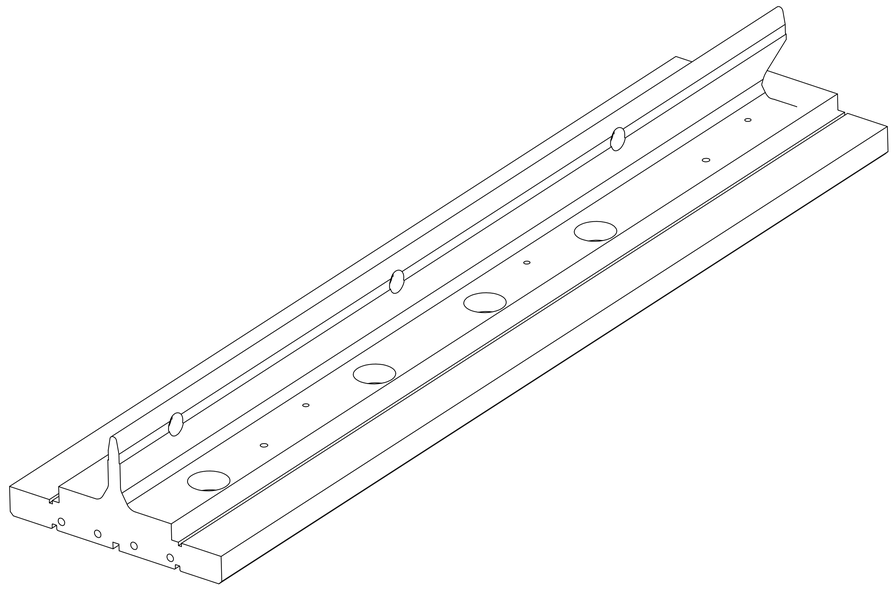
PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212-DB | CATEGORY CODE: FE3211 | DWG. NO.: 25B3466 | SIZE | REV.

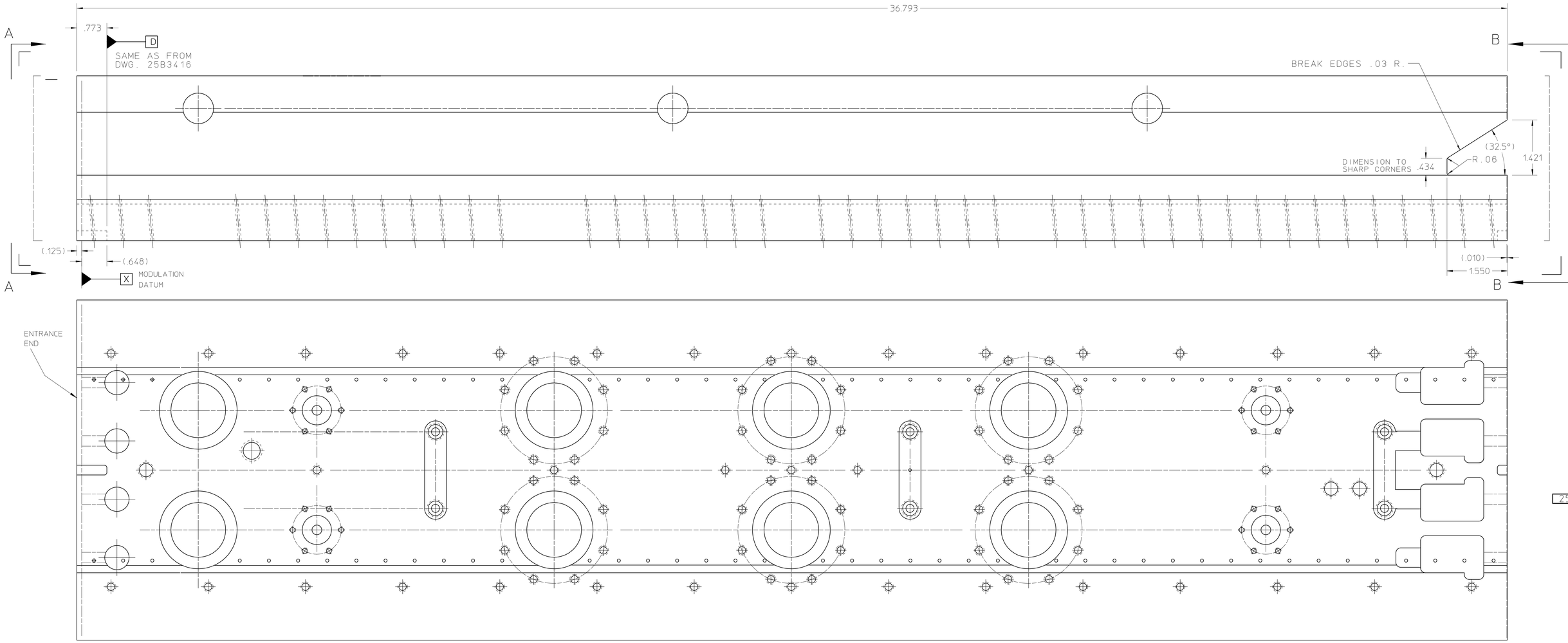


VIEW A-A



VIEW B-B





25B3476

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 142 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES

REQD	ITEM	PART NO.	DESCRIPTION
1	1	25B3416	MODULE 4 MAJOR VANE FINISH MACHINING

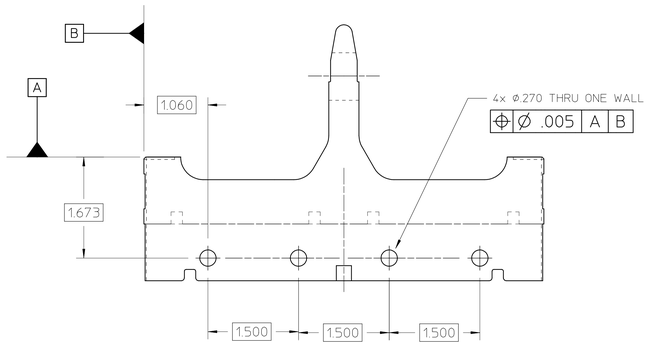
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY MATT HOFF DATE 05-12-00
CHK. BY
DATE

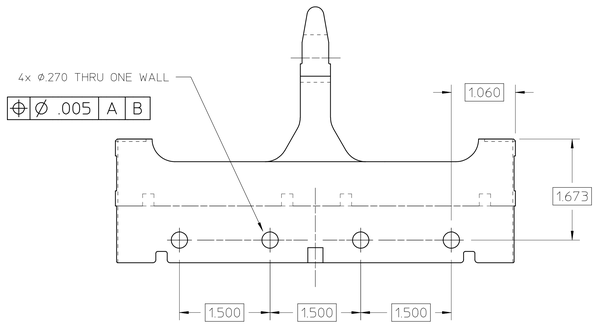
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 4 MAJOR VANE TRIM

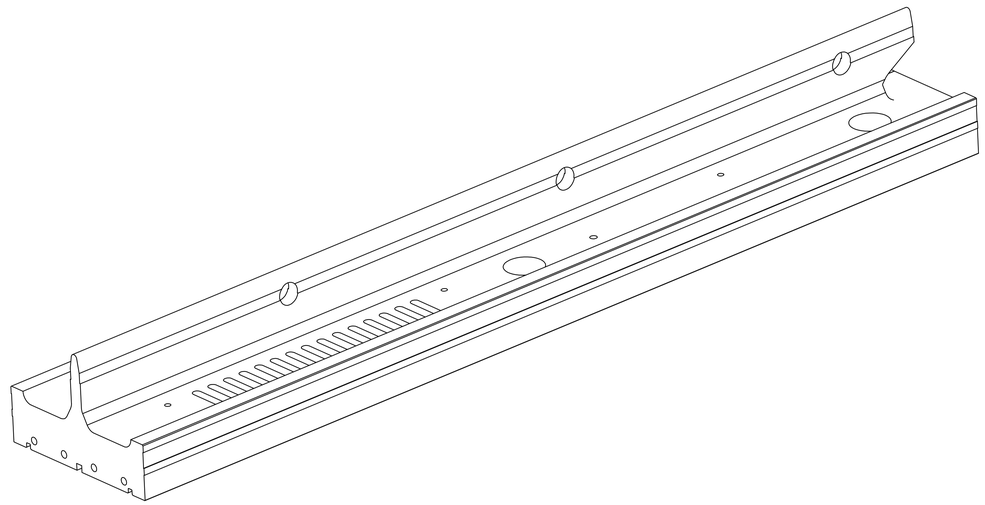
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 1	DO NOT SCALE PRINTS
	DETAIL	00X0000		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV.
	8212-DB	FE3211	25B3476	

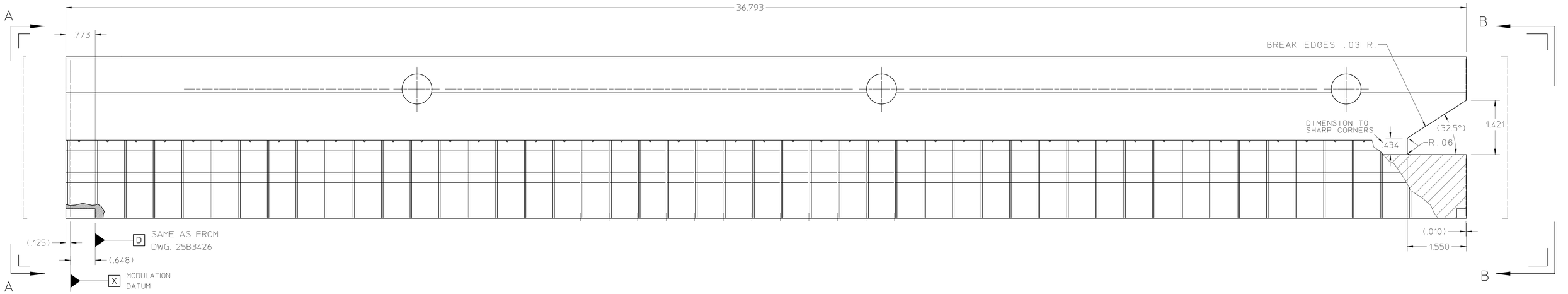


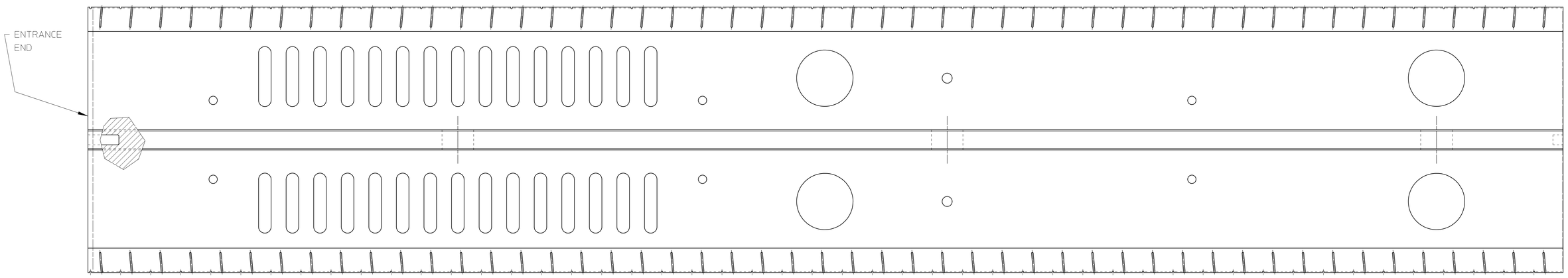
VIEW A-A



VIEW B-B







25B3486

1. PROTECT ALL SOFT COOPER SURFACES FROM SCRATCHES AT ALL TIMES.
2. DIMENSIONS ARE IN INCHES
3. THIS PART WEIGHS APPROX. 134 LBS. AFTER MACHINING.

REV	DWG	CHK	ZONE	DATE	CHANGES

REQD	ITEM	PART NO.	DESCRIPTION
		25B3426	MODULE 4 MINOR VANE FINISH MACHINING

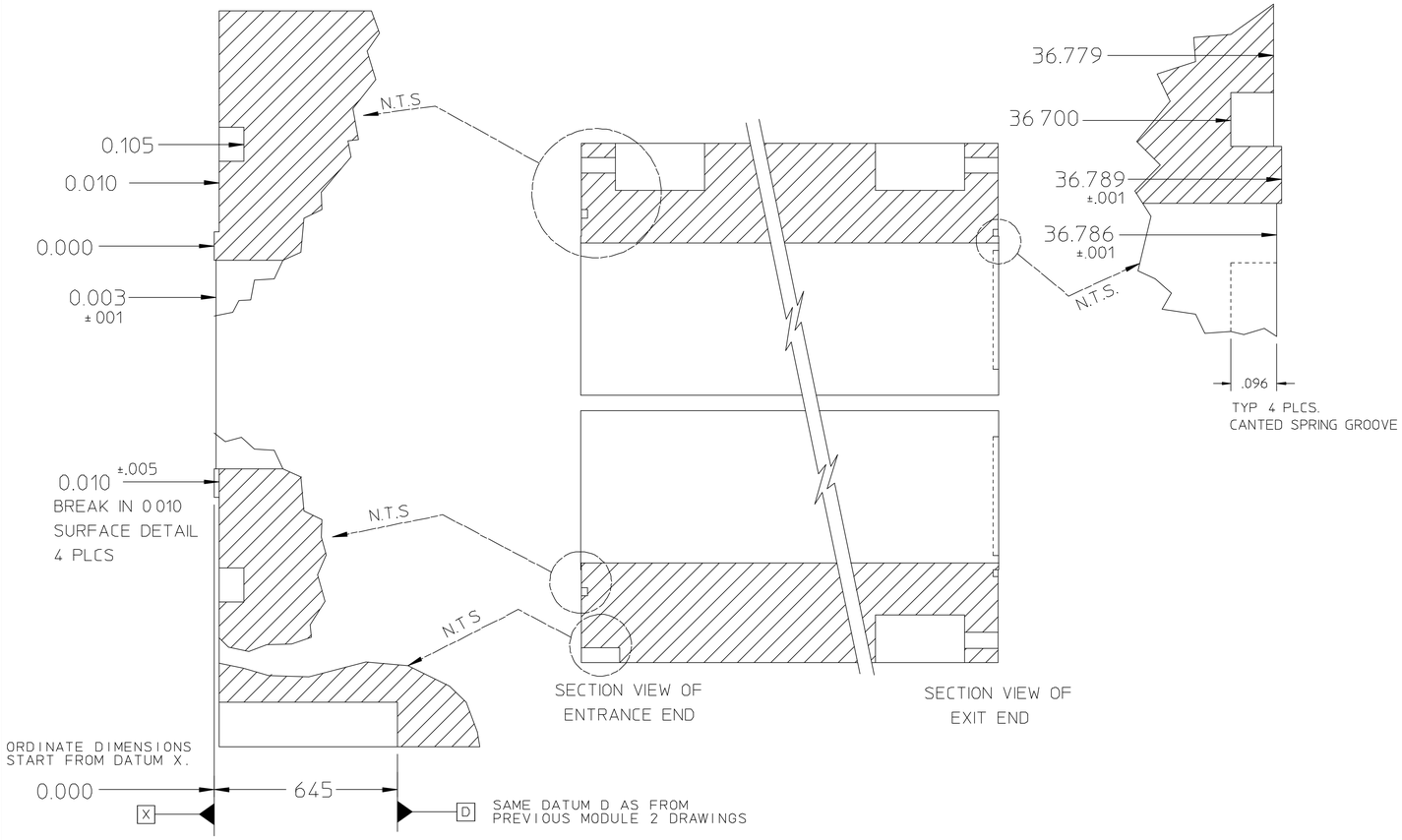
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .005 FINISH 63
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

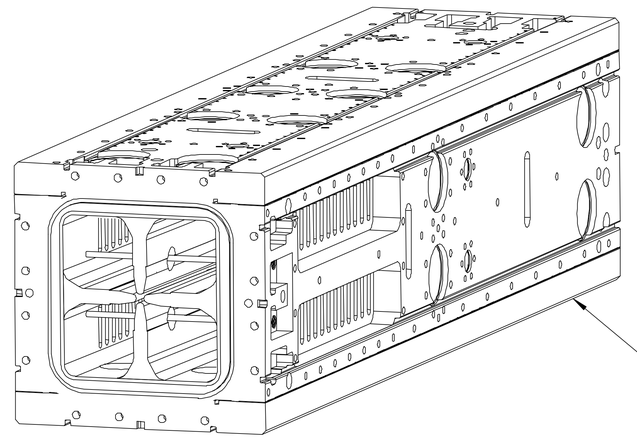
SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE 09-14-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FES RFQ
MECHANICAL STRUCTURES
MODULE 4 MINOR VANE TRIM

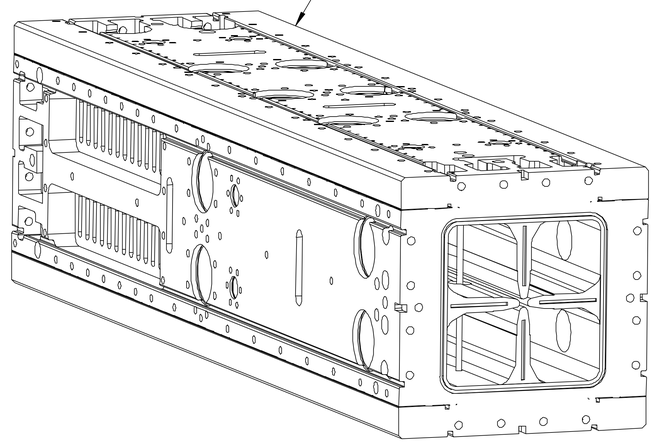
PATENT CLEAR | DWG. TYPE DETAIL | SHOWN ON 00X0000 | SCALE FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DB | CATEGORY CODE FE3211 | DWG. NO. 25B3486 | SIZE | REV.



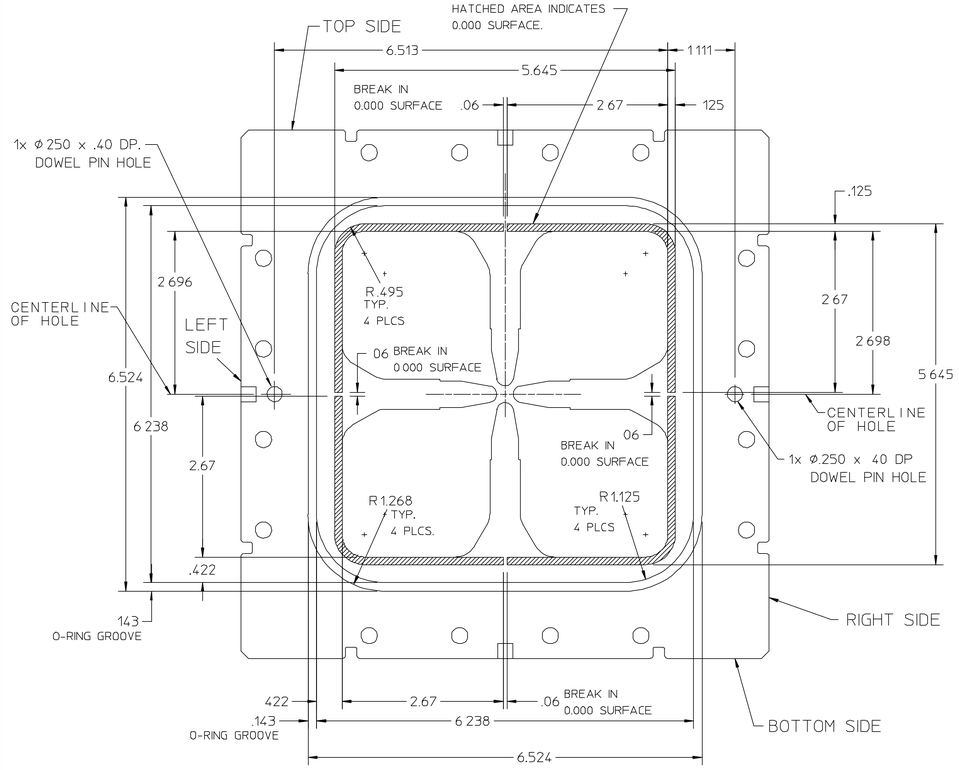


ENTRANCE END

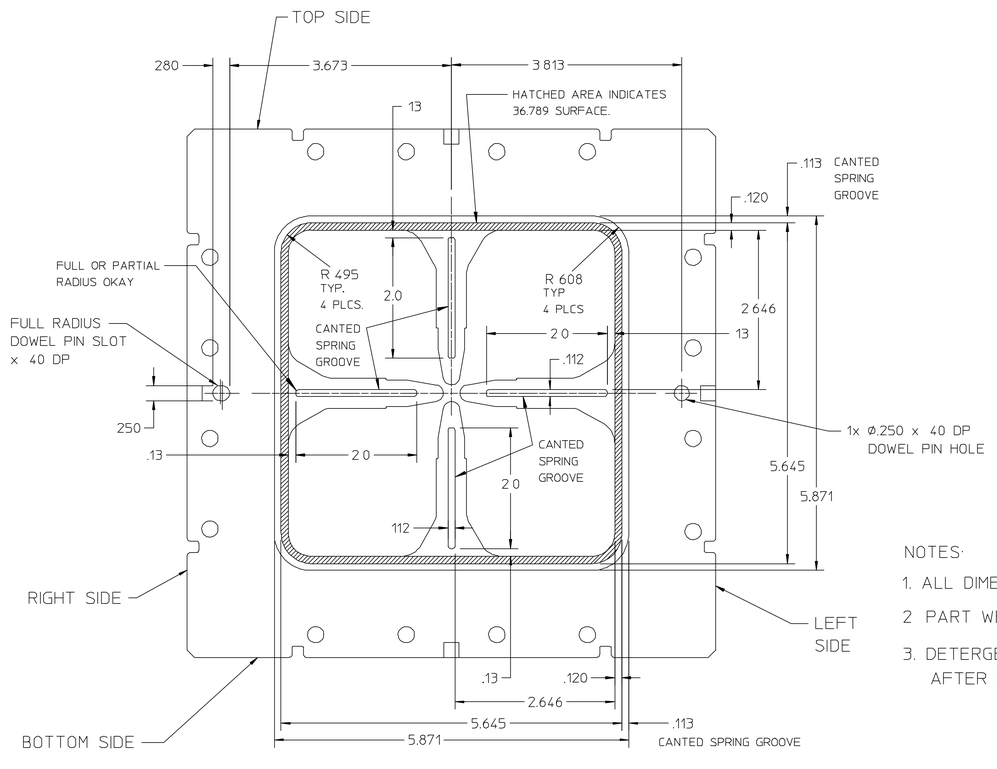
SNS RFQ
MODULE 2



EXIT END



ENTRANCE END



EXIT END

25B3496B

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. PART WEIGHS 630 LBS
3. DETERGENT CLEAN THE ENTIRE PART AFTER MACHINING

REQD	ITEM	PART NO.	DESCRIPTION
		25B3686	MODULE 2 VERTICAL BRAZE ASSY

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH			9/15/02	ADDED BOM INFORMATION
A	MDH			4/17/01	REVISED ENTRANCE END

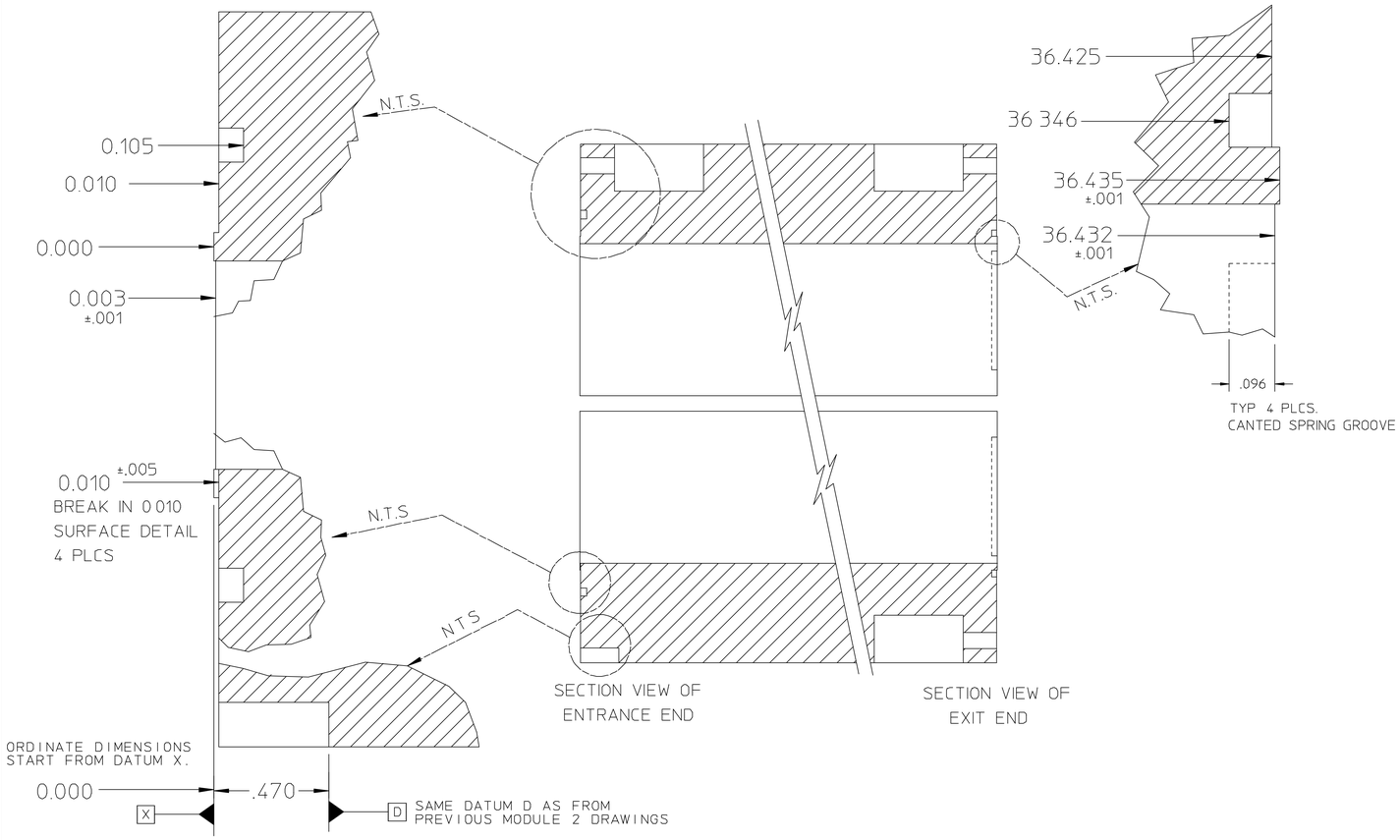
UNLESS OTHERWISE SPECIFIED
TOLERANCES: x ± 1 FRAC ±1/64; xx ± 01 ANGLES ± 1°; xxx ± .003 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS MILD SPATTER & LOOSE SCALE
REFERENCES ANSI Y14.5 & B46.1.

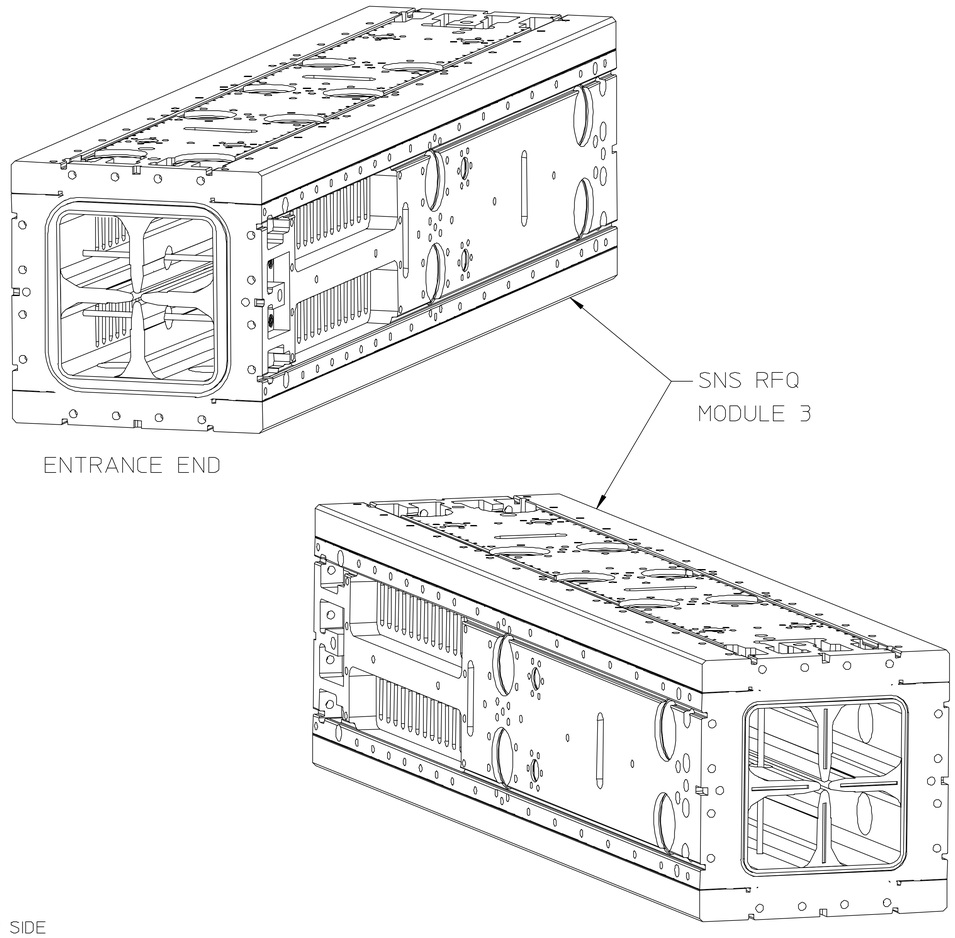
SHOP ORDERS
ACCT NO. | SERIAL NO.
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT: DETERGENT CLEAN
IDENT METH.
DWG MATT HOFF BY | DATE 09-25-00
CHK. BY | DATE

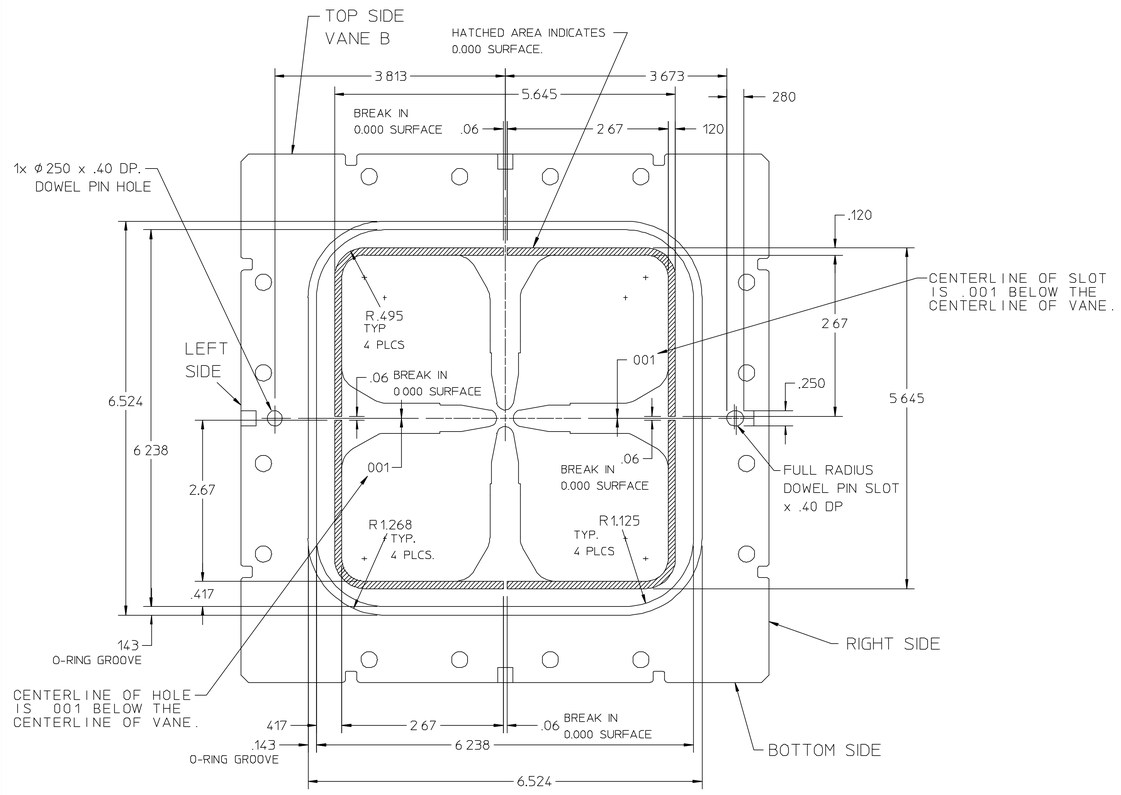
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
MODULE 2 END WALL MACHINING

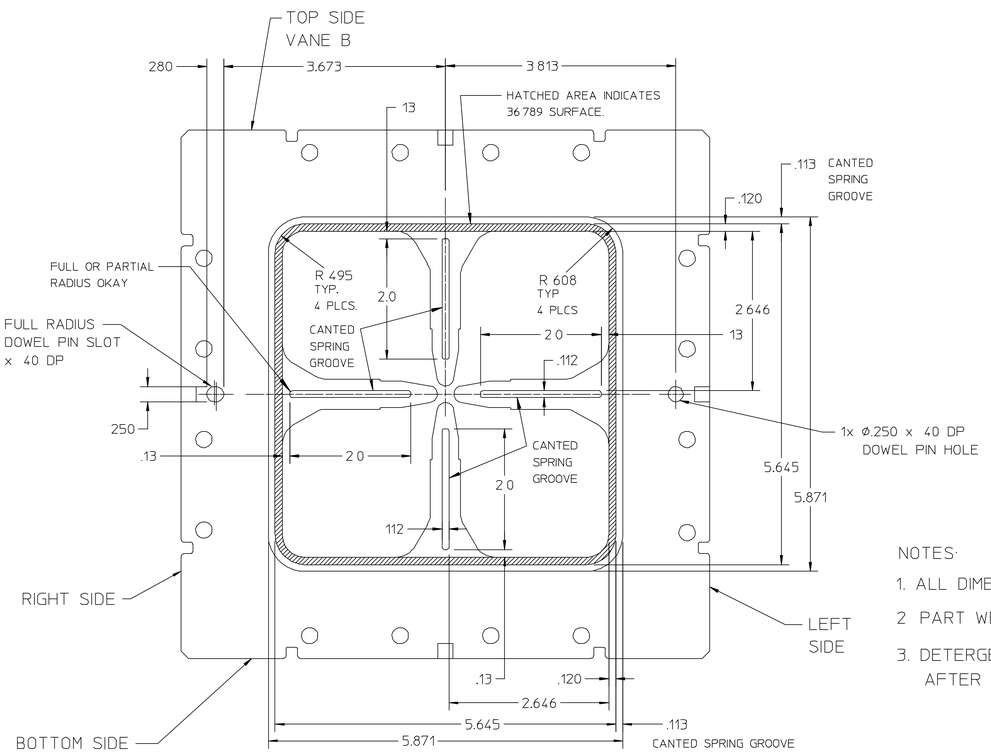
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	SIZE / REV
	8212-DB	FE3211	25B3496	B







ENTRANCE END



EXIT END

25B35065

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. PART WEIGHS 626 LBS
3. DETERGENT CLEAN THE ENTIRE PART AFTER MACHINING

REQD	ITEM	PART NO	DESCRIPTION
		25B3696	MODULE 3 VERTICAL BRAZE ASSY

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH			9-12-02	ADDED BOM INFORMATION
A	MDH			5-22-01	FILLED IN TBD DIMENSIONS

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± 1 FRAC ± 1/64; XX ± 01 ANGLES ± 1°; XXX ± .003 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1 5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14 5 & B46 1

SHOP ORDERS
ACCT NO. | SERIAL NO
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT: DETERGENT CLEAN
IDENT METH
DWG BY: MATT HOFF | DATE: 09-27-00
CHK. BY | DATE

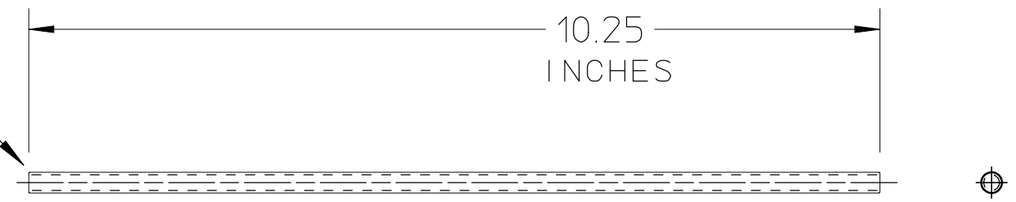
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ
MECHANICAL STRUCTURES
MODULE 3 END WALL MACHINING

PATENT CLEAR | DWG. TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT NO: 8212-DB | CATEGORY CODE: FE3211 | DWG NO: 25B3506 | SIZE: B | REV

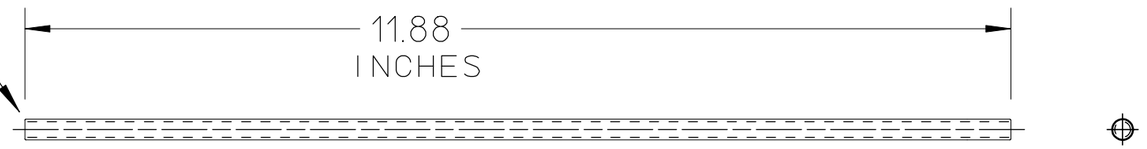
25B3512	REQD	ITEM	PART NUMBER	DESCRIPTION
				1/4-20 MOLYBDENUM THREADED ROD

CHAMFER .01 x 45°
BOTH ENDS



VERSION 1

CHAMFER .01 x 45°
BOTH ENDS



VERSION 2

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 10-11-00	
CHK BY		DATE	

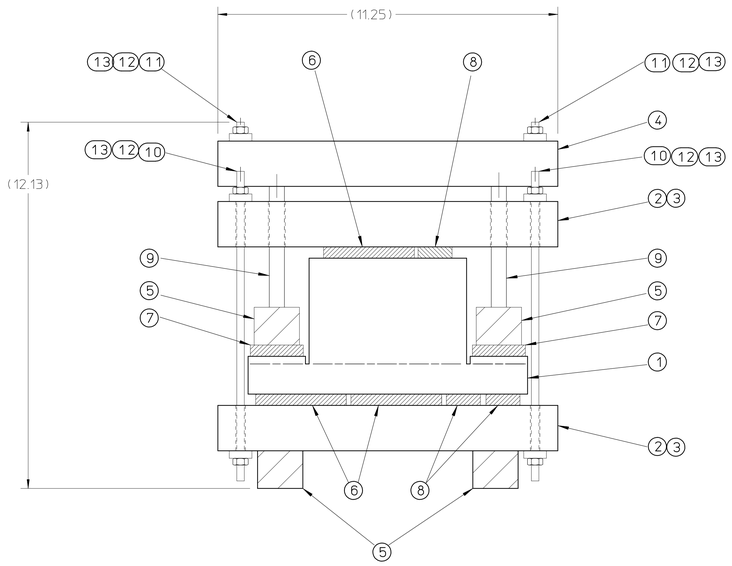
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

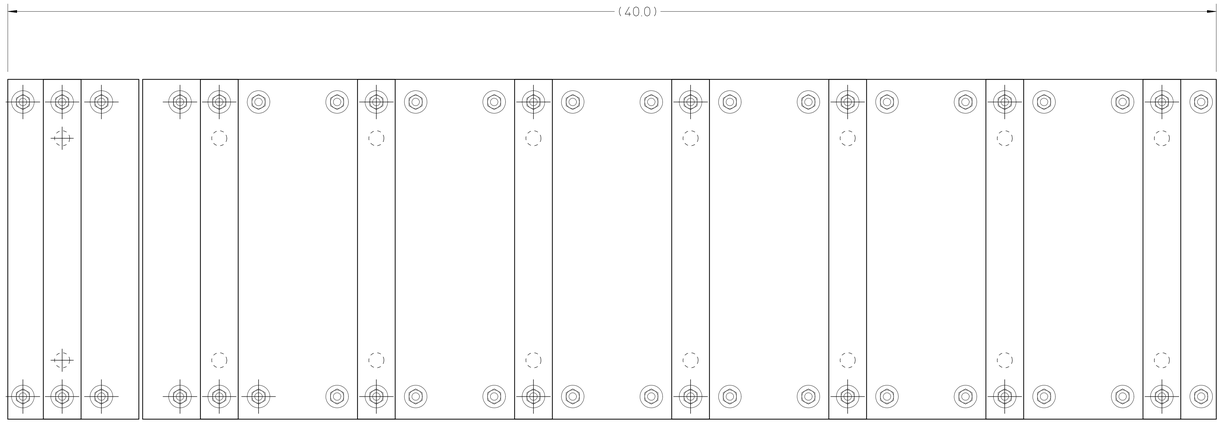
SNS - FES RFQ

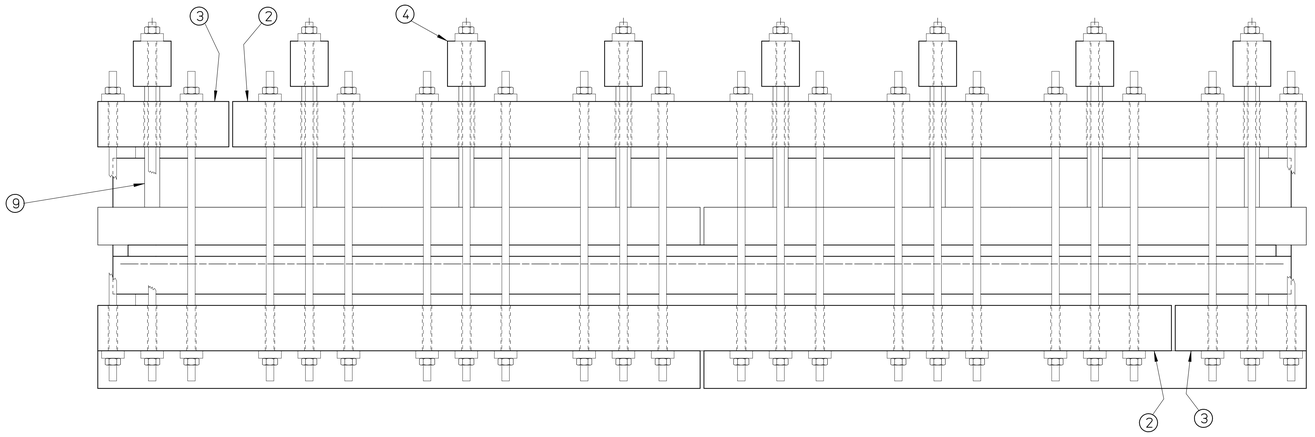
MECHANICAL STRUCTURES

HORIZONTAL BRAZE FIXTURE TIE-ROD

PAT CLEAR	DWG TYPE DETAIL	SHOWN ON 00X0000	SCALE: FULL
			DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B3512 REV







25B3526

THIS PART WEIGHTS APPROX. 480 LBS.

DIMENSIONS ARE IN INCHES.

REQD	ITEM	PART NO.	DESCRIPTION
96	13		CRUSH WASHER
96	12		CRUSH NUT
16	11	25B3512	TIE ROD VERSION 2
32	10	25B3512	TIE ROD VERSION 1
16	9		Ø.5 x 4 STAINLESS ROD
10	8		3/8 x 1.13 x 12 GRAPHITE PLATE
7	7		3/8 x 1.75 x 12 GRAPHITE PLATE
10	6		3/8 x 3 x 12 GRAPHITE PLATE
8	5		1-1/4 x 1-1/2 x 20 GRAPHITE BAR
8	4	25B3582	HORIZONTAL BRAZE FIXTURE CLAMP BAR
2	3	25B3552	HORIZONTAL BRAZE FIXTURE CLAMP PLATE B
2	2	25B3544	HORIZONTAL BRAZE FIXTURE CLAMP PLATE A
1	1	25B3206	MAJOR VANE HORIZONTAL BRAZE

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .001 FINISH 125

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

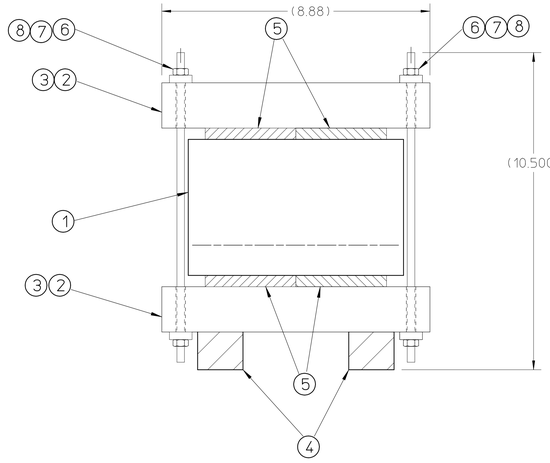
SHOP ORDERS

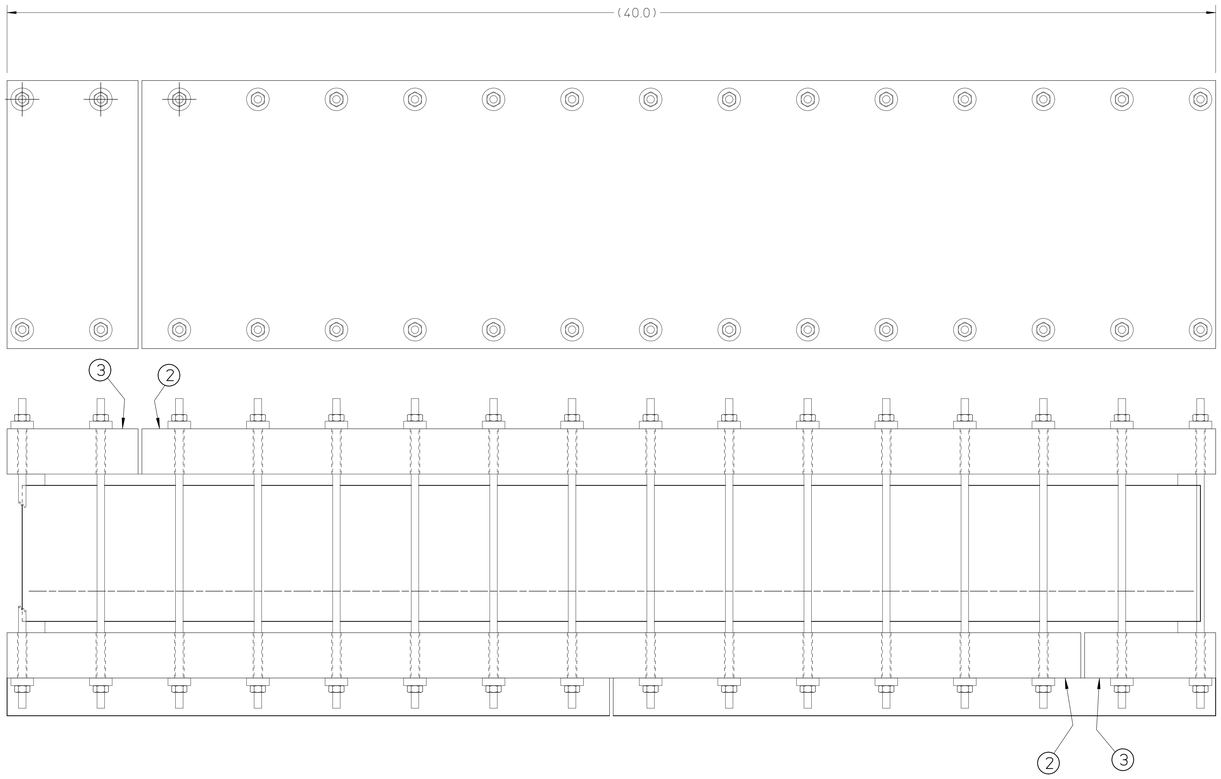
ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-11-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ
MECHANICAL STRUCTURES
MAJOR VANE HORIZONTAL BRAZE FIXTURE ASSY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSEMBLY	00X0000	1:2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3526	





25B3536

THIS PART WEIGHTS APPROX. 480 LBS.

DIMENSIONS ARE IN INCHES.

QTY	ITEM	PART NO.	DESCRIPTION
	13		
	12		
	11		
	10		
	9		
64	8		CRUSH WASHER
64	7		CRUSH NUT
32	6	25B3512	TIE ROD VERSION 1
10	5		3/8 x 3 x 12 GRAPHITE PLATE
8	4		1-1/4 x 1-1/2 x 20 GRAPHITE BAR
2	3	25B3572	HORIZONTAL BRAZE FIXTURE CLAMP PLATE D
2	2	25B3564	HORIZONTAL BRAZE FIXTURE CLAMP PLATE C
1	1	25B3216	MINOR VANE HORIZONTAL BRAZE

REV | DWG | CHK | ZONE | DATE | CHANGES

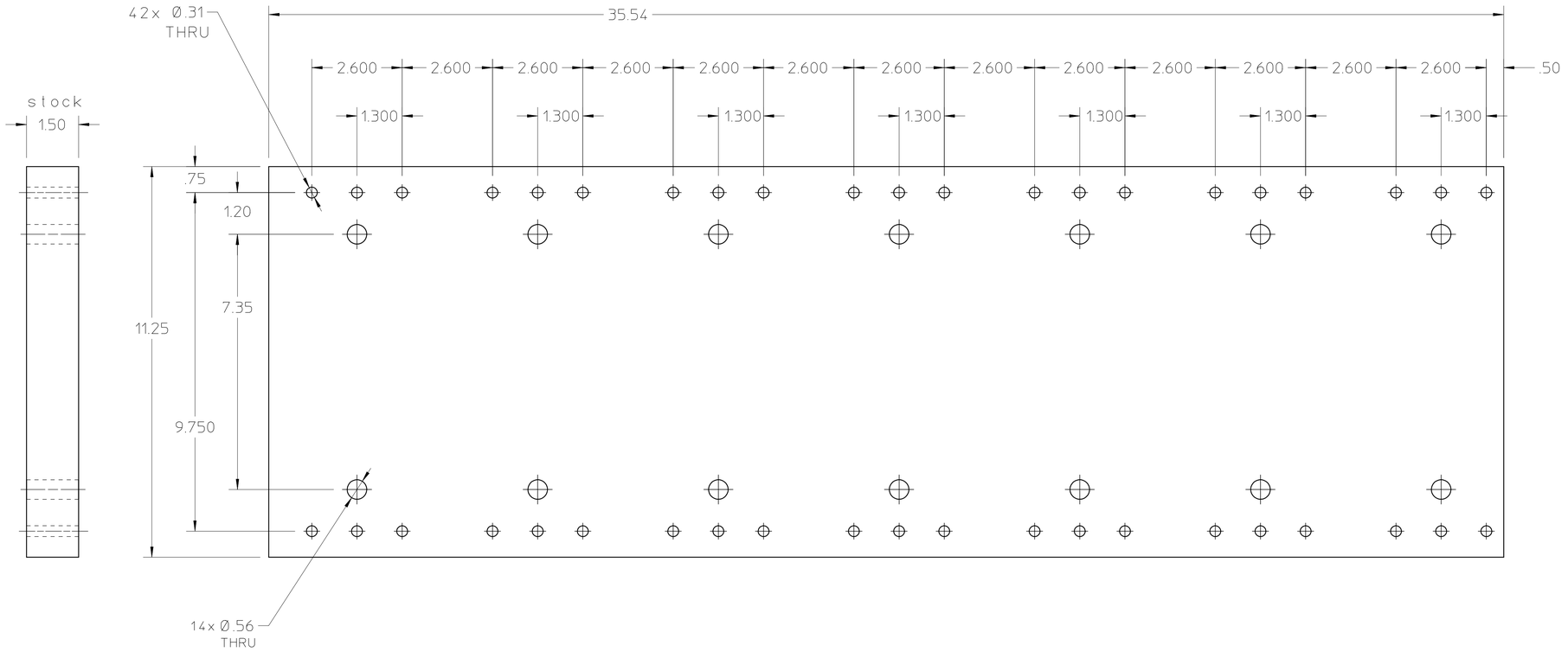
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .001 | FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-13-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS - FES RFQ
MECHANICAL STRUCTURES
MINOR VANE HORIZONTAL BRAZE FIXTURE ASSY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSEMBLY	00X0000	1:2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3536	

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.5 INCH THICK GRAPHITE PLATE



25B3544

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 36 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .001 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-17-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

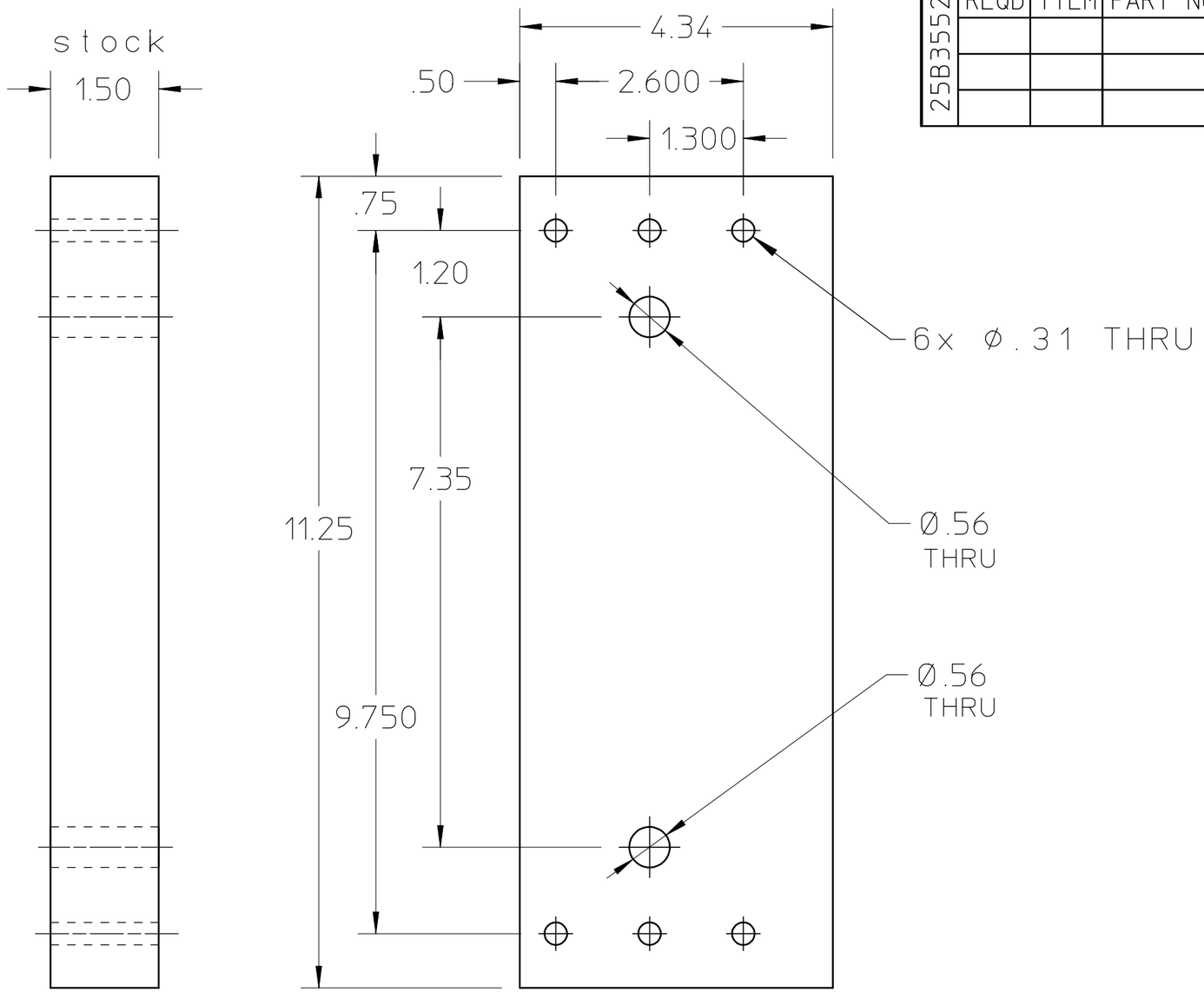
SNS - FES RFQ

MECHANICAL STRUCTURES

HORIZONTAL BRAZE FIXTURE - CLAMP A

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B3544	SIZE / REV.
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211		

25B3552	REQD	ITEM	PART NUMBER	DESCRIPTION
				1.5 INCH THICK GRAPHITE PLATE



DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 5 LBS.

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 10-18-00
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

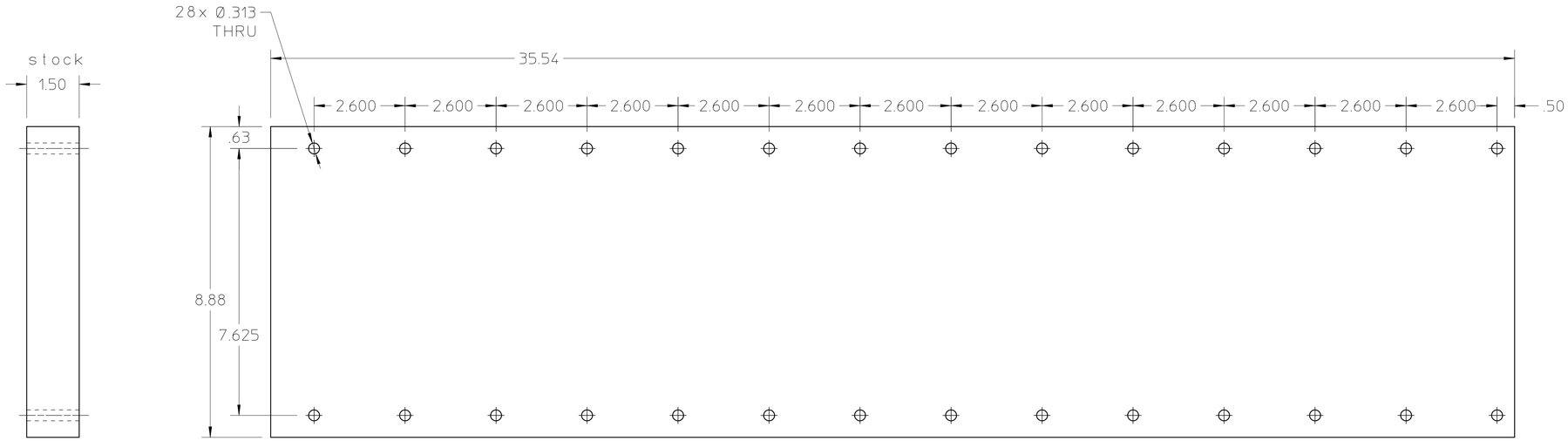
SNS - FES RFQ

MECHANICAL STRUCTURES

HORIZONTAL BRAZE FIXTURE - CLAMP B

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B3552

REQ	ITEM	PART NUMBER	DESCRIPTION
			1.5 INCH THICK GRAPHITE PLATE



25B3564

DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 29 LBS.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .001 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

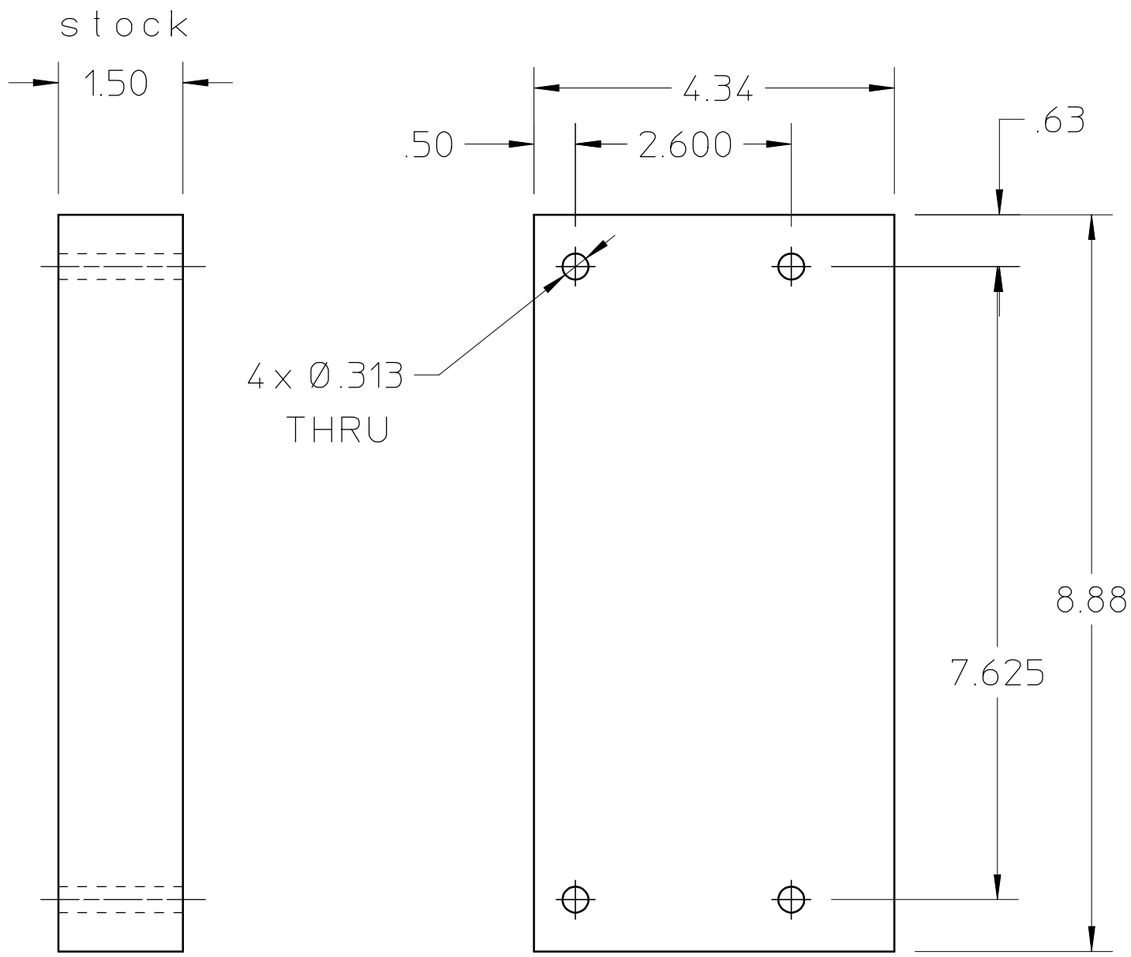
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-16-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ
MECHANICAL STRUCTURES
HORIZONTAL BRAZE FIXTURE - CLAMP C

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B3564	SIZE / REV.
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211		

25B3572	REQD	ITEM	PART NUMBER	DESCRIPTION
				1.5 INCH THICK GRAPHITE PLATE



DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 4 LBS.

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 10-17-00
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

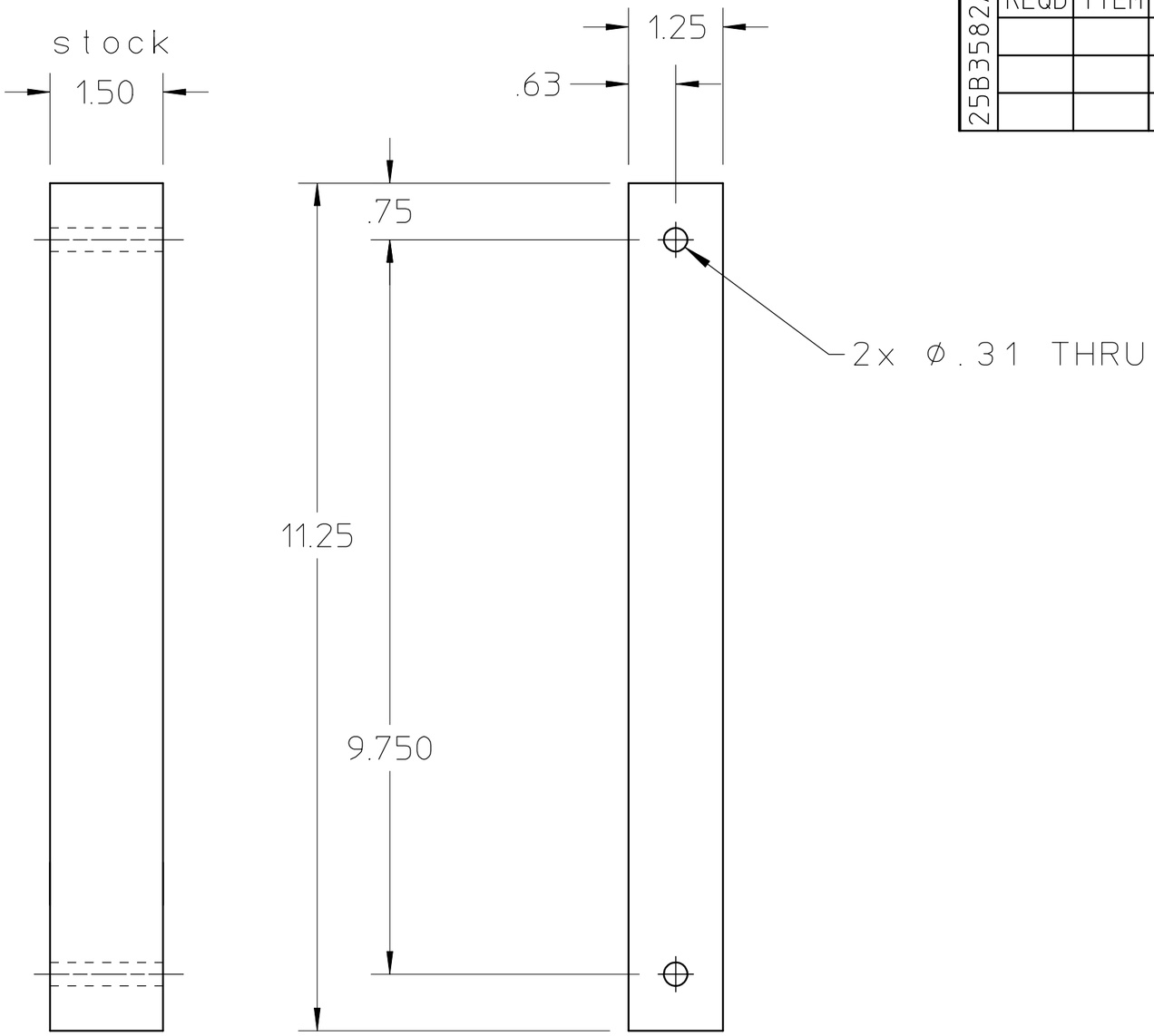
SNS - FES RFQ

MECHANICAL STRUCTURES

HORIZONTAL BRAZE FIXTURE - CLAMP D

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B3572

25B3582A	REQD	ITEM	PART NUMBER	DESCRIPTION
				1.5 INCH THICK GRAPHITE PLATE



DIMENSIONS ARE IN INCHES

THIS PART WEIGHS APPROX. 1.3 LBS.

REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		11/3/00	DELETED ø.56 HOLES

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 10-18-00
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ

MECHANICAL STRUCTURES

HORIZONTAL BRAZE FIXTURE - CLAMP BAR

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B3582A

REQ	ITEM	PART NUMBER	DESCRIPTION
			.020 thick C101 copper plate. (OFHC)

25B3594

DIMENSIONS ARE IN INCHES.

NO RAISED EDGES.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ± 1/64 | .XX ± .01 | ANGLES ± 1° | .XXX ± .001 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-13-00
CHK. BY | DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

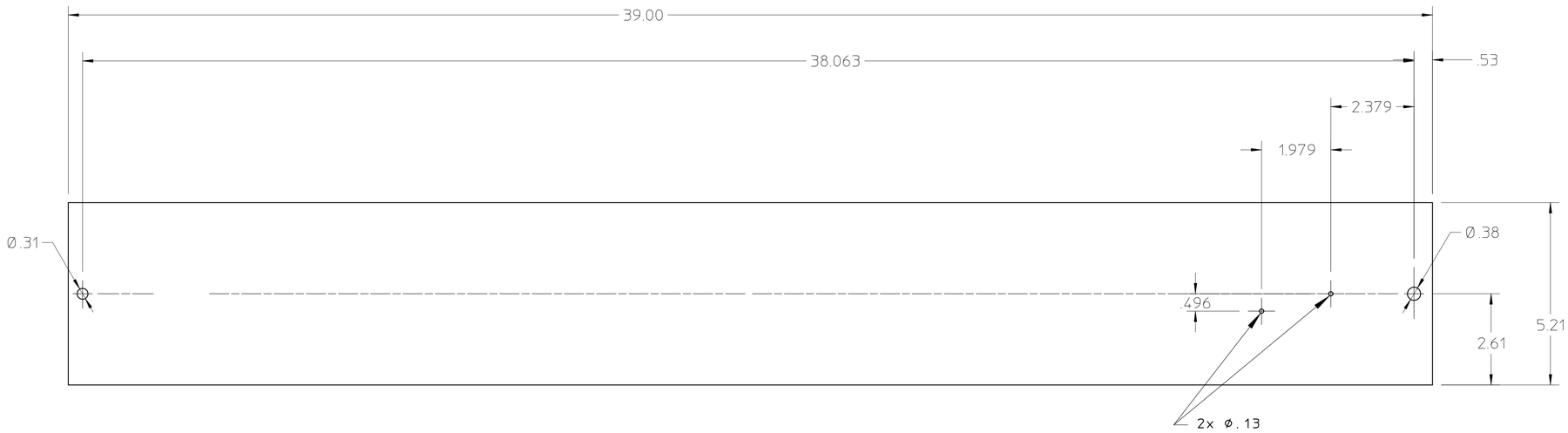
SNS - FES RFQ

MECHANICAL STRUCTURES

BRAZE JOINT SHEET - MINOR VANE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1 : 2	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B3594	SIZE / REV.
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211		

REQ	ITEM	PART NUMBER	DESCRIPTION
			.020 thick C101 copper plate. (OFHC)



25B3604B

DIMENSIONS ARE IN INCHES.
NO RAISED EDGES.

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH			10-26-00	ADDED .496 DIMENSION
A	MDH			10-25-00	5.21 was 9.25

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .001 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

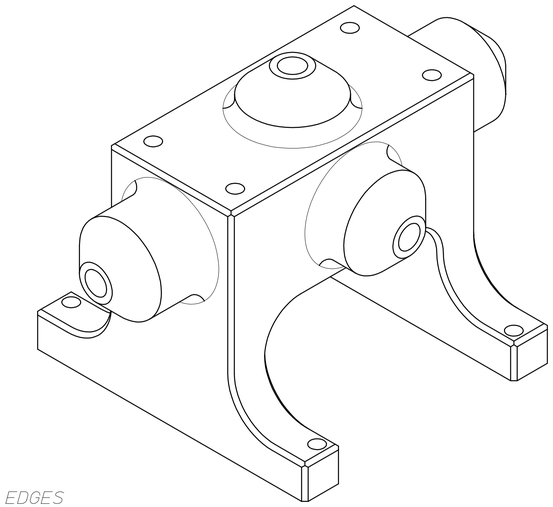
ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY: MATT HOFF | DATE: 10-13-00
CHK. BY | DATE

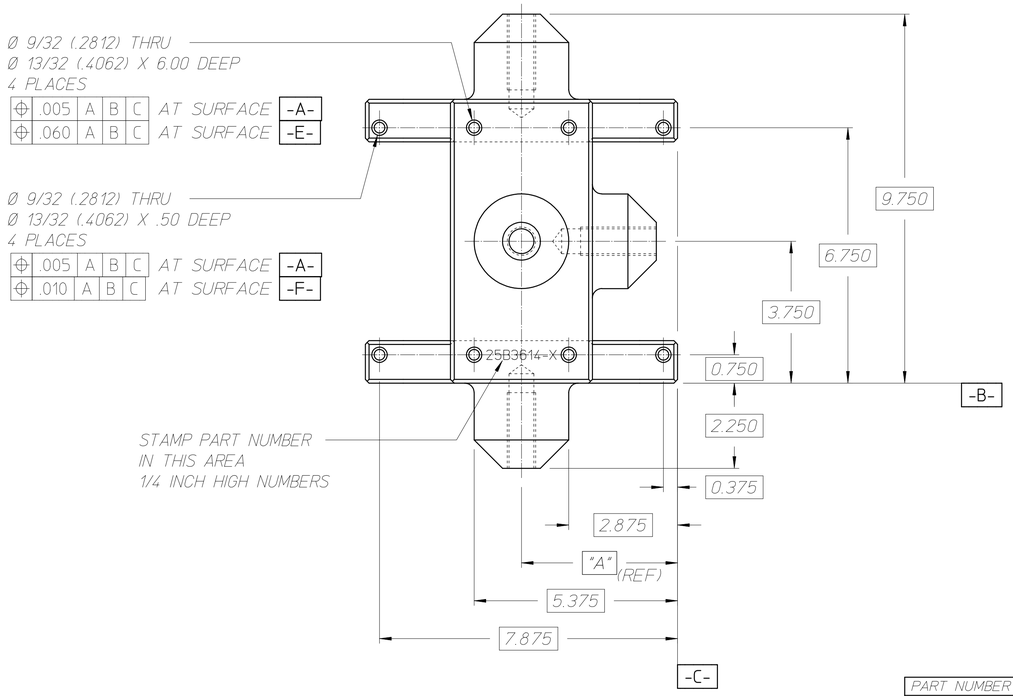
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ
MECHANICAL STRUCTURES
BRAZE JOINT SHEET - MAJOR VANE

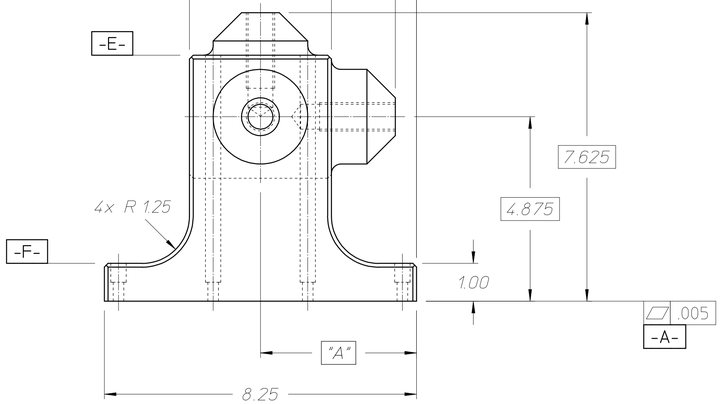
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	00X0000		
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3604	B

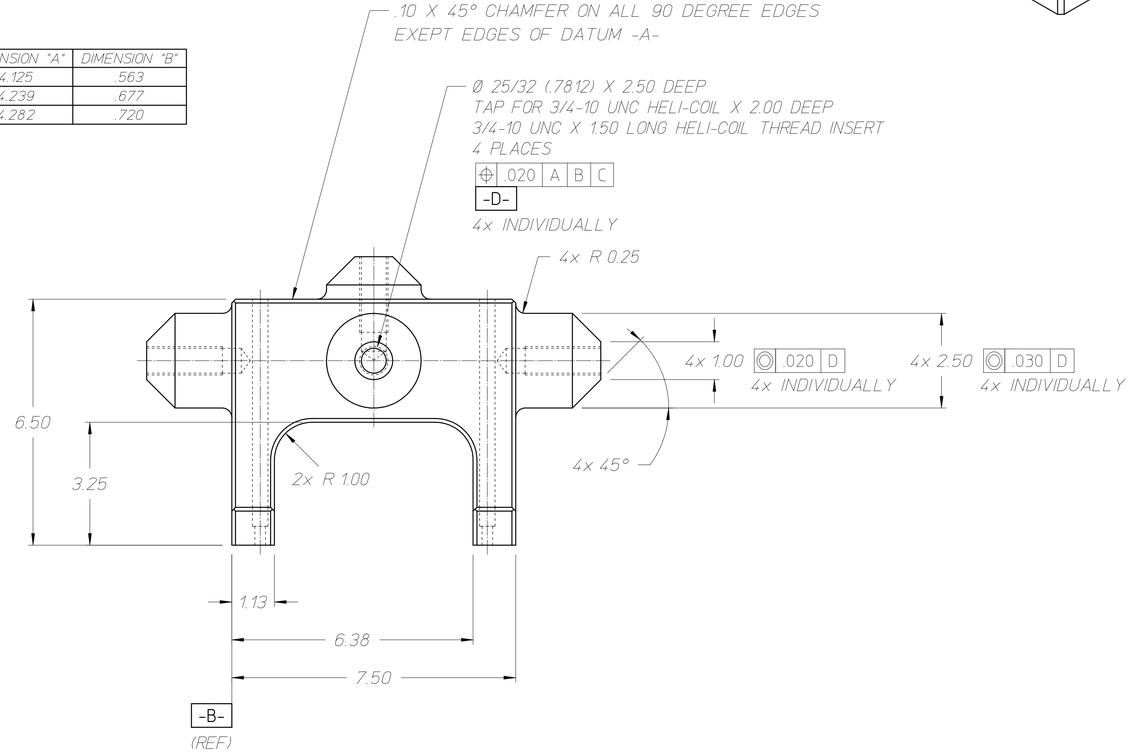
SHEET 1 OF 1	ITEM	REQ	PART NUMBER	DESCRIPTION
25B3614-	1	1		ALUMINUM 6061-T6





PART NUMBER	DIMENSION "A"	DIMENSION "B"
-1	4.125	.563
-2	4.239	.677
-3	4.282	.720





REV.	DWN	CHK	ZONE	DATE	CHANGES
A	???	???	A-1	00/00/00	DESCRIPTION ON DWG 25B6046 WAS 25B3656

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- .X= ± .060 FRACT= ± 1/64
- .XX= ± .020 ANGLES= ± .5°
- .XXX= ± .005 FINISH 125

SAWED, FLAMECUT, SHEARED OR STOCK FINISH.
ALL SCREW THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30° ½ PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT SCREW THREADS.
BREAK EDGES 1/64 MAX. ON MACHINED WORK.
REMOVE BURRS, LOOSE SCALE AND WELD SPATTER.
REFERENCES - ASME Y14.5 ANS B46.1 ANSI B1.1 ANSI/AWS A2.4 ANSI/AWS D1.1
ALL DIMENSIONS ARE IN INCHES

SHOP ORDERS

ACCT. NO.: SER. NO.:
DATE ISS'D: DATE REQ'D: NO. REQ'D.
DELIVER TO:
SURFACE TREATMENT: BEAD BLAST/BLACK ANODIZE
IDENTIFICATION METHOD: PART NUMBER STAMP
DRN BY: A. WANDESFORDE DATE 01/10/00
CHK'D BY: D. DIGENNARO DATE 01/10/00

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

SNS-FES RFQ
MECHANICAL SYSTEMS
RFQ STRUT MOUNT

PATENT CLEAR	DRAWING TYPE	SHOWN ON	SCALE: HALF	DO NOT SCALE PRINTS
	DETAIL	25B6046		
MICROFILMED	DESIGN ACCOUNT	CATEGORY CODE	DRAWING NUMBER	REV.
	0000-00	FE-32-12	25B3614	A

SHEET 1 OF 1

REF: AW 7/98

STEP 1

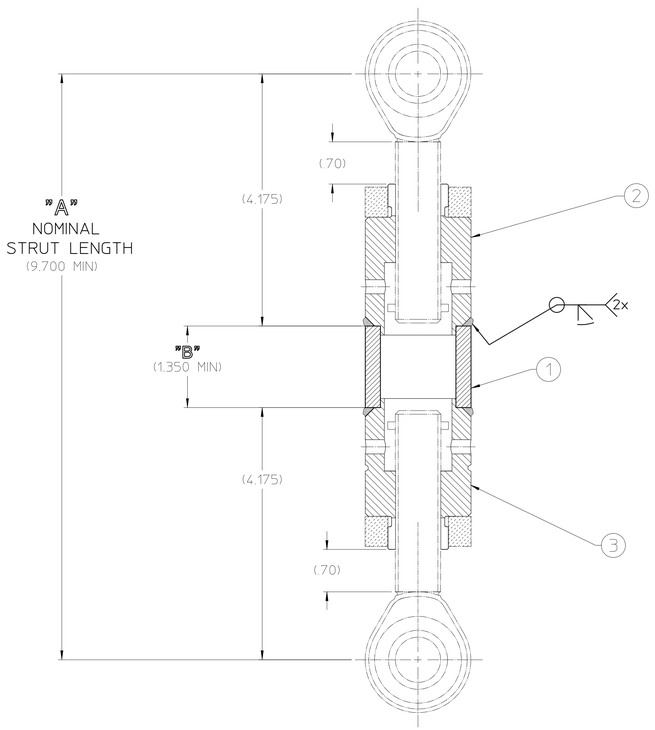
NOTE:

1. ENTER DESIRED NOMINAL STRUT LENGTH IN COLUMN "A", SUBTRACT 8.350 FROM "A" AND ENTER REMAINDER IN COLUMN "B". THIS IS THE LENGTH OF THE TUBE (ITEM 1).

2. CUT THE TUBE (ITEM 1) TO LENGTH "B" AS DETERMINED IN STEP 1, NOTE 1.

3. WELD STRUT TUBE ENDS (ITEMS 2 & 3) TO TUBE (ITEM 1).

4. ELECTROLESS NICKEL PLATE ENTIRE WELDMENT TO A PLATING THICKNESS OF .0003" MIN / .0008" MAX.



Part Number	[Nominal Strut Length] "A"	["A" minus 8.350 =] "B" ± .025	NOTES
25B3626-1	27.75	19.40	RFQ VERTICAL STRUT
25B3626-2	28.00	19.65	RFQ HORIZONTAL STRUT
25B3626-3	14.50	6.15	RFQ Z STRUT 1
25B3626-4	61.50	53.15	RFQ Z STRUT 2
25B3626-5	33.00	24.65	MEBT VERTICAL STRUT
25B3626-6	30.88	22.53	MEBT HORIZONTAL STRUT
25B3626-7	24.50	16.15	MEBT Z STRUT

STEP 2

ASSEMBLY GUIDELINES

1. ADJUSTMENT RATE = .125" CHANGE IN LENGTH PER FULL REVOLUTION OF STRUT TUBE.
   a) OVERALL ADJUSTMENT RANGE = ±1.40"

2. SPRAY COAT THREADS OF STRUT ROD ENDS (ITEMS 4 & 5) WITH ACHESON AERODAG-G LUBRICANT (ITEM 8).

3. STRUT ASSEMBLY AND TORQUE INSTRUCTIONS:

   △a THREAD ROD END - LEFT HAND THREAD (ITEM 5) INTO GROOVED END OF STRUT WELDMENT.

   b) THREAD ROD END - RIGHT HAND THREAD (ITEM 3) INTO OPPOSITE END OF STRUT WELDMENT.

   c) INSTALL SPRING PIN (ITEM 6) THROUGH STRUT STUB END HOLES INTO ROD END HOLES. CENTER SPRING PIN IN ROD END.

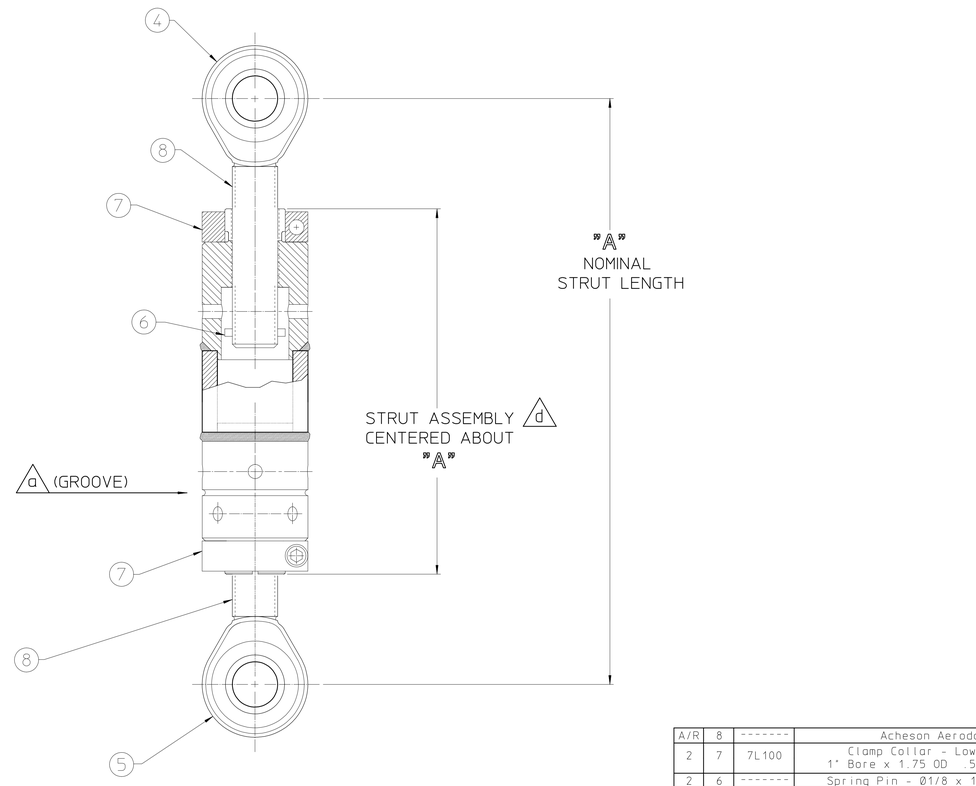
   △d SET STRUT ASSEMBLY TO NONIMAL STRUT LENGTH "A" WITH STRUT BODY CENTERED IN SPAN.

   e) RESTRAIN ONE ROD END FROM ROTATING WITH RESPECT TO THE STRUT TUBE.

   f) TIGHTEN CLAMP COLLAR (ITEM 7) UNTIL A TORQUE OF 8-10 ft/lbs IS REQUIRED TO ROTATE THE STRUT TUBE ABOUT THE ROD END.

   g) REPEAT e) AND f) FOR OPPOSITE ROD END.

   h) RECHECK STRUT ASSEMBLY FOR NOMINAL STRUT LENGTH "A" AND CORRECT AS NECESSARY.



25B3626A

REQD	ITEM	PART NO	DESCRIPTION
A/R	8	-------	Acheson Aerodag-G Lubricant
2	7	7L100	Clamp Collar - Low Profile, One Piece, 1" Bore x 1.75 OD .50 Wide Stl Stafford
2	6	-------	Spring Pin - Ø1/8 x 1.0 lg McMaster Carr
1	5	25D5753	3/4" Strut Rod End - LH Fine Thread
1	4	25D5743	3/4" Strut Rod End - RH Fine Thread
1	3	25D5733	3/4" Strut Stub End - LH Thread
1	2	25D5723	3/4" Strut Stub End - RH Thread
1	1	-------	Tube, Round - 1.75" O.D. x .25 thk Wall DOM STL

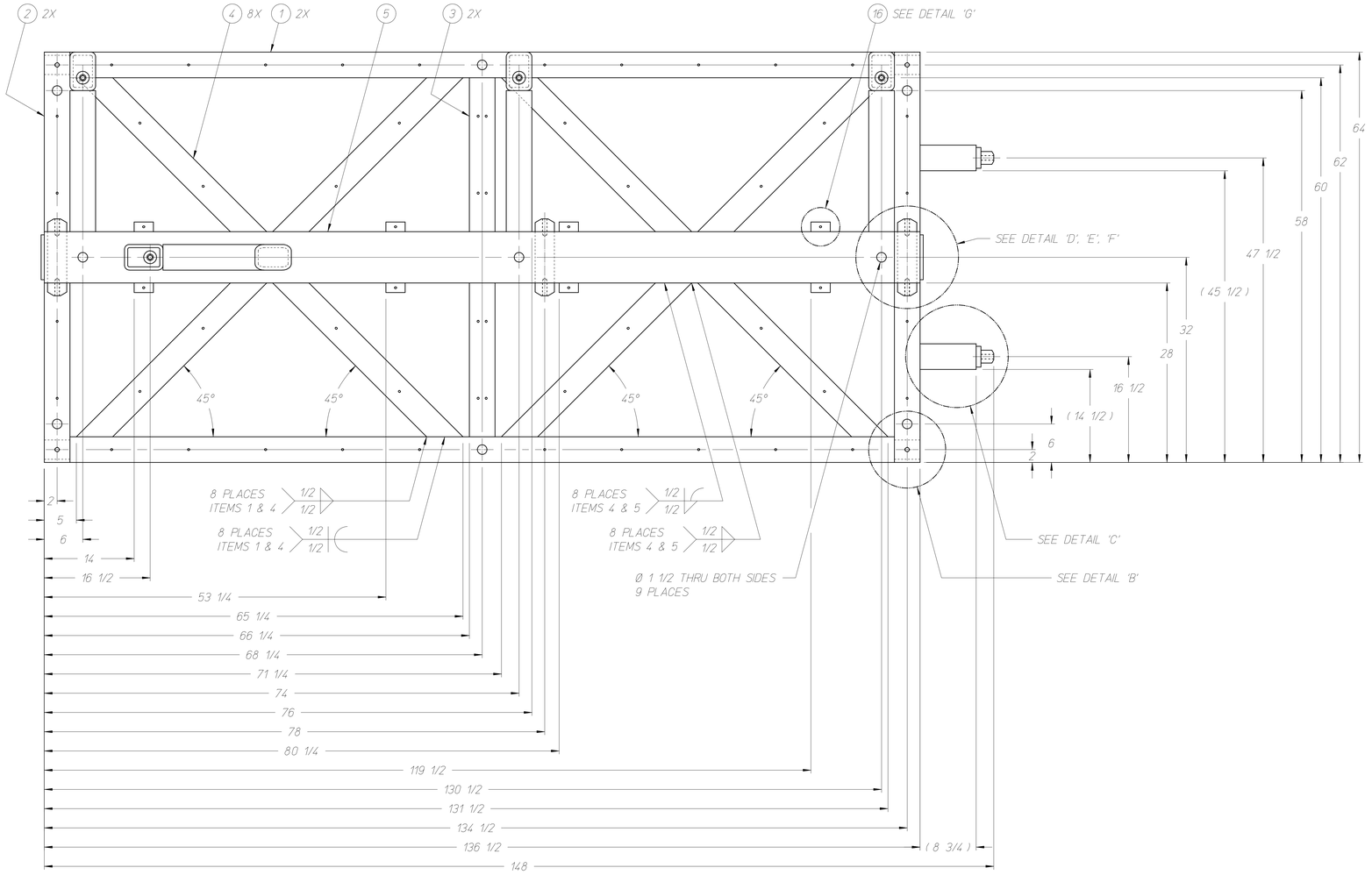
REV	DWG	CHK	ZONE	DATE	CHANGES
A	RLOW			4/24/01	ADDED 25B3626-5,-6 &-7
-	AW			01/16/01	ADDAPTED FROM 25D8986H

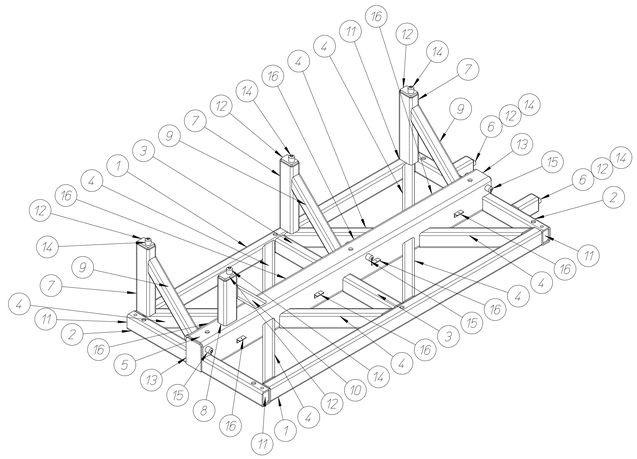
UNLESS OTHERWISE SPECIFIED
TOLERANCES: X ± FRAC ± | .XX ± ANGLES ± | .XXX ± FINISH √
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M - 1994

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH. TAG
DWG BY lim | DATE 06/27/99
CHK BY T LAURITZEN | DATE 06/27/99

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES RFQ
MECHANICAL SUBSYSTEMS
3/4" BASIC TURNBUCKLE STRUT

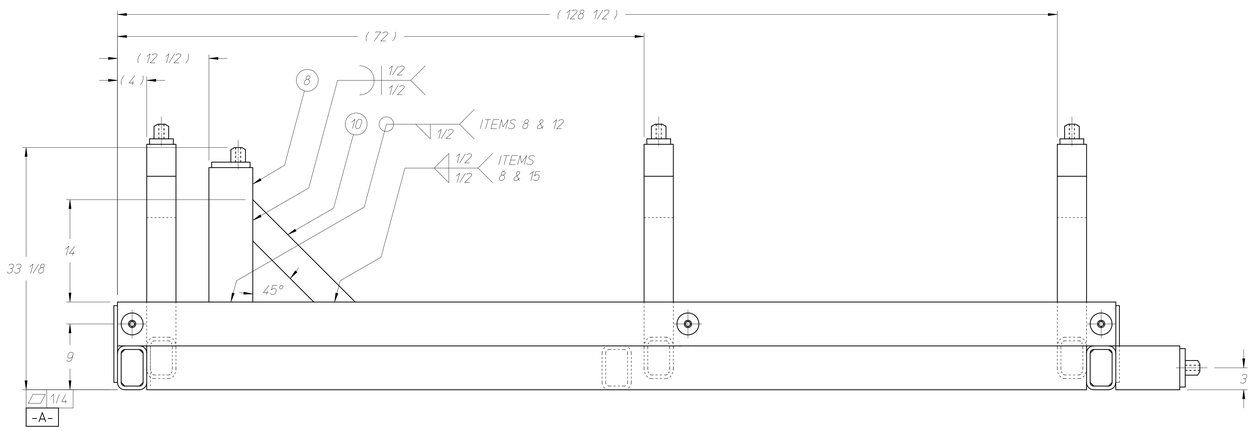
PATENT CLEAR	DWG TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSY		NONE	
MICROFILMED	DESIGN ACCT. NO	CATEGORY CODE	DWG. NO.	SIZE / REV.
		FE3212	25B3626	A

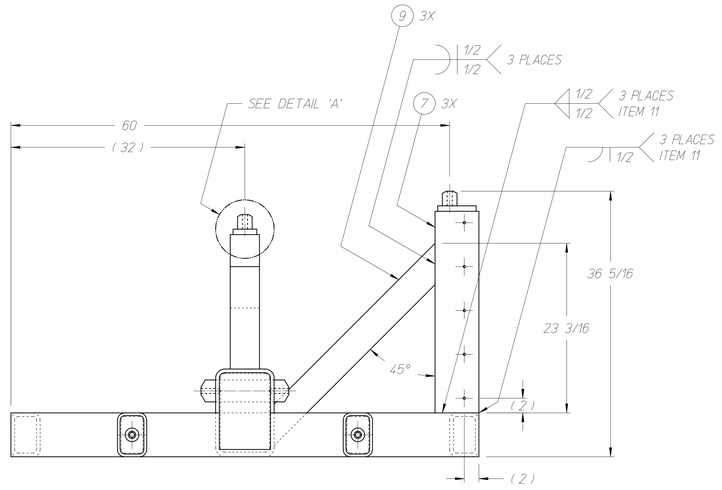




REFERENCE ISOMETRIC VIEW

SCALE: 1/24

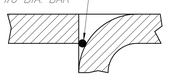




NOTES:

1. ALL WELD SYMBOLS PER ANSI/AWS/A2.4-1986.
2. ALL WELDS PER ANSI/AWS/D1.1-1990.
3. SAWED, SHEARED, FLAME-CUT OR STOCK FINISH ON SURFACES INDICATED WITH ✂.
4. ALL HOLES MAY BE DRILLED OR DRILLED AND TAPPED BEFORE WELDING. EXCEPT AS SHOWN IN DETAIL 'B'
5. USE OF 1/8 DIA. BAR AS A FILLER FOR ALL FLARE BEVEL WELDS IS PERMISSABLE.

1/8 DIA. BAR



6. SURFACE TREATMENT:
   A. ALL SURFACES TO BE FREE OF BURRS, CHIPS, SCALE, SLAG, RUST, DIRT, OIL & GREASE.
   B. ALL SURFACES SHALL BE PAINTED WITH RUSTOLEUM LABOR SAVER HIGH PERFORMANCE POLYURITHANE 9800 DTM URITHANE MASTIC SYSTEM #9879 GLOSS BLACKL, OR EQUIVALENT.
7. APPROXIMATE WEIGHT IS 3,600 POUNDS.

25B3646A
SHEET 1 OF 3

ITEM	REQ	DESCRIPTION
16	8	ANGLE, STEEL, ASTM A-36, 1 1/2 X 1 1/2 X 1/4 (3 LONG)
15	3	BAR, STEEL, ASTM A108, 3.0 DIAMETER (12 LONG)
14	6	BAR, STEEL, ASTM A108, 2.0 DIAMETER (2 LONG)
13	6	PLATE, STEEL, ASTM A-36, 1/2 THICK (7 X 10 1/2)
12	6	PLATE, STEEL, ASTM A-36, 3/4 THICK (4 X 6)
11	4	PLATE, STEEL, ASTM A-36, 3 THICK (3 X 5)
10	1	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 4 X .50 WALL (20 LONG)
9	3	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 4 X .50 WALL (35 3/8 LONG)
8	1	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (18 3/8 LONG)
7	3	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (27 9/16 LONG)
6	2	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (8 3/4 LONG)
5	1	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 8 X 12 X .625 WALL (136 1/2 LONG)
4	8	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (38 LONG)
3	2	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (24 LONG)
2	2	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (64 LONG)
1	2	TUBE, STRUCTURAL STEEL, ASTM A-500 GRADE B, 4 X 6 X .50 WALL (128 1/2 LONG)

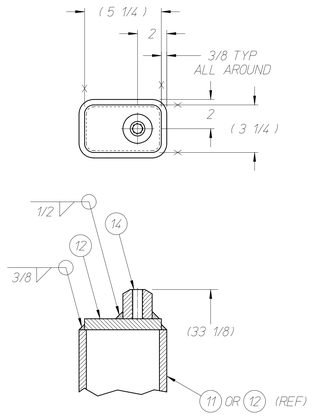
REVISIONS						
A	AW	DG	ALL	12/20/00	ADDED BACKBONE, COMPLETE REDESIGN	
REV	DWN	CHK	ZONE	DATE	CHANGES	

UNLESS OTHERWISE SPECIFIED
.X= ± .060 FRACT= ± 1/8
.XX= ± .020 ANGLES= ± 5°
.XXX= ± .005 FINISH: 125
SAWED, FLAMECUT, SHEARED OR STOCK FINISH ✂
ALL SCREW THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° X H PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT SCREW THREADS.
BREAK EDGES .164 MAX. ON MACHINED WORK.
REMOVE BURRS, LOOSE SCALE AND WELD SPATTER
REFERENCES - ASME Y14.5 AND B46.1 AND B11
ALL DIMENSIONS ARE IN INCHES

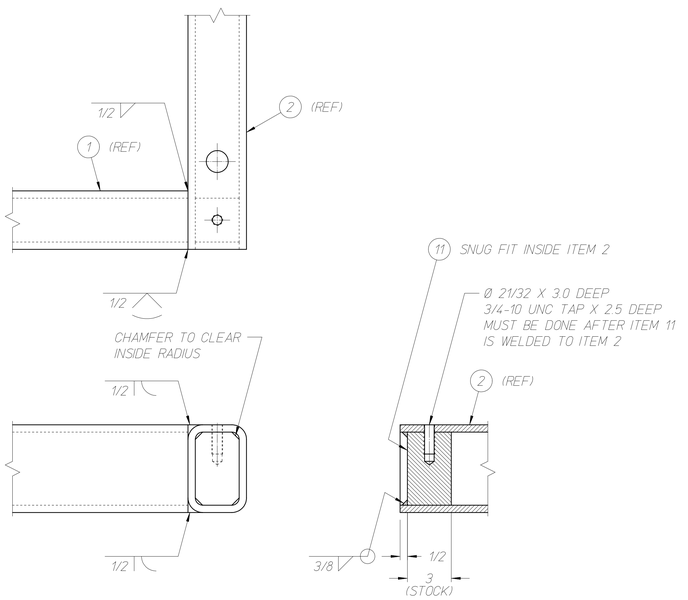
SHOP ORDERS
ACCT NO: | PER NO:
DATE ISSD: | DATE REQ'D: | NO REQ'D:
DELIVER TO:
SURFACE TREATMENT: SEE NOTE 6.
IDENTIFICATION METHOD: ---
DRN BY: A. WANDESFORDE | DATE: 10/27/00
DWK BY: D. DIGENNARO | DATE: 10/27/00

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY
SNS-FES RFQ
MECHANICAL SUBSYSTEMS
RFQ SUPPORT BASE
PATENT CLEAR | DRAWING TYPE: DETAIL | SHRINK ON: 00X00000 | SCALE: 1/8 | DO NOT SCALE PRINTS
DRAWING NUMBER: 25B3646 | REV: A
MICROFILMED | DESIGN ACCOUNT | CATEGORY CODE: FE-32-12
SHEET 1 OF 3

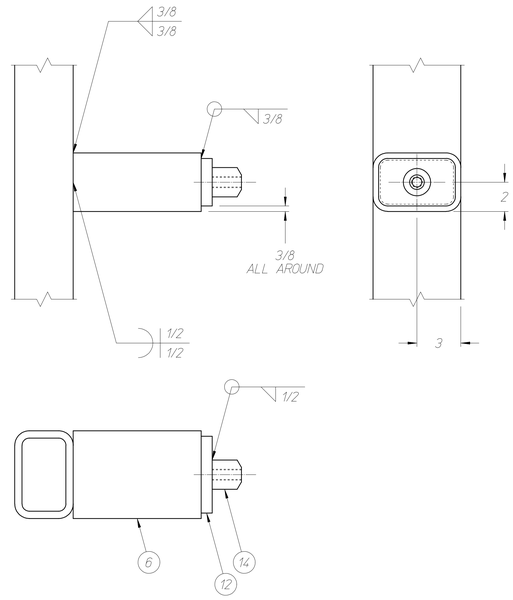
REV. AW 7/95



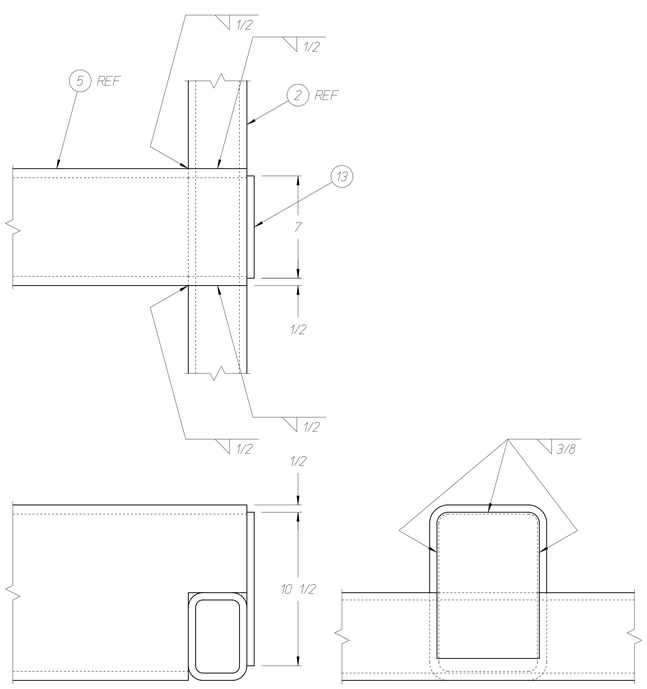
DETAIL A
SCALE: 1/4
TYPICAL 4 PLACES



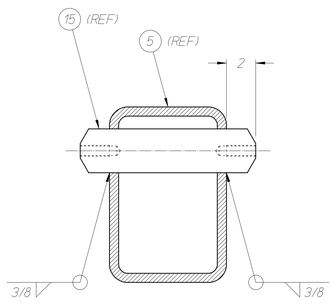
DETAIL B
DETAIL ITEM 11
SCALE: 1/4
SIMPLIFIED FOR CLARITY
TYPICAL 4 PLACES



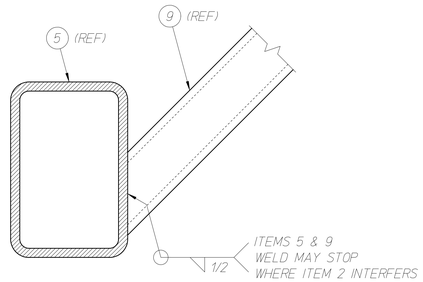
DETAIL C
SCALE: 1/4
SIMPLIFIED FOR CLARITY
TYPICAL 2 PLACES



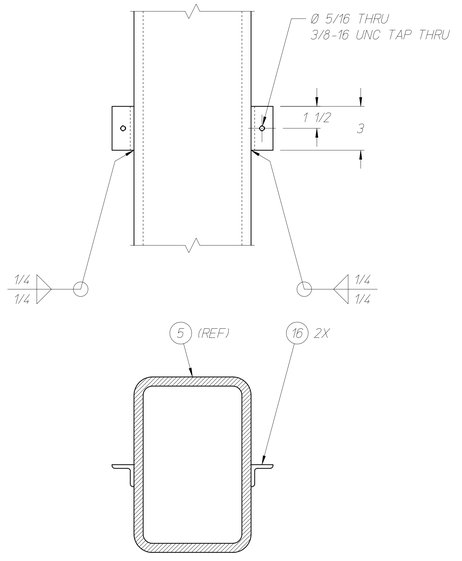
DETAIL D
SCALE: 1/4
SIMPLIFIED FOR CLARITY
TYPICAL 2 PLACES (EACH END OF ITEM 8)



DETAIL E
SCALE: 1/4
SIMPLIFIED FOR CLARITY
TYPICAL 3 PLACES



DETAIL F
SCALE: 1/4
SIMPLIFIED FOR CLARITY
TYPICAL 3 PLACES



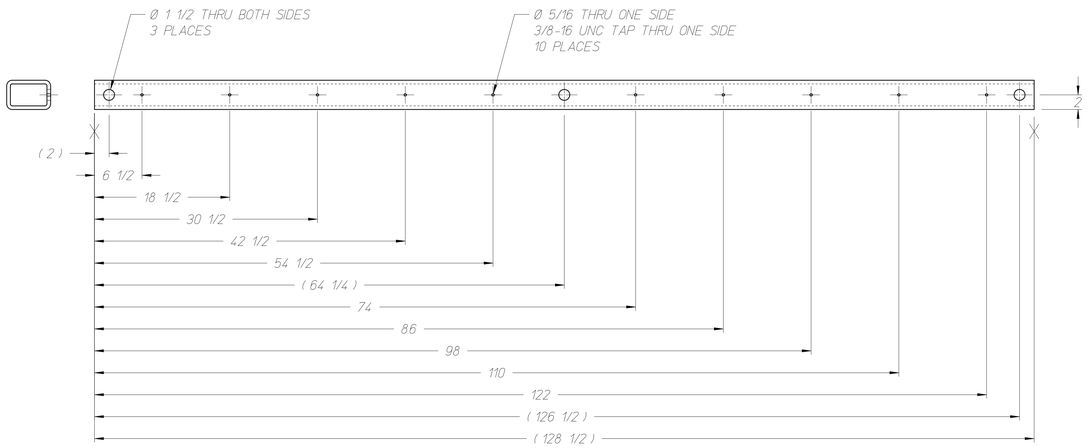
DETAIL G
DETAIL ITEM 16
SCALE: 1/4
SIMPLIFIED FOR CLARITY
TYPICAL 4 PLACES

25B3646A
SHEET 2 OF 3

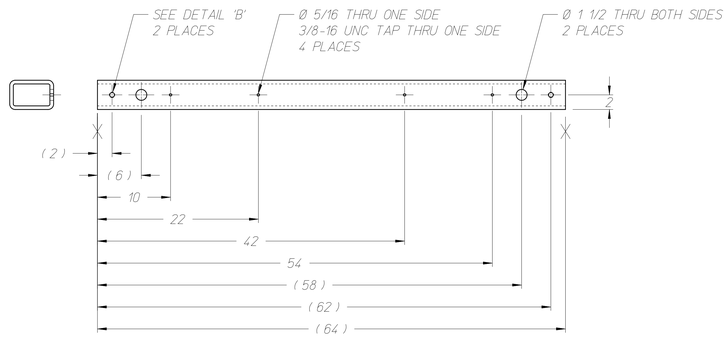
LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA – BERKELEY				
SNS-FES RFQ				
MECHANICAL SUBSYSTEMS				
RFQ SUPPORT BASE				
PATENT CLEAR	DRAWING TYPE: DETAIL	SHOWN ON: 00X0000	SCALE: 1/8	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCOUNT	CATEGORY CODE: FE-32-12	DRAWING NUMBER: 25B3646	REV: A

SHEET 2 OF 3

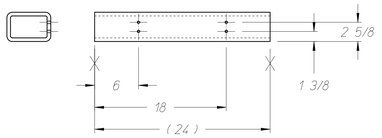
REV AM 7/95



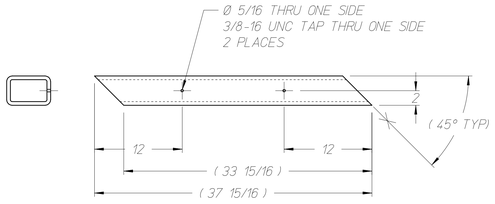
DETAIL ITEM 1
2 EACH



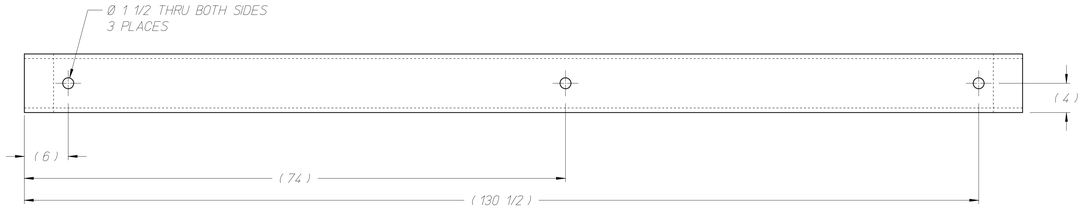
DETAIL ITEM 2
1 EACH

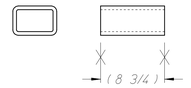


DETAIL ITEM 3
2 EACH



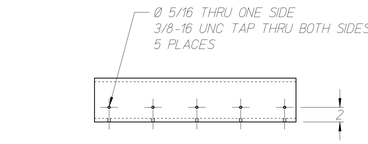
DETAIL ITEM 4
8 EACH

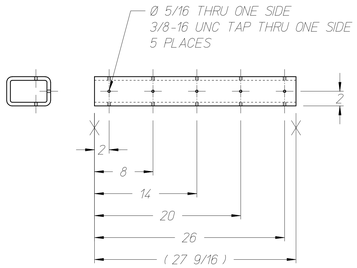




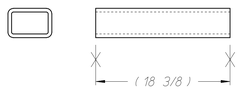
DETAIL ITEM 6
2 EACH

DETAIL ITEM 5
1 EACH

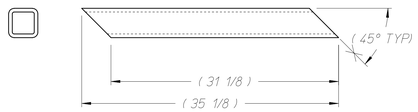




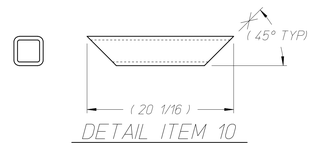
DETAIL ITEM 7
(3 EACH)



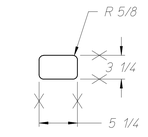
DETAIL ITEM 8
(1 EACH)



DETAIL ITEM 9
(3 EACH)

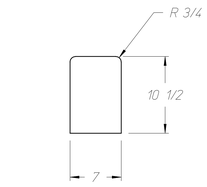


DETAIL ITEM 10
(1 EACH)

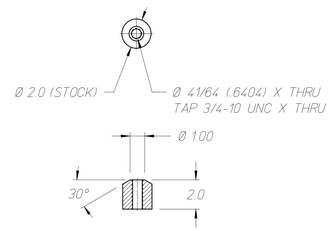


DETAIL ITEM 12
(6 EACH)

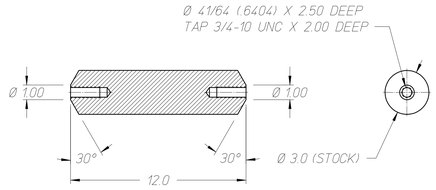
25B3646A
SHEET 3 OF 3



DETAIL ITEM 13
(2 EACH)



DETAIL ITEM 14
SCALE: 1/4

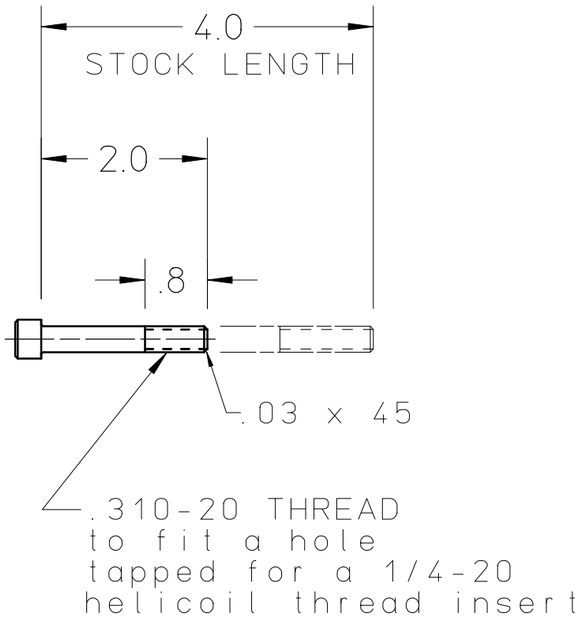


DETAIL ITEM 15
SCALE: 1/4

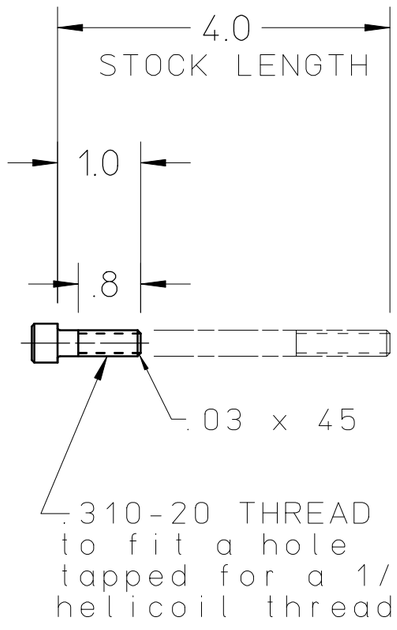
LAWRENCE BERKELEY NATIONAL LABORATORY			
UNIVERSITY OF CALIFORNIA - BERKELEY			
SNS-FES RFQ			
MECHANICAL SUBSYSTEMS			
RFQ SUPPORT BASE			
PATENT CLEAR	DRAWING TYPE: DETAIL	SHOWN ON: 00X0000	SCALE: 1/8 — DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCOUNT	CATEGORY CODE: FE-32-12	DRAWING NUMBER: 25B3646 — REV: A
			SHEET 3 OF 3

REV. AM 7/99

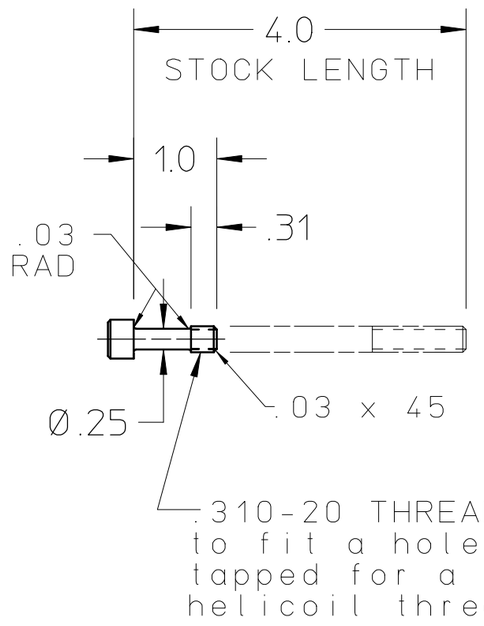
25B3662	REQD	ITEM	PART NUMBER	DESCRIPTION
				5/16-18UNC SOC. HD. CAP x 4 LG., ST. STL.



VERSION 1



VERSION 2



VERSION 3

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT		
IDENTIFIC METHOD		
DWG BY MATT HOFF		DATE 11-22-00
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

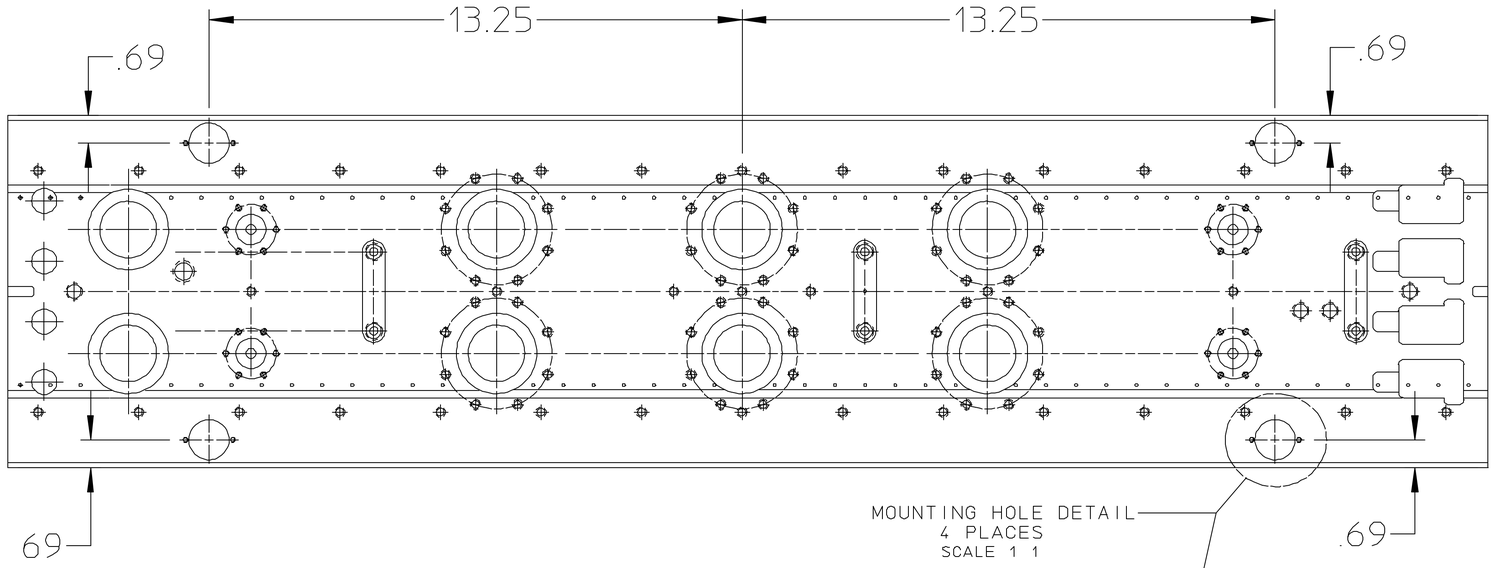
SNS-FES RFQ

MECHANICAL STRUCTURES

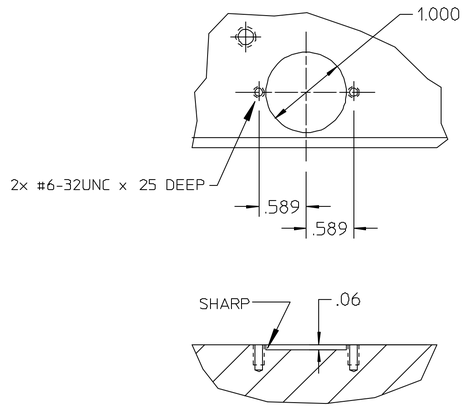
.310-20 SCREWS

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B3662

REQ	ITEM	PART NUMBER	DESCRIPTION
		25B3496	MODULE 2 END WALL MACHINING
		25B3506	MODULE 3 END WALL MACHINING
		25B3716	MODULE 4 END WALL MACHINING



MOUNTING HOLE DETAIL
4 PLACES
SCALE 1 1



25B3674A

MACHINE THESE FEATURES INTO THE TOP MAJOR VANE AFTER END WALL MACHINING

DIMENSIONS ARE IN INCHES.

REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			3-14-02	ADDED 25B3716 DWG NUMBER TO BOM

UNLESS OTHERWISE SPECIFIED
TOLERANCES
X ± 1 FRAC ±1/64
XX ± .01 ANGLES ±1°
XXX ± 001 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO
SERIAL NO.
DATE ISSD
DATE REQD
NO REQD
DELIVER TO
SURFACE TREATMENT
IDENT. METH
DWG BY MATT HOFF
DATE 12-08-00
CHK BY
DATE

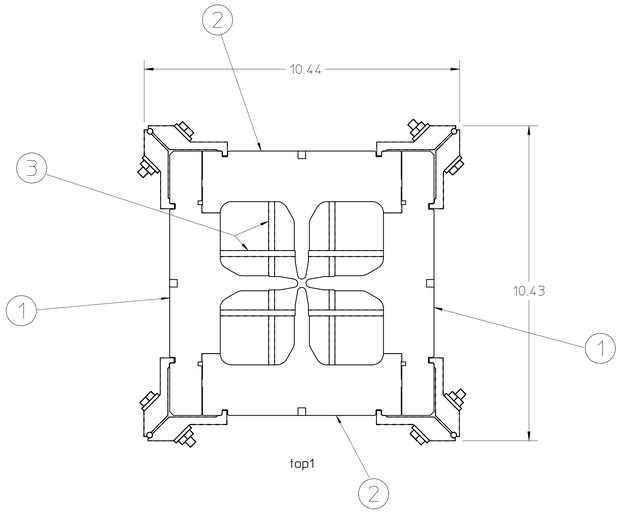
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ

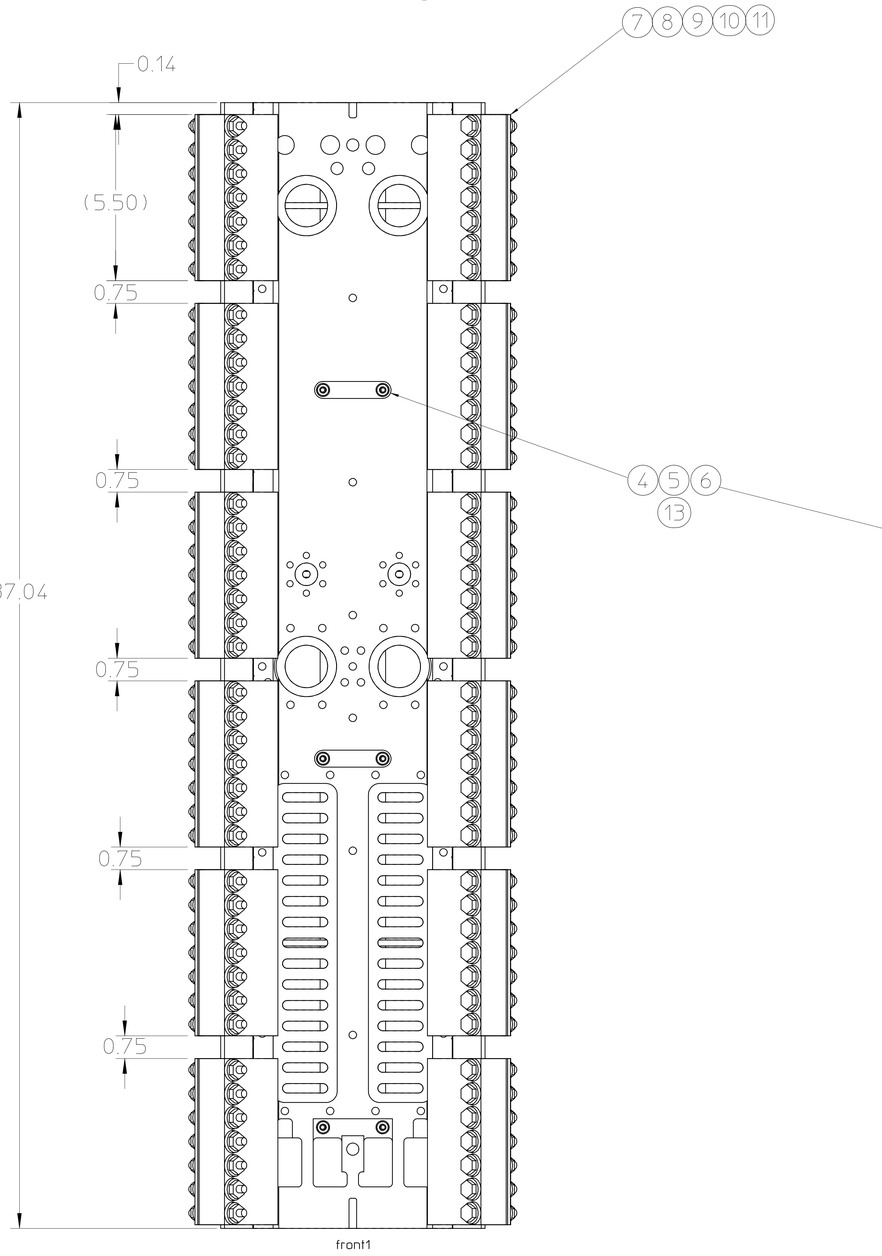
MECHANICAL STRUCTURES

FIDUCIAL POST LOCATION HOLE MACHINING

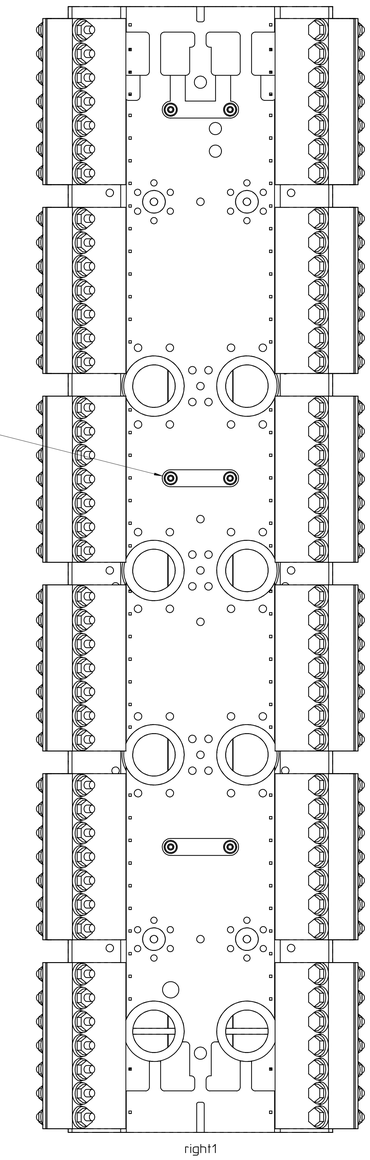
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO.	SIZE / REV.
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	25B3674	A
	8212-DB	FE3211		



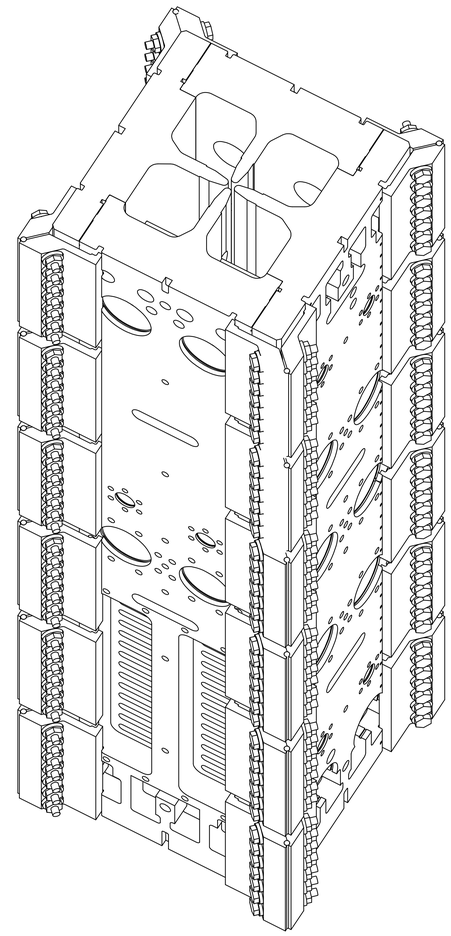
top1



front1



right1



iso1

THIS ASSEMBLY WEIGHS APPROX. 675 LBS.

DIMENSIONS ARE IN INCHES

25B3686

24	13		.025 DIA. CUSIL WIRE FORMED INTO Ø.196 RING
A/R	12		.040 DIA. CUSIL BRAZING WIRE
336	11		BELLEVILLE INCONEL WASHER, .255 x .75 x .04 thk
168	10		1/4-20 STAINLESS NUT
168	9		1/4-20 x 1.75 STAINLESS BOLT
24	8		3/16 x 5.5" STAINLESS ROD STOCK
48	7	25B0803	BRAZING CORNER CLAMP
24	6	25B2332	PI-MODE STABILIZER ROD SWAGE TOOL
24	5	25B2342	SWAGED BRAZING WASHER
24	4	25B0902	PI-MODE STABILIZER ROD FERRULE
12	3	25B0892	SWAGED PI-MODE STABILIZER ROD
2	2	25B3446	MODULE 2 MINOR VANE TRIM
2	1	25B3436	MODULE 2 MAJOR VANE TRIM
REQD	ITEM	PART NO	DESCRIPTION

SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC. ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH – √

THREADS ARE CLASS 2

CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.

BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE

REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

ACCT. NO. | SERIAL NO.

DATE ISSD. | DATE REQD. | NO. REQD.

DELIVER TO

SURFACE TREATMENT –

IDENT. METH. –

DWG BY: Matt Hoff | DATE: 12-13-00

CHK BY: – | DATE: –

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

LAWRENCE BERKELEY NATIONAL LABORATORY

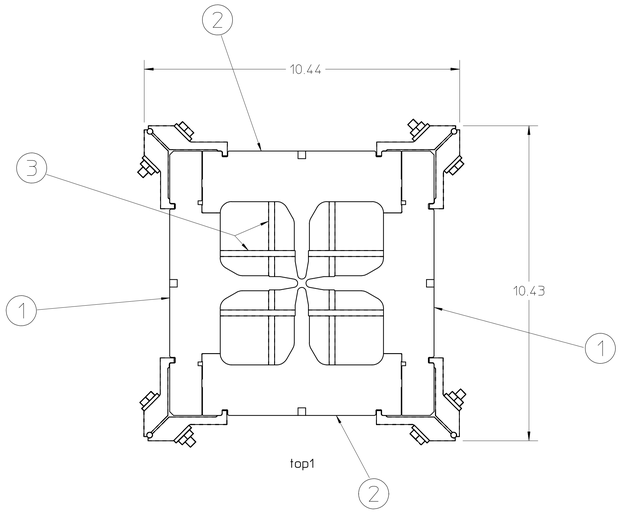
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ

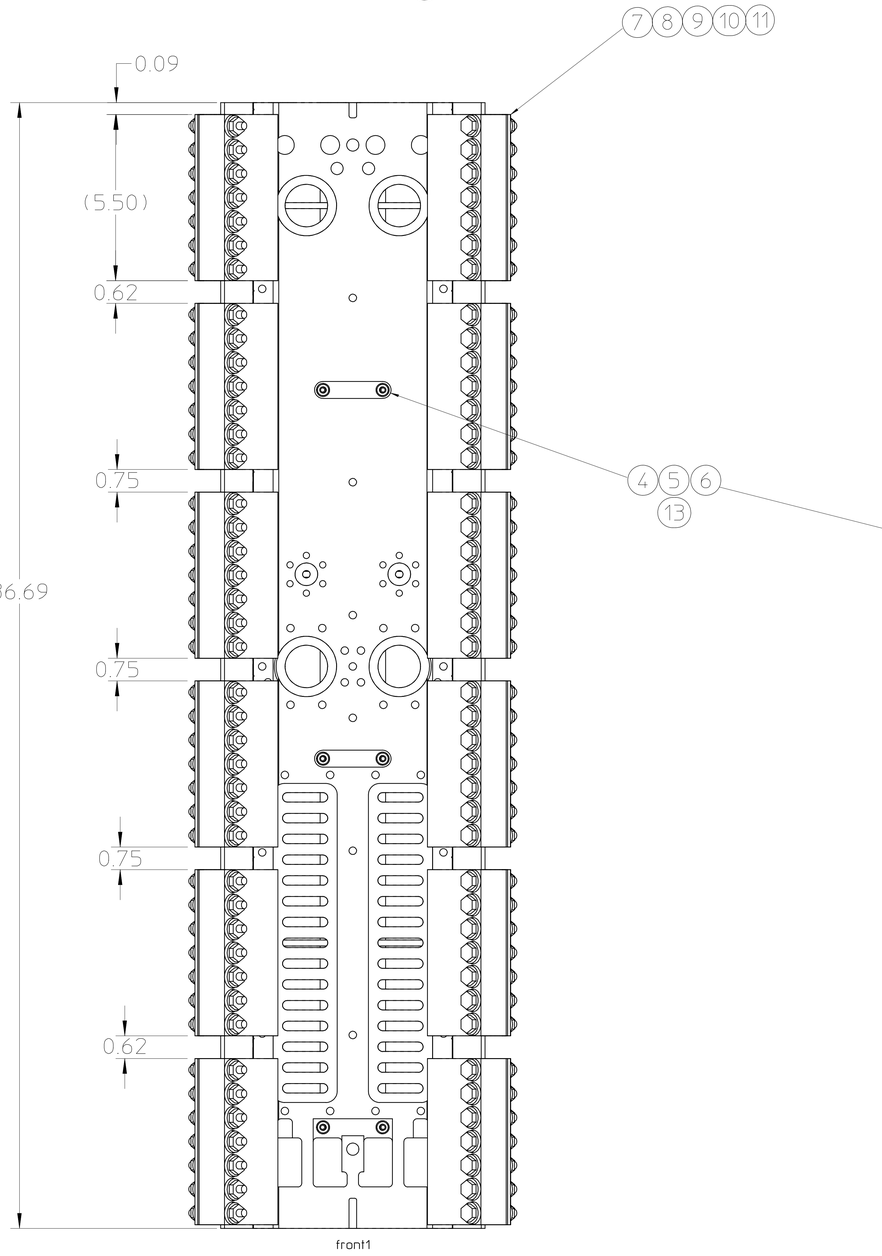
MECHANICAL STRUCTURES

MODULE 2 VERTICAL BRAZE ASSEMBLY

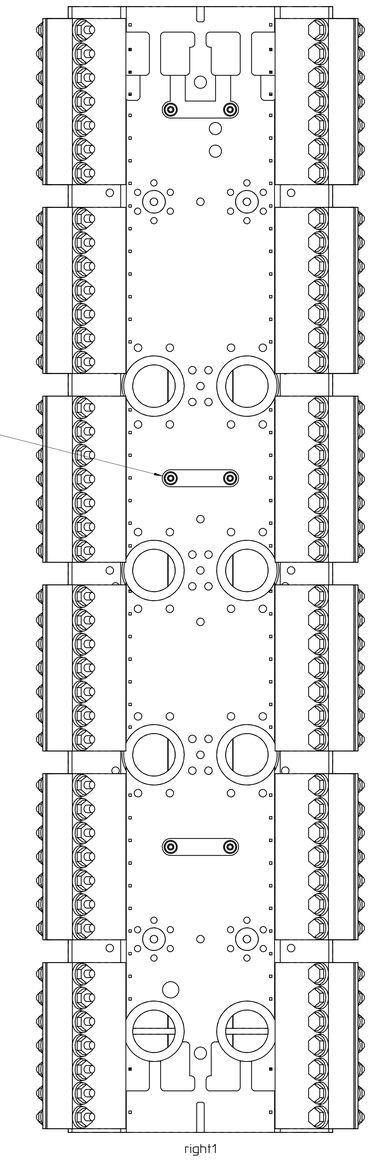
PATENT CLEAR	DWG. TYPE: ASSY	SHOWN ON: –	SCALE: 1:2	DO NOT SCALE PRINTS	
MICROFILMED	DESIGN ACCT. NO.: 8212-DB	CATEGORY CODE: FE3211	DWG. NO.: 25B3686	SIZE	REV



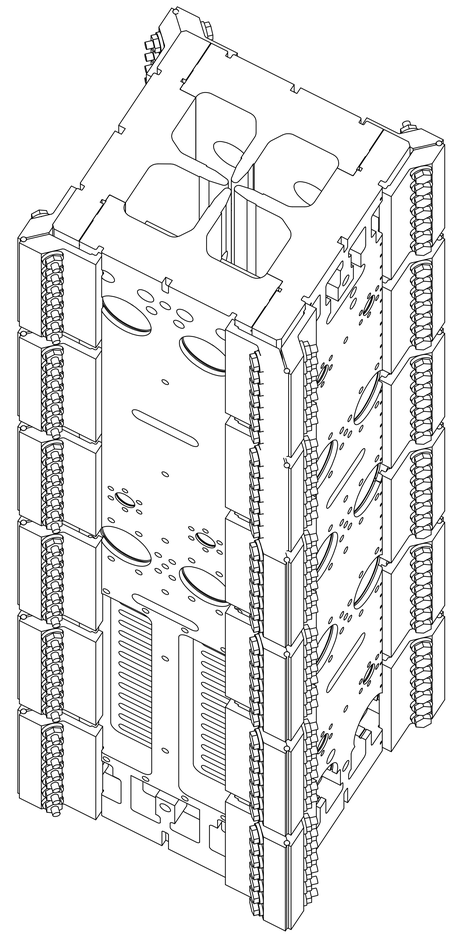
top1



front1



right1



iso1

25B3696

24	13		.025 DIA. CUSIL WIRE FORMED INTO Ø.196 RING
A/R	12		.040 DIA. CUSIL BRAZING WIRE
336	11		BELLEVILLE INCONEL WASHER, .255 x .75 x .04 thk
168	10		1/4-20 STAINLESS NUT
168	9		1/4-20 x 1.75 STAINLESS BOLT
24	8		3/16 x 5.5" STAINLESS ROD STOCK
48	7	25B0803	BRAZING CORNER CLAMP
24	6	25B2332	PI-MODE STABILIZER ROD SWAGE TOOL
24	5	25B2342	SWAGED BRAZING WASHER
24	4	25B0902	PI-MODE STABILIZER ROD FERRULE
12	3	25B0892	SWAGED PI-MODE STABILIZER ROD
2	2	25B3466	MODULE 3 MINOR VANE TRIM
2	1	25B3456	MODULE 3 MAJOR VANE TRIM
REQD	ITEM	PART NO	DESCRIPTION

THIS ASSEMBLY WEIGHS APPROX. 675 LBS.

DIMENSIONS ARE IN INCHES

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC. ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH – √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT –
IDENT. METH. –
DWG BY Matt Hoff | DATE 12-13-00
CHK BY – | DATE –

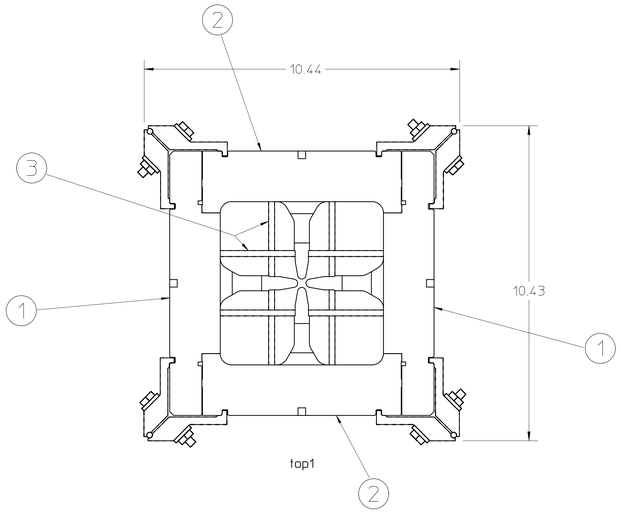
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ

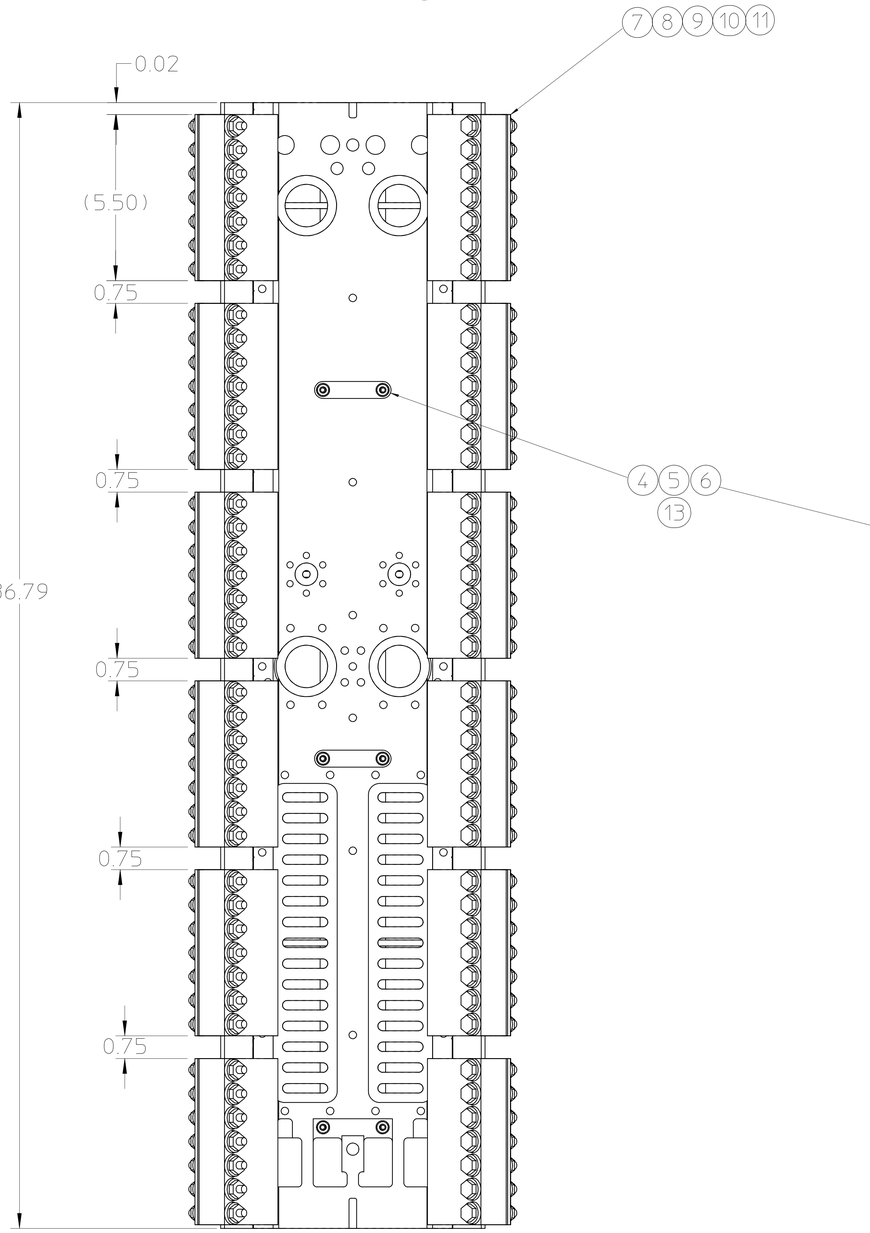
MECHANICAL STRUCTURES

MODULE 3 VERTICAL BRAZE ASSEMBLY

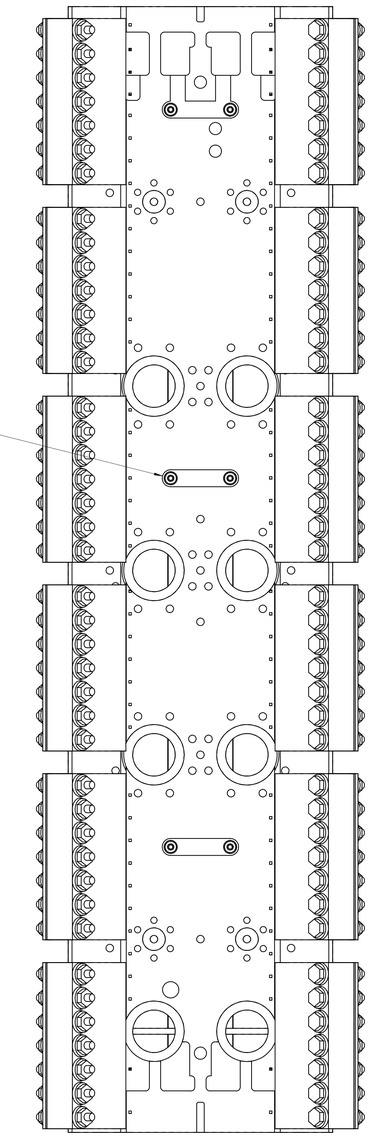
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	ASSY	–	DWG. NO.	SIZE REV
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211	25B3696	



top1



front1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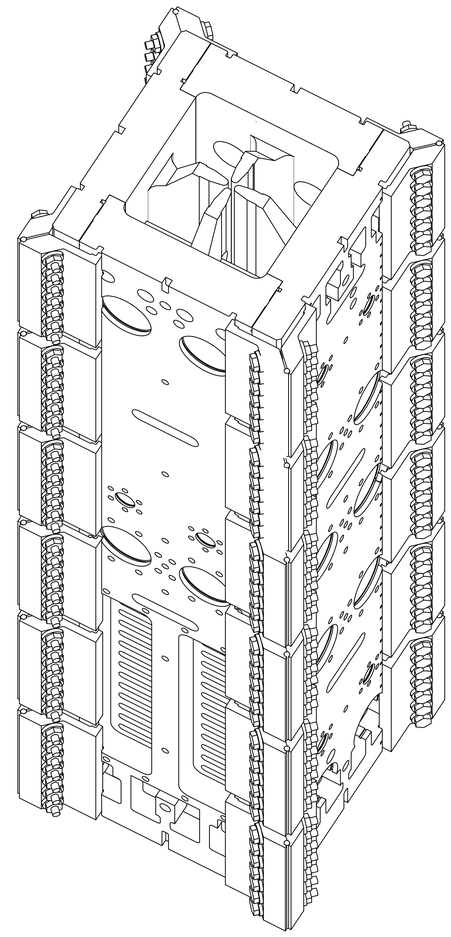

iso1

THIS ASSEMBLY WEIGHS APPROX. 675 LBS.

DIMENSIONS ARE IN INCHES

25B3706

REQD	ITEM	PART NO	DESCRIPTION
24	13		.025 DIA. CUSIL WIRE FORMED INTO Ø.196 RING
A/R	12		.040 DIA. CUSIL BRAZING WIRE
336	11		BELLEVILLE INCONEL WASHER, .255 x .75 x .04 thk
168	10		1/4-20 STAINLESS NUT
168	9		1/4-20 x 1.75 STAINLESS BOLT
24	8		3/16 x 5.5" STAINLESS ROD STOCK
48	7	25B0803	BRAZING CORNER CLAMP
24	6	25B2332	PI-MODE STABILIZER ROD SWAGE TOOL
24	5	25B2342	SWAGED BRAZING WASHER
24	4	25B0902	PI-MODE STABILIZER ROD FERRULE
12	3	25B0892	SWAGED PI-MODE STABILIZER ROD
2	2	25B3486	MODULE 4 MINOR VANE TRIM
2	1	25B3476	MODULE 4 MAJOR VANE TRIM

SHEET 1 OF 1

REV	DWG	CHK	ZONE	DATE	CHANGES
-	-	-	-	-	-

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC. ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH – √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

ACCT. NO. – SERIAL NO.
DATE ISSD. DATE REQD. NO. REQD.
DELIVER TO
SURFACE TREATMENT –
IDENT. METH. –
DWG BY Matt Hoff DATE 12-13-00
CHK BY – DATE –

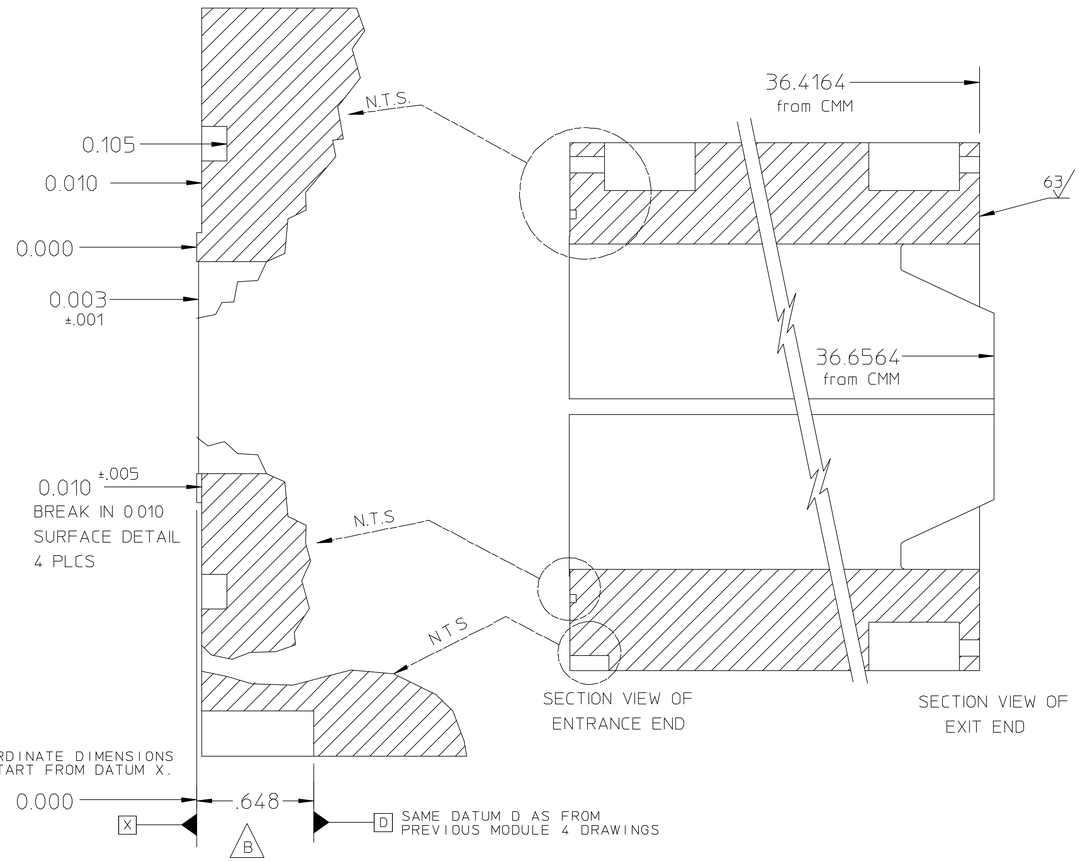
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

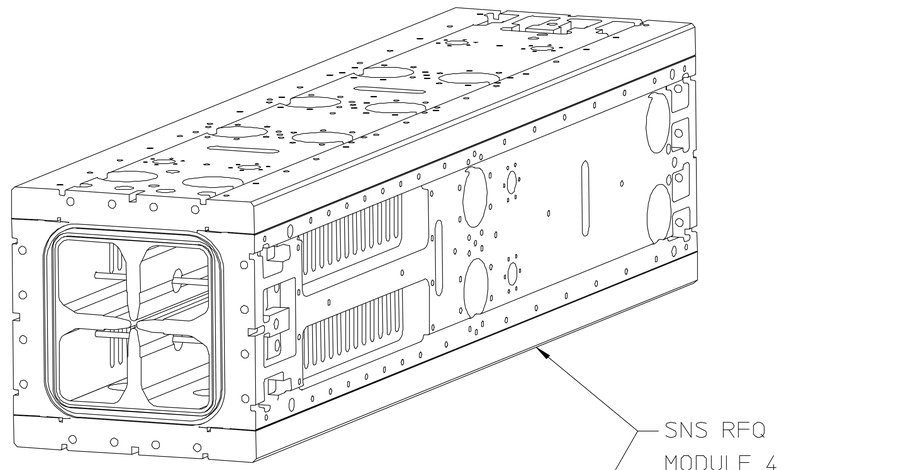
SNS - FES RFQ

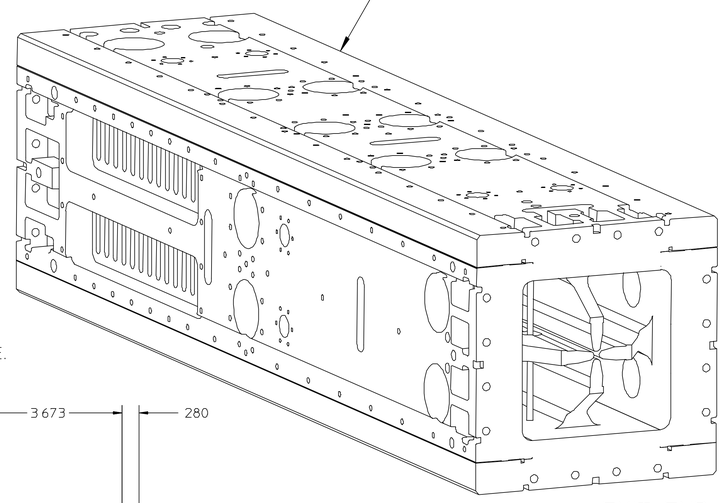
MECHANICAL STRUCTURES

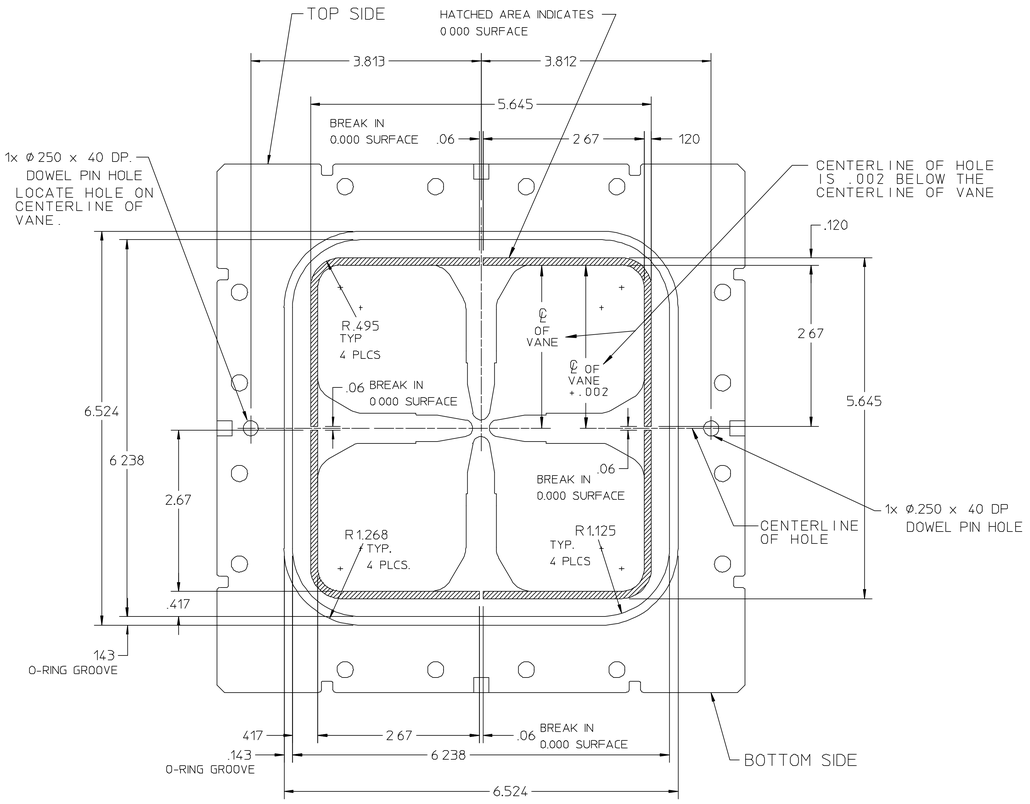
MODULE 4 VERTICAL BRAZE ASSEMBLY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	ASSY	–	DWG. NO.	SIZE REV
MICROFILMED	DESIGN ACCT. NO. 8212-DB	CATEGORY CODE FE3211	25B3706	

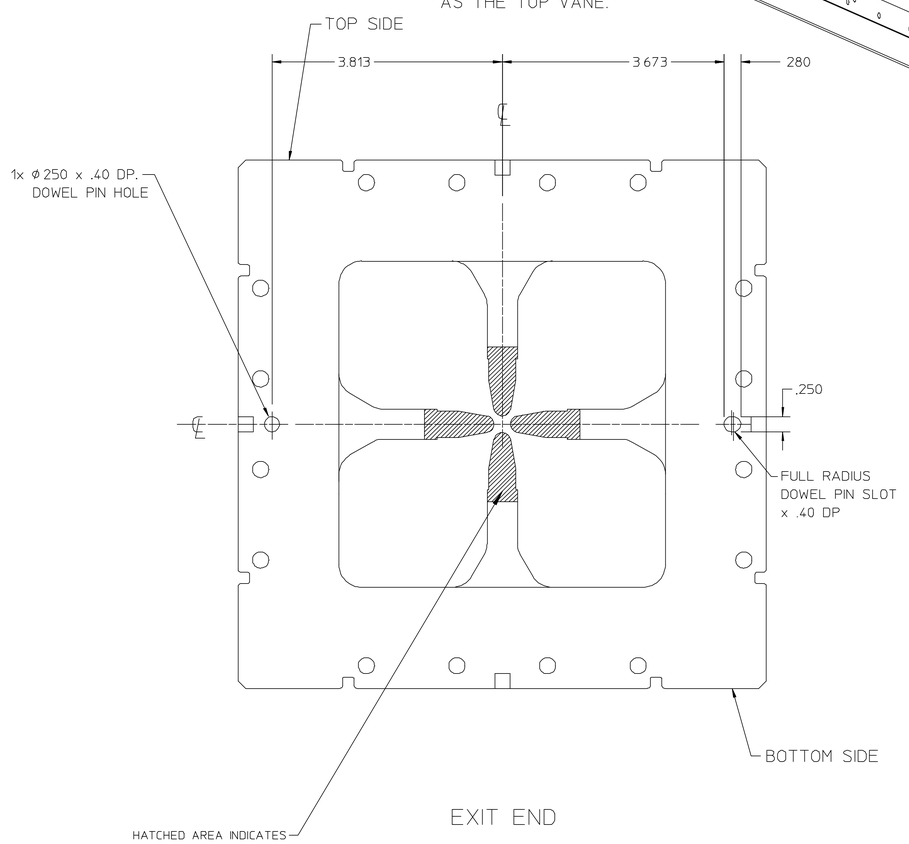








ENTRANCE END



EXIT END

25B3716D

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. PART WEIGHS 626 LBS
3. DETERGENT CLEAN THE ENTIRE PART AFTER MACHINING

REV	DWG	CHK	ZONE	DATE	CHANGES
D	MDH			3-15-02	ADDED BOM INFORMATION
C	MDH			7-27-01	AS BUILT REVISION
B	MDH			7-9-01	Dimension 648 was 470
A	MDH			7-2-01	REVISED ENTRANCE END DIMS

UNLESS OTHERWISE SPECIFIED
TOLERANCES: .x ± 1 FRAC ± 1/64; XX ± 01 ANGLES ± 1°; XXX ± .003 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT NO | SERIAL NO
DATE ISSD | DATE REQD | NO. REQD
DELIVER TO
SURFACE TREATMENT: DETERGENT CLEAN
IDENT METH
DWG BY: MATT HOFF | DATE 12-20-00
CHK. BY | DATE

REQD	ITEM	PART NO	DESCRIPTION
		25B3706	MODULE 4 VERTICAL BRAZE ASSY

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES - RFQ
MECHANICAL STRUCTURES
MODULE 4 END WALL MACHINING

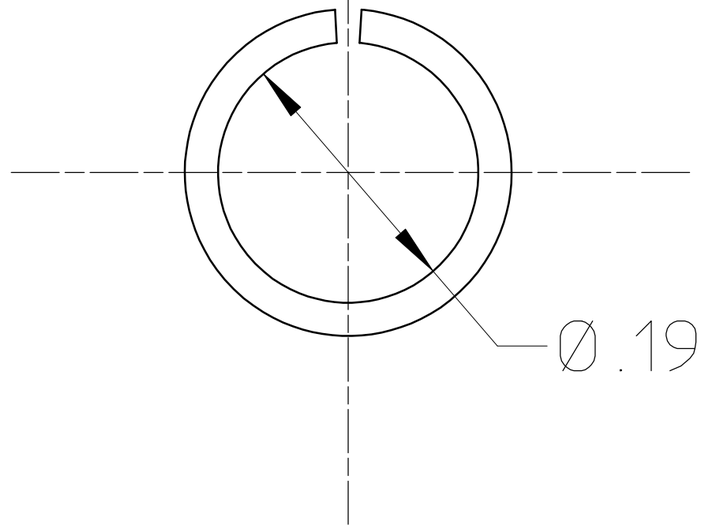
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	DETAIL	00X0000		
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO	SIZE / REV
	8212-DB	FE3211	25B3716	D

25B3722A	REQD	ITEM	PART NUMBER	DESCRIPTION
				.025 CUSIL BRAZING WIRE

WIRE NIPPER
CUT OKAY.

.02 MAX

WHEN WRAPPED AROUND
A .196 DIAMETER ROD.



REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		3/27/01	.025 dia. wire was .020

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO	SER NO		
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 01-03-01	
CHK BY		DATE	

LAWRENCE BERKELEY NATION LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

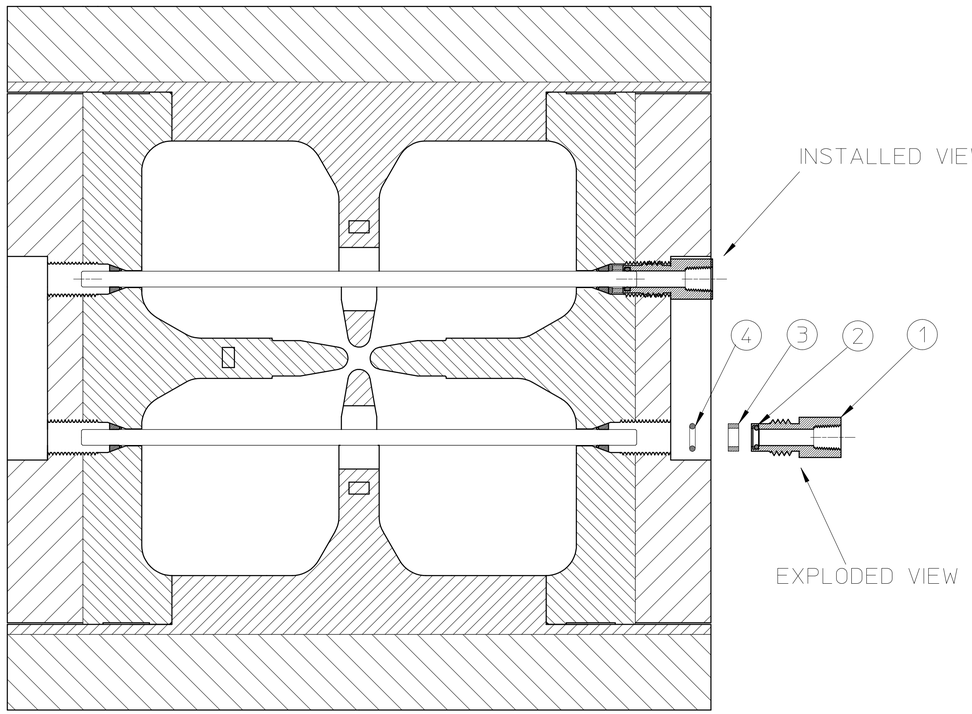
SNS-FES RFQ

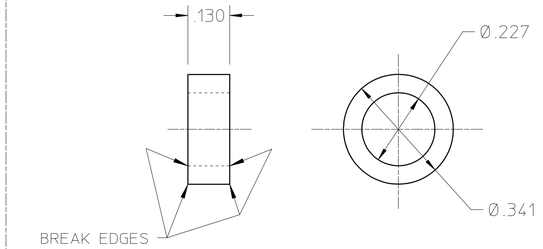
MECHANICAL STRUCTURES

Pi-MODE STABILIZER ROD BRAZE WIRE RING

PAT CLEAR	DWG TYPE DETAIL	SHOWN ON 25Bxxxx	SCALE: 8:1 DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO 8212-DB	CATEGORY CODE FE3211	DWG NO 25B3722A REV

REQ	ITEM	PART NUMBER	DESCRIPTION
	1	25B2994	Cooling Connector - style D
	2		O-Ring size -901, buna-n
	3	SEE DETAIL	Spacer - stainless steel
	4		O-Ring size -009, buna-n





ITEM (3) DETAIL

scale 4:1

25B3744

This drawing is to be used as a guide to repair a vacuum leak around a Pi-Mode Stabilizer Rod. It documents what has been used successfully at LBNL.

Future leaks may be fixed with this method or may require some modification of this recipe. Variations could include varying the length of item 3 and changing the size of item 4.

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± .1 | FRAC. ±1/64 | .XX ± .01 | ANGLES ±1° | .XXX ± .001 | FINISH 125

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT: -
IDENT. METH.: -
DWG. BY: Matt Hoff | DATE: 12-13-01
CHK. BY: - | DATE: -

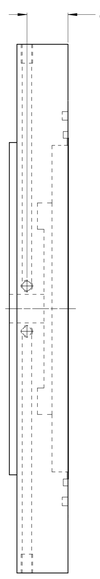
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

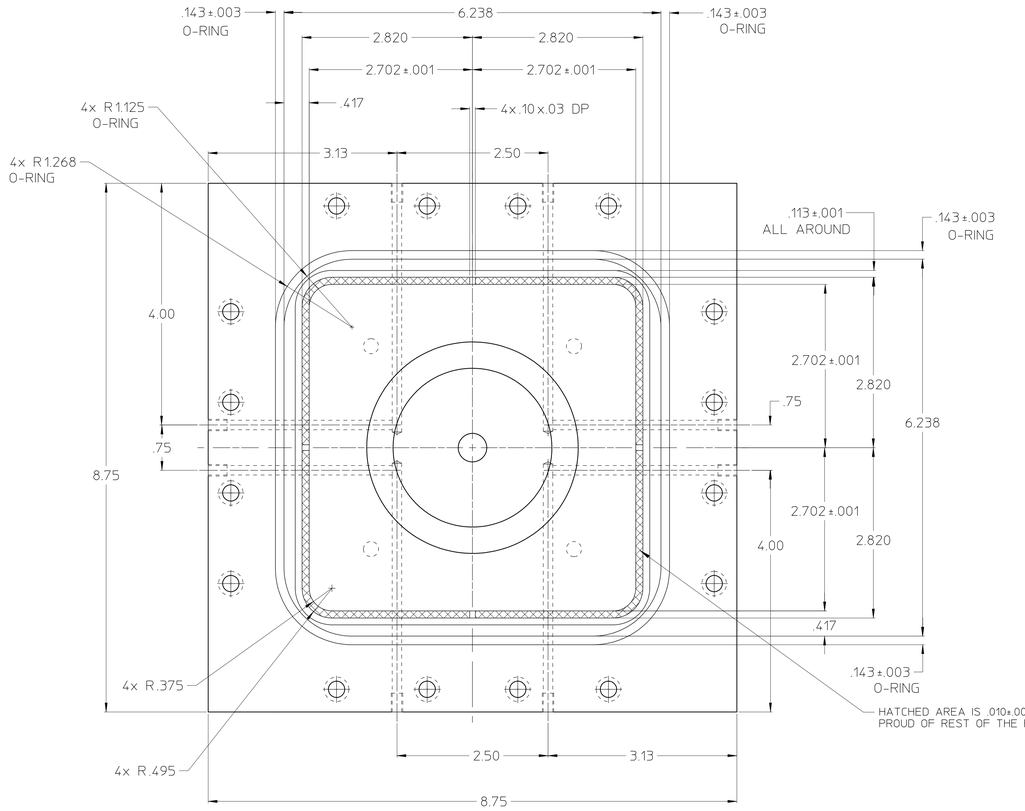
SNS FES RFQ

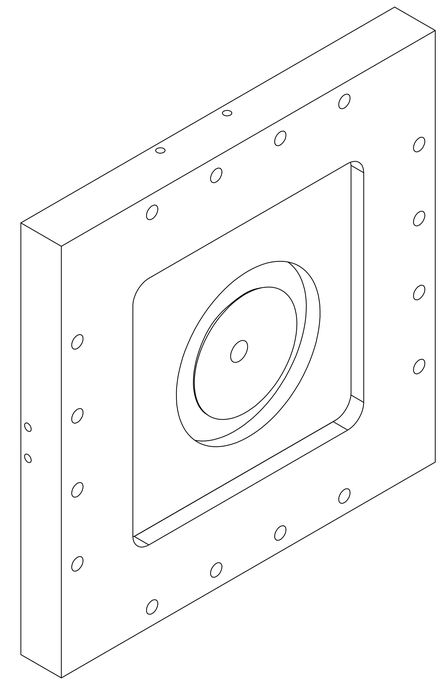
MECHANICAL STRUCTURES

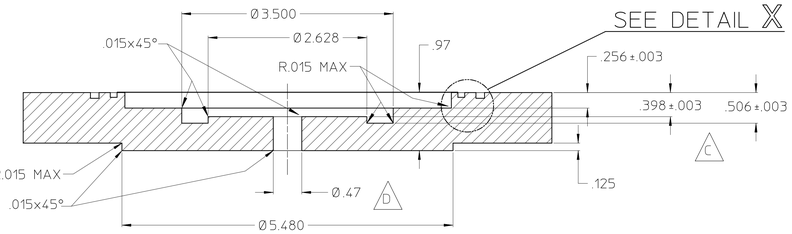
Pi-MODE ROD VACUUM LEAK REPAIR

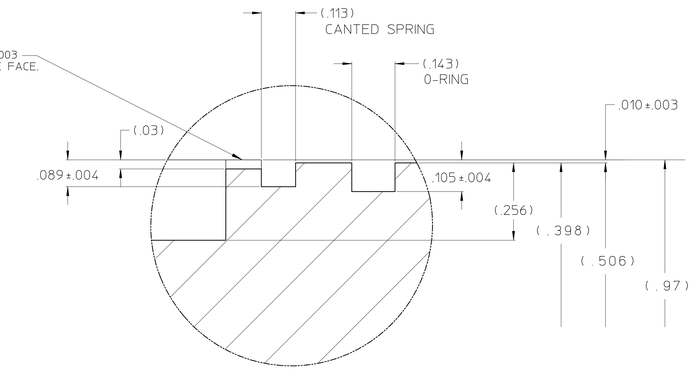
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-DB	FE3211	25B3744	-



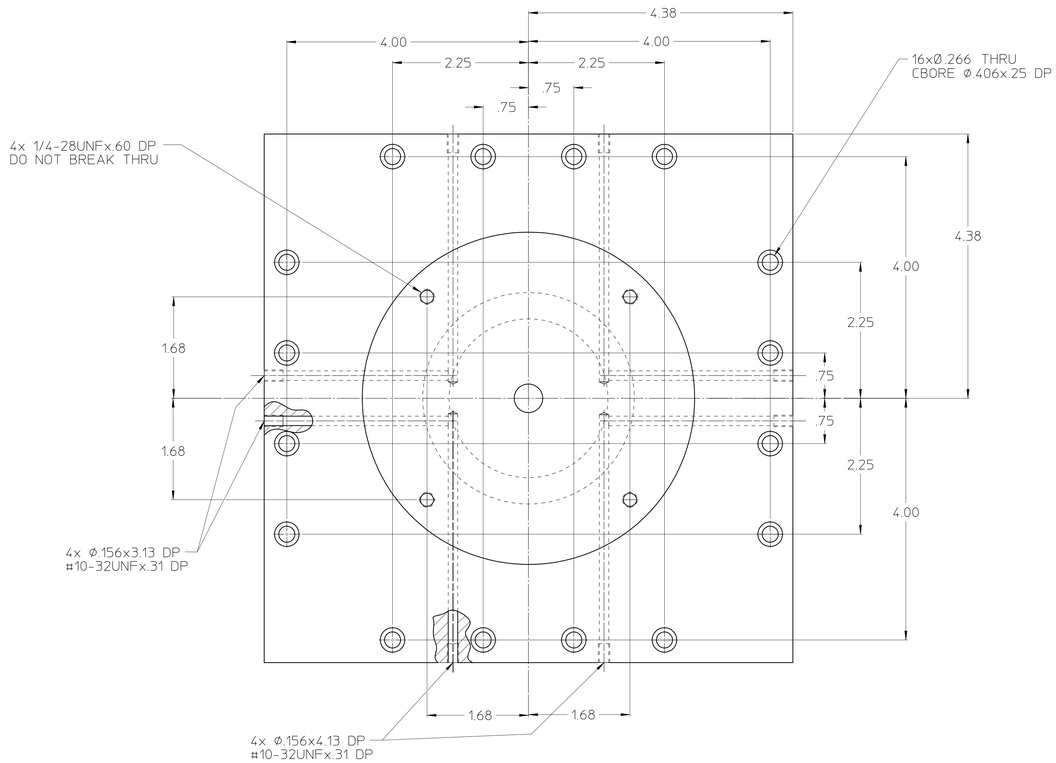








DETAIL X
SCALE, 5x



25B4894D

REV	DWG	CHK	ZONE	DATE	CHANGES
D	MDH		B6	11-01-01	.47 dia. was .31 dia.
C	MDH			10-26-01	ADDED 2.628 DIA 3.500 DIA .398 and .506 dims
B2	MDH			9-06-01	ADDED 3.50 DIA. AND 2 MORE COOLING CHANNELS
B1	MDH			7-19-01	INCREASED THICKNESS TO MATCH MODULE RECESS

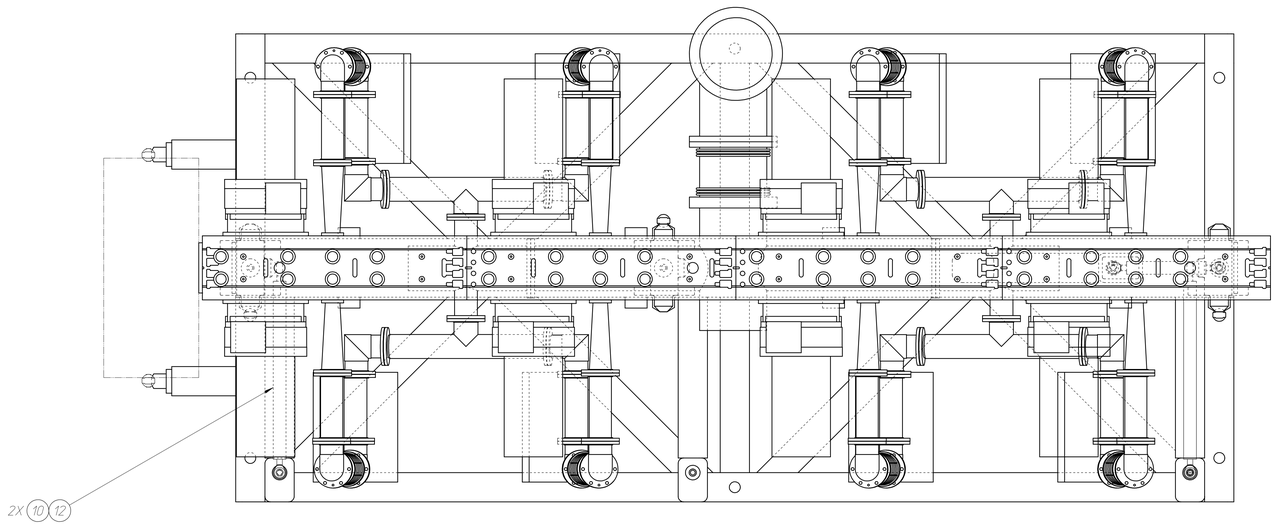
UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC. ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .005 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

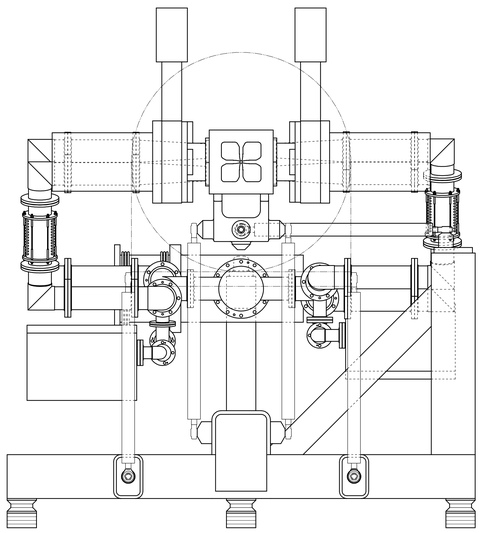
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG BY RAY LOW DATE 07-02-01
CHK BY R.DIGENNARO DATE 07-02-01

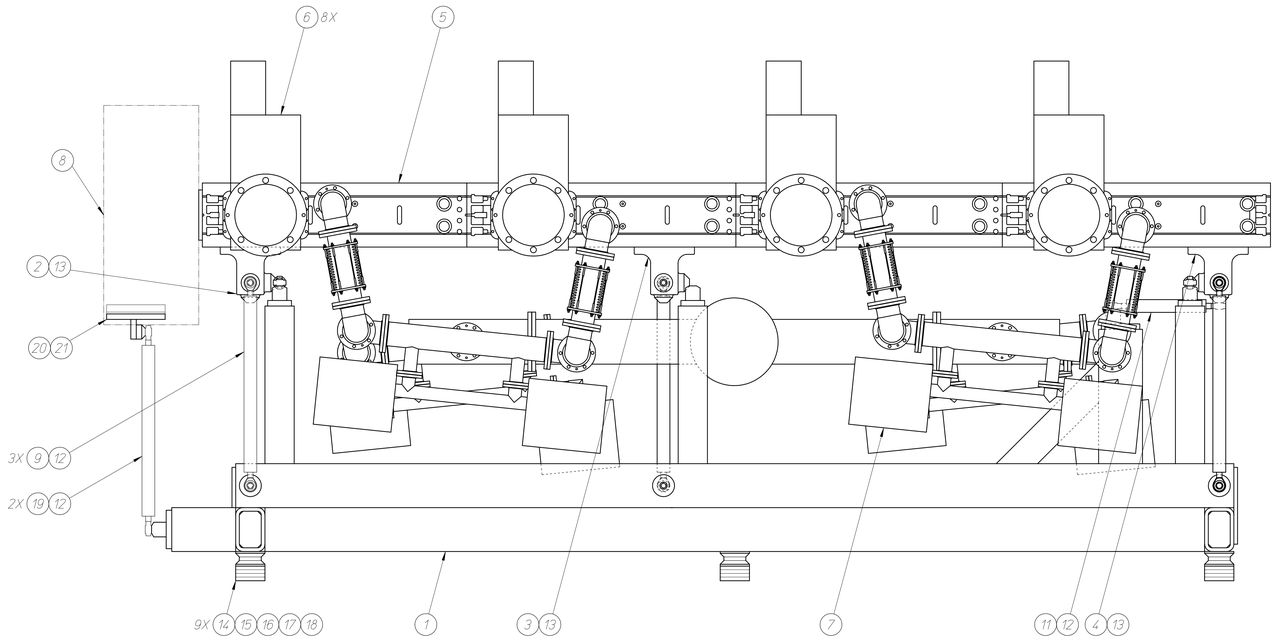
REQD	ITEM	PART NO.	DESCRIPTION
			PLATE COPPER OFHC

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS-FES MEBT
BEAM TRANSPORT SYSTEMS
RFQ END PLATE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL		FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO. 25B4896	SIZE D







25B6046A
SHEET 1 OF 1

ITEM	REQ.	PART NUMBER	DESCRIPTION
21	A/R	25B8226	LEBT STRUT - BRACKET SHIM
20	2	25B8216	LEBT STRUT BRACKET
19	2	25B8206	LEBT STRUT ASSY
18	9	-	NUT, STEEL, 3/4-10 UNC
17	9	-	WASHER, 3/4
16	9	-	STUD, 3/4-10 UNC X LENGTH AS REQUIRED
15	72	-	1/4 SPACER SHIM
14	9	EN62754	GEAR TECHNIC DIAL SHIM
13	24	-	BOLT, STEEL, SOCKET HEAD, 1/4-20 UNC X 1.0 LONG
12	16	-	BOLT, STEEL, SOCKET HEAD, 3/4-10 UNC X 2.0 LONG
11	1	25B3626-3	STRUT, Z, 1
10	2	25B3626-2	STRUT, HORIZONTAL
9	3	25B3626-1	STRUT, VERTICAL
8	1	-	SOURCE/LEBT ASSEMBLY
7	1	25B7436	RF DISTRIBUTION ASSY
6	1	-	VACUUM PUMP AND VALVE ASSEMBLY
5	1	25B6206	RFQ SUB-ASSEMBLY
4	1	25B3614-3	RFQ STRUT MOUNT
3	1	25B3614-2	RFQ STRUT MOUNT
2	1	25B3614-1	RFQ STRUT MOUNT
1	1	25B3646	RFQ SUPPORT BASE

This drawing was previously 25B3656 RFQ SUPPORT ASSEMBLY drawn by Alan Wandesforde on 3-05-01.

REV	DWN	CHK	ZONE	DATE	CHANGES
A	????	???	A-1	00/00/00	ITEM 7 WAS RF WAVE GUIDE ASSEMBLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES: X± .060, XX± .020, XXX± .005; FRACT± 1/64; ANGLES± 5°; FINISH 125
SAWED, FLAMECUT, SHEARED OR STOCK FINISH
ALL SCREW THREADS ARE CLASS 2B
CHAMFER ENDS OF ALL SCREW THREADS 30° X H PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT SCREW THREADS.
BREAK EDGES 1/64 MAX. ON MACHINED WORK
REMOVE BURRS, LOOSE SCALE AND WELD SPATTER
REFERENCES - ASME Y14.5, ANSI B46.1 AND B1.1 ANSI/AWS A2.4, ANSI/AWS D1.1
ALL DIMENSIONS ARE IN INCHES

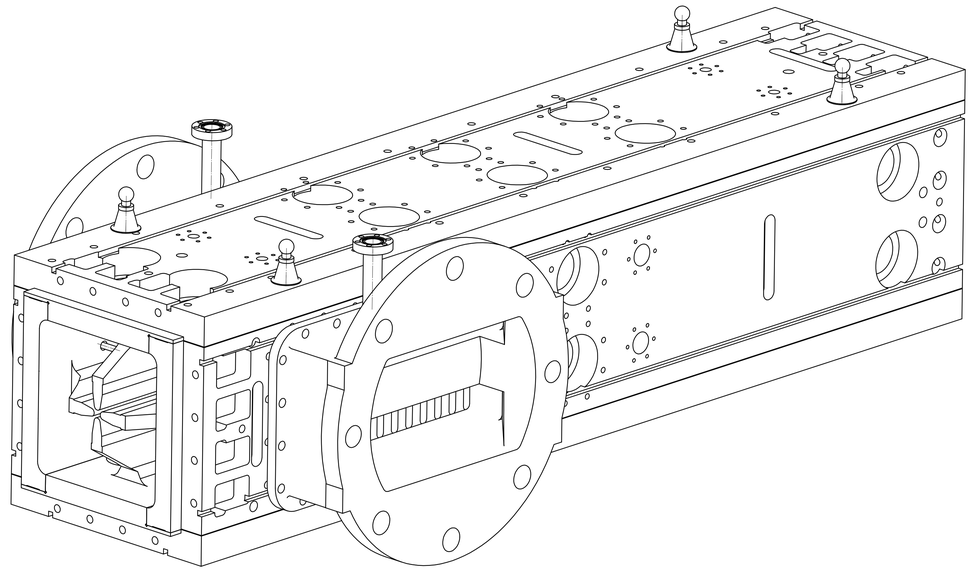
SHOP ORDERS
ADDT'L NO.:
JOB NO.:
DATE QUOTE:
DATE REQ'D:
NO. REQ'D:
DELIVER
SURFACE TREATMENT: ---
IDENTIFICATION METHOD: ---
DRN BY: Matt Hoff — DATE: 12/21/01
CHK BY: - — DATE: 00/00/00

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA – BERKELEY
SNS-FES RFQ
MECHANICAL SUBSYSTEMS
RFQ ASSEMBLY

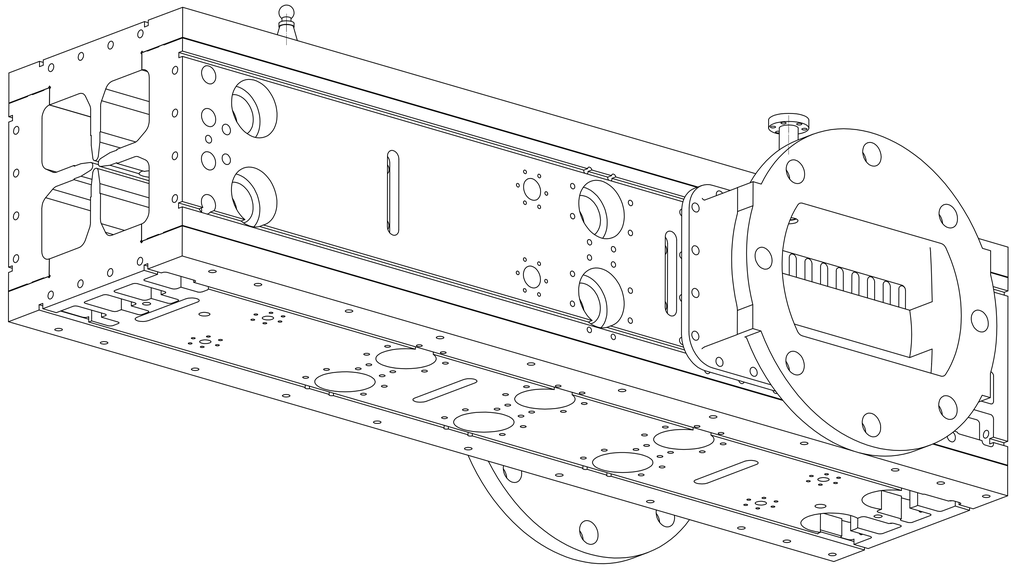
PATENT CLEAR	DRAWING TYPE	SHOWN ON	SCALE: 1:8	DO NOT SCALE PRINTS
	DETAIL	00X0000		
MICROFILMED	DESIGN ACCOUNT	CATEGORY CODE	DRAWING NUMBER	REV.
	8212DB	FE-32-12	25B6046	A

REV. AM 7/95

SHEET 1 OF 1



GEN1



GEN2

25B6166

PRELIMINARY

REQD	ITEM	PART NO.	DESCRIPTION
–	–	–	–

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC. ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH – √

THREADS ARE CLASS 2.
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

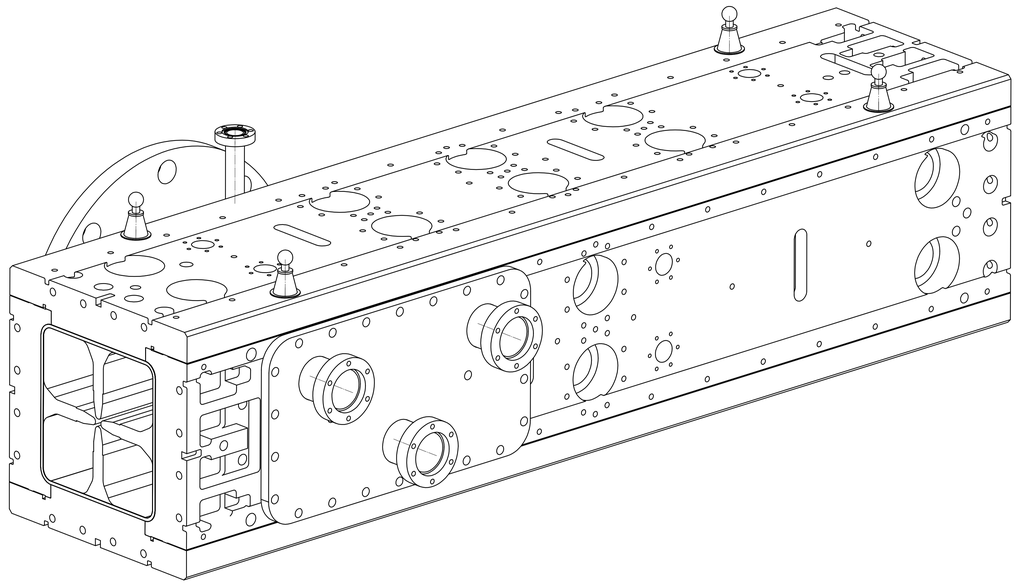
ACCT NO. –
SERIAL NO. –
DATE ISSD. –
DATE REQD. –
NO. REQD. –
DELIVER TO –
SURFACE TREATMENT –
IDENT METH. –
DWG BY Matt Hoff — DATE 2-21-02
CHK BY – — DATE –

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

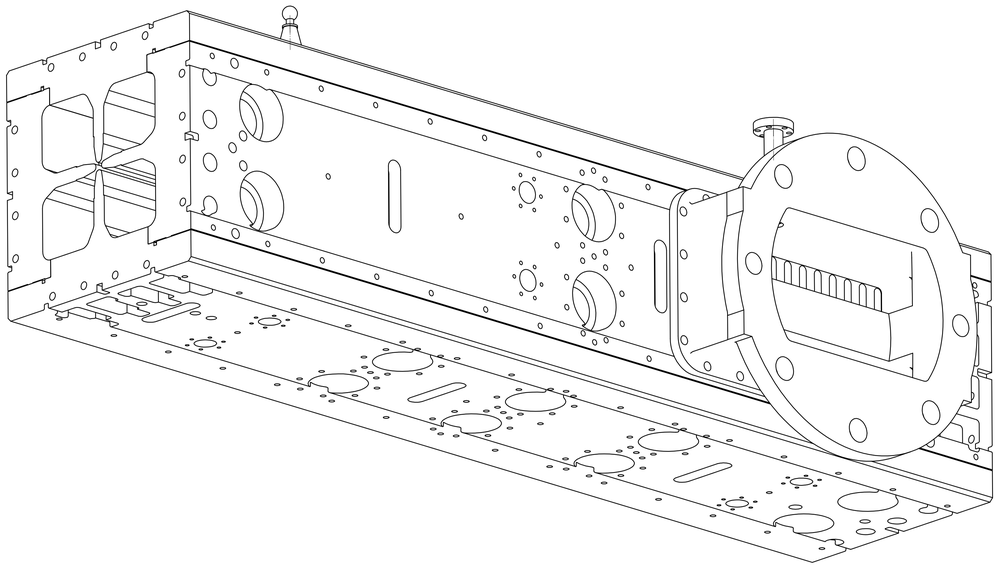
SNS FES RFQ
MECHANICAL STRUCTURES
ALPHA MODULE ASSEMBLY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	ASSY	–		SIZE REV
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	
	8212DB	FE3211	25B6166	

SHEET 1 OF 1



GEN1



GEN2

25B6176

PRELIMINARY

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC ± – ; .XX ± – ANGLES ± – ; .XXX ± – FINISH – √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

ACCT. NO. – SERIAL NO. –
DATE ISSD – DATE REQD. – NO. REQD. –
DELIVER TO –
SURFACE TREATMENT –
IDENT. METH. –
DWG BY Matt Hoff DATE 2-21-02
CHK BY – DATE –

REQD	ITEM	PART NO.	DESCRIPTION
–	–	–	–

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

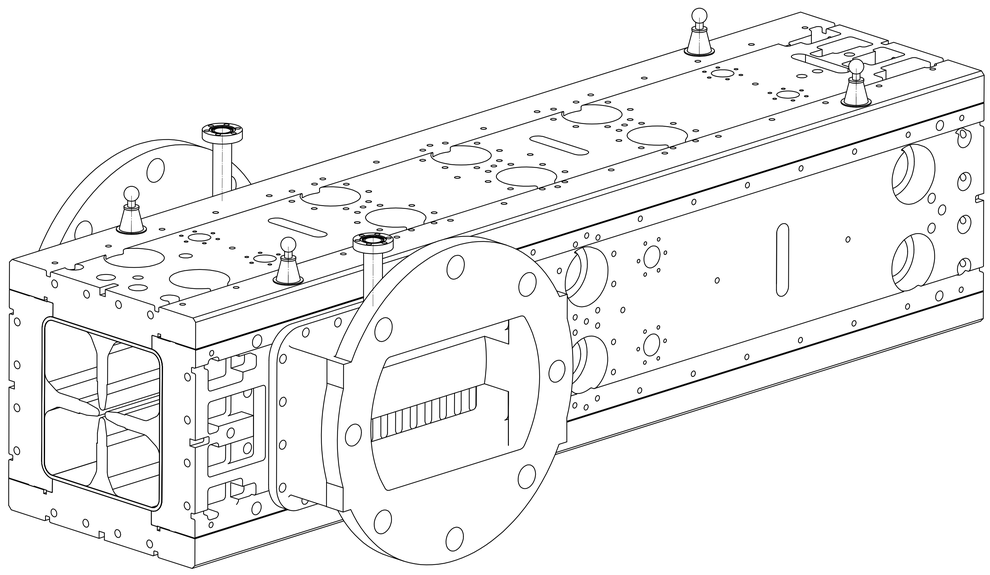
SNS FES RFQ

MECHANICAL STRUCTURES

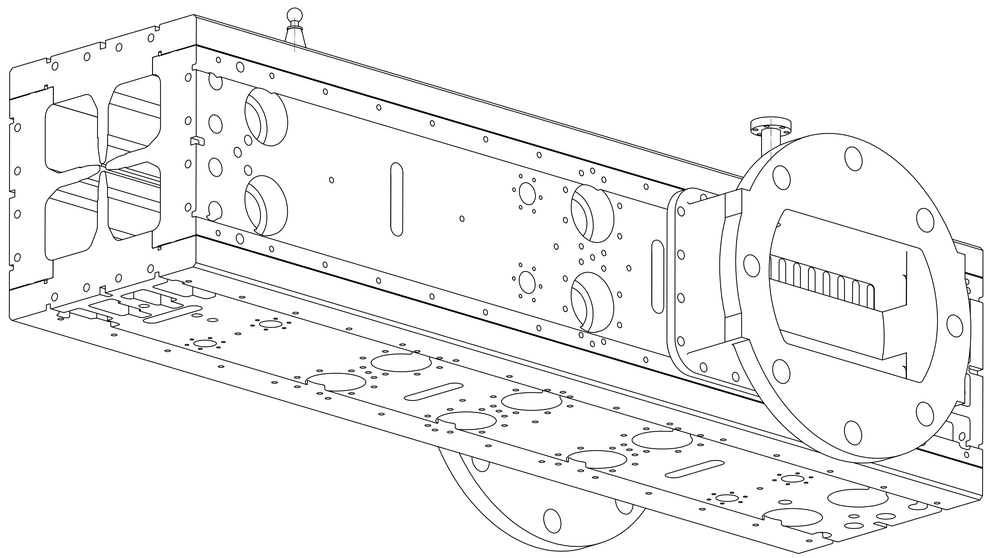
MODULE 2 ASSEMBLY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	ASSY	–	DWG NO.	SIZE REV
MICROFILMED	DESIGN ACCT. NO. 8212DB	CATEGORY CODE FE3211	25B6176	

SHEET 1 OF 1



GEN1



GEN2

25B6186

PRELIMINARY

REQD	ITEM	PART NO.	DESCRIPTION
–	–	–	–

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
X ± –
XX ± –
XXX ± –
FRAC. ± –
ANGLES ±–
FINISH – √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1.

SHOP ORDERS

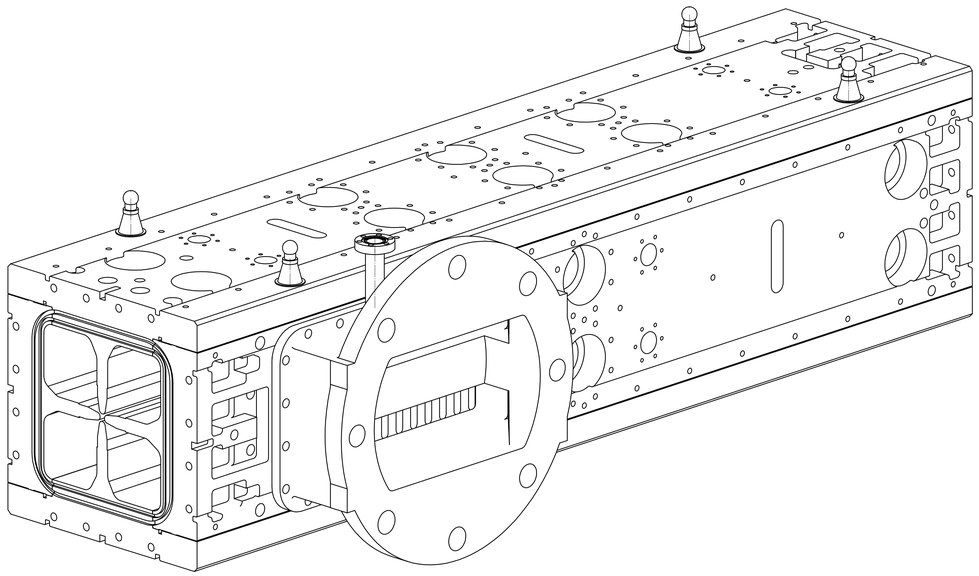
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT –
IDENT. METH. –
DWG. BY Matt Hoff
DATE 2-21-02
CHK. BY –
DATE –

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

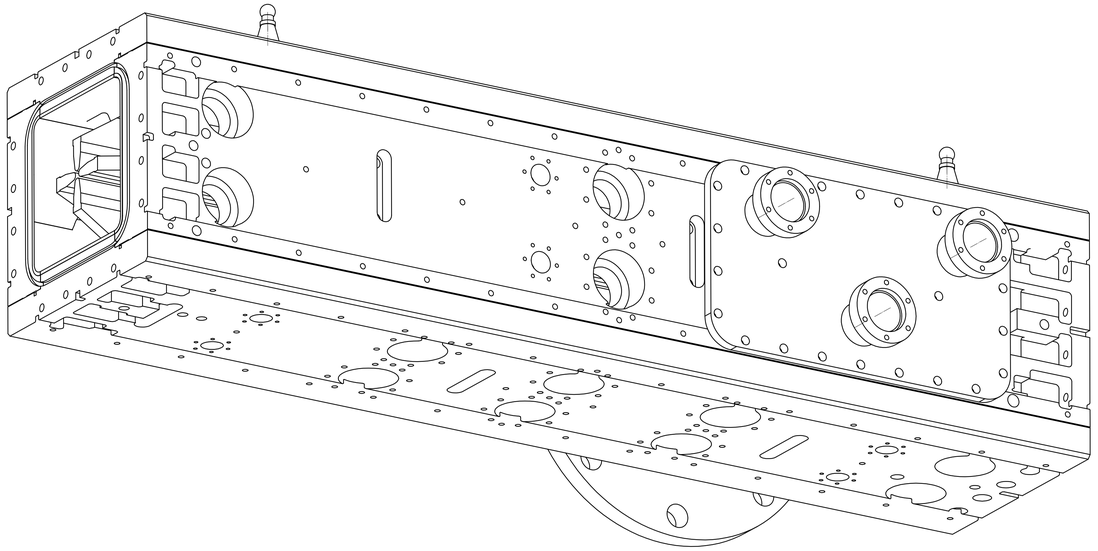
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 3 ASSEMBLY

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSY	–	1 : 2	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE REV
	8212DB	FE3211	25B6186	

SHEET 1 OF 1



GEN1



GEN2

25B6196

PRELIMINARY

REQD	ITEM	PART NO.	DESCRIPTION
–	–	–	–

REV	DWG	CHK	ZONE	DATE	CHANGES
–	–	–	–	–	–

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± – FRAC ± – ; .XX ± – ANGLES ±– ; .XXX ± – FINISH – √

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M-1994 & ANSI B46.1

SHOP ORDERS

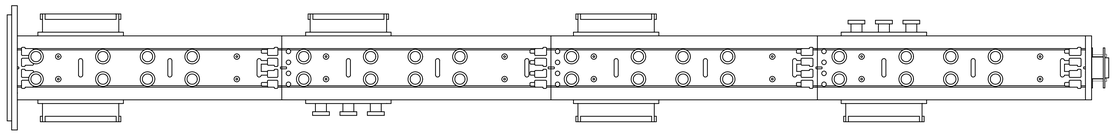
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT –
IDENT. METH. –
DWG BY: Matt Hoff — DATE: 2-21-02
CHK BY: – — DATE: –

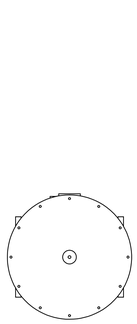
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

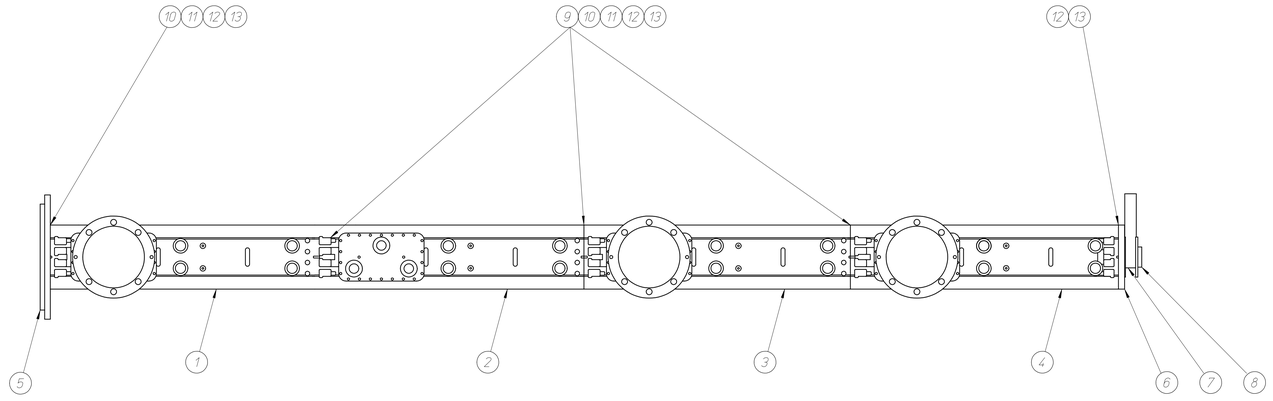
SNS FES RFQ
MECHANICAL STRUCTURES
MODULE 4 ASSEMBLY

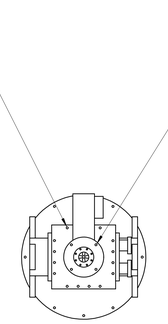
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1:2	DO NOT SCALE PRINTS
	ASSY	–	DWG. NO.	SIZE REV
MICROFILMED	DESIGN ACCT. NO. 8212DB	CATEGORY CODE FE3211	25B6196	

SHEET 1 OF 1









25B6206
SHEET 1 OF 1

ITEM	REQ.	PART NUMBER	DESCRIPTION
17	9	-	1/4 NOM. WASHERS, STAINLESS
16	16	-	1/4-20UNC HEX NUT
15	4	-	1/4-28UNF x 2.25 LG. 12 POINT CAP SCREW, STAINLESS
14	9	-	1/4-20 x 1.75 LG. SHCS, STAINLESS
13	5	-	RF SPRING RING, BAL SEAL INC. RF105MB-(6.00)-BEC-2
12	5	-	O-RING, SIZE -263, VITON
11	80	-	1/4 NOMINAL BELLVILLE WASHERS, STAINLESS
10	64	-	1/4-28UNF x 1.75 LG. 12 POINT CAP SCREW, STAINLESS
9	48	25B3232	BARREL NUT
8	1	25B8044	EXIT VALVE RETAINING FLANGE
7	1	08234-FA44-0001	GATE VALVE, VAT INC, DN50
6	1	25B4896	END PLATE
5	1	25B8186	LEBT DIAGNOSTIC ASSEMBLY
4	1	25B6196	MODULE 4 ASSEMBLY
3	1	25B6186	MODULE 3 ASSEMBLY
2	1	25B6176	MODULE 2 ASSEMBLY
1	1	25B6166	ALPHA MODULE ASSEMBLY

REV	DWN	CHK	ZONE	DATE	CHANGES
A	???				

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES: X= ± .060, XX= ± .020, XXX= ± .005, FRACT= ± 1/64, ANGLES= ± 5°, FINISH 125
SAWED, FLAME-CUT, SHEARED OR STOCK FINISH
ALL SCREW THREADS ARE CLASS 2B
CHAMFER ENDS OF ALL SCREW THREADS 30° x ¼ PITCH RELIEF WITH ROUND NOSE TOOL ON ALL MACHINE CUT SCREW THREADS.
BREAK EDGES 1/64 MAX. ON MACHINED WORK. REMOVE BURRS, LOOSE SCALE AND WELD SPATTER.
REFERENCES - ASME Y14.5, ANSI B4.1 AND B1.1 ANSI/AWS A2.4, ANSI/AWS D1.1

SHOP ORDERS
ADDT. NO.:
SER. NO.:
DATE ISSUED:
DATE REQ'D.:
NO REQ'D.:
DELIVER
SURFACE TREATMENT: ---
IDENTIFICATION METHOD: ---
DFN BY: Matt Hoff — DATE: 02/20/02
CHK BY: --- — DATE: 00/00/00

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

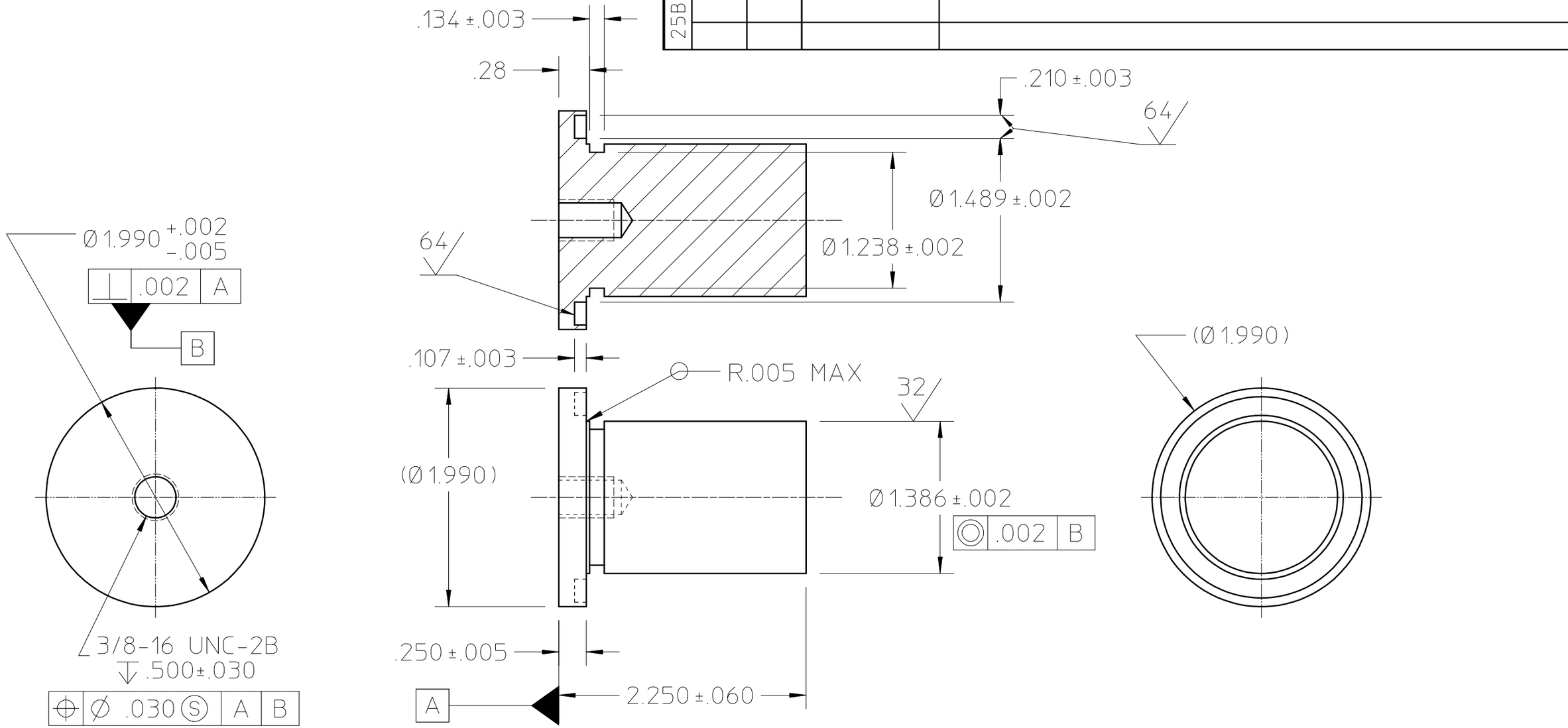
SNS-FES RFQ
MECHANICAL SUBSYSTEMS
RFQ SUB-ASSEMBLY

PATENT CLEAR | DRAWING TYPE: DETAIL | SHOWN ON: 00X0000 | SCALE: 1.8 | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCOUNT: 8212DB | CATEGORY CODE: FE-32-12 | DRAWING NUMBER: 25B6206 | REV: A

SHEET 1 OF 1

REV. AM 7/95

25B6752	REQD	ITEM	PART NUMBER	DESCRIPTION
				BAR, ROUND Ø2.000, COPPER C10100



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ±.01 .XXX ±.005

SURFACE FINISH 63 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 07-23-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ

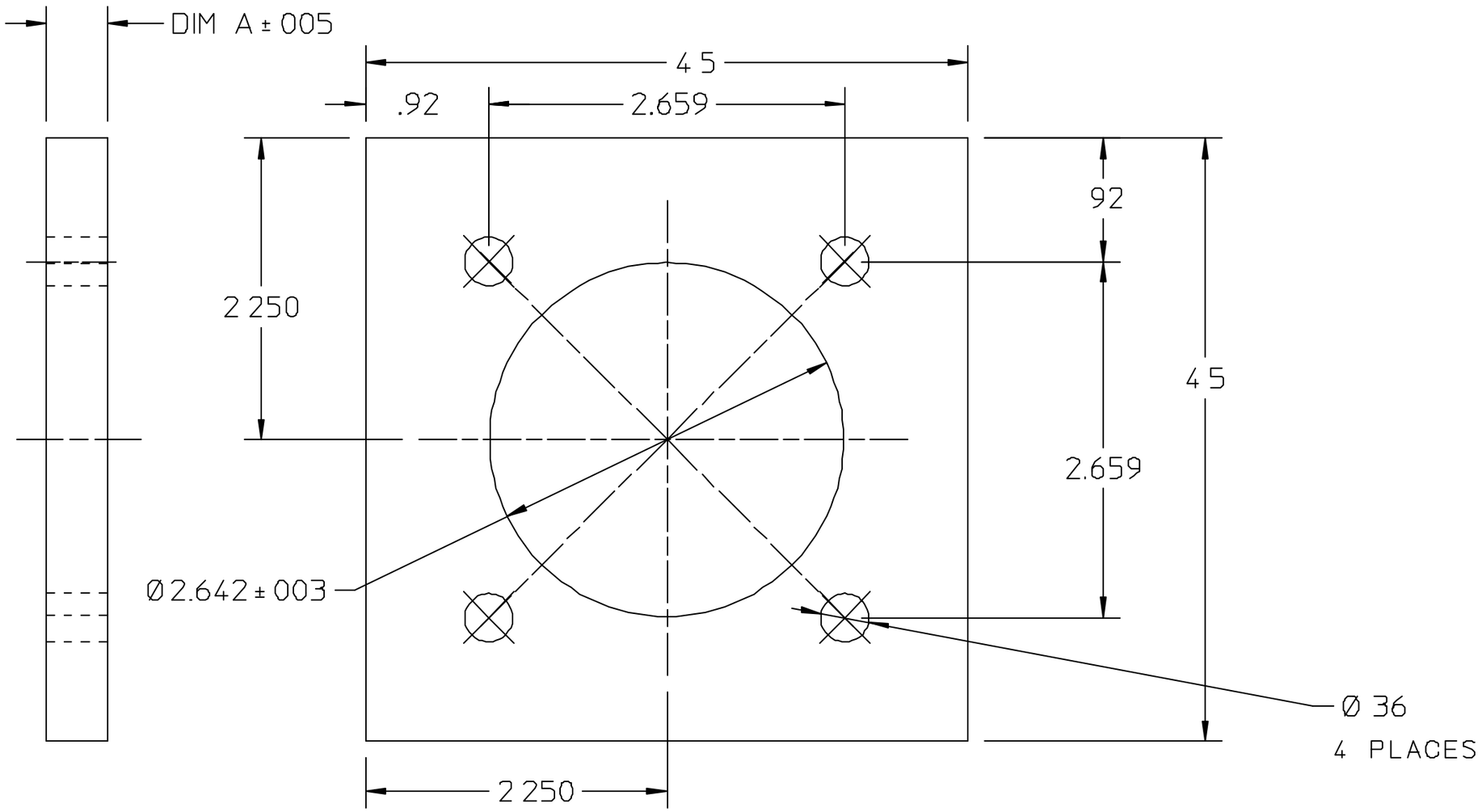
MECHANICAL STRUCTURES

TUNER BLANK with GROOVES

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B6752

VERSION	DIM. A
1	335
2	.459

25B6792	REQD	ITEM	PART NUMBER	DESCRIPTION
				COPPER, any type



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 XX ± 01 .XXX ± 001

SURFACE FINISH 125 √

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

SHOP ORDERS

ACCT NO		SER NO
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 07-24-01
CHK BY		DATE

LAWRENCE BERKELEY NATIONAL LABORATORY

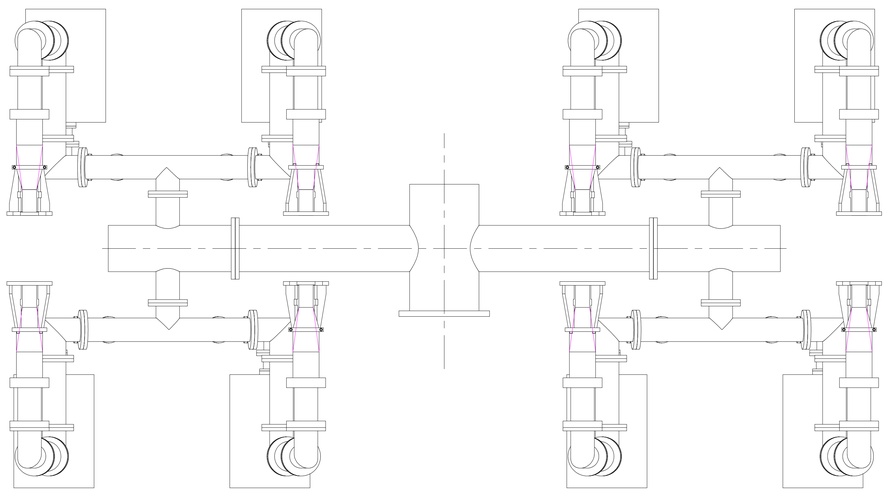
UNIVERSITY OF CALIFORNIA-BERKELEY

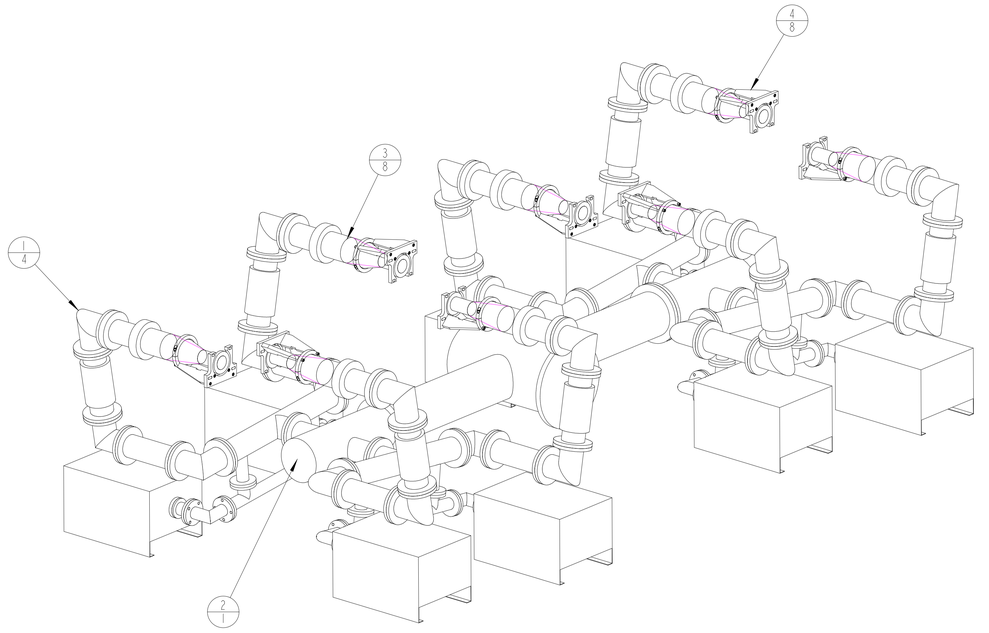
SNS FES RFQ

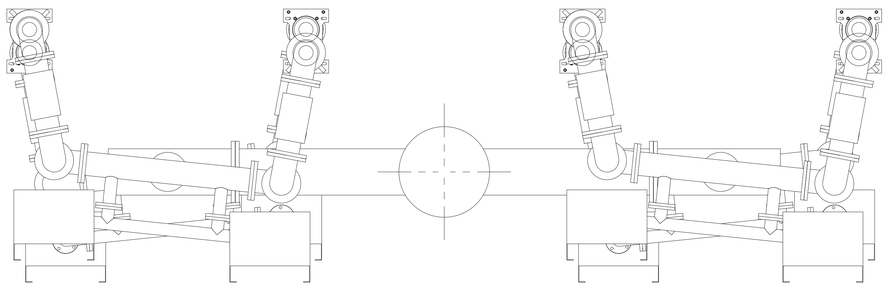
MECHANICAL STRUCTURES

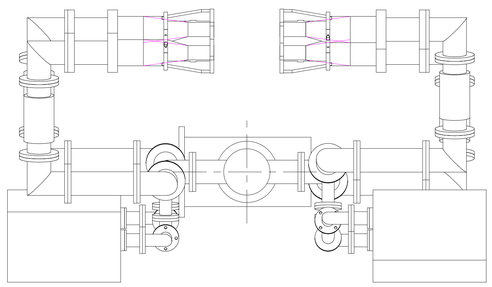
BEAD PULL END PLATE EXTENDER

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	fe3211	25B6792









PRELIMINARY

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
4	nnXnnn	8	SUPPORT BRACKET, RFQ POWER PORT	-
3	TBD	8	RF_PWR_PORT	
2	nnXnnn	1	MANIFOLD, RF DISTRIBUTION	-
1	nnXnnn	4	GYSEL ASSY., MYAT, RFQ	-

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
PROJECTION:
TOLERANCES: X.X ± 0.1 FRAC. ± 1/64; X.XX ± 0.03 Angles ± 1.0°; X.XXX ± 0.010 FINISH 125
DO NOT SCALE PRINT
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THEADS 30°
CUT ROUND, 1.5 THREAD RELIEF ON MACHINED THREADS
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS, WELD SPLATTER & LOOSE SCALE
IN ACCORDANCE WITH ASME Y14.5M & B46.1

SHOP ORDERS
ACCT NO.
REL TO
SURFACE TREATMT -
IDENT METHOD TAG
PROJECT NUMBER 25B743
PROJECT NAME N/A
DWG BY PAL DATE 22-Jan-02
CHK BY DPO DATE
APP BY DPO DATE
SER NO. -
DATE ISSD -
DATE REQD -

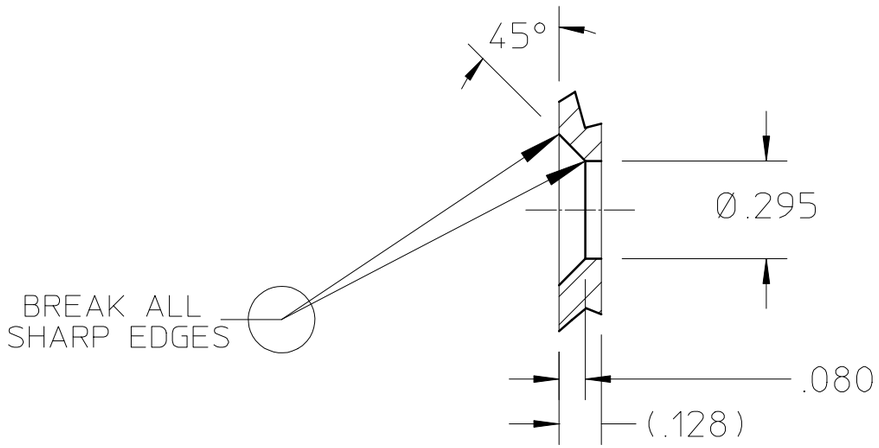
ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA - BERKELEY

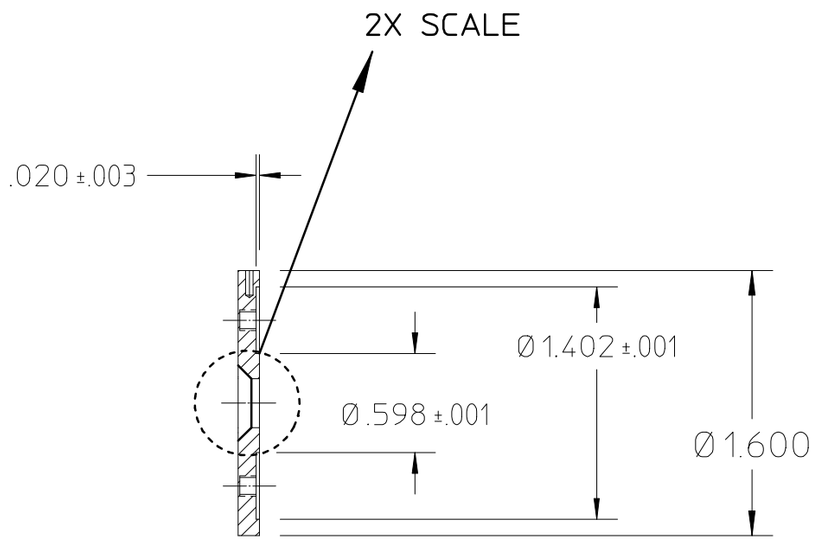
FRONT END EQUIPMENT
RFQ RF DRIVE ASSY
RF DISTRIBUTION ASSY

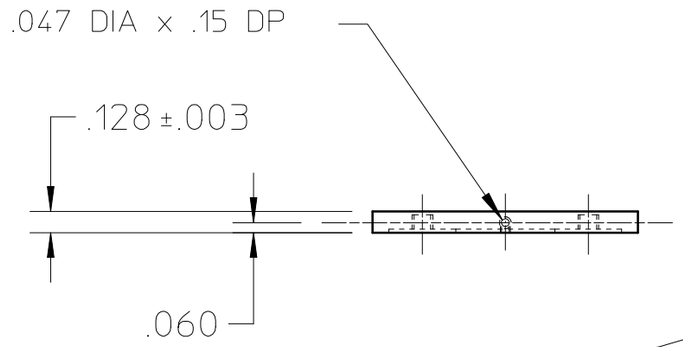
MICROFILMED: | DWG. TYPE ASSEM | SHOWN ON - | SCALE: 1/8 | DO NOT SCALE PRINTS
SHEET 1 OF 1
PATENT CLEAR: | DESIGN ACCT. NO. - | CATEGORY CODE FE3221 | DWG. NO. 25B7436 | SIZE A | REV. A

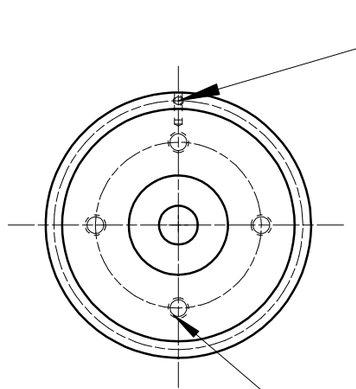
DWG. NO. 25B7436 SIZE A REV. SH. 1

25B3292	REQD	ITEM	PART NUMBER	DESCRIPTION
	1	1		.010 MOLYBDENUM FOIL
	1	2		MOLYBDENUM TZM









REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 125

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.

SHOP ORDERS

ACCT NO		SER NO
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	UHV Clean	
IDENTIFIC METHOD	–	
DWG BY	MACGILL/PRUYN	DATE 8/29/01
CHK BY	–	DATE –

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

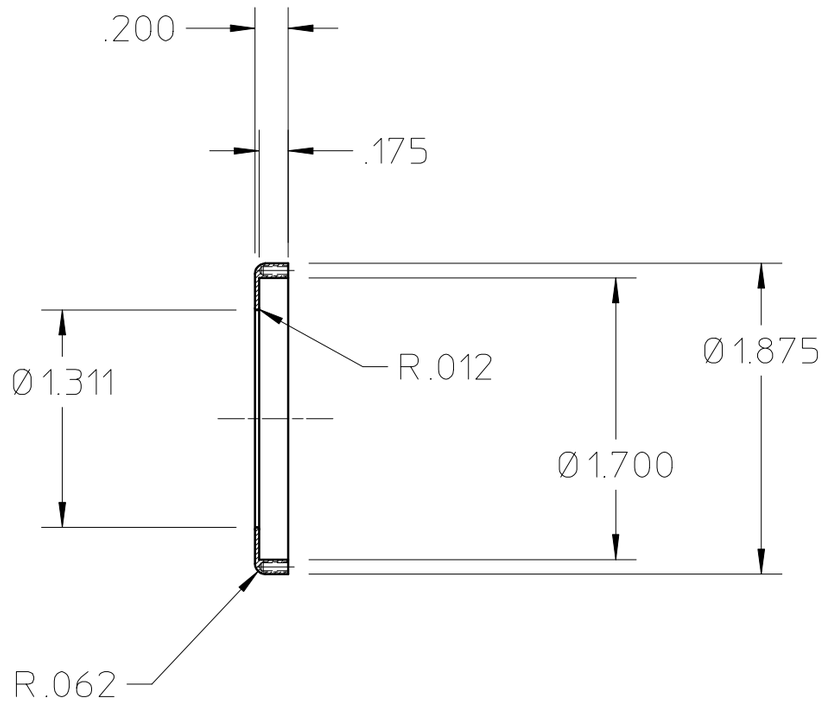
SNS-FE LEBT CHOPPER R&D

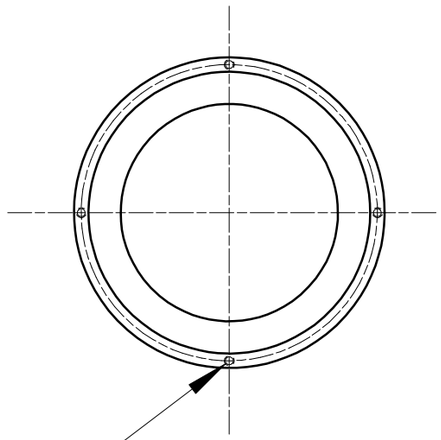
LEBT BEAM CHOPPER DEVELOPMENT

CHOPPER TARGET-4 PIECE

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL		DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8210-32	FE3112	25B8002

25B8012	REQD	ITEM	PART NUMBER	DESCRIPTION
				MOLYBDENUM TZM





4X #0-80 X .150 DP
EQ. SPD. ON 1.788 BCD
DO NOT BREAK THROUGH

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ± .XX ± .XXX ±.005

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT	UHV CLEAN		
IDENTIFIC METHOD	TAG		
DWG BY	J.M.PRUYN	DATE	8/30/01
CHK BY	S.VIROSTEK	DATE	8/31/01

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

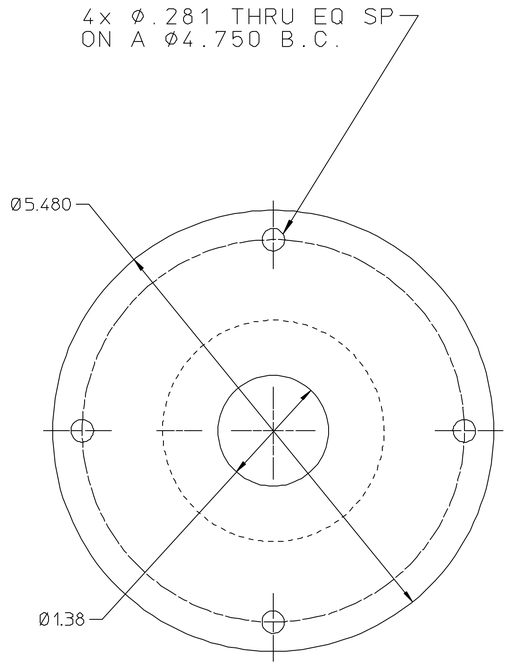
SNS-FE-LEBT CHOPPER R&D

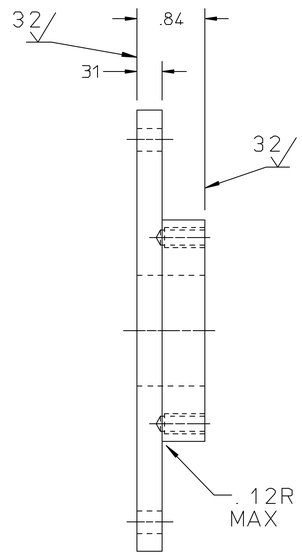
LEBT BEAM CHOPPER DEVELOPMENT

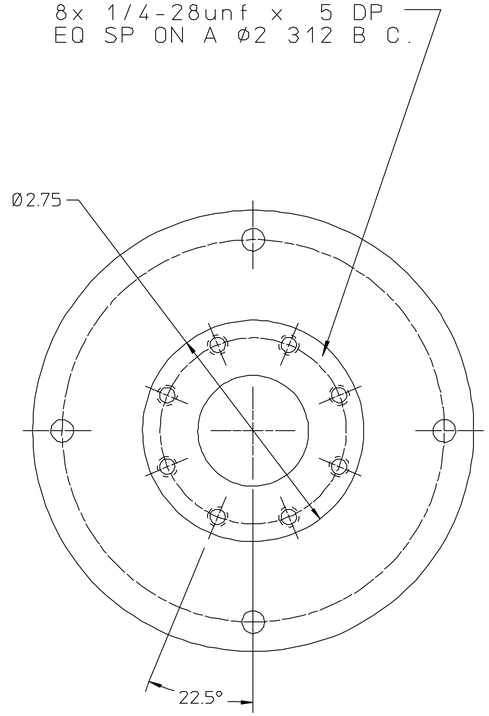
CHOPPER TARGET SHIELD RING

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL		DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8210-32	FE3112	25B8012

REQ	ITEM	PART NUMBER	DESCRIPTION
			STAINLESS STEEL







25B8044

BREAK ALL EDGES

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES:
- X ± 1 — FRAC ±1/64
- XX ± .01 — ANGLES ± 1°
- XXX ± .004 — FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS
BREAK EDGES .016 MAX ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS

ACCT. NO	SERIAL NO.	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	–	
IDENT. METH	–	
DWG BY	Matt Hoff	DATE 09-14-01
CHK BY	–	DATE –

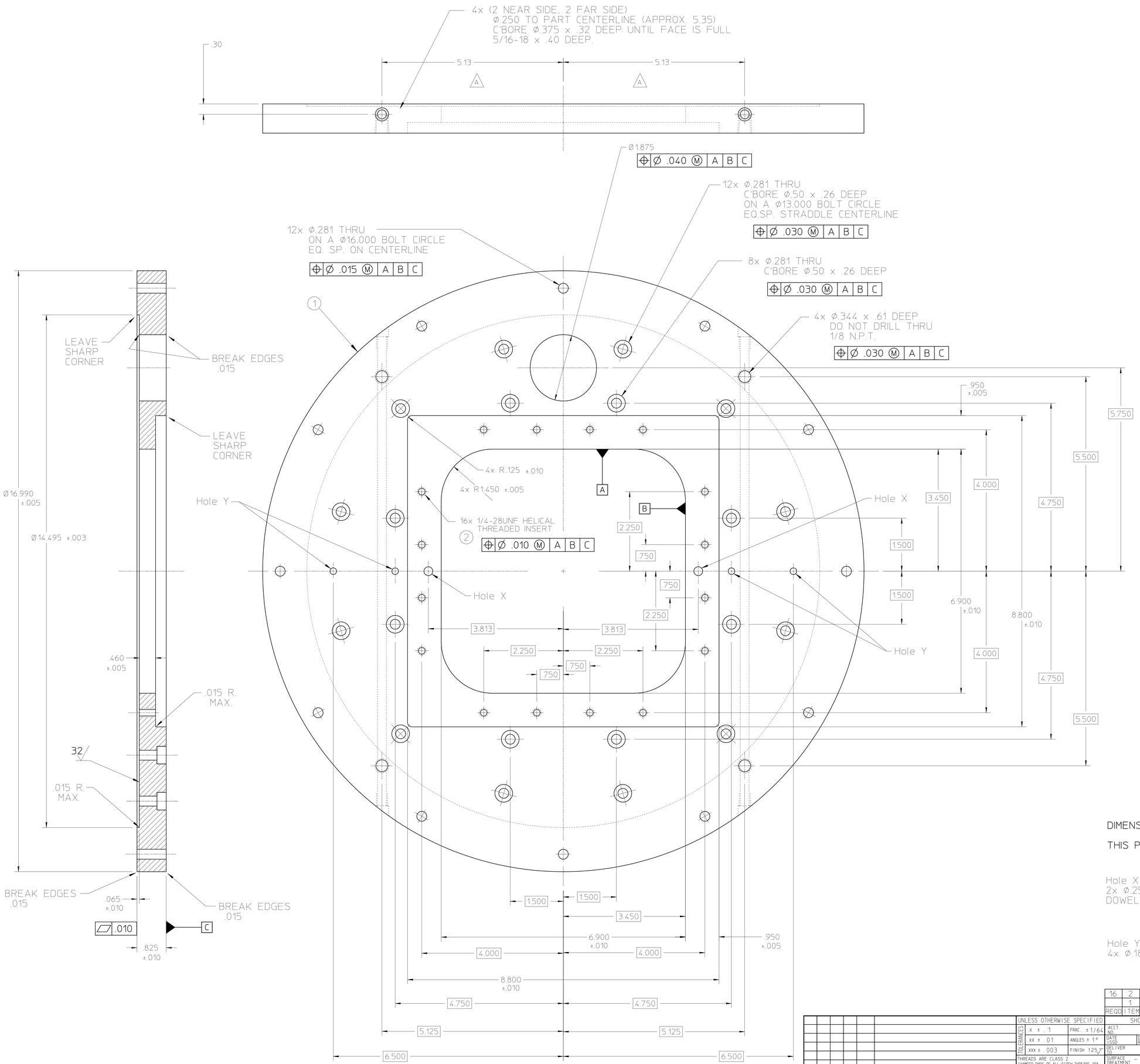
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS FES - RFQ

MECHANICAL STRUCTURES

EXIT VALVE RETAINING FLANGE

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE FULL	DO NOT SCALE PRINTS
	DETAIL	00X0000	DWG. NO. 25B8044	SIZE – REV. –
MICROFILMED	DESIGN ACCT NO 8212DB	CATEGORY CODE FE3211		



DIMENSIONS ARE IN INCHES.

25B8086A

THIS PART WEIGHTS APPROX. 42 LBS.

Hole X
2x Ø.250 x .40 Deep
DOWEL PIN ALIGNMENT HOLES
Ø .005 M A B C

Hole Y
4x Ø.188 Thru
Ø .040 M A B C

REQD	ITEM	PART NO	DESCRIPTION
16	2		1/4-28 x .38 Helicoil threaded insert, stainless
	1		OFHC PLATE

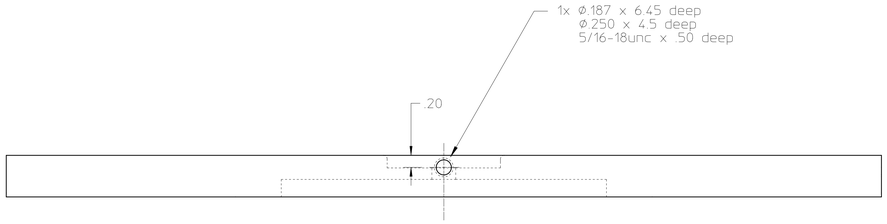
REV	DWG	CHK	ZONE	DATE	CHANGES
A	MDH		D-5	11-21-01	5.13 dim was 4.7

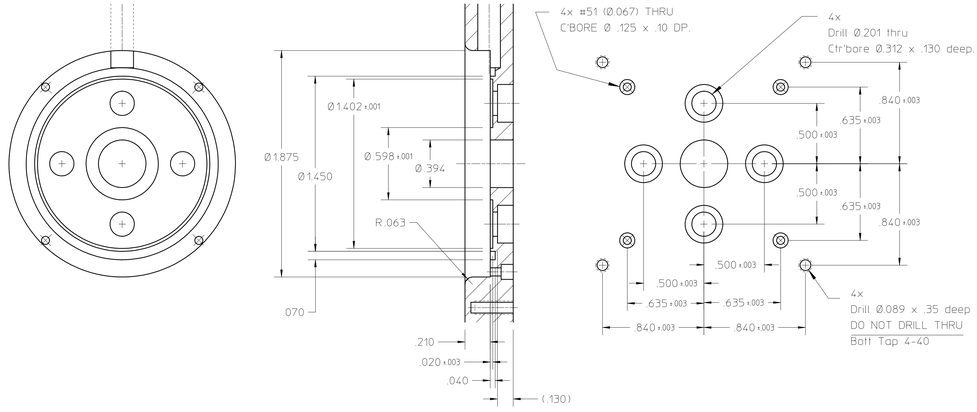
UNLESS OTHERWISE SPECIFIED (TOLERANCES)
.X ± .1 FRAC. ± 1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .003 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD
NO REQD
DELIVER TO
SURFACE TREATMENT –
IDENT METH –
DWG BY Matt Hoff
DATE 09-24-01
CHK –
DATE –

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES ION SOURCE-LEBT
LEBT DIAGNOSTIC
SPLIT FLANGE - DOWNSTREAM

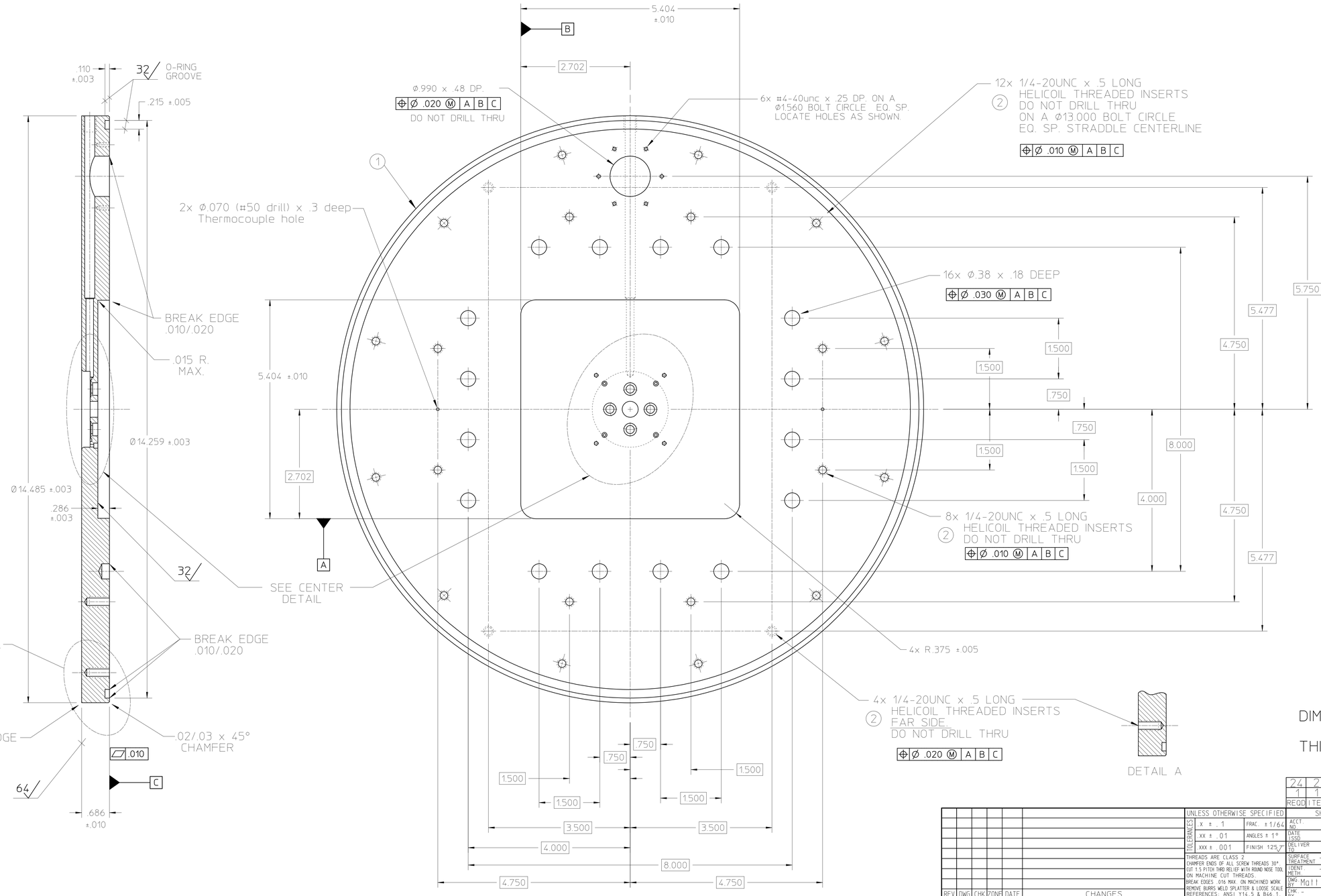
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-CU	FE3112	25B8086	A





CENTER DETAIL

SCALE 2:1



DIMENSIONS ARE IN INCHES.

THIS PART WEIGHTS APPROX. 34 LBS.

25B8096

REQD	ITEM	PART NO.	DESCRIPTION
24	2		1/4-20UNC x .5 LG. HELICOIL INSERT, STAINLESS
1	1		OFHC COPPER PLATE

REV.	DWG.	CHK.	ZONE	DATE	CHANGES

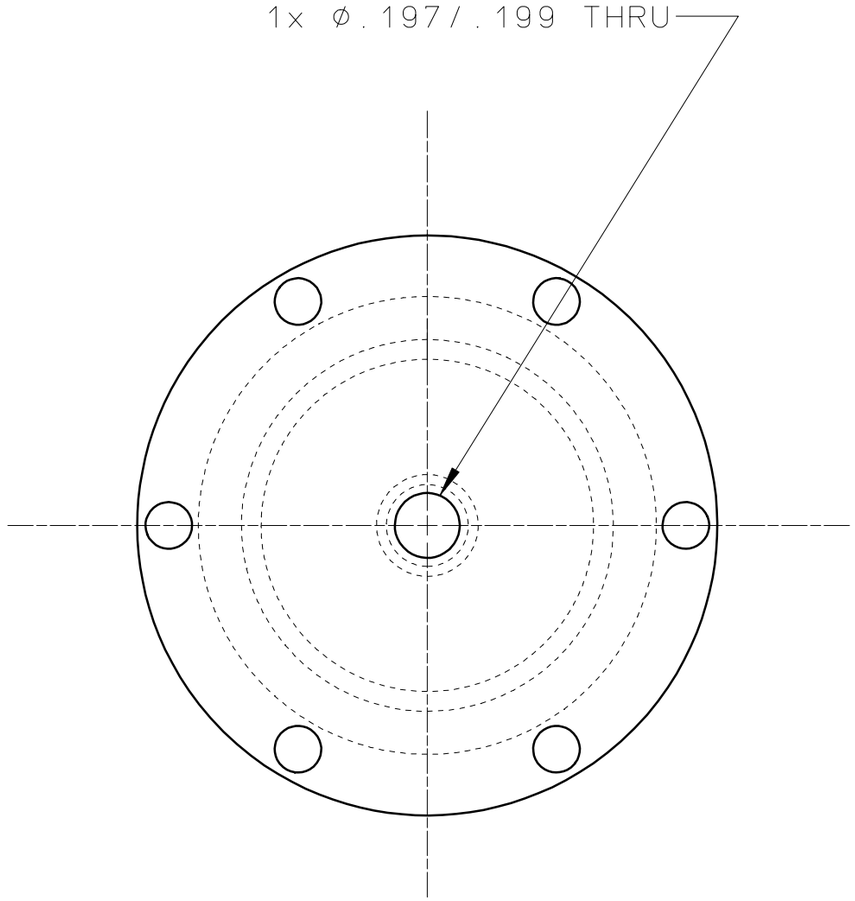
UNLESS OTHERWISE SPECIFIED TOLERANCES:
.X ± .1 FRAC. ±1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .001 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

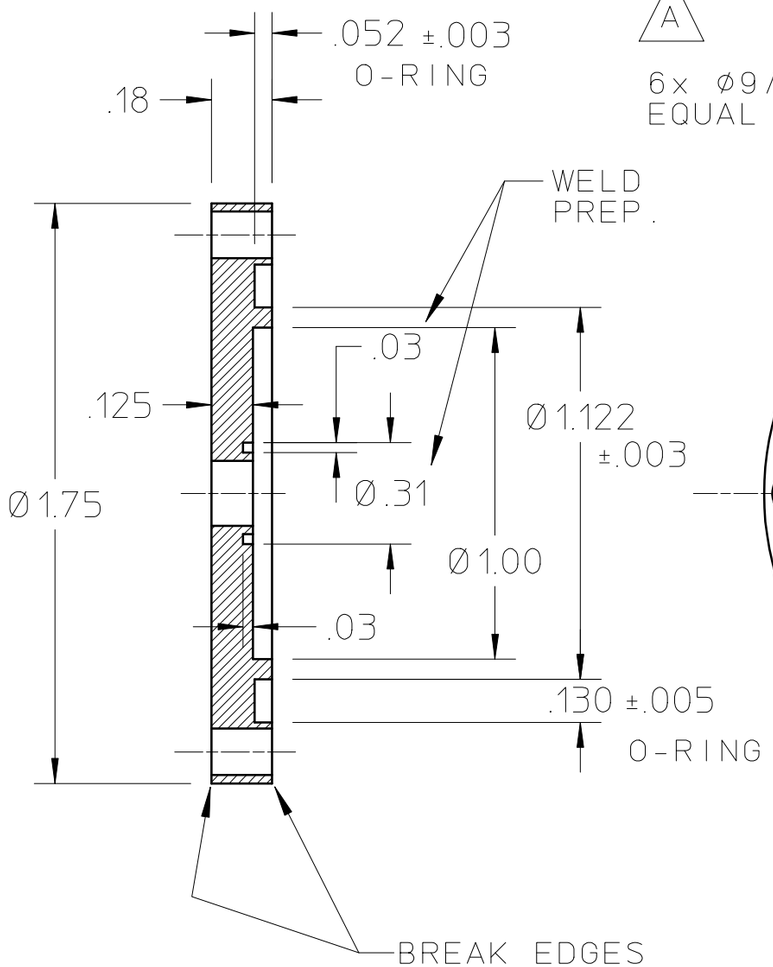
SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD.
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT –
IDENT. METH. –
DWG. BY Matt Hoff
DATE 05-24-01
CHK. BY –
DATE –

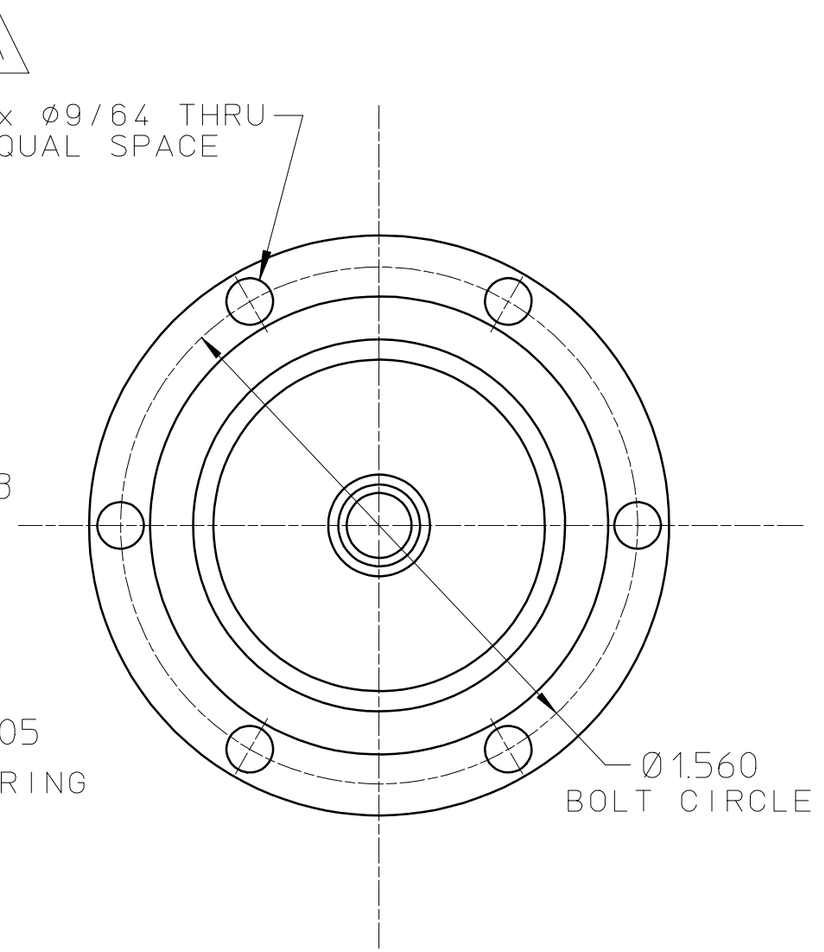
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES ION SOURCE-LEBT
LEBT DIAGNOSTIC
SPLIT FLANGE - UPSTREAM

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	DETAIL	00X0000	FULL	
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE / REV.
	8212-CU	FE3112	25B8096	–

25B8102A	REQD	ITEM	PART NUMBER	DESCRIPTION
				STAINLESS STEEL







DIMENSIONS ARE IN INCHES.
USE A -024 O-RING.

REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		12-10-01	6 HOLE PATTERN WAS 8

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125

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.

SHOP ORDERS

ACCT NO	SER NO		
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 08-22-01	
CHK BY		DATE	

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

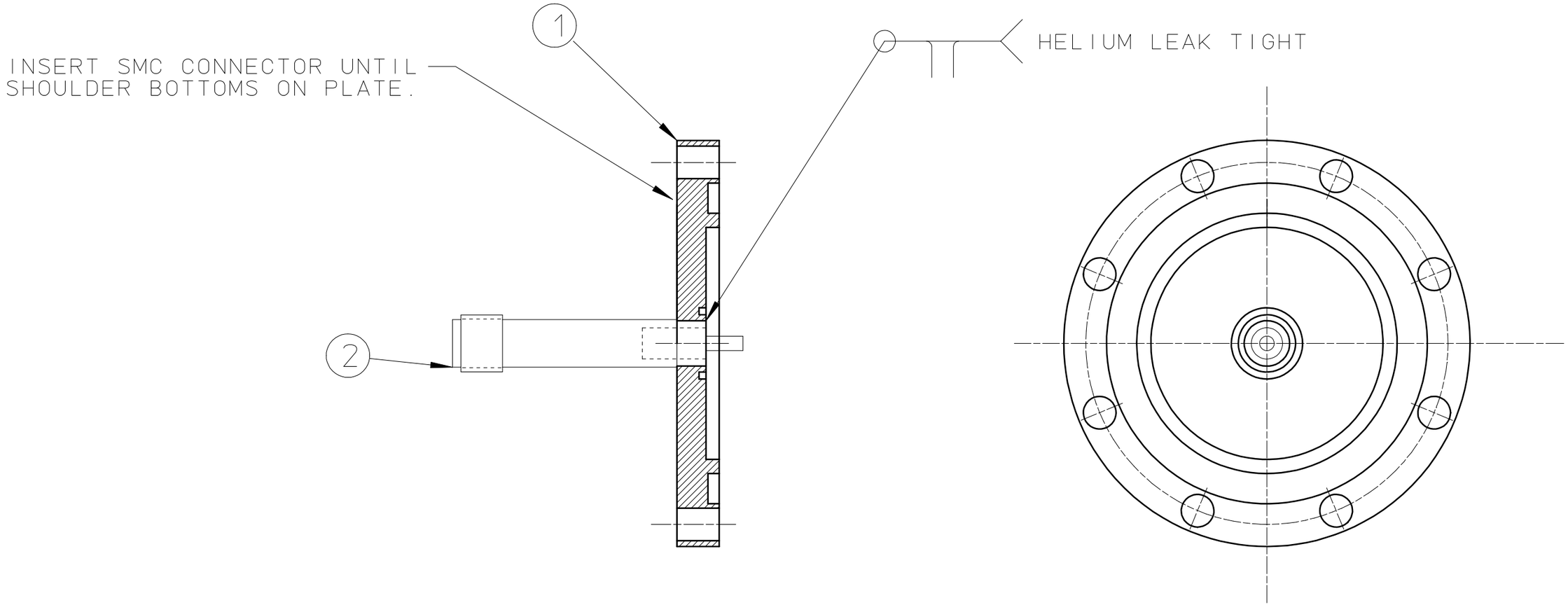
SNS- FE ION SOURCE-LEBT

LEBT DIAGNOSTIC

CONNECTOR MOUNTING PLATE

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 2:1
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-CU	FE3112	25B8102A

25B8112	REQD	ITEM	PART NUMBER	DESCRIPTION
	1	1	25B8102	CONNECTOR MOUNTING PLATE
	1	2		SMA CONNECTOR, KAMAN INSTR. P/N 855213-P002



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE 08-27-01	
CHK BY		DATE	

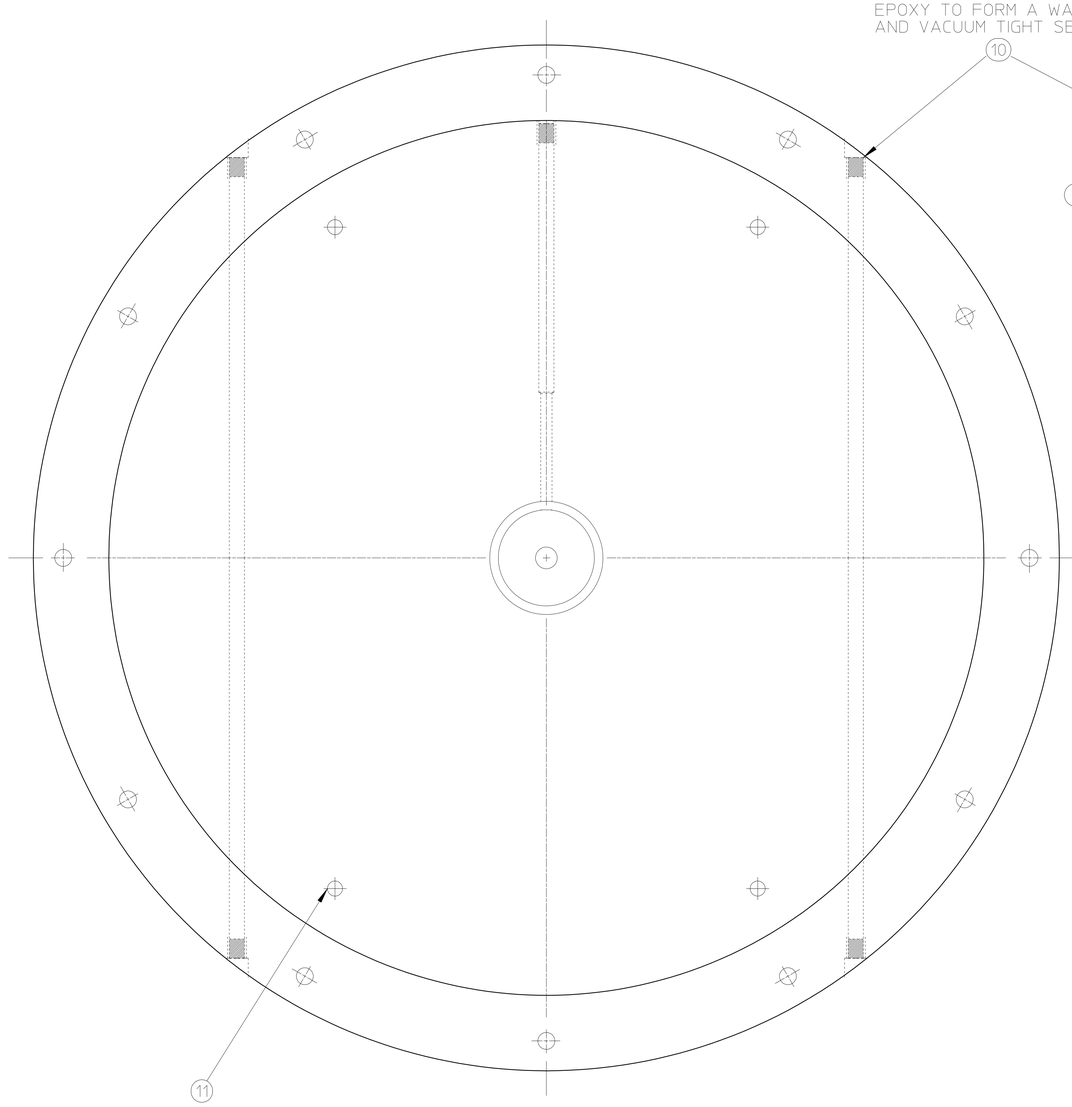
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS- FE ION SOURCE-LEBT

LEBT DIAGNOSTIC

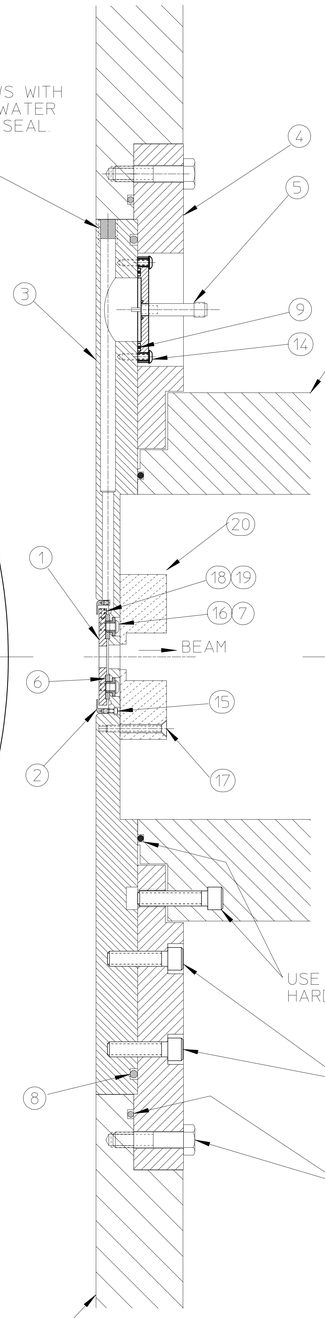
CONNECTOR ASSEMBLY

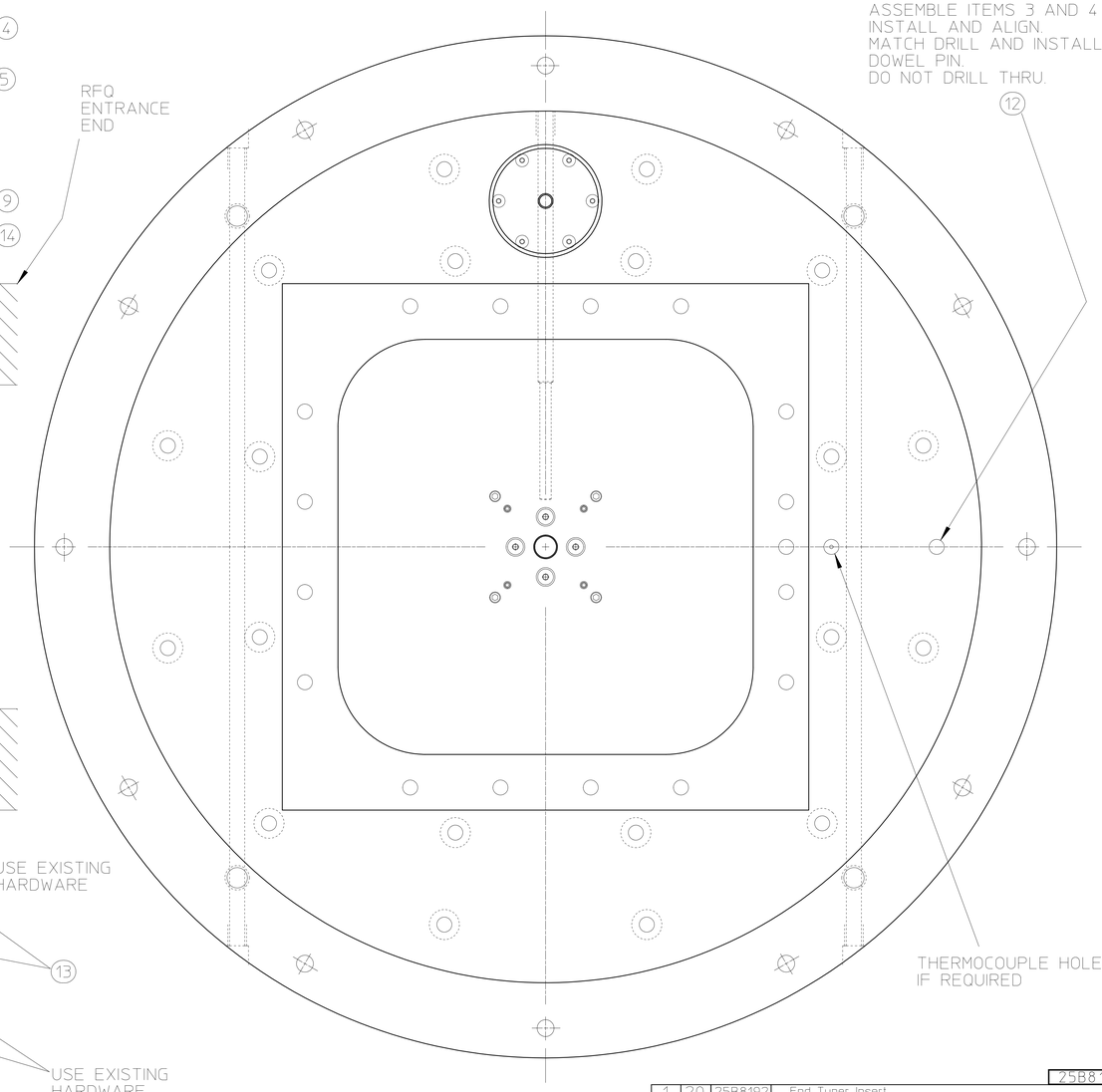
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 2:1
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-CU	FE3112	25B8112



FILE VENT SLOTS ON THE SIDE OF THE SET SCREWS. INSTALL SET SCREW FLUSH. NO SHARP EDGES.

INSTALL SET SCREWS WITH EPOXY TO FORM A WATER AND VACUUM TIGHT SEAL.





TUNER INSERT AND RFQ NOT SHOWN IN THIS VIEW

25B8186

REQD	ITEM	PART NO	DESCRIPTION
1	20	25B8192	End Tuner Insert
1	19		Kapton insulated wire
1	18		#0-80UNC Pan Head Screw x 1/8 inch long
4	17		FLAT HEAD SOCKET #4-40UNC x 1.0 LG. 316 STAINLESS
4	16		Button Head #5-40UNC x .25 LG. ALLOY STEEL
4	15		SHCS #0-80UNC x .19 LG. ALLOY STEEL
6	14		BUTTON HEAD 4-40UNC x .38 LG. ALLOY STEEL
20	13		SHCS, 1/4-20UNC x 1.0 LG. ALLOY STEEL
1	12		DOWEL PIN, REMOVABLE, 1/4 x 1.25, STAINLESS
4	11		SET SCREW, SLOTTED, STAINLESS, 1/4-20 x .5 LG.
5	10		SET SCREW, SLOTTED, STAINLESS, 5/16-18 x .38 LG.
1	9		O-RING SIZE -024, VITON
1	8		O-RING SIZE -280, VITON
4	7	25B3281	TEMP. DETECTOR - INSULATOR - 2
1	6	25B3271	TEMP. DETECTOR - INSULATOR - 1
1	5	25B8116	CONNECTOR ASSEMBLY
1	4	25B8096	SPLIT FLANGE - UPSTREAM
1	3	25B8086	SPLIT FLANGE - DOWNSTREAM
1	2	25B8012	CHOPPER TARGET - SHIELD RING
1	1	25B8002	CHOPPER TARGET - 4 PIECE

UNLESS OTHERWISE SPECIFIED

TOLERANCES: X ± .1 | FRAC. ±1/64 | XX ± .01 | ANGLES ± 1° | XXX ± .001 | FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK. REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD. | DATE REQD. | NO REQD.
DELIVER TO
SURFACE TREATMENT: –
IDENT METH.: –

REV	DWG	CHK	ZONE	DATE	CHANGES

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

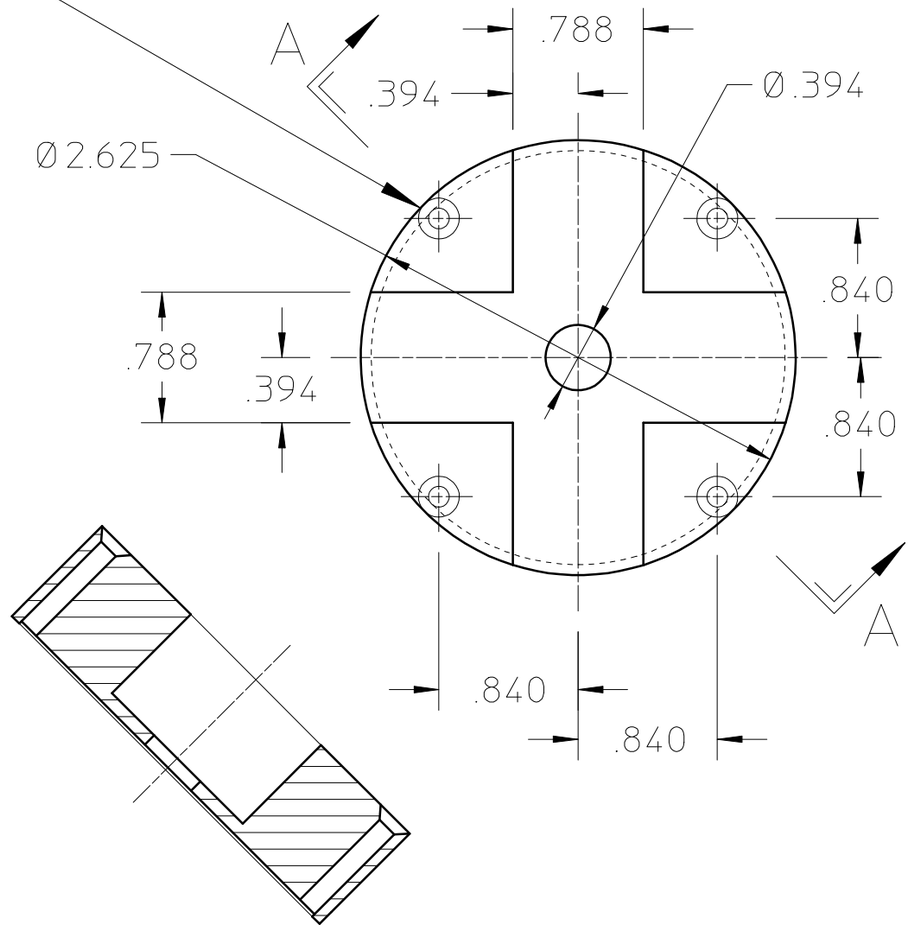
SNS FES ION SOURCE-LEBT
LEBT DIAGNOSTIC
LEBT DIAGNOSTIC ASSEMBLY

PATENT CLEAR | DWG. TYPE: ASSEMBLY | SHOWN ON: 00X0000 | SCALE: FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO.: 8212CB | CATEGORY CODE: FE3112 | DWG. NO.: 25B8186 | SIZE | REV.: –

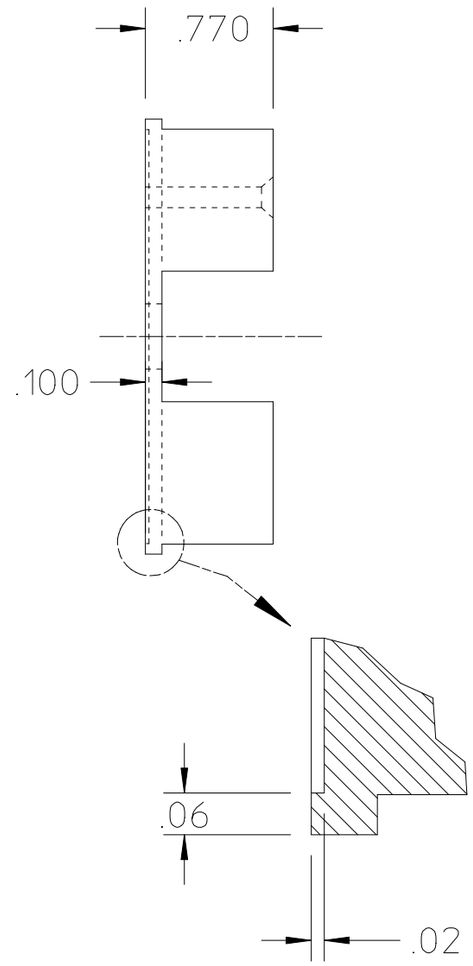
DWG BY: Matt Hoff | DATE: 10-19-01
CHK. BY: – | DATE: –

25B8192	REQD	ITEM	PART NUMBER	DESCRIPTION
				OFHC COPPER

4x Ø.125 THROUGH
.07 x 82° C'SINK
FOR A #4 FH SCREW



SECTION A-A



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.001

SURFACE FINISH 125 √

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.

SHOP ORDERS

ACCT NO		SER NO	
DATE ISSD	DATE REQD	NO REQD	
DELIVER TO			
SURFACE TREATMENT			
IDENTIFIC METHOD			
DWG BY MATT HOFF		DATE	10-26-01
CHK BY		DATE	

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS- FES RFQ

MECHANICAL STRUCTURES

ENTRANCE END TUNER INSERT

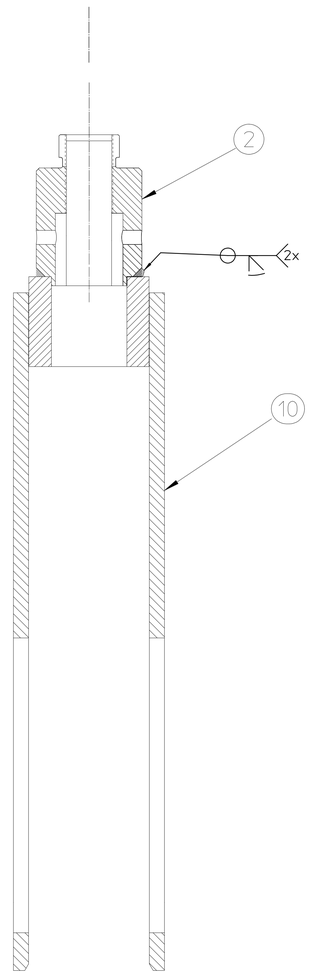
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1 : 1
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-CU	FE3112	25B8192

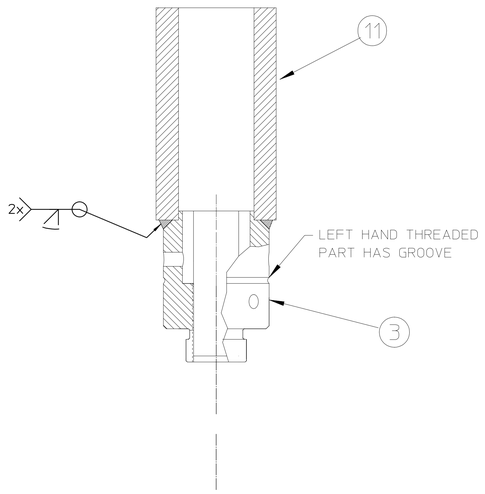
STEP 1

NOTE:

1. WELD STRUT TUBE ENDS (ITEMS 2 & 3) TO PART (ITEM 10) AND (ITEM 11).

2. ELECTROLESS NICKEL PLATE ENTIRE WELDMENT TO A PLATING THICKNESS OF .0003" MIN / .0008" MAX.





STEP 2

ASSEMBLY GUIDELINES

1. SPRAY COAT THREADS OF STRUT ROD ENDS (ITEMS 4 & 5) WITH ACHESON AERODAG-G LUBRICANT (ITEM 8).

2. STRUT ASSEMBLY:

   a) INSTALL CLAMP COLLAR (ITEM 7) OVER STRUT STUB END (ITEMS 2 & 3)

   b) THREAD ROD END - LEFT HAND THREAD (ITEM 5) INTO GROOVED END OF STRUT WELDMENT.

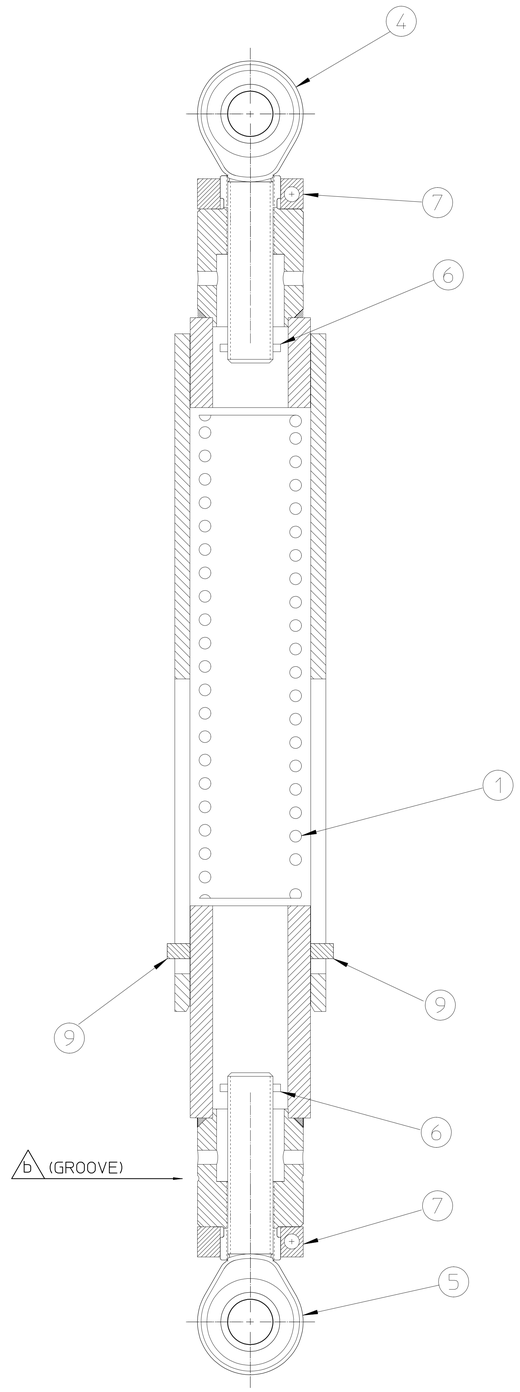
   c) THREAD ROD END - RIGHT HAND THREAD (ITEM 3) INTO OPPOSITE END OF STRUT WELDMENT.

   d) INSTALL SPRING PIN (ITEM 6) THROUGH STRUT STUB END HOLES INTO ROD END HOLES. CENTER SPRING PIN IN ROD END.

   e) INSTALL SPRING (ITEM 1) AND SLIDE THE TWO HALVES TOGETHER.

   f) INSTALL SET SCREWS (ITEM 9) WITH LOCTITE WITH THE SCREW JUST PROUD OF THE OUTER SURFACE.

   g) THREAD ROD ENDS COMPLETELY IN ON BOTH ENDS FOR INSTALLATION POSITION.



25B8206A

REQD	ITEM	PART NO	DESCRIPTION
1	11	25B8242	LEBT STRUT - INNER TUBE, VERSION 1
1	10	25B8232	LEBT STRUT - TUBE WELD
2	9	91375A540	1/4-20unc x .75 lg. set screw, McMaster-Carr
A/R	8	-------	Acheson Aerodag-G Lubricant
2	7	7L100	Clamp Collar - Low Profile, One Piece, 1" Bore x 1.75 OD .50 Wide Stl Stafford
2	6	-------	Spring Pin - Ø1/8 x 1.0 lg McMaster Carr
1	5	25D5753	3/4" Strut Rod End - LH Fine Thread
1	4	25D5743	3/4" Strut Rod End - RH Fine Thread
1	3	25D5733	3/4" Strut Stub End - LH Thread
1	2	25D5723	3/4" Strut Stub End - RH Thread
1	1	9297K99	Die spring, 1024 lbs max. McMaster-Carr

REV.	DWG	CHK	ZONE	DATE	CHANGES
A	MDH			12-20-01	AS BUILT REVISION

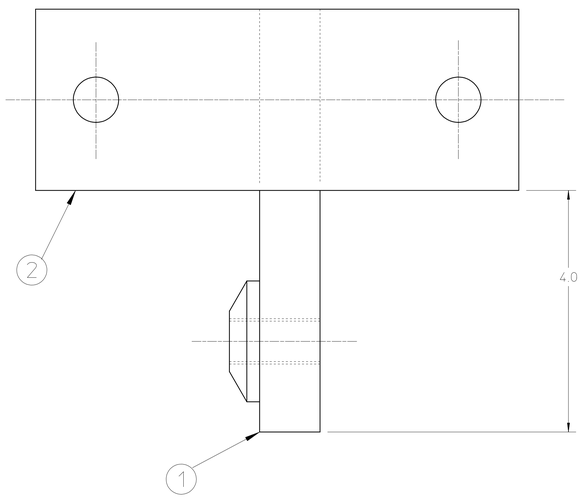
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± FRAC ± ; .XX ± ANGLES ± ; .XXX ± FINISH √
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ASME Y14.5M - 1994

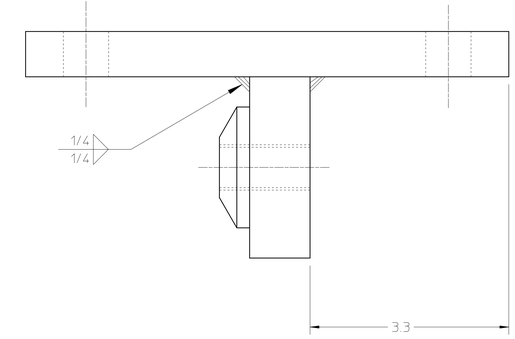
SHOP ORDERS
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT METH TAG
DWG Matt Hoff BY | DATE 11/13/01
CHK. - BY | DATE -

LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

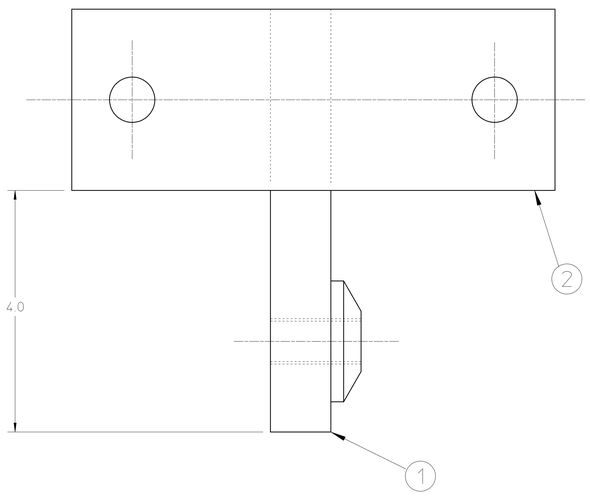
SNS-FES RFQ
SUBSYS - ALIGNMENT
LEBT STRUT ASSEMBLY

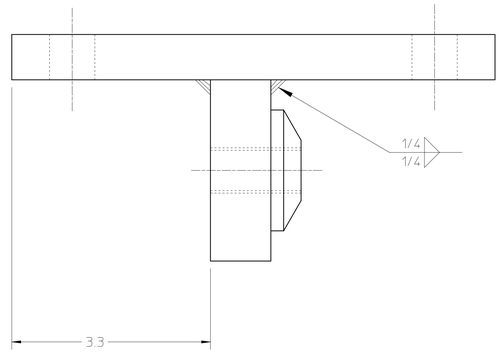
PATENT CLEAR | DWG. TYPE ASSY | SHOWN ON | SCALE FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO 8212-DE | CATEGORY CODE FE3212 | DWG. NO 25B8206 | SIZE | REV. A



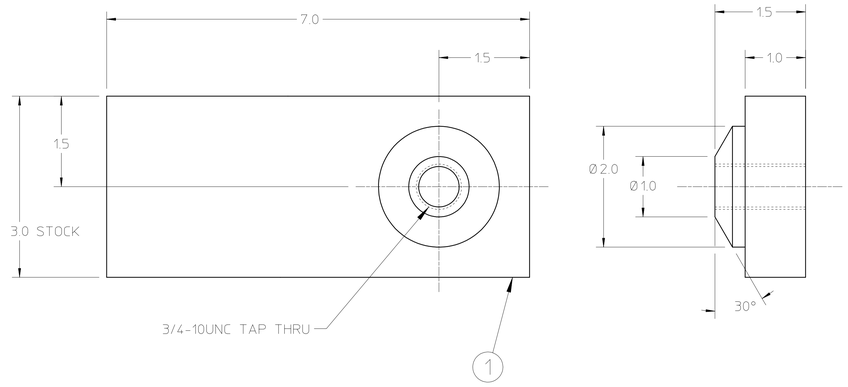


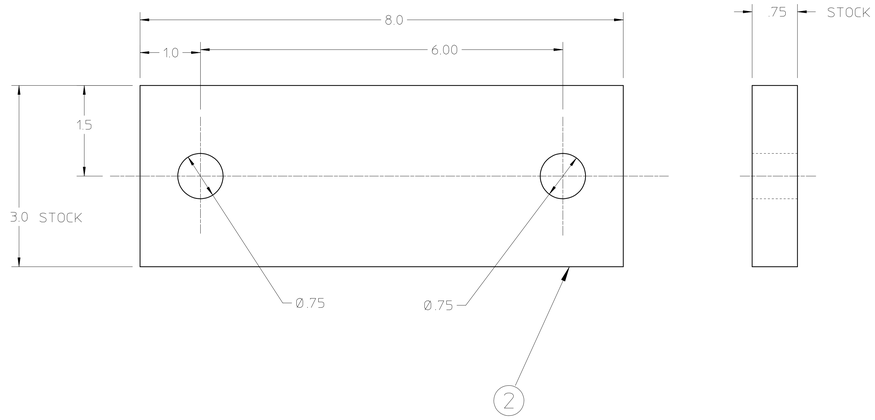
VERSION 1





VERSION 2





25B8216

REQD	ITEM	PART NO.	DESCRIPTION
A/R	2		6061-T6 tooling plate
A/R	1		6061-T6 tooling plate

REV.	DWG.	CHK.	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
TOLERANCES
.X ± .1 FRAC. ±1/64
.XX ± .01 ANGLES ± 1°
.XXX ± .001 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30° OUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS W/LO SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1

SHOP ORDERS
ACCT. NO.
SERIAL NO.
DATE ISSD
DATE REQD.
NO. REQD.
DELIVER TO
SURFACE TREATMENT DEGREASE
IDENT. METH. TAG
DWG. BY Matt Hoff DATE 11-14-01
CHK. BY - DATE -

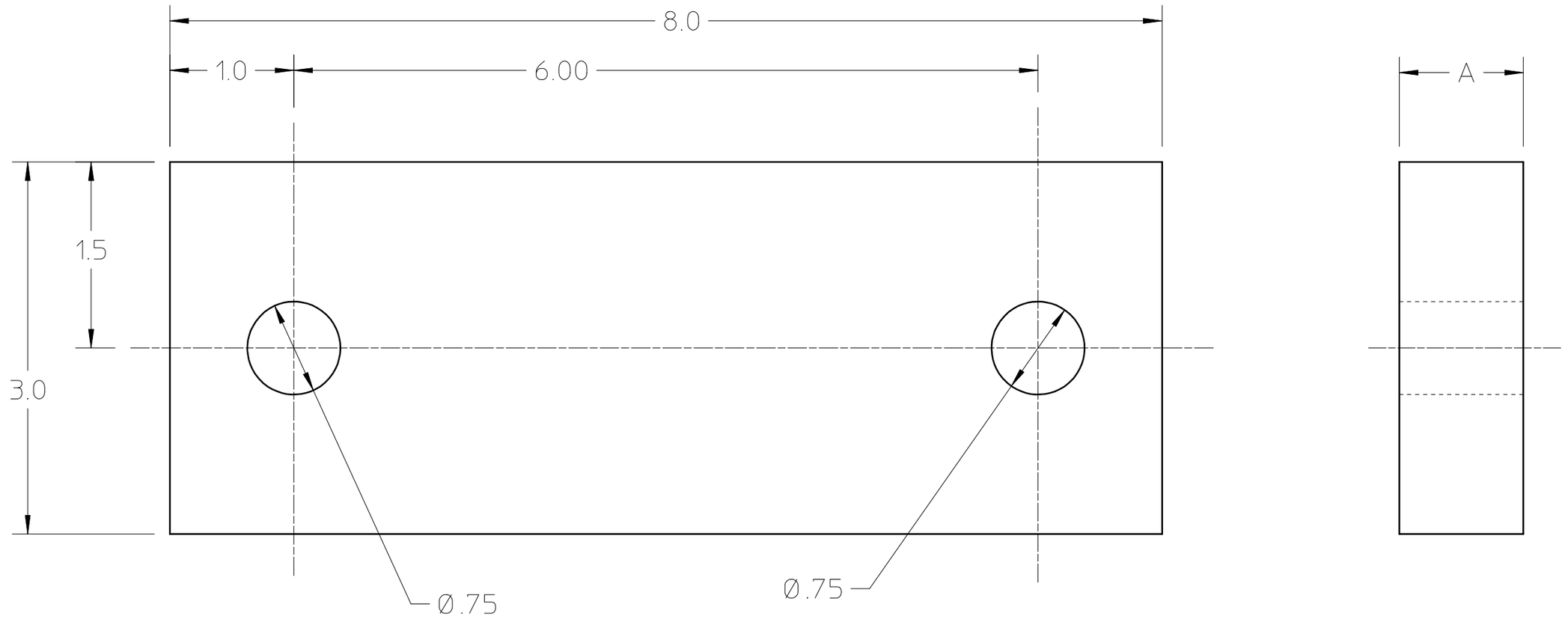
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS - FES RFQ
SUBSYS - ALIGNMENT
LEBT STRUT BRACKET

PATENT CLEAR | DWG. TYPE DETAIL | SHOWN ON 00X0000 | SCALE FULL | DO NOT SCALE PRINTS
MICROFILMED | DESIGN ACCT. NO. 8212-DE | CATEGORY CODE FE3212 | DWG NO. 25B8216 | SIZE - | REV. -

	DIMENSION 'A'
VERSION 1	0.25
VERSION 2	1.0

25B8222	REQD	ITEM	PART NUMBER	DESCRIPTION
				Aluminum



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .02 .XXX ±.003

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO		SER NO
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 11-14-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

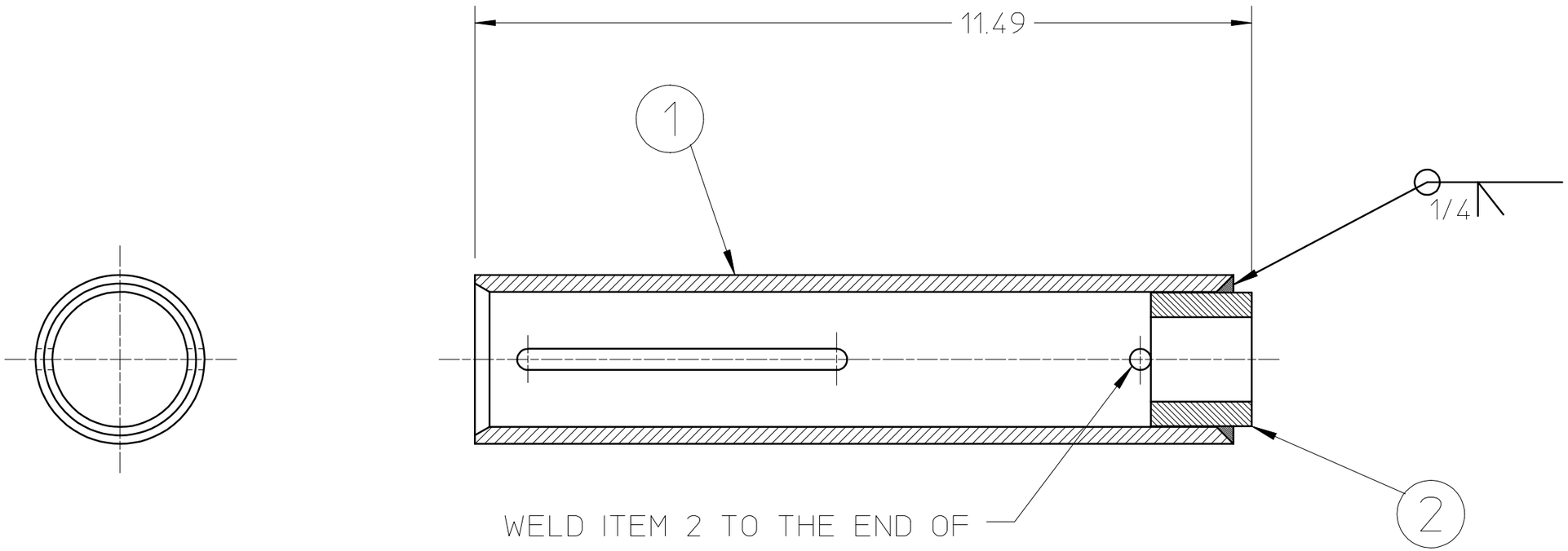
SNS-FE RFQ

SUBSYS - ALIGNMENT

LEBT Strut - Bracket Shim

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DE	FE3212	25B8222

25B8232	REQD	ITEM	PART NUMBER	DESCRIPTION
	1	1	25B8252	Outer tube
	1	2	25B8242	VERS. 2 Inner tube



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .02 .XXX ±.005

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO		SER NO
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 11-12-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

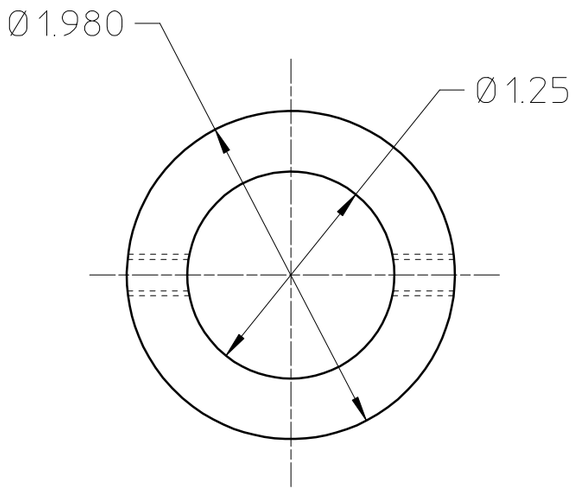
SNS-FE RFQ

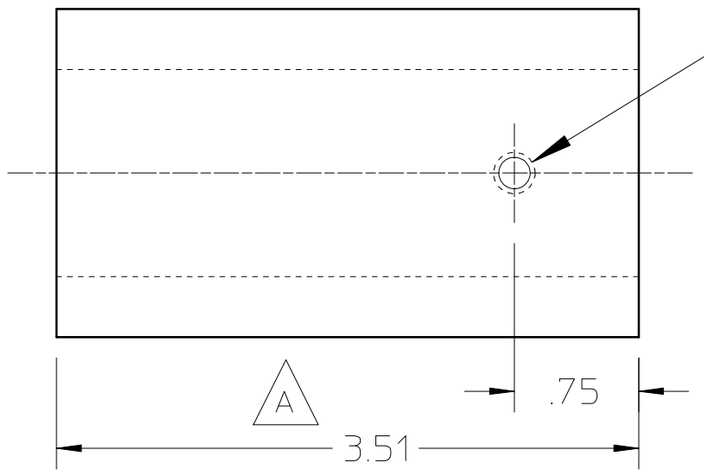
SUBSYS - ALIGNMENT

LEBT Strut - Tube Weld

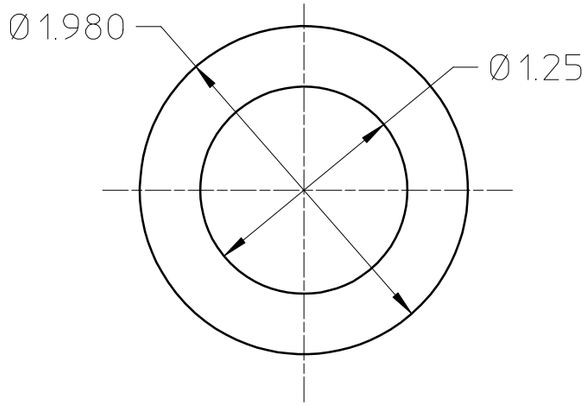
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8212-DE	FE3212	25B8232

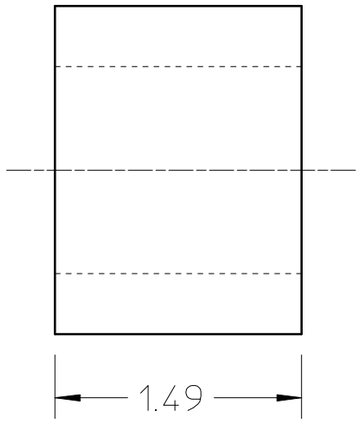
25B8242A	REQD	ITEM	PART NUMBER	DESCRIPTION
				TUBE, 2.0 O.D. X 1.25 I.D. , DOM STEEL





VERSION 1





VERSION 2

REV	DWN	CHK	DATE	DESCRIPTION
A	MDH		12-20-01	3.51 WAS 5.01

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ± .1 .XX ± .02 .XXX ± .003

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 11-09-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY

UNIVERSITY OF CALIFORNIA-BERKELEY

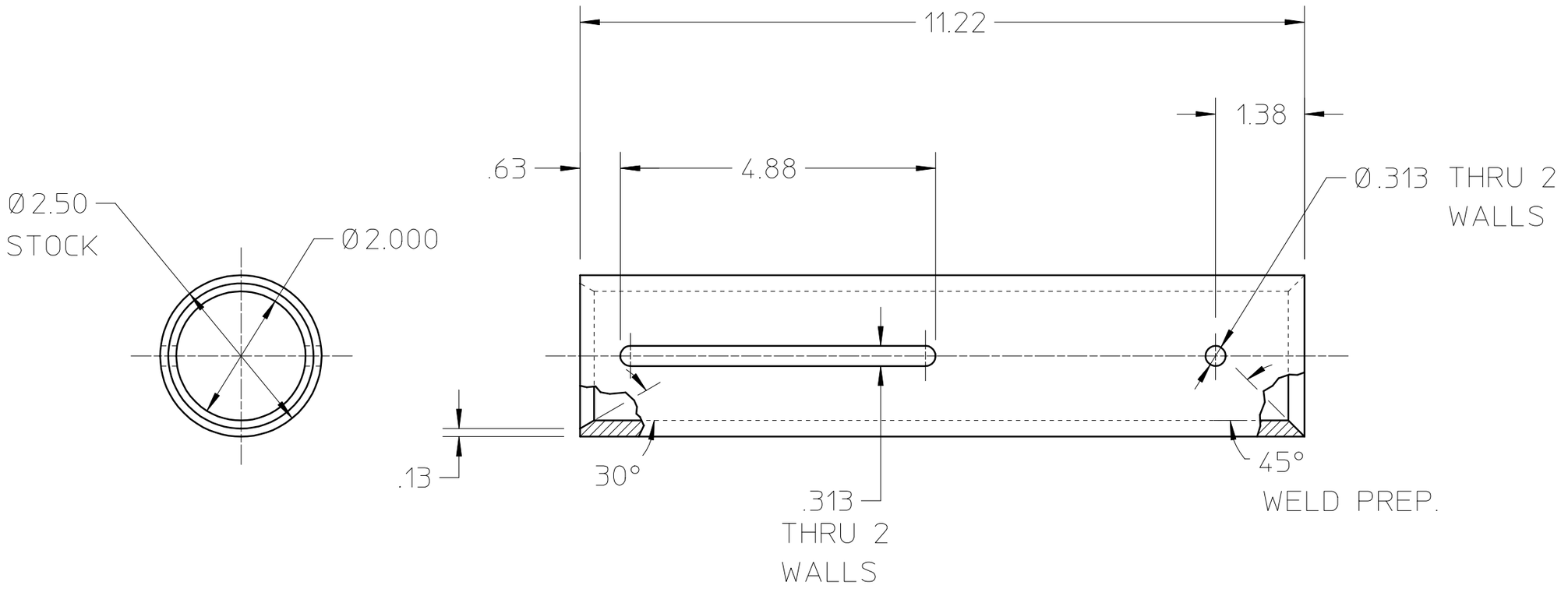
SNS-FE RFQ

SUBSYS - ALIGNMENT

LEBT Strut - Inner Tube

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DE	FE3212	25B8242A

25B8252	REQD	ITEM	PART NUMBER	DESCRIPTION
				TUBE, 2.5 O.D. X 2 I.D. , DOM STEEL



REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .02 .XXX ±.005

SURFACE FINISH 63

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 11-09-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ

SUBSYS - ALIGNMENT

LEBT Strut - Outer Tube

PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: 1:2
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO / REV
	8212-DE	FE3212	25B8252

25B8262	REQD	ITEM	PART NUMBER	DESCRIPTION
				BAR, ROUND Ø2.000, COPPER C10100

.134 ±.003

SPRING SEAL

.28

.125 ±.003

64

2x Ø.040 (#60) drill thru
(weep hole)

Ø1.238 ±.002

SPRING SEAL

Ø1.494 ±.002
O-RING

64

Ø1.990 +.002 -.005

⊥	.002	A

B

.049 ±.003 O-RING

45°

R.005 MAX

32

(Ø1.990)

Ø1.386 ±.002

◎	.002	B

(Ø1.990)

.90

.90

3/8-16 UNC-2B
↧ .500±.030

⌖	Ø .030 Ⓢ	A	B

R.04

.095

A

.25

32

.891±.003

USE A -033 AND -029 O-RING
WITH THIS PART.

REV	DWN	CHK	DATE	DESCRIPTION

UNLESS OTHERWISE SPECIFIED

TOLERANCE .X ±.1 .XX ± .01 .XXX ±.005

SURFACE FINISH 63 √

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.

SHOP ORDERS

ACCT NO	SER NO	
DATE ISSD	DATE REQD	NO REQD
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENTIFIC METHOD	TAG	
DWG BY	Matt Hoff	DATE 11-12-01
CHK BY		DATE

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

SNS-FE RFQ

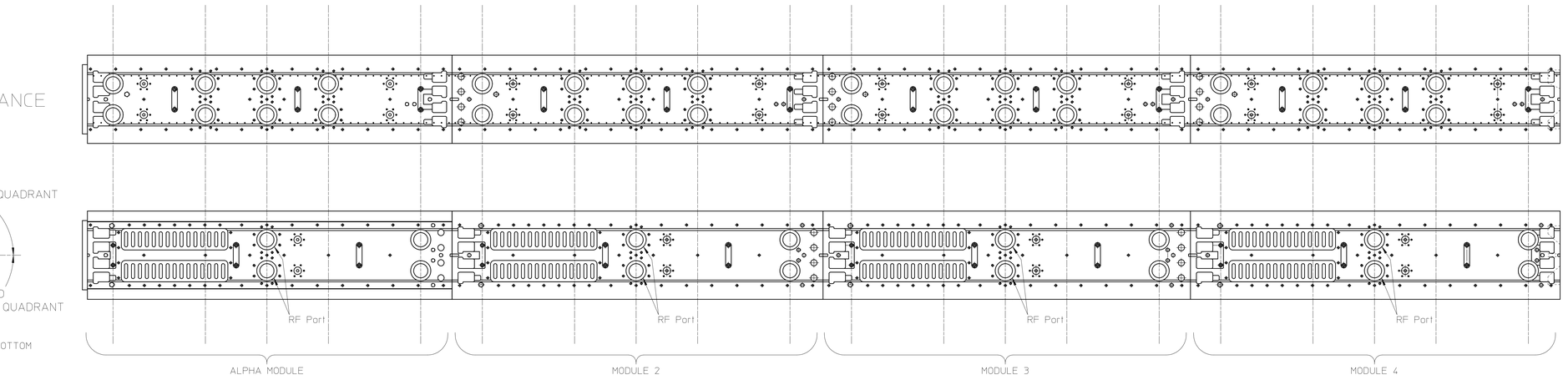
MECHANICAL STRUCTURES

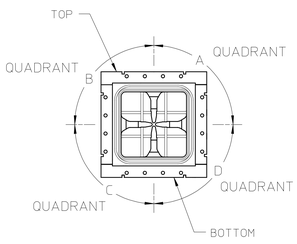
TUNER BLANK with GROOVES and Chamfer

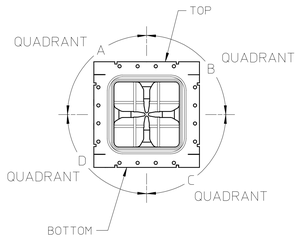
PAT CLEAR	DWG TYPE	SHOWN ON	SCALE: FULL
	DETAIL	00X0000	DO NOT SCALE PRINTS
MICROFILMED	DESIGN ACCT NO	CATEGORY CODE	DWG NO REV
	8212-DB	FE3211	25B8262

BEAM DIRECTION →

TOP VIEW







SIDE VIEW

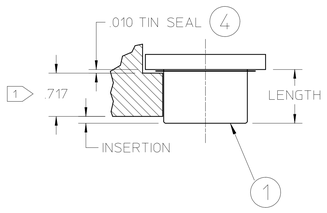
POSITION	QUADRANT A LENGTH	QUADRANT A TUNER STYLE	QUADRANT A INSERTION	QUADRANT B LENGTH	QUADRANT B TUNER STYLE	QUADRANT B INSERTION	QUADRANT C LENGTH	QUADRANT C TUNER STYLE	QUADRANT C INSERTION	QUADRANT D LENGTH	QUADRANT D TUNER STYLE	QUADRANT D INSERTION
1	0.912 IN"	VERSION 2	4.95 MM	0.912 IN"	VERSION 2	4.95 MM	0.912 IN"	VERSION 2	4.95 MM	0.912 IN"	VERSION 2	4.95 MM
2	1.018 IN"	VERSION 1	7.39 MM	1.018 IN"	VERSION 1	7.39 MM	1.018 IN"	VERSION 1	7.39 MM	1.018 IN"	VERSION 1	7.39 MM
3	0.934 IN"	VERSION 1	5.26 MM	0.934 IN"	VERSION 1	5.26 MM	0.934 IN"	VERSION 1	5.26 MM	0.934 IN"	VERSION 1	5.26 MM
4	0.997 IN"	VERSION 1	6.89 MM	0.997 IN"	VERSION 1	6.89 MM	0.997 IN"	VERSION 1	6.89 MM	0.997 IN"	VERSION 1	6.89 MM
5	1.010 IN"	VERSION 1	7.19 MM	1.010 IN"	VERSION 1	7.19 MM	1.010 IN"	VERSION 1	7.19 MM	1.010 IN"	VERSION 1	7.19 MM
6	1.089 IN"	VERSION 1	9.19 MM	1.089 IN"	VERSION 1	9.19 MM	1.089 IN"	VERSION 1	9.19 MM	1.089 IN"	VERSION 1	9.19 MM
7	1.034 IN"	VERSION 1	7.79 MM	1.034 IN"	VERSION 1	7.79 MM	1.034 IN"	VERSION 1	7.79 MM	1.034 IN"	VERSION 1	7.79 MM
8	0.884 IN"	VERSION 1	4.00 MM	0.884 IN"	VERSION 1	4.00 MM	0.884 IN"	VERSION 1	4.00 MM	0.875 IN"	VERSION 3	4.00 MM
9	0.903 IN"	VERSION 1	4.47 MM	0.903 IN"	VERSION 1	4.47 MM	0.903 IN"	VERSION 1	4.47 MM	0.903 IN"	VERSION 1	4.47 MM
10	1.011 IN"	VERSION 1	7.21 MM	1.011 IN"	VERSION 1	7.21 MM	1.011 IN"	VERSION 1	7.21 MM	1.011 IN"	VERSION 1	7.21 MM
11	1.061 IN"	VERSION 1	8.48 MM	1.061 IN"	VERSION 1	8.48 MM	1.061 IN"	VERSION 1	8.48 MM	1.061 IN"	VERSION 1	8.48 MM
12	0.958 IN"	VERSION 1	5.87 MM	0.958 IN"	VERSION 1	5.87 MM	0.958 IN"	VERSION 1	5.87 MM	0.958 IN"	VERSION 1	5.87 MM
13	0.770 IN"	VERSION 1	1.09 MM	0.770 IN"	VERSION 1	1.09 MM	0.770 IN"	VERSION 1	1.09 MM	0.770 IN"	VERSION 1	1.09 MM
14	0.984 IN"	VERSION 1	6.52 MM	0.984 IN"	VERSION 1	6.52 MM	0.984 IN"	VERSION 1	6.52 MM	0.984 IN"	VERSION 1	6.52 MM
15	0.986 IN"	VERSION 1	6.58 MM	0.986 IN"	VERSION 1	6.58 MM	0.986 IN"	VERSION 1	6.58 MM	0.986 IN"	VERSION 1	6.58 MM
16	0.902 IN"	VERSION 1	5.84 MM	0.902 IN"	VERSION 1	5.84 MM	0.957 IN"	VERSION 1	5.84 MM	0.957 IN"	VERSION 1	5.84 MM
17	0.714 IN"	VERSION 1	1.07 MM	0.714 IN"	VERSION 1	1.07 MM	0.769 IN"	VERSION 1	1.07 MM	0.769 IN"	VERSION 1	1.07 MM
18	0.802 IN"	VERSION 1	3.30 MM	0.802 IN"	VERSION 1	3.30 MM	0.857 IN"	VERSION 1	3.30 MM	0.857 IN"	VERSION 1	3.30 MM
19	0.835 IN"	VERSION 1	4.14 MM	0.835 IN"	VERSION 1	4.14 MM	0.890 IN"	VERSION 1	4.14 MM	0.890 IN"	VERSION 1	4.14 MM
20	1.165 IN"	VERSION 1	11.13 MM	1.165 IN"	VERSION 1	11.13 MM	1.165 IN"	VERSION 1	11.13 MM	1.165 IN"	VERSION 1	11.13 MM

B

TUNER STYLE

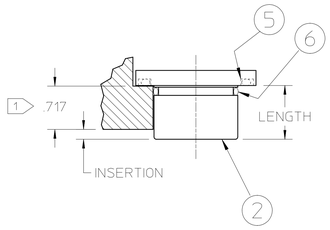
VERSION 1

TIN SEAL



VERSION 2

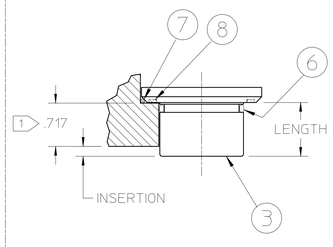
O-RING AND
CANTED SPRING SEAL



Insertion assumes squeezing the O-ring until until metal to metal contact is achieved.

VERSION 3

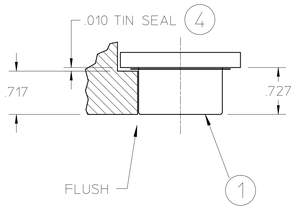
DOUBLE O-RING AND
CANTED SPRING SEAL



Insertion assumes squeezing the O-ring until until metal to metal contact is achieved.

UNUSED RF PORT

TIN SEAL



1 THE USUAL WALL THICKNESS OF .717 is .662 AT THE FOLLOWING LOCATIONS:
POSITION 16, QUADRANTS A and B
POSITION 17, QUADRANTS A and B
POSITION 18, QUADRANTS A and B
POSITION 19, QUADRANTS A and B

INSERTION LENGTHS IN THE TABLE ACCOUNT FOR THIS DIFFERENCE IN WALL THICKNESS.

25B8276B

REQD	ITEM	PART NO	DESCRIPTION
	9		
A/R	8		O-RING 2-029 VITON
A/R	7		O-RING 2-033 BUNA-N
A/R	6		CANTED RF SPRING 105LB-(1.2)BEC-2 BAL-SEAL ENGR.
A/R	5		O-RING 2-222 VITON
A/R	4	25B2592	TIN SEAL VERSION 1
A/R	3	25B8262	TUNER WITH GROOVE AND CHAMFER
A/R	2	25B6752	TUNER WITH GROOVE
A/R	1	25B2972	SLUG TUNER

REV	DWG	CHK	ZONE	DATE	CHANGES
B	MDH			12-11-01	position 2 was .985 in" and 6.55 MM
A	MDH			12-10-01	UPDATED TUNER LENGTHS TO AS BUILT DIMENSIONS

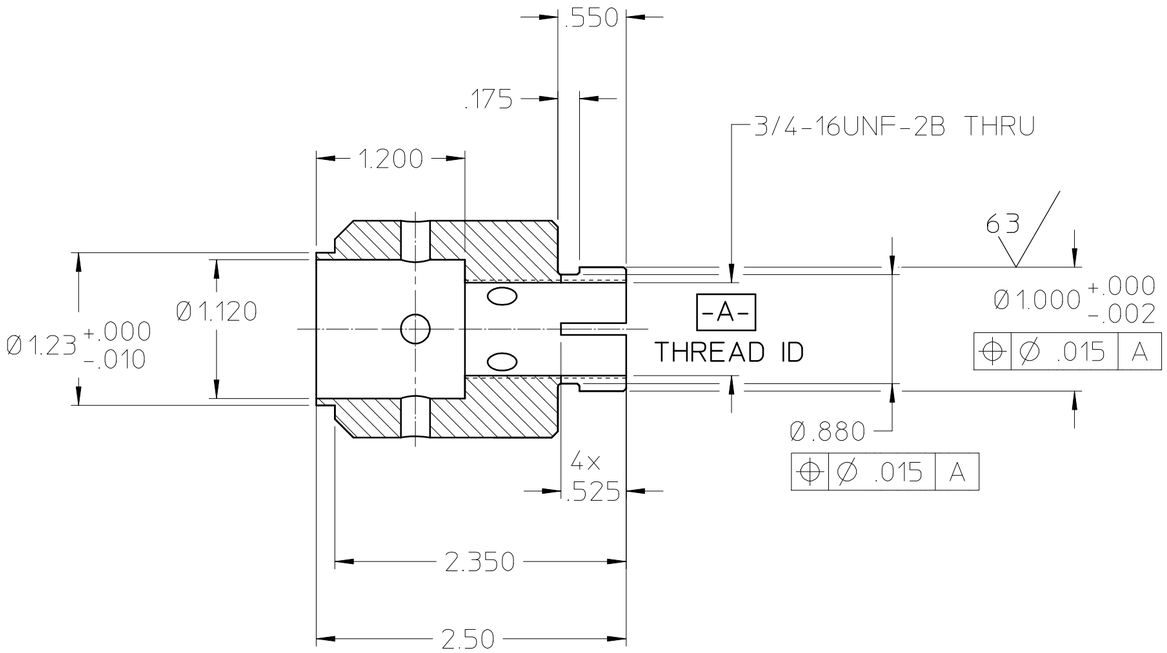
UNLESS OTHERWISE SPECIFIED
TOLERANCES: .X ± .1 FRAC. ± 1/64; .XX ± .01 ANGLES ± 1°; .XXX ± .001 FINISH 125
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK.
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & 846.1

SHOP ORDERS
ACCT. NO. – SERIAL NO. –
DATE ISSD. – DATE REQD. – NO REQD. –
DELIVER TO –
SURFACE TREATMENT –
IDENT. METH. –
DWG. BY Matt Hoff DATE 11-27-01
CHK. BY – DATE –

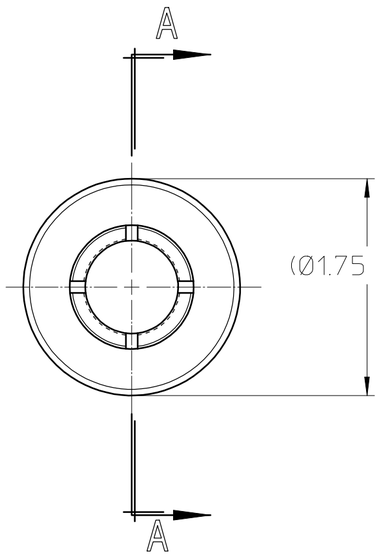
LAWRENCE BERKELEY NATIONAL LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY
SNS FES - RFQ
MECHANICAL STRUCTURES
TUNER LENGTH

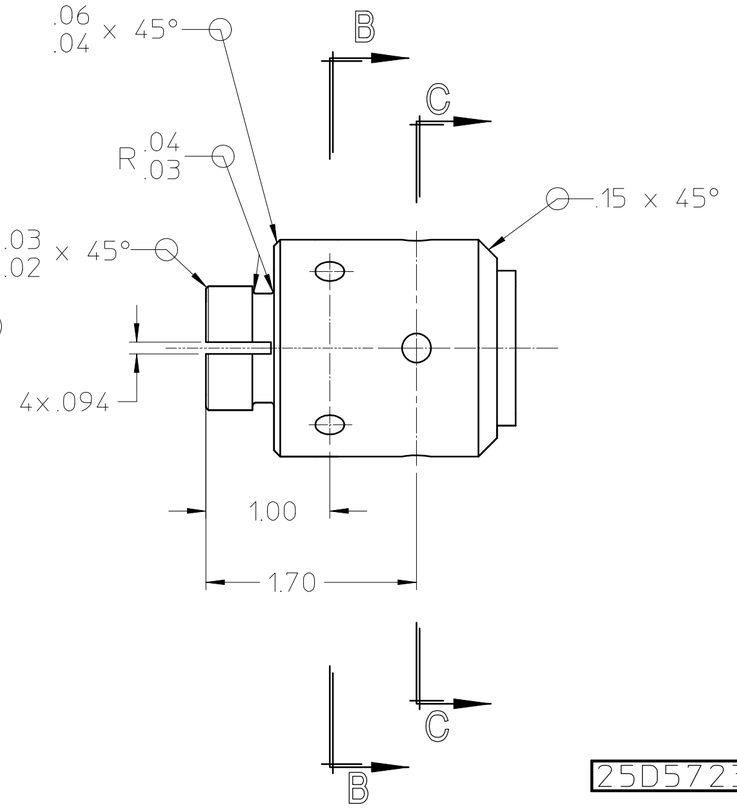
PATENT CLEAR – DWG. TYPE ASSEMBLY – SHOWN ON – SCALE 1:5 – DO NOT SCALE PRINTS
MICROFILMED – DESIGN ACCT. NO. 8212DB – CATEGORY CODE FE3211 – DWG. NO. 25B8276 – SIZE B – REV. B

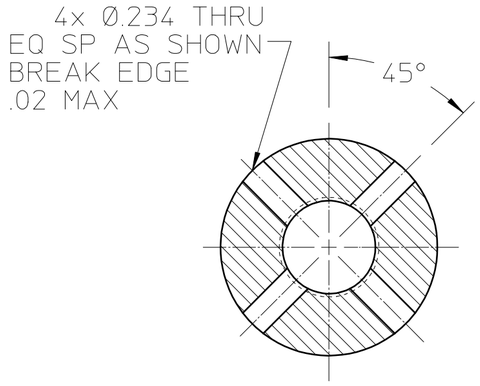
REQ	ITEM	PART NUMBER	DESCRIPTION
		-----	BAR - ROUND Ø1.75 1018 CRS



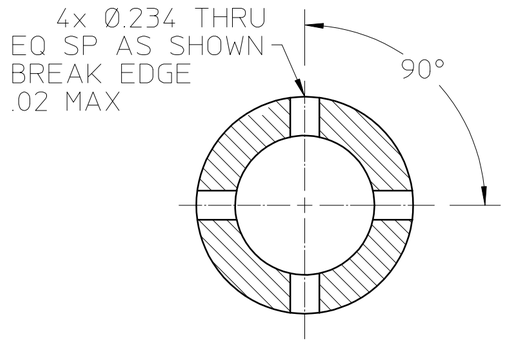
SECTION A - A







SECTION B - B



SECTION C - C

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES		
	.X ± .1	FRAC. ±
	.XX ± .03	ANGLES ±1/2°
	.XXX ± .010	FINISH 125

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5M - 1994

SHOP ORDERS

ACCT. NO.	SERIAL NO.	
DATE ISSD	DATE REQD.	NO. REQD.
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENT. METH.		
DWG. BY lim	DATE 04/05/99	
CHK. BY T LAURITZEN	DATE 04/05/99	

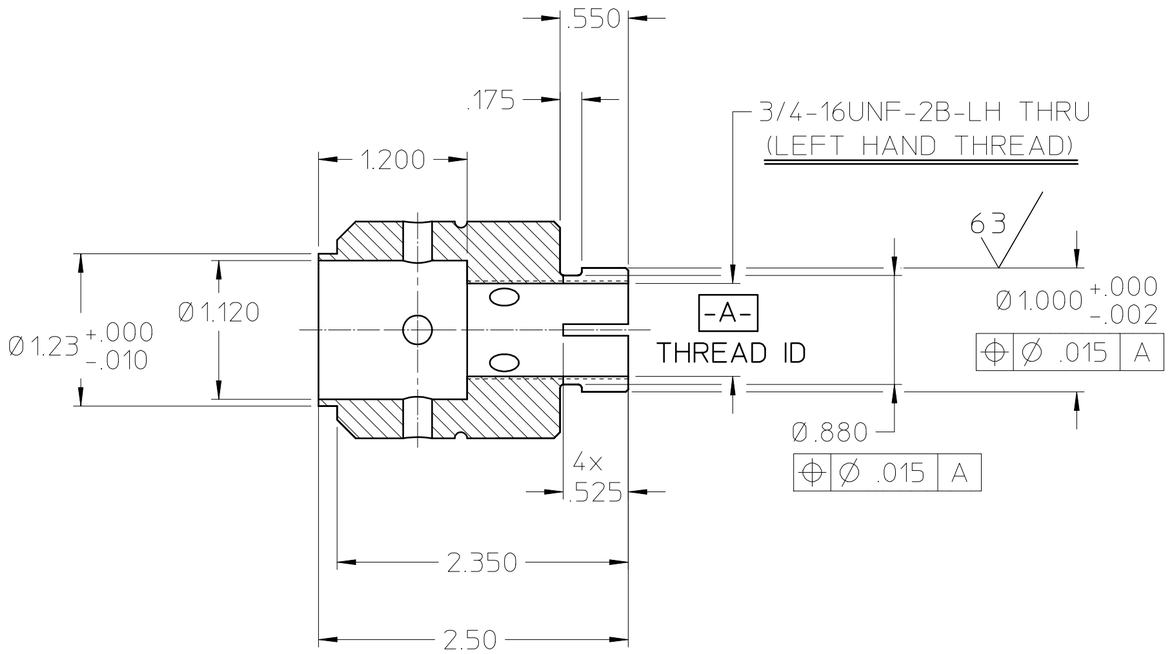
LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

ALS - BEAMLINES
MOUNTING & SUPPORT EQUIPMENT
STRUT STUB END - RH THREAD (3/4-16UNF)

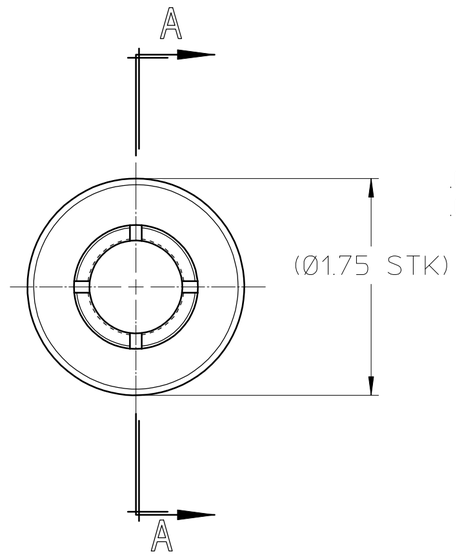
PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1/1	DO NOT SCALE PRINTS
	CDET	25D8986	DWG. NO. 25D5723	SIZE / REV. -
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE AL2012		

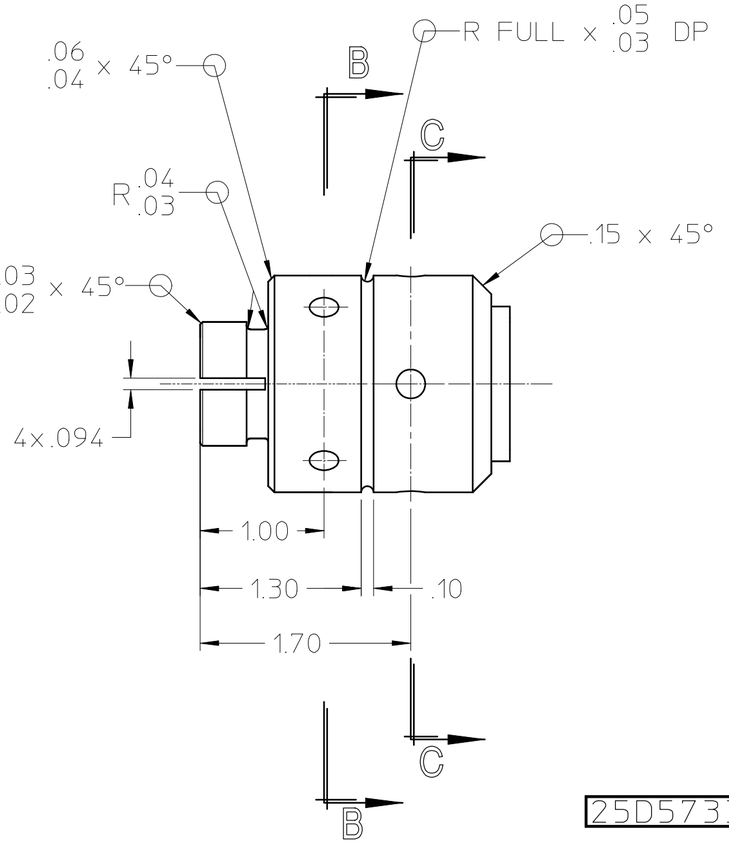
25D5723-

REQ	ITEM	PART NUMBER	DESCRIPTION
		-----	BAR - ROUND Ø1.75 1018 CRS

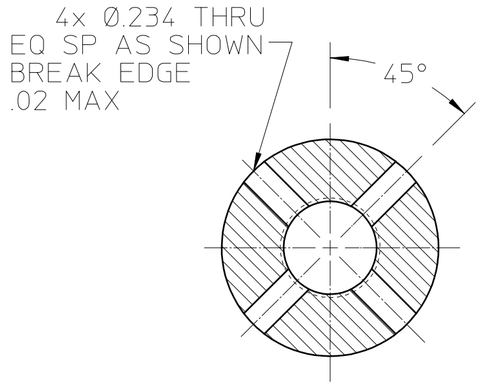


SECTION A - A

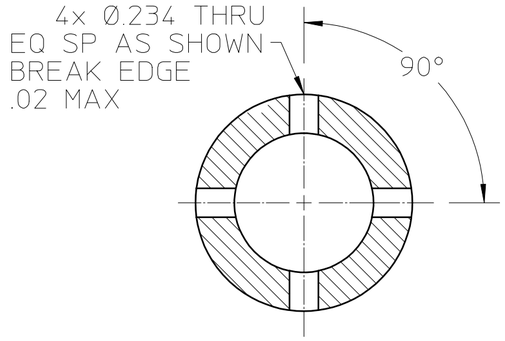




25D5733-



SECTION B - B



SECTION C - C

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

TOLERANCES		
	.X ± .1	FRAC. ±
	.XX ± .03	ANGLES ±1/2°
	.XXX ± .010	FINISH 125√

THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°.
CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL
ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5M - 1994

SHOP ORDERS

ACCT. NO.	SERIAL NO.	
DATE ISSD	DATE REQD.	NO. REQD.
DELIVER TO		
SURFACE TREATMENT	DEGREASE	
IDENT. METH.		
DWG. BY lim		DATE 04/05/99
CHK. BY T LAURITZEN		DATE 04/05/99

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

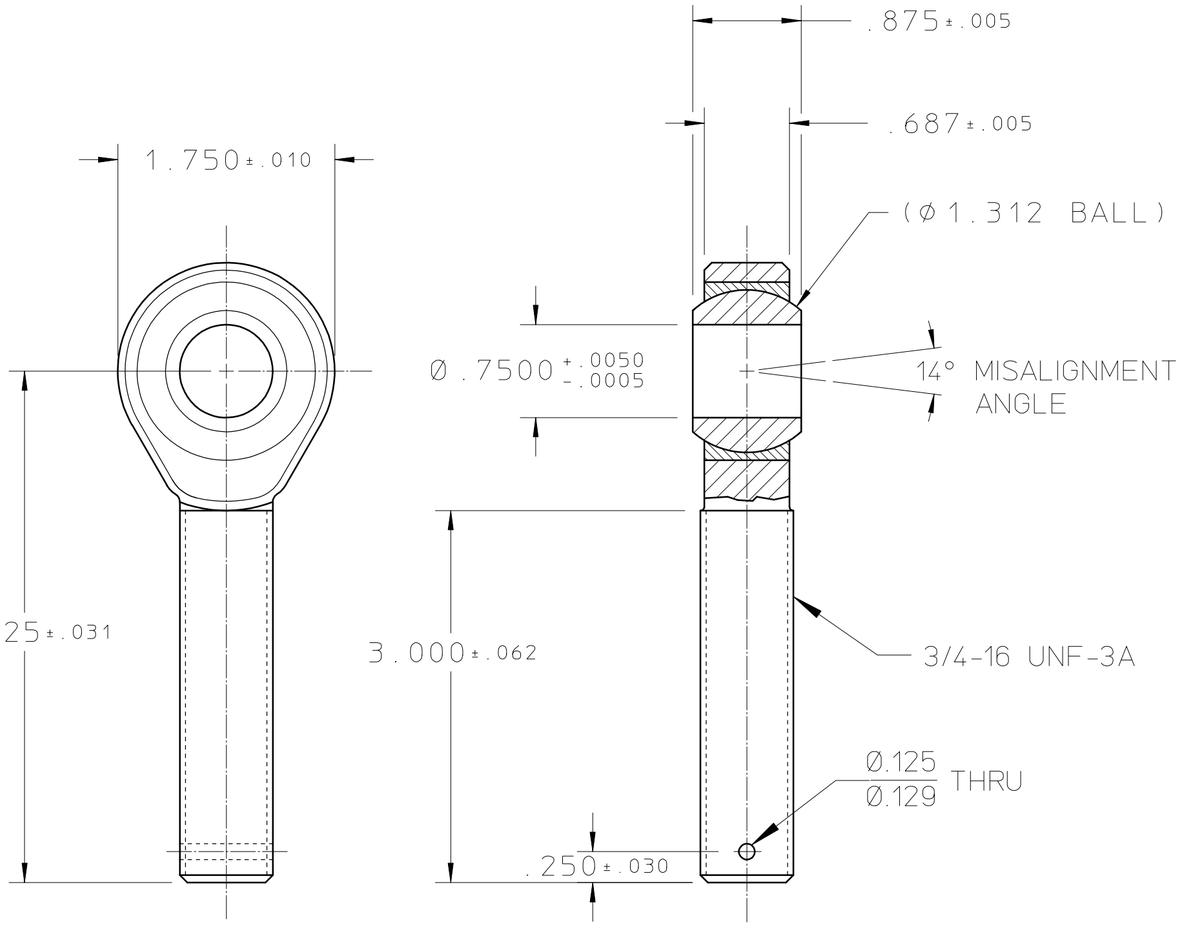
ALS - BEAMLINES

MOUNTING & SUPPORT EQUIPMENT

STRUT STUB END - LH THREAD (3/4-16UNF)

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1/1	DO NOT SCALE PRINTS
	CDET	25D8986	DWG. NO. 25D5733	SIZE / REV. -
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE AL2012		

REQ	PART NUMBER	DESCRIPTION
	MM-12D-27	Male Rod End, .750" Bore, 3/4-16UNF-3A, Steel, Aurora Bearing Co



SPECIFICATIONS:

BODY: CARBON STEEL
PROTECTIVE COATED FOR CORROSION RESISTANCE.
SOLID SHANK, NO LUBRICATION FITTING.

RACE: CARBON STEEL, PROTECTIVE COATED FOR CORROSION RESISTANCE. SOLID OR DRY FILM LUBRICANT ON INSIDE DIAMETER.

BALL: ALLOY STEEL, HEAT TREATED
HARD CHROME PLATED

PRELOAD: THIS ROD END BEARING MUST BE MANUFACTURED WITH A PRELOAD IN ORDER TO ELIMINATE ALL CLEARANCE AND TO INSURE A TIGHT FIT BETWEEN THE BEARING BALL AND ITS OUTER RACE. NORMALLY THE ROD END BEARING WILL BE USED IN A STATIC CONDITION. THE BALL WILL ONLY OCCASIONALLY MOVE WITH RESPECT TO ITS OUTER RACE. DUE TO THE NORMAL STATIC CONDITION OF THE BEARING, THE TORQUE REQUIRED TO MOVE THE BALL IS REFERRED TO AS "BREAKAWAY TORQUE".

25D5743A

THE SPECIFIED BREAKAWAY TORQUE CRITERIA SHALL BE MET AFTER OSCILLATING THE BALL THROUGH ITS TOTAL MISALIGNMENT CONE A MINIMUM OF 10 FULL CYCLES.

ROD END BEARINGS FALLING OUTSIDE THE SPECIFIED BREAKAWAY TORQUE RANGE WILL NOT BE ACCEPTED.

(A) RADIAL STATIC LOAD CAPACITY: 10,000 LBS.

SPECIFIED BREAKAWAY TORQUE RANGE: 10 TO 100 INCH/POUNDS

REV	DWG	CHK	ZONE	DATE	CHANGES
A			2/A	9/1/99	WAS: ULTIMATE RADIAL STATIC LOAD CAPACITY 10,000lbs MIN

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± FRAC. ± | .XX ± ANGLES ± | .XXX ± FINISH √

CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS.
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS WELD SPLATTER & LOOSE SCALE
REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

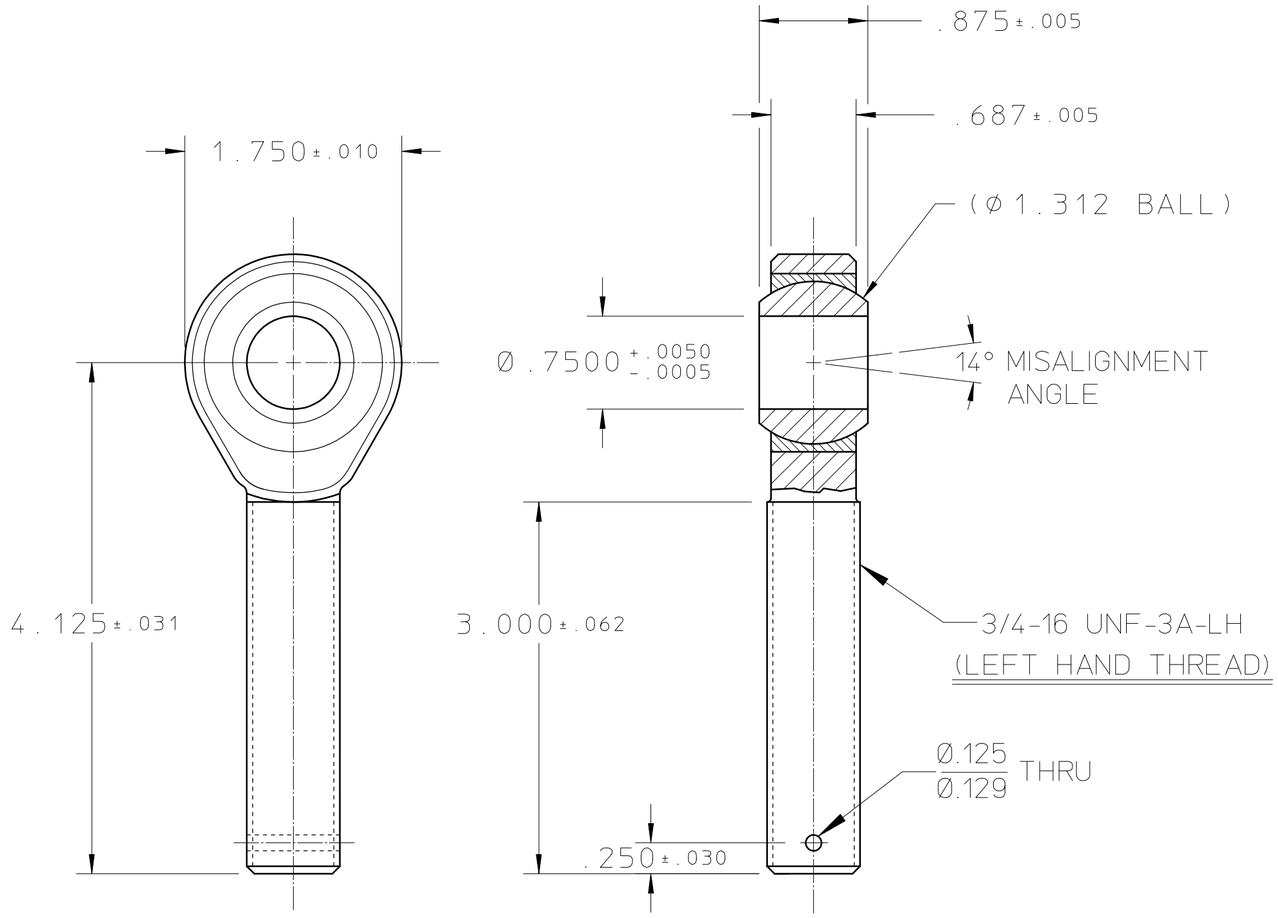
ACCT. NO. | SERIAL NO.
DATE ISSD | DATE REQD. | NO. REQD.
DELIVER TO
SURFACE TREATMENT
IDENT. METH.
DWG. BY lim | DATE 06/01/99
CHK. BY T. LAURITZEN | DATE 06/01/99

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

ALS - BEAMLINES
MOUNTING & SUPPORT EQUIPMENT
3/4" STRUT ROD END - RH FINE THREAD

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1/1	DO NOT SCALE PRINTS
	CDET	25D8986	DWG. NO. 25D5743	SIZE A / REV. A
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE AL2012		

REQ	PART NUMBER	DESCRIPTION
	MB-12D-27	Male Rod End, .750" Bore, 3/4-16UNF-3A LEFT HAND THREAD Steel, Aurora Bearing Company



SPECIFICATIONS:

BODY: CARBON STEEL
PROTECTIVE COATED FOR CORROSION RESISTANCE.
SOLID SHANK, NO LUBRICATION FITTING.

RACE: CARBON STEEL, PROTECTIVE COATED FOR CORROSION RESISTANCE. SOLID OR DRY FILM LUBRICANT ON INSIDE DIAMETER.

BALL: ALLOY STEEL, HEAT TREATED
HARD CHROME PLATED

PRELOAD: THIS ROD END BEARING MUST BE MANUFACTURED WITH A PRELOAD IN ORDER TO ELIMINATE ALL CLEARANCE AND TO INSURE A TIGHT FIT BETWEEN THE BEARING BALL AND ITS OUTER RACE. NORMALLY THE ROD END BEARING WILL BE USED IN A STATIC CONDITION. THE BALL WILL ONLY OCCASIONALLY MOVE WITH RESPECT TO ITS OUTER RACE. DUE TO THE NORMAL STATIC CONDITION OF THE BEARING, THE TORQUE REQUIRED TO MOVE THE BALL IS REFERRED TO AS "BREAKAWAY TORQUE".

25D5753A

THE SPECIFIED BREAKAWAY TORQUE CRITERIA SHALL BE MET AFTER OSCILLATING THE BALL THROUGH ITS TOTAL MISALIGNMENT CONE A MINIMUM OF 10 FULL CYCLES.

ROD END BEARINGS FALLING OUTSIDE THE SPECIFIED BREAKAWAY TORQUE RANGE WILL NOT BE ACCEPTED.

(A) RADIAL STATIC LOAD CAPACITY: 10,000 LBS.

SPECIFIED BREAKAWAY TORQUE RANGE: 10 TO 100 INCH/POUNDS

REV	DWG	CHK	ZONE	DATE	CHANGES
A			2/B	9/1/99	WAS: ULTIMATE RADIAL STATIC LOAD CAPACITY: 10,000 lbs MIN.

UNLESS OTHERWISE SPECIFIED

TOLERANCES: .X ± FRAC. ± | .XX ± ANGLES ± | .XXX ± FINISH √

CHAMFER ENDS OF ALL SCREW THREADS 30°. CUT 1.5 PITCH THRD RELIEF WITH ROUND NOSE TOOL ON MACHINE CUT THREADS. BREAK EDGES .016 MAX. ON MACHINED WORK REMOVE BURRS WELD SPLATTER & LOOSE SCALE REFERENCES: ANSI Y14.5 & B46.1.

SHOP ORDERS

ACCT. NO.	SERIAL NO.	
DATE ISSD	DATE REQD.	NO. REQD.
DELIVER TO		
SURFACE TREATMENT		
IDENT. METH.		
DWG. BY lim	DATE 06/01/99	
CHK. BY T. LAURITZEN	DATE 06/01/99	

LAWRENCE BERKELEY LABORATORY
UNIVERSITY OF CALIFORNIA-BERKELEY

ALS - BEAMLINES

MOUNTING & SUPPORT EQUIPMENT

3/4" STRUT ROD END - LH FINE THREAD

PATENT CLEAR	DWG. TYPE	SHOWN ON	SCALE 1/1	DO NOT SCALE PRINTS
	CDET	25D8986	DWG. NO. 25D5753	SIZE A / REV. A
MICROFILMED	DESIGN ACCT. NO.	CATEGORY CODE AL2012		

Active links shown in blue.
Drawing number format: *serial no_drawing size_revision letter.*

ITEM	DWG NO.	TITLE
1	20Q536_3_D	SURVEY FIDUCIAL POST
2	25B028_6_A	ALPHA MODULE GLIDCOP MACHINING, MAJOR VANE
3	25B029_6_A	ALPHA MODULE GLIDCOP MACHINING MINOR VANE
4	25B030_6_B	ALPHA MODULE C101 MACHINING MAJOR VANE
5	25B031_6_B	ALPHA MODULE C101 MACHINING MINOR VANE
6	25B032_6	ALPHA MODULE CHANNEL DETAILS MAJOR VANE
7	25B033_6	ALPHA MODULE CHANNEL DETAILS MINOR VANE
8	25B044_2_A	10" MODEL COPPER DOWEL PIN
9	25B045_6	ALHPA MODULE C101 BRAZE PREP MAJOR VANE
10	25B046_6	ALPHA MODULE C101 BRAZE PREP MINOR VANE
11	25B049_4_A	ALPHA MODULE - SQUIRT TUBE HOLDER
12	25B050_2	ALPHA MODULE - SQUIRT TUBE
13	25B051_4_B	ALPHA MODULE - CENTER TONGUE
14	25B064_2	ALPHA MODULE C101 EXTENSION MAJOR VANE
15	25B065_6	ALPHA MODULE TONGUE BRAZE MAJOR VANE
16	25B066_6	ALPHA MODULE TONGUE BRAZE MINOR VANE
17	25B067_6	ALPHA MODULE HORIZONTAL BRAZE MAJOR VANE
18	25B068_6	ALPHA MODULE HORIZONTAL BRAZE MINOR VANE
19	25B080_3_A	BRAZING CORNER CLAMP
20	25B083_4	Pi-MODE STABILIZER ROD INSTALLATION
21	25B089_2	SWAGED Pi-MODE STABILIZER ROD
22	25B090_2	Pi-MODE STABILIZER ROD FERRULE
23	25B091_4	ELECTROFORMING FRAME RAIL
24	25B092_4	ELECTROFORMING FRAME HOOK
25	25B094_6_B	ALPHA MODULE MAJOR VANE PORT MACHINING
26	25B095_6 _A	ALPHA MODULE MINOR VANE PORT MACHINING
27	25B096_6_A	ALPHA MODULE MAJOR VANE ROUGH-OUT
28	25B097_6_A	ALPHA MODULE MINOR VANE ROUGH-OUT
29	25B098_6_D	VACUUM PORT MANIFOLD
30	25B099_6_A	GRINDING FIXTURE
31	25B205_6_C	ALPHA MODULE MAJOR VANE FINISH MACHINING
32	25B206_6_C	ALPHA MODULE MINOR VANE FINISH MACHINING
33	25B217_6	END BLOCK - ROUGH MACHINING
34	25B218_6	END BLOCK - FINISH MACHINING - A
35	25B219_6	END BLOCK - FINISH MACHINING - B
36	25B220_4	END PLATE WITH O-RING GROOVE
37	25B221_4	END PLATE FOR BEAD PULL
38	25B222_4	END PLATE - NO GROOVE
39	25B228_2	VANE HANDLING FIXTURE
40	25B233_2	Pi-MODE STABILIZER ROD SWAGE TOOL
41	25B234_2	SWAGED BRAZING WASHER
42	25B235_2	Pi MODE STABILIZER ROD SPACING TOOL
43	25B237_6	ALPHA MODULE VERTICAL BRAZE ASSEMBLY
44	25B238_6_A	FRAME - RFQ BRAZEMENT FIXTURE (sheet 1 of 2)
45	25B238_6_A	FRAME - RFQ BRAZEMENT FIXTURE (sheet 2 of 2)
46	25B239_1_A	FRAME ADJUSTMENT, THREADED ROD LH/RH (1/4-28UNF)
47	25B240_1_A	NUT, KNURLED 1.00 OD X 1/4-28UNF

48	25B242_3_A	CAP, TUNER
49	25B243_4_A	TUNER
50	25B244_2_B	SCREW, TUNER ADJUSTMENT
51	25B245_2_A	SHIM, TUNER
52	25B246_2_A	BLANK, TUNER
53	25B247_2_B	RETAINING DISKS, TUNER
54	25B255_2_A	ALPHA MODULE LIFTING LUG
55	25B256_2	ALPHA MODULE LIFTING SPREADER BAR
56	25B257_6_A	ALPHA MODULE MAJOR VANE CUTBACK MACHINING
57	25B258_6_A	ALPHA MODULE MINOR VANE CUTBACK MACHINING
58	25B259_2_B	ALPHA MODULE TIN SEAL
59	25B260_1	TUBE, SENSOR LOOP
60	25B261_1	BODY - SENSOR LOOP
61	25B262_6_A	ALPHA MODULE MAJOR VANE FINISH TRIM
62	25B263_6_A	ALPHA MODULE MINOR VANE FINISH TRIM
63	25B264_3	ASSEMBLY - SENSOR LOOP
64	25B265_1	CENTER PIN
65	25B266_1	CONNECTOR MODIFICATION
66	25B267_6_B	RFQ VACUUM MANIFOLD WELD ASSEMBLY
67	25B269_6	MAJOR VANE MODIFICATION FOR SHIM
68	25B270_2	VANE REPAIR SHIM
69	25B273_2	CORNER CLAMP SHACKLE BRACKET
70	25B278_2_A	TONGUE LOCKING SCREW
71	25B279_4	SQUIRT TUBE
72	25B288_4_A	MODULE 2 FIDUCIALIZATION
73	25B289_4_A	MODULE 3 FIDUCIALIZATION
74	25B290_4_A	MODULE 4 FIDUCIALIZATION
75	25B291_4	END PLATE - COOLED - NO GROOVE
76	25B292_4	END PLATE - COOLED - WITH GROOVE
77	25B293_6	VACUUM PORT BLANK OFF PLATE
78	25B294_4	VACUUM PORT BLANK OFF FLANGE ASSEMBLY
79	25B297_2	SLUG TUNER
80	25B299_4_A	COOLING CONNECTOR - STYLE D
81	25B300_2	DIVERTER INSERT TOOL
82	25B301_2	SPREADER BAR LIFTING ARRANGEMENT
83	25B302_6_A	ALPHA MODULE END WALL MACHINING
84	25B306_6	MAJOR VANE - C101 MACHINING
85	25B307_6	MAJOR VANE - C101 MACHINING WITH SQUIRT HOLE
86	25B308_6	MINOR VANE - C101 MACHINING
87	25B309_6	MINOR VANE - C101 MACHINING WITH SQUIRT HOLE
88	25B310_6	MAJOR VANE - CHANNEL DETAILS
89	25B311_6	MINOR VANE - CHANNEL DETAILS
90	25B312_6	MAJOR VANE - GLIDCOP MACHINING
91	25B313_6	MINOR VANE - GLIDCOP MACHINING
92	25B314_6	MAJOR VANE - BRAZE PREP
93	25B315_6_A	MINOR VANE - BRAZE PREP
94	25B316_4	STEPPED CENTER TONGUE - SHORT
95	25B317_6	CENTER TONGUE ASSEMBLY
96	25B318_6	MAJOR VANE ROUGH-OUT
97	25B319_6	MINOR VANE ROUGH-OUT

98	25B320_6_A	MAJOR VANE HORIZONTAL BRAZE
99	25B321_6_A	MINOR VANE HORIZONTAL BRAZE
100	25B322_4_A	ALPHA MODULE FIDICIALIZATION
101	25B323_2	RFQ BARREL NUT
102	25B324_6	MINOR VANE GRINDING FIXTURE
103	25B325_6	MODULE 2 MAJOR VANE PORT MACHINING
104	25B326_6_B	MODULE 2 MINOR VANE PORT MACHINING
105	25B327_1	TEMP DETECTOR - INSULATOR 1
106	25B328_1	TEMP DETECTOR - INSULATOR 2
107	25B333_6	MODULE 3 MAJOR VANE PORT MACHINING
108	25B334_6_A	MODULE 3 MINOR VANE PORT MACHINING
109	25B335_6	MODULE 4 MAJOR VANE PORT MACHINING
110	25B336_6_A	MODULE 4 MINOR VANE PORT MACHINING
111	25B337_6_A	MODULE 2 MAJOR VANE FINISH MACHINING
112	25B338_6_A	MODULE 2 MINOR VANE FINISH MACHINING
113	25B339_6_A	MODULE 3 MAJOR VANE FINISH MACHINING
114	25B340_6_A	MODULE 3 MINOR VANE FINISH MACHINING
115	25B341_6_A	MODULE 4 MAJOR VANE FINISH MACHINING
116	25B342_6_A	MODULE 4 MINOR VANE FINISH MACHINING
117	25B343_6	MODULE 2 MAJOR VANE TRIM
118	25B344_6	MODULE 2 MINOR VANE TRIM
119	25B345_6	MODULE 3 MAJOR VANE TRIM
120	25B346_6	MODULE 3 MINOR VANE TRIM
121	25B347_6	MODULE 4 MAJOR VANE TRIM
122	25B348_6	MODULE 4 MINOR VANE TRIM
123	25B349_6_B	MODULE 2 END WALL MACHINING
124	25B350_6_B	MODULE 3 END WALL MACHINING
125	25B351_2	HORIZONTAL BRAZE FIXTURE TIE-ROD
126	25B352_6	MAJOR VANE HORIZONTAL BRAZE FIXTURE ASSY
127	25B353_6	MINOR VANE HORIZONTAL BRAZE FIXTURE ASSY
128	25B354_4	HORIZONTAL BRAZE FIXTURE - CLAMP A
129	25B355_2	HORIZONTAL BRAZE FIXTURE - CLAMP B
130	25B356_4	HORIZONTAL BRAZE FIXTURE - CLAMP C
131	25B357_2	HORIZONTAL BRAZE FIXTURE - CLAMP D
132	25B358_2_A	HORIZONTAL BRAZE FIXTURE - CLAMP BAR
133	25B359_4	BRAZE JOINT - MINOR VANE
134	25B360_4_B	BRAZE JOINT SHEET - MAJOR VANE
135	25B361_4_A	RFQ STRUT MOUNT
136	25B362_6_A	3/4" BASIC TURNBUCKLE STRUT
137	25B364_6_A	RFQ SUPPORT BASE (sheet 1 of 3)
138	25B364_6_A	RFQ SUPPORT BASE (sheet 2 of 3)
139	25B364_6_A	RFQ SUPPORT BASE (sheet 3 of 3)
140	25B366_2	.310-20 SCREWS
141	25B367_4_A	FIDUCIAL POST LOCATION HOLE MACHINING
142	25B368_6	MODULE 2 VERTICAL BRAZE ASSEMBLY
143	25B369_6	MODULE 3 VERTICAL BRAZE ASSEMBLY
144	25B370_6	MODULE 4 VERTICAL BRAZE ASSEMBLY
145	25B371_6_D	MODULE 4 END WALL MACHINING
146	25B372_2_A	Pi-MODE STABILIZER ROD BRAZE WIRE RING
147	25B374_4	Pi-MODE VACUUM LEAK REPAIR

148	25B489_6_D	RFQ END PLATE
149	25B604_6_A	RFQ ASSEMBLY
150	25B616_6	ALPHA MODULE ASSEMBLY
151	25B617_6	MODULE 2 ASSEMBLY
152	25B618_6	MODULE 3 ASSEMBLY
153	25B619_6	MODULE 4 ASSEMBLY
154	25B620_6_A	RFQ SUB-ASSEMBLY
155	25B675_2	TUNER BLANK WITH GROOVES
156	25B679_2	BEAD PULL END PLATE EXTENDER
157	25B743_6_A	RF DISTRIBUTION ASSEMBLY
158	25B800_2	CHOPPER TARGET - 4 PIECE
159	25B801_2	CHOPPER TARGET SHIELD RING
160	25B804_4	EXIT VALVE RETAINING FLANGE
161	25B808_6_A	SPLIT FLANGE - DOWNSTREAM
162	25B809_6	SPLIT FLANGE - UPSTREAM
163	25B810_2_A	CONNECTOR MOUNTING PLATE
164	25B811_2	CONNECTOR ASSEMBLY
164	25B818_6	LEBT DIAGNOSTIC ASSEMBLY
165	25B819_2	ENTRANCE END TUNER INSERT
166	25B820_6_A	LEBT STRUT ASSEMBLY
167	25B821_6	LEBT STRUT BRACKET
168	25B822_2	LEBT STRUT - BRACKET SHIM
169	25B823_2	LEBT STRUT - TUBE WELD
170	25B824_2_A	LEBT STRUT INNER TUBE
171	25B825_2	LEBT STRUT - OUTER TUBE
172	25B826_2	TUNER BLANK WITH GROOVES AND CHAMFER
173	25B827_6_B	TUNER LENGTH
174	25D572_3	STRUT STUB END - RH THREAD (3/4-16UNF)
175	25D573_3	STRUT STUB END - LH THREAD (3/4-16UNF)
176	25D574_3_A	3/4" STRUT ROD END - RH FINE THREAD
177	25D575_3_A	3/4" STRUT ROD END - LH FINE THREAD