

SUSPENSION DRAWING PACKAGE:

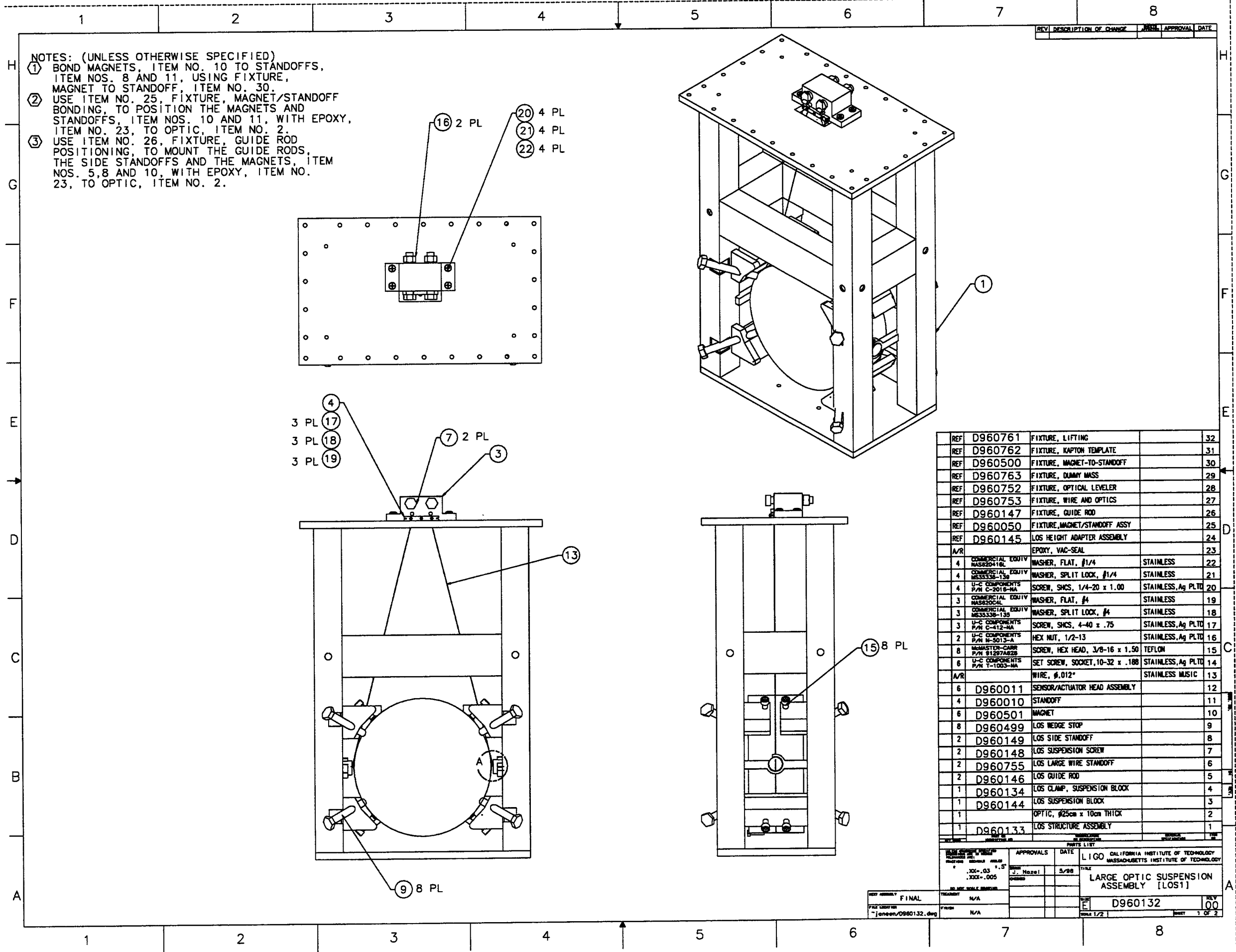
- {a} Large Optics Suspension Assembly Drawings
- {b} LOS Suspension Structure Assembly Drawings
- {c} LOS Fixtures
- {d} Small Optics Suspension Assembly Drawings
- {e} SOS Fixtures

various LIGO-D numbers

5/23/96

Janeen Hazel

D960800-00

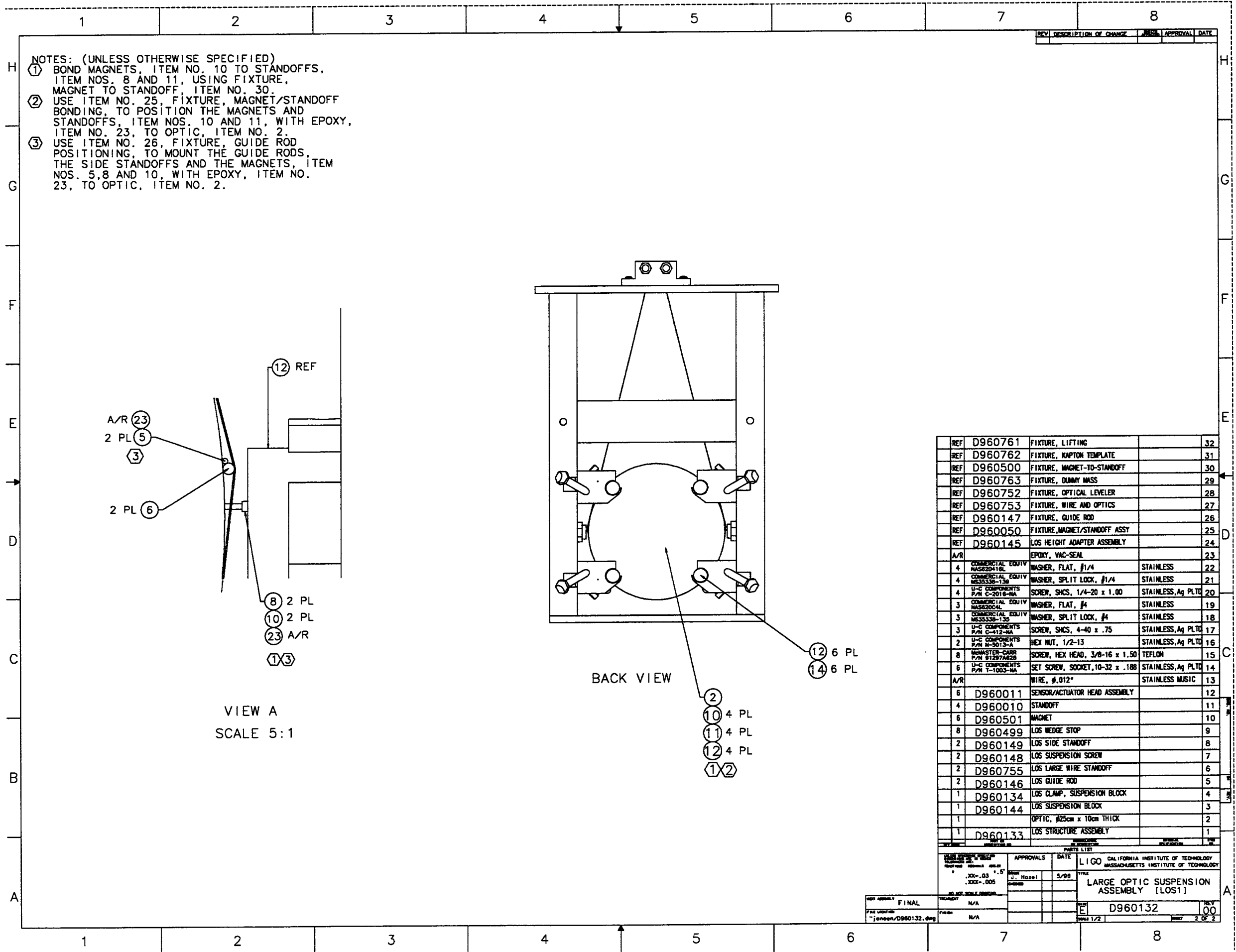


REV	DESCRIPTION OF CHANGE	DATE	APPROVAL	DATE
REF	D960761	FIXTURE, LIFTING		32
REF	D960762	FIXTURE, KAPTON TEMPLATE		31
REF	D960500	FIXTURE, MAGNET-TO-STANDOFF		30
REF	D960763	FIXTURE, DUMMY MASS		29
REF	D960752	FIXTURE, OPTICAL LEVELER		28
REF	D960753	FIXTURE, WIRE AND OPTICS		27
REF	D960147	FIXTURE, GUIDE ROD		26
REF	D960050	FIXTURE, MAGNET/STANDOFF ASSY		25
REF	D960145	LOS HEIGHT ADAPTER ASSEMBLY		24
A/R		EPOXY, VAC-SEAL		23
4	COMMERCIAL EQUIV MAGNET-TO-STANDOFF	WASHER, FLAT, #1/4	STAINLESS	22
4	COMMERCIAL EQUIV MAGNET-TO-STANDOFF	WASHER, SPLIT LOCK, #1/4	STAINLESS	21
4	U-C COMPONENTS P/N C-2018-NA	SCREW, SHCS, 1/4-20 x 1.00	STAINLESS, Ag PLTD	20
3	COMMERCIAL EQUIV MAGNET-TO-STANDOFF	WASHER, FLAT, #4	STAINLESS	19
3	COMMERCIAL EQUIV MAGNET-TO-STANDOFF	WASHER, SPLIT LOCK, #4	STAINLESS	18
3	U-C COMPONENTS P/N C-412-NA	SCREW, SHCS, 4-40 x .75	STAINLESS, Ag PLTD	17
2	U-C COMPONENTS P/N M-3013-A	HEX NUT, 1/2-13	STAINLESS, Ag PLTD	16
8	MASTER-CARR P/N 81297A828	SCREW, HEX HEAD, 3/8-16 x 1.50	TEFLON	15
6	U-C COMPONENTS P/N T-1003-NA	SET SCREW, SOCKET, 10-32 x .188	STAINLESS, Ag PLTD	14
A/R		WIRE, #.012"	STAINLESS MUSIC	13
6	D960011	SENSOR/ACTUATOR HEAD ASSEMBLY		12
4	D960010	STANDOFF		11
6	D960501	MAGNET		10
8	D960499	LOS WEDGE STOP		9
2	D960149	LOS SIDE STANDOFF		8
2	D960148	LOS SUSPENSION SCREW		7
2	D960755	LOS LARGE WIRE STANDOFF		6
2	D960146	LOS GUIDE ROD		5
1	D960134	LOS CLAMP, SUSPENSION BLOCK		4
1	D960144	LOS SUSPENSION BLOCK		3
1		OPTIC, #25cm x 10cm THICK		2
1	D960133	LOS STRUCTURE ASSEMBLY		1

REV	DESCRIPTION OF CHANGE	DATE	APPROVAL	DATE
1	D960132	5/98	J. Hazel	
00				

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
 LARGE OPTIC SUSPENSION ASSEMBLY [LOS1]

D960132 00  
 1 OF 2



NOTES: (UNLESS OTHERWISE SPECIFIED)

- ① BOND MAGNETS, ITEM NO. 10 TO STANDOFFS, ITEM NOS. 8 AND 11, USING FIXTURE, MAGNET TO STANDOFF, ITEM NO. 30.
- ② USE ITEM NO. 25, FIXTURE, MAGNET/STANDOFF BONDING, TO POSITION THE MAGNETS AND STANDOFFS, ITEM NOS. 10 AND 11, WITH EPOXY, ITEM NO. 23, TO OPTIC, ITEM NO. 2.
- ③ USE ITEM NO. 26, FIXTURE, GUIDE ROD POSITIONING, TO MOUNT THE GUIDE RODS, THE SIDE STANDOFFS AND THE MAGNETS, ITEM NOS. 5, 8 AND 10, WITH EPOXY, ITEM NO. 23, TO OPTIC, ITEM NO. 2.

REF	DESCRIPTION OF CHANGE	ISSUE	APPROVAL	DATE
REF	D960761	FIXTURE, LIFTING		32
REF	D960762	FIXTURE, KAPTON TEMPLATE		31
REF	D960500	FIXTURE, MAGNET-TO-STANDOFF		30
REF	D960763	FIXTURE, DUMMY MASS		29
REF	D960752	FIXTURE, OPTICAL LEVELER		28
REF	D960753	FIXTURE, WIRE AND OPTICS		27
REF	D960147	FIXTURE, GUIDE ROD		26
REF	D960050	FIXTURE, MAGNET/STANDOFF ASSY		25
REF	D960145	LOS HEIGHT ADAPTER ASSEMBLY		24
A/R		EPOXY, VAC-SEAL		23
4	COMMERCIAL EQUIV MAGNET/STANDOFF	WASHER, FLAT, #1/4	STAINLESS	22
4	COMMERCIAL EQUIV MAGNET/STANDOFF	WASHER, SPLIT LOCK, #1/4	STAINLESS	21
4	U-C COMPONENTS P/N C-2018-NA	SCREW, SHCS, 1/4-20 x 1.00	STAINLESS, Ag PLTD	20
3	COMMERCIAL EQUIV MAGNET/STANDOFF	WASHER, FLAT, #4	STAINLESS	19
3	COMMERCIAL EQUIV MAGNET/STANDOFF	WASHER, SPLIT LOCK, #4	STAINLESS	18
3	U-C COMPONENTS P/N C-412-NA	SCREW, SHCS, 4-40 x .75	STAINLESS, Ag PLTD	17
2	U-C COMPONENTS P/N N-5013-A	HEX NUT, 1/2-13	STAINLESS, Ag PLTD	16
8	MONSTER-CARR P/N 91297A828	SCREW, HEX HEAD, 3/8-16 x 1.50	TEFLON	15
6	U-C COMPONENTS P/N T-1003-NA	SET SCREW, SOCKET, 10-32 x .188	STAINLESS, Ag PLTD	14
A/R		WIRE, #.012"	STAINLESS MUSIC	13
6	D960011	SENSOR/ACTUATOR HEAD ASSEMBLY		12
4	D960010	STANDOFF		11
6	D960501	MAGNET		10
8	D960499	LOS WEDGE STOP		9
2	D960149	LOS SIDE STANDOFF		8
2	D960148	LOS SUSPENSION SCREW		7
2	D960755	LOS LARGE WIRE STANDOFF		6
2	D960146	LOS GUIDE ROD		5
1	D960134	LOS CLAMP, SUSPENSION BLOCK		4
1	D960144	LOS SUSPENSION BLOCK		3
1		OPTIC, #25cm x 10cm THICK		2
1	D960133	LOS STRUCTURE ASSEMBLY		1

APPROVALS	DATE	TITLE
J. Hazel	5/98	DESIGNER
		CHECKED
		DATE
		REV
		DATE
		REV
		DATE
		REV
		DATE
		REV

FILE LOCATION: joneen/D960132.dwg  
 SHEET: 2 OF 2  
 PARTS LIST: 1/2

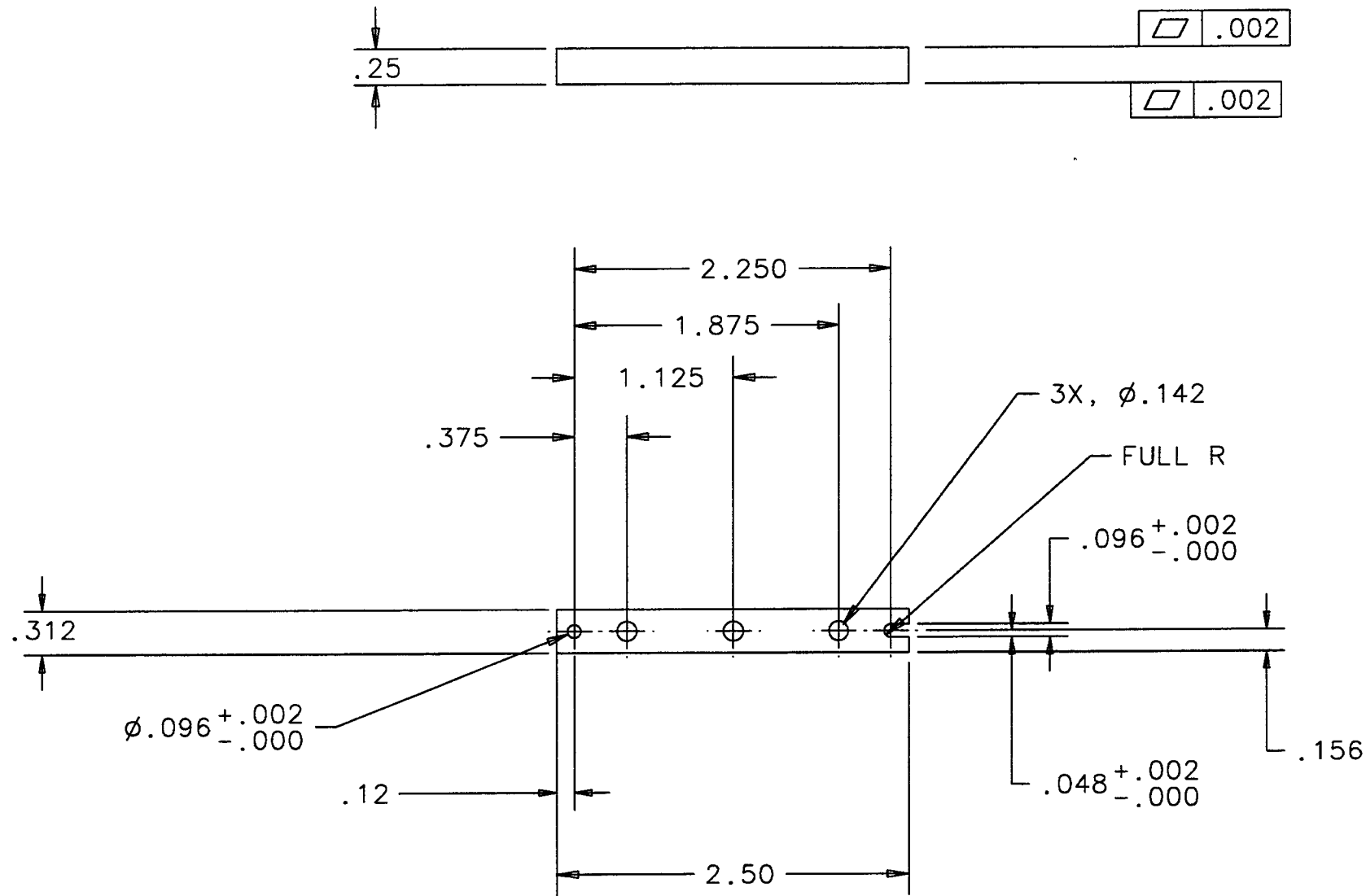
NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BREAK ALL SHARP EDGES.
2. FILLETS: R .015 MAX.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

A  
B  
C  
D

A  
B  
C  
D



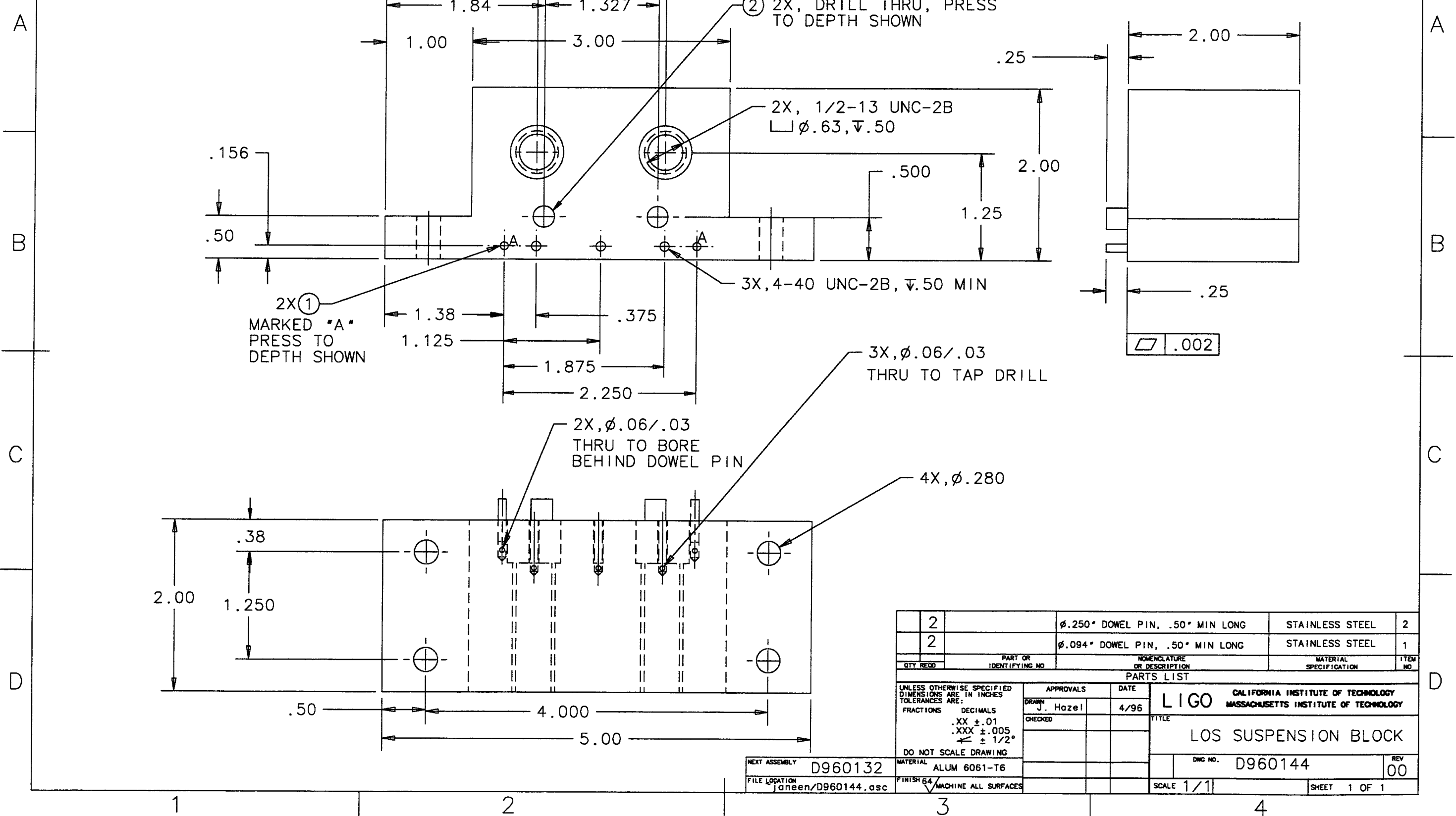
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PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:			APPROVALS		
FRACTIONS			J. Hazel		DATE
DECIMALS			CHECKED		4/96
DO NOT SCALE DRAWING			TITLE		
MATERIAL ALUM 6061-T6			LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		
FINISH 64 MACHINE ALL OVER			LOS CLAMP, SUSPENSION BLOCK		
NEXT ASSEMBLY D960132			DWC NO. D960134		
FILE LOCATION joneen/D960134.asc			SCALE 1/1		REV
			SHEET 1 OF 1		

1 2 3 4

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BREAK ALL SHARP EDGES.
2. FILLETS: R .015 MAX.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



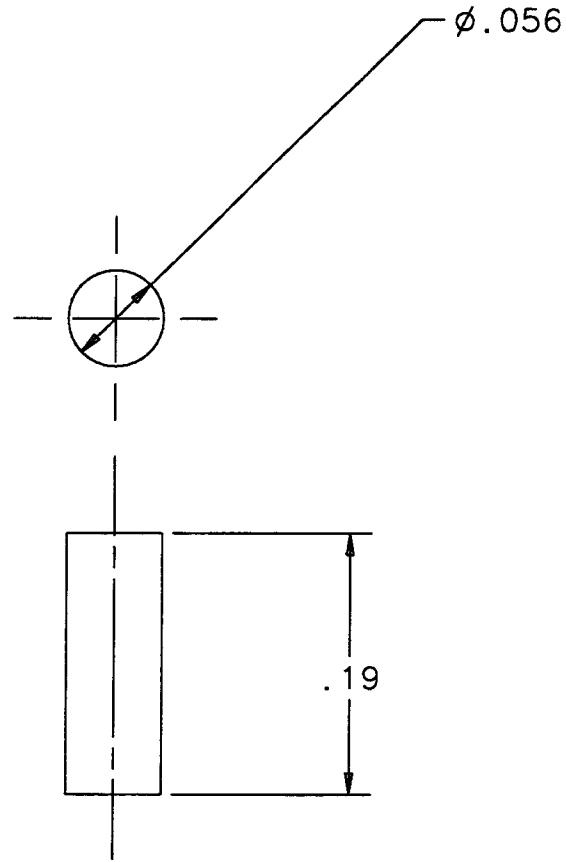
2		0.250" DOWEL PIN, .50" MIN LONG	STAINLESS STEEL	2
2		0.094" DOWEL PIN, .50" MIN LONG	STAINLESS STEEL	1
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	PARTS LIST	
FRACTIONS	DECIMALS	DRAWN	J. Hazel	4/96	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
.XX ± .01	.XXX ± .005	CHECKED			TITLE
± 1/2°					LOS SUSPENSION BLOCK
DO NOT SCALE DRAWING					DWG NO. D960144
NEXT ASSEMBLY	D960132	MATERIAL	ALUM 6061-T6	SCALE	1/1
FILE LOCATION	Janeeen/D960144.asc	FINISH	64 MACHINE ALL SURFACES	SHEET	1 OF 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. DIMENSIONS IN INCHES.
- 2. MATERIAL: ALUMINUM
- 3. REMOVE BURRS AND SHARP EDGES.
- 4. TOLERANCES: .XX ± .01  
                   .XXX ± .005  
                   ANGLES ± †

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



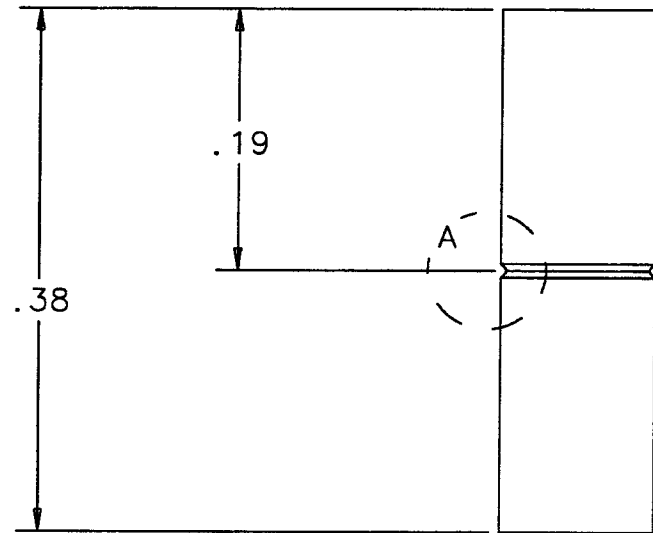
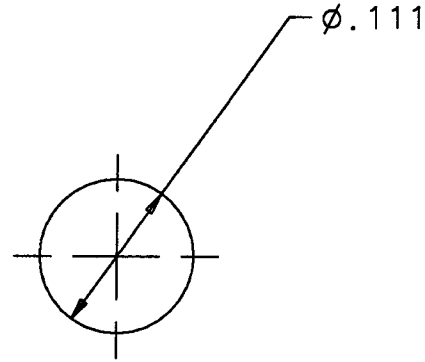
10X SCALE

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PARTS LIST				
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SEE NOTES			DATE	
DO NOT SCALE DRAWING			J. Hazel	
MATERIAL			GROUP	
SEE NOTES			5/96	
FINISH			CHECKED	
SCALE			TITLE	
AS NOTED			LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
NEXT ASSEMBLY			SIZE	
D960132			B	
SCALE			DWG NO.	
AS NOTED			D960146	
FILENAME			REV	
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SHEET 1 OF 1				

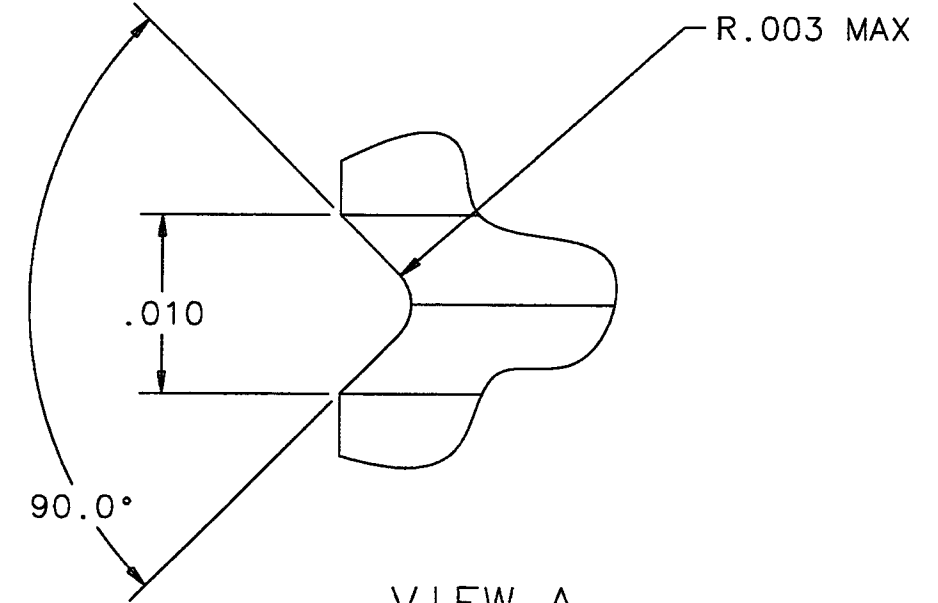
NOTES: (UNLESS OTHERWISE SPECIFIED)

1. DIMENSIONS IN INCHES.
2. MATERIAL: QUARTZ
3. REMOVE BURRS AND SHARP EDGES.
4. TOLERANCES: .XX ± .01  
                   .XXX ± .005  
                   ANGLES ± †

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



8X SCALE



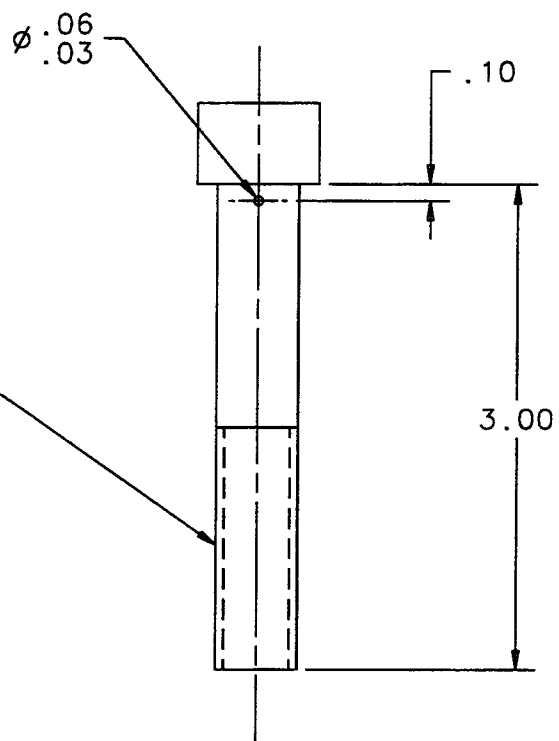
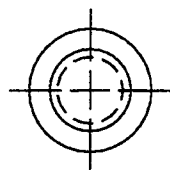
VIEW A  
100:1 SCALE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN [mm] TOLERANCES ARE: FRACTIONS DECIMALS		APPROVALS DRAWN J. Hazel CHECKED	DATE 5/96	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SEE NOTES		TITLE LOS LARGER WIRE STANDOFF		REV 00
DO NOT SCALE DRAWING		SIZE B		DWG NO. D960755
MATERIAL SEE NOTES		FILENAME ~janeen/D960755.asc		SHEET 1 OF 1
FINISH SCALE AS NOTED		NEXT ASSEMBLY D960132		

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. MAKE FROM 300 SERIES STAINLESS SOCKET HEAD CAP SCREW.
2. BREAK ALL SHARP EDGES AND BURRS.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



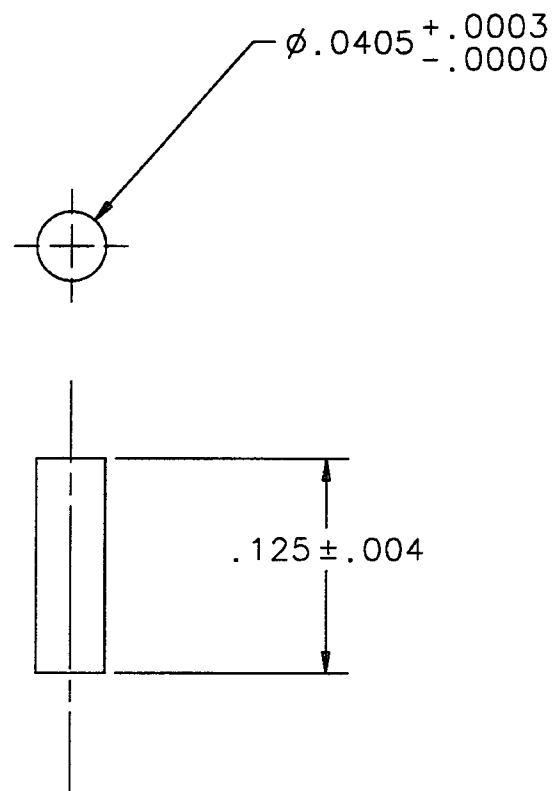
1/2-13 x 3.0 UNC-2B

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		APPROVALS	DATE	<b>LIGO</b> CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY TITLE <b>LOS SUSPENSION SCREW</b> DWG NO. <b>D960148</b> REV <b>00</b>
TOLERANCES ARE:		DRAWN	5/96	
FRACTIONS DECIMALS ANGLES	± .XX = .03 ± .5°	CHECKED		
DO NOT SCALE DRAWING				
NEXT ASSEMBLY	MATERIAL	FINISH	SCALE	SHEET
D960132	SEE NOTE	SEE NOTE	1/1	1 OF 1
FILE LOCATION				
~janeen/D960148.dwg				



NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES.  
 2. REMOVE CUT-OFF BURR.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



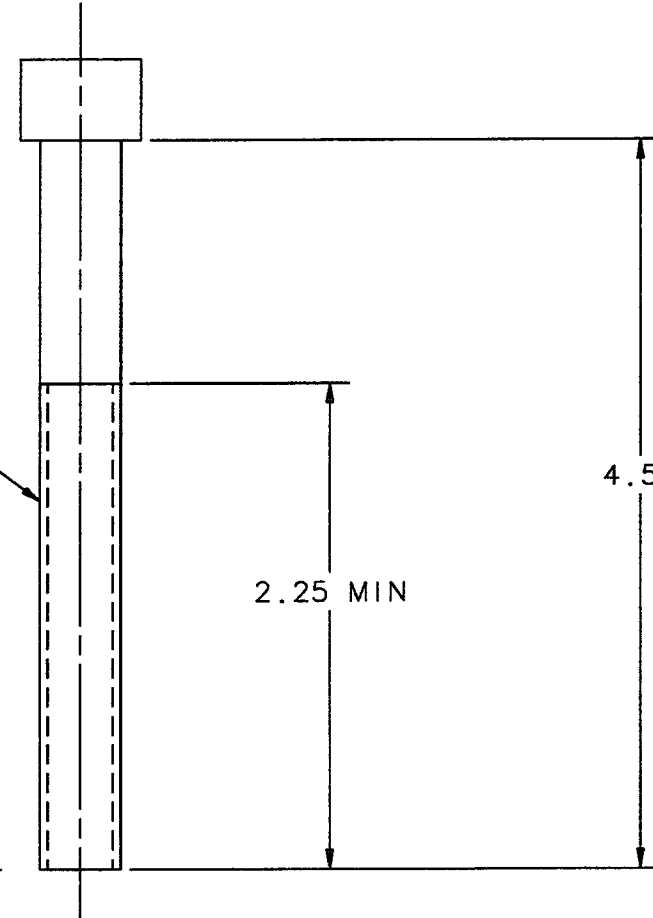
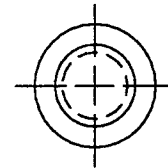
10X SCALE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN (in [mm]) TOLERANCES ARE: FRACTIONS DECIMALS		APPROVALS		DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
N/A		DRAWN J. Hazel	GROUP	5/96	TITLE LOS SIDE STANDOFF	
DO NOT SCALE DRAWING		CHECKED			SIZE B	DWG NO. D960149
MATERIAL 6061-T6 ALUM					REV 00	
FINISH SEE NOTES						
SCALE 10/1		FILENAME ~janeen/D960149.asc			SHEET 1 OF 1	

NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. MAKE FROM TEFLON HEX HEAD OR SOCKET HEAD CAP SCREW.
- 2. BREAK ALL SHARP EDGES AND BURRS.



1/2-13 x 4.5 UNC-2B

4.50

2.25 MIN

.004

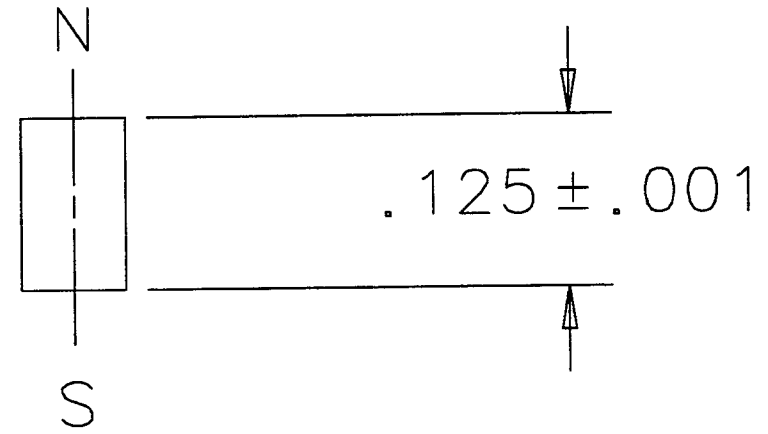
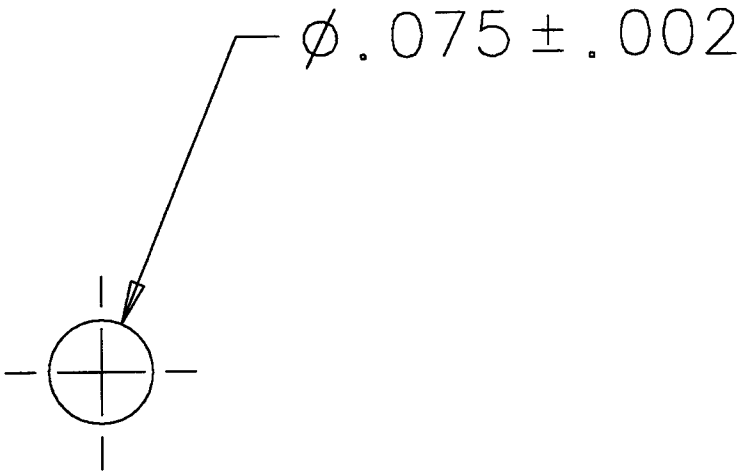
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX - .03 ± .5° ± .XXX - .005		APPROVALS DRAWN J. Hazel CHECKED	DATE 5/96	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DO NOT SCALE DRAWING				TITLE LOS WEDGE STOP
NEXT ASSEMBLY D960132	MATERIAL SEE NOTE	DWG NO. D960499		REV 00
FILE LOCATION ~janeen/D960499.dwg	FINISH SEE NOTE	SCALE 1/1	SHEET 1 OF 1	

NOTES: UNLESS OTHERWISE SPECIFIED  
 1. DIMENSIONS IN INCHES.  
 2. BREAK ALL BURRS AND SHARP EDGES.  
 3. MATERIAL: NEO-35  
 4. NO PLATING OR COATING

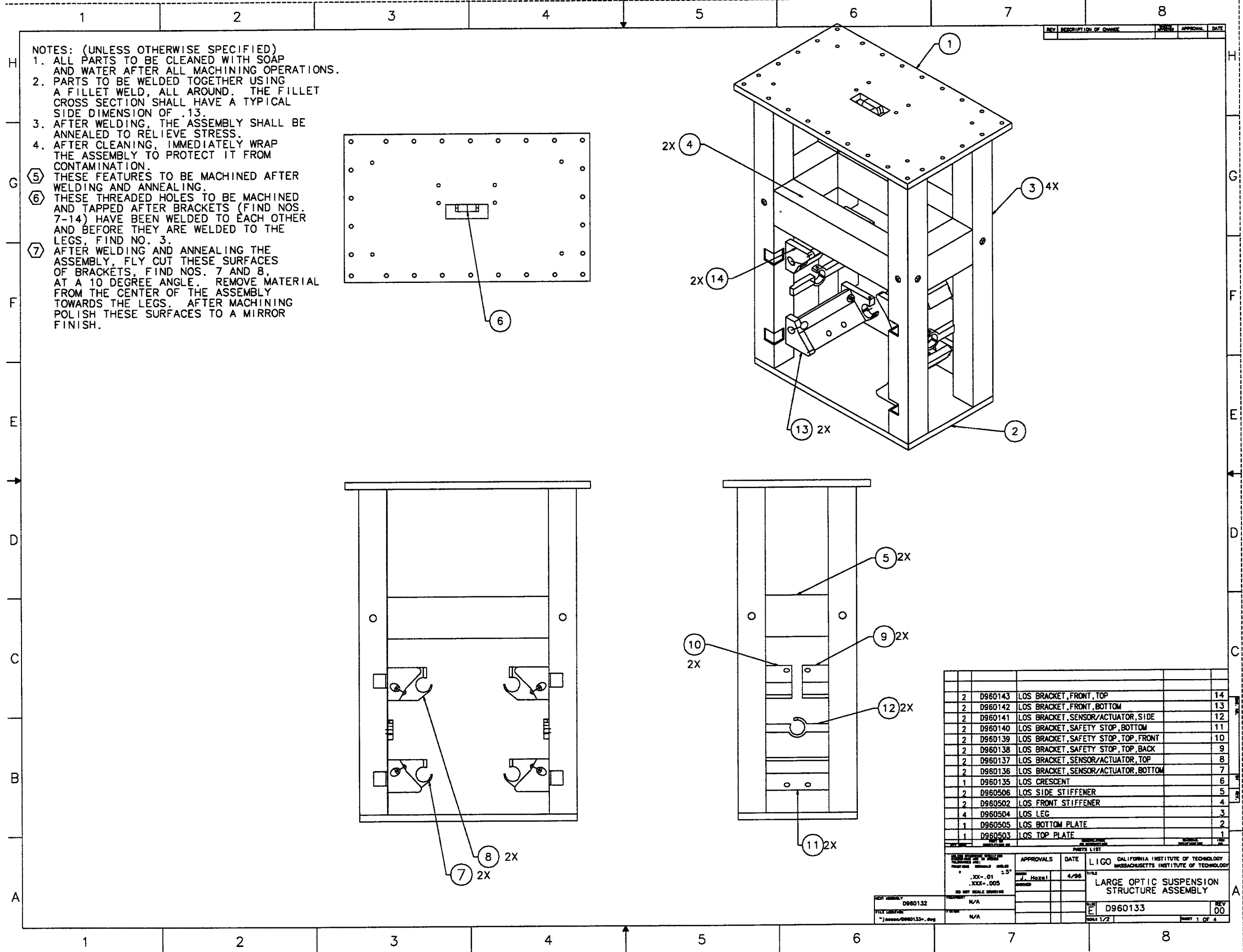
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



SCALE 8:1

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE: IN (in (mm)) FRACTIONS DECIMALS		APPROVALS	DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
AS NOTED		DRAWN J. Hazel	5/96	TITLE MAGNET
DO NOT SCALE DRAWING		CHECKED		
MATERIAL	AS NOTED			SIZE B
FINISH	AS NOTED			DWG NO. D960501
SCALE	AS NOTED	FILENAME ~janeen/D9600501.asc		REV 00
				SHEET 1 OF 1

LOS SUSPENSION STRUCTURE  
ASSEMBLY DRAWINGS



NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. ALL PARTS TO BE CLEANED WITH SOAP AND WATER AFTER ALL MACHINING OPERATIONS.  
 2. PARTS TO BE WELDED TOGETHER USING A FILLET WELD, ALL AROUND. THE FILLET CROSS SECTION SHALL HAVE A TYPICAL SIDE DIMENSION OF .13.  
 3. AFTER WELDING, THE ASSEMBLY SHALL BE ANNEALED TO RELIEVE STRESS.  
 4. AFTER CLEANING, IMMEDIATELY WRAP THE ASSEMBLY TO PROTECT IT FROM CONTAMINATION.  
 5. THESE FEATURES TO BE MACHINED AFTER WELDING AND ANNEALING.  
 6. THESE THREADED HOLES TO BE MACHINED AND TAPPED AFTER BRACKETS (FIND NOS. 7-14) HAVE BEEN WELDED TO EACH OTHER AND BEFORE THEY ARE WELDED TO THE LEGS, FIND NO. 3.  
 7. AFTER WELDING AND ANNEALING THE ASSEMBLY, FLY CUT THESE SURFACES OF BRACKETS, FIND NOS. 7 AND 8, AT A 10 DEGREE ANGLE. REMOVE MATERIAL FROM THE CENTER OF THE ASSEMBLY TOWARDS THE LEGS. AFTER MACHINING POLISH THESE SURFACES TO A MIRROR FINISH.

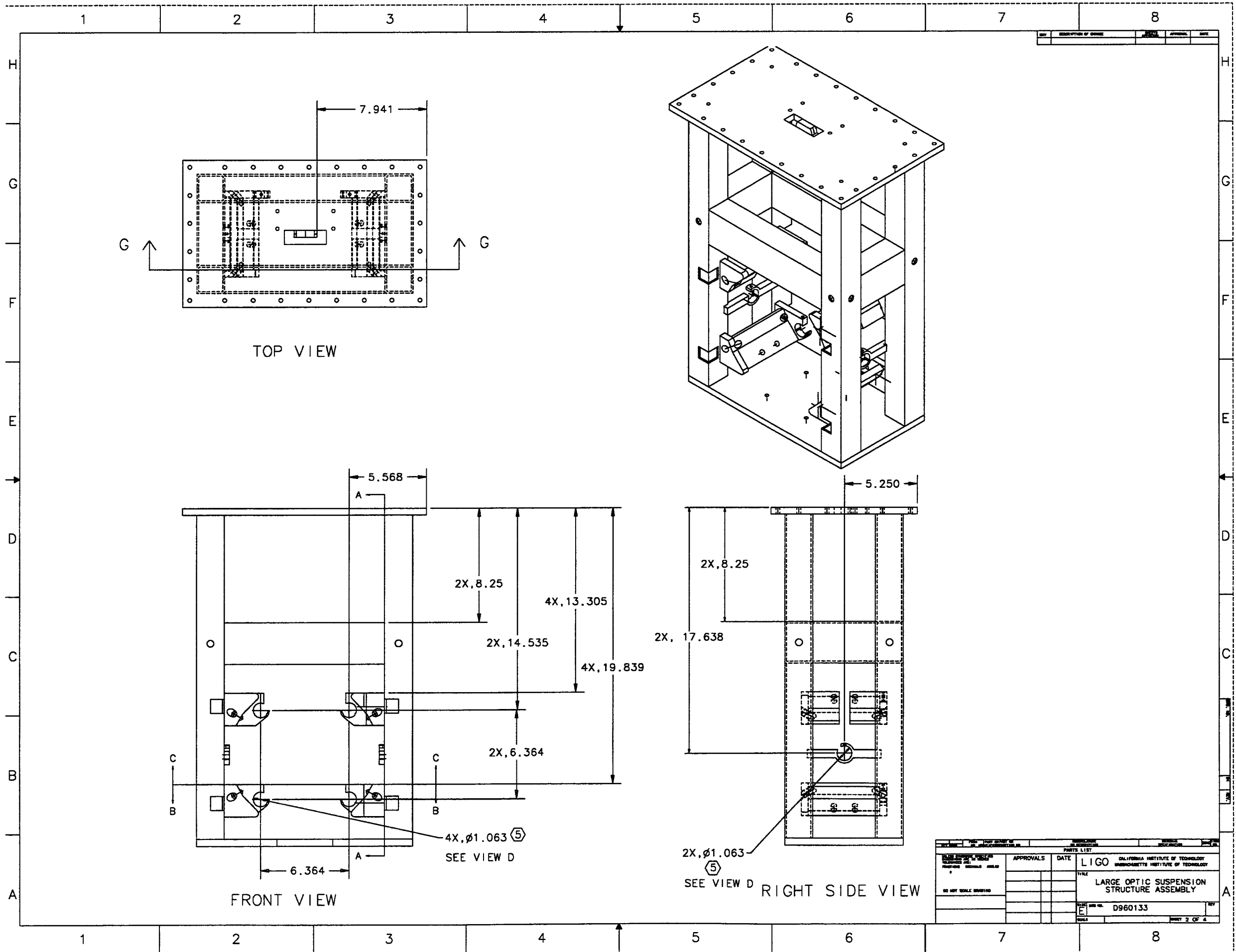
REV	DESCRIPTION OF CHANGE	ISSUE	APPROVAL	DATE

QTY	PART NO.	DESCRIPTION	QTY
2	D960143	LOS BRACKET, FRONT, TOP	14
2	D960142	LOS BRACKET, FRONT, BOTTOM	13
2	D960141	LOS BRACKET, SENSOR/ACTUATOR, SIDE	12
2	D960140	LOS BRACKET, SAFETY STOP, BOTTOM	11
2	D960139	LOS BRACKET, SAFETY STOP, TOP, FRONT	10
2	D960138	LOS BRACKET, SAFETY STOP, TOP, BACK	9
2	D960137	LOS BRACKET, SENSOR/ACTUATOR, TOP	8
2	D960136	LOS BRACKET, SENSOR/ACTUATOR, BOTTOM	7
1	D960135	LOS CRESCENT	6
2	D960506	LOS SIDE STIFFENER	5
2	D960502	LOS FRONT STIFFENER	4
4	D960504	LOS LEG	3
1	D960505	LOS BOTTOM PLATE	2
1	D960503	LOS TOP PLATE	1

APPROVALS	DATE	TITLE

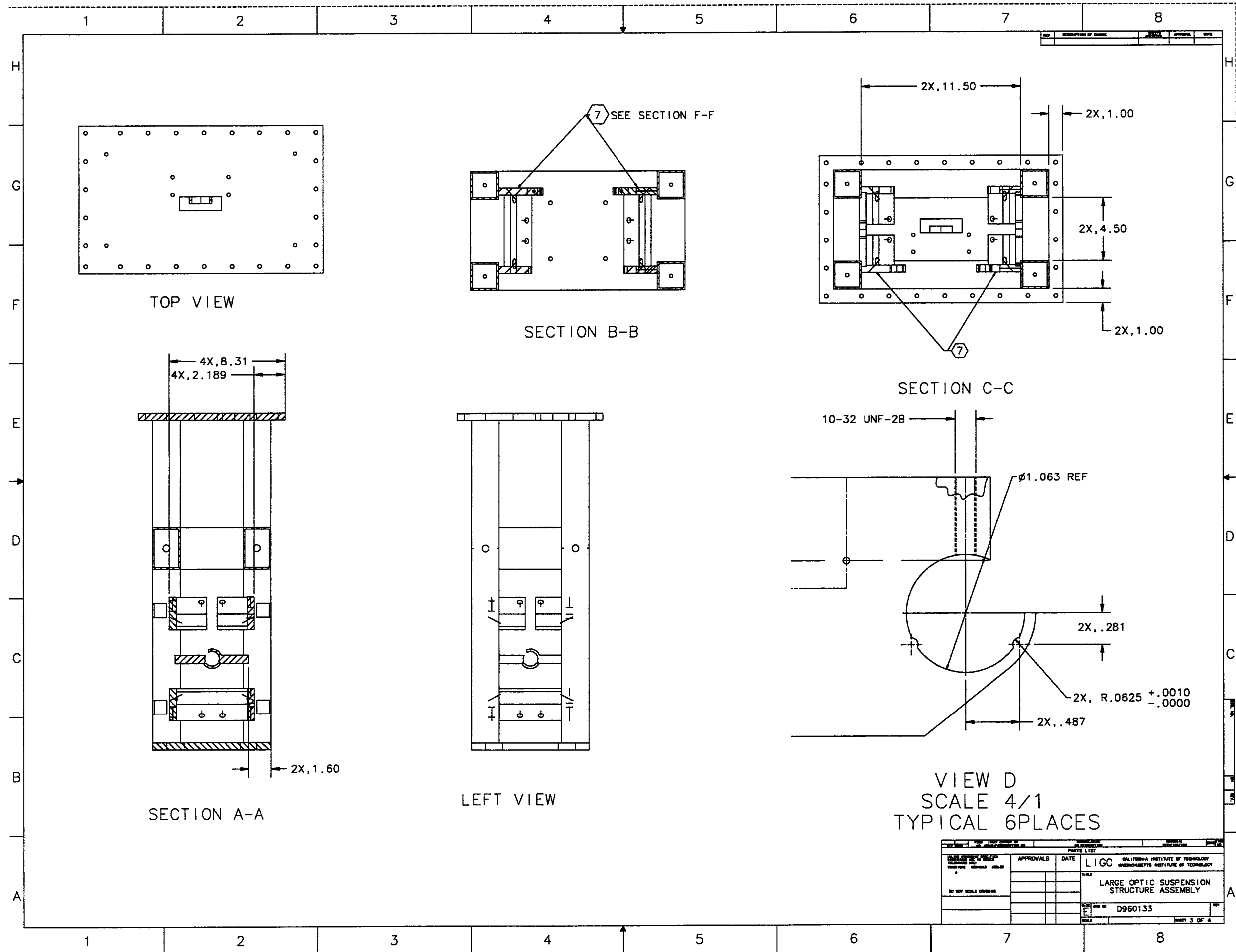
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
 LARGE OPTIC SUSPENSION  
 STRUCTURE ASSEMBLY  
 PART 1/2

NEXT ASSEMBLY: D960132  
 FILE LOCATION: J:\laser\D960133\*.dwg



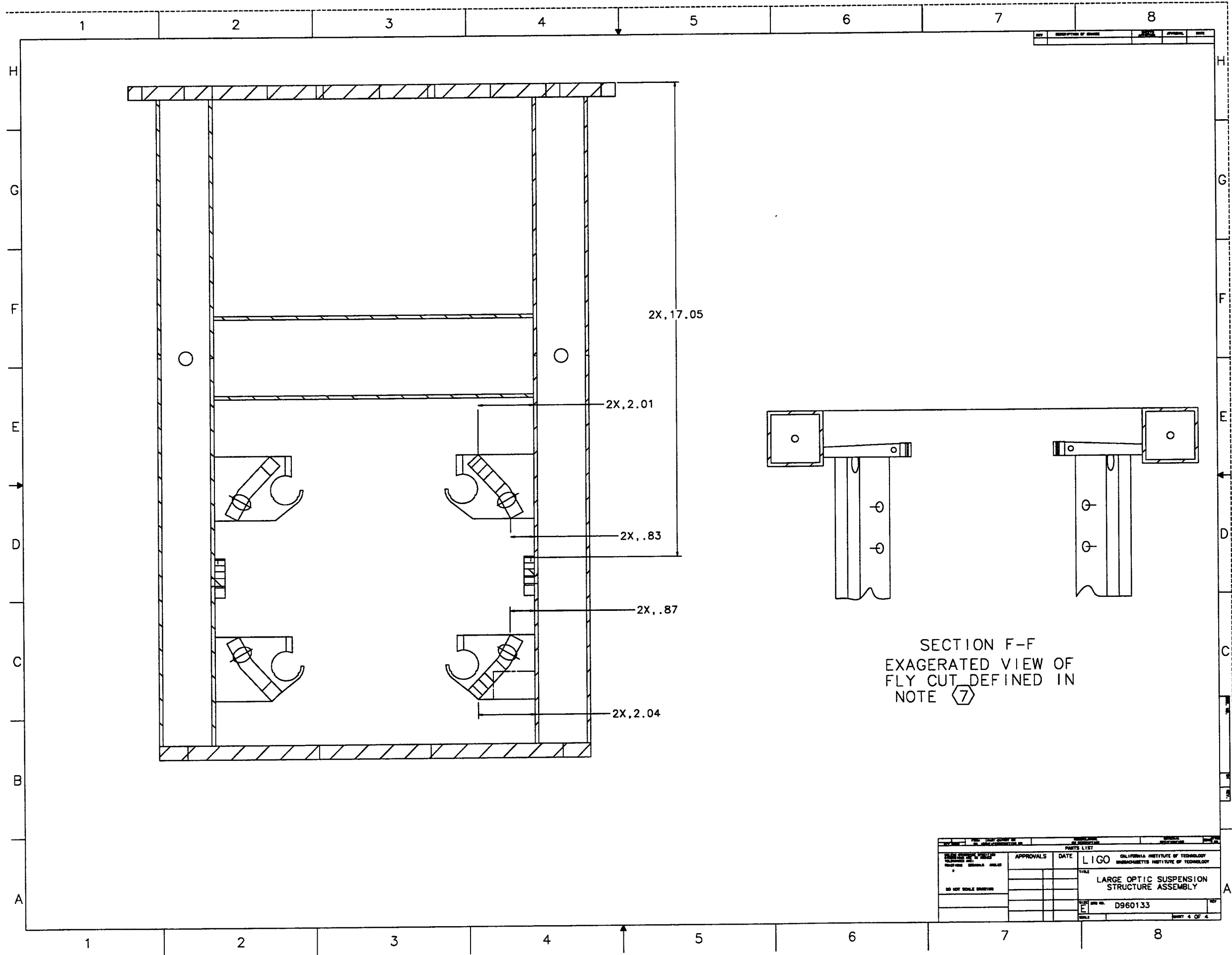
REV	DESCRIPTION OF CHANGE	DATE	APPROVAL	DATE

APPROVALS		DATE	PARTS LIST	
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY			TITLE LARGE OPTIC SUSPENSION STRUCTURE ASSEMBLY	
DRAWING NO. D960133			SHEET 2 OF 4	



VIEW D  
 SCALE 4/1  
 TYPICAL 6PLACES

APPROVALS		DATE	PARTS LIST	
DESIGNED BY	APPROVED BY	DATE	ITEM NO.	DESCRIPTION
DRG. NO. D960133				
L I G O CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY			TITLE LARGE OPTIC SUSPENSION STRUCTURE ASSEMBLY	
			REV. NO.	REV.
			1	
			SHEET 3 OF 4	



SECTION F-F  
EXAGGERATED VIEW OF  
FLY CUT DEFINED IN  
NOTE 7

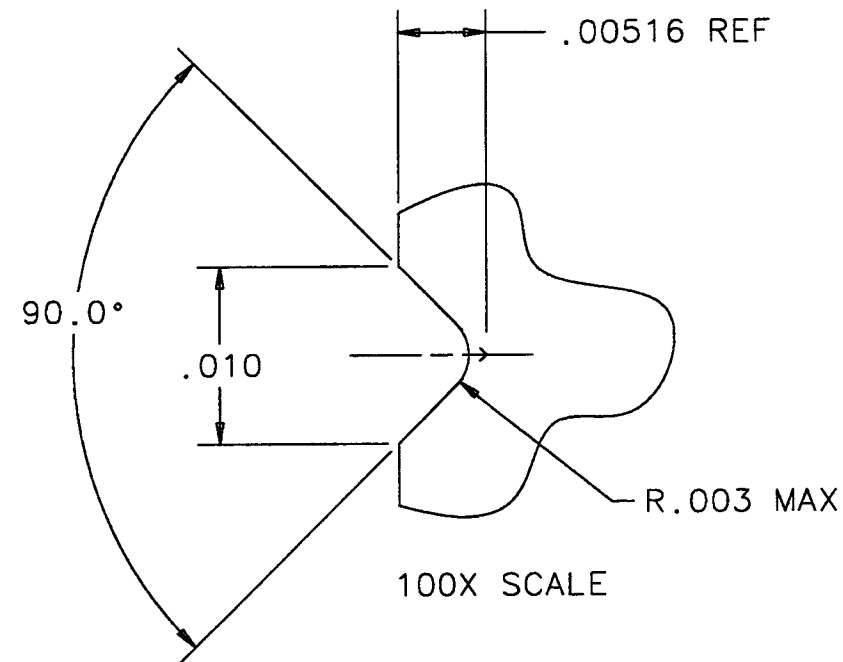
APPROVALS		DATE	PARTS LIST	
<small>DESIGNED BY: [ ]</small> <small>CHECKED BY: [ ]</small> <small>PROGRAM MANAGER: [ ]</small>			<small>PROJECT: LIGO</small> <small>INSTITUTION: CALIFORNIA INSTITUTE OF TECHNOLOGY</small> <small>INSTITUTION: MASSACHUSETTS INSTITUTE OF TECHNOLOGY</small>	
			<small>TITLE:</small> <b>LARGE OPTIC SUSPENSION</b> <b>STRUCTURE ASSEMBLY</b>	
			<small>FIG. NO.:</small> D960133	
			<small>SHEET:</small> 4 OF 4	



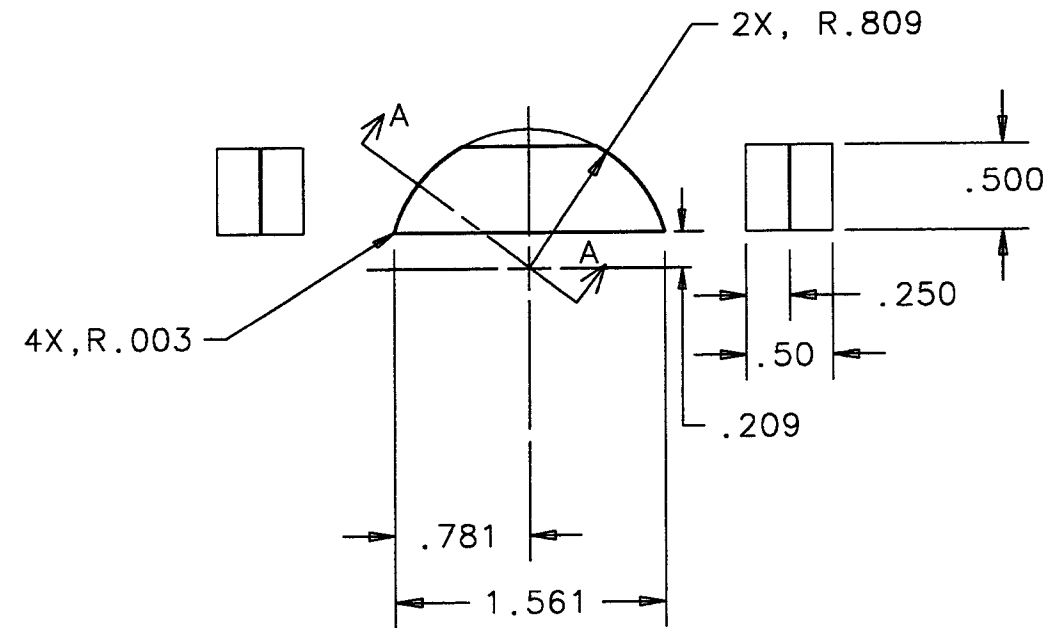
NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.

REV	DESCRIPTION OF CHANGE	SHEETS AFFECTED	APPROVAL	DATE



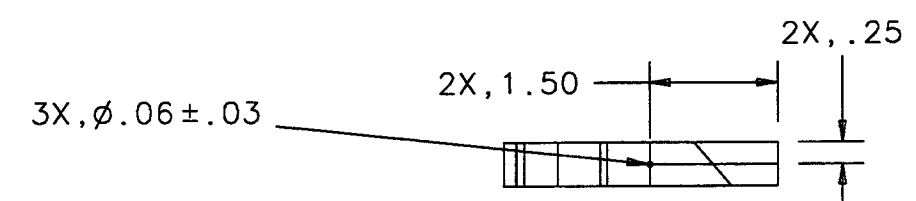
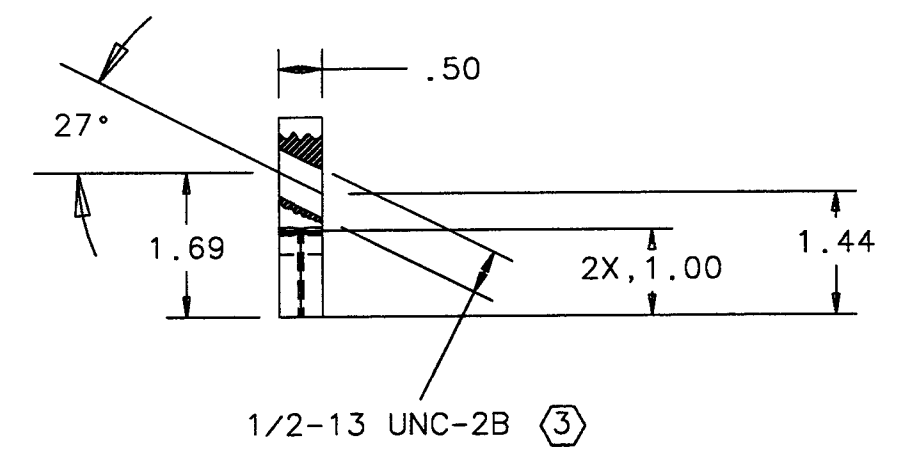
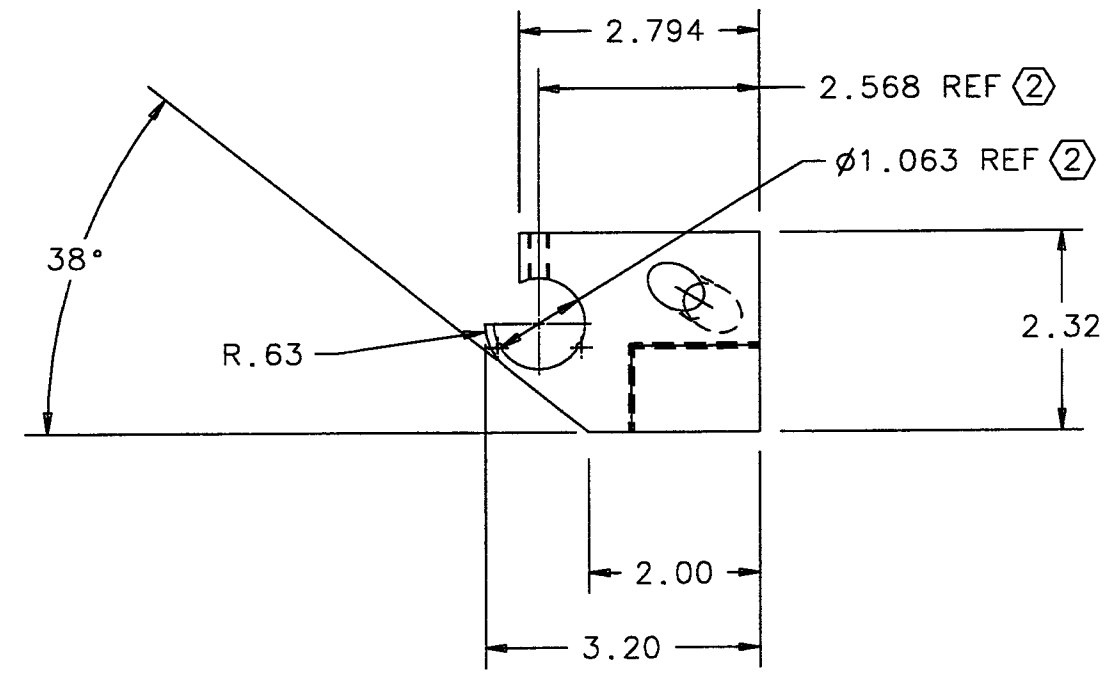
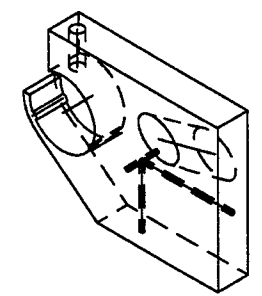
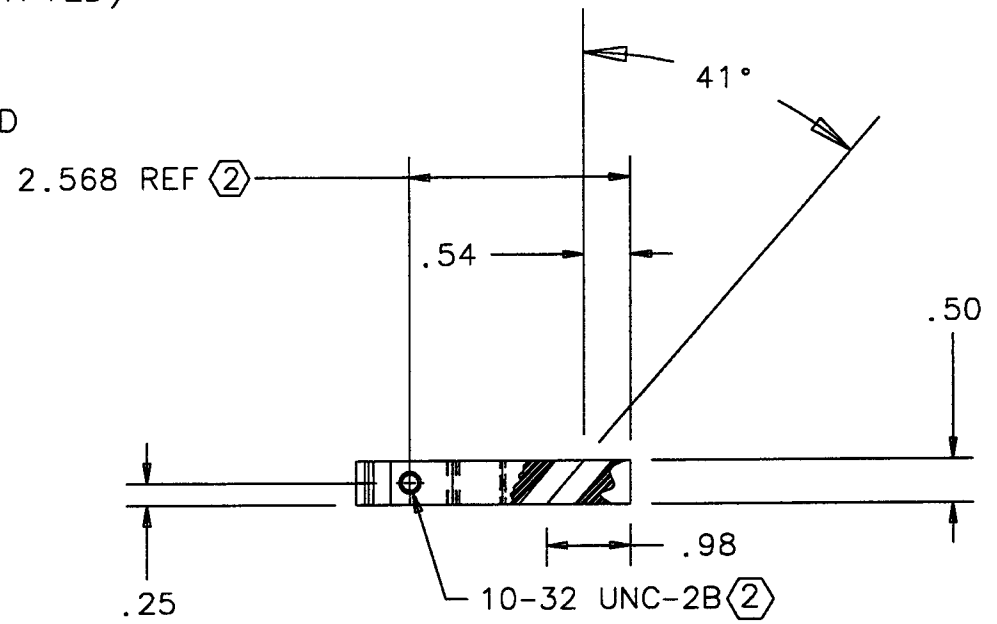
SECTION A-A  
TYPICAL RADIAL PROFILE



QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:			APPROVALS	DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS			DRAWN J. Hazel	4/96	LIGO
DECIMALS			CHECKED		TITLE
.XX ± .01					LOS CRESCENT
.XXX ± .005					DWG NO. D960135
± 1/2"					REV
DO NOT SCALE DRAWING					
NEXT ASSEMBLY	D960133	MATERIAL	304 STAINLESS	SCALE	1/1
FILE LOCATION	laneen/D960135.asc	FINISH	64 MACHINE ALL SURFACES	SHEET	1 OF 1

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES  
 ② THIS FEATURE TO BE DEFINED ON THE NEXT ASSEMBLY  
 ③ THIS FEATURE TO BE MACHINED AND TAPPED AT THE NEXT ASSEMBLY.



QTY	REGO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (MM)		APPROVALS		DATE	
TOLERANCES ARE:		DRAWN	J. Hazel	GROUP	4/15/96
FRACTIONS DECIMALS		CHECKED			
.XX = .01					
.XXX = .005					
angles = .5°					
DO NOT SCALE DRAWING					
MATERIAL		304 STAINLESS		SIZE	
FINISH		MACHINE ALL SURFACES		DWG NO. D960136	
SCALE		1/2		REV 00	
NEXT ASSEMBLY		D960133		FILENAME ~janeen/D960136.dwg	
				SHEET 1	

CALIFORNIA INSTITUTE OF TECHNOLOGY  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
 TITLE LOS BRACKET, SENSOR/  
 ACTUATOR, BOTTOM

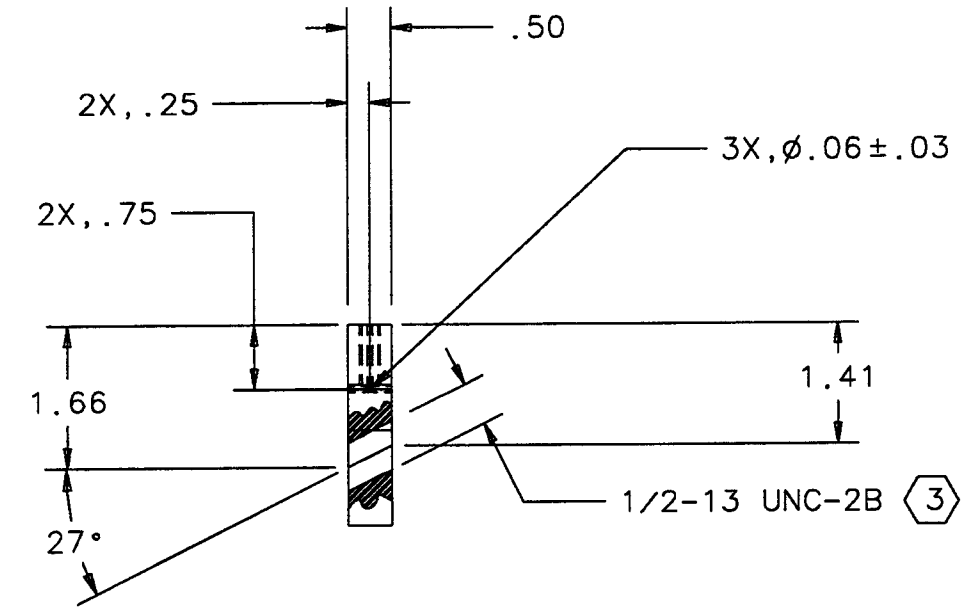
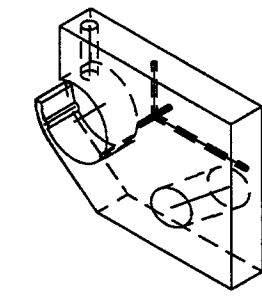
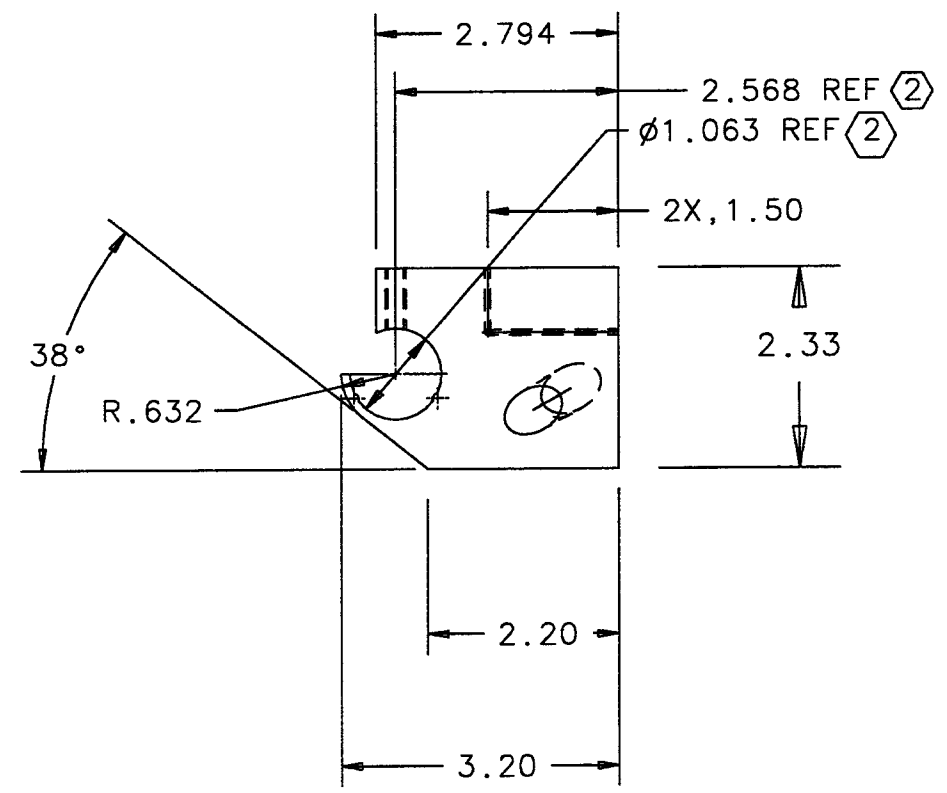
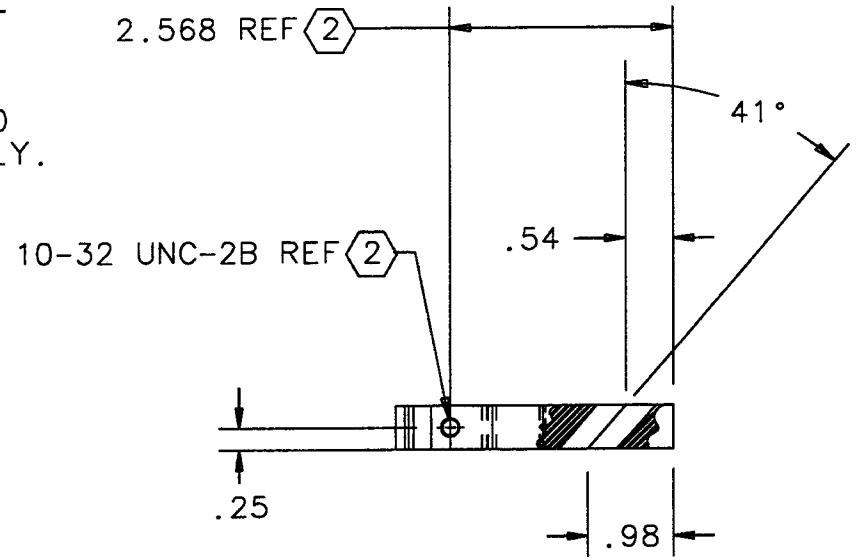
SIZE B DWG NO. D960136 REV 00

NEXT ASSEMBLY D960133 SCALE 1/2 FILENAME ~janeen/D960136.dwg SHEET 1

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. BREAK ALL SHARP EDGES.
- ② THIS FEATURE TO BE DEFINED ON THE NEXT ASSEMBLY.
- ③ THIS FEATURE TO BE MACHINED AND TAPPED AT THE NEXT ASSEMBLY.



QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO												
PARTS LIST																	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS .XX = .01 .XXX = .005 ANGLES = .5° DO NOT SCALE DRAWING			<table border="1"> <thead> <tr> <th colspan="2">APPROVALS</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>DRAWN</td> <td>J. Hazel</td> <td>4/96</td> </tr> <tr> <td>CHECKED</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>			APPROVALS		DATE	DRAWN	J. Hazel	4/96	CHECKED					
APPROVALS		DATE															
DRAWN	J. Hazel	4/96															
CHECKED																	
MATERIAL 304 STAINLESS			<table border="1"> <thead> <tr> <th colspan="2">CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY</th> </tr> </thead> <tbody> <tr> <td>TITLE</td> <td>LOS BRACKET, SENSOR/ACTUATOR, TOP</td> </tr> <tr> <td>SIZE</td> <td>B</td> </tr> <tr> <td>DWG NO.</td> <td>D960137</td> </tr> <tr> <td>REV</td> <td>00</td> </tr> </tbody> </table>			CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		TITLE	LOS BRACKET, SENSOR/ACTUATOR, TOP	SIZE	B	DWG NO.	D960137	REV	00		
CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY																	
TITLE	LOS BRACKET, SENSOR/ACTUATOR, TOP																
SIZE	B																
DWG NO.	D960137																
REV	00																
NEXT ASSEMBLY D960133		SCALE 1/2		FILENAME ~janeen/D960137.dwg													

NEXT ASSEMBLY D960133

SCALE 1/2

FILENAME ~janeen/D960137.dwg

SHEET 1

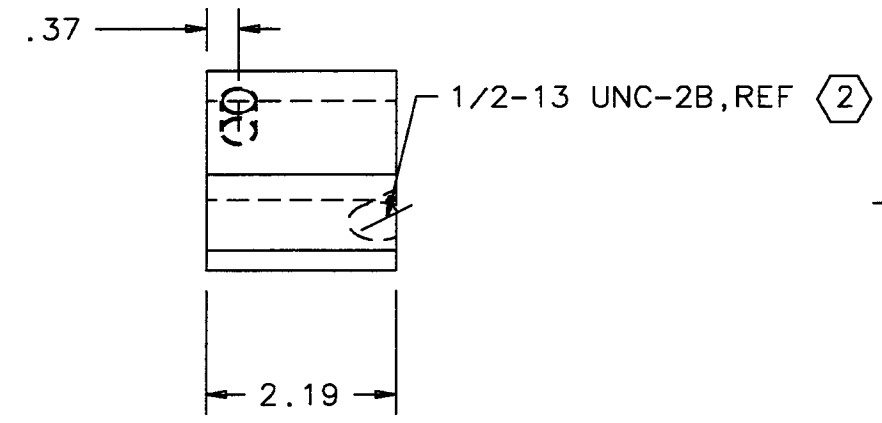
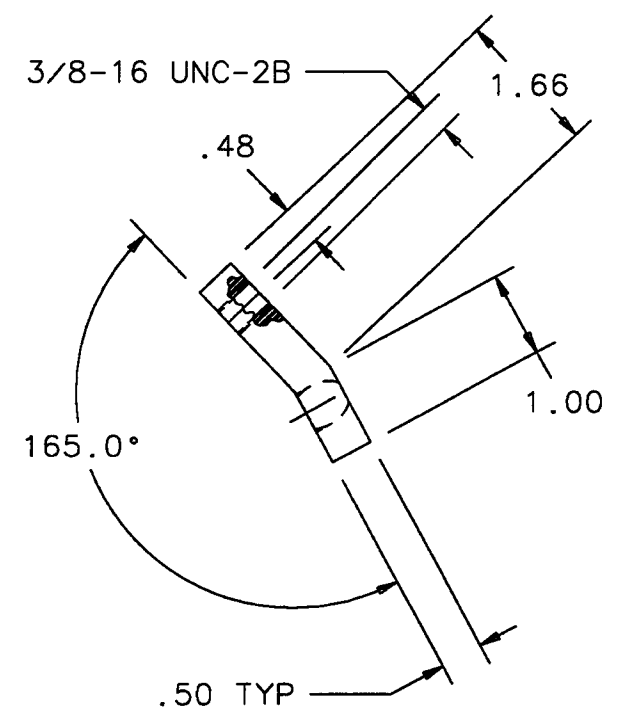
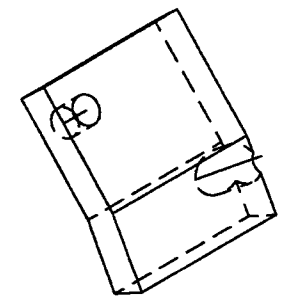
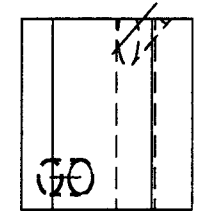
NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. REMOVE ALL SHARP EDGES.
- ② THIS FEATURE TO BE DEFINED AT THE NEXT ASSEMBLY.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

A  
B  
C  
D

A  
B  
C  
D



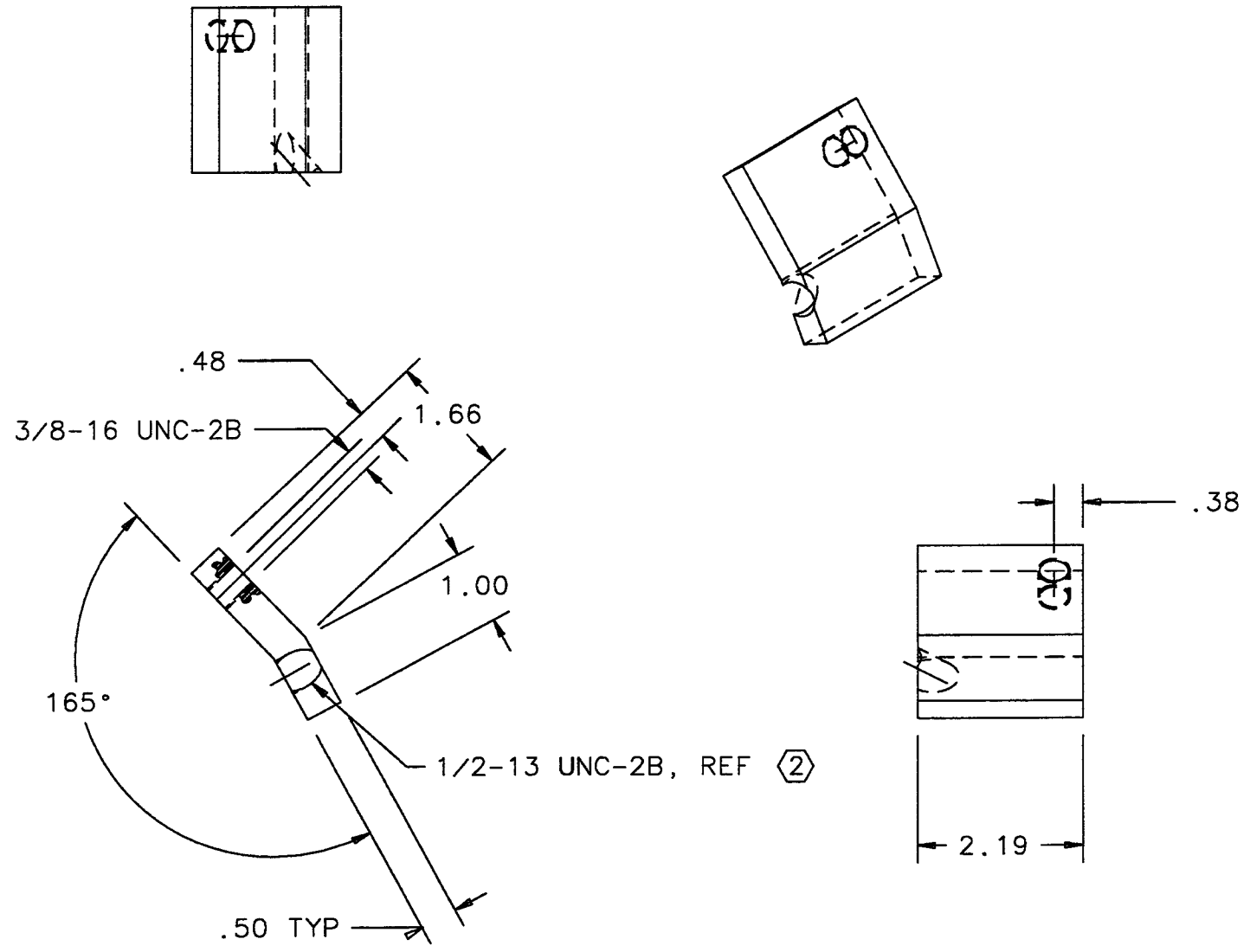
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS .XX ± .01 DECIMALS .XXX ± .005 angles ± 1/2°		DRAWN J. Hazel	4/96	
DO NOT SCALE DRAWING		CHECKED		TITLE BRACKET, SAFETY STOP, TOP, BACK
NEXT ASSEMBLY D960133	MATERIAL 304 STAINLESS			DWG NO. D960138 REV 00
FILE LOCATION janeen/D960138.dwg	FINISH MACHINE ALL SURFACES		SCALE 1/2	SHEET 1 OF 1

1 2 3 4

NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. BREAK ALL SHARP EDGES.
- ② THIS FEATURE TO BE DEFINED AT NEXT ASSEMBLY.

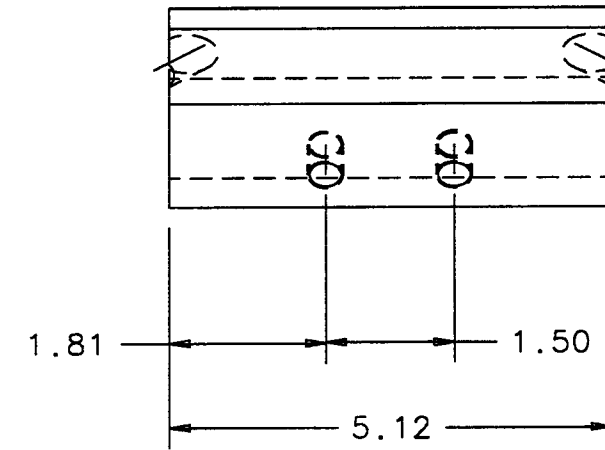
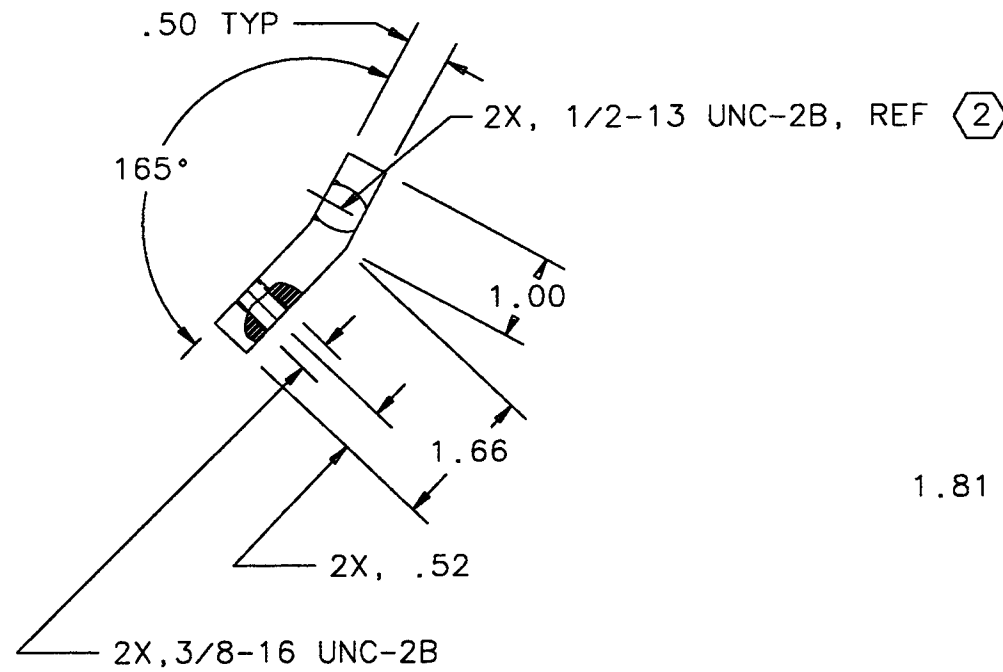
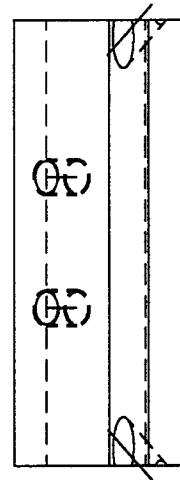
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS    DECIMALS		DRAWN J. Hazel	4/96	
.XX ± .01		CHECKED		TITLE BRACKET, SAFETY STOP, TOP, FRONT
.XXX ± .005				DWG NO.    D960139    REV    00
angles ± 1/2°				SCALE 1/2    SHEET 1 OF 1
DO NOT SCALE DRAWING				
NEXT ASSEMBLY	D960133	MATERIAL	304 STAINLESS	
FILE LOCATION	laneen/D960139.dwg	FINISH	MACHINE ALL SURFACES	

NOTES: (UNLESS OTHERWISE SPECIFIED)

- ② 1. BREAK ALL SHARP EDGES. THIS FEATURE TO BE DEFINED ON THE NEXT ASSEMBLY.



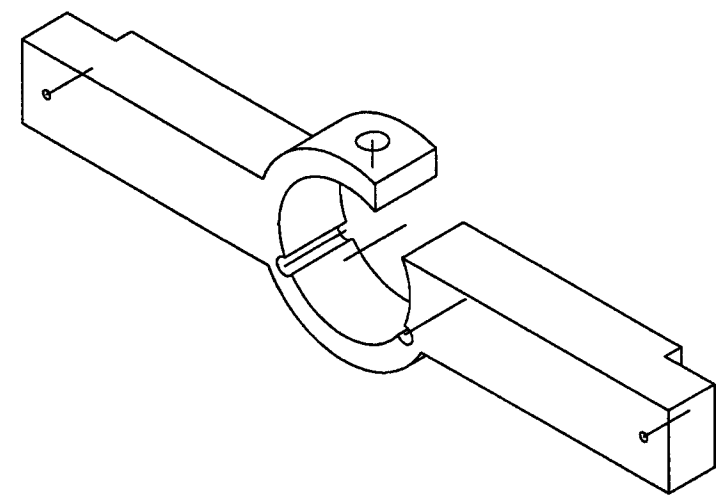
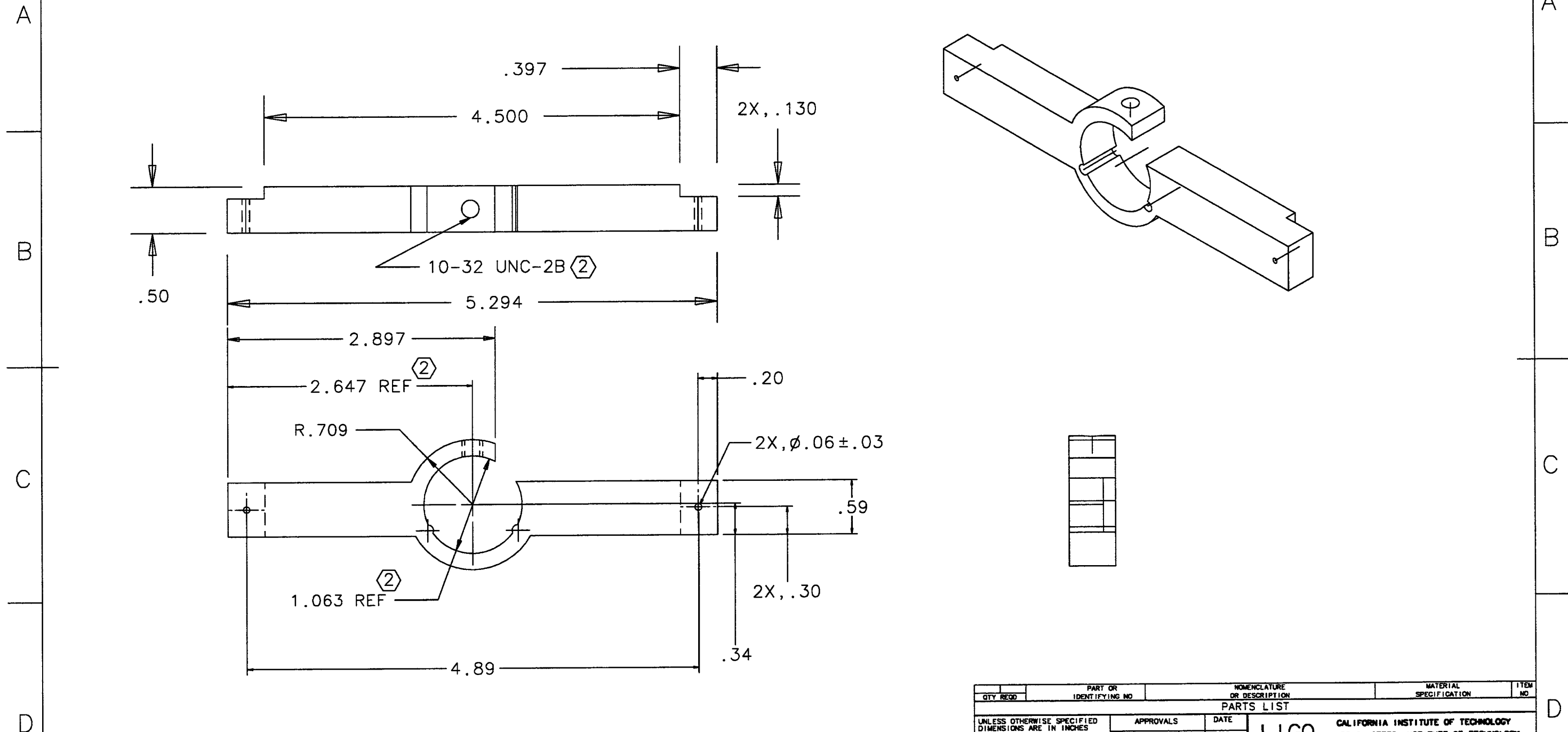
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

QTY REQD	FSOM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:			APPROVALS	DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY TITLE BRACKET, SAFETY STOP, BOTTOM
FRACTIONS DECIMALS .XX ± .01 .XXX ± .005 angles ± 1/2° DO NOT SCALE DRAWING			DRAWN J. Hoze	4/96	
NEXT ASSEMBLY D960133		MATERIAL 304 STAINLESS	DWG NO. D960140		REV 00
FILE LOCATION janeen/D960140.dwg		FINISH MACHINE ALL SURFACES	SCALE 1/2		SHEET 1 OF 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. BREAK ALL SHARP EDGES.  
 ② THIS FEATURE TO BE DEFINED ON THE NEXT ASSEMBLY.

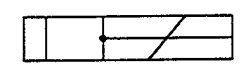
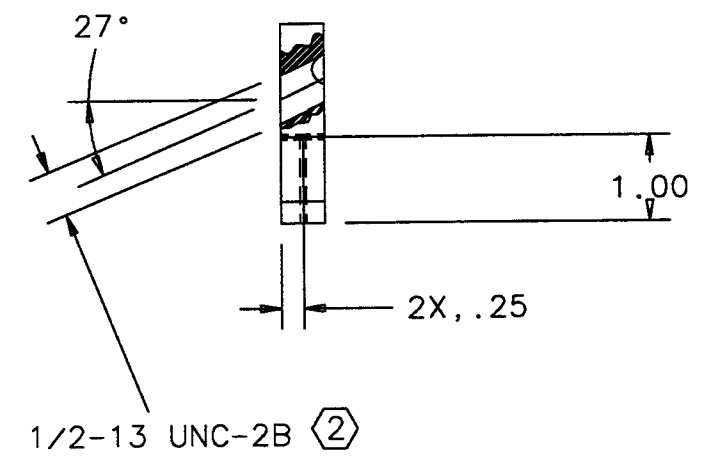
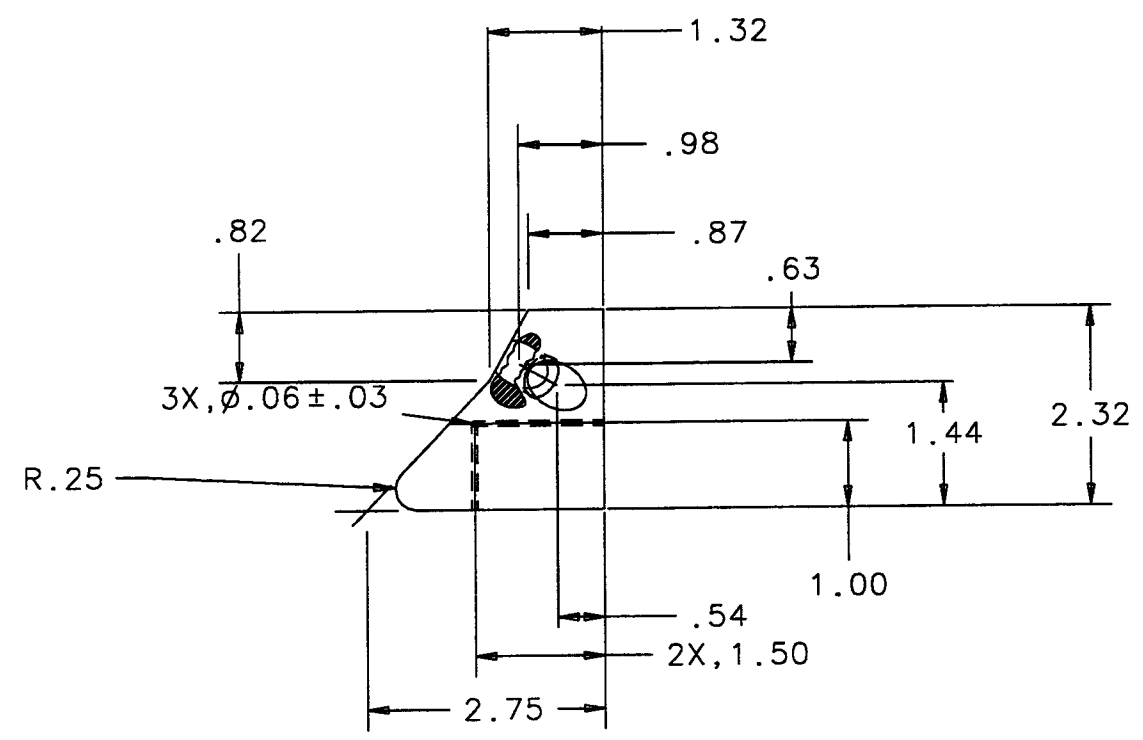
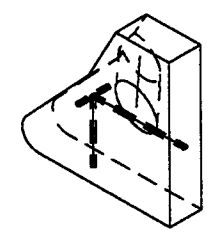
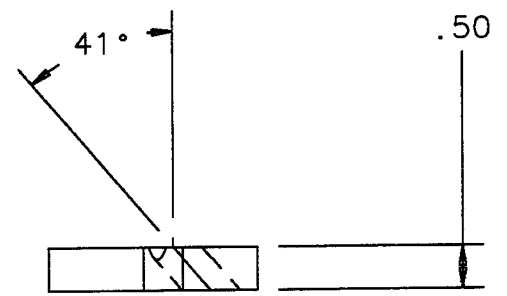
REV	DESCRIPTION OF CHANGE	SHEETS AFFECTED	APPROVAL	DATE




QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS      DECIMALS		DRAWN J. Hazel	4/96	
.XX ± .01		CHECKED		TITLE
.XXX ± .005				SIDE SENSOR/ACTUATOR PLATE
angles ± 1/2°				DWG NO. D960141
DO NOT SCALE DRAWING				REV 00
NEXT ASSEMBLY D960133	MATERIAL 304 STAINLESS			SCALE 1/1
FILE LOCATION janeen/D960141.dwg	FINISH MACHINE ALL SURFACES			SHEET 1 OF 1

NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES  
 ② THIS FEATURE TO BE MACHINED AND TAPPED AT THE NEXT ASSEMBLY.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



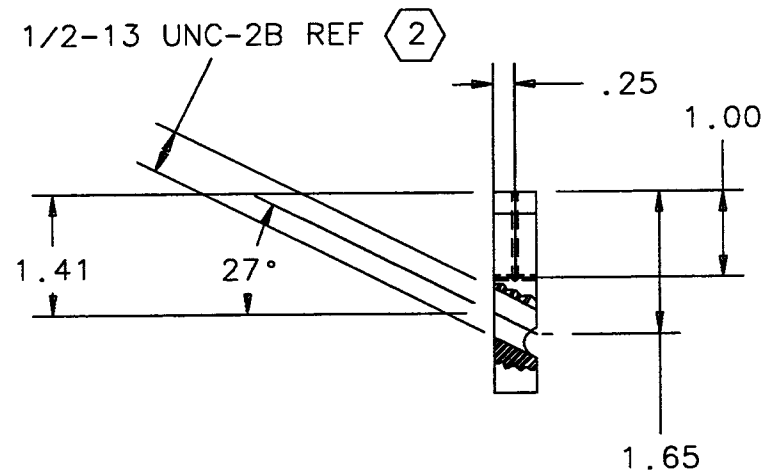
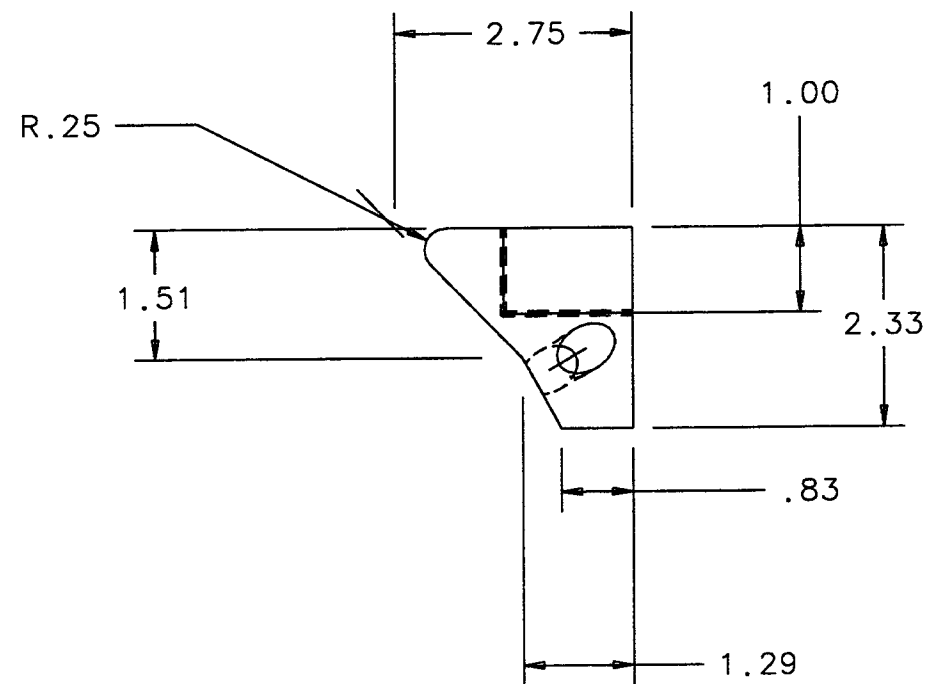
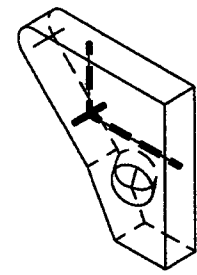
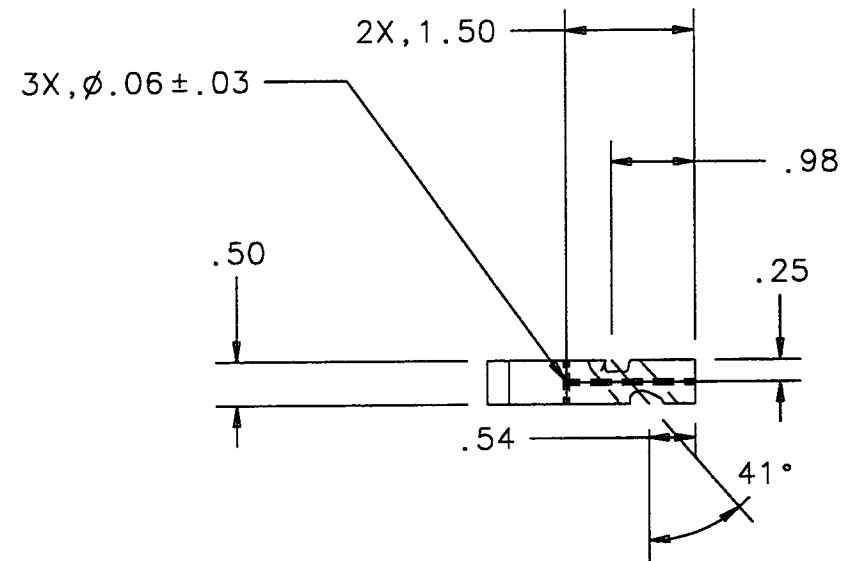
QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS .XX ±.01 .XXX ±.005 angles ± 1/2° DO NOT SCALE DRAWING			APPROVALS DRAWN J. Hazel CHECKED	DATE 4/96	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY TITLE BRACKET, FRONT, BOTTOM
MATERIAL 304 STAINLESS			SIZE B	DWG NO. D960142	REV 00
FINISH MACHINE ALL SURFACES			SCALE 1/2	FILENAME ~janeen/D960142.dwg	SHEET 1 OF 1

NEXT ASSEMBLY D960133

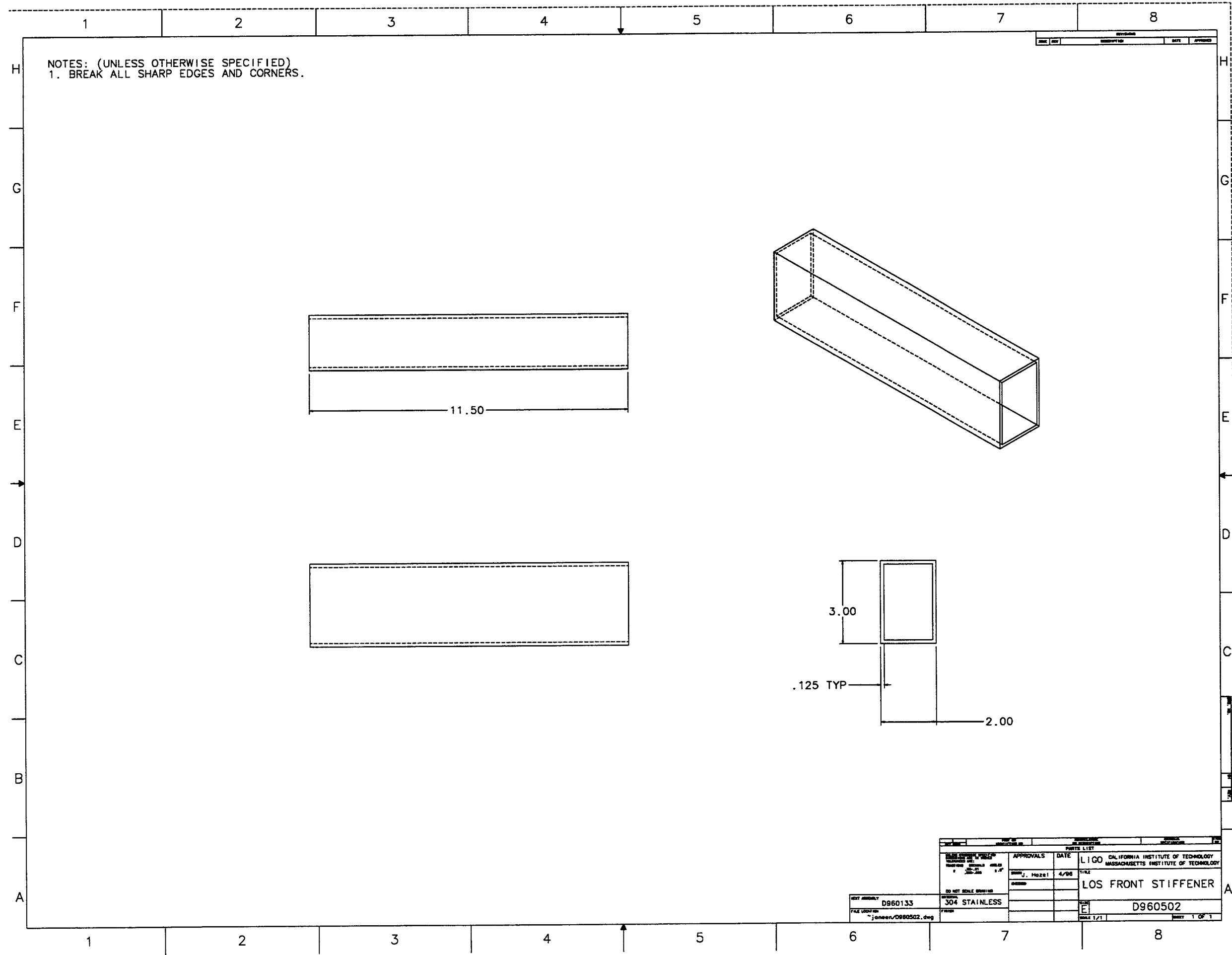


NOTES: (UNLESS OTHERWISE SPECIFIED)  
 NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES.  
 (2) THIS FEATURE TO BE MACHINED AND TAPPED AT THE NEXT ASSEMBLY.

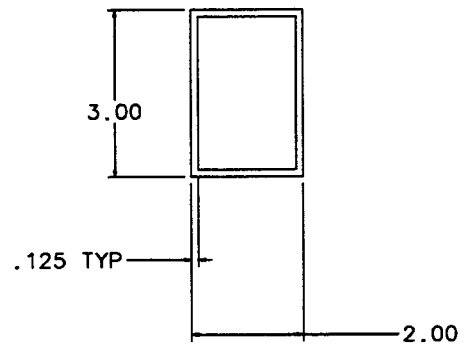
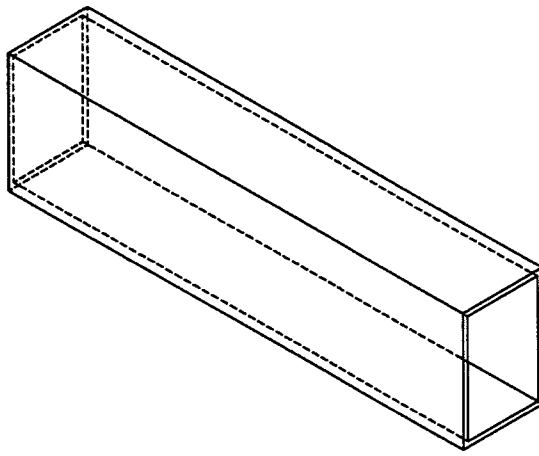
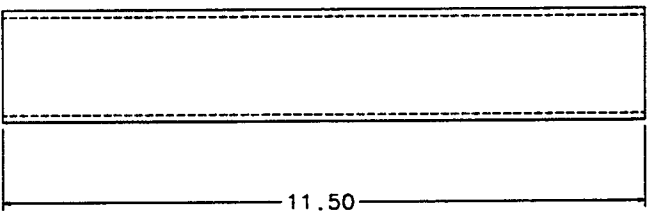
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



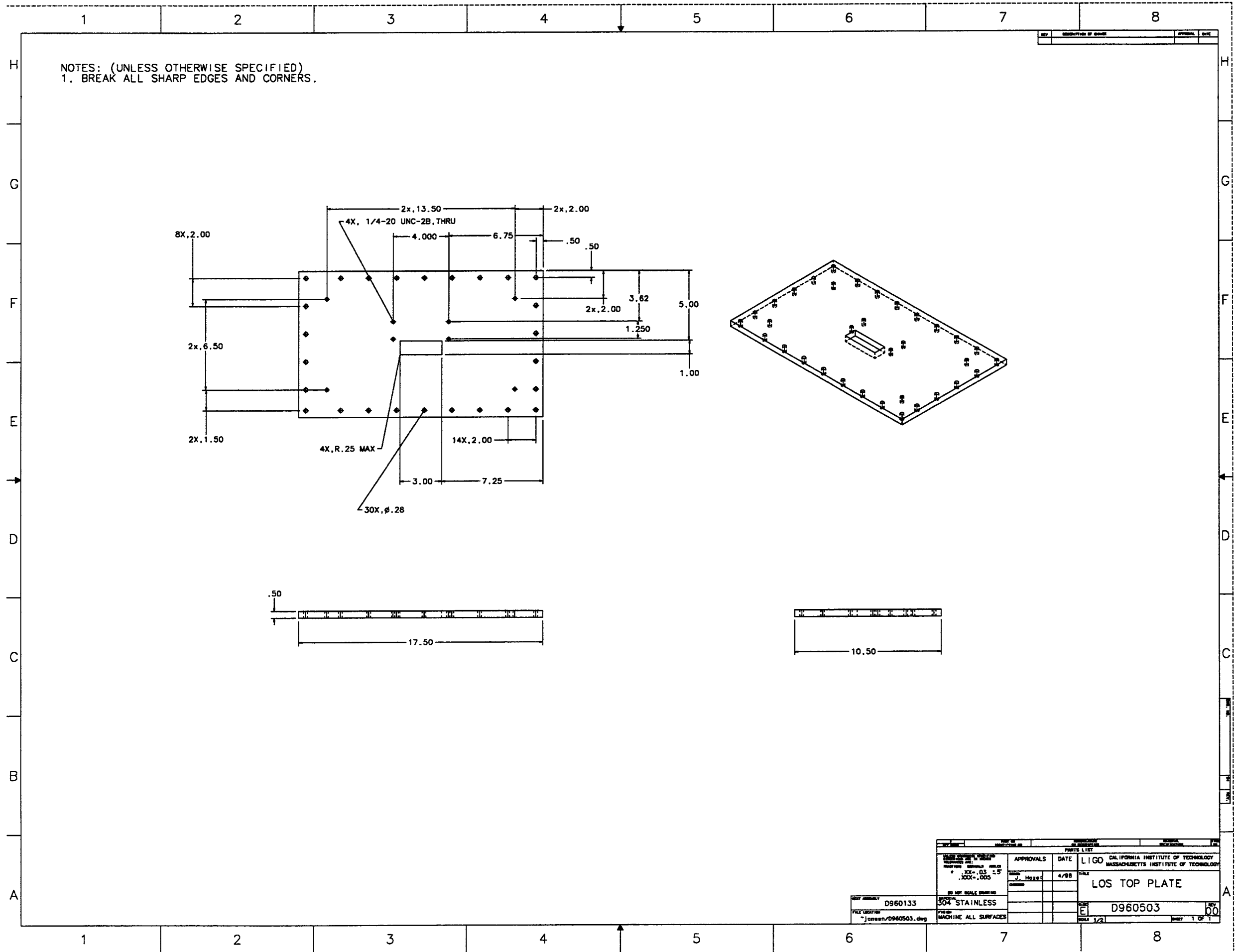
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS    DECIMALS .XX ± .01 .XXX ± .005 angles ± 1/2°		DRAWN J. Hazel	4/96	
DO NOT SCALE DRAWING		CHECKED		TITLE BRACKET, FRONT, TOP
NEXT ASSEMBLY D960133	MATERIAL 304 STAINLESS			DWG NO. D960143    REV 00
FILE LOCATION ~janeen/D960143.dwg	FINISH MACHINE ALL SURFACES		SCALE 1/2	SHEET 1 OF 1



NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES AND CORNERS.



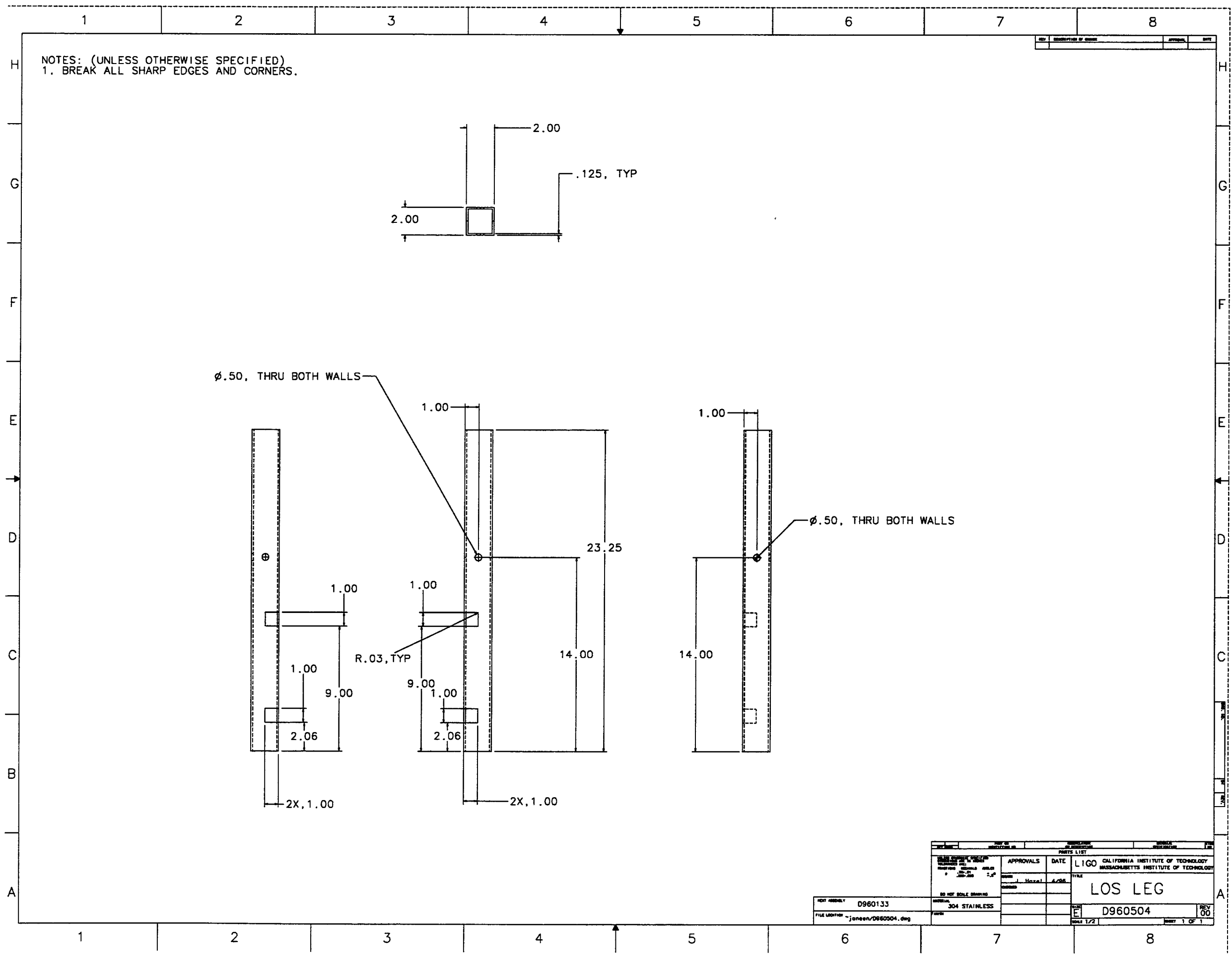
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D960133		J. Hozel		4/98	TITLE	
D960502					LOS FRONT STIFFENER	
304 STAINLESS					PART	
D960502					E	
D960502					SCALE 1/2	
D960502					PAGE 1 OF 1	



PARTS LIST		APPROVALS		DATE	
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		DATE		4/98	
TITLE		DRAWN		SCALE	
LOS TOP PLATE		J. H. H. H.		1/2	
REV		DATE		SHEET	
E				1 OF 1	
D960503					

REV	D960133	304 STAINLESS
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PRINT	MACHINE ALL SURFACES	

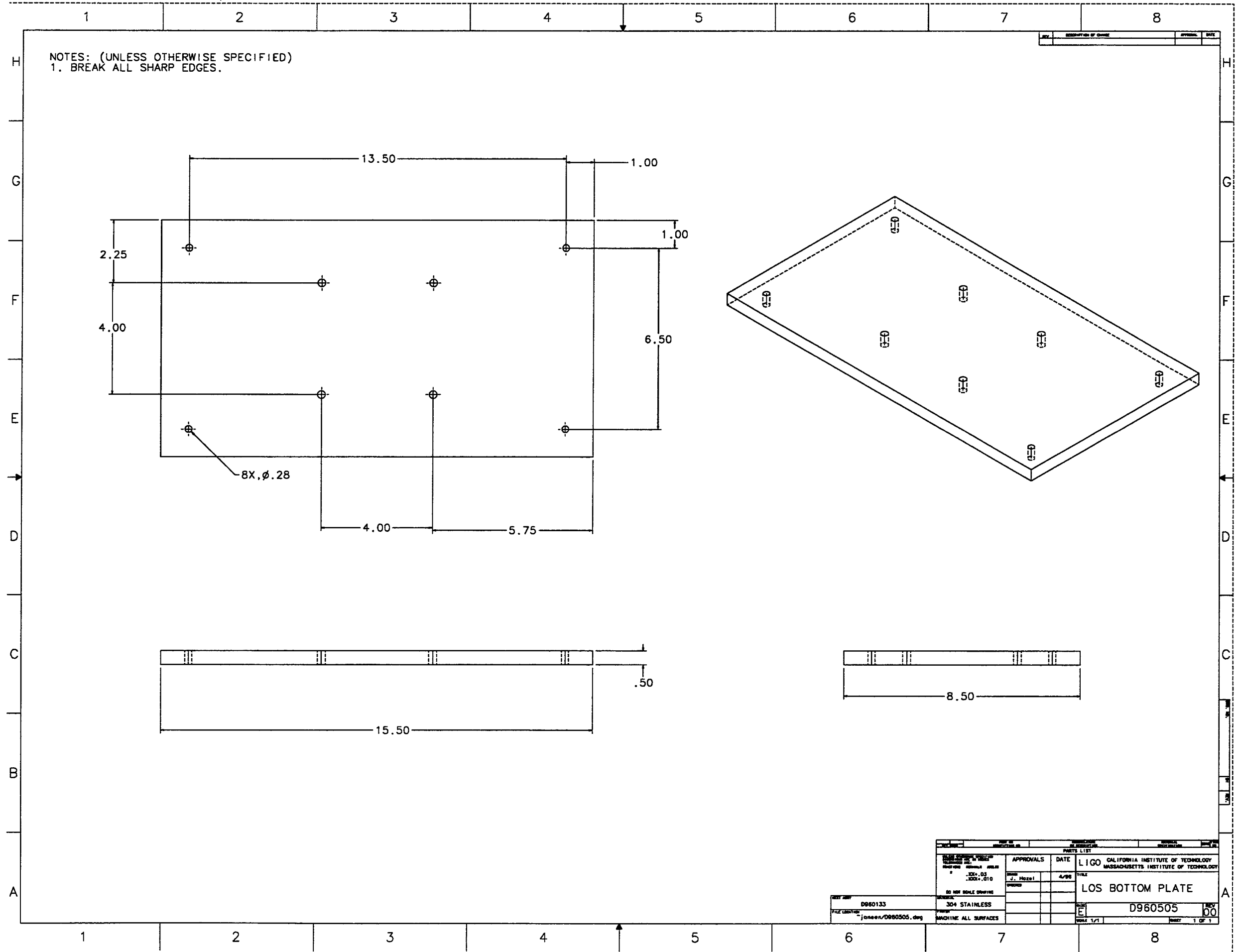


NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES AND CORNERS.

∅.50, THRU BOTH WALLS

∅.50, THRU BOTH WALLS

PART NUMBER		APPROVALS		DATE		PARTS LIST	
D960133		LIGO		CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		TITLE	
304 STAINLESS		REV		4/28		LOS LEG	
FILE LOCATION: joneen/D960504.dwg		SCALE		1/2		REV 00	
						SHEET 1 OF 1	



NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES.

PARTS LIST		APPROVALS	DATE	PARTS LIST	
REV	DESCRIPTION OF CHANGE				
01					
D960133 "janeer/D960505.dwg"		304 STAINLESS MACHINE ALL SURFACES	4/98 J. Hasei	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY LOS BOTTOM PLATE D960505 1/1	

NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

A

A

B

B

C

C

D

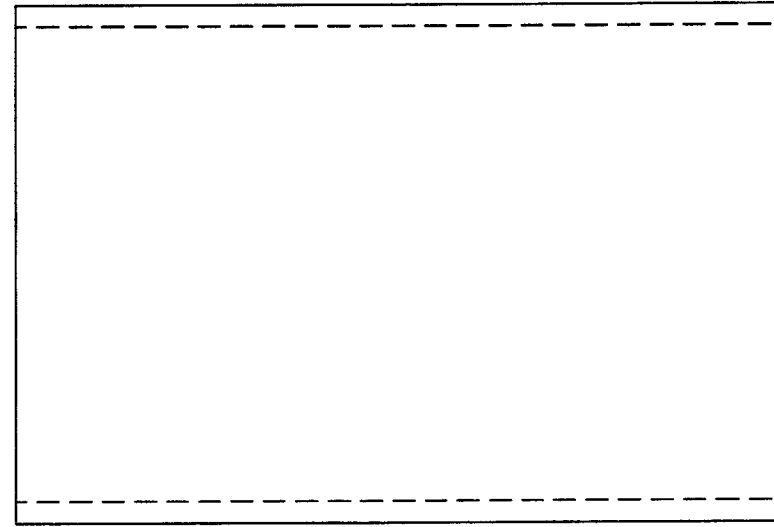
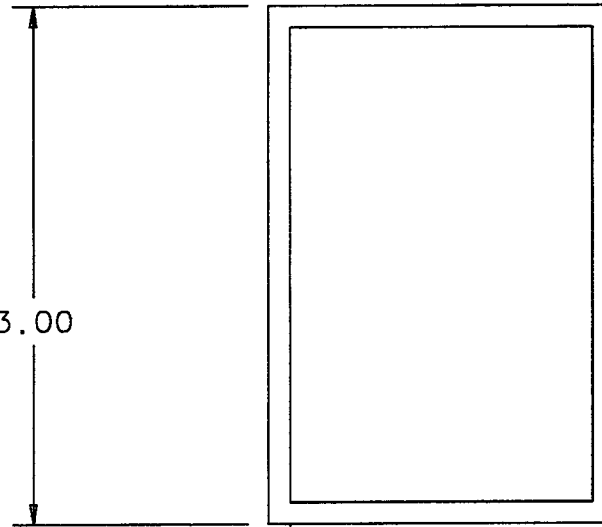
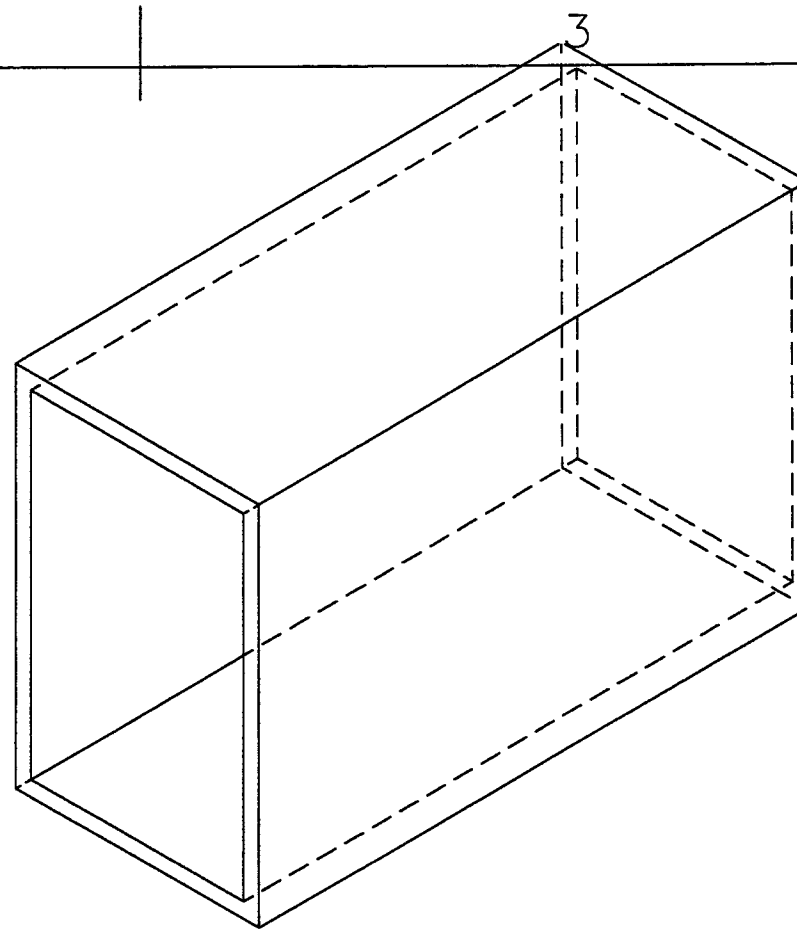
D

4.50

3.00

.125 TYP

2.00



QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN (in (mm)) TOLERANCES ARE: FRACTIONS DECIMALS .XX = .01 .XXX = .005 ANGLES = .5° DO NOT SCALE DRAWING			APPROVALS DRAWN J. Hazel CHECKED	DATE 4/96	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY TITLE LOS SIDE STIFFENER
MATERIAL	304 STAINLESS		SIZE	B	DWG NO. D960506
FINISH	MACHINE ALL SURFACES		SCALE	1/1	REV 00
FILENAME ~janeen/D960506.dwg			SHEET 1 OF 1		

1

2

3

4

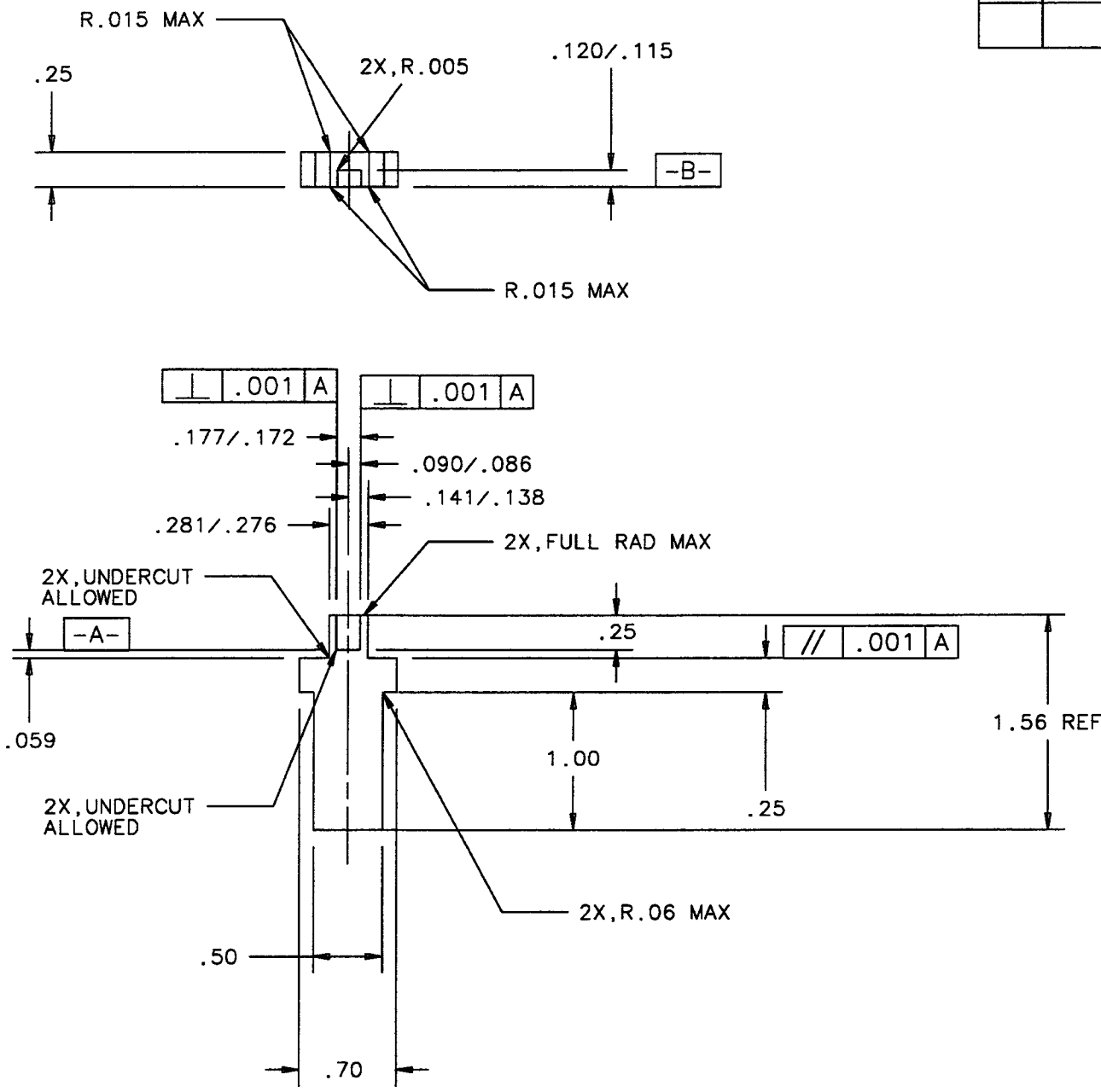
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2

3

LOS FIXTURES

NOTES: (UNLESS OTHERWISE SPECIFIED)  
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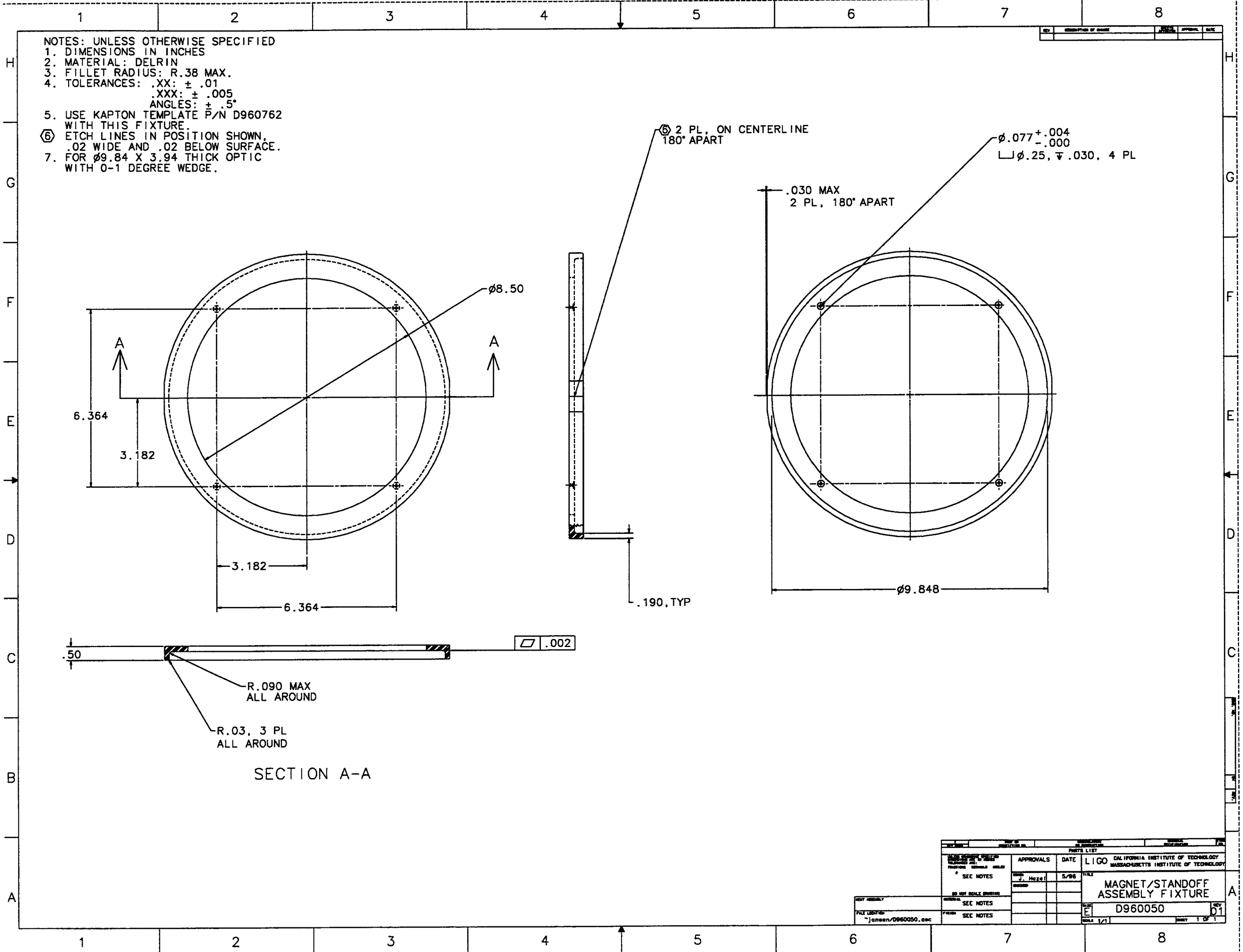


REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ± .XX - .01 ± .XXX - .005 DO NOT SCALE DRAWING			APPROVALS DRAWN J. HAZEL CHECKED	DATE 8/95	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
MATERIAL NYLON OR DELRIN			TITLE LED FIXTURE		
FILE LOCATION janeen/D950126.asc	FINTSR NONE	SIZE A3	DWG NO. D950126	REV 00	SHEET 1 OF 1



- NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS IN INCHES
  2. MATERIAL: DELRIN
  3. FILLET RADIUS: R.38 MAX.
  4. TOLERANCES: .XX:  $\pm .01$   
.XXX:  $\pm .005$   
ANGLES:  $\pm .5^\circ$
  5. USE KAPTON TEMPLATE P/N D960762 WITH THIS FIXTURE.
  6. ETCH LINES IN POSITION SHOWN, .02 WIDE AND .02 BELOW SURFACE.
  7. FOR  $\phi 9.84 \times 3.94$  THICK OPTIC WITH 0-1 DEGREE WEDGE.



2 PL, ON CENTERLINE  
180° APART

$\phi .077^{+.004}_{-.000}$   
L  $\phi .25, \nabla .030, 4 \text{ PL}$

.030 MAX  
2 PL, 180° APART

.190, TYP

$\square .002$

R.090 MAX  
ALL AROUND

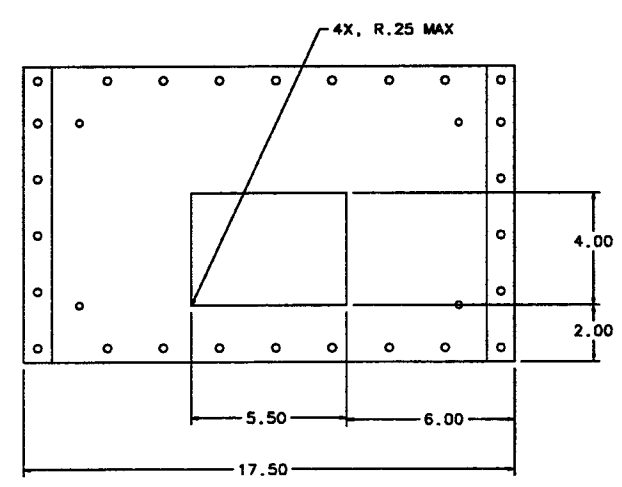
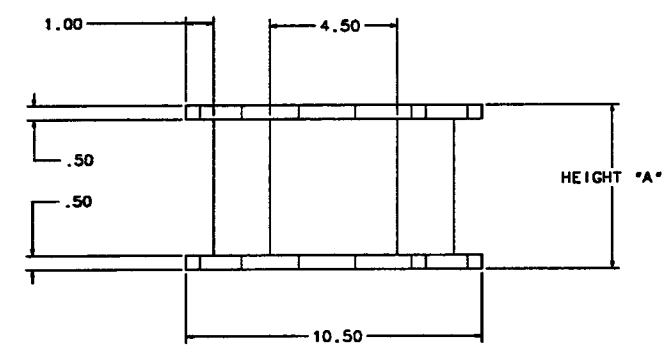
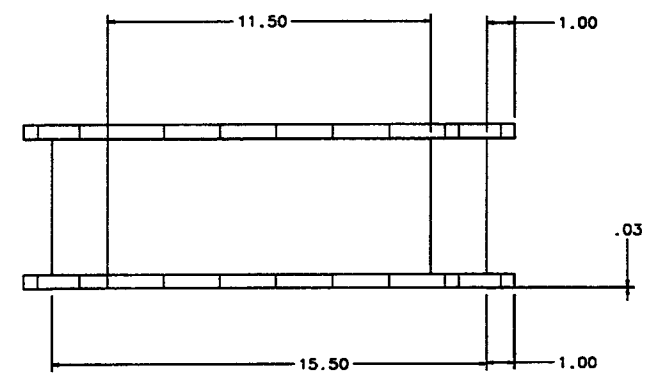
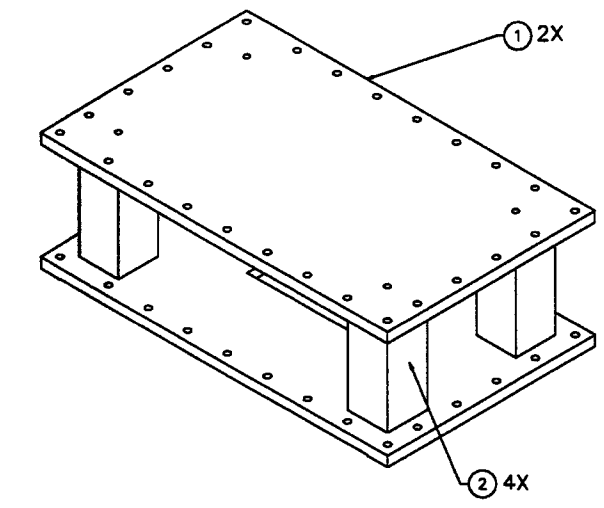
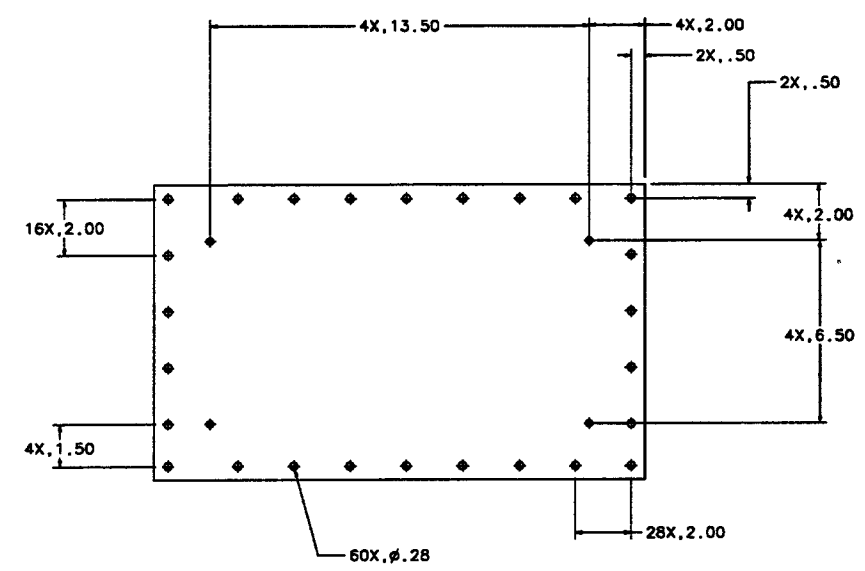
R.03, 3 PL  
ALL AROUND

SECTION A-A

APPROVALS		DATE	PARTS LIST	
SEE NOTES	SEE NOTES	5/96	MAGNET/STANDOFF ASSEMBLY FIXTURE	
SEE NOTES	SEE NOTES		D960050	
SEE NOTES	SEE NOTES		REV 01	

FILE LOCATION: -jonesen/D960050.dwg

- NOTES: (UNLESS OTHERWISE SPECIFIED)
1. BREAK ALL SHARP EDGES.
  2. PARTS TO BE CLEANED BEFORE WELDING AND AFTER MACHINING.
  3. PARTS TO BE CLEANED WITH SOAP AND WATER.
  4. PARTS TO BE WELDED TOGETHER USING A FILLET WELD ALL AROUND THE TOP AND BOTTOM OF EACH OF THE LEGS. THE FILLETS CROSS SECTION SHALL HAVE A TYPICAL SIDE DIMENSION OF .13.
  5. AFTER WELDING, ANNEAL TO RELIEVE STRESS.
  6. AFTER ANNEALING, CLEAN THE ASSEMBLY WITH SOAP AND WATER. IMMEDIATELY WRAP THE ASSEMBLY TO PROTECT IT FROM CONTAMINATION.



DASH NO.	HEIGHT "A"
-1	5.900

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE
2	EXTRUDED LEGS, 2.0 ± 0.20 ± .125 WALL THICKNESS		
1	PLATES, 17.5 x 10.5 x .5		

REV	DESCRIPTION OF CHANGE	APPROVALS	DATE	TITLE
00	304 STAINLESS	J. Hezel	5/26	LOS HEIGHT ADAPTER ASSEMBLY
E	SEE NOTES			D960145

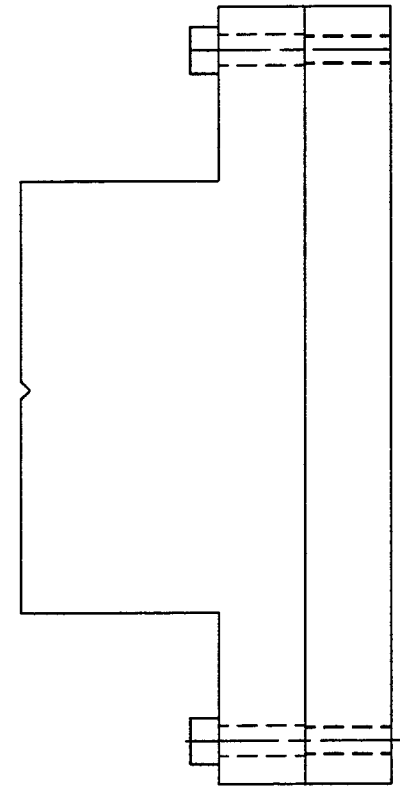
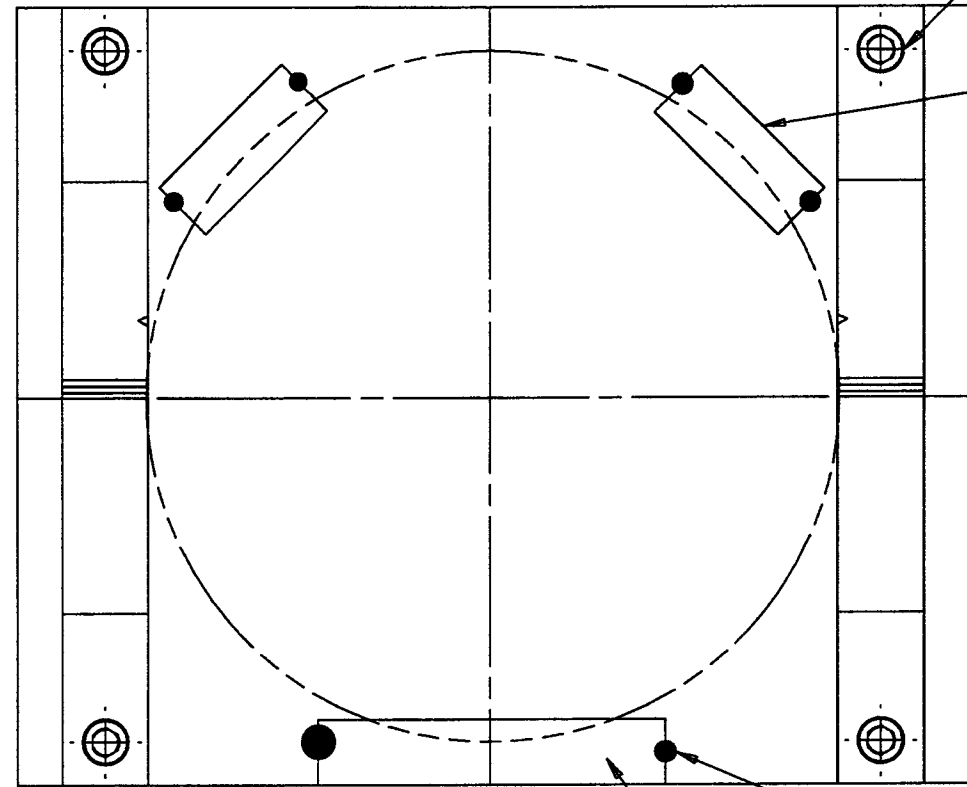
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE
00	304 STAINLESS		
E	SEE NOTES		

REF ASSEMBLY D960132  
 FILE D960145.dwg  
 jones@D960145.dwg

APPROVALS DATE  
 J. Hezel 5/26  
 LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
 TITLE  
 LOS HEIGHT ADAPTER ASSEMBLY  
 D960145  
 REV 00  
 SHEET 1/2

NOTES: (UNLESS OTHERWISE SPECIFIED)

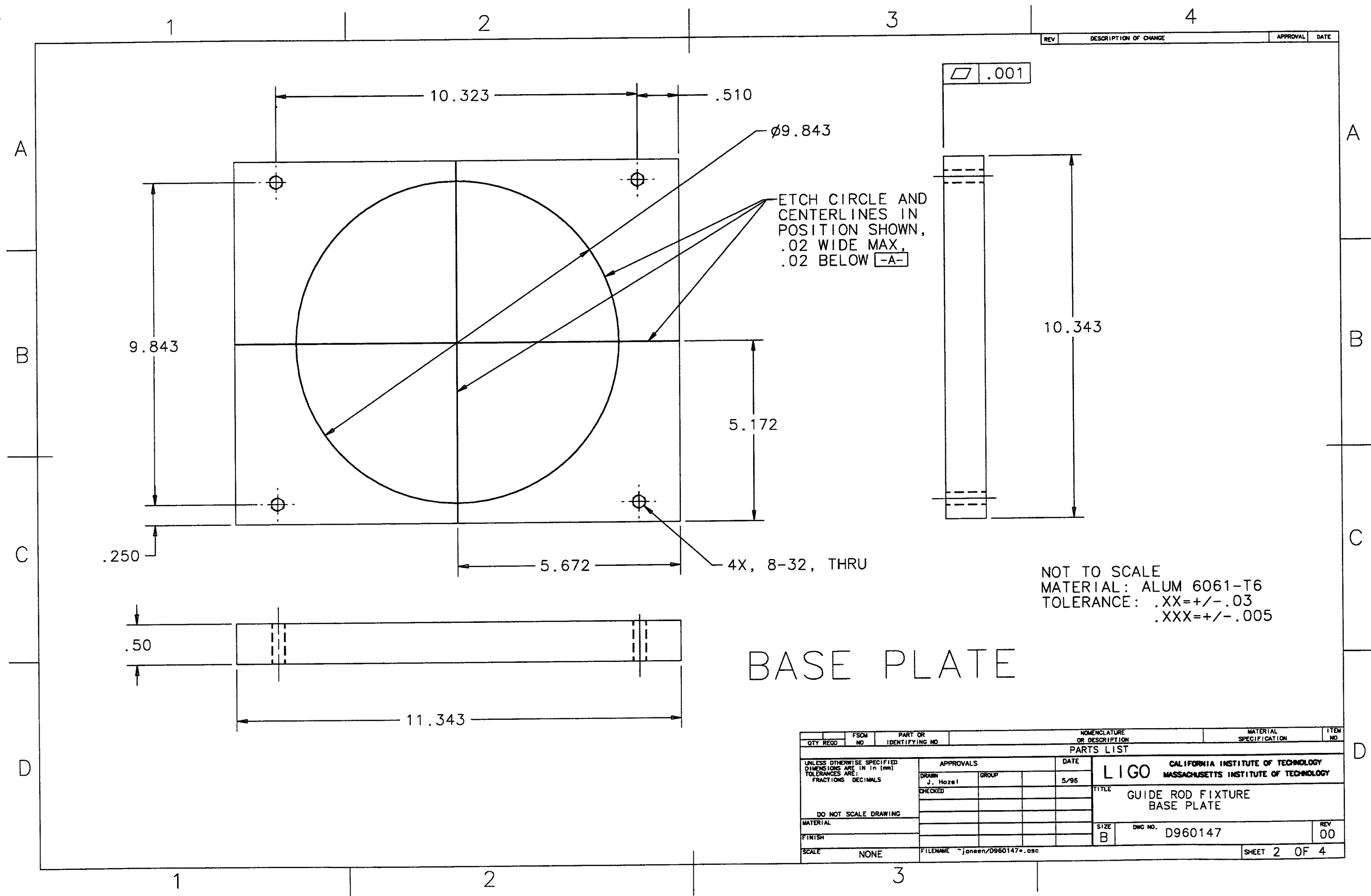
1. FOR  $\varnothing 9.84 \times 3.94$  THICK OPTIC WITH 3 DEGREE WEDGE.



REV	DESCRIPTION OF CHANGE	SHEETS AFFECTED	APPROVAL	DATE

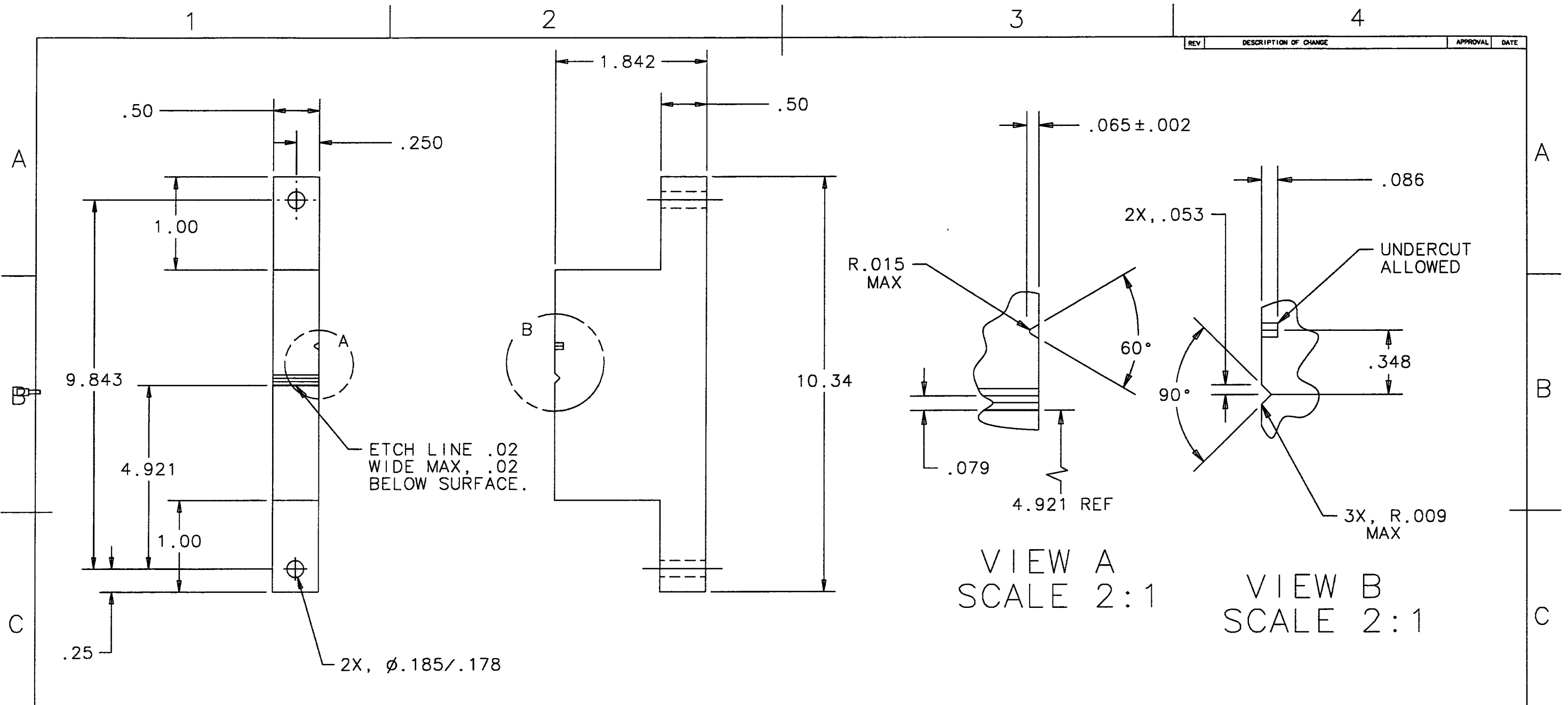
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
4		SCREW, SHCS, 8-32X.75	STAINLESS STEEL	7
A/R		VAC-SEAL EPOXY		6
1		PROTECTIVE SHEET	KAPTON, .38x2.00 x.0075	5
2		PROTECTIVE SHEET	KAPTON, .38x1.00 x.0075	4
1	DETAIL, SHEET 4	RIGHT BLOCK		3
1	DETAIL, SHEET 3	LEFT BLOCK		2
1	DETAIL, SHEET 2	BASE PLATE		1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS		APPROVALS		DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
DO NOT SCALE DRAWING		DRAWN J. Hazel	GROUP	5/96	LIGO	
MATERIAL		CHECKED			TITLE GUIDE ROD FIXTURE	
FINISH					SIZE B	DWG NO. D960147
SCALE NONE		FILENAME "janeen/D960147*.asc"			REV 00	SHEET 1 OF 4



# BASE PLATE

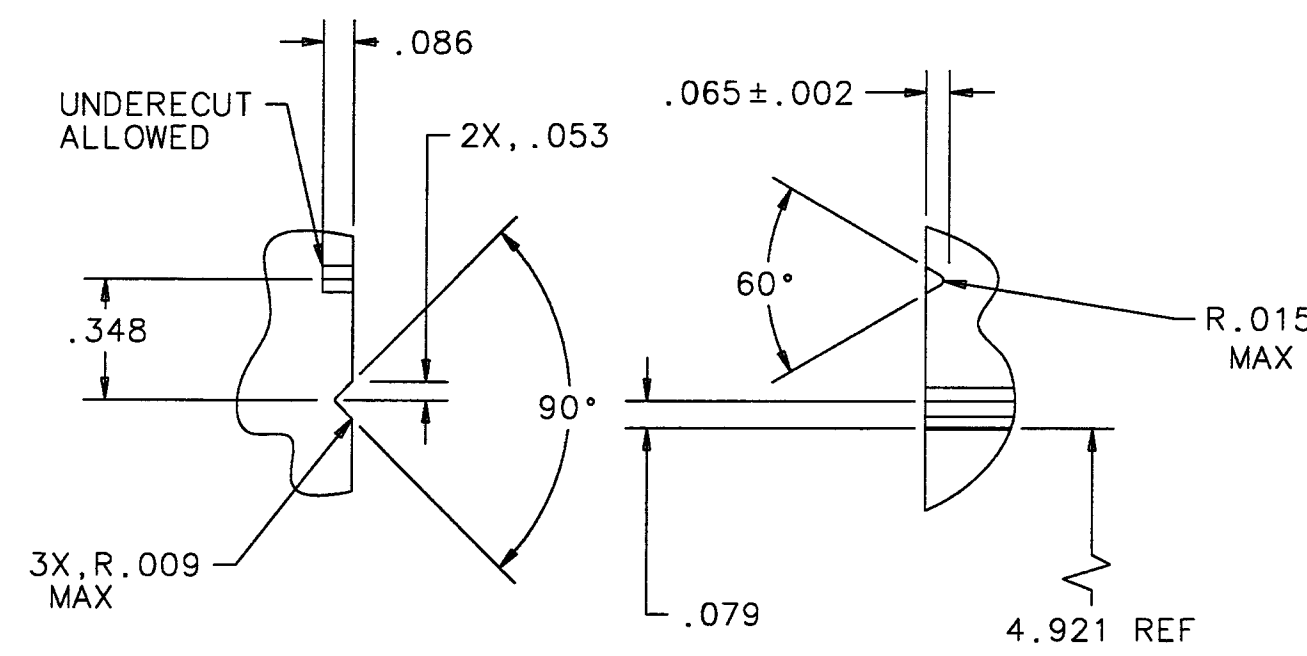
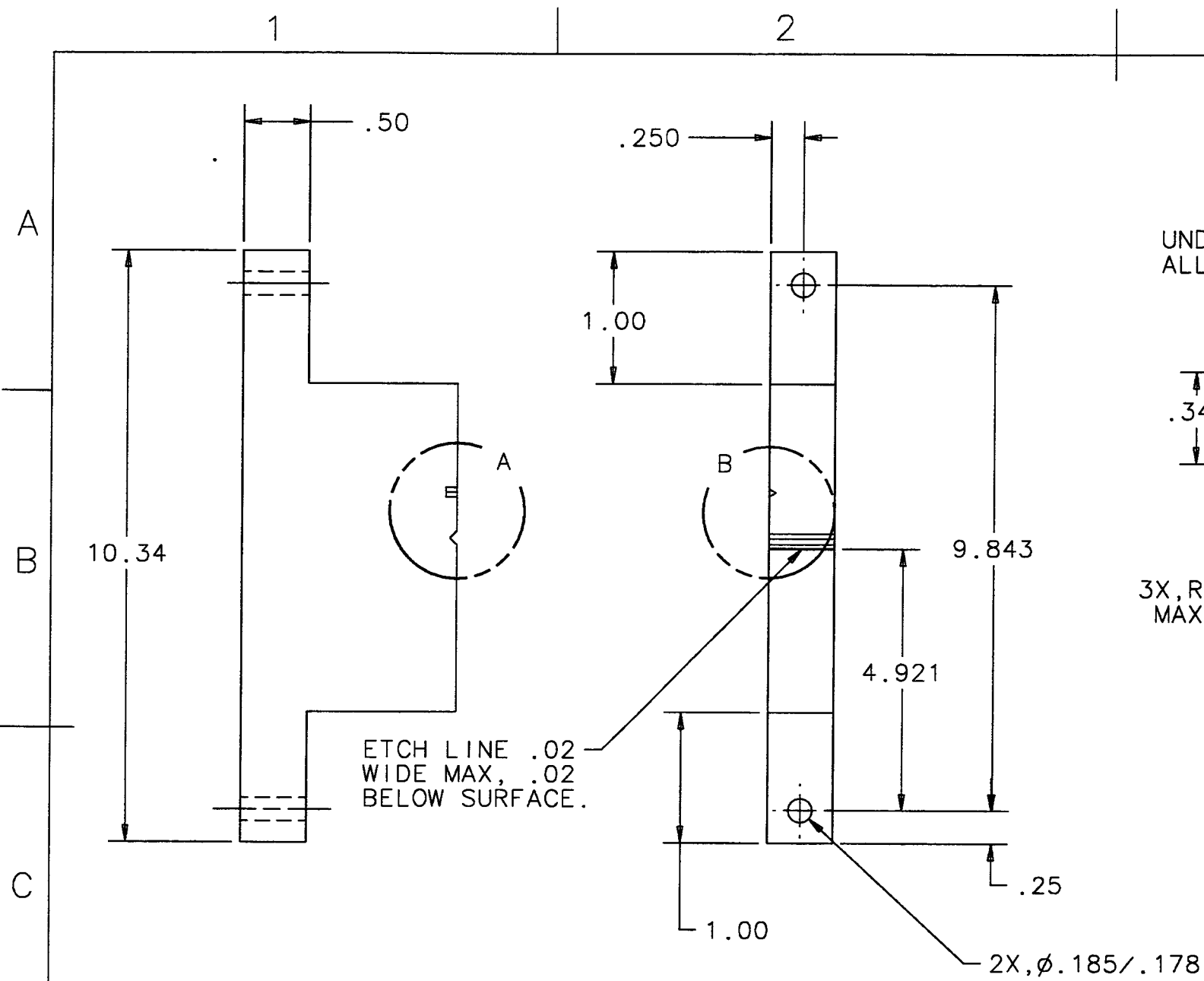
QTY	REQD	FSOM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST						
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS				APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DO NOT SCALE DRAWING				DRAWN J. Hoze!	5/95	
MATERIAL				CHECKED		TITLE GUIDE ROD FIXTURE BASE PLATE
FINISH						SIZE B DWG NO. D960147 REV 00
SCALE NONE				FILENAME ~joneen/D960147*.asc		SHEET 2 OF 4



# LEFT BLOCK

NOT TO SCALE  
 MATERIAL: TEFLON  
 TOLERANCES: .XX=+/- .01  
 .XXX=+/- .005  
 ANGLES= +/- 1°

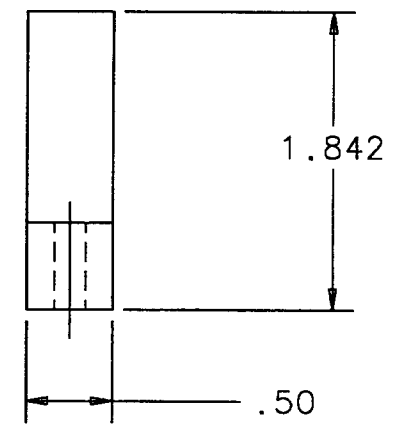
QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS			APPROVALS DRAWN J. Hazel CHECKED	DATE 5/96	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY TITLE GUIDE ROD FIXTURE LEFT BLOCK
DO NOT SCALE DRAWING					
MATERIAL					SIZE B
FINISH					DWG NO. D960147
SCALE NONE			FILENAME janeen/D960147*.asc		REV 00
					SHEET 3 OF 4



VIEW A  
SCALE 2:1

VIEW B  
SCALE 2:1

RIGHT BLOCK



NOT TO SCALE  
 MATERIAL: TEFLON  
 TOLERANCES: .XX=+/- .01  
 .XXX=+/- .005  
 ANGLES= +/- 1°

QTY	RECD	FSDM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST						
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN in (mm) TOLERANCES ARE: FRACTIONS DECIMALS			APPROVALS		DATE	
DO NOT SCALE DRAWING			DRAWN J. Hozei		5/96	
MATERIAL			CHECKED		TITLE	
FINISH			SCALE NONE		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
SCALE NONE			FILENAME ~janeen/D960147*.asc		GUIDE ROD FIXTURE RIGHT BLOCK	
SCALE NONE			FILENAME ~janeen/D960147*.asc		SIZE B DWG NO. D960147 REV 00	
SCALE NONE			FILENAME ~janeen/D960147*.asc		SHEET 4 OF 4	

NOTES: UNLESS OTHERWISE SPECIFIED:  
 1. ALL DIMENSIONS IN INCHES.  
 2. FILLET RADIUS: R .015 MAX  
 3. TOLERANCES, UNLESS OTHERWISE SPECIFIED:  
 .XX + .01  
 .XXX + .005  
 ANGLES + 1

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

A

A

B

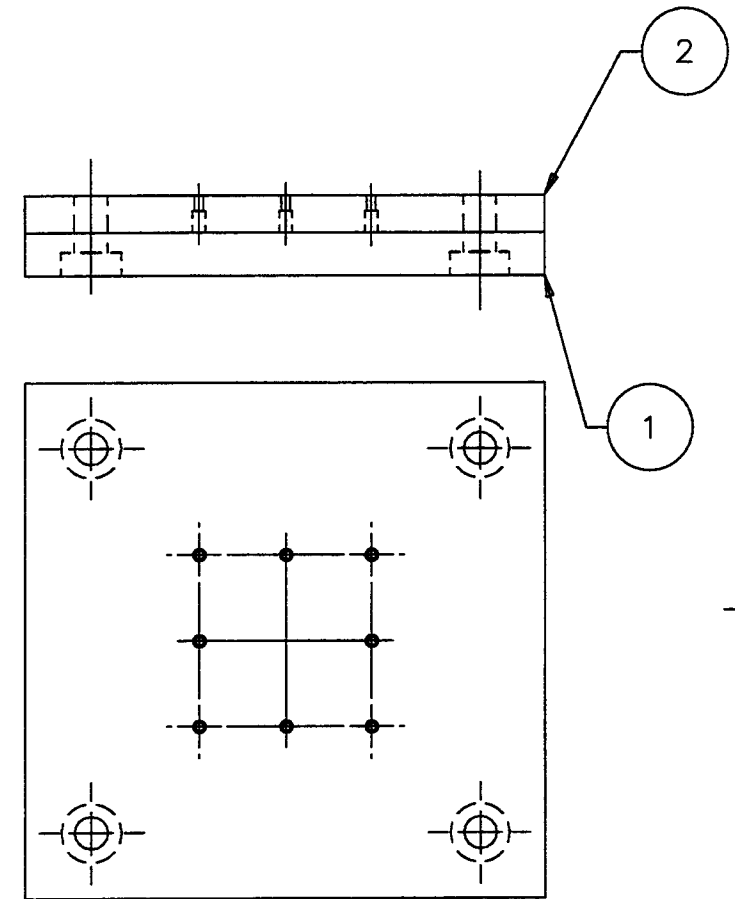
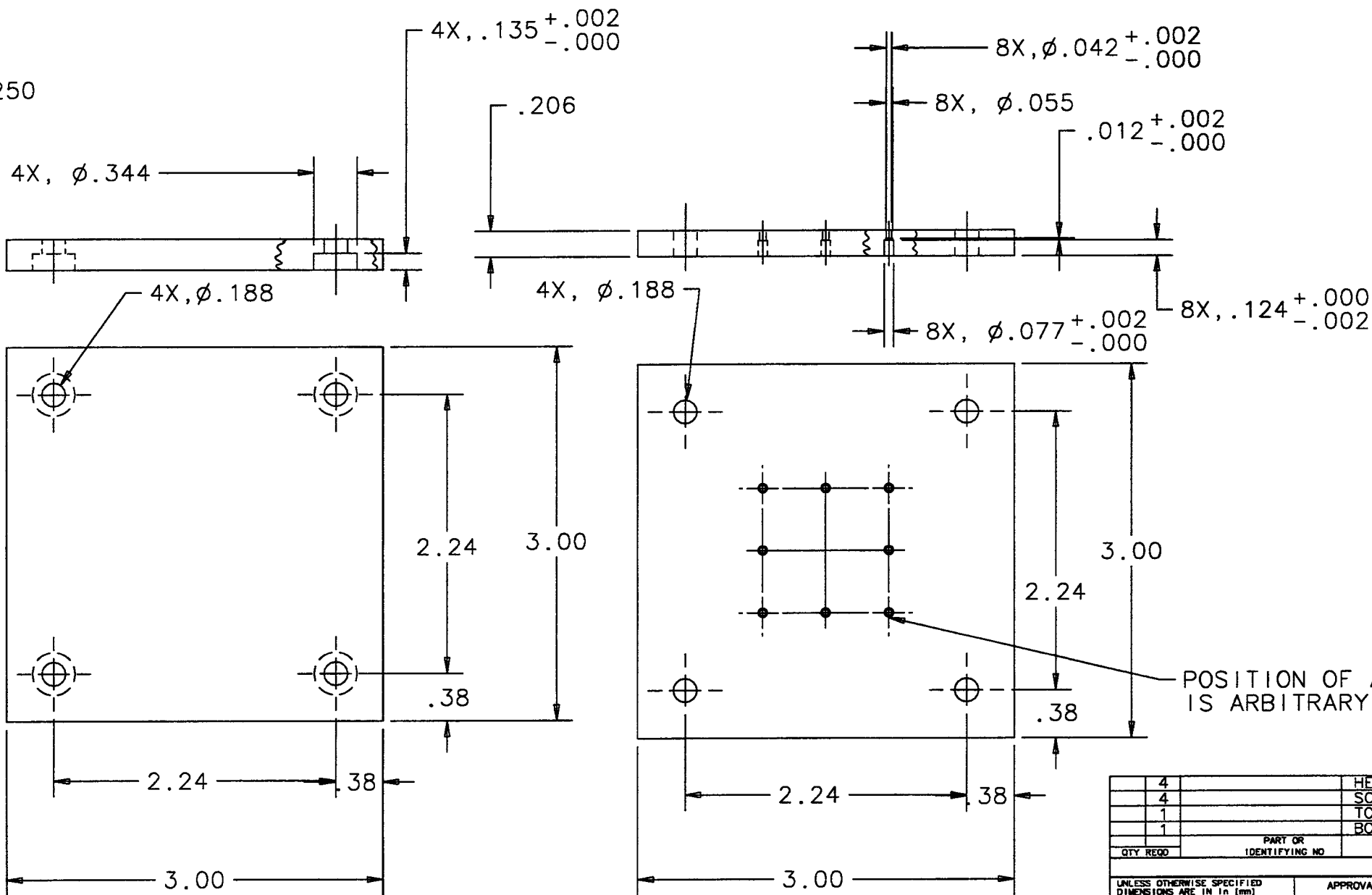
B

C

C

D

D



ASSEMBLY

POSITION OF ARRAY IS ARBITRARY

BOTTOM BLOCK

TOP BLOCK

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
4		HEX NUT, 8-32		4
4		SCREW, 8-32 X .75		5
1		TOP BLOCK		2
1		BOTTOM BLOCK		1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS		APPROVALS		DATE	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
DO NOT SCALE DRAWING	SEE NOTES	DRAWN J. Hazel	GROUP	5/96	LIGO	
MATERIAL DELRIN	DO NOT SCALE DRAWING	CHECKED			MAGNET-TO-STANDOFF FIXTURE	
FINISH NONE					SIZE B	DWG NO. D960500
SCALE 1/1	FILENAME ~janeen/D960500.asc					REV 00

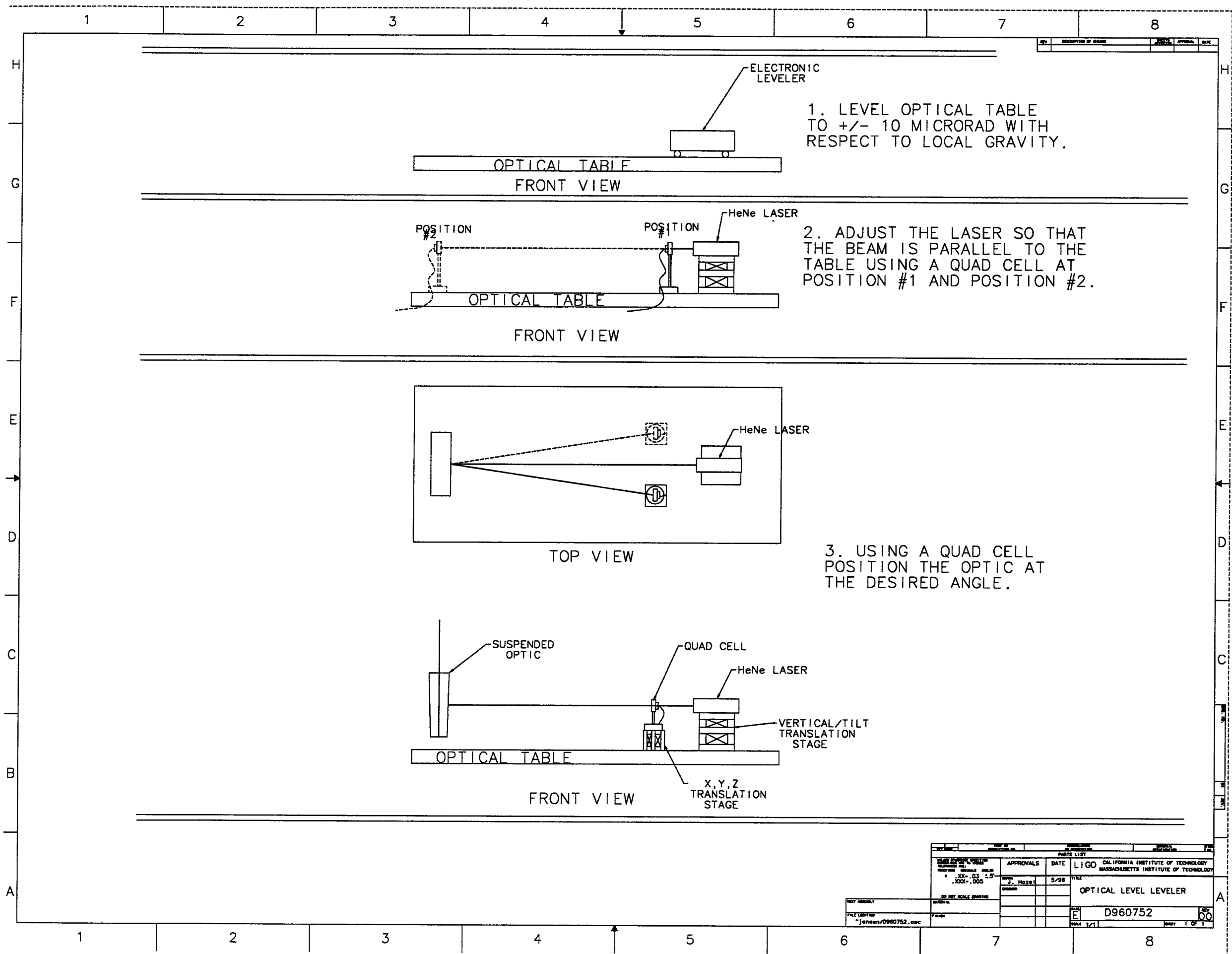
1

2

3

4

SHEET 1 OF 1



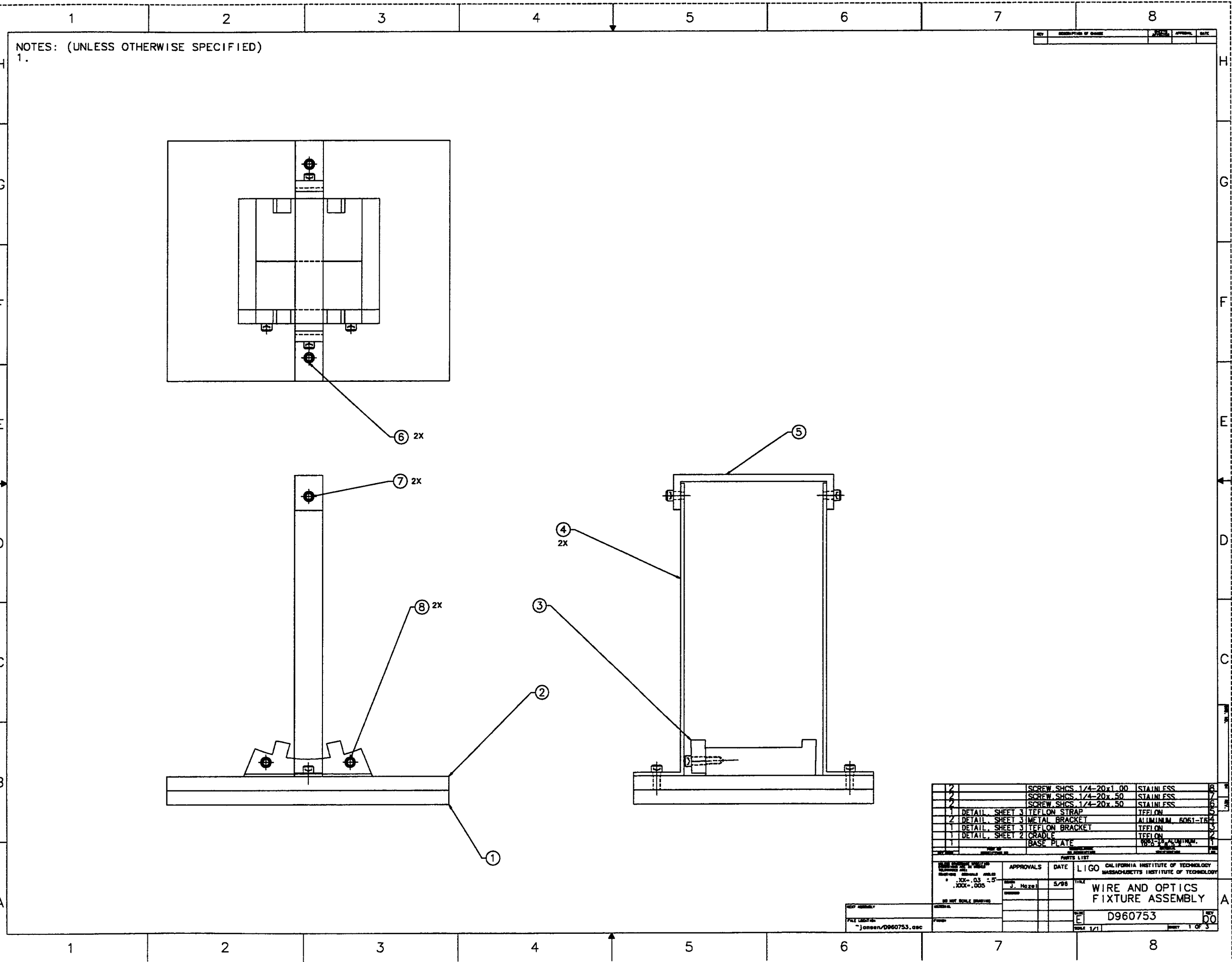
1. LEVEL OPTICAL TABLE TO  $\pm 10$  MICRORAD WITH RESPECT TO LOCAL GRAVITY.

2. ADJUST THE LASER SO THAT THE BEAM IS PARALLEL TO THE TABLE USING A QUAD CELL AT POSITION #1 AND POSITION #2.

3. USING A QUAD CELL POSITION THE OPTIC AT THE DESIRED ANGLE.

PARTS LIST		APPROVALS	DATE	FILE
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY			5/98	
OPTICAL LEVEL LEVELER				
D960752				
PAGE 1/1				





NOTES: (UNLESS OTHERWISE SPECIFIED)

1.

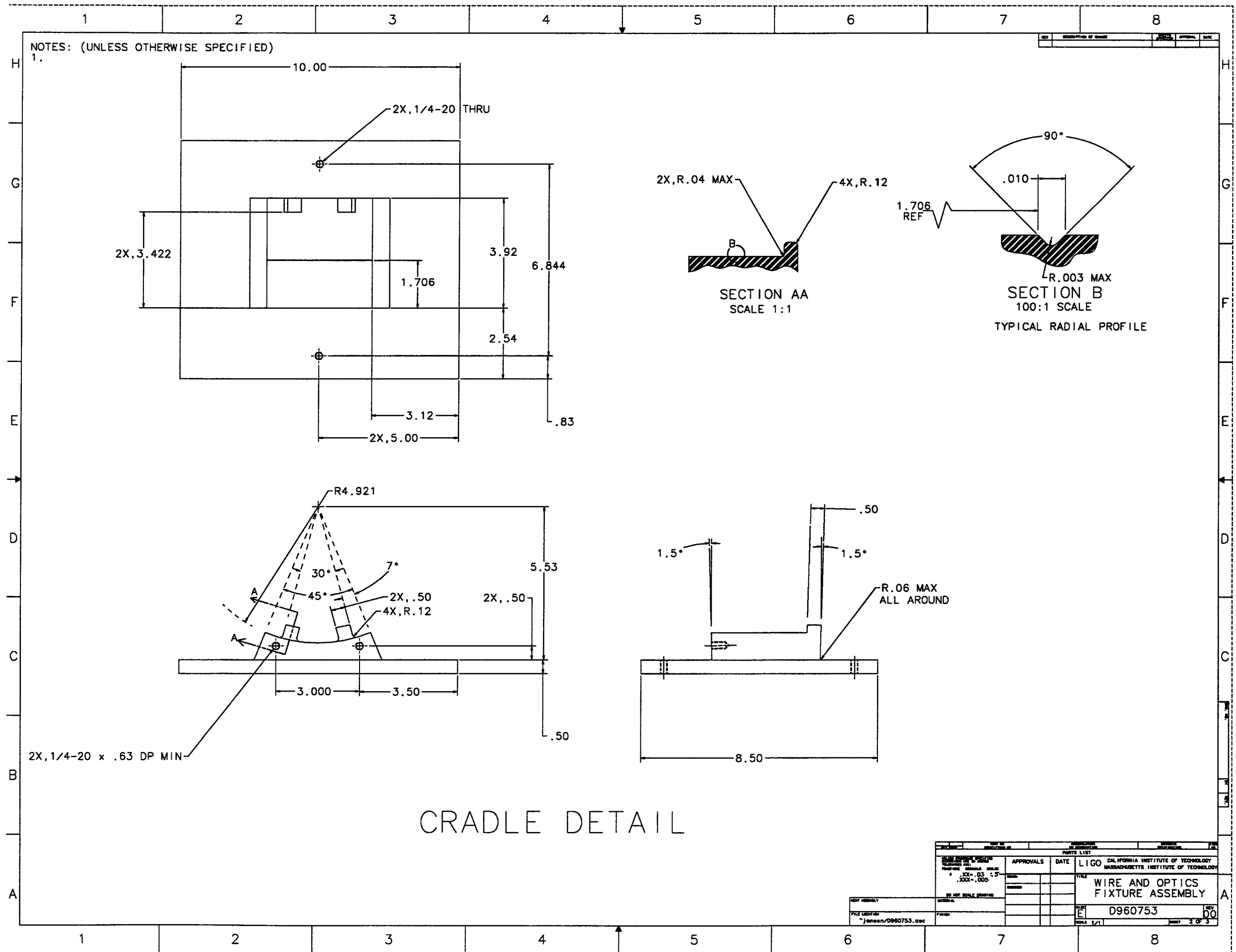
QTY	DESCRIPTION OF PART	MATERIAL	APPROVAL	DATE
2	SCREW SHCS 1/4-20x1.00	STAINLESS		
2	SCREW SHCS 1/4-20x.50	STAINLESS		
2	SCREW SHCS 1/4-20x.50	STAINLESS		
1	DETAIL SHEET 3 TEFELON STRAP	TEFELON		
2	DETAIL SHEET 3 METAL BRACKET	ALUMINUM 6061-T6		
1	DETAIL SHEET 3 TEFELON BRACKET	TEFELON		
1	DETAIL SHEET 2 CRADLE	TEFELON		
1	BASE PLATE	6061-T6 ALUMINUM		

APPROVALS	DATE	TITLE
LIGO	5/98	WIRE AND OPTICS FIXTURE ASSEMBLY

FILE NUMBER	DATE	REV
"jonesen/D960753.dwg"		00

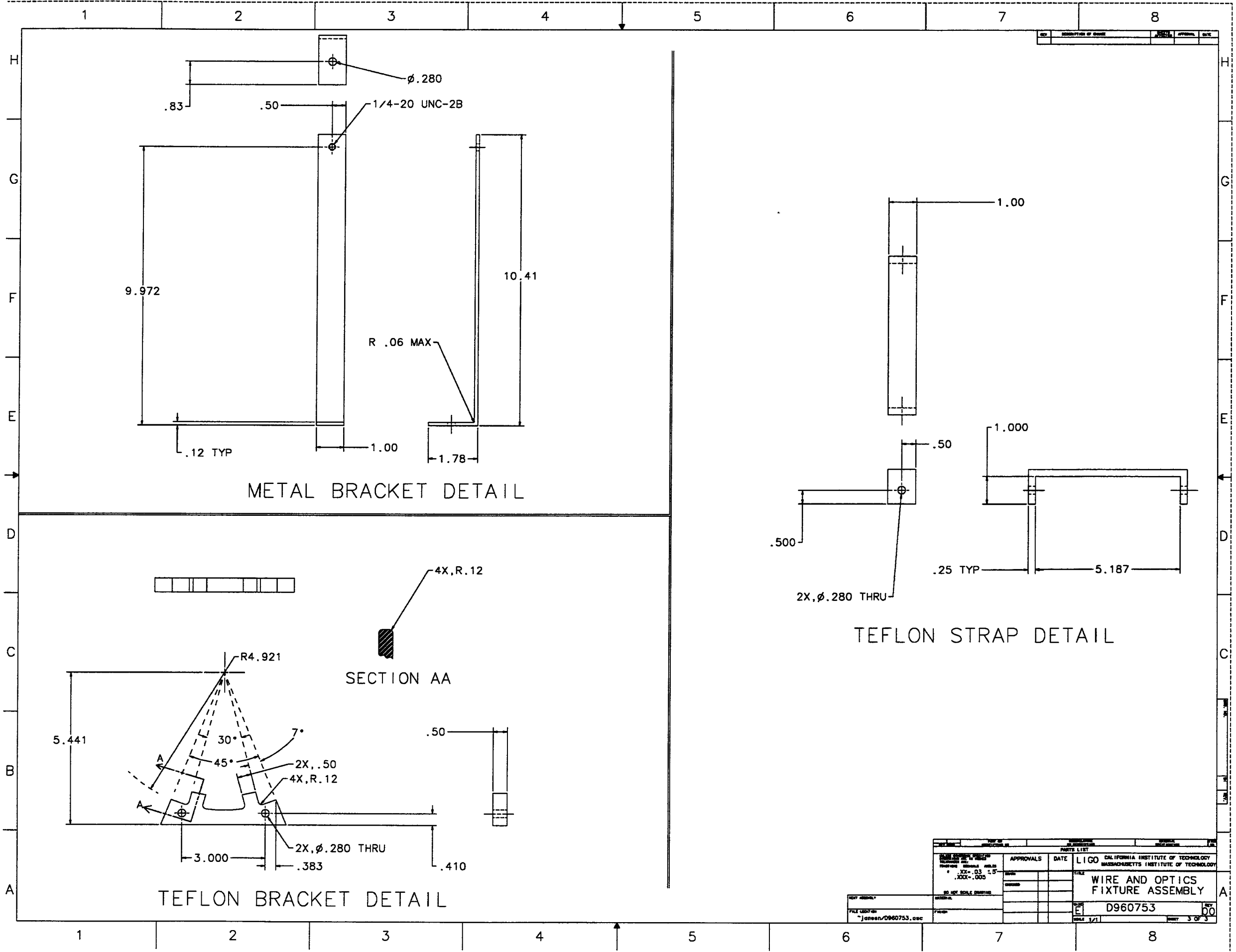


NOTES: (UNLESS OTHERWISE SPECIFIED)

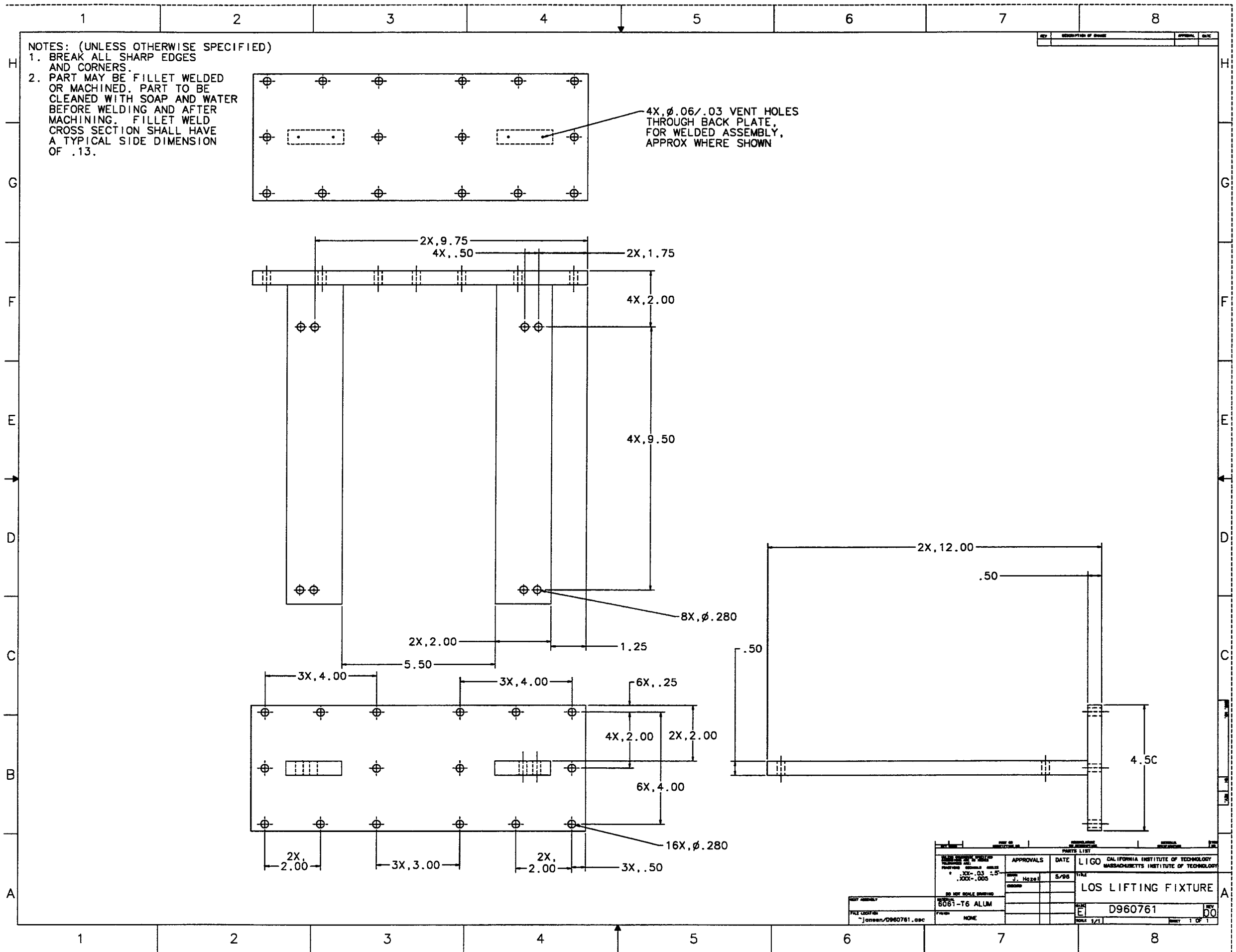
1.

CRADLE DETAIL

APPROVALS		DATE	PARTS LIST	
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY				
WIRE AND OPTICS FIXTURE ASSEMBLY				
D960753				
1/1			2 OF 3	



APPROVALS		DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
DESIGNED BY	FILED BY		TITLE	
~jensen/D960753.dwg			WIRE AND OPTICS FIXTURE ASSEMBLY	
			D960753	REV 00
			SHEET 1/1	3 OF 3

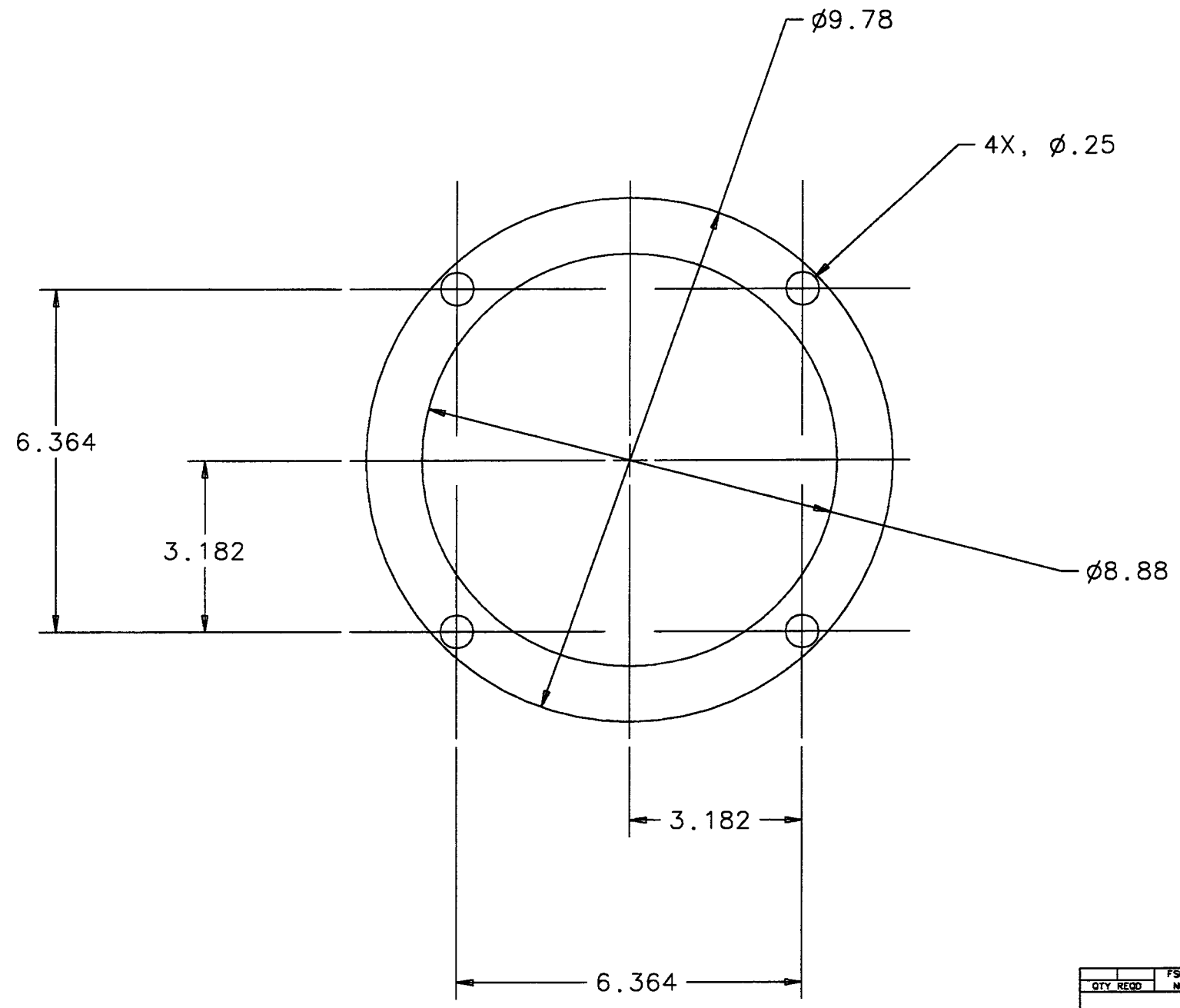


NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. BREAK ALL SHARP EDGES AND CORNERS.  
 2. PART MAY BE FILLET WELDED OR MACHINED. PART TO BE CLEANED WITH SOAP AND WATER BEFORE WELDING AND AFTER MACHINING. FILLET WELD CROSS SECTION SHALL HAVE A TYPICAL SIDE DIMENSION OF .13.

PARTS LIST		APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
REV	DESCRIPTION OF CHANGE	APPROVAL	DATE	TITLE	REV
				LOS LIFTING FIXTURE	
8081-T6 ALUM			5/98	D960761	00
FILE LOCATION: "jansen/D960761.asc"					
					1/1
					1 OF 1

NOTES, UNLESS OTHERWISE SPECIFIED:  
 1. DIMENSIONS IN INCHES  
 2. MATERIAL: KAPTON, .0075 THICK  
 3. FOR  $\phi 9.84$ " X 3.94" THICK OPTIC.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

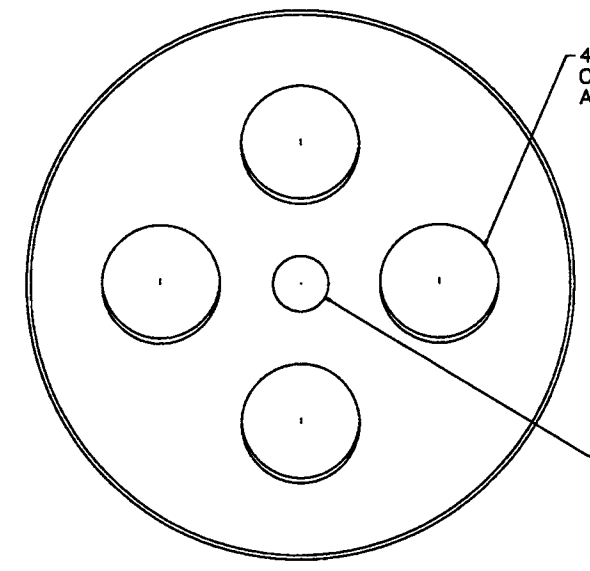
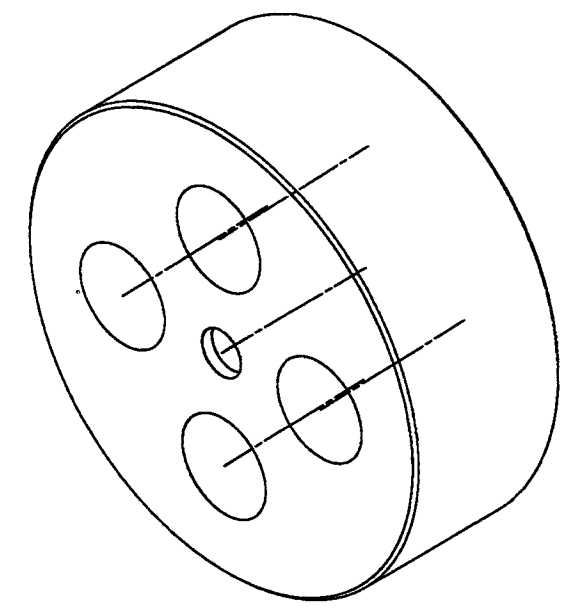
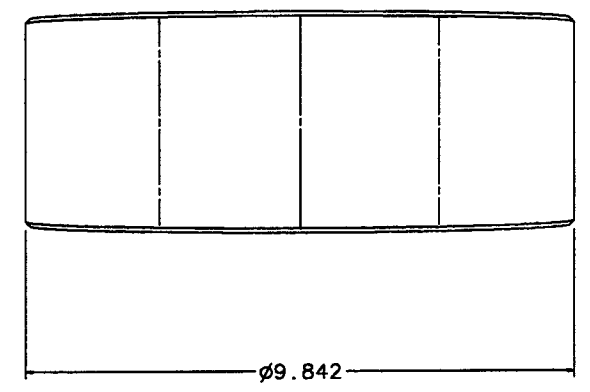


QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN [mm] TOLERANCES ARE: FRACTIONS DECIMALS .XX = .03 .XXX = .010 DO NOT SCALE DRAWING			APPROVALS DRAWN J. Hazel CHECKED	DATE 1/96	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY TITLE KAPTON TEMPLATE
MATERIAL	KAPTON		SIZE	DWG NO.	REV
FINISH	NONE		B	D960762	00
SCALE	NONE		FILENAME	~janeen/D960762.asc	
					SHEET 1 OF 1

NOTES: (UNLESS OTHERWISE SPECIFIED)  
1.

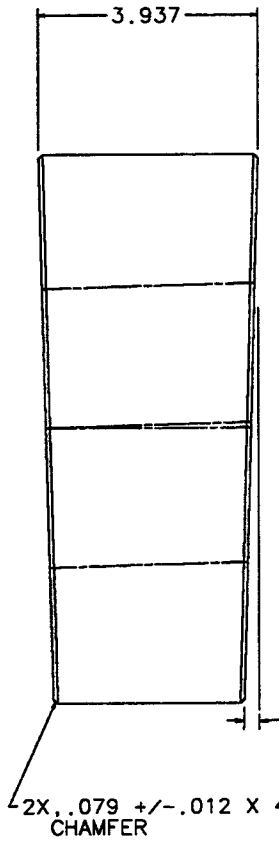
H  
G  
F  
E  
D  
C  
B  
A

REV	DESCRIPTION OF CHANGE	DATE	APPROVAL	DATE



4X,  $\phi 2.125$ , EQUALLY SPACED ON A  $\phi 5.00$  BOLT CIRCLE, AS SHOWN.

2X,  $\phi 1.000$  C'BORE, .250 DEEP, EACH SIDE, AT CYLINDER CENTERLINE.



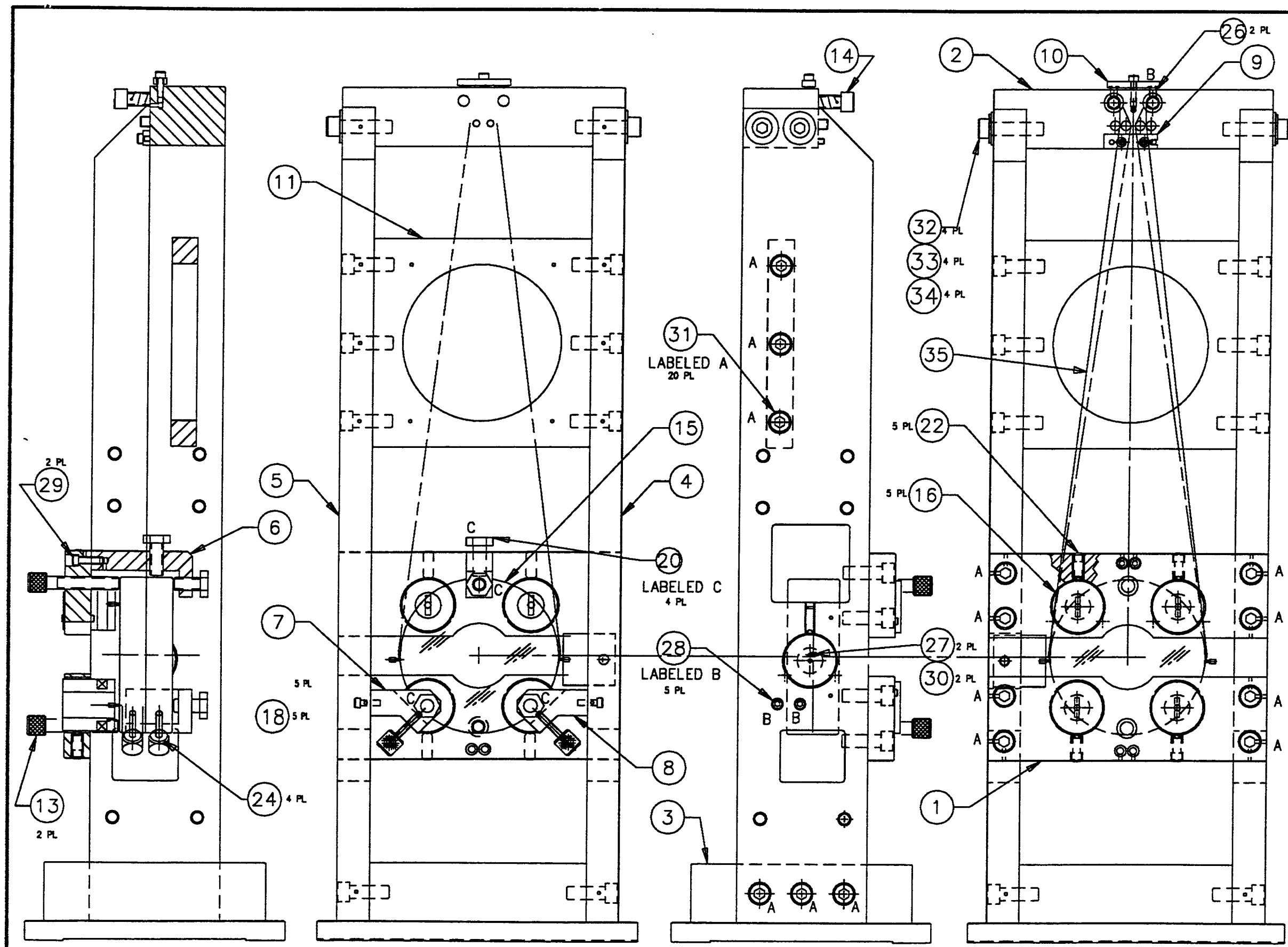
1.5° EACH SIDE

PARTS LIST		APPROVALS	DATE	DATE

CALIFORNIA INSTITUTE OF TECHNOLOGY  
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
 LOS DUMMY MASS,  
 3 DEGREE WEDGE  
 D960763  
 00  
 1 OF 1

1 2 3 4 5 6 7 8

SMALL OPTICS SUSPENSION  
ASSEMBLY DRAWINGS



QTY	PART NUMBER	DISCRIPTION	ITEM NO.
AR		Ø.0017 STEEL MUSIC WIRE	35
4	1/4	SST WASHER, REDUCED OD	34
4	1/4	SST LOCK WASHER	33
4	1/4-20x1.25L	SST SOC HD CAP SCREW	32
20	1/4-20 X.75L	SST SOC HD CAP SCREW	31
2	1205184-2	GUIDE ROD	30
2	4-40 X.50 LG	SST SOC HD CAP SCREW	29
5	4-40 X.38 LG	SST SOC HD CAP SCREW	28
2	1205184-1	WIRE STANDOFF	27
2	8546K31	Ø.13 TEFLON ROD, .19 L	26
		McMASTER P/N	
4	D960014	THUMB SCREW, TEFLON, SMALL	24
5	84985A999	SST SPRING PLUNGER, 10-32	22
		.75-2.5 LBS, McMASTER P/N	
4	91297A540	TEFLON HEX HD SCREW	20
		1/4-20x.75 LG, McMASTER P/N	
6		MAGNET, NEO-35, Ø.075X.125LG	18
REF	D960012	SENSOR/ACTUATOR HEAD	17
5	D960011	SENSOR/ACTUATOR ASSEMBLY	16
1		OPTIC	15
2	1205311-2	WIRE ADJ. SCREW	14
2	1205311-1	THUMB SCREW, TEFLON	13
6	D960010	SMALL STANDOFF	12
1	D960009	STIFFENER PLATE	11
1	1205308-2	TEFLON ROD CLAMP	10
1	1205308-1	WIRE CLAMP	9
1	D960008-2	LOWER CLAMP, OPPOSITE	8
1	D960008-1	LOWER CLAMP	7
1	D960007	UPPER MIRROR CLAMP	6
1	D960006	LEFT SIDE PLATE	5
1	D960005	RIGHT SIDE PLATE	4
1	D960004	TOWER BASE	3
1	D960003	SUSPENSION BLOCK	2
2	D960002	SENSOR/ACTUATOR PLATE	1

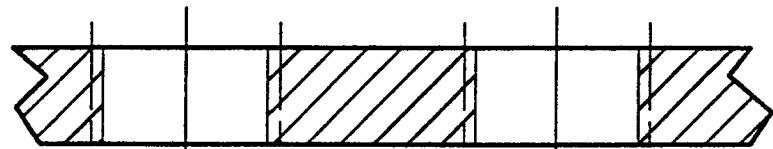
DRWN	12-29-95	LIGO PROJECT	SMALL OPTIC SUSPENSION ASSEMBLY			
CHK			CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	SCALE: 1/1	DRAWING NUMBER: D960001	SHEET 1 OF 1



NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES  
.01/.02 X 45°

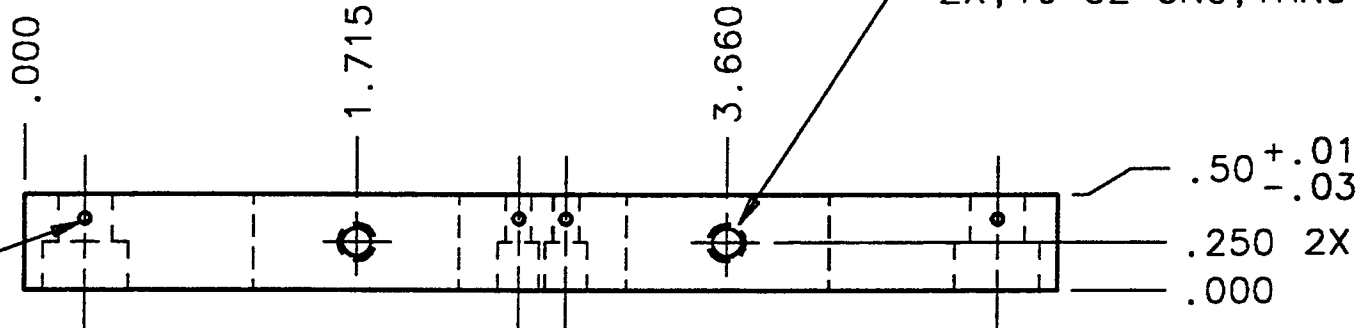
REV	DATE	DRWN	APPD	DCN/DESCRIPTION



Surface finish callouts:  $\\/.0005$  B,  $-B-$ ,  $-A-$ ,  $\\/.0005$  A

SECTION AA

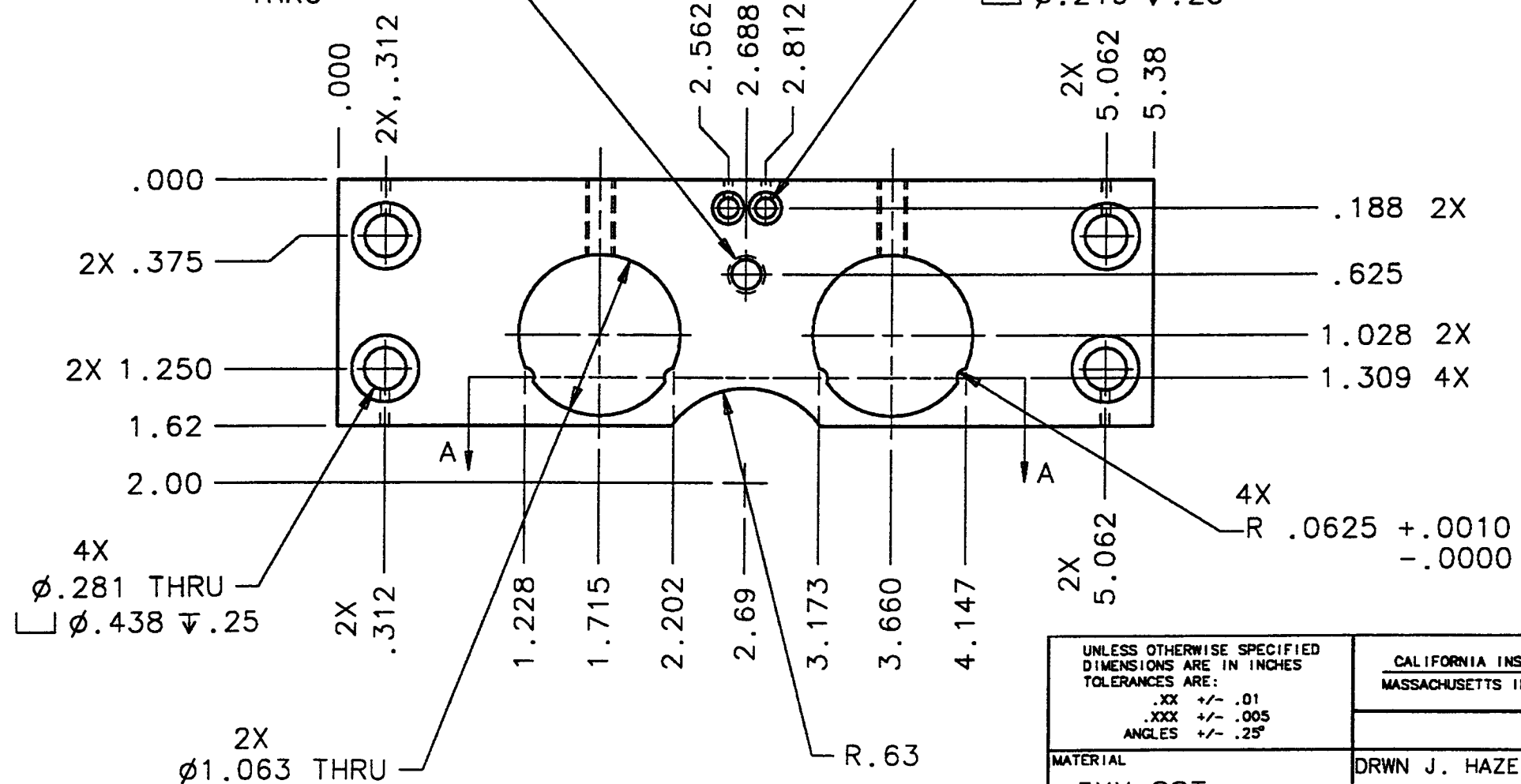
2X, 10-32 UNC, THRU WALL



$\phi$ .03 TO  $\phi$ .07 VENT HOLE FROM EDGE TO THRU HOLE APPROX. WHERE SHOWN  
4X THIS SIDE  
2X FAR SIDE

1/4-20 UNC 2B THRU

2X  $\phi$ .136 THRU  
 $\perp \phi$ .219  $\nabla$ .25



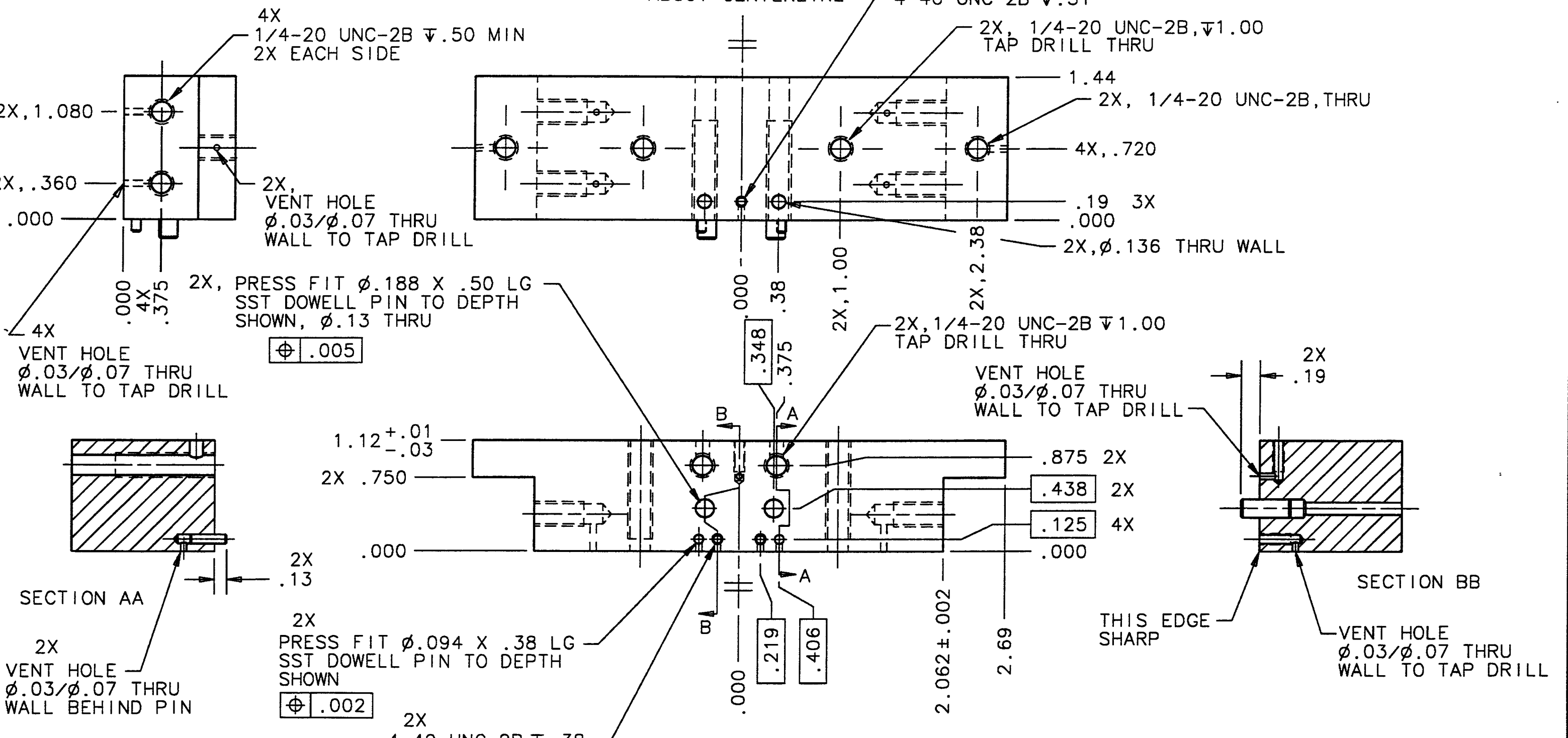
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:	
.XX	+/- .01
.XXX	+/- .005
ANGLES	+/- .25°
MATERIAL	3XX SST
FINISH	64

CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
DRWN J. HAZEL	1/96	SENSOR/ACTUATOR PLATE,	
CHK			
SCALE: 1/1	DRAWING NUMBER: D960002	SHEET 1 OF 1	REV. 00

NOTES: (UNLESS OTHERWISE SPECIFIED)

- 1. FILLETS: R .015 MAX
- 2. BREAK ALL SHARP EDGES .01/.02 X 45°

REV	DATE	DRWN	APPD	DCN/DESCRIPTION

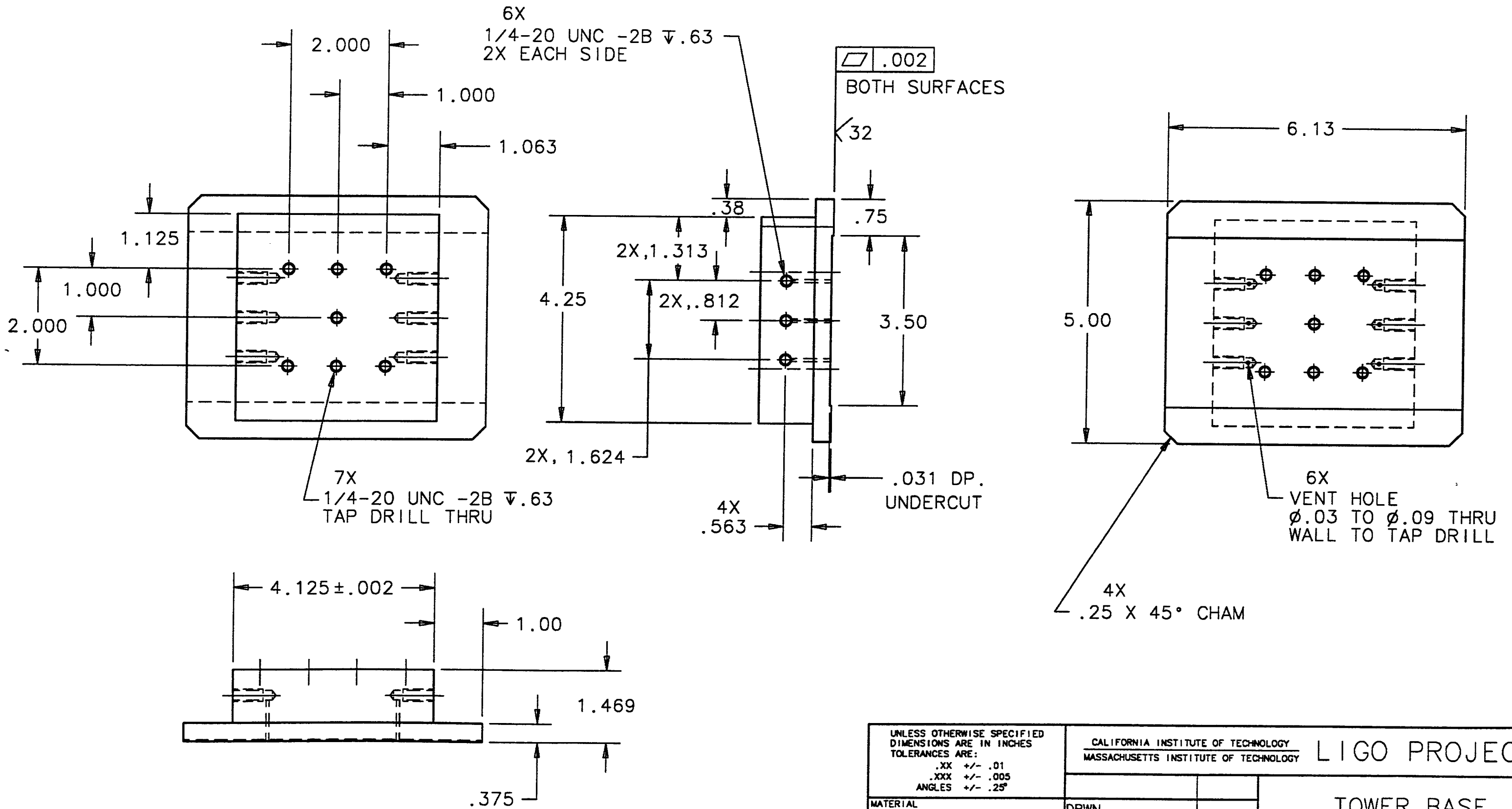


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
	MATERIAL	DRWN	SUSPENSION BLOCK	
6061-T6 AL	CHK			
FINISH	SCALE:	DRAWING NUMBER	SHEET	REV.
54	1/1	D960003	1 of 1	00

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES .01/.02 X 45°

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



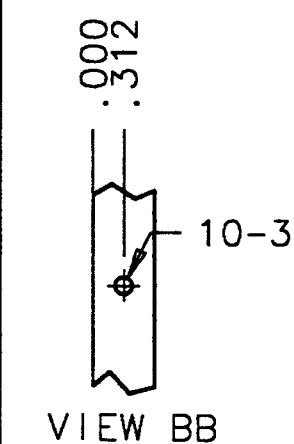
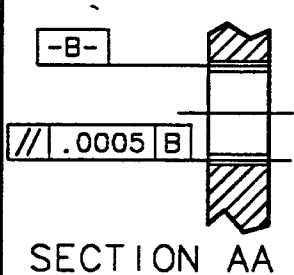
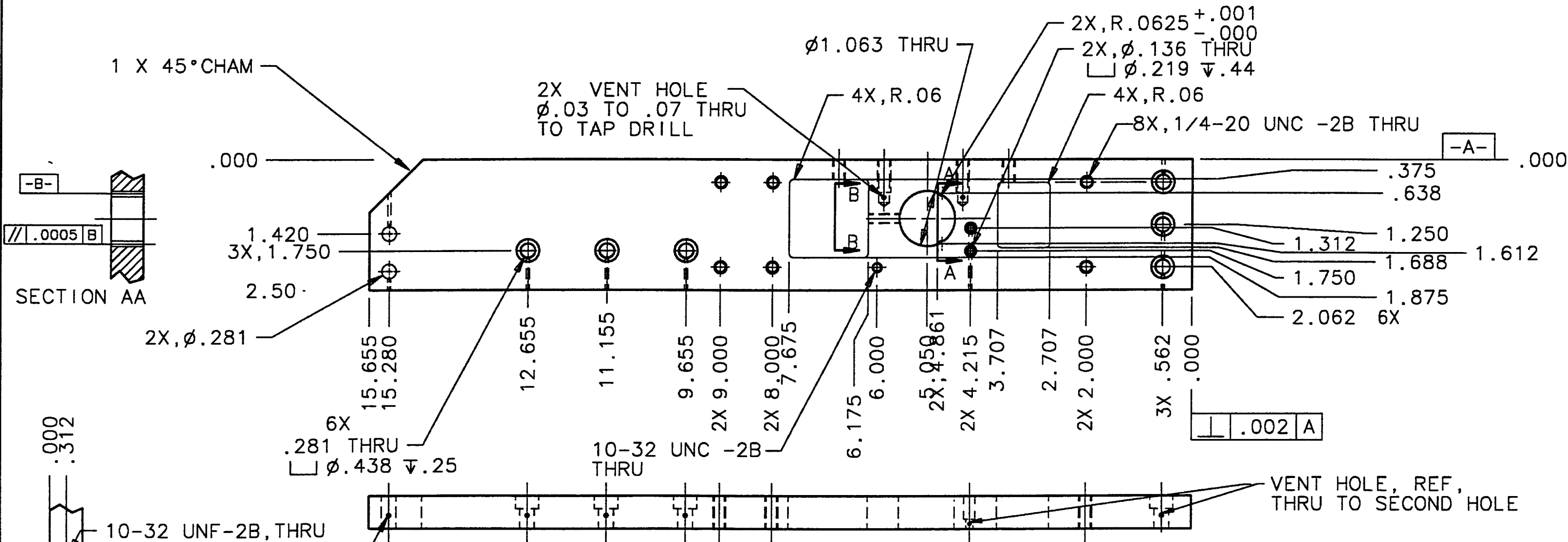
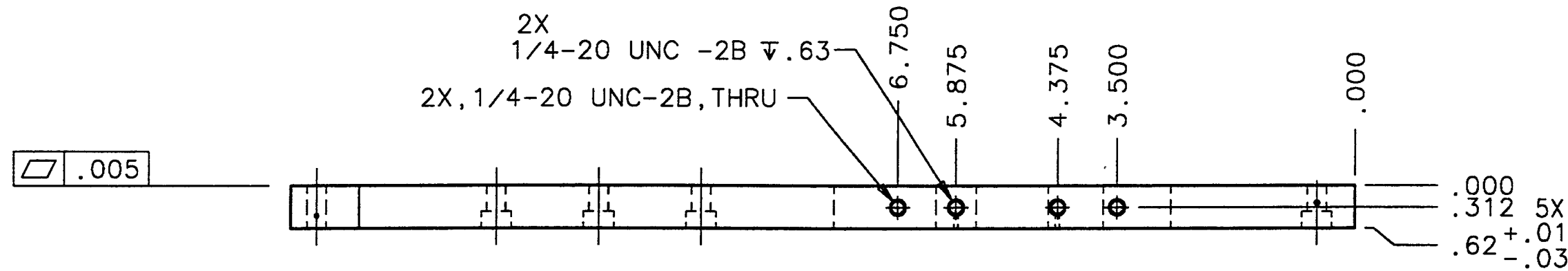
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
	MATERIAL 400 SERIES CRES. HARDEN TO 60/65 ROCKWELL	DRWN	CHK	TOWER BASE
FINISH 64	SCALE: 1/2	DRAWING NUMBER D960004	SHEET 1 OF 1	REV. 00

EDITION .

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES .01/.02 X 45°

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



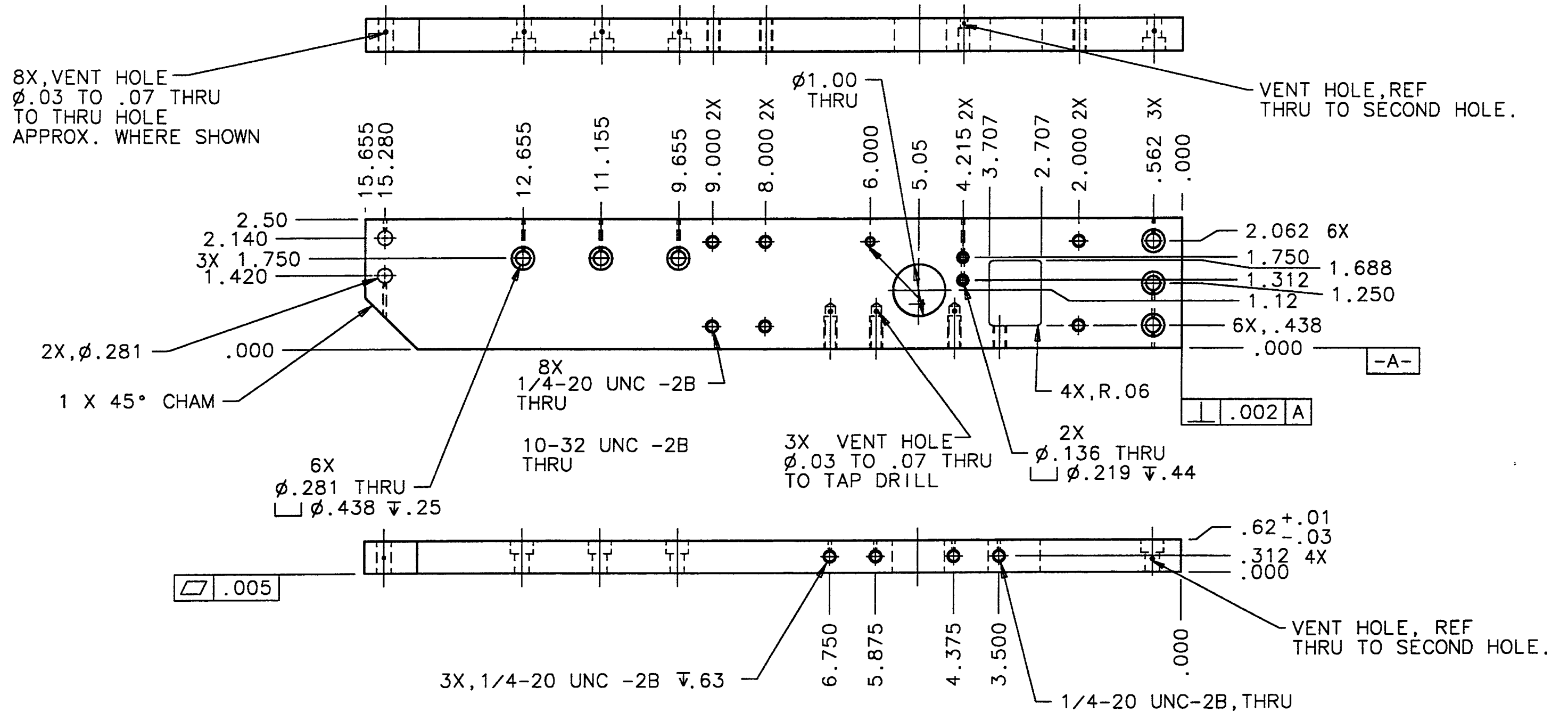
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		<b>LIGO PROJECT</b>	
	MATERIAL <b>3XX SERIES SST</b>	DRWN CHK	<b>RIGHT SIDE PLATE</b>	
FINISH 64	SCALE: 1/2	DRAWING NUMBER D960005	SHEET 1 of 1	REV. 00

EDITION:

NOTES: (UNLESS OTHERWISE SPECIFIED)

- FILLETS: R .015 MAX
- BREAK ALL SHARP EDGES .01/.02 X 45°

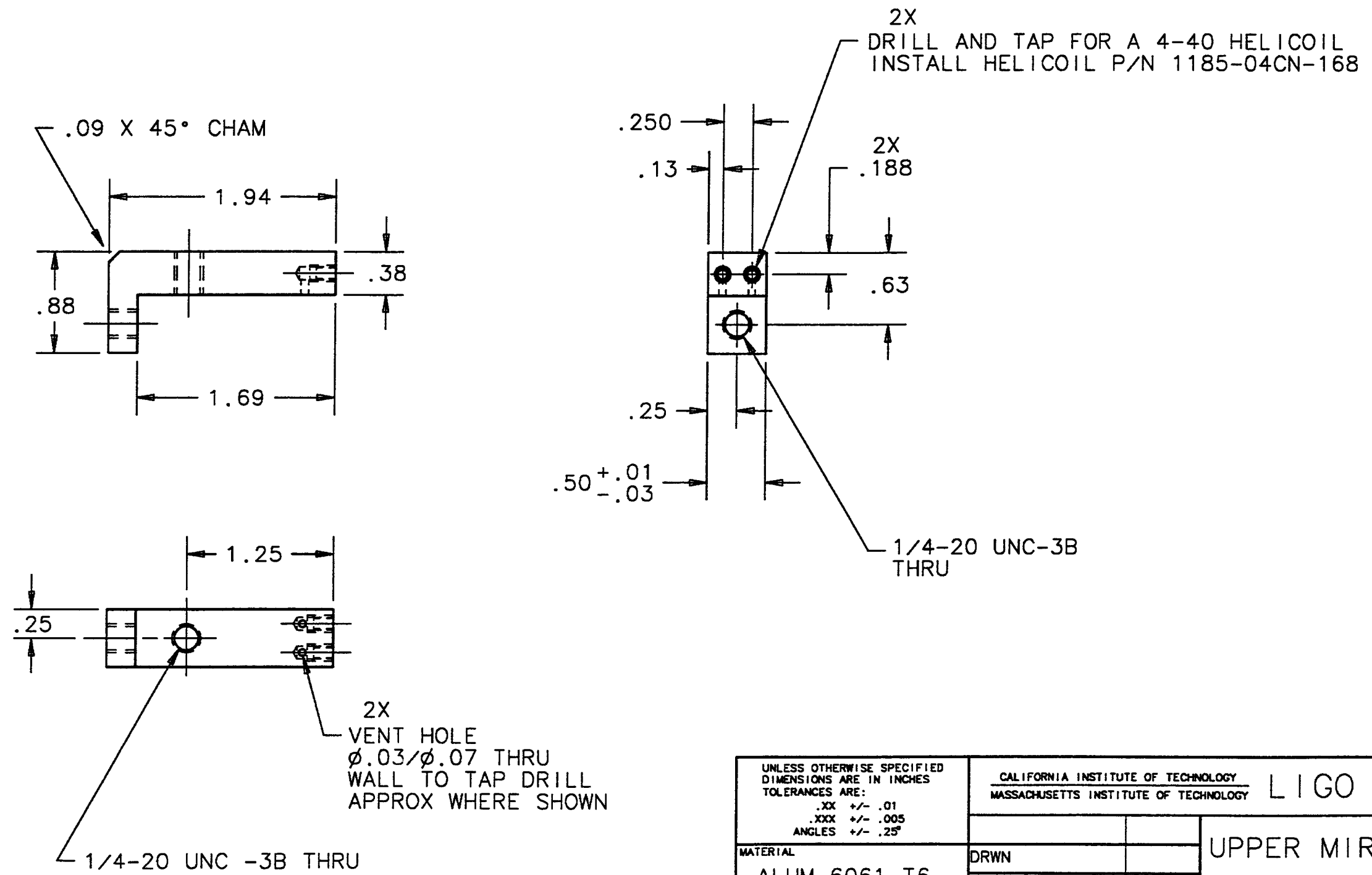
REV	DATE	DRWN	APPD	DCN/DESCRIPTION



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
	MATERIAL 3XX SERIES SST	DRWN	LEFT SIDE PLATE	
FINISH 64	CHK	SCALE: 1/2	DRAWING NUMBER D960006	SHEET 1 OF 1
				REV. 00

NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. FILLETS: R .015 MAX  
 2. BREAK ALL SHARP EDGES .01/.02 X 45°  
 3. MACHINE ALL OVER.

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



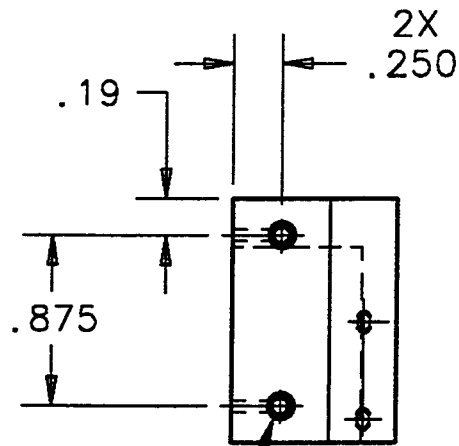
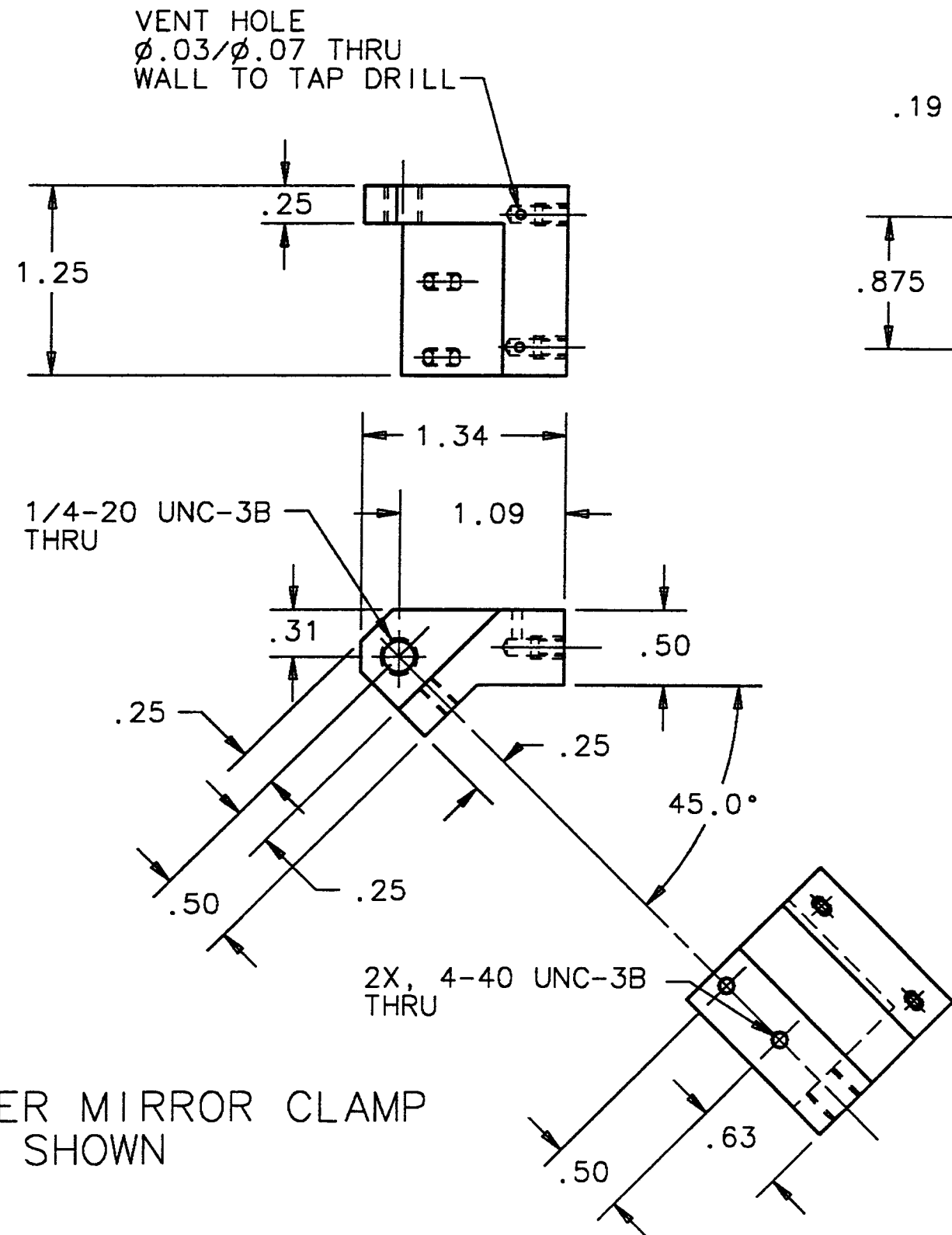
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
	MATERIAL ALUM 6061-T6		UPPER MIRROR CLAMP	
FINISH 64	DRWN	CHK	SCALE: 1/1	DRAWING NUMBER D960007
			SHEET 1 of 1	REV. 

EDITION:

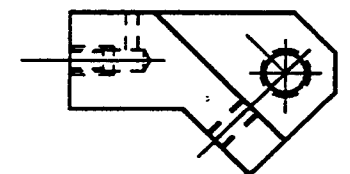
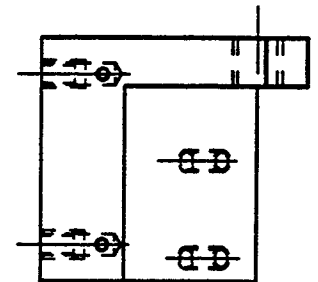
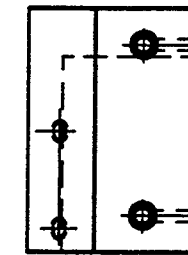
NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES .01/.02 X 45°
3. MACHINE ALL OVER.

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



DRILL AND TAP FOR  
 A 4-40 HELICOIL  
 INSTALL HELICOIL  
 P/N 1185-04CN-168



LOWER MIRROR CLAMP  
 -2. OPPOSITE

LOWER MIRROR CLAMP  
 -1. SHOWN

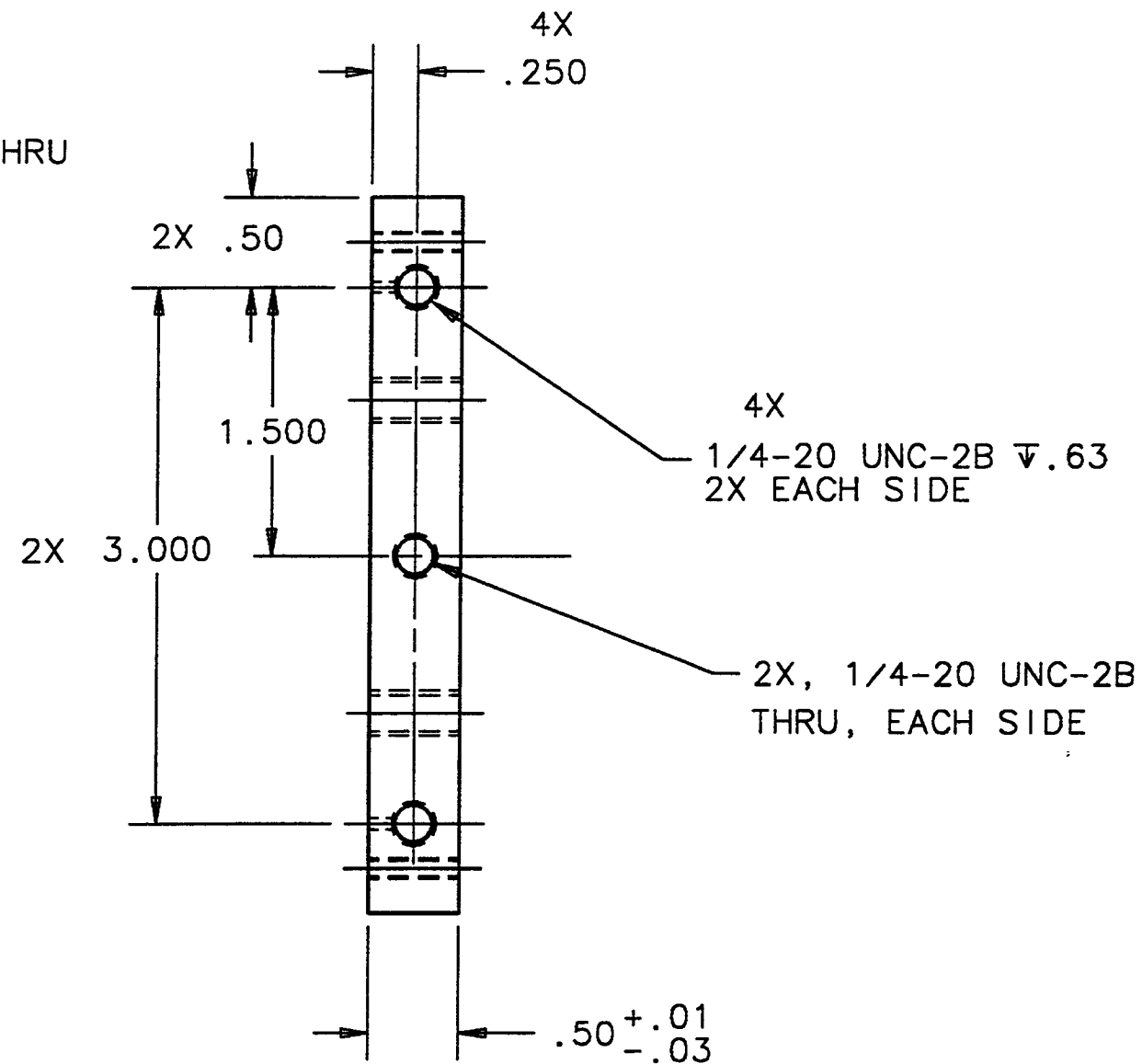
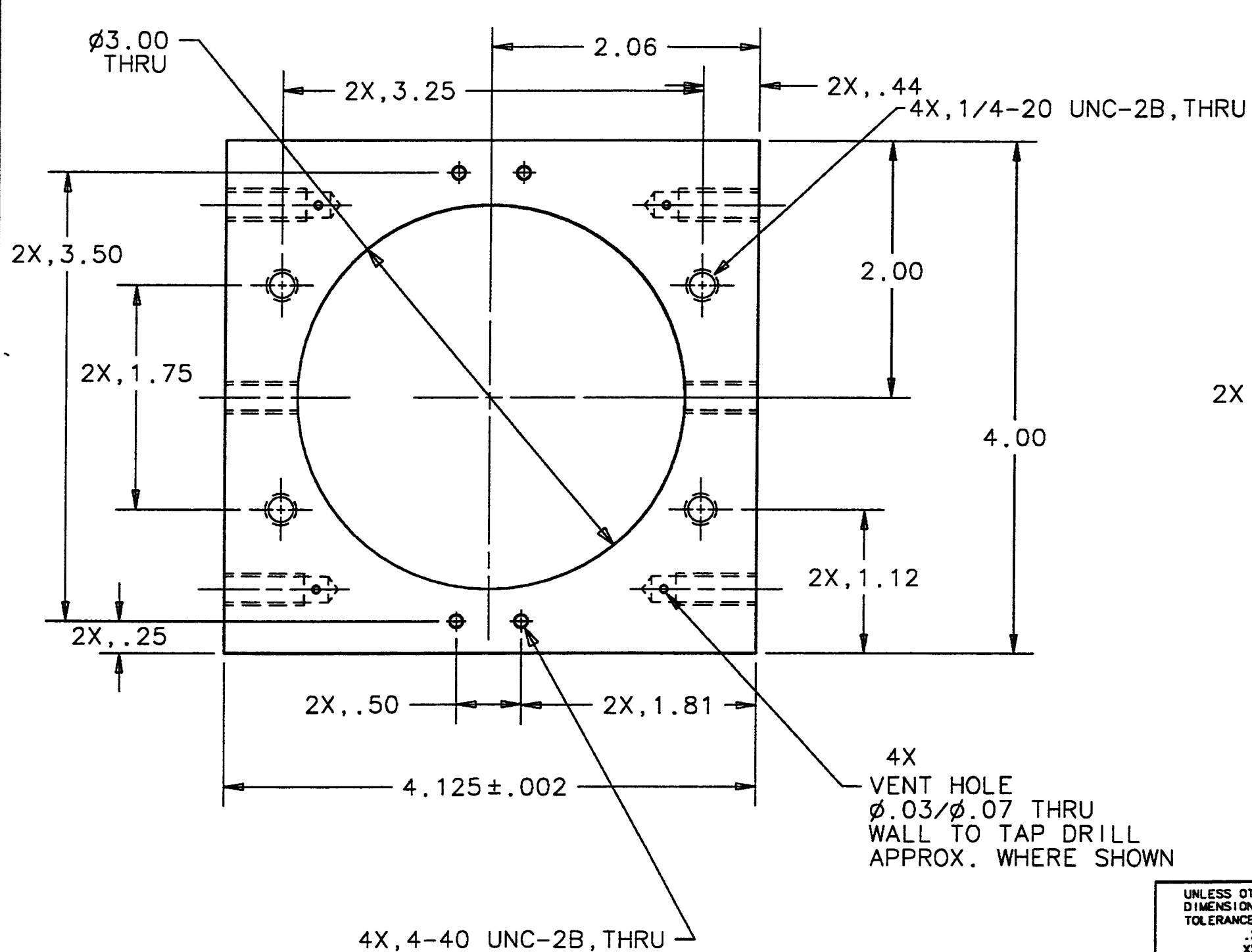
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY				LIGO PROJECT	
	MATERIAL ALUM 6061-T6	DRWN			LOWER MIRROR CLAMP	
FINISH 64	CHK			SCALE: 1/1	DRAWING NUMBER D960008	SHEET 1 of 1

EDITION.

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES .01/.02 X 45°
3. MACHINE ALL OVER.

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



4X  
VENT HOLE  
Ø.03/Ø.07 THRU  
WALL TO TAP DRILL  
APPROX. WHERE SHOWN

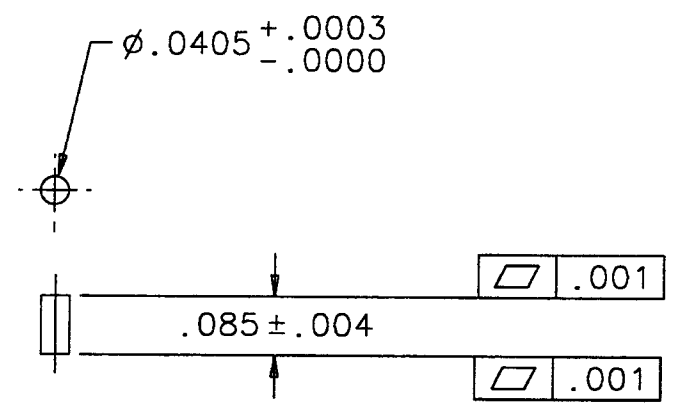
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
	MATERIAL 6061-T6 AL	DRWN	STIFFENER PLATE	
FINISH 64	CHK			
SCALE: 1/1	DRAWING NUMBER D960009	SHEET 1 OF 1	REV.	



NOTES: UNLESS OTHERWISE SPECIFIED:

1. DIMENSIONS IN INCHES.
2. BREAK ALL SHARP EDGES.
3. TOLERANCES: .XXX + .005
4. MATERIAL: 6061-T6 ALUMINUM.
5. REMOVE CUT-OFF BURR.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



SCALE: 4/1

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO

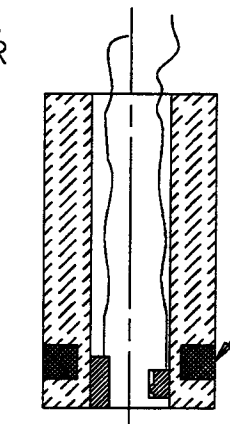
**PARTS LIST**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN [mm]		APPROVALS		DATE	<b>LIGO</b> CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS	DECIMALS	DRAWN J. Hazel	GROUP	5/96	
SEE NOTES		CHECKED			TITLE
DO NOT SCALE DRAWING					SMALLER STANDOFF
MATERIAL	SEE NOTES			SIZE	DWG NO. D960010
FINISH				B	REV 00
SCALE	4/1	FILENAME		~joneen/D960010.esc	SHEET 1

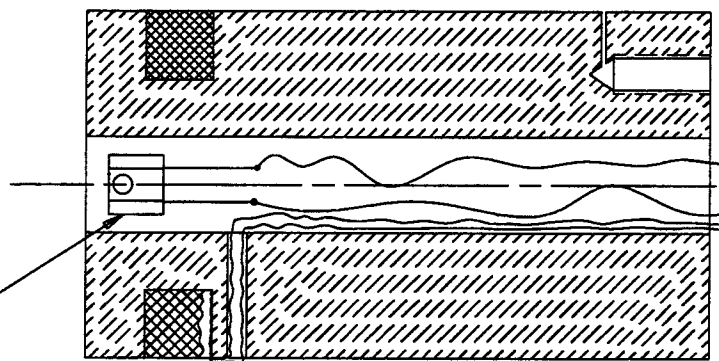
NOTES, UNLESS OTHERWISE SPECIFIED:

- 1. ALL DIMENSIONS IN INCHES.
- ② LABEL BEGINNING AND END OF COIL.
- ③ SOLDER WIRES TO LED AND PHOTODIODE LEAD WIRES. CHECK THAT LEAD WIRES ARE NON-MAGNETIC BEFORE SOLDERING.
- ④ POSITION LED USING SENSOR/ACTUATOR TOOL, P/N D950126-00.
- ⑤ WIND MAGNET WIRE AS TO FILL VOLUME AS SHOWN, 1.013 OD MAX.
- ⑥ BOND LED AND PHOTODIODE TO SENSOR ACTUATOR HEAD USING A MINIMUM OF VAC SEAL EPOXY. POSITION PHOTODIODE FLUSH TO -A-

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

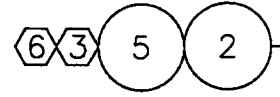
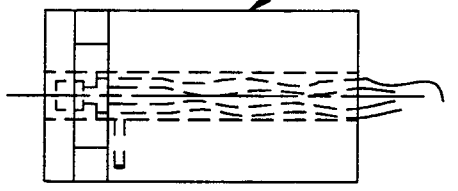
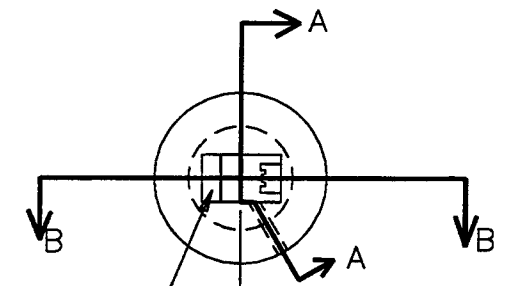


SECTION B-B



SECTION A-A

SCALE 2:1



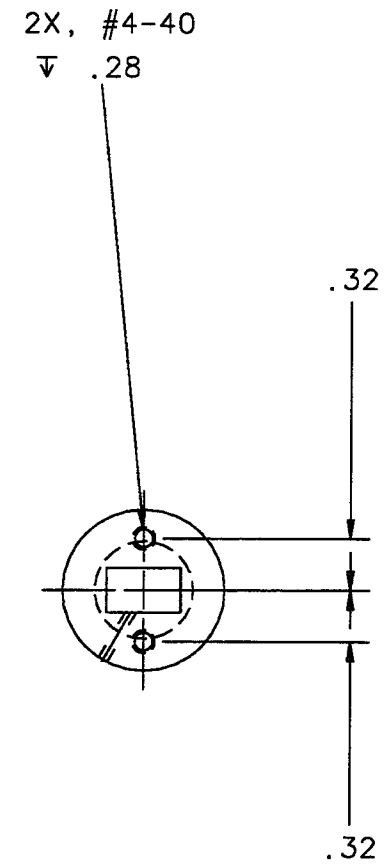
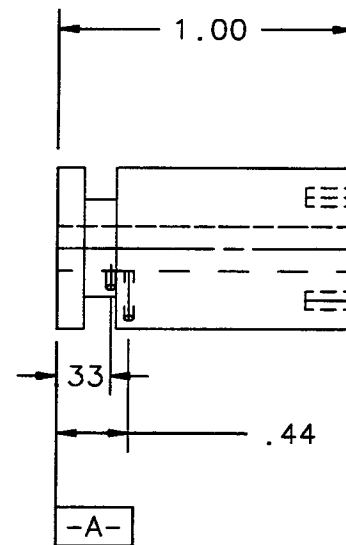
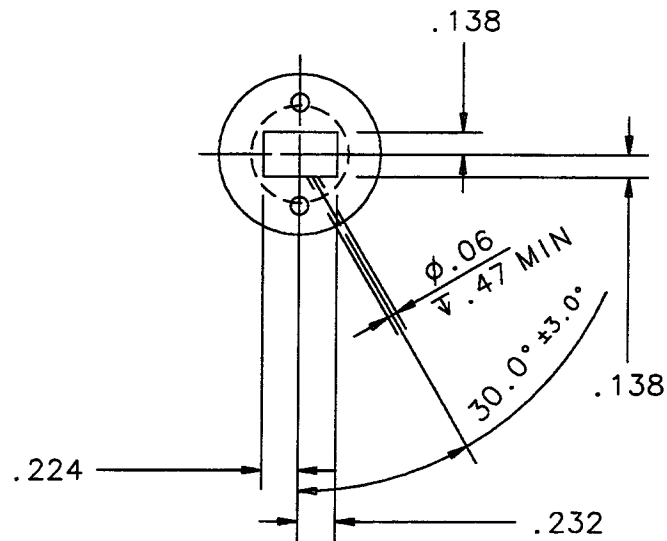
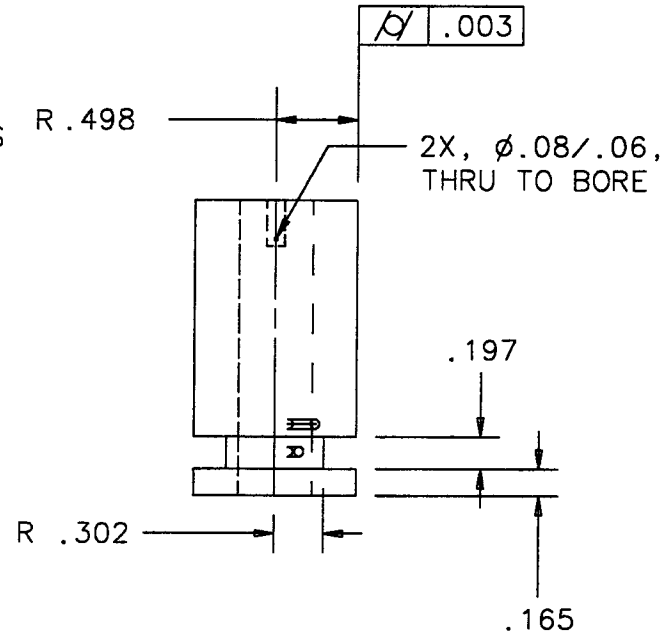
NOT TO SCALE

QTY	REQD	F3OM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
				VAC SEAL EPOXY		5
			FY-5456-1	WIRE, MWS INDUSTRIES P/N		4
			TLN107A	LED, TOSHIBA P/N		3
			TPS703A	PHOTODIODE, TOSHIBA P/N		2
			D960012	SENSOR/ACTUATOR HEAD		1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN [in (mm)] FRACTIONS DECIMALS		APPROVALS		DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
N/A		DRAWN	J. Hazel	1/96	TITLE	
DO NOT SCALE DRAWING		CHECKED			SENSOR/ACTUATOR HEAD ASSEMBLY	
MATERIAL	N/A				SIZE	B
FINISH	N/A				DWG NO.	D960011
SCALE	NONE	FILENAME	~janeen/D960011.asc		REV	00
					SHEET	1 OF 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES  
.02/.01 X 45°
3. MATERIAL: CORNING MACOR
4. 1° ± 1° DRAFT ALLOWED  
FOR SLOT. SLOT DIMENSIONS  
VALID AT DATUM -A-.

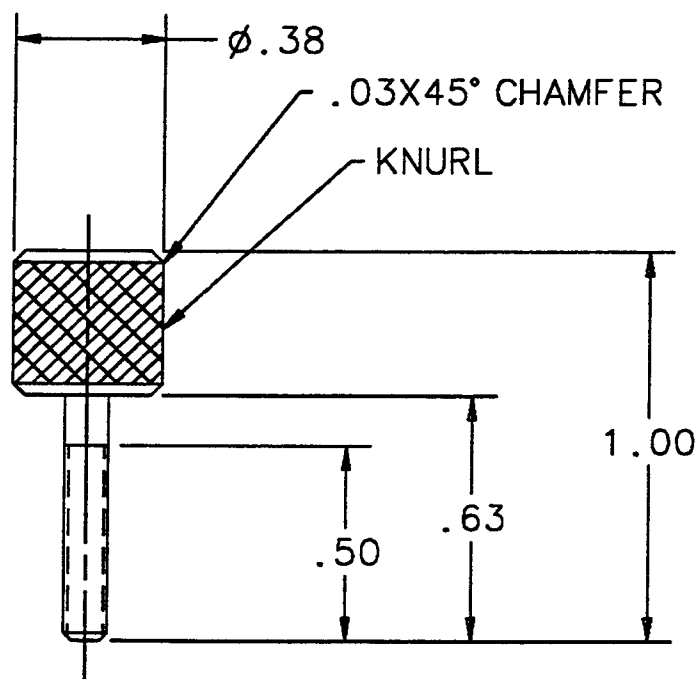


NOT TO SCALE

QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .005 ± .0005 ± .5° DO NOT SCALE DRAWING			CONTRACT NO.	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
APPROVALS			DATE	TITLE	REV
DRAWN J. HAZEL			7/95	SENSOR/ACTUATOR HEAD	00
CHECKED				SIZE DWG NO.	
FINISH 64				A3	D960012
FILE LOCATION ~\janeen/D960012.dwg				SCALE NONE	SHEET 1 OF 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

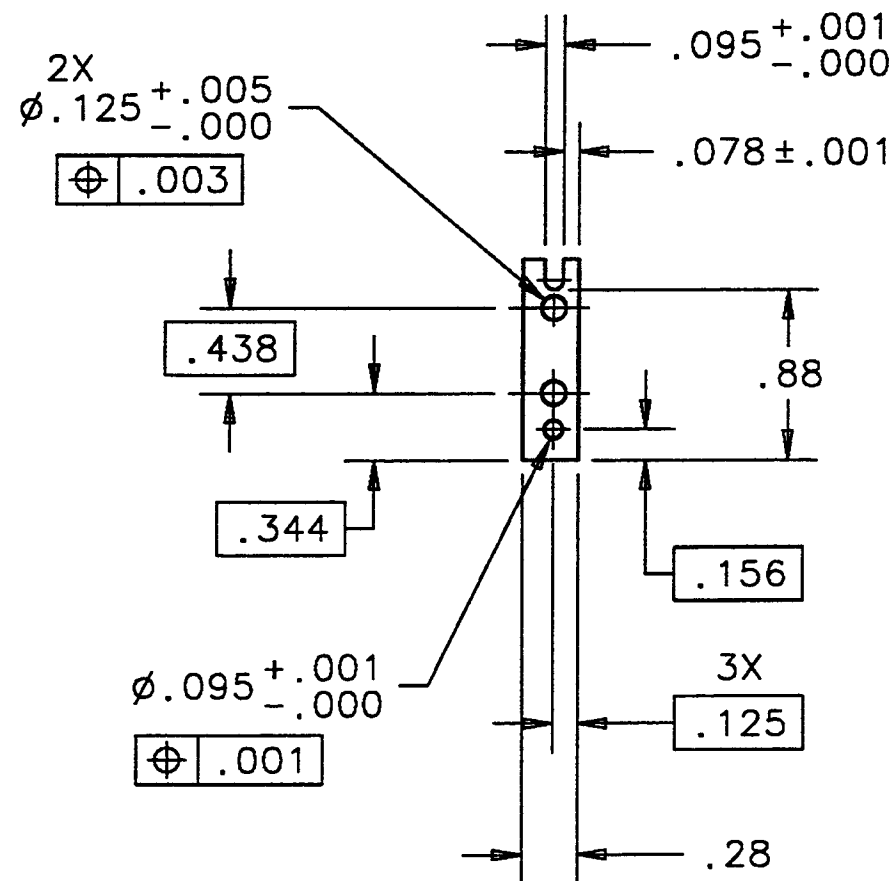
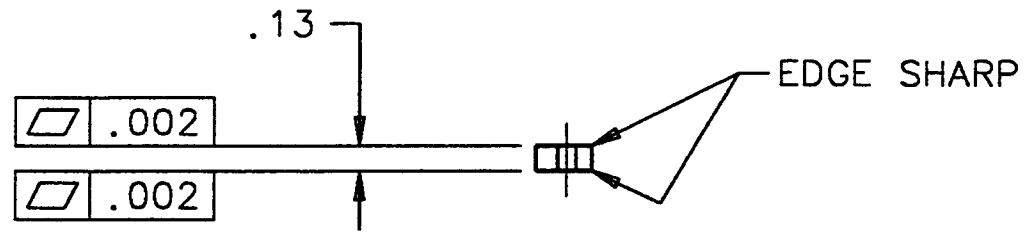
- 1. FILLETS: R .015 MAX.
- 2. BREAK ALL SHARP EDGES: .01/.02 X 45° .



DRWN J. HAZEL	1-15-96	LIGO PROJECT	THUMB SCREW, TEFLON, SMALL			
CHK			CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	SCALE: 2/1	DRAWING NUMBER D960014	SHEET 1 of 1

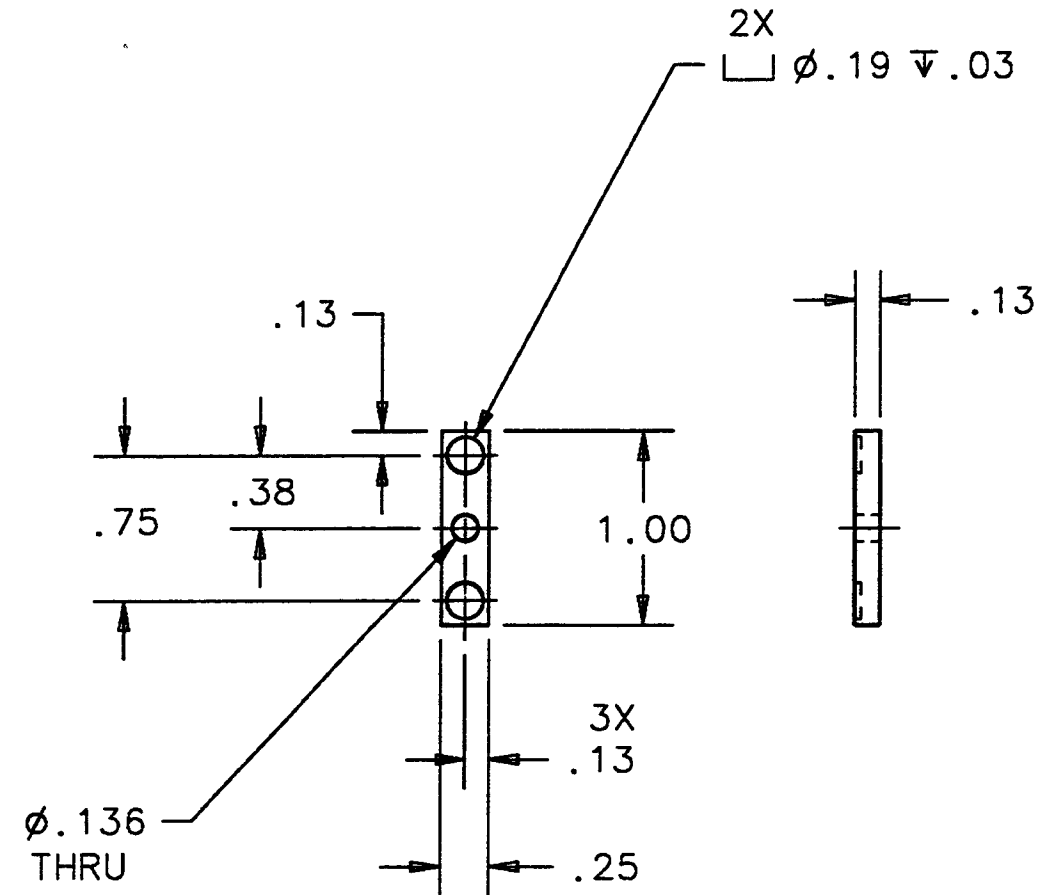
NOTES: (UNLESS OTHERWISE SPECIFIED)

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES .01/.02 X 45°
3. MACHINE ALL OVER.



-1. WIRE CLAMP

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



-2. TEFLON ROD CLAMP

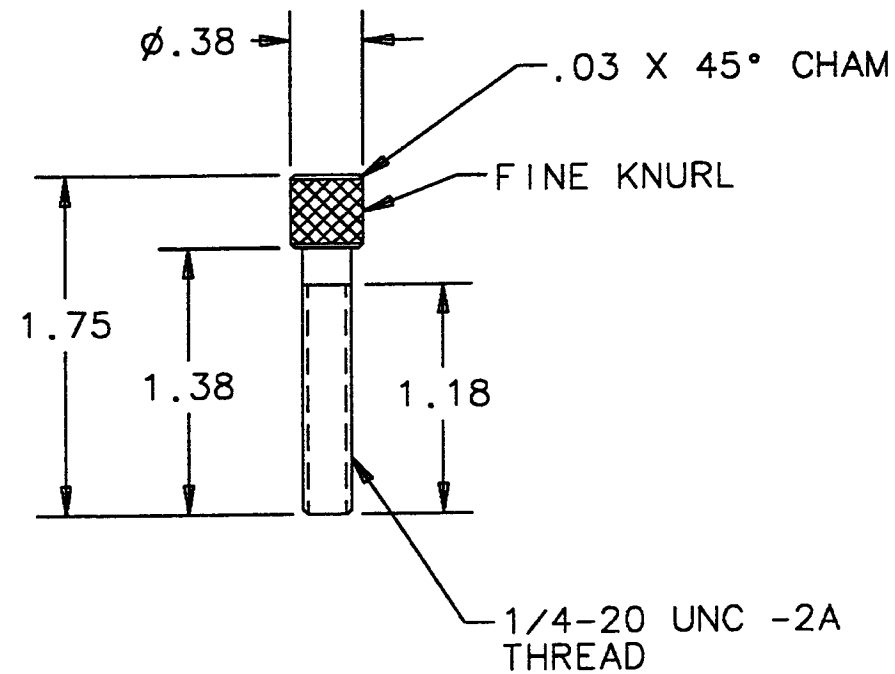
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°		CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY				LIGO PROJECT	
MATERIAL 6061-T6 AL	DRWN					-1. WIRE CLAMP -2. TEFLON ROD CLAMP PNI SUSPENSION	
FINISH 64	CHK					SCALE: 1/1	DRAWING NUMBER 1205308
						SHEET 1 of 1	REV.

EDITION:

NOTES: (UNLESS OTHERWISE SPECIFIED)

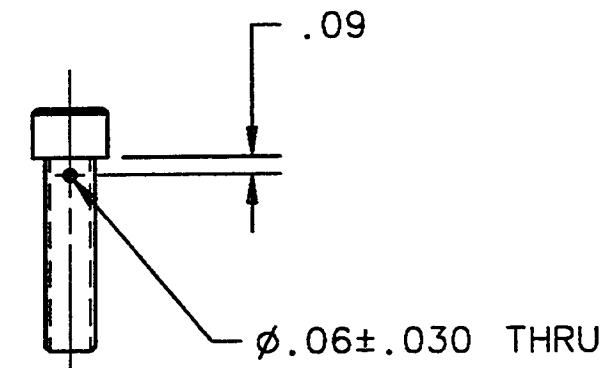
1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES .01/.02 X 45°

REV	DATE	DRWN	APPD	DCN/DESCRIPTION



-1. TEFLON THUMB SCREW

MATERIAL; TEFLON



-2. WIRE ADJUSTMENT SCREW

MATERIAL; 1/4-20 X 1.00 LG.  
SOC HD CAP SCREW

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .XX +/- .01 .XXX +/- .005 ANGLES +/- .25°	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY		LIGO PROJECT	
	MATERIAL NOTED	DRWN CHK	MICS. PARTS PNI SUSPENSION	
FINISH 64	SCALE: 1/1	DRAWING NUMBER 1205311		

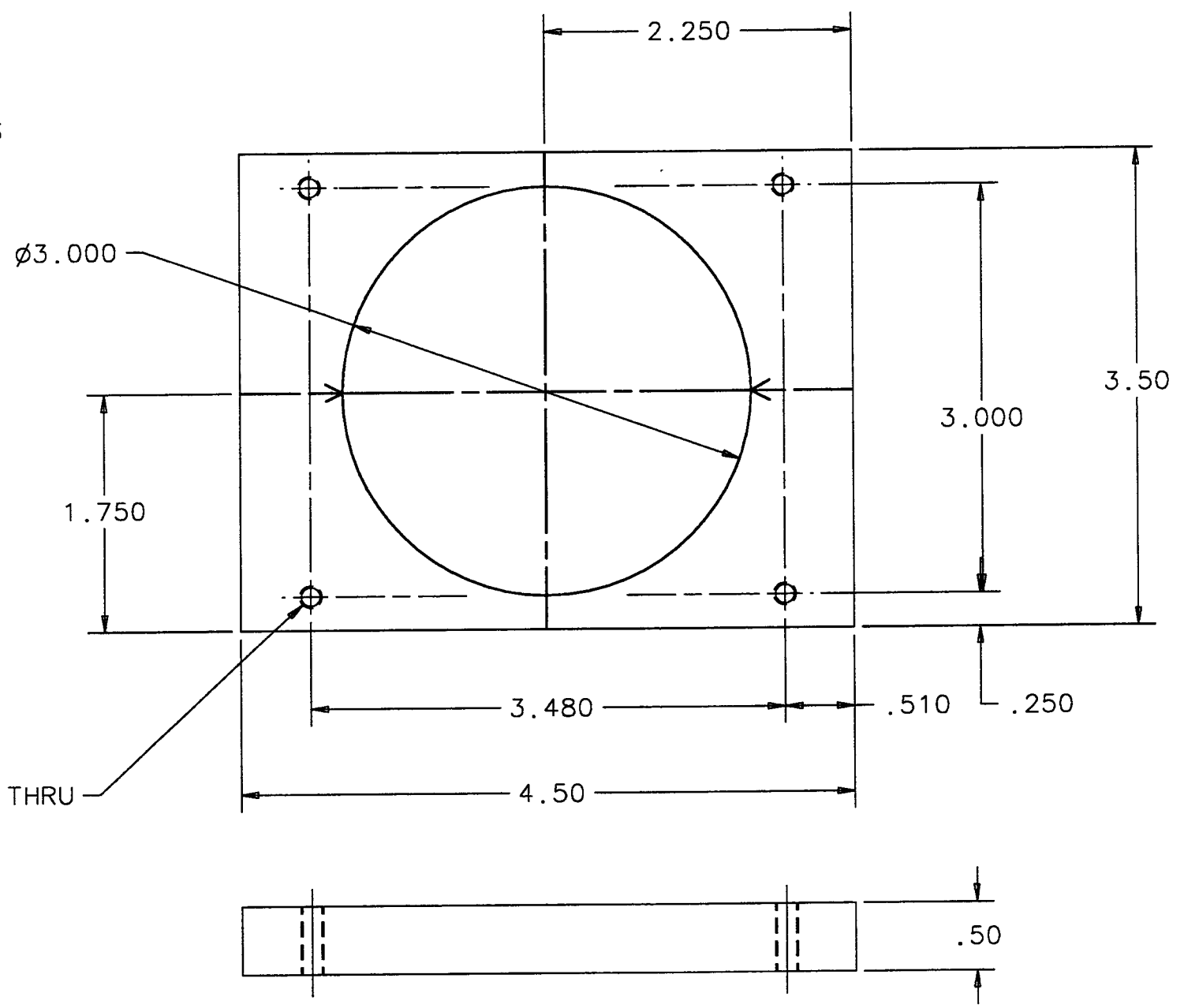
EDITION.

SOS FIXTURES

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS IN INCHES
2. MATERIAL: ALUMINUM
3. FILLET RADIUS: R.38 MAX.
4. REMOVE BURRS AND SHARP EDGES.
5. TOLERANCES: .XX ± .03  
.XXX ± .010
6. ETCH ARROWS, CIRCLE AND CENTERLINES IN POSITIONS SHOWN, .02 WIDE AND .02 BELOW -A-
7. FOR OPTIC  $\phi 3.00"$  X  $1.00"$  THICK WITH 0-30 MIN WEDGE.



4X, 8-32 UNC-2B, THRU

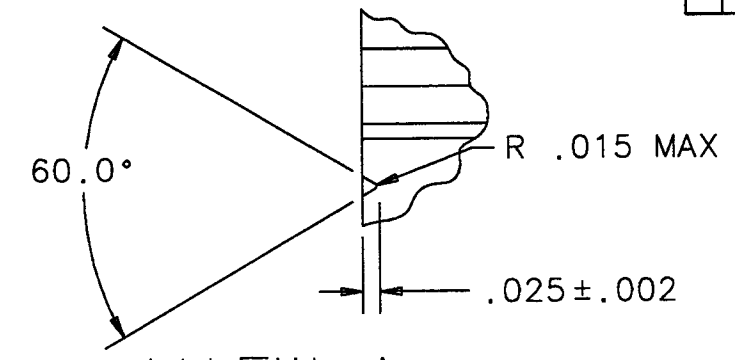
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PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm)		APPROVALS		DATE
TOLERANCES ARE:		DRAWN		1/96
FRACTIONS DECIMALS		J. Hazel		
SEE NOTES		CHECKED		
DO NOT SCALE DRAWING		TITLE		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
MATERIAL SEE NOTES		SIZE		B
FINISH NONE		DWC NO.		D960017
SCALE 1/1		FILENAME		~janeen/D960017.asc
				REV 00
				SHEET 1 OF 1



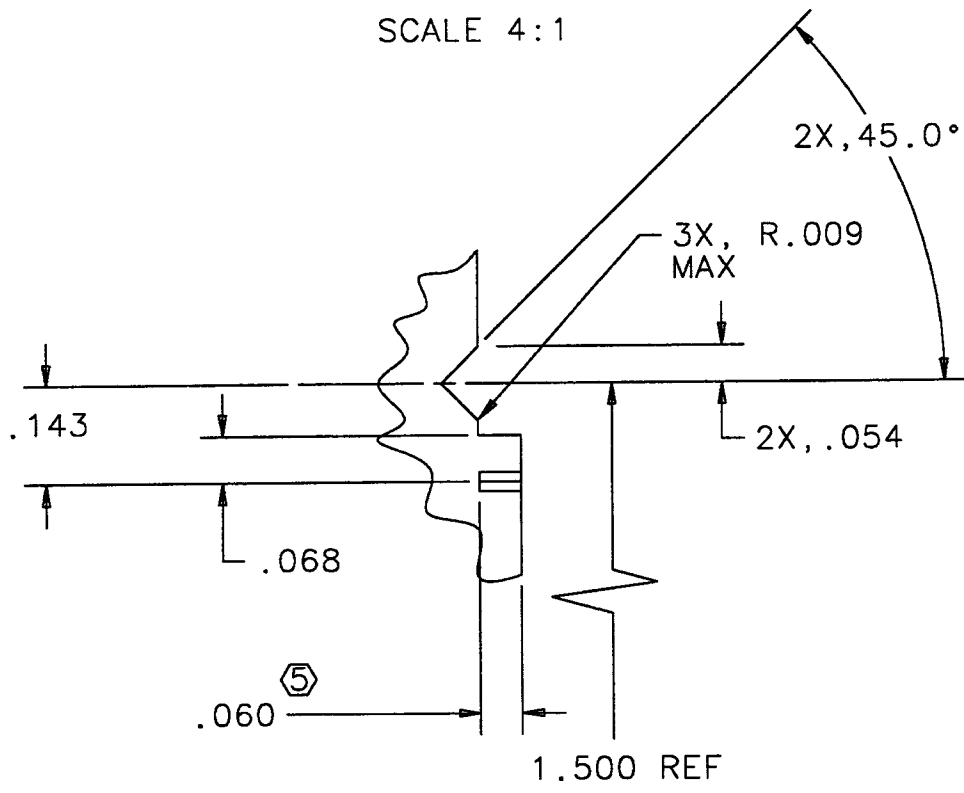
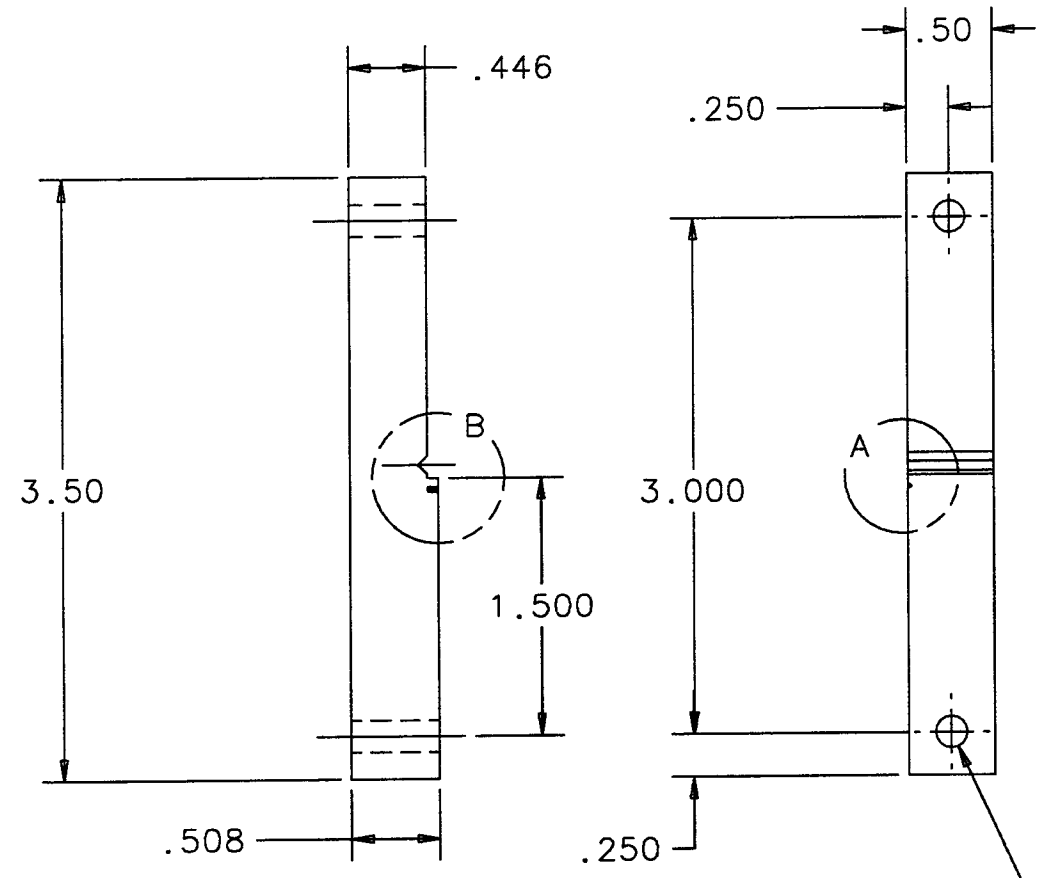
NOTES: UNLESS OTHERWISE SPECIFIED

1. DIMENSIONS IN INCHES.
2. MATERIAL: TEFLON
3. BREAK ALL SHARP EDGES.
4. TOLERANCES:  $.XX \pm .01$   
 $.XXX \pm .005$   
ANGLES:  $\pm 1^\circ$
- ⑤ AN UNDERCUT AND/OR PIN MAY BE USED TO ACHIEVE THIS DIMENSION.
6. FOR  $\phi 3.00$ " X 1.00" OPTIC WITH 0-30 MIN WEDGE.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



VIEW A  
SCALE 4:1



VIEW B  
SCALE 4:1

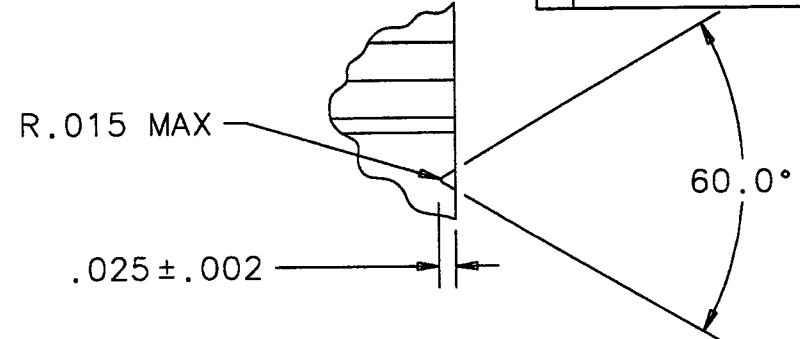
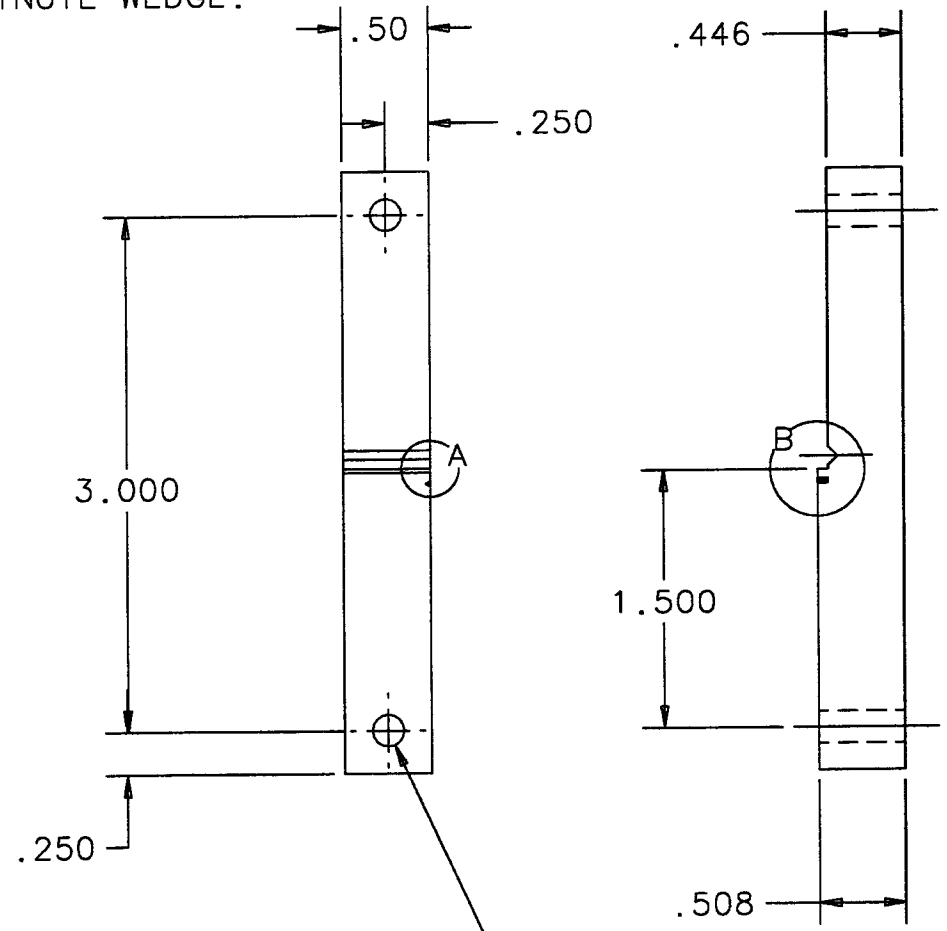
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN [mm] TOLERANCES ARE: FRACTIONS DECIMALS		APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SEE NOTES		DRAWN J. Hazel	1/96	TITLE RIGHT BLOCK
DO NOT SCALE DRAWING		CHECKED		SIZE B
MATERIAL SEE NOTES				DWG NO. D960018
FINISH NONE				REV 00
SCALE 1/1		FILENAME ~janeen/D960018.asc		SHEET 1 OF 1

NOTES: UNLESS OTHERWISE SPECIFIED

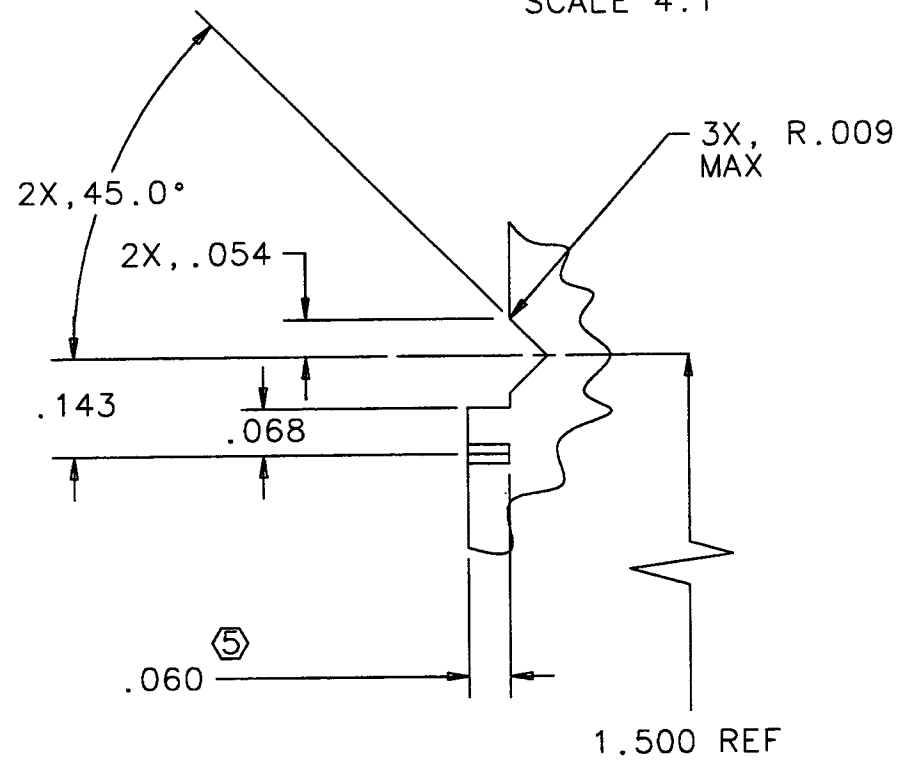
- 1. DIMENSIONS IN INCHES.
- 2. MATERIAL: TEFLON
- 3. BREAK ALL SHARP EDGES.
- 4. TOLERANCES: .XX ± .01  
.XXX ± .005  
ANGLES: ± 1°

⑤ AN UNDERCUT AND/OR PIN MAY BE USED TO ACHIEVE THIS DIMENSION.

6. FOR  $\phi 3.00$ " X 1.00" OPTIC WITH 0-30 MINUTE WEDGE.



VIEW A  
SCALE 4:1



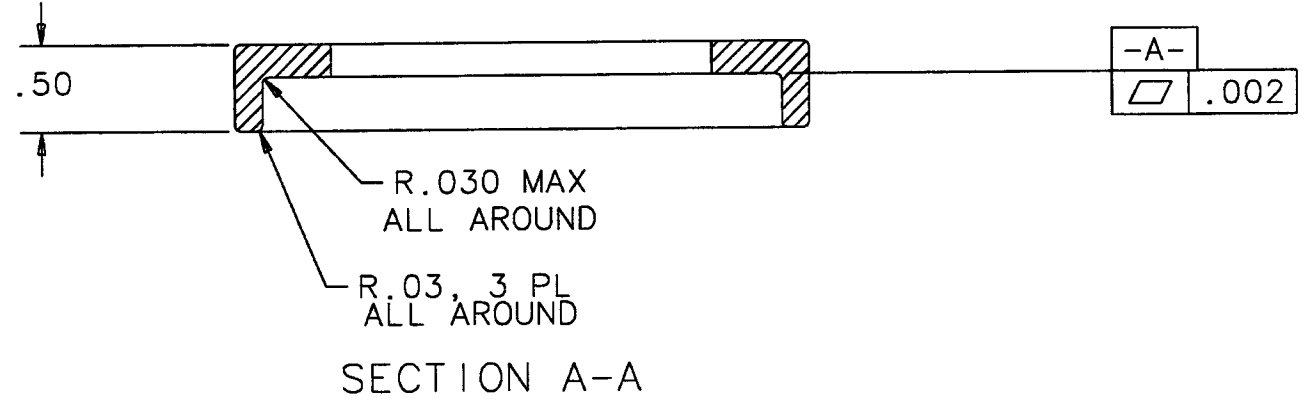
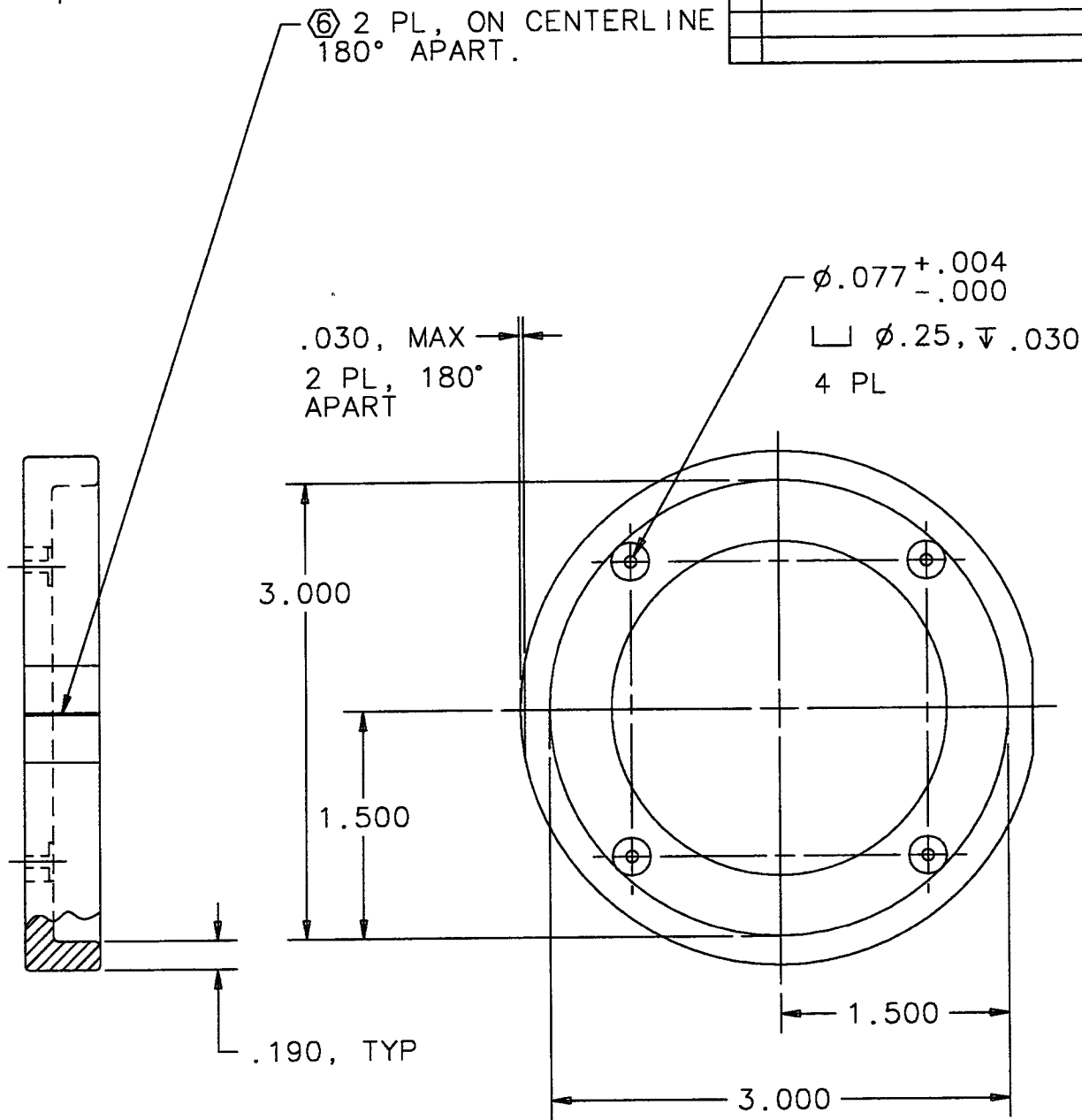
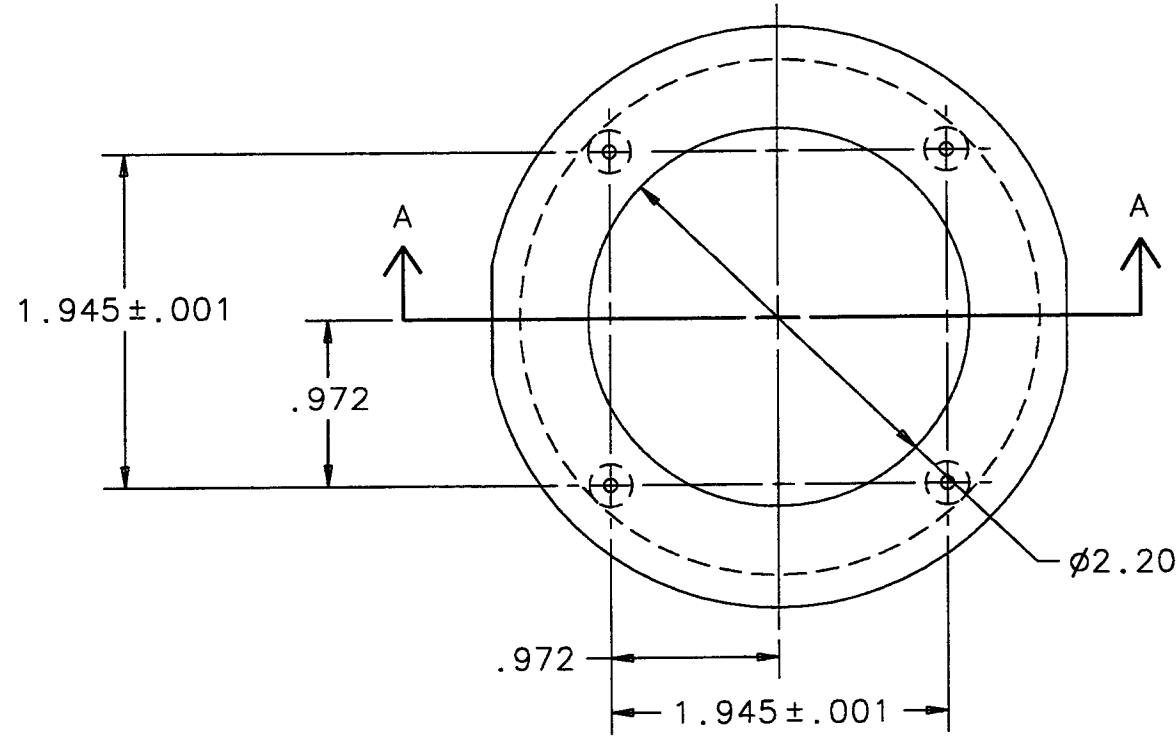
VIEW B  
SCALE 4:1

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS			APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
SEE NOTES			DRN J. Hazel	1/96	
DO NOT SCALE DRAWING			CHECKED		TITLE LEFT BLOCK
MATERIAL	SEE NOTES				SIZE B
FINISH	NONE				DWG NO. D960019
SCALE	1/1		FILENAME ~janeen/D960019.asc		REV 00
					SHEET 1 OF 1

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

- NOTES: UNLESS OTHERWISE SPECIFIED
1. DIMENSIONS IN INCHES
  2. MATERIAL: DELRIN
  3. FILLET RADIUS: R.38 MAX.
  4. TOLERANCES: .XX: + .01  
.XXX: + .005  
ANGLES: + .5
  5. USE KAPTON TEMPLATE P/N D960021 WITH THIS FIXTURE.
  6. ETCH LINES IN POSITION SHOWN, .02 WIDE AND .02 BELOW SURFACE.
  7. FOR  $\phi 3.00 \times 1.00$  THICK OPTIC WITH 0-1 DEGREE WEDGE.



QTY REQD	FSOM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm)			DATE 1/96		
TOLERANCES ARE: FRACTIONS DECIMALS			DRAWN J. Hazel		
SEE NOTES			CHECKED		
DO NOT SCALE DRAWING			MATERIAL SEE NOTES		
FINISH NONE			SCALE 1/1		
APPROVALS			DATE 1/96		
FILENAME ~janeen/D960020.asc			SHEET 1 OF 1		

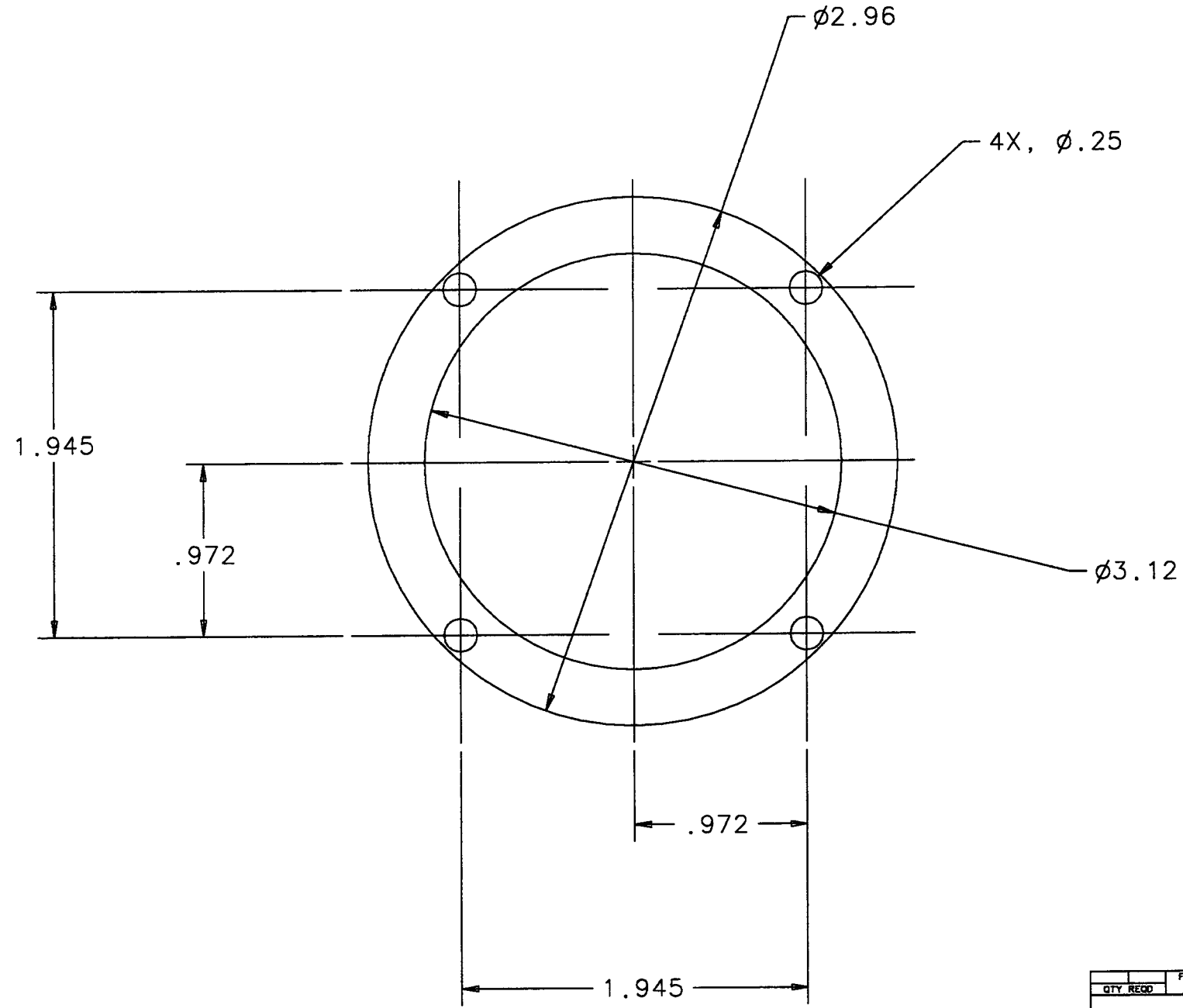
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

TITLE  
MAGNET/STANDOFF ASSEMBLY  
FIXTURE

SIZE B DWG NO. D960020 REV 00

NOTES, UNLESS OTHERWISE SPECIFIED:  
 1. DIMENSIONS IN INCHES  
 2. MATERIAL: KAPTON, .0075 THICK  
 3. FOR  $\phi 3.00$ " X 1.00" THICK OPTIC.

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE



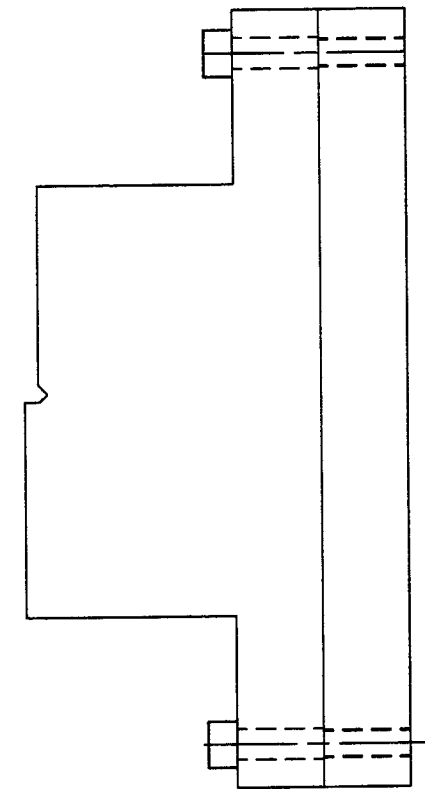
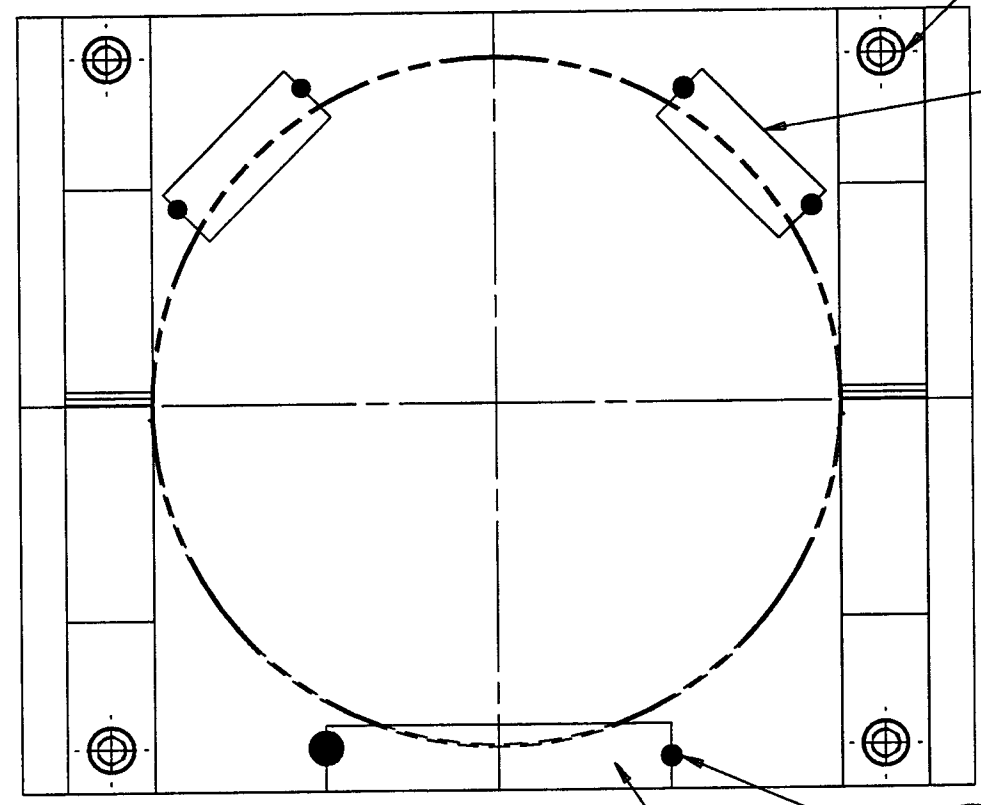
QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN [mm] TOLERANCES ARE: FRACTIONS DECIMALS .XX = .03 .XXX = .010			APPROVALS DRAWN J. Hazel CHECKED	DATE 1/96	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DO NOT SCALE DRAWING			TITLE KAPTON TEMPLATE		
MATERIAL KAPTON			SIZE B		DWG NO. D960021
FINISH NONE			FILENAME ~janeen/D960021.asc		REV 00
SCALE NONE			SHEET 1 OF 1		

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

NOTES: (UNLESS OTHERWISE SPECIFIED)  
 1. DIMENSIONS IN INCHES.  
 2. FOR  $\phi 3.00"$  X  $1.00"$  THICK OPTIC WITH 0-30 MINUTE WEDGE.

A  
B  
C  
D

A  
B  
C  
D



QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO
4		SCREW, SHCS, 8-32X.75	STAINLESS STEEL	7
A/R		VAC-SEAL EPOXY		6
1		PROTECTIVE SHEET	KAPTON, .38x2.00 x.0075	5
2		PROTECTIVE SHEET	KAPTON, .38x1.00 x.0075	4
1	D960018	RIGHT BLOCK		3
1	D960019	LEFT BLOCK		2
1	D960017	BASE PLATE		1

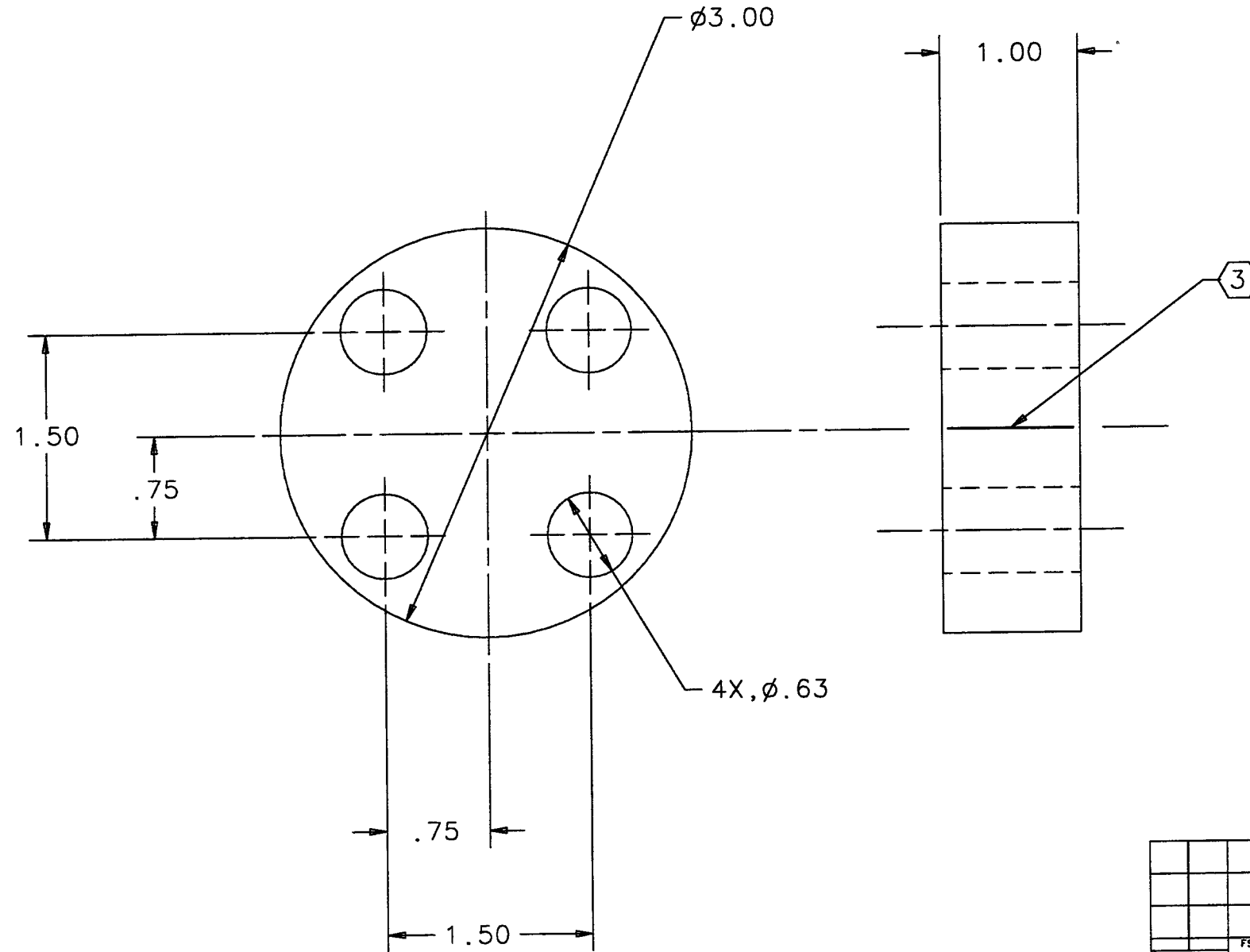
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN IN (mm) TOLERANCES ARE: FRACTIONS DECIMALS		APPROVALS		DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
N/A		DRAWN J. Hazel	GROUP	1/96	TITLE GUIDE ROD FIXTURE	
DO NOT SCALE DRAWING		CHECKED			SIZE B	DWG NO. D960022
MATERIAL N/A					REV 00	
FINISH N/A					FILENAME ~janeen/D960022.asc	SHEET 1 OF 1
SCALE NONE						

1 2 3

NOTES: (UNLESS OTHERWISE SPECIFIED)

REV	DESCRIPTION OF CHANGE	APPROVAL	DATE

1. FILLETS: R .015 MAX
2. BREAK ALL SHARP EDGES
- ③ ETCH OR SCRIBE LINE ON SIDE OF DISC, 4 PLACES, 90° APART. ETCH .02 WIDE AND .02 BELOW SURFACE.



QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		APPROVALS	DATE	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
FRACTIONS	DECIMALS	DRAWN J. Hazel	4/96	
	.XX±.01	CHECKED		TITLE SOS DUMMY MASS
	.XXX±.005			DWG NO. D960159
	∠ ±1/2°			REV 00
DO NOT SCALE DRAWING				
MATERIAL ALUM	FINISH NONE		SCALE 1/1	SHEET 1 OF 1

NEXT ASSEMBLY  
FILE LOCATION: janeen/D960159.asc