REVISION HISTORY

REV	DATE	ECO	APPROVAL	DESCRIPTION
B	5/22/07	1060	Daniel Bryce	Manufacturing Release
C	6/07/07	1063	Daniel Bryce	Many Minor Changes per Drawing Review
D	6/15/07	1064	Daniel Bryce	Many Minor Changes
E	7/26/07	1070	Dave Senders	Changed press fit to slip fit on .5" hole, added Datum B to call-out, changed Notes
F	8/24/2007	1071	Dave Senders	Added hole notes, general notes, vent holes, changed tap drill diameters, tap/vent interfaces
V1 / G	9/5/2007	1072	Dave Senders	Changed location of four tapped hole plus two pin pattern, four places
V2	3/5/09		Andy Stein	Added holes for mounting more components. Added call-outs for etching labels into top surface. Added, deleted, and modified c'sinks, for multiple holes. Changed depths & diameters of some c'sinks and vent holes. Added lead-ins to press-fit pin holes.

Left view callouts
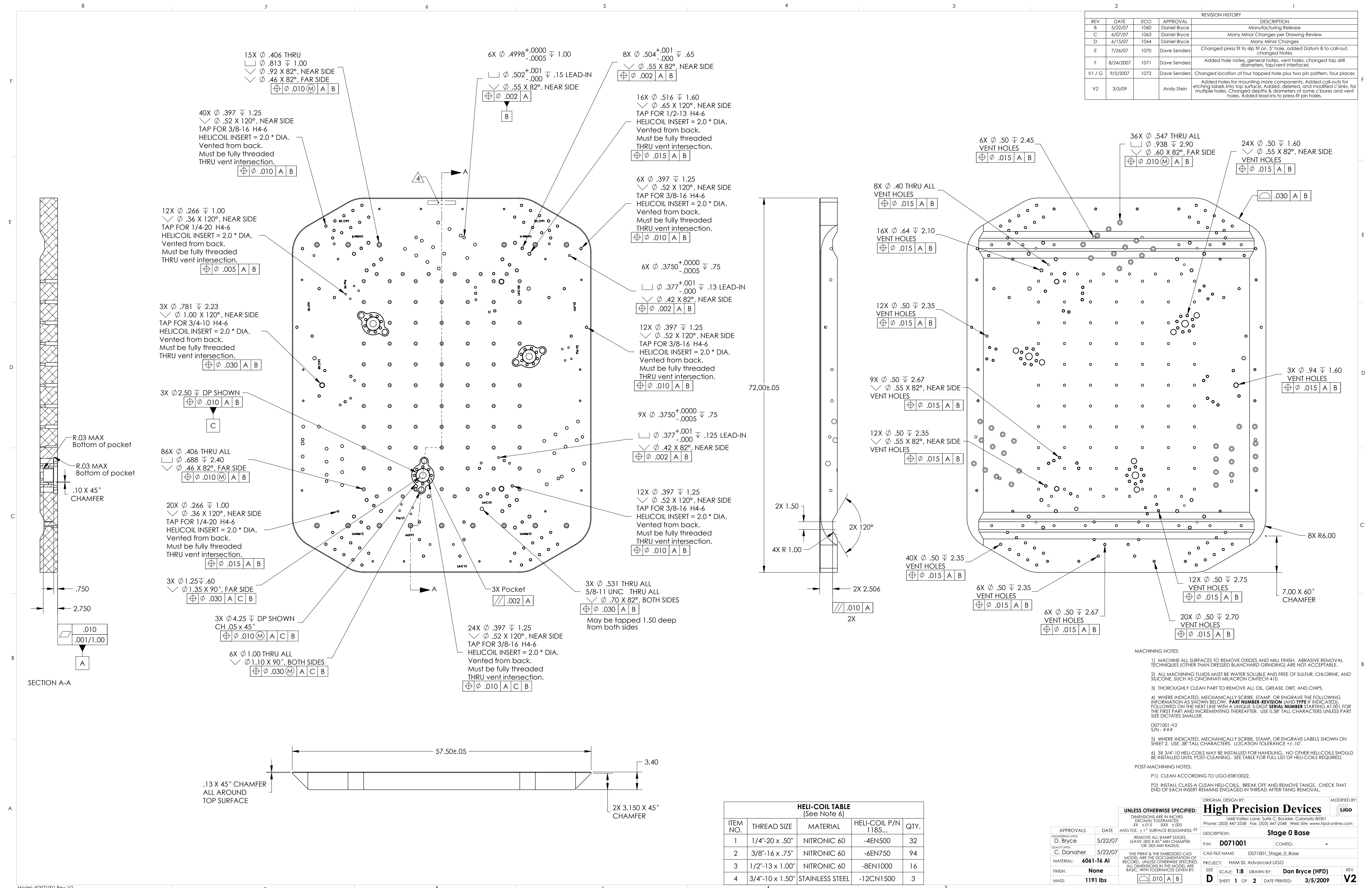
15X ⌀ .406 THRU
⌴ ⌀ .813 ⍈ 1.00
⌵ ⌀ .92 X 82°, NEAR SIDE
⌵ ⌀ .46 X 82°, FAR SIDE
⌖ ⌀ .010 Ⓜ A B

40X ⌀ .397 ⍈ 1.25
⌵ ⌀ .52 X 120°, NEAR SIDE
TAP FOR 3/8-16 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .010 A B

12X ⌀ .266 ⍈ 1.00
⌵ ⌀ .36 X 120°, NEAR SIDE
TAP FOR 1/4-20 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .005 A B

3X ⌀ .781 ⍈ 2.23
⌵ ⌀ 1.00 X 120°, NEAR SIDE
TAP FOR 3/4-10 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .030 A B

3X ⌀2.50 ⍈ DP SHOWN
⌖ ⌀ .010 A B
Ⓒ

86X ⌀ .406 THRU ALL
⌴ ⌀ .688 ⍈ 2.40
⌵ ⌀ .46 X 82°, FAR SIDE
⌖ ⌀ .010 Ⓜ A B

20X ⌀ .266 ⍈ 1.00
⌵ ⌀ .36 X 120°, NEAR SIDE
TAP FOR 1/4-20 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .015 A B

3X ⌀ 1.25 ⍈ .60
⌵ ⌀ 1.35 X 90°, FAR SIDE
⌖ ⌀ .030 A C B

3X ⌀ 4.25 ⍈ DP SHOWN
CH .05 x 45°
⌖ ⌀ .010 Ⓜ A C B

6X ⌀ 1.00 THRU ALL
⌵ ⌀ 1.10 X 90°, BOTH SIDES
⌖ ⌀ .030 Ⓜ A C B

Top-center callouts

6X ⌀ .4998 +.0000/-.0005 ⍈ 1.00
⌴ ⌀ .502 +.001/-.000 ⍈ .15 LEAD-IN
⌵ ⌀ .55 X 82°, NEAR SIDE
⌖ ⌀ .002 A
B

8X ⌀ .504 +.001/-.000 ⍈ .65
⌵ ⌀ .55 82°, NEAR SIDE
⌖ ⌀ .002 A B

16X ⌀ .516 ⍈ 1.60
⌵ ⌀ .65 X 120°, NEAR SIDE
TAP FOR 1/2-13 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .015 A B

6X ⌀ .397 ⍈ 1.25
⌵ ⌀ .52 X 120°, NEAR SIDE
TAP FOR 3/8-16 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .010 A B

6X ⌀ .3750 +.0000/-.0005 ⍈ .75
⌴ ⌀ .377 +.001/-.000 ⍈ .13 LEAD-IN
⌵ ⌀ .42 X 82°, NEAR SIDE
⌖ ⌀ .002 A B

12X ⌀ .397 ⍈ 1.25
⌵ ⌀ .52 X 120°, NEAR SIDE
TAP FOR 3/8-16 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .010 A B

9X ⌀ .3750 +.0000/-.0005 ⍈ .75
⌴ ⌀ .377 +.001/-.000 ⍈ .125 LEAD-IN
⌵ ⌀ .42 X 82°, NEAR SIDE
⌖ ⌀ .002 A B

12X ⌀ .397 ⍈ 1.25
⌵ ⌀ .52 X 120°, NEAR SIDE
TAP FOR 3/8-16 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .010 A B

3X Pocket
∥ .002 A

3X ⌀ .531 THRU ALL
5/8-11 UNC THRU ALL
⌵ ⌀ .70 X 82°, BOTH SIDES
⌖ ⌀ .030 A B
May be tapped 1.50 deep
from both sides

24X ⌀ .397 ⍈ 1.25
⌵ ⌀ .52 X 120°, NEAR SIDE
TAP FOR 3/8-16 H4-6
HELICOIL INSERT = 2.0 * DIA.
Vented from back.
Must be fully threaded
THRU vent intersection.
⌖ ⌀ .010 A C B

Section / side view (left)

R.03 MAX
Bottom of pocket

R.03 MAX
Bottom of pocket

.10 X 45°
CHAMFER

.750
2.750

.010
.001/1.00
A

SECTION A-A

Center/right side view

72.00±.05

2X 1.50
4X R 1.00
2X 120°
2X 2.506
2X

∥ .010 A

Bottom left view

57.50±.05
3.40
.13 X 45° CHAMFER
ALL AROUND
TOP SURFACE
2X 3.150 X 45° CHAMFER

Right view callouts

6X ⌀ .50 ⍈ 2.45
VENT HOLES

36X ⌀ .547 THRU ALL
⌴ ⌀ .938 ⍈ 2.90
⌵ ⌀ .60 X 82°, FAR SIDE
⌖ ⌀ .010 Ⓜ A B

24X ⌀ .50 ⍈ 1.60
⌵ ⌀ .55 X 82°, NEAR SIDE
VENT HOLES
⌖ ⌀ .015 A B

8X ⌀ .40 THRU ALL
VENT HOLES
⌖ ⌀ .015 A B

.030 A B

16X ⌀ .64 ⍈ 2.10
VENT HOLES
⌖ ⌀ .015 A B

12X ⌀ .50 ⍈ 2.35
VENT HOLES
⌖ ⌀ .015 A B

3X ⌀ .94 ⍈ 1.60
VENT HOLES
⌖ ⌀ .015 A B

9X ⌀ .50 ⍈ 2.67
⌵ .55 X 82°, NEAR SIDE
VENT HOLES
⌖ ⌀ .015 A B

12X ⌀ .50 ⍈ 2.35
⌵ ⌀ .55 X 82°, NEAR SIDE
VENT HOLES
⌖ ⌀ .015 A B

8X R6.00

7.00 X 60°
CHAMFER

40X ⌀ .50 ⍈ 2.35
VENT HOLES
⌖ ⌀ .015 A B

6X ⌀ .50 ⍈ 2.35
VENT HOLES

12X ⌀ .50 ⍈ 2.75
VENT HOLES
⌖ ⌀ .015 A B

6X ⌀ .50 ⍈ 2.67
VENT HOLES

20X ⌀ .50 ⍈ 2.70
VENT HOLES
⌖ ⌀ .015 A B

MACHINING NOTES:

1) MACHINE ALL SURFACES TO REMOVE OXIDES AND MILL FINISH. ABRASIVE REMOVAL TECHNIQUES (OTHER THAN DRESSED BLANCHARD GRINDING) ARE NOT ACCEPTABLE.

2) ALL MACHINING FLUIDS MUST BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE, AND SILICONE, SUCH AS CINCINNATI MILACRON CIMTECH 410.

3) THOROUGHLY CLEAN PART TO REMOVE ALL OIL, GREASE, DIRT, AND CHIPS.

4) WHERE INDICATED, MECHANICALLY SCRIBE, STAMP, OR ENGRAVE THE FOLLOWING INFORMATION AS SHOWN BELOW: PART NUMBER-REVISION (AND TYPE IF INDICATED), FOLLOWED ON THE NEXT LINE WITH A UNIQUE 3-DIGIT SERIAL NUMBER STARTING AT 001 FOR THE FIRST PART AND INCREMENTING THEREAFTER. USE 0.38" TALL CHARACTERS UNLESS PART SIZE DICTATES SMALLER.

D071001-V2
S/N - ###

5) WHERE INDICATED, MECHANICALLY SCRIBE, STAMP, OR ENGRAVE LABELS SHOWN ON SHEET 2. USE .38" TALL CHARACTERS. LOCATION TOLERANCE +/-.10".

6) 3X 3/4"-10 HELI-COILS MAY BE INSTALLED FOR HANDLING. NO OTHER HELI-COILS SHOULD BE INSTALLED UNTIL POST-CLEANING. SEE TABLE FOR FULL LIST OF HELI-COILS REQUIRED.

POST-MACHINING NOTES:

P1) CLEAN ACCORDING TO LIGO-E0810022.

P2) INSTALL CLASS-A CLEAN HELI-COILS. BREAK OFF AND REMOVE TANGS, CHECK THAT END OF EACH INSERT REMAINS ENGAGED IN THREAD AFTER TANG REMOVAL.
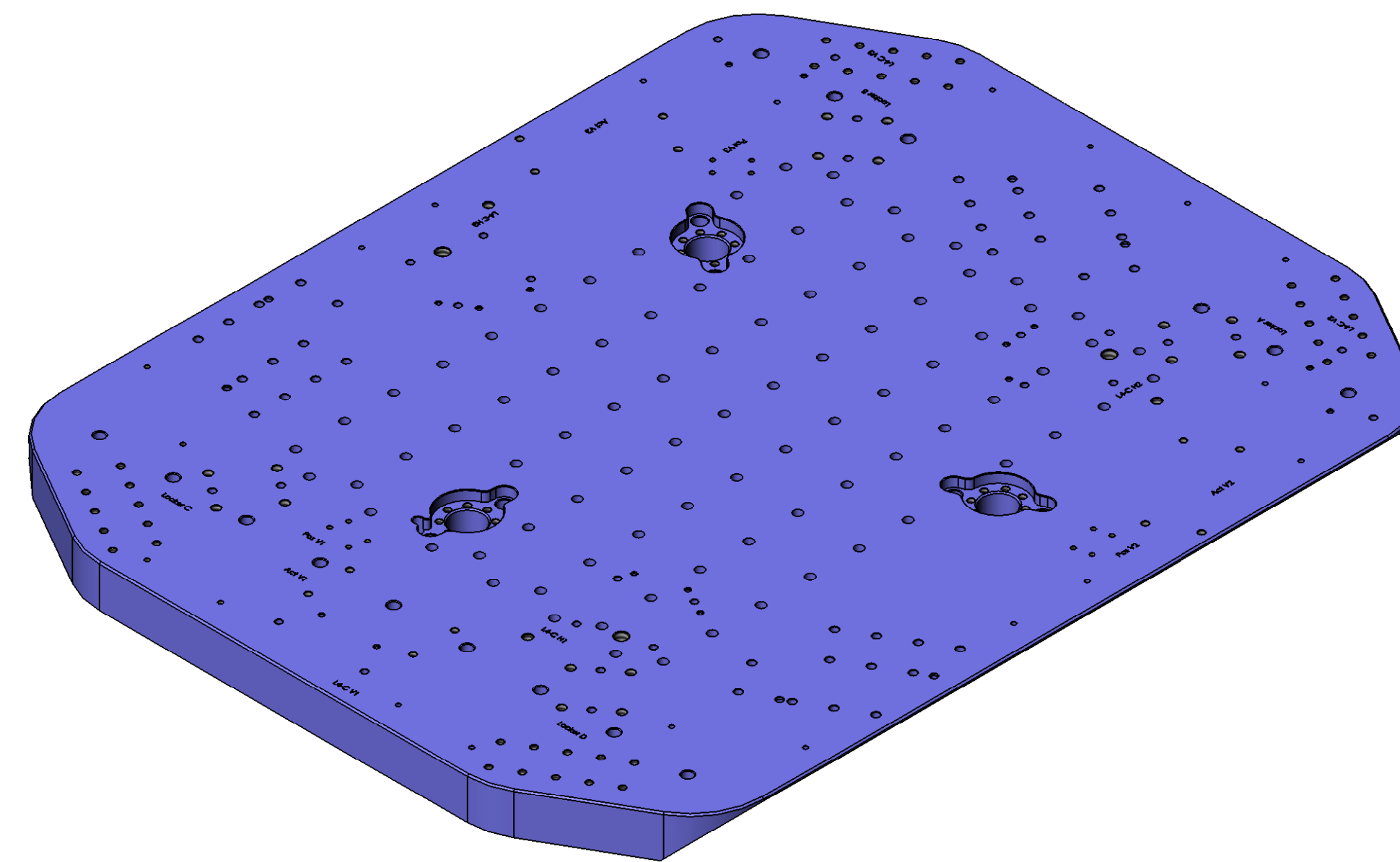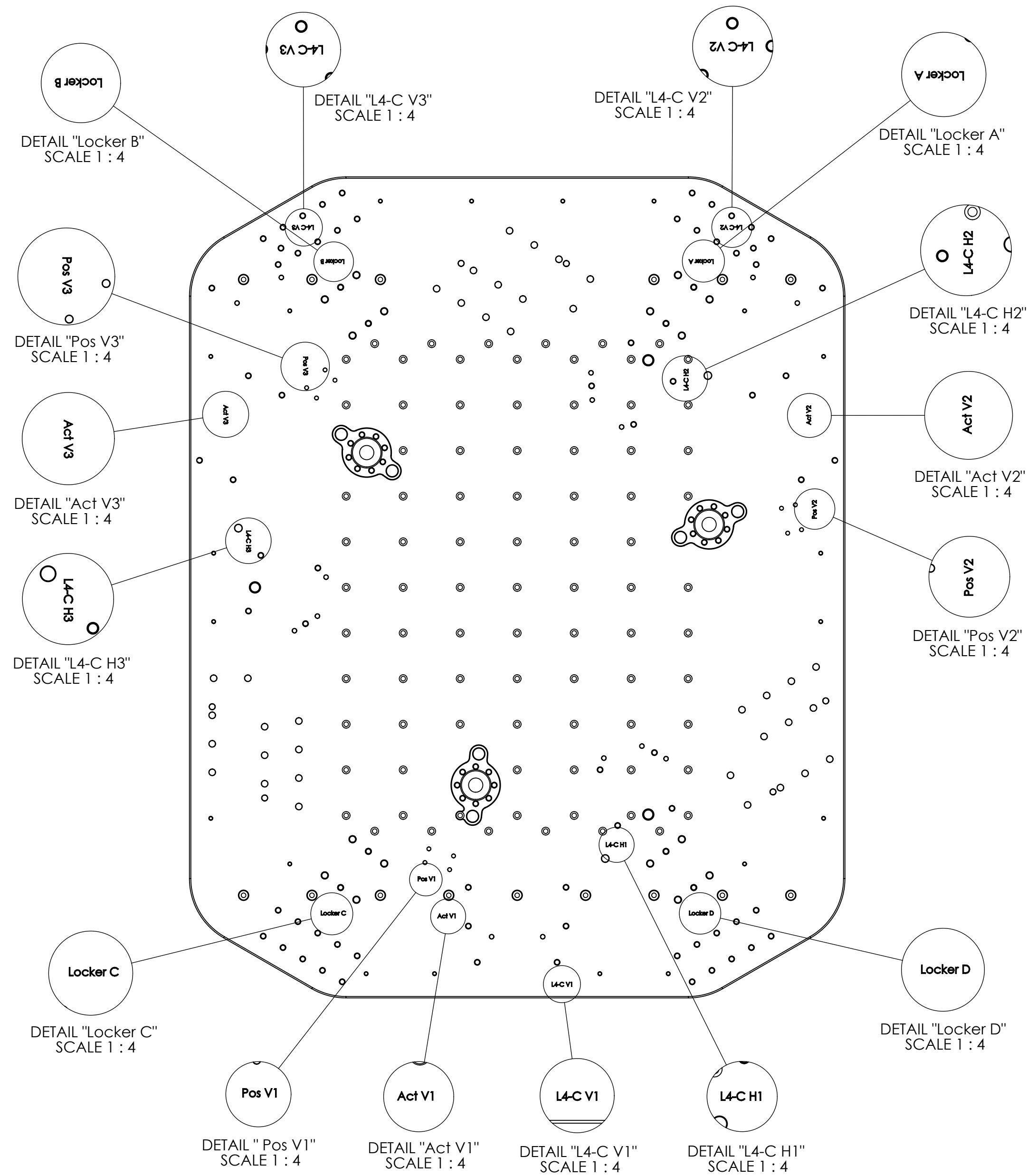
HELI-COIL TABLE
(See Note 6)

ITEM NO.	THREAD SIZE	MATERIAL	HELI-COIL P/N 1185...	QTY.
1	1/4"-20 x .50"	NITRONIC 60	-4EN500	32
2	3/8"-16 x .75"	NITRONIC 60	-6EN750	94
3	1/2"-13 x 1.00"	NITRONIC 60	-8EN1000	16
4	3/4"-10 x 1.50"	STAINLESS STEEL	-12CN1500	3

Title block

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES:
.XX ±.015 .XXX ±.005
ANG TOL: ± 1° SURFACE ROUGHNESS: 63
REMOVE ALL SHARP EDGES.
LEAVE .005 X 45" MIN CHAMFER,
OR .005 MIN RADIUS.
THIS PRINT & THE EMBEDDED CAD MODEL ARE THE DOCUMENTATION OF RECORD. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN THE MODEL ARE BASIC, WITH TOLERANCES GIVEN BY:
.010 A B

High Precision Devices
1668 Valtec Lane, Suite C, Boulder, Colorado 80301
Phone: (303) 447-2558 Fax: (303) 447-2548 Web Site: www.hpd-online.com

ORIGINAL DESIGN BY:
MODIFIED BY: LIGO

DESCRIPTION: Stage 0 Base
P/N: D071001   CONFIG: -
CAD FILE NAME: D071001_Stage_0_Base
PROJECT: HAM ISI, Advanced LIGO

APPROVALS	DATE
ENGINEERING (HPD): D. Bryce	5/22/07
QUALITY (HPD): C. Danaher	5/22/07
MATERIAL: 6061-T6 Al	
FINISH: None	
MASS: 1191 lbs	

SIZE D
SCALE: 1:8
DRAWN BY: Dan Bryce (HPD)
REV V2
SHEET 1 OF 2   DATE PRINTED: 3/5/2009

DETAIL "Locker B"
SCALE 1 : 4

DETAIL "L4-C V3"
SCALE 1 : 4

DETAIL "L4-C V2"
SCALE 1 : 4

DETAIL "Locker A"
SCALE 1 : 4

DETAIL "Pos V3"
SCALE 1 : 4

DETAIL "L4-C H2"
SCALE 1 : 4

DETAIL "Act V3"
SCALE 1 : 4

DETAIL "Act V2"
SCALE 1 : 4

DETAIL "L4-C H3"
SCALE 1 : 4

DETAIL "Pos V2"
SCALE 1 : 4

DETAIL "Locker C"
SCALE 1 : 4

DETAIL "Locker D"
SCALE 1 : 4

DETAIL " Pos V1"
SCALE 1 : 4

DETAIL "Act V1"
SCALE 1 : 4

DETAIL "L4-C V1"
SCALE 1 : 4

DETAIL "L4-C H1"
SCALE 1 : 4

MODIFIED BY: LIGO

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
DECIMAL TOLERANCES:
.XX ±.015   .XXX ±.005
ANG TOL: ± 1° SURFACE ROUGHNESS: 63

REMOVE ALL SHARP EDGES.
LEAVE .005 X 45° MIN CHAMFER,
OR .005 MIN RADIUS.

THIS PRINT & THE EMBEDDED CAD
MODEL ARE THE DOCUMENTATION OF
RECORD. UNLESS OTHERWISE SPECIFIED,
ALL DIMENSIONS IN THE MODEL ARE
BASIC, WITH TOLERANCES GIVEN BY:

APPROVALS	DATE
ENGINEERING (HPD): D. Bryce	5/22/07
QUALITY (HPD): C. Danaher	5/22/07
MATERIAL:	6061-T6 Al
FINISH:	None
MASS:	1191 lbs

.010 | A | B

DESCRIPTION: Stage 0 Base

P/N: **D071001**   CONFIG: -

CAD FILE NAME: D071001_Stage_0_Base

PROJECT: HAM ISI, Advanced LIGO

SIZE **D**   SCALE: **1:8**   DRAWN BY: **Dan Bryce (HPD)**   REV **V2**

SHEET **2** OF **2**   DATE PRINTED: **3/5/2009**