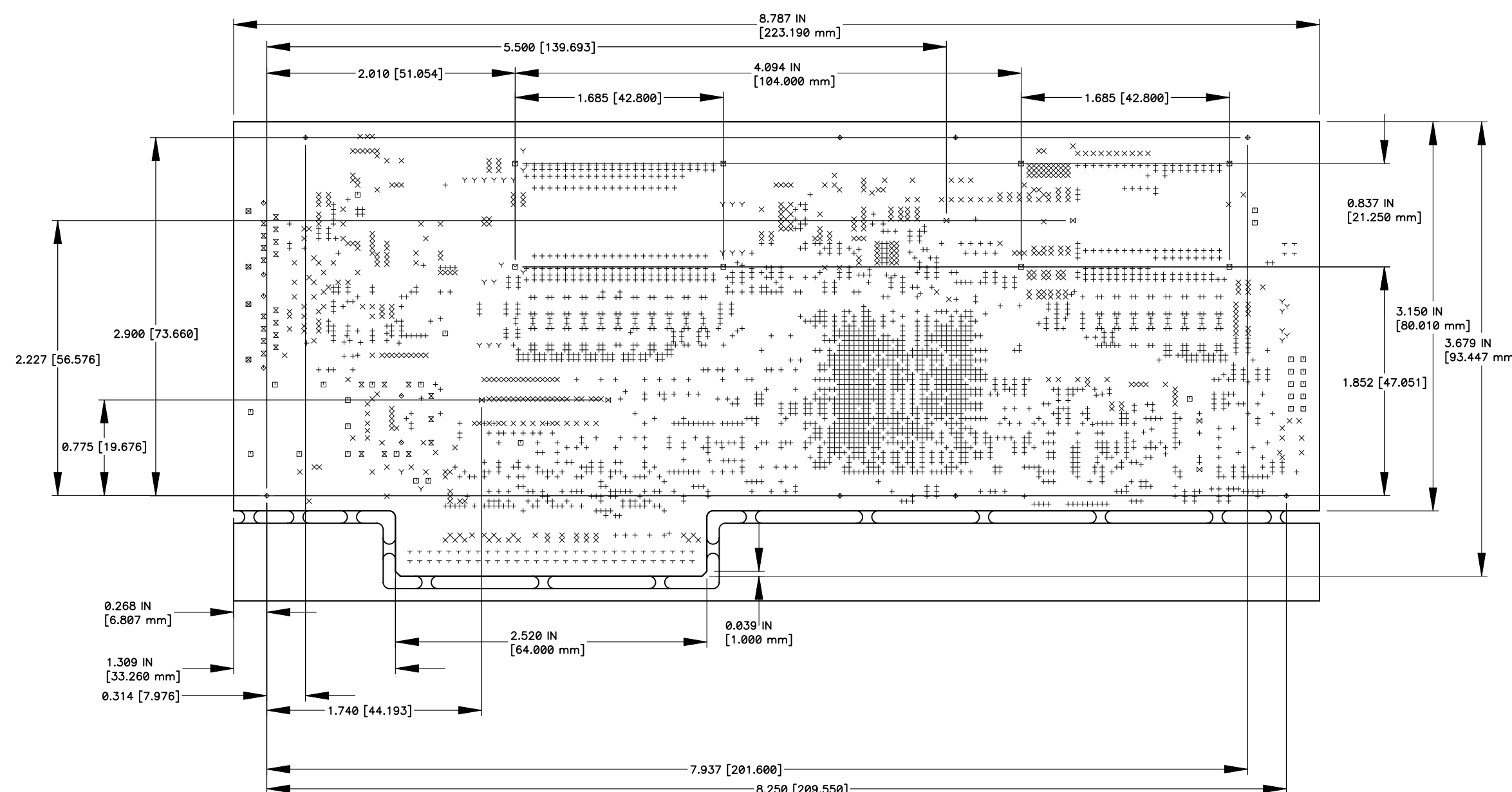


REVISIONS

ZONE	LTR	REVISIONS	ECR	DATE	BY	APRV
	OD	INITIAL RELEASE		24MAR09	DMS	
	A	SEE ECO FOR DETAILS	TRNT-0012	15OCT10	DMS	P.MOORE
	B	SEE ECOs FOR DETAILS	TRNT-017 TRNT-024	09AUG11	DMS	M.HUNTEN



NOTES: unless otherwise specified

- 1.0 Fabricate circuit board to conform to IPC-600 latest revision. Applicable documents  
The following items are required:  
PATTERN FILM / GERBER DATA DWG # TRNT-EL-04-3002  
DETAIL DRAWING DWG # TRNT-EL-04-1002 THIS DOCUMENT
- 1.1 Artwork may not be modified except for process control.
- 2.0 BASE MATERIAL
  - 2.1 Laminate base material shall be natural color, FR370 HR hi temp rohs capable or equivalent. See Detail A-A for layer to layer specification and overall thickness.
  - 2.2 B-Stage shall be selected at vendors discretion to meet over all board thickness and end item requirements.
- 3.0 COPPER PLATING
  - 3.1 Copper plating shall have a minimum purity of 99.5 percent and a minimum thickness of .001 inch. This also applies to the plating in the holes.
- 4.0 SOLDERMASK
  - 4.1 Apply LPI solder mask to layers 1 and 12 using appropriate artwork masters IAW IPC-SM-840. Solder mask artwork pad clearances are provided at 1:1 vendor to resize mask openings for minimal (.001-.003) mask to pad clearance to accommodate manufacturing processes.
- 5.0 FINISH
  - 5.1 EXPOSED COPPER SHALL BE Ni/Au -- IMMERSION GOLD 3-5u INCH (0.00003-0.00005) OVER ELECTROLESS NICKEL 100-200u INCH (0.00001-0.00002) THICK IAW IPC-2221 AND IPC-4552 (ENIG).
- 6.0 SILK SCREEN
  - 6.1 Silk screen top (-1) and bottom (-12) side of board using white epoxy ink according to the -1S pattern film and the -12S pattern film. Ink shall not cover any exposed metal.
- 7.0 DIMENSIONS
  - 7.1 All dimensions are in millimeters.
  - 7.2 Unless otherwise specified all hole sizes apply after plating. Hole sizes are shown in the drill schedule.
- 8.0 TOLERANCES as per IPC-6012B qualification and Performance Specification for Rigid Printed Boards
  - 8.1 Hole size tolerance +- .003 after plating unless otherwise specified.
  - 8.2 Conductor widths and spacing shall be within 20% of the artwork originals.
  - 8.3 Layer to layer registration shall be .007 inches of true position
  - 8.4 Board dimensions shall meet the requirements of the board drawing.
  - 8.5 Warp and twist shall not exceed that defined in IPC-6012B.
- 9.0 APPEARANCE
  - 9.1 All inside and outside corners shall have a maximum radius of .065
  - 9.2 Remove all burrs and smooth sharp edges to .010 max.

Hole Dia (inch)	Symbol	Quantity	Plated
0.010	+	2484	Yes
0.014	X	490	Yes
0.020	Y	29	Yes
0.032	T	64	Yes
0.037	Z	25	Yes
0.039	M	6	No
0.041	□	29	Yes
0.055	◇	4	Yes
0.057	⊠	8	No
0.061	⊙	2	No
0.094	⊞	4	No
0.127	⊕	8	Yes

APPROVED FOR  
CONSTRUCTION  
11-03-11 DMS

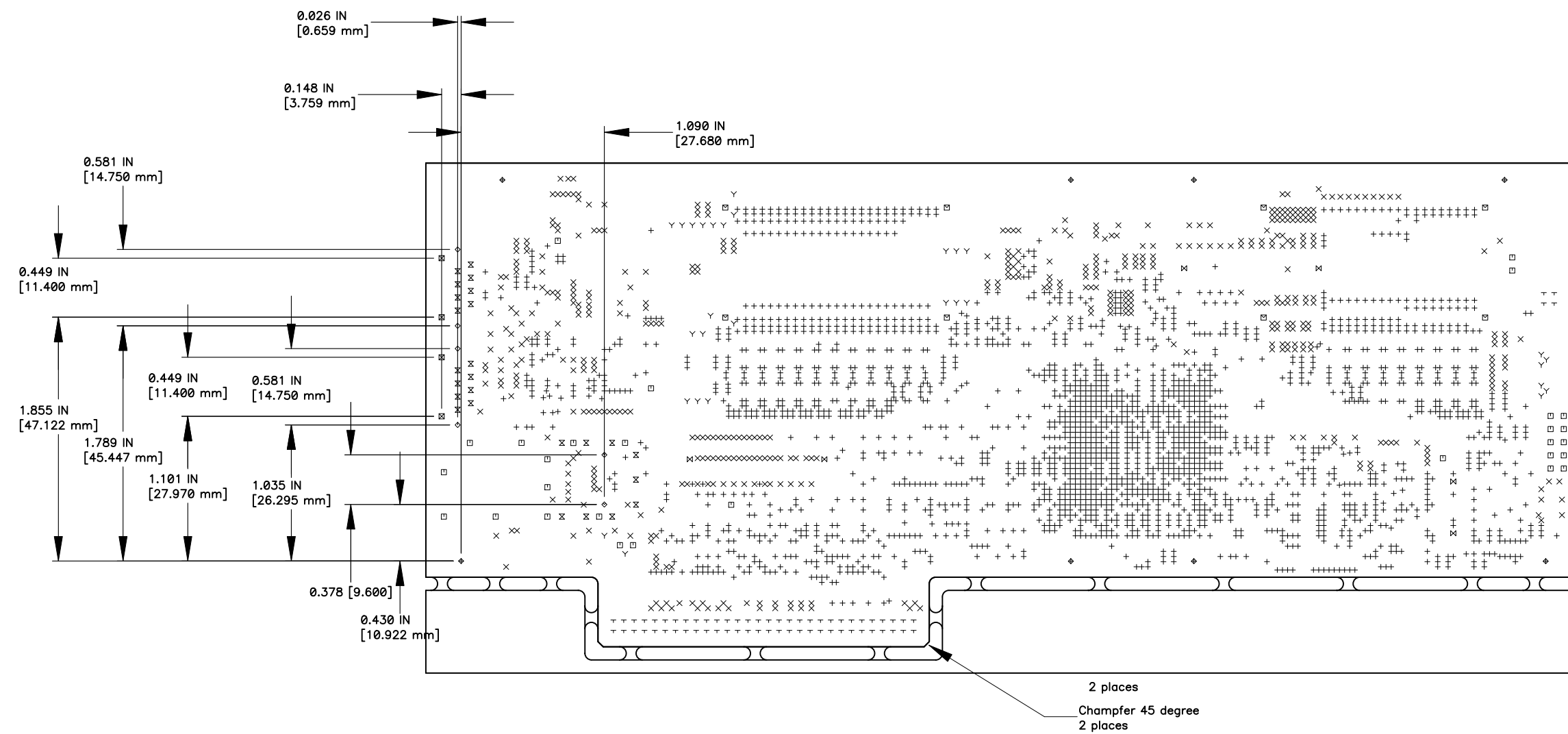
0.090 ± .007

DETAIL A-A

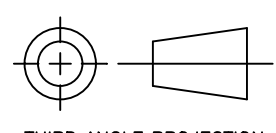
- 0.036 Layer-1 1/2 oz 50 ohm 0.150 mm width
- 0.005 Layer-2 1 oz GND Plane
- 0.045 Layer-3 1/2 oz 50 ohm 0.127mm width
- 0.005 Layer-4 1/2 oz
- 0.005 Layer-5 1/2 oz
- 0.007 Layer-6 1oz PWR Plane
- 0.021 Layer-7 1oz PWR Plane
- 0.005 Layer-8 1/2 oz
- 0.005 Layer-9 1/2 oz
- 0.045 Layer-10 1/2 oz
- 0.005 Layer-11 1 oz GND Plane
- 0.036 Layer-12 1/2 oz 50 ohm 0.150mm width

Modified Date: Fri Nov 04, 2011  
Print Date: Fri Nov 04, 2011

QTY REQ'D	PART OR IDENTIFYING NO	ITEM DESCRIPTION	ITEM NO
TOLERANCES UNLESS OTHERWISE NOTED		<p>THIRD ANGLE PROJECTION</p>	<p><b>NATIONAL OPTICAL ASTRONOMY OBSERVATORIES</b> OPERATED BY THE ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY UNDER COOPERATIVE AGREEMENT WITH NATIONAL SCIENCE FOUNDATION</p>
.XX ± .03	ANGULAR ±.5°		
.XXX ± .010			
DO NOT SCALE DRAWING		NAME	USED ON
NEXT ASSEMBLY TRNT-EL-04-0002		DETAIL LOCAL CONTROL BOARD (LCB)	TORRENT
REFER TO SCHEMATIC TRNT-EL-04-2002			REV B
SCALE: FULL	DESIGNED BY Dee Stover	DATE 10MAR09	CHECKED BY
DWG PRODUCED USING PCAD 2006	DRAWN BY Dee Stover	DATE 10MAR09	APPROVED BY
		DATE	DATE
		DWG NO TRNT-EL-04-1002	RELEASED
			SHEET 1 OF 2



APPROVED FOR  
CONSTRUCTION  
11-03-11 DMS

QTY REQ'D	PART OR IDENTIFYING NO	ITEM DESCRIPTION	ITEM NO
TOLERANCES UNLESS OTHERWISE NOTED		 THIRD ANGLE PROJECTION	NATIONAL OPTICAL ASTRONOMY OBSERVATORIES OPERATED BY THE ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY UNDER COOPERATIVE AGREEMENT WITH NATIONAL SCIENCE FOUNDATION
.XX ± .03	ANGULAR ±.5°		
.XXX ± .010			
DO NOT SCALE DRAWING		NAME	USED ON
NEXT ASSEMBLY TRNT-EL-04-0002		DETAIL LOCAL CONTROL BOARD (LCB)	TORRENT
REFER TO SCHEMATIC TRNT-EL-04-2002			DWG SIZE C
SCALE: FULL	DESIGNED BY Dee Stover	DATE 10MAR09	CHECKED BY
DWG PRODUCED USING PCAD 2006	DRAWN BY Dee Stover	DATE 10MAR09	APPROVED BY
		DATE	DATE
		RELEASED	
DWG NO TRNT-EL-04-1002			SHEET 2 OF 2

Modified Date: Fri Nov 04, 2011  
Print Date: Fri Nov 04, 2011