

STEREO *IMPACT*

IDPU Internal Interface Design

IDPUDesign_D.doc
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Document Revision Record

Rev.	Date	Description of Change	Approved By
A	2002-Apr-16	Preliminary Draft	-
B	2002-Jun-3	<ul style="list-style-type: none"> • Modify internal connector locations (MAG, DCB, STE-U) • Add MAG heater board outline 	-
C	2002-Jun-12	<ul style="list-style-type: none"> • Change internal connector pinout to add STE-U bias supply • Define internal connector on bottom tray 	-
D	2003-Sep-12	<ul style="list-style-type: none"> • Add STE bias supply control signal • Update ICD drawings • Correct order of trays in stack • Add latest PWB board outlines, including shield board outlines 	

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1. Introduction

This document describes the internal mechanical and electrical design of the STEREO IMPACT IDPU for use by the electronic designers in designing their circuit boards. External interfaces are described elsewhere.

1.1. Document Conventions

In this document, **TBD** (To Be Determined) means that no data currently exists. A value followed by **TBR** (To Be Resolved) means that this value is preliminary. In either case, the value is typically followed by a code such as UCB indicating who is responsible for providing the data, and a unique reference number.

1.2. Applicable Documents

The following documents include drawings and STEREO Project policies. All documents and drawings can be found on the Berkeley STEREO/IMPACT FTP site:

<http://sprg.ssl.berkeley.edu/impact/dwc/>

1. ICD/IDPUICD_B - IDPU ICD drawing
2. ICD/Block_E - IMPACT block diagram
3. ICD/ImpactHarnessSpec_D - IMPACT Harness specification (includes IDPU external connector pinouts)
4. ICD/IMPACTSerialInterface_E – serial instrument interface spec

2. Box Design

The IDPU circuit boards are mounted into trays as shown in Figure 1 and 2. The trays are (from bottom to top) the Power Converter, DCB, **STE-U and MAG** trays. The top three trays hold one PWB per tray, while the bottom tray holds the Low Voltage Power Converter (on the left hand side) and the Mag Heater Converter (on the right hand side, in addition to harnessing).

3. Board Outlines

Dimensioned board outline drawings are shown in figures 3,4,5, and 6. Note that the pin locations for the internal connector in the board outlines are not representative; the actual pin rows are staggered.

The bottom tray contains both the LVPS and Mag Heater supply. These shall be hard-wired to the power connector, IDPU-J1, and the internal connector.

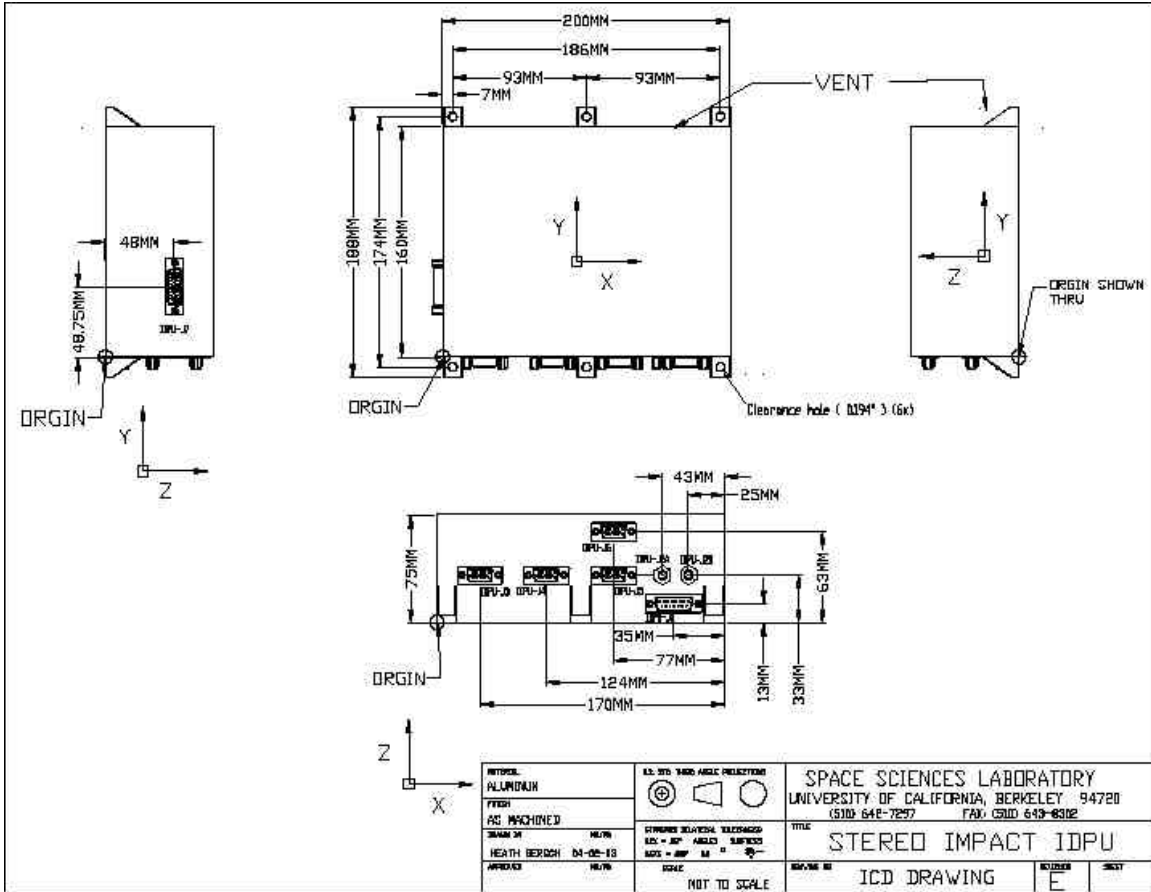


Figure 1 – IDPU Assembly

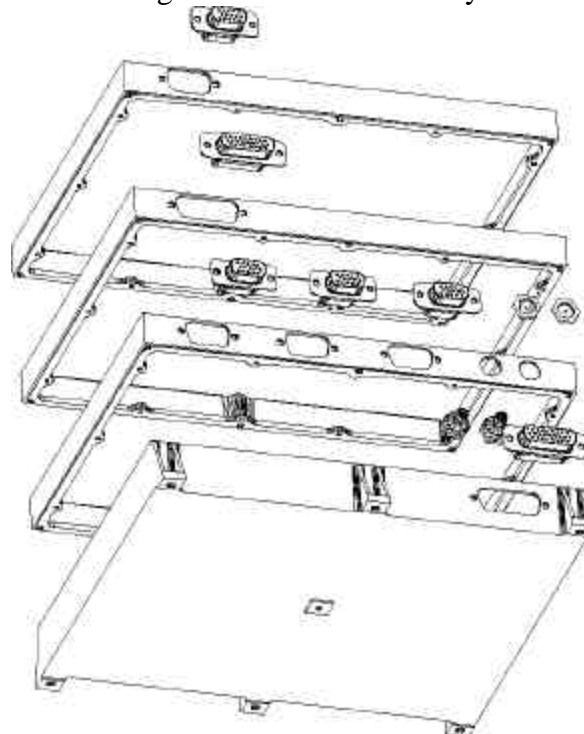


Figure 2 - IDPU Exploded View (Note incorrect location of J7)

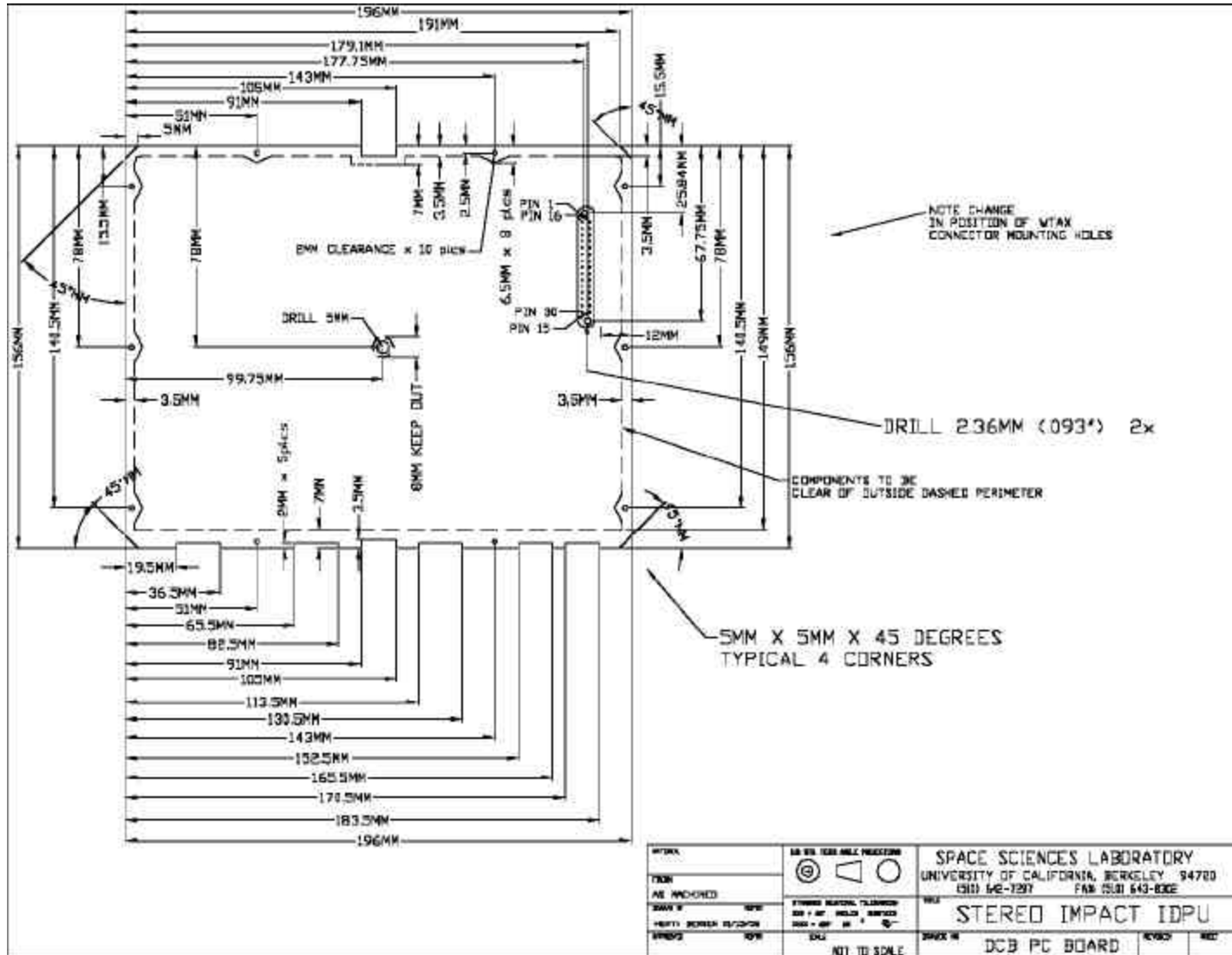


Figure 3 – Data Controller Board Outline

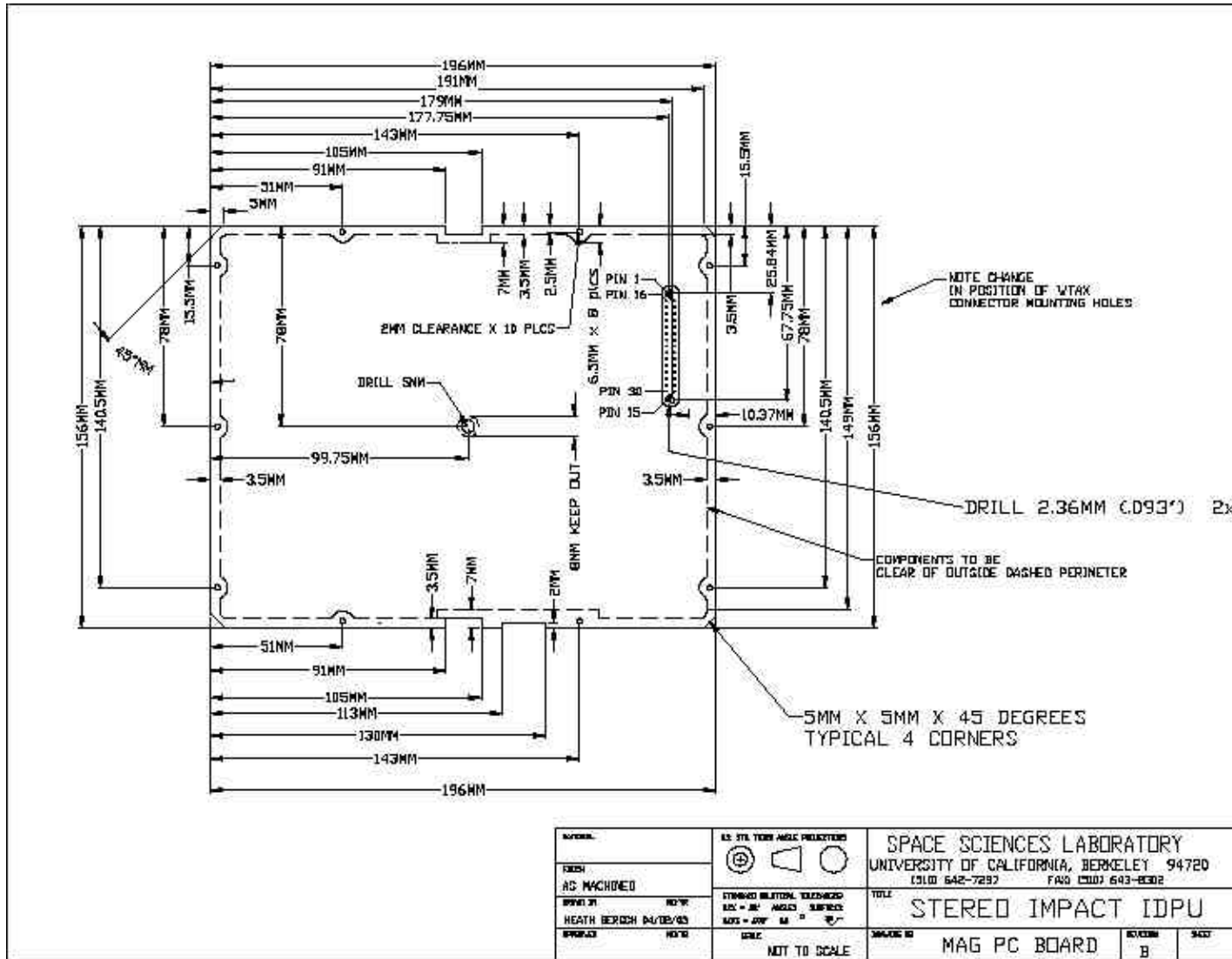


Figure 4 – MAG Board Outline

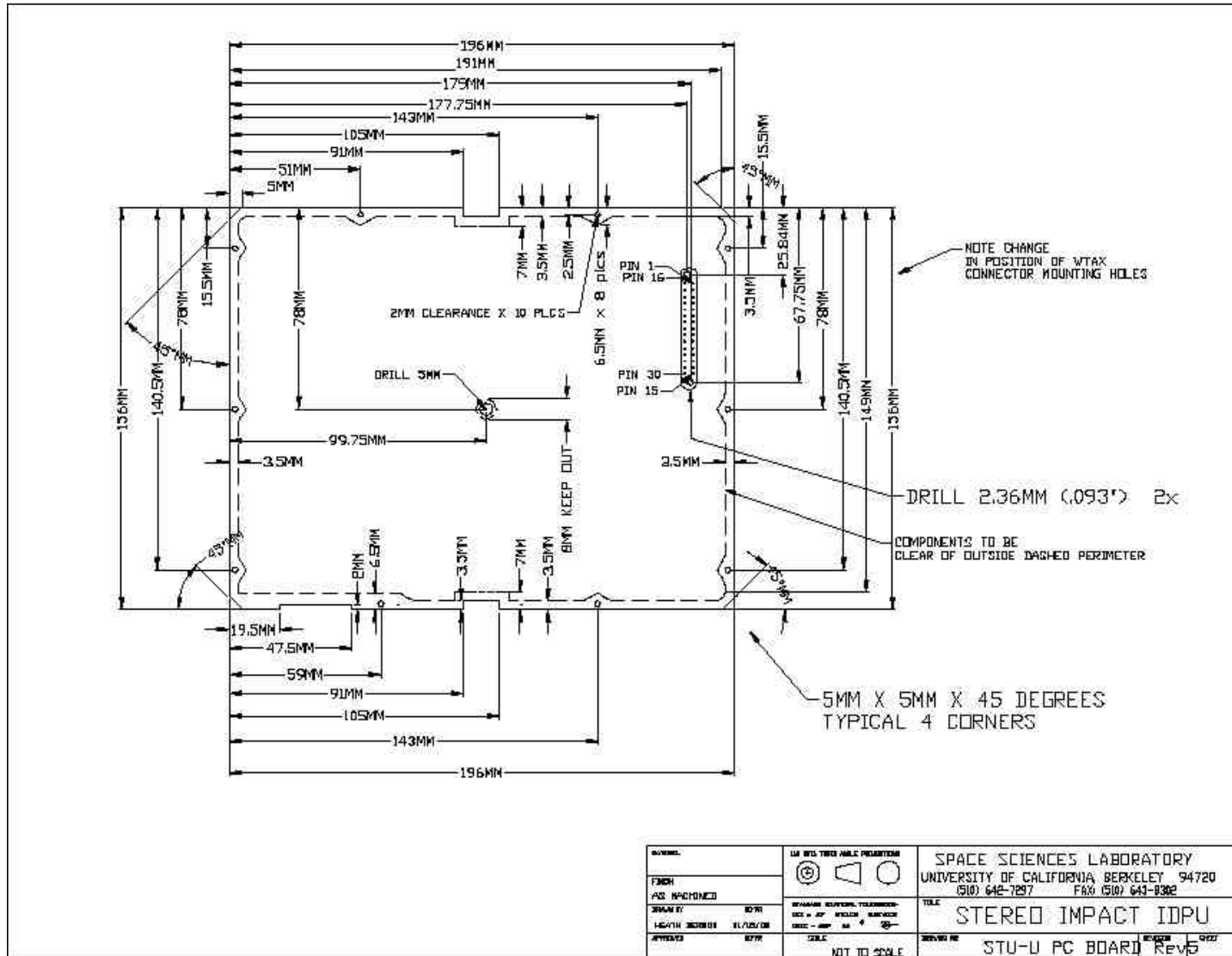


Figure 5 – STE-U Board Outline

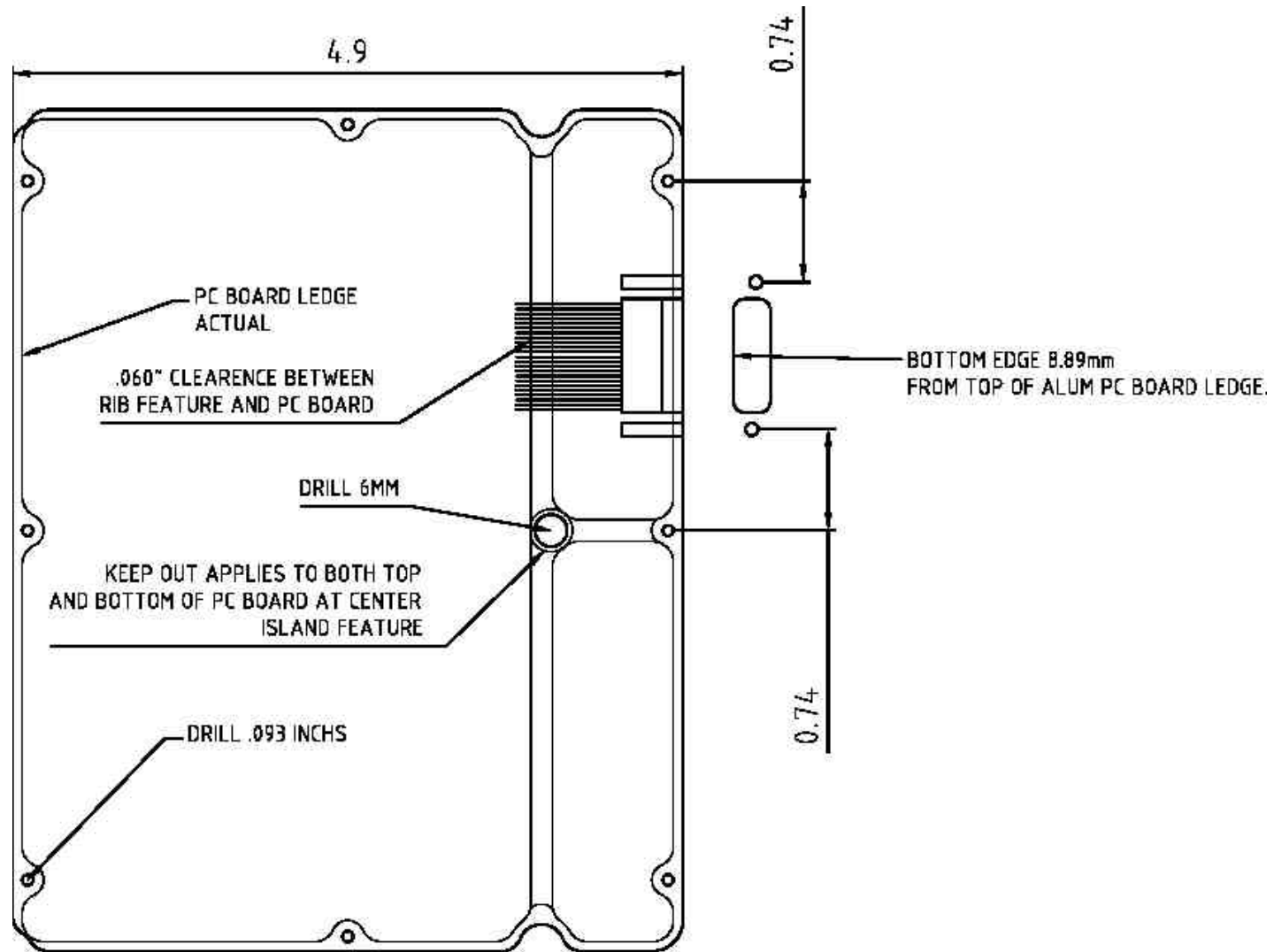


Figure 6 – LVPS Board Outline

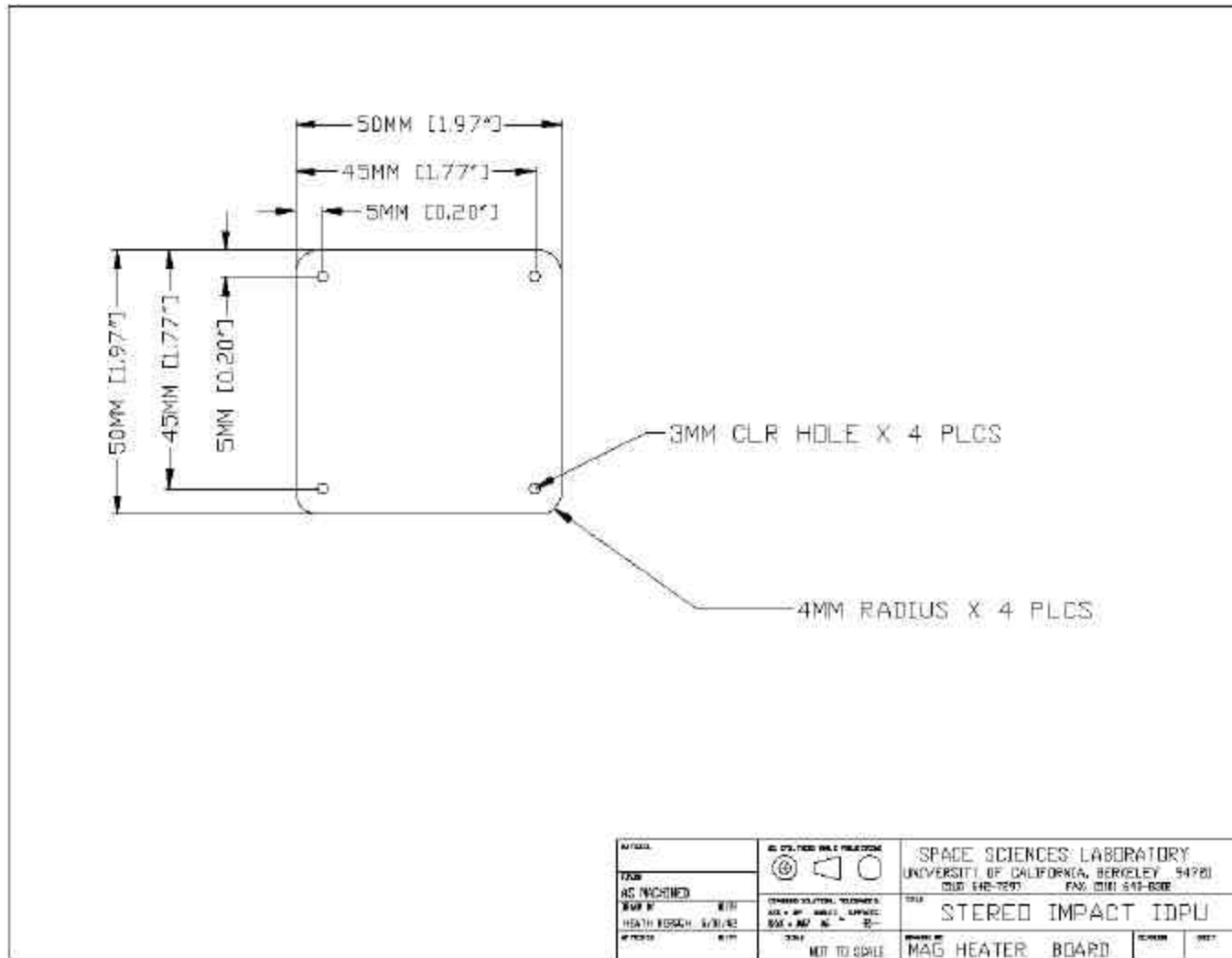


Figure 7 – Mag Heater Footprint

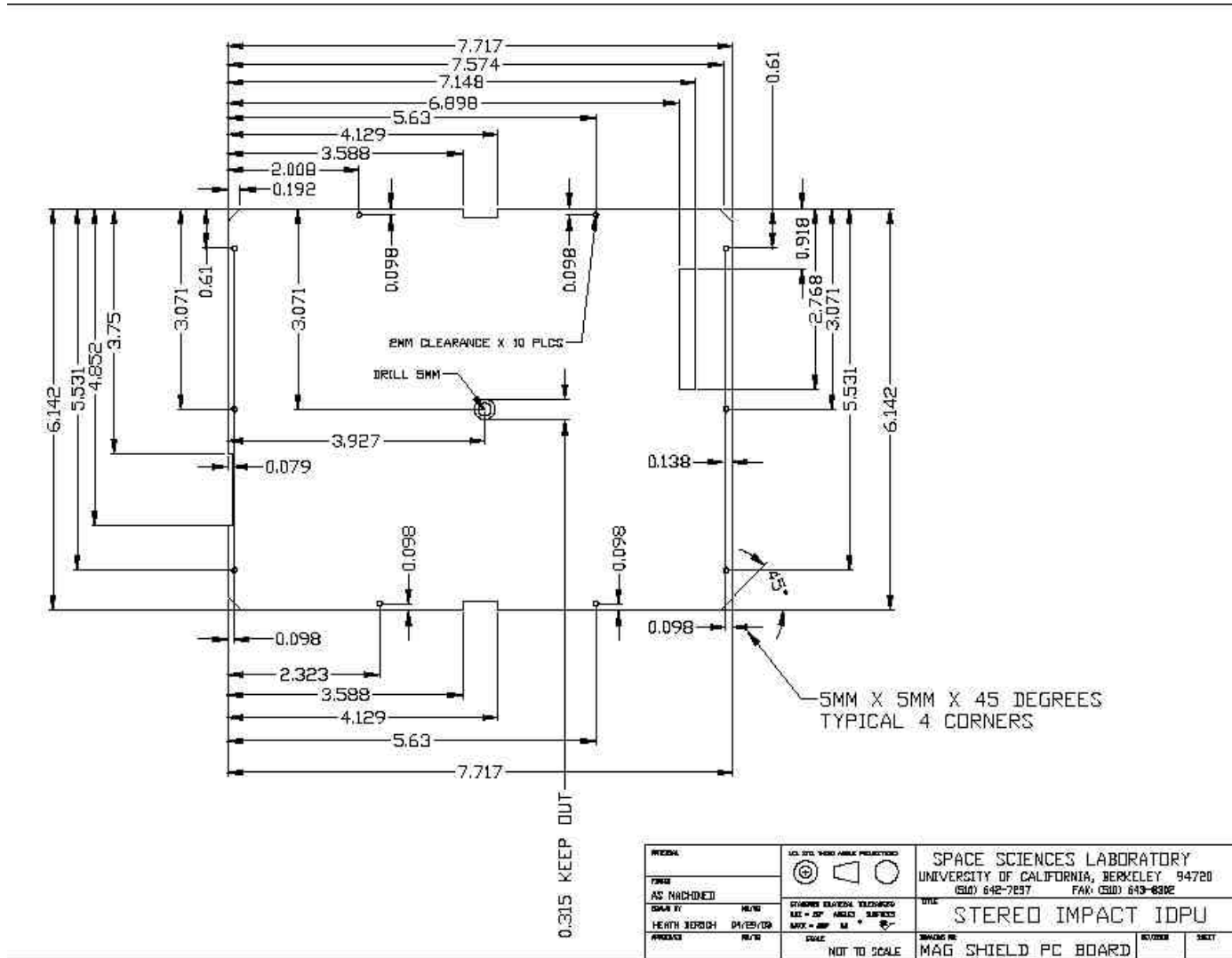


Figure 8 – MAG Shield Board

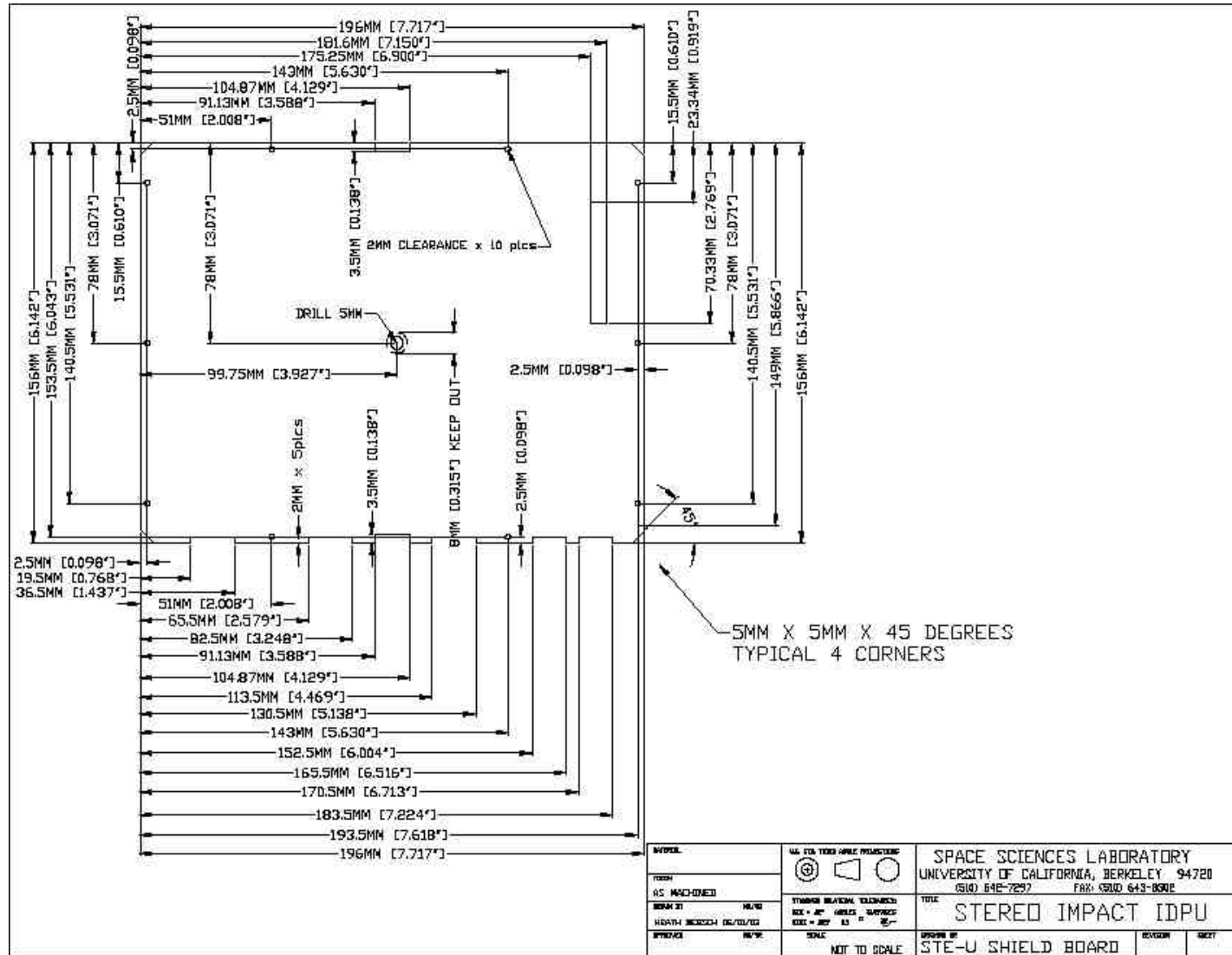


Figure 9 – STE-U Shield Board

4. Internal Connector

The boards are connected together with “stacking” connectors, Airborn type WTAX30SAP27. See the Airborn catalog online at:

<http://www.airborn.com/pdf/wseries/w.pdf>

These connectors consist of a connector body with female sockets, plus long pins that go through the board and plug into the next connector below. The pin length is designed for 15mm board-to-board spacing. When soldering the connectors into the PWB, care needs to be taken not to get solder on the mating part of the pin. The pins have a small amount of compliance. When soldering the connectors into the boards, the connectors need to be placed accurately so that the pins will mate with the next board.

The bottom connector, in the LVPS tray, shall use a solder-cup version of this connector, WTAX30SAC. The pin numbering on these connectors is sometimes incorrect for some reason.

4.1. Internal Connector Pinout

Pin 1 = +50-+140V STE-U Bias supply (from LVPS to STE-U)

Pin 16 = Bias supply control (from STE-U board to power converter)

Pin 2 = +12V analog (from LVPS to MAG, STE-U)

Pin 17 = -12V analog (from LVPS to MAG, STE-U)

Pin 3 = +5V analog (from LVPS to STE-U)

Pin 18 = -5V analog (from LVPS to STE-U)

Pins 4,19 = AGND (from LVPS to MAG, STE-U)

Pins 5 = MagHeaterControl (from MAG to Mag Heater Supply)

Pin 20 = MagHeaterControlReturn (from MAG to Mag Heater Supply)

Pin 6 = HKPMagTemp (analog housekeeping from MAG to STE-U)

Pin 21 = HKPMagHeater (analog housekeeping from MAG to STE-U)

Pin 7 = MAGCLK (from DCB to MAG)

Pin 22 = MAGCMD (from DCB to MAG)

Pin 8 = MAGTLM (from MAG to DCB)

pin 23 = STEUCLK (from DCB to STE-U)

Pin 9 = STEUCMD (from DCB to STE-U)

Pin 24 = STEUTLM (from STE-U to DCB)

Pin 10 = MagHeaterPower (from MAG to Mag Heater Supply)

Pin 25 = MagHeaterPowerReturn (from MAG to Mag Heater Supply)

Pins 11,26 = +2.5VD (from LVPS to DCB, STE-U)

Pins 12,27 = DGND (from LVPS to DCB, MAG, STE-U)

Pins 13,28 = +5VD (from LVPS to DCB, MAG, STE-U)

Pins 14,29 = GND-T (from LVPS to DCB)

Pins 15,30 = +5VT (from LVPS to DCB)

4.2. **Signal Characteristics**

The analog housekeeping signals should be conditioned with respect to AGND in the range +/-5V. The CLK/CMD/TLM signals are described in reference 4.

The supply voltages are regulated to +/-10%, and have less than 20mv p-p ripple. Note that these supplies have significant supply impedance, and so the voltages will vary with load over the indicated range. They may also sag momentarily in response to transient loads outside the range (in particular +12V may drop a few volts when the STE door is actuated). The electronics need not perform in spec, but should not be damaged by this.