ATLAS Inner Detector Semiconductor Tracker

ABC(D) Support Cards from Melbourne - Report to Dec 97 SCT week

Contents

- Melbourne is generally interested in contributing to systems / integration work as an extension to our testbeam support & centre-tap forward wheel activities. Currently we have a tech working full-time on ABC(D) support cards in liaison with LBL & UCSC, and are interested in hardware contributions beyond these.

- **ABC Diagnostic Support Card**

  - **For Carl's Diagnostic ABC+CAFEM hybrid (50-way ELCO connector)**
  - **Same footprint & cables as current CDP support card**
  - **Requires BC96 with LVDS option**

  - **Status: prototype under test**

- **ABC(D) Non-diagnostic Support Card**

  - **For ABCD & Non-diagnostic ABC hybrids as per Carl's spec. (36-way ELCO connector)**
  - **Very similar to ABC Support Card (digital parts only)**
  - **HV pin assignment altered as per Nobu Unno for increased isolation**

  - **Status: layout pending prototype test results**

- **ABC(D) Interconnect**

  - **Same functionality as ABC(D) Non-diagnostic support card**
  - **Small KAPTON similar to real "Dogleg"/"Pigtail"**
  - **Uses prototype LOW-MASS cables with ZIF connectors**
  - **Ancillary board connects to conventional cables**

  - **Status: awaiting comment & detailed specs**

Further details: http://www.ph.unimelb.edu.au/epp/sc97

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Diagnostic ABC Support Card

- **Description**
  - **To be used for Carl's Diagnostic ABC + CAFE-M hybrid**
  - **Functional equivalent of current HAC/CDP support card**
  - **Same cables and mechanical outline**
  - **Needs BC96 with LVDS option, & minor mods to DSP GALs and software by UCI**

- **Design**
  - **Based on schematics from UCSC**
  - **Some problems with component availability**
  - **Interim version using different high-speed transistors (NEC UPA transistors on long back-order)**
  - **ELCO TORSON connectors to be supplied by LBL**
  - **HV pin assignment altered to maximise isolation**
  - **500V bias bypass capacitors**
  - **2-layer design without ground planes for fast prototyping**
  - **LVDS driver/receivers powered from 7V line**

- **Status**
  - **Schematics and layout available for comment (see www)**
  - **Mechanical outline**
  - **One prototype populated & being tested (without hybrid !)**
  - **Prototypes for LBL & UCSC soon**
  - **Ready for production**
  - **Sufficient components to hand for 25 boards (except ELCO TORSON connectors)**

Further details: http://www.ph.unimelb.edu.au/epp/sc97/sc97.html

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ABC(D) Interconnect

- **Idea**
  - **Great interest in moving towards "real" module mechanics for systems test, multi-module lab. tests, TSP ...**
  - **Prototype LOW-MASS cables already available ...**
  - **Why not duplicate (or replace) support card functionality with a small board or kapton closer to final design ?**
  - **Limited to DSP & BC96 single channel *but* these are already available & working in many labs**
- **Design proposal**
  - **Two boards: (See Block Diagram)**
    - **Interconnect: small PCB or Kapton "Dogleg" connecting low-mass cables to hybrid pigtail with ELCO connector**
    - **Anchor: PCB connecting existing conventional cables to low-mass cables with ZIF connectors; approx 1-1.5m from module test mechanics.**
  - **Prototype low-mass cables 1.6m from Ljubljana**
  - **Digital links: LVDS over twist & flat cable (Same as Liverpool system ? Or Mustard ?)**
  - **Redundancy connectors: simple, readily available, e.g., IDC 10-way**
- **Schedule: available February**
- **Questions**
  - **How does this complement other efforts for barrel modules ?**
  - **Which "few-module" tests early next year might use this scheme ?**
  - **Detailed connector specifications for digital links (optical or otherwise) ?**
  - **Mechanical specs for interconnect ?**
  - **Other comments ?**

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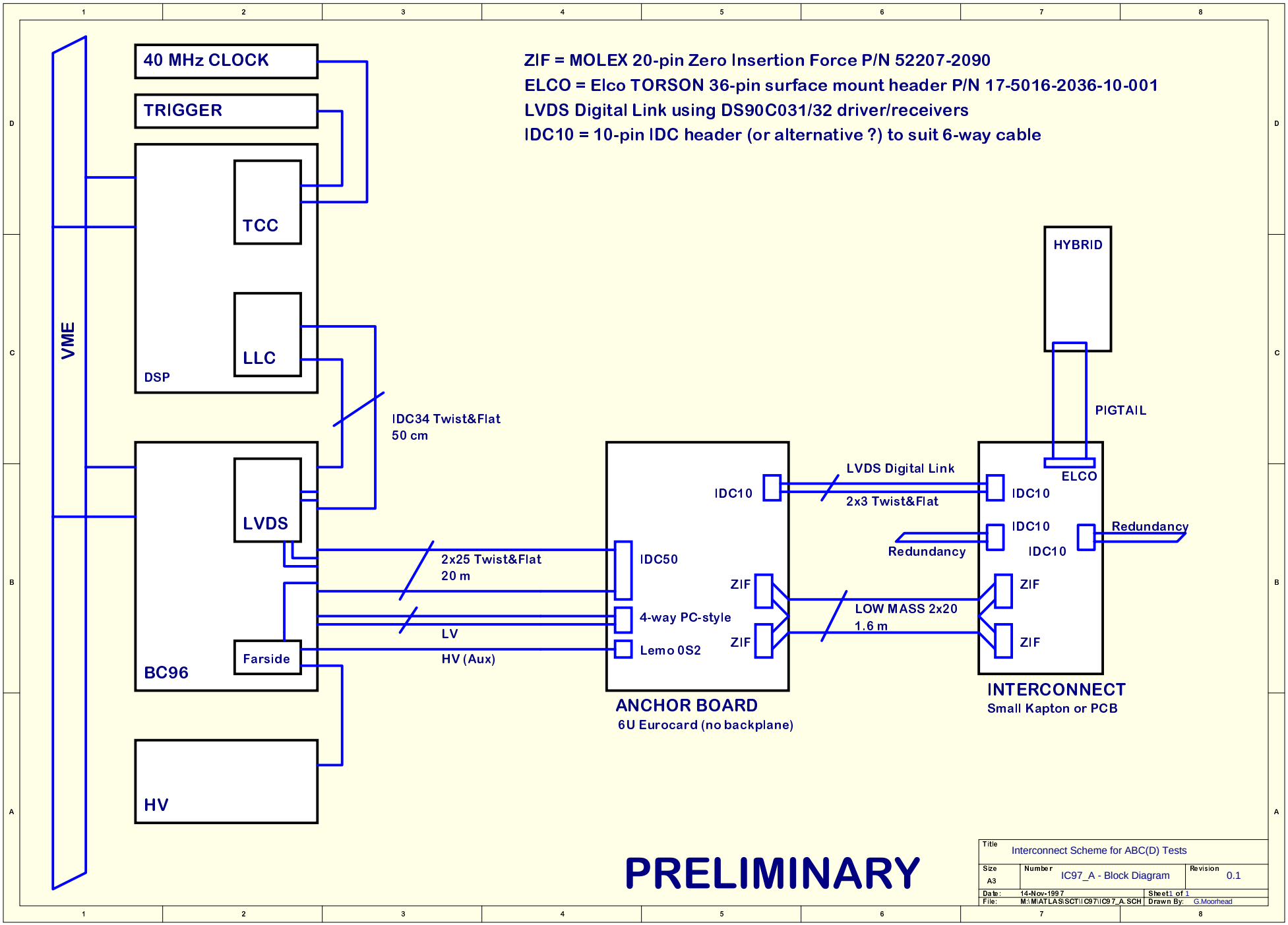
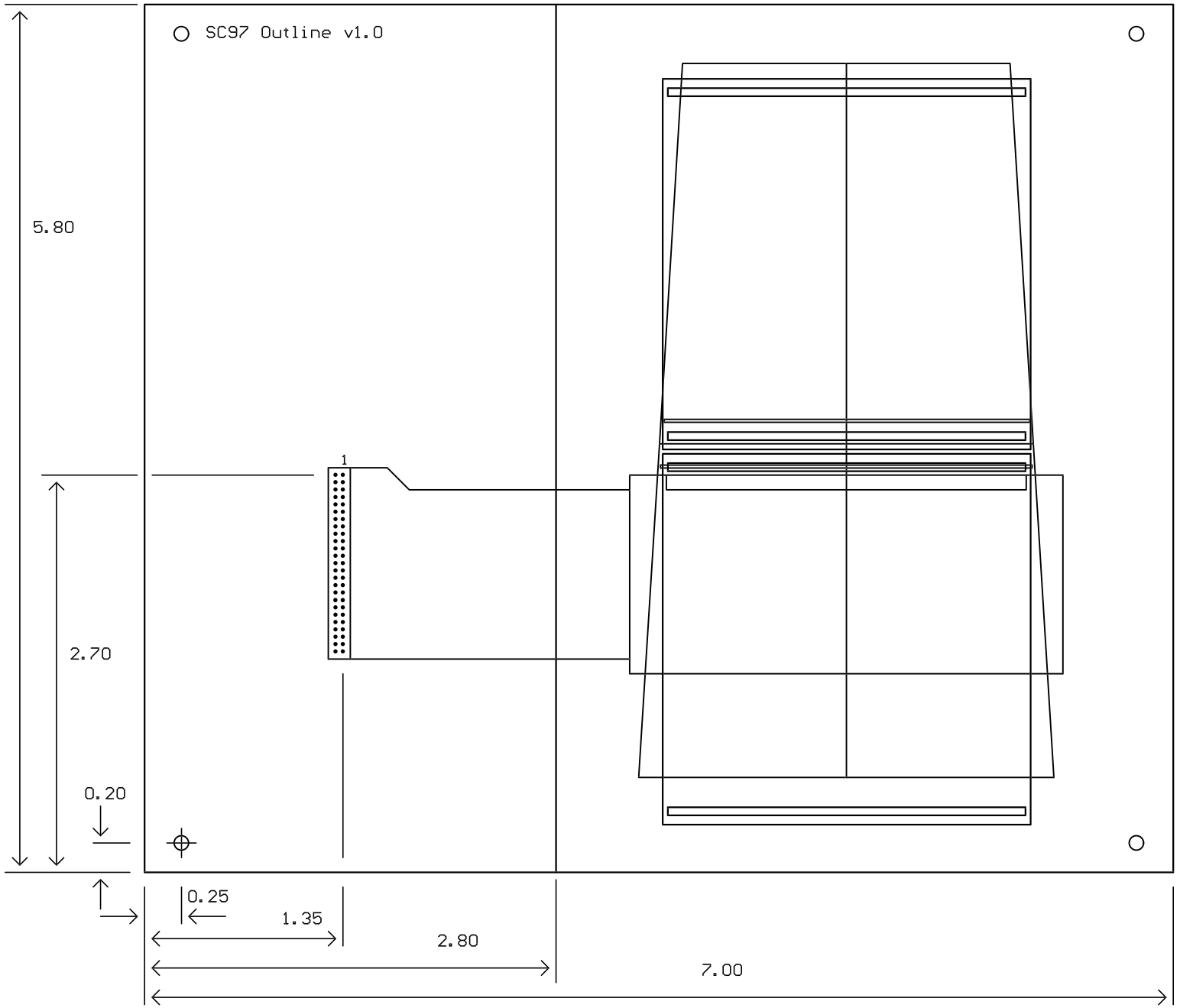

ZIF = MOLEX 20-pin Zero Insertion Force P/N 52207-2090
ELCO = Elco TORSON 36-pin surface mount header P/N 17-5016-2036-10-001
LVDS Digital Link using DS90C031/32 driver/receivers
IDC10 = 10-pin IDC header (or alternative ?) to suit 6-way cable
40 MHz CLOCK
TRIGGER
TCC
LLC
DSP
VME
LVDS
BC96
Farside
HV
HV
IDC34 Twist&Flat
50 cm
2x25 Twist&Flat
20 m
LV
HV (Aux)
IDC50
4-way PC-style
Lemo 0S2
ZIF
ZIF
ANCHOR BOARD
6U Eurocard (no backplane)
IDC10
LVDS Digital Link
2x3 Twist&Flat
Redundancy
LOW MASS 2x20
1.6 m
HYBRID
PIGTAIL
ELCO
IDC10
IDC10
IDC10
Redundancy
ZIF
ZIF
INTERCONNECT
Small Kapton or PCB
PRELIMINARY
Title
Interconnect Scheme for ABC(D) Tests
Size
A3
Number
IC97_A - Block Diagram
Revision
0.1
Date:
14-Nov-1997
Sheet1 of 1
File:
M:\M\ATLAS\SCT\IC97\IC97_A.SCH
Drawn By:
G.Moorhead


SC97 Outline v1.0
1
5.80
2.70
0.20
0.25
1.35
2.80
7.00