TIDI CDR

Electronics Packaging

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ELECTRONICS PACKAGING

- **Electronics Packaging**
  - **ICD - S/C Resources**
  - **Mechanical design**
  - **Structural design**
  - **Thermal design**
  - **Radiation Protection**
- **Status - Issues/Concerns**

ELECTRONICS BOX S/C RESOURCES

- **Electronics Box ICD Summary**
  - Current mass estimate = 6.57 kg
  - Volume envelope (box + harness envelope)

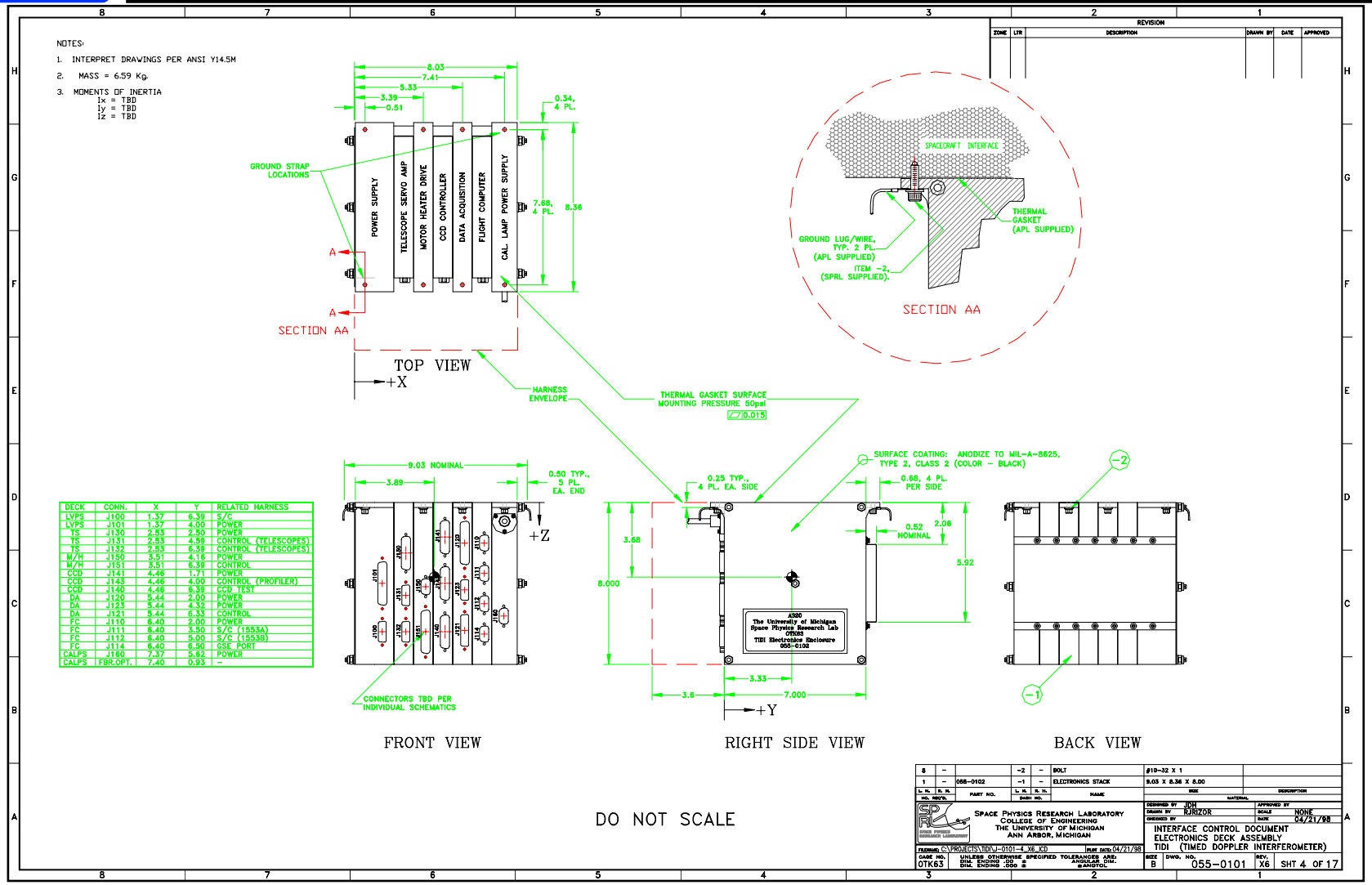
    L = 9.0 in

    W = 11.12 in

    H = 8.0 in
  - Thermally conductive interface to S/C
  - S/C Thermal Interface (ref. TIMED CDR)

	Thermal Control Design Range		TEST I/F Range	
	Operating I/F	Non-Op	Operating	Non-Op
	oC	oC	oC	oC
TIDI E-Box (Cond.)	-19 to 45	-24 to 50	-29 to 55	-34 to 60

ELECTRONICS BOX ICD



DECK	CONN.	X	Y	RELATED HARNESS
LVPS	J100	1.37	6.39	S/C
LVPS	J101	1.37	4.00	POWER
TS	J130	2.53	2.50	POWER
TS	J131	2.53	4.56	CONTROL (TELESCOPES)
TS	J132	2.53	6.58	CONTROL (TELESCOPES)
M/H	J150	3.51	4.16	POWER
M/H	J151	3.51	6.39	CONTROL
CCD	J141	4.46	1.71	POWER
CCD	J143	4.46	4.00	CONTROL (PROFILER)
CCD	J140	4.46	6.39	CCD TEST
DA	J120	5.44	2.00	POWER
DA	J123	5.44	4.32	POWER
DA	J121	5.44	6.33	CONTROL
FC	J110	6.40	2.00	POWER
FC	J111	6.40	3.50	S/C (1553A)
FC	J112	6.40	5.00	S/C (1553B)
FC	J114	6.40	6.50	GSE PORT
CALPS	J160	7.37	5.92	POWER
CALPS	FBR.OPT.	7.40	0.93	-

8	-		-2	-	BOLT	#10-32 X 1
1	-	055-0102	-1	-	ELECTRONICS STACK	9.03 X 8.36 X 8.00
LV. M.	R. M.	PART NO.	LV. M.	R. M.	NAME	SIZE / DESCRIPTION
NO. REQ'D.			DASH NO.			MATERIAL

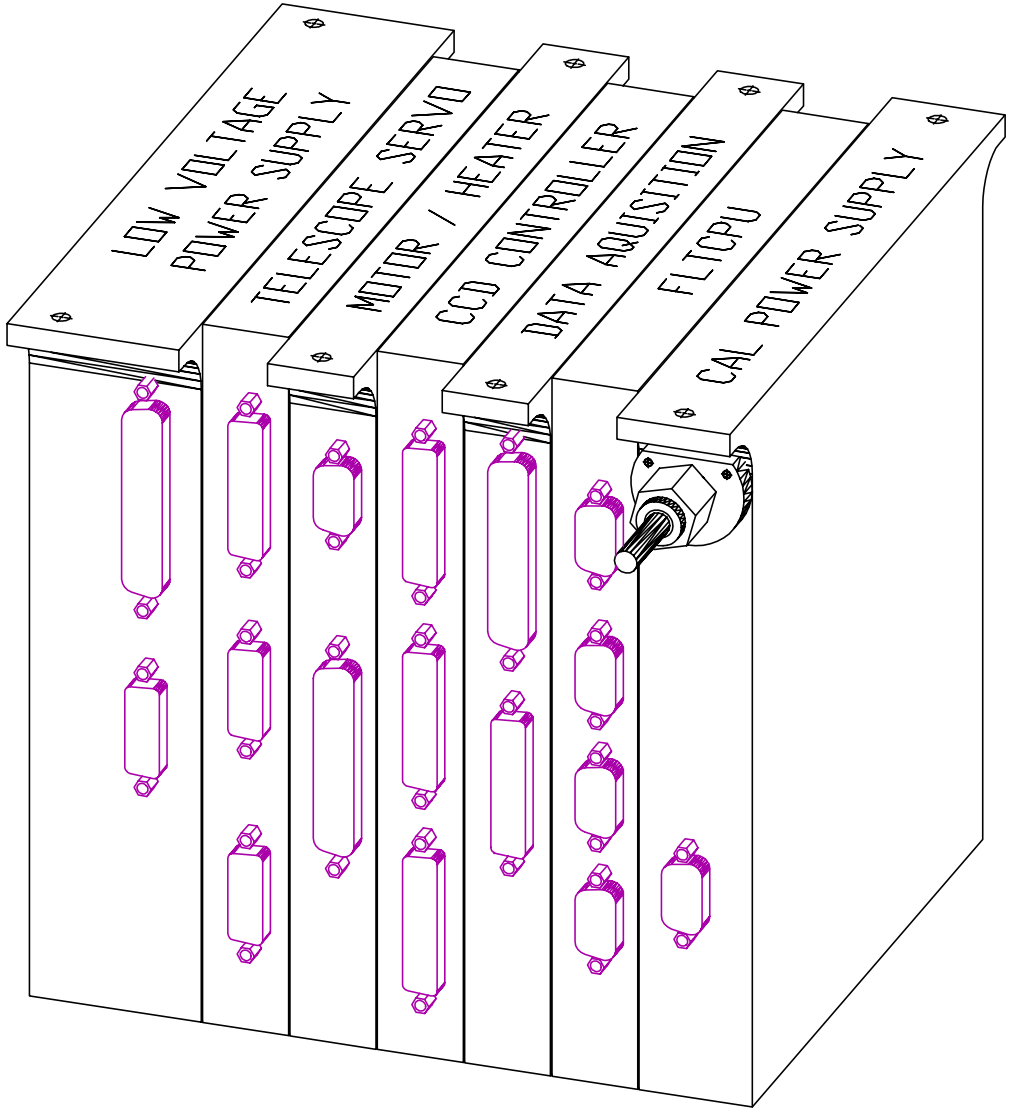
DESIGNED BY	JDH	APPROVED BY	
DRAWN BY	KJRIZOR	SCALE	NONE
CHECKED BY		DATE	04/21/98

FILENAME: C:\PROJECTS\TIDI\J-0101-4_X6_ICD			PLOT DATE: 04/21/98	
CAGE NO. OTK63	UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: LINEAR DIM. ANGULAR DIM. DIM. ENDING .000 ± ±ANGTOL	SIZE B	DWG. NO. 055-0101	REV. X6

SPACE PHYSICS RESEARCH LABORATORY

TIDI

ELECTRONICS BOX MECHANICAL DESIGN



TIDI ELECTRONICS BOX MECHANICAL DESIGN

- **Mechanical Design**
  - **Individual PC board Frames**
  - **Cover plates between each frame and on ends**
  - **Stacked frames become the TIDI E-Box**
  - **HARDI, TOMS heritage**

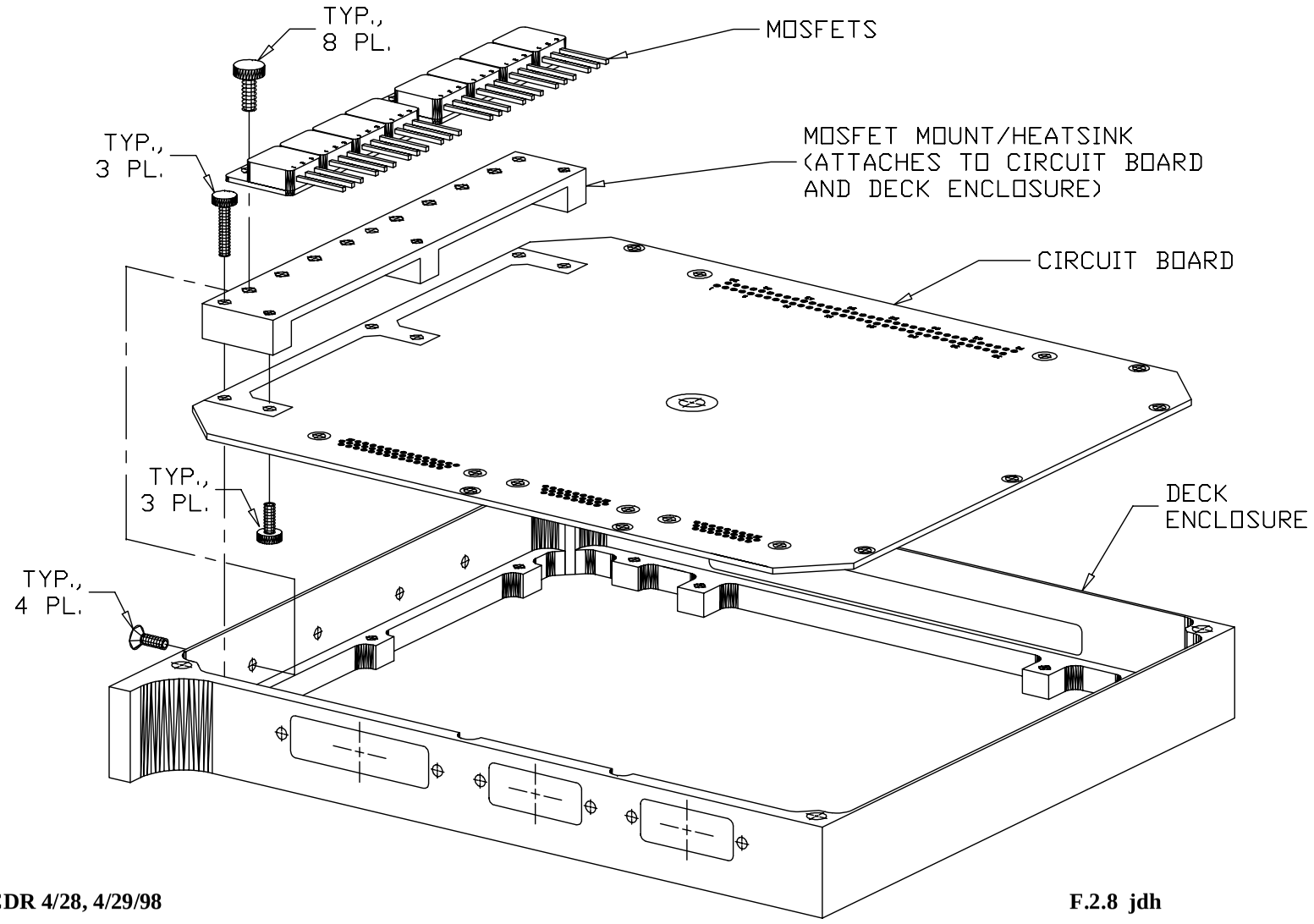
ELECTRONICS THERMAL DESIGN

- **PC Board Thermal Design**
  - Junction Temperatures < 100o C
- **Hot Components average power (+15%):**

– 1553	2ea.	2.3 w	HS to frame (Flight Computer)
– CPU	1ea.	0.58 w	HS to frame (Flight Computer)
– MOSFET	8ea.	0.17 w	HS to frame (Servo deck)
– Pwr Hybrid	2ea.	2.3 w	Internal frame mount (PS deck)
– MOSFET	5ea.	0.12 w	TO 254 attached to frame (PS)
– Rectifier	2ea.	0.13 w	TO-257 attached to frame (PS)
– Pwr switch	1ea.	0.46 w	TO-66 attached to frame (PS)

- **Heat sinks**
  - Integral to frame or custom part bolted in place
  - Indium foil and thermal grease as required at interface

ELECTRONICS THERMAL PACKAGING



RADIATION PROTECTION

- **Radiation Protection**
  - **Shielding to 5 krad on critical components**
  - **Tantalum spot shields where required**
  - **Tantalum Shielded Components = TBD**

STATUS SUMMARY

- **Electronics box hardware**
  - **General frame detail complete**
  - **Details for 4 of 7 decks complete.**
  - **Detailed flight deck drawing package** **Aug 1998**
- **Issues / Concerns**
  - **Component level thermal modeling** **~June 1998**