GLAST Large Area Telescope:

Electronics, Data Acquisition & Flight Software W.B.S 4.1.7

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Last Month's Accomplishment, PDU

- Function of Power Distribution Unit
  - Switches power to TEM's, GASU, EPU crates
  - Digitizes temperatures to be used for thermal control
- Accomplishment/Status
  - Fabricated updated PDU board with flight foot-prints
  - Loaded 2 boards
  - Assembled new box with those two boards (primary & redundant)
  - In test, will replace previous version in testbed
  - Testbox: assembled test boards (simulated loads, sensors, etc)
  - Updating flight parts-list and need to order some more components (some resistor and capacitor values have changed)
- Concern
  - no technical concern, schedule looks ok, driven by need for test-bed and ISIS delivery, not LAT flight hardware delivery

Last Month's Accomplishment, GASU

- **Function:**
  - global trigger, event builder, command-response unit, ACD control/monitoring/data-readout
- **Accomplishment/Status:**
  - Completed update of schematic having flight foot-prints and one-time programmable FPGA's (previous version had JTEG programmable FPGAs)
  - Completed layout, fabricated 4 boards
  - Loaded 1 board, debugged board
  - Loaded 3 more boards
  - 2 board were assembled into GASU enclosure
  - In test
- **Concern:**
  - Schedule, not for flight, but for test-bed, ISIS, and ACD EGSE test-setup delivery
  - Need to investigate failure in G3 -> see EGSE

Last Month's Accomplishment, GASU Power Supply

- Function: Generate power for GASU DAQ board and ACD front-end electronics from 28V
- Accomplishment/Status
  - No news
  - Need to make more boards for EGSE GASU's
- Concern:
    - none

Last Month's Accomplishment, TEM

- Function of Tower Electronics Module
  - control/readout/monitoring of TKR and CAL sub-system
- Accomplishements/Status:
  - No change in board
  - Working on performance test/thermal cycle/vibration/TV test procedure documents
- Concern:
  - Schedule for flight:
    - Enclosure contract awarded
    - PCB fab contract awarded
    - Assembly contract in RFP stage
    - 4 capacitors were apparently not ordered (were stuck in purchasing). 10 weeks delivery, is problem for qual unit availability (for testing).

Last Month's Accomplishment, DAQ ASICs

- TEM Tracker Cable Controller ASIC (GTCC1)
- TEM Calorimeter Cable Controller ASIC (GCCC1)
- GLAST LVDS Translator Chip ASIC (GLTC2)
- Accomplishment/Status
  - Burn-in Boards for screening fabricated, are in test
  - Software for screening performance test in progress

- Concern:
  - flaw might be detected while more testing is going on

Last Month's Accomplishment, TPS

- **Function of Tower Power Supply**
  - **Supply voltages to TKR, CAL sub-system and to TEM from 28V**
- **Accomplishment/Status:**
  - **One resistor value was changed (3 weeks delivery)**
  - **Working on performance test/thermal cycle/vibration/TV test procedure documents**
- **Concern:**
  - **Schedule for flight:**
    - **RFP's out for fab and assembly**
    - **Same caps as on TEM: 4 capacitors were apparently not ordered (were stuck in purchasing). 10 weeks delivery, is problem for qual unit availability (for testing).**

Last Month's Accomplishment, SIU/EPU (1)

- EPU and SIU cCPI crate the same except
  - RAD750 boot code different
  - Storage Interface Card loaded different
  - Status combined
- cCPI crate contains
  - Enclosure
  - Backplane
  - Lat Communication Board (LCB)
  - Storage Interface Board (SIB)
  - Crate Power Supply Board (CPS)

Last Month's Accomplishment, SIU/EPU (2)

- **Enclosure (cPCI crate)**
  - **Received two additional crates (will be used for test-bed)**
- **Custom Backplane**
  - **No change**
- **LCB (Control/event interface from processor to LAT) & SIB (Storage Interface Board, MIL1553 interface to Spacecraft, EEPROM storage for code, control circuit for VCHP heaters)**
  - **Fabriated more boards (for test bed use)**
  - **Need more documentation**

Last Month's Accomplishment, SIU/EPU (3)

- CPS (Generate crate supplies (5V/3.3V) from 28V
  - Debugged module, tested with backplane and LCB, all ok
  - No news
- CPU
  - BAE 750 boards boots in crate
  - Need more boards for test-bed, trying to order but BAE is still working on deciding what bus-bridge to provide.

Last Month's Accomplishment, Misc

- **Point-to-point cables ("Harness")**
  - **DAQ cables to ACD were approved**
  - **All other drawings are still out being reviewed**

- **Heater Control Box**
  - **No news, still have first prototype to be tested**

Last Month's Accomplishment, Simulator

- **Function of Front-End Simulator (FES)**
  - **Simulates TKR and/or Calorimeter front-end electronics on test-bed, connects to TEM like subsystem and to PC (later for downloading data-patterns)**
- **Accomplishment/Status**
  - **Fabricated, loaded, and tested 45 boards**
  - **Mounted on test-bed**
  - **Connect on test-bed incrementally with installed TEM's (as available)**

Last Month's Accomplishment, EGSE

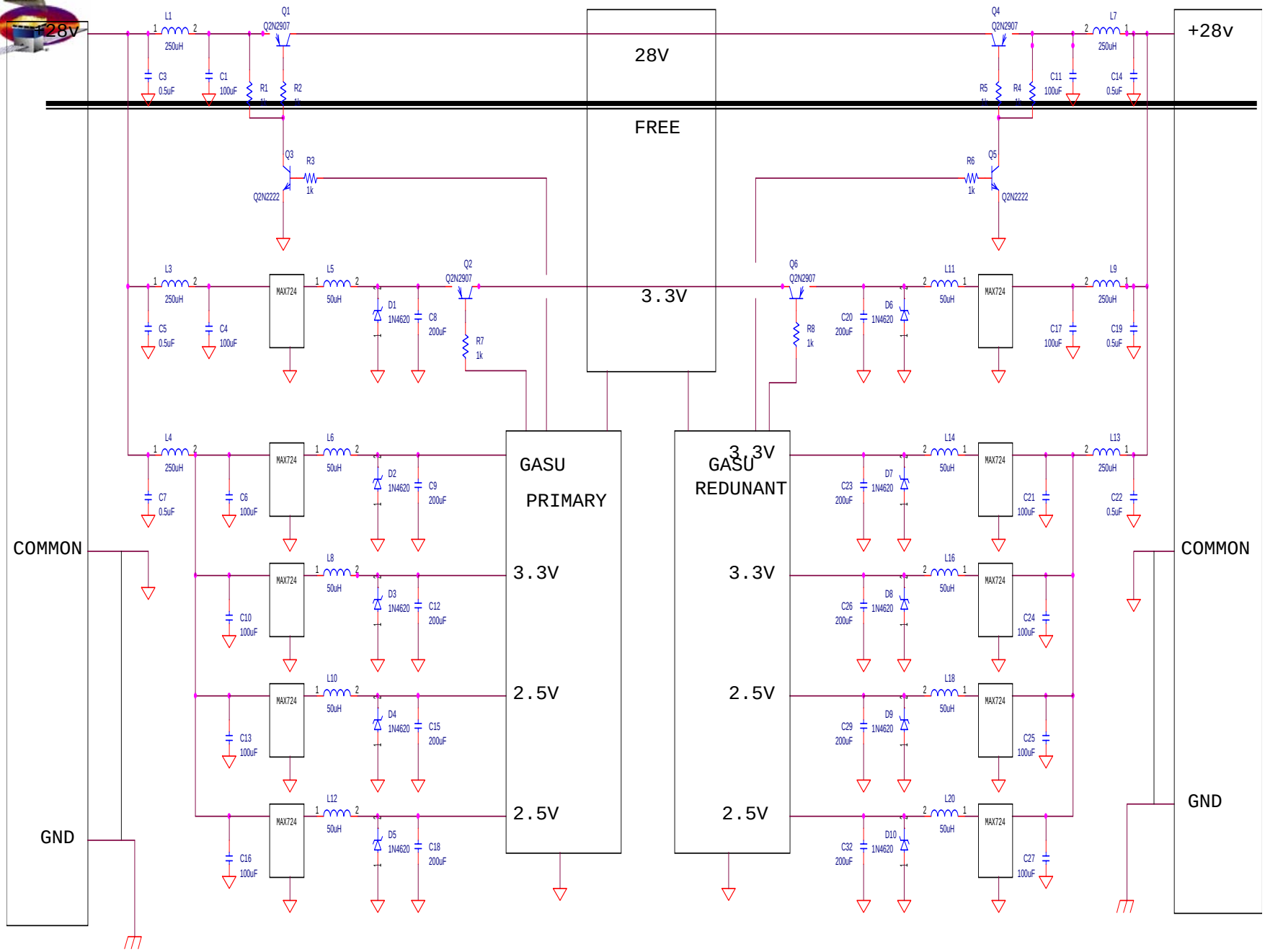
- **Function:**
  - **Provides test-setups for CAL, TKR, DAQ HW & SW effort**
- **Accomplishments/Status:**
  - **Had shipped 1 test-stand to TKR (UCSC), 1 test-stand to CAL (NRL)**
  - **Since no complaints: shipped two test-stands to TKR (Italy), will ship two CAL to NRL next week.**
    - **Should CAL test-stands include flight ARF461 common mode filter for EMI test purposes? Need to decide this week.**

EGSE (2)

- **Shipped G3 test-stand to ACD (GSFC) with several software people**
  - **Connected primary GASU to BEA, all worked**
  - **Connected redundant GASU to BEA, all worked**
  - **Ran available ACD scripts**

EGSE (3)

- Problem when connecting BEA to prime and redundant simultaneously
- Apparently drew more current than expected (and measured at SLAC). There are guesses that something was damaged in shipping, but we don't go for that yet.
- Some experiments were done to investigate why there is more current
  - Connect primary GASU to BEA via standard cable, connected redundant GASU to BEA using break-out box. Only connected one pin, 28V (used for HV), on break-out box. That broke redundant GASU. Guess is that power-switch on GASU smoked and something got damaged. However that can/should only happen if power is shorted, but does not look like it was, so mystery for now.
  - Decided to stop debugging redundant GASU at GSFC since we did not want to risk primary GASU (GASU engineer is at SLAC)
  - Much more important to have primary GASU working with BEA so that all the test-scripts/software can be written and tested
  - Only part which can not be tested for now is fail-over
    - Plan to replace/fix GASU in the next 2 weeks
    - Best is to ship new generation of GASU in 2 weeks, get old back later to investigate occurrence.


+28v
28V
FREE
3.3V
+28v
Q1
Q2N2907
Q4
Q2N2907
L1
250uH
L7
250uH
C3
0.5uF
C1
100uF
R1
R2
R5
R4
C11
100uF
C14
0.5uF
Q3
Q2N2222
R3
1k
R6
1k
Q5
Q2N2222
L3
250uH
L5
50uH
Q2
Q2N2907
Q6
Q2N2907
L11
50uH
L9
250uH
MAX724
C5
0.5uF
C4
100uF
D1
1N4620
C8
200uF
R7
1k
R8
1k
C20
200uF
D6
1N4620
C17
100uF
C19
0.5uF
L4
250uH
L6
50uH
L14
50uH
L13
250uH
C7
0.5uF
C6
100uF
D2
1N4620
C9
200uF
C23
200uF
D7
1N4620
C21
100uF
C22
0.5uF
GASU
PRIMARY
3.3V
GASU
REDUNANT
3.3V
COMMON
L8
50uH
L16
50uH
C10
100uF
D3
1N4620
C12
200uF
C26
200uF
D8
1N4620
C24
100uF
3.3V
L10
50uH
L18
50uH
C13
100uF
D4
1N4620
C15
200uF
C29
200uF
D9
1N4620
C25
100uF
2.5V
2.5V
L12
50uH
L20
50uH
C16
100uF
D5
1N4620
C18
200uF
C32
200uF
D10
1N4620
C27
100uF
2.5V
COMMON
GND
GND

Schedule/Budget

- Total budget: $20,443
- Work Scheduled up to date: $13,168
- Work Performed: $12,606
- Actuals: $12,794
- Schedule Variance $561k (ahead)
  - A few flight parts came in earlier than expected
- Cost Variance: -$188k (over budget)
  - Change requests submitted, not approved yet (amount of CR's is higher since cost variance is higher than it appears due to flight parts which were delivered & credit taken but not paid yet).