



BITNG PROJECT UPDATE

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Date 12/21/2020

Outline

- Progress to date
- LP ECG
- Schedule
 - Gantt Chart update
- Path forward

PROGRESS TO DATE

Progress from last week

- LP ECG
 - Firmware development
 - ~~PCB layout~~

LP ECG PROJECT

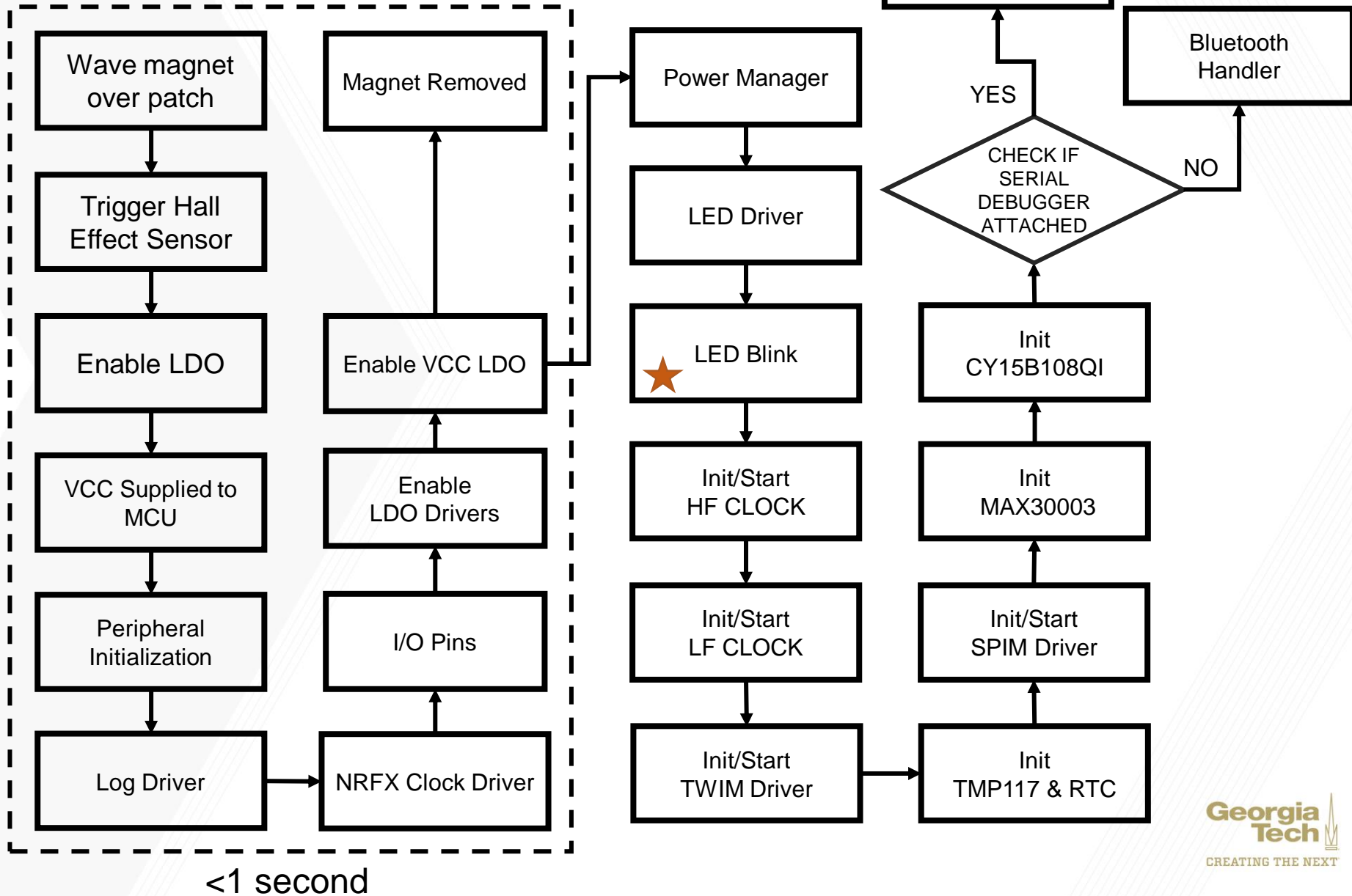
Firmware

- ECG
 - ~~MAX30003~~
 - ~~Drivers~~
 - ~~Optimization~~
- FRAM
 - ~~CY15B108QI~~
 - ~~Drivers~~
 - ~~Optimization~~
- NRF52
 - ~~BLE~~
 - ~~Power Optimization~~
 - ~~RTC~~
- Debugging

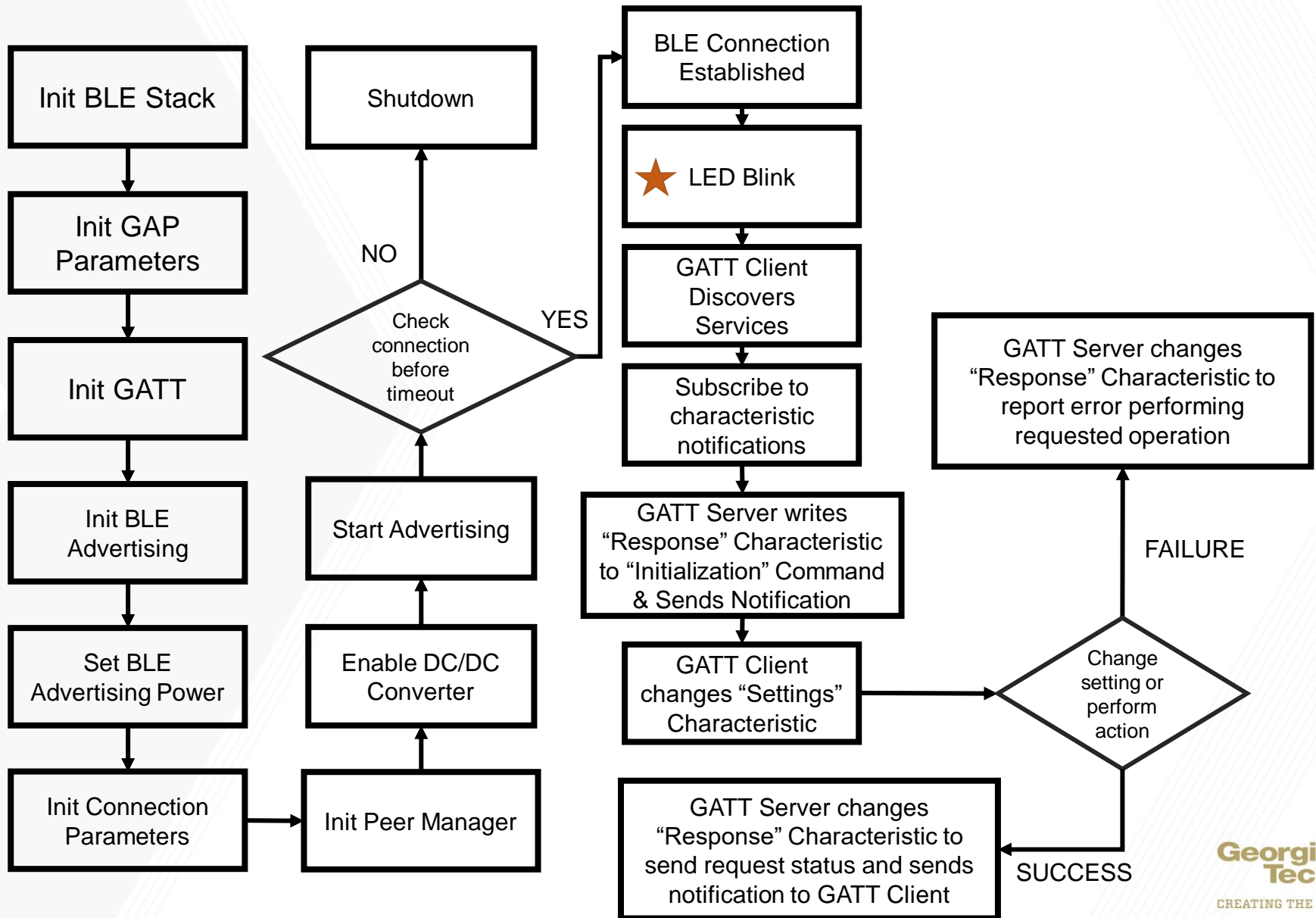
GATT Server [ECG Patch]

Service	Characteristic	Data Type	Read/Write	Notification
Configuration	Settings	uint8_t [10]	Write/Read	NO
	Response	uint8_t [2]	Read	Yes
	CRC	uint8_t [2]	Read	Yes
Temperature	Temperature	uint8_t [250]	Read	Yes
ECG	ECG	uint8_t [250]	Read	Yes

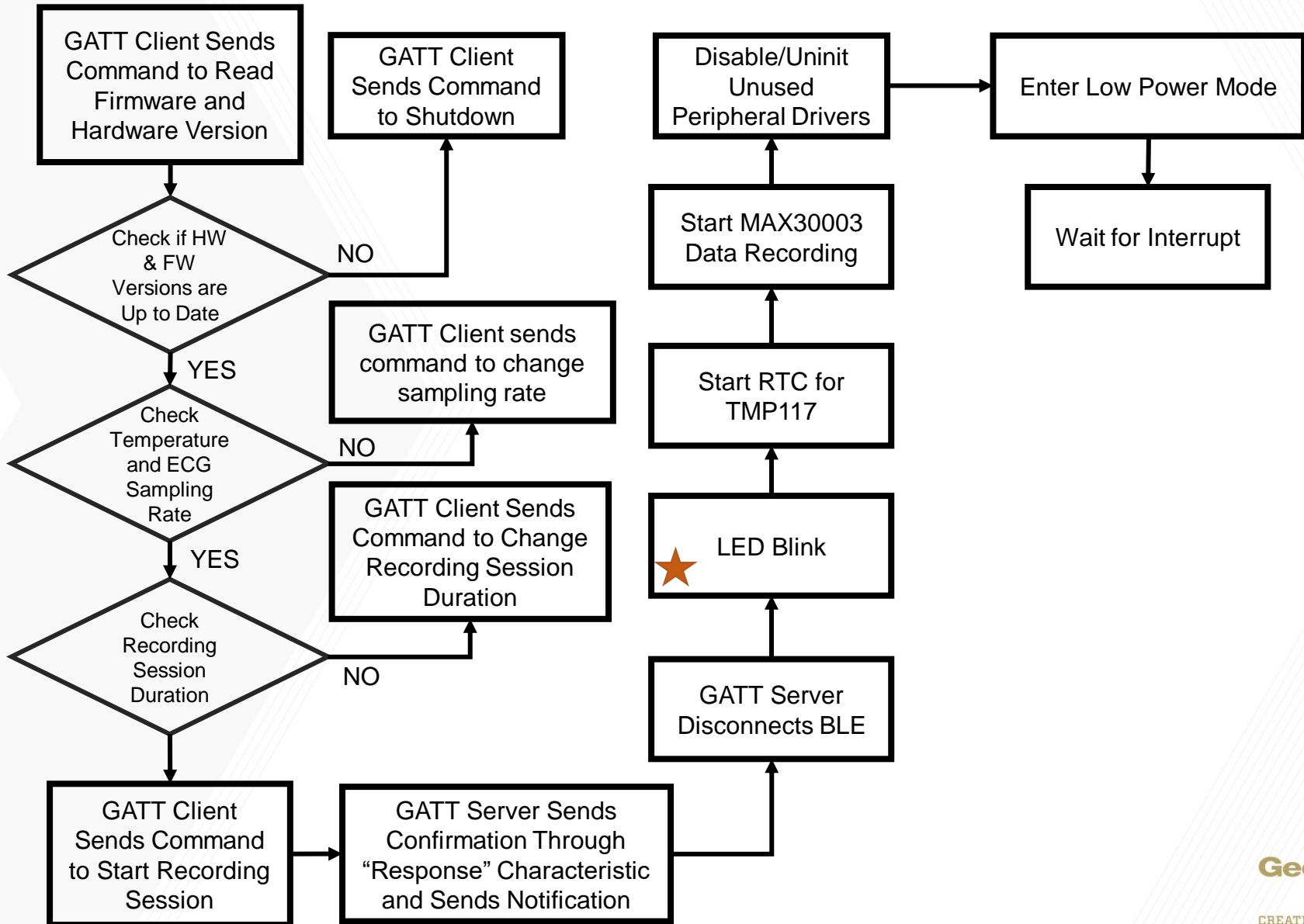
ECG Patch - Wakeup



Bluetooth Handler



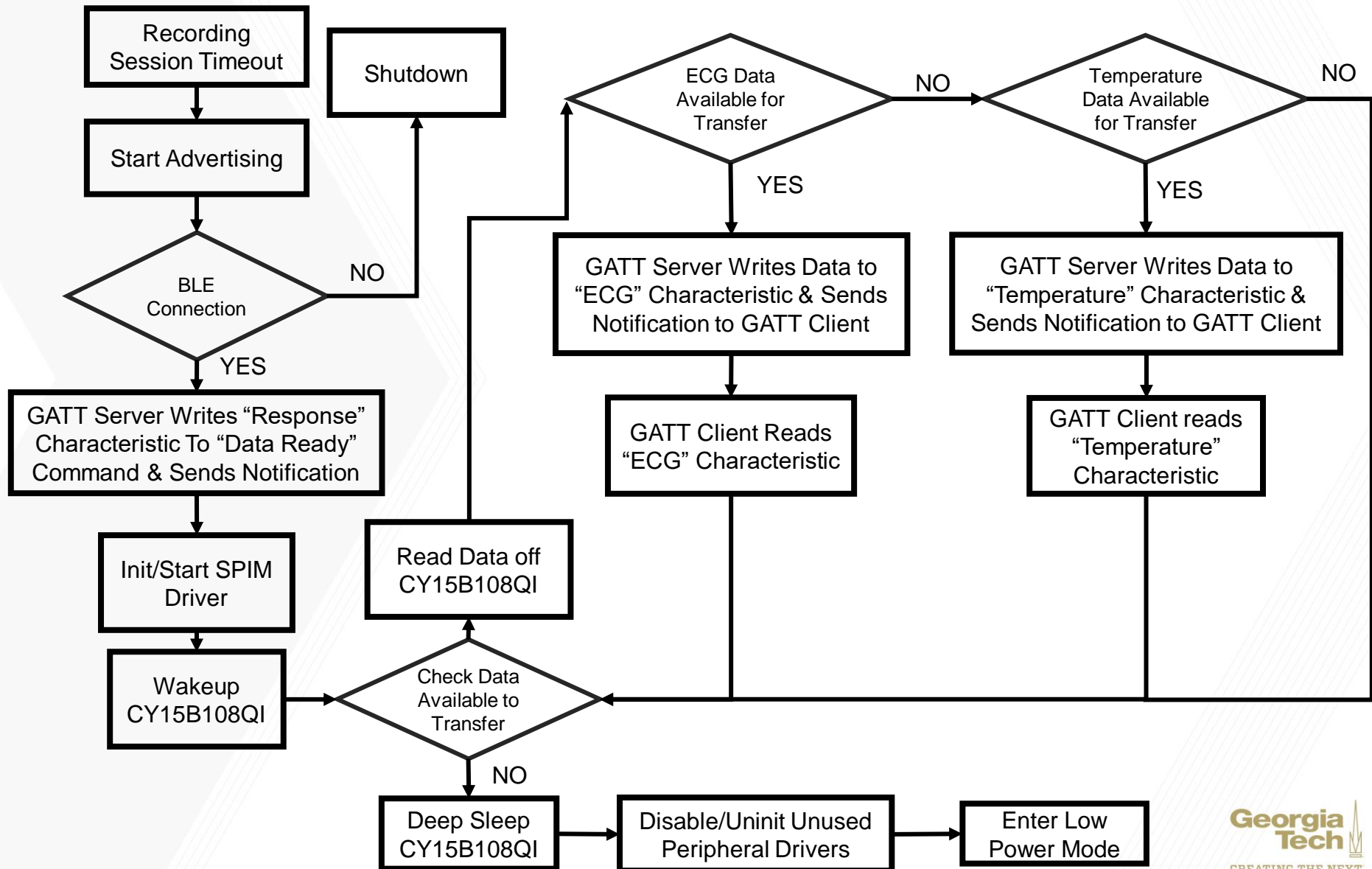
Data Recording Initialization



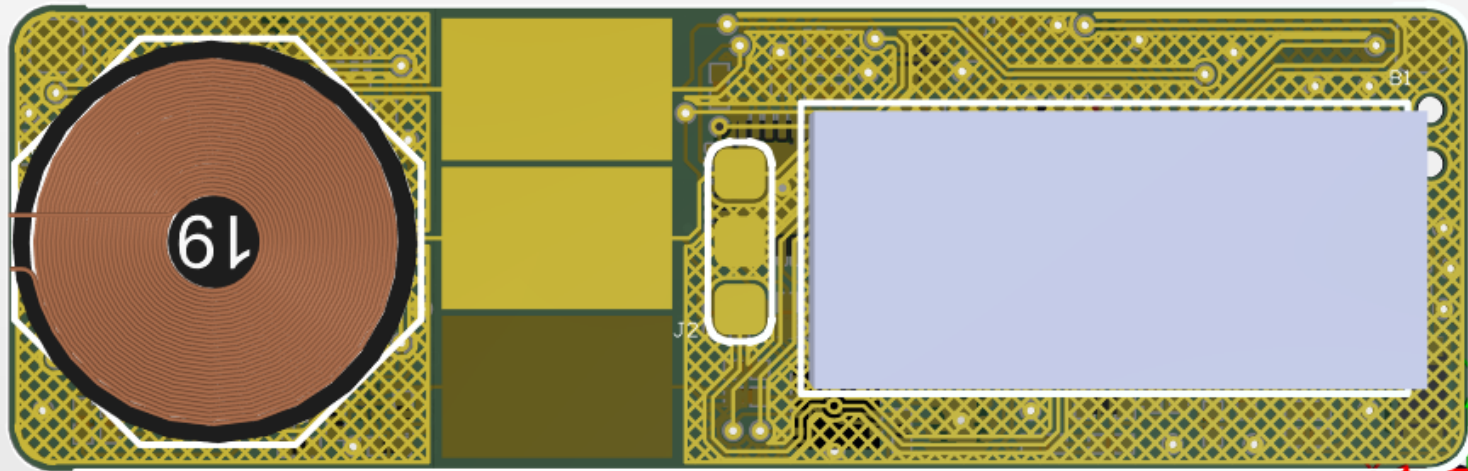
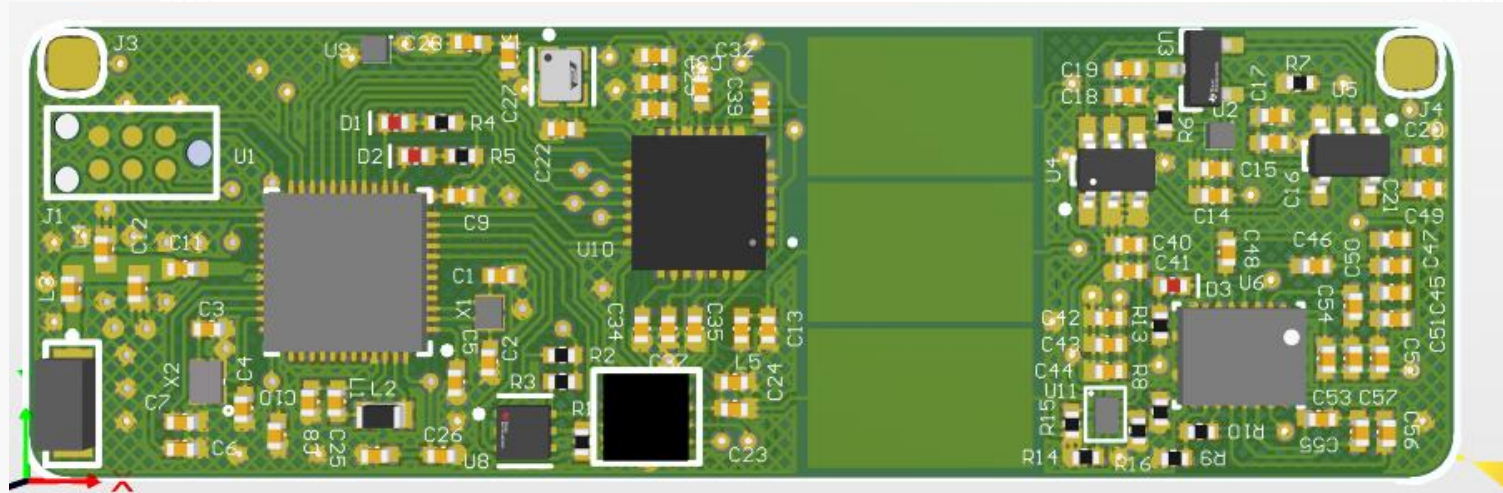
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graph TD
    A[Interrupt Occurred] --> B{TMP117 RTC or MAX30003?}
    B -- TMP117 --> C[Init/Start TWIM Driver]
    C --> D[Read Temperature Value from TMP117]
    D --> E[Wakeup CY15B108QI]
    E --> F[Write Data to Registers]
    F --> G[Deep Sleep CY15B108QI]
    G --> H[Disable/Uninit Unused Peripheral Drivers]
    H --> I[Enter Low Power Mode]
    I --> J[Deep Sleep CY15B108QI]
    J --> K[Write Data to Registers]
    K --> L[Wakeup CY15B108QI]
    L --> M[Read FIFO Memory]
    M --> N{Check FIFO Overflow}
    N -- YES --> O[Reset FIFO Register]
    O --> N
    N -- NO --> P[Init/Start SPIM Driver]
    P --> Q[Read Status Register]
    Q --> N
  
```

Recording Session Timeout

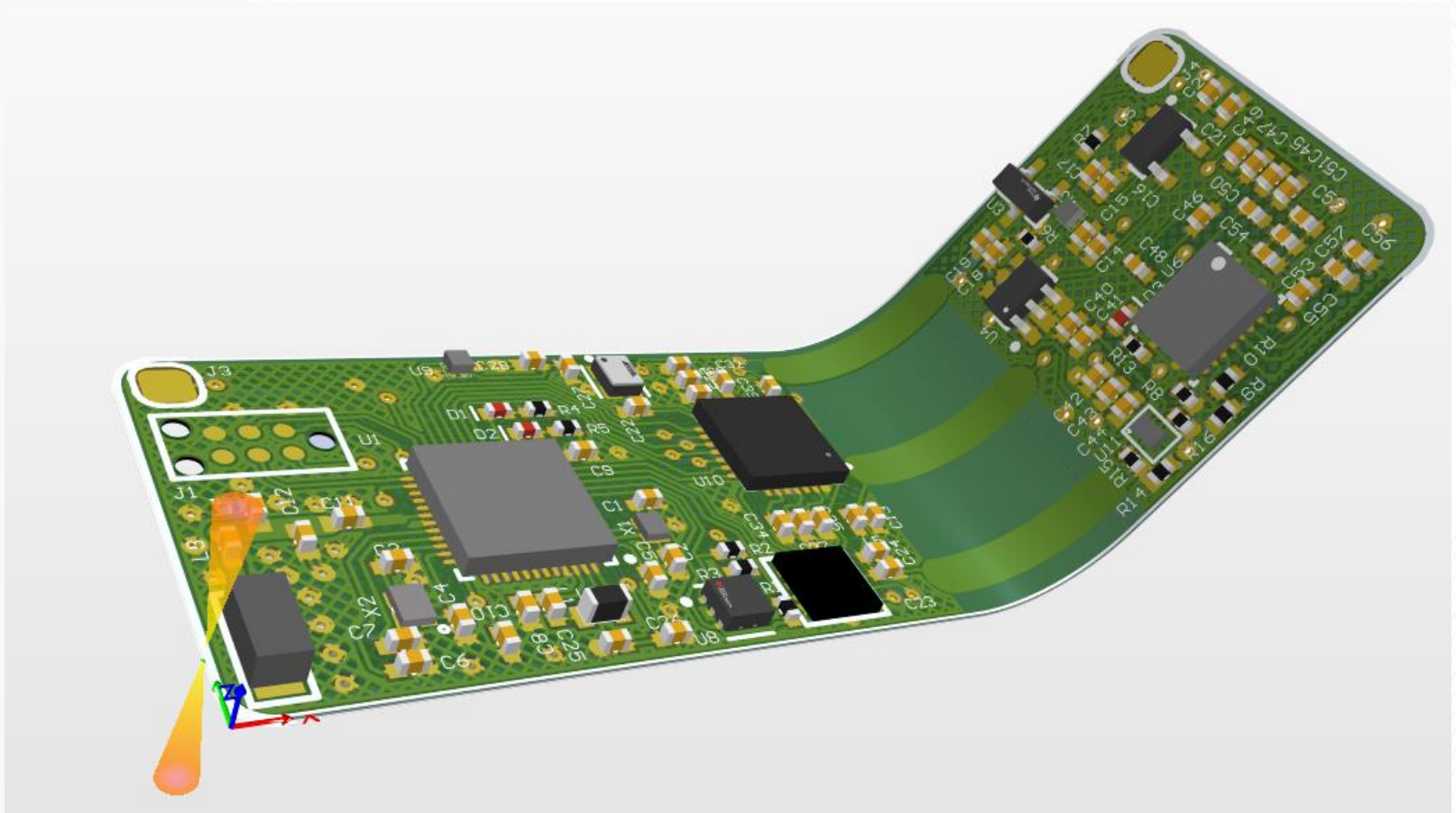


PCB layout



PCB layout

- SUBMITTED



PATH FORWARD

Path forward (12/21/20 – 12/28/20)

- LP ECG:
 - Firmware development
 - ~~Flexible PCB design~~
- Shriner's Project:
 - Literature review
 - Tables and figures

SCHEDULE

Schedule Gantt chart

Task	12/07-12/14	12/14-12/21	12/21-12/28	12/28-1/4	1/4-1/11	1/11-1/18	1/11-1/18
LOW POWER ECG							
-PCB ASSEMBLY							
-HARDWARE DEBUGGING							
-FIRMWARE DEVELOPMENT	✕	●					
-PCB DESIGN	✕						
NEUROMOTOR PEDIATRIC WEARABLE							
-LITERATURE REVIEW		●					
-PCB ASSEMBLY							
-HARDWARE DEBUGGING							
-FIRMWARE DEVELOPMENT		●					
-PRESSURE SENSOR MANUFACTURING							
-STRAIN SENSOR MANUFACTURING							

LEGEND



APPENDIX