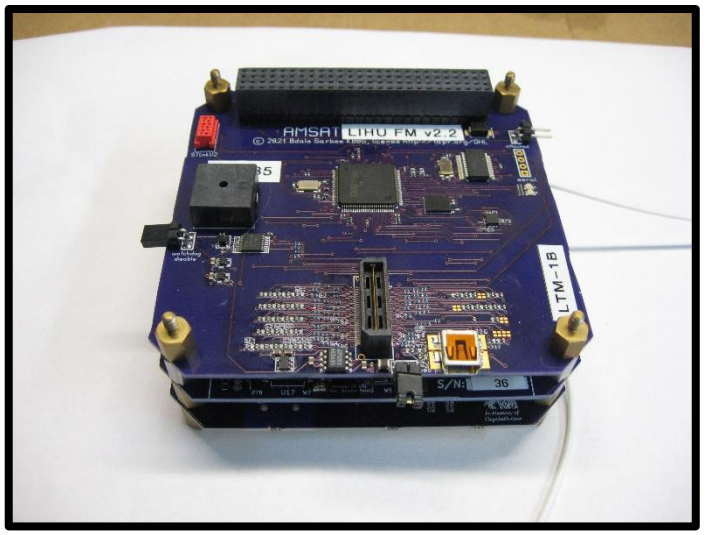
V2.4 – 29 Oct 2021

AMSAT Linear Transponder Module (LTM-1) Overview



INCLUDES THREE (3) POPULATED PCB CARDS:

1. **Legacy Internal Housekeeping Unit (LIHU)**
2. **Improved Command Receiver (ICR)**
3. **Receiver/Transmitter (RX/TX)**

LT MODULE PHYSICAL PARAMETERS:

- **Length: 92 mm**
- **Width: 92 mm**
- **Height: 33 mm**
- **Weight: 145 grams (approximate)**

POWER CONSUMPTION:

- **V_{SYSTEM} (DC Input Voltage): 5.2 volts minimum; 6 volts maximum**
- **DC Input Current:**
  - **SAFE MODE: 100 mA, no TX; 126 mA avg. draw with TLM TX at ~11% duty cycle**
  - **HEALTH or SCIENCE MODE: 600 mA (continuous TLM TX only); 650 mA maximum with transponder enabled, (actual current depends on number and level of passband signals)**

RF OUTPUT POWER:

- **TLM only: 100 mW (nominal); 1200 bps BPSK downlink**
- **TLM + Transponded Signals: 500 mW Low Power, or 1W High Power; both supporting 30 kHz downlink passband bandwidth signals and telemetry channel**

SOFTWARE and INTERFACES:

- **Flight Software/Boot Loader: LTM ground testing supported via a USB 2.0, or 3-wire serial umbilical connection to an external PC terminal emulator**
- **Additional AMSAT support software available:**
  - **AMCOM: Uplink Command Software (requires an Amateur Radio licensed operator)**
  - **FoxTelem: TLM decoding and data display software**
- **Interface Bus Drivers: CAN (primary interface required), also USB, I2C (supporting specific telemetry sources), and discrete GPIOs including:**
  - **Four (4) TLM input channels (analog levels ≤ 3.3 V)**
  - **Four (4) digital discrete I/O pins (2 inputs and 2 outputs)**
- **External Signal Interfaces**
  - **PC-104 type – two 52 pin male or female connectors wired compatible with CubeSat Kit Bus (CSKB) signal pin assignments**
  - **Mini-B USB connector (umbilical console terminal access for devel/troubleshooting)**