

BEAR-10 INSIGHTS

Sunday 2024-05-19 06:45—10:26 H

Project / Flt Dir Payload Flt Sys Flt Tracking Flt Co-ord Lih Wei 9V1LW Wai Phyo 9V1WP-11 and Lih Wei 9V1LW Fu Hang 9V1FH and Kenneth KK7SZI Choong 9V1CV Chew 9V1YP



<-Old New->



CODING

- New functionality for tether-cut/parachute-deploy heater cutter
- Boot-looping due to low-power
 - Should detect boot-loop and low-power -> enter safe mode
- Remote commands
 - Will be great if we can adjust SSTV remotely, or request for reboot

PAYLOAD

- Previous day payloads did not experience need to use heater
- Experiment with 'low-effort-low-weight-small-sized' payload
 - No heater, no insulation for battery
- Weight decreased to 145.6g (Previously 201.6g)

Smart Force Sensor Load1 16.4 g Load4 20.8 g Load2 43.1 g Load3 65.4 g Total Load 145.6 g





PAYLOAD

- New revision of MAX-M10S and PCB
 - Built-in SAW + LNA
 - (previously) requires bypassing external SAW + LNA
 - Now supports turning off internal LNA
 - No bodge work required, received PCB assembled from assembly house











TEST: Nichrome wire cutter

Context: in BEAR7, parachute was inserted into balloon Parachute deployed but tangled with remnants of burst balloon

The nichrome wire (0.1mm diameter) will cut the payload away from the balloon at a certain altitude

+Eliminates chances of any entanglement of the parachute and burst balloon



Current consumption: 0.5A at 6V





HELIUM TANK

- Continued with previous supplier
- For party balloon use
 - <u>https://www.partywholesale.com.sg/helium-tank/medium-helium-tank-3-days-rental-balloon-kit/</u>
 - \$79.90 (price has decreased \$20 from previous flight)
 - 10L tank, assured and specified to be 99.9% pure
- Experienced leakage
 - Seems to be from our regulator, might be time for a replacement

Ground Receiver Station



31 May 2024 11:04:33

31 May 2024 11:04:47

Ground Receiver Station - Wiring Diagram



Ground Receiver Station - More Photos...



Ground Receiver Station - Technical Details

ITEM	MAKE	MODEL
Antenna	Arrow Antenna	146/437-10 LEO Satellite Antenna
Handie	Kenwood	TH-D72A
Laptop	Lenovo	ThinkPad E14 Gen 1
Portable Monitor	Prolink	PRO1301WE 13.3-inch Super-Slim Mobile LED Monitor
4G LTE Dongle	Prolink	PLE902 4G LTE USB Modem
Power Bank	Aukey	PB-WL03S 20000mAh 72Wh
SSTV Program	Guy Roels, ON6MU	RX-SSTV v2.1.6 (https://www.qsl.net/on6mu/download/Setup_RXSSTV.exe)
APRS Program	Frank, AB0WV	PinPoint v2.1 (https://www.pinpointaprs.com/Pinpoint_v2.1_build_240324.msi)

Ground Receiver Station - A Note about the Laptop



Ground Receiver Station - BEAR-10 on SondeHub (Yay!!!)



Ground Receiver Station - Future Improvements





BEAR-10 FLIGHT PATH

Flight testing Nichrome wire cutter with magic knot to seperate payload from weather balloon at a select altitude





20.00

View of Eastern Malaysia and South China sea from 24km

Pulau Ubin and Tekong visible!



Previously in BEAR-7...

Seems like entanglement still occurred, likely getting caught in the balloon fragments on descent, achieved a average descent rate of ~8m/s





Maximum Altitude Reached (Theories)





BEAR 10 Altitude Plot



Preset Cut Altitude=25000m

30000

20000

15000

10000

5000

Average Descent rate of 2.03m/s!

18/5/2024 22:33 18/5/2024 23:02 18/5/2024 23:31 19/5/2024 0:00 19/5/2024 0:28 19/5/2024 0:57 19/5/2024 1:26 19/5/2024 1:55 19/5/2024 2:24

Data available

All design + firmware + flight data available on Github

Electronics: https://github.com/xieliwei/BEAR4-hardware

Firmware: https://github.com/xieliwei/BEAR4-firmware

Flight data: <u>https://github.com/xieliwei/BEAR4-firmware/releases</u> (Check under the "assets" section for each flight)

Thank you, & stay tuned for BEAR-11