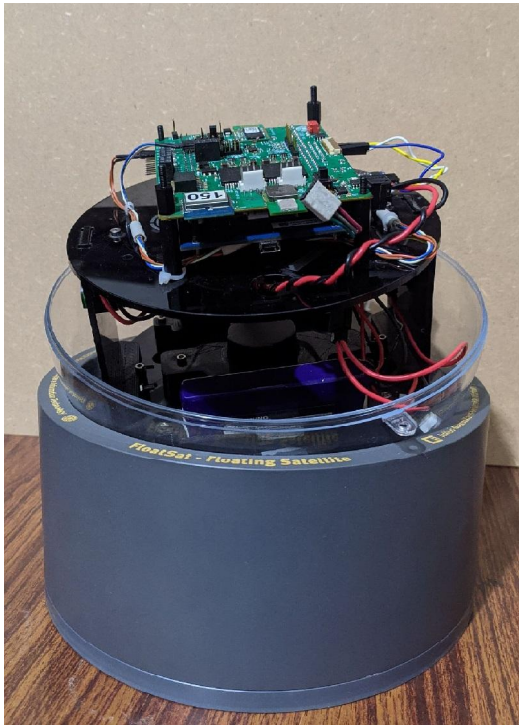
FloatSat:
Getting Started

Rishav Dhungel

May 17, 2021

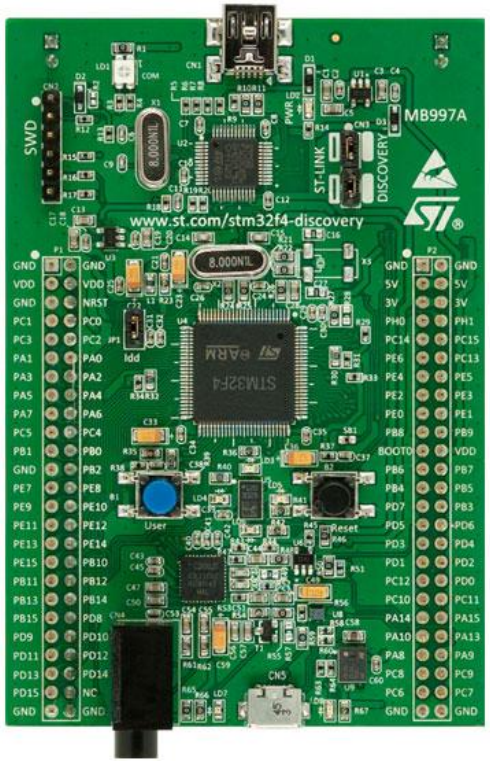
FloatSat Kit

Motor and reaction wheel

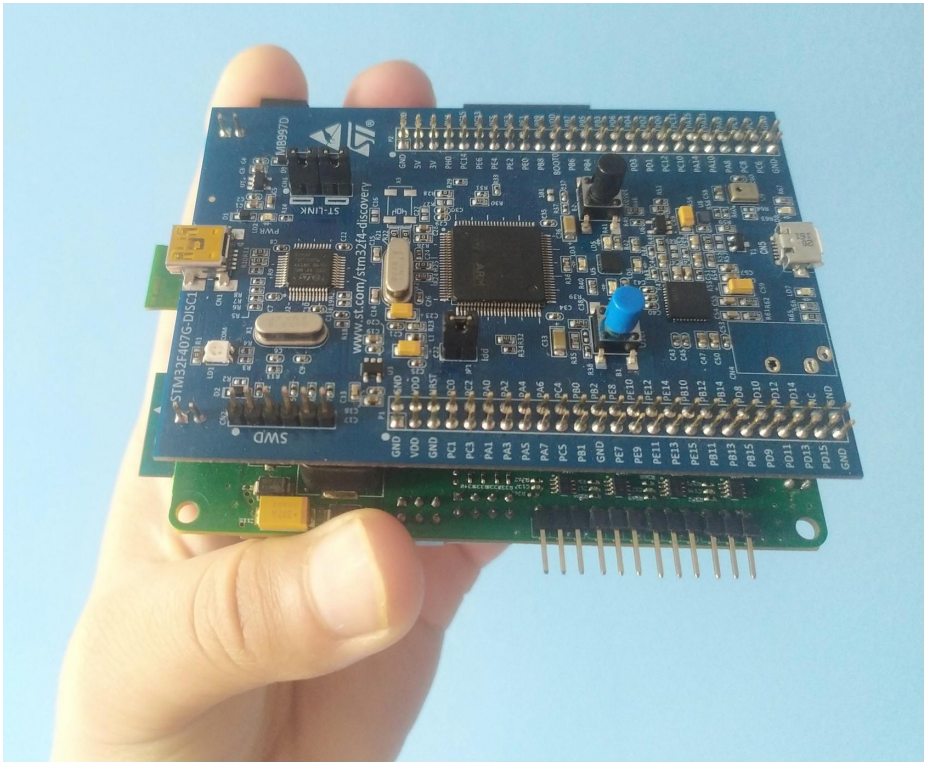


Spherical air bearing

OBC: STM32F4 Discovery Board



STM32F4 Discovery Board



Discovery Board with addon shield

Specifications

STM32F4

Arm® 32-bit Cortex®-M4 CPU with FPU, Adaptive real-time accelerator (ART Accelerator) allowing 0-wait state execution from Flash memory, memory protection unit, 210 DMIPS/ 1.25 DMIPS/MHz (Dhrystone 2.1), and DSP instructions

1. Frequency: Upto 168 MHz
2. 92+4 Kbytes of SRAM
3. 1 Mbyte of Flash memory
4. Mass: 90 gram

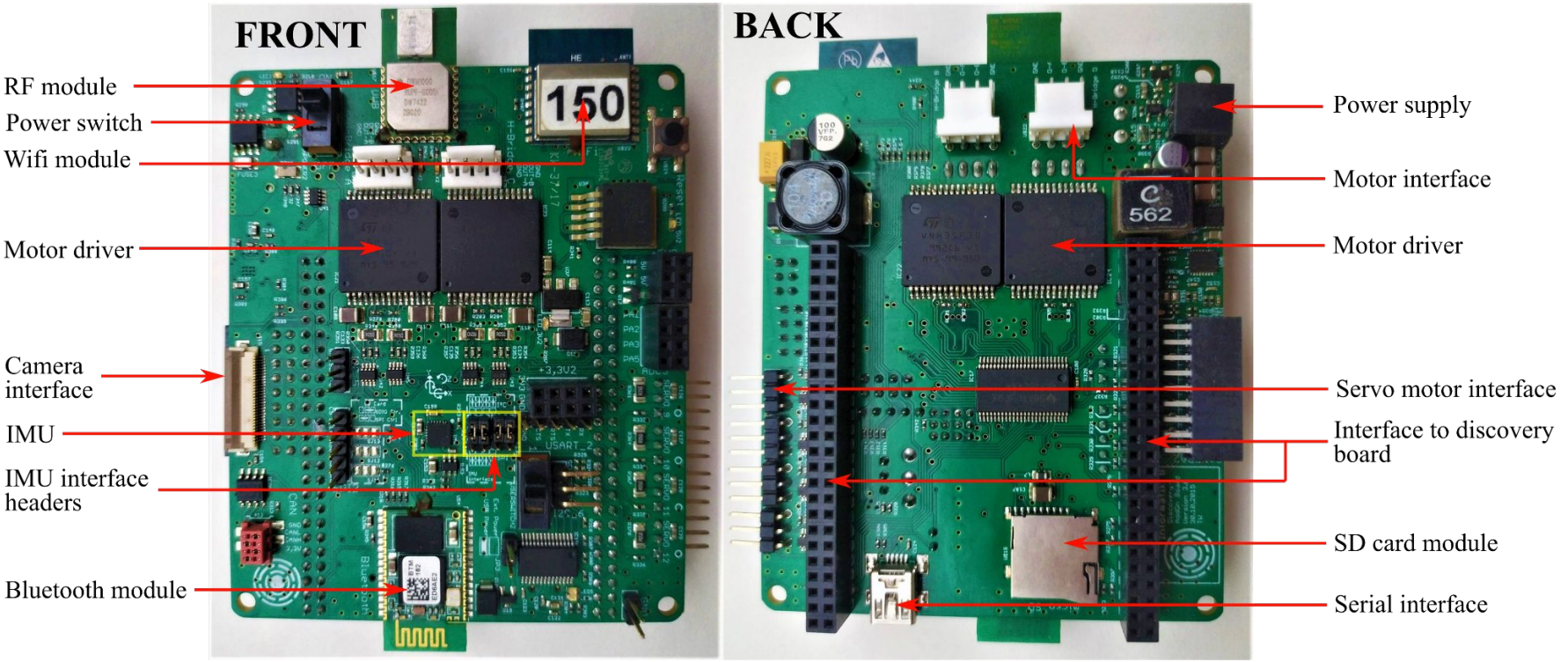
Apollo Guidance Computer (AGC)

1. Frequency: 2.048 MHz
2. 32,768 bits (4.096 Kbytes) RAM
3. 589,824 bits (0.073728 Mbyte) ROM
4. Mass: 32 Kg
5. Power consumption: 55W

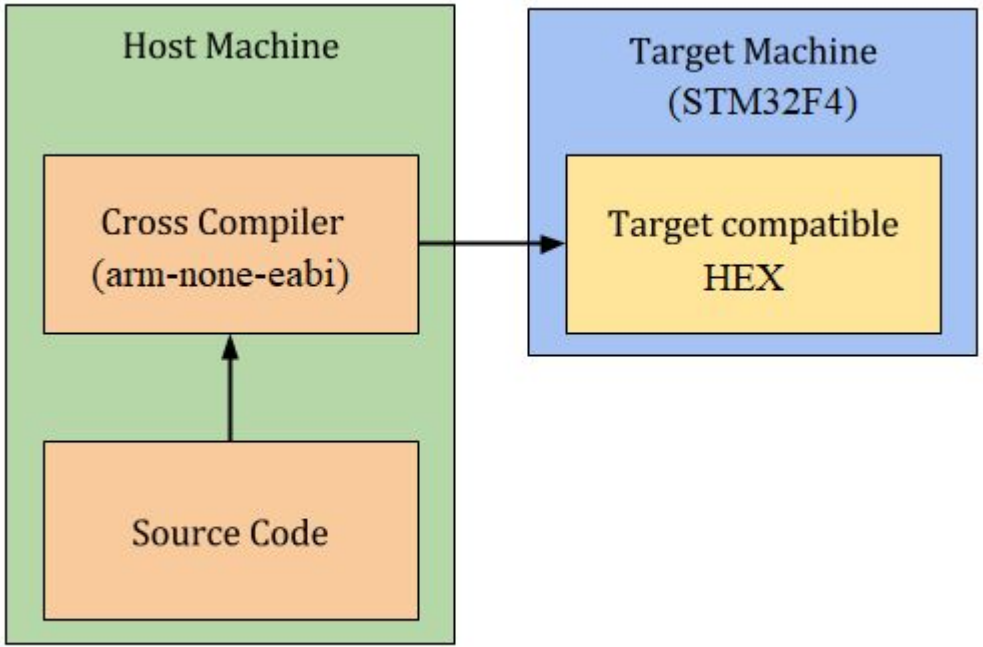
Extra features

1. Communication interface including I2C, UART/USARTs, SPIs, CAN, SDIO and USB 2.0
2. Upto 17 timers (16 bits and 32 bits)
3. SWD, JTAG and Cortex-M4 Embedded Trace Macrocell debug mode
4. 2×12-bit D/A converters
5. 8- to 14-bit parallel camera interface up to 54 Mbytes/s
6. True random number generator
7. CRC calculation unit
8. 16-stream DMA
9. controller with FIFOs and burst support

Addon Board

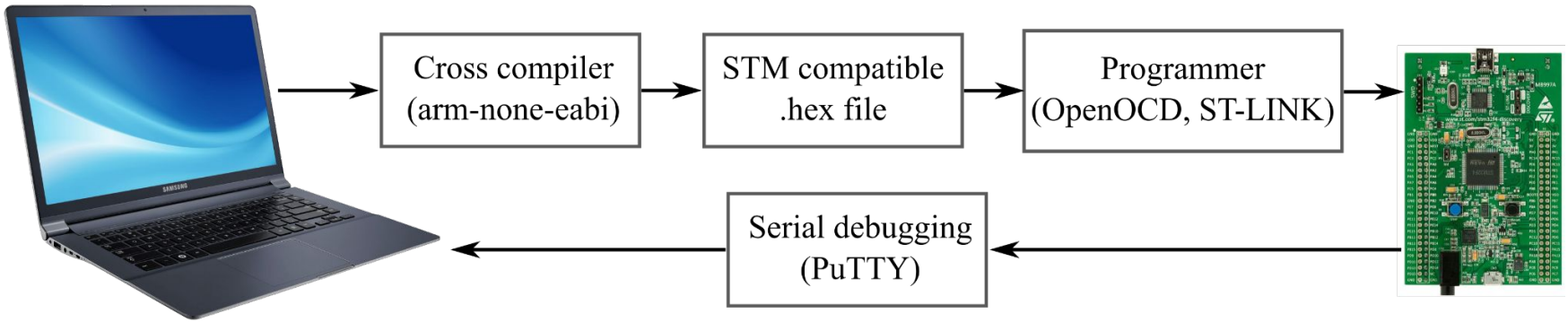

FRONT
BACK
RF module
Power switch
Wifi module
Motor driver
Camera interface
IMU
IMU interface headers
Bluetooth module
Power supply
Motor interface
Motor driver
Servo motor interface
Interface to discovery board
SD card module
Serial interface

Cross Compilation



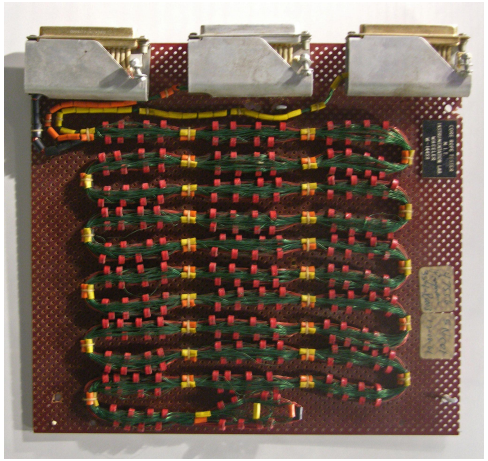
Cross Compiler operation

OBC Software Development

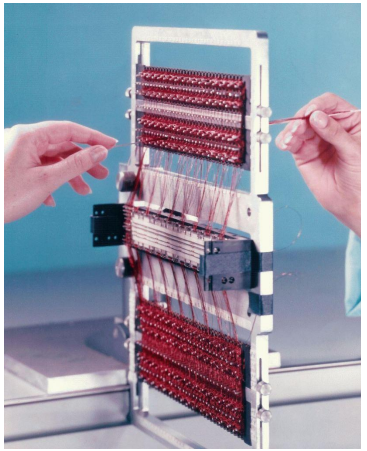


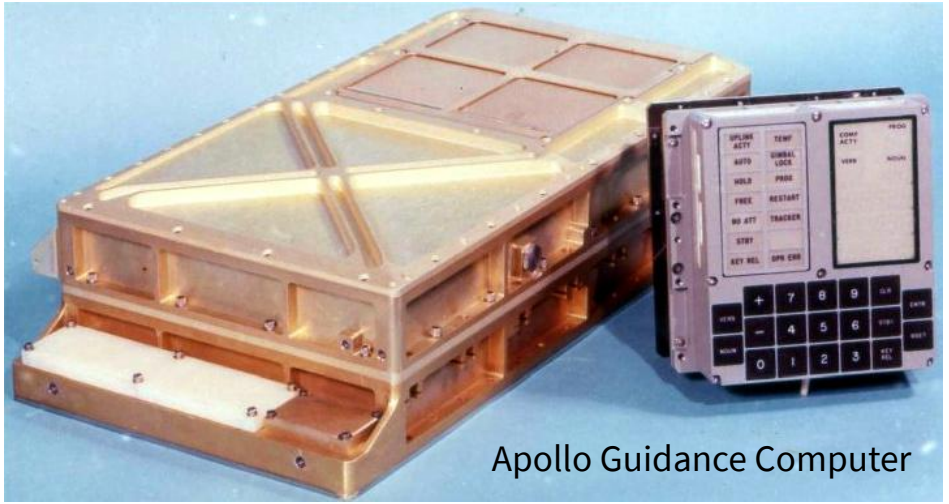
History: AGC


Margaret Hamilton with Apollo mission software



Magnetic-core memory




Apollo Guidance Computer

Thank you !!