
The Apollo Guidance Computer: Architecture and Operation

Chapter 0: The state of the art

From whence we came: early computing
Outside the computer room: early computing in aviation and space
Computing in manned spacecraft
Defining computer "power"
The evolution of computing
Technology acquisition: consumers vs the aerospace industry

Chapter 1: The AGC hardware

Introduction
Overview of Chapter 1
Physical characteristics of the AGC
Properties of number systems
Double precision numbers
FIGMENT
Instructions: the basic units of computer operation
Memory management
A tour of low core and the central registers
Keeping time in the AGC: timers and clocks
Counters - CDUS (X, Y, Z, OPTS, OPTT) and PIPAS (X, Y, Z)
Radar, engine and crew interfaces
Memory addressing and banking in the AGC
Interrupt processing
The instruction set
Communicating with the outside world: the I/O system

Chapter 2: The Executive and Interpreter

Introduction to the Executive
Scheduling: preemptive and cooperative multiprogramming
The Executive
The astronaut interface: the display and keyboard

Telemetry uplink
Synchronous I/O processing and T4RUPT
High level languages and the Interpreter
The Interpreter.

Chapter 3: The basics of guidance and navigation

Hardware unique to solving guidance and navigation problems
The important questions in guidance and navigation
Question 1: Which way is up?
Question 2: Where am I?
Question 3: Which way am I going?

Chapter 4: Mission programs and operations

Introduction
Launch from Earth
The lunar landing
Lunar orbit rendezvous
The digital autopilot
Erasable memory programs
AGC data uplink and downlink
Command Module entry.
Computer problems during Apollo 11 and Apollo 14

Chapter 5: Epilogue
