GPS Driver & Hardware Integration Report

Task: GPS Module

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GitHub repo: https://github.com/salah0eldin/GPS_Module_STM32

Driver Development (Home Phase)

- Wrote a bare-metal UART driver in C to parse NMEA sentences from a 9600 baud GPS.
- Worked exclusively on real hardware; no simulation tools were used.
- Lacking a physical GPS, emulated one by flashing a spare ESP32 board to stream continuous NMEA-like strings over UART at 9600 baud.
- Verified that the STM32 received and parsed all test sentences correctly.
- Pushed all source code, and a minimal README to GitHub (see link above).

Initial Bench Test with the Real GPS Module (At collage)

- Connected the GPS module to a laptop through its on-board USB bridge.
- Expected full NMEA frames (GGA, RMC, etc.), but only partial sentences appeared—most numeric fields were blank.
- Suspected poor satellite lock → moved outdoors under open sky; output remained unchanged.

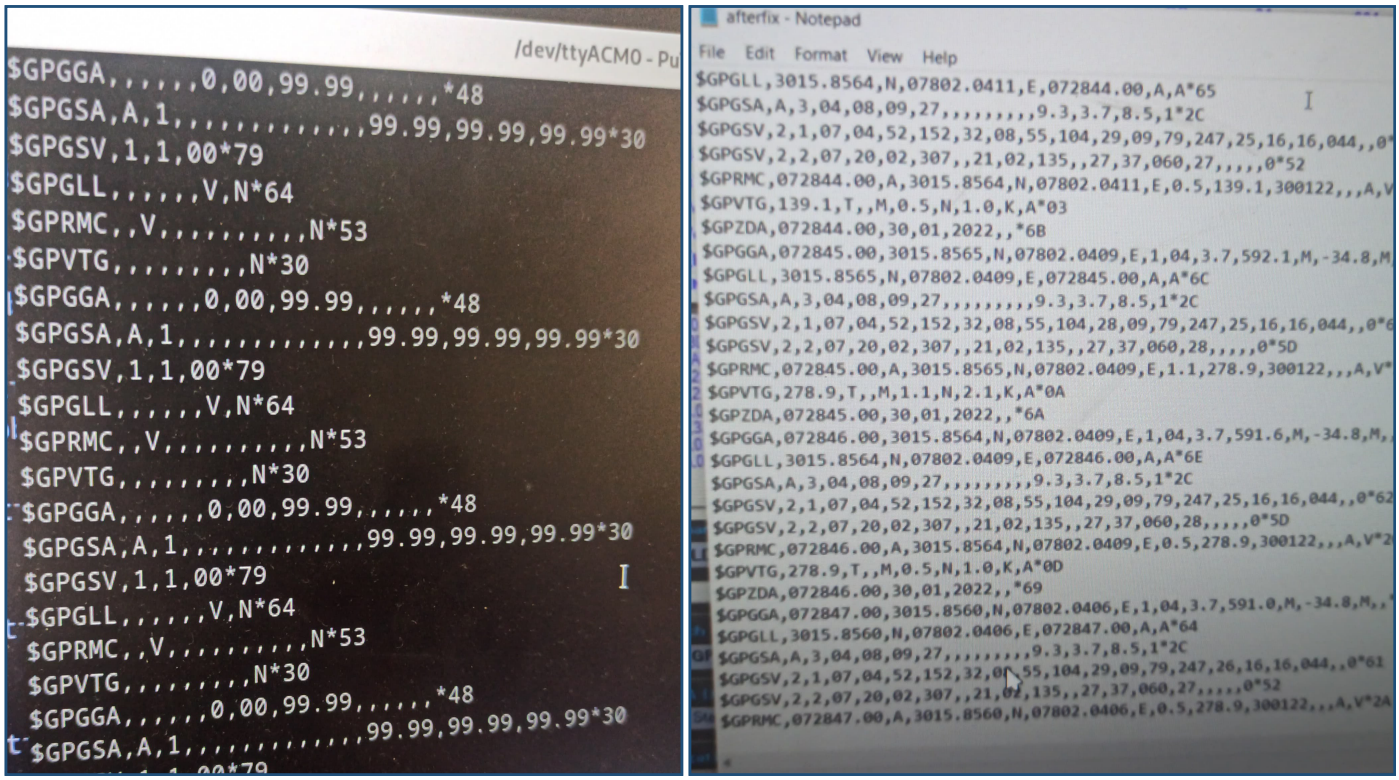

Figure 1 Output is the black one and Expected is the white one

MCU-Side Verification

- Wired the GPS module to the STM32's USART1 (PA9/PA10) at 9600 baud.
- Driver showed no incoming bytes, confirming the issue was on the GPS side, not the MCU firmware.

Conclusion

- All evidence points to a defective GPS module (corrupted serial output).
- Firmware and MCU UART are confirmed functional through emulated-GPS testing.

Quick-Look Handover Summary

- UART driver (9600 baud, NMEA) is finished and verified with a self-made emulator.
- Current GPS hardware on hand is almost certainly dead; replace it.
- No firmware changes are needed once a healthy module is available.