



NMSU *Sat2* Communications

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February 9 2006

NMSUSat2 CDR





Comms Subsystem Description

- **Functions to be performed**
 - The communication system is the interface between the ground station and the satellite. It makes it possible for the flight computer to transmit test, status, and other necessary data to the ground station for evaluation; as well as receive instructions from the ground station. It is a necessary component of the satellite and therefore needs to be robust and efficient. The NMSU communication system is comprised of two individual radio-modem sets in order to increase the reliability of the system.
- **Input and Output Connections**
 - The input and output connections for the Communications Subsystem are Harnesses H, K, and M.
- **Major components within the subsystem**
 - The major components are two radios, two modems, and two antennas.

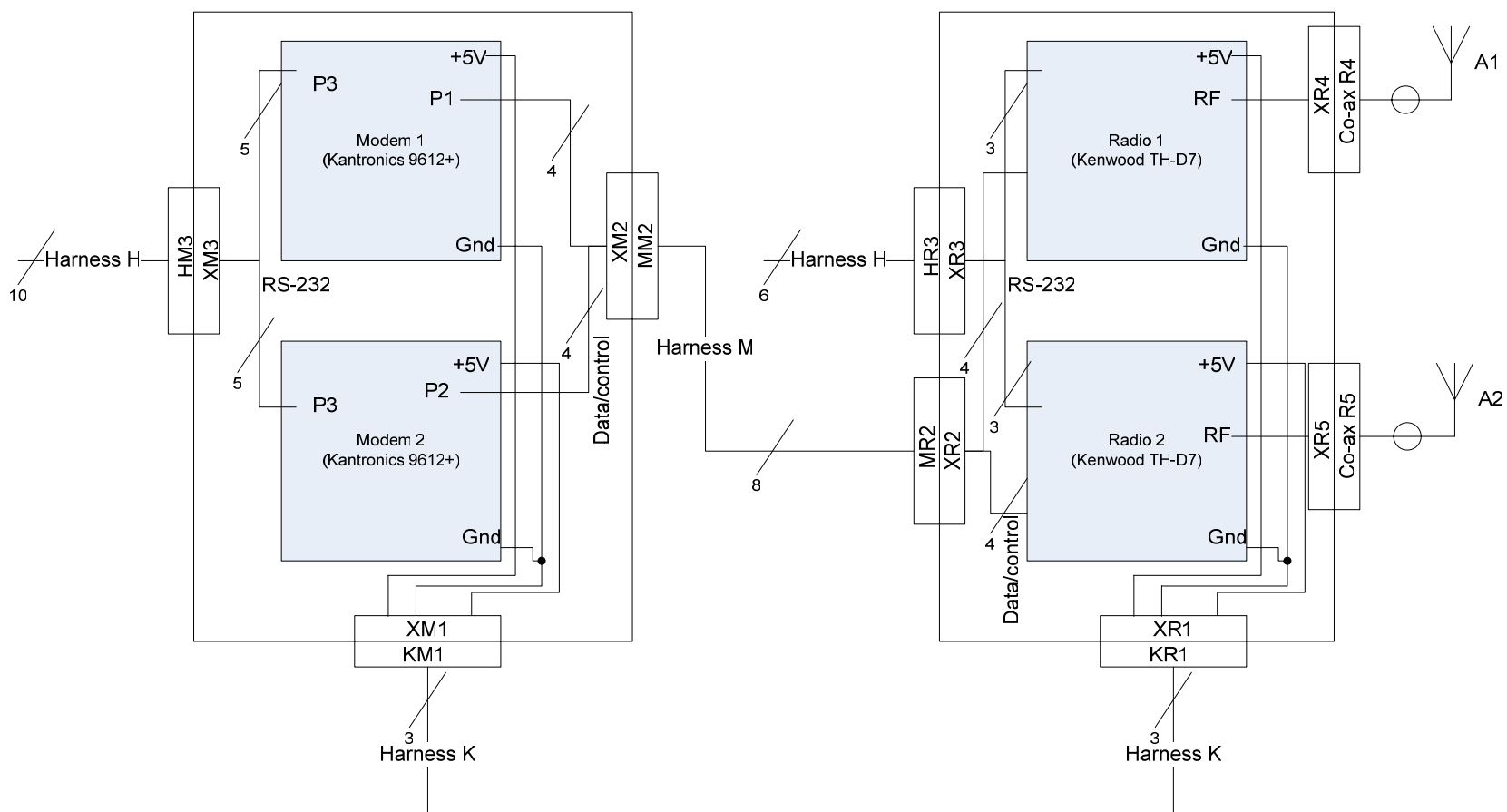


Communication Requirements

| | Communications System (Comms) | Source | Status |
|--------|---|--------|--------|
| S1.2-1 | Comms shall support space telecommand services | S1-1 | Green |
| S1.2-2 | Comms shall support space telemetry services | S1-1 | Green |
| S1.2-3 | Comms will provide outreach telemetry services | M-7 | Green |
| S1.2-4 | Comms will provide outreach access services | M-7 | Green |
| S1.2-5 | Comms shall support communications for ground servicing | M-6 | Green |



Comms Block Diagram



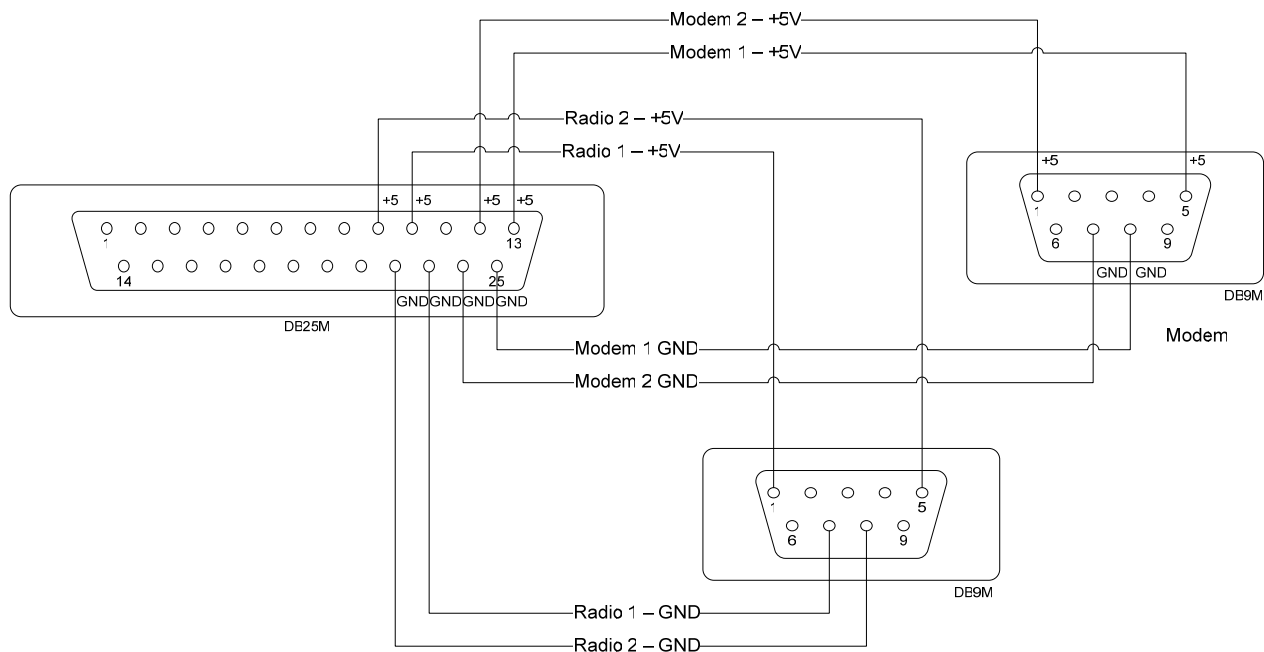


Comms Power

Rev B

Standard: Power female into box
Male plugs into female on box

Communications Power – Flight Computer



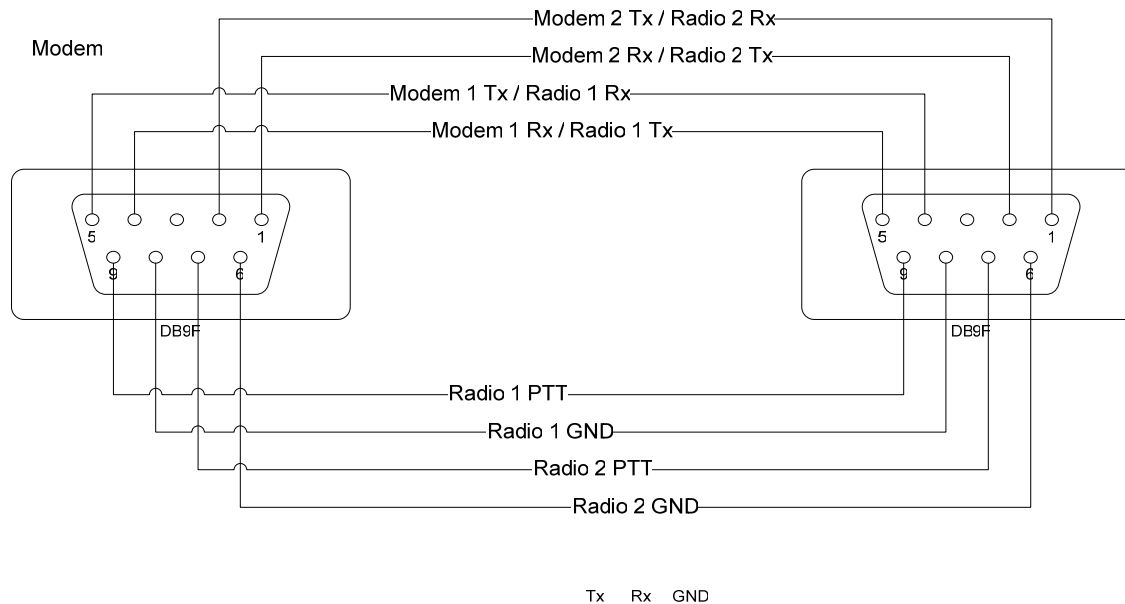


Harness M

Harness M

Radio – Modem Signals

Standard: Signal male to box
DB9 Female connectors to signal box



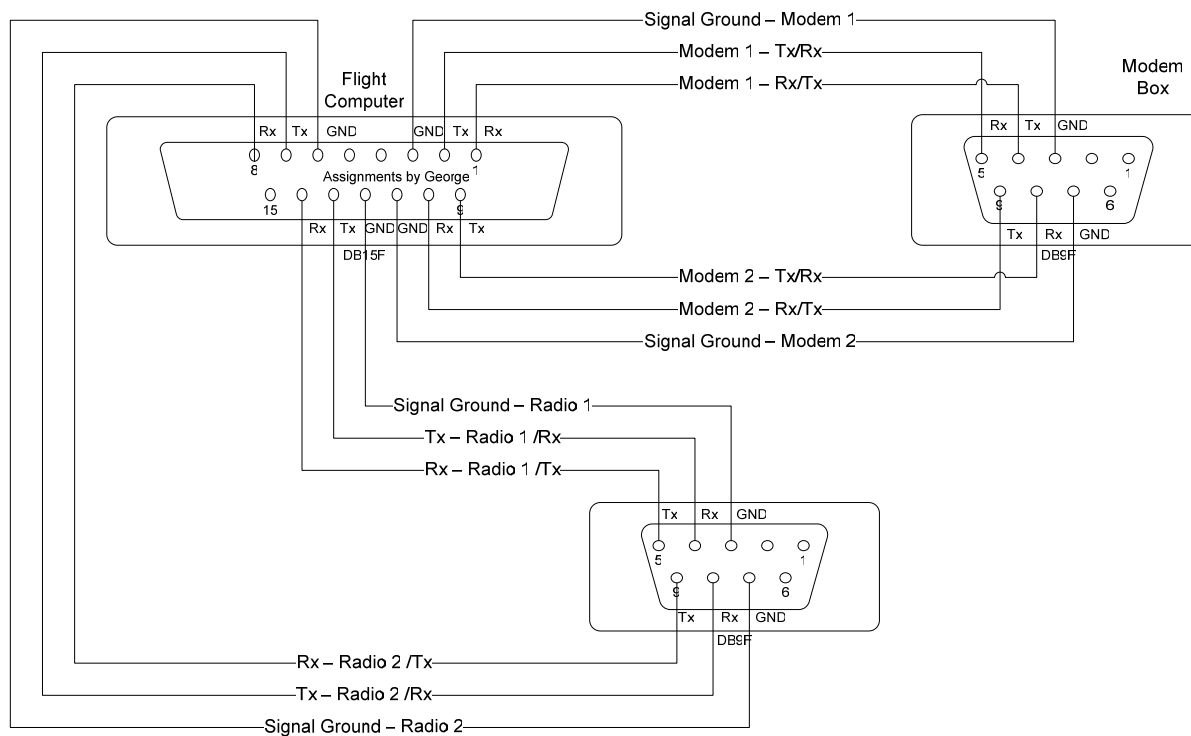


Comms Signal

Rev A

Communications Signal – Flight Computer

Standard: Signal male to box
Female connectors into male box





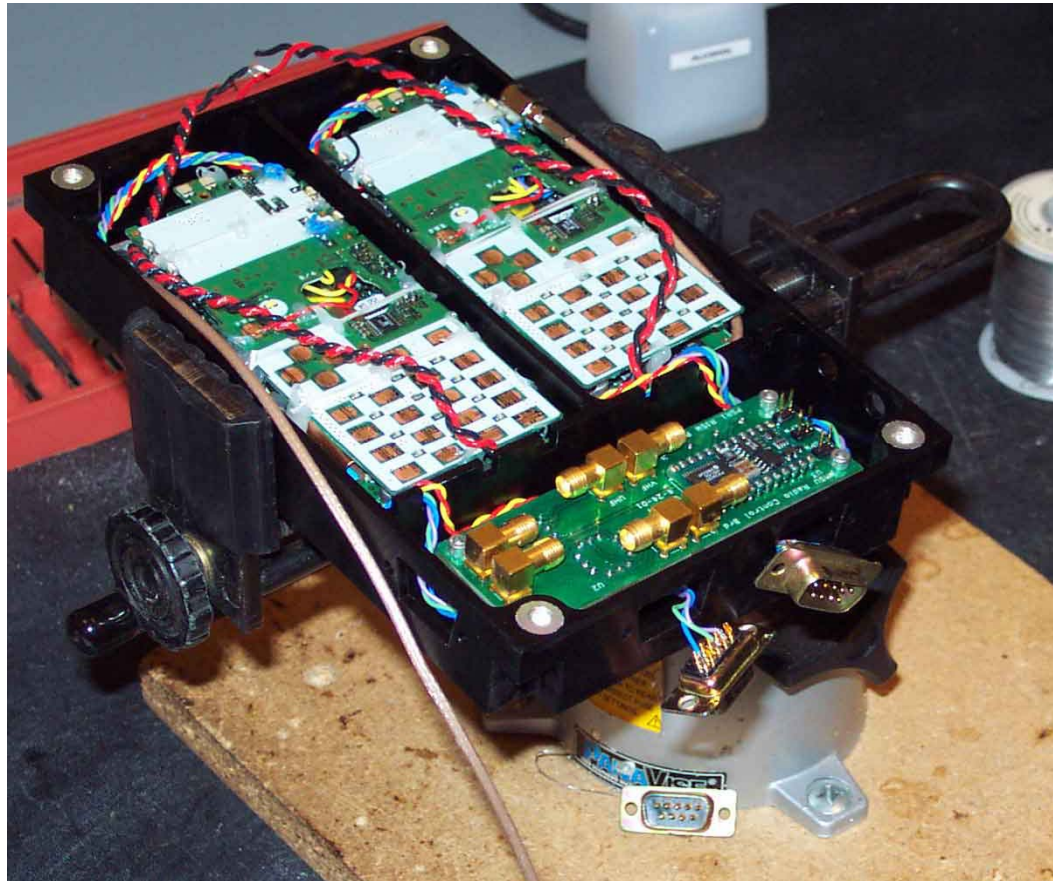
Transceiver

- Modified Kenwood TH-D7 radios
- Support AX.25 protocol
- High speed (9600 bps) packet rate
- Supports APRS





Radio Modifications



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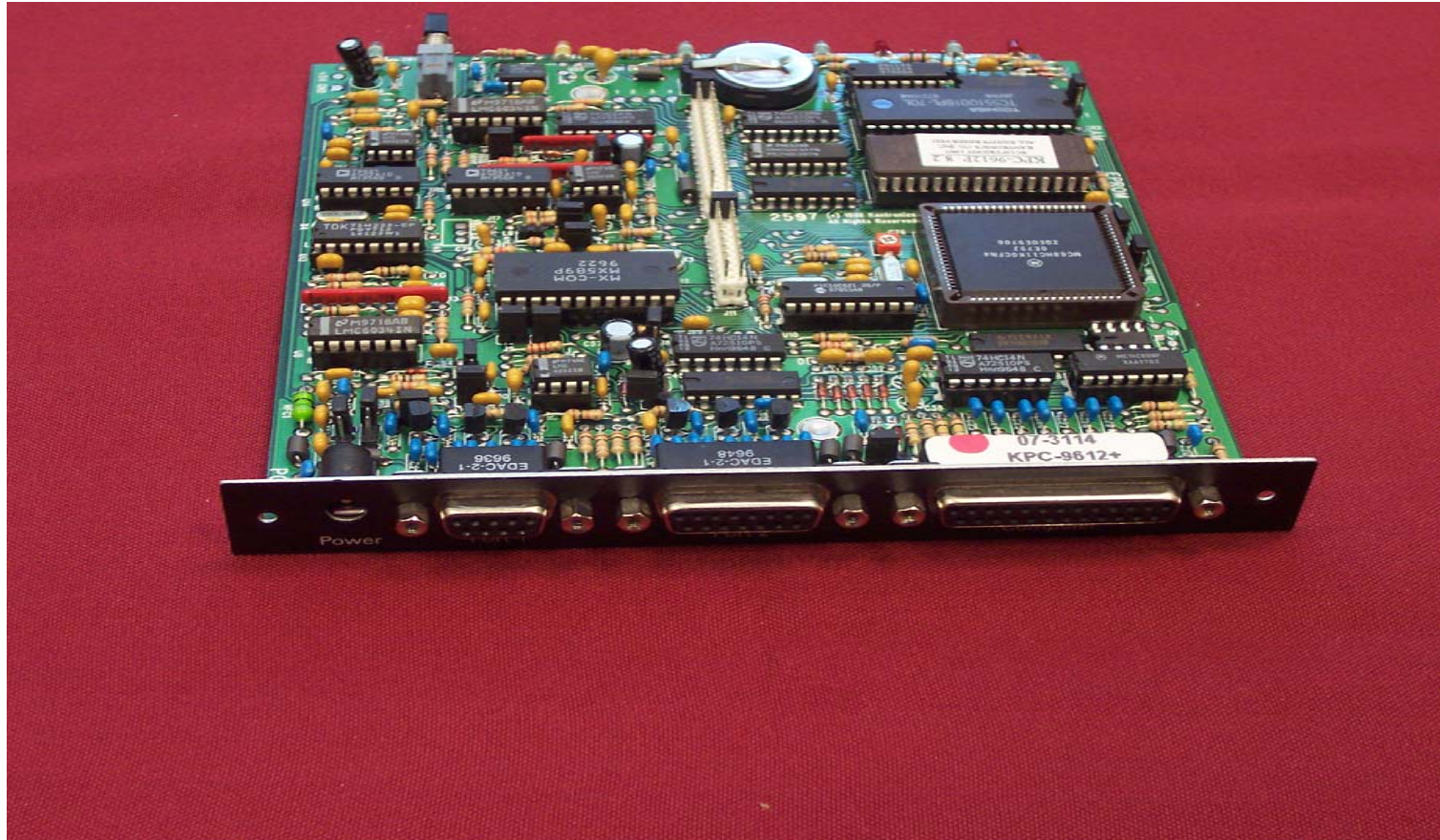
Modem



- Modified Kantronics KWM 9612+
- Suitable for remote locations
- Supports AX.25 protocol
- Low current requirements



Modem Modifications



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Antenna

- Plastic housing removed
- Rubber cover cut off
- Conformal coat



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Operations

- Window of opportunity
- Two channel capability
- Low speed transmission: 1200 bps
- High speed transmission: 9600 bps





Future Work

- Modified component testing
- Integrated Subsystem testing
- Full system testing (Day in the Life)
- Documentation
- System delivery

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