Locomotion- Field Performance

Terrain	slope (0 deg)	slope (0 deg)	slope (10 deg)	slope (17 deg)
Test	Driving	Drawbar Pull	Driving	Driving
Predicted value	**740 W**	**975 lbf**	**1290 W**	**1665 W**
Measured value	**670 W**	**650 lbf**	**1000 W**	**1250 W**

Suspension and Steering

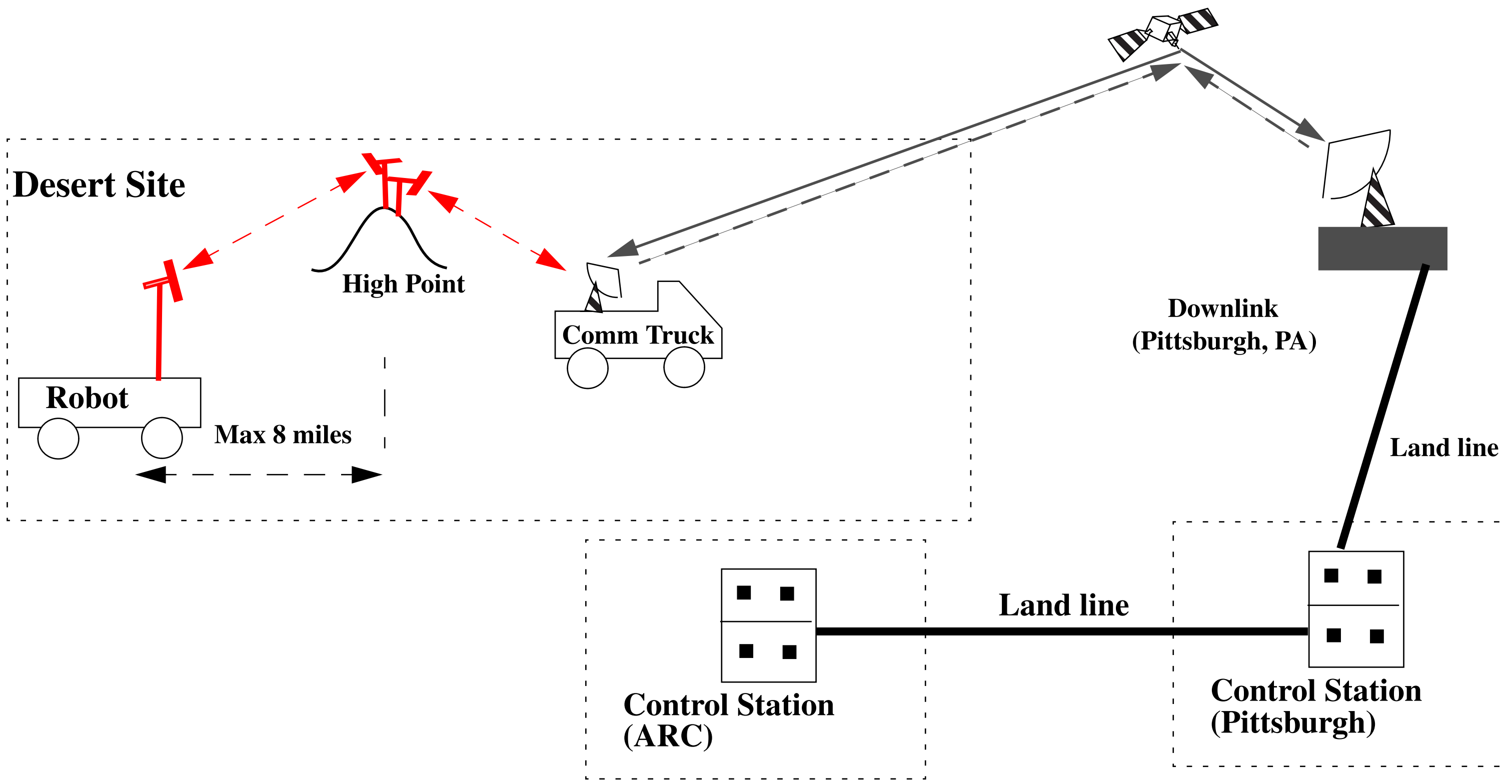
Bogey-type suspension for true body averaging

- Center of gravity moves 1/4 of the wheel elevations
- Body pitch is only 1/2 of the bogey angles
- Substantial obstacle negotiation capability

Coordinated Steering:

- Steers with mechanical linkages and few actuators
- All wheels are steered; steering angles are servoed
- Capable of both skid steering and double Ackerman

Communication



- High data rate (1.5 Mbps) required for video.
- Unprecedented from a moving robot.
- Range and rate achieved by stabilized high gain antenna.
- Pointing Mechanism and controls successfully developed.

Antenna Pointing Mechanism

- Azimuth/Elevation configuration

- less coupling

- Slip ring for elevation actuator

- continuous rotation unlike cable-wrap.
- reduces complexity (management of cables is easier)

- RF rotary joint

- to send RF signal from the transmitter to the antenna
- located co-axial with the slip ring
- RF characteristics remains constant unlike that for flexible RF cable
- Less lossy (0.5 dB) compared to flexible RF cable (1.2 dB)

- *Harmonic drive and brushed motor*

- minimize backlash

- *Balanced system*

- minimizes disturbance torques

US Operations

Control centers: Carnegie Science Center (Pittsburgh, PA), and NASA Ames Research Center (Mountain View, CA)

Display: 6m diameter panoramic screen with 3 projectors at CSC, flat screen with single projector at ARC

User Interface: directional control, image pan/tilt, and heads-up overlay of instruments. [Extended interface includes low level controls of the vehicle and science instrumentation.]

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