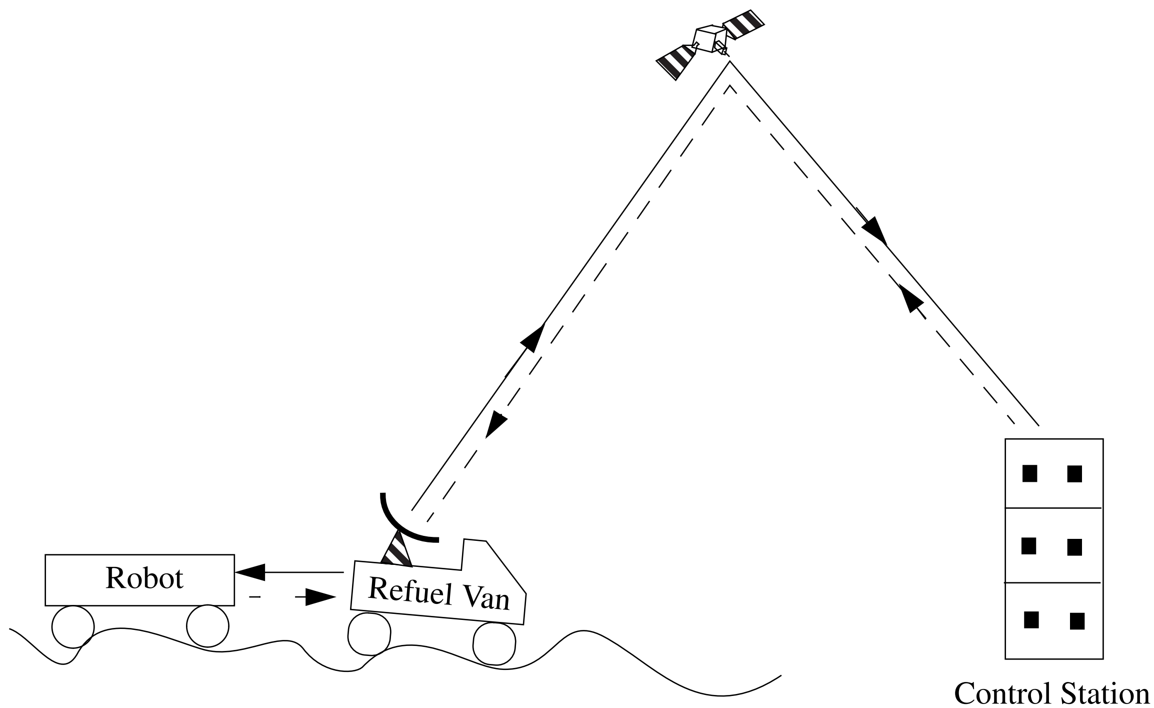
Lunar Rover Terrestrial Prototype: Communication System

Objective:

To

1 Baseline



1.1 Relevance to Flight Rover

Time delay, Remote operation (non-LOS),
High data rate

1.2 Manufacturers and Vendors

Wireless Ethernet Modem- Arlan 640 (Aironet Wireless Communications, Inc.)- $4000/pair

2 Requirements and Specifications

Control from remote site (non line-of-sight)
Real-time access to internet
Continuous data rate: ~ 1 Mbps
Occasional (3-4 times a day): Additional 3 Mbps
real time
Lunar relevance preferred

2.1 Mission and Environmental Requirements

2.2 Design Requirements

2.3 System and Performance Specifications

3 Rationale

4 Options Considered

Option 1

Option 2: Tower

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          Omni                       Land Line
Robot<------------> Tower<--------------->Control Station
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Line of sight to the tower required
Availability of the tower is a restriction
FCC license required
~ 200 m (656 ft) height required to see 50 km.

Option : Air Ballon

Can replace tower.
~ 200 m (656 ft) height required to see 50 km.
Need to find out rates of ballons

Option 3: Cellular Phone

9600 Baud
Might not be available in desert

Option 4: Mobile Van

Robot -> comm van -> satellite -> control station
control station -> satellite -> robot
FCC license required
Satellite time ~ 40,000$/month + Equipment rentals
Antenna pointing not a problem- lunar relevant
Not good from logistics point of view

Option 5: Satellite

Robot <-> Satellite <-> Control Station

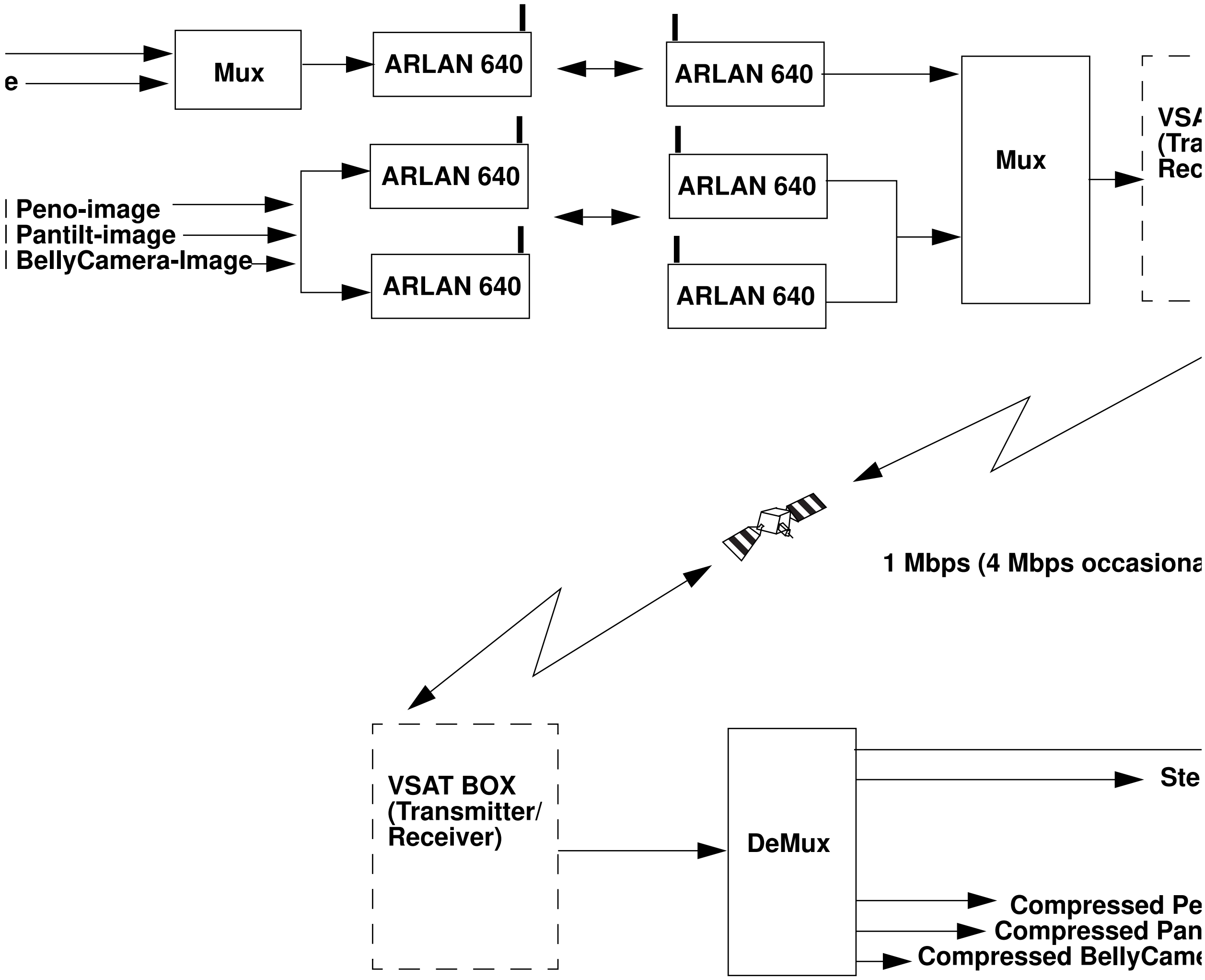
Table 1:

Option #		Data rate	Time delay	Cost	Contacts	Comments
1						
2						
3						
4						
5						

FCC license required
Satellite time ~ 40,000$/month + Equipmement rentals
Antenna to be pointing from rover- lunar relevant
Orbit technology

Option: Local TV network

Might be possible to use local TV network for the transmission of videos. Again availability of TV stations near desert and 2 months duration is a big issue.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