EMERGING COMPUTER TECHNOLOGIES AND THE NEWS MEDIA OF THE FUTURE

Debra A. Vrabel
Sverdrup Technology, Inc.
Lewis Research Center Group
Brook Park, Ohio
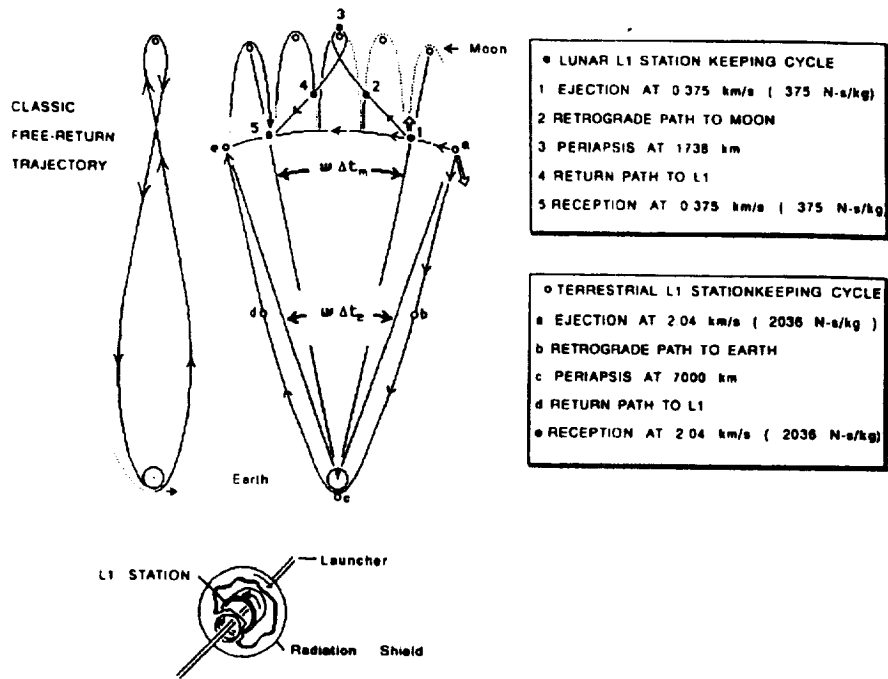
The 21st Century Media Environment:
More Pioneering Journalists Needed
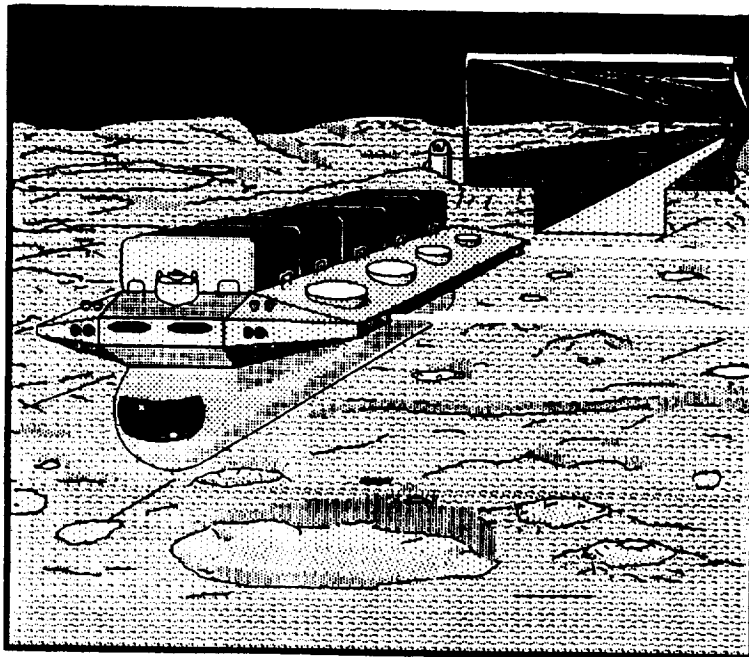
ABSTRACT

The media environment of the future may be dramatically different from what exists today. As new computing and communications technologies evolve and synthesize to form a global, integrated communications system of networks, public domain hardware and software, and consumer products, it will be possible for citizens to fulfill most information needs at any time and from any place, to obtain desired information easily and quickly, to obtain information in a variety of forms, and to experience and interact with information in a variety of ways. This system will transform almost every institution, every profession, and every aspect of human life---including the creation, packaging, and distribution of news and information by media organizations.

This paper presents one vision of a 21st century global information system and how it might be used by citizens. It surveys some of the technolgies now on the market that are paving the way for new media environment.

GRAVITATIONAL MIRROR PROPULSION - L1 STATIONKEEPING

CLASSIC
FREE-RETURN
TRAJECTORY

← Moon

LUNAR L1 STATION KEEPING CYCLE

1 EJECTION AT 0.375 km/s (375 N-s/kg)

2 RETROGRADE PATH TO MOON

3 PERIAPSIS AT 1738 km

4 RETURN PATH TO L1

5 RECEPTION AT 0.375 km/s (375 N-s/kg)

○ TERRESTRIAL L1 STATIONKEEPING CYCLE

a EJECTION AT 2.04 km/s (2036 N-s/kg)

b RETROGRADE PATH TO EARTH

c PERIAPSIS AT 7000 km

d RETURN PATH TO L1

e RECEPTION AT 2.04 km/s (2036 N-s/kg)

Earth

L1 STATION — Launcher

Radiation Shield

TWO-WAY EML PROPULSION - EML MOON LANDING
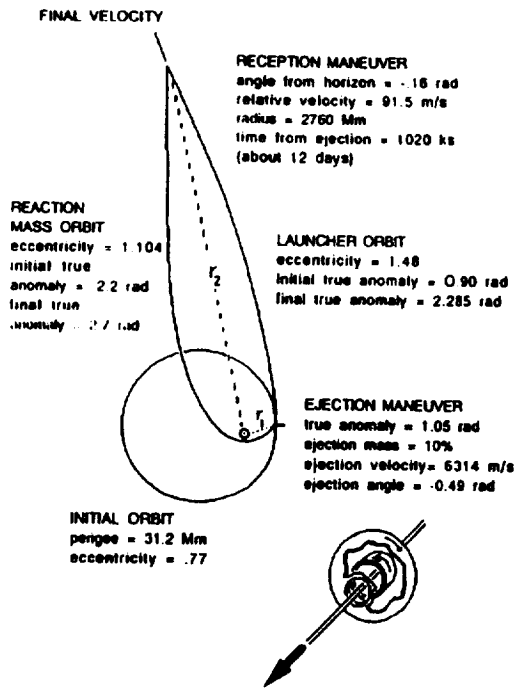
Velocity =
2.34 km/s

Altitude =
10 m

Location:
Congreve
Crater,
Farside
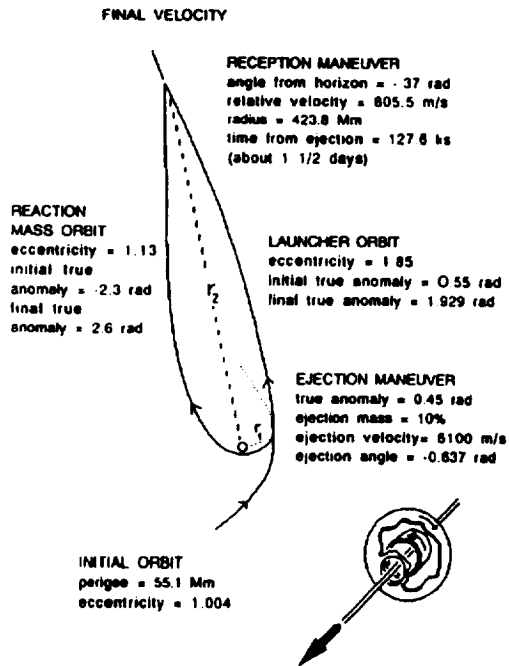
Heading:
270 (West)

GRAVITATIONAL "MIRROR" PROPULSION

FINAL VELOCITY

RECEPTION MANEUVER
angle from horizon = -.16 rad
relative velocity = 91.5 m/s
radius = 2760 Mm
time from ejection = 1020 ks
(about 12 days)

**REACTION
MASS ORBIT**
eccentricity = 1.104
initial true
anomaly = 2.2 rad
final true
anomaly = 2.7 rad

LAUNCHER ORBIT
eccentricity = 1.48
initial true anomaly = 0.90 rad
final true anomaly = 2.285 rad

r_2

EJECTION MANEUVER
true anomaly = 1.05 rad
ejection mass = 10%
ejection velocity = 6314 m/s
ejection angle = -0.49 rad

INITIAL ORBIT
perigee = 31.2 Mm
eccentricity = .77

GRAVITATIONAL MIRROR MANEUVER

Escape From 135 x 31 Mm earth orbit:

- *2.236 km/s hyperbolic excess velocity*

- *Enough to reach Venus*

- *Enough to reach Mars at favorable opposition*

- *Minimum net launcher energy needed: 3.97 MJ/kg.*

- *Reaction mass recovered*

Optimization and perigee maneuvers should yield even better performance.

GRAVITATIONAL "MIRROR" PROPULSION

FINAL VELOCITY

RECEPTION MANEUVER
angle from horizon = -.37 rad
relative velocity = 805.5 m/s
radius = 423.8 Mm
time from ejection = 127.6 ks
(about 1 1/2 days)

**REACTION
MASS ORBIT**
eccentricity = 1.13
initial true
anomaly = -2.3 rad
final true
anomaly = 2.6 rad

LAUNCHER ORBIT
eccentricity = 1.85
initial true anomaly = 0.55 rad
final true anomaly = 1.929 rad

r_2

EJECTION MANEUVER
true anomaly = 0.45 rad
ejection mass = 10%
ejection velocity = 6100 m/s
ejection angle = -0.637 rad

INITIAL ORBIT
perigee = 55.1 Mm
eccentricity = 1.004

GRAVITATIONAL MIRROR MANEUVER

Hyperbolic Orbit Boost

- *2 km/s gain in hyperbolic excess velocity*

- *Suggests addition to a "delta VEGA" maneuver*

- *Enough to reach Mars at favorable opposition*

- *Minimum net launcher energy needed: 2.45 MJ/kg.*

- *All reaction mass recovered*

Optimization and perigee maneuvers should yield even better performance.