Feed-back Presentation: - Space-Art-Rescue Ideas -

SATELLITE ART WORKS (S.A.W.)

creating space art works

Berlin, Germany 2007

satellite.art.works@googlemail.com

Exosphere

690- 10 000 km

Geo Stationary Orbit (GEO)

35.786 km

Sun Synchronous Orbit (SSO)

700-1000 km

85-690 km

Thermosphere

Low Earth Orbit (LEO)

200-1200 km

Outer-Space

100 km

Mesosphere

50-85 km

Near-Space

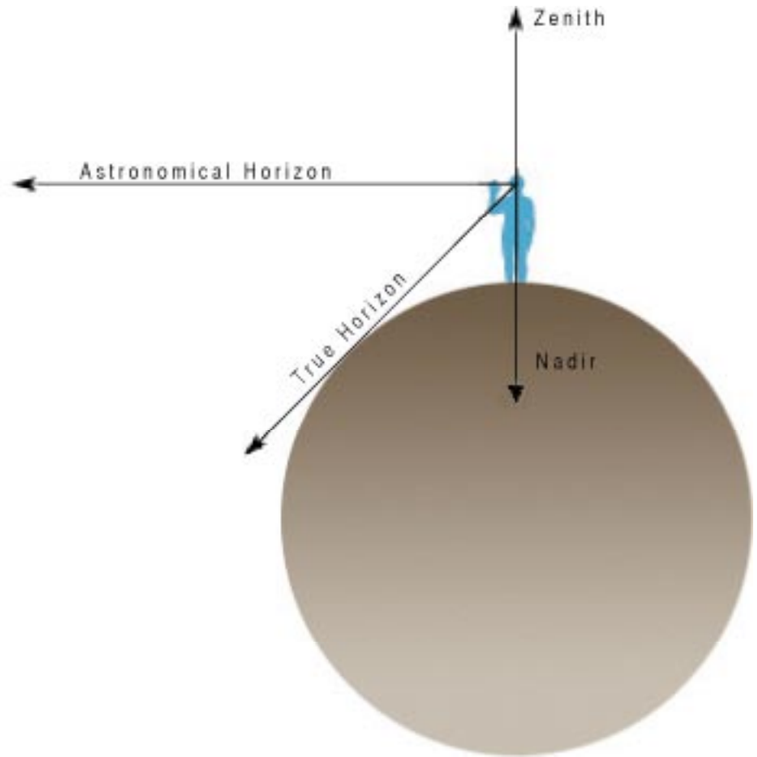
Stratosphere

20-50 km

Troposphere

6-20 km

Air-Space



SATELLITE ART WORKS CREATES ART CONCEPTS WHICH WE CALL
- SPACE-ART-RESCUE -

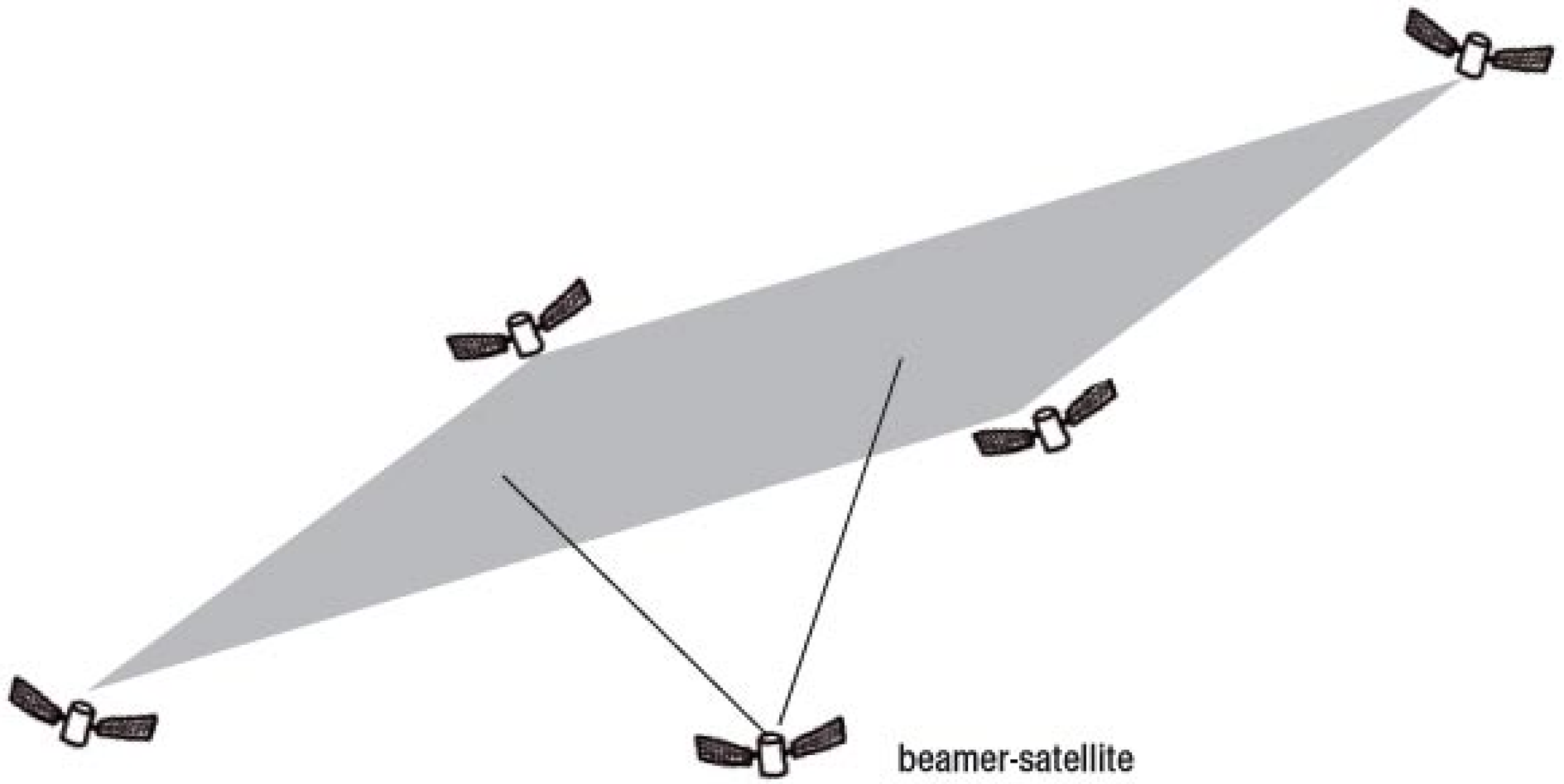
THESE WORKS APPEAR FROM THE EARTH AS VISIONS, IMAGES OR SOUNDS, ACTING AS CONVEYING WARNING MESSENGER, WITHIN A SIGNALLING SYSTEM SUCH AS AN EARLY WARNING SYSTEM AND POSSIBLY WITHIN THE DEVELOPING GLOBAL ALERT SYSTEM. THESE WORKS ARE VIEWED IN THE FOLLOWING WAYS:

FROM EARTH VIEWING TO OUTER-SPACE
FROM EARTH VIEWING TO NEAR-SPACE
FROM EARTH VIEWING TO AIR-SPACE
FROM EARTH VIEWING TO EARTH-SPACE

from earth viewing to Outer-Space

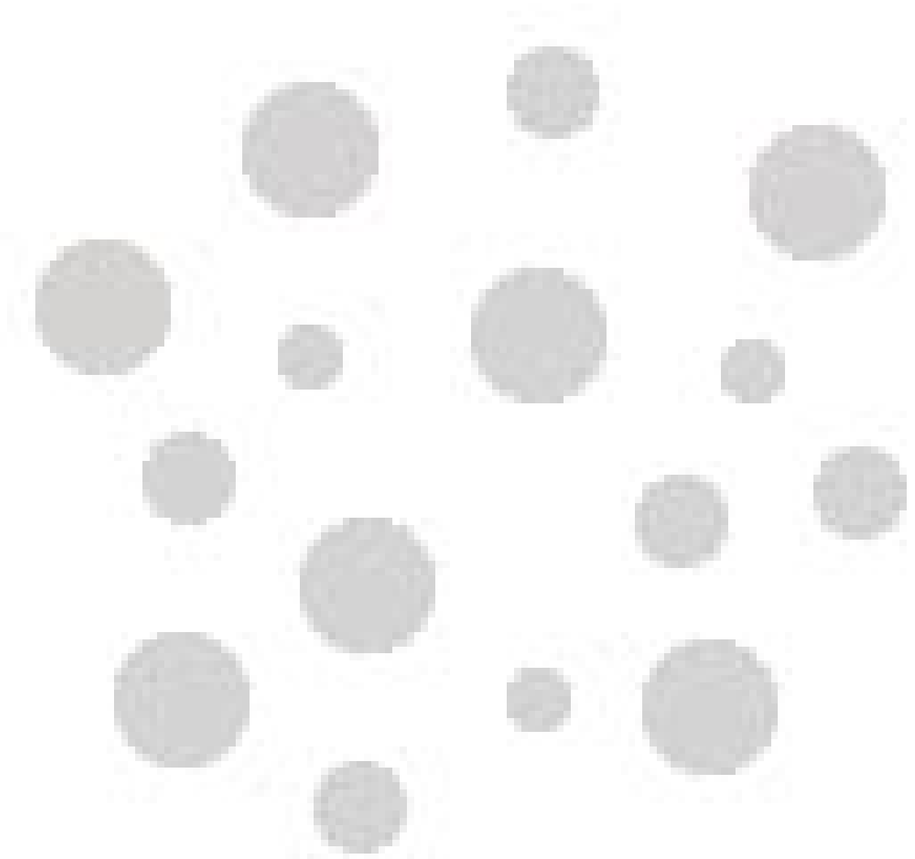
Photo: Flash of an Iridium Satellite (www.fbw.hs-bremen.de/~olbers/ag/foto/spu3_rb.htm 22.11.07)

No.1



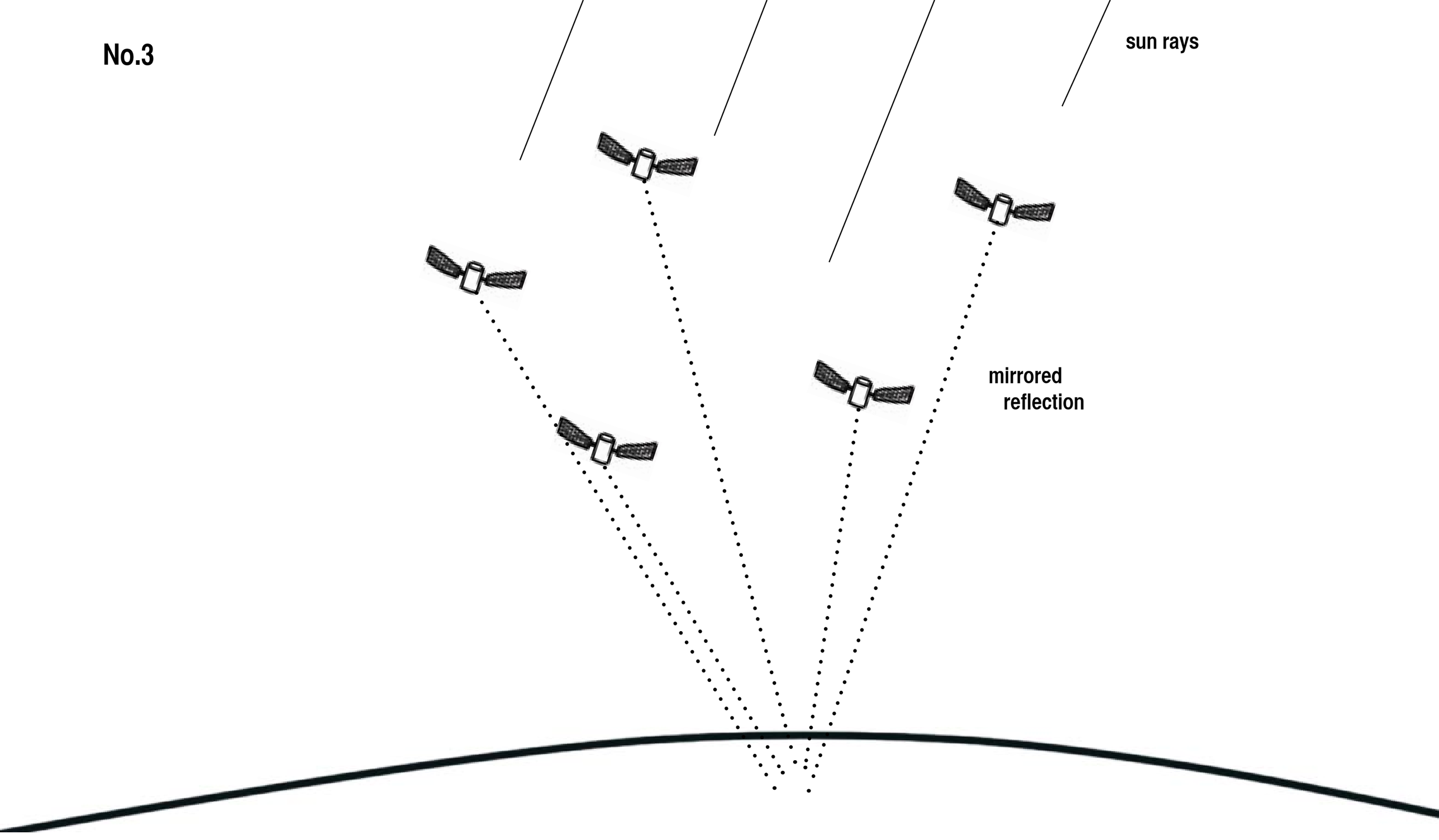
By unfolding a huge screen of biaxially-oriented polyethylene terephthalate (boPET) polyester film (i.e. Mylar, Melinex), held in place by formation flying satellites, the reflecting surface of the film sending sunlight towards the earth‘s surface. This film also can be lightened via lasers directed from the satellites or a further ‘ beamer-satellite ‘ .

No.2



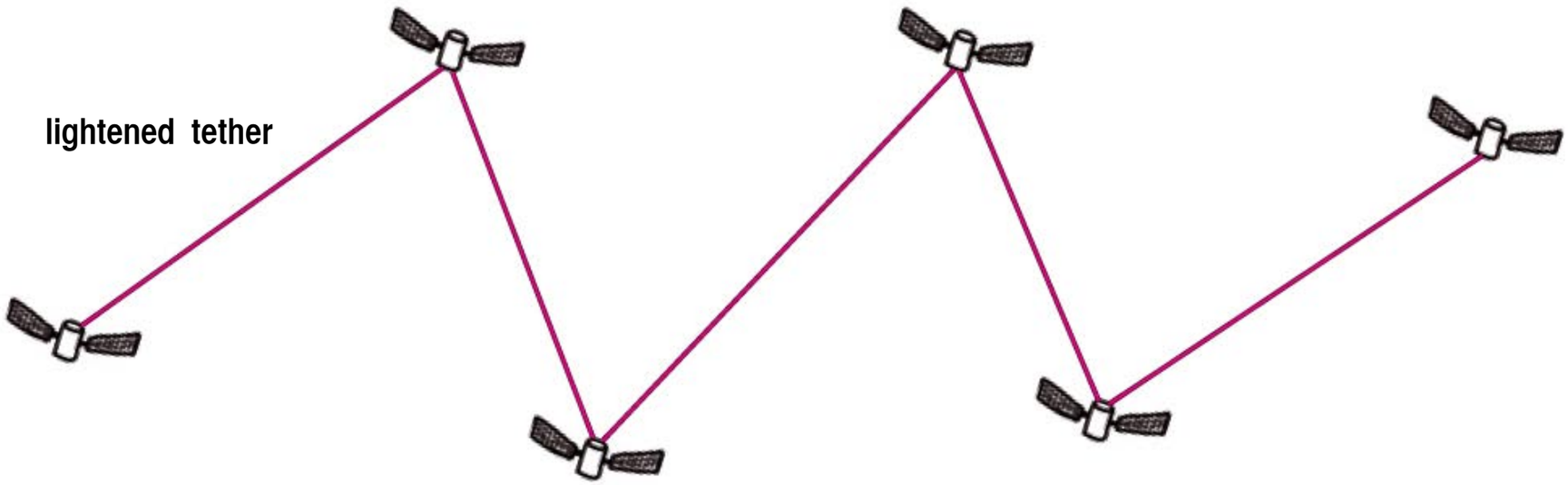
Using multiple spacecraft mission to create a ‘ blinking coloured light system ‘ towards the earth’s surface, visible by the human eye during the day or night time using solar laser conversion.

No.3



Using multiple spacecraft mission, light from the sun‘s rays is reflected from mirrors within each of the craft towards earth‘s surface.

No.4



Using multiple spacecraft mission connected to one another by tether, (the tethering system deploying a minimum of 30 km distance between the craft for earth visibility), with the facility to alter position so creating different pattern formations, illuminated by lasers.

No.5

An electrodynamic tether attached to a satellite, creating large electrical source to power lasers on board satellite.

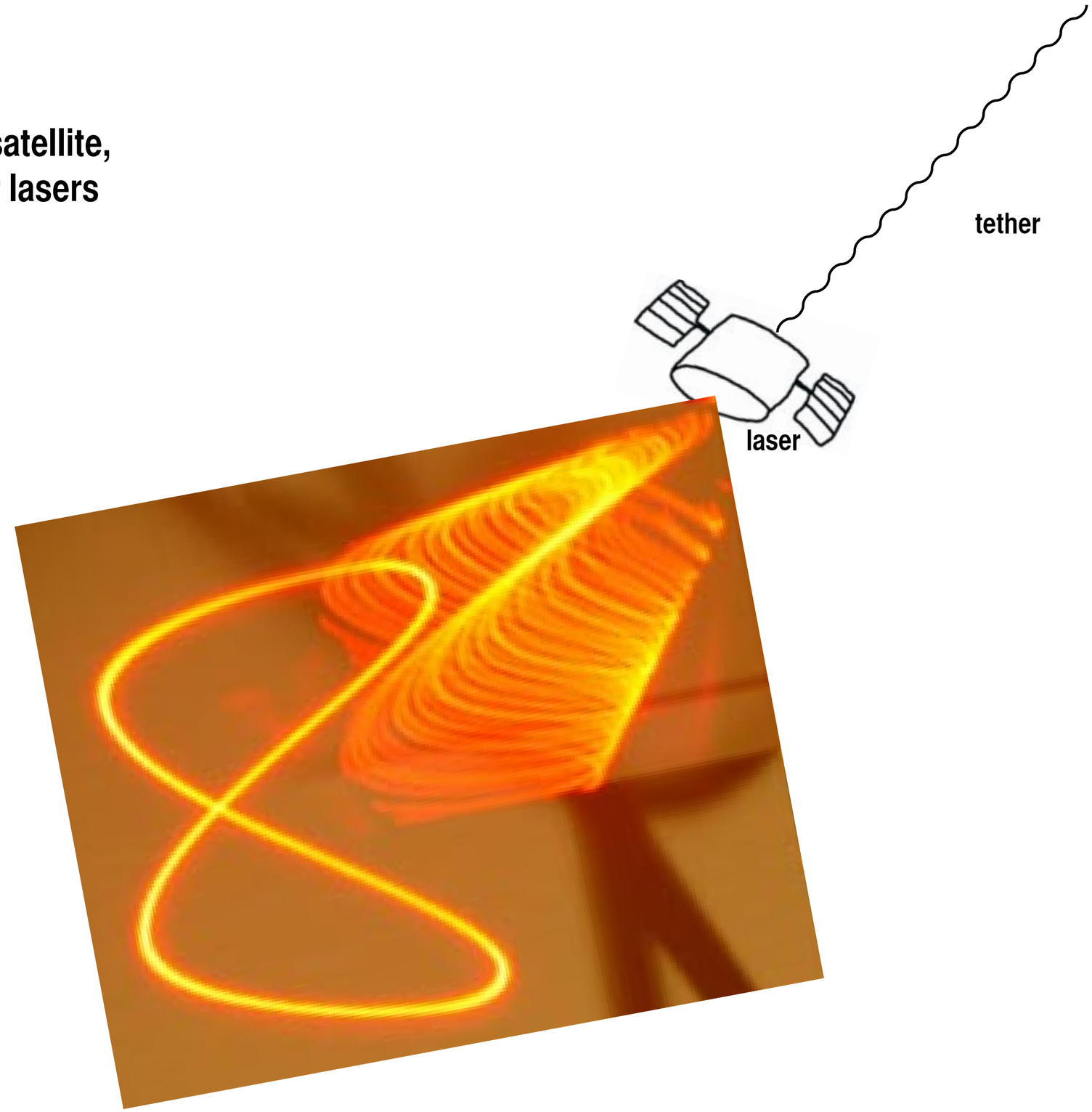


Photo: 3 D Laser Projection (http://www.k2.t.u-tokyo.ac.jp/fusion/LaserActiveTracking/ 29.11.07)

No.6

‘ Space Fireworks ‘ appearing as luminous orbs, as large as the moon to the human eye. These are the result of lithium vapor released into the ionosphere by rockets released from satellites. Sunlight strikes the lithium clouds as they disperse.

Photo: Space Fireworks (www.pinktentacle.com/images/space_fireworks_9.jpg 28.11.07)

from earth viewing to Near-Space

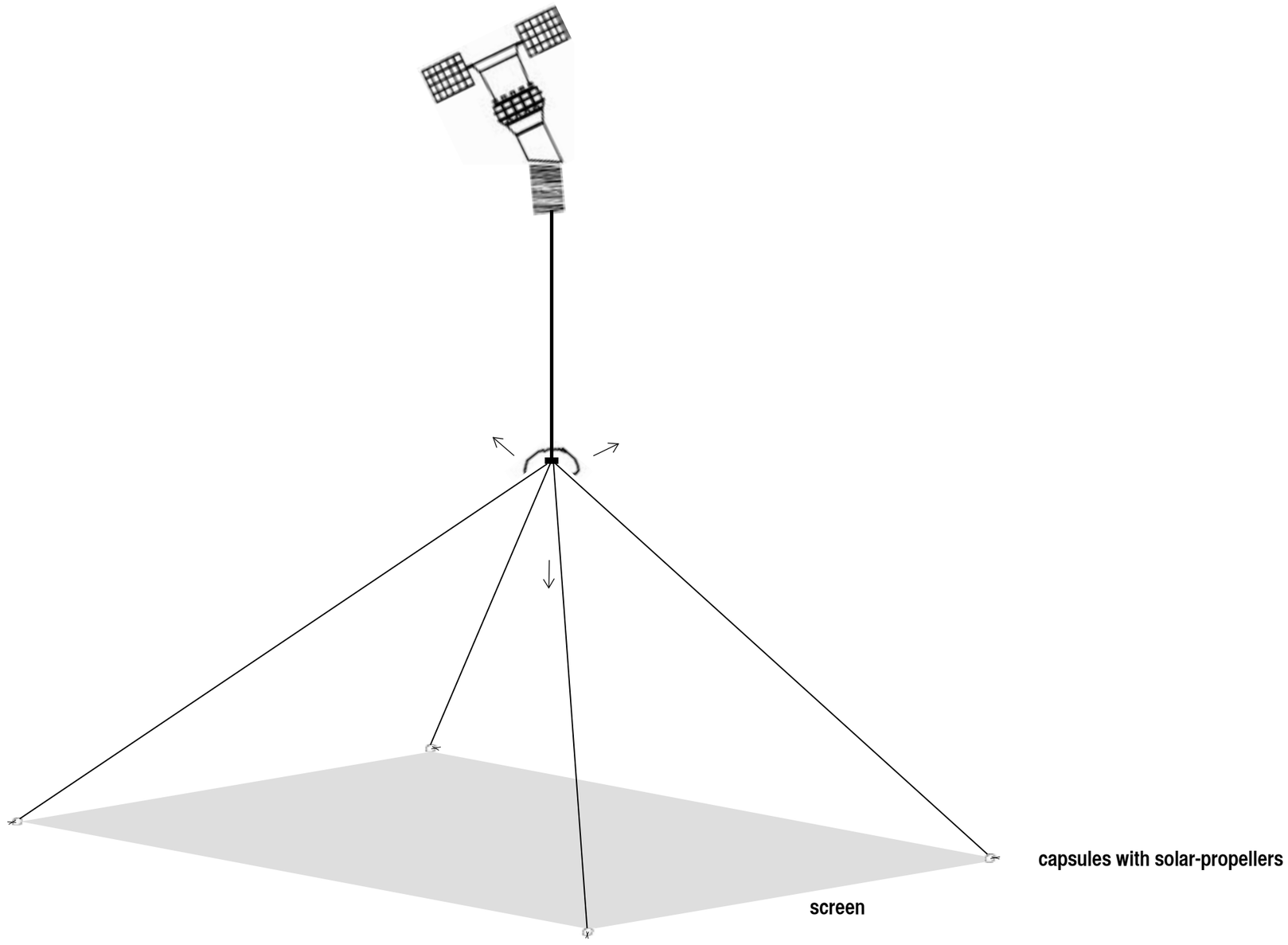
Photo: The Northern Lights in Greenland (http://www.greenlandholiday.com/AboutGreenland/NorthernLights/tabid/67/Default.aspx 17.11.07)

No.7

Using a conductive bare tape electrically floating in Low Earth Orbit as an effective electron beam source to produce artificial aurora effects in Near-Space.

Photo: The Northern Lights in Kangerlussuaq on Greenland‘s west coast (http://www.greenlandholiday.com/AboutGreenland/NorthernLights/tabid/67/Default.aspx 17.11.07)

No.8



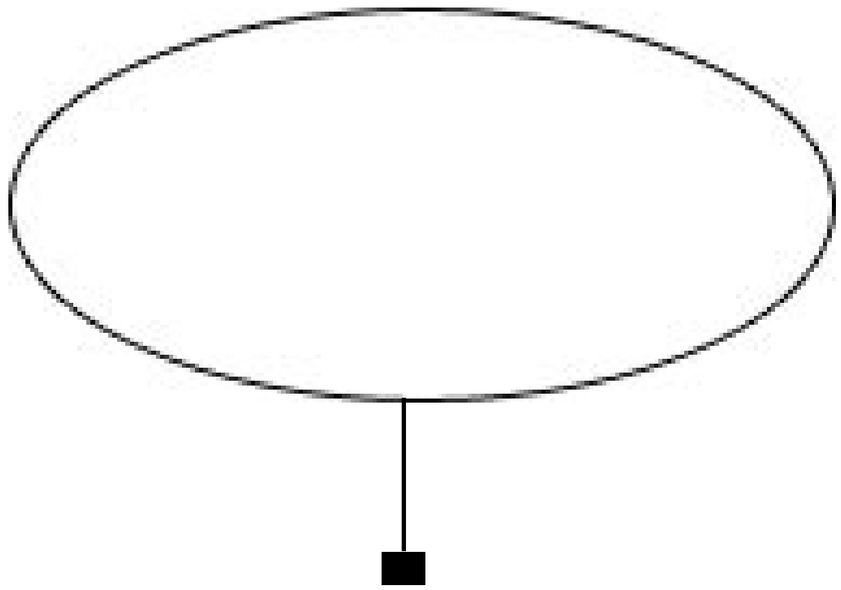
A large light weight capsule is released from satellite payload, via tether, containing a ‘ fold/unfold ‘ screen (biaxially-oriented polythene terephthalate, boPET, polyester film or woven conductive tether material). The reflecting surface sending sunlight towards the earth‘s surface. This is held in place, for example, by small capsules with solar propulsion. The screen can be additionally be high-lighted by lasers within these capsules.

from earth viewing to Air-Space

Photo: Bird Swarm (http://www.ice.csic.es/en/view_research_line.php?RID=19 31.10.07)

No.9

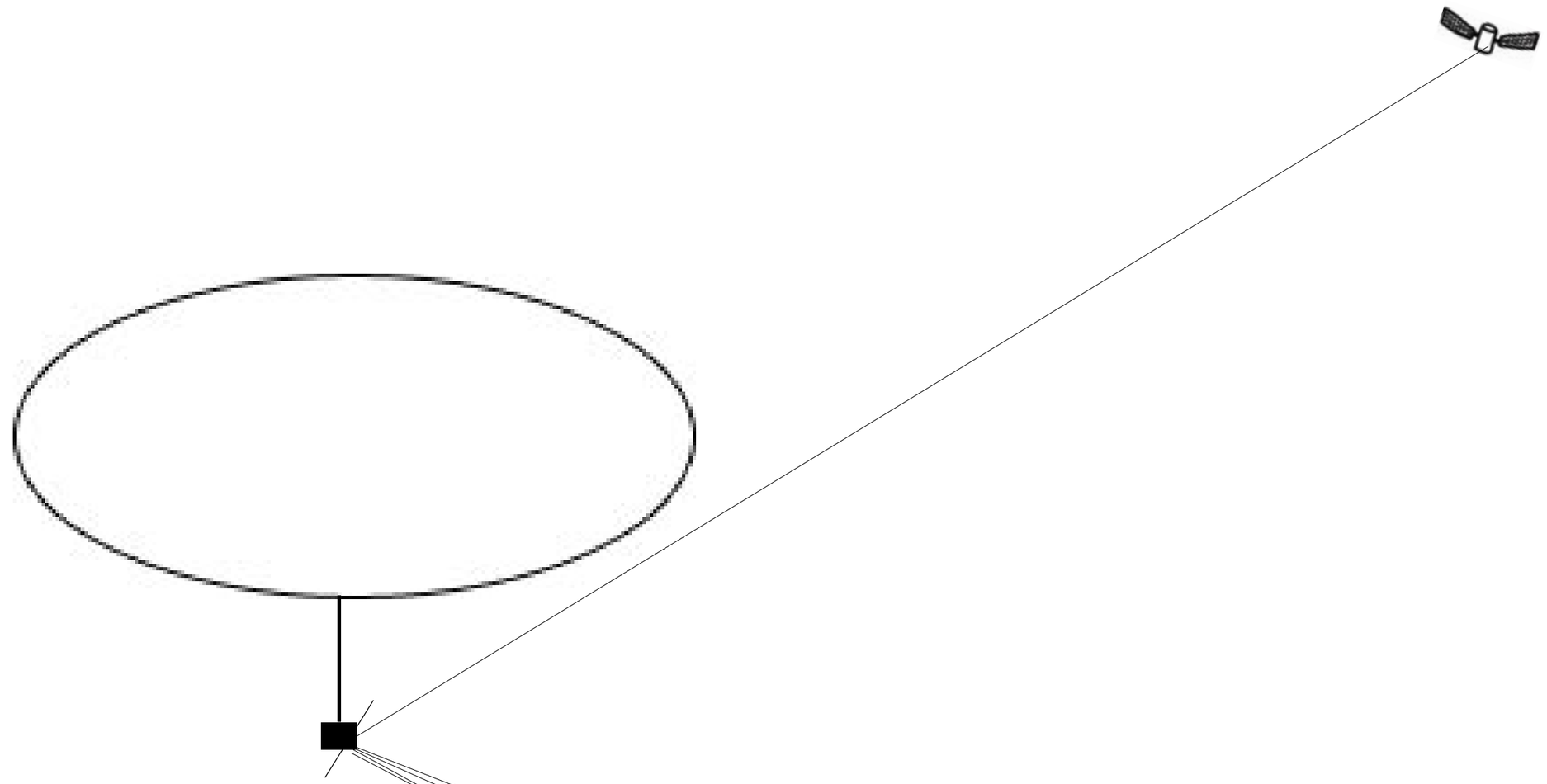
stratospheric balloon



Using a stratospheric Lighter Than Air (L.T.A) vehicle within Near-Space, carrying a payload employing 3D laser technology, postioned in line-of-sight contact above ground area with the beam projecting to Air-Space. (The payload laser power source via satellite from solar conversion).

Photo: 3 D Projection (www.interactivearchitecture.org/wp-content/im... 28.11.07)

No.10



Beaming a laser, via solar power from a Satellite, directed to a mirrored mechanism on board the Lighter Than Air (L.T.A) vehicle payload, directed via reflection a laser image that would appear on cloud formation in Air-Space.

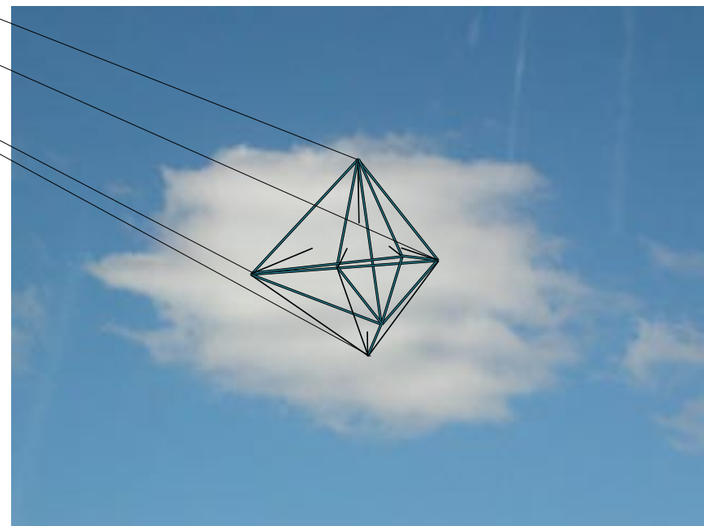
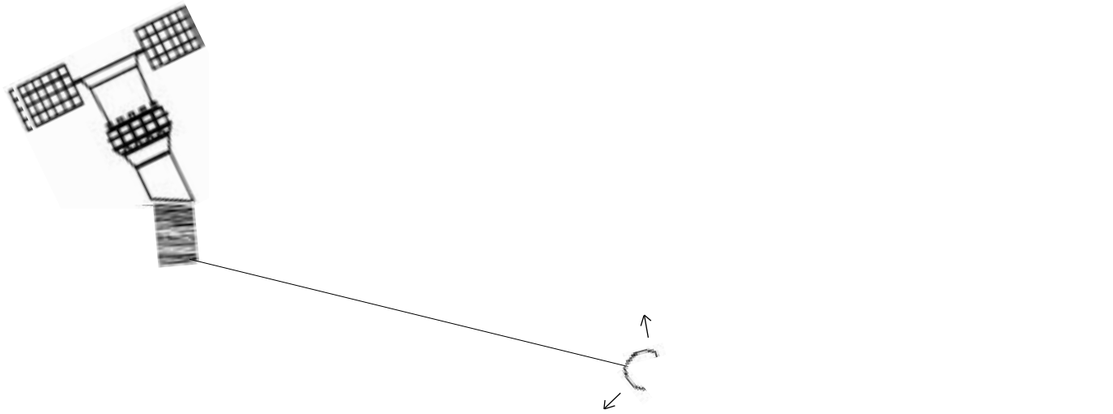
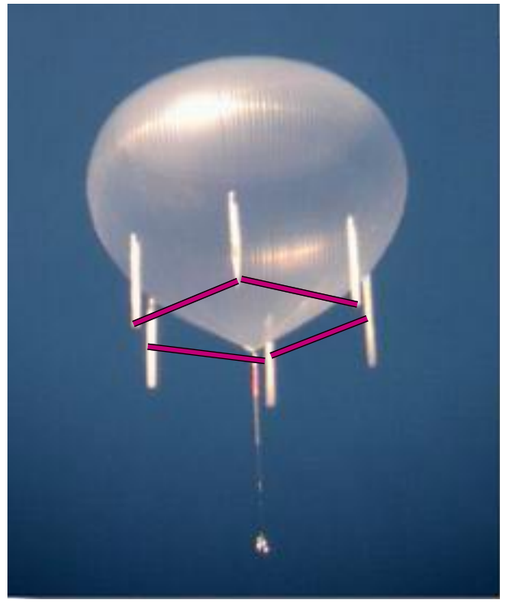


Photo: Cloud (jgt.akpeters.com/papers/Wang04/thumb_fig2.jpg 28.11.07)

No.11

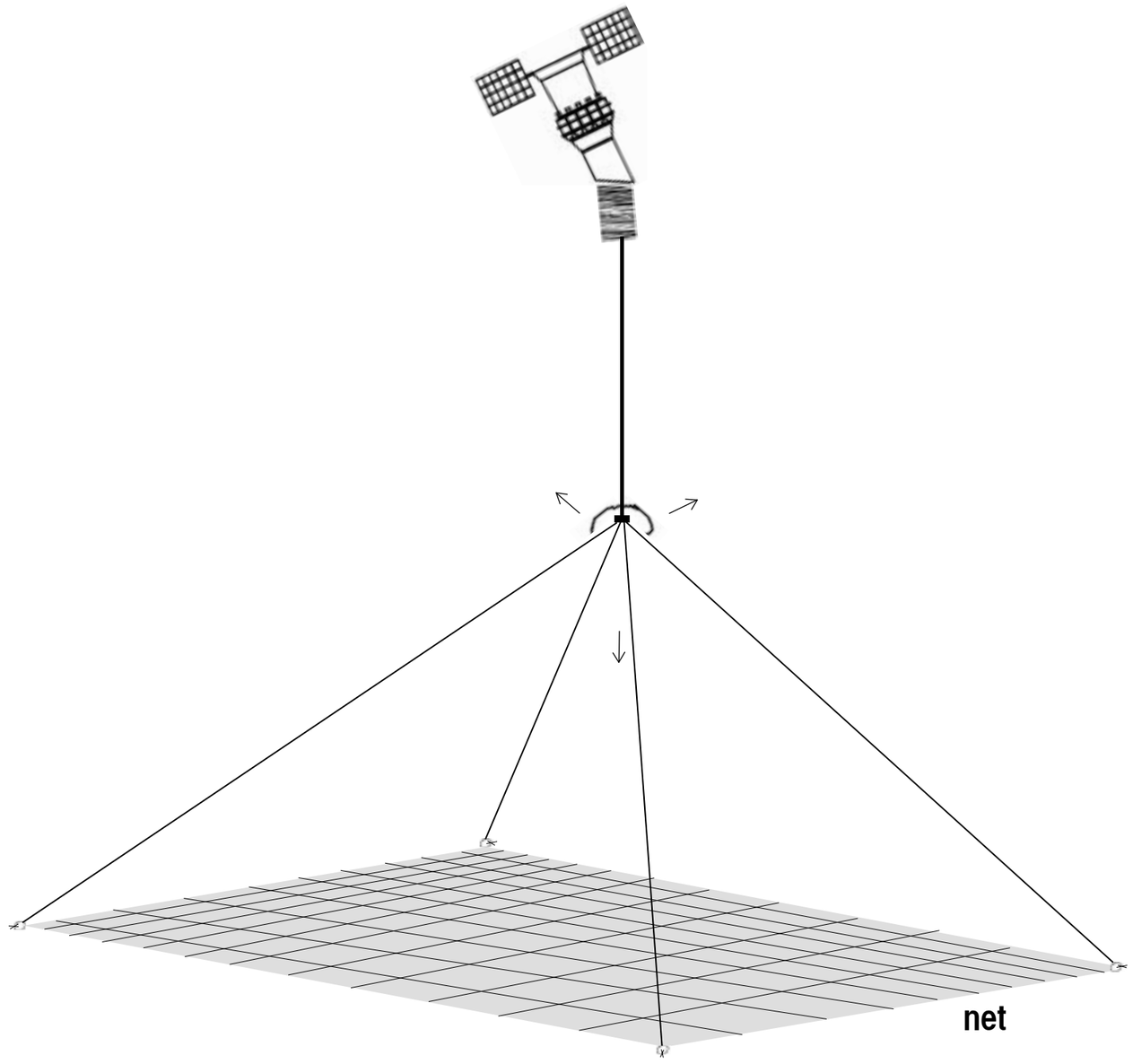




A light weight re-entry capsule is de-orbited into earth‘s atmosphere and releases a large ultra-long duration balloon deploying a series of small high-powered lasers, reflecting off the balloon surface.

Photo: Scientific Balloon (www.aerostar.com/scientificballoons.htm 21.11.07)

No.12



A large re-entry capsule containing a ‘ fold/unfold ‘ net of biaxially-oriented polyethylene terephthalate (boPET) polyester film (i.e. Mylar, Melinex). Each corner of the unfolded screen is held by individual propeller-capsules which guide the positioning - including angle. The film reflects the sunglight towards earth‘s surface. Additional lighting for over-cast conditions, including night-time, is conveyed via lasers.

Installing ‘ off-the-shelf ‘ tether technology on an already existing satellite (i.e. Orlets-1) deploying ‘ capsule machine ‘ : sending several capsules down to earth‘s atmosphere by tethers connected to the satellite.

How much time is needed to jettison the capsules into ‘ assemblage position ‘?

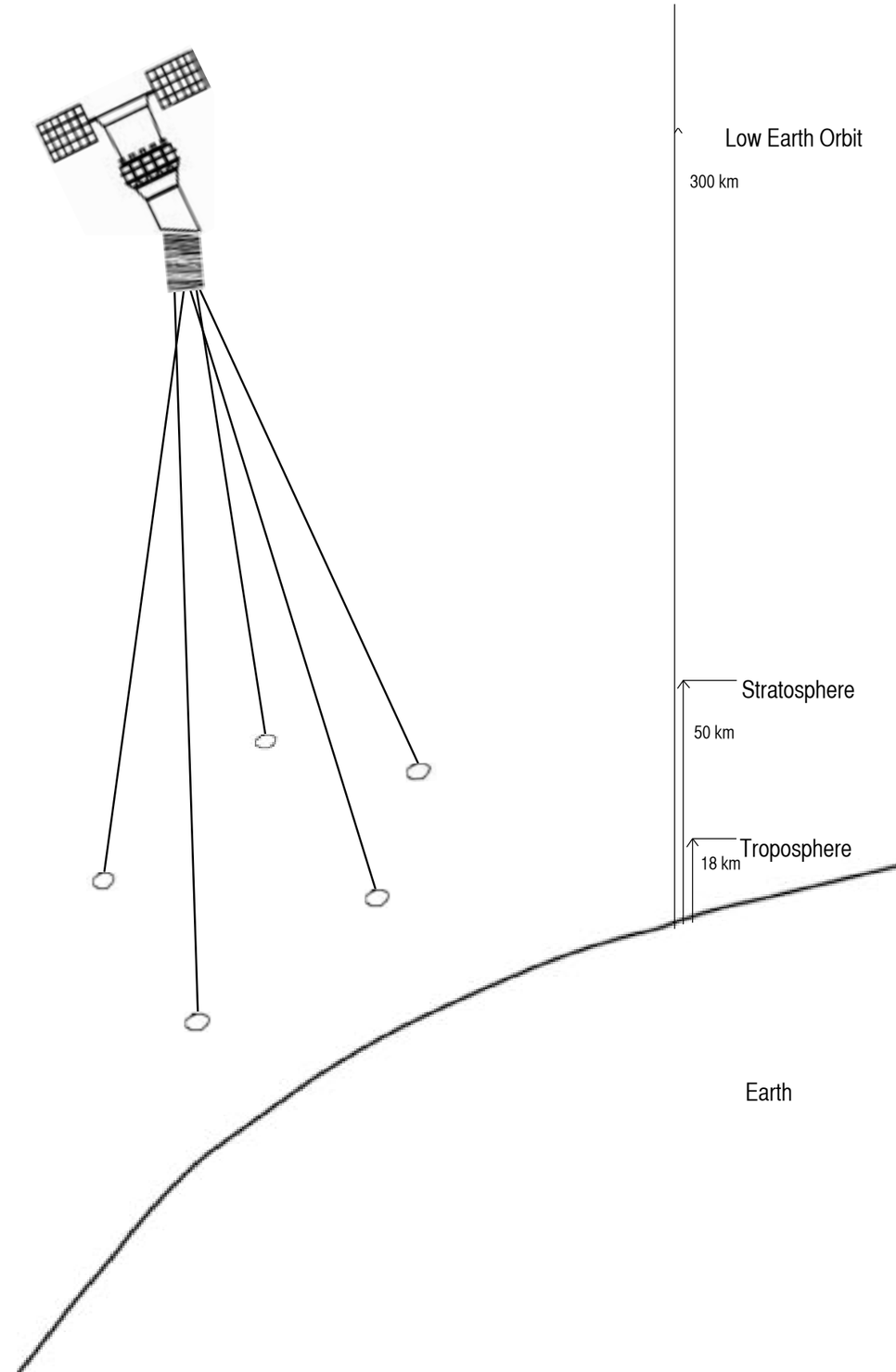
To what depth can the tether reach into earth‘s atmosphere?
i.e into the Troposphere?

Could the length of the tethers be adjusted via on-board mechanism?
i.e so that the ‘ assemblage postition ‘ could be adjusted in terms of cloud cover and non-cloud.

What would be the estimated ‘ tether lifetime ‘?
Baring in mind that they hang continuously between satellite and lower earth‘s atmosphere,
would there be possibility to develop material that would adjust to the stress of use in these conditions?

Can electro-magnetic technology be used to keep the capusles in a formation-position,
so that they don‘t hinder one-another?

Whilst the satellite is orbiting, can the tether‘s remain in this dropped-position?



Orlets satellites

Western experts attribute this satellite to the sixth generation while under the domestic classification it belongs to the second generation of optical intelligence satellites.

In May 1977 the Central Specialized Design Bureau in Samara (TsSKB) decided to develop several new photo-intelligence satellites. The models suggested for development included the Orlets system for large swath high resolution and panoramic photography with faster data delivery.

Under the plan the system was supposed to be developed in two stages. At the first stage the main parameters were to be achieved that did not require a significant change in the satellite weight (mainly the lifetime). At the second, after the development the Zenit-2 launch vehicle with a greater payload than Soyuz-U a modification satellite was supposed to be developed fully meeting the requirements of customers.

To speed up data delivery an automatic machine was added to package exposed films into small return capsules - so-called capsule machine.

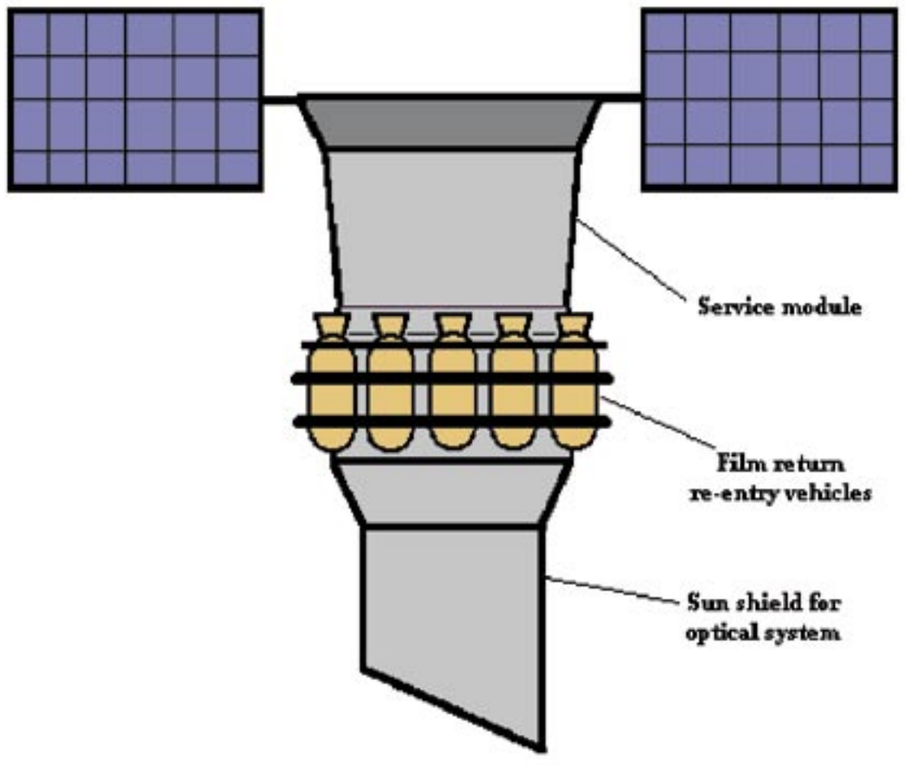
In 1981-1985 work was under way to develop Orlets of the first stage (sometimes known as Orlets-1). The satellite had a capsule machine with **eight capsules**. It was designed for being orbited by Soyuz-U or Soyuz-U1 launch vehicles.17 The first launch took place on July 18, 1989. On August 25, 1992, the system was approved for operation under the name of Don.18 So far six satellites of this type have been launched. Initially their service life was 58-60 days. The last two operated for 102 and 120 days respectively.19

When the second stage of developing Orlets was launched, Orelts-1 was evidently chosen as the prototype and a new capsule machine for **22 capsules** was designed for it. Thanks to this its lifetime could be increased almost four-fold to 160-180 days leaving the pace of deorbiting exposed films to earth unchanged. For Orlets-1 that had eight capsules and that initially flew for 58-60 days the rate was one capsule in 7-8 days.20

In 1994 the design work and ground testing of Orlets of the second generation were completed. The first flight test of Orlets-2 was conducted between August 26, 1994 and April 4, 1995. The mission lasted for 224 days.21 Even though Orlets-2 made only one test flight, on November 30, 1997 it was adopted for service and designated Yenisei.22 The second Orlets-2 was in orbit between September 25, 2000 and April 20, 2001.

http://mdb.cast.ru/mdb/6-2001/mas/rmhrsi/ (22.11.07)

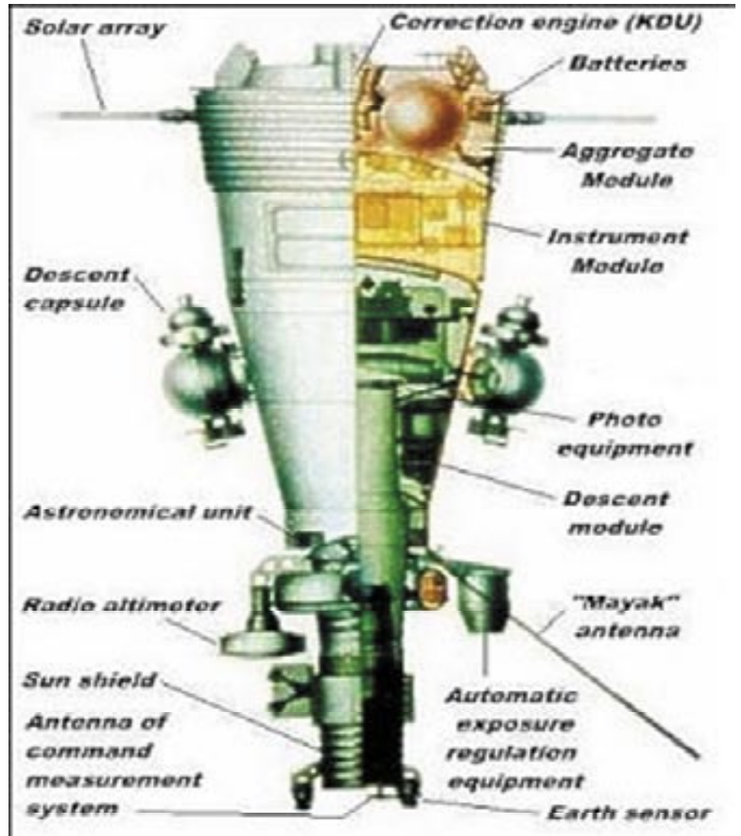
http://mdb.cast.ru/mdb/6-2001/mas/rmhrsi/ (22.11.07)



Yantar-2K

Yantar was the Soviet Union‘s second series of photo reconnaissance satellites, succeeding the Zenit series in the primary film reconnaissance role. Yantars were identified in the West as Fourth Generation Photo Reconnaissance Satellite‘. In comparison with the Zenit series, the Yantar was equipped with maneuvering engines to change the spacecraft‘s orbit, thereby providing more flexibility and surprise in photographing targets of interest. In common with the Zenit it was equipped with a large re-entry capsule which returned the camera and primary electronics for reuse. However it also had two small capsules for return of film before return of the main capsule. The design lifetime of Yantar was 30 days, as opposed to the 12 days of the Zenit. The SpK capsules would typically make interim film deliveries on the tenth and eighteenth days of flight.

http://www.astronautix.com/craftfam/yantar.htm (22.11.07)



Yantar-2K

Descent capsule

Photos: Jakob Terweij
Translation: Dmitry Pieson

No.13

By jettisoning capsules from satellites or capsules attached by tether, filled with coloured powder, released into the sky producing huge powder coloured installation on clouds. At night-time this could be fluorescent, glowing in the sky.

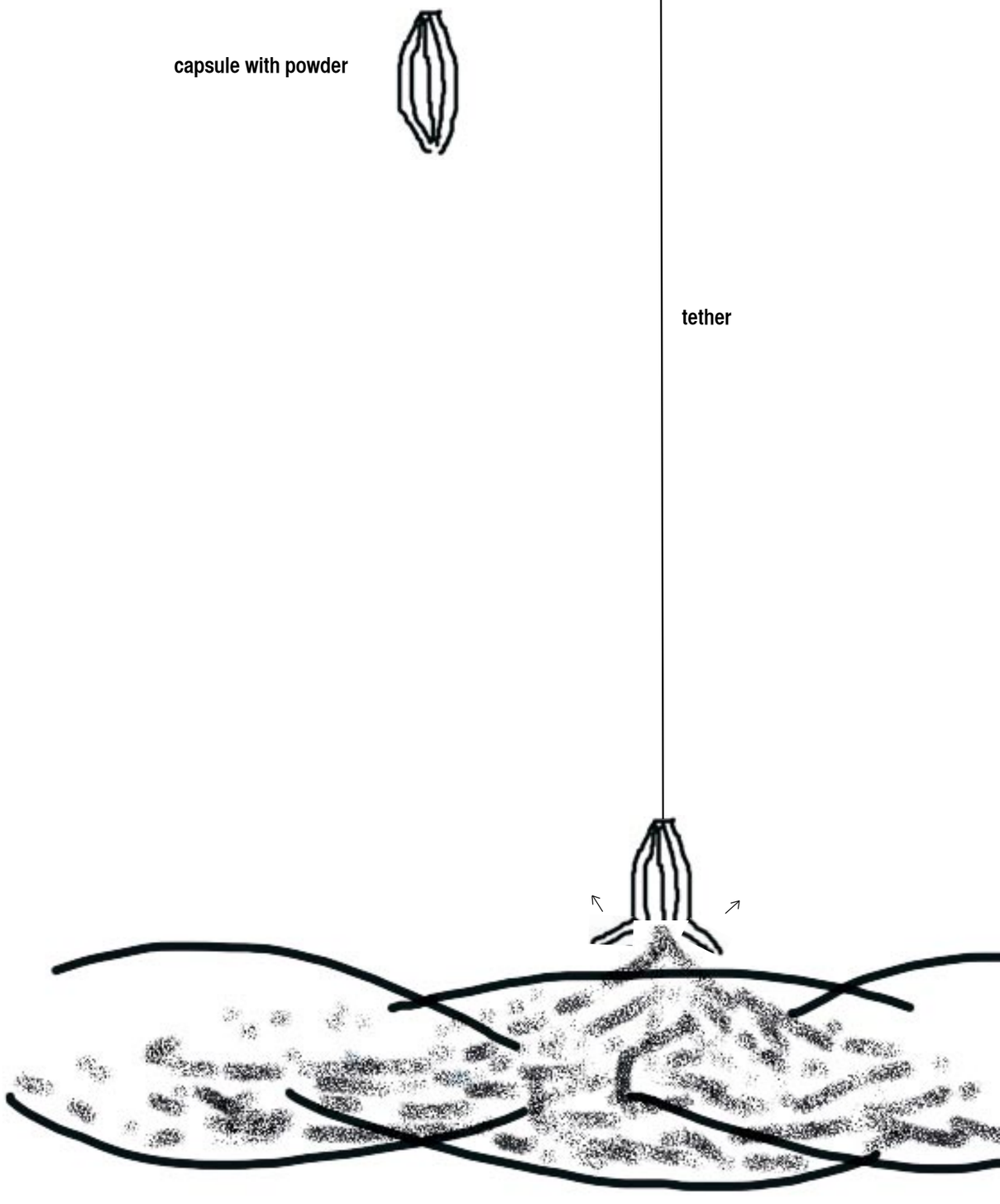
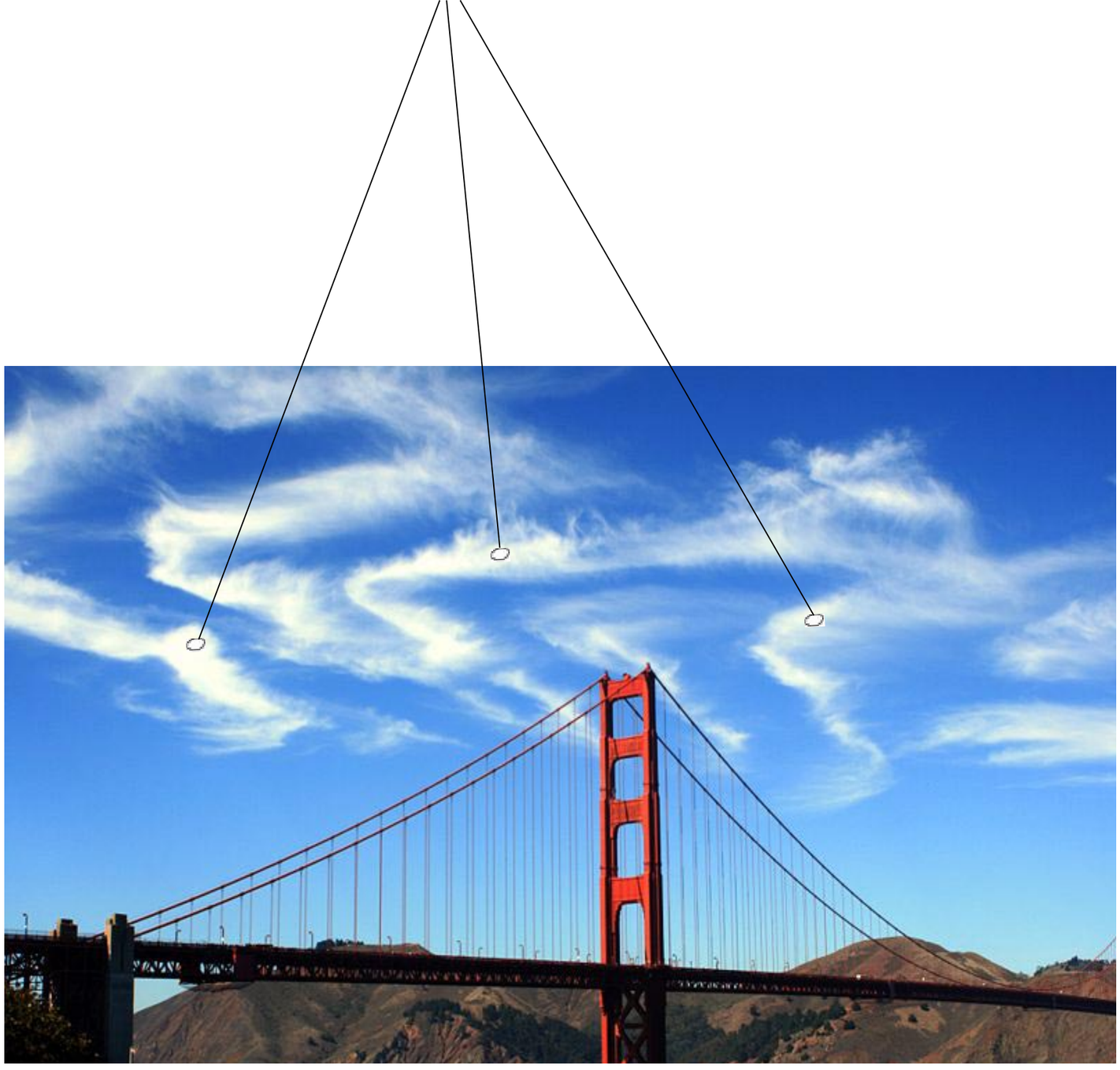


Photo: Clouds : 2006.11.09 11:44 (www.aphoenix.ca/photoblog/photos/Clouds.jpg 25.11.07)

No.14

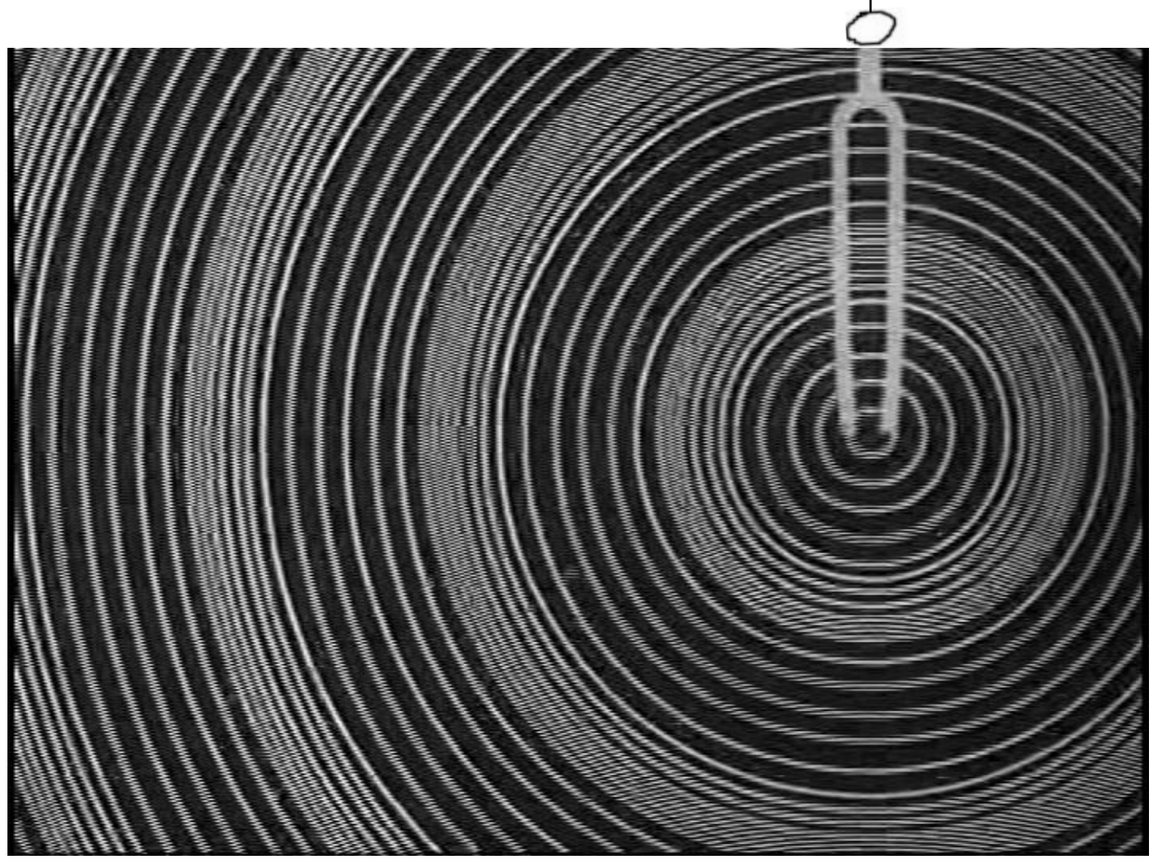
vapor trails



Phosphour vapor is released from capsules, dropped and hanging via tether into Air-Space, visible at ground level.

Photo: Cirrus Clouds over Golden Gate Bridge (http://commons.wikimedia.org/wiki/ 01.12.07)

No.15

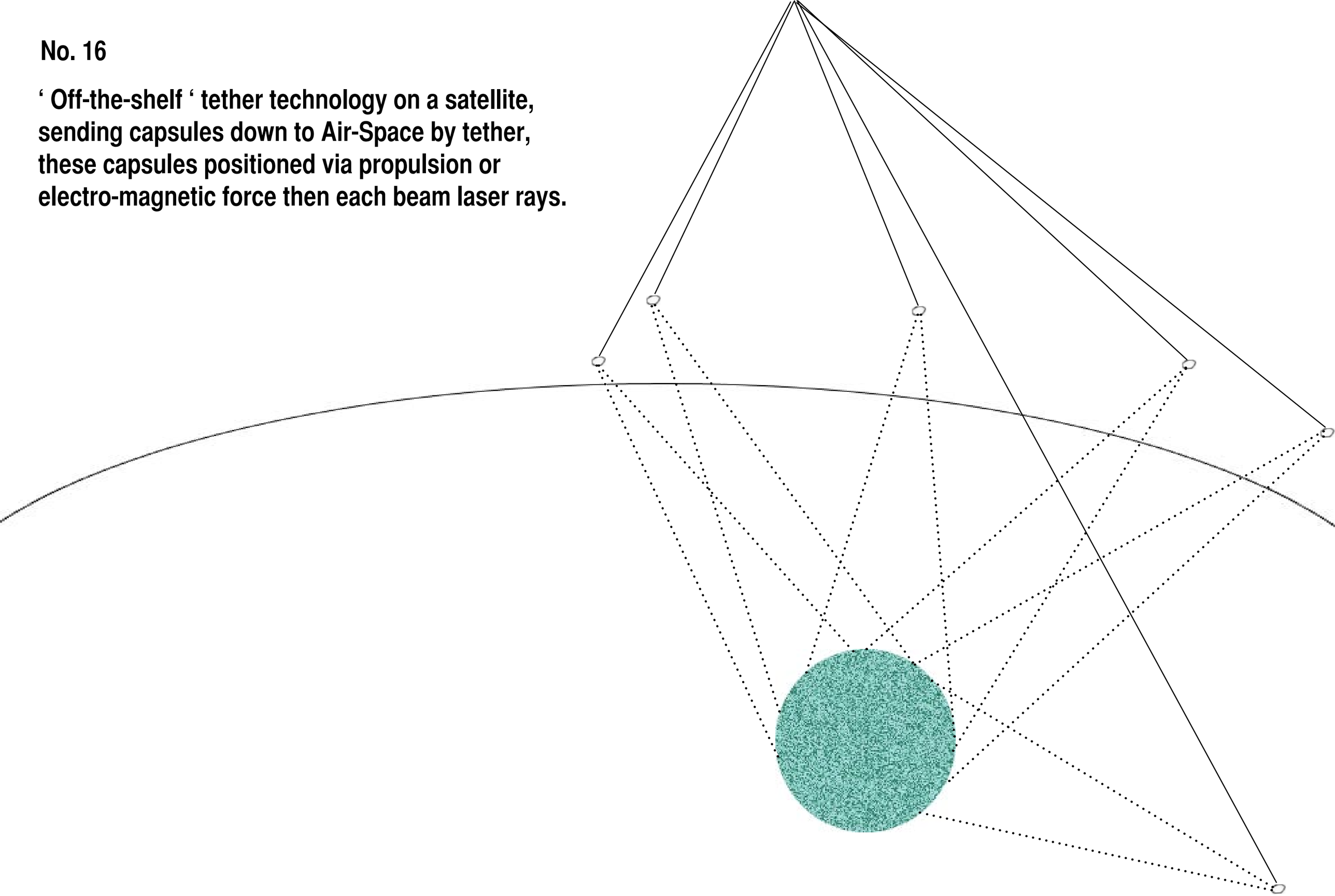


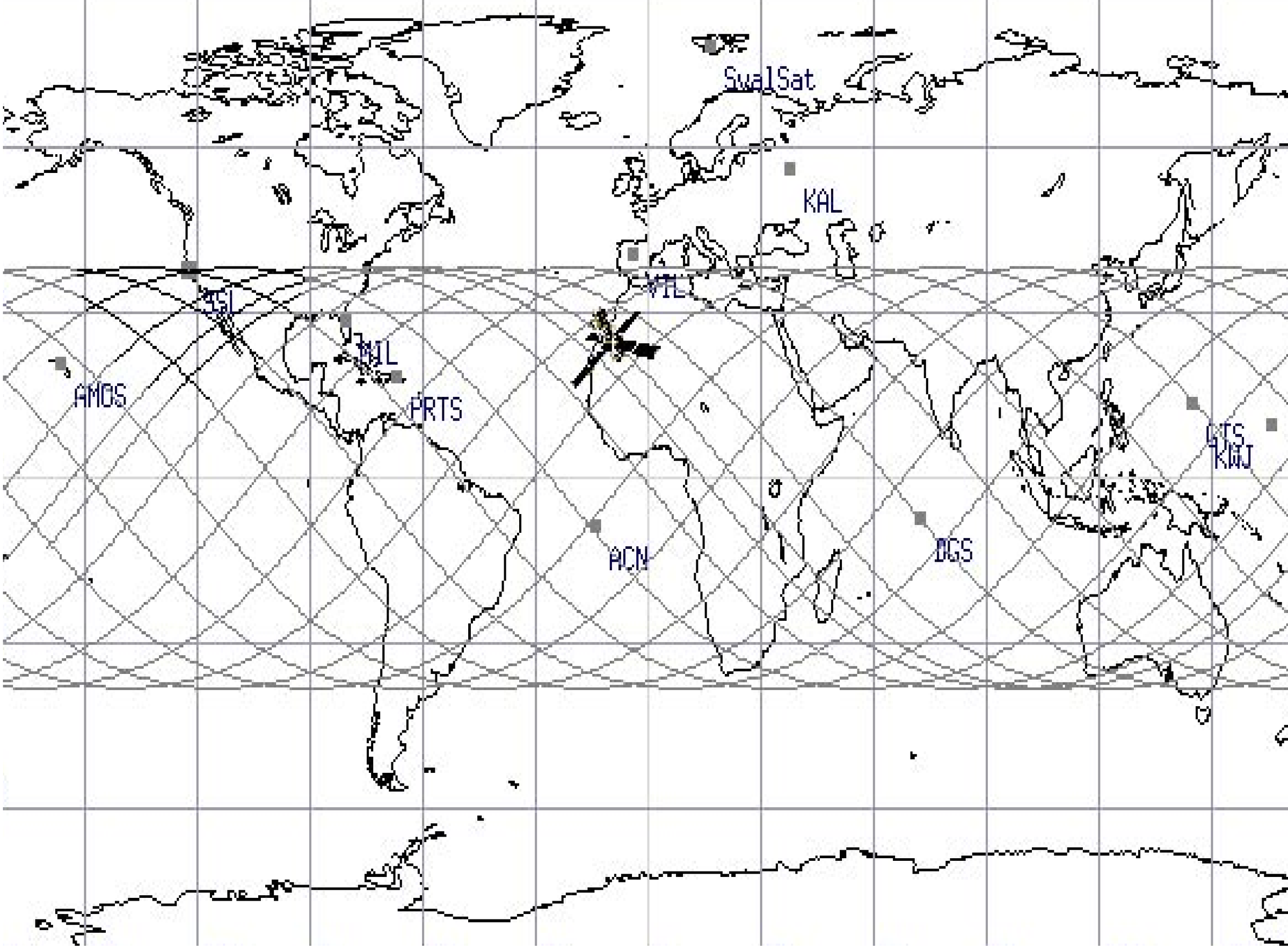
Sound emission transmitted from capsules, dropped and hanging via tether into Air-Space, in line-of-hearing contact, audible at ground level.

Photo: Sound Wave Physics Films DVD (1930s - 1940s) - Cover (www.qualityinformationpublishers.com 04.12.07)

No. 16

‘ Off-the-shelf ‘ tether technology on a satellite, sending capsules down to Air-Space by tether, these capsules positioned via propulsion or electro-magnetic force then each beam laser rays.





The world map of ground track showing 16 orbits for satellite HESSI. (http://hessi.ssl.berkeley.edu 02.12.07)

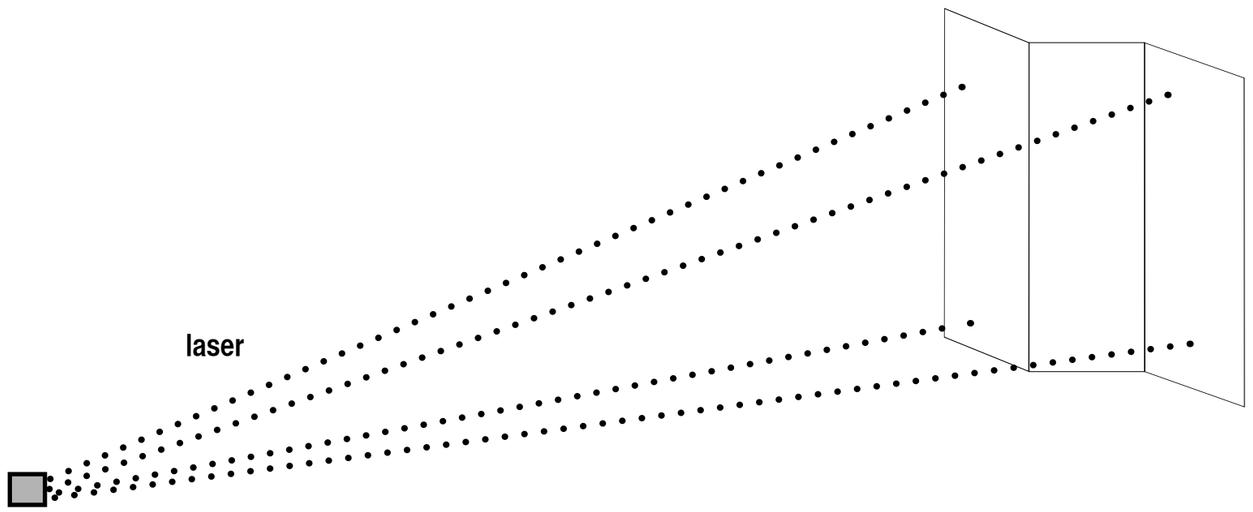
from earth viewing to Earth-Space

Photo: Berlin Earth (Satellite Art Works 01.12.07)

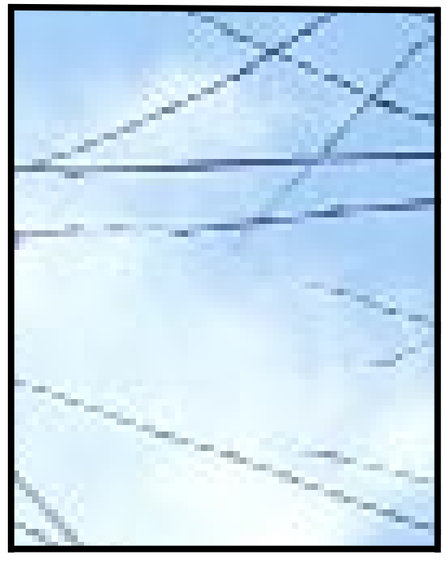
No.17

A ‘ Personal Alert Response Receiver ‘ capable of carrying a receiver which picks up broadcast transmissions of official early warning hazard disaster from satellite alert system. Light-weight robust material personalised to be worn on the body or as an independant unit which alerts via sound and vibration.

No.18



a.)
A series of light-weight reflective materials to be installed, for example, above the traffic light system, sides of building or hill sides. These are lit via laser to inform the warning. The control system is via satellite alert system.



b.)
In rural areas, a series of light portable panels centrally placed to community life, which emit sound transmission as the warning. The control system is via satellite.

SATELLITE ART WORKS CREATES ART CONCEPTS WHICH WE CALL - SPACE-ART-RESCUE -

INTENTION:

THE INTENSION OF THESE CONECEPTS IS FOR POSSIBLE USE WITHIN THE GLOBAL WARNING AND NATIONAL EARLY WARNING SYSTEMS IN THE AREA OF PREPAREDNESS IN DISASTER REDUCTION.

ART RESEARCH & CLIMATE CHANGE:

OVER THE LAST FIVE YEARS THE SEVERITY OF CLIMATE CHANGE IS PREDICTED TO HAVE THE MOST DEVASTATING EFFECT ON COUNTRIES IN THE SOUTHERN HEMISPHERE. THE INTENTION OF THE HYOGO FRAMEWORK FOR ACTION (2005-2015) AND THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) IS TO URGENTLY IDENTIFY GAPS IN THE EXISTING DISATER REDUCTION SYSTEMS GLOBALLY AND NATIONALLY AND ADDRESS THESE CHALLENGES.

VISION:

SATELLITE ART WORKS SEES ITSELF AS PART OF ONE OF THE MANY PROJECTS WORLD WIDE TO ADDRESS THIS CHALLENGE. THEIR WORK IS SPACE BASED, A DELIBERATE INTENTION TO OFFER A SOLUTION FROM A DECENTRALISED, NON-EARTH BOUND POSITION.

SPACE ART:

THESE WORKS APPEAR FROM THE EARTH AS VISIONS, IMAGES OR SOUNDS, ACTING AS CONVEYING WARNING MESSENGER, ADAPTED TO THE CLIMATIC HAZARD AND PART OF OTHER ASPECTS OF AN EXISTING EARLY WARNING SYSTEM.

PRESENTATION:

THIS PRESENTATION IS A CONCEPT-NOTE OF HOW THIS SPACE-ART-RESCUE IS VIEWED BY THE ARTISTS .

Index of Space-Art-Rescue Ideas

EARTH VIEWING TO OUTER-SPACE:

No.01 ‘ Screen in Outer-Space‘ - polyester film distributed between formation flying spacecraft (see footnote below), acting as sun-lit reflective screen lit additionally by lasers.

No.02 ‘ Blinking Coloured Light System ‘ - deploying multiple satellites aimed towards earth‘s surface.

No.03 ‘ Satellite Mirrors‘ - satellites using mirrors reflecting sunlight towards earth‘s surface.

No.04 ‘ Formation Tether Laser Spacecraft‘ - multiple flying spacecraft, the tethering system illuminatd by lasers.

No.05 ‘ Laser Tether ‘ - satellite deploying electrodynamic tether creating electrical source to power on-board laser.

No.06 ‘ Space Fireworks ‘ - exploratory space rockets releasing lithium vapor.

EARTH VIEWING TO NEAR-SPACE:

No.07 ‘ Aurora Borealis ‘ - conductive bare tape electrically floating in Low Earth Orbit as electron beam source.

No.08 ‘ Screen in Near Space ‘ - satellite releases light-weight capsule with ‘ unfold/fold ‘ screen tether-supported with capsules positioned by propulsion. Sunlight reflects towards earth‘s surface with additional laser lighting.

EARTH VIEWING TO AIR-SPACE:

No.09 ‘ L.T.A + 3D Laser Projection ‘ - a Lighter Than Air Vehicle within Near-Space, projects a 3D laser Mid-Air Projection.

No.10 ‘ Satellite, L.T.A, Laser ‘ - laser directed from a satellite to on board mirror mechanism in a Lighter Than Air Vehicle which reflects image to a cloud formation acting as the screen.

No.11 ‘ Ultra Balloon + Laser ‘ - a light weight re-entry capsule de-orbts releasing an ultra-long duration balloon with a series lasers.

No.12 ‘ Screen in Air-Space‘ - a polyester net released from light weight capsule tethered to a satellite, with ‘ unfold/fold ‘ tether-supported with capsules positioned by propulsion. Sunlight reflects towards earth‘s surface with additional laser lighting.

No.13 ‘ Powder Installation‘ - tethered capsules jettisoned from a satellite releasing coloured powder/fluroescent powder over cloud foramtion. Alternative lighting via earth-directed laser.

No.14 ‘ Smoke‘ - tethered capsules jettisoned from a satellite release phosphor vapor into the sky.

No.15 ‘ Transmission‘ - tethered capsules jettisoned from a satellite releasing sound transmission.

No.16 ‘ Off-the-Shelf Lasers ‘ - tethered capsules jettisoned from a satellite with on board propulsion mechanism to positon , each with on-board lasers.

EARTH VIEWING TO EARTH-SPACE:

No.17 ‘ Personal Alert Response Receiver ‘ - a light weight unit or body worn receiver picking up broadcast transmission of official early warning hazard from satellite alert system.

No.18a ‘ Satellite Laser Panel ‘ - light weight reflective panels installed with ability to pick up ground laser transmission controlled by satellite alert system.

No.18b ‘ Satellite Sound Panel ‘ - light weight material installed with the ability to pick up and transmit sound transmission controlled by satellite alert system.

*spacecraft mission is used to describe satellites flying by fundamental formation flying principle. For example, this may be distibuted, cluster or swarm satellites

THANK YOU !

SATELLITE ART WORKS (S.A.W.)

creating space art works

Berlin, Germany 2007

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