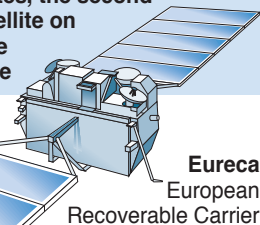


# Shuttle to attempt rope-trick in space

The orbiter Atlantis is due to launch two satellites, the second of which – an attempt to reel out a tethered satellite on the end of a 20km line – is potentially one of the most dangerous tasks ever undertaken in space

The first satellite, Eureka, will be launched to a 400km orbit where it will spend one year performing experiments for the European Space Agency. It will be recovered by Atlantis in June 1993



**Eureka**  
European  
Recoverable Carrier

**Tethered  
Satellite System**

## Artificial gravity

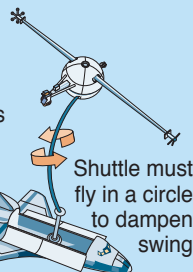
As the satellite and shuttle revolve around the earth at the same velocity, but with one craft at a greater radius orbit, different centrifugal forces will produce tension in the tether. This could be used to create artificial gravity in a space station

Sensors measure changes in magnetic field

## Danger points:

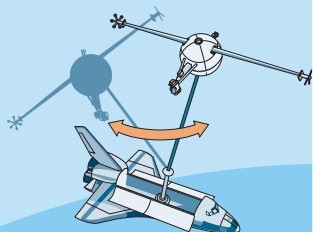
### Skip-rope effect

Tether will swing in 100 metre arc as it moves through earth's magnetic field



Shuttle must fly in a circle to dampen swing

### Pendulum effect



Skip-rope effect changes to pendulum movement as satellite is reeled in. Tether could wrap around shuttle.

## Electrical power

As the tether slices through the earth's magnetic field at 27,300kmh it will generate an electrical potential of up to 5,000 volts

Instruments on retractable booms measure electrical charges surrounding satellite

Conducting tether:  
2.5mm copper wire  
core encased  
in nylon and  
carbon fibre

Electrons collected by the tether will flow down the copper core to the Atlantis where an electron gun will fire them into space thus completing the circuit and generating electrical current