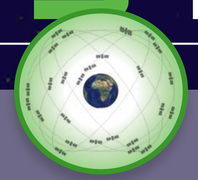
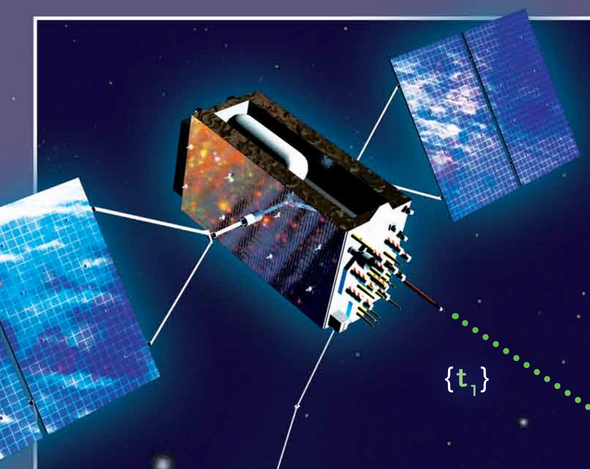
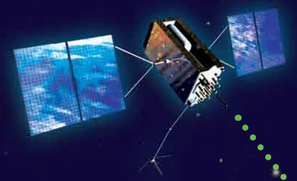
HOW GPS WORKS

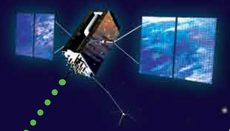


GPS

IS A CONSTELLATION OF 24 OR MORE SATELLITES FLYING 20,350 KM ABOVE THE SURFACE OF THE EARTH. EACH ONE CIRCLES THE PLANET TWICE A DAY IN ONE OF SIX ORBITS TO PROVIDE CONTINUOUS, WORLDWIDE COVERAGE.







{t_1}

1 GPS satellites broadcast radio signals providing their locations, status, and precise time {t_1} from on-board atomic clocks.

{c}

2 The GPS radio signals travel through space at the speed of light {c}, more than 299,792 km/second.

{t_2}

3 A GPS device receives the radio signals, noting their exact time of arrival {t_2}, and uses these to calculate its distance from each satellite in view.

To calculate its distance from a satellite, a GPS device applies this formula to the satellite's signal:

distance = rate x time

where **rate** is {c} and **time** is how long the signal traveled through space.

The signal's travel **time** is the difference between the time broadcast by the satellite {t_1} and the time the signal is received {t_2}.

The GPS Master Control Station tracks the satellites via a global monitoring network and manages their health on a daily basis.

Ground antennas around the world send data updates and operational commands to the satellites.

4 Once a GPS device knows its distance from at least four satellites, it can use geometry to determine its location on Earth in three dimensions.

The Air Force launches new satellites to replace aging ones when needed. The new satellites offer upgraded accuracy and reliability.

How does GPS help farmers? Learn more about the Global Positioning System and its many applications at

WWW.GPS.GOV