How satellites are used in everyday life media essay

Satellites have many types, applications and uses in our daily life. This report will discuss the work process of satellites, its types and its military or non military applications; also it will list the most important countries and entities that have the technology of manufacturing and launching satellites and countries that owns satellites, then the report will show the widely used applications of satellites in the daily life.

We all hear about satellites and its wide use in the modern life, but how many of us can really understand how satellites work or really know about the different uses of satellites.

Satellites technology has developed to extend the use of satellites to be used for different purposes and uses. Satellites now used for many military applications and non military applications like communications, navigation, weather forecasting and many other applications that serves man’s need and make life easier and better.

This report will discuss the work process of satellites, its launching process, its orbits and its coverage areas. Then the report will discuss its types, military and non military applications; also it will list the most important countries and entities that have the technology of manufacturing and launching satellites and countries that owns satellites, then it will show the widely used applications of satellites in the daily life.

III-Satellites Types and Applications:

In this section we are going to discuss the different types of satellites that are used nowadays, and it is in the military and non-military applications.

A) Communications Satellites:

One important type of satellites is the communications satellites that are used and designed for the purpose of telecommunications. Telecommunications include many applications which may be military or non-military applications; some of the non military telecommunications applications that are used by the communications satellites as telephony, satellite television, fixed satellite services, direct broadcasting, mobile satellite technology, satellite radio, satellite internet and others.

Communications satellites have great effect on our daily lives. They link remote areas of the Earth with telephone and television through the telephony systems and the wireless networks, this affects modern financial business through this high speed communications.

The newspaper USA Today is typeset and transmitted to printing plants via satellite. (Source: www. gma. org)

Applications of the communications satellites:

1-Satellite Television: It is one of the important applications that most of the people use in their daily life. Now most the people of the world use satellite T. V receivers to see the channels from all over the world, this makes the world more close to each other and also affects the speed of knowing the news and many things that happened at regions far away from each other. In fact it had a great role in making the world’s global village.

2-Telephony:

Telephony was an important application for communication satellites as is was in intercontinental long distance telephony. The fixed Telephone Network relays telephone calls from land line telephones to an earth station, where they are then transmitted to satellites. Although some decline in the use of satellites for fixed telephony in the 21st century as the technology of in submarine communications cables was developed through the use of fiber-optics, they still serve remote islands and countries where landline telecommunications doesn’t existent, Satellite phones connect them directly to a low-earth-orbit satellites then calls are then forwarded to a satellite teleport connected to the public telephone network or to another satellite phone system.

3-Satellite Radio: Satellite radio offers audio services allow listeners to listen to the same audio programming anywhere. A satellite radio or subscription radio (SR) is a digital radio signal that is broadcast by a communications satellite, which covers a much wider geographical range than terrestrial radio signals. Satellite radio provides alternative to ground-based radio services in some countries, as the United States. Radio services are usually provided by commercial ventures and are subscription-based. Providers usually carry a variety of news, weather, sports, and music channels, with the music channels generally being commercial-free.

4-Satellite Internet: Communications satellites have been used to connect to the Internet via broadband data connections. This can be very useful for users who are located in very remote areas, and cannot access a broadband connection. Satellite Internet services are used in locations where terrestrial Internet access is not available, and also for users who need mobile internet access ability. Broadband Internet access via communications satellite is available almost all over the world, including at sea and mobile land vehicles making them connected to the world. Satellite internet customers range from individual home users with one PC to large remote business at sites with several hundred portable laptops. Satellite modems are now widely used and they have commonly used connectors such as Ethernet or Universal serial bus.

B) Navigation Satellites: http://www. gma. org/surfing/satellites/sat_nav. html

Navigation is used for estimating the position of a vehicle on sea, in air or space and on land to ensure that the chosen route is followed accurately,

both in the short and long term. Short term navigation is required for making instantaneous changes in direction, speed and acceleration to avoid an obstacle, and long term navigation is used for making a general correction to a route.

One of the first applications of artificial Earth satellites was for navigation. Very early in the Space Age, researchers realized that constellations of satellites could be put in orbit to permit ships, aircraft, or other vehicles to precisely determine their locations. A number of navigation satellite constellations have been put into orbit, with the most prominent being the US “ Global Positioning System (GPS)”.

In recent years receivers of satellite navigation systems, and in particular the GPS, have become a personal and mobile communications accessory due to a significant reduction in receiver costs, making them a part of regular gear carried by explorers, travellers, fleet managers, rally organizers, etc.

The GPS constellation was established by the US military for support of American forces in the field, but it is now in widespread use for public and commercial applications as well. It is now being complemented by other navigation satellite systems. This document describes the history, principles, and applications of navigation satellite systems, particularly GPS.

The Global Positioning System (GPS) is a U. S. space-based global navigation satellite system. It provides positioning, navigation, and timing services to worldwide users at any time in anywhere on or near the Earth.

GPS has become a widely used for navigation worldwide, and a useful tool for map-making, land surveying, commerce, scientific uses, tracking and surveillance, and hobbies such as geocaching and waymarking.

Also it is used in many applications including the study of earthquakes and as a time synchronization source for cellular network protocols.

GPS has become a mainstay of transportation systems worldwide, providing navigation for aviation, ground, and maritime operations. Disaster relief and emergency services depend upon GPS for location and timing capabilities in their life-saving missions.

The accurate timing that GPS provides facilitates everyday activities such as banking, mobile phone operations, and even the control of power grids. Farmers, surveyors, geologists and countless others perform their work more efficiently, safely, economically, and accurately using the free and open GPS signals.

Satellites for navigation were developed in the late 1950’s as a direct result of ships needing to know exactly where they were at any given time. In the middle of the ocean or out of sight of land, one can’t determine an accurate position by looking out the window.

Satellite navigational systems as (NAVSTAR) enable a traveler to obtain his position anywhere on or above the planet.

Using a commercial Global Positioning System (GPS) locator, the user can calculate distance by measuring the time it takes for the satellite’s radio transmissions, traveling at the speed of light, to reach the receiver.

One innovative application of GPS technology is to determine Earth movement after an earthquake.

There are two available radio signals that GPS receivers can use: the Standard Positioning Service (SPS) for civilians, and the Precise Positioning Service (PPS) for military and other authorized personnel.

The most significant cause of errors in positioning is the deliberate effort by the Department of Defense to decrease the accuracy of user systems for reasons of national security. Selective Availability (SA) refers to the purposeful degradation of the information broadcast by the satellites. SA affects the accuracy of the SPS, but not PPS. With SA, you can expect your SPS system to be accurate to within 328 feet (100 meters) horizontally and 512 feet (156 meters) vertically 95% of the time.

For those who require positions with higher accuracy, Differential Global Positioning System (DGPS) adds a new element to GPS. DGPS places a GPS stationary receiver at a known location on or near the Earth’s surface. This reference station receives satellite signals and adjusts for transmission delays and Selective Availability. The stationary receiver sends out a correction message for any suitably-equipped local receiver.

The military applications of GPS span many purposes:

Navigation: GPS allows soldiers to find objectives in the dark or in unfamiliar territory, and to coordinate the movement of troops and supplies. The GPS-receivers that commanders and soldiers use are respectively called the Commanders Digital Assistant and the Soldier Digital Assistant.[79][80][81][82]

Target tracking: Various military weapons systems use GPS to track potential ground and air targets before they are flagged as hostile.[citation needed] These weapon systems pass GPS co-ordinates of targets to precision-guided munitions to allow them to engage the targets accurately. Military aircraft, particularly those used in air-to-ground roles use GPS to find targets (for example, gun camera video from AH-1 Cobras in Iraq show GPS co-ordinates that can be looked up in Google Earth).

Missile and projectile guidance: GPS allows accurate targeting of various military weapons including ICBMs, cruise missiles and precision-guided munitions. Artillery projectiles with embedded GPS receivers able to withstand accelerations of 12, 000g’s or about

117, 600 meters/second2 have been developed for use in 155 mm howitzers.[83]

Search and Rescue: Downed pilots can be located faster if they have a GPS receiver.

Reconnaissance and Map Creation: The military use GPS extensively to aid mapping and reconnaissance.

The GPS satellites also carry a set of nuclear detonation detectors consisting of an optical sensor (Y-sensor), an X-ray sensor, a dosimeter, and an electromagnetic pulse (EMP) sensor (W-sensor) which form a major portion of the United States Nuclear Detonation Detection System.[84][85]

http://www. satellites. spacesim. org/english/function/astronom/index. html

C) Astronomical satellites

Other type of satellites is the astronomical satellites that are used for observation of planets, galaxies, and other outer space objects. An astronomy satellite is a really big telescope floating in space as it is in orbit above the Earth, and this to get clear vision which is not clouded by the gases included in the Earth’s atmosphere.

These types of satellites really benefit the scientific research done about the outer space planets, galaxies, stars and other objects.

Astronomical satellites use the infrared imaging equipment in order to get clear images away from the heat of the Earth. These types of satellites can take images of space up to ten times better than a telescope of similar strength on Earth.

These are some pictures taken by the astronomy satellite Hubble of stellar phenomena like supernovas, distant galaxies, black holes, and quasars:

Supernova

Distant galaxies

Black hole

Quasar

Fig……. shows some pictures taken by one of the astronomical satellites.

(Source: www. satellites. spacesim. org)

Astronomical satellites work by analyzing the electromagnetic spectrum that is formed due to the different wavelengths of light making a picture of something far away in space. (For example, ultraviolet, x-ray, visible spectrum, microwaves, and gamma rays)

So, the pictures that come from astronomy satellites are not photographs like that came from a regular camera, but images created from the analysis of electromagnetic waves which are the waves that forms the light spectrum.

Applications Astronomy satellites:

Used to make star maps.

Used to study mysterious phenomena such as black holes and quasars.

Used to take pictures of the planets in the solar system.

Used to make maps of different planetary surfaces.

E) Weather satellite

A weather satellite is a type of satellite that is primarily used to monitor the weather and climate of the Earth. Satellites can be either polar orbiting, seeing the same swath of the Earth every 12 hours, or geostationary,

hovering over the same spot on Earth by orbiting over the equator while moving at the speed of the Earth’s rotation.[1] These meteorological satellites, however, see more than clouds and cloud systems. City lights, fires, effects of pollution, auroras, sand and dust storms, snow cover, ice mapping, boundaries of ocean currents, energy flows, etc., are other types of environmental information collected using weather satellites.

Weather satellite images helped in monitoring the volcanic ash cloud from Mount St. Helens and activity from other volcanoes such as Mount Etna.[2] Smoke from fires in the western United States such as Colorado and Utah have also been monitored.

Other environmental satellites can detect changes in the Earth’s vegetation, sea state, ocean color, and ice fields. For example, the 2002 oil spill off the northwest coast of Spain was watched carefully by the European ENVISAT, which, though not a weather satellite, flies an instrument (ASAR) which can see changes in the sea surface.

El Niño and its effects on weather are monitored daily from satellite images. The Antarctic ozone hole is mapped from weather satellite data. Collectively, weather satellites flown by the U. S., Europe, India, China, Russia, and Japan provide nearly continuous observations for a global weather watch.