

SATELLITES – HUMAN-MADE MIRACLES!©

by Dan Pemble, Kissimmee, Florida- May 14, 2024

*Following is an excellent definition of space-based satellites as directly quoted from a Wikipedia site:
A satellite or artificial satellite is an object, typically a spacecraft, placed into orbit around a celestial body. Satellites have a variety of uses, including communication relay, weather forecasting, navigation (GPS), broadcasting, scientific research, and Earth observation. Additional military uses are reconnaissance, early warning, signals intelligence and, potentially, weapon delivery. Other satellites include the final rocket stages that place satellites in orbit and formerly useful satellites that later become defunct.
Unquote*

THE BEGINNINGS

It's likely that some who will be reading this article were not yet born when the so-called "space race" began. Actually, the first-ever man-made satellite to orbit the earth was the Soviet Union-built Sputnik-1, as launched on October 4, 1957. This satellite emitted a simple "beep beep" signal that could be easily detected by many amateur radio operators around the world. The signal remained active for about 3 weeks until its battery power supply was depleted. Aerodynamic drag caused this satellite to fall from orbit during January, 1958. Sputnik 2 was unique in its own right; launched on November 3, 1957, not only did it carry a dog into space but it had the capability to transmit collected data back to earth. It remained active until April 14, 1958. And so it was; the space race had begun, as initiated by the Soviets. Here are some "photo shopped" images of the first 2 Sputnik satellites:



SPUTNIK-1

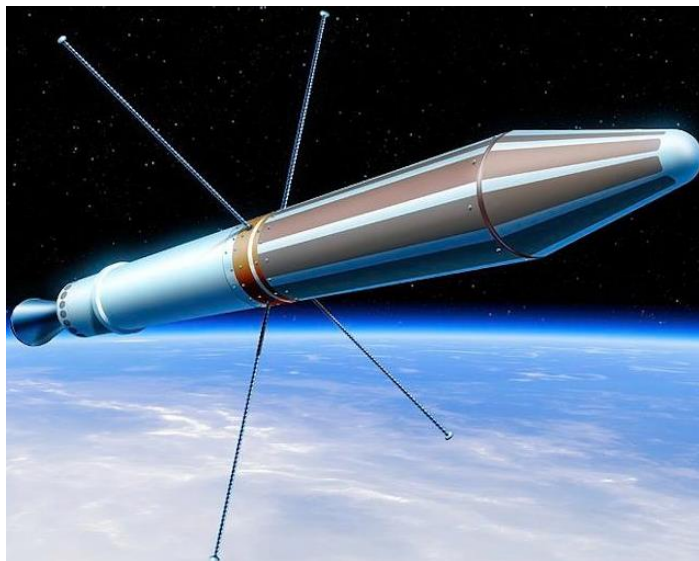


SPUTNIK-2

THE BEGINNINGS (continued)

Indeed, during the late 1950's and early 1960's, the space race was in full motion and the United States definitely was not sitting idly by! In fact, on January 31, 1958, the United States launched its very first satellite known as Explorer-1. This and other follow-on Explorer satellites collected data that confirmed the existence of charged particle radiation trapped by Earth's magnetic field. On May 23, 1958, the signals sent from Explorer 1 ended when its batteries were depleted. It wasn't until over 12 years later that Explorer 1 finally de-orbited and burnt up in the earth's atmosphere while over the Pacific Ocean.

On July 10, 1962, the United States launched the world's first communications satellite called Telstar 1! This satellite enabled the beaming of television, radio, and telephone signals to and from the United States and European locations! This satellite remained active for just over a year before technical issues ended its useful life. However, it remained in orbit for many additional years. To me, the Telstar satellite launch date is significant for several reasons: July 10, 1962 was the day before my 18th birthday and the date that I was on my way to Navy boot camp! Coincidentally, just 10 days later on July 22, 1962, a British musical group called the Tornados recorded a song named Telstar! This song became very popular at the same time the Telstar satellite was in orbit and each time I heard the song back then, it brought about feelings of wonderment and awe – just as this song still does today. Following are a couple of “doctored” depictions of a pair of America's initial satellite efforts, as I've just described:



EXPLORER-1



TELSTAR-1

There were many more additional satellites developed by the United States and others during the early years of the space race; however, a discussion of all these other satellites is beyond the intended scope of this article.

AND SUDDENLY IT IS TODAY

-67 years after the very first satellite was launched, the total numbers of satellites now in orbit are a bit “fuzzy”; however, the number appears to be 11,000 or more!

-Most all countries in the world have at least 1 satellite in orbit. The countries with the most satellites in orbit are: the United States, China, the UK, Multinational, Russia, Japan, India, and Canada. It is noteworthy that the total of United States satellites outnumbers all others by a wide margin.

-As of April, 2024, the American company Space-X has launched a total of 5874 Star Link satellites of which 5800 were still operation. These satellites are being used to provide internet service to all corners of the world. The service life of each Star Link satellite is 5 years after which they are de-orbited and vaporized as they enter the earth’s atmosphere. Space-X’s ultimate/incredible goal is to have as many as 42,000 Star Link satellites in orbit!

-Without a doubt, amongst all benefits afforded to all of us by satellites, certainly GPS has proven itself to be invaluable. This system was developed initially by the US government for use by the military but has since been made available to anyone with a GPS receiver! As of September 3, 2023, there were a total of 32 operational GPS satellites in orbit. Aside from helping us navigate our cars and airplanes, GPS is also most helpful to us during a round of golf!

-As vast as space is, with the ever-increasing numbers of satellites that are placed in orbit, the space is filling up, not only with the satellites themselves, but also via the forever-increasing quantities of “space junk”. A description of space junk as directly quoted from a Wikipedia site is as follows: Space debris (also known as space junk, space pollution, space waste, space trash, space garbage, or cosmic debris) are defunct human-made objects in space – principally in Earth orbit – which no longer serve a useful function. These include derelict spacecraft (nonfunctional spacecraft and abandoned launch vehicle stages), mission-related debris, and particularly- numerous in-Earth orbit, fragmentation debris from the breakup of derelict rocket bodies and spacecraft. In addition to derelict human-made objects left in orbit, space debris includes fragments from disintegration, erosion, or collisions; solidified liquids expelled from spacecraft; unburned particles from solid rocket motors; and even paint flecks. Space debris represents a risk to spacecraft. Unquote. It is an unfortunate fact that collisions with space junk can and has damaged and destroyed satellites and efforts are being made to mitigate this problem. Please see an artist’s perhaps-somewhat-exaggerated perception of satellites and space junk in orbit on the next page.



SATELLITES & SPACE JUNK IN ORBIT (AN ARTIST'S PERCEPTION)

CONCLUSIONS

The benefits to mankind from satellites are immeasurable! However, there are some concerns such as the forever increasing number of satellites occluding astronomer's views of distant bodies, additional collisions may occur, reflection of the sun on satellites artificially brightens the otherwise very dark night sky, and, the unknown implications of a continuous array of expended satellites and space junk falling from orbit and entering the earth's atmosphere.

I have been fascinated with the subject of satellites since their very beginning; thus, the reason I decided to write this short article. I hope you have found it to be of some interest.



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