

How GPS Works

The GPS System



In space:

24 or more satellites orbit the earth twice a day at an altitude of 12000 miles. The 1st was launched in 1978, the 24th in 1994.



On earth:

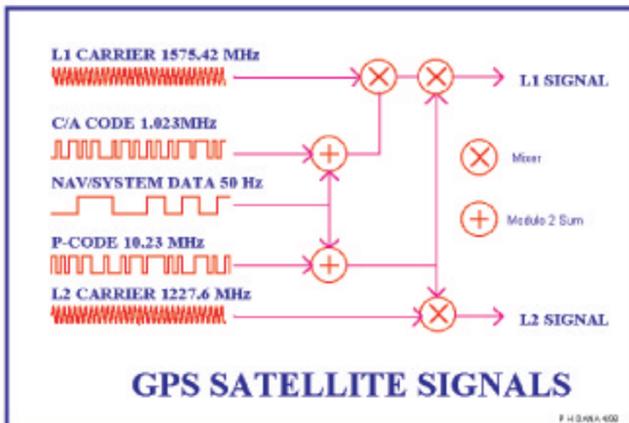
- (1) The US Air Force operates several control stations around the world.
- (2) Users receive signals broadcast by the satellites. The GPS receiver calculates the user's position.



Technical Details *(skip if you like!)*

Carriers are 2 sinusoids onto which the GPS codes and navigation messages (see below) are modulated:
L1 carrier: 1575.42 MHz
L2 carrier: 1227.60 MHz

"Selective Availability", or SA, the deliberate degradation of the signal, was turned off in May 2000.



GPS Block II satellites :	
weight	930 kg in orbit
size	5.1 m
speed	4 km/sec
clocks	2 cesium, 2 rubidium
design life	7.5 years
launched	Delta rocket

Codes (sequences of 0s and 1s, phase-modulated onto carriers)

C/A code, available to all, modulated onto L1 only.

Y code, encrypted and available to military users, modulated onto L1 and L2.

Navigation message: satellite positions, clock corrections, other information.

How phase modulation works:

