

The JETS Challenge

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Challenge 97 – The Transmissions from Space Challenge

Problem:

Twenty-five years ago, the Russian spacecraft, Venera 13, landed on the challenging surface of Venus with an acidic atmosphere hot enough to melt lead. Venera 13 survived on the surface long enough to obtain 14 color images on March 1, 1982. The color of each pixel was digitized at 9 bits per pixel with a 10th bit added to define the parity. It took 0.82 seconds to transmit each line of code that consisted of 41 pixels. Each image consisted of 252×1024 pixels. The transmission rate was increased by a factor of 12 by relaying the signal through the flyby relay spacecraft.

Calculate how many hours the spacecraft transmitted photos before failing.

Solution:

T = .82 seconds, each line of code for 41 pixels

Each image 252 × 1024 pixels

Transmission rate × 12

$$x \text{ hours} = \frac{.82 \text{ sec}}{41 \text{ pixels}} * \frac{1 \text{ min.}}{60 \text{ sec.}} * \frac{1 \text{ hr.}}{60 \text{ min.}} * \frac{14(252 \times 1024)}{12}$$

= 1.67 hours