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[Miscellaneous items found throughout the magazine]

Miscellaneous Items

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Information About the Publication
(Editorial Board, Editors, Table of Contents)



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Front Cover

The Space Telescope (Photo courtesy NASA). See page 18 (the article entitled "People").



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Category 1. Undergraduate students

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Category 3. Anyone else under 30 years of age

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Authors of best papers will be given a **COSMIC SEARCH AWARD** of \$100 and the paper will be published in **COSMIC SEARCH**. Authors should include their full address and telephone number. Authors should enclose a self-addressed stamped envelope if they wish to have their manuscripts returned.

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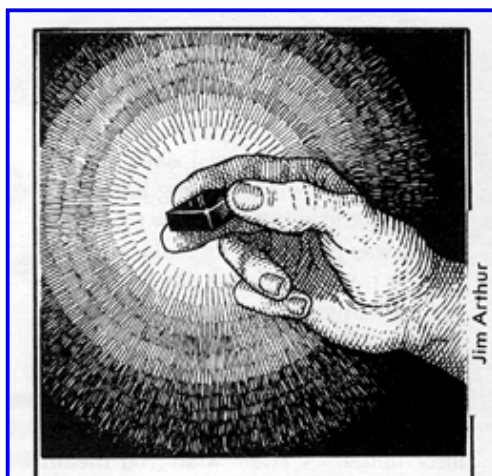
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A Message to Humanity

A puzzle for computer buffs

[This puzzle was found on page 12 in the magazine, with hints found on page 21 and the answers found on page 24. Try to solve this puzzle without looking at the Hints and the Answers found here immediately below the puzzle.]



Suppose a friendly extraterrestrial presents us with a message to humanity in the form of a 20-gram piece of carborundum (silicon carbide). It looks like a palm-sized version of the monolith from "2001." The message is encoded in the lattice of the crystal; each carbon atom represents a zero, each silicon atom a one. The number 2001, for example, is represented by the sequence SiSiSiSiSiSiCSiCCCSi.

From the above data calculate:

- (1) the number of bits of information in the message,
- (2) the time necessary to read the message if it can be read at 10 megabits per second,
- (3) the number of computer tapes necessary to store the message if each tape is 730 meters long and stores 1600 bytes per inch (8 bits = 1 byte), and
- (4) the cost of these tapes if each one is \$25.

This problem is from John Ball, a radio astronomer at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. Some hints are on page 21. [\[See immediately below, but DON'T LOOK!\]](#)

A Message to Humanity — Hints

These are hints to help solve the problem on page 12. A gram-mole of any substance contains Avogadro's number (6.0225×10^{23}) of molecules. The molecular weight of silicon is 28.086, and of carbon 12.011; so the molecular weight of silicon carbide is 40.097. Thus 40.097 grams of silicon carbide contain Avogadro's number of molecules. But the prescription in the problem records two bits in each molecule.

The answers are on page 24. [\[See immediately below, but again DON'T LOOK!\]](#)

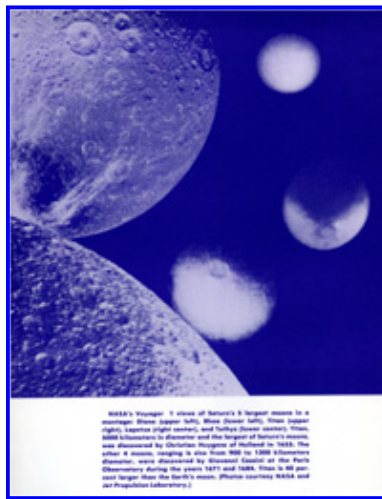
A Message to Humanity — Answers

These are answers to the problem on page 12. (1) 6×10^{23} bits. (2) 1.9×10^9 years (That is almost half the age of Earth.) (3) 1.6×10^{15} tapes (That is about 400,000 tapes for each person on Earth.) (4) \$40,000,000,000,000,000.

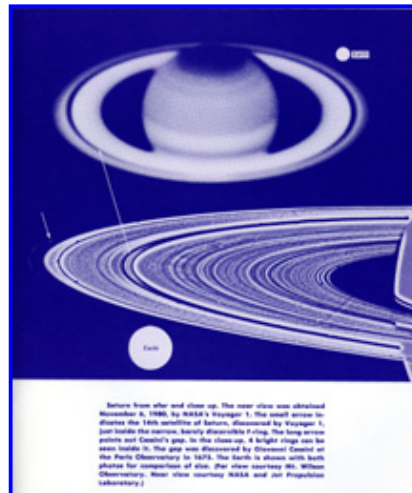
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