

Message to the stars

from Ian Ridpath

MANKIND'S first deliberate message to other civilisations among the stars has long since left our planetary system, leaving behind it on Earth certain rumblings about the way in which it was done. The media, both popular and scientific, outside the USA have turned such a deaf ear to this momentous event that the adjacent diagram, transmitted by the slower methods that remain conventional on Earth, may be the first detailed description of it to reach many parts of the community.

The 1,679 part message was transmitted in 169 seconds from the 1,000-foot Arecibo radio telescope in Puerto Rico. The frequency used was 2,380 MHz (wavelength 12.6 cm)—not one of the standard lines suggested for interstellar communication, but instead the top end of Arecibo's radar astronomy facility that is being used for projects such as the detailed mapping of Venus.

Writing in *Nature* for October 5, 1973, Frank Drake and Carl Sagan of Cornell University noted that the telescope's new capability would allow it to communicate with an identical instrument anywhere in the Galaxy. The Arecibo message, transmitted after a re-dedication ceremony following the resurfacing of the Arecibo arch, can only be seen as an attempt to demonstrate the truth of their proposition.

The key to the message is that it breaks down into a grid, 23 characters by 73. The diagram shows the picture that can be built up from it. Reading from top right (a tricky start) the pictogram describes in binary form the numbers one to ten as a kind of lesson to establish the language of the following message. Below this top row of numbers is a group displaying the atomic numbers of hydrogen, carbon, nitrogen, oxygen and phosphorous.

Next, the message uses this information to describe the molecular components of DNA and on lines 32 to 46 actually depicts DNA's double-helix structure. The central core is the number 4,000 million—roughly the number of characters in the genetic code.

All this adds up to a description of the chemical basis of terrestrial life: next comes a cryptic human (Ned Kelly in gumboots?) with an indication of his height to the right (14 wavelengths of the transmission) and on the left the approximate number of the human population (4,000 million again).

On the next line is a sketch of the solar system, with below it a representation of the Arecibo telescope itself, pointing downwards to a number that roughly describes its diameter.

This interstellar IQ test was devised

by members of the National Astronomy and Ionosphere Center, of which Arecibo is part. Radio astronomer Frank Drake of Cornell University, which runs Arecibo, says that the contents of the message were arrived at after exhaustive discussions, and after being 'market tested' to see how easy it was to decipher. Some people, doubtless familiar with the workings of the originators' minds, managed to unravel most of it. But a spot check in the *Nature* office revealed no intelligences (native or alien) that could decipher it. Are interstellar IQ tests culture fair?

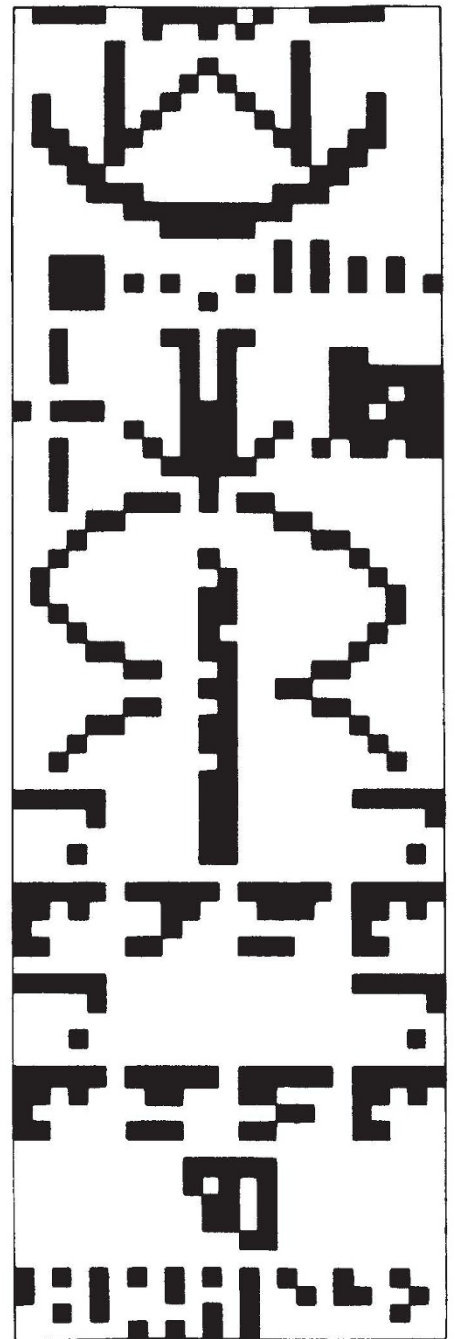
The message was beamed at the globular cluster M13, which is 24,000 light years away. At that distance the radio telescope beam just covers the cluster's 300,000 stars. Astronomer Carl Sagan estimates that there is a one in two chance that there will be a civilisation there to receive it. The signal frequency was modulated to correct for the motion of the Earth in space, although other radio astronomers have pointed out that just such a Doppler shift on an interstellar signal would give valuable information about the orbit of the sending planet and its axial spin, as well as its size.

The single transmission of such a message cannot be regarded as a very serious attempt at interstellar communication; more likely, it will serve as an example to boost the funding chances of those who wish to listen for similar messages coming to us from other civilisations. No prior news of the Arecibo message was given, even to delegates who discussed interstellar communications at the previous month's International Astronautical Federation meeting in Amsterdam.

Yet at the 1971 International Meeting on Communication with Extraterrestrial Intelligence (CETI) the delegates concluded that such undertakings were best done "by representatives of the whole of mankind".

Drake now says that he did not consider the Arecibo message a major enough event to require international cooperation. But Tony Lawton, a member of the CETI standing committee of the International Academy of Astronautics, thinks that it has established "a very nasty precedent" and is frankly surprised that it has been done at all without prior international discussion and approval. He says that "now there is nothing to stop any nation from transmitting any signal, anywhere, to any spot it chooses. A little warning, a little consultation, would have been better."

The critics still have time to influence matters for the future. The Arecibo message is planned to be repeated when telescope time permits, although no dates have yet been chosen.



Above: the message. Below: answer?



Courtesy: The Sunday Times