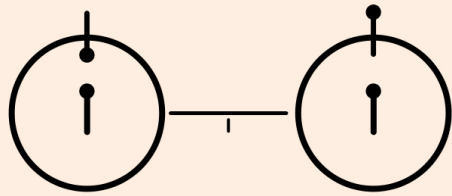
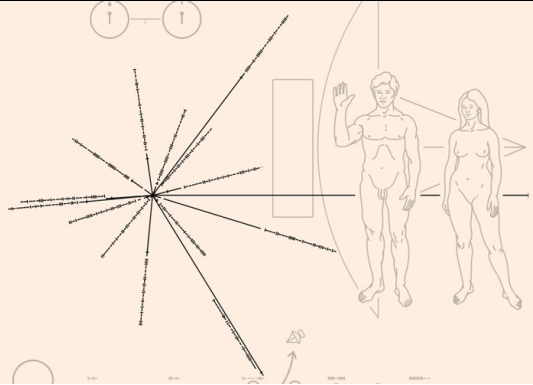


Typical explanations of Pioneer plaque features

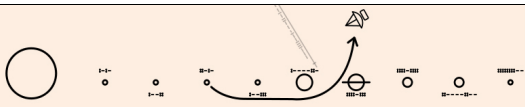
Ernst Gombrich commentary on Pioneer plaque



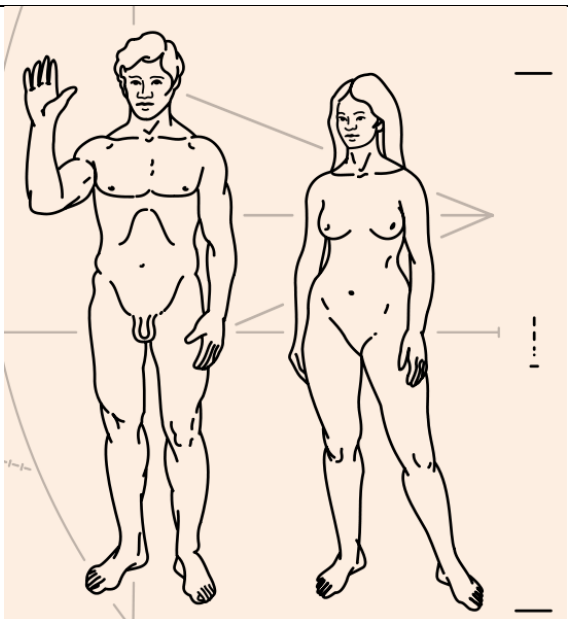
Hyperfine transition of neutral hydrogen, a basic unit of time and distance throughout the universe.



Map of 14 pulsars locating the sun relative to pulsars and the centre of our galaxy. On the lines, binary digits denote pulse-times. With the hydrogen time unit, an extraterrestrial analyst should realise that the times are about 0.1 second, a typical pulsar period. Since the periods decrease at known rates, pulsars serve as galactic clocks. Thus an advanced civilisation could review its galactic database and identify the origin and time of launch, even if Pioneer is not discovered until several billion years from now.



Planets of the solar system (note Saturn's rings), binary relative distances, and path indicating origin of Pioneer (which points back toward Earth).



Outline drawings of humans (upheld hand shows 4 fingers and opposing thumb) drawn in proportion to Pioneer craft in background. The interiors of the human shapes are opaque.

The National Aeronautics and Space Administration has equipped a deep-space probe with a pictorial message 'on the off-chance that somewhere on the way it is intercepted by intelligent scientifically educated beings.' It is unlikely that their effort was meant to be taken quite seriously, but what if we try? These beings would first of all have to be equipped with 'receivers' among their sense organs that respond to the same band of electromagnetic waves as our eyes do. Even in that unlikely case they could not possibly get the message. Reading an image, like the reception of any other message, is dependent on prior knowledge of possibilities; we can only recognize what we know. Even the sight of the awkward naked figures in the illustration cannot be separated in our mind from our knowledge. We know that feet are for standing and eyes are for looking and we project this knowledge onto these configurations, which would look 'like nothing on earth' without this prior information. It is this information alone that enables us to separate the code from the message; we see which of the lines are intended as contours and which are intended as conventional modelling. Our 'scientifically educated' fellow creatures in space might be forgiven if they saw the figures as wire constructs with loose bits and pieces hovering weightlessly in between. Even if they deciphered this aspect of the code, what would they make of the woman's right arm that tapers off like a flamingo's neck and beak? The creatures are 'drawn to scale against the outline of the spacecraft,' but if the recipients are supposed to understand foreshortening, they might also expect to see perspective and conceive the craft as being further back, which would make the scale of the manikins minute. As for the fact that 'the man has his right hand raised in greeting' (the female of the species presumably being less outgoing), not even an earthly Chinese or Indian would be able to correctly interpret this gesture from his own repertory.

The representation of humans is accompanied by a chart: a pattern of lines beside the figures standing for the 14 pulsars of the Milky Way, the whole being designed to locate the sun of our universe. A second drawing (how are they to know it is not part of the same chart?) 'shows the earth and the other planets in relation to the sun and the path of Pioneer from earth and swinging past Jupiter.' The trajectory, it will be noticed, is endowed with a directional arrowhead; it seems to have escaped the designers that this is a conventional symbol unknown to a race that never had the equivalent of bows and arrows.

Gombrich, Ernst H (1974): 'The Visual Image'. In David R Olson (Ed.): *Media and Symbols: The Forms of Expression, Communication and Education*. Chicago, IL: University of Chicago Press, pp. 255-8; first published in *Scientific American* 227 (September 1971): 82-96