

Draft of revision of IAA Position Paper

Note: the original paper was distributed in 8/96

International Academy of Astronautics

Position Paper

A Decision Process for Examining the Possibility of Sending Communications to
Extraterrestrial Civilizations

A Proposal

Foreword

This open document is a proposal to begin serious international consultation on the controversy over whether groups or individuals should attempt deliberately to transmit electromagnetic signals from Earth in response to the detection of an extraterrestrial civilization, and whether such attempts have bearing on the long-term well-being and security of humankind. Following many years of preparation, the original version of this International Academy of Astronautics (IAA) Position Paper was approved by the IAA Board of Trustees in 1996, making the document a formal IAA Position Paper. The Position Paper was then endorsed by the Board of Directors of the Institute for Space Law (IISL).

Both organizations considered that the questions raised in the document were of sufficient import to warrant sending it to many nations with a request that they consider bringing it to the attention of the Committee on the Peaceful Uses of Outer Space (COPUOS) of the United Nations for further study, and possible action, on behalf of all humankind. In September of 1996, the IAA Position Paper was sent by the Academy to the sixty-three member states of COPUOS. Only seven responded. None was prepared to introduce the Paper as an item for discussion by COPUOS, although Australia said it would be willing to support any other nation that did.

In June of 2000, the Position Paper was presented by Jill Tarter, then-Chair of the IAA SETI Committee, and by officials of the IAA and the IISL, to COPUOS in Vienna. Subsequently, the General Assembly voted to approve the COPUOS report that included this presentation and the IAA Position Paper on which it was based. No further action will be taken on it until it is formally introduced as a COPUOS agenda item by a member state or states.

What follows below is the first revision of the Position Paper.

Summary

This position paper outlines an approach to an international process for deciding whether and how to send a response to an extraterrestrial civilization.

For forty-five years, humans have conducted searches for electromagnetic signals bearing evidence of extraterrestrial intelligence (ETI). Collectively, these efforts are known as the Search for Extraterrestrial Intelligence (SETI).

If SETI is successful in detecting unequivocal evidence of the existence of an extraterrestrial civilization, it will raise many new questions, prominent among which will be whether and how humanity should attempt to communicate with the other civilization. How should that decision be made? What should be the content of such a message? Who should decide?

The first section of this paper introduces the idea of extraterrestrial intelligent life, and describes our growing scientific and technological capabilities in SETI. The second section addresses the issue of humanity's sending a reply. The third section proposes the development of a Declaration of Principles concerning the sending of communications to ETI.

I. The Science of SETI

Speculation about intelligent life on other worlds has a very long history, dating back at least as far as Classical Greece. The Copernican revolution, which displaced the Earth from the center of the universe, accelerated speculation about intelligent life elsewhere. Subsequent advances in astronomy and the study of evolution have made it seem more probable that life, including intelligent life, may be widespread in the universe. Elegant overviews of the history of the extraterrestrial life debate are available in books by Guthke¹ and Dick². An excellent book on "Life in the Universe," now known also as astrobiology, has been recently published by Bennett, Shostak, and Jakosky³.

The central hypothesis of SETI is that we now have the means to discover evidence of the existence of ETI by detecting electromagnetic signals their society may transmit. In 1959, Giuseppe Cocconi and Philip Morrison, noting the existence of powerful radio telescopes, proposed that a search be made at frequencies near the hydrogen line (21 centimeters)⁴. In 1960, the American radio astronomer Frank Drake independently carried out the first search using a radio telescope, aiming at two nearby stars⁵. Since then, over 100 searches have been carried out by American, Russian, Canadian, French, German, Italian, Australian, and Argentinian astronomers, though without detecting credible evidence of ETI⁶. Most searches to date have been carried out in the microwave region of the spectrum, but a few are in the optical region. For recent surveys of SETI activities, and plans for the future, see Tarter⁷, and "SETI 2020: A Roadmap for the Search for Extraterrestrial Intelligence", by Ekers, et al.⁶

In the first ten years following the first detection of a planet around a main-sequence star, approximately 200 extrasolar planets were discovered, many by Geoffrey Marcy and his colleagues⁸. Although none of these was Earth-sized, it is reasonable to expect that further improvement in search technology will reveal terrestrial planets. Theories of the possible widespread distribution of extraterrestrial life and ETI would then be strengthened.

Within the radio spectrum, there is a region known as the free space microwave window, between 1 gigahertz and 60 gigahertz. This is the quietest region of the radio spectrum. It is the region in which it is easiest to detect a faint radio signal emanating from another civilization against the noise of the natural background. The 21-centimeter line is at the low frequency end of this window. Most radio searches for ETI have concentrated on this region of the radio spectrum.

While the scientific and technological sophistication of these searches has grown in recent years, the central strategy of SETI remains to listen. However, proposals also have been made to send our own signals in the hope that they will be detected by another civilization and will generate a response. Whichever strategy we pursue, our improving capabilities are making detection more likely.

A signal we detect could range from a simple carrier wave conveying little information to a message rich in information. We currently have no way of predicting what this information might include. The signal from ETI could have been transmitted to attract the attention of other civilizations, or, as eavesdroppers, we might overhear communications within their own solar system. It is conceivable that we might even intercept transmissions between two other civilizations. In any of these cases, we would know for the first time that we are not alone. Note that it is also possible that others might already have discovered us by detecting our own civilization's internal transmissions, for example, planetary or military radar signals, or by some other means.

In recent years, authors have addressed questions surrounding a putative discovery of ETI. Billingham reviewed possible actions following detection⁹. D. Tarter considered response policy in the context of different complexities of a signal from ETI¹⁰, and also interpreting and reporting on a discovery¹¹. Almar examined the consequences in terms of different discovery scenarios¹². Societal implications were studied in some depth in a series of Workshops conducted by the SETI Institute on the cultural aspects of SETI and involving experts in the fields of sociology, psychology, anthropology, history, comparative religion, space law, the media, education, and the science of SETI¹³. Almar and J. Tarter have constructed the "Rio Scale", as a measure of the broad significance of a detection depending on the circumstances of the discovery and on various characteristics of the signal¹⁴.

If we detect the existence of ETI, our conception of the universe and our future as a species would surely change, as it did after the Copernican revolution.

Twenty years ago, the SETI Committee of the International Academy of Astronautics began discussing the question of what Humankind should do after a detection. One result of these exchanges was a series of papers in a Special Issue of *Acta Astronautica*, edited by J. Tarter and Michaud, entitled “SETI Post Detection Protocol”¹⁵. The discussions also led to the formulation of a “Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence” (see Annex I, page 8, for full text). By 1992, that document, intended for voluntary agreement among researchers, had been endorsed by six international space and astronomy organizations. It also had the support of nearly all SETI scientists. While most of the principles in the Declaration deal with the dissemination of knowledge of the discovery, one principle deals with the question of sending a communication from Earth in response to the discovery.

II. Sending Replies from Earth

Principle 8 of the Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence states that “No response to a signal or other evidence of extraterrestrial intelligence should be sent until appropriate international consultations have taken place. The procedures for such consultations will be the subject of a separate agreement, declaration, or arrangement”.

This Position Paper proposes that separate instrument. It includes a draft Declaration of Principles Concerning the Sending of Replies to Extraterrestrial Civilizations. See Section III and Annex 2 below. Transmissions have been contemplated or studied by a number of interested people for several decades, notably in the SETI Committee, now the SETI Permanent Study Group, of the IAA, and their colleagues in the IISL. These studies led to the Position Paper, now a formally approved IAA document, with endorsement from the IISL.

The detection of a signal from an extraterrestrial civilization would raise an important question: Should we humans send a message back to the civilization that we have detected, a “Response from Earth”? The international context of transmissions from Earth has been discussed by several authors. In the mid-1980s, Goodman¹⁸, and Ney¹⁹, proposed international agreements on this issue, and Goldsmith suggested that the International Astronautical Federation and the International Astronomical Union create a committee to attempt to reach a consensus on an international “Reply from Earth”²⁰. Michaud et al. proposed that an agreement be developed creating an international process by which Humankind would decide whether and how to reply if a detection were made²¹.

In 1956, Andrew Haley^{22,23} coined the term “metalaw,” to refer to the study and development of a workable system of laws that could be applied to all our relations with ETI. Fasan has derived eleven metalaws of postulated universal validity²⁴. Metalaw issues have been reviewed in a recent paper by Sterns²⁵.

However one chooses to address the issue of transmitting from Earth, an array of questions emerges. One is whether it is worth the expenditure of any significant effort to

address the question now. It could be years, decades, or even centuries before we detect a signal, if we ever do. Despite this uncertainty, the fact remains that we could detect a signal in the near future, particularly because of the increased scale and sensitivity of SETI searches. Further, while the probability of detection is unknown, the consequences of success would be profound. It would therefore seem prudent now to begin the process proposed in this IAA Position Paper.

As we are discussing the potential for contact between civilizations with vastly different sets of technologies, cultural values, perceptions and capabilities, it would seem prudent to contemplate some guiding principles.

How should we go about it? Should we make a decision in advance of a detection that humanity should or should not send a message? Should we attempt to design a generic response, or should we wait until we have a signal to analyze? If we decide to send a message, what should be its content? Should humanity respond with one voice, or with many different messages from separate nations or organizations? Who should decide on the answers to these questions? How and by whom should the decisions be implemented?

The issues involved in sending messages to extraterrestrial civilizations raise profound philosophical and political questions. These questions are of such weight for the future of our own civilization that they merit extensive discussion in the years to come.

Such discussions have begun. Michaud has asked “If Contact Occurs, Who Speaks for Earth?”²⁶. Michaud has also published a seminal paper on “Ten Decisions that could Shake the World”²⁷. Billingham has constructed decision trees that involve both scientific and societal questions and answers²⁸. Vakoch has published extensively on the content of messages that might be transmitted²⁹. In his “Dialogic Model”, he has also argued for the representation of diversity in messages to extraterrestrials³⁰.

There is also the question of the institutional context for such discussions. Clearly, sending a message to another civilization is more than just a scientific research project. It is a broad policy question that should be addressed by policy bodies. The most universal of existing international policy bodies is the United Nations. Hence, it would seem appropriate for the issue to be addressed there, beginning with the Committee on the Peaceful Uses of Outer Space (COPUOS). However, given their existing agendas of more politically pressing issues, United Nations bodies are unlikely to give much attention to SETI issues in advance of confirmed evidence of the existence of ETI.

Initial steps have already been taken by interested non-governmental bodies. As a starting point, the IAA, in consultation with the IISL, developed, as part of this proposal (See III below), a draft declaration of principles for consideration by others. In the initial stages, this draft declaration could be a focal point for discussion rather than a finished, formal document. Many mechanisms can be used to stimulate discussion, including workshops, public debates, university seminars, and media coverage. This implies a long, complex process that is unlikely to produce a quick agreement. Given the magnitude of the

questions involved, it will be important to allow time for the development of some degree of consensus.

In June of 2000, the original version of this IAA Position Paper was presented to COPUOS by the Chair of the IAA SETI Committee, Jill Tarter, and officials from the IAA and the IISL. The document was accepted without amendment. However, the substance of the document has not been discussed as a formal action item at a COPUOS meeting. For this to happen, one or more member States would have to introduce the Position Paper and its Draft Declaration of Principles as a formal action item on the COPUOS agenda. Any agreement resulting from these discussions might subsequently be pursued by COPUOS and the General Assembly as a draft for a statement of international policy.

Periodic reports or presentations by interested non-government bodies to the COPUOS would be useful to keep governments informed and to facilitate subsequent approval of a draft declaration. If evidence of the existence of ETI were confirmed, the COPUOS might be willing to devote more time and attention to the transmission issue and to texts.

III. A Draft Declaration of Principles Concerning the Sending of Replies to Extraterrestrial Intelligence

Rather than trying to decide the substance of our decisions in advance, it may be more fruitful to focus on the process by which the human species as a whole might decide whether and how to send a message. It probably is premature to try to develop the text of a formal international agreement on the subject. However, this is not the only option. A technique used with some success in the United Nations system is to first address issues through the development of non-binding declarations of principles. For example, the Outer Space Treaty of 1967 originated from such a declaration. A declaration of principles could establish consensus on procedures enabling all humans, through appropriate representatives, to participate in the making of decisions on the sending of communications to an extraterrestrial civilization.

As a starting point for discussion, the draft agreement or declaration might include the following basic principles:

1. The decision on whether or not to send a message to extraterrestrial intelligence should be made by an appropriate international body, broadly representative of Humankind.
2. If a decision is made to send a message to extraterrestrial intelligence, it should be sent on behalf of all Humankind, rather than from individual States or groups.
3. The content of such a message should be developed through an appropriate international process, reflecting a broad consensus.

Annex 2 presents a proposed text of a declaration of principles on the sending of replies to extraterrestrial intelligence. This is simply a draft, to be revised as necessary in later discussions. However, it provides a starting point for an important and intellectually exciting debate with potentially profound consequences.

Annexes

1. Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence
2. Draft Declaration of Principles Concerning the Sending of Replies to Extraterrestrial Intelligence

Annex 1

DECLARATION OF PRINCIPLES CONCERNING ACTIVITIES FOLLOWING THE DETECTION OF EXTRATERRESTRIAL INTELLIGENCE

Foreword

This is a revision of a document intended as a series of guidelines for individuals or organizations, national or international, engaged in carrying out scientific searches for extraterrestrial intelligence (SETI). It deals primarily with steps to be taken after evidence is thought to have been identified, and subsequently after a detection has been unambiguously confirmed.

The Declaration was originally, and is now, intended as a basis for a voluntary compact among those engaged in SETI, rather than for a formal legal agreement between governments.

The original Declaration was developed during the 1980s by the SETI Committee of the International Academy of Astronautics, with the assistance of many experts interested in the issues involved. In April of 1989, it was approved by the Board of Trustees of the Academy, and also by the Board of Directors of the International Institute of Space Law. Over the next three years, it was endorsed by the Committee on Space Research, by the International Astronomical Union, by the members of Commission J of the Union Radio Scientifique Internationale, and by the International Astronautical Federation.

DECLARATION OF PRINCIPLES CONCERNING ACTIVITIES FOLLOWING THE DETECTION OF EXTRATERRESTRIAL INTELLIGENCE

We, the institutions and individuals participating in the scientific search for extraterrestrial intelligence,

Inspired by the profound significance for humankind of detecting evidence of extraterrestrial intelligence,

Recognizing that an initial detection may be incomplete and ambiguous and may require careful examination as well as confirmation, and that it is essential to maintain the highest standards of scientific responsibility and credibility,

Recalling that the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, commits States parties to that Treaty “to inform the Secretary General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations, and results” of their space exploration activities,

Convinced that a confirmed detection should be made known to all of humankind,

Agree to the following principles:

1. Any individual, public or private research institution, or governmental agency that believes it has detected evidence of extraterrestrial intelligence (the discoverer) should seek to verify that the most plausible explanation for the evidence is the existence of extraterrestrial intelligence rather than some other natural phenomenon or anthropogenic phenomenon before making any public announcement. If the evidence cannot be confirmed as indicating the existence of extraterrestrial intelligence, the discoverer may disseminate this information as appropriate to the discovery of any unknown phenomenon.
2. The discoverer should promptly inform other observers so that they may seek to confirm the discovery by independent observations at other sites, and so that continuous monitoring of the phenomenon may be made more feasible. While it is recognized that the discoverer and other observers may need to respond to questions from media personnel and other persons at an early stage, they should not initiate a public announcement of this discovery until it is determined whether this information is or is not credible evidence of the existence of extraterrestrial intelligence.
3. After concluding that the discovery is credible evidence of extraterrestrial intelligence, the discoverer should disseminate this information promptly, openly and widely to public media as well as through appropriate scientific networks, and should inform the Secretary-General of the United Nations. The discoverer should have the privilege of making the first announcement.
4. All data necessary for the confirmation of the detection should be made available to the international scientific community through publications, meetings, conferences, and other appropriate means.
5. The discovery should be monitored. Any data bearing on the evidence of extraterrestrial intelligence should be recorded and stored permanently to the greatest

extent feasible and practicable, in a form that will make it available to observers and to the scientific community for further analysis and interpretation.

6. If the evidence of detection is in the form of electromagnetic signals, observers should seek international agreement to protect the appropriate frequencies by exercising the extraordinary procedures established within the World Administrative Radio Council of the International Telecommunication Union.

7. No transmission in response to a signal or other evidence of extraterrestrial intelligence should be sent until appropriate international consultations have taken place. The procedures for such consultations should be the subject of a separate agreement, declaration, or arrangement.

Annex 2**DRAFT DECLARATION OF PRINCIPLES CONCERNING THE SENDING OF
REPLIES TO EXTRATERRESTRIAL INTELLIGENCE**

The Parties to this Declaration,

Recognizing that the scientific search for evidence of extraterrestrial intelligence is being conducted with increasingly effective means,

Acknowledging the possibility of discovering such evidence,

Recognizing the potentially profound importance of such a discovery for Humankind,

Noting the acceptance within the international scientific, legal, and diplomatic communities of the Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence, including procedures for the verification and announcement of evidence of extraterrestrial intelligence,

Noting the Report of the Committee on Peaceful Uses of Outer Space to the General Assembly of the United Nations of June 26, 2000, A/55/20, paras 16 and 157, whereby the Committee agreed that the Office for Outer Space Affairs retain a copy of the position paper on file for review, and that the issue of the international process relating to possible communication with any eventually discovered extraterrestrial civilization... should be given serious consideration in connection with the future work of the Committee and its Legal Subcommittee,

Conscious of the question of whether Humankind should send a communication in response to a verified detection of extraterrestrial intelligence,

Recognizing the scientific, legal, political, and technical issues to be considered in formulating and communicating a message to extraterrestrial intelligence,

Desiring to establish an orderly process for resolving such issues,

Agree to the following Principles:

I. Any message from Earth in response to the detection of an extraterrestrial intelligence should be sent on behalf of all Humankind, rather than from individual States.

II. The content of such a message should reflect a careful concern for the broad interests and well-being of Humankind, and should be made available to the public in advance of transmission.

- III. The content, formulation, and transmission of a message should draw on the knowledge of a wide variety of persons with relevant interests and expertise.
- IV. As the sending of a response to extraterrestrial intelligence could lead to an exchange of communications separated by many years, consideration should be given to a long-term institutional framework for such communications.
- V. No communication in response to the detection of extraterrestrial intelligence should be sent by any State until appropriate international consultations have taken place. States should not cooperate with attempts to communicate with extraterrestrial intelligence that do not conform to the Principles in this Declaration.
- VI. States should encourage governmental and non-governmental organizations to initiate international studies and discussions to consider the issues of sending a message to extraterrestrial civilizations.
- VII. These studies and discussions should be open to participation by all interested parties, should accommodate participation by qualified, interested individuals, organizations and groups that can provide diversity of opinion and multiple perspectives, and should be intended to lead to recommendations reflecting consensus.
- VIII. States should urge the United Nations Committee on Peaceful Uses of Outer Space to place on its agenda consideration of the issues to be examined in the sending of a message to extraterrestrial intelligence.
- IX. The Committee on the Peaceful Uses of Outer Space should report the results of these discussions to the United Nations General Assembly for appropriate consideration.
- X. States should encourage the establishment by the United Nations Office of Outer Space Affairs of an international archive for the deposit of the record of the international deliberations and the content of any message to be sent to or received from extraterrestrial intelligence, which archive shall be open and available to researchers and other interested parties.

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