

IAA Position Paper

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

A Proposal

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FOREWORD

This open document is a proposal to begin serious international consultation on the question of future attempts to deliberately transmit electromagnetic signals from Earth to extraterrestrial civilizations. It was prepared over a number of years in the SETI Committee of the International Academy of Astronautics by a special subcommittee under the leadership of Michael Michaud. It has been endorsed by the Board of Trustees of the Academy, which decided to make it a formal Academy Position Paper. It has also been endorsed by the Board of Directors of the International Institute of Space Law. Both organizations consider that the questions raised in the document are of sufficient import to warrant sending it to many nations with a request that they consider bringing it to the attention of the Committee of the Peaceful Uses of Outer Space of the United Nations, for further study, and possible action, on behalf of all humankind. In September of 1996, the document was sent by the Academy to the sixty-three nations which make up this UN Committee.

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Summary

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

For over thirty years, humans have used radio technology to conduct searches for evidence of extraterrestrial intelligence (ETI). Collectively, these efforts are known as the Search for Extraterrestrial Intelligence (SETI).

If SETI is successful in detecting an extraterrestrial civilization, it will raise the question of 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 same questions would apply to proposals that signals be sent in the absence of detection, in the hope that they might be detected by an extraterrestrial civilization.

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

I. The Science of SETI

Speculation about 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, as other worlds came to seem more equal to our own¹. 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. The central hypothesis of SETI is that we have the means to detect evidence of extraterrestrial civilizations, particularly the electromagnetic signals they may emit.

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)². In 1960, the American radio astronomer Frank Drake independently carried out the first search using a radio telescope, aiming at two nearby stars³. Since then, about sixty other searches have been carried out by American, Russian, Canadian, French, and Argentine astronomers, though without detecting credible evidence of ETI⁴.

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.

The signal we detect could range from a simple carrier wave conveying little information to a message rich in information. The signal could have been transmitted to attract the attention of other civilizations, or we might "overhear" internal communications of the other civilization. In either case, we would know for the first time that we are not alone. Our conception of the universe and our future as a species surely would change, as it did after the Copernican revolution. Information from the other civilization could have a significant impact on our science and our culture.

Ten 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*, entitled "SETI Post Detection Protocol".⁵ The discussions also led to the formulation of a "Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence" (see Annex I, page 6, for full text). This document, which is intended for voluntary agreement among researchers, has been endorsed by six international space and astronomy organizations. 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 in response to the discovery.

II. Sending a Communication from Earth

Detecting 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"? This issue also has been examined by a number of interested persons during recent years, notably in the SETI Committee of the International Academy of Astronautics. Proposals to send messages to attract the attention of other civilizations we have not yet detected (sometimes called "active SETI") raise essentially the same question.⁶

One approach would be to make no effort to prepare for this eventuality, addressing the question at the time of a discovery. Another approach is to begin to address the question now, even in the absence of confirmed evidence of extraterrestrial intelligence. Such a discussion could lead to the development of an agreement or procedure on this issue.

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."

The substance of such a response has been discussed by several authors in recent years. In the mid-1980s, Goodman and Ney proposed international agreements on this issue⁷, and Goldsmith proposed 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."⁸ More recently, Michaud et al. have proposed that an agreement be developed creating an international process by which the species would decide whether and how to reply if a detection is made.⁹

However one chooses to address this issue, 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.

If we decide that this question is worth addressing, 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 as one, or with many different messages from separate nations or organizations? Who should decide on these questions?

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 as to merit extensive discussion, perhaps over a period of many years.

There also is 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 policy question that should be addressed by policy bodies. The most universal of existing international policy bodies is the United Nations; ultimately, 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 would be unlikely to give much attention to SETI issues in advance of a confirmed detection of a signal.

The initial work could begin outside the United Nations, perhaps in interested non-governmental bodies. As a starting point, the International Academy of Astronautics, in consultation with the International Institute of Space Law, has developed, as part of this proposal (See III below), a draft agreement or declaration of principles for consideration by others. In the initial stages, this draft agreement or 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.

International non-governmental organizations cannot themselves introduce matters for discussion by COPUOS; only member governments can do this. If a draft agreement or declaration were developed, one or more of the member governments would have to be persuaded to introduce it. This draft could then be considered by the United Nations, through the COPUOS, and might be endorsed by the COPUOS and the General Assembly as 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 a signal were received and confirmed, the COPUOS might be willing to devote more time and attention to the issue and to texts.

III.A Draft Declaration of Principles Concerning Sending Communications 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:

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.

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.

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 a communication 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

Annex 1: Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence

Annex 2: Draft Declaration of Principles Concerning Sending Communications with Extraterrestrial Intelligence

References

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Annex 1

April 1989, Paris, France, 2 pages.

This declaration, endorsed by more than 15 international organizations, is presented below.

Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence

We, the institutions and individuals participating in the search for extraterrestrial intelligence, recognizing that the search for extraterrestrial intelligence is an integral part of space exploration and is being undertaken for peaceful purposes and for the common interest of all mankind, inspired by the profound significance for mankind of detecting evidence of extraterrestrial intelligence, even through the probability of detection may be low, recalling the treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, which commits States Parties to that Treaty to inform the Secretary General of the United Nations as well as the public and the scientific community, to the greatest extent feasible and practicable, of the nature, conduct, location and results of their space exploration activities (Article XI), recognizing that any initial detection may be incomplete or ambiguous and thus require careful examination as well as confirmation, and that it is essential to maintain the highest standards of scientific responsibility and credibility,

Agree to observe the following principles for disseminating information about the detection of extraterrestrial intelligence:

Any individual, public or private research institution, or governmental agency that believes it has detected a signal from or other 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 discovery may disseminate the information as appropriate to the discovery of any unknown phenomenon.

Prior to making a public announcement that evidence of extraterrestrial intelligence has been detected, the discovery should promptly inform all other observers or research organizations that are parties to this declaration, so that those other parties may seek to confirm the discovery by independent observations at other sites and so that a network can be established to enable continuous monitoring of the signal phenomenon until it is determined whether this information is or is not credible evidence of the existing of extraterrestrial intelligence. The discoverer should inform his/her or its relevant national authorities.

After concluding that the discovery appears to be credible evidence of extraterrestrial intelligence, and after informing other parties to this declaration, the discoverer should inform observers throughout the world through the Central Bureau for Astronomical Telegrams of the International Astronomical Union, and should inform the Secretary General of the United Nations in accordance with Article XI of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. Because of their demonstrated interest in and expertise concerning the question of the existence of extraterrestrial intelligence, the discoverer should simultaneously inform the following international institutions of the discovery and should provide them with all pertinent data and recorded information concerning the evidence: the International Academy of Astronautics, the International Telecommunication Union, Commission 51 of the International Astronomical Union, the Committee on Space Research, of the International Council of Scientific Unions, the International Institute of Space Law, the International Astronautical Federation and Commission J of the International Radio Science Union.

A confirmed detection of extraterrestrial intelligence should be disseminated promptly, openly, and widely through scientific channels and public media, observing the procedures in this declaration. The discoverer should have the privilege of making the first public announcement.

All data necessary for confirmation of detection should be made available to the international scientific community through publications, meetings, conferences, and other appropriate means.

The discovery should be confirmed and monitored and 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 for further analysis and interpretation. These recordings should be made available to the international institutions listed above and to members of scientific community for further objective analysis and interpretation.

If the evidence of detection is the form of electromagnetic signals, the parties to this declaration should seek international agreement to protect the appropriate frequencies by exercising procedures available through the International Telecommunication Union. Immediate notice should be sent to the Secretary General of the ITU in Geneva, who may include a request to minimize transmissions on the relevant frequencies in the Weekly Circular. The Secretariat, in conjunction with advice of the Union's Administrative Council, should explore the feasibility and utility of convening an Extraordinary Administrative Radio Conference to deal with the matter, subject to the opinion of the members Administration of the ITU.

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.

The SETI Committee of the International Academy of Astronautics, in coordination with Commission 51 of the International Astronomical Union, will conduct a continuing review of procedures for the detection of extraterrestrial intelligence and the subsequent handling of the data. Should credible evidence of extraterrestrial intelligence be discovered, an international committee of scientists and other experts should be established to serve as a focal point for continuing analysis of all observational evidence collected in the aftermath of the discovery, and also provide advice on the release of information to the public. This committee should be constituted from representatives of each international institution listed above and such other members as the committee may deem necessary. To facilitate the convocation of such a committee at some unknown time in the future, the SETI Committee of the International Academy of Astronautics should initiate and maintain a current list of willing representatives from each of the international institutions listed above, as well as other individuals with relevant skills, and should make that list continuously available through the Secretariat of the International Academy of Astronautics. The International Academy of Astronautics will act as the Depository for this declaration and will annually provide a current list of parties to all the parties to this declaration.

Annex 2 Draft Declaration of Principles Concerning the Sending of Communications to Extraterrestrial Intelligence

The States participating in this Declaration,

Recognizing that a 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 existence of procedures for the verification and announcement of a detection of evidence of extraterrestrial intelligence,

Conscious of the question of whether and how Humankind should send a communication to extraterrestrial intelligence,

Desiring to establish an orderly process for dealing with that question,

Agree to the following Principles:

I

International consultations should be initiated to consider the question of sending communications to extraterrestrial civilizations.

II

Consultations on whether a message should be sent, and its content, should take place within the Committee on the Peaceful Uses of Outer Space of the United Nations and within other governmental and non-governmental organizations, and should accommodate participation by qualified, interested groups that can contribute constructively to these consultations.

III

These consultations should be open to participation to all interested states and should be intended to lead to recommendations reflecting a consensus.

IV

The United Nations General Assembly should consider making the decision on whether or not to send a message to extraterrestrial intelligence, and on what the content of that message should be, based on recommendations from the Committee on the Peaceful Uses of Outer Space and from governmental and non-governmental organizations.

V

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.

VI

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

VII

As the sending of a communication 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.

VIII

No communication to 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.

IX

In their deliberations on these questions, States participating in this Declaration and United Nations bodies should draw on the expertise of scientists, scholars, and other persons with relevant knowledge.

X

Should a decision be made to send a communication, the encoding and transmission of the message should be assigned to scientists and engineers specializing in the technologies required.