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PROCUREMENT AND ENFORCEMENT OF INTELLECTUAL PROPERTY

PATENT, TRADEMARK COPYRIGHT & RELATED MATTERS

July 20, 1999

Dr. Richard H. Battin
Department of Aeronautics and Astronautics
Massachusetts Institute of Technology
77 Massachusetts Avenue, Building 9, Room 470
Cambridge, Massachusetts 02139

VIA FEDERAL EXPRESS
Tracking Number: 807958538780

Re: Dr. Michael Minovitch's Invention of Gravity-Assist Propulsion
(Our Ref.: D-7621)

Dear Dr. Battin:

Please be advised that our firm represents Dr. Michael Minovitch of Los Angeles, California in certain legal matters pertaining to his inventorship of gravity-assist propulsion. As you well know, Dr. Minovitch was the first person to recognize the important principle of gravity-assist trajectory design, which uses planetary flybys as sources of thrust to help project a vehicle from one planet to another while reducing fuel requirements. Being the original inventor of gravity-assist propulsion is an important property right owned by Dr. Minovitch.

Our client is aware of your recent claims of having designed the first realistic multiple flyby mission, first found in your 1994 paper "On Algebraic Compilers and Planetary Fly-By Orbits." Our client believes your claims are not credible for a number of reasons. Initially your graduate student at MIT, Walter Hollister, took such credit, although Dr. Hollister later acknowledged Dr. Minovitch was the discoverer.[1, 2, 3] Secondly, your claim that the publisher of

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[1] In 1963, MIT's Department of Aeronautics and Astronautics (where you are a member) recognized one of their graduate students, Walter Hollister, for originating gravity-assist trajectories. Hollister named the idea "bi-elliptical transfers." Hollister used the innovation for his Ph.D. Dissertation at MIT (Exhibit 2) and explicitly claimed credit on page 7 with the statement: "Because of the large volume of work on different aspects of a mission to Mars it would be impossible to make reference to all of the literature on the subject. It should be noted, however, that the author has found no mention in the literature of the specific missions suggested in this work, namely trips to Mars via bi-elliptical transfer or via a Venus encounter that includes a significant velocity change near Venus." The fact that you were aware of, and therefore acknowledged Hollister's claimed innovation can be documented by the fact that Hollister explicitly identified you by name as providing technical advice. Quoting directly from page iii (Exhibit 2), "The staff of the M.I.T. Instrumentation Laboratory has been extremely helpful. Dr. Richard H. Battin, Dr. James S. Miller, Kenneth Fertig, and John L. Gropper have provided technical advice." He described the innovation in Chapter 7 of his Dissertation entitled "Bi-elliptical

the 1963 book Air, Space, & Instruments delayed publication of your chapter lacks credibility, given the later dates found in references for other chapters in that book.[4] Thirdly, your previous

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Transfers." (See pages 42-47, and page 71 Exhibit 2.) The Dissertation (containing this published claim) with you explicitly identified as providing technical advice was certified by three Thesis Supervisors from MIT's Department of Aeronautics and Astronautics and accepted by MIT's Chairman of the Departmental Graduate Committee in May 1963.

[2] Several "peer-reviewed" papers were published in the professional literature during the 1960s citing Walter Hollister for originating gravity-assist trajectories and citing his 1963 Ph.D. Dissertation (Exhibits 3, 4). No paper has ever been published in the professional literature giving the credit to you, and up until 1994, you yourself never claimed the credit for this revolutionary and fundamentally important discovery.

[3] After taking his Ph.D., Hollister became a member of MIT's Department of Aeronautics and Astronautics and joined you as a faculty member in that Department both working on interplanetary trajectories. In 1970, Hollister published a paper (Exhibit 5) and gave Michael Minovitch the credit for originating gravity-assist trajectories, citing Minovitch's August 23, 1961 JPL paper (Exhibit 6). Since it is inconceivable that you would have neglected to inform Hollister about your alleged January 1961 discovery of gravity-assist trajectories for ten years (1961-1970), this paper by Hollister (Exhibit 5) also represents conclusive and irrefutable evidence proving that your claim of having discovered gravity-assist Earth-Venus-Mars-Earth trajectories in January 1961 is not credible.

[4] The paper you wrote describing your alleged January 1961 Earth-Venus-Mars-Earth gravity-assist trajectory (Exhibit 7) was published, with a collection of other papers, in a book entitled Air, Space, and Instruments, by McGraw-Hill in early 1963. In your 1994 IAF paper you infer (page 5, Exhibit 1) that the contributing papers in the book (including your paper) were written prior to August 1961 (i.e., prior to Minovitch's August 23, 1961 JPL paper) and explain the fact that the book was not published until 1963 by simply claiming, with no documentary evidence, that the publisher delayed publication. Your exact words were:

> A volume of original contributions titled Air, Space, and Instruments was planned to honor Charles Stark Draper on his sixtieth birthday which would occur on October 2, 1961. Hal Laning and I contributed a chapter on our trajectory work for interplanetary missions. Unfortunately, the actual publication of the Draper Anniversary Book was delayed by the publisher and it did not appear until early 1963.

(Notice that if the book was to have been presented to Draper on his birthday on October 2, 1961, the manuscript of all of the papers had to have been completed and submitted to the publisher by the editor (Sidney Lees) well before August 23, 1961.) On page 7 of your 1994 IAF paper (Exhibit 1), you repeat your explanation of the discrepancy in your claimed 1961 date for your manuscript and the 1963 publication date, by simply claiming that the publisher delayed the publication. Quoting directly from this page, you state:

> Needless to say, I was most anxious to publish the result. Our chapter for the Draper Anniversary Book was already underway and the multiple fly-by orbit would provide a really dramatic climax for our contribution. I would have published it in a separate paper had I known that McGraw-Hill would slip their publication schedule for the Draper volume by more than one year.

Thus, you clearly claimed that the book was delivered to the publisher in 1961 (i.e., prior to Minovitch's August 23, 1961 JPL paper). A careful reading of the various papers published in that book reveal that the book could not have been sent to the publisher before May 16, 1962. On page 72 of that book a reference was made, in the past tense, to a paper that was presented by the author (Herbert Weiss) at a Naval Research Conference during May 14-16, 1962. Quoting directly from this reference (page 72, Ref. 50): "Foreseeable Changes in Operations Research Tasks, Techniques and Organizations," paper presented at the 20th Anniversary Conference on Operations Research sponsored by Office of

published papers in which you credit or discredit others, without taking credit yourself, are also inconsistent with your present claims.[5] Finally, in your 1990 interview with William Kosmann as to your role in developing gravity-assist trajectories, you also made inconsistent statements.[6] Other evidence is also available from our client.

Unless you can provide a detailed, satisfactory explanation as to how your recent claims of inventorship square with the above, we will presume there is no such explanation, and your recent claims were less than truthful.

This letter is to demand that you withdraw your 1994 paper from pending publication in Volume 23 of the AAS History Series, and that you cease-and-desist from any further false claims of inventorship of gravity-assist propulsion. Additionally, we would like you to issue a press release or other communication formally giving credit to Dr. Minovitch for having invented gravity-assist propulsion. If these conditions are timely satisfied, including keeping your paper out of Volume 23 of the AAS History Series, our client may consider this matter resolved.

You should be aware that if you are proven to have engaged in misrepresentations and other wrongful conduct to Dr. Minovitch's detriment, you (and any institution which sponsors or publishes such misrepresentations) may be held liable for fraud, misappropriation of right of publicity, slander of title, trade libel, interference with prospective economic advantage, unfair

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Naval Research, May 14-16, 1962 (Exhibit 8). This proves that the manuscript of the papers for the book was sent to the publisher by the editor after this date. There are other papers in the book citing other articles and books published in 1962. For example, see Ref. 74 page 73, Ref. 4 page 96, and Refs. 4 and 5 page 445 in that book (Exhibit 9).

[5] In 1978, you published a paper and gave the credit to Crocco for originating the idea of gravity-assist trajectories (Exhibit 10). But in 1964, you published a book and pointed out that Crocco did not originate the idea of gravity-assist trajectories (Exhibit 11). It is submitted that these publications by you (Exhibits 10, 11) conclusively prove that you did not originate the idea of gravity-assist trajectory by discovering your alleged Earth-Venus-Mars-Earth gravity-assist trajectory in 1961 because you would have pointed out the differences between your alleged 1961 Earth-Venus-Mars-Earth gravity-assist trajectory and Crocco's Earth-Mars-Venus-Earth constant elliptical path trajectory and claimed the credit for originating gravity-assist trajectories in his 1964 or 1978 publications. You obviously did not claim the credit because your Department of Aeronautics and Astronautics at MIT gave the credit to Hollister in his Ph.D. Dissertation (Exhibit 2).

[6] In 1990, William Kosmann interviewed you regarding your role in the development of gravity-assist trajectories. Kosmann reported this interview in a meeting with Michael Minovitch and Richard Dowling on January 5, 1991. The story you told Kosmann at that time was that you discovered Earth-Venus-Mars-Earth gravity-assist trajectories in 1956, not 1961. Minovitch documented the meeting with Kosmann by summarizing Kosmann's report on the interview with you in a letter dated January 11, 1991 which he mailed back to Kosmann (Exhibit 12). The letter was seven pages long and contained conclusive evidence proving that your 1956 claim (or any other claim you might make on discovering gravity-assist trajectories), was not true for the simple reason that you, along with MIT's Department of Aeronautics and Astronautics, acknowledged Hollister as originating the idea in 1962 (Exhibit 2). Minovitch also gave a copy of this letter to Richard Dowling. Dowling then sent a copy of this letter (with the enclosures showing that your 1956 claim was not true) to Frederick Ordway in a letter dated January 25, 1991 (Exhibit 13).

competition and related causes. Besides compensatory damages, punitive damages may also be available to our client, not to mention the personal embarrassment which may befall yourself and MIT from the adverse publicity of a lawsuit, if filed and resolved in our client's favor.

We must hear from you within the next twenty (20) days as to your intentions in this matter. Otherwise, our client may initiate a civil action against you and MIT, seeking damages as outlined above, and seeking a preliminary and permanent injunction against further acts of misrepresentation as to inventorship of gravity-assist propulsion in violation of our client's property rights.

We await your prompt response to this office. Should you have any questions or comments, please contact the undersigned by telephone.

Very truly yours,

CISLO & THOMAS LLP

Robert J. Lauson

RJL:ce

cc: Dr. Edward Crowley, MIT, Chairman, Department of Aeronautics and Astronautics
Dr. Charles Best, MIT, President
Mr. Frederick I. Ordway III, Chairman, Editorial Committee
Mr. Thomas Henneberry, Legal Department
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