David J. Cowan
ATTORNEY AT LAW
The Wiltern Theatre Tower
3780 Wilshire Blvd., Suite 910
Los Angeles, California 90010-2842
Telephone: (213) 386-7957 • Facsimile: (213) 386-7958

April 21, 2000

Gary E. Shoffner, Esq.
410 W. 4th Street, 2nd Fl.
Santa Ana, CA 92701

Re: Minovitch v Battin (LASC Case No. BC 224528)

Dear Mr. Shoffner:

This will respond to your letter of April 14, 2000.

First, concerning the production, I am still waiting to hear from the Draper Laboratory concerning whether it will approve the tests proposed by my client's forensic analyst. Assuming it consents, I trust your client will also and that we can then proceed to schedule a date for the production in Boston as soon as possible.

Second, concerning your contentions regarding the validity of this suit, this is to reiterate that we believe the complaint very much has merit, and that it is anticipated my client will prevail. If you are under the impression that we believe the complaint does not have merit, you are sorely mistaken. While I have been willing to extend you the courtesy of an extension of time to respond, in order that the discovery might help clarify matters, it is not because I think it will dispose of the case in your client's favor. The complaint already sets forth considerable evidence in support of its claims. In particular, I refer you to paragraph 12 of the complaint and items A through I therein, each of which set of facts supports the complaint. I have been shown no evidence which rebuts those facts. Further, we believe that the proposed discovery will corroborate the voluminous evidence already provided as exhibits to the complaint.

Further, while not required, and in an attempt to show you that what my client is interested in, as a scientist, is simply determination of the truth, and that there is certainly no intent to act maliciously (for which my client has no motive) or otherwise prolong an action for which there is

no need, I have asked my client to review the five articles referenced in your letter to determine whether they in any way defeat the allegations of the complaint. As discussed below, his analysis of these articles in fact only further corroborates the action. Hence, I suggest to you that either in your own reading of these articles, you have not appreciated why those articles do not respond to the contentions of the complaint, or you need to do more than just take your client's word that these articles supposedly prove that he is correct.

The articles you cited as representing grounds for dismissal of the complaint were:

(1) "The Determination of Round – Trip Planetary Reconnaissance Trajectories," [Published – – The Journal of the Aerospace Sciences, September 1959].

(2) "A Navigation Theory for Round Trip Reconnaissance Missions to Venus and Mars," [Published – – The Proceedings of the Fourth AFBMD/STL Symposium, Advances in Ballistic Missile and Space Technology, Pergamon Press, New York, 1961].

(3) "A Comparison of Fixed and Variable Time of Arrival Navigation for Interplanetary Flight," [Published – – The Proceedings of the Fifth AFBMD/STL Aerospace Symposium on Ballistic Missile and Space Technology, Vol.3, Academic Press, Inc., New York, 1960].

(4) "A Statistical Optimizing Navigation Procedure for Space Flight," [Published – – American Rocket Society Journal, November 1962].

(5) "The Trajectory Problem As It Relates to the Mission for Interplanetary Flight," [Published in, Air, Space and Instruments, S. Lees, Editor, McGraw – Hill Book Co., Inc., New York, 1963].

Except for the last publication (5), which was published in 1963 (almost two years after Minovitch's August 23, 1961 JPL paper), and which is therefore irrelevant to determining if your client made the discovery before my client did so in the above-referenced 1961 paper, none of the above papers describe or even suggest the possibility of "gravity-assist trajectories," "multiplanetary trajectories," or "double-planet trajectories," or the possibility of designing a trajectory that passes two different planets with one space vehicle in the same mission, any Earth-Venus-Mars-Earth, Earth-Mars-Venus-Earth round-trip trajectories or, in particular, any gravity assist trajectories which would allow a trip time of far less than the over three years that was at the time believed to have been all that was possible - as was Minovitch's significant contribution. Indeed, that these articles do not do so is consistent with what Battin himself later stated in his 1994 and 1996 papers that are the subject of the complaint. After describing his alleged discovery of Earth-Venus-Mars-Earth gravity-assist trajectories on January 26, 1961, Battin states therein:

> "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 a year."

This statement proves that the first paper that Battin wrote disclosing his alleged discovery of gravity-assist Earth – Venus – Mars – Earth multiplanetary trajectories was his Draper paper (paper 5 in the above list) that was published in 1963. Therefore, the first four papers in the above list obviously did not disclose these gravity-assist multiplanet trajectories.

That the above four papers (1-4) do not mention or describe any type of multiplanetary trajectories (in particular Earth-Venus-Mars-Earth gravity-assist multiplanetary round-trip trajectories) can also be demonstrated by examining some of the statements Battin made therein.

Paper No. 1.

From the Abstract, Battin stated the basic aim of this paper:

> "After a general discussion, the determination of the propulsion – free round-trips to the planet Mars is considered."

From the concluding section entitled "A Class of Round-Trip Trajectories," Battin summarized the computed round-trip trajectories, which were all single-planet Earth-Mars-Earth trajectories, by stating (see page 565):

> "It is interesting to note that the total time of 3.2 years required for the trip does not vary by more than two months for any solution in the class."

Since the round-trip Earth-Venus-Mars-Earth gravity-assist trajectories that Battin claimed to have discovered on January 26, 1961 had total trip times of only 1.26 years, as stated in Battin's 1963 paper (Paper No. 5), presumably that would have been disclosed in this paper had Battin known about these double-planet trajectories when he wrote this paper. The fact that he did not mention the trajectories in this paper proves that he was not aware of the trajectories when he wrote this paper.

Paper No. 2.

From the Abstract, Battin stated the basic aim of this paper:

> "A self-contained navigation scheme is described and analyzed for the case of an unmanned spaceship launched from Earth and established in a free-fall solar orbit that passes within a few thousand miles of another planet and subsequently returns to Earth."

The fact that all of the round-trip trajectories considered in this paper are the standard single-planet round-trip type having the form, Earth-Target Planet-Earth can be demonstrated from Battin's description that he published in the introduction found on page 40 of this paper. Quoting directly from this page, Battin states:

> "It is possible to establish a round- trip course to the planets Venus or Mars with a departure velocity from Earth which is only slightly larger than the minimum escape velocity."

Notice that Battin describes his round-trip trajectories as going to either Venus or Mars. He never describes the possibility of round-trip trajectories passing both Venus and Mars.

In the concluding section (Section 5) of this paper entitled, "Computation Results and Conclusions," Battin describes all of the round-trip trajectories to Mars as having the standard form, Earth-Mars-Earth with total trip times exceeding 3 years. He describes two trajectories of the form Earth-Mars-Earth and one involving Venus having the form Earth-Venus-Earth. (See pages 50-56) Since it is absurd to assume that the reason why Battin did not describe his claimed double-planet Earth – Venus – Mars – Earth round-trip trajectories that required a total trip time of only 1.26 years (and offered the additional spectacular opportunity of passing two different planets in the same mission) because he wanted to keep them a secret, it can only be concluded that he did not mention these revolutionary double-planet trajectories because he was not aware of these trajectories when he submitted this paper for publication.

Paper No. 3.

This paper only involves one-way trajectories to either Venus or Mars, whereas what is in question in the complaint are round trip multi-planetary trajectories. Quoting from the Abstract, Battin stated the basic aim of this paper:

> "Two types of self-contained navigation schemes are contrasted for the case of an unmanned spacecraft launched from Earth and established in a free-fall solar orbit destined to contact either Venus or Mars."

Therefore, this paper has no relevance.

Paper No. 4.

This paper involved navigation procedures for round-trip missions to either Mars or Venus, one-way missions to either Mars or Venus, or round-trip missions to the moon. Battin explicitly described the round-trip interplanetary missions to either Mars or Venus by referencing previous publications. Quoting directly from the first paragraph of this paper (page 1682), Battin describes the round-trip interplanetary trajectories by stating:

> "During the past three years, the problems of guiding a space vehicle during the midcourse phase of its mission have been extensively explored at the Massachusetts Institute of Technology Instrumentation Laboratory. Following the specific demonstration of the technical feasibility of an unmanned photographic reconnaissance flight to the planet Mars, reported by Laning, Frey, and Trageser (1), the detailed navigational aspects of such a venture were developed by Laning and the present author (2)."

The first paper cited by Battin in Ref (1) was entitled "Preliminary Considerations on the Instrumentation of a Photographic Reconnaissance of Mars." All of the round-trip trajectories in this paper were described as the standard Earth-Mars-Earth types having a total trip time of about 3 years. Quoting directly from page 68 of this paper:

> "The main idea in the nonstop [round-trip] trajectory is that a vehicle which makes two circuits about the Sun while the Earth makes three, passing near to Mars in the process."

The trajectory, referenced in this quotation, is a closed elliptical path leaving and returning to Earth with a period of three years, as illustrated in Fig. 2, shown on page 68 of this paper.

The second paper cited by Battin in Ref (2) (see page 1696) is paper No. 2 cited in your letter. As described above, the second paper described all round-trip trajectories to Mars or Venus as the standard, single-planet Earth-Mars-Earth or Earth-Venus-Earth trajectories. The total trip times

required for the Earth-Mars-Earth trajectories described by Battin in this paper, was over three years. None of the other papers cited in this paper involves round-trip interplanetary trajectories. Therefore, all of the interplanetary round-trip trajectories Battin described in this fourth paper involve the usual Earth-Mars-Earth and Earth-Venus-Earth trajectories. Therefore, Battin obviously believed that the trip time required for round-trip missions to Mars to be over 3 years when he submitted this paper for publication. He made no mention of the possibility of gravity-assist Earth-Venus-Mars-Earth trajectories requiring a trip time of only 1.26 years.

The date that the editor received this paper from Battin is given at the bottom of the first page of this fourth paper. Quoting directly from the first page of this paper:

> "Presented at the ARS Space Flight Report to the Nation, New York, October 9-15, 1961; revision received June 4, 1962."

Therefore, Battin must have submitted this revised version of the published paper at the end of May 1962. Since it is absurd to assume that the reason why Battin did not describe his claimed double-planet Earth – Venus – Mars – Earth round-trip trajectories that required a total trip time of only 1.26 years (and offered the additional spectacular opportunity of passing two different planets in the same mission) because he either considered them unimportant or wanted to keep them a secret, it can only be concluded that he did not mention these revolutionary double-planet trajectories because he was not aware of these trajectories when he submitted this paper for publication near the end of May 1962.

Paper No. 5.

This paper was the first paper Battin wrote describing the possibility of these multiplanetary trajectories and was presented in a book entitled *Air, Space and Instruments* published in 1963. In 1994, and again in 1996, Battin published papers claiming (by inference) that he wrote this paper in early 1961 (prior to Minovitch's JPL August 23, 1961 paper, thereby taking the credit for discovering the basic principle of gravity-assist multiplanetary trajectories from Minovitch) by claiming that the publisher (McGraw-Hill Book Co.) delayed publication for over one year. Quoting directly from page 5 from the 1994 paper:

> "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 17 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 in 1963."

Quoting from page 6 of this same paper, Battin repeats this claim by writing:

> "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 a year."

A careful reading of the various papers published in that book reveal, however, that the publisher (McGraw-Hill Book Co.) could not have received the manuscript in 1961, and delayed the publication for more than a year for the simple reason that some of the papers presented in that book described events that took place in 1962. In particular, on page 72 of that book, a reference (50) 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 that was published in the Draper book:

> "Foreseeable Changes in Operations Research Tasks, Techniques and Organizations, paper presented at the 20th Anniversary Conference on Operations Research sponsored by Office of Naval Research, May 14-16, 1962."

This proves that Battin's paper for the Draper book could not have been delivered to the publisher (McGraw-Hill) prior to May 16, 1962. 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, 5 page 445) This also proves that Battin's statement, in his 1994 paper, was false and obviously made to make it appear (as evidence) that he wrote the 1963 paper (listed as paper 5 in your list) prior to Minovitch's August 23, 1961 JPL paper in an attempt to take the credit for discovering the first gravity-assist multiplanetary trajectory. Battin republished the same false claims (on page 900) of the 1996 article referenced in the complaint.

Thus, the above analysis of your client's five articles cited in your letter, in an attempt to prove that Battin discovered gravity-assist multiplanetary trajectories prior to my client, demonstrates that just the opposite is true. In particular, papers 1-4 prove that Battin could not have discovered his claimed gravity – assist Earth-Venus-Mars-Earth multiplanetary trajectories prior to May 1962. In turn, the fifth paper you cite proves that Battin's published claim to the effect that he made the discovery in early 1961, in that the McGraw-Hill Book Co. delayed its publication of the 1963 Draper book by more than one year, is false.

For these reasons, we suggest that you discuss with your client a resolution of this case which acknowledges my client's entitlement to the relief requested in the complaint.

Very truly yours,

DAVID J. COWAN

cc Michael Minovitch