

1 Q. And it was also reproduced in your book,
2 Astronomical Guidance?

3 A. Yes.

4 Q. And that was published, I believe, in 1964?

5 A. Yes.

6 Q. All right, and were these lecture notes
7 republished at any -- in any other --

8 A. well --

9 Q. -- book?

10 A. Well, the Astronautical Guidance did not
11 consist of reproducing this. Astronautical Guidance
12 was a textbook, and I used a lot of stuff that was
13 in here. In that book, all of the orbits were
14 re-drawn by McGraw-Hill.

15 MR. SWOPE: Again, when Dr. Battin
16 referred to "this," he was referring to Exhibit 6.

17 THE WITNESS: Yes.

18 BY MR. HERMES:

19 Q. But the language in Exhibit 6 with respect
20 to multi-planetary fly-bys shown on pages 49 and 50
21 appears in your book Astronomical Guidance --

22 A. Yes.

23 Q. -- does it not?

24 A. Astronautical Guidance.

1 Q. I beg your pardon. At least I didn't say
2 "astrological guidance."

3 Now, is it a fair statement, sir, that
4 other than the republication in perhaps a slightly
5 modified form of the information in Exhibit 6, you
6 did not write again on the subject of
7 multi-planetary fly-bys until 1994; is that correct?

8 A. That's correct.

9 Q. However, you did have other writings in the
10 period between 1961 and 1994 with respect to various
11 matters; is that correct?

12 A. That's right.

13 Q. And is it your best -- do you have a
14 recollection whether or not you referred to the
15 subject of multi-planetary fly-bys in any writing
16 between 1961 and 1994, other than these notes or the
17 republication in a slightly revised form of these
18 notes?

19 A. Yes, the introduction to my textbook is a
20 copy of a paper that I wrote for the 50th
21 anniversary of the AIAA. It says at the top
22 there -- but you'll probably find that the --

23 Q. When you say --

24 A. I do steal from myself. In other words, if

1 I've written something and I'm going to rewrite it,
2 I take chunks of it.

3 Q. I understand that. I'm just -- my point
4 here is that between 1961 and 1994, is it the case
5 that your only writings with respect to
6 multi-planetary fly-bys was reference to material
7 which appeared originally in the lecture notes,
8 Exhibit 6?

9 A. That's right.

10 Q. All right. Now, in 1994 and 1996 and
11 subsequently, you have had occasion to write other
12 materials with respect to multi-planetary fly-bys;
13 correct?

14 A. Right.

15 Q. And in the period between 1961 and 1994, you
16 had other publications in which you did not mention
17 multi-planetary fly-bys; correct?

18 A. Yes.

19 Q. Now, I note, sir, that on Exhibit Number 6,
20 the cover page appears to have been produced on one
21 typewriter, and it appears that all of the other
22 pages appear to have been produced by a different
23 typewriter. Do you know why that is?

24 MR. SWOPE: Object to the form of the

1 question. You may answer.

2 BY MR. HERMES:

3 Q. Well, let me ask you a question, sir. Does
4 it appear to you that there's different typewriters
5 that is distinguishing between page 1 on the one
6 hand and the rest of the paper on the other?

7 A. Yes.

8 Q. Do you know why that is?

9 A. Yes.

10 Q. Why is that, sir?

11 A. Because this is the manuscript that was sent
12 to the publisher to be printed for Dr. Draper's, and
13 this was the page that was put on to indicate that
14 they were also going to be used as lecture notes.

15 Q. Who --

16 MR. SWOPE: And -- excuse me -- for
17 clarity of the record, the first "this" referred to
18 everything in Exhibit 6 except the first page; and
19 the second "this" referred to the first page of
20 Exhibit 6; is that correct?

21 THE WITNESS: Yes.

22 BY MR. HERMES:

23 Q. Now, with respect to the portion that you
24 referred to as being sent to the publisher for the

1 Draper book, when was that sent to the publisher for
2 the Draper book?

3 A. Sometime in the -- before -- it was sometime
4 in the first few months of 1961.

5 Q. Do you know when specifically?

6 A. I knew we had a target date, because
7 Dr. Draper's 60th birthday --

8 Q. My question is: Do you know when
9 specifically?

10 A. Exactly when, no.

11 Q. All right. Do you have any documents which
12 evidenced the date on which the manuscript, that is,
13 Exhibit 6 except for the cover page, went to the
14 publisher?

15 A. Yes.

16 Q. What documents do you have?

17 A. It was a letter from McGraw-Hill.

18 McGraw-Hill was the publisher of the Draper, and I
19 contacted them asking if they had any information of
20 that nature, and they had found a letter in there
21 from the head of our publications department to
22 McGraw-Hill, and they were indicating that the
23 Battin contribution was to be -- the copyright to
24 that would be held by MIT and not by McGraw-Hill.

1 Q. Do you have that letter with you, sir?

2 A. I don't.

3 Q. Is that something you've given to Mr. Swope?

4 A. Yes.

5 Q. What is the date of the letter which refers
6 to the copyright issue?

7 A. It's sometime in August.

8 Q. Of what year, sir?

9 A. '61.

10 Q. Now, Dr. Battin, on the cover of Exhibit
11 Number 6, there is a "c" with a circle around it --

12 A. Right.

13 Q. -- which I think we can agree is a symbol
14 for a copyright?

15 A. Right.

16 Q. Did you actually copyright that paper?

17 A. I didn't do it.

18 MR. SWOPE: Object to the form of the
19 question.

20 BY MR. HERMES:

21 Q. Did you ever take steps to copyright that --
22 copyright Exhibit Number 6?

23 MR. SWOPE: Object to the form of the
24 question. You may answer.

1 BY MR. HERMES:

2 Q. Please go ahead and answer, sir.

3 A. Okay. Well, let me say this, that the
4 publications department was headed by a woman by the
5 name of Dorothy Ladd, and it was her -- she said
6 that any time we publish anything, she says I want
7 those identified and copyrighted.

8 And she would own everything that she
9 ever did for me, even if it was trivial, I mean,
10 like a chapter on orbital mechanics, which is
11 certainly not new, but if it was written, it was
12 going to be in my book, give it to her to prepare,
13 it would come back copyrighted.

14 Q. Is it your testimony that Ms. Land typed the
15 cover page of Exhibit Number 6?

16 MR. SWOPE: Ladd, L-A-D-D.

17 BY MR. HERMES:

18 Q. Ladd.

19 A. Well, her department did. I don't know
20 whether she did.

21 Q. Do you know where the balance of Exhibit
22 Number 6 was typewritten?

23 A. The balance?

24 Q. Yes. Well --

1 A. You mean who actually did this?

2 Q. Who actually typed it, yes, sir.

3 A. It was somebody in her department.

4 Q. All right.

5 MR. SWOPE: "This" being every page of
6 Exhibit 6 except the first page.

7 BY MR. HERMES:

8 Q. Other than the first page.

9 A. Other than the first page.

10 Q. Do you know why the change was made to use a
11 different typewriter?

12 A. Well, this was prepared for my lecture. So
13 they took this manuscript. I said I want to use
14 this manuscript for my lecture. Okay, then they put
15 a title on there indicating they were lecture notes.
16 You wouldn't send this to McGraw-Hill. It's not --
17 it's identifying this material for lecture notes.

18 Q. Are you aware, sir, that every other page of
19 your lecture notes for the year 1960 are typewritten
20 on the same typewriter as the cover page of Exhibit
21 6?

22 A. Probably.

23 Q. Then my question is: Why was a different
24 typewriter used, if you know, to do that portion of

1 Exhibit 6 other than the first page?

2 A. My guess is for something of this length,
3 that she probably farmed it out to another group to
4 just prepare the manuscript.

5 Q. You don't know that to be the case?

6 A. I don't know. I'm just guessing.

7 Q. All right. With respect to Exhibit 6, did
8 you ever make any application to any agency of the
9 United States government to obtain a copyright?

10 A. No.

11 Q. Dr. Battin, I've just given you a copy of a
12 two-page document?

13 A. Yes.

14 Q. Can you identify that for me?

15 A. Yes. This was an article that I wrote for
16 the AIAA. Every year, at one time, they asked the
17 chairman of each of their technical committees to
18 just write something, a page or so, to sort of
19 indicate what the highlights -- as it says stamped
20 at the top, the highlights of that particular year.

21 MR. HERMES: All right. May we have
22 this marked as Exhibit Number 7, please.

23 (Battin Exhibit No. 7 - Article Written For The
24 AIAA By Dr. Battin - was marked for

1 identification.)

2 A. At the time --

3 MR. SWOPE: Just a minute. While she's
4 marking, you can't speak.

5 (Discussion off the record.)

6 BY MR. HERMES:

7 Q. Now, with respect to Exhibit Number 7, which
8 you wrote, Dr. Battin, was there a particular
9 highlight which you were addressing in this article?

10 A. Well, I haven't seen this article in a long
11 time.

12 MR. SWOPE: Why don't you take a minute
13 and read it.

14 BY MR. HERMES:

15 Q. Please take a moment to look at it --

16 A. Okay.

17 Q. -- and see if, after reviewing it, you can
18 answer my question.

19 A. Okay.

20 Q. I believe my question was, in substance,
21 Dr. Battin: was there a particular highlight which
22 you were addressing in the article which is Exhibit
23 Number 7?

24 A. Well, there are several examples that are

1 given of gravity assist maneuvers.

2 Q. Was there a particular reason why you were
3 addressing gravity assist maneuvers in Exhibit
4 Number 7, Dr. Battin?

5 A. Well, I was trying to find what date this
6 was that this was written. Oh, here it is, 1978.

7 well, the examples given, for example,
8 Project Galileo couldn't have been done without
9 using gravity assist.

10 Q. Well, was it the fact that events relating
11 to Project Galileo were taking place in 1978 the
12 reason why you discussed gravity assist fly-bys?

13 A. Well, I was just asked to write an article,
14 and I polled my committee and said what should we
15 put in it, and various people made contributions,
16 and then I put them all together as a -- to do my
17 job as chairman. So not all of these were in here
18 at my suggestion. They were there just because they
19 interested somebody on our committee.

20 Q. Well, the third paragraph begins, "One class
21 of imaginative proposals for space missions
22 exploited the gravity field of the planets to
23 achieve multi-planetary fly-bys."

24 A. Yes.

1 Q. Do you see that?

2 A. Yes.

3 Q. Was that a portion of the paper which you
4 wrote?

5 A. Probably. It sounds like my -- well, I
6 wrote the whole thing, but the interesting thing
7 about the Crocco was that in 1956, which was before
8 the Sputnik, he presented a paper at the
9 International Astronautical Congress in Rome.

10 His one-year exploration of
11 Earth-Mars-Venus-Earth was done in a very -- I mean,
12 it didn't pay attention to where the planets were
13 and didn't have a launch date. It was just showing
14 that you could do it by a series of so-called
15 Hohmann transfers; and it was totally impractical,
16 but at least it was showing that the idea of
17 visiting several planets at one time was being
18 thought about.

19 Q. Did you review his paper to determine
20 whether or not he was talking about gravity-assisted
21 fly-bys?

22 A. I had -- I saw his paper, and he was not.
23 He was not using fly-by as such. He was just -- in
24 fact, he was -- so that he would have these things

1 come out right, he was trying to cancel -- I don't
2 think that he -- I think that he had engines on to
3 make the cancellation of these -- it was a totally
4 impractical thing.

5 Q. Was that in part because the engines that he
6 posited didn't exist to produce the thrust that he
7 needed?

8 A. I'm sure that was it. He was just doing a
9 little exercise, probably because he wanted a free
10 trip to the congress in Rome.

11 Q. And these weren't his, as you reviewed his
12 paper, gravity-assisted fly-bys?

13 A. No.

14 Q. In fact, in one sense, they were probably --
15 well, strike that. In 1978, were you aware of the
16 work of Dr. Minovitch?

17 A. No.

18 Q. When did you first become aware of the work
19 of Dr. Minovitch?

20 A. I think it was when the first three history
21 papers were written. In Dresden was the first one,
22 and I think those are 1990. I was at that
23 conference.

24 And I did not attend the history

1 session, but somebody mentioned to me that there had
2 been a talk about multiple fly-bys and orbital
3 exercises, but without any mention of work that had
4 been done at MIT. It seemed sort of strange to
5 write a history that -- because we did a lot of work
6 in the late '50s, and it was just passed by.

7 So the person who told me this thought I
8 should know, and I don't think I had -- I didn't
9 have a copy of the paper. You can go and pick up
10 the papers that you're interested in at these
11 meetings and buy them. I just know that -- I
12 wondered who are the people who authored it, and
13 that was the first time I had heard of --

14 MR. HERMES: I move to strike the answer
15 as non-responsive to the question, except with
16 respect to the reference to the date.

17 BY MR. HERMES:

18 Q. With respect to Exhibit Number 7, sir, was
19 there a particular reason why in Exhibit 7 you
20 didn't mention your own work with gravity-assisted
21 fly-bys?

22 A. Because we were talking about highlights of
23 things that are coming.

24 Q. Well, you apparently also talked about some

1 prior history in it, did you not, by your reference
2 to Crocco?

3 A. Well, that was -- yeah.

4 Q. Why was it you didn't talk about your own
5 prior work?

6 A. Because it didn't go back to 1950 -- the
7 reason this is interesting was because it was very
8 early in the whole history of space flight. There
9 were very few papers that were written before
10 sputnik.

11 Q. With respect to 1978, your paper was one
12 which was written which made reference to
13 gravity-assisted fly-bys?

14 A. Yes. This thing?

15 Q. No, sir. Well, didn't your 1963 -- or your
16 lecture notes as published in '63, '64 and whenever
17 they were written, didn't they make reference to
18 what is essentially gravity-assisted fly-by?

19 A. And so did my book, which was out before
20 this.

21 Q. I see; but for whatever reason, you made no
22 reference to your own contribution in that paper,
23 sir?

24 A. That didn't seem appropriate.

1 Q. You mentioned Hohmann. Had you read -- or
2 have you read Dr. Hohmann's works?

3 A. Partially. The only interesting thing about
4 it is he wrote it on my birth date.

5 Q. He wrote what on your birth date, sir?

6 A. He wrote his article in 1925.

7 Q. The original article was written on your
8 birth date?

9 A. Yes.

10 Q. Now, were the Hohmann trajectories
11 gravity-assisted?

12 A. No.

13 Q. Do you know Victor Clarke, Jr.?

14 A. I knew him back in the early days when we
15 had some contact with JPL, you know, attended
16 professional meetings and got to know him just
17 through that.

18 Q. Victor Clarke, Jr. was, at one time, the
19 director of the Jet Propulsion Laboratory in
20 Pasadena; correct?

21 A. The director of the whole laboratory?

22 Q. Yes.

23 A. I didn't know that.

24 Q. Well, when you knew of him, what was his

1 position?

2 A. I was not really aware of what his title
3 was. He was just a person. I didn't know very many
4 people out there at the time.

5 Q. When you say "at the time," what's the time
6 frame to which you're referring?

7 A. The late '50s, early '60s.

8 Q. Do you recall whether or not you had any
9 telephone conversations with Victor Clarke?

10 A. I don't remember.

11 Q. Do you -- as you sit here today, do you have
12 a specific memory of any telephone conversation with
13 Victor Clarke, Jr. in which he discussed
14 Dr. Minovitch's work?

15 A. No.

16 Q. Do you have any records of any kind which
17 would document telephone calls which you had with
18 people at JPL or other people in a business context
19 dating back to the early '60s?

20 A. No.

21 Q. Your answer is "no," sir?

22 A. No.

23 Q. Do you -- now, I think you said that in
24 1990, you became aware of Dr. Minovitch's work;

1 correct?

2 A. (Witness nods.)

3 Q. Yes?

4 A. Yes.

5 Q. And I think you said that upon hearing of
6 that, it occurred to you that mention was not made
7 of work which was done at MIT?

8 A. Right.

9 Q. And when you say "MIT," you are specifically
10 including work done at the Instrumentation
11 Laboratory?

12 A. Yes.

13 Q. And at some point, did you take any action
14 to attempt to make public information concerning the
15 work done at MIT in that time period?

16 A. Well, yes. There was the history paper by
17 the four authors, of which Minovitch was one, which
18 was for the Dresden conference; and then the next
19 one was in Montreal, the second one. And so I
20 decided that for the IAF meeting that was going to
21 be held in Jerusalem that I would write a history
22 from my point of view of the multiple fly-by, at
23 least the MIT history of that.

24 Q. Now --

1 A. And I also wanted to include, and did
2 include, the story of the algebraic compiler,
3 because that's part of the title of that paper.
4 Everybody seems to forget that it was a two-part
5 paper, and the first part was a tribute to Hal
6 Laning.

7 Q. Well, that was about George, wasn't it?

8 A. Yes.

9 Q. Who or what was George?

10 A. George was not anybody. It was an
11 affectionate name that was the particular compiler
12 that he created for the very first time. There was
13 an expression in those days, "Oh, if it's too
14 complicated, let George do it." So he called the
15 program that he wrote George.

16 Q. All right. Was the paper that you delivered
17 in Jerusalem in 1994 the first paper in which you
18 attempted to set forth information concerning the
19 involvement at MIT with respect to gravity-assisted
20 fly-bys?

21 A. That's right, as a technical paper, yes, not
22 as a chapter in the Draper volume or my books or
23 anything. It was the first time writing a technical
24 article on the subject.

1 Q. To digress briefly for a moment, in the time
2 period when you were doing work on trajectories to
3 go to Mars, were you aware of the -- generally the
4 views of scientists about the ability to travel to
5 planets beyond Mars and Venus?

6 A. Was I aware?

7 Q. Well --

8 A. Well, the thing you would be aware of, that
9 to get to the outer planets, it takes a heck of a
10 lot larger engine than anything that we were
11 contemplating building, and you really couldn't plan
12 on doing that.

13 Q. In effect, to get to the outer planets, you
14 had to pack so much fuel onto a rocket that there
15 wasn't a rocket capable of lifting the fuel?

16 A. That is correct.

17 Q. All right, and so an idea like
18 gravity-assisted trajectories allowed people to send
19 spacecraft to places they could not otherwise have
20 gone?

21 A. Exactly.

22 Q. And one of the possibilities posited for
23 travel to the outer planets in the late '50s, early
24 '60s related to nuclear propulsion; correct?

1 A. Yes.

2 Q. And in general, because it never became
3 engineeringly feasible to have nuclear propulsion,
4 that method was never used; isn't that correct?

5 A. I think so.

6 Q. You're aware of no trip in which nuclear
7 propulsion was used?

8 A. If they did it, they did it behind my back.

9 MR. HERMES: Off the record for a
10 moment.

11 (Discussion off the record.)

12 BY MR. HERMES:

13 Q. So one of the things that gravity-assisted
14 trajectories allowed scientists to do was to send
15 spacecraft to outer planets?

16 A. Yes.

17 Q. All right. Do you know Walter Hollister?

18 A. Yes.

19 Q. You've known Walter Hollister for more than
20 40 years, have you not?

21 A. Yes.

22 Q. How would you characterize your relationship
23 today?

24 A. Well, we are roommates. His desk is as

1 close to mine as Jeffrey.

2 Q. At MIT?

3 A. At MIT.

4 Q. So both of you are retired, but they allow
5 you to come back and teach students from time to
6 time?

7 A. He is an emeritus, and I am a senior
8 lecturer; and I get paid, and I teach my course
9 every year, and I'm still doing it even though I'm
10 going to have my 80th birthday next month.

11 Q. So do you consider Dr. Hollister a friend?

12 A. Sure.

13 Q. I mean, you're more than just faculty
14 acquaintances?

15 A. Yes, we've known each other for a very long
16 time. He was my student in 1960 when my course was
17 being tried out as part of another course.

18 Q. He wrote a doctoral thesis in 1963, did he
19 not?

20 A. Yes.

21 Q. And in that thesis, he makes certain
22 references to you?

23 A. You know, I've never read his thesis. So
24 I'm taking you at your word.

1 Q. Do you know whether or not -- has he ever
2 told you whether or not his thesis addresses the
3 question of gravity-assisted fly-bys?

4 A. I knew that. I knew that.

5 Q. You did know that?

6 A. But it was not -- at the time, 1963, I was
7 busy doing other things. I didn't have time to
8 go -- to become, you know, his advisor, so to speak.

9 Q. Are you telling me --

10 A. I couldn't do any really advising. I may
11 have been on his committee but --

12 Q. Whether you could do any or had time to do
13 any advising, are you telling me that you did not,
14 in fact, do any advising for Walt Hollister in
15 connection with his thesis?

16 A. I think there was that time he came in and
17 asked me some questions, and I pointed him in
18 certain directions, and he acknowledged that in his
19 thesis; but that's as far as it ever went.

20 Q. Do you recall ever providing any computer
21 programs to him?

22 A. I didn't have any computer programs. None
23 of my computer programs survived that period. I
24 mean, the reason is because the 650 didn't survive,

1 and I couldn't run those if I had wanted to on
2 another machine.

3 Q. Is it a fair statement, sir, that your IBM
4 650 computer programs were made outmoded or outdated
5 by advancements in computer technology?

6 A. That's correct.

7 Q. And so either the language has changed or
8 the speed of the machines or technology changed in
9 such a way that your programs could not be used; is
10 that correct?

11 A. That's correct. If I had them today, I
12 wouldn't know what to do. They're nothing but punch
13 cards.

14 Q. You do not have the programs which you used
15 to calculate the trajectories?

16 A. No.

17 Q. Do you know when you last had them?

18 A. On January the 26th, 1961.

19 Q. And the form that those programs took was a
20 series of punch cards --

21 A. Right.

22 Q. -- is that correct, sir?

23 A. Yes.

24 Q. Are you aware in certain literature

1 Dr. Hollister has been given credit for work
2 relating to gravity-assist trajectories?

3 A. I don't understand "given credit to."

4 Q. Well, do you know a man by the name -- do
5 you know of a man by the name of Ehricke,
6 E-R-I-C-K-E -- E-R-I-C-H --

7 A. Yes.

8 Q. Who is Dr. Ehricke?

9 A. He was one of the German scientists that
10 came over with Wernher von Braun and others.

11 Q. Do you know whether he ever did any writings
12 attributing to Walt Hollister advances in the field
13 of gravity-assisted trajectories?

14 A. Did he work with?

15 Q. Did he ever attribute to Walter Hollister
16 advances in the field of gravity-assisted
17 trajectories?

18 A. I don't know.

19 Q. Do you have any information whether anyone
20 attributed to Walter Hollister advances in the field
21 of gravity-assisted trajectories?

22 A. No.

23 Q. Do you know who it is who first thought of
24 the idea of gravity-assisted trajectories?

1 A. You must mean predating the two that I did
2 in 1961?

3 Q. Well, let's start there. Do you know of
4 anyone who -- I mean he --

5 A. Who did it before that?

6 Q. Yes.

7 A. No.

8 Q. Have you had occasion to review
9 Dr. Minovitch's August 23, 1961 JPL paper?

10 A. The memo?

11 Q. Yes.

12 A. Yes.

13 Q. And that memo does discuss, does it not,
14 gravity-assisted trajectories?

15 A. It does, yes.

16 Q. All right, and do I take it that you know of
17 no one, other than yourself, who first identified
18 gravity-assisted trajectories for multi-planetary
19 fly-bys before you did so in January of 1961?

20 A. I don't know of any, no.

21 Q. And do you know of anyone who identified
22 gravity-assisted trajectories with respect to
23 multi-planetary fly-bys between the time of your
24 work, which you tell us took place in January of

1 1961, and Dr. Minovitch's work in August of 1961?

2 A. No.

3 Q. Your answer was "no," sir?

4 A. No.

5 Q. Do you know of a Russian physicist by the
6 name of Tsander, T-S-A-N-D-E-R?

7 A. It's a familiar-sounding name, but I don't.

8 Q. Do you know whether Tsander ever did any
9 work on gravity-assisted fly-bys?

10 A. I don't know.

11 Q. You're not aware of any as you sit here?

12 A. (Shakes head.)

13 MR. HERMES: Off the record for a
14 moment.

15 (Discussion off the record.)

16 (Battin Exhibits Nos. 8 - 2000 American
17 Astronautical Society Symposium, Article
18 Entitled "A Scrapbook of Beautiful Equations and
19 Great Ideas"; 9 - Article Entitled "On Algebraic
20 Compilers and Planetary Fly-By Orbits"; and 10 -
21 Six-Page Letter Dated 10 September 1999 - were
22 marked for identification.)

23 (A lunch recess was taken from 12:27 to 1:21 p.m.)

24 BY MR. HERMES:

1 Q. Do I understand correctly, Dr. Battin, that
2 it was in 1960 that you first taught a course at
3 MIT?

4 A. Not so.

5 Q. All right.

6 A. I taught my first course at MIT in 1946.

7 Q. Okay. There is a graduate course which you
8 taught for the first time in 1960; is that correct?

9 A. That's right.

10 Q. And is that Class 16.46?

11 A. Yes.

12 Q. Is that how that class is still known today?

13 A. Now it's known as 16.346.

14 Q. And what was Class 16.46 when you first
15 taught it? What was the name of the course?

16 A. "Astronautical Guidance."

17 Q. In some places I have seen the notation
18 "16.46T." Does the "T" have meaning?

19 A. Yes, "temporary."

20 Q. Do I take it that the first year you taught
21 the course, it was a temporary course?

22 A. It was, and I was not the only speaker.

23 Q. What did the notation "temporary" mean?

24 A. It was either temporary or a trial balloon

1 or something. It was just you run it and see what
2 the audience response was before it became an
3 official course.

4 Q. Now, do I understand that it became an
5 official course in 1961?

6 A. Yes.

7 Q. And in 1961, were you the only person who
8 taught the course?

9 A. I have always been the only one.

10 Q. Since 1961?

11 A. Yes.

12 Q. In 1960, did you use notes in teaching the
13 course?

14 A. I didn't hand any notes out to the class. I
15 lectured at the blackboard, and people took notes
16 themselves. I didn't have anything to hand out.

17 Q. Did you prepare notes of what it was that
18 you were going to teach for the class in 1960?

19 A. Nothing that I would give them.

20 Q. Well, whether you would give the notes to
21 someone else, did you have notes or any documents
22 from which you taught?

23 A. No, I think I was just talking from the
24 papers that I had written, plus just things that I

1 had -- I was beginning to learn the subject myself;
2 and whatever I had written down, you know, about
3 orbital mechanics, I didn't -- I don't think I
4 handed it out; or maybe some of those things that
5 were in the 1961 folder, they could have been done
6 then, but just as scraps of paper, not -- nothing
7 official.

8 Q. All right. In 1961, you had a series of
9 lecture notes that you handed out, did you not?

10 A. Yes.

11 Q. And I think it was -- it may have been four,
12 five or six sets of lecture notes; correct?

13 A. More than that, I think.

14 Q. All right. It's fair to say that in 1960,
15 when you taught the course with others, you did not
16 hand out similar notes?

17 A. No.

18 Q. And is it fair to say that you do not today
19 have the note -- any notes you may have used in the
20 teaching of the course in 1960?

21 A. My guess would be that's not a true
22 statement, because if you look at any one of those
23 big thick books, you'll see that the months are
24 different; and what I was really doing was trying to

1 keep up with my notes, and I would get them --

2 Q. Please finish your answer, sir.

3 A. No, each one of them was at a later time;
4 and they're all 1961, but there would be something
5 in February or March and then something in April and
6 something in May.

7 Q. I understand that. You have a series --

8 A. And I think I have the rough stuff, not
9 typed, that I was using in the "T," the trial
10 course. So the students really had to take notes
11 off the blackboard.

12 Q. But you have nothing today which constitutes
13 the notes from which you taught in 1960?

14 A. I don't know. I think some of the early
15 stuff in there, which wasn't formalized until '61, I
16 was using those, but nothing that I handed out.

17 Q. You're making reference to three binders of
18 lecture notes --

19 A. Right.

20 Q. -- that your counsel brought with him this
21 morning; correct?

22 A. Right.

23 Q. And the dates on those lecture notes are
24 1961, 1962, and 1963, are they not?

1 A. Yes.

2 Q. So it is fair to say that while you may have
3 taught from the substance of some of those notes,
4 you did not teach from those specific notes;
5 correct?

6 A. That's correct.

7 Q. And to the extent that some of the material
8 from which you taught in 1960 may have been
9 incorporated in there, it might be possible to find
10 some of that information; is that correct?

11 A. You probably would find it in some of my
12 earlier papers --

13 Q. But in terms of --

14 A. -- more likely.

15 Q. But in terms of you being able to identify
16 what you had in front of you in the classroom when
17 you taught the class, you can't do that, can you --

18 A. (Witness shakes head.)

19 Q. -- with respect to the year 1960; is that
20 correct?

21 A. That's correct.

22 Q. Making reference to Exhibit 6, which have
23 been identified and bear the reference "Lecture
24 Notes," and it has a date on the first page of

1 August 1961 --

2 A. Right.

3 Q. -- there are various figures in those notes
4 that bear references to the MIT Instrumentation
5 Laboratory. For instance, I believe Figure 21,
6 which I think we looked at, was on page 44.

7 A. Yes, right, right, right.

8 Q. There is a notation on the slide itself --

9 A. Yes.

10 Q. -- "MIT Instrumentation Laboratory";
11 correct?

12 A. Yes.

13 Q. If you look at Figures, I believe it's 26
14 and 27, which are on pages 51 and 52, there is no
15 reference on those slides to the MIT Instrumentation
16 Laboratory; is that correct?

17 A. That's true.

18 Q. Do you know why that is the case?

19 A. I don't know why, but I can tell you where
20 they -- the only ones that I have with that little
21 label on it was a paper I gave at a UCLA conference;
22 and the artist who was doing this said, oh, you're
23 giving this paper -- and these are for your papers,
24 so they put that little label on them.

1 Q. When you say "that little label," what are
2 you referring to?

3 A. The thing you were referring to.

4 Q. The label that says "MIT Instrumentation
5 Laboratory"?

6 A. Yes, and the date. There's a date on it,
7 too, which tells you when -- it would be nice if all
8 of them had that, but it was just that one
9 particular talk that says "July 1959, MIT
10 Instrumentation Laboratory." Those were -- I have
11 slides for all these, too, and those were for that
12 particular talk.

13 Q. Do the slides also -- do any of the slides
14 also contain the label "MIT Instrumentation
15 Laboratory"?

16 A. If they have it here, they have it on the
17 slides.

18 Q. All right.

19 A. No, it was just for that one talk that they
20 seemed to do that. I don't think you'll find any
21 more other than the ones that say "July 1959."

22 Q. What talk was that?

23 A. It was the talk which you have a copy of
24 that's in that -- that's the Air Force Ballistic

1 Missile Fourth Conference held at the UCLA campus in
2 July or August of 1959.

3 Q. All right, thank you. Now, I'm finished
4 with Exhibit 6.

5 Dr. Battin, when we started this
6 morning, I marked as Exhibit Number 1 a paper which
7 you delivered in a conference in Israel in 1964;
8 correct?

9 A. Yes.

10 Q. I have put in front of you two other papers.
11 Exhibit 8 refers to a symposium in the year 2000,
12 sir?

13 A. Yes.

14 Q. And Exhibit 9 refers to a publication which
15 took place --

16 A. That's the publication of the Israeli paper.

17 Q. All right. It's true, then, is it not, that
18 Exhibit Number 1 and Exhibit Number 9 are the same
19 papers, with possibly some minor editorial changes?

20 A. Well, yes. See, what you have here is what
21 you would take to the meeting.

22 Q. That's Exhibit 1, sir?

23 A. Yes.

24 Q. And Exhibit 9 is the publication of the

1 paper at some subsequent date?

2 A. That's right.

3 Q. And just to be fair to you, sir, there is --

4 A. There is an appendix.

5 Q. There is an addendum --

6 A. Addendum.

7 Q. -- on Exhibit Number 9 --

8 A. Right.

9 Q. -- which does not appear in Exhibit Number
10 1; is that correct?

11 A. That's right.

12 Q. And the addendum in Exhibit Number 9 makes
13 reference to six orbit charts, sir; is that correct?

14 A. That's right.

15 Q. When were those six orbit charts prepared?

16 A. You mean the ones that are --

17 Q. The ones to which reference is made in the
18 addendum, Dr. Battin.

19 A. The ones referenced are the ones from
20 January 26, 1961, those two orbits. It says for
21 them that there are six orbit charts, and the ones
22 that have the '60s label are the orbit
23 Earth-Venus-Mars-Earth, and the dates are the dates
24 of the configure -- particular configuration of the

1 planets and spacecraft on those dates.

2 So there are -- and the reason I did it
3 that way is because the earlier one, April 20, 1966,
4 would show the orbit from Earth out to the way
5 things were at that date; and then the next one, the
6 September 20, 1966, the orbit would extend a little
7 bit further. And then after these were all made,
8 then I decided I really don't want to do that, so I
9 just stuck with the two, the completed orbits.

10 Q. Those are Figures 26 and 27 --

11 A. That's right.

12 Q. -- in Exhibit Number 6?

13 A. Yes, that's right.

14 Q. And do I understand that --

15 A. Well, see, it says June 18, 1973; and if you
16 look on here, it says June 18, 1973 is that slide
17 that came out of the log.

18 Q. Do I take it, then, that the additional
19 slides that you prepared purported to show certain
20 conditions at a -- essentially a snapshot at
21 different dates?

22 A. The different dates, right, and those are
23 the dates.

24 Q. Yes, and again, pointing to the addendum on

1 Exhibit Number 9?

2 A. Right.

3 Q. And then you determined that what you really
4 wanted to focus on were the originals --

5 A. The complete ones.

6 Q. All right.

7 A. And the one that's labeled here as the June
8 18, 1973, that is the configuration of the planets,
9 but the orbit is completed. If you looked at any of
10 the earlier ones, you would just see a part of the
11 orbit. I was doing that for dramatic effect. It
12 turned out to be not so interesting.

13 Q. And is your testimony the same with respect
14 to those additional charts that depict the
15 trajectory in Figure 27?

16 A. Yes.

17 (Discussion off the record.)

18 BY MR. HERMES:

19 Q. Dr. Battin, let me show you a document
20 marked as Exhibit Number 10. It appears to be a
21 letter which you wrote, having six pages, to Robert
22 J. Lauson, L-A-U-S-O-N?

23 A. Yes.

24 Q. Is that a letter that you wrote to

1 Mr. Lauson in or about September of 1999?

2 A. It looks like my signature.

3 Q. Is this one of the documents you reviewed in
4 preparation for your deposition today?

5 A. No.

6 Q. Do you have any doubt, sir, that this is a
7 letter that you wrote?

8 A. No. It looks like my letter. One of the
9 clues is that it was done on this typesetting
10 program called Textures, and I can recognize the
11 fonts and the whole format.

12 Q. Is that a font and format that you have on a
13 computer to which you have access?

14 A. Yes. It's mine.

15 Q. Is that at your home?

16 A. Yes. I --

17 MR. SWOPE: There's no question before
18 you.

19 BY MR. HERMES:

20 Q. Would you look at page 5, sir.

21 A. Right.

22 Q. This letter is a response to a letter that
23 Mr. Lauson wrote to you; correct?

24 A. Yes.

1 Q. And in the various numbered paragraphs, I
2 take it you are responding to specific statements
3 that he made in a letter to you?

4 A. Right.

5 Q. At the top of page 5, there is item number
6 7?

7 A. Yes.

8 Q. And then you have a paragraph which reads,
9 "You asked why I never 'publicly claimed credit for
10 this revolutionary and fundamentally important
11 discovery until 1994.'" And you go on to write,
12 "The answer is simple - I had failed to recognize
13 its potential for future space missions."

14 A. Yes.

15 Q. Did you write that on that occasion?

16 A. Yes.

17 Q. Did you believe it to be true at that time?

18 A. Yes.

19 Q. Is it true today?

20 A. I think so, yes.

21 Q. Down at the bottom of page 5 --

22 A. Okay.

23 Q. -- in the last full sentence, you say, "I
24 made" -- or you wrote, "I made an early contribution

1 to the field, as I have explained and which is well
2 documented."

3 A. Yes, right.

4 Q. What is the early contribution that you
5 made?

6 A. Well, I think what I'm talking about here is
7 the two Earth-Venus-Mars-Earth orbits.

8 Q. Immediately above that, you state that you
9 do not, and have never claimed, "inventorship" of
10 gravity assist trajectories?

11 A. That's true.

12 Q. Do you make any claims, sir, with respect to
13 gravity assist trajectories?

14 A. Only one, and that is that I did two
15 multiple fly-bys, and I did them when I said I did
16 them. That's all.

17 Q. And is it a fair statement, sir, that you
18 make no claims with respect to any work having to do
19 with multi-planetary fly-bys unrelated to those
20 Earth-Venus-Mars-Earth trajectories?

21 A. Yes.

22 (Discussion off the record.)

23 MR. HERMES: I have no further
24 questions.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

MR. SWOPE: I have nothing.

(The deposition was concluded at 1:43 p.m.)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

ERRATA SHEET

Case Name: Michael A. Minovitch v.
Richard H. Battin

Witness Name: Richard H. Battin, Ph.D.

Deposition Date: February 9, 2005

Page No. Line No. Change

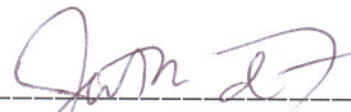
I do hereby acknowledge I have read and examined the foregoing pages of testimony, and the same is a true, correct and complete transcription of the testimony given by me, and any changes and/or corrections, if any, appear in the attached errata sheet signed by me.


Richard H. Battin, Ph.D. _____
Date

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

CERTIFICATE OF NOTARY PUBLIC

I, Justina M. deFaria, the officer before whom the foregoing deposition was taken, do hereby certify that the witness whose testimony appears in the foregoing deposition was duly sworn by me; that the testimony of said witness was taken by me in stenotype and thereafter reduced to typewriting under my direction; that said deposition is a true record of the testimony given by said witness; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this deposition was taken; and, further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.



Notary Public in and for 
The Commonwealth of Massachusetts

My commission expires:
January 12, 2007