DOE/R4/10318--T1

FL-0186

Grant No. DEFG4480R410318

Grantee: Don Plank
4321 1st Ave. N.
St. Petersburg,
Florida 33713

✓ "The Solar-Powered Car"

Grant Amount \$3,118.00

Total Cost \$8,250. (approx).

(New) Phone:
(813) 327-8715

FINAL TECHNICAL AND PERFORMANCE
REPORT

DOE/R4/10318--T1

DE84 000414

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Report Submitted to Atlanta Support Office, D.O.E., date 3/31/82.

Copy to Governors Energy Office, Tallahassee date 4/2/82.

Report Prepared
by Don Plank

3/30/82

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(1) SUMMARY OF EVENTS PRECEEDING AWARD OF GRANT.

For about 5 years I (Don Plank) had been studying the technology of photovoltaics and designing uses and applications for this science.

I had built up a considerable technical work shop of testing instruments, various sizes of solar cells and modules (small) of cells for use in testing and experimentation. I had done some minor writing on the subject; articles, book outlines and the like, and in my art studio, named "Solar Studios" had completed many technical drawings, sketches and matching specifications, for possible new products and applications. Many of these are patentable.

In October, 1979, I became recipient of an A.T. grant to build and display an exhibit which was a work of Art titled "The Solar Powered Postage Stamp- An Artist's Energy Statement". This exhibit was lighted by photovoltaic electric lighting. The project had financial help from Solar Studios and the display space, the lobby of a local Post Office, was donated by the U.S. Postal Service. This exhibit received wide public and media notice and acclaim.

During this time I was driving, as a commuting vehicle, an electric car. The news media and the public was interested and gave me personal coverage (See Exhibit #1 attached) for my ideas that this electric car could be "solar powered". I applied for an A.T. Grant to construct such a solar powered car.

In October, 1980 I was awarded the grant to build the exhibit "The Solar Powered Car".

(2) SUMMARY OF THE CONSTRUCTION OF THE SOLAR CAR (A) TECHNICAL

At the time I was awarded the grant I had (and planned to use) a 1966 model Electric Citi-Car that ran on eight 6 volt batteries (48 V.) and performed well as a commuter vehicle with a top speed of 38 M.P.H.

By measuring all of the body space available to mount photovoltaic modules, it was determined that the maximum voltage of the propelling motor could only be 36 volts. The existing car, therefore, was disposed of (sold) and replaced with a 1965 model Citi-Car that was constructed to run, though at a slower 24-28 M.P.H., on a 36 volt battery system.

With this configuration planning was begun on the electronics, wiring diagrams, voltage and charging regulators, monitoring guages and the like. The designs took various forms, on a trial and error basis, until the final exhibit car was completed for it's first media coverage in Feb. 1981, and was further modified by the time (April 1981) that it was covered in the West German and Australian papers. See Exhibits #2 and #3 attached.

Without going into detail; the conclusions reached were that the car must have the following modifications. Complete re-wiring to assure that the frame of the car, the frames of the solar modules and the batteries all had a common (-) ground. That the various circuits, 12 volt, 15 volt and 36 volt, all had separate (+) positives lines (in addition to the 18, 24 and 36 volt motor speed controls) and that they be metered with guages for monitoring and display purposes. A special voltage regulator system for the high amperage 36 volt input from the solar modules to the battery pack had to be designed and built. The Photovoltaic modules had to be adjustable to the best "sun angle" when running or parked. The final decision was that the best demonstration needed a total of six(6) modules, whereas the initial was four.

(2) Continued- Summary of the Construction of the Solar Car

(B) FINANCIAL

Item- Expenditure	Don Plank- Solar Studios Contributions	Grant Proceeds
Basic Citi-Car	\$ 2,500.00	
Tag, Licenses, Sales Tax, Inspect.Fees	157.50	
P.V. Module from previous exhibit #1	330.00	
#2	330.00	
Electronic, Photovoltaic Supplies, Materials	1,320.00	\$ 2,183.00
Other Materials, Aluminum, bolts, rivets, etc.	494.50	873.49
Bank Charges		11.51
Labor to form Aluminum Module Frames		50.00
Total Project Cost (see notes below)\$8,250.	5,132.00	3,118.00

Note 1: Also Contributed was all Labor to Build and Modify; Test and Exhibit the Solar Car. Contributed by Don Plank.

Note 2. The Solar Modules and other electronic parts are now an integral part of the Solar Car and are being depreciated with the Car as a single unit. The title to the car rests with Solar Studios. The Depreciation Schedule is as Follows:

Residual Value (1985)	\$	910.
Depreciated	1980	1,050.
Depreciate	1981	1,920.
	1982	1,920.
	1983	1,625.
	1084	825.

Note 3. The Solar Car is now being Exhibited also by-
Mike Rankin, President
Solar Electric Systems
6702 Central Avenue
St. Petersburg, Fl 33707.
They are paying all exhibit
expenses when they use the car.

Note 4. A custom Trailer (made to fit the Solar Car) has been furnished by a local Battery Manufacturer in exchange for the advertising value of having his company name associated with the exhibit.

(3) SHOWING AND PUBLICATION COVERAGE OF THE CAR.

- TELEVISION COVERAGE:
1. The Car was used in four segments of a showing of "P.M. Magazine" show in early 1982
 2. Shown in Connection with Solar Electric Systems Local News Coverage (N.B.C.) on 3/28/82.
 3. Shown on Local News Coverage from Tampa 9/19/81
 4. Shown on Local News Coverage of Univ. of South Florida- "Sun-Day" 5/3/81.
 5. Local Stations have file coverage which they use when covering alternate energy stories.

PUBLICATIONS: Article in SEP/OCT Issue of "Experimental Vehicle News"
See Exhibit #3 attached.

Coverage in STERN (West Germany) Magazine 4/18/81

Coverage through Automotive News Service, Sydney Australia.

Article in "Automotive News" 4/6/81 - See Exhibit #4 attached.

Article in St. Petersburg Times 2/9/81 - See Exhibit #2.

Pictures with Captions: The Tampa Tribune 9/22/81

Tampa Times 9/19/81 see exhibits
#5 and #6

TRADE SHOWS - ENERGY SHOWS:

1. The Car is currently being shown at various shows, weekend Shopping Center Shows, Local Parades and etc. following is a partial listing of some of the past exhibits.
2. Energy Expo-America, Bayfront Center, St. Petersburg, Fl (3 days) December 19, 20, 21, 1980.
3. Energy Expo-America, Bayfront Center, St. Petersburg, Fl (3 days) April 3, 4, 5, 1981 - see Exhibit #7 attached.
4. 1981 Energy Conservation Transportation Fair, Tampa Bay Center, September 19-20, 1981. see exhibits #4 and #5.
5. Central Florida SUN-DAY Energy Show, Riverfront Park, Univ. of South Florida, May 3rd 1981.
6. Various Cub Scout, Boy Scout showings in St. Petersburg.
7. Various Local School Showings, Science Classes- Vocational Schools.

(5) CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS:

The exhibit "The Solar Powered Car" turned out to be very effective in calling attention to alternate energy. A solar car is much more attractive to display than bare panels of hot water collectors or photovoltaic panels. A crowd will form at every show to view, and take a demonstration ride in, the solar car. Other more practical items can be offered to the audience so formed.

The car does not qualify as a prototype of serious commuter transportation as it was developed, however. Hindsight being the best view, I can visualize, and could now build, a practical solar assisted commuter car- a hybrid ideally, that would be marketable. The building of the first one gave us all a lot of valuable information on the subject.

If the Appropriate Technology Grants, or any other Grants, were now still available I could build the ultimate in Solar-Electric- Fossil Fuel, Hybrid Vehicle. The concepts are so advanced, however, that I have had no luck attracting Grants or other interest from private industry.

I am attaching an outline of the successor to my current Solar Car. It is a "High Performance, Long Range, Solar-Electric Hybrid". This then, I believe, may be the future for the Solar Car and an extension of the work done under the grant just completed.

The Outline of the Future Solar Car is Exhibit #8.

(6) LIST OF ATTACHMENTS TO REPORT:

- Removed*
- Exhibit #1 - Article, St.Petersburg Independent Newspaper 5/13/80
 - #2 - Article, St.Petersburg Times Newspaper 2/9/81
 - #3 - Article, Experimental Vehicle Newsletter with (on reverse) Coverage in STERN (West Germany) Magazine 4/18/81
 - #4 - Article, Automotive News 4/6/81
 - #5 - Photo & Caption, Tampa Times Newspaper 9/19/81
 - #6 - Photo & Caption, The Tampa Tribune Newspaper 9/22/81
 - #7 - Article, St.Petersburg Times 4/4/81
 - #8 - Proposal for Advertising Campaign based upon production of prototype Solar-Electric Car.

Dear Friend,

I am presenting for your consideration an advertising campaign. This advertising campaign will consist of the building and exhibition of a unique solar electric automobile that has the looks of a sports car, has high performance and unlimited range all unlike the general limitations of existing electric cars. This is not a securities offer- but a genuine advertising display. The project could lead to a program of manufacture and sales of similar machines, however, and under those circumstances a securities offer might be considered.

Illustrations

Design Art

Printing

Publications

Exhibits

Displays

Lectures

Sales

For some background- Solar Studios has been in business as an Art, Design Studio since 1975. We produce Advertising Art, Technical Drawings and Illustrations and Camera Ready Mechanicals; Type Setting and Printing when required.

Since 1978, Solar Studios has also been sucessfully involved with the design, research and development of products that use Photovoltaics (the production of electrical power directly from the sun) and, of course, we have built, exhibited and received International Media Coverage, with our Solar Car and other products.

The persommel and associates of Solar Studios represent a high degree of expertise in various fields and technologies as follows:

Degrees in Physics- Business Management- Accounting. Authorships and Consultants in Business Management, Electronics and Photovoltaics. Consultants to Large Engineering and Space Sciences Firms. Awarded Grants from D.O.E. and others for R. & D. in Photovoltaics. Members of various Trade Associations and Technical Societies. Awarded Presidential Energy Award.

Our next project, outlined here, will be an exciting one; the culmination of years of study, design work, research and development. We are going to produce the first SOLAR-ELECTRIC- HYBRID VEHICLE; a SPORTS CAR, that will fulfill the aesthetic, performance and economy requirements of the car of the future:

A HIGH PERFORMANCE- FOUR PASSENGER- SPORTS CAR THAT RUNS ON SOLAR-ELECTRIC POWER FOR ITS FIRST 100 MILES OF TRAVEL AT 2¢ PER MILE, AND THEN WILL TRAVEL ACROSS COUNTRY USING A HYBRID GENERATING ENGINE ALONG WITH THE SOLAR-ELECTRIC AT A RATE OF 150 MILES PER GALLON FOR THE GENERATING ENGINE. THE MODEL WILL BE A DEMONSTRATION OF A CAR THAT CAN BE PRODUCED TO COMPETE IN PRICING WITH EXISTING VEHICLES.

We offer to build the worlds first Solar-Electric-Hybrid and exhibit it, promote your Company and your products with the media coverage of this unique event. You can take advantage of the invaluable advertising value of the project, and- we might decide (together or with other parties) to produce the car.

Our homework has been done. We know the costs, engineering and other needs to complete and sucessfully promote the car and your Company.

Following is an outline that may answer some of your further questions. We can then talk further- call us and let's talk.

P.O. Box 15555
St. Petersburg
Florida 33733

Phone
(813) 894-4020

Studios
4321-1st Ave. N.

SOLAR
STUDIOS
4321-1st Ave. N.
St. Petersburg, FL 33733
(813) 894-4020

PEOPLE WITH vision - VISION - VISION will recognize this as a Product that will attract untold Media and Advertising values for the Company and Products associated with it.

We will be able to give you the exact details on the construction, and costs, of the Model Show Car; the cost of exhibiting it for 1 year, and the potential for expanding the program further.

The Total Cost to build the show car (as a SHOW car)	\$24,500.
The Cost of exhibiting, touring and producing Media Events	40,000. (One Year)

Do these figures fit your Advertising Budget?

After the public falls in love with the car (they will) we can consider producing custom cars on order in the \$18-15,000 range (4-6,000 profit)

This is a rough Sketch of the Car.....

The Generator will be a small trailer, attachable for trips longer than 100 miles, that matches the styling of the car.

The photovoltaic (solar) cells will be built-in, flush with the body panels. They will produce over 200 Watts of Power by themselves, -(we have perfected this technology).

Think this over carefully- Your Company could be World Famous as the Sponsors of this Display and Exhibition.

Don

Don Plank
Don Plank's Solar Studios.