ADVENT OF THE HEADRICK SOLAR-VOLTAIC DOME™ POWER STATION

MAINSTREAM DEPLOYMENT OF BI-PV IN THE UNITED STATES ENERGY ARENA SOLAR ARRAY CONFIGURATION BENEFITS, ELECTRONICS AND ISSUES

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INTRODUCTION

Civilization has embraced a highly refined essence of culture for well over 2,000 years. Commerce and quality of life have danced in a delicate and at times bold interplay throughout the evolution of humankind. Yet, never so precariously as it does, today.

The earth and its abundant blessings and resources sway on a pendulum in orbit between the drive for survival and the corruptibility of commerce. Decisions regarding global resources are now -more than ever -entertwined with the very essence of global survival. We may no longer separate the issue of fuels for our individual automobiles and energy production choices from our collective journey together on planet earth. People around the world are asking for responsible energy products, it is up to us to put them within reach and within budget, today.[1]

In the alarm-ridden, media-meshed world in which we live another crisis call can no longer be depended upon to meet the need. Humanity in every nation must be readily provided environmentally-protective energy solutions with related products commercialized through sound financial and marketing strategies that will responsibly address our growing needs, today -as well as ten to one hundred years down the road. I believe the Headrick Solar-Voltaic Dome™ is one of the technologies to meet the need and put us on the path to mainstream deployment of clean sustainable electricity.

The real estate proforma has an attractive return on an investment with nearly $1 million dollars a year income from non-polluting grid-connected or stand alone energy, passive energy savings and a real estate lease for twenty to thirty years. Clearly we must dissolve the double bind limiting mainstream deployment of ***building-integrated photovoltaics (BI-PV)*** *in the domestic and global marketplace. I welcome the guidance and wisdom of those who acknowledge the need and have the courage to facilitate the opportunity to evolve BI-PV into a mainstream World Trade Commodity of the 21st Century as we create clean demand-site electricity within the rooftops and facades of our nation's architecture, today.*

Figure 1 Colonel Richard T.Headrick & Model of Solar-Voltaic Dome™ Ritz Carlton Kansas City, Missouri 1995

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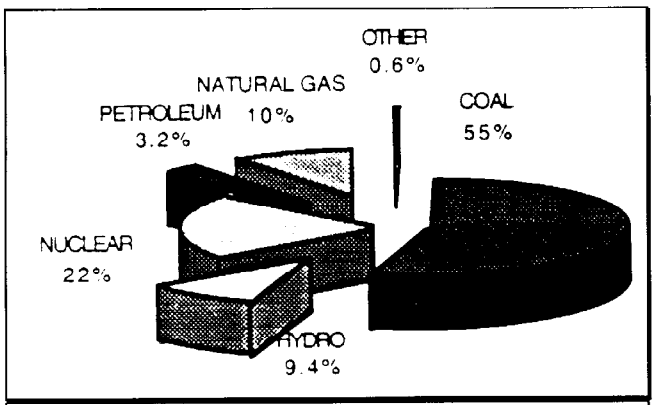

Figure 2 US Electricity Consumption 1994
Energy Policy Plan 1995 US Dept. of Energy

Headrick Solar-Voltaic Dome™

During the last twenty years, while coal production doubled and the cost of photovoltaics (PV) shrank to less than $5 watt, Lt. Colonel Richard T. Headrick was inventing technology. He designed the Spruce Goose Dome that housed the Spirit of St. Louis. In the early 1980s, he was commissioned to design a dome structure for a prominent congregation in Southern California. In that process, he was asked if it was possible to utilize solar panels on the dome roof to provide enough electricity for the facility. The question captured his attention for the next two years.

In World War II Colonel Headrick successfully completed 96 B17 missions destroying the major transportation routes of Hitler's extermination regime. In 1984, he patented a legacy of peace for the 21st Century. Colonel Headrick used the same aviation geometry that had saved his life in the air many times to engineer the most efficient terrestrial solar array in existent, today.

The array is designed to follow the sun through a solar day with 21,000 SF of *building-integrated photovoltaics (BI-PV)* surface creating minimal shading. The rotating mechanism is much simpler than revolving restaurants. The array tracks the sun vertically in a stationary configuration of 60, 45 and 30 degree angles capturing the optimum amount of light while it provides passive solar shading from intense sun. This solar array increases *packing density* on an acre 4.5 times over the traditional Hesperia field. A 12.5 watts per SF surface in this configuration will produce 262.5 kWp on an acre footprint. The array can be integrated into a variety of sizes and shapes of structures. It is ideal for high demand needs like electric car rental charging stations. In Irvine California, the inventor's hometown, it will produce around 2-3 MWh per day.

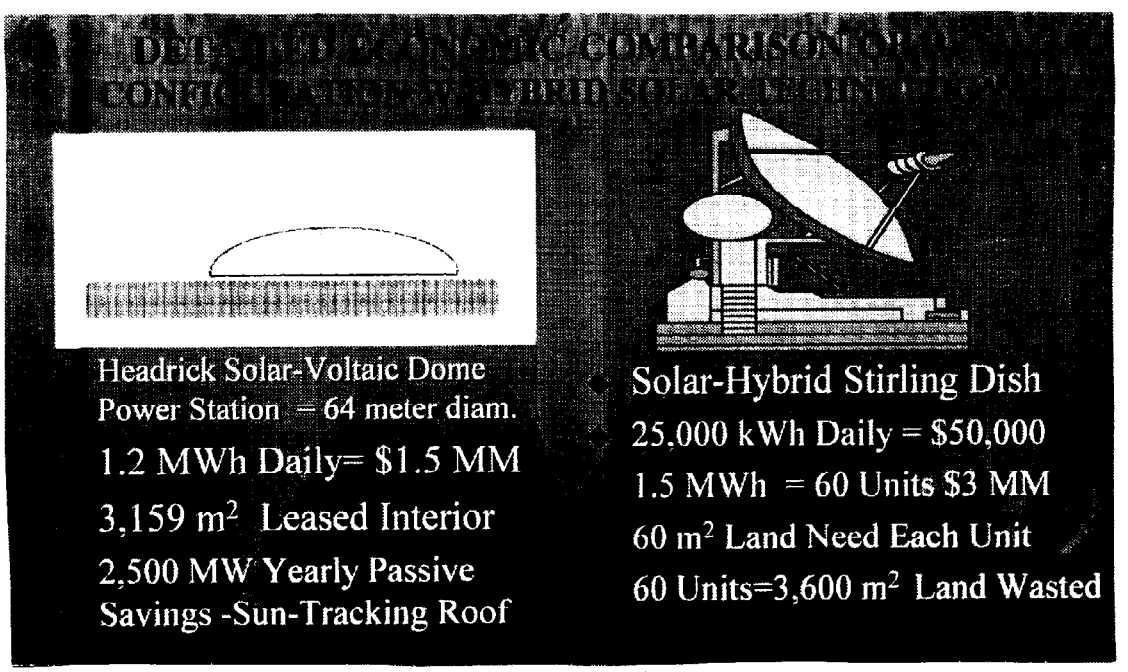

Figure 3 - Comparison: Headrick Solar-Voltaic Dome ™ and Hybrid Solar Stirling Dish

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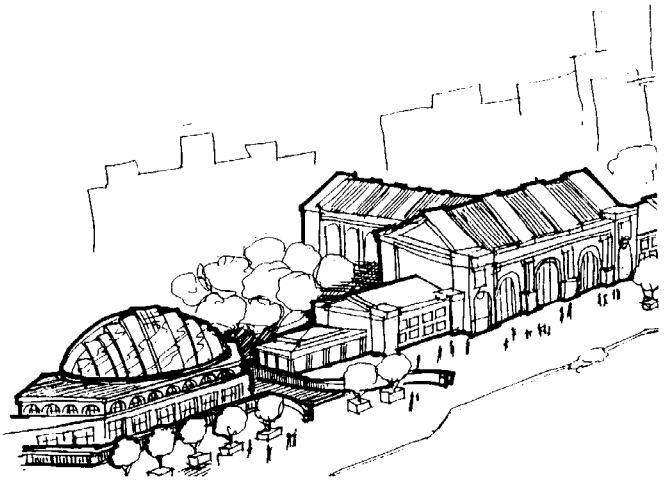

Figure 4 - ECO TECHE'[2] featuring Science City & Solar Solution® for KC Union Station
Energy was a major problem for this beautiful national landmark train station with a 94'-6" span from ceiling to floor in the grand lobby.

In 1992, while working on a restoration plan for this 450,000 SF train station, I founded my business to assure timely mainstream deployment of *building-integrated photovoltaics (BI-PV)* in the domestic and global marketplace.

The community wanted a science museum included in the project. With new energy technology on the horizon and the growing environmental problems from the *Big Three* fuels, the perfect solution was to combine the need of substantial electricity and science education into this highly visible redevelopment project. I developed a 1.3 million SF plan for the structure and adjacent land. The solar dome electric generator is shown in these drawings as an energy history museum that will include demonstrations of new and historic technology.[3]

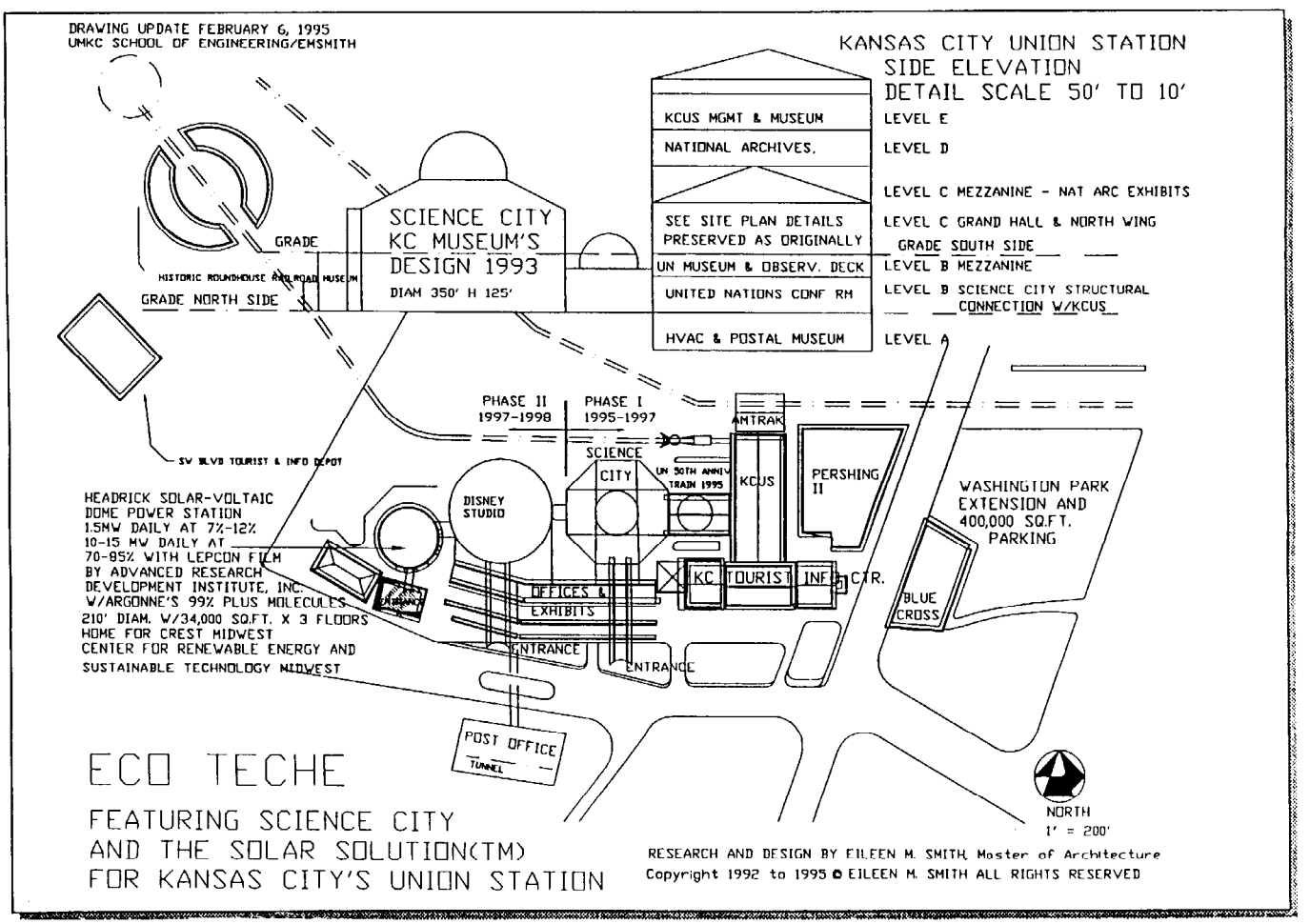

Figure 5 - Site Plan: ECO TECHE' featuring Science City & Solar Solution for KC Union Station

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Form Follows Function

Jon McGowan, a mechanical engineer at the University of Massachusetts conducted a study of this invention for the U.S. Department of Energy in 1986 indicating the mathematics of the invention are sound.[4] At that time, it was suggested for 3rd World Nations to deploy in new energy industries because photovoltaics was quite expensive being over $100 watt at that time. Several projects were proposed including the one for a large refrigeration unit in a remote Indonesian village. A rendering of the project is shown on the next page. The goal was to provide electricity to refrigerate the daily fisherman's catch to increase the harvest of fish.

Arco Solar conducted a study to determine how much the Headrick Solar-Voltaic Dome™ configuration varied in efficiency from one latitude to another. They discovered the array only varied 5% in comparing Norway and Miami. The natural shape of the earth and the mean of 208.7 feet in diameter yields four times the photovoltaic surface a 100 foot dome provides. However, the surface only doubles from 200 to 400 feet in diameter.

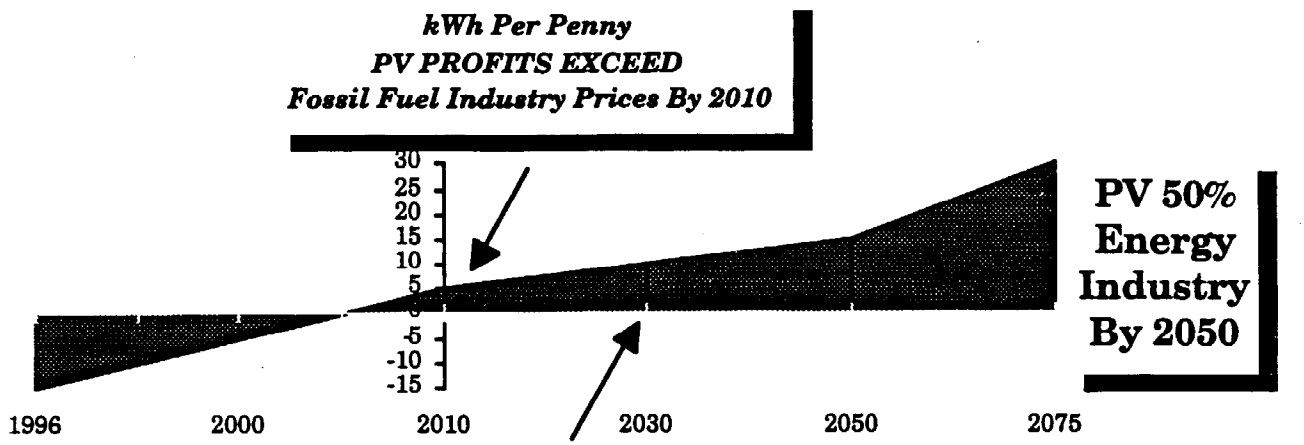
LIST OF SOLAR DEV COOPERATIVE PROGRAMS FOR SOLAR-VOLTAIC DOME™

- **Advent of the Headrick Solar Voltaic Dome™ Power Station**
- **100 H-SVDPS By 2000**
  Three World Powers Competition of Discovery for US - Europe - Japan
- **1000 By 2010 -SDC $2 Billion Busin. Plan**

- **Sustainable Village® Developments**
- **Solar Electric Car Rental Facility**
- **Solar Electric Building Materials Manufacturing Facility[5]**
- **Recreation Centers & Schools**

Sustainable Village® Developments include a solar electric car rental facility. The plan provides a focus on healthy lifestyles from health food stores to clean energy to exercise. Where appropriate solar-electric building materials manufacturing plants and fifty plus homes are combine to build neighborhoods in American cities or remote villages in 3rd World Nations. Solar electric car rental facilities in urban or remote sites provide clean ***electricity and mobility*** economically and independently.

STRATEGIC MARKETING PLAN FOR BUILDING-INTEGRATED PV



Solar Bonds Mature 2030

Market Incentives: Advent of the Headrick Solar-Voltaic Dome Power Station
Solar Bonds enhance pay-back strategy for six-year real estate proformas
30-Year Bonds Start PV at $5 Watt Peak (Wp) - Mature 2030 around 15 Wp $1

Figure 6 - Strategic Marketing Plan For Building-Integrated Photovoltaics Using Solar Bonds[6]

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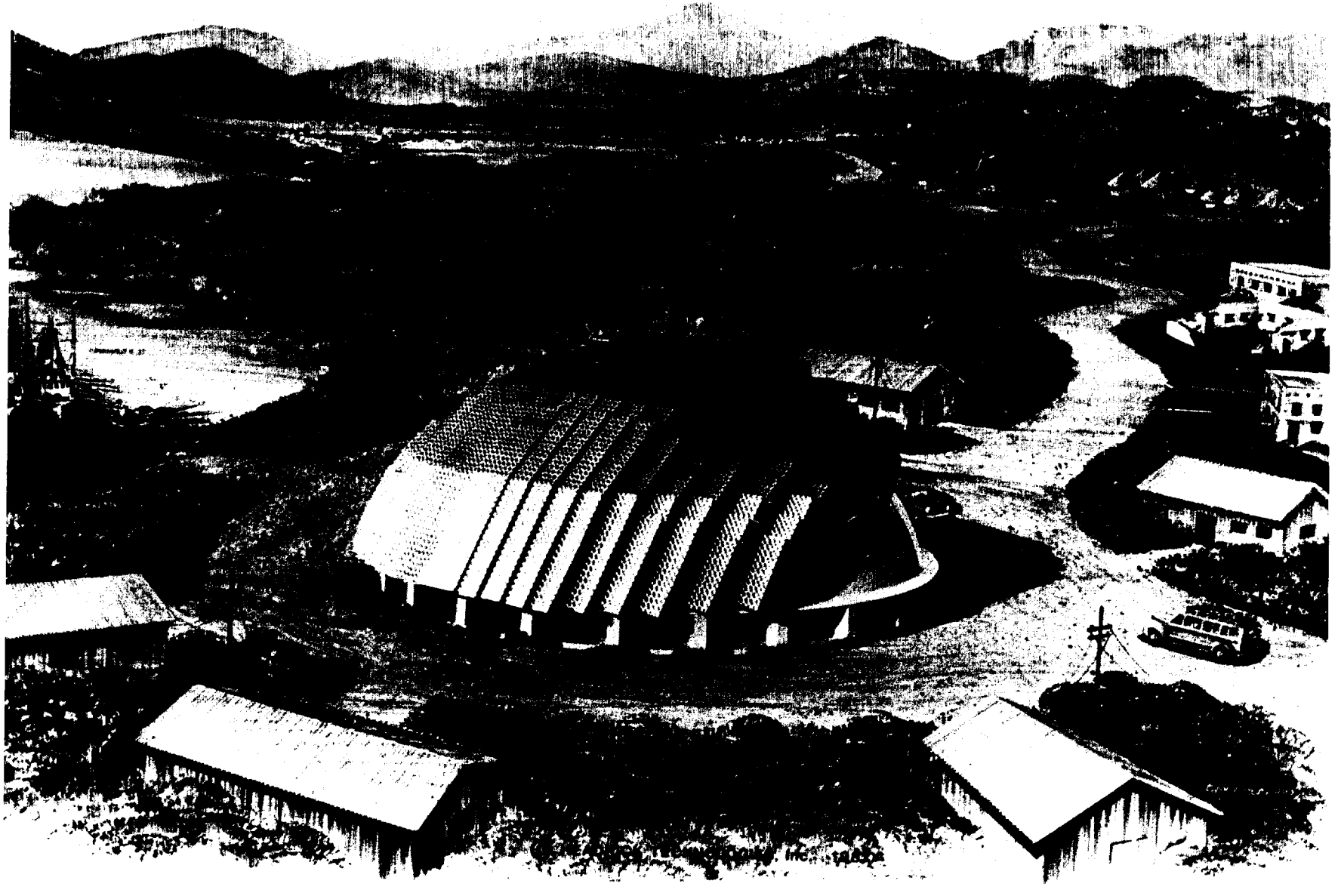

Figure 7: Headrick Solar-Voltaic Dome™ Power Station for Indonesian Fishing Village Refrigeration Unit[7]

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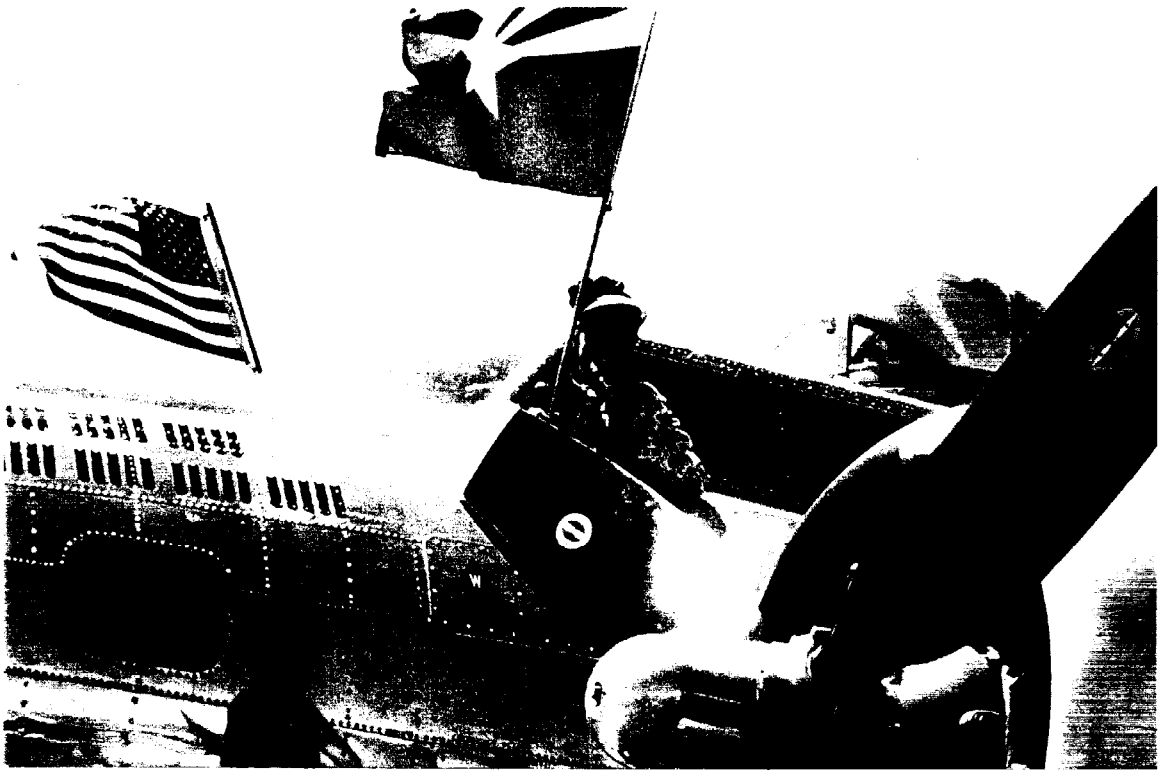

Figure 8 - Author: Eileen M. Smith, M.Arch. Waving Hello From Cockpit of B17 47th And Last Air Show At El Toro Air Force Base Orange County California April 1997

THE DOME
A SYMBOL OF AMERICAN DEMOCRACY[8]

Sir Norman Foster designed a modern dome for the Reichstadt in Berlin. When I visited Berlin for a conference in 1996, we discussed the possibility of making the unique glass dome photovoltaic as a global symbol for prosperity and peace into the next millennium.

Having tried out the seat of the B17 at the 47th El Toro Air Show last spring to take this picture, it is difficult to imagine living in one for two years. I have a healthy respect for those people who have fought for freedom and democracy. When the call for action came Colonel Headrick at the age of 23 did not hesitate to answer. He generously gave the time, and talent it took to destroy transportation routes throughout enemy territory to protect the world from one of the bloodiest dictatorships in human history.

In 1986, Colonel Headrick patented what I call a *legacy of peace.* To build this important Solar-Voltaic Dome™ Power Station array requires an investment of less than $2 million dollars with guaranteed return on investment in twenty years. We should not take so long to answer this much easier *call to peace* least our labors are, too soon, diverted, again, to war. We need a prototype of this configuration built, yesterday. Who has the courage to answer the call, today?

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[1] Smith, Eileen M.; ***The Advent of the Headrick Solar-Voltaic Dome™ Power Station***, 13th European PV Solar Energy Conference & Exhib Oct, 1995 Nice France

[2] Smith, Eileen M.; ***ECO TECHE' featuring Science City & Solar Solution® for KC Union Station***
Ferguson, Susan; ***An Alternative View-A Women's (Architect) Vision for Union Station Includes Dev of a Solar Power Station,*** **The Wednesday Magazine,** Sept 6, 1995

[3] Smith, Eileen M.; ***Solar Solution® For KC's Union Station; Commercialization Financing Renewable Energy Tech.,*** *Ventures Program OTA DOE Feb 28'94*

[4] McGowan, Jon; ***Headrick Solar-Voltaic Dome™ Report for US Dept Energy 1986,*** Univ Massachusetts. Amhurst

[5] EA Engineering, ***Economic Impacts of a Photovoltaic Module Manufacturing Facility,*** US Dept Energy 5-92

[6] Smith, E.; ***100 Headrick Solar-Voltaic Dome™ By 2000, World Renewable Energy Congress June 1996***

[7] Headrick, Richard; **Solar-Voltaic Dome™ 1987**

[8] ***The Dome: Symbol of American Democracy***, Natl. Bldg Museum Oct 20 '95 Apr 14 '96 Washington DC

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