Making General Aviation Great Again: The Airplane

Making General Aviation Great Again: The People

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By
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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

General Aviation is the overall sector of airplane related activities which are outside large companies, airlines, and the military. General Aviation (GA) encompasses piloting aircraft for oneself or family, small aircraft repair, maintaining and managing local airports, and the plethora of activities that come with an airport (skydiving, sightseeing/tours, airshows, etc.). Unfortunately, many of these GA airports have been disappearing over the years, as there were over 4500 in 1974[1], and less than 3000 in 2022[2]. A huge source of income for smaller towns and a huge source of identity and life for less populated communities have slowly degraded to the point of closure. Even knowledge of GA has slowly been forgotten, with the only time media referring to GA and pushing knowledge of its vital operations is to inform the general populace of another rare accident causing the death of a pilot (something that happens much more routinely in cars, with 6 million car accidents[3] vs ~1000 GA accidents per year[4]). GA as a whole has been on the decline since the 1970s, with participation in all related fields decreasing every year[5], and the price of even a 4-person GA aircraft increasing every year[6]. A typical GA aircraft, the user-friendly Cessna 172, costed approximately $16,000 in 1975, less than an average Volvo 242 in the same year. In 2023, the same airplane costs ~$400,000, and a similarly functioning modern car costs ~$40,000, an absurd difference. The manufacturing techniques, materials used, and overall design of GA aircraft has barely changed since the mid-1900s, unlike the automotive industry which has seen substantial modernization at every turn possible.

Figure 1 – Cessna 172 Skyhawk from the 1970s (top) and Cessna 172 Skyhawk from 2023 (bottom), note identical design, materials, and price (~$16,000 top, ~$400,000 bottom)

In my Technical Project, I will research the causes of such a large increase in aircraft prices and look to design manufacturing techniques and a more modern GA aircraft to reduce prices back to an affordable level. The GA community is built on integrity, respect, excellence, and personal responsibility; values and virtues seeming to be less prevalent in the newer generations. Social media, over-reliance on technology, and general laziness have seemingly swept the country's youth like a plague in the last 10 years. Stark contrasts are obvious when considering the mental health of youth in the 1970s and that of youth today[7]. In my STS Research, I will investigate the societal causes of the GA decline, and the implications this effect in turn has on American society. With these connections, I will show how the revitalization and expanding of the GA community can help to mitigate and eventually eliminate the problems plaguing youth today. While nationwide virtue increase may be an endeavor requiring much more than a revitalization of the GA industry and community, the broad list of other factors would be too numerous to incorporate all at once, and so the GA promotion will be the factor focused on during this research. The Technical Project is the method by which one can solve the STS Research problem: by making airplanes more affordable, they become more desirable and the General Aviation community can begin to grow, fostering the virtues which the new generations desperately need to cultivate.

Making General Aviation Great Again: The Airplane

General Aviation is a crucial part of America's economy, supporting nearly 1.2 million jobs and a total of $246.8 billion in economic output[8]. The pilots, mechanics, manufacturers, technicians, air traffic controllers, and all members of the logistical processes of flight are part of a continent spanning network of thousands of airports, helipads, and airfields. These people that are a part of this network perform very vital tasks: transport blood/organs for transplant, perform search and rescue missions, support wildfire control and general environmental stability, as well as business and entertainment interests. Most aspects of a US Citizen's life are affected by

General Aviation (GA) in some way; however, most people do not understand much about this crucial industry. Few people may recognize and appreciate GA now, but this was not always the case. Throughout the 1970s and 1980s, airplanes costed as much as a car[6 9], and the community as a whole was very well supported with new airports being constructed, new events being publicized, and the thrill of flight being a mainstream opportunity for any who wanted to be a part of it. Since then, as myself and many pilots have seen, most airports are crumbling, most airplanes are old (1950-1960s design), and the media regards GA with disdain as a hazardous way to a quick, fiery, early death[10]. One of the principal reasons that the GA community has died down is the manner by which its main sector can grow: aircraft owners. Without an aircraft, there is no aviation. Prices of owning an aircraft have increased to over 10 times the price of a car, making it an extremely huge burden to own even an old, 4 person aircraft, let alone a brand new one[6 9]. The airplane flies because it is a light object with lots of power, enabling it to catch the air under the wings lifting it off the ground. Making aircraft lighter, more powerful, and, most importantly, safer, the price of an aircraft can go down. However, this is a very complicated task to undertake, requiring manufacturing compatibility, maintenance simplicity, and ease of learning. Not to mention, the aircraft has to be permitted by the Federal Aviation Administration, keeping in line with all the thousands of policies and laws. This entire system of requirements and problems is not something that can be deciphered and solved with an ideal aircraft if we keep trying the same things as in years past: using the same materials, same processes, same ideas, same training, same engines, same maintenance, and same publicity. A new take on GA aircraft is required, and my research will investigate all the possibilities, narrow them into probabilities, and filter them into pathways one can take to develop a new affordable aircraft that can help push General Aviation back on the map for the general US Citizen. There have been dozens of new materials developed, many manufacturing techniques have been updated, and a better and safer aircraft to make General Aviation great again.

Making General Aviation Great Again: The People

Why has General Aviation seen such a decline since the 1960s and 1970s? Why is there a stigma of the people born from 1990-2010s being a ruined, degenerate, and stunted new generation? Are these two situations connected? How can these situations be reversed? My research will show that the latter situation is partially caused by the former, because the values engrained, skills taught, and lessons learned through GA are antidotes to many of the plagues of the mind people experience today. Taking away such mentally grounding activities (not unlike camping, wholesome family activities, interpersonal recreation, etc.) cause many of the problems we see in youth today. Mental health crises are on the rise, and have been not only more frequently diagnosed, but have turned into a sort of epidemic. Loneliness has pushed its way into the lives of millions because of COVID-19. Motivation to work and act with self-responsibility has seen record low numbers in recent years due to the quick efficiency of rapidly expanding technology, and peoples' over-reliance on that technology[11]. My research will take a Virtue Ethics approach and employ the Actor-Network Theory to show how the problems of modern-day society amongst youth are, in part, related to the decline of General Aviation; furthermore, I will hypothesize how bringing GA back to the forefront will push the younger generations to feel happier, more self-responsible/motivated, and prepared to grow and change the world around them. Through a series of studies of research performed by others (historical analysis of secondary sources), surveys implemented, and interviews implemented, I will show the lack of GA knowledge, and separately the lack of values, in the youth of present day, the values GA fosters, and propose a revitalization of the General Aviation community to mitigate these problems at least in part. The secondary sources I will be researching will primarily discuss the generational issues of society mainly in America since the early 2000s, marking a large increase in technology available to the average US citizen's home. The data from these

secondary sources will show trends the youth of today's society, illustrate potential causes (the actors) of these trends, and show possible solutions either already implemented or suggested. The surveys done will gather data concerning the ethical state of youth today, as they will be fielded to youth of all ages between 14 and 24 with questions pertaining to their own personal values, their perception on problems today, and knowledge about GA. Interviews with members of the older generations (especially GA members) will show where their values lie, their take on problems of youth today, and what values the GA community fosters either directly or indirectly, along with when/how they learned about GA. The hope is that the answers to these interviews and surveys will show stark differences between personal values and the awareness of the GA community. With the evidence gathered, I hope to formulate a general plan to mitigate some of the problems youths have today by revitalizing General Aviation. This plan will be very high level in the general sense, offering overarching ideas and potential solutions for different areas of the problems found, and very specific in the implementation of GA back into the mainstream of society. The Actor Network theory will show how different actors are responsible for the situation of today, and that by giving more power to certain actors, one can begin to change and reverse the problems of today.

Conclusion

There are several problems that plague the youth of today's society, of which they are not solely responsible for bringing into the world. The decline of the General Aviation community has paralleled its descent with that of rising mental health crises, declining personal responsibility, and related challenges young Americans face. The purpose of my technical research is to develop strategies to design and create an affordable GA aircraft, which can help bring GA back into the limelight. My STS research will prove the problems are real, widespread, and in need of mitigation, and that a revitalization of the GA community will foster the values necessary to dispel of such problems. The research paper will show the findings of all research as well as the plans of the affordable GA aircraft and the plans of how to revitalize the GA

community outside the technical approach, with emphasis on its outcome being the partial destruction of the problems plaguing society, and partial renovation of values long lost to the newer generations.

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Footnotes

1: General Aviation Manufacturers Association, Statistical Data, 1976, table on page 21 reports 4,575 Public General Aviation (GA) Airports.

2: Federal Aviation Administration Report updated in 2022 states less than 3,000 Public GA Airports.

3: Bureau of Transportation Statistics with 2021 car crash data (6,102,936 per year).

4: Bureau of Transportation Statistics with 2021 GA crash data (1,157 per year).

5: Air Facts Journal shows several charts with relevant declines, especially showing the Private Pilot is becoming less common than the Airline Transport Pilot, and less common in general.

6: Forbes published in 2021 that the price of some Cessna 172s went from $12,500 in 1970 to some costing as low as $432,000 in 2021.

7: National Institute of Health reported less than 2% of youth using mental health services, I include 2 articles stating the mental health crises (anxiety, depression, etc.) have increased drastically since the 1970s, with the LinkedIn article discussing several reasons why mental health of children was stable in the 1970s.

8: General Aviation News quoted a National Association of State Aviation Officials report giving the numbers stated in the text and positive commentary on the matter.

9: 1975-1980 Volvo 242 stats listed $18,900 as the highest sales price of the car.

10: A simple Google search for “usa general aviation cnn” yielded 2 top results, near misses (US airplane near misses keep coming. Now officials are talking about averting 'catastrophic' incidents) and accidents (Aviation safety expert and ex-NFL star both killed).

11: Gabrielson and Harper discuss this trend in their article on wilderness therapy (The role of wilderness therapy for adolescents in the face of global trends of urbanization and technification)