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THE GET AWAY SPECIAL PROGRAM: YEAR 2000 AND BEYOND

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ABSTRACT

The Get Away Special Program flew its first payload in 1982. Since then, 157 payloads have flown on the STS. As the GAS program approaches the new millennium, interest in flying the low-cost access to space continues. Many changes are in store, or are already underway, that will impact the GAS user community in the coming years. This presentation will briefly outline some of those changes and other external impacts to the GAS Program.

INTRODUCTION

The Get Away Special Program, or GAS, has been in place since the early days of the Space Shuttle Program. The fundamental premise behind the program remains the same today as it was in 1982 when the first GAS payload was flown on STS-4:

- Enable low-cost access to space
- Encourage the use of space by all researchers; educational organizations to private companies and foreign organizations
- Research and development on concepts that might lead to prime experiments
- Generate enthusiasm amongst the educational community and foster space education

For more information on the fundamental aspects of the Get Away Special, technical information summaries, flight history, available reference documentation, and other information about the program, the NASA Goddard Space Flight Center (GSFC) maintains an extensive web site at: <http://www.wff.nasa.gov/~sspp/gas/gas.html>

CURRENT STATUS

To date 157 GAS payloads have flown on a total of 35 STS missions. On average approximately 10-11 GAS payloads have been flown per year. (See Figure 1) Most recently 16 GAS payloads were flown in 1998 on 5 missions. Other than the years 1987 and 1988 when the Shuttle Program was recovering from Challenger, only 1990 went by without a GAS flight. This year the GAS program faces only its second operational year without a single flight opportunity, due primarily to the International Space Station assembly. Nevertheless, there continues to be much interest in the program from long-standing customers and new customers as well. There are 440 GAS reservations on file

today. The GAS project team maintains an "active" list of payloads to denote customers who are actively submitting documentation and working with NASA. Currently, there are 30 payloads on this active list, representing a diverse group of organizations from high schools and universities across the country to international organizations like the Canadian Space Agency (CSA) and the European Space Agency (ESA).

IMPACT OF ISS ASSEMBLY ON GAS

As NASA moves further into the assembly sequence of the International Space Station, the opportunities for small payloads like GAS enter an era with a greater degree of uncertainty. Although opportunities in the GAS program has always been based on available weight and volume margin in the cargo bay, the missions identified for ISS have a greater degree of variability in their parameters. In addition, the Shuttle Program is shortening its templates for standard processing of missions. This includes the preparation of the Orbiter and all of the systems that comprise the STS, as well as delivery and installation of cargo elements. The combination of these two factors will result in the GAS customer and NASA's GAS project team having less time to react to flight opportunities. Another new consideration presented by the ISS missions involves the environmental conditions experienced by the payloads mounted in the cargo bay. The Orbiter will be docked with the ISS elements for long periods of time and the orientation of the ISS-Orbiter configuration could potentially produce some severe temperature extremes for cargo bay payloads. Until the larger ISS solar arrays are installed, the ISS will be orbiting in a configuration that maximizes the effect of the smaller arrays. This happens to orient the Orbiter such that payloads on the sidewall of the cargo bay could be in direct sunlight for extremely long periods of time. There is the possibility that portions of the ISS could end up shadowing the cargo bay in some locations. In order to know the predicted thermal conditions for a given payload, extensive modeling will be required on a mission-by-mission basis. As further ISS missions fly, it is expected that further data will become available to the GAS project team that will enable us to determine the severity of the thermal issue.

CHANGES TO GAS AFFECTING THE CUSTOMER

There are many changes going on within the NASA community. Some are with regard to shifts in focus; for example, towards greater efforts in the area of educational outreach. Within the Shuttle Small Payloads Project (SSPP), this was a driving force in the development of the Space Experiment Module (SEM) Program. Other changes involve updates to hardware, documentation, and policy. The following sections briefly describe some of the changes that will be affecting GAS customers in the coming months and years.

Changes to CFR (Policy)

The GAS Program is governed by federal law. The Code of Federal Regulations (14 CFR 1214.9 and 1214.10) has always held the requirements for eligibility, classification and

flight priority. When the program was introduced, three classes were formed: Class I (Educational), Class II (Commercial/Private/Foreign), and Class III (US Government). The flight assignment priority was then established as II, I, II, III. The Class II payloads were given stronger emphasis at the time because it was felt that educational and government experiments would have many other opportunities within other programs to fly. Figure 2 shows historically how many payloads have flown from each class.

With NASA placing greater emphasis on the opportunity to use GAS as a tool for fostering educational outreach, the NASA Administrator recently directed that the policy be revisited. The resulting changes, which are yet to be implemented, will further emphasize the Class I educational payloads. The existing policy is in the process of being revoked. It is expected that the new policy will be placed into effect sometime in 2000. Until that time, however, the program will not be on hold and will be governed by the new classification and priority rotation established during the review of the existing policy (Reference 2). Five classes will now comprise the queue system: Class I (US Educational), Class II (US Government), Class III (US Commercial), Class IV (International Educational), and Class V (International Government/Industry). The flight assignment priority will be established such that every other payload will be from Class I, in other words as follows: I, II, I, III, I, IV, I, V.

GAS Hardware Upgrades

NASA is in the process of upgrading some of the GAS hardware that has been in service since the inception of the program. The lower end plate of the GAS canister, known as the Instrumented Electronics Plate (IEP), contains the electronics that provide control of the payload power. The components that comprise this system, including the GAS Control Decoder (GCD) are being upgraded to a digital interface to the crew laptop, or PGSC. The functions and services provided to the customer will essentially remain the same; however, the GAS team will be provided with some housekeeping data that was not previously available. It is conceivable that this additional data, including temperature, pressure, and more accurate relay status information, could be made available post-flight to GAS customers.

Changes to GAS Safety Requirements

The basic safety certification process for GAS payloads, as it is presented to the customer, will not be much different than it has been in the past. GSFC continues to be the advocate for the GAS customers in obtaining safety approval for flight aboard the STS.

The primary focus of recent changes in documentation and requirements for safety involves emphasis on improved communications; both between the GAS project team and the customer, and between GSFC and the Shuttle Program centers, Johnson Space Center (JSC) and Kennedy Space Center (KSC). In the coming months, customers will be seeing improved safety help documentation, including a more clearly defined schedule

of required documentation within the approval process. A Memorandum of Agreement (MOA) is being established between the three NASA centers that are involved with processing GAS safety that will streamline the process and provide a smoother flow of information between all parties.

GAS Documentation

The GAS Experimenters Handbook, last updated in 1995, has remained essentially the same since early in the program's history. The GAS safety manuals and guidelines have been through several iterations over the years. With the increasing availability and convenience of the Internet as a media tool, a revision to the handbook at this time will be centered around providing an on-line users guide, with available hard-copy versions. Safety reference documentation will be integrated within the handbook to emphasize the importance of safety within a project's development.

Changes Within Goddard Space Flight Center

GSFC has undergone some organizational changes within the last two years that have had an impact on GAS. As part of an initiative to redefine the role of Wallops Flight Facility (WFF) as part of GSFC, project management and engineering support to the GAS Program began transitioning to WFF in late 1997. By the year 2000, most of the functions for the GAS and SEM programs will be performed at WFF. For GAS customers this means that some familiar names and faces have and will be changing. However, with GSFC's ever increasing commitment to being a customer-focused organization, it is our desire that any organizational impacts within the Center not affect the level of assistance offered to the GAS customer.

SUMMARY

Despite the changes summarized in this paper, the GAS Program continues to receive the support from NASA Headquarters as a viable method of providing low-cost access to space for a diverse user community. It is the hope of the GSFC GAS project team that our customers continue to find the program a worthwhile endeavor.

REFERENCES

1. NASA 14 CFR 1214.9, Use of Small Self-Contained Payloads
2. Memo from J. Rothenberg, Code M AA for Space Flight, to the NASA Administrator, *Review of the NASA Small Self-Contained Payloads (SSCP) Program*, dated September 16, 1998.

Figure 1: GAS Payloads Flown (By Year)

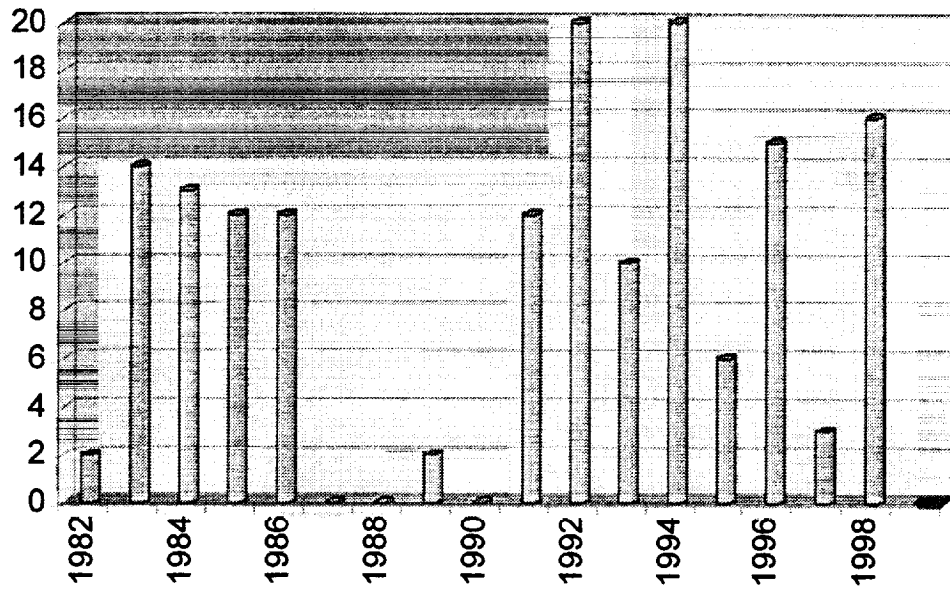
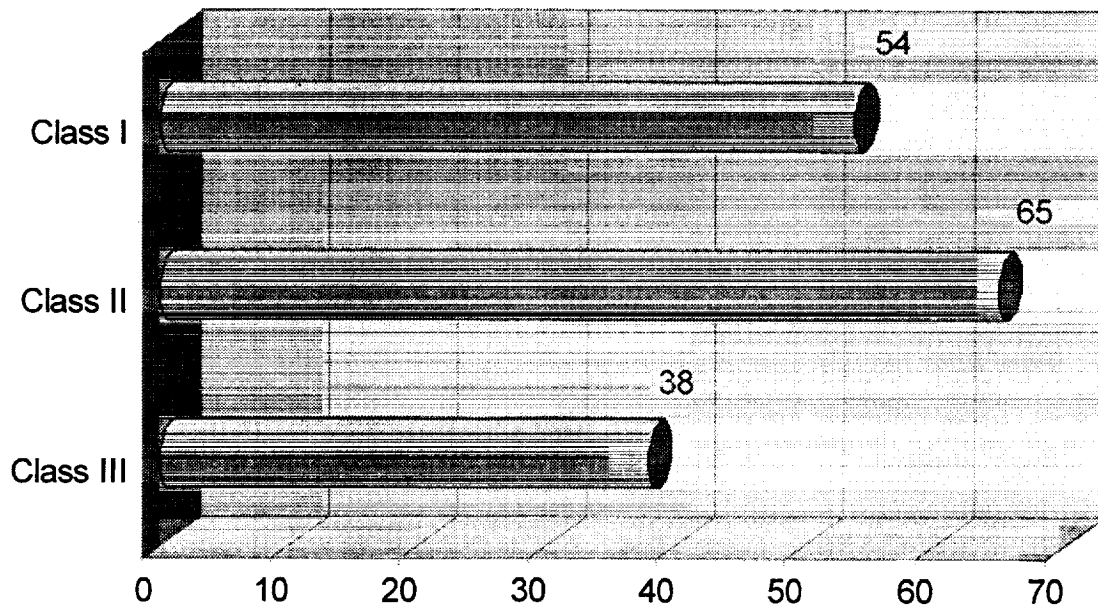


Figure 2: GAS Payloads Flown (By Class)



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