AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS

HOUSTON SECTION

NEWSLETTER

November 1982

IN THIS ISSUE

The Houston Section Newsletter is published periodically by the Houston Section AIAA; This issue printed by Lockheed. Address all communications to Carolyn Conley, Associate Editor on Site, NASA/JSC, Mail Code CH4, or to Robert Glowczwski, Associate Editor, Martin Marietta, Mail Code MMC, 1740 NASA Road 1, Suite 100, Houston, Texas 77058.

W. A. Stewart, Editor

O CHRISTMAS PARTY INVITATION

I want to invite everyone to an AIAA Christmas party and program, Wednesday, December 15, 1982. This event will be an after work reception, featuring the new JSC Director, Gerald D. Griffin. Mr. Griffin will share his views for the center's future direction. (We are incidentally planning a few surprises as well.)

Come join us and celebrate the season, friendly rapport, and participation in speculations of future technical ventures.

Sharon Barnes Castle, Chairman
AIAA - Houston Section

O ARE YOU PART OF THE PROCESS?

On November 2, 1982, millions of Americans fulfilled their obligation at the polls and indicated their choice for the local, state, and national officials who will guide the nation for the next 2 or 4 or 6 years. Were you part of the process? I hope so! Nationally, the turnout was better than usual for a non-presidential election year, but was still substantially less than 50 percent of registered voters.

All of us vote the way we do because of an individually unique and complex mix of interests, fears, biases, etc. Of paramount importance to me is casting an informed ballot. Being an informed voter is hard work. There are so many issues, and so many answers, and even more candidates who want to "fix" things for the rest of us. To sort all of this out and come to some reasoned conclusions about the issues we face, requires a continuous search for and evaluation of diverse facts and opinions.

As AIAA members, we all share a common interest in aerospace and in the local, state and national government policies which affect the aerospace industry. And an excellent and efficient way to stay current on the major issues which affect us professionally is to give your ASTRONAUTICS AND AERONAUTICS magazine a good reading every month. The AIAA Washington representatives Johan Benson and Pat Jefferson (who is Mrs. Benson) each month write a very informative column called the "AIAA Public Policy Docket;" John Newbauer's "Report on the National Scene" is always excellent; the editorials are crisp; the guest columns (recently one by Senator John Tower) are timely and thought-provoking. And the monthly articles are usually an overview treatment of major programs, problems and issues in our business.

What do you think about our national space policy? Do we need a Space Station, and if so, what kind and when? Should we have a planetary program? Should we exploit the moon? Should we sign the space treaty? What about the B-1? MX? Laser weapons in orbit? These are complex, tough issues. ASTRONAUTICS AND AERONAUTICS every month is one very valuable tool for you to use in informing yourself and in making decisions about them.

As professional people, we have been trained to be analytical, to interrogate the system for the pertinent facts, to probe and synthesize and test opinions on the way to a conclusion. You daily go through this routine in serving your employer and your family. You certainly owe your Government no less.

Aerospace issues are some of the elements you consider in voting and in corresponding with your representatives. Your monthly ASTRONAUTICS AND AERONAUTICS comes to you as part of your annual dues package, and gives you an outstanding source of broad-based, concise, accurate, timely data. Read it! Use it! Question it! Act on its contents!

Norman Chaffee

O STALKING THE CAREER KILLER, CREEPING OBSOLESCENCE

What's the single most significant career-related problem facing a majority of engineers today? If you answered "creeping obsolescence" you are probably right. Nation-wide, the case load of suits charging age discrimination in employment filed by persons forty years of age and older has more than doubled within the past year. Factors of obsolete skills figure in many of these.

Closer to home, several widely publicized legal actions involving major aerospace companies a few yars ago added credence to the voice of critics. These charge that industry prefers to pay lower wages to successive crops of recent graduates trained here and abroad. Older, more highly paid engineers whose professional training in many cases is outmoded have been dismissed. Simply writing off the problem by saying that continuing education is available to all engineers who really want it is not enough. For many, an unreasonable continuing sacrifice of both time and money would be required. Further, most working engineers have little taste for formal campus instruction, and don't care to compete academically with those enrolled in advanced degree programs.

Now, out of a study conducted by the MIT electrical engineering department earlier this year, comes a proposed solution which makes a great deal of sense to me. ("New Slant on Engineer Training", Science, Vol 218, No 4569, p 269, 15 October 1982). The MIT professors propose that the unceasing demand for up-to-date, fully qualified engineers be met through better utilization of the presently available workforce. This would be accomplished through continuing education at the workplace with the active encouragement and support of employers.

Space here will not permit recounting all features of the proposal; however, one of the most interesting is the recommendation for adoption of the Stanford "tutored video instruction" method as a model for course instruction. This involves television recordings of regular Stanford classes used in off-campus sessions in small classes guided by tutors. The technique stresses frequent playback and discussion of material during the session, with questions being referred to a lecturer at Stanford by phone for discussion at the next meeting of the class. All features seem aimed at cost effectiveness, and at genuine integration of the educational activity into the routine work environment.

The AIAA has since its founding offered meetings, symposia, short courses, tutorials, etc., etc., all aimed at continuing the education of its members in one sense or another. The AIAA Educational Activities Committee has always been one of the most active, talented, and innovative elements of the Institute.

What's new in the MIT approach is that it focuses on a long term, continuing commitment on the part of both employee and employer to the easily understood goal of maintaining currency. Also, this would be basically a local activity, and would involve a new kind of cooperative relationship between local academies, working engineers, and management, all elements of our oustanding Houston AIAA Section.

This leads me to the notion that our local Section might successfully assume the role of catalyst in promoting the establishment of such programs amongst the employers represented in our area. In time, this type of continuing education could become a generally accepted, routine part of professional life, to the real benefit of all.

Jim McLane.

O CHAIRMAN ADMONISHES MEMBERSHIP

I have in the past sent out questionnaires to gain insight into the membership's wishes concerning programs, area of interest, and general convenience factors. I have tried to see that these wishes were implemented to the nearest intent they were understood.

The Section has in accordance, implemented a Thursday dinner meeting schedule, allowing for as late as a Tuesday Deadline time. It was hoped that this procedure would be a convenience for the membership.

At this time I would like to make an appeal to you, the membership. Please observe the reservation deadlines when you see the flyers. We need your support!! This courtesy would be of great benefit to the Section management in planning for the program and planning for future programs.

Now, I realize that all of us are busy and AIAA might not be the highest priority. But, please realize that AIAA is providing a service to its membership by providing a forum for an exchange of technical ideas. Please show your professionalism and exhibit a little consideration. We all will benefit in the long run.

Sharon Barnes Castle

(As always, I have an open door policy. I will welcome any rebuttals, criticisms, and suggestions. Feel free to let me know what you are thinking -- good or bad. I want to be of service. JSC, CH6, 483-2583)

O YOU COULD WANT TO "GET INVOLVED"

Is reading this newsletter your biggest involvement in AIAA? If so, you're missing out on any number of technical, educational, and just plain fun opportunities sponsored by your Houston Section. The monthly dinner meetings provide a focal point for the membership as a whole, and everyone is encouraged to attend.

But these monthly meetings are only a small part of the activities available. Technical committee meetings are a convenient, inexpensive, way to get together with members (and visitors, too) and expand your knowledge in a large number of areas. Most of the meetings are lunch-and-learn type sessions. They take little extra time and allow you to bring your choice of brown bags.

Don't be afraid of having to "join" a technical committee. All that would be required of you, as a member, is to look, listen and learn.

AIAA also sponsors, or co-sponsors, a number of major technical activities throughout the year: the American Astronautical Society conference, held in Houston, was co-sponsored by the AIAA; and the mini-symposium, held annually, is a chance for you to either present your own work, or just sit and listen to what others are doing. No formal papers are required, and the time for each talk is only about ten minutes. (So, let's hear from you this year.) As for just plain fun, how about the recent bus trip to Texas A&M for the A&M-Rice football game?

If you have ideas for any other activities, just give me, or any of the other councillors, a call. AIAA is for you -- so don't miss the many opportunities to become involved.

Karen Godek
333-6171

O TEXAS A&M - RICE FOOTBALL TRIP

A full bus of AIAA-Houston Section members and their guests enjoyed a beautiful day at College Station on Saturday, October 23rd. A gourmet lunch, with appropriate beverages, was served on the bus enroute. The game was, as always, entertaining and in particular the band performances at half time were worth the trip by themselves. After the game a barbeque dinner was served on a grassy area across from the football stadium. Thanks go to Norm Chaffee and Ernie Hillje of JSC and to David Norton of Texas A&M for helping make the day a big success.

O AAS ANNUAL CONFERENCE IN HOUSTON

The 29th Anniversary Conference, sponsored by the American Astronautical Society (AAS), and co-sponsored by AIAA was held October 25-27 at the Astrovillage Hotel, Houston. Focusing on the theme, "Developing and Space Frontier," panels reviewed

the National space policy, defined civilian government, military and commercial participation, presented a status of present achievement and projected our National preparedness.

Dr. Robert S. Cooper, Director, DARPA, in the session on "Roles in Space Development", defined the five major roles of government in space: To provide access to space, to develop technologies, to promote science and technology, to strengthen National security, and to provide leadership. Lt General James A. Abrahamson, USAF, Associate Administrator for Space Flight, NASA, reiterated that the Space Transportation System will be the principle means for access to space. It will be "managed by partnerships between NASA and DOD to provide a single national STS to serve the needs of America and our friends". The two agencies are working together for efficiency, but neither has any interest in performing the job of the other.

Brig. General C. N. Beer, Deputy Chief of Staff Plans, USAF SPACECOM, outlined the role of the newly created Space Command to implement President Reagan's July 4, 1982 directive to have a strong space security. SPACECOM goals are to provide national security and space leadership. One objective is to have a unified program with the Army and Navy. The Air Force is going operational in space.

"Implementing the Development of Space," the status of government and private sector participation in space, Dr. Klaus P. Heiss of the Space Transportation System Co. urged that the national attitude get away from the adversary approach and adopt instead government and industry cooperation in developing the space frontier. Presently, the USA does not have a civilian goal in space. A goal beyond military security is needed. What are our international competitors such as the Japanese doing? One possible goal is to go after the world-wide information sector.

Although not intentional, David Hannah, Jr., Chairman of the Board, Space Services, Inc., had a perfect example of the shortcomings in cooperating between the government and private sectors. For Space Services second launch, September 9, 1982, off Matagorda Island, approval from the FAA and State Department did not come until five and seven days prior to launch. He pointed out that if they had based their launch schedule on approvals, they probably would still be waiting. Bureaucrats in Washington, D.C., are very cautious. Because this is a new venture there are no clearly defined rules so people have to take risks. The trick is to make it easier for someone to say "Yes" than "No."

The "Governing Policies" session focused on the "The United States Space Policy. The Formulation and Implications." The civilian and Department of Defense national space policies were addressed. Implications from Congressional, international telecommunications, national security, and earth observation viewpoints were discussed.

An interesting session on "Preparing the Base for Space Development" evaluated national needs for technological, educational. social, and political development to support the effort in space for the present and the next few decades.

The keynote speaker for the banquet was James Michener, who evaluated "Tactics for Survival." At the Awards Luncheon Astronauts J. Engle, C. Fullerton, J. Lousma and R. Truly received the Flight Achievement Award. Fourteen aerospace leaders were presented to AAS Fellows.

This was the second major AAS conference to be held in Houston over the past four years. In October 1978 the 25th Anniversary Conference theme was "The Future United States Space Program." That Conference covered a wider range of topics than this year's. It included economics, law, space guidance, applications and science programs.

Carolynn Conley
Associate Editor

MITRE CORP. HOSTS TC-CMS

The National Communications Systems TC (TC-CMS) met with Mitre Corporation, Bedford, Massachusettes on 20 October 1982. A summary of the highlights of that meeting follows:

1) Chairman Dave McElroy called for nomination of new TC-CMS candidates. Would like more military members. Will not entertain candidates from company elements/locations now represented and continuing next year.

2) C. Wolfers circulated a letter proposition to try a tri-annual local section TC Newsletter as a project of the local section liaison sub-committee of TC-CMS. Project was approved for trial in 1983 by TC-CMS members present.

3) Max Reid (visitor from JPL) made an appeal for TC-CMS to consider acting as an objective AIAA body to coordinate world-wide radio astronomy and deep space tracking facilities. There is now an urgent need for standardization and shared facility use to promite a more economic approach to the massive expansion now underway. Committee agreed the subject is within TC-CMS jurisdiction and should be supported. AIAA Management will be advised and new TC-CMS members solicited to serve this new functional area.

4) Messrs. Kadar and Eaves presented an outline for a new AIAA reprint publication on Satellite Business Services. Project was well received by the committee and will be formally recommended to AIAA Headquarters as a financially viable publication venture. Approval anticipated and book to be assembled largely from existing AIAA papers. Assembly and editing by Kadar and Eaves with TC-CMS assistance as needed.

C.V. Wolvers/TC-CMS
Chairman Elect

SECTION ACTIVITY

MOSSINGHOFF REPORTS ON PATENT OFFICE

Gerald J. Mossinghoff, Commissioner of Patents and Trademarks, Department of Commerce, discussed changes in the Office in an address before the November meeting of the Houston Section AIAA.

A backlog of 350,000 cases was inherited when Mossinghoff took over in mid-1981. At that time it required two years to issue a patent, and 27 months for a trademark. Progress toward shortening that time has already begun. The personnel of the Department has been increased by 235 examiners, and plans include the further increase of another 245. Of the 235 examiners added in fiscal 1982, more than half are college honor graduates.

The volume of material necessary for the study of a patent application is illustrated by the need to examine more than 24,000,000 documents to determine the face of originality. The situation has been further complicated by the unavailability of around 7 per cent of prior documents. These are either missing or have been misplaced.

One of the major efforts is the transferance from "hard" copy to electronic "files". Key word searches of the files then makes possible the location of pertinent data a great deal more rapidly than other methods. There are more than 800,000 patents already in this memory. Means has been incorporated in the system to assure that memory will not be damaged by loss of power or some other occurance.

The cost of a patent has been increased to a figure several times that charged previously.

The history of the Patent Office is in many ways the history of the United States. Outstanding is the Whitney gin. It appears possible that the invention and manufacture of this device gave rise to part of the problems which led to the Civil War. Agreements with European Patent Offices, and tentative agreements with Japanese, have increased interest in international patents. Activity is flourishing as never before. There is a great deal of interest among Europeans in space activity; the average Swiss (Man on the street) will know more about NASA than an American counterpart.

BALDWIN AND CIMINO ADDRESS DINNER MEETING

The October dinner meeting of the Houston Section AIAA heard Richard R. Baldwin and Dr. JoBea Cimino give continued reporting of the STS flight results.

Advantages inherent in the pattern set for the STS flights was addressed by Dick Baldwin in his comments. Of the many disciplines which have been involved in experiments to become part of the flight procedure during future missions, there has been a selection and a schedule has been set up. The same hardware will be used for each of these several different procedures; the material can be used over and over again.

Various disciplines have been assigned to particular flights. Included in these would be such that would come under the interest of the biomedical lab, for instance. Others would involve the use of infra red for the study of earth-side surfaces as they are seen from the shuttle. Weather -- cloud cover -- etc., of interest would be readings obtained as a function of longitude.

Data from flights thus far has been of a great deal of interest, and has suggested the possible direction of further studies. Three minutes of 16-mm film has been obtained. Data has been recorded on magnetic tape. Day photos of storm cells, and above the clouds pictures of lightening flashes also have been obtained.

The photos, which have been taken in color, indicate changes in reflections as a function of plant growth. The presence of plant material is indicated. Conclusions concerning the outlook food wise, etc., for the areas can be drawn from this material.

JoBea Cimino called attention to the considerable increase in information concerning ground cover, as well as the nature of the surface itself, available through the use of high resolution radar, as compared with that obtained by the use of photographic methods utilizing visible light. Slides showing such characteristics were used to illustrate the information contained in the address. Actual soil penetration was shown in some of the slides, while others gave much greater detail when substituted for pictured sections.

The address gave some information concerning the characteristics of the radar utilized in the experiment, emphasing the improvements as compared with previously available radar equipment. One such comparison also was drawn concerning visible light examination. Radar frequencies have an advantage in that while cloud cover blocks the view of surface characteristics, certain radar frequencies penetrate very easily, and give essential information unobtainable in other ways.

SUPPORT OUR STUDENT MEMBERS

The AIAA is attempting to alleviate a growing problem that involves its Student members -- that is the carryover of membership from the student classification to regular membership after the student graduates and becomes a professional. The Houston Section - Student Affairs Committee is initiating a new program that will help this situation if our membership will support it. The program is called the "Paired Member Program". The way it would work is thus:

1) Volunteers will be solicited from the current membership through a form in the newsletter.

2) The volunteers will be paired with a student at one of the four universities that we have a student chapter. Addresses and phone numbers will be exchanged.

3) The volunteer members would continue to communicate with the student through graduation. Types of activities include the following:

   - Status of the Student's progress.
   - Advice on cirriculum, outside involvement, career direction, etc.
   - Visits to the campus when appropriate (i.e. Engineering Day, etc.)
   - Invitations to Houston Section meetings (and other appropriate events), to include transportation, meeting cost, etc. as offered by the volunteer member.

4) Communication after graduation -- Particularly the status of membership.

The obvious advantages to the AIAA as a whole are twofold. First is membership retention. One of the biggest problems that AIAA has is locating student members after they graduate. The second advantage is the continuing encouragement of the student throughout his or her career and the knowledge that someone in the professional community cares. I believe the Houston Section can make this work. Please fill out the form that is included in this issue and send it to Ernie Hillje at NASA/JSC-ET3, Houston, Texas 77058 (Please see final page of this issue for blank form).

GETAWAY SPECIAL FOR LAMAR UNIVERSITY

The Houston Section's newest Student Chapter at Lamar University in Beaumont is deeply interested in obtaining a reservation for a "Getaway Special", or GAS, payload. In the past the Houston Section has assisted Rice University and Texas A&M University in both obtaining the down payment, and with advice on the payload design (Prairie View A&M University has been working with McDonnell Douglas on their GAS project).

At the last meeting of the Executive Council it was proposed and agreed, that the Houston Section should likewise assist Lamar University.

The payload size/cost has been retained by NASA for a three year period as from 1.5 to 5 cubic feet for $3000 to $10,000, respectively. The down payment of $500 is the initial object of the Houston Section to ensure a reservation.

A prospectus, or memorandum of understanding, with the University will be written to formalize the AIAA-Houston Section's participation.

Donations to the "Lamar University GAS Fund" are being requested for the membership at this time. If only one half of our 900-plus members were to contribute any where from $1.00 to $5.00 then we would reach our goal very easily. All donations are tax deductable.

Make checks payable to the AIAA Houston Section and note that they are for "Lamar-GAS". Fund raising for the total cost of the final chosen size GAS by Lamar University will be done at a later date by a Steering Committee composed of AIAA and University representatives. This effort will be coordinated by Ernie Hillje/JSC-ET3. Send donations to him.

MINUTES OF THE MECHANICS/CONTROL OF FLIGHT TECHNICAL COMMITTEE MEETING

A "Lunch and Learn" meeting of the Mechanics/Control of Flight Technical Committee was held on 20 October 1982 in Room 3014, Bldg. 4 of the NASA/JSC. There were twenty-eight attendees and the subject of the presentation was the History of Smoke Visualization, by Dr. T.J. Mueller, Professor of Aerospace and Mechanical Engineering at the University of Notre Dame. Dr. Mueller presented an informative slide discussion of the evolution of non-intrusive, smoke injection techniques in wind tunnel tests, which yield graphic evidence of flow field characteristics. In addition to the graphic portrayal of flow, smoke visulation provides a cost-effective approach to establishing where detailed measurements by pitot tubes can be most effective, rather than relying on a sweep technique. Much of the disucssion centered on pioneering work performed by Professor Brown at the University of Notre Dame. A 16 mm film was presented which illustrated the effects of the frequency of the injected sound waves on the flow field around a sphere. As the frequency of the injected sound was increased, the turbulence in the wake decreased dramatically, up to a point. Increased frequencies beyond that point caused an abrupt reappearance of turbulence.

December Cranium Cruncher

Let me acknowledge a few stragglers who correctly grappled with October's puzzle and figured out that my house was number 35 on a street having 49 houses.

Rod Werner	Texas A&M
Tom Henderson	NASA (FE4)
F. E. Volentine	Lockheed
David Mercier	Singer-Link

Good work from all you folks.

The November Newsletter was a little late getting out and as of this writing (11/15/82), I have only received one response, but I know I will get a lot more over the next two weeks. So I will acknowledge all of you who found the smallest number with 28 divisors in next month's Newsletter. If you haven't tackled that one yet, give it a try and send me your answer.

And now, try this one for your Christmas present!

> "Four boys, Alan, Brian, Charles, and Donald, and four girls, Eve, Fay, Gwen, and Helen, are each in love with one of the others and, sad to say, in no case is their love requited. Alan loves the girl who loves the man who loves Eve. Fay is loved by the man who is loved by the girl loved by Brian. Charles loves the girl who loves Donald. If Brian is not loved by Gwen, and the boy who is loved by Helen does not love Gwen, who loves Alan?"

If you can fight your way through this verbal maze to an answer, send it to

Norman Chaffee
NASA-JSC, Mail Code EP
Houston, Texas 77058.

I will randomly select one of the correct respondents as winner of a free AIAA dinner.

Happy Holidays to all of you!

Revised 9/1/82

1982-83 AIAA HOUSTON SECTION

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Committee Chairman

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HOUSTON SECTION - AIAA - PAIRED MEMBER PROGRAM

Yes, I would like to support our student chapter membership by participating in the "Paired Member Program".

NAME _____

ADDRESS _____

_____

_____

TELEPHONE _____(WORK) _____(HOME)

FIELD _____

_____

YEARS EXPERIENCE _____ COMPANY _____

GRADUATE OF _____

AVAILABILITY:

PREFER TO ASSOCIATE WITH A STUDENT FROM:
- ☐ PRARIE VIEW A&M
- ☐ TEXAS A&M
- ☐ RICE UNIVERSITY
- ☐ LAMAR UNIVERSITY

I CAN HELP WITH THE GETAWAY SPECIAL PROGRAM ☐ YES ☐ NO

I CAN HELP WITH THE STUDENT PROGRAMS ☐ YES ☐ NO

REMARK:

PLEASE MAIL TO: ERNEST R. HILLJE
NASA-JSC-CODE ET3
HOUSTON, TX 77058

aiaa newsletter

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS

HOUSTON SECTION

UPCOMING ACTIVITES

DECEMBER 15 - 5:00 P.M.

AFTER WORK RECEPTION at the Gilruth Center
Guest speaker: Gerald D. Griffin, Director,
NASA Johnson Space Center
"Challenges for JSC and AIAA"

APRIL 28 - 6:00 P.M.

DINNER MEETING at the Gilruth Center
Guest speaker: Michael Yarymovych, AIAA President,
V-P Advanced Systems Division, Rockwell
"National Space Issues"

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THE HOUSTON SECTION EXECUTIVE COUNCIL WISHES EVERYONE

A SAFE AND HAPPY HOLIDAY SEASON

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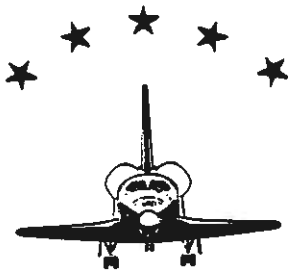

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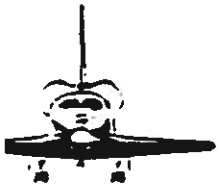
From the desk of. . .
Sharon Barnes Castle



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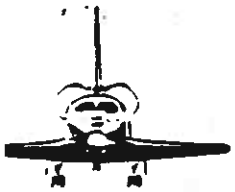
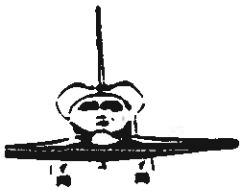
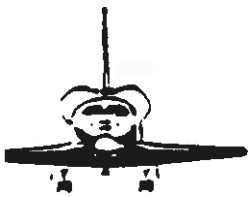


Congratulations Columbia

& Crew - -

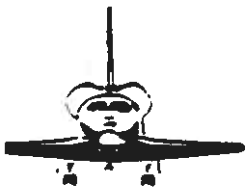


Much Success in the Future!!



Houston AIAA

Sharon Barnes Castle
Chairman,



AIAA HOUSTON SECTION 1982-1983 MEETINGS
HELD AT JOHNSON SPACE CENTER
ROBERT R. GILRUTH RECREATION CENTER

Registration: 5:00
Social & Program: 5:30 to 7:00

AMERICAN
INSTITUTE OF
AERONAUTICS AND
ASTRONAUTICS

HOUSTON SECTION
P. O. BOX 57524
WEBSTER, TEXAS 77598

WEDNESDAY-DEC. 15, 1982

CHALLENGES FOR JSC AND AIAA

GERALD D. GRIFFIN
DIRECTOR
NASA JOHNSON SPACE CENTER

THIS AFTER WORK RECEPTION IS DESIGNED TO CAPTURE THE SPIRIT OF THE APPROACHING HOLIDAY SEASON AND WE ARE DELIGHTED TO HAVE MR. GRIFFIN AS THE GUEST SPEAKER. DURING THE RECEPTION SPACE SHUTTLE EVENTS OF THE PAST YEAR WILL BE FEATURED USING A MULTIPROJECTOR SLIDE PRESENTATION.

COME ENJOY THE EVENT WITH YOUR FRIENDS AND SANTA!

PLUS TECHNICAL COMMITTEE FEATURE DISPLAY BY MECHANICS AND CONTROL OF FLIGHT

FOR RECEPTION RESERVATIONS, CALL:

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333-4150	333-2030	488-5660	483-3995	845-7541
(Martin Marietta)	EXT. 242 (Rockwell)	EXT.211 (MDTSCO)	(NASA)	(College Station)

HOT & COLD HORS D' OEUVRES

MEMBERS & SPOUSES	$6.00
NON-MEMBERS	$7.00
STUDENT DISCOUNT	$2.00

RESERVATIONS DEADLINE IS FRIDAY – DEC. 10 at 12:00 NOON

CANCELLATIONS ARE REQUIRED

ALL ARE WELCOME

THERE IS NO CHARGE FOR ATTENDING THE PROGRAM ONLY