CPIA’S 40th ANNIVERSARY

Clockwise from upper left to right: Lorri Pickett, Bill Gutman, Bee Hackett, Tom Reedy, Bonnie Campbell, Claire Negas, Janet Sullins, Lee Piper, Dottie Becker, Les Holtschlag, Tracy Wilson, LaVerne Simmons, Karen Strange, Sharon Poppe, Tom Christian, John Hannum, Debbie Eggleston, Harry Hoffman, and Harry Hege.

This year marks the 40th anniversary of CPIA. To commemorate this occasion, the editor informally surveyed the propulsion community to learn how CPIA is perceived by its users. Unfortunately, it was not possible to contact everyone. The responses received were decidedly positive for the most part. As the editor, I would like to share some of these responses with the readers.

The first question asked was "How do you perceive CPIA's evolution to its present function?" All of the responses cited the need for communication and cooperation amongst the armed services, NASA, and defense contractors as the major driving force that has shaped CPIA's structure and services. CPIA's association with JANNAF was also cited as an important link in providing information exchange in a timely and effective fashion.

When questioned as to CPIA's strengths or weaknesses, all the responses mentioned strengths. Even though deeper digging would

Cont'd. on page 2
RECENT CPIA PUBLICATIONS


LS86-17: Temperature Sensitivity of Nitrocellulose-Base Propellants (U) (supersedes LS81-2; period covered 1943-1985D; 94 citations; indexes).

Chemical Propulsion Technology Reviews (CPTR) published:

IGNITION AND FLAMESPREADING WORKSHOP PLANNED

A workshop on the influence of gas-phase chemical kinetics on the low-pressure ignition and flame-spreading in solid propellants is to be held 23-24 October 1986 in conjunction with the 23rd JANNAF Combustion Subcommittee Meeting at NASA Langley Research Center. Mr. George E. Keller of the US Army Ballistic Research Laboratory is the workshop coordinator.

The workshop will address problems of anomalous ignition behavior in gun propelling charges. Issues that will be covered are: reviewing the evidence for the participation of chemical kinetics in the low-pressure burning of solid propellants; reviewing mode simulations which include finite-rate kinetics; and determining which model simulations and which further experimental characterizations would be most fruitful.

For further information, contact George Keller at:
US Army Ballistic Research Lab
Attn: George E. Keller
Code A'MXBR-IBD
Aberdeen Proving Ground, MD
21005-5066

Boron Hydrides (Cont'd)

and combustion modeling of boron-hydride-based VHBR propellants were some of the issues highlighted in this session.

The need to seek out and compile the work done in past years on boron hydride salts, boronanes, Hivelite, etc. and burning rate promoters was discussed extensively. It was decided that Dr. Juhasz will explore the possibility of gaining CPIA assistance in this task.

Combustion mechanisms and modeling were the themes of the final day of the workshop. Subjects covered included nitramine borohydride chemical interactions, effects of Hivelite and other boron compounds on nitramine decomposition by pyrolysis GC-FTIR, and the implications of the new borane thermochemistry.

The workshop was closed with a sum-up by Dr. Juhasz of the issues covered during the workshop. Each question from the list prepared by the coordinators was examined by the workshop participants. Results of this discussion will be prepared by Dr. Juhasz and distributed to the workshop attendees.

The workshop proceedings will be presented at the 23rd JANNAF Combustion Meeting in October 1986 and published in the meeting proceedings by CPIA.

QUESTIONS AND COMMENTARY

As a regular feature of the bulletin, we hope to establish a "Readers Write . . ." column. Send in any questions, comments, or opinions that might be of interest to the propulsion community. Of course, news items concerning yourself, your work or your organization are very welcome.
The 23rd JANNAF Combustion Meeting will be held on October 20-23, 1986 at NASA Langley, Hampton, VA.

The overall security level of the meeting is CONFIDENTIAL with attendance limited to invited U.S. citizens and authorized immigrant aliens who possess the proper security clearance and need-to-know certification.

Preliminary program packages have been assembled and distributed to the combustion community. The program consists of 135 papers which will be presented in 21 sessions. In addition, there will be two technical workshops on DDT modeling and ignition and flame spread in solid propellants.

The schedule of the sessions and workshops is as follows:

**Mon., Oct. 20**
- Primer and Propelling Charge Diagnostics
- Combustion Instability in Solid Rockets
- Solid Fuel Ramjets
- Interior Ballistic and Combustion Modeling for Solid Propellant Guns
- Nonlinear Instability in Solid Rockets
- Nitramines

**Tues., Oct. 21**
- Combustion Behavior: Gun Tube Wear and Muzzle Flash
- Combustion and Solid Rocket Motors
- Supersonic Combustion Technology
- LOVA Propellant Ignition and Combustion
- Liquid Propellant Physical Properties and Structures
- Ramjet Combustion Instability - I

**Wed., Oct. 22**
- Ignition/Igniter Concepts for Liquid Propellant Guns
- Metal Combustion and Experimental Techniques
- Ramjet Combustion Instability - II
- Ignition and Combustion of Liquid Guns
- Steady-State Combustion
- Ramjet Combustion Instability - III

**Thur., Oct. 23**
- Interior Ballistics and Combustion Modeling of Liquid Propellant Guns
- Liquid Rocket Engine Performance and Instability
- Regenerative Liquid Propellant and Ballistic Investigations
- Workshop: DDT Modeling
- Workshop: Ignition and Flame Spread in Solid Propellants

Five of the nine gun sessions will consider liquid propellant guns (LPG): the physical and chemical characterizations of the propellants; the experimental performance of the guns; and the ignition and flow characteristics within the chambers and tubes of the guns. The remaining sessions will cover granular and stick propellant grains. Specific papers will discuss igniters and flamespreading, and the design and performance of propelling charges.

The five solid rocket propellant sessions will focus on the diagnostics, combustion, and performance of metallized propellants, the steady-state combustion and combustion instability behavior of rocket propellants.

The nitramine session will include both rocket and gun propellants. It will highlight the kinetics of both thermal decomposition and combustion of nitramine-based propellants.

The initiation, growth, and control of pressure oscillations in both liquid- and solid-fueled ramjets are subjects of three of the five ramjet sessions. Another session will cover steady-state combustion and modeling of solid-fuel ramjets. The fifth session will discuss the combustion, flow characteristics, and performance of supersonic ramjets.

The final session will consider the performance and instability prediction models of liquid rocket engines.

Dr. Merrill W. Beckstead of the BYU is the Program Chairman. He is assisted by the following Program Area Organizers: Dr. Kenneth P. McCarty, Hercules, Inc./Bacchus Works; Mr. Albert Pavli, NASA/Lewis; Dr. Klaus C. Schadow, NWC; Dr. Neale A. Messina, PCRL; Dr. Joseph E. Flanagan, Rocketdyne.

Persons who did not receive the security form and preliminary program package and wish to attend the Meeting should complete the form below, cut and mail it to: Johns Hopkins University, Applied Physics Laboratory, Chemical Propulsion Information Agency, Attn: Dorothy L. Becker, Johns Hopkins Road, Laurel, Maryland 20707.

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I plan to attend the 23rd JANNAF Combustion Meeting. Please mail the necessary security and need-to-know form and meeting details to:

Name: ____________________________________________________________
Address: __________________________________________________________

(Return prior to September 5, 1986)
Richard L. McArth has been appointed manager of TRW's Capistrano Test Site (CTS). The Test Site is a major facility for testing technology applications in the space, defense and energy fields.

Mr. McArth joined TRW in 1977 as a senior manager after 25 years service as a Naval officer. Mr. McArth has assumed positions of increasing responsibility, including management of construction and startup of the CTS Fossil Energy Test Site and of the coal combustor development project.

He holds a B.S. degree in chemistry from Purdue University, a B.S. degree in ordnance engineering from the U.S. Naval Postgraduate School, and an M.S. degree in chemistry from Lehigh University. Mr. McArth has also attended the Industrial College of the Armed Forces.

Daniel Raymer and Dr. David Pratt have joined the Aerojet Propulsion Research Institute as Research Director of Future Missions and Research Director of Supercomputing, respectively.

The Aerojet Propulsion Research Institute is a new organization charged with developing advanced propulsion systems. As Research Director of Future Missions, Mr. Raymer will develop and manage an organization that will define future aerospace missions and vehicles.

Mr. Raymer joins Aerojet from the North American Aircraft Operations of Rockwell International, where he directed the engineering activities of several research projects including early development of the Advanced Tactical Fighter project. Mr. Raymer holds bachelors and masters degrees in astronautics and aeronautics from Purdue University and an MBA from USC.

Dr. Pratt joins Aerojet from the University of Washington, where he was Chairman of the Department of Mechanical Engineering. He earned his bachelor of science degree from the University of Washington and his masters and doctorate in mechanical engineering from UC-Berkeley.

Mr. Pratt will develop and manage an organization that will use supercomputers to simulate and analyze large-scale systems and problems encountered in developing very advanced forms of propulsion.

Dominick J. Sanchini, former Rocketdyne Executive Vice President and newly appointed President of the Rocky Flats Plant of Rockwell International Corporation, was the recipient of the Wyld Propulsion Award "for the successful design, development and operation of the Space Shuttle Main Engine." Mr. Sanchini accepted the award during the 22nd Joint Propulsion Conference, Huntsville, AL, sponsored by the American Institute of Aeronautics and Astronautics in conjunction with three other technical societies.

Mr. Sanchini joined North American Aviation, Inc., in 1953 as a research engineer in engine analysis. He subsequently held a variety of managerial positions in groups working on major Rocketdyne programs, including the experimental engine and Saturn V booster engine from the Apollo moon landing missions. In 1970 he became manager of marketing for the Space Shuttle Main Engine and manager of the SSME proposal. Beginning in July, 1971, Mr. Sanchini held three SSME program managing positions; in May, 1975, he was named vice president and program manager. He assumed the role of Executive Vice President of Production in September 1983.

Following the successful maiden launch of the Space Shuttle Columbia in 1981, he received NASA's highest honor for non-federal employees, the Distinguished Public Service Medal. For his contributions to the SSME program, Mr. Sanchini was elected to membership in the National Academy of Engineering in 1984.

Mr. Sanchini received a bachelor of science degree in mechanical engineering in 1951 from Lehigh University, Bethlehem, PA. He earned a bachelor of law degree in 1958 from the University of Southern California Law School and is a member of the California Bar.

Hercules Aerospace Products has announced the appointments of Gary R. Muir to Senior Vice President, Operations, and Bruce A. Biehler, Senior Vice President, Propulsion Marketing and Programs.

Mr. Muir will be responsible for the operational activities of the three Aerospace Products Group plants at Allegany Ballistics Laboratory (ABL), Cumberland, MD; the Bacchus Works near Salt Lake City, and the plant at McGregor, TX.

Mr. Muir also has served as strategic propulsion vice president since reorganization of the Aerospace Group (then Aerospace Division) in 1982. Between 1974 and 1979 he was Joint Venture Deputy Program Manager and Joint Venture

Cont'd on page 4
Hercules Appointments (Cont'd)

Program Manager for Trident I C-4. In 1979 he was named assistant general manager, becoming vice president and general manager in 1981 at the beginning of the largest growth period in the history of Baechus.

Mr. Biehler will be responsible for all marketing and program activities for both tactical and strategic business units. He has been business development vice president since 1982.

Mr. Biehler, former Baechus assistant general manager, was program manager for Poseidon C-3, Pershing II, and the Navy alternate propellant program that led to a new family of high-energy formulations. He also innovated and implemented the business arrangement with the Goshute Indian band which led to construction of the Tekoi rocket motor testing facility.

ATLANTIC RESEARCH ANNOUNCES AEROCHEATING TEST CAPABILITIES

The Propulsion Division of Atlantic Research Corporation, Alexandria, VA has recently completed a series of flow tests that accurately simulate the flight aeroheating effects on the exterior of missile rocket motors flying at supersonic velocities. These tests were conducted in the Division's Air Test Facility, which normally is used to static test airbreathing rocket motors.

ARC aeroheating tests provide vital thermodynamic and heat transfer data at a very small fraction of the cost and time required for actual test flights of the missile. Moreover, the experimental conditions of the test are readily controlled, and test data acquisition is quick and straightforward. The test technique has been applied successfully to the U.S. Navy's MK-30 sustainer rocket motor, widely used in the Standard Missile ER.

AIR FORCE SELECTS HERCULES FOR SMALL ICBM

Hercules Aerospace has been selected by the Air Force to develop the laser ordnance firing system for the new Small Intercontinental Ballistic Missile (ICBM). The ordnance contract is awarded separately from booster motor contracts, which will be announced later this year. Hercules is competing for the Small ICBM second and third stages.

Hercules will develop a lightweight, low-cost, laser-initiated ordnance system which will replace the conventional EBW system now in use on all strategic missiles. It will involve an on-board laser firing unit which initiates through fiber optics all booster functions, including motor ignition, thrust vector actuation, stage separation, and some post-boost vehicle functions.

Hercules demonstrated the validity of laser ordnance for the Small ICBM in a highly successful series of vibration, shock and temperature testing under a concept validation contract awarded last June.

The components also were subjected to extensive above- and under-ground nuclear tests to demonstrate survivability. The tests showed improvements in safety, weight and cost as advantages of laser ordnance. In addition, the system is completely testable for firing unit operation and fiber optic cable continuity.

40th Anniversary (Cont'd)

probably reveal some problems, it is gratifying to know that we are highly regarded throughout the propulsion community.

CPIA's future role in the propulsion community? The consensus was for CPIA to continue providing the same services that it has over the years. Increased automation, accessibility of our services via national computer networks, and expanding into other areas such as insensitive munitions were among the suggestions received for improving CPIA's role in the propulsion field.

We at CPIA are looking forward to 40 more years of maintaining and improving the high standards that the propulsion community expects from us. We thank you for your comments.

ROCKET NOZZLE MEETING TO BE HELD AT PATRICK AFB

The 8th JANNAF Rocket Nozzle Technology Subcommittee Meeting will be held on 21-24 October 1986 at Patrick AFB, Florida. The overall security classification of this meeting is UNCLASSIFIED. The meeting co-chairmen are Dr. Nick Pagano, AFVAL/Wright-Patterson AFB, and Mr. James Wanchek, AFRPL/Edwards AFB.

The meeting will consist of both formal papers and short contract status reports dealing with the following topics: quality assurance, modeling, design and failure analysis, advanced materials, and processing science. In addition to the regular paper presentations, two workshops are currently scheduled, addressing rocket nozzle inspection procedures and the desirability of sponsoring a carbon-carbon database. The proceedings of this meeting will be published and distributed by CPIA.

Authors of papers are reminded that the deadline for the receipt of manuscripts and paper clearance forms at CPIA is 3 October 1986. Cleared papers not received by this date must be removed from the program unless special arrangements have been made with CPIA. Meeting attendees are also reminded that the deadline for the receipt of personal security clearance forms at CPIA is 15 October 1986. Admission to the meeting will be delayed if your clearance is not received in time.

For further meeting information, please contact Mrs. LaVerne D. Simmons at (301) 992-7304.

STEP LADDER

An example of a seven-step word ladder which changes two to six is two, too, boo, box, fox, fix, six. Can you change black to white in only nine steps? Can you find more than one solution? Send your solution to the editor. Acknowledgments will be made in the next issue to the first five correct solutions from the East Coast and West Coast.
JANNAF MEETING CALENDAR

<table>
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<tr>
<th>1986</th>
<th>MEETING</th>
<th>TYPE</th>
<th>LOCATION</th>
<th>SEC. CLASS.</th>
<th>ABSTRACT/PAPER DEADLINE</th>
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<tr>
<td>26-28 Aug</td>
<td>1986 JANNAF PROPULSION MEETING</td>
<td>Conference</td>
<td>New Orleans, LA</td>
<td>Confidential</td>
<td>Past 6 Aug</td>
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<td>9-11 Sep</td>
<td>JANNAF EXHAUST PLUME TECHNOLOGY SUBCOMMITTEE MEETING</td>
<td>Conference/Workshop*</td>
<td>U.S. Air Force Academy, CO</td>
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<td>18 Apr 29 Aug</td>
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<td>Late Sep</td>
<td>JANNAF SAFETY AND ENVIRONMENTAL PROTECTION SUBCOMMITTEE WORKSHOP ON PLUME FLOW MODELING</td>
<td>Workshop*</td>
<td>Vandenberg AFB, CA</td>
<td>Unclassified</td>
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<td>7-9 Oct</td>
<td>JANNAF SAFETY AND ENVIRONMENTAL PROTECTION SUBCOMMITTEE WORKSHOP ON TOXIC SUBSTANCE DETECTION TECHNOLOGY</td>
<td>Workshop*</td>
<td>Ft. Detrick, MD</td>
<td>Unclassified</td>
<td>11 Aug 7 Oct</td>
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<td>26-23 Oct</td>
<td>23RD JANNAF COMBUSTION SUBCOMMITTEE MEETING</td>
<td>Conference/Workshops*</td>
<td>NASA/LaRC Hampton, VA</td>
<td>Confidential</td>
<td>27 May 6 Oct</td>
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<td>21-24 Oct</td>
<td>JANNAF ROCKET NOZZLE TECHNOLOGY SUBCOMMITTEE MEETING</td>
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<td>18 Apr 3 Oct</td>
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<td>JANNAF PROPELLANT CHARACTERIZATION SUBCOMMITTEE MEETING</td>
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<td>1987</td>
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<td>20 Oct 1988 13 Apr 1987</td>
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*Attendance at JANNAF Workshops is by invitation only.

MEETING CALENDAR SUBJECT TO CHANGE. FOR LATEST DETAILS, CONTACT THE CPIA.

CPIA Bulletin CHEMICAL PROPULSION INFORMATION AGENCY
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