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## Space Congress Programs

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4-26-1988

# 1988 Twenty-Fifth Space Congress Program

Canaveral Council of Technical Societies

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**EMBRY-RIDDLE**  
Aeronautical University™  
SCHOLARLY COMMONS

**TWENTY-FIFTH**



**SPACE CONGRESS**

**PROGRAM**

Cocoa Beach, Florida April 26, 27, 28, 29, 1988

## CHAIRMAN'S MESSAGE

Welcome and thank you for your attendance and support to the silver anniversary of the Space Congress. The Space Congress, which had its beginning in the early days of manned spaceflight from the Space Coast, has become a prestigious event which has drawn national and international leaders and proponents of the exploration of space.



The program for your **Twenty-Fifth Space Congress** is unique and reflects the 1988 theme of "**Heritage – Dedication – Vision**".

You have four full days packed with panel sessions and paper presentations which represent the readiness of this nation to once again move forward into tomorrow's threshold of space exploration and exploitation as well as providing the space oriented hardware and systems for our national security.

The leaders of previous Space Congress will be recognized and honored and we will hear from top-level speakers.

Congressman Bill Nelson will be our keynote speaker at the opening session, USAF Secretary Edward C. "Pete" Aldridge, Jr. will be the banquet speaker on Tuesday and former Astronaut Gene Cernan is the luncheon speaker on Wednesday.

Scores of interesting and informative discussions are in store for the four days.

A handwritten signature in dark ink, appearing to read "W. E. Fields". The signature is stylized and cursive.

**W. E. Fields**  
**General Chairman**  
**Twenty-Fifth Space Congress**

## GENERAL INFORMATION

### HEADQUARTERS/REGISTRATION

Headquarters for the Twenty-Fifth Space Congress is the Holiday Inn, Cocoa Beach. Registration will take place in the Dolphin Room from noon to 5:00 p.m. Monday, April 25, 1988. Registration will continue from 7:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday, and from 8:00 a.m. to noon on Friday.

PACKAGE REGISTRATION . . . . . \$125.00  
(Includes four items listed below)

Tuesday Luncheon . . . . . 7.00

Tuesday Banquet . . . . . 25.00

Wednesday Luncheon . . . . . 10.00

Loose-Leaf Copy of Proceedings . . . . . 70.00

Sessions all four days . . . . . 25.00

Individual Sessions . . . . . 5.00

Individual Sessions (Students) . . . . . 2.00

Package registration will save you money; however, each item may be purchased individually at the listed price. Telephone contact can be made through the Holiday Inn 783-2271 (ask for Dolphin Room).

### PRESS ROOM

Press facilities are located in the Egret Room of the Holiday Inn of Cocoa Beach and the Skylab Room of the Howard Johnson Plaza Hotel. Press facilities are staffed and directed by Leslie Neihouse from 12 noon to 5:00 p.m. on Monday and from 8:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday and 8:00 a.m. to noon on Friday. The telephone numbers for the press facilities are: Holiday Inn (407) 799-0472, 0493 and Howard Johnson Plaza Hotel 799-0535, 0568.

### MESSAGE/LOCATOR ASSISTANCE

The sponsoring organization, the Canaveral Council of Technical Societies (CCTS), assists attendees by maintaining a message board. Registrants who wish to leave lodging and local phone information can do so by turning in locator forms, available at the Registration Desk, to the CCTS/Message/Locator Desk located in the Dolphin Room, Holiday Inn, or by phone to (407) 799-3529, 3530.

### PROCEEDINGS

The proceedings of the Twenty-Fifth Space Congress are available at the registration desk in the Holiday Inn during the Space Congress. After the close of the Space Congress, additional proceedings can be purchased for \$70 each plus postage from Secretary, CCTS, Post Office Box 245, Cape Canaveral, Florida 32920.

## EXHIBITS

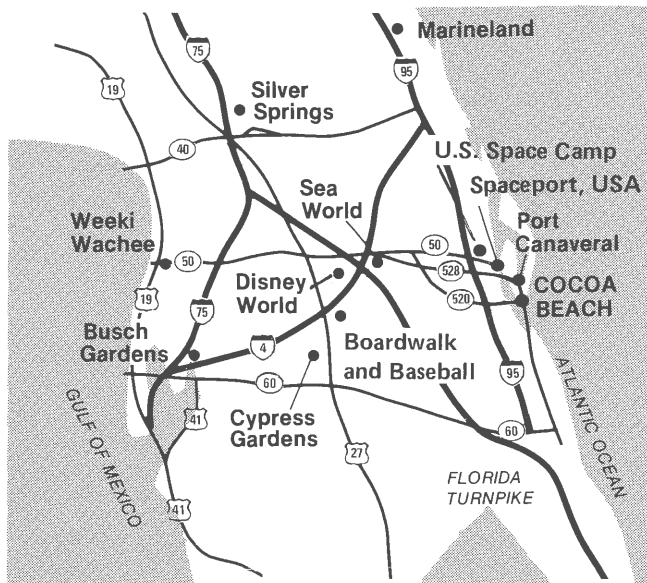
Exhibits will include displays of the Space Station, Space Shuttle, Shuttle payloads, expendable launch vehicles, and communications satellites. The exhibit hall and exhibit rooms will be open from 11:00 a.m. to 7:00 p.m. on Tuesday, from 11:00 a.m. to 8:00 p.m. on Wednesday, and from 9:00 a.m. to 3:00 p.m. on Thursday. Representatives of the exhibitors will be in attendance to assist and inform visitors. The exhibit hall and rooms are located in the Cocoa Beach Hilton, 1550 N. Atlantic Ave. (A1A), Cocoa Beach.

### EXHIBITORS

Advanced Process Systems  
Allen Bradley Company  
Applied Business Technology  
Aviation Week  
BAMSI  
Boeing Company  
Brevard Community College  
Canaveral Council of Technical Societies  
Computer Sciences Corporation  
Digital Equipment Corporation  
Diversified Information Systems  
Eastman Kodak  
EG&G Florida, Inc.  
Embry Riddle Aeronautical University  
Florida Institute of Technology  
General Dynamics Corporation  
Harris Corporation  
Hercules Aerospace  
Honeywell  
International Business Machines Corporation  
Lockheed Missiles and Space Company  
Martin Marietta Corporation  
MBB-ERNO  
McDonnell Douglas Corporation  
Morton Thiokol  
Oneirus Aerospace Corporation  
Pan Am World Services, Inc.  
Rocketdyne  
Rockwell International  
Shephard Press  
Space Camp  
Systonetics  
Teledyne Brown  
TRW, Inc.  
United States Air Force  
United States Navy  
United Technologies Corporation  
University of Central Florida  
University of Florida  
Vitro, Inc.  
Westinghouse

### ATTRACTION CENTERS

Late April in Florida is a delightful time of the year for the entire family. The weather is pleasant, the hardy find the Atlantic warm enough for swimming and tourist attractions are not yet crowded, **Cocoa Beach** offers a long stretch of swimming beach, surfing areas, and both deep-sea and shore fishing. **Sea Escape** one day cruises and three and four day cruises aboard the **SS Oceanic** or the **SS Royale** can be enjoyed from Port Canaveral. Bus tours of the **Kennedy Space Center** and **Cape Canaveral Air Force Station** are available from the **Spaceport, USA** where a free exhibit-filled space museum can be enjoyed by both children and adults.



Within one to two hours drive is a world of vacation fun in the Magic Kingdom of **Walt Disney World** and **Epcot Center** — **Sea World**, one of America's finest marine attractions — the mystery and excitement of Africa in **Busch Gardens** — famed Glass Bottom boats at **Silver Springs** — the beautiful gardens and daily water ski revue with lovely aquamaids at **Cypress Gardens**.

## YOUTH SCIENCE FAIR

Science fair displays and demonstrations from local secondary school students will be open to the public from 11:00 a.m. to 7:00 p.m. on Tuesday, and 12:00 noon to 8:00 p.m. on Wednesday. The Thursday schedule is from 9:00 a.m. to 1:00 p.m. All Youth Science Fair Activities will take place in the Dolphin Room of the Cocoa Beach Holiday Inn. Judging will be conducted from 8:00 a.m. to 12:00 p.m. on Wednesday, April 27. The awards will be presented to the winners at the 8:00 p.m. "Meet the Astronauts" panel session to be held at the Howard Johnson Plaza Hotel in Cocoa Beach at 7:30 p.m. on Thursday, April 28.

## PIONEERS' DAY

The Pioneers' Day Banquet '88 will be held on Friday, April 29, at the Officers Open Mess, Patrick Air Force Base.

Speakers: James M. Beggs, former NASA Administrator, currently CEO, Spacehab, Inc., Washington, D.C.

Social Hour	6:30 p.m.
Dinner	7:30 p.m.
Speaker	8:30 p.m.

Registration is April 26, 27 and 28 at the Holiday Inn, Cocoa Beach, and 5:30 to 6:30 p.m. at the Officers Open Mess on April 29.

## CANAVERAL COUNCIL OF TECHNICAL SOCIETIES

Air Force Association  
Armed Forces Communication Electronics Association

American Institute of Architects  
American Institute of Aeronautics & Astronautics  
American Institute of Industrial Engineers  
American Meteorological Society  
American Society of Civil Engineers  
American Society of Heating, Refrigeration & A/C Engineers  
American Society for Industrial Security  
American Society of Mechanical Engineers  
American Society for Nondestructive Testing  
American Society for Quality Control  
American Society of Safety Engineers  
American Society for Training and Development  
American Welding Society  
Florida Engineering Society  
Institute of Electrical & Electronic Engineers  
Instrument Society of America  
Missile, Space & Range Pioneers, Inc.  
National Contract Management Association  
National Association of Accountants  
Society of Manufacturing Engineers  
Society for the Advancement of Materials & Process Engineering  
Society of Logistics Engineers  
Society of Photo-Optical Instrumentation Engineers  
Society for Technical Communication  
Space Business Roundtable of East Central Florida

Many of the societies will have educational/promotional brochures/information on display at the CCTS Desk. Attendees are invited to stop by and review this material.

## SPACE CONGRESS GOLF TOURNAMENT

Golfers can enjoy a tournament at the Patrick Air Force Base Golf Course on Friday, April 29. Map available at Space Congress Registration Desk.

The tournament will be a four player, select shot format, as in the past. You may sign up with one partner or by yourself. The tournament committee will assign teams based on playing ability. Fill in your name and average score for 18 holes on the registration form, along with the same for your partner, and enclose \$25, each person, for the fee. A maximum of 128 players will be registered on a first come, first in basis. Lunch, refreshments on the course, green fees, carts, and trophies are included in the fee. Lunch at 11:30 a.m., and shotgun start at 12:30 p.m. will allow completion in time for Pioneers' Banquet attendance.

Transfer of golf registration will be permitted with notification by April 15. No refunds will be made after April 1.

## TWENTY-FIFTH SPACE CONGRESS PROGRAM

TUESDAY, APRIL 26, 1988

### KEYNOTE ADDRESS (8:30 a.m. to 9:00 a.m.) Howard Johnson Plaza Hotel

Introduction: Mr. Wendy Fields  
Speaker: Congressman Bill Nelson

Bill was elected to the U.S. Congress in 1978 and was re-elected to his fifth term in 1986. He is chairman of the Space Science and Applications subcommittee and a member of the Banking, Finance and Urban Affairs Committee.

As chairman of the subcommittee, Bill trained and flew with the crew of the Space Shuttle Columbia. After being launched from Kennedy Space Center on January 12, 1986, Columbia and its crew returned to Earth six days later at Edwards Air Force Base in California. Bill conducted several experiments designed to aid cancer research, the storage of human blood, and the understanding of man's adaptation to space travel.



Bill is a fifth generation Floridian whose family settled in Washington County in Florida's Panhandle in 1829. His grandparents homesteaded in 1915 on what is now the Kennedy Space Center. He attended public schools in Brevard County and was graduated from Melbourne High School in 1960. He earned a bachelor of arts degree at Yale University, a law degree from the University of Virginia and was admitted to the Florida Bar in 1968. Bill was a U.S. Army Captain, serving on active duty from 1968 to 1970.

He was elected to the Florida legislature in 1972 and served six years until he was elected to Congress. While a state legislator, he was honored by the Florida Jaycees as one of the Five Outstanding Young Men of Florida and was nominated as the Most Valuable Member of the House of Representatives.

Four Florida colleges have conferred upon him honorary degrees — a Doctor of Laws from Rollins College, a Doctor of Science from Florida Institute of Technology, a Doctor of Laws from Bethune-Cookman College and a Doctor of Science from Embry-Riddle Aeronautical University.

Congressman Nelson was unanimously elected chairman of the U.S. Congressional Travel and Tourism Caucus in January. The caucus is a bipartisan coalition of more than 150 members of Congress who share the common goal of increasing awareness of tourism and its economic impact in the U.S.

He is married to the former Grace Cavert of Jacksonville. They have two children: Billy, age 11, and Nan Ellen, age 10. The family attends the Tabernacle Church in Melbourne and Christ Church of Arlington, Virginia.

### PANEL SESSION I (9:00 a.m. to 11:30 a.m.) Howard Johnson Plaza Hotel

#### SPACE SHUTTLE RETURN TO FLIGHT

Session Chairman: Mr. Arnold D. Aldrich, Director, National Space Transportation System, NASA Headquarters, Washington, D.C.  
Session Organizers: Mr. Frank S. Coe, Deputy Director, Program Planning and Control, NASA Headquarters, Washington, D.C.  
Mr. Cecil W. Houston, Manager, MSFC Resident Office, KSC

#### MEMBERS:

- Mr. Gerald W. Smith, Manager, Solid Rocket Booster Project, George C. Marshall Space Flight Center, Marshall Space Flight Center, AL
- Mr. Joseph A. Lombardo, Manager, Space Shuttle Main Engine Project, George C. Marshall Space Flight Center, Marshall Space Flight Center, AL
- Mr. Thomas E. Utsman, Director of Space Transportation System Management and Operations, John F. Kennedy Space Center, Kennedy Space Center, FL
- Col. Bryan D. O'Connor, Chairman, Space Flight Safety Panel, Lyndon B. Johnson Space Center, Houston, TX
- Mr. Leonard S. Nicholson, Manager, NSTS Integration and Operations, Lyndon B. Johnson Space Center, Houston, TX

### MEET THE PRESS LUNCHEON (12:00 noon) Holiday Inn, Manatee Rooms

Session Chairman: William B. Harwood, Vice President, Public Relations, Martin Marietta Corporation, Bethesda, MD

#### MEMBERS:

- Mr. Howard Benedict, AP Aerospace Writer
- Mr. Bruce Hall, CBS-TV Correspondent, Atlanta, GA
- Mr. Edward H. Kolcum, Senior Editor Aviation Week & Space Technology
- Rob Navias, Correspondent UPI-Radio, Miami
- George Alexander, Former Los Angeles Science Writer

### PAPER SESSION I (2:00 a.m. to 5:00 p.m.)

#### A. COMMERCIAL ASPECTS OF SPACE RESEARCH AND TECHNOLOGY Howard Johnson Plaza Hotel, Discovery Room

Session Chairman: Mr. Ronald Thornton, Director of the Southern Technology and Applications Center  
Session Organizer: Mr. Thomas M. Hammond, Technology Utilization Officer, NASA, KSC

1. COMMERCIAL SPACE POTENTIAL FOR SMALL BUSINESS INNOVATION RESEARCH (SBIR)  
Mr. Harry W. Johnson, Director of SBLR, Office of Commercial Programs, NASA Headquarters
2. LESSONS LEARNED FROM KSC'S GROUND PROCESSING OF SCIENTIFIC AND APPLICATIONS EXPERIMENTS  
Mr. P. R. Elfrey, Payload Management and Operations, NASA, KSC

3. THE COMMERCIAL ATLAS/CENTAUR; GOVERNMENT PROCUREMENT OF LAUNCH SERVICES  
Dr. L. R. Scherer, Director of Commercial Programs, General Dynamics Corporation
4. DEVELOPMENT OF A COMMERCIAL EXPENDABLE LAUNCH VEHICLE INDUSTRY  
Dr. Barbara A. Stone, Director of Plans and Policy, Office of Commercial Programs, NASA Headquarters
5. DESIGN OF A SMALL, GENERAL PURPOSE, LOW EARTH ORBIT SATELLITE BUS  
Mr. Marty R. Mosier, Space Station Academic Group, Department of Navy

## B. THE BUSINESS OF SPACE BUSINESS

### Howard Johnson Plaza Hotel, Atlantis Room

Session Chairman: Rear Admiral Stuart J. Evans (USN, Retired), Assistant Administrator for Procurement, NASA Headquarters

Session Organizer: Ms. Barbara Y. Powell, Industry Assistance Office, NASA, KSC

1. ADVOCATING THE DEVELOPMENT OF SPACE ENTERPRISE: THE SPACE BUSINESS ROUNDTABLE MOVEMENT NATIONWIDE  
Mr. Stephen L. Morgan, Synergistics Aerospace Company, Inc.  
Mr. Freddie "Chick" Garcia, Jr., Grumman Corporation
2. CONSIDERATIONS FOR A TEAMING AGREEMENT TO PROPOSE ON GOVERNMENT PRIME CONTRACTS  
Mr. Lawrence J. Costello, Avco Research Laboratory TEXTRON
3. INSIGHTS INTO THE NEGOTIATION STRATEGIES AND TACTICS EMPLOYED BY U.S. AIR FORCE CONTRACT NEGOTIATORS  
Lt. Col. Gary L. Delaney, Air Force Institute Technology, Wright Patterson AFB
4. LET'S MAKE IT SIMPLE  
Mr. George T. Nickolas, Headquarters, U.S. Army Armament, Munitions and Chemical Command
5. THE FLORIDA GOVERNOR'S COMMISSION ON SPACE: ITS IMPACT ON SPACE ENTERPRISE  
Mr. Stephen L. Morgan, Center for Space Enterprise Research, Space Research Institute, Florida Institute of Technology

## C. ROBOTICS

### Holiday Inn, Manatee Room

Session Chairman: Lt. Col. Gerald Haynes, U.S. Air Force, Space Division, Project Management

Session Organizer: Mr. V. Leon Davis, NASA, KSC

1. ROBOTICS REFURBISH SPACE SHUTTLE HARDWARE  
Mr. Tony S. Humble, United Technologies, USBI  
Mr. Alan R. Fertig, United Technologies, USBI
2. TELEROBOTIC SPACE STATION APPLICATIONS  
Mr. Scott A. Hofacker, United Technologies-Space Flight Systems  
Mr. Bernard J. Schroer, University of Alabama in Huntsville  
Mr. Arthur Herkert, University of Alabama in Huntsville

3. THE USE OF FORCE FEEDBACK CONTROL FOR ROBOTIC MATING OF UMBILICAL FUEL LINES  
Dr. R. Fullmer, Iowa State University  
Dr. Dilpare, Florida Institute of Technology  
Mr. V. Leon Davis, Robotics Section, NASA, KSC
4. COMPLIANCE STRATEGIES FOR THE ROBOTIC GROUND SERVICING OF THE SHUTTLE  
Dr. Robert Podlasek, Bradley University
5. AUTOMATION AND ROBOTICS FOR EXPERIMENT OPERATIONS IN AN ENHANCED MAN TENDED FREE FLYER  
Mr. Eike Schmidt, Manager Orbital Systems Technology, MBB/ERNO, Bremen, Federal Republic of Germany
6. ALGORITHM DEVELOPMENT AND COMPUTER GRAPHIC SIMULATION OF AN ARTICULATED TRANSPORTER/MANIPULATOR SYSTEM  
Mr. Shih-chien Chiang, Center for Intelligent Machines and Robotics, University of Florida  
Mr. Carl D. Crane III, Center for Intelligent Machines and Robotics, University of Florida  
Mr. James S. Tulenko, Department of Nuclear Engineering, University of Florida  
Mr. Robert Carlton, Odetics, Inc.

## SPACE CONGRESS BANQUET

### Howard Johnson Plaza Hotel

Cocktails: 7:00 p.m. to 8:00 p.m.  
Banquet: 8:00 p.m.

Introductions: Mr. Wendy Fields  
Mr. Jim Phillips

Speaker: Honorable Edward C. Aldridge, Jr., Secretary of the Air Force

Mr. Aldridge was born August 18, 1938, in Houston and spent his youth in Shreveport, La. He received a bachelor of science degree in aeronautical engineering from Texas Agricultural and Mechanical University in 1960, and a master of science degree, also in aeronautical engineering, from the Georgia Institute of Technology in 1962.

Prior to joining the Department of Defense in 1967, Mr. Aldridge held various staff and management positions with the Douglas Aircraft Co., Missile and Space Division, in Santa Monica, Calif., and in Washington, D.C.



In 1967 he joined the staff of the assistant secretary of defense for systems analysis as an operations research analyst and then served as director of the Strategic Defense Division until July 1972. He also served as an adviser to the Strategic Arms Limitation Talks in Helsinki and Vienna.

He re-entered private industry in 1972 as a senior manager with LTV Aerospace Corp. in Dallas for a year until he was named senior management associate in the Office of Management and Budget, Executive Office of the President, Washington, D. C.

Returning to the Department of Defense in February 1974, Mr. Aldridge served as deputy assistant secretary of defense for strategic programs until March 1976. He was then selected to be the director of planning and evaluation, a principal adviser to the secretary of defense in the planning and program evaluation of U.S. military forces and support structure.

He was named vice president, National Policy and Strategic Systems Group for the Systems Planning Corp., Arlington, Va., in March 1977. Mr. Aldridge was responsible for the corporation's study and analysis activities in the areas of strategic and conventional forces and long-range strategic planning.

In August 1981 he became under secretary of the Air Force with additional responsibility for providing overall direction, guidance and supervision for Air Force space programs, including launch and on-orbit operations, and planning for future space capabilities. Prior to the space shuttle Challenger accident in January 1986, Mr. Aldridge was in astronaut training in preparation for his participation as a payload specialist on the first shuttle mission from Vandenberg Air Force Base, Calif. He assumed his present duties in June 1986.

His work in various assignments has earned him numerous awards. Among these are the Secretary of Defense Meritorious Civilian Service Award, Department of Defense Distinguished Civilian Service Award and Department of Defense Distinguished Public Service Award. He has been named a distinguished college of engineering alumnus from Texas A&M University and was the 1985 recipient of the American Astronautical Society Military Astronautics Award.

Mr. Aldridge is married to the former Joanne Knotts of Italy, Texas. They have four children.

**WEDNESDAY, APRIL 27, 1988**

**PANEL SESSION II (8:30 a.m. to 11:30 a.m.)  
Howard Johnson Plaza Hotel**

#### **DOD PANEL**

Session Chairman: Lt. Gen. Aloysius Casey, Commander, Space Division, AFSC, Los Angeles, CA  
Session Organizer: Lt. Pete Silvero, Eastern Test Range, PAFB, FL

#### **MEMBERS:**

Lt. Gen. Donald J. Kutyna, Commander, Air Force Space Command, Peterson AFB, CO

Maj. Gen. Donald L. Cromer, Commander, Space & Missile Test Organization, Vandenberg AFB, CA

Maj. Gen. Eugene Fox, Strategic Defense Initiative Organization, The Pentagon, Washington, D.C.

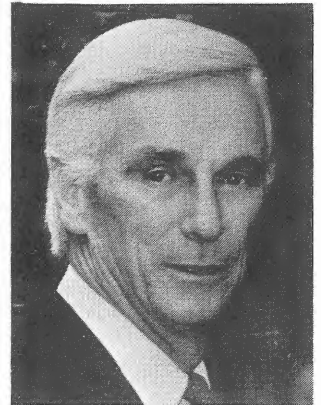
Brig. Gen. Robert L. Stewart, DC, Army Strategic Defense Command, Huntsville, AL

### **LUNCHEON (11:45 a.m.) Holiday Inn, Manatee Rooms**

Introductions: Mr. Wendy Fields  
Mr. Jim Phillips

Speaker: Eugene A. Cernan, Captain, USN (Retired)

Captain Cernan has recently joined Digital Equipment Corporation as Director, Marketing Development — Government/Aerospace. Captain Cernan is Chairman of the Board and President of The Cernan Group, Inc. and The Cernan Corporation, space-related technology and marketing consulting firms. Since its founding in 1981, The Cernan Group has been involved with consumer applications of current technology. Additionally, Captain Cernan acts as a Technical Consultant with the ABC Television network in support of ABC News and Special Events programming.



He appears with regularity as a news commentator and covers space and related documentary activities.

From 1976 to 1981, Captain Cernan served as the Executive Vice President, International for Coral Petroleum, Inc. He was charged with the corporate development of a worldwide supply and marketing strategy. During this period, Captain Cernan continued his education at the Wharton School of Finance and Northwestern University.

After serving twenty years as a Naval Aviator, Captain Cernan retired from the United States Navy in 1976. Thirteen of these years were dedicated to direct involvement with the National Aeronautics and Space Administration (NASA) United Space Program as an Astronaut. During his years with NASA, Captain Cernan carried out three separate space flights. He was the second man to walk in space as the pilot of Gemini IX, one of a crew of three to venture to the moon on Apollo X, and as Commander of Apollo XVII, he holds the distinction of being the last man to leave his footprints on the surface of the moon. Captain Cernan also actively participated in the design, engineering, and development testing of spacecraft hardware and systems. He was a member of the NASA senior management team and reviewed decisions which directly affected operations and mission planning. From 1973 through 1975, Captain Cernan served as a Senior United States Negotiator during discussions with the USSR concerning the joint United States and Soviet Apollo/Soyuz project.

Captain Cernan received a Bachelor of Science degree in Electrical Engineering from Perdue University in Lafayette, Indiana, in 1956.



He was awarded a Master of Science degree in Astronautical Engineering in 1963 from the United States Naval Post Graduate School in Monterey, California. Captain Cernan was also awarded Honorary Doctorates of Engineering from Perdue, Drexel and Gonzaga Universities, and an Honorary Doctorate degree from Western State College of Law. His honors include the Navy Distinguished Flying Cross, the Distinguished Service Medal with Star, the NASA Distinguished Service Medal, the FAI International Gold Medal for Space, and the VFW Gold Space Award.

Captain Cernan is an active member of several professional societies. Representative among them are the Society of Experimental Test Pilots, Association of Naval Aviators, Tail Hook Association, American Space Institute, American Institute of Aeronautics and Astronautics, and the American Astronautical Society and Explorers Club. He is a corporate board member of Allied Bank Memorial (Houston), American Investors Corporation, Asamera Inc., and Up With People, an international educational foundation for young men and women. In addition, he is a Trustee of the Naval Aviation Museum Foundation, Inc. and serves on the President's Committee of Perdue University.

## **PAPER SESSION II (2:00 p.m. to 5:00 p.m.)**

### **A. HUMAN EXPANSION INTO THE SOLAR SYSTEM**

**Howard Johnson Plaza Hotel, Discovery Room**

Session Chairman: Mr. Jimmy Underwood, Director of Mission Studies, Office of Exploration, NASA Headquarters, Washington, D.C.

Session Coordinator: Mr. Charles Bachstein, Payloads Management and Operations, NASA, KSC

1. THEMES IN HUMAN EXPLORATION  
Mr. Alan Ladwig, Director of Program Support, Office of Exploration, NASA Headquarters
2. STRATEGIES AND OPTIONS FOR HUMAN EXPLORATION PROGRAMS  
Mr. Barney Roberts, Lunar and Mars Exploration Office, Johnson Space Center
3. THE TECHNOLOGY CHALLENGE OF POST SPACE-STATION EXPLORATION MISSIONS  
Mr. Ed Gabris, Office of Exploration, NASA Headquarters
4. SCIENCE OPPORTUNITIES IN THE HUMAN EXPLORATION OF MOON AND MARS  
Dr. Michael Duke, Office of Exploration, NASA Headquarters
5. EXPLORATION STRATEGIES  
Authors' names not available at time of publication.

### **B. SPACE STATION TECHNOLOGIES**

**Howard Johnson Plaza Hotel, Atlantis Room**

Session Chairman: Dr. James W. Johnson, Deputy Project Manager, Space Station Project Office, NASA, KSC

Session Organizer: Ms. Susan N. Campbell, Space Station Project Office, NASA, KSC

1. TECHNOLOGIES FOR PROTECTION OF THE SPACE STATION POWER SYSTEMS POLYMERIC SURFACES IN ATOMIC OXYGEN ENVIRONMENT  
Mr. Henry K. Nahra, Solar Array Branch, NASA, Lewis Research Center  
Ms. Sharon K. Rutledge, Electro-physics Office, NASA, Lewis Research Center
2. TECHNOLOGY DEVELOPMENT MISSIONS CONCEPT DEFINITION STUDY TDMX 2066 LARGE INFLATABLE/RIGIDIZED STRUCTURES  
Dr. Karen M. Seiser, Space Engineering and Hardware, Wyle Laboratories  
Dr. Ronald E. Giuntini, Space Engineering and Hardware, Wyle Laboratories
3. SPACE STATION PHOTOVOLTAIC POWER MODULES  
Mr. Charles A. Tatro, Space Station Solar Array Branch, NASA, Lewis Research Center
4. USER ASSEMBLY AND SERVICING SYSTEM FOR SPACE STATION - AN EVOLVING ARCHITECTURE APPROACH  
Mr. Thomas A. LaVigna, Project Manager for the Space Station Servicing System, NASA, Goddard Space Flight Center  
Mr. Helmut P. Cline, Space Station Servicing System Electrical Manager, NASA, Goddard Space Flight Center
5. WELDING OF THE SPACE STATION COMMON MODULE PROTOTYPE  
Mr. Thomas J. Bosworth, Ballistic Systems Division, Boeing Aerospace Company  
Ms. Clara M. Miller, Ballistic Systems Division, Boeing Aerospace Company  
Mr. Clinton C. Griffee, Manufacturing Research and Development Division, Boeing Aerospace Company
6. MODELING OF MICROGRAVITY ENVIRONMENT OF THE MAN TENDED FREE FLYER (MTFF)  
Dr. Wilfried Wohlke, System Engineer for Columbus Program, MBB/ERNO, Bremen, Federal Republic of Germany
- 1B. SPACE STATION GAS-GRAIN SIMULATION FACILITY: MICROGRAVITY PARTICLE RESEARCH  
Mr. Glenn C. Carle, Chief Solar System Exploration Branch, NASA, Ames Research Center  
Dr. Guy Fogleman, Program Scientist, RCA Government Services, Moffett Field, CA  
Ms. Judith L. Huntington, Research Scientist, SETI Institute, NASA, Ames Research Center

### **C. ARTIFICIAL INTELLIGENCE APPLICATIONS**

**Holiday Inn, Manatee Room**

Session Co-chairmen: Dr. Robert E. Dalton, Vitro Corporation, Silver Spring, MD

E. Rachovitsky, Air Force Wright Aeronautical Laboratory, Wright Patterson AFB

Session Organizer: Arthur E. Beller, NASA Artificial Intelligence Laboratory, NASA, KSC

1. GROUND OPERATIONS SUPPORT BY ARTIFICIAL INTELLIGENCE  
Mr. Rainer Gruen, ERNO, Bremen, Federal Republic of Germany

2. EXPERT SYSTEM PROTOTYPE DEVELOPMENTS FOR NASA-KSC BUSINESS AND ENGINEERING APPLICATIONS  
Dr. James M. Ragusa, College of Business, University of Central Florida  
Dr. Avelino J. Gonzalez, College of Engineering, University of Central Florida
3. LRS-II: LAUNCH RESOURCE SCHEDULING  
Captain James E. Crawford Jr., Foreign Technology Division, Wright Patterson AFB  
Lt. Col. Gregory S. Parnell, Ph.D., Air Force Institute Technology, Wright Patterson AFB
4. NAVARES: A PROTOTYPE EXPERT SYSTEM FOR NAVSTAR ANOMALY RESOLUTION  
Captain Michael A. Rampino, Headquarters Base ESC/SX  
Lt. Col. Gregory S. Parnell, Ph.D., Air Force Institute Technology, Wright Patterson AFB
5. AI AND ADA - A PROTOTYPE COMBINING THE BEST OF BOTH WORLDS  
Mr. Patrick P. Roach, DEC European Technical Center, France
6. DESIGN KNOWLEDGE CAPTURE: PRESERVING ENGINEERING KNOWLEDGE FOR FUTURE APPLICATIONS  
Mr. R. B. Purves, Boeing Aerospace Company  
Mr. James R. Carnes, Boeing Computer Services

**EXHIBIT CENTER COCKTAIL RECEPTION**  
**(5:45 p.m. to 7:00 p.m.)**  
**Hilton, Cocoa Beach**

**THURSDAY, APRIL 28**

**PANEL SESSION III (8:30 a.m. to 11:30 a.m.)**  
**Howard Johnson Plaza Hotel**

**DEPARTMENT OF DEFENSE SPACE PROJECTS**

Session Chairman: Col. Victor W. Whitehead, Asst. Deputy Commander for Launch Systems, Los Angeles AFB, CA  
Session Organizer: Lt. Rick Acosta, Eastern Test Range, PAFB, FL

**MEMBERS:**

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Col. John R. Wormington, Director, Advanced Launch Systems, (SD/CLVH), Los Angeles AFB, CA  
Col. Sebastian F. Cogliatore, Director, Titan IV Program Office (SD/CLVD), Los Angeles AFB, CA  
Col. Robert T. Cote, Director, Space Systems (AFSC/SS), Andrews AFB, MD  
Col. Roger G. DeKok, NSC, Washington, D.C.  
Lt. Col. Michael R. Callaway, Titan II Program Manager (SD/CLVT), Los Angeles AFB, CA  
Mr. Richard E. Brackeen, President, Martin Marietta Commercial Titan Inc., Denver, CO

**PAPER SESSION III (1:00 p.m. to 4:00 p.m.)**

**A. LUNAR AND MARS EXPLORATION CONCEPTS**  
**Howard Johnson Plaza Hotel, Discovery Room**

- Session Chairman: Dr. Michael Duke, Office of Exploration, NASA Headquarters  
Session Organizer: Dennis Matthews, Advanced Projects, Technology and Commercialization, NASA, KSC
1. MANNED MARS MISSION PROGRAM CONCEPTS  
Mr. E. C. Hamilton et al, SRS Technologies
  2. MARS MISSION PROFILE OPTIONS AND OPPORTUNITIES  
Mr. Archie Young, NASA, Marshall Space Flight Center
  3. A SPACE-BASED COMMUNICATIONS CONCEPT TO SUPPORT MARS EXPLORATION MISSIONS  
Mr. Stanley Poreda, Air Force Weapons Laboratory, Kirtland AFB  
Mr. Lawrence Cooper, Air Force Weapons Laboratory, Kirtland AFB
  4. SP-100 POWERED MARS EXPLORATION MISSIONS  
Mr. Jack Heller, NASA, Lewis Research Center
  5. TECHNOLOGIES FOR ON-ORBIT FUELS DEPOT  
Mr. R. Stubbs et al, NASA, Lewis Research Center
  6. SPACE-BASED OPERATIONAL ERGONOMICS  
Mr. Jim Stramler, Selected Operations and Research, Inc.

**B. LAUNCH VEHICLES OF THE FUTURE**  
**Howard Johnson Plaza Hotel, Atlantis Room**

- Session Chairman: Lt. Col. Cort Durocher, Deputy Director, Advanced Launch System, U.S. Air Force, Space Division  
Session Organizer: Mr. Ray Evans, Advanced Projects, Technology and Commercialization, NASA, KSC
1. SPACE LAUNCH SYSTEMS RESILIENCY  
Mr. Harry Bernstein, Aerospace Corporation
  2. LAUNCH VEHICLE OPERATIONS ANALYSIS  
Dr. Bryan P. Leonard, L Systems Inc.
  3. ADVANCED LAUNCH SYSTEM ISSUES  
Mr. Vince Calvor, Boeing Aerospace Company
  4. PRODUCIBILITY OF ADVANCED LAUNCH SYSTEMS  
Mr. Fred West, General Dynamics Space Systems Division
  5. OCEAN LAUNCH ALTERNATIVES  
Dr. Chuck Rubin, Hughes Aircraft Company
  6. TAKING THE HIGH COST OUT OF ROCKET ENGINES  
Mr. James R. Brown, Pratt & Whitney
  7. STATUS OF THE ADVANCED LAUNCH SYSTEM  
Major Michael P. Uecker, Air Force Space Division

**C. SYSTEMS AUTOMATION**  
**Holiday Inn, Manatee Room**

Session Chairman: William H. Rock, Manager, Advanced Projects, Technology and Commercialization Office, NASA, KSC

Session Organizer: Mrs. Tina Phillips, Advanced Projects, NASA, KSC

1. CONCEPTUAL MODEL-BASED REASONING FOR KNOWLEDGE-BASED SOFTWARE PROJECT MANAGEMENT  
Mr. Kent D. Bimson, Lockheed Software Technology Center  
Ms. Linda Boehm Burris, Lockheed Artificial Intelligence Center
2. KSC BASE OPERATIONS CONTRACTOR LAUNCH READINESS ASSESSMENT SYSTEM  
Mr. W. D. Geaslen, Integrated Operations, EG&G Florida, Inc.
3. THE GENERIC CHECKOUT SYSTEM APPROACH TO GROUND CHECKOUT SYSTEMS  
Mr. Peter C. Simons, McDonnell Douglas Astronautics Company
4. AUTOMATION OF SHUTTLE TILE INSPECTION: ENGINEERING METHODOLOGY FOR SPACE STATION  
Dr. M. J. Wiskerchen, Stanford University  
Ms. C. L. Mollakarimi, Lockheed Space Operations Company
5. LAUNCH TEAM TRAINING SYSTEM  
Mr. J. T. Webb, Launch Control Center Operations, Lockheed Space Operations Company
6. REAL-TIME FAULT MANAGEMENT FOR LARGE-SCALE SYSTEMS  
Mr. H. Biglari, Boeing Aerospace Company  
Mr. C. Cheng, School of Electrical Engineering  
Mr. G. Vachtsevanos, School of Electrical Engineering

**SPACE CONGRESS RECEPTION (6:00 p.m. to 8:00 p.m.)**  
**Holiday Inn – Observation Deck**

**PANEL SESSION IV (7:30 p.m. to 9:30 p.m.)**  
**Howard Johnson Plaza Hotel**

**MEET THE ASTRONAUTS**

Session Chairman: Lt. Gen. Forrest S. McCartney, USAF Retired, Center Director, NASA, Kennedy Space Center, FL

A panel open to the general public with several astronauts and payload specialists discussing present and future activities for men and women in space.

Science Fair Winners will be presented awards.

Astronauts Daniel Brandenstein and Steve Hawley are expected to be present.

**FRIDAY, APRIL 29**

**PANEL SESSION V (8:30 a.m. to 11:30 a.m.)**  
**Howard Johnson Plaza Hotel**

**SPACE STATION**

Session Chairman: Daniel H. Herman, Senior Engineer, Office of Space Station, NASA Headquarters, Washington, D.C.

Session Organizer: Mr. Keith B. Chandler, Aerospace Consultant, Merritt Island, FL

**MEMBERS:**

- Mr. Angelo (Gus) Guastaferrro, Vice President, Space Station Programs, Lockheed Missiles and Space, Sunnyvale, CA  
Dr. Franklin D. Lemkey, Senior Consulting Scientist, United Technology Research Center, East Hartford, MA  
Dr. Jack L. Kerrebrock, Associate Dean of Engineering, MIT, Cambridge, MA  
Dr. William C. Schneider, Vice President, Development Computer Sciences, Silver Spring, MD  
Ms. Marcia Smith, Specialist in Aerospace Policy, Library of Congress, Congressional Research Service/SDR, Washington, D.C.

**PAPER SESSION IV (12:45 p.m. to 3:15 p.m.)**

**A. SPECIAL SUBJECTS SESSION**  
**Howard Johnson Plaza Hotel, Discovery Room**

Session Co-chairmen: Mr. L. P. (Bud) Evans Jr., President, Center for Space and Advanced Technology, Arlington, VA  
Mr. Samuel T. Beddingfield, Beddingfield Aerospace Consultants, Titusville, FL

Session Organizer: Mr. L. E. Wagnon, Data Systems Division, NASA, KSC

1. ORBITER MANEUVERING VEHICLE SUPPORT TO THE SPACE STATION  
Mr. William E. Galloway, OMV Project Engineering Office, George C. Marshall Space Flight Center
2. STS 30, 34, AND 44 – A REBIRTH OF PLANETARY MISSIONS  
Mr. Ed Bangsund, Director of Space Systems Planning, Boeing Aerospace Company  
Mr. Robert Knutson, Planning Staff Administrator, Boeing Aerospace Company
3. GROUND BASED SCIENCE EXPERIMENTS AT LEWIS RESEARCH CENTER  
Ms. Maryjo Meyer, Microgravity Materials Science Laboratory, NASA, Lewis Research Center  
Mr. James C. Johnston, Microgravity Materials Science Laboratory, NASA, Lewis Research Center  
Mr. Thomas K. Glasgow, Microgravity Materials Science Laboratory, NASA, Lewis Research Center

4. MODEL SHUTTLE VEHICLE DEVELOPED TO SUPPORT VANDENBERG HYDROGEN DISPOSAL INVESTIGATION  
Mr. Charles L. Heckart, SIS Test Project Engineer, Lockheed Space Operations Company, Vandenberg AFB  
Mr. Jack D. Rhonda, Group Engineer, Lockheed Missiles & Space Company
5. HYDROGEN-AIR-STEAM COMBUSTION REGIMES IN LARGE VOLUMES  
Mr. Marty P. Sherman, Sandia National Laboratories  
Mr. Scott E. Slezak, Sandia National Laboratories
6. PEACEKEEPER MISSILES  
Mr. John Wiles, Systems Analysis Department, TRW, Inc.

**B. COMMERCIAL SPACE ENTERPRISES**  
**Howard Johnson Plaza Hotel, Atlantis Room**

Session Chairman: Dr. Joseph A. Angelo, Jr., Director of Advanced Technology, EG&G, Inc., Rockledge, FL  
Session Organizer: Ms. Karin K. Biega, STS Management and Operations, NASA, KSC

1. ORION: DESIGN OF A SMALL, GENERAL PURPOSE, LOW EARTH ORBIT SATELLITE BUS  
Mr. M. Mosier, Space Systems Academic Group, Department of Navy
2. MULTIMEGAWATT POWER SOURCES FOR COMMERCIALIZED SPACE OPERATIONS  
Dr. John A. Dearin, EG&G  
Mr. J. Martinelli, EG&G
3. CONESTOGA LAUNCH VEHICLES  
Mr. Mark H. Daniels, Space Services, Inc. of America  
Mr. James E. Davidson, Space Services, Inc. of America
4. SPACE ULTRA VACUUM: A NEW IDEA FOR TECHNOLOGICAL AND COMMERCIAL DEVELOPMENT  
Mr. A. Ignatiev  
Mr. C. W. Chu
5. LOCALIZED COATING REMOVAL USING PLASTIC MEDIA BLASTING  
Mr. Howard L. Novak, USBI, Division of United Technologies  
Mr. Michael G. Wyckoff, USBI, Division of United Technologies  
Mr. Lee M. Zook, USBI, Division of United Technologies
6. LOFT-1 MISSION: A NEW CONCEPT FOR EDUCATIONAL AND COMMERCIAL SPACEFLIGHT  
Mr. J. Wayne McCain, University of Alabama  
Dr. Jack R. Walker, University of Alabama  
Mr. Scott Dixon, University of Alabama  
Mr. Matt Steele, University of Alabama
7. HEAT PIPES FOR TERRESTRIAL APPLICATIONS IN DEHUMIDIFICATION SYSTEMS  
Mr. Mukesh K. Khattar, Florida Solar Energy Center

**SPACE CONGRESS GOLF TOURNAMENT**  
**(12:30 p.m. to 5:00 p.m.)**

Patrick Air Force Base Golf Course — Map available at registration desk.

**PIONEERS' ANNUAL BANQUET (6:30 p.m.)**  
**Patrick AFB, Officer's Open Mess**

Speaker: Mr. James M. Beggs

6:30 Social Hour

7:30 Dinner

8:30 Speaker

**PROGRAM SUMMARY**

**MONDAY, April 25**

12:00 noon to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

**TUESDAY, April 26**

7:00 a.m. to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. KEYNOTE ADDRESS  
Howard Johnson Plaza Hotel

9:00 a.m. to 11:30 a.m. PANEL SESSION I — SPACE SHUTTLE RETURN TO FLIGHT  
Howard Johnson Plaza Hotel

11:00 a.m. to 7:00 p.m. YOUTH SCIENCE FAIR  
Holiday Inn Dolphin Room

11:00 a.m. to 7:00 p.m. EXHIBITS  
Hilton Convention Center

12:00 noon to 2:00 p.m. MEET THE PRESS PANEL

2:00 p.m. to 5:00 p.m. PAPER SESSION I:  
A. COMMERCIAL ASPECTS OF SPACE  
Howard Johnson Plaza Hotel

B. BUSINESS OF SPACE BUSINESS  
Howard Johnson Plaza Hotel

C. ROBOTICS  
Howard Johnson Plaza Hotel

7:00 p.m. BANQUET SOCIAL HOUR  
Howard Johnson Plaza Hotel

8:00 p.m. BANQUET  
Howard Johnson Plaza Hotel

WEDNESDAY, April 27

7:00 a.m. to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. to 11:30 a.m. PANEL SESSION II — DOD SPACE PROJECTS  
Howard Johnson Plaza Hotel

12:00 noon to 8:00 p.m. YOUTH SCIENCE FAIR  
Holiday Inn Dolphin Room

11:00 a.m. to 8:00 p.m. EXHIBITS  
Hilton Convention Center

11:45 a.m. to 1:00 p.m. SPACE CONGRESS LUNCHEON  
Holiday Inn Manatee Rooms

2:00 p.m. to 5:00 p.m. PAPER SESSION II:  
A. HUMAN EXPANSION INTO THE SOLAR SYSTEM  
Howard Johnson Plaza Hotel

B. SPACE STATION TECHNOLOGIES  
Howard Johnson Plaza Hotel

C. ARTIFICIAL INTELLIGENCE  
Holiday Inn Manatee Room

5:45 p.m. to 7:00 p.m. EXHIBIT CENTER COCKTAIL RECEPTION  
Hilton Convention Center

THURSDAY, April 28

7:00 a.m. to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. to 11:30 a.m. PANEL SESSION III — EXPENDABLE LAUNCH VEHICLES  
Howard Johnson Plaza Hotel

9:00 a.m. to 1:00 p.m. YOUTH SCIENCE FAIR  
Holiday Inn Dolphin Room

9:00 a.m. to 3:00 p.m. EXHIBITS  
Hilton Convention Center

1:00 p.m. to 4:00 p.m. PAPER SESSION III:  
A. LUNAR AND MARS EXPLORATION CONCEPTS  
Howard Johnson Plaza Hotel

B. LAUNCH VEHICLES OF THE FUTURE  
Howard Johnson Plaza Hotel

C. SYSTEMS AUTOMATION  
Howard Johnson Plaza Hotel

6:00 p.m. to 8:00 p.m. SPACE CONGRESS RECEPTION  
Holiday Inn Observation Deck

7:30 p.m. to 9:30 p.m. PANEL SESSION IV — MEET THE ASTRONAUTS  
Howard Johnson Plaza Hotel

FRIDAY, April 29

8:00 a.m. to 12:00 noon REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

8:30 a.m. to 11:30 a.m. PANEL SESSION V — SPACE STATION  
Howard Johnson Plaza Hotel

11:30 a.m. to 5:00 p.m. SPACE CONGRESS GOLF TOURNAMENT  
Patrick Air Force Base Golf Course

12:45 p.m. to 3:15 p.m. PAPER SESSION IV:  
A. SPECIAL SUBJECTS  
Howard Johnson Plaza Hotel

B. COMMERCIAL SPACE ENTERPRISES  
Howard Johnson Plaza Hotel

7:00 p.m. to 10:00 p.m. MISSILE, SPACE AND RANGE PIONEERS' ANNUAL BANQUET  
Patrick Air Force Base, Officers Open Mess

**ACKNOWLEDGEMENTS**

The Twenty-Fifth Space Congress gratefully acknowledges the special support of the following organizations:

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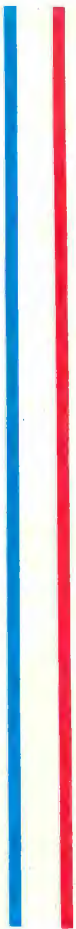
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