History of the IEEE Aerospace and Electronic Systems Society

Moshe Kam, Drexel University
[for Eric Herz]

6 August 2009

**Aerospace & Electronic Systems Society**

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Original Speaker: Eric Herz

- An engineering and program manager in the US Aerospace Industry for 28 years
    - Atlas, Mercury, Space Shuttle, Cruise missiles

- President of the IEEE Aerospace and Electronic Systems Society

- IEEE Vice President, Technical Activities
- IEEE executive director and general manager (14 yrs)
- Served on the IEEE Board of Directors for 33 Years

- President, Eta Kappa Nu
- Eminent Member, Eta Kappa Nu

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The Real Eric Herz

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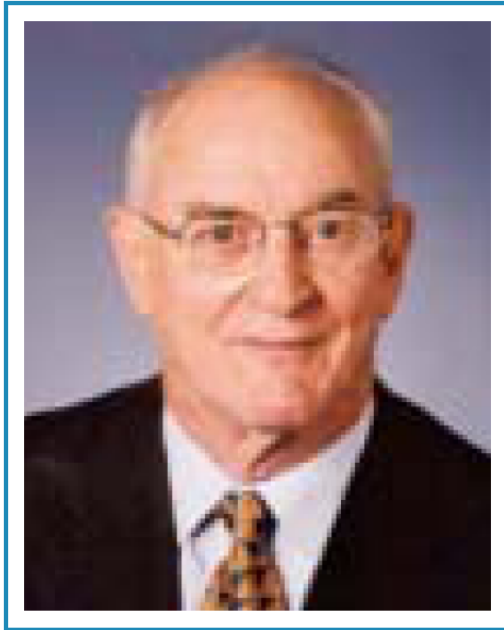
The Real Eric Herz   An Eric Herz wannabe

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Objectives of AESS

- **Advancement of integrated electronic <u>systems</u> and large-scale integrated interoperable <u>systems</u>**

- **The organization, design, development, integration, and operation of complex <u>systems</u> for space, air, ocean, or ground environments**
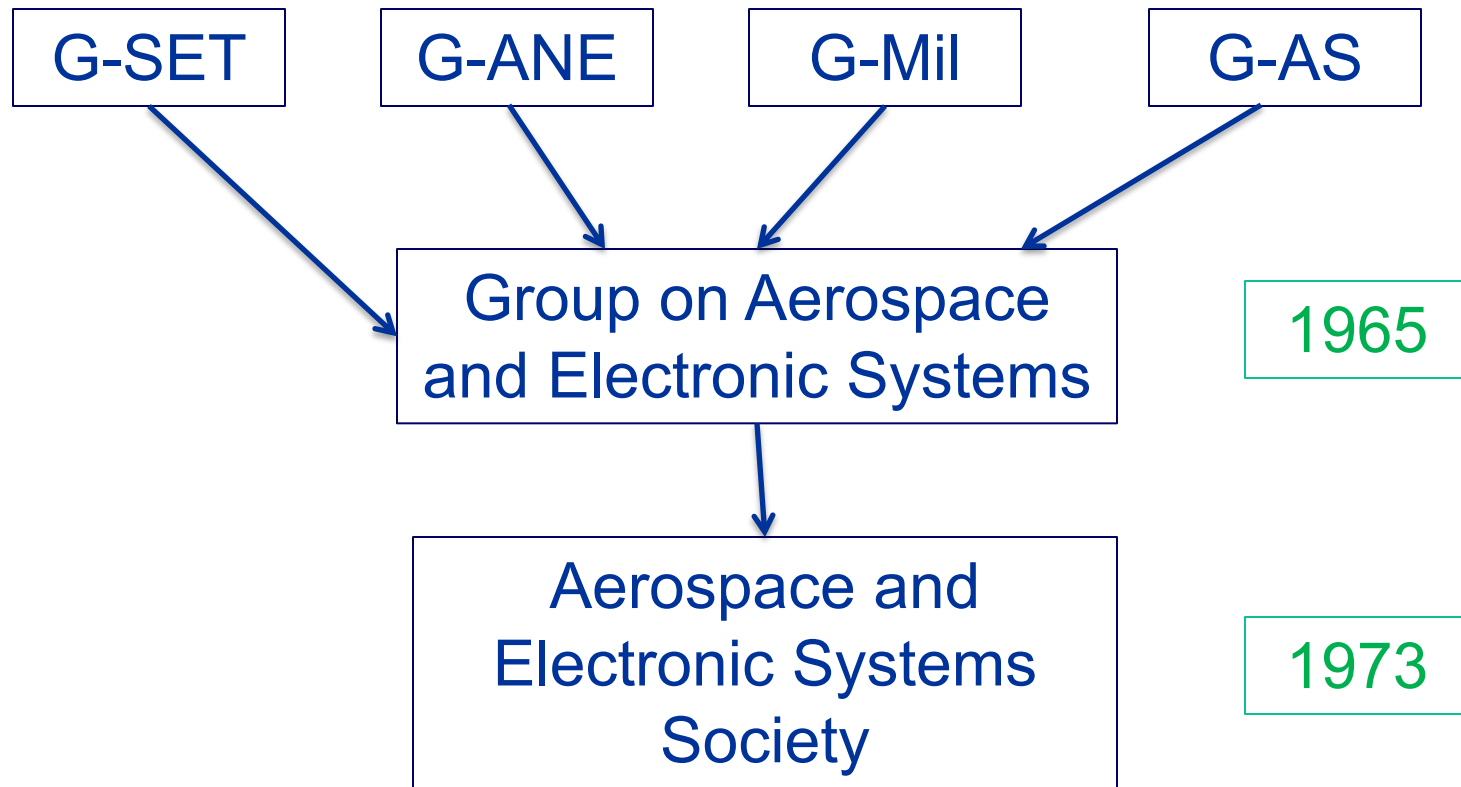
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These <u>systems</u> include…

- **Navigation**
- **Avionics**
- **Mobile electric power and electronics**
- **Radar**
- **Sonar**

- **Telemetry**
- **Military**
- **Law-enforcement**
- **Automatic test**
- **Simulators**
- **Command and control**

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How AESS was created

```
G-SET        G-ANE        G-Mil        G-AS
   \            \           /           /
    \            \         /           /
     \            v       v           /
      \    Group on Aerospace        /        1965
       --> and Electronic Systems <--
                    |
                    v
            Aerospace and
            Electronic Systems              1973
                Society
```

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Key Events in the History of the Society: G-SET

Event	When
Professional Group on **Radio Telemetry and Remote Control** (PGRTRC) met	**11/30/1950**
<u>Name change</u>: IRE Professional Group on **Telemetry and Remote Control** (PGTRC)	**8/26/1955**
<u>Name change</u>: IRE Professional Group on **Space Electronics and Telemetry** (G-SET)	**3/25/1959**

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Key Events in the History of the Society: G-ANE

Event	When
IRE Professional Group on **Airborne Electronics** (PGAE) met	**2/15/1951**
<u>Name change</u>: The Professional Group on **Aeronautical and Navigational Electronics** (PGANE)	**9/29/1953**
<u>Name change</u>: IRE Professional Group on **Aerospace and Navigational Electronics** (PGANE)	**1/25/1961**

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Key Events in the History of the Society: G-ANE

Event	When
Name change: IEEE Professional Technical Group on **Aerospace and Navigational Electronics** (PTGANE)	**1/22/1963**
Name change: **Aerospace and Navigational Electronics** Group (G-ANE)	**3/24/1964**

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Key Events in the History of the Society: G-MIL

Event	When
IRE **Professional Group on Military Electronics** (G-Mil) meets	12/12/1955

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Key Events in the History of the Society: G-AS

Event	When
Aerospace Institute Technical Group met	**1/26/1963**
Name change: Professional Technical Group on **Aerospace** (PTGAS)	**8/5/1963**
Name change: Group on **Aerospace** (G-AS)	**7/28/1963**

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Key Events in the History of the Society

Event	When
G-SET, G-ANE, G-Mil and G-AS merged to form **Group on Defense and Navigational Systems**	**1965**
<u>Name Change</u>: **Group on Aerospace and Electronic Systems**	**3/18/1965**
Group on Aerospace and Electronic Systems became **Aerospace and Electronic Systems Society**	**1/16/1973**

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How AESS was created

G-SET	G-ANE	G-Mil	G-AS

Group on Aerospace and Electronic Systems — 1965

Aerospace and Electronic Systems Society — 1973

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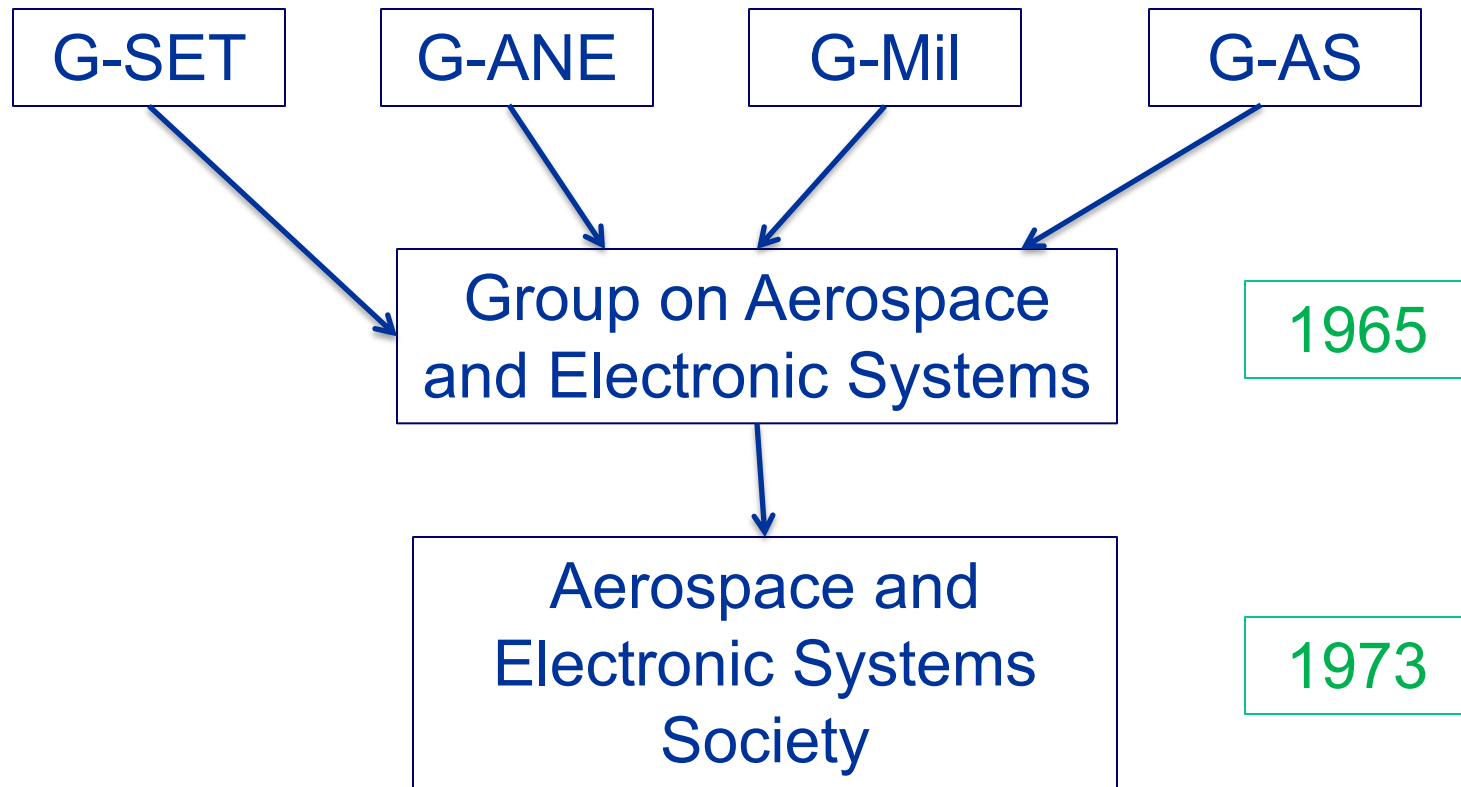
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Current membership as of July 2009

- **Higher Grade members ~ 4500**
- **Students ~150**
- **Affiliates ~ 30**
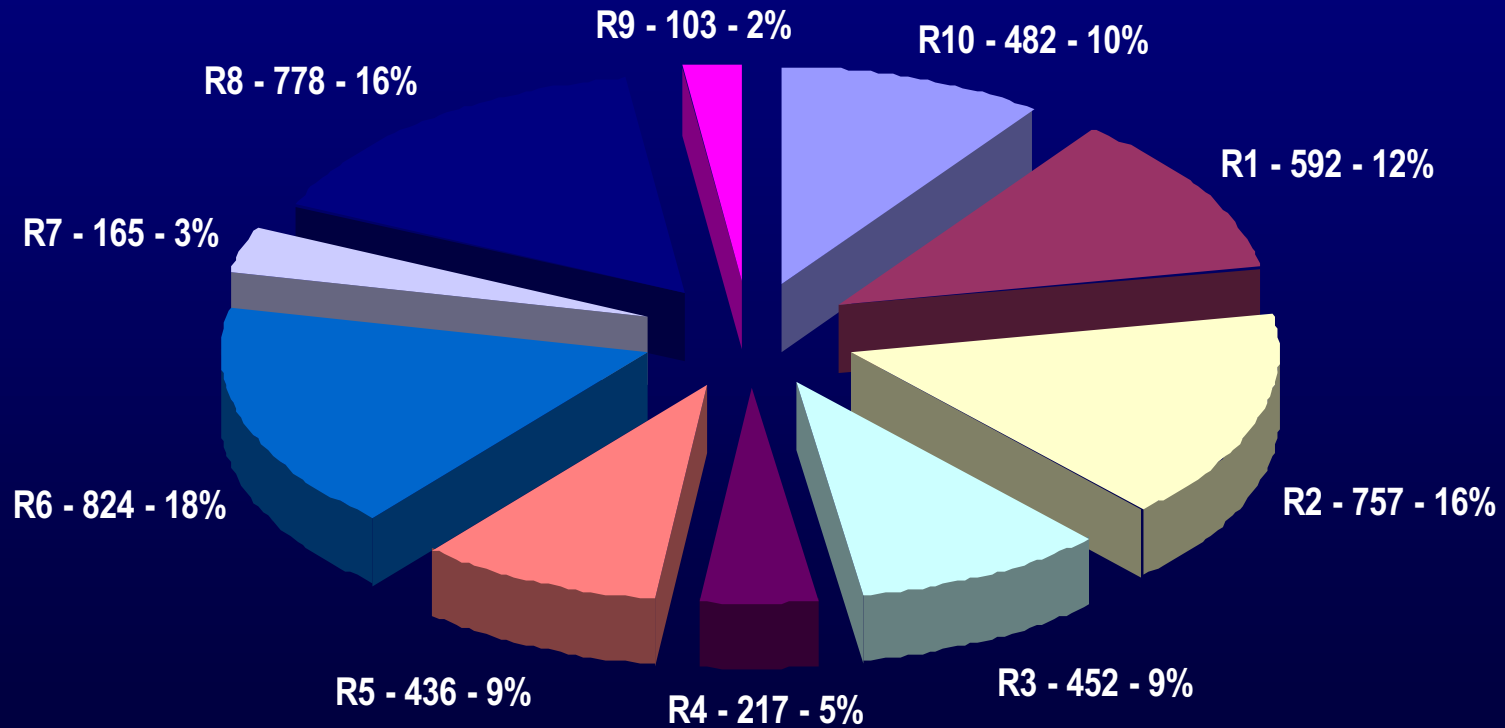
- **Growth from 2008 to 2009 ~ 1.5%**

- **Society budget ~$2.7M**

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IEEE AESS Membership by Year

Chart: Members (y-axis, 4000–7000) vs. December 31st Data for Each Year (x-axis, 1998–2007)

Year	Members
1998	6488
1999	6344
2000	5958
2001	5826
2002	5671
2003	5222
2004	5064
2005	4933
2006	5046
2007	5442

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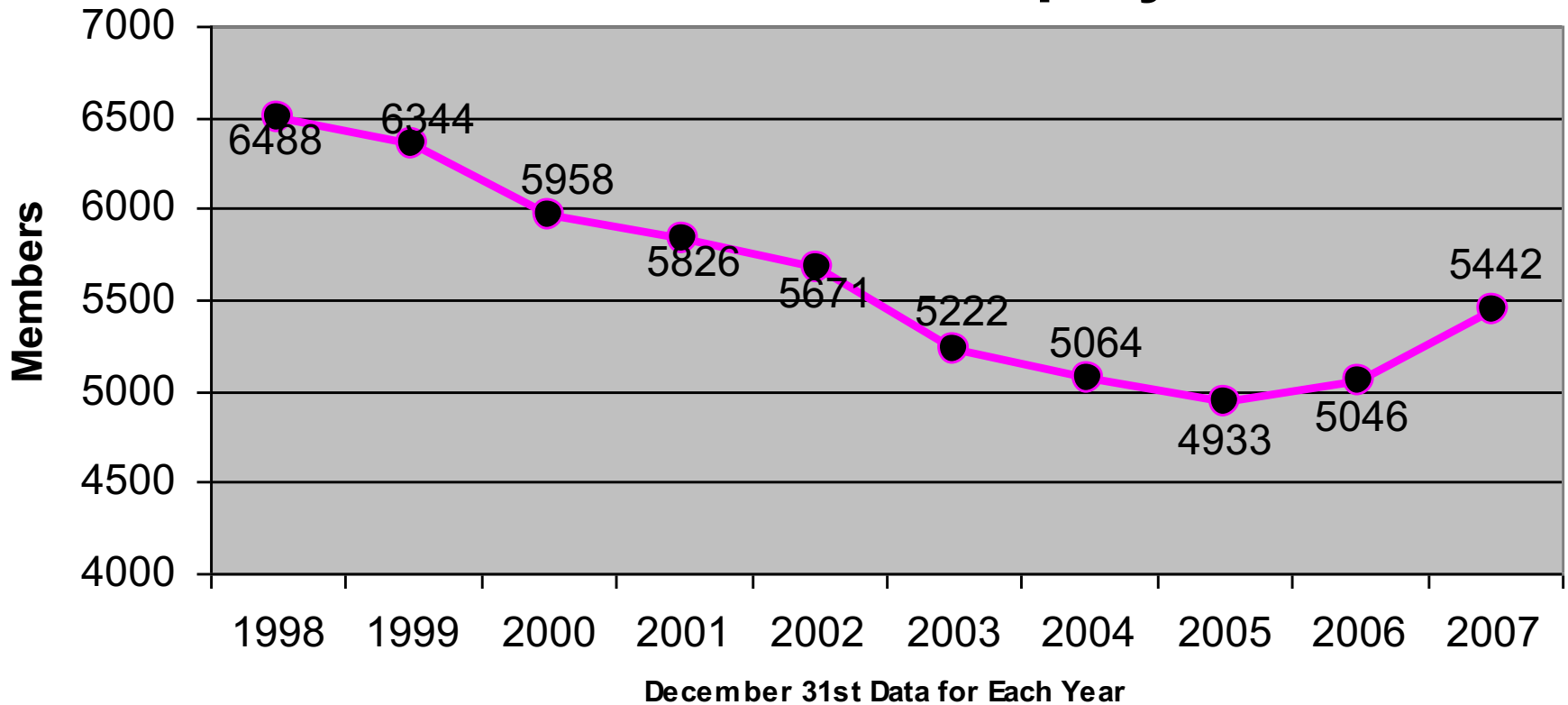
AESS Members Per Region

Non-US: 31%

R9 - 103 - 2%

R10 - 482 - 10%

R8 - 778 - 16%

R1 - 592 - 12%

R7 - 165 - 3%

R6 - 824 - 18%

R2 - 757 - 16%

R5 - 436 - 9%

R4 - 217 - 5%

R3 - 452 - 9%

US: 69%

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AESS Chapters (2008)

53 Active Chapters

Average Chapter size   **20.4**

Sections with less than 10 AESS members   **645**

Sections with AESS members
without AESS Chapters   **67**

AESS Members in Sections
without AESS Chapter   **2001**

AESS Chapters

Regions 1-6   North America   Region 7 Canada

Region 8 Europe, Africa and Northern Asia

Region 9 Central and South America

Region 10   SE Asia and Australia
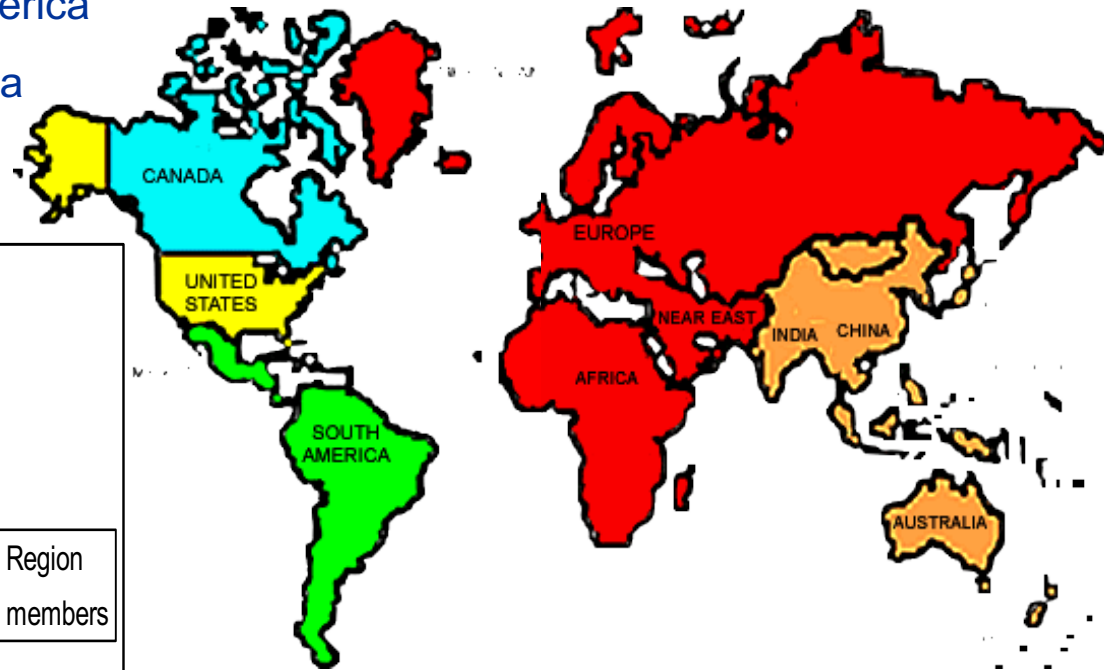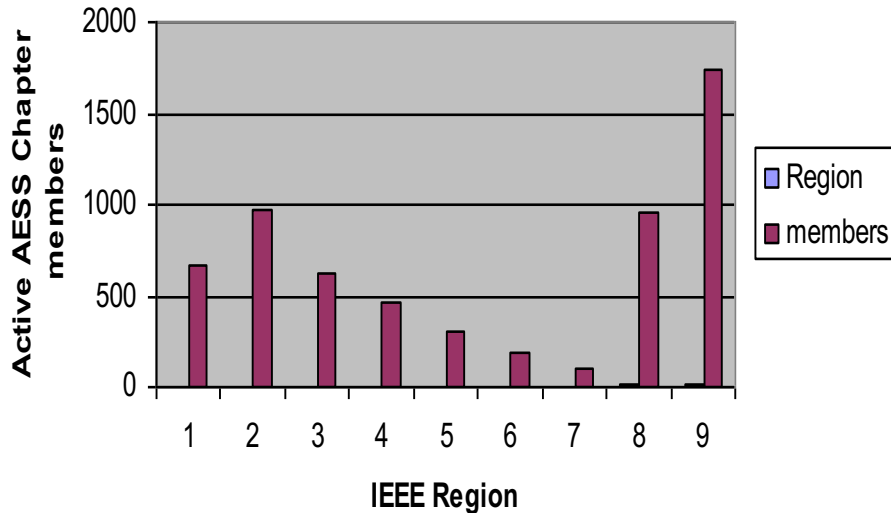
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Principal Publications

IEEE TRANSACTIONS ON
AEROSPACE & ELECTRONIC SYSTEMS

IEEE
Aerospace and Electronic Systems Magazine

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History of the *Transactions*

Name	Years
Transactions of the IRE Professional Group on **Airborne Electronics**	**1952**
Transactions of the IRE Professional Group on **Aeronautical and Navigational Electronics**	**1953-4**
Transactions of the IRE Professional Group on **Radio Telemetry and Remote Control**	**1954**

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History of the *Transactions*

Name	Years
IRE Transactions on Aeronautical and Navigational Electronics	1955-1962
IRE Transactions on Military Electronics	1959 - 1962
IRE Transactions on Space Electronics and Telemetry	1959 - 1962

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History of the *Transactions*

Name	Years
IEEE Transactions on Aerospace and Navigational Electronics	1963-1965
IEEE Transactions on Aerospace	1963-1965
IEEE Transactions on Military Electronics	1963-1965
IEEE Transactions on Telemetry and Space Electronics	1963-1965
IEEE Transactions on Aerospace and Electronic Systems	1965 – present

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Where are IEEE-T-AES papers coming from?

Country	Percentage
US	31.8%
China PRC	23.5%
Canada	5.6%
China ROC	4.25%
R. of Korea	3.73%
India	3.65%
Italy	3.56%
UK	3.47%
Australia	3.21%

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IEEE Publications in Aerospace and Defense

- *IEEE Transactions on Aerospace and Electronic Systems*
- *IEEE Aerospace and Electronic Systems Magazine*
- *IEEE Circuits and Systems Magazine*
- *IEEE Transactions on Vehicular Technology*
- *IEEE Signal Processing Magazine*
- *IEEE Sensors Journal*
- *IEEE Engineering in Medicine and Biology Magazine*
- *IEEE Security & Privacy Magazine*

Aerospace/Avionics articles in IEEEXplore: 65,700

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How are IEEE AES publications ranked? (2008)

Rank	Name	Publisher
1	**Acta Astronautica**	**Elsevier**
2	**Aeronautical Journal**	**Royal Aeronautical Society**
3	**Aerospace Science and Technology**	**Elsevier-France**
4	**Aerospace America**	**AIAA**
5	**AIAA Journal**	**AIAA**

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How are IEEE AES publications ranked? (2008)

Rank	Name	Publisher
6	**Aircraft Engineering and Aerospace Technology**	**Emerald Group**
7	**Cosmic Research**	**Maik Nakua / Springer**
8	**ESA Bulletin**	**European Space Agency**
9	**IEEE AES Magazine**	**IEEE**
10	**IEEE T AES**	**IEEE**

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AIAA J vs. IEEE-T-AES (2008)

Item	AIAA J	IEEE-T-AES
Total Cites	9941	4403
Impact Factor	1.025	1.024
5 Yr Impact Factor	1.26	1.757
Immediacy Factor	0.14	0.109
Total Articles	301	128

The Impact Factor numbers tell an interesting story

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Additional activities: the Distinguished Lecturer Program

7 Lectures Delivered So Far in 2008
5 Lecture/Tutorial Tours in Process
Potential Total of 12 or More for FY08

4
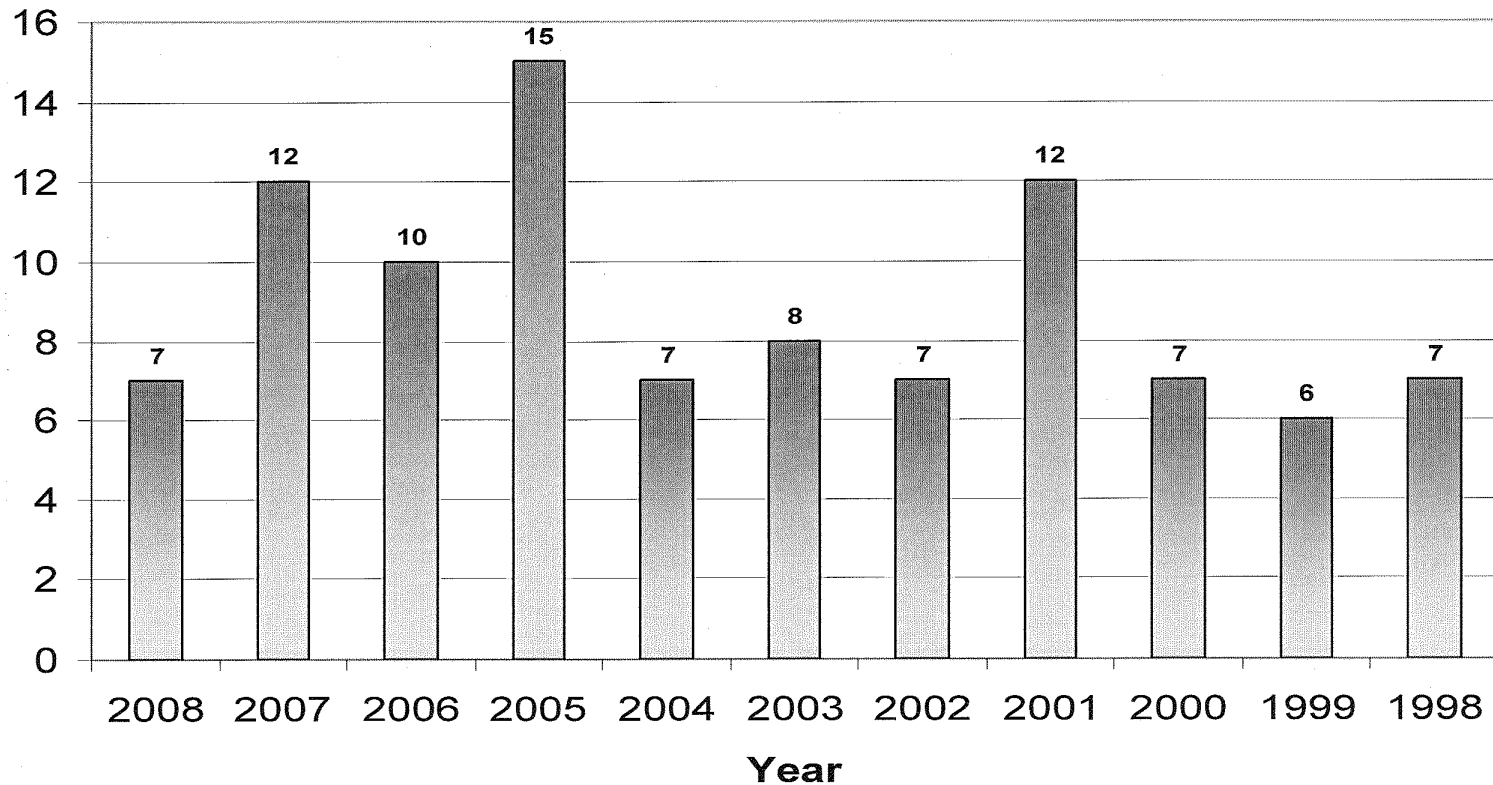
2008 Pioneer Award:
Robert D. Briskman

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Additional activities:
IEEE Aerospace Junior Conference

Part of
IEEE Aerospace Conference
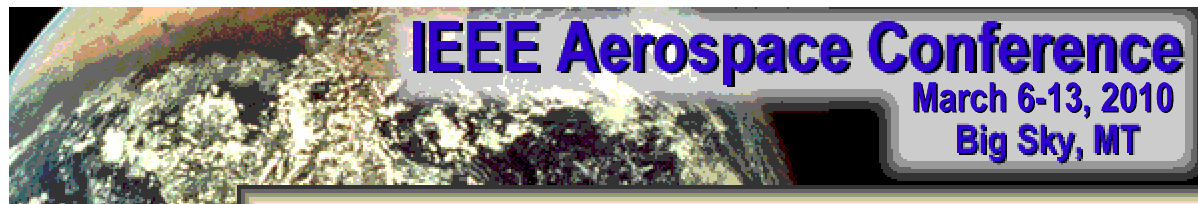
IEEE Aerospace Conference
March 6-13, 2010
Big Sky, MT

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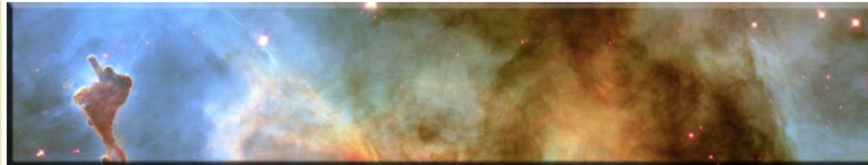
Antennas

By: Amy Haupt
Senior

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Building My Antenna

- **The substrate for my antenna is a 10.28 cm by 10.45 cm piece of polycarbonate (plastic)**

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The Prisoner's Dilemma
or
Life With My Brother and Sister

John Willett
Age 9
G.H. Robertson
Coventry, CT

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... spend time with my loving sister

play with my cool brother, or ...

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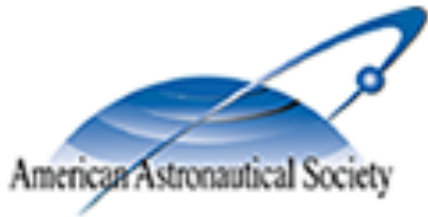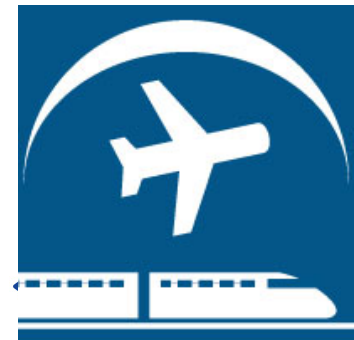
Competitors

- **American Institute of Aeronautics and Astronautics – AIAA**

- **Royal Aeronautical Society**

- **SAE International**

- **ASME Environmental and Transportation Group**

- **American Astronautical Society**

- **Aerospace Industries Association**

- **American Helicopter Society**

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Competitors:

AIAA
The World's Forum for Aerospace Leadership

- **The American Institute of Aeronautics and Astronautics**

- **Founded 1963**
  - **merger of**
    - **the *American Rocket Society* (ARS), founded in 1930 as the *American Interplanetary Society* (AIS)**
    - ***Institute of Aerospace Sciences* (IAS), founded in 1932 as the *Institute of Aeronautical Sciences*.**

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The World's Forum for Aerospace Leadership

- **AIAA Mission: AIAA advances the state of aerospace science, engineering, and technological leadership.**

- **AIAA Vision: AIAA is the shaping, dynamic force in aerospace – the forum for innovation, excellence and global leadership.**

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- **U.S. representative:**
  - **International Astronautical Federation**
  - **International Council on the Aeronautical Sciences**
- **More than 35,000 members**
- **Seven (7) regions**
- **Standards writing activities.**
- **Nine (9) technical journals,**
- **Monthly general interest magazine, *Aerospace America***
- **A series of technical books**
- **Conferences on space engineering.**

The World's Forum for Aerospace Leadership

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References

- **IEEE-T-AES Title History**
  - **http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=7**
- **ISI Web of Knowledge (JCR)**
- **"History of the Aerospace and Electronic Systems Society," IEEE AES Systems Magazine, August 1993, P. 14**
- **AAES Board of Governors Minutes**
  - **http://ieee-aess.org/main/index.php?option=com_docman&task=cat_view&gid=924&Itemid=108**

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Questions/Discussion

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