SATELLITE AND SPACE COMMUNICATIONS **SSC**
www.comsoc.org/socstr/techcom/ssc

IEEE COMMUNICATIONS SOCIETY

SSC Newsletter **Vol.9, No.2, December, 1999**

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The Satellite and Space Communications (SSC) Committee is a volunteer group actively involved in advancing satellite and space communication technologies within the IEEE. This committee is approved by the IEEE Communications Society and is governed by the constitution and bylaws of the IEEE as well as the other twenty Technical Committees in the Society.

SATELLITE & SPACE

- JOIN US -

All conference attendees are welcome to join us in the SSC Committee meeting.

Hotel: Inter-Continental
Room: Ametista
Tuesday, December 7th
7:00 am - 8:15 am

Future SSC Meetings

June 20, 2000	New Orleans
Nov. 29, 2000	San Francisco
June 13, 2001	Helsinki

Globecom'99 SSC Committee Activities

Monday, 6 Dec. Multimedia Satellite
8:00 am - 12:00 pm Communication
Business Application Session

Monday, 6 Dec. Satellites and Wireless
10:45 am - 12:30 pm Access
Technical Session GC01

Tuesday, 7 Dec. Satellite Communications
8:30 am - 12:30 pm in Latin America
Business Application Session

Tuesday, 7 Dec. Future Satellite
9:30 am - 12:30 pm Communication Systems
Technical Session GC09

Wednesday, 8 Dec. Workshop on Satellite Based
Afternoon Information Systems
Workshop WK02

ICC GLOBECOM IEEE

SSC COMMITTEE OFFICERS

CHAIR
Mr. Walter J. Ciesluk
The MITRE Corporation
202 Burlington Road
Bedford, MA, USA 01730-1420
Tel: +1 781 271 6997
Fax: +1 781 271 6170
E-mail: wciesluk@mitre.org

PAST CHAIR
Dr. Satchandi N. Verma
Motorola, Satellite
Communication Group
2501 S. Price Rd
Chandler, AZ, USA 85248
Tel: +1 602 732 2930
Fax: +1 602 732 2299
E-mail: Satchandi_Verma-P27555@email.mot.com

VICE CHAIR
Dr. Iwao Sasase
Department of Information and
Computer Science
Keio University
3-14-1, Hiyoshi, Kohoku-ku,
Yokohama, Kanagawa 223-8522
Japan
Tel: +81 45 563 1141 Ext.3376
Fax: +81 45 563 2773
Email sasase@sasase.ics.keio.ac.jp

COMMITTEE HISTORIAN
Mr. Louis Pollack
c/o Pollack Associates
15321 Delphinium Lane
Rockville, MD, USA 20853
Tel: +1 301 929 1295

SECRETARY / EDITOR
Dr. Ron P. Smith
TRW Space & Electronics
One Space Park, O2/2322
Redondo Beach, CA, USA 90278
Tel: +1 310 812 9395
Fax: +1 310 813 7562
E-mail: ron.p.smith@trw.com

COMMITTEE ADVISOR
Dr. Desmond P. Taylor
Dept. of Electrical & Electronic
Engineering
University of Cantterbury
Private Bag 4800
Christchurch, New Zealand
Tel: +64 3 364 2213
Fax: +64 3 364 2761
E-mail: taylor@elec.canterbury.ac.nz

MESSAGE FROM THE CHAIR

New and revolutionary developments continue to take place in the field of satellite and space communications. The goals of the Satellite and Space Communications (SSC) committee are to be actively on top of these new developments, insure that they are made visible to the IEEE ComSoc community, and provide a forum to facilitate technical interchange among those working in the field. Toward these objectives, the committee continues the process of formulating plans to expand activities, enhance the visibility of the committee, and to attract new members, particularly from the industries and organizations at the fore-front of these new developments.

The committee continues to meet semi-annually at the ICC and Globecom conferences and regularly sponsors technical sessions, tutorials, workshops, and business applications sessions (BAS) at ICC, Globecom, and MILCOM conferences. For instance, a workshop on “Satellite Communications Architecture and Networks” was organized and chaired by Committee Chair Walter Ciesluk, and Member Marie-Jose Montpetit at ICC'99 in Vancouver. Committee Secretary Ron Smith presented a paper at this workshop. Walter Ciesluk has also organized a BAS on Satellite Communications in Latin America for Globecom'99 in Rio de Janeiro.

The committee has also been actively promoting satellite communications systems and technology via professional journals, transactions, and magazine publications. Member Sastri Kota was co-guest editor for the July 1999 IEEE Communications magazine feature topic section on “Broadband Satellite Network Performance.” Member Michael Enoch is co-guest editor for a feature topic section on “Free Space Laser Communications” to be published in the August 2000 edition. In addition, Marie-Jose Montpetit and Walter Ciesluk continue to serve as area editors on radio and satellite communications for the IEEE "Communications Surveys" electronic magazine. The committee is also attempting to establish a more active relationship with the IEEE Journal on Selected Areas in Communications and the International Journal of Satellite Communications.

The Committee is also involved in the development of emerging standards related to satellite communications. Sastri Kota is active in ITU-R Ka-band Fixed Satellite Service standards development activities. In addition, he is also active in the Wireless ATM Forum where he chairs the Satellite Access and Infrastructure Mobility group.

(continued on page 3)

Because of the broad range of the technologies involved, and the necessity of integrating and interfacing satellite communications with other networks, the committee has attempted to develop liaisons with other committees such as the Personal Communications (PC), Multimedia Communications (MM), and Communications Simulation and Modeling (CSIM). For example, the SSC and CSIM committees are jointly organizing a symposium on "Satellite Communications for the New Millennium" for Globecom 2000 in San Francisco. Sastri Kota will serve as the chair for the symposium and Ron Smith and C. K. Toh will serve as vice chairs.

SSC is also striving towards a joint working relationship with the American Institute of Aeronautics and Astronautics (AIAA) with the objective of co-sponsoring an annual conference on Satellite Communications. Ron Smith, who is also a member of the AIAA TCCS, is active in the steering committee formulating plans for the next symposium. The SSC committee has recommended ComSoc co-sponsorship of the AIAA International Communications Satellite System Conference (ICSSC-18).

In addition, several committee members are serving on the technical program committee of the Fourth IEEE International Workshop on Satellite-Based Information Systems (WOSBIS 99) to be held in conjunction with Globecom'99 in Rio de Janeiro.

The committee has also initiated development of a plan for the recruitment of new members particularly from the satellite communications industry in Europe, Asia, and Latin America as well as North America. In 1999, we have added 37 new members to the membership role.

The committee continues to publish the "SSC Newsletter" semiannually. In addition, Ron Smith continues to maintain and improve the committee web pages. The SSC web site now includes a list of reviewers with preferred topics for conference and publication reviews, a list of Technical Program Committee (TPC) representatives and liaisons, past newsletters, meeting minutes, calls for papers and other information to help members be active without needing to attend committee meetings.

Clearly, the field of satellite communications continues to grow rapidly and remains interesting and exciting. I encourage all who are interested in this field to join our committee. Please visit our web site located at http://www.comsoc.org/socstr/techcom/ssc, where you can get information on events and upcoming meetings, and interact with committee officers and members.

Walter Ciesluk, Chair
Satellite and Space Communications
Technical Committee

FORTHCOMING GLOBECOM AND ICC CONFERENCES

ICC 2000
June 18 - 22, 2000,
New Orleans, USA

Globecom 2000
Nov. 26 - 30, 2000,
San Francisco, USA

ICC 2001
June 11 - 15, 2001,
Helsinki, Finland

COSPONSORING / RELATED CONFERENCES AND WORKSHOPS

ICSSC 2000 (April 10 - 14, 2000, Oakland, USA)
The 18th AIAA International Communication Satellite Systems Conference is a pre-eminent technical conference in the field of satellite communication. The conference will be held in Oakland, California, and will feature a special emphasis on new services and on interoperability of terrestrial and satellite communications. Also planned is a visit to the satellite integration facilities of Lockheed Martin and a colloquium devoted to interoperability and convergence.

Milcom 2000 (Oct. 22 - 25, 2000, Los Angeles, USA)
Hosted by TRW and The Aerospace Corporation, unclassified sessions will be held at the L.A. Airport Marriott and classified sessions at The Aerospace Corporation. The conference focus is on architectures and technologies needed for information superiority in 21st century military communications. **Abstracts due Jan. 31, 2000.**

SCANNING THE WORLD

National Space Development Agency of Japan (NASDA) is planning to launch two data relay test satellites (DRTS), DRTS-West and SRTS-East, by using H-II and H-IV launch vehicles from Tanegashima Space Center in Japan in the summer of 2000 and 2002. The two DRTS satellites will be deployed in geostationary orbits. DRTS will conduct orbital experiments for advanced data relay technology in response to a wide variety of requirements for future space missions. By using the two DRTS satellites, a ground station is able to communicate with low earth orbit satellites, space stations and rockets without requiring the help of other ground stations in most part of their flying area.

There are three main objectives of DRTS. The first objective is to test and verify an advanced receiver, an advanced inter-satellite communications antenna, and a high-performance tracking and acquisition system, which will improve data relay speed and performance. DRTS will transmit high bit rate data over 240 megabits per second. High-speed data transmission is a key technology to support various space activities such as global data reception from earth observation satellites. Mission equipment consists of S- band and Ka-band inter-satellite communication equipment and Ka-band feeder link equipment.

The second objective is to establish common technology for a three-axis stabilized and medium-size geostationary satellite bus, which will shorten satellite development period, and improve the payload to bus system weight ratio. The unified propulsion subsystem consisting of a bipropellant apogee engine, DC arc jet thrusters, and hydrazine thrusters. The attitude control subsystem is based on that of COMETS using feed-forward disturbance compensation with an inter-orbit link antenna. An adaptive cooperated control, which identifies the antenna mass characteristic parameters on board in real time from attitude angle errors, is adopted to minimize the influence of errors of expected disturbance, and to achieve a highly precise pointing of the antenna. The satellite weight at launch is 2650 kg, structure is 2.2m×2.4m×2.2m, solar array paddle is 2.4m×7.3m, aperture diameters of inter-satellite communication antenna and feeder link antenna are 3.6m and 1.8m, respectively, and mission life is 7 years

The third objective is to test and verify network operation and communication control technology between a ground station and the target spacecraft using the two DRTS satellites. The two DRTS satellites, which are deployed in geostationary orbits, will conduct various communications network experiments such as data link handover experiments between two DRTS satellites, and network scheduling experiments for two target satellites and more. For more information, see NASDA Home Page URL, http://www.nasda.go.jp/.

Prof. Iwao Sasase, Vice Chair
Satellite and Space Communications
Technical Committee

CONFERENCE CALENDAR

Conference	Date	Location	Information
ICSSC 2000 18th AIAA International Communication Satellite Systems Conference	April 10-14, 2000	Oakland, CA, USA	Neil Helm Institute of Applied Space Research George Washington University EECS--IASR Suite 340 2033 K Street NW Washington, D. C., USA 20052 Tel: +1 202 994 5509 Fax: +1 202 994 5505 E-mail: helm@seas.gwu.edu
VTC 2000/Spring Vehicular Technology Conference	May 15-18, 2000	Tokyo, Japan	Prof. Tadashi Matsumoto Secretary for VTC2000-Spring Wireless Labs., NTT DoCoMo 3-5 Hirkarino-oka Yokosuka, Kanagawa 239-8536 Japan Tel: +81 468 40 3552 Fax: +81 468 40 3790 E-mail: matsumoto@mars.yrp.nttdocomo.co.jp http://www.convention.co.jp/vtc2000s
ICC 2000 International Conference on Communication	June 18-22, 2000	New Orleans, USA	Mr. Richard W. Miller Bell South Telecommunication Inc. Rm. 1050, 365 Canal St. New Orleans, LA 70130 Tel: +1 504 528 2553 Fax: +1 504 528 2387 E-mail: r.w.miller@ieee.org
ISIT 2000 International Symposium on Information Theory	June 25-30, 2000	Sorrento, Italy	Prof. Giorgio Taricco Dipartimento di Electronica Politecnico di Torino c.so Duca degli Abruzzi 24 I-10129 Torino, Italy Tel:+39 11 564 4084 Fax: +39 11 564 4099 E-mail: taricco@polito.it http://www.unisa.it/isit2000
ISSSTA 2000 International Symposium on Spread Spectrum Techniques & Applications	Sept. 6-8, 2000	Parsippany, USA	Prof. Clare Naporano Center for Communications & Signal Processing Research, NJIT Newark, NJ 07102 Tel: +1 973 596 8474 Fax: +1 973 596 8473 E-mail: clare@magahertz.njit.edu http://www.isssta2000.org/isssta.html

Conference	Date	Location	Information
PIMRC 2000 Personal, Indoor and Mobile Radio Communications	Sept. 18-21, 2000	London, England	Prof. A. H. Aghvami E-mail: hamid.aghvami@kcl.ac.uk http://www.pimrc2000.com
VTC 2000/Fall Vehicular Technology Conference	Sept. 24-28, 2000	Boston, USA	Mr. Stuart J. Lipoff Aurthur D. Little, Inc. 20 Acorn Park Cambridge, MA 02140 Tel: +1 617 498 6077 E-mail: s.lipoff@ieee.org http://www.vtc2000.org
MILCOM'00 Military Communications International Symposium	Oct. 22-25, 2000	Los Angeles, USA	Mr. Jamie Morgan TRW Space & Electronics Group One Space Park, Redondo Beach, CA 90278 Tel: +1 310 813 7685 E-mail: jamie.morgan@trw.com
GLOBECOM'00 Global Telecommunications Conference	Nov.26-30, 2000	San Francisco, USA	Ms. Gayle Weisman Meeting Administrator IEEE Communications Society 305 E. 47th St., 9th Floor New York, NY 10017 Tel: +1 212 705 8941
ICPWC 2000 International Conference on Personal Wireless Communications	Dec. 17-20, 2000	Hyderabad, India	Dr. Ram Gopal Gupta Dept. of Electronics, Govt. of India 6 CGO Complex, Lodhi Rd. New Delhi 100 003, India Tel: + 91 11 436 3095 Fax: +91 11 436 3079 E-mail: guptarg@xm.doe.ernet.in http://www.citr.ece.uvic.ca/icpwc2000

EDITORIAL / LETTERS TO THE EDITOR

This SSC newsletter is issued twice a year and is intended to bring you information on ICC, GLOBECOM and other SSC Committee activities. This letters to the editor section is your column for your ideas, program descriptions and other contributions. Please forward your letter to the Editor:

Dr. Ron P. Smith
TRW Space & Electronics
One Space Park, 02/2322
Redondo Beach, CA, USA 90278
Tel: +1 310 812 9395
Fax: +1 310 813 7562
E-mail: ron.p.smith@trw.com

To all SSC members:

If your postal or e-mail addresses, telephone or fax numbers have changed, please update them with the committee secretary (send e-mail to ron.p.smith@trw.com). You can review our current records on our web page at www.comsoc.org/socstr/techcom/ssc.

Excerpt from: "An Overview of the Satellite and Space Communications Committee" By Walter J. Ciesluk and Iwao Sasase, Chair and Vice-Chair of SSC, December 1998.

The Satellite and Space Communications (SSC) Committee has provided a forum for technical interchange among those working in this field for nearly 40 years. It began in the early 1960's soon after it was recognized that the rocket capabilities demonstrated by the Soviet Union and United States in the late 1950's could readily be used to launch communications satellites.

From that time, the development and impact of satellite communications has been revolutionary. In the early days, the major activity was associated with the business, political and technical issues associated with the development and introduction of the first communications satellites. The technical community was occupied with the tradeoff studies associated with satellite orbits, frequency bands and link design. However, the first communications satellites came along quickly with low earth orbit launches of Telstar and Relay in 1962, the first synchronous orbit satellite, Syncom, in 1963, and the launch of INTELSAT 1 and MOLNIYA 1 in 1965. From that time, the field of satellite communications has continued to grow rapidly. Satellites became dramatically larger, capable of increased capacity, and employed rapidly developing light weight electronics technology, spacecraft control and power generation and storage devices. Significant development went into sophisticated space-borne regional and spot-beam dual polarized antennas at both C- and Ku-band to increase payload capacity through frequency reuse techniques. Next, Very Small Aperture Terminal (VSAT) networks and applications, and direct broadcast satellite systems and technology were introduced. Quickly, the exploitation of the Ka band frequencies for future growth became important topics within the satellite communications community. During the 70s and 80s, major engineering efforts were devoted to the development or higher power amplifiers, lighter weight and improved performance microwave filters and circuit switches, and electric power generation and storage devices which contributed to larger communications satellite payloads that fit the launch constraints of available launch vehicles. Eventually, systems to provide communications services to mobile terminals, e.g., ships, land vehicles and aircraft were developed. These systems exploited one of the major attributes of communications satellites, that is the capability to offer wireless services over a large service area.

Today, communications satellites carry about one third of voice and essentially all international television traffic. Significant advances in video compression and data protocol enhancement technology have made new and many previously very expensive satellite communications services such as digital direct broadcast satellite (DBS), digital direct-to-home (DTH), and Internet Access available at lower cost. At the same time, we are entering a new and potentially revolutionary era in satellite communications. A large number of commercial systems are being planned and introduced to provide a wide array of voice, data, and video services that promise to radically change global telecommunications. These include narrow band systems, such as Ellipso, Globalstar, ICO, Iridium, and ECCO, which intend to provide cellular telephone-like services in L/S-band. There are also a host of wide band systems being planned for Ka-band, such as Astrolink, Spaceway and Teledesic, which intend to provide multimedia services to desktop computer-size terminals starting around 2000. Both the narrow band and wide band systems appear attractive because they offer much higher capacity and relatively low user costs compared to traditional systems. In the latter part of 1997, several companies announced proposals to build satellite systems in the Q and V bands to supplement the Ka-band wide band systems now in various stages of development.

[End of excerpt.]

For the full article, please visit our web page at http://www.comsoc.org/socstr/techcom/ssc/ and select the link to SSC Overview.

SSC COMMITTEE MEMBERSHIP APPLICATION

You can participate in the SSC Committee as a member by attending the SSC Committee meeting which is held twice a year during ICC and GLOBECOM conferences or you can participate as an associate member by filling in and mailing the application form below (preferably send an e-mail with the same information). Please note there is no difference between a member and an associate member except that an associate member has never attended an SSC Committee meeting.

The members and associate members can receive various information through the SSC newsletter and on our web page at www.comsoc.org/socstr/techcom/ssc, and also may propose hot topics, workshops and tutorials as well as provide paper reviews for conferences and publications. The members and associate members may provide regional conference / workshop information to the Editor which may appear in the SSC newsletter and on our web page if it is applicable to the committee's charter.

Place
Stamp
Here

Dr. Ron P. Smith

TRW Space & Electronics
One Space Park, 02/2322
Redondo Beach, CA, USA, 90278

Tel: +1 310 812 9395
Fax: +1 310 813 7562
E-mail: ron.p.smith@trw.com

Name _____

Title _____

Affiliation _____

Business Address _____

_____

Tel _____ Fax _____ E-mail _____

Paper topics you would like to review (optional) _____

_____

Please Note: Your contact information will appear on our web page unless requested otherwise.