ACTIVITIES AND TRENDS OF PHOTOGRAMMETRIC AND REMOTE SENSING SYSTEMS FOR DATA PROCESSING AND ANALYSIS 1984-88 COMMISSION II REPORT

Lawrence W. Fritz
NOAA Charting Research and Development Laboratory
National Ocean Service
National Oceanic and Atmospheric Administration
Rockville, Maryland
U.S.A.

During the past 4 years, many major technological advancements have taken place that will significantly affect the future directions of our photogrammetric and remote sensing profession. ISPRS Commission II, responsible for "Instrumentation for Data Reduction and Analysis," has been privileged to recognize, acknowledge, research, develop, and report on these advancements. The change has been so dramatic that Commission II's name and areas of responsibility (Terms of Reference) have been reevaluated and major changes in both have been recommended for ratification by the XVI ISPRS General Assembly in Kyoto, Japan, July 1988.

Commission II - Instrumentation for Data Reduction and Analysis

It was recognized by the 1980-84 President of Commission II, Dr. Zarko Jaksic, and his Commission members that the term "Instrumentation" had become less descriptive of the tools that photogrammetric and remote sensing scientists use in the profession. Instead "Systems" has become the predominant term that characterizes their tools. As a result, an adjustment to the new Commission II Terms of Reference replaces the term 'instrumentation' with the term 'systems' to recognize that modern analysis systems include software and hardware and transcend the traditional meaning of 'instrument.' Similarly the term 'data reduction' has given way to 'data processing.' Thus it is now proposed that Commission II hereafter be titled "Systems for Data Processing and Analysis."

Commission II - Terms of Reference

The current terms of reference of Commission II are as follows:

Commission II - Instrumentation for Data Reduction and Analysis

- Design and construction of instruments for reduction, mensuration, analysis, and display of photographic and other remote sensor data.

- Calibration, accuracy and precision, and performance of data reduction and analysis instruments.

- Physiological factors in instrument design and operations.

At the March 1987 Annual Meeting of Commission II Officers a new set of Terms of reference for Commission II were refined to reflect modern technology and issues. The redefinition of Commission II areas of responsibility are proposed as follows:

Commission II - Systems for Data Processing and Analysis

- Design and development of systems for measurement, processing, analysis, presentation and storage of photogrammetric and remotely sensed data.

- Integrated information systems for georeferenced and other data bases.

- Design and performance of automated and intelligent data and information processing systems for correlation, measurement, compilation and interpretation.

- Evaluation, testing, calibration and performance of data processing and analysis systems.

- Standards for testing of systems for data exchange.

- Biotechnological factors in system design and operations.

Notable differences in this modernization of the terms to which Commission II activities are referenced include: 1) the emphasis on systems; 2) the recognition of digital imagery as well as analog imagery (film); 3) addition of systems for storage and data bases; 4) acknowledgment of automated and knowledge based systems (intelligent systems); e) an emphasis on standards, especially for systems designed to transfer data between sensor, data base and processing systems; and f) change from physiological to biotechnological[1] factors.

Working Group Activities and Technology Trends

For the 1984-88 period, Commission II was organized into six Working Groups (WGs), sponsored the activities of the Intercommission I/II Working Group (IC WG), and promoted and financed the publication of the "Instruments for Teaching" Newsletter. All WGs were formed in accordance with six resolutions passed by the XV ISPRS General Assembly at Rio de Janeiro, Brazil, on June 28, 1984. (ISPRS Archives, 1984.) In

---

[1]Biotechnology is the study of the relationship between human beings and machines, especially in terms of physiological, physchological, and technological requirements. (Random House, 1974.)

late 1984 and early 1985, the WGs were formed and Terms of Reference for each were developed.

Membership of Commission II Working Groups is broad-based and consists of representatives from manufacturers, research laboratories, universities, government and private production organizations. WG Chairmen are selected by the Commission President based on their proven accomplishments and leadership related to the domain of the WG and to ensure an international perspective is maintained. When appropriate, WG Co-chairmen are selected on a wide geographical basis to facilitate communications between WG members of different continents. Similarly, WG members are solicited on an international basis. The following is a synopsis for the 1984-88 period of each WG's Terms of Reference and other relevant information regarding its activities and future trends of its technology.

Working Group II/1 "Analytical Instruments"

Chairman:	Morris L. McKenzie, U.S. Geological Survey (retired), U.S.A.
Secretary:	Chester C Slama, NOAA/National Ocean Service (retired), U.S.A.
36 Members	

WG II/1 has been responsible for activities related to all analytical photogrammetric instruments and is developing testing procedures, standardized programs, and data exchange for analytical stereoplotters. Primary goals, which were achieved, were to produce: 1) a manual containing an updated ISPRS Analytical Stereoplotter Evaluation Guide; 2) an assemblage of testing procedures; 3) guidelines for standardizing input, output, and computer programs; and 4) a reference manual listing analytical photogrammetric instrument manufacturers. (See fig. 1.)

Trends identified in analytical instruments include the predomination of analytical stereoplotter systems (ASP's) for aerotriangulation, feature extraction and digital vector output; superimposition in stereo and/or color; on-line automated functions for registration, point setting and calibration; large format stages for multimodelling and large format sensors (LFC, KFA-1000, etc.); and open architecture software design.

Working Group II/2 "Photogrammetric Digital Image Processing Systems"

Chairman:	Dr. Zarko Jaksic, National Research Council of Canada, Canada
Secretary:	David Havelock, National Research Council of Canada, Canada
30 Members	

WG II/2 was established to address intelligent information compilation systems, metric digital imagery processing, and

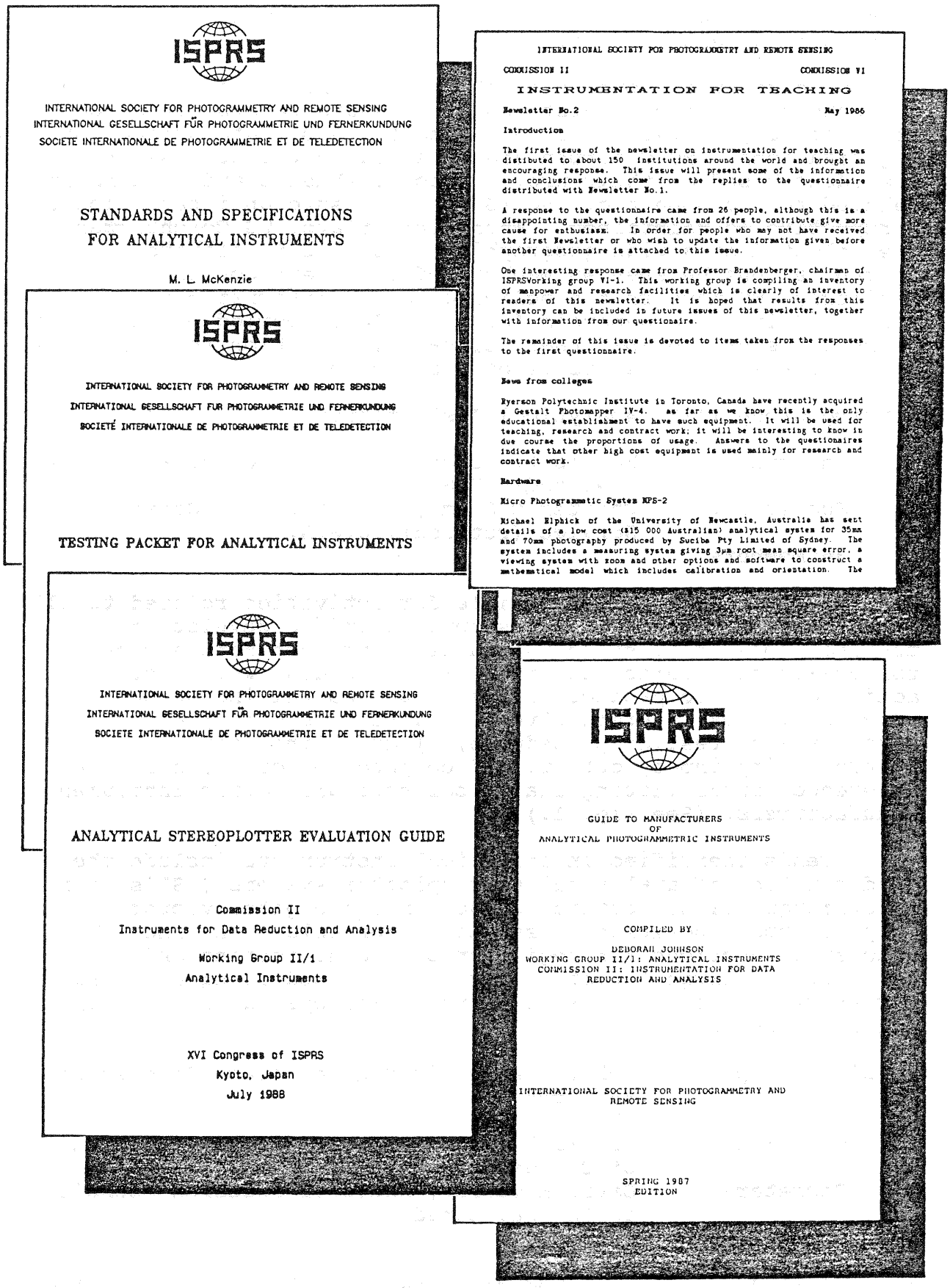
ISPRS
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING
INTERNATIONAL GESELLSCHAFT FÜR PHOTOGRAMMETRIE UND FERNERKUNDUNG
SOCIETE INTERNATIONALE DE PHOTOGRAMMETRIE ET DE TELEDETECTION
STANDARDS AND SPECIFICATIONS
FOR ANALYTICAL INSTRUMENTS
M. L. McKenzie
ISPRS
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING
INTERNATIONAL GESELLSCHAFT FUR PHOTOGRAMMETRIE UND FERNERKUNDUNG
SOCIETÉ INTERNATIONALE DE PHOTOGRAMMETRIE ET DE TELEDETECTION
TESTING PACKET FOR ANALYTICAL INSTRUMENTS
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING
COMMISSION II
COMMISSION VI
INSTRUMENTATION FOR TEACHING
Newsletter No.2
May 1986
Introduction
The first issue of the newsletter on instrumentation for teaching was distibuted to about 150 institutions around the world and brought an encouraging response. This issue will present some of the information and conclusions which come from the replies to the questionnaire distributed with Newsletter No.1.
A response to the questionnaire came from 26 people, although this is a disappointing number, the information and offers to contribute give more cause for enthusiasm. In order for people who may not have received the first Newsletter or who wish to update the information given before another questionnaire is attached to this issue.
One interesting response came from Professor Brandenberger, chairman of ISPRSWorking group VI-1. This working group is compiling an inventory of manpower and research facilities which is clearly of interest to readers of this newsletter. It is hoped that results from this inventory can be included in future issues of this newsletter, together with information from our questionnaire.
The remainder of this issue is devoted to items taken from the responses to the first questionnaire.
News from colleges
Ryerson Polytechnic Institute in Toronto, Canada have recently acquired a Gestalt Photomapper IV-4. as far as we know this is the only educational establishment to have such equipment. It will be used for teaching, research and contract work; it will be interesting to know in due course the proportions of usage. Answers to the questionnaires indicate that other high cost equipment is used mainly for research and contract work.
Hardware
Micro Photogrammetic System MPS-2
Michael Elphick of the University of Newcastle, Australia has sent details of a low cost ($15 000 Australian) analytical system for 35mm and 70mm photography produced by Sucipa Pty Limited of Sydney. The system includes a measuring system giving 3µm root mean square error, a viewing system with zoom and other options and software to construct a mathematical model which includes calibration and orientation. The
ISPRS
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING
INTERNATIONAL GESELLSCHAFT FÜR PHOTOGRAMMETRIE UND FERNERKUNDUNG
SOCIETE INTERNATIONALE DE PHOTOGRAMMETRIE ET DE TELEDETECTION
ANALYTICAL STEREOPLOTTER EVALUATION GUIDE
Commission II
Instruments for Data Reduction and Analysis
Working Group II/1
Analytical Instruments
XVI Congress of ISPRS
Kyoto, Japan
July 1988
ISPRS
GUIDE TO MANUFACTURERS
OF
ANALYTICAL PHOTOGRAMMETRIC INSTRUMENTS
COMPILED BY
DEBORAH JOHNSON
WORKING GROUP II/1: ANALYTICAL INSTRUMENTS
COMMISSION II: INSTRUMENTATION FOR DATA
REDUCTION AND ANALYSIS
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND
REMOTE SENSING
SPRING 1987
EDITION

Figure 1

design principles and performance characteristics of photogrammetric digital imaging processing systems. Objectives were to review, discuss, and report on digital processing systems with emphasis on concepts, definitions of types, functions and structures; design principles, characteristics and optimal configurations; evaluation criteria, performance parameters, and testing procedures.

Trends noted in this growing field of technology include the development of digital stereoimage processing stations for precision real-time metrology and for semi-automated feature extraction; faster processing on more powerful on-line 32 bit microprocessor; on-line automatic correlation with spatial filtering; real-time quality control systems for industrial metrology; and virtual n-stage comparators.

Working Group II/3 "Systems for Analysis of Remotely Sensed Data"

Chairman: Dr. W. Murray Strome, Perceptron Computing Inc., Canada
Co-chairman: Frederick C. Billingsley, Jet Propulsion Laboratory, U.S.A.
30 Members

WG II/3 has been emphasizing digital analysis and optical imaging processing. The WG's aim is to advance standardization for digital data interchange as well as of hardware, and analysis of software interfaces. In addition, the WG has addressed the rapid advances being made in commercially available optical recording technology. Five primary topics were addressed including; systems, media-conversion devices, computer graphics applied to image processing, special devices, and interfaces.

Trends have been toward more powerful computers utilizing super- and concurrent-computer architectures with bus capabilities of greater than 40 megabytes per second; associative memory; distributed image processing; optical storage technologies (CD-ROM, 5.25 inch WORM); integration and synthesis of data sources - both image and vector data; and development of standards for raster/vector conversions, data descriptions, and for formats for transmission, transfer and archiving.

Working Group II/4 "Systems for Reception, Recording, Preprocessing, Archiving, and Dissemination of Remotely Sensed Data"

Chairman: Russell Koffler, NOAA/National Environmental Satellite Data and Information Service, USA
Secretary: Mr. Michael Matson, NOAA/National Environmental Satellite Data and Information Service, USA
10 Members

WG II/4 has concentrated on three areas: preprocessing, storage, and dissemination of data; the assessment of available instrumentation and technological trends; and the identification of priority areas where the need for special research activities is expected. The WG is also addressing compatibility of products and standards of international remote sensing programs.

Trends identified by WG II/4 include the use of array processors for preprocessing to remove radiometric and geometric distortions; use of optical disk for recording and archiving; development of Artificial Intelligence/Expert Systems to merge and synthesize data from multiple sensor systems; and development of new strategies for handling large volumes of data, i.e., hundreds of gigabytes daily per reception site.

Working Group II/5 "Systems and Instrumentation for Synthetic Aperture Radar Processing"

Chairman: Dr. Andrew Goldfinger, Applied Physics Laboratory, U.S.A.
Co-chairman: Dr. Jean Pierre Guignard,, European Space Agency, the Netherlands
58 Members

WG II/5 has been promoting the development of systems and instrumentation for Synthetic Aperture Radar (SAR) preprocessing and information extraction. Five primary topic areas have been addressed: 1) SAR preprocessing; 2) SAR image processing, and information extraction, including radargrammetry; 3) calibration and validation; 4) precision product development and dissemination; and 5) integration with other sensors. The WG also decided to prepare a tutorial book on SAR to help bridge the gap between the microwave and optical remote sensing communities by exposing a larger audience to SAR technology and applications.

Trends identified in SAR technology include the development of multifrequency, multipolarization SAR imagers; the use of phased array antennas with solid state amplifiers; the use of supercomputer systems with pipelining and parallelism architectures to perform signal processing at 300-400 megaflops per second; more use of radargrammetry and stereoradar extraction on analytical stereoplotters; and the development of radar image simulators to prepare for future SAR missions.

Working Group II/6 "Integrated Photogrammetric Systems"

Chairman: Dr. Branko Makarovic, International Institute for Aerial Survey and Earth Sciences, The Netherlands
Co-chairman: Dr. Mossad Allam, Department of Energy, Mines and Resources, Canada

32 Members

WG II/6 was a new WG formed to promote research and development in the areas of integrated information systems with emphasis on photogrammetric collection and conditioning of geographic based information. Three subgroups were formed on concepts and models, design and development, and existing systems. Six primary topical areas have been addressed: photogrammetric concepts and system models; design and development; existing integrated systems; performance and reliability studies; evaluation; and impact on organizational and technological environment.

Trends in this field include the development of versatile processing stations for multisensor inputs, e.g. combined capability for mono and stereoplotting, orthophoto and editing; integration of photogrammetric instruments into digital mapping systems; development of digital image analysis systems with embedded software; and the use of open architectural designs to permit ready capture of benefits from new technological advancements.

Intercommission I/II Working Group - "Acquisition and Use of Space Photographic Data"

Chairman: Dr. Klaus Szangolies, Scientific Technical Society for Geodesy, Photogrammetry, and Cartography, German Dem. Rep.

IC WG I/II has concentrated its activity on optical-photographic cameras for space and on instruments and techniques for restitution and evaluation of space photography. The WG has been addressing new and existing space cameras; films; and processing equipment; investigating space camera technical parameters; estimating useful information content and volume of various sensors systems; potentials for international test field; and trends for future developments.

Trends observed in this activity include the development and testing of new high resolution metric space cameras (Metric Camera, Large Format Camera, Soviet KFA-1000 Camera) that can offer potential of 1:50,000 worldwide mapping; development of higher resolution films; and the development of systems designed to synthesize topographic and thematic products from a variety of imaging sensors, e.g., multispectral, metric, microwave, etc.

ISPRS Commissions II and VI Newsletter - "Instrumentation for Teaching"

Editor: Dr. Ian Dowman, University College London, United Kingdom

This newsletter activity has been established to address the unique needs of the teaching profession in photogrammetry and remote sensing. These needs include the awareness and

hands-on experience of students to modern technology at a minimal cost. Not all universities can afford to own and maintain the sophistication of image processing and photomeasurement systems available. The availability of low cost instrument systems permit the basic principles to be demonstrated and taught. The Newsletter surveys and reports on worldwide developments and availability of instrument systems from manufacturers on surplus from major organizations. (See fig. 1.) It is published at a minimum of one issue per year and is distributed worldwide with Commission II financing and under joint sponsorship of Commission VI.

Meetings and Conferences

Commission II has organized and participated in many formal meetings at which technical presentations were delivered by WG members. Individual WGs often hold informal meetings during other scheduled conferences and events. In addition, a formal Commission II Officers Meeting has been held annually at which all WG Chairman, Co-chairs and Secretaries participate in discussions on Commission II directions and objectives. A summary of the activities at these meetings follows:

13 March 1985 - Commission II Officers Business Meeting held in Washington, D.C., USA, during the annual ASPRS convention for review WG terms of references, WG membership, and conduct of Commission II business.

14-16 January 1985 - Joint Working Groups II/2, II/2 and II/6 Colloquium and Business Meeting convened in Rockville, Maryland, USA, and sponsored by NOAA/National Ocean Service. The meeting was highlighted by the delivery of nine technical presentations and a tour of the photogrammetric facilities at the National Ocean Service.

17 March 1986 - Commission II Officers Business Meeting held in Washington, D.C., USA, during the annual ASPRS convention with reports on WG activities and final coordination and preparation of for the Commission II mid-Congress Symposium.

26-30 May 1986 Commission II Symposium - Photogrammetric and Remote Sensing Systems for Data Processing and Analysis was a week-long activity in Baltimore, Maryland, USA, that began with WG business meetings. A total of 80 formal presentations were made to an audience of 150 registered attendees. A modest commercial exhibition of instruments and systems was conducted by 12 companies and agencies from Tuesday through Thursday. Social activities included an outstanding reception in the National Aquarium, a dinner cruise and an organ recital. At the opening reception, Past President Commission II, Dr. Z. Jaksic, was presented the Key to the City of Baltimore, and Prof. G. Togliatti represented ISPRS Council in receiving the Proclamation of "ISPRS Week" by the City of Baltimore. A

program for accompanying persons was also prepared. In total, 190 individuals participated as attendees, exhibitors, and committee members. The technical program by each of the seven WGs was preceded by a tutorial on the WG's technical domain. The 90-minute sessions included five to six technical papers which, in retrospect, severely limited technical discussions. The two Manufacturers' Forums, for photogrammetry and remote sensing instrumentation respectively, were quite satisfactory. The joint panel discussions were successful and generated significant audience participation. The week concluded with Friday afternoon WG business meetings to prepare for future activities. The proceedings were published (627 pp.) and are available from ASPRS. (See fig. 2.)

31 March 1987 - Commission II Officers Business Meeting
held in Baltimore, Maryland, USA, during the annual ASPRS Convention. Reviewed deliberations from ISPRS Council meetings with Commission Presidents at Edinburgh, Scotland; reviewed WG activities; completed revision of Commission II Terms of Reference; and made initial plans for Kyoto Congress.

31 March-1 April 1987 - Joint WG II/3 and II/4 Technical Sessions
conducted under auspices of ASPRS/ACSM Auto/Carto convention was organized by R. Koffler, Chairman WG II/4 and M. Strome, Chairman WG II/3. Highlighted by 10 technical presentations on topics of artificial intelligence and expert systems for remote sensing systems and standards for processing remotely sensed data, the sessions concluded with a joint WG II/3 and II/4 business meeting.

2-4 June 1987 - Intercommission Conference on Fast Processing of Photogrammetric Data
held at Interlaken, Switzerland, and sponsored by the Institute of Geodesy and Photogrammetry, ETH Zurich. This three Commission conference was jointly organized by Prof. Dr. A. Gruen and WG's II/2, III/2, and V/6 and was highlighted by 31 technical presentations and one panel discussion. The proceedings are published (437 pp.) and are available from ETH. (See fig. 2.)

9-12 June 1987 - Systems and Instrumentation for Synthetic Aperture Radar Processing
conducted by WG II/5 at Ecole Nationale Superieure Des Techniques Industrielles et Des Mines D'Ales (ENSIMA) was organized by Dr. J.P. Guignard, Co-chairman of WG II/5 and was highlighted by seven invited technical presentations and discussions focussed on SAR product simulation, SAR precision processing and SAR geocoding. The Ales Meeting concluded with discussion of the proposed SAR tutorial book and WG business.

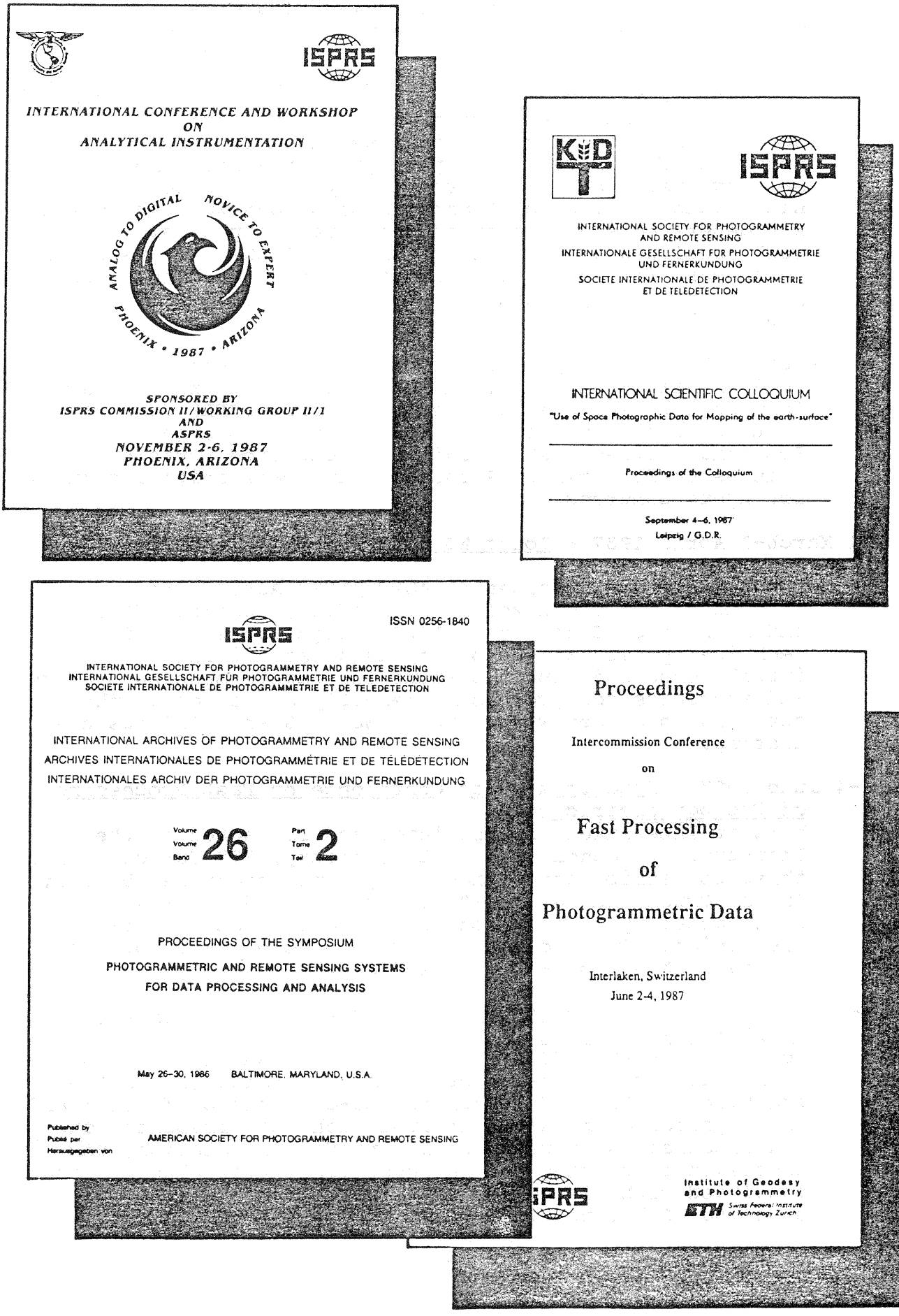
ISPRS
INTERNATIONAL CONFERENCE AND WORKSHOP
ON
ANALYTICAL INSTRUMENTATION
ANALOG TO DIGITAL
NOVICE TO EXPERT
PHOENIX • 1987 • ARIZONA
SPONSORED BY
ISPRS COMMISSION II/WORKING GROUP II/1
AND
ASPRS
NOVEMBER 2-6, 1987
PHOENIX, ARIZONA
USA
KD T
ISPRS
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY
AND REMOTE SENSING
INTERNATIONALE GESELLSCHAFT FÜR PHOTOGRAMMETRIE
UND FERNERKUNDUNG
SOCIETE INTERNATIONALE DE PHOTOGRAMMETRIE
ET DE TELEDETECTION
INTERNATIONAL SCIENTIFIC COLLOQUIUM
"Use of Space Photographic Data for Mapping of the earth-surface"
Proceedings of the Colloquium
September 4–6, 1987
Leipzig / G.D.R.
ISPRS
ISSN 0256-1840
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING
INTERNATIONAL GESELLSCHAFT FÜR PHOTOGRAMMETRIE UND FERNERKUNDUNG
SOCIETE INTERNATIONALE DE PHOTOGRAMMETRIE ET DE TELEDETECTION
INTERNATIONAL ARCHIVES OF PHOTOGRAMMETRY AND REMOTE SENSING
ARCHIVES INTERNATIONALES DE PHOTOGRAMMÉTRIE ET DE TÉLÉDÉTECTION
INTERNATIONALES ARCHIV DER PHOTOGRAMMETRIE UND FERNERKUNDUNG
Volume 26
Part 2
PROCEEDINGS OF THE SYMPOSIUM
PHOTOGRAMMETRIC AND REMOTE SENSING SYSTEMS
FOR DATA PROCESSING AND ANALYSIS
May 26–30, 1986 BALTIMORE, MARYLAND, U.S.A.
Published by
AMERICAN SOCIETY FOR PHOTOGRAMMETRY AND REMOTE SENSING
Proceedings
Intercommission Conference
on
Fast Processing
of
Photogrammetric Data
Interlaken, Switzerland
June 2-4, 1987
ISPRS
Institute of Geodesy
and Photogrammetry
ETH Swiss Federal Institute of Technology Zurich

Figure 2

4-6 September 1987 - International Scientific Colloquium - Use of Space Photographic Data for mapping of the Earth Surface
was held in Leipzig, German Democratic Republic, and organized by Prof. Dr. K. Szangolies, Chairman of Intercommission WG I/II. This "Space Photography" meeting was sponsored by WTG GPK of the Chamber of Technology, German Dem. Rep., with the assistance of Kombinat VEB Carl Zeiss JENA and was highlighted by over 30 technical presentations and the Zeiss Jena exhibition at the Leipzig Fair. The proceedings were published (226 pp.) and are available from Chamber of Technology WTG GPK. (See fig. 2.)

21-23 September 1987 - Joint Colloquium of Working Groups II/1, II/2, and II/6
was held at University College London, United Kingdom, and organized by Dr. Ian Dowman. The meeting was highlighted by 19 technical presentations and a visit to the photogrammetric and remote sensing laboratories at University College London. A business meeting was held to coordinate WG activities for the Kyoto Congress.

2-6 November 1987 - International Conference and Workshop on Analytical Instrumentation
was held in Phoenix, Arizona, USA, and sponsored by WG II/1 and ASPRS. Deborah Johnson, member of WG II/1, was Director of this conference. It was highlighted by eight tutorials by noted experts, 24 technical presentations, a panel discussion and hands-on workshops by eight manufacturers. The proceedings were published (447 pp.) and are available from ASPRS. (See fig. 2.)

2 December 1987 - Joint Working group II/3, II/4, and II/5 Officers Business Meeting
was conducted in Beltsville, Maryland, USA, to review WG activities and to coordinate WG activities for the Kyoto Congress.

15 March 1988 - Commission II Officers Business Meeting
held in St. Louis, Missouri, USA, during the annual ASPRS convention for final review of the technical and business program for the XVI Congress. Draft resolutions and future directions for the Commission II were discussed.

Commission II - Future Work

The future of Commission II has been discussed by its current officers and is expressed in a series of draft resolutions prepared for discussion and acceptance at the 1988 XVI ISPRS Congress in Kyoto. A summary of some of the recommendations contained in draft resolutions are as follows:

- That WG II/1 on "Analytical Instruments" be continued for the 1988-92 term to address expansion of the reports on standardization and testing and to survey the users and

manufacturers for future report needs.

- That WG II/2 on "Photogrammetric Digital Image Processing Systems" be continued for the 1988-92 term as progress in this area is rapid and substantial and the need for developing, evaluating and reporting on the subject is increasing.

- That WG II/3 on "Systems for Analysis of remotely Sensed Data" be continued for the 1988-92 term to address data transfer and data description standards for space-based remote sensing systems in close liaison with other international remote sensing and standards organizations such as the Committee on Earth Observation Satellites and the Consultative Committee for Space Data Systems.

- That WG II/4 on "Systems for Reception, Recording, Preprocessing, Archiving and Dissemination of Remotely Sensed Data" be continued for the 1988-92 term to address and analyze emerging technologies for handling large volumes of satellite data.

- That WG II/5 on "Systems and Instrumentation for Synthetic Aperture Radar Processing" be continued for the 1988-92 term as rapid advancements in SAR preprocessing have occurred that require emphasis on precision product development and dissemination and on optimal extraction of information. In addition, close cooperation with other WGs involved in multisensor approaches should be maintained.

- That WG II/6 on "Integrated Photogrammetric Systems" be continued for the 1988-92 term to address the growing need for further research and development in the area of integration of photogrammetric systems into broader geo-information systems.

- That the efforts initiated by Intercommission I/II on "Acquisition and Use of Space Photographic Data for Mapping" be continued for application of space photography to map production and revision especially using ground test field for comparison tests and by further coordination with Commission IV.

- That the need for practical experience and for inexpensive equipment for training purposes continues and the newsletter on "Instrumentation for Teaching" be continued as a means for spreading information concerning new developments.

- That efforts be initiated to foster joint collaborative activities with WGs of other international societies on topics of mutual interest, since many other international organizations are also addressing issues and technologies on "Systems for Processing and Analysis of Photogrammetric and Remote Sensing Data."

Acknowledgements

Commission II activities have flourished during the 1984-88 period. Although some goals and objectives, such as the tutorial book on Synthetic Aperture Radar, were not completed as originally planned, the overall contributions by the WG Officers and members were significant. As summarized above, many contributions in the form of evaluation and testing manuals, manufacturer guides, survey questionnaires and reports, conference proceedings, technical symposia, informal meetings and colloquia, individual WG newsletters and the newsletter "Instrumentation for Teaching" have been successfully prepared. I sincerely appreciate the contributions of those many individuals and organizations responsible for these successes.

References

International Archives of Photogrammetry and Remote Sensing, ISPRS Rio de Janeiro, 1984, published by the Committee of the XVth International Congress of Photogrammetry and Remote Sensing, 87-89.

The Random House Dictionary of the English Language, The Unabridged Edition, 1974.