TWELFTH CONGRESS OF THE
INTERNATIONAL SOCIETY FOR PHOTOGRAMMETRY
OTTAWA, CANADA

National Report for U.S.A.

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THIS NATIONAL REPORT of the American Society of Photogrammetry is for the period since the 1968 Eleventh Congress of the International Society for Photogrammetry at Lausanne, Switzerland, to the Twelfth International Congress at Ottawa, Canada. It is our endeavor to give an account of the Society's activities toward fulfilling the

AIMS OF THE SOCIETY

The objective and business of the Society is to advance knowledge in the art and science of photogrammetry; to provide means for the dissemination of new knowledge and information; to encourage the free exchange of ideas and communication among those contributing to the advance of photogrammetry to stimulate student interest in photogrammetry; to exert its efforts toward the improvement of standards; to uphold high ethical principles; and to extend and encourage the use of photogrammetry in related fields.

The Society's definition of photogrammetry is: Photogrammetry is the art, science and technology of obtaining reliable information about physical objects and their environment through the processes of recording, measuring and interpreting photographic images and patterns of radiant energy.

THE SOCIETY

Figure 1 shows the new organizational structure of the American Society of Photogrammetry. Each region and each division is represented by one elected director. Only the President and the First and Second Vice Presidents are elected by the membership at large.

Besides the national headquarters, in Falls Church, Virginia, the Society is divided into 17 regions (Figure 2). A small percent of the annual dues of each member goes to support the region in which he resides. Within some of the regions there are local chapters which in turn are supported by the region in which they are located.

The accompanying graphs (Figures 3, 4, 5, and 6) show the membership of the Society for the period of this report.

The Society disseminates scientific photogrammetric information through meetings and publications. It publishes, monthly, *Photogrammetric Engineering*. This journal also contains the Society's *Newsletter*, which gives the members current news of the regions, the members, new and interesting projects, and other photogrammetric notes of interest. In addition to the distribution to each member, Figure 7 shows subscriptions to the Journal.

The Society has published, since its founding, numerous basic manuals of the science of photogrammetry. During the past four years three such manuals have been available (Figure 8). (Table 1)

In addition, the Society, through local and national meetings, disseminates knowledge of the science of photogrammetry as rapidly and effectively as possible. Since the Lausanne Congress the American Society of Photogrammetry has sponsored or cosponsored the following meetings, symposiums, and workshops. Without exception all have been well received and supported.

1968 Sept. 29–Oct. 3. ASP-ACSM Semi-Annual Convention, San Antonio, Texas. Proceedings published.

1969 January. Computational Photogrammetry Seminar, Syracuse, N. Y. Cosponsored with Syracuse University. 40 papers published in proceedings.

February. Sponsored "Earth Observations from Balloons" Symposium, Washington, D. C. 14 papers published in proceedings.

March 9–14. 35th ASP–ACSM Annual Meeting, Washington, D. C. 35 papers published in proceedings.★

June. "New Horizons in Color Aerial Photography," New York, N. Y. Cosponsored with Society of Photographic Scientists & Engineers. 37 papers published in proceedings.

September 23–26. ASP-ACSM Fall Convention, Portland, Ore. 39 papers published in proceedings.*★

October. Cooperated "Remote Sensing Symposium" at University of Michigan, Ann Arbor.

November. Cosponsored "Symposium on Photogrammetry, Lasers and Holograms," Oakland University, Rochester, Mich.

December. Cooperated with Alaska Dept. of Economic Development in "Seminar on Remote Sensing," Alaska.

1970 January. Sponsored Symposium on Computational Photogrammetry, Alexandria, Va. 32 papers published in proceedings.

March 1–6. 36th ASP-ACSM Annual

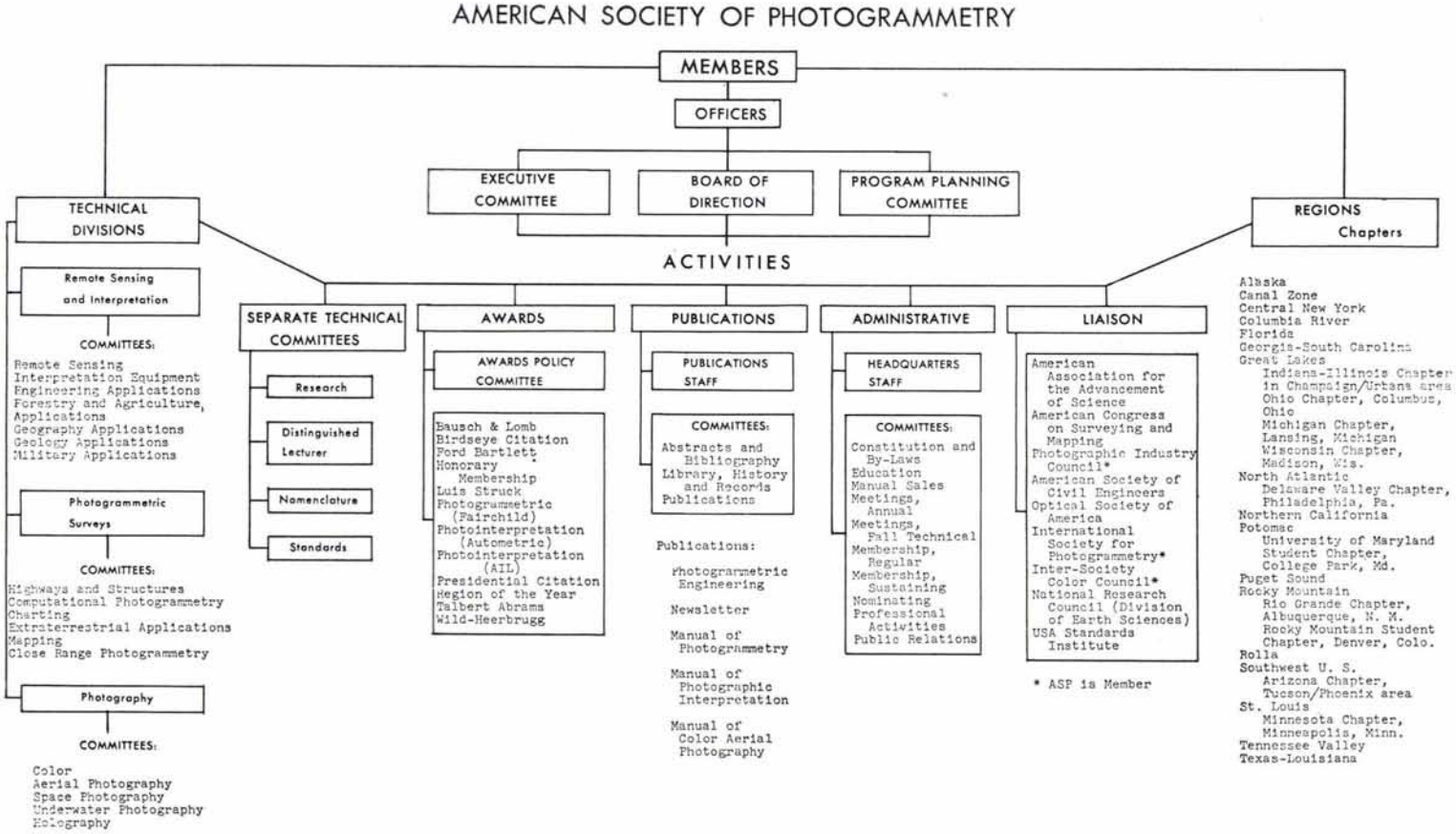

FIG. 1. The organizational structure of the American Society of Photogrammetry.

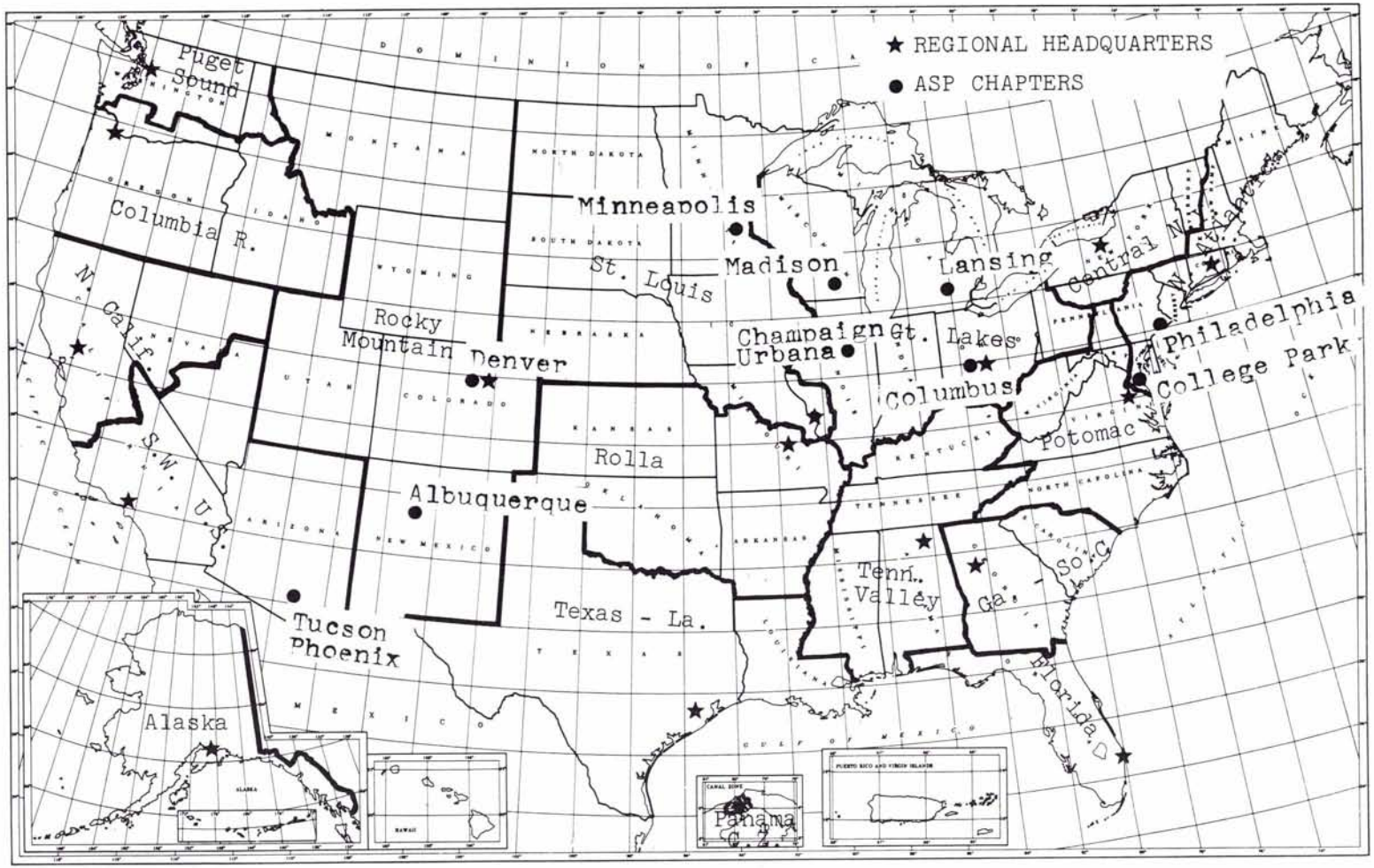

FIG. 2. The geographical distribution of the Regional organizations of the American Society of Photogrammetry.

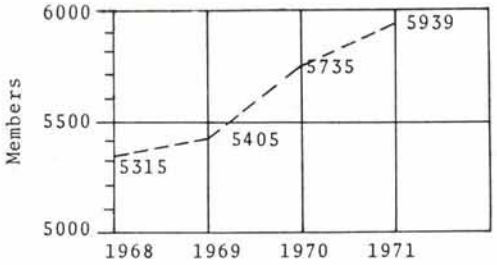

FIG. 3. The total membership of the American Society of Photogrammetry.

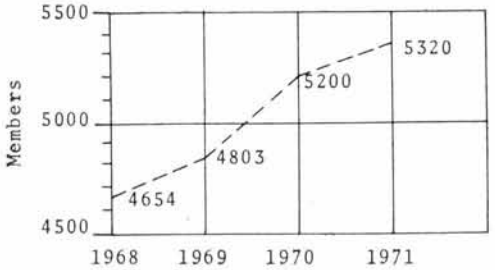

FIG. 4. The Corporate (ordinary) Members of the American Society of Photogrammetry.

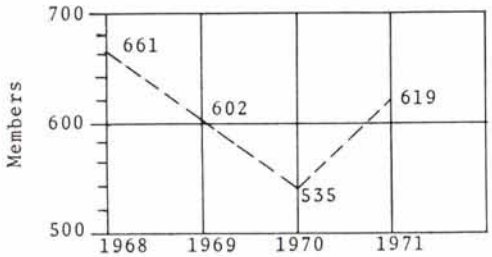

FIG. 5. The Student Members of the American Society of Photogrammetry.

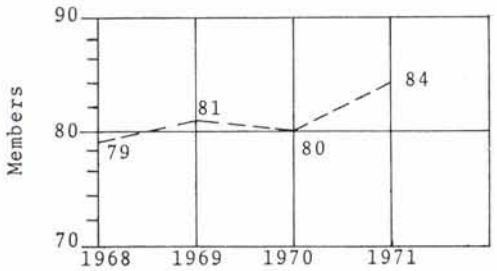

FIG. 6. The Sustaining Members of the American Society of Photogrammetry. These ordinarily are firms and companies whose membership dues are $3.00 per year.

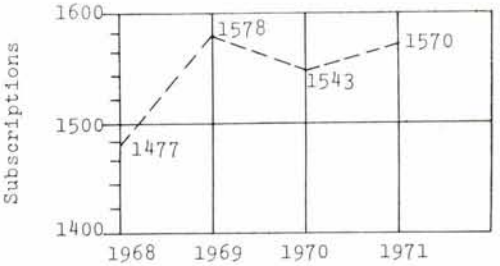

FIG. 7. Subscriptions to *Photogrammetric Engineering*, such as libraries, in addition to Corporate and Student Members.

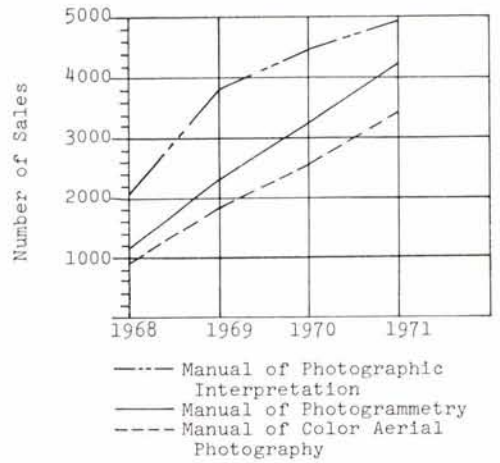

FIG. 8. Cumulative sales of publications.

TABLE 1. PRICES OF THE MANUALS OF THE SOCIETY

	Prices		
	Member	*Non-Member*	*Bookstore*
Manual of Photographic Interpretation	$12.00	15.00	9.00
Third Edition—*Manual of Photogrammetry*	19.00	22.50	13.50
Manual of Color Aerial Photography	21.00	24.50	14.70

Meeting, Washington, D. C. 72 papers published in proceedings.*★

May. Cosponsored ISP Commission I Photography & Navigation Symposium, Ohio State University, Columbus, Ohio. Proceedings published.*

June. "Symposium on Applications of Reconnaissance Technology to Monitoring and Planning Environmental Change," cosponsored with USAF Rome Air Development Center and Rome Reconnaissance Association. Griffiss AFB, Rome, N. Y.

Oct. 7–10. ASP-ACSM Technical Conference, Denver, Colo. 34 papers published in proceedings.*

1971 January. Seminar on Close-Range Photogrammetry, University of Illinois, Urbana, Ill., cosponsored. 33 papers published in proceedings.*

January. Cosponsored with American Congress on Surveying and Mapping Orthophotography Workshop, Washington, D. C. 22 papers published in proceedings.*

March 7–10. 37th ASP-ACSM Annual Meeting, Washington, D. C. 70 papers published in proceedings.*★

March. Cosponsored Third Biennial Workshop on Color Aerial Photography in the Plant Sciences, Gainesville, Fla.—Fla. Dept. of Agriculture, U. S. Dept. of Agriculture Research Service, University of Florida.

May. Sponsored "Space Photography and the Environment" seminar, Stephen F. Austin State University, Nacogdoches, Texas.

May. Cosponsored seminar "Quantitative Imagery in the Bio-Medical Sciences," Houston, Texas—Baylor College of Medicine, Biological Photographic Assoc., Optical Society of North America (Gulf Coast Region).

Sept. 7–11. ASP-ACSM Fall Convention, San Francisco, Calif. 47 papers published in proceedings.★

September. Symposium on Computational Photogrammetry, San Francisco, Calif., held during 1971 ASP-ACSM Fall Convention.

October. Symposium on Photogrammetric Surveys and Mapping, cooperated with and held at University of Missouri, Rolla, Mo.

1972 Feb. 1–4. Seminar on Operational Remote Sensing, Houston, Tex. Proceedings published.*

March 12–17. 38th ASP-ACSM Annual Meeting, Washington, D. C.★

The ASP Distinguished Lecture Series was continued throughout the period of this report. It was supported each year by the National Science Foundation.

1968—Four lecturers visited 12 locations and made a total of 19 lectures.

1969—Seven lecturers visited 18 locations and delivered 28 lectures.

1970—Seven lecturers participated and delivered 25 lectures.

1971—Five lecturers participated and delivered 25 lectures.

The program did not vary in scope too much from year to year. The total attendance each year varied from 1500 to 2000.

Awards

Two changes were made during this period in the annual awards. The FMA, The Photographic Interpretation Award, is now the AIL, Information Systems Award; the change is in name only.

In 1970 Wild Heerbrugg doubled the amount of The Wild Heerbrugg Photogrammetric Fellowship Award to $3,000.

All other awards were continued as in the past.

Significant Photogrammetric Developments

Among the most significant developments in remote sensing since the Lausanne Congress in 1968 have been the development of commercial services utilizing high-resolution line-scanners and both coherent and "brute force" radar systems. These developments have extended our aerial inventory capabilities into portions of the electromagnetic spectrum not previously available outside of military auspices. The concurrent and continuing development of multispectral scanners, multi-frequency radars, and computer systems to handle the high data rates of these new sensing systems is providing powerful tools to help meet the escalating needs for better, more timely information in both economic development and environmental protection.

The dramatic results obtainable with the newer remote systems largely overshadow the steady improvement in results obtainable with camera systems. Multispectral techniques based upon the steadily growing knowledge of spectral signatures of terrain features have been important here, as with the scanning and radar sensors. Better interpretation equipment designed to maximize the strengths of both electronic computers and human interpreters is appearing on the market in response to the higher processing demands associated with multispectral data.

Among the accomplishments of the new equipment and techniques have been improved multistage resource inventory designs; previsual detection of some plant dis-

* Copies of proceedings still available.
★ Especially significant conventions.

eases; automated mapping of vegetation communities; thermal detection and inventory of populations of large mammals; mapping and monitoring of tides, currents, and temperature profiles in water bodies and the effect of natural and manmade discharges on these phenomena; detection, identification, and mapping of water pollutants in inland and oceanic waters; monitoring the dispersal of smoke plumes from industrial areas; detection of incipient earth subsidence; and determination of differences in chemical composition of exposed rock and soil surfaces. The use of infrared scanning systems for detection and mapping of forest fires has become an operational reality, and the all-weather capabilities of radar systems has permitted acquisition of cartographic data in tropical areas where nearly permanent cloud cover virtually precludes aerial photography and conventional photogrammetric mapping.

The impending launch of the first of the Earth Resources Technology Satellites (ERTS) is a direct result of the successful earth resources reconnaissance experiments completed from the Apollo series of manned satellites. While the ERTS launches represent a tremendous technical development, the real proof of their utility will not be available until after their data has been put to use. These results are expected to be a major subject of the report for the 1972–76 period.

Since the last Congress, manufacturing companies and U. S. Government installations have made great strides in improving the automatic instrumentation for the production of orthophotomaps. The improvement of orthophoto equipment has increased the metric accuracy and the production rate of making orthophotomaps. Many organizations and mapping companies have made experimental orthophotomaps and charts for various disciplines. Through these efforts a user demand has developed.

Experimental $7\frac{1}{2}$-minute orthophotoquads at a 1:24,000 scale and 15-minute orthophotoquads at a scale of 1:50,000 scale were produced from high-altitude photography taken at approximately 21,340 meters above sea level. Orthophotomaps are now being used for land planning, tax mapping, forestry, geology, hydrology, nautical and aeronautical charting, housing and urban development in many of our larger cities, etc.

The first orthophoto workshop or seminar held in the United States was cosponsored by the Potomac Region of the Society. It was very successful. This new photogrammetric technique will no doubt have the Society's further support at other workshops or seminars to keep its members current on improvements, such as the vertical profiling of scanned stereomodels, the use of color infrared photography, and the development of a set of standards for orthophotomapping.

A number of new techniques have been developed, using both color films and color coding instrumentation for both the metric and photo-interpretive fields in photogrammetry.

The color-orthophoto map has been developed to the point where it is now practical to mass-produce finished maps through this technique.

Multi-spectral cameras have been developed to such an extent that data are now gathered routinely, thanks to greater accuracy and dependability.

New color films have been made available for both the color negative and color positive systems, with finer grain emulsions, giving higher resolution characteristics, along with new chemistries for faster processing of the materials. But there is still a lack of hard-copy material for color prints although research is being conducted and some of the new sample materials show great promise.

Color density-slicing for enhancement purposes of very minute tonal changes, although still in the development stage, can now be produced in laboratories with minimal equipment. These materials will greatly facilitate the interpretation of water pollution problems in the near future.

At present experimental work is being conducted with laser color recorders, as well as color-coded thermal infrared imagery devices which should become practical working tools within the next 12 to 18 months.

As photogrammetric instruments become more sophisticated, and consequently capable of resolving and analyzing smaller bits of information, the requirements to reach ever higher altitudes become more pressing. The arrival of jet aircraft was a gigantic step in this direction, but unfortunately the cost of early jets, added to the high costs of installing sensing equipment in their pressurized cabins, made them uneconomical for use by private enterprise. The adaptation of the small business jet airplane for high-altitude photography and sensing by one of our leading commercial aerial survey companies has resolved this requirement of higher altitude fixed wing sensoring.

Two major developments in under-water photography have been reported. A new high energy strobe light system named LIBEC has completed preliminary tests. This unit is a

8,750 watt-seconds strobe light which is powered by cable from the surface, and is used for wide-angle bottom photographic surveys. The configuration uses a 90° field of view lens with a camera being placed beneath the strobe light. The strobe has adequate power or light output to allow broad photographic coverage of the bottom. Because of the wide-angle coverage and the severe attenuation of the light at the corners, a special reflector was developed to direct a large portion of the light to the corners and edges of the field of view to provide uniform bottom illumination. This development is particularly significant in that it is now possible to get photographic coverage of areas far in excess of anything accomplished to date.

The second item of interest affecting underwater lighting was the announcement of a low-light level underwater television camera. These cameras are essentially identical with current models, except they are using silicon diode vidicon tubes which have greatly increased sensitivity and require considerable less light.

One of the larger, if not the largest, photogrammetric-geodetic programs, the World Passive Geometric Satellite Triangulation Program, completed field observations in September 1970 and completed the measuring of over 2,500 star and satellite photographic plates in April of 1972. Computations and analysis are expected to be completed by the end of July 1972. There are 45 stations in this world network that connects all the continents and most of the major islands on a single datum. It is scaled by five scale lines measured on four continents. They were measured to accuracies of 1:500,000 to 1:1,000,000. The total program entailed the cooperation and assistance of 31 nations. The latitude and longitude of the stations will have an accuracy of ± 3 to ± 4 meters; and an accuracy of better than ± 5 meters *RMS* in all three position components.

Another large and important program, The Earth Resources Technology Satellite Program, is scheduled to be launched during 1972. The satellites carrying photographic and remote-sensing equipment will eventually return about 50,000 images (RBV photographs) per year of a wide variety of land and water features of the United States. Repetitive images of such features will be used to improve knowledge of our natural resources. All of the data from this equipment, some of which is in the development stages, must pass ground-truth tests to make certain the data so collected meets the requirements of those who have the need to know. Tests are now under way from these various sensors aboard high-altitude fixed-wing jet planes.

A data center is being built near Sioux Falls, South Dakota, as a key installation in the handling of data obtained from aircraft and spacecraft for resources and environmental surveys. The center will be a central repository where the data will be received, processed, and filed for use by resource, and environmental scientists throughout the world. The facilities of the center will be available to provide professional and instrumental assistance to users of the data.

International Archives

The *International Archives of Photogrammetry*. Series XVII, Volumes 1 to 10 (which constitute the proceedings of the Eleventh International Congress of Photogrammetry in Lausanne in 1968) may now be ordered. Briefly, the Contents are: Vol. 1: Congress Affairs. Vol. 2: National Reports and Commission Reports. Vol. 3 and 4: "Invited" Papers. Vol. 5–10: "Presented" Papers.

Edition A: Vol. 1–4, 190 Swiss Francs plus 10 Francs postage. Edition B: Vol. 1–10, 440 Swiss Francs plus postage.

Send orders to: Institute de Photogrammetrie EPFL, 33 Avenue de Cour, CH-1007 Lausanne, Switzerland. Payment may be made to: Société de Banque Suisse for account Nr. 255172, Photogrammétrie, pl St. François, CH-1001 Lausanne, Switzerland.