it has also an excellent collection of encyclopedias, dictionaries and directories.

Computer Centre :

In view of the important role which digital computation has come to play in outstanding academic institutions, a Computer Centre was established in the summer of 1963 with the installation of an IBM-1620 system. The Kanpur Institute is the first among the Indian Institutes of Technology to acquire a high speed digital computer for educational and research purposes. Short duration courses are given by the Computer Centre to enable a person to learn computer language and to acquire proficiency in its use. The activities of the digital computation was extended far beyond the boundaries of this Institute. Alongwith the academic programmes for students at IIT, Kanpur, a regular series of short intensive courses in computation and courses in systems programming have been offered and participants from institutions all over India have taken part.

The Computer Centre cooperates in offering the Technical Arts courses to all engineering undergraduate students in their third year. The syllabus covers the entire spectrum of computation ranging from slide-rule, desk-calculators, analogue and digital computer programming and Numerical methods. The most valuable part of this course is a three-hour laboratory session each week for a group of 25 students supervised by two instructors. The computer is completely at the disposal of the laboratory group during the lab sessions.

In addition to technical arts course for third year students and the course on numerical methods for fourth year students, courses on analogue and digital Computation technology and pulse and digital circuits are offered to the 5th year students. The elective course in numerical methods to the fourth year and fifth year students is under consideration.

Seven intensive courses in computer programming have been given to approximately 600 persons from over 50 different institutions and government organizations. This course extended over 10 days with three hours of each day devoted to lectures in Fortran programming, numerical analysis, and machine logic.

In addition, the Centre organized two six-week courses on SPS programming and a three-week course on systems programming during 1964-65. A two-day Symposium of High Speed Computation Methods and Machinery was held in conjunction with the Ninth Congress of Theoretical and Applied Mechanics. There were 225 attendees including delegates from Australia, Holland, Japan, Mexico, U.K. and U.S.

Staff of the Computer Centre :

Dr. H. K. Kesavan, Head and Prof. of Electrical Engineering.
Dr. V. Rajaraman, Associate Head, Asstt. Prof. of Electrical Engineering.
Dr. H. N. Mahabala, Assistant Prof. Electrical Engineering.
Dr. V. K. Stokes, Asstt. Prof. Mechanical Engineering.
Mr. R. N. Basu, Senior Technical Assistant.
Mr. A. N. Taneja, Senior Technical Assistant (till 30-9-65)
Mr. S. Kapoor, Junior Technical Assistant.
Mr. S. G. Ravi Kumar, Junior Technical Assistant.
Mr. K. Natarajan, Junior Technical Assistant.
Mr. G. K. Gupta, Junior Technical Assistant (till 15-8-65).
Mr. G. C. Mazumdar, Junior Technical Assistant (till 28-7-65).
Mr. H. K. Nathani, Junior Stenographer.
Mr. M. N. Misra, Key Punch Operator.
Mr. R. N. Pandey, Laboratory Attendant.
Mr. Bodhraj Mehta, Mech. ' B ' (Air Conditioning).
Mr. Rajeshwari Prasad, Attendant.

Visiting Personnel :

Mr. Giovanni Wiederhold, Head of Programming, Computer Centre, University of California, Berkeley (till 2-10-65).

Mr. Irving N. Rabinowitz, Assoc. Director, Computer Centre, Princeton University, New Jersey (till November, 1964).

Dr. Forman S. Acton, Assoc. Professor Electrical Engineering Princeton University, New Jersey (till August, 1964).

The digital computer has already come to be regarded as an essential tool in scientific and engineering research work. The Computer Centre has, from its very inception, catered to the needs of a wide spectrum of users ranging from 1st year engineering students to senior scientific and engineering personnel and faculty from IIT and outside instiutions.

IIT faculty and graduate students have made steady use of the computer in many different research areas which are active on campus. Many of these users have received training and used computers in other countries while others were trained in the various special courses given for outside personnel, as well as, the occasional short courses given especially to introduce new faculty and graduate students to digital computation.

A first step towards the application of computers to data processing problem arising in the routine paper-work operations of the IIT was taken with the preparation of programmes to process and prepare grade

reports. Not only jobs can be done with greater speed and accuracy in this manner, but also it is possible to do a far more efficient job.

List of participants of Advanced Computer Seminar

Dr. Forman S. Acton
Princeton University
Princeton, New Jersey

Dr. Robert R. Archer
Case Institute of Technology
Cleveland,Ohio
at IIT Kanpur

Dr. S. Barton
Control Data Corporation
Canberra, Australia

Dr. S. Beltran
Centro de Calulo
Cuidad Universitaria
Mexico

Dr. J. Bennett
School of Physics
University of Sydney
Sydney, Australia

Dr. L. Carter
System Development Corporation
Santa Monica, California

Dr. David C. Evans
Computer Centre
University of California
Berkeley, California

Dr. Bruce Gilchrist
Service Bureau Corporation
New York, New York

Dr. Harry D. Huskey
University of California
Berkeley, California

Dr. S. Moriguiti
University of Tokyo,
Tokyo, Japan

Dr. C. Perry
Computer Centre
University of California
San Diego, California

Dr. A. Van Wijngaarden
Mathematisch Centrum
Amsterdam, Holland

Dr. M. Wilkes
University Math Laboratory
Cambridge, England

Mr. Gio Wiederhold
University of California
at IIT, Kanpur

List of the Institutions and Organizations represented in short intensive courses :

1. Agro-Economic Research Centre, Kaira District
2. Allahabad University, Allahabad
3. University of Madras, Madras
4. M. S. University of Baroda, Baroda
5. Punjab University, Chandigarh
6. Jadavpur University, Calcutta
7. Osmania University, Hyderabad
8. Marathwada University, Aurangabad

9. Banaras Hindu University, Varanasi
10. Ford Foundation, New Delhi
11. All India Institute of Medical Sciences, New Delhi
12. Planning Commission, New Delhi
13. Central Statistical Organization (Planning Commission), New Delhi
14. Institute of Agricultural Research Statistics, New Delhi
15. National Council of Applied Economic Research, New Delhi
16. Economic Intelligence and Statistics, Government of U.P., Lucknow
17. Centre for International Studies, MIT, New Delhi
18. Indian Institute of Management, Calcutta
19. Central Water and Power Commission, New Delhi
20. Army Statistical Organization, Ministry of Defence, New Delhi
21. Indian Institute of Science, Bangalore
22. Central Salt and Marine Chemical Research Institute, Bhavanagar
23. Indian Institute of Technology, Bombay
24. University of Bombay, Bombay
25. Commissioners for the Port of Calcutta, Calcutta
26. Indian Statistical Institute, Calcutta
27. Posts and Telegraphs Directorate, New Delhi
28. Irrigation Department, Yamuna Bhawan, Dehra Dun
29. Directorate of Economics and Statistics, Ministry of Food and Agriculture
30. Bengal Engineering College, Howrah
31. Registrar General, Government of India, New Delhi
32. Central Road Research Institute, New Delhi
33. Central Design Directorate, Irrigation Department, Lucknow
34. Irrigation Department, Ramganga Project, Moradabad
35. Central Water and Power Research Station, Poona
36. Central Building Research Institute, Roorkee
37. Central Potato Research Institute, Simla
38. National Aeronautical Laboratory, Bangalore
39. Indian Institute of Technology, Delhi
40. Psychological Foundations, New Delhi
41. Bhakra and Beas Organization, New Delhi
42. Indian National Scientific Documentation Centre, New Delhi
43. Central Mechanical Engineering Research Institute, Durgapur
44. Survey of India, Dehra Dun
45. Malviya Regional Engineering College, Jaipur
46. Regional Engineering College, Srinagar
47. Kodaikanal Observatory, Kodaikanal

48. Saha Institute of Nuclear Physics, Calcutta
49. Joint Cipher Bureau, New Delhi
50. Defence Research Laboratory, Bangalore
51. National Physical Laboratory, Delhi
52. Birla Engineering College, Pilani
53. Tata Power Co. Ltd., Bombay
54. National Chemical Laboratory, Poona
55. Kurukshetra University, Kurukshetra
56. Central Public Health Research Institute, Nagpur
57. U. P. State Observatory, Nainital
58. Aligarh Muslim University, Aligarh
59. Indian Central Jute Committee, Calcutta
60. DCM Chemical Works, New Delhi
61. Oil and Natural Gas Commission, Dehra Dun
62. Tata Iron and Steel Co. Ltd., Jamshedpur
63. Defence Research Laboratory (Material), Kanpur
64. Lucknow University, Lucknow
65. Institute of Tropical Meteorology, Poona
66. University of Patna, Patna

List of the Institutions and Government Organizations who sent their representatives for six-week course on programming :

1. Institute of Agricultural Research Statistics, New Delhi
2. Programme Evaluation Organization (Planning Commission), New Delhi.
3. Indian National Scientific Documentation Centre, New Delhi
4. Delhi School of Economics, University of Delhi, Delhi
5. Central Mechanical Engineering Research Institute, Durgapur
6. Indian Institute of Technology, Kharagpur
7. IBM World Trade Corporation, New Delhi
8. Punjab University, Chandigarh
9. College of Engineering, Guindy, Madras

Central Research Laboratory :

The Liquid Helium plant and Liquid Nitrogen plant have been set up in the laboratory and the apparatus for low temperature research is being developed. A Jarrel-Ash 10 mm. grating spectrograph and Cary Spectrophotometer have been put in working condition. The work in Electrical Spectra and Infrared Spectra is in progress. The laboratories for Electron Paramagnetic Resonance and Nuclear Magnetic Resonance have been fully developed. The work on spectra of single crystal and free radicals is in progress.

Glass blowing workshop has been improved by setting up a few glass blowing lathes.

Aeronautical Engineering :

Research undertaken by members of staff or Research Fellows :

(1) *Kartik Modifications:* The flight group had taken in hand the performance testing of an O.S.T.I.V. Standard Class glider designed by Dr. S. Ramamritham, Director, Research and Development, D.G.C.A., New Delhi named the Kartik. Its performance characteristics were flight tested in Delhi by Mr. Olcott and Mr. Nanda. It proved to be so interesting to the Technical Centre, D.G.C.A. that the glider was assigned to the IIT/Kanpur on a loan basis for further test work.

The programme that evolved during which the aerodynamic characteristics of the glider were gradually altered by progressive drag reductions, increased the lift-to-drag ratio (a measure of gliding efficiency) from 22 to about 32 by sealing gaps in the spoilers and modifying the centre section. This glider can be compared with any of the gliders of the world in this class. This can be termed as a commendable beginning for the Flight Test Section of Aeronautical Engineering Department. Since the machine was a single seater, the students could not participate in the collection of data but did share to the fullest extent in its reduction and analysis. They also actively participated in the discussions of alterations or aerodynamic fixes.

(2) *Theoretical Studies on Aerodynamic Loads and Vibrations :*

In furtherance of a long-standing interest in lifting-surface airload prediction, Holt Ashley conducted theoretical studies on two problems; nonlinear influence of thickness on steady and escillatory pressure distributions over supersonic wings, and exact numerical solutions for two and three-dimensional motions of lifting objects in incompressible fluid. Some results were presented and published in Proceedings of Ninth Congress of Theoretical and Applied Mechanics, held in December, 1964.

Chemical Engineering :

A research laboratory for the study of kinetics of fast reactions and detonation wages in explosive gas mixtures was set up under the guidance of Dr. V. Subbarao. One important activity was the measurement of Induction-detonation-distances in high energy fast reactions. Preliminary survey on energy transfer processes were conducted. The adiabatic flame temperatures were computed on the IBM 1620. Thin film thermometry to measure the transient temperatures in