THE IVORY TOWERS

The March Issue of the Science Today speaks volumes of a dedicated effort and massive preparations that have gone into various contributions. For the editors of the Science Today it is a great day to have dragged scholars and the researchers out of their ivory towers and make them talk to the common man in a civilized language. It, certainly, is a milestone in the popularization of a highly technical subject like computers. Surinder Jha has earned our admiration and sincere congratulations.

It is gratifying to note that the entire Publications Committee along with various other experts in and around Bombay have contributed in taking computers to common man. The views expressed under the column “Points to Ponder” are equally enlightening to computerwallas. We expect some similar efforts will be made in the regional languages of India and the Chapters will have to take a lead in this task.

But the ivory towers have not been completely pulled down by this effort. There is a continued material famine for the Newsletter and for the Journal. If we have to carry out the mandate of the National Council of selling the Newsletter and Journal separately and in a packet, channels will have to be established for communication between all levels of intellectuals — nay literate population of our country. It is hoped that the lead given by the Publications Committee will go a long way.
**Technical News**

**LINE PRINTER** (Corc-Computer Related Equipment Limited, Surrey CR0 4RS England)

The company announces the introduction of a new 600 lpm line printer from Data Printer Corporation of U.S.A. which incorporates a unique "Chain Train" subsystem. The new "Chain Train" subsystem has 384 fully formed characters to European OCR B alphanumeric design, arranged in 45 character lines. These lines of 8 characters move end-to-end, attached firmly to a double belt assembly.

On their back, an alignment guide follows a mono-rail track giving extra control that ensures that every character imprint is correctly aligned. Print rate of the new printer is quoted at 300 lines per minute, with a full 132 columns and 64 character set. Variations can give a print rate of 450 lpm with a 36 character set or 700 lpm with a 45 character set.

Print is on standard single-part continuous sprocket fed forms, and the printer interface is fully compatible with PDP 11, PDP 8E, Nova and IBM by stem 3 etc.

**TELEX AND DATA SWITCHING EXCHANGE** (L. M. Ericsson, 12625 Stockholm, Sweden)

This electronic stored program controlled exchange was developed for telex and data switching by ELMETEL, a new company jointly owned by the Swedish Telecommunication Administration and L. M. Ericsson. The control system of the exchange features a new compiler also intended for use in L. M. Ericsson's telephones exchanges. The switching method used is based upon the time division multiplex technique. The first exchange of the new type has been ordered by the Swedish Telecommunications Administration for installation in Malmo and to be put into service in 1977. The Malmo exchange will handle both national and international traffic. The TDM-technique used has made it possible to drastically reduce space and power requirements at the same time as the exchange has a high traffic handling capability. The flexibility of the new computer makes it suitable to control different switching networks for telephony as well as for telex and data traffic. Redundancy is provided for all vital parts of the exchange giving maximum reliability and a large part of the maintenance functions are carried out automatically. The exchange offers subscribers a variety of features such as automatic multi-address calls, abbreviated dialling, keyboard selection, dedicated network and call duration advice.

**SYSTEMS NETWORK ARCHITECTURE** (IBM United Kingdom Ltd, London W11 OAB, UK)

SNA, Systems Network Architecture, provides users with a common design framework embracing an entire teleprocessing network from a System/370 virtual storage computer to the terminal. Versatile, general purpose terminals which conform to this framework are also announced: the IBM 3790 Communication System, the IBM 3770 Data Communication System and the IBM 3677 Communication Terminal. With SNA, programmers can concentrate on the applications themselves. Network management becomes a system responsibility with the power centre controlling the entire system operation through a common line control method. The network itself can be further developed with changes in both number and type of terminals with little or no reprogramming. Under SNA, a wide range of terminal type can share the same communication line and each of these terminals may be working with a different application or group of applications at the same time. For example, a banking system and a general purpose system could use the same teleprocessing line to the central processing unit (CPU) rather than two separate lines. Also, at different times during the day, the same terminal could be used to access different applications in the computer. This can lead to lower line costs and to reduce terminal requirements for a given range of applications.

**CONVENTION Glimpses** (Continued from Feb. Issue)

**RESEARCH AND DEVELOPMENT IN COMPUTER HARDWARE**

**INSTRUMENTATION FOR COMPUTERISED PROCESS CONTROL APPLICATIONS**

V. P. Thakare
Automation Department, Tata Electric Company, Bombay.

This paper presents the instrumentation requirements embracing three phases of process automation namely Data Acquisition and Processing System (DAPPS), Operator Guidance System (OGS) and Direct Digital Control (DDC). The first two phases of automation need translators for analog and digital process variables like pressure, level, flow, temperature, vibrations, eccentricity, expansions, electrical parameters, status indications etc. The third phase will need in addition to above suitable actuators to execute the control commands from the computer. The paper discusses the special features of these instruments necessary for computerised process control applications. Further, the attempt has been made to assess the adequacy of indigenous available instruments. The paper also brings out the necessity of suitable interfaces to make the indigenous instruments compatible for use with on-line digital computers.

**A COMPUTERISED PROCESS CONTROL SCHEME FOR EFFECTIVE INTERACTION**

V. Balakrishnan
Computer Group, ECIL, Hyderabad.

An implementation of computer process control that permits maximum human interaction with the process under control is presented. The control scheme design is inextricably coupled to the design of the Process Operators Console that supports the scheme. The implementation permits extensive on-line experimentation with various control strategies, involving Feedback and Feedforward, Cascade of loops, Ratio Control, and combinations of Proportional, Integral and Derivative algorithms. There is built in provision for model-based optimisation control and the schemes can be adopted for Supervisory control as well as DDC, depending on the application.

Many practical situations have been provided for, like computer shutdown, computer isolation in emergencies, fail-safe operation and isolation against model, programming and operator errors, detection and handling of human over-ride actions, etc. There are facilities for post-analysis of process behaviour.

The scheme is being implemented on TDC-312 computer system for a typical Process Control Application.

**DATA ACQUISITION APPLICATIONS**

Drs. D. S. Rane and Shri B. N. Rayannan
Vikram Sarabhai Space Centre Trivandrum.

The usage of digital computers in Data Acquisition Control and Applications has had a slow progress in our country so far, barring a few stray applications; however, of late the awareness is fast growing in this direction. Various studies have been conducted by the Indian Space Research Organisation Units on data acquisition applications, related to a variety of disciplines like the Static Testing of Rocket Motors, Kinetic Heating Simulation and Flight monitoring of Satellite Launch Vehicles. Some details of these applications and the principal functions encountered in any typical data acquisition system are presented in this paper which can serve as a useful guide to the potential user.

**DESIGN OF PROCESS CONTROL AND REAL TIME SYSTEMS.**

**DESIGN OF DIGITAL COMPUTER CONTROL SYSTEMS FOR NUCLEAR POWER PLANTS**

K. Subramaniam
The first part of this paper deals with the design of digital computer control systems for nuclear power plants having CANUDI pressurized heavy water reactors. Specific considerations that are discussed include control parameters, system Disturbances, Response Time and Accuracy Requirements. The diverse functions performed by control computers are described with emphasis on the Direct Digital Control of Nuclear Power. Application of Modified Control Theory to nuclear power plants is briefly reviewed. Innovations in man-machine subsystems and the simulation testing of Computer Control Systems are also treated.

The second part of this paper describes the design of a computer controlled on power feed handling machine used to refuel CANUDI type nuclear reactors. The prototype control system is designed around the TDC-312 digital computer and is currently under development at B.A.R.C.
COMPUTER SIMULATION FOR RESEARCH AND INDUSTRY

TRANSMISSION DYNAMICS OF MALARIA — A COMPUTER SIMULATION APPROACH TO MEASUREMENT
N. R. Rao, O. P. Vig, S. N. Agarwal, S. S. Sathok and V. N. Rao
Haffine Institute, Bombay 400012

The epidemiological problems of disappearing malaria faced with the danger of reintroduction of sources of infection needs an evaluation technique—an accurate system of measurement, more sensitive and adaptable to the control of disease. Information and ideas have been contributed by several disciplines, including entomologists, parasitologists, epidemiologists, and mathematicians. But no general theory seems to offer the prospect of being adequately tested and so providing some resolution by the useful interpretations. A stochastic model giving the infection rate, the recovery rate and the probability of natural recovery was developed and the course of events expected were analyzed by some of the computer simulation was used to reproduce a number of simulation for the end of malaria transmission with different sets of parameters. The construction of the model and its sources of data were lucidly explained in the paper with appendices of summarised field data and the computer flow chart. The computer simulation has given us the first comprehensive view of what we were likely to encounter with a given set of parameters. Statistical analysis were carried out on data generated by Computer Simulation to make useful interpretations in field applications.

TRACK TIME STUDY BY SIMULATION
S. R. Sahu
EDP Centre, Rourkela Steel Plant, Rourkela

Track time (the time lapse between the complete finishing in pit side of steel melting shop and charging finished in soaking pit study which was long felt necessary was taken up at the instance of the management. Track time study is a very complex problem in nature due to large number of components present in the system, due to complex nature of interaction among the components of system and due to presence of random variance. Study has been made for 1.6 and 1.8 MT of steel productions, taking into account four and then five makes for transferring the stripped ingots from strip yard to soaking pits.

OPTIMUM TRACK TIME WAS A RESULT OF THIS STUDY. APART FROM THIS SHORT DELAY IN some areas like pairing delay (waiting between the two bolts ahead and later L. D. beam in steel melting shop), unavailability of the products due to the removal of stripped models from strip yard and due to taking an hour to put time between the finishing in pit side of steel melting shop and stripping in strip yard, but also effect of variation of these delay parameters were studied.

WAREHOUSING MODEL — A SIMULATION STUDY
K. Vishwanathan and T. R. Natarajan
Computer Centre, College of Engineering, Guindy, Madras 600025.

A medium size hardware manufacturing company produces and supplies it to warehouses all the states in the country through four of its existing regional warehouses located at four centres. These warehouses now place orders for warehouses along the line of supply and to their customers. The purpose of this simulations is to design alternative models and compare the economy of operation. The supply to these plants is from a central warehouse dispensing the regional warehouses in regional warehouses in the existing warehouse and the place orders on the central warehouse and then compared with the existing model to arrive at a final model. The devolved models were developed as to which is the most economical one. For testing the model was solved using System 370/Model 155.

COMPUTER SIMULATION FOR FRAGMENT DISTRIBUTION OF A SHELL
R. K. Panfil

The article proposes a simulation model for the behaviour of a high explosive and to weight of fragments, the report of which has been analysed by fitting a long-norm distribution. It has been long established that random this phenomena, the model has been proposed at ARDE Centre, that it is possible to determine the distribution parameters with factors which influence the distribution.

MANAGEMENT OF COMPUTER INSTALLATIONS AND PROBLEMS OF SMALL SCALE COMPUTER USERS

PRL COMPUTER CENTRE AND ITS MANAGEMENT PHILOSOPHY
Ashok Gupta
Physical Research Laboratory, Ahmedabad — 9.

PRL Computer Centre is working more or less like a Regional Computer Centre. This has been drawn from various fields in the staff to understand the problems of the users, and to reduce the communication gap. A flat organisational structure provides better interaction with the management and improves communication. The management of the Centre believes in the philosophy that an environment be created and maintained where each staff member is inspired to perform to the best of his abilities.

PROFILE OF A LARGE COMPUTER CENTRE
H. N. Mahabala

Computer Centre like a library must have as its primary objective, service to users. Expiry date of a book is not a consideration. Similarly, the computer centre is not involved in solving programming problems. A library containing manuals and related literature will go a long way in improving the technical standard of programs written. One must also attend to functional needs of an user such as quick availability of a book near an operational viewpoint. Computer programmers, those who can correct only a few errors while debugging, explanation of error messages etc., whereas one must humour the user, one should also remember that too free an access or too much assistance encourage irresponsible and not-so-well thought out use of computer.

A sensitive area in the operation of a large multiprogramming system is accounting. It is virtually impossible in such a system to assure that the same program run with identical data will not cost differently on two occasions. One can only assure uniformity statistically.

In a system with provision for user to keep his private files in an on-line medium such as disk, there is need to evolve rules and charging procedures, such that available on-line storage is used for maximum global advantage. In the context of a regional or national computer centre it might be necessary to make conscious decisions to discourage certain types of applications for example, pay roll on a large scientific system, when the system gets saturated.

A centre with a large third/fourth generation machine serving a large community of users is not a more amplified version of a small centre. Even with a routing activity like accounting, the provision of consumables needs an aggressive and streamlined approach. Down times on the system are very expensive and time consuming, so to maintain this system in a state to be drastically reduced. Stuffing needs an enlighten approach especially since now services coming up would establish sophisticated centers to meet their personal needs. Physical facilities such as user work areas, storage areas, backup diesel generator need special attention.

THE PROBLEMS OF SMALL SCALE COMPUTER USERS
Dhananjay H. Rawal

This paper presents the problems faced by the small scale computer users. It is based on the problems experienced by the author, his colleagues and other users in Western India over last two years with —
— two large size computer systems belonging to research institutions
— one small size computer systems belonging to a university

To qualify the problems faced by users in a more meaningful way a questionnaire is attached, which would provide information to the planners of computer centres. An attempt also been made to conceptualize the ideal computer centre.

COMPUTER SECURITY MANAGEMENT
Lt. Col. S. G. Moskerjee, VSM and Major J. G. S. Ganguly
Army HQ, EDP Centre, Signapur Enclave, New Delhi—110 010

DANSIER'S basic rule says, "Whenever something is invented some one, some where, immediately begins trying to figure out a method to beat the invention." Computer security is a type of insurance. As the computers are growing in their importance with organisations, the need to protect them is increasing. In INDIA, this has been of an alarming magnitude, it is time to build awareness of all concerned in order to save organisations from being ruined because of Computer Centre
irregularities. Needs of computer security must be evaluated and the amount and type of risk to be assumed must be arrived at intellectually after the risks have been studied in detail. It is with this in view, that the paper has been written to arouse general consciousness about the problems of computer security and to emphasise that the element of security is a significant aspect of the computer installation and operation including operating systems. In this paper, however, stress has been given to "physical security" which has been universally accepted as the foundation of all computer security. In the first instance, the problem connected with computer security in general has been covered. Subsequently the steps that should be taken at pre-installation planning as well as post installation operation stages to safeguard and computer installation has been proposed. In addition, matters connected with personnel, data security and so on, have been dealt with in some detail, to assist our DP managers in solving his day to day problems.

COMPUTER AND DATA SECURITY: A RISK MANAGEMENT APPROACH

K.B.C. Saxson
Space Applications Centre, Ahmedabad - 380 058.

Top management concern about computer and data security has been simulated recently by several well-publicised cases of computer-related fraud. This paper explores the ground for this concern by examining the existing threats and protection measures available. It develops a risk management approach as a solution to the computer security problem. The paper consists of analysing the computer system security problem, and formulating a model based on the experience gained at a multi-user Computing facility at the Army Headquarters.

THE ANATOMY OF A REGIONAL CENTRE

Major R. Thagirajan
Army HQ, EDP Centre, Signals Enclave, New Delhi - 110 010.

Regional Computer Centres are gradually emerging as large Service Centres for use of the Computer Community of the various metropolitan cities of our Country. Each of these Centres is alleged to have been assigned a specific role. For instance, the Bombay Centre is expected to develop higher level software among other things. An exhaustive study has recently been conducted to assess the users' needs and study the possible application areas for the Delhi region.

While the application areas would depend to a large extent upon the genius of the Computer Community of the metropolis, one may venture to suggest that an in-depth study of the organisational structure of such a Centre is now overdue. The paper attempts to build a model of organisation for the Computer Centre after focusing attention on the merits and demerits of the organisation of the DP departments in the Educational Institutions on the other, Responsibility Centres and Authority Centres associated with the structure is also proposed. The model is based on the experience gained at a multi-user Computing facility at the Army Headquarters.

ERROR

in reporting the presentation of an article by Brig. V. M. Sundaram and Maj. N. K. Moorthy is regretted. This paper was not presented in the Convention.

THAKUR'S DESK

Dear Member,

Finally we have reduced the mailing of our Newsletter. The number has now come down from over 2500 to about 1700. Either we failed to keep the remaining 800 with us or perhaps their addresses were wrong and they never knew that we are still surviving. All the same if someone complains to you that he is not receiving the Newsletter any more, please provide him to receive the membership. Paper shortage or no paper shortage, we want to send out more copies of the Newsletter.

I observe that about 600 members have not yet submitted their new application forms even though they had paid their fees. If you want to know whether your application forms is with me or not, just have a look at the name address label. If the top line contains only your membership number, then, I have not received your new application form. If besides the membership number it also contains some other digits, it is an indication that your new application form has been received and registered and it is time you checked whether the details as registered are accurate.

Following the membership number digit 1 or digit 2 are printed. Digit one indicates that you are nominated by an Institution and 2 indicates that you are continuing in your individual capacity. This is followed by an alphabetic, A, M or S. This A does not indicate adult rating in your private jokes but that it shows you are registered as an Affiliate. Whenever you feel that you are adequately qualified, please get the membership category changed to full member. The full members carry the alphabet M. The S indicates the student grade of the member. We do not have any Fellows and therefore if there is a F instead of A, M or S then, please assume that F indicates a fault on my side and not a Fellow member. The alphabet is followed by some digits. This digit indicates the Division, one has only one to choose for. The very last two digits indicate the Chapter of your choice. The Chapter Codes are 01 - Bombay, 02 - Calcutta, 03 - Jamshedpur, 04 - Delhi, 05 - Madras, 06 - Hyderabad, 07 - Bangalore, 08 - Ahmedabad, 09 - Poona. 10 - Moscow and 00 indicates the absence of the Chapter.

I want your help in getting your pin code updated. If the pin code is blank or wrong, please let me know the correct position.

In case you have already torn off the wrapper and the name address label, please wait for a month. The name address label next month could help you out.

Our important thing (not that the above unimportant). In case you renewed your membership late and did not receive your copy of the Journal, write to Dr. S. Ramani, Computer Group, T.I.F.R., Homi Bhabha Road, Bombay-400005. He will send you a copy of the last issue of the Journal published in December. Please do not forget to indicate your membership number while writing to Dr. Ramani.

You may recall that during the Ahmadabad Convention, Maj. Thagirajan had quoted about 2%, which you add to your cheque (I hope towards bank commission. A Committee consisting of Mr. Sankaran your Treasurer, Mr. Jabaui, W. Ryl and Mr. Kanath of Gıkko Laboratories is looking into this matter. I am sure, they will find a way out and you will be saved these Rs. 2% from next year.

Savvuttam Thakur

Personalia

Shri Kapil Dev of the Indian Airlines has been promoted as the EDP Manager. Our congratulations.

Mr. Nana Patel of Systems Group Inc. has been invited for a three month consulting assignment by a

Editor's Mail

in U.S. he will explore the possibility of software export and also that of key-punching services.

Washington based software house. During the stay

Mr. Shatru Patel of Systems Group Inc. has been

Srivardhan Takhur

Dear Sir,

Every issue of the Newsletter in its 'Literature Window' lists lot of Books and articles on all aspects of computers. To enhance the value of such listings it is in fitness of things that a brief description and in a few cases a review he carried out of the books. I am sure some of our members of the Society will be too glad to review the books gratis. I know space in

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FROM THE CHAPTERS

BANGALORE CHAPTER

The Chapter proposes to conduct a one-day Seminar on computerised production planning and control in Bangalore some time during June 1973. Details will be announced shortly. [M. Venkateswara Rao, Correspondent]

BOYAM CHAP TER

The Chapter organised a lecture on "Data Bases/ Data Communications (DB/DC) Systems" by Mr. Ashok Nanda, IBM World Trade Corp, delivered on 15-3-75. [Shri R. Nath, Correspondent]

POONA CHAPTER

The Chapter is organizing "COMPUTER A P P R E C I A T I O N SEMINAR" on 2nd April 1975 at Hotel Amrit. The Seminar aims to familiarize the people in the Industry with the computer and its applications in various industrial fields. It does not pre-suppose any knowledge of computer applications. Fee is Rs. 75/- per participant.

ROURKELA CHAPTER

The Chapter conducted a training course for the students of the College of Accountancy and Management Studies, Cuttack, Orissa preparing students for the Diploma in Management Accountancy from February 17 to February 25, 1975 at the Technical Institute of the Steel Plant. The institution offers various courses to the students including operation research, management information system and computer applications and it was the proud privilege of the Rourkela Chapter to organise and conduct a ten-day course for the benefit of the students Mr. P.K. Ramakrishna, the Course Director. Prof. B.N. Mishra, Principal of the College in giving an opportunity to the local Fifteen students led by Mr. A.B. Kanwal, the students were as a part of the training on various systems and applications including an overview on operation, research and related techniques were received well by the students.

HYDERABAD CHAPTER

1. A Hyderabad Chapter has organized a Seminar on IRIS (French) series of Computer Systems. The Seminar was held on February 25, 1975 at the Committee Room of the Regional Research Laboratory, Mr. Yogesh Gupta and Mrs. E. Bricher of (CII) International Company for Information, France, gave a brief account of IRIS Systems and screened three different films on computer marketed by C.I.I. Enterprises from about 15 institutions attended the meeting.

2. Two Courses on Basic FORTRAN Programming and Advanced Computer Methods and Numerical Analysis have just come to an end on 14-3-1975. These courses were as usual of 6 weeks duration each. [P.J. Reddy, Correspondent]

JAMSHEDPUR CHAPTER

The Chapter organized a talk on "Change over from one Computer to another" by Mr. W.H. Moran on 18-2-75. A lecture on "Data Base Data Communication System" by Mr. Ashok Nanda, IBM World Trade Corp, was delivered on 15-3-75. [Shri R. Nath, Correspondent]

PROBLEMS OF SUPPLY OF "PAPER WARE"—A STUDY

INTRODUCTION

The use of computers in industry is increasing at a steady pace to meet the challenges of Information Explosion. Over the past few years, the number of computer installations has touched a figure around 300. As is evident, the most commonly used media for input of information into computers are magnetic cards or paper tapes and likewise the most commonly used output media are again punched cards, paper tapes or continuous stationary used on Line Printers. These input/output media have been referred to as "paper ware." Most of the computer users are institutional members of the Computer Society of India (CSI) and are faced with the common problems concerning paper ware, as is evident from the communications received from a large number of computer users. Some of the extracts of such communications are placed at Appendix A.

Library users of the Society have been disturbed mainly about the quality and quantity of all types of computer stationary. In fact this issue was also highlighted by Brig V.M. Sundaram, Ex-President of the CSI during his Presidential Address in Madras Convention.

Since then the position has been progressively deteriorating and there seems to be no hope of price stabilization unless Government takes a hand.

To enable the Society to put up such a proposal to Government as a professional body, a request was made to various computer users to forward their requirements to the Secretariat of the CSI.

The Executive Committee in one of its meetings has decided that a small sub-committee be formed to look into the matter. The sub-committee consisted of Mr. P. Sudarshan, Shri S.S. Thakur and Mr. V.M. Sundaram. They were entrusted with the job of putting up a report to Government highlighting the problem and suggesting remedial actions.

This paper is a result of the study and is being forwarded to all concerned.

THE PROBLEM

The irrelevancy of "paper ware" is causing serious concern.

(1) Price of "paper ware" is spiralling.

STATISTICS

A rough survey of cost of certain types of stationary shows the trend as at Appendix B.

*This study was undertaken for the Computer Society of India.

As a result of the Survey conducted through the questionnaire sent out by Shri Thakur, the changes in 1973, 1974 and the forecast for 1975 are given at Appendix C.

MANUFACTURERS' PROBLEMS

Basic Premises

Stationery meant for computer usage must have the following characteristics—

(a) must have high hygroscopic tendencies.

(b) must have resistance to tear; this means grammage of 60 gm or better for continuous stationery and 200 gm or better for punched cards.

Computer stationery for this analysis can be divided into two categories—

(a) Hollerith cards of 90 columns.
(b) Continuous stationery.

Hollerith Cards

Owing to the specialised nature, special pulp has to be imported. Unfortunately, only one firm has been licences in India so far and it more or less holds a monopoly in the manufacturing of the cards which are then marketed by firms like M/s IBM or ICL under their company identification.

There are a few other individuals who are trying to get into the business. They however have to rely on the same supplier for the basic paper.

Continuous Stationery

As earlier stated in the basic premises, the continuous stationery should have resistance to tear e.g. grammage should be 60 gm or better. As there are not many concerns in Public Sector, other undertakings who produce paper suitable for use in computers, most of the continuous stationery supplies have to rely on the basic paper on which limited producers of paper. As a result, whatever prices the paper producers demand is paid by the suppliers and in turn increase the burden on actual user heavily. The few suppliers of continuous stationery who are still maintaining the quality have increased their rates exorbitantly. This will be evident from the cost illustrations shown in Appendix B for M/s TATA PRESS, Bombay, JK Business Machines, CALCUTTA, and Precision Printers, Bombay. At times, the users face the problem when some publishers do not quote the rates and categorically states its inability to do so. Under these circumstances, the user has to choose except to place the orders with the supplier with lowest rates out of the very few quotations.
3. BHARAT HEAVY ELECTRICAL LIMITED, HYDERABAD — Letter No Py/0994/74/1172 of 17 Sep. '74.  

"I very much appreciate the approach taken by you with regard to availability of computer and other equipments material for development of our programs as per our license agreement". 

5. BURMAH-SHELL, BOMBAY — Letter No. EDP. 4 of 18 Sep. '74.  

"May we request you to please advise us the outcome of your negotiations with the Government regarding the release of paper quota for computer installations". 


"I hope that our efforts in this direction would be successful as a large number of institutions are finding it difficult to acquire 
stationery in time".

Manufacture: M S J K Business Machines, Calcutta

Year → 71/72 72/73 73/74 74/75
Item 1 Single Part 1 NQ 1.53 4.02
Two Part 1 NQ 1.37 2.75
Three Part 1 NQ 1.30 2.57
Four Part 1 NQ 1.68 2.51

*Note: No Quoted.*
Appendix 'B' (Continued)

Manufacturer: M/S Precision Printers, Bombay

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<th>72/73</th>
<th>73/74</th>
<th>74/75</th>
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<td>2.16</td>
<td>4.21</td>
</tr>
<tr>
<td>Two Part</td>
<td>NQ</td>
<td>1</td>
<td>1.64</td>
<td>3.07</td>
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<tr>
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<td>NQ</td>
<td>1</td>
<td>1.48</td>
<td>2.9</td>
</tr>
<tr>
<td>Four Part</td>
<td>NQ</td>
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</table>

COMPUTER STATIONERY REQUIREMENTS IN INDIA OVER THREE YEARS

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<th>Sr No</th>
<th>Description</th>
<th>YEAR '73-74 (Lakhs)</th>
<th>'74-75 (Lakhs)</th>
<th>'75-76 (Lakhs)</th>
<th>Remarks</th>
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<tr>
<td>1.</td>
<td>15&quot; x 12&quot; Single Part</td>
<td>256.50</td>
<td>34.08</td>
<td>42.71</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>15&quot; x 12&quot; 1-1 Part</td>
<td>70.71</td>
<td>91.94</td>
<td>109.01</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>15&quot; x 12&quot; 1-2 Part</td>
<td>34.77</td>
<td>69.22</td>
<td>58.13</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>15&quot; x 12&quot; 1-3 Part</td>
<td>22.13</td>
<td>59.00</td>
<td>43.00</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Cards (80 Column)</td>
<td>44.63</td>
<td>50.88</td>
<td>57.45</td>
<td></td>
</tr>
</tbody>
</table>

Note: The above are the standard sizes of papers used in most computer installations. However, to suit the convenience of individual users, they use preprinted stationery which are of dimensions varying from user to user and which are not included in the above table.

Short Communication

COMPUTERISATION AT T.I.F.R. LIBRARY

The Tata Institute of Fundamental Research is the National Centre of the Government of India for Nuclear Science, Mathematics, and Software Development and Computing Techniques. In addition to these, the research activities of the Institute extend to other disciplines such as, Theoretical Physics, Radio Astronomy, Chemical Physics, Molecular Biology and Solid State Electronics.

As a support facility at the Institute, the Library has specialized in libraries pertaining to the research activities. It has a collection of 55,000 volumes (33,000 books, 22,000 journal volumes) and receives 700 journals. The collection of non-conventional literature consisting of preprints, reports and theses is around 2,000.

Although the computer facility (CDC 3600) was under the roof since 1963, we did not avail of it purposes, whereas the Library would use it as just a facility. It was only when we found it absolutely necessary to bring out the monthly list sooner, i.e., within the short span of three weeks, after the month is over.

In computerizing the monthly list, we had other important objectives in our view. Formerly, the subject catalogue was maintained in strip form. We now have it in the form of computer printout. The entries in the monthly list are arranged subjectwise and when these are cumulated, it automatically results in an updated subject catalogue. This has saved considerable time spent otherwise in maintaining a classified catalogue on strips/cards. The cumulation is done once in a quarter.

Good many books will have more than one facet, with the result that the class number represents two or three subjects, appropriately linked with one another. Any classified catalogue thus has analytical entries to indicate the second and the third subject as well. The computer-produced classified catalogue has accommodated such entries, as well.

The second step was to hold information about current periodicals and the back volumes in machine-readable form. Very many changes concerning journals have to take place throughout the year and it has always been a problem to have up-to-date information on them. Since 1972, this information is held on magnetic tapes. (See Appendix 2 for the format). It is now easier to update our records and to bring out the revised editions of the serial catalogue, without having to retype the entire data.

The third step was to store information about our book collection on magnetic tapes. We started with books received from 1971 onwards. Since then the monthly list of Recent Additions is being produced using the computer. (See Appendix 3 for a sample page).

Further Work

With the experience gained in computerisation thus far, we now plan to process in machine readable form, the data on the following:

1. Pre-1972 book collection, so that the cumulative classified catalogue of the entire book collection will be stored on magnetic tapes.
2. Papers published by the Institute research staff during 1946-1974 (about 2,000 in number) and onwards. Author and subject indexes will be automatically provided.
3. Conference proceedings held by the Library. Indexes such as personal author, corporate author, place, subject, keyword, etc. will be provided. Conference proceedings published as part of journals will also be covered.
4. Theses by the Institute members. Both M. Sc. and Ph. D. These submitted by the members of TIFR will be included. The computer will produce author and subject indexes as usual.

Acknowledgements

It was the late Dr. M.B. Vajidkar, former Librarian, TIFR, who prepared the ground for initiating
the automation of library procedures. The assistance of Dr. S. Ramani and Smt. Mythili Rao of the Computer Group, and the encouragement of Professor R. Narasimhan are particularly acknowledged. The work of Mrs. Mary Stevens merits special mention. A Canadian Library Science teacher, she was with us as a guest worker in 1972-73 and actively participated in our automation projects. The KVIC Index and the cumulated classified catalogue programs are entirely her contribution.

S.K. Havane
M.G. Raikar

APPENDIX 2

Format of the entry for serials

<table>
<thead>
<tr>
<th>TITLE</th>
<th>PLACE</th>
<th>COUNTRY</th>
<th>PUBLISHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>HISTORY</td>
<td>TR. OF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st SUBJECT</td>
<td>2nd SUBJECT</td>
<td>NATURE</td>
<td>PERIODICITY</td>
</tr>
<tr>
<td>HOLDINGS</td>
<td>CUM INDEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGENTS</td>
<td>PRICE</td>
<td>NO. OF</td>
<td>MODE OF</td>
</tr>
<tr>
<td>COPY</td>
<td>DESPATCH</td>
<td>LOCATION</td>
<td></td>
</tr>
</tbody>
</table>

APPENDIX 3

A sample of KVIC Index

<table>
<thead>
<tr>
<th>Classification No.</th>
<th>Advances in Cell Biology</th>
<th>Advances in Radiation Biology</th>
<th>Advances in Theoretical Biology</th>
<th>Related Areas of Molecular Biology</th>
<th>Biology/Advances in Enzymology and Molecular Biology</th>
<th>Topics in Developmental Biology/Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>076.3 (047.1)</td>
<td>076.125 (047.1)</td>
<td>076.155 (047.1)</td>
<td>076.955 (047.1)</td>
<td>076.895 (047.1)</td>
<td>077 (047.1)</td>
<td>075 (047.1)</td>
</tr>
</tbody>
</table>

GENERAL


NATIONAL COMPUTER CONFERENCE: NCC - the place to be. Infosystems 1974, 21(4), 66.

NATIONAL COMPUTER CONFERENCE: 119 sessions highlight AFIPS' world of DP. Infosystems 1974, 21(3), 72, 74.

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Engineering


History


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Microfilm ... it's bigger than you think. Infosystems 1974, 21(4), 24-7.

Irrigation

BERMAN R: Where the grass is greener. Data Systems 1974, 15(May), 21-3.

Language & Literature


Medical Science


ENDEJANN J G: Rare animal disorders studied for clues to human muscle diseases. Computers and People 1974, 23(6), 36.