
Administration

Board of Governors. The Polytechnic learnt with deep regret of the demise of the Chairman of the Board of Governors, Mr Chua Chor Teck, on 13 January 1986. Mr Chua had served as Chairman of the Board from 1980-86 and was responsible for the mapping out and successful completion of the Singapore Polytechnic's five-year Expansion Plan (1981-1986). In memory of the late Chairman, the Polytechnic set up the Chua Chor Teck Gold Medal Award with donations from well-wishers, staff and students. The Gold Medal is to be awarded annually to a top student of the Singapore Polytechnic.

The three-year term of office of the Board of Governors ended on 31 March 1986. The Polytechnic would like to record its appreciation to all Board members for their invaluable services and especially to Messrs Koh Yong Guan, Lam Sheung Lim, Lim Boon Heng, M.F. Morissette, Yutaka Ohtsuka and Dr Guido Zargani, who had since left the Board on expiry of their term of office.

A new Board has been appointed for the following three-year term from 1 April 1986 to 31 March 1989.

Board of Studies. The term of office of the fourteen elected members on the Board of Studies also ended on 31 March 1986. A review of the terms of reference of the Board of Studies vis-a-vis the Board of Governors was undertaken. Pending the finalisation of this review, it was decided in February 1986 to extend the term of office of elected members for another year until 31 March 1987.

Technical Committee on Medical Training for the Merchant Navy. The Polytechnic has six Advisory Committees which advise its teaching departments on matters relating to course structure, curriculum revision, practical training for students, laboratory/workshop development, demand and employment prospects for graduates.

In addition to these Advisory Committees, the Board of Governors appointed in September 1985, a Technical Committee on Medical Training for the Merchant Navy. The terms of reference of the Committee are as follows:

- To ensure effective co-ordination between the medical authorities, the Marine Department and the Singapore Polytechnic in the provision of medical training for merchant navy personnel.
- To ensure the provision by the Polytechnic of such courses as are necessary to meet the requirements of the Marine Department.
- To ensure the orderly development in Singapore of medical training for merchant navy personnel.

The Committee members, comprising representatives from the Ministries of Health, Environment and Communications and Information, were appointed for a three-year term.

Administrative support of the Computer Centre. The year saw a major redesigning of administrative computer systems, from centralised processing to a distributed one, which will also incorporate office automation facilities. Each department, administrative and academic, was allocated a cluster of microcomputers networked together to provide data processing, word processing and electronic filing services. Department clusters would have access to a central database and central host through a new fully digital PABX capable of voice and data transmission over the same wires. Access to the central host would enable electronic communications between departments.

The equipment was purchased at a cost of about \$2.5 million. Training for all staff using the system was carried out with over 200 persons being given a 40-hour course introducing computers, data processing and office automation. Training for specific software on microcomputers took place at the Centre's newly set-up training room and involved all levels of staff.

Budget. In the year under review, the Polytechnic operated with a budget of \$64.3 million, of which \$56.6 million was provided through a government grant and \$7.7 million through revenue earned. Of the \$64.3 million, which was 13.1% higher than the previous financial year, \$51.9 million (80.7%) was for Expenditure on Manpower and \$11.9 million (18.5%) was spent on Other Operating Expenditure. The recurrent cost of training per student in FY 1985 was \$6,802 which was 7.5% higher than that in FY 1984.

The Polytechnic also received an allocation of \$32 million under its five-year expansion development budget. Of this amount, \$10.7 million was spent on Works and Buildings, \$13.3 million on Furniture and Equipment, \$0.4 million on Staff Quarters, \$7.2 million on Sports Facilities and \$0.4 million on miscellaneous items. The Auditors' Report for the year ending 31 March 1986 is contained in Appendix VII.



The scope of the fast-expanding Computer Centre encompasses support for both administrative and academic activities.

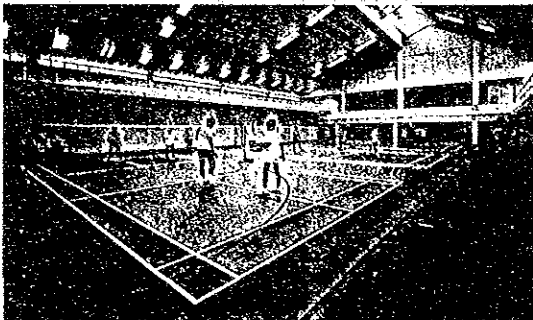
Expansion

In keeping with the stated direction of the Corporate Plan to provide a conducive environment within campus boundaries, the Polytechnic completed both recreational and academic facilities for staff and students.

The major landmark of the year was the completion of the swimming pool complex and staff centre, built at a cost of about \$9 million. The facilities include an Olympic-size swimming pool, a fully air-conditioned and carpeted centre for staff to meet and enjoy the facilities provided, a large sports hall, gymnasium, a fifth canteen for students and a large playing field.



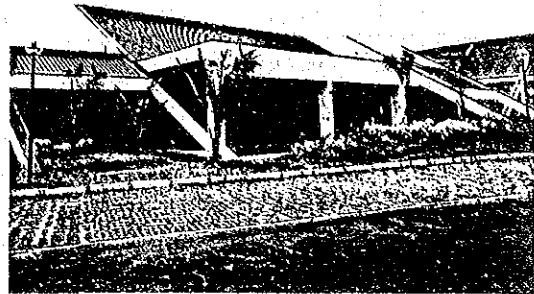
The \$1.25 million Olympic-size swimming pool, a milestone in the Polytechnic's expansion programme.



The new Sports Hall houses three badminton courts, an indoor basketball court and ample space for table-tennis.

The Student Affairs Centre of some 2,400 m², built at a cost of \$1.4 million, was also constructed for student activities. This building houses an exhibition hall, a music room, the Students' Union office, and 21 rooms for clubs and societies. In addition, the Department of Student and Public Affairs is located within the building, for easy liaison with the student clubs.

Also completed during the year was an Engineering Applications Centre (EAC) which occupied extensively renovated rooms above the existing CADD Centre One. The EAC provides a "high-tech" environment for specialised engineering applications using computers. Renovations were also carried out to the former Moberly Block (EB 20) and Teaching Block 8 for the expanding needs of the Electronics & Communication Engineering Department.



The exterior of the new Staff Centre building.

A new facade was added to the Administration Building in the form of an extension which added some 300m² to accommodate an enlarged Department of Continuing Education, Computer Centre, Planning Office, Public Relations and Publications units. Improvements in the extension include a seminar room for staff and a theatre for visitors.

Landscaping work to improve the campus environment was also carried out. These included improvements to entrances and the provision of more outdoor study areas with sheltered study benches for students in areas around the campus.

Towards the end of the financial year, contracts for the construction and completion of other facilities were awarded for commencement of work. These included a new Student Health Clinic, a CAM (Computer-Aided Manufacturing) Centre for the Mechanical & Manufacturing Engineering Department and a second CADD (Computer-Aided Design and Drafting) Centre.



The newly-completed Staff Centre where staff can partake of both lunch and dinner in comfortable surroundings.

Appendices

I Enrolment Statistics, 1985/86*

Full-Time Courses	First Year	Second Year	Third Year	Total
Diploma				
Architectural Technology	117	105	153	375
Building	—	127	161	288
Building/Quantity Surveying@	198	—	—	198
Chemical Process Technology	241	202	187	630
Civil Engineering Construction	—	128	150	278
Civil Engineering Construction/Design	223	—	—	223
Civil Engineering Design	—	123	130	253
Electrical Engineering	306	263	194	763
Electronics & Communication Engineering	603	525	348	1,476
Land Surveying	37	35	43	115
Manufacturing Engineering	—	346	—	346
Marine Engineering	127	155	156	438
Maritime Studies (Shipping Commerce)	83 [†]	61 [†]	80	224
Mechanical Engineering	—	442	615	1,057
Mechanical/Manufacturing Engineering@	966	—	—	966
Nautical Studies (Pre-Sea Phase)	71	—	—	71
Production Engineering	—	—	53	53
Quantity Surveying	—	64	75	139

*To be awarded the new Diploma in Business & Communications.

Certificate

Maritime Radiocommunications	—	17	—	17
TOTAL	2,972	2,593	2,345	7,910

Day-Release Courses	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
Diploma						
Chemical Process Technology	—	—	15	23	16	54
Mechanical Engineering	—	—	—	29	23	52
Certificate						
Aeronautical Maintenance Engineering	28	23	20	—	—	71

Evenings-Only Courses

Diploma						
Architectural Technology	30	60	102	101	97	390
Building	—	—	129	96	90	315
Building/Quantity Surveying@	92	128	—	—	—	220
Chemical Process Technology	50	32	—	—	—	82
Civil Engineering	—	—	—	11	39	50
Civil Engineering Construction	23	36	43	38	—	140
Civil Engineering Design	32	57	40	59	—	188
Electrical Engineering	119	193	181	173	130	796
Electronics & Communication Engineering	243	267	172	167	92	941
Land Surveying	21	28	18	14	—	81
Manufacturing Engineering	—	57	60	—	—	117

21

Mechanical Engineering	—	170	170	139	85	564
Mechanical/Manufacturing Engineering@	195	—	—	—	—	195
Production Engineering	—	—	—	44	34	78
Quantity Surveying	—	—	8	16	—	24
Structural Engineering	—	—	—	—	47	47
Advanced Diploma						
Advanced Plastics Technology	18	14	—	—	—	32
Post-Graduate Diploma						
Industrial Management	54	—	—	—	—	54
Maritime Studies (Shipping Management)	15	—	—	—	—	15
Certificate						
Industrial Management	194	170	—	—	—	364
Plastics Mould Design	22	—	—	—	—	22
Process Plant Engineering Design	22	—	—	—	—	22
Maritime Studies (Shipping Management)	22	20	—	—	—	42
TOTAL	1,152	1,232	923	858	614	4,779

* Figures provided are as at 6th week 1st Term (17 July 1985) with exception of the Nautical Studies (Induction Phase) for which both intakes are included viz. June 1985 = 47; January 1986 = 24.

@ On passing the examinations students will be channelled to the respective next stage of the course options according to their aptitudes.

Continuing Education Courses	Number Attended
Advanced Surveying & Underground Surveying Technology	60
BCS Part 1: General Papers 1 & 2	59
BCS/NCB – Options C & D	30
Building Maintenance (for PWD)	25
CEI Part 1	524
CEI Part 2	309
Computer-Aided Printed Circuit Board	18
Construction Technology (for PWD)	38
Data Processing For Managerial Personnel	14
Energy Management	14
Engineering Mathematics	21
FORTRAN Programming	26
Installation, Testing & Maintenance of CNC Machine Tools	17
Introduction to Computer-Aided Drafting	76
Introduction to Computer-Aided Drafting (Three-Dimensional)	34
Introduction to Computer-Aided Drafting (Two-Dimensional)	161
Introductory UNIX For Programmers	20
Microbiological Examination of Foods	32
Power Electronics	43
Retaining Walls	46
Seminar on Manufacturing Resource Planning	23
Seminar on Personnel Management	14
Seminar on Personnel Management (for MINDEF)	30
TOTAL	1,634

II Staff Consultancy Work and Service to Industry

Department	Name	Description
Administration	N Varaprasad (Dr)	Consultant for the Applied Research Corporation on bus revenue studies.
Chemical Process Technology	Kuo Yian Lin (Mrs)	Participated in ASEAN project on Food Technology research and development.
	Ong Kim Lian (Mrs)	Consultancy work for Gardenia Foods (S) Pte Ltd on flour testing. Participated in ASEAN project on Food Technology research and development.
	Poh Hee Seng	Honorary Advisor to Singapore Plastic Mould and Moulding Manufacturers' Association on training needs and technical publications.
	Paul Yap Yeow Pin	Project leader for ASEAN project on Food Technology research and development.
Civil Engineering & Building	Chan Wing Kong	Consultant to Kongsberg (S'pore) Pte Ltd on user application of computer-aided mapping systems.
	Chan Wing Kong Maik Seck Hoe Yeong Fook Cheong	Lectured in advanced surveying and underground surveying technology for the Mass Rapid Transit Corporation.
	Norman E Devall	Conducted a course for Urban Redevelopment Authority to prepare their officers for the RICS Exams.
	Edward Feng	Assisted in the training of employees for the Singapore Contractors' Association Ltd.
	Ian McGunnigle	Acted as a consultant to PI Building Surveying & Management Services Pte Ltd.
	Sam Man Keong	Taught Engineering Mathematics to Mechanical Engineering students at Ngee Ann Polytechnic.
	Wong Chi Meng (Mrs)	Consultant to the Singapore Contractors Association Ltd
	Wong Lock Sek	Consultancy work for Roger Gill & Associates Pte Ltd on manpower studies.
Electronics & Communication Engineering	Fung Chun Che	Conducted "Industrial Electronics Basic Analogue Electronics" course for Singapore Manufacturers' Association.
	Yee Fook Hwa	Conducted "6502 Microprocessor and Apple Computer" course for Engineering Apple Computer International Pte Ltd.
English Language	Foong Wai Ping (Miss)	Conducted courses on minutes and telex writing for senior officers at the Port of Singapore Authority.
	G Colin-Jones	Conducted English Language Course for GATX Terminals Pte Ltd. Conducted a seminar on Effective Writing for Executives for Willy Thompson's Communications.
	Constance Lee (Miss)	Conducted seminars on writing letters of application for jobs and curriculum vitae to young job seekers organised by Willy Thompson's Communications.
Finance	Chng Kiat Leng	Conducted courses in accounting at the Vocational and Industrial Training Board.

Department	Name	Description
Marine Engineering	Aji Pal Amit Ray S Das Sarma Subir Mukerji	Consultants for the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) on a study of present conditions of Asean fleets and alternative solutions to improve fuel efficiency.
Nautical Studies	Chew Cheah Boon Soh Eng Sim	
Mechanical & Manufacturing Engineering	Chia Ah Lay D N Collins	Consultancy with PUB on measurement and monitoring productivity of Public Lighting Section Electrician Teams. Conducted seminar on Heat Treatment for Progress Technology Services. Conducted seminar on Principles of Failure Analysis for Centre for Management Technology.
	Lee Yum Fun	Conducted lectures on Industrial Automation at National Productivity Association. Carried out a productivity improvement study for the Public Lighting Section of the PUB.
	Loh Peng Chum	Consultancy with Ordinance Devt & Engg. Co. S (Pte) Ltd on welding of special materials for certain types of military weapons. Consultancy with Harry Revie & Associates Ltd on welding procedure qualification. Investigated the causes of weld failures in certain military weapons and provided remedies for them for Chartered Industries of Singapore Pte Ltd. Lectured on "Welding of Stainless Steels" to SWS and SNAMEs members.
	Tay Chor Eng	Conducted course on Plant Maintenance (Production Management Engineering Course) for National Productivity Association.
Nautical Studies	Lye Hoong Wai (Capt)	Consultancy with Olivetti (S'pore) Pte Ltd on seamanship and navigation.
	Lye Hoong Wai (Capt) John Pothen (Capt) R F Short (Capt)	Conducted courses in seamanship and navigation for the Republic of Singapore Yacht Club.
	V Maheantharan K A Pillai (Capt)	Conducted tutorial classes for students preparing for the Associateship Exams of the Institute of Chartered Shipbrokers.
	R F Short (Capt)	Presented technical papers at an International Maritime Organisation seminar in Malaysia. Presented technical papers at an International Maritime Organisation seminar on Maritime Safety Administration held in Dhaka. Nautical Assessor in the High Court for Godwin & Co. Advocates & Solicitors.

III Staff Serving on External Committees

Department	Name	Organisation	Appointment	
Administration	Khoo Kay Chai	Governing Council Singapore Institute of Management	Member	
	Cheng Huang Leng	National CAD/CAM Steering Committee	Singapore Polytechnic Representative	
	N Varaprasad (Dr)	Trustees Committee of Chua Chor Teck Memorial Fund	Singapore Polytechnic Representative	
		Trustees Committee of Chua Chor Teck Memorial Fund	Singapore Polytechnic Representative	
	Caroline Hu (Miss)	Governing Council Singapore Institute of Management	Alternate Member	
	Chan Ban Aik	Junior Flying Club	Committee Member	
	Chemical Process Technology	Leong Chee Lu (Dr)	Singapore Institute of Standards & Industrial Research (SISIR)	Alternate Member, Chemical Industries Standards Committee
		Lee Wah Ling	Plastics & Rubber Institute (Singapore Section)	Committee Member
		Aaron Loh Chun Pong (Dr)	Curriculum Development Institute of Singapore (Secondary Technical Education Project)	Advisor
			Asian Countries Union of Polymer Science	Council Member
		Plastics & Rubber Institute (Singapore Section)	Honorary Secretary	
Mak Fong Keng (Dr)		Energy, The International Journal, Pergamon Press, USA	Associate Editor	
Ong Kim Lian (Mrs)		Singapore Institute of Food Science and Technology	Council Member	
		SISIR Technical Committee on Methods of Testing for Flexible Plastic Packaging Materials	Member	
Poh Hee Seng		SISIR Technical Committee Code of Practice for Transportation and Storage of Pesticides	Member	
		Society of Plastics Engineers (USA)	Local Chapter Faculty Advisor	
	Tay Chin How	SISIR Standards Committee on Flexible Plastic Packaging Materials	Committee Member	
	Yeow Kian Peng	Singapore Institute of Standards & Industrial Research	Member, Chemical Industries Standards Committee	
Civil Engineering & Building	Chan Wing Kong	Singapore Institute of Surveyors & Valuers	Committee Member	
	R Ganeswaran	Singapore Concrete Institute	Honorary Treasurer	
	Lee Mee Fah (Mrs)	Education Committee of Singapore Institute of Building Ltd	Singapore Polytechnic Representative	
	Lim Meng Tong	Council of Singapore Institute of Surveyors & Valuers	Assistant Honorary Treasurer	
	Board of Directors Singapore Institute of Building Ltd	Director		

Department	Name	Organisation	Appointment
Civil Engineering & Building	Maik Seck Hoe	Land Surveyors Board Cadastral Survey System Review Committee	Member
		Singapore Institute of Surveyors & Valuers	Committee Member
	Rose Ng (Mrs)	National CAD/CAM Adhoc Committee	Member
	B L Ong	Singapore Concrete Institute	Vice President
	Ian Ong Kah Chai	Land Surveyors Board Examination Committee	Secretary-cum-member
	John Ooi	Singapore Concrete Institute Sub-committee on Precast Concrete	Member
	Stephen Price	Singapore Institute of Surveyors & Valuers	Honorary Secretary
	Balbir Singh	Quantity Surveying Division Committee of Singapore Institute of Surveyors & Valuers	Committee Member
	Alice Tham (Mrs)	Singapore Institute of Standards & Industrial Research Technical Committee on Revision of Code of Practice 6.	Chairman
	Yap Siew Lay (Mrs)	National CAD/CAM Adhoc Committee	Member
Computer Centre	Jack Koh	Integrph Users Group	Chairman and Singapore Polytechnic Representative
	Sally Lim (Miss)	Integrph Users Group	Honorary Auditor and Singapore Polytechnic Representative
Continuing Education	M V Jarman	Committee on Continuing Education for Professionals	Alternative Chairman
Electrical Engineering	Chair You Wah	SISIR Technical Committee on Specifications for Portable Electric Motor-operated Tools	Member
	Chin Jeck Swee	Institution of Engineers, Singapore	Council Member
		SISIR Technical Committee for for XLPE Power Cables	Member
	Teo Chye Poh	Singapore National Committee World Energy Conference	Member
English Language	Pearly Gan Chwee Lian (Ms)	Singapore Tertiary English Teachers' Society (STETS)	Committee Member
	Ng Chee Hian	Singapore Linguistic Society	Honorary Secretary
	Tan Kim Hock	Singapore Tertiary English Teachers' Society (STETS)	Treasurer

Department	Name	Organisation	Appointment
Library	Poh Guan Huat	Singapore Integrated Library Automation Service Standards Committee	Member
		Library Association of Singapore, Editor of the "Singapore Libraries" Journal	Editor
	Ambika Raghavan (Ms)	Library Association of Singapore Associate Editor of the "Singapore Libraries" Journal	Associate Editor
	R D Yeap (Mrs)	Singapore Integrated Library Automation Service Advisory Committee	Member
		National Book Development Council of Singapore (NBDC) Executive Committee	Member
	School Library Committee, Ministry of Education	Member	
Marine Engineering	R K Agrawal	Society of Naval Architects and Marine Engineers, Singapore	Chairman Education Committee
	P P Chugani	Institute of Marine Engineers (Singapore Branch)	Editorial Committee
	J C Thompson	Institute of Marine Engineers (Singapore Branch)	Vice Chairman Technical Editor
Maths & Science	Lam Kim Loy	Organising Committee of Conference on Achieving a Better Acoustic Environment	Member
		Technical Sub-Committee on Code of Practice for Noise Control on Construction and Demolition Sites, SISIR	Member
	Liao Kuo Tang	Science & Technology Advisory Committee, National Youth Awards Panel, People's Association	Member
Mechanical & Manufacturing Engineering	S Arulanandam	Institution of Production Engineers, Singapore Section	Honorary Auditor
	Cheong Choon Kee	Junior Flying Club	School Liaison Officer
		Edmund Cheung (Dr)	Institution of Production Engineers, Singapore Section
			Society of Manufacturing Engineers, Singapore Chapter
		Singapore Tool & Die Association	Vice-Chairman
		Singapore Robotics and Automation Association	Member, Editorial Board and Member, Conference Organising Committee
	Goh Yong Guan	Institution of Production Engineers, Singapore Section	Exco Member

Department	Name	Organisation	Appointment
Mechanical & Manufacturing Engineering	Kwek Seng Heng	Institution of Production Engineers, Singapore Section	Exco Member
	Lee Yow Fatt	Technical Committee on Testing and Rating of Room Air-conditioners, SISIR	Member
	Loh Peng Chum	Singapore Welding Society	President
		Shipbuilding & Repairing Trade Advisory Committee, VITB	Member
	Low Boon Meng	Society of Manufacturing Engineers, Singapore Chapter	Committee Member
	Quah Kok Wah	Singapore Robotics and Automation Association	Chairman
	Teng Chong Heng	Singapore Tool & Die Association	Councillor
	Teo Kai Tee	Technical Committee on Code of Practice for Welding, Cutting and Other Operations involving the use of Heat	Chairman
Nautical Studies	N S Advani (Capt)	Singapore Nautical Institute	Honorary Auditor
	Chew Kwok Tim (Capt)	Singapore Nautical Institute	Assistant Honorary Secretary
	Ibrahim A Karim (Capt)	Singapore Nautical Institute	Member of Council
	Jaafar b Sidin (Capt)	Chartered Institute of Transport	Member, Education Committee
	R F Short (Capt)	United World College of South East Asia	Member Board of Governors
	Soh Eng Sim	Singapore Institute of Management	Alternate Member of Governing Council
		Flying Angel Missions to Seamen	Member
	R D Vardon (Capt)	Singapore Nautical Institute	Honorary Secretary

IV Academic Linkages

Department	Institution	Area of Linkage
Chemical Process Technology	Plastics and Rubber Institute, London	Diploma in Chemical Process Technology (Polymer Technology) Advanced Diploma in Plastics Technology
	Singapore Institute of Food Science and Technology	Diploma in Chemical Process Technology (Food Technology) Advanced Diploma in Food Technology
	Sunderland Polytechnic, UK Thames Polytechnic, UK	External Examinership Software Engineering Development

Department	Institution	Area of Linkage
English Language	National University of Singapore and Ngee Ann Polytechnic	Undertook a joint United Nations Development Programme (UNDP) Project on English for Business and Technology
Marine Engineering	Associate of Marine Engineering Schools, UK Australian Maritime College	Curriculum Development Simulation Application
Mechanical & Manufacturing Engineering	Sheffield City Polytechnic, UK Institute of Industrial Management, UK	External Examinership Overseas Internal College for Certificate in Industrial Management and Diploma in Industrial Management awards
Nautical Studies	Newcastle-upon-Tyne Polytechnic	Curriculum Development in Business & Communications Studies

V Vacation Training Establishments

The Singapore Polytechnic wishes to express its thanks to the following organisations who have participated in our Vacation Training Programme:-

- | | | |
|--|---|--|
| 1 A D Consortium | 34 Avery South East Asia (Pte) Ltd | 67 CCW Acoustics Pte Ltd |
| 2 A P Lim Builders Pte Ltd | 35 Avimo Singapore (Pte) Ltd | 68 CDC-Construction & Development Pte Ltd |
| 3 A.C.E. Daikin (S) Pte Ltd | 36 B & Lee Electronics Engineering Pte Ltd | 69 Central Meridien Co |
| 4 AAF-Environmental Control Pte Ltd | 37 B.R.C. Weldmesh (SEA) Pte Ltd | 70 Central Provident Fund Board |
| 5 ACI Singapore Pte Ltd | 38 Baker Marine Energy Ltd | 71 Century Park Sheraton Singapore |
| 6 Acma Engineers Pte Ltd | 39 Beecham (Mfg) Singapore Pte Ltd | 72 CEP Private Limited |
| 7 Airedale Services Pte Ltd | 40 Beecham Pharmaceuticals (Pte) Ltd | 73 Chan & Chan Architects |
| 8 Albert L P Loh Consultants | 41 Bensons Metal Products Pte Ltd | 74 Chan Boon Teck Pte Ltd |
| 9 Alcan Far East (Pte) Ltd | 42 Berli Jucker (S'pore) Pte Ltd | 75 Chan Chee Wah Maunsell & Partners |
| 10 Alcom Systems | 43 Bescon Consultants Pte Ltd | 76 Changi International Airport Services Pte Ltd |
| 11 AMD (International) Ltd | 44 Biomedical Engg Dept, Ministry of Health | 77 Chartered Industries of Singapore Pte Ltd |
| 12 Analytical Laboratories (S) Pte Ltd | 45 Black & Decker (House ware) | 78 Chee Hup Construction Pte Ltd |
| 13 Ang Kheng Leng & Associates | 46 Black & Decker S.E.A. Pte Ltd | 79 Chee Soon Wah Chartered Architects |
| 14 Antara Koh Pte Ltd | 47 Bocotra Construction Pte Ltd | 80 Chi & Associates |
| 15 Antenna Engineering Asia Pte Ltd | 48 Bok Seng Engineering Pte Ltd | 81 Chloride Batteries S E Asia Pte Ltd |
| 16 Anti-Pollution Unit (ESD) | 49 Bored Piling (Pte) Ltd | 82 Chok & Associates Chartered Architect |
| 17 Applied Engineering Pte Ltd | 50 Bork Singapore Pte Ltd | 83 Chong Lee Leong Seng Co Pte Ltd |
| 18 Applied Research Corporation | 51 Botanicus Pte Ltd | 84 Chuan Seng Polybags Industry Pte Ltd |
| 19 Architects Team 3 | 52 Broadway Enterprises (Pte) Ltd | 85 Chung Swee Pooey & Sons |
| 20 Architects 61 | 53 Building Cost & Management Consultants | 86 Chynchen Associates Pte Ltd |
| 21 Archive Singapore Pte Ltd | 54 Building Design Consultants | 87 Ciba-Geigy S E Asia (Pte) Ltd |
| 22 Ariecs Pte Ltd | 55 Bulbs & Tubes Co Pte Ltd | 88 CKP Surveyors |
| 23 Artic Builders & Co (Pte) Ltd | 56 Bush Boake Allen Singapore Pte Ltd | 89 Climate Engineering Pte Ltd |
| 24 Asea Singapore Pte Ltd | 57 C & C Chartered Architects | 90 Cold Storage Manufacturing |
| 25 Asia Cement (S) Pte Ltd | 58 C.H.C. Industries Pte Ltd | 91 Communication Services Pte Ltd |
| 26 Asia Motor Co Pte Ltd | 59 Calltex (Asia) Ltd | 92 Computer Centre Pte Ltd, The |
| 27 Asia Radio Singapore Pte Ltd | 60 Camponon Bernard S'pore Piling Civil | 93 Computer Engineering Systems Pte Ltd |
| 28 Asia-Fortune (S) Pte Ltd | 61 Cape-Sing Lun Construction Pte Ltd | 94 Computer Memories (FE) Ltd |
| 29 Associated Geotechnical Services Pte Ltd | 62 Cardos Electronics Pte Ltd | 95 Concrete Innovators Co Pte Ltd |
| 30 Astec Toolcraft Pte Ltd | 63 Cast Laboratories Pte Ltd | |
| 31 Atlas Copco (SE Asia) Pte Ltd | 64 Castrol (Far East) Pte Ltd | |
| 32 ATS Computercentre Pte Ltd | 65 Castron Electronic Enterprises | |
| 33 Automation & Computer Engineering Pte Ltd | 66 CCL Chartered Surveyors | |

96	Construction Technology Pte Ltd	158	Evercrisp Snack Products (Asia) Limited	216	Hitachi Zosen Robin Dockyard Pte Ltd
97	Construction Cost Surveyors	159	Evergreat Construction Co Pte Ltd	217	Hitech Industries Pte Ltd
98	Consultant Consortium Int'l Pte Ltd	160	Evershine Auto Co (1977) Pte Ltd	218	Hltrek Engineering
99	Consulting, Inspection & Testing Services	161	Exsel Batteries Pte Ltd	219	Ho Kwong Yew & Sons Architects
100	Contium Engineers Far East Pte Ltd	162	Factory Inspectorate, Ministry of Labour	220	Hock Cheong Engineering Pte Ltd
101	Cooling Systems & Flexibles Pte Ltd	163	Fairchild Sales Pte Ltd	221	Hock Choon Construction Co.
102	Core Laboratories International Ltd	164	Fairchild Singapore Pte Ltd	222	Hock Chuan Ann Construction Pte Ltd
103	CPM/Pacific Pte Ltd	165	Fame Engineering & Trading Pte Ltd	223	Hock Lian Seng Engineering (Pte) Ltd
104	Cranpac Singapore Pte Ltd	166	Fantastic Electrical Contractor	224	Hoe Huat Construction & Engg Pte Ltd
105	Crown Cork & Seal (S'pore) Co Ltd	167	Far East-Levingston Shipbuilding Ltd	225	Hoe Yong Heng Construction
106	Cummins Diesel Sales Corporation	168	Federal Paint Factory (S) Pte Ltd	226	Honeywell Pte Ltd
107	Cycle & Carriage Ltd	169	Fetim Pte Ltd	227	Hong Chern Mechanical Engg Pte Ltd
108	Debeg Pte Ltd	170	FG Land Surveys Pte Ltd	228	Hong Leong Industries Mfg Ltd
109	Del Mar Furniture Industries (S) Pte Ltd	171	Fisher Controls Pte Ltd	229	Hong Leong Finance Ltd
110	Delta Switchgear Mfg Pte Ltd,	172	Flexon Pte Ltd	230	Housing & Development Board
111	Denka Singapore Pte Ltd	173	Foxboro Far East Pte Ltd	231	How Huai Hoon Registered Surveyor
112	Department of Pathology	174	Fraser & Neave (S) Pte Ltd	232	Huan Chew Oil Trading Pte Ltd
113	Department of Scientific Services	175	Fugro (S) Pte Ltd	233	Huat Heng Engineering Co.
114	Descon Chartered Architects & Planners	176	G.E. (USA) Aviation Service Operation Pte Ltd	234	Hughes Tool Company (FE) Pte Ltd
115	Design 2 Architects	177	G.T.M. - Coignet J.V.	235	Hunt Chemical Asia/Pacific Pte Ltd
116	Design Architects	178	Gamma Electronic Pte Ltd	236	Hup Swee Huat Construction Pte Ltd
117	Design Development Architects	179	GE (USA) Asia Company	237	Hyatt Regency Singapore
118	Det Norske Veritas (SEA) Pte Ltd	180	GE (USA) Appliance Components Pte Ltd	238	Hytech Builders Pte Ltd
119	Development Resources (Pte) Ltd	181	GE (USA) Controls Pte Ltd	239	ICI Paints (Singapore) Pte Ltd
120	Diethelm Industries Pte Ltd	182	GE (USA) Hermetic Motor Operation Pte Ltd	240	Impeg Construction Co
121	Digital Engineering (S) Pte Ltd	183	GE (USA) TV & Appliance Pte Ltd	241	In-line Engineering Pte Ltd
122	Digital Equipment International Ltd	184	GE Company of Singapore Pte Ltd, The	242	Incom Singapore Pte Ltd
123	Diversitec Distributors Pte Ltd	185	General Automotive Services Pte Ltd	243	Indeco
124	DP Architects Pte	186	General Electr & Instrumentation Corp Pte Ltd	244	Indeco Engineers Pte Ltd
125	Dragages Sembawang Construction Pte Ltd	187	General Engineering & Trading (S) Pte Ltd	245	Indel-Davis (Singapore) Pte Ltd
126	Dynachem (S) Pte Ltd	188	GEO Engineers Private Limited	246	Industrial & Offshore Computer Services Pte Ltd
127	Dyno Industries (S) Pte Ltd	189	George Cohen (Far East) Pte Ltd	247	Industrial Testing & Analytical Lab Pte Ltd
128	East Machinery Pte Ltd	190	George Low Company	248	Instant Solutions
129	Eastern Developers Pte Ltd	191	Geotex Surveyors Pte Ltd	249	Intel S'pore Ltd
130	Eastern Industries Pte Ltd	192	Glaxochem (Pte) Ltd	250	Inter-draft Technical Services Ltd
131	Eastern Realty Company Ltd	193	GM Singapore Pte Ltd	251	Interconics Industries S'pore Pte Ltd
132	Eastern Wire Mfg. Co (Pte) Ltd	194	Golden Mile Services (Pte) Ltd	252	Interdesign
133	Easternland Piling Co Pte Ltd	195	Goldlite Pte Ltd	253	International Computers Ltd
134	EB Communications (S) Pte Ltd	196	Great Sea Construction Pte Ltd	254	International Project Consultants
135	Econ Piling Pte Ltd	197	Greatearth Construction Pte Ltd	255	ITF Electronic Components Associates Pte
136	Econ Resources Pte Ltd	198	Ground & Sharp Cutter Servicing	256	IVS Richard Yim Architects
137	Eka General Construction Pte Ltd	199	Group Design Architects	257	J K Foo & Associates Surveyor Pte Ltd
138	Elastomers (S) Pte Ltd	200	Guan Ho Construction Co Pte Ltd	258	Jack Chia Industries (S) Pte Ltd
139	Electech Distribution Systems Pte Ltd	201	Guan Tong Construction Co Pte Ltd	259	Jason Electronics Pte Ltd
140	Electro Mechanical Industries Pte Ltd	202	Guen Heng Machinery Works	260	Job Associates (Pte) Ltd
141	Emhart Industries Pte Ltd	203	Gul Engineering (Pte) Limited	261	John Connell Consultants Pte Ltd
142	Enamelled Wire & Cable (S) Pte Ltd	204	Gunac Enterprises (Pte) Ltd	262	John Lysaght (SEA) Pte Ltd
143	Enclech Engineering Co Pte Ltd	205	Hagemeyer Electronics (S) Pte Ltd	263	Jones Enterprises Pte Ltd
144	Enercon Engineering Pte Ltd	206	Haxxon Pte Ltd	264	Jotun NOF (S) Pte Ltd
145	Eng Fong Construction Pte Ltd	207	Henderson Motors	265	Jurong Engineering Ltd
146	Eng Hup Heng Construction Pte Ltd	208	Heng Huat Book Binder Co	266	Jurong Industries Ltd
147	Eng Lim Construction Co Pte Ltd	209	Hewlett Packard Sales (M) Sdn Bhd	267	Jurong Shipyard Ltd
148	Engineering Structures Consultants Pte Ltd	210	Hewlett Packard (S) Pte Ltd	268	Jurong Town Corporation
149	Engineering Construction Pte Ltd	211	Hiap Hoe & Co Pte Ltd	269	Jyoto Works (S) Pte Ltd
150	Engineering Associates	212	Hickson's Timber Preservation (S) Pte Ltd	270	K H Chong & Associates
151	Engineering Resources Pte Ltd	213	Hitachi Cable (S) Pte Ltd	271	K S Ng Partnerships Quantity Surveyors
152	Environ (S) Pte Ltd	214	Hitachi Chemical (S) Pte Ltd	272	Kajima Hazama JDC (JV)
153	Epan Cable & Wire (Pte) Ltd	215	Hitachi Plant Engg & Construction Co Ltd	273	Kajima-Keppel Joint Venture
154	Esab Singapore Pte Ltd			274	Kaneka Singapore Co (Pte) Ltd
155	Esso Singapore Pte Ltd			275	Kee Soon Engineering Pte Ltd
156	European Standard Electronics Pte Ltd			276	Kenda (S) Pte Ltd, (EE Dept)
157	Everbloom Mushroom (Pte) Ltd				

277	Kentucky Fried Chicken (S) Pte Ltd	335	Matsushita Technical Center (S) Pte Ltd	393	Pacific International Lines Pte Ltd
278	Kenwa Plastics Industries Pte Ltd			394	Pacific Vinitex Pte Ltd
279	Keppel Shipyard Limited	336	Mayor Pte Ltd	395	Pan Malaysia Cement Works (S) Pte Ltd
280	Kerry Hill Architects	337	Maystar Engineering Works		
281	KES Systems & Services Pte Ltd	338	McClelland International, Ltd	396	Pan World Precision Engineering Pte Ltd
282	Kestronics Singapore Pte Ltd	339	Mechanical Handling (S) Pte Ltd		
283	Kian Gwan Electric Pte Ltd	340	Mentor Graphics (S) Pte Ltd	397	Panther Private Ltd
284	Kim Tian Computer Trading (S) Pte Ltd	341	Metal Box Singapore Limited	398	Panweld Engineering Pte Ltd
		342	Metalock (S) Pte Ltd	399	Parison Precision & System Engineering
285	Kimly Construction Pte Ltd	343	Metax Engineering Corpn Pte Ltd		
286	King Radio Corporation Singapore	344	Metrobilt Construction Pte Ltd	400	Parkway Properties Pte Ltd
287	Kongsi Construction Pte Ltd	345	Microelectronic Packaging (S) Pte Ltd	401	Paul Y Construction (S) Pte Ltd
288	Konsortium Bernas Arkitek	346	Ministry of the Environment	402	Pavilion Intercontinental Singapore, The
289	KPK Quantity Surveyors	347	Ministry of Defence		
290	Kumagai-Zeneccon Construction Pte Ltd	348	Mirason Packaging Industries Pte Ltd	403	Peerless Engineering Pte Ltd
		349	Mitsubishi S'pore Heavy Industries Pte Ltd	404	Penta-Ocean Construction Co Ltd
291	Kumpulan Akitek			405	Pentex-Schweizer Circuits Pte Ltd
292	Kyodo Electronic (S) Pte Ltd	350	Mitsui Construction Co Ltd	406	Petrochemical Corp of S'pore (Pte) Ltd
293	L & M Prestressing Pte Ltd	351	Mobil Oil Singapore Pte Ltd		
294	L & R Engineering (Singapore)	352	Modern Packaging Industries Pte Ltd	407	Petrolite Pacific Pte Ltd
295	Lam Cheong Construction Co	353	Moh & Associates (S) Pte Ltd	408	Phang Contractor
296	Lam Soon Oil & Soap Mfg (S) Pte Ltd	354	Molex Singapore Pte Ltd	409	Philips Petroleum S'pore Chemicals Pte Ltd
297	Langdon Every and Seah	355	Motorway International Tyre Services Pte		
298	Lau Chok Metal Engineering Works			410	Philips Singapore Pte Ltd (Toa Payoh)
299	Lau Downie & Partners	356	Mott Hay & Anderson Asia Pte	411	Philips Singapore Pte Ltd (Jurong)
300	Lau Teo & Yong Chartered Quantity Surveyors	357	MTU Singapore Pte Ltd	412	Phua Consultants
301	Lead Engineering Consultants	358	Mulpha Marketing (S) Pte Ltd	413	Pillar Construction Company
302	Leblond Makino Asia Pte Ltd	359	Mustafa Wong & Rakan Sdn Bhd	414	Pioneer Die-casting Industries Pte Ltd
303	Lee Berakan Consulting Engineers	360	N C Senan & Sons Pte Ltd		
304	Lee Kim Tah Pte Ltd	361	N.C. Co Jurutera Ukur Perunding Sdn Bhd	415	Plastic & Metal Industries of S'pore Pte
305	Lee Kum Kit Chartered Architect	362	Nalco South East Asia Pte Ltd	416	Poly Engineers Pte Ltd
306	Lee Sian Teck Chartered Architect	363	National Grain Elevator Ltd	417	Polyplate Industrial Co Pte Ltd
307	Leeds & Northrup Singapore Pte Ltd	364	National Iron & Steel Mills Ltd	418	Polyskill Engineering Pte Ltd
308	Lefa Gearing Company	365	National Laundry Services Pte Ltd	419	Polytechnic Industries Co Pte Ltd
309	Leong Seng & Co	366	NCR Singapore Sdn Bhd	420	Port of Singapore Authority
310	Light Electrical Industries	367	Neutron Electronic Company	421	Precision Casting Pte Ltd
311	Lighting Inc & Services Pte Ltd	368	Nemic-Lambda (S) Pte Ltd	422	Preece, Cardew & Rider (S.E. Asia)
312	Lightweight Concrete Pte Ltd	369	Neo Corporation Pte Ltd	423	Premier Milk (S) Pte Ltd
313	Lim Chan Hoe & Partners	370	Nestle S'pore Pte Ltd	424	Presco Pte Ltd
314	Lim Kah Ngam Ltd	371	Ng Khang Kee & Bros Organisation Sdn Bhd	425	Price Asia Manufacturing Co Pte Ltd
315	Lim Wee Hung Tillyard Pte Ltd			426	Prima Limited
316	Loh & Loh Construction Pte Ltd	372	NGL Singapore Pte Ltd	427	Promet Private Ltd
317	Loh Hoe Peng & Associates Chartered Architects	373	Nishimatsu Construction Co Ltd	428	PTL Construction Services
		374	NMB Singapore Ltd	429	Public Utilities Board
318	Low Ah Long Chartered Architect	375	Norelco Engineering Works & Services	430	Public Works Department
319	Low Keng Huat Construction Co (S) Pte Ltd			431	Pyramid Construction Engineering Pte Ltd
320	Low Keng Huat Construction Co Sdn Bhd	376	North Shipyard (Pte) Ltd	432	QS Partnership
		377	Occidental Chemical Company Pte Ltd	433	Quants Associates Chartered Surveyors
321	Lum Chang Building Contractors Pte Ltd	378	OD Architects		
322	M C Packaging Pte Ltd	379	Oh Teck Thye (Pte) Ltd	434	R E Morris International Pte Ltd
323	M K Electric (S) Pte Ltd	380	Ohbayashi Corporation	435	Racal Survey (Singapore) Pte Ltd
324	Mac Electric S'pore Pte Ltd	381	Ohbayashi-Okumura Joint Venture	436	Radac Pte Ltd
325	Malayan Breweries (S) Pte Ltd	382	Okamoto (S) Pte Ltd	437	RAK Materials Consultants Pte Ltd
326	Malayan Credit Properties (Pte) Ltd	383	Olivetti (S) Pte Ltd	438	Rank O'Connor's S'pore Pte Ltd
327	Malayan Sugar Manufacturing Co Berhad	384	Ong & Ong Architects	439	Rank Xerox (Overseas) Ltd
		385	Ong Chwee Kou Bldg Contractors Pte Ltd	440	Raymond H C Chan & Associates
328	Marine Fisheries Research Department	386	ONGCHINBEE Architects	441	Rediffusion Services (S) Pte Ltd
		387	Ordnance Development & Engg Co (S) Pte Ltd	442	Reed Rockbit Co Int'l Ltd
329	Marissco (Pte) Ltd			443	Regional Development Services Pte Ltd
330	Mark Grow Engineering Pte Ltd	388	Overseas Shipyard Pte Ltd	444	Registry of Vehicles
331	Mass Rapid Transit Corporation	389	Overseas Union Project Management Pte Ltd	445	Reliability S'pore Pte Ltd
332	Matsushita Refrigeration Ind (S) Pte Ltd	390	P & T Architects	446	Reliance Contractors (Pte) Ltd
		391	P.T Avlau Indonesia Fabricators	447	Resources Development Corpn (Pte) Ltd
333	Matsushita Electronics (S) Pte Ltd	392	Pacific Construction Co Ltd	448	Rheem Closures (FE) Pte Ltd
334	Matsushita Refrigeration Ind (S) Pte Ltd				

449	Richard Liong & Assc Chartered Architects	508	Singapore Cement Mfg Co (Pte) Ltd	562	Teng & Associates
450	Richvein Pte Ltd	509	Singapore Engg & Consultancy Services Pte Ltd	563	Teo Teck Huat (S) Pte Ltd
451	Rite-Mix Private Limited	510	Singapore Tobacco Co (Pte) Ltd	564	Testconsult CEBTP Pte Ltd
452	Robin Construction (Pte) Ltd	511	Singapore United Estates (Pte) Ltd	565	Tet Wai Computer Services (Pte) Ltd
453	Rockwell International Mfg Pte Ltd	512	Singapore Aero-Engine Overhaul (Pte) Ltd	566	Texas Instruments Singapore (Pte) Ltd
454	Rotary Switchgear & Testing Pte Ltd	513	Singapore Land Limited	567	Thomas Cowan & Co Pte Ltd
455	Rothmans of Pall Mall (S) Pte Ltd	514	Singapore Airport Terminal Services (Pte) Ltd	568	Thomson-CSF Semiconductor (S) Pte Ltd
456	RSEA International Pte Ltd	515	Singapore Polymer Corporation (Pte) Ltd	569	Tigers Polymer Singapore Pte Ltd
457	Rush & Tompkins Singapore Pte Ltd	516	Singmarine Shipyard (Pte) Ltd	570	Times Printers Sdn Bhd
458	S L Piling Pte Ltd	517	SISIR	571	Times Publishing Bhd
459	S P Chua Pte Ltd	518	SKF Manufacturing Singapore (Pte) Ltd	572	Tiong Aik Construction Pte Ltd
460	S'pore Electronic & Engineering Pte Ltd	519	So Say Cheong Pte Ltd	573	Tobishima/Takenaka Joint Venture
461	S'pore Shipbuilding & Engg Pte Ltd	520	Societe Generale D'Entreprises Construction	574	Toho Rubber Process Co Pte Ltd
462	SAA Partnership	521	Soil Investigation (Pte) Ltd	575	Tong Hup Him Construction Pte Ltd
463	Sanyo Industries (S) Pte Ltd	522	Soilcrete Private Limited	576	Tong Hup Seng Construction Co Pte Ltd
464	Sanyo-Ik Color (Pte) Ltd	523	Solar Industries	577	Toshiba Singapore Pte Ltd
465	Sato Kogyo Co., Ltd	524	Solo Industry Pte Ltd	578	Travenol Laboratories Pte Ltd
466	Scott & English Ltd	525	Sonex Trading	579	TRW Turbine Overhaul Services Pte Ltd
467	Seagate Technology (S) Pte Ltd	526	South Island Elect & Engg Co	580	Tsung Dao Pte Ltd
468	See Hup Seng (Pte) Ltd	527	Spices of the Orient	581	Tuh Fuh Lee & Lee Bay Tseng
469	Selco Shipyard Pte Ltd	528	Squire Mech Pte Ltd	582	Tung Mung Textile Co (S) Pte Ltd
470	Sembawang Engineering Pte Ltd	529	Ssanyong Construction Co Ltd	583	Twentieth Century Standard Brands Pte Ltd
471	Sembawang Shipyard Ltd	530	Stahl Chemical Asia Pte Ltd	584	UCT Pte Ltd
472	Semicon Advance Technology (S) Pte Ltd	531	Steady Piling Engineering Pte Ltd	585	Unify Engineering Pte Ltd
473	Seng Cheong Tin Fty (Pte) Ltd	532	Steen Consultants Pte Ltd	586	Unisource Pte Limited
474	Seng Motor Hung	533	Steensen Varming Consulting Engineers	587	United Central Engg Works (S) Pte Ltd
475	SetSCO Pte Ltd	534	Sugar Industry of Singapore Ltd	588	United Surveyors Pte Ltd
476	SGS Semiconductor (Pte) Ltd	535	Sum Cheong Piling (Pte) Ltd	589	United Wealth Industries Pte Ltd
477	SGS Singapore (Pte) Ltd	536	Sumber Engineering (S) Pte Ltd	590	Urban Redevelopment Authority
478	Shell Eastern Petroleum (Pte) Ltd	537	Sun Kong Wah Mechanical Engineering Works	591	Utraco Pte Ltd
479	Shimano (S) Pte Ltd	538	Survey Department	592	Van Der Horst Limited
480	Shimizu Construction Co Ltd	539	Survey Service Consultants	593	Van Leer Singapore Pte Ltd
481	Shinluck International (S) Pte Ltd	540	Swanmet Engineering Pte Ltd	594	Varta Private Ltd
482	SIA Properties (Pte) Ltd	541	Swee Construction & Transport Co Pte Ltd	595	Veterinary Public Health Laboratory
483	Siang Lim Builders Pte Ltd	542	Syarikat Pembinaan Yeoh Tiong Lay Sdn Bhd	596	Vickers Systems Pte Ltd
484	Siemens Components Pte Ltd	543	Systems Design Pte Ltd	597	Victory Industrial Co Pte Ltd
485	Sim Ho Engineering Works	544	Systems Technology Pte Ltd	598	Vosper Pte Ltd
486	Sime Darby Edible Products Ltd	545	T C Sin & Associates Consulting Engineers	599	VSI Systems Pte Ltd
487	Sime Darby Singapore Limited	546	T Y Lin South-east Asia (Pte) Ltd	600	Wah-Chang Engineering Corporation Pte Ltd
488	Simon Lim, Oh & Teo Bldg Cost Consultants	547	Tai Shiong Tool & Die Co	601	Watson E P Industries Pte Ltd
489	Sin Cheong Containers Mfg Co Pte Ltd	548	Tai Win Construction Pte Ltd	602	Watt & Akkermans Pte Ltd
490	Sinbelco Construction Pte Ltd	549	Takasago Thermal Engineering Co. Ltd	603	Wee & Associates Akitek
491	Sing Huat Hardware & Machinery Pte Ltd	550	Takenaka Komuten Co Ltd	604	Wee Poh Construction Co (Pte) Ltd
492	Sing Lun Engg Pte Ltd	551	Tan Chong Realty (Pte) Ltd	605	Weltron Automation & Engineering Pte Ltd
493	Singa Plastics Ltd	552	Tanaka Electronics (S) Pte Ltd	606	Wendy International (Pte) Ltd
494	Singapore Polytechnic	553	Tang & Teo Architects	607	Wescon (Asia) Pte Ltd
495	Singapore Slipway & Engg Co Pte Ltd	554	Tang Wee Houe Architects	608	West Pharmapack Pte Ltd
496	Singapore Aerospace Maintenance Co Pte Ltd	555	Tanglin Corporation Pte Ltd	609	White Industries Singapore Pte Ltd
497	Singapore Piling & Civil Engg Pte Ltd	556	Teamdesign Associates	610	Wild Singapore Pte Ltd
498	Singapore Oilseal Co Pte Ltd	557	Technichem Laboratory Services (S) Pte Ltd	611	Wireforms Pte Ltd
499	Singapore Plastic Products Pte Ltd	558	Teck Hua Construction Pte Ltd	612	Worthington Pump (Asia) Pte Ltd
500	Singapore Refining Co Pte Ltd	559	Teh Leong Huat Construction Pte Ltd	613	WT Partnership
501	Singapore Semiconductor Pte Ltd	560	Telecoms	614	Xiandai Equipment (S) Pte Ltd
502	Singapore Piling & Civil Engg Pte Ltd	561	Tenby Electrical Accessories Pte Ltd	615	Y K Tham Engineering Works
503	Singapore Zoological Gardens			616	Y K Wong Construction Co Pte Ltd
504	Singapore Automotive Engineering Pte Ltd			617	Y S Lau Consulting & Civil Structural Engineer
505	Singapore Bus Service (1978) Ltd			618	Yang Ah Kang & Sons Pte Ltd
506	Singapore Broadcasting Corporation			619	Yeo Hiap Seng Ltd
507	Singapore Chemi-con (Pte) Ltd			620	Yokogawa Corporation of Asia Pte Ltd
				621	Zenecon Sdn Bhd

VI Scholarships, Bursaries & Study Loans

The following scholarships, bursaries and study loans were awarded to Singapore Polytechnic students during the 1985/86 session:

Awards	No. of Awards	Total Value of Awards
1 BP Bursary	10	\$ 10,000
2 Chew Boon Lay Bursary	3	\$ 3,000
3 City Developments Ltd Bursary	2	\$ 2,000
4 CONTECH Bursary	2	\$ 3,000
5 Cycle & Carriage Scholarship	1	\$ 1,750
6 Esso Marine Scholarship	6	\$ 9,000
7 Esso Sports Scholar Award	3	\$ 2,400
8 Forward Oversea Credit Ltd Scholarship	3	\$ 3,000
9 Hongkong & Shanghai Banking Corporation Centenary Scholarship	1	\$ 1,000
10 Hong Leong Foundation Scholarship	2	\$ 2,000
11 Institution of Engineers Singapore Scholarship	2	\$ 1,500
12 Insurance Corporation of Singapore Scholarship	2	\$ 3,200
13 Jaian Kayu CCCC Bursary	2	\$ 1,200
14 James Raper Trust Fund Scholarship	6	\$ 6,000
15 Kampong Glam CCCC Scholarship	1	\$ 800
16 Keppel Shipyard Ltd Scholarship	2	\$ 3,200
17 Kwan Im Thong Hood Cho Temple Scholarship	8	\$ 4,000
18 Lee Foundation Bursary	13	\$ 6,500
19 Lee Foundation Study Grant	7	\$ 4,000
20 Lembaga Biasiswa Kenangan Maulud (LBKM) Bursary	11	\$ 5,500
21 Lim Kah Ngam Bursary	2	\$ 2,000
22 Lim Song Scholarship	3	\$ 3,600
23 Majlis Ugama Islam (MUIS) Bursary	23	\$ 11,500
24 McDermott SEA Pte Ltd Scholarship	1	\$ 1,000
25 Mountbatten CCCC Bursary	4	\$ 3,000
26 MSE Angullia Muslim Education Fund Bursary	12	\$ 5,900
27 Nam Hoe Scholarship	1	\$ 1,000
28 Nee Soon CCCC Bursary	1	\$ 1,000
29 Ngee Ann Kongsi Scholarship	4	\$ 8,000
30 Ngee Ann Kongsi Bursary	2	\$ 1,200
31 NTUC Comfort Scholarship	2	\$ 3,500
32 NTUC Comfort Bursary	12	\$ 18,000
33 NTUC Fairprice Scholarship	5	\$ 7,500
34 Oversea-Chinese Banking Corporation Scholarship	6	\$ 9,000
35 People's Scholarship Fund	12	\$ 14,400
36 Pesi B Davar Memorial Scholarship	29	\$ 43,500
37 Professional Engineers Board Bursary	6	\$ 6,000
38 Queenstown Scholarship Fund Award	2	\$ 1,500
39 Resources Development Corporation Scholarship	2	\$ 4,000
40 Reuben Meyer Trust Fund Scholarship	20	\$ 15,000
41 Sembawang Shipyard Bursary	3	\$ 3,000
42 Singapore Airlines Group Bursary	2	\$ 2,000
43 Singapore Association of Shipbuilders & Repairers Scholarship	2	\$ 2,000
44 Singapore Buddhist Lodge Bursary	2	\$ 600
45 Singapore Chinese Chamber of Commerce Foundation Scholarship	5	\$ 10,000
46 Singapore Cycle & Motor Traders' Association Scholarship	1	\$ 1,000
47 Singapore Government Merit Bursary	5	\$ 7,500
48 Singapore Government Special Malay Bursary	2	\$ 1,600
49 Singapore Government Study Loan	9	\$ 8,500
50 Singapore Hokkien Foundation Scholarship	4	\$ 4,000
51 Singapore International Chamber of Commerce Rubber Association Scholarship	12	\$ 13,950
52 Singapore Labour Foundation Study Loan	3	\$ 4,500
53 Singapore Manufacturers' Education & Training Fund Scholarship	3	\$ 3,000
54 Singapore Masonic Scholarship	1	\$ 1,500
55 Singapore Nanyang Khek Community Guild Bursary	3	\$ 4,500
56 Singapore Polytechnic Students' Union Bursary	15	\$ 15,000
57 Singapore Polytechnic Study Loan	65	\$ 61,790
58 Singapore Port Workers Union Bursary	4	\$ 2,800
59 Singapore Shipping Association Scholarship	3	\$ 3,600
60 Singapore Shipping Association Bursary	3	\$ 3,600
61 Singapore Tobacco Company Scholarship	11	\$ 16,500
62 Soh Chuan Swee Memorial Scholarship	1	\$ 700
63 Tan Lian Boh Bursary	1	\$ 1,000
64 Tan Sri Dr Runme Shaw Scholarship	1	\$ 900
65 United Overseas Bank Group Scholarship	1	\$ 1,500
Total	398	\$408,690

VII Financial Statements & Auditors' Report

We have audited the accounts set out on pages 34 to 43.

In our opinion,

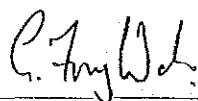
- (a) the accounts are properly drawn up in accordance with the Singapore Polytechnic Act, Cap. 180 so as to give, on the basis of the significant accounting policies disclosed in note 1 to the accounts, a true and fair view of the state of affairs of the Singapore Polytechnic at 31 March 1986, and its recurrent income and expenditure account for the year ended on that date;

THE SINGAPORE POLYTECHNIC
(Established under the Singapore Polytechnic Act, Cap. 180)

BALANCE SHEET
31 MARCH 1986

FUNDS' BALANCES AND LIABILITIES

	<u>Note</u>	<u>1986</u> S\$	<u>1985</u> S\$
ACCUMULATED FUND	2	1,882,835	870,653
GENERAL FUND	3	126,004	276,006
MISCELLANEOUS FUNDS	4	<u>31,358,111</u>	<u>21,805,437</u>
Funds' balances		<u>33,366,950</u>	<u>22,952,096</u>
LONG TERM LOANS – net of portion shown under current liabilities	5	<u>1,482,506</u>	<u>2,350,986</u>
CURRENT LIABILITIES			
Current portion of long term loans	5	121,708	314,019
Sundry creditors and accruals		10,073,033	7,758,566
Deposits held and sundry credit balances		747,252	1,761,972
Bank overdraft – unsecured		256,508	1,098,411
Total Current Liabilities		<u>11,198,501</u>	<u>10,932,968</u>
TOTAL FUNDS' BALANCES AND LIABILITIES		<u><u>S\$46,047,957</u></u>	<u><u>S\$36,236,050</u></u>



 ADJUNCT PROFESSOR GEORGE FONG WAH
 Chairman
 Board of Governors

- (b) the accounting and other records including the fixed assets register required by the Act to be kept by the Singapore Polytechnic have been properly kept in accordance with the provisions of the Act; and
- (c) the receipt, expenditure, and investment of monies and the acquisition and disposal of assets of the the Singapore Polytechnic during the year have been made in accordance with the provisions of the Act.

COOPERS & LYBRAND
Public Accountants, Singapore

ASSETS

	Note	1986 S\$	1985 S\$
LOANS TO STAFF – net of portion shown under current assets	6	20,032,614	13,790,701
LOANS TO STUDENTS – net of portion shown under current assets	7	150,377	103,717
CURRENT ASSETS			
Current portion of loans to staff	6	1,945,045	1,539,141
Current portion of loans to students	7	18,838	18,415
Due from Ministry of Finance		1,628,817	–
Sundry debtors, deposits and prepayments		247,894	134,246
Singapore Government Treasury bills		300,000	297,812
Fixed deposits		17,524,240	17,572,734
Cash and bank balances		2,602,239	1,098,774
Total Current Assets		24,267,073	20,661,122
DEFERRED RENT RECOVERABLE	8	1,597,893	1,680,510
TOTAL ASSETS		S\$46,047,957	S\$36,236,050

KHOO KAY CHAI
Principal

The notes on pages 36 to 43 form part of the accounts.

THE SINGAPORE POLYTECHNIC
(Established under the Singapore Polytechnic Act, Cap. 180)

RECURRENT INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31 MARCH 1986

	Note	1986 S\$	1985 S\$	Estimates for 1986 (Unaudited) S\$
INCOME				
Government contributions		56,992,500	49,620,610	56,649,677
Fees from students	9	7,931,282	5,688,022	7,581,000
Adjustment of prior year – Surplus of provision		218,074	36,407	–
Rental collections		70,291	71,356	69,000
Sales of prospectus		20,774	28,217	14,000
Miscellaneous		4,100	3,350	4,000
Total Income		65,237,021	55,447,962	64,317,677
Deduct				
EXPENDITURE				
Personnel emoluments	10	51,812,073	45,038,339	52,412,077
Maintenance and upkeep	11	4,384,757	4,159,500	4,395,992
Materials for class use		2,705,918	2,289,533	2,705,981
Staff development		1,490,679	1,502,428	1,490,680
Administration		804,025	629,549	806,436
Replacement and upgrading of laboratory equipment		472,754	486,181	472,759
Library books		369,000	336,000	369,000
Transport, travelling and passages		190,535	244,019	190,548
Furniture and equipment		453,031	260,715	453,823
Property tax		81,765	124,689	81,765
United Nations Development Programme		68,062	58,956	15,250
Miscellaneous		934,040	1,009,993	923,366
Total Expenditure		63,766,639	56,139,902	64,317,677
Surplus/(Deficit) transferred to/ (from) the Accumulated Fund	2	S\$ 1,470,382	S\$ (691,940)	S\$ –

The notes on pages 36 to 43 form part of the accounts.

NOTES TO THE ACCOUNTS – 31 MARCH 1986

1. SIGNIFICANT ACCOUNTING POLICIES

(a) Basis of Accounting

- (i) The accounts of The Singapore Polytechnic are prepared under the historical cost convention.
- (ii) With the exception of recurring expenditure, the Singapore Polytechnic adopts the cash basis of accounting, that is, transactions are recognised and recorded in the books when cash has been paid or received.
- (iii) Recurring expenditure such as purchases of laboratory and other equipment and materials are budgetted for annually. These expenses are taken up in the recurrent income and expenditure account based on requisitions which were already included in the budget.

(b) Fund Accounting

- (i) The accounts of The Singapore Polytechnic are maintained substantially in accordance with the principles of 'Fund Accounting'. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes as funds in relation to activities or objectives specified by The Board of Governors.
- (ii) Government grants received for works and buildings, furniture and equipment are credited to current liabilities. Expenses incurred are debited directly against the grants and included in the notional net book value of fixed assets in Note 15.
- (iii) Government grants for recurring expenditure are taken in as income in the recurrent income and expenditure account.

(c) Fixed Assets

Fixed assets are written off to the recurrent income and expenditure account in the year of purchase. Any assets replaced during the year are charged to the income and expenditure account at cost less the trade-in value or proceeds from the disposal of the old assets. The notional net book value of the fixed assets is shown in Note 15.

(d) Singapore Government Treasury Bills

These are stated at cost less provision for any permanent decline in value.

(e) Foreign Currency

Foreign currency assets and liabilities are converted into Singapore dollars at the rates of exchange approximating to those ruling at the balance sheet date and transactions during the year are converted at rates ruling on the transaction dates. Differences on exchange are included in the recurrent income and expenditure account.

2. ACCUMULATED FUND

	<u>1986</u> S\$	<u>1985</u> S\$
Balance at beginning of the year	870,653	1,104,393
(Less)/Add		
Government Grant FY 85/86 from Staff Development Account	<u>(458,200)</u>	<u>458,200</u>
	412,453	1,562,593
Surplus/(Deficit) in recurrent income and expenditure account	<u>1,470,382</u>	<u>(691,940)</u>
Balance at the end of the year	<u>S\$ 1,882,835</u>	<u>S\$ 870,653</u>

3. GENERAL FUND

	<u>1986</u> S\$	<u>1985</u> S\$
Balance at beginning of the year	276,006	273,608
Add		
Interest received from fixed deposits and current accounts of development estimates, recurrent grants, and caution money	634,947	1,128,020
Rental of rooms	<u>5,051</u>	<u>4,900</u>
	916,004	1,406,528
Less		
Transfer to Staff Development Fund (Note 4)	—	(400,000)
Transfer to Other Funds (Note 4)	—	(603,000)
Transfer to 30th Anniversary expenses	—	(127,522)
Transfer to External Examination Revolving Fund (Note 4)	(150,000)	—
Transfer to Innovation Fund (Note 4)	<u>(640,000)</u>	<u>—</u>
Balance at end of the year	<u>S\$ 126,004</u>	<u>S\$ 276,006</u>

THE SINGAPORE POLYTECHNIC
(Established under the Singapore Polytechnic Act, Cap. 180)

NOTES TO THE ACCOUNTS — 31 MARCH 1986 (cont'd)

4. MISCELLANEOUS FUNDS

					ADD
1986	Note	Balance at beginning of the year S\$	Contributions during the year S\$	Interest Received S\$	Grants from the Government S\$
Revolving Fund:	6				
Housing Loan Fund		12,945,550	—	819,580	6,315,327
Loan Fund		968,556	—	47,324	—
Renovation Loan Fund		2,634,144	—	138,458	379,000
Staff Development Fund	3	1,098,616	—	52,400	—
Computer Loan Fund		354,725	—	16,798	—
Students' Loan Fund	7	270,995	517	19,376	—
Scholarships and Bursaries		130,213	708,052	6,861	—
Other Funds	3	3,402,638	918,158	206,123	840,813
Total Miscellaneous Funds		S\$21,805,437	S\$ 1,626,727	S\$ 1,306,920	S\$ 7,535,140
1985					
Revolving Fund:	6				
Housing Loan Fund		8,901,523	—	598,037	3,445,990
Loan Fund		927,491	—	41,065	—
Renovation Loan Fund		1,171,897	—	91,247	1,371,000
Staff Development Fund	3	651,467	—	48,158	—
Computer Loan Fund		336,425	—	18,300	—
Students' Loan Fund	7	270,995	—	—	—
Scholarships and Bursaries		119,866	326,860	10,647	—
Other Funds	3	2,492,903	658,930	226,266	—
Total Miscellaneous Funds		S\$14,872,567	S\$ 985,790	S\$ 1,033,720	S\$ 4,816,990

		LESS				
Other Revenue Received	Transfers from General Fund	Total	Payment of Awards to Students	Disburse- ments	Balance at the end of the year	
S\$	S\$	S\$	S\$	S\$	S\$	
-	-	20,080,457	-	-	20,080,457	
-	-	1,015,880	-	-	1,015,880	
-	-	3,151,602	-	-	3,151,602	
-	-	1,151,016	-	-	1,151,016	
-	-	371,523	-	-	371,523	
-	-	290,888	-	-	290,888	
-	-	845,126	561,252	-	283,874	
2,036,206	790,000	8,193,938	30,020	3,151,047	5,012,871	
<u>S\$ 2,036,206</u>	<u>S\$ 790,000</u>	<u>S\$35,100,430</u>	<u>S\$ 591,272</u>	<u>S\$ 3,151,047</u>	<u>S\$31,358,111</u>	
-	-	12,945,550	-	-	12,945,550	
-	-	968,556	-	-	968,556	
-	-	2,634,144	-	-	2,634,144	
-	400,000	1,099,625	-	1,009	1,098,616	
-	-	354,725	-	-	354,725	
-	-	270,995	-	-	270,995	
-	-	457,373	327,160	-	130,213	
1,940,941	603,000	5,922,040	35,640	2,483,762	3,402,638	
<u>S\$ 1,940,941</u>	<u>S\$ 1,003,000</u>	<u>S\$24,653,008</u>	<u>S\$ 362,800</u>	<u>S\$ 2,484,771</u>	<u>S\$21,805,437</u>	

THE SINGAPORE POLYTECHNIC
(Established under the Singapore Polytechnic Act, Cap. 180)

NOTES TO THE ACCOUNTS — 31 MARCH 1986 (cont'd)

5. LONG TERM LOANS

	<u>1986</u> S\$	<u>1985</u> S\$
Due within twelve months	121,708	314,019
Due after twelve months	<u>1,482,506</u>	<u>2,350,986</u>
	<u>S\$1,604,214</u>	<u>S\$2,665,005</u>

The long term loan of S\$1,604,214 (1985: S\$1,719,034) is unsecured and is repayable in 20 annual instalments, commencing 1 January 1977 and bears interest at 6% per annum.

The term loan is in respect of the staff quarters, and the repayment will be substantially funded from the rental receivable from those quarters.

6. LOANS TO STAFF

Loans to staff of S\$21,979,659 (1985: S\$15,329,842) consist of housing, vehicle, renovation, computer, settling-in and personal loans which are made from the revolving fund, comprising of the housing loan fund and loan fund, in accordance with the loan scheme regulations. Interest received on the loans to staff is credited to the respective fund account (Note 4).

7. LOANS TO STUDENTS

Loans to students of S\$169,215 (1985: S\$122,132) are made from the Students' Loan Fund in accordance with the Administration of Student Study Loan Fund regulations. No interest is charged on these loans.

8. DEFERRED RENT RECOVERABLE

Deferred rent recoverable of S\$1,597,893 (1985: S\$1,680,510) represents the rental income recoverable (net of purchases for replacements and maintenance of appliances) from the staff quarters which has been set aside for the repayment of the long term loan (see Note 5).

9. FEES FROM STUDENTS

	<u>1986</u> S\$	<u>1985</u> S\$	Estimates 1986 (Unaudited) S\$
Tuition	6,406,124	5,037,650	6,338,800
Examination	364,337	342,783	363,000
Students' medical	93,245	85,755	94,000
Registration	21,336	25,810	18,000
Others	<u>1,046,240</u>	<u>196,024</u>	<u>767,200</u>
Total	<u>S\$7,931,282</u>	<u>S\$5,688,022</u>	<u>S\$7,581,000</u>

10. PERSONNEL EMOLUMENTS

	<u>1986</u> S\$	<u>1985</u> S\$	Estimates 1986 (Unaudited) S\$
Salaries, allowances and leave pay	39,286,163	33,954,288)	
Contributions to provident and skills development funds	9,812,506	8,438,031)	52,412,077
Part-time salaries and allowances	2,713,404	2,646,020)	
	<u>S\$51,812,073</u>	<u>S\$45,038,339</u>	<u>S\$52,412,077</u>

11. MAINTENANCE AND UPKEEP

	<u>1986</u> S\$	<u>1985</u> S\$	Estimates 1986 (Unaudited) S\$
Public utilities	2,473,742	1,968,697	2,473,950
Maintenance of buildings, equipment and others	1,692,137	1,935,172	1,703,126
Rental of staff quarters	—	49,244	10
Staff amenities	110,624	102,500	110,630
Upkeep of vehicles	24,614	26,011	24,620
Rental of land	14,305	14,416	14,306
Cleaning of materials	26,338	17,000	26,340
Staff uniforms	42,997	46,460	43,000
Rental of student hostel and furniture, air-conditioner to staff house	—	—	10
Total	<u>S\$4,384,757</u>	<u>S\$4,159,500</u>	<u>S\$4,395,992</u>

12. WORKS AND BUILDINGS

The income and expenditure for the works and buildings for the year is as follows:—

	<u>1986</u> S\$	<u>1985</u> S\$
Government contribution	<u>18,780,400</u>	<u>25,474,200</u>
Deduct		
Progress payments made or accrued on:		
Staff quarters	442,000	—
Linkway/Staff centre	418,000	—
Expansion of Dover Road campus	10,752,400	24,968,200
Physical education facilities	7,168,000	506,000
	<u>18,780,400</u>	<u>25,474,200</u>
Balance	<u>S\$ NIL</u>	<u>S\$ NIL</u>

THE SINGAPORE POLYTECHNIC
(Established under the Singapore Polytechnic Act, Cap. 180)

NOTES TO THE ACCOUNTS — 31 MARCH 1986 (cont'd)

13. FURNITURE AND EQUIPMENT ACCOUNT

The income and expenditure for the furniture and equipment account for the year is as follows:—

	<u>1986</u> S\$	<u>1985</u> S\$
Government contribution	13,259,620	12,916,000
Deduct		
Purchase of:		
Furniture and equipment	13,079,620	12,816,000
Learning Resource Centre	180,000	100,000
	<u>S\$13,259,620</u>	<u>S\$12,916,000</u>
Balance	S\$ NIL	S\$ NIL

14. CAPITAL COMMITMENTS

Capital commitments approved but not contracted for are as follows:—

	<u>1986</u> S\$	<u>1985</u> S\$
Buildings and campus	3,665,296	21,812,533
Furniture and fittings	16,138,212	6,118,611
Staff quarters	—	383,245
	<u>S\$19,803,508</u>	<u>S\$28,314,389</u>

15. FIXED ASSETS — NOTIONAL NET BOOK VALUE

The historical cost of fixed assets written off and the related notional depreciation and net book value are shown below:—

	<u>Buildings, Campus and Staff Quarters</u>	<u>Office Equipment and Furniture</u>	<u>Workshop Equipment and Tools</u>	<u>Motor Vehicles</u>	<u>Total</u>
	S\$	S\$	S\$	S\$	S\$
COST					
Balance at					
1 April 1985	115,743,548	4,998,707	31,753,766	114,524	152,610,545
Additions	16,072,073	1,380,337	13,310,777	7,040	30,770,227
Disposals	—	(115,301)	(631,634)	(7,115)	(754,050)
Balance at					
31 March 1986	<u>S\$131,815,621</u>	<u>S\$6,263,743</u>	<u>S\$44,432,909</u>	<u>S\$114,449</u>	<u>S\$182,626,722</u>

15. FIXED ASSETS – NOTIONAL NET BOOK VALUE (CONT'D)

NOTIONAL ACCUMULATED DEPRECIATION

	Buildings, Campus and Staff Quarters	Office Equipment and Furniture	Workshop Equipment and Tools	Motor Vehicles	Total
	S\$	S\$	S\$	S\$	S\$
Balance at 1 April 1985	--	2,869,743	10,723,995	25,549	13,619,287
Current year's depreciation	--	1,120,055	4,027,270	11,445	5,158,770
Disposals	--	(22,643)	(614,216)	(5,692)	(642,551)
Balance at 31 March 1986	S\$ --	S\$3,967,155	S\$14,137,049	S\$ 31,302	S\$18,135,506
Notional net book value	<u>S\$131,815,621</u>	<u>S\$2,296,588</u>	<u>S\$30,295,860</u>	<u>S\$83,147</u>	<u>S\$164,491,216</u>

COST

Balance at 1 April 1984	80,741,641	3,549,898	18,626,177	91,104	103,008,820
Additions	35,001,907	1,509,267	13,786,634	38,170	50,335,978
Disposals	--	(60,458)	(659,045)	(14,750)	(734,253)
Balance at 31 March 1985	<u>S\$115,743,548</u>	<u>S\$4,998,707</u>	<u>S\$31,753,766</u>	<u>S\$114,524</u>	<u>S\$152,610,545</u>
Balance at 1 April 1984	--	1,905,311	9,359,401	28,962	11,293,674
Current year's depreciation	--	998,255	1,978,585	9,862	2,986,702
Disposals	--	(33,823)	(613,991)	(13,275)	(661,089)
Balance at 31 March 1985	--	2,869,743	10,723,995	25,549	13,619,287
Notional net book value	<u>S\$115,743,548</u>	<u>S\$2,128,964</u>	<u>S\$21,029,771</u>	<u>S\$88,975</u>	<u>S\$138,991,258</u>

Fixed assets are taken into the fixed assets register as and when the fixed assets are received.

No notional depreciation has been provided for buildings, campus and staff quarters. The notional depreciation on the other fixed assets is computed utilising the straight-line method to write off the cost of the fixed assets over their estimated useful lives as follows:

- Motor vehicles – 10 years
- Office equipment and furniture – 5 to 10 years
- Workshop equipment and tools – 10 years

Singapore Polytechnic Mission and Corporate Goals

1. THE MISSION

The mission of the Singapore Polytechnic is to educate and train persons as engineering technologists or to an equivalent level of manpower to support the technological, economic and social development of Singapore. The Polytechnic is committed to excellence in teaching and management and the provision of relevant programmes in a conducive learning environment.

2. CORPORATE GOALS

2.1 EXCELLENCE IN TEACHING

To ensure effective learning through quality teaching and appropriate teaching assessment methods and techniques.

2.2 EXCELLENCE IN MANAGEMENT

(a) To utilise all resources in an efficient and effective manner through human resource development and appropriate management practices and systems.

(b) To provide an organisational climate and work environment conducive to the development of a sense of belonging, team effort and quality of work life.

2.3 RELEVANT PROGRAMMES

(a) To ensure that all curricula are balanced, relevant and explicit.

(b) To encourage the innovative development and practical application of engineering technology relevant to the needs of industry.

(c) To provide continuing education to meet the specific needs of industry and career development of graduates.

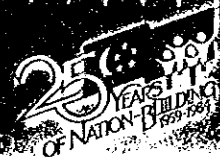
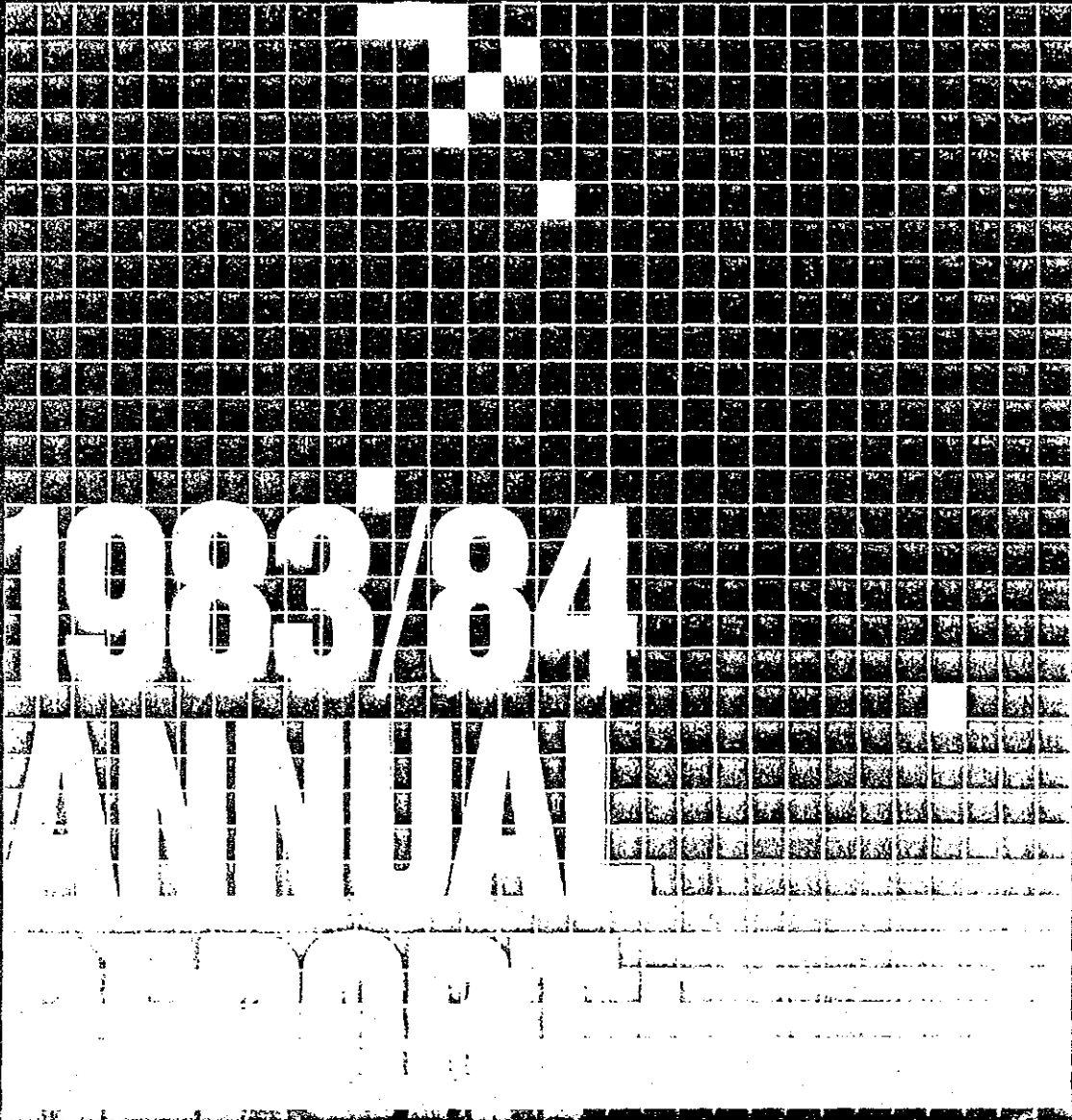
2.4 CONDUCTIVE LEARNING ENVIRONMENT

(a) To create an atmosphere which fosters learning and personal development among staff and students.

(b) To create a physical environment that promotes teaching and learning.



National Computer Board



Contents

- 2 Members of the Board
- 4 Chairman's Review
- 7 Computer Services Industry Development
- 13 Computer Education and Standards
- 17 The Civil Service Computerisation Programme
- 21 Applied Research in Information Technology
- 25 The New NCB Building
- 26 The NCB Organisation Chart
- 27 The NCB Management Committee
- 29 Financial Statements

Members of the Board



CHAIRMAN
Mr Philip Yeoh Uat Kok
2nd Permanent Secretary
Ministry of Defence



Representing the Economic Development
Board
Mr CHUA SENG FIAH
Divisional Director (Industry)



MEMBER
Mr Goh Seng Kim
 General Manager
 Telecommunication Authority
 of Singapore



Representing the Computer Services Industry
Mr Johnny Maa Kwee Chong
 Chairman
 Singapore Federation of Computer
 Industry



Representing the Computer Services Industry
Mr Noel Han Chia Chun
 Secretary
 Singapore Federation of Computer
 Industry



Representing the National University
 of Singapore
Dr Jigar Motiwalla
 Director
 Institute of Systems Science
 Vice-President
 Singapore Computer Society



Representing the Ministry of Education
Mr Wang Mong Hin
 Director,
 Curriculum Development Institute
 of Singapore



Representing the Ministry of Finance
Mr Ajith Prasad
 Deputy Director
 Budget Division

The National Computer Board entered into its third year of operation in Financial Year 1983/84. It was a year of steady progress. Of its various statutory functions, the implementation of the Civil Service Computerisation Programme (CSCP) remained a key activity in the year under review.

The Board's workplan for the CSCP called for the building up of a strong pool of trained and skilled computer professionals to implement the CSCP during its initial years of operation. By the end of the financial year, 227 computer professionals had been deployed at the Ministries as well as the NCB HQ to undertake various computerisation projects.

The scope of professional work undertaken by the Board to computerise the Civil Service was also enlarged. The Board extended its services to cover computerisation projects for those Ministries which were not originally included in the CSCP, such as the Ministry of Law and the Ministry of Foreign Affairs.

Much progress was achieved on the CSCP during the year under review. The Board provided professional support to the Ministries of National Development, Home Affairs, Trade & Industry, Health, the Registry of Vehicles, the Singapore Meteorological Services and the Department of Civil Aviation in the evaluation of nine tenders to procure computer hardware and software. Of these, seven tenders were awarded. The remaining tenders are expected to be finalised in the later part of 1984. By then, tenders for all required computing facilities under the CSCP will be fully evaluated and awarded. This will complete one of the most significant milestones of the CSCP. More than 80% of the CSCP application systems will be operational by the end of FY 86/87. With more and more systems becoming operational, we will benefit from a more effective and efficient public administration which is the main objective of the CSCP.

The NCB takes pride in being a people-oriented organisation. We place great emphasis on human resource management to ensure that our staff are fully trained and given the opportunities to advance professionally. Our professionals must keep abreast of the rapidly advancing information technology if we are to contribute effectively towards the national computerisation effort. During the year, a formalised training programme was introduced for our professionals.

To ensure the smooth implementation of the CSCP, users at Ministries must also be trained to participate actively during the development phase of projects and to manage information as a corporate resource. A User Education Programme (UEP) for the Civil Service was therefore formulated to equip Ministry staff at various levels with the computer concepts and knowledge they would need to play an active role in computerisation projects.

For Singapore to evolve into a software centre, we must first build up a large pool of well-trained and highly skilled computer professionals. In FY 83/84, we were the first to be able to enjoy the fruits of the various publicly funded tertiary computer educational institutes set up in 1981 and 1982. In 1983, the Institute of Systems Science, NUS produced 43 graduates from its full-time post-

"More than 80% of the CSCP application systems will be operational by the end of FY 86/87. With more and more systems becoming operational, we will benefit from a more effective and efficient public administration which is the main objective of the CSCP."

"The NCB takes pride in being a people-oriented organisation. We place great emphasis on human resource management to ensure that our staff are fully trained and given the opportunities to advance professionally."

Chairman's Review

graduate Diploma in Systems Analysis course. Another 45 candidates successfully completed the two-year Analyst-Programmer Diploma course of the Japan-Singapore Institute of Software Technology in February 1984. The Department of Information Systems and Computer Science (formerly known as the Department of Computer Science) of NUS produced 98 graduates with a Bachelor of Science degree in Computer Science. The total of 186 fully-trained new computer professionals represents a significant step forward in attaining a target of 600 to 700 computer professionals annually by 1986 to meet the demand of the industry.

Parallel to our efforts to increase the pool of computer professionals in Singapore is the need to ensure that our professionals are able to attain internationally recognised standard of competence. The joint computer examinations conducted by the BCS and the NCB serve as a means by which our local computer personnel can measure their professional knowledge. By the number of candidates who registered and sat for both the Part I and Part II Examinations in 1983, Singapore became the largest overseas BCS computer examination centre outside the United Kingdom.

One of the key objectives of the NCB is to develop a viable computer services industry and to turn Singapore into a software centre by 1990. The NCB has two strategies for the promotion of the industry — firstly, the promotion of computer awareness among the general population, and secondly, the transfer of technology from the advanced countries to Singapore.

The success of our national computerisation programme depends greatly on the level of computer literacy of the general population. In May 1983, the first national information week, Informatics '83, was organised under the sponsorship of the Board. This was designed to promote greater computer awareness and to demonstrate the great importance of information technology to our economy in future. Informatics '83 achieved significant results in promoting computer awareness and in providing a further impetus towards our industry promotion effort.

A further step in promoting computer literacy was taken with the formation of the National CAD/CAM Training Committee set up in September 1983. The Committee will formulate an integrated educational programme for all our tertiary educational institutes. This will ensure that all engineers, architects and technicians will be able to use computer aided facilities in their engineering and technical work which, in turn, will achieve greater professional productivity and bring about a higher level of industrial automation.

The NCB is active in promoting the transfer of technology from world leaders in information technology to Singapore. Joint business ventures between overseas and local vendors are being encouraged. Market leaders have also been encouraged to set up software development centres in Singapore. Two examples demonstrate this. Sperry Computer Systems in February 1984 announced the setting up of an application development centre to enhance its UNIDAS package for use in regional markets as well as to develop a software development tool. IBM also announced the establishment of a Regional Health Industry Centre specialising in the development of hospital information systems and medical application systems.

The computer services industry continued to make impressive progress. An industry survey carried out by the Board in early 1984 shows that there was a 42% increase in 1983 over 1982. The total sales of computer products and services reached \$368 million as compared to \$259 million in the preceding year. Of the total sales, one-fifth came from the export of the computer products and services to other countries. With an increase in Singapore of highly competent computer

"The total of 186 fully-trained new computer professionals represents a significant step forward in attaining a target of 600 to 700 computer professionals annually by 1986 to meet the demand of the industry."

"One of the key objectives of the NCB is to develop a viable computer services industry and to turn Singapore into a software centre by 1990."

"The computer services industry continued to make impressive progress. An industry survey carried out by the Board in early 1984 shows that there was a 42% increase in 1983 over 1982."

Chairman's Review

professionals who have up-to-date knowledge of application, the computer services industry will have great potential as a major export earner.

Apart from establishing the infrastructure which will develop the manpower resources required by the computer services industry, the Board is increasingly giving more attention to the establishment of a strong technological base with applied research and development capabilities. Excellence in the application of information technology can only be attained through extensive applied research and development activities. The establishment of a strong technological base will be the next main thrust of our national computerisation programme. It will be the driving force behind our computer services industry.

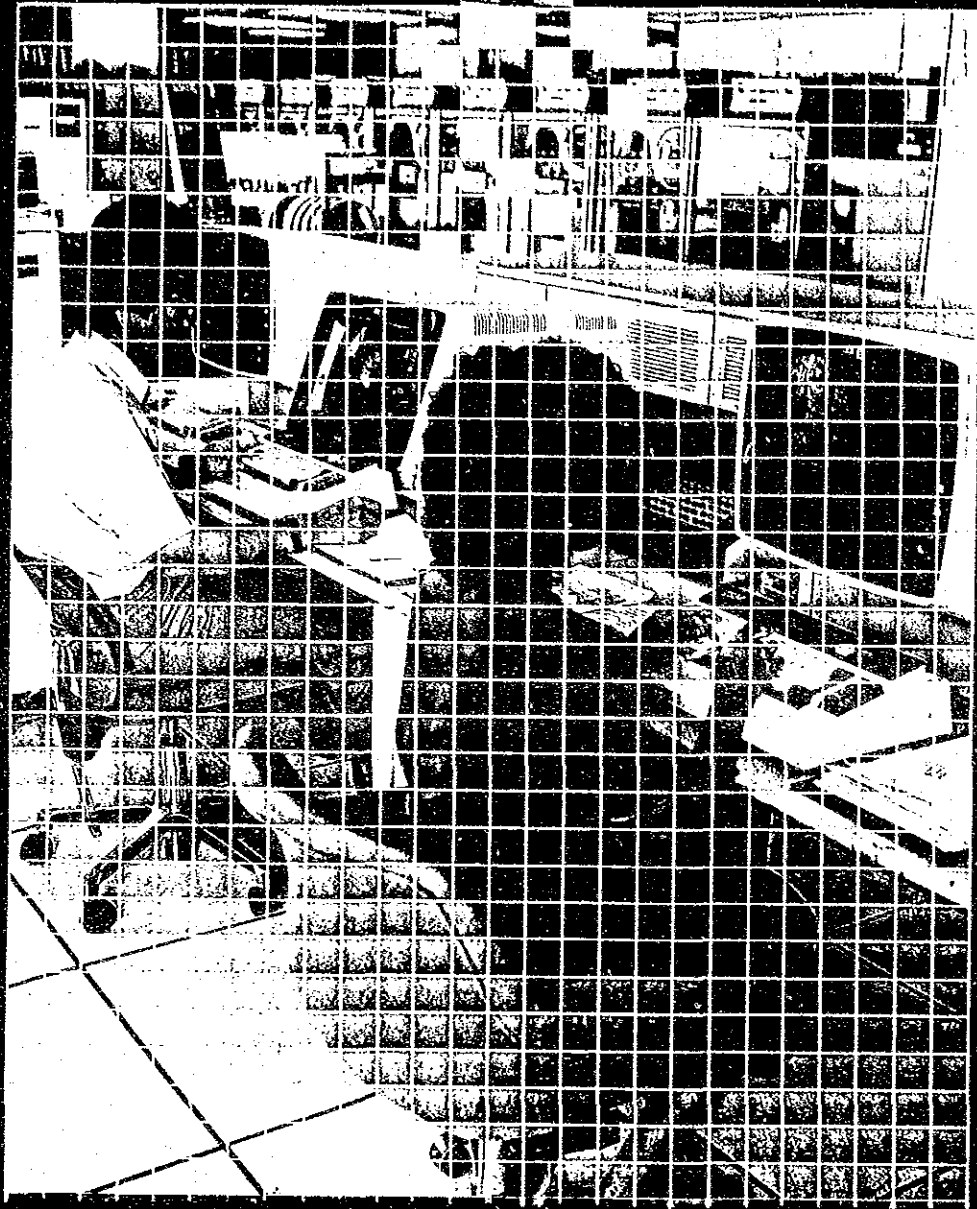
To demonstrate leadership in this endeavour, a Joint Software Engineering Programme (JSEP) was established in July 1983. This programme pooled together full-time software and computer engineers from both the NCB and the S&C Organisation of Ministry of Defence. Under this programme, various research and development projects in software and computer engineering were started. The main aims of these projects were to improve the productivity of computer professionals and to explore better ways of exploiting information technology. This programme will constitute the advanced technological arm of the NCB and will provide examples in establishing applied research. Good progress has been achieved since the programme began. The infrastructure has been established which will enable advanced information technology expertise to be developed.

Our effort in moving the nation into the information age is gaining momentum. The collective efforts of various organisations and the enthusiasm of the public have propelled us several steps ahead in achieving our long-term aspirations. A solid foundation has been laid to enable us to make further progress.



A handwritten signature in dark ink, which appears to read "Philip Yeo". The signature is written in a cursive style and is positioned to the right of the portrait photograph.

Philip Yeo
Chairman
National Computer Board



Computer Services Industry Development

The main statutory function of the National Computer Board (NCB) is to implement the national policy on computerisation laid down by the Government. The national policy calls for:-

- the building up of a broad computer-user base in the economy, with the public sector taking the initiative with the CSCP;
- the provision of adequate manpower training and education to produce a steady supply of computer professionals; and
- the promotion of Singapore as a software centre.

The three strategies have created and will continue to create a solid infrastructure for the computer services industry. This industry not only supports the computerisation needs of other industries but also exists in its own right as a producer and potentially large exporter of software products and services.

The promotion of computer use by the NCB helps to expand the computer-user base. This in turn creates a larger market potential for computer products and services. The NCB promotes not only computerisation amongst business firms and organisations, but also computer awareness amongst the general population who have responded well to the Government's call for greater computer literacy. Computer awareness and appreciation courses are taught at grass roots level, at the People's Association, the National Trades Union Congress and the Singapore Armed Forces Reservists Association as well as in the schools.

The spread of computer awareness has given rise to a distinct market for home computers which is different from the market for business-use computers. The home computer market is potentially large for the following reasons:-

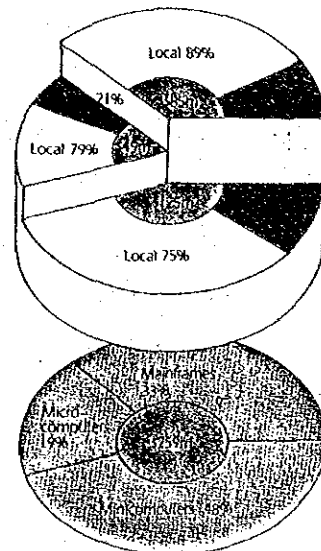
- Secondary school students are exposed daily to microcomputers in school computer clubs. Students thus constitute a large potential market for home computer purchases.
- Computerisation at work is increasing in all economic sectors. Office workers are now also likely to own and use home computers to prepare office work at home.
- Nation-wide projects, such as Telecoms' Teleview and home banking, currently in the experimental stage, will eventually require households to own computers in order to gain access to electronic information and transactions.

Informatics '83/An information week called Informatics '83 was organised under the sponsorship of the NCB in May 1983 to promote nation-wide public awareness of the uses of computers and to keep the public informed of trends in computer technology.

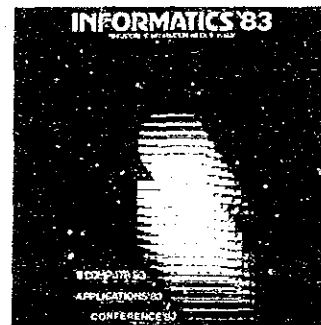
Four main activities were organised in Informatics '83 namely, two exhibitions, one on computer vendors' products and the other on users' applications; a conference on Very Large Data Bases; and a series of computer competitions for students and undergraduates.

A computer quiz and a home viewer contest was telecast over SBC during Informatics '83. In conjunction with Informatics '83, SBC also featured a 10-part computer programme series on the theme of computer use.

Total Value of Hardware, Software and Services Sold in 1982



Informatics '83 was organised under the sponsorship of the NCB in May 1983



Computer Services Industry Development

The exhibition of computer products and services and applications of computers was a timely event for the public. About 65,000 people from all walks of life attended Informatics '83 to find out more about computers and their applications.

Overseas visitors rated Informatics '83 highly and were impressed that Singapore had a potentially wide computer-user base and a growing computer services industry. Informatics '83 succeeded in highlighting Singapore's national policy of computerisation and provided an immeasurable impetus towards the promotion of the computer services industry.

Industry Development Software Missions/Like most leading industries in Singapore, the computer services industry needs a strong presence of foreign investment and technology from leading international companies so that Singapore's software products and services can eventually have a competitive edge in external markets.

Since the computer services industry is technology-based, computer software and services companies have to keep abreast of changing technology. This technology is being actively transferred from overseas, particularly from developed countries like the USA, Japan, Western Europe and Australia.

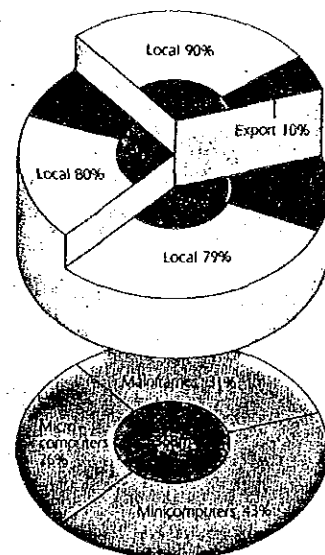
To play an effective role in providing local computer vendors with technology transfer, the NCB organised two software missions, one to Japan in May 1983 and the other to Australia in January 1984. A total of 15 local vendors participated in these two missions. These missions provided vendors with opportunities to forge joint ventures with foreign companies in the development of software products, product cross licensing and joint marketing. Local computer vendors also gained an insight into overseas markets and technical expertise. Some of the computer vendors concluded agreements for joint ventures while others explored suitable avenues for mutual co-operation in the computer software and services business.

Industry Promotion Mission/To attract investment by leading international computer companies, the NCB sent a computer industry promotion mission to the USA in September 1983. The mission produced good responses from some of the companies who wanted to expand their software and services operations in Singapore.

Software Development Centres/Singapore cannot be fully established as a software centre without the support of leading international computer companies. The NCB has been actively encouraging these companies to set up their own software development centres in Singapore to carry out research and development activities for commercial applications. These leading international computer companies can depend on the supporting services of local computer vendors to develop jointly software systems and to market the finished products internationally through their worldwide market outlets.

Generally, our local computer vendors have relatively sound knowledge of the industry and the technical expertise needed for commercial and industrial applications. However, they still lack skills in software documentation, quality assurance and an international marketing network. By working closely with the software development centres of leading international computer companies, they should be able to overcome these problems. At the same time, they will be able to receive the very latest technological expertise through joint projects.

Total Value of Hardware, Software and Services Sold in 1983



Computer Services Industry Development

In March 1984, IBM announced the setting up of its Regional Health Industry Centre, a specialised software development centre which is concerned primarily with developing medical systems for local health authorities. The medical systems developed in the Regional Health Industry Centre will later be exported internationally through IBM's world-wide marketing channels. The establishment of the Regional Health Industry Centre is in line with the national objective of developing Singapore into a software centre as well as a medical and health care services centre.

Sperry Computer Systems also set up a software development centre in Singapore in February 1984. The initial cost was \$1 million but this will rise to \$3 million by the end of 1984. Sperry's Software Development Centre will develop UNIDAS, a storage and retrieval information system for large users, especially Government bodies. The UNIDAS package was originally developed in Sperry's Applications Development Centre in West Germany. In Singapore, Sperry will enhance the UNIDAS package for use in regional markets. Another Sperry project is the development of the MAPPER KIT, a software development tool which has very wide application in accelerating the development of application systems.

The establishment of Sperry's Software Development Centre and IBM's Regional Health Industry Centre is significant for the computer service industry in Singapore. The commitment of these leading companies shows clearly their confidence in Singapore's national computerisation programme. It also reflects Singapore's potential as a software centre.

Communication With The Computer Services Industry/The NCB promotes close relationships within the industry through regular dialogues between the NCB, individual computer companies and potential investors.

Apart from informal relationships with the industry, the NCB has a board-level Committee on Industry Promotion. Through this Committee, computer vendors, users and computer professionals can discuss a wide range of computer services industry issues with representatives of the NCB, Economic Development Board, Trade Development Board and Telecoms.

The NCB also publishes a bi-monthly industry newsletter, the "IT FOCUS". The newsletter features national issues, vendors' performance and experts' opinion on the trends in computer hardware and software development. The "IT FOCUS" is intended as a two-way dialogue between the NCB and members of the industry. At the same time, the "IT FOCUS", with its international circulation, informs overseas readers, who are mainly computer professionals and executives, about what Singapore is doing for the computer services industry.

The NCB helps computer companies to apply for financial assistance in developing software systems for export. This financial assistance is normally granted for projects with a high technical content and with export potential through market outlets outside Singapore.

In September 1983, a local company, Computer Systems Advisers, was awarded a grant under the Product Development Assistance Scheme to develop an advanced system software. The NCB viewed this software project as a significant contribution towards upgrading software expertise in Singapore.

Accommodation for Software Research and Development/ In 1981 and 1982, computer vendors paid high rents for commercial buildings. The NCB therefore asked the Jurong Town Corporation in late 1982 if it could make available to computer vendors undertaking software research and development, JTC flatted

"IT FOCUS" features national issues, vendors' performance and experts' opinion on the trends in computer hardware and software development. It is intended as a two-way dialogue between the NCB and members of the industry. At the same time, the "IT FOCUS", with its international circulation, informs overseas readers, who are mainly computer professionals and executives, about what Singapore is doing for the computer services industry."



Computer Services Industry Development

factories originally meant for manufacturing companies. On 21 March 1983, the NCB, the EDB and the JTC jointly announced a scheme, known as JASSI — JTC Accommodation for Selected Services Industries. Under this scheme, approved computer software and specialised engineering and engineering consultancy services companies, and technical and laboratory testing-service companies will be considered for accommodation in JTC flatted factory buildings. At the end of March 1984, eleven software houses were accommodated in JTC flatted factory buildings occupying a floor area of 8,840 sq m. The softening of the property market in late 1983 and early 1984 has led to a decreasing use of the scheme by the industry.

A Software Technology Centre is being constructed in Singapore Science Park at an estimated cost of \$20 million. It will be made available to leading computer companies so that they can carry out high level software development activities. It will provide rentable space of 9,000 square metres to accommodate computer companies promoted by the NCB. Together with the proposed NCB Building, which will also be located in the Science Park, the Software Technology Centre will serve as a nucleus for generating software research and development activities in Singapore. The Software Technology Centre is expected to be ready by June 1986.

Computer Aided Design/Computer Aided Manufacturing [CAD/CAM] Training/ CAD/CAM expertise is a specialised computer application in architecture, engineering, and other manufacturing work.

Currently most CAD/CAM users are in the public sector with a few users in private architectural and engineering firms. It is estimated that 400 people in Singapore use CAD/CAM, but this number will increase substantially in the near future as the tertiary institutions and polytechnics formalise their CAD/CAM curriculum. In response to the increasing importance of CAD/CAM in industries, the NCB appointed a National CAD/CAM Training Committee under the chairmanship of Assoc. Professor Robert Gay of the Nanyang Technological Institute.

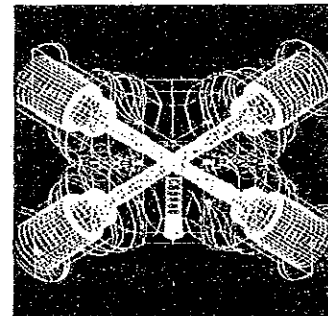
The NCB, EDB, Nanyang Technological Institute, National University of Singapore, Singapore Polytechnic and Ngee Ann Polytechnic are represented on the Committee. One of the main functions of the Committee is to set up a CAD/CAM training programme which will equip students at the tertiary institutions and polytechnics with the knowledge of and skills in CAD/CAM needed for practical application in industries.

Industry Performance/ In 1983, the computer services industry achieved a healthy 42% growth in sales. It sold \$368 million worth of computer products and services compared with \$259 million in 1982.

The domestic market provided 80% of the revenue from the sale of computer products and services. The revenue of 20% from exports was relatively low but it increased by 27%, from \$51 million in 1982 to \$64 million in 1983. This growth in export sales is encouraging. In 1983, nine out of ten computer vendors reported export earnings compared with three out of four in 1982.

The computer vendors have showed their potential to be more export-oriented in the near future. With technical support from leading international computer companies, local subsidiaries and Software Development Centres and in joint ventures in the production and distribution of software products, local computer vendors will be increasingly more competitive in export markets.

"In response to the increasing importance of CAD/CAM in industries, the NCB appointed a National CAD/CAM Training Committee under the chairmanship of Assoc. Professor Robert Gay of the Nanyang Technological Institute."



Computer Services Industry Development

The NCB's survey on the performance of Singapore Computer Vendors in 1983 shows that revenue earned from software and services was highest at the mainframe level and lowest at the microcomputer level. It shows that for every \$100 worth of hardware sold, the computer vendors sold \$37 worth of software products and services. At the mainframe level, software and services revenue was 70% of the hardware value sold. This dropped to 37% at the minicomputer level and 11% at the microcomputer level.

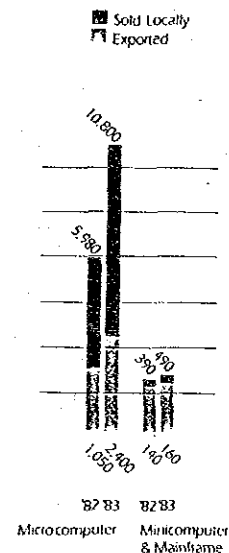
Microcomputer dominated the market with a 88% increase in unit sales, from 7,030 in 1982 to 13,200 in 1983. Sales of mainframes increased 50%, from 24 units in 1982 to 36 units in 1983. Minicomputers had a relatively lower growth of 21%, from 506 units in 1982 to 614 units in 1983.

Despite large volume sales, microcomputers accounted for only about one-third of the total dollar market value of all computers sold in 1983. The total dollar market value of hardware, software and services was even less, about one-quarter of the \$368 million.

Microcomputers are expected to play a leading role in computer use both in the business sector and in the homes. The growth of microcomputer use in Singapore is consistent with that of developed countries. Enhanced technology in microcomputer design has enabled the microcomputer to perform processing tasks which could previously only be done by minicomputers and mainframes. Microcomputers are already being used in networks in which multiple microcomputer units have a communication linkage with minicomputers and mainframes. This allows an increasing number of users to gain access to the computing power of the higher-end computer systems.

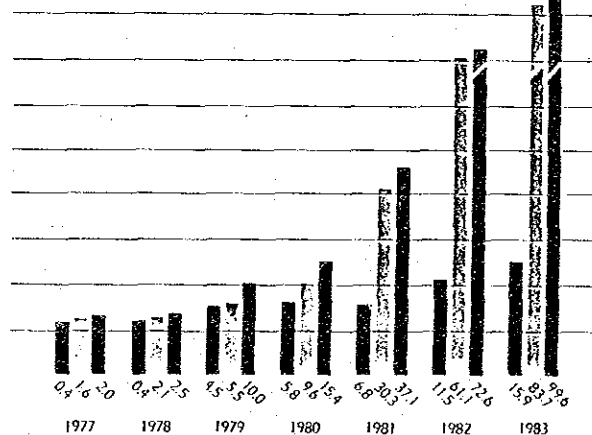
The fact that the higher-end hardware market will not be growing as fast as the microcomputer market will have implications for the computer services industry. In software and services revenue, the higher-end computer market will still continue to generate higher absolute dollar turnover than the microcomputer level. However, a relatively untapped area of software and services revenue is in the development of communications software that allows different models and levels of computers to communicate interactively with one another in networks. This kind of software development is relatively sophisticated. The local computer services industry is therefore encouraged to have joint ventures with leading international computer companies which can service this demand not only in Singapore but, more importantly, in the international markets.

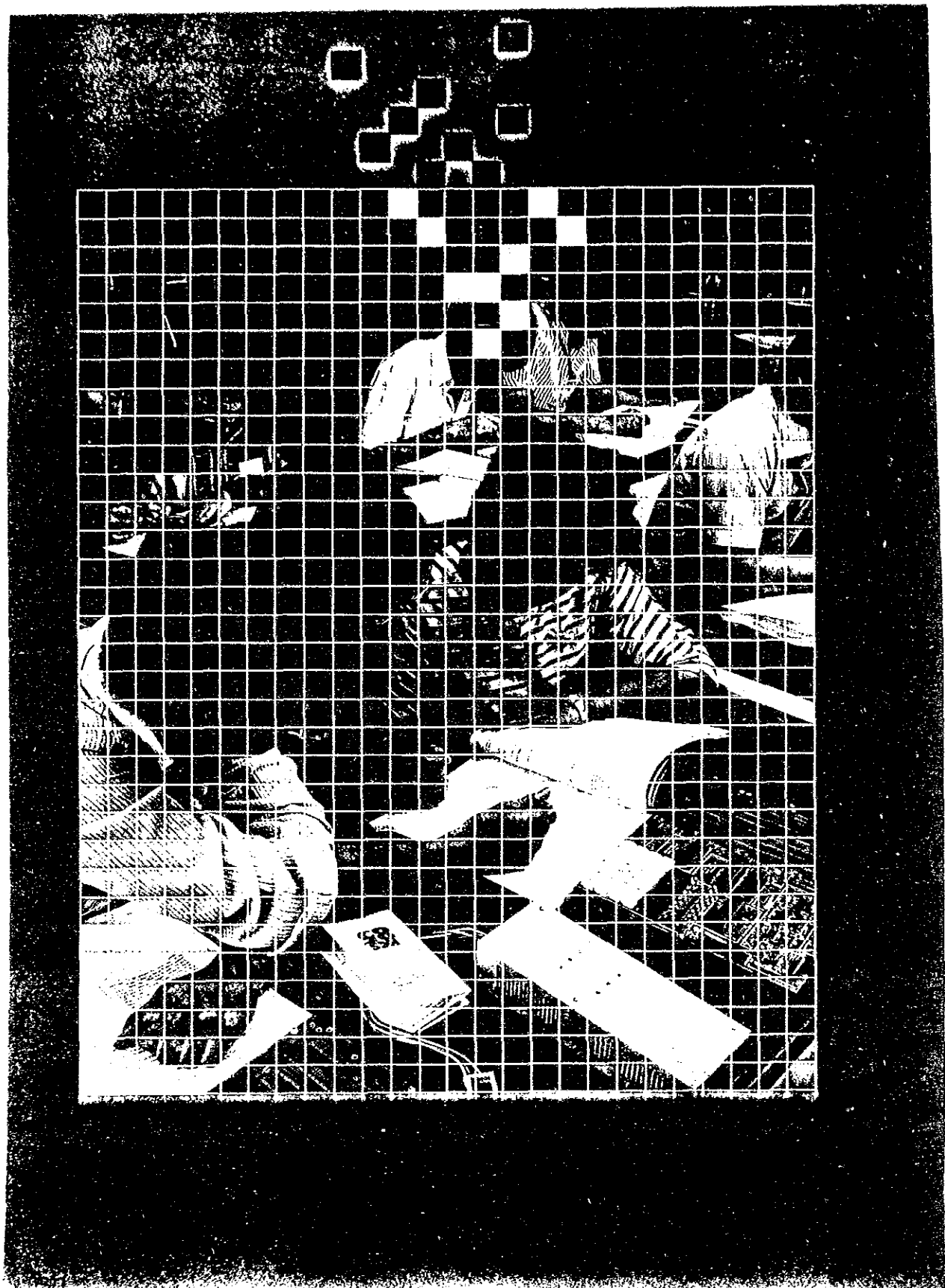
Computer Hardware Sold Locally and Exported



Value of Software and Services Sold from 1977 to 1983

■ Export
■ Local
■ Total





Computer Training Programmes/ The NCB, through its representation on the advisory boards of the various public-funded computer training institutions, continued to participate actively in the co-ordination of the computer education programmes offered by these institutions.

Computer Science Department, National University Of Singapore/In 1982, a Computer Science Curriculum Review Committee was formed to review the existing curriculum of the Computer Science Department of the National University of Singapore. The Review Committee comprised representatives from the NUS, the NCB and the computer services industry. The review aimed at expanding the existing curriculum to include information systems. This was in response to the growing market demand for graduates with knowledge of and skills in systems analysis, systems programming, database administration, and communication systems.

The Committee completed its review in January 1984. The Computer Science Department is now known as the Department of Information Systems and Computer Science (DISCS). From academic year 1984, the department will be offering two major disciplines. Students who complete the same core subjects in the first year will then be streamed in the second year to do either the Information systems curriculum or the Computer Science curriculum.

In 1983, 98 graduates completed the three-year degree course. The department plans to produce 200 graduates a year, about 70% of whom will be awarded a Bachelor of Science degree in Information Systems and the other 30%, a Bachelor of Science degree in Computer Science. The department has started offering a two and a half year part-time masters programme in computer science in 1982. A plan has also been worked out for the department to offer an honours degree course by 1986.

Institute Of Systems Science/ The Institute of Systems Science, which was set up at the National University of Singapore in December 1981, is the centre for advanced computer training and application research. It concentrates on increasing and improving the skills of computer professionals. It also provides skills training for computer users and managers.

The postgraduate Diploma in Systems Analysis course is a programme which offers computer training to graduates from non-Computer Science disciplines. Graduates of this course add to the pool of new entrants to the computer services industry. There were 43 graduates who were awarded the Diploma in 1983 as compared to 32 in 1982.

Japan-Singapore Institute Of Software Technology/ The Japan-Singapore Institute of Software Technology (JSIST) was set up in December 1980. It aims to train students for careers as programmers or systems analysts in the computer services industry.

The first batch of 45 of the two-year Analyst-Programmer Diploma course graduated in February 1984. The JSIST eventually plans to train up to about 100 GCE 'A' Level graduates a year. The Institute also offers Systems Analysis courses which train university graduates as systems analysts in the user environment or in the systems development environment. In 1983, the two-year Analyst-Programmer Diploma course received accreditation from the NCB.

"The Computer Science Department of the National University of Singapore is now known as the Department of Information Systems and Computer Science (DISCS)."



"The Institute of Systems Science, which was set up at the National University of Singapore in December 1981, is the centre for advanced computer training and application research."



Computer Education And Standards

The Centre For Computer Studies, Ngee Ann Polytechnic/ The Centre for Computer Studies was formed in December 1982. Students of this centre are trained for careers as programmers or systems analysts in the industry.

The first batch of about 100 students of its two-year diploma course in Computer Studies will graduate in late 1984. Besides receiving the Ngee Ann Polytechnic Diploma in Computer Studies, these graduates will also be awarded the United Kingdom BTEC (Business and Technician Education Council) Higher National Diploma in Computer Studies and will be exempted from the BCS-NCB Part I Examination. The Centre eventually plans to train about 200 'A' level graduates a year.

New Entrants To The Industry/ In the past financial year, 186 new entrants to the computer services industry graduated from the various government computer training institutions.

Institution	Computer Programme	No of Graduates In FY 83
Dept of Information Systems & Computer Science, National University of S'pore	Bachelor of Science in Computer Science	98
Institute of Systems Science, National University of S'pore	Post-graduate Diploma in Systems Analysis	43
Japan-Singapore Institute of Software Technology	Analyst-Programmer Diploma	45
TOTAL NUMBER OF NEW ENTRANTS		186

The intake of these institutions will be increased with the aim of producing 600 to 700 qualified new computer professionals annually from 1986 onwards.

Professional Computer Examinations/ The BCS-NCB Joint Examinations serve as one of the means by which our local computer professionals can certify their standards. Since the adoption of the BCS-NCB Examinations in May 1982, 1,500 candidates have registered for both the Part I and Part II Examinations.

During the year, the NCB initiated plans to introduce more professional computer examinations in Singapore. Official contact was established with the Institute for Certification of Computer Professionals (ICCP) of the United States of America to examine the possibility of its conducting its professional computer examinations in Singapore under the joint auspices of the ICCP and the NCB.

The ICCP is a non-profit organisation which tests and certifies the knowledge and skills of computer professionals. It was incorporated in 1973 by a number of electronic data-processing (EDP)-oriented associations including the Institute of Electrical and Electronic Engineering (IEEE) Computer Society and the Association of Computing Machinery (ACM). The ICCP examinations are conducted at 2 levels; one aims at senior programmers, the other at computer professionals at the supervisory and management level.

"The Japan-Singapore Institute of Software Technology (JSIST) was set up in December 1980. It aims to train students for careers as programmers or systems analysts in the computer services industry."



"The Centre for Computer Studies was formed in December 1982. Students of this centre are trained for careers as programmers or systems analysts in the industry."



1983 BCS-NCB Joint Examinations/The 1983 BCS-NCB Part I and Part II Examinations were conducted at the National University of Singapore. About 550 candidates took the Part I Examination. This was double that of the 1982 examinations. Fifty candidates took the Part II Examination which was an increase of 60% over 1982. Singapore is now the largest overseas BCS examination centre outside the United Kingdom. The candidates' performance in the examinations will be monitored closely. Steps are being taken to assist and advise training institutions that conduct courses to prepare candidates for these examinations.

NCB Scholarship Scheme/The NCB Scholarship Scheme was initiated in 1982. It aims to form a pool of computer experts who will lead Singapore in the advancement of information technology. Under the scheme, 60 undergraduate scholarships and 40 post-graduate scholarships will be awarded over a period of five years.

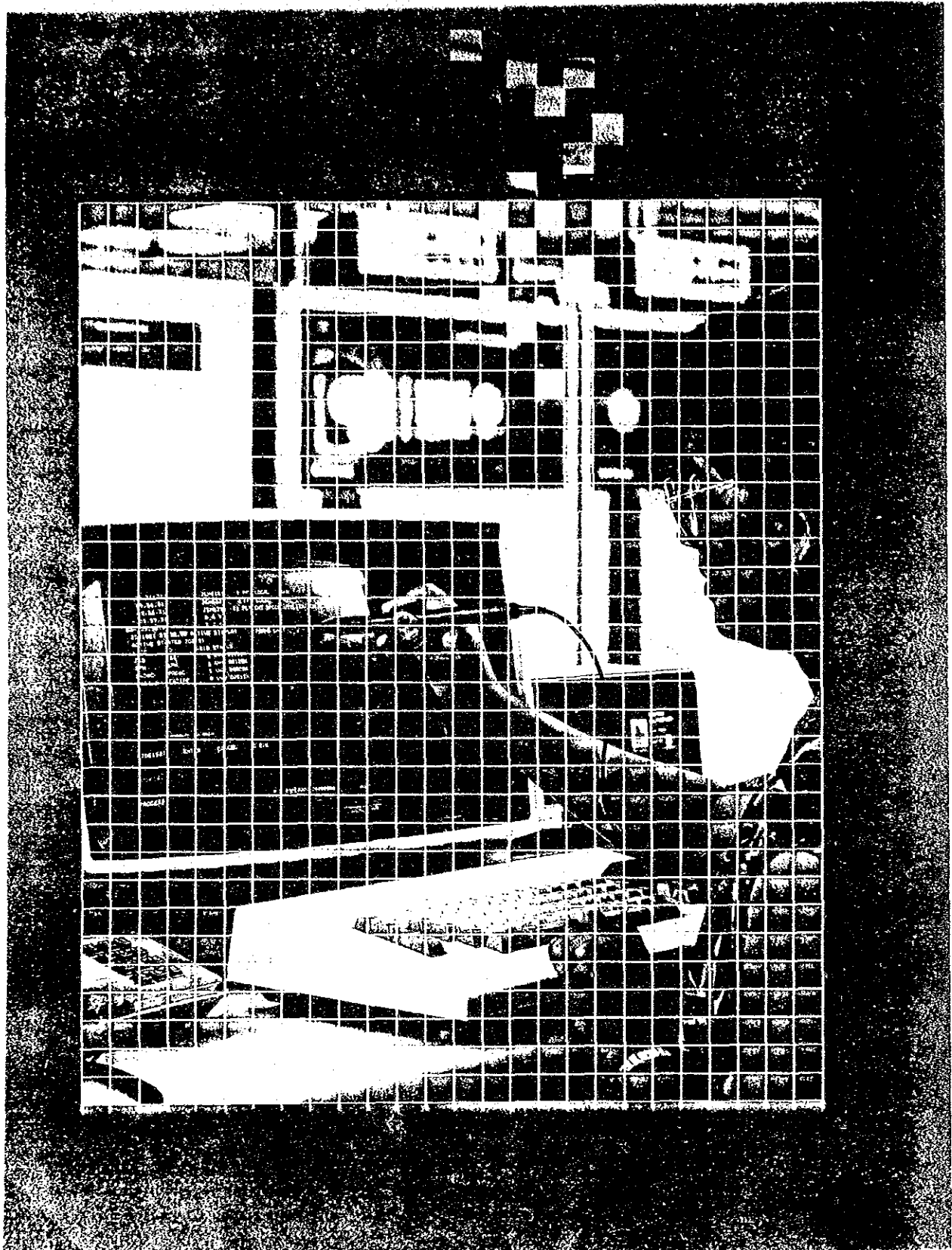
The response of the NCB Undergraduate Scholarship Scheme has been overwhelming. A second batch of 12 undergraduate scholars (1983 Awards) was selected and they were placed in prominent universities in the United States of America and in Canada. To date 24 undergraduate scholarships have been awarded for candidates to read Computer Science, Computer Engineering and Information Systems.

The post-graduate scholarship scheme has not been able to attract many well-qualified applicants. This is because, owing to the present acute shortage of experienced computer professionals, the ideal candidates would be those who already have successful careers. The NCB, however, will continue to look for the best candidates willing to invest their time in achieving excellence in information technology.

Looking Forward/ The NCB will continue to co-ordinate efforts to ensure that enough high-quality competent computer professionals are trained each year to meet the market demand.

In view of the rapid advances in information technology, the NCB recognises the need to expand its responsibility to include the formidable task of further promoting computer literacy nationally. This is in line with the Government's objective to prepare Singapore for the information age.

"Singapore is now the largest overseas BCS examination centre outside the United Kingdom."



The Civil Service Computerisation Programme

The Singapore Government has identified computerisation as one of the key pillars of Singapore's development plan. It has taken the lead in computerisation with its move to increase productivity and efficiency through the increased use of computers in the Civil Service. In 1981, a blue print to accelerate computerisation by decentralising computer facilities was drawn up for 10 ministries. This was the foundation of the Civil Service Computerisation Programme (CSCP). The NCB, formed in September the same year, was given the role of providing the professional staff and technical advice needed to implement the CSCP.

Today, more than 200 professional staff of the NCB support thirteen ministries and organs of state in formulating or implementing their computerisation plans. The CSCP now covers the computerisation projects of the Customs and Excise Department of the Ministry of Finance, and the Ministries of Communications, Health, Home Affairs, National Development, Social Affairs, and Trade and Industry. In addition, the NCB began to co-ordinate the on-going computerisation programmes of ministries and departments which were already operating their own computer systems. These were the Computer Services Department of the Ministry of Finance, and the Ministries of Education, Environment, and Labour, and the Public Service Commission. The NCB also helped the Ministries of Foreign Affairs and Law to draw up their long range computerisation plans.

In general, good progress was made in implementing the CSCP during the Financial Year 1983/84. While the previous year concentrated mainly on a rapid build-up of staff, this year attention was shifted to acquiring computer hardware and systems software.

Acquisition Of Hardware/At the request of the ministries and departments, the NCB provided the necessary help in the calling and evaluation of tenders for computer hardware and software. Nine tenders were called and seven were awarded. Of these, three major hardware tenders were awarded for Fujitsu, Digital and IBM computers. The Meteorological Services, Singapore obtained a FACOM M360R mainframe computer and other peripheral graphics and front-end computers to support their weather forecasting applications. The Department of Civil Aviation installed a VAX 11/750 computer to support their operations. The Ministry of Health signed an agreement with IBM Singapore in March 1984 to jointly develop software for an integrated hospital information system. It bought an IBM 3083 computer to operate this system.

The evaluations of tenders for the Registry of Vehicles, the Ministry of National Development, the Ministry of Home Affairs and the Ministry of Trade and Industry were completed or were in the process of completion. These tenders will be awarded in FY 84/85. In all, the total value of tenders awarded up to the end of this financial year was \$18.2 million.

System Development/The system development work in FY 83/84 mainly involved specifying functional requirements and system designs. At the end of the year, 39 systems were in various stages of development. Seven systems were implemented in the Ministries of Social Affairs, Communications (Department of Civil Aviation) and Trade and Industry (Department of Statistics).

"The Meteorological Services, Singapore obtained a FACOM M360R mainframe computer and other peripheral graphics and front-end computers to support their weather forecasting applications."



"The Department of Civil Aviation installed a VAX 11/750 computer to support their operations."



The Civil Service Computerisation Programme

The Ministries of Foreign Affairs and Law set up study teams to formulate their respective computerisation plans. The teams were led by senior officers of the respective ministries who were helped by professional staff from the NCB. The studies will identify and schedule development programmes which will service the information needs of these ministries.

As the CSCP gathers momentum, more applications will be brought on-line. It is estimated that more than 80% of the 110 applications identified under the CSCP will be completed by FY 86/87.

Staff Development/The number of high calibre and experienced computer professionals still falls short of that needed to implement the CSCP. Efforts made to attract talented professionals from overseas to work in Singapore were successful and some critical senior appointments were filled. At the same time, the NCB adopted a three-pronged strategy to counter the shortage of experienced staff. Senior staff took on more assignments and devoted time to coaching and developing junior staff. Promising juniors were given higher responsibilities. Some consultants were hired where necessary to fill important vacant positions and to transfer their skills to local staff.

The NCB is committed to upgrading its own staff through classroom training and on-the-job coaching. Local training was supplemented by in-house and public seminars. International authorities in computing and related fields, such as Professor John McCarthy, were invited to share their knowledge and experience in the state-of-the-art computer technology and practices.

A Cadetship Programme was developed in late 1983 to equip new and inexperienced staff with the tools and skills needed to perform their job effectively. As part of the programme, cadets will be attached to mature computer installations for on-the-job training. They will also attend formal training courses in programming, design and systems analysis. This programme will be launched in FY 84/85 when a general recruitment exercise will be carried out. About 20 to 30 new recruits will benefit from this scheme yearly.

Data Administration/A highlight of FY 83/84 was the launching of the Data Administration Programme. Data administration is concerned with the policies and procedures needed to manage an organisation's data resources. Some important issues include ensuring data security and privacy, controlling data consistency, timeliness and accuracy, allocating data creation responsibility, and authorising data usage.

The NCB conducted a study to assess the degree of data sharing and to formulate plans to implement Data Administration in the Civil Service. Ministries and statutory boards have been asked to take an active role in this programme.

Software Standards And Productivity/Methodology and software standards are needed to improve productivity in systems development. Standards have been drawn up in conjunction with the Systems & Computer Organisation of Ministry of Defence. These include standards for project management, quality assurance, audit, security and development methodology. Authoritative institutions such as the Stanford Research Institute (SRI) International in the USA and other overseas consultants have reviewed these standards to ensure that they are up-to-date and of international quality.

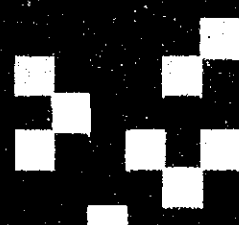
"The Ministry of Health signed an agreement with IBM Singapore in March 1984 to jointly develop software for an integrated hospital information system. It bought an IBM 3083 computer to operate this system."

The Civil Service Computerisation Programme

To further boost productivity, software tools for analysts and programmers are being developed under the Joint Software Engineering Programme of the NCB and the Systems and Computer Organisation, MINDEF. The first of these, a Data Dictionary package was released in September, 1983. It helps analysts and programmers to keep track of what data is used in which systems. Another package to enable project leaders to record and monitor project plans and to report project performance is almost completed.

User Training/The NCB has always emphasised the importance of a partnership between its own professional staff and the ministries' staff. It recognises that the success of any computerisation project depends not only on technical skills and technology, but also on user commitment to, participation in and acceptance of the new computerised system and procedures. With this in mind, this year, a User Education Programme (UEP) was drawn up to introduce computer concepts and the role of users in computer projects to ministries' staff. Courses will be tailored and held for managerial personnel, implementation staff and all other users who will directly or indirectly be affected by computerisation. These courses will help everyone to understand the impact and benefits of the CSCP and to appreciate the opportunities afforded by and the limitations of information technology.

Looking Forward/ There is every reason to expect that the Civil Service Computerisation Programme will be successful and beneficial in the years to come. The infrastructure which implements the CSCP has been built. Computerisation in the Civil Service is established and on-going. The NCB aims to keep abreast of information technology by constantly upgrading its staff and improving their skills and productivity. This, combined with its partnership with committed, enthusiastic and well-informed users in the ministries, will enable it to meet the challenges of implementing new applications brought about by new development in information technology.



SOFTWARE DEVELOPMENT METHODOLOGY
PROFESSIONAL WORKSTATION
SOFTWARE PRODUCTIVITY TOOLS
PERFORMANCE MEASUREMENT
SOFTWARE QUALITY ASSURANCE STANDARDS
ADVANCED SOFTWARE APPLICATIONS
S/W CLASSIFICATION & CERTIFICATION
ARTIFICIAL INTELLIGENCE
SECURITY STANDARDS
MICROCOMPUTER SERVICES
TECHNICAL DATABANKS

NETWORK REQUIREMENT PLANNING
NETWORK OPERATION SUPPORT
NETWORKING TECHNOLOGY

Joint Software Engineering ProgrammeThe NCB recognises that information technology is one of the cornerstones of the nation's future growth and development. In this connection, it has identified two key areas in information technology for applied research. These are software engineering and computer engineering. In July 1983, a Joint Software Engineering Programme (JSEP) was set up by the NCB and the Systems and Computer Organisation (S&C) of MINDEF. This programme provides a vehicle for applied research and development in these two areas.

Under the JSEP, computer professionals of the Software Engineering Department and Computer Engineering Department of the NCB and the Information Engineering Centre of S&C work closely on software engineering and computer engineering projects. This avoids duplication of effort and dilution of expertise.

The overall objective of the JSEP is to achieve the technical excellence which can enable Singapore to use up-to-date information technology widely and effectively. To do this, a two-pronged strategy has been adopted: applied research and development, as well as knowledge acquisition and sharing.

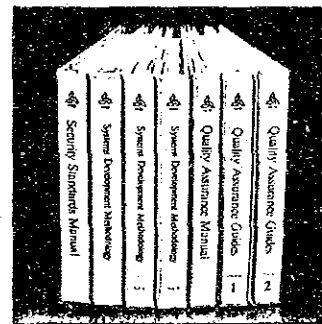
Software EngineeringSoftware engineering is concerned with the development of quality software systems in the most productive and most effective manner possible.

Rapid advances in the development of micro-electronics have continued to make computer hardware more powerful and cost-effective. This has led to a greater demand for software, both in volume and complexity, which in turn has generated the need for more productive and quality-conscious software development methodologies. These methodologies have been introduced in recent years. However, they could be further improved to meet today's software development demands more successfully. One of these improvements is to automate, wherever possible, the processes required in applying these methodologies which emphasise a disciplined and structured approach in developing software systems.

The CSCP has placed a great challenge on software development professionals of the NCB. These professionals have two goals in mind when they develop systems: quality and productivity. Quality designed into these systems will ensure their high performance, reliability, security, recoverability, usability, and that they meet end-user business requirements. Productivity is emphasised so as to reduce the development costs of the systems whenever possible.

An integrated set of systems development methodologies for the planning, analysis and design of information systems has been successfully developed by the NCB and introduced in the Civil Service. To achieve goals of software quality and productivity, programmes have been set up to automate the application of these methodologies, to manage the systems development project, to identify and evaluate software productivity tools, and to implement software quality assurance standards. Pilot projects are undertaken by the NCB to exploit the applications of artificial intelligence techniques in solving complex problems in areas which cannot be handled by conventional data processing techniques.

"Software engineering is concerned with the development of quality software systems in the most productive and most effective manner possible."



Computer Engineering/Computer Engineering is concerned with the development of an effective and efficient information network, in terms of reliability, performance, security and integrity. It also addresses the integration of information services, such as data, text, voice, image and video services.

The sharp rise in recent years in the number of computer installations and networks worldwide, as well as in the CSCP, is largely a result of the convergence of the computer and telecommunications technologies. While the cost of computing power has steadily decreased, the cost of telecommunications resources has remained virtually unchanged. Because of this, the trend in computer use is now clearly towards distributed processing. Computers are now located at a number of geographically dispersed locations linked together by computer networks.

Communications cost is taking an increasing proportion of the overall information systems budget of an organisation. Consequently, an integrated and systematic approach towards network planning, design and management is essential to safeguard this investment and to ensure a high quality information system.

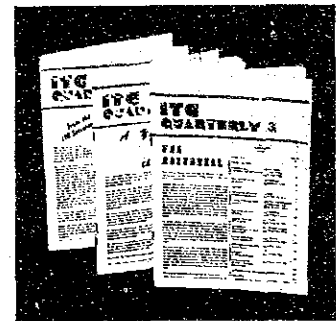
The Computer Engineering Department (CED) became operational in Financial Year 1983/84 to meet these challenges. The CED advises the CSCP in the areas of data communications and information network design, implementation, and management. The Department also keeps abreast of the latest advances in networking technology worldwide. It monitors developments in international standards for computer networking such as those of the International Organisation for Standards (ISO). This is to facilitate the interworking of information processors and the integration of information services.

During its first year of operation, the Department undertook experiments and pilot projects in office automation and communication links among micro, mini, and mainframe computers. It also evaluated various computer terminal equipment and digital PABX systems.

Knowledge Acquisition And Sharing/To keep abreast of the latest advances and developments in information technology, a knowledge acquisition programme has been formulated. The programme sends the NCB's computer professionals to attend seminars, courses and conferences overseas so that they can acquire specialised knowledge not available locally. Overseas conferences have also provided ample opportunities for establishing contacts with experts and organisations whose expertise can be tapped.

The NCB's close relationship with the Central Computing and Telecommunications Agency of the United Kingdom, with exchange visits between computer professionals of the two organisations between June and September 1983, has proved to be invaluable. Both organisations have benefited immensely through the mutual sharing of expertise and experiences relating to information technology.

1983 also saw the formation of Information Technology Groups (ITGs) under a special Information Technology Movement. Its main aim is to raise the level of professional expertise within the NCB and S&C by providing opportunities for knowledge acquisition, sharing, consolidation and dissemination in identified technical areas.



Applied Research In Information Technology

1983 also saw the formation of Information Technology Groups (ITGs) under a special Information Technology Movement. Its main aim is to raise the level of professional expertise within the NCB and S&C by providing opportunities for knowledge acquisition, sharing, consolidation and dissemination in identified technical areas.

On knowledge acquisition, the ITGs have been in contact with national and international experts on their areas of interest. In addition, experts from abroad were invited to conduct seminars to enable the transfer of specialised technical knowledge.

Since the ITGs comprise internal specialists and consultants in their own areas, knowledge sharing is ensured. Each ITG holds regular meetings and presentations where experiences are shared, problems investigated and solutions discussed. A technical publication, the ITG Quarterly, has been published regularly to disseminate information and ideas to a readership of some 550 computer professionals.

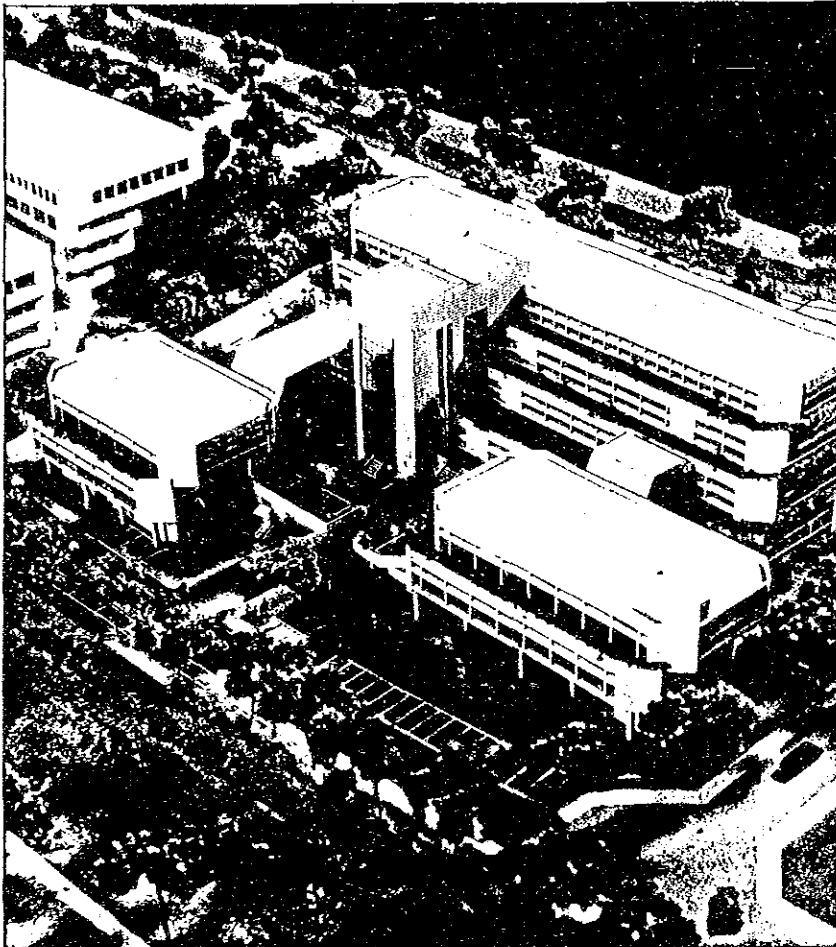
"IT" — The Key To Our Future/ The NCB, in partnership with S&C, has laid a solid foundation in applied research in information technology. The results of this solid foundation have been promising, and the NCB will continue to strengthen and widen its efforts in exploring new frontiers of information technology.

The New NCB Building

In November 1983, the Development Planning Committee approved the proposal for the construction and furnishing of the NCB Building at the Singapore Science Park at a total cost of \$22.3 million.

In line with Government policy, the open office layout concept will be adopted for the proposed building. This will help achieve effective communication and economical use of office space. The proposed building will be equipped with a local area network, a floor ducting cabling system and other advanced facilities. Design features include a landscape grand plaza fronting the Ayer Rajah Road and a roof-top garden on the two annex blocks.

Piling and earthworks for the proposed building began on 17 March 1984, following a ground-breaking ceremony officiated by Mr Philip Yeo, Chairman, NCB. The superstructure construction work is scheduled to start in October 1984. The proposed building will be ready for occupation by the middle of 1986.



CHAIRMAN		GENERAL MANAGER		2ND ASSISTANT GENERAL MANAGER (SYSTEMS)	
REGISTRAR PROFESSIONAL EXAMINATION SECRETARIAT					
1ST ASSISTANT GENERAL MANAGER (EDUCATION, COMPUTER PERSONNEL)					
DIRECTOR TRAINING & PROFESSIONAL DEVELOPMENT DEPARTMENT	1 Plan manpower development for the computer services industry.	2 Draw up/review computer training curriculae.	3 Plan and promote activities to effect rapid international transfer of advanced computer technology to Singapore.	4 Plan the career path of NCB information systems professionals, including those employed in the Civil Service.	5 Plan and co-ordinate programmes for professionals.
DIRECTOR COMPUTER AUDIT & SECURITY DEPARTMENT	1 Carry out management and audit reviews of computerisation projects.	2 Formulate security control standards.			
DIRECTOR ADMINISTRATION DEPARTMENT	1 Plan and manage the financial resources of the Board.	2 Provide Secretarial Services to the Board and Management Committee.	3 Provide personnel administrative support.	4 Provide office services and logistics support.	5 Co-ordinate the construction of the proposed NCB Building.
DIRECTOR INDUSTRY DEVELOPMENT DEPARTMENT	1 Formulate strategies and policies for the development of the computer services industry.	2 Co-ordinate and guide the growth of the computer services industry.	3 Promote investment and skill upgrading in the computer services industry through Government incentives.		
DIRECTOR PROJECT MANAGEMENT DEPARTMENT	1 Formulate computerisation strategies for Civil Service.	2 Implement information systems projects in the Ministries and Departments.	3 Acquire computing products and services.	4 Provide specialist services by NCB departments or external vendors to the Civil Service.	
DIRECTOR SPECIAL PROJECTS DEPARTMENT	1 Implement special information systems projects of certain Ministries and Departments.				
DIRECTOR SOFTWARE ENGINEERING DEPARTMENT	1 Set standards for information systems development.	2 Develop and support application software.	3 Source, evaluate, modify and introduce software packages, methodologies and productivity tools.	4 Promote, co-ordinate and perform research in software and information engineering.	5 Provide specialist consultancy services on computer systems programming and information engineering.
DIRECTOR COMPUTER ENGINEERING DEPARTMENT	1 Provide specialist consultancy services in computer hardware, data communications and networking.	2 Work with the telecommunication authorities in formulating national policies on data communications and public data networks.	3 Set standards for data communications in the Civil Service.		

Management Committee



Mr Tan Chin Nam
General Manager

Mr Seah Kie Hoon
1st Assistant General Manager

Mrs Pearlgen Chan
2nd Assistant General Manager

Mr Lim Swee Say
Director, Joint Software
Engineering Programme
(NEA & S&C Organisation)

Mr Seah Kie Ger
Board Secretary/Director,
Administration Department

Mr Yeo Khoo Leng
Director, Industry Development
Department

Mr Ang Hoon Kee
Director, Software Engineering
Department

Mrs Cheng Sar Hin
Director, Project Management Department

Dr Leong Kwo Sing
Registrar, Professional Examination
Secretariat

Mr Chan Gim Siang
Manager, Computer Services
Department, Ministry of Finance

Mdm Tan Tahn Joo
Acting Director, Computer
Engineering Department

Mr William Chan
Director, Systems & Computer
Organisation, Ministry of Defence

Mdm Low Sin Leng
Director, Planning & Management
Services Division, Ministry of
Education

Sitting: (left to right) Yeo Khoo Leng, Mrs Pearlgen Chan, Tan Chin Nam (General Manager), Seah Kie Hoon, Lim Swee Say

Standing: Mdm Tan Tahn Joo, Mrs Cheng Sar Hin, Seah Kie Ger, William Chan, Ang Hoon Kee, Chan Gim Siang, Dr Leong Kwo Sing

Financial Statements

Auditor's Report
Balance Sheet
Income And Expenditure Statement
Statement Of Changes In Financial Position
Notes To The Accounts

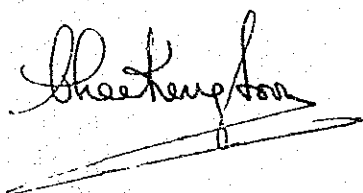
Auditor's Report
On the Accounts of The National Computer Board

For the Year Ended 31 March 1984

The accounts of the National Computer Board have been examined under my direction and in accordance with the provisions of the National Computer Board Act, 1981 (No 14 of 1981). I have obtained all the information and explanations I have required.

In my opinion:

- a) the accompanying accounts show fairly the state of affairs of the Board at 31 March, 1984 and the results and changes in financial position of the Board for the year ended on that date;
- b) proper accounting and other records have been kept; and
- c) the receipt, expenditure and investment of moneys, and the acquisition of assets by the Board during the year have been in accordance with the provisions of the National Computer Board Act, 1981.



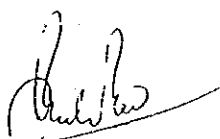
CHEE KENG SOON
Auditor General
Singapore

20 July 1984

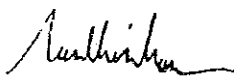
National Computer Board
Balance Sheet

As At 31 March 1984

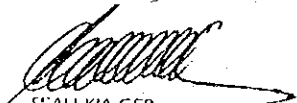
	Note	1983/84	1982/83
		\$	\$
Accumulated Surplus	2	981,004	619,403
Investment Fund	3	550,000	550,000
Revolving Fund	4	523,600	—
		<u>2,054,604</u>	<u>1,169,403</u>
Represented by:-		\$	\$
Investments	5	550,000	100,000
Fixed Assets	6	141,058	131,360
Current Assets			
Trade debtors		74,947	676,560
Other debtors and prepayments		636,386	187,379
Government grant receivable		5,230,000	3,627,713
Fixed deposits		1,383,278	2,608,274
Cash and bank balances		173,960	79,493
		<u>7,498,571</u>	<u>7,179,419</u>
Current Liabilities			
Trade creditors		5,812,413	5,890,276
Other creditors & accruals		303,323	351,100
Amount owing to subsidiary company		19,289	—
		<u>6,135,025</u>	<u>6,241,376</u>
Net Current Assets		<u>1,363,546</u>	<u>938,043</u>
		<u>2,054,604</u>	<u>1,169,403</u>



PHILIP YEO LIAT KOK
Chairman



TAN CHIN NAM
General Manager



SEAH KIA GER
Secretary/Director Administration

The accompanying notes form part of the accounts

National Computer Board
Income And Expenditure Statement

For The Year Ended 31 March 1984	Note	1983/84	1982/83
Income		\$	\$
Consultancy and professional fees	8	8,221,178	6,479,981
Procurement fees for hardware & software		115,327	77,826
Professional examination fees		137,298	77,796
Management service fee		50,000	—
Fixed deposit interest		159,271	111,561
Sundry income		50,280	6,029
		<u>8,733,354</u>	<u>6,753,193</u>
Expenditure			
Advertisement		52,345	30,083
Audit fees		9,500	8,695
Computer hardware/modem rental		223,253	431,211
Consultancy fees		738,657	175,947
Depreciation of fixed assets	6	56,623	45,617
Entertainment		14,169	11,506
Industry promotion		102,389	5,091
Insurance		6,508	5,155
Knowledge Acquisition Programme		108,593	—
Land rental		149,253	11,742
Legal fees		19,043	5,900
Medical		6,624	7,158
Miscellaneous expenses		19,233	4,545
Office equipment rental & maintenance		155,540	83,476
Office expenses		33,249	25,258
Office furniture rental		109,371	83,714
Office rental		728,347	706,392
Printing and stationery		107,046	81,241
Professional examination		13,933	21,862
Professional services	9	8,806,205	6,909,396
Property tax		21,927	—
Recruitment expenses		1,023	13,921
Salaries, CPF & other contributions		813,313	832,742
Scholarships		692,934	249,929
Staff training		426,900	305,945
Staff welfare		9,514	15,788
Telephone, telex and postage		34,190	28,873
Travelling		67,372	51,532
Vehicle rental and maintenance		72,539	63,413
		<u>13,599,593</u>	<u>10,216,132</u>
Less/Add : Gain/Loss in exchange		2,160	(30,612)
		<u>13,601,753</u>	<u>10,185,520</u>
Deficit before Government grant		[4,868,399]	[3,432,327]
Less Government grant	7	5,230,000	3,627,713
Surplus for the year		<u>361,601</u>	<u>195,386</u>

The accompanying notes form part of the accounts.

National Computer Board
Statement Of Changes In Financial Position

For the Year Ended 31 March 1984	1983/84	1982/83
Source of Funds	\$	\$
Surplus for the year	361,601	195,386
Adjustment for item not involving the movement of funds:		
Depreciation	56,623	45,617
Funds from operations	418,224	241,003
Revolving Fund	523,600	—
Proceeds from sale of investment	—	500,000
Disposal of fixed assets	—	233
Decrease in current assets:		
Trade debtors	601,613	—
Fixed deposits	1,224,996	—
Increase in current liabilities:		
Trade creditors	—	5,681,337
Other creditors & accruals	—	351,100
Amount owing to subsidiary company	19,289	—
	<u>2,787,722</u>	<u>6,773,673</u>
Application Of Funds	\$	\$
Purchase of fixed assets	66,321	96,567
Investment in subsidiary/associated companies	450,000	50,000
Increase in current assets:		
Trade debtors	—	676,560
Other debtors & prepayments	449,007	150,254
Fixed deposits	—	2,158,274
Cash & bank balances	94,467	14,305
Government grant receivable for operating deficit	1,602,287	3,627,713
Decrease in current liabilities		
Trade creditors	77,863	—
Other creditors & accruals	47,777	—
	<u>2,787,722</u>	<u>6,773,673</u>

National Computer Board
Notes To The Accounts

As At 31 March 1984

1 Significant Accounting Policies

1.1 Basis of Accounting

The accounts have been prepared under the historical cost convention.

1.2 Depreciation

Depreciation is calculated on the straight line method to write off the cost of the fixed assets over their estimated useful lives as follows:

	Years
Office Fittings	10
Office Equipment	5
Motor Scooter	5
Motor Car	7
Training Materials	3

1.3 Foreign Currencies

Foreign currency transactions have been converted at rates of exchange ruling at transaction date. Foreign currency assets and liabilities have been converted at rates of exchange ruling at balance sheet date. Exchange differences have been taken up in the income and expenditure account.

2. Accumulated Surplus

	1983/84	1982/83
	\$	\$
Balance as at 1 April	619,403	424,017
Surplus for the year	361,601	195,386
Balance as at 31 March	<u>981,004</u>	<u>619,403</u>

3 Investment Fund

This Fund was created by a grant from the Ministry of Finance for investment in a subsidiary company.

4 Revolving Fund

Revolving Fund of \$523,600/- has been provided by the Ministry of Finance for the following:

	\$
Car Loan	35,000
Motor Cycle Loan	25,000
Renovation Loan	50,000
Microcomputer Loan	37,500
Housing Loan	376,100
	<u>523,600</u>

5 Investments

	1983/84	1982/83
	\$	\$
Unquoted shares at cost —		
National Computer Systems Pte Ltd (known as Systems Education Centre Pte Ltd prior to 15 March 83) 550,000 (31 March 83 : 100,000) ordinary shares of \$1 each	550,000	100,000
	<u>550,000</u>	<u>100,000</u>

6 Fixed Assets

	Cost	Accumulated Depreciation	Net Book Value	Depreciation Charged for The Year
1983/84	\$	\$	\$	\$
Office Fittings	40,260	10,481	29,779	4,026
Office Equipment	99,482	48,409	51,073	19,896
Motor Vehicle	39,112	6,804	32,308	5,740
Training Materials	80,884	52,986	27,898	26,961
	<u>259,738</u>	<u>118,680</u>	<u>141,058</u>	<u>56,623</u>
1982/83	\$	\$	\$	\$
Office Fittings	34,884	6,455	28,429	3,489
Office Equipment	77,797	28,512	49,285	15,572
Motor Vehicle	2,662	1,065	1,597	532
Training Materials	78,073	26,024	52,049	26,024
	<u>193,416</u>	<u>62,056</u>	<u>131,360</u>	<u>45,617</u>

7 Government Grant

The Ministry of Finance has given an undertaking to finance the operating deficit incurred by the Board's headquarters through a Government grant to be provided in FY 1984/85. The amount of \$5,230,000/- is an estimated figure. The actual amount of grant receivable from the Government will be worked out by the Ministry of Finance.

8 Consultancy and Professional Fees

The amount of \$8,221,178 represented charges for the professional services rendered to Government Ministries under the Civil Service Computerisation Programme. The Board was reimbursed the salaries and other expenses in connection with the employment of the computer personnel as well as a portion of the overheads.

9 Professional Services

During the year under review, the Board entered into an agreement with National Computer Systems Pte Ltd (a company incorporated in the Republic of Singapore). Under the agreement, the Company agreed to recruit and employ computer personnel on behalf of the Board. In return, the Board agreed to reimburse the Company the salaries and other emoluments and all disbursements made by the Company as well as to pay the Company an administrative fee of \$1,300 per annum for each computer personnel recruited and employed on behalf of the Board.

The sum of \$8,806,205 represented the total amount paid by the Board to the Company under the agreement during the financial year under review.

10 Capital Commitment

The capital commitment not included in the accounts is estimated at \$710,000/-.

11 Comparative Figures

Certain comparative figures have been re-classified to conform to the current year's presentation.

DESIGNED & PRODUCED BY DESIGN OBJECTIVES PTE LTD
PRINTED BY INTERNATIONAL PRESS CO PTE LTD

資料-8 移管に伴う関連資料

(1) EDBより外務省(シ国)宛文書

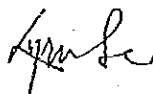
Our ref: EDB Cf 9032/8/6

27 Feb 87

PS (Foreign Affairs)
Attn: Mr Roger Lee

TRANSFER OF
JAPAN-SINGAPORE INSTITUTE OF SOFTWARE TECHNOLOGY FROM
ECONOMIC DEVELOPMENT BOARD TO SINGAPORE POLYTECHNIC

The administration of JSIST Project will be transferred from EDB to SP. We have attached the write-up on the rationale and the details of this transfer. Would appreciate it if you could officially convey this to Embassy of Japan.



LYOU SOON TIAN
HEAD, PLANNING & DEVELOPMENT
MANPOWER DEVELOPMENT DIVISION
ECONOMIC DEVELOPMENT BOARD

cc Mr Hosoya
Embassy of Japan

Mr Tanaka
Resident Representative
JICA

enc

LST/dt

TRANSFER OF
JAPAN-SINGAPORE INSTITUTE OF SOFTWARE TECHNOLOGY FROM
ECONOMIC DEVELOPMENT BOARD TO SINGAPORE POLYTECHNIC

The administration of the Japan-Singapore Institute of Software Technology (JSIST) will be transferred from the Economic Development Board (EDB) to the Singapore Polytechnic (SP) with effect from 1 April 1987.

The transfer will enable SP to offer computer education that will be more in line with the streamlined and intensive computer education courses at the National University of Singapore (NUS) and Ngee Ann Polytechnic (NP) which already have the Institute of Systems Science (ISS) and the Centre for Computer Studies (CCS) under them respectively. Like the JSIST, the ISS at NUS and the CCS at NP also provide training and facilities for comprehensive formal courses in computer studies. EDB's manpower training programmes have, for practical reasons, been linked directly to industry sectors that the Board has sought to promote. The EDB has thus developed an intimate knowledge of and close working relationships with these sectors. When JSIST was established in 1980, EDB was responsible for the promotion of the computer software industry. Since then, however, this role has been taken over by the National Computer Board (NCB) which was set up in 1981.

The ISS/NUS, CCS/NP and JSIST/SP arrangements will now allow for better overall coordination of manpower planning and development for computer professionals by the NCB.

JSIST will function as an autonomous institute within SP, and be administered by a management council. The management council will in turn be responsible to the SP Board of Governors.

The JSIST will continue with its 5-year Phase II Project which was agreed between the Governments of Japan and Singapore in January 1986.

(2) 新聞発表 (Press Release)

PRESS RELEASE

(Released jointly by the Economic Development Board
and the Singapore Polytechnic)

11 March 1987

TRANSFER OF THE JAPAN-SINGAPORE INSTITUTE OF SOFTWARE TECHNOLOGY FROM THE ECONOMIC DEVELOPMENT BOARD TO THE SINGAPORE POLYTECHNIC

The Japan-Singapore Institute of Software Technology (JSIST) will be transferred from the Economic Development Board (EDB) to the Singapore Polytechnic (SP) with effect from 1 April 1987.

The JSIST was established in 1980 under the EDB as an integral part of its manpower development programme to provide the nascent computer services industry with practice-oriented computer professionals. In the following year, the National Computer Board (NCB) was set up as a single-focus organisation responsible for the promotion of computerisation and the overall development of Singapore's computer services industry in particular.

Over the years, good progress has been made in professional manpower development for the computer services industry. The implementation of the National Information Technology Plan calls for a consolidation of our manpower development programme. The transfer of JSIST to SP will bring about a streamlined and focussed approach in the coordination of manpower development for the information technology industry, which is undertaken by the NCB.

Today, apart from the JSIST, the National University of Singapore (NUS) and the Ngee Ann Polytechnic (NP) each has a training centre related to computer studies, ie the Institute of Systems Science (ISS) and the Department of Information Science & Computer Science (DISCS) within the NUS, and the Centre for Computer Studies (CCS) within the NP.

All these institutions offer formal training courses in computer studies. The transfer of the JSIST to SP will therefore bring the Institute in line with the organisational arrangement adopted by all the other national computer training institutions.

The JSIST will function as an autonomous institute within SP. It will be administered by a management council which will in turn be responsible to the SP Board of Governors.

The JSIST will continue with its five-year Phase II Project which commenced in January 1986 under an agreement between the Governments of Japan and Singapore. Under the Phase II Project, the Institute will introduce an Advanced Diploma Course in Software Technology in the second half of this year.

The Institute will also continue to offer the two-year full-time Diploma Course in Programming & Systems Analysis for 'A' level holders. However, with the transfer of the JSIST to the Singapore Polytechnic, the Institute will take in one batch of 120 students this year instead of two batches of 60 previously. The intake will be in June, in line with the Polytechnic's academic year. The new students will pay the same tuition fees as other SP students, following the practice adopted by the Centre for Computer Studies in NP.

The present JSIST students enrolled in this course will continue under their existing bursary scheme administered by the EDB. The bursary scheme will be phased out when these students graduate.

Students graduating from these courses after 1 April 1987 will be awarded joint Singapore Polytechnic-JSIST diplomas.

Plans are being drawn up to house the JSIST at the SP Campus at Dover Road. In the meantime, the JSIST will continue to run its courses at the World Trade Centre.

PUBLIC RELATIONS UNIT
ECONOMIC DEVELOPMENT BOARD

01521/sm/mc

REPORTERS ATTENDING PRESS CONFERENCE ON JSIST TRANSFER, 11/3/87

Berita Harian	:	(not covering)
Business Times	:	Chuang Peck Ming
Lianhe Wanbao	:	Mok Kiat Yong
Lianhe Zaobao	:	Miss Goh Sin Hwee
SBC News	:	Ramesh Subaraman
SBC Digest	:	(coverage undecided)
Shin Min Daily	:	Lim Tow Seng
Straits Times	:	Grace Chng

Poly to take over software institute

FROM next month, the Japan-Singapore Institute of Software Technology (JSIST), will be transferred from the Economic Development Board to the Singapore Polytechnic.

This brings the institute in line with the arrangement adopted by all the other national computer training institutions, said Mr Tan Chin Nam, EDB's General Manager.

For example, the National University of Singapore has within its jurisdiction the Institute of Systems Science while Ngee Ann Polytechnic has the Centre for Computer Studies.

"We believe this trans-

fer is a significant development. It offers a better mechanism to consolidate all our computer training programmes in Singapore," he said.

The transfer was announced at the first EDB press conference to be held at its new office in Raffles City Tower yesterday.

JSIST was set up in 1980 under the EDB in collaboration with the Japanese government to train software professionals for the then infant computer services market. This collaboration with the Japanese government remains unchanged with the transfer.

Mr Khoo Kay Chai, Singapore Polytechnic's principal, who was also pres-

ent at the press conference, said JSIST's students will benefit from the transfer.

"They will be able to enjoy campus life and receive a balanced, well-rounded education. They can also expect new premises as plans are in the pipeline to put up a new building to house JSIST at our campus in Dover Road," said Mr Khoo.

The same courses will be offered — the two-year diploma in programming, a three-month certificate in systems analysis, and a six-month diploma in systems analysis. An advanced diploma course in software technology will be offered later this year.

Students will receive a joint Singapore Polytechnic-JSIST diploma at the end of their course.

The intake of A-level students will remain at 120 and they will be admitted in June in line with the polytechnic's academic year.

The 138 students currently enrolled at the institute and who have received financial assistance from the EDB, will continue under this scheme.

They will have to serve their three-year bond when they complete their studies, said JSIST's Deputy Director Dr Ho Tat Kin.

New students will not come under the EDB scheme and they will have to pay the same fees as other polytechnic students.

JICA