附　属　資　料

1．Joint Comittee Meeting(合同委員会)用資料(ミニッツ ANNEX Ⅱ)

2．情報工学部に係る KMITL の構想

3．KMITL・JKUCAT 大学間交流覚え書・ミニッツ

附 属 資 料　1.

Joint Comittee Meeting（合同委員会）用資料
（ミニッツ ANNEX Ⅱ）

ANNEX II

THE EXPANSION PROJECT OF

KING MONGKUT'S INSTITUTE OF TECHNOLOGY LADKRABANG

Fourth Joint Committee Meeting

26 November 1991

CONTENTS

AGENDA

Joint Committee Meeting for the Expansion Project
of King Mongkut's Institute of Technology Ladkrabang
Office of the Rector, KMITL
Tuesday 26 November 1991, 14.30 hours

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1. Review of progress.
2. Formulation of annual work plan.
3. Exchange of views on major issues.
4. Other matters.

Joint Committee

1. Assoc. Prof. Dr. Kosol Petchsuwan, KMITL Rector, Chairman
2. Assoc. Prof. Dr. Somkiat Supadech, Dean, Faculty of Engineering
3. Assoc. Prof. Dr. Chom Kimpan, Deputy Director, Computer Research and Service Center
4. Asst. Prof. Dr. Kobchai Dejhan, Head, Department of Telecommunications Engineering
5. Mr. Pradit Vachrapibool, Head, Department of Industrial Technology
6. Dr. Mongkol Mongkolwongrojn, Head, Department of Mechanical Engineering
7. Assoc. Prof. Dr. Yothin Prempraneerath, Head, Dept. of Control Engineering
8. Dr. Worawat Limpoka, Head, Department of Computer Engineering
9. Dr. Chantavit Sujatanond, Director of Foreign Relations Division, Ministry of University Affairs. MUA Representative
10. Mrs. Tipsuda Nopmongcol, Chief of Japan Sub-Division, External Cooperation Div. III, Dept. of Technical and Economic Cooperation, DTEC Representative
11. Representative, Office of the Civil Service Commission
12. Representative, Bureau of the Budget
13. Mr. Akira Kumakura, Leader, Advisory Survey Team
14. Mr. Katsuhiko Ito, Member, Advisory Survey Team
15. Prof. Dr. Toshio Iijima, Member, Advisory Survey Team
16. Mr. Minoru Yoshida, Member, Advisory Survey Team
17. Mr. Kiyokuni Hagiwara, Member, Advisory Survey Team
18. Mr. Eri Sugita, Coordinator, Advisory Survey Team
19. Mr. Chiyohiko Hakoishi, Chief Adviser and Expert in Data Communication
20. Prof. Dr. Hiromu Hashimoto, Expert in Mechanical Engineering
21. Mr. Kaname Hiraguri, Expert in Telecommunications
22. Mr. Mutsuo Murasato, Expert in Broadcasting
23. Mr. Hideo Sakuraba, Coordinator
24. Mr. Makoto Ashino, Assistant Resident Representative, JICA Thailand Office

Observers

25. Asst. Prof. Dr. Supachai Ratanopas, Vice-Rector for Academic Affairs
26. Assoc. Prof. Dr. Kosan Kusamran, Vice-Rector for Internationas Affairs
27. Asst. Prof. Dr. Jongkol Ngamwiwit, Assistant Rector for International Affairs

Background Information

The Institute King Mongkut's Institute of Technology Ladkrabang (KMITL) was established in 1971 as the Ladkrabang Campus of KMIT and became a full national university in 1986. Its origin went back to the Nondhaburi Telecommunications Training Center, which was established in 1960 with technical cooperation from the Government of Japan. Through step-by-step development the Training Center then became the Nondhaburi Institute of Telecommunications, and finally the Faculty of Engineering in KMITL. The Institute now has five faculties, one school and one center: Faculties of Engineering, Architecture, Industrial Education, Science, Agricultural Technology, School of Graduate Studies, and Computer Research and Service Center. At present there are 6,500 students engaged in 41 bachelor's degree programmes, 9 master's degree programmes, and the doctorate programme in electrical engineering.

The Project On 15 December 1987 the record of discussions for the Expansion Project of KMITL was concluded by Mr. Masao Hasegawa, Leader of the Implementation Survey Team, and Dr. Kosol Petchsuwan, KMITL Rector. This agreement was the result of two previous missions in the same year: the Preliminary Survey Team headed by Mr. Yoshiyuki Takeda in March, and the Preliminary Study Team headed by Mr. Kobo Inamura in September.

The Expansion Project of KMITL is a technical cooperation project having the duration of 5 years from 1988-1993. It covers 4 fields: telecommunications, broadcasting, data communication, and mechanical engineering. There are 3 components of the cooperation: experts from Japan, fellowships for KMITL counterparts to receive training in Japan, and equipment.

Long-Term Experts

1) Chief Adviser and Expert in Data Communication: Mr. Chiyohiko Hakoishi, Special Adviser, Ministry of Posts and Telecommunications (MPT), took up his appointment from 22 August 1991. He succeeded Mr. Masabumi Kawamura, Communications Research Laboratory, MPT, who served in this post from 31 May 1988 to 30 May 1991.

2) Expert in Telecommunications: Mr. Kaname Hiraguri, International Affairs Department, Nippon Telegraph and Telephone Corporation (NTT), continues his two-year appointment starting from 9 August 1990.

3) Expert in Broadcasting: Mr. Mutsuo Murasato, Broadcasting Engineering Department, Japan Broadcasting Corporation (NHK), continues his two-year appointment starting from 21 May 1990.

4) Expert in Mechanical Engineering: Dr. Hiromu Hashimoto, Professor of Mechanical Engineering, Faculty of Engineering, Tokai University, took up his appointment from 9 April 1991. He succeeded Professor Dr. Toshio Iijima, also of Tokai University, who served in this post from 18 April 1988 to 17 April 1991.

5) Coordinator: Mr. Hideo Sakuraba, Social Development Cooperation Department, Japan International Cooperation Agency (JICA), has been with the Project since 20 September 1989. His appointment has been extended until 31 March 1992.

Agenda Item 1. Review of Progress

A. PROGRESS IN THE FIELD OF TELECOMMUNICATIONS

I. Equipment Supplied by the Project (see Annex 1-1)

II. Utilization of Equipment (see Annex 2 for details)

1. Education

Subject	Topic	Year-Semester	Equipment	Staff in Charge
Telecomm. Lab.	Digital Microwave Measurement	3 -I,II	Digital Microwave System	Mr. Narong H.
Telecomm. Lab.	Multiplex cct. Measurement	3 -I,II	Digital Multiplex System	Mr. Thawil K.
Telecomm. Lab.	Optical Fiber Measurement	3 -I,II	Optical Transmission System and Optical Measurement Set	Mr. Apinun M.
Telecomm. Lab.	*1. Digital Exchange & Digital PABX Technology	3 -I,II	Digital PABX and Terminals	Mr. Tawil P.
Telecomm. Lab.	*2. ISDN Protocol Technology	3 - I,II	ISDN Protocol Simulator/ Monitor and Terminals	Mr. Tawil P.
Telecomm. Lab.	*3. DSP and VLSI Technology	3 - I,II	Workstation, PC and DSP cct. design Software	Dr.Kobchai D.

Subject	Topic	Year-Semester	Equipment	Staff in Charge
Telecomm. Lab.	*4. Digital Circuit	3 - I,II	Digital Circuit Trainer	Mrs. Nipa L.

Remark : *1,2,3,4 From 1st Semester 1992

2. Research

The following list shows the research topics which are being carried out using the main equipment supplied by JICA

Research Topic	Equipment	Staff
1. Microwave Circuit Design	Microwave Measuring Equipment	Mr. Monai K.
2. Millimeter-wave Attenuation due to Rain	" "	Mr. Tawil P.
3. Microwave Attenuation due to Rain	" "	Mr. Narong H.
4. VHF Wave Propagation	" "	Mrs. Nipa L.
5. Digital Microwave Circuit	Digital Microwave Equipment	Mr. Narong H.
6. Optical Image Scanner	Optical Transmission System and Optical Equipment	Mr. Apinun M.
7. Effect of Signal via 8M bit/s Optical Fiber System	" "	Mr. Thawil K. Dr. Kobchai D.
8. Bit Error Rate Monitor	" "	Dr. Kobchai D. Mr. Thawil K.

Research Topic	Equipment	Staff
9. ISDN Protocol	ISDN Protocol Simula- -tor/monitor	Mr. Tawil P.
10. DSP and VLSI	Workstation and Cir- -cuit Design Software	Dr. Kobchai D. Mr.Kriangkrai W.
11. Image Recognition	Personal Computer and Software	Dr. Wiwat K.
12. Cellular Mobile Telephone Development	Cellular Mobile Telephone Test System	Mr. Tawil P.
13. Contention Ring Protocol for High-Speed LAN	Workstation	Dr. Suvipol S.

III. Short-Term Experts

Name	Term	Topic	Counterpart	Equipment
Y. Suzuki (NEC)	June 20 - July 11,1989	Digital Microwave Installation	Mr. Apinun M. Mr. Narong H. Mrs. Nipa L.	Digital μ-wave
T. Ikeda (NEC)	June 27 - July 11,1989	Digital Microwave Equipment Guidance	Mr. Narong H. Mr. Apinun M. Mrs. Nipa L.	"
M. Wakimoto (NEC)	July 18 - Aug. 1,1989	Optical Fiber Multiplex Equipment Installation	Mr. Thawil K. Mr. Apinun M.	Optical Fiber Multiplex Equipment
Y. Sato (NTT)	July 16 - Aug. 24,1989	Radio Communication Guidance	Mr. Narong H. Mr. Apinun M.	Digital Microwave Equipment
T. Kuroda (NEC)	Aug. 8 - Sep. 24,1989	Optical Fiber Multiplex Guidance	Mr. Thawil K. Mr. Apinun M.	Optical Fiber Multiplex Equipment

Name	Term	Topic	Counterpart	Equipment
Y. Moriya (Tokai)	Aug. 9 - Sep. 7,1989	Microwave Propaga--tion Guidance	Mr. Tawil P. Mr. Narong H. Mr. Apinun M. Mrs. Nipa L.	Microwave Measuring Equipment
S. Fujikawa (Anritsu)	Aug. 24 - Sep. 7,1989	Measurement Technic Guidance	Mr. Thawil K. Mr. Narong H. Mr. Apinun M. Mrs. Nipa L.	Optical Fiber Multiplex Digital μ-wave Measuring Equipment
S. Doi (NTT)	Nov. 1 - Dec. 15,1989	Transmission Line Guidance	Mr.Kemthong N. Mr. Apinun M.	Optical Fiber Measuring Equipment
T.Wakabayashi (Tokai University)	Aug. 1 - Aug. 14,1990	Electromagnetic Wave Technology & Research Guidance	Mr. Narong H. Mr. Monai K.	μ-wave Equipment μ-wave Measuring Instruments
Y. Moriya (Tokai University)	Dec. 5 - Dec. 31,1990	Microwave Propagation Technology & Research Guidance	Mr. Tawil P. Mr. Narong H. Mr. Apinun M. Mrs. Nipa L.	μ-wave Measuring Instruments
T. Matsuura (Tokai Univ.)	Jul.29 - Aug.15,1991	Digital Circuit	Dr. Wiwat K. Mr. Pramote W.	Personal Computer
Y. Moriya (Tokai Univ.)	Mar. 1992 (3 W)	Microwave Propaga--tion Technology & Research Guidance	Mr. Tawil P. Mr. Narong H. Mr. Apinun M. Mr. Nipa L.	μ-wave Measuring Instruments

Name	Term	Topic	Counterpart	Equipment
- (Tekeleck)	Jan. 1992 (2 W)	ISDN Protocol Simulator/Monitor Operation Guidance	Mr. Tawil P. Mr. Manoon S. Dr.Suvipol S.	ISDN Protocol Simulator/ Monitor
- (NTT)	Feb. 1992 (3 W)	ISDN Protocol Technology Guidance	" "	" "
- (Tokodai Univ.)	Feb. 1992 (2 W)	Digital Signal Processing (DSP) Research Guidance	Dr.Kobchai D. Mr.Kriangkrai	Workstation and Software

IV. Training in Japan

Name	Term	Field	Organization
Mr. Thawil K.	28 July 1988- 20 November 1988	Digital Transmission	NTT, NEC, ANRITSU
Mr. Narong H.	1 September 1988- 22 December 1988	Microwave Technology	NTT, NEC, ANRITSU
Mr. Kemthong N.	17 August 1989- 3 November 1989	Outside Plant & Cable	NTT, ANDO
Mr. Monai K.	24 October 1989- 23 December 1989	μ-wave Circuit	Tokai Univ. (Prof. Wakabayashi)
Mr. Sukon N.	6 March 1990- 14 April 1990	Rural Telecom.	Tokai Univ.
Mr. Tawil P.	3 June 1990- 2 September 1990	Digital Switching/ Microwave Propagation	NTT, NEC, Tokai Univ. (Prof. Moriya)
Mr. Suchin J.	10 January 1991- 11 March 1991	Digital Switching	NTT
Mr. Manoon S.	23 October 1991- 20 December 1991	Network Planning	NTT

Name	Term	Field	Organization
Dr. Kobchai D.	19 November 1991- 19 December 1991	Digital Signal Processing	Tokodai Univ. (Prof. Onoda)
Dr. Wiwat K.	16 January 1992- 31 March 1992	Data Communication/ Digital Circuit	NTT Tokai Univ. (Prof. Matsuura)
Mr. Apinun M.	11 February 1992- 25 March 1992	Optical Fiber Cable Trans--mission	NTT Tokai Univ. (Prof.)

V. Publications

(1) Textbooks

Title	Author	Language	Manuscript	Publication
1. Optical Fiber Cable Measurement	Mr. Apinun M.	E	Completed	1989
2. Optical Fiber Cable Splicing & Measurement	Mr. Kemthong N. Mr. Apinun M.	T	"	1989
3. Satellite Communication	Mr. Narong H.	T	"	1989
4. Telex and Facsimile	Mr. Sukon N.	T	"	1989
5. Marine Radar	Mr. Apinun M.	T	Completed	1989
6. Electromagnetics	Mr. Narong H.	T	"	1989
7. Digital Microwave	Mr. Narong H.	E	Completed	1989
8. Radio & Cable Transmission Lab. Guide book	All staff	E	"	1989
9. Digital Microwave Radio System	Mr. Narong H.	E	"	1989
10. Optical Fiber Communication Theory	Mr. Apinun M.	T	"	1990

Title	Author	Language	Manuscript	Publication
11. Digital Transmission Technology	Mr. Thawil K.	T	"	1990
12. 2M PCM MUX Measurement	Mr. Thawil K.	E	Completed	1990
13. 8M Digital MUX Equipment & 8M Optical Line Terminating Equipment & Measurement	Mr. Thawil K.	E	"	1990
14. Outside Plant Eng.	Mr. Kemthong N.	T	June 1991	In Press
15. Telecommunication Circuit Design	Mr. Tawil P.	T	June 1991	"
16. Digital Microwave Communication Engineering	Mr. Narong H.	T	*	
17. Digital Switching Technology	Mr. Tawil P.	T	*	
18. Digital PABX	Mr. Tawil P.	T	*	

Remark : T : Thai language E : English * : Under preparation

(2) Research Publications

The recent research publications (from January 1991-present)

1. W. Thongtun, K. Dejhan, S. Junnapiya, "A New Design Technique for Addressable Fire Detector", Proc. of The 29th Kasetsart University Annual Conference , pp. 701-708, 4-7 Feb. 1991.
2. M. Krairiksh, K. Panichpathompong, "Interior Fields of Slot on Sphere", pp.687-699, ibid.
3. P. Sanaolump, P. Buntra, T. Puangma, "To Record the Data of the Amount of a High Accuracy the Moment Rain Fall due to the Time by a Microcomputer",Proc. of Electrotechnology '91, Engineering Institute of Thailand, pp.107-116, 23-26 May 1991.

4. P. Buntra, P. Sanaolump, T. Puangma, "Body Check Signal Transmitter and Receiver System Via Telephone Network", pp.264-273, ibid.

5. W. Kiranon, P. Wardkien, "A Volt Meter to DC Meter Adaptor", pp.286-297, ibid.

6. S. Thitimutha, K. Dejhan, W. Surakampontorn, S. Junnapiya, S. Nampetch, "A Current Conveyor-Based Integrated Instrumentation Amplifier", pp.310-317, ibid.

7. K. Dejhan, B. Chalermpanich, S. Uunnapiya, S. Khuntaweetep, "CMOS VLSI Latch Circuit Optimization Based on 2μm Process Gate Length ", pp.318-337, ibid.

8. M. Krairiksh, K. Panichpathompong,"Rectangular Planar Phased Array", pp.353-367, ibid.

9. W. Thongtun, K. Dejhan, S. Sdangrith, S. Junnajpiya, S. Nampetch, "A New Design Technique for Digital Signal Transmission Based on Single Pair Transmission Line Without Power Supply at Receiver End", pp.409-421, ibid.

10. W. Surakampontorn,V. Riewruja, K. Kumvachara, K. Dejhan,"An Accurate CMOS-Based Current Conveyors", IEEE Trans. on Instrumentation and Measurement, August 1991.

11. T. Trisuwannawat, F. Cheevasuvit, K. Dejhan, "A Design Technique of Linear Phase Recusive Digital Filter with Controllable Magnitude at an Arbitrary Specified Frequency", Proc. 1991 IEEE Int. Sym. on Circuits and Systems, pp.2435-2438, Singapore, 11-14 June 1991.

12. F. Cheevasuvit, K. Dejhan, T. Trisuwannawat, C. Vangviwattana, S. Junnapiya, "Boolean Expression for Edge Detection in Binary Images",Proc. ENTECH '91, Engineering Institute of Thailand, 31 Oct. -3 Nov. 1991.

13. T. Puanma, P. Buntra, M. Sukkasem, "Telephone Recording and Signalling", ibid.

14. T. Puangma, P. Sanaolump, M. Sukkasem, " Telephony Commander ", ibid.

15. T. Puangma, I. Arungsrisangchai, I. Moriya, "Analysis of Effect of Microwave Signal due to Rain at 20 GHz in Thailand", ibid.

16. M. Sukkasem,T. Puangma,I. Arungsrisangchai,"Research and Development of Mobile Telephone in Thailand", ibid.

17. W. Kiranon, P. Wardkien, "Analog RC Meter", ibid.

18. P. Jusereewong, C. Vangwiwattana F. Cheevasuvit, K. Dejhan "A High-

Pass Recursive digital Filter with Improved Passband Magnitude Response and Remained Maximally Flat Group Delay", ibid.

19. M. Krairiksh, T. Wakabayashi, W. Kiranon, "Characteristic of Microwave Applicator Using Slots on a Sphere", Digest of World Congress on Medical Physics and Biomedical Engineering, Kyoto, Japan, pp.423, 7-12 July 1991.
20. W. Kiranon, P. Wardkien, C. Loescharataramdee, "Simple Frequency/ Voltage Converter with Low Ouput Ripple", Electronic Lett, pp.205-206, 31 Jan. 1991.
21. F. Cheevasuvit, K. Dejhan, V. Tipsuwanporn, T. Trisuwannawet, "Multispectral Image Segmentation by Applying Graph Theory onto the First Principal Component Image", Proc. of Asian Conf. on Remote Sensing, Singapore, Nov. 1991.
22. J. Ngarmnil, S. Jantarung, F. Cheevasuvit, K. Dejhan, "False Colour Composite Display of Multiband Images on Personal Computer Using Cubic Colour Bloce Techniques", ibid.
23. K. Dejhan, S. Limpaiboon, S. Junnapiya, S. Khuntaweethep, "A New Integrable Composite of Modified Field-Effect Transistor with Improved Dynamic Performance", The 14th National Electrical Engineering Conference, Prince of Songkla University, 7-8 November 1991.
24. P. Julserivong, F. Cheevasuvit, T. Trisuwannawat, K. Dejhan, "A Maximally Flat Group Delay, Sand-Ellimination Recursive Digital Filter with Improved Passband Magnitude Response", Ibid.
25. S. Sithicheevapak, "New Collision Resolution Algorithm for High Speed Contentation Ring Protocol", ibid.
26. W. Kiranon, P. Wardkien,"Integrator with Large Time Constant", Ibid.
27. T. Matsuura, W. Kiranon, P. Wardkien, "Handwriter Identification Based on Hanwriting Motion", ibid.
28. S. Kosalwit, K. Panichpratompong, "Parabolic Cylindrical Antenna for 479-493.5 MHz Cellular Telephone System", ibid.
29. K. Yayupak, M. Krairiksh, P. Noiram, S. Kosalwit, "Planar Slot Array Near-Field Analysis", ibid.
30. M. Krairiksh, K. vayupak, S. Kosalwit, P. Noiram, "A Concentric Conducting Spherical Cavity", ibid.
31. P. Sanaolum, I. Arungsridangchai, T. Puangma, "Frequency to Voltage

Converter for Highly Accurate Rain-Guage Measurement", ibid.

32. S. Wilasuwan,I. Arunsrisangchai,T. Puangma, "Designation of Cellular Mobile Telelphone System", ibid.

33. P. Buntra, K. Hiraguri, M. Sukkasem, T. Puangma,"Time Slot Switching Circuit for Integrated Services in DPBX", ibid.

VI. Number of students, Department of Telecommunications Engineering

Academic Year	1989-1990	1990-1991	1991-1992
2nd Year	26	27	105
3rd Year	34	26	28
4th Year	45	34	26
Total	105	88	159

VII. Budgets from the Thai Government

Type	Amount (Baht)		
	FY 1989/90	FY 1990/91	FY 1991/92
a. Personnel	1,842,720	2,176,800	2,741,880
b. Materials	489,899	658,284	779,650
c. Equipments	326,000	796,300	4,350,000
Total	2,658,619	3,631,384	7,871,530

VIII. List of Thai Counterparts

(1) Staff

Associate Professors :

1. Dr. Wiwat	Kiranon	B.Eng. (KMITL) M.Eng., D.Eng. (Tokai)
2. Dr. Charray	Surawatpunya	B.Eng. (KMITL) 1st Class Hons., M.Eng., D.Eng. (Osaka)
3. Mr. Manoon	Sukkasem	B.Eng., M.Eng. (Tokai)
4. Mr. Tawil	Puangma	B.Eng., M.Eng. (KMITL)

Assistant Professors :

5. Dr. Kobchai	Dejhan (Head)	B.Eng., M.Eng. (KMITL), Docteur (Telecom Paris)
6. Mr. Narong	Haemmakorn	B.Eng., M.Eng. (Tokai)
7. Mr. Apinun	Manyanon	B.Eng. (Tokai), M.Eng. (Tokyo Denki Tsushin)
8. Mr. Thawil	Kingthong	B.Eng., M.Eng. (Tokai)
9. Mr. Sompol	Kosalwit	B.Eng., M.Eng. (Tokai)
10. Mr. Monai	Krairiksh	B.Eng., M.Eng. (KMITL)
11. Mr. Roong	Potisuwan	B.Ed. (SWU)
12. Mr. Suchin	Jamjod	B.Eng. (KMITL)

Lecturers :

13. Dr. Suvipol	Sitticheevapak	B.Eng. (Hons.), M.Eng. (Osaka), Ph.D. (Kobe)
14. Mr. Somyot	Junnapiya	B.Ind. Tech., M.Eng. (KMITL)
15. Mr. Kriangkrai	Wongrojjanapom	B.Eng. (KMITT), M.S.E.E. (Ohio)
16. Mr. Pramote	Wardkien	B.Sc. (SWU), M.Eng. (KMITL)
17. Mr. Sukhon	Nampetch	B.Eng. (KMITL)
18. Mr. Kemthong	Nimsiri	B.Eng. (KMITL)
19. Mrs. Nipa	Leelaruji	B.Eng. (KMITL)

20. Mr. Punya Thitimajshima B.Eng., M.Eng. (KMITL)
(Continues studying at University of Brest, France)
21. Mr. Suthichai Nopnakeepong B.Eng., M.Eng. (KMITL)
(Continues studying at Tokyo Institute of Technology, Japan)
22. Mr. Thongtod Vanishsri B.Eng., M.Eng. (KMITL)
(Continues studying at Imperial College of Science, Technology,and Medicine, England)

Projected Number of Staff

Year	No.
1992	23
1993	23
1994	24

B. PROGRESS IN THE FIELD OF BROADCASTING

I Utilization of Equipment

1. Education activities

The equipment is used for 1st - year and 2nd - year students in broadcasting and telecommunication engineering laboratory courses as follows.

Subject	Topic	Year-Semester	Equipment	Person in charge
Electronics Laboratory III	Filter design	1 - II	Network Analyzer	Dr. Kanok J.
	Antenna design	2 - II		Dr. Kanok J.
	Microprocessor application	2 - I	Logic Analyzer	Mr. Paisan S.
	Audio Signal measurement	2 - I	Audio Measurement Set	Mr. Uthai S.
	Logic Signal analysis	2 - I	Logic Analyzer	Dr. Paisal S.
	Audio spectrum analysis	2 - I	Spectrum analyzer Function Generator Oscilloscope	Mr. Pradit V.
Telecommunications Laboratory	Video Amp design	2 - II	VHF Sweep Generator Video Sweep-Generator	Mr. Nikorn S.
	Camera Setting	2 - II	CCD Camera B - CAM	Mr. Vichai S.

Subject	Topic	Year-Semester	Equipment	Person in charge
Telecommunications Laboratory	Chrominanceance Signal Analysis	2 - II	White Balance Checker Vector scope	Mr. Uthai S.
	UHF Transmitter	2 - II	UHF TV Transmitter Spectrum Analyzer	Mr. Pradit V.
	Stereo Measurement	2 - II	Stereo measurement Set	Dr. Anan C.
Computer Laboratory	Computer Graphics	1 - II	16-bit Microcomputer	Mr. Attasit L.
	System Programing	1 - II	NEC APC-IV Computer	Mr. Chawalit B.
	Computer Network	1 - II	8-bit Microprocessor X-Y Plotter	Mr. Paisan S.

2. Research activities

Theme	Name	Equipment	Remark
Realization of an Active Distributed RC Line Filters and Its Application	Master's Thesis Mr.Paisan S.	Personal Computer Powermate 100 MHZ Oscilloscope Network Analyzer X-Y Plotter	Dr. Kanok J.
Design of the Low Pass Type Wave Digital Filters	Master's Thesis Mr.Chawalit B.	Personal computer Powermate 100 MHZ Oscilloscope Network Analyzer X-Y Plotter	Dr. Kanok J.
On the Approximation of Sine-Squared Pulse by Using Optimization	Master's Thesis Mr. Kittisak T.	Personal Computer Ossilloscope X-Y Plotter Waveform Generator Waveform Monitor	Dr. Kanok J.
Equalization of Phase Delay of generalized Bessel Polynomial	Master's Thesis Mr. Nikorn S.	Personal Computer Oscilloscope X-Y Plotter Waveform Generator Waveform monitor	Dr. Kanok J.
Computer-Aided PCB design	Master's Thesis Mr. Suttinun P.	NEC PC Powermate IV X-Y Plotter	Dr. Kanok J.

Theme	Name	Equipment	Remark
256x256 Color Video Digitizer	Master's Thesis Mr. Vichai M.	Color Video Camera 16 bit Microcomputer Logic Analyzer Flash A/D	Mr. Attasit L.
FM Broadcasting Transmitter	Mr. Wanchai K.	FM Sideband Analyzer Oscilloscope Frequency Counter	Mr. Pradit V.
UHF TV Broadcasting	4th - Year Students	10 Watts UHF TV Transmitter TV Monitor Spectrum Analyzer	Mr. Pradit V.
UHF Loop Antenna	4th - Year Students	RF Sweep Generator Spectrum Analyzer	Mr. Pradit V.
Parabolic Antenna Installation	4th - Year Students	Satellite Receiver TV Monitor	Mr. Pradit V.
Teletext Signal on FM Broadcast Signal	Master's Thesis Mr. Kriddakorn	Spectrum analyzer FM Signal Generator Oscilloscope	Dr. Kanok J.

II. Experts

1. Long-Term Experts

Name	Term
Y. Tamura	31 May 88 - 30 May 90
M. Murasato	21 May 90 - 20 May 92

2. Short-Term Experts

Name	Term	Topic	Counterpart	Equipment
FY 1988				
Mr. Ito (NHK)	20 Jul.-19 Sep. 1989	Measurement Technique	Mr. Nikorn S. Mr. Pradit V. Mr. Uthai S.	TV Signal Generator Vector Scope Camera Tone Burst Generator
FY 1989				
Mr.Sekino (SONY)	2 Jul.-28 Jul. 1990	Measuring Equipment: Digital Oscilloscope, Logic Analyzer, GP-IB I/F	Mr. Nikorn S. Mr. Pradit V. Mr. Uthai S. Mr. Attasit L.	Digital Oscilloscope TV Signal Generator GP-IB I/F Board
Mr.Iwahana(NHK)	23 Jul.-22 Sep. 1990	Measurement technique: GP-IB Measurement System Audio Analyzer	Dr. Kanok J. Mr. Nikorn S. Mr. Pradit V. Mr. Attasit L.	APC-IV with GP-IB Digital Oscilloscope Logic Analyzer Network Analyzer Audio Precision Set X-Y plotter

Name	Term	Topic	Counterpart	Equipment
Mr.Nakahata(NHK)	21 Aug.-28 Aug. 1990	HDTV Technology	Dr. Kanok J. Mr. Vichai S. Mr. Pradit V.	Speakers at the HDTV Seminar
Mr.Seo (NHK)	21 Aug.-28 Aug. 1990	HDTV Technology	Dr. Anan C. Mr. Nikorn S.	Speakers at the HDTV Seminar
Dr.Kando (Tokai University)	Dec. 1991	Image Processing	Mr. Attasit L. Dr. Paisal N.	
Dr.Teramoto (Tokai University)	Feb. 1992	Filter Designing	Mr. Nikorn S. Dr. Kanok J.	
Mr.Nio (Toshiba)	Jan. 1992	Satellite Broadcasting Technology	Dr. Kanok J. Dr. Paisal N. Dr. Anan C.	
(NHK)	Feb. 1992	HDTV Broadcasting Technology	Mr. Pradit V. Mr. Uthai S. Mr. Vichai S.	
(NHK)	Mar. 1992	Ghost Reduction Technology	Dr. Kanok J. Mr. Paisan S.	

III. Training in Japan

Name	Term	Topic
FY.1988		
1.Dr.Kanok Jainchirapongvej	2 Oct.-24 Nov. 1988	Measuring equipment
FY.1989		
1.Dr.Anan Chailertvanitkul	15 May-14 Jul.1989	Measuring equipment
FY.1990		
Mr.Uthai Sritheeravirojana	16 Jul.- 4 Oct.1990	Fundamental Television Engineering (NHK)
FY.1990		
Mr.Pradit Vachrapibool	16 Jan.- 3 Mar.1991	Television Engineering (Advanced) (NHK)
FY.1991		
Mr.Nikorn Sukutamatanti	30 Sep.-28 Dec.1991	Circuit Design
Mr.Vichai Surapat	16 Jan.- 3 Mar. 1992	Television Engineering (Advanced) (NHK)

IV Publications

1. Textbooks

Title	Author	Finishing Date (Fiscal year)
1. Electronic Circuit I	Nikorn S.	1989
2. Electronic Circuit II	Nikorn S.	1989
3. Introduction to Microprocessor	Attasit L.	1990
4. Solved Problems in Electronics	Nikorn S.	1990
5. Video Test Signal	Kanok J.	1990
6. Radio and TV Transmitter	Pradit V.	1991

2. Technical papers

Title	Author(s)	Name of Seminar/Symposium/ Society/Organization	Date	Venue
1. Insertion of Teletext Signal on Horizontal Blanking Interval RC Lines	Kriddakorn K. Kanok J.			
2. Real Time Video digitizer	Attasit L. Manus S. Pichai K. Prapakorn S.	11th Conference of Electrical Engineering	16-17 Dec.88	Rajamangala Institute of Technology
3. Realization of an Active Low Pass Filter Using Uniformly Distributed	Kanok J. M.Teramoto	IEICE, CAS 89-54-71	26 Oct.89	Osaka, Japan
4. On the Approximation of Low Pass Filter with Maximally Flat Group Delay	Paisan S. Chawalit B. Kanok J.	12th Conference of Electrical Engineering	24-25 Dec.89	Kasetsart University
5. The Characterization of the Generalized Bessel Polynomials	Kanok J.	16th Conference on Science and Technology of Thailand	25-27 Oct.90	Central Plaza Hotel Bangkok

Title	Authors	Name of Seminar/Symposium/ Society/Organization	Date	Venue
6. Equalization of Luminance to Chrominance Linear	Chaisak V. Kanok J.			
7. Realization of an Equalizer Using Uniform Distributed RC Circuit	Paisan S. Kanok J.			
8. On the Approximation of Sine-Squared Pulse by Using Optimization	Kitisak T. Kanok J.	13th Conference of Electrical Engineering	8-9 Dec.90 8-9 Dec.90	University of Chiangmai
9. Analysis of Yagi Dipole Antenna by Using Two Term Current Distribution	Amarit S. Kanok J. Monai K.			
10. Improvement of Pre-Undershoot in Model Reduction Obtained by Aggregation	Alrab S. Kanok J. Jongkol N.			
11. Design of a Second Order Butterworth Type Wave Digital Filter	Chawalit B. Kanok J.			
12. High Resolution Color Image Digitizer by Low Access Time Memory Devices	Attasit L. Viwat S. Manus S. Prapakorn S.			
13. Realization of an Low Pass Sharp Cut-off Filter by Using Distributed RC Circuit	Chakree T. Kanok J.	The Engineering Institute of Thailand	23-24 May 91	Asia Hotel

Title	Author	Name of Seminar/Symposium/ Society/Organization	Date	Venue
14. On the Approximation of Line Squared Pulse by Using Negative Gradient with Preseribed Poles	Kanok J.			
15. Ultraspherical Generalized Bessel Polynomal Low Pass Filter	Kanok J.	14th Conference of Electrical Engineering	7-8 Dec.91	Prince of Songkla University
16. Application of FM Broadcasting for Information Services	Kanok J.			

V. Budgets from the Thai Government

Fiscal Year	Materials	Equipment	Personnel	Total
1988	500,000	400,000	108,000	1,008,000
1989	550,000	450,000	108,000	1,108,000
1990	600,000	450,000	108,000	1,158,000
1991	600,000	500,000	108,000	1,208,000

VI. Number of Students

The Department of Industrial Technology admits mainly students with technician training and practical experience in appropriate fields. A student can enrol in either a full-time or part-time program. The duration of the full-time program is two years, while the part-time program requires three years. Successful students are awarded Bachelor of Industrial Technology Degree (B. Ind. Tech.). At present, the Department is offering a program majoring in Industrial Electronics Technology and Telecommunications Technology (Broadcasting).

Academic year	1989-1990		1990-1991		1991-1992	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
Broadcasting and Telecommunications						
1st year	35	35	35	35	70	35
2nd year	35	35	35	35	35	35
3nd year	-	35	-	35	-	35
Total	70	105	70	105	105	105
Electronics						
1st year	35	35	35	35	70	35
2nd year	35	35	35	35	35	35
3nd year	-	35	-	35	-	35
Total	70	105	70	105	105	105
	350		350		420	

VII. Thai Counterparts

Assistant Professors :

1. Dr. Kanok Jainchirapongvej B. Eng.(Hons, KMITL) M. Eng., D.Eng.(Tokai)
2. Mr. Vichai Surapat B. Eng.(KMITL), M. Eng.(Chula)
3. Mr. Nikorn Sukutamatanti B. Eng.(KMITL)

Lecturers

4. Mr. Pradit Vachrapibool (Head) B. Eng.(Tokai), M. Eng.(Tokai)
5. Dr. Paisal Nakpipat B. Eng.(Chiangmai), Ph. D.(Toulousse)
6. Dr. Anan Chailertvanitkul B. Eng., M. Eng.(Yokohama), Dr. Eng.(TIT)
7. Mr. UThai Srithreeravirojana Grad. Dip. in EE, B.Ind. Tech.(KMITL)
8. Mr. Somphop Kaewmechai B. Ind. Tech.(KMITL)
9. Mr. Attasit Lasakul B. Ind. Tech., M. Eng.(KMITL)
10. Mr. Chawalit Benjangkaprasert B. Ind. Tech., M. Eng.(KMITL)
11. Mr. Paisan Sithiyopasakul B. Ind. Tech., M. Eng.(KMITL)
12. Mr. Jakkri Theekapakvisith B. Ind. Tech.(KMITL)

C. PROGRESS IN THE FIELD OF DATA COMMUNICATION

I. UTILIZATION OF EQUIPMENT

1. EDUCATION

1.1 Computing Services

Number of Students/Semester (CRSC)

No.	Faculty/School	2nd/1989	1st/1990	2nd/1990	1st/1991
1.	Faculty of Engineering	524	920	650	492
2.	Faculty of Architecture	87	142	122	111
3.	Faculty of Industrial Education	26	26	25	27
4.	Faculty of Science	62	242	163	134
5.	Faculty of Agricultural Technology	48	65	215	316
6.	Faculty of Graduate Studies	5	14	15	16
	Total	852	1,409	1,190	1,097

Note: Number of Microcomputers for education (in classroom)

No.	Faculty/School	Number of Computers
1.	Faculty of Engineering	40
2.	Faculty of Architecture	-
3.	Faculty of Industrial Education	-
4.	Faculty of Science	15
5.	Faculty of Agricultural Technology	10
6.	School of Graduate Studies	-
7.	Computer Research and Service Center	30
	Total	95

1.2 Seminars

Duration	Topic
6-15 Dec. 1989	Using RAJWITHEE Word Processing and LOTUS 123
(6 days)	- 80 participants, administrative staff from all the faculties and the Rector's Office
16-20 Apr. 1990	Computer-Aided Design for Architecture
(1 week)	- 12 participants, researchers and instructors for the Faculties of Architecture and Industrial Education
28-30 May 1990	Using ATSS-AF
(3 days)	- 13 participants, researchers and instructors from the Faculties of Engineering and Science
5 Sep. 1991	Using ATSS-AF
(1 day)	- 25 participants, students from the Department of Applied Mathematics and Computer Science, Faculty of Science
7-8 Oct. 1991	Using Public Utilities and Maintenance Software Package
(2 days)	(Developed by CRSC/MIS staff)
	- 8 participants, officers involved
18 Oct. 1991	Using Public Utilities and Maintenance Software Package
(1 day)	(Developed by CRSC/MIS staff)
	- 8 participants, officers involved
21-25 Oct. 1991	Using Public Utilities and Maintenance Software Package
(5 days)	(Developed by CRSC/MIS staff)
	- 8 participants, officers involved
28-30 Oct. 1991	Using Public Utilities and Maintenance Software Package
(3 days)	(Developed by CRSC/MIS staff)
	- 8 participants, officers involved

1.3 Number of Students in Computer Engineering Department

BACHELOR DEGREE

	1988	1989	1990	1991
1st Year	-	-	-	-
2nd Year	53	33	47	58
3rd Year	47	50	33	47
4th Year	36	46	50	33
Total	136	129	130	138

MASTER DEGREE

	1988	1989	1990	1991
1st Year	24	15	4	30
2nd Year	30	4	12	-
Total	54	19	16	30

DOCTORAL DEGREE

	1988	1989	1990	1991
1st Year	5	5	1	2
2nd Year	-	5	4	4
Total	5	10	5	6

1.4 Curriculum of Computer Engineering Department

CURRICULUM
FIRST YEAR
First Semester

CODE	SUBJECT	Crs. (Lec.-Prac.)
12101	Engineering Communication	1 (0-3)
14101	Electrical Circuit Analysis	3 (3-0)
15101	Mechanics	3 (3-0)
18101	Mathematics I	6 (6-0)
35...	Elective in Languages	3 (2-2)
35...	Elective in Humanity	2 (2-0)
35...	Elective in Humanity	2 (2-0)
	Total	20(18-5)

FIRST YEAR
Second Semester

CODE	SUBJECT	Crs. (Lec.-Prac.)
11101	Electromagnetics	3 (3-0)
12102	Engineering Laboratory II	1 (0-3)
14104	Quantum Physics	2 (2-0)
15102	Thermodynamics	3 (3-0)
15103	Engineering Drawing	1 (1-2)
17101	Introduction to Computer Sciences	2 (2-0)
18102	Mathematics II	3 (3-0)
35...	Elective in Languages	3 (2-2)
	Total	21(19-7)

SECOND YEAR
First Semester

CODE	SUBJECT	Crs. (Lec.-Prac.)
12201	Engineering Laboratory III	1 (0-3)
12202	Fundamental of Electrical Machines	3 (3-0)
14201	Fundamental of Electronics	3 (3-0)
15221	Solid and Fluid Mechanics	3 (3-0)
15222	Material Sciences	3 (3-0)
17201	Principle of Computer Programming	2 (2-0)
17202	Microprocessor and Microcomputer	3 (3-0)
18201	Mathematics III	3 (3-0)
19201	Fundamental of Civil Engineering	3 (3-0)
19389	Hydraulics	3 (3-0)
	Total	21(20-3)

SECOND YEAR
Second Semester

CODE	SUBJECT	Crs. (Lec.-Prac.)
17203	Data Structures and Algorithms	3 (3-0)
17203	Switching Theory	3 (3-0)
17205	Microprocessor Interfacing	3 (3-0)
17206	Computer Organization & Architecture	3 (3-0)
17207	Computer Laboratory I	2 (0-6)
16261	Measurement and Instrumentation	3 (3-0)
18207	System and Control Engineering	3 (3-0)
	Total	20(18-6)

THIRD YEAR
First Semester

CODE	SUBJECT	Crs.	(Lec.-Prac.)
17301	Computer Project I	2	(0-6)
17303	Computer Laboratory II	2	(0-6)
17305	Assembly Language and System Programming	3	(3-0)
17306	Information System Analysis and Design	3	(3-0)
17307	Communication Engineering	3	(3-0)
17308	Computer Engineering Mathematics	3	(3-0)
35...	Elective in Humanity	2	(2-0)
	Total	18	(14-12)

THIRD YEAR
Second Semester

CODE	SUBJECT	Crs.	(Lec.-Prac.)
17302	Computer Project II	2	(0-6)
17304	Computer Laboratory III	2	(0-6)
17309	Computer Network	3	(3-0)
17310	Operating System I	3	(3-0)
17311	Compiler Construction	3	(3-0)
17312	Database Systems	3	(3-0)
17313	Artificial Intelligence	3	(3-0)
	Total	19	(15-12)

THIRD YEAR
Summer Semester

CODE	SUBJECT	Crs.	(Lec.-Prac.)
...	Industrial Training	1	(0-300)

FORTH YEAR
Fist Semester

CODE	SUBJECT	Crs.	(Lec.-Prac.)
17401	Project I	3	(0-9)
1....	Engineering Electives	3	(3-0)
1....	Engineering Electives	3	(3-0)
1....	Engineering Electives	3	(3-0)
35...	Elective in Social Sciences	2	(2-0)
	Total	14	(11-9)

FORTH YEAR
Second Semester

CODE	SUBJECT	Crs.	(Lec.-Prac.)
17402	Project II	3	(0-9)
1....	Engineering Electives	3	(3-0)
1....	Engineering Electives	3	(3-0)
1....	Engineering Electives	3	(3-0)
35...	Elective in Social Sciences	2	(2-0)
35...	Elective in Social Sciences	2	(2-0)
	Total	16	(13-9)

Subjects for Selecting

17403	Expert Systems
17404	Operations Research
17405	Pattern Recognitions
17406	Voice Recognitions
17407	Image Processing
17408	Computer Graphics
17409	Basic VLSI Design
17410	Computer Aided Design and Manufacturing
17411	Software Engineering
17412	Remote Sensing
17413	Digital Signal Processing
17414	Management Information Systems
17415	Office Automation
17416	Computer Crime and Counter Measurement
17417	Computer Center Management
17418	Robotic Engineering
17419	Network Systems Programming
17420	System Software Environment
17421	Operating Systems II
17422	Computer Language Concepts
17423	Microcomputer Applications
17424	Selected Topics in Computer Communications
17425	Selected Topics in Information Technology
17426	Selected Topics in Operation Systems
17427	Selected Topics in Management Information Systems
17429	Selected Topics in Hardware Technology

1.5 Publications of Textbooks (in Thai)

(a) ACOS-4/MVP Handbook*

(b) Introduction to ACOS-4/MVP Relational Data Base System : RIQS and DS/TQF

(c) COBOL/Structure Language Programming

Note: * ACOS-4/MVP: The operation system under which the NEC-610 system is operated.

2. RESEARCH

2.1. Research Subjects

Computer Research and Service Center

Research work done in the past year.(1991 April-1992 March)

Name	Topic	Budget Source
Prof. Dr.Pairash Thajchayapong et al.	Computer X-Ray Tomography	NECTEC
Mr. Surasit Vannakrairojn et al.	Unix-based Engineering Workstation I	NECTEC
Assoc. Prof. Dr.Chom Kimpan	Thai-Character Recognition II	NECTEC
Mr.Wicha Sripanyapong	32-bit Microcomputer	NECTEC
Mr.Surasit Vannakrairojn et al.	Geographic Information System	NRCT
Mr.Surasit Vannakrairojn et al.	Development of a Professional Thai-English Desktop Publishing System	NRCT
Mr.Surasit Vannakrairojn	Development of a Basic Image Processing System for Microcomputer	NRCT
Asst. Prof. Kanchit Haitree	Neural Network for Adaptive System	NRCT
Assoc. Prof. Dr.Chom Kimpan	Thai Voice Recognition II	NRCT
Dr.Kittima Mekhabanchakij	Development of a TSS-based Authoring System for Computer based Instruction	NRCT
Dr.Kittima Mekhabanchakij	Development of a Computer managed Instruction System for the general and Vocational Education	NRCT

Remark
NECTEC: National Electronic and Computer Technology Center, Ministry of Science, Technology and Energy
NRCT : National Research Council of Thailand, Ministry of Science, Technology and Energy

2.2 Technical papers, etc.

Computer Research and Service Center

1. P.Thajchayapong, K.Yamman and A.Khunkitti, "Recursive Digital Filters with Predetermined Group Delay and Chebyshev Stopband Attenuation.," Electronics Letters, vol. 24, no. 25, pp. 1547-1549, Dec. 1988.

2. P.Thajchayapong and M.Chinakarn, "A Further Improvement in the Counting and Direction Sensing Circuit.," Int. J. Electronics, vol. 66, no. 6, pp.935-938, 1989.

3. P.Thajchayapong, Y.Rungsunseri and C.Punkasirikul, "Design of MURROMAF Filters with Equiripple Stopband Attenuation.," Int. J. Electronics, vol. 67, no. 1,pp. 73-80, 1989.

4. P.Thajchayapong, S.Vannakrairojn, N.Baubthong, "Multiple Real-Pole and Multiple-Critical-Pole Maximally Flat RC Active Lowpass Filters with Sharp Cut-out.," Int. J. Electronics, vol. 70, no. 1, pp. 151-157, 1991.

5. P.Thajchayapong, K.Yamman and A.Khunkitti,"X-RAY Computerized Tomography.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

6. P.Thajchayapong, K.Mekhabanchakij and M.Luakjumnian, "Testing for the Edge Visibility of General 3D Objects.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

7. P.Thajchayapong, K.Maitree and V.Wittawatkul, "Thai Expert System Shell.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

8. P.Thajchayapong, K.Mekhahbanchakij and P.Pakdokeenarong, "Program Development of Drawing Convex Object Wireframes.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

9. P.Thajchayapong, K.Maitree and S.Sayasatid, "Expert System of Fundamental Chemical Analysis.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

10. P.Thajchayapong, K.Maitree and P.Puajindanate, "Improvement of an Algorithm for Simplification of Remote Sensing Picture.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

11. P.Thajchayapong, K.Maitree and P.Sawangsamut, "English-Thai Machine Translation.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

12. P.Thajchayapong, K.Maitree and S.Tangwaritorn, "Expert System to Diagnosis Common Diseases.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

13. P.Thajchayapong, W.Supasuteekul and W.Lapwattanakit, "A Comparison of Algorithm Between Fast Fourier and Fast Hartley Transforms.," Proc. of 11th Conference of Electrical Engineering, 16-17 Dec.1988.

14. P.Thajchayapong, K.Maitree and P. Poajindanate, "Improvement of an Algorithm for Simplification of Remote Sensing Picture,." C.R.S.C. Bulletins KMITL, vol. 2, no. 2, pp. 1.1-1.11, Aug. 1989.

15. P.Thajchayapong, K.Maitree and S.Sayasathit, "Computation of Multiweight.," C.R.S.C. Bulletins KMITL, vol. 2, no. 2, pp. 2.1-2.11, Aug. 1989.

16. P.Thajchayapong, K.Maitree and P.Pucksaratananon, "Development of Expert System for Consultation of Microcomputer Troubleshooting and Maintenance.," C.R.S.C Bulletins KMITL, vol. 2, no. 2, pp. 3.1-3.10 Aug. 1989.

17. P.Thajchayapong, K.Maitree and S.Veeratavemuth, "Improvement of Topological Properties Extraction using Combination of Connected Number.," C.R.S.C Bulletins KMITL, vol. 2, no. 2, pp. 4.1-4.12, Aug. 1989.

18. P.Thajchayapong, K.Maitree and V.Thitisatientum, "A Soil Management Advisory System for Agriculture.," C.R.S.C. Bulletins KMITL, vol. 2, no. 2, pp. 5.1-5.8, Aug. 1989.

19. P.Thajchayapong and A.Khunkitti, "An Introduction to NMR Imaging.," C.R.S.C. Bulletins KMITL, vol. 1, no. 1, pp. 1.1-1.20, Mar. 1990.

20. P.Thajchayapong, K.Maitree and. S.Veeratavemuth, "System Editor for Software Reusability.," C.R.S.C. Bulletins KMITL, vol. 2, no. 3, pp. 2.1-2.7, Mar. 1990.

21. P.Thajchayapong, K.Maitree and S. Veeratavemuth, "Flying Target Detection by using Topological Properties of Object.," C.R.S.C. Bulletins KMITL, vol. 2, no. 3, pp. 3.1-3.12, Mar. 1990.

22. P.Thajchayapong, K.Maitree, S.Sayasathit and V.Wittawatkul, "Development of Chemical Analysis Expert System by using Thai Expert shell.," C.R.S.C. Bulletins KMITL, vol. 2, no. 4, pp. 1.1-1.12, May 1990.

23. P.Thajchayapong, K.Mekhabanchakij and V.Supasuteku, "Animated 3D CT Imaging.," C.R.S.C. Bulletins KMITL, vol. 2, no. 4, pp. 2.1-2.15, May 1990.

24. P.Thajchayapong, K.Maitree and C.Kraimanee, "Analysis on the Clustering of Handwritten Characters.," C.R.S.C. Bulletins KMITL, vol. 2, no. 4, pp. 3.1-3.14, May 1990.

25. P.Thajchayapong, V.Sripayapong and P.Pucksaratananon, "Z80 Emulator.," C.R.S.C. Bulletins KMITL, vol. 2, no. 5, pp. 1.1-1.10, July 1991.

26. P.Thajchayapong, K.Maitree and S.Veeratavemuth, "Semantic Zooming and Panning System Organization for Geographic Information Retrieval.," C.R.S.C Bulletins KMITL, vol. 2, no. 5, pp. 2.1-2.13, July 1991.

27. P.Thajchayapong, R.Varakulsiripun and N.Suntornsaratool, "Designing Data Communication in Microcomputer Network using BUS.," C.R.S.C. Bulletins KMITL, vol. 2, no. 5, pp. 3.1-3.8, July 1991.

28. P.Thajchayapong, C.Kimpan and S.Mitatha, "Thai Speech Recognition Using Syllable Unit.," C.R.S.C. Bulletins KMITL, vol. 2, no. 6, pp. 1.1-1.9, Sep. 1991.

29. P.Thajchayapong, K. Maitree and V.Sutunchiyanon, "Integration of Image and Database Management.," C.R.S.C. Bulletins KMITL, vol. 2, no. 6, pp. 2.1-2.11, Sep. 1991.

30. P.Thajchayapong, K.Maitree and K.Soljaroensuk, "Object Detection of Airplane by Syntactic Approach, Statistic Approach and Heuristic Technique.,"C.R.S.C. Bulletins KMITL, vol. 2, no. 6, pp. 3.1-3.15, Sep. 1991.

3. OTHERS

3.1 Development of KMITL Management Information System (KMIS)

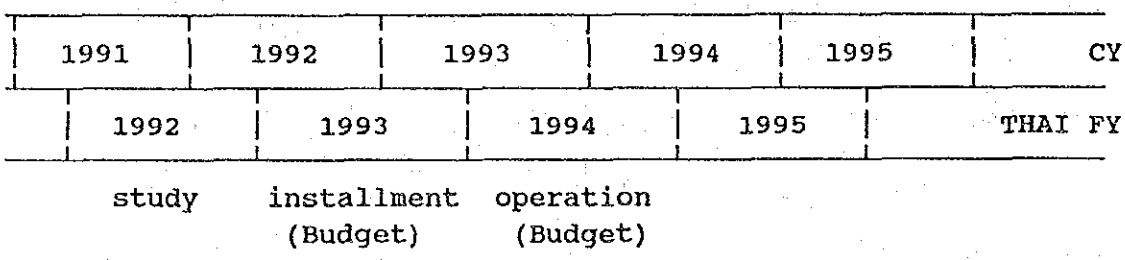
- Subsystems being under development include:
  Finance and Accountings;
  Personnel, Registration and Student Records Processing;
  Hardware and Software Stocks Control;
  Public Utilities and Maintenance;
  Library Management.

3.2 NEC-610 USAGE COMMITTEE

In order to foster the utility of NEC-610 system, NEC-610 USAGE COMMITTEE chaired by Dr. Pairash, Director of CRSC was established. The first meeting was convened on May 21, 1991 and up to now seven meetings were held. Facts finding and opinion polling are proceeding with the aim of enlargement of computer usage in study, research and administration of KMITL.

3.3 KMITL CAMPUS NETWORK

To encourage the development of databases and share the common information using the mainframe NEC 610 among every faculties and offices on education, research and so on, KMITL CAMPUS NETWORK PLAN was prepared by university staff and authorized by the Bureau of the Budget, Office of the Prime Minister. The current schedule for this network is as follows



3.4 INTERUNIVERSITY NETWORK PROJECT

The National Electronics and Computer Technology Center (NECTEC), Minister of Science, Technology, and Energy (MOSTE), set up a networking project, the Interuniversity Network Project, in late 1988. The objective is to implement a national network for supporting universities in the sharing of information and computational resources.

The initial phase of the project which connect four major institutions (Asian Institute of Technology, Chulalongkorn University, KMITL, MOSTE) will be finished by the end of this year. The project will expand the network with linking the computer center of at least 11 universities all around the country together with the computer center of MOSTE and also linking other appropriate information center or other computer networks abroad as well.

II. SHORT-TERM EXPERTS

Term	Name	Topic	Counterparts	Equipment
1989:				
27 Jan-10 Jul	Mr. Yuki Oka	Installation	Dr. Kittima, Mr.Wicha	NEC-610
27 Jan-24 Jul	Mr. Shuzo Himeno	Installation	Mr. Wicha and Staff	NEC-610
3 Jul-20 Aug	Mr. Kenji Shikano	Installation	Dr. Kittima and Staff	NEC-610
	Mr. Hiroyuki Kawata	Installation	Dr. Kittima and Staff	NEC-610
20 Oct-19 Dec	Mr. Kenji Shikano	Software training	Dr. Kittima and Staff	NEC-610
	Mr. Hiroyuki Kawata	Software training	Dr. Kittima and Staff	NEC-610
10 Nov-30 Nov	Mr. Shuzo Himeno	Hardware expansion	Dr. Kittima,Mr.Wicha	NEC-610
	Mr. Shirou Minamizono	Hardware expansion	Dr. Kittima,Mr.Wicha	NEC-610
1990:				
17 Jan-28 Jul	Mr. Kenji Shikano	Data Base	Dr. Kittima and Staff	NEC-610
1 Jul-28 Jul	Mr. Hiroyuki Kawata	Data Base	Dr. Kittima and Staff	NEC-610
1 Jul-14 Jul	Mr. Tetsuya Otsuki	Graphics	Dr. Kittima and Staff	NEC-610
2 Dec-29 Dec	Mr. Kenji Shikano	(NCS) Software	Dr. Kittima and Staff	NEC-610
2 Dec-28 Dec	Mr. Yukihiro Kawata	(NCS) Software	Dr. Kittima and Staff	NEC-610

III. TRAINING IN JAPAN

	Name of Trainee	Period	Field of Training	Organization
1.	Dr. Kittima Mekhabunchakij	12 Jan-28 Feb 1989	ACOS-4 Software	NEC
2.	Mr. Wicha Sripanyapong	7 Mar-23 May 1989	ACOS-4 Hardware	NEC
3.	Mr. Praiboon Pantarakpong	11 Jul-12 Sep 1989	ACOS-4 Software	NEC
4.	Mr. Petch Suttinanondh	21 Mar-29 Jan 1990	ACOS-4 Hardware	NEC
5.	Mr. Somchai Deemark	21 Mar-16 Jan 1990	Software Development	Tokai Univ.
6.	Mr. Prasert Poomsirichayo	11 Jul- 3 Sep 1990	ACOS-4 Software	NEC
7.	Mr. Watchara Chatwirity	10 Sep 1991-29 Mar 1992	VLSI Design	Tokyo

IV. BUDGETS FROM THE THAI GOVERNMENT

1. Computer Research and Service Center

(Baht)

Type	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992
a. Personnel	1,458,700	1,498,600	1,955,900	2,084,900	2,584,500
b. Materials and Supplies	1,407,000	1,479,400	1,556,100	5,119,400	3,487,500
c. Equipment	310,400	284,500	172,000	11,600,000*	14,538,100*
d. Research	500,000	1,725,640	1,626,287	1,500,000	580,000
e. Building	-	-	-	19,125,000	16,404,000
Total	3,676,100	4,988,140	4,737,500	39,429,300	37,594,100

Remark * Include first phase of CAD CENTER at 9,600,000.-
** Include second phase of CAD CENTER at 8,000,000.-

2. Department of Computer Engineering

(Baht)

Type	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992
a. Personnel	925,800	978,480	1,051,440	1,306,200	To be Allocated
b. Materials and Supplies	361,735	527,442	811,904	642,420	To be Allocated
c. Equipment	270,000	542,500	140,000	2,642,500	To be Allocated
d. Research	-	139,900	86,000	132,600	To be Allocated
Total	1,557,535	2,188,322	2,089,344	4,723,720	-

3. Most departments and divisions have budgets for microcomputer applications. The exact amount is very difficult to estimate. but it should not be less than 3 million baht.

V. LIST OF THAI COUNTERPARTS

1. Computer Research and Service Center

Director: Prof. Dr. Pairash Thajchayapong, Ph.D.(Cantab)
Deputy Director: Assoc. Prof. Dr. Chom Kimpan, D.Eng.(KMITL)
Assistant Directors: Dr. Worawat Limpoka, D.Eng. (INPG)
Asst. Prof. Dr. Ruttikorn Warakulsiripun, D.Eng. (Tohoku)
Mr. Surasit Vannakrairojn, M.Eng. (KMITL)

Director Office
Head: Mr. Pantamit Chennut, B.A. (RU)

Division of Systems and Programming
Head: Mr. Praiboon Pantarakpong, MBA. (NIDA)
System Analyst: Mr. Praiboon Pantarakpong, MBA. (NIDA)
System Engineer: Mr. Yuttapong Rangsanweree, M.Eng. (KMITL)
Computer Operators: Mr. Somchai Deemak, B.Ind.Tech. (KMITL)
Mr. Chatchai Naksuthi, Dip. (Electronics)

Division of System Operation and Maintenance

Head:	Mr. Wicha Sripanyapong, B.Eng. (KMITL)
Computer Operator:	Mr. Prasert Poomisirichayo, B.Ind.Tech. (KMITL)
Engineer:	Mr. Akarin Khunkiti, M.Eng. (KMITL)
Technician:	Mr. Narongsak Jaiyu, Dip. (Electrical)

Division of Academic Affairs

Head:	Mr. Suresit Vannakrairojn, M.Eng. (KMITL)
Academic staff:	Miss Duangporn Sriwattana, B.Sc. (RU)
Engineer:	Mr. Kawin Sonthipermpoon, M.Eng. (KMITL)
Technicians:	Mr. Suvit Yomwan, Dip. (Electronics)
	Mr. Waiyavudth Saithanoo, Dip. (Electronics)

2. Department of Computer Engineering

Professors:	Dr. Pairash Thajchayapong, Ph.D.(Cantab)
	Dr. Srisakdi Charmonman, Ph.D. (Georgia Tech)
Associate Professors:	Dr. Chom Kimpan, D.Eng. (KMITL), BSEE (Nihon)
	Mr. Pratheep Bunyatroparat, M.Eng (Tokai)
	Mr. Kanchit Maitree, M.Eng. (Tokai)
Assistant Professor:	Dr. Boonwat Attachoo, D.Eng. (Tokai)
Lecturers:	Dr. Voravat Limpoka, D.Eng. (INPG), (Head)
	Dr. Suphamit Chittayasothorn, Ph.D. (Queensland)
	Dr. Boonthee Kruatrachoo, Ph.D. (Oregon)
	Mr. Bunjong Piyatamrong, M.S. (Louisiana)
	Mr. Wiboon Promphanich, M.Eng. (KMITL)
	Mr. Watchara Chatwiriya, B.Eng. (KMITL)
	Mr. Somsak Chumchuay, M.Eng. (KMITL)
	Miss. Kritawan Kruatrachue

D. PROGRESS IN THE FIELD OF MECHANICAL ENGINEERING

I Utilization of Equipment

1. Technical Equipment

See Annex 1-3.

2. Education

The following topics have been provided for students in both Mechanical Engineering Department and Control Engineering Department.

Subject	Topic	Year-Semester	Equipment	Person in charge
Mechanical Eng. Laboratory	Tension test	3-I	Universal testing machine	Somchai N.
	Impact test	ditto		
	Hardness test	ditto	Vickers hardness tester	Tereza C. Prasit C.
	Torsion test	ditto	Torsion test equipment	Somchai P.
	Micro-structure of metal	ditto	Microscope,Polishing attachment	Pornsak A.
	Bending of beam	ditto		
	CNC machining	ditto	CNC milling machine	Thaveesak T.
	Measurement of air flow in pipe	ditto	Pitot tube,Goettingen manometer	Chamlong P.
	Heat exchanger	ditto	Thermocouple	Pongjait P.
	Performance test of pump	ditto	Pump	Chamlong P.
	Pipe friction	ditto	Manometer	Akradech S.
	Performance test of internal combustion engine	ditto	Engine performance test equipment,Oscilloscope,Recorder	Attason S.
	Linear vibration	ditto	Strain gauge & Amplifier, Oscilloscope,Recorder	Pongjet P.
	Mechatronics I	ditto	One-board microcomputer	Mongkol M.
	System Simulation	ditto	Automotive Control Simulator	Mongkol M.
Manufacturing process	CNC machining	ditto	CNC milling machine	Thaveesak T.
ditto	CAD/CAM	ditto	CNC lathe	Thaveesak T.
Machine design	CAD,CAD/CAM	ditto	Computer,Plotter,CNC lathe	Mongkol M.
ditto	Drawing	ditto	Drafting machine	
Engineering drawing	Drawing	ditto	ditto	Pornsak A. Prasit K. Chamlong P. Thaveesak T.

Control Eng. Laboratory	Mechatronics I	ditto	Single board microcomputer, Stepping motor Switch power supply	Yothin P. Thamrongsak S. Jongkol N. Vipan P.
ditto	Mechatronics II	ditto	ditto	ditto
ditto	Controller setting	ditto	Personal computer,printer	Jongkol N. Yothin P.
ditto	System compensation	ditto	Personal computer,printer	Jongkol N. Vipan P.
ditto	Mechatronics III	from 1991	DC motor,DC Servo Amplifier A/D,D/A Converter Switching power supply Single board microcomputer	Yothin P. Thamrongsak S. Jongkol N.
ditto	Mechatronics IV	from 1991	Robot Arm,Personal Computer	ditto
ditto	Programmable logic control	3-I	Personal Computer	Suthian G. Jongkol N. Yothin P.
ditto	CNC machining	ditto	CNC milling machine	Jongkol N. Suthian G. Yothin P.

3. Research

Name	Theme	Equipment	Remark
(Department of Mechanical Engineering)			
Akradech S.	Noise reduction in muffle	Multi-thermometer recorder Noise meter,Microphone	
Somchai N.	Buckling of composite Materials	Universal testing machine, Strain gauge & amplifier Personal computer,Plotter	
Thaveesak T.	Research on machining accuracy	Projector,Recorder,Gas analyzer	
Attason S.	Exhaust gas emission from ICE.	Engine performance test equipment Oscilloscope,Recorder,Computer	
Tawatchai N.	ditto		
Chakrid W.	(Study abroad(Imperial College))	Master course, 9/1990-8/1992	
Ming L.	(Study abroad (Imperial College))	Doctor course, 9/1989-8/1992	-
Mongkol M.	Experimental investigation of Journal bearings with turbulence behavior	Pressure Sensors,Thermocouple, Oscilloscope,Recorder,Hydraulic pump system	
Mongkol M.	Hybrid systems for internal combustion vehicles	Computer,Hydraulic servo-valves, Pump,Load cell	
Chamlong P.	Study on cylindrical combustor flow with swirling flow	Wind fan,Hot wire anemometer	
Pongjait P.	Noise reduction of air conditioning system		
Pornsak A.	Fatigue strength of new alloy	Microscope,Furnace	
Prasit K.	Research on optimum welding conditions	Universal testing machine	
Tereza C.	Corrosion of stainless steel	Microscope	

Damri J.	same as Mr. Thaveesak	--
Mathee L.	same as Mr. Attason	--
Pongsak K.	ditto	--
Monta T.	same as Mr. Mongkol	--

(Department of Control Engineering)

Yothin P.	Phase locked loop for position control system	DC servo amp.,DC servo motor,Power supply,Personal computer,Printer, X-Y plotter,Universal counter, Function generator,Digital storage, Oscilloscope,Digital stroboscope
Jongkol N.	Controller design by regulator problem	Personal computer
Yothin P. Jongkol N. Vipan P.	Robot Vision	Video Camera,A/D and D/A converter Oscilloscope,Personal computer
Warasak J	DC motor Controller	Power supply,Oscilloscope,VOM
Thumrongsak S.	Digital measurement of electrical power	Single board microcomputer,Oscilloscope Power supply

(Cooperative research between both departments)

Yothin P. Jongkol N. Pornsak A. Prasit K. T. Iijima	Welding robot	Step motor driver,Step motor, Single Board,Microcomputer,Power supply Oscilloscope,DC servo amp., DC servo motor,Personal computer, Printer	Joint project between Mech. Eng.Dept. and Control Dept.
Yothin P. Anutharachai N.	Mobile robot	Proximity sensors,DC servo amp. DC servo motor,single board-microcomputer,oscilloscope, DC power supply	
Yothin P. Jettana S.	Phase-locked controller	Electronic components,single board-microcomputer,DC servo amp., DC servo motors	
Kosol P. Yothin P.	Pattern Tracking System	Electronic components,single board-microcomputer,DC servo amp., DC servo motors,stepping motors, stepping motors drivers	

II Short-Term Experts

Name	Term	Field	Topic	Counterpart
Mr.Masayuki Waku (Shimadzu Co.)	Apr. 24 - May 8 1989	Manufacturing process	Instruction on Installation and operation of Universal testing machine	Somchai T., Pornsak A.
Dr.Kenichi Nagase (Shimadzu Co.)	Apr. 24 - May 8 1989	Manufacturing process	Instruction on Installation and operation of CNC Milling	Thaveesak T., Damri J., Jongkol N.

Damri J.	same as Mr. Thaveesak	-
Mathee L.	same as Mr. Attason	-
Pongsak K.	ditto	-
Monta T.	same as Mr. Mongkol	-

(Department of Control Engineering)

Yothin P.	Phase locked loop for position control system	DC servo amp.,DC servo motor,Power supply,Personal computer,Printer, X-Y plotter,Universal counter, Function generator,Digital storage, Oscilloscope,Digital stroboscope
Jongkol N.	Controller design by regulator problem	Personal computer
Yothin P. Jongkol N. Vipan P.	Robot Vision	Video Camera,A/D and D/A converter Oscilloscope,Personal computer
Warasak J	DC motor Controller	Power supply,Oscilloscope,VOM
Thumrongsak S.	Digital measurement of electrical power	Single board microcomputer,Oscilloscope Power supply

(Cooperative research between both departments)

Yothin P. Jongkol N. Pornsak A. Prasit K. T. Iijima	Welding robot	Step motor driver,Step motor, Single Board,Microcomputer,Power supply Oscilloscope,DC servo amp., DC servo motor,Personal computer, Printer	Joint project between Mech. Eng.Dept. and Control Dept.
Yothin P. Anutharachai N.	Mobile robot	Proximity sensors,DC servo amp. DC servo motor,single board-microcomputer,oscilloscope, DC power supply	
Yothin P. Jettana S.	Phase-locked controller	Electronic components,single board-microcomputer,DC servo amp., DC servo motors	
Kosol P. Yothin P.	Pattern Tracking System	Electronic components,single board-microcomputer,DC servo amp., DC servo motors,stepping motors, stepping motors drivers	

II Short-Term Experts

Name	Term	Field	Topic	Counterpart
Mr.Masayuki Waku (Shimadzu Co.)	Apr. 24 - May 8 1989	Manufacturing process	Instruction on Installation and operation of Universal testing machine	Somchai T., Pornsak A.
Dr.Kenichi Nagase (Shimadzu Co.)	Apr. 24 - May 8 1989	Manufacturing process	Instruction on Installation and operation of CNC Milling	Thaveesak T., Damri J., Jongkol N.

Mr.Kazuhei Kojima (Daizen Co.)	June 20 - July 3 1989	Internal combustion engine	Instruction on Installation and operation of engine performance test equipment	Attason S., Akradech S., Pongsak K.
Mr.Nobuo Kitakaze (Daizen Co.)	ditto 1989	ditto	ditto	ditto
Dr.Morihito Hayashi (Tokai Univ.)	Aug.1 - Aug.15 1989	Material engineering	Research on fatigue strength of alloy	Pornsak A., Tereza C.
Dr.Kiyoshi Nishimoto (Tokai Univ.)	Aug.20 - Sep.3 1989	Manufacturing process	Research on machining accuracy	Thaveesak T.
Mr.Tadae Morishita (Tokai Univ.)	ditto 1989	ditto	Research on optimum welding condition	Prasit K., Pornsak A.
Dr.Hiromu Hashimoto (Tokai Univ.)	ditto 1989	Lubrication	Research on lubrication	Mongkol M.
		Robotics	Research on robotics	Yothin P., Jongkol N.
Mr.Minoru Maeda (Tokai Univ.)	July 16 - Aug.4 1990	Thermodynamics	Research on noise control	Akradech S., Attason S. Pongjait P.
Mr.Kiyohide Tsuruoka (Shimadzu Co.)	July 20 - Aug.9 1990	Internal combustion engine	Instruction on installation and operation of combustion gas testing machine	Attason A., Ponjait P., Pongsak K.
Dr.Hirakazu Kasuya (Tokai Univ.)	July 27 - Aug.8 1990	Material Eng.	Research on solid mechanics	Somchai N.
Dr.Kiyoshi Nishimoto (Tokai Univ.)	Aug.13 - Aug.25 1990	Manufacturing process	Research on machining accuracy	Thaveesak T.
			Research on optimum welding condition	Prasit K. Pornsak A.
Dr.Hiromu Hashimoto (Tokai Univ.)	ditto 1990	Lubrication	Research on lubrication	Mongkol M.
Dr.Syuntaro Murakami (Tokai Univ.)	Aug. 21 - Sep.6 1990	Thermodynamics	Research on noise control	Akradech S.
Dr.Masaru Sato (Tokai Univ.)	Mar.8,1991	Manufacturing process	Research on precision machining	Prasit K., Thaveesak T., Pornsak A.
Dr.Hisayuki Waku (Nihon Denshi Co.)	Feb.1991 2 weeks	ditto	Instruction on Installation and operation of CNC Milling	Pornsak A., Tereza C.
Dr.Katsumi Aoki (Tokai Univ.)	July.16 - Aug.2,1991	Fluid mechaanics	Research on Jet pump	Chamlong.P
Mr.Minoru Maeda (Tokai Univ.)	July.16 - Aug.11,1991	Thermodynamics	Research on noise control	Akradech S.
Dr.Morihito Hayashi (Tokai Univ.)	July.30 - Aug.8,1991	Material engineering	Research on fatigue strength of alloy	Pornsak A., Tereza C.
Dr.Toshio Iijima (Tokai Univ.)	July.30 - Aug.19,1991	Interanl combustion engine	Flow characteristics and emission of IEC.	Attason S.
Dr.Syuntaro Murakami (Tokai Uriv.)	Dec. 2 weeks	Thermodynamics	Research on noise control	Akradech S.
Dr.Masaru Sato (Tokai Univ.)	Dec. 2 weeks	Manufacturing process	Research on precision machining	Thaveesak T., Pornsak A., Prasit K.
Dr.Sansaku Aoki (Tokai univ.)	Dec.,1991 2 weeks	Precision engineering	Research on precission machine elements	Taveesak T. Pornsak A., Prasit K.

III Training in Japan

Name	Term	Field	Topic	Remark
Mr.Thaveesak Tescharoen	Oct.31 1988 - Nov.30 1988	Manufacturing process	Training on CNC Machining	Washino Eng.
Mr.Pornsak Attavanich	Mar.20 1990 - Sep.30 1990	Material Eng.	Research on fatigue strength	Tokai Univ.
Dr.Yothin Prempraneerach	Mar.20 1990 - May 31 1990	Mechatronics	Research on servo-motor	Tokai Univ.
Mr.Akradech Sindhuphak	Oct.1 1990 - Apr.15 1991	Thermodynamics	Noise control	Tokai Univ.
Mr.Somchai Norasethasopon	Oct.1 1990 - Apr.1 1991	Material Eng.	Buckling of composite material	Tokai Univ.
Mr.Prasit Kampanyim	Mar.15 1991 - Jun.15 1992	Welding	Optimum welding condition	Tokai Univ.

IV Publications

1. Textbooks

Title	Author	Publishing Company	Date
(Department of Mechanical Engineering)			
Fundamental of Solid Mechanics	Somchai N.	Book Center, KMITL	Mar.1990
Advanced Solid Mechanics	Somchai N.	Book Center, KMITL	Mar.1990
Mechanics of Machine	ditto	ditto	ditto
Principles of Refrigeration	Akradech S.	ditto	ditto
Manufacturing Processes	Thaveesak T.	ditto	Dec.1990
Heat transfer	Pongjait P.	ditto	ditto
Engineering drawing	Pornsak A.,T. Iijima	ditto	Mar.1991
Mechanical Laboratory	Dept.of Mechanical Eng.	ditto	ditto
Machine Design and Drawing I	Thaveesak T,Pornsak A. Chamlong P.,Mongkol M. T. Iijima	ditto	ditto
Machine Design and Drawing II	ditto	ditto	ditto
Basic Lubrication Theory	Mongkol & Hashimoto	ditto	Mar.1992
Air Condition Practice	Akradech	ditto	Mar.1992
Material Science and Engineering	Pornsak	ditto	Mar.1992
Mechanic of Composite Materials	Somchai	ditto	Mar.1992
Mechanical Vibration	Pongjet	ditto	Mar.1992
Automotive Engineering	Attason	ditto	Mar.1992

(Department of Control Engineering)

Numerical Control	Jongkol N.	ditto	Mar.1990
Control Laboratory	Dept.of Control Eng.	ditto	ditto
Engineering Laboratory	ditto	ditto	ditto
DC Motors Electronic Control Servo Systems	Yothin P.	ditto	ditto
Linear Algebra and State Space Equations	Vipan P.	ditto	Mar.1991
Modern System Analysis	ditto	ditto	ditto
Microcomputer-Controlled System	Yothin P.	ditto	ditto
Control System Engineering	Jongkol N.	ditto	ditto
Operation Research	Kosol P.	ditto	ditto

2. Technical Papers

Title of paper	Author	Appearance	Date
(Department of Mechanical Engineering, see also Annex 1-4)			
Design of Thermo-hydrodynamic Bearings by Microcomputer	Mongkol M. Pornsak A.	3rd Mechanical Engineering Symposium	18 May 1989
Thermal Design of an Inclined Roof	Mongkol M.,Ming L.	ditto	ditto
Flame Propagation in clossed Vessels	Pongjait P.,Akradech S. Akradech S.,T. Iijima	diito	ditto
Internal Model Control of Single Input Output System	Mongkol M.	ditto 1989	ditto
Internal Model Control of Level and Temperature in a Water stirred tank System	Mongkol M.	ditto	ditto
Design and Development of Electronic Fruit Grader	Mongkol M.	ditto	ditto
An Experimental Study on the Performance of Internal Combustion Engine with an Energy Storage System	Mongkol M.,Chamlong P.	4th Mechanical Engineering Symposium	18 May 1990
Research on the Surface Roughness of Mechined Surface	Thaveesak T., K. Nishimoto,T. Iijima	ditto	ditto
Development of Simple Air-Micrometer	Thaveesak T.,T. Iijima	ditto	ditto
Flow Around Cylinder by Personal Computer	Warakon N.,T. Iijima	4th Mechanical Engineering Symposium	18 May 1990
Flow Characteristics of an Unsteady Jet ejected into Prechamber Spark Ignition Engine (in English)	T. Iijima,Tawatchai N. Pongjait P.,et al.	International Conference on Auto Technology, Chulalongkorn Univ.,Thailand	13 Nov.1990
An Experimental Study on Energy Storage in Hybrid Vehicles (in English)	Mongkol M.,Chamlong P.	ditto	14 Nov.1990

Experimental studies on Helical Gear Vibration with included Bearings Stiffness effects (in English)	Mongkol M. K. Umezawa,H. Houjoh	International Conference on Motion and Power Transmissions,Hiroshima,Japan	24-26 Nov.1991
Static Characteristic Analysis of a High Speed Elliptical Journal Bearing with Included Surface Roughness Effect	Mongkol M. H.Hashimoto	5th Mechanical Engineering Symposium	17-18 Oct.1991
Dynamic Behaviour of Short Elliptical Journal Bearings with Non-Newtonian Lubricants	ditto	5th Mechanical Engineering Symposium	17-18 Oct.1991
Approximate Adiabatic Solution for Dynamic Characteristic of Turbulent Journal Bearings with Homogeneous Surface Roughness Effect	ditto	5th Mechanical Engineering Symposium	17-18 Oct.1991
Fundamental Study of a Frequency Responce of Hydraulic Servo-Mechanism	Chamlong P. H.Hashimoto	5th Mechanical Engineering Symposium	17-18 Oct.1991
Acoustical Performance of Helmcholtzs,s Type Resonators	Akradech S. S.Hagi S.Murakami M.Maeda T.Iijima	5th Mechanical Engineering Symposium	17-18 Oct.1991
Acoustical Performance of Side-branch Type Silencers	Akradech S.Hagi S.Murakami M.Maeda T.Iijima	5th Mechanical Engineering Symposium	17-18 Oct.1991
The Fracture Mechanics of FRP Plate with Notches	Somchai N. Y.Yasui H.Kasuya H.Moriyama	5th Mechanical Engineering Symposium	17-18 Oct.1991
Bending Fatigue Strength of Heat-resisting Aluminum Alloy AC8A-F	Pornsak A. H.Hayashi	5th Mechanical Engineering Symposium	17-18 Oct.1991
Research on Surface Roughness for Machined Specimens	Taveesak T. K.Nishimoto	5th Mechanical Engineering Symposium	17-18 Oct.1991
Study on Pollution of Gasoline Engine by Consumption of Fuel Control System	Attason S.	5th Mechanical Engineering Symposium	17-18 Oct.1991
Heat-exchanger selection for Automotive Air Conditioning System	Pongjait P.	5th Mechanical Engineering Symposium	17-18 Oct.1991
Rotating Bending Fatigue Strength of Uni-directional Solidified AC8A Alminimum Alloy	M.Hayashi Pornsak A.	Transaction of the Japan Foundrymen's Society	1991
Effects of Flow-generated Noise on Attenuation Characteristics of Expansion Chamber Mufflers	M.Maeda Y.Natori Akradech S. S.Murakami S.Hagi	Proc. 3rd Int.Symposium Fluid Control,Measurement and Vibration	August, 1991
Relation Between Flow Patern and Flow Generated Noise in Expansion Chamber Mufflers	S.Murakami Akradech S. S.Hagi	Proc. 3rd Int.Symposium Fluid Control,Measurement and Vibration	August,1991

(Department of Control Engineering)

Method of Increasing the Step Resolution of Stepping Motor	Yothin P.	11th Electrical Engineering Conference	1988
Fast Response of the Positioning by Digital Controller	ditto	ditto	ditto
Phase-locked Loop for Four Quardrants Motor Speed Control System	ditto	12th Electrical Engineering Conference	1989
Phase-locked Loop for Position Control System	ditto	ditto	1989
Mathematical Modeling of Step Motor	ditto	Journal of the Engineering Institute of Thailand,Vol.2	1990
Measuring the Variation of Torque Depending on Shaft Angle of Stepping Motor Application for Shift the Equilibrium Position Torque	ditto	13th Electrical Engineering Conference	ditto
Start-stop of Motion Control System with Minimum Time by	Yothin P.,Jongkol N.	ditto	ditto
Using Piecewise Continuous Input	Yothin P.	ditto	ditto
Improvement Setpoint Tracking by Pole-zero Placement Controller			
A New PFD Controller for Fast Lock in a Position Servo System	ditto	ditto	ditto
Use of MARC for Improving the External Disturbance Response of a DC Motor Position Control System	ditto	ditto	ditto
Four Quardrants Speed Control of DC motor Based on Microprocessor	ditto	ditto	ditto
Motor Speed Measurement Based on 8031 Microprocessor	ditto	ditto	ditto
Improved Pre-undershoot in Model Reduction Obtained by Aggregation	Jongkol N.	ditto	ditto
Application of the Integral Controller for Minimum Time Setting Control of DC Motor Speed by Piecewise Continuous Input	Yothin P.,Jongkol N.	Journal of the Engineering Institute of Thailand,Vol.4	1990
Transducers and Sensors for Low Cost Automation Technology	Yothin P.,Kosol P.	Regional Seminar on Low Cost Automation at Philippines	Jan.1991
Induction Motor Speed Control with PMM mothod based on P	Thamrongsak S.,Yothin P.	Engineering Institute of Thailand	May 1991

3. Other Activities
   (1) Seminar

Topic of Seminar	Date	Lecturers	Participants
CNC Machine Tools	March 19-20, 1991	Thaveesak T. Jongkol N. & Staff	17 lecturers of technical colleges

V Budgets from the Thai Government (Baht)

Department	Year	Materials	Equipment	Building
Mechanical Engineering	10/1987-9/1988			
	10/1988-9/1989	575,169	874,000	
	19/1989/9/1990	382,000	1,200,000	65,000,000
	10/1990/9/1991	513,520	1,760,000	
Control Engineering	10/1987-9/1988			
	10/1988-9/1989	744,951	690,800	
	10/1989-9/1990	483,413	1,063,500	
	10/1990-9/1991	522,580	1,383,000	

VI Building

The four-story building for Department of Mechanical Engineering is under construction. The construction will be completed by 1992.

VII Number of Students

Department	Year	Number of Students
Mechanical Engineering	1988	85
	1989	115
	1990	132
	1991	115
Control Engineering	1988	78
	1989	71
	1990	80
	1991	94

Agenda Item 2 : Formulation of Annual Work Plans in 1992

A. Annual Plans for the Field of Telecommunications

1. Education

The staff are going to revise the bachelor's degree curriculum in the next summer semester (April - May 1992). At the same time the arrangement of starting the master's degree and doctorate programs in telecommunications engineering is being carried out. Our curriculum must be improved according to the rapid growth in telecommunications fields. The courese should provide for the new technologies.

We have already set new basic electronic instruments and computer laboratories for students and staff on the first floor of the Telecommunications Building. According to the increment of students in the Department, some other rooms in the building must be renovated for new laboratories for students.

2. Research

(1) Constitution of research groups

Referring to the report of The Third Joint Committee Meeting on 19 December 1990, pp.31-32, we established 14 research groups according to individual staff and research subjects, but the number of groups were too many. In order to efficiently use the equipment and push forward coperative research activities among the staff, we decided to reorganize those 14 research groups into only 4 groups, namely :

- Radio Transmission and Electromagnetic Wave Technology
  - : Mr. Narong Hemmakorn, Mrs. Nipa Leelaruji, Mr. Roong Pothisuwan, Mr. Thongtod Vanisri
  - : Mr. Sompol Kosalwit, Mr. Monai Krairiksh
  - : Dr. Charray Surawatpunya
- Line Transmission and Optical Fiber Transmission Technology
  - : Dr. Wiwat Kiranon, Mr. Pramote Wardkien
  - : Mr. Thawil Kingthong, Mr. Kemthong Nimsiri, Mr. Apinun Manyanon, Mr. Suthichai Nopanakeepong

- Switching, Terminal Technology and Information Communication.
  : Dr. Suvipol Sitthicheevapak, Mr. Sukon Nampetch
  : Mr. Manoon Sukkasem, Mr. Tawil Puangma, Mr. Suchin Jamchod
- Digital Signal Processing and Image Processing Technology
  : Dr. Kobchai Dejhan, Mr. Kriengkrai Vongrochanaporn, Mr. Somyot Junnapiya, Mr. Punya Thitimajshima

In the near future, we may establish 2 new research groups. They are Electronic Communication (Dr. Wiwat, Dr. Kobchai, Mr. Pramote) and Information Communication (Dr. Suvipol), but it depends on the academic situation and new technology.

(2) Research topics of staff

Basically, the research topics of each staff member depend on his research group to which he belongs. Some topics, however, may involve other groups' research, although the main subject is up to his research group.

(3) Establishment of new laboratories

1. There is a rapid increase in the number of students of the Telecommunications Department. Accordingly, the number of staff also could be increased. In order to cope with this situation, the Department has to prepare some new laboratories for their common use, which are equipped with basic electronic instruments and personal computers. The equipment now available will be shared by the staff and some will be newly procured. The equipment will be managed by the departmental office.

2. The Department has some cooperation with

- Tokyo Institute of Technology (Prof. Onoda) to establish DSP Laboratory at the beginning of next year.
- Tohoku University at Sendai (Prof. Noguchi) to establish the satellite earth station for Academic Computer Network via Satellite, ETS-V. This project is being conducted by the Government of Japan and the equipment will be supplied by Japan. The definite response could be known during the beginning of next year.

3. Equipment

(1) From JICA

In order to enhance our Department ability both in education and

research, we have requested for additional assistance for equipment supply in FY 1991 from JICA. They are 2 workstation systems for DSP Laboratory. with accessories, pheripherals and softwares. Other 3 workstation systems are requested to extend the Telecom Computer Network System capability.

(2) Departmental Budgets

The department received 4.35 M baht to establish the Telecom Computer Network System which is shared by all research groups in the Department. We are going to discuss about some conditions with the Budget Bureau, and we expect that at the beginning of next year the Department can use this budget to establish this mini-computer system. Together with the Thai Government budget and JICA's donated equipment, the Telecom Computer Network will be successful for serving all students and staff in their studies and research. The plan of the Telecom Computer Network is shown in Fig.1 (Annex 3).

4. Training in Japan

The Department and the Japanese experts are going to arrange the staff and topics suitable for the Department. The following is our proposal for the training in FY 1992.

1) Mr. Monai Krairiksh	Electromagnetic Wave Technology	1992.4-6	Tokai Univ. (Dr. Wakabayashi)
2) Dr. Suvipol Sitticheevapak	Information Communication Technology	1992.4-6	Osaka Univ. (Dr. Okada)
3) Mr. Tawil Paungma	ISDN Technology	1993.1.14-3.23	NTT Group Training Course
	Protocol Development	1993.3.24-4.14	NTT
4) Mr. Somyot Junnapiya	Digital Transmission	1992.9-12	NTT Group Training Course

5. Short-Term Experts

In order to push forward with research in telecommunications technology, the following researchers are requested to come and cooperate with our staff.

			Counterpart
1) Dr. Wakabayashi (Tokai Univ.)	Electromagnetic Wave Technology	1992.11 (3 W)	Mr. Manai K.
2) Dr. Onoda or his colleague (Tokyo Inst. Tech.)	DSP Technology	1992.8 (3 W)	Dr. Kobchai D. Mr. Kriangkrai W.
3) Dr. Matsuura (Tokai Univ.)	Digital Circuit (Image Recognision)	1992.8 (3 W)	Dr. Wiwat K.
4) - (NTT)	ISDN Protocol Technology	1992.10 (3 W)	Mr. Tawil P. Mr. Manoon S. Dr. Suvipol S.
5) - (Tokai Univ.)	Optical Fiber Transmission Technology	1992.8 (3 W)	Mr. Apinun M. Mr. Kemthong N.

6. Textbooks

In addition to the titles in under I-V-(1), the following titles of textbooks in Thai will be published in FY 1991 to FY 1992.

Title	Author	Manuscript
1. Outside plant Laboratory Guidebook*	Mr. Kemthong N.	after Nov. 1991
2. Principle of Data Communication	Dr. Wiwat K.	after Nov. 1991
3. Communication Systems	Dr. Wiwat K.	after Nov. 1991
4. Electromagnetics	Mr. Monai K.	after Nov. 1991
5. High Speed Network Architecture	Dr. Suvipol S.	after Nov. 1991

Title	Author	Manuscript
6. Digital Microwave Communication Engineering	Mr. Narong H.	after Dec. 1991
7. Optical Fiber Communi--cation System	Mr. Apinun M.	after Dec. 1992
8. Optical Device	Mr. Apinun M.	after Dec. 1992
9. Digital Switching Technology	Mr. Tawil P.	after Feb. 1992
10. Digital PABX	Mr. Tawil P.	after Feb. 1992
11. Digital PABX Laboratory Guidebook*	Mr. Tawil P.	after Feb. 1992
12. Statistical Communication	Dr. Kobchai D.	after Feb. 1992
13. Introduction of ISDN Technology	Mr. Tawil P. Mr. Manoon S.	after Apr. 1992
14. ISDN Protocol Technology	Mr. Tawil P.	after Apr. 1992
15. ISDN Protocol Laboratory Guidebook*	Mr. Tawil P.	after Apr. 1992
16. Digital Telecommunication Network Planning & Design	Mr. Manoon S.	after Apr. 1992
17. Optical Fiber Communi--cation Laboratory* Guidance	Mr. Apinun M.	after Apr. 1992

Remark : * in English

7. Budget Plan

For the next Thai Fiscal Year (Oct. 1992-Sept. 1993), the Department submitted a request to the Government for support of pheripherals for extending the Telecom Computer Network. The response will be received in mid-1992. If the Government support is obtained, the Telecom Computer Network would be completed. On this occasion, the Department requested 10 IBM-compatible personal computers for connecting to the mini-computer and they will be used as terminals of the computer network.

The three workstations requested from JICA, which is mentioned in section 3, are also related to the enlargement of this Telecom Computer Network System.

Item	1991/1992	1992/1993 (Proposed)
a. Personel	2,741,880	3,000,000
b. Material	779,650	850,000
c. Equipment	4,350,000	8,400,000
Total	7,871,530	12,250,000

8. Telecommunications Expansion Plan and Request from JICA

(1) The first stage of the expansion plan in the Telecommunications Engineering Department is to well equip necessary resources for education and research both for staff and students, including computer facilities. We expect this project will completely succeed during the Thai fiscal year 1992/93 through the assistance from the Thai Government and JICA.

(2) The Department would like to start a course, the "Telecommunications Management course", for administrative persons in private enterprises which intend to introduce their own telecommunications systems for their business purpose. it names According to the rapid technological growth in telecommunications engineering fields and the enlargement of telecommunications market, many enterprises and companies are going to share in this market and also introduce the modern telecommunications systems into their companies for improving their enterprise ability. The staff in enterprises and companies, however, are not familiar with modern telecommunications technologies, system planning and designing methodology and how to maintain and operate systems. Therefore, training them in planning and managing ability for telecommunications systems is very important and helpful for their enterprise activity.

The Department has enough potential to conduct that training course because it has long experience in the group training course supported by both DTEC and JICA. The Department requests assistance From JICA in organizing the course by sending short-term experts in telecommunications network planning and administration. The short-term experts will give some special lectures in this course.

(3) In order to push forward our research activity in telecommunications fields, we strongly wish to establish and maintain close cooperation with Japanese universities and other research organizations. It will take long term to grow up human resources of research and development. Therefore, we would like to ask JICA for continuous assistance for an exchange program of personnel. Under this program, JICA will send short-term experts to KMITL and accept KMITL staff for training in Japan. At the same time KMITL will open a special lecture course by short-term experts and the course attendants can take some credits.

B. ANNUAL PLANS FOR THE FIELD OF BROADCASTING

1. satellite parabolic antenna installation, the antenna part was completed, the receiver, feeder and feed horn are under testing. We plan to connect the antenna movement control equipment and contruct the new basement for the antenna in the 2nd semester.
2. 10-Watts UHF TV Transmitt will be tested for broadcasting the TV signal around Ladkrabang area at the end of this year (1991).
   At the same time the Loop UHF transmitting antenna made by the students will be tested with this transmitter. The characteristics and the field strength of the antenna will be measured.
3. The basic laboratory is planned to move from Nonthaburi Campus to Ladkrabang after the new building for the Department is completed in the next two years.
4. The Japanese expert and the Department are going to arrange suitable tropics and staff for training in Japan in the next year.

C. ANNUAL PLANS FOR THE FIELD OF DATA COMMUNICATION

I. EDUCATION

1. Computing services.

In order to promote the use of the NEC-610 computer system and raise the system utilization, we plan to set up short-course seminars and training for introducing and advising the use of the NEC-610 system, especially for the KMITL's academic staff, researchers and research assistants. Appropriate courses will be discussed and defined at the NEC-610 USAGE COMMITTEE in advance.

2. Curriculum for the new Faculty of Information Technology.

On the newly starting "Seventh National Social and Economic Development Plan (Oct 1, 1991 - Sept 30, 1996), it is authorized that KMITL can establish the Faculty of Information Technology in order to lead the society and industry keeping pace with the information age. As the new faculty, on the current schedule, is to start on the first semester of 1994 (June of 1994), design of curriculum for the new faculty is a urgent business.

3. Publication of Textbooks (in Thai).

Last year, to stimulate usage of NEC-610 we published some handbooks, eg., ACOS-4/MVP Handbook etc. This year we plan to make some fundamental computer technology books,eg., data structure and file organization etc. which will be used as a textbook in class by the staff of Computer Research and Service Center and Computer Engineering Department for undergraduate and graduate students.

II. RESEARCH

Computer Research and Service Center

Research Plan for the Coming Year(1992 April-1993 March)

Name	Topic	Budget Source
Prof. Dr.Pairash Thajchayapong et al.	Computer X-Ray Tomography (cont.)	NECTEC
Mr. Surasit Vannakrairojn et al.	Unix-based Engineering Workstation II	NECTEC
Mr.Bunjong Piyatamrong	The Design and Fabrication of Educational VLSI Circuit	NECTEC
Mr.Kawin Sonthipermpoon	CNC-Vertical Milling Machine	NECTEC
Mr.Surasit Vannakrairojn	Microcomputer Prototype for Education	NRCT
Mr.Surasit Vannakrairojn	Thai in X-Windows Environment	NRCT
Mr.Kawin Sonthipermpoon	Thyristor Servo Amplifier for DC Motor	NRCT
Mr.Kawin Sonthipermpoon	Medical Image and Database Software	NRCT
Assoc.Prof.Dr.Chom Kimpan	General speech remote control system	NRCT
Mr.Praiboon Pantarakpong	Computer Assisted planning	NRCT
Mr.Praiboon Pantarakpong	UNIX-Based Data Base Application Support Thai Language	NRCT
Mr.Wicha Sripanyapong	Carbon Mark Checker	NRCT
Mr.Wicha Sripanyapong	Power Control by Local Area Network Concept	NRCT

Remark
NECTEC: National Electronic and Computer Technology Center, Ministry of Science, Technology and Energy
NRCT : National Research Council of Thailand, Ministry of Science, Technology and Energy

III. SHORT-TERM EXPERTS (Apr. 1992 - Mar. 1993)
- Data Communication : 2 persons
- New Curriculum and Research : 5 persons

IV. TRAINING IN JAPAN (Apr. 1992 - Mar. 1993)
- Computer Network : 1 person
- Computer Tomography : 1 person

V. BUDGETS FROM THE THAI GOVERNMENT
- Computer Research and Service Center

(Baht)

Type	FY 1992	FY 1993 (est.)
a Personnel	2,584,500	2,622,240
b Materials and Supplies	3,487,500	4,094,380
c Equipment	13,631,600*	44,097,700**
d Research	580,000	2,280,000
e Building	16,404,000	45,171,000
Total	36,687,600	98,265,320

Remark * Include second phase of CAD CENTER at 8,000,000
** Include third phase of CAD CENTER at 20,400,000 and KMITL CAMPUS NETWORK at 13,441,800

- Department of Computer Engineering

(Baht)

Type	FY 1992	FY 1993 (est.)
a Personnel	To be Allocated	-
b Materials and Supplies	To be Allocated	-
c Equipment	To be Allocated	-
d Research	To be Allocated	-
Total	-	-

VI. OTHERS

1. Development of KMITL Management Information System (KMIS)

i) Development
- Library Management
- Hardware and Software Stocks Control

ii) Revision, if necessary
- Finance and Accounting
- Personnel, Registration and Students Records Processing
- Public Utilities and Maintenance

2. NEC-610 USAGE COMMITTEE

This committee considers and plans to take at least three activities to meet the requirement of the university through the maximum usage of computer; computation for research, information service and high level education of computer.

As regards computation for research, some educational process is required to encourage and help researchers to use the mainframe for research. Besides advertisement and seminars, the committee may organize cooperative research such as computation of strength of architecture among the researchers and CRSC staff.

As regards information service, it is very necessary to set a standard in the systems and services among inter-faculty information in order to ensure free flow of information and easy access from each terminal.

Finally, high level education of computer which required understanding and dealing with mainframe is to be included in the curriculum to meet the social demand for graduate students.

3. KMITL CAMPUS NETWORK

Following the installation of NEC-610 EtherNet with five terminals by the end of March 1992, KMITL will enlarge the system in order to meet the requirement of education, research and administrative work.

The protocol analysis on connectivity between NEC-610 and EtherNet, between EtherNet and installed terminals, between EtherNet and other old or new terminals should be sought with the aim to make the enlarged system economical.

To encourage the people to use the system more frequently, it is very necessary to cultivate and accumulate many information services such as on-line library catalog and public information programs.

4. INTERUNIVERSITY NETWORK PROJECT

As this project is proceeding with rapid pace, KMITL is responsible to make it best to serve to all the nation-wide universities and MOSTE (Ministry of Science, Technology and Energy) as one of the key information center.

The protocol analysis on connectivity between NEC-610 and terminals installed in other universities and MOSTE, between the mainframes of other universities and MOSTE and the terminals of KMITL should be examined with the aim to maximize the utility and minimize cost pertaining ensuring the interface. Information service on academic and research is getting more and more important. Library catalog and bibliographic service are indispensable tool for research work. Information on research activities is quite necessary for efficient and effective R&D. KMITL is seeking some measure to act as a key information center in some academic field.

D. ANNUAL PLAN FOR THE FIELD OF MECHANICAL ENGINEERING in 1992

I Promotion of Educational and Research Activities

1. Education

The following new topics will be developed for student education.

Subject	Topic	Year-Semester	Equipment	Person in charge
Mechanical Eng. Laboratory	Surface Analysis	3-II	X-ray Micro-Analyzer	Pornsak A.
	High-precision Three-dimensional measurement	3-II	Three-dimensional measurement machine	Taveesak T.
	Exhaust gas analysis	3-II	Smoke analyzer	Attason S.
Control Eng. Laboratory	Automatic control	3-II	Automatic control education system	Yothin P.

2. Research

Current research topics will be continued and new topics mentioned below will be started in 1992.

Name	Theme	Equipment
Thaveesak T.	The effects of operation condition in EDM	Three-dimensional measurement machine
Mongkol M.	Vibration analysis on Minea-Ball Bearings	Display sensor,FFT,Oscilloscope PCB accelerometer sensor
Yothin P.	Closed loop control of stepping motor	DC servo motor and amplifier,
Yothin P.	Micro-step control of stepping motor	Single board computer,Oscilloscope ditto

3. Technical Papers Presented at International Conferences

Name	Conference/Journal	Title	Date
Mongkol M.	ASME-STLE Tribology Conference Trans. ASME, Journal of Tribology	An Approximate Adiabatic for Dynamic Characteristics of Turbulent Journal Bearings with Homogeneous Surface Effect	Under Preparation

Mongkol M.	Tribology International Journal	Dynamic Behavior of Short Elliptical Journal Bearings with Non-Newtonian Lubricants	Under Preparation

II Short-Term Experts

Name	Term	Field	Topic	Counterpart
Mr.Minoru Maeda (Tokai Univ.)	Aug.-Sep.1992 2 weeks	Thermodynamics	Research on noise control	Akradech S.
Dr.Toshio Iijima (Tokai Univ.)	ditto	Internal Combustion Engine	Flow characteristics and emission of ICE	Attason S. Tawatchai N.
Dr.Morihito Hayashi (Tokai Univ.)	ditto	Material Engineering	Research on fatigue strength of alloy	Pornsak A., Tereza C.
Mr.Hiroyuki Moriyama	ditto	Solid Mechanics	Research on solid mechanics	Somchai N.
Dr.Katsumi Aoki	ditto	Fluid Engineering	Research on fluid engineering	Chamlong P.
Mr.Kagawa	ditto	Manufacturing Process	Research on EDM	Thaveesak T.

III Training in Japan

Name	Term	Field	Topic	Institution
Mr. Tawatchai Nakpipat	Oct.1 1992 - Mar.20 1993	Thermal Engineering	Diesel Engine	Tokai Univ.
Mr. Chamlong Prabkeao	Oct.1 1992 - Mar.20 1993	Hydraulics	Hydraulic Control	Tokai Univ.

IV Seminar

Topic of Seminar	Date	Lecturer	Participant
Mechatronics	August 1-3 1992	Yothin P. Jongkol N.	Engineers and lecturers of technical colleges

V Budgets of the Thai Government (Baht)

Department	Year	Materials	Equipment	Building
Mechanical Engineering	10/1991-9/1992	513,520	1,760,000	
Control Engineering	10/1991-9/1992	522,580	1,383,000	

VI List of Thai Counterparts

a. Department of Mechanical Engineering

Associate Professor:

1. Mr. Somchai Norasethasophon — BEng(KMITN),MEng(Chula)

Assistant Professors:

2. Mr. Akradech Sindhuphak — BEng(KMITL),MS(West Coast)
3. Mr. Thaveesak Teschareon — BSIEd(KMITN)

Lecturers:

4. Dr. Mongkol Mongkolvongrojn (Head) — BEng(Hons),MEng(KMITT),PhD(UW-Madison)
5. Mr. Attason Soontrnchat — BEng(KMITT)
6. Mr. Chakrid Wansiri — BEng(KMITL) Study aboard
7. Mr. Chamlong Prabkeo — BSIEd(KMITN)
8. Mr. Ming Lokitsangtong — BE(Tasmania),MEng(KMITT) Study aboard
9. Mr. Pongjait Promwong — BEng(KKU),MEng(Chula)
10. Mr. Pornsak Attavanich — BEng(PSU)
11. Mr. Prasit Champanyim — BSIEd(KMITN)
12. Mr. Tawatchai Nakpipat — BEng(KMITT)
13. Mr. Chinda Charoenphonphanich — BEng(KMITL)
14. Mr. Jaruwat Charurnsuk — BEng(KMITL)

Instructors:

15. Mr. Damri Junsangsuk — Dip Welding
16. Mr. Methee Limkul — Dip Automechanics

Projected Number of Staff

Year	No.
1992	19
1993	20

b. Department of Control Engineering

	Associate Professors:	
1.	Dr. Kosol Pechsuwan	BSc(First Class Hons), ACGI,DIC,PhD(London)
2.	Dr. Yothin Prempraneerath (Head)	BEng(KMITL),MSEE,DEng(Nihon)
3.	Mr. Vipan Prijapanij	BSc(Hons),ACGI,MSc(Cantab)
	Assistant Professors:	
4.	Dr. Pallop Laocharoen	BEng(KMITL),MEng,DEng(Osaka)
5.	Dr. Jongkol Ngamwiwit	BEng(KMITL),MEng & DEng(Tokai)
6.	Mr. Suthien Kiertsoonthorn	BEng,MEng(KMITL)
	Lecturers:	
7.	Mr. Nonthawat Chuladaycha	BEng(KMITL),MEng(KMITL)
8.	Mrs. Pornsook Tescharoen	BEng(KMITL)
9.	Mr. Wanchai Ruiruja	BEng,MEng(KMITL)
	Instructors:	
10.	Mr. Kittiwan Songsataya	BIndTech(KMITL)
11.	Mr. Thamrongsak Suksai	BEng(KMITL)

Projected Number of Staff

Year	No.
1992	16
1993	17

Agenda Item 3. Exchange of Views

Agenda Item 4. Other Matters

ANNEX 1-1

EQUIPMENT IN THE FIELD OF TELECOMMUNICATIONS

1. 供与機材 (Equipment Supplied)

1991.10.31

No.	Equipment	Quantity	Supplier	Remarks	Arrival Date
	Optical Fiber Transmission Equipment (including MUX)				
1.	8 Mbps Optical Fiber Transmission System	1sys	NEC		June,2 1989
	1.1 Slim Rack	5			
	1.2 8M Optical Fiber Line Terminating Equipment (FD-2035A)	2units			
	(1) Line terminal equipment(LTE)	(2)			
	(2) Vacant modurack	(2)			
	(3) Power supply unit	(2)			
	(4) Alarm unit	(2)			
	(5) Bipolar interface unit	(2)			
	(6) Transmit optical interface unit	(2)			
	(7) Receive optical interface unit	(2)			
	(8) Through unit	(2)			
	1.3 Distribution Frame	1unit			
	(1) 240mm frame	(1)			
	(2) Terminal panel (N8778FA)	(4)			
	(3) Fiber distribution panel (N8778GA)	(2)			
	(4) Terminal pannel (N8778AA)	(2)			
	1.4 Optical Fiber cable	1lot			
	(1) Nylon coated fiber	(100m)			
	(2) Fiber cable accessories	(1lot)			
2.	8M Optical Repeater (FD-2135A)	1unit	NEC		Jun.2,'89
	2.1 Vacant Modurack	(1)			
	2.2 Power Supply Unit	(2)			
	2.3 Alarm unit	(1)			
	2.4 Alarm Control Unit	(1)			
	2.5 Transmit Optical Interface Unit	(2)			
	2.6 Receive Optical Interface Unit	(2)			
	2.7 Orderwire Interface Unit	(1)			
3.	Optical Attenuator	14	ANRITSU		Jun.2,'89
	3.1 Fixed Optical Attenuater	(10)			
	3.2 Optical Variable Attenuater (MN-924A)	(4)			

No.	Equipment	Quantity	Supplier	Remarks	Arrival Date
4.	8M Digital Multiplexer (NE5520A)	2units	NEC		Jun.2,'89
	4.1 Vacant Modurack	(2)			
	4.2 Multiplexer	(2)			
	4.3 Demultiplexer	(2)			
	4.4 Interface Unit	(2)			
	4.5 Through Unit	(2)			
	4.6 Alarm-1 Unit	(2)			
	4.7 Power Unit (DC-48V)	(4)			
5.	2M PCM Multiplexer	2units	NEC		Jun.2,'89
	5.1 Vacant Modurack	(2)			
	5.2 Transmitter	(2)			
	5.3 Receiver	(2)			
	5.4 Control Unit	(2)			
	5.5 Power Unit	(2)			
	5.6 Channel Unit for FXS	(2)			
	5.7 Channel Unit for 4W 1E/M	(2)			
	5.8 Ringing Generator(DC-48V, 20W)	(1)			
6.	Accessories	1lot	NEC		Jun.2,'89
	6.1 Testing Cord	(4)			
	6.2 Fiber Patch Cord	(20)			
	6.3 Testing Adapter (3 types)	(2)			
	6.4 Pig Tail Cord	(4)			
	6.5 Terminating Plug	(1set)			
	6.6 Testing Devices (Connectors APD LD)	(1)			
	6.7 Fuses	(50)			
7.	Orderwire (FD-0206)	3	NEC		Jun.2,'89
	(Measuring Instruments)				
8.	Optical Fiber Transmission Measuring Set (ME98B)	1	ANRITSU	10k to 30M Hz	Jun.2,'89
9.	Probe and Power Supply (MA44B)	2	- " -		Mar.20,'89
10.	Inpedance Transformer(50 to 75)(MP614A)	2	- " -	50 to 70 Ω	- " -
11.	Optical Spectrum Analyzer (AQ-6310B)	1	ANDO		- " -
12.	Optical Time Domain Reflectometer(OTDR)	1			Jun.2,'89
	(1) Mainframe (MW910C)	(1)	ANRITSU		
	(2) Unit (MH938C1)	(1)	ANRITSU		

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
13.	Optical Wave Monitor	(AQ-5510)	1	ANDO		Mar.20,'89
14.	White Light Source	(AQ-4303B)	1	ANDO		- " -
15.	Averager	(MH911A)	1	ANRITSU		Jun.2,'89
16.	Optical Branch Coupling Unit		1set	ANRITSU		- " -
	(1) Optical Key Box Main Frame	(MZ105A)	(1)			
	(2) Optical Branch Coupling Unit	(MN910A)	(1)			
17.	Attenuater Switch		1set	ANRITSU		- " -
	(1) Optical Key Box Main Frame	(MZ105A)	(1)			
	(2) Optical Attenuator Unit	(MN932A)	(1)			
	(3) Optical Switch Unit	(MN931A)	(2)			
18.	Stabilized Light Source	(AQ-4137)	1	ANDO		Mar.20,'89
	LD Unit	(AQ-4139)	1	ANDO		
19.	Visible Light Source	(AQ-4302)	1	ANDO	He-Ne Laser	- " -
20.	Optical Power Meter	(AQ-1135E)	1	ANDO		- " -
	Power Sensor	(AQ-1973)	1	ANDO		
	Connector Adapter	(AQ-1918(FC))	1	ANDO		
	Bare Fiber Adapter	(AQ-9302)	1	ANDO		
21.	Optical Fiber(GI)	(EG-51102)	20km	SUMITOMO	Multimode 2x10km	-"-
22.	Optical Fiber(SM)	(ES-1/10)	30km	SUMITOMO	Single mode 3x10km	-"-
	FC Connector(Plug)		10	SUMITOMO		
23.	Bare Fiber Connector(V-ditch type)		10	SUMITOMO		-"-
24.	Optical Fiber Cutter	(FC-3)	2	SUMITOMO		-"-
25.	Mode Scrambler	(MZ106A)	1	ANRITSU		Jun.2,'89
26.	Optical Fiber Jacket Rimover		2	SUMITOMO		
27.	Dummy Fiber		1	SUMITOMO		Mar.20,'89
28.	Optical fiber Cord for Base Band Measurement					
		(J0282)	1	ANRITSU		- " -
29.	Optical Fiber Cord	(J0200B-2m)	5	ANRITSU		- " -
		(J0200B-4m)	5	- " -		
		(J0056B-2m)	5	- " -		
		(J0056B-4m)	5	- " -		
30.	OPtical Fiber Code Adapter					- " -
	(1) FC-Adapter	(FC-A)	12	- " -		
	(2) FC-Plug<FC-1-2M-GI>	(J0303)	12	- " -		
31.	Digital transmission Analyzer	(ME520B)	1	- " -	Including ME520B-1	Jun.2.'89
32.	Frequency Synthesizer	(MG440C)	1	- " -		Mar.20,'89
33.	Jitter Moduration Oscillator	(MH370A)	1	- " -		Jun.2.'89
34.	Storage Oscilloscope model 7633		1set	SONY TEKTRONICS		- " -
	(1) Main frame	(7633 OP A2)	(1)		DC to 100MHz	
	(2) Time Base	(7B53A)	(1)			
	(3) Camera	(C4 OP.02)	(1)			
	(4) Amplifier	(7A26)	(1)			
	(5) Voltage Probe	(P61-6A)	(1)		250MHz	

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
35.	PCM MUX Tester		1set	ANRITSU		Jun.2,'89
	(1)	(MS339A)	(1)			
	(2)	(MH340A)	(1)			
	(3)	(MH341A)	(1)			
	(4)	(MH342A)	(1)			
	(5)	(MZ90A)	(1)			
36.	Printer Paper for AQ-6310B		5	ANDO		Mar.20,'89
37.	Printer Paper for 520B		5	ANRITSU		- " -
	Digital Microwave Transmission Equipment					
38.	2GHz Digital Microwave Equipment	(TRP-2G8MB-770)	1sys	NEC	1x8MB 2GHz band +20dBm,DC-48V,BR CKT	Jun.2 '89
39.	RF Attenuator(with connector cable)		1	NEC		- " -
40.	2GHz Parabolic Antenna		1	NEC	2GHz band 1.2mdia. Grid Prabolic	- " -
41.	Coaxial Switch	(MP59B)	2	ANRITSU		Jun.2 '89
42.	Accesories		1lot	NEC	cord,adapter,etc.	
43.	Spare Parts			NEC		Jun.2 '89
	(1) Transmitter(for +20dBm)		2			
	(2) Voltage Control Oscillator(for TX)		2			
	(3) Crystal (for RX)		2			
	(4) Phase Demodulator		1			
	(5) TX Digital Processor Unit		1			
	(6) RX Digital Processor Unit		1			
	(7) DC-DC Converter		1			
	(Measuring Instruments)					
44.	Power Meter			ANRITSU		Jun.2 '89
	(1) Power meter	(ML4803A)	1		100kHZ to 140GHz	
	(2) Power sensor					
	•For high level COX	(MA4701A)	1		10MHz to 18GHz, -30 to +20dBm Amolfas power sensor	
	•For low level COX	(MA4702A)	1		10MHz to 18GHz -70 to -20dBm Diode power sensor	
	(3) 30dB Attenuator for sensitivity calibration	(MP47A)	1			

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
45.	Frequency Counter	(MF76A)	1	ANRITSU	10M to 18GHz	Mar.20 '89
46.	Spectrum Analyzer	(MS710F)	1	ANRITSU	2 bands • 100KHz to 2GHz, • 1.7GHz to 23GHz	Mar.20,'89
47.	Stereo Signal Demodulator	(HSD-508)	1	ANDO	Input frequency - " - • monoral 20Hz-15kHz • stereo 20Hz-53kHz	
48.	Signal Generator	(MG724A1)	1	ANRITSU	1.7 to 2.3GHZ	Jun.2,'89
49.	IF Tester	(MS546B)	1	ANRITSU	70/140MHz two bands	Jun.2,'89
	Digital PABX Equipment	(NEAX2400)	1sys	NEC	Bangkok Port:May 09 '91 KMITL :Jun 04 '91	
(PABX Mainframe)						
50.	NEAX2400 IMS MMG Main Unit - 32 line with Dual-1 redundancy - Maintenance administration terminal - Printer for fault report - Technical documents (English 3 copies)		1			
51.	Digital Interface for NEAX2400 IMS - 30 DIT x 2 - PLOA x 2 - Cables - Spares (30 DIT, PLOA)		1			
52.	Analog Interface for NEAX2400 IMS - 16LC x 2 - 8 COT x 1		1			
53.	Consumable Spare Parts		1 lot			
54.	Spare Packages					
	- 16LC (Line Circuit)		1			
	- 8COT (C.O.Trank)		1			
	- 8DLCH (Digital Line Circuit)		1			
	- 4DTL (Data Line)		1			
	- 4MDMT (Modem Trank)		1			
	- IMG PROG. 4222 (Program Package)		1			
55.	M.D.F. with Installation Materials		1 lot			
56.	Power Supply Equipment					
	- Rectifier (100A, single)		1			
	- Battery (600AH, Lead Acid, 6HR)		1 lot			
57.	Modem Pooling Equipment - 4MDMT & Cable x 1 - DATAX SP 2424AA x 1		1			
58.	PA-M00 Extension Package		1			

No.	Equipment	Quantity	Supplier	Remarks	Arrival Date
(Terminals)					Mar. '91
59.	NEAX2400 DA-005A Data Adapter (C/W AC/DC)	2			
60.	NEAX2400 DT-001A Data Module (C/W AC/DC)	2			
61.	D-Term 160 Digital Multifunction	4sets			
62.	Personal Computer (APC-IV Power-Mate 286 plus)				
	- Main Unit	2			
	(MM:3MB, FDD:1.2MB, HDD:40MB, Key-board, Color display)				
	- Printer PG300 (Dotmatrix Printer)	2			
(Measuring Instruments for NEAX2400)					Mar. '91
63.	M1011A Test Handset	1			
64.	1224B PBX Tester	1			
65.	Manual Wrapping Tool	2			
66.	Manual Unwrapping Tool	2			
67.	8012 JN Portable Field Service	1			
(Others : Interface to Multiplexer Unit)					Mar. '91
68.	Interface Unit(for NE5520A 8M Digital Mux.)	1			
69.	Power Unit (for NE5520A 8M Digital Mux.)	1			
70.	Control Unit (for NE5511A 2M PCM Mux.)	1			
71.	Receiver Unit (for NE5511A 2M PCM Mux.)	1			
72.	Power Unit (for NE5511A 2M PCM Mux.)	1			
(Measuring Instruments)					Mar.29 '91
73.	Logic Analyzer (YHP 1652B)		YHP		
	- YHP 1652B	1			
	- Printer (2225DK)	1			
	- Cable (YHP 13242-60010)	1			
74.	Dinamic Signal Analyzer (YHP 35660A)		YHP		
	- YHP 35660A	1			
	- Instruments BASIC (35680A)	1			
	- Probe (10430A)	1			
75.	Function Generator (YHP 3314A)		YHP		
	- YHP 3314A	1			
Equipment supplied in FY 1991 and FY 1992					
76.	Digital Microwave Training Kit		HYORO HITECH		Sept.25'91
	- ASK,FSK,PSK Modulator (Type 4252)	1			
	- ASK,FSK,PSK Demodulator (Type 4253)	1			
	- Stabilised Triple Power Supply	1			
77.	Digital Storage Oscilloscope (Model DS-8631)	1	IWATSU		Oct.8'91

2. 専門家携行機材 (Equipment Accompanied by Experts)

No.	Equipment	Quantity	Supplier	Remarks	Arrival Date
A. 河本専門家 (Mr.Komoto)					
1.	Electronic volt meter (Model 163A)	1	KIKUSUI(菊水電子)		Apr. '89
2.	Digital multimeter (Model DME1400)	2	KIKUSUI		
3.	Power supply (Model PAB 250)	1	KIKUSUI		
4.	PD module (FFC-R-2208)	1	FUJIKURA(藤倉電線)		
5.	LED module (FFC-R-1013)	1	FUJIKURA		
6.	Optical fiber code (FFC-1P-2M)	2	- " -		
	(FFC-2P-5M)	1	- " -		
7.	Optical connector adapter (FFC-A)	1	- " -		
8.	MSA to BNC plug conversion adapter	1	HIROSE(ヒロセ電機)		
9.	Hard disk unit for PC-9801 (HDD-40R)	1	EPSON		
10.	IBM-PC XT/AT emulation system PC board (PC-PC)	1	SESTEX(セステックス)		
11.	Power transformer 220v to 100v(AR-1000A)	1	?		
12.	OHP sheets (Optical fiber technology)	1 set	NTT		
13.	Diode power sensor (MA 4704A)	1	ANRITSU		May 9,'90
14.	2 pin SP3 CP cord 8m (2.5C-XW)	6	NEC		
15.	Coaxial adapter N-P•BNC-J (J0040)	2	ANRITSU		
	NC-P•BNC-J (J0055)	1			
16.	N<->APC-3.5 conversion connector (J0364)	1	- " -		
17.	Sensor cord for MA470A power sensor(J0370C)	1	- " -		
18.	Fixed attenuator-20dB (MA721D)	1	- " -		
19.	Optical fiber cord GI type (J0200D)	2	- " -	0.3m (for MB98B)	
	SM type (FC-2-1-SM)	2		1 m	
20.	Termination (BB-50M1)	2	IWATSU		
21.	Cord (SM3CV•CP-3CV)	4	NEC		Jul.20.'90
22.	Optical fiber cord(FC cord) (D4-FC)	4	NEC		
23.	Spare parts for 8M Digital MUX		NEC		
	(1) Multiplexer Unit (E32-483-R8247-0A00)	1			
24.	Spare parts for 2M PCM MUX		NEC		
	(1) Transmit control unit(E32-482-X1128-0B01)	1			
	(2) CTRL (E32-482-X1130-0A01)	1			
	(3) 4w 1E/M channel unit (E32-132-X1136-AA02)	1			
	(4) RTG16P2X1AA plug (A32-4CX0271-04)	2			
	(5) RTG16P2X1AA plug (A32-4CX0271-04)	2			

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
A. 河本専門家 (Mr.Komoto)						
25. Spare parts for 8M digital MUX				NEC		Aug.13,'90
(1) Demultiplexer	(E32-483-R8248-0A00)	1				
26. Spare parts for 2M PCM MUX				NEC		
(1) Channel unit for 2WFXS-B	(E32-132-X1149-AB00)	1		NEC		
27. Frequency shifter	(MH618)	1		ANRITSU		
B. 佐藤専門家 (Mr.Sato :NTT)						
1. Oscilloscope	(2430A)	1		Sony Techtronics		Aug.'90
C. 森屋専門家 (Mr.Moriya :Tokai Univ.)						Aug.'89
1. Dish antenna	(DSA-418C)	1				
2. Converter	(DSA-528E)	1				
3. Sattellite Receiver	(DSA-654E)	2				
4. Line amplifier	(US-3SE)	2				
5. Antenna	(10HR430)	2				
6. T.V. Antenna	(8V112)	1				
7. Antenna pole	(MP060-100V)	1				
8. Mast base	(MHB-1001)	1				
9. Mast anchor	(MAX27-82V)	1				
10. Cable	(7C-FVS)	1				
	(5C-FVS)	1				
11. Cork	(F-7SC)	1				
	(F-5SC)	1				
12. Flow meter	(XFS-1204)	1		MITSUBA DENKI (三ツ葉電機)		28 Dec.'90
13. Counter for flow meter with down transformer for 220V / AC adapter		1		—" —		
14. Frequency counter with AC adapter(200V)	(FC-863)	1		YOKOGAWA(横河インスツルメンツ)		
15. Recorder(LR4100 series)	(3711-2 2-B-0)	1		YOKOGAWA(横河電機)		
16. Ribbon cassette	(B9585SH)	6pcs		—" —		
17. Record paper	(B7617AH)	30pcs		—" —		
18. Pen cartridge (Red)	(B9586XA)	20pcs		—" —		
(Green)	(B9586XB)	20pcs				

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
C. 森屋専門家 (Mr.Moriya :Tokai Univ.)						
19.	FV Converter	(KAZ-731)	1	KOKO RESEARCH(ｺｺｳｹﾝｷｭｳｼｮ)		28,Dec.'90
20.	Program loader	(PL-1)	1	〃		
21.	Rain gauge	(34-T420)	1	OTA KEISOKU(大田計測)		
22.	VHF/FM transceiver	(C111E)	2sets	NIHON MARANTZ(日本ﾏﾗﾝﾂ)		
	Battery pack	(CNB111)	2sets			
	Desk top charger	(CSA-111E AC220V)	2sets			
23.	Wide band receiver	(AX700E AC220V)	1	NIHON MARANTZ(日本ﾏﾗﾝﾂ)		
24.	Signal level meter	(LFC-945)	1	LEADER DENSHI(ﾘｰﾀﾞ"電子)		
25.	Regulated DC power supply	(LPS-162A)	1	〃		
26.	Recorder	(Model:3065 YEW)	1	YOKOGAWA(横川電機)		13,Feb.'91
27.	Recorder	(D-72C)	1	RIKEN DENSHI		
28.	Recorder for rainfall	(RP2011)	1	OGASAWARA		
29.	Receiver	( )	1set	ANRITSU		
30.	Parabola Antenna	(GMS-100)	1set			
31.	BS Antenna (DX)	(DSA-405CM)	1	DSA		
32.	Cable for DX antenna					
	•100m	(5D-FB)				
	•100m	(5c-FVS)				
33.	Folding Chart	(B9501AH)	60pcs	YOKOGAWA		
	Folding Chart	(SP-10)	22pcs	RIKEN DENSHI		
34.	Ink		1set			
35.	Selective Level Meter	(SLM-42SP)	1	ANDO		
37.	Facsimile	(UF-2)	4	MATSUSITA		
D. 土井専門家 (Mr. Doi :NTT)						
1.	Digital transmission analyzer	(ME 520B)	1set	ANRITSU		Nov.'89
(1)	Main frame (with trans./rec. unit)		1			
(2)	Coaxial cable (2m)		4			
(3)	Power cord		1			
(4)	Fuse set		2sets			
E. 若林専門家 (Dr.Wakabayasi :Tokai Univ.) (東海大学)						
1.	Personal Computer			NEC		Aug.13,'90
(1)	Personal computer	(PC98C1EX2)	1			
(2)	Hard disk	(PC98C1EX35)	1			
(3)	Floppy disk unit	(PC9831MF2)	1			

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
E. 若林専門家 (Dr.Wakabayasi :Tokai Univ.) (東海大学)						
(4)	Display	(PCKD853N)	1			
(5)	Printer	(PCPR201J)	1			
(6)	Tracter feeder	(PCPR201X03)	1			
(7)	Sheet feeder	(PCPR201X04)	1			
(8)	Modem board	(PC98C1-57)	1			
(9)	Power source	(C-150)	1			
(10)	Transformer	(KD-1000)	1			
(11)	Air head	(M-15H)	1			
		(M-25)	1			
(12)	Ink ribbon		10			
(13)	Floppy disk 10pcs/box, 3.5inch 2HD		1box			
(14)	- " - , 5 inch		1box			
2.	Sweep oscillator	(8690B)	1	SHIMADA RIKA		Aug.1,'89
3.	Regular pressure wave detector	(3E030)	1	SHIMADA RIKA		- " -
F. 平栗専門家 (Mr. Hiraguri :NTT Longterm Expert)						
1.	Consumers for PC9801					Oct.2,'90
(1)	Floppy disk 10pcs/box, 3.5inch		1 box			
	10pcs/box, 5inch		3 boxes			
(2)	Printer ribbon	(PCPR201-01)	10 pcs			
2.	Books(CCITT Blue Book, etc.)					Dec.11,'90
3.	UPS 1000VR Power Saver		1	SISTA Business Sys.		Dec.25,'90
4.	UPS 1000VA (POWBACK)		2	SYNDOM Engineering and Consultant Co.		Mar.17,'91
G. 鈴木専門家 (Mr.Suzuki :Special lecturer of the 14th group training course)						
1.	Digital telephone set		4 sets	NTT		Mar.29,'91
	Transformer		4 sets			- ditto -
2.	Electronic OHP		1 set	NTT-LS		- ditto -
	Transformer		1 set			- ditto -
H. 松浦専門家 (Dr.Matsuura :Tokai Univ.) 東海大学						
1.	Scalar Network Analizer	(Model 560)	1	WILTRON		Aug.2,'91
2.	Sweep Frequency Measure System	(Model 1038)	1	PACIFIC MEASUREMENT INC.		- ditto
3.	Sweep Oscilator	(Model 8620C)	1	YHP		- ditto
	RF Unit	(Model 86240A)	1	YHP		- ditto

No.	Equipment		Quantity	Supplier	Remarks	Arrival Date
H. 松浦専門家 (Dr. Matsuura :Tokai Univ.) 東海大学						
5. Personal Computer						Aug. '91
(1) Personal Computer	(PC-9801 DX2)		1	NEC		
(2) Hard Disk	(LHD-540N)		1	NEC		
(3) Printer	(HG-4000PC)		1	NEC		
(4) EMS Board	(EMJ-2000L)		1	NEC		
(5) Digitalizer	(KD-3310)		1			
(6) Tablet Pen	(KD-0021C)		1			
(7) Connection Cable	(CB-0045)		1			
(8) Transformer	(1000AE)					
(9) Floppy Disk			5 boxs			
(10) Color Display	(PC-KD-882)		1			

Annex 1-2

EQUIPMENT IN THE FIELD OF BROADCASTING

Item	Name of Equipment	Quantity	No
1	SYNC. Generator (PAL 1411R)	1	88-B1
2	Waveform/Vector Scope (PAL 1751)	1	88-B2
3	Gain/Delay Measurement (MS 321A/A1)	1	88-B3
4	3 Tube Camera (PXC-M3APK/MK2)	1	88-B5
5	Tripod for Camera (WT-204)	1	88-B6
6	Oscilloscope (100 MHz 2PHe. 2236, with Caster)	1	88-B7/21
7	Waveform Monitor (PAL 1481R, with Input Circuit)	1	88-B8/26
8	Oscilloscope (150 MHz 4PHe. 2445B)	1	88-B9
9	TV-Signal Generator (PAL TSG271, with Audio SG)	1	88-B10/23
10	Audio-Tone Burst Generator (506)	1	88-B11
11	Comm. Satellite Receiver (SR-500)	1	88-B12
12	Personal CPU (16 bits) (APC-TV,with GP-IBI/F board)	1	88-B13/24
13	X-Y Plotter (SR-6310)	1	88-B14
14	Personal CPU (16 bits) (APC-TV,with GP-IBI/F board)	1	88-B15/16
15	Oscilloscope (100MHz 2PHe. 2236, with caster)	1	88-B17/21
16	Pulse Generator (PG 501)	1	88-B18
17	Color Monitor (CMM20-7/2)	1	88-B19
18	Camera for Waveform (C5-C)	1	88-B20
19	Test-Chart (8 kinds)	1	88-B22
20	Probe for Oscilloscope (P6108A, X2)	1	88-B25
21	Stereo Measurement Set (856 A)	1	89-6
22	Component WFM.	1	89-7
23	Network Analyzer (MS 3401A)	1	89-9
24	Video Noise Meter (925D)	1	89-11
25	Digital Oscilloscope (2230)	1	89-12
26	Function Generator (FG 504)	1	89-14
27	Video Sweep Generator (SV 11 A)	1	89-13

Item	Name of Equipment	Quantity	No
28	Personal CPU (16 bits) (APC-H2020E)	1	89-15
29	Oscilloscope (2235A,with cart)	1	89-16/28
30	Spectrum Analyzer (2710)	1	89-1
31	Logic Analyzer (1241)	1	89-2
32	F. Store/Synchronizer (P147-30)	1	89-3
33	Audio Analyzer (SYS-22A)	1	89-4
34	B-CAM. Corder (BVW-70P)	1	89-5
35	Component Signal Generator (TSG-300)	1	89-8
36	UHF-Transmitter (147B-R)	1	89-17
37	Color Monitor (CMM20-11/1.2)	1	89-18
38	Vector-Scope (1781R)	1	89-19
39	Audio Attenuator (STA-11)	2	89-21
40	Tripod for Cameca (VT-440)	1	89-22
41	U-Matic. VTR (BVU-950P)	1	89-23
42	White Balance Checker (CW80C)	1	89-24
43	Video Attenuator (M-215C)	2	89-20
44	Personal CPU (16 bits) (APC-H2020E)	1	89-25
45	Test-Chart	1	89-27
46	Tape for B-CAM. (Metal L)	10	89-30
47	Tape for U-Matic. (KSP-60)	10	89-31
48	Tape for U-Matic. (KCA-60BRS)	10	89-31
49	Probe for Oscilloscope (P6 108A)	10	89-33
50	B-CAM. Cleaning-Tape (BCT-5CL)	2	89-32
51	U-Matic. Cleaning-Tape (KCS-1CL)	2	89-32
52	Video Plotter (UA-455A)	1	89-10
53	Waveform Camera (C5-C)	1	89-26
54	Thraline RF Wattmeter (4410-030)	1	89-29
55	Field Strength Meter (ML518A, with Dipole)	1	89-(1)
56	Video Casette Recorder (AG-6200-ENZ)	1	89-(2)

Item	Name of Equipment	Quantity	No
57	Electric White Board (UB 1850)	1	89-(3)
58	Portable Digital Audio Tape Recorder	1	89-(4)
69	Digital Audio Tape Recorder (DTC-1000ES)	1	89-(5)
60	Disk Player (CLD-360)	1	89-(6)
61	A/V Monitor (TC-AV29XR)	1	89-(7)
62	Digital Audio Tape (DT-60R, DT-120R)	3, 10	89-(8)
63	Digital Multimeter (DMM 175)	2	89-(9)
64	V/A Distributor (EP-200)	1	89-(10)
65	Antenna Rotator (KR-800SDX,KR-1000SDX)	1	89-(11)
66	Antenna Tower (HS-3700W)	1	89-(12)
67	Parabola Antenna (CS-600S)	1	89-(13)
68	Tool set (S-75,S-81)	2, 2	89-(14)
69	BNC & Cable Joint Tool (3C-2V,5C-2V)	100, 100	89-(15)
70	Delay Line Trainer (P240 L211,P050D181)	2, 2	89-(16)
71	Wide Band Receiver (RZ-1)	2	89-(17)
72	Floppy Disk (MD2-D, MD2-256HD)	10, 10	89-(18)
73	Bread Board (WBU-206, WBU-208)	10, 10	89-(19)
74	A/D Convertor (HA 19210 TP)	10	89-(20)
75	Digital Signal Processor-IC (TM32010NL)	10	89-(21)
76	BBD-IC (MN3005)	10	89-(22)
77	Video & Audio Soft (CD, LO)	5, 2	89-(23)

Annex 1-3

EQUIPMENT IN THE FIELD OF MECHANICAL ENGINEERING

A. Equipment provided in 1988

Item	Name of Equipment	Quant.	Remark
1	Universal Testing machine	1	
2	Static strain meter	1	
3	Hardness tester	1	
4	Microscope	2	
5	Polishing attachment	1	
6	Electric furnace	1	
7	CNC milling machine	1	
8	Profile projector	1	
9	Roughness tester apparatus	1	
10	Dynamic strain meter	1	
11	Digital storage oscilloscope	1	
12	Pen recorder	1	
13	Printer	2	
14	Plotter	2	
15	Digitizer	1	
16	Pressure gauge calibrator	1	
17	Pitot tube	2	
18	Goettingen manometer	1	
19	Hot-wire anemometer	1	
20	Centrifugal wind fan	1	
21	Centrifugal water pump	1	
22	Electric power meter	1	
23	Multi-thermometer	1	
24	Millivolt ampere meter	2	
25	Millivolt ampere meter	2	
26	Centrifugal wind fan	1	
27	Engine performance testing apparatus	1	
28	Dynamic strain meter	1	
29	Pressure transducer	2	
30	Digital storage oscilloscope	1	
31	Pen recorder	1	
32	Oscillator	2	
33	Dynamic strain meter	5(2)	
34	Digital storage oscilloscope	3(1)	
35	Oscilloscope	6(2)	
36	Pen recorder	3(1)	
37	X-Y recorder	4(1)	
38	Universal counter	3(1)	
39	Stroboscope	2(1)	
40	One board micro-computer	8(4)	
41	DC power supply	8(4)	
42	DC power supply	6(3)	

43	DC power supply	6(3)
44	Personal computer	4(2)
45	Printer	2(1)
46	Plotter	2(1)
47	Function generator	6(2)
48	Mini control valve	1(1)
49	DC servo motor	3(3)
50	DC servo motor amplifier	3(3)
51	AC servo-motor	3(3)
52	AC servo-amplifier	3(3)
53	Step motor	10(10)
54	Step motor driver	5(5)
55	Digital controller	3(3)
56	Displacement sensor	2(2)
57	Brushless resolver	2(2)
58	Brushless resolver	2(2)
59	Acceleration sensor	1(1)
60	Acceleration sensor	1(1)
61	Torque sensor	1(1)
62	Torque sensor	1(1)
63	Load cell	1(1)
64	Personal computer	5(1)
65	Printer	5(1)
66	Plotter	5(1)
67	Pen recorder	5(1)
68	Color image input camera system	1
69	Graphic software	1
70	AD/DA board	1
71	Ram board	1
72	Color printer	1

B. Equipment provided in 1989

Item	Name of Equipment	Quant.	Remark
1	Personal computer	2	
2	Dynamic strain meter	2	
3	Dynamic strain meter	3(1)	
4	Dynamic strain meter	2	
5	Data recorder	1	
6	Oscilloscope	1	
7	Digital storage oscilloscope	5(1)	
8	Oscilloscope trace recording system	1	
9	Digital storage oscilloscope	3(1)	
10	Function generator	6(1)	
11	Camera	1	
12	Photo-printing equipment	2	
13	Multi-meter	10(2)	
14	DC amplifier	5(1)	
15	Hardness tester	1	
16	Hardness tester	1	

17	Microscope	2
18	Camera for microscope	1
19	TV-Camera	1
20	Polishing attachment	1
21	Electric furnace	1
22	Heat flux meter	1
23	Gas flow meter	1
24	Multi-thermometer	1
25	Mini control valve	1
26	Personal computer	2(1)
27	NEC-IBM PC soft converter board, NEC-IBM PC	2(1)
28	FFT analyser	1
29	Precision cutting machine	1
30	Test piece set equipment	1
31	Video tape recorder	1
32	Schlieren system	1
33	Printer	5
34	Plotter	5
35	Slit light supply	1
36	NOx analyzer	1
37	Infrared gas analyzer	1
38	Hydrocarbon gas analyzer	1
39	Pressure transducer	1
40	Hydraulic pump	1
41	Hydraulic pump	1
42	Hydraulic pump	1
43	Sound measurement system	1
44	Eddy current type dynamometer	1
45	Difference pressure meter	1
46	Pressure transducer	1
47	FFT analyser	1

C. Equipment provided in 1990

Item	Name of Equipment	Quant.	Remark
1	Scanning electron microscope	1	
2	Rotary bending fatique testing machine	1	
3	Recorder	2	
4	Digital storage oscilloscope	2	
5	Regulated DC power supply	2	
6	Drafting machine	35	
7	Dynamic strain amplifier	5	
8	Dynamic strain amplifier	1	
9	Static strain meter	1	
10	Lathe dynamometer	1	
11	Load cell	1	
12	Pressure transducer	2	
13	Acceleration transducer	1	
14	Acceleration transducer	1	
15	Acceleration transducer	1	

16	Torque transducer	1
17	Torque transducer	1
18	Lathe	2
19	Hydraulic pump	1
20	CNC lathe	2
21	Gap sensor	2
22	Air compressor	3(1)
23	Electronic control motor	2
24	Blower	1
25	Grinding machine	1
26	Stepping motor	6
27	Stepping motor	6
28	DC Servo motor	2
29	AC Servo motor	2
30	Encorder	6
31	Potentiometer	1
32	Hydraulic motor	2
33	Electro hydraulic servo valve	2
34	Amplifier for servo valve	2
35	Personal computer	4
36	Milling	1
37	Brand vertical metal cutting bandsawing machine	1
38	Air compressor	1
39	Stainless rod	1
40	Variable speed motor	1
42	Arc welding	1

D. Equipment provided in 1991

Item	Name of Equipment	Quant.	Remark
1.	Milling machine	1	
2.	Image storage system for electron microscope	1	
3.	Automotic control simulator	2(1)	
4.	Robot	2(1)	
5.	Attachment for universal tester	1	
6.	Slip gauge	2	
7.	Variable speed motor	1	
8.	Lathe	1	
9.	X-ray micro analyser	1	
10.	Three dimensional measurement machine	1	
11.	Automatic control eductional system	1	
12.	Smoke analyser	1	

*The quantity number in brackets are for Control Engineering Department.

Annex 2 - 1

Telecommunications Laboratory I
2nd Year Students
1st Semester/2534 (1991)

No.	Title	Instructor	Equipment
1.	Grid Dip Meter	Mr. Roong P.	- Multi Band Radio Receiver - Short Wave Trans--mitter - Antenna - Resonant Circuit
2.	Line Measurement I	Mr. Kemthong N.	- Optical Fiber Cutter - Splicing Machine
3.	Signal for Automatic Switching	Mr. Suchin J.	-
4.	Teleprinter	Mr. Sukhon N.	- Teleprinter

Annex 2 - 2

Telecommunications Laboratory I
3rd Year Students
1st Semester/2534 (1991)

No.	Title	Instructor	Equipment
1.	Digital Microwave Labolatory I	Mr. Narong H.	- Digital Microwave Equipment - Digital Transmission Analyzer - Oscilloscope - 700 S Extension Card 300 - 700 S Extention Cord 2000 - Connector - Attenuator - Adapter - Impedance Transformer - Spectrum Analyzer - Frequency Synthesizer
2.	Switch Capacitor	Mr. Pramote W.	- Signal Generator - Oscilloscope - Power Supply - Proto Board - IC Circuit FM 5
3.	Microwave Measurement	Mr. Monai K.	- Signal Generator - Directional Coupler

No.	Title	Instructor	Equipment
			- Power Meter - Applicator and Accessory - Microwave Heating System
4.	Ampitude Modulation-Demodulation	Mrs. Nipa L.	- Modulator-Demodulator - Trainer - Oscilloscope
5.	Telex	Mr. Sukhon N.	- Telex CX-5
6.	Single Side Band (SSB)	Mr. Roong P.	- VOM Meter (Volt Ohm Amp Meter) - Standard Signal Generator - Oscilloscope - Frequency Counter - Dummy Load Antenna - Two Tone Signal Generator
7.	DTMF Signalling	Mr. Suchin J.	-
8.	Optical Fiber Measurement	Mr. Apinun M.	- Light Source - Optical Fiber - Optical Power Meter - Microscope - Laser - Large Size Optical Fiber ROD

No.	Title	Instructor	Equipment
9.	Balance Modulation	Mr. Somyot J.	- Oscilloscope - Function Generator
10.	Mobile Antenna Characteristics	Mr. Sompol K.	- Tracking Generator - Spectrum Analyzer - Direction Coupler - Dummy Load
11.	Metallic Cable Measurement	Mr. Kemthong N.	- Wheat Stone Bridge - DC Power Supply - VOM - Cable Foult Locator
12.	Digital Multiplexer Measurement I	Mr. Thawil K.	- PCM Digital signal Analyzer - Synthesizer MG 440C - PCM Channel Test Set
13.	Measurement of Microwave Training Kit	Dr. Suvipol S.	- Klystron Power supply - Klystron Mount 2K25 - Variable Attenuator - Frequency Meter - Precision Type Attenuator - V.S.W.R Amplifier - Crystal Mount - Dummy Load 2 - Movable Short - Magic Tee - Directional Coupler

Annex 2 - 3

Telecommunications Laboratory II
3rd Year Students
2nd Semester/2534 (1991)

No.	Title	Instructor	Equipment
1.	S.S.B Receive Aligiment	Mr. Roong P.	- Oscilloscope - Frequency Counter - Dummy Load Antenna
2.	Digital Speech Path	Mr. Somyot J.	- Personal Computer - A/D, D/A Card - Telephone Set
3.	Standing Wave Measurement by Leader Wire	Mr. Sompol K.	- Direction Coupler - Dummy Load - Spectrum Analyzer
4.	Optical Fiber Measurement II	Mr. Apinun M.	- GI-Type Optic Fiber - O T D R - Connector Adaptor - Bare Fiber Adaptor
5.	Facsimile	Mr. Sukhon N.	- Facsimile Set
6.	Digital Multiplex Measurement II	Mr. Thawil K.	- PCM Digtal Signal Generator - Oscilloscope - Digital Transmission Analyzer - Optical Attenuator - Optical Switch - Optical Power Meter

No.	Title	Instructor	Equipment
7.	Optical Fiber Splicing	Mr. Kemthong N.	- PCM Multiplex Tester - Splicing Machine - Optical Fiber Cutter
8.	Digital Microwave Measurement II	Mr. Narong H.	- Digital Microwave Equipment - Digital Transmission Analyzer - Frequency Synthesizer - Oscilloscope - Extension Card 300 - Extension Cord 2000 - Attenuator
9.	FM Stereo Multiplex	Mrs. Nipa L.	- FM Stereo - Stereo Signal Demodulator

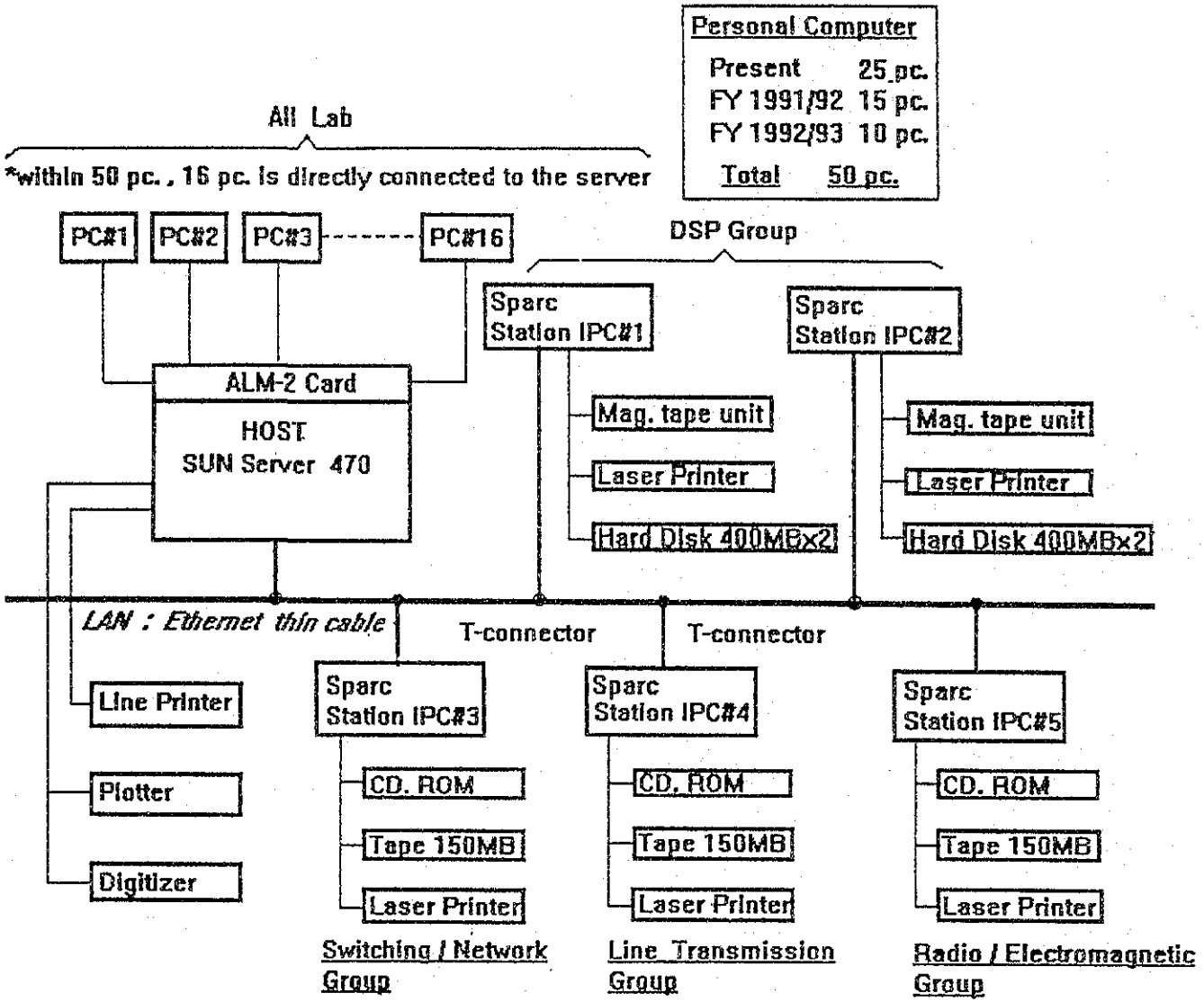
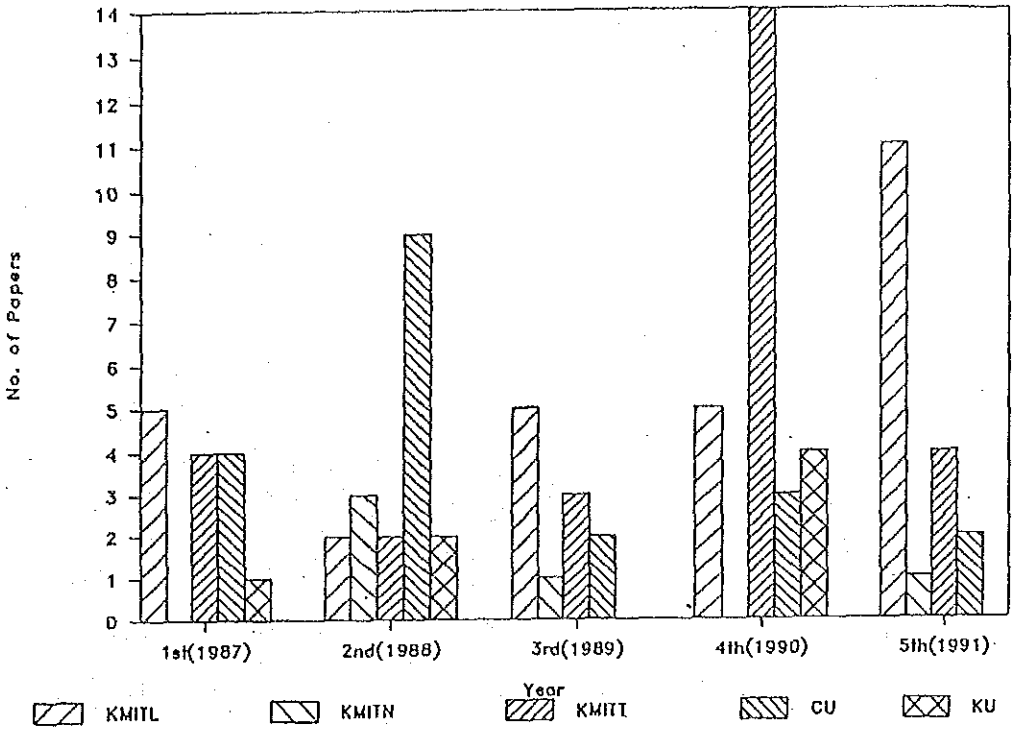
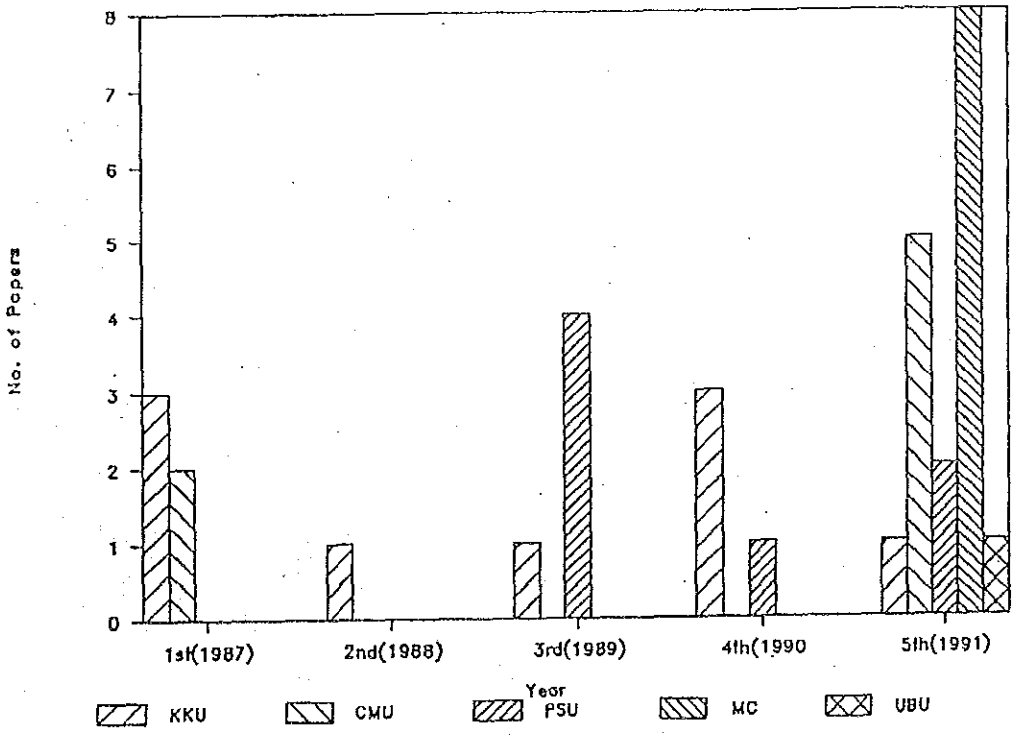


Fig.1 Telecom Mini - LAN System

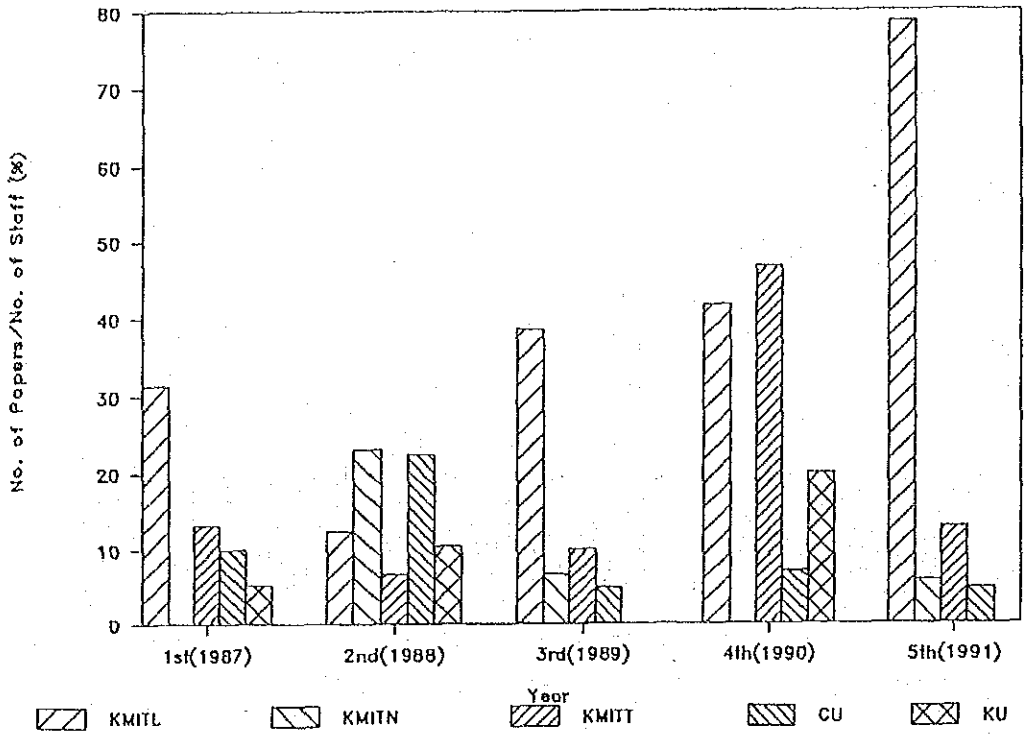


(a) Universities in Bangkok

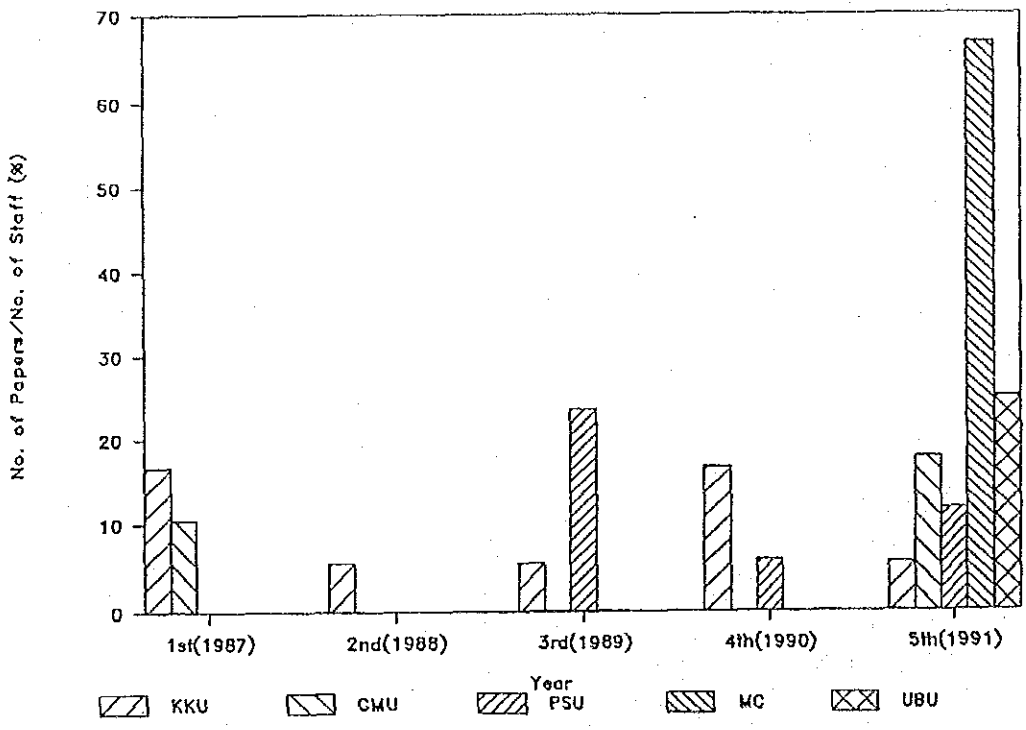


(b) Provincial and Private Universities

Fig.1 Number of Technical Papers Presented at 1st-5th Mechanical Engineering Symposium



(a) Universities in Bangkok



(b) Provincial and Private Universities

Fig.2 Ratio of Presented Papers to Number of Educational Staff

Annex 5

MINUTES OF DISCUSSIONS ON

THE TECHNICAL COOPERATION FOR

THE EXPANSION PROJECT OF KING MONGKUT'S

INSTITUTE OF TECHNOLOGY LADKRABANG

The Japanese Mutual Consultation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (JICA), visited the Kingdom of Thailand from December 14 to 22, 1990 and had a series of meeting with the authorities concerned of the Government of Thailand (hereinafter referred to as "Thai side") on the implementation of the Japanese Technical Cooperation for the Project of the King Mongkut's Institute of Technology Ladkrabang (hereinafter referred as "the Project").

Both sides discussed the progress of the Project based on the report which Thai counterparts prepared for the third joint meeting in consultation with the dispatched Japanese experts.

As the results of the discussions, the Team and Thai side agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

December 21, 1990
Bangkok, Thailand

Mr. Junsaku Koizumi
Leader,
Mutual Consultation Team,
Japan International Cooperation
Agency

Dr. Kosol Petchsuwan
Rector,
King Mongkut's Institute of
Technology Ladkrabang

Attached Document

1. PRESENT SITUATION OF THE PROJECT

Both sides reviewed the achievements up to the present stage, and confirmed that the implementation of the Project was smoothly making progress in general, in line with the schedule which was planned in the Record of Discussions.

2. INPUT

(1) Assignment of Japanese Experts

Both sides confirmed on assignment of Japanese experts for FY 1991 as follows:

1) Long-term experts

Fields	Number of experts
Chief Advisor (Data Communication)	1
Telecommunication	1
Broadcasting	1
Mechanical Engineering	1
Coordinator	1
Total	5

2) Short-term experts

Appropriate number of short-term experts will be decided in accordance with the annual work plan of technical transfer and research activities.

(2) Counterpart Training in Japan

Both sides recognized that counterpart training in Japan would be undertaken not only in private sectors but in certain academic

institutes along with the contents of technological transfer and research activities.

(3) Provision of Equipment for FY. 1991

Appropriate equipment will be decided in accordance with the annual work plan of technical transfer and research activities.

3. OUTPUT

(1) Curriculum

The Team recognized that development of level and content of the curriculum made smooth progress in line with the schedule which was planned in the Record of Discussions and the annual Joint Meeting.

(2) Textbooks

The Team was reported that the counterparts were developing the textbooks in consultation with the Japanese experts as scheduled.

(3) Counterparts

Both sides confirmed that the proper number of counterparts had been assigned for the experts and the technological transfer was making the smooth progress.

(4) Research activities

The Team recommended Thai side to take necessary measures in order to more activate research for the latter part of the cooperation period.

4. SUSTAINABILITY OF THE PROJECT

The Team drew attention of the Thai side to importance of sustainability of the Project after duration of the Japanese cooperation, and suggested the Thai side to take necessary measures as follows.

(1) Maintenance/Calibration of the equipment

The Japanese side recommended to establish some sort of system for the continuous maintenance and calibration of equipment as soon as possible.

(2) Budget

The Team evaluated the effort of Thai side that the proper budget had been secured for maintenance for the equipment in the field of data communication requested by the Advisory Survey Team in 1989, and asked for its continuous efforts so that the Project could be sustained by Thai side at the earliest possible stage.

(3) Periodical meetings

Both sides recognized that the contents of research activities as well as education had been developed in line with the Record of Discussions. The Team, however, recommended Thai side to organize and activate periodical meetings through which researchers from not only same department but different departments would be able to exchange their views for further development of the Project.

附 属 資 料　2.

情報工学部に係るKMITLの構想

THE PHILOSOPHY OF NEW FACULITY

FACULTY OF INFORMATION TECHNOLOGY

1. Banckground of establishment of new faculty

The economic growth of Thailand during the past few years has been remarkable. The country has been train into the production base of verious foreign investors namely Japan, USA., Taiwan etc. To justain such economic growth, it is crucial that the country must keeps up with the demand on human resources in science and technology especially in information technology. The country therefore needs to produce the qualified personel in information technology. As a leading technical institute in science and technology, King Mongkut's Institute of Technology Ladkraband must take the initiative to answer such needs. This may be done in selling up a new faculty in informaion technology. As it is very new to the local people together with the fact that Japan has already had experiences in information technology and industry, it is therefore very appreciate that the cooperation should be set up for this purpose.

2. Purpose of establishment of Information Technology.

2.1 To produce technologists and scientists in information technology.

2.2 To conduct research and development activities in information technology for the benefit of the country.

2.3 To provide academic services in information technology to both the public and private sectors.

3. *THE VISION - INFORMATION TECHNOLOGY*

Information technology or IT is a relatively new term. But the concepts it embodies - the use of man-made tools for the collection, generation, communication, recording, re-arrangement and exploitation of information - goes back a long way in history : A forty five thousand year history, traced back to the extant maps of Mesopotamia, has been claimed for IT. The contemporary popularity of the concept of 'IT' cannot be explained fully by the remarkable progress achieved in the development of microelectronic devices like the microcomputer, facsimile machine, cellular telephone and the like, even though such devices are fast becoming pervasive in our society.

The picture could perhaps be completed by another trend, this time a socio-economic one acting from the demand side : as we progress beyond the industrial society, more and more people are engaged in the handling of information. The dominance of information-sector occupations (when more people are engaged in the handling of information then in producing food, manufacturing goods or providing services) has been observed in many advanced countries. Since IT is a productivity tool for the information workers, the potential impact of IT should expand in relation to the expanding information workforce.

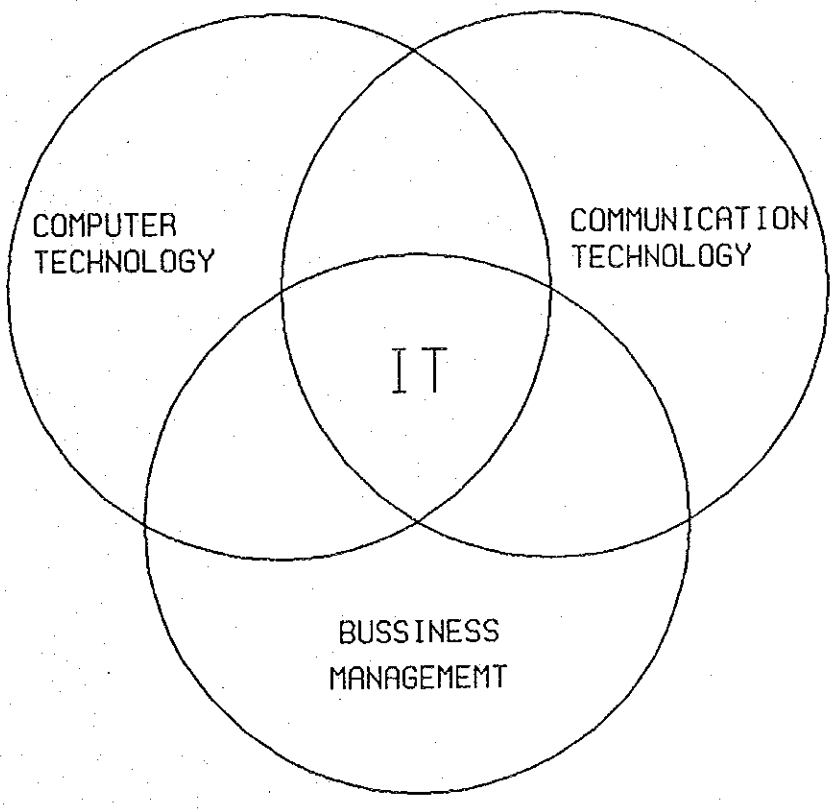
The convergence of these two trends - the proliferation of more and more cost-effective information technology devices, and the seemingly inexorable growth in information handling occupations - will bring about the Information Age. From a social point of view, IT promises changes in the way we communicate and reach decisions. From an economic viewpoint, IT promises productivity improvement in information handling, of the same order as those already experienced in the mechanisation and automation of agriculture and manufacturing. From the personal point of view, IT promises more power for the individual to navigate through an information rich environment.

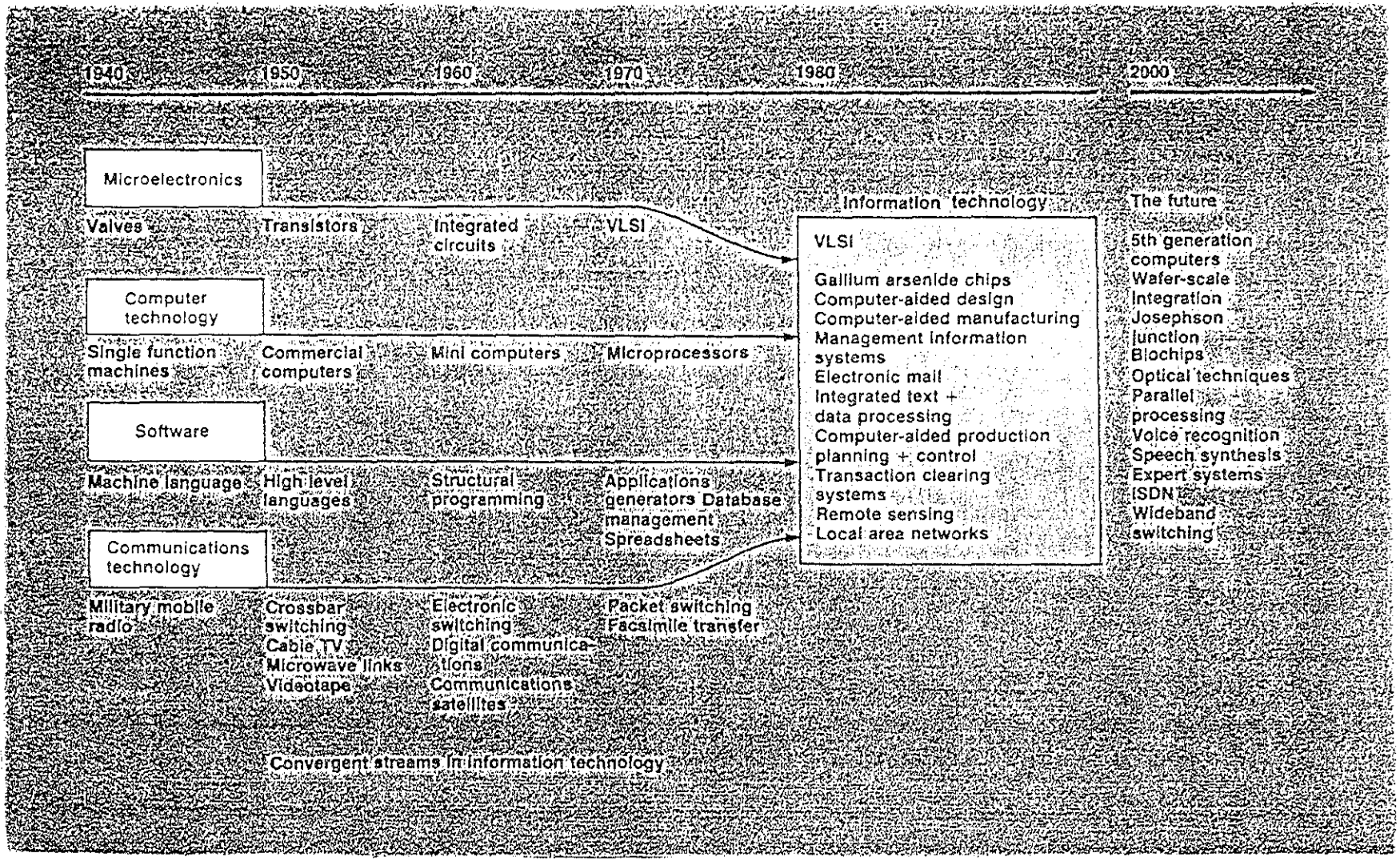
More power to navigate through an information rich environment.

4. THE IT MANPOWER (THE PRODUTION)

The National IT Plan envisages the development of a corps of IT professionals who combine an indepth knowledge of the technology with an innovative approach to exploiting it. In terms of expertise level, the technological capalility of our IT manpower has to be upgraded to meet the demands of system integration and other high value adding activities, and to provide enough R&D calibre software engineers to meet the needs of the software development centres which country wants to attract through investment promotion. The challenge for IT manpower development lies in producing more high calibre IT specialists and in mobilising the available expertise for critical projects.

5. TECHNOLOGY INVOLVED




1940
1950
1960
1970
1980
2000
Microelectronics
Valves
Transistors
Integrated circuits
VLSI
Computer technology
Single function machines
Commercial computers
Mini computers
Microprocessors
Software
Machine language
High level languages
Structural programming
Applications generators Database management Spreadsheets
Communications technology
Military mobile radio
Crossbar switching
Cable TV
Microwave links
Videotape
Electronic switching
Digital communications
Communications satellites
Packet switching
Facsimile transfer
Convergent streams in information technology
Information technology
VLSI
Gallium arsenide chips
Computer-aided design
Computer-aided manufacturing
Management information systems
Electronic mail
Integrated text + data processing
Computer-aided production planning + control
Transaction clearing systems
Remote sensing
Local area networks
The future
5th generation computers
Wafer-scale integration
Josephson junction
Biochips
Optical techniques
Parallel processing
Voice recognition
Speech synthesis
Expert systems
ISDN
Wideband switching